

STATE OF WASHINGTON
Department of Conservation and Development
W. A. GALBRAITH, Director

Water-Supply Bulletin No. 6
Monthly and Yearly Summaries
of Hydrographic Data

IN THE
State of Washington

To September, 1953

Division of Water Resources
MURRAY G. WALKER, Supervisor
Olympia, Washington

Prepared cooperatively by Department
of the Interior

UNITED STATES GEOLOGICAL SURVEY
Water Resources Division

F. M. VEATCH, District Engineer
Tacoma, Washington

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In Memory Of
Charles J. Bartholet



Water users of the State of Washington will always be indebted to Charles J. Bartholet for his 37 years of service to the public of the State, in fairly administering the Water Code and thus giving stability to the water rights for diversions from our streams. More recently he was instrumental in establishing the Ground Water Code, so that the users of ground waters could have their rights protected too.

Charles Bartholet came from a prominent pioneer family. Both his grandfathers settled in the Yakima valley in the 1860's. His father, Matt Bartholet, was at various times auditor and treasurer of Yakima County and mayor of Ellensburg. Charles first practiced engineering in the surveys and construction of Kittitas County irrigation canals and the Milwaukee Railroad. For three years, 1906 to 1909, he was resident engineer on the latter. Then, as an engineer for the Land Department of the Northern Pacific Railway Company he made water power surveys on Klickitat River and made the original surveys for the Roza and Kennewick projects in the Yakima Valley. He was with the State Highway Department on the Snoqualmie Pass and other highway surveys from 1914 to August 1917 when he came into the Department of Conservation and Development as Assistant Supervisor of Hydraulics. He became Supervisor in November 1929 and, except for serving as consulting engineer from 1945 to 1949, held the position of Supervisor until his death on June 23, 1954. He served under nine Directors of the Department of Conservation and Development, and six Governors. From 1917 to date, 17,900 applications for water rights were filed in his office for irrigation, power, domestic, industrial, and other uses of water.

Mr. Bartholet is survived by his wife, Irene Wilson Bartholet, two daughters, Mrs. Mary Tulet and Marjorie Bartholet, and two sons, Charles Jr. and Robert. He was a member of the Knights of Columbus, American Society of Civil Engineers, Western Association of State Engineers (president 1940), the Washington and National Reclamations Associations, the Thurston County Poggie Club, and the Western Washington Reclamation Institute. The organization last named presented him posthumously with a Certificate of Appreciation for "devoted and faithful service rendered" as a hydraulic engineer and as State Supervisor of Water Resources.

Charles Bartholet early recognized the prime importance of water resources to the development of the State of Washington and to the national defense. He utilized the annual (since 1909) cooperative program with the United States Geological Survey for obtaining the coordinated State-wide collection and publication of the basic water data needed by his office and by the people of the State. His tact, fairness, and non-partisan attitude in dealing with the public, combined with his broad knowledge of hydraulics and of the State's water problems made him a great asset to the Department at all times, regardless of the political party in power. It is to the memory of his long impartial service to his fellow man that this publication is dedicated.

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PURPOSE OF REPORT

Streamflow records in the State of Washington to the end of September 1953, representing an aggregate of about 7,100 station-years of discharge record from 693 gaging stations, are summarized in this volume. Only 277 of the discharge gaging stations are still in operation. A number of stage records on lakes and reservoirs are also being obtained.

Water-Supply Bulletin 5 and preceding volumes have summarized streamflow records in successive groups of years from 1878 to 1933; however, the supply of these publications is nearly exhausted. Therefore, with the availability of an additional 20 years of record since the publication of Bulletin 5, and with the advantage of a recent complete review of all streamflow records in the State to September 1950 by the U. S. Geological Survey, it is timely that another bulletin containing all records since 1878 be published. Nearly all the records presented are for the discharge of streams. Only a few stage records of lakes and reservoirs are given.

Streamflow data in this State are becoming more urgently needed and widely used each year, due to the increased use of our water for domestic and industrial supply, irrigation, fish propagation, power development, and many other purposes.

COOPERATION

Since 1909, successive Washington State legislatures have appropriated funds for cooperative hydrographic and topographic surveys within the State. The surveys are made by the U. S. Geological Survey, and investigations are financed by equal allotments of State and Federal funds. The hydrographic data contained herein have been compiled as a part of this cooperative program.

ACKNOWLEDGMENT

Manuscripts and tables contained in this volume have been prepared by Marian L. Crosby, Lucille I. Peterson, and Elaine F. Crawford under the direct supervision of Henry C. Broom, Hydraulic Engineer, U. S. Geological Survey.

EXPLANATION OF DATA

The data presented in this bulletin are assembled for water years ending September 30, with few exceptions, which is the month-end considered by most users of hydrographic data to be nearest the end of the annual hydrologic cycle. For the convenience of those who use the data for other purposes, a summary on a calendar year basis is also included.

Base data collected at gaging stations consist primarily of records of river stage and measurements of discharge. The river stage has been obtained by several methods ranging from manually-read staff gages in early years to automatic water-stage recorders in recent years. Discharge measurements are made by field personnel by means of combining the measured area and velocity of the stream at the station to give the flow in cubic feet of water per second of time. With this information available, rating tables are developed for each gaging station. The rating table is verified by check measurements made on the average of every 4 to 6 weeks throughout the year.

Daily discharges are computed for publication in U. S. Geological Survey annual reports by applying the daily mean stage to the applicable rating table, using shift corrections to account for channel changes affecting the stage-discharge relation at the gage. From these daily discharges the minimum, mean, and annual discharges become available.

The data presented in this report for most of the gaging stations comprise a description of the station and three tables. The station description gives the location of the gaging station, drainage area, types and datums of gages, average discharge, extremes of discharge, and general remarks concerning the data.

For each gaging station, the first table gives the monthly and yearly mean discharge in cubic feet per second. The second table gives the minimum daily mean discharge which occurred each month and year.

The third or summary table has been developed on a water-year basis and includes the momentary maximum discharge that occurred each year, and the date of its occurrence. For the convenience of those who are interested primarily in the annual figures, the summary table includes a relisting of the discharge of the minimum day and of the mean for the year. The mean is also converted into acre-feet, discharge in cubic feet per second per square mile, and runoff in inches. The latter two quantities have not been computed where the yield of the drainage basin is affected by upstream storage or diversion and, therefore, do not represent natural conditions. In several instances data are available for changes in contents of reservoirs and for the diversions above a river gaging station, and records for a number of the stations so affected have been adjusted for these conditions.

BIBLIOGRAPHY

Data in this bulletin are in agreement with the latest U. S. Geological Survey compilation reports of streamflow records in 1950, to be published in Water-Supply Papers 1316, 1317, 1318, and include in addition streamflow data for years 1951 to 1953. In order to give a longer and more continuous record of flow some monthly figures have been estimated or partly estimated. These figures are designated by an asterisk in the monthly tables.

All figures herein are the latest and most accurate figures available at this time and no attempt has been made to designate a figure that is a revision of one previously published in other bulletins or Geological Survey annual reports. Revisions are explained in Geological Survey annual and compilation reports. As noted in the Geological Survey reports on compilations of streamflow data to 1950 mentioned above, records of streamflow at several stations were found in error or inconsistent with other streamflow records in the area and were consequently omitted from publication in those reports. The erroneous records have likewise been omitted from this report. For records of daily discharge and other detailed information, reports listed in the following section should be consulted.

PUBLICATIONS

Early records of streamflow in the United States are published in combination with other geologic data in reports listed below. In many of these reports, records for years earlier than those indicated are included for some streams.

**Streamflow data for the years 1884-1901, in reports of the U. S. Geological Survey
(A = Annual Report; B = Bulletin; W = Water-Supply Paper)**

Report	CHARACTER OF DATA	Year
10th A, pt. 2.....	Descriptive information only	
11th A, pt. 2.....	Monthly discharge and descriptive information.....	1884 to September 1890
12th A, pt. 2.....	Monthly discharge and descriptive information.....	1884 to June 30, 1891
13th A, pt. 3.....	Monthly discharge and descriptive information.....	1884-92
14th A, pt. 2.....	Monthly discharge.....	1888-93
B 131.....	Descriptions, measurements, gage heights, and ratings.....	1893-94
16th A, pt. 2.....	Descriptive information only	
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge.....	1895
W 11.....	Gage heights.....	1896
18th A, pt. 4.....	Descriptions, measurements, ratings, and monthly discharge.....	1895-96
W 16.....	Descriptions, measurements, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries above Kansas River.....	1897
19th A, pt. 4.....	Descriptions, measurements, ratings, and monthly discharge.....	1897
W 28.....	Measurements, ratings, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries.....	1898
20th A, pt. 4.....	Monthly discharge.....	1898
W 35 to 39.....	Descriptions, measurements, gage heights, and ratings.....	1899
21st A, pt. 4.....	Monthly discharge.....	1899
W 47 to 52.....	Descriptions, measurements, gage heights, and ratings.....	1900
22d A, pt. 4.....	Monthly discharge.....	1900
W 65, 66.....	Descriptions, measurements, gage heights, and ratings.....	1901
W 75.....	Monthly discharge.....	1901

Reports on surface-water supply containing records from 1899 to date for drainage basins in this report are listed below. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained.

Number of Geological Survey water-supply papers containing results of stream measurements in Pacific slope basins and upper Columbia River basin (Part 12), Snake River basin (Part 13), and lower Columbia River basin (Part 14), 1899-1953.

YEAR	Part 12	Part 13	Part 14	YEAR	Part 12	Part 13	Part 14	YEAR	Part 12	Part 13	Part 14
1890.....	38	38	38	1918.....	482	483	484	1937.....	832	833	834
1900.....	51	51	51	1919-20.....	512	513	514	1938.....	862	863	864
1901.....	66, 75	66, 75	66, 75	1921.....	532	533	534	1939.....	882	883	884
1902.....	85	85	85	1922.....	552	553	554	1940.....	902	903	904
1903.....	100	100	100	1923.....	572	573	574	1941.....	932	933	934
1904.....	135	135	135	1924.....	592	593	594	1942.....	962	963	964
1905.....	178	178	178	1925.....	612	613	614	1943.....	982	983	984
1906.....	214	214	214	1926.....	632	633	634	1944.....	1012	1013	1014
1907-8.....	252	252	252	1927.....	652	653	654	1945.....	1042	1043	1044
1909.....	272	272	272	1928.....	672	673	674	1946.....	1062	1063	1064
1910.....	292	292	292	1929.....	692	693	694	1947.....	1092	1093	1094
1911.....	312	312	312	1930.....	707	708	709	1948.....	1122	1123	1124
1912.....	332-A	332-B	332-C	1931.....	722	723	724	1949.....	1152	1153	1154
1913.....	362-A	362-B	362-C	1932.....	737	738	739	1950.....	1182	1183	1184
1914.....	392	393	394	1933.....	752	753	754	1951.....	1212	1213	1214
1915.....	412	413	414	1934.....	767	768	769	1952.....	1242	1243	1244
1916.....	442	443	444	1935.....	792	793	794	1953.....	1286	1287	1288
1917.....	462	463	464	1936.....	812	813	814				

In addition to the above annual publications several reports have been published that are compilations of monthly and yearly summaries of records by the State of Washington and the U. S. Geological Survey.

PUBLICATION		Period	Issued by
Water-Supply Bulletin	No. 1.....	1878-1920	Washington State Department of Conservation and Development
	No. 2.....	1921	do
	No. 3.....	1922	do
	No. 4.....	1878-1928	do
	No. 5.....	1878-1933	do
Water-Supply Paper	No. 492.....	1878-1919	U. S. Geological Survey
	No. 870.....	1919-1935	do
	No. 1316 (Part 12)....	1890-1950	do
	No. 1317 (Part 13)....	1897-1950	do
	No. 1318 (Part 14)....	1878-1950	do

NOTE.—Annual or biennial reports of the State of Washington Department of Conservation and Development and a few other special reports by that department contain information concerning discharge of streams in the State of Washington.

Additional special reports and water-supply papers containing pertinent hydrologic, quality, and sediment information and special information on floods are available at offices of either the State of Washington Department of Conservation and Development or the U. S. Geological Survey and are not noted in this bibliography.

MONTHLY AND YEARLY SUMMARIES

of

HYDROGRAPHIC DATA

in the

STATE OF WASHINGTON

WATER-SUPPLY BULLETIN NO. 6

NASELLE RIVER BASIN

Naselle River near Naselle, Wash.

Location.—Lat. 46°22'25", long. 123°44'45", in SW¼ sec. 1, T. 10 N., R. 9 W., on left bank 150 ft. downstream from county bridge, 1½ miles upstream from Salmon Creek, and 3½ miles east of Naselle.

Drainage area.—55.3 sq. mi.

Gage.—Staff gage and, since Sept. 13, 1950, crest-stage indicator. Altitude of gage is 24 ft. (by barometer).

Average discharge.—24 years (1929-53), 425 cfs.

Extremes.—1929-53: Maximum discharge, 11,100 cfs Jan. 22, 1935 (gage height, 15.9 ft., from floodmarks), from rating curve extended above 4,000 cfs; minimum observed, 19 cfs Sept. 12, 13, 14, 1949, Sept. 21-24, 1951; minimum gage height observed, 1.70 ft. Sept. 21-30, Oct. 15-20, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1929.....													
1930.....	33.0	37.6	476	360	1,040	458	315	171	209	32.2	40.7	30.0	264
1931.....	111	342	344	901	486	622	626	99.9	235	115	41.5	127	353
1932.....	563	863	1,040	1,030	1,020	1,010	959	131	67.6	72.9	76.2	50.8	556
1933.....	135	1,340	1,220	1,030	871	1,060	331	354	211	67.1	42.3	198.	573
1934.....	508	516	2,530	1,350	294	539	241	213	75.5	73.2	51.3	27.9	543
1935.....	584	1,033	999	1,608	544	766	243	114	73.1	63.1	44.4	87.5	515
1936.....	89.6	294	476	1,338	616	644	188	256	278	156	55.4	52.0	371
1937.....	43.0	37.3	663	340	1,105	489	858	268	251	95.4	71.6	74.7	355
1938.....	322	1,488	1,002	618	510	661	548	184	64.0	38.4	31.1	28.9	457
1939.....	156	663	653	1,022	1,020	508	120	89.9	160	94.3	43.6	35.5	377
1940.....	129	307	1,226	555	1,154	693	361	331	63.2	43.7	40.4	42.6	410
1941.....	454	502	605	649	318	194	139	276	111	54.1	47.1	313	305
1942.....	335	535	1,119	315	661	335	188	218	289	135	58.6	35.3	350
1943.....	164	940	974	419	940	354	574	181	118	63.5	66.6	39.3	398
1944.....	289	334	694	570	465	397	455	189	31.4	43.5	34.4	72.6	287
1945.....	118	694	439	955	739	933	338	306	91.4	42.1	28.1	106	399
1946.....	100	972	1,052	1,045	1,200	719	559	120	125	149	50.4	49.5	607
1947.....	328	534	1,075	727	896	264	303	118	146	113	56.1	80.5	413
1948.....	796	510	737	813	748	489	448	448	102	56.7	50.1	176	472
1949.....	326	929	1,244	246	1,408	448	197	217	65.9	42.2	34.4	34.4	426
1950.....	177	876	958	914	1,532	1,217	627	193	77.9	46.6	62.4	52.2	547
1951.....	458	927	1,263	1,128	1,256	503	201	116	61.0	36.5	28.0	76.0	500
1952.....	727	561	781	787	797	543	287	133	94.2	55.3	46.0	36.4	400
1953.....	38.1	96.8	738	1,969	757	471	262	267	139	71.0	56.3	66.7	413

NASELLE RIVER BASIN

Naselle River near Naselle, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929								97	79	49	32	27	27
1930	22	25	32	122	468	160	160	114	94	44	26	25	23
							160	62	50	58	30	28	26
1931	33	95	172	235	160	249							
1932	90	293	293	293	222	263	235	86	41	41	38	36	36
1933	29	378	209	293	278	501	149	190	102	48	35	34	29
1934	97	184	295	501	138	123	109	109	61	44	41	41	41
1935	45	444	280	237	164	294	142	78	56	48	88	36	36
1936	49	75	176	224	141	264	95	93	141	76	45	36	36
1937	36	34	34	178	290	176	323	121	78	54	37	40	34
1938	89	250	290	290	323	211	190	93	47	30	26	24	24
1939	28	255	200	390	352	163	95	60	103	67	38	27	27
1940	29	120	350	168	382	192	168	95	45	30	30	32	29
1941	39	188	248	248	155	113	84	88	78	41	51	163	31
1942	164	163	325	104	189	191	120	117	137	85	43	30	30
1943	30	227	393	150	161	97	189	117	77	52	34	30	30
1944	30	120	127	227	250	205	190	94	56	34	28	26	26
1945	64	220	115	188	173	182	192	130	60	33	24	24	24
1946	45	205	282	325	470	376	196	79	71	79	38	32	32
1947	33	190	190	163	201	147	201	72	82	79	41	40	38
1948	76	231	228	166	123	184	278	167	65	42	39	42	38
1949	175	265	317	115	99	212	140	86	52	30	23	19	19
1950	24	130	272	241	241	399	228	109	56	29	29	30	24
1951	49	206	505	360	302	215	97	80	40	30	21	19	19
1952	172	225	284	225	257	257	122	87	81	44	85	30	30
1953	29	37	93	656	239	149	174	144	109	48	37	33	29

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acres-foot		Inches	Acres-foot
1929			27							
1930	2,460	Dec. 23, 1929	22	264	4.77	64.75	191,000	284	69.77	206,000
1931	2,860	Jan. 23, 1931	26	353	6.38	83.60	258,000	494	121.22	357,000
1932	5,030	Feb. 26, 1932	36	566	10.1	137.57	403,000	574	142.05	416,000
1933	6,090	Nov. 13, 1932	29	573	10.4	141.46	415,000	648	168.52	470,000
1934	7,540	Dec. 9, 1933	41	543	9.52	133.30	393,200	462	113.85	334,500
1935	11,100	Jan. 22, 1935	36	515	9.31	126.38	372,600	368	90.27	268,100
1936	6,210	Feb. 27, 1936	36	371	6.71	91.83	269,100	362	89.16	262,800
1937	3,560	Feb. 22, 1937	34	355	6.42	87.15	256,700	528	129.09	380,800
1938	5,780	Nov. 25, 1937	24	457	8.26	112.12	330,500	345	84.70	249,800
1939	5,230	Feb. 12, 1939	27	377	6.82	92.58	272,700	394	96.95	285,100
1940	5,550	Dec. 16, 1939	29	410	7.41	100.66	298,000	401	98.68	291,400
1941	4,360	Jan. 17, 1941	31	305	5.52	74.93	221,300	342	83.89	247,400
1942	4,520	Dec. 16, 1941	30	350	6.38	85.93	253,600	357	87.69	258,400
1943	5,300	Oct. 31, 1942	30	398	7.20	97.74	288,000	335	82.26	242,400
1944	7,030	Dec. 3, 1943	26	297	5.57	73.09	215,400	290	71.32	210,600
1945	6,500	Mar. 19, 1945	24	399	7.22	93.01	295,900	473	116.06	342,100
1946	5,060	Dec. 23, 1945	32	507	9.17	124.43	367,100	521	127.37	377,200
1947	5,800	Dec. 11, 1946	38	413	7.47	101.40	295,700	418	102.62	302,300
1948	4,620	Jan. 1, 1948	38	472	8.54	116.24	342,800	485	119.37	352,200
1949	10,300	Feb. 22, 1949	19	426	7.70	104.52	308,500	386	94.48	278,600
1950	5,710	Feb. 24, 1950	24	547	9.69	134.25	395,800	607	147.43	434,800
1951	6,330	Feb. 9, 1951	19	500	9.04	122.73	362,100	452	110.95	327,300
1952	5,760	Feb. ①, 1952	30	400	7.23	98.54	290,500	300	73.90	217,900
1953	6,390		29	413	7.47	101.81	298,800			

① Probably Jan. 23, 1953.

NASELLE RIVER BASIN

3

Salmon Creek near Naselle, Wash.

Location.—Lat. 46°21'20", long. 123°45'00", in NE¼ sec. 14, T. 10 N., R. 9 W., on left bank half a mile upstream from last crossing of U. S. Highway 830, 2 miles upstream from mouth, and 3 miles southeast of Naselle.

Drainage area.—16.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map).

Extremes.—June to September, 1953: Maximum discharge, 270 cfs Sept. 30 (gage height, 3.34 ft.); minimum, 2.4 cfs Sept. 20 (gage height, 0.90 ft.).

Remarks.—Slight regulation from mill pond. Possibly some diversion for domestic use, above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									29.2	10.5	7.22	11.0	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									21	5.0	2.8	3.0	

NEMAH RIVER BASIN

North Nemah River near South Bend, Wash.

Location.—Lat. 46°29'25", long. 123°49'55", in SE¼ sec. 30, T. 12 N., R. 9 W., on right bank 500 ft. downstream from Finn Creek, 5 miles upstream from mouth, and 12 miles south of South Bend.

Drainage area.—18.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 60 ft. (from topographic map).

Average discharge.—7 years (1946-53), 120 cfs.

Extremes.—1946-53: Maximum discharge, 1,700 cfs Jan. 23, 1953 (gage height, 8.58 ft.); minimum, 5.1 cfs Sept. 21, 22, 23, 1951; minimum gage height, 1.28 ft. Nov. 8, 9, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946					295	204	130	38.8	45.0	48.2	19.0	19.2	
1947	75.7	211	282	183	208	75.6	72.7	30.9	40.5	29.8	17.4	17.4	103
1948	180	218	182	216	199	137	126	124	30.7	18.5	13.9	30.9	123
1949	71.6	224	384	77.5	332	119	51.9	51.4	20.1	14.8	11.9	9.37	119
1950	43.5	194	250	280	403	298	140	57.4	25.7	18.3	20.4	16.7	144
1951	133	267	354	344	319	129	49.0	27.9	16.0	10.6	7.09	19.3	139
1952	149	135	212	221	207	173	82.0	40.9	29.0	16.7	13.4	10.6	107
1953	9.29	27.6	195	453	216	137	73.1	78	45.3	22.9	16.2	19.4	110

NEMAH RIVER BASIN

North Nemah River near South Bend, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946					111	137	58	25	27	26	13.5	12.5	.....
1947	12	52	75	62	65	48	49	21	23	22	14.5	12.5	12
1948	14.5	62	64	67	59	66	73	46	19.5	12.5	11	10.5	10.5
1949	32	51	105	31	29	51	39	25	16.5	11.5	9.8	6.0	6.6
1950	7.2	34	58	90	130	139	68	34	18	14	14.5	11	7.2
1951	14.5	71	156	146	85	65	27	20	11.5	5.2	6.3	4.7	4.7
1952	34	49	70	61	85	78	36	28	24	12.5	9.6	8.3	8.3
1953	7.1	5.8	30	174	75	52	50	40	36	15.5	12	10	5.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1946			12	103	5.72								
1947	1,550	Dec. 11, 1946				77.63	74,520	104	78.31		75,180		
1948	1,180	Jan. 1, 1948	10.5	123	6.33	92.70	89,020	131	99.15		95,200		
1949	1,550	Feb. 10, 1949	6.0	113	6.23	84.96	81,550	96.4	72.68		99,760		
1950	1,330	Feb. 24, 1950	7.2	144	8.00	108.61	104,300	160	125.50		120,500		
1951	1,420	Feb. 9, 1951	4.7	139	7.72	104.72	100,500	117	88.39		84,850		
1952	1,200	Feb. 3, 1952	8.3	107	5.94	81.19	77,940	85.4	64.56		61,980		
1953	1,700	Jan. 23, 1953	5.8	110	6.11	83.07	79,760						

WILLAPA RIVER BASIN

Willapa River at Lebam, Wash.

Location.—Lat. 46°33'50", long. 123°33'50", in SW¼ sec. 33, T. 13 N., R. 7 W., on left bank half a mile west of Lebam and 1 mile upstream from Walker Creek.

Drainage area.—41.4 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 154.0 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—5 years (1948-53), 199 cfs.

Extremes.—1948-53: Maximum discharge, 4,930 cfs Feb. 22, 1949 (gage height, 17.53 ft., from high-water mark in gage house), from rating curve extended above 2,200 cfs; minimum, 1.4 cfs Sept. 22, 1951; minimum gage height, 2.39 ft. Aug. 22, 23, 1951, Oct. 27, 1952.

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948									36.7	16.3	11.0	22.0	.....
1949	59.8	382	533	125	746	183*	76.4	98.0	20.3	9.59	7.63	6.69	183*
1950	23.1	337	441	497	641	555	233	77.1	25.8	11.5	133	10.8	236
1951	154	413	513	590	631	271	95.0	41.3	15.3	9.01	5.46	5.16	227
1952	161	313	462	377	345	199	116	69.2	22.6	11.3	8.41	5.00	174
1953	6.04	18.8	279	939	327	204	107	109	47.9	18.8	11.0	17.9	174

* Estimated.

WILLAPA RIVER BASIN

Willapa River at Lebam, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									19	11.5	8.4	4.8	
1949	20	53	163	55	49	95*	55	32	14.5	6.6	6.0	3.6	3.6
1950	5.4	16	103	115	144	218	109	38	15.5	7.8	7.2	7.2	5.4
1951	9.0	87	232	206	162	133	42	24	9.8	6.3	3.5	2.2	2.2
1952	21	62	123	125	115	110	56	30	15.5	7.6	5.5	3.7	3.7
1953	3.7	7.0	26	300	111	65	65	47	35	9.8	6.4	8.1	3.7

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-foot			
1948													
1949	4,930	Feb. 22, 1949	3.6	183	4.42	60.11	132,700	169	55.29	122,100			
1950	3,040	Nov. 27, 1949	5.4	236	5.70	77.48	171,100	260	85.21	183,200			
1951	3,460	Feb. 9, 1951	2.2	227	5.48	74.29	164,100	215	70.36	155,400			
1952	2,260	Jan. 30, 1952	3.7	174	4.20	57.16	126,200	121	39.82	87,930			
1953	2,750	Jan. 8, 1953	3.7	174	4.20	57.02	125,900						

Fork Creek near Lebam, Wash.

Location.—Lat. 46°33'20", long. 123°35'00", in NW¼ sec. 5, T. 12 N., R. 7 W., on right bank three-quarters of a mile upstream from mouth and 1½ miles southwest of Lebam.

Drainage area.—20.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 155 ft. (from topographic map).

Extremes.—June to September, 1953: Maximum discharge, 780 cfs Sept. 30 (gage height, 4.12 ft.); minimum, 7.7 cfs Aug. 19, 20 (gage height, 1.78 ft.).

Remarks.—Small diversion to State Fish Hatchery above station with possibly some regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									41.2	17.4	14.9	30.0	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									30	11	8.1	8.5	

* Estimated.

WILLAPA RIVER BASIN

Stringer Creek near Holcomb, Wash.

Location.—Lat. 46°35'15", long. 123°37'50", in NW¼ sec. 25, T. 13 N., R. 8 W., on left bank 30 ft. upstream from road bridge, half a mile upstream from mouth, and 1¼ miles northwest of Holcomb.

Drainage area.—3.02 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 95 ft. (from topographic map).

Extremes.—May to September, 1953: Maximum discharge, 36 cfs Sept. 30 (gage height, 1.52 ft.); minimum, 1.4 cfs Sept. 13, 14, 21; minimum gage height, 0.91 ft. Sept. 13, 14.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	5.78	8.15	2.08	2.45	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	4.4	2.2	1.5	1.4	.....

Mill Creek near Willapa, Wash.

Location.—Lat. 46°38'50", long. 123°38'20", in NE¼ sec. 2, T. 13 N., R. 8 W., on right bank a quarter of a mile upstream from mouth and 2¼ miles southeast of Willapa.

Drainage area.—23.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 35 ft. (from topographic map).

Extremes.—May to September, 1953: Maximum discharge, 85 cfs Sept. 30 (gage height, 1.86 ft.); minimum, 1.6 cfs Sept. 22 (gage height, 0.86 ft.).

Remarks.—Small amount of diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	21.2	7.84	4.14	4.67	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	16	3.7	1.8	1.8	.....

WILLAPA RIVER BASIN

7

Willapa River near Willapa, Wash.

Location.—Lat. 46°38'55", long. 123°38'40", in NW¼ sec. 2, T. 13 N., R. 8 W., on right bank 150 ft. downstream from Mill Creek and 2½ miles southeast of Willapa.

Drainage area.—130 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 5.69 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Aug. 26 to Oct. 16, 1947, water-stage recorder 60 ft. upstream at different datum.

Average discharge.—5 years (1948-53), 687 cfs.

Extremes.—1947-53: Maximum discharge, 11,400 cfs Feb. 22, 1949 (gage height, 24.22 ft.), from rating curve extended above 7,300 cfs; minimum, 15.5 cfs Sept. 22, 1951 (gage height, 2.93 ft.).

Remarks.—Some diversion for domestic use and irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947													55.0
1948											50.4	113	
1949	251	1,225	1,890	395	2,260	668	284	324	79.8	44.2	32.3	82.2	613
1950	115	1,193	1,690	1,914	2,082	1,847	853	284	97.7	59.6	67.6	49.3	848
1951	542	1,384	1,831	2,036	2,123	951	343	153	70.7	36.6	24.6	57.8	789
1952	693	964	1,503	1,229	1,142	671	392	231	100	50.8	37.8	30.3	586
1953	31.0	32.8	954	3,115	1,163	693	389	372	178	73.6	50.4	69.7	597

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947													84
1948											44	38	36
1949	100	214	520	193	148	314	195	109	63	35	26	24	24
1950	28	69	512	580	440	730	400	185	75	36	83	30	28
1951	43	318	830	770	600	478	153	100	42	28	19	16	16
1952	99	245	450	442	353	348	194	111	76	36	24	24	24
1953	28	43	89	1,100	395	246	248	194	134	43	30	29	23

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR		
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acres-foot		Inches	Acres-foot
1947										
1948			38							
1949	11,400	Feb. 22, 1949	24	613	4.72	63.99	443,600	532	60.74	421,000
1950	8,450	Dec. 28, 1949	28	848	6.52	88.51	613,600	612	95.19	660,000
1951	10,300	Feb. 9, 1951	16	789	6.07	82.39	571,200	739	77.20	535,200
1952	6,900	Feb. 4, 1952	24	586	4.51	61.37	425,600	412	43.17	299,300
1953	7,690	Jan. 23, 1953	23	597	4.59	62.31	482,000			

WILLAPA RIVER BASIN
Ward Creek near Willapa, Wash.

Location.—Lat. 46°41'45", long. 123°38'55", in SW¼ sec. 14, T. 14 N., R. 8 W., on right bank 50 ft. downstream from Fairchild Creek and 1¾ miles northeast of Willapa.

Drainage area.—19.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 10 ft. (from topographic map).

Extremes.—May to September, 1953: Maximum discharge, 202 cfs Sept. 30 (gage height, 3.61 ft.), from rating curve extended above 30 cfs by logarithmic plotting; minimum, 4.1 cfs Aug. 15, 22 (gage height, 0.94 ft.).

Remarks.—No diversion above station. Slight regulation by mill pond.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									29.1	10.9	7.73	9.53	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	J	July	Aug.	Sept.	Annual
1953									5	6.2	4.2	4.7	.....

South Fork Willapa River near Raymond, Wash.

Location.—Lat. 46°37'45", long. 123°42'00", in E½ sec. 8, T. 13 N., R. 8 W., on left bank at downstream side of logging bridge a quarter of a mile downstream from Rue Creek and 4¼ miles southeast of junction of Highways 101 and 12 at Raymond.

Drainage area.—27.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 155 ft. (from topographic map).

Extremes.—May to September, 1953: Maximum discharge, 257 cfs Sept. 30 (gage height, 2.64 ft.); minimum, 24 cfs Sept. 20-22 (gage height, 1.38 ft.).

Remarks.—Some slight diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									70.7	43.2	33.1	33.6	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									57	33	29	24	.....

NORTH RIVER BASIN

9

North River near Brooklyn, Wash.

Location.—Lat. 46°46'55", long. 123°28'50", in S½ sec. 18, T. 15 N., R. 6 W., on left bank 1¼ miles upstream from Fall River and 1½ miles northeast of Brooklyn.

Drainage area.—29.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map).

Extremes.—June to September, 1953: Maximum discharge, 177 cfs Sept. 30 (gage height, 1.42 ft.); minimum, 7.7 cfs Sept. 25-26 (gage height, 0.43 ft.).

Remarks.—Possibly some small diversion for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	39.7	16.5	11.8	13.5	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	29	11.5	8.9	7.7	.....

Fall River at Brooklyn, Wash.

Location.—Lat. 46°46'30", long. 123°30'15", in NW¼ sec. 24, T. 15 N., R. 7 W., on right bank 40 ft. upstream from bridge, a quarter of a mile upstream from mouth and east of Brooklyn.

Drainage area.—41.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 175 ft. (from topographic map).

Extremes.—June to September, 1953: Maximum discharge, 404 cfs Sept. 30 (gage height, 3.21 ft.); minimum, 14.5 cfs Sept. 26; minimum gage height, 1.18 ft. Sept. 16, during period of bridge construction.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	74.5	39.1	26.3	27.6	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	59	27	20	15	.....

NORTH RIVER BASIN

Little North River near Cosmopolis, Wash.

Location.—Lat. 46°54'20", long. 123°42'50", in NW¼NW¼ sec. 5, T. 16 N., R. 8 W., on right bank 1½ miles upstream from mouth and 4½ miles southeast of Cosmopolis.

Drainage area.—18.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map).

Extremes.—1945-49, 1953: Maximum discharge, 1,250 cfs Feb. 22, 1949 (gage height, 12.82 ft.); minimum, 1.0 cfs Sept. 18, 1953 (gage height, 1.69 ft.).

Remarks.—Possibly some diversion and slight regulation for domestic use above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	16.2*	148	201	190	196	141	93.7	21.6	17.2	14.3	4.09	4.37	83.8*
1947...	32.5	134	204*	157	183	44.5	51.8	16.7	16.1	9.65	6.35	4.41	70.9*
1948...	118	131	135	140	166	104	76.2	101*	15.7	6.45	3.96	18.6	83.7*
1949...	44.7	179	247	52.7	270	84.1*	33.2	38.8	9.53	4.45	2.71	6.30	79.5*
1953...	.....	.....	.....	.....	.....	.....	.....	.....	20.7	7.05	4.43	4.69	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	4.2*	39	43	61	59	72	40	12	10	6.5	2.4	1.9	1.9
1947...	3.1	20	35*	26	38	28	31	9.1	10	6.5	3.9	2.8	2.8
1948...	8.4	39	40	28	25	34	47	30	8.0	3.9	2.9	2.9	2.9
1949...	23	34	63	22	21	34	21	13	7.3	3.0	1.5	2.6	1.5
1953...	.....	.....	.....	.....	.....	.....	.....	.....	12.5	3.7	2.2	1.4	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acra-feet		Inches	Acra-feet
1946.....	872	Dec. 29, 1945	1.9	66.8	4.67	63.35	62,840	87.1	63.68	63,090
1947.....	1,010	Jan. 28, 1947	2.8	70.9	3.81	51.72	51,320	72.1	52.62	52,200
1948.....	803	Mar. 22, 1948	2.9	83.7	4.50	61.24	60,740	90.8	66.45	65,910
1949.....	1,250	Feb. 22, 1949	1.5	79.5	4.27	58.00	57,530	.....	.....	.....
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

NORTH RIVER BASIN

North River near Raymond, Wash.

Location.—Lat. 46°48'30", long. 123°51'00", in sec. 6, T. 15 N., R. 9 W., on left bank 1¼ miles upstream from Salmon Creek and 10 miles northwest of Raymond.

Drainage area.—219 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 7.39 ft. above mean sea level (Western Washington Electric Light and Power Co. benchmark).

Average discharge.—26 years (1927-53), 935 cfs.

Extremes.—1927-53: Maximum discharge, 35,000 cfs Dec. 10, 1933 (gage height, 15.8 ft., from floodmarks) which included storage water released by failure of splash dam 800 ft. upstream, from rating curve extended above 7,500 cfs; minimum, 21 cfs Aug. 24, 1951 (gage height, 1.01 ft.).

Remarks.—No diversion. Considerable regulation prior to December, 1933, due to splash dam operation above station in connection with logging operations.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927											74.0	243	
1928	987	2,740	1,610	1,970	966	1,850	1,670	671	161	113	69.9	62.2	1,070
1929	455	774	1,060	906	749	1,830	1,430	482	316	135	84.6	61.5	648
1930	74.9	74.1	935	868	2,500	1,040	829	436	251	107	65.0	83.8	594
1931	216	574	640	1,840	1,260	1,630	2,110	273	393	214	84.8	227	789
1932	1,470	1,880	2,220	2,400	2,780	2,630	1,560	376	175	115	112	98.4	1,310
1933	233	2,610	2,920	3,000	1,710	2,090	724	591	331	135	77.5	334	1,230
1934	1,046	1,356	9,450	3,542	833	1,351	611	445	168	125	77.4	114	1,610
1935	1,070	2,321	2,412*	4,088	1,256	1,942	597	265	151	104	58.0	118	1,202*
1936	114	346	768	2,943	1,441	1,689	480	421	511	222	66.9	91.6	760
1937	73.6	65.8	1,315	700	2,728	970	2,035	584	499	193	116	118	769
1938	400	3,201	3,306	1,734	1,401	1,501	1,138	346	121	66.2	47.2	83.5	1,105
1939	209	1,110	1,405	2,317	2,504	1,190	309	226	299	140	63.3	63.2	811
1940	155	361	2,157	1,286	2,576	1,642	1,021*	940	144*	72.8	58.9	78.0	870*
1941	629	994	1,297	1,434	665	486	282	519	209	84.1	83.4	375	589
1942	530	1,035	2,468	840	1,257	839	433	450	427	224	98.5*	57.8*	720*
1943	162	1,917	2,025	1,061*	1,864*	836	1,372	344*	209*	110	83.1	66.5	828*
1944	325	438	1,524	1,408	989	773	906	349	169	83.1	60.9	92.3	592
1945	133	1,053	818	1,459*	1,789	1,726	743	616	202	62.5*	43.3*	136	723*
1946	168	1,540	2,126	2,269	2,328	1,574	1,180	304	217	175	73.9	84.7	995
1947	330	1,334	2,326	1,764	2,129	628	674	229	210	194	72.1	73.5	821
1948	1,220	1,761*	1,559	1,849	1,334	1,376	1,010	1,127	245	112	89.1	228	1,032*
1949	495	1,749	3,015	680	3,002	1,023	458	451	135	79.9	57.2	63.2	920
1950	275	1,702	2,710	2,880*	3,040	2,734	1,222	416	173	98.7	104	92.3	1,273*
1951	604	2,052	2,838	2,960	3,370	1,650	631	241	115	54.5	81.3	77.8	1,215
1952	1,177	1,185	2,045	1,619	1,804	852	589	945	166	63.0	64.9	45.8	830
1953	40.3	124	1,304	5,369	2,476	933	616	558	318	133	93.0	81.7	1,002

* Estimated.

NORTH RIVER BASIN

North River near Raymond, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927											65	117	65
1928	350	766	396	787	213	364	891	274	138	62	28	33	28
1929	56	202	395	891	860	608	686	234	191	91	69	46	46
1930	53	56	66	314	1,130	378	484	249	149	57	54	28	28
1931	51	151	297	471	438	848	446	153	112	99	69	59	51
1932	175	672	550	1,010	732	1,019	662	120	64	69	72	42	42
1933	64	818	915	920	695	873	322	180	199	93	64	59	54
1934	172	456	646	1,490	408	366	279	236	113	88	56	54	54
1935		925	780*	900	561	705	375	181	110	66	46	41	41
1936	58	96	225	649	344	668	265	272	285	118	66	58	58
1937	58	58	63	400	607	410	834	252	178	112	77	68	56
1938	110	370	691	826	662	440	408	187	88	49	33	25	25
1939	32	414	452	997	934	460	221	143	186	80	48	45	32
1940	46	138	610	405	768	586	460*	231	86	54	44	47	44
1941	74	383	518	628	378	304	190	184	130	60	42	201	42
1942	266	277	750	445	466	450	250*	260*	191	140	70*	49	49
1943	60*	494	901	300*	520*	316	516	200*	142	78	60	53	53
1944	55	197	374	680	605	482	415	212	115	58	39	32	32
1945	76	345	360*	577	591	570	430	254	177	52*	35*	39	35
1946	50*	369	633	816	524	598	564	191	150	94	65	66*	59
1947	62	232	522	357	565*	382	400	130	136	87	52	48	48
1948	58	534	540	466	415	549	664	440	142	83	73	61	58
1949	241	356	925	324	306	528	316	165	110	58	44	35	35
1950	48	185	832	1,010	500	1,210	594	248	126	64*	58	50*	48
1951	96	520	1,300	1,140	948	752	272	167	70*	40	22	28	22
1952	248	496	691	637	551	510	296	183	121	57	43	35	35
1953	28	50	57	1,790	664	436	441	324	241	82	57	49	28

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1927			65							
1928	8,610	Nov. 24, 1927	28	1,070	4.69	66.74	780,000	821	51.06	596,000
1929	5,660	Mar. 27, 1929	46	648	2.96	40.20	469,000	548	33.96	356,000
1930	4,900	Dec. 23, 1929	26	594	2.71	36.79	429,000	622	38.53	450,000
1931	7,320	April 13, 1931	51	789	3.60	48.91	571,000	1,140	70.51	823,000
1932	11,000	Feb. 27, 1932	42	1,310	5.93	81.69	955,000	1,330	82.55	966,000
1933	7,240	Jan. 9, 1933	54	1,230	5.62	76.40	693,000	1,750	108.68	1,270,000
1934	35,000	Dec. 10, 1934	54	1,610	7.35	99.82	1,166,000	1,094	67.89	792,000
1935	24,000	⓪	41	1,292	5.49	74.51	870,400	819	50.75	593,000
1936	7,890	Feb. 28, 1936	58	760	3.47	47.27	552,000	780	48.52	566,600
1937	6,600	April 15, 1937	58	759	3.47	47.04	549,500	1,214	75.22	878,600
1938			25	1,105	5.05	65.52	890,200	756	46.89	547,200
1939	7,100	Feb. 13, 1939	32	811	3.76	50.28	587,000	509	50.12	585,300
1940	7,360	Dec. 16, 1940	44	870	3.97	54.06	651,200	889	55.24	646,200
1941	5,440	Jan. 18, 1941	42	589	2.69	36.49	426,200	683	42.34	494,600
1942	7,890	Dec. 20, 1941	49	720	3.29	44.62	511,100	723	44.84	624,000
1943	6,410	April 2, 1943	53	828	3.78	51.35	599,700	678	42.04	491,000
1944	7,230	Dec. 4, 1943	32	692	2.70	36.79	429,800	560	35.19	411,200
1945	6,600	Feb. 8, 1945	35	723	3.30	44.89	523,400	877	54.36	635,000
1946	7,230	Dec. 30, 1945	59	995	4.54	61.69	730,500	1,013	62.80	733,400
1947	7,660	Jan. 27, 1947	48	821	3.75	50.84	593,900	862	53.41	624,000
1948	5,800	Mar. 23, 1948	58	1,032	4.71	64.16	749,400	1,033	67.93	703,000
1949	8,660	Feb. 23, 1949	33	920	4.20	57.04	660,400	872	54.05	631,400
1950	10,700	Dec. 29, 1949	48	1,273	5.81	78.92	921,700	1,358	84.15	933,000
1951	14,800	Feb. 11, 1951	22	1,215	5.55	75.32	879,800	1,108	68.71	802,400
1952	6,660	Feb. 5, 1952	35	830	3.79	51.56	692,200	584	30.25	423,600
1953	11,100	Jan. 24, 1953	28	1,002	4.68	62.11	725,500			

* Estimated.

⓪ Sometime between January 21-24, 1935.

NORTH RIVER BASIN

13

Elkhorn Creek near Raymond, Wash.

Location.—Lat. 46°46'10", long. 123°44'50", in SW¼ sec. 24, T. 15 N., R. 9 W., on left bank 20 ft. upstream from bridge on U. S. Highway 101 and 5 miles north of Raymond.

Drainage area.—15.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 140 ft. (from topographic map).

Extremes.—May to September, 1953: Maximum discharge, 117 cfs Sept. 30 (gage height, 2.90 ft.); minimum, 0.8 cfs Aug. 15, Sept. 21; minimum gage height, 1.12 ft. Aug. 15.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									14.7	4.63	3.57	4.64	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953									9.2	1.7	1.0	1.1	.....

JOHNS RIVER BASIN

Johns River near Markham, Wash.

Location.—Lat. 46°51'30", long. 123°55'40", in NW¼ sec. 21, T. 16 N., R. 10 W., on left bank at logging company railroad bridge three-quarters of a mile upstream from Atwood Creek, 4½ miles southeast of Markham, and 6 miles upstream from mouth.

Drainage area.—18.9 sq. mi.

Gage.—Staff gage. Altitude of gage is 20 ft. (from topographic map).

Extremes.—1942-43: Maximum gage height over 6.0 ft. (estimated) Oct. 31, 1942, (discharge not determined); minimum discharge observed, 16 cfs Sept. 17-24, 1942 (gage height, 0.94 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942									32.6	22.5	18.3	33.8	.....
1943									25.2	26.9	20.4	79.9	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942									23	19	16	16	16
1943									21	18	17	18	17

NEWSKAH CREEK BASIN

Newskah Creek near Aberdeen, Wash.

Location.—Lat. 46°54'45", long. 123°49'20", in SE¼SE¼ sec. 32, T. 17 N., R. 9 W., on right bank 3½ miles upstream from mouth and 4 miles south of Aberdeen.

Drainage area.—8.0 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map).

Extremes.—1945-49: Maximum discharge recorder, 570 cfs Feb. 17, 1949, but may have been greater Oct. 19, 1947, when water-gage recorder was not operating; minimum, 1.6 cfs Sept. 9-12, 28, 1946 (gage height, 2.15 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	12.6	31.4	30.7	33.0	38.5	58.2*	45.4*	11.3*	11.1	9.93	2.87	2.50	40.3*
1947...	22.1	68.2	56.5	75.9	87.4*	22.5	28.7	9.75	12.7	9.24	4.91	5.08	35.6*
1948...	30.4	70.2	37.8	74.1	77.4	51.4	48.4	54.8	9.43	5.50	4.46	21.9	48.6
1949...	30.5	37.2	114	27.8	116	46.2	21.5	21.6	5.96	3.17	3.06	3.87	39.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	3.4	26	19	36	30	31*	15*	7.8	7.1	4.7	2.0	1.6	1.6
1947...	2.0	11	16	13	18	14	16	5.7	6.0	6.4	3.4	3.1	2.0
1948...	5.4	19.5	22	14.5	13	15.6	27	16.5	5.7	4.1	3.5	4.1	3.5
1949...	12	16	33	11*	10*	17	11	7.3	3.8	2.4	2.8	2.4	2.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....	337	Dec. 28, 1945	1.6	40.3	5.04	63.37	29,170	40.5	68.74	29,330
1947.....	554	Mar. 21, 1948	2.0	35.6	4.45	60.33	25,770	40.8	69.25	29,550
1948.....	570	Feb. 17, 1949	2.4	39.6	4.95	67.19	28,680	48.0	81.75	34,880

* Estimated

CHARLIES CREEK BASIN

Charlies Creek near Aberdeen, Wash.

Location.—Lat. 46°56'25", long. 123°48'10", in SE¼ sec. 21, T. 17-N., R. 9 W., on left bank 2 miles upstream from mouth and 2 miles south of Aberdeen.

Drainage area.—5.70 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (by barometer).

Extremes.—1945-49: Maximum discharge, 436 cfs Feb. 2, 1947; maximum gage height, 11.57 ft. Oct. 19, 1947; minimum discharge, 0.3 cfs Sept. 11, 1946.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	9.09*	50.2	51.5	48.8	51.9	36.9	29.8	9.81	9.70	6.88	2.99	1.78	25.6*
1947...	9.38	33.3	44.4	37.1	47.9	17.2	17.0	7.27	8.07	6.44	3.22	3.59	19.4
1948...	29.1	30.0	54.5	54.5	53.2	36.4	31.3	37.8	8.27	4.23	2.20	6.52	29.0
1949...	15.3	56.6	77.1	19.3	81.0	30.8	16.1	14.5	5.29	3.67*	8.11	4.27	26.9*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	3.0*	20	21	25	25	24	16	7.4	6.6	4.0	1.7	0.5	0.5
1947...	2.0	14	13	9.2	16	11	12	3.1	4.3	4.9	1.6	2.0	1.6
1948...	4.0	9.6	11	12.5	12	11	21	14	4.5	2.3	.9	1.4	.9
1949...	6.4	11	23	9.6	9.0	15	11	6.6	4.3*	2.6	2.4	3.2	2.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary Maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....	241	Dec. 23, 1945	0.5	25.6	4.49	60.97	18,530	23.6	56.23	17,100
1947.....	436	Feb. 2, 1947	1.6	19.4	3.40	46.17	14,030	21.7	51.57	15,680
1948.....	330	Mar. 21, 1948	.9	29.0	5.09	69.23	21,040	31.9	76.22	23,160
1949.....	388	Feb. 17, 21, 1949	2.4	26.9	4.72	64.06	19,460	.....	.....	.....

* Estimated.

CHEHALIS RIVER BASIN

Chehalis River near Pe Ell, Wash.

Location.—Lat. 46°32'15", long. 123°17'25", in SW¼ sec. 10, T. 12 N., R. 5 W., on left bank two-thirds of a mile upstream from Crim Creek, and 2½ miles south of Pe Ell.

Drainage area.—54.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 440 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 312 cfs Nov. 1 (gage height, 4.18 ft., from recorded range in stage), from rating curve extended above 120 cfs; minimum, 17 cfs Sept. 9-13 (gage height, 1.14 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944										22.5	28.0	42.7	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944										19	17	24	.....

Rock Creek near Pe Ell, Wash.

Location.—Lat. 46°33'00", long. 123°20'25", in SW¼ sec. 5, T. 12 N., R. 5 W., on right bank 1 mile upstream from McCormick Creek and 2½ miles southwest of Pe Ell.

Drainage area.—13.4 sq. mi.

Gage.—Staff gage. Altitude of gage is 520 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 71 cfs Nov. 1 (gage height, 1.74 ft., from graph based on gage readings); minimum observed, 1.7 cfs Aug. 28, 30, Sept. 5-7, 9 (gage height, 0.64 ft.).

Remarks.—Small diversions for irrigation and power above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944										2.57	2.30	5.61	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944										1.7	1.7	2.4	.....

CHEHALIS RIVER BASIN

Chehalis River near Doty, Wash.

Location.—Lat. 46°37'00", long. 123°16'40", in NW¼ sec. 14, T. 13 N., R. 5 W., on right bank 1½ miles upstream from Elk Creek, 1½ miles south of Doty, and 3½ miles north of Pe Ell.

Drainage area.—113 sq. mi.

Gage.—Staff gage and, since Sept. 2, 1950, crest-stage indicator. Datum of gage is 302.1 ft. above mean sea level (river-profile survey).

Average discharge.—14 years (1939-53), 541 cfs.

Extremes.—1939-53: Maximum discharge, 18,100 cfs Feb. 7, 1945 (gage height, 17.80 ft., estimated by observer, water over gage); minimum observed, 18 cfs Oct. 14, 1952; minimum gage height, 0.84 ft. Aug. 25-27, Sept. 21, 22, 1951.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	73.1	144	1,667	678	1,771	1,065	549	542	78.1	40.1	29.7	33.9	570
1941...	262	500	750	1,025	387	308	207	396	127	53.7	45.5	229	358
1942...	244	741	1,128	488	653	441	248	238	285	128	56.1	32.4	455
1943...	131	1,293	1,310	533	1,320	669	846	218	129	59.5	43.8	29.8	540
1944...	156	220	653	849	646	433	508	166	108	47.5	32.5	36.1	321
1945...	49.5	502	350	1,069	1,293	1,528	536	324	104	46.6	33.1	105	488
1946...	71.8	1,179	1,430	1,563	1,567	875	690	161	128	110	44.3	51.8	650
1947...	271	1,191	1,471	948	1,326	424	369	131	140	73.0	36.5	83.3	535
1948...	691	891	842	1,229	1,129	773	698	700	122	56.6	43.8	124	624
1949...	241	1,189	1,480	318	2,054	819	312	304	77.5	48.1	31.5	36.6	566
1950...	181	1,114	1,343	1,125	1,911	1,724	753	275	93.5	53.7	56.7	56.5	719
1951...	601	1,234	1,563	1,545	2,021	774	468	171	65.7	33.9	23.6	57.0	705.
1952...	662	809	1,211	852	1,175	624	438	203	80.6	48.5	31.1	25.3	512
1953...	24.5	76.9	721	2,888	1,096	605	342	344	150	67.6	50.7	60.4	535

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	25	60	317	215	433	276	239	121	46	31	22	24	22
1941...	29	186	235	334	205	164	12	108	90	38	30	96	29
1942...	112	114	415	202	228	235	152	134	124	82	43	28	28
1943...	30	223	482	180	312	185	263	128	80	41	32	25	25
1944...	27	87	154	320	320	233	217	105	62	38	27	25	25
1945...	24	138	135	262	281	321	240	151	63	38	28	28	24
1946...	41	154	321	387	678	459	281	104	89	54	37	39	37
1947...	42	143	244	183	292	208	205	79	85	48	30	30	30
1948...	42	236	254	205	161	254	445	225	72	41	34	31	31
1949...	109	179	375	139	123	445	247	114	60	37	28	23	23
1950...	29	91	415	302	355	585	415	131	65	37	39	37	29
1951...	52	267	660	535	460	302	187	101	40	26	19	19	19
1952...	131	181	357	312	341	374	242	105	60	30	24	20	20
1953...	18	26	62	748	331	198	226	181	117	43	34	32	18

CHEHALIS RIVER BASIN

Chehalis River near Doty, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR		
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1940.....	15,100	Dec. 15, 1939	22	570	5.04	68.66	413,800	538	64.75	390,200
1941.....	9,140	⊙	29	358	3.17	43.03	259,400	460	55.21	332,800
1942.....	8,760	Dec. 19, 1941	28	455	4.03	54.66	329,400	453	54.40	327,800
1943.....	6,260	Feb. 6, 1943	25	540	4.78	64.82	390,600	400	45.08	280,700
1944.....	5,670	Dec. 8, 1943	25	321	2.84	38.62	232,800	309	37.20	224,300
1945.....	18,100*	Feb. 7, 1945	24	488	4.32	58.61	353,200	637	76.55	461,300
1946.....	7,910	Nov. 28, 1945	37	650	5.75	75.10	470,600	671	80.68	486,100
1947.....	9,860	Feb. 2, 1947	30	585	4.73	64.25	367,200	509	61.19	368,800
1948.....	8,720	Jan. 2, 1948	31	624	5.62	75.17	453,000	648	77.99	470,100
1949.....	12,800	Feb. 22, 1949	23	566	5.01	66.00	409,900	543	65.25	393,200
1950.....	11,400	Nov. 27, 1949	29	719	6.36	86.37	520,500	783	94.09	567,000
1951.....	15,700	Feb. 9, 1951	19	705	6.24	84.72	510,500	646	77.55	487,300
1952.....	9,320	Feb. 4, 1952	20	512	4.63	61.64	371,500	356	42.91	268,600
1953.....	7,640	Jan. 8, 1953	18	685	4.73	64.27	387,400	.....	.....	.....

⊙ Jan. 17 or 18, 1941.

Elk Creek near Doty, Wash.

Location.—Lat. 46°37'40", long. 123°19'50", in NE¼ sec. 8, T. 13 N., R. 5 W., on left bank half a mile upstream from Nine Creek, 1 mile upstream from Deer Creek, and 2½ miles west of Doty.

Drainage area.—46.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 360 ft. (from topographic map). Prior to Aug. 15, 1944, staff gage at datum 0.75 ft. higher.

Average discharge.—6 years (1944-50), 164 cfs.

Extremes.—1942-50: Maximum discharge, 2,380 cfs. Feb. 22, 1949 (gage height, 8.21 ft., from rating curve extended above 1,600 cfs); minimum, 8.6 cfs Sept. 9-11, 1944.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43.1	20.5	12.9	.....
1943.....	55.2	.....	.....	.....	.....	.....	.....	.....	.....	27.6	18.5	16.8	.....
1944.....	42.7	.....	.....	.....	.....	.....	.....	.....	.....	20.1	19.8	16.9	.....
1945.....	26.5	144	117	275	305*	278*	162*	105	42.1	19.5	15.0	27.9	125*
1946.....	28.4	245	349	386	412	248	171	59.2	46.8	33.7	16.3*	23.5	167*
1947.....	79.4	235	460	279	378	134	108	44.0	40.2	21.7	15.5	17.3	154
1948.....	127	278	245	347	326	236	151	187	59.0	28.9	22.2	28.7	172
1949.....	60.4	243	509	121	653	198	95.8	86.8	42.6	20.2	16.9	15.5	160
1950.....	42.3	229	390	361	652*	470*	198	89.9	40.1	25.8	21.8	19.2	209*
1951.....	94.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

CHEHALIS RIVER BASIN

Elk Creek near Doty, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										29	14	12	12
1943	14									19	14	13	13
1944	13									15	10	8.6	8.6
1945	16	53	57	103	107	110*	90	61	26	16	13	13	13
1946	16	51	120	142	178	169	100	41	31	20	14	16	14
1947	17.5	50	124	95	124	86	74	29	28	16	13	13.5	13
1948	15	104	107	99	66	109	124	97	38	22	19.5	14	14
1949	27	58	169	73	67	138	74	42	26	18.5	14	12.5	12.5
1950	14	20	148	140	180*	250*	118	50	29	18.5	16.5	13	13
1951	18.5												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1942			12									
1943			13									
1944			8.6									
1945	1,370	Feb. 7, 1945	13	125	2.68	36.43	80,720	153	44.58	111,000		
1946	1,720	Dec. 28, 1945	14	167	3.58	48.42	120,600	184	53.39	133,000		
1947	1,820	Dec. 11, 1946	13	154	3.30	44.67	111,800	139	40.38	100,600		
1948	1,320	Mar. 21, 1948	14	172	3.68	50.04	124,600	186	54.08	134,700		
1949	2,380	Feb. 22, 1949	12.5	160	3.43	46.57	116,000	147	42.84	106,700		
1950	1,770	Dec. 28, 1949	13	209	4.48	60.74	151,300					

South Fork Chehalis River at Boistfort, Wash.

Location.—Lat. 46°32'45", long. 123°07'55", in NW¼NW¼ sec. 12, T. 12 N., R. 4 W., on left bank a quarter of a mile south of Boistfort and 6 miles upstream from mouth.

Drainage area.—49.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 255 ft. (from topographic map). Prior to Aug. 15, 1944, staff gage 500 ft. downstream at datum 1.45 ft. lower.

Average discharge.—6 years (1944-50), 209 cfs.

Extremes.—1942-50: Maximum discharge, 7,250 cfs Feb. 7, 1945 (gage height, 11.57 ft.), from rating curve extended above 1,400 cfs; minimum, 2.5 cfs Sept. 14, 1944 (gage height, 1.67 ft.).

Remarks.—Small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942										33.8	15.8	10.5	
1943	26.0									20.2	13.5	9.13	
1944	43.3									12.7	7.85	8.88	
1945	15.8	144	120	368	487	568	217	96.4	38.3	15.5	8.79	22.7	172
1946	17.2	395	526	572	545	311	232	53.2	52.0	26.0	10.6	12.8	226
1947	49.9	371	547	321	470	173	127	44.0	35.0	17.1	10.2	14.0	180
1948	226	276	282	483	441	283	185	230	47.9	18.4	11.6	15.9	208
1949	38.3	390	660	146	829	245	91.4	100	29.2	13.7	8.33	8.61	208
1950	32.7	412	545	515	787	541	213	73.3	34.6	16.7	12.5	8.87	259

* Estimated.

CHEHALIS RIVER BASIN

South Fork Chehalis River at Boistfort, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942...										23	12	8.4	8.4
1943...	9.0									13	9.1	7.6	7.6
1944...	9.9									8.2	4.8	2.8	2.8
1945...	9.6	48	55	114	125	124	90	59	23	11	6.1	6.5	6.1
1946...	8.6	37	134	176	209	176	104	34	21	15	7.5	9.2	7.5
1947...	11.5	37	94	56	119	91	70	28	22	13	7.5	8.0	7.5
1948...	8.6	103	94	90	74	96	137	84	25	11	7.7	3.7	3.7
1949...	16.5	39	166	64	62	146	70	44	22	8.1	6.8	4.9	4.9
1950...	8.1	23	172	163	160	222	116	41	23	8.8	6.8	5.6	5.6

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1942.....			8.4							
1943.....			7.6							
1944.....			2.8							
1945.....	7,250	Feb. 7, 1945	6.1	172	3.50	47.59	124,900	228	62.83	164,900
1946.....	8,200	Dec. 29, 1945	7.5	226	4.59	62.48	163,800	229	63.13	165,700
1947.....	8,500	Feb. 2, 1947	7.5	130	3.66	49.57	130,100	164	45.35	119,000
1948.....	3,300	Jan. 2, 1948	3.7	208	4.23	57.50	150,900	232	64.32	168,800
1949.....	6,250	Feb. 17, 1949	4.9	208	4.23	57.49	150,900	201	55.40	145,300
1950.....	5,000	Nov. 27, 1949	5.6	259	5.20	71.43	187,460			

Halfway Creek near Boistfort, Wash.

Location.—Lat. 46°31'35", long. 123°08'55", in NW¼ sec. 14, T. 12 N., R. 4 W., on right bank 350 ft. upstream from mouth and 1½ miles southwest of Boistfort.

Drainage area.—13.4 sq. mi.

Gage.—Staff gage. Altitude of gage is 310 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 28 cfs Nov. 1 (gage height, 1.41 ft., from graph based on gage readings); minimum observed, 1.4 cfs Sept. 7-11.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944.....									3.14	2.05	1.59	2.50	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944.....									2.1	1.6	1.4	1.6	.....

CHEHALIS RIVER BASIN

Bunker Creek near Adna, Wash.

Location.—Lat. 46°39'05", long. 123°07'30", in SE¼ sec. 36, T. 14 N., R. 4 W., on left bank 0.4 mile upstream from Deep Creek and 3½ miles northwest of Adna.

Drainage area.—20.1 sq. mi.

Gage.—Staff gage. Altitude of gage is 210 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge observed, 15 cfs Nov. 2, 3, 4; maximum gage height observed, 1.69 ft. Nov. 4; minimum discharge observed, 0.1 cfs Sept. 3, 9, 11, 12.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									0.81	0.27	0.33	0.63	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									0.3	0.2	0.1	0.2	.....

Stearns Creek near Napavine, Wash.

Location.—Lat. 46°34'40", long. 122°59'00", in SW¼ sec. 30, T. 13 N., R. 2 W., on left bank 4 miles west of Napavine and 4½ miles upstream from mouth.

Drainage area.—14.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 200 ft. (from topographic map). Prior to Aug. 9, 1945, staff gage at same site and datum.

Extremes.—July to October, 1945: Maximum discharge, 11 cfs Sept. 4 (gage height, 1.78 ft.); minimum, 1.2 cfs Aug. 22 (gage height, 1.23 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945											1.75	2.88	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945											1.4	1.7	.....

CHEHALIS RIVER BASIN

Stearns Creek near Adna, Wash.

Location.—Lat. 46°35'50", long. 123°00'10", in NE¼SW¼ sec. 24, T. 13 N., R. 3 W., on right bank 300 ft. upstream from county road bridge, 3 miles upstream from mouth, and 3½ miles southeast of Adna.

Drainage area.—27.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map). Prior to July 22, 1944, staff gage a quarter of a mile downstream at different datum.

Extremes.—July to November, 1944: Maximum discharge, 18 cfs Nov. 3 (gage height, 2.62 ft.), from rating curve extended above 3.5 cfs; minimum, 0.1 cfs July 26 (gage height, 1.48 ft.).

Remarks.—A few small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944										2.53	2.72	3.49	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944										2.2	0.7	0.3	

Chehalis River near Chehalis, Wash.

Location.—Lat. 46°38'30", long. 123°00'55", in NE¼ sec. 2, T. 13 N., R. 3 W., at highway bridge 2 miles upstream from Newaukum River and 2 miles southwest of Chehalis.

Drainage area.—434 sq. mi.

Gage.—Chain gage. Altitude of gage is 170 ft. (from topographic map). Prior to Aug. 15, 1929, staff gage at same site and datum.

Extremes.—1929-31: Maximum discharge, 11,400 cfs Apr. 1, 1931 (gage height, 29.20 ft., from graph based on gage readings); minimum, 54 cfs Oct. 1, 1929 (gage height, 1.37 ft.).

Remarks.—Minor diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	108	99.2	1,750	1,200	3,830	2,040	1,580	662	561	208	107	82.3	874
1931	174	674	667	3,230	2,250	2,620	3,110	375	458	237	102	158	1,160

CHEHALIS RIVER BASIN

Chehalis River near Chehalis, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1879.....						920	1,160	402	302	142	82	60	60
1930....	54	71	88	532	1,850	554	582	845	217	101	69	60	54
1931....	79	120	270	510	565	950	615	215	127	117	88	84	79

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1929.....	7,880	April 15, 1929	60										
1930.....	7,580	Dec. 23, 1929	54	874	2.01	27.33	634,000	836	26.12	605,000			
1931.....	11,400	April 1, 1931	79	1,160	2.67	36.39	842,000						

Newaukum River near Onalaska, Wash.

Location.—Lat. 46°34'35", long. 122°41'00", on line between secs. 28 and 33, T. 13 N., R. 1 E., on left bank 0.9 mile upstream from Lost Creek and 1¼ miles east of Onalaska.

Drainage area.—40.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 540 ft. (from topographic map). Prior to Sept. 28, 1944, staff gage at datum 0.93 ft. higher.

Extremes.—1942-48: Maximum discharge, 3,810 cfs Dec. 11, 1946 (gage height, 8.40 ft.); minimum observed, 21 cfs Sept. 6, 8-12, 1944.

Remarks.—A few small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942.....										91.5	43.3	29.5	
1943.....	59.0									47.4	33.2	26.9	
1944.....	60.7									34.6*	27.4	39.9	
1945.....	45.3	152	143	398	358*	414*	304*	230*	75.4	40.7	33.3	60.2	188*
1946.....	53.4	448	883	486	525*	836	161	95.4	107	87.6	38.4	37.8	228*
1947.....	165	298	812	332*	334	195	248	75.0	73.1	43.5	31.6	51.4	204*
1948.....	231	451	809	420*	378	244	241	218	94.0	50.1	51.7	72.9	232*
1949.....	108												

* Estimated.

CHEHALIS RIVER BASIN

Newaukum River near Onalaska, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										60	34	26	26
1943	25									34	28	24	24
1944	24									28*	24	21	21
1945	31	62	68	90	148	150*	150*	120*	52	36	28	30	28
1946	30	107	137	168	250*	196	130	68	57	49	33	32	30
1947	32	82	155	122	144	113	128	61	44	34	28	28	28
1948	39	165*	150*	119	96	115	185	126	69	39	36	37	36
1949	62												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1942			26									
1943			24									
1944			21									
1945	2,680	Feb. 7, 1945	28	188	4.61	62.63	136,300	234	77.74	169,200		
1946	1,910	Dec. 25, 1945, Jan. 4, 1946	30	228	5.59	75.84	105,000	245	81.36	177,000		
1947	3,810	Dec. 11, 1946	28	204	5.00	67.97	147,900	199	66.27	144,200		
1948	2,030	Nov. 7, 1947	36	232	5.69	77.31	168,200					

North Fork Newaukum River near Forest, Wash.

Location.—Lat. 46°39'20", long. 122°46'40", in SW¼ sec. 35, T. 14 N., R. 1 W., on right bank 1¼ miles upstream from Lucas Creek and 5½ miles northeast of Forest.

Drainage area.—32.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 380 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 130 cfs Nov. 1 (gage height, 3.57 ft.); minimum, 2.4 cfs Sept. 9-11 (gage height, 1.66 ft.).

Remarks.—Cities of Chehalis and Centralia divert about 15 cfs above station for municipal use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944										5.16	11.8	17.6	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944										2.6	2.4	9.3	

* Estimated.

Newaukum River near Chehalis, Wash.

Location.—Lat. 46°37'10", long. 122°56'40", on line between secs. 9 and 16, T. 13 N., R. 2 W., on left bank at highway bridge 2½ miles southeast of Chehalis and 3½ miles upstream from mouth.

Drainage area.—159 sq. mi.

Gage.—Staff gage and, since Sept. 14, 1950, crest-stage indicator. Altitude of gage is 190 ft. (from topographic map). Prior to Oct. 1, 1929, at datum 1.0 ft. higher.

Average discharge.—13 years (1929-31, 1942-53), 476 cfs (unadjusted).

Extremes.—1929-31, 1942-53: Maximum discharge, 6,440 cfs Feb. 17, 1949 (gage height, 13.06 ft., from graph based on gage readings), from rating curve extended above 3,800 cfs by logarithmic plotting; minimum observed, 12 cfs Sept. 13, 14, 1949; minimum gage height, 0.74 ft. (present datum) Sept. 12, 13, 15, 1929.*

Remarks.—Cities of Chehalis and Centralia divert about 15 cfs above station for municipal use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929						781	698	246	160	59.1	39.0	35.8	
1930	41.3	47.6	513	437	1,180	604	302	273	145	57.4	35.0	37.2	297
1931	69.1	262	298	914	624	771	849	151	169	73.0	89.0	54.7	354
1942										153	71.5	45.2	
1943	69.1	1,114	1,118	635	1,232	587	603	227	145	79.7	53.6	40.0	486
1944	135	216	690	705	629	414	410	161	111	51.4	43.6	68.1	304
1945	79.0	336	368	844	1,038	1,040	635	440	144	55.4	46.8	87.9	423
1946	80.0	797	965	1,290	1,333	1,001	380	158	232	147	56.6	57.0	537
1947	297	966	1,318	937	934	516	563	130	115	68.2	42.0	71.3	494
1948	461	1,088	796	1,216	1,109	673	627	618	178	80.8	79.3	137	567
1949	233	1,109	1,678	399	1,582	815	328	300	97.4	42.3	33.2	47.4	549
1950	187	688	1,188	1,334	1,224	683	250	135		71.0	46.6	40.3	638
1951	349	1,387	1,382	1,488	1,438	913	333	181	73.6	36.1	21.6	40.0	632
1952	371	713	1,115	764	959	636	358	183	96.7	67.5	41.5*	29.1	443*
1953	35.1	56.1	300	2,169	1,034	426	388*	337	233	102	77.3	58.0	436*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929						405	405	120	83	44	35	32	
1930	33	37	39	155	537	157	208	134	96	40	30	27	27
1931	31	49	117	231	197	302	190	81	67	45	34	33	31
1942										98	56	36	
1943	36	252	518	252	294	176	252	152	99	51	43	34	34
1944	36	101	239	294	353	239	213	117	68	40	37	33	33
1945	60	130	141	246	352	399	305	204	75	50	33	38	33
1946	30	200	308	477	609	509	213	107	88	66	45	44	39
1947	49	176	204	226	294	266	252	78	74	49	34	36	34
1948	49	266	399	266	213	266	399	252	103	59	52	52	49
1949	119	239	415	164	164	460	266	121	75	17	18	14	14
1950	28	98	358	274	410	548	238	148	100	44	35	25	25
1951	42	288	583	583	465	376	160	107	42	25	14	21	14
1952	72	210	386	350	470	368	197	108	75	36	33	19.5	19.5
1953	22	30	48	578	305	222	236	182	170	65	47	42	22

* Estimated.

CHEHALIS RIVER BASIN

Newaukum River near Chehalis, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1929.....	3,090	Mar. 27, 1929					
1930.....	3,090	Mar. 24, 1930	27	297	215,000	299	216,000
1931.....	6,120	April 1, 1931	31	354	256,000		
1942.....							
1943.....	4,990	Nov. 23, 1942	34	453	351,900	380	276,200
1944.....	4,500	Dec. 3, 1943	33	304	229,500	252	204,500
1945.....	4,760	Feb. 8, 1945	33	423	305,900	511	370,200
1946.....	4,700	Feb. 6, 1946	39	537	389,500	599	433,900
1947.....	5,400	Dec. 11, 1946	34	494	357,400	473	342,600
1948.....	4,880	Mar. 22, 1948	49	567	425,800	644	467,300
1949.....	6,440	Feb. 17, 1949	14	549	397,200	468	339,100
1950.....	5,720	Feb. 24, 1950	25	638	461,900	726	525,400
1951.....	5,240	Feb. 9, 1951	14	632	457,700	556	402,600
1952.....	3,980	Feb. 4, 1952	19.5	443	321,800	297	215,600
1953.....	4,540	Jan. 23, 1953	22	436	315,900		

Skookumchuck River near Centralia, Wash.

Location.—Lat. 46°47'15", long. 122°42'45", in SW ¼ NW ¼ sec. 17, T. 15 N., R. 1 E., on left bank, half a mile upstream from Bloody Run Creek, 4 ¼ miles upstream from Thompson Creek, and 12 miles northeast of Centralia.

Drainage area.—60.8 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 300.00 ft. above mean sea level (river-profile survey). Apr. 1, 1929, to Dec. 6, 1933, staff gage a quarter of a mile downstream at different datum. Oct. 9 to Nov. 29, 1939, staff gage at present site and datum.

Average discharge.—18 years (1929-33, 1939-53), 238 cfs.

Extremes.—1929-33, 1939-53: Maximum discharge, 5,770 cfs Feb. 17, 1949 (gage height, 48.39 ft.); minimum, 15.5 cfs Nov. 28, 29, 1952 (gage height, 39.22 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929.....													
1930.....	26.3	25.7	273	178	551	309	333 151	152 134	104 77.4	45.9 35.0	30.1 26.5	24.8 23.7	149
1931.....	36.1	107	115	441	296	392	411	91.6	98.1	56.1	33.2	42.1	176
1932.....	174*	475*	627*	681*	671	620	411	142	69.0	72.0	40.3	31.7	333*
1933.....	65.8	659	729	565	257	570	288	243	185	65.9	49.2	102	311
1934.....	216	282											
1940.....	44.7	72.7	545	202	621	429	246	223	61.5	33.9	26.1	25.2	209
1941.....	75.0	181	257	296	149	129	110	155	84.7	41.1	32.1	79.3	132
1942.....	141	297	632	211	296	197	114	139	212	89.9	44.5	28.8	200
1943.....	46.2	528	531	268	516	294	335	97.5	94.5	65.3	35.0	26.0	233
1944.....	61.0	104	346*	404	261	195	220	101	61.5	30.1	24.2	30.6	153*
1945.....	35.4	195	154	442	465	503	343	249	74.8	46.4*	26.0	41.8	213*

* Estimated.

CHEHALIS RIVER BASIN

Skookumchuck River near Centralia, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	44.9	521	525	642	630	454	213*	109	130	102	41.3	86.7	285*
1947...	184	464	778	450	489	227	253	71.0	64.8	42.6	29.2	85.0	252
1948...	282	409	401	525	504	331	285	96.0	96.0	49.4	47.8	70.9	278
1949...	129	469	601	166	802	452	206	195	60.0	36.5	28.8	28.4	268
1950...	66.1	346	592	595*	938*	712	451	182	98.7	47.3	36.1	81.9	838*
1951...	220	630	698	642	718	346	199	109	49.4	27.4	22.3	28.9	296
1952...	220	855	464	331	469	246	220	138	61.9	42.5	25.8	21.9	216
1953...	21.4	28.5	222	1,156	492	254	185	187	133	59.4	39.4	85.3	234

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929							203	83	59	35	23	22	22
1930...	22	22	22	66	221	86	99	66	52	51	23	21	21
1931...	22	26	48	86	92	137	111	61	50	89	29	29	22
1932					140	260	197	90	46	44	33	28	28
1933	26	197	148	188	118	250	172	197	104	46	37	37	26
1934	56	104											
1940...	25*	28	130	101	128	157	119	73	86	28	22	21	21
1941...	22	83	101	145	85	74	63	62	61	82	25	39	22
1942...	67	64	169	109	111	111	85	78	104	61	35	26	26
1943...	24	109	252	121	150	92	121	74	62	36	28	23	23
1944...	24	47	102	152	136	110	106	75	39	24	22	20	20
1945...	18	67	71	111	127	176	197	128	53	30	20	21	18
1946...	23	64	137	197	255	271	160	74	66	53	33	27	23
1947...	28	64	105	74	154	125	46	44	35	25	25	25	25
1948...	26	129	118	118	90	116	217	147	63	40	40	32	26
1949...	61	95	192	79	76	228	177	82	47	31	25	23	23
1950...	24	45	152	230*	220*	257	195	115	69	35	29	24	24
1951...	31	140	315	263	195	133	106	71	83	22	18.5	18.5	18.5
1952...	53	94	180	124	175	182	142	74	49	27	23	20	20
1953...	18.5	19.5	28	264	164	124	145	108	94	38	30	25	18.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Minim-um day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1929			22								
1930	2,020	Mar. 22, 1930	21	149	2.45	33.22	103,000	143	31.88	103,000	
1931	3,240	Mar. 31, 1931	22	176	2.69	39.23	127,000	261	58.29	189,000	
1932	4,160	Feb. 26, 1932	23	333	5.48	74.61	242,000	348	77.85	253,000	
1933	4,070	Nov. 18, 1932	26	311	5.12	69.44	225,000				
1940	2,740	Dec. 15, 1939	21	209	3.44	46.78	151,700	196	43.89	142,300	
1941	1,880	Jan. 18, 1941	22	132	2.17	29.56	95,830	179	40.06	129,000	
1942	3,800	Dec. 19, 1941	26	200	3.29	44.61	144,700	202	45.12	146,300	
1943	2,830	Nov. 23, 1942	23	233	3.23	52.06	168,900	184	41.06	153,100	
1944	2,760	Dec. 3, 1943	20	183	2.52	34.26	111,100	142	31.80	103,100	
1945	3,080	Feb. 7, 1945	18	213	3.50	47.60	154,400	272	60.80	197,100	
1946	3,080	Dec. 28, 1945	23	285	4.69	63.70	206,600	310	69.15	224,300	
1947	3,880	Dec. 11, 1946	25	252	4.14	56.27	182,400	228	59.90	165,000	
1948	3,880	Mar. 22, 1948	26	278	4.57	62.17	201,600	293	65.70	213,000	
1949	5,770	Feb. 17, 1949	23	263	4.41	59.80	193,900	245	54.64	177,200	
1950	5,360	Dec. 28, 1949	24	338	5.56	75.37	244,500	375	83.02	271,200	
1951	3,980	Feb. 9, 1951	18.5	296	4.87	66.10	214,300	262	58.51	189,800	
1952	2,850	Feb. 4, 1952	20	216	3.55	48.39	156,900	152	34.04	110,300	
1953	2,680	Jan. 9, 1953	18.5	234	3.65	52.21	169,300				

* Estimated.

CHEHALIS RIVER BASIN

Hanaford Creek near Centralia, Wash.

Location.—Lat. 46°44'50", long. 122°46'40", in NW¼ sec. 35, T. 15 N., R. 1 W., on right bank, 1 mile downstream from Coal Creek, and 8 miles east of Centralia.

Drainage area.—13.3 sq. mi.

Gage.—Staff gage. Altitude of gage is 240 ft. (from topographic map).

Extremes.—July to September, 1944: Maximum discharge not determined, occurred during period of no gage-height record; minimum daily (estimated), 2.4 cfs Sept. 8-12.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944										3.86	3.15	3.86*	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944										3.2	2.7	2.4*	

Lincoln Creek near Rochester, Wash.

Location.—Lat. 46°44'10", long. 123°10'40", in SW¼SW¼ sec. 34, T. 15 N., R. 4 W., on left bank 1¼ miles downstream from confluence of North and South Forks, and 7 miles southwest of Rochester.

Drainage area.—20.9 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 190 ft. (from topographic map). Prior to Apr. 1, 1947, staff gage at same site and datum.

Average discharge.—6 years (1944-50), 72.4 cfs.

Extremes.—1942-50: Maximum discharge, 990 cfs Dec. 28, 1949 (gage height 15.65 ft.); minimum observed, 0.4 cfs Aug. 23, 1945.

Remarks.—Small diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										12.0	5.05	2.50	
1943	9.41									7.32	3.91	2.41	
1944	8.78									4.38	2.18	3.41	
1945	5.21	58.8	55.0	139*	162	145	68.0	32.5	12.1	3.47	1.22	4.92	56.0*
1946	5.87	112	160	190	172	106	70.5	17.8	10.2	7.37	2.53	3.12	71.0
1947	16.9	120	200	127	167	53.9	49.8	17.4	11.2	0.46	1.63	2.75	63.6
1948	52.4	114	101	154	150	105*	77.7	60.7	16.9	4.44*	2.71*	7.78*	72.0*
1949	23.7*	142	269	51.6*	251	96.6	40.0	30.7	8.21	2.70*	1.70*	1.56*	75.4*
1950	21.8	116	213	171	299*	218*	55.1	28.2	9.73	4.94	3.39	2.03	96.5*
1951	33.2												

* Estimated.

CHEHALIS RIVER BASIN

Lincoln Creek near Rochester, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										7.7	3.0	1.8	1.8
1943	2.0									4.3	2.9	1.6	1.6
1944	1.8									2.9	1.2	1.4	1.2
1945	1.6	24	24	50	54	50	33	20	6.8	1.7	.4	.8	.4
1946	.6	13	42	51	63	63	35	11	7.3	3.8	1.4	1.6	.6
1947	1.8	15.5	30	19.5	44	32	30	10	5.6	1.0	.9	.9	.9
1948	1.3	39	40	30	26	36*	59	30	6.7	2.5*	2*	1*	1*
1949	9*	21	75	24*	21	57	28	12	5.6	1.3	1.4	1.3	1.3
1950	1.5	11	59	70*	75*	110*	41	15	6.5	3.4	1.7	.9	.9
1951	2.5												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1942			1.8							
1943			1.6							
1944			1.2							
1945	830	Feb. 7, 1945	0.4	56.0	2.68	50.35	40,530	69.3	45.03	50,200
1946	890	Dec. 28, 1945	.6	71.0	3.40	46.10	51,350	76.4	49.63	55,330
1947	934	Jan. 25, 1947	.9	63.6	3.04	41.30	46,050	57.3	37.20	41,470
1948	699	Mar. 22, 1948	1	72.0	3.44	46.90	52,260	86.0	56.04	62,440
1949	930	Feb. 17, 1949	1.3	75.4	3.61	48.95	54,580	63.4	44.41	49,500
1950	960	Dec. 23, 1949	.9	96.5	4.02	62.69	69,870			

* Estimated.

Chehalis River near Grand Mound, Wash.

Location.—Lat. 46°46'35", long. 123°02'05", in NE¼ sec. 22, T. 15 N., R. 3 W., on left bank at county bridge at Meadow, 1½ miles southwest of Grand Mound, and 6 miles downstream from Skookumchuck River.

Drainage area.—895 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 123.27 ft. above mean sea level, datum of 1929. Prior to Oct. 3, 1934, staff gage at datum 3.00 ft. higher.

Average discharge.—25 years (1928-53), 2,675 cfs.

Extremes.—1928-53: Maximum discharge, 48,400 cfs Dec. 29, 1937 (gage height, 18.39 ft.); minimum, 90 cfs. Aug. 23-26, 1951 (gage height, 1.20 ft.).

Remarks.—Many small diversions for irrigation and domestic use above station, including municipal water supply for Centralia and Chehalis. No regulation.

CHEHALIS RIVER BASIN

Chehalis River near Grand Mound, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	549	1,100	2,740	2,800	2,300	3,940	4,390	1,240	900	405	193	197	1,730
1930...	272	326	2,390	2,070	6,830	3,100	1,570	1,200	710	287	155	189	1,900
1931...	350	1,200	1,230	5,650	3,860	4,460	5,150	709	355	409	235	314	2,030
1932...	1,470	4,120	5,610	6,030	6,650	7,340	4,320	1,110	533	399	252	242	3,170
1933...	532	7,540	9,150	8,260	4,370	6,930	2,380	1,760	1,120	436	295	650	3,620
1934...	1,790	2,792	19,280	9,445	2,020	3,453	1,565	891	353	243	189	229	3,558
1935...	2,457	9,192	7,475	9,047	3,946	5,127	2,038	745	414	262	171	253	3,452
1936...	294	637	1,921	10,320	5,141	5,522	1,577	1,567	2,482	550	264	268	2,561
1937...	224	221	3,777	2,160	7,859	4,251	6,787	1,570	1,902	604	312	357	2,460
1938...	664	8,107	8,822	5,817	4,193	5,290	3,366	963	351	223	159	131	3,172
1939...	374	2,098	3,581	6,401	8,174	3,664	1,088	549	650	330	189	172	2,238
1940...	291	497	5,812	3,803	9,067	5,422	3,206	2,870	489	259	160	214	2,656
1941...	735	2,139	3,785	4,627	1,884	1,462	1,093	1,451	640	299	212	736*	1,596*
1942...	1,051	3,278	8,181	2,812	4,209	2,226	1,134	1,233	1,569	625	282	180	2,225
1943...	249	5,551	5,936	4,107	6,935	2,637	4,161	1,123	762	369	254	208	2,661
1944...	615	1,018	3,115	4,153	3,232	2,231	2,406	887	571	240	154	193	1,669
1945...	284	1,866	1,850	4,813	6,226	6,151	2,577*	1,951*	572	256	173	363	2,235*
1946...	298	3,075*	5,453*	7,370	7,731	4,533	2,600	340	710	609	237	257	2,876*
1947...	1,043*	5,305	8,042	5,109	6,497	2,569	2,403	710	536	300	772	280	2,725*
1948...	2,429	4,630	4,531	6,363	6,400	4,272	3,389	3,496	621	348*	273	469	3,152*
1949...	995*	5,268	10,260	2,131	11,060	3,956	1,568	1,414	428	243	173	172	3,085*
1950...	502	4,175	7,414	8,133	10,630	8,497	3,332	1,238	536	265	274	209	3,774
1951...	2,110	7,037	8,545	9,597	9,239	5,043	1,534	819	356	182	123	155	3,732
1952...	2,137	3,776	6,909	4,417	6,054	3,071	1,836	955	436	257	163	135	2,507
1953...	125	257	2,454	12,800	6,298	2,734	1,752	1,571	382	361	248	216	2,462

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	284	260	665	950	840	1,370	1,370	650	500	224	170	170	170
1930...	132	270	300	735	3,130	340	1,010	610	515	163	147	149	147
1931...	225	285	500	885	855	1,490	355	565	440	270	212	212	212
1932...	320	1,030	1,310	2,180	1,490	2,730	1,730	630	420	265	209	212	209
1933...	243	1,660	1,610	2,640	1,610	3,060	1,440	1,350	660	310	212	244	212
1934...	450	1,110	1,320	3,310	960	870	675	460	254	206	146	131	131
1935...	183	2,510	2,050	1,040	1,650	1,940	1,350	503	307	165	131	134	131
1936...	173	255	520	1,330	1,050	1,960	934	544	790	322	207	204	173
1937...	123	196	204	1,190	1,720	2,120	2,350	763	578	344	243	265	193
1938...	271	666	2,190	2,530	2,600	1,750	1,630	516	271	162	130	111	111
1939...	141	940	1,120	2,740	2,950	1,690	705	432	402	215	171	133	133
1940...	144	293	990	1,250	2,120	1,690	1,350	666	347	200	124	144	124
1941...	217	331	1,220	1,020	1,010	602	620	612	446	196	152	450*	152
1942...	470*	550*	2,040	1,370	1,410	1,340	765	716	813	408	215	160	160
1943...	165	1,280	2,610	1,700	1,580	673	1,430	632	533	262	215*	179	165
1944...	132	502	804	1,780	1,780	1,280	1,120	555	319	172	122	116	116
1945...	207	610	795	1,600	1,780	1,900	1,300*	300*	360	196	140	148	140
1946...	172	600*	1,500*	2,270	3,030	2,340	1,470	533	448	307	186	195*	172
1947...	210*	703	1,580	1,160	1,850	2,430	1,260	414	354	230	140	143	140
1948...	198	1,480	1,760	1,540	1,250	1,600	2,490	1,430	455	245*	210	186	186
1949...	613	821	2,490	970	593	2,260	1,250	619	348	187	134	131	131
1950...	156	403	2,260	2,370	2,200	3,250	1,770	675	375	167	167	141	141
1951...	234	1,330	3,660	3,530	2,560	2,070	330	515	219	139	90	93	90
1952...	390	958	2,140	2,180	2,350	2,150	1,016	584	322	162	121	111	111
1953...	104	150	190	4,050	1,930	1,270	1,160	844	656	232	156	162	104

* Estimated.

Chehalis River near Grand Mound, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1929.....	13,700	Mar. 27, 1929	170	1,730	1.93	26.20	1,250,000	1,650	24.99	1,200,000
1930.....	12,200	Feb. 8, 1930	147	1,600	1.79	24.30	1,160,000	1,540	23.28	1,110,000
1931.....	19,400	April 1, 1931	212	2,030	2.27	30.81	1,470,000	2,730	41.40	1,980,000
1932.....	23,500	Feb. 27, 1932	209	3,170	3.54	48.18	2,300,000	3,870	55.81	2,660,000
1933.....	24,900	Dec. 3, 1932	212	3,620	4.04	54.79	2,620,000	4,200	63.66	3,040,000
1934.....	45,700	Dec. 21, 1933	131	3,558	3.98	54.03	2,576,000	3,138	47.65	2,272,000
1935.....	38,000	Jan. 28, 1935	131	3,432	3.89	52.80	2,520,000	2,139	32.44	1,549,000
1936.....	36,300	Jan. 13, 1936	178	2,561	2.86	38.57	1,859,000	2,662	40.40	1,933,000
1937.....	24,300	April 15, 1937	193	2,460	2.75	37.33	1,781,000	3,574	54.16	2,587,000
1938.....	46,400	Dec. 29, 1937	111	3,172	3.54	47.99	2,396,000	2,268	33.53	1,599,000
1939.....	24,800	Feb. 16, 1939	133	2,288	2.50	33.04	1,626,000	2,259	34.63	1,657,000
1940.....	22,700	Dec. 17, 1939	124	2,656	2.97	40.43	1,928,000	2,687	40.43	1,929,000
1941.....	18,800	Jan. 19, 1941	152	1,596	1.78	24.14	1,155,000	2,089	31.62	1,512,000
1942.....	26,900	Dec. 20, 1941	160	2,225	2.49	33.80	1,610,000	2,153	32.71	1,569,000
1943.....	20,200	Feb. 7, 1943	165	2,661	2.97	40.26	1,929,000	2,079	31.47	1,505,000
1944.....	16,400	Dec. 4, 1943	116	1,569	1.75	23.81	1,189,000	1,503	22.82	1,091,000
1945.....	27,000	Feb. 9, 1945	140	2,235	2.50	33.94	1,618,000	2,690	40.86	1,948,000
1946.....	23,100	Dec. 30, 1945	172	2,878	3.22	43.71	2,083,000	3,300	50.09	2,389,000
1947.....	24,200	Jan. 26, 1947	140	2,728	3.05	41.40	1,975,000	2,488	37.74	1,801,000
1948.....	20,000	Jan. 3, 1948	186	3,152	3.52	47.01	2,288,000	3,568	54.31	2,590,000
1949.....	36,500	Feb. 18, 1949	131	3,085	3.45	46.83	2,235,000	2,714	41.06	1,965,000
1950.....	26,300	Feb. 26, 1950	141	3,774	4.22	57.28	2,732,000	4,246	64.40	3,074,000
1951.....	38,000	Feb. 10, 1951	90	3,732	4.17	56.59	2,702,000	3,323	50.89	2,406,000
1952.....	18,800	Feb. 6, 1952	111	2,507	2.80	38.13	1,820,000	1,671	25.41	1,213,000
1953.....	20,500	Jan. 10, 1953	104	2,462	2.75	37.33	1,782,000	.....	.....	.....

Scatter Creek near Grand Mound, Wash.

Location.—Lat. 46°49'30", long. 122°57'20", in SE¼ sec. 32, T. 16 N., R. 2 W., on left bank, 300 ft. downstream from highway crossing, and 3¼ miles northeast of Grand Mound.

Drainage area.—21.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 200 ft. (from topographic map).

Extremes.—July to September, 1944: Maximum discharge, 2.3 cfs July 17, 18 (gage height, 35.19 ft.); no flow Sept. 7-15, 19-30.

Remarks.—Several small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944.....	1.05	0.07	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944.....	0.1	0	.....

CHEHALIS RIVER BASIN

Wadell Creek near Little Rock, Wash.

Location.—Lat. 46°54'50", long. 123°03'00", in SW¼ sec. 34, T. 17 N., R. 3 W., on right bank, 1½ miles northwest of Little Rock, and 1¼ miles upstream from mouth.

Drainage area.—15.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 185 cfs Nov. 3 (gage height, 2.88 ft.); minimum, 1.8 cfs Sept. 9 (gage height, 1.50 ft.)

Remarks.—Some regulation by small reservoir on tributaries above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944								6.45	4.53	6.80	11.3		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944								3.4	2.8	2.2	5.2		

Black River at Little Rock, Wash.

Location.—Lat. 46°54'10", long. 123°01'20", in NE¼SW¼ sec. 2, T. 16 N., R. 3 W., on right bank at bridge crossing in Little Rock, 600 ft. downstream from Wadell Creek, and 0.4 mile upstream from Beaver Creek.

Drainage area.—60 sq. mi., approximately; does not include area drained by artificial channel from Black Lake to Percival Creek.

Gage.—Water-stage recorder. Altitude of gage is 125 ft. (from topographic map). Prior to Sept. 29, 1944, staff gage at same site and datum.

Average discharge.—6 years (1944-50), 162 cfs.

Extremes.—1942-50: Maximum discharge, 1,700 cfs Dec. 28, 1949 (gage height, 7.40 ft.), from rating curve extended above 510 cfs; minimum observed, 5.3 cfs Sept. 9, 1944 (gage height, 1.30 ft.).

Remarks.—Black Lake at headwaters is tapped by artificial channel to Percival Creek which flows into Puget Sound. Records herein do not include inter-basin flow from Black Lake or area drained by this channel. Regulation of Black Lake, by artificial channel to Percival Creek, varies with stage of lake. No artificial regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										25.5	11.1	8.83	
1943	17.8									22.2	12.2	9.64	
1944	32.5									10.8	8.57	10.6	
1945	15.9	89.4	105	291	318	278	149	83.4	37.9	13.4	8.16	14.4	116
1946	20.1	169	289	413	364	271	193	64.0	46.5	31.2	12.6	11.4	156
1947	35.5	143	346	313	376	154	120	51.6	34.2	16.4	11.6	13.7	183
1948	116	176	202	347	307	267	180	193	68.5	29.7	22.8	36.4	162
1949	72.8	252	653	151	516	249	111	77.7	32.2	17.4	12.8	11.6	178
1950	30.2	232	465	490	683	523	220	68.5	45.9	22.8	23.1	13.9	227

Black River at Little Rock, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										16	9.7	8.2	8.2
1943	9.6									14	9.0	8.0	8.0
1944	9.0									7.3	7.3	5.6	5.6
1945	9.9	32	52	94	132	125	68	59	22	9.0	6.0	7.3	6.0
1946	8.6	24	122	189	218	187	115	45	33	15.5	10.5	9.5	8.6
1947	10	21	138	120	156	110	88	30	20	12	10	9.1	9.1
1948	12	102	106	135	118	164	137	106	37	18.5	16	14	12
1949	40	79	241	96	88	180*	87	43	24	13.5	11	10	10
1950	11	23	162	227*	195	295	143	62	30	16	13	11	11

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1942			8.2				
1943			8.0				
1944			5.6				
1945	840	Feb. 8, 1945	6.0	116	83,920	138	100,200
1946	840	Jan. 4, 1946	8.6	156	112,900	160	115,800
1947	1,220	Jan. 25, 1947	9.1	133	86,570	131	94,580
1948	695	Jan. 4, 1948	12	162	117,500	203	147,100
1949	1,350	Feb. 23, 1949	10	178	128,600	157	113,400
1950	1,700	Dec. 28, 1949	11	227	164,400		

Garrod Creek near Oakville, Wash.

Location.—Lat. 46°48'45", long. 123°15'05", in SE¼ sec. 1, T. 15 N., R. 5 W., on left bank at road crossing, three-quarters of a mile upstream from mouth, and 2¼ miles southwest of Oakville.

Drainage area.—27.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 50 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 90 cfs. Nov. 4 (gage height, 3.93 ft.); minimum, 2.1 cfs Sept. 12 (gage height, 0.56 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									7.10	4.21	6.16	10.9	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									4.8	2.8	2.2	5.6	

* Estimated.

CHEHALIS RIVER BASIN

Rock Creek at Cedarville, Wash.

Location.—Lat. 46°52'05", long. 123°18'25", in SW¼SW¼ sec. 15, T. 16 N., R. 5 W., on left bank 0.2 mile downstream from Williams Creek, 1 mile west of Cedarville, and 1¼ miles upstream from mouth.

Drainage area.—24.8 sq. mi. At site prior to September, 1944, 26.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map). Prior to Aug. 17, 1944, staff gage at railroad bridge three-quarters of a mile downstream at different datum.

Average discharge.—9 years (1944-53), 84.2 cfs.

Extremes.—1942-53: Maximum discharge, 1,660 cfs Feb. 9, 1951 (gage height, 13.77 ft., from rating curve extended above 800 cfs); minimum, 0.3 cfs Sept. 25, 1946.

Remarks.—Minor diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										10.5	4.25	1.99	
1943	11.1									5.08	2.71	2.70	
1944	22.6									4.15	1.62	2.92	
1945	5.33	90.1	72.6	202	136	147	62.2*	30.2	5.61	3.33	1.47	4.38	66.6*
1946	5.80	131	198	207	192	125	101	22.3	11.6	6.40	1.51	1.22	82.9
1947	13.8	110	209	167	191	65.6	68.1	14.7	12.1	5.38	2.80	3.80	71.2
1948	81.9	137	141	188*	193	121	85.7	100	17.2	6.63	4.20	7.69	89.6*
1949	29.4	190	237	57.3	283	82.1	39.2	37.4	9.06	3.60	2.02	2.11	83.8
1950	12.2	148	249	214	295	222	97.9	31.1	11.3	3.53	3.14	2.06	106
1951	47.0	174	245	274	274	164	44.0	14.7	8.21	1.66	.95	3.28	103
1952	77.2	142	208*	170*	149	86.0	53.5*	27.0	10.9	3.54	1.97	1.87*	77.3*
1953	1.81	5.20	74.2	427	205	75.5	58.4	51.9	19.6	5.79	2.88	2.60	77.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										4.2	2.8	1.6	1.6
1943	2.0									3.0	2.0	1.7	1.7
1944	4.0									2.2	.8	.7	.7
1945	2.2	25	28	58	49	36	23	6.3	4.9	1.8	.9	1.0	.9
1946	1.7	13.5	52	59	59	66	45	12.0	7.0	1.8	.5	.4	.4
1947	1.6	8.4	39*	28	49	35	34	6.5	6.0	3.2	1.6	1.6	1.6
1948	3.5	49	51	35	32	44	61	34	7.5	3.2	2.8	1.9	1.9
1949	5.2	29	79	27	24	42	30	15	6.0	1.9	1.3	1.1	1.1
1950	2.2	7.3	75	80	77	89	47	16.5	6.5	1.9	1.6	1.1	1.1
1951	2.8	40	105	87	80	69	20	9.8	1.5	1.0	.4	.6	.4
1952	12.5	37	60	56*	57	48	27	12	7.3	1.6	1.2	1.1	1.1
1953	1.0	2.4	4.4	154	60	33	33	26	11	2.9	1.8	.9	.9

* Estimated.

Rock Creek at Cedarville, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1942.....			1.6									
1943.....			1.7									
1944.....			.7									
1945.....	1,440	Feb. 7, 1945	.9	66.8	2.69	36.55	48,340	80.8	44.23	58,510		
1946.....	1,000	Dec. 28, 1945	.4	82.9	3.34	45.41	60,060	82.9	45.37	60,000		
1947.....	1,310	Feb. 2, 1947	1.6	71.2	2.87	38.97	51,550	72.6	39.72	52,530		
1948.....	1,140	Mar. 22, 1948	1.9	89.6	3.61	49.21	65,080	103	56.40	74,580		
1949.....	1,370	Feb. 17, 1949	1.1	83.8	3.38	45.87	60,670	75.6	41.39	54,760		
1950.....	1,390	Dec. 28, 1949	1.1	106	4.27	58.18	76,960	111	60.81	80,420		
1951.....	1,660	Feb. 9, 1951	.4	103	4.15	56.87	74,820	100	54.75	72,480		
1952.....	746	Feb. 4, 1952	1.1	77.3	3.12	42.44	56,140	48.5	26.62	35,210		
1953.....	1,120	Jan. 23, 1953	.9	77.1	3.11	42.17	55,800					

Cedar Creek near Oakville, Wash.

Location.—Lat. 46°52'50", long. 123°16'20", in NW¼NE¼ sec. 14, T. 16 N., R. 5 W., on left bank 300 ft. downstream from highway bridge, 1 mile upstream from mouth, and 3½ miles northwest of Oakville.

Drainage area.—38.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 205 cfs Nov. 3 (gage height, 3.04 ft.); minimum, 9.3 cfs Sept. 6, 10, 11 (gage height, 1.65 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944.....										12.5	18.5	25.0	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944.....										9.7	9.3	16	.....

CHEHALIS RIVER BASIN

Chehalis River at Porter, Wash.

Location.—Lat. 46°56'20", long. 123°18'45", on line between secs. 21 and 28, T. 17 N., R. 5 W., in upstream end of right bank pier of Chehalis River bridge at mouth of Porter Creek, 700 ft. west of Porter.

Drainage area.—1,300 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 25 ft. (from topographic map).

Extremes.—1952-53: Maximum discharge, 24,800 cfs Jan. 31, 1953 (gage height, 19.93 ft.); minimum, 164 cfs Oct. 17, 1952 (gage height, 2.25 ft.).

Remarks.—Many small diversions for irrigation and domestic use above station, including municipal water supply for Centralia and Chehalis. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952					9,243	4,543	3,048	1,552	677	391	228	199	
1953	196	376	3,362	17,270	10,370	4,079	2,897	2,472	1,398	579	323	304	3,606

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952					3,930	3,420	1,500*	515	528	247	194	168	
1953	166	250	286	5,560	3,500	2,270	2,050	1,550	1,000	360	240	227	166

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mlie	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1952			168										
1953	24,800	Jan. 31, 1953	166	3,606	2.77	37.64	2,611,000						

* Estimated.

Porter Creek at Porter, Wash.

Location.—Lat. 46°57'00", long. 123°17'30", in NE¼NE¼ sec. 22, T. 17 N., R. 5 W., left bank 1 mile northeast of Porter and 1½ miles upstream from mouth.

Drainage area.—36.0 sq. mi. At site prior to August, 1944, 37.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 60 ft. (from topographic map). Prior to Aug. 16, 1944, staff gage 0.3 mile downstream at different datum.

Extremes.—1942-48: Maximum discharge recorded, 1,360 cfs Feb. 7, 1945 (gage height, 7.03 ft.), but may have been greater in 1947 during period of no gage-height record; minimum recorded, 4.2 cfs Sept. 11, 1944.

Remarks.—Small diversions for irrigation and domestic use above station during summer months. No regulation.

CHEHALIS RIVER BASIN

Porter Creek at Porter, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										37.3	18.8	14.1	
1943	30.1									25.8			
1944										14.5	9.72	24.3	
1945	33.1	164	120	259	268	270	138	91.7	36.1	16.7	14.3*	19.4	118*
1946	28.9	224	263	315	322	223	162	49.8	40.5	32.7	15.1	15.2	140
1947	50.8	203	352	297*	362*	132	98.5	36.3	29.0	15.7	11.5	14.1	133*
1948	162	187	196	224	211	167	153	165	61.4	26.7	24.2*	47.0	133*
1949	79.2												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										26	14	12	12
1943	14									16			
1944										10	4.8	4.6	4.6
1945	14	57	52	99	110	104	74	48	22	14	11*	13	11*
1946	12.0	43	98	126	184	137	94	31	24	17.5	12.5	11.5	11.5
1947	11.5	37	106	73	99	74	61	20	16	11.5	8.6	8.9	8.6
1948	12	75	69	82	72	94	123	84	30	18	19*	16	12
1949	40												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1942			12									
1943												
1944			4.6									
1945	1,360	Feb. 7, 1945	11	118	3.28	44.61	85,640	135	50.93	97,750		
1946	1,140	Jan. 4, 1946	11.5	140	3.69	52.74	101,200	148	55.82	107,200		
1947			8.6	133	3.69	50.01	96,030	126	47.53	91,270		
1948	1,150	Oct. 18, 1947	12	133	3.69	50.14	96,270					
1949												

* Estimated.

Wildcat Creek near Elma, Wash.

Location—Lat. 47°01'30", long. 123°21'10", in SE¼ sec. 19, T. 18 N., R. 5 W., on right bank 500 ft. upstream from highway bridge, three-quarters of a mile upstream from mouth, and 2½ miles northeast of Elma.

Drainage area.—19.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map).

Extremes.—July to November, 1944: Maximum discharge, 144 cfs Nov. 3 (gage height, 2.86 ft.), from rating curve extended above 33 cfs; minimum, 2.9 cfs Sept. 6-15 (gage height, 1.11 ft.).

Remarks.—No known diversion. Slight regulation by mill pond above station.

CHEHALIS RIVER BASIN

Wildcat Creek near Elma, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									5.74*	8.62	9.46	14.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									4.1	3.2	2.9	7.6	

Cloquallum River at Elma, Wash.

Location.—Lat. 47°00'20", long. 123°23'10"; in S½NW¼ sec. 36, T. 18 N., R. 6 W., on right bank 10 ft. downstream from highway bridge, half a mile east of Elma, and 1.8 miles downstream from Wildcat Creek.

Drainage area.—65.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Prior to Aug. 7, 1944, staff gage 350 ft. downstream at datum 0.42 ft. lower. Aug. 7, 1944, to Sept. 1, 1953, water-stage recorder 200 ft. upstream at same datum.

Average discharge.—9 years (1944-53), 252 cfs.

Extremes.—1942-53: Maximum discharge, 4,470 cfs Feb. 9, 1951 (gage height, 11.04 ft.); minimum, 6.8 cfs Sept. 15, 1945 (gage height, 143 ft.).

Remarks.—Several small diversions above station. Some regulation by long pond on Wildcat Creek.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										50.6	29.3	21.7	
1943	46.0									42.2	31.8	26.4	
1944	50.7									27.6	20.0	37.0	
1945	50.0	292	183	563	431	372	221	178	77.0	32.6	26.3*	26.3	205*
1946	46.5	383	569	570	627	462	372	107	86.1	64.0	31.5	30.3	277
1947	69.2	255	477	553	617	225	203	78.4	57.8	34.9	24.6	26.0	218
1948	214	284	366	440	415	331	225	302	94.4*	53.1*	41.7	57.6	235*
1949	111	405	780	206*	534*	507	157	142	53.6	84.7	29.1	30.7	254*
1950	60.3	326	602	498	768	733	301	125	65.3	32.3	35.6	31.9*	296*
1951	213	526	704	790	916	448	156	91.7	51.3	30.8	23.4	26.9	328
1952	106	296	459	398	463	255	161	96.2	59.1	33.6	31.8*	23.7	205*
1953	24.4	34.6	202	1,199	694	245	194	170	93.5	44.3	30.5	29.4	245

* Estimated.

CHEHALIS RIVER BASIN

Cloquallum River at Elma, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										36	23	20	20
1943	22									33	26	23	22
1944	23									22	16	14	14
1945	28	100	96	159	132	102	143	106	45	28*	19*	12	12
1946	23	84	191	186	289	282	181	74	64	40	27	24	23
1947	26	58	164	135	201	159	123	54	35	25	20	21	20
1948	23	153	185	134	127	175	178	148	61*	41*	35	29	23
1949	55	116	277	125*	120*	198	120	68	44	29	25	22	22
1950	22	47	218	210	218	326	173	79	48	32	28	24	22
1951	25*	165	380	371	372	210	107	68	37	24	18.5	14	14
1952	40	113	205	203	245	190	109	61	45	27*	21*	20	20
1953	18.5	24	30	231	231	156	131	101	64	34	21	21	18.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1942			20							
1943			22							
1944			14							
1945	3,050	Feb. 7, 1945	12	208	3.16	42.93	150,600	247	51.01	179,000
1946	2,440	Dec. 28, 1945	23	277	4.21	57.08	200,400	260	53.71	168,500
1947	3,290	Jan. 25, 1947	20	216	3.28	44.58	158,500	221	45.65	160,200
1948	1,810	Mar. 22, 1948	23	235	3.57	48.62	170,600	271	56.13	197,000
1949	3,110	Feb. 22, 1949	22	254	3.86	52.38	183,800	228	47.04	165,100
1950	3,750	Dec. 28, 1949	22	296	4.50	61.06	214,300	334	68.79	241,900
1951	4,470	Feb. 9, 1951	14	328	4.98	67.64	237,300	287	59.15	207,500
1952	1,800	Jan. 30, 1952	20	205	3.12	42.46	149,000	143	30.52	107,100
1953	3,390	Jan. 31, 1953	18.5	245	3.72	50.54	177,300			

* Estimated.

Chehalis River at South Elma, Wash.

Location.—Lat. 46°49'00", long. 123°24'40", in NE¼NE¼ sec. 10, T. 17 N., R. 6 W., on logging company railroad bridge, 200 ft. upstream from county bridge at South Elma, and 1.1 miles downstream from Cloquallum River.

Drainage area.—1,420 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 15 ft. (from topographic map). Prior to Apr. 9, 1947, wire-weight gage 200 ft. downstream at same datum.

Average discharge.—5 years (1946-51) 5,057 cfs.

Extremes.—1942-44, 1946-52: Maximum discharge, 38,400 cfs Feb. 11, 1951 (gage height, 76.93 ft.); minimum observed, 202 cfs Sept. 12, 1944 (gage height, 55.43 ft.).

Remarks.—Many minor diversions for irrigation and domestic use above station, including municipal water supply for Centralia and Chehalis. No regulation.

CHEHALIS RIVER BASIN

Chehalis River at South Elma, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										978	514	348	
1943	483	8,057	9,340							686			
1944	915									450	293	363	
1945	478	2,931	2,980										
1947	280	1,130	2,500	1,840	3,400	2,450	3,412	1,262	944	588	341	429	4,005*
1948	3,351	6,341	6,356	10,590	9,352	6,852	4,934	5,493	1,540	736	576	845	4,763
1949	1,703	7,395	10,190	3,699	15,440	6,476*	2,783	2,329	806	491	357	341	4,760*
1950	771	5,499	11,370	12,670	15,520	14,170	5,925	2,346	1,069	661	601	399	5,851
1951	2,388	9,795	13,590	14,960	14,580	8,060	3,254	1,566	752	391	254	310	5,816
1952	3,257	5,178	9,713*	6,602	9,717								

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										690	378	298	298
1943	298	1,680	4,850							505			298
1944	320									322	245	202	202
1945	340	1,140	1,450										
1947	280*	1,130	2,500	1,840	3,400	2,450	2,110	819	709	464	262	262	262
1948	317	2,670	2,770	2,770	2,370	3,070	4,060	2,670	975	555	489	419	317
1949	1,040	1,360	4,820	2,000*	1,970	4,200*	2,320	1,140	668	405	300	276	276
1950	300	645	3,830	4,000*	4,000*	6,120	3,390	1,410	807	440	364	294	294
1951	454	2,470	6,860	6,240	5,040	4,060	1,770	1,060	489	282	210	222	210
1952	775	2,020	4,000*	3,840	4,060								

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1942			298									
1943			298									
1944			202									
1945												
1947	23,000	Jan. 26, 1947	262	4,095	2.88	39.15	2,965,000	3,802	36.36	2,753,000		
1948	24,400	Jan. 5, 1948	317	4,763	3.35	45.66	3,458,000	5,516	52.87	4,005,000		
1949	35,600	Feb. 24, 1949	276	4,790	3.35	45.50	3,446,000	4,116	39.35	2,880,000		
1950	34,500	Feb. 27, 1950	294	5,851	4.12	55.94	4,236,000	6,568	62.80	4,755,000		
1951	38,400	Feb. 11, 1951	210	5,816	4.10	55.60	4,211,000	5,148	49.16	3,723,000		
1952	28,100	Feb. 6, 1952										

* Estimated.

East Fork Satsop River near Matlock, Wash.

Location.—Lat. 47°09'45", long. 123°22'00", in NE¼SE¼ sec. 1, T. 19 N., R. 6 W., on left bank 2¾ miles upstream from Bingham Creek and 5½ miles southeast of Matlock.

Drainage area.—23.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 260 ft. (from topographic map).

Extremes.—1945-47: Maximum discharge, 1,470 cfs Jan. 25, 1947 (gage height, 8.13 ft.); minimum, 40 cfs Sept. 1-3, 1947.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946			277	304	308	252	228	113	82.4	68.9	55.0	49.5	
1947	55.6	135	247	274	313	146	124	82.0	66.4	55.0	45.2	42.8	131

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946			127	175	195	192	151	88	72	60	52	48	
1947	48	50	112	94	149	116	97	69	60	51	41	40	40

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946								167	90.01	113,800
1947	1,470	Jan. 25, 1947	40	131	6.58	75.20	95,030			

Bingham Creek near Matlock, Wash.

Location.—Lat. 47°09'40", long. 123°23'45", in SE¼ sec. 2, T. 19 N., R. 6 W., on right bank 1½ miles upstream from mouth and 5½ miles south of Matlock.

Drainage area.—30 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 260 ft. (from topographic map).

Extremes.—1946-48: Maximum discharge, 2,250 cfs Jan. 25, 1947 (gage height, 6.40 ft.); minimum, 19 cfs Oct. 15, 1947 (gage height, 2.04 ft.).

Remarks.—No diversion or regulation above station.

CHEHALIS RIVER BASIN

Bingham Creek near Matlock, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946.....								115	65.8	46.6	31.7	24.7	.....
1917....	27.4	125	309	362	447	154	127	88.4	56.1	38.8	28.1	25.4	147
1948....	144	155	244*	306	232	195	149	196	84.9	60.8	37.2	33.4	153*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946.....								77	66	36	28	22	.....
1947....	20	32	187	107	191	116	105	65	47	32	25	22	20
1948....	24	108	104*	126	100	128	130	120	62	42	33	30	24

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1946.....							
1947.....	2,250	Jan. 25, 1947	20	147	106,500	154	111,600
1948.....	1,100	Jan. 2, 1948	24	153	111,000		

Middle Fork Satsop River near Satsop, Wash.

Location.—Lat. 47°05'10", long. 123°29'20", in SE¼ sec. 36, T. 19 N., R. 7 W., on left bank 0.4 mile upstream from confluence with East Fork and 6 miles north of Satsop.

Drainage area.—63 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 100 ft. (from river-profile map).

Extremes.—1942-43: Maximum discharge not determined; minimum observed, 30 cfs Sept. 27, 1942.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942....									142	61.4	36.9	131	.....
1948....									63.7	45.1	37.3	167	.....

* Estimated.

Middle Fork Satsop River near Satsop, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942...									88*	44	30	36	30
1943...									47	33	83	35	33

Satsop River near Satsop, Wash.

Location.—Lat. 47°00'05", long. 123°29'40", in sec. 36, T. 18 N., R. 7 W., in west pier of bridge on U. S. Highway 410, three-quarters of a mile west of Satsop, and 2 miles upstream from mouth.

Drainage area.—290 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Mar. 19, 1938, staff gage 60 ft. downstream at datum 20.9 ft. higher.

Average discharge.—24 years (1929-53), 1,922 cfs.

Extremes.—1929-53: Maximum discharge, 46,600 cfs Jan. 22, 1935 (elevation, 38.9 ft., from floodmarks), from rating curve extended above 17,000 cfs; minimum, 166 cfs Sept. 21, 1938.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...							2,490	992	794	413	284	227	
1930...	314	230	2,030	1,540	4,850	1,890	2,050	894	556	342	250	296	1,250
1931...	678	1,340	1,410	4,740	2,820	3,650	3,170	674	1,390	587	821	590	1,770
1932...	1,990	3,760	4,970	4,690	4,750	4,960	3,130	898	438	422	372	273	2,590
1933...	523	3,700	4,030	4,510	2,800	4,130	1,820	1,640	870	445	293	809	2,130
1934...	2,062	2,481	9,298	6,413	2,269	2,787	1,187	976	420	462	314	327	2,432
1935...	1,898	4,200	3,913	9,002	2,936	3,166	1,508	330	501	329	242	451	2,415
1936...	491	1,008	2,298	5,807	2,677	2,990	1,112	1,178	1,328	645	317	374	1,687
1937...	315	268	3,318	1,276	3,558	2,977	4,063	1,671	1,382	578	355	266	1,653
1938...	1,703	6,372	5,060	3,567	2,821	3,324	2,702	1,031	510	351	258	208	2,320
1939...	664	1,913	2,768	5,035	3,341	2,199	923	711	600	367	253	231	1,590
1940...	691	1,637	5,069	2,973	4,728	3,097	1,770	1,435	438	313	272	261	1,534
1941...	1,739	2,065	3,097	3,451	1,990	1,478	910	1,330	563	330	278	592	1,511
1942...	1,258	2,149	4,483	1,654	2,546	1,513	898	870	968	654	345	246	1,461
1943...	409	3,235	3,766	2,047	3,766	2,223	2,888	944	657	422	303	243	1,707
1944...	642	841	2,789	3,032	1,996	1,674	1,726	832	474	289	225	336	1,238
1945...	421	2,653	1,916*	4,046	4,210	3,629	1,784	1,649	596	346	265	373	1,827*
1946...	702	3,449	4,333	4,206	4,048	3,661	3,029	958	614	619	309	269	2,171
1947...	631	2,344	4,090	4,073	4,363	1,601	1,769	855	555	462	232	356	1,818
1948...	2,825	1,967	3,370	3,341	3,037	2,287	2,071	2,696	669	397	352	929	1,996
1949...	1,153	3,743	4,619	1,127	4,794	3,291	1,545	1,355	488	351	234	338	1,905
1950...	837	4,246	5,228	3,722	6,122	5,983	2,848	1,246	644	383	390	320	2,648
1951...	1,862	3,935	6,107	5,343	6,752	2,362	1,321	742	430	287	231	314	2,449
1952...	2,176	2,373	3,064	2,760	3,744	1,841	1,660	1,061	601	341	357	289	1,833
1953...	244	553	3,017	9,598	4,688	1,848	1,387	1,425	737	415	291	317	2,038

* Estimated.

CHEHALIS RIVER BASIN

Satsop River near Satsop, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929							1,330	615	460	322	245	220	
1930	220	233	245	690	2,190	860	1,070	690	445	284	228	203	203
1931	255	560	830	1,000	1,240	1,620	1,030	480	420	400	270	270	255
1932	460	1,420	1,330	1,720	1,330	2,450	1,490	635	385	362	300	242	242
1933	242	1,390	922	1,980	1,070	2,320	1,250	1,200	555	530	262	242	242
1934	420	945	1,160	3,400	1,100	890	640	585	360	312	250	245	248
1935	259	2,110	1,710	2,070	1,620	1,050	1,140	570	397	264	215	205	205
1936	255	333	720	1,650	875	1,540	875	788	745	418	257	262	255
1937	248	230	222	920	920	1,450	1,820	788	555	355	266	206	206
1938	337	1,230	1,950	1,920	1,920	1,650	1,400	690	410	290	232	184	184
1939	182	940	1,040	2,070	1,600	1,330	723	432	392	253	232	225	182
1940	230	571	1,890	1,130	1,770	1,330	937	598	334	279	234	224	224
1941	229	910	1,330	1,440	1,070	951	546	539	420	275	237	477	229
1942	477	608	1,750	1,090	1,090	1,130	708	588	499	466	282	226	226
1943	218	809	2,070	1,100	1,480	727	1,270	734	401	329	272	208	208
1944	216	471	850	1,380	1,070	992	969	602	340	253	203	192	162
1945	266	870	692	1,140	1,220	1,330	1,250*	970	416	282	249	242	242
1946	220	830	1,360	2,190	2,190	2,120	1,620	594	484	376	270	235	220
1947	217	531	1,120	806	1,480	1,140	1,050	467	440	352	249	249	217
1948	300*	855	1,040	948	804	1,140	1,420	1,050	462	325	295	295	295
1949	608	955	1,770	580	536	1,920	1,160	647	387	282	235	191	191
1950	251	686	1,640	1,880	1,470	2,480	1,510	880	480	312	263	212	212
1951	344	1,120	3,180	2,560	1,900	1,230	754	548	320	252	215	197	197
1952	620	1,000	1,600	1,220	1,400	1,410	1,100	627	459	285	226	241	236
1953	210	258	352	3,840	1,560	1,060	1,030	880	520	319	254	203	203

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1929										
1930	11,300	Dec. 23, 1929	203	1,250	4.31	53.51	905,000	1,310	61.36	952,000
1931	19,200	Jan. 23, 1931	255	1,770	6.10	82.80	1,280,000	2,390	111.65	1,730,000
1932	30,900	Feb. 26, 1932	242	2,560	8.83	130.19	1,850,000	2,350	110.25	1,700,000
1933	15,300	Jan. 8, 1933	242	2,130	7.34	99.64	1,510,000	2,610	122.17	1,890,000
1934	24,500	Dec. 21, 1933	243	2,432	8.39	113.59	1,761,000	2,094	98.01	1,516,000
1935	46,600	Jan. 22, 1935	206	2,415	8.33	113.07	1,748,000	1,903	89.05	1,378,000
1936	16,600	Jan. 4, 1936	255	1,687	5.82	79.22	1,225,000	1,698	79.76	1,233,000
1937	15,200	April 14, 1937	206	1,653	5.70	77.37	1,197,000	2,421	113.35	1,758,000
1938	30,100	Dec. 28, 1937	184	2,320	8.00	108.59	1,620,000	1,670	78.19	1,209,000
1939	25,600	Jan. 1, 1939	182	1,530	5.45	73.98	1,144,000	1,756	82.26	1,271,000
1940	18,700	Dec. 15, 1939	224	1,884	6.50	88.48	1,305,000	1,841	86.43	1,336,000
1941	25,200	Jan. 18, 1941	229	1,511	5.21	70.72	1,094,000	1,594	74.66	1,154,000
1942	13,200	Dec. 19, 1941	226	1,461	5.04	68.41	1,058,000	1,416	66.24	1,025,000
1943	13,100	April 1, 1943	208	1,707	5.89	79.95	1,236,000	1,448	67.74	1,049,000
1944	19,900	Dec. 2, 1943	192	1,238	4.27	58.12	898,800	1,204	60.71	839,300
1945	28,000	Feb. 7, 1945	242	1,827	6.36	85.52	1,322,000	2,121	99.23	1,536,000
1946	17,200	April 11, 1946	220	2,171	7.49	101.67	1,572,000	2,058	96.38	1,480,000
1947	24,000	Jan. 25, 1947	217	1,818	6.27	85.11	1,316,000	1,908	89.32	1,351,000
1948	17,300	Oct. 19, 1947	295	1,996	6.88	93.65	1,449,000	2,106	98.82	1,528,000
1949	27,000	Feb. 22, 1949	191	1,905	6.57	89.18	1,379,000	1,977	92.31	1,427,000
1950	27,600	Dec. 28, 1949	212	2,643	9.11	123.66	1,913,000	2,779	130.07	2,012,000
1951	36,200	Feb. 9, 1951	197	2,449	8.44	114.65	1,773,000	2,089	97.79	1,512,000
1952	15,800	Jan. 30, 1952	236	1,683	5.80	78.98	1,222,000	1,366	64.11	991,000
1953	26,700	Jan. 23, 1953	203	2,086	7.02	95.28	1,474,000			

* Estimated.

CHEHALIS RIVER BASIN

Wynoochee River at Oxbow, near Aberdeen, Wash.

Location.—Lat. 47°20'00", long. 123°39'00", in SW¼SW¼ sec. 1, T. 21 N., R. 8 W., on left bank at lower end of Oxbow, 600 ft. upstream from head of canyon, and 25 miles northeast of Aberdeen.

Drainage area.—68 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 492 ft. (by barometer). Prior to Nov. 7, 1925, staff gage 1,200 ft. downstream at different datum. Nov. 7, 1925, to Sept. 3, 1947, water-stage recorder 1½ miles downstream at datum 444.0 ft. above mean sea level (levels by city of Aberdeen).

Average discharge.—27 years (1925-52), 771 cfs.

Extremes.—1925-52: Maximum discharge, 18,000 cfs Jan. 22, 1935 (gage height, 30.3 ft., from floodmarks, site and datum then in use), from rating curve extended above 5,300 cfs; minimum, 64 cfs Jan. 27, 1949.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1925									425	101	119	105	.....
1926	103	747	2,040	1,140*	1,390*	560	384	551	254	136	130	145	625*
1927	1,160	1,260	1,270	1,530	1,330	822	572	894	536	258	150	394	846
1928	791	1,620	771	1,910	688	1,270	654	710	334	187	132	161	794
1929	747	955	880	514	247	708	796	590*	590*	228	133	96.7	542*
1930	187	187	1,010	469	1,720	667	969	408	271	153	97.1	155	512
1931	392	590	608	2,050	983	1,320	1,210	368	550	256	127	299	732
1932	719	1,320	1,670	1,260	1,550	1,520	1,240	612	475	372	235	140	923
1933	343	1,634	1,321	1,465	722	1,274	836	979	764	485	212	651	887
1934	946	960	3,472	2,529	878	1,132	537	529	183	203	188	146	987
1935	910	2,049	1,388	3,473	1,303	1,214	614	511	404	226	150	369	1,051
1936	308	475	1,102	1,769	740	938	522	772	758	411	171	176	680
1937	140	112	1,395	339	644	1,140	1,494	1,055	919	303	174	141	655
1938	809	2,219	1,841	1,082	763	1,021	972	527	292	149	102	95.0	822
1939	548	923	1,259	1,890	926	682	548	494	327	229	131	146	675
1940	356	999	2,452	1,265	1,663	1,225	580	623	187	127	115	122	809
1941	1,185	859	1,390	1,274	960	714	469	681	279	161	146	533	721
1942	812	1,091	1,337	654	869	519	486	444	588	376	176	120	664
1943	209	1,364*	1,632*	832*	1,730*	1,032	1,348*	447	342	198	138	119	775*
1944	412	428	1,016	1,333	732	615	621	419	257	134	104	197	523
1945	309	1,374	511	1,477	1,867*	1,306*	600	1,019	344	188*	104*	210	794*
1946	409	1,423	1,612	1,394	1,187	1,220	1,130	636	506	406	166	161	852
1947	280	894*	1,468	1,271	1,885	565	661	404	329	346	165*	201	698*
1948	1,548	882	1,583	1,152	965	712	836	1,272	557	249	186	574	885
1949	594	1,320	1,058	246*	1,216	1,250*	844	548	420	266	191	232	703*
1950	473	1,943	2,071	1,230*	1,736	1,692	1,055	680	662	344	231	153	1,021*
1951	1,129	1,456	2,143	1,501	1,966	632	705	540	236	144	107	236	894
1952	1,212	1,095	960	886*	1,378	629	832	794	505	270	247	167	746*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1925									246	188	107	95	95
1926	85	95	750			396	291	282	162	122	115	113	85
1927	273	333	534	674	444	496	444	464	387	177	132	161	132
1928	269	576	454	552	300	326	645	454	227	149	120	114	114
1929		250	398	257	183	312	439	360*	320*	159	111	87	87
1930	87	105	108	234	715	329*	450	295	186	112	88	78	78

* Estimated.

CHEHALIS RIVER BASIN

Wynoochee River at Oxbow, near Aberdeen, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	123	272	367	450	418	535	546	287	234	159	106	104	104
1932...	212	473	433	504	348	756	760	473	356	272	160	123	123
1933...	113	635	411	560	354	760	610	710	572	315	149	139	113
1934...	248	364	460	1,240	376	387	324	280	139	114	121	107	107
1935...	100	585	022	485	800	715	416	405	276	170	122	97	97
1936...	146	170	305	532	254	473	354	417	364	218	137	119	119
1937...	110	98	99	204	204	580	693	558	484	192	134	103	96
1938...	166	668	606	643	484	580	520	385	193	112	93	88	88
1939...	88	417	417	718	462	417	417	279	229	166	115	105	83
1940...	112	280	750	368	650	576	389	259	138	108	97	94	94
1941...	98	348	605	552	405	394	254	254	218	128	104	248	98
1942...	241	283	618	390	331	850	340	314	282	241	136	105	105
1943...	113	320*	1,000*	490*	560*	251	603	329	258	145	118	104	104
1944...	105	215	304	435	338	338	393	388	170	113	93	87	87
1945...	140	414	296	414	600*	450*	470	626	221	122*	90*	100*	90*
1946...	103	348	446	649	479	697	501	422	355	234	136	122	103
1947...	112	220*	412	305	538	392	444	228	216	210	140*	115	112
1948...	148	431	438	351	291	369	504	538	369	182	140	187	140
1949...	329	400	419	115*	107*	740*	567	478	291	173	137	112	107
1950...	137	291	464	450*	484	778	574	639	471	200	128	97	97
1951...	128	570	948	516	510	320	462	315	175	119	69	92	92
1952...	292	500	590	370*	470	470	658	603	346	181	128	121	121

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1925.....			95				
1926.....	8,350	Dec. 11, 1925	85	628	454,000	695	503,000
1927.....	7,790	Oct. 16, 1926	132	846	612,000	802	580,000
1928.....	9,910	Jan. 12, 1928	114	784	576,000	745	540,000
1929.....	5,560	Mar. 28, 1929	87	542	382,000	438	317,000
1930.....	7,870	Dec. 23, 1929	78	512	371,000	632	585,000
1931.....	11,000	Jan. 22, 1931	104	732	530,000	911	659,000
1932.....	12,800	Feb. 26, 1932	123	923	671,000	892	648,000
1933.....	9,230	Nov. 12, 1932	113	857	642,100	1,061	768,300
1934.....	14,000	Dec. 21, 1933	107	987	714,400	896	648,900
1935.....	13,000	Jan. 22, 1935	97	1,051	760,800	846	612,600
1936.....	6,830	Jan. 1, 1936	119	680	493,700	661	479,800
1937.....	8,830	Dec. 22, 1936	96	655	474,000	923	667,900
1938.....	11,100	Oct. 28, 1938	88	822	595,400	644	466,400
1939.....	13,300	Jan. 1, 1939	88	675	488,900	767	554,900
1940.....	11,400	Dec. 15, 1939	94	809	587,000	777	633,100
1941.....	10,600	Jan. 17, 1941	98	721	521,800	746	540,200
1942.....	9,270	Dec. 2, 1941	105	664	480,400	617	447,000
1943.....			104	775	561,000	663	479,900
1944.....	9,510	Dec. 3, 1943	87	523	379,600	574	416,900
1945.....	12,800	Feb. 7, 1945	90	794	574,800	874	633,100
1946.....	6,820	Feb. 24, 1946	103	852	616,300	785	568,500
1947.....	9,750	Feb. 13, 1947	112	693	506,400	815	589,700
1948.....	10,700	Oct. 18, 1947	140	385	642,500	796	577,700
1949.....	8,630	Feb. 22, 1949	107	703	509,000	830	600,800
1950.....	16,400	Nov. 26, 1949	97	1,021	739,500	1,048	755,200
1951.....	14,200	①	92	894	646,800	771	568,300
1952.....	7,660	Jan. 30, 1952	121	746	641,700		

* Estimated.
 ① Feb. 9 or 10, 1951.

Wynoochee River above Save Creek, near Aberdeen, Wash.

Location.—Lat. 47°18', long. 123°39', in NW¼ sec. 24, T. 21 N., R. 8 W., on left bank 1 mile upstream from mouth of Save Creek and 22 miles northeast of Aberdeen.

Drainage area.—69.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 411 ft. above mean sea level (by barometer).

Extremes.—1951-53: Maximum discharge, 11,900 cfs Jan. 3, 1953 (gage height, 12.53 ft.); minimum, 104 cfs Oct. 20, 1952 (gage height, 4.03 ft.).

Remarks.—No diversion or regulation above station.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952...	1,253	1,150	1,060	941	1,394	646	640	803	521	274	254	180	774
1953...	138	407	1,358	3,953	1,536	665*	625	794	456	304	181	270	890*

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952...	536	493	640	406	520	487	652	640	382	180	130	133	130
1953...	106	149	255	1,290	520	405*	410	543	346	203	163	133	106

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1952.....	7,390	Jan. 30, 1952	130	774	11.1	151.62	562,000	644	126.12	467,500
1953.....	11,900	Jan. 3, 1953	106	890	12.8	173.86	644,400	.....	.....	.....

* Estimated.

Wynoochee River near Montesano, Wash.

Location.—Lat. 47°10'45", long. 123°37'30", in sec. 36, T. 20 N., R. 8 W., on left bank at Waters Ranch, 1¼ miles downstream from Schafer Creek, and 14 miles north of Montesano. Records represent flow past measuring section 2½ miles downstream.

Drainage area.—110 sq. mi., approximately, at measuring section 2½ miles downstream.

Gage.—Staff gage. Altitude of gage is 210 ft. (from topographic map).

Average discharge.—7 years (1923-30), 997 cfs.

Extremes.—1923-30: Maximum discharge, 25,600 cfs Feb. 11, 1924 (gage height 17.2 ft., from graph based on gage readings), from rating curve extended above 12,000 cfs; minimum, 96 cfs Oct. 1-3, 1929.

Remarks.—No diversion or regulation above station.

CHEHALIS RIVER BASIN

Wynoochee River near Montesano, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923					417	1,000	1,060	806	540	330	208	177	
1924	427	777	3,200	2,720	4,100	730	640	337	200*	159*	150	639	1,100*
1925	2,350	2,390	1,790	2,650	2,910	872	656	617	517	244	155	139	1,270
1926	135	1,020	2,930	1,520	1,930	728	464	729	332	187	171	177	855
1927	1,420	1,660	1,800	2,270	1,930	1,170	717	1,220	624	303	156	525	1,150
1928	1,080	2,280	1,190	2,660	950	1,310	1,400	914	353	221	143	171	1,100
1929	907	1,280	1,310	800	384	1,020	1,180	715	714	277	160	110	740
1930	208	164	1,310	702	2,500	974	1,320	545	356	210	135	206	707

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923					210	342	866	555	393	250	174	143	
1924	174	250	733	1,500	1,430	470	360					106	106
1925	560	530	715	1,090	820	490	463	423	318	180	135	123	123
1926	109	127	890	600	1,110	505	355	355	222	161	140	140	109
1927	355	415	755	960	563	623	568	563	462	216	166	202	166
1928	332	820	690	820	462	414	570	514	255	172	122	118	118
1929	145	349	440	370	250	490	670	440	370	197	132	100	100
1930	96	118	132	328	1,080	465	605	392	269	161	118	104	96

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1923							
1924	25,600	Feb. 11, 1924	106	1,160	539,000	1,330	966,000
1925	11,700	Feb. 2, 1925	123	1,270	920,000	1,070	773,000
1926	10,000	Dec. 11, 1925	109	855	610,000	921	667,000
1927	8,770	Dec. 30, 1926	166	1,150	832,000	1,120	810,000
1928	13,000	Jan. 12, 1928	118	1,100	802,000	1,020	739,000
1929	6,400	Mar. 28, 1929	100	740	536,000	569	426,000
1930	7,040	April 5, 1930	96	707	512,000		

* Estimated.

CHEHALIS RIVER BASIN

49

Wynoochee River below Black Creek near Montesano, Wash.

Location.—Lat. 47°00'35", long. 123°39'00", in NW¼NW¼ sec. 35, T. 18 N., R. 8 W., on right bank 200 ft. downstream from county bridge, 700 ft. downstream from Black Creek, and 2½ miles northwest of Montesano.

Drainage area.—178 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map). Prior to July 9, 1947, wire-weight gage 200 ft. upstream at same datum.

Average discharge.—7 years (1942-49), 1,276 cfs.

Extremes.—1942-49: Maximum discharge observed, 16,600 cfs Feb. 8, 1945 (gage height, 82.65 ft.); minimum observed, 51 cfs Sept. 11, 1944.

Flood of November, 1949, reached a stage of 84.90 ft. (discharge, 27,600 cfs, from rating curve extended above 19,200 cfs).

Remarks.—City of Aberdeen diverts about 56 cfs for municipal supply 1½ miles above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										499	191	112	.....
1943	257	2,363	2,505	1,412	2,408*	1,285	2,194	669	468	247	151	105	1,161*
1944	550	692	2,160	2,455	1,329	1,070	1,109	573	289	126	88.5	203	689
1945	347	1,991	1,338	2,587	2,556	2,469	1,199	1,589	419	178	103	223	1,288
1946	540	2,658	3,315	2,943	2,603	2,121	1,980	837*	617	515	160	124	1,528*
1947	537	1,872	3,292	2,641	3,423	918	1,005	592	429	330	139	210	1,277
1948	2,320	1,678	2,519	2,343	1,963	1,383	1,450	2,058	669	256	179	679	1,459
1949	901	2,468	2,823	729*	3,160	2,399	1,205	1,266	467	264	179	247	1,332*
1950	732												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942										298	133	93	93
1943	99	552	1,520	768	806	355	1,010	460	310	164	118	85	85
1944	87	310	678	1,000	605	570	605	440	180	104	69	53	53
1945	156	605	440	830	910	678	870	910	220	131	79	79	79
1946	76	720	300	1,270	1,170	1,120	800	535	440	240	105	87	76
1947	48	350*	720	535	845	605	700	295	260	119	99	96	68
1948	130	720	800	613	510	655	846	990	401	164	130	168	130
1949	445	655	1,050	354	358	1,370	731	553	312	179	130	102	102
1950	154												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1942			93				
1943	10,000	April 2, 1943	85	1,161	840,400	1,019	737,600
1944	15,100	Dec. 3, 1943	52	829	645,200	906	657,700
1945	16,600†	Feb. 8, 1945	79	1,285	932,900	1,530	1,108,000
1946	11,000	April 11, 1946	76	1,528	1,107,000	1,461	1,058,000
1947	15,800	Feb. 14, 1947	68	1,277	924,200	1,346	974,500
1948	13,400	Oct. 19, 1947	130	1,459	1,059,000	1,431	1,039,000
1949	16,200	Feb. 22, 1949	102	1,332	964,200		

* Estimated.

† Maximum observed.

CHEHALIS RIVER BASIN

Wiskkah River near Wishkah, Wash.

Location.—Lat. 47°06'35", long. 123°47'20", in S½ sec. 22, T. 19 N., R. 9 W., at county road bridge 2.9 miles northwest of Wishkah and 3.8 miles upstream from East Fork.

Drainage area.—57.8 sq. mi.

Gage.—Wire-weight gage. Altitude of gage is 20 ft. (by barometer).

Extremes.—1942-43: Maximum discharge observed 7,400 cfs Oct. 31, 1942 (gage height, 72.55 ft.), from rating curve extended above 250 cfs by logarithmic plotting; minimum observed, 33 cfs. Oct. 19, 20, 1942 (gage height, 67.05 ft.).

Remarks.—Low-water flow affected by two small reservoirs operated by city of Aberdeen which diverts up to 10 cfs for municipal water supply.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942									120*	53.5	44.1	114	
1943									87.0	63.0	45.4	78.3	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942									79*	45	40	34	34
1943									51	47	43	41	41

HOQUIAM RIVER BASIN

West Fork Hoquiam River near Hoquiam, Wash.

Location.—Lat. 47°03'25", long. 123°55'35", in SE¼ sec. 9, T. 18 N., R. 10 W., on highway bridge near right bank 250 ft. upstream from Polson Creek and 5 miles northwest of Hoquiam.

Drainage area.—16.0 sq. mi.

Gage.—Staff gage. Altitude of gage is approximately mean sea level (by barometer).

Extremes.—1942-43: Maximum discharge not determined; maximum gage height, 6.3 ft. (estimated) Oct. 31, 1942 (possible backwater from tide); minimum observed, 6.1 cfs Oct. 25, 1942.

Remarks.—City of Hoquiam diverts about 2½ cfs above gage for municipal use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942									19.5	9.66	7.91	27.3	
1943									13.5	11.1	9.17	36.9	

* Estimated.

HOQUIAM RIVER BASIN

51

West Fork Hoquiam River near Hoquiam Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1942									12	7.5	6.5	6.5	6.5
1943									9.4	8.0	7.1	7.4	7.1

HUMPTULIPS RIVER BASIN

Humptulips River near Humptulips, Wash.

Location.—Lat. 47°13'40", long. 123°56'25", in NE¼ sec. 17, T. 20 N., R. 10 W., on right bank at abandoned bridge site 1 mile southeast of Humptulips, 2.5 miles upstream from Stevens Creek, and ¾ miles downstream from confluence of East and West Forks.

Drainage area.—130 sq. mi.

Gage.—Staff gage. Datum of gage is 117.4 ft. above mean sea level (river-profile survey). May 17, 1933, to Jan. 13, 1935, Mar. 1, 1950, to Jan. 15, 1953, water-stage recorder and July 1, 1942, to Feb. 28, 1950, staff gage at same site and datum.

Average discharge.—12 years (1933-34, 1942-53), 1,299 cfs.

Extremes.—1933-35, 1942-53: Maximum discharge, 33,000 cfs Jan. 22, 1935 (gage height, 12.7 ft., from floodmarks), from rating curve extended above 16,500 cfs; minimum observed, 82 cfs Sept. 11, 1944; minimum gage height, 0.64 ft. Sept. 14, 1949 (from graph based on gage readings).

Remarks.—No diversion. Slight regulation by fish hatchery on West Fork for short periods at low flow.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1933								1,340*	769	367	204	766	
1934	1,290*	1,573	5,646	3,903	1,436	1,904	779	745	232	405	301	264	1,560*
1935	1,514	3,082	2,172*	3,968*									
1942										518	216	145	
1943	395	2,148	2,239	1,090	1,983	1,245	1,901	605	414	249	187	164	1,042
1944	586	697	2,074	2,189	1,179	1,128	1,049	577	320	154	109	342	868
1945	416	2,028	1,230	2,857	2,671	2,412	1,113	1,361	347	187	124	802	1,246
1946	831	2,562	2,751	2,446	2,338	2,341	1,964	656	552	512	211	218	1,445
1947	605	1,655	2,887	2,631	3,001	830	1,073	532	414	420	204	282	1,200
1948	2,344	1,484	2,583	2,004	1,875	1,267	1,270*	1,731*	469	232	251	758	1,857*
1949	999	2,707	2,620	614	2,724	2,065	1,074	1,038	317	295	227	856	1,242
1950	909	3,098	3,835	2,324	3,576	3,124	1,921	937	552	290	404	234	1,760
1951	1,700	2,189	3,366	2,771	3,623	1,253	966	546	272	151	108	318	1,423
1952	1,837	1,767	1,837	1,701	2,230	1,133	1,188	869	556	265	277	211	1,155
1953	171	599	2,056	5,750	2,584	1,258	975	1,035	464	259	185	346	1,304

* Estimated.

HUMPTULIPS RIVER BASIN

Humptulips River near Humptulips, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1933								1,060	472	245	171	162	
1934	291	512	750	1,950	472	401	326	859	180	150	196	163	150
1935	199	1,350	956										
1942										300	160	127	
1943	146	548	1,190	577	713	321	750	403	236	168	140	126	126
1944	138	321	546	864	578	514	612	453	201	123	93	82	82
1945	206	578	395	645	788	690	785	653	214	148	107	101	101
1946	139	696	653	1,100	1,060	1,200	785	859	307	269	174	154	139
1947	145	355	605	450	800	570	570	270	270	260	171	168	145
1948	189	660	760	510	425	570	880	760	290	183	165	250	165
1949	425	570	925	382	310	1,020	605	400	238	165	183	162	162
1950	192	385	946	772	796	1,190	883	692	390	210	174	185	174
1951	276	708	1,680	1,310	846	559	467	368	182	121	99	94	94
1952	627	634	943	648	701	774	790	514	390	191	137	149	137
1953	125	202	420	1,700	818	500	590	612	315	188	162	124	124

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1933												
1934	16,800	Dec. 9, 1933	150	1,550	11.9	161.53	1,122,000	1,398	146.60	1,012,000		
1935	33,000	Jan. 22, 1935										
1942												
1943	11,600	April 1, 1943	126	1,042	8.02	106.87	764,400	925	96.65	669,000		
1944	18,400	Dec. 3, 1943	82	808	6.68	90.93	630,200	891	93.24	647,200		
1945	24,500	Feb. 7, 1945	101	1,246	9.58	130.04	901,900	1,454	152.03	1,053,000		
1946	12,200	April 11, 1946	139	1,445	11.1	150.68	1,046,000	1,363	142.53	886,500		
1947	17,200	Jan. 25, 1946	145	1,200	9.23	125.29	868,900	1,309	137.10	947,300		
1948	11,800	Dec. 23, 1947	165	1,357	10.4	141.56	985,100	1,346	141.56	977,200		
1949	10,200	Feb. 22, 1949	162	1,242	9.55	129.64	899,600	1,370	142.58	992,000		
1950	22,200	Nov. 26, 1949	174	1,760	13.5	183.25	1,274,000	1,714	178.98	1,241,000		
1951	25,500	Feb. 9, 1951	94	1,423	10.9	148.58	1,030,000	1,268	132.44	978,200		
1952	11,600	Jan. 30, 1952	137	1,155	8.88	120.94	838,600	937	98.09	680,000		
1953	20,400	Jan. 23, 1953	124	1,304	10.0	136.19	944,200					

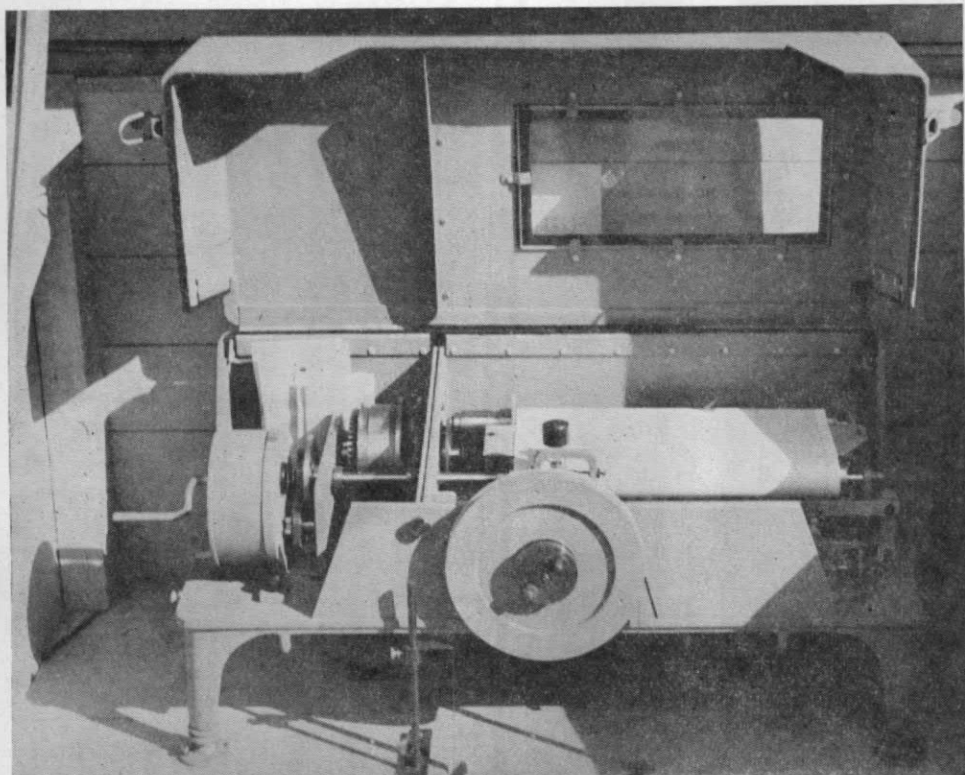


Figure 1. Continuous water-stage recorder (Stevens Type A-35), holding one year of chart supply. Clock is weight driven. Float and counterweight operate float wheel visible on front of instrument.

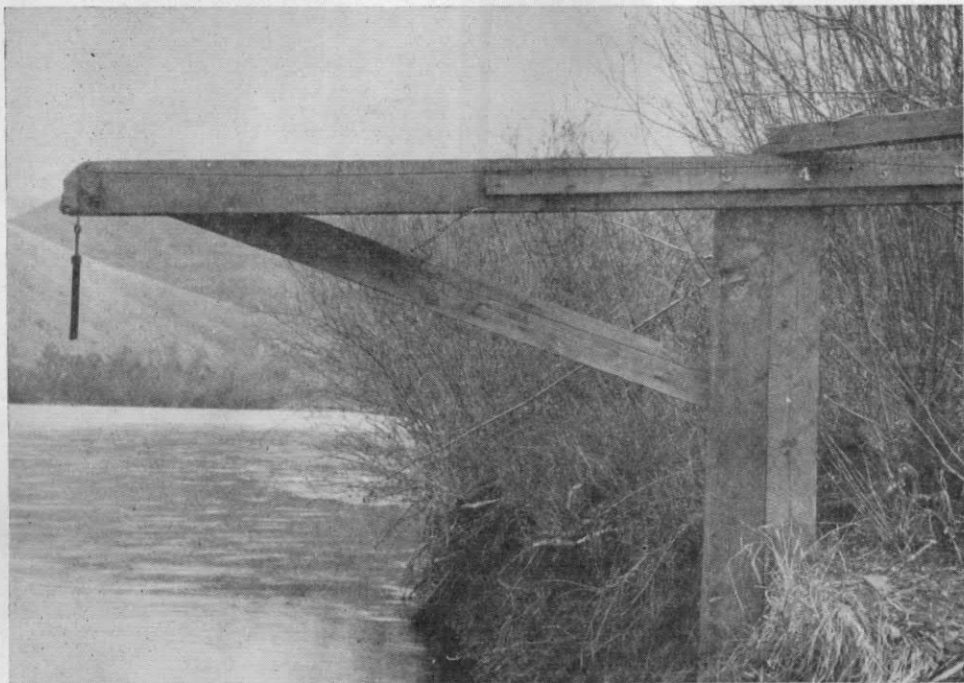


Figure 2. Early type cantilever chain gage.

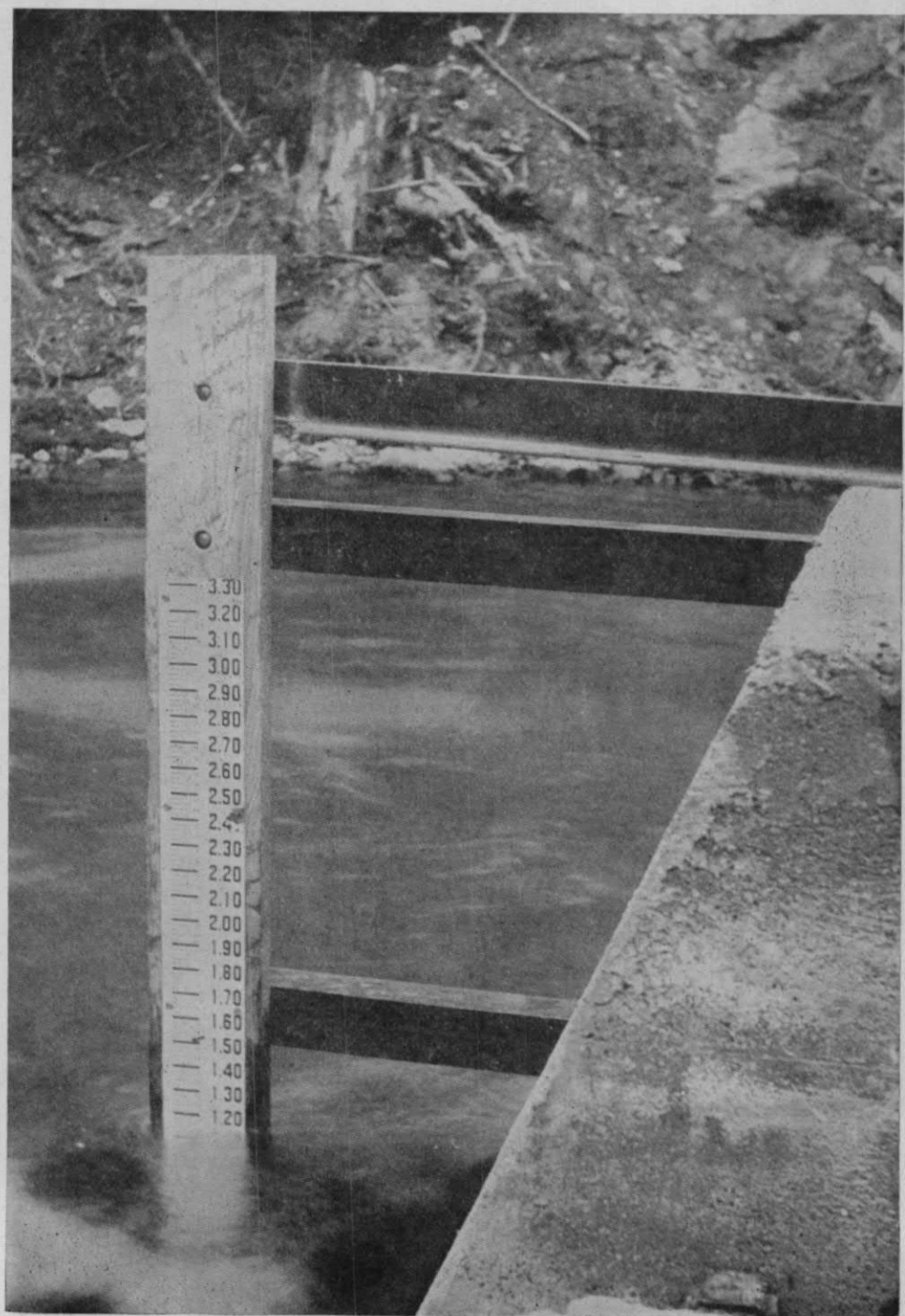


Figure 3. Vertical staff gage.

QUINAULT RIVER BASIN

Quinault River at Quinault Lake, Wash.

Location.—Lat. 47°27'30", long. 123°53'30", in sec. 25, T. 23 N., R. 10 W., on left bank at outlet of Quinault Lake, 50 ft. downstream from Olympic Highway bridge, and 4 miles southwest of Quinault.

Drainage area.—264 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 184.60 ft. above mean sea level (Washington State Highway benchmark). Prior to Sept. 30, 1916, several staff gages at sites on lake within 4 miles of outlet at different datums. Oct. 1, 1916, to May 2, 1935, water-stage recorder 300 ft. downstream at datum approximately 0.36 ft. higher.

Average discharge.—42 years (1911-53), 2,715 cfs.

Extremes.—1911-53: Maximum discharge, 42,300 cfs Nov. 27, 1949 (gage height, 18.60 ft., from rating curve extended above 25,000 cfs); minimum, 276 cfs Sept. 12, 1944 (gage height, 1.96 ft.).

Flood in November, 1909, reached a stage of approximately 22 ft. present datum (discharge, 52,600 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	900*	4,640	2,770	4,710	4,440	1,160	1,180	1,940	2,010	1,230	1,020	1,220	2,260*
1913...	1,870	5,660	3,600	2,990	2,580	1,810	2,060	3,040	3,790	3,210	1,430	2,050	2,840
1914...	2,630	5,330	2,950	7,150	2,470	3,190	3,470	2,720	2,790	1,900	866	1,670	3,130
1915...	4,050	5,170	1,850	2,620	2,280	2,900	4,140	2,630	1,770	1,020	610	490	2,460
1916...	2,550	3,270	5,990	2,180	4,800	4,760	2,660	2,990	3,670	3,320	1,730	835	3,230
1917...	624	2,780	2,220	2,130	2,290	1,570	1,760*	2,840	3,780	2,210	1,440	693	2,030*
1918...	975	2,040	9,720	6,160	4,210	3,660*	2,580	1,370	1,860	888*	789	502	2,940*
1919...	2,480	3,620	6,280	5,270*	3,610	2,770	3,680	3,360	3,000	2,620	1,170	648	3,210*
1920...	506	4,090	4,640	4,560	2,310	2,210	1,490	1,630	2,690	1,200	600	3,670	2,470
1921...	5,640	3,470	4,340	4,960	4,410	2,640	1,950	2,880	4,420	2,760	1,530	2,410	3,450
1922...	6,760	5,530	6,710	1,350	1,610	1,250	1,680	3,240	3,610	1,610	804	1,100	2,940
1923...	2,190	1,770	5,100	7,200*	2,000*	1,300*	2,300*	2,400*	2,300*	1,500	604*	565*	2,490*
1924...	1,100*	1,500*	4,700*	4,200*	8,300*	1,900*	1,100*	1,700*	1,100*	640*	452	1,300	3,210*
1925...	5,220	5,600*	3,600*	3,900*	6,500*	2,200*	2,700*	3,200*	2,500*	1,700*	745*	610*	3,180*
1926...	376	2,120	6,460	3,100	4,130	1,900	1,630	2,210	1,250	585	502	467	2,060
1927...	3,970	3,670	4,150	4,650	3,620	2,310	1,740	3,440	3,520	2,000	860	1,660	2,960
1928...	3,160	5,410	2,760	5,800	2,120	3,650	2,500	3,260	2,070	1,050	475	465	2,750
1929...	2,410	3,090	2,430	1,600	673	1,980	2,300	2,330	3,280	1,560	723	417	1,950
1930...	656	484	2,960	1,530	5,420	2,140	3,410	1,760	1,570	655	428	519	1,760
1931...	1,740	2,240	2,190	5,800	3,090	3,860	3,690	2,440	2,900	1,370	539	841*	2,560*
1932...	1,960*	3,560*	4,010*	3,640*	4,250	4,350	3,720	2,610	3,020	2,250	1,180	657	2,930*
1933...	1,710	5,270	5,160*	4,590*	2,170*	3,200*	2,400*	2,960*	3,690	3,340	1,650	1,370	3,090*
1934...	3,205	4,056	10,260	7,246	3,072	3,670	2,432	2,419	1,116	1,561*	876	689	3,400*
1935...	2,963	6,269*	4,315	9,265	4,189	3,111	1,706	2,310	2,611	1,754	742	1,452	3,390*
1936...	1,257	1,516	3,205	4,860	1,844	2,912	2,119	3,880	3,939	1,824	691	700	2,403
1937...	523	410	4,345	1,177*	1,589	2,844	3,780	3,841	4,662	2,083	923	645	2,362*
1938...	2,557	6,668	5,832	3,468	1,938	2,840	3,002	2,651	2,325	1,251	528	411	2,811
1939...	1,596	3,365	4,370	6,157	2,651	1,942	2,096	2,608	2,166	1,657*	752	628	2,437*
1940...	1,307	3,545	8,173	4,457	4,847	3,898	2,267	3,053	1,261	949	500	594	2,880
1941...	3,906	2,828	4,318*	3,681	3,209	2,418	1,925	2,896	1,538	778	448	1,728	2,472*
1942...	3,056	3,477*	6,219*	1,901	2,485	1,532	1,818	2,045	2,614	1,679	637	403	2,344*
1943...	693	3,771	3,632	2,178	2,823	2,250	4,484	2,156	2,187	1,566	709	470	2,225
1944...	1,456	1,676	3,364	4,013	2,250	1,874	1,779	1,561	1,591	738	422	760	1,818
1945...	1,288	4,653	2,968	4,804	4,807	2,871	1,776	3,945	2,155	1,361	591	847	2,659
1946...	1,710	4,655	4,745	4,225	2,941	3,377	3,294	3,615	3,557	2,801	1,193	746	3,073
1947...	1,928	2,765	5,713	3,622	6,141	1,994	2,433	2,245	1,954	1,382*	637	681	2,543*
1948...	4,639	3,050	4,754	3,360	2,860	2,018	2,597	4,575	3,959	1,806	1,008	2,006	3,049
1949...	2,362	3,964	3,668*	1,892	3,457	3,615	2,823	4,428	2,760	1,927	1,255	1,256	2,730*
1950...	1,841	6,678	6,199	3,495	4,491	4,417	3,221	2,794	4,115	3,072	1,771	870	3,571
1951...	3,743	4,899	7,752	4,825	7,181	1,892	2,394*	2,715	2,224	1,232	571	556	3,309*
1952...	3,735	3,349	3,241	2,114	3,905	1,655	2,550	3,691	3,007	2,140	1,142	680	2,580
1953...	414*	1,154*	3,356	11,390	5,216	2,054	2,059	3,399	2,534	2,452	1,224	854	3,006*

* Estimated.

QUINAULT RIVER BASIN

Quinault River at Quinault Lake, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912		650	1,850	1,240	1,670	1,010	814	1,490	1,580	940	752	608	
1913	704	1,070	2,080	1,400	1,240	1,320	1,670	1,400	2,810	2,080	940	870	704
1914	814	1,160	1,970	2,670	1,580	2,190	2,080	2,080	2,080	1,010	626	538	538
1915	1,060	2,910	980	1,180	1,670	1,490	1,670	1,490	1,180	805	530	400	400
1916	410	1,600	2,160	1,120	1,500	2,040	2,280	2,040	2,280	2,520	1,210	632	410
1917	446	1,170	1,160	1,140	1,210	954		2,180	2,920	1,990	912	745	446
1918	690	558	2,120	2,500	1,640		1,930		1,260	641	590	428	428
1919	425	1,750	1,810	1,340	1,990	1,690	2,380	2,180	2,440	1,870	780	495	425
1920	432	691	855	1,520	895	831	1,150	1,260	1,400	691	499	540	432
1921	2,350	1,100	2,350	2,350	2,160	1,620	1,240	1,910	3,400	1,970	1,040	779	779
1922	1,200	2,090	1,460	942	966	966	1,310	1,680	2,620	870	610	565	605
1923	658	1,730	730										
1924											390	289	
1925	1,460												
1926	290	427	2,480	1,790	2,350	1,410	1,240	1,620	891	440*	393	369	290
1927	1,000	1,240	1,910	1,850	1,310	1,460	1,360	2,090	2,220	1,410	601	703	601
1928	1,220	2,090	1,620	1,080	1,030	897	1,550	2,090	1,460	697	371	318	318
1929	891	949	1,070	783	635	887*	1,470	2,090	1,970	1,060	552	309	309
1930	801	871	404	732	2,560	992	2,010	1,330	1,150	547	335	301	301
1931	589	1,250	1,330	1,330	1,360	1,850	1,970	1,910	1,910	732			
1932	732			1,510	1,060	2,280	2,350	2,090	2,030	1,620	817	541	541
1933	414								3,040	2,480	924	720	414
1934	1,040	1,410	1,620	4,110	1,300	1,310	1,730	1,620	800	600	580	504	504
1935	456	3,000*	2,380	1,560	2,640	1,620	1,110	2,020	1,900	1,070	581	490	456
1936	607	685	1,220	1,780	799	1,510	1,040	2,710	2,200	851	525	462	462
1937	406	370	370	732	726	1,450	2,080	2,080	2,060	1,150	728	460	370
1938	748	2,500	2,130	2,020	1,400	1,700	1,600	1,910	1,910	776	388	323	328
1939	388	1,700	1,650	2,500	1,350	1,260	1,750	1,860	1,550*	1,210	562	442	388
1940	434	1,300	2,910	1,500	2,190	2,250	1,750	1,650	889	508	379	374	374
1941	403	1,400*	1,900*	1,960	1,450	1,500	1,450	1,450	1,120	503	374	981	374
1942	1,120	1,200*	2,100*	1,340	1,060	1,040	1,430	1,530	1,840	1,010	403	328	328
1943	425	1,340	2,220	1,460	1,610	882	2,600	1,510	1,820	962	568	394	394
1944	433	903	1,130	1,510	1,070	1,100*	1,310	1,560	1,130	523	342	285	285
1945	700	1,760	1,180	1,510	1,460	1,230	1,360	2,460	1,560	860	453	431	431
1946	462	1,760	1,510	2,160	1,460	1,880	1,510	3,070	2,720	1,930	814	536	432
1947	386	860	1,550	1,160	2,020	1,550	1,810	1,700	1,450	1,030	515	468	386
1948	497	1,600	1,400	1,850	1,060	1,170	1,600	1,980	2,670	1,300	790	940	497
1949	1,300	1,500	2,000*	740	716	2,030	1,700	2,880	1,980	1,500	908	679	679
1950	836	1,260	1,860	1,300	1,550	2,210	1,810	1,860	3,320	1,980	1,210	630	630
1951	716	1,800	3,420	2,690	1,860	1,210	1,860*	1,900*	1,920	760	440	345	345
1951	1,780	1,540	1,630	1,080	1,440	1,280	1,690	2,370	2,280	1,400	670	410*	410*
1953	360*	510*	900*	4,570	1,700	1,270	1,280	2,780	2,120	1,670	932	491	360

* Estimated.

QUINULT RIVER BASIN

Quinault River at Quinault Lake, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1912	20,300	Nov. 18, 1911	.....	2,280	8.56	118.31	1,640,000	2,490	128.35	1,810,000
1913	18,200	Nov. 19, 1912	.....	704	2,840	10.8	145.85	2,050,000	2,860	147.46
1914	32,500	Jan. 6, 1914	.....	538	3,130	11.9	161.27	2,270,000	3,100	159.53
1915	16,200	Oct. 19, 1914	.....	400	2,460	9.32	126.38	1,790,000	2,530	129.93
1916	20,300	Dec. 8, 1915	.....	410	3,230	12.2	166.46	2,340,000	2,700	139.45
1917	6,670	Nov. 4, 1916	.....	446	2,940	7.69	104.48	1,470,000	2,640	135.65
1918	32,300	Dec. 18, 1917	.....	428	2,940	11.1	151.12	2,130,000	2,910	149.38
1919	23,800	Dec. 14, 1918	.....	425	3,210	12.2	165.15	2,320,000	2,940	151.38
1920	21,300	Nov. 15, 1919	.....	432	2,470	9.36	127.31	1,790,000	2,830	145.72
1921	20,100	Feb. 11, 1921	.....	779	3,450	13.1	177.22	2,500,000	3,910	200.90
1922	37,000	Dec. 12, 1921	.....	565	2,930	11.1	151.34	2,130,000	2,120	108.76
1923	.....	.....	.....	2,490	9.43	125.02	1,800,000	2,340	120.39	1,700,000
1924	.....	.....	.....	2,310	8.75	119.14	1,680,000	2,900	149.63	2,110,000
1925	.....	.....	.....	3,180	12.0	163.69	2,310,000	2,730	140.28	1,980,000
1926	14,800	Dec. 23, 1925	.....	290	2,060	7.80	105.64	1,490,000	2,290	117.69
1927	14,800	Oct. 16, 1926	.....	601	2,930	11.2	152.25	2,150,000	2,920	150.65
1928	17,100	.....	.....	318	2,760	10.4	141.76	2,000,000	2,470	127.25
1929	10,300	Nov. 13, 1928	.....	309	1,950	7.39	100.11	1,410,000	1,630	83.73
1930	11,800	Feb. 8, 1930	.....	301	1,780	6.74	91.73	1,290,000	1,960	100.55
1931	21,000	Jan. 23, 1931	.....	2,560	9.70	131.78	1,860,000	2,850	146.28	2,060,000
1932	28,100	Feb. 27, 1932	.....	541	2,930	11.1	151.02	2,130,000	3,090	159.52
1933	.....	.....	.....	414	3,020	11.7	158.51	2,230,000	3,590	184.81
1934	35,000	Dec. 21, 1933	.....	504	3,400	12.9	174.74	2,462,000	3,057	156.95
1935	36,100	Jan. 24, 1935	.....	456	3,390	12.8	174.25	2,454,000	2,760	141.95
1936	11,200	Jan. 4, 1936	.....	462	2,403	9.10	123.74	1,744,000	2,346	120.93
1937	15,200	Dec. 22, 1936	.....	370	2,262	8.57	116.38	1,638,000	3,092	159.01
1938	21,500	Dec. 29, 1937	.....	328	2,811	10.6	144.56	2,035,000	2,317	119.19
1939	25,400	Jan. 1, 1939	.....	383	2,497	9.46	128.40	1,806,000	2,810	144.49
1940	21,500	Dec. 15, 1939	.....	374	2,880	10.9	148.48	2,091,000	2,715	139.87
1941	16,000	Oct. 19, 1940	.....	374	2,472	9.36	127.12	1,790,000	2,615	134.45
1942	.....	.....	.....	328	2,344	8.88	120.62	1,697,000	1,940	99.71
1943	13,100	April 2, 1943	.....	394	2,225	8.43	114.38	1,610,000	2,103	108.12
1944	19,600	Dec. 3, 1943	.....	285	1,818	6.89	93.76	1,320,000	2,016	103.92
1945	27,500	Feb. 8, 1945	.....	431	2,659	10.1	136.72	1,925,000	2,845	146.29
1945	14,100	Nov. 15, 1945	.....	482	3,073	11.6	157.98	2,224,000	2,959	152.13
1947	27,100	Feb. 14, 1947	.....	386	2,548	9.65	131.01	1,845,000	2,773	142.60
1948	17,100	Oct. 19, 1947	.....	497	3,049	11.5	157.22	2,214,000	2,838	146.35
1949	15,300	Feb. 23, 1949	.....	679	2,730	10.3	140.37	1,976,000	3,131	160.97
1950	42,300	Nov. 27, 1949	.....	630	3,571	13.5	183.62	2,586,000	3,718	191.19
1951	36,700	Feb. 10, 1951	.....	345	3,309	12.5	170.15	2,306,000	2,798	143.86
1952	11,600	Jan. 31, 1952	.....	410	2,596	9.83	133.83	1,584,000	2,144	110.67
1953	20,700	Jan. 12, 1953	.....	360	3,006	11.4	154.55	2,176,000	.....	.....

① Jan. 12 or 13, 1928.

QUEETS RIVER BASIN

Clearwater River near Clearwater, Wash.

Location.—Lat. 47°35'00", long. 124°17'40", in lot 4, NW¼ sec. 18, T. 24 N., R. 12 W., on left bank 1½ miles north of Clearwater and 3 miles upstream from mouth.

Drainage area.—140 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 60.0 ft. above mean sea level (river-profile survey). Oct. 1, 1931, to Sept. 30, 1932, staff gage 600 ft. upstream at datum 5.2 ft. higher.

Average discharge.—13 years (1931-32, 1937-49), 1,176 cfs.

Extremes.—1931-32, 1937-49: Maximum discharge, 23,700 cfs Feb. 16, 1949 (gage height, 17.38 ft.), from rating curve extended above 6,800 cfs on basis of slope-area determination of peak flow; minimum, 58 cfs Aug. 28, 1947 (gage height, 5.27 ft.), apparently result of flash-dam operation.

Maximum stage known, 20.1 ft. in January, 1935, from floodmarks (discharge, 30,400 cfs).

Flood in November, 1949, reached a stage of 19.2 ft., from floodmarks (discharge, 28,200 cfs).

Remarks.—No diversion. Occasional slight regulation from flash dam.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1932...	1,200	2,220	2,310	2,060	2,890	2,240	1,700	357	227	500	300	228	1,350
1937...										129	186	154	.....
1938...	1,671	3,285	2,575	1,589	1,258	1,695	1,288	453	162	101	81.4	121	1,189
1939...	983	1,736	2,354	3,319	1,995	1,142	828	587	474	426	148	302	1,206
1940...	1,014	2,229	3,583	1,504	2,256*	1,969	790	1,045	180	161	183	169	1,281*
1941...	1,715	1,289	2,305	1,824	1,741	1,042	599	1,025	296	151	164	648	1,081
1942...	1,921	1,599	2,776	822	1,254	1,106	864	563	990	465	164	107	1,054
1943...	562	1,977	2,146	1,077	2,003	1,287	1,811	555	334	502	154	157	1,012
1944...	764	729	2,035	2,726*	1,133	1,184	445	306	105	83.1	403	906*	
1945...	659	2,397	1,420	2,988	2,230*	2,363*	1,096	1,110	207	165	90.2	807	1,247*
1946...	982	2,748	2,297	2,318	2,172	2,287*	1,775	515*	491*	422	160	201	1,358*
1947...	553	1,626	2,520*	1,817*	2,771*	677*	820	595	496*	547*	201	240	1,075*
1948...	2,296	1,350	2,324*	1,933	2,190	1,333	1,440	1,759	307	157	264	838	1,349*
1949...	1,024	2,777*	2,506	603*	2,946	1,635	925	896	216	204	246	290	1,176*
1950...	1,036												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1932...	271	745	655	735	520	960	610	280	150	150	194	180	130
1937...										73	67	91	.....
1938...	246	1,010	682	690	699	518	465	248	113	60	66	62	62
1939...	95	394	548	1,050	680	593	295	259	271	215	114	102	95
1940...	146	665	850	470*	950*	655	408	259	120	99	107	103	99
1941...	130	441	680	557	466	441	245	256	223	112	97	312	97
1942...	424	377	689	454	375	405	405	300	256	256	118	84	84
1943...	144	539	1,060	506	465	243	556	340	182	118	98	102	85
1944...	191	293	382	700*	422	382	475	321	127	63	71	62	62
1945...	210	529	280	428	520*	460*	690	338	139	96	77	83	77
1946...	128	810	578	900	930	1,000*	650	300*	225*	210	110	102	102
1947...	113	302	420*	340*	600*	400*	529	270*	215*	250*	138	135	113
1948...	190	490*	425	422	320	450	770	563	132	119	103	277	103
1949...	420*	660*	802	270*	260*	745	436	245	141	114	103	114	114
1950...	181												

* Estimated.

QUEETS RIVER BASIN

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Clearwater River near Clearwater, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1932.....	21,000	Feb. 26, 1932	130	1,850	9.64	130.95	978,000			
1937.....										
1938.....	17,500	Oct. 28, 1937	62	1,189	8.49	115.30	860,800	1,027	99.59	743,000
1939.....	16,300	Jan. 1, 1939	95	1,206	8.61	116.97	873,300	1,311	127.15	949,300
1940.....	15,100	Dec. 14, 1939	99	1,281	9.15	124.61	930,300	1,155	112.36	838,900
1941.....	16,500	Jan. 17, 1941	97	1,081	7.72	104.85	783,000	1,164	112.90	843,000
1942.....	13,000	Oct. 9, 1941	84	1,064	7.53	102.24	763,400	917	88.88	683,600
1943.....	11,200	Oct. 31, 1942	98	1,012	7.23	98.10	732,500	917	88.90	663,800
1944.....	17,500	Dec. 2, 1943	62	906	6.47	88.11	657,900	982	95.47	712,900
1945.....	22,200	Feb. 7, 1945	77	1,247	8.81	120.94	903,000	1,378	133.63	997,700
1946.....	13,700	Nov. 14, 1945	102	1,358	9.70	131.66	983,000	1,249	121.08	904,000
1947.....			113	1,075	7.69	104.20	778,200	1,183	114.68	856,300
1948.....	16,300	Jan. 1, 1948	103	1,849	9.64	131.13	979,000	1,378	133.52	996,800
1949.....	①23,700	Feb. 16, 1949	114	1,176	8.40	114.08	851,700			
1950.....										

① Inconsistent with momentary maximums on nearby streams.

Queets River near Clearwater, Wash.

Location.—Lat. 47°32'20", long. 124°18'50", in SW¼ sec. 36, T. 24 N., R. 13 W., on right bank on Quinault Indian Reservation, 2 miles downstream from Clearwater River, and 2¾ miles southwest of Clearwater.

Drainage area.—445 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 14.5 above mean sea level (river-profile survey). Sept. 15, 1930, to Jan. 22, 1935, water-stage recorder at datum 4.0 ft. higher. Aug. 24 to Oct. 23, 1935, staff gage at described site and datum.

Average discharge.—19 years (1930-49), 4,115 cfs.

Extremes.—1930-49: Maximum discharge, 130,400 cfs Jan. 22, 1935 (gage height, 27.0 ft., described datum, from floodmarks); minimum, 368 cfs Sept. 9, 1944; minimum gage height, 4.42 ft., described datum, Oct. 11, 1932.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	3,460	3,720	3,800	9,800	4,830	6,560	6,340	1,770	3,030	1,280	571	1,500	3,890
1932.....	3,710	7,470	7,610	6,730	9,520	8,350	6,220	2,110	2,130	2,450	1,290	834	4,850
1933.....	2,310	9,400	8,270	8,410	4,970	6,710	2,960	3,660	2,310	2,090	1,230	3,670	4,710
1934.....	3,574*	5,229	15,750	11,920	4,411	5,372	2,833	2,921	1,042	1,612	1,230	849	4,798*
1935.....	4,255	10,460	7,726	23,560*	8,700*	5,300*	2,600*	3,200*	3,400*	2,100*	516*	2,344	6,196*
1936.....	1,967	2,731	5,705	9,488	3,889	5,851	2,470	3,701	4,509	2,331	849	1,105	3,727
1937.....	940	754	7,881	1,787	6,004	4,633	7,093*	4,833*	4,078	1,419	939	740	3,407*
1938.....	4,903	10,189	8,447	5,052	3,753	5,045	4,339	2,264	1,616	883	469	635	3,950
1939.....	3,095	5,569	8,122	10,270	5,669	3,535	2,268	2,543	2,134	1,895	798	988	3,905
1940.....	2,793	6,132	11,620	6,157	7,959	6,178	2,719	5,567	1,050	768	708	679	4,190
1941.....	5,838	4,292	7,002	5,744	5,210	3,395	2,343	3,765	1,604	874	676	2,811	3,625
1942.....	5,565	5,322	8,971	2,949	3,964	3,100	2,840	2,264	3,550	1,909	757	497	3,475
1943.....	1,616	6,027	6,466	3,452	5,898	3,949	6,104	2,255	1,763	1,277	790	666	3,334
1944.....	2,471	2,278	6,027	7,569	3,484	3,418	3,253	1,950	1,304	716	473	1,468	2,872
1945.....	2,090	7,319	4,480	8,736	7,238	6,827	3,255	4,472	1,456	1,147	605	1,198	4,057
1946.....	8,337	8,636	7,658	7,119	6,196	6,558	5,504	2,781	3,195	2,219	1,054	902	4,534
1947.....	1,896	5,080	9,170	7,404	8,948	2,312	3,563	2,373*	2,563*	2,065	842	1,032*	3,908*
1948.....	8,221*	4,985*	8,524*	5,440*	5,309*	3,888	4,539	6,263	2,632	1,434	1,390	2,970	4,639*
1949.....	3,211	8,689	7,379	1,861	8,674	5,636	3,740	4,093	1,973	1,499	1,251	1,351	4,077
1950.....	3,462	11,760*											

* Estimated.

QUEETS RIVER BASIN

Queets River near Clearwater, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	860	1,570	1,710	2,020	1,570	2,540	2,360	1,320	1,210	810	455	455	455
1932...	960	1,940	1,840	2,540	1,800	3,480	2,900	1,610	1,440	.....	809	646	646
1933...	548	3,400	1,840	2,820	1,360	3,400	1,910	2,740	2,120	.....	917	674	548
1934...	1,260	1,510	2,120	5,420	1,500	1,270	1,600*	1,340	743	606	615	530	530
1935...	460	4,480	2,620	.....	.....	.....	.....	.....	.....	.....	614	480	460
1936...	632	859	1,400	2,420	1,180	2,180	1,520	2,160	1,960	1,100	620	614	614
1937...	575	520	575	1,110	1,190	1,700	3,600*	2,700	1,920	764	626	478	478
1938...	842	3,430	2,450	2,760	2,210	2,040	2,150	1,700	1,320	540	401	401	401
1939...	413	2,110	1,920	3,730	2,320	2,320	1,660	1,370	1,500	1,200	620	504	413
1940...	588	2,110	3,470	1,950	3,340	2,610	1,700	1,340	760	540	484	470	470
1941...	477	1,760	2,400	2,340	1,800	1,800	1,340	1,400	1,200	576	485	1,250	477
1942...	1,680	1,540	2,670	1,740	1,310	1,360	1,530	1,470	1,350	1,160	549	410	410
1943...	541	1,740	3,430	1,820	2,000	983	2,660	1,620	1,340	873	573	445	445
1944...	532	1,020	1,350	2,320	1,540	1,420	1,320	1,540	983	523	414	384	384
1945...	841	2,240	1,330	2,000	2,100	1,810	2,240	2,490	1,010	724	504	477	477
1946...	526	2,740	2,060	3,100	2,740	3,000*	2,320	1,900	1,920	1,400	792	584	526
1947...	462	1,060	1,820	1,360	2,080	1,510	2,240	1,600*	1,500*	1,180	600*	550*	462
1948...	513*	2,100*	1,950*	1,700*	1,400*	1,670	2,570	1,880	1,580	1,070	860	1,150	540
1949...	1,350	1,830	2,360	821	713	2,880	2,120	2,640	1,320	969	854	530	530
1950...	755	1,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1930.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1931.....	47,000	Jan. 23, 1931	455	3,890	8.74	118.64	2,820,000	4,540	138.46	3,280,000	.....	.....	.....
1932.....	80,700	Feb. 26, 1932	646	4,850	10.9	145.37	3,520,000	4,950	151.09	3,530,000	.....	.....	.....
1933.....	48,400	Nov. 12, 1932	548	4,710	10.6	133.89	3,410,000	5,130	156.71	3,770,000	.....	.....	.....
1934.....	54,800	Dec. 21, 1933	530	4,763	10.8	146.60	3,474,000	4,579	139.82	3,315,000	.....	.....	.....
1935.....	130,400	Jan. 22, 1935	466	6,190	13.9	188.68	4,486,000	5,195	158.62	3,761,000	.....	.....	.....
1936.....	38,500	Jan. 4, 1936	614	3,727	8.38	114.06	2,705,000	3,662	112.02	2,658,000	.....	.....	.....
1937.....	44,900	Dec. 22, 1936	478	3,407	7.66	103.93	2,467,000	4,566	139.82	3,306,000	.....	.....	.....
1938.....	65,300	Dec. 29, 1937	401	3,950	8.53	120.54	2,859,000	3,390	103.44	2,454,000	.....	.....	.....
1939.....	63,600	Jan. 1, 1939	413	3,905	8.78	119.18	2,827,000	4,223	128.82	3,057,000	.....	.....	.....
1940.....	54,800	Dec. 15, 1939	470	4,190	9.42	128.22	3,042,000	3,906	119.51	2,836,000	.....	.....	.....
1941.....	68,200	Jan. 17, 1941	477	3,625	8.15	110.63	2,625,000	3,855	117.55	2,791,000	.....	.....	.....
1942.....	51,200	Dec. 2, 1941	410	3,475	7.51	106.02	2,516,000	2,955	91.08	2,161,000	.....	.....	.....
1943.....	38,500	April 2, 1943	445	3,334	7.49	101.67	2,414,000	3,061	93.39	2,216,000	.....	.....	.....
1944.....	58,000	Dec. 3, 1943	384	2,572	6.45	87.79	2,055,000	3,120	85.42	2,265,000	.....	.....	.....
1945.....	78,900	Feb. 7, 1945	477	4,057	9.12	123.60	2,937,000	4,643	138.46	3,289,000	.....	.....	.....
1946.....	43,500	Nov. 14, 1945	526	4,584	10.3	139.82	3,313,000	4,297	131.13	3,111,000	.....	.....	.....
1947.....	61,200	Jan. 25, 1947	462	3,908	8.78	119.18	2,829,000	4,382	133.71	3,172,000	.....	.....	.....
1948.....	64,400	①	542	4,639	10.4	141.56	3,367,000	4,421	135.16	3,209,000	.....	.....	.....
1949.....	62,800	Feb. 17, 1949	530	4,077	9.16	124.34	2,952,000	.....	.....	.....	.....	.....	.....
1950.....	93,000	Nov. 26, 1949	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

① Oct. 18 or 19, 1947.

HOH RIVER BASIN

61

Hoh River near Spruce, Wash.

Location.—Lat. 47°48'20", long. 124°06'20", in NE¼ sec. 34, T. 27 N., R. 11 W., on left bank 1 mile downstream from Maple Creek, 2¼ miles west of Spruce, and 5 miles downstream from South Fork.

Drainage area.—208 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 320 ft. (from river-profile map).

Average discharge.—27 years (1926-53), 1,961 cfs.

Extremes.—1926-53: Maximum discharge, 38,700 cfs Nov. 26, 1949 (gage height, 22.2 ft., from high-water marks), from rating curve extended above 13,000 cfs on basis of slope-area determination of peak flow; minimum, 247 cfs Nov. 14, 15, 1929; minimum gage height, 0.68 ft. Oct. 18, 19, 1946.

Maximum stage known since at least 1891, that of Nov. 26, 1949.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926											1,110	713	.....
1927	2,670	2,490	3,180	2,870	2,460	1,790	1,260	2,320	2,400	1,740	1,340	1,720	2,190
1928	2,960	3,800	2,180	4,080	1,270	2,560	1,880	2,170	1,540	1,400	930	790	2,140
1929	1,900	2,050	1,590	1,060	612	1,440	1,630	1,950	2,360	1,580	1,160	772	1,610
1930	910	503	2,010	1,110	4,050	1,780	2,330	1,250	1,490	1,180	939	1,030	1,530
1931	1,540	1,490	1,450	3,600	1,930	2,360	2,410	1,710	2,440	1,590	926	1,080	1,870
1932	1,370	2,990	2,470	2,230	2,960	2,880	2,370	1,610	2,150	1,840	1,250	859	2,080
1933	1,250	4,170	3,290	2,840	1,310	2,100	1,480	1,790	2,390	2,320	1,600	2,040	2,220
1934	2,887	2,318	6,543	4,805	1,970	2,406	1,730	1,801	1,218	1,394	1,205	867	2,442
1935	2,120	4,802*	2,920	6,443	2,938	1,959	1,237	1,358	1,769	1,550	997	1,395	2,465*
1936	1,074	1,000	1,954	3,220	1,244	2,184	1,616	2,008	3,069	1,999	1,182	982	1,850
1937	740	466	3,040	779	1,407	1,711	2,251	2,210	2,860	1,733	1,088	845	1,950
1938	1,799	3,937	3,618	2,199	1,212	1,715	1,796	1,611	1,698	1,357	816	865	1,889
1939	1,582	2,146	3,178	3,761	1,767	1,897	1,438	1,884	1,734	1,321	1,109	839	1,838
1940	1,125	2,604	5,381	2,842	2,861	2,545	1,861	2,157	1,208	1,067	947	849	2,081
1941	2,656	1,527	3,007	2,416	2,303	1,324	1,064	1,965	1,386	1,268	943	1,386	1,772
1942	2,561	2,582	3,939	1,267	1,387	1,031	1,181	1,372	2,103	1,799	1,096	699	1,756
1943	966	2,576	2,622	1,585	2,206	1,415	2,709	1,537	1,621	1,546	957	815	1,702
1944	1,317	1,141	2,283	2,782	1,313	1,173	1,171	1,250	1,311	1,032	790	1,161	1,396
1945	1,393	3,042	1,934	3,257*	2,846	2,173	1,412	2,451	1,665	1,459	968	1,010	1,956*
1946	1,482	3,222	3,144	2,725	2,024	2,306	2,056	2,295	2,356	2,070	1,270	822	2,152
1947	891	1,747	3,575	2,270	3,764	1,152	1,496	1,638	1,764	1,571	934	823	1,790
1948	2,984	2,149	3,319	2,391	2,222	1,419	1,532	2,854	2,664	1,609	1,357	1,649	2,181
1949	1,682	3,895*	2,492	689	2,427	2,155	1,832	2,776	1,928	1,611	1,363	1,233	2,018*
1950	1,500	3,903	4,112	2,430*	3,148	2,651	2,086	1,656	2,597	2,091	1,488	792	2,378*
1951	2,362	2,836	4,346	3,200	4,625	1,504	1,571	1,522*	1,590*	1,291	823	934	2,203*
1952	2,646	2,498	2,081	1,537	2,420	1,011	1,557	2,016	1,897	1,776	1,283	802	1,791
1953	577	657	2,492	7,092	3,234	1,829	1,368	2,074	1,675	1,693	1,275	1,167	2,102

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926											866	382	.....
1927	825	1,010	1,700	1,390	985	1,300	892	1,480	1,740	1,420	825	802	802
1928	1,010	1,600	1,060	1,160	735	628	1,300	1,740	1,180	1,040	780	514	514
1929	813	772	676	598	476	759	1,000	1,340	1,270	1,200	954	434	434
1930	446	250	389	553	1,740	819	1,400	936	1,170	912	776	492	250
1931	505	912	850	999	803	1,170	1,290	1,230	1,410	1,050	736	632	505
1932	592	1,100	875	1,020	740	1,810	1,560	1,140	1,220	1,250	950	685	562
1933	560	1,760	1,250	1,020	686	1,330	1,040	1,300	1,760	1,720	1,100	846	560
1934	970	992	1,080	2,710	948	886	1,250	1,150	1,060	992	927	516	516
1935	530	2,000	1,390	1,100*	1,670	1,160	900*	1,100	1,160	1,130	783	713	530

* Estimated.

HOH RIVER BASIN

Hoh River near Spruce, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	594	463	655	1,220	565	985	752	1,560	1,930	1,310	958	565	463
1937...	393	333	344	534	550	825	1,180	1,330	2,030	975	748	585	338
1938...	847	1,620	1,340	1,220	850	910	1,010	1,120	1,220	930	668	668	647
1939...	519	1,140	1,100	1,770	928	845	1,090	1,180	1,890	1,440	845	570	519
1940...	525	885	1,930	1,090	1,390	1,330	864	1,120	958	558	742	619	525
1941...	498	678	1,270	1,150	958	882	810	932	1,160	858	619	764	498
1942...	932	834	1,440	893	631	631	873	949	1,260	1,230	659	480*	480*
1943...	437	923	1,470	949	1,140	573	1,590	1,080	1,350	1,190	791	601	487
1944...	636	618	948	1,040	655	632	945	892	1,110	819	632	667	618
1945...	704	1,210	760*	992	1,040	1,010	1,160	1,750	1,160*	901	726	638	638
1946...	695	1,370	1,110	1,460	1,010	1,340	1,010	1,750	1,680	1,610	1,000	509	495
1947...	400	632	1,000	750	1,230	856	250	1,100	1,290	1,080	708	572	400
1948...	782	1,150	975	928	711	834	879	1,300	2,330	1,200	950	1,050	711
1949...	840*	940*	1,100	552	572	1,250	1,140	1,330	1,190	1,190	942	712	572
1950...	712	942	1,340	1,520*	1,460	1,310	1,140	1,090	1,800	1,520	696	539	539
1951...	463	1,060	1,860	1,660	1,460	942	1,140	1,940	1,350*	990	572	539	463
1952...	1,250	959	1,020	664	948	768	1,130	1,340	1,240	1,310	772	619	619
1953...	421	424	608	2,430	1,350	1,020	885	1,480	1,450	1,240	939	620	421

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1926.....											
1927.....	15,600	Oct. 16, 1926	802	2,190	10.5	142.72	1,580,000	2,230	145.81	1,620,000	
1928.....	16,300	Jan. 12, 1928	514	2,140	10.3	139.83	1,550,000	1,850	121.30	1,340,000	
1929.....	11,900	Oct. 8, 1928	434	1,510	7.29	98.79	1,100,000	1,340	87.33	869,000	
1930.....	11,900	Feb. 18, 1930	250	1,530	7.36	100.14	1,110,000	1,620	105.63	1,170,000	
1931.....	19,400	Jan. 22, 1931	505	1,870	8.99	121.04	1,350,000	2,060	134.73	1,490,000	
1932.....	22,800	Feb. 26, 1932	592	2,080	10.0	135.95	1,510,000	2,230	146.14	1,520,000	
1933.....	17,600	Nov. 12, 1932	560	2,220	10.7	144.79	1,610,000	2,460	161.97	1,800,000	
1934.....	28,600	Dec. 21, 1933	516	2,442	11.7	159.37	1,768,000	2,274	148.38	1,646,000	
1935.....	36,100	Nov. 5, 1934	530	2,455	11.8	160.23	1,777,000	1,972	128.69	1,428,000	
1936.....	9,840	Jan. 4, 1936	463	1,850	8.89	121.04	1,343,000	1,809	122.84	1,357,000	
1937.....	15,000	Dec. 22, 1936	333	1,595	7.67	104.12	1,155,000	2,020	131.82	1,462,000	
1938.....	21,500	Oct. 28, 1937	647	1,859	9.08	123.26	1,867,000	1,686	110.00	1,220,000	
1939.....	20,200	Jan. 1, 1939	519	1,883	9.08	123.24	1,367,000	2,074	135.38	1,502,000	
1940.....	20,700	Dec. 15, 1939	525	2,031	10.0	136.17	1,511,000	1,921	125.72	1,395,000	
1941.....	16,000	Jan. 17, 1941	495	1,772	8.52	115.67	1,233,000	1,930	125.68	1,398,000	
1942.....	21,800	Dec. 2, 1941	450	1,756	8.44	114.59	1,271,000	1,508	92.40	1,092,000	
1943.....	11,000	Oct. 31, 1942	457	1,702	8.18	111.09	1,232,000	1,585	103.47	1,546,000	
1944.....	17,400	Dec. 3, 1943	618	1,396	6.71	91.37	1,014,000	1,529	100.05	1,110,000	
1945.....	17,400	Feb. 7, 1945	638	1,956	9.40	127.68	1,416,000	2,051	135.84	1,507,000	
1946.....	9,580	①	495	2,152	10.3	140.43	1,558,000	2,017	131.84	1,460,000	
1947.....	16,700	Feb. 13, 1947	400	1,790	8.61	116.81	1,296,000	1,979	129.14	1,433,000	
1948.....	19,400	Oct. 18, 1947	711	2,181	10.5	142.72	1,583,000	2,144	140.28	1,546,000	
1949.....	12,200	Feb. 22, 1949	572	2,018	9.70	131.71	1,461,000	2,154	140.54	1,559,000	
1950.....	38,700	Nov. 26, 1949	539	2,378	11.4	165.17	1,721,000	2,371	154.71	1,716,000	
1951.....	22,400	Feb. 10, 1951	463	2,203	10.6	143.74	1,595,000	2,007	130.95	1,453,000	
1952.....	11,400	Jan. 30, 1952	619	1,791	8.61	117.24	1,301,000	1,516	99.24	1,101,000	
1953.....	16,900	Jan. 31, 1953	421	2,102	10.1	137.17	1,522,000				

* Estimated.

① Oct. 26, Nov. 15, 1945.

Soleduck River near Fairholm, Wash.

Location.—Lat. 48°02'40", long. 123°57'35", in lot 4, SW¼ sec. 35, T. 30 N., R. 10 W., on right bank 300 ft. downstream from South Fork, 2.5 miles southwest of Fairholm, and 17 miles east of Beaver.

Drainage area.—83.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,060 ft. (from topographic map). Oct. 10, 1917, to Sept. 26, 1921, water-stage recorder and Oct. 4 to Nov. 4, 1933, staff gage at datum 1.2 ft. higher.

Average discharge.—24 years (1917-21, 1933-53), 607 cfs.

Extremes.—1917-21, 1933-53: Maximum discharge, 23,500 cfs Nov. 26, 1949 (gage height, 16.42 ft., from high-water mark in well), from rating curve extended above 5,300 cfs on basis of slope-area determination of peak flow; minimum, 51 cfs Sept. 11, 12, 1944; minimum gage height, 0.79 ft., Oct. 17, 18, 19, 20, 1953.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	143	252	2,650	1,430	1,100	869	636	457	408	165	125	71.3*	692*
1919...	499	838	1,700	1,380	890	564	893*	751	663	560	244	123	759*
1920...	59.9	822	929	1,000	449	461	312	363	512	217	112	617	490
1921...	1,130	729	969	1,140	1,290	655	495	733	892	480	244*	528	772*
1934...	732	702	2,495	1,747	652	882	520	570	254	171	106	107	750
1935...	463	1,489	1,019	2,579	1,129	637	414	516	561	348	145	211	791
1936...	227	318	567	1,070	382	717	570	796	717	348	126	129	498
1937...	67.6	82.7	1,060	213	347	557	818	826	899	362	151	95.1	461
1938...	388	1,341	1,446	668	372	614	657	504	444	207	97.1	76.3	591
1939...	332	665	1,114	1,329	517	491	552	584	469	317	133	88.3	551
1940...	193	723	1,981	939	1,025	997	439	620	209	307	76.0	67.2	615
1941...	480	470	1,134	904	749	406	290	650	295	136	87.4	203	483
1942...	629	802	1,439	407	439	331	399	387	504	266	111	71.9	483
1943...	148	842	893	613	780	523	980	475	459	320	125	85.0	509
1944...	263	314	654	1,010	412	350	359	354	270	122	72.8	124	359
1945...	235	868	560	1,116	1,041	673	457	917	433	216	98.7	107	558
1946...	379	1,038	1,156	981	703	744	740	869	738	489	215	121	681
1947...	191	561	1,304	846	1,445	430	505	462	422	263	109	69.0	550
1948...	797	609	1,139	852	766	465	514	967	857	364	210	296	660
1949...	441	1,051	720	320	746	730	721	1,052	644	401	242	234	607
1950...	407	1,469	1,606	712	1,109	870	821	756	1,166	658	298	145	832
1951...	743	1,085	1,601	1,167	1,668	456	603	578	460	234	112	116	729
1952...	653	808	649	438	819	333	572	712	561	358	163	103	513
1953...	82.8	202	768	2,582	1,016	478	457	686	539	470	219	213	643

* Estimated.

QUILLAYUTE RIVER BASIN

Soleduck River near Fairholm, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	92	101	295	580	352	210	438	279	231	111	91	59	59
1919...	58	379	508	353	445	305	.....	498	553	361	147	90	58
1920...	75	141	.....	293	190	175	252	259	326	125	54	54	75
1921...	436	230	468	527	472	392	369	436	645	350	159	142	142
1924...	208	296	336	915	308	276	333	315	168	112	78	75	75
1935...	72	625	501	375	600	338	256	412	372	218	104	71	71
1936...	95	129	214	402	200*	286	228	556	402	182	93	84	84
1937...	70	60*	69	120*	120*	286	399	421	615	195	118	72	60*
1938...	87	354	469	425	225	348	345*	410	341	124*	81	66	66
1939...	62	318	342	565	250*	212	396	389	356	204	98	70	62
1940...	69	166	638	354	456	489	310	286	134	85	64	58	58
1941...	57	209	432	392	316	263	223	239	200	95	70	119	57
1942...	192	217	449	312	208	210	312	306	329	157	85	61	61
1943...	66	248	417	293	397	189	547	329	397	172	95	68	66
1944...	65	137	195	264	196	167	289	292	188	85	58	52	52
1945...	97	270	221	289	306	264	306	627	280	134	74	70	70
1946...	60	274	354	488	316	809	333	642	560	336	146	90	60
1947...	72	148	350	266	457	319	336	358	305	169	81	65	65
1948...	68	358	307	369	275	266	284	392	591	250	160	144	68
1949...	238	253	366	197	166	415	392	638	392	307	157	104	104
1950...	134	229	501	315*	370*	441	404	469	780	397	178	117	117
1951...	114	343	625	559	397	282	429	400	397	144	87	67	67
1952...	195	301	284	157	325	238	366	461	404	214	123	76	76
1953...	63	84	155	675	380	296	284	481	498	276	147	87	63

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1918.....	15,800	Dec. 18, 1917	50	692	8.26	112.12	501,000	690	111.83	500,000	
1919.....	13,200	Dec. 4, 1918	58	759	9.06	128.00	550,000	657	106.48	476,000	
1920.....	10,000	Nov. 15, 1919	75	490	5.55	79.58	355,000	574	93.25	416,000	
1921.....	11,400	Feb. 11, 1921	142	772	9.21	125.03	558,000	.....	.....	.....
1934.....	19,800	Dec. 21, 1933	75	750	8.95	121.41	542,600	666	107.27	482,100	
1935.....	18,800	Nov. 5, 1934	71	791	9.44	128.14	572,700	636	103.09	460,700	
1936.....	3,060	Jan. 4, 1936	84	498	5.94	89.91	361,600	509	82.64	369,300	
1937.....	9,670	Dec. 22, 1936	69	461	5.50	74.75	334,100	623	100.96	451,200	
1938.....	12,200	Dec. 29, 1937	68	591	7.05	95.72	427,800	502	81.37	393,700	
1939.....	9,430	Jan. 1, 1939	82	551	6.88	89.23	398,700	617	100.00	447,000	
1940.....	9,430	Dec. 15, 1939	58	615	7.34	99.93	446,600	547	88.56	397,200	
1941.....	8,100	Jan. 17, 1941	57	483	5.76	78.30	350,000	549	88.97	397,600	
1942.....	9,050	Dec. 2, 1941	61	483	5.76	78.23	349,600	399	64.62	288,800	
1943.....	4,710	Nov. 23, 1942	66	509	6.07	82.45	368,500	455	73.70	329,400	
1944.....	6,670	Dec. 3, 1943	52	359	4.28	55.39	261,000	395	64.10	229,500	
1945.....	14,600	Feb. 7, 1945	70	558	6.66	90.33	446,600	634	102.77	459,300	
1946.....	6,330	Nov. 14, 1945	60	681	8.13	110.32	493,100	640	103.68	463,400	
1947.....	7,380	Feb. 13, 1947	65	550	6.56	89.09	398,200	595	96.34	430,000	
1948.....	7,929	Oct. 18, 1947	68	660	7.88	107.18	479,100	626	101.60	454,100	
1949.....	4,810	Dec. 1, 1948	104	607	7.24	98.29	439,800	714	116.58	516,600	
1950.....	23,500	Nov. 26, 1949	117	832	9.93	134.75	602,300	828	133.98	599,700	
1951.....	10,800	Feb. 9, 1951	67	729	8.70	118.15	528,000	618	100.12	447,500	
1952.....	4,740	Jan. 30, 1952	76	513	6.12	83.29	372,300	425	69.03	398,500	
1953.....	8,640	Jan. 9, 1953	63	643	7.67	104.16	465,500	.....	.....	.....

* Estimated.

Soleduck River at Snider ranger station, near Beaver, Wash.

Location.—Lat. 48°04'00", long. 124°07'00", in E½ sec. 28, T. 30 N., R. 11 W., on right bank 1,250 ft. upstream from Snider ranger station, 4 miles downstream from Camp Creek, 9 miles downstream from South Fork, and 11 miles east of Beaver.

Drainage area.—116 sq. mi.

Gage.—Staff gage. Altitude at gage is 730 ft. (from topographic map). Nov. 13 to Dec. 16, 1921, staff gage 250 ft. upstream at same site and datum.

Extremes.—1922-28: Maximum discharge, 23,500 cfs Dec. 12 1921 (gage height, 14.7 ft., from graph based on gage readings); minimum observed, 28 cfs Sept. 14, 1926 (gage height, 1.10 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1922...	1,340*	1,380*	2,130	330*	362	210	376	1,080	876	292	120	138	723*
1923.....	.....	1,550*	2,140	547	444	554	602	523	319	114	85	.....	.....
1924.....	196	513	1,850	1,310	2,110	420	319	340	211	107	60.1	300	641
1925.....	1,080	1,370	1,390	1,250	2,150	580	544	669	496	266	108	55.9	824
1926.....	44.6	.....	.....	.....	.....	.....	.....	418	204	83.4	50.8	64.4	.....
1927.....	.....	.....	.....	.....	.....	.....	524	850	745	355	136	313	.....
1928.....	735	1,330	693	1,690	454	979	756	743	411	188	79.5	60.5	683

* Estimated.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1922.....	.....	340	780	.....	198	186	238	520	520	153	83	72	72
1923.....	.....	.....	.....	360	.....	285	443	402	380	162	75	54	.....
1924.....	60	117	425	.....	750	205	220	235	146	72	43	34	34
1925.....	333	633	439	462	608	333	394	485	417	144	77	44	44
1926.....	.....	.....	.....	.....	.....	.....	.....	313	121	59	40	28	.....
1927.....	.....	.....	.....	.....	.....	.....	333	509	509	209	94	130	.....
1928.....	276	417	353	445	260	223	489	583	293	115	55	45	45

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1922.....	23,500	Dec. 12, 1921	72	723	6.23	84.66	523,000	.....	.....	.....
1923.....	11,800	Dec. 24, 1922	.....	.....	.....	.....	.....	661	77.22	479,000
1924.....	15,600	Jan. 31, 1924	34	641	5.63	75.07	465,000	747	87.67	541,000
1925.....	7,430	Feb. 3, 1925	44	824	7.10	96.44	596,000	.....	.....	.....
1926.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1927.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1928.....	7,430	Jan. 12, 1928*	45	653	5.89	50.13	496,000	.....	.....	.....

QUILLAYUTE RIVER BASIN

Calawah River near Forks, Wash.

Location.—Lat. 47°57'40", long. 124°23'20", in SW¼ sec. 4, T. 28 N., R. 13 W., at highway bridge 0.8 mile north of Forks and 7 miles upstream from mouth.

Drainage area.—131 sq. mi.

Gage.—Wire-weight gage. Altitude of gage is 230 ft. (from topographic map).

Extremes.—1897-1901: Maximum discharge, 15,000 cfs Nov. 18, 1897 (gage height, 17.2 ft., from graph based on gage readings); minimum, 15 cfs Sept. 28, 1899 (gage height, -0.65 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898		1,970	3,580	1,230	2,730	765	824	449	524	323	201*	320	
1899	807	1,460	2,180	2,770	2,190	1,240	1,230	823	433	194	116	65.3	1,120
1900	576	3,380	2,720	2,940	1,740	2,400	742	721	1,130	460	169	133	1,420
1901	1,810	2,310	3,110	1,550	1,150	1,370	1,040	966	478	180	86.5	82.8	1,180
1902	229	2,450	2,090										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898			873	689	797	474	301	270	270	155	105	40	
1899	345	604	604	740	621	554	426	689	301	80	70	15	15
1900	80	474	835	850	777	665	237	225	330	190	110	70	70
1901	105	777	1,160	314	300	566	566	548	314	147	71	71	71
1902	71	762	566										

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary Maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1898	15,000	Nov. 18, 1897						973	100.82	704,000
1899	8,600	Jan. 20, 1899	15	1,120	8.58	116.52	314,000	1,310	135.55	947,000
1900	13,900	Mar. 9, 1900	70	1,420	10.9	147.57	1,039,000	1,470	152.78	1,070,000
1901	12,600	Jan. 12, 1901	71	1,180	9.03	122.60	857,000	973	100.84	704,000

* Estimated.

LYRE RIVER BASIN

Lyre River at Piedmont, Wash.

Location.—Lat. 48°05'35", long. 123°47'30", in NE¼ sec. 14, T. 30 N., R. 9 W., on north shore of Crescent Lake, on dock at Log Cabin Hotel at Piedmont, and half a mile upstream from lake outlet.

Drainage area.—49.5 sq. mi.

Gage.—Staff gage. Altitude of gage is 580 ft. (from topographic map). Oct. 15, 1917, to Oct. 16, 1922, and Oct. 1, 1923, to Dec. 16, 1925, water-stage recorder three-quarters of a mile downstream at different datums.

Average discharge.—10 years (1917-27), 218 cfs.

Extremes.—1917-27: Maximum discharge observed, 1,180 cfs Jan. 10, 11, 1923; minimum 18 cfs Sept. 19, 1924.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	65.6	71.4	388	642	457	350	316	217	143	51.3	61.2	42.1	235
1919...	134	251	500	434	518	367	313	277	229	171	90.0	53.5	277
1920...	37.4	102	163	258	261	192	157	126	135	64.1	53.8	96.0	137
1921...	232	204	311	455	509	377	228	227	262	151	94.2	76.7	264
1922...	201	408	675	328	238	198	169	230	272	137	189	83.1	257
1923...	70.9	88.3	230	550	342	272	208	209 ^o	184	126	64.5	50.9	225
1924...	63.8	77.0	330	243	634	286	163	127	92.1	55.7	35.2	53.8	179
1925...	177	438	323	364	608	316	206	203	167	89.5	47.6	35.9	245
1926...	26.6	56.4	202	291	321	216	154	141	56.5	55.4	38.5	33.1	134
1927...	113	161	267	405	352	324	238	268	252	158*	72.9	60.7	222*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	51	50	56	348	335	258	250	169	104	60	49	32	32
1919...	57	189	239	278	426	299	285	252	207	126	64	39	39
1920...	28	36	83	207	189	166	130	110	76	21	37	57	21
1921...	128	112	278	379	364	263	209	197	242	127	76	49	49
1922...	102	289	478	248	199	175	153	152	217	88	56	51	33
1923...	44	74	70	464	257	195	192	198	157	79	57	39	39
1924...	49	58	110	198	470	178	147	106	72	44	28	20	20
1925...	114	336	258	258	439	226	182	188	130	61	41	30	30
1926...	26	32	89	203	232	176	127	118	72	40	36	26	26
1927...	39	148	208	295	264	280	183	235	235	96	59	59	39

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1918.....	1,080	Jan. 4, 1918	32	235	4.75	64.59	170,000	265	72.83	192,000
1919.....	692	Dec. 14, 1918	39	277	5.60	75.96	200,000	228	62.50	165,000
1920.....	320	①	21	137	2.77	37.56	99,200	174	47.85	126,000
1921.....	718	Feb. 14, 1921	49	264	5.33	72.53	191,000	310	84.83	224,000
1922.....	985	Dec. 13, 1921	33	257	5.19	70.39	186,000	182	49.84	132,000
1923.....	1,150	Jan. 10, 11, 1923	39	225	4.55	61.65	163,000	232	63.57	168,000
1924.....	862	Feb. 12, 1924	20	179	3.62	40.00	120,000	217	56.66	157,000
1925.....	327	Feb. 5, 1925	30	245	4.95	67.32	178,000	191	52.47	139,000
1926.....	376	Feb. 10, 1926	26	134	2.71	36.85	97,200	156	42.68	113,000
1927.....	560	Jan. 3-7, 1927	39	222	4.48	60.59	161,000	.....	.....	.....

* Estimated.

① Jan. 30 to Feb. 2, 1920.

SALT CREEK BASIN

69

Salt Creek near Port Angeles, Wash.

Location.—Lat. 48°07'40", long. 123°40'40", in NW¼ sec. 2, T. 30 N., R. 8 W., on right bank a quarter of a mile upstream from West Fork and 8 miles west of Port Angeles.

Drainage area.—8.31 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map).

Extremes.—May to November 1952: Maximum discharge, 4.8 cfs May 22 (gage height, 1.52 ft.); maximum gage height, 1.54 ft. Oct. 30; minimum discharge, 0.31 cfs Oct. 7, 8 (gage height, 1.33 ft.).

Remarks: No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1952	1.48	0.841	0.480*	1.10	0.631	.....	.....

* Estimated.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1952	0.62	0.48	.....	0.42	0.34	.....	.....

ELWHA RIVER BASIN

Lake Mills at Glines Canyon, near Port Angeles, Wash.

Location.—Lat. 48°00'05", long. 123°36'00", in SE¼ sec. 17, T. 29 N., R. 7 W., at Glines Canyon Dam, 2 miles upstream from Griff Creek, 4 miles south of Elwha, and 11 miles southwest of Port Angeles.

Drainage area.—245 sq. mi.

Gage.—Staff gage. Datum of gage is 19.74 ft. below mean sea level, datum of 1929 supplementary adjustment of 1947.

Extremes.—1927-53: Maximum contents observed, 39,940 acre-ft. Dec. 22, 1936 (gage height, 613.0 ft.); minimum observed (since reservoir first filled in May 1927), 24,290 acre-ft. Nov. 14, 1929 (gage height, 574.4 ft.).

Remarks.—Reservoir is formed by concrete dam completed in 1927; storage began Apr. 1, 1927. Capacity, 37,790 acre-ft. at top of gates (gage height, 608 ft.). Water is used by Crown Zellerbach Corp. for power development. Records given herein represent total contents.

ELWHA RIVER BASIN

Lake Mills at Glines Canyon near Port Angeles, Wash.—Continued

Contents, in Acre Feet, on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927							20,060	35,260	35,520	36,610	36,770	36,560	.....
1928	37,789	37,480	36,280	38,380	36,740	38,520	38,440	38,820	38,390	35,820	31,630	31,110	.....
1929	34,900	37,120	37,550	32,830	29,070	37,450	36,610	38,050	38,090	38,350	35,650	34,290	.....
1930	27,800	25,700	38,220	34,670	38,090	38,740	32,440	38,050	38,130	30,280	34,900	36,610	.....
1931	38,440	38,690	37,830	38,310	38,610	38,560	38,690	38,780	38,650	36,320	38,260	37,240	.....
1932	38,330	38,740	37,600	38,150	38,590	38,780	37,200	38,760	38,610	34,820	35,130	35,400	.....
1933	36,030	36,130	38,740	38,560	38,560	38,520	38,560	38,390	38,560	38,650	37,290	38,650	.....
1934	38,760	36,550	38,350	38,610	38,480	38,050	33,010	38,050	36,680	36,970	37,220	36,020	.....
1935	38,780	35,210	38,840	36,190	38,740	34,530	32,990	38,740	38,670	38,370	36,970	35,840	.....
1936	35,520	36,570	38,970	36,420	37,940	35,710	38,890	38,890	38,820	37,880	37,390	31,710	.....
1937	20,490	32,910	38,060	31,850	37,540	38,960	30,550	38,700	38,500	36,970	38,200	35,400	.....
1938	37,020	38,370	35,460	38,710	38,540	38,380	37,850	38,650	38,560	37,920	38,140	33,300	.....
1939	38,610	37,120	38,310	38,560	38,040	37,880	38,500	38,910	38,910	38,820	37,030	34,660	.....
1940	34,700	37,960	38,560	38,860	38,910	38,820	38,560	38,820	37,290	38,130	38,350	37,450	.....
1941	37,200	37,580	38,060	38,860	38,780	38,440	37,060	38,390	38,450	37,080	38,180	36,400	.....
1942	35,970	38,820	38,690	37,710	38,620	30,760	30,950	37,830	36,670	38,980	38,400	30,470	.....
1943	38,550	38,740	38,820	37,660	38,440	38,740	38,310	38,820	39,950	38,130	37,710	34,450	.....
1944	36,870	38,870	37,290	38,560	38,780	38,490	30,780	38,820	38,610	38,900	34,700	36,070	.....
1945	38,820	38,740	38,190	38,310	37,750	37,790	38,910	38,740	37,120	38,260	38,940	38,310	.....
1946	37,710	38,440	38,390	38,480	38,520	37,900	38,650	38,740	38,860	38,820	30,700	38,040	.....
1947	34,830	38,780	38,310	38,860	38,820	38,390	38,820	38,560	38,820	38,310	37,790	37,840	.....
1948	38,690	37,290	38,520	37,830	38,820	37,370	37,030	38,480	38,560	38,910	37,870	37,960	.....
1949	37,540	38,560	37,710	38,440	38,860	37,290	38,260	38,310	38,740	38,910	36,910	38,350	.....
1950	36,360	38,740	38,690	37,920	38,060	36,320	30,110	38,740	38,390	38,740	36,530	37,240	.....
1951	38,620	38,620	38,560	38,860	38,310	37,830	38,000	38,260	38,690	38,440	37,160	38,650	.....
1952	38,220	38,740	38,180	38,990	38,360	37,760	30,080	38,350	38,480	38,860	38,310	38,110	.....
1953	32,930	33,140	38,310	38,650	38,130	36,740	38,440	38,560	38,610	38,740	38,350	38,390	.....

Elwha River at McDonald Bridge, near Port Angeles, Wash.

Location.—Lat. 48°03'20", long. 123°34'55", in NE¼NW¼ sec. 33, T. 30 N., R. 7 W., on right bank 300 ft. upstream from McDonald Bridge (now removed), half a mile upstream from Little River, 7 miles upstream from mouth, and 8 miles southwest of Port Angeles.

Drainage area.—269 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 200.00 ft. above mean sea level, datum of 1929. Oct. 8, 1897, to Dec. 31, 1901, wire-weight gage and Dec. 9, 1918, to May 1, 1936, water-stage recorder at site, 300 ft. downstream at different datums.

Average discharge.—39 years (1897-1901, 1918-53), 1,450 cfs, adjusted for storage since April 1927.

Extremes.—1897-1901, 1918-53: Maximum discharge, 41,600 cfs Nov. 18, 1897 (gage height, 14.5 ft., from graph based on gage readings, site and datum then in use), from rating curve extended above 3,300 cfs on basis of two recent determinations of peak flow over dam referred to 1897 datum; minimum daily, 10 cfs Oct. 3, 1938.

Remarks.—Diversion for power returned to stream above station. Flow regulated since 1927 by Lake Mills (see preceding page).

ELWHA RIVER BASIN

Elwha River at McDonald Bridge near Port Angeles, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898...	635	2,400	2,960	1,590	2,160	1,250	1,230	2,010	2,230	1,750	1,200	695	1,670
1899...	889	1,070	1,220	1,470	1,370	684	763	1,250	2,120	2,040	999	670	1,200
1900...	742	4,670	2,910	2,520	920	3,160	1,740	1,920	2,790	1,250	941	672	2,020
1901...	1,330	1,650	4,410	1,820	1,060	1,450	957	2,180	2,160	1,640	1,170	711	1,770
1902...	664	3,210	2,090										
1919...	1,800*	1,600*	2,470	2,080	1,840	990	1,750	2,100	2,310	2,300*	1,800*	657*	1,740*
1920...	381*	1,140*	1,440	1,690	1,230	864	689	962	1,540	1,220	720	1,330	1,100*
1921...	2,770	1,850	1,860	2,160	2,320	1,490	1,120	2,010	3,070	2,290	1,800	1,110	2,000
1922...	2,710	2,600	3,550	919	765	559	691	2,000	2,990	1,400	726	594	1,630
1923...	695	596	1,670	2,820	1,100	884	-1,210	2,070	2,280	1,610	752	605	1,360
1924...	494	673	2,310	1,660	3,830	992	751	1,770	1,360	840	562	739	1,320
1925...	2,070	2,610	2,020	1,470	2,350	1,000	1,570	2,600	2,180	1,550	751	464	1,710
1926...	313	409	1,880	1,440	1,680	1,060	1,170	1,140	922	595	444	330	943
1927...	1,160	1,340	1,920	1,810	1,460	1,140	727	1,660	2,970	1,900	982	828	1,490
1928...	1,300	2,120	1,800	2,750	1,140	1,500	1,360	2,380	1,670	1,050	620	484	1,470
1929...	830	1,080	1,000	873	476	511	-900	1,790	2,140	1,390	753	424	1,010
1930...	485	328	642	609	2,200	1,190	2,040	1,240	1,490	996	550	423	1,010
1931...	638	717	780	1,920	1,560	1,550	1,460	1,930	1,950	1,160	508	532	1,220
1932...	608	1,580	1,470	1,350	1,890	1,930	1,760	2,040	2,840	1,710	523	495	1,540
1933...	706	2,470	1,930	1,700	770	1,100	1,050	1,720	3,000	2,820	1,530	1,050	1,600
1934...	1,424	1,738	4,713	3,445	1,923	2,234	2,065	1,898	1,362	917	635	503	1,910
1935...	1,005	3,105	1,487	3,513	2,792	1,671	1,023	1,610	2,249	1,575	563	629	1,603
1936...	604	565	921	1,592	635	1,270	1,485	2,662	2,469	1,279	697	617	1,222
1937...	400	219	1,141	638	528	1,044	1,306	2,077	3,155	1,757	773	536	1,135
1938...	502	2,481	2,002	1,800	871	1,245	1,546	2,219*	2,533	1,393	729	435	1,584*
1939...	625	945	1,039	2,391	1,102	944	1,396	1,580	1,460	1,262	695	473	1,237
1940...	510	1,029	3,619	2,262	2,029	2,094	1,371	1,968	1,285	675	539	361	1,481
1941...	1,327	1,997	2,009	1,769	1,652	1,057	980	1,521	1,285	777	483	531	1,210
1942...	1,000	1,360	2,832	974	981	656	832	1,091	1,578	1,069	525	376	1,114
1943...	321	1,076	1,433	1,067	1,275	990	2,210	1,530	1,327	1,532	696	490	1,201
1944...	534	633	1,194	1,549	883	705	744	1,156	1,370	696	434	406	859
1945...	477	1,452	1,272	1,896	1,373	1,149	904	2,265	1,841	1,101	640	524	1,279
1946...	659	1,429	1,825	1,679	1,080	1,138	1,471	2,950	2,669	2,101	1,068	570	1,557
1947...	542	785	2,254	1,351	3,063	1,144	1,198	1,856	1,582	1,065	544	345	1,300
1948...	1,527	1,452	2,050	1,758	1,229	899	903	2,557	3,512	1,566	968	768	1,602
1949...	1,002*	1,474	1,298	692	1,235	1,477	1,564	3,164	2,562	1,714	1,063	761	1,501*
1950...	738	2,660	2,592	1,559	1,820	1,852	1,474	2,020	4,096	2,917	1,405	660	1,931
1951...	1,379	2,276	3,617	1,976	3,106	1,074	1,617	2,208	2,305	1,484	720	458	1,846
1952...	1,246	1,274	1,245	714	1,320	763	1,281	2,238	2,110	1,701	894	560	1,278
1953...	387	417	983	4,033	2,215	950	991	2,200	2,080	2,203	1,133	773	1,530

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898...	300	562	1,150	855	967	637	687	1,240	1,640	1,290	631	470	300
1899...	330	637	520	660	770	510	520	575	1,630	1,630	575	510	330
1900...	475	595	1,000	1,020	690	710	930	1,100	1,260	810	650	562	475
1901...	495	930	1,570	965	645	685	625	1,070	1,230	1,340	873	605	495
1902...	460	795	1,070										
1919...			800*	543	1,040	784	1,050	1,470			935	440	
1920...	321	319	250	621	672	632	623	751	809	777	591	548	250
1921...	1,450	843	1,050	1,300	1,020	992	829	952	2,690	1,760	829	648	646
1922...	802	1,040	1,210	744	702	458	499	662	2,109	952	600	436	458
1923...	401	478	374	900	652	690	1,000	1,040	1,660	970	622	390	374
1924...	344	376	680	788	1,840	654	568	732	886	627	330	310	310
1925...	696	1,420	1,080	763	1,090	731	715	1,410	1,070	1,020	510	350	350

* Estimated.

ELWHA RIVER BASIN

Elwha River at McDonald Bridge near Port Angeles, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926...	205	254	715	917	926	850	534	690	746	430	300	258	254
1927...	355	559	926	989	762	890	303	.....	.....	1,340	048	560	203
1928...	548	.....	373	762	484	426	935	1,350	1,250	673	522	38	36
1929...	36	478	272	.....	.....	204	653	1,070	1,550	918	560	33	33
1930...	286	155	31	341	582	643	1,380	771	1,050	378	30	29	29
1931...	104	.....	46	215	368	770	544	1,420	1,300	396	92	87	.....
1932...	116	92	63	330	90	1,390	1,440	1,230	1,560	668	116	11	11
1933...	27	870	763	318	126	510	54	683	2,090	1,900	90	111	27
1934...	377	664	522	2,200*	922	653	1,590	1,330	802	245	203	75	75
1935...	216	1,020	436	804	1,660	1,010	226*	1,140	1,640	1,080	431	180	180
1936...	364	.....	36	570	167	612	411	1,960	1,550	748	290	61	36
1937...	44	40	154	346	244	501	600	782	2,460	962	434	101	40
1938...	242	900	1,120	571	176	460	211	1,100*	1,360	83	42	14	14
1939...	10	331	86	1,260	916	133	1,080	1,300	1,190	1,050	333	54	10
1940...	104	272	1,380	960*	1,230	1,260	1,200	1,420	917	82	177	22	22
1941...	223	653	919	860	986	809	746	963	978	76	373	153	76
1942...	445	443	1,150	602	559	422	532	499	1,320	783	163	12	12
1943...	115	355	825	480	670	254	1,300*	573	1,350*	972	320	84	84
1944...	192	413	470	388	427	443	396	712	902	95	250	44	44
1945...	263	600	282	569	772	602	640	1,390	1,170	443	334	224	224
1946...	340	592	614	1,040	471	734	680	1,540	1,310	1,570	750*	217	217
1947...	168	242	904	653	1,210	866	689	1,160	934	625	293	98	98
1948...	361	643	592	1,110	674	638	494	969	2,400	762	517	168	168
1949...	609	666	410	440	270	1,130	710	1,670	1,510	1,210	654	171	171
1950...	468	526	785	796	815	1,020	766	767	2,920	1,310	1,030	382	382
1951...	856	963	1,780	1,320	1,270	820	997	1,300	1,770	859	317	260	266
1952...	550	710	401	459	784	560	705	1,220	1,560	1,240	490	260	266
1953...	286	248	280	1,230	986	771	611	1,230	1,710	1,440	757	454	248

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1898.....	41,600	Nov. 18, 1897	300	1,670	6.22	54.34	1,210,000	1,440	72.44	1,040,000
1899.....	5,820	Feb. 16, 1899	330	1,200	4.47	60.67	871,000	1,630	82.16	1,150,000
1900.....	30,200	Mar. 11, 1900	475	2,020	7.52	102.13	1,470,000	1,950	98.63	1,410,000
1901.....	20,600	Dec. 20, 1900	495	1,770	6.57	89.13	1,280,000	1,640	82.80	1,190,000
1902.....	33,600	Nov. 27, 1901	.....	.....	.....	.....	.....	.....	.....	.....
1919.....	.....	.....	.....	1,740	6.47	87.83	1,250,000	1,520	76.70	1,100,000
1920.....	11,000	Nov. 15, 1919	250	1,100	4.09	55.67	798,000	1,400	70.78	1,010,000
1921.....	11,700	Feb. 11, 1921	646	2,000	7.43	100.86	1,450,000	2,190	110.50	1,590,000
1922.....	21,400	Dec. 12, 1921	458	1,630	6.06	82.26	1,180,000	1,140	57.56	823,000
1923.....	9,880	Dec. 24, 1922	374	1,350	5.02	68.14	950,000	1,400	70.59	1,010,000
1924.....	14,200	Jan. 31, 1924	310	1,320	4.91	66.83	960,000	1,590	80.44	1,160,000
1925.....	9,500	Nov. 19, 1924	350	1,710	6.36	86.33	1,240,000	1,370	69.09	992,000
1926.....	6,550	Dec. 11, 1925	254	943	3.51	47.65	683,000	1,100	55.52	794,000

* Estimated.

Elwha River at McDonald Bridge near Port Angeles, Wash.—Continued

Summary—Continued

Year	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Observed				Adjusted		Observed		Adjusted			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
Dis-charge	Date											
1927..	7,600	Dec. 2, 1926	203	1,490	1,080,000	1,540	5.72	77.65	1,510	1,090,000	1,560	78.73
1928..	10,700	Jan. 12, 1928	38	1,470	1,060,000	1,460	5.43	73.91	1,320	955,000	1,320	66.83
1929..	9,600	Oct. 9, 1928	33	1,010	732,000	1,020	3.79	51.45	890	644,000	890	44.93
1930..	7,150	Feb. 13, 1930	29	1,010	728,000	1,010	3.75	50.90	1,060	769,000	1,060	53.48
1931..	12,100	Jan. 23, 1931	.....	1,220	886,000	1,220	4.54	61.63	1,350	978,000	1,350	63.14
1932..	16,200	Feb. 26, 1932	11	1,540	1,120,000	1,540	5.73	77.94	1,660	1,210,000	1,660	83.98
1933..	12,100	Nov. 12, 1932	27	1,060	1,200,000	1,660	6.17	83.75	1,900	1,370,000	1,900	95.83
1934..	26,700	Dec. 21, 1933	75	1,910	1,383,000	1,905	7.08	96.11	1,713	1,240,000	1,713	86.47
1935..	125,200	Nov. 5, 1934	180	1,803	1,305,000	1,804	6.71	91.08	1,512	1,094,000	1,512	76.29
1936..	4,680	Jan. 4, 1936	36	1,232	894,600	1,227	4.56	62.07	1,205	875,000	1,204	60.98
1937..	8,870	Dec. 22, 1936	40	1,135	621,600	1,140	4.24	57.56	1,505	1,089,000	1,501	75.74
1938..	18,600	Dec. 23, 1937	14	1,584	1,146,000	1,581	5.88	79.82	1,335	866,400	1,339	67.60
1939..	17,100	Jan. 1, 1939	10	1,237	895,500	1,239	4.61	62.58	1,403	1,015,000	1,403	70.86
1940..	15,000	Dec. 15, 1939	22	1,481	1,075,000	1,485	5.52	75.14	1,419	1,030,000	1,420	71.87
1941..	10,800	Jan. 17, 1941	76	1,210	876,000	1,209	4.49	60.95	1,281	927,100	1,281	64.61
1942..	17,100	Dec. 2, 1941	12	1,114	806,400	1,106	4.11	55.79	907	656,500	907	45.75
1943..	6,770	April 2, 1943	34	1,201	869,600	1,207	4.49	60.95	1,163	841,700	1,160	58.51
1944..	10,000	Dec. 3, 1943	44	859	623,900	862	3.20	43.56	928	673,300	929	46.96
1945..	14,000	Feb. 7, 1945	224	1,279	926,100	1,278	4.75	64.48	1,340	970,000	1,340	67.60
1946..	5,910	Dec. 28, 1945	217	1,557	1,128,000	1,558	5.79	78.60	1,531	1,108,000	1,531	77.24
1947..	13,000	Feb. 13, 1947	98	1,300	941,400	1,302	4.84	65.70	1,421	1,029,000	1,422	71.81
1948..	18,000	Oct. 18, 1947	168	1,602	1,163,000	1,603	5.96	81.12	1,406	1,066,000	1,405	75.68
1949..	5,370	Nov. 28, 1948	171	1,501	1,066,000	1,497	5.57	75.61	1,688	1,220,000	1,687	85.11
1950..	30,000	Nov. 26, 1949	382	1,981	1,434,000	1,984	7.38	100.18	2,091	1,514,000	2,091	105.62
1951..	14,300	Feb. 9, 1951	266	1,846	1,336,000	1,848	6.37	93.25	1,551	1,123,000	1,550	78.24
1952..	5,380	Oct. 19, 1951	266	1,278	925,000	1,273	4.73	64.45	1,114	808,400	1,114	56.35
1953..	11,100	Jan. 31, 1953	248	1,580	1,108,000	1,585	5.71	77.43	.....	.....	.....	.....

† Maximum observed.

Elwha River near Port Angeles, Wash.

Location.—Lat. 48°05'40", long. 123°33'20", in sec. 15, T. 30 N., R. 7 W., at power-plant in Elwha Canyon, 2¾ miles downstream from McDonald Bridge, and 6 miles southwest of Port Angeles.

Drainage area.—315 sq. mi.

Supplemental records available.—October 1911 to September 1912, gage heights and discharge measurements only.

Gage.—Chain gage. Datum of gage is 74.21 ft. (from Olympic Power Company benchmarks). Prior to May 4, 1911, staff gage at same site and datum.

Extremes.—April to September 1911: Maximum discharge observed, 5,520 cfs May 3; maximum gage height observed, 8.3 ft. June 13, minimum discharge observed, 455 cfs August 29.

Flood of November 1911 reached a stage of 11.55 ft. Flood of October 1912, caused by failure of Olympic Power Co. dam, reached a stage much greater (stage and discharge not known).

Remarks.—No diversion or regulation above station.

ELWHA RIVER BASIN

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911								2,820	3,210	2,620	1,020	618	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911								2,000	2,280	1,620	455	488	

Elwha River below diversion, near Port Angeles, Wash.

Location.—Lat. 48°06'55", long. 123°33'10", in NE¼ sec. 10, T. 30 N., R. 7 W., on right bank at upstream side of railroad bridge, 2¼ miles upstream from mouth, and 3½ miles west of Port Angeles.

Drainage area.—318 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 60 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge recorded, 12,600 cfs Jan. 9 (gage height, 5.88 ft.); minimum recorded, 62 cfs Nov. 28 (gage height, 0.29 ft.).

Remarks.—Natural flow of station affected by Port Angeles industrial canal which diverts out of drainage basin, storage in Lake Mills and Lake Aldwell, and power developments that return flow above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951											642	432	
1952	1,124	1,329											
1953	288	315	918	4,530	2,416	972	963	2,166	2,040	2,199	1,007	671	1,540

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951											445	335	
1952	497	630											
1953	208	120	150	1,290	1,030	804	645	1,240	1,580	1,360	610	357	120

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1951													
1952													
1953	12,000	Jan. 9, 1953	120	1,540	4.84	75.74	1,115,000						

Ennis Creek near Port Angeles, Wash.

Location.—Lat. 48°06'25", long. 123°23'40", in SW¼ sec. 12, T. 30 N., R. 6 W., on right bank 1 mile upstream from mouth and 1 mile east of Port Angeles.

Drainage area.—8.32 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 85 ft. (from topographic map).

Extremes.—May to October 1952: Maximum discharge, 23 cfs May 23 (gage height, 1.52 ft.); minimum, 2.3 cfs Oct. 17-19 (gage height, 1.01 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	May	June	July	Aug.	Sept.	Oct.	Annual
1952.....		14.7	11.0	4.56	3.46	2.88	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	May	June	July	Aug.	Sept.	Oct.	Annual
1952.....		11.5	6.6	3.7	3.0	2.3	.....

SIEBERT CREEK BASIN

Siebert Creek near Port Angeles, Wash.

Location.—Lat. 48°05'35", long. 123°17'00", in SE¼ sec. 14, T. 30 N., R. 5 W., on left bank 2¼ miles upstream from mouth and 6½ miles east of Port Angeles.

Drainage area.—17.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 225 ft. (from topographic map).

Extremes.—1952-53: Maximum discharge, 358 cfs Jan. 9, 1953 (gage height, 3.45 ft.; maximum gage height, 3.50 ft. Jan. 8, 1953; minimum discharge, 2.0 cfs Sept. 3-5, 1952; minimum gage height, 1.38 ft. Aug. 14-19, Sept. 5-7, 9-12, 14-26, 1953.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....									5.36	3.53	2.67	2.26	.....
1953.....	2.23	2.52	6.71	69.1	29.2	12.0	8.83	7.16	15.3	6.34	3.50	3.88	18.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....									4.5	2.8	2.2	2.0	.....
1953.....	2.1	2.1	2.6	8.7	10.5	9.9	7.0	5.7	7.0	3.6	2.6	2.4	2.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1952.....												
1953.....	358	Jan. 9, 1953	2.1	13.8	0.802	10.91	10,020					

DUNGENESS RIVER BASIN

Dungeness River near Sequim, Wash.

Location.—Lat. 48°00'55", long. 123°07'50", in SW¼SE¼ sec. 12, T. 29 N., R. 4 W., on right bank three-quarters of a mile upstream from Canyon Creek, 4½ miles southwest of Sequim, and 11½ miles upstream from mouth.

Drainage area.—156 sq. mi. At site prior to 1931, 157 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 569.3 ft. above mean sea level (from river-profile survey). June 8, 1923, to Sept. 30, 1930, staff gage half a mile downstream at different datum. June 19 to Aug. 12, 1937, staff gage at present site and datum.

Average discharge.—23 years (1923-30, 1937-53), 348 cfs.

Extremes.—1923-30, 1937-53: Maximum discharge, 6,820 cfs Nov. 27, 1949 (gage height, 7.3 ft.), from rating curve extended above 2,000 cfs on basis of slope-area determination of peak flow; minimum observed, 77 cfs Sept. 10, 1928.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923...									733*	553*	341*	210*	.....
1924...	178*	169	392	368	1,040	232	210	490	390	291	176	167	340*
1925...	379	636	470	344	473	253	519	800	626	487	266	172	462
1926...	195	148	293	224	243	197	279	307	259	179	134	105	210
1927...	262	301	515	449	402	306	331	517	973	621	334	223	437
1928...	243	333	264	609	268	284	314	561	433	292	143	83.8	321
1929...	185	206	188	133	106	134	201	525	666	447	223	129	263
1930...	96.7	86.6	187	105*	297	211	374	361	456	284	169	134	232*
1937...									880*	655	228	133	.....
1938...	156	392	575	393	218	261	433	713	879	537	229	152	413
1939...	170	160	256	459	202	229	329	448	454	375	190	125	254
1940...	120	163	740	586	397	400	344	666	335	303	188	156	385
1941...	348	261	434	393	359	240	276	416	508	344	174	152	325
1942...	209	364	715	251	217	163	270	477	635	457	201	120	341
1943...	106	125	251	235	255*	194	400	449	586	495*	231	137	304*
1944...	149	137	207	195	138	161	185	343	412	220	129	103	199
1945...	110	237	219	276	417*	231*	240	609	579	409	200	150	306*
1946...	127	214	310	283	194	201	313	684	696	631	324	165	347
1947...	133	173	306	269	652	306	347	622	551	346	186	130	336
1948...	849	265	414	333	234	214	265	772	1,196	584	308	216	434
1949...	234	305	333	141	331	313	385	772	697	477	294	225	350
1950...	145	597	529	313	379	408	320	598	1,103	813	412	201	455
1951...	296	550	342	495	754	294	441	641	717	502	243	153	493
1952...	242	223	234	133	250	182	377	612	602	527	271	149	317
1953...	106	102	174	730	439	209	365	675	639	753	393	233	402

* Estimated.

DUNGENESS RIVER BASIN

Dungeness River near Sequim, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923													
1924	141	125	158	158	326	165	148	248	312	216	119	90	90
1925	164	295	295	222	257	211	258	425	425	357	164	140	140
1926	118	112	182	173	156	156	201	212	222	132	112	82	82
1927	99	140	270	258	258	270	234	357	550	495	201	147	99
1928	156	182	125	147*	212	192	245	312	326	201	99	77	77
1929	82	164	132	112	99	105	118	297	478	312	173	93	82
1930	82	77	77		125	125	297	312	390	201	132	118	
1937									692	300*	153	107	
1938	104	140	217	240	172	194	188	402	655	321	162	123	104
1939	112	125	137	211	149	125	259	320	370	258	141	109	109
1940	98	102	347	259	280	322	276	499	394	232	159	129	98
1941	117	157	266	226	206	190	212	232	398	218	141	117	117
1942	121	134	290	208	158	135	201	240	517	270	142	100	100
1943	87	106	162	155*	175*	129	327	285	414	356	174	112	87
1944	106	115	115	111	108	97	141	222	304	158	106	92	92
1945	80	126	112*	110	180*	155*	159	437	426	251	146	115	80
1946	84	119	156	198	133	151	156	357	550	479	240	119	84
1947	97	93	155	141	253	226	230	418	360	237	138	110	93
1948	118	179	162	237	178	148	162	222	860	424	208	134	118
1949	150	140	170	114	96	213	209	333	402	348	237	134	98
1950	108	111	246	135*	194	239	228	254	813	549	270	148	108
1951	132	224	388	349	359	262	278	354	506	330	178	118	118
1952	173	144	139	105	146	126	181	364	434	380	184	128	105
1953	90	84	88	181	224	178	166	425	553	460	267	153	84

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1923										
1924	6,340	Feb. 11, 1924	90	340	2.17	29.45	249,000	402	34.82	291,000
1925	3,120	Nov. 19, 1924	140	452	2.88	39.04	327,000	375	32.41	271,000
1926	740	Dec. 23, 1925	82	210	1.34	18.15	152,000	253	21.88	183,000
1927	2,860	Dec. 1, 1926	99	437	2.78	37.78	316,000	417	36.02	302,000
1928	1,400	Jan. 12, 1928	77	321	2.04	27.81	233,000	299	25.91	217,000
1929	1,000	June 15, 1929	52	263	1.68	22.74	190,000	246	21.25	178,000
1930	920	Feb. 20, 1930		232	1.48	20.03	168,000			
1937										
1938	5,360	Dec. 28, 1937	104	413	2.65	35.93	298,500	363	32.03	266,200
1939	3,850	Jan. 1, 1939	109	284	1.82	24.71	205,600	322	27.98	232,500
1940	4,010	Dec. 15, 1939	98	385	2.47	33.59	279,400	386	33.66	280,100
1941	2,400	Jan. 17, 1941	117	325	2.08	28.31	235,600	348	30.09	250,400
1942	4,120	Dec. 2, 1941	100	341	2.19	29.64	246,800	294	24.69	265,500
1943	1,010	May 26, 1943	87	304	1.95	26.50	220,400	295	25.64	213,400
1944	1,520	Dec. 3, 1943	92	199	1.28	17.34	144,400	205	17.86	148,600
1945	3,380	Feb. 7, 1945	80	306	1.96	26.59	221,200	313	27.22	226,600
1946	1,200	June 14, 1946	84	347	2.22	30.16	251,000	346	30.12	250,600
1947	2,530	Feb. 12, 1947	93	336	2.15	29.20	242,900	363	32.03	266,400
1948	2,790	Oct. 19, 1947	118	434	2.78	37.84	314,900	420	36.67	305,200
1949	2,820	Dec. 1, 1948	96	350	2.44	33.06	275,000	413	35.94	299,000
1950	6,820	Nov. 27, 1949	108	485	3.11	42.20	351,000	520	45.30	376,800
1951	4,600	Feb. 9, 1951	118	493	3.16	42.87	256,600	410	35.67	296,900
1952	1,890	Apr. 30, 1952	105	317	2.03	27.68	230,400	290	25.34	210,900
1953	2,480	Jan. 12, 1953	84	402	2.58	34.99	291,000			

* Estimated.

DUNGENESS RIVER BASIN

Dungeness River below Canyon Creek, near Sequim, Wash.①

Location.—Lat. 48°02'30", long. 123°08'45", in NE¼ sec. 2, T. 29 N., R. 4 W., on right bank at county bridge, 3½ miles southwest of Sequim, and 9 miles upstream from mouth.

Drainage area.—170 sq. mi.

Gage.—Staff gage. Altitude of gage is 410 ft. (from topographic map).

Extremes.—1897-98: Maximum discharge, 2,950 cfs Nov. 18, 1897 (gage height, 8.10 ft., from graph based on gage readings); minimum observed, 85 cfs Dec. 26, 1897 (gage height, 3.80 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1897													
1898	182	636	738	277	498	223	279	698	740	370	321	181	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1897													
1898	138	157	85	190	190	188	157	476	371	310	218	157	

Dungeness River at Dungeness, Wash.

Location.—Lat. 48°08'40", long. 123°07'40", in NE¼ sec. 36, T. 31 N., R. 4 W., on highway bridge at Dungeness 1 mile upstream from mouth.

Drainage area.—197 sq. mi.

Gage.—Wire-weight gage. Altitude of gage is 10 ft. (from topographic map).

Extremes.—1898-1900: Maximum discharge, 7,540 cfs. Dec. 20, 1900 (gage height, 11.30 ft., from graph based on gage readings); minimum observed, 65 cfs Aug. 20, 1899; minimum gage height observed, 2.30 ft. Dec. 14-18, 1898.

Remarks.—Two irrigation ditches diverted an unknown amount of water above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1899	220	165	231	458	394	297	304	470	664	521	238	200	347
1900	222	1,160	784	589	296	1,180	670	604	827	529	339	224	620
1901	294	326	1,340	572	420	875	330	358	810	664	457	225	558
1902	180	669	504										

① Published as Dungeness River near Sequim.

DUNGENESS RIVER BASIN

Dungeness River near Dungeness, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1899...	123	138	108	225	255	225	235	225	473	395	65	162	65
1900...	122	337	265	365	272	212	425	395	495	460	260	171	122
1901...	153	270	420	252	270	206	236	320	620	570	302	178	153
1902...	165	165	338	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1899.....	1,080	Jan. 21, 1899	65	347	1.76	23.91	251,000	475	32.75	344,000	
1900.....	7,000	Mar. 11, 1900	122	620	3.15	42.75	449,000	605	41.69	438,000	
1901.....	7,540	Dec. 20, 1900	153	558	2.83	38.46	404,000	500	34.85	306,000	
1902.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

JIMMYCOMELATELY CREEK BASIN

Jimmycomelately Creek near Blyn, Wash.

Location.—Lat. 48°00'40", long. 123°00'05", in NE¼ sec. 13, T. 29 N., R. 3 W., on left bank 1 mile upstream from mouth and 1 mile south of Blyn.

Drainage area.—18.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map).

Extremes.—May to November 1952: Maximum discharge, 14.1 cfs June 22 (gage height, 1.21 ft.); minimum, 0.96 cfs Sept. 3-6, Oct. 15-20; minimum gage height, 0.77 ft. Oct. 9-16.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1952.....	4.41	2.57	1.46	1.24	1.30	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1952.....	2.5	1.3	1.2	1.0	1.0	.....	.....

SALMON CREEK BASIN

Salmon Creek near Maynard, Wash.

Location.—Lat. 47°58'50", long. 122°53'40", in N½ sec. 26, T 29 N., R. 2 W., on right bank 1 mile upstream from mouth and 1½ miles southwest of Maynard.

Drainage area.—13.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 75 ft. (from topographic map)

Extremes.—May to November 1952: Maximum discharge, 11.5 cfs June 21 (gage height, 1.28 ft.); minimum, 0.73 cfs Sept. 20, 21 (gage height, 0.81 ft.).

Remarks: Small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1952							1.51	2.85	1.78	1.36	1.74		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1952							2.0	2.0	1.4	0.8	1.1		

SNOW CREEK BASIN

Snow Creek near Maynard, Wash.

Location.—Lat. 47°56'30", long. 122°53'05", in SE¼ sec. 2, T. 28 N., R. 2 W., on left bank about 600 ft. upstream from mouth of Andrews Creek and 3¼ miles south of Maynard.

Drainage area.—13.2 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 180 ft. (from topographic map).

Extremes.—1952-53: Maximum discharge, 245 cfs Jan. 8, 1953 (gage height, 2.57 ft.); minimum, 1.6 cfs Oct. 20, 1952; minimum gage height, 1.22 ft. Sept. 18, 19, Oct. 16-20, 1952.

Remarks.—Some small diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952									11.9	7.17	2.94	2.41	
1953	2.38	4.43	19.9	53.0	19.8	12.7	10.5	13.2	29.7	8.63	6.04	4.27	16.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952									5.3	3.0	2.7	2.3	
1953	2.0	2.8	3.9	24	9.2	7.9	13.5	12	15	3.9	2.9	2.9	2.0

SNOW CREEK BASIN

Snow Creek near Maynard, Wash.—Continued
Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1952.....	245	Jan. 8, 1953	2.0	16.0	1.21	16.51	11,620			
1953.....										

SNOW CREEK BASIN

Andrews Creek near Maynard, Wash.

Location.—Lat. 47°56'35", long. 122°53'00", in SW ¼ sec. 1, T. 28 N., R. 2 W., on left bank 250 ft. upstream from mouth and 3 ¼ miles south of Maynard.

Drainage area.—10.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 175 ft. (from topographic map).

Extremes.—May to September 1952: Maximum discharge, 6.0 cfs July 2 (gage height, 1.34 ft.); no flow Aug. 26 to Sept. 30.

Remarks.—No known diversion above station. Flow regulated by natural flow from Crocker Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....									2.22	1.91	0.155	0	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....									1.2	0.71	0	0	0

CHIMACUM CREEK BASIN

Chimacum Creek near Chimacum, Wash.

Location.—Lat. 47°58'25", long. 122°46'35", in SW ¼ sec. 26, T. 29 N., R. 1 W. on right bank 100 ft. downstream from culvert, 3 ¼ miles upstream from mouth of East Fork, and 3 miles south of Chimacum.

Drainage area.—12.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 140 ft. (from topographic map).

Extremes.—1952-53: Maximum discharge, 102 cfs Jan. 9, 1953 (gage height, 4.07 ft.); minimum, 0.2 cfs Aug. 2, 1953 (gage height, 1.11 ft.).

Remarks.—Some regulation and diversions during summer months for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....									3.16	2.69	2.24	2.69	.....
1953....	3.25	6.10	22.8	36.3	13.4	13.5	9.45	7.64	11.7	4.54	3.73	3.17	11.2

CHIMACUM CREEK BASIN

Chimacum Creek near Chimacum, Wash.—Continued . .

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952													
1953	2.7	3.4	7.5	17.5	8.5*	7.1	7.1	5.1	2.4	2.0	1.7	2.2	2.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary Maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1952													
1953	102	Jan. 9, 1953	2.3	11.2	0.889	12.12	8,130						

LITTLE QUILCENE RIVER BASIN

Little Quilcene River near Quilcene, Wash.

Location.—Lat. 47°50'15", long. 122°53'15", in NE¼ sec. 14, T. 27 N., R. 2 W., on left bank 60 ft. downstream from bridge on U. S. Highway 101, 1¼ miles northwest of Quilcene, and 1½ miles upstream from mouth.

Drainage area.—19.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 90 ft. (from topographic map). Aug. 25, 1926, to Oct. 4, 1927, staff gage at site 120 ft. upstream at different datum.

Extremes.—1926-27, 1951-53: Maximum discharge, 565 cfs Apr. 30, 1952 (gage height, 4.10 ft.), from rating curve extended above 300 cfs; minimum observed, 4.1 cfs Sept. 1, 1926 (gage height, 0.86 ft., site and datum then in use).

Remarks.—Possibly 1 cfs diverted above station during most of each year for irrigation and domestic use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926													7.48
1927	27.7	41.2	74.8	90.4	76.2	60.0	45.2*	55.4*	39.8	20.2	13.0	17.5	46.7*
1951										13.4	9.46	7.25	
1952	17.0	40.4	83.3	43.0	89.7	51.8	18.3	65.7	38.0	29.8	13.7	9.42	44.0
1953	7.43	13.5	66.5	164	62.6	38.3	47.9	56.5	85.6	40.0	26.9	19.4	52.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926													4.1
1927	5.7	9.8	31	47	43	45	37*	46*	24	13	10	11	5.7
1951										11.5	7.2	5.9	5.9
1952	8.6	0.0	24	23	36	33	52	36	28	17.5	19	8.2	8.2
1953	7.1	7.4	13	94	36	29	34	41	49	24	16.5	14.5	7.1

* Estimated.

LITTLE QUILCENE RIVER BASIN

Little Quilcene River near Quilcene, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1926							
1927	271	Jan. 2, 1927	5.7	46.7	33,500		
1951			5.9				
1952	565	April 30, 1952	8.2	44.9	32,560	42.1	30,580
1953	524	Jan. 9, 1953	7.1	52.4	37,910		

BIG QUILCENE RIVER BASIN

Big Quilcene River at Quilcene, Wash.

Location.—Lat. 47°49'10", long. 122°52'30", in NW ¼ sec. 24, T. 27 N., R. 2 W., on right bank, a quarter of a mile south of Quilcene, and half a mile upstream from mouth.

Drainage area.—68.7 sq. mi.; 66.4 sq. mi. at former location.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Aug. 24, 1926, to Sept. 30, 1927, staff gage at highway bridge 2 miles upstream at different datum.

Extremes.—1926-27, 1951: Maximum discharge, 1,620 cfs Dec. 2, 1926 (gage height, 4.10 ft., from graph based on gage readings, site and datum then in use), from rating curve extended above 700 cfs; minimum, 17 cfs Sept. 27, 1951 (gage height, 1.05 ft.).

Remarks.—A maximum of 26.2 cfs can be diverted at Port Townsend Dam for municipal water supply of that city. Possible slight regulation by fish hatchery above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926												34.3	214
1927	182	260	301	356	234	167	101	262	280	156	91.2	68.3	
1951									152*	93.1	42.3	23.1	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926												26	33
1927	33	64	117	149	120	129	100	198	201	124	66	58	
1951									115*	59	30	18	18

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1926													
1927	1,620	Dec. 2, 1926	33	214	3.22	43.69	155,000						
1951			18										

* Estimated.

BIG QUILCENE RIVER BASIN

Big Quilcene River at Quilcene, Wash.—Continued

DOSEWALLIPS RIVER BASIN

Dosewallips River near Brinnon, Wash.

Location.—Lat. 47°43'35", long. 123°00'30", in SW ¼ sec. 24, T. 26 N., R. 3 W., on left bank half a mile west of Corrighenda ranger station, 5½ miles northwest of Brinnon, and 7½ miles upstream from mouth.

Drainage area.—93.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 295 ft. (from river-profile map).

Average discharge.—19 years (1930-49), 445 cfs.

Extremes.—1930-49, 1951: Maximum discharge, 10,900 cfs Nov. 5, 1934 (gage height, 9.57 ft.), from rating curve extended above 4,500 cfs; minimum, 65 cfs Dec. 4, 1936 (gage height, 1.71 ft.).

Flood of November 1949 reached a stage of 9.92 ft., from floodmarks (discharge 13,200 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	167	159	171	682	424	359	401	676	664	388	162	200	372
1932...	172	395	426	371	558	520	521	732	981	535	278	154	469
1933...	161	630	683*	354	168	280	369	632	1,190	1,080	482	315	504*
1934...	385	479	1,203	811	450	563	648	637	467	316	189	132	529
1935...	409	1,080	543	1,091	692	422	326	625	760	519	265	248	581
1936...	173	149	298	401	205	279	468	899	943	424	214	154	394
1937...	107	79.4	264	106	111	340	406	808	1,272	692	265	165	386
1938...	258	762	733	496	293	412	551	935	1,116	602	235	159	547
1939...	244	251	409	557	246	278	429	603	546	397	193	127	801
1940...	181	244	1,063	626	611	679	489	827	607	325	187	154	605
1941...	523	972	618	552	564	413	482	594	565	355	191	208	453
1942...	271	519	858	328	326	185	360	564	689	445	208	132	405
1943...	122	340	397	293	342	280	677	551	685	528	235	145	382
1944...	243	228	369	373	243	224	262	477	508	251	147	136	289
1945...	161	541	412	522	629	334	293	863	750	477	223	160	447
1946...	181	331	562	434	291	296	451	1,078	1,039	332	392	204	513
1947...	164	239	570	323	506	381	423	703	587	350	184	132	403
1948...	545	353	483	400	294	218	306	903	1,273	593	292	259	494
1949...	306	370	332	167	332	426	477	1,008	837	531	261	205	440
1950...	174												
1951									889	524	233	172	

* Estimated.

DOSEWALLIPS RIVER BASIN

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Dosewallips River near Brinnon, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	91	112	120	140	250*	268	250	468	422	.....	150	130	91
1932...	106	185	172	200	140	383	402	514	585	337	195*	118	106
1933...	107	222	.....	177	128	206	222	432	734	656	275	203	107
1934...	150	224	219	504	306	377	417	425	317	221	143	106	106
1935...	101	515	391	233	433	305	236	441	535	349	206	161	101
1936...	118	112	150	214	139	175	150	620	585	282	164	114	112
1937...	78	70	67	84	81	207	232	323	936	357	174	120	67
1938...	126	194	351	315	214	251	235	505	624	335	173	130	126
1939...	104	157	195	262	179	142	330	411	447	282	144	102	102
1940...	94	97	429	286	337	390	381	582	433	231	160	126	94
1941...	115	237	299	292	292	303	355	247	441	225	150	139	115
1942...	135	147	332	241	190	160	250	292	482	266	146	108	108
1943...	80	122	222	199	219	166	450	343	501	347	177	112	80
1944...	117	163	166	168	149	142	159	335	374	178	123	109	109
1945...	86	261	224	210	252	218	201	584	534	274	167	125	86
1946...	97	157	227	281	188	224	213	467	770	574	288	140	97
1947...	104	97	245	177	305	270	260	457	383	235	134	101	97
1948...	115	214	184	251	176	149	186	254	900*	408	217	173	115
1949...	190	190	207	127	112	264	248	453	467	367	199	136	112
1950...	114	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1951.....	.....	.....	.....	.....	.....	.....	.....	.....	615	327	162	106*	106*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1931.....	4,860	Jan. 23, 1931	91	372	3.98	53.95	269,000	411	69.62	297,000
1932.....	4,790	Feb. 26, 1932	106	469	5.02	65.30	341,000	434	70.44	351,000
1933.....	4,050	Nov. 13, 1932	107	504	5.39	73.17	365,000	581	84.23	420,000
1934.....	5,980	Dec. 21, 1933	106	529	5.66	76.78	382,000	524	76.13	379,000
1935.....	10,900	Nov. 5, 1934	101	581	6.21	84.29	420,300	463	67.23	335,200
1936.....	2,400	June 16, 1936	112	384	4.11	55.94	278,900	370	53.88	288,700
1937.....	1,980	Dec. 22, 1936	67	386	4.13	56.01	279,300	495	71.86	358,300
1938.....	3,870	Dec. 28, 1937	126	547	5.85	74.44	366,200	476	69.13	344,800
1939.....	4,220	Jan. 1, 1939	102	361	3.80	52.38	261,200	407	59.02	294,300
1940.....	4,310	Dec. 8, 1939	94	505	5.40	73.51	366,500	510	74.31	370,600
1941.....	3,400	Oct. 20, 1940	115	453	4.84	65.70	327,600	463	67.20	335,100
1942.....	6,370	Dec. 2, 1941	105	405	4.33	58.82	293,300	339	49.26	245,600
1943.....	1,580	April 2, 1943	80	382	4.09	55.51	276,800	381	55.31	275,800
1944.....	3,410	Dec. 3, 1943	109	289	3.09	42.01	209,500	311	45.27	225,700
1945.....	4,950	Feb. 7, 1945	86	447	4.78	64.92	323,800	448	65.11	324,700
1946.....	1,780	June 14, 1946	97	513	5.49	74.54	371,700	501	72.76	362,800
1947.....	3,650	Feb. 12, 1947	97	403	4.31	58.45	291,400	437	63.42	316,200
1948.....	5,740	Oct. 18, 1947	115	494	5.28	71.88	358,400	462	67.27	335,400
1949.....	1,830	May 12, 1949	112	440	4.71	63.85	318,400	.....	.....	.....
1950.....	13,200	Nov. 26, 1949	.....	.....	.....	.....	.....	.....	.....	.....
1951.....	.....	.....	106	.....	.....	.....	.....	.....	.....	.....

* Estimated.

DOSEWALLIPS RIVER BASIN

Dosewallips River at Brinnon, Wash.

Location.—Lat. 47°41'30", long. 122°54'10", in NW¼ sec. 2, T. 25 N., R. 2 W., on left bank at old highway bridge half a mile upstream from mouth and 0.9 mile north of Brinnon.

Drainage area.—116 sq. mi.

Gage.—Staff gage. Altitude of gage is 17 ft. (from river-profile map). Oct. 30, 1910, to Oct. 31, 1911, staff gage at different datum.

Extremes.—1910-11, 1924-25, 1928-30: Maximum gage height observed, 7.7 ft. Nov. 20, 1910 (discharge not determined); minimum observed, 19 cfs. Aug. 24, 1925 (storage behind splash dam).

Remarks.—No diversion. Slight regulation prior to 1928 by splash dam, used for logging operations.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...		802	779	286	208	333	390	897	946	771	394	243	.....
1912...	192												.....
1924...											182	195	.....
1925...	729	924	636	431	796	277	609	1,080	812	564	264	148	610
1926...	116	218	662										.....
1928...													.....
1929...	177	412	391	226	84.4	215	343	653	748	502	177	126	.....
1930...	107	64.6	258	82.9	629	339	615	495	521	346	174	138	311

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...		191	344	202	128	128	280	516	671	590	270	144	.....
1912...	116												.....
1924...											135	88	.....
1925...		457	330	128	318	183	183	366	670	345	157	113	113
1926...	100	113	226										.....
1928...													.....
1929...	94	109	161	104	73	86	161	400	535	845	124	88	.....
1930...	68	52	50	40	198	181	460	400	430	220	161	75	73
											129	64	40

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1911													
1912													
1924													
1925		3,060	Oct. 20, 1924	113	610	5.26	71.44	442,000	497	58.21		360,000	
1926													
1928													
1929		2,200	Nov. 12, 1928	78	343	2.00	40.18	248,000	297	34.77		215,000	
1930		2,350	Feb. 20, 1930	40	311	2.63	56.43	225,000					

DUCKABUSH RIVER BASIN

Duckabush River near Brinnon, Wash.

Location.—Lat. 47°41'00", long. 123°00'40", in SW ¼ sec. 1, T. 25 N., R. 3 W., on left bank, 4½ miles upstream from mouth, and 5 miles west of Brinnon.

Drainage area.—66.5 sq. mi.

Supplemental records available.—August to November 1910, gage heights and discharge measurements only.

Gage.—Water-stage recorder. Datum of gage is 241.49 ft. above mean sea level, datum of 1929. Aug. 19, 1910, to Dec. 31, 1911, staff gage at different datum and June 24, to Aug. 9, 1938, at present datum.

Average discharge.—15 years (1938-53), 387 cfs.

Extremes.—1910-11, 1938-53: Maximum discharge, 8,960 cfs Nov. 26, 1949 (gage height, 10.06 ft.), from rating curve extended above 1,800 cfs on basis of slope-area determination of peak flow; minimum, 45 cfs Oct. 26, 28, 29, 1942; minimum gage height, 1.32 ft. Sept. 30, 1939.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911				216	118	322	337	851*	833	470	177	177	
1912	149*	556	519										
1938										343	113	68.3	
1939	258	301	450	656	220	254	318	411	370	236	96.9	63.3	304
1940	59.0	217	1,268	811	588	547	402	564	368	154	82.2	70.6	432
1941	513	354	672	569	539	357	374	507	380	189	107	226	400
1942	254	617	951	335	334	162	237	430	466	272	98.8	57.6	357
1943	71.0	413	382	256	334	277	656	396	463	308	115	68.7	311
1944	321	248	375	452	246	198	232	354	358	145	75.1	73.0	257
1945	115	704	342	518	646*	300*	251	117	499	301	120	119	384*
1946	129	474	690	459	326	300	457	310	777	586	240	118	448
1947	136	282	650	292	378	297	290	403	249	180	95.8	77.3	324
1948	662	524	521	370	340*	223	325	796	861	864	169	208	431*
1949	275	409	302	129	375	495	465	728	520	323	156	132	353
1950	132	822	596	351	547	482	398	569	903	602	267	116	480
1951	477	631	1,059	470*	698*	239							
1952	428	479	349	214	434	240	560	772	626	484	206	96.8	407
1953	65.8	155	477	1,180	486	282	408	669	584	598	260	183	448

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911				194	108	100			420	290	135		
1912			169										
1938										171*	77	56	
1939	46	122	149	234	122	96	244	201	206	153	76	60	46
1940	51	70	376	210	270	318	312	386	224	112	66	55	51
1941	50	191	222	248	202	242	248	258	268	105	81	107	50
1942	97	112	253	188	134	126	227	259	301	145	72	47	47
1943	46	104	186	152	166	113	392	257	364	176	89	55	46
1944	54	133	137	150	112	110	148	254	240	97	58	51	51
1945	49	225	161	170	190*	150*	154	493	335	163	86	68	49
1946	53	122	184	236	146	201	194	409	578	376	161	83	53
1947	59	72	194	130	257	206	199	260	204	126	76	58	58
1948	58	170	134	160*	100*	130	170	222	570	242	128	91	58
1949	140	170	165	83	80	219	179	391	297	222	109	76	76
1950	80	161	204	148	177	250	240	243	611	362	158	85	80
1951	76	228	504*	290*	210*	135*	320	350	403	167	82	52	52
1952	145	193	160	110	170	160	232	421	435	313	130	74	74
1953	55	55	109	495	206	164	170	454	458	355	197	89	55

* Estimated.

DUCKABUSH RIVER BASIN

Duckabush River near Brinnon, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1911								395	80.64	286,000
1912										
1938										
1939	4,960	Jan. 1, 1939	46	304	4.57	62.05	220,100	352	71.84	254,800
1940	6,080	Dec. 15, 1939	51	432	6.50	88.37	313,400	431	83.21	312,900
1941	4,750	Oct. 23, 1940	50	400	6.02	51.68	289,700	421	85.93	304,800
1942	6,080	Dec. 2, 1941	47	357	5.37	72.89	258,500	277	56.47	200,300
1943	2,700	April 2, 1943	46	311	4.68	63.39	284,800	318	64.82	229,900
1944	3,780	①	51	257	3.80	62.56	186,400	274	56.08	193,800
1945	5,600*	Feb. 7, 1945	49	384	5.77	78.37	217,900	396	80.80	286,600
1946	2,530	Dec. 3, 1945	53	445	6.74	01.48	324,400	430	87.69	311,000
1947	5,370	Feb. 12, 1947	58	324	4.87	68.14	234,600	361	73.72	261,400
1948	5,970	②	58	431	6.48	88.16	312,700	386	78.93	280,000
1949	2,410	Mar. 19, 1949	76	353	5.31	72.10	255,700	401	81.79	290,100
1950	3,960	Nov. 26, 1949	80	460	7.22	97.97	347,500	533	108.77	385,800
1951	4,190	Feb. 9, 1951	52	471	7.08	96.18	341,100	394	80.49	285,400
1952	2,940	April 30, 1952	74	407	6.12	83.34	295,600	361	73.83	261,900
1953	3,240	Jan. 9, 1953	55	448	6.74	91.54	324,600			

① Oct. 24, Dec. 3, 1943.

② Oct. 18 or 19, 1947.

HAMMA HAMMA RIVER BASIN

Hamma Hamma River near Eldon, Wash.

Location.—Lat. 47°35'20", long. 123°07'00", in NW¼ sec. 7, T. 24 N., R. 3 W., on left bank, a quarter of a mile downstream from Watson Creek, 4½ miles northeast of Eldon, and 6 miles upstream from mouth.

Drainage area.—51.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 510 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 2,780 cfs Jan. 9, 1953 (gage height, 5.25 ft.); minimum, 42 cfs Oct. 21-23, Nov. 9, 1952 (gage height, 0.71 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										174	74.2	68.2	
1952	404	433	310	181	405	212	470	664	476	333	146	76.1	342
1953	47.5	122	440	1,068	438	242	325	537	415	360	162	114	357

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										102	58	43*	43
1952	162	178	147	60	168	139	226	398	372	212	98	56	56
1953	42	42	94	480	186	153	153	422	322	207	120	67	42

* Estimated.

HAMMA HAMMA RIVER BASIN

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Hamma Hamma River near Eldon, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1851.....			43							
1952.....	1,940	Nov. 30, 1951	56	342	6.67	90.77	248,300	298	79.01	216,200
1953.....	2,780	Jan. 9, 1953	42	357	6.96	94.44	258,400			

Hamma Hamma River near Hoodsport, Wash.

Location.—Lat. 47°33'00", long. 123° 03'15", in NW ¼ sec. 27, T. 24 N., R. 3 W., on left bank, 900 ft. upstream from old bridge site, half a mile upstream from U. S. Highway 101, three-quarters of a mile upstream from mouth, and 11 miles northeast of Hoodsport.

Drainage area.—84 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is approximately mean sea level (from river-profile map).

Extremes.—1926-30: Maximum discharge, 5,770 cfs Dec. 2, 1926 (gage height, 8.3 ft., from graph based on gage readings); minimum observed, 23 cfs Sept. 28, 1929 (gage height, 1.25 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926.....							285	330	172	81.7	45.8	39.9	.....
1927.....	871	1,290	1,050	1,050	765	448	378	669	791	401	164	175	670
1928.....	800	880	460	1,060	484	646	523	639	346	162	75.6	49.3	469
1929.....	195	326	716	297	95.5	370	505	568	561	241	83.2	46.0	376
1930.....	46.1	30.6	681	179	1,310	348	670	346	287	116	64.6	35.8	332

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926.....						264	212	230	121	54	43	31	.....
1927.....	126	244	276	356	268	280	255	510	595	308	95	84	84
1928.....	148	318	226	211	179	157	347	520	248	112	53	38	36
1929.....	35	91	310	118	74	108	185	334	310	135	38	23	23
1930.....	35	26	27	55	178	159	413	280	169	85	44	37	26

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1926.....										
1927.....	5,770	Dec. 2, 1926	84	670	7.98	108.34	455,000	538	86.91	389,000
1928.....	3,840	Jan. 3, 1928	36	469	5.58	75.99	340,000	477	77.31	346,000
1929.....	3,750	Nov. 12, 1928	23	376	4.48	60.79	272,000	295	47.71	214,000
1930.....	3,420	Feb. 20, 1930	26	332	3.95	53.66	240,000			

EAGLE CREEK BASIN

Eagle Creek near Lilliwaup, Wash.

Location.—Lat. 47°29'10", long. 123°04'40", in NW¼ sec. 16, T. 23 N., R. 3 W., on left bank, 750 ft. upstream from mouth, and 2½ miles northeast of Lilliwaup.

Drainage area.—7.06 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 10 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 25 cfs Sept. 29 (gage height, 1.83 ft.), from rating curve extended above 11 cfs; minimum, 6.9 cfs Sept. 20 (gage height, 1.42 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									10.5	8.60	8.08	8.19	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									9.1	8.0	7.6	7.3	7.3

FINCH CREEK BASIN

Finch Creek at Hoodspert, Wash.

Location.—Lat. 47°24'20", long. 123°08'50", in SE¼ sec. 11, T. 22 N., R. 4 W., on right bank in Hoodspert, a quarter of a mile upstream from mouth.

Drainage area.—3.45 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 27 cfs Sept. 29; maximum gage height, 1.40 ft. June 13-14; minimum discharge, 11 cfs Aug. 31.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									17.2	14.4	12.2	12.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									15.5	13	11.5	11.5	11.5

SKOKOMISH RIVER BASIN

North Fork Skokomish River below Staircase Rapids, near Hoodspport, Wash.

Location.—Lat. 47°30'55", long. 123°19'45", in NW¼ sec. 4, T. 23 N., R. 5 W., on left bank, 1¼ miles upstream from Lake Cushman, 8 miles northwest of Cushman Dam No. 1, and 11½ miles northwest of Hoodspport.

Drainage area.—58.1 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 762.26 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 22, 1934, water-stage recorder, and Nov. 1, 1934, to Nov. 10, 1941, staff gages on right bank at same datum.

Average discharge.—29 years (1924-53), 471 cfs.

Extremes.—1924-53: Maximum discharge, 27,000 cfs Nov. 5, 1934 (gage height, 14.4 ft., from high-water mark), from rating curve extended above 1,500 cfs on basis of slope-area determination at gage height 12.2 ft.; minimum recorded, 16 cfs Sept. 23, 1930 (gage height, 1.12 ft.).

Remarks: No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924											63.6	122	.....
1925	1,020*	916	598	689	1,030	337	565	770	541	239	110	69.2	573
1926	47.5	396	1,000	547	743	372	352	402	211	88.5	54.9	50.2	356
1927	782	930	795	704	508	310	344	606	848	404*	163	210	550*
1928	449	792	354	968	470	642	412	688	403	172	69.1	64.8	437
1929	263	544	363	194	111	306	294	601	598	258	112	58.4	310
1930	75.5	48.9	396	150	686	331	585	333	242*	135	64.2	60.1	256*
1931	154	240	255	922	475	583	611	539	518	216	70.8	113	391
1932	207	587*	585	420	566	661	682	766	835	427	135	85.3	500
1933	165	926	635	480	186	366	433	699	964	617	308	360	624
1934	494	464	1,778	1,204	571	661	419	438	184	188	109	86.1	552
1935	673*	1,320	665	1,235	744	431	338	610	604	334	140	197	606*
1936	181	213	583	688	348	406	473	348	771	334	115	82.2	421
1937	44.5	40.0	603	124	128	507	637	923	1,091	438	139	95.9	399
1938	396	1,169	1,052	589	267	488	602	727	610	266	94.8	60.6	526
1939	323	467	706	851	283	335	438	459	333	202	95.2	60.1	384
1940	111	335	1,604	1,007	780	707	301	626	262	110	65.0	61.6	516
1941	785	551	857	710	679	495	448	547	264	140	113	275	490
1942	369	694	1,166	423	413	228	346	428	506	252	97.7	56.1	415
1943	95.0	582	552	338	381	429	801	475	405	207	108	65.8	387
1944	321	299	517	646	351	260	318	412	325	126	63.0	84.0	310
1945	163	878	448	702	656	325	326	359	304	269	110	145	471
1946	182	628	851	634	460	437	641	1,017	381	619	223	120	558
1947	204	460	955	443	1,153	408	410	400	314	190	93.1	84.0	422
1948	598	455	755	493	305	272	438	1,000	974	349	160	280	538
1949	364	514	366	153	386	633	634	1,036	639	351	164	148	449
1950	166	1,215	529	507	629	620	537	769	1,099	661	286	123	626
1951	728	914	1,464	617	1,087	303	642	663	534	234	100	134	615
1952	599	614	465	290	602	253	639	939	719	497	229	115	496
1953	68.7	201	578	1,915	719	332	472	812	647	539	230	198	564

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924											43		
1925	203	380	224*	237	360	237	237	452	409	171	71	49	49
1926	35	35	446	300	364	266	253	283	134	58	40	28	28
1927	103	216	280	294	210	233	213	425	620	256	105	93	93
1928	154	291	187	197	257	242	277	418	262	69	50	38	38
1929	107	105	170	120	91	98	156	319	352	180	78	47	47
1930	45	35	31		292	160	359	257		85	44	17	17

* Estimated.

SKOKOMISH RIVER BASIN

North Fork Skokomish River Staircase Rapids near Hoodsport, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	31	105	135	175	235	320	364	400	330	119	48	46	31
1932...	60	54	199	216	119	364	479	538	543	240	110	60	54
1933...	42	362	267	183	112	212	258	475	674	461	161	138	42
1934...	157	167	162	636	233	251	274	248	134	99	73	58	58
1935...	53	528	321	177	342	248	202	450	405	202	106	75	53
1936...	84	90	182	321	136	187	161	615	405	174	79	54	54
1937...	37*	33	33	79	68	259	314	389	745	211	91	49	33
1938...	93	365	390	334	169	277	242	468	468	189	68	50	50
1939...	43	198	238	340	174	139	285	321	253	137	72	40	40
1940...	40	86	495	276	345	387	367	348	176	88	55	46	40
1941...	42	262	295	330	262	330	312	312	198	96	63	128	42
1942...	118	156	359	261	171	169	253	267	355	144	68	45	45
1943...	43	159	280	186	206	161	500	310	367	159	78	52	43
1944...	50	152	176	195	150	141	206	301	201	80	48	42	42
1945...	53	326	198	201	229	186	193	660	218	157	78	74	53
1946...	53	171	209	332	166	205	240	576	587	348	150	79	53
1947...	58	104	276	194	365	293	280	300	186	132	72	58	58
1948...	64	239	191	245	159	161	197	300	690	233	121	96	64
1949...	176	219	200	106	96	332	311	646	351	245	117	76	76
1950...	85	110	305	200	214	293	182	388	788	356	168	89	85
1951...	82	259	620	339	326	200	461	411	425	138	77	53	53
1952...	168	220	197	116	239	150	255	544	534	305	120	82	82
1953...	47	50	114	660	270	217	200	539	468	309	158	76	47

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acres-feet		Inches	Acres-feet	
1924											
1925	4,400	Feb. 2, 1925	49	573	9.68	133.94	415,000	482	112.58	349,000	
1926	4,250	Dec. 11, 1925	26	356	6.13	83.13	256,000	445	103.89	322,000	
1927	5,350	Dec. 1, 1926	93	550	9.47	123.57	398,000	473	110.56	343,000	
1928	4,100	Jan. 3, 12, 1928	38	457	7.87	106.96	331,000	422	98.29	306,000	
1929	2,540	Nov. 9, 1928	47	310	5.84	72.43	224,000	256	59.76	185,000	
1930	4,050	Dec. 14, 1929	17	256	4.41	59.75	185,000	266	62.17	193,000	
1931	8,830	Jan. 22, 1931	31	391	6.73	91.34	283,000	452	105.61	327,000	
1932	5,950	Dec. 19, 1931	54	500	8.61	117.06	363,000	519	121.56	377,000	
1933	4,340	Nov. 12, 1932	42	524	9.02	122.31	379,000	619	144.82	448,000	
1934	10,900	Dec. 21, 1933	58	652	9.50	129.07	400,000	543	126.96	393,400	
1935	127,000	Nov. 5, 1934	53	608	10.4	141.67	439,000	467	109.06	337,900	
1936	2,410	June 17, 1936	54	421	7.25	98.65	305,700	397	93.01	268,200	
1937	5,150	Dec. 22, 1936	33	399	6.87	93.24	288,900	560	130.81	406,800	
1938	10,200	Oct. 28, 1937	50	526	9.05	122.93	380,900	433	101.12	313,800	
1939	8,580	Jan. 1, 1939	40	384	6.61	89.63	277,800	431	100.71	312,100	
1940			40	516	8.88	120.91	374,700	528	123.61	383,000	
1941	6,630	Jan. 17, 1941	42	490	8.43	114.44	354,600	493	115.07	356,600	
1942	9,700	Dec. 2, 1941	45	415	7.14	97.07	300,800	331	77.29	239,500	
1943	4,400	April 2, 1943	43	387	6.66	90.42	280,200	380	88.79	275,100	
1944	5,540	Dec. 8, 1943	42	310	5.34	72.74	225,400	380	79.36	245,900	
1945	12,900	Feb. 7, 1945	53	471	8.11	109.99	340,800	496	113.54	351,800	
1946	3,140	Nov. 14, 1945	53	558	9.60	130.29	463,700	555	129.59	401,500	
1947	6,500	Feb. 12, 13, 1947	53	422	7.26	98.48	305,200	463	103.18	335,200	
1948	10,700	Oct. 18, 1947	64	538	9.26	125.96	390,300	404	108.78	337,100	
1949	2,530	Dec. 2, 1949	76	449	7.73	104.95	325,200	538	125.63	359,300	
1950	24,200	Nov. 26, 1949	85	626	10.8	146.30	453,400	695	162.28	502,800	
1951	7,030	Feb. 10, 1951	53	615	10.59	143.67	445,200	495	115.66	358,100	
1952	3,810	Nov. 30, 1951	82	496	8.54	116.18	360,000	427	99.92	309,600	
1953	6,730	Jan. 9, 1953	47	564	9.71	131.77	408,300				

* May include storage water released from log jam or slide. * Estimated.

SKOKOMISH RIVER BASIN

Lake Cushman reservoir near Hoodspport, Wash.

Location.—Lat. 47°25'05", long. 123°13'20", in SW ¼ sec. 5, T. 22 N.; R. 4 W., on up-stream face of Cushman Dam No. 1, 4 miles northwest of Hoodspport.

Drainage area.—93.7 sq. mi.

Gage.—Staff gage. Datum of gage is 2.99 ft. below mean sea level (levels by city of Tacoma).

Since May 28, 1931, auxiliary staff gage at spillway.

Extremes.—1925-53: Maximum contents observed, 459,200 acre-ft. Dec. 22, 1933 (gage height, 739.38 ft.); minimum observed (since reservoir first filled), 164,560 acre-ft. Dec. 13, 1929 (gage height, 650.8 ft.).

Remarks.—Reservoir is formed by concrete arch dam; dam was completed and storage began Oct. 21, 1925. Capacity, 281,300 acre-ft. between gage height 649.0 ft. (lower limit of operation) and 735.0 ft. (spillway crest). Water used by city of Tacoma for power development.

Contents in Acre Feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928...	2,000	36,660	126,940	180,220	247,500	277,260	302,700	329,450	338,550	338,550	333,300	292,320	.....
1927...	269,670	277,420	252,340	247,100	277,670	296,980	320,330	370,550	429,800	434,850	420,060	422,320	.....
1928...	439,850	410,350	370,340	390,970	380,530	403,810	417,800	423,920	422,040	423,120	412,630	382,560	.....
1929...	368,320	368,750	351,880	288,240	218,860	216,110	223,240	266,100	312,780	321,140	300,220	264,520	.....
1930...	428,660	177,010	207,130	201,320	266,320	298,290	353,900	351,050	351,550	394,650	395,870	373,000	.....
1931...	339,250	319,100	297,140	381,340	417,440	446,410	446,550	445,020	446,120	441,330	432,920	420,880	.....
1932...	423,420	411,110	428,800	413,450	437,470	420,560	422,960	438,700	437,310	443,500	441,370	433,210	.....
1933...	428,880	426,000	414,850	417,920	414,030	413,440	425,440	442,190	445,670	442,270	430,800	433,570	.....
1934...	435,100	416,100	451,680	441,520	437,270	435,790	442,270	441,370	439,850	440,590	431,360	417,800	.....
1935...	413,000	422,560	412,320	446,320	430,000	418,800	421,640	434,190	440,300	439,980	429,360	423,640	.....
1936...	404,800	392,220	421,920	421,120	424,560	407,950	423,320	444,980	444,940	437,310	421,520	395,980	.....
1937...	363,130	323,320	343,660	327,950	317,270	349,260	396,280	445,060	445,920	435,180	412,780	358,670	.....
1938...	389,700	442,160	446,990	422,000	424,400	421,890	431,600	436,410	440,590	431,400	411,570	382,040	.....
1939...	370,150	374,830	392,290	421,960	416,960	413,910	415,470	421,600	416,020	397,340	366,260	326,890	.....
1940...	291,350	286,260	421,200	441,040	441,980	440,880	445,590	449,830	438,740	424,560	400,050	373,680	.....
1941...	393,700	398,940	432,720	434,360	426,160	418,440	415,590	440,380	439,400	414,770	382,530	372,170	.....
1942...	362,510	330,640	430,360	414,190	401,760	369,110	386,150	410,870	436,650	438,500	437,890	433,170	.....
1943...	406,430	413,020	400,500	386,740	380,270	397,960	436,610	444,480	443,750	451,720	443,340	423,600	.....
1944...	413,910	370,940	366,120	393,160	357,340	358,700	382,060	406,540	424,440	428,200	428,320	420,480	.....
1945...	396,590	400,920	368,460	350,160	396,890	370,510	373,430	434,250	441,780	448,750	444,200	420,520	.....
1946...	399,210	414,260	415,400	401,720	336,780	375,840	402,250	438,540	449,540	451,800	439,110	421,120	.....
1947...	401,830	411,920	409,270	376,850	404,150	393,180	411,300	426,880	445,060	451,050	450,460	433,330	.....
1948...	436,160	414,690	419,160	392,400	385,040	370,300	336,970	440,590	448,180	451,720	449,370	444,690	.....
1949...	423,280	420,320	365,450	362,920	378,610	405,570	433,050	432,120	444,200	452,140	440,250	439,690	.....
1950...	417,840	448,830	431,200	409,000	429,520	402,440	415,440	436,900	445,100	451,970	446,720	436,200	.....
1951...	435,460	438,380	437,970	411,340	419,280	377,820	388,520	416,880	446,260	452,140	447,400	440,920	.....
1952...	420,720	413,100	362,520	355,250	337,060	362,880	408,730	440,260	449,080	451,430	448,730	427,160	.....
1953...	397,960	372,060	377,210	447,720	428,920	413,800	431,960	445,870	449,830	452,270	444,530	434,480	.....

SKOKOMISH RIVER BASIN

North Fork Skokomish River near Hoodspport, Wash.

Location.—Lat. 47°25'20", long. 123°13'10", in SW ¼ sec. 5, T. 22 N., R. 4 W., at city of Tacoma Cushman Dam No. 1, 4 miles west of Hoodspport.

Drainage area.—93.7 sq. mi. At site October 1923 to November 1930, 94.8 sq. mi.

Supplemental records available.—August 1910 to September 1911, fragmentary record of gage heights and discharge.

Gage.—Staff gage. Datum of gage is 2.99 ft. below mean sea level (levels by city of Tacoma). Prior to Sept. 23, 1911, staff gage, Feb. 13, 1913, to Sept. 1, 1918, water-stage recorder at datum 486.4 ft. above mean sea level (levels by city of Tacoma) and Sept. 2, 1918, to Sept. 30, 1923, at datum 5.00 ft. higher. Oct. 1, 1923, to Dec. 2, 1930, water-stage recorder 1 mile downstream at different datum.

Average discharge.—42 years (1911-53), 713 cfs (unadjusted).

Extremes.—1913-30: Maximum discharge, 14,000 cfs Jan. 6, 1914 (gage height, 23.5 ft., from graph based on gage readings); no flow Oct. 22, 1925, when gates in dam were closed.

1931-53: Maximum not determined; no flow most years.

Remarks.—Small diversion from minor tributary for domestic use above station. Flow regulated in Lake Cushman Reservoir near Hoodspport since October 1925. Monthly discharge determined from combined flow through turbines and spillway since October 1930.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	229*	1,260*	742*	1,290*	1,230*	331*	351*	617*	555*	353*	261*	293*	625*
1913...	430*	1,400*	950*	800*	666	546	704	1,000	1,200	855	383	561	793*
1914...	511	1,620	925	2,410	727	1,010	1,190	973	809	506	215	464	948
1915...	1,270	1,600	666	867	848	889	1,350	806	715	279	166	128	771
1916...	423	334	1,660	545	1,270	1,330	916	1,080	1,300	1,000	517	238	934
1917...	195	634	536	491	564	394	751	1,010	1,100	571	333	223	596
1918...	168	500	2,290	1,530	1,110	1,010	806	577	447	221	158	104	744
1919...	475	906	1,590	1,490	1,110	684	1,090	975	857	683	298	168	864
1920...	133	512	1,310	1,060	569	566	338	365	661	263	163	521	587
1921...	1,640	1,290	1,290	1,210	1,120	805	610	961	1,310	741	378	467	984
1922...	1,850	1,500	1,610	380	397	339	490	973	1,080	405	210	220	813
1923...	488	398	1,300	1,840	649	499	690	632*	624	372	168	168	651*
1924...	268	410	1,220	1,080	2,270	521	312	439	287	167	115	426	623
1925...	1,490	1,570	929	992	1,700	613	786	910	691	410	161	138	870
1926...	72.2	10*	10*	10*	14.1*	54.9	80.0	100	128	127	209	824	137*
1927...	1,540	1,310*	1,630	1,380*	652	326	235	196	143	463	462	324	716*
1928...	436	1,750	1,240	1,190	834	751	562	837	524	215	203	618	768
1929...	651	922	1,040	1,420	1,450	624	526	96.4	48.3	218	511	730	681
1930...	721	978	265*	405	95.0	66.0	32.9	42.4	155	114	69.8	507	288*
1931...	823	782	362	298	233	518	622	661	650	334	276	443	568
1932...	511	1,160	948	1,060	524	1,290	1,020	688	935	376	223	292	752
1933...	332	1,520	1,130	878	460	823	689	824	1,090	919	536	501	803
1934...	710	968	2,141	1,949	837	1,010	458	611	242	256	298	356	822
1935...	828	2,201	1,255	1,651	1,464	948	500	583	654	395	337	444	934
1936...	560	645	558	1,227	491	901	305	680	803	469	403	563	645
1937...	633	753	530	618	649	381	362	419	1,298	637	516	580	620
1938...	582	1,127	1,699	1,360	594	974	728	838	636	436	452	596	839
1939...	716	623	718	1,031	681	623	589	535	534	557	650	781	673
1940...	836	660	401	1,242	1,424	1,188	647	755	169	373	487	569	763

* Estimated.

SKOKOMISH RIVER BASIN

95

North Fork Skokomish River near Hoodspout, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	812	758	789	1,135	1,217	841	572	321	340	548	607	574	707
1942...	716	785	1,057	816	919	934	217	159	194	268	200	137	541
1943...	586	830	1,124	770	796	413	619	430	501	140	161	508	571
1944...	060	1,168	873	654	1,216	428	118	112	76.2	89.7	92.2	263	478
1945...	643	1,306	1,184	876	1,162	1,155	440	253	429	143	135	570	688
1946...	584	862	1,420	1,306	1,131	944	542	568	805	617	431	452	804
1947...	606	633	1,551	1,259	1,336	724	255	207	89.3	113	105	365	601
1948...	1,353	963	1,141	1,292	815	713	442	556	965	323	225	431	774
1949...	643	1,009	1,078	770	615	654	404	1,200	489	257	262	277	661
1950...	572	1,279	1,778	1,209	877	1,573	588	542	1,033	585	428	311	903
1951...	1,167	1,402	2,268	1,498	1,596	1,166	633	340	100	160	134	315	900
1952...	1,266	1,154	1,498	751	790	578	159	639	634	456	305	485	730
1953...	573	750	993	1,859	1,373	783	325	810	590	555	367	448	786

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1912.....				628	6.70	91.25	456,000	674	97.85	489,000	
1913.....				793	8.46	114.88	574,000	816	118.26	591,000	
1914.....	14,000	Jan. 6, 1914	136	948	10.1	137.36	680,000	971	140.82	703,000	
1915.....	6,030	Oct. 19, 1914	100	771	8.23	111.76	559,000	733	107.01	535,000	
1916.....	8,030	Dec. 8, 1915	105	934	9.97	135.73	675,000	806	117.22	585,000	
1917.....	2,260	Nov. 4, 1916	124	596	6.36	86.30	431,000	727	105.36	527,000	
1918.....	9,580	Dec. 18, 1917	89	744	7.94	107.77	539,000	744	107.78	538,000	
1919.....	7,530	Dec. 4, 1918	92	864	9.22	125.19	626,000	804	116.41	582,000	
1920.....	6,380	Dec. 24, 1919	111	587	6.26	85.25	426,000	752	109.18	546,000	
1921.....	5,680	Feb. 11, 1921	176	934	10.5	112.57	713,000	1,070	154.92	774,000	
1922.....	12,100	Dec. 12, 1921	128	813	8.63	117.84	588,000	657	80.83	404,000	
1923.....	7,660	Dec. 27, 1922	105	651	6.95	94.26	471,000	626	90.48	453,000	
1924.....	12,400	Jan. 31, 1924	79	623	6.57	89.49	458,000	798	114.59	580,000	
1925.....	5,530	Feb. 2, 1925	121	870	9.18	124.56	629,000				

SKOKOMISH RIVER BASIN

North Fork Skokomish River near Hoodspert, Wash.—Continued

Summary—Continued

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Dis-charge	Date	Mini- mum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1926.....	2,250	Sept. 30, 1926	0	137	99,000	541	5.71	77.54	506	366,000	680	97.37
1927.....	3,190	Dec. 9, 1926	47	716	518,000	896	9.45	128.28	625	453,000	789	112.95
1928.....	3,640	Nov. 25, 1927	2	768	553,000	713	7.52	102.45	702	510,000	676	97.07
1929.....	2,379	Nov. 26, 1928	3	681	493,000	518	5.46	74.25	626	458,000	426	61.06
1930.....	2,130	Oct. 3, 10, 1929	2	288	208,000	438	4.62	62.68	331	240,000	455	65.23
1931.....				568	411,000	634	6.75	91.68	580	420,000	761	110.28
1932.....				752	546,000	769	8.21	111.71	782	566,000	783	110.79
1933.....				803	582,000	804	8.58	116.50	877	635,000	928	134.51
1934.....				832	602,600	810	8.64	117.37	867	627,700	813	117.73
1935.....				934	675,900	941	10.1	136.42	724	523,900	737	106.76
1936.....				645	468,300	607	6.48	89.18	658	477,400	557	80.88
1937.....				620	445,600	607	6.48	87.91	745	539,600	881	127.64
1938.....				839	607,100	832	8.88	120.55	726	525,500	680	94.20
1939.....				673	487,100	597	6.37	86.43	659	477,400	699	101.31
1940.....				753	546,700	818	8.73	118.76	791	574,400	807	117.25
1941.....				707	511,800	705	7.52	102.12	724	524,100	721	104.48
1942.....				541	391,500	626	6.68	90.69	639	390,500	498	72.17
1943.....				571	413,500	558	5.96	80.82	584	422,700	536	77.71
1944.....			0	476	345,400	471	5.03	68.49	512	371,800	515	74.86
1945.....			60	688	497,800	688	7.34	99.62	666	482,200	731	105.57
1946.....			106	804	581,800	805	8.59	116.55	793	577,700	789	114.37
1947.....			0	601	435,000	618	6.60	89.49	657	475,800	670	97.10
1948.....			0	774	562,200	790	8.43	114.76	730	529,600	697	101.24
1949.....			0	661	478,900	655	6.99	94.83	720	521,400	770	111.49
1950.....			0	903	658,800	898	9.58	130.14	1,005	727,900	1,015	147.02
1951.....			0	800	651,700	907	9.63	131.36	823	595,600	718	104.09
1952.....			0	730	529,800	711	7.59	103.26	595	432,000	615	89.39
1953.....			0	786	569,000	794	8.50	115.32				

Deer Meadow Creek near Hoodspert, Wash.

Location.—Lat. 47°25'00", long. 123°13'30", in NW¼ sec. 8, T. 22 N., R. 4 W., on left bank, a quarter of a mile upstream from mouth, and 4 miles west of Hoodspert.

Drainage area.—0.28 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 691.27 ft. (levels by city of Tacoma). Prior to Oct. 1, 1952, water-stage recorder at datum of 0.48 ft. higher.

Extremes.—1950-51, 1952-53: Maximum discharge, 60 cfs Feb. 9, 1951 (gage height, 2.48 ft., present datum); minimum, 0.2 cfs Oct. 8-11, 1952 (gage height, 0.39 ft). Discharge on Oct. 4, 1951 (when gage was destroyed by blasting beaver dam upstream) probably greater than that of Feb. 9, 1951.

Remarks.—No diversion or regulation above station.

SKOKOMISH RIVER BASIN

Deer Meadow Creek near Hoodspport, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950												0.73	
1951	3.40	6.84	9.02	8.15	9.99	3.77	2.48	1.75	1.19	0.91	0.81		
1953	.33	.49*	4.65	14.3	6.86*	3.74*	2.58	2.29	1.61	1.33	.97	.89	3.34*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950												0.6	
1951	0.7	3.1	6.3	5.0	3.9	2.7	1.5	1.3	1.0	0.8	0.7		
1953	.2	.3	.6	6.0	2.9	2.4*	1.3	1.6	1.4	.9	.9	.6	.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950													
1951	60	Feb. 9, 1951											
1953	26	Jan. 2, 1953	0.2	3.34	11.9	162.11	2,420						

Dow Creek near Hoodspport, Wash.

Location.—Lat. 47°24'40", long. 123°11'15", in E½ sec. 9, T. 22 N., R. 4 W., on right bank, 1 mile upstream from mouth, and 2¼ miles west of Hoodspport.

Drainage area.—1.67 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is about 600 ft. (from topographic map). Prior to Mar. 6, 1953, water-stage recorder on opposite bank at same datum.

Extremes.—1950-53: Maximum discharge, 543 cfs Feb. 9, 1951 (gage height, 2.72 ft.); minimum, 0.02 cfs Sept. 14, 15, 16, 20, 21, 1951; minimum gage height, 0.52 ft. Oct. 1, 2, 1951.

Remarks.—City of Tacoma diverts above station about one-third cubic foot per second for use of Cushman powerplant operators' village. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950												0.21	
1951	4.54	18.6	22.0	15.1	40.5	8.55	4.57	1.67	0.82	0.24	0.11	0.20	9.53
1952	7.75	13.2	15.4	13.7	22.6	10.6	5.89	2.84	1.04	.49	.30	.23	7.79
1953	.20	.47	15.6	50.5	15.6	8.47	4.69	3.70	1.96	.84	.47	.39	8.82

* Estimated.

SKOKOMISH RIVER BASIN

Dow Creek near Hoodspport, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....												0.1	
1951....	0.1	1.8	8.5	4.1	7.6	4.4	2.3	1.2	0.5	0.1	0.1	.1	0.1
1952....	.5	4.7	6.3	4.1	7.4	8.7	3.0	1.5	.7	.4	.2	.2	.2
1953....	.1	.2	.5	.21	5.2	3.7	2.9	2.6	1.1	.6	.4	.2	.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950.....													
1951.....	543	Feb. 9, 1951	0.1	9.53	5.71	77.45	6,900	8.80	71.52	6,370			
1952.....	145	Jan. 30, 1952	.2	7.79	4.66	63.47	5,650	6.12	49.89	4,440			
1953.....	157	Jan. 2, 1953	.1	8.82	5.28	71.71	6,380						

McTaggart Creek near Hoodspport, Wash.

Location.—Lat. 47°24'50", long. 123°14'25", in N½ sec. 7, T. 22 N., R. 4 W., on left bank, three-quarters of a mile upstream from mouth and 4¾ miles west of Hoodspport.

Drainage area.—1.30 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 770 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 170 cfs Feb. 9, 1951 (gage height, 4.04 ft.); no flow at times each year.

Remarks.—No known diversion or regulation above station. This stream is now diverted into Deer Meadow near Hoodspport.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....											0	0	
1951....	2.17	10.4	20.2	15.2	24.2	4.76	2.40	.81	.08	0	0	.04	6.58
1952....	2.29	5.49	9.41	5.97	15.3	4.94	3.87	1.85	.35	0	.02	0	4.08
1953....	0	.12	8.21	33.7	12.3	4.03	2.65	1.35	.79	.05	0		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....													
1951....	0	2.6	12.5	8.6	6.0	3.8	1.2	0.4	0	0	0	0	0
1952....	0	2.2	3.6	1.8	5.0	4.4	2.3	1.0	0	0	0	0	0
1953....	0	0	0	11.5	3.9	2.6	1.6	.9	.3	0	0	0	0

McTaggart Creek near Hoodspport, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1950.....			0							
1951.....	170	Feb. 9, 1951	0	6.58	5.06	68.72	4,760	5.27	55.06	3,820
1952.....	59	Jan. 30, 1952	0	4.08	3.14	42.71	2,060	3.34	35.02	2,430
1953.....	81	Jan. 2, 1953	0							

North Fork Skokomish River near Pottlatch, Wash.

Location.—Lat. 47°19'40", long. 123°14'30", in NE¼NW¼ sec. 7, T. 21 N., R. 4 W., on left bank, 1 mile upstream from mouth, 6 miles southwest of Pottlatch, and 7 miles downstream from Cushman Dam No. 2.

Drainage area.—117 sq. mi., includes 99 sq. mi. above Cushman Dam No. 2 which is normally noncontributing.

Gage.—Water-stage recorder. Datum of gage is 63.49 ft. above mean sea level (levels by city of Tacoma). Prior to May 10, 1950, water-stage recorder 200 ft. downstream at same datum.

Average discharge.—8 years (1944-49, 1950-53), 135 cfs (unadjusted).

Extremes.—1944-53: Maximum discharge, 4,800 cfs about Nov. 27, 1949 (gage height, 9.66 ft. from high-water mark), from rating curve extended above 2,400 cfs on basis of slope-area determination of peak flow; minimum recorder, 1.3 cfs Sept. 5, 14, 16, 1951 (gage height, 2.02 ft.).

Remarks.—Entire flow of river normally diverted at Cushman Dam No. 2, 7 miles upstream, to supply powerplant which discharges directly into sea (Hood Canal). Flow regulated by Lake Cushman Reservoir (see p. 93) and by pondage in Cushman Reservoir No. 2. Flow at station includes infrequent releases and spillage from dams above station. Part of McTaggart Creek diverted during year into Deer Meadow Creek, which empties into Reservoir No. 2 from which the flow may bypass this station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944.....							59.5	30.5*	20.6	9.22	7.55	4.52	.....
1945.....	5.37	90.7	80.5*	180*	222	191	66.1	55.6	24.3	12.3	7.97	9.08	78.4*
1946.....	10.3	154	217	190	169	150	145	251	320	215	14.0	10.8	154
1947.....	18.7	57.1	134	127	187	56.2	41.4	22.2	16.2	12.2	7.21	9.49	56.6
1948.....	356	167	129	157*	134	98.2*	85.7	139*	28.9	13.3	12.0	19.2	112*
1949.....	35.5	134	85.6	53.5	254	164.	58.6	45.1	24.3	8.52	7.52	8.87	72.1
1950.....	12.7						108	38.8	18.2	9.87	7.65	6.35	.....
1951.....	234	306	1,262	732	982	102	44.7	25.9	10.1	5.30	2.83	4.98	311
1952.....	943	133	422	158	232	78.8	47.9	28.1	13.6	7.64	11.9	4.95	174
1953.....	5.38	12.9	186	697	399	85.6	48.8	37.5	21.2	10.1	6.20	6.15	125

* Estimated.

SKOKOMISH RIVER BASIN

North Fork Skokomish River near Potlatch, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944							36	28*	17	7.0	5.5	3.2	
1945	3.6	25	40*	66	78	64	44	34	17	9.6	5.8	5.3	3.6
1946	4.4	14.5	69	85	103	103	71	39	17.5	17	11.5	7.3	4.4
1947	7.9	17.5	15.5	35	9.6	33	28	13	11	9.6	4.9	4.4	4.4
1948	9.0	23	30	50	42	50*	65	60*	15.5	10.5	9.6	9.0	9.0
1949	24	39	55	37	34	69	51	25	20	2.1	4.8	5.7	2.1
1950	6.2	29					46*	25	11.5	7.5	5.7	6.6	
1951	8.4	46	167	366	92	77	27	17	4.7	3.3	1.9	1.4	1.4
1952	15.5	50	111	65	76	59	27	16.5	10.5	6.1	4.9	4.4	4.4
1953	4.6	5.6	12.5	218	74	42	31	29	15	6.9	5.0	3.2	3.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1944							
1945	2,760	Feb. 7, 1945	3.6	78.4	66,750	95.1	62,860
1946	1,530	June 3, 1946	4.4	154	111,800	140	101,400
1947	1,730	Feb. 14, 1947	4.4	56.6	41,000	93.7	67,820
1948	2,500	Oct. 19, 1947	9.0	112	81,100	78.4	56,950
1949	2,030	Feb. 22, 1949	2.1	72.1	52,180		
1950	4,800	Nov. 27, 1949					
1951	3,280	Feb. 10, 1951	1.4	311	225,400	266	207,000
1952	2,920	Oct. 19, 1951	4.4	174	126,600	65.2	47,310
1953	2,650	Jan. 23, 1952	3.2	125	90,650		

* Estimated.

South Fork Skokomish River near Potlatch, Wash.

Location.—Lat. 47°23'10", long. 123°18'30", in NW¼ sec. 22, T. 22 N., R. 5 W., on right bank at head of canyon, 1 mile upstream from Rock Creek, 3 miles downstream from Brown Creek, and 7½ miles west of Potlatch.

Drainage area.—65.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 456 ft. (by barometer).

Average discharge.—16 years (1923-32, 1946-53), 569 cfs.

Extremes.—1923-32, 1946-53: Maximum discharge, 19,300 cfs Nov. 26, 1949 (gage height, 17.75 ft.), from rating curve extended above 5,000 cfs, by logarithmic plotting; minimum, 38 cfs Sept. 15, 1926; minimum gage height, 0.74 ft. Sept. 21, 22, 1953.

Remarks.—No diversion or regulation above station.

SKOKOMISH RIVER BASIN

South Fork Skokomish River near Potlatch, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924...	189	366	1,020	853	1,320*	422	247	178	97.7	68.7*	62.1	317	465*
1925...	1,230	1,330	604	1,110	1,480	457	445*	419*	296	137	86.0	74.6	651*
1926...	66.1	542	1,350	760	1,080	407	269	346	155	64.8	51.2	63.5	426
1927...	812	1,020	1,020	1,320	1,050	598	465	725	471	203	109	236	668
1928...	551	1,150	544	1,250	569	1,040	731	549	276	132	82.2	92.1	583
1929...	371	745	588*	384	200	510	570	477	463	179	114	77.1	391*
1930...	103	77.1	694	302	1,160	437	546	223	189	106	71.8*	89.3	333*
1931...	251	403	453	1,480	716	950	815	301	369	177	82.7	159	513
1932...	496	808	1,080	841	1,010*	1,150*	1,000*	500*	389	240	148	88.3	644*
1946...												105	
1947...	269	745	1,293	799	1,506	439	423	275	204	179	101	109	522
1948...	1,109	490	1,007	754	638	491	652	1,024	510	186	120	367	613
1949...	425	951	702	236*	850	1,033	734	783	340	186	121	145	540*
1950...	241	1,495	1,377	816	1,133	1,132	692	695	600	266	185*	118*	740*
1951...	942	1,266	1,835	1,197	1,717	431	656	478	253	134	85.0	156	756
1952...	796	283	757	584	1,107*	502	789	761	419	211	176	117	500
1953...	93.0	299	1,077	2,954	1,077	535	507	631	332	217	119	176	668

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924...		123	347	271		243	193	116*	80			44	44
1925...	249	538	312*	342	503	273*	262*	287*	180	105	76	65	65
1926...	58	58	490	378	594	283	208	198	90	51	45	39	39
1927...	140	212	418	556	391	378	328	391	316	141	95	112	95
1928...	160	418	340	365	238	214	490	365	177	95	73	73	73
1929...	68	137		216	103	214	293	340	282	137	67	67	67
1930...	67	66	66		522	282	234	223	150	82	62	53	53
1931...	98	153	268	314	304	400	414	212	176	107	67	66	66
1932...	118	290	296	372					285	177	112	72	72
1946...												85	
1947...	75	146	298	220	421	285	301	170	140	114	85	81	75
1948...	89	235	225	303	243	265	340	406	298	130	103	106	89
1949...	215	265	327	166	158	505	452	406	221	140	96	79	79
1950...	100	153	361	328	330	541							
1951...	102	315	515	620	444	303	497	485	378	166	135	90	90
1952...	277	273	369	187	402	335	411	318	182	102	73	64	64
1953...	80	90	169	1,110	417	320	298	519	302	138	97	93	93
								446	241	141	101	78	78

* Estimated.

SKOKOMISH RIVER BASIN

South Fork Skokomish River near Potlatch, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1924.....	9,950	Jan. 31, 1924	44	465	7.09	96.54	338,000	614	127.34	446,000
1925.....	7,700	Feb. 1, 1925	65	651	9.92	134.62	471,000	533	110.47	386,000
1926.....	4,560	Dec. 11, 1925	39	426	6.49	88.03	308,000	501	103.67	362,000
1927.....	4,960	Dec. 1, 1926	95	668	10.2	138.29	483,000	615	127.48	440,000
1928.....	5,070	Jan. 12, 1928	73	583	8.89	120.97	423,000	539	111.71	391,000
1929.....	3,010	Mar. 28, 1929	67	391	5.96	80.83	283,000	322	66.60	233,000
1930.....	4,570	Dec. 22, 1929	53	333	5.08	68.84	241,000	352	72.77	255,000
1931.....	9,110	Jan. 22, 1931	68	513	7.82	106.09	371,000	620	128.21	449,000
1932.....	11,500	①	72	644	9.82	133.68	468,000	.....	.....	.....
1946.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1947.....	7,800	Feb. 13, 1947	75	522	7.96	108.04	378,000	548	113.44	396,000
1948.....	8,760	Oct. 18, 1947	89	613	9.34	127.26	445,200	567	117.71	411,800
1949.....	5,330	Feb. 22, 1949	79	540	8.23	111.67	390,700	626	129.55	453,200
1950.....	19,300	Nov. 26, 1949	90	740	11.3	153.06	535,500	614	168.63	589,600
1951.....	11,500	Feb. 9, 1951	64	756	11.5	156.49	547,500	626	129.49	453,100
1952.....	6,120	Jan. 30, 1952	93	590	8.99	122.32	423,000	509	105.64	369,600
1953.....	10,000	Jan. 2, 1953	78	668	10.2	135.32	483,900	.....	.....	.....

① Probably Feb. 26, 1932.

South Fork Skokomish River near Union, Wash.

Location.—Lat. 47°20'30", long. 123°16'30", in NE¼ sec. 2, T. 21 N., R. 5 W., on right bank, 3½ miles upstream from North Fork and Vance Creek, and 8 miles west of Union.

Drainage area.—79.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (by barometer).

Average discharge.—22 years (1931-53), 690 cfs.

Extremes.—1931-53: Maximum discharge, 21,600 cfs Jan. 22, 1935, Nov. 26, 1949 (gage height, 11.0' ft.), from rating curves extended above 11,000 cfs; minimum, 62 cfs Sept. 18, 1938; minimum gage height, 2.81 ft. Sept. 18-22, 25-27, 1953.

Remarks.—No diversion or regulation above station.

SKOKOMISH RIVER BASIN

South Fork Skokomish River near Union, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931											109	190	
1932	584*	915*	1,250	1,030	1,230	1,330	1,110	588	407	260	163	107	747*
1933	209	1,410	1,020	1,120	523	1,110	830	937	716	421	285	446	744
1934	807	697	2,998	2,112	739	845	371	415	161	205	141	117	806
1935	630	1,912	1,082	2,888	1,115	642	564	532	301	180	108	242	876
1936	223	405	1,074	1,624	705*	874*	430	634	598	276	123	116	697*
1937	85.3	76.8	1,116	299	450	1,074	1,397	997	821	301	156	129*	573*
1938	554	1,976	1,746	992	693	1,044	941	502	274	144	91.8	69.0	752
1939	415	729	1,107	1,696	702	630	463	361	228	145	89.6	84.8	554
1940	194	626	2,563	1,292	1,472	1,123	598	547	170	107	80.1	97.6	741
1941	1,098	857	1,279	1,161	965	632	439	584	239	131*	116*	356*	654*
1942	629	996	1,722	570	786	448	376	361	398	236	121	86.8	560
1943	126	964	1,007	570	827	780	1,112	407	306	165	106	82.5	536
1944	340	370	778	1,107	681	496	515	331	197	105	81.7	106	426
1945	202	1,246	642	1,137	1,515	926	566	575	275	145	94.0	155	642
1946	240	1,180	1,490	1,366	987	979	954	638	452	334	135	114	738
1947	278	877	1,528	954	1,738	502	455	298	198	183	102	112	595
1948	1,222	616	1,153	930	781	633	789	1,259	549	191	182	401	722
1949	465	1,110	855	243	1,094	1,247	813	715	366*	202*	130	150	620*
1950	248	1,708	2,010	1,124	1,404	1,375	1,016	741	624	314	226	148	908
1951	977	1,413	2,129	1,323	1,899	546	661	490	270	137	87.6	159	835
1952	1,000	1,028	918	724	1,466	593	888	844	474	252	199	132	707
1953	88.7	372*	1,339*	4,030	1,484	662	576	688	371	240	142	192	849*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931											94	94	
1932		360	360	459		750	799	422	316	195	130	90	90
1933	74	544	350	363	235	679	580	619	535	265	134	120	74
1934	260	272	257	1,010	847	805	238	232	130	114	100	89	69
1935	89	510	532	436	728	512	405	430	244	127	94	83	83
1936	108	145	296	475*	225*	406	237	371	315	153	103	94	94
1937	75	71	71	160	162	600	684	524	444	187	130	100	71
1938	152	471	606	634	477	692	586	370	191	116	75	63	63
1939	64	252	298	500	238	358	358	240	161	104	69	69	64
1940	69	166	843	398	691	563	334	234	136	93	66	66	66
1941	69	384	445	572	452	365	289	211	183	110*	85*	150*	69
1942	190*	224	539	344	303	308	298	268	240	163	99	79	79
1943	78	228	578	320	352	226	549	331	228	115	90	74	74
1944	74	170	276	355	280	276	312	253	132	85	73	71	71
1945	86	435	296	425	368	306	423	494	182	115	82	80	80
1946	78	219	382	654	368	611	445	430	333	183	105	91	78
1947	84	155	329	270	474	329	324	188	122	122	83	83	83
1948	93	280	270	306	223	348	452	521	300	135	117	120	93
1949	250	319	374	162	149	591	516	430*	240*	155*	103	85	85
1950	106	171	729	494	435	675	615	568	433	225	175	121	106
1951	121	392	1,090	627	543	356	436	335	187	102	78	70	70
1952	296	320	452	246	490	461	570	570	372	165	112	104	104
1953	84	100*	184	1,400*	498	360	358	506	282	168	118	86	84

* Estimated.

South Fork Skokomish River near Union, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1931										
1932	13,000	Feb. 26, 1932	90	747	9.38	127.65	542,000	736	125.83	534,000
1933	4,740	Nov. 13, 1932	74	744	9.35	126.93	539,000	904	154.27	655,000
1934	20,500	Dec. 21, 1933	89	806	10.1	137.50	553,000	733	124.92	530,300
1935	21,600	Jan. 22, 1935	88	876	11.0	149.43	634,400	713	121.58	516,200
1936	5,830	Feb. 27, 1936	94	597	7.50	132.14	483,700	562	96.16	408,300
1937	10,000	Dec. 22, 1936	71	573	7.20	97.75	415,000	323	140.29	595,600
1938	16,000	Dec. 28, 1937	63	752	9.45	128.27	544,600	584	99.51	422,400
1939	13,900	Jan. 1, 1939	64	554	6.90	94.48	401,100	652	111.23	472,200
1940	17,200	Dec. 15, 1939	66	741	9.31	126.70	537,800	726	124.15	527,100
1941	12,500	Jan. 17, 1941	69	654	8.22	111.60	473,800	604	113.16	480,500
1942	17,600	Dec. 2, 1941	79	560	7.04	95.49	405,100	454	77.40	325,600
1943	8,540	Mar. 3, 1943	74	535	6.72	91.19	387,100	485	82.74	351,200
1944	8,470	Dec. 3, 1943	71	426	5.35	72.56	309,300	474	81.07	344,200
1945	19,400	Feb. 7, 1945	80	642	8.07	109.45	464,700	712	121.37	515,200
1946	4,920	Feb. 24, 1946	78	738	9.27	125.81	534,100	719	122.68	520,600
1947	8,160	Feb. 13, 1947	83	595	7.47	101.44	430,700	622	106.02	450,100
1948	9,780	Oct. 18, 1947	93	722	9.07	123.54	524,400	674	115.18	489,000
1949	6,200	Feb. 22, 1949	85	620	7.79	105.66	448,600	748	127.63	541,900
1950	21,600	Nov. 26, 1949	106	908	11.4	154.85	657,400	956	162.99	691,600
1951	12,300	Feb. 9, 1951	70	835	10.5	142.32	604,200	703	119.85	508,900
1952	8,050	Jan. 30, 1952	104	707	8.85	120.96	513,500	612	104.68	444,400
1953	15,600	Jan. 2 or 3, 1953	84	549	10.7	144.81	614,800			

Skokomish River near Potlatch, Wash.

Location.—Lat. 47°19'00", long. 123°11'05", in NW¼NW¼ sec. 15, T. 21 N., R. 4 W., on left bank, half a mile upstream from U. S. Highway 101, 2.8 miles downstream from confluence of North and South Forks, 4.7 miles southwest of Potlatch, and 5.5 miles upstream from mouth.

Drainage area.—230 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 19.35 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to May 22, 1947, water-stage recorder on left bank, May 22 to July 23, 1947, staff gage on left bank, and July 24 to Sept. 30, 1947, water-stage recorder on right bank at same datum. Oct. 1, 1947, to Apr. 18, 1951, water-stage recorder on right bank at datum 2.87 ft. lower.

Average discharge.—10 years (1943-53), 1,170 cfs.

Extremes.—1943-53: Maximum discharge, 19,200 cfs Nov. 27, 1949, Feb. 10, 1951; maximum gage height, 14.51 ft., at datum then in use, Nov. 27, 1949; minimum discharge, 125 cfs Sept. 14-17, 1944 (gage height, minus 0.01 ft.).

Flood of December 1933 reached a stage of 14.3 ft., present datum (discharge, 18,600 cfs).

Remarks.—Flow partially regulated by Lake Cushman Reservoirs near Hoodport. Practically entire flow of North Fork is diverted at dam No. 2 and returned to sea through Cushman powerplant No. 2.

SKOKOMISH RIVER BASIN

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Skokomish River near Potlatch, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....										296	197	161	.....
1944....	470	557	1,324	1,660	1,012	789	833	504	308	189	144	150	662
1945....	284	1,761	999	1,715	2,316	1,725	959	1,125	426*	217	175	225	985*
1946....	377	1,981	2,467	2,147	1,776	1,722	1,666	1,221	1,146	734	219	194	1,301
1947....	427	1,386	2,674	1,578	3,048	772*	643*	497	341	297	202	201	993*
1948....	2,436	1,279	2,074	1,903	1,306	1,033	1,184	1,675	692	310	229	585	1,223
1949....	759	1,924	1,897	524	2,132	2,151	1,181	1,347	506	307	225	287	1,068
1950....	476	2,802	3,179	1,910	2,648	3,241	1,624	1,049	637	462	313	213	1,556
1951....	1,514	2,273	4,330	2,834	4,002	1,076	1,019	751*	421*	274	198	261	1,571*
1952....	2,162	1,485	1,728	1,210	2,143	1,002	1,221	1,040	573	342	291	225	1,116
1953....	169	453	1,803	5,540	2,399	1,041	868	970	533	347	210	304	1,223

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....										208	181	145	.....
1944....	143	395	376	623	454	443	502	381	228	154	129	126	126
1945....	152	672	408	609	756	680*	760*	670*	292	188	155*	150*	150*
1946....	152	340	779	1,090	949	1,040	830*	699	786*	285	173	175	152
1947....	164	252	652	472	851	580	510*	322	273	232	173	169	164
1948....	173	577	551	538	459	577	725	840	465	245	209	204	173
1949....	411	525	855	350	322	1,110	879	629	373	250	196	160	160
1950....	285	312	629	642	746	1,360	1,020	899	618	324	240	165	165
1951....	200	653	1,920	1,580	962	702	680*	510*	331	230	176	156	156
1952....	448	570	980	442	816	770	984	771	448	255	188	180	180
1953....	152	168	290	2,060	821	625	604	716	391	238	188	158	152

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1943.....							
1944....	11,400	Dec. 3, 1943	126	662	480,600	717	520,800
1945....	16,700	Feb. 7, 1945	150	985	712,900	1,135	822,000
1946....	9,320	Apr. 11, 1946	152	1,301	941,800	1,274	922,200
1947....	14,100	Feb. 14, 1947	164	993	718,600	1,103	782,900
1948....	15,100	Oct. 19, 1947	173	1,228	891,600	1,115	809,200
1949....	11,900	Feb. 22, 1949	160	1,068	773,500	1,235	804,000
1950....	19,290	Nov. 27, 1949	165	1,556	1,127,000	1,704	1,233,000
1951....	19,200	Feb. 10, 1951	156	1,571	1,137,000	1,335	966,600
1952....	11,300	Jan. 30, 1952	180	1,116	810,400	874	634,800
1953....	15,500	Jan. 3, 1953	182	1,223	885,200		

* Estimated.

UNION RIVER BASIN

Union River near Bremerton, Wash.

Location.—Lat. 47°31'45", long. 122°47'05", in SW¼NE¼ sec. 34, T. 24 N., R. 1 W., on right bank, 400 ft. upstream from county bridge, 1¼ miles upstream from Hazel Creek, and 7 miles southwest of Bremerton.

Drainage area.—3.16 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 395 ft. (from topographic map). Prior to Jan. 30, 1952, at site 100 ft. upstream at datum 398.0 ft. above mean sea level.

Average discharge.—8 years (1945-53), 12.4 cfs.

Extremes.—1945-53: Maximum discharge, 476 cfs Feb. 22, 1949 (gage height, 3.85 ft.), from rating curve extended above 160 cfs by logarithmic plotting; minimum, 0.3 cfs on many days in August and September 1950 and 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	1.05	17.8	24.6	27.6	26.2	19.9	19.8	3.35	2.42	1.71	.79	.80	12.1
1947...	1.06	19.2	23.9	20.7	34.0	9.45	4.37	2.62	1.79	.94	.65	.85	9.86
1948...	18.6	11.2	18.4	23.7	22.1	14.6	10.5	15.5	5.35	1.70	1.03	1.83	12.0
1949...	3.84	21.3	24.6	10.2	38.3	14.4	5.79	5.33	1.66	8.81	.56	.69	10.5
1950...	1.25	30.3	27.9	34.7	41.5	32.7	12.4	3.66	1.56	.78	.62	.50	15.5
1951...	8.54	31.1	42.6	38.1	44.8	18.0	4.77	2.14	1.17	.64	.46	.64	15.5
1952...	12.9	18.4	23.0	30.7	26.6*	9.04*	4.87	3.10	1.72	.83	.61	.51	11.0*
1953...	.58	.97	14.6	78.5	23.7	13.8	7.23	3.87	2.37	1.35	.89	.90	12.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	0.6	1.6	4.4	10	9.8	11	5.5	2.4	1.7	1.0	0.7	0.7	0.6
1947...	.8	2.0	5.7	4.6	7.3	4.6	3.1	1.4	1.2	.7	.5	.6	.5
1948...	.8	4.4	4.9	5.7	4.9	5.8	7.5	7.3	2.6	1.0	.9	.7	.7
1949...	2.8	3.3	9.5	4.5	4.0	7.6	4.2	2.6	1.2	.6	.5	.5	.5
1950...	.6	1.2	7.8	6.5	8.1	12.5	6.0	2.1	1.0	.6	.4	.3	.3
1951...	.6	6.5	22	13	10.5	6.1	3.6	2.0	1.4	.6	.4	.4	.4
1952...	1.5	5.8	6.7	7.9	8.5*	6.5	4.2	2.8	1.8	1.0	.6	.6	.4
1953...	.4	.6	1.4	26	8.4	5.1	2.7	1.6	.8	.5	.3	.3	.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1946.....	142	Apr. 11, 1946	0.6	12.1	3.83	51.84	8,760	12.2	52.32	8,520		
1947.....	218	Feb. 2, 1947	.5	9.86	3.12	42.36	7,130	10.2	43.69	7,350		
1948.....	332	Oct. 18, 1947	.7	12.0	3.80	51.83	8,740	12.1	52.32	8,820		
1949.....	476	Feb. 22, 1949	.5	10.5	3.32	45.02	7,580	11.3	48.46	8,170		
1950.....	465	Nov. 26, 1949	.3	15.5	4.91	66.55	11,220	17.4	72.87	12,610		
1951.....	378	Feb. 9, 1951	.3	15.5	4.91	66.55	11,220	13.2	56.50	9,530		
1952.....	.....	.....	.4	11.0	3.48	47.35	7,980	7.81	33.62	5,670
1953.....	212	Jan. 3, 1953	.4	12.4	3.92	53.08	8,650	.....	.....	.....

* Estimated.

UNION RIVER BASIN

107

Union River near Belfair, Wash.

Location.—Lat. 47°28'20", long. 122°49'40", in NE¼ sec. 20, T. 23 N., R. 1 W., on left bank at highway bridge, 1½ miles north of Belfair, and 2 miles upstream from mouth.

Drainage area.—19.2 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 45.6 ft. above mean sea level (closed stadia traverse).

Average discharge.—6 years (1947-53), 56.9 cfs.

Extremes.—1947-53: Maximum discharge, 1,610 cfs Feb. 22, 1949 (gage height, 7.81 ft.), from rating curve extended above 500 cfs; minimum, 13 cfs Sept. 29, 1947, Sept. 11, 1953; minimum gage height, 1.06 ft. Sept. 5, 6, 1949.

Remarks.—City of Bremerton diverts approximately 3,100 acre-ft. about 5 miles above station annually for municipal use. Entire low-water flow is diverted at times each year. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947	.....	.....	.....	.....	.....	.....	.....	.....	.....	18.6	16.2	16.7	.....
1948	66.8	36.8	60.2	89.3	79.7	60.5	43.6	57.0	30.4	24.9	22.8	24.8	49.8
1949	27.2	67.3	90.1	38.5	187.	64.1	40.2	53.0	25.9	22.5	20.4	20.7	52.2
1950	19.5	90.6	108	123	147	130	60.7	77.1	32.2	26.7	21.5	18.0	67.2
1951	35.7	91.2	151	149	194	77.3	49.2	38.1	30.6	25.1	23.2	24.7	73.4
1952	46.5	62.2	80.2	93.1	90.2	42.5	33.9	27.4	22.4	18.9	16.5	15.5	45.7
1953	26.9	17.4	49.6*	250	97.2	51.6	38.7	29.4	24.6	19.6	17.0	17.2	53.3*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	15	15	.....
1948	15	20	21	31	30	32	35	35	26	22	22	20	15
1949	24	23	35	27	27*	42	36	28	24	20	20	19	19
1950	17	18	55	40*	48*	72	41	34	30	24	18.5	16.5	16.5
1951	17.5	22	90	60	67	53	43	34	26	23	21	22	17.5
1952	21	27	38	37	37	36	28	22	20	16.5	15	14.5	14.5
1953	15.5	15.5	16*	74	43	36	34	25	22	18	15.5	14.5	14.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Discharge	Date						
1947	.....	.....	.....	.....	.....	.....	.....
1948	1,090	Oct. 19, 1947	15	49.8	36,160	51.5	37,370	
1949	1,610	Feb. 22, 1949	19	52.2	37,790	54.8	39,680	
1950	1,160	Jan. 21, 1950	16.5	67.2	48,660	72.5	62,520	
1951	1,230	Feb. 9, 1951	17.5	73.4	53,120	65.9	47,670	
1952	616	Jan. 30, 1952	14.5	45.7	33,130	37.7	27,380	
1953	702	Jan. 3, 1953	14.5	53.3	38,580	.....	.....

* Estimated.

MISSION CREEK BASIN

Mission Creek near Bremerton, Wash.

Location.—Lat. 47°32'00", long. 122°50'05", in NE¼NW¼ sec. 32, T. 24 N., R. 1 W., on west shore of Mission Lake, 300 ft. upstream from lake outlet, and 9½ miles southwest of Bremerton.

Drainage area.—1.91 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 513.0 ft. above mean sea level (closed stadia traverse).

Average discharge.—8 years (1945-53), 6.63 cfs.

Extremes.—1945-53: Maximum discharge, 96 cfs Feb. 22, 1949 (gage height, 6.36 ft.); no flow at times each year.

Remarks.—No diversion. Fish screen at lake outlet may have slight regulating effect since November 1949.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									1.71	0.296	0.002	0.043	
1946	0.10	5.78	18.0	18.6	14.6	13.9	13.0	2.66	1.08	.83	.06	0	7.36
1947	.23	4.35	12.6	9.53	20.2	6.21	2.86	1.15	.69	.14	0	0	4.74
1948	5.70	6.57	8.79	15.7	11.0	8.66	6.20	9.77	3.41	.88	.33	.47	6.46
1949	1.05	8.52	15.4	6.21	21.8	8.48	3.54	2.27	.67	.10	0	0	5.57
1950	.02*	31.4*	16.8*	18.5*	22.4	19.4	7.14	2.19	.70	.13	.006	0	8.14*
1951	2.70*	15.2	24.6	21.9	22.9	7.57	3.34	.67	.01	0	0	0	8.40*
1952	2.03	9.00	16.9	14.6	17.6	4.38	4.63	2.24	.46	.20	0	0	6.02
1953	0	0	8.06	37.6	15.3	8.99	5.80	2.33	.27	.32	0	.01	6.38

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									0.7	0.04	0	0	
1946	0	0.5	6.5	8.8	9.4	9.4	5.9	1.6*	.8	.3	0	0	0
1947	0	.6	5.0	3.8	7.0	4.2	1.9	.4	.4	0	0	0	0
1948	0	3.3	3.0	3.0	2.8	4.4	5.5	5.4	1.7	.4	.3	.2	0
1949	.9	1.1	6.8*	3.4	8.4	5.2	2.4	1.2	.3	0	0	0	0
1950	0	0	7*	5.6	6.5*	9.3	4.2	1.0	.5	0	0	0	0
1951	0	6.2	17.5	11	5.0	4.2	.8	0	0	0	0	0	0
1952	0	1.5	4.2	3.8	4.1	3.4	4.1	.5	.3	0	0	0	0
1953	0	0	0	19	4.9	3.7	1.8	.2	.1	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1945										
1946	38	Jan. 4, 5, 1946	0	7.36	3.85	52.33	5,330	6.79	48.24	4,910
1947	51	Feb. 14, 1947	0	4.74	2.48	33.64	3,420	5.06	35.96	3,660
1948	38	Jan. 2, 1948	0	6.46	3.38	46.03	4,680	6.78	48.35	4,820
1949	96	Feb. 22, 1949	0	5.57	2.92	39.57	4,030	5.83	41.45	4,220
1950	90	Jan. 22, 1950	0	8.15	4.26	57.81	5,890	9.59	68.15	6,950
1951	90	Feb. 9, 1951	0	8.40	4.40	59.73	6,060	6.9	49.67	5,050
1952	69	Jan. 31, 1952	0	6.02	3.15	42.88	4,370	4.31	30.68	3,120
1953	67	Jan. 9, 1953	0	6.38	3.34	45.33	4,610			

* Estimated.

MISSION CREEK BASIN

109

Mission Creek near Belfair, Wash.

Location.—Lat. 47°29'20", long. 122°51'45", in NW¼NW¼ sec. 18, T. 23 N., R. 1 W., on left bank, 3 miles northwest of Belfair, and 5 miles upstream from mouth.

Drainage area.—4.37 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 330.0 ft. above mean sea level (closed stadia traverse).

Average discharge.—7 years (1945-52), 12.4 cfs.

Extremes.—1945-53: Maximum discharge, 403 cfs Feb. 22, 1949 (gage height, 6.10 ft., from graph based on gage readings); no flow Sept. 16, 21, 22, Oct. 1, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	0.60	12.8	36.9	35.7	27.4	24.6	20.5	2.97	0.86	0.63	0.50	0.39	13.6
1947...	.42	7.86	22.4	15.9	41.8	10.5	3.48	1.03	.47	.23	.22	.27	8.51
1948...	11.6	12.0	17.4	30.2	20.5	15.6	11.0	17.0	4.24	.91	.59*	.56	11.8*
1949...	.61	12.8	31.0	9.47	50.0	16.8	5.56	3.48	.91	.64	.43	.33	10.7
1950...	.30	21.7	29.9	35.9*	38.7*	34.6*	12.7	3.53	.99	.68	.39	.23	14.8*
1951...	.88	29.0	50.3	43.8	55.8	13.2	3.94	1.33	.68	.45	.22	.10	16.5
1952...	6.37	17.8	28.8	25.9	31.6	9.88	1.70	1.52	.62	.53	.45	.30	10.6
1953...	.21	.36	20.2	01.7	31.3	13.4							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	0.5	0.6	9.1	14	15	16	8.0	1.1	0.8	0.5	0.4	0.3	0.3
1947...	.4	.4	4.0	1.9	12	5.8	1.9	.5	.3	.2	.1	.1	.1
1948...	.2	3.5	2.4	6.1	3.6	6.0	8.9	8.5	1.3	.8	.5	.4	.2
1949...	.5	.5	12	3.1	2.9	9.1	3.4	1.3	.6	.5	.3	.2	.2
1950...	.2	.2	8.5	9.5*	11*	17*	6.8	1.2	.8	.5	.2	.2	.2
1951...	.1	2.4	31	16.5	15	7.7	1.8	.8	.5	.3	.2	0	0
1952...	.1	9.3	12.5	11	9.1	7.1	2.6	.7	.6	.5	.4	.2	.1
1953...	.1	.2	.9	46	10.5	5.6							.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1946.....	93	Jan. 4, 1946	0.3	13.6	3.11	42.24	9,550	11.9	37.11	8,660	
1947.....	140	Feb. 14, 1947	.1	8.51	1.95	26.43	6,160	9.37	29.11	6,750	
1948.....	96	Jan. 2, 1948	.2	11.8	2.70	36.92	8,610	12.1	37.81	8,820	
1949.....	403	Feb. 22, 1949	.2	10.7	2.45	33.39	7,790	11.4	35.30	8,230	
1950.....	230	Jan. 22, 1950	.2	14.8	3.39	46.11	10,750	17.8	53.72	12,520	
1951.....	278	Feb. 9, 1951	0	16.5	3.78	51.19	11,930	14.1	43.90	10,230	
1952.....	120	Feb. 1, 1952	.1	10.6	2.43	33.16	7,730	7.96	24.79	5,760	
1953.....	159	Jan. 9, 1953	.1								

* Estimated.

TAHUYA RIVER BASIN

Gold Creek near Bremerton, Wash.

Location.—Lat. 47°33'20", long. 122°48'35", in NE¼SW¼ sec. 21, T. 24 N., R. 1 W., on right bank, 1¼ miles upstream from mouth, and 8 miles west of Bremerton.

Drainage area.—1.54 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 750.9 ft. above mean sea level (closed stadia traverse).

Average discharge.—8 years (1945-53), 5.90 cfs.

Extremes.—1945-53: Maximum discharge, 203 cfs Feb. 22, 1949 (gage height, 3.27 ft.); minimum, 0.2 cfs Aug. 14, 1950; minimum gage height, 0.75 ft. Oct. 2, 1945, Aug. 14, 1950.

Remarks.—No diversion. Possible slight regulation by beaver dams above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	0.80	10.5	13.9	13.0	11.6	11.3	9.72	2.92	1.77	1.50	0.86	0.65	6.52
1947...	1.02	8.36	9.54	11.7*	16.3	5.20	2.55*	1.53*	1.23*	.69*	.56	.77	4.89*
1948...	8.70	6.26	9.55	11.2	10.4	6.90	5.97	7.08	3.09	1.18	1.03	1.18	6.10
1949...	1.99	8.67	9.75	3.54	17.6	8.34	3.85	3.34	1.85	1.18	.73	.83	5.08
1950...	.83	13.6	12.8	15.0	17.0	15.2	6.63	2.73	1.28	.79	.56	.52	7.26
1951...	3.62	18.4	15.2	16.6	19.2	6.47	2.84	1.40	.79	.56	.44	.49	6.92
1952...	4.97	7.75	10.1	12.3	10.2	5.18	2.91	1.80	1.07	.62	.44	.38	4.79
1953...	.60	.94	7.65	29.3	11.9	7.03	3.79	2.15	1.52	.97	.71	.91	5.60

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	0.3	1.2	4.6	6.1	5.6	7.7	4.4	2.1	1.3	1.0	0.4	0.5	0.3
1947...	.7	1.1	4.0	3.2*	4.5	2.7	1.9*	1.0*	.9*	.6*	.5	.5	.5
1948...	.8	3.6	3.2	3.4	3.0	3.2	4.2	3.8	1.6	1.0	1.0	.7	.7
1949...	1.2	2.2	4.0	1.8	1.7	5.6	3.0	2.3	1.6	1.0	.5	.6	.5
1950...	.5	1.1	5.3	4.3	5.0*	7.8	4.5	2.0	1.0	.7	.3	.4	.3
1951...	.5	2.8	10	7.8	6.5	4.0	1.7	1.0	.6	.5	.4	.3	.3
1952...	.6	2.8	4.7	4.7	4.8	3.3	1.8	1.4	.6	.5	.3	.3	.3
1953...	.3	.6	1.6	11.5	5.2	3.4	2.6	1.5	1.3	.7	.6	.6	.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....	65	Apr. 11, 1946	0.3	6.52	4.23	57.47	4,720	5.99	52.52	4,340
1947.....	122	Feb. 2, 1947	.5	4.89	3.18	43.09	3,540	5.37	47.33	3,690
1948.....	143	Oct. 18, 1947	.7	6.10	3.96	53.91	4,430	5.74	60.77	4,170
1949.....	203	Feb. 22, 1949	.5	5.03	3.30	44.75	3,650	5.64	49.71	4,060
1950.....	194	Nov. 26, 1949	.3	7.26	4.71	63.95	5,250	7.93	69.88	5,740
1951.....	153	Feb. 9, 1951	.3	6.92	4.49	60.97	5,000	5.89	51.90	4,260
1952.....	97	Jan. 30, 1952	.3	4.79	3.11	42.40	3,480	3.65	32.31	2,650
1953.....	106	Jan. 2, 1953	.3	5.60	3.64	49.39	4,060	.....	.....	.....

* Estimated.

TAHUYA RIVER BASIN

111

Tahuya River near Bremerton, Wash.

Location.—Lat. 47°33'00", long. 122°50'30", in SE¼SE¼ sec. 19, T. 24 N., R. 1 W., on left bank, 1¼ miles downstream from Tahuya Lake, and 10 miles west of Bremerton.

Drainage area.—6.12 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 539.0 ft. above mean sea level (closed stadia traverse).

Average discharge.—8 years (1945-53), 21.4 cfs.

Extremes.—1945-53: Maximum discharge, 460 cfs Feb. 9, 1951; maximum gage height, 5.58 ft. Nov. 27, 1949; minimum discharge, 0.1 cfs Sept. 22-26, 1947, Sept. 1-10, 12, 13, 1949, Oct. 4-10, 1952.

Remarks.—Small diversions above station for irrigation and domestic use below station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									4.82	1.77	0.746	1.02	.....
1946	1.45*	32.8	50.7	50.7	44.4	38.9	31.8	6.53	3.23	3.65	1.17	.68	22.0*
1947	2.37	29.1	37.6	32.7	63.2	16.9	6.93*	4.51*	3.27	1.89	.47	.47	16.2*
1948	27.1	20.1	30.3	43.9	40.6	24.1	21.2	31.9	7.84	2.34	1.14	2.33	21.6
1949	6.11	42.5	48.5	18.8	68.7	25.4	9.67	7.86	2.61	.95	.60	.38	19.0
1950	1.22	51.1	49.5	57.8*	70.4	57.8	19.8	6.11	2.16	.44	.41	.36	26.1*
1951	8.83	66.3	81.5	64.3	80.7	25.0	7.93	2.78	1.15	.68*	.30*	.28	28.0*
1952	20.1*	33.0	39.7	42.9	41.1	17.9	8.33	6.40	2.28	.99	.39	.20	18.1*
1953	.18	.42*	29.0*	120	43.7	25.1	11.7	4.86	3.13	1.65	.88	.78	20.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									1.9	0.67	0.35	0.35	.....
1946	0.6		13	21	19	23	8.4	3.8	1.2	1.6	.5	.4	0.4
1947	.6	2.6	12	9.0	11	7.0	3.2*	2.3	2.2	.5	.2	.1	.1
1948	.2	5.5	5.6*	8.1	6.9	7.3	13	13	3.5	1.2	.4	.5	.2
1949	3.8	6.9	18	7.7	7.3	13	7.1	3.1	1.2	.2	.2	.1	.1
1950	.5	2.7	9.3	8*	12*	23	10.5	1.9	.4	.2	.2	.2	.2
1951	.4	15	49	29	22*	11	2.7	1.5	.8	.5*	.2	.2	.2
1952	.3*	6.5*	11.5	11.5	11.5	11	5*	2.0	1.0	.2	.2	.2	.2
1953	.1	.2	.6*	50*	15.5	9.6	7.2	3.6	2.5	1.0	.7	.6	.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acro-feet		Inches	Acro-feet		
1945												
1946	161	April 11, 1946	0.4	22.0	3.59	48.89	15,960	20.7	45.92	14,990.		
1947	314	Feb. 14, 1947	.1	16.2	2.65	35.90	11,710	17.4	33.67	12,610		
1948	248	Oct. 19, 1947	.2	21.6	3.53	47.95	15,640	22.7	50.40	16,440		
1949	424	Feb. 22, 1949	.1	19.0	3.10	42.15	13,770	19.4	42.97	14,030		
1950	431	Jan. 21, 22, 1950	.2	26.1	4.26	53.00	18,920	30.8	68.21	22,260		
1951	460	Feb. 9, 1951	.2	28.0	4.58	62.03	20,240	23.1	51.14	16,890		
1952	265	Jan. 30, 1952	.2	18.1	2.96	40.34	13,160	12.5	27.73	9,050		
1953	224	①	.1	20.1	3.28	44.61	14,560	.....	.....	.....

① Probably Jan. 8, 1953.

* Estimated.

TAHUYA RIVER BASIN

Panther Creek near Bremerton, Wash.

Location.—Lat. 47°31'50", long. 122°51'30", in NW¼ sec. 31, T. 24 N., R. 1 W., on left bank, half a mile downstream from Panther Lake, and 11 miles southwest of Bremerton.

Drainage area.—1.00 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 486 ft. above mean sea level (closed stadia traverse).

Average discharge.—8 years (1945-53), 3.04 cfs.

Extremes.—1945-53: Maximum discharge, 88 cfs Feb. 22, 1949 (gage height, 3.02 ft.); no flow at times each year.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									0.168	0.053	0	0	
1946	0	1.67	8.87	9.01	7.82	6.29	4.10	1.69	.23	.27	.07	0	3.32
1947	.05	3.02	6.85	4.74	11.6	2.42	.86	.28	.11	0	0	0	2.43
1948	3.58	3.00	5.04	7.55	5.27	3.64	2.50	4.62	.91	.08	0	.01	3.02
1949	.12	4.40	7.62	3.56	10.7	3.92	.97	.87	.13	.01	0	0	2.64
1950	0	4.33	6.89	7.31	10.6*	9.19	3.06	.56	.09	0	0	0	3.47*
1951	.32	7.11	11.8	9.94	11.7	2.72	.74	.18	0	0	0	0	3.66
1952	.70	4.21	7.74	7.42	8.94	2.43	1.00	.37	.02	0	0	0	2.56
1953	0	0	2.66	19.5	7.06	3.12	1.24	.45	.10	.02	0	0	2.85

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									0.10	0	0	0	
1946	0	0	0.9	2.7	3.4	2.9	0.8	0.3	.1	.1	0	0	0
1947	0	.1	.6	.3	2.6	1.0	.4	0	0	0	0	0	0
1948	0	.8	.7	1.3	.9	1.1	1.6	1.7	.2	0	0	0	0
1949	.1	.1	2.8	1.8	1.6	1.6	.5	.2	0	0	0	0	0
1950	0	0	2.1	3	3.6*	4.3							
1951	0	.5	7.3	4.1	3.0	1.5	1.5	.2	0	0	0	0	0
1952	0	.4	3.2	2.8*	2.0	1.7	.3	.1	0	0	0	0	0
1953	0	0	0	8.5	2.1	1.1	.5	.2	.1	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945											
1946	30	April 11, 1946	0	3.32	3.32	45.05	2,400	3.26	44.28	2,360	
1947	43	Feb. 14, 1947	0	2.43	2.43	33.01	1,760	2.58	34.97	1,570	
1948	43	Oct. 18, 1947	0	3.02	3.02	41.12	2,190	3.06	41.67	2,220	
1949	88	Feb. 22, 1949	0	2.64	2.64	35.87	1,910	2.57	34.92	1,860	
1950	49	Nov. 26, 1949	0	3.47	3.47	47.11	2,510	4.13	56.08	2,990	
1951	63	Feb. 9, 1951	0	3.66	3.66	49.67	2,650	3.11	42.25	2,250	
1952	31	Jan. 30, 1952	0	2.56	2.56	34.84	1,870	1.72	23.46	1,250	
1953	36	Jan. 8, 15, 1953	0	2.85	2.85	38.67	2,060				

* Estimated.

TAHUYA RIVER BASIN

113

Tahuya River near Belfair, Wash.

Location.—Lat. 47°29'40", long. 122°54'20", in SE¼SE¼ sec. 10, T. 23 N., R. 2 W., on left bank, 3½ miles downstream from Panther Creek, and 5 miles northwest of Belfair.

Drainage area.—16.1 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 353 ft. above mean sea level (closed stadia traverse).

Average discharge.—8 years (1945-53), 46.6 cfs.

Extremes.—1945-53: Maximum discharge not determined, probably occurred Jan. 21 or 22, 1950; no flow at times each year.

Remarks.—Small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									7.40	0.532	0.249	0.165	.....
1946	0.20*	67.9	121	118	98.8	82.9	71.9	12.3	4.22	4.16	.55	.17	48.3*
1947	.43	56.5	86.8	69.6	136	35.6	12.0	6.36	4.19	.73	.18	.15	33.4
1948	63.2	44.4	87.5	113	89.0	58.3	44.5	78.2	13.3	2.09	.43	1.77	49.6
1949	6.34	35.1	116	39.2*	159	57.8	18.1	13.3	2.34	.42	.16	.14	40.4*
1950	.05	78.6	87.0	144*	180	131	43.9	11.2	2.50	.37	.12	0	55.5*
1951	13.3	132	181	154	158	47.0	15.0	5.35	.86	.08	0	0	58.3
1952	35.5	89.2	102	104*	98.2*	36.2	16.0	10.2	2.22	.78	.23	.04	40.8*
1953	0	0	70.1	204	101	52.8	33.0	8.29	2.60	1.69	.36	0	46.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									2.2	0.34	0.20	0.07	.....
1946	0		25	49	45	45	21	5.9	1.8	.8	.4	.1	0
1947	0	2.0	21	16	25	14	6.2	2.6	1.8	.3	.1	.1	0
1948	0	11.5	11.5	17.5	14	16	28	24	4.7	.5	.4	.4	0
1949	3.8	7.2	37	14*	13*	28	13	4.7	.8	.2	.1	0	0
1950	0	0	23	32*	85*	57	25	4.1	.8	.2	.1	0	0
1951	0	18.5	112	62	39	22	6.5	2.0	.2	0	0	0	0
1952	0	20	30	30*	22	23	8.5	3.7	1.3	.4	.1	0	0
1953	0	0	0	119	31	19	12	4.7	1.5	1.2	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1945										
1946	428	April 11, 1946	0	45.2	3.00	40.60	34,950	44.5	37.49	32,190
1947	622	Feb. 14, 1947	0	33.4	2.07	28.18	24,190	37.8	31.88	27,370
1948	544	Oct. 19, 1947	0	49.6	3.08	41.96	36,040	50.3	42.51	36,520
1949	900	Feb. 22, 1949	0	40.4	2.51	34.09	29,270	37.2	31.35	26,920
1950			0	55.8	3.47	47.04	40,380	69.3	58.42	50,170
1951	750	Feb. 9, 1951	0	58.3	3.62	49.15	42,210	49.7	41.87	35,940
1952	642	Jan. 30, 1952	0	40.8	2.53	34.51	29,620	28.1	23.74	20,380
1953	616	Jan. 8, 1953	0	46.2	2.87	38.97	33,450			

* Estimated.

TAHUYA RIVER BASIN

Tahuya River near Tahuya, Wash.

Location.—Lat. 47°24'20", long. 123°00'20", in SW¼ sec. 12, T. 22 N., R. 3 W., on right bank, 2½ miles upstream from mouth, and 2½ miles northeast of Tahuya.

Drainage area.—43.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 60 ft. (from topographic map).

Extremes.—July to October 1947: Maximum discharge, 30 cfs Oct. 2 (gage height, 2.88 ft.); minimum, 6.9 cfs Sept. 2, 3 (gage height, 2.55 ft.).

Remarks.—Several small diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									10.9	8.89	9.83		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									9.5	7.4	7.4		

DEWATTO CREEK BASIN

Dewatto Creek near Dewatto, Wash.

Location.—Lat. 47°28'10", long. 123°01'30", in sec. 23, T. 23 N., R. 3 W., on right bank at county road bridge, 1½ miles upstream from mouth, and 2 miles northeast of Dewatto.

Drainage area.—17.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 55 ft. (from topographic map).

Average discharge.—6 years (1947-53), 68.9 cfs.

Extremes.—1947-53: Maximum discharge, 1,630 cfs Nov. 27, 1949 (gage height, 6.75 ft.), from rating curve extended above 780 cfs; minimum, 9.6 cfs Sept. 22, 1950; minimum gage height, 1.57 ft. Sept. 20, 21, 22, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										15.4	13.2	13.6	
1948	82.1	53.1	101	133	99.6*	69.3	62.3	34.1	33.2	21.1	18.4	21.2	64.5*
1949	25.5	119	136	58.6*	213*	98.3	43.6	35.1	21.4	17.0	15.0	16.0	64.6*
1950	16.0	131	123	142	221	165	75.8	37.0	23.5	17.2	14.7	12.0	80.6
1951	44.0	133	163	170	213	78.4	42.9	32.5	21.2	16.2	12.9	13.3	79.6
1952	61.3	92.6	120	141	127	60.2	39.2	29.5	20.9	16.5	14.3	11.9	61.1
1953	12.2	15.8	95.0	295	123	75.9	43.4	29.3	21.5	16.4	14.2*	14.1	63.0*

* Estimated.

DeWatto Creek near DeWatto, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										13	13	11	
1948	13	24	23	41*	36*	37	50	47	24	17	16	15.6	13
1949	21	24	60*	30*	28*	61	37	25	19.5	15.5	14	13	13
1950	13	14	36	41	60*	80	50	28	19.5	15.5	12.5	10	10
1951	11.5	30	112	83	75	52	33	26	17	14	11.5	11	11
1952	15	30	56	55	54	47	31	23	18.5	14.5	13.5	11	11
1953	11	12.5	20	121	57	42	33	23	18.5	15*	12.5	12	11

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1947												
1948	660	Oct. 19, 1947	13	64.5	3.69	50.14	46,800	67.3	52.33	48,850		
1949	1,430	Feb. 22, 1949	13	64.6	3.69	50.07	46,750	64.4	49.93	46,630		
1950	1,630	Nov. 27, 1949	10	80.6	4.61	62.50	53,330	88.6	68.76	64,190		
1951	1,160	Feb. 9, 1951	11	79.6	4.55	61.70	57,600	71.9	55.77	52,060		
1952	963	Jan. 30, 1952	11	61.1	3.49	47.53	44,350	48.6	37.77	35,230		
1953	680	Jan. 3, 1953	11	63.0	3.60	48.85	45,590					

ANDERSON CREEK BASIN

Anderson Creek near Holley, Wash.

Location.—Lat. 47°34'05", long. 122°57'40", in S½ sec. 17, T. 24 N., R. 2 W., on left bank, half a mile upstream from mouth, and 1 mile northeast of Holley.

Drainage area.—6.3 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map).

Extremes.—July to October 1947: Maximum discharge, 12 cfs Oct. 2 (gage height, 1.47 ft.); minimum, 4.8 cfs July 29-31, Aug. 4.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									5.22	5.30	5.03		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									4.9	4.9	5.5		

* Estimated.

STAVIS CREEK BASIN

Stavis Creek near Seabeck, Wash.

Location.—Lat. 47°37'25", long. 122°52'30", in SW¼ sec. 25, T. 25 N., R. 2 W., on right bank, three-quarters of a mile upstream from mouth, and 2¼ miles west of Seabeck.

Drainage area.—5.60 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 15 ft. (from topographic map).

Extremes.—July to October 1947: Maximum discharge, 40 cfs Oct. 15 (gage height, 1.89 ft.); minimum, 6.3 cfs July 20, 21, 29, 30 (gage height, 1.36 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									7.07	7.04	7.31		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									6.6	6.6	6.6		

DOGFISH CREEK BASIN

Dogfish Creek near Poulsbo, Wash.

Location.—Lat. 47°45'10", long. 122°38'30", in SW¼ sec. 11, T. 26 N., R. 1 E., on left bank, half a mile upstream from mouth, and 1 mile north of Poulsbo.

Drainage area.—6.77 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Prior to Nov. 2, 1950, 200 ft. downstream at datum 1.75 ft. lower.

Average discharge.—6 years (1947-53), 8.34 cfs.

Extremes.—1947-53: Maximum discharge, 265 cfs Feb. 22, 1949 (gage height, 9.82 ft., site and datum then in use, from high-water mark on gage house), by contracted-opening method; minimum, 1.8 cfs Aug. 13, 1947, July 30, 1951.

Remarks.—Small diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										2.54	2.51	3.05	
1948	7.35	6.34	12.6	13.5	14.7	8.15	8.57	10.2	5.00	3.68	3.81	4.47	8.19
1949	5.30	11.2	11.9	6.92	30.9*	14.1*	6.13	3.83	3.41	3.55	2.93	3.61	8.49*
1950	4.45	8.62	10.0	16.2	24.5*	17.1							
1951	5.54	13.4	16.0	15.7	21.5	9.03	7.35	4.51	3.48	3.18	3.17	3.30	8.73*
1952	7.06	12.4	16.9	18.1	11.8	6.89	5.71	5.09	3.76	3.12	3.20	3.83	8.75
1953	4.05	6.08	11.5	28.5	8.89	9.18	6.06	5.11	4.99	3.14	2.85	3.48	7.81

* Estimated.

Dogfish Creek near Poulsbo, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										2.3	2.2	2.6	
1948	3.0	4.5	4.8	5.0	5.2	5.1	5.5	4.0	3.1	3.2	3.3	3.2	3.0
1949	4.6	5.0	5.2*	4.9*	5.3*	8.3	4.5	3.0	3.0	2.9	2.7	3.0	2.7
1950	3.8	3.4	5.7	5.0*	11*	9.4	4.8	3.8	3.0	2.9	3.0	2.9	2.9
1951	3.6	4.3	6.1	4.6	5.6	6.6	4.7	4.1	2.8	2.6	2.6	3.1	2.6
1952	4.5	3.3	8.0	7.4	6.1	5.3	4.3	4.3	3.1	2.6	2.7	2.6	2.6
1953	2.9	4.0	4.3	10.5	5.8	5.4	5.0	4.4	3.8	2.6	2.4	2.5	2.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1947												
1948	93	Jan. 1, 1948	3.0	8.19	1.21	16.47	5,950	8.35	16.79	6,060		
1949	265	Feb. 22, 1949	2.7	8.49	1.25	17.02	6,150	8.06	16.15	5,840		
1950	109	Jan. 21, 1950	2.9	8.73	1.29	17.50	6,320	9.72	19.50	7,040		
1951	127	Feb. 9, 1951	2.6	8.75	1.29	17.53	6,340	8.87	17.77	6,430		
1952	100	Nov. 30, 1952	2.6	8.05	1.19	16.18	5,850	6.82	13.71	4,950		
1953	202	Jan. 8, 1953	2.4	7.84	1.16	15.71	5,610					

CLEAR CREEK BASIN

Clear Creek near Silverdale, Wash.

Location.—Lat. 47°39'50", long. 122°40'50", at north line sec. 16, T. 25 N., R. 1 E., on left bank, 75 ft. downstream from highway crossing, 1 mile upstream from mouth, and 1½ miles northeast of Silverdale.

Drainage area.—8.5 sq. mi., approximately.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 30 ft. (from topographic map).

Extremes.—July to October 1947: Maximum discharge, 9.0 cfs Sept. 6 (gage height, 2.20 ft.); minimum, 1.5 cfs July 30 (gage height, 1.46 ft.).

Remarks.—Small diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									2.39	2.30	2.89		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1947									2.0	2.0	2.4		

* Estimated.

CHICO CREEK BASIN

Chico Creek near Bremerton, Wash.

Location.—Lat. 47°35'30", long. 122°42'30", at north line sec. 8, T. 24 N., R. 1 E., on left bank at highway crossing, half a mile downstream from Dickerson Creek, and 2½ miles northwest of Bremerton.

Drainage area.—15.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 50 ft. (from topographic map).

Extremes.—1947-50: Maximum discharge, 1,640 cfs Feb. 22, 1949 (gage height, 5.40 ft.), from rating curve extended 170 cfs; no flow Aug. 13 to Sept. 6, 1947.

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										1.81	0.31	1.58	.....
1948	34.5	25.0	49.7	92.0	71.8	61.3	39.4	42.2	15.8	6.02	3.65	5.26	35.8
1949	7.72	45.9	82.4	40.4	175*	51.4*	21.7	15.1	6.49	2.29	1.08	.96	36.5*
1950	2.70	55.7	72.7	94.2	121	105	44.0	17.2	7.07	3.47*	2.46*	1.61*	43.5*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										0.7	0.1	0	.....
1948	1.0	12.5	11	23	21	25	32	24	6.6	3.7	2.9	1.9	1.0
1949	5.2	6.9	36	19*	17*	30*	16	7.5	3.4	1.7	.7	.2	.2
1950	.9	2.9	32	33*	32*	58	23	9.8	5.0	2.5*	1.7*	1*	.9

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1947												
1948	738	Oct. 18, 1947	1.0	35.8	2.34	31.88	26,030	38.6	34.30	28,000		
1949	1,640	Feb. 22, 1949	.2	36.5	2.39	32.37	26,430	36.1	31.93	20,100		
1950	665	Nov. 26, 1949	.9	43.5	2.84	38.56	31,460					

* Estimated.

BLACKJACK CREEK BASIN

Blackjack Creek at Port Orchard, Wash.

Location.—Lat. 47°32'20", long. 122°37'50", in SE¼ sec. 26, T. 24 N., R. 1 E., on left bank at Port Orchard, a third of a mile upstream from mouth.

Drainage area.—14.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 30 ft. (from topographic map).

Extremes.—1947-50: Maximum discharge, 285 cfs Feb. 22, 1949 (gage height, 3.62 ft.), from rating curve extended above 150 cfs by logarithmic plotting; minimum, 6.7 cfs July 25, Sept. 2, 3, 1947 (gage height, 1.32 ft.).

Remarks.—Many small diversions for irrigation above station. No regulation.

BLACKJACK CREEK BASIN

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Blackjack Creek at Port Orchard, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...										7.69	7.49	8.05	.....
1948...	19.0	11.9	23.3	38.9	38.8	30.1	25.6	27.1	14.2	10.5	9.27	11.7	21.7
1949...	12.3	24.6	30.5	19.6	61.8	23.8	15.8	15.0	10.8	8.38	8.81	8.70	20.2
1950...	11.0	25.8	36.0	51.4	43.1	65.6	29.0	17.9	14.2	11.0	10.8	10.1	26.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...										7.1	7.1	6.9	.....
1948...	8.6	8.1	9.1	14.5	15	16	21	16	10.5	8.6	8.1	9.1	8.1
1949...	9.6	11.5	16	14*	14*	16	13	12.5	10	7.6	7.8	7.6	7.6
1950...	8.4	10.5	21	20*	21*	31	20	15	12	9.9	9.9	9.4	8.4

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1947							
1948	228	Mar. 21, 1948	8.1	21.7	15,739	23.2	16,850
1949	265	Feb. 22, 1949	7.6	20.2	14,630	20.1	14,550
1950	213	Jan. 21, 22, 1950	8.4	26.2	18,940		

BURLEY CREEK BASIN

Burley Creek at Burley, Wash.

Location.—Lat. 47°24'50", long. 122°37'50", in NE¼ sec. 11, T. 22 N., R. 1 E., on left bank at county road bridge, 400 ft. west of State Highway No. 14 at Burley, and a quarter of a mile upstream from mouth.

Drainage area.—10.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 10 ft. (from topographic map).

Extremes.—1947-50: Maximum discharge, 291 cfs Mar. 3, 1950 (gage height, 4.53 ft.); minimum, 11 cfs July 19-21, 1947.

Remarks.—Several small diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										13.5	13.8	14.9	.....
1948	29.5	26.5	31.4	33.1	32.4	34.2	28.3	29.2	20.0	15.8	16.0	19.4	26.8
1949	21.0	34.0	42.3	27.5	50.8	50.3	24.1	20.0	16.9	15.9	15.5	15.5	26.0
1950	19.2	32.7	34.9	43.1	50.4	59.9	31.0	21.1	18.1	16.4	16.8	16.8	29.9

* Estimated.

BURLEY CREEK BASIN

Burley Creek at Burley, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										13	13	13	
1948	14	20	21	21	21	25	23	19	15.5	14.5	14.5	14	14
1949	17.5	19.5	26	25	25	24	22	17.5	16	14.5	14.5	14	14
1950	14.5	17.5	21	24	27	33	23	17.5	16.5	15.5	14.5	14.5	14.5

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	CALENDAR YEAR	
	Dis-charge	Date				Mean	Runoff in acre-feet
1947							
1948	255	Oct. 18, 1947	14	26.8	19,420	27.6	20,020
1949	264	Feb. 10, 1949	14	26.0	15,520	25.1	18,160
1950	291	Mar. 3, 1950	14.5	29.9	21,670		

MINTER CREEK BASIN

Huge Creek near Wauna, Wash.

Location.—Lat. 47°23'20", long. 122°41'50", at north line sec. 20, T. 22 N., R. 1 E., at downstream side of bridge, an eighth of a mile upstream from mouth, and 2½ miles northwest of Wauna.

Drainage area.—5.51 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map). Prior to June 26, 1951, water-stage recorder at datum 0.86 ft. higher.

Average discharge.—6 years (1947-53), 11.5 cfs.

Extremes.—1947-53: Maximum discharge, 391 cfs Feb. 9, 1951 (gage height, 3.64 ft., datum then in use); minimum, 3.2 cfs Sept. 1, 1950.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										4.28	4.24	4.30	
1948	6.95	5.94	9.25	17.2	16.1	14.0	9.87	11.2	6.20	4.56	4.54	5.90	9.30
1949	4.92	9.24	21.8	10.3	28.6	13.6	8.77	6.83	5.17	4.44	4.20	4.30	10.1
1950	5.13	11.4	17.6	29.5*	35.4*	38.9	14.0	8.25	6.99	5.55	4.50	4.30	15.0*
1951	6.50	15.1	34.1	34.5	51.8	17.7	9.30*	7.55*	6.71*	5.79	4.82	5.00	16.4*
1952	6.47	7.80	12.2	13.1	18.7	8.93	6.17	4.77	4.62	4.45	4.32	4.21	7.95
1953	4.09	4.13	4.97	43.4	25.9	10.8	5.16	6.10	5.15	4.50	4.44	4.72	10.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947										3.7	4.0	3.5	
1948	4.2	4.4	4.6	5.7	5.4	7.1	7.9	7.1	4.6	4.3	4.1	4.8	4.1
1949	4.3	4.8	7.9	6.0	6.0	8.1	7.7	5.1	4.8	4.2	3.9	3.9	3.9
1950	4.2	4.5	7.2	7*	12*	16.5	10	6.8	5.8	5.1	3.6	3.6	3.6
1951	3.9	5.8	17*	16.5	16	11*	7.5*	7*	6*	5.2	4.4	4.6	3.9
1952	5.2	5.6	6.6	6.3	9.2	7.7	5.9	4.6	4.2	3.8	3.6	4.0	3.6
1953	3.6	3.8	4.0	5.2	10.5	8.3	6.6	5.4	4.8	4.2	4.2	4.2	3.6

* Estimated.

MINTER CREEK BASIN

Huge Creek near Wauna, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1947										
1948	59	Mar. 22, 1948	4.1	9.30	1.09	22.98	6,750	10.5	25.85	7,590
1949	115	Feb. 22, 1949	3.9	10.1	1.83	24.82	7,290	9.91	24.41	7,170
1950	266	Jan. 21, 1950	3.6	15.0	2.72	37.03	10,870	16.9	41.52	12,190
1951	391	Feb. 9, 1951	3.9	16.4	2.68	40.34	11,840	13.9	34.26	10,090
1952	68	Feb. 4, 1952	3.6	7.95	1.44	19.63	5,770	6.83	16.89	4,960
1953	163	Jan. 31, 1953	3.5	10.5	1.91	25.75	7,570			

SHUMOCHER CREEK BASIN

Shumocher Creek near Union, Wash.

Location.—Lat. 47°19'10", long. 122°59'20", in SW ¼ sec. 7, T. 21 N., R. 2 W., on right bank, a quarter of a mile upstream from mouth, and 6 miles southeast of Union.

Drainage area.—12.2 sq mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map).

Extremes.—June to October 1951: Maximum discharge, 19.5 cfs Oct. 2 (gage height, 1.04 ft.); minimum, 4.0 cfs Sept. 27 (gage height, 0.69 ft.).

Remarks.—No regulation or diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1951								13.3*	10.5	7.91	6.89		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1951								11.5	8.7	7.0	5.3		

* Estimated.

DEER CREEK BASIN

Deer Creek near Shelton, Wash.

Location.—Lat. 47°16'00", long. 123°00'10", in NW ¼ sec. 36, T. 21 N., R. 3 W., on left bank, three-quarters of a mile upstream from mouth, and 6 miles northeast of Shelton.

Drainage area.—13.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Dec. 29, 1942, to Sept. 30, 1943, staff gage at same site and datum.

Extremes.—1942-43, 1948-51: Maximum discharge, 386 cfs Feb. 22, 1949 (gage height, 5.13 ft.); minimum observed, 16 cfs Sept. 24, 25, 27-29, 1943.

Remarks.—No known diversion or regulation above station.

DEER CREEK BASIN

Deer Creek near Shelton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				43.1	94.3	52.0	60.8	33.6*	26.5	20.7	20.4	18.3	
1948											22.2*	29.2	
1949	32.9	57.3	106	46.7	110	59.2	37.0	29.7	23.6	20.1	22.0	21.4	46.8
1950	29.0	73.4	73.5	86.5*	121	129	65.1	39.4	28.8	28.1	23.1	22.7	59.2*
1951									24.7	21.2	19.3	22.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				27*	42	32	35	31	23	19	19	16	
1948											10.5	19	
1949	24	26	53	34	33	47	33	25	22	18.5	18.5	18	18
1950	18	28	28	52	48*	78	47	32	25	21	21	20	18
1951									22	18.5	18	18	18

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1943													
1948													
1949	386	Feb. 22, 1949	18	46.8	3.44	46.71	33,860	45.0	44.94	32,600			
1950	251	Mar. 5, 1950	18	59.2	4.35	50.10	42,870						
1951			18										

* Estimated.

CRANBERRY CREEK BASIN

Cranberry Creek near Shelton, Wash.

Location.—Lat. 47°16'00", long. 123°00'30", in NW¼ sec. 36, T. 21 N., R. 3 W., on left bank, half a mile upstream from mouth, and 6 miles northeast of Shelton.

Drainage area.—15.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 25 ft. (from topographic map). Dec. 30, 1942, to Sept. 30, 1943, staff gage at same site and datum.

Extremes.—1942-43, 1948-51: Maximum discharge, 860 cfs Feb. 9, 1951 (gage height, 7.12 ft.); minimum, 4.7 cfs Sept. 3, 11, 13, 1949; minimum gage height, 0.74 ft. Sept. 23-25, 1943.

Remarks.—Minor diversion for irrigation above station. No regulation.

CRANBERRY CREEK BASIN

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Cranberry Creek near Shelton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				36.4	36.5	36.4	56.7	22.2	15.2	9.90	8.55	7.47	.....
1948											8.81*	11.2	.....
1949	13.1	40.0	102	39.3	112	59.5	29.3	20.4	11.2	7.75	6.82	6.68	36.9
1950	10.5	61.5	91.3	130	126*	167	61.7	16.1	15.7	10.7	9.82	9.16	59.7*
1951	22.8	77.4	115	134	200	61.7	29.5	21.0	13.6	8.79	7.64	8.92	57.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				17	33	21	29	18	12	7.8	7.8	6.3	.....
1948											8*	6.6	.....
1949	9.3	8.2	48	24	23	41	24	14	8.9	6.3	5.9	5.2	5.2
1950	6.6	10.5	40	76*	70*	96	37	18.5	14	9.1	7.5	7.5	6.6
1951	9.1	16.5	56	58	64*	42*	21	15.5	9.8	7.2	6.5	6.5	6.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Min- imum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1943												
1948												
1949	402	Feb. 22, 1949	5.2	36.9	2.43	32.94	26,710	37.5	33.52	27,180		
1950	359	Mar. 5, 1950	6.6	59.7	3.93	53.36	43,260	64.1	57.25	46,400		
1951	860	Feb. 9, 1951	6.5	57.5	3.78	51.31	41,590					

* Estimated.

JOHNS CREEK BASIN

Johns Creek near Shelton, Wash.

Location.—Lat. 47°15'10", long. 123°05'15", in NE¼ sec. 5, T. 20 N., R. 3 W., on left bank, 3 miles upstream from mouth, and 3 miles north of Shelton.

Drainage area.—17.7 sq. mi.

Gage.—Water-stage recorder and, until Oct. 20, 1949, wooden control. Altitude of gage is 200 ft. (from topographic map). Dec. 31, 1942, to Sept. 30, 1943, staff gage at different datum.

Extremes.—1942-43, 1948-51: Maximum discharge recorded, 211 cfs Mar. 5, 1950; maximum gage height, 3.49 ft. Feb. 23, 1949; minimum discharge, 3.9 cfs Sept. 22, 1951 (gage height, 0.29 ft.).

Remarks.—No diversion or regulation above station.

JOHNS CREEK BASIN

Johns Creek near Shelton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				37.2	70.6	32.9	47.7	24.2	15.3	10.3	8.24	6.73	
1948											8.86	10.9	
1949	12.2	27.6	69.1	35.5	74.8	55.2	31.6	20.2	11.9	8.15	5.95	6.01	29.6
1950	7.66	26.3	48.9	64.9	90.1	116	59.8	29.6	17.3	12.3	10.3	7.68	40.7
1951									12.3	8.42	6.54	6.34	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				19	40	22	32	19	12	8.9	7.3	5.9	
1948											7.5	7.7	
1949	9.6	11.5	39*	24	23	43	26	15	9.6	6.1	4.6	4.6	4.6
1950	5.0	6.4	21	39	41	78	41	21	14	11	9.1	5.8	5.0
1951									9.6	7.1	5.7	4.3	4.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1943												
1948												
1949		198	Feb. 23, 1949	4.6	29.6	1.67	22.70	21,410	27.4	21.01	19,820	
1950		211	Mar. 5, 1950	5.0	40.7	2.30	31.20	29,450				
1951				4.3								

GOLDSBOROUGH CREEK BASIN

Goldsborough Creek near Shelton, Wash.

Location.—Lat. 47°12'50", long. 123°10'50", in SW¼ sec. 15, T. 20 N., R. 4 W., on right bank, 3½ miles west of Shelton, and 5½ miles upstream from mouth.

Drainage area.—42 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 205 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 1,090 cfs Jan. 31, 1953 (gage height, 8.33 ft.); minimum discharge, 16 cfs Sept. 23, 1951, Sept. 22-25, 1952; minimum gage height, 1.75 ft. Sept. 23, 1951.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										24.4	20.2	23.2	
1952	69.5	108	172	155	186	104	71.5	51.3	35.5	24.3	22.7	17.3	84.4
1953	18.6	25.0	160	376	324	122	71.7	17.4	47.2	29.3	23.4	23.6	104

* Estimated.

GOLDSBOROUGH CREEK BASIN

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Goldsborough Creek near Shelton, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....										21	18.5	17	17
1952....	26	43	85	90	94	82	52	37	29	22	19.5	16	16
1953....	16.5	19.5	20	138	134	94	76	51	35	24	22	19	16.5

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR					
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1951.....			17										
1952.....	468	Jan. 31, 1952	16	84.4	2.01	27.36	61,300	67.3	21.80		48,820		
1953.....	1,090	Jan. 31, 1953	16.5	104	2.48	33.52	75,100						

Goldsborough Creek at Shelton, Wash.

Location.—Lat. 47°12'40", long. 123°06'30", in NE¼ sec. 19, T. 20 N., R. 3 W., on right bank at upstream side of railroad bridge in Shelton, 1 mile upstream from mouth.

Drainage area.—55 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Dec. 28, 1942, to Sept. 30, 1943, staff gage at downstream side of bridge at different datum.

Extremes.—1942-43, 1951: Maximum discharge, 950 cfs Feb. 6, 1943 (gage height, 4.00 ft., site and datum then in use, from graph based on gage readings); minimum, 4.9 cfs Aug. 22, 23, 1951 (gage height, 1.00 ft.).

Remarks.—Diversion above station of as much as 29 cfs for use in lumber and pulp industry below station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....				130	287	131	187	68.1	36.3	17.3	14.2	14.0	.....
1951.....									52.3	14.1	7.13	8.35	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....				50*	109	62	88	49	21	14	13	14	.....
1951.....									16	9.4	5.0	5.2	5.0

* Estimated.

MILL CREEK BASIN

Mill Creek at Shelton, Wash.

Location.—Lat. 47°11'40", long. 123°05'45", in NW¼ sec. 29, T. 20 N., R. 3 W., on right bank, a quarter of a mile south of Shelton, and 2¼ miles downstream from Lake Isabella.

Drainage area.—19.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from topographic map). Dec. 28, 1942, to Sept. 30, 1943, staff gage at different datum.

Extremes.—1942-43, 1951: Maximum discharge, 474 cfs Feb. 7, 1943 (gage height, 3.42 ft., datum then in use, from graph based on gage readings); minimum observed, 11 cfs Sept. 15, 1943 (gage height, 0.59 ft., datum then in use).

Remarks.—Some diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				79.1	170	68.2	121	47.8	30.7	17.6	12.9	12.2	
1951									22.9	15.6	12.5	13.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943				45*	63	40	60	39	23	13	12	11	
1951									18	13.5	11.5	11.5	11.5

SKOOKUM CREEK BASIN

Skookum Creek at Kamilche, Wash.

Location.—Lat. 47°07'30", long. 123°06'50", in NW¼ sec. 19, T. 19 N., R. 3 W., on right bank, three-quarters of a mile southwest of Kamilche, and 3 miles upstream from mouth.

Drainage area.—17.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 35 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 795 cfs Jan. 31, 1953 (gage height, 9.85 ft.); minimum, 0.7 cfs Sept. 16, 1951; minimum gage height, 1.33 ft. Oct. 23, 24, 1952.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										2.13	1.65	2.33	
1952	35.2	65.9	105*	85.4	94.6	44.0	31.0	16.8	6.24	2.66	2.29	2.19	41.1*
1953	2.39	3.39	43.0	318	160	39.6	35.3	29.6	13.1	4.47	2.62	3.04	54.2

* Estimated.

SKOOKUM CREEK BASIN

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Skookum Creek at Kamilche, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										1.7	1.8	1.1	1.1
1952	5.6	24*	41*	44	38	34	19	7.1	3.8	1.9	1.8	1.9	1.8
1953	1.4	2.3	3.4	58	44	27*	23	17.5	7.9	2.8	2.0	1.8	1.4

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR					
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1951			1.1										
1952	204	Feb. 4, 1952	1.8	41.1	2.39	32.53	29,860	27.7	21.89	20,100			
1953	795	Jan. 31, 1953	1.4	54.2	3.15	42.78	39,240						

KENNEDY CREEK BASIN

Kennedy Creek near New Kamilche, Wash.

Location.—Lat. 47°05'30", long. 123°05'45", in NE¼ sec. 31, T. 19 N., R. 3 W., on left bank, 1 mile south of New Kamilche, and 2 miles upstream from mouth.

Drainage area.—18.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 30 ft. (from topographic map).

Extremes.—May to September 1951: Maximum discharge, 14 cfs Sept. 30 (gage height, 1.88 ft.); minimum, 2.8 cfs Aug. 23-27 (gage height, 1.53 ft.).

Remarks.—Small amount of diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									8.71	5.19	3.60	3.96	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									5.7	4.2	2.8	3.1	2.8

* Estimated.

DESCHUTES RIVER BASIN

Deschutes River near Rainier, Wash.

Location.—Lat. 46°51'10", long. 122°40'00", in SW¼ sec. 22, T. 16 N., R. 1 E., on right bank, 75 ft. upstream from county road crossing, half a mile downstream from mouth of outlet from Reichel Lake, and 2½ miles southeast of Rainier.

Drainage area.—89.8 sq. mi.

Gage.—Water stage recorder. Altitude of gage is 350 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 3,940 cfs Dec. 28, 1949 (gage height, 11.06 ft.); minimum, 21 cfs Sept. 20, 1952; minimum gage height, 2.64 ft. Sept. 20, Oct. 17, 1952.

Remarks.—Probably some small diversion for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949									62.2*	43.8	35.6	35.4	
1950	60.0	325	537	671	855	755	421	193	109	53.3	41.6	36.7	335
1951	191	570	639	672	809	365	226	122	57.1	40.8	33.2	33.2	312
1952	175	353	480	353	510	248	232	166	70.8	45.5	30.0	25.1	223
1953	25.4	35.9	189	1,071	475	273	182	173	119	63.6	44.5	41.0	224

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949									52	38	33	29	
1950	31	45	148	190*	240*	338	206	135	74	43	36	25	28
1951	30	113	394	295	262	187	127	78	44	36	25	26	26
1952	42	72	296	152	206	173	148	93	56	24	22	22	22
1953	24	27	34	255	172	128	144	107	85	47	37	33	24

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1949													
1950	3,940	Dec. 28, 1949	28	335	3.73	50.65	242,600	375	56.70	271,500			
1951	3,570	Feb. 9, 1951	26	312	3.47	47.15	225,800	279	42.21	202,100			
1952	3,160	Jan. 30, 1952	22	223	2.48	33.81	162,000	160	24.22	116,000			
1953	2,770	Jan. 9, 1953	24	224	2.40	33.88	162,200						

* Estimated.

DESCHUTES RIVER BASIN

Spurgeon Creek near Olympia, Wash.

Location.—Lat. 46°57'00", long. 122°50'30", on west line sec. 20, T. 17 N., R. 1 W., on right bank, a quarter of a mile upstream from mouth, and 7.2 miles southeast of Olympia.

Drainage area.—11.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 180 ft. (from topographic map).

Extremes.—1949-50: Maximum gage height, 6.46 ft. Dec. 28, 1949, affected by backwater from Deschutes River (discharge not determined); minimum discharge, 4.8 cfs Aug. 18, 1949 (gage height, 1.62 ft.).

Remarks.—Probably some small diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949										8.14	6.75	6.83	
1950	8.32	14.7	33.3	55.5	49.2	55.7	29.3	18.4	13.5	10.4	9.71	8.99	25.5
1951	13.2												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										7.6	5.9	6.2	
1950	6.4	7.3	17.5	30	25	37	23	14.5	12	9.0	8.7	7.3	6.4
1951	8.7												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1949													
1950			6.4	25.5	2.32	31.46	18,460						

DESCHUTES RIVER BASIN

Deschutes River near Olympia, Wash.

Location.—Lat. 47°00'05", long. 122°53'40", in NW¼SE¼ sec. 35, T. 18 N., R. 2 W., on left bank, 1½ miles upstream from mouth, and 2½ miles south of Olympia.

Drainage area.—160 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 95 ft. (from topographic map). Prior to Oct. 14, 1947, water-stage recorder on right bank at same datum.

Average discharge.—8 years (1945-53), 407 cfs.

Extremes.—1945-53: Maximum discharge, 4,600 cfs Feb. 10, 1951 (gage height, 7.92 ft.); maximum gage height, 8.00 ft. Feb. 18, 1949; minimum discharge, 66 cfs Oct. 11, 1945; minimum gage height, 1.90 ft. Oct. 18, Nov. 11, 1952.

Remarks.—Small diversions for irrigation above station. No regulation.

DESCHUTES RIVER BASIN

Deschutes River near Olympia, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....								527	139	9.48	79.2	91.5	.....
1946....	82.8	482	620	846	875	686	390	227*	197	163	105	98.0	391*
1947....	144	511	952	616	712	371	337	179	136	106	89.0	90.9	352
1948....	315	451	649	834	711	619	527	499	246	146	122	128	428
1949....	169	516	1,051	352	1,027	613	359	333	165	119	100	92.7	404
1950....	119	392	728	1,002	1,216	1,176	664	346	221	149	127	116	517
1951....	263	742	934	1,021	1,344	717	413	260	164	127	111	104	512
1952....	247	419	920	466	713	378	328	244	146	115	91.7	81.3	319
1953....	76.8	85.6	242	1,308	794	424	304	277	211	186	106	94.4	330

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....								216	110	84	74	79	.....
1946....	70	99	224	338	520	480	320*	179	161	117	98	88	70
1947....	85	136	352	279	348	273	256	143	114	96	84	78	78
1948....	78	278	272	323	284	352	428	336	171	127	117	103	78
1949....	119	136	473	221	210	428	323	202	143	108	93	86	86
1950....	85	108	245	424	500	660	415	268	179	134	118	106	86
1951....	115	210	620	520	620	465	260*	205	138	115	104	96	96
1952....	121	147	319	265	373	202	238	172	132	96	85	77	77
1953....	74	77	83	316	362	298	264	210	169	108	95	86	74

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1945.....													
1946.....	2,800	Dec. 29, 1945	70	391	2.44	33.18	253,200	426	36.17	308,700			
1947.....	3,560	Jan. 26, 1947	78	352	2.20	29.83	254,600	327	27.74	236,800			
1948.....	2,950	Mar. 22, 1948	78	428	2.68	36.45	311,000	464	39.48	336,800			
1949.....	3,860	Feb. 18, 1949	83	404	2.52	34.31	292,700	362	30.75	262,400			
1950.....	4,080	Mar. 6, 1950	85	517	3.23	43.89	374,500	576	48.85	416,800			
1951.....	4,600	Feb. 10, 1951	96	512	3.20	43.41	370,400	457	38.78	331,000			
1952.....	2,990	Jan. 31, 1952	77	310	1.99	27.17	231,900	246	20.89	178,300			
1953.....	2,870	Jan. 10, 1953	74	336	2.10	28.52	243,500						

* Estimated.

WOODWARD CREEK BASIN

Woodward Creek near Olympia, Wash.

Location.—Lat. 47°05'00", long. 122°51'30", on north line sec. 6, T. 18 N., R. 1 W., on left bank of county road crossing, 2¼ miles upstream from mouth, and 3.3 miles northeast of Olympia.

Drainage area.—3.80 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map).

Extremes.—June to October 1949: Maximum discharge, 13.5 cfs Oct. 28 (gage height, 1.19 ft.); minimum, 2.4 cfs Oct. 2, 3 (gage height, 0.57 ft.).

Remarks.—Some diversion for domestic use above station. No regulation.

WOODWARD CREEK BASIN

Woodward Creek near Olympia, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									3.51	3.14	3.03	3.17	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									3.0	2.9	2.8	2.4	

WOODLAND CREEK BASIN

Woodland Creek near Olympia, Wash.

Location.—Lat. 47°04'20", long. 122°49'00", in SW¼ sec. 4, T. 18 N., R. 1 W., on left bank, 1½ miles upstream from mouth, and 4.4 miles northeast of Olympia.

Drainage area.—24.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 25 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 204 cfs Feb. 9, 1951 (gage height, 4.46 ft.); minimum, 8.0 cfs Dec. 17, 18, 19, 20, 21, 1952; minimum gage height, 1.20 ft. Aug. 7, 1953.

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										17.1	15.0	13.0	
1950	13.1	17.0	24.2	50.8	61.2	84.1	59.9	40.0	30.6	24.7	20.5	17.4	36.8
1951	17.5	23.6	44.6	67.3	102	77.1	51.3	33.4	30.3	21.4	16.6	14.4	41.7
1952	17.0	18.6	26.6	26.8	30.5	24.2	20.0	17.0	15.9	12.8	10.2	9.41	19.1
1953	9.25	9.36	9.60	26.2	40.9	26.4	21.7	15.2	15.8	12.5	11.1	10.9	17.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										15.5	14	12	
1950	12	12.5	13.5	35*	42	69	47	34	27	23	18.5	16.5	12
1951	15	16.5	33	45	67	63	45	31	25	19	15	12.5	12.5
1952	15	14.5	19.5	21	25	22	18	16	15	11	9.6	9.0	9.0
1953	8.6	8.8	8.0	8.8	31	24	20	16.5	14	11.5	11	10.5	8.0

* Estimated.

WOODLAND CREEK BASIN

Woodland Creek near Olympia, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1949.....												
1950.....	120	⊙	12	36.8	1.51	20.56	26,660	39.5	22.06	23,570		
1951.....	204	Feb. 9, 1951	12.5	41.7	1.72	23.30	30,180	39.7	22.19	23,700		
1952.....	59	Feb. 4, 1952	9.0	19.1	.786	19.71	13,910	16.3	9.12	11,820		
1953.....	68	Jan. 31, 1953	8.0	17.5	.720	9.76	12,660					

⊙ Dec. 28, 1949, Mar. 5, 1950.

McALLISTER CREEK BASIN

McAllister Springs near Olympia, Wash.

Location.—Lat. 47°01'45", long. 122°43'25", in SE¼ sec. 19, T. 18 N., R. 1. E., on right side of stilling pool just above city of Olympia control gates, 8 miles east of Olympia.

Gage.—Water-stage recorder. Altitude of gage is about sea level. Auxiliary water-stage recorder 30 ft. downstream from base gage.

Extremes.—1951-53: Maximum daily discharge, 38cfs Mar. 25, 1951; minimum daily, 17.5 cfs Sept. 21, 1952, Aug. 12, 1953.

Remarks.—City of Olympia diverts 2 to 8 cfs for municipal use above station. Gage pool regulated by low dam and flashboards. Backwater from tides occurs daily.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....							34.0	32.4	30.1	26.9	25.8	25.8	.....
1952...	25.3	26.5	27.2	28.5	28.5	25.6	24.1	23.3	22.9	20.6	21.2	20.1	24.5
1953...	20.3	21.0	22.0	23.4	27.1	27.5	25.0	23.4	22.3	19.9	19.5	19.5	22.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....							32	30	28	26	25	24	.....
1952...	24	25	26	26	27	23	23	21	21	19*	20	17.5	17.5
1953...	19.5	20	20	21	24	26	22	22	20	18.5	17.5	18.5	17.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Maximum daily		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1951.....	138	Mar. 25, 1951					
1952.....	30	Jan. 25, 1952	17.5	24.5	17,780	23.2	16,820
1953.....	35	Feb. 17, 1953	17.5	22.5	16,320		

* Estimated.

† Maximum during period March to June.

Nisqually River near Ashford, Wash.

Location.—Lat. 46°44'30", long. 121°55'40", in S½ sec. 33, T. 15 N., R. 7 E., near left bank on foot bridge, half a mile downstream from Mount Rainier National Park boundary, 7 miles east of Ashford.

Drainage area.—68.5 sq. mi.

Supplemental records available.—January 1912 to September 1914, gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 1,950 ft. (from topographic map).

Extremes.—1910-11: Maximum discharge observed, 3,400 cfs Nov. 10, 1910 (gage height, 7.3 ft.); minimum observed, 92 cfs Feb. 24 to Mar. 6, 13, 14, 1911.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....		838	253	178	116	145	192	335	598*	508	268	336*	
1912.....	209	473	285										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....		280	152	152	92	92	136	245	360	280*	215	215	
1912.....	190	190	230										

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minim-um day	Mean	Per square mille	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911.....	3,400	Nov. 10, 1910	92					304	60.27	220,000
1912.....										

* Estimated.

NISQUALLY RIVER BASIN

Nisqually River near National, Wash.

Location.—Lat. 46°45'10", long. 122°05'00", in SW¼SW¼ sec. 29, T. 15 N., R. 6 E., on right bank, 100 ft. downstream from railroad bridge, 1 mile west of National, 2½ miles west of Ashford, and 3 miles upstream from Mineral Creek.

Drainage area.—133 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,450 ft. (from river-profile map).

Average discharge.—11 years (1942-53), 748 cfs.

Extremes.—1942-53: Maximum discharge, 9,560 cfs Dec. 11, 1946 (gage height, 10.34 ft.); minimum, 108 cfs Dec. 1, 3, 1952 (gage height, 2.76 ft.).

Remarks.—No diversion above station. Slight regulation at low flow by power-plant of Mount Rainier National Park on Paradise River.

NISQUALLY RIVER BASIN

Nisqually River near National, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942									1,039	774	519*	357	
1943	230*	915	963	523*	663*	583	1,128	844	1,003	810	422	378	705*
1944	315	343	657	521*	500*	355	495	766	687	525	381	399	496*
1945	297	356	515	940	880	501	632	1,491	931	681	444	446	675
1946	367	563	939	863	578	658	805	1,465	1,364	1,052	536	297	820
1947	547	846	1,401	705	881	639	827	874	773	601	426	418	752
1948	1,333	1,400	904	826	671	568*	675	1,373	1,577	732	492	351*	900*
1949	396	591	471*	237*	469*	776	973	1,651	1,221	911	554*	369	726*
1950	405	1,002	751	725	867	1,041	789	1,145	1,721	1,277	707	496	915
1951	708	1,263	1,452	745	1,408	475	388	1,024	867	649	468	395	857
1952	714	630	584	334	722	418	830	1,051	521	739	533	412	661
1953	311	140	246	1,535	991	432	627	949	1,052*	1,165*	595	474	709*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942									743	505	280*	239	
1943	135*	197	566	305*	315*	264	682	485	724	604	283	264	135
1944	165	217	292	290*	254	214	325	235	576	351	292	233	185
1945	230	185	240	224	343	295	431	1,040	583	456	332	290*	185
1946	210*	557	339	465	423	500	427	958	1,000	589	388	221	210
1947	154	292	471	350	502	437	524	605	595	409	318	299	154
1948	405	900*	673	454	363	430*	401	562	940	580*	368	240*	240*
1949	271	271	280*	220*	210*	619	595	1,050	725	699	350*	290*	210
1950	253	299	408	270*	396	497	540	556	1,150	751	560	302	270
1951	270	451	932	482	408	302	492	587	636	501	258	255	255
1952	336	377	325	220*	332	267	521	592	516	597	286	235	220
1953	178	115	110	251	358	304	332	704	776	700*	374	325	110

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1942													
1943	6,870	Nov. 23, 1942	135	705	5.30	71.99	510,700	640	65.29	463,000			
1944	4,830	Dec. 3, 1943	185	496	3.73	50.72	359,700	483	49.43	350,600			
1945	5,250	①	185	675	5.08	68.92	458,800	759	77.50	549,700			
1946	5,000	Dec. 28, 1945	210	820	6.17	83.65	593,500	880	89.84	637,400			
1947	9,560	Dec. 11, 1946	154	752	5.65	76.75	544,400	814	83.09	589,400			
1948	5,560	Nov. 8, 1947	240	909	6.83	93.00	659,800	726	74.33	527,400			
1949	3,010	May 13, 1949	210	726	5.46	74.12	525,800	790	80.61	571,800			
1950	8,160	Nov. 27, 1949	270	915	6.88	93.89	662,400	1,017	103.76	736,000			
1951	7,170	Feb. 11, 1951	255	857	6.44	87.45	620,500	732	74.70	529,800			
1952	2,700	Feb. 4, 1952	220	661	4.67	67.64	479,700	568	67.09	404,900			
1953	4,760	Jan. 31, 1953	110	709	5.33	72.36	513,300						

* Estimated.

① Jan. 7, Feb. 7, 1945.

Mineral Creek near Mineral, Wash.

Location.—Lat. 46°44'20", long. 122°08'40", in SW¼ sec. 35, T. 15 N., R. 5 E., on right bank, three-eighths of a mile downstream from railroad bridge, 1 mile upstream from mouth, and 2½ miles northeast of Mineral.

Drainage area.—74.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,340 ft. (from topographic map).

Average discharge.—11 years (1942-53), 360 cfs.

Extremes.—1942-53: Maximum discharge, 5,390 cfs Feb. 9, 1951 (gage height, 7.65 ft.), from rating curve extended above 3,500 cfs; maximum gage height, 8.25 ft. Dec. 11, 1946; minimum discharge, 19.5 cfs Sept. 22, 23, Oct. 6, 7, 8, 9, 10, 13, 14, 1952; minimum gage height, 1.40 ft. Sept. 22, 23, 1950.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942									842	139	56.6	35.7	.....
1943	59.5	759	724	349	608	433	723	276	203	85.3	44.5	32.8	360
1944	83.7	143	393	358	325	227	290	206	107	59.0	33.0	48.3	191
1945	65.9	210	216	603	653	466	444	657	164	54.6	35.8	81.4	302
1946	83.7	557	724*	862	564	616	644	523	373	177	53.7	43.6	436*
1947	149	610	1,289	691	721	362	395	142	109	64.7	46.5	63.2	356
1948	472	581	460	646	594	395	484	696	288	93.4	60.1	74.2	401
1949	161	516	551	172	631	620	611	745	215	74.3	43.7	43.4	364
1950	161	576	627	616	774	838	611	570	429	110	55.1	48.1	449
1951	312	768	860	624	1,067	357	509	332	90.3	39.5	29.0	39.3	414
1952	390	442	531	346	626	292	560	388	128	63.8	33.2	23.7	319
1953	23.1	35.9	195	1,568	698	319	361	404	249	96.5	55.2	46.9	337

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942									120	60	43	30.	.....
1943	26	149	420	180	180	149	361	197	146	54	35	26	26
1944	25	63	126	194	140	125	161	129	80	39	26	23	23
1945	44	74	93	99	184	182	318	410	82	42	30	31	30
1946	41	194	201	310	240*	365	318	323	107	73	40	33	33
1947	31	116	374	318	274	236	261	71	74	47	41	41	31
1948	50	249	196	201	149	196	278	333	142	63	54	46	46
1949	74	104	207	104	94	348	310	313	122	54	37	32	32
1950	37	97	240	175*	219*	340	359	359	256	61	43	31	81
1951	53	236	563	284	214	129	321	147	49*	31	24	24	24
1952	99	152	288	189	209	160	410	209	86	38	27	20	20
1953	20	21	24	226	209	158	225	278	153	61	43	34	20

* Estimated.

NISQUALLY RIVER BASIN

Mineral Creek Near Mineral, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1942.....												
1943.....	4,750	Nov. 23, 1942	26	360	4.65	65.68	260,300	283	51.68	204,800		
1944.....	2,800	Dec. 3, 1943	23	191	2.57	35.06	138,900	180	33.04	130,000		
1945.....	4,610	Feb. 7, 1945	30	302	4.06	55.23	218,900	375	68.60	271,000		
1946.....	4,130	Dec. 28, 1945	33	436	5.87	79.60	315,500	404	90.18	357,400		
1947.....	5,240	Dec. 11, 1946	31	386	5.20	70.43	279,100	340	62.15	246,300		
1948.....	2,640	Jan. 1, 1948	46	401	5.40	73.42	290,900	378	69.18	274,100		
1949.....	3,340	Feb. 17, 1949	32	364	4.90	66.53	263,600	377	68.45	271,300		
1950.....	4,700	Nov. 27, 1949	31	449	6.04	82.02	325,000	497	90.86	360,000		
1951.....	5,390	Feb. 4, 1951	24	414	5.57	75.70	300,000	366	66.92	265,200		
1952.....	3,420	Feb. 4, 1952	20	319	4.29	58.43	231,500	226	41.43	164,200		
1953.....	4,070	Jan. 31, 1953	20	337	4.54	61.49	243,700					

East Creek near Elbe, Wash.

Location.—Lat. 46°44'40", long. 122°12'20", in NW¼ sec. 32, T. 15 N., R. 5 E., on right bank, 1½ miles upstream from mouth, and 1½ miles south of Elbe.

Drainage area.—11.5 sq. mi.

Gage.—Water-stage recorder and wooden control. Datum of gage is 1,225 ft. above mean sea level (levels by city of Tacoma). Aug. 12, 1918, to Sept. 30, 1922, staff gage on left bank at same site and datum.

Average discharge.—5 years (1918-22, 1949-50), 61.6 cfs.

Extremes.—1918-22, 1949-50: Maximum discharge, 1,510 cfs Jan. 22, 1919 (gage height, 8.60 ft., from graph based on gage readings), from rating curve extended above 740 cfs; minimum, 1.6 cfs Sept. 15-29, Sept. 21, 23, 1950.

Remarks.—Possibly some small diversion for domestic use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918.....													1.61
1919.....	13.2	87.1	125	258	95.5	98.8	117	46.0	19.1	5.17	2.60	2.92	72.4
1920.....	8.06	54.9	119	80.8	33.5	68.0	56.1	29.8	26.5	7.92	4.93	54.0	44.5
1921.....	115	79.1	132	135	127	129	67.1	55.8	26.9	7.81	3.94	7.78	78.8
1922.....	39.5	113	133	28.4	30.9	48.6	65.7	107	37.0	4.80	3.58	3.64	51.3
1949.....										5.69	3.47	4.64	
1950.....	18.9	108	110	87.8*	134*	114*	92.6	76.5	35.2	7.12*	7.08	5.70	65.9*
1951.....	76.6												

* Estimated.

NISQUALLY RIVER BASIN

East Creek near Elbe, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918												1.6	
1919	2.4	20	27	24	32	48	42	30	9.4	3.0	1.7	1.8	1.7
1920	3.3	19.0		13.0	11.6	11.0	34	19.5	11.6	4.6	3.2	4.6	3.2
1921	35	17	65	43	55	39	28	32	15	4.0	2.8	2.6	2.6
1922	5.1	20	22	18	19	20	38	54	7.5	3.3	3.0	3.0	3.0
1949										3.9	2.9	2.9	
1950	3.9	10	33	24*	32*	48*	43	48	15.5	4.5*	3.9*	1.6	1.6
1951	6.2*												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1918													
1919	1,510	Jan. 22, 1919	1.7	72.4	6.30	85.48	52,500	68.8	81.27	49,900			
1920	949	Dec. 24, 1919	3.2	44.5	3.87	52.61	32,390	56.6	66.99	41,100			
1921	792	Mar. 17, 1921	2.6	73.8	6.42	87.06	53,400	70.2	82.87	50,800			
1922	736	Dec. 11, 1921	3.0	51.3	4.46	60.56	37,200						
1949													
1950			1.6	65.9	5.73	77.76	47,680						

* Estimated.

NISQUALLY RIVER BASIN

Nisqually River near Alder, Wash.

Location.—Lat. 46°46'05", long. 122°16'05", in SW¼ sec. 23, T. 15 N., R. 4 E., on right bank, 2½ miles southeast of Alder, 3½ miles upstream from Alder Dam, and 8 miles downstream from Mineral Creek.

Drainage area.—252 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,013.9 ft. above mean sea level (stadia traverse).

Average discharge.—13 years (1931-44), 1,158 cfs.

Extremes.—1931-44: Maximum discharge, 25,000 cfs Dec. 22, 1933 (gage height, 13.2 ft., from high-water marks), from rating curve extended above 10,000 cfs; minimum, 142 cfs Nov. 3, 1935 (gage height, 1.31 ft.).

Remarks.—No diversion or regulation above station.

NISQUALLY RIVER BASIN

Nisqually River near Alder, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931													399
1932	756	1,210	1,410	1,430	1,640	2,400	1,980	1,700	1,600	1,050	631	447	1,350
1933	549	3,200	1,860	1,930	643	1,530	1,180	1,640	2,460	1,410	849	731	1,500
1934	1,502	1,546	6,512	3,404	1,052	1,624	1,201	946	634	605	552	393	1,677
1935	1,357	2,078	1,603	2,282	1,511	991	975	1,306	1,203	817	537	462	1,325
1936	297	373	686	2,139	959	1,407	1,526	2,232	1,846	557	574	448	1,114
1937	353	189	1,264	332*	774	1,528	2,050	1,372	2,253	1,021	547	502	1,058*
1938	466	2,675	2,263	1,999	816	1,200	1,720	1,471	1,041	732	478	393	1,277
1939	353	741	1,462	1,845	1,229	1,241	1,327	1,346	1,062	823	556	413	1,033
1940	406	480	2,180	1,073	2,025	1,755	1,071	1,240	682	544	460	392	1,025
1941	443	720	1,061	1,129	671	575	675	905	644	576	422	578	701
1942	962	1,121	2,318	500	1,003	729	845	958	1,422	921	576	387	1,004
1943	287	1,046	1,876	1,108	1,728	1,359	2,241	1,215	1,248	912	491	432	1,220
1944	446	557	1,187	1,003	954	688	895	1,027	842	601	439	452	760
1945	378												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931													293
1932	285	630	560	736	491	1,120	1,320	1,120	1,040	635	401	305	285
1933	285	1,080	732	665	421	855	802	1,040	1,650	1,000	695	450	285
1934	450	700	675	1,800	610	688	828	658	452	376	400	200	200
1935	100	1,080	1,060	568	900	574	609	1,040	765	574	389	333	190
1936	203	158	335	793	407	793	605	1,490	945	644	365	281	158
1937	239	156	152	150*	220*	786	1,120	1,230	1,590	535	384	306	150
1938	271	429	872	1,060	612	845	826	1,080	715	516	357	246	246
1939	219	361	592	1,050	644	539	930	930	865	602	358	252	219
1940	261	322	662	503	721	1,030	786	721	556	413	376	254	254
1941	203	378	548	614	408	440	509	490	533	386	275	330	203
1942	458	428	890	600	505	505	724	669	914	642	324	255	255
1943	171	470	1,040	630	635	519	1,240	765	925	660	346	292	171
1944	265	823	464	562	487	438	591	794	710	429	350	327	265
1945	286												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1931											
1932	14,600	Feb. 26, 1932	285	1,350	5.36	73.12	684,000	1,540	83.03	1,120,000	
1933	12,600	Nov. 15, 1932	285	1,500	5.95	80.87	1,090,000	1,840	99.13	1,330,000	
1934	25,000	Dec. 22, 1933	209	1,077	6.65	99.25	1,214,000	1,368	73.07	983,200	
1935	14,400	Oct. 25, 1934	190	1,325	5.28	71.34	959,400	951	51.24	688,700	
1936	6,230	Jan. 12, 1936	158	1,114	4.42	60.20	808,700	1,152	62.27	836,400	
1937	8,100	Apr. 14, 1937	150	1,058	4.20	56.98	765,700	1,358	73.14	933,300	
1938	9,620	Apr. 16, 1938	249	1,277	5.07	68.75	924,500	1,039	55.93	751,900	
1939	6,660	Jan. 2, 1939	216	1,033	4.10	55.66	748,000	1,078	58.06	760,400	
1940	9,880	Dec. 15, 1939	254	1,025	4.07	55.35	744,000	952	51.44	691,300	
1941	5,610	Jan. 18, 1941	203	701	2.75	37.74	507,200	884	47.64	640,300	
1942	9,520	Dec. 19, 1941	255	1,004	3.98	54.09	727,100	977	52.64	707,500	
1943	12,960	Nov. 23, 1942	171	1,230	4.88	66.28	890,600	1,071	57.69	775,400	
1944	8,500	Dec. 3, 1943	265	760	3.02	41.00	551,500				
1945											

* Estimated.

Little Nisqually River near Alder, Wash.

Location.—Lat. 46°47'20", long. 122°18'45", in NW¼ sec. 16, T. 15 N., R. 4 E., on left bank, 1,500 ft. upstream from mouth, and 1½ miles southwest of Alder.

Drainage area.—28.0 sq. mi.

Gage.—Water stage recorder. Datum of gage is 977.9 ft. above mean sea level (stadia traverse). Prior to Apr. 19, 1921, staff gages at approximately same site at different datums.

Average discharge.—22 years (1920-42), 118 cfs.

Extremes.—1920-43: Maximum discharge, 2,920 cfs Dec. 20, 21, 1933 (gage height, 6.8 ft.), from rating curve extended above 1,300 cfs; minimum, 0.9 cfs July 17, 1926, caused by temporary storage behind splash dam upstream; minimum gage height, 0.52 ft. Sept. 22, 23, 1938.

Remarks.—No diversion. Some regulation by splash dam above station, 1925-30.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920											17.1	124*	
1921	234	157	305	274	308	277	161	130	60.0	22.8	11.3	20.0	164
1922	86.6	260	308	56.7	71.5	99.5*	166	250	92.2	17.6	11.8	14.2	120*
1923	48.3	41.6	237	502	93.9	102	188	95.8	57.6	20.8	14.7	10.7	114
1924	67.6	60.0	212	170	324	53.8	58.9	28.1	10.6	7.29	7.03	9.25	83.2
1925	146	327	149*	358	336	85.0	123	75.9	45.2	13.2	10.9	6.64	135*
1926	5.44	56.0	223	135	247	77.7	31.2	40.3	17.9	5.70	6.60	17.1	71.8
1927	103	177	252	320	334	163	141	187	74.9	21.6	10.8	37.5	151
1928	125	381	115	262	63.7	265	217	118	28.1	23.1	9.71	9.43	135
1929	61.3	97.0	163	108	40.0*	194	213	153	84.5	22.9	11.7	7.84	98.7*
1930	6.51	5.71	187	65.5*	328	136	84.8	76.1	31.6	14.1	9.21	8.38	77.7*
1931	11.7	37.6	49.2	250	161	228	220	36.7	72.4	23.1	7.27	8.99	81.6
1932	80.1	151	245	236	224	358	231	104	52.4	29.5	12.8	7.56	144
1933	22.8	321	266	248	78.1	293	165	197	183	40.6	16.3	58.9	158
1934	133	120	879	473	96.2	178	81.4	85.0	20.7	12.2	6.14	10.8	177
1935	158	375	216	362	191	121	122	100	43.4	18.9	7.74	13.9	144
1936	15.8	60.7	130	379	176	186	141	153	120	30.0	11.9	13.0	118
1937	7.95	5.86	164	25.8*	128	259	320	146	151	35.2	16.0	18.6	110*
1938	31.6	374	321	244	94.1	176	191	75.2	25.5	11.3	7.72	6.70	130
1939	33.7	109	154	251	174	167	110	55.6	36.5	16.5	9.54	9.27	93.5
1940	25.7	40.8	339	134	323	242	119	95.9	20.5	11.3	8.35	9.55	114
1941	35.6	95.5	145	196	87.7	73.1	51.0	86.6	37.7	15.6	10.9	40.9	73.3
1942	73.7	150	337	93.9	160	88.9	60.2	53.2	102	41.1	17.1	10.4	98.6
1943	24.4	323	256	124	253	160	206	59.2					

* Estimated.

NISQUALLY RIVER BASIN

Little Nisqually River near Alder, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920											12	14	
1921	48	27	104	71	104	52	57	72	32	12	9.0	8.2	8.2
1922	15	43	42		41		79	129	32	12	9	10	9
1923	12	20		80	41	62	78	56	24	12	9	8	8
1924	10	14	50	59	107	30	36	15	8.8	6.8	5.6	5.2	5.2
1925	15	90		78	57	54	50	39	17	9.2	7.6	3.5	3.5
1926	4.1*	4.6	60	53	94	34	21	20	5.0	3.5	3.4	5.0	3.4
1927	21	30	84	75	72	84	30	59	27	13	9.2	15	9.2
1928	57	82	58	50	25	25	108	32	21	12	5	5	5
1929	14	17	36			60	65	60	40	15	8.5	6.2	6.2
1930	3.4	3.1	4.0		96	39	52	27	22	10	7.8	6.9	3.1
1931	5.9	10	24	40	40	70	62	22	16	20	5.0	5.0	5.0
1932	6.4	51	49	64	36	110	137	62	24	13	7.5	6.2	6.2
1933	5.7	59	50*	54	36	124	93	135	74	19	8.4	9.2	5.7
1934	25	36	35	179	45	41	36	30	14	8.2	4.0	3.3	3.3
1935	5.0	96	79	65*	50	49	53	67	23	10	5.6	4.4	4.4
1936	7.0	9.8	29	74	38	74	55	74	42	17	8.0	8.0	7.0
1937	5.6	4.0	4.1	5*	10*	90	113	65	63	19	11	10	4.1
1938	13	34	74	107	59	92	94	42	16	8.0	6.5	4.8	4.8
1939	6.5	43	40	107	59	64	76	39	22	10	8.6	7.0	6.5
1940	8.2	20	80	43	77	53	55	31	13	9.2	7.3	7.0	7.0
1941	7.7	32	46	73	37	36	24	23	25	11	8.0	15	7.7
1942	25	22	37	50	46	46	38	30	35	24	14	7.2	7.2
1943	5.9	52	120	60	61	43	103	27					

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1920										
1921	2,300	Dec. 30, 1920	8.2	164	5.86	79.77	110,000	159	77.10	115,000
1922	2,560	Dec. 11, 1921	9	120	4.29	58.30	87,000	93.0	45.06	67,400
1923	2,560	Jan. 7, 1923	8	114	4.07	55.32	82,700	115	55.51	83,300
1924	1,999	Dec. 6, 1923	5.2	83.2	2.97	40.46	60,400	107	51.76	77,300
1925	1,539	Nov. 19, 1924	3.5	138	4.93	66.99	100,000	110	53.45	79,800
1926	925	Dec. 23, 1925	3.4	71.8	2.56	34.81	51,900	92.4	44.53	66,900
1927	1,750	Jan. 2, 1927	9.2	151	5.39	73.12	109,000	158	76.51	114,000
1928	1,790	Nov. 24, 1927	5	135	4.82	65.57	97,900	170	53.58	80,000
1929	1,210	Dec. 10, 1928	6.2	96.7	3.45	46.87	70,000	86.7	41.97	62,700
1930	1,270	Dec. 14, 1929	3.1	77.7	2.78	37.68	50,300	69.1	33.49	50,000
1931	1,880	Feb. 12, 1931	5.0	91.6	3.27	44.43	66,400	124	59.55	89,400
1932	2,740	Feb. 26, 1932	6.2	144	5.14	70.15	105,000	155	75.38	113,000
1933	1,600	Nov. 13, 1932	5.7	158	5.64	76.47	114,000	203	98.28	147,000
1934	2,920	Dec. 20, 21, 1933	3.3	177	6.32	85.57	127,600	143	69.47	103,700
1935	2,170	Jan. 22, 1935	4.4	144	5.14	69.71	104,100	98.6	47.78	71,350
1936	1,510	Jan. 12, 1936	7.0	118	4.21	57.42	85,750	118	57.17	85,360
1937	2,090	Apr. 14, 1937	4.1	110	3.93	53.42	79,770	154	74.69	111,500
1938	1,950	Dec. 28, 29, 1937	4.8	130	4.64	62.03	93,980	94.1	45.60	68,110
1939	1,489	Jan. 2, 1939	6.5	93.5	3.34	45.35	67,740	103	49.59	74,520
1940	2,250	Dec. 15, 1939	7.0	114	4.07	55.20	82,440	103	49.94	74,570
1941	1,510	Jan. 18, 1941	7.7	73.3	2.62	35.54	53,070	97.0	47.05	70,260
1942	1,810	Dec. 19, 1941	7.2	96.6	3.52	47.80	71,370	102	49.34	73,680
1943	2,250	Nov. 23, 1942								

* Estimated.

Alder Reservoir at Alder, Wash.

Location.—Lat. 46°48'05", long. 122°18'30", in NW¼ sec. 9, T. 15 N., R. 4 E., near left end of Alder Dam on Nisqually River, 1 mile west of Alder, and 4½ miles upstream from Mashel River.

Drainage area.—286 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 7.61 ft. below mean sea level, datum of 1929 (levels by city of Tacoma). Prior to July 8, 1946, vertical staff gage which is present reference gage.

Extremes.—1944-53: Maximum contents, 231,680 acre-ft. Aug. 6, 1953 (elevation, 1,206.98 ft.); minimum observed (since reservoir first filled), 93,990 acre-ft. Feb. 16, 1949 (elevation, 1,147.61 ft.).

Remarks.—Reservoir is formed by concrete arch dam; storage began Nov. 7, 1944; dam completed in 1945. Capacity 179,600 acre-ft. between gage height 1,114 ft. (lower limit of operating range) and 1,207 ft. (top of spillway gates). Dead storage, 52,100 acre-ft. Water is used by city of Tacoma for power development. Figures given herein represent total contents.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945	.....	17,990	61,090	178,420	203,870	204,160	192,590	153,900	189,700	189,700	193,920	187,360	.....
1946	117,440	157,560	194,180	193,360	202,710	194,180	205,320	204,160	208,810	207,940	206,200	189,180	.....
1947	164,450	187,880	163,010	167,710	166,460	171,780	178,420	198,940	210,260	207,360	205,320	176,630	.....
1948	203,580	200,390	200,680	192,320	192,320	149,900	161,090	193,350	210,260	209,970	205,610	197,780	.....
1949	177,140	205,320	179,700	123,200	144,640	160,610	182,500	198,070	205,320	211,710	205,610	185,060	.....
1950	174,740	190,720	127,580	107,850	163,060	174,220	187,700	198,940	215,780	218,530	211,420	190,740	.....
1951	101,350	182,480	180,380	182,790	155,260	160,020	167,310	178,060	192,910	208,580	212,330	196,250	.....
1952	202,130	187,100	155,960	114,740	142,190	106,250	161,980	197,780	208,810	223,240	209,680	196,050	.....
1953	141,750	120,400	104,510	222,340	213,450	185,820	169,740	200,390	211,710	228,950	218,440	203,580	.....

La Grande Reservoir at La Grande, Wash.

Location.—Lat. 46°49'20", long. 122°18'10", in SE¼ sec. 33, T. 16 N., R. 4 E., at left end of gate control structure, 1 mile southeast of La Grande, and 1½ miles downstream from Alder Dam.

Drainage area.—289 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 7.61 ft. below mean sea level, datum of 1929 (levels by city of Tacoma). Prior to June 12, 1947, staff gages at dam.

Extremes.—1947-53: Maximum contents, 2,760 acre-ft. May 14, 1950 (gage height, 936.4 ft.); minimum (since reservoir first filled), 1,600 acre-ft. June 21, 1953 (gage height, 908.8 ft.).

Remarks.—Reservoir is formed by concrete dam completed in 1944; storage began February 1945. Usable storage, 1,050 acre-ft., between elevations 910 ft. (minimum efficient operating level) and 935 ft. (normal reservoir level). Dead storage, 1,630 acre-ft. Water used by city of Tacoma for power development. Figures given herein represent total contents.

NISQUALLY RIVER BASIN

LaGrande Reservoir at LaGrande, Wash.—Continued

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...					1,750	1,930	1,880	1,810	1,760	1,480	1,680	2,500	.....
1946...	2,280	2,540	2,530	2,320	2,460	2,410	2,430	2,420	2,420	2,500	2,480	2,480	.....
1947...	2,260	2,430	2,390	2,420	2,420	2,520	2,310	2,500	2,490	2,520	2,500	2,560	.....
1948...	2,500	2,330	2,480	2,390	2,360	2,360	2,340	2,060	2,470	2,480	2,510	2,460	.....
1949...	2,230	2,300	2,350	2,270	2,240	2,300	2,250	2,290	2,250	2,260	2,320	2,330	.....
1950...	2,290	2,270	2,330	2,310	2,310	2,340	2,450	2,240	2,340	2,250	2,260	2,310	.....
1951...	2,392	2,328	2,313	2,367	2,232	2,187	2,210	2,261	2,160	1,956	1,884	2,265	.....
1952...	2,223	2,323	2,333	2,323	2,531	2,333	2,318	2,362	2,280	2,284	2,357	2,280	.....
1953...	2,270	2,397	2,328	2,294	2,246	2,352	2,338	2,328	2,147	1,960	2,313	2,338	.....

Tacoma Power Conduit near La Grande, Wash.

Location.—Lat. 46°48'00", long. 122°18'30", in NW¼ sec. 9, T. 15 N., R. 4 E., on right bank, 750 ft. downstream from headworks and diversion dam, and 2½ miles southeast of La Grande.

Gage.—Long-distance water-stage recorder. Altitude of gage is 925 ft. (from river-profile map).

Average discharge.—12 years (1919-31), 512 cfs.

Extremes.—1919-31: Maximum discharge, 987 cfs Mar. 27, 1931 (gage height, 11.15 ft.); no flow at times when gates are closed.

Remarks.—Conduit diverts from left bank of Nisqually River in NW¼ sec. 9, T. 15 N., R. 4 E., 700 ft. upstream from Nisqually River near La Grande gaging station. Water is used by city of Tacoma for power development. Flow regulated.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920...	18,400	30,200	33,500	33,800	31,000	32,000	32,100	34,100	30,500	29,700	31,400	31,200	368,000
1921...	35,300	32,100	36,200	33,900	28,700	28,200	25,200	23,700	20,000	19,400	19,600	21,100	321,000
1922...	26,600	30,200	34,600	34,000	29,000	31,500	29,900	27,200	22,200	20,400	22,700	24,600	333,000
1923...	23,900	23,100	27,500	36,300	32,400	30,900	34,100	35,500	27,300	30,600	31,700	28,600	373,000
1924...	25,600	22,900	36,600	38,100	34,700	32,900	32,700	29,500	25,300	29,500	33,000	24,100	365,000
1925...	23,600	35,400	40,300	39,700	38,100	41,500	39,000	38,300	36,500	34,100	29,800	22,300	410,000
1926...	18,300	26,700	43,100	44,500	40,700	44,000	39,900	42,400	34,800	33,400	30,200	24,600	423,000
1927...	21,400	24,500	27,100	38,800	37,800	39,500	40,200	38,200	33,400	19,100	26,700	28,300	375,000
1928...	30,700	12,300	19,300	11,800	21,800	22,600	27,300	10,000	20,100	30,600	32,200	25,900	264,000
1929...	29,800	30,300	35,700	34,900	22,900	44,500	44,000	45,800	44,300	41,000	37,200	23,400	435,000
1930...	17,500	12,100	39,800	32,100	44,700	33,700	42,800	45,400	40,900	38,600	32,700	23,500	409,000
1931...	23,000	26,900	31,200	48,000	37,600	49,700	31,400	17,500	18,900	25,900	34,700	17,000	365,000

NISQUALLY RIVER BASIN

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Nisqually River at La Grande, Wash.

Location.—Lat. 46°50'30", long. 122°19'35"; in SE¼ sec. 29, T. 16 N., R. 4 E., on right bank, half a mile downstream from city of Tacoma powerplant, half a mile northwest of La Grande, and three-quarters of a mile upstream from Mashel River.

Drainage area.—292 sq. mi. At sites 1906-11 and 1919-31, 286 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 490 ft. (from river-profile map). Prior to Mar. 9, 1945, staff gages or water stage recorders at several sites within 4 miles of present site, at different datums.

Average discharge.—27 years (1906-11, 1919-31, 1943-53), 1,320 cfs (unadjusted).

Extremes.—1906-11, 1919-31, 1943-53: Maximum discharge, 19,500 cfs Dec. 12, 1921; practically no flow at times as result of regulation.

Remarks.—Records in this report for October 1919 to September 1931 include flow of Tacoma power conduit which, for this period, diverted above the station and was returned to river below station. Flow regulated by Alder Reservoir at Alder since November 1944, and by La Grande Reservoir at La Grande since February 1945. Discharge for part of some years computed from power plant records.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907...	1,150	3,500*	2,570	1,550	2,850	954	1,810	1,510	1,060	1,000	718	662	1,600*
1908...	520	1,370	1,900*	1,740	1,230	1,820	1,990	1,670	1,750	1,770	967	551	1,440*
1909...	568	1,230	1,210	1,430*	680*	501*	1,915*	1,570	1,940	1,180	788	560	1,050*
1910...	386	3,550	1,920	1,530	1,840	3,210	2,100	1,600	962	761	642	483	1,570
1911...	1,310	2,870	1,820	1,320	680	1,020	1,130	2,690	2,170	1,590*	755*	751	1,510*
1912...	1,150												
1920...	418*	1,290*	1,800*	1,950	1,050*	904	1,300	1,360	1,310	859	661	1,260	1,180*
1921...	2,160	1,610	2,220	2,650	3,100	2,500	1,700	1,880	1,830	1,020	650*	456*	1,810*
1922...	729*	1,700*	3,250	598*	575*	739	1,170	2,150	1,740	760	636	547	1,220*
1923...	514*	514*	1,720	3,870	835	964	1,470	1,560	1,330	998	732	497*	1,260*
1924...	602*	654*	1,670	1,470	3,150	734	823	1,120	752	681	505*	445*	1,050*
1925...	812	2,180	1,860	2,470	3,040	993	1,530	1,620	1,010	794	550*	383*	1,430*
1926...	311	467	2,010	1,340	1,910	1,060	762	898	690	650	543	446	920
1927...	1,130	1,370*	1,830	2,170	2,090	1,390*	1,210*	1,360	1,770	1,000	588*	776*	1,420*
1928...	1,590	3,220	1,520	2,440	757*	1,900	1,720	1,700	860	861	553	450	1,470*
1929...	742	747	963	783	440*	1,290	1,420	2,080	1,720	874	623	404	1,010*
1930...	290	207	1,270	656*	2,400	1,240	1,220	1,080	755	677	544	404	893*
1931...	427	469*	547*	1,890	1,390*	1,750	2,050	1,200	1,160	865	646	502*	1,070*
1944...	465*	620*	1,405	1,338	1,082	761	1,032	1,124	896	632	453	401	858*
1945...	370	435	154	89.6*	1,706*	1,366	1,235	2,708	638	730	387	638	866*
1946...	1,615	1,318	1,769	2,177	1,561	1,813	1,544	2,169	1,741	1,233	655	661	1,525
1947...	1,214	1,590	3,956	1,618	2,203	1,146	1,355	779	742	741	482	921	1,392
1948...	1,463	2,395	1,763	2,384	1,997	2,015	1,339	1,973	1,606	1,047	773	669	1,019
1949...	1,050	1,217	2,064	1,431	1,620	1,746	1,685	2,509	1,370	921	684*	815	1,433*
1950...	923	1,754	2,831	2,467	1,746	2,658	1,722	1,846	2,117	1,381	969	906	1,778
1951...	1,262	2,974	3,235	2,253	3,543	1,621	1,661	1,475	853	490	452	710	1,697
1952...	1,364	1,774	2,063	1,715	1,577	1,573	893	1,214	874	662	804	688	1,265
1953...	1,240	593	925	2,702	2,351	1,475	1,484	1,124	1,205	887	860	805	1,299

* Estimated.

NISQUALLY RIVER BASIN

Nisqually River at LaGrande, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1907	116,600	Nov. 15, 1906	380	1,600	5.59	76.00	1,160,000	1,310	62.12	949,000
1908	17,020	April 19, 1908	380	1,440	5.03	68.62	1,050,000	1,380	65.86	1,000,000
1909				1,050	3.67	49.63	756,000	1,280	60.80	926,000
1916	110,600	Mar. 2, 1910	305	1,570	5.49	74.46	1,140,000	1,580	75.13	1,150,000
1911	110,500	Nov. 21, 1910		1,510	5.28	71.79	1,100,000			
1920	11,500	Dec. 24, 1919		1,180	4.13	56.24	860,000	1,390	66.15	1,010,000
1921	12,500	Dec. 30, 1920		1,810	6.33	55.93	1,310,000	1,780	84.43	1,290,000
1922	19,500	Dec. 12, 1921		1,220	4.27	57.96	885,000	977	46.42	708,000
1923	16,600	Jan. 7, 1923		1,260	4.41	59.58	912,000	1,270	60.27	922,000
1924	13,100	Feb. 12, 1924		1,050	3.67	49.95	762,000	1,210	57.58	877,000
1925	9,410	Feb. 3, 1925		1,430	5.00	67.87	1,030,000	1,260	59.36	910,000
1926	6,700	Dec. 23, 1925	184	920	3.22	43.66	666,000	1,050	49.76	760,000
1927	9,200	Jan. 2, 1927	403	1,420	4.97	67.56	1,030,000	1,590	75.35	1,150,000
1928	13,900	Nov. 25, 1927	322	1,470	5.14	70.18	1,070,000	1,150	54.90	837,000
1929	4,590	Dec. 10, 1928	186	1,010	3.53	47.87	729,000	951	45.29	638,000
1930	6,070	Dec. 14, 1929	115	893	3.12	42.36	640,000	864	41.02	620,000
1931	10,700	Mar. 31, 1931	249	1,070	3.74	50.89	777,000			

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR					
Year	Observed				Adjusted			Observed		Adjusted		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
	Dis-charge	Date										
1944			319	858	622,000			729	529,100	813	37.84	
1945	12,000	Feb. 8, 1945	4	866	626,800	1,128	3.86	52.40	1,181	855,300	1,369	63.68
1946	10,600	Dec. 31, 1945	206	1,525	1,104,000	1,527	5.23	70.99	1,699	1,230,000	1,656	76.97
1947	11,600	Dec. 14, 1946	364	1,392	1,007,000	1,375	4.71	63.94	1,292	935,400	1,344	62.44
1948	8,360	Jan. 2, 1948	170	1,619	1,175,000	1,647	5.64	76.77	1,512	1,098,000	1,484	69.16
1949	6,640	May 13, 1949	315	1,433	1,037,000	1,415	4.83	65.78	1,532	1,109,000	1,460	67.86
1950	15,000	May 14, 1950	389	1,778	1,288,000	1,786	6.12	83.04	1,942	1,406,000	2,015	93.67
1951	15,400	Feb. 10, 1951	414	1,607	1,220,000	1,705	5.84	79.26	1,505	1,090,000	1,476	68.60
1952	9,350	Dec. 28, 1951	462	1,265	918,200	1,265	4.33	58.95	1,064	772,200	989	46.00
1953	10,600	Feb. 1, 1953	204	1,209	940,200	1,309	4.48	60.86				

† Maximum observed.

NISQUALLY RIVER BASIN

Mashel River near La Grande, Wash.

Location.—Lat. 46°51'25", long. 122°18'05", in SE¼ sec. 21, T. 16 N., R. 4 E., on right bank, 50 ft. below highway bridge, 1¼ miles northeast of La Grande, and ¾ miles upstream from mouth.

Drainage area.—80.7 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 619.53 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—13 years (1940-53), 218 cfs.

Extremes.—1940-53: Maximum discharge, 7,980 cfs Dec. 11, 1946 (gage height, 9.30 ft.), from rating curve extended above 3,200 cfs; minimum, 4.5 cfs Sept. 24, 1952 (gage height, 1.72 ft.).

Remarks.—Small diversion for city of Eatonville water supply above station. Some regulation by millpond in Eatonville.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	63.4	201	242	222	98.6	88.3	162	157	114	26.2	20.9	108	125
1942...	194	244	575	178	253	163	132	206	294	98.1	25.3	13.2	198
1943...	22.0	339	484	243	421	245	342	145	159	42.2	19.2	16.2	205
1944...	74.1	98.4	250	234	207	164	203	141	83.3	20.6	14.1	53.3	127
1945...	36.1	105	142	322	350	411	409	441	101	20.3	14.1	67.2	201
1946...	73.0	476	431	593	441	414	258	204	329	135	26.0	32.1	276
1947...	148	450	590	478	409	182	232	67.2	60.7	42.9	19.4	30.9	253
1948...	198	584	445	521	471	295	341	422	193	63.5	58.6	83.3	305
1949...	126	471	494	149	499	423	337	285	72	32	16	15	242
1950...	96.5	224	379	334	670	567	332	267	191	61.3	28.2	31.3	263
1951...	188	518	519	529	567	295	253	165	52.7	14.7	12.7	23.1	259
1952...	229	335	353	198	409	245	264	139	66.3	44.4	13.3	11.3	191
1953...	10.0	12.9	83.2	694	368	266	245	255	246	71.5	40.3	40.3	194

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	18	94	92	107	54	45	45	47	56	16	13	27	13
1942...	68	62	121	85	94	100	78	87	111	43	16	10	10
1943...	11	64	205	110	132	52	147	93	68	19	13	11	11
1944...	10	35	64	97	91	95	110	91	33	13	9.7	9.2	9.2
1945...	18	30	53	87	116	158	256	264	38	13	9.2	10	9.2
1946...	20	193	129	179	193	262	185	120*	96	43	17	17	17
1947...	23	121	156	115	133	96	115	29	34	16	13	13	13
1948...	17	160	130	81	26	99	179	221	79	42	42	23	17
1949...	50	92	132	69	63	233	262	99	41	15	12	10	10
1950...	11.5	34	127	30*	105*	227	161	176	144	29	18.5	13	11.5
1951...	20	142	306	228	90	52	192	65	27	7.2	8.5*	6.6	6.6
1952...	44	66	146	56	134	94	138	70	30	16	9.6	7.2	7.2
1953...	6.8	8.4	14	104	96	100	150	108	129	40	18.5	27	6.8

* Estimated.

NISQUALLY RIVER BASIN

Mashel River near LaGrande, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1941	1,320	Jan. 18, 1941	13	125	1.55	21.07	96,680	168	28.29	121,600
1942	4,040	Dec. 19, 1941	10	198	2.45	33.29	143,300	183	30.84	132,700
1943	2,660	Mar. 28, 1943	11	205	2.54	34.42	148,200	169	28.50	122,700
1944	1,720	Dec. 3, 1943	9.2	127	1.57	21.50	92,560	116	19.52	84,000
1945	1,910	Feb. 7, 1945	9.2	201	2.49	33.78	145,400	259	43.56	187,500
1946	2,460	Nov. 26, 1945	17	276	3.42	46.35	199,500	319	53.61	230,700
1947	7,980	Dec. 11, 1946	13	253	3.14	42.40	182,900	230	38.70	166,600
1948	3,800	Nov. 7, 1947	17	305	3.78	51.52	221,700	294	49.62	213,600
1949	2,660	Feb. 17, 1949	10	242	3.00	40.65	175,000	209	35.18	151,400
1950	2,770	①	11.5	268	3.26	44.17	190,100	306	51.62	221,800
1951	2,880	Feb. 11, 1951	6.6	259	3.21	43.64	187,800	234	39.34	169,300
1952	2,070	Jan. 30, 1952	7.2	191	2.37	32.27	133,900	124	20.83	89,710
1953	1,890	Jan. 31, 1953	6.8	194	2.40	32.57	140,100			

① Feb. 24, Mar. 5, 1950.

Lynch Creek near Eatonville, Wash.

Location.—Lat. 46°52'50", long. 122°16'30", in SW¼ sec. 11, T. 16 N., R. 4 E., on left bank, a quarter of a mile upstream from mouth, and 1 mile northwest of Eatonville.

Drainage area.—16.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 550 ft. (from topographic map).

Extremes.—June to October 1949: Maximum discharge, 76 cfs Oct. 28 (gage height, 2.41 ft.); minimum, 4.2 cfs Sept. 13, 14 (gage height, 0.36 ft.).

Remarks.—Some diversion for irrigation above station. No known regulation.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									8.16	6.22	6.12	13.1	

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									5.9	4.8	4.3	5.4	

NISQUALLY RIVER BASIN

Ohop Creek near Eatonville, Wash.

Location.—Lat. 46°52'50", long. 122°16'45", in SE¼ sec. 10, T. 16 N., R. 4 E., on left bank, 400 ft. downstream from Lynch Creek, 600 ft. downstream from outlet of Ohop Lake, and 1 mile northwest of Eatonville.

Drainage area.—35.5 sq. mi.

Gage.—Water-stage recorder and, after July 20, 1948, concrete control. Datum of gage is 519.8 ft. above mean sea level (stadia traverse). June 3, 1927, to Sept. 30, 1932, water-stage recorder at same site at datum 2.79 ft. higher. Sept. 6, 1941, to Mar. 17, 1942, staff gage at present datum.

Average discharge.—17 years (1927-32, 1941-53), 63.6 cfs.

Extremes.—1927-32, 1941-53: Maximum discharge, 1,600 cfs Dec. 11, 1946 (gage height, 5.97 ft.); minimum, 2.3 cfs Aug. 22, 23, 1944.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927									32.7	11.3	8.13	35.4	.....
1928	90.8	191	99.7	169	39.9	135	141	59.9	22.2	18.1	8.25	8.51	82.1
1929	30.6	24.8	52.7	58.7	52.0	127	104	81.5	63.6	14.6	7.49	6.67	51.2
1930	7.69	11.0	69.4	39.4	153	85.7	44.3	38.0	22.7	8.52	5.31	6.03	40.1
1931	12.4	41.3	27.4	87.4	64.2	70.3	121	29.9	61.3	21.3	7.51	10.3	45.9
1932	49.0	73.7	56.6	86.4	111	191	98.6	32.4	12.2	20.1	5.88	9.69	62.0
1941													36.7
1942	49.4	72.5	174	66.9	71.0	54.9	41.9	66.4	114	47.2	13.8	7.8	65.0
1943	8.3*	111	131	76.5	122	58.4	95.9	43.7	47.5	15.3	8.1	11.9	60.2*
1944	50.3	26.2	68.4	63.8	67.9	68.2	55.5	35.1	23.7	6.04	5.90	16.0	37.8
1945	12.8*	23.8*	37.8	93.3	101	113	125	101	28.1	6.99	4.97	12.8	54.7*
1946	18.7	120	118	162	151	133	60.6	26.6	79.9	53.0	8.51*	19.0	78.7*
1947	48.1	148	268	155	96.7	59.0	92.1	19.4	29.1	17.3	10.2	9.74*	79.3*
1948	57.2	132	117	128	121	121	123	115	68.7*	29.4	23.7	29.3	88.5*
1949	49.7	112	237	53.8	144	104	67.5	51.2	15.1	12.2	9.07*	9.43	71.7*
1950	28.4	67.9	114	139	200	172	108	65.2	22.2	12.3	13.9	12.7	78.9
1951	58.1	145	162	183	202	102*	43.8	30.6	15.6	8.49	5.30	12.4	80.0*
1952	59.6	77.5	102	49.5	92.0	78.1	62.4	42.7	18.7	13.9	6.20	4.44	50.5
1953	9.83	8.51	24.5	142	122	75.5	71.3	70.5	90.8	27.6	12.0	14.7	55.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927									18	8.0	6.3	11	.....
1928	35	43	46	50	29	27	84	26	18	9.6	7.4	7.0	7.0
1929	12	15	17	25	27	74	72	37	27	9.0	6.1	5.5	5.5
1930	6.5	7.0	11	21	59	26	32	21	14	6.5	4.0	4.3	4.0
1931	5.6	10	18	21	38	39	28	18	15	9.7	6.0	6.0	5.6
1932	8.9	34	31	40	31	96	48	18			4.3		4.3
1941													15
1942	26	26	37	44	40	40	26	20*	46	23	9	5	5
1943		32	67	38	45	29	42	22	18	8	7	5	5
1944	8.7	17	17	34	44	33	26	26	11	3.3	2.5	7.0	2.5
1945	6.0*	9.5*	19.0	30	36	64	66	44	15.0	3.7	3.2	3.5	3.2
1946	4.3	60	42	48	72	75	36	10.5	15	14	6.5	9.7	4.3
1947	12	40	68	68	39	36	46	14.5	13.5	8.4	8.8	6.0*	6.0*
1948	6.0	60	70	47	34	71	80	49	31	20	17	10	6.0
1949	21	40	90	29	27	66	52	20	11	9.8	7.5*	6.5*	6.5*
1950	8.2	24	50	55	73	90	68	32	12	7.5	8.0	4.3	4.3
1951	17	37	81	92	68	60*	26	21	9.8	6.2	4.0	4.3	4.0
1952	19.5	30	58	30	53	44	31	22	3.0	4.9	4.3	3.6	3.6
1953	7.1	4.5	9.7	25	41	43	55	31	46	7.5	5.2	8.8	4.5

* Estimated.

NISQUALLY RIVER BASIN

Ohop Creek Near Eatonville, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acres-foot		Inches	Acres-foot
1927										
1928	511	Jan. 3, 1928	7.0	82.1	2.31	31.46	59,600	59.4	22.77	43,100
1929	298	Dec. 10, 1928	5.5	51.2	1.44	19.57	37,100	49.5	18.93	35,900
1930	416	Mar. 24, 1930	4.0	40.1	1.13	15.32	29,000	39.4	15.07	28,500
1931	606	April 1, 1931	5.6	45.9	1.20	17.57	33,200	54.2	20.72	30,200
1932	732	Mar. 5, 1932	4.3	62.0	1.75	23.79	45,000			
1941										
1942	840	Dec. 20, 1941	5	65.0	1.83	24.84	47,000	60.0	23.29	44,080
1943	485	Nov. 23, 1942	5	60.2	1.70	23.00	43,560	49.6	18.98	35,960
1944	286	Dec. 3, 1943	2.5	37.8	1.06	14.51	27,480	33.7	12.84	24,510
1945	344	April 12, 1945	3.2	54.7	1.54	20.93	39,630	70.0	26.76	50,080
1946	659	Jan. 5, 1946	4.3	78.7	2.22	30.11	57,000	96.2	36.80	69,660
1947	1,600	Dec. 11, 1946	6.0	79.3	2.23	30.32	57,420	66.0	25.22	47,750
1948	429	Feb. 26, 1948	6.0	88.5	2.49	33.94	64,270	96.4	36.95	69,970
1949	892	Dec. 9, 1948	6.5	71.7	2.02	27.44	51,940	55.9	21.36	40,460
1950	615	Feb. 25, 1950	4.3	78.9	2.22	30.17	57,140	91.9	35.12	66,590
1951	1,020	Feb. 11, 1951	4.0	80.0	2.25	30.59	57,910	69.5	26.58	50,300
1952	350	Oct. 23, 1951	3.6	50.5	1.42	19.37	36,610	34.1	13.08	24,710
1953	456	Jan. 31, 1953	4.5	55.4	1.56	21.18	40,100			

* Estimated.

NISQUALLY RIVER BASIN

Nisqually River near McKenna, Wash.

Location.—Lat. 46°51'20", long. 122°27'10", in SE¼ sec. 20, T. 16 N., R. 3 E., on right bank, 800 ft. downstream from Elbow Creek, three-quarters of a mile upstream from Tanwax Creek, and 7.4 miles southeast of McKenna.

Drainage area.—445 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 373.6 ft. above mean sea level (stadia traverse). Prior to Sept. 30, 1941, staff gage at same site and datum.

Average discharge.—12 years (1941-53), 1,695 cfs.

Extremes.—1941-53: Maximum discharge, 17,700 cfs Feb. 11, 1951 (gage height, 11.37 ft.); maximum gage height, 11.45 ft. Dec. 11, 1946; minimum discharge, 85 cfs Oct. 19, 1945 (gage height, 2.57 ft.); minimum daily, 176 cfs Jan. 30, 1945.

Remarks.—Yelm Irrigation District canal diverts up to 70 cfs during summer season, 3.6 miles above station for irrigation below station. Major portion of flow regulated by Alder and La Grande Reservoirs (see p. 141).

NISQUALLY RIVER BASIN

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Nisqually River near McKenna, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941											461*	828	.....
1942	1,295	1,761	3,577	1,273	1,655	1,117	1,128	1,363	2,080	1,142	695	367	1,444
1943	313	2,721	2,914	1,907	2,629	1,889	3,985	1,621	1,561	1,014	508	436	1,705
1944	594	777	1,727	1,601	1,451	1,070	1,942	1,303	1,004	620	428	521	1,036
1945	486	601	370	592	2,298	2,214	2,201	3,954	770	741	365	703	1,271
1946	1,759	1,983	2,461	3,214	2,272	2,428	1,859	2,349	2,204	1,485	659	710	1,949
1947	1,467	2,252	5,370	2,465	2,972	1,570	1,938	920	905	795	486	1,066	1,847
1948	1,922	3,260	2,565	3,031	2,519	2,477	1,943	2,047	2,028	1,023	814	807	2,065
1949	1,326	1,904	2,906	1,681	2,329	2,188	2,110	2,804	1,365	850	677	804	1,750
1950	928	2,008	3,399	3,060	2,636	3,346	2,177	2,189	2,214	1,435	955	931	2,104
1951	1,576	3,450	4,002	2,943	4,284	2,133	1,553	1,650	891	498	479	766	2,037
1952	1,645	2,241	2,482	1,976	2,120	1,929	1,248	1,409	951	706	845	692	1,520
1953	1,281	578	1,038	3,416	2,991	1,923	1,920	1,511	1,594	1,021	945	910	1,587

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941											271	400*	.....
1942	546	517	1,290	878	757	750	985	841	1,240	722	309	241	241
1943	196	709	1,780	1,250	1,230	728	1,640	1,120	1,140	707	360	308	196
1944	300	408	638	785	645	655	544	1,030	807	429	336	374	300
1945	322	308	295	176	434	550	507	2,376	384	351	341	332	176
1946	245	1,320	1,350*	1,040*	1,800	1,800*	1,520	1,590	1,180	644	458	635	248
1947	1,050	1,360	1,760	1,310	1,500	892	965	428	602	398	314	415	314
1948	570	1,430	1,250	945	1,380	2,220	1,250	796	336	584	405	312	336
1949	762	596	1,140	877	1,270	1,610	1,600	477	701	403	312	378	312
1950	352	739	962	1,380	1,450	1,410	1,450	1,480	1,240	679	453	350	350
1951	708	882	1,940	1,620	1,490	1,470	1,400*	750	472	443	432	416	416
1952	172	1,170	1,860	928	1,710	1,290	784	610	576	474	466	419	419
1953	460	197	303	732	1,340	1,240	1,180	866	964	548	521	516	197

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1941							
1942	16,000	Dec. 19, 1941	241	1,444	1,045,000	1,383	1,001,000
1943	16,400	Nov. 23, 1942	196	1,705	1,234,000	1,468	1,063,000
1944	10,800	Dec. 3, 1943	300	1,036	751,800	895	649,400
1945	14,400	Feb. 8, 1945	176	1,271	919,900	1,673	1,211,000
1946	10,500	Dec. 31, 1945	248	1,949	1,471,000	2,193	1,588,000
1947	17,000	Dec. 11, 1946	314	1,847	1,337,000	1,731	1,253,000
1948	10,300	Jan. 2, 1948	336	2,065	1,514,000	1,952	1,417,000
1949	8,460	Dec. 9, 1948	312	1,750	1,267,000	1,767	1,279,000
1950	11,100	Nov. 27, 1949	350	2,104	1,523,000	2,329	1,638,000
1951	17,700	Feb. 11, 1951	416	2,037	1,475,000	1,814	1,313,000
1952	6,520	Dec. 18, 1951	419	1,520	1,103,000	1,230	892,900
1953	10,700	Feb. 1, 1953	197	1,587	1,749,400		

* Estimated.

NISQUALLY RIVER BASIN

Tanwax Creek near McKenna, Wash.

Location.—Lat. 46°51'55", long. 122°27'05", in NW¼NE¼ sec. 20, T. 16 N., R. 3 E., on left bank, a quarter of a mile upstream from mouth, and 7 miles southeast of McKenna.

Drainage area.—26.6 sq mi.

Gage.—Water-stage recorder. Altitude of gage is 390 ft. (from topographic map).

Average discharge.—5 years (1945-50), 33.6 cfs.

Extremes.—1944-50: Maximum discharge, 328 cfs Dec. 15, 1946 (gage height, 3.20 ft.); minimum, 0.7 cfs Sept. 9, 1949, Sept. 16, 1950.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945			5.06	30.1	53.5	44.5	61.0	42.4	15.5	3.70	1.60*	2.50*	
1946	2.67	22.0	44.0	70.8*	79.5*	70.6	32.2	12.2	13.4	13.4	2.57	1.92	30.2*
1947	4.64	49.2	120	59.1	53.0	37.1	39.2	13.0	6.67	2.60	1.49	1.55	32.2
1948	4.25	29.0	53.2	81.3	70.0	68.9	50.8	46.4	18.6	6.90*	3.87	5.65	36.3*
1949	9.09	40.2	127	31.3*	78.4*	51.5	26.0	16.6	4.15	1.84	1.35	1.44	32.1*
1950	1.92	17.4	51.1	101	108	101							
1951	7.32						42.7	17.5	4.78	1.84	1.83	1.47	37.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945			3.5	6.2	22	27	27	15	6.7	1.9	1.2*	1.4*	
1946	1.2	6.1	22	40	60*	46	2.0	7.9	7.1	5.2	1.8	1.4	1.2
1947	1.5	6.4	42	29	25	24	19	7.9	3.7	1.9	1.2	1.3	1.2
1948	1.5	15.5	33	29	28	36	35	19.5	10	3.8	3.0	2.4	1.5
1949	5.2	16.5	48	17*	16*	33	17.5	5.4	2.7	1.3	.9	.8	.8
1950	.8	1.4	27	41*	60*	51	28	7.0	2.8	1.4	1.3	.9	.8
1951	1.2												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1945	181	April 11, 1945						26.8	13.67	19,370
1946	282	①	1.2	30.2	1.14	15.40	21,840	39.1	19.93	26,280
1947	328	Dec. 15, 1946	1.2	32.2	1.21	16.43	23,350	24.5	12.64	17,930
1948	206	Feb. 26, 1948	1.5	36.3	1.36	18.56	26,360	43.9	22.46	31,850
1949	310	Dec. 10, 1948	.8	32.1	1.21	16.0	23,270	23.3	11.80	16,520
1950	288	Jan. 23, 1950	.8	37.2	1.40	18.97	26,900			

* Estimated.

① About Dec. 29, 1945.

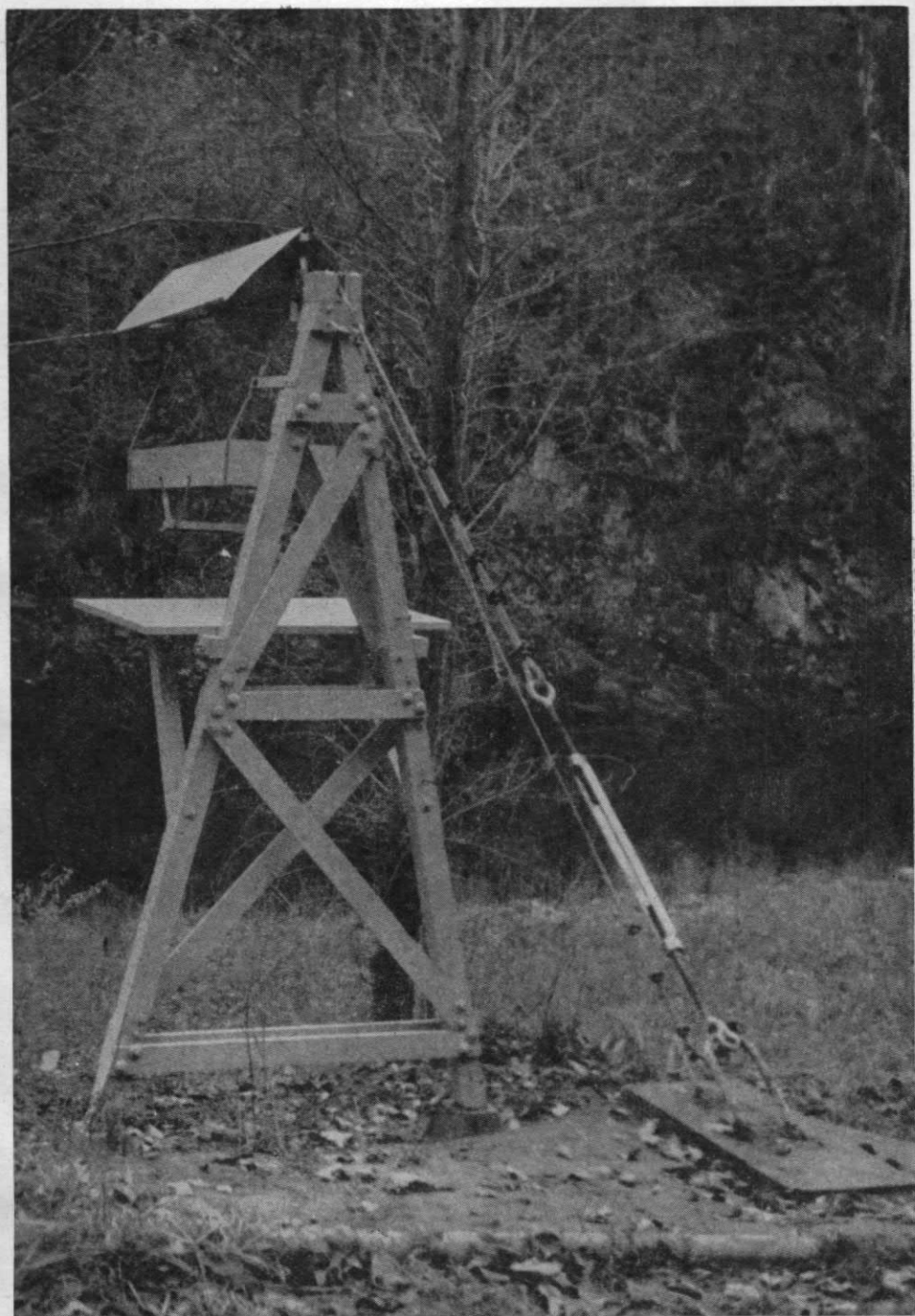


Figure 4. Typical wooden A-frame cable support, concrete anchorage and sitdown-type cable car. Baker River at Concrete.

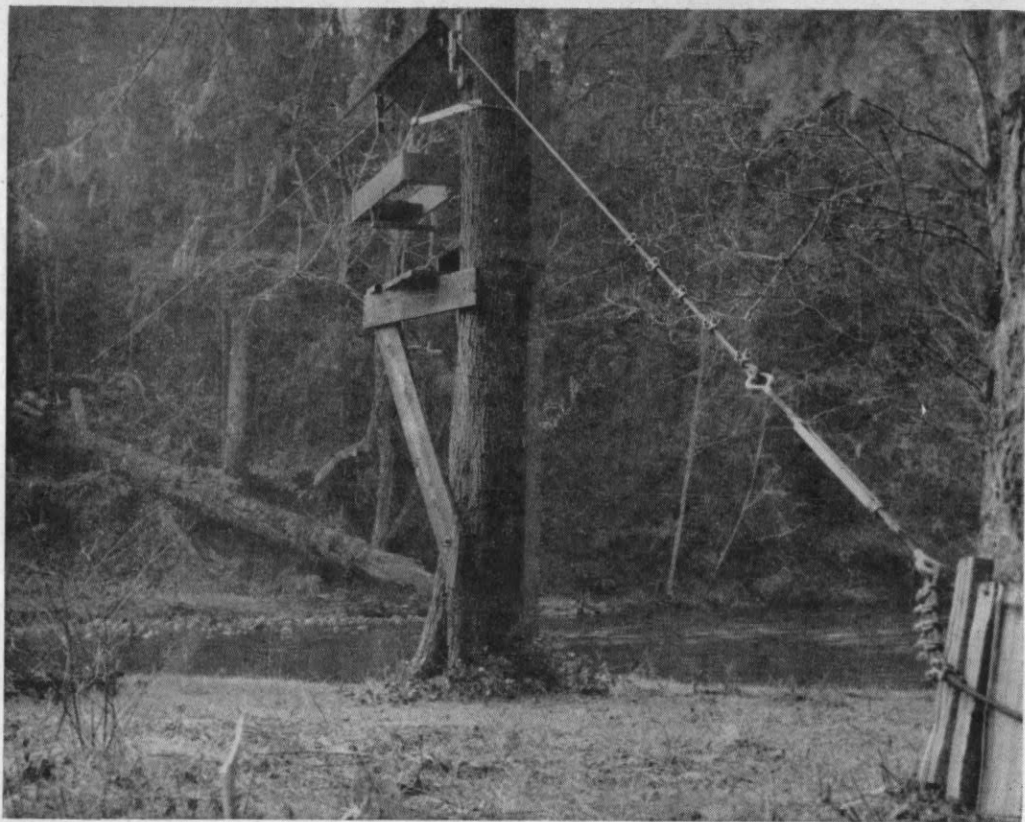


Figure 5. Cable installation utilizing trees for support and anchorage. Mashel River near La Grande.

Nisqually River at McKenna, Wash.

Location.—Lat. 46°56'00", long. 122°33'35", in SE¼NW¼ sec. 28, T. 17 N., R. 2 E., on left bank, 100 ft. downstream from highway bridge at McKenna, and 9.0 miles downstream from Tanwax Creek.

Drainage area.—517 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 275 ft. (from river-profile map).

Average discharge.—6 years (1947-53), 1,562 cfs.

Extremes.—1947-53: Maximum discharge, 16,900 cfs Feb. 11, 1951 (gage height, 11.30 ft.); minimum, 42 cfs Sept. 19, 1948 (gage height, 0.98 ft.).

Remarks.—Yelm Irrigation District canal diverts up to 70 cfs during summer months, 12.9 miles above station, and Centralia power canal diverts an average of 360 cfs 4.4 miles above station for irrigation and power below station. Major portion of flow regulated by storage reservoirs upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	1,582*	2,887	2,126	2,861	2,219	2,330	1,666	2,351	1,854	686	493	449	1,795
1949...	971	1,621	2,990	1,449	2,209	2,096	1,798	2,659	1,174	629	447	508	1,548
1950...	672	1,872	3,336	3,132	2,741	3,398	1,910	1,837	1,894	1,135	648	635	1,931
1951...	1,220	3,012	3,561	2,656	4,091	1,827	1,591	1,293	586	181	148	380	1,696
1952...	1,228	1,705	2,183	1,647	1,772	1,552	910	1,128	507	364	477	334	1,165
1953...	872	272	655	2,983	2,659	1,568	1,534	1,124	1,252	817	685	518	1,237

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	250*	912	756	658	1,100	2,050	905	560	169	314	164	128	128
1949...	408	589	929	648	998	1,700	1,570	314	424	130	109	117	109
1950...	135	533	768	1,290	1,450	1,290	1,130	1,120	982	492	186	158	135
1951...	365	640	1,860	1,340	1,380	1,090	1,130	557	178	144	105	97	97
1952...	452	760	1,569	659	1,370	965	484	306	245	163	164	120	120
1953...	182	58	132	462	1,060	970	834	502	738	815	255	180	58

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1948.....	11,500	Jan. 2, 1948	126	1,795	1,303,000	1,713	1,244,000	
1949.....	9,170	Dec. 9, 1948	109	1,548	1,121,000	1,573	1,139,000	
1950.....	12,200	Nov. 28, 1949	135	1,931	1,398,000	2,091	1,514,000	
1951.....	16,900	Feb. 11, 1951	97	1,696	1,228,000	1,480	1,071,000	
1952.....	5,289	Dec. 5, 1951	120	1,165	845,000	851	639,500	
1953.....	9,990	Feb. 1, 1953	58	1,237	895,500	.....	.....

* Estimated.

NISQUALLY RIVER BASIN

Muck Creek near Loveland, Wash.

Location.—Lat. 47°00'55", long. 122°25'15", on west line sec. 27, T. 18 N., R. 3 E., on right bank at county road crossing, 1 mile upstream from South Creek, and 3½ miles south of Loveland.

Drainage area.—16.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 410 ft. (from topographic map).

Extremes.—July to October 1949: Maximum discharge, 8.0 cfs Sept. 4 (gage height, 1.09 ft.); minimum, 1.6 cfs July 23 (gage height, 0.68 ft.).

Remarks.—Small diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									2.98	3.17	3.84		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									2.1	2.3	2.6		

CHAMBERS CREEK BASIN

Clover Creek near Tillicum, Wash.

Location.—Lat. 47°08'40", long. 122°30'10", on west line sec. 12, T. 19 N., R. 2 E., on right bank, 1½ miles upstream from mouth, and 2½ miles northeast of Tillicum.

Drainage area.—70.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 270 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 568 cfs Feb. 12, 1951 (gage height, 4.64 ft.); no flow for many days in 1949, 1952-53.

Remarks.—Some diversion for domestic use and by army air base above station. Probably some regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										8.53	3.05	1.07	
1950	0.23	4.01	27.4	124*	128	192	121	65.7	37.5	19.9	11.4*	6.37	61.1*
1951	10.4	25.0	119	158	279	173	88.0	46.9	26.2	12.5	3.79	1.40	77.4
1952	3.99	6.27	19.5	25.2	47.1	40.6	29.8	20.8	12.0	4.47	.56	.077	17.4
1953	0	0	0	30.1	103	47.8	40.7	31.5	21.4	10.7	3.65	2.40	23.7

* Estimated.

CHAMBERS CREEK BASIN

Clover Creek near Tillicum, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										5.6	1.6	0.3	0.3
1950	0	0	17.5	70	110*	151	92	49	30	13.5	8.8	4.5	0
1951	7.7	14.5	71	122	143	130	62	35	17.5	8.0	1.2	.8	.8
1952	2.2	3.3	11.5	21	36	36	25	16	8.0	2.0	.1	0	0
1953	0	0	0	0	63	41	38	28	16	5.9	2.5	1.6	0

Summary

WATER YEAR ENDING SEPTEMBER 30°

CALENDAR YEAR

YEAR	Momentary maximum		Minl- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1949			0.3							
1950	290	Mar. 6, 1950	0	61.1	0.87	11.80	44,190	71.4	13.79	51,690
1951	568	Feb. 12, 1951	.8	77.4	1.10	14.96	56,060	66.9	12.93	48,440
1952	60	Feb. 4, 1952	0	17.4	.248	3.37	12,070	14.9	2.88	10,850
1953	164	Feb. 5 or 6, 1953	0	23.7	.337	4.55	17,170			

Chambers Creek at Steilacoom Lake, near Steilacoom, Wash.

Location.—Lat. 47°10'45", long. 122°32'00", in SW¼NE¼ sec. 34, T. 20 N., R. 2 E., on right bank, 450 ft. downstream from outlet of Steilacoom Lake, and 3 miles northeast of Steilacoom.

Drainage area.—78.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map).

Extremes.—1938-40: Maximum discharge, 120 cfs sometime during period Mar. 8-12, 1940 (gage height, 2.13 ft., from recorded range in stage); minimum recorded, 0.7 cfs Nov. 26, 27, 28, 1938; minimum gage height recorded, 0.43 ft. Oct. 23-29, 1938.

Remarks.—Some small diversions for domestic use and irrigation above station. Flow regulated at outlet of Steilacoom Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1939	14.7	10.1	15.2	44.5	38.8	111	76.6	47.9	18.9	15.2	10.2*	5.77	38.0*
1940	16.7	10.6	12.0	41.8	66.6	104	18.0	71.6*	42.6*	23.7*	13.1	14.5*	41.2*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1939	12	0.7	0.8	9.6	63	99	62	30	5.2	12	7.6	3.7	0.7
1940	2.5	1.3	1.3	24	38	93	28	60*	25*	20*	6.3	10*	1.3

* Estimated.

CHAMBERS CREEK BASIN

Chambers Creek at Steilacoom Lake, near Steilacoom, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1939.....	118	Mar. 2, 3, 4, 1939	0.7	38.0	27,500	37.9	27,450
1940.....	120	①	1.3	41.2	29,890		

① Exact date not known; discharge from recorded range in stage Mar. 8-12.

CHAMBERS CREEK BASIN

Chambers Creek below Leach Creek, near Steilacoom, Wash.

Location.—Lat. 47°11'55", long. 122°31'40", in NE¼NE¼ sec. 27, T. 20 N., R. 2 E., on left bank, a quarter of a mile downstream from Leach Creek, 1½ miles downstream from outlet of Steilacoom Lake, and 4 miles northeast of Steilacoom.

Drainage area.—104 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map). Prior to July 14, 1952, 50 ft. downstream at same datum.

Average discharge.—12 years (1938-40, 1943-53), 110 cfs.

Extremes.—1937-40, 1943-53: Maximum discharge, 661 cfs Feb. 11, 1951; maximum gage height, 3.32 ft. Dec. 29, 1937 (from recorded range in stage); minimum discharge, 31 cfs Oct. 9-12, 1952 (gage height, 0.71 ft.).

Remarks.—Some diversions from tributaries for domestic use and for use at army air base above station. Partly regulated at outlet of Steilacoom Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938.....				343	269	224	229	176	108	80.9	67.1	77.6	.....
1939.....	57.3	65.6	76.3	109	182*	193	137	101	67.9	52.5	45.5	44.9	93.6*
1940.....	55.0	47.6	63.0*	86.5*	123*	186	135	130	85.5	60.5	47.0	56.2	89.5*
1943.....											48.4	46.4	.....
1944.....	57.3	49.5*	52.9	67.8	96.7	88.4	63.1	60.4	51.5	40.9	40.0	42.4	59.3*
1945.....	38.6	43.5	40.5	43.7	93.4	124	134	95.1	83.0	56.1	42.0	48.6	69.9
1946.....	49.5	61.1	82.6	217	257	256	201	127	101	75.0	54.9	50.1	127
1947.....	49.4	66.3	159	166	245	181	156	110	82.1	67.8	56.9	55.4	116
1948.....	66.9	71.5	89.2	204	186	237	213	201	126	101	94.8	79.7	139
1949.....	75.2	80.9	212	180*	200	211	169	110	81.0	58.4	45.6	51.5	123*
1950.....	46.1	53.7	94.7	265	278	448	270	175	113	79.9	68.0	59.7	162
1951.....	38.5	96.0	238	310	499	391	235	126	86.1	67.9	54.1*	50.5*	184*
1952.....	76.6	72.7	86.1	87.2	130	116*	84.7	72.0	61.1	44.9	42.7	40.7	76.1*
1953.....	36.0	37.6	42.7	81.3	234	135	111	89.5	79.3	71.8	41.6	47.1	82.8

* Estimated.

CHAMBERS CREEK BASIN

Chambers Creek below Leach Creek, near Steilacoom, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938				294	224	192	178	143	83	63	63	62	.....
1939	51	48	48	86	128	169	114*	50	59	48	44	41	41
1940	41	40*	40*	70*	85*	141	65	107	60*	54	37	48	37
1943											46	45	.....
1944	45	44*	46	56	85	83	48	54*	45	39	38	39	38
1945	35	38	37	36	49	106	105	70	68	47	40	40	35
1946	42	51	69	110	228	242	167*	93	75	64	49	48	42
1947	46	48	83	139	204	162	145	60	73	65	53	52	46
1948	52	65	74	139	145	193	191	169	93	89	84	69	52
1949	69	70	113	136	130	191	133	96	78	43	43	48	43
1950	37	44	68	163	241	356	218	142	89	64	61	57	37
1951	59	80	152	265*	301	310	150*	114	69	62	48*	48*	45*
1952	54	67	76	81	106	104	62	62	56	43	41	37	37
1953	31	35	40	45	165	119	86	74	64	49	38	40	31

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1938	461	Dec. 29, 1937	62			146	106,100
1939	278	①	41	93.8	67,920	91.0	65,800
1940	263	②	37	89.5	64,970		
1943							
1944	128	Feb. 6, 1944	38	59.3	43,030	56.2	40,770
1945	160	Apr. 8, 1945	35	69.9	50,620	75.9	54,920
1946	348	Jan. 7, 1946	42	127	91,860	134	96,860
1947	323	Feb. 2, 1947	46	116	84,070	112	81,170
1948	281	Jan. 14, 1948	52	139	101,000	151	109,600
1949	321	③	43	123	88,780	108	78,110
1950	611	Mar. 4, 1950	37	162	117,200	181	130,700
1951	661	Feb. 11, 1951	46	184	138,100	169	122,100
1952	152	Feb. 4, 1952	37	76.1	55,240	66.1	47,980
1953	347	Feb. 8, 1953	31	82.8	59,980		

* Estimated.

① Between Mar. 2 and 4, 1939.

② Between Mar. 8 and 12, 1940.

③ Feb. 17 or 18, 1949.

PUYALLUP RIVER BASIN

Puyallup River near Electron, Wash.

Location.—Lat. 46°54'10", long. 122°02'00", in NW¼ sec. 3, T. 16 N., R. 6 E., on left bank, 1,000 ft. upstream from Puget Sound Power and Light Co.'s flume headworks, a quarter of a mile downstream from Mowich River, and 10 miles southeast of Electron.

Drainage area.—92.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,640 ft. (from river-profile map). Jan. 1, 1909, to Dec. 31, 1912, staff gage, and Jan. 1, 1913, to Sept. 30, 1926, water-stage recorder at different datums.

Average discharge.—30 years (1908-33, 1944-49), 523 cfs.

Extremes.—1909-26, 1944-49: Maximum discharge, 9,160 cfs Dec. 11, 1946 (gage height, 8.75 ft.); minimum not determined, probably occurred during period of ice effect December 1914 or December 1922.

Remarks.—No diversion or regulation above station.

Cooperation.—Records for October 1923 to September 1933 furnished by Puget Sound Power and Light Co.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...	280	350	260	418	273	205	217	380	724	542	451	361	372
1910...	224	944	368	264	251	671	477	536	413	554	437	296	453
1911...	615	873	426	319	163	230	254	448	821	766	453	390	454
1912...	214	660	352	694	515	183	264	632	950	762	723	516	535
1913...	331	654	396	442	262	168	261	522	1,090	916	701	548	520
1914...	446	403	253	624	290	449	509	517	548	661	574	370	474
1915...	399	715	174	215	201	243	451	385	452	635	727	300	409
1916...	476	592	598	241	660	753	436	505	882	962	693	413	601
1917...	224	364	328	328	418	198	395	590	1,170	1,260	746	461	541
1918...	290	236	1,880	1,070	496	295	359	462	842	738	655	537	659
1919...	419	312	618	237	324	248	504	634	619	761	612	352	522
1920...	205	600	528	594	269	254	316	481	637	695	567	589	473
1921...	645	391	511	614	756	504	421	559	1,000	661	548	325	577
1922...	341	478	951	203	154	146	265	625	953	653	574	438	464
1923...	290	233	431	920	230	248	394	593	759	830	586	417	497
1924...	361	215	421	450	709	221	272	646	487	593	536	373	445
1925...	347	596	707	489	576	299	488	759	658	775	580	386	558
1926...	260	291	843	468	488	431	366	465	508	639	556	340	474
1927...	614	546	513	591	456	258	377	623	960	742	665	727	585
1928...	937	1,326	536	881	231	505	467	861	565	762	491	377	664
1929...	457	557	309	251	171	384	379	1,620	1,230	760	718	336	625
1930...	218	130	453	213	830	432	499	508	556	621	599	376	461
1931...	308	196	180	530	341	343	524	510	712	511	401	399	413
1932...	385	359	340	384	468	741	606	688	1,090	730	498	358	562
1933...	458	1,470	628	575	179	288	328	537	1,100	934	612	403	628
1945...	325	326	368	733	534	298	357	909	604	626	541	503	518
1946...	359	591	600	530	332	419	452	868	962	822	595	333	573
1947...	503	636	1,028	559	523	346	520	588	673	512	366	376	553
1948...	844	956	600	503	443	297	365	838	1,157	634	512	379	627
1949...	384	579	481	213*	407	418	535	995	797	664	472	369	523*

* Estimated.

PUYALLUP RIVER BASIN

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Puyallup River near Electron, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909				165	173	170	166	255	495	390	918	215	165
1910	136	181	178	120	168	290	272	330	272	290	284	154	120
1911	270	290	244	180	138	130	180	251	468	551	350	205	130
1912	156	150	220	184	262	147	219	293	598	539	397	346	147
1913	251	262	255	133	136	125	145	170	512	460	296	306	125
1914	239	254	174	193	188	245	235	349	340	461	371	207	174
1915	232	296	112	171	163	161	234	218	330	403	479	194	112
1916	235	225	301	173*	236	262	330	349	457	543	328	292	173*
1917	167	189	194	198	222	157	207	344	681	648	602	309	157
1918	185	159	178	421	228	158	232	304	405	536	434	315	158
1919	210	204	210	164	235	178	325	353	427	515	448	190	164
1920	136	244		178	154	147	192	272	353	480	345	345	136
1921	342	202	253	247	216	262	241	343	574	551	325	180	180
1922	202	192	231	140	126	120	183	303	664	415	842	245	120
1923	178	157		212		180	295	278	410	510	383	226	
1924	214	158	287	264	343	162	169	308	354	239	343	158	158
1925	176	206	380	237	276	216	204	478	368	627	517	192	176
1926	169	199	370	316	330	256	262	326	323	398	269	201	169
1927	253	297	300	243	253	246	243	347	562	537	300	378	243
1928	450	499	264	276	183	131	303	504	350	531	374	264	181
1929	211	168	183	165	140	158	206	543	729	411	466	136	136
1930	124	93	118	139*	333	155	354	273	391	390	336	153	93
1931	160	136	136	151	192	216	257	312	325	365	290	240	136
1932	209	209	187	183	132	375	392	410	506	424	312	250	132
1933	235	466	302	207	145	178	237	318	629	624	421	295	145
1945	258	208	184	188	222	204	250	690	420	436	380	296	184
1946	222	350	228	311	220	269	235	516	590	615	462	236	220
1947	162	242	335	278	272	228	329	384	460	388	255	275	162
1948	329	476	371	269	206	212	194	296	800	500	400	232	194
1949	186	214	205	165*	150*	266	249	561	480	484	326	256	150*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acres-foot		Inches	Acres-foot
1909			165	372	4.01	54.43	269,000	425	62.23	308,000
1910	12,490	Nov. 23, 29, 1909	120	453	4.38	66.24	328,000	489	71.06	352,000
1911	13,200	Nov. 10, 1910	130	484	5.22	70.86	350,000	426	62.31	308,000
1912	4,300	Nov. 19, 1911	147	538	5.80	78.95	391,000	551	80.87	405,000
1913	2,390	Dec. 29, 1912	125	520	5.60	76.12	377,000	498	72.80	360,000
1914	2,610	Jan. 4, 1914	174	474	5.11	69.33	343,000	489	71.49	354,000
1915	2,070	Nov. 2, 1914	112	409	4.41	59.83	296,000	441	64.48	320,000
1916	3,440	Dec. 21, 1915	173	601	6.48	88.12	436,000	539	79.08	391,000
1917	2,080	July 16, 1917	157	641	5.83	79.13	392,000	667	97.61	484,000
1918	7,700	Dec. 18, 1917	153	659	7.10	96.34	477,000	568	83.14	412,000
1919	6,540	Jan. 23, 1919	164	522	5.62	76.40	378,000	520	76.04	376,000
1920	2,720	Dec. 24, 1919	136	473	5.10	69.36	343,000	492	72.16	357,000
1921	3,750	Dec. 30, 1920	180	577	6.22	84.41	418,000	596	87.14	431,000
1922	6,980	Dec. 12, 1921	120	484	5.22	70.78	350,000	415	60.75	301,000
1923	5,810	Jan. 6, 1923		497	5.36	72.69	360,000	506	73.95	366,000
1924	3,350	Jan. 31, 1924	153	445	4.80	65.28	323,000	495	72.55	359,000
1925	2,830	Dec. 11, 1924	178	558	6.01	81.58	404,000	537	78.60	389,000

* Estimated.
† Maximum observed.

PUYALLUP RIVER BASIN

Puyallup River near Electron, Wash.—Continued

Summary—Continued

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1926	2,740	Dec. 23, 1925	169	474	5.11	69.29	343,000	497	72.66	359,700
1927			243	585	6.30	85.57	423,000	678	99.23	491,000
1928			181	664	7.16	97.35	452,000	516	75.73	375,000
1929			136	525	5.66	76.31	350,000	506	74.08	367,000
1930			93	451	4.88	65.93	325,000	441	64.46	319,000
1931			136	413	4.45	60.44	299,000	447	65.36	323,000
1932			132	552	5.95	80.90	402,000	673	98.72	490,000
1933			145	628	6.77	91.82	454,000	734	107.42	531,000
1945	4,590	Feb. 7, 1945	184	518	5.58	75.70	374,700	560	81.94	405,600
1946	3,830	Dec. 28, 1945	220	573	6.17	88.81	414,500	625	91.45	452,600
1947	9,160	Dec. 11, 1946	162	553	5.96	80.57	400,300	572	88.64	418,900
1948	6,580	①	194	627	6.76	92.02	455,500	543	79.08	394,400
1949	3,320	Nov. 23, 1948	150	523	5.64	76.44	375,300			

① Probably Nov. 7, 1947.

Puyallup River at Electron, Wash.

Location.—Lat. 46°59'45", long. 122°10'30", in NE¼ sec. 4, T. 17 N., R. 5 E., on left bank, a quarter of a mile downstream from Electron Powerplant, three-quarters of a mile east of Electron, and 1½ miles upstream from Fox Creek.

Drainage area.—131 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 630 ft. (from river-profile map).

Extremes.—July to October 1946: Maximum discharge, 1,410 cfs Oct. 20 (gage height, 4.19 ft.); minimum, 58 cfs Oct. 16, 19 (gage height, 1.48 ft.).

Remarks.—Flow regulated by powerplant a quarter of a mile above station; all water diverted upstream returned to river above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946										583	344		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946										436	219		

Kapowsin Creek near Kapowsin, Wash.

Location.—Lat. 46°59'30", long. 122°11'30", in NE¼ sec. 5, T. 17 N., R. 5 E., on right bank, half a mile downstream from Kapowsin Lake, and 1½ miles east of Kapowsin.

Drainage area.—23 sq. mi., approximately.

Gage.—Water-stage recorder and wooden control. Datum of gage is 561 ft. above mean sea level (stadia traverse). June 10, 1927, to Oct. 7, 1932, water-stage recorder at datum 3.23 ft. higher. Oct. 1, 1941, to Mar. 31, 1942, staff gage at same site and datum.

Average discharge.—17 years (1927-32, 1941-53), 47.6 cfs.

Extremes.—1927-32, 1941-53: Maximum discharge, 605 cfs Dec. 12, 1946 (gage height, 5.69 ft.); maximum gage height, 5.83 ft. Dec. 12, 1946 (backwater from debris); minimum discharge, 0.9 cfs Aug. 23-27, 1951 (gage height, 1.72 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927									31.5	11.3	5.47	13.9	
1928	62.4*	137	96.6	136	45.6	106	129	62.1	18.4	14.8	5.08	3.36	65.2*
1929	20.9	22.8	43.4	52.6	41.0	86.0	77.4	67.6	45.3	13.3	4.55	4.39	39.9
1930	5.88	7.76	46.0	30.4	125	69.0*	44.4	32.2	22.3	6.85	2.33	2.30	32.8*
1931	5.92	20.4	22.6	61.3	50.0	51.2	102	22.9	31.5	18.1*	4.62	8.02	33.1*
1932	19.9	61.2	54.2	76.2	94.5	166	95.1	40.1	13.7	8.30	5.45	3.80	53.1
1942	27.7	73.6	185	59.0	58.6	45.9	92.4	41.3	69.4	22.5	6.45*	3.34*	47.8*
1943	5.02*	83.0	96.7	65.1	95.2	43.0	79.3	34.4	35.7	11.7	5.12	5.01	46.1
1944	15.3	14.6	43.9	45.9	48.6	41.4	31.9	23.8	15.4	5.68	3.50	5.16	24.8
1945	7.56	19.9	26.3	65.5	71.3	74.0	80.8	66.0	25.3	4.54	2.30	7.19	36.7
1946	10.2	74.2	86.0	133	120	112	55.8	26.4	47.8	34.2	6.87	12.1	59.5
1947	25.8	102	181	101	77.2	44.5	64.0	21.8	20.4	12.7	4.80	4.84	54.8
1948	27.0	82.3	77.5*	96.1*	98.1*	95.9	86.9	85.4	41.1	17.3	12.2	16.0	61.2*
1949	33.1	83.5	169	43.7	116	71.4	49.2	43.4	10.1	6.24	4.05	6.03	52.7
1950	11.2	40.9	108	140	151	149	85.2	43.7	16.5	6.93	5.24	4.38	63.9
1951	34.2	108	138	139	176	81.5	33.6	20.7	10.1	2.86	1.42	2.53	61.6
1952	24.9	42.3	76.9	37.5	74.6	54.9	47.2	36.9	13.3	6.35	2.41	2.11	34.8
1953	2.65	4.00	13.2	99.9	102	50.1	53.9	46.7	56.3	19.9	6.76	6.64	38.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927									19	6.3	4.9	6.6	4.9
1928	36	43	53	53	34	31	91	28	14	7.0	3.2	2.5	2.5
1929	4.8	14	22	32	23	62	62	42	32	8.8	3.6	3.6	3.6
1930	5.2	5.6	8.1		46		32	19	12	3.6	1.6	1.6	1.6
1931	2.3	6.4	15	21	32	37	33	13	8.9	7.5	3.4	4.1	2.3
1932	7.2	44	33	41	37	94	59	24	6.1	5.4	4.6	2.7	2.7
1942	9.5	22	30	30	35*	31	17	17	31	12	4.0*	2.3*	2.3*
1943		21	69	36	34	18	34	20	15	5.8	4.2	3.8	
1944	3.8	8.8	14	26	30*	24	20	20	8.8	3.6	3.1	2.9	2.9
1945	5.4	11	13	20	35	54	50	33	12	1.2	1.2	2.0	1.2
1946	6.1	30	41	49	63	71	41	17	18	10	5.6	6.1	5.6
1947	11.5	35	56	41	33	32	40	15	14	7.6	3.4	3.0	3.0
1948	4.7	49	58	40*	33*	58	66	50	28	12.5	9.2	10.5	4.7
1949	18.5	24	67	29	28	54	39	15.5	7.4	4.5	4.3	4.5	4.3
1950	5.6	18	46	56	65	73	53	21	14.5	4.4	3.9	2.9	2.9
1951	7.6	33	77	79	59	40	21	16	4.7	1.6	.9	1.4	.9
1952	9.2	19	43	26	44	40	24	18.5	11	3.0	1.9	1.6	1.8
1953	1.9	3.8	4.1	12	33	33	45	22	34	6.7	4.3	4.1	1.9

* Estimated.

PUYALLUP RIVER BASIN

Kapowsin Creek near Kapowsin, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1927			4.9							
1928	302	Jan. 4, 1928	2.5	68.2	2.97	40.36	49,400	50.7	30.05	36,500
1929	149	Mar. 29, 1929	3.8	39.9	1.73	23.57	28,900	37.7	22.22	27,300
1930	189	Feb. 16, 1930	1.6	32.8	1.43	19.35	23,700	31.8	18.79	23,000
1931	263	Apr. 2, 1931	2.3	33.1	1.44	19.52	23,900	40.3	23.73	29,100
1932	393	Mar. 6, 1932	2.7	53.1	2.31	31.41	38,500			
1933										
1942	546	Dec. 19, 1941	2.3	47.8	2.08	28.21	34,600	43.4	25.62	31,430
1943	324	Nov. 24, 1942		46.1	2.00	27.24	33,400	36.9	21.80	26,720
1944	168	Dec. 4, 1943	2.9	24.8	1.08	14.68	18,020	23.2	13.70	16,820
1945	160	Apr. 11, 1945	1.2	36.7	1.60	21.68	26,570	46.4	27.40	33,600
1946	397	Jan. 6, 1946	5.6	59.5	2.59	35.08	43,050	71.1	41.04	51,450
1947	605	Dec. 12, 1946	3.0	54.8	2.38	32.36	39,700	44.6	26.31	32,290
1948	260	Feb. 26, 1948	4.7	61.2	2.66	36.80	44,400	69.6	41.17	50,490
1949	417	Dec. 10, 1948	4.3	52.7	2.29	31.08	38,140	42.8	25.28	31,030
1950	430	Feb. 26, 1950	2.9	63.0	2.78	37.68	46,250	73.1	43.12	52,920
1951	582	Feb. 12, 1951	.9	61.6	2.68	36.38	44,610	50.3	29.67	36,400
1952	176	Feb. 5, 1952	1.5	34.5	1.51	20.61	25,260	24.5	14.49	17,760
1953	285	Feb. 1, 1953	1.9	38.2	1.66	22.51	27,620			

Puyallup River near Orting, Wash.

Location.—Lat. 47°02'20", long. 122°12'25", in SW¼SW¼ sec. 17, T. 18 N., R. 5 E., on right bank, 600 ft. downstream from highway bridge, 4 miles south of Orting, and 9 miles upstream from Carbon River.

Drainage area.—172 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 357.5 ft. above mean sea level, unadjusted. Prior to Feb. 6, 1946, water-stage recorder 600 ft. upstream at datum 3.93 ft. higher.

March 1942 to February 1946, auxiliary water-stage recorder 200 ft. upstream at datum 2.1 ft. higher than present base gage datum, used to supplement base gage at times of doubtful record.

Average discharge.—22 years (1931-53), 694 cfs.

Extremes.—1931-53: Maximum discharge, 12,800 cfs Dec. 10, 1933 (gage height, 11.87 ft., from recorded range in stage), from rating curve extended above 3,300 cfs; minimum, 25 cfs Nov. 28, 1952 (gage height, 2.16 ft.); minimum daily, 59 cfs Nov. 29, 1952.

Remarks.—Water diverted for Electron powerplant is returned to river above station. Some regulation by Electron powerplant. Discharge obtained from supplemental gage for several periods 1942-46 when stage-discharge relations at base gages were unreliable.

PUYALLUP RIVER BASIN

Puyallup River near Orting, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931												303	
1932	471	588	494	698	898	1,270	858	743	965	745	504	382	715
1933	462	1,850	1,000	1,060	354	644	540	790	1,270	1,240*	724	439	866*
1934	1,038	1,046	3,015	2,314	635	794	645	530	311	540	532	330	985
1935	752	1,346	1,002	1,170	649	556	453	550	833	693	483	371	739
1936	270	256	303	927	470	697	791	1,282	1,275	615	449*	283	636*
1937	235*	153	683	205	481	674	938	815	1,373	813	474	446	607*
1938	373	1,299	1,041	880	397	477	866	772	698	708	495	443	705
1939	352	596	826	777	753	659	571	744	828	774	595	369	652
1940	242	323	1,040	463	905	749	586	719	515	515	509	486	587
1941	461	545	577	439	285	266	378	494	512	566	533	511	465
1942	599	816	1,138	455	436	353	454	700	1,120	925	670	409	675
1943	318	973	946	475	685	530	761	537	711	686	455	498	630
1944	411	354	787	470	480	417	399	601	701	608	497	627	528
1945	364	396	468	956	819	581	620	1,131	770	690	597	532	660
1946	378	838	898	925	743	755	614	892	1,075	910	603	381	751
1947	617	941	1,663	974	752	501	701	675	715	529	410	445	744
1948	1,056	1,365	887*	885*	780*	576	572	1,057	1,263	673	562	439	843*
1949	496	874	944	331*	772	691	657	1,092	790	620	468	387	668*
1950	485	831	799	890	1,167	1,151	722	730	1,176	960	586	403	823
1951	708	1,167	1,374	939	1,340	631	594	725	651	569	454	391	781
1952	801	692	682	336	668	403	647	747	578	626	453	311	577
1953	210	92.8	205	1,555	847	419	569	801	839	841	531	397	612

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931												168	
1932	164	298	268	305	337	686	618	468	547	424	310	226	164
1933	198	808	482	377	229	443	385	630	793		462	182	182
1934	290	390	420*	1,370	330	366	477	347	188	343	260*	191	188
1935	171	620	540	399	428	385	357	446	656	516	275	238	171
1936	179	161	214	364	234	364	371	728	579	462	286	147	147
1937	165	131	123	138	192	357	404	610	850	456	239	239	123
1938	102	294	544	544	336	357	336	484	430	484	357	294	192
1939	207	223	275	456	314	357	404	430	544	544	314	192	192
1940	134	150	336	257	336	484	380	404	357	380	314	336	134
1941	275	257	357	294	207	207	314	336	430	404	326	356	207
1942	322	322	283	342	265	265	365	412	790	620	280	214	214
1943	162	440	596	301	321	213	463	355	428	404	278	254	162
1944	232	206	282	278	296	268	269	394	585	452	363	306	206
1945	263	242	224	256	347	410	400	825	495	472	454	310	224
1946	178*	495	364	455*	434	451	385	601	638	616	450	265	178*
1947	165	242	440	295	397	382	490	461	536	418	316	338	165
1948	406	760	520*	440*	300*	397	236	424	991	515	429	256	256
1949	258	323	389	241*	240*	412	481	650	492	455	342	292	240*
1950	234	306	370	316*	509*	526	440	430	792	657	465	272	234
1951	239	410	584	562	440	392	430	392	460	406	283	266	239
1952	366	352	352	190	312	251	459	445	365	426	243	193	190
1953	124	59	68	173	315	286	355	575	689	497	330	211	69

* Estimated.

PUYALLUP RIVER BASIN

Puyallup River near Orting, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum (day)	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1931										
1932	6,950	Feb. 26, 1932	164	715	4.16	56.61	519,000	861	68.10	625,000
1933	11,800	Nov. 13, 1932	182	866	5.03	68.35	628,000	1,020	80.53	739,000
1934	12,800	Dec. 10, 1933	188	985	5.73	77.74	713,200	375	64.29	589,300
1935	8,900	Nov. 5, 1934	171	739	4.30	58.36	535,400	550	43.37	397,300
1936	4,850	June 7, 1936	147	636	3.70	50.29	461,400	656	51.95	476,500
1937	4,640	Apr. 14, 1937	123	607	3.53	47.93	439,700	744	58.68	538,300
1938	2,680	Apr. 18, 1938	192	705	4.10	55.66	510,600	626	49.38	453,000
1939	5,110	Feb. 15, 1939	192	652	3.70	51.46	472,000	640	50.51	463,400
1940	5,600	Dec. 15, 1939	134	587	3.41	46.45	426,100	585	46.26	424,300
1941	5,600	Nov. 29, 1940	207	465	2.70	36.70	336,700	547	43.14	395,800
1942	6,700	Dec. 19, 1941	214	675	3.92	53.24	488,400	647	51.09	463,600
1943	7,460	Nov. 23, 1942	162	630	3.66	49.69	455,800	572	45.11	413,600
1944	5,800	Dec. 3, 1943	206	528	3.07	41.80	383,400	502	39.73	364,500
1945	5,240	Jan. 7, 1945	224	600	3.84	52.07	477,700	734	57.92	531,300
1946	5,530	Dec. 28, 1945	178	751	4.37	59.29	543,900	845	66.69	611,800
1947	11,200	Dec. 11, 1946	165	744	4.33	58.72	538,600	750	59.21	543,100
1948	8,300	Nov. 7, 1947	256	843	4.00	66.68	611,600	760	60.12	651,500
1949	4,720	Feb. 17, 1949	240	668	3.88	52.69	483,400	651	51.37	471,200
1950	9,720	Nov. 27, 1949	234	823	4.78	64.93	595,600	918	72.45	664,600
1951	6,250	Feb. 11, 1951	239	791	4.60	62.46	572,900	700	55.23	506,600
1952	3,060	Oct. 3, 1951	190	577	3.35	45.64	418,600	439	34.73	318,600
1953	4,730	Jan. 31, 1953	59	612	3.56	48.33	443,400			

Carbon River near Fairfax, Wash.

Location.—Lat. 47°01'40", long. 122°01'50", in SW¼SW¼ sec. 22, T. 18 N., R. 6 E., on left bank, 1¼ miles upstream from highway bridge, 1¼ miles northwest of Fairfax, and 2¼ miles downstream from Evans Creek.

Drainage area.—78.9 sq. mi. At site prior to August 1912, 76.2 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,212.6 ft. above mean sea level (river-profile survey). Nov. 23, 1910, to July 12, 1912, staff gage at railroad crossing, 1.7 miles upstream at different datum.

Average discharge.—24 years (1929-53), 410 cfs.

Extremes.—1919-12, 1929-53: Maximum discharge, 11,000 cfs Dec. 9, 1933 (gage height, 10.2 ft.), from rating curve extended above 700 cfs; minimum, 36 cfs Nov. 28, 29, 1952; minimum gage height, 0.75 ft. Nov. 20, 1944, but may have been less during some period of no gage-height record.

Remarks.—Diversions by lumber industry returned to river above station. No regulation.

Carbon River near Fairfax, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...			392	260	120	191	202	356	628*	567	400*	287*	.....
1912...	121	668	264	650	586	133	264	778	950*				.....
1929							256	599	668	533	416	229	.....
1930...	201	59.0	270	142	650	322	401	395	464	347	239	158	304
1931...	182	167	129	380	212	298	437	474	559	368	251	185	304
1932...	316	405	321	348	410	684	534	546	676	510	283	162	433
1933...	371	1,138	512	519	151	296	324	529	587	702	406	309	512
1934...	629	549	1,952	948	336	570	522	505	360	338	207	183	601
1935...	495	624	490	630	369	309	270	417	512	491	284	211	431
1936...	134	163	205	525	185	336	507	854	834	450	273	196	389
1937...	140	59.3	416	110	194	348	468	619	957	547	292	265	370
1938...	237	1,074	554	540	171	248	577	543	506	355	227	181	435
1939...	190*	409	545	454	301	377	418	603	638	514	298	191	412*
1940...	192	256*	620*	250	511	441	357	537	310	264	241	200	348*
1941...	244	362	351	247	141	143	241	246	326	332	235	323	276
1942...	305	361	543	259	205	176	308	511*	759	576	436*	184*	397*
1943...	171*	614	572	310	408	244	522	431	683	582	270	205	417*
1944...	147*	185*	487	230	229	237	253	443	460	327	243	310	296*
1945...	188	188	327	652	417	242	359	853	569	413	262	333	461
1946...	282	522	494	464	378	374	412	682	707	564	285	166	445
1947...	358	502	802	488	400	307	453	553	588	417	220	247	445
1948...	676	707	421	354	363	229	309	645	900	455	338	286	469
1949...	275	410	414	212*	362	329	463	546	651	550	361	262	425*
1950...	404	754	516	415	461	566	471	665	882	734	447	247	539
1951...	450	746	785	505	781	368	419	564	519	351	249	208	496
1952...	503	373	285	137	324	211	415	538*	440*	457	265	167	343*
1953...	111	62.5*	110	790	492	189	356	462	585	645	297	209	359*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...			255	155	85	98	155	220	440*	405	290*	155	.....
1912...	85	74	126	126	276*	99	122	280	669*				.....
1929							146	336	405	297	163	50	.....
1930...	50	46	47	78	254	110	293	208	321	245	158	84	46
1931...	92	92	94	96	103	125	210	254	282	294	192	110	92
1932...	103	148	119	139	94	366	333	366	457	290	153	96	94
1933...	91	392		156	111	174	192	304	610	460	254	179	91
1934...	170	204	228	490	176	209	418	330	255	189	213	166	166
1935...	103	286	286	163	214	156	174	298	382	318	208	137	103
1936...	102	83	133	193	103	184	155	556	470	330	184	124	83
1937...	78	68	71	81	76	183	235	354	767	274	167	123	68
1938...	79	176	219	227	120	162	169	289	341	263	171	133	79
1939...	121	175	139	235	140	141	230	321	459	360	172	117	117
1940...	106	150*	309*	140	176	273	227	270	250	224	196	130	106
1941...	104	142	190	155	100	112	179	221	230	214	132	176	100
1942...	147	142	213	173	123	125	230	300*	581	330*	154	100*	100*
1943...	84	183	274	169	173	117	274	231	410	367	183	110	84
1944...	90*	108	195	156	123	100	168	287	353	242	178	181	90*
1945...	123	83	132	136	163	160	210	588	356	250	171	163	83
1946...	122	308	164	254	180	221	191	417	514	354	208	143	122
1947...	119	194	223	170	216	188	258	376	406	283	145	173	119
1948...	223	291	213	176	108	162	140	216	655	347	269	145	108
1949...	137	153	207	135*	130*	216	223	510	424	424	261	173	130*
1950...	153	295	265	160*	200*	299	314	314	633	515	310	165	153
1951...	182	238	373	260	225	158	288	235	310	271	152	138	138
1952...	182	106	150*	94	154	124	244	260*	270*	320	149	114	94
1953...	90	40	41	79	158	136	155	300	392	334	183	110	40

* Estimated.

PUYALLUP RIVER BASIN

Carbon River near Fairfax, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1911.....								339	60.46	246,000
1912.....										
1929.....										
1930.....	1,770	Feb. 5, 1930	46	304	3.85	52.27	220,000	299	51.45	217,000
1931.....	2,950	Mar. 31, 1931	92	304	3.85	52.26	220,000	351	60.40	254,000
1932.....	5,500	Feb. 23, 1932	94	433	5.49	74.69	314,000	514	58.66	373,000
1933.....	7,100	Nov. 13, 1932	91	512	6.49	85.02	370,000	608	104.52	440,000
1934.....	11,000	Dec. 9, 1933	106	601	7.62	103.34	434,900	471	81.05	341,200
1935.....	6,500	Oct. 25, 1934	103	431	5.46	74.11	311,500	338	53.14	244,600
1936.....	2,550	June 7, 1936	83	359	4.93	67.12	282,400	401	69.13	290,900
1937.....	1,810	April 14, 1937	68	370	4.69	63.72	268,100	472	81.22	341,500
1938.....	5,560	April 18, 1938	79	435	5.51	74.84	314,900	376	64.60	271,900
1939.....	2,640	Dec. 7, 1938	117	412	5.22	70.94	293,500	406	69.90	294,200
1940.....	1,810	May 1, 1940	106	348	4.41	60.06	252,700	338	58.39	245,700
1941.....	4,040	Nov. 29, 1940	100	276	3.50	47.42	199,600	305	52.44	220,700
1942.....	2,580	Dec. 19, 1941	100	397	5.03	68.27	287,300	401	68.98	290,300
1943.....	4,760	Nov. 23, 1942	84	417	5.20	71.72	301,500	372	64.04	269,500
1944.....	5,020	Dec. 3, 1943	90	296	3.75	51.09	215,000	286	49.41	207,900
1945.....	4,370	Jan. 7, 1945	83	401	5.08	65.93	290,100	450	77.44	325,900
1946.....	4,500	Dec. 23, 1945	122	445	5.64	76.50	321,900	476	81.84	344,400
1947.....	5,960	Dec. 11, 1946	119	445	5.64	76.53	322,000	456	78.52	330,400
1948.....	4,330	Nov. 7, 1947	108	469	5.94	80.95	340,600	410	70.78	297,800
1949.....	2,440	Nov. 23, 1948	130	423	5.42	73.67	310,000	476	81.90	344,600
1950.....	3,750	Nov. 27, 1949	153	539	6.83	92.65	389,900	567	97.58	410,600
1951.....	4,770	Feb. 9, 1951	138	496	6.29	85.28	358,900	425	73.05	307,400
1952.....	2,670	Oct. 3, 1951	94	343	4.35	59.16	249,000	269	46.48	195,600
1953.....	4,580	Jan. 31, 1953	40	359	4.55	61.69	260,000			

Gale Creek at Wilkeson, Wash.

Location.—Lat. 47°06'20", long. 122°02'45", near center of sec. 28, T. 19 N., R. 6 E., on right bank, 75 ft. upstream from highway bridge in Wilkeson, and 4½ miles upstream from mouth.

Drainage area.—25.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 800 ft. (from topographic map).

Extremes.—July to October 1949: Maximum discharge, 478 cfs Oct. 28 (gage height, 3.16 ft.); minimum, 6.3 cfs Sept. 13 (gage height, 0.90 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949.....									13.6	12.0	9.19	41.8	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949.....									10	9.1	7.0	7.0	.....

PUYALLUP RIVER BASIN

South Prairie Creek at South Prairie, Wash.

Location.—Lat. 47°08'30", long. 122°05'30", in NE¼NW¼ sec. 18, T. 19 N., R. 6 E., on right bank, 0.3 mile northeast of South Prairie and 5 miles upstream from mouth.

Drainage area.—78.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 430 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 3,550 cfs Feb. 11, 1951 (gage height, 7.23 ft.); minimum, 22 cfs Nov. 29, 1952 (gage height, 1.25 ft.).

Remarks.—Minor diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....									162	108	70.6	56.6	.....
1950....	171	343	449	390	507	527	371	243	263	130	67.5	55.2	292
1951....	220	465	537	451	656	352	195	199	112	51.3	38.4	45.3	275
1952....	220	226	268	154	291	206	244	251	142	84.9	38.0	35.2	180
1953....	34.0	35.2	61.5	510	401	186	281	252	320	156	65.4	56.9	195

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....									127	83	54	44	.....
1950....	45	51	172	125*	160*	243	172	192	209	81	48	35	35
1951....	55	106	269	207	199	143	120	111	71	39	32	24	24
1952....	56	108	139	74	118	111	152	154	93	44	33	31	31
1953....	30	26	29	51	120	126	196	150	194	76	50	41	26

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1949.....												
1950.....	2,930	⊙	35	292	8.72	50.37	211,200	314	54.17	227,100		
1951.....	3,550	Feb. 11, 1951	24	275	3.50	47.44	198,900	232	40.05	167,900		
1952.....	1,460	Feb. 4, 1952	31	180	2.29	31.13	130,400	181	22.64	94,910		
1953.....	2,660	Jan. 31, 1953	26	195	2.43	33.71	141,300	.....	.....	.....

* Estimated.

⊙ Dec. 28, 1949, Mar. 4, 1950.

PUYALLUP RIVER BASIN

Voight Creek near Crocker, Wash.

Location.—Lat. 47°04'10", long. 122°07'00", in SW¼ sec. 1, T. 18 N., R. 5 E., on right bank, 2½ miles southeast of Crocker, and 4¾ miles upstream from mouth.

Drainage area.—22.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 820 ft. (from topographic map).

Extremes.—July to October 1949: Maximum discharge, 230 cfs Oct. 28 (gage height, 2.93 ft.), from rating curve extended above 40 cfs; minimum, 7.2 cfs Sept. 7 (gage height, 0.97 ft.).

Remarks.—Minor diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									11.4	9.75	9.80	34.1	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									8.1	7.8	7.6	8.1	.....

Fennel Creek near McMillin, Wash.

Location.—Lat. 47°09'10", long. 122°12'55", in NE¼ sec. 7, T. 19 N., R. 5 E., on left bank, a third of a mile upstream from mouth, and 1.3 miles northeast of McMillin.

Drainage area.—12.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map).

Extremes.—June to October 1949: Maximum discharge recorded, 29 cfs Oct. 28 (gage height, 1.58 ft.); minimum, 8.7 cfs Sept. 20, 21, Oct. 2, 16, 17, 18.

Remarks.—Minor diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									11.5	10.1	9.49	10.5	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									10.5	9.7	8.7	8.7	.....

Puyallup River at Alderton, Wash.

Location.—Lat. 47°11'05"; long. 123°13'45", on line between sec. 25, T. 20 N., R. 4 E., and sec. 30, T. 20 N., R. 5 E., on-right-bank at downstream side of county bridge No. 30205-A on State Highway 5E, 1 mile north of Alderton, 1 mile south of Sumner, and 2 miles upstream from Stuck River.

Drainage area.—438 sq. mi.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, unadjusted. Prior to Aug. 5, 1918, staff gage at datum 50 ft. higher. Aug. 5, 1918, to Feb. 1, 1927, staff or chain gages at datum 49 ft. higher.

Average discharge.—22 years (1914-26, 1943-53), 1,577 cfs.

Extremes.—1914-27, 1943-53: Maximum discharge, 22,600 cfs Dec. 11, 1946 (gage height, 56.80 ft.); minimum not determined, probably occurred during period of no gage-height record in November or December 1953.

Flood of 1906 reached a stage of 66.5 ft., from floodmarks (discharge not determined).

Remarks.—Minor diversions above station for irrigation and lumber industry. Slight regulation by powerplant at Electron.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...	1,190*	2,080*	657	1,040	671	865	1,330	1,090	1,210	1,380*	1,310	607	1,190*
1916...	1,150	2,260	2,920	919	2,930	3,060	1,660	1,700	2,180	2,530	1,350	834	1,960
1917...	519	1,020	1,640	1,670	1,810	1,110	2,180	1,920	3,280	2,830	1,380	998	1,700
1918...	694	620	5,880	4,300	2,180	1,300	1,240	1,350	1,860	1,450	1,140	883	1,920
1919...	941	1,050	2,180	2,250	1,500	1,440	2,040	1,860	1,520	1,400	1,030	781	1,500
1920...	562	1,740	1,420	2,390	1,100	1,110	1,530	1,200	1,810	1,640	1,120	1,510	1,430
1921...	2,330	1,320	2,030	2,790	2,710	2,040	1,340	1,710	2,210	1,560	1,140	794	1,830
1922...	737	1,630	3,710	824	831	813	1,210	2,050	2,180	1,260	1,000	847	1,430
1923...	741	869	1,660	4,240	1,490	1,510	1,610	1,920	2,030	1,790	1,080	897	1,650
1924...	988	857	1,830	1,600	3,130	817	1,010	1,430	1,040	1,070	919	636	1,270
1925...	830	2,010	2,750	2,000	2,030	1,070	1,400	1,700	1,370	1,310	893	640	1,510
1926...	550	626	2,680	1,560	1,650	1,130	974	1,260	1,100	1,120	1,010	854	1,210
1927...	1,420	1,310	1,770	1,810									
1944...	750*	819*	1,813	1,114	1,203	1,096	1,032	1,468	1,441	1,116*	878	1,164	1,157*
1945...	678	799	993	2,299	1,875	1,367	1,634	2,547	1,425	1,158	975	1,153	1,407
1946...	830	2,078	2,134	2,472	1,963	1,961	1,703	2,304	2,653	2,095	1,136	731	1,842
1947...	1,266	2,085	3,936	2,232	1,869	1,249	1,738	1,569	1,686	1,186	721	806	1,695
1948...	1,994	2,910	2,004	1,889	1,873	1,432*	1,674	2,611	2,840	1,518	1,260	1,025	1,917*
1949...	1,209	2,005	2,335	874	1,969	1,562	1,670	2,534	1,766	1,431	924*	776	1,585*
1950...	1,166	1,958	2,124	2,264	2,686	2,777	1,932	1,802	2,613	1,995	1,159	732	1,929
1951...	1,624	2,740	3,070	2,430	3,702	1,796	1,448	1,700	1,512	1,195	815	649	1,879
1952...	1,720	1,498	1,501	856	1,606	1,183	1,572	1,772	1,403	1,327	884	587	1,320
1953...	386*	217*	433*	3,177	2,353	1,060	1,548	1,780	2,093	1,793	979	676	1,370*

* Estimated.

PUYALLUP RIVER BASIN

Puyallup River at Alderton, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...			390	570	530	610	670	610	830	.....	1,040	390	.....
1916...	390	530	1,380	590	760	1,160	1,360	1,360	1,460	1,360	850	638	890
1917...	436	616	830	1,050	1,050	910	1,120	1,260	2,110	1,520	1,180	798	486
1918...	505	430	600	2,330	1,110	830	965	1,110	1,180	1,150	798	600	430
1919...	528	678	765	550	1,110	1,040	1,520	1,260	1,180	965	798	407	407
1920...	342	690	428	540	610	442	910	770	1,060	960	690	540	342
1921...	1,120	505	815	1,060	585	1,060	640	1,060	1,400	1,300	680	460	460
1922...	530	565	825	638	638	600	905	1,120	1,470	738	675	595	485
1923...	362	495	460	1,470	905	1,120	1,120	1,270	1,270	990	825	395	302
1924...	428	343	905	825	1,270	565	712	750	825	750	638	228	228
1925...	416	845	935	890	845	682	720	1,080	682	1,080	510	478	415
1926...	270	325	1,030	800	1,030	720	682	652	720	610	760	478	270
1927...	575	510	1,050	890	.....	.....	.....	.....	.....	.....	.....	.....	.....
1944...	.....	485	664	664	720	650	760	980	1,150	900	604	760	.....
1945...	424	352	367	415	1,000	900	970	2,020	1,000	920	890	782	352
1946...	465	1,210	850	1,220	1,080	1,200	1,060	1,640	1,640	1,280	900	520	465
1947...	384	681	1,110	890	952	910	1,230	1,120	1,170	670	450	585	334
1948...	708	1,840	1,200	870	690	850	1,010	1,260	1,960	1,170	1,010	594	594
1949...	651	801	1,020	590	565	1,090	1,220	1,430	1,210	1,100	650*	545	545
1950...	498	676	934	817	1,180	1,450	1,120	1,150	1,780	1,330	843	501	498
1951...	522	813	1,760	1,430	1,270	940	1,020	620	1,040	1,000	556*	493	493
1952...	784	901	950	528	847	722	1,180	1,160	892	940	520	388	388
1953...	300*	150*	150*	700	760	750	932	1,190	1,430	998	687	344	150*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dts-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1915.....			390	1,190	2.72	37.02	865,000	1,330	41.09	901,000
1916.....	12,600	Dec. 22, 1915	390	1,960	4.47	60.95	1,430,000	1,700	52.69	1,230,000
1917.....	9,970	Dec. 18, 1916	436	1,700	3.88	52.61	1,230,000	2,040	63.19	1,480,000
1918.....	19,300	Dec. 13, 1917	430	1,920	4.38	59.39	1,390,000	1,660	51.52	1,200,000
1919.....	17,200	Jan. 23, 1919	407	1,560	3.42	46.82	1,090,000	1,460	45.29	1,060,000
1920.....	9,440	Jan. 28, 1920	342	1,430	3.26	44.35	1,040,000	1,590	49.53	1,160,000
1921.....	12,900	Dec. 30, 1920	460	1,830	4.18	56.73	1,330,000	1,860	57.75	1,350,000
1922.....	20,000	Dec. 12, 1921	495	1,430	3.26	44.28	1,030,000	1,190	36.96	804,000
1923.....	10,600	Jan. 6, 1923	362	1,650	3.77	51.16	1,200,000	1,690	52.25	1,220,000
1924.....	11,700	Feb. 12, 1924	228	1,270	2.99	39.51	928,000	1,430	44.43	1,040,000
1925.....	11,500	Dec. 11, 1924	415	1,510	3.45	46.65	1,090,000	1,360	42.22	986,000
1926.....	8,820	Dec. 23, 1925*	270	1,210	2.76	37.50	876,000	1,260	39.13	914,000
1927.....	8,600	Oct. 16, 1926*	.....	.....	.....	.....	.....	.....	.....	.....
1944.....	14,600	Dec. 8, 1943	.....	1,157	2.64	35.93	840,100	1,060	33.55	784,100
1945.....	12,700	Jan. 7, 1945	352	1,407	3.21	43.59	1,018,000	1,626	50.39	1,177,000
1946.....	13,900	Dec. 29, 1945	465	1,842	4.21	57.10	1,333,000	2,028	62.87	1,460,000
1947.....	22,600	Dec. 11, 1946	384	1,695	3.87	52.53	1,227,000	1,071	51.46	1,202,000
1948.....	14,600	Nov. 8, 1947	594	1,917	4.38	59.57	1,392,000	1,805	56.08	1,310,000
1949.....	10,600	Feb. 17, 1949	545	1,585	3.62	49.13	1,148,000	1,560	48.34	1,129,000
1950.....	12,400	Nov. 27, 1949	498	1,929	4.40	59.80	1,397,000	2,113	65.45	1,530,000
1951.....	17,100	Feb. 11, 1951	493	1,579	4.29	58.23	1,360,000	1,651	51.20	1,195,000
1952.....	6,280	Oct. 8, 1951	368	1,320	3.01	41.02	958,300	1,012	31.43	734,500
1953.....	11,700	Feb. 1, 1953	150	1,370	3.13	42.44	991,600	.....	.....	.....

* Estimated.

White River at Greenwater, Wash.

Location.—Lat. 47°08'50", long. 121°38'50", in SE¼ sec. 10, T. 19 N., R. 9 E., on right bank, three-quarters of a mile southeast of Greenwater, three-quarters of a mile upstream from Greenwater River, 18½ miles east of, and 25 miles upstream from Buckley.

Drainage area.—216 sq. mi.

Supplemental records available.—December 1911 to May 1912, fragmentary gage heights and discharge.

Gage.—Water-stage recorder. Altitude of gage is 1,725 ft. (from river-profile map). Dec. 16, 1911, to May 5, 1912, staff gage 2 miles upstream at different datum.

Average discharge.—24 years (1929-53), 822 cfs.

Extremes.—1929-53: Maximum discharge, 18,100 cfs Dec. 21, 1933 (gage height, 9.38 ft.), from rating curve extended above 3,600 cfs by logarithmic plotting; minimum, 120 cfs Nov. 2, 1935 (gage height, 1.69 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929							490	1,220	1,360	979	707	376	.....
1930	238	173	341	230*	877*	605	923	847	922	762	615	401	575*
1931	321	252	234	605	645	537	819	1,390	1,020	788	559	385	619
1932	326	503	576	699	811	1,150	1,040	1,350	1,720	1,160	622	379	861
1933	364	1,750	915*	853*	318	458	749	1,230	2,380	1,900	990	556	1,040*
1934	946	1,009	3,648	1,693	889	1,177	1,334	1,130	898	761	671	431	1,222
1935	656	1,359	926	1,305	897	633	646	1,111	1,396	988	646	509	922
1936	299	220	269	618	292	579	1,012	1,704	1,548	881	663	451	713
1937	324	188	388	162*	256	537	819	1,358	2,187	1,242	637	485	717*
1938	394	1,195	992	828	396	458	1,106	1,531	1,812	1,116	608	502	916
1939	325	427	533	604	417	641	1,009	1,325	1,163	916	645	406	707
1940	286	299	730	564	679	693	746	1,267	1,006	753	593	483	675
1941	433	420	631	447	368	398	566	834	890	793	615	426	570
1942	478	603	1,060	456	454	352	655	950	1,448	1,118	710	424	727
1943	303	789	872	584	704	539	1,227	1,007	1,447	1,314	673	498	828
1944	357	325	568	349	446	330	542	943	1,066	740	543*	437	558*
1945	309	329	436	869	773	456	632	1,625	1,427	991	555	410*	735*
1946	374	644*	787*	779	516	737	1,031	1,855	1,692	1,354	802	469	923*
1947	463	710	1,462	841	899	735	971	1,538	1,247	839	576	481	888
1948	1,114	1,140	800	739*	581	499	630	1,592	2,652	1,058	691	467	1,004*
1949	466	643	649	432	581	762	1,121*	2,280	1,762	1,128	666	473	915*
1950	414	960	769	655*	694*	924	892	1,570	2,660	1,874	862	552	1,070*
1951	818	1,448	1,536	727	313	624	1,169	1,504	1,484*	1,129*	638	422	1,065*
1952	556	544	501	330	642	428	970	1,407	1,249	1,004	625	433	724
1953	341	227	243	1,043	978	416	665	1,149	1,302	1,404	715	500	747

* Estimated.

PUYALLUP RIVER BASIN

White River at Greenwater, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929							240	764	913	724	532	222	
1930	182	139	165			296	761	569	736	585	463	244	
1931	228	201	206	213	367	349	469	766	593	668	444	252	201
1932	216	302	258	354	219	552	725	868	1,000	705	395	300	216
1933	285	555		302	262	305	446	790	1,590	1,270	608	440	262
1934	590	515	488	1,050	653	622	1,000*	570	722	565	607	229	229
1935	176	760	661	386	594	428	428	825	1,050	699	538	362	176
1936	213	160	206	313	210	344	284	1,240	953	741	496	290	160
1937	230	154	174	140*	150*	359	508	714	1,510	672	469	315	140*
1938	252	374	558	549	318	406	395	554	1,260	774	520	393	252
1939	242	271	333	375	286	267	748	952	952	629	407	311	242
1940	251	242	345	333	380	543	596	1,000	834	581	528	362	242
1941	272	247	405	326	291	341	439	508	712	612	427	308	247
1942	322	204	598	368	305*	287	453	514	1,170	754	416	326	267
1943	241	332	560	366	360	337	840	628	1,030	944	516	343	241
1944	261	244	315	280	265	241	408	662	952	600*	440*	291	241
1945	257	248	279	271	349	349	413	1,180	1,060	643	370*	310*	248
1946	283	390*	354*	466	349	537	504	1,140	1,270	966	621	359	283
1947	271	335	650	472	650	530	650	1,130	696	578	436	380	271
1948	513	708	608	440*	355	373	398	578	1,310	825	569	360	355
1949	346	364	450	303	298	580*	500*	1,100*	1,030	825	513	373	298
1950	286	364	428	350*	390*	550	636	738	1,270	1,030	650	353	286
1951	360	608	1,040	531	548	474	666	802	1,030	837	492	335	335
1952	370	390	370	250	385	330	486	746	519	746	432	360*	250
1953	281	167	167	198	426	360	370	792	1,040	516	504	385	167

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1929											
1930				575	2.66	36.14	416,000	580	36.42	420,000	
1931	2,740	Mar. 31, 1931	201	619	2.87	38.88	448,000	669	42.04	484,000	
1932	3,600	Feb. 26, 1932	216	561	3.99	54.25	625,000	995	62.71	722,000	
1933	6,460	Nov. 13, 17, 1932	262	1,040	4.51	65.39	754,000	1,262	79.25	914,000	
1934	15,100	Dec. 21, 1933	229	1,222	5.66	76.79	884,300	994	62.52	120,000	
1935	5,440	Nov. 5, 1934	176	922	4.27	57.96	667,700	743	46.66	537,600	
1936	2,470	Ⓛ	160	713	3.30	44.92	517,200	722	45.53	524,700	
1937	4,210	June 21, 1937	140	717	3.32	45.04	518,900	857	53.82	620,300	
1938	5,440	April 18, 1938	252	916	4.24	57.53	662,800	812	51.02	587,700	
1939	2,470	May 29, 1939	242	707	3.27	44.43	511,800	706	44.34	510,600	
1940	1,780	Dec. 16, 1939	242	675	3.12	42.53	490,100	689	43.42	500,300	
1941	2,690	Nov. 29, 1940	247	570	2.64	35.82	412,600	625	39.30	452,600	
1942	2,500	Dec. 2, 1941	287	727	3.37	45.70	526,500	711	44.71	515,100	
1943	4,770	Nov. 23, 1942	241	828	3.93	52.03	599,200	769	48.31	566,400	
1944	2,500	Dec. 3, 1943	241	556	2.58	35.79	405,300	543	34.25	394,400	
1945	4,050	Jan. 7, 1945	248	735	3.40	46.18	531,000	796	50.02	570,200	
1946	5,620	Ⓛ	283	923	4.27	57.99	668,000	993	62.44	719,200	
1947	7,460	Dec. 11, 1946	271	898	4.16	56.42	649,900	932	55.56	674,500	
1948	5,000	May 28, 1948	355	1,094	4.65	63.29	729,000	896	56.46	650,300	
1949	4,220	May 13, 1949	298	875	4.24	57.54	662,800	947	59.54	685,800	
1950	8,270	Nov. 27, 1949	286	1,070	4.95	67.24	774,500	1,209	76.01	875,400	
1951	5,550	Feb. 9, 1951	335	1,065	4.93	66.93	770,000	880	55.83	637,300	
1952	2,190	May 20, 1952	250	724	3.45	45.61	525,300	658	41.45	477,400	
1953	4,020	Jan. 31, 1953	167	747	3.40	46.95	541,100				

* Estimated.

Ⓛ May 14, June 7, 1936.

Ⓛ Exact date not known; discharge from recorded range in stage, probably occurred Dec. 29, 1945.

PUYALLUP RIVER BASIN

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Greenwater River at Greenwater, Wash.

Location.—Lat. 47°09'15", long. 121°38'00", in NW¼NW¼ sec. 11, T. 19 N., R. 9 E., on left bank, 1 mile upstream from mouth, 1 mile east of Greenwater, and 19 miles east of Buckley.

Drainage area.—73.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,725 ft. (from topographic map). Sept. 6, 1911, to Aug. 9, 1912, staff gages at approximately same site at different datums. May 1, 1929, to Aug. 14, 1934, water-stage recorder, 900 ft. upstream at different datum.

Average discharge.—24 years (1929-53), 201 cfs.

Extremes.—1911-12, 1929-53: Maximum discharge, 4,280 cfs Dec. 11, 1946 (gage height, 7.50 ft.), from rating curve extended above 2,000 cfs; minimum, 23 cfs Oct. 7, 1934; minimum gage height, 2.00 ft. Nov. 28 to Dec. 2, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	46.6	405	179	372	314	79.5							
1929...								456	368	129	57.8	40.4	
1930...	33.6	30.3	64.4	46.3*	216	214	313	256	200	78.5	41.2	31.5	126*
1931...	38.8	54.5*	54.0	119	130*	162	263	323	142	79.0	45.3	41.7*	121*
1932...	71.6	125	125	171	212	411	410	501	430	120	58.1	38.2	222
1933...	51.9	369	272	310	87.7	140	276	458	711	392	95.9	68.7	279
1934...	170	287	1,116	597	312	376	407*	237	101	61.6	36.5	31.4	311*
1935...	126	315	276	440	316	189	199	371	333	123	65.1	40.5	234
1936...	38.7	47.9	61.1	196	70.3	203	422	611	368	111	55.8	42.4	186
1937...	36.2	29.7	108	45.3	72.4	178	266	469	500	155	68.8*	52.8	165*
1938...	69.9*	322*	337	296	116	145	364	506	304	89.7	47.5	34.5	220*
1939...	36.7	83.4	220	255	129	273	404	451	271	123	54.1	45.3	197
1940...	39.3	60.9	163	120	205	189	194*	310	127	62.5	38.2	33.1	128*
1941...	36.3	78.9	139	106	80.7	77.5	136	156	135	82.1	41.3	57.9	92.4
1942...	137	166	289	120	130	165	245	307	415	156	70.3	43.6	182
1943...	40.5	157	276	189	217	165	420	245	417	193	69.6	42.8	210
1944...	41.8	30.1	124	68.2	110	104	182	285	205	82.0	46.2	47.5	112
1945...	39.4	42.0	88.5	282	204	140	227	548	300	99.8	46.6	70.0	174
1946...	62.8	192	249	241	178*	251	352	643	416	177	70.0	49.7	241*
1947...	77.2	163	538	263	245	270	341	408	255*	111*	58.1	47.1	231*
1948...	181	504	320	225*	177	135	241	605	747	184	92.3	72.1	290*
1949...	89.3	156	159	102	171	222	433	333	425	160	67.3	45.3	244
1950...	64.7	180	226	203	240	286	291	575	900	371	162	57.2	291
1951...	94.0	328	400	235	327	175	411	528	319	114	57.5	43.1	252
1952...	69.5	97.2	118	64.4	158	118	323	391	218	119	55.5	38.3	147
1953...	32.1	32.9	35.0	276	297	124	206	364	357	191	71.9	47.7	169

* Estimated.

PUYALLUP RIVER BASIN

Greenwater River at Greenwater, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	37	37	66	56	125	52							
1929													
1930...	30	28	28		86	78	262	194	124	51	34	35	29
1931	27					110	163	180	114	57	37		27
1932...	29	72	52	87	67	187	272	330	227	76	45	32	29
1933...	30	138	145	119		84	154	394	490	186	71	59	30
1934...	53	135	143	343	224	257	330*	170	69	42	27	26	26
1935...	24	153	172	122	169	118	120	250	198	53	51	32	24
1936...	31	31	43	103	50	118	87	490	169	72	45	35	31
1937...	32	24	24	35*	35	111	148	210	317	90	55*	42	24
1938...	40*	70*	150*	177	57	127	125	345	161	57	37	32	32
1939...	30	35	65	129	86	78	277	334	210	72	44	36	30
1940...	34	30*	73	82	103	159	160*	197	50	52	31	28	28
1941...	29	95	95	76	64	68	124	118	91	44	35	37	29
1942...	83	82	141	100	76	76	192	303	258	99	52	37	37
1943...	31	53	145	117	110	93	287	224	355	97	52	35	31
1944...	32	36	45	51	61	54	111	216	131	56	36	32	32
1945...	31	28	42	54	110	106	127	390	174	61	36	32	28
1946...	38	110	92	147	100*	165	144	436	290	101	54	39	38
1947...	38	68	194	131	189	158	236	304	170	83*	47	38	38
1948...	37	240	214	155*	114	97	114	197	378	120	76	59	37
1949...	62	64	104	75*	58	175	165	465	239	100	50	39	39
1950...	37	64	117	120*	130*	167	200	236	604	160	67	47	37
1951...	49	115	254	142	146	115	214	278	200	74	48	35	35
1952...	39	64	79	51	90	69	158	256	155	71	43	32	32
1953...	31	50	28	29	112	95	110	275	272	95	56	43	28

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1912										
1929										
1930	753	Mar. 25, 1930		126	1.71	23.15	91,300	128	23.44	92,460
1931	850	April 1, 1931	27	121	1.64	22.24	87,600	136	24.91	98,100
1932	1,490	Feb. 26, 1932	29	222	3.00	40.93	162,000	270	40.67	196,000
1933	2,200	Nov. 16, 1933	30	279	3.78	51.17	202,000	337	61.94	244,000
1934	4,140	Dec. 9, 1933	26	311	4.21	57.19	225,400	239	43.82	172,700
1935	1,320	Jan. 23, 1935	24	234	3.17	42.96	169,300	186	34.21	134,800
1936	840	May 5, 1936	31	188	2.52	34.24	134,900	188	34.65	136,600
1937	748	May 4, 1937	24	165	2.23	30.28	118,400	211	38.50	152,900
1938	1,410	April 18, 1938	32	220	2.98	40.36	159,700	188	34.51	136,000
1939	1,110	Dec. 8, 1938	30	197	2.67	36.11	142,300	190	34.82	137,200
1940	567	Feb. 10, 1940	28	128	1.73	23.64	93,170	128	23.49	92,590
1941	773	Nov. 29, 1940	29	92.4	1.25	16.97	66,880	121	22.21	87,530
1942	924	June 11, 1942	37	182	2.46	33.43	131,600	172	31.58	124,400
1943	920	Nov. 23, 1942	31	210	2.84	38.65	152,400	189	34.69	136,700
1944	575	Dec. 3, 1943	32	112	1.52	20.65	81,370	108	19.93	78,550
1945	990	Jan. 7, 1945	28	174	2.35	31.91	125,800	202	37.03	146,000
1946	1,760	Dec. 23, 1945	38	241	3.26	44.18	174,700	264	48.41	190,800
1947	4,289	Dec. 11, 1946	38	231	3.13	42.46	167,300	250	45.90	180,900
1948	1,890	May 23, 1948	37	290	3.92	53.38	210,300	239	44.11	173,800
1949	1,640	May 13, 1949	39	244	3.30	44.76	176,400	250	45.84	180,700
1950	1,210	June 17, 20, 1950	37	291	3.04	53.44	210,600	320	58.35	232,000
1951	1,130	⊙	35	252	3.41	46.27	182,300	207	37.99	149,700
1952	576	May 20, 1952	32	147	1.99	27.12	106,900	132	24.28	65,690
1953	1,370	Feb. 1, 1953	28	169	2.29	30.98	122,100			

* Estimated.

⊙ Feb. 11, May 11, 1951

Mud Mountain Reservoir near Buckley, Wash.

Location.—Lat. 47°08'30", long. 121°55'50", in NE¼ sec. 17, T. 19 N., R. 7 E., on left bank of reservoir just upstream from Mud Mountain Dam on White River, 5 miles southeast of Buckley, and 6 miles downstream from Clearwater River.

Drainage area.—400 sq. mi.

Gage.—Staff gage. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.—1943-53: Maximum contents observed, 21,800 acre-ft. June 8, 1953 (elevation, 1,082.6 ft.); no pool at times most years.

Remarks.—Reservoir is formed by earth-fill dam, and is used for flood control. Dam was completed and storage began in 1942. Capacity 106,000 acre-ft. between elevation 895 ft. (invert of outlet tunnel), and elevation 1,215 ft. (spillway crest). Storage is released after each flood without creating damaging flows downstream.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944...	43	43	1,790	52	31	35	62	95	1,220	1,380	39	39	.....
1945...	39	1,670	1,340	1,930	1,670	288	522	1,790	155	151	110	1,800	.....
1946...	20	71	1,760	1,820	1,020	89	126	1,670	261	103	101	20	.....
1947...	1,830	1,470	2,110	1,160	334	708	1,570	1,670	348	346	411	107	.....
1948...	475	252	164	86	279	89	72	13,860	3,290	154	66	1,810	.....
1949...	42	116	52	39	183	52	1,370	2,930	161	266	95	85	.....
1950...	72	14,320	1,960	149	14,960	651	178	13,510	16,540	200	148	95	.....
1951...	127	14,540	1,620	113	179	191	135	142	224	130	0	80	.....
1952...	0	82	43	84	48	62	873	252	77	45	48	43	.....
1953...	43	43	43	8,710	62	62	667	20,880	168	454	1,780	1,900	.....

White River near Buckley, Wash.

Location.—Lat. 47°09'05", long. 121°57'00", in SW¼NW¼ sec. 8, T. 19 N., R. 7 E., on right bank, 0.7 mile upstream from Red Creek, 1 mile downstream from Mud Mountain Dam, and 4 miles east of Buckley.

Drainage area.—401 sq. mi. At site prior to 1934, 400 sq. mi.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929 (Corps of Engineers benchmark). Oct. 26, 1928, to Nov. 30, 1933, water-stage recorder at site 3 miles upstream at different datum. Nov. 26, 1938, to Feb. 14, 1939, staff gage at present site and datum.

Average discharge.—20 years (1928-33, 1938-53), 1,372 cfs.

Extremes.—1928-33, 1938-53: Maximum discharge, 17,000 cfs Feb. 26, 1932 (gage height, 17.5 ft., site and datum then in use), from rating curve extended above 4,000 cfs; minimum, 10 cfs Sept. 26, 1948 (elevation, 796.92 ft.); minimum daily, 72 cfs Oct. 13, 1942.

Maximum stage known, 23.4 ft. in December 1933, from floodmarks, at former site (discharge, 28,000 cfs, from rating curve extended above 3,000 cfs).

Remarks.—No diversion above station. Flow regulated by Mud Mountain Reservoir for flood control since 1942 (see above). Storage is not retained and observed annual runoff closely represents natural runoff of basin.

PUYALLUP RIVER BASIN

White River near Buckley, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	660*	487	495	440	336	1,060	1,060	2,480	2,300	1,220	815	526	994*
1930...	368	264	747	528*	1,700	3,330	1,520	1,410	1,390	983	756	492	952*
1931...	476	538	481	1,290	956	1,250	1,670	1,930	1,460	964	716	555	1,020
1932...	755	1,090	1,210	1,420	1,930	2,840	2,140	2,390	2,620	1,500	884	578	1,600
1933...	729	4,070	1,790	2,200	657	1,190	1,570	2,320	4,140	2,450	1,260	891	1,940
1934...	1,670	2,120											
1939...	550*	817*	1,245	1,542	1,022	1,565	1,867	2,123	1,804	1,265	810	586	1,277*
1940...	491	634	1,362	969	1,480	1,409	1,284	2,005	1,327	920	720	597	1,099
1941...	640	926	1,295	910	657	648	952	1,240	1,252	652	718	689	908
1942...	1,030	1,116	2,035	894	922	759	1,205	1,635	2,530	1,494	874	549	1,255
1943...	456	1,522	1,539	1,115	1,523	1,085	2,166	1,708	2,304	1,734	895	634	1,413
1944...	611	588	1,180	768	920	758	1,029	1,496	1,368	937	620	617	910
1945...	467	565	698	2,023	1,537	1,027	1,434	2,718	2,021	1,232	772	813	1,283
1946...	663	1,359	1,688	1,871	1,284	1,551	1,941	3,104	2,640	1,852	962	629	1,631
1947...	843	1,497	2,306	1,927	1,561	1,330	1,876	2,325	1,840	1,051	743	702	1,589
1948...	1,820	2,601	1,687	1,582	1,413	1,060	1,445	2,901	3,916	1,538	991	692	1,802
1949...	825	1,338	1,543	799*	1,404	1,813	2,301	3,706	2,541	1,495	886	645	1,618*
1950...	779	1,552	1,921	1,345*	1,570	2,315	1,853	2,652	3,868	2,670	1,148	728	1,868*
1951...	1,282	2,647	3,067	1,858	2,623	1,299	1,061	2,401	2,109	1,816	760	577	1,818
1952...	1,075	1,199	1,158	630	1,354	870	1,591	2,293	1,674	1,391	810	541	1,199
1953...	373	267	348	2,243	2,127	848	1,432	1,771	2,430	1,875	971	666	1,273

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	419	357	310			483	629	1,410	1,740	854	674	320	
1930...	285	221	230		500*	589	1,270	975	1,040	768	573	250	221
1931...	270	289	368	375		742	975	1,130	1,040	802	589	390	270
1932...	292	615	473	650	488	1,350	1,480	1,680	1,930	940	633	490	292
1933...	367	1,400	1,060	737		667	1,020	1,480	2,580	1,560	890	684	367
1934...	566	1,030											
1939...			698	850	615	595	1,380	1,520	1,520	975	560	467	
1940...	415	438	655	544	655	1,000	1,000	1,390	1,060	771	640	436	415
1941...	391	440	808	660	500	552	840	840	945	745	534	547	391
1942...	584	575	1,010	760	594	584	1,010	1,050	1,860	976	575	442	442
1943...	72	534	1,040	679	705	664	1,400	1,180	1,660	1,240	657	450	72
1944...	431	379	560	518	530	470	659	1,720	1,360	785	579	330	295
1945...	295	295	470	566	571	680	725	1,080	1,120	823	548	454	379
1946...	374	878	643	678	374	925	900	2,020	1,980	1,130	800	464	374
1947...	206	605	1,200	910	1,020	885	1,300	1,460	1,410	788	565	487	206
1948...	675	1,440	1,170	738	599	742	788	1,200	3,140	1,140	810	249	249
1949...	504	575	938	590*	540*	1,240	1,240	2,500	1,550	1,140	698	520	504
1950...	455	538	910	560*	750*	1,050	1,270	1,480	3,140	1,380	835	555	455
1951...	504	1,050	1,970	1,140	1,020	742	1,300	1,300	1,710	965	520	455	455
1952...	510	660	635	436	695	640	876	1,310	1,200	924	592	450	436
1953...	302	175	230	293	724	659	890	702	1,730	700	724	504	175

* Estimated.

PUYALLUP RIVER BASIN

White River near Buckley, Wash.—Continued

summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1929.....	4,350	May 24, 1929	.....	994	2.48	33.78	720,000	973	33.05	704,000	
1930.....	4,870	Mar. 25, 1930	.....	221	952	32.31	689,000	961	32.60	696,000	
1931.....	3,850	Mar. 31, 1931	.....	270	1,020	34.73	742,000	1,160	39.18	837,000	
1932.....	17,000	Feb. 26, 1932	.....	292	1,600	54.63	1,170,000	1,900	64.57	1,380,000	
1933.....	16,500	Nov. 13, 1932	.....	367	1,940	4.85	1,410,000	.....	.....	.....
1939.....	4,270	Mar. 24, 1939	.....	1,277	3.18	43.22	924,300	1,258	42.59	910,800	
1940.....	4,060	Feb. 10, 1940	.....	415	1,069	37.31	798,100	1,130	38.36	820,500	
1941.....	7,600	Nov. 20, 1940	.....	391	908	2.26	30.75	657,600	1,020	34.52	738,300
1942.....	7,550	Dec. 10, 1941	.....	442	1,255	3.18	42.50	908,800	1,223	41.41	865,600
1943.....	9,950	Nov. 23, 1942	.....	72	1,413	3.52	47.84	1,023,000	1,294	43.80	936,700
1944.....	7,320	Dec. 3, 1943	.....	379	910	2.27	30.89	660,700	864	29.34	627,600
1945.....	8,820	Jan. 7, 1945	.....	295	1,283	3.20	43.43	928,700	1,440	48.73	1,042,000
1946.....	10,600	Dec. 29, 1945	.....	374	1,631	4.07	55.22	1,181,000	1,795	60.78	1,300,000
1947.....	12,300	Dec. 11, 1946	.....	206	1,529	3.96	53.78	1,150,000	1,625	55.01	1,176,000
1948.....	7,580	Nov. 8, 1947	.....	249	1,802	4.49	61.16	1,308,000	1,602	54.38	1,163,000
1949.....	6,950	May 12, 1949	.....	504	1,613	4.02	54.61	1,168,000	1,659	56.16	1,201,000
1950.....	7,580	Nov. 28, 1949	.....	455	1,868	4.66	63.24	1,353,000	2,098	71.03	1,519,000
1951.....	9,650	Feb. 12, 1951	.....	455	1,818	4.53	61.53	1,316,000	1,519	51.42	1,010,000
1952.....	5,550	Feb. 4, 1952	.....	436	1,199	2.99	40.70	870,500	994	33.74	721,700
1953.....	9,000	Feb. 3, 1953	.....	175	1,273	3.17	43.08	921,400	.....	.....	.....

White River flume at Buckley, Wash.

Location.—Lat. 47°10'10", long. 122°00'20", in NW¼ sec. 2, T. 19 N., R. 6 E., on right bank, 800 ft. downstream from intake, half a mile upstream from Northern Pacific Railway bridge, and 1 mile northeast of Buckley.

Gage.—Water-stage recorder. Datum of gage is 660.78 ft. above mean sea level (levels by Puget Sound Power & Light Co.).

Average discharge.—25 years (1913-38), 780 cfs.

Extremes.—1913-38: Maximum discharge not determined; no flow in flume when headgates are closed.

Remarks.—Flume diverts water from left bank of White River in NE¼ sec. 2, T. 19 N., R. 5 E. Flow is stored in Lake Tapps until returned to Stuck River (lower White River) after being used for power development at Dieringer.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913.....					36,700	35,800	46,000	7,380	57,200	45,100	42,700	37,300	.....
1914.....	37,900	34,800	34,400	36,500	32,400	36,600	35,000	37,100	22,700	43,100	47,600	32,700	431,000
1915.....	35,000	27,400	36,200	39,500	34,100	44,300	33,000	36,800	33,900	37,800	40,600	32,300	431,000
1916.....	34,400	30,600	43,500	32,600	40,800	35,000	37,800	36,800	37,100	37,100	47,100	40,200	462,000
1917.....	28,400	43,100	46,200	40,300	34,200	37,900	23,700	37,800	35,700	34,100	21,000	34,000	428,000
1918.....	31,200	25,500	52,700	42,800	37,400	42,100	37,800	27,400	37,600	55,700	52,900	40,000	453,000
1919.....	52,100	43,600	61,500	52,800	39,800	53,100	42,500	53,700	46,700	49,800	50,500	36,500	583,000
1920.....	29,800	61,300	52,000	42,900	38,400	49,700	30,500	41,500	42,100	45,900	48,100	37,300	520,000
1921.....	44,200	38,900	44,600	32,600	20,000	40,000	38,400	26,100	32,800	39,800	44,300	30,100	438,000
1922.....	38,600	37,000	40,000	36,200	29,500	30,300	68,400	40,800	38,800	45,600	51,800	40,000	497,000
1923.....	33,400	37,800	52,700	50,200	40,500	60,100	45,400	48,000	45,600	49,900	64,000	39,900	568,000
1924.....	44,500	40,900	59,500	55,500	53,400	46,200	66,600	57,200	48,900	53,800	47,800	32,700	607,000
1925.....	32,710	66,940	69,930	68,440	48,020	63,390	58,730	53,110	65,080	59,930	47,820	30,330	664,400

PUYALLUP RIVER BASIN

White River flume at Buckley, Wash.—Continued

Runoff in Acre-feet—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926...	25,190	28,660	71,760	53,270	38,490	38,330	66,660	57,950	53,950	52,190	44,920	31,330	560,700
1927...	51,270	48,950	44,800	49,300	53,990	54,360	63,930	56,760	45,280	48,820	48,790	51,740	617,200
1928...	51,370	46,680	62,800	74,300	53,660	55,510	53,450	64,610	55,790	62,860	51,750	34,400	667,200
1929...	43,750	30,990	33,220	29,290	21,170	59,750	68,160	85,120	60,080	70,530	51,060	30,970	574,700
1930...	23,700	17,080	45,310	29,110	78,130	63,150	52,160	61,070	60,100	55,320	44,480	30,640	560,200
1931...	28,530	32,450	28,850	69,900	47,920	54,670	54,480	62,370	57,960	56,590	44,470	32,190	570,400
1932...	36,110	66,690	59,790	51,210	35,160	78,650	56,170	55,480	52,600	63,560	51,540	38,360	631,300
1933...	46,830	63,400	52,850	52,850	36,680	62,870	50,880	58,310	55,670	54,800	48,680	48,750	637,600
1934...	50,660	56,060	39,290	53,650	59,110	55,920	56,140	62,850	60,940	52,820	47,230	33,830	628,500
1935...	39,110	46,480	72,880	50,990	51,370	57,100	50,820	56,810	60,000	54,830	42,860	39,100	621,800
1936...	28,620	29,280	37,220	78,420	37,060	73,930	68,750	62,850	69,060	71,770	52,220	33,550	642,300
1937...	27,070	18,230	62,100	17,600	35,660	73,120	74,200	65,860	54,960	78,820	50,930	39,010	630,200
1938...	34,990	64,320	49,340	64,080	44,800	62,150	53,760	69,280	63,440	75,500	46,860	35,740	674,300

Boise Creek near Enumclaw, Wash.

Location.—Lat. 47°11'20", long. 121°58'20", in SW¼ sec. 30, T. 20 N., R. 7 E., on right bank, 1½ miles southeast of Enumclaw and 3 miles upstream from mouth.

Drainage area.—9.58 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 740 ft. (from topographic map).

Extremes.—1945-46: Maximum discharge, 306 cfs Dec. 28, 1945 (gage height, 3.68 ft.); minimum, 1.6 cfs July 29, Aug. 30, 1945 (gage height, 0.59 ft.).

Remarks.—Diversions for industrial and domestic use above station. Flow supplemented by water diverted from Scatter Creek during low-water periods. Partly regulated by millpond 3 miles above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945													
1946...	15.3	50.0	45.1	61.3	57.7	62.8	34.8	18.2	30.4	21.6*	7.63	16.4	84.2*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945													
1946...	4.2	25	22	33	34	34	27	9.8	14		4.6	3.6	3.6

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1945								
1946	306	Dec. 28, 1945	3.6	34.2	24,760			

* Estimated.

White River at Buckley, Wash.

Location.—Lat. 47°10'30", long. 122°01'10", in SE¼ sec. 34, T. 20 N., R. 6 E., on left bank, 40 ft. downstream from Northern Pacific Railway bridge and 1 mile northeast of Buckley.

Drainage area.—427 sq. mi. At site 1899-1903, 415 sq. mi., excluding Boise Creek.

Supplemental records available.—January 1902 to August 1903, gage heights only.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (levels by Puget Sound Power & Light Co.). Apr. 22, 1899, to Aug. 31, 1903, wire-weight gage 550 ft. upstream at different datum. June 8, 1910, to Nov. 30, 1911, staff gage 50 ft. upstream at datum 624.92 ft. above mean sea level (Stone & Webster Engineering Corp. benchmark); record supplemented by staff-gage readings at site 5 miles upstream.

Average discharge.—23 years (1899-1901, 1910-11, 1913-28, 1933-38), 1,591 cfs.

Extremes.—1899-1901, 1910-11, 1913-28, 1933-38: Not determined.

Remarks.—Records since February 1913 includes flow of White River flume (see p. 178) which diverts from left bank in NE¼ sec. 2, T. 19 N., R. 5 E., half a mile upstream and carries an average flow of 780 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1899								2,560	4,080	3,030	1,650	1,160	.....
1900	1,360	2,680	4,400	3,020	1,670	2,240	1,860	2,240	2,210	1,510	1,140	836	2,100
1901	1,270	1,510	2,660	1,820	1,950	1,850	1,270	2,360	2,140	1,650	1,060	620	1,680
1902	584	1,230	1,850										.....
1910										1,340	949	673	.....
1911	1,580	2,630	1,710	1,330	669	1,060	1,160	1,840	2,500	1,550	702	634	1,460
1912	429	2,010											.....
1913					1,360	1,030	1,710	2,260	3,280	2,110	1,070	770	.....
1914	919	959	679	1,730	1,110	1,620	1,790	2,040	1,700	1,320	866	558	1,280
1915	667	1,800	602	659	626	873	1,540	1,230	1,400	1,160	931	553	1,000
1916	659	1,850	1,930	744	1,920	2,820	2,030	2,380	3,450	3,160	1,500	833	1,940
1917	472	781	1,160	1,260	1,660	732	1,730	2,680	4,110	3,020	1,220	734	1,630
1918	511	443	5,010	3,720	1,740	1,150	1,560	1,710	2,360	1,320	910	682	1,770
1919	927	948	2,330	2,910	1,190	1,220	2,050	2,310	2,210	1,690	985	637	1,620
1920	498	1,220	1,350	2,100	1,470	928	1,400	1,720	1,890	1,350	932	938	1,330
1921	1,440	1,130	1,490	2,180	2,570	2,100	1,740	2,680	3,210	2,020	1,120	672	1,860
1922	652	1,190	2,800	670	553	508	1,220	3,090	3,140	1,270	907	687	1,400
1923	561	670	1,230	2,880	819	1,130	1,640	2,300	2,260	1,830	1,090	696	1,460
1924	792	763	1,630	1,440	2,800	955	1,160	2,220	1,320	1,040	812	581	1,290
1925	562	1,360	2,070	1,720	1,730	1,120	1,760	2,670	1,730	1,210	817	541	1,430
1926	481	468	1,950	1,260	1,330	1,170	1,210	1,200	1,080	943	757	558	1,030
1927	997	1,130	1,460	1,840	1,320	1,020	1,330	2,850	3,270	1,560	903	933	1,470
1928	1,650	3,400	2,030	2,990	995	1,750	1,800	3,110	1,700	1,410	877	606	1,870
1934	1,502	2,137	6,676	4,317	2,048	2,329	2,247	1,964	1,212	957	802	604	2,267
1935	1,840	3,816	2,518	3,012	1,940	1,871	1,454	2,209	2,419	1,858	974	699	2,051
1936	502	625	641	2,516	783	1,799	2,701	3,517	3,244	1,295	871	580	1,584
1937	452	315	1,162	301	695	1,239	1,871	2,338	3,356	1,619	860	665	1,244
1938	613	3,487	2,788	2,334	881	1,148	2,360	2,624	2,065	1,331	795	623	1,817

PUYALLUP RIVER BASIN

White River at Buckley, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1899							
1900	†14,200	Dec. 1, 1899	650	2,100	1,520,000	1,850	1,340,000
1901	†11,200	Jan. 13, 1901	480	1,680	1,220,000	1,590	1,150,000
1902	†14,600	Nov. 22, 1901					
1910							
1911	†12,600	Nov. 10, 1910	425	1,460	1,060,000		
1912	†13,000	Nov. 19, 1911					
1913							
1914	6,650	Jan. 6, 1914	405	1,280	927,000	1,320	957,000
1915	4,160	Nov. 3, 1914	429	1,000	725,000	1,120	810,000
1916	9,330	July 2, 3, 1916	415	1,940	1,400,000	1,770	1,280,000
1917	6,760	June 17, 1917	393	1,630	1,180,000	1,930	1,400,000
1918	23,100	Dec. 18, 1917	349	1,770	1,280,000	1,610	1,170,000
1919	†19,000	Jan. 22, 1919	417	1,620	1,180,000	1,530	1,110,000
1920				1,330	962,000	1,410	1,020,000
1921	112,400	Dec. 30, 1920	456	1,860	1,350,000	1,910	1,380,000
1922	†16,600	Dec. 13, 1921	410	1,400	1,010,000	1,210	878,000
1923	†13,300	Jan. 6, 1923		1,460	1,050,000	1,520	1,100,000
1924			375	1,200	936,000	1,350	960,000
1925			358	1,430	1,030,000	1,340	968,000
1926			342	1,030	747,000	1,090	791,000
1927				1,470	1,070,000	1,760	1,270,000
1928				1,870	1,350,000		
1934				2,267	1,641,000	2,055	1,488,000
1935	14,300	Oct. 25, 1934		2,051	1,485,000	1,508	1,092,000
1936	8,960	Jan. 4, 1936		1,584	1,150,000	1,608	1,167,000
1937	7,170	April 14, 1937		1,244	900,500	1,648	1,193,000
1938	12,400	April 18, 1938		1,817	1,316,000		

† Maximum observed.

‡ Flow in bypass channel estimated.

Stuck River near Sumner, Wash.

Location.—Lat. 47°14'55", long. 122°14'35", in NE¼SW¼ sec. 1, T. 20 N., R. 4 E., on right bank, 300 ft. downstream from county bridge, 3 miles north of Sumner, and 4½ miles upstream from mouth.

Drainage area.—470 sq. mi., excludes that of Lake Tapps.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (Inter-County River Improvement Commission benchmark).

Average discharge.—8 years (1945-53), 628 cfs.

Extremes.—1945-53: Maximum discharge, 13,100 cfs Dec. 14, 1946 (gage height, 59.74 ft.); minimum, 32 cfs Nov. 29, 30, 1952.

Remarks.—White River flume (see p. 178) diverts 22 miles upstream for storage in Lake Tapps (see p. 182) and for power development at Dieringer powerplant below this station. Flood flow regulated by Mud Mountain Reservoir (see p. 175).

PUYALLUP RIVER BASIN

Stuck River near Sumner, Wash.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945					765	211	441	1,364	347	174*	96.2	113	
1946	117	272	1,064	1,066	544	744	1,116	2,169	1,384	603	188	71.0	781
1947	227	626	2,565	1,167	630	338	561*	1,102	595	127	73.9	68.5	676*
1948	981	1,356	603	563	693	323	352	1,519	2,742	271	119	90.5	798
1949	115	378	501	169	446	246	980	2,920	950	171	155	71.8	593
1950	144	486	895	610	641	1,550	605	1,287	2,456	1,273	189	59.4	853
1951	198	1,025	2,325	811*	1,928	204	653	751	315	164	85.1	87.0	712*
1952	111	107	154	142	303	135	346	764	325	93.6	65.4	85.7	219
1953	54.0	49.9	61.1	993	1,404	174	245	352	710	356	252	84.0	388

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945					92	122	154	448	141		82	72	
1946	62	135	130*	174	171	256	259	950	600	134	72	57	57
1947	46	50	167	102	149	146	320*	305	180	93	52	64	46
1948	61	181	219	162	144	191	163	233	1,430	141	99	70*	61
1949	80*	109	180	126	159	172	176	455	200	131	99	54	54
1950	78	104	174	179	196	241	158	166	1,620	140	83	62	62
1951	108	132	355	150*	194	184	155	121	139	85	68	71	68
1952	79	74	118	104	132	101	151	164	85	72	55	52	52
1953	48	36	40	64	174	118	132	132	157	114	78	70	36

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1945							
1946	11,400	Dec. 29, 1945	57	781	565,600	947	685,800
1947	13,100	Dec. 14, 1946	46	676	489,400	633	458,600
1948	7,950	Oct. 19, 1947	61	798	579,300	636	461,600
1949	7,190	May 14, 1949	54	593	429,500	638	461,900
1950	6,010	Mar. 6, 1950	62	853	617,600	1,024	741,000
1951	12,200	Feb. 11, 1951	68	712	515,600	445	322,100
1952	2,660	May 1, 1952	52	219	159,160	202	146,500
1953	6,700	Feb. 4, 1953	36	388	280,600		

* Estimated.

PUYALLUP RIVER BASIN

Lake Tapps near Sumner, Wash.

Location.—Lat. 47°14'30", long. 122°11'30", in NE¼ sec. 8, T. 20 N., R. 5 E., 1½ miles east of Dieringer and 3 miles northeast of Sumner.

Gage.—Staff gage. Datum of gage is 0.70 ft. above mean sea level (levels by Puget Sound Power and Light Co.).

Extremes.—1911-53: Maximum contents observed, 48,100 acre-ft. July 16, 1941, July 14, 21, 28, Aug. 4, 1947, July 12, 1948, Apr. 25, June 24, 25, July 3, 1949, Dec. 1, 7, 1950, June 15, 25, 1951, May 1, Sept. 22, 1952 (gage height, 540.0 ft.); minimum observed, 458 acre-ft. June 24, 1912 (gage height, 505.70 ft.).

Remarks.—Reservoir is formed by diked natural lake. Lake fed by White River flume (see p. 178) which diverts from White River 10 miles southeast of Buckley. Usable capacity, 50,400 acre-ft. between elevations 505 and 541 ft. Dead storage unknown. Contents given herein are usable contents. Water used for power development at Dieringer by Puget Sound Power and Light Co.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912		17,340	11,800	18,040	17,200	14,340	20,900	14,460	3,380	15,660	27,380	27,190	
1913	27,000	20,260	29,900	81,500	34,100	32,100	37,540	5,260	29,880	33,840	36,580	36,380	
1914	37,280	37,540	33,860	37,500	36,160	36,490	37,450	38,460	38,310	33,740	35,880	32,120	
1915	31,200	25,020	24,840	30,200	29,600	37,630	36,720	37,580	36,090	36,890	36,300	28,460	
1916	27,530	26,960	32,380	26,330	36,720	36,890	37,360	37,630	37,720	34,940	36,260	34,830	
1917	17,940	25,330	36,390	37,450	37,740	35,630	38,090	38,660	37,190	44,670	43,700	41,170	
1918	25,830	15,900	41,940	42,490	43,410	43,830	43,500	34,580	34,680	47,020	46,410	39,320	
1919	40,050	43,080	44,490	41,370	44,400	44,710	44,250	43,940	41,350	46,930	46,230	35,550	
1920	19,600	44,600	45,040	44,800	41,720	44,430	39,390	45,240	44,030	47,310	46,580	47,240	
1921	47,220	44,470	46,350	46,190	40,550	46,250	45,460	43,040	42,930	46,760	47,510	44,950	
1922	45,970	46,140	45,260	32,600	10,850	7,680	11,980	46,710	46,650	47,150	44,400	37,250	
1923	24,160	24,680	40,110	45,970	38,930	45,610	47,040	46,880	46,430	46,740	45,240	45,090	
1924	30,560	32,020	45,560	46,050	45,090	31,600	41,630	46,210	46,600	42,360	39,960	33,680	
1925	29,760	38,790	39,630	46,120	44,010	45,240	45,820	42,640	45,750	41,300	36,280	27,650	
1926	20,500	22,380	43,810	46,780	45,790	40,730	45,790	43,740	45,750	43,240	38,180	31,620	
1927	43,090	46,190	45,790	39,190	43,080	43,830	38,550	45,870	45,500	47,840	43,680	47,620	
1928	47,880	44,560	41,720	47,850	36,670	40,000	40,730	47,440	46,960	46,820	36,640	26,600	
1929	17,620	16,430	20,770	17,020	12,360	23,890	33,930	46,960	43,220	46,450	36,510	17,890	
1930	12,900	14,750	40,600	22,750	44,800	41,570	42,360	44,650	46,120	39,540	34,770	43,380	
1931	16,690	22,960	23,250	43,260	43,300	44,690	44,540	47,770	47,150	41,520	26,280	16,520	
1932	24,620	34,350	39,760	43,150	26,450	46,820	46,870	46,866	46,850	45,480	45,240	26,910	
1933	21,140	46,650	45,690	45,090	34,390	40,320	43,700	46,800	47,070	47,000	41,630	47,020	
1934	46,500	46,010	37,380	38,600	47,400	47,370	47,130	46,740	47,090	47,090	42,090	40,690	
1935	39,040	44,870	45,550	41,940	44,650	42,780	37,830	38,600	46,910	46,650	37,940	24,840	
1936	11,590	16,040	19,680	41,880	14,520	24,430	40,880	42,860	42,620	44,400	31,860	15,240	
1937	19,220	15,050	31,160	28,880	28,960	37,690	44,890	42,730	47,020	44,550	30,440	29,160	
1938	36,800	45,240	45,000	46,380	40,530	45,590	41,940	46,250	42,360	47,220	44,600	33,610	
1939	27,020	38,820	46,470	43,570	44,380	45,020	44,890	44,760	46,130	46,910	43,740	36,910	
1940	27,110	24,010	46,120	41,590	46,380	46,340	43,580	45,810	47,060	44,760	45,220	44,380	
1941	42,840	40,660	45,260	43,810	28,290	29,080	39,030	44,250	46,470	45,680	44,210	46,560	
1942	46,650	45,170	40,300	45,020	43,010	43,520	44,400	47,040	47,810	46,450	46,340	46,740	
1943	45,420	46,360	48,080	44,060	46,490	43,740	43,700	44,270	46,740	45,770	44,160	45,990	
1944	44,010	44,270	45,460	42,910	42,510	43,700	44,360	44,930	45,720	46,300	45,460	43,350	
1945	47,040	45,640	41,520	45,060	44,010	43,820	45,500	44,780	46,210	45,240	43,190	45,680	
1946	46,210	45,550	45,280	45,700	46,160	46,710	45,550	43,220	46,820	45,240	44,050	44,930	
1947	46,160	46,690	45,900	45,900	45,020	45,770	46,250	44,670	46,410	47,180	47,530	46,520	
1948	47,660	47,070	43,960	45,810	46,430	28,710	37,320	47,730	46,430	47,200	45,860	46,600	
1949	45,550	47,130	44,230	40,050	46,780	39,080	33,170	35,230	47,090	47,440	44,230	46,820	
1950	47,700	46,710	47,130	37,800	40,310	36,320	46,140	46,740	45,920	47,180	46,740	45,460	
1951	46,380	47,420	42,930	44,100	40,550	30,440	36,180	44,890	47,220	47,220	44,580	46,860	
1952	42,530	44,250	40,400	27,970	29,340	27,720	48,100	47,090	42,600	45,940	47,770	46,980	
1953	46,960	44,930	44,360	45,390	16,040	9,920	22,920	31,840	43,480	45,060	45,000	44,840	

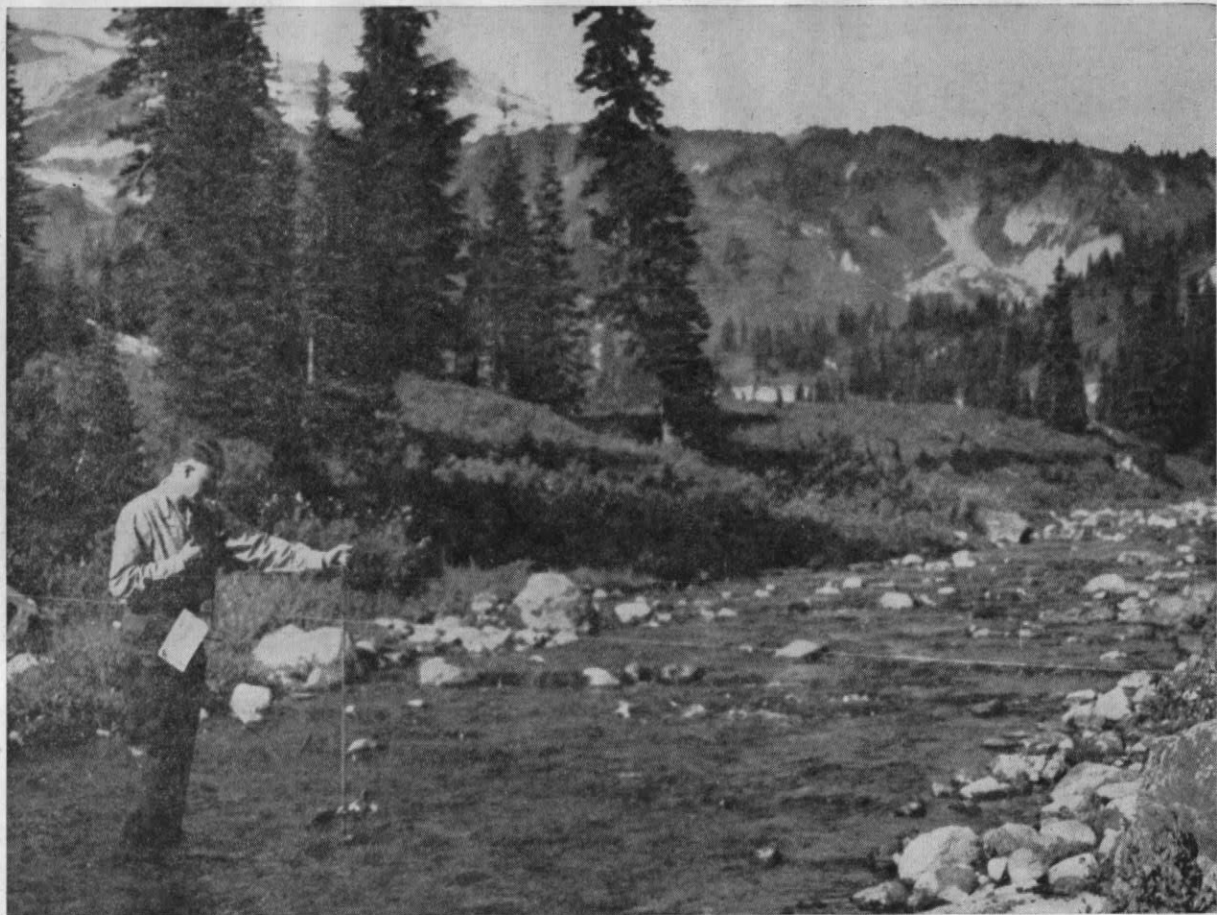


Figure 6. Discharge measurement by wading, with current meter suspended on rod.



Figure 7. Discharge measurement from standup-type cable car, with current meter suspended above lead weight. Puyallup River at Puyallup.

PUYALLUP RIVER BASIN

Puyallup River at Puyallup, Wash.

Location.—Lat. 47°12'30", long. 122°19'35", in NW¼ sec. 20, T. 20 N., R. 4 E., on left bank 0.8 mile upstream from highway bridge and Clark Creek, 1 mile northwest of Puyallup, and 7 miles upstream from mouth.

Drainage area.—948 sq. mi.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Dec. 3, 1919, at sites ¼ miles upstream and 900 ft. upstream at different datums. Dec. 3, 1919, to Nov. 9, 1935, at site 500 ft. upstream at datum 9.61 ft. higher.

Average discharge.—39 years (1914-53), 3,250 cfs (unadjusted).

Extremes.—1914-53: Maximum discharge, 57,000 cfs Dec. 10, 1933 (elevation, 31.0 ft., present datum); minimum, 344 cfs Nov. 29, 1952 (elevation, 8.27 ft.).

Remarks.—All diverted water returned to river above station. Large part of flow of White River diverted by White River flume into Lake Tapps (see p. 182) and returned via Stuck River above station. Flood flow on White River regulated since 1942 by Mud Mountain Reservoir (see p. 175). Minor pondage on tributaries and upper Puyallup River.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914.....	.....	.....	.....	.....	.....	.....	.....	3,500	3,270	2,560	1,970	1,630	.....
1915.....	1,850*	4,820	1,590	2,060	1,460	1,640	3,020	2,320	2,700	2,590	2,330	1,410	2,320*
1916.....	2,040	3,330	4,500	1,810	5,010	6,520	3,380	4,510	5,810	5,950	2,900	1,930	4,080
1917.....	1,370	2,000	2,970	2,970	3,580	1,900*	4,070	5,050	8,200	6,370	2,730*	1,850	3,630*
1918.....	1,450*	1,200	11,200	7,630	4,150	2,620	2,900	3,360	4,340	2,700	2,230*	1,940	3,830*
1919.....	1,990	2,350	4,300	5,820	2,840	2,860	4,370	4,010	3,760	3,190	2,240	2,640	3,350
1920.....	1,640	2,790	3,010	4,880	2,900	2,160	3,450	3,260	3,020	2,970	2,230	1,840	2,960
1921.....	3,330	2,960	4,000	5,560	6,370	4,940	3,000	4,530	6,150	3,360	2,320	1,750	4,150
1922.....	1,730	3,330	7,380	2,200	2,340	1,760	2,130	5,060	6,120	3,080	1,790	1,440	3,200
1923.....	1,290*	1,950	3,100	7,150	2,500	2,570	3,690	4,840*	4,270	3,570	2,450	2,120	3,270*
1924.....	2,160	1,720	3,100	3,320	5,910	2,310	2,120	3,530	2,570	2,390	1,960	1,040	2,720
1925.....	1,630	2,660	4,420	4,120	4,440	2,590	3,610	4,350	3,150	2,760	2,150	1,550	3,110
1926.....	1,230	1,230	4,230	3,580	3,030	2,630	2,220	2,510	2,040	2,040	2,020*	1,090	2,420*
1927.....	2,250	2,350	3,530	3,720	3,560	2,900	2,700	3,580*	5,500*	3,000*	2,230	2,350	3,170*
1928.....	3,770	7,550	3,960	5,460	2,170	4,100	4,240	5,160	3,010*	3,650*	2,050	1,720	3,870*
1929.....	2,700	1,510	1,560	1,710*	1,620	2,820	2,800	4,060	5,130	2,690	2,130	1,600	2,500*
1930.....	1,160	678	1,770	1,730	4,030*	3,080	3,020	2,720	2,740	2,170	1,780	1,440	2,180*
1931.....	1,620*	1,130	1,040	2,550	2,120	2,660	4,300	3,360	3,610	2,430	1,900	1,500	2,350*
1932.....	1,730	2,910	2,860	3,390	4,490	6,430	4,630	4,410	5,350	3,480*	2,950	1,840	3,630*
1933.....	2,290	5,120	4,520	5,390	2,020	3,240	3,560	4,360	6,230	4,480	2,560	2,120	4,060
1934.....	4,316	4,034	15,790	8,024	4,103	5,060	4,236	4,751	2,663*	2,066	1,797	1,330	4,927*
1935.....	3,719	5,902	4,414	6,261	3,521	3,133	2,985	3,215	4,116	3,189	2,018	1,626	3,676
1936.....	1,193	1,238	1,499	4,396	2,734	3,540	4,115	6,647	6,001	3,191	2,438	1,909	3,240
1937.....	1,358	792	3,140	1,416	2,352	2,996	4,103	4,105	6,322	3,360	2,060	1,661	2,812
1938.....	1,427	6,280	5,222	4,203	2,324	2,572	4,092	4,430	4,155	2,855	1,918	1,805	3,516
1939.....	1,700	2,264	3,344	3,700	3,098	3,497	3,380	3,784	3,978	3,050	2,093	1,565	2,963
1940.....	1,423	1,727	3,392	3,135	4,486	3,964	3,098	3,618	2,447	2,097	1,706	1,561	2,717
1941.....	1,591	2,217	2,515	2,324	1,801	1,585	1,977	2,575	2,666	2,218	1,737	1,818	2,687
1942.....	2,313	2,670	4,860	2,325	2,483	1,942	2,487	3,505	5,167	3,682	2,183	1,360	2,917
1943.....	1,139	4,206	4,038	2,940	4,094	2,763	4,601	3,339	4,448	3,389	1,796	1,502	3,676
1944.....	1,540	1,490	3,037	2,074	2,305	2,054	2,196	3,027	2,955	2,069	1,028	1,860	2,186
1945.....	1,315	1,477	2,189	4,693	3,977	2,755	3,395	4,951	3,616	2,375	1,798	2,056	2,379
1946.....	1,829	4,335	4,594	5,034	4,059	4,289	4,053	5,534	5,200	3,910	2,104	1,383	3,867
1947.....	2,141	3,897	7,523	4,411	4,110	3,156	3,603	3,962	3,308	2,479	1,505	1,642	3,335
1948.....	3,026	5,641	4,513	4,084	3,762	3,304	3,753*	5,095*	6,063	3,447	2,454	1,824	4,011*
1949.....	2,186	3,495	4,356	1,869	3,640	3,904	4,399	6,047	4,969	3,226	2,171	1,483	3,461
1950.....	2,192	4,067	4,630	4,509	5,000	5,969	4,145	4,692	6,928	5,160	2,643	1,737	4,301
1951.....	3,123	5,594	6,577	4,812	7,187	3,529	3,494	4,153	3,665	2,583	1,777	1,364	3,867
1952.....	2,916	2,632	2,910	1,874	3,289	2,277	3,267	4,291	3,505	2,808	1,744	1,192	2,720
1953.....	846	656	964	6,348	5,490	2,297	2,981	3,600	4,551	3,924	2,026	1,483	2,907

PUYALLUP RIVER BASIN

Puyallup River at Puyallup, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914								2,870	2,450	1,970	1,660	1,340	
1915	1,280	2,190	1,280	1,340	1,280	1,310	1,710	1,590	2,190	1,960	1,920	1,190	1,190
1916	1,190	1,250	2,560			2,460	2,910	3,310	3,240	3,040	1,750	1,350	
1917	1,120	1,330	1,530	1,600	1,860		2,040	3,480	5,180	3,200		1,600	1,120
1918		870	1,220	4,470	2,020		2,140	2,450	1,900	1,840	1,660	1,440	870
1919	1,100	1,710	1,810	1,450	2,320	2,260	3,080	2,580	2,940	2,380	1,930	1,290	1,100
1920		1,500	1,850	1,660	1,630	1,570	1,820	1,750	2,530	2,030	1,750	1,630	
1921	2,270	1,690	2,030	2,520	2,720	2,820	2,030	2,620	4,220	2,720	1,680	1,470	1,470
1922	1,550	1,550	2,040	1,730	2,000	1,500	1,920	2,230	3,410		1,500	1,290	1,260
1923		1,460	1,510	2,620	1,750	1,960	2,820		2,530	2,440	1,890		
1924		1,320	1,630	2,030	3,040	1,630	1,570	1,590	2,110	1,960	1,510	1,360	1,320
1925	1,250	1,820	1,960	2,330	2,190	1,890	2,350	2,110	2,190	2,270	1,570	1,250	1,250
1926	1,040	1,080	1,960	2,110	2,440	1,960	1,750	1,060	1,570	1,750			1,040
1927	1,460	1,710	2,350	2,270	2,030	2,190	2,030	1,900			1,750	1,750	1,460
1928	2,110	2,270	2,030	1,890	1,890	1,630	2,530	3,280			1,750	1,460	1,460
1929	1,240	1,240	1,240	1,480	1,480	1,750	2,280	3,030	3,880	1,660	1,400	1,300	1,240
1930	610	410	440			1,570	1,570	1,570	2,170	1,480	1,300	1,130	410
1931			645	645	1,130	1,480	1,580	2,180	2,070	1,630	1,120	717	
1932	704	2,020	1,240	1,740	1,630	3,020	3,460	3,020	3,460	1,850	1,330	1,160	704
1933	1,280	3,530	2,300	1,830	1,330	1,630	2,180	3,020	4,250	2,960	1,800	1,530	1,280
1934	1,740	2,000*	2,000	4,560	3,150	3,450	3,156	3,600	1,600*	1,400*	900*	700*	700*
1935	800	2,450	2,310	2,380	2,210	2,140	1,840	2,010	3,000	1,820	1,200	900	800
1936	600	500*	997	2,320	1,540	2,000	1,500	4,220	2,940	1,940	1,520	1,240	500*
1937	850	640	700	907	1,100	1,730	2,020	2,370	3,440	2,280	1,400	1,060	640
1938	784	1,770	2,510	2,560	1,720	1,810	2,010	3,010	2,060	1,940	1,530	1,390	784
1939	1,140	1,460	2,160	2,830	1,880	2,280	2,680	2,210	3,080	2,300	1,450	1,240	1,140
1940	986	1,000*	1,920	2,210	2,020	2,640	1,600	2,460	1,500	1,560	1,380	1,170	986
1941	1,099	1,150	1,660	1,520	1,350*	1,100	1,370	1,520	1,620	1,470	1,310	1,140	1,099
1942	1,200	1,170	2,000*	1,650*	1,410	1,290	1,660	1,910	3,680	2,410	1,060	1,040	1,040
1943	850	1,380	2,750	1,690	1,890	1,280	3,030	2,500	2,860	2,020	1,240	1,120	850
1944	692	886	1,490	1,260	1,490	1,340	1,380	1,920	2,250	1,420	1,160	1,360	692
1945	898	860	1,030	1,040	1,870	1,810	2,310	3,980	2,270	1,540	1,230	1,270	860
1946	1,120	3,060	2,190	3,140	2,340	2,860	1,080	3,810	4,030	2,690	1,840	962	962
1947	848	1,430	2,750	1,980	2,780	2,370	2,930	2,850	2,500	1,320	972	1,050	848
1948	1,260	3,220	2,920	1,850	1,560	1,970	1,750	2,200*	5,740	2,060	1,690	930	930
1949	1,050	1,320	1,830	840	870	3,030	2,520	4,000	3,030	1,890	1,220	930	840
1950	840	1,550	1,830	1,810	2,090	3,380	2,750	2,950	5,490	3,330	1,420	970	840
1951	1,020	1,760	3,650	2,940	2,620	2,380	2,430	2,600	2,760	1,440	950	868	868
1952	1,040	1,300	2,070	828	2,300	1,000	1,940	2,530	2,350	1,200	978	629	629
1953	528	400	508	664	2,480	1,210	2,130	2,730	3,250	1,650	1,020	774	400

* Estimated.

PUYALLUP RIVER BASIN

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Puyallup River at Puyallup, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1914							
1915	9,390	Nov. 3, 1914	1,190	2,320	1,680,000	2,530	1,830,000
1916	22,300	Dec. 22, 1915	1,190	4,080	2,960,000	3,710	2,700,000
1917	15,000	Dec. 13, 1916	1,120	3,630	2,630,000	4,290	3,100,000
1918	40,500	Dec. 18, 1917	870	3,830	2,770,000	3,420	2,450,000
1919	36,500	Jan. 23, 1919	1,100	3,350	2,420,000	3,190	2,310,000
1920	16,500	Jan. 28, 1920		2,960	2,160,000	3,260	2,360,000
1921	24,900	Dec. 30, 1920	1,470	4,130	3,030,000	4,320	3,130,000
1922	35,600	Dec. 13, 1921	1,280	3,200	2,320,000	2,690	2,650,000
1923	31,000	Jan. 8, 1923		3,270	2,370,000	3,320	2,400,000
1924	21,700	Feb. 12, 1924	1,320	2,720	1,970,000	2,860	2,080,000
1925	18,600	Dec. 11, 1924	1,250	3,110	2,250,000	2,940	2,130,000
1926	15,800	Dec. 23, 1925	1,040	2,420	1,750,000	2,540	1,840,000
1927	14,500	Oct. 16, 1926	1,460	3,110	2,260,000	3,700	2,680,000
1928	25,400	Nov. 25, 1927	1,460	3,870	2,810,000	3,050	2,200,000
1929	8,610	June 14, 1929	1,240	2,560	1,850,000	2,430	1,760,000
1930	8,390	Mar. 25, 1930	410	2,180	1,560,000	2,190	1,590,000
1931	19,800	April 1, 1931		2,350	1,700,000	2,670	1,930,000
1932	33,000	Feb. 26, 1932	704	3,630	2,640,000	4,240	3,080,000
1933	37,800	Nov. 13, 1932	1,280	4,060	2,840,000	4,910	3,550,000
1934	57,000	Dec. 10, 1933	700	4,927	3,567,000	4,014	2,906,000
1935	39,500	Oct. 25, 1934	800	3,678	2,662,000	2,831	2,050,000
1936	14,000	June 8, 1936	500	3,249	2,358,000	3,365	2,448,000
1937	17,800	April 15, 1937	640	2,812	2,036,000	3,446	2,495,000
1938	33,900	April 18, 1938	784	3,516	2,546,000	3,050	2,208,000
1939	13,000	Feb. 15, 1939	1,140	2,963	2,145,000	2,900	2,099,000
1940	11,500	Feb. 10, 1940	986	2,717	1,972,000	2,697	1,958,000
1941	18,400	Nov. 29, 1940	1,090	2,087	1,511,000	2,384	1,726,000
1942	22,500	Dec. 19, 1941	1,040	2,917	2,112,000	2,926	2,118,000
1943	25,700	Nov. 23, 1942	850	3,226	2,336,000	2,900	2,089,000
1944	19,900	Dec. 3, 1943	886	2,189	1,387,000	2,095	1,521,000
1945	21,800	Jan. 7, 1945	890	2,879	2,084,000	3,362	2,434,000
1946	23,800	Dec. 29, 1945	962	3,867	2,800,000	4,099	2,968,000
1947	33,800	Dec. 11, 1946	848	3,535	2,560,000	3,582	2,593,000
1948	17,700	Nov. 8, 1947	930	4,011	2,912,000	3,675	2,668,000
1949	14,000	Feb. 17, 1949	840	3,461	2,505,000	3,531	2,557,000
1950	17,400	Mar. 4, 1950	840	4,301	3,114,000	4,604	3,376,000
1951	29,800	Feb. 11, 1951	868	3,960	2,867,000	3,399	2,460,000
1952	9,110	Feb. 4, 1952	629	2,727	1,950,000	2,221	1,612,000
1953	16,900	Feb. 1, 1953	400	2,907	2,104,000		

PUYALLUP RIVER BASIN

Clark Creek at Puyallup, Wash.

Location.—Lat. 47°10'40", long. 122°19'00", in NE¼SE¼ sec. 32, T. 20 N., R. 4 E., on left bank in Puyallup, a quarter of a mile upstream from East Branch, half a mile downstream from source at Maplewood Springs, and 3 miles upstream from mouth.

Drainage area.—1.66 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 40 ft. (from topographic map).

Extremes.—1946-48: Maximum discharge, 27 cfs Mar. 21, 1948 (gage height, 1.37 ft.); minimum, 10 cfs Feb. 13, 14, 1946.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946.....						11.9	12.0	14.7	15.6	16.7	17.2	17.5	.....
1947.....	17.8	17.9	18.1	17.2	18.2*	17.0	17.7	19.1	20.0	20.8	21.0	20.9	18.8*
1948.....	19.0*	19.2*	18.5	18.4	18.2	17.9	18.7	19.1					

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946.....						11	11	14	15	16	17	17	.....
1947.....	11	17	16	15	17*	17	17	18	20	20	21	20	15
1948.....	18*	18*	16.5	17	17	17	18	18*					

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1946.....							
1947.....	25	Jan. 25, 1947	15	18.8	13,620	19.1	13,800
1948.....	†27	Mar. 21, 1948					

* Estimated.

† Maximum during period October to May.

WAPATO CREEK BASIN

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Wapato Creek near Tacoma, Wash.

Location.—Lat. 47°13'30", long. 122°20'10", on section line between secs. 17 and 18, T. 20 N., R. 4 E., on left bank, 4 miles upstream from mouth, and 5½ miles southeast of Tacoma.

Drainage area.—6.00 sq mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map).

Extremes.—June to October 1949: Maximum discharge, 13 cfs Oct. 28; maximum gage height, 2.02 ft. Aug. 1; minimum discharge, 1.5 cfs Aug. 11.

Remarks.—Some diversion for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949	2.79	3.18	4.25	4.72	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949	1.7	1.7	3.6	3.6	.....

HYLEBOS CREEK BASIN

Hylebos Creek near Tacoma, Wash.

Location.—Lat. 47°16'05", long. 122°19'40", in NW¼ sec. 32, T. 21 N., R. 4 E., on right bank, 5 miles upstream from mouth, and 5.3 miles east of Tacoma.

Drainage area.—11.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 45 ft. (from topographic map).

Extremes.—1949-50: Maximum discharge, 108 cfs Mar. 17, 1950 (gage height, 2.65 ft.), from rating curve extended above 35 cfs; minimum, 6.4 cfs Aug. 29, 31, 1950.

Remarks.—Several small diversions for domestic use and possibly some regulation at trout farm above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.99	9.27	8.78	.....
1950	9.16	12.1	13.1	19.3	13.9	20.7	16.3	12.0	11.0	9.98	10.2*	9.92	13.1*

* Estimated.

HYLEBOS CREEK BASIN

Hylebos Creek near Tacoma, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949...										9.0	9.0	8.3	.....
1950...	8.2	8.4	9.6	11*	8.4	13	18.5	11	10	9*	7.2	6.8	6.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1949.....													
1950.....	108	Mar. 17, 1950	6.8	13.1	1.16	16.80	9,510						

DUWAMISH RIVER BASIN

Snow Creek near Lester, Wash.

Location.—Lat. 47°15'00", long. 121°24'00", in NW¼NW¼ sec. 3, T. 20 N., R. 11 E., on right bank at road crossing, a quarter of a mile upstream from mouth, and 5½ miles northeast of Lester.

Drainage area.—11.9 sq. mi.

Gage.—Water-stage recorder and, after Aug. 7, 1947, rock or concrete control. Altitude of gage is 1,950 ft. (from topographic map).

Average discharge.—8 years (1945-53), 66.1 cfs.

Extremes.—1945-53: Maximum discharge, 1,210 cfs Jan. 31, 1953 (gage height, 4.87 ft.); minimum, 3.0 cfs Nov. 29, 30 (gage height, 1.99 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	38.8	70.4	61.7	46.6	23.2	57.9	104	189	137	40.5	11.0	6.65	65.7
1947...	41.5	52.2	142	73.2	59.0	96.9	124	88.5	45.3	21.0	7.97	8.48	63.9
1948...	43.1	117	50.0	21.7	35.7	34.6	76.2	206	177	26.6	9.87	10.2	67.3
1949...	28.2	30.1	25.9	29.7	35.5	44.6	125	244	139	50.3	13.3	9.61	65.2
1950...	62.4	102	72.7	40.3*	42.1*	75.6	75.5	169	230	85.8	17.9	10.3	82.1*
1951...	53.4	120	116	56.9	124	39.5	131	163	75.9	16.0	6.93	6.93	76.1
1952...	63.2	63.8	36.1	20.8	56.0	33.2	127	152	67.7	27.8	7.00	5.48	54.1
1953...	4.16	4.23	7.75	153	107	42.8	85.2	116	85.2	32.3	9.26	6.68	54.6

* Estimated.

DUWAMISH RIVER BASIN

Snow Creek near Lester, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	9.8	30	20	22	15.5	34	32	117	66	18.0	6.5	6.0	6.0
1947...	4.7	22	33	22	29	39	67	44	17.5	10.5	7.0	7.1	4.7
1948...	7.6	26	20	9.6	9.6	17.5	25	45	70	13.5	9.2	8.9	7.6
1949...	9.4	9.6	9.4	16	12.5	12.5	9.5	118	80	24	9.7	7.1	7.1
1950...	7.1	24	21	17*	17	34	46	65	189	28	11	6.8	6.8
1951...	11	30	45	25	32	22*	50	82	34	8.3	5.8	4.1	4.1
1952...	12.5	28	23	12.5	22	15	46	75	42	11	5.8	4.7	4.7
1953...	3.7	3.0	3.4	5.2	26	23	28	75	62	12.2	7.3	4.4	3.0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....	443	Dec. 28, 1945	6.0	65.7	5.52	74.99	47,600	71.3	81.34	51,630
1947.....	938	Dec. 11, 1946	4.7	63.9	5.37	72.91	46,280	61.5	70.19	44,540
1948.....	930	Nov. 8, 1947	7.6	67.3	5.66	76.96	48,850	87.4	65.62	41,660
1949.....	498	May 12, 1949	7.1	65.2	5.48	74.36	47,180	77.5	83.38	56,080
1950.....	692	Nov. 27, 1949	6.8	82.1	6.90	93.66	59,440	87.3	99.57	63,180
1951.....	842	Feb. 9, 1951	4.1	76.1	6.39	86.84	55,100	63.9	72.91	46,260
1952.....	298	May 13, 1952	4.7	54.1	4.55	61.89	39,270	42.7	48.61	30,980
1953.....	1,210	Jan. 31, 1953	3.0	54.6	4.59	62.26	39,510	.....	.....	.....

* Estimated.

Friday Creek near Lester, Wash.

Location.—Lat. 47°13'10", long. 121°27'10", in SE¼NW¼ sec. 18, T. 20 N., R. 11 E., on left bank, 0.4 mile upstream from mouth, and 2 miles northeast of Lester.

Drainage area.—4.55 sq. mi.

Gage.—Water-stage recorder, with wooden control Aug. 25, 1949, to Aug. 8, 1951, and concrete control since Aug. 9, 1951. Altitude of gage is 1,760 ft. (from topographic map).

Average discharge.—8 years (1945-53), 27.4 cfs.

Extremes.—1945-53: Maximum discharge, 497 cfs Dec. 11, 1946 (gage height, 4.90 ft.); minimum, 1.3 cfs Sept. 26-29, Oct. 2, 3, 1949, Nov. 28, 29, 30, 1952; minimum gage height, 2.28 ft. Sept. 29, 30, 1946.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	19.3	33.9	27.7	21.5	13.4	26.3	44.7	81.1	67.1	19.3	4.61	2.68	30.2
1947...	17.3	23.6	63.9	37.0	36.9	39.3	51.2	35.4	19.7	10.8	3.76	4.84	28.6
1948...	23.7	57.0	31.7	18.9	18.2	16.1	29.0	62.8	73.1	14.0	6.00	5.26	29.6
1949...	11.2	22.0	19.5	11.5	16.7	23.3	46.5	87.9	61.1	21.4	6.57	3.45	27.6
1950...	22.8	33.0	29.0	23.3*	18.2	26.5	30.5	59.7	65.2	34.8	8.39	5.86	31.8*
1951...	20.2	51.2	45.7	21.4	46.0	16.0	41.6	63.7	32.1	6.39	3.34	3.08	29.0
1952...	16.7	22.9	14.2	8.60	22.6	16.0	45.5	61.8	26.8	10.7	3.79	2.66	21.0
1953...	2.15	1.96	3.23	63.9	38.6	15.7	29.2	49.5	35.0	11.9	4.19	3.18	21.7

* Estimated.

DUWAMISH RIVER BASIN

Friday Creek near Lester, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	5.4	7.4	8.7	9.8	7.2	16	14	49	42	7.6	3.5	2.2	2.2
1947...	2.4	8.4	17	10	21	15	28	17	11	5.5	2.5	3.0	2.4
1948...	3.8	18	19	11.5	7.7	11	13.5	18.5	32	7.7	4.8	4.2	3.5
1949...	6.2	7.2	10.5	6.4	5.3	14	14	47	40	10	4.8	1.3	1.3
1950...	1.3	10	9.7	9*	6.9	13	20	26	60	10.5	5.5	3.4	1.3
1951...	5.2	12	22	8.6	12	8.3	21*	33	12	3.8	2.8	2.1	2.1
1952...	3.9	13	8.7	5.0	9.7	7.4	19	23	16	4.7	3.0	2.2	2.2
1953...	2.0	1.3	1.4	2.2	11.5	10	11.5	39	26	5.0	3.4	2.4	1.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....	194	Dec. 28, 1945	2.2	30.2	6.64	90.24	21,880	32.3	96.38	23,360
1947.....	497	Dec. 11, 1946	2.4	28.6	6.29	85.38	20,730	29.2	87.01	21,120
1948.....	219	Nov. 10, 1947	3.8	29.6	6.51	88.47	21,460	24.6	73.64	17,860
1949.....	173	May 12, 1949	1.3	27.6	6.07	82.40	20,000	30.7	91.67	22,240
1950.....	228	Nov. 27, 1949	1.3	31.8	6.99	94.86	23,040	34.1	101.75	24,680
1951.....	262	Feb. 11, 1951	2.1	29.0	6.37	86.67	21,020	23.8	70.67	17,200
1952.....	125	May 20, 1952	2.2	21.0	4.62	62.73	15,230	17.1	51.14	12,420
1953.....	300	Jan. 31, 1953	1.3	21.7	4.77	64.81	15,720	.....	.....	.....

Green River near Lester, Wash.

Location.—Lat. 47°12'30", long. 121°33'10", in NE¼SE¼ sec. 20, T. 20 N., R. 10 E., on right bank, three-eighths of a mile downstream from Champion Creek, 1¼ miles downstream from McCain Creek, and 3 miles west of Lester.

Drainage area.—104 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,480 ft. (from river-profile map).

Average discharge.—8 years (1945-53), 422 cfs.

Extremes.—1945-53: Maximum discharge, 10,200 cfs probably Dec. 11, 1946 (gage height 12.7 ft., from high-water mark in well), from rating curve extended above 4,500 cfs; minimum, 22 cfs Nov. 30, 1952 (gage height, 2.92 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	186	436	443	337	229	487	806	1,246	628	198	64.6	43.7	426
1947...	168	275	1,064*	530	502	600	716	453	220	122	53.0	56.6	395*
1948...	443	904	433	305	310	281	582	1,237	888	163	87.9*	65.2	480*
1949...	160	371	398	193	337	528	998	1,455	624	208	72.0	48.5	447
1950...	221	617	558	318*	358	587	631	1,151	1,263	388	91.3	60.6	520*
1951...	268	798	795	452	787	293	805	899	349	89.0	43.7	38.4	465
1952...	186	307	255	126	369	268	832	838	313	145	49.7	34.5	309
1953...	26.0	27.9	44.9	943	688	280	515	688	481	191	61.0	40.7	331

* Estimated.

Green River near Lester, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	61	224	120	175	119	314	283	794	362	90	45	34	34
1947...	34	109	260*	204	307	279	435	248	142	76	36	36	34
1948...	38	391	266	185	133	179	240	346	353	104	67*	44	36
1949...	72	93	179	118	104	316	319	745	332	115	50	38	36
1950...	38	133	186	180*	148	270	420*	502	745	135	00	44	38
1951...	60	190	382	205	221	144	420	444	158	52	37	28	28
1952...	48	165	101	81	150	180	364	460	200	66	39	29	29
1953...	24	22	23	34	188	175	221	488	352	82	45	32	22

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1946.....	4,010	Dec. 28, 1945	34	426	4.10	55.67	308,760	468	60.54	337,400	
1947.....	10,200	①	34	398	3.83	52.00	288,300	423	55.22	306,300	
1948.....	3,920	Nov. 8, 1947	38	480	4.62	62.76	348,100	402	52.54	291,500	
1949.....	2,840	May 13, 1949	38	447	4.30	58.36	323,700	489	63.79	353,800	
1950.....	3,610	Nov. 27, 1949	38	520	5.00	67.92	376,800	559	73.00	405,000	
1951.....	4,790	Feb. 9, 1951	28	465	4.47	67.70	336,700	372	48.54	269,300	
1952.....	1,680	Apr. 19, 1952	29	309	2.97	40.49	224,600	255	33.40	185,200	
1953.....	4,990	Jan. 31, 1953	22	331	3.18	43.16	229,300	.....	.....	.....

① Probably Dec. 31, 1946.

Smay Creek near Lester, Wash.

Location.—Lat. 47°15'40", long. 121°33'50", in SW¼ sec. 32, T. 21 N., R. 10 E., on right bank, 3½ miles upstream from mouth, and 4½ miles northwest of Lester.

Drainage area.—8.71 sq. mi.

Gage.—Water-stage recorder and, since Aug. 7, 1947, rock or concrete control. Altitude of gage is 1,900 ft. (from topographic map). Prior to Dec. 11, 1946, water-stage recorder 200 ft. upstream at datum 4.28 ft. higher.

Average discharge.—7 years (1946-53), 51.6 cfs.

Extremes.—1946-53: Maximum discharge not determined, occurred Dec. 11, 1946, when recorder was damaged by high water; minimum, 4.2 cfs Nov. 21 to Dec. 1, 1952 (gage height, 2.48 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	27.3	42.6	154*	61.3*	51.5*	60.9*	64.5	52.0*	32.7	22.9	10.0*	12.5	48.6*
1948...	62.2	122*	66.4*	47.8	41.1	33.2	55.9	123	113	30.5	15.5	15.5	60.4*
1949...	25.6	38.2	40.4	27.4	31.0	50.6	77.5	151	51.1	35.5	16.6	10.0	48.8
1950...	41.0	72.2	68.1	52.7	51.8	73.3	65.0	112	159	63.4	19.8	12.0	85.9
1951...	36.8	97.9	100	61.1	99.9	32.8	82.1	98.7	46.7	16.5	9.55	8.57	57.2
1952...	40.5	55.3	36.1	20.1	50.7	27.1	80.8	85.3	46.0	25.1	10.9	7.49	41.3
1953...	6.81	4.89	7.09	105	84.8	33.6	48.1	72.9	55.1	28.9	12.8	8.52	38.7

* Estimated.

DUWAMISH RIVER BASIN

Smay Creek near Lester, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	6.2	24	35*	26*	31*	30*	32*	30*	18	11*	9.0	9.0	6.2
1948...	11	45*	35*	29	17.5	22	35	60	50	24	11.5	8.4	8.4
1949...	13.5	15.5	29	18.5	12	37	28	49	56	18.5	13.5	11	11
1950...	8.4	26	30	23*	21	37	44	55	113	28	14	9.6	8.4
1951...	10.5	29	58	34	36	24	40	60	25	11.5	8.4	6.9	6.9
1952...	11	32	25	14	24	17	37	59	32	15	8.0	6.9	6.9
1953...	5.3	4.2	4.5	5.9	29	25	23	60	45	17	10	6.9	4.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1946			6.2	48.6	5.58	75.70	35,170	50.5	78.73	36,580		
1947			11	60.4	6.63	94.80	43,810	43.3	75.50	35,070		
1948	412	Nov. 3, 1947	8.4	43.8	5.60	76.15	36,370	55.3	86.26	40,650		
1949			8.4	65.9	7.57	102.72	47,720	70.3	109.61	50,910		
1950	332	Nov. 27, 1949										
1951	457	Feb. 9, 1951	6.9	57.2	6.57	89.12	41,400	48.6	75.70	35,170		
1952	147	May 21, 1952	6.9	41.3	4.74	64.00	30,000	31.8	49.71	23,090		
1953	447	Jan. 31, 1953	4.2	38.7	4.44	60.33	28,020					

Charley Creek near Eagle Gorge, Wash.

Location.—Lat. 47°15'00", long. 121°47'00", in SW¼NW¼ sec. 3, T. 20 N., R. 8 E., on left bank, 300 ft. downstream from Beaverdam Lake Creek, 1½ miles southwest of Eagle Gorge, and 1¾ miles upstream from mouth.

Drainage area.—11.0 sq. mi.

Average discharge.—7 years (1946-53), 71.2 cfs.

Gage.—Water-stage recorder. Altitude of gage is 1,350 ft. (from topographic map).

Extremes.—1946-53: Maximum discharge, 1,510 cfs Feb. 11, 1951 (gage height, 5.71 ft.), from rating curve extended above 570 cfs by logarithmic plotting; maximum gage height, 6.17 ft. Dec. 11, 1946; minimum discharge, 7.2 cfs Oct. 19, 1946; minimum gage height, 1.12 ft. Sept. 23, 24, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946												10.3	
1947	38.3	61.9	172	106	80.9	69.7	102	35.4	42.0	26.8	15.4	20.5	65.9
1948	94.2	152*	87.0*	79.7*	88.0	52.1*	85.4	125	59.7	29.7	36.3	34.7	79.1*
1949	42.3	102	79.9	43.8*	76.6	51.6*	118	128*	39.1*	26.7	18.2	14.0	64.0*
1950	73.5*	108*	112*	63.1*	112	139	125	131	123	42.0	23.5	19.1	89.3*
1951	79.7	156	161	133	179	63.1*	98.6	88.5	30.0	14.8	11.8	13.0	84.2*
1952	55.1	78.2*	75.9	38.5	90.1	62.6	99.6	90.2	43.8	23.5	13.4	11.1	56.3*
1953	9.63	9.22	19.0	211	135	54.3	79.3	68.7	65.7	29.0	16.4	15.2	59.0

* Estimated.

Charley Creek near Eagle Gorge, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946												7.9	
1947	7.4	27	58*	38	47	43	54	22	20	17	13	13	7.4
1948	13	54*	52*	35*	29	30*	40	46	42	20	23	19	13
1949	18	24	38*	23*	21*	64*	56*	50*	30*	19.5	14	11.5	11.5
1950	12.5*	20	39*	30*	35	64	76	84	91	23	17	12	12
1951	22	42	95	57	45*	31*	59	47	18.5	12.5	11	10	10
1952	18	26	44	21	33	27	63	53	31	15	11.5	10	10
1953	8.8	7.3	7.3	15.8	38	36	42	41	35	18.0	14.0	11.6	7.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1946													
1947	1,350	Dec. 11, 1946	7.4	65.9	5.99	81.29	47,650	69.2	85.33	50,070			
1948	559	Nov. 7, 1947	13	79.1	7.19	97.90	57,430	70.0	86.65	50,840			
1949	440	Feb. 17, 1949	11.5	64.0	5.82	78.98	46,340	69.8	86.17	50,550			
1950	510	Mar. 4, 1950	12	89.8	8.16	110.85	65,020	98.5	121.68	71,320			
1951	1,510	Feb. 11, 1951	10	84.2	7.65	103.95	60,960	66.4	84.35	49,500			
1952	463	Feb. 4, 1952	10	56.3	5.12	69.70	40,880	42.2	52.17	30,590			
1953	1,070	Jan. 23, 1953	7.3	59.0	5.30	72.77	42,700						

Bear Creek near Eagle Gorge, Wash.

Location.—Lat. 47°17'00", long. 121°48'10", in NW ¼ sec. 28, T. 21 N., R. 8 E., on left bank, a quarter of a mile upstream from mouth, and 2½ miles northwest of Eagle Gorge.

Drainage area.—4.25 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,000 ft. (from topographic map). Prior to Sept. 8, 1949, water-stage recorder 25 ft. upstream at same datum.

Average discharge.—7 years (1946-53), 25.0 cfs.

Extremes.—1946-53: Maximum discharge, 830 cfs Feb. 11, 1951 (gage height, 4.00 ft.), from rating curve extended above 70 cfs on basis of slope-area determination of peak flow; minimum not determined, probably occurred Oct. 17, 18, 1946, during period of no gage-height record; minimum gage height, 0.41 ft. Sept. 16-24, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947	14.3*	44.8*	76.7*	41.3*	30.2*	62.2*	29.6	7.72	14.4	7.98	2.08	5.49	25.0*
1948	46.0	64.8	39.0	35.5	37.8	23.6	37.2	36.6	10.4	8.82	7.73	9.85	30.6
1949	12.1	36.8	26.6	12.7	30.6	31.5	45.7	27.0	6.36	6.92	4.08	3.31	20.2
1950	28.9	30.8	41.4	23.5	41.9*	48.3	48.2	41.8	25.1	5.23	5.05	4.92	29.0*
1951	32.6	49.2	54.8	41.2	69.7*	23.2*	30.0	20.1	6.01	2.54	1.23	2.51	29.0*
1952	25.1	31.2	31.2	13.4	33.6	27.2	34.6	21.3	10.0	5.44	2.20	1.82	19.7
1953	1.24	2.20	9.35	91.9	43.4	22.8	28.8	19.3	22.6	7.65	3.10	4.08	21.3

* Estimated.

DUWAMISH RIVER BASIN

Bear Creek near Eagle Gorge, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	0.5*	7.1	17*	11	13.5	13	10.5	4.9	5.5	3.5	1.3	1.4	6.5*
1948...	3.3	22	21*	12	5.8	11.5	18.5	19	9.8	4.7	4.7	4.0	3.3
1949...	5.2	9.8	9.4	4.9	4.0	14	15	8.8	3.8	3.8	2.4	1.7	1.7
1950...	3.7	8.0	12	7.6*	9.2*	18.5	26	31	12	3.3	2.2	2.0	2.0
1951...	5.4	11	28	15*	10*	7*	13	9.6	3.8	1.6	.9	.7	.7
1952...	6.2	11	13.5	5.0	8.0	9.9	21	9.1	6.3	3.2	1.6	1.2	1.2
1953...	1.1	.8	.8	5.9	9.0	12.5	17.5	8.6	12.5	4.1	2.2	2.1	.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....										
1947.....	605	Dec. 10 or 11, 1946	0.5	25.0	5.88	79.80	18,090	26.3	83.96	19,030
1948.....	275	Nov. 7, 1947	3.3	30.6	7.20	98.06	22,210	24.2	77.61	17,560
1949.....	367	Feb. 17, 1949	1.7	20.2	4.75	64.46	14,610	22.7	72.49	16,420
1950.....	384	Mar. 4, 1950	2.0	29.0	6.82	92.58	20,950	31.6	101.04	22,900
1951.....	830	Feb. 11, 1951	.7	29.0	6.82	92.68	21,000	24.9	79.49	18,020
1952.....	188	Feb. 4, 1952	1.2	19.7	4.64	63.05	14,290	13.4	43.07	9,750
1953.....	275	Jan. 23, 1953	.8	21.3	5.01	67.92	15,390			

* Estimated.

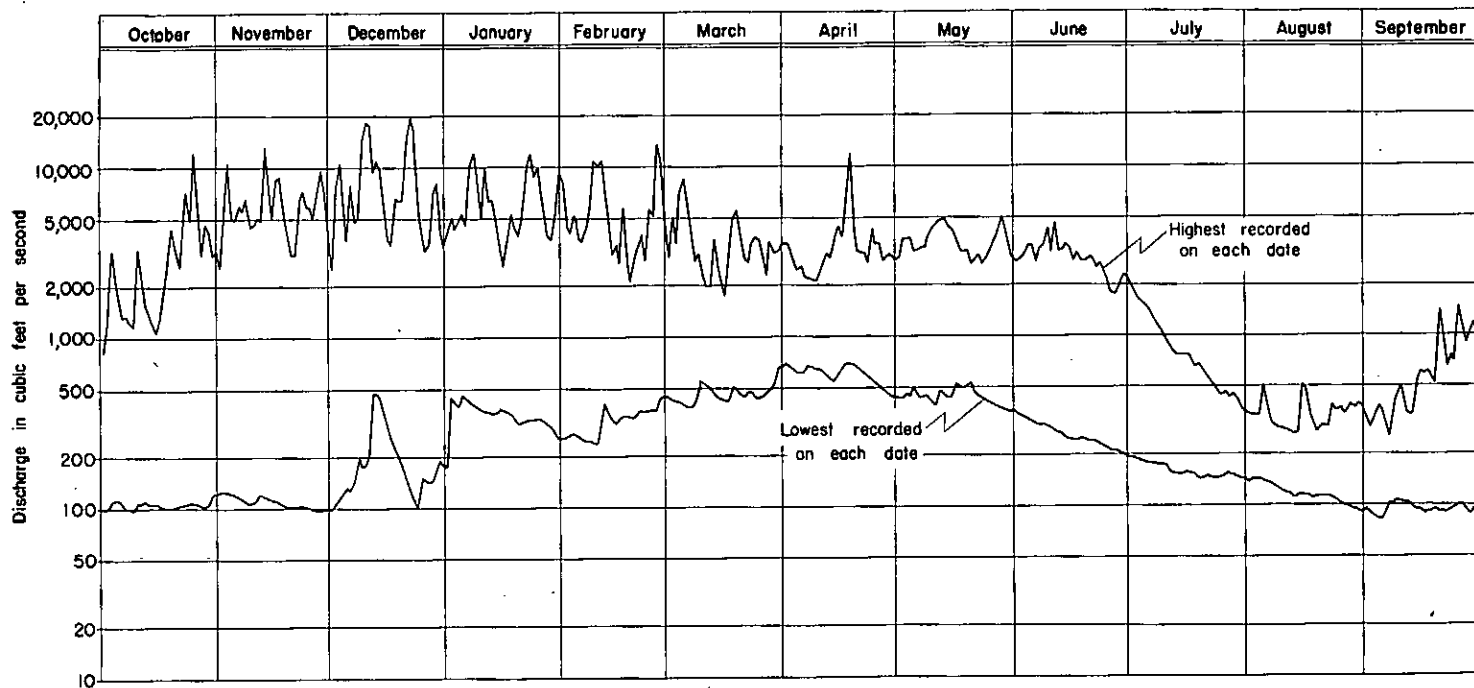


Figure 8. Typical hydrographs of maximum and minimum daily discharges that have been recorded on each date at a gaging station. These are for Green River near Palmer, during water years 1932-1953.

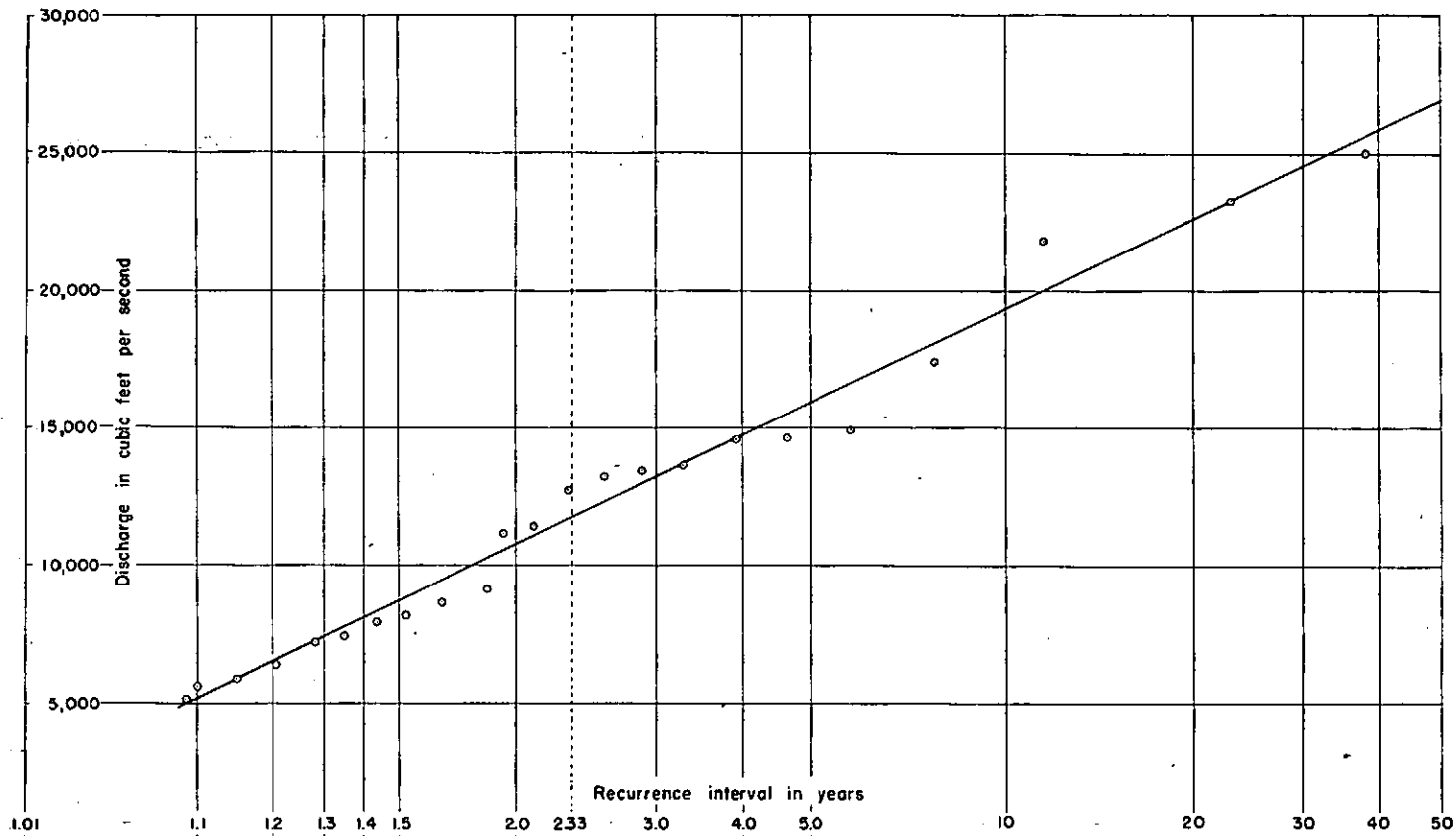


Figure 9. Typical flood-frequency curve. This curve is for gaging station, Green River near Palmer, and is based on annual flood peaks recorded during water years 1932-53.

Green River near Palmer, Wash.

Location.—Lat. 47°17'40", long. 121°49'20", in SW¼NW¼ sec. 20, T. 21 N., R. 8 E., on right bank, 1½ mile upstream from diversion dam and intake of Tacoma water-supply system, 2½ miles downstream from North Fork, and 3½ miles southeast of Palmer.

Drainage area.—230 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 912.6 ft. above mean sea level (river-profile survey).

Average discharge.—22 years (1931-53), 1,058 cfs.

Extremes.—1931-53: Maximum discharge, 23,200 cfs Dec. 11, 1946 (gage height, 19.95 ft., from high-water mark in well); minimum, 81 cfs Sept. 4, 5, 1934.

Flood of December 1917 reached a stage of about 20 ft., from crest head over city of Tacoma diversion dam and gage-height relationship curve (discharge about 25,000 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1932...	653	1,200	985	1,640	1,760	2,950	2,090	1,640	1,110	408	221	209	1,240
1933...	576	3,700	1,730	2,330	542	1,250*	1,600	1,950	2,140	696	197	391	1,430*
1934...	1,009	1,858	5,533	3,248	1,142	1,868	1,101	586	265	171	117	148	1,479
1935...	1,136	1,792	1,748	2,630	1,377	1,131	1,050	1,254	777	336	195	136*	1,130*
1936...	160*	388	640	2,040	666	1,640	1,985	2,224	1,097	315	157	159	953*
1937...	101	126	1,513	395	830	1,474	1,909	1,787	1,498	453	223	177	879
1938...	270	2,686	1,789	1,602	579	996	2,141	1,600	622	202	134	99.2	1,052
1939...	106	841	1,601	1,932	1,061	1,412	1,517	1,172	825	338	165	152	933
1940...	292	682	1,273	709	1,545	1,517	1,035	1,052	294	169	125	118	736
1941...	224	730	1,083	732	523	520	630	530	458	207	144	372	511
1942...	962	978	1,700	578	915	834	1,241	1,066	1,534	463	214	136	889
1943...	227	1,592	1,911	1,058	1,242	1,096	2,162	1,504	1,147	441	197	146	1,057
1944...	265	445	1,456	658	841	786	1,055	1,269	570	230	162	257	669
1945...	239	481	914	2,192	1,406	999	1,565	2,231	854	262	128	448	976
							1,932	2,351	1,468	588	221	170	1,226
1946...	641	1,527	1,520	1,548	1,042	1,693							
1947...	539	1,059	3,154	1,765	1,431	1,317	1,622	894	614	399	163	245	1,105
1948...	1,384	2,608	1,530	1,240	1,241	975	1,655	2,503	1,842	487	295	265*	1,325*
1949...	523	1,315	1,334	664	1,317	1,713	2,289	2,872	1,226	485	218	167	1,179
1950...	781	1,631	1,766	1,086	1,464	2,169	2,000	2,514	2,526	347	279	210	1,436
1951...	900	2,157	2,278	1,603	2,614	979	1,769	1,722	746	241	146	145	1,265
1952...	708	1,112	1,025	525	1,403	917	1,836	1,645	715	396	131	143	820
1953...	110	113	220	3,029	2,106	924	1,310	1,412	1,101	492	216	166	926

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1932...	184	611	411	549	342	1,190	1,400	1,040	571	230	177	154	154
1933...	141	1,190	772	593	342	562*	998	1,400	1,190	303	113	100	100
1934...	234	727	862	1,500	659	720	593	360	203	147	90	81	81
1935...	115	812	868	700*	840	548	642	1,020	395	215	146	115*	115*
1936...	107	154	360	762	370	762	608	1,330	455	200	132	128	107
1937...	121	112	121	250	235	762	1,210	1,210	982	270	176	135	112
1938...	115	335	928	845	455	762	845	905	286	144	99	88	88
1939...	96	210	532	905	550	555	1,150	770	570	208	140	110	90
1940...	130*	305	699	372	601	976	724	417	194	144	107	100	100
1941...	110	231	657	438	364	413	440	395	310	155	123	149	110
1942...	400	375	802	445	445	465	852	770	720	305	168	109	109
1943...	104	500	860	565	555	535	1,160	1,040	850	265*	148	118	106
1944...	307	229	489	352	453	383	805	825	314	176	139	129	107
1945...	176	205	336	395	630	550	958	1,620	456	148	109	106	106

* Estimated.

DUWAMISH RIVER BASIN

Green River near Palmer, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	195	958	550	838	540	1,040	885	1,740	1,040	309	173	128	128
1947...	120	396	896	686	1,020	790	1,160	530	422	281	154	157	126
1948...	165	1,150	900	650	425	615	750	1,050	900	310	230*	160*	160*
1949...	216	346	660	410	366	1,090	1,060	1,440	760	320	166	140	140
1950...	151	410	610	520*	510	1,040	1,340	1,600	1,740	345	211	154	151
1951...	207	700	1,430	840	750	540	1,060	980	382	170	128	112	112
1952...	200	628	668	322	604	516	1,170	1,060	520	223	163	124	124
1953...	100	97	97	175	712	680	760	1,100	556	276	182	126	97

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1932.....	17,400	Feb. 26, 1932	154	1,240	5.89	73.19	897,000	1,500	88.66	1,090,000		
1933.....	14,000	Nov. 13, 1932	100	1,430	6.22	84.41	1,030,000	1,690	99.70	1,220,000		
1934.....	21,700	Dec. 9, 1933	81	1,479	6.43	87.29	1,071,000	1,712	65.62	504,800		
1935.....	13,400	Oct. 25, 1934	115	1,130	4.91	66.70	818,100	838	49.45	606,600		
1936.....	7,080	Jan. 4, 1936	107	958	4.17	56.70	695,600	1,011	59.81	783,700		
1937.....	5,580	April 14, 1937	112	879	3.82	51.86	638,200	1,122	66.20	812,000		
1938.....	13,200	April 18, 1938	88	1,052	4.57	62.05	761,500	876	51.68	634,000		
1939.....	6,300	Dec. 7, 1938	96	933	4.06	55.06	675,400	903	53.28	653,600		
1940.....	5,040	Feb. 10, 1940	100	736	3.20	43.57	534,400	717	42.41	520,200		
1941.....	8,070	Nov. 29, 1940	110	511	2.22	30.14	369,700	653	38.53	472,600		
1942.....	7,900	Dec. 10, 1941	109	889	3.87	52.47	643,600	890	52.52	644,300		
1943.....	11,200	Nov. 23, 1942	106	1,057	4.60	62.36	765,000	927	54.71	671,100		
1944.....	14,600	Dec. 3, 1943	107	669	2.91	39.57	485,400	623	36.89	452,500		
1945.....	13,600	Jan. 7, 1945	106	975	4.24	57.52	706,600	1,146	67.65	829,900		
1946.....	11,400	Dec. 28, 1945	128	1,226	5.33	72.36	857,600	1,318	77.76	953,900		
1947.....	23,200	Dec. 11, 1946	126	1,105	4.80	65.24	800,200	1,167	68.55	844,600		
1948.....	8,510	Nov. 7, 1947	160	1,325	5.76	78.41	961,900	1,129	66.84	819,900		
1949.....	7,340	Feb. 17, 1949	140	1,175	5.11	69.34	850,600	1,255	74.24	910,700		
1950.....	9,050	Mar. 4, 1950	151	1,436	6.24	84.74	1,039,000	1,534	90.55	1,111,000		
1951.....	14,500	Feb. 9, 1951	112	1,265	5.50	74.65	915,700	1,056	62.34	764,500		
1952.....	5,040	Feb. 4, 1952	124	880	3.83	52.10	439,100	680	49.22	493,400		
1953.....	12,700	Jan. 23, 1953	97	920	4.03	54.67	670,600	.....	.....	.....

* Estimated.

Green River at Kanasket, Wash.

Location.—Lat. 47°19'10", long. 121°53'30", in SE¼ sec. 10, T. 21 N., R. 7 E., on left bank, 25 ft. downstream from highway bridge, and an eighth of a mile southeast of Northern Pacific Railway station at Kanasket.

Drainage area.—240 sq. mi.

Gage.—Staff gage. Altitude of gage is 780 ft. (from river-profile map).

Extremes.—May to October 1911: Maximum discharge, 3,450 cfs May 19 (gage height, 6.9 ft.), from graph based on gage readings; minimum observed, 132 cfs Aug. 27 to Sept. 2 (gage height, 2.05 ft.).

Remarks.—No known diversion or regulation above station.

Green River at Kanasket, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1911.....							1,750	1,090	398	186	509	276	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1911.....							1,220	625	249	132	132	222	.....

Green River near Black Diamond, Wash.

Location.—Lat. 47°17'00", long. 122°03'10", in NW¼ sec. 28, T. 21 N., R. 6 E., on left bank at highway bridge, three-quarters of a mile upstream from Newaukum Creek, and 3 miles southwest of Black Diamond.

Drainage area.—281 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 158.5 ft. above mean sea level (river-profile survey). Prior to Nov. 11, 1944, staff gage at same site and datum.

Average discharge.—9 years (1939-48), 1,007 cfs.

Extremes.—1939-48: Maximum discharge, 21,100 cfs Dec. 11, 1946 (gage height, 11.24 ft.); minimum observed, 56 cfs Sept. 25, 26, 1940 (gage height, 1.39 ft.).

Remarks.—City of Tacoma diverted about 85 cfs from river near Palmer several miles above station prior to Mar. 1, 1948, and about 105 cfs thereafter, for municipal use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	266	687	1,343	783	1,695	1,736	1,158	1,153	301	150	96.3	77.8	790
1941...	181	662	1,039	719	526	495	509	508	450	199	118	333	485
1942...	906	964	1,796	657	1,008	955	1,232	1,140	1,620	542	214	113	932
1943...	168	1,766*	2,159	1,190	1,368	1,244	2,346*	1,612	1,112	389	172	127	1,134*
1944...	233	428	1,459	724	844	813	1,109	1,366	606	208	127	197	676
1945...	219	466	967	2,375	1,605	1,138	1,807	2,431	877	298	143	426	1,060
1946...	671	1,652	1,624	1,809	1,232	1,905	2,092	2,455	1,475	618*	215	142	1,325*
1947...	534	1,185	3,559	2,192	1,719	1,424	1,714	959	640*	357	139	189	1,207*
1948...	1,489	2,870	1,735	1,558	1,452	1,142	1,693	2,569	1,799	536	308	264	1,450

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	112	204	719	434	640	1,100	760	465	182	118	73	56	56
1941...	76	219	602	462	364	394	431	364	319	138	94	118	70
1942...	400	382	804	516	516	516	980	840	709	841	159	91	91
1943...	78	570*	985	565	625	585	1,310	1,200	737	212	145	103	73
1944...	703	193	459	370	494	433	823	970	307	133	95	73	73
1945...	147	187	382	446	701	686	1,160	1,700	495	188	119	112	112
1946...	219	1,000	624	1,050	732	1,170	970	1,800	1,090	310*	147	105	105
1947...	102	435	1,180	990	1,200	961	1,240	950*	415	207	102	105	102
1948...	202	1,360	1,060	924	620	790	897	1,150	951	340	236	162	162

* Estimated.

DUWAMISH RIVER BASIN

Green River near Black Diamond, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1940.....	4,710	Feb. 10, 1940	56	790	573,200	754	547,700
1941.....	8,650	Nov. 29, 1940	70	485	351,200	636	460,300
1942.....	8,360	Dec. 19, 1941	91	932	674,500	966	699,300
1943.....	11,000	Nov. 23, 1942	78	1,134	820,800	970	702,100
1944.....	13,900	Dec. 3, 1943	73	676	491,000	637	462,200
1945.....	14,400	Jan. 7, 1945	112	1,060	767,600	1,232	906,200
1946.....	11,100	Dec. 29, 1945	105	1,325	959,000	1,437	1,041,000
1947.....	21,100	Dec. 11, 1946	102	1,207	814,000	1,274	922,000
1948.....	8,730	Nov. 8, 1947	162	1,450	1,053,000	.....	.....

Newaukum Creek near Enumclaw, Wash.

Location.—Lat. 47°13'40", long. 121°58'15", in NW¼ sec. 18, T. 20 N., R. 7 E., on right bank 75 ft. upstream from county road crossing and 2 miles north of Enumclaw.

Drainage area.—13.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 710 ft. (from topographic map).

Extremes.—July to September 1945: Maximum discharge, 45 cfs Sept. 20 (gage height, 2.26 ft.); minimum, 7.1 cfs Aug. 22, 29 (gage height, 0.98 ft.).

Remarks.—Several small diversions for irrigation above station. Waste water from city of Enumclaw water-supply and sewer systems enters above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....	9.90	8.65	13.3	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....	8.2	7.5	8.8	.....

Newaukum Creek near Black Diamond, Wash.

Location.—Lat. 47°16'30", long. 122°03'30", in SW¼ sec. 28, T. 21 N., R. 6 E., on right bank, three-quarters of a mile upstream from mouth, and 3½ miles southwest of Black Diamond.

Drainage area.—25.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 310 ft. (from topographic map).

Average discharge.—7 years (1944-50, 1952-53), 65.3 cfs.

DUWAMISH RIVER BASIN

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Newaukum Creek near Black Diamond, Wash.—Continued

Extremes.—1944-50, 1952-53: Maximum discharge, 1,820 cfs, about Feb. 17, 1949 (gage height, 3.54 ft., from recorded range in stage), from rating curve extended above 600 cfs; minimum, 8.0 cfs Oct. 13, 14, 1952 (gage height, 1.07 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944										21.4	16.5	15.3	
1945	14.1	18.8	25.1	76.2*	105	92.3	90.4*	66.8	35.1	21.8	19.7	22.8*	48.6*
1946	27.5	70.2	85.6	134	130	140	67.2	33.3	21.0	27.9	21.4	23.8	65.7
1947	34.3	71.9	156	130	123*	70.2	68.7	35.4	31.3	20.9	16.8	19.0	63.6*
1948	44.8	88.3	101	129	125	99.2	90.7	83.2	62.2	40.1	29.5	33.4	77.1
1949	39.1	80.7	159	62.6*	168*	76.3*	54.9	47.4	25.5	19.5	16.3	15.0	63.1*
1950	21.4	60.7	125	192*	153	215	105	55.6	35.2	25.8	21.1	19.3	85.9*
1951	38.9												
1953	9.42	10.1	11.4	155	131	65.1	764	52.5	58.4	30.7	22.4	19.7	53.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944										18	14	14	
1945	11	12	15*	23*	41	57	59*	41	29	18	17	18*	11
1946	20	38	50*	68	77	95	51	24	20	21	20	20	20
1947	17	22	60	70	65*	52	40	28	26	18	14	16	14
1948	17	35	70	61	55	67	64	48	38	30	25	22	17
1949	30	36	67	35*	35*	62	43	30	22	16.5	14.5	14	14
1950	13.5	18	45	50*	75*	75	60	38	31	23	18.5	17.5	13.5
1951	18												
1953	8.3	9.0	9.5	11	49	43	57	32*	36	25	20	17.5	8.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1944										
1945	477	Feb. 7, 1945	11	48.6	1.91	25.86	35,180	59.1	31.46	42,780
1946	510	Dec. 28, 1945	20	65.7	2.58	34.98	47,570	71.5	38.08	51,750
1947	503	Dec. 14, 1946	14	63.6	2.49	33.86	46,030	62.1	33.03	44,930
1948	528	Feb. 25, 1948	17	77.1	3.02	41.14	55,970	80.9	43.18	58,730
1949	1,820	Feb. 17, 1949	14	63.1	2.47	33.58	45,660	57.1	30.38	41,310
1950	1,820	Mar. 4, 1950	13.5	85.9	3.37	45.71	62,190			
1951										
1953	704	Jan. 31, 1953	8.3	53.0	2.08	28.21	38,400			

* Estimated.

DUWAMISH RIVER BASIN

Burns Creek near Black Diamond, Wash.

Location.—Lat. 47°17'00", long. 122°06'10", in NE¼ sec. 25, T. 21 N., R. 5 E., on left bank, three-quarters of a mile upstream from mouth, and 5 miles southwest of Black Diamond.

Drainage area.—3.47 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (from topographic map).

Extremes.—July to September 1945: Maximum discharge, 25 cfs Sept. 20 (gage height, 1.53 ft.); minimum, 4.1 cfs Sept. 12-14 (gage height, 1.12 ft.).

Remarks.—Large portion of flow may come directly from Green River. Small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										7.54*	5.34	6.04	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										5.5	4.8	4.1	

Little Soos Creek near Kent, Wash.

Location.—Lat. 47°22'20", long. 122°06'40", on line between secs. 24 and 25, T. 22 N., R. 5 E., 1½ miles upstream from mouth, and 5½ miles east of Kent.

Drainage area.—3.12 sq. mi., excludes 3.95 sq. mi. in vicinity of Youngs Lake, flow from which has been diverted to Cedar River since about 1935.

Gage.—Water-stage recorder. Altitude of gage is 390 ft. (from topographic map). Prior to July 30, 1945, staff gage at same site and datum.

Extremes.—1945-46: Maximum discharge, 56 cfs Dec. 28, 1945 (gage height, 1.80 ft.); minimum, 0.5 cfs Sept. 23, 24, 1946.

Remarks.—No known diversion above station. Flow includes between 2 and 2.5 cfs diverted into stream at source from Youngs Lake except during periods of high flow when diversion is ceased to avoid flood damage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										1.78	1.82	2.24	
1946	2.22	8.03	11.5*	13.9	12.3	9.04	5.13	2.51	2.66	2.66	1.95	1.56	6.17*

* Estimated.

Little Soos Creek near Kent, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....										1.7	1.8	1.8	.....
1946....	1.8	2.7	3	4.8	4.4	6.0	3.5	1.9	1.8	2.3	1.7	.6	0.6

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1945.....							
1946.....	56	Dec. 28, 1945	0.6	6.17	4,470		

Big Soos Creek above Jenkins Creek, near Auburn, Wash.

Location.—Lat. 47°20'20", long. 122°08'00", in N½ sec. 2, T. 21 N., R. 5 E., on left bank, 300 ft. upstream from Jenkins Creek, and 5 miles northeast of Auburn.

Drainage area.—16.3 sq. mi., excludes 5.95 sq. mi. in vicinity of Youngs Lake, flow from which has been diverted to Cedar River since about 1935.

Gage.—Water-stage recorder. Altitude of gage is 300 ft. (from topographic map). July 4 to Nov. 6, 1944, water-stage recorder 150 ft. downstream at different datum.

Extremes.—1944-45: Maximum discharge recorded, 35 cfs Sept. 20, 1945 (gage height, 1.66 ft.); minimum 4.3 cfs. July 14, 1945.

Remarks.—Several small diversions for domestic use above station. City of Seattle diverts between 2 and 2.5 cfs from Youngs Lake into Little Soos Creek, a tributary, except during periods of high flow.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944.....									6.19	5.90	6.55	8.12	.....
1945.....									6.74	6.42	11.4		.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944.....									5.1	5.3	5.6	6.3	.....
1945.....									5.2	5.8	6.5		.....

DUWAMISH RIVER BASIN

Jenkins Creek near Auburn, Wash.

Location.—Lat. 47°20'20", long. 122°07'55", in NE¼ sec. 2, T. 21 N., R. 5 E., on left bank, 75 ft. upstream from mouth, and 5 miles northeast of Auburn.

Drainage area.—14.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 300 ft. (from topographic map).

Extremes.—1944-45: Maximum discharge recorded 30 cfs Sept. 4, 1945 (gage height, 6.06 ft.); minimum, 10 cfs Oct. 11, 1944.

Remarks.—Minor diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									17.7	13.8	12.5	12.1	.....
1945									19.4	14.7	17.7		.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									15	12	12	11	.....
1945									16	13	13		.....

Covington Creek near Black Diamond, Wash.

Location.—Lat. 47°20'10", long. 122°02'40", in NE¼SE¼ sec. 4, T. 21 N., R. 6 E., on left bank, 1,000 ft. east of outlet of Lake Sawyer, 3 miles northwest of Black Diamond, and 5 miles upstream from Big Soos Creek.

Drainage area.—9.77 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 526.5 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.—January to September 1953: Maximum discharge, 124 cfs Feb. 1 (gage height, 3.13 ft.); no flow Aug. 2 to Sept. 30.

Remarks.—Some regulation by dam at outlet of Lake Sawyer. Probably some small diversions for domestic use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953					57.6	15.7	24.8	13.7	18.6	3.63	0.003	0	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953					21	10.5	10	6.7	11	0.2	0	0	0

Covington Creek near Auburn, Wash.

Location.—Lat. 47°19'10", long. 122°07'00", in SW¼ sec. 12, T. 21 N., R. 5 E., three-quarters of a mile upstream from mouth and 5 miles northeast of Auburn.

Drainage area.—18.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 300 ft. (from topographic map).

Extremes.—1944-45: Maximum discharge recorded, 18 cfs June 30, 1945; maximum gage height recorded, 2.96 ft. Sept. 26, 1945; minimum discharge observed, 2.4 cfs Nov. 6, 1944, result of discharge measurement.

Remarks.—During low-flow season, a coal company diverted entire flow of Rock Creek (head of Covington Creek) above Lake Sawyer. Several other small diversions for domestic use and irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									8.35	3.96	3.14		
1945									10.9	5.40	6.12		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1944									5.5	2.9	2.9		
1945									6.6	4.0	4.3		

Big Soos Creek near Auburn, Wash.

Location.—Lat. 47°19'00", long. 122°08'40", in SE¼ sec. 10, T. 21 N., R. 5 E., on right bank, three-quarters of a mile downstream from Covington Creek, 2 miles upstream from mouth, and 4 miles east of Auburn.

Drainage area.—49.4 sq. mi., excludes 3.95 sq. mi. in vicinity of Youngs Lake, flow from which has been diverted to Cedar River since about 1935.

Gage.—Water-stage recorder. Altitude of gage is 170 ft. (from topographic map). Prior to Aug. 14, 1951, 700 ft. upstream at different datum.

Average discharge.—8 years (1944-50, 1951-53), 117 cfs.

Extremes.—1944-53: Maximum discharge observed, 1,570 cfs Feb. 10, 1951 (gage height, 5.57 ft.); minimum discharge, 20 cfs July 23, 24, Sept. 19 to Oct. 12, 1952.

Remarks.—Several small diversions for irrigation and domestic use above station. City of Seattle diverts between 2 and 2.5 cfs from Youngs Lake into Little Soos Creek, a tributary, except during periods of high flow.

DUWAMISH RIVER BASIN

Big Soos Creek near Auburn, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944													24.6
1945	25.0	34.5	43.4	141	223	178*	169*	142	80.1	42.3	29.8	38.8	94.7*
1946	38.7	120	193	304	255	263	189	103	67.2	48.3	32.8	35.9	140
1947	38.1	80.2	309	207	272	154	124	99.5	59.7	38.8	30.7	31.2	117
1948	77.0	174	211	325	239	226	181	163	113	85.1	56.5	51.7	158
1949	57.5	126	288	151*	278	208	130	101	58.6	38.2	28.1	27.9	123*
1950	36.7	64.5	145	298	341	431	228	110	66.6	43.1	33.8	30.8	152
1951	52.5	140	333	322							25.7	25.8	
1952	36.5	56.7	109	108	166	122	85.5	60.4	39.3	28.0	26.5	21.8	71.3
1953	21.7	24.0	30.4	157	263	106	114	90.1	56.3	52.1	37.1	32.5	83.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944													22
1945	23	25	34	43	109	140	145	117	54	34	27	28	23
1946	31	58	122	210	220	230	146	75	52	36	31	32	31
1947	30	35	146	120	160	122	94	54	46	34	29	27	27
1948	29	143	171	176	158	155	163	115	94	63	49	39	28
1949	48	62	179	110	105	163	111	73	51	31	26	25	25
1950	28	32	78	160	190	274	168	80	54	35	28	28	28
1951	30	58	246	225							22	24	22
1952	24	33	80	83	116	102	64	47	34	21	23	20	20
1953	20	23	23	33	128	84	99	73	72	42	33	30	20

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1944						26.05	68,500	116	32.00	84,250
1945	493	Feb. 8, 1945	23	94.7	1.92	38.57	101,600	146	40.17	105,800
1946	488	Jan. 8, 1946	31	140	2.83	32.18	84,760	120	32.91	86,690
1947	743	Dec. 15, 1946	27	117	2.27	43.66	115,000	159	43.81	115,600
1948	496	Feb. 26, 1948	28	158	3.20	33.93	89,400	105	28.74	75,730
1949	733	Feb. 17, 1949	25	123	2.49	41.82	110,200	176	48.28	127,200
1950	869	Mar. 5, 1950	28	152	3.08					
1951	†1,570	Feb. 10, 1951	22			19.63	51,750	60.7	16.72	44,070
1952	281	Feb. 4, 1952	20	71.3	1.44	22.89	60,290			
1953	580	Feb. 1, 1953	20	83.3	1.69					

* Estimated.

† Maximum observed.

DUWAMISH RIVER BASIN

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Green River near Auburn, Wash.

Location.—Lat. 47°18'15", long. 122°12'10", in lot 3, NW¼ sec. 17, T. 21 N., R. 5 E., on left bank, 1½ miles east of Auburn, and 2 miles downstream from Big Soos Creek.

Drainage area.—382 sq. mi. (excludes 4 sq. mi. in vicinity of Youngs Lake, flow from which has been diverted to Cedar River basin since about 1935).

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Average discharge.—17 years (1936-53), 1,269 cfs.

Extremes.—1936-53: Maximum discharge, 22,000 cfs Dec. 11, 1946 (elevation, 68.16 ft.); minimum, 81 cfs Sept. 23, 1952; minimum elevation, 54.21 ft. Sept. 1-3, 1945.

Remarks.—Diversion of about 85 cfs May 8, 1913, to Mar. 1, 1948, and about 108 cfs thereafter, near Palmer several miles above station, for municipal supply of city of Tacoma. Many small diversions on tributaries for domestic use and irrigation above station. Minor regulation on Little Soos Creek, a tributary.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936											567	376	
1937	230	157	1,757	627	1,304	1,909	2,505	2,010	1,685	537	287	231	1,108
1938	321	3,142	2,496*	2,509	1,684	1,463	2,632	1,977	725	317	165	144	1,421*
1939	222	966	1,753	2,449	1,694	1,923	1,810	1,342	1,033	486	233	203	1,174
1940	327	821	1,600	1,028	2,071	2,077	1,450	1,309	408	223	155	148	872
1941	255	324	1,377	1,030	732	651	827	676	607	290	182	437	662
1942	1,056	1,156	2,358	981	1,350	1,137	1,457	1,206	1,849	639	298	106	1,743
1943	222	1,923	2,367	1,435	1,630	1,438	2,624	1,685	1,331	569	238	173	1,298
1944	305	521	1,631	906	1,180	1,041	1,302	1,492	768	303	195	256	827
1945	276	562	1,075	2,762	2,099	1,583	2,172*	2,797	1,076	362	201	510	1,285*
1946	734	1,946	2,040	2,432	1,776	2,442	2,453	2,665	1,710	774	297	239	1,625
1947	733	1,311	4,182	2,452	2,211	1,757	1,977	1,117	750	453	204	256	1,451
1948	1,007	3,062	1,974	1,980	1,812	1,531	1,959	2,854	2,305	707	404	375	1,703
1949	643	1,568	1,945	1,000	1,875	2,042	2,409	3,018	1,318	537	250	187	1,390
1950	775	1,741	2,225	1,715	2,187	3,112*	2,615	2,829	2,648	954	340	244	1,778*
1951	971	2,533	2,912	2,368	4,061	1,620	2,033	1,870	847	291	151	132	1,632
1952	727	1,137	1,253	746	1,732	1,166	1,955	1,694	734	414	173	108	963
1953	110	111	224	3,409	2,824	1,173	1,584	1,588	1,300	625	279	186	1,115

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936											486	210	
1937	192	170	172	428	428	1,120	1,590	1,360	1,140	262	240	182	170
1938	170	408	1,456	1,480	912	1,080	1,300	1,210	452	212	146	125	125
1939	125	266	642	1,430	930	980	1,430	914	742	315	191	146	125
1940	156	391	939	590	832	1,360	951	620	250	183	120	113	133
1941	145	365	828	671	509	540	505	510	432	202	145	190	145
1942	486	456	1,020	734	726	728	1,090	936	980	410	238	166	166
1943	148	625	1,310	868	836	713	1,460	1,220	1,030	320	181	130	136
1944	122	230	609	561	777	637	1,000	967	430	216	155	146	122
1945	201	250	433	535	990	972	1,350	2,100	584	243	167	164	164
1946	268	1,220	849	1,400	1,170	1,620	1,350	2,000	1,260	408	233	200	200
1947	190	467	1,470	1,120	1,520	1,280	1,570	690	435	282	163	166	166
1948	256	1,520	1,280	1,110	770	1,070	1,150	1,320	1,150	483	320	253	253
1949	360	463	1,130	642	539	1,320	1,330	1,570	868	360	193	158	158
1950	166	477	938	850	1,020	1,700	1,870	1,920	1,770	448	248	178	166
1951	236	558	1,920	1,480	1,540	1,080	1,330	1,170	446	189	116	96	96
1952	215	682	900	519	855	746	1,360	1,130	540	224	130	81	81
1953	37	92	115	190	840	912	1,050	1,240	1,050	350	225	146	87

* Estimated.

DUWAMISH RIVER BASIN

Green River near Auburn, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1936							
1937	6,820	April 15, 1937	170	1,108	802,100	1,421	1,029,000
1938	14,400	April 18, 1938	125	1,421	1,029,000	1,170	847,200
1939	5,420	Dec. 8, 1938	125	1,174	849,800	1,158	838,200
1940	5,150	Feb. 10, 1940	113	972	705,900	950	689,500
1941	7,290	Nov. 29, 1940	145	662	479,000	833	600,400
1942	9,310	Dec. 19, 1941	166	1,143	827,800	1,137	822,800
1943	10,900	Nov. 28, 1942	136	1,208	939,800	1,127	816,200
1944	12,900	Dec. 3, 1943	122	827	600,200	781	566,700
1945	13,600	Jan. 7, 1945	164	1,285	930,500	1,620	1,100,000
1946	12,800	Dec. 29, 1945	200	1,625	1,176,000	1,757	1,272,000
1947	22,000	Dec. 11, 1946	166	1,451	1,050,000	1,479	1,071,000
1948	8,960	Nov. 8, 1947	258	1,703	1,236,000	1,496	1,086,000
1949	9,470	Feb. 17, 1949	158	1,896	1,011,000	1,445	1,046,000
1950	11,800	Mar. 4, 1950	160	1,778	1,258,000	1,918	1,889,000
1951	18,400	Feb. 10, 1951	96	1,632	1,182,000	1,356	981,700
1952	6,280	Feb. 4, 1952	81	983	713,300	759	551,000
1953	13,400	Feb. 1, 1953	87	1,115	807,100		

LAKE WASHINGTON BASIN

North Fork Cedar River near Lester, Wash.

Location.—Lat. 47°19'00", long. 121°30'00", in SW¼ sec. 11, T. 21 N., R. 10 E., on right bank, 120 ft. downstream from falls, 1 mile upstream from confluence with South Fork, and 7½ miles north of Lester.

Drainage area.—8.81 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,320 ft. (from topographic map). Prior to Nov. 30, 1951, 100 ft. upstream and Nov. 30, 1951, to Sept. 23, 1953, 70 ft. upstream at datum 2 ft. higher than present datum.

Average discharge.—9 years (1944-53), 69.8 cfs.

Extremes.—1944-53: Maximum discharge, 1,180 cfs Jan. 7, 1945 (gage height, 7.37 ft., site and datum then in use), from rating curve extended above 350 cfs; maximum gage height, 8.9 ft., datum then in use, probably Jan. 31, 1953; minimum discharge, 5.4 cfs Nov. 27-30, 1952, but may have been less during period of ice effect; minimum gage height, -0.07 ft., present datum, Sept. 25, 26, 1953.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945	17.6	25.2	50.2	112	65.8	25.9	48.8	192	115	29.0	11.5	27.0	60.0
1946	45.3	73.7	51.2	36.8	19.2	34.4	82.2	210	183	83.4	16.2	10.6	70.8
1947	48.9	38.4	131	74.7	65.6	80.9	113	125	74.2	27.1	11.4	17.2	67.0
1948	98.8	118	57.4	31.5	26.3*	26.4	49.9	164	270*	52.9	20.1	17.0	80.1*
1949	35.2	44.0	32.7	25.3*	37.0*	39.9	82.0	245	172	94.1	23.0	18.5	70.5*
1950	63.8	107	56.7	41.4*	34.0	65.5	54.8	181	278	144	27.3	16.2	85.2*
1951	68.8	110	115	48.0	120	81.6*	91.2	185*	124	32.1	12.3	11.5	78.8*
1952	45.0*	51.2*	28.7	19.3	48.8	28.5	107	170	106	43.0	13.3	8.60	65.9*
1953	6.89	6.39	10.2	174*	98.5	32.9	69.3	104*	120	74.2	15.6	9.96	60.0*

* Estimated.

North Fork Cedar River near Lester, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	11	15	15	14	23	19	22	126	54	15	10	10	10
1946...	12.5	31	17.5	20	15.0	24	25	101	120	27	11.5	8.7	8.7
1947...	8.4	21	34	25	38	33	48	77	39	14.5	9.5	8.9	8.4
1948...	12.5	44	34	21	19*	16.5	19.5	35	140*	25	16	12	12
1949...	15	15.5	18	15*	14*	28	24	108*	112	56	14	12	12
1950...	11.5	24	21	16*	17	29	32	44	165	46	19	13	11.6
1951...	21	30	44	24	33	22*	36	75*	65	15	10.5	8.5	8.5
1952...	13*	23*	21	13	18.5	13.5	40	60	62	18.5	10.5	7.5	7.5
1953...	6.4	5.4	5.6	7.5	26	24	30	75*	85	22	10.8	8.9	5.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....	1,180	Jan. 7, 1945	10	60.0	6.31	92.46	43,430	66.4	102.36	48,080
1946.....	575	Oct. 25, 1945	8.7	70.8	3.04	109.05	51,240	74.6	114.91	53,990
1947.....	1,050	Dec. 11, 1946	8.4	67.0	7.60	103.29	48,530	72.0	110.86	52,090
1948.....	645	May 12, 1949	12	80.1	9.09	123.70	58,110	66.5	102.76	48,270
1949.....	590	Nov. 27, 1949	11.5	70.5	8.00	108.66	51,050	80.2	123.53	58,040
1950.....	900			85.2	9.67	131.35	61,720	90.9	140.10	65,820
1951.....	1,200	Feb. 9, 1951	8.5	78.8	8.94	121.39	57,010	64.6	99.55	46,750
1952.....	363	May 13, 1952	7.5	55.9	6.35	86.33	40,560	47.3	73.74	34,380
1953.....			5.4	60.0	6.81	92.38	43,410			

* Estimated.

⊙ Oct. 19, 1947, May 28, 1948.

South Fork Cedar River near Lester, Wash.

Location.—Lat. 47°18'30", long. 121°31'00", in NE¼ sec. 15, T. 21 N., R. 10 E., on left bank, about half a mile upstream from confluence with North Fork, and 7 miles northwest of Lester.

Drainage area.—6.00 sq. mi.

Gage.—Water-stage recorder and, since Aug. 31, 1951, concrete control. Altitude of gage is 2,300 ft. (from topographic map).

Average discharge.—9 years (1944-53), 40.5 cfs.

Extremes.—1944-53: Maximum discharge, 878 cfs Jan. 7, 1945 (gage height, 4.86 ft.), from rating curve extended above 125 cfs; maximum gage height, 6.38 ft. Feb. 17, 1949 (backwater from ice and debris); minimum discharge, 1.9 cfs Nov. 27, 28, 1952; minimum gage height, 1.25 ft. Oct. 17-19, 1946.

Remarks.—No diversion or regulation above station.

LAKE WASHINGTON BASIN

South Fork Cedar River near Lester, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	8.40	10.6	37.6	60.2	39.8	13.4	31.2	122	48.4	10.5	4.15	10.1	34.7
1946...	24.0	37.4	37.1	23.0	10.6	27.2	62.1	178	107	35.7	6.84	3.70	46.3
1947...	27.9	25.8	90.0	51.5	33.1	49.0	65.7	44.8	27.9	13.5	5.08	6.46	37.2
1948...	51.0	60.7	38.9	20.1	22.4	19.9	33.1	109	114	20.3	9.19	7.57	43.8
1949...	18.0	29.4	26.1	15.3*	27.0	28.6	54.3	140	91.3	44.0*	12.0	5.77	41.1*
1950...	43.0	96.5	41.7	30.5*	27.4*	42.5	33.4	76.0	173	62.1	12.4	7.46	54.2*
1951...	38.2	77.1	76.8	29.5	75.4	16.3	56.4	98.6	42.3	9.45	4.25	3.83	43.7
1952...	30.7	35.3	18.4	10.0	29.8	12.3	60.5	95.8	45.4	19.3	5.30	3.25	30.4
1953...	2.59	2.49	4.91	99.8	56.8	17.3	43.5	77.4	57.6	23.9	6.30	4.27	32.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	5.0	5.8	8.0	7.2	11.0	8.7	14.0	73	21	5.2	3.3	3.2	3.2
1946...	5.4	17.5	9.3	10.5	7.0	16.0	14.0	78	60	11.5	4.4	3.0	3.0
1947...	2.0	9.0	23	17	24	22	33	26	16	6.5	4.2	3.8	2.9
1948...	4.8	32	22	13	9.5	11	14.5	25	50	11	7.0	5.8	4.8
1949...	7.6	7.6	14*	9.9	8.6*	22	18.5	61	50	26*	6.0	4.8	4.8
1950...	4.8	30	14.5	13*	14*	19	19.5	27	104	19	8.5	6.2	4.8
1951...	8.1	15	23	9.5	17	11	19	46	20	5.1	3.6	2.0	2.6
1952...	7.9	16.5	14*	6.4	12	7.6	20	39	29	7.6	4.2	2.7	2.7
1953...	2.5	2.0	2.0	3.0	13.8	10.8	13.5	54	44	8.0	5.3	3.5	2.0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945.....	878	Jun. 7, 1945	3.2	34.7	5.78	78.60	25,150	38.2	86.47	27,660	
1946.....	398	Dec. 28, 1945	3.0	40.3	7.72	104.78	33,500	50.2	113.62	36,300	
1947.....	630	Dec. 11, 1946	2.9	37.2	6.20	84.15	26,930	39.3	89.00	28,480	
1948.....	540	Nov. 7, 1947	4.8	43.8	7.30	99.41	31,800	35.7	81.06	25,950	
1949.....	305	May 13, 1949	4.8	41.1	6.85	93.07	29,790	50.6	114.41	36,610	
1950.....	585	Nov. 27, 1949	4.8	54.2	9.03	122.70	39,200	54.7	123.84	39,630	
1951.....	604	Feb. 9, 1951	2.6	43.7	7.28	98.97	31,670	34.7	78.54	25,130	
1952.....	199	May 13, 1952	2.7	30.4	5.07	69.07	22,100	24.2	54.97	17,580	
1953.....	715	Jan. 31, 1953	2.0	32.9	5.48	74.53	23,850	.....	.....	.....

* Estimated.

Cedar River below Bear Creek, near Cedar Falls, Wash.

Location.—Lat. 47°20'40", long. 121°33'00", in SE¼SE¼ sec. 32, T. 22 N., R. 10 E., on right bank, 500 ft. downstream from Bear Creek, and 12 miles southeast of Cedar Falls.

Drainage area.—25.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,880 ft. (from topographic map).

Average discharge.—8 years (1945-53), 179 cfs.

Extremes.—1945-53: Maximum discharge, 1,940 cfs Dec. 11, 1946 (gage height, 6.32 ft.); minimum, 12.5 cfs Nov. 27, 1952; minimum gage height, 2.59 ft. Oct. 17-19, 1946.

Remarks.—No diversion or regulation above station.

LAKE WASHINGTON BASIN

Cedar River below Bear Creek, near Cedar Falls, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	112*	194	160	132	66.2	133	235	491	387	164	42.0	27.4	180*
1947...	106	130	353	219	183	211	283	245	162*	72.0	28.5	39.9	169*
1948...	256	338	173	104	109	90.9	168	457	543	114	49.0	42.1	204
1949...	91.7	154	116	72.8	95.9	127	250	565	375	184	58.6	34.9	178
1950...	155	256	192	125	123	195	169	362	608	282	65.4	41.2	215
1951...	153	297	269	149	311	95.2	271	412	233	57.1	25.4	23.4	192
1952...	143	157	85.2	49.9	134	75.6	289	410	227	96.3	30.4	20.5	143
1953...	16.2	16.5	27.9	459	251	94.4	199	309	266	133	34.6	24.4	152

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	31*	95	55	71	46	85	79	304	254	64	32	21	21
1947...	20	61	98	71	112	96	154	154	100*	38	22	22	20
1948...	31	140	100	65	49	56	74	128	259	59	38	32	31
1949...	42	47	63	46	41	87	81	275	232	116	37	28	28
1950...	30	96	72	65	59	80	100	142	414	100	47	32	30
1951...	41	83	111	78	97	67	116	207	128	31	21	18	18
1952...	43	75	64	32	57	44	107	178	146	40	24	16	18
1953...	14.8	13.0*	13.0*	22	76	74	72	204	201	49	28	20	13*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Min- imum day	Mean	Per square mille	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1946.....	1,110	Dec. 28, 1945	21	180	7.09	95.94	130,000	190	101.61	137,600		
1947.....	1,940	Dec. 11, 1946	20	169	6.65	90.50	122,600	164	98.32	133,200		
1948.....	1,250	⊙	31	204	8.03	109.06	147,800	170	90.92	123,200		
1949.....	1,090	May 13, 1949	28	178	7.01	95.12	128,900	198	105.90	143,500		
1950.....	1,510	Nov. 27, 1949	30	215	8.46	114.69	155,300	226	120.82	163,600		
1951.....	1,600	Feb. 9, 1951	18	192	7.56	102.55	138,900	163	86.87	117,700		
1952.....	764	May 13, 1952	18	143	5.63	76.81	104,000	116	62.00	34,120		
1953.....	1,000	Jan. 31, 1953	13	152	5.98	81.25	110,100	.....	.....	.....

* Estimated. ⊙ Nov. 7, 1947, May 28, 1948.

Cedar River near Cedar Falls, Wash.

Location.—Lat. 47°22'20", long. 121°37'30", in SE¼SW¼ sec. 23, T. 22 N., R. 9 E., on right bank, 2 miles upstream from Cedar Lake, and 8 miles southeast of Cedar Falls.

Drainage area.—41.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,560 ft. (from topographic map).

Average discharge.—8 years (1945-53), 276 cfs.

Extremes.—1945-53: Maximum discharge, 3,850 cfs Dec. 11, 1946 (gage height, 9.34 ft.); maximum gage height, 11.4 ft. Feb. 11, 1951 (backwater from Cedar Lake); minimum discharge, 20 cfs Nov. 30 to Dec. 1, 1952 (gage height, 2.10 ft.).

Remarks.—No diversion or regulation above station. Records during periods of backwater from Cedar Lake computed by stage-ratio method.

LAKE WASHINGTON BASIN

Cedar River near Cedar Falls, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	179	325	278	251	130*	255	375	678	533	223	61.5	43.4	278*
1947...	168	235	602	384	326	317	417	327	217	107	44.0	61.1	267
1948...	403	523	297	313	206	175	281	618	640	156	74.7	68.7	304
1949...	140	274	211	121	204	277	417	757	451	227	80.0	47.4	267
1950...	237	387	313	220	246	420	362	553	779	330	102	68.4	335
1951...	379	487	508	300	636	185	362	535	255	78.0	39.6	36.8	309
1952...	225	251	167	96.6	260	143	407	545	300	140	49.2	31.3	218
1953...	24.8	27.1	63.5	722	430	183	311	426	370*	178	54.0	34.1	234*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	56	165	92	141	85*	156	137	433	372	92	45	35	35
1947...	35	95	171	127	209	166	250	203	133	60	36	36	35
1948...	47	232	166	116	83	108	138	200	366	83	60	50	47
1949...	64	71	105	72	62	174	164	415	291	152	50	37	37
1950...	39	110	116	90	97	150	190	272	580	144	77	48	39
1951...	67	152	262	138	172	118	222	255	157	48	34	27	27
1952...	70	122	110	59	108	84	195	252	203	66	37	26	26
1953...	22	20	22	51	127	120	150	328	290*	74	41	25	20

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....	2,160	Dec. 28, 1945	35	278	6.65	90.41	201,600	298	96.64	215,500
1947.....	3,850	Dec. 11, 1946	35	267	6.39	86.84	193,600	285	92.59	206,400
1948.....	1,920	Nov. 7, 1947	47	304	7.27	99.10	221,000	254	82.56	184,700
1949.....	1,470	May 13, 1949	37	267	6.39	86.56	183,600	294	95.35	212,600
1950.....	2,460	Nov. 27, 1949	39	335	8.01	108.88	242,700	304	118.00	263,300
1951.....	3,080	Feb. 9, 1951	27	309	7.39	100.28	223,600	256	83.15	185,400
1952.....	1,250	Feb. 4, 1952	26	218	5.22	70.83	157,900	173	56.39	125,700
1953.....	3,230	Jan. 31, 1953	20	284	5.60	76.03	169,500	.....	.....	.....

* Estimated.

Rex River near Cedar Falls, Wash.

Location.—Lat. 47°21'10", long. 121°39'50", in NE¼NW¼ sec. 33, T. 22 N., R. 9 E., on right bank, 2½ miles upstream from mouth and Cedar Lake, and 7 miles southeast of Cedar Falls.

Drainage area.—13.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,600 ft. (from topographic map).

Average discharge.—8 years (1945-53), 104 cfs.

Extremes.—1945-53: Maximum discharge, 1,880 cfs Feb. 11, 1951, from rating curve extended above 680 cfs; maximum gage height, 6.27 ft., Feb. 11, 1951, Jan. 23, 1953; minimum discharge, 4.3 cfs Nov. 29, 1952 (gage height, 2.43 ft.).

Remarks.—No diversion or regulation above station.

Rex River near Cedar Falls, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	87.8	130	133	115	68.6	113	143	256	186	61.1	13.7*	10.1*	111*
1947...	72.2	106	278*	141*	134	112	157	92.5	80.0	31.0	11.4	34.4	104*
1948...	171	213	137	89.5	94.5	59.1	107	219	218	40.2	29.8	31.0	117
1949...	60.6	131	78.7	40.1*	101*	111	160	243	158	74.6	22.6	16.9	99.6*
1950...	118	152	127	79.8	111	138	130	186	263	116	30.3	25.5	123
1951...	123	184	191	115	220	58.1	134	179	76.4	13.9	7.27	12.8	109
1952...	103	104	62.7	34.3	97.7	50.6	145	181	108	37.5	10.4	8.02	78.3
1953...	6.30	7.91	37.7	326	140	66.0	119	161	126	39.9	12.9	12.9	87.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	16	52	31	48	31	58	51	155	117	21	10*	8.4	8.4
1947...	9.6	38	55*	34*	68	50	87	45	41	16	8.6	9.5	8.6
1948...	19	66	55	38	23	31	41	66	92	19.5	19	15.5	15.5
1949...	21	29	35	23*	20*	55	55	142	100	45	12.5	9.8	9.8
1950...	12.5	35	40	27*	26	49	68	98	195	38	16	11	11
1951...	30	38	83	39	38	23	80*	94	28	8.6	6.0	6.0	6.0
1952...	25	36	31	14.5	30	24	62	81	66	13.5	8.3	8.4	6.4
1953...	5.3	5.6*	6.4	22	36	36	43	113	91	15.0	9.6	7.4	5.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1946.....	1,780	Dec. 28, 1945	8.4	111	8.54	115.47	80,040*	119	124.33	86,230	
1947.....			8.6	104	8.00	108.66	75,350	109	114.10	79,120	
1948.....	1,080	Nov. 7, 1947	15.5	117	9.00	122.84	55,170	96.3	100.63	69,900	
1949.....	933	Nov. 23, 1948	9.8	99.6	7.66	103.95	72,090	110	114.93	79,670	
1950.....	1,560	Nov. 27, 1949	11	123	9.46	128.12	88,510	131	137.23	95,140	
1951.....	1,880	Feb. 11, 1951	6.0	109	8.38	115.48	78,690	89.6	93.51	64,840	
1952.....	702	Feb. 4, 1952	6.4	78.3	6.02	82.00	56,850	60.1	62.69	43,600	
1953.....	1,660	Jan. 23, 1953	6.3	87.7	6.75	91.59	63,500				

* Estimated.

Cedar River at Cedar Lake, near North Bend, Wash.

Location.—Lat. 47°24'20", long. 121°43'10", in SE¼ sec. 12, T. 22 N., R. 8 E., on right bank, 800 ft. downstream from outlet of Cedar Lake, 3 miles southeast of Cedar Falls, and 7 miles southeast of North Bend.

Drainage area.—77.7 sq. mi. At site 1898-99, 79.2 sq. mi.

Gage.—Staff gage. Datum of gage is 1,542.07 ft. above mean sea level (levels by city of Seattle). June 26, 1898, to May 28, 1899, staff gage at Vaughn Bridge 2,000 ft. downstream at different datum.

Extremes.—1898-99, 1902-3: Maximum discharge observed, 5,080 cfs Jan. 21, 1899 (gage height, 6.60 ft., site and datum then in use), from rating curve extended above 370 cfs; minimum observed, 44 cfs Sept. 9-12, 14-19, 1898 (gage height, 1.20 ft., site and datum then in use).

Remarks.—No diversion or regulation above station.

LAKE WASHINGTON BASIN

Cedar River at Cedar Lake, near North Bend, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898										203	68.0	73.1	
1899	168	610	684	1,290	1,110	321	560	1,250					
1903		668	797	1,260	289	243	414	894	931	349			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898										89	57	44	
1899	106	267	135	110	350	165	165	544					
1903		198	274	402	198	175	247	514	466	142*			

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Maximum observed		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1898			44									
1899	5,089	Jan. 21, 1899										
1903	4,310	Jan. 3, 1903										

* Estimated.

Cedar River at Cedar Falls, Wash.

Location.—Lat. 47°25'10", long. 121°47'20", in SE¼ sec. 4, T. 22 N., R. 8 E., on right bank, three-quarters of a mile downstream from Seattle municipal powerplant at Cedar Falls, and 3 miles downstream from Cedar Lake.

Drainage area.—84.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 910 ft. (from river-profile map).

Average discharge.—39 years (1914-53), 297 cfs.

Extremes.—1914-53: Maximum discharge, 6,440 cfs Dec. 22, 1933 (gage height, 11.5 ft.); no flow part of Nov. 25, 1917, Aug. 18, 1923; minimum daily, 2 cfs Sept. 20, 1922.

Remarks.—All artificially diverted water returned to river above station. Regulated by Cedar Lake reservoir for power.

Cedar River at Cedar Falls, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

Y. EAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914							635	525	356	187	167	147	.....
1915	128	338	224	204	179	191	224	71.7	62.4	81.3	85.5	179	164
1916	218	502	515	232	525	658	565	690	873	491	237	221	493
1917	145	245	233	459	671	275	459	811	1,420	514	258	160	498
1918	152	150	2,200	1,390	617	363	512	502	440	213	117	123	567
1919	227	403	506	511	311	261	319	433	395	253	106	85.9	319
1920	182	330	344	408	435	320	330	319	316	214	112	219	293
1921	336	319	333	491	410	423	370	379	382	328	215	172	346
1922	187	292	849	361	204	153	260	317	430	288	174	92	302
1923	106	277	295	813	315	283	315	387	380	266	247	52.3	312
1924	152	151	354	400	524	421	301	342	285	72.6	53.2	178	269
1925	147	165	346	410	610	240	291	332	174	65.1	44.0	92.5	241
1926	69.8	246	302	423	214	159	110	88.5	79.1	24.5	30.8	110	158
1927	291	219	297	363	149	229	161	292	471	257	75.5	75.9	240
1928	212	637	519	740	302	223	203	427	126	98.6	53.4	47.1	299
1929	16.8	78.5	79.1	152	176	171	306	265	313	136	99.4	37.4	165
1930	36.6	91.8	108	229	239	358	138	180	148	87.5	56.9	38.2	147
1931	49.0	244	254	234	152	158	287	228	197	160	99.5	120	164
1932	160	233	240	302	337	800	716	504	452	215	132	132	352
1933	137	990	509	695	210	271	230	261	829	342	174	116	395
1934	192	372	2,193	1,175	304	528	422	195*	180*	90.0*	45.0*	45.0*	496*
1935	100*	207	439	533	512	265	230	231	249	160	76.6	73.7	264*
1936	64.5	64.3	114	524	285	407	205	711	407	174	99.0	62.5	261
1937	57.4	43.7	159	205	224	347	214	328	645	156	104	97.8	215
1938	77.6	276	495	441	230	131	327	424	146	97.0	76.5	62.8	232
1939	55.6	97.0	143	547	314	342	140	354	333	126	81.3	07.0	217
1940	106	79.1	224	142	272	432	346	361	98.3	65.7	81.8	84.2	193
1941	62.1	91.2	143	134	116	89.0	77.1	77.1	84.2	69.0	59.9	115	93.0
1942	199	151	238	438	256	228	404	284	281	301	123	65.7	250
1943	61.2	262	610	392	317	220	410	361	376	395	130	115	308
1944	99.1	142	355	202	234	215	371	272	316	108	126	113	215
1945	116	139	203	655	513	380	443	173	478	224	78.6	81.1	314
1946	163	502	368	506*	253	467	392*	396	672	332	227	59.6*	362*
1947	47.0	200	784	526	649	417*	506	473	258	137	96.4	79.1	346
1948	158	662	358	371	369	500	433	440	866	370	177	102	399
1949	104	323	473	194	317	523	354	663	585	346	191	90.0	349
1950	141	234	275	441	297	638	468	656	1,009	463	114	145	407
1951	143	370	714	448	930	574	316	332	301	298	109	53.3	380
1952	105	252	254	133	355*	154	458	595	435	166	104	66.8	255*
1953	34.7	24.9	47.7	472	972	394	291	433	412	103	88.1	48.7	273

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914							410*	300	242	150	131	94	.....
1915	48	188	192	154	69	162	87	36	24	15	10	85	10
1916	154	234	280	175	208	246	407	394	694	230	170	169	154
1917	42	102	223	250	292	217	217	469	978	260	161	109	42
1918	108	43	52	650	315	290	301	191	305	81	60	93	43
1919	102	256	281	256	107	202	234	328	287	90	60	59	59
1920	76	278	313	322	324	274	280	279	247	100	90	93	70
1921	291	234	298	344	349	374	307	312	334	262	88	58	58
1922	80	234	390	291	51	60	214	224	298	195	28	2	2
1923	30	290	245	322	105	226	245	285	308	196	130	30	30
1924	32	44	214	250	336	276	204	361	91	11	7.0	71*	7.0
1925	70	66	172	309	295	124	98	200	82	43	5	22	5
1926	21	54	108	234	146	148	80	74	34	4	25	16	4
1927	52	42	117	64	76	81	66	130	304	96	28	35	28
1928	65	276	80	266	186	93	123	357	98	40	19*	14	14
1929	53	54	56	21	47	78	188	120	122	93	30	28	28
1930	22	46	48	33	72	98	86	122	105	50	27	30	22
1931	28	46	178	98	78	114	159	180	162	90	59	62	28
1932	70	122	85	262	103	188	396	344	264	124	104	85	70
1933	86	142	170	183	152	150	204	322	352	168	115	100	66
1934	100	159	154	434	105	175	148	143	.....	.....	.....	.....	.....
1935	.....	57	215	264	275	97	118	192	200	80	42	42	42

* Estimated.

LAKE WASHINGTON BASIN

Cedar River at Cedar Falls, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	58	58	60	436	125	306	94	180	205	91	64	59	56
1937...	55	30	31	77	60	76	92	223	365	111	87	87	30
1938...	61	73	149	318	93	91	80	276	98	76	60	52	52
1939...	51	37	68	194	144	88	92	237	205	92	65	56	37
1940...	48	59	75	74	85	160	108	103	84	69	56	53	48
1941...	54	58	66	76	76	59	64	67	74	52	53	54	52
1942...	67	62	103	194	65	63	110	74	80	114	65	34	34
1943...	53	100	206	84	93	65	144	159	153	86	56	55	53
1944...	53	62	146	60	65	64	91	74	90	60	51	54	51
1945...	56	64	59	70	95	90	80	222	152	39	56	32	32
1946.....	400	72	.....	70	.....	.....	.....	95	500	71	.....	.....	.....
1947.....	14	9.5	386	230	159	152	309	71	63	57	53	50	9.5
1948.....	56	112	115	108	86	82	78	88	355	80	44	60	44
1949.....	60	64*	89	72	63	217	90	128	137	86	60	59	59
1950.....	58	94	112	150	90	176	186	108	624	93	54	68	64
1951.....	67	132	339	134	96	232	65	63	95	128	35	32	32
1952.....	32	75	53	35	65	57	283	75	144	125	78	30	30
1953.....	23	23	24	111	510	78	40	60	61	24	13.5	8.8	8.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1914.....	.....	.....	.....	.....	.....	.....	.....
1915.....	1,180	April 15, 1915	10	164	118,000	209	152,000
1916.....	1,930	Mar. 11, 1916	154	493	358,000	446	324,000
1917.....	1,980	June 17, 1917	42	498	361,000	653	473,000
1918.....	6,290	Dec. 19, 1917	43	567	411,000	451	327,000
1919.....	1,230	Jan. 23, 1919	59	319	231,000	295	214,000
1920.....	776	Jan. 31, 1920	70	293	213,000	305	221,000
1921.....	748	Jan. 6, 1921	58	346	251,000	376	272,000
1922.....	4,500	Dec. 12, 1921	2	362	219,000	247	179,000
1923.....	2,790	Jan. 10, 1923	30	312	226,000	311	225,000
1924.....	915	Feb. 12, 1924	7.0	269	195,000	269	195,000
1925.....	1,850	Feb. 7, 1925	5	241	174,000	237	172,000
1926.....	765	Jan. 21, 1926	4	158	114,000	173	125,000
1927.....	1,210	June 10, 1927	28	240	174,000	237	208,000
1928.....	3,430	Jan. 13, 1928	14	299	217,000	213	154,000
1929.....	714	April 29, 1929	26	165	120,000	158	114,000
1930.....	964	May 4, 1930	22	147	106,000	175	127,000
1931.....	802	Mar. 14, 1931	23	184	134,000	189	137,000
1932.....	1,740	Mar. 19, 1932	70	352	255,000	432	314,000
1933.....	3,060	Nov. 17, 1932	80	395	286,000	506	368,000
1934.....	0,440	Dec. 22, 1933	.....	496	359,200	312	225,900
1935.....	3,270	Jan. 25, 1935	42	284	205,900	242	175,300
1936.....	1,940	May 16, 1936	56	261	189,100	262	190,200
1937.....	1,600	June 20, 1937	30	215	155,400	264	191,100
1938.....	2,020	Nov. 29, 1937	52	232	168,200	186	134,600
1939.....	1,100	Jan. 25, 1939	37	217	157,000	226	163,500
1940.....	1,310	Mar. 8, 1940	48	193	139,900	183	133,000
1941.....	742	Nov. 28, 1940	52	93.0	67,300	118	85,190
1942.....	822	June 15, 1942	34	250	180,900	270	201,700
1943.....	924	June 10, 1943	53	308	223,300	283	204,700
1944.....	866	May 24, 1944	51	215	156,190	201	145,500
1945.....	946	Jan. 7, 1945	32	314	227,300	362	262,000
1946.....	1,140	May 29, 1946	.....	362	262,000	362	262,400
1947.....	2,860	Dec. 14, 1946	9.5	346	250,500	357	258,700
1948.....	1,380	Nov. 12, 1947	44	399	290,000	377	273,600
1949.....	1,340	May 16, 1949	59	349	252,600	328	237,400
1950.....	2,050	Mar. 6, 1950	54	407	294,700	456	329,900
1951.....	3,860	Feb. 11, 1951	32	330	275,000	328	237,300
1952.....	800	①	30	255	185,400	213	154,900
1953.....	2,250	Feb. 1, 1953	8.8	273	197,500	.....	.....

* Estimated. ① Probably Dec. 21, 1951.

Taylor Creek near Selleck, Wash.

Location.—Lat. 47°23'10", long. 121°50'45", in NW¼ sec. 19, T. 22 N., R. 8 E., on right bank, half a mile upstream from mouth, and 1 mile northeast of Selleck.

Drainage area.—17.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 321 cfs Sept. 20 (gage height, 3.75 ft.), from rating curve extended above 85 cfs; minimum, 23 cfs Sept. 1 (gage height, 1.22 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945									41.6	26.2	59.0		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945									30	24	23		

Cedar River near Landsburg, Wash.

Location.—Lat. 47°23'35", long. 121°56'50", in NE¼SW¼ sec. 17, T. 22 N., R. 7 E., on left bank, 2 miles upstream from Seattle municipal water-supply intake at Landsburg, 4¾ miles east of Maple Valley, 5 miles downstream from Taylor Creek, and 12 miles downstream from Cedar Lake.

Drainage area.—125 sq. mi., excludes that of Rock Creek. At site 1895-1900, 140 sq. mi.; at Seattle municipal water-supply intake 1901-13, 139 sq. mi.; at site 1914-28, 135 sq. mi.; at present site 1928-32, 134 sq. mi., includes that of Rock Creek.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. (from river-profile map). July 25, 1895, to Sept. 30, 1898, staff gage 2¼ miles downstream at different datum. Mar. 24, 1901, to May 15, 1913, staff gage 2 miles downstream at datum of 535.84 ft. above mean sea level (levels by city of Seattle). Apr. 30, 1914, to Oct. 22, 1928, water-stage recorder a quarter of a mile downstream from present site at different datum.

Average discharge.—58 years (1895-1953), 684 cfs.

Extremes.—1895-98, 1901-53: Maximum discharge, 14,200 cfs Nov. 19, 1911 (gage height, 10.0 ft., from graph based on gage readings, site and datum then in use), caused by failure of flashboards at Cedar Lake; minimum observed, 83 cfs Sept. 19, 1898.

Remarks.—Records include flow of Seattle municipal water-supply 1901-13 and Rock Creek 1895-1931. Rock Creek (see p. 223), a tributary which entered just above present gage prior to 1932, has been diverted to enter river at a point 2 miles downstream from Seattle municipal water-supply intake to lessen danger of pollution. Some regulation by Cedar Lake, 12 miles above station, since Oct. 14, 1904.

LAKE WASHINGTON BASIN

Cedar River near Landsburg, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1895											163	210	
1896	166	141	1,060	1,170	1,210	910	744	1,100	1,540	688	236	165	762
1897	159	1,540	2,200	1,330	1,370	814	1,500	1,410	977	1,010	373	313	1,060
1898	308	1,270	1,530	754	1,300	508	618	921	724	262	124*	127*	700*
1899	306*	762*	1,000*	1,840*	1,590*	566*	888*	1,510*	1,220*	909*	330*	345*	935*
1900	408*	1,420*	2,330*	1,600*	885*	1,190*	986*	1,190*	663*	453*	225*	251*	969*
1901	381*	300*	1,410*	964*	1,030*	930*	750	973	824	439	207	205	746
1902	197	1,040	1,120	947	676	745	705	1,140	710	604	245	211	695
1903	209	837	1,150	1,790	572	480	693	1,020	960	533	179	440	739
1904	057	780	1,070	1,110	744	712	1,030	942	856	502	183	175	730
1905	141	359	831	647	557	766	644	829	679	352	243	221	523
1906	734	499	756	968	992	635	704	566	567	349	238	230	601
1907	712	1,930	1,040	675	1,470	625	828	826	456	312	246	258	778
1908	224	637	868	689	563	1,190	979	1,010	1,020	553	288	269	691
1909	297	548	634	870	705	612	692	933	955	429	305	296	608
1910	303	2,060	1,120	579	695	1,550	1,090	867	501	316	226	265	798
1911	468	1,280	792	724	527	490	454	995	669	343	254	293	600
1912	267	1,760	800	1,090	1,100	561	614	950	708	517	318	318	750
1913	343	852	738	1,070	847	644	827	993*	1,080*	678*	392*	373*	736*
1914	611*	974*	555*	1,300*	918*	948*	783*	763	554	340	300	292	869*
1915	290	669	440	563	504	450	510	306	358	366	250	346	442
1916	447*	902	1,050	641	1,150	1,500	1,100	1,140	1,250	916	560	479	927*
1917	347	510	641	924	1,130	626	954	1,220	1,800*	1,050	469	354	837*
1918	313*	317	2,760	2,200	1,250	792	837	810	650	389	304	204	912*
1919	459	663	1,010	1,210	914*	860*	862	643	517	568	330	276	742*
1920	354	680	656	974	928	767	865	692	669	502	315	468	654
1921	670	609	770	1,160	1,120	1,070	918	838	757	644	472	394	784
1922	418	644	1,440	699	526	444	610	671	762	571	427	287	626
1923	292	473	608	1,460	737	730	675	729	791	579	476	230	650
1924	306	312	628	732	1,220	862	682	571	527	301	227	332	556
1925	357	493	747	1,040	1,310	688	705	709	495	359	297	277	619
1926	223*	418	710	866	726	622	476	449	402	268	217	283	470*
1927	525	463	703	967	738	768	611	733	911	584	373	362	651
1928	590	1,380	1,210	1,550	737	726	739	880	456	410	325	278	775
1929	432	289	338	437	445	628	764	694	809	521	425	278	594
1930	221	559	368	478	654	756	601	648	514	403	333	266	449
1931	255	448	484	540	445	539	778	585	630	459	379	352	483
1932	394	522	583	828	898	1,640	1,300	940	821	518	427	388*	771*
1933	568	1,500	1,090	1,370	608	782	694	689	1,240	708	485	426	631
1934	566	1,126	3,126	2,013	880	931	836	539	464	334	259	220	944
1935	371	707	943	1,518	996	721	641	595	557	467	360	326	632
1936	270	267	337	979	675	896	617	1,096	859	515	398	329	604
1937	271	225	512	469	605	814	715	764	1,029	493	402	374	555
1938	316	803	1,052	1,037	664	576	846	832	403	371	395	239	632
1939	247	306	433	998	802	807	525	679	713	444	355	323	552
1940	359	351	611	516	731	906	729	732	382	344	312	284	521
1941	253	311	413	399	394	360	335	331*	360	312	275	337	340*
1942	440	400	709	815	708	587	674	551	635	610	402	290	568
1943	266	640	1,016	804	766	622	843	729	713	681	450	334	656
1944	300	348	632	435	519	483	620	553	563	353	335	299	454
1945	251	336	424	962	924	830	940	928	831	589	327	324	635
1946	395	928	807	1,179	754	975	814	747	1,074	700	520	304	766
1947	278	503	1,415	1,063*	1,174*	851	924	796	576	403	311	236	712*
1948	473*	1,182	869	921	875	971	873	901	1,200	689	488	369	821*
1949	349	656	934	569	770	967	789	1,056	1,481	650	469	321	707
1950	388	538	736	951	823	1,326	1,035	1,108	1,405	791	397	409	825
1951	476	850	1,299	1,080	1,773	1,072	729	682	616	579	343	241	806
1952	332	516	690	467	760	521	652	946	726	416	319	241	556
1953	190	162	179	944	1,516	838	733	862	803	427	367	301	604

* Estimated.

LAKE WASHINGTON BASIN

Cedar River near Landsburg, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1895											151	151	.....
1896	128	96		517	635	501	517	825	1,220	292	182	144	96
1897	137	604	680	825	825	608	775	875	725	473	315	282	137
1898	266	295	554	369	354	360	354	775	408	163	106*	83	83
1901							623	680	680	265	185	175	.....
1902	175	595	532	455	455	560	518	755	560	325	195	110	110
1903	139	283	630	740	448	396	483	718	688	283	130	156	130
1904	205	377	906	429	436	422	623	845	736	248	156	143	143
1905	126	130	416	396	289	442	511	420	416	223	185	200	126
1906	165	301	560	595	616	497	616	504	497	254	216	210	185
1907	226	548	539	462	830	455	553	623	344	243	216	232	216
1908	210	216	469	422	371	462	602	914	338	295	254	248	210
1909	238	289	410	504	483	497	511	672	546	307	271	243	238
1910	275	418	575	451	519	390	832	680	405	247	200	215	200
1911	384	457	512	505	444	405	347	717	366	253	215	241	215
1912	215	253	610	498	755	408	505	718	484	444	255	264	215
1913	258	379	540	540	575	540	610						
1914								556	400	290	266	244	.....
1915	186	400	376	404	300	390	268	256	316	296	233	256	186
1916	368*	455	678	577	572	670	960	858	1,020	593	478	412	366*
1917	239	294	493	518	624	545	597	941	1,400*	482	390	331	239
1918	266	223	306	1,320	785	675	601	442	472	.....	239	229	223
1919	230	510	510	606			762	835	660	.....	250	233	230
1920	238	544	513	630	694	670	745	638	590	364	239	273	238
1921	543	430	619	896	370	385	744	703	700	545	392	264	264
1922	282	472	608	608	356	344	542	558	575	478	271	.....	.....
1923	197	410	410	748	512	649	597	589	645	497	350	202	197
1924	188	187	437	473	378	682	539	519	402	242	185	214	185
1925	250	374	492	.....	778	555	508	606	382	324	263	225	225
1926	167*	225	396	627	604	540	421	402	323	233	196	167	167*
1927	257	260	454	547	521	620	504	563	669	406	314	316	257
1928	364	692	591	875	666	560	637	607	506	346	277	238	238
1929	298	234	284	282	266	416	605	530	446	435	315	237	234
1930	190	203	219	.....	438	524	526	470	442	348	278	238	190
1931	223	260	380	352	325	334	580	492	476	395	323	286	223
1932	.....	390	352	628	528	945	804	776	682	422	.....	.....	.....
1933	279	464	637	614	548	580	.....	641	763	.....	383	365	279
1934	406	570	573	1,170	547	548	507	448	332	299	219	206	206
1935	306	494	592	731	736	558	330	323	505	375	307	238	206
1936	240	236	256	874	481	748	526	565	533	414	348	300	236
1927	250	197	200	354	353	451	517	682	753	415	374	317	197
1938	292	312	647	323	506	476	323	602	386	344	307	262	262
1939	231	207	287	593	633	529	475	546	548	378	333	299	207
1940	285	295	360	415	425	507	572	419	360	323	288	242	242
1941	229	240	304	310	351	318	310	310	336	288	260	262	229
1942	222	311	446	632	448	396	436	350	359	434	314	248	248
1943	320*	406	542	440	566	403	652	574	508	401	308	260	220*
1944	238	253	398	325	328	326	330	318	356	290	242	226	226
1945	214	240	223	267	487	598	632	656	508	323	278	242	214
1946	263	672	512	790	543	536	557	454	877	407	324	273	263
1947	243	226	746	650*	806	578	772	402	378	308	262	240*	226
1948	235*	510*	630	593	493	585	524	510	816	405	366	305	235*
1949	232	324	534	404	376	708	602	620	664	374	312	262	262
1950	256	334	455	626	518	732	717	589	1,070	400	326	317	256
1951	330	508	632	690	628	842	438	402	418	384	252	208	208
1952	206	332	346	353	362	363	651	402	416	358	296	191	191
1953	174	148	148	224	916	526	495	455	451	317	288	262	148

* Estimated.

LAKE WASHINGTON BASIN

Cedar River near Landsburg, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary Maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1895							
1896	3,420	Jan. 9 or 10, 1896	90	762	553,000	912	708,000
1897	5,350	Nov. 14 or 15, 1896	137	1,060	771,000	999	724,000
1898	5,030	Nov. 19, 1897	83	700	506,000	912	443,000
1899				935	677,000	1,110	804,000
1900				969	703,000	838	608,000
1901				746	540,000	726	526,000
1902	3,790	Dec. 24, 1901	110	695	504,000	682	494,000
1903	10,200	Jan. 5, 1903	130	739	535,000	765	554,000
1904	2,620	Jan. 15, 1904	143	730	530,000	682	459,000
1905	2,080	May 24, 1905	126	523	738,000	578	418,000
1906	2,020	Jan. 25, 1906	185	601	435,069	741	537,000
1907	12,400	Nov. 15, 1906	216	778	568,000	615	445,000
1908	5,100	Mar. 16, 1908	210	691	501,000	670	486,000
1909	2,480	Jan. 14, 1909	238	608	440,000	775	561,000
1910	8,370	Nov. 23, 1909	200	798	577,000	719	520,000
1911	4,520	Nov. 21, 1910	215	609	441,000	632	458,000
1912	14,200	Nov. 19, 1911	215	750	545,000	677	492,000
1913	3,730	Jan. 3, 1913		136	532,000	728	527,000
1914				669	484,000	631	457,000
1915	1,330	April 4, 1915	186	422	305,000	507	367,000
1916	2,630	Mar. 10, 1916	366	927	673,000	851	618,000
1917	2,240	June 17, 1917	239	837	608,000	990	723,000
1918	7,500	Dec. 29, 1917	223	912	661,000	805	582,000
1919	3,160	Jan. 22, 1919	280	742	537,000	795	510,000
1920	1,860	Jan. 28, 1920	238	654	475,000	684	497,000
1921	1,920	Feb. 11, 12, 1921	264	784	567,000	822	595,000
1922	5,960	Dec. 12, 1921		926	453,000	530	384,000
1923	4,160	Jan. 10, 1923	197	629	471,000	640	464,000
1924	3,100	Feb. 12, 1924	155	556	404,000	585	425,000
1925	2,740	Feb. 8, 1925	225	619	448,000	569	433,000
1926	1,720	Jan. 5, 1926	167	470	340,000	499	361,000
1927	1,820	Jan. 2, 1927	267	651	472,000	775	561,000
1928	4,860	Jan. 13, 1928	238	775	563,000	597	434,000
1929	1,180	Mar. 31, 1929	234	504	365,000	487	353,000
1930	1,350	Jan. 4, 1930	190	449	325,000	477	346,000
1931	1,200	Mar. 31, 1931	223	483	349,000	509	368,000
1932	4,860	Feb. 26, 1932		771	560,000	893	648,000
1933	4,300	Jan. 8, 1933	279	831	601,000	980	715,000
1934	7,520	Dec. 22, 1933	206	944	683,400	708	513,000
1935	4,160	Jan. 25, 1935	206	682	494,000	586	424,300
1936	1,900	May 17, 1936	236	604	438,300	615	440,500
1937	1,800	June 20, 1937	197	555	402,000	653	472,000
1938	2,360	Nov. 29, 1937	267	632	457,700	533	385,500
1939	1,500	Feb. 15, 1939	202	552	399,500	580	420,000
1940	1,880	Mar. 7, 1940	242	521	378,400	492	357,200
1941	1,050	Nov. 28, 1940	229	340	245,900	388	280,900
1942	1,830	Dec. 19, 1941	248	568	411,300	509	433,800
1943	2,140	Nov. 23, 1942	220	636	475,100	602	486,200
1944	1,380	May 24, 1944	226	454	329,600	434	314,900
1945	1,970	Feb. 7, 1945	214	685	450,900	726	525,700
1946	2,040	Dec. 28, 1945	263	766	554,800	773	550,900
1947	4,100	Dec. 14, 1946	236	712	515,700	738	534,300
1948	1,940	Nov. 11, 13, 1947	235	821	536,200	775	561,300
1949	1,750	Feb. 17, 1949	262	707	511,500	683	494,600
1950	3,050	Mar. 5, 1950	256	825	597,400	906	656,200
1951	6,200	Feb. 11, 1951	208	890	585,600	706	511,200
1952	1,740	Feb. 4, 1952	191	555	402,900	479	347,800
1953	3,370	Feb. 1, 1953	148	604	437,200		

† Caused by failure of flashboards at Cedar Lake.

Rock Creek diversion near Landsburg, Wash.

Location.—Lat. 47°23'30", long. 121°58'40", in SE¼ sec. 13, T. 22 N., R. 6 E., on right bank, 1 mile upstream from mouth, and 1¼ miles north of Landsburg.

Drainage area.—11 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 650 ft. (from topographic map). Prior to July 1945, staff gage a quarter of a mile upstream at different datum.

Average discharge.—16 years (1932-48), 25.5 cfs.

Extremes.—1945-48: Maximum discharge, 213 cfs Dec. 14 1946 (gage height, 3.30 ft., from recorded range in stage); minimum, 2.2 cfs Sept. 26, 1946.

Remarks.—Canal diverts entire flow of Rock Creek in NE¼ sec. 16, T. 23 N., R. 7 E., and discharges into Cedar River below city of Seattle water-supply intakes and the Cedar River near Landsburg gaging station. Some regulation at Walsh Lake by city of Seattle. Records, October 1934 to June 1945, published only in conjunction with those for Cedar River near Landsburg.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1933...	250*	4,200*	5,000*	6,600*	1,700*	3,900*	2,900*	2,400*	2,000*	1,400*	740*	710*	31,600*
1934...	1,800*	4,500*	11,000*	9,500*	4,500*	2,000*	2,100*	1,700*	480*	250*	180*	120*	37,530*
1935...	2,090*	3,730*	3,730*	3,990*	1,980*	1,690*	1,320*	599*	571*	373*	248*	190*	20,770*
1936...	244*	674*	1,170*	4,670*	1,770*	3,060*	1,620*	1,750*	1,500*	510*	250*	361*	17,580*
1937...	196*	165*	2,650*	708*	2,840*	3,450*	3,650*	1,410*	1,960*	375*	268*	345*	18,320*
1938...	1,020*	1,860*	0*	0*	0*	0*	1,170*	1,410*	298*	280*	448*	365*	6,870*
1939...	120*	180*	550*	2,800*	3,100*	3,100*	1,700*	920*	1,600*	800*	180*	300*	15,350*
1940...	750*	830*	2,140*	2,350*	2,640*	2,850*	1,660*	1,230*	880*	380*	230*	250*	16,240*
1941...	1,290*	1,550*	2,890*	2,340*	1,220*	1,410*	1,010*	1,050*	1,010*	430*	120*	650*	14,970*
1942...	1,230*	1,190*	3,070*	1,840*	2,220*	1,840*	1,490*	922*	1,790*	922*	307*	179*	17,000*
1943...	184*	1,490*	2,150*	1,840*	2,220*	1,230*	1,790*	922*	774*	246*	184*	119*	13,150*
1944...	615*	1,190*	615*	922*	1,440*	922*	833*	738*	695*	307*	184*	417*	8,780*
1945...	369*	893*	922*	2,460*	2,780*	3,690*	4,170*	1,540*	714*	302	237	1,270	19,350*
1946...	1,020	3,110*	2,960	3,260	2,730	2,550	1,400*	639	1,270	859	254	375	20,430*
1947...	705	2,010	4,850*	2,620	2,530	1,630*	1,750	579	1,760	470	276	681	18,790*
1948...	2,370*	4,010	2,950	3,540	3,040	2,270	2,050	2,360	1,820	944	780	917	27,650*
1949...	988												

* Estimated.

NOTE—All flow of Rock Creek during period December 1937 to March 1938, when diversion dam was washed out, entered river above Cedar River near Landsburg gaging station through original natural channel.

Rock Creek near Maple Valley, Wash.

Location.—Lat. 47°22'50", long. 122°01'10", in NE¼ sec. 22, T. 22 N., R. 6 E., on left bank, 650 ft. upstream from mouth, and 2 miles southeast of Maple Valley.

Drainage area.—14.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 425 ft. (from topographic map). Prior to Mar. 16, 1953, 50 ft. downstream at datum 0.816 ft. higher.

Average discharge.—8 years (1945-53), 21.8 cfs.

Extremes.—1945-53: Maximum discharge, 165 cfs Feb. 11, 1951 (gage height, 4.26 ft., datum then in use, from recorded range in stage); minimum, 2.7 ft. Dec. 23, 24, 1952.

Remarks.—No known diversion or regulation above station.

LAKE WASHINGTON BASIN

Rock Creek near Maple Valley, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...										11.4	8.31	7.78	.....
1946...	8.77	20.1*	27.9*	47.8	49.0	46.2	31.4	17.4	14.2	13.7	10.0	7.87	24.4*
1947...	6.46	9.85	46.5*	34.8	46.1	27.4	22.2	15.5	10.2	8.36	6.30	5.26	19.8*
1948...	9.19	31.2	30.4	66.0	37.5	43.5	34.5	28.9	23.4	17.4	11.2	8.75	25.1
1949...	8.00	12.6	48.0	29.3	35.2	32.5	19.7	16.8	10.5	7.04	7.11	6.60	19.5
1950...	5.47	7.42	23.6	51.4	59.0	83.4	53.6	31.8	16.8	11.0	8.23	7.05	29.3
1951...	7.48	16.3	46.2	59.4	83.7*	46.1	25.5	14.6	9.84	7.24	5.66	5.44	27.0*
1952...	5.55	8.45	14.2	12.3	21.7	20.0	18.3	12.4	8.97	7.08	5.32	4.82	11.6
1953...	4.78	4.33	4.04	15.8	42.8	18.7	21.3	17.8	16.8	12.2	8.85	6.53	14.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...										9.6	7.2	6.7	.....
1946...	8.1	11*	22	37	39	41	22	14.0	13.5	12.0	8.8	6.7	6.7
1947...	5.7	6.3	17.5	26	33	22	20	12.5	9.1	7.2	5.4	3.8	3.8
1948...	3.5	20	32	34	24	32	32	25	19.5	13	9.6	7.9	3.5
1949...	7.7	7.7	34	20	16.5	25	16.5	13	8.2	7.7	6.1	5.9	5.9
1950...	4.2	4.4	15	34*	36	61	44	21	13	9.5*	7.2	7.5	4.2
1951...	6.8	10.5	37	51	51*	37	18.5	12	8.1	6.6	5.2	4.6	4.8
1952...	5.0	5.2	11	9.7	17	18.5	15	10.5	7.8	6.5	5.2	4.3	4.3
1953...	4.3	4.1	2.8	3.9	25	16	18.5	16	15	9.8	7.3	5.9	2.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....										
1946.....	72	Jan. 7, 1946	6.7	24.4	1.74	23.68	17,660	24.9	24.20	18,060
1947.....	105	Dec. 14, 1946	3.8	19.8	1.41	19.18	14,320	20.9	20.29	15,160
1948.....	87	Feb. 27, 1948	3.5	25.1	2.01	27.37	20,430	27.5	26.74	19,960
1949.....	72	Dec. 12, 1948	5.9	19.5	1.39	18.89	14,100	16.8	16.26	12,130
1950.....	138	Mar. 5, 1950	4.2	29.8	2.13	28.92	21,590	32.7	31.66	23,040
1951.....	165	Feb. 11, 1951	4.8	27.0	1.93	26.17	19,540	23.5	22.74	16,980
1952.....	24	①	4.3	11.6	0.829	11.25	8,420	10.4	10.05	7,540
1953.....	70	Jan. 30, 1953	2.8	14.3	1.02	13.83	10,330			

* Estimated. ① Feb. 8-12, 15-17, 1952.

LAKE WASHINGTON BASIN

Cedar River at Renton, Wash.

Location.—Lat. 47°28'50", long. 122°12'10", in SW ¼NW ¼ sec. 17, T. 23 N., R. 5 E., on left bank, 125 ft. downstream from bridge on U. S. Highway 10 at Renton, and 2 miles upstream from mouth.

Drainage area.—197 sq. mi. (includes 4 sq. mi. in vicinity of Youngs Lake, in the Big Soos Creek basin).

Gage.—Water-stage recorder. Datum of gage is 15.20 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Mar. 10, 1901, to July 15, 1903, and Aug. 25, 1906, to Dec. 31, 1907, staff gage half a mile downstream, at datum 10.67 ft. above mean sea level (unadjusted). Aug. 7, 1945, to Dec. 7, 1950, water-stage recorders 700 ft. upstream at different datums.

Average discharge.—9 years (1906-7, 1945-53), 749 cfs.

Extremes.—1901-3, 1906-7, 1945-53: Maximum discharge not determined, probably occurred Feb. 11, 1951, during period of no gage-height record (discharge measurement of 6,640 cfs, gage height, 9.48 ft., made Feb. 10, 1951); minimum discharge, 49 cfs Nov. 20, 21, 28, 30, 1952.

Remarks.—The city of Seattle has diverted at Landsburg 25 miles above this station increasing amounts from 35 cfs in 1901 to between 150 and 250 cfs in recent years for municipal use. Flow partly regulated by Cedar Lake reservoir for power.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1901							944	1,010	900	504	223	200	
1902	195	1,170	1,280	1,320	942	945	845					179	
1903	195	667							1,100				
1906												250	
1907	608	1,740	1,130	1,080	2,250	1,100	1,280	1,160	705	369	256	261	987
1908	234	771	1,620										
1945											280	250	
1946	339	1,095	957	1,507	1,002	1,176	905	717	1,039	629	408	186	829
1947	195	515	1,636	854	1,211*	976	985	801	529*	296	176	212	699*
1948	511	1,357	1,070	1,225	1,101	1,076	940	960	1,329	618	353	292	903
1949	281	747	1,176	637	1,006	1,066	771	1,006	789	487	317	234	708
1950	808	520	800	1,155	1,068	1,651	1,032*	968*	1,320	618	250*	239*	826*
1951	385	953	1,439*	1,140*	2,029*	1,023*	604*	548*	439	368	150	119	756*
1952	259	463	595	444	855	579	550	879	576	239*	135	109	497*
1953	76.4	61.2	91.2	1,059	1,590	769	650	803	706	288	184	173	533

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1901							636	714	773	295	190	164	
1902	160	372	678	792	494	773	734					114	
1903	134	250							370				
1906												213	
1907	185	675	635	655	1,450	860	860	1,000	465	300	205	250	165
1908	205	250	1,150										
1945											109	107	
1946	176	608	526	942	723	732	649	424	786	322	186	152	152
1947	127	138	759	638	1,000*	680	840	390*	370*	178	144	140	127
1948	152	733	789	684	614	705	606	554	878	329	290	208	152
1949	200	246	695	422	419	756	462	652	463	232	200	186	186
1950	184	265	437	768	702	830	600*	450*	999	238	140*	130*	730*
1951	190	417	995*	700*	640*	790*	285*	255*	243	189	87	82	82
1952	124	267	402	324	410	382	685	360	291	157	104	64	64
1953	64	51	53	96	877	559	485	427	431	154	115	137	51

* Estimated.

LAKE WASHINGTON BASIN

Cedar River at Renton, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
YEAR	Momentary Maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1901							
1902							
1903							
1906							
1907	15,650	Nov. 15, 1906	165	927	714,000	916	664,000
1908							
1945							
1946	2,680	Dec. 29, 1945	152	829	600,000	827	598,400
1947	5,510	Dec. 15, 1946	127	699	505,900	747	538,500
1948	2,750	Feb. 26, 1948	162	903	655,700	843	611,900
1949	2,750	Feb. 17, 1949	186	708	512,700	660	477,700
1950	4,160	Mar. 4, 1950	180	820	598,100	922	667,800
1951			82	759	549,600	637	460,800
1952	2,190	Feb. 4, 1952	64	497	360,600	406	294,400
1953	4,110	Feb. 1, 1953	51	533	385,800		

† Maximum observed.

May Creek near Renton, Wash.

Location.—Lat. 47°31'10", long. 122°11'10", in SE¼SE¼ sec. 32, T. 24 N., R. 5 E., on left bank, 20 ft. downstream from county bridge, 1 mile upstream from mouth, and 2½ miles north of Renton.

Drainage area.—13.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map).

Average discharge.—5 years (1945-50), 22.2 cfs.

Extremes.—1945-50: Maximum discharge, 401 cfs Feb. 17, 1949 (gage height, 3.98 ft.); minimum, 1.9 cfs July 30, 1945, July 10, Sept. 3, 5, 1947.

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										2.75	2.65	5.64	
1946	5.91*	25.2*	38.2*	53.5	50.5	38.2	23.1	6.96*	6.01*	5.54	3.65*	3.75*	21.6*
1947	4.95	18.2	51.0	28.0	44.6	18.3	10.9	5.98	4.30	2.95	2.68	2.76	16.5
1948	26.3	42.2	49.0	56.8	47.6	34.4	22.5	22.7	14.9	7.38	4.35	5.88	27.8
1949	5.39	31.9	49.0	23.2	66.1	28.8	14.8	9.13	4.22	3.02	2.87	2.89	19.6
1950	3.91	14.9	28.8	67.5	67.2	76.4	31.3	9.07	4.09	3.32	3.66	3.87	25.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										2.6	2.4	2.4	
1946	2.8*	5.7*	10*	20	23	28	13	4.0*	3.1*	3.7	2.8*	2.4*	2.4*
1947	3.1	5.5	15	11	18	12	9.8	4.0	3.4	2.4	2.1	2.1	2.1
1948	2.6	22	30	15	14	14	17	10	8.0	4.0	3.4	3.4	2.6
1949	3.0*	6.6	19	10	9.5	16	11	5.1	3.7	2.6	2.5	2.5	2.5
1950	2.6	3.7	10	26*	24*	16	15.5	5.0	3.5	2.9	2.7	3.5	2.6

* Estimated.

May Creek near Renton, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....										
1946.....	131	Dec. 29, 1945	2.4	21.6	1.64	22.17	15,600	22.0	22.60	15,910
1947.....	198	Dec. 14, 1946	2.1	16.5	1.25	17.01	11,970	20.2	20.73	14,590
1948.....	148	Jan. 2, 4, 1948	2.6	27.8	2.11	28.67	20,190	25.2	25.88	18,290
1949.....	401	Feb. 17, 1949	2.5	19.8	1.50	20.36	14,340	16.6	17.03	11,990
1950.....	354	Mar. 4, 1950	2.6	25.1	1.90	25.83	18,180			

Mercer Creek near Bellevue, Wash.

Location.—Lat. 47°36'05", long. 122°11'00", in NW¼NW¼ sec. 4, T. 24 N., R. 5 E., on right bank, 50 ft. upstream from county road crossing, 1 mile southeast of Bellevue, and 1½ miles upstream from mouth.

Drainage area.—12.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 25 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 26 cfs Sept. 25 (gage height, 1.49 ft.); minimum, 2.8 cfs July 30, Aug. 21 (gage height, 0.72 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									3.45	3.25	6.07		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									3.1	3.0	3.3		

Juanita Creek near Kirkland, Wash.

Location.—Lat. 47°42'35", long. 122°12'35", in SE¼ sec. 30; T. 26 N., R. 5 E., on left bank at upstream side of county bridge, half a mile upstream from mouth, and 2 miles north of Kirkland.

Drainage area.—5.6 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 35 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 4.8 cfs Sept. 20 (gage height, 1.18 ft.); minimum, 1.1 cfs Sept. 1 (gage height, 0.86 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

LAKE WASHINGTON BASIN

Juanita Creek near Kirkland, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945								2.73*	1.84	1.55	2.15		

* Estimated.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945								2.1*	1.6	1.3	1.3		

* Estimated.

Issaquah Creek near Issaquah, Wash.

Location.—Lat. 47°28'55", long. 122°02'10", in NW¼ sec. 15, T. 23 N., R. 6 E., on left bank, 3½ miles south of Issaquah, and 4 miles upstream from East Fork.

Drainage area.—26.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 210 ft. (from topographic map). Prior to Oct. 1, 1948, and Oct. 1, 1948, to July 6, 1952, water-stage recorder 70 ft. downstream at datums 0.99 ft. higher and 0.41 ft. lower, respectively.

Average discharge.—8 years (1945-53), 71.5 cfs.

Extremes.—1945-53: Maximum discharge, 2,610 cfs Feb. 9 or 10, 1951 (gage height, 6.08 ft. site and datum then in use); minimum, 10.5 cfs Sept. 1, 3, 4, 1952; minimum gage height, 0.81 ft. Sept. 21, 22, 1953.

Remarks.—Several small diversions for irrigation and domestic use above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										19.4	16.1	41.0	
1946	34.9	106*	131*	169	160	126	77.8	36.7	48.5	34.9	18.9	20.2	79.0*
1947	33.0	91.8	205	116	138	70.6	75.4	30.7	37.9	22.2	16.0	28.7	71.7
1948	103	154	152	156	138	102	93.2	91.0	69.8	35.9	26.5	33.4	96.1
1949	56.3*	109	150	70.5	169	95.5	58.4	42.5	22.4	19.0	15.8	15.0*	68.0*
1950	26.4	56.2	119	167	158	208	132	52.6*	24.9*	19.1	18.4	17.7	82.9*
1951	47.4	116	145	171	252*	91.5	43.5	39.1	25.1	16.2	14.4	14.8	80.2*
1952	33.3	50.5	81.6	64.2	95.2	80.6	44.3	30.5	21.2	15.5	12.6	11.8	45.0
1953	12.2	13.0	17.3	145	119	56.8	61.6	58.4	55.3	25.2	18.8	15.2	49.4

* Estimated.

Issaquah Creek near Issaquah, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										16	15	15	
1946	20	62*	45	60*	87	84	52	25	27	20	16	17	16
1947	18	27*	60*	43*	54	49	44	23	22	18	14	18	14
1948	22	74	112	62	48	53	74	44	37	25	21	21	21
1949	28*	20	60	37	33	64	48	26	19.5	17	14*	13	13
1950	13*	18	37	73	66*	131	86*	30*	21*	17	15	14	13*
1951	15.5	42	93	95	70*	58	34	30	19	13.5	12	11.5	11.5
1952	18	30	46	40	48	47	29	24	17	13	11	11	11
1953	11	12	13	16.5	42	33	45	32	33	20	15.5	13.5	11

* Estimated.

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum					Runoff						
	Dis-charge	Date	Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff			
						Inches	Acre-feet		Inches	Acre-feet		
1945												
1946	452	Dec. 28, 1945	16	79.0	3.04	41.26	57,190	84.0	43.84		60,770	
1947	675	Dec. 14, 1946	14	71.7	2.78	37.45	51,830	78.3	40.88		56,680	
1948	540	Feb. 26, 1948	21	96.1	3.70	50.34	69,810	88.3	46.24		64,120	
1949	1,120	Feb. 17, 1949	13	68.0	2.62	35.49	49,200	58.4	30.50		42,290	
1950	800	Mar. 4, 1950	13	82.9	3.19	43.30	60,050	91.9	47.98		66,530	
1951	2,610	Feb. 9 or 10, 1951	11.5	60.2	3.08	41.90	58,080	63.3	35.67		49,450	
1952	342	Feb. 4, 1952	11	45.0	1.73	23.58	32,690	34.7	18.16		25,170	
1953	655	Jan. 31, 1953	11	49.4	1.90	25.81	35,790					

East Fork Issaquah Creek at Issaquah, Wash.

Location.—Lat. 47°31'55", long. 122°01'20", in SE¼ sec. 27, T. 24 N., R. 6 E., on left bank, half a mile east of Issaquah, and 1 mile upstream from mouth.

Drainage area.—8.54 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 180 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 39 cfs Sept. 25 (gage height, 1.62 ft.); minimum, 2.3 cfs Aug. 20-24 (gage height, 0.92 ft.).

Remarks.—Some small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945									3.61	2.60	3.21		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945									2.8	2.3	2.5		

LAKE WASHINGTON BASIN

Bear Creek near Redmond, Wash.

Location.—Lat. 47°43'00", long. 122°04'30", in SW¼ sec. 20, T. 26 N., R. 6 E., on right bank at county road crossing, 1 mile upstream from Cottage Lake Creek, and 3½ miles northeast of Redmond.

Drainage area.—12.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from topographic map).

Extremes.—1945-49: Maximum discharge, 196 cfs Feb. 2, 1947 (gage height, 3.83 ft.); minimum, 3.1 cfs Aug. 22, 1946.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									9.31	6.46	6.15	8.92	
1946	12.0	37.3	50.8	53.5	61.3	47.8	26.1	11.6	18.8	7.75	5.21	7.30	27.7
1947	11.6	37.2	67.5	52.7	68.3	25.7	27.1	10.5	10.3	6.97	6.73	9.14	27.5
1948	20.2	50.8	58.2	63.9	60.2	38.4	32.8	41.2	24.5*	12.5*	11.0*	14.7	35.6*
1949	16.5	44.3	38.1	37.2*	64.4	38.3	20.6	17.7	8.37	7.19	6.48	7.10	25.3*
1950	13.2												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									6.9	5.8	5.6	6.0	
1946	6.5	18	21	21	22	28	16.5	8.8	7.9	4.9	3.7	6.1	3.7
1947	7.5	11	28	19	26	19	16	7.5	7.5*	6.1	6.1	6.8	6.1
1948	8.8	22	37	26	24	22	23	20*	18*	9.6*	9.6	8.3	8.3
1949	7.6	16	16*	16*	15	25	14	8.3	6.6	5.2	5.5	4.9	4.9
1950	7.5												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945											
1946	139	Feb. 6, 1946	3.7	27.7	2.16	29.34	20,030	29.0	30.79	21,020	
1947	198	Feb. 2, 1947	6.1	27.5	2.15	29.22	19,930	28.6	30.35	20,700	
1948	130	Jan. 4, 1948	8.3	35.6	2.78	37.57	25,550	33.1	35.16	24,000	
1949	180	Feb. 22, 1949	4.9	25.3	1.93	26.79	18,250				

* Estimated.

Cottage Lake Creek near Redmond, Wash.

Location.—Lat. 47°44'00", long. 122°05'00", in SE¼ sec. 18, T. 26 N., R. 6 E., on left bank, 100 ft. downstream from county road bridge, 2 miles upstream from mouth, and 4½ miles northeast of Redmond.

Drainage area.—11.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 150 ft. (from topographic map).

Extremes.—June to September 1945: Maximum discharge, 11 cfs Sept. 20 (gage height, 1.09 ft.); minimum, 4.2 cfs Aug. 15, 17 (gage height, 0.93 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....										5.16	4.73	5.06	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....										4.8	4.4	4.8	.....

Evans Creek near Redmond, Wash.

Location.—Lat. 47°39'15", long. 122°04'45", in NW¼ sec. 17, T. 25 N., R. 6 E., on left bank at county road crossing, 2 miles upstream from mouth, and 2½ miles southeast of Redmond.

Drainage area.—11.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 75 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 21 cfs Sept. 25 (gage height, 4.65 ft.); minimum, 4.7 cfs Aug. 21 (gage height, 4.22 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									6.51	5.74	7.11	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									5.9	5.1	5.4	.....	.....

LAKE WASHINGTON BASIN

Bear Creek at Redmond, Wash.

Location.—Lat. 47°40'10", long. 122°06'30", in NE¼ sec. 12, T. 25 N., R. 5 E., on right bank, 300 ft. downstream from highway crossing, half a mile east of Redmond, and three-quarters of a mile upstream from mouth.

Drainage area.—47.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map).

Average discharge.—5 years (1945-50), 83.4 cfs.

Extremes.—1945-50: Maximum discharge, 654 cfs Mar. 5, 1950; maximum gage height, 6.53 ft. Jan. 22, 1950; minimum discharge, 13 cfs Aug. 26, 1947.

Remarks.—Several small diversions for irrigation and domestic use above station. Minor regulation by fish trap half a mile above gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									33.9	20.2	18.0	25.9	
1946	35.5	99.1	131	165	176	146	79.0	36.4	40.7	27.2	19.4	24.5	81.1
1947	35.6	97.1	178	127	191	78.4	89.0	33.0	30.5	21.8	16.0	25.1	75.4
1948	51.2	117	139	181	166	111	96.6	113	74.1	35.2	34.1	36.7	96.5
1949	48.7	112	119	98.1	194	105	62.5	47.7	27.3	25.0	21.5	22.3	72.6
1950	35.5	58.8	96.6	191*	213	250	99.1	57.5	32.2	23.0	22.5	21.7	91.1*
1951	43.1												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									24	18	16	18	
1946	22	54	78	96	103	96	53	28	28	19	17	20	17
1947	26	36	73	56	78	60	49	23	22	17.5	15.5	19	16.5
1948	24	70	97	85	79	71	75	54	44	30	30	26	24
1949	36	47	64	63	51	72	51	31	24	22	19	18	18
1950	25	30	54	75*	70*	112	71	39	25	20	18.5	17.5	17.5
1951	22												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945											
1946	363	Feb. 6, 1946	17	81.1	1.71	23.17	58,710	85.0	24.27	61,500	
1947	460	Feb. 2, 1947	15.5	75.4	1.59	21.50	54,620	75.1	21.46	54,330	
1948	349	①	24	96.5	2.03	27.68	70,070	94.2	27.00	68,370	
1949	555	Feb. 22, 1949	18	72.8	1.53	20.80	52,690	65.4	18.63	47,310	
1950	654	Mar. 5, 1950	17.5	91.1	1.92	26.05	65,960				

* Estimated.

① Jan. 4, Feb. 26, 1948.

Sammamish River near Redmond, Wash.

Location.—Lat. 47°40'10", long. 122°07'50", in NE¼ sec. 11, T. 25 N., R. 5 E., on right bank at highway crossing, 500 ft. downstream from Bear Creek, half a mile west of Redmond, and 1¼ miles downstream from outlet of Sammamish Lake.

Drainage area.—144 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 23.08 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 14, 1946, May 30 to Nov. 15, 1950, staff gages at sites 1¼ or 2 miles upstream on left shore of Sammamish Lake at approximately 2.0 ft. higher. Nov. 14, 1946, to July 8, 1947, water-stage recorder at present site at datum 1.52 ft. higher.

Average discharge.—14 years (1939-53), 277 cfs.

Extremes.—1939-53: Maximum discharge, 1,520 cfs Feb. 11, 1951 (gage height, 9.17 ft.); minimum, 43 cfs Aug. 20, 21, 24, 1951.

Remarks.—Numerous small diversions for irrigation and domestic use above station. Slight regulation on some tributaries.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1939					500	485	289	137	108	108	87.0	58.6	.....
1940	55.7	84.8	252	391	393	586	398	381	187	94.4	78.0	68.8	247
1941	87.7	159	252	333	292	227	194	166	125	77.4	58.6	87.4	170
1942	133	194	477	460	440	365	249	180	189	143	90.5	84.8	250
1943	76.3	229	464	413	441	300	463	312	191	112	79.0	65.1	261
1944	76.7	127	160	212	284	270	222	208	151	84.1	69.0	69.6	159
1945	83.7	115	201	277	420	494	580	429	258	129	72.1	86.6	261
1946	105	288	496	629	611	590	463	273	172	155	89.5	88.0	329
1947	137	261	723	532	674	456	361	215	152	106	68.0	69.6	311
1948	203	537	552	737	606	625	484	423	343	201	129	137	414
1949	207	322	603	465	523	594	375	238	116	82.3	67.6	69.8	304
1950	99.4	176	323	706	837	1,094	651	360	175	105	82.6	71.3	333
1951	122	340	725	827	1,056	616	343	197	125	70.8	50.1	67.6	374
1952	105	158	339	341	446	368	283	173	109	82.4*	57.7	52.8	209*
1953	53.8	59.7	82.1	350	570	330	320	235	213	128	76.6	73.4	205

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1939					404	418	192	104	96	87	55	51	.....
1940	51	64	97	304	286	483	328	262	125	83	69	62	51
1941	60	137	194	299	245	194	172	137	98	62	56	61	56
1942	97	146	272	382	382	316	201	161	156*	99	87	80	80
1943	76	84	401	353	377	230	377	252	143	88	72	58	56
1944	53	120	138	158	241	241	268	178	111	68	56	60	53
1945	80	88	178	178	274	413	554	353	188	93	64	64	64
1946	93	120	450	554	554	523	377	198	158	120	72	72	72
1947	109	158	484	448	568	369	305	150	135*	53	61	63	61
1948	72	423	503	568	503	529	436	322	287	143	119	117	72
1949	165	177	516	329	294	503	294	154	96	76	61	60	60
1950	81	104	244	453	709	844	507	240	135	88	74	62	62
1951	71	196	655	715	750	505	244	156	95	54	45	53	45
1952	83	117	265	303	357	307	216	135	88	64	52	49	49
1953	52	55	61	97	425	276	278	209	182	81	68	65	52

* Estimated.

LAKE WASHINGTON BASIN

Sammamish River near Redmond, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1939.....										
1940.....	689	Mar. 9, 1940	51	247	1.72	23.39	179,600	256	24.22	186,000
1941.....	370	Jan. 20-26, 1941	59	170	1.18	16.03	123,100	196	16.46	141,600
1942.....	672	Dec. 23-25, 1941	60	250	1.74	23.54	180,800	247	23.25	178,600
1943.....	541	April 5, 1943	56	261	1.81	24.59	188,600	236	21.28	163,400
1944.....	307	Feb. 17, 1944	63	159	1.10	15.03	115,400	163	15.40	118,300
1945.....	620	April 12, 1945	64	261	1.81	24.59	188,600	302	23.48	218,700
1946.....	704	Jan. 9-12, 1946	72	329	2.28	30.98	237,900	348	32.84	252,200
1947.....	224	Dec. 15, 16, 1946	61	311	2.16	29.32	225,100	325	30.61	235,100
1948.....	860	Jan. 10, 11, 1948	72	414	2.82	39.15	300,600	401	37.92	291,200
1949.....	346	Feb. 24, 1949	60	304	2.11	23.67	220,200	259	24.44	187,700
1950.....	1,360	Mar. 6, 1950	62	368	2.69	36.53	230,600	437	41.22	316,600
1951.....	1,520	Feb. 11, 1951	45	374	2.60	35.23	270,500	324	30.59	234,000
1952.....	524	Feb. 4, 1952	49	209	1.45	19.76	151,700	175	16.52	126,900
1953.....	653	Feb. 7, 1953	52	205	1.42	19.33	148,400			

Bear Creek at Woodinville, Wash.

Location.—Lat. 47°45'55", long. 122°09'20", in SW ¼ sec. 3, T. 26 N., R. 5 E., on left bank at county road crossing, three-quarters of a mile north of Woodinville, and 1 mile upstream from mouth.

Drainage area.—15.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 75 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 25 cfs Sept. 20 (gage height, 1.43 ft.); minimum, 3.4 cfs Aug. 21.

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									5.03	4.50	8.22		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									4.2	4.0	5.0		

LAKE WASHINGTON BASIN

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North Creek near Bothell, Wash.

Location.—Lat. 47°47'30", long. 122°11'45", on line between secs. 29 and 32, T. 27 N., R. 5 E., on left bank, 2 miles north of Bothell, and 2½ miles upstream from mouth.

Drainage area.—24.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map). June 11, 1945, to Apr. 4, 1950, water-stage recorder at present site and datum. Apr. 5, 1950, to Sept. 30, 1951, water-stage recorder at present site at datum 0.59 ft. higher.

Average discharge.—8 years (1945-53), 35.1 cfs.

Extremes.—1945-53: Maximum discharge, 680 cfs Mar. 5 or 6, 1950 (gage height, 7.0 ft., present datum, from high-water elevation, pointed out by local resident); minimum, 1.0 cfs Aug. 10, 1946.

Remarks.—Several small diversions for irrigation and domestic use above station. Slight regulation by small dam above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									10.2	5.83	6.09	9.71	.....
1946	13.1	48.2	59.7	74.4	103	70.7	35.1	14.5	15.0	9.38	6.42	7.60	37.6
1947	11.5	33.0	63.1	59.8	108	33.5	27.2	11.4	10.3	7.17	6.09	7.31	31.0
1948	24.4	37.8	72.9	69.9	81.1	50.0	50.5	58.9	31.2	11.0	10.8	13.9	44.3
1949	19.0	50.2	59.9	38.6*	121	50.9	26.1	22.9	9.14	7.09	8.00	8.48	34.5*
1950	13.3	28.8	48.8	96.4*	111*	132*	39.8	19.2	11.6	8.72	9.09	8.57	43.6*
1951	19.5	51.2	85.9	104	109	53.1	23.6*	19.1	9.73	6.26	6.85*	10.0	41.2*
1952	19.6	25.4	55.5	51.2	53.5	52.8	19.6	12.6	10.2	7.47	7.39	7.09	26.8
1953	7.74	9.99	16.1	69.1	37.2	80.6	31.5	17.8	20.0	8.70	7.12	9.34	22.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									6.3	4.7	4.5	6.3	.....
1946	7.1	16.0	23	31	47	37	21	10.5	7.4	6.3	5.1	6.3	5.1
1947	7.9	11.0	25	18.5	38	19.5	17.5	6.8	7.1	6.0	4.7	6.0	4.7
1948	7.3	18.5	34	38	33	25	32	16.5	12.5	8.0	8.3	5.8	5.8
1949	13.5	18	30	18.5	17.5	34	18	9.4	7.8	5.5	6.2	6.2	5.5
1950	8.1	11	19.5	46*	64*	54*	22	12	8.3	6.6	5.8	6.2	6.8
1951	7.1	14	51	46	46	36	15.5*	12	6.2	5.1	5.4	7.5	5.1
1952	9.8	13.5	26	23	25	29	12	8.4	7.4	5.6	6.2	6.2	5.6
1953	5.9	8.9	11	19.5	21	17	20	11.5	11.5	6.2	5.3	7.1	5.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1945													
1946	280	Feb. 27, 1946	5.1	37.6	1.56	21.20	27,260	36.6	20.58	26,480			
1947	420	Feb. 2, 1947	4.7	31.0	1.29	17.48	22,480	33.5	18.79	24,220			
1948	323	Oct. 19, 1947	5.8	44.3	1.84	25.03	32,160	43.7	24.71	31,770			
1949	455	Feb. 17, 22, 1949	5.5	34.5	1.43	19.43	24,980	31.3	17.63	22,660			
1950	680	Mar. 5 or 6, 1950	5.8	43.6	1.81	24.57	31,590	49.2	27.69	35,600			
1951	320	Feb. 9, 1951	5.1	41.2	1.71	23.20	29,800	36.5	20.54	26,890			
1952	177	Feb. 1, 1952	5.6	26.8	1.11	15.14	19,490	21.2	11.99	15,430			
1953	172	Jan. 8, 1953	5.3	22.0	.913	12.40	15,950						

* Estimated.

LAKE WASHINGTON BASIN

Sammamish River at Bothell, Wash.

Location.—Lat. 47°45'20", long. 122°11'35", in NW¼SE¼ sec. 8, T. 26 N., R. 5 E., on left bank in Bothell, a quarter of a mile downstream from North Creek and 3½ miles upstream from mouth.

Drainage area.—205 sq. mi.

Gage.—Water-stage recorder. Datum of gage is mean lower low water at Seattle (Corps of Engineers benchmark), or 6.54 ft. below mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Dec. 28, 1939, staff gages at same site and datum.

Average discharge.—14 years (1939-53), 351 cfs.

Extremes.—1939-53: Maximum discharge, about 1,900 cfs Feb. 12 and/or 13, 1951; maximum gage height, 32.12 ft. Feb. 22, 1949; minimum discharge, 62 cfs Aug. 22, 23, 1951 (gage height, 22.92 ft.).

Remarks.—Numerous small diversions for irrigation and domestic use above station. Slight regulation on some tributaries.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	111	152	441	508	563	710	474	438	218	123	92.9	91.4	326
1941...	139	229	332	440	307	291	272	197	155	93.2	72.8	118	225
1942...	183	272	637	553	558	441	285	261	239	166	108	100	320
1943...	107	336	593	537	565	439	661	381	217	129	100	88.1	338
1944...	142	178	209	304	362	319	283	252	176	97.3	74.3	90.1	207
1945...	111	189	242	363	605	646	639	408	208	165	110	123	330
1946...	158	401	587	789	843	765	533	323	229	177	113	119	417
1947...	167*	344	849	667	928	535	444	257	185	124	80.8	98.0	368*
1948...	274*	607	694	963	737*	738	591	556	415	248	179	154	515*
1949...	259	337	718	551	764	745	430	301	154	105	85.9	93.5	362
1950...	141	240	450	899	1,052	1,264	715	396	211	119	95.4	94.9	470
1951...	193	461	907	1,026	1,851	731	396	256	163	101	76.6*	82.8	474*
1952...	151	215	432	427	556	468	334	213	142	112	80.5	74.8	266
1953...	77.6	93.1	131	506	680	400	398	268	248	142	95.8	95.9	260

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	99	114	193	378	370	549	363	292	151	109	82	83	82
1941...	98	166	262	335	308	250	202	159	125	74	67	80*	67
1942...	136	176	364	450	435	383	238	197	180	134	97	97	97
1943...	100	178	525	445	461	334	465	296	161	103	86	82	82
1944...	85	161	185	249	312	291	249	210	126	74	63	71	63
1945...	103	134	210	223	361	510	555	390	216	128	96	94	94
1946...	134	210	469	650	697	629	439	243	198	136	99	105	99
1947...	180*	210	499	531	663	424	366	173	161	102	79	87	79
1948...	98*	515	563	663	590*	679	515	380	324	198	161	149	96*
1949...	217	224	546	366	336	584	344	202	130	83	80	73	73
1950...	98	143	329	546	613	947	546	278	149	96	82	85	82
1951...	102	270	815	815	836	600	290	208	122	84*	64	72	64
1952...	111	157	312	362	427	368	259	164	120	89	71	67	67
1953...	71	86	100	155	479	333	344	255	200	105	87	83	71

* Estimated.

Sammamish River at Bothell, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1940.....	878	①	82	326	1.59	21.68	237,000	326	21.65	236,700
1941.....	752	Jan. 18, 1941	67	225	1.10	14.87	162,600	262	17.35	189,700
1942.....	1,030	Dec. 23, 1941	97	320	1.56	21.20	231,800	311	20.59	225,200
1943.....	872	Mar. 23, 1943	82	338	1.65	22.37	244,600	295	19.56	213,800
1944.....	510	April 25, 1944	63	207	1.01	13.76	150,400	208	13.82	151,100
1945.....	922	Feb. 8, 1945	94	330	1.61	21.88	239,200	331	25.24	275,900
1946.....	1,070	Feb. 6, 1946	99	417	2.03	27.64	302,200	436	28.85	315,400
1947.....	1,230	Feb. 2, 1947	79	388	1.89	25.66	280,500	405	26.82	293,300
1948.....	1,210	Jan. 8, 1948	98	515	2.51	34.19	373,800	499	33.10	361,900
1949.....	1,570	Feb. 22, 1949	73	362	1.86	25.28	276,400	336	22.24	243,200
1950.....	1,630	Mar. 5, 6, 1950	82	470	2.29	31.12	340,200	531	35.19	384,800
1951.....	1,900†	②	64	474	2.31	31.38	343,000	410	27.13	290,500
1952.....	779	Feb. 4, 1952	67	266	1.30	17.68	193,300	225	14.92	163,100
1953.....	829	Feb. 4, 1953	71	260	1.27	17.25	188,400	.....	.....	.....

† About 1,900. ① Mar. 5, 8, 9, 1940. ② Feb. 12 and/or 13, 1951.

Swamp Creek near Bothell, Wash.

Location.—Lat. 47°46'00", long. 122°14'25", in NE¼SW¼ sec. 1, T. 26 N., R. 4 E., on right bank at county road crossing, 1 mile upstream from mouth, and 1½ miles west of Bothell.

Drainage area.—21.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 17 cfs Sept. 22 (gage height, 1.04 ft.); minimum, 2.4 cfs Aug. 22 (gage height, 0.67 ft.).

Remarks.—Several small diversions for irrigation, domestic and industrial use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									3.74	3.69	6.65		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945.....									3.2	2.8	3.5		

LAKE WASHINGTON BASIN

McAleer Creek near Bothell, Wash.

Location.—Lat. 47°45'30", long. 122°17'25", in NE¼ sec. 9, T. 26 N., R. 4 E., on right bank at downstream side of county road crossing, 1 mile upstream from mouth, and 4 miles west of Bothell.

Drainage area.—7.48 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map). June 28 to Oct. 1, 1945, water-stage recorder at site 50 ft. upstream at datum 1.04 ft. higher.

Extremes.—1945, 1947-49: Maximum discharge, 141 cfs Feb. 23, 1949 (gage height, 2.23 ft.), from rating curve extended above 18 cfs on basis of computation of peak flow through culvert; minimum, 1.6 cfs Aug. 20-22, 1945.

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915										2.17	2.14	2.83	
1947				14.6	30.8	9.44*	5.72*	8.71	3.84	2.40	2.89	2.97	
1948	7.80	9.43*	16.6	18.0	16.8	9.49	9.70	10.7	7.14	4.01	3.87	4.51	9.76*
1949	6.07	10.2	11.5	8.99*	34.4	16.5	7.20	5.18	3.49	2.65	2.41	3.61	9.17*
1950	4.13												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										2.0	1.9	2.0	
1947				5.8	12	5*	4.5*	2.9*	2.7	2.3	2.1	2.4	
1948	3.3	7*	10	7.0	7.0	6.9	6.8	6.2	4.2	3.2	3.5	3.2	3.2
1949	4.6	5.6	7.4	4.6	4.6	9.7	5.4	4.0	3.0	2.0	2.0	2.6	2.0
1950	2.6												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1945													
1947										8.96	16.25		6,480
1948										9.28	16.89		6,740
1949		67	Oct. 18, 1947	3.2	9.76	1.30	17.75	7,090					
		141	Feb. 23, 1949	2.0	9.17	1.23	16.65	6,640					

* Estimated.

LAKE WASHINGTON BASIN

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Thornton Creek near Seattle, Wash.

Location.—Lat. 47°41'45", long. 122°16'30", in SE¼ sec. 34, T. 26 N., R. 4 E., on left bank at highway crossing, a quarter of a mile upstream from mouth and 1½ miles north of Seattle.

Drainage area.—13.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map).

Extremes.—1945-46: Maximum discharge, 151 cfs Feb. 5, 1946 (gage height, 2.69 ft.); minimum, 2.0 cfs Aug. 22, 23, 1946.

Remarks.—Several small diversions for irrigation and domestic use above station. Flow partly regulated by supplemental inflow from city of Seattle water supply.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									11.6	4.97	10.1	17.3	.....
1946	18.1	29.8	30.7	36.2	45.0	34.4	25.8	13.7	14.8	10.1	5.72	13.9	23.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945									5.1	3.1	3.8	14	.....
1946	14.5	18.0	19.0	22	27	27	21	8.2	7.5	3.1	2.4	11.0	2.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1945													
1946	151	Feb. 5, 1946	2.4	23.0	1.70	23.15	16,660						

POWDER CREEK BASIN

Powder Creek near Mukilteo, Wash.

Location.—Lat. 47°57'15", long. 122°16'15", in SE¼ sec. 34, T. 29 N., R. 4 E., on right bank at highway crossing, a quarter of a mile upstream from mouth, and 1¼ miles east of Mukilteo.

Drainage area.—2.06 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 160 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 3.8 cfs June 30, Aug. 6 (gage height, 1.22 ft.); minimum, 1.9 cfs Aug. 8.

Remarks.—No known diversion or regulation above station.

POWDER CREEK BASIN

Powder Creek near Mukilteo, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916									2.68	2.49	2.39	2.51	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916									2.3	2.2	2.3	2.3	

SNOHOMISH RIVER BASIN

Tye River near Skykomish, Wash.

Location.—Lat. 47°42'20", long. 121°17'40", in NW¼NW¼ sec. 32, T. 26 N., R. 12 E., on left bank, a quarter of a mile upstream from confluence with Foss River and 3 miles east of Skykomish.

Drainage area.—79.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,060 ft. (from river-profile map). Aug. 1, 1929, to Sept. 30, 1931, staff gage at different datum.

Extremes.—1929-31, 1946: Maximum discharge not determined, probably occurred Oct. 26, 1946, during period of no gage-height record; minimum not determined, probably occurred during period Jan. 8-30, 1930, when stage-discharge relation was affected by ice.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929											122	76.3	
1930	80.5	76.9	187	96.6*	543	394	743	649	525	202	36.2	67.5	302*
1931	136	172	145	283	336	333	454	602	545	173	61.2	87.2	308
1946										514	138	90.2	
1947	272												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929											92	65	
1930	60	53	62		232	178	475	435	362	112	66	56	
1931	53	110	95	102	188	217	217	322	337	102	65	65	53
1946										218	94	73	
1947	71												

* Estimated.

SNOHOMISH RIVER BASIN

South Fork Skykomish River near Skykomish, Wash.

Location.—Lat. 47°42'20", long. 121°18'30", in NW¼NE¼ sec. 31, T. 26 N., R. 12 E., on left bank, a quarter of a mile downstream from confluence of Tye and Foss Rivers and 2½ miles east of Skykomish.

Drainage area.—135 sq. mi. At site 1929-31, 137 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,030 ft. (from river-profile survey). Aug. 1, 1929, to Sept. 30, 1931, staff gages about 1,000 ft. downstream at different datum.

Average discharge.—6 years (1929-31, 1946-50), 846 cfs.

Extremes.—1929-31, 1946-50: Maximum discharge, 12,400 cfs Nov. 27, 1949 (gage height, 10.51 ft.), from rating curve extended above 6,600 cfs; minimum observed, 124 cfs Dec. 4, 1929, may have been less during period Jan. 10-31, 1930, when stage-discharge relation was affected by ice.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	183	154	411	212*	1,040	645	1,190	1,020	947	512	327	206	555*
1931	343	356	282	560	638	750	823	1,440	1,070	440	238	239	600
1946										1,102	390	253	
1947	530	481	1,135	799	609	517	1,270	1,973	1,569	776	349	823	902
1948	1,074	1,160*	887*	502	411	375	717	2,021	2,963	1,065	516	369	1,056*
1949	638	625	517	276*	443	580	1,086	2,523	1,942	1,186	629	399	898*
1950	784	1,302	904	689	498	781	763	1,566	3,018	2,023	770	838	1,114
1951	907	1,140											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	130	130	124		520	325	960	655	725	325	249	142	
1931	143	270	186	186	335	450	480	920	725	296	202	178	143
1946										600	288	195	
1947	170*	302	437	331	505	421	655	1,330	1,030	505	254	245	170*
1948	250	480*	450*	320	254	285	331	542	1,510	687	400	285	250
1949	323	331	308	210*	195*	406	406	1,090	1,150	830	363	256	195*
1950	259	437	421	344	315	437	487	643	1,880	980	453	254	254
1951	247	437											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1929												
1930	2,440	Feb. 19, 1930		558	4.07	53.39	405,000	350	57.55	420,000		
1931	3,060	Jan. 28, 1931	143	600	4.38	59.46	434,000					
1946												
1947	6,410	Dec. 11, 1946	170	902	6.68	90.76	653,400	979	63.48	708,600		
1948	8,200	Oct. 19, 1947	250	1,005	7.44	101.34	729,600	893	99.01	648,100		
1949	4,850	May 13, 1949	195	838	6.65	90.28	649,900	969	100.44	723,000		
1950	12,400	Nov. 27, 1949	254	1,114	8.25	111.98	806,300					

* Estimated.

Beckler River near Skykomish, Wash.

Location.—Lat. 47°44'20", long. 121°19'10", in SW¼ sec. 18, T. 26 N., R. 12 E., on left bank, a quarter of a mile downstream from Eagle Creek, 2¼ miles upstream from mouth, and 3 miles northeast of Skykomish.

Drainage area.—96.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,080 ft. (from topographic map).

Average discharge.—7 years (1929-33, 1946-49), 606 cfs.

Extremes.—1929-33, 1946-49: Maximum discharge, 10,900 cfs Nov. 13, 1932 (gage height, 9.6 ft.), from rating curve extended over 3,300 cfs; minimum recorded, 50 cfs Oct. 3, 1929 (gage height, 2.09 ft.), but may have been less during period of ice effect Jan. 9-29, 1930.

Flood of Nov. 27, 1949, reached a stage of 9.4 ft., from floodmarks (discharge, 9,600 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	80.2	75.3	260	142*	903	509	1,030	796	628	215	76.1	66.5	394*
1931...	223	247	252	518	501	633	692	1,140	720	220	83.9	108	445
1932...	222	539	331	471	750	897	1,000	1,300	1,480	579	148	100	649
1933...	284	1,740	774	501	170	323	543	1,040	1,810*	1,210*	431*	485*	776*
1946	.....	.....	.....	.....	.....	.....	.....	.....	.....	658	143	92.5	.....
1947...	338	321	1,003	663	712	709	1,026	1,412	641	374	125	85.4	644
1948...	783	778	648	368	310	232	591	1,595	2,057	544	165	189	695
1949...	398	494	351	173*	311*	526	873	1,977	1,320	721	220	184	636*
1950	465	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	51	61	60	.....	413	248	781	553	400	100	68	56	.....
1931...	57	159	150	145	285	369	394	652	175	107	66	66	57
1932...	98	237	162	.....	.....	449	652	373	974	258	100	74	74
1933...	69	624	234	168	.....	197	316	624	.....	658	.....	.....	.....
1946	.....	.....	.....	.....	.....	.....	.....	.....	.....	250	95	76	.....
1947...	75	165	367	250	412	376	541	974	616	199	91	70	70
1948...	72	417	329	235	161	199	258	444	1,180	246	158	125	72
1949...	215	229	265	110*	100*	353	343	567	769	420	131	90	90
1950	131	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1929	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1930	2,380	Feb. 5, 1930	.....	394	4.03	53.33	285,000	419	53.97	304,000	.....	.....
1931	4,620	Jan. 28, 1931	57	445	4.61	62.56	322,000	475	66.86	344,000	.....	.....
1932	10,000	Feb. 26, 1932	74	649	6.73	91.58	472,000	790	111.49	575,000	.....	.....
1933	10,900	Nov. 13, 1932	.....	776	8.04	109.17	563,000	.....	.....	.....	.....	.....
1946	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1947	5,790	Dec. 11, 1946	70	644	6.87	90.59	466,200	639	96.89	498,600	.....	.....
1948	6,580	Oct. 19, 1947	72	695	7.20	98.00	504,400	614	86.57	445,600	.....	.....
1949	4,140	May 13, 1949	90	636	6.59	89.40	460,200	.....	.....	.....	.....	.....
1950	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

SNOHOMISH RIVER BASIN

Miller River at Miller River, Wash.

Location.—Lat. 47°42'30", long. 121°23'50", in SW¼ sec. 28, T. 26 N., R. 11 E., on left bank, five-eighths of a mile south of Miller River and five-eighths of a mile upstream from mouth.

Drainage area.—44.7 sq. mi. At site May 1911 to September 1919, 44.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 915 ft. (from river-profile map). May 24, 1911, to Sept. 30, 1919, and Dec. 13, 1928, to Sept. 30, 1931, staff gages at sites within half a mile upstream at different datums.

Average discharge.—11 years (1911-19, 1928-31), 337 cfs.

Extremes.—1911-19, 1928-31, 1946: Maximum discharge not determined, occurred during flood of Dec. 18, 1917, which destroyed gage; minimum, 18 cfs Sept. 3, 1930.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...									745	348	55.3	259	.....
1912...	87.0	1,190	279	373	339	109	261	765	596	237	137	116	373
1913...	153	349	253	220*	353*	210*	434*	702	990	627	170	175	337*
1914...	351	433	157	366	165	392	540	640*	455	210*	65*	120*	325*
1915...	333*	581*	99.1	83.1	96.0	206	449	312	158	89.0	32.6	34.3	214*
1916...	531	285	300	154	452	506	494	569	576	660	236	126	432
1917...	64.2	276	136	169*	908	108*	326	675*	1,050	865	220*	79.1*	356*
1918...	100*	160*	1,500*	660*	272*	130*	400*	550*	641*	240*	147*	35.9*	405
1919...	508*	345	945	461*	225*	182*	472*	589	567*	400*	110*	75*	408*
1929...	310	170	140	79.5	45.2	240	303	368	775	335	120	29.7	255
1930...	83.0	69.0	310	98.4*	636	314	450	392	361	130	29.0	44.2	244*
1931...	287	144	130	496	245	385	351	586	448	98.9	29.1	102	278
1946...										412	82.5	54.2	.....
1947...	264												.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...									390	98	31	31	.....
1912...	40	40	51	95	112	64	172	256	267	98	51	37	37
1913...	39	143	126		77			239	625	323	77	70	70
1914...	92		64	70	70	160			224				
1915...			64	52	76	90	290	153	98	47	24	25	24
1916...	63	116	110	44	118	124	260	295	610	330	137	53	44
1917...	33	79	59	63					438		91		53
1918...											62		
1919...	30	195	150	119	100	150	161	377	348				
1929...				40	33	64	46	450	470	231	45*	23	
1930...	23	47	40		134	91	191	171	237	47	20	18	18
1931...	31	70	61	58	79	79	191	237	263	44	22	25	22
1946...										151	42	33	.....
1947...	36												.....

* Estimated.

Miller River at Miller River, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Min- imum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911			37	378	8.44	114.81	270,000	308	94.94	224,000
1912			70	387	8.70	118.72	280,000	404	123.92	292,000
1913	2,850	Jan. 5, 1914		328	7.42	100.56	237,000	331	101.51	240,000
1914			24	214	4.84	65.57	155,000	223	68.55	161,000
1915										
1916			44	432	9.77	133.11	314,000	378	116.43	274,000
1917			33	356	8.05	109.41	258,000	465	142.96	337,000
1918				405	9.16	124.20	293,000	403	125.20	295,000
1919	4,160†	Dec. 13, 1918		408	9.23	125.43	296,000			
1920				285	6.38	86.54	207,000	273	82.94	198,000
1920	2,260	Feb. 5, 1930	18	244	5.46	74.05	177,000	252	76.54	182,000
1931	3,920	Jan. 28, 1931	22	278	6.22	84.43	201,000			
1946										
1947										

† Maximum observed.

South Fork Skykomish River near Index, Wash.

Location.—Lat. 47°48'20", long. 121°32'40", in NE¼ sec. 29, T. 27 N., R. 10 E., on right bank, 600 ft. upstream from Sunset Falls, 1 mile southeast of Index, and 2 miles upstream from North Fork.

Drainage area.—355 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 574.80 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 15, 1934, staff gages and water-stage recorder about 300 ft. downstream as follows: Oct. 6, 1902, to Sept. 30, 1905, staff gage at datum 0.39 ft. higher, and Apr. 26, 1911, to Sept. 30, 1913, at datum 1 ft. higher; Oct. 1, 1913, to Sept. 13, 1920, staff gage, Sept. 14, 1920, to Oct. 1, 1921, water-stage recorder, and Jan. 23, 1922, to Mar. 14, 1934, staff gage at present datum.

Average discharge.—45 years (1902-5, 1911-53), 2,346 cfs.

Extremes.—1902-5, 1911-53: Maximum discharge, 55,000 cfs Dec. 12, 1921 (gage height, 22.8 ft., from high-water marks at site then in use), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 165 cfs Nov. 29, 1952.

Flood of 1897 reached a stage of about 5 ft. higher than that of Dec. 12, 1921 (discharge, about 70,000 cfs).

Remarks.—No diversion or regulation above station.

SNOHOMISH RIVER BASIN

South Fork Skykomish River near Index, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903...	697	2,090	2,530	3,580	1,070	1,280	1,880	3,800	6,260	2,690	1,000	1,600	2,400
1904...	2,420	2,570	2,550	2,340	1,000	1,510	3,710	3,540	4,090	2,380	790	527	2,290
1905...	546	2,590	2,510	1,570	1,440	2,690	2,080	2,380	2,700	1,100	511	1,040	1,790
1911.....								3,550	4,010	1,940	642	1,250	.....
1912.....	593	4,700	2,070	2,890	2,340	926	1,690	4,560	4,370	1,810	553	1,340	2,350
1913.....	1,100*	2,800*	1,700*	1,700*	1,600*	1,600*	2,700*	4,900*	6,780	4,280	1,310	1,400	2,050*
1914.....	2,410	2,350	1,270	3,310	1,520	2,660	3,540	4,330	3,080	1,400*	500*	934	2,330*
1915.....	1,800	4,200	919	749	780	1,720	3,260	1,740	1,050	657	421	334	1,470
1916.....	2,060	2,280	2,390	941	2,590	3,400	3,150	4,200	6,300	4,510	1,560	793	2,840
1917.....	464	1,900	960	1,300	2,020	898	2,280	4,510	7,460	6,020	1,460	650	2,490
1918.....	615	1,030	11,000	5,060	2,090	1,770	2,530	3,630	4,750	1,610	980	446	3,000
1919.....	2,130	2,040	5,110	3,840	1,320	1,560	3,350	4,750	4,120	2,680	882	580	2,710
1920.....	612	4,950	3,100	3,590	1,660	1,630	1,650	2,550	3,100	1,550	634	2,560	2,220
1921.....	3,590	2,050	2,370	2,720	3,680	2,900	2,550	4,770	6,380	2,760	904	1,590	3,010
1922.....	1,900*	2,600*	5,000*	730*	560	683	1,790	4,450	4,980	1,320	596	773	2,120*
1923.....	1,070	1,340	2,870	4,380	584	1,400	3,260	4,180	3,890	2,280	719	442	2,250
1924.....	884	1,650	2,990	2,160	5,410	1,240	1,800	4,750	2,590	1,000	536	491	2,120
1925.....	2,120	2,480	4,040	2,850	3,740	1,560	3,210	6,340	3,450	1,420	558	351	2,690
1926.....	750	1,310	4,790	2,170	2,110	1,910	2,140	2,130	963	424	419	674	1,650
1927.....	2,800	1,820	2,120	1,730	1,710	1,300	2,360	4,290	5,470	2,050	502	1,720	2,330
1928.....	3,060	5,740	2,900	4,570	1,100	2,700	2,220	5,080	2,960	1,310	474	407	2,720
1929.....	1,950	1,070	976	595	454*	1,720	1,630	4,800	4,560	1,670	540	350	1,720*
1930.....	461	428	1,610	770*	3,970	2,090	3,360	2,650	2,340	962	406	380	1,600*
1931.....	1,280	1,160	1,010	2,140	2,040	2,720	2,620	3,700	2,810	961	404	597	1,790
1932.....	1,210	2,460	1,460	2,210	3,930	4,060	3,690	4,340	4,660	2,350	512	581	2,640
1933.....	1,684	7,910	3,377	2,792	780	1,719	2,045	4,119	6,890	4,682	1,693	1,962	3,350
1934.....	4,326	3,788	9,440	5,834	2,262	4,278	4,244	3,158	1,627	839	498	588	3,383
1935.....	2,610	4,132	2,848	5,093	2,651	1,630	1,641	3,688	4,322	2,072	635	491	2,651
1936.....	528	938	1,153	2,081	695*	1,681	3,807	7,005	5,017	1,424	535	538	2,141*
1937.....	479	305	3,092	595*	897	1,858	2,464	4,424	6,309	2,013	637	449	1,973*
1938.....	697	4,810	3,258	2,158	802	1,551	3,725	4,169	3,352	1,122	434	841	2,237
1939.....	740	2,398	3,151	3,524	1,394	1,986	3,322	4,827	3,730	2,364	755	506	2,399
1940.....	1,135	2,055	3,838	1,611	2,248	2,481	2,467	3,538	1,651	655	403	322	1,868
1941.....	1,232	1,477	1,974	1,435	1,068	1,209	1,640	2,167	1,414	646	323	1,578	1,352
1942.....	3,035	2,233	3,155	819	1,010	1,209	2,859	3,293	3,922	1,563	557	360	2,007
1943.....	642	3,053	2,603	1,760	1,709	2,348	4,336	3,969	4,933	3,283	808	508	2,501
1944.....	717	1,151	2,999	1,376	1,254	1,553	2,217	3,516	2,607	880	471	1,297	1,679
1945.....	1,011	1,637	2,280	3,605	2,311	1,460	1,815	5,027	3,013	1,197	480	1,004	2,109
1946.....	1,756	2,808	2,322	2,040	1,432	1,950	3,129	6,260	5,552	2,686	732	502	2,609
1947.....	1,695	1,515	4,331	2,977	2,032	2,538	3,750	4,656	3,413	1,625	637	704	2,564
1948.....	3,539	3,590	2,778	1,655	1,559	1,293	2,833	5,707	7,130	2,327	1,095	944	2,840
1949.....	1,725	2,374	1,700	748	1,569	2,258	3,395	6,758	4,740	2,807	1,142	952	2,518
1950.....	2,273	4,104	3,047	1,942	1,899	3,131	2,777	4,579	7,966	4,926	1,757	781	3,269
1951.....	2,545	3,926	4,321	2,266	4,844	1,419	3,059	4,622	3,614	1,363	536	589	2,775
1952.....	2,682	2,048	1,868	873	1,891	1,123	2,973	4,593	3,340	1,728	587	376	1,982
1953.....	297	316	892	6,668	3,375	1,398	2,410	4,057	3,860	3,172	925	603	2,343

* Estimated.

South Fork Skykomish River near Index, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903...	457	1,310	888	1,410	846	806	1,110	2,150	3,620	1,410	766	618	457
1904...	980	1,060	1,000	930	766	806	1,020	2,150	2,650	1,110	550	403	403
1905...	356	518	1,020	888	618	1,410	1,360	1,410	1,560	806	550	518	356
1911.....								2,520	2,440	930	487	487	.....
1912.....	429	403	974	690	930	690	1,310	1,740	2,150	974	318	690	313
1913.....										2,220	846	728	.....
1914.....	690	1,110	728	806	512	1,300	1,520	2,700	2,030				
1915.....	622	1,370	556	524	692	692	1,520	1,230	764	492	360	264	264
1916...	374	1,040	1,000	524	622	1,150	2,110	2,540	3,200	2,370	918	402	374
1917...	332	732	550	620	732	620	894	2,100	4,130	2,530	787	488	332
1918...	432	550	1,070	1,780	920	730	1,500	2,100	2,460	920	640	346	346
1919...	367	1,070	1,250	775	920	820	1,920	2,510	2,850	1,250	560	359	359
1920...	333	990	713	940	713	713	1,040	1,560	1,720	713	417	483	333
1921...	1,440	776	866	990	915	1,480	1,440	2,120	3,700	1,440	575	483	483
1922.....					466	433	1,020	1,920	2,760	673	483	417	417
1923.....	340	594		990		955	2,390	2,210	2,480	990	556	846	846
1924...	346	453	1,260	990	1,880	843	843	2,300	1,650	633	387	320	320
1925...	753	1,320	1,090	1,040	1,200	1,040	1,140	2,960	2,300	798	417	271	271
1926...	214	519	1,720	1,090	990	990	1,260	1,380	556	333	308	367	214
1927...	843	735	1,040	830	830	980	1,160	2,660	3,060	1,040	530	645	530
1928...	1,420	2,040	780	830	645	605	1,350	2,390	1,960	690	374	304	304
1929...	575	575	575			930	830	2,570	3,160	830	309	271	271
1930...	271	350	327		1,420	830	2,390	1,720	1,560	540	327	282	271
1931...	304	610	510	510	895	1,430	1,500	1,890	1,990	535	350	350	304
1932...	400	895	615	745	535	1,640	2,380	2,750	2,950	1,130	575	400	400
1933...	327	2,230	1,370	640		730	1,580	2,500	4,700	2,590	730	600	327
1934...	855	1,230	1,420	3,030	1,290	1,840	2,850	2,190	1,050	630	433	415	415
1935...	418	1,040	1,360	830	1,420	835	728	2,340	2,790	925	491	402	402
1936...	362	432	567	651	410*	752	591	4,090	2,430	665	468	421	362
1937...	367	320	327	360*	370*	1,030	1,510	1,970	4,740	884	617	330	320
1938...	292	832	1,370	1,150	612	1,110	1,030	2,110	2,250	605	345	272	272
1939...	244	978	956	1,520	983	877	2,260	2,090	2,780	1,360	619	323	244
1940...	311	923	1,610	860	1,210	1,490	1,690	2,010	939	490	338	279	279
1941...	303	570	1,020	756	700	868	1,330	1,210	975	444	345	491	303
1942...	878	829	1,070	656	554	565	1,340	1,590	2,480	759	454	310	310
1943...	275	1,060	1,260	885	950	915	2,320	2,120	3,530	1,470	605	395	275
1944...	396	649	630	714	666	606	1,450	2,290	1,660	562	386	317	317
1945...	550	638	920	920	906	913	1,210	3,170	1,770	632	377	350	350
1946...	415	1,550	896	1,110	745	1,190	1,190	3,190	3,290	1,190	548	387	387
1947...	359	695	1,300	854	1,580	1,360	1,380	3,130	2,340	980	454	359	359
1948...	449	1,700	1,300	945	596	812	1,050	1,660	4,950	1,360	812	532	449
1949...	746	889	764	460	406	1,460	1,400	3,230	2,320	1,960	710	435	406
1950...	570	1,050	1,020	792	845	1,520	1,620	2,120	4,970	2,200	930	570	570
1951...	660	1,260	1,060	1,140	1,210	852	1,760	2,000*	2,710	715	400	325	325
1952...	1,010	988	830	500	792	754	1,320	2,200	2,040	853	420	302	302
1953...	221	180*	197	590	1,100	948	1,000	2,640	2,750	1,370	640	367	190*

* Estimated.

SNOHOMISH RIVER BASIN

South Fork Skykomish River near Index, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1903	32,800	Jan. 3, 1903	457	2,400	6.76	91.77	1,740,000	2,590	99.09	1,870,000
1904	12,400	Nov. 30, 1903	403	2,290	6.45	87.79	1,660,000	2,130	81.67	1,540,000
1905	10,200	Nov. 22, 1904	356	1,790	5.04	68.41	1,300,000			
1911										
1912	26,000	Nov. 19, 1911	313	2,350	6.62	90.11	1,700,000	2,200	84.39	1,600,000
1913				2,650	7.46	101.27	1,920,000	2,740	104.79	1,980,000
1914	24,800	Jan. 6, 1914		2,330	6.56	89.05	1,690,000	2,350	89.86	1,700,000
1915	15,800	Nov. 3, 1914	264	1,470	4.14	56.19	1,060,000	1,460	55.79	1,060,000
1916	14,200	Oct. 31, 1915	374	2,540	8.00	108.90	2,069,000	2,550	97.73	1,550,000
1917	14,300	Nov. 9, 1916	332	2,490	7.01	95.16	1,800,000	3,290	125.83	2,380,000
1918	54,100	Dec. 18, 1917	346	3,000	8.45	114.70	2,170,000	2,710	103.57	1,960,000
1919	26,500	Dec. 14, 1918	359	2,710	7.63	103.58	1,960,000	2,520	98.68	1,860,000
1920	33,900	Nov. 15, 1919	333	2,220	6.25	85.09	1,610,000	2,250	86.11	1,630,000
1921	22,100	Feb. 11, 1921	483	3,010	8.48	115.30	2,180,000	3,140	120.12	2,270,000
1922	55,000	Dec. 12, 1921	417	2,120	5.97	81.14	1,540,000	1,770	67.54	1,280,000
1923	25,400	Jan. 6, 1923	348	2,230	6.28	85.29	1,620,000	2,250	86.06	1,630,000
1924	50,500	Feb. 12, 1924	320	2,120	5.97	81.17	1,540,000	2,330	91.22	1,730,000
1925	22,400	Feb. 2, 1925	271	2,590	7.30	98.81	1,570,000	2,440	93.10	1,760,000
1926	22,400	Dec. 23, 1925	214	1,650	4.65	63.05	1,190,000	1,610	61.60	1,170,000
1927	21,500	Oct. 19, 1926	580	2,330	6.56	89.32	1,690,000	2,770	109.03	2,010,000
1928	34,200	Jan. 12, 1928	304	2,720	7.66	104.24	1,970,000	2,080	79.67	1,510,000
1929	10,500	Oct. 9, 1928	271	1,720	4.85	65.58	1,240,000	1,590	60.79	1,150,000
1930	10,900	Feb. 5, 1930	271	1,600	4.51	61.15	1,160,000	1,650	64.18	1,210,000
1931	19,400	Jan. 27, 1931	304	1,700	5.04	68.23	1,200,000	1,920	73.63	1,390,000
1932	50,000	Feb. 26, 1932	400	2,640	7.44	101.08	1,910,000	3,280	125.82	2,380,000
1933	46,900	Nov. 13, 1932	327	3,352	9.44	128.17	2,427,000	3,757	143.71	2,720,000
1934	53,800	Dec. 21, 1933	415	3,383	9.53	129.49	2,449,000	2,705	103.46	1,958,000
1935	35,400	Oct. 25, 1934	402	2,651	7.47	101.30	1,919,000	2,068	79.06	1,497,000
1936	11,800	May 16, 1936	382	2,141	6.03	82.03	1,554,000	2,254	86.37	1,637,000
1937	14,400	Dec. 13, 1936	320	1,973	5.56	75.56	1,429,000	2,405	92.03	1,741,000
1938	27,700	April 18, 1938	272	2,237	6.30	85.47	1,620,000	2,090	76.42	1,448,000
1939	17,200	Jan. 1, 1939	244	2,399	6.76	91.72	1,736,000	2,462	94.15	1,738,000
1940	15,400	Dec. 15, 1939	279	1,668	5.26	71.62	1,356,000	1,671	64.07	1,213,000
1941	13,000	Nov. 29, 1940	303	1,352	3.81	51.70	979,100	1,668	63.78	1,208,000
1942	12,600	Dec. 2, 1941	310	2,007	5.65	76.72	1,453,000	1,824	69.75	1,321,000
1943	21,200	Nov. 23, 1942	275	2,501	7.05	95.64	1,811,000	2,384	91.17	1,726,000
1944	41,900	Dec. 3, 1943	317	1,679	4.73	64.40	1,219,000	1,683	64.53	1,222,000
1945	28,200	Jan. 7, 1945	350	2,109	5.04	80.61	1,527,000	2,274	86.95	1,648,000
1946	18,400	Oct. 25, 1945	387	2,609	7.35	99.76	1,889,000	2,666	101.04	1,930,000
1947	24,700	Dec. 11, 1946	359	2,564	7.22	95.05	1,856,000	2,759	105.50	1,997,000
1948	26,900	Oct. 19, 1947	449	2,840	8.00	108.59	2,061,000	2,495	95.68	1,811,000
1949	13,800	May 13, 1949	406	2,618	7.09	96.28	1,823,000	2,821	107.87	2,042,000
1950	33,700	Nov. 27, 1949	570	3,269	9.21	125.02	2,367,000	3,420	130.78	2,478,000
1951	33,300	Feb. 9, 1951	325	2,775	7.82	106.12	2,009,000	2,349	89.84	1,701,000
1952	7,600	Oct. 3, 1951	302	1,962	5.53	75.24	1,425,000	1,574	60.85	1,143,000
1953	25,100	Jan. 31, 1953	190	2,343	6.60	89.58	1,696,000			

Troublesome Creek near Index, Wash.

Location.—Lat. 47°54'00", long. 121°23'40", in NE¼ sec. 21, T. 28 N., R. 11 E. (unsurveyed), on right bank, a quarter of a mile upstream from mouth and 9 miles northeast of Index.

Records represent flow passing measuring section, 1¼ miles upstream.

Drainage area.—10.6 sq. mi. at measuring station.

Gage.—Water-stage recorder. Altitude of gage is 1,350 ft. (from topographic map).

Average discharge.—12 years (1929-41), 114 cfs.

Extremes.—1929-41: Maximum discharge, 2,300 cfs Dec. 21, 1933 (gage height, 7.0 ft.), from rating curve extended above 750 cfs; maximum gage height, 7.54 ft. Feb. 26, 1932; minimum discharge, 10 cfs Nov. 17, 18, 19, 1936.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	31.0	20.8	66.4	27.4	158	71.3	142	119	135	125	54.1	29.1	77.7
1931	86.3	56.9	45.3	119	56.2	88.7	117	193	208	87.5	37.7	57.7	96.3
1932	66.9	112	54.2	75.2	146	126	127	141	177	154	73.4	48.4	109
1933	61.2	309	115	117	29.9	48.5	96.8	154	279	237	134	148	147
1934	226*	161	351	274	98.6	217	180*	158	101	51.5	49.5	52.0	166*
1935	149	291	195	287	94.6	61.8	58.1	156	202	147	56.7	50.6	146
1936	35.3	43.3	51.4	92.2	21.1	67.2	146	258	235	96.5	45.3	48.2	95.4
1937	33.1	11.7	236	17.9	103	202	250	200	303	132	51.9	34.2	131
1938	77.4	322	214	96.9	18.9	55.8	153	190	194	101	38.3	32.7	125
1939	74.0	112	148	130	32.0	71.5	127	211	181	174	59.5	37.7	114
1940	51.2	110	162	58.1	83.6	86.9	103	148	101	54.6	36.7	27.4	87.7
1941	116	70.4	88.4*	56.9	40.3	53.8	71.3	105	83.3	55.4	32.8	106	73.6*
1942	182*												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929										68	38	14	
1930	13	14	14	11	41	22	96	66	96	53	30	22	11
1931	28	32	25	22	21	32	54	93	123	56	30	29	21
1932	20	26	18	23	14	33	66	81	89	89	55	35	14
1933	18	85	32	28	22	32	42	75	183	164	69	46	18
1934	45*	36	48	127	62	75*	130	99	71	55	45	24	24
1935	18	69	53	18*	41	19	18	95	118	85*	45	25	18*
1936	20	16	25	21	12	16	12	133	126	59	35	25	12
1937	15	10	11	12	11	51	76	80	231	73	31	18	10
1938	14	52	56	37	14	35	32	82	120	57	32	25	14
1939	20	35	28	34	17	14	74	112	132	117	39	24	14
1940	23	49	46	20	27	40	62	90	68	40	29	21	20
1941	26	28	30*	20	23	34	52	55	63	33	25	42	20
1942	30*												

* Estimated.

SNOHOMISH RIVER BASIN

Troublesome Creek near Index, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1929										
1930	632	Feb. 5, 1930	11	77.7	7.33	99.47	56,200	83.6	107.02	60,600
1931	1,100	Jan. 27, 1931	21	96.3	9.08	123.38	69,800	100	127.08	72,400
1932	2,220	Feb. 26, 1932	14	109	10.3	139.37	78,800	132	169.32	95,300
1933	1,620	Nov. 13, 1932	18	147	13.9	188.09	108,000	169	216.16	122,000
1934	2,300	Dec. 21, 1933	24	166	15.7	212.58	120,200	154	197.73	111,800
1935	1,480	Jan. 24, 1935	18	146	13.8	187.09	105,800	104	132.97	75,190
1936	486	May 16, 1936	12	95.4	9.00	122.46	69,230	108	138.96	73,560
1937	740	Dec. 18, 1936	10	131	12.4	168.07	95,020	159	203.16	114,900
1938	940	April 18, 1938	14	125	11.8	160.02	90,470	102	130.40	73,720
1939	720	Oct. 12, 1938	14	114	10.8	146.83	82,450	115	147.89	83,620
1940	438	Dec. 15, 1939	20	87.7	8.27	112.68	63,710	81.2	104.33	58,990
1941	575	Oct. 10, 1940	20	73.6	6.94	94.23	53,270			
1942										

North Fork Skykomish River at Index, Wash.

Location.—Lat. 47°49'10", long. 121°33'10", in NW¼ sec. 20, T. 27 N., R. 10 E., on highway bridge at Index, 1¼ miles upstream from mouth.

Drainage area.—149 sq. mi.

Gage.—Wire-weight gage. Altitude of gage is 525 ft. (from river-profile map). Aug. 24, 1910, to Sept. 30, 1922, staff or chain gages at several sites within 1,600 ft. of described site at different datums. Feb. 19, 1929, to Sept. 8, 1930, chain gage at described site and datum.

Average discharge.—23 years (1910-22, 1929-38, 1946-48), 1,210 cfs.

Extremes.—1910-22, 1929-38, 1946-48: Maximum discharge observed, 28,400 cfs Dec. 21, 1933 (gage height, 10.7 ft., from graph based on gage readings), from rating curve extended above 6,200 cfs on basis of proportioned peak flow of Skykomish River near Gold Bar and logarithmic plotting, probably higher Dec. 12, 1921, when gage washed out; minimum observed, 78 cfs Sept. 25, 1930.

Remarks.—No diversion or regulation above station.

North Fork Skykomish River at Index, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	1,500*	2,030	1,020	617	223	664	929	1,750	2,000	1,060	285	617	1,060*
1912...	276	2,530	891	1,030	1,030	376	820	2,060	2,270	894	392	385	1,080
1913...	541	1,550*	850*	750*	650*	700*	1,280	2,120	2,990	2,080	645	766	1,240*
1914...	1,240	1,370	541	1,460	660	1,330	1,630	2,050	1,640	802	272	679	1,140
1915...	928	2,030	394	342	372	874	1,660	572	540	320	168	163	720
1916...	1,000	1,050	994	456	1,260	1,370	1,220	1,760	2,320	2,190	796	572	1,290
1917...	246	1,060	428	624	855	875	912	2,060	3,500	2,770	820	358	1,170
1918...	327	641	4,450	1,950	841	713	1,470	1,750	2,520	872	621	214	1,370
1919...	1,170	959	2,020	1,420	593	650	1,750	2,550	2,330	1,760	426	303	1,330
1920...	284	2,230	1,360	1,820	764	769	663	1,360	1,670	869	295	1,560	1,120
1921...	1,800	1,070	1,710	1,200	1,820	1,280	1,189	2,500	3,500	1,620	478	1,080	1,550
1922...	1,450	1,410	2,720	251	165	245	785	2,046	2,350	583	266	416	1,060
1929...						740	838	2,330	2,230	818	249	145	.....
1930...	278	224	891	363	1,940	977	1,650	1,370	1,310	502	178	198	611
1931...	885	581	541	1,380	910	1,270	1,340	2,100	1,750	550	210	416	998
1932...	795	1,200	733	997	1,630	2,160	2,150	2,630	3,000	1,650	462	805	1,470
1933...	1,051	3,662	1,467	1,176	358	684	1,147	2,069	3,624	2,838	951	1,988	1,704
1934...	2,277	1,858	4,581	2,792	1,077	2,294	2,172	1,680	808	422	204	292	1,723
1935...	1,275	2,265	1,484	2,671	1,325	787	802	2,011	2,275	1,214	386	317	1,406
1936...	363	539	662	959	256*	809	1,796	3,224	2,665	796	258	286	1,052*
1937...	269	128	1,424	252*	378	867	1,203	2,216	3,054	993	316	208	944*
1938...	620	2,018	1,493	1,000	368	735	1,667	2,034	1,761	625	182	138	1,055
1946...										1,658	426	252	.....
1947...	948	871	1,838	1,311	1,268	1,074	1,705	2,315	1,813	776	294	314	1,211
1948...	1,796	1,446	1,218	699	647	623	1,103	2,806	3,424	1,123	631	591	1,326

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...		600	560	270	182	182	550	1,300	1,220	490	182	110	110
1912...	144	144	404	293	445	200	577	885	1,000	445	197	156	144
1913...	244							692	2,120	1,020	363	276	.....
1914...	276	454	311	293	311	594	546	904	963	348	196	144	144
1915...	368	742	227	227	293	293	848	642	368	227	137	97	97
1916...	198	523	212	227	293	546	642	1,020	1,550	1,090	523	293	198
1917...	130	460	247	247	354	289	374	585	1,780	1,140	433	232	130
1918...	187	250	506	674	354	249	714	1,070	1,270	425	320	143	143
1919...	159	490	490	299	395	413	684	1,170	1,590	714	213	115	115
1920...	115	365		309	272	212	378	650	1,140	390	176	187	.....
1921...	720	352	352	403	378	600	600	895	2,020	850	272	226	226
1922...	309	330	340	95	80	130	382	612	1,340	246	141	130	60
1929...						265	342	1,160	1,520	403	180	99	.....
1930...	91	153	145		640	830	1,220	850	650	235	131	78	78
1931...	145	330	283	254	413	700*	719	1,231	1,050	288	174	150*	145
1932...	224	420	288	399	236	767	1,080	1,620	1,800	663	314	236	224
1933...	188	1,170	400*	362		405	570	1,080	2,340	1,400	410	316	.....
1934...	430	833	570	1,260	540	885	1,490	1,110	410	270	158	182	152
1935...	120	1,180	631	320*	704	841	341	1,160	1,590	612	273	171	120
1936...	142	227	330	310	100*	320	254	1,790	1,250	370	178	162	100*
1937...	140	86	84	140*	130*	410	710	1,000	2,130	428	215	140	84
1938...	110	510	622	540	269	500	482	1,050	1,250	271	136	112	110
1946...										690	279	199	.....
1947...	169	507	676	473	666	507	753	1,580	1,150	411	209	201	169
1948...	250	743	593	427	285	362	490	865	2,030	611	355	267	250

* Estimated.

North Fork Skykomish River at Index, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911	15,300	Nov. 21, 1910	110	1,060	7.11	96.74	769,000	988	89.99	716,000
1912	16,900	Nov. 19, 1911	144	1,080	7.25	98.92	787,000	1,020	93.28	742,000
1913				1,240	8.32	112.94	900,000	1,260	114.84	914,000
1914	11,800	Jan. 6, 1914	144	1,140	7.65	103.84	827,000	1,160	105.74	838,000
1915	10,200	Nov. 2, 1914	97	720	4.83	65.56	622,000	697	63.53	505,000
1916	7,500	Oct. 31, 1915	198	1,290	8.66	117.88	936,000	1,180	107.80	856,000
1917	8,750	Nov. 9, 1916	130	1,170	7.85	106.56	844,000	1,480	184.79	1,070,000
1918	26,300	Dec. 18, 1917	148	1,370	9.19	124.74	993,000	1,260	114.84	914,000
1919	13,800	Dec. 14, 1918	116	1,330	8.93	121.22	965,000	1,310	119.32	946,000
1920	16,800	Nov. 15, 1919		1,180	7.58	103.64	824,000	1,150	104.72	831,000
1921	11,300	Feb. 11, 1921	226	1,550	10.4	140.84	1,120,000	1,680	153.17	1,220,000
1922			80	1,060	7.11	96.85	768,000			
1929										
1930	6,200	Feb. 5, 1930	78	811	5.44	73.30	588,000	886	78.81	627,000
1931	12,900	Jan. 27, 1931	145	998	6.70	90.50	722,000	1,050	95.52	759,000
1932	28,000	Feb. 26, 1932	224	1,470	9.87	133.86	1,060,000	1,760	160.70	1,280,000
1933	23,900	Nov. 13, 1932		1,704	11.4	155.22	1,234,000	1,933	175.93	1,399,000
1934	28,400	Dec. 21, 1933	132	1,723	11.6	156.89	1,247,000	1,400	127.55	1,013,000
1935	21,000	Oct. 24, 1934	120	1,406	9.44	128.16	1,018,000	1,117	101.82	808,700
1936	6,550	May 16, 1936	100	1,052	7.06	96.17	764,100	1,074	98.19	780,160
1937	8,180	Dec. 13, 1936	84	944	6.34	86.02	683,500	1,136	103.42	822,500
1938	16,400	April 18, 1938	110	1,055	7.08	96.11	764,200			
1946										
1947	13,800	Dec. 11, 1946	169	1,211	8.13	110.29	876,500	1,277	116.87	924,900
1948	13,400	Oct. 10, 1947	250	1,326	8.90	121.74	962,600			

Skykomish River near Gold Bar, Wash.

Location.—Lat. 47°50'15", long. 121°40'00", in SW¼ sec. 9, T. 27 N., R. 9 E., on right bank, 2 miles southeast of Gold Bar and 5 miles upstream from Wallace River and Startup.

Drainage area.—535 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 209.26 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—25 years (1928-53), 3,740 cfs.

Extremes.—1928-53: Maximum discharge, 88,700 cfs Dec. 21, 1933 (gage height, 21.3 ft.), from rating curve extended above 32,000 cfs by logarithmic plotting; minimum, 315 cfs Nov. 29, 1952; minimum gage height, 2.73 ft. Dec. 1, 1936.

Remarks.—No diversion or regulation above station.

Skykomish River near Gold Bar, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	4,030	1,690	1,670	1,090	791	2,690	2,890	7,670	7,330	2,720	983	594	2,860
1930...	803	678	2,610	1,350*	6,100	3,400	5,490	4,350	3,940	1,740	722	662	2,620*
1931...	2,240	1,590	1,770	4,060	3,090	4,240	4,360	6,210	4,850	1,650	712	1,160	3,020
1932...	2,020	3,860	2,510	3,230	5,570	8,400	6,050	6,970	7,980	4,230	1,520	1,140	4,280
1933...	2,785	11,930	5,307	4,407	1,414	2,700	4,013	6,297	10,960	8,080	2,839	3,368	5,358
1934...	6,655	5,885	14,400	8,885	3,700	6,841	6,879	5,259	2,600	1,391	754	976	5,385
1935...	4,158	6,704	4,568	8,245	3,996	2,705	2,758	5,878	6,753	3,385	1,235	917	4,278
1936...	1,003	1,630	2,023	3,397	1,230	2,994	5,086	10,700	7,776	2,339	888	926	3,412
1937...	789	134	4,822	945	1,502	2,989	3,925	6,700	9,627	3,243	1,136	719	3,084
1938...	1,757	7,504	5,094	3,507	1,480	2,548	6,002	6,345	5,188	1,848	690	535	3,543
1939...	1,424	3,898	5,125	5,463	2,139	3,007	5,109	7,646	6,089	3,943*	1,260*	830	3,840*
1940...	2,001	3,439	6,119*	2,706	3,707	4,055	4,034	5,408	2,595	990	659	515	3,019*
1941...	2,237	2,479	3,386	2,336	1,767	2,020	2,567	3,425	2,169	971	612	2,542	2,210
1942...	4,893	3,439	4,896	1,395	1,698	1,975	4,264	4,983	5,931	2,511	918	612*	3,135*
1943...	1,095	4,667	4,205	2,765*	2,570*	3,534*	6,493	6,155	7,498	5,090	1,347	733	3,849*
1944...	1,251	1,904	4,785	2,303	2,030	2,515	3,638*	5,474	4,029	1,358	606	2,147	2,681*
1945...	1,805	2,890	3,573	6,042	4,533	2,469	2,951	8,358	4,903	1,896*	849*	1,777*	3,507*
1946...	3,068	4,365	3,630	3,367	2,445	3,152	4,793	9,618	8,551	4,403	1,310	808	4,135
1947...	2,903	2,657	6,932	4,743	4,779	3,865	5,821	7,457	5,617	2,568	1,039	1,176	4,144
1948...	5,977	5,626	4,528	2,745	2,590	2,114	3,771	8,863	11,060	3,594	1,832	1,765	4,542
1949...	2,798	3,843	2,764	1,353	3,143*	3,608	5,162	10,620	7,549	4,666	1,972	1,691	4,100*
1950...	3,826	6,725	5,240	3,471*	3,506*	5,030	4,289	6,365	11,900	7,761	2,845	1,274	5,225*
1951...	4,568	6,019	6,740	3,552	8,108	2,315	4,617	6,964	5,558	2,132	843	1,015	4,339
1952...	4,440	3,213	2,192	1,383	3,101	1,775	4,593	7,172	5,430	2,886	991	646	3,146
1953...	448	606	1,673	11,030	5,227	2,318	3,848	6,376	6,020	5,090	1,608	1,121	3,782

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	718	993	1,030	813	630	1,200	1,420	3,630	5,080	1,480	750	447	447
1930...	896	531	454	.....	2,390	1,570	3,300	2,780	2,650	1,000	524	428	398
1931...	517	1,120	960	950	1,490	2,270	2,410	2,650	3,330	920	590	555	517
1932...	725	1,490	1,050	1,290	892	2,800	3,900	4,410	5,060	2,070	1,150	532	725
1933...	706	3,959	1,870	1,330	835	1,500	2,400	3,740	7,200	4,500	1,530	1,070	705
1934...	1,420	2,000	2,300*	4,320	2,210	3,070	4,060	3,670	1,620	968	654	640	640
1935...	686	3,130	2,400	1,260	2,200	1,380	1,540	3,710	4,350	1,770	904	634	634
1936...	538	742	1,140	1,290	707	1,430	1,760	6,400	3,710	1,170	723	676	538
1937...	541	437	425	630*	611	1,700	2,400	3,130	7,230	1,520	821	534	425
1938...	443	1,540	2,250	1,990	1,140	1,910	1,620	3,300*	3,660	920	630	444	443
1939...	388	1,760	1,730	2,370	1,350	1,210	3,570	4,990	4,760	2,200*	824	540	388
1940...	530*	1,570	2,560	1,290	1,920	2,360	2,710	3,200	1,360	766	532	445	445
1941...	495	1,080	1,740	1,310	1,140	1,410	2,040	1,920	1,460	683	532	827	495
1942...	1,520	1,420	1,750	1,130	925	943	3,000	3,000	3,770	1,260	750*	530*	530*
1943...	433	1,390	1,980	1,500*	1,450*	1,300*	3,550	8,240	5,260	2,320	858	622	433
1944...	576	1,060	1,370	1,110	1,040	954	2,300*	3,460	2,990	873	573	480	450
1945...	870	1,190	1,210	1,190	1,470	1,420	1,950	5,330	5,360	1,140*	620*	570*	570*
1946...	661	2,440	1,400	1,870	1,280	2,060	1,990	4,800	5,280	2,120	845	591	591
1947...	546	1,460	2,040	1,460	2,500*	2,700	2,810	4,840	3,680	1,620	717	744	546
1948...	789	2,670	2,100	1,620	1,140	1,460	1,740	4,940	6,360	2,160	1,460	1,030	789
1949...	1,300	1,560	1,390	1,000*	840*	2,230	2,160	4,990	4,520	3,320	1,230	864	840*
1950...	1,010	1,730	1,970	1,710*	1,600*	2,430	2,570	3,240	6,390	3,640	1,560	830	830
1951...	971	1,910	2,930	1,790	1,970	1,440	2,710	3,000	4,250	1,180	650	479	479
1952...	1,030	1,530	1,270	777	1,240	1,180	2,670	3,440	3,330	1,460	708	535	535
1953...	410	385	431	1,010	1,810	1,610	1,690	4,210	4,420	2,340	1,110	649	385

* Estimated.

SNOHOMISH RIVER BASIN

Skykomish River near Gold Bar, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1928										
1929	16,800	Oct. 9, 1928	447	2,860	5.35	72.52	2,070,000	2,580	65.49	1,870,000
1930	15,300	Feb. 5, 1930	398	2,620	4.90	65.49	1,900,000	2,770	70.30	2,010,000
1931	35,100	Jan. 28, 1931	517	3,020	5.64	76.56	2,190,000	3,220	81.78	2,330,000
1932	63,300	Feb. 26, 1932	725	4,280	8.00	108.81	3,110,000	5,240	133.21	3,300,000
1933	72,500	Nov. 13, 1932	705	5,358	10.0	135.02	3,879,000	5,975	151.59	4,326,000
1934	88,700	Dec. 21, 1933	640	5,385	10.1	136.61	3,595,000	4,396	111.56	3,183,000
1935	62,400	Oct. 24, 1934	634	4,278	8.00	108.49	3,097,000	3,376	85.65	2,444,000
1936	19,400	May 16, 1936	538	3,412	6.36	86.80	2,477,000	3,541	90.08	2,571,000
1937	25,300	Dec. 18, 1936	425	3,054	5.76	78.22	2,233,000	3,762	95.40	2,728,000
1938	47,200	April 18, 1938	443	3,543	6.62	89.90	2,565,000	3,221	81.76	2,332,000
1939	28,900	Jan. 1, 1939	388	3,840	7.18	97.47	2,780,000	2,936	89.90	2,850,000
1940	26,000*	Dec. 16, 1939	445	3,019	5.64	76.79	2,191,000	2,729	69.41	1,961,000
1941	21,600	Nov. 28, 1940	495	2,210	4.13	56.07	1,600,000	2,643	67.04	1,913,000
1942	21,100	Dec. 2, 1941	530	3,185	5.36	79.54	2,270,000	2,854	72.43	2,066,000
1943	85,000	Nov. 23, 1942	433	3,849	7.19	97.65	1,786,000	3,684	93.48	2,687,000
1944	71,600	Dec. 8, 1943	480	2,681	5.01	68.21	1,946,000	2,718	69.04	1,970,000
1945	47,400*	Jan. 7, 1945	570	3,507	6.56	88.99	2,539,000	3,734	94.73	2,703,000
1946	34,500	Oct. 25, 1945	501	4,185	7.73	104.90	2,993,000	4,276	108.51	3,099,000
1947	40,200	Dec. 11, 1946	546	4,144	7.75	105.16	3,000,000	4,429	112.37	3,206,000
1948	45,300	Oct. 10, 1947	759	4,542	8.49	115.57	3,298,000	3,977	101.20	2,887,000
1949	22,300	Nov. 23, 1948	840	4,100	7.66	104.03	2,968,000	4,635	117.62	3,356,000
1950	56,500	Nov. 27, 1949	830	5,225	9.77	132.50	3,783,000	5,357	135.91	3,579,000
1951	65,600	Feb. 10, 1951	479	4,339	8.11	110.09	3,142,000	3,711	94.17	2,687,000
1952	13,300	Oct. 3, 1951	535	3,146	5.88	80.03	2,284,000	2,553	64.96	1,854,000
1953	40,600	Jan. 31, 1953	385	3,782	7.07	95.94	2,738,000			

* Estimated.

Wallace River at Gold Bar, Wash.

Location.—Lat. 47°51'50", long. 121°41'45", in NE¼ sec. 6, T. 27 N., R. 9 E., on left bank, 30 ft. downstream from county bridge, a quarter of a mile north of Gold Bar, and 1¼ miles upstream from Olney Creek.

Drainage area.—19.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 200 ft. (from topographic map). Dec. 9, 1928, to Sept. 30, 1933, staff gage 50 ft. upstream at different datum.

Average discharge.—12 years (1928-33, 1946-53), 153 cfs.

Extremes.—1928-33, 1946-53: Maximum discharge, 2,740 cfs Feb. 26, 1932 (gage height, 8.5 ft., from graph based on gage readings, site and datum then in use); minimum, 9.2 cfs Oct. 18, 19, 1952; minimum gage height, 0.32 ft. Aug. 27, Sept. 3-5, 1930, site and datum then in use.

Remarks.—No diversion or regulation above station.

Wallace River at Gold Bar, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	165*	73.0*	89.4	48.3	30.0	139	125	203	244	52.0	19.1	16.6	101*
1930...	71.4	32.6	188	76.4	279	163	168	129	117	33.0	12.2	45.4	104
1931...	166	95.8	105	240	117	177	192	147	154	41.6	14.9	116	130
1932...	149	177	149	170	225	385	203	224	222	140	41.0	56.1	183
1933...	186	615	234	256	60.3	128	151	224	307	163	41.4	161	211
1946.....										95.9	25.0	24.3	.....
1947...	153	164	305	220	205	144	238	169	193	51.3	25.3	53.0	160
1948...	231	292	230	156	142	96.7	171	335	294	81.2	106	106	187
1949...	103	195	121	60.2*	131	185	197	294	176	138	53.3	62.5	143*
1950...	199*	229	201	151	228	240	196	244	364	160	73.6	42.1	196*
1951...	163	232	266	162	265	128	187	203	103	26.5	14.6	51.4	150
1952...	244	124	100	75.5	139	96.7	180	223	158	66.7	30.0	26.5	123
1953...	17.2	31.2	132	479	138	119	199	228	192	37.6	33.3	54.4	146*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929.....				23	22	52	60	87	113	22	14	11	11
1930...	13	24	21	26	76	47	104	52	60	16	9.9	9.6	9.6
1931...	30	40	49	48	48	68	91	76	54	16	11	12	11
1932...	41	66	49	53	35	67	127	113	130	40	30	24	24
1933...	18	167	66	56	41	66	30	128	193	55	22	30	13
1946.....										37	15	15	.....
1947...	20	65	85	61	93	83	104	92	80	32	16	24	16
1948...	26	114	93	88	62	72	53	110	146	52	59	58	26
1949...	62	63	62	40*	33*	81	79	152	114	34	32	19*	19*
1950...	33	55*	32	62*	75*	93	106	132	210	39	37	11	11
1951...	29	56	109	72*	64	46	112	93	45	16.5	11	11.5	11
1952...	94	53	60	34	50	53	99	111	84	29*	19	16	16
1953...	9.8	19	20	89	62	72	37	157	145	35*	20*	18	9.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1929.....			11	101	5.10	69.13	72,900	93.6	64.24	67,800
1930.....	1,670	Feb. 1, 1930	9.6	101	5.25	71.14	76,100	114	78.27	82,600
1931.....	1,630	Jan. 27, 1931	11	130	6.57	89.46	94,500	139	95.09	100,000
1932.....	2,740	Feb. 26, 1932	24	183	9.24	125.44	132,000	229	157.77	167,000
1933.....	2,680	Nov. 12, 16, 1932	18	211	10.7	144.43	153,000	.....	.....	.....
1946.....										
1947.....	1,580	Oct. 25, 1946	16	160	8.08	109.33	115,500	170	116.79	123,300
1948.....	1,880	Oct. 19, 1947	28	187	9.44	128.37	135,600	159	109.06	116,200
1949.....	1,420	Nov. 23, 1948	10	143	7.22	97.86	103,300	161	110.04	116,200
1950.....	1,500	Mar. 4, 1950	11	196	9.90	134.40	141,900	199	136.56	144,200
1951.....	1,780	Feb. 9, 1951	11	150	7.58	102.58	103,300	133	91.29	96,410
1952.....	1,450	Oct. 3, 1951	16	123	6.21	84.43	89,150	98.6	67.81	71,610
1953.....	1,760	Jan. 23, 1953	9.8	146	7.37	100.37	106,000	.....	.....	.....

* Estimated.

SNOHOMISH RIVER BASIN

Olney Creek near Gold Bar, Wash.

Location.—Lat. 47°56'40", long. 121°42'30", in SW¼ sec. 6, T. 28 N., R. 9 E., on left bank, 5½ miles north of Gold Bar, and 7¼ miles upstream from mouth.

Drainage area.—8.03 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 970 ft. (from topographic map).

Extremes.—1946-50: Maximum discharge, 4,020 cfs Oct. 25, 1946 (gage height, 6.30 ft., from rating curve extended above 310 cfs on basis of slope-area determination at peak flow of flood of Feb. 9, 1951, at gage height, 6.10 ft.); minimum, 5.6 cfs Aug. 26-29, 1947 (gage height, 1.28 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										34.0	8.69	11.7	
1947	108	79.2	144	104	100	70.2	124	63.9	91.9	27.0	14.7	33.6	79.9
1948	119	131	117	77.0	78.4	47.4	99.1	145	111	35.2	67.6	57.0	90.0
1949	42.3	112	59.0	22.8	75.3	98.4	93.7	128	71.5	68.2	23.9	35.4	69.1
1950	84.4	107	122	69.0	115	116	107	105	134	61.7	34.2	20.2	90.2
1951	86.0	120											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										12	6.0	6.3	
1947	10	24	23	15	38	34	59	36	31	14	5.6	9.8	5.6
1948	19	38	38	29	15	23	40	48	60	14	21	19	14
1949	15	27	22	11.5	10.5	41	42	61	49	35	12.5	7.8	7.8
1950	16.5	15	33	15	26	35	51	68	69	31	11.5	7.2	7.2
1951	19	28											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1946												
1947	4,020	Oct. 25, 1946	5.6	79.0	9.95	135.00	57,830	82.2	138.59	59,490		
1948	1,080	Oct. 2, 1947	14	90.0	11.2	152.53	65,310	77.6	131.51	56,320		
1949	1,080	Nov. 23, 1948	7.8	69.1	8.61	116.75	50,000	77.7	131.29	56,230		
1950	1,070	Oct. 9, 1949	7.2	90.2	11.2	152.48	65,320					

Olney Creek near Startup, Wash.

Location.—Lat. 47°55'35", long. 121°43'10", in SE¼ sec. 12, T. 28 N., R. 8 E., on left bank, 5 miles northeast of Startup and 6 miles upstream from mouth.

Drainage area.—9.95 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 830 ft. (from topographic map).

Average discharge.—8 years (1922-26, 1929-33), 84.1 cfs.

Extremes.—1922-26, 1929-33: Maximum discharge, 2,400 cfs Feb. 26, 1932 (gage height, 7.50 ft.); minimum, 3.8 cfs Oct. 16, 1925; minimum gage height, 0.61 ft. Aug. 26, 1933.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923...	59.0	43.8	108	161	38.6	68.7	108	37.9	83.3	17.3	7.63	11.5	66.5
1924...	35.0	67.6	132	126	178	42.0	87.0	68.2	52.3	15.1	22.1	41.2	71.7
1925...	157*	125	169	164*	136	81.7	107	56.4	52.1	11.5	11.3	7.24	92.2*
1926...	88.5	51.2	229	102	181	64.9	37.0	70.6	24.6	8.94	17.9	44.8	74.9
1929...						112	83.7	126	112	23.3	10.3	10.6	
1930...	33.2	20.0	97.3	49.3	169	95.6	108*	62.6	55.0	14.7*	6.80	28.8	60.9*
1931...	57.0	55.2	63.0	154	60.8	122	112	54.3	96.8	23.0	7.71	86.2	76.9
1932...	91.7	119	88.2	114	141	258	164	105	90.9	68.1	25.7	30.5	108
1933...	122	315	158	145	37.4*	113	93.1	135	143	70.0	26.7	107	122*
1934...	111	97.0											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923...	17	22	18	30		36	61	48		8	6	5.5	5.5
1924...	7.0	13	47	37	61	26	34	38	26	10	8.0	8.0	7.0
1925...		52	31		37	38	50	47	21	6.5	5.8	5.5	5.5
1926...	3.8	26	42	31		32	27	26	12	5.2	4.2	10	3.8
1929...						50	35	73	52	10	7.3	6.9	
1930...	8.9	14	11	16	32	21			20	7.4	6.3	6.2	6.2
1931...	14	20	27	30*	23	37	46	34	24	9.0	5.4	6.0	5.4
1932...	12	31	28	25	17	51	88	64	63	24	17	16	12
1923...	14	58	28	23*	16	42	51	92	86	28	12	19	12
1934...	21												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1923.....	1,450	Jan. 10, 1923	5.5	66.5	6.68	90.86	48,100	68.4	93.51	49,600
1924.....	1,520	Feb. 12, 1924	7.0	71.7	7.21	98.30	52,100	82.9	123.21	65,300
1925.....	1,450	Dec. 10, 1924	5.5	92.2	9.27	126.00	66,800	87.9	119.99	63,700
1926.....	1,600	Oct. 27, 1925	3.8	74.9	7.53	102.25	54,200			
1929.....										
1930.....	1,730	Feb. 1, 1930	6.2	60.9	6.12	83.16	44,100	65.4	89.36	47,400
1931.....	945	Sept. 13, 1931	5.4	76.9	7.73	104.96	55,600	84.6	115.63	61,300
1932.....	2,400	Feb. 26, 1932	12	108	10.9	147.78	78,400	132	181.42	96,200
1933.....	2,100	Nov. 16, 1932	12	122	12.3	167.22	88,500			

* Estimated.

SNOHOMISH RIVER BASIN

May Creek near Gold Bar, Wash.

Location.—Lat. 47°51'30", long. 121°36'30", in NE¼ sec. 2, T. 27 N., R. 9 E., on left bank, half a mile downstream from Lake Isabel, and 4 miles east of Gold Bar.

Drainage area.—4.07 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,800 ft. (from topographic map) Prior to Dec. 31, 1932, staff gages 20 ft. upstream at different datums. Jan. 1, 1933, to Dec. 31, 1934, staff gage at present site at different datum.

Average discharge.—8 years (1928-34, 1945-47), 37.1 cfs.

Extremes.—1928-34, 1945-47: Maximum discharge, 726 cfs Oct. 25, 1946 (gage height, 4.9 ft.), from rating curve extended above 435 cfs by logarithmic plotting; minimum observed, 1.0 cfs Sept. 4-6, 1934.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928												7.19	
1929	42.3	19.0	15.8	9.40	5.98	18.8	23.4	72.2	73.9	21.8	2.95	2.23	25.8
1930	4.91	8.38	29.7	12.9	58.4	29.1	45.1	35.1	46.6	12.1	1.70	5.92	23.8
1931	34.7	21.4	26.5*	58.2	30.6	40.1	47.1	55.3	61.6	18.7	2.30	23.9	35.3*
1932	26.2	35.6	26.6	30.4	34.2	73.1	52.1	62.1	72.8	47.2	11.8	8.14	40.0
1933	32.0	142	65.1	42.4	10.2	17.4	27.0	54.5	59.0	58.9	19.5	30.9	49.2
1934	50.3	46.1	117	72.5	29.9	44.7	44.0	35.3	10.7	4.53	2.29	11.6	39.3
1935	27.0	68.0	45.3										
1946	62.3*	52.7	29.5	35.4	22.7	28.4	39.5	77.5	71.0	40.4	7.1*	4.61	39.6*
1947	43.5	38.8	73.7	52.1	53.9	37.7	64.2	59.6*	65.1	18.7	4.52	15.3	43.7*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928												4.7	
1929	7.7	12	11	6.8	3.4	6.5	13	42	49	6.3	2.2	1.6	1.6
1930	2.2	6.3	6.0	3.8	24	9.4	37	22	25	2.8	1.2	1.1	1.1
1931	6.6	15	15*	12	13	23	30	43	43	5.2	1.5	1.9	1.5
1932	9.7	14	6.8	13	6.8	23	34	44	40*	18	7.0*	6.0	5.0
1933	5.0	37	13	12	7.0*	10*	16	29	62	35	7.5	8.5*	5.0
1934	9.9	11	22	40	12	10	25	17	5.4	2.2	1.2	1.0	1.0
1935	3.3	24	30										
1946	22*	33	11	22	12	17	16	53	55	18	3*	3	3
1947	4.0	13.5	20*	13.5	20	10	20	39*	38	8.2	1.4	4.1	1.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1928													
1929	138	Oct. 9, 1928	1.6	25.8	6.34	65.94	18,700	22.9	76.36	16,600			
1930	100	Feb. 19, 1930	1.1	23.8	5.85	79.51	17,300	27.2	90.59	19,700			
1931	210	Jan. 23, 1931	1.5	35.3	8.67	117.69	25,500	35.8	119.26	25,900			
1932	330	Feb. 26, 1932	5.0	40.0	9.83	133.91	29,100	52.5	175.71	33,100			
1933	475	Dec. 2, 1932	5.0	49.2	12.1	163.98	35,600	47.2	157.47	34,200			
1934	525	Dec. 21, 1933	1.0	39.3	9.66	131.00	28,440	33.0	110.05	23,830			
1935													
1946	428	Oct. 25, 1945	3	39.6	9.73	132.14	28,650	40.5	134.93	29,290			
1947	726	Oct. 25, 1946	1.4	43.7	10.7	145.62	31,590						

* Estimated.

Skykomish River at Sultan, Wash.

Location.—Lat. 47°51'40", long. 121°48'50", in NW¼ sec. 5, T. 27 N., R. 8 E., on right bank at county bridge at Sultan, a quarter of a mile upstream from Sultan River.

Drainage area.—618 sq. mi.

Gage.—Staff gage. Altitude of gage is 100 ft. (from topographic map).

Extremes.—1910-11: Maximum discharge observed, 19,600 cfs Nov. 21, 1910 (gage height, 12.0 ft.), discharge may have exceeded 40,000 cfs this day; minimum discharge, 624 cfs Sept. 26, 1910, discharge measurement.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	6,010	7,220	4,030	2,920	1,240	2,500	3,150	5,780	6,420	3,160	1,170	2,190	3,830

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	1,670	2,320	1,980	1,360	970	900	1,670	4,090	3,450	1,530	900	970	900

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
YEAR	Momentary Maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1911.....	19,600†	Nov. 21, 1910	900	3,830	2,770,000	.....	.....

† Maximum observed.

Sultan River near Startup, Wash.

Location.—Lat. 47°58'30", long. 121°46'30", in NE¼ sec. 28, T. 29 N., R. 8 E., on left bank, 1½ miles upstream from intake of Everett water-supply system, and 7½ miles north of Startup.

Drainage area.—74.5 sq. mi. (Published as 75 sq. mi., approximately, 1934-50).

Gage.—Water-stage recorder. Altitude of gage is 750 ft. (from river-profile map).

Average discharge.—19 years (1934-53), 755 cfs.

Extremes.—1934-53: Maximum discharge, 34,600 cfs Feb. 9, 1951 (gage height, 17.22 ft., from high-water mark in well), from rating curve extended above 2,900 cfs on basis of slope-area determination of peak flow; minimum, 48 cfs Sept. 25, 27, 29, 30, 1942; minimum gage height, 3.32 ft. Sept. 22, 23, 24, 1938, Oct. 19, 20, 1952.

Remarks.—No diversion or regulation above station.

SNOHOMISH RIVER BASIN

Sultan River near Startup, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934								663	260	245	101	251	.....
1935	1,077	1,561	1,127	1,809	832	612	595	916	860	523	209	243	864
1936	288	512	600	975	355	750	1,281	1,728	1,124	343	129	237	694
1937	235	120	1,573	143	368	806	1,084	1,209	1,518	392	195	136	650
1938	621	1,004	1,222	803	284	573	1,500	951	462	172	68.4	65.9	721
1939	604	1,053	1,514	1,303	408	652	1,089	1,417	1,032	661*	163	174	842*
1940	714	844	1,401	584	967	994	739	741	284	113	107	72.1	630
1941	907	723	891	657*	370	393	386	730	351	134	75.0	732	637*
1942	1,164	743	1,066	349	458	636	863	887	1,241	445	103	56.7	660
1943	401	1,341	1,065	536	700	726	978	985	870	570	172	119	704
1944	460	477	1,190	617	405	608	745	978	550	166	103	670	561
1945	526	928	751	1,546	954	586	691	1,346	515*	262	89.6	502	724*
1946	1,200	1,064*	879	835*	562*	776	1,111	1,447	1,421	648	209	152	860*
1947	683	800	1,797*	1,353*	1,320*	820	1,180	877	920	364	156	305	880*
1948	1,418	1,076	1,135	607	736*	543	904	1,630	1,310	418	478	597	904*
1949	545	1,632	539	219*	710	892	1,081	1,529	912	738	324	447	746*
1950	1,022	1,380	1,269	760	911	1,277	1,025	1,316	1,767	940	645	270	1,044
1951	1,144	1,328	1,502	824	2,369	460	827	908	566	202	96.4	271	865
1952	1,232	720	447	384	766	423	980	1,159	866	457	170	123	644
1953	83.6	176*	662	3,143	1,031	538	883	1,052	816	568	229	395	799*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934								397	154	109	72	67	.....
1935	95	485	412	199	344	201	220	555	481	216	193	97	95
1936	91	152	227	262	80*	234	179	990	440	158	98	116	80*
1937	114	94	96	90*	92	320	595	678	880	191	123	93	90*
1938	80	334	325	331	161	337	331	396	325	82	58	55	65
1939	61	323	246	425	101	171	674	638	773	302	100	88	61
1940	87	240	380	173	340	460	426	280	128	75	56	54	54
1941	129	221	270	270*	173	206	309	318	220	74	51	188	51
1942	166	190	275	178	166	192	595	462	535	165	72	49	48
1943	60	330	342	198	218	156	535	535	555	225	114	74	69
1944	79	182	170	205	156	147	465	518	326	90	66	51	51
1945	136	203	160	232	225	198	360	768	380*	118	62	67	62
1946	326	500*	225	350*	220*	389	428	960	810	314	126	102	102
1947	105	246	500*	370*	400*	492	570	530	511	197	88	114	88
1948	137	374	341	260*	180*	318	347	456	702	243	213	199	137
1949	177	282	210*	140*	107	393	393	825	612	474	190	117	107
1950	192	241	243	170*	217	360	500	660	1,030	520	270	127	127
1951	206	300	460	248	248	169	500	445	377	120	77	62	62
1952	320	245	203	117	217	223	442	576	428	231	105	82	82
1953	61	100*	95*	323	260	265	298	708	624	258	141	95	61

* Estimated.

Sultan River near Startup, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acres-foot		Inches	Acres-foot
1934										
1935	27,000	Oct. 24, 1934	95	364	11.5	156.49	625,800	666	120.65	482,400
1936	5,800	May 16, 1936	80	694	9.25	126.01	503,900	740	134.32	537,200
1937	14,800	Dec. 6, 1936	90	650	8.67	117.56	470,000	799	144.64	573,800
1938	19,600	April 17, 1938	55	721	9.61	130.55	522,100	875	122.07	458,400
1939	11,600	Oct. ①, 1939	61	842	11.2	153.35	609,600	825	149.23	596,900
1940	8,600	Oct. 4, 1939	54	630	8.40	114.29	457,200	593	107.62	430,500
1941	11,600	Oct. 10, 1940	51	537	7.16	97.15	388,600	574	103.95	415,800
1942	7,700	June 15, 1942	45	660	8.80	119.41	477,600	645	116.72	466,800
1943	19,000	Oct. 31, 1942	69	704	9.39	127.43	509,600	649	117.39	469,500
1944	29,400	Oct. 3, 1943	61	681	7.75	105.54	422,200	587	106.52	426,100
1945	20,000	Jan. 7, 1945	62	724	9.65	130.96	523,800	803	145.32	581,200
1946			102	660	11.5	155.72	622,900	673	157.93	631,700
1947			88	880	11.7	150.21	636,900	909	164.43	657,800
1948	14,600	Oct. 19, 1947	137	904	12.1	164.11	656,400	776	140.89	563,500
1949	10,400	Nov. 23, 1948	107	746	9.95	135.08	540,300	879	159.12	636,400
1950	18,200	Mar. 4, 1950	127	1,044	13.9	188.99	756,000	1,068	194.68	773,500
1951	34,600	Feb. 9, 1951	62	865	11.6	157.67	626,500	733	133.61	631,000
1952	7,550	Oct. 3, 1951	82	644	8.64	117.62	467,300	521	95.18	378,100
1953	17,700	Jan. 23, 1953	61	799	10.7	145.64	578,600			

① Oct. 12, 1938, May 28, 1939.

Sultan River near Sultan, Wash.

Location.—Lat. 47°55'40", long. 121°47'50", in E½ sec. 8, T. 28 N., R. 8 E., on left bank at head of Horsehoe Bend, a quarter of a mile downstream from Miners Creek, 4½ miles north of Sultan, and 6 miles upstream from mouth.

Drainage area.—88 sq mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 420 ft. (from river-profile map). Prior to Oct. 29, 1915, at Camp Habecker, 1½ miles upstream at different datum.

Average discharge.—17 years (1911-26, 1929-31), 780 cfs.

Extremes.—1911-26, 1929-31: Maximum discharge, 24,600 cfs Dec. 12, 1921 (gage height, 18.5 ft., from high-water mark in well), from rating curve extended above 16,000 cfs; minimum, 2.7 cfs Aug. 25, 1931, result of diversion.

Remarks.—City of Everett diverted water 2 miles above gage, in varying amounts from 3 cfs in 1916 to possibly 80 cfs in 1931, for municipal use; practically entire flow diverted July to September 1931. No regulation prior to October 1930. Possible slight regulation thereafter by sluicing at diversion dam.

SNOHOMISH RIVER BASIN

Sultan River near Sultan, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911												458	
1912	226	1,810	923	1,050	928	268	529	936	701	458	304	328	706
1913	698	1,340	837	633	732	565	934	1,300	1,320	940	304	574	850
1914	692	1,000	465	1,180	780	390	978	794	806	289	123	593	753
1915	845	1,360	485	499	633	508	1,090	524	367	283	95.4	94.1	558
1916	998	1,060	1,040	348	1,250	1,370	1,000	1,050	1,110	936	304	376	901
1917	208	1,010	440	679	903	332	1,020	1,500	2,110	1,200	342	212	827
1918	270	493	4,500	1,820	929	803	938	900	781	266	386	106	1,020
1919	860	902	1,530*	1,330	643*	695	1,360	1,340	811	469	149	156	881*
1920	354	2,000	1,200	1,720	437	749	667	781	784	270	131	1,310	866
1921	1,270	764	1,090	1,180	1,680	1,090	1,000	1,220	1,320	572	233	695	1,000
1922	1,050	1,320	1,910	227	195	313	768	1,560	1,100	236	177	375	778
1923	757	463	1,330	1,810	378	554	916	944	824	367	112	103	718
1924	872	756	1,240	993	2,010	378	708	841	549	196	161	207	695
1925	1,320	1,210	1,570	1,400	1,400	629	994	1,150	669	272	132*	66.5*	899*
1926	408	685	1,850	857	1,030	720	550*	928*	232	70.0	118	381	625*
1927	919												
1929						747	757	1,300	1,120	337	126	76.8	
1930	238	188	830	365	1,660	802	878	663	675	238	75.2	165	559
1931	760	436	466	1,250	557	988	986	698	811	149	5.40	415	627

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914	206	275	234	275	227	411	368	541	435	140	92	83	83
1915	250	638	135	227	358	258	297	227	227	139	77	71	71
1916	149	345	328	124	202	332	573	710	690	501	157	152	124
1917	90	248	183	198	238	202	332	860	1,290	457	168	109	90
1918	120	167	472		227	171	400	570	304	166	151	79	79
1919	52	268		192	279	339	553	609	440	229	99	79	79
1920	57	480	124	187	182	126	292	497	382	101	54	51	54
1921	324	170	287	318	336	324	376	742	696	243	127	112	112
1922	142	366	172	110*	110*	128	373	585	567	123	92	107	92
1923	96	160	115	292*		330	530*	532	430	162	87	52	52
1924	69	114		258		222	265	399	314	117	83	69	69
1925	262		278	316	345	326	356	600	420*	161	160*	45	45
1926	32	183	334	277	428	301			116	41	35	77	82
1927	27*												
1929						234	320	710	610	186	82	41	
1930	47	128	112	196	366	242	527	378	378	116	46	41	41
1931	143	179	167	162	184	258	525	390	268	9.3	2.9	4.2	2.9

* Estimated.

SNOHOMISH RIVER BASIN

McCoy Creek near Sultan, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										4.4	1.8	1.8	
1947	3.0	16	19.5	12.5	30	16	14	3.9	4.2	4.4	1.6	1.8	1.6
1948	3.6	20	27	17	13	10	17.5	21	9.8	4.2	4.2	6.6	3.6
1949	8.1	14.5	16.5	6.8	5.8	25	19	8.1	2.0	2.0	2.4	1.6	1.6
1950	4.2	7.5	9.7	14*	15*	20	55.5	13.5	8.4	2.2	1.9	1.4	1.4
1951	3.2	14.5											

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946										
1947	385	Feb. 2, 1947	1.6	27.2	4.41	59.90	19,720	29.0	63.63	20,960
1948	255	Oct. 19, 1947	3.6	30.1	4.88	66.31	21,830	27.7	61.16	20,130
1949	588	Feb. 17, 1949	1.6	24.8	4.02	54.63	17,960	23.5	51.61	16,900
1950	548	Mar. 4, 1950	1.4	29.0	4.70	63.80	20,990			

* Estimated.

Elwell Creek near Sultan, Wash.

Location.—Lat. 47°50'10", long. 121°51'00", in SE¼ sec. 12, T. 27 N., R. 7 E., on left bank, 500 ft. upstream from mouth, and 2½ miles southwest of Sultan.

Drainage area.—22.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 130 cfs July 8 (gage height, 2.68 ft.); minimum, 5.8 cfs Sept. 4 (gage height, 1.43 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									37.3	8.80	13.9		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									12	6.4	6.1		

Roesiger Creek near Machias, Wash.

Location.—Lat. 47°57'50", long. 121°55'00", in SE¼SW¼ sec. 28, T. 29 N., R. 7 E., on right bank, 20 ft. downstream from county road crossing, half a mile downstream from Roesiger Lake, and 6½ miles southeast of Machias.

Drainage area.—3.94 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 500 ft. (from topographic map). Prior to Aug. 6, 1947, at site above road crossing at datum 1.57 ft. higher.

Extremes.—1946-48: Maximum discharge, 157 cfs about Nov. 11, 1947 (gage height, 1.97 ft., from recorded range in stage); minimum, 0.02 cfs Sept. 13, 1946.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										5.51	0.185	0.057	
1947	2.69	18.9	30.3	22.2	22.4	8.21	17.8	4.07	1.97	1.34	.215	.370	10.8
1948	7.59	38.1	23.7	17.3	22.5	18.0	16.6	13.3	8.21	2.48	1.69	5.25	14.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										0.70	0.05	0.03	
1947	0.07	6.1	11	7.5	10	5.8	9.8	0.73	0.59	.41	.09	.15	0.07
1948	.58	15*	19	9.2	10.5	7.7	10.5	3.7	3.1	.88	.55	1.4	.55

* Estimated.

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1946													
1947	69	Dec. 12, 1946	0.07	10.8	2.74	37.16	7,800	12.2	42.10	8,860			
1948	157	⊙	.55	14.5	3.68	50.16	10,550						

⊙ About Nov. 11, 1947.

SNOHOMISH RIVER BASIN

Woods Creek below Roesiger Creek, near Monroe, Wash.

Location.—Lat. 47°56'40", long. 121°53'40", in SE¼NW¼ sec. 3, T. 28 N., R. 7 E., near right bank on county bridge, a quarter of a mile downstream from Roesiger Creek, and 7 miles northeast of Monroe.

Drainage area.—19.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 410 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 152 cfs Oct. 25 (gage height, 3.14 ft.), from rating curve extended above 44 cfs; minimum, 6.0 cfs Sept. 11-13, 28-30, (gage height, 1.37 ft.).

Remarks.—Minor diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									22.5	7.74	6.70	23.3	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									10	6.4	6.0	6.4	

Carpenter Creek near Machias, Wash.

Location.—Lat. 47°57'50", long. 121°58'10", in NE¼NE¼ sec. 36, T. 29 N., R. 6 E., on right bank, 40 ft. upstream from county bridge, and 4 miles southeast of Machias.

Drainage area.—3.89 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 290 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 83 cfs Oct. 25 (gage height, 2.60 ft.), from rating curve extended above 21 cfs; minimum, 1.1 cfs Sept. 11 (gage height, 0.93 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									9.00	2.21	1.80	12.9	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									2.3	1.5	1.3	2.3	

SNOHOMISH RIVER BASIN

267

Woods Creek near Monroe, Wash.

Location.—Lat. 47°52'20", long. 121°55'10", in W½ sec. 33, T. 28 N., R. 7 E., on left bank, 200 ft. downstream from West Fork and 2½ miles northeast of Monroe.

Drainage area.—55.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map).

Average discharge.—7 years (1946-53), 147 cfs.

Extremes.—1946-53: Maximum discharge, 1,710 cfs Feb. 26, 1950 (gage height, 7.18 ft.), from rating curve extended above 770 cfs; minimum, 12 cfs Aug. 22, 1951, Sept. 27, Oct. 10, 1952; minimum gage height, 1.97 ft. Aug. 22, 1951, Oct. 10, 1952.

Remarks.—Several small diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										56.5	21.5	19.8	
1947	56.9	222	358	288	273	115	209	56.6	47.5	29.7	19.3	24.6	140
1948	138	430	341	310	265	201	232	201	116	48.5	38.6	49.2	198
1949	109	246	282	133	335	203	93.5	87.1	29.0	25.5	17.6	19.2	130
1950	55.6	204	300	309	458	440	255	115	46.4	26.1	20.1	20.6	186
1951	78.2	297	300	340	347	231	85.3	67.2	33.5	17.5	18.7	17.6	151
1952	120	132	257	131	178	213	104	54.1	35.4	27.4	17.9	14.4	107
1953	14.7	19.6	46.0	352	225	179	209	119	130	36.9	21.3	22.5	114

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										25	18	17	
1947	10	69	127	82	127	82	114	33	32	23	16	18	16
1948	18	174	210	128	102	96	142	80	66	31	29	26	18
1949	55	75	126	60	55	144	67	38	23	16	15.5	14	14
1950	19	30	139	115*	120*	192	161	37	35	21	18	16	16
1951	19.5	114	220	157	166	114	47	42	21	14	12	12.5	12
1952	25	74	112	73	94	82	51	40	26	19	15	12.5	12.5
1953	12.5	17	19.5	61	119	98	132	66	76	21	16.5	17	12.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946										
1947	1,020	Jan. 24, 1947	16	140	2.55	34.68	101,000	163	40.32	118,300
1948	1,590	Nov. 11, 1947	18	198	3.60	43.93	143,500	175	43.22	128,700
1949	1,360	Feb. 17, 22, 1949	14	130	2.36	32.14	94,200	124	30.55	89,570
1950	1,710	Feb. 26, 1950	16	166	3.38					
1951	1,260	Feb. 10, 1951	12	151	2.75	45.88	134,600	195	48.23	141,500
1952	764	Dec. 22, 1951	12.5	107	1.95	37.35	109,500	138	33.98	99,640
1953	740	Jan. 23, 1953	12.5	114	2.07	28.10	77,670	71.0	17.57	51,560

* Estimated.

SNOHOMISH RIVER BASIN

Middle Fork Snoqualmie River near North Bend, Wash.

Location.—Lat. 47°29'20", long. 121°45'35", in SE ¼ sec. 10, T. 23 N., R. 8 E., on right bank, 50 ft. downstream from county road bridge, 1¼ miles southeast of North Bend, and 2¾ miles upstream from mouth.

Drainage area.—169 sq. mi. Prior to 1945, 173 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 460 ft. (from river-profile map). Aug. 10, 1907, to Sept. 2, 1912, and Feb. 15, 1929, to Sept. 30, 1932, staff gages, and Sept. 2, 1912, to Aug. 6, 1915, water-stage recorder at several sites and datums 2 miles downstream. Aug. 7, 1915, to June 2, 1926, water-stage recorder at site a quarter of a mile downstream from described site at different datum.

Average discharge.—22 years (1907-26, 1929-32), 1,183 cfs.

Extremes.—1907-26, 1929-32, 1945: Maximum discharge, 26,700 cfs Nov. 23, 1909 (gage height, 14.6 ft., from graph based on gage readings, site and datum then in use); minimum, 102 cfs Oct. 24, 1925.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907...													
1908...	278	819*	1,120*	593	507	1,700*	1,400*	1,760*	2,200*	1,200*	310*	485*	1,010*
1909...	686	1,060	933	1,370	845	631	997	1,510	2,040	895	298	340	960
1910...	552	3,500*	1,550*	1,210	842	2,340	1,710	1,880	1,070	554	256	214	1,310*
1911...	1,840	2,300*	1,100*	800*	390*	590*	719	1,400	1,350	799	403	727	1,040*
1912...	369	3,040	1,390	1,840	1,370	429	856	1,960	1,610	745	356	710	1,220
1913...	655	1,560	1,040	1,040	1,100	1,000	1,410	2,200*	2,650	1,600	526	672	1,290*
1914...	1,720	1,410	808	1,710	846	1,300	1,550	1,680	1,320	570	240	460	1,140
1915...	909	2,090	429	548	542	842	1,490	852	598	448	228	196	762
1916...	1,370	1,610	1,460	602	1,730	2,159	1,570	1,750	2,600	2,070	735	497	1,510
1917...	247	1,180	686	953	1,340	632	1,260	2,040	3,380	2,650	697	344	1,270
1918...	471	703	5,020	2,810	1,380	1,030*	1,540	1,750	2,140	700	763	254	1,550*
1919...	1,390	1,180	2,320	2,210	703	954	1,590	2,040	1,640	975	340	325	1,310
1920...	462	2,120	1,490	2,230	709	929	1,040	1,330	1,520	678	312	1,320	1,150
1921...	1,660	1,080	1,400	1,650	2,070	1,440	1,370	1,970	2,510	1,140	414*	959	1,470
1922...	1,140	1,520	2,650*	378	356	435	1,120	2,500	2,590	675	284	568	1,100*
1923...	690	790	1,730	2,590	540	906	1,550	1,930	1,950	1,060	330	209	1,200
1924...	730	988	1,600	1,340	2,670	617	1,120	2,180	1,270	528	229	334	1,130
1925...	1,400	1,510	2,050	1,640	1,550	771	1,540	2,150	1,350	576	241	173	1,250
1926...	470	884	2,520	1,150	1,150	1,050	965	1,050	580*	310*	320*	550*	914*
1929...						1,220	1,110	2,290	2,340	872	265	185	
1930...	237	245	1,250	604	2,340	1,160	1,450	1,400	1,190	489	194	210	857
1931...	1,020	785	575	1,400	1,130	1,620	1,490	1,660	1,530	426	100	456	1,020
1932...	1,000	1,470	970	1,380	1,760	2,220	1,770	1,970	2,230	1,310	394	351	1,410
1945...										575	232	1,005	

* Estimated.

Middle Fork Snoqualmie River near North Bend, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													266
1908	226	352	504	424	400								154
1909	222	248	176	446	372	534	584	900	1,300	488	170	176	176
1910	338			342	438	1,000	1,000	1,080	648	372	222	174	174
1911	516						488	975	804	476	372	372	172
1912	276	276	710	565	635	200	635	790	1,160	370	255	292	200
1913	391	580	711	358	421	730	912		1,700	779	335	300	300
1914	210	936	608	606	488	654	600	1,010	838	295	189*	169	169
1915	328	806	306	355	427	394	569	467	452	318	182	150	150
1916	277	654	659	315	456	690	1,060	1,020	1,390	1,060	471	268	268
1917	177	394	323	331	455	347	551	1,020	1,870	1,130	372	240	177
1918	202	301	747	1,170	543		376	1,090	1,090	445	357	184	184
1919	194	585	617	365	401	616	860	1,020	990	480	236	203	194
1920	188	682	329	434	292	285	582	800	800	321	190	253	188
1921	641	310	485	531	643	637	655	1,060	1,410	649	275	292	275
1922	345	750	401	270	253	247	628	1,010	1,500	294		226	
1923	194	348	256	514		572	1,090	1,050	1,090	455	250	165	165
1924	182	266	885*	578*	956	390	450	1,090	813	298	199	189	182
1925	415	802	596	800*	514	451	546	1,170	893	318	195	135	135
1926	102		652	507	527	512	591	613					102
1929						630	492	1,390	1,550	415	191	145	
1930	132	196	188	244	720	408	950	750	750	254	147	137	132
1931	147	326	326	307	440	690	795	900	900	236	156	163	147
1932	236	465	330	440	330	690	910	1,050	1,210	480	307	254	236
1945										283	182	184	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1907											
1908				154	1,010	5.84	79.49	737,000	1,050	82.63	765,000
1909	8,700	June 1, 1909	176	966	5.58	75.75	699,000	1,210	94.88	874,000	
1910	26,700	Nov. 23, 1909	174	1,310	7.57	102.76	947,000	1,280	100.45	927,000	
1911			372	1,040	6.01	81.58	751,000	998	78.32	723,000	
1912	22,800	Nov. 18, 1911	200	1,220	7.05	95.96	885,000	1,100	86.57	795,000	
1913	4,910	Feb. 16, 1913	300	1,290	7.46	101.27	933,000	1,350	105.88	974,000	
1914	11,700	Oct. 10, 1913	169	1,140	6.59	89.45	823,000	1,000	85.52	790,000	
1915	8,100	Nov. 2, 1914	150	762	4.40	59.73	552,000	850	66.65	615,000	
1916	3,450	Mar. 9, 1916	268	1,510	8.73	118.83	1,100,000	1,310	103.04	954,000	
1917	6,620	June 4, 1917	177	1,270	7.34	99.63	921,000	1,610	126.38	1,170,000	
1918	23,200	Dec. 18, 1917	184	1,550	8.96	121.63	1,120,000	1,450	113.75	1,050,000	
1919	15,200	Dec. 14, 1918	194	1,310	7.57	102.70	950,000	1,240	97.33	895,000	
1920	10,200	Nov. 15, 1919	188	1,160	6.82	92.70	854,000	1,190	93.83	861,000	
1921	12,300	Dec. 30, 1920	275	1,470	8.50	115.15	1,060,000	1,560	122.84	1,130,000	
1922	22,000	Dec. 12, 1921		1,190	6.88	93.45	862,000	1,010	79.63	734,000	
1923	14,200	Dec. 24, 1922	165	1,200	6.94	93.95	865,000	1,200	94.60	872,000	
1924	22,000	Feb. 12, 1924	132	1,330	6.53	89.19	824,000	1,270	99.95	924,000	
1925	11,700	Dec. 11, 1924	135	1,250	7.23	97.55	901,000	1,150	90.28	833,000	
1926	10,500	Jan. 5, 1926	102	914	5.28	71.77	662,000				
1929											
1930	7,900	Feb. 1, 1930	132	857	5.18	69.58	642,000	941	73.77	681,000	
1931	9,150	Jan. 28, 1931	147	1,020	5.90	80.20	740,000	1,120	87.75	810,000	
1932	25,600	Feb. 26, 1932	236	1,410	8.15	110.73	1,020,000				
1945											

* Estimated.

SNOHOMISH RIVER BASIN

North Fork Snoqualmie River near Snoqualmie Falls, Wash.

Location.—Lat. 47°37'10", long. 121°42'35", in SW¼ sec. 30, T. 25 N., R 9 E., on right bank, 1 mile upstream from Calligan Creek, 7½ miles northeast of town of Snoqualmie Falls, 8½ miles northeast of Snoqualmie, and 9½ miles upstream from confluence with Middle Fork.

Drainage area.—65 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,150 ft. (from river-profile map).

Average discharge.—20 years (1929-49), 492 cfs.

Extremes.—1929-49: Maximum discharge, 13,000 cfs Feb. 26, 1932 (gage height, 17.5 ft.), from rating curve extended above 2,200 cfs by logarithmic plotting; minimum observed, 30 cfs Sept. 17-19, 1929.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929												43.5	335*
1930	119	130	511	243*	960*	449	539	473	398	115	45.0		
1931	492	290	260	475	398*	682	577	539	520	122	52.4	225	403*
1932	407	542	408	537	708	1,070	940	884	906	453	144	171	606
1933	393*	1,460*	751	833	203	465	544	845	1,140	682*	226	621	673*
1934	366	968	1,556	1,310	432	743	519	424*	145	97.5	67.3	135	609*
1935	906	787*	717	1,072	499	403	387	564	602	302	139	110	542*
1936	160	413	407	718	243	519	792	1,248	804	230	78.5	176	483
1937	123	85.4	870	124*	297	468	659	555	1,090	260	144	171	424*
1938	351	1,127*	775	582	201	357	814	636	359	97.6	47.7	44.2	455*
1939	206	620	936	754	320	453	634	837	707	409	81.1	107	514
1940	371	560	887	362	612	665	542	583	216	70.3	67.4	47.5	414
1941	386	435	548*	393*	236	234	255	478	319	96.8	54.8	574	337*
1942	648	478	731	259	256	327	536	590	552	279	87.6	57.1	429
1943	138	939*	883*	394*	554*	482*	718*	713	666	344	118	501	503*
1944	297	300	740	365	325	362	558	789	464	140	88.5	101	410
1945	245	567	508	750*	563*	382	491	1,062	484	168	71.0	424	475*
1946	451	518	654	573	423	492	674	988	973	404	100	97.3	557
1947	496	560	1,131	740	702	610	823	609	590	212	88.3	174	552
1948	678*	1,106*	735*	460	422	293	305	1,126	1,139	347	291	304	615*
1949	369	732	414	193*	507*	571*	698	1,150	685	454	196	157	510*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929												30	34
1930	39	84	85		225	156	318	234	204	59	36	34	34
1931	65	125	126	124	150*	236	262	275	234	61	42	47	42
1932	91	157	133	154	105	364	507	491	602	168	100	62	83
1933				219		242	307	512	768	330*	116	113	
1934	151	151	257	464	182	184	315	220*	101	78	50*	50*	50*
1935	96*	330*	321	199	251	172	197	370	348	131	88	52	62
1936	51	112	173	246	120*	213	168	690	313	99	54	81	51
1937	71	65	72	80*	91	203	349	442	621	177	78	56	56
1938	57	234	271	271	142	228	219	341	205	48	36	33	33
1939	38	201	195	330	171	135	403	468	516	145	55	61	38
1940	60	171	271	150	235	330	319	223	91	48	38	38	38
1941	60	144	200*	240*	130	136	226	220	192	56	41	126	41
1942	154	152	222	147	122	146	339	360	460	118	56	43	48
1943	45*	200*	275*	100*	200*	155*	325*	350*	448	145	89	72	45*
1944	75	141	151	173	146	130	355	400	277	69	57	47	47
1945	106	147	124	171	170*	176	281	670	262	83	56	61	56
1946	103	357	187	264	178	274	264	542	578	160	64	72	62
1947	87	191	262	188	309	271	963	343	352	122	59	73	59
1948	90*	350*	290*	211	126	178	208	296	605	179	186	130	90*
1949	128	193	179	130*	120*	283	277	565	400	283	106	71	71

* Estimated.

SNOHOMISH RIVER BASIN

North Fork Snoqualmie River near Snoqualmie Falls, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1929												
1930	4,930	Feb. 1, 1930	34	335	5.15	70.03	243,000	359	74.95		260,000	
1931	4,430	Jan. 28, 1931	42	403	6.20	84.15	292,000	434	90.65		314,000	
1932	13,000	Feb. 26, 1932	82	605	9.31	126.66	439,000	703	147.29		510,000	
1933	8,730	Nov. 17, 1932		673	10.4	140.62	487,000	742	154.06		537,000	
1934	8,360	Nov. 2, 1933	50	609	9.37	127.30	441,100	626	109.72		389,700	
1935	11,100	Oct. 25, 1934	52	542	8.34	113.08	392,300	421	88.01		306,000	
1936	3,540	May 16, 1936	51	483	7.43	101.09	350,400	492	103.04		357,200	
1937	4,340	Dec. 6, 1936	56	424	6.62	88.45	306,600	520	108.61		376,800	
1938	8,730	April 17, 1938	33	455	7.00	94.85	329,200	415	86.50		300,100	
1939	5,230	Dec. 7, 1938	36	514	7.91	107.46	372,300	519	108.48		375,800	
1940	4,070	Nov. 7, 1939	38	414	6.37	86.72	300,600	377	78.83		273,300	
1941	6,640	Nov. 28, 1940	41	337	5.18	70.35	243,900	378	78.99		273,800	
1942	4,070	Dec. 19, 1941	43	429	6.60	89.59	310,600	436	91.15		318,000	
1943	10,000	Nov. 23, 1942	45	503	7.74	105.01	364,000	461	94.31		328,900	
1944	9,640	Dec. 3, 1943	47	410	6.31	85.88	297,700	408	85.44		296,200	
1945	11,100	Jan. 7, 1945	56	475	7.31	99.29	344,200	528	110.36		362,600	
1946	6,420	Oct. 25, 1945	62	557	8.57	116.21	402,900	577	120.52		417,600	
1947	7,990	Dec. 11, 1946	59	552	8.49	116.24	399,500	579	120.81		418,800	
1948	6,640	Oct. 19, 1947	90	615	9.46	128.78	446,500	531	111.20		365,500	
1949	5,230	Nov. 23, 1948	71	510	7.85	106.47	269,100					
1950	9,350	Nov. 27, 1949										

North Fork Snoqualmie River at cable bridge, near North Bend, Wash.

Location.—Lat. 47°34'20", long. 121°42'50", in NE¼NE¼ sec. 13, T. 24 N., R. 8 E., on left bank, 300 ft. downstream from Hancock Creek, 600 ft. upstream from cable bridge, 6 miles upstream from mouth, and 6 miles northeast of North Bend.

Drainage area.—85.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,020 ft. (from river-profile map).

Extremes.—1913-15: Maximum discharge, 3,840 cfs Jan. 5, 1914 (gage height, 6.4 ft.); minimum, 67 cfs Aug. 29 to Sept. 2, 1914 (gage height, 0.54 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914	550*	656	388	762	469	714	738	726	660	237	83.2	256	519*
1915	495	896	255	410	370	536	781	584	241	255	100	91.1	425

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914			206	257	250	304	287	548	425	109	67	67	67
1915	156	450	140	226	273	257	360	295	230	159	75	74	74

* Estimated.

North Fork Snoqualmie River at cable bridge near North Bend, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1914.....	3,840	Jan. 5, 1914	67	519	6.06	32.27	376,000	523	82.86	375,000
1915.....	3,280	April 2, 1915	74	425	4.96	67.48	308,000			

North Fork Snoqualmie River near North Bend, Wash.

Location.—Lat. 47°32'20", long. 121°44'20", in NE¼ sec. 26, T. 24 N., R. 8 E., on right bank, 2 miles upstream from mouth, and 3½ miles northeast of North Bend.

Records represent flow passing measuring section 1¾ miles downstream.

Drainage area.—105 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 470 ft. (from river-profile map). Prior to Sept. 2, 1912, staff gage, and Sept. 2, 1912, to Sept. 26, 1916, water-stage recorder 2 miles downstream at different datum.

Average discharge.—28 years (1907-26, 1929-38), 698 cfs.

Extremes.—1907-26, 1929-38: Maximum discharge, 15,800 cfs Nov. 23 or 24, 1909 (gage height, 15.5 ft., from graph based on gage readings), from rating curve extended above 2,300 cfs by logarithmic plotting; minimum, 54 cfs Aug. 31, Sept. 1, 1930, Sept. 1, 1934.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907...											197	320*	.....
1908...	189	672*	770*	466	353	1,200*	900*	1,100*	1,200*	477	174	159	630*
1909...	358	664	576	917	594	420	657	959	1,360	527	189	229	619
1910...	373	2,100*	1,170	773	630	1,640	1,240	1,170	577	202	81.2	82.8	836*
1911...	978	1,370	713	511	242	377	428	954	769	379	111	414	605
1912...	203	1,770	760	1,000	823	223	466	1,020	734	374	247	407	667
1913...	377	944*	700*	750*	575	500*	800*	1,200*	1,230	714	189	404	698*
1914...	861	849	312	979	754	1,040	1,000	934	804	283	86.6	310	683
1915...	601	1,110	352	520	472	655							
1916...	691	840	954	380	1,110	1,410	956	657	403	294	112	91.9	520
1917...	129	731	476	653	977	325	893	990	1,230	975	266	246	837
1918...	195	393	2,890	1,600	861	652	825	871	755	208	369	115	816
1919...	685	670	1,250	1,180	469	493	1,020	1,050	706	358	180	155	682
1920...	287	1,180	882	1,240	410	522	638	771	788	255	110	721	650
1921...	911	661	800	1,060	1,070	898	880	1,170	1,240	484	149	439	812
1922...	551	967	1,520	251	270	264	702	1,530	1,260	277	131	363	666
1923...	459	459	947	1,360	410	566	930*	1,030	999	372	123	80.4	649*
1924...	298	466	904	949	1,540	363	631	1,010*	561	176	148	193	600*
1925...	815	958	1,240	1,090	1,070	522	952	1,059	682	193	96.1	77.9	728
1926...	235	624	1,700	822	826	714	549	310	300*	125*	185*	300*	578*
1929...						690	660	1,480	1,280	334	107	78	.....
1930...	157	184	651	851	1,240	570	751	649	567	180	69.7	101	450

* Estimated.

North Fork Snoqualmie River near North Bend, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	509	408	366	898	612	971	854	701	669	189	83.2	306	552
1932...	626	756	599	759	928	1,550	1,510	1,400	1,370	695	197	241	884
1933...	840*	2,250	1,080	1,160	281	693	756	1,150	1,530	827	283	695	963*
1934...	1,159	1,043	2,555	1,859	662	954	775	642	312	119	76.6	166*	857*
1935...	1,051*	1,269	1,057	1,493	797	621	668	977	834	466	200	156	794*
1936...	222	603	704	1,140	372	769	1,152	1,671	1,060	319	115	242	609
1937...	167	125	1,202	229	428	762	1,026	1,319	1,551	374	210	168	634
1938...	497	1,813	1,126	907	333	555	1,210	1,003	498	143	71.6*	70.5*	686*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907											141		
1908...	147	167		271	223					202	141	131	131
1909...	131	183	153	328	271	325	394	601	750	271	131	131	131
1910...	223		430	328	360	303	750	693	300	126	78	56	56
1911...	292	446	346	243	176	176	292	578	411	155	83	83	83
1912...	134	134	377	265	368	167	331	489	545	207	180	174	134
1913...	180	304			257				810	284	144	144	144
1914...	183	219	88	470	449	563	513	650	508	124	64	69	59
1915...	205	470	226	340	372	368	456	401	288	178	74	71	71
1916...	78	206	443	238	292	412	640	613	862	537	161	134	78
1917...	81	278	258	254	355	245	331	704	1,180	510	123	85	81
1918...	98	156	476	688	322	234	443	377	302	157	163	79	79
1919...	81	319	358	250	323	277	488	617	464	177	80	76	76
1920...	104	452		259	182	173	311	456	475	123	71	103	71
1921...	345	190	301	338	324	360	369	738	802	192	117	143	117
1922...	156	399	277	187	161	159	365	715	667	118	89	128	89
1923...	114	229	159	375		355				149	87	64	64
1924...	70	127	615	413	556	222	228	563	304	108	69	56	56
1925...	253	355	327	364	390	327	381	518	385	99	77	65	65
1926...	56	109	455	331	445	360*	367	298					56
1929						236	284	193	700	158	78		
1930...	68	127	144		342	218	437	346	290	94	54*	54	54
1931...	96	196	198	196	257	410	453	415	346	105*	65	70	65
1932...	151		244	289	187	665	940	870	960		127	112	112
1933...		767	543	331		370	463	756	1,010	421	119	125	
1934...	197	340	516	815	311	320	554	369	134	84	55	54*	54*
1935...	700*	525	564	337	430	262	398	616	510	169	127	90	90
1936...	85	161	341	442	186	328	262	959	415	151	86	125	85
1937...	113	100	100	140	132	390	588	691	886	177	132	102	100
1938...	161	366	460	446	247	366	350	564	284	71	60*	68	68

* Estimated.

North Fork Snoqualmie River near North Bend, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acro-feet		Inches	Acro-feet
1907.....			131	659	6.09	82.89	464,000	636	82.49	462,000
1908.....			131	619	5.90	80.09	449,000	790	102.05	572,000
1909.....	6,450	June 2, 1909	56	836	7.96	108.06	606,000	789	101.94	571,000
1910.....	15,800	①								
1911.....	7,210	Nov. 21, 1910	83	605	5.78	78.19	438,000	577	74.66	418,000
1912.....	13,200	②	194	007	6.35	86.44	484,000	608	78.82	441,000
1913.....			144	098	6.65	90.27	505,000	698	90.27	505,000
1914.....	5,980	Oct. 11, 1913	59	083	6.50	88.23	495,000	686	88.64	497,000
1915.....	4,270	April 2, 1915	71	520	4.95	37.19	377,000	557	71.94	403,000
1916.....	5,840	Mar. 9, 1916	78	837	7.97	108.49	607,000	739	95.82	536,000
1917.....	3,050	June 24, 1917	81	728	6.93	94.07	528,000	911	117.80	660,000
1918.....	13,300	Dec. 18, 1917	79	816	7.77	105.46	591,000	741	95.84	536,000
1919.....			76	082	6.60	88.23	494,000	659	85.25	477,000
1920.....	9,420	Nov. 15, 1919	71	650	6.19	84.15	472,000	653	84.64	474,000
1921.....			117	812	7.73	104.88	587,000	863	111.67	624,000
1922.....	11,100	Dec. 12, 1921	89	666	6.34	86.09	482,000	573	74.07	415,000
1923.....	8,980	Dec. 24, 1922	64	649	6.18	83.83	470,000	632	81.62	457,000
1924.....	14,100	Feb. 12, 1924	58	800	5.71	74.74	419,000			
1925.....	8,320	Dec. 10, 1924	65	728	6.93	93.99	526,000	691	89.15	499,000
1926.....	7,880	Dec. 23, 1925	56	578	5.60	77.74	435,000	712	92.36	517,000
1929.....										
1930.....	4,610	Feb. 1, 1930	54	450	4.29	58.16	326,000	479	61.94	347,000
1931.....	4,610	Jan. 28, 1931	65	552	5.26	71.32	390,000	605	78.18	438,000
1932.....	15,400	Feb. 26, 1932	112	584	8.42	114.67	642,000	1,070	138.17	774,000
1933.....	11,100	Nov. 17, 1932		963	9.17	124.63	698,000	1,020	181.44	736,000
1934.....	11,300	Dec. 9, 1933	54	857	8.16	110.65	620,200	742	95.69	536,800
1935.....	12,800	③	80	794	7.56	102.66	574,800	686	82.19	460,600
1936.....	3,730	May 16, 1936	85	690	6.66	90.59	507,100	697	90.34	505,900
1937.....	4,760	Dec. 6, 1936	100	634	6.04	81.95	458,900	794	102.74	575,000
1938.....	9,860	April 18, 1938	58	086	6.53	89.69	496,800			

① Nov. 23 or 24, 1909. ② Nov. 18 or 19, 1911. ③ Oct. 24 or 25, 1934.

South Fork Snoqualmie River near Garcia, Wash.

Location.—Lat. 47°25'00", long. 121°35'20", in SW¼ sec. 6, T. 22 N., R. 10 E., on left bank at Bide-a-wee Ranch, 150 ft. downstream from Alice Creek, a quarter of a mile upstream from Fifteenmile Bridge, and 1¼ miles southeast of Garcia.

Drainage area.—45.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,470 ft. (from river-profile map). Prior to Nov. 6, 1913, staff gage at same site at datum 1.54 ft. lower.

Average discharge.—5 years (1910-15), 275 cfs.

Extremes.—1910-15: Maximum discharge, 8,070 cfs Nov. 19, 1911 (gage height, 10.0 ft., described datum, from floodmarks), from rating curve extended above 1,200 cfs; minimum observed, 21 cfs several days in August and September 1910, and September 1911.

Remarks.—No known diversion or regulation above station.

South Fork Snoqualmie River near Garcia, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910.....											38.6	30.0	.....
1911....	521	650	168	212	71.4	111	279	570	433	135	41.2	141	279
1912....	72.7	1,080	240	279	259	65.3	265	712	433	111	73.9	100	306
1913....	120	409	189	369	307	108	398	690	717	274	72.5	89.7	303
1914....	418	294	149	415	171	402	514	616	383	111	42.4	71.2	296
1915....	209	573	97.0	58.8	90.2	268	553	206	104	76.9	40.2	33.1	192

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910.....											21	21	.....
1911....	36	168	102	102	54	54	183	350	308	54	36	21	21
1912....	54	54	04	45	45	30	115	273	165	54	45	45	30
1913....	54	115	64	45	54	45	64	183	440	115	33	38	33
1914....	45	114	90	93	83	195	179	320	216	57	33	30	30
1915....	55	214	55	42	59	97	184	124	70	47	29	28	28

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1910.....												
1911.....	4,670†	Nov. 21, 1910	21	279	6.16	83.53	202,000	282	84.56	204,000		
1912.....	5,070	Nov. 19, 1911	30	306	6.75	92.01	222,000	251	75.36	182,000		
1913.....	2,220†	Jan. 3, 1913	33	303	6.69	90.73	219,000	315	94.60	228,000		
1914.....	2,920†	Oct. 11, 1913	30	286	6.53	88.58	214,000	296	88.81	215,000		
1915.....	3,020	April 2, 1915	28	192	4.24	57.67	139,000					

† Minimum observed.

South Fork Snoqualmie River at North Bend, Wash.

Location.—Lat. 47°29'40", long. 121°47'20", in NE¼ sec. 9, T. 23 N., R. 8 E., on right bank at county road crossing at North Bend, 2 miles upstream from mouth.

Drainage area.—83 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 430 ft. (from river-profile map). Prior to Sept. 1, 1912, staff gage and Sept. 1, 1912, to Oct. 1, 1916, water-stage recorder a quarter of a mile downstream at different datum. Oct. 2, 1916, to May 30, 1926, and Feb. 12, 1929, to Sept. 30, 1938, water-stage recorder a quarter of a mile upstream from described site at different datum.

Average discharge.—32 years (1907-26, 1929-38, 1945-49), 547 cfs.

Extremes.—1907-26, 1929-38, 1945-50: Maximum discharge recorded, 7,620 cfs Oct. 25, 1934 (gage height, 11.2 ft., site and datum then in use), from rating curve extended above 1,400 cfs, but may have been greater several days in November 1909 when water was over gage; minimum discharge, 63 cfs Oct. 22, 1925.

Remarks.—No diversion or regulation above station.

SNOHOMISH RIVER BASIN

South Fork Snoqualmie River at North Bend, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907											171	176	.....
1908	121	417	596	351	304	900*	700*	800*	900*	497	163	109	480*
1909	220	526	416	518	423	378	475	705	807	312	109	152	419
1910	184	1,400*	508	841	288	1,120	717	609	270	128	84.8	76.8	477*
1911	574	929	456	358	213	348	412	708	546	213	104	239	428
1912	144	973	485	739	690	311	450	842	553	223	151	155	473
1913	201	622	390*	600*	530*	391	550*	900*	849	412	157	173	473*
1914	527	409	321	732	4.6	693	762	710	506	255	117	163	480
1915	321	760	271	236	292	428	650	354	244	161	110	106	334
1916	450	644	660	342	650	961	797	967	1,120	795	310	164	659
1917	141	431	358	498	003	313	665	096	1,360	860	225	198	549
1918	125	210	2,050	1,250	745	577	776	763	670	232	246	118	645
1919	448	546	1,080	1,070	633	544	792	979	816	350	136	122	627
1920	164	775	580	954	666	498	535	584	548	227	122	395	502
1921	629	446	586	965	1,100	985	821	1,060	1,100	486	158	315	719
1922	420	554	1,290	279	178	190	303	1,030	1,040	359	136	160	616
1923	201	306	625	1,300	446	494	797	930	930	340	136	96.2	551
1924	192	325	664	625	1,280	552	524	797	392	163	106	121	476
1925	441	604	995	973	1,120	622	816	995	573	223	108	83.8	626
1926	140	328	993	607	607	690	610	515	220*	100*	130*	210*	433*
1929						533	584	1,110	1,020	414	177	97.3	.....
1930	100	92.4	428	262	822	550	686	577	477	224	101	51.5	363
1931	288	273	213	477	484	713	823	794	575	279	115	149	431
1932	333	572	394	681	830	1,350	1,170	1,100	1,020	519	259*	160	698*
1933	402	1,620	990	1,060	382	549	662	922	1,250	695	238	421*	761*
1934	843	938	2,267	1,579	771	997	336	592	290	145	169	170*	807*
1935	632*	939	792	1,233	718	564	488	733	643	363*	165	107	615*
1936	126	255	323	708	291	676	827	1,267	959	341	157	132	497
1937	113	98.7	609	213	359	560	723	964	1,141	423	215	153	473
1938	216	1,194	919	784	340	459	954	906	552	195	100*	90.0*	560*
1945										264	134	292	.....
1946	404	655	584	678	458	583	729	1,128	1,009	521	207	136	594
1947	373	481	1,308	352	810	643	829	721	557	278	156	218	601
1948	746	1,074	762	647	562	471	577	1,127	1,250	424	235	201	672
1949	337	613	599	311	510	622	501	1,271	844	480	235	148	562
1950	463	753	706	617	724	1,023							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907											128	128	.....
1908	113	180	248	212	180					212	117	77	77
1909	68	152	230	265	248	350	330	457	464	152	86	77	68
1910	140		198	144	144	406	426	380	160	101	79	71	71
1911	160	220	242	220	178	169	266	515	278	121	69	89	89
1912	114	174	316	266	403	266	354	450	286	131	107	114	107
1913		201							575	213	117	117	117
1914	126	268	218	218	336	442	452	475	380	180	98	88	88
1915	120	365	202	218	242	261	351	268	188	136	93	81	81
1916	115	291	398	241	283	364	598	604	827	477	160	138	115
1917	115	231	243	248	313	250	330	634	925	350	141	105	105
1918	01	138	341	651	425	336	576	555	343	140	137	90	90
1919	90	352	410	358	520	425	520	662	520	175	110	93	90
1920	92	345	223	311	375	311	375	425	403	135	95	108	92
1921	302	182	250	596	535	660	596	703	193	206	130	130	130
1922	170	333	402	176	142	141	278	560	678	163	110	110	110
1923	98	155	132	522	400	368	560	598	638	168	104	88	88
1924	84	110	416	373	740	343	336	450	234	121	92	80	80
1925	226	492	378	610	650	512	512	630	412	124	97	73	73

* Estimated.

SNOHOMISH RIVER BASIN

South Fork Snoqualmie River at North Bend, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926...	65	143	461	428	433	464	460	386					65
1929						257	290	750	675	257	115	81	
1930...	81	82	88	129	406	291	530	392	331	135	82	73	73
1931...	68	177	146	146	247	401	578	578	395	165	89	83	68
1932...	105	300	232	291	303	810	882	788	742	328		122	105
1933...	107	515	505	418	305	374	435	625	810	325	155		107
1934...	229	552	552	445	575	592	610	468	191	121*	120*		
1935...	75*	544	492	439	476	318	358	544	425		121	91	75*
1936...	88	121	198	331	179	325	283	820	492	214	115	101	88
1937...	96	87	92	152	143	382	458	499	825	264	175	114	87
1938...	96	214	516	488	288	398	364	605	341	110*			
1945										166	107	103	
1946...	184	368	246	426	318	406	371	730	745	287	144	107	107
1947...	192	231	538	381	517	425	502	476	376	209	121	121	102
1948...	149	582	486	886	284	338	324	415	840	270	196	141	141
1949...	179	213	343	200	183	405	391	758	604	357	154	109	109
1950...	105	222	320	334	381	560							

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1907			77	490	5.90	80.31	356,000	492	80.72	357,000
1908			68	419	5.06	68.55	304,000	496	81.17	359,000
1909	2,040	June 1, 1909	71	477	5.75	78.05	346,000	467	76.42	338,000
1910			89	428	5.16	70.01	310,000	393	64.21	285,000
1911	4,440	Nov. 21, 1910	107	473	5.70	77.56	343,000	437	71.73	317,000
1912	6,650	Nov. 18 or 19, 1911	117	473	5.70	77.37	342,000	492	80.50	356,000
1913			88	480	5.78	78.56	348,000	480	78.46	347,000
1914	2,750	Oct. 11, 1913	81	334	4.02	54.54	241,000	368	60.13	266,000
1915	2,670	Nov. 3, 1914	115	659	7.94	108.14	478,000	590	96.78	428,000
1916	3,100	Mar. 10, 1916	105	549	6.61	89.73	397,000	673	110.09	487,000
1917	2,200	June 16, 1917	90	648	7.81	106.01	469,000	621	101.54	450,000
1918	6,780	Dec. 18, 1917	627	7.55	102.52	454,000	579	94.75	419,000	
1919	5,820	Dec. 14, 1918	92	502	6.05	82.33	365,000	515	84.39	374,000
1920	3,570	Nov. 15, 1919	130	719	8.66	117.52	520,000	769	125.83	557,000
1921	4,410	Dec. 30, 1920	110	518	6.24	84.70	375,000	423	69.23	306,000
1922	6,780	Dec. 12, 1921	88	551	6.64	90.12	390,000	555	90.81	402,000
1923	5,500	Jan. 7, 1923	80	476	5.73	78.02	345,000	547	89.70	397,000
1924	6,460	Feb. 12, 1924	73	626	7.54	102.42	454,000	578	94.48	419,000
1925	4,540	Dec. 12, 1924	65	433	5.22	70.86	314,000			
1926	3,160	Dec. 23, 1925	73	303	4.37	59.44	263,000	376	61.49	272,000
1929	1,900	Feb. 19, 1930	68	431	5.19	70.51	312,000	475	77.65	344,000
1930			105	698	8.41	114.51	507,000	840	137.48	610,000
1931	2,810	Jan. 28, 1931	107	761	9.17	124.40	551,000	854	139.82	618,000
1932	7,600	Feb. 26, 1932	807	807	9.72	132.06	584,600	660	108.01	478,000
1933	7,100	Nov. 13, 1932	75	615	7.41	100.58	445,200	476	77.84	344,600
1934	7,430	Dec. 22, 1933	88	497	5.99	81.58	361,100	516	84.59	374,500
1935	7,620	Oct. 25, 1934	87	473	5.70	77.95	342,400	590	96.49	427,100
1936	2,420	May 16, 1936	560	6.75	91.59	405,400				
1937	2,810	Dec 19, 1936								
1938	5,410	April 18, 1938								
1945										
1946	5,200	Oct. 25, 1945	107	594	7.16	97.13	430,000	636	104.01	460,600
1947	6,490	Dec. 11, 1946	102	601	7.24	98.36	435,400	635	103.93	460,100
1948	4,320	Oct. 19, 1947	141	672	8.10	110.28	488,200	584	95.72	423,700
1949	2,910	Nov. 24, 1948	109	562	6.77	91.84	400,600	595	97.38	431,100
1950										

* Estimated.

SNOHOMISH RIVER BASIN

Snoqualmie River near Snoqualmie, Wash.

Location.—Lat. 47°32'45", long. 121°50'35", in SW ¼ SW ¼ sec. 19, T. 24 N., R. 8 E., on left bank, an eighth of a mile downstream from Snoqualmie Falls, half a mile upstream from Tokul Creek, and 1½ miles northwest of Snoqualmie.

Drainage area.—375 sq. mi.

Supplemental records available.—October 1904 to September 1905, and November to December 1906, gage heights only.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from river-profile map). Prior to Nov. 3, 1902, and Nov. 1 to Dec. 31, 1906, staff gages above and below Snoqualmie Falls at different datums. Nov. 3, 1902, to Sept. 30, 1905, staff gage at site 4 miles upstream and 300 ft. downstream from South Fork at different datum.

Average discharge.—28 years (1898-99, 1902-4, 1907-32), 2,448 cfs.

Extremes.—1898-1900, 1902-4, 1926-27: Maximum discharge, 24,400 cfs Jan. 3, 1903 (gage height, 19.6 ft., from floodmarks, site and datum then in use); minimum recorded, 320 cfs July 8, 1926.

Remarks.—No diversion above station. After 1900, low-flow records collected below Snoqualmie Falls are affected by powerplant operation. Records August 1907 to May 1926 and March 1929 to September 1932 are the sum of flow in North, Middle and South Forks (see elsewhere in this report).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898								4,480	4,710	2,040	691	1,030	
1899	2,220	3,610	3,220	5,270	4,800	1,800	2,970	5,120	6,930	3,570*	840*	970*	3,480*
1900				3,790	2,760	3,820	2,570	3,660	2,810				
1903	840	2,710	3,730	5,140	1,290	1,460	1,960	1,140	5,290	2,240	745	2,440	2,670
1904	2,240	3,250	3,240	3,330	1,330	1,970	4,210	3,300	3,590	1,780	700*	580*	2,470*
1907													
1908	585*	1,910*	2,490*	1,420*	1,160*	3,800*	3,000*	3,600*	4,300*	2,170*	678*	951*	
1909	1,200*	2,250*	1,920*	2,800*	1,860*	1,430*	2,130*	3,170*	4,210*	1,730*	742*	499*	2,140*
1910	1,110*	7,000*	3,230*	2,320*	1,760*	5,100*	3,670*	3,660*	1,920*	884*	696*	721*	2,000*
											422*	374*	2,620*
1911	3,390*	4,600*	2,270*	1,700*	845*	1,320*	1,570*	3,060*	2,660*	1,390*	615*	1,350*	2,070*
1912	716*	5,780*	2,530*	3,580*	2,850*	963*	1,770*	3,820*	2,900*	1,340*	754*	1,310*	2,360*
1913	1,260*	3,130*	2,040*	2,390*	2,200*	1,890*	2,760*	4,300*	4,730*	2,730*	872*	1,250*	2,460*
1914	3,710*	2,790*	1,440*	3,420*	2,050*	3,030*	3,310*	3,320*	2,630*	1,120*	444*	933*	2,300*
1915	1,830*	3,960*	1,050*	1,350*	1,310*	1,920*	3,140*	1,860*	1,240*	923*	456*	394*	1,020*
1916	2,510*	3,090*	3,070*	1,320*	3,520*	4,520*	3,300*	3,710*	4,950*	3,840*	1,330*	927*	3,000*
1917	517*	2,340*	1,520*	2,100*	2,920*	1,170*	2,780*	4,240*	6,620*	4,680*	1,700*	618*	2,650*
1918	691*	1,310*	9,960*	5,660*	2,990*	2,260*	3,140*	3,380*	3,560*	1,200*	1,400*	457*	3,070*
1919	2,520*	2,400*	4,650*	4,460*	1,800*	1,990*	3,400*	4,070*	3,160*	1,680*	915*	602*	2,620*
1920	1,110*	4,050*	2,950*	4,420*	1,750*	1,950*	2,210*	2,650*	2,680*	1,160*	544*	2,440*	2,330*
1921	3,200*	2,190*	2,790*	3,680*	4,240*	3,320*	3,070*	4,200*	4,850*	2,110*	721*	1,710*	3,000*
1922	2,110*	2,950*	5,460*	998*	744*	539*	2,320*	5,110*	4,980*	1,310*	551*	1,110*	2,370*
1923	1,850*	1,560*	3,300*	5,370*	1,400*	1,970*	3,280*	3,390*	3,880*	1,770*	569*	365*	2,460*
1924	1,230*	1,730*	3,160*	2,910*	5,400*	1,530*	2,280*	4,000*	2,220*	867*	543*	645*	2,210*
1925	2,660*	3,070*	4,280*	3,700*	3,740*	1,920*	3,310*	4,220*	2,530*	992*	445*	325*	2,600*
1926	854*	1,790*	5,210*	2,580*	2,650*	2,450*	2,120*	2,180*	1,100	536	555	1,060	1,920*
1927	2,850	2,300	2,740	2,450	2,780	2,050	2,780	4,730	5,290	2,930	830	2,390	2,760
1928	3,640*	6,660*	5,310*	6,030*	1,460*	3,330*	2,440*	4,720*	2,550*	1,100*	425*	416*	3,020*
1929	2,320*	1,240*	1,110*	785*	604*	2,440*	2,350*	4,330*	4,640*	1,620*	543*	360*	1,910*
1930	494*	521*	2,330*	1,220*	4,400*	2,250*	2,690*	2,630*	2,230*	893*	365*	392*	1,700*
1931	1,850*	1,470*	1,150*	2,780*	2,230*	3,300*	3,170*	3,160*	2,770*	894*	388*	911*	2,000*
1932	2,050*	2,800*	1,970*	2,820*	3,520*	5,120*	4,450*	4,470*	4,620*	2,520*	350*	752*	2,990*

* Estimated.

SNOHOMISH RIVER BASIN

Snoqualmie River near Snoqualmie, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898								2,890	2,280	1,090	520	465	.....
1899	915	1,680	970	1,290	1,770	1,160	1,220	2,060	5,020				
1900				1,510	1,510	1,860	1,220	2,060	1,860				
1903	615	1,550	1,220	1,920	995	850	1,160	2,160	3,110	1,100	520	388	388
1904	850	1,220	1,620	1,410	995	945	1,620	2,000	2,250	895			
1926									710	400	414	493	.....
1927	1,180	865	1,550	840	1,220	1,630	1,590	2,390	2,640	850	504	672	504

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1898											
1899				3,430	9.15	124.20	2,450,000				
1900											
1903	24,400	Jan. 3, 1903	388	2,670	7.12	96.65	1,920,000	2,790	100.99	2,020,000	
1904	15,200	Jan. 14, 1904		2,470	6.59	89.70	1,790,000				
1907											
1908				2,140	5.71	77.72	1,560,000	2,180	79.08	1,550,000	
1909				2,000	5.33	72.35	1,450,000	2,500	90.54	1,810,000	
1910				2,620	6.99	94.53	1,900,000	2,540	91.90	1,340,000	
1911				2,070	5.52	74.93	1,500,000	1,970	71.26	1,430,000	
1912				2,360	6.29	85.62	1,710,000	2,140	77.72	1,650,000	
1913				2,450	6.56	89.05	1,780,000	2,530	91.63	1,830,000	
1914				2,300	6.13	83.21	1,600,000	2,260	81.85	1,630,000	
1915				1,620	4.82	58.64	1,170,000	1,770	64.07	1,280,000	
1916				3,000	8.00	103.90	2,180,000	2,640	95.92	1,920,000	
1917				2,550	6.80	92.31	1,840,000	3,190	115.52	2,320,000	
1918				3,010	8.03	109.00	2,180,000	2,810	101.67	2,030,000	
1919				2,620	6.99	94.53	1,900,000	2,450	89.73	1,790,000	
1920				2,330	6.21	84.56	1,690,000	2,300	85.46	1,710,000	
1921				3,000	8.00	108.44	2,170,000	3,190	115.70	2,310,000	
1922				2,370	6.82	85.54	1,720,000	2,010	72.62	1,450,000	
1923				2,400	6.40	86.76	1,730,000	2,390	86.60	1,730,000	
1924				2,210	5.89	80.15	1,600,000	2,530	91.53	1,840,000	
1925				2,600	6.93	93.94	1,880,000	2,420	87.63	1,750,000	
1926				1,920	5.12	69.68	1,390,000	1,930	69.73	1,390,000	
1927	16,500	Oct. 16, 1926	504	2,760	7.36	100.62	2,000,000	3,240	117.23	2,340,000	
1928				3,020	8.05	109.69	2,190,000	2,280	82.69	1,650,000	
1929				1,910	5.09	69.26	1,380,000	1,800	65.25	1,300,000	
1930				1,700	4.53	61.52	1,230,000	1,800	64.98	1,300,000	
1931				2,000	5.33	72.60	1,450,000	2,200	79.50	1,590,000	
1932				2,900	7.97	108.61	2,170,000				

SNOHOMISH RIVER BASIN

Tokul Creek near Snoqualmie, Wash.

Location.—Lat. 47°33'20", long. 121°50'15", in NW¼ sec. 19, T. 24 N., R. 8 E., on right bank, 50 ft. downstream from highway bridge, half a mile upstream from mouth, and 1½ miles north of Snoqualmie.

Drainage area.—34 sq. mi., approximately. At site 1907-14, 33 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 180 ft. (from river-profile map). July 21, 1907, to Oct. 31, 1914, staff gage 1 mile upstream from datum about 340 ft. higher. Mar. 20, 1929, to Sept. 30, 1931, staff gage three-eighths of a mile downstream from described site at different datum.

Average discharge.—8 years (1908-14, 1929-31), 103 cfs.

Extremes.—1907-14, 1929-31, 1945: Maximum discharge not determined, probably occurred during period Nov. 19-29, 1909, when water was over gage; minimum, 13 cfs Sept. 16-20, 1909.

Remarks.—Some diversion for industrial use and municipal supply of community of Snoqualmie Falls above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													
1908	24.3	75.7*	133*	118*	115					34.5	23.8	25.5*	
1909	46	86	109	204	227	175	96.2			19.9	25.0	21.8	
1910	22.1	267	228	161	230	359	198	100	39.1	46.7	16.3	17.9	93.0
1911	130	348	186	199	157	128	86.2	172	54.7	26.3	20.0	21.6	139
1912	28.1	131	196	150	164	82.0	88.9	75.3	61.1	63.7	20.7	45.5	130
1913	82.4	201	137	205	142	117	93.1	67.5	52.9	54.3	63.5	77.4	98.9
1914	104	150	103	211	141	102	91.2	54.1	53.5	36.0	36.8	42.8	102
1915	49.8										25.9	28.3	91.5
1929							162	81.3	123	39.5	26.3	24.1	
1930	26.9	33.5	142	118*	150	98.7	82.4	85.2	72.4	36.5	25.4	23.0	76.4*
1931	54.9	95.4	87.8	176	147	151	177	60.0	65.7	51.5	30.1	38.0	94.1
1945										36.5	28.8	52.3	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													
1908	22	29	64	66	50					37	19	22	
1909			76	158	130	106	76	70	23	16	16	13	13
1910	19	106	158	106	137	228	112	76	31	23	19	16	16
1911	39	112	180	151	124	106	46	44	35	27	16	16	16
1912	27	27	147	104	116	68	74	62	57	47	43	57	27
1913	57	86	92	92	92	83	57	52	47	42	33	33	33
1914	37	68	57	80	104	77	68	44	39	30	24	24	24
1915	28												
1929							94	45	72	28	25	23	
1930	13	27	30		64	56	69	52	47	28	22	22	22
1931	21	55	62	72	75	91	75	40	32	33	27	26	21
1945										31	20	26	

* Estimated.

Tokul Creek near Snoqualmie, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Maximum observed		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1907.....											
1908.....											
1909.....	312	Jan. 20, 1909	13	93.0	2.82	33.25	67,300	116	47.69	83,900	
1910.....			16	139	4.21	57.51	101,000	152	62.36	110,000	
1911.....			16	130	3.94	53.39	93,800	104	42.82	75,400	
1912.....	242	Nov. 20, 1911	27	98.9	3.00	40.89	71,900	104	43.02	75,700	
1913.....			35	102	3.89	42.10	74,200	97.1	39.91	70,300	
1914.....	350	Jan. 7, 1914	24	91.5	2.77	37.63	66,200				
1929.....											
1930.....	343	Dec. 15, 1929	22	76.4	2.25	30.49	55,300	79.3	31.64	57,400	
1931.....	388	April 2, 1931	21	94.1	2.77	37.58	63,100				
1945.....											

Raging River near Fall City, Wash.

Location.—Lat. 47°32'25", long. 121°54'30", on west line sec. 27, T. 24 N., R. 7 E., on left bank at highway crossing, 2 miles southwest of Fall City, and 2½ miles upstream from mouth.

Drainage area.—30.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 250 ft. (from topographic map).

Average discharge.—5 years (1945-50), 161 cfs.

Extremes.—1945-50: Maximum discharge, 2,200 cfs Feb. 17, 1949 (gage height, 5.60 ft.), from rating curve extended above 1,300 cfs on basis of contracted-opening determination of peak flow of Feb. 9, 1951, at gage height, 6.76 ft.; minimum, 8.8 cfs Sept. 9, 10, 1949.

Remarks.—Some small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....										17.3	13.0	93.3	.....
1946....	101	378	224	293	291	237	148	53.1	99.4	62.5	16.2	17.1	156
1947....	84.9	236	387	254	226	141	171	33.0	78.9	28.9	15.0	39.8	141
1948....	266	347	256	306	293	179	164	106	117	47.0	42.5	60.9	187
1949....	92.3	314	307	112	328	230	110	97.8	26.2	21.3	14.1	13.1	138
1950....	101	224	334	283	410	389	255	99.6	44.9	18.1	22.6	26.4	133

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....										13	11	11	.....
1946....	24	185	74	112	137	138	78	30	32	20	13	12.5	12.5
1947....	16.0	73	81	56	75	67	77	17.5	19.0	18.5	10.5	11.0	19.5
1948....	17.5	132	143	98	73	91	116	80	61	26	24	23	17.5
1949....	40	70	99	48*	41	126	66	31	21	16	11	8.8	8.8
1950....	11	41	79	82*	90*	116	119	61	28	13	11	13	11

* Estimated.

SNOHOMISH RIVER BASIN

Raging River near Fall City, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....										
1946.....	1,380	Dec. 28, 1945	12.5	158	5.16	70.12	114,400	159	70.47	115,000
1947.....	1,650	Dec. 11, 1946	10.5	141	4.61	62.60	102,200	155	68.56	111,900
1948.....	1,550	Oct. 19, 1947	17.5	187	6.11	83.03	135,500	174	77.20	126,000
1949.....	2,200	Feb. 17, 1949	8.8	133	4.51	61.03	99,620	133	59.09	96,450
1950.....	2,050	Mar. 4, 1950	11	183	5.98	80.96	132,100			

Patterson Creek near Fall City, Wash.

Location.—Lat. 47°35'00", long. 121°56'25", in NW¼ sec. 8, T. 24 N., R. 7 E., on left bank, 2 miles upstream from mouth, and 2¾ miles northwest of Fall City.

Drainage area.—18.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 90 ft. (from topographic map).

Extremes.—1947-50: Maximum discharge, 480 cfs Feb. 17, 1949 (gage height, 4.81 ft.), from rating curve extended above 130 cfs; minimum 7.1 cfs Aug. 23, 24, 27, 1947.

Remarks.—Some small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947.....						30.3	35.6	13.5	19.0	10.1	8.57	10.8	.....
1948.....	37.8	76.1	55.3	73.0	68.5	50.9	40.1	48.8	29.6	14.5	13.3	16.5	43.1
1949.....	19.3	57.9	51.5	32.0	94.5	39.0	25.4	21.5	12.7	10.2	9.11	10.9	31.6
1950.....	14.5	30.7	50.2	88.6	83.1	88.9	49.2	27.1	13.8	11.8	11.6	12.7	40.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947.....						21	20	10	11*	8.7	7.6	9.4	.....
1948.....	10	25	35	29	27	26	28	20	16	11	12	12	10
1949.....	15	20	23	18	17	25	19.5	16	11	9.0	8.0	8.5	8.0
1950.....	11	13	22	31	30*	32	29	15	12	11	10.5	11	10.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1947.....										
1948.....	330	Oct. 19, 1947	10	43.1	2.37	32.24	31,300	39.8	29.75	28,890
1949.....	480	Feb. 17, 1949	8.0	31.6	1.74	23.55	22,850	28.8	21.49	20,860
1950.....	379	Jan. 22, 1950	10.5	40.0	2.20	29.82	23,960			

* Estimated.

Patterson Creek eight-tenths mile above mouth, near Fall City, Wash.

Location.—Lat. 47°35'15", long. 121°55'40", on line between secs. 4 and 9, T. 24 N., R. 7 E., 50 ft. upstream from county bridge, 0.8 mile upstream from mouth, and 2 miles northwest of Fall City.

Drainage area.—21.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge not determined; probably occurred Sept. 20 during period of no gage-height record; minimum, 7.3 cfs Aug. 8 (gage height, 1.33 ft.).

Remarks.—Some small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945										10.1	8.60	18.0	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1945										9.0	8.1	7.8	.....

Griffin Creek near Carnation, Wash.

Location.—Lat. 47°37'00", long. 121°54'15", in SW¼SW¼ sec. 27, T. 25 N., R. 7 E., on left bank, a quarter of a mile upstream from bridge on State Highway 15B, three-quarters of a mile upstream from mouth, and 2 miles south of Carnation.

Drainage area.—17.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map). Prior to Sept. 21, 1951, 1,000 ft. downstream at different datum.

Average discharge.—8 years (1945-53), 42.7 cfs.

Extremes.—1945-53: Maximum discharge, 738 cfs Feb. 10, 1951 (gage height, 5.03 ft., site and datum then in use); minimum, 2.2 cfs Aug. 20, 1953; minimum gage height, 0.75 ft. Aug. 22, 23, 1945 (site and datum then in use).

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										4.82	3.51	15.8	.....
1946	18.2	117	64.4	76.5	87.6	84.6	38.4	11.6	22.6	13.9	6.37	5.62	45.1
1947	18.2	77.5	105	99.5	89.2	37.3	67.2	14.1	20.5	9.89	4.41	3.46	45.6
1948	66.4	123	88.9	119	102	65.6	48.5	58.9	39.2	17.9	14.6	17.0	62.4
1949	26.8	117	75.1	39.8	101	62.0*	23.9	20.9	7.40	4.64	3.23	4.12	40.0*
1950	14.1	64.0	74.3	87.0*	116	114	59.1	33.0	8.72	4.85	4.56	4.77	48.4*
1951	24.4	94.1	88.5	87.2	104	45.5	22.9	17.1	11.1	4.22	3.28	4.46	41.8
1952	25.3	36.1	87.5	35.5*	51.4*	49.9*	19.6	13.6	9.94	13.2	3.21	2.90	29.6*
1953	3.17	3.98	7.38	103	57.9	37.4*	46.9	38.2	39.6	7.77	3.25	3.27	29.1*

* Estimated.

SNOHOMISH RIVER BASIN

Griffin Creek near Carnation, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										3.8	2.9	3.3	
1946	7.0	61	27*	29	32	45	21	7.9	7.9	6.1	4.5	4.9	4.5
1947	5.3	23	44	38	29	23	26	9.5	9.9	6.1	3.4	5.5	3.4
1948	7.0	47	59	36	26	18	34	25	19	14	9.9	9.9	7.0
1949	13	23	34	22	20	30*	17	9.2	5.1	3.6	2.8	2.6	2.6
1950	4.7	14.5	26	30*	28	31	34	14	5.9	4.2	3.9	3.8	3.8
1951	5.8	27	51	31	32	35	13	12	5.4	3.4	2.8	3.6	2.8
1952	7.5	18.5	35	17.5*	21*	22*	9.6	10.5	4.8	3.9	2.5	2.7	2.5
1953	2.7	3.4	3.9	8.4	28	20*	34	22	20	3.4	2.4	2.4	2.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1945												
1946	209	Feb. 6, 1946	4.5	45.1	2.64	35.51	32,650	45.3	35.98	32,800		
1947	306	Dec. 15, 1946	3.4	45.6	2.67	36.19	33,900	52.1	41.34	37,680		
1948	522	Oct. 19, 1947	7.0	62.4	3.65	49.67	45,290	57.4	45.67	41,670		
1949	393	Feb. 17, 1949	2.6	40.0	2.34	31.78	28,990	34.5	27.43	25,010		
1950	462	Mar. 4, 1950	3.8	48.4	2.83	38.39	35,010	52.9	42.00	38,300		
1951	738	Feb. 10, 1951	2.8	41.8	2.44	33.20	30,280	37.1	29.41	26,820		
1952	248	Dec. 22, 1951	2.5	29.0	1.70	23.10	21,070	17.7	14.12	12,880		
1953	200	Jan. 23, 1953	2.4	29.1	1.70	23.10	21,090					

* Estimated.

SNOQUALMIE RIVER BASIN

North Fork Tolt River near Carnation, Wash.

Location.—Lat. 47°42'40", long. 121°47'35", in SE¼NW¼ sec. 28, T. 26 N., R. 8 E., on right bank, 2¾ miles upstream from confluence with South Fork, and 7 miles northeast of Carnation.

Drainage area.—39.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. above mean sea level (from river-profile map).

Extremes.—1952-53: Maximum discharge, 5,850 cfs Jan. 23, 1953 (gage height, 10.94 ft.), from rating curve extended above 2,800 cfs; minimum, 40 cfs Nov. 30, Dec. 1, 1952, but may have been less sometime during period of no gage-height record in October 1952; minimum gage height, 3.77 ft. Sept. 22, 1953.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	50.5*	69.0*	221	1,160	583	304	409	445	362	191	91.5	113	332*

* Estimated.

North Fork Tolt River near Carnation, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	42*	40	40	119	256	225	228	312	277	111	69	51	40

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1953.....	5,850	Jan. 23, 1953	40	332	8.47	115.11	240,700	.....	.....	.....

* Estimated.

South Fork Tolt River near Carnation, Wash.

Location.—Lat. 47°41'20", long. 121°42'35", in SW¼SW¼ sec. 31, T. 26 N., R. 9 E., on left bank, 7 miles upstream from confluence with North Fork, and 10 miles northeast of Carnation.

Drainage area.—19.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is about 1,300 ft. (from river-profile map).

Extremes.—1952-53: Maximum discharge, 3,160 cfs Jan. 23 (gage height, 6.26 ft.), from rating curve extended above 1,600 cfs; minimum not determined, probably occurred sometime during period of no gage-height record in October.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	21.4*	40.2*	186	675*	245*	139*	205	211	171	51.9	32.7	48.2	167*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	14*	23*	23	47*	75*	90*	90*	136	118	39	23	17.5	14*

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1953.....	3,160	Jan. 23, 1953	14	167	8.48	115.21	121,000	.....	.....	.....

* Estimated.

SNOHOMISH RIVER BASIN

Tolt River near Carnation (formerly Tolt), Wash.

Location.—Lat. 47°41'45", long. 121°49'30", in S½NE¼ sec. 31, T. 26 N., R. 8 E., on right bank, 500 ft. downstream from the forks, a quarter of a mile upstream from Stossel Creek, and 5 miles northeast of Carnation.

Drainage area.—79.7 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 348 ft. above mean sea level (from river-profile survey). Aug. 10 to Oct. 30, 1928, staff gage and Oct. 31, 1928, to Jan. 3, 1932, water-stage recorder 350 ft. upstream at datum 7.1 ft. higher.

Average discharge.—19 years (1928-31, 1937-53), 575 cfs.

Extremes.—1928-32, 1937-53: Maximum discharge, 16,800 cfs Feb. 9, 1951 (gage height, 12.92 ft.), from rating curve extended above 5,700 cfs on basis of slope-area determination of peak flow; minimum, 53 cfs Sept. 22, 23, 1951 (gage height, 3.84 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928												90.6	
1929	679	333	344	246	163*	671	574	582	755	228	162*	100	433*
1930	166	155	606	404	1,260*	581	587	509	411	148	82.9	121	413*
1931	462	395	421	794	512	848*	671	417	460	189	95.1	293	463*
1932	470	674	582										
1937												121	
1938	343	1,417	990	641	362	504	1,053	625	275	121	84.2	77.3	553
1939	255	1,017	1,172	1,207	581	642	731	829	805	424	188	167	665
1940	450	664	1,029	534	869	898	609	560	216	128	97.2	72.9	510
1941	451	569	689	560	329	289	289	468	361	145	93.1	529	399
1942	787	529	916	398	455	496	563	624	587	295	145	94.2	517
1943	329	1,029	1,055	543	740	646	866	796	582	298	186	113	590
1944	335	376	392	519	451	432	712	894	458	162	125	537	499
1945	356	755	711	1,066	706*	657	715	1,102	424	173	113	472	605*
1946	553	1,097	839	869	719	800	782	888	909	378	151	131	675
1947	536	762	1,460	1,084*	1,044*	654	919	509	613	268	142	219	680*
1948	891	1,333	1,024	687*	710*	509	709	1,208	942	339	409	395	763*
1949	465	1,101	669	355	730	816	794	1,078	551	397	196	226	615
1950	663	900	1,036	869	1,070	1,189	886	917	1,064	506	302	193	797
1951	686	1,050	1,112	882	1,534	522	601	598	375	134	80.3	135	686
1952	853	722*	547	417	728	500	718	831	585	300	129	103	536*
1953	80.7	123	432	2,058	928	524	711	753	606	300	135	165	567

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928												65	
1929	234	204	170			372	319	552	438			72	72
1930	75	105	114				409	352	231	97	72	68	68
1931	92	194	251	254	254	359	402	274	220	110	76	78	76
1932	143	331	274										
1937												84	
1938	80*	275	465	457	264	323	361	338	163	92	72	64	64
1939	67	384	352	620	340	326	522	484	545	204	110	102	67
1940	101	261	470	286	349	495	367	209	133	92	76	63	63
1941	85	232	323	337	207	192	202	197	227	100	77	144	77
1942	250	220*	381	274	236	278	410	348	410	176	104	79	79
1943	82	365	405	301	304	232	421	455	365	160	105	88	82
1944	96	180	259	294	275	230	480	481	256	117	101	91	91
1945	135	230	236	280*	270*	334	476	734	272	118	97	98	97

* Estimated.

Tolt River near Carnation (formerly Tolt), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	143	567	349	458	349	481	416	584	530	204	110	98	98
1947...	105	302	463	338	490	445	535	302	305	187	104	110	104
1948...	122	550	467	300*	250*	322	384	510	550	207	199	199	122
1949...	222	330	353	194	180	448	448	545	337	253	130	99	99
1950...	139	236	364	270*	420*	540	555	625	780	289	178	104	104
1951...	139	376	610	512	416	282	390	344	206	93	65	58	58
1952...	250	260*	324	156	330	297	488	464	340	164	105	77	77
1953...	63	78	77	200	378	368	400	534	460	161	195	80	63

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1928											
1929	4,090	Oct. 9, 1923	72	433	5.43	73.67	313,000	397	67.55	227,000	
1930			68	413	5.18	70.35	299,000	442	75.32	320,000	
1931	3,250	Oct. 26, 1930	76	463	5.81	78.80	335,000	500	85.15	362,000	
1932											
1937											
1938	10,600	April 18, 1938	64	558	7.00	95.06	404,100	533	90.83	386,100	
1939	4,800	Nov. 16, 1938	67	665	8.34	113.18	421,100	640	106.98	463,300	
1940	4,680	Nov. 7, 1939	63	510	6.40	87.08	370,200	475	81.13	344,800	
1941	8,250	Nov. 28, 1940	77	399	5.01	68.04	289,200	442	75.34	320,200	
1942	5,190	Dec. 19, 1941	79	517	6.49	88.03	374,200	534	90.87	386,300	
1943	12,300	Oct. 31, 1942	82	590	7.40	100.49	427,100	518	88.19	374,000	
1944	9,210	Dec. 2, 1943	91	499	6.26	85.23	362,300	519	88.67	376,900	
1945	12,700	Jan. 7, 1945	97	605	7.59	103.08	433,200	661	112.56	478,500	
1946	4,960	Oct. 25, 1945	98	675	8.47	115.03	489,000	698	118.94	505,600	
1947	8,450	Oct. 25, 1946	104	686	8.61	116.83	496,600	727	123.79	526,200	
1948	7,720	Oct. 19, 1947	122	763	9.57	130.25	553,600	679	115.99	493,000	
1949	7,250	Nov. 23, 1948	89	615	7.72	104.75	445,300	645	109.83	466,800	
1950	10,600	Mar. 4, 1950	104	797	10.0	135.76	577,000	818	139.28	592,000	
1951	16,800	Feb. 9, 1951	53	636	7.98	108.36	460,600	576	98.03	416,700	
1952	4,890	Feb. 4, 1952	77	535	6.71	91.40	383,500	411	70.17	298,200	
1953	10,000	Jan. 23, 1953	63	567	7.11	96.54	410,300				

* Estimated.

Snoqualmie River near Carnation (formerly Tolt), Wash.

Location.—Lat. 47°39'55", long. 121°55'30", in W½ sec. 9, T. 25 N., R. 7. E., on left bank, 40 ft. downstream from highway bridge, 1 mile northwest of Carnation, and 2 miles downstream from Tolt River.

Drainage area.—608 sq. mi.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, unadjusted. Prior to Dec. 20, 1933, chain or wire-weight gage on old bridge, 100 ft. upstream at datum 42.96 ft. higher. Dec. 20, 1933, to Sept. 30, 1939, water-stage recorder at present site at datum 42.96 ft. higher.

Since Dec. 21, 1933, auxiliary water-stage recorder 1¼ miles upstream from base gage.

Average discharge.—25 years (1928-53), 3,666 cfs.

Extremes.—1928-53: Maximum discharge, 59,500 cfs Feb. 27, 1932; maximum elevation observed, 59.93 ft. Nov. 13, 1932; minimum discharge recorded, 239 cfs Aug. 21,

SNOHOMISH RIVER BASIN

Snoqualmie River near Carnation (formerly Tolt), Wash.—Continued

Extremes.—Continued

1945, but may have been less sometime during period of faulty intake action Sept. 13 or 14, 1949; minimum elevation recorded, 43.30 ft. Sept. 11, 1930; minimum daily discharge, 396 cfs Sept. 24, 1938.

Remarks.—Several small diversions for irrigation and domestic use above station. Low flow regulated by powerplant at Snoqualmie Falls.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	4,470	1,950	2,140	1,260	873	3,850	3,470	6,369	5,960	1,850	693	521	2,810
1930...	761	792	3,930	1,920	6,780	3,510	4,040	3,430	3,000	963	492	547	2,480
1931...	2,760	2,230	1,870	5,290	3,420	4,720	4,850	4,260	3,500	1,200	500	1,250	2,990
1932...	2,830	4,400	3,530	5,150	5,540	9,980	6,800	5,620	5,450	3,820	1,340	1,180	4,590
1933...	3,060	12,800	6,640	6,960	2,350	4,360	4,060	5,730	7,740	4,000	1,420	3,020	5,190
1934...	5,760	6,712	14,530	9,550	4,003	5,122	4,244	3,178	1,567	1,067	773	1,106	4,523
1935...	4,434	6,381	5,319	5,530	3,974	3,282	2,842	3,626	3,584	2,126	1,091	779	3,827
1936...	994	2,651	3,199	6,055	2,207	4,228	4,934	7,847	5,570	1,681	716	963	3,446
1937...	871	967	5,688	1,291	3,233	4,052	5,414	5,646	6,856	2,197	1,059	794	3,144
1938...	1,909	8,551	6,019	4,514	2,065	2,946	5,962	4,555	2,760	1,090	588	493	3,609
1939...	1,790	3,942*	6,105	6,376	3,516	3,711	4,112	5,031	4,900	2,811	902	851	3,624*
1940...	2,325	3,509	6,277	3,019	4,640	5,089	4,043	4,422	1,803	840	626	517	3,091
1941...	2,012	2,025	3,894	2,941	2,001	1,933	2,230	3,072	2,250	966	523	3,032	2,314
1942...	4,369	3,401	5,929	2,222	2,648	2,646	3,677	4,117	6,035	2,206	899	576	3,224
1943...	1,016	6,979	6,000	3,116	3,772	3,683*	5,546	4,921	4,881	2,713	1,023	791	3,689*
1944...	1,569	2,101	5,123	2,511	2,658	2,721	3,869	5,224	3,263	1,156	734	2,563	2,515
1945...	1,664	3,402	3,883	6,161	4,860	3,740	4,144	6,688	3,626	1,472	615	2,574	3,551
1946...	3,309	6,693	4,835	4,861	3,562	4,315	4,655	6,333	6,233	3,081	1,023	511	4,166
1947...	3,059	4,061	8,690	6,105	5,674	3,833	5,601	4,265	3,994	1,846	899	1,614	4,131
1948...	5,811	8,282	5,634	4,632	3,961	3,207	4,067	7,288	7,372	2,740	2,015	1,633	4,737
1949...	2,739	5,494	4,168	2,115	4,264	4,546	4,747	7,191	4,541	3,087	1,528	1,223	3,798
1950...	3,820	5,279	5,427	4,729	3,565	7,093	5,235	5,872	7,850	4,410	2,133	1,109	4,644
1951...	4,281	6,642	7,502	5,203	9,219	3,012	3,800	4,955	3,624	1,376	578	719	4,200
1952...	4,374	3,424	3,362	2,095	4,030	2,685	4,392	5,573	3,884	2,327	790	593	3,224
1953...	479	619	1,756	1,140	6,169	3,012	4,413	5,302	4,703	2,955	1,126	871	3,533

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...						1,350	1,590	3,350	3,870	930	470	430	.....
1930...	446	598	645	670	2,500	1,330	2,960	2,210	1,670	516	430	415	415
1931...	555	910	1,040	995	1,180	2,350	2,450	2,450	1,480	645	415	430	415
1932...	620	1,730	1,250	2,140	1,360	4,250	4,820	4,440	4,060	1,730	910	655	620
1933...	560	4,250	2,050	2,320	1,360	2,720	2,420	3,740	5,090	1,850	795	595	560
1934...	890	2,420	2,720	5,400	2,400	2,400	3,040	2,320	1,190	921	634	618	618
1935...	812	3,000	3,100	1,930	2,550	1,660	1,840	2,730	2,370	1,120	730	542	542
1936...	441	984	1,890	2,540	1,060	2,280	1,950	5,000	2,650	926	568	598	441
1937...	915	546	588	821	854	2,200	3,450	3,580	4,960	1,310	750	535	535
1938...	475	1,780	2,740	2,650	1,680	1,910	2,150	3,030	1,960	691	472	306	398
1939...	450	1,700*	1,900	3,620	2,070	1,960	2,040	3,320	3,700	1,480	680	536	450
1940...	532	1,630	2,800	1,630	2,080	2,890	2,720	2,010	1,020	630	462	420	420
1941...	579	1,320	1,070	1,970	1,410	1,460	1,840	1,660	1,560	543	446	590	446
1942...	1,450	1,460	2,550	1,650	1,300	1,390	2,630	2,710	3,550	1,180	667	467	467
1943...	416	2,040	2,950	1,500*	1,460*	1,370	2,710	3,120	3,740	1,320	787	636	416
1944...	612	1,110	1,310	1,370	1,570	1,470	2,780	3,150	1,990	745	556	526	526
1945...	973	1,190	1,520	1,750	1,760	2,040	2,880	4,040	2,260	772	453	405	453
1946...	952	3,480	1,880	2,820	2,820	2,680	2,390	4,200	4,290	1,540	719	623	623
1947...	667	1,760	3,070	2,260	2,910	2,540	3,450	2,910	2,610	1,200	640	732	640
1948...	1,010	3,820	3,236	2,400	1,710	2,070	2,330	2,900	4,510	1,610	1,340	1,130	1,010
1949...	1,380	1,760	2,180	1,320	1,120	2,810	2,660	4,310	3,040	2,180	828	672	672
1950...	800	1,540	2,250	2,050*	2,250	3,440	3,360	3,610	5,400	2,460	1,270	660	650
1951...	1,020	2,320	4,310	3,129	2,710	1,840	2,710	2,480	2,480	750	472	416	416
1952...	1,600	1,630	2,040	1,130	1,740	1,660	2,200	2,800	2,710	1,080	597	464	464
1953...	423	444	451	1,060	2,250	2,160	2,310	3,860	3,620	1,490	853	556	423

* Estimated.

Snoqualmie River near Carnation (formerly Tolt), Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1929				2,810	4.62	62.71	2,030,000	2,550	56.88	1,840,000
1930	14,800	ⓐ	415	2,480	4.08	55.46	1,800,000	2,600	57.98	1,880,000
1931	27,400	Jan. 28, 1931	415	2,999	4.92	66.65	2,160,000	3,310	73.90	2,400,000
1932	59,500	Feb. 27, 1932	620	4,500	7.55	102.85	3,840,000	5,570	124.05	4,040,000
1933	59,000	Nov. 13, 1932	560	5,190	8.54	115.82	3,760,000	5,580	124.68	4,040,000
1934	41,000	Dec. 10, 1933	618	4,823	7.93	107.68	3,492,000	3,901	87.09	2,824,000
1935	47,100	Oct. 25, 1934	542	3,827	6.29	85.43	2,770,000	3,050	68.10	2,205,000
1936	16,100	May 16, 1936	441	3,445	5.67	77.13	2,501,000	3,450	77.92	2,527,000
1937	17,200	April 15, 1937	535	3,144	5.17	70.19	2,276,000	3,933	87.80	2,847,000
1938	38,800	April 18, 1938	396	3,509	5.77	78.34	2,540,000	3,052	63.14	2,210,000
1939	22,900	Dec. 8, 1938	450	3,624	5.96	80.92	2,624,000	3,699	82.59	2,678,000
1940	18,900	Dec. 16, 1939	420	3,091	5.05	69.20	2,244,000	2,815	63.01	2,043,000
1941	20,000	Nov. 29, 1940	446	2,314	3.81	51.67	1,676,000	2,721	69.76	1,970,000
1942	19,700	Dec. 19, 1941	467	3,224	5.30	71.99	2,334,000	2,245	72.45	2,349,000
1943	30,300	Nov. 24, 1942	416	3,689	6.07	82.37	2,671,000	3,286	73.37	2,379,000
1944	48,400	Dec. 3, 1943	526	2,815	4.63	63.02	2,044,000	2,799	62.67	2,032,000
1945	32,000	Jan. 8, 1945	453	3,551	5.84	79.29	2,571,000	4,043	90.25	2,927,000
1946	23,500	Oct. 26, 1945	623	4,166	6.85	93.00	3,016,000	4,257	95.05	3,082,000
1947	32,600	Dec. 11, 1946	640	4,137	6.80	92.37	2,995,000	4,457	99.50	3,227,000
1948	24,800	ⓑ	1,010	4,737	7.79	106.05	3,439,000	4,124	98.23	2,994,000
1949	20,200	Nov. 24, 1948	672	3,798	6.25	84.80	2,750,000	3,954	88.37	2,862,000
1950	30,100	Mar. 4, 1950	650	4,844	7.97	108.15	3,507,000	5,197	116.03	3,763,000
1951	52,200	Feb. 10, 1951	416	4,200	6.91	93.76	3,040,000	3,591	80.18	2,600,000
1952	14,300	Feb. 4, 1952	454	3,124	5.14	69.94	2,268,000	2,428	54.87	1,763,000
1953	32,400	Feb. 1, 1953	423	3,533	5.81	78.88	2,558,000			

ⓐ Dec. 14, 1929, Feb. 5, 1930. ⓑ Oct. 19, Nov. 8, 1947.

Harris Creek near Carnation, Wash.

Location.—Lat. 47°40'40", long. 121°54'30", in SE¼ sec. 4, T. 25 N., R. 7 E., on right bank, 1 mile upstream from mouth, and 1.8 miles north of Carnation.

Drainage area.—9.57 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map).

Extremes.—June to October 1945: Maximum discharge, 15 cfs. Sept. 30, caused by destruction of beaver dam upstream (gage height, 0.97 ft.); minimum, 2.3 cfs Aug. 21, 22, Sept. 1-3 (gage height, 0.59 ft.).

Remarks.—Several small diversions for irrigation and domestic use above station. Flow affected at times by removal of beaver dams above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										3.45	2.95	4.32	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945										2.8	2.5	2.3	

Cherry Creek near Duvall, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1945										
1946	512	Feb. 27, 1946	2.8	50.6	2.54	34.51	36,610	56.8	38.91	41,130
1947	918	Feb. 2, 1947	2.2	61.5	3.09	41.95	44,540	69.6	47.47	50,400
1948	689	Oct. 19, 1947	4.4	75.6	3.80	51.72	54,920			
1949										

Evans Creek near Snohomish, Wash.

Location.—Lat. 47°50'30", long. 122°05'00", in SW¼NE¼ sec. 7, T. 27 N., R. 6 E., on right bank, 300 ft. upstream from county bridge, half a mile upstream from mouth, and 5 miles south of Snohomish.

Drainage area.—2.75 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 20 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge not determined, probably occurred Oct. 25 during period of missing gage-height record; minimum, 2.7 cfs Aug. 26.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									3.80	3.23	3.28	4.45	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1946									3.4	2.8	2.8	3.2	

French Creek near Monroe, Wash.

Location.—Lat. 47°53'40", long. 122°00'40", on west line SW¼ sec. 23, T. 28 N., R. 6 E., on right bank at highway crossing, 3 miles northwest of Monroe.

Drainage area.—7.09 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 35 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 16 cfs (regulated) Aug. 9, Oct. 25; maximum gage height, 1.77 ft. Oct. 25; minimum discharge, 0.34 cfs Aug. 9, 10, 17 (gage height, 1.14 ft.).

Remarks.—City of Everett at times wastes water from filtration plant into French Creek above station causing minor regulation.

SNOHOMISH RIVER BASIN

French Creek near Monroe, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										3.07	1.11	1.05	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										0.53	0.53	0.76	

Pilchuck River below Worthy Creek, near Granite Falls, Wash.

Location.—Lat. 48°01'20", long. 121°53'10", in SE¼ sec. 3, T. 29 N., R. 7 E., on right bank, three-quarters of a mile downstream from Worthy Creek, and 5½ miles south-east of Granite Falls.

Drainage area.—41.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 500 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 294 cfs June 30 (gage height, 3.46 ft.), from rating curve extended above 140 cfs; minimum, 40 cfs Sept. 2, 3, 29 (gage height, 1.65 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										123	52.6	56.9	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										66	41	40	

Pilchuck River near Granite Falls, Wash.

Location.—Lat. 48°03'15", long. 121°57'25", in SE¼ sec. 30, T. 30 N., R. 7 E., on right bank, 200 ft. upstream from county road bridge, and 2 miles southeast of Granite Falls.

Drainage area.—53.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 340 ft. (from topographic map). May 31 to Oct. 12, 1911, staff gage at different datum. Jan. 14, 1943, to July 9, 1946, staff gage at present datum.

Average discharge.—10 years (1943-53), 332 cfs.

Extremes.—1911, 1943-53: Maximum discharge, 10,500 cfs Oct. 25, 1945 (gage height, 10.4 ft., from graph based on gage readings), from rating curve extended above 4,100 cfs on basis of slope-area determination at gage height 8.00 ft.; minimum, 27 cfs Oct. 19, 20, 1952; minimum gage height, 1.89 ft. Aug. 23, 24, 1945.

Remarks.—City of Snohomish diverts about 5 cfs, 5 miles above station, for municipal use. Slight regulation at low flow; cause unknown.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....									172	91.0	53.4	239	.....
1943.....				255*	447	314	362	392	199	108	51.8	40.2	.....
1944....	181	195	408	292	204	321	309	428	170	54.7	53.9	259	245
1945....	172	352	312	766	478	487	409	886	162	72.0	55.3	304	345
1946....	542	645	357	560	579	688	336	229	407	152	58.7	61.9	375
1947....	343	455	733	593	535	282	472	170	294	103	57.0	131	346
1948....	446	660	608	475	516	359	471	454	321	144	150	214	403
1949....	235	554	509	178	550	547	342	321	151	151	90.6	132	312
1950....	386	517	721	455	775	739	550	321	290	143	97.0	36.0	422
1951....	331	488	525	573	729	394	273	227	120	45.6	32.6	79.4	316
1952....	437	298	396	277	411	373	273	250	198	99.4	51.2*	53.9	259*
1953....	44.0	72.7	245	1,016	480	350	385	309	306	116	83.2	145	296

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....									97	54	42	42	.....
1943.....				140*	169	104	169	195	120	53	40	33	.....
1944....	33	84	97	142	142	158	152	182	82	41	37	31	31
1945....	76	122	76	191	191	178	234	191	115	55	46	51	46
1946....	50	260	115	227	236	274	218	158	158	72	50	46	46
1947....	53	140	204	148	204	175	229	98	107	64	40	54	40
1948....	62	226	274	187	142	172	292	247	169	82	78	84	62
1949....	102	156	177	94	84	301	261	145	109	78	60	44	44
1950....	82	124	217	170*	190*	294	294	225	170	95	57	41	41
1951....	70	151	290	258	217	145	151	136	59	84	28	29	28
1952....	105	137	185	108	163	178	170	156	116	52*	36	34	34
1953....	28	40	44	150	190	217	211	175	192	61	44	47	28

* Estimated.

SNOHOMISH RIVER BASIN

Pilchuck River near Granite Falls, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1911.....							
1943.....						239	178,000
1944.....	4,170	May 24, 1944	31	245	177,600	265	192,400
1945.....	8,070	Jan. 7, 1945	46	345	249,800	383	280,900
1946.....	19,500	Oct. 25, 1945	48	375	271,400	374	271,000
1947.....	6,970	Oct. 25, 1946	40	349	250,400	361	261,200
1948.....	5,380	Oct. 19, 1947	62	403	292,500	368	287,200
1949.....	4,560	Feb. 17, 1949	44	312	225,700	340	245,800
1950.....	5,420	Feb. 24, 1950	41	322	305,200	388	288,000
1951.....	6,760	Feb. 9, 1951	28	316	228,400	298	215,700
1952.....	3,420	Oct. 19, 1951	34	259	188,300	195	141,600
1953.....	5,600	Jan. 23, 1953	28	296	214,400		

Little Pilchuck Creek near Lake Stevens, Wash.

Location.—Lat. 48°02'00", long. 122°03'00", in NW¼NW¼ sec. 4, T. 29 N., R. 6 E., on right bank just downstream from highway crossing, 1½ miles northeast of Lake Stevens, and 2 miles upstream from Stevens Creek.

Drainage area.—17.5 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 200 ft. (from topographic map).

Average discharge.—6 years (1946-51, 1953), 30.9 cfs.

Extremes.—1946-51, 1953: Maximum discharge, 322 cfs Nov. 11, 1947; maximum gage height, 4.65 ft. Feb. 26, 1950; minimum discharge, 1.0 cfs Aug. 18, 24-26, 1951, Aug. 22, Sept. 9-11, 13, 15, 16, 18-22, 1953; minimum gage height, 0.70 ft. Aug. 18, 24-26, 1951.

Remarks.—Several small diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946.....										7.53	1.81	1.88	.....
1947.....	6.67	39.2	71.7	55.0	50.2	26.3	45.4	6.73	7.04	3.35	2.06	2.56	26.2
1948.....	13.9	102	82.8	62.7	67.9	41.8	43.5	45.9	24.6	6.55	3.83	4.76	41.5
1949.....	32.9	53.9	85.9	30.0*	88.4*	49.9	20.2	21.8	2.66	2.55	2.34	2.37	32.4*
1950.....	5.78	30.6	70.4	63.3*	105	82.9	41.3	12.1	4.05	2.12	1.85	1.78	34.7*
1951.....	7.50	52.0	65.1	84.8	59.4	63.4	14.4	10.4	2.72	1.38	1.29	1.76	30.7
1953.....	1.70	2.09	5.67	51.9	51.9	36.6	41.8	17.9	24.2	3.87	1.49	1.48	19.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946.....										2.0	1.4	1.6	.....
1947.....	1.9	6.2	20	14	24	14	17	2.5	2.5	2.0	1.7	1.8	1.7
1948.....	1.9	38	45	24	22	18	22	12	8.5	3.8	2.9	2.0	1.9
1949.....	7.6	16.5	20*	12*	12*	29	10.5	3.4	2.2	1.6	1.8	1.6	1.6
1950.....	2.2	3.7	21	28*	28*	34	22	5.5	2.5	1.8	1.5	1.5	1.5
1951.....	1.7	11.5	39	29	30*	26	6.6	4.3	1.4	1.2	1.0	1.3	1.0
1953.....	1.2	1.7	2.6	6.1	16	16.5	24	10	10.5	1.5	1.1	1.0	1.0

* Estimated.

Little Pilchuck Creek near Lake Stevens, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946										
1947	199	Dec. 12, 1946	1.7	26.2	1.50	29.31	18,960	32.0	25.52	23,830
1948	322	Nov. 11, 1947	1.9	41.5	2.37	32.24	30,110	39.4	30.64	23,600
1949	284	①	1.6	32.4	1.85	25.16	23,470	26.9	20.85	19,460
1950	312	Feb. 26, 1950	1.5	34.7	1.98	26.91	25,130	36.2	28.04	26,180
1951	225	Jan. 23, 1951	1.0	30.7	1.75	23.77	22,200			
1953	137	Feb. 1, 1953	1.0	19.8	1.13	15.37	14,240			

① Feb. 17 and/or Feb. 22, 1949.

Stevens Creek at Lake Stevens, Wash.

Location.—Lat. 48°01'00", long. 122°03'10", in E½ sec. 8, T. 29 N., R. 6 E., on left bank at county bridge, a third of a mile east of town of Lake Stevens, and three-quarters of a mile upstream from mouth.

Drainage area.—15.3 sq. mi.

Gage.—Staff gage. Altitude of gage is 210 ft. (from topographic map).

Extremes.—1946-50: Maximum discharge observed, 136 cfs Mar. 6, 1950 (gage height, 2.72 ft.); no flow Aug. 26 to Sept. 25, 1950.

Remarks.—Several small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										5.96	0.68	0.38	
1947	2.23	14.9	56.0	44.4	53.6	35.0	31.8	15.3	6.11	2.28	.63	.50	21.7
1948	5.13	46.6	61.3	65.8	55.7	46.7	42.6	44.3	41.6	15.3	6.39	3.64	36.2
1949	19.4	24.7	59.4	36.3	50.9	49.0	24.7	21.0	3.54	.91	.30	.16	24.1
1950	1.19	18.4	46.6	66.3	75.8	85.3	43.8	15.6	5.07	1.59	.15	.03	29.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										1.5	0.5	0.3	
1947	0.2	4.3	28	25	40	28	27	6.6	5.1	1.1	.3	.3	0.2
1948	.2	24	53	47	38	32	33	27	26	7.3	4.9	1.6	.2
1949	9.6	11.5	41	13.5	18	33	17	7.0	1.4	.3	.1	.1	.1
1950	.1	2.0	32	41	46	59	32	6.6	3.1	.7	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1946							
1947	95	Jan. 26, 1947	0.2	21.7	15,730	25.0	13,110
1948	107	Feb. 26, 1948	.2	36.2	26,260	35.4	25,710
1949	127	Feb. 22, 1949	.1	24.1	17,430	20.9	15,160
1950	136	Mar. 6, 1950	0	29.8	21,550		

SNOHOMISH RIVER BASIN

Dubuque Creek near Lake Stevens, Wash.

Location.—Lat. 47°58'25", long. 122°01'40", in NW ¼ NW ¼ sec. 22, T. 29 N., R. 6 E., on left bank, 300 ft. upstream from Panther Creek, and 2½ miles southeast of town of Lake Stevens.

Drainage area.—9.10 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 150 ft. (from topographic map).

Extremes.—1946-50: Maximum discharge, 390 cfs Feb. 22, 1949, Mar. 6, 1950, from rating curve extended above 100 cfs on basis of critical-depth determination of peak flow at gage height 4.35 ft.; maximum gage height, 4.70 ft. Nov. 11, 1947; minimum discharge, 0.2 cfs on many days during July 1949, August and September 1950.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946											0.693	0.756	
1947	3.27	25.1	39.0	37.6	36.9	12.1	26.3	3.06	2.80	0.96	.49	.70	15.5
1948	15.3	61.7	46.8	41.3	41.5	16.9	20.1	22.7	10.7	1.96	1.43	2.88	23.5
1949	11.2	29.3	34.2	12.6*	66.8	22.1	7.13	7.86	.61	.75	.47	.81	15.8*
1950	5.81	21.1	33.5	41.3*	71.1	59.5	17.6	7.17	1.80	.51	.27	.50	21.4*
1951	3.60	23.8											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946											0.53	0.57	
1947	0.7	3.5	9.8	6.0	12	6.6	8.0	1.0	0.9	0.4	.4	.4	0.4
1948	.3	14	24	11	11	4.0	10	5.0	3.0	.8	.7	.7	.3
1949	6.2	6.7	11	5.3*	5.2*	12.5	4.0	1.0	.3	.2	.3	.4	.2
1950	1.1	3.5	8.4	14*	15*	15	4.7	3.7	.8	.3	.2	.2	.2
1951	.7	2.8											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1946												
1947	200	Feb. 2, 1947	0.4	15.5	1.70	23.16	11,250	20.2	30.16	14,640		
1948	367	Nov. 11, 1947	.3	23.5	2.58	35.14	17,060	19.4	20.07	14,110		
1949	390	Feb. 22, 1949	.2	15.8	1.74	23.61	11,460	14.6	21.82	10,580		
1950	390	Mar. 6, 1950	.2	21.4	2.35	31.89	15,490					

* Estimated.

Panther Creek near Lake Stevens, Wash.

Location.—Lat. 47°59'25", long. 122°01'40", in NW¼NW¼ sec. 22, T. 29 N., R. 6 E., on right bank, 300 ft. upstream from mouth, and 2½ miles southeast of town of Lake Stevens.

Drainage area.—5.93 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 140 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 107 cfs (regulated) July 6 (gage height, 3.35 ft.); minimum, 1.1 cfs Sept. 13, Oct. 3, 4 (gage height, 1.42 ft.).

Remarks.—City of Everett frequently wastes large quantities of water into Panther Creek from their industrial water-supply pipeline several miles above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										24.3	32.3	11.0	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										3.0	3.1	1.2	

Snohomish River at Snohomish, Wash.

Location.—Lat. 47°54'40", long. 122°05'50", in SE¼ sec. 13, T. 28 N., R. 5 E., on downstream end of drawrest of bridge No. 205 on State Highway 1A in Snohomish.

Drainage area.—1,720 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 10 ft. below mean sea level, datum of 1929.

Auxiliary water-stage recorder, 2½ miles downstream from base gage.

Extremes.—1941-53: Maximum discharge, 153,000 cfs Feb. 10, 1951 (gage height, 30.12 ft., backwater from tide).

Maximum stage known, 35 ft. at base gage and 31 ft. at auxiliary gage in 1906, from flood profile furnished by Corps of Engineers.

Remarks.—Station operated for flood flows only; discharges below 10,000 cfs not generally computed. Large diurnal fluctuation because of tides; discharge computed by using fall as factor. No appreciable regulation or diversion at stages for which discharges are published.

SNOHOMISH RIVER BASIN

Snohomish River at Snohomish, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942			15,290				10,570	12,240	16,120				
1943		16,360	14,620		9,370		15,670	13,590	14,080				
1944								13,580					
1945								18,670	10,520				
1946		15,650						19,140	18,880				
1947					15,500		15,280						
1948		19,400*						21,000	25,010				
1949							12,600	21,880	14,420				
1950						18,530	13,960	15,900	23,800	14,700			
1951			19,570					14,270					
1952								15,700					
1953				30,110				14,810	13,350				

Annual Flood Peaks of Snohomish River at Snohomish, Wash.

Water year	Date	Gage height (feet)	Discharge (cfs)
1942	Dec. 19, 1941	22.80	33,400
1943	Nov. 24, 1942	25.88	56,600
1944	Dec. 3, 1943	26.90	64,600
1945	Jan. 7, 1945	26.7	61,000
1946	Oct. 25, 1945	26.27	55,800
1947	Dec. 15, 1946	†	70,900
1948	Oct. 19, 1947	27.10	58,700
1949	Nov. 24, 1948	24.79†	44,000
1950	Nov. 27, 1949	27.50†	67,000
1951	Feb. 10, 1951	30.12	153,000
1952	Oct. 4, 1951	21.43	28,800
1953	Jan. 23, 1953	28.17	65,800

† Computed by using fall obtained from stage-fall curve; only one gage operating.
 * Estimated.

Wood Creek near Everett, Wash.

Location.—Lat. 47°55'25", long. 122°11'00", on east line sec. 8, T. 28 N., R. 5 E., on left bank, 300 ft. upstream from county road crossing, and 2 miles southeast of Everett.

Drainage area.—1.96 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 25 ft. (from topographic map).

Extremes.—1946-48: Maximum discharge, 35 cfs Feb. 2, 1947 (gage height, 1.54 ft.) from rating curve extended above 9 cfs; minimum 1.8 cfs Oct. 17, 1947 (gage height 0.78 ft.), apparently result of temporary jam of small debris above gage.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										4.85	4.60	4.74	.....
1947	5.00	5.37	6.35	6.20	9.45	5.08	5.42	4.74	4.73	4.08	4.01	3.93	5.84
1948	4.38	5.07	5.68	6.45*	6.72*	6.52	6.36	7.10	5.44	4.78	6.18	4.93	5.72*

* Estimated.

Wood Creek near Everett, Wash.—Continued.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										4.6	4.4	4.6	.....
1947	4.6	4.8	5.3	5.3	5.6*	4.6	4.3	4.6	4.2	3.8	3.8	3.8	3.8
1948	3.8	4.4	4.6	4.8*	4.8*	5.8	5.8	5.8	3.8	3.8	4.8	4.6	3.8

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1946							
1947	35	Feb. 2, 1947	3.8	5.34	3,860	5.20	3,770
1948	26	Oct. 18, 1947	3.8	5.72	4,150		

* Estimated.

Allen Creek at Marysville, Wash.

Location.—Lat. 48°03'05", long. 122°09'45", in SE¼SE¼ sec. 28, T. 30 N., R. 5 E., on left bank at highway crossing, half a mile east of Marysville, and 1 mile upstream from mouth.

Drainage area.—7.93 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 15 ft. (from topographic map).

Extremes.—June to October 1946: Maximum discharge, 11 cfs June 30 (gage height, 1.32 ft.); minimum, 1.8 cfs Aug. 16, 19, 21 (gage height, 0.92 ft.).

Remarks.—Several small diversions above station for irrigation and domestic use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										3.72	2.42	2.56	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										2.1	2.0	2.4	.....

SNOHOMISH RIVER BASIN

Quilceda Creek near Marysville, Wash.

Location.—Lat. 48°06'20", long. 122°09'40", in NE¼NE¼ sec. 9, T. 30 N., R. 5 E., on right bank, 300 ft. downstream from Middle Fork, and 3½ miles north of Marysville.

Drainage area.—13.9 sq. mi.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 35 ft. (from topographic map).

Average discharge.—7 years (1946-53), 23.6 cfs.

Extremes.—1946-53: Maximum discharge, 155 cfs Feb. 22, 1949; maximum gage height, 5.72 ft. Feb. 26, 1950; minimum discharge, 2.2 cfs July 16, 1951; minimum gage height, 1.49 ft. Sept. 19, 1953.

Remarks.—Several diversions above station for irrigation and domestic use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										8.20	4.76	4.40	.....
1947	7.56	24.0	47.6	39.8	33.2	19.9	27.8	9.08	9.57	6.33	4.91	5.90	19.6
1948	12.5	49.9	57.2	48.4	50.9	31.6	33.0	38.8	23.3	11.5	8.24	7.70	31.0
1949	29.8	47.7	64.7	26.3	59.8	41.2	22.5	18.6	7.49	7.94	5.61	5.11	27.9
1950	7.20	20.6	43.1*	49.7*	64.8	49.7	31.6	14.2	9.46	6.85	4.90	4.40	25.3*
1951	13.3	37.0	46.9	62.5	48.8	56.2	17.6	13.6	6.03	3.59	3.37	4.59	26.1
1952	8.66	14.3	46.5	37.3	38.4	42.6	22.3	9.86	6.44	4.74	4.02	4.82	19.9
1953	4.06	5.79*	8.48	26.1	35.3	27.1	27.3	15.7	18.9	6.28	3.85	4.07	15.2*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946										5.5	4.1	4.1	.....
1947	4.7	8.7	17	13	19	14	15	6.1	6.1	4.7	4.4	4.7	4.4
1948	5.0	18	26	22	22	19	19	14	11	7.5	6.8	4.4	4.4
1949	8.7	20	23	13*	13	30	15	8.3	6.4	5.8	5.0	4.4	4.4
1950	4.4	5.6	16*	23*	25*	27	20	10	7.3	5.8	3.8	3.5	3.5
1951	4.4	17.5	34	22*	22*	26	12.5	5.7	4.2	2.8	2.8	3.7	2.8
1952	4.8	7.7	18.5	21*	19	18	11	7.4	5.4	4.3	3.6	3.8	3.8
1953	4.1	4.7	5.9	7.1	15	13.5	14	10	10	4.3	3.4	3.0	3.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acres-feet		Inches	Acres-feet			
1946													
1947	121	Dec. 11, 1946	4.4	19.6	1.41	19.10	14,160	22.9	22.37	16,590			
1948	135	Feb. 26, 1948	4.4	31.0	2.23	30.36	22,510	32.9	32.24	23,900			
1949	155	Feb. 22, 1949	4.4	27.9	2.01	27.23	20,170	21.9	21.39	15,840			
1950	143	Feb. 26, 1950	3.5	25.3	1.82	24.74	18,330	27.5	26.88	19,930			
1951	144	Mar. 13, 1951	2.8	26.1	1.88	25.51	18,920	23.8	23.28	17,250			
1952	128	Dec. 22, 1951	3.8	19.9	1.43	19.54	14,470	15.7	15.27	11,380			
1953	104	Feb. 3, 1953	3.4	15.2	1.09	14.88	11,050						

* Estimated.

STILLAGUAMISH RIVER BASIN

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South Fork Stillaguamish River at Silverton, Wash.

Location.—Lat. 48°04'20", long. 121°34'50", in SE¼NE¼ sec. 24, T. 30 N., R. 9 E., on right bank, just downstream from Marble Gulch, and three-quarters of a mile southwest of Silverton.

Drainage area.—38.4 sq. mi.

Gage.—Vertical staff gage. Altitude of gage is 1,450 ft. (from river profile map).

Extremes.—1929-32: Maximum discharge, 11,800 cfs Feb. 26, 1932 (gage height, 8.7 ft., from graph based on gage readings), from rating curve extended above 2,100 cfs; minimum, 24 cfs Sept. 1, 2, 1930.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929									564	212	75.9	40.3	.....
1930	111	77.8	358	125*	780	297	456	332	348	134	38.9	72.2	257*
1931	324	193	219	620	289	507	492	531	580	173	44.9	231	350
1932	266	478.	371	509	702	584	606.	625	648	459	166	115	462

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929									348	119	50	27	.....
1930	26	48	45		188	92	267	173	415	56	25	24	24
1931	43	88	76	82	88	173	228	308	285	67	32	33	32
1932	66	99	88	107		212	356	416	416	212	109	58	58

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1929													
1930				24	257	6.69	90.78	186,000	273	96.36	107,000		
1931	5,940	Jan. 27, 1931	32	350	9.11	123.84	254,000	383	135.49	278,000			
1932	11,800	Feb. 26, 1932	58	462	12.0	163.70	335,000						

* Estimated.

South Fork Stillaguamish River below Bender Creek, near Silverton, Wash.

Location.—Lat. 48°04'10", long. 121°35'50", in NW¼ sec. 24, T. 30 N., R. 9 E., on right bank, half a mile upstream from Marten Creek, and 1¼ miles west of Silverton.

Drainage area.—40.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,400 ft. (from river-profile map).

Extremes.—June to September 1950: Maximum discharge, 4,000 cfs Aug. 15 (gage height, 3.53 ft.), from rating curve extended above 1,400 cfs; minimum, 72 cfs Sept. 20, 21 (gage height, 0.18 ft.).

Remarks.—No known diversion or regulation above station.

STILLAGUAMISH RIVER BASIN

South Fork Stillaguamish River below Bender Creek, near Silverton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930										639	845	143	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										800	149	72	

South Fork Stillaguamish River near Silverton, Wash.

Location.—Lat. 48°04'00", long. 121°36'20", in SE¼ sec. 23, T. 30 N., R. 9 E., on right bank, a quarter of a mile downstream from Marten Creek, and 2 miles southwest of Silverton.

Drainage area.—44.5 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,360 ft. (from river-profile map).

Average discharge.—7 years (1910-17), 396 cfs.

Extremes.—1910-17: Maximum discharge, 7,900 cfs Nov. 18, 1911 (gage height, 8.5 ft., from graph based on gage readings), from rating curve extended above 3,300 cfs; minimum observed, 29 cfs Sept. 7, 23-26, 29, 30, 1915 (gage height, 0.70 ft.).

Remarks.—No regulation or diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910													70.5
1911	787	1,010	681	358	86.8	250	334	674	533	323	93.2	260	451
1912	125	1,130	330	572	495	127	244	553	371	239	190	188	383
1913	150	400*	209	89.2	122	189	339	741	744	585	253	173	341*
1914	240	600	300*	784	295	544	500	418	540	207	74.0	331	403*
1915	381	676	129	106	216	354	575	264	154	116	39.8	43.4	261
1916	493	427*	666	170	612	643	633	693	770	628	217	185	511*
1917	125	502	206	247	330	126	510	762	991	789	253	189	423*
1918	200	217											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910													47
1911	126	186	155	47	60	62	188	422	225	155	62	62	47
1912	47	47	80	101	126	80	126	225	188	80	60	50	47
1913	101		80	62	101	101	188	268	556	422	155	62	62
1914	126			155	101	155		155	312	90	47	35	35
1915	99	262	37	76	140	137	154	125	112	59	31	29	29
1916	48		98	60	60	98	368	465	465	306	138	77	48
1917	37	138	93	92	116	63	224			368	116	62	37
1918	50	72											

* Estimated.

South Fork Stillaguamish River near Silverton, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1911.....	7,190	Nov. 20, 1910	47	451	10.13	137.73	327,000	379	115.57	275,000
1912.....	7,890	Nov. 18, 1911	47	383	8.61	117.00	278,000	313	95.78	228,000
1913.....	.....	.....	62	341	7.66	103.98	247,000	370	112.92	268,000
1914.....	7,830	Jan. 6, 1914	35	403	9.06	122.94	292,000	407	124.08	294,000
1915.....	3,310	Nov. 8, 1914	29	261	5.87	79.73	189,000	296	90.30	214,000
1916.....	5,080	Dec. 9, 1915	48	511	11.5	156.32	371,000	447	136.80	325,000
1917.....	.....	.....	37	423	9.51	128.91	306,000	.....	.....	.....

Boardman Creek near Silverton, Wash.

Location.—Lat. 48°04'00", long. 121°40'30", in SW¼ sec. 20, T. 30 N., R. 9 E., on left bank at road crossing, 200 ft. upstream from mouth, and 5 miles west of Silverton.

Drainage area.—8.52 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,220 ft. (from river-profile map).

Extremes.—June to September 1950: Maximum discharge, 1,460 cfs Aug. 15 (gage height, 3.93 ft.), from rating curve extended above 240 cfs by logarithmic plotting; minimum, 5.4 cfs Sept. 23, 24 (gage height, 0.84 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....	221	122	66.6	30.4	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....	95	68	20	5.4	.....

Benson Creek near Granite Falls, Wash.

Location.—Lat. 48°05'30", long. 121°46'30", in NE¼ sec. 16, T. 30 N., R. 8 E., on left bank, 600 ft. upstream from mouth, and 9 miles east of Granite Falls.

Drainage area.—2.7 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 930 ft. (from river-profile map).

Extremes.—June to September 1950: Maximum discharge, 37 cfs June 22 (gage height, 1.82 ft.); minimum, 0.8 cfs Sept. 21, 22.

Remarks.—No known diversion or regulation above station.

STILLAGUAMISH RIVER BASIN

Benson Creek near Granite Falls, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950									12.6	3.95	3.24	2.42	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950									9.1	2.2	1.7	0.8	

South Fork Stillaguamish River near Granite Falls, Wash.

Location.—Lat. 48°06'10", long. 121°56'40", in SW ¼ NW ¼ sec. 8, T. 30 N., R. 7 E., on right bank, a quarter of a mile upstream from county road bridge, 1½ miles upstream from Canyon Creek, and 2 miles northeast of town of Granite Falls.

Drainage area.—119 sq. mi.

Supplemental records available.—December 1902 to July 1903, gage heights only, at Robe, 8 miles upstream.

Gage.—Water-stage recorder. Altitude of gage is 310 ft. (from river-profile map). Prior to Aug. 31, 1928, staff gage 8 miles upstream at different datum.

Average discharge.—25 years (1928-53), 1,028 cfs.

Extremes.—1928-53: Maximum discharge, 38,800 cfs Feb. 26, 1932 (gage height, 19.7 ft., from graph based on gage readings), from rating curve extended above 6,200 cfs; minimum, 55 cfs Sept. 23, 24, 1938; minimum gage height, 2.99 ft. Aug. 19-21, 1941.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928											117	153	
1929	1,220	668	724	349	183	1,010	945	1,570	1,320	375	156	99.6	721
1930	856	203	1,170	458*	2,230	980	1,060	808	796	253	91.4	231	702*
1931	917	616	789	1,690	943	1,600	1,430	1,020	1,230	340	111	738	964
1932	663	1,440	1,290	1,360	2,310	2,220	1,920	1,430	1,350	1,000	295	319	1,310
1933	1,010	3,330	1,640	1,550	560	1,260	1,130	1,570	2,010	1,190	454	1,140	1,410
1934	1,596	1,326	3,917	2,641	1,096	1,819	969	1,067	436	367	161	496	1,325
1935	1,172	2,197	1,512	2,031	1,050	898	751	1,107	1,025	610	253	368	1,160
1936	382	720	842	1,396	642	1,142	1,582	2,118	1,373	458	171	310	929
1937	247	162	2,104	246*	589	1,136	1,573	1,474	1,908	487	267	148	862*
1938	811	2,477	1,812	1,175	450	821	1,632	1,222	580	205	77.7	78.4	952
1939	857	1,379	1,838	1,926	675	902	1,319	1,631	1,166	531	201	210	1,086
1940	853	1,127	2,021	888	1,439	1,456	1,010	901	318	140	142	98.8	865
1941	1,116	1,053	1,272	968	580	514	454	988	427	146	97.7	902	711
1942	1,384	1,162	1,536	513	673	737	1,057	1,033	1,413	584	146	91.7	861
1943	431	1,779	1,468	771	1,048	1,065	1,511	1,158	994	703	217*	161	939*
1944	650	657	1,324*	960*	653*	798*	959	1,236	615*	207	131	907	739*
1945	755	1,431*	907*	2,037	1,320	1,037	915	1,598	767	300	110	640	983*
1946	1,208	1,583	1,386	1,575*	1,120	1,700	1,461	1,741*	1,628	684	230	200	1,174*
1947	1,191	1,322	2,140	1,573	1,652	982	1,452	1,042	1,056*	450*	209*	416	1,120*
1948	1,878	1,411	1,634	1,040	1,078	694	1,205	1,332	1,560	466	533	800	1,192*
1949	821	1,490	928	386	1,148	1,291	1,440	2,013	1,192	902	426	562	1,045
1950	1,360	2,114	1,918*	1,292*	1,855*	1,960	1,530	1,568	2,007	1,028	646	352	1,466*
1951	1,557	1,788	2,112	1,387	3,216	746	1,055	1,170	683	264	136	375	1,194
1952	1,009	1,043	799	697	1,178	599	1,216	1,465	1,045	509	221	177	878
1953	104	297	944	4,093	1,545	785	1,131	1,357	1,074	700	356	601	1,087

* Estimated.

South Fork Stillaguamish River near Granite Falls, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928											88	81	.....
1929	209	186	209	142	118	438	409	776	664	206	107	77	
1930	72	132	120	.....	480	282	618	414	409	132	70	68	68
1931	301	244	297	297	312	535	642	636	510	152	86	86	86
1932	186	344	348	400	293	700*	1,100	884	919	361	219	175	175
1933	131	915	393	366	234	591	659	1,020	1,310	618	227	166	131
1934	284	282	503	1,110	397	389	666	562	240	168	106	89	89
1935	120	666	666	290*	499	322	337	638	578	281	169	109	109
1946	114	209	304	390	170*	397	325	1,160	567	221	128	149	114
1937	128	109	119	160*	136	493	751	832	1,070	234	136	92	92
1938	105	493	464	473	267	421	440	586	398	98	64	56	56
1939	76	438	330	726	337	334	828	880	814	353	144	114	76
1940	112	357	515	288	505	623	542	315	149	99	82	79	79
1941	190	305	369	394	248	264	327	361	242	92	74	291	74
1942	235	235	372	274	340	303	700	536	580	221	165	78	78
1943	105	411	480	327	365	267	655	655	631	271	154	108	105
1944	114	235	256*	327	300*	270*	560*	730	310*	135	92	74	74
1945	200	300*	240*	300	296	350	494	956	490*	139	76	78	76
1946	123	692	381	520*	373	589	595	1,100*	925	342	159	128	123
1947	140	390	495	338	563	495	799	607	589	271	126	144	128
1948	164	532	516	382	257	340	560	644	788	206	241	247	164
1949	241	382	352	216	191	620	614	1,040	788	572	241	155	155
1950	257	313	350*	370*	603	662	752	888	1,040	544	316	148	148
1951	247	415	680	516	432	309	610	621	475	161	110	103	102
1952	402	358	316	207	326	312	648	689	490	257	133	108	108
1953	78	139	146	515	392	374	435	916	782	316	188	139	78

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1928										
1929	13,800	Oct. 9, 1928	77	721	6.06	82.44	523,000	640	73.02	403,000
1930	9,790	Feb. 1, 1930	68	702	5.90	80.06	509,000	756	86.17	547,000
1931	14,500	Jan. 27, 1931	86	964	8.10	109.82	693,000	1,070	122.40	778,000
1932	35,500	Feb. 28, 1932	175	1,310	11.0	149.36	952,000	1,510	172.49	1,090,000
1933	26,200	Nov. 13, 1932	131	1,410	11.8	160.69	1,020,000	1,490	169.51	1,080,000
1934	21,700	Dec. 21, 1933	89	1,325	11.1	151.05	959,200	1,156	131.93	837,000
1935	28,200	Jan. 24, 1935	109	1,160	9.75	132.35	839,900	915	104.32	692,300
1936	7,620	May 16, 1936	114	929	7.81	106.18	674,400	979	111.30	710,500
1937	17,200	Dec. 6, 1936	92	862	7.24	98.35	624,100	1,081	123.19	722,300
1938	18,700	April 18, 1938	56	952	8.00	108.57	689,200	807	98.98	628,000
1939	15,100	Oct. 12, 1938	76	1,086	9.13	123.05	786,600	1,076	122.78	779,300
1940	11,500	Dec. 15, 1939	79	865	7.27	98.99	628,400	818	93.58	594,000
1941	9,790	Oct. 10, 1940	74	711	5.97	81.09	514,600	765	87.26	553,800
1942	8,340	Dec. 19, 1941	73	861	7.24	98.25	623,700	826	94.16	597,600
1943	14,200	Nov. 23, 1942	105	939	7.89	107.17	680,100	854	97.37	618,000
1944	24,000	Dec. 3, 1943	74	759	6.38	86.76	550,600	796	91.00	577,600
1945	23,000	Jan. 7, 1945	70	983	8.26	112.07	711,300	1,079	123.10	781,300
1946	18,100	Oct. 25, 1945	123	1,174	9.87	133.87	849,500	1,210	137.98	875,600
1947	25,800	Oct. 25, 1946	128	1,120	9.41	127.76	810,900	1,147	130.83	830,400
1948	21,700	Oct. 18, 1947	164	1,192	10.0	138.34	865,400	1,045	119.52	758,600
1949	9,310	Oct. 7, 1948	155	1,045	8.78	119.23	756,700	1,226	139.89	887,800
1950			148	1,466	12.3	167.19	1,061,000	1,472	167.93	1,068,000
1951	36,500	Feb. 9, 10, 1951	103	1,194	10.0	136.16	864,200	1,025	118.94	742,300
1952	8,720	Jan. 30, 1952	108	878	7.33	100.45	637,700	707	80.88	513,400
1953	16,300	Jan. 31, 1953	78	1,087	9.13	123.99	787,000			

* Estimated.

STILLAGUAMISH RIVER BASIN

Canyon Creek near Granite Falls, Wash.

Location.—Lat. 48°07'15", long. 121°55'45", in NE¼ sec. 5, T. 30 N., R. 7 E., on left bank at Canyon Creek Lodge, 3 miles upstream from mouth, and 3 miles northeast of town of Granite Falls.

Drainage area.—56.8 sq. mi. At site December 1928 to September 1932, 58.3 sq. mi.

Supplemental records available.—September 1911 to September 1912, January to March 1913, gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 470 ft. (from topographic map). Sept. 4, 1911, to Sept. 30, 1912, Jan. 1 to Mar. 31, 1913, staff gage at practically the same site at different datum. Dec. 19, 1928, to Sept. 30, 1932, staff gage 1 mile downstream at different datum.

Extremes.—1928-32, 1950: Maximum discharge, 8,880 cfs Feb. 26, 1932 (gage height, 9.7 ft., from graph based on gage readings), from rating curve extended above 2,000 cfs; minimum observed, 32 cfs Aug. 24, to Sept. 6, 1930 (gage height, 1.38 ft., site and datum then in use).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...				184	59.8	590	465	633	476	126	65.5	46.4	.....
1930...	104	72.2	508	289	1,020	477'	412	311	293	80.8	37.8	130	307
1931...	407	312	407	918	452	768	669	353	495	132	49.3	508	457
1932...	411	667	608	749	793	1,420	1,040	631	526	494	123	117	631
1950...									560	351	254	113*	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...				90	65	240	215	295	228	70	51	39	.....
1930...	39	53	53	82	259	132	259	175	132	50	32	32	32
1931...	63	117	159	237	159	332	367	209	155	61	40	56	40
1932...	107	209	183	209	187	448	590	405	332	162	101	80	80
1950...									330	217	95	52*	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1929.....								282	65.64	204,000
1930.....	5,360	Feb. 1, 1930	32	307	5.27	71.40	222,000	343	79.93	248,000
1931.....	6,320	Jan. 27, 1931	40	457	7.84	106.50	331,000	504	117.36	365,000
1932.....	8,880	Feb. 26, 1932	80	631	10.8	147.39	458,000			
1950.....										

* Estimated.

STILLAGUAMISH RIVER BASIN

South Fork Stillaguamish River above Jim Creek, near Arlington, Wash.

Location.—Lat. 48°10'05", long. 122°04'05", in SW¼ sec. 17, T. 31 N., R. 6 E., on right bank, 2 miles upstream from Jim Creek, and 3 miles southeast of Arlington.

Drainage area.—199 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 80.00 ft. above mean sea level, datum of 1929. Prior to Dec. 31, 1936, staff gage at same site and datum.

Average discharge.—17 years (1936-53), 1,532 cfs.

Extremes.—1936-53: Maximum discharge, 27,700 cfs Feb. 9, 1951 (gage height, 27.26 ft.), from rating curve extended above 23,000 cfs; minimum, 110 cfs Sept. 23, 24, 1951; minimum gage height, 10.44 ft. Oct. 19, 20, 1952.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1937...	318*	215	3,246	393*	1,058	1,867	2,548	2,177	2,736	679	470	230	1,924*
1938...	1,272	3,850	2,334	1,963	835	1,290	2,578	1,852	774	298	145	142	1,488
1939...	1,308	2,209	2,817	3,096	1,185	1,470	1,994	2,270	1,751	1,229	301	336	1,671
1940...	1,255	1,640	2,518	1,394	2,220	2,197	1,556	1,367	509	214	218	149	1,293
1941...	1,560	1,613	1,922	1,452	882	768	668	1,420	669	222	147	1,306	1,054
1942...	1,855	1,652	2,295	876	1,095	1,152	1,014	1,539	2,109	819	225	142	1,282
1943...	671	2,816	2,431	1,326	1,775	1,559	2,237	1,752	1,376	950	292	224	1,446
1944...	903	944	1,935	1,496	1,078	1,305	1,425	1,782	956	294	205	1,284	1,134
1945...	1,057	2,103	1,377	2,996	1,905	1,539	1,450	3,308	959	414	170	991	1,438
1946...	2,017	3,556	1,949	2,208*	1,783	1,930	2,119	2,224	2,296	982	315	252	1,723*
1947...	1,739	2,030*	3,163	2,416	2,468	1,592	2,341	1,455	1,636	697	301	614	1,699*
1948...	2,771	2,795*	3,020*	1,868*	1,941*	1,217	1,906	2,952	2,249	824	808	1,260	1,968*
1949...	1,444	2,285	1,591	707	1,764	2,118	2,112	2,811	1,609	1,235	639	731	1,586
1950...	1,036	3,253*	3,036	1,995	2,920	2,983*	2,459	2,257	2,586	1,418	685	486	2,203*
1951...	2,138	2,627	3,286	2,538	4,224	1,321	1,721	1,724	1,050	383	169	459	1,785
1952...	2,385	1,564	1,272	1,148*	1,823	1,027	1,602	2,037	1,491	719	320	305	1,332*
1953...	259	453	1,473	5,733	2,469	1,313	1,843	2,071	1,615	930	500	818	1,621

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1937...	162	142	145	220	220	825	1,260	1,350	1,530	313	196	162	142
1938...	166	777	832	868	617	677	758	614	616	170	129	117	117
1939...	146	818	561	1,340	623	594	1,200	1,240	1,200	522	216	196	146
1940...	206	523	904	517	823	1,060	896	490	228	152	127	114	114
1941...	174	512	634	705	420	420	496	496	364	141	114	454	114
1942...	368	377	647	463	415	496	1,100	574	825	360	154	118	118
1943...	139	759	902	640*	664	479	1,040	1,040	888	385	215	166	139
1944...	169	340	414	583	571	508	880	1,040	523	199	143	122	122
1945...	391	431	398	559	553	559	880	1,330	621	219	115	112	112
1946...	215	1,300	640*	800*	700*	1,030	998	1,440	1,300	490	212	159	159
1947...	187	860*	513	596	927	825	1,390	907	881	392	201	230	187
1948...	251	900*	900*	771	540*	691	955	1,040	1,300	479	359	392	251
1949...	438	702	705	375	325	1,050	1,050	1,070	787	349	219	219	219
1950...	329	450*	913	708	1,100*	1,150*	1,110	1,320	1,550	501	443	210	210
1951...	358	646	1,280	1,150	850	472	1,020	955	708	216	117	114	114
1952...	670	574	500*	370*	574	546	1,120	1,030	736	373	201	185	185
1953...	139	243	240	855	643	637	733	1,290	1,120	427	268	228	139

* Estimated.

South Fork Stillaguamish River above Jim Creek, near Arlington, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1937			142	1,324	6.65	90.19	958,600	1,669	113.63	1,208,000	
1938	20,700	April 17, 1938	117	1,488	7.48	101.42	1,077,000	1,854	92.47	950,500	
1939	17,500	Oct. 12, 1938	146	1,671	8.40	114.07	1,210,000	1,620	110.54	1,173,000	
1940	13,100	Dec. 15, 1939	114	1,293	6.50	88.45	939,000	1,241	84.83	901,000	
1941	13,500	Oct. 10, 1940	114	1,054	5.30	71.87	762,900	1,114	75.96	806,200	
1942	11,700	Dec. 19, 1941	118	1,282	6.44	87.44	927,700	1,288	87.89	932,700	
1943	17,500	Oct. 31, 1942	139	1,446	7.27	95.62	1,047,000	1,269	86.59	919,000	
1944	21,800	Dec. 3, 1943	122	1,134	5.70	77.58	823,300	1,195	81.74	867,500	
1945	23,200	Jan. 7, 1945	112	1,438	7.23	98.12	1,041,000	1,608	109.70	1,164,000	
1946	22,600	Oct. 25, 1945	159	1,723	8.66	117.51	1,247,000	1,757	119.82	1,272,000	
1947	25,500	Oct. 25, 1946	187	1,699	8.54	115.88	1,230,000	1,838	125.36	1,330,000	
1948	22,900	Oct. 19, 1947	251	1,966	9.89	134.61	1,429,000	1,692	115.75	1,228,000	
1949	13,700	Nov. 23, 1948	219	1,586	7.97	106.20	1,148,000	1,830	124.84	1,325,000	
1950	20,900	Dec. 28, 1949	210	2,203	11.1	150.30	1,595,000	2,186	149.13	1,583,000	
1951	27,700	Feb. 9, 1951	114	1,785	8.97	121.79	1,293,000	1,552	105.88	1,124,000	
1952	12,700	Jan. 30, 1952	185	1,332	6.69	91.11	967,100	1,078	73.72	782,500	
1953	20,300	Jan. 31, 1953	139	1,621	8.15	110.57	1,173,000				

Jim Creek near Oso, Wash.

Location.—Lat. 48°12'30", long. 121°55'40", in NE¼ sec. 5, T. 31 N., R. 7 E., on left bank, three-quarters of a mile upstream from Cub Creek, and 4 miles south of Oso.

Drainage area.—10 sq. mi., approximately. At site September 1947 to October 1948, 8.0 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. (from topographic map). Sept. 10, 1947, to Oct. 25, 1948, water-stage recorder at site three-quarters of a mile upstream at different datum.

Extremes.—1947-49: Maximum discharge not determined, known to have been considerably higher than 1,500 cfs Dec. 28, 1949; minimum recorded, 5.7 cfs Sept. 12-14, 1949.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948	115	159	143	103	82.3	47.6	90.1	159	86.5	25.7	35.5	53.4	91.6
1949	108*					133	122	160	63.8	45.1	16.1	13.7	
1950	48.3*	92.8	257										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948	10	40	31	26	12	18	34	48	34	8	10	15	8
1949	22*					49	50	67	39	23	9.2	5.7	
1950	10*	25*	117										

* Estimated.

STILLAGUAMISH RIVER BASIN

Jim Creek near Oso, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1948.....			8	91.6	11.4	155.84	68,500			
1949.....										
1950.....										

Cub Creek near Oso, Wash.

Location.—Lat. 48°12'20", long. 121°56'10", in N½ sec. 5, T. 31 N., R. 7 E., on right bank, three-quarters of a mile upstream from mouth, and 4½ miles south of Oso.

Drainage area.—8.7 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 610 ft. (from topographic map).

Extremes.—1949-50: Maximum discharge, 1,030 cfs Dec. 28, 1949 (gage height, 5.50 ft.); minimum, 2.0 cfs July 6-9, 1949; minimum gage height, 0.93 ft. July 26, 1950.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....							33.0	32.2	5.69	7.03	5.18	4.66	
1950.....	21.8	56.1	108	67.9*	114*	87.0*	59.9*	23.5	16.6	5.97	5.96	4.85	47.2*
1951.....	37.6	67.9	75.5*										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....							16*	10	2.4	2.2	3.6	2.4	
1950.....	3.8	10	27	21*	50*	40*	22	17	9.2	2.6	3.4	3.0	2.6
1951.....	6.0	23	40*										

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1949.....										
1950.....	1,030	Dec. 28, 1949	2.6	47.2	6.43	73.71	34,200	46.0	71.76	33,310

* Estimated.

STILLAGUAMISH RIVER BASIN

311

Jim Creek near Arlington, Wash.

Location.—Lat. 48°10'25", long. 122°04'05", in W½ sec. 17, T. 31 N., R. 6 E., on right bank at abandoned bridge, 1¼ miles upstream from mouth, and 3 miles southeast of Arlington.

Drainage area.—48.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from river-profile map).

Average discharge.—15 years (1937-51, 1952-53), 198 cfs.

Extremes.—1937-53: Maximum discharge, 4,730 cfs Dec. 28, 1949 (gage height, 9.28 ft.), from rating curve extended above 1,900 cfs; minimum, 5.9 cfs Sept. 16, 1943 (gage height, 0.62 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938...	144	588	431	320	163	185	325	197	42.6	15.0	9.23	7.89	202
1939...	95.2	322	401	557	305	230	192	144	148	73.7	17.2	19.5	208
1940...	132	231	394	243	385	390	210	142	28.1	12.7	14.7	12.1	182
1941...	118	252	310	235	115	95.8	74.2	151	81.4	23.6	13.1	90.9	130
1942...	149	250	393	172	225	181	187	181	280	61.0	21.4	13.0	176
1943...	48.5	396	399	260*	347	152	209	152	102	54.9	18.0	10.7	178*
1944...	108*	115*	196*	250	210	178	191	191	94.0	20.1	14.4	109	139*
1945...	116	367	192	409*	255*	275	253	204	66.0	19.7	14.1	109	190*
1946...	323*	447	270*	413*	355	380	259	169	193	82.9	23.8	22.1	244*
1947...	206	302	472	375	342	207	258	82.7	141	65.2	28.4	73.6	215
1948...	270	420	414	294	351	209	255	358	186	75.2	70.5	111	252
1949...	236	365	385	132*	380	341	232	260	81.5	69.3	34.5	33.8	213*
1950...	131	343	526	340*	565	471	344	166	133	57.9	37.1	27.6	262*
1951...	216	345	429	427	443	275	169	140	50.9	13.7	9.83	21.4	210
1953...	22.5	44.4	180	595	349*	203	211	181	149	50.0	39.5	65.0	172*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938...	22	143	134	132	102	82	115	63	23	6.8	6.6	6.4	6.4
1939...	12	130	87	305	140	146	127	82	92	25	13	14	12
1940...	15	93	179	104	124	123	103	36	13	8.3	9.8	9.6	8.3
1941...	13	91	120	153	62	57	38	37	42	14	9.0	30	9.0
1942...	54	53	113	84	73	98	86	84	68	32	14	10	10
1943...	13	122	142	130*	136	60	94	90	71	20	13	6.3	6.3
1944...	9.0*	49*	60*	130	122	84	122	99	36	14	10	9.3	9.0*
1945...	42	86	70*	92	88	111	175	107	32	12	9.6	13	9.6
1946...	32*	270	110*	150*	179	219	177	94	81	31	18	16	16
1947...	22	118	131	88	141	108	141	38	38	27	17	22	17
1948...	25	157	174	116	84	103	190	154	88	37	30	41	25
1949...	62	124	165	60*	55*	167	147	90	50	34	20	14	14
1950...	25	54	137	110*	200*	238	126	128	104	27	12.5	7.3	7.3
1951...	25	124	210	180*	143	97	90	71	17*	9.3	7.2	7.3	7.2
1953...	13	26	27	106	120*	115*	131	101	98	21	13	20	13

* Estimated.

STILLAGUAMISH RIVER BASIN

Jim Creek near Arlington, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1938.....	3,340	Dec. 28, 1937	6.4	202	4.13	56.10	146,300	174	48.20	125,700
1939.....	2,040	Jan. 1, 1939	12	208	4.25	57.85	150,800	203	56.47	147,200
1940.....	1,620	Mar. 30, 1940	8.3	162	3.72	50.58	131,900	175	48.75	127,100
1941.....	2,470	Nov. 29, 1940	9.0	130	2.66	36.13	94,240	140	38.77	101,100
1942.....	1,680	June 15, 1942	10	176	3.60	48.73	127,100	150	49.88	130,000
1943.....	1,660	Nov. 15, 1942	6.3	178	3.04	49.38	126,800	143	39.60	103,300
1944.....	1,570	①	9.0	139	2.84	38.78	101,100	160	44.59	116,300
1945.....	2,750	Jan. 7, 1945	9.6	190	3.69	52.60	137,300	220	61.22	159,600
1946.....	1,060	②	16	244	4.99	67.76	176,700	239	66.22	172,700
1947.....	3,690	Oct. 25, 1946	17	215	4.40	59.55	155,300	224	62.30	162,500
1948.....	2,960	Oct. 19, 1947	25	252	5.15	70.04	182,700	243	67.74	176,700
1949.....	3,030	Oct. 4, 1948	14	213	4.36	59.13	154,300	213	59.04	154,000
1950.....	4,780	Dec. 28, 1949	7.3	262	5.36	72.85	190,000	261	72.58	189,300
1951.....	2,820	Feb. 10, 1951	7.2	210	4.29	58.42	152,300	.....	.....	.....
1953.....	1,940	Jan. 31, 1953	13	172	3.52	47.76	124,600	.....	.....	.....

① Probably Dec. 3, 1943. ② Probably Oct. 25, 1945.

South Fork Stillaguamish River near Arlington, Wash.

Location.—Lat. 48°11'40", long. 122°05'45", in NW¼ sec. 7, T. 31 N., R. 6 E., near left bank on logging railroad bridge 1½ miles downstream from Jim Creek, 1½ miles southeast of Arlington, and 2½ miles upstream from confluence with North Fork.

Drainage area.—254 sq. mi.

Gage.—Staff gage. Altitude of gage is 70 ft. (from river-profile map).

Average discharge.—8 years (1928-36), 1,790 cfs.

Extremes.—1928-36: Maximum discharge, 39,000 cfs Feb. 26, 1932 (gage height 15.2 ft., from graph based on gage readings), from rating curve extended above 13,000 cfs; minimum observed, 108 cfs Sept. 6, 1930; minimum gage height, 1.70 ft. Nov. 2-4, 1936.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	1,880*	1,080*	1,360*	702	451	1,940	1,660	2,550	1,910	567	244	174	1,220*
1930...	379	357	2,040	939	3,610	1,790	1,710	1,320	1,210	371	155	425	1,170
1931...	1,480	1,100	1,310	3,250	1,660	3,020	2,450	1,440	1,960	499	182	1,370	1,640
1932...	1,400	2,150	2,180	2,840	3,280	4,520	3,250	2,220	2,020	1,420	433	424	2,170
1933...	1,443	5,396	3,525	3,068	1,314	2,531	1,909	2,680	3,236	1,737	655	1,440	2,415
1934...	2,439	2,471	5,729	4,193	1,741	2,760	1,635	1,517	612	464	196	649	2,043
1935...	1,553	4,160	2,857	4,842	2,196	1,905	1,469	1,823	1,501	895	392	559	2,012
1936...	582	1,252	1,368	3,118	1,399	2,260	2,679	3,498	2,181	653	266	483	1,647
1937...	374	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

STILLAGUAMISH RIVER BASIN

South Fork Stillaguamish River near Arlington, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929				306	257	850	895	1,100	1,040	292	166	141	.....
1930	143	222	201	.....	1,120	585	1,020	690	620	193	117	108	108
1931	238	402	625	625	595	960	1,150	870	710	238	149	140	149
1932	290	790	670	960	710	1,530	1,910	1,440	1,330	580	308	236	236
1933	159	1,200	970	920	470	1,280	1,170	1,790	1,920	875	310	255	159
1934	373	565	875	1,780	670	670	970	790	290	225	135	110	110
1935	163	1,280	1,280	605	1,180	760	760	1,150	890	420	268	220	163
1936	208	305	475	900	422	900	640	1,830	800	306	219	246	208
1937	219												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minim-um day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1929				1,220	4.80	64.94	881,000	1,090	58.05	787,000
1930	14,600	Feb. 1, 1930	108	1,170	4.61	62.80	850,000	1,270	67.75	918,000
1931	19,700	Jan. 27, 1931	149	1,640	6.46	87.51	1,190,000	1,800	95.99	1,300,000
1932	39,000	Feb. 26, 1932	236	2,170	8.54	116.51	1,550,000	2,560	137.06	1,860,000
1933	32,600	Nov. 13, 1932	159	2,415	9.51	129.94	1,748,000	2,446	130.80	1,770,000
1934	26,400	Dec. 21, 1933	110	2,043	8.04	109.20	1,479,000	1,863	99.46	1,348,000
1935	33,100	Jan. 24, 1935	163	2,012	7.92	107.55	1,457,000	1,564	83.63	1,132,000
1936	11,200	May 16, 1936	208	1,647	6.48	88.29	1,196,000			
1937										

Squire Creek near Darrington, Wash.

Location.—Lat. 48°16'15", long. 121°40'00", in SE¼ sec. 8, T. 32 N., R. 9 E., on left bank, 150 ft. upstream from road crossing, a third of a mile upstream from Ashton Creek, and 3½ miles northwest of Darrington.

Drainage area.—18.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 490 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 6,440 cfs Feb. 10, 1951 (gage height, 10.52 ft.), from rating curve extended above 700 cfs by logarithmic plotting; minimum, 7.3 cfs Oct. 20-24, 1952 (gage height, 0.57 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950									361	247	136	62.3	.....
1951	271	310	426	213	548	104	167	251	193	78.9	31.0	66.6	218
1952	254	160	125	83.6	183	83.0	183	230	205	127	46.5	30.9	143
1953	19.7	89.3	136	639	275	104	153	202	174	174	72.6	107	174

STILLAGUAMISH RIVER BASIN

Squire Creek near Darrington, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950									191	138	67	30	
1951	40	81	130	89	83	53	112	104	155	43	21	13	13
1952	71	56	44	29	62	55	98	131	106	66	25	15.5	15.5
1953	7.3	9.6	10.5	84	77	61	72	121	136	80	44	21	7.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950													
1951	6,440	Feb. 10, 1951	13	218	11.6	157.65	158,100	178	128.68	129,000			
1952	1,450	Oct. 3, 1951	15.5	143	7.61	103.39	103,700	114	82.57	82,760			
1953	3,290	Jan. 11, 1953	7.3	174	9.26	125.95	126,300						

North Fork Stillaguamish River near Darrington, Wash.

Location.—Lat. 48°16'40", long. 121°42'00", in NW¼ sec. 7, T. 32 N., R. 9 E., in upstream side of left bank bridge pier of county road bridge, 1 mile downstream from Squire Creek, and 5 miles northwest of Darrington.

Drainage area.—82.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 410 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 15,500 cfs Feb. 10, 1951 (gage height, 10.63 ft.), from rating curve extended above 4,200 cfs by logarithmic plotting; minimum, 28 cfs Oct. 18-24, 1952 (gage height, 0.86 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										621	286	140	
1951	871	1,134	1,454	742	1,760	478	816	787	466	165	63.1	134	732
1952	702	512	468	356	788	296	759	787	467	235	91.9	70.4	459
1953	48.3	88.2	457	2,210	977	418	539	614	436	296	122	197	533

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										304	133	65	
1951	102	352	508	332	375	226	498	455	310	87	43	39	39
1952	243	222	190	110	220	185	396	466	275	151	61	43	43
1953	28	40	42	303	273	232	250	381	327	137	88	49	28

North Fork Stillaguamish River near Darrington, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acro-feet		Inches	Acro-feet	
1950.....											
1951.....	15,500	Feb. 10, 1951	39	732	8.21	120.86	529,800	583	96.20	421,700	
1952.....	4,320	Jan. 30, 1952	43	459	5.58	76.05	333,400	368	60.88	267,300	
1953.....	11,800	Jan. 31, 1953	28	533	6.48	87.97	385,500				

Boulder River near Oso, Wash.

Location.—Lat. 48°16'45", long. 121°46'45", in NW¼ sec. 9, T. 32 N., R. 8 E., on left bank at county road crossing, a third of a mile upstream from mouth, and 7 miles east of Oso.

Drainage area.—27.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 340 ft. (from topographic map).

Extremes.—June to September 1950: Maximum discharge, 1,410 cfs Aug. 15 (gage height, 4.90 ft.), from rating curve extended above 400 cfs; minimum, 48 cfs Sept. 20 (gage height, 1.18 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950.....								392	279	176	91.4		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950.....								226	179	91	49		

STILLAGUAMISH RIVER BASIN

Deer Creek at Oso, Wash.

Location.—Lat. 48°17'00", long. 121°55'45", in SE¼ sec. 5, T. 32 N., R. 7 E., on left bank, 1 mile north of Oso, and 1¼ miles upstream from mouth.

Drainage area.—71 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 220 ft. (from river-profile map). Aug. 11, 1917, to Sept. 30, 1930, water-stage recorder half a mile upstream at different datums.

Average discharge.—13 years (1917-30), 493 cfs.

Extremes.—1917-30, 1950: Maximum discharge, 10,400 cfs Dec. 12, 1921 (gage height, 11.7 ft., from high-water mark, site and datum then in use), from rating curve extended above 1,700 cfs; minimum, 18 cfs Sept. 5, 1930 (gage height, 0.18 ft., site and datum then in use).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1917												120	
1918	153	405	2,170	1,110	634	618	535	564	374	103	182	44.3	579
1919	651	700	1,090	850*	470	430	532	711	350	126	41.0	58.1	526*
1920	127	982	783	1,150	281*	555	453	502	386	75.2	65.8	886	520*
1921	919	562	745	776	1,020	512	554	667	654	160	71.4	354	582
1922	792	1,050	1,060	262*	194*	235	623	1,040	715	109	123	314	544*
1923	445	294	1,020	1,150	255	371	623	651	463	103	40.8	66.4	462
1924	136	495	835*	672	1,310	232	446	366	168	61.4	82.2	194	417*
1925	860	782*	1,140	1,060	973	443	676	595	324	75.0	58.2	32.1	609*
1926	251	463	1,260	575	735	479	308	418	94.5	30.3	101	338	419
1927	854	609	805	651	680	429	492	857	613	126	77.6	318	544
1928	769	1,140*	449	1,170	349	731	549	545	253	77.9	32.7	35.2	510*
1929	595	331	422	210	98.0	572	536	824	497	88.8	49.6	31.1	372
1930	98.0	75.9	592	250*	1,270	537	501	335	195	53.2	24.8*	114	331*
1950										419	258	199	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1917												49	
1918	57	104	206	396		104	272	302	120	58	37	31	31
1919	33	219	212		174	208	329	339	161	54	32	27	27
1920	34	229			59		280	298	178	41	29	37	29
1921	216	92	216	228	196	195	217	376	304	64	41	61	41
1922	78	219						362	263	54	45	72	45
1923		116		126	83	181	391	410	190	46	34	28	28
1924	46	60	223		419	111	175	175	60	45	36	35	35
1925	143		212	230*	64	175	239	425	147	40	30	25	25
1926	22	85	204	150	323		181	156	41	23	19	34	19
1927	227	139	206	192	146	235	202	420	245	47	32	56	32
1928	218		82	148	166	155	317	245	109	45	25	22	22
1929	96	87	99		61	227	199	405	170	50	29	23	23
1930	28	40	45		217	134	248	169		33*	20	18	18
1950										166	78	38	

* Estimated.

Deer Creek at Osó, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1917.....										
1918.....	9,300	Dec. 18, 1917	31	579	8.15	110.75	410,000	551	105.40	399,000
1919.....	7,850	Dec. 4, 1918	27	526	7.41	100.73	351,000	479	91.55	347,000
1920.....	8,490	Nov. 15, 1919	20	520	7.32	99.69	378,000	550	105.37	399,000
1921.....	7,230†	Feb. 10, 1921	41	582	8.20	111.30	421,000	633	122.08	462,000
1922.....	10,460	Dec. 12, 1921	45	544	7.66	104.09	394,000	450	85.89	324,000
1923.....	7,230	Oct. 25, 1922	28	462	6.51	88.26	334,000	440	84.18	319,000
1924.....	8,490	Feb. 11, 1924	35	417	5.87	80.01	303,000	523	100.39	380,000
1925.....	7,230	Dec. 10, 1924	25	609	8.58	116.43	441,000	541	103.41	392,000
1926.....	6,170	Dec. 23, 1925	19	419	5.90	50.26	304,000	444	84.03	322,000
1927.....	5,640	Oct. 16, 1926	32	544	7.66	104.04	394,000	551	105.31	399,000
1928.....	7,290	Jan. 12, 1928	22	510	7.18	97.69	370,000	442	84.84	321,000
1929.....	6,030	Nov. 9, 1928	23	372	5.24	71.18	270,000	307	58.73	222,000
1930.....	5,640	Dec. 13, 14, 1929	18	331	4.66	63.27	239,000			
1950.....										

† Maximum recorded.

North Fork Stillaguamish River near Arlington, Wash.

Location.—Lat. 48°15'40", long. 122°02'50", in SE¼NW¼ sec. 16, T. 32 N., R. 6 E., on right bank, 6 miles northeast of Arlington, 7 miles upstream from mouth, and 8 miles downstream from Deer Creek.

Drainage area.—269 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 89.34 ft. above mean sea level, datum of 1929.

Average discharge.—25 years (1928-53), 1,732 cfs.

Extremes.—1928-53: Maximum discharge, 30,600 cfs Feb. 9, 1951 (gage height, 13.30 ft.); maximum gage height, 13.46 ft. Feb. 10, 11, 1951; minimum discharge, 117 cfs Sept. 23, 1938; minimum gage height, 0.97 ft. Sept. 10, 12, 1944.

Remarks.—No known diversion or regulation above station.

STILLGUMISH RIVER BASIN

North Fork Stillgumish River near Arlington, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928											235	256	
1929	1,750	1,470	1,300	783	467	1,900	1,830	2,840	1,730	559	305	222	1,230
1930	334	268	1,770	929	3,620	1,730	1,970	1,100	956	381	212	363	1,120
1931	1,310	1,050	1,330	3,370	1,940	2,850	2,700	1,530	1,590	602	240	1,290	1,050
1932	1,330	2,360	2,370	2,450	3,230	4,170	3,390	2,210	1,930	1,460	483	359	2,140
1933	1,290	5,180	3,100	2,840	1,290	2,840	1,960	2,570	2,830	1,640	621	1,310	2,270
1934	2,635	2,068	5,734	4,455	1,928	2,692	1,736	1,534	643	713	330	566	2,068
1935	1,385	3,439	2,547	4,655	2,326	1,697	1,263	1,618	1,324	620	383	568	1,824
1936	553	1,132	1,394	2,839	1,232	2,200	2,330	2,940	2,014	659	299*	442	1,506*
1937	321	223	2,950	434*	1,110	2,101	2,698	2,243	2,793	715	470	302	1,308*
1938	1,217	4,216	3,644	2,643	1,050	1,735	2,890	2,009	789	332	166	140	1,739
1939	1,134	2,304	3,072	3,488	1,545	1,725	2,116	2,175	1,568	989	351	315	1,731
1940	1,146	2,071	3,797	1,873	2,671	2,323	1,659	1,532	525	290	266	216	1,571
1941	1,651	1,719	2,369	1,852	1,190	985	812	1,473	706	336	225	1,345	1,223
1942	1,997	2,168	3,225	1,189	1,343	1,355	1,607	2,243	2,326	349	329	205	1,510
1943	728	3,185	3,015	1,740	2,209	1,685	2,922	1,991	1,723	1,020	369	255	1,725
1944	658	994	2,104	2,298	1,543	1,574	1,575	1,733	911	359	252	1,187	1,282
1944	1,076	2,341	1,629	3,464	2,204	1,788	1,771	2,691	997	496	308	568	1,624
1946	2,275	2,988	2,809	2,673	2,270	2,512	2,648	2,764	2,554	1,111	436	370	2,073
1947	1,682	1,679*	3,611	3,115	3,065	1,922	2,489	1,512	1,542	788	387	719	1,898*
1948	2,892	2,992	3,219	2,204	1,932	1,463	1,932	3,356	2,347	336	327	1,191	2,093
1949	1,581	2,736	1,895	571	2,227	2,663	2,547	3,638	1,320	1,192	636	677	1,574
1950	1,868	3,572	3,606	2,323*	3,396	3,426	2,645	2,453	3,088	1,522	588	573	2,439*
1951	2,493	3,161	4,368	2,493	4,826	1,558	1,996	2,055	1,079	489	271	415	2,084
1952	2,509	1,858	1,807	1,394	2,555	1,317	2,221	2,247	1,438	669	379	409	1,565
1953	283	447	1,080	5,852	3,196	1,554	1,827	2,087	1,526	918	492	672	1,703

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928											203	176*	
1929	484	373	434		325	1,100	890	1,350	950	350	240	193	193
1930	101	203	216	350	1,340	674	1,060	745	650	293	178	163	163
1931	236	457	614	614	810	1,160	1,300	920	705	307	178	167	167
1932	355	732	755	633	640	1,580	2,060	1,540	1,400	637	361	232	232
1933	185	1,800	572	1,000		1,480	1,200	1,740	1,090	910	368	301	185
1934	457	620	910	2,250	638	755	1,070	848	432	334	267	250	250
1935	265	1,280	1,420	820	1,200	785	718	1,030	762	454	297	225	225
1936	236	347	615	880	475	855	736	2,000	880*	377	220*	248	220*
1937	181	160	167	340*	340*	970	1,500	1,500	1,030	405	306	234	160
1938	243	965	1,100	1,140	620	930	1,040	1,000	530	204	133	123	123
1939	139	688	620	1,670	880	808	1,400	1,300	1,060	510	279	225	189
1940	217	785	1,350	725	1,140	1,320	971	572	337	251	210	194	194
1941	199	640	908	962	576	597	576	555	458	236	191	440	191
1942	511	500	972	676	590	609	1,150	945	1,000	452	257	173	173
1943	200	792	1,270	816	866	632	1,340	1,750	1,190	484	286	210	200
1944	199	414	488	836	712	644	1,020	1,110	504	279	215	193	193
1945	397	601	488	659	760	666	1,180	1,660	644	356	265	263	263
1946	343	1,350	736	1,140	810	1,400	1,360	1,870	1,600	630	336	258	256
1947	237	450*	900	615	1,280	1,150	1,530	960	840	454	294	300	237
1948	333	1,320	1,120	990	662	900	1,120	1,360	1,390	560	495	520	333
1949	672	990	960	565	530	1,420	1,390	1,030	1,250	870	454	318	318
1950	472	955	1,060	800*	1,130*	1,670	1,470	1,590	1,040	860	500	282	282
1951	439	1,060	1,760	1,240	950	640	1,140	1,140	714	346	207	172	172
1952	604	798	768	515	905	780	1,480	1,330	835	442	274	264	264
1953	200	257	282	1,050	1,010	943	929	1,330	1,160	495	380	297	200

* Estimated.

North Fork Stillaguamish River near Arlington, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1928												
1929	14,300	Oct. 9, 1928	192	1,230	4.57	61.88	889,000	1,050	62.85	759,000		
1930	12,800	Feb. 5, 1930	163	1,120	4.16	56.74	513,000	1,240	62.49	895,000		
1931	22,100	Jan. 23, 1931	167	1,650	6.13	83.30	1,200,000	1,850	93.19	1,340,000		
1932	27,700	Feb. 26, 1932	232	2,140	7.96	108.44	1,560,000	2,430	122.68	1,760,000		
1933	24,600	Nov. 13, 1932	185	2,270	8.44	114.47	1,640,000	2,350	118.78	1,700,000		
1934	21,100	Dec. 21, 1933	250	2,038	7.76	105.37	1,512,000	1,822	91.99	1,319,000		
1935	22,600	Jan. 24, 1935	225	1,824	6.78	92.06	1,320,000	1,466	73.97	1,061,000		
1936	10,800	Jan. 4, 1936	220	1,505	5.59	76.27	1,093,000	1,543	78.19	1,120,000		
1937	12,000	Dec. 13, 1936	160	1,368	5.09	69.07	990,500	1,231	92.39	1,328,000		
1938	22,300	Dec. 28, 1937	123	1,739	6.46	87.66	1,259,000	1,529	76.93	1,105,000		
1939	15,400	Jan. 1, 1939	139	1,731	6.43	87.35	1,253,000	1,774	89.57	1,285,000		
1940	12,600	Dec. 15, 1939	194	1,571	5.84	79.53	1,141,000	1,484	74.10	1,035,000		
1941	9,760	Oct. 10, 1940	191	1,223	4.55	61.71	535,400	1,362	68.73	968,100		
1942	14,200	Dec. 19, 1941	173	1,510	5.61	76.20	1,093,000	1,468	74.07	1,093,000		
1943	17,000	Nov. 23, 1942	200	1,725	6.41	87.07	1,249,000	1,479	74.65	1,071,000		
1944	19,200	Dec. 3, 1943	193	1,282	4.77	64.89	930,900	1,862	68.94	989,000		
1945	21,800	Jan. 7, 1945	263	1,624	6.04	81.97	1,176,000	1,845	93.13	1,336,000		
1946	23,600	Oct. 25, 1945	258	2,073	7.71	104.63	1,501,000	2,023	102.12	1,465,000		
1947	27,500	①	237	1,866	6.94	94.15	1,351,000	2,038	102.86	1,478,000		
1948	21,000	Oct. 19, 1947	333	2,093	7.78	105.98	1,519,000	1,856	93.89	1,347,000		
1949	12,600	Feb. 17, 1949	318	1,374	6.97	94.56	1,357,000	2,112	106.60	1,529,000		
1950	25,000	Dec. 28, 1949	282	2,439	9.07	123.07	1,765,000	2,524	127.38	1,827,000		
1951	30,600	Feb. 9, 1951	172	2,034	7.75	105.18	1,509,000	1,760	88.80	1,274,000		
1952	13,600	Jan. 30, 1952	264	1,565	5.82	79.21	1,136,000	1,250	63.26	907,600		
1953	23,500	Jan. 31, 1953	200	1,703	6.33	85.94	1,233,000					

① Probably Jan. 24, 1947.

Armstrong Creek near Arlington, Wash.

Location.—Lat. 48°13'15", long. 122°08'00", in NW¼ sec. 35, T. 32 N., R. 5 E., on right bank at Northern Pacific Railway culvert, 1 mile north of Arlington.

Drainage area.—7.33 sq. mi.

Gage.—Water-stage recorder above concrete and wooden control. Altitude of gage is 75 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge not determined, occurred Feb. 9 or 10, 1951, when gage height was affected by backwater from Stillaguamish River; minimum, 1.2 cfs Sept. 14, 1951; minimum gage height, 0.14 ft. July 5, 1951 (from outside gage, control leaking).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950									7.33	5.44	4.51	5.81	.....
1951	13.6	22.1	24.4	32.1	27.2	38.5	10.7	8.98	6.34	4.70	4.36	2.78	16.3
1953	3.30	3.70	5.62	18.7	19.3	18.0	13.3	12.2	13.8	5.14	3.14	2.97	9.86

* Estimated.

STILLAGUAMISH RIVER BASIN

Armstrong Creek near Arlington, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....									5*	4.3	3.8	3.4	.....
1951....	3.8	10.5	12.5	15	15	11.5	2.4	1.8	3.5*	3.8*	3.4	1.6	1.6
1953....	2.8	3.2	3.8	5.0	9.8	11.5	9.8	7.5	8.8	3.4	2.8	2.6	2.6

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950.....													
1951.....				1.6	16.3	2.22	30.17	11,800					
1953.....	3S	Jan. 23, 1953	2.6	9.86	1.35	18.25	7,140						

* Estimated

Pilchuck Creek near Bryant, Wash.

Location.—Lat. 48°16'00", long. 122°09'45", in NE¼ sec. 16, T. 32 N., R. 5 E., on right bank, 500 feet upstream from highway bridge, and 2 miles north of Bryant.

Drainage area.—49.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 140 ft. (from topographic map). Mar. 12, 1929, to Sept. 30, 1931, staff gages 100 ft. downstream at different datums.

Extremes.—1929-31, 1950-53: Maximum discharge, 3,990 cfs Feb. 9, 1951 (gage height, 6.69 ft.); minimum observed, 0.5 cfs Aug. 29 to Sept. 1, 1931 (gage height, 0.90 ft., site and datum then in use).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929.....							343	218	118	17.6	14.2	7.21	.....
1930....	62.0	104	347	236*	535	337	129	128	55.4	11.1	1.58	63.1	173*
1931....	340	154	244	524	340	596	459	103	313	51.2	1.52	316	286
1950.....										65.0	50.0	79.4	.....
1951....	384	455*	588	537	567	307	197	161	27.0	2.94	2.29	15.9	265*
1953....	15.4	48.1	357	804	462	322	259	228	218	38.8	10.6	31.7	232

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929.....							189	88	32	9.3	4.6	4.9	.....
1930....	4.9	17	25	.....	136	76	75	34	32	2.8	.9	.8	0.8
1931....	30	67	84	104	101	139	110	31	11	5.0	.5	.5	.5
1950.....										17.5	11	6.2	.....
1951....	35	130*	214	206	154	84	74	51	4.1	1.9	1.4	1.9	1.4
1953....	4.8	13.5	32	164	140	168	150	110	105	10.5	4.2	3.9	3.9

* Estimated.

Pilchuck Creek near Bryant, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1929										
1930	3,790	Feb. 1, 1930	0.8	173	3.48	47.17	125,000	184	50.33	133,000
1931	3,190	Jan. 27, 1931	.5	286	5.75	78.15	207,000			
1950										
1951	3,990	Feb. 9, 1951	1.4	265	5.33	72.20	191,600			
1952	2,540	Jan. 23, 1953	3.9	232	4.67	63.38	168,000			

Portage Creek near Arlington, Wash.

Location.—Lat. 48°10'45", long. 122°11'40", in NW¼ sec. 17, T. 31 N., R. 5 E., on left bank at crossing on U. S. Highway 99, 0.3 mile upstream from mouth in South Slough, and 3 miles west of Arlington.

Drainage area.—8.8 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map).

Extremes.—June to September 1950: Maximum discharge, 41 cfs Sept. 26 (gage height, 1.32 ft.), from rating curve extended above 15 cfs; minimum, 9.2 cfs Aug. 29, 31 (gage height, 1.01 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950								14.4	12.9	12.4	12.1		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950								12	12	11	10.5		

STILLAGUAMISH RIVER BASIN

Fish Creek near Arlington, Wash.

Location.—Lat. 48°10'30", long. 122°13'30", in NW¼ sec. 18, T. 31 N., R. 5 E., on right bank, three-quarters of a mile upstream from mouth, and 4½ miles west of Arlington.

Drainage area.—7.6 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 50 ft. (from topographic map). Prior to Mar. 13, 1952, 250 ft. upstream with wooden control and at different datum.

Extremes.—1950-53: Maximum discharge, 92 cfs Jan. 2, 1951 (gage height, 2.17 ft., site and datum then in use); minimum, 0.3 cfs part of each day Aug. 20-26, Sept. 4-7, 1951; minimum gage height, 0.58 ft. July 25, Aug. 14, 15, 16, 18, 1953.

Remarks.—Several small diversions for irrigation and domestic use above station. Slight regulation; cause unknown.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										0.860	0.775	1.16	.....
1951....	4.00	11.4	17.6	27.9	16.6	21.6	4.21	3.31	1.88	.61	.46	.56	9.12
1952....	1.92	3.84	14.9	14.9	15.9	15.6	6.75	2.84	1.59	1.03	.86	.90	6.74
1953....	.94	1.33	2.61	9.52	9.16	9.09	7.57	4.33	4.61	1.05	.82	.98	4.30

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										0.63	0.58	0.58	.....
1951....	1.0	3.6	9.6	9*	10*	10	2.3	1.6	0.7*	.5	.3	.3	0.3
1952....	.9	1.6	3.8	5.5*	7.2	5.5	3.4	2.0	1.1	.8	.7	.7	.7
1953....	.7	1.0	1.4	2.2	4.2	5.2	4.7	1.7	2.0	.6	.5	.7	.5

* Estimated.

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1950.....												
1951.....	92	Jan. 2, 1951	0.3	9.12	1.20	16.29	6,600	8.10	14.45	5,860		
1952.....	70	Dec. 18, 1951	0.7	6.74	.887	12.06	4,890	5.41	9.69	3,930		
1953.....	31	Mar. 23, 1953	0.5	4.30	.666	7.67	3,110					

STILLAGUAMISH RIVER BASIN

323

Church Creek near Stanwood, Wash.

Location.—Lat. 48°14'00", long. 122°19'30", in SE¼NW¼ sec. 29, T. 32 N., R 4 E., on right bank, 500 ft. upstream from highway crossing, 1½ miles upstream from mouth, and 2 miles southeast of Stanwood.

Drainage area.—6.4 sq. mi., approximately.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 20 ft. (from topographic map).

Extremes.—June to September 1950: Maximum discharge not determined, occurred Sept. 26 (gage height, 1.40 ft.); minimum not determined; minimum gage height, 0.50 ft. Sept. 10.

Remarks.—Several diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950								0.63	0.37	0.25	0.61		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950								0.3	0.2	0.1	0.1		

SKAGIT RIVER BASIN

Skagit River near Hope, British Columbia
(International gaging station)

Location.—Lat. 49°02'50", long. 121°05'45", on left bank just downstream from Galena Creek, 4 miles upstream from international boundary, and 27 miles southeast of Hope, British Columbia.

Drainage area.—357 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,670 ft. (from topographic map). Mar. 27, 1915, to Sept. 30, 1922, water-stage recorder 550 ft. downstream at different datum.

Average discharge.—25 years (1916-22, 1934-53), 966 cfs.

Extremes.—1915-22, 1934-53: Maximum discharge observed, 10,200 cfs June 21, 1950 (gage height, 12.20 ft.); minimum recorded, 81 cfs Feb. 9, 1937.

Remarks.—No diversion or regulation above station.

Cooperation.—This station is one of the international gaging stations maintained by Canada under agreement with the United States.

SKAGIT RIVER BASIN

Skagit River near Hope, British Columbia—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915							957	897	814	420	292	166	.....
1916	423	549	373				1,400	2,550	4,430	2,410*	877*	378*	.....
1917	220	312	191	104*	109*	122	498*	2,910*	3,870	2,290	682	355	987*
1918	283	463	826	1,070	625	315	1,430	2,630	3,520	1,310	551	301	1,160
1919	365	407	485	336	303	413	1,510	3,010	3,600	2,320	697	451	1,160
1920	180*	850*	730*	670*	912*	416*	460*	2,200*	3,000*	1,990	570	523	1,040*
1921	1,200	510	485	494	733	721*	842*	3,020*	4,520	1,660	533*	474	1,270*
1922	644	757	1,230	372	261*	213	484	2,250	3,810	985	413	339	980*
1935	282*	1,010	618	1,090*	1,530	519	560	2,130	2,710	1,330	495	308	1,040*
1936	217	184	213	184	120*	232	1,720	3,310	1,910	533	263	192	757*
1937	145	115	277*	125*	94*	237*	682*	2,440	4,120	1,230	395	240	847*
1938	329	651	667	542	232	520	1,140	3,210	2,870	903	311	199	971
1939	151	196	367	553	211	457	1,520	2,820	2,140	1,190	405	201	859
1940	243	419	1,020	465	417	614	1,060	1,860	1,070	431	224	165	607
1941	362	243	365	310	343	431	944	1,080	853	388	202	334	488
1942	1,000	843	1,040	361	245	225	593	1,070	1,740	751	337	172	779
1943	136	237	523	471	413	490	2,010	2,160	3,160	2,090	570	264	1,040
1944	207	193	265	175	152	180	576	1,510	1,530	549	285	260	492
1945	253	281	385	470	474	284	385	2,320	2,120	818	305	238	695
1946	469	672	360	329	266	430	986	3,660	2,650	1,260	465	245	1,030
1947	211	214	471	312	536	823	1,500	3,250	2,180	882	362	237	925
1948	533	583	552	463	276	244	870	3,350	5,090	1,110	651	439	1,180
1949	628	373	302	236	191	386	1,440	3,880	2,750	1,270	706	522	1,050
1950	432	1,200	1,070	430	429	592	777	2,680	6,500	3,500	673	317	1,560
1951	602	1,180	1,650	788	1,010	477	1,520	3,270	3,070	1,450	477	277	1,320
1952	377	404	343	221	268	219	1,390	2,970	2,160	1,090	360	201	832
1953	147	139	122	561	824	306	910	2,930	3,080	2,030	700	416	1,020

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915							780	700	656	365	219	120	.....
1916	110	300	260				964	1,600	2,400			275	.....
1917	183	222	158			156	147		2,550	1,030	442	300	.....
1918	227	227	581	721	330	270	450	1,300	2,060	770	405	246	227
1919	234	208	298	302	233	212	1,120	1,830	2,540	930	500	290	212
1920										396	390	300	.....
1921	623	400	330	358					3,000	906		246	.....
1922	302	470	400		230	202	230	901	1,950	525	370	270	202
1935		550	450	170	655	410	349	1,010	1,780	733	345	221	170
1936	154	160	181	130	110*	133	178	2,310	860	338	211	152	110*
1937	118	99	97	99*	81	99	402*	1,380*	2,620	585*	280	163	81
1938	142	466	469	331	235	401	448	1,530	1,660	472	222	164	142
1939	141	157	164	265	168	145	1,080	1,900	1,700	713	264	143	141
1940	140	253	627	309	333	391	725	1,220	641	305	187	140	140
1941	124	192	212	225	254	217	770	802	579	254	171	181	124
1942	446	603	484	283	206	203	358	755	1,200	508	218	137	137
1943	120	130	198	204	313	333	750	1,090	2,100	990	343	204	120
1944	173	165	176	139	122	113	225	930	1,896	356	213	165	113
1945	184	219	233	216	281	231	292	820	1,240	425	219	105	134
1946	154	429	281	254	207	354	490	1,410	1,570	749	321	188	154
1947	155	179	199	202	329	409	374	1,070	1,200	525	256	202	155
1948	199	395*	380*	320	225	208	312	822	2,320	639	445	323	199
1949	356	304	200	172	145	230	424	1,410	1,440	920	582	350	145
1950	301	468	605	283	408	488	472	921	4,000	1,370	406	270	270
1951	255	584	1,030	566	516	400	544	1,330	2,130	750	302	222	222
1952	269	290	218	161	206	179	344	1,360	1,510	570	245	176	161
1953	132	90	94	104	352	320	394	1,490	1,930	816	509	298	90

* Estimated.

Skagit River near Hope, British Columbia—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1915	1,280†	April, 4, 1915								
1916	7,560†	June 17, 1916								
1917	5,920*†	May 29, 1917		987	2.78	38.94	717,000	1,060	41.63	768,000
1918	5,980†	June 10, 1918	227	1,160	3.26	44.36	841,000	1,140	60.28	822,000
1919	5,140†	May 26, 1919	212	1,160	3.25	44.32	841,000	1,200	45.91	871,000
1920				1,040	2.93	29.81	756,000	1,070	41.09	780,000
1921	6,920†	June 7, 1921		1,270	3.56	48.34	917,000	1,310	49.88	946,000
1922	6,850†	June 4, 1922	202	980	2.75	37.38	711,000			
1935	6,560	Jan. 25, 1935	170	1,040	2.91	39.68	755,000	935	35.55	677,000
1936	5,070	May 31, 1936	110	757	2.12	28.88	549,000	751	28.64	545,000
1937	6,570	June 3, 1937	81	547	2.37	32.22	613,000	940	35.75	680,000
1938	6,370	May 26, 1938	142	971	2.72	36.91	703,000	897	34.10	650,000
1939	5,440	May 16, 1939	141	859	2.41	32.45	621,000	936	35.58	677,000
1940	2,990	May 24, 1940	140	667	1.87	25.44	484,000	608	23.17	440,500
1941	1,560	May 2, 1941	124	488	1.37	18.55	353,200	649	24.69	470,100
1942	4,440	May 26, 1942	137	779	2.18	29.61	563,800	811	23.25	442,600
1943	5,420	May 27, 1943	120	1,040	2.91	39.73	756,500	1,030	39.04	743,300
1944	2,510	May 29, 1944	113	492	1.33	18.75	357,000	511	19.49	371,200
1945	5,560	May 30, 1945	184	605	1.95	26.43	503,300	745	28.33	539,500
1946	5,960	May 27, 1946	154	1,030	2.69	39.00	742,700	976	37.13	717,000
1947	5,630	May 8, 1947	155	925	2.59	35.19	670,000	888	37.56	714,900
1948	9,720	May 28, 1948	199	1,180	3.31	45.04	857,600	1,140	43.56	829,300
1949	6,350	May 16, 1949	145	1,050	2.94	40.04	762,200	1,180	44.77	852,400
1950	10,200†	June 21, 1950	270	1,560	4.37	59.20	1,127,000	1,620	61.57	1,172,000
1951	5,560	May 24, 1951	222	1,320	3.70	50.01	952,200	1,120	42.63	812,000
1952	4,970	May 19, 1952	161	832	2.33	31.70	603,500	772	29.41	560,300
1953	5,720	June 13, 1953	90	1,020	2.86	38.87	739,900			

* Estimated.

† Maximum daily.

‡ Maximum observed.

Lightning Creek near Newhalem, Wash.

Location.—Lat. 48°53'30", long. 120°58'50", in SE¼ sec. 4, T. 39 N., R. 14 E. (un-surveyed), on right bank, a quarter of a mile downstream from Three Fools Creek, 3 miles upstream from mouth, and 19 miles northeast of Newhalem.

Drainage area.—129 sq. mi., of which 22 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 1,810 ft. (by barometer).

Extremes.—1943-48: Maximum discharge not determined, occurred during period of no gage-height record May 27-31, 1948; minimum, 46 cfs Feb. 17, 1948 (gage height, 0.79 ft.).

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

Lightning Creek near Newhalem, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944...	91.8	78.9	103	73.4	65.3	75.1	229	611	598	192	107	89.7	193
1945...	88.8	84.8	125	142	201	105	160	970	903	344	137	110	281
1946...	176	218	125	105	91.5	146	400	1,388	1,124	538	189	112	386
1947...	94.5	82.4	112	109*	185	284	513	1,210	805	340	152	85.1	333*
1948...	188	183	190	146	104	98.6	304	1,222	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944...	81	71	69	58	64	50	83	394	382	128	83	70	50
1945...	71	72	72	75	85	85	98	394	474	182	102	90	71
1946...	72	144	99	84	71	112	160	546	612	293	138	88	71
1947...	71	70	60*	50*	102	125	284	710	455	211	118	82	50*
1948...	82	135	127	110	73	83	116	276	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1944.....	1,140	May 28, 1944	50	193	1.50	20.36	139,900	195	20.59	141,500
1945.....	2,500	May 30, 1945	71	281	2.18	29.59	203,500	300	31.84	216,900
1946.....	2,100	May 27, 1946	71	366	2.99	40.64	279,500	367	38.60	265,500
1947.....	2,240	May 8, 1947	50	333	2.58	35.00	240,800	356	37.41	257,400
1948.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

Skagit River above Devils Creek, near Newhalem, Wash.

Location.—48°50'30", long. 121°02'20", in W½ sec. 30, T. 39 N., R. 14 E., on left bank, 2 miles upstream from Devils Creek, 9½ miles upstream from Ross Dam, and 15 miles northeast of Newhalem.

Drainage area.—650 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 1,410 ft. (from river-profile map).

Average discharge.—5 years (1940-45), 1,490 cfs.

Extremes.—1940-45: Maximum discharge, 9,140 cfs May 31, 1945 (gage height, 7.27 ft.); minimum, 257 cfs Nov. 13, 1942 (gage height, 0.39 ft.).

Remarks.—No diversion or regulation above station.

Skagit River above Devils Creek, near Newhalem, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940.....							2,164	3,770	2,434	1,051	630	492	.....
1941....	1,137	576	933	796	891	1,007	1,098	2,258	1,910	976	567	728	1,157
1942....	1,873	1,695	2,298	763	532	520	1,190	3,088	3,360	1,713	843	435	1,581
1943....	342	536	1,016	746	762	993	3,851	3,320	5,888	4,611	1,483	708	2,067
1944....	524	463	869	481	434	476	1,226	3,025	3,198	1,257	724	662	1,065
1945....	607	627	837	1,027	1,235	763	1,021	4,609	4,323	2,032	832	613	1,548

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940.....							1,450	2,420	1,450	818	512	394	.....
1941....	362	519	582	532	690	804	1,520	1,520	1,270	655	478	478	362
1942....	820*	1,080	1,040	590	461	457	670	1,490	2,330	1,120	560	358	358
1943....	260	263	436	527	535	621	1,820	2,110	4,110	2,450*	977	522	260
1944....	461	405	410	350	342	309	545	1,900	2,020	904	561	464	309
1945....	424	463	480*	468	638	604	735	1,700	2,760	1,040	698	460*	424

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1940.....	5,900	May 24, 1940										
1941.....	4,210	Oct. 21, 1940	362	1.157	1.78	24.16	837,600	1,419	29.63	1,027,000		
1942.....	6,570	Dec. 3, 1941	358	1.581	2.43	33.02	1,145,000	1,247	26.04	802,600		
1943.....	3,220	June 10, 1943	360	2,067	3.18	43.17	1,496,000	2,047	42.75	1,432,000		
1944.....	4,630	①	309	1,095	1.68	22.93	795,200	1,133	23.72	822,200		
1945.....	9,140	May 31, 1945	424	1,548	2.38	32.33	1,121,000					

* Estimated.

① May 15, 16, 29, 1944.

SKAGIT RIVER BASIN

Beaver Creek near Newhalem, Wash.

Location.—Lat. 48°46'40", long. 121°04'20", in S½ sec. 14, T. 38 N., R. 13 E. (unsurveyed), on left bank, three-quarters of a mile upstream from Ross Reservoir, 3 miles north of Ross Dam on Skagit River, and 10½ miles northeast of Newhalem.

Drainage area.—52 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,600 ft. (from river-profile map).

Average discharge.—8 years (1940-48), 376 cfs.

Extremes.—1940-48: Maximum discharge, 3,980 cfs Dec. 2, 1941 (gage height, 7.76 ft.); minimum, 65 cfs Jan. 14, 1947 (gage height, 0.97 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...						410	510	759	605	396	261	237	.....
1941...	606	220	278	201	201	257	428	501	502	367	243	306	345
1942...	443	379	481	119	88.4	108	355	516	607	552	280	137	340
1943...	118	200	266	152	125*	191	651	670	929	907	393	212	402*
1944...	177	126	209	157	114	138	270	458	551	340	226	269	255
1945...	232	264	251	235*	266*	141*	209*	874	742	555	273	235	366*
1946...	338	285	172	154	147*	212	455	1,224	962	812	445	257	458*
1947...	190	125	306	156	310	278	498	839	726	565	294	227	382
1948...	508*	269	299	180	119	113	330	966	1,399	628	484	355*	471*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...						220	359	501	434	274	203	157	.....
1941...	112	123	160	120	125	200	279	256	356	246	169	188	112
1942...	184	164	160*	91	80	30	144	236	389	344	149	90	80
1943...	76	82	118	110*	100*	100	380*	368	615	615	262	149	70
1944...	123	98	103	86	74	67	147	296	409	265	170	166	67
1945...	119	142	102	93	120*	100*	145*	400	409	272	189	121	93
1946...	90	194	109	111	84*	146	198	595	575	595	333	132	84*
1947...	83	84	124	79	136	152	260	492	475	322	200	126	79
1948...	210*	150	116	104	82	92	134	285	885	475	357	260*	82

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1940.....												
1941.....	3,540	Oct. 19, 1940	112	345	6.63	90.07	249,500	362	94.38	261,500		
1942.....	3,980	Dec. 2, 1941	80	340	6.54	88.75	246,100	279	72.93	202,300		
1943.....	1,550	July 4, 1943	76	402	7.73	105.05	291,300	396	103.30	286,500		
1944.....	1,280	Dec. 3, 1943	67	255	4.90	66.74	185,100	274	71.83	199,200		
1945.....	1,680	May 31, 1945	98	356	6.85	93.03	258,000	361	94.29	261,500		
1946.....	3,760	Oct. 26, 1945	84	458	8.81	119.48	331,300	443	115.74	321,000		
1947.....	1,760	Oct. 25, 1946	79	382	7.35	99.68	276,400	420	109.65	304,100		
1948.....	2,490	①	82	471	9.06	123.38	342,200	.....	.....	.....

* Estimated.

① May 28, June 10, 1948.

Skagit River near Newhalem, Wash.

Location.—Lat. 48°44'50", long. 121°01'50", in S½ sec. 30, T. 38 N., R. 14 E. (unsurveyed) on right bank, ¼ miles upstream from Ruby Creek and 11 miles northeast of Newhalem.

Drainage area.—765 sq. mi. of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 1,250 ft. (from river-profile map).

Average discharge.—10 years (1929-39), 2,633 cfs.

Extremes.—1929-40: Maximum discharge, 25,700 cfs Feb. 27, 1932 (gage height, 15.9 ft.), from rating curve extended above 13,000 cfs; minimum, 230 cfs Feb. 21, 1937 (gage height, 3.27 ft.).

Flood in December 1921 reached a stage of 17.8 ft., from floodmarks (discharge, about 33,000 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929									5,530	2,330	1,260	750	.....
1930	703	414	1,000*	550*	1,930*	1,690	5,030	4,300	4,860	2,750	1,390*	980	2,130*
1931	860	873	627	1,290	1,650	1,850	2,350	6,200	4,400	2,090	1,110	1,280	2,050
1932	831	1,589	1,120	1,180	2,740	2,850	3,500	6,260	7,120	3,070	1,650	938	2,730
1933	1,240	3,980	2,660	1,360	790	1,080	2,840	5,160	9,570	7,010	2,890	1,670	3,360
1934	3,422	3,436	3,420	3,396	2,497	3,779	7,858	7,193	4,844	2,721	1,612	1,048	3,774
1935	1,122	3,718	2,049	3,392	3,875	1,539	1,627	4,942	6,142	3,804	1,661	1,444	2,932
1936	842	901	726	733	480	936	4,307	7,366	5,161	2,013	1,189	847	2,102
1937	631	419	887	518	384	1,045	1,045	5,346	3,973	3,678	1,431	960	2,191
1938	1,327	2,244	2,171	1,709	845	1,579	3,222	7,136	7,330	3,230	1,251	947	2,757
1939	814	798	1,357	2,022	804	1,339	3,607	6,218	4,844	3,445	1,626	837	2,311
1940	943	1,294	3,311	1,535	1,377	2,076*	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929									3,740	1,550	965	486	.....
1930	479	369	.....	.....	.....	1,080	3,760	3,040	3,530	.....	.....	635	.....
1931	581	714	479	450	1,160	1,160	1,690	3,680	2,420	1,460	896	872	450
1932	646	874	639	834	568	1,930	2,260	3,620	4,360	1,880	1,160	736	563
1933	600	1,460	1,120	940	678	842	1,380	3,520	5,870	1,660	1,700	1,240	600
1934	1,200	2,360	2,320	2,320	1,980	2,440	4,150	4,970	3,060	1,930	1,330	678	678
1935	594	1,930	1,480	870*	1,880	1,200	1,040	2,800	4,300	2,380	1,250	884	594
1936	692	552	614	579	425*	524	680	5,090	2,620	1,440	936	608	425*
1937	458	370	365	386*	340	420	1,350	2,190	6,030	1,820	896	667	340
1938	577	1,280	1,480	1,070	697	1,240	1,320	3,200*	5,290	1,770	958	750	577
1939	559	625	709	1,060	685	613	2,600	4,300	3,980	2,430	1,020	625	559
1940	577	792	1,870	940	1,080	1,400	.....	.....	.....	.....	.....	.....	.....

* Estimated.

SKAGIT RIVER BASIN

Skagit River near Newhalem, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1929.....										
1930.....	8,270	June 11, 1930		2,130	2.78	87.74	1,540,000	2,150	88.08	1,550,000
1931.....	9,860	May 2, 1931	450	2,060	2.68	83.34	1,480,000	2,150	88.08	1,550,000
1932.....	25,700	Feb. 27, 1932	568	2,730	3.57	48.60	1,980,000	3,080	54.88	2,240,000
1933.....	17,300	June 16, 1933	600	3,350	4.38	59.48	2,480,000	3,570	63.26	2,550,000
1934.....	14,300	April 24, 1934	678	3,774	4.93	66.98	2,732,000	3,485	61.88	2,523,000
1935.....	17,000	Nov. 5, 1934	594	2,932	3.83	52.05	2,123,000	2,540	45.08	1,889,000
1936.....	12,000	May 31, 1936	425	2,102	2.75	37.40	1,526,000	2,083	37.03	1,512,000
1937.....	12,700	June 3, 1937	340	2,191	2.86	38.85	1,587,000	2,510	44.48	1,817,000
1938.....	13,600	May 26, 1938	577	2,757	3.60	48.00	1,996,000	2,526	44.79	1,829,000
1939.....	12,100	May 29, 1939	589	2,311	3.02	40.97	1,673,000	2,529	44.85	1,831,000
1940.....										

Granite Creek near Newhalem, Wash.

Location.—Lat. 48°41'40", long. 120°53'30", in SE¼NE¼ sec. 20, T. 37 N., R. 16 E., (unsurveyed), on right bank at bridge on Cascade Crest trail, 1 mile upstream from confluence with Canyon Creek, and 16 miles east of Newhalem.

Drainage area.—69 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,980 ft. (by barometer).

Extremes.—1946-48: Maximum discharge, 1,800 cfs May 26, 1947 (gage height, 5.79 ft.); minimum, 25 cfs Mar. 10, 1948 (gage height, 2.07 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar. ²	April	May	June	July	Aug.	Sept.	Annual
1947...	61.9	47.9	56.4	47.1	62.4	141	362	917	634	282	98.0	53.3	232
1948...	124	101	78.5	57.5	41.0	40.7	137						

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	34	34*	41*	36*	43	56	151	471	311	156	64	42	34
1948...	47	66	68	43	38	34	46						

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1947.....	1,800	May 26, 1947	34	232	3.86	45.59	167,800	243	47.86	176,100
1948.....										

* Estimated.

Ruby Creek below Panther Creek, near Newhalem, Wash.

Location.—Lat. 48°42'30", long. 120°58'10", in NW¼ sec. 10, T. 37 N., R. 14 E. (un-surveyed), on right bank, 200 ft. downstream from Panther Creek, 4 miles upstream from mouth, and 13 miles northeast of Newhalem.

Drainage area.—199 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,640 ft. (by barometer).

Average discharge.—5 years (1948-53), 708 cfs.

Extremes.—1948-53: Maximum discharge, 8,640 cfs Nov. 27, 1949 (gage height, 10.95 ft.), from rating curve extended above 5,600 cfs; minimum, 46 cfs Feb. 10, 1949, Nov. 28, 1952; minimum gage height, 0.70 ft. Feb. 10, 1949.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948												284	
1949	362	191	142	116*	102	218	810	2,636	1,916	1,023	409	288	688*
1950	283	900	630	252*	185	241	814	1,295	3,532	2,108	595	244	888*
1951	363	561	744	365	657	261	862	2,173	2,234	1,186*	394	232	836*
1952	248	215	152	96.6*	132	114	719	1,822	1,564	815	326	161	531*
1953	98.9	74.7	71.5	247	327	187	494	1,855	1,885	1,251	461	227	600

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948												235	
1949	226	163	121	100	63	154	210	820	895	574	275	178	63
1950	178	284	334	190*	169	177	190	402	2,000	766	328	186	169
1951	161	249	452	239	234	226	200	665	1,470	580*	247	156	156
1952	197	151	110*	75*	97	94	137	740	974	472	168	134	75*
1953	79	49	59	64*	166	146	186	755	1,100	612	273	144	49

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acra-feet		Inches	Acra-feet		
1948												
1949	5,170	May 15, 1949	63	688	3.46	46.92	498,100	781	53.26	565,400		
1950	8,640	Nov. 27, 1949	109	883	4.44	60.26	639,500	872	59.47	631,200		
1951	4,170	May 23, 1951	156	886	4.20	57.00	605,100	747	50.97	541,000		
1952	3,150	May 18, 1952	75	531	2.67	36.32	385,600	500	34.20	363,100		
1953	3,820	June 13, 1953	49	600	3.02	40.90	434,100					

* Estimated.

SKAGIT RIVER BASIN

Ruby Creek near Newhalem, Wash.

Location.—Lat. 48°43'20", long. 121°00'30", in SE¼ sec. 5, T. 37 N., R. 14 E., 2 miles upstream from mouth and 12 miles east of Newhalem.

Drainage area.—210 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,554.26 ft. above mean sea level (levels by city of Seattle). Prior to Mar. 8, 1940, water-stage recorder 1½ miles downstream at different datum.

Average discharge.—20 years (1928-48), 610 cfs.

Extremes.—1919-20, 1928-49: Maximum discharge, 9,920 cfs May 27, 1948 (gage height, 9.2 ft.), from rating curve extended above 5,600 cfs; minimum recorded, 25 cfs Feb. 16, 1948 (gage height, 1.96 ft., result of snowslides upstream).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910									2,210	1,620	610	309	
1920	185	356	293	281	319	212							
1928													170
1929	347	197	181*	117*	105*	160*	274	1,610	1,730	588	248	138*	477*
1930	107	78.8	74.9*	60*	185*	290*	1,040	1,220	1,500	762	284	175	451*
1931	143	130	90.0	172	250	283	498	1,860	1,230	498	226	214	467
1932	146	254	194	155*	631	575	816	1,920	2,240	791	357	178	630*
1933	221	803	450	249	143	182	606	1,270	2,950	2,110	717	331	840
1934	821	890	787	531	435	857	2,216	2,164	1,648	810	367	201	976
1935	182	733	420	643	834	300	396	1,605	2,182	1,225	426	264	761
1936	145	105	104	106	82.5*	131	969	2,279	1,670	459	250	152	542*
1937	109	76.5	120	81.6*	66.4*	188	326	1,538	2,740	1,039	283	192	665*
1938	269	394	359	288	163	282	755	2,059	2,304	510	227	167	675
1939	154	140	189	308	140	291	894	1,895	1,464	929	310	157	576
1940	178	266	518	250	220	316	649	1,570	1,048	394	203	159	488
1941	400	215	264	181	177	274	807	922	793	348	199	274	405
1942	559	406	509	194	134	141	626	1,362	1,371	670	239	115	528
1943	85.6	119	194	176	176	224	959	1,287	2,388	1,872	481	210	683
1944	160	121	180	111	108	133	415	1,237	1,306	438	204	257	389
1945	206*	180	240	290	809	180	282	1,699	1,682	696	243	190	515*
1946	313	361	200	183*	139*	221	676	2,663	2,067	1,184	402	194	720*
1947	177	146	197	145*	235	440	942	2,357	1,792	810	311	174	639*
1948	359	278	248	191	139	129	445	2,182	3,602	1,817	467	305	803
1949	382	228	182*	129*	122*	257*	587	2,646					

* Estimated.

Ruby Creek near Newhalem, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1919											354	172	
1920	96	87		143	189	157							
1928												124	
1929	151	154					124	575	1,100	324	177	91	91
1930	83							800	1,070	366	171	104	
1931	94	103		65	167	188	234	920	625	315	166	144	
1932	124					412	427	1,120	1,390	427	224	132	
1933	101	226	260	177	117	141	208	705	1,600	888	338	250	101
1934	300*	548	522	373	372	477	1,010	1,430	938	460	276	118	118
1935	101	394	320	120*	377	223	194	742	1,460	665	294	154	101
1936	96*	96	94	90*	70*	100*	98	1,320	725	330	177	108	70*
1937	85	61	67	70*	54	82	198	492	1,870	378	180	126	54
1938	137	236	210*	170*	143	219	217	932	1,600	353	174	141	137
1939	106	109	125	161	110*	108	523	1,200	1,080	550*	190	117	106
1940	115	160	308	171	184	181	385	755	587	252	170	114	114
1941	97	160	188	160	155	186	559	374	450	214	158	170	97
1942	303	300	255*	152	122	123	278	495	838	328	148	96	96
1943	70	78	94	127	127	147	375	561	1,470	598	297	153	70
1944	729	108	110*	90*	93	91	168	701	810	263	161	134	90*
1945	155*	153	145*	133	168	157	163	610	848	290	168	141	138
1946	117	231	159	130*	105*	175	257	1,010	1,040	615	288	130	105*
1947	89	100*	113*	95*	149	190	412	1,310	894	453	212	134	95*
1948	168	197	205	155	120	113	153	436	2,250	557	358	243	113
1949	260	208	148*	114*	89*	170*	254	342					

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mle	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1919										
1920										
1928										
1929	3,460	May 22, 1929	91	477	2.27	30.78	345,000	438	28.26	317,000
1930	3,030	June 6, 1930		481	2.29	51.12	349,000	490	31.67	356,000
1931	3,570	May 14, 1931		467	2.22	30.20	338,000	486	31.45	352,000
1932	6,730	Feb. 27, 1932		686	3.27	44.55	498,000	762	49.44	553,000
1933	6,510	June 14, 1933	101	840	4.00	54.23	609,000	923	59.52	669,000
1934	4,920	April 23, 1934	118	976	4.65	63.18	706,300	880	56.98	637,400
1935	3,460	Nov. 5, 1934	101	761	3.62	49.28	551,100	680	44.01	492,000
1936	4,850	June 2, 1936	70	542	2.58	35.22	393,700	538	34.96	390,800
1937	4,480	June 2, 1937	54	565	2.69	36.56	409,200	625	40.44	452,600
1938	4,530	May 25, 1938	137	675	3.21	43.65	484,400	630	40.73	455,800
1939	4,650	May 28, 1939	106	575	2.74	37.19	416,400	615	39.79	445,500
1940	3,070	May 23, 1940	114	493	2.30	31.28	350,300	476	30.84	345,400
1941	1,630	Oct. 20, 1940	97	405	1.93	26.19	293,300	454	29.37	328,900
1942	4,650	May 25, 1942	96	528	2.51	34.16	382,600	439	28.35	317,600
1943	4,160	June 9, 1943	70	633	3.25	44.12	494,200	638	44.46	498,000
1944	2,370	May 15, 28, 1944	90	389	1.85	25.24	282,800	403	26.13	292,700
1945	4,360	May 30, 1945	138	515	2.45	33.28	372,300	535	34.61	357,600
1946	4,160	May 26, 27, 1946	105	720	3.43	46.57	521,000	691	44.67	500,200
1947	4,260	May 8, 1947	95	639	3.04	41.27	462,300	669	43.26	484,500
1948	9,920	May 27, 1948	113	803	3.82	52.07	588,300	796	51.57	577,700
1949										

* Estimated.

Skagit River below Ruby Creek, near Newhalem, Wash.

Location.—Lat. 48°44'20", long. 121°03'40", in SE¼ sec. 35, T. 38 N., R. 13 E. (unsurveyed), on right bank, three-quarters of a mile downstream from Ruby Creek, 9 miles northeast of Newhalem, and 23 miles northeast of Marblemount.

Drainage area.—978 sq. mi., of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 1,190 ft. (from river profile map).

Average discharge.—25 years (1908-33), 3,248 cfs.

Extremes.—1919-30: Maximum discharge, 45,700 cfs Dec. 12, 1921 (gage height, 16.1 ft.); from rating curve extended above 11,000 cfs on basis of discharge at gage heights 9.8, 10.1 and 11.9 ft., determined by subtracting Thunder Creek and miscellaneous inflow from Skagit River at Reflector Bar near Newhalem; minimum recorded, 390 cfs Dec. 11, 12, 1929, probably less during period of no gage-height record during that winter.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...	930*	2,530*	1,080*	1,880*	1,190*	1,330*	2,280*	5,900*	11,400*	6,650*	2,360*	1,720*	3,150*
1910...	1,450*	5,520*	2,960*	1,420*	1,240*	3,550*	6,160*	12,200*	8,380*	5,720*	2,310*	1,310*	4,350*
1911...	4,020*	4,630*	2,000*	1,180*	760*	1,430*	2,750*	6,440*	11,200*	5,460*	2,300*	1,750*	3,660*
1912...	850*	1,320*	1,130*	1,090*	1,090*	920*	2,180*	7,520*	8,800*	3,900*	2,120*	1,020*	2,710*
1913...	530*	1,550*	1,070*	760*	1,130*	1,160*	3,060*	8,100*	12,800*	6,180*	2,660*	2,060*	3,450*
1914...	1,930*	2,160*	1,480*	2,870*	1,040*	2,320*	4,430*	7,980*	7,040*	4,460*	2,020*	1,270*	3,250*
1915...	1,430*	3,070*	1,400*	720*	630*	1,290*	4,370*	3,930*	3,250*	2,660*	2,190*	980*	2,160*
1916...	1,370*	1,620*	1,510*	690*	960*	1,430*	2,540*	7,140*	12,900*	7,700*	3,000*	1,780*	3,550*
1917...	920*	1,110*	750*	730*	1,020*	770*	1,680*	7,120*	10,200*	6,650*	2,300*	1,440*	2,900*
1918...	1,180*	1,470*	4,120*	5,780*	2,070*	1,640*	4,430*	7,290*	10,500*	4,900*	2,330*	1,570*	3,940*
1919...	1,780*	1,670*	2,700*	1,680*	1,160*	1,016*	4,330*	8,000*	9,870*	7,380*	2,690*	1,610*	3,740*
1920...	770*	2,140*	2,190*	2,330*	2,210*	1,270*	1,350*	4,790*	7,260*	6,870*	2,250*	2,050*	2,910*
1921...	3,960	1,880	1,540	1,790	2,570	2,320	2,740	8,830	13,500	5,790	2,650	1,720	4,110
1922...	3,060	2,840	5,250	1,200	750	657	1,670	6,870	12,200	4,070	2,120	1,600	3,540
1923...	1,420	1,120	1,660	2,040	934	1,130	4,350	8,400	9,940	5,780	2,160	1,320	3,360
1924...	965	743	1,460	883	4,810	1,850	1,880	10,400	6,070	3,210	1,660	1,280	2,930
1925...	2,020	2,050	4,500	1,660	2,700	1,760	4,310	11,000	8,040	4,380	1,920	1,050	3,960
1926...	577	605	2,160	1,250	1,220	1,460	3,900	3,770	2,870	1,920	1,290	518	1,820
1927...	1,980	1,190	1,710	1,290	909	1,060	2,530	6,130	11,500	4,360	2,140	2,320	3,100
1928...	3,250	3,150	2,790	3,940	1,600	2,060	2,480	10,500	6,020	3,480	1,510	1,060	3,500
1929...	2,690	1,160	976	619	497*	928	1,710	7,110	7,410	3,140	1,630	919	2,360*
1930...	826	500*	501*	500*	2,280	1,830*	6,230	5,680	6,650	3,760	1,700	1,160	2,630*
1931...	1,000*	1,000*	717*	1,460*	1,800*	2,130*	2,820*	8,060*	5,630*	2,590*	1,340*	1,490*	2,520*
1932...	977*	1,830*	1,310*	1,340*	3,370*	3,420*	4,320*	8,180*	9,360*	3,860*	2,010*	1,120*	3,420*
1933...	1,460*	4,780*	3,040*	1,610*	933*	1,260*	3,450*	6,420*	12,500*	9,120*	3,610*	2,000*	4,190*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1919									7,250	4,250	1,650	945	
1920...	654	570		1,200	1,250	1,040	982	2,640	3,170	3,150	1,350	1,160	570
1921...	2,100	1,250	960	1,120	945	1,790	1,910	2,500	7,760	3,980	1,620	975	945
1922...	1,270	1,690	1,860	787	678	627	750	2,820	7,290	2,840	1,800	1,190	627
1923...	814	918		850*		902	2,880	4,160	5,820	2,810	1,800	934	
1924...	751	604	842	751	2,260	1,160	1,160	4,370	4,180	2,140	1,110	800	604
1925...	1,040	1,370	1,420	1,220	1,520	1,370	1,630	5,020	5,880	3,000	1,220	650	680
1926...	450	534	1,540	652	912	1,020	1,600	2,490	2,220	1,200	1,120	615	450
1927...	664	880	1,020	775*	740	888	1,230	3,600	6,440	3,080	1,480	1,330	664
1928...	1,600	1,800	1,210		1,210	1,140	1,650	3,300	4,270	2,150	1,140	603	803
1929...	852	920	754				873	3,450	4,960	2,020		620	
1930...	628				600			4,020	5,070	2,180	1,120	784	

* Estimated.

Skagit River below Ruby Creek, near Newhalem, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1909				3,150	3.22	43.71	2,280,000	3,600	59.04	2,610,000
1910				4,850	4.45	60.40	3,150,000	4,410	61.16	3,190,000
1911				3,660	3.74	50.77	2,650,000	3,060	42.37	2,210,000
1912				2,710	2.77	37.70	1,970,000	2,720	37.77	1,910,000
1913				3,450	3.53	47.92	2,500,000	3,620	50.23	2,620,000
1914				3,250	3.32	45.07	2,350,000	3,280	45.44	2,370,000
1915				2,160	2.21	30.00	1,560,000	2,040	28.37	1,480,000
1916				3,550	3.63	49.41	2,530,000	3,410	47.55	2,480,000
1917				2,900	2.97	40.32	2,100,000	3,230	44.86	2,340,000
1918				3,040	4.03	54.70	2,850,000	3,880	53.37	2,810,000
1919				3,740	3.82	51.85	2,710,000	3,670	51.00	2,660,000
1920	12,600	July 1, 1920	570	2,910	2.98	40.47	2,110,000	3,100	43.15	2,250,000
1921	25,200	June 7, 1921	945	4,110	4.20	57.03	2,980,000	4,430	61.45	3,210,000
1922	45,700	Dec. 12, 1921	627	3,540	3.62	49.16	2,560,000	2,960	41.03	2,130,000
1923	19,200	June 8, 1923	600	3,360	3.44	46.76	2,430,000	3,260	45.56	2,370,000
1924	26,200	Feb. 12, 1924	604	2,930	3.00	40.62	2,120,000	3,370	46.94	2,450,000
1925	23,200	May 19, 20, 1925	680	3,960	4.05	54.94	2,860,000	3,520	48.33	2,550,000
1926	7,460	April 30, 1926	450	1,820	1.86	25.29	1,320,000	1,950	27.03	1,410,000
1927	22,200	June 7, 1927	664	3,100	3.17	43.03	2,240,000	3,460	48.03	2,500,000
1928	22,200	May 22, 1928	603	3,500	3.56	48.56	2,540,000	3,060	42.80	2,240,000
1929	13,600	May 23, 1929	600	2,360	2.41	32.76	1,710,000	2,170	30.05	1,570,000
1930	10,700	June 11, 1930	600	2,630	2.69	36.59	1,910,000	2,710	37.58	1,960,000
1931				2,520	2.58	35.02	1,820,000	2,630	36.43	1,900,000
1932				3,420	3.50	47.64	2,480,000	3,860	53.68	2,800,000
1933				4,190	4.28	58.10	3,030,000			

Ross Reservoir near Newhalem, Wash.

Location.—Lat. 48°44'00", long. 121°04'10", in SE¼ sec. 35, T. 38 N., R. 13 E., at Ross Dam on Skagit River, 1 mile downstream from Ruby Creek, and 9 miles northeast of Newhalem.

Drainage area.—980 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (city of Seattle bench-mark). Prior to Sept. 24, 1940, staff gage, and Sept. 24, 1940, to June 27, 1943, water-stage recorder at same site and datum. June 28, 1943, to Apr. 29, 1948, staff gage 500 ft. upstream at same datum.

Extremes.—1940-53: Maximum contents observed, 1,405,300 acre-ft. Aug. 16, 17, 1953 (elevation, 1,600.00 ft.); minimum since storage began, not determined.

Remarks.—Reservoir is formed by concrete arch dam completed to elevation 1,615 ft. in 1949; storage began Mar. 11, 1940. Capacity, 1,202,930 acre-ft. between elevations 1,250 ft. (lowest outlet) and 1,582 ft. (spillway crest). Dead storage is negligible. Water used to supplement low flow of Skagit River through Diablo and Newhalem powerplants. Figures given herein represent total contents.

Ross Reservoir near Newhalem, Wash.—Continued

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Annual
1940						4,530	25,360	106,540	97,140	105,660	102,620	86,490	.....
1941	106,190	89,760	105,540	105,830	105,560	84,580	108,060	107,650	100,820	111,740	98,800	91,770	.....
1942	102,920	107,190	99,990	43,440	1,600	1,990	22,510	107,040	108,060	110,450	105,110	92,840	.....
1943	154,450	66,730	55,550	55,730	69,240	7,450	107,740	107,740	111,710	107,740	99,530	77,400	.....
1944	28,820	80,030	54,850	55,810	41,330	25,940	22,350	103,810	103,420	98,960	103,030	91,820	.....
1945	59,320	55,670	49,280	71,310	32,560	9,340	5,200	111,310	95,310	84,660	79,770	51,360	.....
1946	64,000	39,060	42,300	16,600	8,360	5,600	62,810	169,560	145,600	150,270	169,070	165,180	.....
1947	171,530	160,640	182,200	171,280	209,390	117,940	172,520	498,930	482,190	508,940	498,360	469,210	.....
1948	332,470	322,340	174,750	42,540	7,610	6,360	52,690	482,190	1,003,700	909,900	888,560	828,450	.....
1949	708,390	680,500	551,670	333,840	168,390	100,700	229,170	715,010	1,057,000	1,178,600	1,082,900	1,013,400	.....
1950	909,000	1,069,700	987,300	704,120	469,740	224,410	129,240	370,220	1,128,100	1,166,900	1,167,400	1,082,900	.....
1951	1,087,000	1,121,900	1,122,900	892,800	851,120	729,470	562,600	776,410	1,163,700	1,203,000	1,169,000	1,084,900	.....
1952	926,300	715,010	534,240	318,220	157,600	60,180	220,010	720,610	1,077,800	1,202,000	1,194,500	1,140,600	.....
1953	975,800	782,290	647,160	703,900	725,430	642,710	630,260	980,600	1,290,100	1,398,300	1,396,000	1,345,500	.....

† Contents by capacity table used beginning Oct. 1, 1942; contents Sept. 30, 1942, by capacity table used since Oct. 1, 1942, was 92,550 acre-ft.

NOTE—Contents at 12 p.m. based on daily observations March to September 1940, June 1943 to March 1948. All other contents from elevations at 12 p.m.

Thunder Creek near Newhalem, Wash.

Location.—Lat. 48°40'20", long. 121°04'20", in SE¼ sec. 23, T. 37 N., R. 13 E. (unsurveyed), on right bank, half a mile upstream from backwater from Diablo Reservoir, 8 miles east of Newhalem, and 20 miles northeast of Marblemount.

Drainage area.—98 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,220 ft. (from river-profile map).

Average discharge.—23 years (1930-53), 607 cfs.

Extremes.—1930-53: Maximum discharge, 9,630 cfs Nov. 27, 1949 (gage height, 12.14 ft.), from rating curve extended above 2,900 cfs on basis of logarithmic plotting; minimum not determined, probably less than 50 cfs during period of ice effect or no gage-height record in February 1936.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931	360	379	95.2*	278*	212*	222*	333	955	1,350	1,340	825	664	555*
1932	214	301	195	180	630	455	590	542	1,620	1,440	935	320	623
1933	460	760	352	183	97.8	121	322	610	1,360	1,710	1,330	678	668
1934	917	728.	746	493	335	546	1,057	1,125	1,245	1,382	1,125	606	803
1935	451	717	831	686	500	201	216	747	1,270	1,401	947	850	695
1936	343	110	108	100	57.3*	116	680*	1,330*	1,515	1,153	1,009	614	596*
1937	371	115	167	84.6	04.2	144	243	751	1,633	1,375	796	640	537
1938	554	493	356	238	111	189	463	951	1,888	1,417	744	782	657
1939	361	175	258	300	115	183	468	968	1,222	1,318	942	548	550
1940	494	375	502	241	202	285	407	912	1,047	1,025	832	747	591
1941	915	210	313	185	161	201	430	609	891	1,104	930	600	557
1942	572	353	412	128	103	301	347	703	963	1,289	952	526	544
1943	257	197	277*	108*	144*	199	640	709	1,204	1,533	875	607	570*
1944	345	146	221	120	111	124*	223	651	979	965	726	737	452*
1945	452	251	266	302	270	141	192	882	1,011	1,080	786	514	515
1946	429	335*	168*	157	129*	182	409	1,247	1,191	1,300	863	441*	574*
1947	303	147	253	171	261	289	553	1,210	1,057	1,217	720	527	558*
1948	753	290	262	174	117	113	298	1,071	2,072	1,126	1,019	598	659
1949	426	183	147	103	109	212	540	1,353	1,249	1,214	930	730	602
1950	422	918	394	201	138	237	271	804	1,888	1,826	1,251	703	757
1951	502	562	700	246	564	169	527	1,035	1,271	1,367	924	640	717
1952	480	246	152	92.3	140	105	437	905	1,053	1,256	1,083	592	547
1953	390*	120*	132*	401	366	152	202	858	932	1,410	1,060	699	668*

* Estimated.

SKAGIT RIVER BASIN

Thunder Creek near Newhalem, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	141	136					212	624	698	698	586	274	.....
1932...	141	139	109	103	74		326	640	740	820	442		74
1933...	190	217	149	116	88	95	169	391	692	1,130	800	327	88
1934...	304	313	324	319	234	307	497	586	758	766	375	199	199
1935...	190	286	217	125*	217	145	121	372	860	750	690	328	121
1936...	144	88	82	65	50*	68	80	070*	1,000	925	657	202	50*
1937...	125	84	77	60*	62	67	169	293	1,070	664	431	246	60*
1938...	158	237	213	143	92	153	148	437	840	930	581	442	92
1939...	131	130	135	146	92	77	324	530	639	797	578	281	77
1940...	188	208	251	138	145	177	255	450	707	749	639	412	138
1941...	266	147	180	143	127	162	279	286	639	764	499	354	127
1942...	238	213	169	113	85	85	165	257	558	799	401	249	85
1943...	110	98	130*	120*	110*	115	300*	311	665	960	603	383	98
1944...	163	116	122	95	79	75*	140*	383	690	588	503	383	75*
1945...	275	163	129	116	139	116	133	441	519	586	519	230	116
1946...	135*	206	105*	122	94*	136	179	518	722	950	550*	208	94*
1947...	92	111	135	105	147	159	276	520*	722	663	500	241	92
1948...	307	183	159	119	95	93	127	274	1,410	865	798	335	93
1949...	195	145	108	82	71	163	170	512	685	685	605	410	71
1950...	206	248	150	130*	110	140	167	320	1,000	1,100	855	312	110
1951...	215	180	308	163	163	142	212	333	685	975	530	310	142
1952...	242	156	106	77	98	90	124	374	615	845	647	337	77
1953...	180	62*	63*	100*	149	124	142	415	687	890	619	334	62*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1931.....	3,630	June 26, 1931	.....	555	5.66	77.00	402,000	562	77.83	407,000
1932.....	9,150	Feb. 26, 1932	74	623	6.36	86.36	452,000	690	95.64	500,000
1933.....	5,010	Nov. 13, 1932	88	668	6.82	92.49	483,000	742	102.84	537,000
1934.....	4,440	July 16, 1934	199	893	8.81	119.55	624,600	787	109.07	569,800
1935.....	6,120	Nov. 5, 1934	121	695	7.09	96.27	503,000	617	85.46	446,500
1936.....	3,800	May 30, 1936	50	598	6.10	83.12	433,800	605	84.19	439,500
1937.....	2,650	June 21, 1937	60	537	5.48	74.41	389,100	595	82.40	430,800
1938.....	7,630	Oct. 23, 1937	92	657	6.70	91.06	475,900	611	84.71	442,700
1939.....	4,740	May 23, 1939	77	550	5.61	76.17	398,400	599	82.89	433,400
1940.....	2,060	May 23, 1940	136	591	6.03	82.03	428,700	597	82.87	433,200
1941.....	5,430	Oct. 20, 1940	127	557	5.68	77.09	403,000	548	75.88	396,700
1942.....	3,530	Oct. 3, 1941	85	544	5.55	75.29	393,600	492	68.19	356,400
1943.....	2,300	July 10, 1943	98	570	5.82	78.93	412,500	568	78.72	411,400
1944.....	2,780	Sept. 20, 1944	76	452	4.61	62.74	327,800	473	65.73	343,600
1945.....	3,080	Sept. 4, 1945	116	515	5.26	71.27	372,500	511	70.80	370,000
1946.....	4,220	Oct. 25, 1945	94	574	5.66	79.54	415,800	555	76.92	402,100
1947.....	5,550	Oct. 25, 1946	92	588	5.69	77.23	403,700	608	84.26	440,400
1948.....	4,410	Oct. 19, 1947	93	659	6.72	91.38	478,400	613	85.10	444,500
1949.....	2,500	May 13, 1949	71	602	6.14	83.50	436,400	684	94.73	405,100
1950.....	9,630	Nov. 27, 1949	110	767	7.72	104.91	548,300	768	106.43	555,800
1951.....	3,870	Feb. 10, 1951	142	717	7.32	96.26	518,700	635	88.02	460,000
1952.....	2,580	June 4, 1952	77	547	5.58	75.98	397,100	527	73.26	382,800
1953.....	2,690	Sept. 23, 1953	62	568	5.80	78.70	411,300	.....	.....	.....

* Estimated.

SKAGIT RIVER BASIN

Thunder Creek near Marblemount, Wash.

Location.—Lat. 48°42'30", long. 121°06'00", in NW¼ sec. 10, T. 37 N., R. 13 E., on left bank, a quarter of a mile upstream from mouth, 1½ miles southeast of Diablo Dam, and 20 miles northeast of Marblemount.

Drainage area.—111 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,085 ft. (by water level transfer from Diablo Dam).

Average discharge.—11 years (1919-30), 651 cfs.

Extremes.—1919-30: Maximum discharge, 15,400 cfs Dec. 12, 1921 (gage height, 15.5 ft.); minimum discharge not determined, but probably occurred during period Jan. 19 to Feb. 15, 1929, when stage-discharge relation was affected by ice.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1919						148	515	988	1,070	1,570	1,260	666	
1920	202	490	381	346	317	185	196	536	887	1,860	1,340	599	639
1921	721	298	244	289	402	330	355	1,010	1,970	1,560	1,230	578	750
1922	920	486	998	149	82.6	77.6	196	758	1,660	1,430	1,210	860	740
1923	477	288	805	382	173*	189	546	905	1,330	1,680	1,220	740	684*
1924	309	162	280	173	751	236	269	1,280	1,020	1,240	996	646	614
1925	448	315	563	196	323	208	522	1,300	1,400	1,560	1,030	598	708
1926	294	135	435	225	214	239	587	650	1,050	1,320	1,060	483	556
1927	868	312	294	205	147	154	305	658	1,560	1,410	1,230	919	676
1928	778	597	425	630	199	264	289	1,200	1,200	1,500	971	665	739
1929	747	206	135	73.6	68.9	103	205	921	1,240	1,140	1,000	539	535
1930	275	90.8	87.5	84.7*	407	267*	690	617	970	1,140	927	674	519*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910						113	332	477		1,060	818	804	
1920	113	92		180	160	143	156	318	354	1,210	571	511	92
1921	361	217	177	184	168	262	261	326	1,040	1,040	619	278	168
1922	346	265	216			71	94	329	1,220	1,010	830	516	71
1923	273	195		165*		154	407	500	602	1,060	775	384	
1924	147	116	140	124	331	163	154	523	695	702	542	248	116
1925	185	228		134	185	166	197	516	636	1,230	470	222	
1926	160	119	246	168	152		224	375	617	770	785	178	110
1927	190	216	178	131	124	138	170	375	900	1,050	695	503	124
1928	375	345	178		167	155	207	359	633	1,000	718	328	155
1929	235	155	91			65	97	420	660	805	615	127	
1930	118	75	70				480	360	570	640	530	250	

* Estimated.

Thunder Creek near Marblemount, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1919										
1920	4,960	Sept. 11, 1920	92	639	5.76	78.39	468,000	655	80.43	475,000
1921	4,570	June 7, 1921	168	750	6.76	91.83	543,000	847	103.63	613,000
1922	15,400	Dec. 12, 1921	71	740	6.67	90.55	536,000	623	76.21	451,000
1923	3,180	June 9, 1923		684	6.16	83.62	495,000	666	81.51	482,000
1924	6,360	Feb. 12, 1924	116	614	5.53	75.41	446,000	657	80.66	477,000
1925	4,200	Dec. 12, 1924		708	6.38	86.60	512,000	664	81.30	481,000
1926	2,680	July 5, 1926	119	556	5.01	68.05	403,000	612	74.96	444,000
1927	10,400	Oct. 16, 1926	124	676	6.09	82.65	489,000	702	85.93	508,000
1928	3,620	May 22, 1923	155	739	6.66	90.46	536,000	650	83.21	493,000
1929	8,800	Oct. 9, 1923		535	4.82	65.44	387,000	481	58.87	345,000
1930	2,680	July 13, 1930		519	4.63	63.53	378,000			

Diablo Reservoir near Newhalem, Wash.

Location.—Lat. 48°43'00", long. 121°08'00", in Diablo Dam on Skagit River, in SE¼ sec. 5, T. 37 N., R. 13 E. (unsurveyed), 1 mile downstream from Thunder Creek, and 6 miles northeast of Newhalem.

Drainage area.—1,100 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, subject to adjustment to datum of 1929. Prior to Oct. 12, 1931, staff gage at approximately same site and datum.

Extremes.—1929-53: Maximum contents, 90,600 acre-ft. July 14, 1933 (elevation, 1,206.5 ft.); minimum since storage began, not determined.

Remarks.—Reservoir is formed by concrete dam, completed in 1930; storage began in October 1929. Usable capacity, 76,220 acre-ft. between elevations 1,040 ft. (bottom of outlet pipes) and 1,205 ft. (top of taintor gates). Dead storage, 13,000 acre-ft. Crest of spillway is at elevation 1,187 ft. Water is used by city of Seattle for power development at Diablo and Newhalem powerplants. Figures given herein represent total contents.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	660	1,850	4,020	1,780	7,770	2,690	650	820	600	3,070	24,570	59,470	.....
1931...	70,300	64,200	54,860	91,770	83,400	88,950	90,550	90,050	80,220	90,640	91,110	84,500	.....
1932...	49,700	85,650	73,700	81,730	82,060	77,750	79,290	80,800	90,450	88,010	91,020	72,420	.....
1933...	58,070	91,020	87,540	80,220	80,490	22,960	79,960	85,840	86,930	89,610	89,610	90,920	.....
1934...	91,390	90,830	89,950	90,080	89,700	89,800	88,680	88,070	88,860	88,200	87,730	72,850	.....
1935...	72,800	87,920	91,820	91,540	86,860	45,400	53,100	88,290	88,200	80,350	91,300	83,580	.....
1936...	47,730	36,720	38,760	35,470	21,750	19,680	90,610	89,980	90,140	91,020	91,020	81,730	.....
1937...	79,160	75,450	91,860	64,660	44,990	80,640	86,630	90,550	86,500	90,650	89,940	78,870	.....
1938...	91,980	91,540	91,220	91,250	86,430	86,090	88,550	90,280	90,750	91,440	90,560	92,010	.....
1939...	92,040	86,090	91,850	91,810	88,710	87,720	88,730	88,280	88,520	91,540	91,300	89,510	.....
1940...	91,770	91,250	91,820	91,540	91,510	71,600	91,270	89,790	91,900	91,840	91,620	91,110	.....
1941...	88,470	89,960	90,930	91,330	86,540	88,550	91,430	90,720	90,540	90,570	90,660	85,410	.....
1942...	90,100	92,160	89,420	90,760	81,040	63,520	87,230	89,630	87,790	88,260	88,950	88,570	.....
1943...	85,820†	85,990	87,590	84,320	73,660	87,590	88,130	88,220	80,060	81,320	87,860	87,320	.....
1944...	86,340	88,130	88,950*	85,020*	84,240	86,520	88,580	86,760	87,500	87,600	86,820	86,700	.....
1945...	86,880	87,500	86,880	86,080	87,230	85,640	86,340	86,520	86,880	88,040	86,790	88,130	.....

* Estimated

† Contents by capacity table used beginning Oct. 1, 1942; contents Sept. 30, 1942, by capacity table used since Oct. 1, 1942, was 86,610.

Diablo Reservoir near Newhalem, Wash.—Continued

Contents in Acre-feet on Last Day of Month—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	88,040	86,960	86,170	87,140	86,060	87,320	87,410	89,220	88,400	86,860	85,460	86,880	.....
1947...	86,080	87,050	85,820	86,840	86,840	87,500	86,050	87,770	87,590	87,770	87,410	87,860	.....
1948...	89,130	89,310	88,480	87,560	89,500	88,580	88,040	87,590	87,590	88,860	87,860	88,220	.....
1949...	88,670	87,770	88,620	88,560	88,670	87,410	88,400	89,590	86,170	87,590	77,300	77,700	.....
1950...	77,300	77,380	76,900	76,590	76,760	76,670	78,420	78,910	78,670	77,460	78,180	77,780	.....
1951...	79,080	79,400	77,700	78,910	80,250	28,420	79,160	77,780	61,140	74,890	84,500	85,990	.....
1952...	79,400	88,400	86,700	87,050	87,400	87,140	88,760	87,050	87,770	89,680	88,950	88,560	.....
1953...	86,700	79,490	86,700	88,580	87,060	85,990	86,700	85,730	88,040	86,780	84,830*	84,760	.....

Skagit River at Reflector Bar, near Newhalem, Wash.

Location.—Lat. 48°42'50", long. 121°08'30", in N½ sec. 8, T. 37 N., R. 13 E. (un-surveyed), on right bank just downstream from Canyon Diablo, a quarter of a mile downstream from later site of Diablo Dam, three-quarters of a mile upstream from Stettatle Creek, 1½ miles downstream from Thunder Creek, 6 miles northeast of Newhalem, and 19 miles northeast of Marblemount.

Drainage area.—1,100 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 880 ft. (from river-profile map). Prior to Apr. 13, 1914, staff gage at same site and datum.

Average discharge.—25 years (1908-33), 4,078 cfs.

Extremes.—1913-22: Maximum discharge, 58,000 cfs Dec. 12, 1921 (gage height, 14.1 ft.); minimum, 665 cfs Nov. 11, 12, 1919 (gage height, 1.64 ft.).

Flood of about 1815 reached a stage of approximately 20 ft. (discharge, about 100,000 cfs). Flood in November 1909 reached a stage of approximately 15 ft. (discharge, about 62,000 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...	1,240*	3,160*	1,380*	1,720*	1,450*	1,600*	2,720*	6,860*	13,700*	7,640*	3,740*	2,640*	3,080*
1910...	1,940*	6,910*	3,660*	1,760*	1,510*	4,250*	7,260*	14,000*	10,100*	7,730*	3,970*	2,020*	5,400*
1911...	5,360*	5,790*	2,540*	1,470*	980*	1,720*	3,280*	7,400*	13,500*	7,380*	3,660*	2,700*	4,640*
1912...	1,130*	1,650*	1,400*	1,360*	2,060*	1,110*	2,600*	6,760*	10,600*	5,280*	3,370*	1,570*	3,410*
1913...	1,110*	1,940*	1,320*	950*	1,880*	1,380*	3,640*	9,310*	15,400*	8,360*	4,230*	3,200*	4,350*
1914...	2,580*	2,690*	1,830	3,600	1,270	2,800	5,350	9,150	8,450	6,010	3,200	1,960	4,100*
1915...	1,910	3,840	1,730	899	769	1,560	3,200	4,520	3,920	3,590	3,480	1,500	2,750*
1916...	1,830	2,030	1,870	860*	1,170*	1,720*	3,020*	8,210*	15,600	10,400	4,760	2,740	4,520*
1917...	1,130	1,280	930*	910*	1,250*	925*	2,000*	8,150	12,300	8,990	3,600	2,220	3,690*
1918...	1,560	1,840	5,090	7,220	2,530	1,960	5,270	8,350	12,700	6,620	3,700	2,420	4,860
1919...	2,370	1,960	3,330	2,100	1,410	1,220	5,150	10,300	12,000	9,320	4,510	2,340	4,660
1920...	1,020	2,760	2,690	2,610	2,710	1,670	1,670	5,480	8,750	5,470	3,690	1,300	3,730
1921...	4,850	2,270	1,850	2,240	3,210	2,760	3,220	10,400	16,700	7,650	4,030	2,430	5,140
1922...	4,070	3,610	6,700	1,420	876	785	2,000	8,150	14,500	5,700	3,490	2,530	4,490
1923...	1,970*	1,390*	2,060*	2,570*	1,150*	1,390*	5,180*	9,450*	11,400*	7,760*	3,520*	2,160*	4,170*
1924...	1,390*	960*	1,830*	1,240*	5,950*	1,930*	2,220*	11,900*	7,400*	4,630*	2,760*	2,000*	3,680*
1925...	2,580*	2,440*	5,200*	1,950*	3,200*	2,060*	5,500*	13,300*	10,200*	6,140*	3,040*	1,670*	4,770*
1926...	811*	762*	2,740*	1,520*	1,520*	1,780*	4,540*	4,640*	4,170*	3,320*	2,460*	1,360*	2,470*
1927...	2,900*	1,600*	2,100*	1,600*	1,140*	1,300*	2,980*	7,040*	13,600*	6,020*	3,490*	3,400*	3,930*
1928...	4,140*	3,860*	3,270*	4,720*	1,730*	2,460*	2,860*	12,000*	7,590*	5,060*	2,610*	1,740*	4,350*
1929...	2,820*	1,410*	1,150*	706*	570*	1,100*	1,090*	8,260*	9,090*	4,310*	2,660*	1,460*	2,970*
1930...	1,110*	697*	720*	606*	2,900*	2,260*	6,680*	6,430*	7,660*	4,980*	2,720*	1,920*	3,230*
1931...	1,420*	1,200*	844*	1,960*	2,260*	2,530*	3,350*	9,360*	7,450*	3,940*	2,220*	2,260*	3,240*
1932...	1,220*	2,260*	1,540*	1,560*	4,330*	4,100*	6,230*	9,400*	11,700*	5,280*	3,120*	1,010*	4,270*
1933...	1,970*	5,800*	3,460*	1,880*	1,040*	1,470*	3,940*	7,340*	14,300*	11,100*	5,130*	2,880*	5,040*

* Estimated.

SKAGIT RIVER BASIN

Skagit River at Reflector Bar, near Newhalem, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914			1,210	1,160	1,110	1,070	2,390	5,480	5,760	3,320	2,190*	1,290	
1915	1,240	2,560	1,060	739	739	824	3,020	3,500	2,650	2,560	2,650	962	739
1916	794	1,270	1,160						8,840	5,960	2,920	1,670	
1917									8,340	4,020	2,990	1,540	
1918	813	917	1,120	2,230	1,650	1,160	3,110	4,810	7,000	4,570	2,600	1,520*	813
1919	1,260	1,300	1,660	1,250	1,110	922	3,220	5,630	5,220	5,760	2,560	1,260	922
1920	807	605		1,480	1,460	1,289	1,260	3,060	3,710	4,670	1,880	1,880	665
1921	2,760	1,500	1,220	1,350	1,190	2,120	2,210	2,960	10,400	5,690	2,380	1,400	1,190
1922	1,720	2,070	2,170		739	725	947	3,540	9,550	3,650	2,700	1,820	725

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1910			5,400	4.91	66.65	3,910,000	5,500	67.84	3,930,000	
1911				4,640	4.22	57.28 ¹	3,360,000	3,850	47.56	2,790,000
1912				3,410	3.10	42.20	2,480,000	3,420	42.27	2,450,000
1913				4,350	3.95	53.62	3,150,000	4,580	56.59	3,320,000
1914	16,800	Jan. 6, 1914		4,100	3.73	50.64	2,970,000	4,120	50.90	2,990,000
1915	11,800	April 3, 1915	739	2,750	2.50	33.94	1,990,000	2,610	32.17	1,890,000
1916	29,400	June 17, 1916		4,520	4.11	55.94	3,280,000	4,340	53.77	3,150,000
1917	19,700	June 16, 1917		3,690	3.35	45.48	2,670,000	4,110	50.77	2,970,000
1918	37,300	Dec. 29, 1917	813	4,960	4.51	61.22	3,590,000	4,890	60.41	3,540,000
1919	24,200	May 27, 1919	922	4,680	4.25	57.81	3,390,000	4,580	56.56	3,320,000
1920	15,600	July 1, 1920	665	3,730	3.39	46.15	2,710,000	3,950	48.87	2,870,000
1921	30,800	June 7, 1921	1,190	5,140	4.67	63.54	3,730,000	5,590	68.96	4,050,000
1922	58,000	Dec. 12, 1921	725	4,490	4.08	55.49	3,250,000	3,740	46.19	2,710,000
1923				4,170	3.79	51.45 ²	3,020,000	4,060	50.11	2,940,000
1924				3,650	3.35	45.60	2,670,000	4,190	51.82	3,040,000
1925				4,770	4.34	58.91	3,450,000	4,280	52.84	3,100,000
1926				2,470	2.25	30.54	1,790,000	2,660	32.90	1,920,000
1927				3,690	3.57	48.46	2,840,000	4,320	53.35	3,130,000
1928				4,350	3.95	53.77	3,160,000	3,840	47.56	2,790,000
1929				2,970	2.70	36.65	2,150,000	2,710	33.41	1,960,000
1930				3,230	2.94	39.91	2,340,000	3,330	41.08	2,410,000
1931				3,240	2.95	40.04	2,350,000	3,360	41.42	2,430,000
1932				4,270	3.88	52.83	3,100,000	4,800	59.82	3,450,000
1933				5,040	4.58	62.17	3,650,000			

* Estimated.

SKAGIT RIVER BASIN

Stetattle Creek near Newhalem, Wash.

Location.—Lat. 48°43'30", long. 121°09'20", in NE¼ sec. 6, T. 37 N., R. 13 E., on left bank, three-quarters of a mile upstream from mouth, 5½ miles northeast of Newhalem, and 18½ miles northeast of Marblemount.

Drainage area.—21.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 925 ft. (by barometer). Dec. 19, 1913, to Nov. 14, 1915, staff gage half a mile downstream at different datum. Sept. 7, 1933, to Aug. 26, 1937, water-stage recorder 150 ft. upstream at datum 1.69 ft. higher.

Average discharge.—20 years (1933-53), 170 cfs.

Extremes.—1913-15, 1933-53: Maximum discharge, 8,580 cfs Nov. 26, 1949 (gage height, 9.70 ft.), from rating curve extended above 780 cfs on basis of slope-area determination of peak flow; minimum, 9 cfs Nov. 9-11, 1936.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914				192	39.0	126							
1915			56.9	37.2	41.0	106	259						
1933												178	
1934	293	203	290	212	141	248	323	323	255	192	109	77.5	223
1935	147	320	162	301	164	85.2	116	285	336	261	114	80.9*	193*
1936	93.5	53.8	95.9	78.6	20.7	83.3	200	375	341	166	78.8	54.1	144
1937	39.8	20.5	118	27.2	27.5	102	141	305	437	205	80.7	47.0	129
1938	169	240	171	94.2	42.2	101	232	365	412	216	71.7	54.5	181
1939	95.4	109	167	188	42.0	100	233	393	301	270	105	63.0	109
1940	169	190	286	105	105	180	174	321	219	116	62.7	45.3	165
1941	234	85.9	144	103	79.5	111	162	198	178	85.9	47.1	164	133
1942	240	173	177	41.8	44.9	52.9	160	228	258	171	49.6	22.6	135
1943	37.1	87.7*	152	105	75.5*	104	272	250	308	395*	189*	54.4*	170*
1944	84.9*	67.6	115	84.9*	56.6*	75.7	127	222	209	83.9	57.2	129	110*
1945	101	127	116	150	145	66.8	118	373	278	198	71.7	95.7	153
1946	190	121	89.7	101	61.0	99.5	203	463	366	293	153	78.5	187
1947	98.4	74.9	137	103	153	138	225	373	310	222	96.7	78.7	167
1948	251	105*	151	65.8	53.8*	55.1	160	383	520	216	164	131	188*
1949	133	92.6	46.5	39.7*	52.2	106	251	493	366	303	147	130	181*
1950	152	363	106	85.8	94.7	150	137	326	520	380	210	94.1	217
1951	216	292	327	104	279	55.5*	217	354	362*	245	112	100	221*
1952	193	104	65.7	36.2	65.2	52.3	213	334	336	259	111	55.6	155
1953	41.2	40.5	65.8	346	153	66.5	174	320	292	316*	157*	167*	179*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914				83	28	55							
1915			29	26	28	42	117						
1933												52	
1934	39	61	85	100	64	102	163	186	166	107	83	28	28
1935	28	102	69	45	66	40	36	157	220	168	75*	36	28
1936	32	31	50	31	15	37	29	232	214	98	51	30*	15
1937	37	9	11	16	15	41	97	145	251	75	48	25	9
1938	27	68	65	50	31	63	61	128	185	99	52	40	27
1939	31	49	45	53	31	30	143	172	207	170	71	34	30
1940	30*	72	73	32	49	75	96	153	127	67	46	31	30*
1941	25	51	57	42	39	62	84	74	115	45*	35	57	25
1942	52	47	41	29	26	25	81	84	147	71	30	17	17
1943	15	20*	50*	48	30*	38	125	109	168	260*	75*	40*	15
1944	40*	41	34	33*	28*	20	69	105	139	62	40	35	20
1945	40	56	28	24	31	30	53	193	131	77	43	41	24

* Estimated.

Stetattle Creek near Newhalem, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	27	64	30	49	32	52	68	198	198	188	94	31	27
1947...	23*	33	44	33	55	51	88	183	205	106	59	37	23*
1948...	75	50*	40	39	23*	37	59	94	305	142	106	75	23*
1949...	50	46	26	24*	24*	61	59	173	171	193	83	53	24*
1950...	48	57	31	44	60*	64	77	144	263	210	112	62	31
1951...	44	53	84	48	49	40	90	134	210*	160	73	49	40
1952...	78	47	27	23*	35	35	67	121	149	153	57	41	23*
1953...	24	21	20	35*	46	38	65	165	182	170*	100*	50*	20

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1914.....										
1915.....										
1933.....										
1934.....	2,020	Oct. 23, 1933	28	223	10.4	141.27	161,200	209	132.60	151,300
1935.....	5,640	Nov. 5, 1934	28	198	9.25	125.55	143,200	166	105.33	120,200
1936.....	1,010	June 2, 1936	15	144	6.73	91.92	104,900	138	88.65	100,500
1937.....	1,370	June 18, 1937	9	129	6.03	82.05	93,620	163	103.57	118,200
1938.....	3,220	Oct. 28, 1937	27	181	8.46	115.01	131,200	163	103.53	118,100
1939.....	2,560	May 28, 1939	30	169	7.90	107.00	122,100	192	122.06	139,300
1940.....	1,130	Nov. 30, 1939	30	165	7.71	104.85	119,700	150	95.31	108,800
1941.....	1,940	Oct. 19, 1940	25	133	6.21	84.33	96,230	143	90.96	103,800
1942.....	2,680	Dec. 2, 1941	17	135	6.31	85.85	98,000	108	68.82	78,550
1943.....	870	June 17, 1943	15	170	7.94	107.81	123,000	170	107.65	122,900
1944.....	1,510	Dec. 3, 1943	20	110	5.14	70.06	79,980	116	74.10	84,570
1945.....	1,980	Feb. 7, 1945	24	153	7.15	97.33	111,100	158	100.34	114,500
1946.....	3,210	Oct. 25, 1945	27	167	8.74	118.70	135,500	180	113.95	130,100
1947.....	1,740	Oct. 24, 1946	23	167	7.80	106.20	121,200	184	116.69	133,200
1948.....	2,730	Oct. 19, 1947	23	168	8.79	119.71	136,600	189	107.23	122,400
1949.....	1,740	Oct. 6, 1948	24	161	8.46	114.66	130,900	209	132.96	151,600
1950.....	8,580	Nov. 26, 1949	31	217	10.1	137.84	157,300	238	149.50	170,600
1951.....			40	221	10.3	140.34	160,200	182	116.23	131,500
1952.....	1,480	June 4, 1952	23	165	7.24	98.64	112,600	137	87.16	99,480
1953.....	1,820	①	20	179	8.36	113.24	129,200			

* Estimated.

① Probably Sept. 30, 1953.

SKAGIT RIVER BASIN

... Skagit River at Newhalem, Wash.

Location.—Lat. 48°40'20", long. 121°14'45", in SE¼ sec. 21, T. 37 N., R 12 E., on right bank, a quarter of a mile upstream from Newhalem Creek, half a mile downstream from city of Seattle powerplant at Newhalem, 11 miles from Bacon Creek, and 13 miles northeast of Marblemount.

Drainage area.—1,160 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Datum of gage is 401.5 ft. above mean sea level (river-profile survey). Dec. 21, 1908, to May 23, 1914, staff gages half a mile upstream at datum 91 ft. higher. Nov. 15, 1920, to June 4, 1923, staff gage 500 ft. upstream at present datum.

Average discharge.—45 years (1908-53), 4,282 cfs (unadjusted); 4,326 cfs (adjusted for storage since October 1929).

Extremes.—1908-14, 1920-53: Maximum discharge, 63,500 cfs Nov. 29, 1909 (gage height, 22.0 ft., from floodmark, site and datum then in use); minimum, 54 cfs Nov. 1, 1943 (gage height, 78.15 ft.); minimum daily, 136 cfs Aug. 24, 1930.

Several large floods occurred prior to 1909. See Skagit River at Reflector Bar, near Newhalem (see p. 340) for which peaks are practically equivalent to those at this station.

Remarks.—Flow regulated for power by Gorge dam since August 1924, by Diablo Reservoir since October 1929 and by Ross Reservoir since March 1940 (see elsewhere in this report).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...	1,380*	3,000*	1,540*	1,960	1,690	1,740	3,020	7,270	14,100	8,170	3,960	2,320	4,270*
1910...	2,150	7,880	4,250	2,050	1,660	4,660	8,060	14,800	10,400	8,270	3,890	2,160	5,870
1911...	5,950	6,000	2,940	1,600	1,020	1,880	3,040	7,850	13,900	7,890	3,850	2,890	5,030
1912...	1,250	1,880	1,620	1,560	2,270	1,210	2,890	9,290	10,900	5,650	3,570	1,680	3,650
1913...	1,230	2,210	1,530	1,090	1,520	1,520	4,040	9,870	15,900	8,950	4,480	3,430	4,650
1914...	2,660	3,070	1,860	4,080	1,430	3,050	5,900	9,730	8,740*	6,430*	3,390*	2,100*	4,390*
1915...	2,120*	4,380*	2,010*	1,030*	850*	1,700*	5,770*	4,790*	4,040*	3,840*	3,690*	1,600*	2,980*
1916...	2,030*	2,310*	2,170*	990*	1,290*	1,890*	3,350*	8,700*	16,100*	11,100*	5,040*	2,930*	4,820*
1917...	1,370*	1,580*	1,050*	1,050*	1,380*	1,010*	2,220*	8,670*	12,760*	9,620*	4,030*	2,350*	3,920*
1918...	1,750*	2,100*	5,900*	8,300*	2,780*	2,160*	5,850*	8,880*	13,180*	7,080*	3,920*	2,650*	5,870*
1919...	2,630*	2,230*	3,860*	2,420*	1,550*	1,830*	5,720*	10,900*	12,400*	9,920*	4,780*	2,500*	5,020*
1920...	1,130*	3,170*	3,120*	3,230*	2,980*	1,710*	1,850*	5,810*	9,010*	9,060*	3,910*	3,320*	4,020*
1921...	5,740*	2,660	2,310	2,810	3,970	3,850	3,810	11,400	17,600	8,560	4,160	2,720	5,700*
1922...	4,650	4,170	7,680	1,530	938	609	2,290	8,850	14,600	5,960	3,680	2,690	4,840
1923...	2,150	1,460	2,510	2,840	1,190	1,480	5,530	9,590	11,700	8,230	3,800	2,250	4,420
1924...	1,440	1,090	2,180	1,440	6,270	2,010	2,340	12,400	7,700	4,930	2,930	2,090	3,900
1925...	2,990	2,060	5,660	2,150	3,480	2,240	5,850	13,500	10,500	6,520	3,200	1,720	5,040
1926...	863	851	3,170	1,080	1,070	1,920	4,810	4,890	4,270	3,500	2,640	1,460	2,650
1927...	3,220	1,850	2,410	1,830	1,260	1,430	3,270	7,360	13,700	6,460	3,690	3,630	4,190
1928...	4,550	4,390	3,550	5,210	1,940	2,670	3,070	12,400	7,670	5,340	2,890	1,790	4,610
1929...	3,220	1,590	1,300	771	598	1,210	2,160	8,858	9,190	4,460	2,720	1,470	3,130
1930...	1,160	006	767	744*	3,110	2,680	7,400	6,620	7,870	5,160	2,620	1,470	3,320*
1931...	1,420	1,420	1,110	1,750	2,520	2,850	3,690	9,930	7,710	4,110	2,310	2,540	3,460
1932...	1,370	1,950	1,790	1,650	4,680	4,460	5,710	9,710	11,000	5,660	3,280	2,050	4,530
1933...	1,370	6,410	3,890	2,190	1,940	1,710	3,280	7,490	14,700	11,500	5,350	3,090	5,300
1934...	6,027	5,706	5,829	5,056	3,819	5,995	12,300	11,600	8,352	5,325	3,373	2,237	6,034
1935...	2,025	5,684	3,224	5,695	5,792	3,070	2,440	7,419	10,500	6,952	3,263	2,961	4,906
1936...	2,103	1,131	1,168	1,279	930	1,594	5,079	12,010	9,211	4,105	2,684	1,929	3,658
1937...	1,254	723	1,290	1,162	927	1,157	2,856	8,220	14,330	6,517	2,734	2,077	3,611
1938...	2,293	3,717	3,406	2,576	1,309	2,360	4,927	10,790	11,950	5,855	2,409	2,008	4,480
1939...	1,533	1,459	2,078	3,175	1,258	2,139	5,556	9,779	7,917	6,195	3,047	1,694	3,837
1940...	1,907	2,322	5,011	2,248	2,051	3,314	3,822	6,803	6,033	3,135	2,251	2,128	3,424

* Estimated.

Skagit River at Newhalem, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	3,638	1,966	2,222	1,870	1,877	2,416	3,315	5,021	4,858	3,158	2,519	2,605	3,003
1942...	3,892	3,428	4,732	2,338	2,059	1,440	2,930	5,122	7,385	4,769	2,693	1,626	3,547
1943...	1,181	1,907	2,165	2,056	2,145	3,033	5,670	7,540	11,800	10,240	3,792	2,399	4,503
1944...	2,362	1,077	1,392	1,346	1,393	1,531	2,768	5,028	6,870	3,576	2,152	2,656	2,687
1945...	2,420	1,785	2,220	2,271	3,504	2,051	2,209	7,740	9,341	5,281	2,576	2,451	3,648
1946...	2,776	3,452	1,891	2,307	1,537	2,286	3,683	12,610	11,430	7,305	3,133	1,947	4,548
1947...	1,524	1,406	2,315	1,954	2,281	4,959	4,845	6,496	9,103	4,765	2,702	2,279	3,723
1948...	5,216	3,433	5,203	4,317	2,031	1,404	2,731	4,389	8,613	7,194	4,441	3,628	4,394
1949...	3,367	3,377	3,791	4,596	4,278	3,451	3,813	6,745	4,191	4,776	5,120	3,884	4,322
1950...	4,120	4,416	5,825	5,082	7,447	6,769	4,938	5,004	6,643	10,640	4,910	3,640	5,797
1951...	3,555	4,946	7,288	6,757	7,138	3,009	7,732	8,060	5,140	6,301	3,616	3,666	5,675
1952...	5,060	5,299	4,516	4,327	4,488	2,860	2,300	2,039	2,316	3,555	3,147	2,644	3,545
1953...	3,891	4,153	2,987	3,302	3,190	3,073	3,788	4,205	4,365	6,776	4,299	3,124	3,936

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...				1,560	1,350	1,290	2,320	3,280	8,360	5,510	2,430	1,810	
1910...	1,560	1,560	1,490	1,240	1,240	1,680	3,120	8,340	6,470	5,540	1,840	1,460	1,240
1911...	2,910	3,210	2,170	1,240	870	920	2,350	5,020	8,340	5,360	2,980	1,490	870
1912...	920	880	1,170	970	1,490	920	2,110	3,120	6,280	3,740	1,890	1,170	880
1913...	920	1,030	1,240	920	820	1,240	1,320	3,370	10,500	5,190	2,660	1,990	820
1914...	1,320	1,890	1,240	1,240	1,240	1,890	2,430	5,900					
1921...		1,450	1,450	1,630	1,360	2,500	2,620	3,520	10,300	6,410	2,500	1,270	1,270
1922...	1,630	2,150	2,310	1,080	800	740	1,080	3,630	8,870	3,780	2,760	1,560	740
1923...	1,160	1,080		1,320	940	1,160	3,620	5,160	7,000	4,400	3,040	1,330	
1924...	925	810	1,200	1,010	2,800	1,360	1,330	5,230	5,430	3,210	1,740	1,100	810
1925...	1,320	1,700	1,640	1,400	1,920	1,720	1,990	5,960	6,970	4,960	1,720	940	940
1926...	657	656	2,070	1,190	1,120	1,330	1,960	3,330	3,140	2,120	2,120	862	656
1927...	955	1,230	1,410	1,060	934	1,160	1,570	4,450	8,290	4,940	2,450	2,220	934
1928...	2,210	2,470	1,520	1,690	1,530	1,410	2,060	3,980	5,280	3,410	1,970	1,190	1,190
1929...	1,360	1,160	956			598	1,070	4,220	6,440	2,920	1,940	704	
1930...	230	275	262		578	666	5,380	4,740	6,070	3,950	136	690	136
1931...	828	619	536	534	1,270	1,800	2,180	5,660	4,460	2,260	1,840	1,730	534
1932...	1,540	1,250	1,040	1,210	1,200	1,590	3,640	6,100	6,570	3,380	2,220	1,480	1,040
1933...	1,370	2,200	1,890	1,530	1,460	969	1,240	2,180	8,240	6,180	2,950	1,860	969
1934...	1,560	2,580	3,130	3,300	2,250	3,750	6,160	7,390	4,710	3,170	2,780	1,450	1,450
1935...	1,360	3,230	1,560	1,700	3,000	1,310	1,990	2,890	6,760	4,720	2,350	1,860	1,310
1936...	1,220	604	658	591	463	731	1,010	7,650	4,880	2,860	1,820	772	463
1937...	603	458	720	934	680	522	1,260	3,370	9,630	3,010	1,660	1,300	458
1938...	644	2,140	2,180	1,510	1,030	1,860	1,260	5,270	8,450	3,030	1,630	1,400	644
1939...	1,090	1,130	1,340	1,330	962	801	3,760	6,840	6,110	4,160	1,940	1,140	801
1940...	1,020	1,220	2,120	1,280	1,390	1,220	1,390	4,480	2,810	2,160	1,470	1,520	1,020
1941...	1,330	1,350	1,290	1,180	1,360	1,290	2,290	3,110	2,530	1,590*	1,550	2,080	1,180
1942...	2,310	2,280	1,890	1,510	839	836	1,350	2,020	4,590	2,150	1,560	1,020	836
1943...	717	698	1,260	1,340	818	1,280	3,950	4,710	7,640	5,940	2,200	1,890	698
1944...	1,110	747	318	526	380	326	1,330	3,740	4,720	2,660	386	1,760	318
1945...	1,430	821	588	598	1,610	950	1,210	2,990	6,590	2,530	1,770	1,250	588
1946...	1,070	2,260	1,090	1,420	1,120	1,350	2,160	5,400	7,660	2,780	2,330	1,190	1,070
1947...	1,150	1,100	1,200	1,250	1,250	1,320	2,530	1,860	3,510	2,760	1,570	1,330	1,150
1948...	2,290	2,290	3,260	3,590	783	758	1,330	2,450	4,030	3,850	2,540	2,390	758
1949...	1,760	1,640	1,780	2,340	2,070	2,150	2,530	3,390	3,000	2,730	1,310	1,420	1,310
1950...	2,960	1,900	3,870	3,830	4,900	3,900	2,660	2,080	2,970	4,560	2,700	1,420	1,420
1951...	2,530	3,170	4,910	4,020	4,200	3,470	3,490	5,140	3,180	4,000	1,440	1,240	1,240
1952...	2,850	4,500*	702	3,760	3,280	1,300	1,310	1,140	1,390	1,820	1,070	1,120	702
1953...	2,280	3,220	1,180	2,120	1,710	1,340	1,380	2,950	3,060	2,520	1,380	1,270	1,180

* Estimated.

SKAGIT RIVER BASIN

Skagit River at Newhalem, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1909	26,900	June 2, 1909		4,270	3.68	49.95	3,090,000	4,920	57.56	3,560,000
1910	63,500	Nov. 29, 1909	1,240	5,870	5.06	68.69	4,250,000	5,980	70.04	4,330,000
1911	25,500	June 14, 1911	870	5,030	4.34	58.91	3,640,000	4,130	48.32	2,990,000
1912	19,500	May 15, 1912	880	3,650	3.15	42.38	2,650,000	3,670	43.02	2,860,000
1913	27,900	June 3, 1913	820	4,650	4.01	54.43	3,370,000	4,890	57.28	3,540,000
1914	20,700	Jan. 6, 1914		4,390	3.78	51.31	3,180,000	4,450	52.05	3,220,000
1915				2,990	2.57	34.89	2,160,000	2,820	32.97	2,040,000
1916				4,820	4.16	58.62	3,500,000	4,620	54.15	3,350,000
1917				3,920	3.38	45.88	2,840,000	4,400	51.56	3,190,000
1918				5,370	4.63	62.85	3,890,000	5,280	61.75	3,820,000
1919				5,020	4.33	58.78	3,630,000	4,920	57.54	3,560,000
1920				4,020	3.47	47.23	2,920,000	4,300	50.43	3,120,000
1921	31,400	June 8, 1921	1,270	5,760	4.97	67.45	4,170,000	6,260	73.17	4,580,000
1922	60,000	Dec. 12, 1921	740	4,840	4.17	56.68	3,500,000	3,960	46.43	2,870,000
1923	21,400	June 8, 9, 1923		4,420	3.81	51.63	3,190,000	4,290	50.25	3,110,000
1924	31,400	Feb. 12, 1924	810	3,900	3.36	45.74	2,830,000	4,440	52.16	3,220,000
1925	25,400	May 20, 1925	940	5,040	4.34	58.94	3,650,000	4,510	52.70	3,260,000
1926	9,220	April 30, 1926	656	2,650	2.28	31.03	1,920,000	2,670	33.57	2,070,000
1927	26,000	June 8, 1927	934	4,190	3.61	45.96	3,030,000	4,800	52.80	3,280,000
1928	27,200	May 21, 1928	1,190	4,610	3.97	54.11	3,350,000	4,050	47.95	2,970,000
1929	23,600	Oct. 9, 1928		3,130	2.70	36.56	2,260,000	2,820	32.99	2,040,000

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR					
Year	Observed				Adjusted			Observed		Adjusted		
	Dis- charge	Date	Mini- mum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run- off in inches	Mean	Runoff in acre-feet	Mean	Run- off in inches
1930	13,400	June 11, 1930	136	3,320	2,410,000	3,400	2.93	39.84	3,440	2,480,000	3,510	41.04
1931	15,500	May 2, 1931	534	3,450	2,500,000	3,450	3.00	40.78	3,590	2,600,000	3,620	42.42
1932	45,000	Feb. 27, 1932	1,040	4,530	3,230,000	4,510	3.89	52.98	5,070	3,630,000	5,090	59.75
1933	28,200	June 15, 1933	969	3,369	3,840,000	5,330	4.69	62.31	5,760	4,170,000	5,760	67.87
1934	25,000	April 23, 1934	1,450	6,304	4,564,000	6,279	5.41	73.51	5,740	4,166,000	5,743	67.24
1935	30,300	Jan. 25, 1935	1,310	4,906	3,552,000	4,921	4.24	57.68	4,364	3,169,000	4,290	50.21
1936	22,400	May 31, 1936	463	3,658	2,655,000	3,655	3.15	42.81	3,563	2,588,000	3,636	42.56
1937	22,500	June 3, 1937	458	3,611	2,614,000	3,607	3.11	42.19	4,125	2,956,000	4,124	48.26
1938	24,400	Oct. 28, 1937	644	4,480	3,244,000	4,409	3.88	52.62	4,118	2,981,000	4,119	48.18
1939	22,400	May 29, 1939	801	3,837	2,778,000	3,834	3.31	44.36	4,188	3,032,000	4,187	49.00
1940	15,100	May 23, 1940	1,020	3,424	2,486,000	3,546	3.06	41.60	3,306	2,400,000	3,451	40.49
1941	17,100	Oct. 20, 1940	1,180	3,003	2,174,000	3,002	2.59	35.15	3,358	2,431,000	3,348	39.18
1942	17,400	May 26, 1942	836	3,547	2,568,000	3,553	3.06	41.58	2,973	2,152,000	2,958	34.57
1943	20,400	May 27, 1943	698	4,503	3,260,000	4,482	3.86	52.46	4,470	3,230,000	4,429	51.84
1944	11,200	June 12, 1944	318	2,687	1,951,000	2,707	2.33	31.77	2,520	2,047,000	2,510	32.98
1945	20,700	May 31, 1945	588	3,648	2,641,000	3,694	3.10	42.66	3,737	2,742,000	3,777	44.19
1946	24,400	May 27, 1946	1,070	4,548	3,292,000	4,703	4.05	55.04	4,309	3,120,000	4,503	52.68
1947	13,600	May 25, 1947	1,150	3,723	2,696,000	4,745	3.57	48.49	4,449	3,221,000	4,442	51.97
1948	15,100	June 15, 1948	758	4,394	3,190,000	4,789	4.21	57.36	4,148	3,011,000	4,664	54.73
1949	11,800	May 15, 1948	1,310	4,322	3,129,000	4,664	3.93	53.40	4,610	3,337,000	5,198	60.82
1950	17,700	June 29, 1950	1,420	5,797	4,197,000	5,694	5.08	68.97	5,917	4,284,000	6,100	71.45
1951	18,300	Dec. 24, 1950	1,240	5,075	4,108,000	5,659	4.90	68.57	5,596	4,051,000	4,795	56.12
1952			702	3,545	2,574,000	3,625	3.12	42.63	3,223	2,330,000	3,378	39.62
1953	19,700	July 14, 1953	1,180	3,938	2,650,000	4,214	3.63	49.31				

Goodell Creek near Newhalem, Wash.

Location.—Lat. 48°40'25", long. 121°15'50", in SE¼ sec. 20, T. 37 N., R. 12 E., on right bank at combination railroad and highway bridge, 500 ft. upstream from mouth, and three-quarters of a mile west of Newhalem.

Drainage area.—38.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 475 ft. (from river-profile map).

Extremes.—1943-44: Maximum discharge recorded, 1,710 cfs probably Sept. 20, 1944 (gage height, 5.92 ft., from recorded range in stage), from rating curve extended above 610 cfs; minimum discharge recorded, 77 cfs probably Sept. 9 and Oct. 21, 1944 (gage height, 4.11 ft., from recorded range in stage).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943.....											136	153	
1944.....									234	144	300	224	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943.....											101	95	
1944.....									163	99	85*	77*	

* Estimated.

Skagit River above Alma Creek, near Marblemount, Wash.

Location.—Lat. 48°36'25", long. 121°21'35", in NE¼ sec. 15, T. 36 N., R. 11 E., on right bank, three-quarters of a mile upstream from Alma Creek, and 7 miles north of Marblemount.

Drainage area.—1,260 sq. mi., of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Datum of gage is 358.8 ft. above mean sea level (from river-profile survey).

Extremes.—1950-53: Maximum discharge, 28,000 cfs Feb. 10, 1951 (gage height, 14.40 ft.), from rating curve extended above 18,000 cfs; minimum, 1,320 cfs Dec. 28, 1952, but may have been less sometime during August or September 1952; minimum daily, 1,400 cfs Aug. 31, 1952.

Remarks.—No diversion above station. Flow partly regulated by powerplants on upper Skagit River, and by Ross Reservoir (see p. 335) and by Diablo Reservoir (see p. 339).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951....	4,932*	6,046	8,739	7,370	8,952	4,436	8,754	9,418	6,454*	7,069*	3,987	4,032	6,670*
1952....	5,073	5,804	4,862	4,514	4,964	3,171	3,165	3,321	3,310*	4,474*	3,594*	2,893*	4,170*
1953....	4,038*	4,193	3,266	4,565	3,804	3,461	4,467	5,404	5,512	5,202	4,842	3,572	4,821*

* Estimated.

Skagit River above Alma Creek, near Marblemount, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...	3,600*	4,000	5,540	5,660	4,650	3,840	4,350	5,770	4,300	4,560	2,030	1,650	1,650
1952...	3,500	4,850	1,930	3,990	3,560	1,660	2,120	1,850	2,200*	2,000*	1,400*	1,500*	1,400*
1953...	2,500*	3,320	1,450	2,420	2,150	1,710	1,800	3,710	4,370	4,010	1,870	1,660	1,450

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1951.....	23,000	Feb. 10, 1951	1,650	6,670	4,829,000	6,409	4,640,000
1952.....	19,900	Oct. 29, 1951	1,400	4,170	3,028,000	3,739	2,715,000
1953.....	20,200	July 14, 1953	1,450	4,621	3,345,000		

* Estimated.

Alma Creek near Marblemount, Wash.

Location.—Lat. 48°36'00", long. 121°21'40", in SE¼ sec. 15, T. 36 N., R. 11 E., on left bank, 150 ft. upstream from mouth and 6 miles northeast of Marblemount.

Drainage area.—8.48 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 360 ft. (from river-profile map).

Extremes.—August to October 1943: Maximum discharge, 140 cfs Oct. 24 (gage height, 1.90 ft.), from rating curve extended above 50 cfs; minimum, 12 cfs Oct. 4.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943.....											21.6	30.5	

Minimum Discharge, in Acre Feet

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943.....											13	13	

Bacon Creek near Marblemount, Wash.

Location.—Lat. 48°35'20", long. 121°23'40", on line between secs. 20 and 21, T. 36 N., R. 11 E., on highway bridge near right bank, a quarter of a mile upstream from mouth and 4½ miles north of Marblemount.

Drainage area.—50.9 sq. mi.

Gage.—Wire-weight gage. Altitude of gage is 350 ft. (from river-profile map).

Average discharge.—7 years (1943-50), 429 cfs.

Extremes.—1943-50: Maximum discharge, 18,100 cfs Nov. 26, 1949 (gage height, 7.13 ft., from high-water marks on pier), by slope-area determination of peak flow; minimum observed, 74 cfs Oct. 18, 1945.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943											258	146	290
1944	205	197	312	295	190	209	311	527	525	233	150	320	290
1945	269	397	306	486	428	224	260	815	651	474	194	234	395
1946	447	466	328	302	257	306	370	891	864	741	330	179	458
1947	320	223	447	238	432	351	432	722	658	433	193	178	393
1948	574	325	431	272	199	177	338	833	1,202	526	404	350	470
1949	357	306	172	113	161	360	545	1,030	748	620	315	297	420
1950	354	954	517	248	375	445	368	646	1,287	917	629	315	678

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943											186	93	83
1944	88	112	110	135	92	83	195	287	378	158	102	88	83
1945	105	155	86	81	167	99	170	510	343	190	123	118	81
1946	74	252	149	149	111	195	158	370	495	429	209	98	74
1947	78	120	106	110*	200	200	230	395	420	230	135	108	78
1948	187	156	150	168	128	144	170	230	695	350	248	196	128
1949	156	166	104	88	84	230	215	445	420	420	200	153	84
1950	150	160	178	129	142	220	230	348	580	562	310	246	129

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1943										
1944	3,050	Dec. 3, 1943	83	290	5.70	77.56	210,600	311	83.27	226,100
1945	5,510	Feb. 7, 1945	81	395	7.76	105.24	285,700	417	111.27	302,100
1946	7,000	Oct. 25, 1945	74	458	9.00	122.20	331,800	438	116.71	316,800
1947	6,420	Oct. 24, 1946	73	393	7.72	104.89	284,700	422	112.50	305,400
1948	5,670	Oct. 19, 1947	128	470	9.23	125.65	341,100	428	114.46	310,700
1949	3,300	Oct. 7, 1948	84	420	8.25	112.02	304,100	502	133.85	363,300
1950	18,100	Nov. 26, 1949	129	578	11.4	154.01	418,100			

* Estimated.

SKAGIT RIVER BASIN

Diobsud Creek near Marblemount, Wash.

Location.—Lat. 48°33'40", long. 121°25'00", in SW¼ sec. 32, T. 36 N., R. 11 E., on right bank, 200 ft. downstream from highway bridge, a quarter of a mile upstream from mouth, and 2½ miles north of Marblemount.

Drainage area.—25.4 sq. mi.

Gage.—Staff gage. Altitude of gage is 350 ft. (from river-profile map). July 31 to Oct. 30, 1943, staff gage at site 200 ft. upstream at different datum.

Extremes.—1943-44: Maximum discharge observed, 950 cfs Sept. 20, 1944 (gage height, 3.75 ft., from graph based on gage readings); minimum observed, 32 cfs Sept. 4, 1944 (gage height, 1.00 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										91.4	68.9	93.8	
1944									82.2	62.0	182	134	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										66	40	39	
1944									54	44	48	58	

Skagit River at Marblemount, Wash.

Location.—Lat. 48°32'00", long. 121°25'40", in NW¼ sec. 7, T. 35 N., R. 11 E., on right bank, half a mile north of Marblemount and 0.6 mile upstream from Cascade River.

Drainage area.—1,360 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Datum of gage is 305.1 ft. above mean sea level (river-profile survey).

Average discharge.—5 years (1946-51), 658 cfs.

Extremes.—1943-44, 1946-51: Maximum discharge, 59,300 cfs Nov. 27, 1949 (gage height, 11.37 ft., from high-water mark in gage well), from rating curve extended above 20,000 cfs; minimum, 620 cfs Mar. 6, 1944 (gage height, 0.55 ft.); minimum daily, 1,190 cfs Feb. 25, 1944.

Remarks.—No diversion above station. Flow partly regulated by powerplants on upper Skagit River, and by Ross Reservoir (see p. 335) and by Diablo Reservoir (see p. 339).

Skagit River at Marblemount, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...												3,044	
1944...	3,263	1,864	2,609	2,450	2,115	2,343	3,932	7,133*	8,639				
1947...	2,663	2,224	4,331	3,254	4,159	6,289	6,650	9,294	11,580	6,280	3,460	2,934	5,263
1948...	7,253	4,763	6,725	5,323	2,910	2,222	4,065	7,303	12,370	8,931	6,925	4,890	6,112
1949...	5,142	4,716	4,558	5,038*	4,847	4,824	5,702	10,330	6,864	6,848	6,133	4,973	6,355*
1950...	5,421	7,433	7,423	6,467*	8,912	8,438	6,455	7,487	11,260	14,730	7,635	5,120	8,064*
1951...	6,153	7,848	10,300	7,923	10,340	4,983	9,534	10,630	7,535	7,719	4,204	4,292	7,604

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...												2,500*	
1944...	2,110	1,390	1,500	1,960	1,100	1,200	2,430	4,750	5,980				
1947...	1,550	1,740	2,500	2,020	2,490	2,330	4,970	4,170	5,450	3,850	2,340	2,010	1,550
1948...	2,860	3,230	4,130	4,220	1,490	1,510	2,200	4,230	8,580	4,680	4,030	3,340	1,490
1949...	2,710	2,730	2,590	3,500*	3,140	3,400*	3,400*	5,230	5,240	4,890	2,480	2,470	2,470
1950...	4,050	3,360	4,630	5,000*	6,100*	5,700	4,160	3,720	6,070	6,930	4,630	2,760	2,760
1951...	4,200*	5,120	6,280	6,030	5,250	4,330	5,250	6,620	5,330	5,030	2,400	1,990	1,990

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Discharge	Date						
1943...								
1944...	16,800	Dec. 3, 1943						
1947...	24,600	Oct. 25, 1946	1,550	5,263	3,810,000	6,065	4,391,000	
1948...	35,400	Oct. 19, 1947	1,490	6,112	4,437,000	5,746	4,171,000	
1949...	17,900	May 12, 1949	2,470	5,355	4,239,000	6,345	4,594,000	
1950...	59,300	Nov. 27, 1949	2,750	8,064	5,338,000	8,404	6,084,000	
1951...	42,400	Feb. 10, 1951	1,990	7,604	5,505,000			

* Estimated.

Marble Creek near Marblemount, Wash.

Location.—Lat. 48°32'10", long. 121°16'20", in NE¼ sec. 8, T. 35 N., R. 12 E., on left bank at highway bridge, half a mile upstream from mouth, and 7 miles east of Marblemount.

Drainage area.—15.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,100 ft. (by barometer).

Extremes.—1943-44: Maximum discharge recorded, 790 cfs Sept. 20, 1944 (gage height, 3.48 ft.), from rating curve extended above 200 cfs; minimum, 40 cfs Sept. 30, 1943, Oct. 21, 1944.

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

Marble Creek near Marblemount, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943											78.7	60.5	
1944									143	91.4	150	89.5	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943											45	46	
1944									80	58	57	42	

Cascade River near Marblemount, Wash.

Location.—Lat. 48°32'00", long. 121°17'00", in W½ sec. 8, T. 35 N., R. 12 E., on right bank, a quarter of a mile downstream from Marble Creek, 6¾ miles east of Marblemount, and 8 miles upstream from mouth.

Drainage area.—140 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 970 ft. (from river-profile map). Prior to May 25, 1909, staff gage 500 ft. downstream at different datum.

Extremes.—1909-13: Maximum discharge, 26,000 cfs Nov. 29, 1909 (gage height, 15.0 ft., from graph based on gage readings), from rating curve extended above 3,000 cfs; minimum observed, 208 cfs Mar. 6, 1911 (gage height, 0.83 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909													
1910	647	2,890	1,100	498	355	976	1,270	1,180 1,860	2,320 1,220	1,500 2,250	983 1,010	836 674	1,230
1911	2,380	2,090	816	446	275	376	516	1,350	3,010	2,380	1,060	848	1,300
1912	312	729	423	500	705	274	393	2,050	3,470	2,120	1,870	473	1,070
1913	324	626	350	278	882	326	738						

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909													
1910	472	444	436	284	284	400	455 483	535 640	1,440 404	1,160 1,400	694 492	404 418	284
1911	670	700	580	344	250	212	323	731	1,190	1,340	678	290	212
1912	212	225	290	250	305	225	335	445	1,490	1,020	445	275	212
1913	250	275	305	228	222	275	281						

SKAGIT RIVER BASIN

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Cascade River near Marblemount, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acres-foot		Inches	Acres-foot
1900.....	26,000	Nov. 29, 1909	284	1,230	8.79	119.62	892,000	1,290	125.24	933,000
1910.....										
1911.....	13,200	Nov. 21, 1910	212	1,300	9.20	126.26	942,000	981	95.11	710,000
1912.....	7,000	June 19, 1912	212	1,070	7.64	103.77	774,000	1,050	102.44	764,000
1913.....										

Cascade River at Marblemount, Wash.

Location.—Lat. 48°31'25", long. 121°23'00", in N½ sec. 16, T. 35 N., R. 11 E., on right bank, 1½ miles downstream from Boulder Creek, 2 miles east of Marblemount, and 2½ miles upstream from mouth.

Drainage area.—171 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 380.3 ft. above mean sea level (river-profile survey).

Average discharge.—25 years (1928-53), 982 cfs.

Extremes.—1928-53: Maximum discharge, 17,800 cfs Nov. 27, 1949 (gage height, 11.47 ft.), from rating curve extended above 5,000 cfs by logarithmic plotting; minimum, 118 cfs Nov. 30, 1952; minimum gage height, 1.11 ft. Feb. 8, 1937.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	1,020	416	317	201	146*	313	509	1,600	1,960	1,220	699	361	734*
1930...	307	176	335	210*	972	611	1,310	1,760	1,580	1,330	724	552	769*
1931...	645	476	352	641	639	631	851	1,710	1,790	1,110	556	746	867
1932...	482	804	598	624	1,140	1,040	1,220	1,660	2,290	1,560	941	505	1,060
1933...	653	2,050	941	565	270	447	880	1,320	2,600	2,730	1,600	1,070	1,270
1934...	1,592	1,371	1,946	1,372	856	1,173	1,773	1,676	1,489	1,270	343	556	1,331
1935...	682	1,409	912	1,599	1,053	485	481	1,288	2,018	1,598	813	680	1,055
1936...	393	255	307	455	221	475	1,368	2,538	2,492	1,777	689	490	906
1937...	359	197	511	219	195	522	674	1,525	2,815	1,575	657	498	817
1938...	696	1,078	785	738	353	466	1,037	1,702	2,198	1,327	585	511	960
1939...	494	481	836	932	358	561	1,047	1,872	1,861	1,783	833	505	969
1940...	792	873	1,344	751	638	850	860	1,604	1,283	867	593	512	916
1941...	1,053	501	881	512	417	449	736	1,074	1,144	856	565	886	754
1942...	1,191	755	1,054	373	323	316	788	1,263	1,784	1,464	700	395	871
1943...	299	612*	792	624	555	562	1,340	1,306	1,991	2,767	836	541	979*
1944...	473	869	562	409	377	397	638	1,282	1,550	949	603	363	708
1945...	681	508*	632	919	777	467	557	1,645	1,748	1,310	689*	653	900*
1946...	1,043	877*	550*	507	459	644	973	2,395	2,036	1,848	954	517	1,076*
1947...	727	462	900	626	878	801	1,173	2,130	1,945	1,415	735	560	1,020
1948...	1,239	797	864	572	407	384	721	2,026	3,413	1,626	1,109	749	1,152
1949...	886	609	463	278*	354	729	1,128	2,657	2,137	1,811	1,032	794	1,074*
1950...	580	1,753	947	560	589	852	775	1,541	3,423	2,735	1,406	672	1,347
1951...	1,065	1,252	1,568	678	1,524	479	1,687	1,782	1,068	1,425	710	571	1,172
1952...	875	611	448	230	551	337	984	1,702	1,720	1,549	789	461	856
1953...	294	185	252	1,324	952	415	697	1,566	1,696	2,136	1,071	719	943

* Estimated.

SKAGIT RIVER BASIN

Cascade River at Marblemount, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928													270
1929	328	278	244			157	235	320	1,110	820	526	207	
1930	203	149	158		492	292	990	765	1,110	820	448	242	
1931	244	399	256	282	402	500	482	990	1,340	765	421	427	244
1932	332	397	328	358	279	536	794	1,020	1,290	955	558	337	279
1933	214	785	421	312		289	474	812	1,520	1,550	900	682	214
1934	496	588	650	855	520	695	990	855	990	820	695	237	237
1935	259	730	592	340*	510*	342	293	660	1,290	1,050	615	358	259
1936	246	220	246	284	187	269	236	1,360	1,400	800	520	284	187
1937	211	173	166	175	158	260	394	708	1,880	708	436	284	158
1938	237	426	620	404	284	402	391	800	1,290	762	484	391	237
1939	281	322	416	455	269	251	720	1,020	1,320	1,240	530	350	251
1940	300	470	675	395	426	590	590	1,020	915	630	474	359	300
1941	276	320*	498	356	305*	340	530	530	840	570	405	440	276
1942	472	435	450	334	252	249	507	535	1,180	810	417	290	249
1943	219	256*	370*	360*	350	319	835	692	1,140	1,390	670	350	219
1944	340	274	290	264*	249	230	392	760	1,110	670	450	431	230
1945	420*	340*	316	299	397	330	418	1,020	962	510*	425	418	299
1946	307	570*	360*	330	259	466	451	1,060	1,320	1,150	712	301	259
1947	214	308	452	356	508	452	656	1,160	1,270	850	488	279	214
1948	488	488	498	402	293	310	372	568	2,100	1,130	875	627	293
1949	450	400	305	230*	223	515	484	1,050	1,180	1,180	648	472	223
1950	442	438	463	279	209	460	500	730	1,870	1,560	870	476	279
1951	343	440	785	418	432	332	550	705	1,120	990	488	368	332
1952	562	385	240	155	262	252	399	738	1,030	948	460	372	155
1953	185	118	119	205	388	319	328	888	1,220	1,200	655	388	118

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1929	10,700	Oct. 9, 1929		734	4.29	58.25	532,000	656	52.13	475,000
1930	2,740	June 7, 1930		769	4.50	61.06	567,000	824	65.43	596,000
1931	4,480	Jan. 27, 1931	244	867	5.07	68.85	628,000	902	71.54	653,000
1932	12,900	Feb. 26, 1932	279	1,060	6.20	84.65	772,000	1,210	96.37	878,000
1933	10,400	Nov. 13, 1932	214	1,270	7.43	100.52	917,000	1,380	109.55	997,000
1934	8,050	Nov. 2, 1933	287	1,331	7.78	105.63	963,400	1,169	82.78	846,200
1935	11,500	Nov. 5, 1934	250	1,085	6.35	86.09	785,200	914	72.53	661,500
1936	5,760	June 2, 1936	187	906	5.30	72.11	657,700	916	72.88	664,700
1937	4,760	June 3, 1937	158	817	4.78	64.87	591,700	942	74.75	681,700
1938	8,810	Oct. 28, 1937	237	960	5.61	76.18	694,800	898	71.27	650,000
1939	7,670	May 28, 1939	251	969	5.67	76.91	701,400	1,070	84.90	774,200
1940	3,190	Dec. 15, 1939	300	916	5.38	72.88	664,700	864	63.76	627,100
1941	4,430	Oct. 19, 1940	276	754	4.41	59.26	545,900	806	63.95	583,300
1942	6,730	Dec. 2, 1941	249	871	5.09	69.14	630,600	761	60.43	561,100
1943	3,220	June 17, 1943	219	979	5.73	77.71	708,700	956	75.88	692,000
1944	5,210	Dec. 8, 1943	230	708	4.14	56.34	518,800	741	58.98	537,900
1945	4,430	Jan. 7, 1945	299	900	5.26	71.45	651,700	955	75.81	691,400
1946	9,620	Oct. 25, 1945	259	1,076	6.29	85.44	779,200	1,044	82.91	756,100
1947	11,600	Oct. 2, 1946	214	1,030	6.02	81.80	746,000	1,098	87.20	795,300
1948	11,000	Oct. 10, 1947	293	1,152	6.74	91.68	836,200	1,068	85.02	775,500
1949	5,420	May 13, 1949	223	1,074	6.28	85.23	777,900	1,213	96.25	877,900
1950	17,800	Nov 27, 1949	279	1,347	7.88	106.94	975,300	1,374	109.11	995,000
1951	9,650	Feb. 10, 1951	332	1,172	6.85	93.09	848,900	1,009	80.98	730,200
1952	4,280	June 4, 1952	155	856	5.01	68.08	621,100	755	60.08	548,000
1953	4,750	Jan. 31, 1953	118	943	6.51	74.84	682,500			

* Estimated

SKAGIT RIVER BASIN

Clark Creek at Marblemount, Wash.

Location.—Lat. 48°31'15", long. 121°25'05", in SE¼NE¼ sec. 18, T. 35 N., R. 11 E., on left bank at bridge, 500 ft. upstream from mouth, and three-quarters of a mile south-east of Marblemount.

Drainage area.—Not determined.

Gage.—Water-stage recorder. Altitude of gage is 310 ft. (by barometer).

Extremes.—1944-46: Maximum discharge not determined; maximum gage height, 6.01 ft. Oct. 25, 1945 (backwater from Cascade River); minimum discharge, 5.8 cfs Aug. 19-25, 1944 (gage height, 1.40 ft.).

Remarks.—No diversion or regulation above station. High-water records may include some overflow from Jordan Creek and other nearby tributaries.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944											7.10	12.9	
1945	10.9	15.1	17.2	26.9	32.2	27.4	26.7	33.4	26.6	18.4*	9.45*	11.2	21.2*
1946	24.2	34.1	27.4	29.4	29.5	22.9	19.9	26.5	20.4*				

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944													
1945	7.3	9.0	8.6	5.6	14	16	18	24	20*	13*	5.8	6.9	
1946	6.3	26	13.5	22	20	13.6	14.0	20	16.0*		7.6	7.6	7.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1944							
1945			7.3	21.2	15,350	24.8	17,920
1946							

* Estimated.

Jordan Creek at Marblemount, Wash.

Location.—Lat. 48°31'00", long. 121°25'00", in NE¼SE¼ sec. 18, T. 35 N., R. 11 E., on left bank, half a mile upstream from mouth and 1 mile southeast of Marblemount.

Drainage area.—12.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 380 ft. (by barometer). Prior to Feb. 18, 1947, water-stage recorder 100 ft. downstream at different datum.

Extremes.—1943-47: Maximum discharge recorded, 895 cfs Oct. 19, 1947 (gage height, 4.55 ft.), from rating curve extended above 210 cfs; minimum discharge, 10 cfs Sept. 1-3, 1945.

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

Jordan Creek at Marblemount, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943											33.2	17.7	
1944	29.7									29.6	17.2	37.9	
1945	38.8	48.2	53.5	68.8	53.3	33.6*	38.4	110	87.6	48.4	10.6	29.6	52.8*
1946	68.6	82.7	62.5*	60.3	48.0	53.2	70.5	179	137	72.4	28.5	16.9	74.2*
1947	46.3	43.1*	88.9*	65.2*	30.7*	59.4	89.9	135	104	56.0	23.6	23.7	67.9*
1948	65.5												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943											24	14	
1944	12									20	14*	11	11
1945	24	25	32	31	22	16	28	66	50	26	11	10	10
1946	14	49	30*	38	24	37	34	94	94	43	21	13	13
1947	11	26*	42*	35*	44	34	49	90	74	34	15	14	11
1948	15												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1943												
1944			11									
1945	245	Feb. 7, 1945	10	52.3	4.12	55.85	37,840	58.4	62.40	42,270		
1946	515	Oct. 25, 1945	13	74.2	5.84	79.26	53,700	71.3	76.15	51,580		
1947			11	67.9	5.35	72.55	49,120					
1948												

* Estimated.

Rocky Creek near Marblemount, Wash.

Location.—Lat. 48°30'30", long. 121°29'50", in SW ¼ sec. 22, T. 35 N., R. 10 E., on right bank, half a mile upstream from mouth, and 3½ miles southwest of Marblemount.

Drainage area.—10.0 sq. mi.

Gage.—Staff gage. Altitude of gage is 360 ft. (by barometer).

Extremes.—August to November 1943: Maximum discharge, 53 cfs Oct. 29, 30 (gage height, 2.46 ft.); minimum, 3.5 cfs Oct. 8.

Remarks.—No diversion or regulation above station.

Rocky Creek near Marblemount, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943											5.60	20.1	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943											4.2	3.5	

Illabot Creek near Rockport, Wash.

Location.—Lat. 48°28'10", long. 121°29'10", in SE¼ sec. 34, T. 35 N., R. 10 E., on left bank, 1¼ miles upstream from mouth and 4½ miles east of Rockport.

Drainage area.—41.3 sq. mi. At site August to October 1943, 42.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 450 ft. (from topographic map). Aug. 23 to Oct. 29, 1943, water-stage recorder half a mile downstream at different datum.

Extremes.—1943-44: Maximum discharge recorded, 940 cfs Sept. 20, 1944 (gage height, 3.3 ft.); minimum discharge, 58 cfs Sept. 8, 1944.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943											93.9	130	
1944									169	93.0	187	159	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943											66	66	
1944									115	72	66	68	

SKAGIT RIVER BASIN

North Fork Sauk River near Barlow Pass, Wash.

Location.—Lat. 48°05'20", long. 121°20'00", in sec. 14, T. 30 N., R. 11 E. (unsurveyed), on right bank, 1 mile downstream from Lost Creek, 2¼ miles upstream from South Fork, 7 miles northeast of Barlow Pass, and 17 miles southeast of Darrington.

Drainage area.—76 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,700 ft. (from river-profile map). Prior to Dec. 23, 1917, water-stage recorder and Dec. 23, 1917, to Oct. 6, 1918, staff gage at same site and datum.

Extremes.—1917-20: Maximum discharge, 7,400 cfs Dec. 29, 1917 (gage height, 14.0 ft., from floodmarks); minimum recorded, 75 cfs probably Oct. 20, 1917 (gage height, 1.00 ft., from recorded range in stage), but may have been less in December 1919 during period of no gage-height record.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	132	254	1,290	757*	283	238	565	531	1,450	663	308	175	551*
1919...	438	349	562	406	220	171	524	997	1,080	1,010	403*	212*	534*
1920...	121	571	565*	698	391*	244	234	394	882	738	307	643	499*
1921...	807	402	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	.....	103	180	292	156	110	318	460	634	390	210	112	.....
1919...	118	182	196	159	155	122	331	538	778	.....	.....	105	105
1920...	58	121	.....	445	198	172	172	349	445	308	.....	185	88
1921...	406	234	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1918.....	7,400	Dec. 29, 1917	.....	551	7.64	103.76	420,000	553	98.70	400,000
1919.....	2,430	Dec. 14, 1918	106	534	7.03	95.22	356,000	525	83.72	380,000
1920.....	2,780	Nov. 15, 1919	88	499	6.57	89.30	362,000	.....	.....	.....
1921.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

SKAGIT RIVER BASIN

359

South Fork Sauk River near Barlow Pass, Wash.

Location.—Lat. 48°03'45", long. 121°24'20", in NE¼ sec. 29, T. 30 N., R. 11 E. (unsurveyed), on right bank, 2¾ miles upstream from North Fork, 3½ miles northeast of Barlow Pass, and 16 miles southeast of Darrington.

Drainage area.—32.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,550 ft. (from river-profile map).

Average discharge.—6 years (1917-20, 1928-31), 283 cfs.

Extremes.—1917-21, 1928-31: Maximum discharge, 9,410 cfs Dec. 29, 1917 (gage height, 9.1 ft.), from rating curve extended above 1,400 cfs on basis of logarithmic plotting; minimum, 27 cfs Oct. 3, 1929.

Flood of Dec. 12, 1921, reached a stage of 9.5 ft. (discharge, 10,500 cfs), from high-water mark in well.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	118	202	1,070	498	218	176	322	376	575	322	209	93.5	350
1919...	373	238	459	313*	126	136*	377*	654*	620*	517	203*	102*	345*
1920...	70.0	568	291*	431	163	134	110	291*	410	326	133	487	279*
1921...	480	202	192	228	.....	.....	.....	.....	.....	.....	.....	294	.....
1929...	363*	159	149	62.9	30.5*	129	164	495	578	335	133	60.6	223*
1930...	76.0	59.2	195*	72.7*	475	195	376	317	351	233	90.3	82.2	208*
1931...	204	135*	121*	493*	393*	430*	296	468	503	218	105	180	295*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	.....	77	96	152	76	48	176	204	291	206	132	.....	48
1919...	70	109	150	.....	81	.....	204	.....	.....	277	.....	52	52
1920...	36	81	.....	63	43	37	58	150	160	152	58	57	36
1921...	155	52	43	58	.....	.....	.....	.....	.....	.....	.....	55	.....
1929...	109	91	86	.....	.....	35	77	240	316	209	84	31	.....
1930...	29	33	.....	.....	152	80	.....	.....	252	142	54	44	.....
1931...	45	.....	.....	.....	.....	.....	140	256	281	124	93	95	45

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1918.....	9,410	Dec. 29, 1917	48	350	10.7	145.07	253,000	322	133.71	233,000	
1919.....	3,350	Dec. 14, 1918	52	345	10.6	143.19	250,000	327	135.61	237,000	
1920.....	5,870	Nov. 15, 1919	36	279	8.53	116.10	203,000	280	116.70	203,000	
1921.....	.....	.....	.....	.....	.....	92.48	161,000	194	80.57	141,000
1929.....	1,100	June 15, 1929	.....	223	6.82	86.24	151,000	219	90.74	153,000
1930.....	2,060	Feb. 5, 1930	.....	208	6.36	.....	.....	.....	.....	.....
1931.....	3,210	Jan. 27 or 28, 1931	45	295	9.02	122.38	213,000	.....	.....	.....

* Estimated.

Sauk River above Whitechuck River, near Darrington, Wash.

Location.—Lat. 48°10'00", long. 121°27'45", in NW¼ sec. 24, T. 31 N., R. 10 E., on right bank, half a mile upstream from Whitechuck River, and 9½ miles southeast of Darrington.

Drainage area.—152 sq. mi.

Supplemental records available.—August to November 1919, fragmentary gage heights and discharge measurement only.

Gage.—Water-stage recorder. Altitude of gage is 930 ft. (from river-profile map). Aug. 29 to Nov. 17, 1910, staff gage three-eighths of a mile downstream at different datum.

Average discharge.—30 years (1917-22, 1928-53), 1,102 cfs.

Extremes.—1917-22, 1928-53: Maximum discharge, 30,200 cfs Nov. 27, 1949 (gage height, 14.90 ft., in gage well), from rating curve extended above 6,200 cfs by logarithmic plotting; minimum, 115 cfs Nov. 15, 16, 30, Dec. 1, 1936.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918...	421*	545	3,510	2,160	954	782	1,200	1,570	2,390	1,230	650	323*	1,320*
1919...	1,130	978	1,580	1,190	591	572	1,280	2,080	2,120	1,970	770	884*	1,230*
1920...	260	1,430*	1,200	1,560	827	603	555	1,200	1,680	1,310	508	1,500	1,050*
1921...	1,590*	843*	841*	1,010	1,350	1,060	940*	1,950*	3,400	1,530	784	911	1,400*
1922...	1,430*	1,390	2,660	464	321	340	692	1,900	2,680	1,030	529	458	1,160*
1928...													268
1929...	1,070	482	468	250	167	481	654	2,020	2,150	1,070	392	217	790
1930...	240	210	657	284*	1,540	700	1,520	1,310	1,430	809	201	239	703*
1931...	564	424	433	1,180	869	1,060	1,160	2,020	1,950	819	251	416	931
1932...	585*	1,060	665	665	1,560	1,480	1,530	2,070	2,510	1,480	614	315	1,210*
1933...	765	2,589	1,230	890	297	625	962	1,690	3,180	2,800	1,240	1,050	1,440
1934...	1,704	1,416	3,077	1,968	948	1,698	1,991	1,859	1,231	770	395	394	1,461
1935...	996	1,970	1,102	2,108	1,199	687	600	1,619	2,151	1,365	525	427	1,229
1936...	309	345	466	707	267	648	1,536	2,772	2,419	910	370	314	923
1937...	252	187	1,051	244*	272	656	912	1,635	2,951	1,307	426	268	862*
1938...	588	1,687	1,380	592	334	595	1,317	1,017	2,051	953	298	215	1,020
1939...	509	711	1,057	1,324	460	673	1,392	2,303	1,948	1,614	506	291	1,070
1940...	567	870	1,795	781	914	1,083	1,360	1,834	1,136	451	261	190	922
1941...	1,034	712	1,067	677	521	552	840	1,162	895	396	215	749	736
1942...	1,441	1,020	1,395	368	369	409	1,053	1,390	1,928	1,059	336	177	916
1943...	276	1,186*	1,047	667	670	763	1,020	1,661*	2,222	1,976	604	283	1,083*
1944...	399	490	986	606	495	602	814	1,501	1,410	563	262	635	738
1945...	600	776	808	1,381	1,139	571	620	2,191	1,778	984	343	460	972
1946...	901	1,067	832	792	592	707	1,203	2,026	2,677	1,839	644	308	1,211
1947...	728	695	1,469	968*	1,210	937	1,483	2,402	2,010	1,154	459	376	1,159*
1948...	1,594	1,436*	1,146	711	588	499	970	2,604	3,531	1,267	687	663	1,308*
1949...	823	813	624*	314*	684*	899*	1,258*	2,965	2,294	1,693	774	652	1,162*
1950...	1,065	2,360	1,466	1,019	996	1,264	996	1,706	3,505	2,671	1,163	469	1,557
1951...	1,362	1,011	1,968	921	2,369*	581	1,252	2,202	1,843	997	406	428	1,322*
1952...	1,248	828	582	353*	730*	363	1,208	2,302	1,969	1,319	502	278	974*
1953...	194	230	516	2,584	1,444	570	967	1,973	2,008	2,131	815	545	1,165

* Estimated.

SKAGIT RIVER BASIN

Sauk River above Whitechuck River, near Darrington, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1918		272	383	671	421	311	760	916	1,216	720	439		
1919	292	488	534	351	414	403	755	1,030	1,470	1,080	476	210	210
1920	178			478	393	310	387	707	798	615	287	275	178
1921				435	417	615			1,960	1,270	472	275	275
1922		622	608	367	220	230	873	911	1,770	500		224	220
1928													168
1929	322	264	256			185	296	988	1,500	631	269	160	
1930	156	168	164		630	292	1,180	830	1,090	386	201	148	
1931	168	310	253	249		536	622	1,200	1,460	371			168
1932		330	258	320	204	823	1,010	1,340	1,500	791	337	226	204
1933	152	919	495	310	196	310	519	1,040	2,140	1,700	512	315	152
1934	449	526	652	1,070	585	775	1,230	1,220	800	484	323	224	224
1935	188	947	646	315	646	368	300	920	1,450	790	362	237	188
1936	181	205	256	261	130*	320	268	1,700	1,350	509	286	210	130*
1937	143	115	119	140*	128	399	517	823	2,269	607	255	167	115
1938	149	448	622	496	255	418	394	1,050	1,480	406	235*	176	149
1939	153	356	389	565	310	274	938	1,530	1,530	922	320	209	153
1940	211	403	700*	346	476	593	755	1,150	637	337	199	165	165
1941	156	358	532	384	319	395	573	600	622	227	193	329	156
1942	463	423	459	294	228	224	686	723	1,310	471	254	132	132
1943	138	300*	650*	368	373	313	1,000*	880*	1,400*	1,070	358	201	138
1944	190	308	386*	298	275	241	521	976	1,020	353	209	190	190
1945	271	353	313	308	395	352	412	1,380	1,140	423	244	223	223
1946	201	627	356	480	295	448	455	1,390	1,650	966	401	200	200
1947	168	324	550*	320*	619	506	665	1,420	1,360	642	304	254	168
1948	273	900*	492	395	263	315	421	740	2,130	338	546	371	268
1949	387	364	307	230*	215*	620*	580*	1,360	1,360	1,230	500	423	215*
1950	429	514	619	570	500*	626	626	776	1,960	1,340	633	297	297
1951	265	556	372	448	550*	417	654	862	1,260	598	292	220	220
1952	510	428	300*	220	330*	264	439	970	1,120	726	309	220	220
1953	150	140	138	318	486	380	390	1,240	1,390	1,060	628	250	138

* Estimated.

Sauk River above Whitechuck River, near Darrington, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1918	24,400	Dec. 29, 1917	.....	1,320	8.68	117.77	955,000	1,250	111.68	906,000	
1919	8,430	Dec. 14, 1918	.....	210	1,230	8.09	109.49	857,000	1,160	103.33	837,000
1920	11,400	Nov. 15, 1919	.....	178	1,050	6.81	94.24	763,000	1,110	99.54	806,000
1921	8,960	Oct. 4, 1920	.....	275	1,400	9.21	175.16	1,020,000	1,560	139.52	1,130,000
1922	29,100	Dec. 12, 1921	.....	220	1,160	7.63	103.85	842,000	.....	.....	.....
1928	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1929	7,030	Oct. 9, 1928	.....	790	8.20	70.43	571,000	712	68.56	576,000	
1930	5,060	Feb. 5, 1930	.....	763	5.02	68.02	552,000	788	70.36	570,000	
1931	7,410	Jan. 27, 1931	.....	168	931	6.12	83.14	674,000	1,010	89.73	728,000
1932	22,000	Feb. 26, 1932	.....	204	1,210	7.96	108.22	578,000	1,390	124.60	1,010,000
1933	13,000	Nov. 13, 1932	.....	152	1,440	9.47	128.69	1,040,000	1,590	141.64	1,160,000
1934	18,600	Dec. 21, 1933	.....	224	1,461	9.61	130.34	1,057,000	1,278	114.15	925,400
1935	13,200	Jan. 25, 1935	.....	185	1,229	8.09	109.07	889,900	983	87.97	711,000
1936	4,400	May 16, 1936	.....	130	923	6.07	82.59	670,200	951	85.07	690,200
1937	4,310	June 3, 1937	.....	115	862	5.67	76.98	623,900	1,046	93.40	757,100
1938	8,240	April 18, 1938	.....	149	1,020	6.71	91.07	738,400	906	80.85	655,600
1939	7,010	May 29, 1939	.....	153	1,070	7.04	95.61	774,900	1,151	102.83	833,400
1940	5,480	Dec. 15, 1939	.....	165	922	6.07	82.54	669,000	886	79.39	643,500
1941	4,180	Oct. 18, 1940	.....	156	736	4.84	65.74	533,000	825	73.65	597,100
1942	7,220	Dec. 2, 1941	.....	132	916	6.03	81.60	663,100	800	71.46	579,400
1943	6,230	Nov. 23, 1942	.....	138	1,063	7.12	96.69	782,800	1,031	92.07	746,200
1944	10,300	Dec. 3, 1943	.....	190	733	4.82	65.66	532,200	758	67.93	550,600
1945	8,940	Feb. 7, 1945	.....	228	972	6.39	86.80	703,500	1,023	91.40	740,900
1946	8,050	Oct. 25, 1945	.....	200	1,211	7.97	108.17	876,900	1,220	108.96	833,200
1947	10,200	Oct. 25, 1946	.....	168	1,159	7.62	108.51	839,900	1,266	118.06	916,400
1948	13,500	Oct. 19, 1947	.....	268	1,308	8.61	117.15	949,700	1,148	102.77	833,100
1949	5,660	May 13, 1949	.....	215	1,152	7.58	102.89	834,100	1,371	122.47	922,700
1950	30,200	Nov. 27, 1949	.....	297	1,557	10.2	139.07	1,127,000	1,565	139.79	1,133,000
1951	.....	.....	.....	220	1,322	8.70	118.07	957,100	1,129	100.50	817,100
1952	5,080	June 5, 1952	.....	220	974	6.41	87.22	707,000	830	74.32	602,500
1953	9,360	Jan. 31, 1953	.....	138	1,165	7.66	104.03	843,400	.....	.....	.....

Whitechuck River near Darrington, Wash.

Location.—Lat. 48°10'30", long. 121°23'00", in NW¼ sec. 16, T. 31 N., R. 11 E., on left bank, 4½ miles upstream from mouth, and 11 miles southeast of Darrington.

Drainage area.—75 sq. mi., approximately.

Supplemental records available.—August to October 1910, fragmentary gage heights and discharge measurement only.

Gage.—Water-stage recorder. Altitude of gage is 1,310 ft. (from river-profile map). Aug. 29 to Oct. 14, 1910, staff gage 4 miles downstream at different datum.

Extremes.—1919-21: Maximum discharge recorded, 4,540 cfs Dec. 12, 1921 (gage height, 6.4 ft.), may have been greater than 9,000 cfs on this date; minimum recorded, 111 cfs sometime between Nov. 4 and 14, 1919, but may have been less during period of no gage-height record in December 1919.

Flood of Dec. 29, 1917 reached a stage of 8.4 ft., from floodmarks (discharge, about 9,000 cfs).

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

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Whitechuck River near Darrington, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920										950	488		
1921	679	223*	278	306	366*	300*	300*	727*	1,410	946*	591*	362	550*
1922	461	438											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920										545	275		
1921			184	222					832		314	202	
1922	233	287											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1920	3,480	Probably Nov. 15, 1919											
1921	3,840	Oct. 4, 1920		550	7.33	99.52	399,000						
1922	4,540†	Dec. 12, 1921											

† Maximum recorded.

Sauk River above Clear Creek, near Darrington, Wash.

Location.—Lat. 48°13'00", long. 121°34'00", in SW¼ sec. 31, T. 32 N., R. 10 E., on left bank, 50 ft. upstream from Clear Creek, and 3 miles southeast of Darrington.

Drainage area.—259 sq. mi.

Gage.—Staff gage. Datum of gage is 610 ft. above mean sea level (from river-profile survey).

Extremes.—1910-11, 1913: Maximum discharge observed, 22,600 cfs Nov. 21, 1910 (gage height, 5.50 ft.); minimum observed, 350 cfs Oct. 5, 25, 26, 27, 1911.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910													523
1911	3,100	4,470*	3,250*	1,490	660	901	1,250	2,590	4,030	2,410	952	948	2,150*
1913				957	1,060	807	1,400			3,760	1,680	1,610	

* Estimated.

SKAGIT RIVER BASIN

Sauk River above Clear Creek, near Darrington, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910													
1911	1,100*	1,200*	1,000	880	428*	420	880	1,770	2,300	1,310	680	388	
1913				505	505	500	650			2,300	890	450*	420
												680	
												680	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1910							
1911	22,600†	Nov. 21, 1910	420	2,150	1,580,000		
1913							

* Estimated.

† Maximum observed.

Sauk River at Darrington, Wash.

Location.—Lat. 48°15'00", long. 121°35'00", in SW¼ sec. 24, T. 32 N., R. 9 E., on right bank, half a mile southeast of Darrington, and 2¼ miles downstream from Clear Creek.

Drainage area.—293 sq. mi.

Gage.—Staff gage. Altitude of gage is 525 ft. (from river-profile map). Prior to Apr. 14, 1922, staff gage 700 ft. upstream at different datum.

Average discharge.—16 years (1914-26, 1928-32), 1,980 cfs.

Extremes.—1914-26, 1928-32: Maximum discharge, 46,500 cfs Feb. 26, 1932 (gage height, 16.0 ft., from floodmarks), from rating curve extended above 7,000 cfs on basis of velocity-area studies; minimum observed, 262 cfs Sept. 25, 1930, may have been less during period of ice effect Jan. 11-25, 1930.

Remarks.—An average diversion of possibly 10 cfs was reported during 1922 to 1926 for the purpose of driving shingle bolts to mill at Darrington; may have operated during entire period of record. No regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914										2,010	876	1,020	
1915	1,570	3,610	841	755	789	1,190	2,790	1,510	1,220	1,020	844	440	1,380
1916	1,620	1,760	2,230	588	2,490	2,590	2,140	2,900	4,600	4,100	1,880	962	2,320
1917	641	1,590	893	795	1,180	679	1,520	3,110	5,240	5,050	1,710	836	1,930
1918	632	1,130	7,430	4,430	1,970	1,560	2,070	2,570	4,050	2,210	1,270	665	2,510
1919	2,390	2,100	3,350	2,830	1,790	1,490	2,980	3,570	3,860	3,450	1,640	747	2,550
1920	582	2,060	2,710	2,830	1,500	1,180	1,030	2,020	2,770	2,200	999	2,690	1,960
1921	3,500	1,590	1,750	2,080	2,430	1,740	1,630	3,400	5,640	3,050	1,350	1,440	2,470
1922	2,640	2,080	4,510	808	581	479	1,240	3,140	4,410	1,880	980	920	2,030
1923	1,260	996	2,360	2,990	1,010*	1,060	2,150	2,980	3,490	2,560	963	641	1,880*
1924	988	1,470	2,640	1,600	4,210	984	1,190	3,500	2,440	1,460	821*	817*	1,830*
1925	2,370*	2,360*	2,860	2,590	2,980	1,170	2,346	4,350	3,490	2,320	681	506	2,390*

* Estimated.

SKAGIT RIVER BASIN

Sauk River at Darrington, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926...	691	865	3,150	1,860	1,870	1,340	1,790	2,110	1,400	874	672	929	1,460
1928...										1,830	684*	470	.....
1929...	1,930	1,040	1,030	590	377	1,110	1,320	3,450	3,750	1,860	779	420	1,480
1930...	497	417	1,320	651	3,890	1,440	2,570	2,220	2,500	1,600	689	507	1,530
1931...	1,120	655	919	2,360	1,670	2,220	2,220	3,400	3,390	1,540	609	1,020	1,750
1932...	1,140	2,130	1,570	1,560	2,770	2,710	2,730	3,270	4,240	2,870	1,190	735	2,240

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914										1,040	595	470	.....
1915	690	1,420	550	510	572	530	1,260	1,110	850	740	530	340	340
1916...	370	850	975	418	400	1,110	1,500	1,296	2,390	2,250	1,110	640	370
1917...	370	618	490	550	595	510	690	1,420	3,230	2,120	1,110	618	370
1918...	400	470	740	1,420	755*	580	1,240	1,510	1,920	1,420	795	489	400
1919...	489	1,240	1,420	1,080	1,330	1,160	2,200	2,380	2,930	1,960	885	548	469
1920...	498	710	471	588	664	624	710	1,150	1,240	1,060	588	588	471
1921...	1,330	710	830	820	765	1,060	1,060	1,530	3,200	2,000	765	555	555
1922...	664	1,150	985	520	478	315	732	1,360	3,190	1,050	554	562	315
1923...	469	675	469	1,030		554	1,760	1,760	2,340	1,210	780	505	469
1924...	505	432	990		1,470	662	690	1,700	1,700	920			432
1925...			340	875	990	640	805	2,510	2,080	1,470	546	398	398
1926...	286	415	1,360	930	930	890	1,260	1,310	930	507	483	415	286
1928...										1,300		295	.....
1929...	620	550	520			410	620	1,620	2,490	1,030	520	300	300
1930...	300	300	300		1,270	680	1,940	1,720	1,830	905	390	262	.....
1931...	315	515	515	482	825	1,090	1,160	1,880	2,240	863	450	515	315
1932...	450	782	685	760	470	1,350	1,670	2,150	2,410	1,560	760	500	450

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per. square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1914											
1915	16,500	April 2, 1915	340	1,380	4.71	63.72	996,000	1,350	62.36	975,000	
1916	12,000	Dec. 8, 1915	370	2,320	7.92	107.79	1,680,000	2,100	97.65	1,520,000	
1917	8,260	Nov. 9, 1916	370	1,930	6.50	89.46	1,400,000	2,460	113.23	1,780,000	
1918	38,000	Dec. 29, 1917	400	2,610	8.57	116.22	1,820,000	2,390	110.69	1,730,000	
1919	15,100	Dec. 14, 1918	469	2,550	8.70	115.15	1,830,000	2,410	111.82	1,750,000	
1920	17,200	Nov. 15, 1919	471	1,960	6.69	91.18	1,430,000	2,020	93.62	1,460,000	
1921	16,200	Oct. 4, 1920	555	2,470	8.43	114.46	1,790,000	2,720	126.15	1,970,000	
1922	36,000	Dec. 12, 1921	315	2,030	6.93	93.95	1,470,000	1,590	73.65	1,150,000	
1923	12,300	Dec. 24, 1922	469	1,886	6.42	87.09	1,360,000	1,910	88.74	1,390,000	
1924	27,200	Feb. 12, 1924	432	1,830	6.25	85.35	1,330,000	2,000	97.20	1,520,000	
1925	15,500	Dec. 11, 1924	398	2,390	8.16	110.72	1,730,000	2,110	97.77	1,530,000	
1926	10,800	Jan. 5, 1926	286	1,460	4.98	67.88	1,060,000				
1929											
1929	13,900	Oct. 9, 1928	300	1,480	5.05	68.55	1,070,000	1,380	61.67	982,000	
1930	9,630	Feb. 5, 1930		1,580	5.22	70.94	1,110,000	1,590	73.48	1,150,000	
1931	13,600	Jan. 27-28, 1931	315	1,780	6.08	82.35	1,290,000	1,340	89.84	1,400,000	
1932	46,500	Feb. 26, 1932	450	2,240	7.65	103.99	1,620,000				

* Estimated.

SKAGIT RIVER BASIN

Suiattle River below Lime Creek, near Darrington, Wash.

Location.—Lat. 48°14'55", long. 121°18'10", in sec. 19, T. 32 N., R. 12 E., on right bank, half a mile downstream from Lime Creek, 1 mile upstream from Suiattle ranger station, 2 miles upstream from Buck Creek, and 14 miles east of Darrington.

Drainage area.—213 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,120 ft. (from river-profile map).

Extremes.—1920-21: Maximum discharge, 5,890 cfs June 7, 1921 (gage height, 7.1 ft.); minimum, 469 cfs Feb. 6, 1921 (gage height, 1.68 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	1,490	802	690	744	924	775	741	1,840	3,380	2,390	1,410	827	1,340
1922...	1,020	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	900	600	513	517	473	622	600	600	2,300	1,990	672	558	473
1922...	622	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1921.....	5,890	June 7, 1921	473	1,340	6.29	85.21	997,000	.....	.....	.....
1922.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Big Creek near Mansford, Wash.

Location.—Lat. 48°20'20", long. 121°26'10", in SW¼ sec. 18, T. 33 N., R. 11 E., on right bank, half a mile upstream from mouth, and 4 miles northeast of Mansford.

Drainage area.—20.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 800 ft. (from topographic map).

Extremes.—1943-46: Maximum discharge, 2,110 cfs Oct. 24, 1946 (gage height, 6.79 ft.), from rating curve extended above 570 cfs; minimum, 34 cfs Oct. 6-9, 1943.

Remarks.—No diversion or regulation above station.

Big Creek near Mansford, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....												47.9	
1944.....	64.7	72.6	103	74.6	65.3	72.7	112	234	228	89.2	56.3	105	106
1945.....	85.6	91.7	105	156	133	73.3	95.4	332	276	156	55.2	103	138
1946.....	142	167	117	110	94.8	101	155	389	347	253	94.0	64.9	170
1947.....	127												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....												37	
1944.....	34	49	54	52	46	42	68	124	163	60	43	36	34
1945.....	52	56	56	52	65	56	60	205	183	88	44	42	42
1946.....	45	108	77	84	66	81	76	174	235	125	72	56	45
1947.....	52												

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1943.....											
1944.....	860	Dec. 3, 1943	34	106	5.22	71.40	77,290	110	73.73	79,800	
1945.....	810	Feb. 7, 1945	42	138	6.80	92.47	100,100	150	100.49	108,600	
1946.....	950	Oct. 25, 1945	45	170	8.37	113.73	123,100				
1947.....											

Suiattle River near Mansford, Wash.

Location.—Lat. 48°21'50", long. 121°29'30", in N½ sec. 10, T. 33 N., R. 10 E., on left bank, 2½ miles downstream from Big Creek, and 4 miles north of Mansford.

Drainage area.—335 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 530 ft. (from river-profile map).

Average discharge.—11 years (1938-49), 1,750 cfs.

Extremes.—1938-49: Maximum discharge, 30,700 cfs Nov. 27, 1949 (gage height, 15.60 ft.), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum, 413 cfs Oct. 13, 1942.

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

Suiattle River near Mansford, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938										2,274	1,034	878	
1939	774	832	1,400	1,879	807	1,020	1,904	3,463	3,449	3,275*	1,450	852	1,783*
1940	987	1,237	2,254	1,356	1,242	1,551	1,611	2,939	2,492	1,476	998	801	1,561
1941	1,532	964	1,595	1,172	846	774	1,280	1,836	1,985	1,491	1,014	1,287	1,315
1942	1,874	1,455	1,989	774*	674	675	1,501	2,315	3,333	2,673	1,328	778	1,620*
1943	582	1,362	1,598	1,163	1,199	1,108	2,427	2,417	3,556	4,026	1,644	922	1,561
1944	351	682	1,110	828	750	757	1,198	2,366	2,868	1,592	683	1,381	1,272
1945	1,087	1,119	1,218	1,740	1,672	975	1,035	3,256	3,277	2,250	1,190	1,121	1,663
1946	1,588	1,695	1,269	1,225	958	1,131	1,591	4,434	4,142	3,314	1,515	870	1,930
1947	1,151	1,045	1,888	1,260	1,635	1,363	1,939	3,966	3,716	2,500	1,221	919*	1,893*
1948	2,020	1,860	1,799	1,250	919	823	1,216	3,870	7,091	3,047	1,835	1,142	2,250
1949	1,352	1,236	1,044	650	1,017*	1,395	1,938	5,217	4,150	3,259	1,704	1,239	2,024*
1950	1,468	3,024											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938										1,250	808	642	
1939	484	570	802	1,020	597	516	1,360	2,240	2,570	2,000*	901	580	484
1940	496	711	1,400	748	879	1,140	1,140	2,030	1,780	1,100	559	588	496
1941	625	670	1,180	859	577	577	914	984	1,480	984	767	786	577
1942	952	370	1,000*	698	542	546	952	1,700	2,500	1,590	792	582	542
1943	430	587	952	774	805	640	1,640	1,400	2,200	2,560	1,140	656	430
1944	550	521	596	601	512	409	780	1,400*	2,260	965	746	752	469
1945	722	722	672	644	837	732	774	1,840	1,990	1,220	830	726	644
1946	562	1,260	761	910*	630	830	767	1,790	2,610	1,990	1,180	572	562
1947	460	666	950	745	1,050	860	1,120	2,290	2,410	1,530	890	670*	490
1948	800*	1,260	1,150	860	645	645	694	1,080	1,400	2,230	1,420	860	645
1949	800	745	694	540*	520*	1,020	950	2,060	2,290	2,290	1,150	830	520*
1950	772	950											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1938											
1939	9,680	May 29, 1939	464	1,783	5.32	72.20	1,291,000	1,895	76.76	1,372,000	
1940	5,580	Dec. 15, 1939	496	1,581	4.72	64.25	1,148,000	1,549	62.94	1,124,000	
1941	4,980	①	577	1,318	3.93	53.39	954,000	1,421	57.55	1,028,000	
1942	9,100	Oct. 3, 1941	542	1,020	4.84	65.63	1,173,000	1,469	59.54	1,064,000	
1943	7,200	June 30, 1943	430	1,861	5.56	75.41	1,347,000	1,778	72.04	1,287,000	
1944	8,550	Dec. 3, 1943	469	1,272	3.80	51.68	923,500	1,346	54.67	976,600	
1945	9,520	Feb. 8, 1945	644	1,663	4.96	67.39	1,204,000	1,752	71.000	1,268,000	
1946	12,600	Oct. 25, 1945	562	1,980	5.91	80.23	1,434,000	1,947	78.90	1,410,000	
1947	19,200	Oct. 25, 1946	460	1,893	5.65	76.70	1,370,000	2,031	82.30	1,470,000	
1948	13,600	Oct. 19, 1947	645	2,260	6.72	91.42	1,034,000	2,074	84.24	1,505,000	
1949	9,800	May 13, 1949	520	2,024	6.04	82.00	1,465,000				
1950	30,700	Nov. 27, 1949									

* Estimated.

① Oct. 18, 19, 1940.

Sauk River near Sauk, Wash.

Location.—Lat. 48°25'15", long. 121°34'00", in NW¼ sec. 19, T. 34 N., R. 10 E., on left bank, 5 miles upstream from mouth, 5 miles southeast of Sauk, and 8 miles downstream from Suiattle River.

Drainage area.—714 sq. mi. At site 1910-12, 684 sq. mi.

Supplemental records available.—August to October 1910, fragmentary gage heights, and discharge measurements only.

Gage.—Water-stage recorder. Datum of gage is 266 ft. above mean sea level (river-profile survey). Aug. 27, 1910, to Aug. 3, 1912, staff or chain gages at different sites from 1 mile downstream to 5 miles upstream at different datums.

Average discharge.—25 years (1928-53), 4,154 cfs.

Extremes.—1910-12, 1928-53: Maximum discharge, 82,400 cfs Nov. 27, 1949 (gage height, 16.93 ft.); minimum recorded, 572 cfs Dec. 5, 1929, but may have been less during period of ice effect Jan. 10-27, 1930.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911							2,690	5,560	8,520	5,630	2,360	2,350	.....
1912	1,100	5,320	3,170	4,000	4,430	1,520	2,410	6,760	9,580	5,180	.....	.....	.....
1928											2,000	1,410	.....
1929	3,490	1,980	1,980	1,280*	793	2,180*	2,630	6,650	7,810	4,450	2,210	1,220	3,070*
1930	993	724	2,290	1,310*	5,620	2,960	6,260	4,580	5,670	4,130	1,960	1,400	3,050*
1931	2,060	1,700	1,740	4,300	3,390	4,050	4,250	6,830	7,230	3,700	1,820	2,150	3,600
1932	1,990	3,730	3,110	3,040	6,950*	5,690	5,510	6,750	8,990	6,040	2,970	1,700	4,620*
1933	2,830	9,590	5,140	3,890	1,760	3,000	3,620	5,600	10,800	10,100	5,070	3,860	5,450
1934	6,203	5,819	11,560	8,136	4,287	6,303	7,375	7,305	5,519	8,934	4,422	1,897	5,919
1935	3,231	6,944	4,353	8,381	4,722	2,762	2,888	5,376	7,606	5,465	2,502	2,040	4,650
1936	1,424	1,468	1,842	3,220	1,539	2,948	5,311	10,040	9,904	4,348	2,148	1,645	3,824
1937	1,183	751	3,023	1,214*	1,332	2,908	3,710	6,437	11,430	5,955	2,209	1,498	3,553*
1938	2,327	6,031	5,399	4,204	1,891	2,638	4,947	6,821	7,940	4,268	1,758	1,428	4,154
1939	1,976	2,733	4,234	5,542	2,353	2,834	4,816	7,805	7,171	6,420	2,823	1,589	4,209
1940	2,200	3,183	6,585	3,480	3,512	4,148	3,784	6,166	4,469	2,522	1,713	1,371	3,600
1941	3,034	2,697	3,906	2,665	2,106	2,123	2,860	4,162	3,715	2,515	1,778	2,991	2,887
1942	4,262	3,693	5,692	1,882	1,920	1,683	3,569	5,033	6,933	4,742	1,988	1,089*	3,566*
1943	1,136*	3,672*	4,283	2,871	3,886	3,410	6,216	5,443	7,964	7,785	2,961	1,653	4,232*
1944	1,743	1,877	3,444	2,620	2,187	2,175	2,912	5,321	5,679	2,970	1,719*	2,412	2,922*
1945	2,534	3,047	2,816	4,655	4,689	2,765	2,701	7,092	6,098	4,143	1,909	2,132	3,709
1946	3,372	4,497	3,458	3,691	2,648	3,290	4,310	9,104	8,635	6,388	2,761	1,547	4,487
1947	2,706	2,624	5,429	3,785	4,704	3,470	4,798	7,993	7,149	4,821	2,330	1,751	4,295
1948	4,482	4,053	4,233	3,470	2,075	2,366	3,472	8,411	12,610	5,533	3,469	2,703	4,811
1949	3,178	3,159	2,760	1,464	2,649	3,881	4,867	10,570	8,217	6,206	3,241	2,540	4,430
1950	3,718	8,028	5,642	3,904	4,153	5,396	4,254	6,189	12,430	10,310	4,811	2,175	5,923
1951	4,647	6,185	7,418	4,122	9,062	2,775	4,777	7,442	7,628	4,757	2,215	1,853	5,206
1952	4,164	3,209	2,790	1,695	3,491	1,798	4,431	7,188	6,590	5,043	2,347	1,511	3,684
1953	1,089	886	1,457	7,956	5,615	2,465	3,393	6,029	6,216	7,174	3,492	2,280	4,000

* Estimated.

SKAGIT RIVER BASIN

Sauk River near Sauk, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911							1,680	3,940	4,820	3,460	1,020	1,050	.....
1912	780	780	2,100	975	2,140	1,220	2,020	2,020	5,000	2,540			.....
1918											1,500	1,030	.....
1929	1,390	1,180	1,200		692	888	1,420	3,440	5,200	2,810	1,620	676	676
1930	668	614	578		2,610	1,480	4,220	3,120	4,340	2,380	1,330*	700	.....
1931	896	1,220	1,180	1,120	1,770	2,410	2,560	4,200	5,160	2,410	1,350	1,140	896
1932	1,040	1,720	1,490	1,700		3,300	3,680	4,630	5,130	3,570	1,840	1,330	1,040
1933	964	3,910	2,470	1,760	1,270	2,000	2,220	3,570	7,060	6,480	2,650	1,920	964
1934	2,000	2,740	2,940	4,880	2,740	3,250	5,000	5,000	3,800	2,740	2,000	1,120	1,120
1935	952	3,640	2,840	1,750*	2,550	1,780	1,550	3,320	4,950	3,420	1,900	1,260	952
1936	1,100	944	1,266	1,010	1,010	1,020	1,400	5,940	5,640	2,740	1,680	1,090	944
1937	780	640*	628	800*	790	1,850	2,200	3,140	8,500	2,730	1,430	923	628
1938	791	1,780	2,510*	2,470	1,510	2,020	1,970	3,910	5,800	2,900	1,440	1,140	791
1939	847	1,540	1,870	1,660	1,440	3,860	5,130	5,780	4,500*	1,720	1,100	847	.....
1940	932	1,600*	3,360	1,750	2,030	2,660	2,660	4,030	2,950	1,870	1,400	1,000	932
1941	1,180*	1,920	2,740	1,510	1,460	1,600	2,150	2,220	2,740	1,680	1,540	1,840	1,180*
1942	2,110	1,860	2,220	1,600	1,190	1,180	2,560	2,650	5,260	2,560	1,200*	840*	2,110
1943	790*	1,500*	2,390	1,600	1,740	1,600	3,800	3,140	5,130	4,630	2,100	1,180	790*
1944	1,200	1,740	1,440	1,620	1,280	1,150	1,750*	3,460	4,376	1,960	1,300*	1,850*	1,200
1945	1,850	1,900	1,600	1,620	2,100	1,890	2,000	4,630	4,060	2,080	1,350	1,390	1,850
1946	1,210	2,530	1,780*	2,370	1,590	2,260	2,140	4,750	5,020	3,950	2,050	1,040	1,040
1947	830	1,260	2,460	1,620	2,740	2,200	2,530	5,120	4,900	3,620	1,650	1,280	830
1948	1,400*	2,740	2,280	2,320	1,710	1,580	1,880	2,370	8,050	3,950	2,630	1,060	1,400
1949	1,660	1,560	1,660	1,090	1,030	2,570	2,390	5,130	4,870	4,620	2,110	1,450	1,660
1950	1,520	2,130	2,580	1,620*	1,940	2,850	2,760	3,050	7,400	5,800	2,550	1,600	1,520
1951	1,330	2,480	3,780	2,480	2,760	2,000*	2,850	3,360	5,130	3,050	1,040	1,260	1,330
1952	2,280	1,860	1,560	1,060	1,040	1,380	2,130	3,500	4,250	3,110	1,600	1,160	1,060
1953	784	590*	600*	1,400	2,200	1,880	1,720	4,070	4,480	4,370	2,380	1,230	590*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acres-foot		Inches	Acres-foot
1911										
1912										
1928										
1929	21,800	Oct. 9, 1928	676	3,070	4.30	58.24	2,220,000	2,750	52.53	2,010,000
1930	15,200	Feb. 5, 1930	.....	3,050	4.27	58.01	2,210,000	3,180	60.43	2,300,000
1931	21,800	Jan. 28, 1931	896	3,600	5.04	68.49	2,610,000	3,680	73.71	2,810,000
1932	68,500	Feb. 26, 1932	1,040	4,620	6.47	88.15	3,360,000	5,350	101.89	3,820,000
1933	42,500	Nov. 13, 1932	964	5,450	7.63	103.53	3,950,000	5,970	113.51	4,320,000
1934	56,600	Dec. 22, 1933	1,120	5,019	8.20	112.46	4,285,000	5,150	97.88	3,729,000
1935	49,400	Nov. 5, 1934	952	4,650	6.51	88.42	3,366,000	3,829	72.79	2,772,000
1936	16,600	June 3, 1936	944	3,824	5.36	72.95	2,776,000	3,921	74.83	2,846,000
1937	15,900	June 3, 1937	628	3,553	4.98	67.54	2,572,000	4,209	80.04	3,047,000
1938	29,900	April 18, 1938	791	4,154	5.82	78.95	3,008,000	3,756	71.38	2,710,000
1939	25,200	Jan. 1, 1939	847	4,209	5.89	79.99	3,048,000	4,463	84.50	3,232,000
1940	20,000	Dec. 15, 1939	952	3,600	5.04	68.61	2,673,000	3,404	64.88	2,471,000
1941	7,980	May 17, 1941	1,180	2,887	4.04	54.88	2,060,000	3,225	61.30	2,335,000
1942	19,000	Dec. 2, 1941	840	3,566	4.89	67.80	2,552,000	3,179	60.45	2,302,000
1943	10,560	Nov. 23, 1942	790	4,232	5.93	80.46	3,064,000	4,065	77.27	2,943,000
1944	29,900	Dec. 3, 1943	1,150	2,922	4.09	55.70	2,122,000	3,032	57.80	2,201,000
1945	26,800	Feb. 8, 1945	1,350	3,709	5.19	70.52	2,686,000	3,954	75.17	2,863,000
1946	25,000	Oct. 25, 1945	1,040	4,487	6.28	85.29	3,249,000	4,444	84.48	3,217,000
1947	33,200	Oct. 25, 1946	830	4,295	6.02	81.65	3,109,000	4,457	84.74	3,227,000
1948	35,900	Oct. 10, 1947	1,400	4,511	6.74	91.70	3,492,000	4,531	88.36	3,298,000
1949	16,700	May 13, 1949	1,030	4,430	6.20	84.22	3,207,000	5,096	96.59	3,690,000
1950	82,400	Nov. 27, 1949	1,620	5,923	8.30	112.60	4,288,000	5,007	114.01	4,341,000
1951	62,700	Feb. 10, 1951	1,260	5,206	7.29	99.00	3,769,000	4,529	86.12	3,279,000
1952	13,600	June 5, 1952	1,060	3,684	5.16	70.22	2,674,000	3,123	59.52	2,267,000
1953	28,400	Jan. 31, 1953	690	4,000	5.60	76.04	2,896,000	.....	.....	.....

* Estimated.

Jackman Creek near Concrete, Wash.

Location.—Lat. 48°31'25", long. 121°42'45", in NW¼ sec. 13, T. 35 N., R. 8 E., on left bank, 300 ft. downstream from railroad bridge at Van Horn, an eighth of a mile upstream from mouth, and 2 miles southeast of Concrete.

Drainage area.—23.9 sq. mi.

Gage.—Staff gage. Altitude of gage is 175 ft. (by barometer).

Extremes.—1943-47: Maximum discharge, 3,150 cfs Jan. 7, 1945 (gage height, 4.15 ft., from graph based on gage readings), from rating curve extended above 1,300 cfs; minimum observed, 8.0 cfs Aug. 25, 28, 29, Sept. 2-4, 1947.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943												17.5	
1944	55.7	81.9	146	131	82.0	82.4	115	197	105	27.0	17.5	81.3	93.5
1945	75.0	144	126	339	161	103	113	377	170	50.8	20.3	46.9	144
1946	166	262	140	182	150	165	191	397	342	152	35.0	18.2	179
1947	141	131	231	188	258	150	207	242	168	50.7	14.4	32.5	160

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943												13	
1944	12	38	49	64*	42	34	72	126	45	17	12	10	10
1945	35	58	56	49	62	51	74	213	92	28	14	12	12
1946	23	131	64	91	80	122	120	247	243	60	18	10	10
1947	12	87	94	66	107	68	110	166	86	22	8.0	8.0	8.0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1943													
1944	1,000	Dec. 3, 1943	10	83.5	3.91	53.25	67,890	98.6	56.09	71,500			
1945	3,150	Jan. 7, 1945	12	144	6.03	81.74	104,200	163	92.82	117,700			
1946	3,020	Oct. 24, 1945	10	179	7.49	101.67	129,600	174	98.75	125,800			
1947	2,240	Oct. 24, 1946	8.0	150	6.28	84.99	108,300						

* Estimated.

Sandy Creek near Concrete, Wash.

Location.—Lat. 48°41'05", long. 121°42'23", in NE¼ sec. 24, T. 37 N., R. 8 E. (unsurveyed), on left bank at downstream side of road crossing, 1¼ miles upstream from mouth, and 10½ miles northeast of Concrete.

Drainage area.—10.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map).

Extremes.—March to September 1953: Maximum discharge, 498 cfs Sept. 30 (gage height, 2.25 ft.); minimum, 25 cfs Sept. 18 (gage height, 0.85 ft.).

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

Sandy Creek near Concrete, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1933...						47.6	75.5	138	128	124	55.8	59.0	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1933...						32*	35	85	98	60	86	27	.....

Baker River below Anderson Creek, near Concrete, Wash.

Location.—Lat. 48°39'50", long. 121°40'25", in SE¼ sec. 30, T. 37 N., R. 9 E., on left bank, 350 ft. downstream from Anderson Creek, and 9½ miles northeast of Concrete.

Drainage area.—211 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 521 ft. above mean sea level (river-profile survey). Prior to Oct. 22, 1910, staff gage an eighth of a mile upstream at different datum. Oct. 22, 1910, to Sept. 23, 1915; staff gages at described site and datum.

Average discharge.—18 years (1910-25, 1928-31), 1,999 cfs.

Extremes.—1910-25, 1928-31: Maximum discharge, 36,800 cfs Dec. 29, 1917 (gage height, 13.7 ft.), from rating curve extended above 8,100 cfs; minimum recorded, 219 cfs Dec. 15, 16, 1919.

Flood occurring between 1805 and 1825 reached a stage about 2 ft. higher than, and flood of 1897 reached a stage about equal to that of Dec. 29, 1917. Flood of November 1909 reached a stage of 15.3 ft. (discharge, 46,200 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	3,400	3,500	1,900	909	503	943	1,350	2,660	4,040	3,710	2,060	1,930	2,250
1912...	926	1,070	1,440	1,610	1,920	738	1,160	2,830	4,140	2,960	2,190	1,370	1,940
1913...	1,120	2,360	686	688	1,190	764	1,830	3,820	5,030	4,690	2,330	1,500*	2,200*
1914...	1,790	2,170	1,090	2,720	962	1,560	1,900	3,010	2,690	2,590	1,610	1,610	1,970
1915...	1,810	2,800	777	584	656	1,300	3,040	1,990	1,800	1,800	1,810	893	1,660
1916...	2,340	1,380	1,710	633	2,330	2,080	1,940	2,430	3,920	3,650	2,490	1,350	2,160
1917...	730	1,270	713	734	1,050	632	1,470	3,250	4,490	4,930	2,230	1,400	1,610
1918...	1,320	2,100	5,230	5,280	1,240	1,180	1,800	2,460	4,050	3,080	1,850	1,400*	2,600*
1919...	2,360	1,430	2,410	1,370	977	790	1,960	3,100	2,910	3,850	1,890	1,130	1,980
1920...	603	2,650	2,090*	2,290*	1,370	980	998	1,910	3,160	3,170	1,740	3,030	2,000*
1921...	3,510	1,470	1,490	1,450	2,230	1,860	1,400	2,880	5,050	3,110	2,020	2,240	2,350
1922...	3,350	2,050	3,070	604	465	471	1,100	2,700	4,290	2,540	1,830	1,790	2,030
1923...	1,820	922	1,840	1,580	732	847	1,830	2,700	3,340	2,990	1,560	1,300	1,790
1924...	1,000	952	1,590	1,470	4,720	1,110	1,360	3,460	2,720	2,010	1,510	1,480	1,940
1925...	2,510	1,650	3,260*	1,360	2,220	1,110	2,030	3,860	3,280	2,730	1,550	927	2,210*
1928...												1,030	
1929...	2,430	1,260	960	558	387*	883	1,140	3,070	3,370	2,120	1,390	832	1,540*
1930...	924	462	1,140	620*	2,290	1,340	2,450	2,790	2,700	2,110	1,280	1,190	1,550*
1931...	1,400	1,140	935	2,540	1,250	1,820	1,960	2,960	3,660	2,050	1,070	1,750	1,880
1932...	1,290												

* Estimated.

Baker River below Anderson Creek, near Concrete, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911				572	410	410	750	1,500	2,210	2,340	1,510	890	410
1912	572	524	818	572	890	626	966	1,310	2,210	1,960	1,050	890	524
1913	710	800*	710	615	525	660	770	1,500	3,740	3,070	1,500	457	457
1914	431	1,120	730	847	730	1,120	1,270	1,910	1,710	1,440	1,350	975	431
1915	910	1,350	554	554	730	676	1,270	1,120	1,190	1,190	1,350	577	554
1916	560	650	821	525	543	880	1,410	1,410	2,060	2,710	1,410	943	525
1917	508	688	625	543	543	525	642	1,590	2,460	2,280	1,690	943	508
1918	665	735	911	1,560	615	505		1,300	1,960	2,330	1,300		505
1919	920	706	781	591	642		1,130	1,610	1,930	2,050	1,250	659	591
1920	448	408	220		616	575	782	1,190	1,640	1,840	1,150	998	220
1921	1,270	660	794	861	794	908	903	1,230	2,700	2,500	1,360	814	660
1922	1,020	854	722	450	408	398	595	1,160	3,120	1,540	1,360	950	398
1923	652	652	625	625		560	1,320	1,320	1,960	1,560	1,160	813	
1924	471	460	746	610	1,360	840	374	1,430	1,840	1,400	1,040	923	460
1925	514	769	663	718	888	828	828	2,120	1,880	2,020	1,000	548	548
1928												655	
1920	718	625	575			470	570	1,510	2,220	1,460	900	432	
1930	482	415	408			755	1,750	2,000	1,260		862	545	408
1931	695	690	575	575	741	1,040	1,120	1,730	2,340	1,480	814	840	575
1932	605												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911	20,000†		410	2,250	10.7	145.25	1,630,000	1,380	120.87	1,360,000
1912	6,860†	June 25, 1912	524	1,940	9.19	124.97	1,410,000	1,940	125.09	1,410,000
1913	8,600†	Sept. 4, 1913	457	2,200	10.4	141.50	1,590,000	2,250	145.25	1,630,000
1914	24,900†	Jan. 6, 1914	431	1,970	9.34	127.02	1,430,000	2,000	128.68	1,450,000
1915	17,700†	April 2, 1915	554	1,660	7.87	106.54	1,200,000	1,660	106.83	1,200,000
1916	14,800	Feb. 15, 1916	525	2,190	10.4	141.07	1,590,000	1,060	126.45	1,420,000
1917	8,210	July 16, 1917	503	1,910	9.05	123.18	1,390,000	2,420	156.11	1,750,000
1918	36,300	Dec. 29, 1917	605	2,600	12.3	167.25	1,860,000	2,360	153.39	1,730,000
1919	18,700	Dec. 4, 1918	591	1,960	9.38	127.50	1,440,000	1,910	122.85	1,350,000
1920	19,000	Nov. 15, 1919	220	2,060	9.48	128.01	1,450,000	2,100	135.43	1,520,000
1921	16,700	Oct. 4, 1920	660	2,350	11.1	151.11	1,700,000	2,520	161.53	1,820,000
1922	23,600	Dec. 12, 1921	398	2,030	9.62	120.66	1,470,000	1,700	109.41	1,230,000
1923	11,800	Dec. 24, 1922		1,790	8.48	115.36	1,500,000	1,700	106.41	1,230,000
1924	28,500		460	1,940	9.19	125.01	1,410,000	2,260	146.08	1,640,000
1925			548	2,210	10.5	142.25	1,600,000			
1928										
1929	20,900	Oct. 8, 1928		1,540	7.30	99.21	1,120,000	1,360	87.55	987,000
1930	7,390	Feb. 18, 1930	403	1,550	7.35	99.73	1,120,000	1,640	105.47	1,180,000
1931	19,600	Jan. 23, 1931	575	1,880	8.91	121.26	1,370,000			
1932										

* Estimated.

† Maximum observed. ① Nov. 20, or 21, 1910. ② Jan. 31 or Feb. 1, 1924.

SKAGIT RIVER BASIN

Bear Creek near Concrete, Wash.

Location.—Lat. 48°37'10", long. 121°44'35", in SE¼ sec. 10, T. 36 N., R. 8 E., on left bank at downstream side of road bridge, half a mile upstream from North Fork, and 5½ miles north of Concrete.

Drainage area.—10.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 925 ft. (from topographic map).

Extremes.—March to September 1953: Maximum discharge, 171 cfs Sept. 30 (gage height, 2.28 ft.); minimum, 6.2 cfs Sept. 14-17 (gage height, 1.33 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953							62.5	71.9	58.9	43.8	12.1	15.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953							36	49	46	18.5	8.4	6.2	

North Fork Bear Creek near Concrete, Wash.

Location.—Lat. 48°38'05", long. 121°44'20", in SW¼ sec. 2, T. 36 N., R. 8 E., on right bank at road bridge, 1 mile upstream from confluence of North and South Forks, and 6½ miles north of Concrete.

Drainage area.—20.2 sq. mi., includes 8.27 sq. mi. from Sulphur Creek and 10.75 sq. mi. from Rocky Creek for greater part of year.

Gage.—Water-stage recorder. Altitude of gage is 1,040 ft. (from topographic map).

Extremes.—March to September 1953: Maximum discharge, 140 cfs Sept. 27 (gage height, 3.18 ft.); minimum, 15.5 cfs Apr. 16 (gage height, 0.85 ft., result of regulation).

Remarks.—Not all high-water flow diverted from Rocky and Sulphur Creeks above station. Regulation at diversion dams on Rocky and Sulphur Creeks.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953						49.5	55.2	78.4	73.9	71.5	56.4	48.0	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953						32	30	71	70	65	32	28	

* Estimated.

Lake Shannon at Concrete, Wash.

Location.—Lat. 48°32'55", long. 121°44'25", in SW¼ sec. 2, T. 35 N., R. 8 E., on Baker Dam on Baker River near left bank, half a mile north of Concrete, and 1 mile upstream from mouth of Baker River.

Drainage area.—297 sq. mi.

Gage.—Staff gage or water-stage indicator. Datum of gage is at mean sea level, subject to datum adjustment of 1929.

Extremes.—1925-53: Not determined.

Remarks.—Reservoir is formed by concrete dam completed to elevation 405.00 ft. in November 1925 and to 435.00 ft. in June 1927. Storage began in November 1925. Capacity, 132,500 acre-ft. between elevations 360 ft. (lowest elevation for capacity operation) and 435 ft. (spillway crest). Dead storage unknown. Water is used for power development. Figures given herein represent contents above elevation 340 ft. (center line of outlet tunnel).

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annua
1926	.....	24,300	76,020	75,780	76,090	74,580	77,940	90,340	93,350	72,760	69,140	48,650	.....
1927	92,650	95,040	91,210	90,170	76,480	54,040	92,520	132,780	145,890	165,520	151,750	154,910	.....
1928	153,000	155,140	137,160	151,040	132,230	146,340	142,610	162,150	151,480	154,980	117,010	97,120	.....
1929	137,420	115,410	105,570	55,010	34,800	57,010	63,190	155,790	155,720	152,060	119,900	81,910	.....
1930	58,220	42,590	108,570	78,960	152,330	132,210	155,480	155,340	156,130	141,580	122,080	111,080	.....
1931	128,500	85,270	84,280	165,790	130,040	154,660	155,140	155,700	155,090	146,620	93,740	86,420	.....
1932	77,430	138,450	146,530	143,270	140,770	138,750	148,790	142,610	144,100	158,030	154,590	107,160	.....
1933	117,950	155,790	153,470	142,560	127,420	151,550	144,750	145,340	145,030	154,120	154,400	154,580	.....
1934	162,350	155,520	152,220	152,530	153,090	154,420	150,260	155,140	156,220	156,240	156,240	138,150	.....
1935	165,590	154,600	149,350	154,190	139,370	132,970	119,150	139,180	151,170	154,640	121,040	117,590	.....
1936	85,880	58,940	72,860	65,560	47,980	88,580	136,170	140,770	156,170	148,870	98,410	52,000	.....
1937	46,660	45,170	94,030	47,860	41,090	77,240	123,550	135,280	152,940	152,400	123,390	109,060	.....
1938	145,690	156,080	152,530	151,840	119,900	121,140	137,120	151,910	155,450	153,720	119,640	90,740	.....
1939	108,400	118,800	141,860	138,600	115,780	107,340	141,400	153,900	153,360	156,240	134,430	123,120	.....
1940	153,770	149,090	153,500	151,750	147,100	151,970	152,570	154,260	152,890	146,770	145,160	143,140	.....
1941	153,880	151,420	151,840	154,010	140,150	139,090	139,240	155,360	155,360	153,900	154,040	153,700	.....
1942	153,900	150,220	151,220	150,350	141,080	127,170	138,300	155,090	157,000	154,580	151,910	152,200	.....
1943	155,700	150,240	155,430	147,230	153,340	155,200	151,310	152,440	152,110	158,180	153,090	152,310	.....
1944	146,220	145,160	152,800	146,840	124,910	120,250	122,320	154,480	157,000	156,400	154,550	151,420	.....
1945	150,710	156,490	138,940	147,960	145,760	138,840	132,420	155,560	157,570	153,770	142,830	145,780	.....
1946	156,330	154,220	153,860	151,770	148,090	150,420	133,070	139,140	153,390	155,340	155,310	148,340	.....
1947	154,440	158,160	155,300	150,510	154,080	156,880	150,240	151,860	157,440	156,960	155,430	147,780	.....
1948	157,710	151,680	158,230	148,760	141,070	103,860	117,630	150,510	156,330	157,980	157,890	157,210	.....
1949	143,400	153,090	137,540	138,620	138,210	152,310	155,410	149,220	157,350	158,950	150,860	152,040	.....
1950	167,080	158,120	155,560	133,430	152,600	154,630	154,530	150,970	158,000	157,100	156,330	156,440	.....
1951	157,980	158,160	157,820	157,320	149,040	119,580	157,340	155,160	158,250	155,790	152,470	156,580	.....
1952	156,200	123,980	115,690	109,620	121,260	72,240	132,740	156,650	156,230	158,560	158,160	155,640	.....
1953	145,580	127,890	147,960	160,020	130,060	67,900	68,970	155,900	160,160	157,870	159,520	160,450	.....

SKAGIT RIVER BASIN

Baker River at Concrete, Wash.

Location.—Lat. 48°32'35", long. 121°44'35", on line between secs. 10 and 11, T. 35 N., R. 8 E., on left bank, 800 ft. downstream from Baker River powerplant, a quarter of a mile northeast of Concrete, and three-quarters of a mile upstream from mouth.

Drainage area.—297 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 172.6 ft. above mean sea level (from river-profile survey). Sept. 11, 1910, to Mar. 4, 1915, staff gage half a mile downstream at different datum.

Average discharge.—14 years (1910-14, 1943-53), 2,519 cfs (unadjusted), 2,520 cfs, adjusted for storage since 1943.

Extremes.—1910-15, 1943-53: Maximum discharge, 35,200 cfs Nov. 27, 1949 (gage height, 20.32 ft., from high-water mark), from rating curve extended above 16,000 cfs on the basis of computation of peak flow over dam; minimum, 21 cfs Feb. 7, 1949 (gage height, 0.20 ft.); minimum daily, 121 cfs Jan. 20, 1952.

Remarks.—No diversion above station. Flow regulated since November 1925 by Baker River powerplant and Lake Shannon (see p. 377).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	4,560	4,630	2,560	1,420	798	1,280	1,630	3,210	4,470	3,770	2,170	2,550	2,760
1912...	1,260	3,060	1,740	2,260	2,650	992	1,350	3,460	4,570	2,980	2,100	1,250	2,310
1913...	1,360	3,080	1,800	930	1,740	1,230	1,970	3,540	5,610	5,030	2,630	2,320	2,610
1914...	2,690	2,990	1,160	3,370	1,050	2,280	2,740	3,380	2,960	2,740	1,730	1,760	2,400
1915...	2,190	3,260	1,010	1,280	1,070								
1943...												1,128	
1944...	1,409	1,037	1,711	1,068	1,526	1,387	1,588	2,314	2,553	1,625	1,156	1,943	1,712
1945...	1,633	2,351	2,070	2,616	2,519	1,719	1,786	4,191	3,580	2,845	1,596	1,463	2,363
1946...	2,690	2,020	2,024	1,995	1,823	1,831	2,925	4,917	4,440	3,866	1,947	1,270	2,701
1947...	1,671	1,455	3,219	1,896	2,847	2,017	2,669	4,038	3,684	2,659	1,349	1,427	2,409
1948...	3,708	2,309	2,961	1,872	1,424	1,677	1,667	3,850	6,156	3,003	2,459	2,199	2,783
1949...	2,170	1,511	1,564	736	1,097	1,938	2,997	5,571	4,191	3,548	2,089	1,814	2,469
1950...	1,865	4,262	2,969	1,653	1,776	2,783	2,372	3,778	6,042	5,048	3,955	1,764	3,119
1951...	3,357	3,397	5,188	2,448*	4,561	1,781	1,860	3,689	3,582	2,487	1,409	1,232	2,930*
1952...	2,773	2,041	1,707*	1,028	1,734	1,872	1,691	3,598	3,938	3,393	1,786	1,098	2,217*
1953...	1,184	1,263	1,459*	4,907	3,244	2,287	2,060	2,100	3,443	4,113	2,121	1,738	2,482*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	1,940	1,510	1,560	820	640	640	1,060	2,050	2,670	2,850	1,780	1,140	640
1912...	750	700	960	820	1,180	874	1,180	1,600	2,450	2,000	1,180	860	700
1913...	778	855	1,040	634	645	772	890	1,390	4,170	2,860	1,500	1,050	634
1914...	730	1,190	695	1,000	695	1,190	1,310	2,170	1,820	1,710	1,400	970	695
1915...	1,170	1,360	652	720	894								
1943...												499	
1944...	594	804	679	564	669	614	749	654	1,310	618	454	728	304
1945...	384	633	620	628	679	684	988	1,970	2,540	1,160	706	660	384
1946...	399	1,820	682	1,210	844	914	1,620	2,740	1,600	2,110	1,310	560	399
1947...	450	878	1,020	784	1,090	1,140	1,440	1,880	2,380	1,140	511	332	332
1948...	1,190	1,410	1,180	529	446	1,060	1,020	1,530	3,820	2,140	1,520	1,500	446
1949...	564	792	154	142	265	968	2,160	2,450	2,370	2,420	948	278	142
1950...	814	1,300	1,850	650*	550*	1,580	1,850	2,090	2,990	2,820	2,150	382	382
1951...	1,540	827	1,450	1,500*	1,800	985	1,590	1,890	2,160	1,090	512	565	505
1952...	1,520	1,760	1,320	121	1,220	1,580	1,470	1,400	2,360	2,430	448	397	121
1953...	460	400*	600*	1,350*	2,120	2,160	570	1,580	2,480	2,480	1,430	470	400*

* Estimated.

SKAGIT RIVER BASIN

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Baker River at Concrete, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1910.....										
1911.....	24,600	Nov. 21, 1910	640	2,760	9.29	126.12	2,000,000	2,280	104.27	1,650,000
1912.....	14,800	Nov. 18, 1911	700	2,310	7.73	103.71	1,670,000	2,320	106.42	1,690,000
1913.....	18,100	Sept. 4, 1913	634	2,610	8.79	119.23	1,890,000	2,660	121.55	1,920,000
1914.....	31,000	Jan. 6, 1914	695	2,400	8.06	109.91	1,740,000	2,370	108.42	1,720,000
1915.....										

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR					
Year	Observed				Adjusted			Observed		Adjusted		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
	Discharge	Date										
1943.....												
1944.....	14,100	Dec. 3, 1943	304	1,712	1,243,000	1,710	5.76	78.39	1,866	1,355,000	1,847	84.67
1945.....	20,000	Feb. 8, 1945	354	2,363	1,711,000	2,355	7.93	107.64	2,471	1,789,000	2,492	113.87
1946.....	27,000	Oct. 25, 26, 1945	399	2,701	1,956,000	2,705	9.11	123.63	2,621	1,897,000	2,623	119.87
1947.....	20,000	Oct. 24, 1946	332	2,409	1,744,000	2,408	8.11	110.06	2,635	1,907,000	2,639	120.62
1948.....	23,000	Oct. 18, 1947	446	2,753	2,020,000	2,795	9.41	128.11	2,488	1,806,000	2,460	112.71
1949.....	12,800	May 10, 1949	142	2,469	1,787,000	2,464	8.30	112.50	2,764	2,001,000	2,788	127.44
1950.....	35,200	Nov. 27, 1949	382	3,119	2,258,000	3,125	10.5	142.84	3,364	2,435,000	3,367	153.86
1951.....	29,700	Feb. 10, 1951	505	2,930	2,121,000	2,930	9.87	133.90	2,473	1,790,000	2,415	110.37
1952.....	11,000	Oct. 19, 1951	121	2,217	1,609,000	2,220	7.47	101.74	1,993	1,447,000	2,038	93.40
1953.....	16,200	Jan. 12, 1953	400	2,482	1,797,000	2,484	8.36	113.55				

Skagit River near Concrete, Wash.

Location.—Lat. 48°31'30", long. 121°46'10", in NE¼ sec. 16, T. 35 N., R. 8 E., on right bank at dallas, 1½ miles southwest of Concrete, and 2½ miles downstream from Baker River.

Drainage area.—2,700 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Gage.—Water-stage recorder. Datum of gage is 130.0 ft. above mean sea level, datum of 1929. Prior to Dec. 10, 1924, staff gage 200 ft. upstream and Dec. 10, 1924, to Oct. 27, 1937, water-stage recorder at present site at datum 12.69 ft. higher than present datum.

Average discharge.—29 years (1924-53), 14,310 cfs (unadjusted).

Extremes.—1924-53: Maximum discharge, 154,000 cfs Nov. 27, 1949 (gage height, 40.8 ft); minimum probably less than 2,160 cfs during period Oct. 1-24, 1925, when recorder was not operating and gates in Baker River dam were first closed; minimum daily recorded, 2,610 cfs Nov. 14, 1936.

Maximum stage known, 69.3 ft., present datum, about 1815, from floodmarks at site 200 ft. upstream (discharge, about 500,000 cfs).

Remarks.—No known diversion above station. Flow partly regulated by power-plants on Baker and upper Skagit Rivers, and by Ross, Diablo, and Lake Shannon Reservoirs (see elsewhere in this report).

SKAGIT RIVER BASIN

Skagit River near Concrete, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1925...	14,000	13,500	21,300	12,700	17,800	9,160	17,600	36,300*	29,700	19,600	9,330	5,300*	17,200*
1926...	8,510*	4,430	18,600	9,530	9,880	8,100	14,000	14,400	12,300	9,400	7,410	5,680	9,760*
1927...	14,900	10,560	12,700	10,400	8,900	7,750	10,200	20,600	36,500	19,900	10,400	12,300	14,600
1928...	16,600	10,900	14,400	22,600	8,340	11,500	11,000	31,900	22,500	18,000	8,190	6,710*	15,800*
1929...	13,100	8,460	6,850	4,670*	8,190	6,220	5,990	24,100	23,000	15,000	8,880	5,690	11,100*
1930...	5,140*	3,540*	5,290	4,490*	15,400	10,100	20,300	17,600	21,400	14,900	7,670	5,530	10,900*
1931...	7,010*	6,570	5,550*	11,900	10,900	12,400	14,300	26,500	25,400	13,300	7,670	9,600	12,600*
1932...	7,460	11,100*	9,650	7,770	18,200	18,700	18,700	25,600	32,600	20,300	11,000	7,440	15,800*
1933...	9,750	29,300	16,300	11,700	6,360	8,650	12,500	21,300	33,300	33,900	16,800	12,500	18,100
1934...	20,690	18,440	31,150	24,010	13,880	19,830	29,270	27,720	20,260	14,560	9,094	7,374	19,740
1935...	9,505	22,830	14,090	25,240	19,010	10,050	8,324	19,290	26,500	18,240	9,663	8,538	15,900
1936...	7,010	5,682	6,309	9,204	5,061	8,855	20,150	35,150	32,150	14,090	8,984	7,114	13,380
1937...	4,614	2,876	9,393	4,604	8,991	7,721	11,350	23,800	42,130	19,790	9,245	6,440	12,190
1938...	9,018	19,060	10,870	12,580	6,544	9,016	16,480	27,310	30,770	16,130	7,402	6,251	14,830
1939...	6,742	8,003	12,600	16,720	7,376	9,102	16,080	28,450	25,330	21,510	10,060	6,350	14,060
1940...	8,759	11,640	22,720	11,020	11,000	14,680	13,480	22,270	17,390	9,310	6,550	5,998	12,920
1941...	13,790	8,307	11,670	8,882	7,869	8,088	10,810	15,300	14,330	9,337	6,403	10,480	10,450
1942...	16,540	12,970	18,040	7,043	6,951	6,313	11,220	16,730	23,610	16,460	7,955	4,852	12,430
1943...	4,145	11,800	12,800	9,975	9,888	10,670	21,560	20,160	30,330	27,810	10,460	6,394	14,680
1944...	7,042	5,469	9,265	8,162	6,866	6,907	9,712	16,810	19,360	10,440	6,464	6,556	9,029
1945...	8,511	9,460	10,170	13,720	14,170	9,192	9,574	24,520	23,960	15,620	7,674	7,992	12,890
1946...	13,170	15,520	11,140	11,900	9,395	11,300	15,410	34,720	31,720	23,300	10,580	6,364	16,250
1947...	8,528	8,179	16,040	10,850	14,320	13,600	18,480	24,680	25,570	15,690	8,161	6,875	14,090
1948...	18,240	13,560	16,810	12,660	8,463	7,933	10,950	23,200	30,540	20,140	15,500	10,850	18,040
1949...	11,950	11,430	10,500	8,098	10,060	13,100	16,620	31,410	23,170	19,830	13,180	10,470	15,020
1950...	12,520	22,900	20,250	13,460	16,600	18,710	14,050	20,050	35,650	33,950	16,860	9,677	19,620
1951...	16,050	19,470	26,950	17,250	28,700	11,000	19,270	25,330	21,550	16,930	8,850	8,148	18,220
1952...	16,150	13,710	11,500	8,905	13,000	8,440	12,990	19,020	18,350	6,276	9,316	6,305	12,740
1953...	6,753	7,079	7,595	29,150	16,370	9,740	12,320	18,250	20,060	24,320	12,010	8,668	13,860

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1925...	5,580	7,510	7,070	6,850	8,200	7,070	7,070	18,000*	18,900	13,900	5,780	3,400*	3,400*
1926...	.....	2,740	9,840	6,820	6,620	6,170	7,300	10,000	8,680	6,740	6,200	3,650	.....
1927...	5,200	6,750	5,070	5,530	5,440	6,450	5,440	12,500	23,400	14,600	7,220	.....	5,200
1928...	.....	.....	6,240	6,150	6,560	8,440	7,420	13,050	14,300	10,000	6,400	.....	.....
1929...	5,940	6,260	.....	.....	.....	3,000	5,540	12,900	19,300	9,990	7,060	3,900	.....
1930...	.....	.....	.....	.....	7,320	5,620	15,000	12,400	16,000	8,640	3,970	4,250	.....
1931...	9,520	.....	.....	3,460	6,960	7,840	8,720	14,900	16,600	9,650	5,760	6,520	3,490
1932...	4,680	.....	.....	5,760	5,830	9,700	11,560	16,300	19,000	12,200	8,100	6,380	4,680
1933...	6,000	11,600	8,700	6,750	5,200	6,180	7,420	11,560	24,600	20,700	9,390	6,990	5,200
1934...	6,720	8,840	10,700	14,900	8,970	11,500	17,400	18,100	12,500	9,440	8,020	5,510	5,510
1935...	5,360	12,200	9,750	6,600*	10,500	7,260	7,100	10,400	17,100	13,500	7,680	6,500	5,860
1936...	6,300	4,940	5,130	6,560	4,640	6,560	5,000	22,100	17,700	9,840	7,300	5,220	4,040
1937...	2,910	2,610	2,720	3,000*	2,860	5,260	7,840	10,700	29,000	10,500	6,940	4,740	2,010
1938...	3,150	8,490	9,230	7,490	5,270	7,930	6,500	14,100	21,200	9,280	5,980	5,280	3,150
1939...	4,100	5,440	6,830	8,660	5,560	5,540	11,000	16,500	19,700	14,900	6,720	6,420	4,100
1940...	4,790	6,450	10,500	6,340	6,910	8,800	9,620	15,400	11,000	6,960	5,700	4,960	4,790
1941...	4,120	5,720	8,250	6,280	5,810	6,420	8,590	9,340	10,700	6,390	5,300*	6,330	4,120
1942...	7,350	6,760	8,320	6,120	5,080	4,550	7,340	10,300	17,200	10,200	5,150	3,940	3,040
1943...	2,930	4,120	5,420	6,670	6,880	6,860	13,500	12,800	19,600	18,300	6,870	5,340	2,930
1944...	4,680	3,740	4,680	5,400	4,880	4,140	6,610	11,600	14,300	7,920	4,060	5,020	3,740
1945...	5,090	4,690	4,400	4,170	7,340	6,600	7,550	14,200	16,400	9,040	6,040	5,400	4,170
1946...	4,700	11,100	6,820	9,060	6,240	7,720	9,100	18,000	21,700	14,400	8,400	3,940	3,940
1947...	3,740	5,350	8,570	6,340	8,340	7,200	12,400	12,700	16,100	9,200	5,540	4,480	3,740
1948...	6,340	9,050	9,780	8,110	5,350	5,730	6,130	10,300	25,300	12,700	10,300	8,110	5,350
1949...	7,970	6,620	6,590	6,150	5,930	10,600	9,960	16,100	18,400	14,500	7,270	6,280	5,930
1950...	8,110	8,570	11,600	6,530	11,300	13,600	10,500	10,000	20,100	17,500	10,300	6,130	6,130
1951...	8,110	9,780	14,200	12,400	11,600	9,150	11,600	15,800	15,400	11,000	6,210	5,400	6,400
1952...	11,100	11,400	8,480	6,470	8,760	6,830	8,220	9,950	12,200	11,700	4,460	4,390	4,390
1953...	5,100	4,760	4,600	5,830	8,480	7,730	7,900	13,200	15,600	14,600	7,120	4,470	4,470

* Estimated.

Skagit River near Concrete, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1856.....	350,000	ⓐ	.....	.....	.....	.....	.....
1896.....	275,000	Nov. 19, 1897	.....	.....	.....	.....	.....
1910.....	260,000	Nov. 30, 1909	.....	.....	.....	.....	.....
1918.....	220,000	Dec. 30, 1917	.....	.....	.....	.....	.....
1922.....	240,000	Dec. 13, 1921	.....	.....	.....	.....	.....
1925.....	92,500	Dec. 12, 1924	3,400	17,200	12,500,000	15,500	11,200,000
1926.....	51,600	Dec. 23, 1925	.....	9,700	7,000,000	10,700	7,760,000
1927.....	88,900	Oct. 16, 1926	5,200	14,600	10,600,000	16,700	11,400,000
1928.....	95,500	Jan. 12, 1928	.....	15,800	11,400,000	13,900	10,100,000
1929.....	74,300	Oct. 9, 1928	.....	11,100	8,070,000	9,830	7,190,000
1930.....	82,200	June 7, 1930	.....	10,900	7,880,000	11,800	8,160,000
1931.....	60,600	June 26, 1931	3,490	12,600	9,110,000	13,400	9,730,000
1932.....	147,000	Feb. 27, 1932	4,620	15,800	11,400,000	18,600	13,100,000
1933.....	116,000	Nov. 13, 1932	5,200	16,100	18,100,000	19,400	14,100,000
1934.....	101,000	Dec. 22, 1933	5,510	19,740	14,290,000	17,700	12,810,000
1935.....	131,000	ⓑ	5,360	15,960	11,560,000	13,670	9,899,000
1936.....	60,000	June 3, 1936	4,640	13,380	9,712,000	13,210	9,589,000
1937.....	68,300	June 19, 1937	2,610	12,190	8,827,000	14,530	10,520,000
1938.....	89,600	Oct. 28, 1937	3,150	14,830	10,730,000	13,360	9,673,000
1939.....	79,600	May 29, 1939	4,100	14,080	10,190,000	15,410	11,160,000
1940.....	48,200	Dec. 15, 1939	4,790	12,920	9,379,000	12,140	8,810,000
1941.....	51,000	Oct. 19, 1940	4,120	10,450	7,568,000	11,610	8,407,000
1942.....	76,300	Dec. 2, 1941	3,940	12,430	8,086,000	10,830	7,842,000
1943.....	54,000	Nov. 23, 1942	2,930	14,680	10,620,000	14,100	10,210,000
1944.....	65,200	Dec. 3, 1943	3,740	9,629	6,090,000	10,160	7,373,000
1945.....	70,800	Feb. 8, 1945	4,170	12,890	9,332,000	13,870	10,040,000
1946.....	102,000	Oct. 25, 1945	3,940	16,250	11,770,000	15,670	11,350,000
1947.....	32,200	Oct. 25, 1946	3,740	14,090	10,200,000	15,420	11,160,000
1948.....	95,200	Oct. 19, 1947	5,350	16,040	11,840,000	14,800	10,750,000
1949.....	55,700	May 13, 1949	5,930	15,020	10,870,000	16,840	12,190,000
1950.....	154,000	Nov. 27, 1949	6,130	10,620	14,210,000	20,210	14,630,000
1951.....	139,000	Feb. 10, 1951	5,400	18,220	13,190,000	16,450	11,010,000
1952.....	43,600	June 5, 1952	4,390	12,740	9,249,000	11,070	8,037,000
1953.....	66,000	Feb. 1, 1953	4,470	13,860	10,030,000	.....	.....

ⓐ Exact date not known. ⓑ Probably Jan. 25, 1935.

Finney Creek near Concrete, Wash.

Location.—Lat. 48°30'35", long. 121°48'45", in NE¼ sec. 19, T. 35 N., R. 8 E., on left bank, 1½ miles upstream from mouth, and 3 miles southwest of Concrete.

Drainage area.—55.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 170 ft. (by barometer). Prior to Apr. 19, 1945, water-stage recorder 500 ft. downstream at different datum.

Extremes.—1943-48: Maximum discharge, 4,300 cfs Oct. 19, 1947 (gage height, 6.52 ft.); minimum recorded, 16 cfs Oct. 8, 9, 1943, Aug. 22, 23, 24, 1945.

Remarks.—No diversion or regulation above station.

SKAGIT RIVER BASIN

Finney Creek near Concrete, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....													
1944.....	117										35.3	22.6	.....
1945.....	130	322	232	527*	285*	198*	259*	521	144	30.8	21.0	110	.....
1946.....	329	536	462	488	386	440	400	534	358	125	33.1	27.9	351
1947.....	263	362	692	442	577	296	345	224	184	116*	42.8	109	303*
1948.....	498	412	518	360	309	255	312	556	378	91.1	79.0	156	327

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....													
1944.....	16									22	25	17	.....
1945.....	50	103	85*	82*	95*	85*	140*	302	74	24	16	17	16
1946.....	32	213	132	190	113	217	194	320	213	52	24	21	21
1947.....	23	137	211	149	208	172	226	155	120*	76*	25	25	23
1948.....	52	189	156	156	115	154	178	214	175	55	41	76	41

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1943.....													
1944.....													
1945.....	2,700	Jan. 7, 1945	16	231	4.17	56.62	167,300	265	69.87	206,500			
1946.....	3,530	Oct. 25, 1945	21	351	6.34	85.90	253,200	350	85.78	253,500			
1947.....	4,080	Oct. 24, 1946	23	303	5.47	74.16	219,100	312	76.47	226,000			
1948.....	4,300	Oct. 19, 1947	41	327	5.90	80.43	237,600	.....	.....	.....

* Estimated.

Grandy Creek near Concrete, Wash.

Location.—Lat. 48°32'00", long. 121°53'00", in SE¼ sec. 10, T. 35 N., R. 7 E., on left bank, 250 ft. upstream from highway bridge, 1 mile upstream from mouth, and 6 miles west of Concrete.

Drainage area.—18.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 190 ft. (by barometer). July 17 to Oct. 14, 1943, water-stage recorder at site 100 ft. downstream at different datum.

Extremes.—1943-44: Maximum discharge recorded, 219 cfs Sept. 20, 1944 (gage height, 2.90 ft.), from rating curve extended above 30 cfs; minimum discharge, 4.5 cfs Sept. 9, 10, 11, 1944.

Remarks.—No diversion or regulation above station.

Grandy Creek near Concrete, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										11.0	7.92		
1944										7.54	23.6	23.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										8.0	6.3		
1944										5.1	4.9	12	

O'Toole Creek near Hamilton, Wash.

Location.—Lat. 48°30'40", long. 121°55'05", in NW¼ sec. 21, T. 35 N., R. 7 E., on left bank, 800 ft. upstream from mouth, and 3 miles southeast of Hamilton.

Drainage area.—5.69 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (by barometer).

Extremes.—1943-44: Maximum discharge recorded, 137 cfs Oct. 24, 1943 (gage height, 3.20 ft.), from rating curve extended above 25 cfs; minimum, 2.8 cfs Sept. 10-13, 1943 (gage height, 1.46 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										6.53	4.26	19.7	
1944									4.57	3.72	14.7	20.6*	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										4.2	3.3	3.5	
1944									3.8	3.1	2.8	6.4*	

* Estimated.

SKAGIT RIVER BASIN

Alder Creek near Hamilton, Wash.

Location.—Lat. 48°31'40", long. 121°57'00", in NE¼ sec. 18, T. 35 N., R. 7 E., on left bank at railroad trestle, a quarter of a mile upstream from highway bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Hamilton.

Drainage area.—10.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 125 ft. (by barometer). Prior to Nov. 15, 1945, water-stage recorder 80 ft. upstream at datum 2.46 ft. higher. Nov. 15, 1945, to Jan. 7, 1947, water-stage recorder at present site at datum 2.56 ft. higher. Jan. 8, 1947, to Aug. 24, 1951, water-stage recorder at present site at datum 0.98 ft. higher than present datum.

Average discharge.—10 years (1943-53), 33.6 cfs.

Extremes.—1943-53: Maximum discharge, 670 cfs Jan. 7, 1945 (gage height, 4.28 ft., site and datum then in use); minimum, 5.9 cfs Oct. 19, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943													8.70
1944	10.1	10.9	29.5	38.4	29.2	31.5	23.1	23.1	18.9	8.96	7.15	8.91	19.5
1945	9.77	22.8	27.2	78.8	40.9	47.2	58.0	34.1	15.5	10.4	9.08	9.48	30.3
1946	35.4	65.6	50.1	62.7	51.6	62.0	45.2	27.7	20.9	15.7	10.4	8.79	37.9
1947	18.8	32.1	82.4	64.4	65.5	38.7	38.3	23.6	17.8	13.9	10.2	11.6	34.6
1948	37.6	60.6	63.2	62.1	47.6	44.6	49.9	45.8	21.0	15.5	12.9	11.9	39.4
1949	17.5	56.1	55.0	24.8	42.9	85.7	49.3	31.5	15.0	12.3	10.0	10.8	34.2
1950	19.9	36.1	85.8	44.9	76.8	102	66.5	45.4	25.1	15.1	13.1	12.4	45.1
1951	33.5	47.9	72.2	82.5	127	53.9	42.5	23.6	15.7	10.9*	8.59	7.00	43.3*
1952	18.6	32.3	34.0	26.6	65.0	33.1	32.2	19.2	12.6	11.0	8.05	7.44	25.1
1953	6.64	7.93	19.7	80.9	63.4	32.8	32.2	23.1	19.0	13.2	9.73	8.47	26.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943													8.0
1944	8.0	9.9	15	21	20	17	19	14	12	7.4	6.6	6.3	6.3
1945	7.3	8.4	14	16	24	30	49	21	12	9.6	8.4	8.4	7.3
1946	9.2	27	29	44	36	42	37	19	16.5	11.5	9.1	8.2	8.2
1947	7.9	16.5	32*	21*	38	28	29	17	14.5	11.5	9.8	9.8	7.9
1948	10	29	28	31	19	30	43	26	17	13	11	10	10
1949	11	16	26	16	17	47	44	18	14	11	9.3	8.9	8.9
1950	10	18	25	30*	31	56	44	38	17	13	11	10	10
1951	15.5	26	38	44	45*	30*	27	19	13*	9.9	7.5	6.4	6.4
1952	8.8	16	23	21	33	22	22	12.5	9.9	9.6	7.7	6.9	6.9
1953	6.1	6.8	7.2	22	31	28	24	17	15	10.6	8.8	7.5	6.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1943													
1944	137	Dec. 3, 1943	6.3	19.3	1.85	25.20	14,370	29.6	26.18	14,920			
1945	670	Jan. 7, 1945	7.3	30.3	2.82	35.40	21,900	37.9	48.09	27,430			
1946	265	Oct. 25, 1945	8.2	37.9	3.54	48.12	27,470	36.5	46.32	26,450			
1947	450	Dec. 11, 1946	7.9	34.6	3.23	43.02	25,080	36.9	46.36	26,750			
1948	241	Oct. 19, 1947	10	39.4	3.68	50.11	28,610	36.6	46.60	26,600			
1949	256	Dec. 1, 1948	8.9	34.2	3.20	43.38	24,760	35.4	44.88	26,620			
1950	477	Dec. 27, 1949	10	45.1	4.21	57.21	32,650	46.1	53.43	33,340			
1951	654	Feb. 10, 1951	6.4	49.3	4.05	54.68	31,310	37.5	47.63	27,110			
1952	212	Feb. 4, 1952	6.9	25.1	2.85	31.88	18,190	20.8	28.50	16,130			
1953	364	Jan. 31, 1953	6.1	26.2	2.46	33.27	18,980						

* Estimated.

SKAGIT RIVER BASIN

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Day Creek near Lyman, Wash.

Location.—Lat. 48°30'05", long. 122°02'45", in NW¼ sec. 28, T. 35 N., R. 6 E., on left end of county highway bridge, 1 mile upstream from mouth, and 1¼ miles south-east of Lyman.

Drainage area.—36.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 90 ft. (from topographic map).

Average discharge.—10 years (1943-53), 261 cfs.

Extremes.—1943-53: Maximum discharge, 5,570 cfs Dec. 28, 1949 (gage height, 8.35 ft.), from rating curve extended above 3,000 cfs on basis of logarithmic plotting; minimum, 5.9 cfs Feb. 1, 1945; minimum gage height, 0.47 ft. Sept. 16-19, 1953.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943											28.4	26.6	.....
1944	195	117	356	420	206	203	228	187	78.3	21.4	18.7	131	180
1945	148	498	230	530	206	263	248	397	74.9	22.1	14.2	114	235
1946	358	517	502*	455	340	372	400	319	346	81.1	24.4	30.5	312*
1947	240	262	534	395	436	269	349	120	187	92.2	41.0	96.8	255
1948	453	321	438	301	275	202	282	516	238	60.6	86.7	200	281
1949	200	432	226	105	380	414	375	444	203	107	65.8	99.1	253
1950	238	487	573	263*	539	514	421	368	368	129	96.7	67.6*	337*
1951	398	423	644	433	701	198	261	223	60.1	19.8	11.7	29.6*	282*
1952	356	287	224	249	377	173	359	343	228	53.1	34.2	50.0	227
1953	33.1	72.1	343	984	403	232	235	256	211*	58.2	33.5	79.2	245*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943											21	15	.....
1944	18	42	52	106	64	57	122	76	26	18	14	13	13
1945	33	61	33	49	54	46	132	173	33	16	9.7	11	9.7
1946	20	142	95*	138	94	154	147	189	156	35	16	13	13
1947	18	51	97	68	136	124	156	62	60	61	32	25	18
1948	29	180	113	109	70	113	150	161	91	34	28	49	28
1949	60	114	85	43*	43*	153	154	212	114	60	39	23	28
1950	39	63	91	85*	140*	194	185	239	257	46	36*	20*	20*
1951	53	113	207	209	94	59	120	98	26	13	9.5	10*	9.5
1952	70	64	67	49	92	92	162	170	100	28	13	16	13
1953	14	26	31	183	98	89	107	157	129	27	16.5	12.5	12.5

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1943				190	4.96	67.66	131,000	196	73.66	142,600
1944	4,370	Dec. 3, 1943	15	235	6.47	88.01	170,400	278	104.09	201,500
1945	4,310	Jan. 7, 1945	9.7							
1946	4,310	Nov. 14, 1945	13	312	8.60	116.59	225,700	288	107.61	208,300
1947	4,530	Oct. 24, 1946	18	255	7.02	95.32	184,600	235	99.28	192,200
1948	4,420	Oct. 18, 1947	28	231	7.74	103.54	204,300	251	94.13	182,300
1949	3,330	Feb. 18, 1949	28	253	6.97	94.58	183,100	290	108.47	210,000
1950	5,570	Dec. 28, 1949	20	337	9.28	126.03	244,000	351	131.41	254,400
1951	4,510	Feb. 9, 1951	9.5	282	7.77	105.29	203,800	231	86.43	167,300
1952	3,350	Oct. 2, 1951	13	227	6.25	85.08	164,700	192	72.01	139,400
1953	3,880	Jan. 2, 1953	12.5	245	6.75	91.47	177,200			

* Estimated.

SKAGIT RIVER BASIN

Jones Creek near Lyman, Wash.

Location.—Lat. 48°32'15", long. 122°02'40", in SW¼ sec. 9, T. 35 N., R. 6 E., on right bank, 1¼ miles upstream from mouth, and 1 mile northeast of Lyman.

Drainage area.—7.80 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map)

Extremes.—1943-44: Maximum discharge recorded, 46 cfs Sept. 20, 1944 (gage height, 1.94 ft.); minimum, 0.4 cfs Oct. 7-10, 1943.

Remarks.—Diversions for municipal and industrial use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										1.50	1.83	6.09	
1944									1.85	1.26	5.10	5.55	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										0.9	0.5	0.4	
1944									0.7	0.9	0.8	1.7	

Gilligan Creek near Lyman, Wash.

Location.—Lat. 48°29'05", long. 122°08'00", in NW¼ sec. 35, T. 35 N., R. 5 E., on right bank, 60 ft. upstream from county highway bridge, three-eighths of a mile upstream from mouth, and 4½ miles southwest of Lyman.

Drainage area.—6.31 sq. mi.

Gage.—Staff gage. Altitude of gage is 80 ft. (from topographic map).

Extremes.—July to October 1943: Maximum discharge, 79 cfs Oct. 24 (gage height, 2.4 ft., from graph based on gage readings), from rating curve extended above 10 ft.; no flow for many days.

Remarks.—About 3 cfs diverted 2 miles above gage for municipal use of Sedro Woolley. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										1.03	0.57	14.5	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943										0	0	0	

SKAGIT RIVER BASIN

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Cool Creek near Sedro Woolley, Wash.

Location.—Lat. 48°32'00", long. 122°09'00", in S½ sec. 10, T. 35 N., R. 5 E., on right bank, 400 ft. upstream from bridge on State Highway 17A and 4 miles northeast of Sedro Woolley.

Drainage area.—1.8 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 150 ft. (by barometer).

Extremes.—1947-50: Maximum discharge, 468 cfs Dec. 27, 1949 (gage height, 3.60 ft.), from rating curve extended above 140 cfs; minimum, 0.3 Sept. 12-14, 1949.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	12.3	16.8	15.1	12.5	9.63	8.22	10.1	13.5	7.73	2.05	4.69	4.10	9.77
1949...	5.85	14.8	8.00	3.75*	14.9	19.1	10.9	10.2	3.77	2.72	1.77	3.23	8.20*
1950...	9.37	10.5	22.1	7.66*	14.7	17.3	13.3	13.5	10.4	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	1	5.2	5.2	4.1	2.4	4.4	6.6	7.0	2.7	1.5	1.0	1.5	1.0
1949...	2.4	4.4	2.9	2*	2*	6.6	7.4	4.4	2.2	1.5	.8	.4	.4
1950...	1.2	2.7	2.2	3.3*	5.0*	8.2	8.7	10	6.6	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1948.....	394	Oct. 15, 1947	1.0	9.77	5.43	73.88	7,090	8.47	64.01	6,140
1949.....	183	Feb. 16, 1949	.4	8.20	4.56	61.81	5,390	9.34	70.44	6,760
1950.....	468	Dec. 27, 1949	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

SKAGIT RIVER BASIN

Hansen Creek near Sedro Woolley, Wash.

Location.—Lat. 48°30'30", long. 122°12'10", in NW¼ sec. 20, T. 35 N., R. 5 E., on right bank at bridge on State Highway 17A, three-quarters of a mile upstream from mouth, and 1 mile east of Sedro Woolley.

Drainage area.—10.3 sq. mi.

Gage.—Staff gage. Altitude of gage is 50 ft. (from topographic map).

Extremes.—1943-45: Maximum discharge, 332 cfs Jan. 7, 1945 (gage height, 7.45 ft., from floodmarks); no flow Aug. 22, 23, 24, 1945.

Remarks.—Several small diversions for irrigation and domestic use above station, the largest of which is 0.8 cfs for use at Northern State Hospital. No regulation.

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Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....											3.32	2.75	.....
1944.....	6.10	4.82	28.6	25.8	28.4	24.6	20.0	21.5	9.83	2.68	2.28	5.97	15.0
1945.....	4.54	29.1	18.0	79.2	37.4	34.4	30.1	23.5	5.71	1.29	1.05	9.66	23.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....											1.7	1.5	.....
1944.....	1.3	3.0	6.4	13	13	12	12	9.3	4.0	1.4	1.2	1.1	1.1
1945.....	2.3	7.8	9.0*	14	20	21	21	12	3.0	.5	0	.7	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1943.....							
1944.....	296	Dec. 3, 1943	1.1	15.0	10,920	16.0	11,620
1945.....	332	Jan. 7, 1945	0	23.3	16,840		

* Estimated.



Figure 10. Discharge measurement from highway bridge with battery-power-operated crane. Skagit River near Mount Vernon.



Figure 11. Discharge measurement from railway bridge. Skagit River near Sedro Woolley.

SKAGIT RIVER BASIN

Skagit River near Sedro Woolley, Wash.

Location.—Lat. 48°29'05", long. 122°14'30", in NW¼ sec. 36, T. 35 N., R. 4 E., at Northern Pacific Railway bridge, three-quarters of a mile downstream from entrance to Beatty's Slough, and 1½ miles south of Sedro Woolley.

Drainage area.—3,000 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Gage.—Staff or chain gages. Datum of gage is extreme low sea level in Puget Sound (levels by Corps of Engineers), which is 8.9 ft. below mean sea level, unadjusted.

Average discharge.—16 years (1908-24), 16,220 cfs.

Extremes.—1908-24: Maximum discharge observed, 220,000 cfs Nov. 30, 1909 (gage height, 56.5 ft.), from rating curve extended above 62,000 cfs; minimum observed, 2,830 cfs Sept. 29-30, Oct. 10-11, 1915.

Maximum stage known, approximately 63.5 ft., about 1815, estimated from height of flood plain, from stage and discharge at The Dalles and by comparison with 1856 and 1909 flood stages (discharge, about 400,000 cfs).

Remarks.—Flow in Beatty's slough which diverts from 1.5% of total flow at low stages to 8% at high stages, is included in this record. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903								15,700	26,000	25,100	10,500	5,570	.....
1909	5,320	18,700	8,370	10,000	7,690	6,860	8,360	14,600	25,100	17,900	9,410	7,300	11,900
1910	7,010	33,200	23,600	11,800	9,220	19,400	22,800	35,100	24,900	19,900	10,700	6,500	18,700
1911	23,900	29,500	17,600	11,600	5,470	8,480	11,400	21,700	35,500	23,400	11,400	10,800	17,600
1912	4,930	17,500	11,500	12,800	15,300	5,990	8,870	25,200	33,200	19,300	11,600	6,460	14,400
1913	5,930	15,100	11,600	9,200	11,000	8,720	14,300	25,700	42,900	30,100	15,200	13,100	16,900
1914	14,000	10,700	3,870	22,000	8,470	15,000	19,800	26,100	23,700	19,500	10,300	9,360	16,200
1915	9,020	19,600	7,930	7,120	6,060	8,580	19,700	13,700	11,700	10,400	9,220	4,500	10,700
1916	10,000	12,100	14,300	5,460	16,400	19,100	16,900	24,000	39,400	33,300	17,600	8,620	18,100
1917	5,920	11,400	7,290	7,650	9,320	6,280	11,000	26,100	40,100	37,000	16,500	10,000	15,800
1918	8,140	11,100	36,500	32,800	14,760	11,500	16,500	23,200	36,900	22,100	12,800	8,260	19,600
1919	14,460	12,600	21,400	15,300	10,000	9,710	18,100	28,900	30,000	27,660	13,800	8,220*	17,500*
1920	5,990	19,100	16,900	18,000*	14,100*	9,400*	7,200*	16,300*	25,100*	25,500*	11,900*	17,300*	15,600*
1921	23,100*	11,900*	11,700*	13,100*	18,100	13,000	12,000	27,700	45,800	25,400	14,700	13,200	19,100*
1922	15,700	19,500	34,500	6,950	5,410	5,540	9,330	24,200	41,700	18,500	11,300	10,700	17,000
1923	10,400	7,090	15,000	20,600	6,700	7,710	13,900	25,500	31,200	23,900	10,600	7,440	15,300
1924	6,370	6,900	13,700	11,000*	34,600*	10,500*	9,540*	32,600*	21,500*	14,700*	9,370*	8,330*	14,900*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908								11,500	14,800	11,200	6,520	3,540	.....
1909	3,540	4,630	6,150	5,350	5,350	5,350	6,800	7,350	13,100	12,400	6,520	5,160	3,540
1910	5,160	6,360	9,570	6,200	5,970	11,500	11,900	20,200	16,600	14,000	5,970	4,890	4,890
1911	10,300	11,500	11,000	6,080	4,300	4,300	3,240	16,100	22,300	16,500	8,570	5,820	4,300
1912	3,230	3,040	7,370	5,180	8,120	4,870	7,300	9,630	21,200	12,300	6,800	4,120	3,040
1913	3,750	4,650	8,370	5,320	4,900	6,240	5,950	10,600	23,400	15,600	10,300	7,560	3,750
1914	6,000	7,500	5,770	6,000	6,380	9,590	9,590	15,100	15,500	11,500	8,710	6,150	5,770
1915	6,320	10,600	5,290	5,080	5,290	5,290	3,060	9,990	8,830	7,510	7,790	2,830	2,830
1916	2,830	6,100	7,300	3,270	4,740	8,260	12,900	16,000	21,000	22,400	10,300	6,100	2,830
1917	4,500	6,630	5,330	5,690	5,690	5,330	6,630	12,600	26,100	19,700	12,000	7,830	4,500
1918	5,690	6,250	8,320	12,700	7,500	5,900	10,900	13,000	17,700	15,000	9,210	6,110	5,690
1919	5,900	7,500	8,900	7,050	7,540	7,540	11,500	16,100	22,000	17,500	9,340	6,160	5,900
1920	5,290	5,940	5,000*										
1921					7,780	9,620	8,270	9,620	27,600	18,200	9,060	5,390	.....
1922	7,540	9,620	9,420	5,200	4,680	4,680	5,570	11,800	27,600	12,200	8,800	8,500	4,680
1923	4,850	5,570		7,400		5,980	13,000	13,800	19,200	13,000	8,500	5,020	.....
1924	4,200	3,610	7,400										.....

* Estimated.

SKAGIT RIVER BASIN

Skagit River near Sedro Woolley, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minim- um day	Mean	Per square mille	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1856.....	300,000	About 1856								
1897.....	185,000	Nov. 16, 1896								
1898.....	190,000	Nov. 19, 1897								
1907.....	180,000	Nov. 16, 1906								
1908.....	48,200†	June 11, 1908								
1909.....	97,000	Nov. 18, 1908	3,540	11,900	3.87	53.33	3,020,000	14,500	65.56	10,500,000
1910.....	220,000	Nov. 30, 1909	4,590	18,700	6.23	84.71	13,600,000	19,300	87.28	14,000,000
1911.....	114,000	Nov. 21, 1910	4,300	17,600	5.87	79.66	12,700,000	14,500	65.50	10,500,000
1912.....	66,600	Nov. 19, 1911	3,040	14,400	4.80	65.19	10,400,000	14,200	84.38	10,300,000
1913.....	70,800	June 3, 1913	3,780	16,900	5.63	76.45	12,200,000	17,500	79.14	12,700,000
1914.....	104,000	Jan. 7, 1914	5,770	16,200	5.40	73.30	11,700,000	16,000	72.35	11,600,000
1915.....	67,300	April 3, 1915	2,830	10,700	3.57	48.46	7,750,000	10,600	47.92	7,700,000
1916.....	75,800	June 18, 1916	2,830	18,100	6.03	82.11	13,100,000	17,100	77.59	12,400,000
1917.....	60,400	Nov. 19, 1917	4,500	15,800	5.27	71.48	11,400,000	18,400	83.21	13,300,000
1918.....	195,000	Dec. 30, 1917	5,090	19,600	6.53	88.50	14,200,000	19,000	85.83	13,700,000
1919.....	80,200	Dec. 4, 1918	5,000	17,500	5.83	79.32	12,700,000	17,000	76.07	12,300,000
1920.....				15,600	5.20	70.78	11,300,000	16,000	72.55	11,600,000
1921.....				19,100	6.37	86.47	13,900,000	21,100	85.43	15,300,000
1922.....	210,000	Dec. 13, 1921	4,680	17,000	5.67	77.06	12,300,000	13,900	62.85	10,100,000
1923.....	71,000	Dec. 24 or 25, 1922		15,300	5.10	69.32	11,100,000	14,900	67.46	10,800,000
1924.....				14,900	4.97	67.65	10,800,000			

† Maximum during period May to September.

Nookachamps Creek near Mount Vernon, Wash.

Location.—Lat. 48°24'05", long. 122°14'10", in SW¼ sec. 25, T. 34 N., R. 4 E., on right bank, a quarter of a mile downstream from outlet of Big Lake, and 4½ miles east of Mount Vernon.

Drainage area.—22.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 75 ft. (from topographic map).

Extremes.—1943-44: Maximum discharge recorded, 9.2 cfs Oct. 31, 1943 (gage height, 1.43 ft.); minimum, 0.02 cfs Oct. 5-6, 1943.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943.....										1.00	.357	1.63	
1944.....									2.79	.35*	1.32		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1943.....										0.4	0.07	0.03	
1944.....									0.7*	.2	.2		

* Estimated.

SKAGIT RIVER BASIN

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East Fork Nookachamps Creek near Clear Lake, Wash.

Location.—Lat. 48°25'30", long. 122°12'30", in NE¼ sec. 19, T. 34 N., R. 5-E., on right bank, at county road bridge, 3 miles southeast of Clear Lake, and 3½ miles upstream from mouth.

Drainage area.—20.5 sq. mi.

Gage.—Staff gage. Altitude of gage is 70 ft. (from topographic map).

Average discharge.—7 years (1943-50), 90.5 cfs.

Extremes.—1943-50: Maximum discharge observed, 2,710 cfs Oct. 25, 1945 (gage height, 10.3 ft., from high-water mark), from rating curve extended above 500 cfs; minimum observed, 0.1 cfs July 8, 9, 1944.

Remarks.—Several small diversions for irrigation and municipal use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943												4.92	
1944	50.8	18.4	76.1	105	67.5	68.5	82.0	77.4	81.1	2.31	3.97	42.1	52.1
1945	27.7	179	55.4	178	84.2	81.8	111	88.0	16.1	3.91	4.49	48.7	72.5
1946	160	264	125	147	141	130	104	71.8	84.1	25.8	4.53	4.89	105
1947	84.0	115	171	157	91.1	51.4	150	43.6	68.9	15.8*	6.60*	45.3	83.2*
1948	136	216	168	131	128	88.3	87.3	178	130	12.0	47.3	55.6	115
1949	102	145	138	39.4*	217*	128*	96.9	86.2	41.0	40.2	23.0	21.4	88.8*
1950	88.9	128	285	132	210	197	153	106	73.0	20.0	9.36	13.9	117

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943												1.8	
1944	1.8	3.0	9.0	29	25	9.6	34	39	4.6	6.1	0.7	1.0	0.1
1945	7.3	25	13	29	22	26	54	38	6.4	2.2	1.7	2.2	1.7
1946	6.1	16	49	57	61	74	67	49	33	6.5	3.1	1.0	1.0
1947	3.7	19	32	21	14.5	10	43	10*	10*	7*	3.5*	2.5	2.5
1948	3.5	60	40	34	32	38	58	71	25*	5.0	3.9	6.3	3.5
1949	14	30	14.5	13*	13*	58	60	23	14	3.4	3.8*	2.5	2.5
1950	4.0	11	72	49	76	76	67	74	45	7.5	3.1	1.4	1.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1943										
1944			0.1	52.1	2.54	34.57	37,810	61.5	40.83	44,650
1945	2,000	Jan. 7, 1945	1.7	72.5	3.54	47.99	52,460	96.7	64.02	70,000
1946	2,710	Oct. 25, 1945	1.0	105	5.12	69.40	75,870	90.0	59.60	65,140
1947			2.5	83.2	4.06	55.09	60,230	95.5	63.22	69,130
1948	2,220	Oct. 19, 1947	3.5	115	5.61	76.05	83,140	103	68.63	75,020
1949	2,130	Feb. 17, 1949	2.5	88.8	4.33	58.31	64,290	98.8	65.39	71,490
1950	2,010†	Dec 28, 1949	1.4	117	5.71	77.74	84,990			

† Maximum observed.

* Estimated.

SKAGIT RIVER BASIN

Skagit River near Mount Vernon, Wash.

Location.—Lat. 48°26'40", long. 122°20'00", in SE¼ sec. 7, T. 34 N., R. 4 E., on draw-rest of, and 150 ft. downstream from bridge on U. S. Highway 99, and 1 mile north of Mount Vernon.

Drainage area.—3,060 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Average discharge.—13 years (1940-53), 15,420 cfs.

Extremes.—1940-53: Maximum discharge, 144,000 cfs Feb. 11, 1949 (elevation, 36.85 ft.); minimum, 2,740 cfs Oct. 26, 1942 (elevation, 7.37 ft.).

Maximum stage known, 37 ft. in 1906 from Great Northern Railway high-water profile.

Remarks.—Flow partly regulated by powerplants on Baker and upper Skagit Rivers, and by Ross, Diablo and Lake Shannon Reservoirs (see elsewhere in this report). Small diversions for domestic and municipal use above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	14,800*	9,880*	14,290	10,810	8,654	8,487	11,080	15,880	14,970	9,820	6,441	11,450	11,360*
1942...	17,330	13,860	20,490	7,636	7,826	9,556	11,510	10,870	25,400	17,230	8,373	5,023	13,220
1943...	4,823	13,380	15,710	11,730	11,970	11,600	23,360	21,660	31,420	29,840	11,430	7,183	18,140
1944...	8,100	6,592	10,670	9,965	8,944	7,878	10,610	17,400	19,620	10,430	6,835	9,945	10,510
1945...	8,735	10,810	10,930	15,950	14,860	9,714	10,130*	25,960	25,370	10,170	8,083	8,469	13,760
1946...	14,340	17,990	12,540	13,670	10,680	12,820	16,560	38,530	32,810	23,750	10,590	6,745	17,460
1947...	5,957	9,351	18,200	12,800	16,430	14,460	17,720	24,720	25,740	15,760	8,310	7,390	14,980
1948...	19,110	15,670	19,050	15,130	10,380	8,448	11,800	24,680	39,280	20,380	13,760	11,590	17,460
1949...	12,820	13,290	12,840	9,015	12,020	15,200	17,900	35,920	24,470	20,010	13,320	10,910	10,340
1950...	12,970	23,740	21,830	15,560*	19,740	22,810	17,720	22,020	37,920	35,710	17,060	10,200	21,440*
1951...	17,120	21,000	30,560	19,650	31,140	11,760	19,580	26,400	21,700	17,460	9,269	8,329	19,420
1952...	16,890	14,480	12,790	9,541	14,910	9,501	13,690	20,280	18,810	16,260	9,607	6,642	13,600
1953...	6,898	7,252	8,417	26,740	20,170	10,930	13,180	19,180	20,030	23,920	12,430	8,995	14,880

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	.....	6,540	9,960	6,980	5,660	6,760	8,810	9,960	10,600	6,540	5,220	6,760	.....
1942...	7,580	7,200	9,220	6,630	5,160	4,980	7,920	10,100	18,600	11,000	5,340	3,860	3,860
1943...	3,050	4,980	9,650	7,780	7,780	7,580	15,400	14,100	21,600	18,300	7,950	6,230	3,050
1944...	5,740	4,970	5,470	6,340	5,880	4,970	8,090	12,300	14,600	8,260	4,900	5,630	4,900
1945...	5,740	5,620	5,740	5,500	8,200	7,520	8,020	15,400	17,200	9,570	6,640	6,120	5,500
1946...	5,260	12,000	7,360	9,570	7,210	8,760	9,570	19,300	23,300	14,600	8,730	4,360	4,360
1947...	3,980	6,550	9,400	7,820	9,760	8,800	13,500	13,700	16,600	9,690	5,840	5,000	3,980
1948...	6,560	11,100	11,100	10,700	7,000*	6,740	7,280	10,900	27,100	14,200	10,000	8,760	6,560
1949...	8,360	8,250	7,820	7,280	7,280	12,300	10,700	17,600	17,600	15,500	7,280	6,740	6,740
1950...	8,560	5,360	11,100	10,200*	12,100	16,000	12,500	11,800	21,800	18,500	11,400	6,920*	6,920*
1951...	8,360	10,800	15,800	13,700	11,890	9,600*	12,500	17,100	16,300	11,400	6,380	5,660	5,660
1952...	11,500	11,600	9,060	7,730	9,490	7,420	9,840	11,100	13,000	11,500	5,350	4,970	4,970
1953...	5,460	5,240	4,920	7,100	9,840	8,860	8,380	14,300	15,800	14,900	7,690	6,130	4,920

* Estimated.

Skagit River near Mount Vernon, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1941.....				11,860	8,221,000	12,420	8,995,000
1942.....	65,300	Dec. 3, 1941	3,860	13,220	9,572,000	11,670	8,449,000
1943.....	47,000	June 15, 1943	3,050	16,140	11,680,000	15,470	11,300,000
1944.....	55,700	Dec. 3, 1943	4,900	10,510	7,623,000	10,930	7,993,000
1945.....	59,600	Feb. 8, 1945	5,500	13,760	9,959,000	14,960	10,830,000
1946.....	94,300	Oct. 26, 1945	4,300	17,460	12,640,000	16,780	12,140,000
1947.....	64,900	Oct. 25, 1946	3,950	14,080	10,640,000	16,430	11,890,000
1948.....	69,400	Oct. 19, 1947	6,560	17,460	12,670,000	16,200	11,760,000
1949.....	56,200	May 13, 1949	6,740	16,340	11,830,000	17,090	13,010,000
1950.....	114,000	Nov. 28, 1949	6,920	21,440	15,520,000	22,310	16,150,000
1951.....	144,000	Feb. 11, 1951	5,660	19,420	14,060,000	17,350	12,560,000
1952.....	41,400	June 5, 1952	4,070	13,600	9,876,000	11,300	8,568,000
1953.....	65,700	Feb. 1, 1953	4,920	14,830	10,730,000		

SAMISH RIVER BASIN

Friday Creek near Burlington, Wash.

Location.—Lat. 48°34'20", long. 122°20'15", in NE¼NE¼ sec. 31, T. 36' N., R. 4 E., on left bank, 1¾ miles upstream from mouth, and 6 miles north of Burlington.

Drainage area.—37.1 sq. mi. At site 1943-45, 38.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 130 ft. (from topographic map). Apr. 11, 1943, to Oct. 23, 1945, staff gage three-quarters of a mile downstream at different datum.

Average discharge.—5 years (1943-48), 74.9 cfs.

Extremes.—1943-48: Maximum discharge observed, 1,090 cfs Oct. 25, 1945 (discharge measurement); minimum observed, 1.3 cfs Sept. 9, 1944.

Remarks.—Some regulation and possibly some diversion at low flow, purpose unknown.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943.....												3.61	
1944.....	9.60	13.0	71.1	87.6	107	75.1	48.6	32.7	23.5	4.73	2.60	5.92	40.0
1945.....	8.47	120	94.1	267	113	105	76.2	45.9	9.39	2.53	2.11	4.21	70.5
1946.....	123	211*	124	203	195	193	136	35.2	37.1	19.7	3.41	2.77	106*
1947.....	13.4	45.3	170	227	143	94.4	101	32.3	8.55	4.45	6.16	7.23	70.8
1948.....	37.3	184	173	192	167	112	64.9	78.3	52.1	11.8	5.91	16.8	87.2
1949.....	23.3												

* Estimated.

SAMISH RIVER BASIN

Friday Creek near Burlington, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943													2.1
1944	2.3	9.3	31	57	70	50	33	10	10	2.0	1.7	1.3	1.3
1945	2.0	30*	40	81	76	72	49	23	3.9	2.0	1.5	1.7	1.6
1946	2.0	103	62	129	118	104	77	9.4	13	4.0	2.5	2.3	2.3
1947	2.5	22	54	58	83	57	59	6.0	4.0	2.0	2.4	2.3	2.3
1948	7.1	79	94	87	63	57	40	35	31	5.5	4.0	8.9	4.0
1949	7												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1943										
1944	195†	Dec. 3, 1943	1.3	40.0	1.05	14.31	29,020	50.6	18.12	36,750
1945	960	Jan. 7, 8, 1945	1.5	70.5	1.88	25.18	51,050	90.3	32.48	65,350
1946	1,090†	Oct. 25, 1945	2.3	106	2.66	33.82	77,020	87.4	31.95	63,240
1947	826	Dec. 11, 1946	2.3	70.3	1.91	23.61	51,250	80.3	29.40	58,140
1948	537	Jan. 4, 1948	4.0	67.2	2.35	31.99	63,290			
1949										

* Estimated.

† Maximum observed.

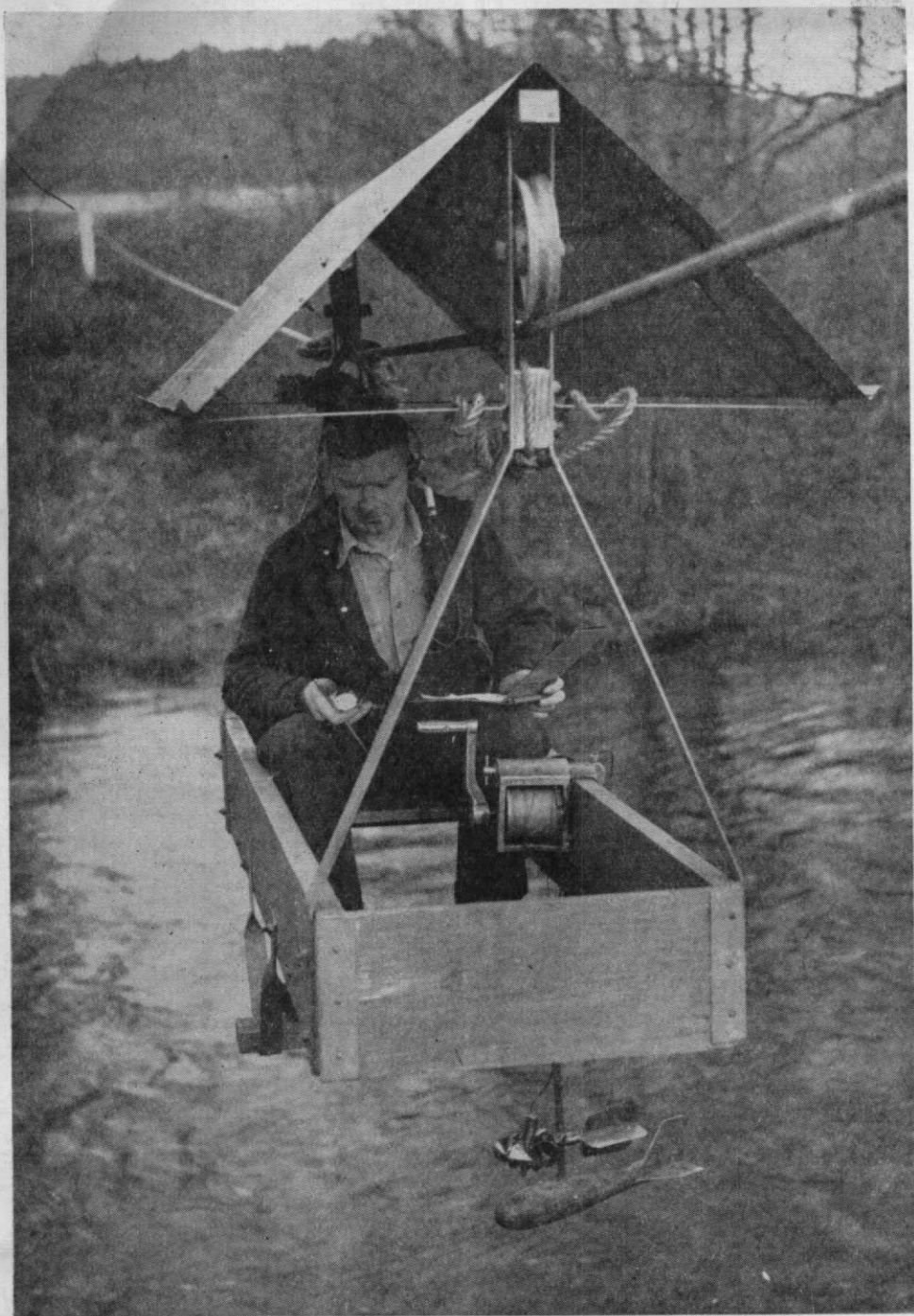


Figure 14. Discharge measurement from sitdown cable car using hand-operated reel and current meter suspended over lead weight, Samish River near Burlington.

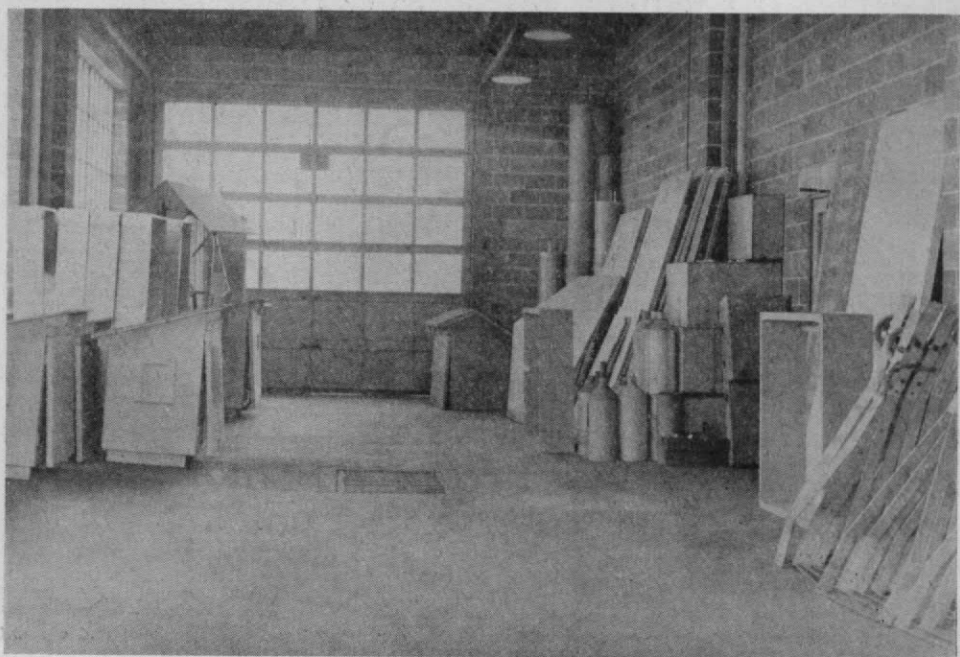
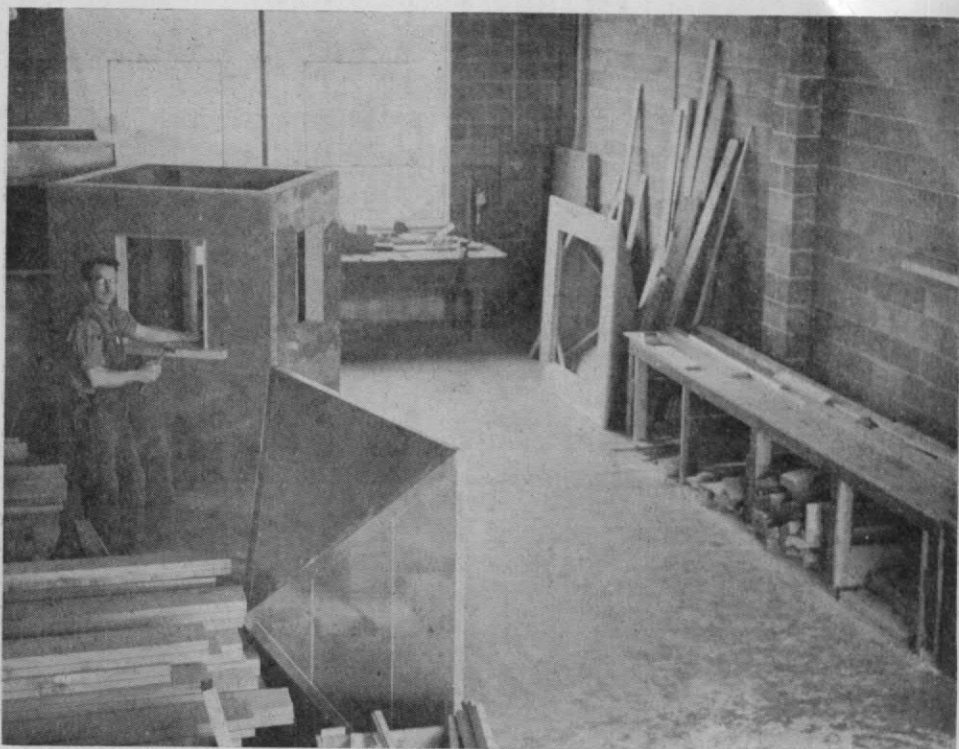


Figure 15. Prefabrication of demountable gage shelter (top), stock of gaging station equipment (bottom), at warehouse in Tacoma.

Samish River near Burlington, Wash.

Location.—Lat. 48°32'45", long. 122°20'15", in SE¼ sec. 6, T. 35 N., R. 4 E., on left bank, 500 ft. downstream from bridge on U. S. Highway 99, half a mile downstream from Friday Creek, and 5 miles north of Burlington.

Drainage area.—87.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 45 ft. (from topographic map). Prior to Dec. 1, 1948, water-stage recorder 500 ft. upstream at different datum.

Average discharge.—10 years (1943-53), 236 cfs.

Extremes.—1943-53: Maximum discharge, 5,830 cfs Dec. 28, 1949 (gage height, 11.89 ft.); minimum recorded, 11 cfs July 10, 1951 (gage height, 2.01 ft.).

Remarks.—State fish hatchery on Friday Creek diverts about 4 cfs which is returned above station. There is evidence of slight regulation and there may be some pumping for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...											35.0	30.5	.....
1944...	55.2	64.2	221	232	254	203	151	125	86.9	27.4	25.1*	44.1	123*
1945...	50.0	298	231	738	386	319	258	174	49.9	27.7	25.2	38.7	215
1946...	444	649	370	552	556	547	401	183*	136	71.9	30.9	29.4	329*
1947...	84.4	181	490	530*	360	280	293	113	70.0	41.4	31.0	41.2	209
1948...	194	391	446	476	405	317	244	260	150	65.4	69.2	80.2	259
1949...	146	420	582	203	656	439	213	184	66.2	50.2	39.0	64.9	252
1950...	113	264	798	555*	688	698	469	202	103	46.4	38.0	33.6	332*
1951...	149	340	589	618	793	390	179	135	54.2	26.8	21.1	21.0	274
1952...	97.6	194	313	301	376	297	236	169	78.3	42.0	27.4	25.1	179
1953...	25.5	30.4	89.2	578	546	299	292	165	122	51.4	29.0	27.7	186

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...											27	25	.....
1944...	26	48	84	148	159	124	111	63	42	20*	20*	19	19
1945...	33	96	101	186	212	210	183	86	33	25	22	23	22
1946...	30	282	218	361	386	326	292	96*	76*	37	26	26	26
1947...	29	92	202	188	198	184	166	55	41	29	25	26	25
1948...	31	222	232	218	172	176	180	168	98	44	37	46	31
1949...	56	142	248	112	103	258	177	82	40	37	29	25	25
1950...	32	76	150	330*	340*	381	224	144	69	34	27	26	26
1951...	31	108	315	285	258	185	114	81	32	23	19	17.5	17.5
1952...	29	60	156	167	170	157	175	108	56	30	23	22	22
1953...	21	26	26	89	217	212	194	110	90	31	25	21	21

* Estimated.

SAMISH RIVER BASIN

Samish River near Burlington, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acro-feet		Inches	Acro-feet
1943.....										
1944.....	998	Dec. 3, 1943	19	123	1.40	19.11	89,490	143	22.15	103,700
1945.....	2,820	Jan. 7, 1945	22	215	2.45	33.30	156,000	290	44.75	209,600
1946.....	4,310	Oct. 25, 1945	26	329	3.75	50.00	238,300	270	41.82	165,800
1947.....	2,750	Dec. 11, 1946	25	206	2.33	32.32	151,300	232	35.84	167,800
1948.....	1,210	Oct. 19, 1947	31	259	2.95	40.08	187,700	268	41.60	194,800
1949.....	4,900	Feb. 17, 1949	25	252	2.87	38.99	182,600	255	39.42	184,600
1950.....	5,830	Dec. 25, 1949	26	332	3.78	51.37	240,000	324	49.99	234,400
1951.....	4,030	Feb. 10, 1951	17.5	274	3.12	42.34	193,200	234	36.18	169,400
1952.....	1,210	Jan. 31, 1952	22	179	2.04	27.79	130,100	141	21.83	102,100
1953.....	2,150	Jan. 31, 1953	21	186	2.12	28.71	134,500			

WHATCOM CREEK BASIN

Austin Creek near Bellingham, Wash.

Location.—Lat. 48°42'45", long. 122°19'50", in SW¼NW¼ sec. 8, T. 37 N., R. 4 E., on left bank at county road crossing, three-quarters of a mile upstream from mouth, and 5 miles southeast of Bellingham.

Drainage area.—7.80 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 330 ft. (from topographic map).

Extremes.—July to September 1948: Maximum discharge, 13 cfs Sept. 23 (gage height, 1.35 ft.); minimum, 0.8 cfs Aug. 12, 13, 17, 18 (gage height, 0.78 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										2.15	3.45	4.89	.....

* Estimated.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										1.3	0.8	2.2	.....

Whatcom Creek near Bellingham, Wash.

Location.—Lat. 48°45'10", long. 122°25'40", in NW¼SE¼ sec. 28, T. 38 N., R. 3 E., on left bank in Whatcom Falls Park, three-quarters of a mile downstream from Lake Whatcom, and 2 miles east of Bellingham.

Drainage area.—55.4 sq. mi.

Supplemental records available.—October 1912 to September 1914, gage heights and discharge measurements only.

Gage.—Water-stage recorder. Datum of gage is 200.00 ft. above mean sea level (levels by city of Bellingham). Nov. 1, 1910, to Sept. 30, 1914, staff gage half a mile upstream at datum 108.53 ft. higher.

Average discharge.—8 years (1911-12, 1939-46), 70.8 cfs.

Extremes.—1910-12, 1939-46: Maximum discharge observed, 739 cfs Nov. 20, 21, 1911 (gage height, 5.50 ft., site and datum then in use); minimum, 0.1 cfs Aug. 1, 2, Sept. 25-29, 1946.

Remarks.—Flow regulated by Lake Whatcom (usable capacity, 28,800 acre-ft.). City of Bellingham diverts about 30 cfs from lake for municipal use. Records do not include about 1.5 cfs diverted around station by fish hatchery.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...		342	406	397	202	160	60.7	24.4	18.6	19.6	24.3	25.1	.....
1912...	19.0	310	341	249	278	121	70.0	37.5	59.4	28.5	25.9	40.6	135
1939...											4.70	20.1*	.....
1940...	41.9	22.4	228	281	148	214	23.9	25.9	1.59	3.92	14.8	4.32	84.5
1941...	2.30	5.90	.83	143	61.9	2.10	12.6	1.85	2.27	2.00	1.59	8.25	19.8
1942...	14.6	59.2	320	51.4	.58	39.6	12.7	18.9	55.6	6.64	.88	4.81	49.3
1943...	7.98	10.6	101	242	291	17.5	115	20.8	22.0	7.59	4.34	2.23	68.7
1944...	1.87	1.92	2.37	87.5	118	44.6	10.3	4.29	4.28	1.44	1.03	1.11	22.9
1945...	2.11	3.18	81.9	374	166	164	48.3	7.28	19.9	2.54	2.72	1.43	72.6
1946...	25.2	319	165	306	245	151	165	1.51	1.29	.57	.30	.53	114

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...		100	280	280	181	132	19	2	8	14	13	11	2
1912...	11	13	280	182	222	76	66	61	41	12	9	28	9
1939...											.9	1.0	.....
1940...	.9	1.4	2.6	1.7	1.4	2.6	1.9	1.7	1.2	1.3	1.3	1.1	.9
1941...	1.6	.7	.7	.4	2.1	1.8	1.8	1.2	1.4	1.2	1.1	.8	.4
1942...	.5	.8	184	.6	.5	.6	11	2.4	.6	.4	.6	.6	.4
1943...	.4	.3	13	61	77	11	5.7	5.7	13	.8	1.7	1.6	.3
1944...	1.6	1.9	1.9	2.9	46	48	3.8	4.0	.6	.4	.4	1.0	.4
1945...	.4	.7	1.0	26	4.4	6.3	8.3	5.8	1.2	1.9	1.3	.8	.4
1946...	.8	170	.9	126	202	1.9	1.9	1.3	.2	.2	.2	.2	.2

* Estimated.

WHATCOM CREEK BASIN

Whatcom Creek near Bellingham, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1911.....						133	96,400
1912.....	739†	Nov. 20, 21, 1911	9	135	98,200		
1939.....							
1940.....	412	Mar. 16, 1940	.9	54.5	61,350	60.6	43,970
1941.....	473	Jun. 23, 1941	.4	19.8	14,330	52.3	37,880
1942.....	538	Dec. 6, 1941	.4	49.3	35,680	26.1	18,920
1943.....	473	April 9, 1943	.3	68.7	49,740	59.1	42,790
1944.....	154	Jan. 25, 1944	.4	22.9	16,940	29.8	21,620
1945.....	590	Jan. 10, 1945	.4	72.6	52,540	108	77,560
1946.....	505	Mar. 30, 1946	.2	114	82,530		

† Maximum observed.

Whatcom Creek below hatchery, near Bellingham, Wash.

Location.—Lat. 48°45'10", long. 122°25'40", in NW¼SE¼ sec. 28, T. 38 N., R. 3 E., on right bank in Whatcom Falls Park, seven-eighths of a mile downstream from Lake Whatcom, and 2 miles east of Bellingham.

Drainage area.—55.5 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 252.55 ft. above mean sea level (city of Bellingham benchmark).

Average discharge.—8 years (1945-53), 88.0 cfs.

Extremes.—1945-53: Maximum discharge, 1,350 cfs probably Dec. 29, 1949 (gage height, 6.0 ft., from recorded range in stage); minimum, 0.7 cfs Nov. 24, 1952 (gage height, 1.37 ft.).

Remarks.—Flow completely regulated by Lake Whatcom (usable capacity, about 28,800 acre-ft. under normal operating conditions). City of Bellingham diverts about 30 cfs from this lake for municipal use. Records include return flow from fish hatchery which diverts water 1,000 ft. upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	38.2	342	176	317	254	158	199	6.30	5.67	5.05	5.13	5.57	125
1947...	3.65	50.2	258	211	219	121	52.3	21.2	0.80	7.34	7.08	5.43	79.7
1948...	67.8	140	170	214	164	175	37.6	10.2	18.4	7.30	7.05	5.45	84.8
1949...	6.28	208	344	35.6*	326	250	6.23	18.2	6.48	6.59	7.29	5.67	100*
1950...	5.69	50.5	469	333	338	437	191	11.3	4.92	4.19	6.21	5.07	154
1951...	5.03	8.62	265	357	337	104	7.38	7.57	6.08	5.61	5.02	3.82	95.8
1952...	5.06	5.45	7.34	7.09	115	89.7	70.9	36.5	9.93	9.26	8.53	6.71	30.6
1953...	5.71	4.47	2.33	5.88	180	112	58.2	13.1	11.4	12.0	10.0	6.70	34.1

* Estimated.

WHATCOM CREEK BASIN

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Whatcom Creek below hatchery, near Bellingham, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...	4.8	195	5.2	174	208	5.8	7.5	5.2	4.8	3.5	4.5	3.9	3.5
1947...	2.8	4.8	35	6.2	50	6.5	6.2	5.8	5.8	7.0	5.2	4.8	2.8
1948...	5.5	108	105	6.4	6.0	5.0	5.0	5.3	6.0	6.8	5.3	5.9	5.3
1949...	5.3	7.8	7.8	4.1	4.5*	7*	5.6	3.8	5.3	6.4	5.3	5.3	3.8
1950...	5.3	5.0	5.2	6.5*	8*	311	6.9	6.6	7.1	2.6	5.8	4.3	2.6
1951...	3.8	6.2	115	116	4.6	6.0	6.4	6.0	4.6	5.0	4.0	3.3	3.3
1952...	4.4	5.0	6.0	6.4	7.2	10	16	9.1	9.1	8.7	6.4	5.7	4.4
1953...	5.0	1.1	1.2	2.8	10.5	13.5	12	12	10.5	11	9.1	4.2	1.1

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1946.....	544	Mar. 31, 1946	3.5	125	90,360	105	75,930
1947.....	638	Jan. 27, 28, 1947	2.8	79.7	57,700	85.1	61,610
1948.....	505	Jan. 5, 1948	5.3	84.8	61,520	99.8	72,470
1949.....	602	Feb. 19, 1949	3.8	100	72,640	98.0	70,830
1950.....	1,350	Dec. 29, 1949	2.6	154	111,600	134	96,690
1951.....	1,100	Feb. 11, 1951	3.3	95.8	69,360	73.4	53,120
1952.....	361	Mar. 18, 1952	4.4	30.6	22,170	30.1	21,840
1953.....	685	Feb. 4, 1953	1.1	24.1	24,650		

SQUALICUM CREEK BASIN

Squalicum Creek at Bellingham, Wash.

Location.—Lat. 48°46'50", long. 122°26'25", in NW¼SW¼ sec. 16, T. 38 N., R. 3 E., on right bank at Bellingham city limits, 50 ft. downstream from railroad bridge, and 3½ miles upstream from mouth.

Drainage area.—12.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map).

Extremes.—July to December 1948: Maximum discharge, 269 cfs Dec. 1 (gage height, 4.21 ft.), from rating curve extended above 77 cfs by logarithmic plotting; minimum, 0.2 cfs July 25, 26, Aug. 1-5, 10, 11; minimum gage height, 1.33 ft. July 25, 26, Aug. 1, 2.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1948.....							0.56	0.46	0.55	4.32	32.9	43.8	.....

* Estimated.

SQUALICUM CREEK BASIN

Squalicum Creek at Bellingham, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1948...	9.3	0.2	0.4	0.8	3.4	15*	.....

NOOKSACK RIVER BASIN

Nooksack River at Excelsior, Wash.

Location.—Lat. 48°54'20", long. 121°49'10", in sec. 31, T. 40 N., R. 8 E., on highway bridge near right bank, 600 ft. downstream from Nooksack Falls powerplant, half a mile downstream from Wells Creek, and 6 miles east of Glacier.

Drainage area.—95.7 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,320 ft. (from river-profile map).

Extremes.—1920-21: Maximum discharge observed, 4,650 cfs Oct. 4, 1920 (gage height, 5.4 ft.); minimum observed, 186 cfs Feb. 5-9, 1921.

Remarks.—Entire flow above Nooksack Falls, half a mile upstream, is diverted at low flow through powerplant and returned to stream 600 ft. above gage. Small diurnal fluctuation by powerplant above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	885
1921...	1,180	512	374	339	537	326	345	1,010	1,990	1,290	928	698	796

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	426
1921...	426	230	206	206	186	206	206	314	1,170	1,090	590	276	186

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1920.....
1921.....	4,650†	Oct. 4, 1920	186	796	8.32	112.09	576,000

* Estimated.

† Maximum observed.

Nooksack River above Cascade Creek, near Glacier, Wash.

Location.—Lat. 48°54'20", long. 121°50'30", in NW¼ sec. 1, T. 39 N., R. 7 E., on left bank, a quarter of a mile upstream from Cascade Creek, half a mile downstream from Dead Horse Creek, 4½ miles east of Glacier, and 6 miles upstream from Glacier Creek.

Drainage area.—105 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,245 ft. (from river-profile map).

Average discharge.—16 years (1937-53), 729 cfs.

Extremes.—1937-53: Maximum discharge, 10,300 cfs Nov. 26, 1949 (gage height, 10.50 ft.), from rating curve extended above 2,700 cfs on basis of contracted-opening determination at gage height 8.13 ft.; minimum, 73 cfs Feb. 16, 1949.

Remarks.—No diversion above station. Some diurnal fluctuation at low flow caused by powerplant at Excelsior.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935...	746	885	684	432	184	309	611	1,096	1,506	1,158	639	604	732
1936...	481	402	767	645	206	335	749	1,419	1,402	1,435	775	430	759
1940...	613	687	1,354	605	463	569	597	1,280	1,018	725	537	426	739
1941...	1,011	405*	685*	428	415	352	544	951	893	788	473	625	627*
1942...	995	903	820	257	249	215	462	843	1,228	1,067	908	442	677
1943...	296	539	598	487	351	306	864	850	1,425	1,550	970	431	699
1944...	434	355	478	397	226	261	372	863	1,176	785	527	602	540
1945...	495	601	453	550	513	266	322	1,187	1,294	1,130	599	494	604
1946...	855	736	491	419	353*	328	552	1,546	1,606	1,478	519	478	808*
1947...	501	366	560	368	731	502	705	1,386	1,332	1,023	552	476	704
1948...	1,039	601	613	333	245	191	312	1,329	2,459	1,185	936	793	842
1949...	622	460	257	178	208	425	720	1,579	1,461	1,137	755	643	707
1950...	501	1,070	694	472*	608	490	474	949	2,190	1,955	1,261	945	952*
1951...	1,219	1,023	1,186	471	792	313	637	1,081	1,275	1,091	581	466	845
1952...	658	397	348	179*	369	221	659	1,340	1,322	1,231	732	418	656*
1953...	275	216	273	827	535	309	490	1,103	1,252	1,517	960	716	707

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935...	216	430	352	232	130*	232	224	544	918	759	516	338	130*
1936...	194	242	307	283	165	149	510	787	908	1,070	537	235	149
1940...	150*	342	482	316	298	329	395	731	719	536	410	268	150*
1941...	168	260*	366	250	260*	168	365	436	678	515	304	316	168
1942...	353	322	280*	200*	187	187	296	376	840	660	461	338	187
1943...	172	237	306	272	258	171	514	475	850	1,040	470	352	171
1944...	301	263	230	220	154	141	234	445	912	530	418	397	141
1945...	278	347	194	185	217	151	108	682	790	607	425	285	151
1946...	174	445	250*	289	210*	248	259	634	1,010	1,010	585	348	174
1947...	248	248	244	204	285	274	387	820	978	618	378	318	204
1948...	430	347	282	252	191	159	179	255	1,480	880	682	486	159
1949...	339	321	164	125	110	325	316	629	796	829	490	325	110
1950...	293	354	293	270*	315	313	324	424	1,320	1,180	960	705	270*
1951...	665	533	543	327	354	249	388	452	792	792	386	283	249
1952...	400	255	180*	130*	228	180	275	579	831	853	404	316	130*
1953...	193	150*	150*	237	226	201	220	680	1,010	1,000	685	351	150*

* Estimated.

NOOKSACK RIVER BASIN

Nooksack River above Cascade Creek, near Glacier, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1938	9,670	Oct. 28, 1937	130	732	6.97	94.53	530,200	677	87.41	490,300
1939	5,100	May 28, 1939	149	759	7.23	98.14	549,400	843	109.06	610,500
1940	4,950	Dec. 10, 1939	150	739	7.04	95.82	586,500	693	89.80	503,100
1941	6,300	Oct. 19, 1940	168	627	5.97	81.01	453,700	678	87.61	490,700
1942	7,450	Dec. 2, 1941	187	677	6.45	87.47	489,800	568	73.48	411,400
1943	3,250	July 3, 1943	171	699	6.66	90.33	505,900	685	88.57	490,100
1944	3,900	Dec. 3, 1943	141	540	5.14	70.07	392,400	569	73.72	412,800
1945	4,100	Dec. 5, 1944	151	664	6.32	85.89	481,000	704	91.07	510,000
1946	8,400	Oct. 25, 1945	174	808	7.70	104.51	585,200	754	97.44	545,600
1947	6,100	Oct. 24, 1946	204	704	6.70	91.01	509,600	773	90.09	559,900
1948	6,600	Oct. 19, 1947	159	842	8.02	109.69	610,900	764	99.11	555,000
1949	3,540	Oct. 4, 1948	110	707	6.73	91.36	511,700	775	100.21	561,300
1950	10,300	Nov. 20, 1949	270	952	9.07	123.06	689,200	1,069	136.06	767,000
1951	6,050	Dec. 24, 1950	249	845	8.05	109.24	611,700	675	87.21	483,400
1952	3,660	June 4, 1952	180	656	6.25	85.04	476,300	603	78.09	437,400
1953	4,710	Sept. 20, 1953	150	707	6.73	91.40	511,900	.....	.....	.....

Nooksack River near Glacier, Wash.

Location.—Lat. 48°54'15", long. 121°59'30", in NE¼ sec. 2, T. 39 N., R. 6 E., on left bank, 275 ft. downstream from highway bridge, 600 ft. downstream from Canyon Creek, and 2½ miles northwest of Glacier.

Drainage area.—195 sq. mi.

Supplemental records available.—Sept. 7 to Dec. 19, 1910, fragmentary gage heights and discharges, and discharge measurements only.

Gage.—Water-stage recorder. Altitude of gage is 720 ft. (from river-profile map). Sept. 7, 1910, to Sept. 30, 1911, staff gage 50 ft. upstream at different datum.

Average discharge.—5 years (1933-38), 1,147 cfs.

Extremes.—1911, 1933-38: Maximum discharge, 9,400 cfs Oct. 28, 1937 (gage height, 7.74 ft.), from rating curve extended above 6,000 cfs; minimum recorded, 130 cfs Oct. 17, 1934.

Remarks.—Minor diurnal fluctuation caused by powerplant at Excelsior 9 miles above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									2,380	2,350	1,440	1,390	.....
1934	1,750*	1,500*	2,150*	1,500*	754*	1,111	1,941	1,961	1,371	1,230	1,130	801	1,480*
1935	792	1,584	1,001	1,657	1,101	512	471	1,215	1,996	1,637	901	988	1,154
1936	670	549	540	708	269*	593	1,389	2,263	2,212	1,200	872	532	992*
1937	502	300	923	267*	265	678	570	1,706	3,057	1,689	784	629	979*
1938	1,054	1,536	1,312	924	354	535	1,932	1,721	2,297	1,792	805	634	1,171

* Estimated.

NOOKSACK RIVER BASIN

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Nooksack River near Glacier, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									1,350	1,710	1,050	740	
1934						450*	1,100*	1,210	642	100	850	282	
1935	160	687	577	270*	465	372	310	604	1,360	1,050	688	454	160
1936	394	416	377	377	140*	300	274	1,370	1,320	920	638	190	140*
1937	266	222	216	200*	186	375	560	773	2,280	695	388	300	186
1938	349	785	619	441	280	413	395	788	1,300	989	612	456	280

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1911													
1934				1,439	7.38	100.20	1,042,000	1,267	88.25	917,300			
1935	8,810	Nov. 5, 1934	160	1,154	5.92	60.25	835,400	1,019	70.94	738,000			
1936	4,240	June 11, 1936	140	992	5.09	69.23	720,500	991	69.09	719,200			
1937	6,150	June 21, 1937	185	919	5.02	68.16	709,000	1,160	80.78	840,200			
1938	9,400	Oct. 28, 1937	280	1,171	6.01	81.55	847,700						

Kendall Creek at Kendall, Wash.

Location.—Lat. 48°55'05", long. 122°08'35", in NW¼ sec. 34, T. 40 N., R. 5 E., on left bank at Kendall, 1½ miles upstream from mouth.

Drainage area.—24.0 sq. mi., of which 5.6 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 430 ft. (from topographic map).

Extremes.—1948-50: Maximum discharge, 162 cfs Dec. 29, 1949 (gage height, 2.70 ft.); no flow Sept. 10 to Nov. 26, 1949 except for partial day Sept. 17.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										8.19	4.07	1.61	
1949	1.85	14.7	38.7	27.2	36.4	49.9	38.3	27.3	15.5	8.18	3.05	.28	21.7
1950	0	.20	22.0	32.0*	49.0	95.5	85.3	56.7	39.8	23.2	14.2	7.60	35.4*
1951	6.90												

* Estimated.

NOOKSACK RIVER BASIN

Kendall Creek at Kendall, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										5.9	2.8	1.0	.....
1949	1.0	1.4	29	23	19*	42	34	20	12.5	4.4	1.5	0	0
1950	0	0	1.8	21*	24	68	64	49	30	18	9.9	5.0	0
1951	4.5												.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1948													
1949			0	21.7	0.904	13.08	15,720	18.9	10.73				13,710
1950	162	Dec. 29, 1949	0	35.4	1.48	20.00	25,610						

Coal Creek near Kendall, Wash.

Location.—Lat. 48°53'20", long. 122°09'05", in NW¼NW¼ sec. 10, T. 39 N., R. 5 E., on left bank, a quarter of a mile upstream from mouth, and 2 miles south of Kendall.

Drainage area.—4.57 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 400 ft. (from river-profile map).

Extremes.—July to September 1948: Maximum discharge, 70 cfs Sept. 22 (gage height, 2.10 ft.); minimum, 0.7 cfs Aug. 13 (gage height, 0.78 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										2.08	8.61	10.4	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										1.0	0.8	2.0	.....

* Estimated.

Middle Fork Nooksack River near Deming, Wash.

Location.—Lat. 48°46'45", long. 122°06'20", in SW¼ sec. 13, T. 38 N., R. 5 E., on left bank, half a mile upstream from Heislars Creek, three-quarters of a mile upstream from highway bridge, and 6 miles southeast of Deming.

Drainage area.—68.4 sq. mi. At site 1910-11, 1920-21, 70.5 sq. mi.

Supplemental records available.—October 1910 to March 1911, fragmentary gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 590 ft. (from river-profile map). Oct. 11, 1910, to Mar. 14, 1911, and Aug. 28, 1920, to Sept. 30, 1921, staff gages three-quarters of a mile downstream at different datums. Feb. 18 to Apr. 6, 1934, staff gage and Apr. 7 to Sept. 14, 1934, water-stage recorder at described site and datum.

Extremes.—1920-21, 1934-35: Maximum discharge not determined, probably occurred Nov. 5, 1934 (gage height, 15.0 ft., from floodmarks); minimum observed, 127 cfs Apr. 9, 1935.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920												796	
1921	1,270	585	559	499	855	363	380	780	1,200	654	417	434	665
1934					531*	603	553	688	418	440	332	397*	
1935	484*	924*	574*	587	671*	247*	208*	458*	506*	366*	250*	350*	490*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920												221	
1921	323	195	221	266	236	236	200*	323	670	443	236	208	195
1934					218	200*	355	317	281	281	281	246	
1935	180*	317	200*	178	249*	178	127	248	316*	240*	101	160*	127

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1920													
1921	7,500	Oct. 4, 1920	195	665	9.43	123.09	481,000						
1934													
1935				127	490	7.18	97.32	355,100					

* Estimated.

NOOKSACK RIVER BASIN

Canyon Creek at Kulshan, Wash.

Location.—Lat. 48°50'00", long. 122°08'05", in SE¼SE¼ sec. 27, T. 39 N., R. 5 E., on left bank at county road crossing at Kulshan and a quarter of a mile upstream from mouth.

Drainage area.—8.70 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 350 ft. (from river-profile map).

Average discharge.—5 years (1948-53), 52.3 cfs.

Extremes.—1948-53: Maximum discharge not determined, occurred Feb. 11, 1951 (gage height, 8.44 ft.); minimum, 1.0 cfs Sept. 15-24, 1951; minimum gage height, 0.59 ft. Sept. 12-14, 1949.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										24.2	30.5	33.3	
1949	36.0	67.0	30.9	20.0	33.7	57.5	63.0	110	59.5	41.4	19.9	19.8	46.0
1950	33.1	78.8	85.5	37.7*	51.5	76.6	55.6	81.2	116	51.2	21.0	13.9	58.5*
1951	60.5	103	149	77.6	195	27.3	44.3	65.5	33.9	8.22	2.26	3.30	63.2
1952	52.3	35.8	28.5	27.8	50.2	23.7	69.0	88.0	56.2	20.5	6.82	8.16	38.8
1953	7.71	10.7	25.0	212	72.5	33.7	60.2	82.8	73.0	36.3	8.67	20.4	54.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										12	8.8	15	
1949	16	23	17	11*	9*	26	25	53	23	28	7.9	5.6	5.6
1950	9.6	14	13*	17*	13	28	30	40	64	21	10.5	6*	6*
1951	12.5	17	33	20	22	14	23	27	20	3.4	1.4	1.0	1.0
1952	12	17.5	14	9.5	19.5	13.5	26	37	26	5.5	4.6	4.5	4.6
1953	2.8	6.0	5.6	14.5	16	15	17	48	50	11	6.0	4.9	2.9

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1948												
1949	378	Nov. 23, 1948	5.6	46.6	5.30	72.69	33,720	51.9	81.06	37,610		
1950	1,660	Nov. 27, 1949	6	58.5	6.72	91.26	42,360	68.1	106.32	49,340		
1951			1.0	63.2	7.26	98.65	45,770	46.8	73.07	33,000		
1952	320	Jan. 30, 1952	4.6	38.8	4.46	60.74	28,180	32.7	51.15	23,740		
1953	1,090	Jan. 2, 31, 1953	2.9	54.5	6.26	84.97	39,420					

* Estimated.

NOOKSACK RIVER BASIN

South Fork Nooksack River near Wickersham, Wash.

Location.—Lat. 48°39'50", long. 122°07'50", in lot 2, SW ¼ sec. 26, T. 37 N., R. 5 E., on left bank, three-quarters of a mile upstream from Skookum Creek, and 4 miles east of Wickersham.

Drainage area.—103 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 385 ft. (from river-profile map). Prior to July 9, 1934, staff gage at same site and datum.

Average discharge.—20 years (1933-53), 715 cfs.

Extremes.—1933-53: Maximum discharge, 15,800 cfs Nov. 27, 1949 (gage height, 12.01 ft.); minimum, 66 cfs Oct. 9, 1940, Sept. 11-13, 1944; minimum gage height, 1.95 ft. Sept. 24, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934...	1,200*	1,000*	2,200*	1,900*	900*	1,000*	800*	714	308	281	138	306	899*
1935...	506	1,449	1,138	1,688	961	531	475	962	911	411	141	309	789
1936...	392	462	615	907	375*	744	1,152	1,666	1,135	358	132	220	681*
1937...	164	126	1,162	194*	310	774	925	1,230	1,710	390	190	125	612*
1938...	667	1,660	1,251	836	380	575	994	915	545	204	102	86.4	686
1939...	342	628	1,364	1,238	445	623	934	1,242	1,063	646	181	152	741
1940...	546	886	1,535	658	966	1,187	697	777	309	123	95.7	81.4	664
1941...	695	623	1,007	948*	647	574	453	712	359	140	104	734	583*
1942...	1,068	1,020	1,026	414	418	516	616	648	900	317	119	84.4	601
1943...	222	1,114	1,093	666	774*	650	1,289	972	965	589	170	147	719*
1944...	376	311	794	803	490	527	606	812	484	147	110	385	483
1945...	380	948	586	1,248	885	582	667	1,419	556	246	122	349	664
1946...	1,110	1,132	975*	1,092*	777*	739*	910*	1,052*	1,125*	541*	185	131	815*
1947...	657	531	1,290	945	1,259	775	1,040	873	672	352	140	271	731
1948...	1,337	872	1,144	707	492	477	675	1,502	1,330	410	321	412	809
1949...	548	965	516	292	666	979	1,043	1,594	1,042	645	296	394	748
1950...	643	1,251	1,265	698*	1,003	1,093	893	1,173	1,576	832	376	288	923*
1951...	987	1,029	1,739	1,108	1,847	514	897	1,043	571	205	113	149	844
1952...	902	672	553	461	781	403	940	1,253	812	378	154	137	627
1953...	121	164	500	2,092	1,026	509	747	1,029	828	542	199	324	674

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934...								430*	206	146	113	111	.....
1935...	112	451	537	290*	463	272	232	560	475	168	116	103	103
1936...	103	192	290	314	95*	256	235	1,100	520	135	103	112	95*
1937...	100	93	91	135*	135*	358	554	606	899	178	134	37	87
1938...	95	438	429	406	243	393	375	559	352	117	82	72	72
1939...	77	218	308	505	258	262	594	775	656	312	134	98	77
1940...	92	339	501	263	399	566	460	340	158	94	75	67	67
1941...	69	263	368	319	250	363	350	363	239	91	71	230	69
1942...	271	275	343	270*	212	222	176	422	395	164	92	73	73
1943...	90	263	404	208	320*	222	658	591	676	229	121	99	90
1944...	91	158	200	288	219	190	390	501	246	97	76	66	66
1945...	145	296	212	232	285	255	385	895	331	132	90	101	90
1946...	134	556	394	440*	290*	360*	360*	740*	630*	288	130	102	102
1947...	102	194	390	300*	471	404	539	528	403	900	108	108	102
1948...	128	404	368	527	232	285	373	456	709	242	150	206	123
1949...	234	372	270	172	158	472	478	886	595	420	189	136	136
1950...	203	256	328	313	270*	499	534	668	920	425	217	132	132
1951...	226	356	482	435	340	241	546	494	374	123	91	80	80
1952...	302	310	270*	192	272	261	415	658	435	204	106	97	97
1953...	80	106*	106	332	344	306	328	609	590	238	157	107	80

* Estimated.

NOOKSACK RIVER BASIN

South Fork Nooksack River near Wickersham, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1931.....				899	8.73	18.50	650,700	787	103.53	569,400
1935.....	11,200	Nov. 5, 1934	103	789	7.66	103.95	571,100	654	88.17	473,200
1936.....	3,770	May 4, 1936	95	681	6.61	90.03	494,500	681	89.88	494,100
1937.....	5,470	Dec. 6, 1936	87	612	5.94	80.62	443,000	788	103.78	570,700
1938.....	12,900	Oct. 28, 1937	72	688	6.66	90.30	496,300	583	76.73	422,000
1939.....	7,760	Jan. 1, 1939	77	741	7.19	97.64	536,500	803	106.78	581,000
1940.....	6,380	Dec. 15, 1939	67	664	6.45	87.63	481,700	602	79.49	436,700
1941.....	5,340	Jan. 18, 1941	69	683	6.66	76.83	422,100	649	85.51	460,800
1942.....	7,370	Nov. 13, 1941	73	691	5.83	79.23	435,200	543	71.53	392,900
1943.....	8,430	Jan. 14, 1943	90	719	6.98	94.72	520,300	640	84.39	463,600
1944.....	9,080	Dec. 3, 1943	66	489	4.74	64.42	353,900	522	69.04	379,300
1945.....	11,300	Jan. 7, 1945	90	664	6.45	87.55	480,900	775	102.08	500,700
1946.....	14,400	Oct. 25, 1945	102	815	7.91	107.45	590,200	754	99.40	546,000
1947.....	15,600	Oct. 24, 1946	102	731	7.10	96.29	528,900	804	105.95	582,000
1948.....	14,400	Oct. 18, 1947	128	809	7.85	106.91	587,300	697	92.05	505,700
1949.....	4,550	Feb. 16, 1949	136	749	7.26	98.69	541,600	243	111.14	610,600
1950.....	15,800	Nov. 27, 1949	182	923	8.96	121.60	608,000	974	128.35	705,100
1951.....	15,600	Feb. 10, 1951	80	844	8.19	111.25	611,100	714	94.16	517,200
1952.....	5,450	Jan. 30, 1952	97	627	6.09	82.84	455,100	509	67.23	369,300
1953.....	8,100	Jan. 31, 1953	80	674	6.54	88.85	488,000			

Skookum Creek near Wickersham, Wash.

Location.—Lat. 48°40'20", long. 122°08'25", in NE¼ sec. 27, T. 37 N., R. 5 E., on left bank, 100 ft. upstream from private road crossing, 500 ft. upstream from mouth, and 3½ miles northeast of Wickersham.

Drainage area.—23.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 400 ft. (from river-profile map). Prior to May 8, 1953, on right bank.

Average discharge.—5 years (1948-53), 131 cfs.

Extremes.—1948-53: Maximum discharge, 3,050 cfs Nov. 27 or Dec. 1, 1949 (gage height, 9.0 ft., from floodmark), from rating curve extended above 400 cfs by logarithmic plotting; minimum, 17 cfs Feb. 9, 10, 1949, Sept. 23, 24, 1951; minimum gage height, 1.70 ft. Oct. 19-20, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										81.6	82.9	92.2	.....
1949.....	102	191	80.3	44.1	111	172	178	277	169	107	63.0	80.0	181
1950.....	87.2	208	230	107*	196	220*	150	189	276	129	66.0	42.6	158*
1951.....	160	167	277	181	288	85.7	147	157	89.6	48.5	27.2	28.8	137
1952.....	156	124	95.3	69.0	134	67.8	178	214	130	79.5	41.8	83.0	110
1953.....	25.0	31.7	88.8	315	158	91.4	189	189	146	101	48.7	71.5	117

* Estimated.

NOOKSACK RIVER BASIN

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Skookum Creek near Wickersham, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										64	39	48	.....
1949....	45	68	39	25*	19	80	77	136	96	76	42	33	19
1950....	30	33	49	52*	62*	78	76	91	188	80	33	17.5	17.5
1951....	88	52	90	78	64	42	78	80	70	81	20	17	17
1952....	50	55	41	28	53	45	71	109	77	51	23	23	23
1953....	18	19.6	22	64	53	49	55	111	106	53	40	23	18

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1948.....													
1949.....	893	Sept. 15, 1949	19	131	5.67	77.08	94,940	144	84.62	104,200			
1950.....	3,050	⊙	17.5	153	6.84	92.87	114,400	165	96.88	119,400			
1951.....	2,100	Feb. 10, 1951	17	137	5.93	80.41	99,050	118	69.07	85,080			
1952.....	960	Oct. 19, 1951	23	110	4.76	64.82	79,860	90.8	53.48	65,890			
1953.....	1,320	Jan. 31, 1953	18	117	5.06	63.63	84,530						

⊙ Nov. 27 or Dec. 1, 1949.

South Fork Nooksack River at Saxon Bridge, Wash.

Location.—Lat. 48°40'40", long. 122°09'55", in SE¼ sec. 21, T. 37 N., R. 5 E., on downstream side of left pier of Saxon Bridge, 1½ miles downstream from Skookum Creek, and 2½ miles northeast of Wickersham.

Drainage area.—129 sq. mi.

Gage.—Staff gage. Altitude of gage is 350 ft. (from river-profile map). Aug. 30, 1920, to Sept. 30, 1921, at different datum.

Extremes.—1920-21, 1933-34: Maximum discharge observed, 13,100 cfs Feb. 11, 1921 (gage height, 9.0 ft., datum then in use); maximum observed, 111 cfs Sept. 4, 1934 (gage height, 1.22 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920....													1,800
1921....	1,880	1,020		1,160				1,050	1,120		244	1,080	
1933....										1,120*	370	941	
1934....	1,341	1,118	2,418	2,125	1,041	1,176	947	841	873	352	186	361	1,027

* Estimated.

NOOKSACK RIVER BASIN

South Fork Nooksack River at Saxon Bridge, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920												121	
1921	526	332		282				685	745		178	178	
1933										530	220	180	
1934	314	314	505	1,020	484	456	580	540	254	205	129	114	114

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Maximum observed		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1920										
1921	13,100	Feb. 11, 1921								
1933										
1934	7,100	Dec. 21, 1933	114	1,027	7.96	108.01	743,300			

Nooksack River at Deming, Wash.

Location.—Lat. 48°48'40", long. 122°12'15", in lot 12, sec. 6, T. 38 N., R. 5 E., on left bank, 800 ft. downstream from South Fork, and 1 mile southeast of Deming.

Drainage area.—580 sq. mi.

Supplemental records available.—Sept. 6 to Nov. 24, 1910 and Dec. 5, 1910, to Mar. 31, 1911, gage heights and discharge measurements only.

Gage.—Water-stage recorder. Datum of gage is 203.6 ft. above mean sea level, datum of 1929. Prior to Dec. 5, 1910, staff gage 1½ miles downstream at different datum. Dec. 5, 1910, to Mar. 31, 1911, staff gage at Nugent's bridge 5 miles downstream at different datum.

Average discharge.—18 years (1935-53), 3,109 cfs.

Extremes.—1935-53: Maximum discharge, 43,200 cfs Feb. 10, 1951 (gage height, 15.69 ft.), from rating curve extended above 25,000 cfs; minimum, 502 cfs Nov. 29, 1952.

Remarks.—No diversion above station. Slight regulation by powerplant at Excelsior.

NOOKSACK RIVER BASIN

Nooksack River at Deming, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935										2,659*	1,400	1,957	
1936	2,042	1,903	1,997	3,727	1,349*	3,228	4,561	6,750	5,266	2,625	1,450	1,594	3,063*
1937	1,104	672	4,528	957*	1,504	3,163	3,491	4,643	7,815	3,281	1,720	1,226	2,846*
1938	2,751	6,405	5,039	3,532	1,600	2,110	3,510	3,914	3,640	2,483	1,817	1,176	3,133
1939	1,543	2,238	4,966	5,093	2,123	2,447	3,492	4,716	4,536	3,778	1,895	1,222	3,133
1940	2,024	3,322	6,370	2,932	3,568	4,409	2,776	3,767	2,363	1,652	1,334	1,136	3,030
1941	2,841	2,020	3,521	2,947	2,395	2,063	1,924	3,135	2,463	1,562	1,339	2,759	2,444
1942	4,102	3,714	4,173	1,658	1,635	1,784	2,365	2,950	4,227	2,730	1,584	963	2,667
1943	1,031	3,348	4,054	2,607	2,988	2,264	5,011	4,040*	4,511*	4,023	1,715	1,300	3,075*
1944	1,723	1,370	3,233	2,771	1,701	1,990	2,283	3,372	3,142	1,798	1,324	1,983	2,227
1945	1,751	3,276	2,430	4,456	3,179	2,472	2,619	5,480	3,617	2,696*	1,490	1,743	2,934*
1946	4,102*	5,010	3,481	3,558	3,007	3,098	3,725	6,123	5,327*	3,761	1,949	1,245	3,703*
1947	2,331	2,099	4,459	3,435	4,420	2,974	3,774	4,413	4,030	2,564	1,348	1,495	3,104
1948	4,815	3,921	4,752	3,542	2,505	2,063	2,636	5,637	6,550	6,027	2,742	2,587	3,736
1949	2,300	4,063	2,523	1,430	2,731*	3,706*	4,029	6,109	4,538	3,405	2,201	2,161	3,309*
1950	2,465	4,462	4,931	3,146*	3,617*	4,782*	3,631	4,630	7,207	4,963	2,668	1,664	4,041*
1951	3,856	4,175*	6,244	4,247	7,118	2,284	3,205	4,067	3,458	2,366	1,432	1,218	3,617*
1952	3,316	2,509*	2,416*	1,560	3,193	1,823	3,590	5,260	4,153	3,160	1,855	1,252	2,839*
1953	895	901	1,760	6,941	4,355	2,290	3,041	4,305	4,056	3,511	1,978	1,847	3,017

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935										1,670	1,000	890	
1936	970	1,140	1,190	1,620	600*	1,280	1,050	4,380	3,170	1,600	1,120	950	600*
1937	626	560	575	650	674	1,560	2,200	2,380	5,390	1,680	1,130	768	560
1938	802	2,370	2,450	1,350	1,110	1,540	1,680	2,450	2,660	1,550	1,080	895	802
1939	640	1,000	1,760	2,610	1,410	1,280	2,470	3,300	3,470	2,680	1,380	778	640
1940	644	1,640	2,840	1,420	2,000	2,620	2,200	2,130	1,640	1,200	966	756	644
1941	692	1,230	1,320	1,560	1,300	1,510	1,560	1,320	1,930	1,340	1,050	1,380	692
1942	1,510	1,460	1,700*	1,320*	992	1,020	1,720	1,780	2,370	1,730	1,000	767	767
1943	645	1,120	1,720	1,410	1,620	1,120	3,050*	2,500*	3,180	2,470	1,300	878	645
1944	959	844	1,310	1,370	986	869	1,650	2,190	2,120	1,300	1,020	1,000	844
1945	800	1,060	970	973	1,490	1,370	1,720	3,650	2,400*	1,370	1,170	1,100	800
1946	1,100*	3,130	1,620	2,260	1,560	1,570	1,830*	3,550	3,660	2,350	1,470	906	906
1947	805	1,060	1,740	1,360	2,020	1,810	2,260	2,330	2,330	1,450	1,030	1,000	805
1948	1,220	2,020	1,870	1,770	1,210	1,360	1,520	1,870	4,100	1,970	1,640	1,510	1,210
1949	1,500	1,710	1,410	880*	810*	2,080	2,020	3,440	2,830	2,540	1,490	1,160	810*
1950	1,080	1,330	1,670	1,700*	1,450*	2,540	2,350	2,340	4,690	2,730	1,770	1,240	1,060
1951	1,250	1,700*	2,830	2,260	1,880	1,330	2,350	2,350	2,600	1,840	1,030	797	797
1952	1,340	1,400*	982	698	1,470	1,310	1,940	2,910	2,570	2,130	1,160	976	698
1953	610	526	544	1,450	1,810	1,530	1,630	2,970	3,320	2,200	1,420	960	526

* Estimated.

NOOKSACK RIVER BASIN

Nooksack River at Deming, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1935.....												
1936.....	12,100	May 4, 1936	600	3,063	5.23	71.85	2,224,000	3,097	72.84	2,249,000		
1937.....	20,100	Dec. 22, 1936	560	2,848	4.91	66.67	2,062,000	3,505	82.00	2,538,000		
1938.....	33,200	Oct. 28, 1937	802	3,133	5.40	73.27	2,265,000	2,679	62.71	1,940,000		
1939.....	23,000	Jan. 1, 1939	640	3,138	5.49	74.43	2,304,000	3,454	51.50	2,522,000		
1940.....	14,200	Dec. 15, 1939	644	3,030	5.22	71.08	2,200,000	2,700	63.36	1,960,000		
1941.....	15,000	Jan. 18, 1941	692	2,444	4.21	57.20	1,770,000	2,745	64.23	1,988,000		
1942.....	15,800	①	767	2,667	4.60	62.41	1,930,000	2,371	55.60	1,716,000		
1943.....	17,200	Jan. 15, 1943	645	3,075	5.30	71.97	2,228,000	2,896	67.78	2,097,000		
1944.....	23,300	Dec. 3, 1943	844	2,227	3.84	52.25	1,617,000	2,318	54.33	1,633,000		
1945.....	28,800	Jan. 7, 1945	800	2,934	5.06	68.66	2,124,000	3,365	73.76	2,436,000		
1946.....	38,000	②	906	3,703	6.88	86.66	2,651,000	3,896	79.48	2,459,000		
1947.....	29,900	Oct. 25, 1946	805	3,104	5.35	72.84	2,247,000	3,459	81.06	2,526,000		
1948.....	31,400	Oct. 19, 1947	1,210	3,736	6.44	87.63	2,712,000	3,388	79.53	2,460,000		
1949.....			810	3,309	5.71	77.43	2,395,000	3,512	82.19	2,543,000		
1950.....	36,600	Nov. 27, 1949	1,060	4,041	6.97	94.56	2,926,000	4,252	99.50	3,079,000		
1951.....	43,200	Feb. 10, 1951	797	3,617	6.24	84.65	2,619,000	3,110	72.77	2,251,000		
1952.....	14,200	Jan. 30, 1952	698	2,839	4.89	66.64	2,061,000	2,447	57.43	1,776,000		
1953.....	22,700	Jan. 31, 1953	526	3,017	5.20	70.62	2,184,000					

① Dec. 2, 1941, June 15, 1942. ② Probably Oct. 25, 1945.

Anderson Creek at Goshen, Wash.

Location.—Lat. 48°51'20", long. 122°20'20", in E½ sec. 19, T. 39 N., R. 4 E., on right bank at downstream side of county bridge at Goshen and half a mile upstream from mouth.

Drainage area.—12.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 145 ft. (from topographic map).

Extremes.—July to September 1948: Maximum discharge, 25 cfs Aug. 26 (gage height, 1.45 ft.); minimum, 0.4 cfs Aug. 5, 9-12, 17, 18; minimum gage height, 0.79 ft. Aug. 18.

Remarks.—Minor diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										1.22	4.06	4.91	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										0.7	0.4	1.4	

NOOKSACK RIVER BASIN

415

Nooksack River near Lynden, Wash.

Location.—Lat. 48°55'10", long. 122°29'10", in NE¼NE¼ sec. 36, T. 40 N., R. 2 E. on right bank, 150 ft. downstream from bridge on State Highway 1B, 1½ miles upstream from Fishtrap Creek, 2 miles southwest of Lynden, and 12 miles upstream from mouth.

Drainage area.—636 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 24.4 ft. above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.—9 years (1944-53), 3,616 cfs.

Extremes.—1944-53: Maximum discharge, 46,200 cfs Feb. 10, 1951 (gage height, 21.76 ft.); minimum, 595 cfs Nov. 30, 1952 (gage height, 5.01 ft.).

Remarks.—No known diversion above station. Slight regulation by powerplant at Excelsior not effective at this station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	1,930	3,640	2,734	5,408	3,818	2,894	2,967	6,412	4,143	2,891	1,618	1,911	3,369
1946...	4,933	5,327	3,681	3,867	3,267	3,397	4,093	6,550	5,652*	3,841	2,018	1,366	4,005*
1947...	2,397	2,145	4,701	3,781	4,738	3,006	3,779	4,480	4,063	2,570	1,412	1,568	3,204
1948...	4,896	3,941	4,866	3,786	2,844	2,228	2,714	5,955	6,816	3,047	2,739	2,618	3,875
1949...	2,204	4,326	2,854	1,511	3,392*	4,334*	4,168	6,886	4,727	3,567	2,316	2,305*	3,597*
1950...	2,398	4,930	5,600	3,447*	4,236	5,460	4,008	4,744	7,428	5,083	2,783	1,843*	4,338*
1951...	4,068	4,846	7,559	4,758	7,373*	2,541	3,332	4,502	3,697	2,510	1,498	1,258	4,011*
1952...	3,461	2,588	2,506	1,626*	3,366	1,912	3,732	5,417	4,405	3,417	1,883	1,262	2,964*
1953...	942	952	1,808	7,277	4,746	2,456	3,244	4,649	4,348	4,075	1,901	1,859	3,189

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...			1,170	1,200	1,780	1,500	1,820	4,300	2,720	1,570	1,280	1,220	.....
1946...	1,120	3,130	1,600	2,360	1,680	2,020	2,020	3,890	3,890	2,560	1,600	1,080	1,080
1947...	1,000	1,150	1,720	1,340	2,260	1,980	2,310	2,780	2,890	1,640	1,120	1,120	1,000
1948...	1,240	2,160	1,940	1,980	1,410	1,440	1,606	1,980	4,020	2,070	1,680	1,600	1,240
1949...	1,480	1,640	1,640	900*	850*	2,200*	2,150*	3,700	3,010	2,800*	1,580	1,230*	850*
1950...	1,210	1,410	1,760	1,900*	1,520*	3,150	2,600	2,760	4,720	3,030	1,950	1,260	1,210
1951...	1,260	1,760	2,920	2,400*	2,000*	1,400*	2,450	2,350	2,700	2,000*	1,160	925	925
1952...	1,560	1,470	1,000*	720*	1,430	1,330	2,010	2,660	2,660	2,200	1,170	1,050	720*
1953...	706	605	625	1,490	1,840	1,640	1,710	3,190	3,420	2,230	1,520	1,070	605

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1945.....	35,300	Jan. 7, 1945	.....	3,369	5.30	71.91	2,439,000	3,843	82.02	2,782,000	
1946.....	44,500	Oct. 26, 1945	1,030	4,005	6.30	85.48	2,900,000	3,615	77.15	2,617,000		
1947.....	31,000	Dec. 11, 1946	1,000	3,204	5.04	68.40	2,320,000	3,578	76.37	2,590,000		
1948.....	31,600	Oct. 19, 1947	1,240	3,875	6.09	82.91	2,813,000	3,559	76.15	2,583,000		
1949.....	17,500	Feb. 17, 1949	850	3,597	5.66	76.76	2,604,000	3,845	82.06	2,734,000		
1950.....	41,200	Nov. 27, 1949	1,210	4,333	6.81	92.48	3,187,000	4,638	96.95	3,356,000		
1951.....	46,200	Feb. 10, 1951	925	4,011	6.31	85.61	2,904,000	3,344	71.36	2,421,000		
1952.....	13,400	Jan. 31, 1952	720	2,964	4.66	63.43	2,162,000	2,657	64.73	1,856,000		
1953.....	24,100	Feb. 1, 1953	605	3,189	5.01	63.08	2,309,000	.....	.....	.....

* Estimated.

NOOKSACK RIVER BASIN

Fishtrap Creek at Lynden, Wash.

Location.—Lat. 48°57'50", long. 122°26'00", on north line sec. 16, T. 40 N., R. 3 E., on right bank at downstream side of bridge on State Highway 1A, 1 mile north of Lynden.

Drainage area.—24.1 sq. mi., of which 18.5 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from topographic map).

Average discharge.—5 years (1948-53), 35.6 cfs.

Extremes.—1948-53: Maximum discharge, 550 cfs Feb. 11, 1951 (gage height, 6.59 ft.), excludes overflow in sloughs; minimum, 0.4 cfs Sept. 10, 1949 (gage height, 1.00 ft.).

Remarks.—Probably some small diversion for minor irrigation and domestic use above station. No regulation. Undetermined part of flood flow bypasses gage through sloughs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...										7.46	7.95	7.73	.....
1949...	15.4	51.4	66.0	27.8	60.9	52.5	29.9	21.5	8.66	6.96	3.47	2.43	28.7
1950...	5.63	21.1	73.8	42.0*	130	118	54.9	42.6	17.8	9.45	7.34	6.72	46.1*
1951...	16.9	41.4	94.2	114	162	103	37.9	31.1	13.6	7.46	6.41	4.54	52.1
1952...	11.4	22.1	39.3	40.3*	60.6	35.5	20.7	15.7	9.76	6.62	3.85	4.51	22.4*
1953...	4.31	4.59	15.1	704	82.2	40.3	32.3	22.3	17.4	9.99	6.12	6.01	26.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1946...										6.0	6.2	6.2	.....
1949...	6.8	14	37	13*	13*	34	28	11	7.4	5.3	1.3	.8	0.8
1950...	2.8	4.5	25	25*	30*	70	52	27	12.5	7.4	5.5	5.8	2.8
1951...	7.2	13	28	61	60	55*	28	19	8.7	6.6	5.1	3.4	3.4
1952...	5.6	9.3	20	17*	28	25	13	10.5	8.8	4.0	3.4	3.6	3.4
1953...	3.4*	3.4	3.4	17.5	36	27	26	15	13	7.8	5.1	4.5	3.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1948.....							
1949.....	289	Feb. 17, 1949	0.8	28.7	20,370	26.1	18,880
1950.....	342	Dec. 23, 1949	2.8	46.1	33,360	50.4	36,500
1951.....	550	Feb. 11, 1951	3.4	52.1	37,740	45.4	32,860
1952.....	278	Jan. 31, 1952	3.4	22.4	16,280	18.3	13,310
1953.....	286	Jan. 23, 1953	3.4	28.9	20,940		

* Estimated.

NOTE—Maximums exclude overflow in slough.

Bertrand Creek near Lynden, Wash.

Location.—Lat. 48°55'30", long. 122°31'50", in SE¼ sec. 27, T. 40 N., R. 2 E., on left bank, three-quarters of a mile upstream from mouth, and 3 miles west of Lynden.

Drainage area.—40.3 sq. mi., of which 23.1 sq. mi. is in Canada.

Gage.—Water-stage recorder. Altitude of gage is 35 ft. (from topographic map).

Extremes.—July to September 1948: Maximum discharge, 34 cfs Aug. 21 (gage height, 1.68 ft.); minimum, 11.5 cfs Aug. 13; minimum gage height, 1.07 ft. Sept. 15.

Remarks.—Minor diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										15.2	15.8	15.4	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										13.0	12.0	12.5	

Tenmile Creek near Ferndale, Wash.

Location.—Lat. 48°51'15", long. 122°32'25", in NE¼SW¼ sec. 22, T. 39 N., R. 2 E., on right bank, 100 ft. downstream from county bridge, and 2 miles east of Ferndale.

Drainage area.—22.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map).

Extremes.—July to September 1948: Maximum discharge, 14.5 cfs Aug. 21 (gage height, 2.75 ft.); minimum, 5.2 cfs Aug. 13 (gage height, 1.82 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										7.80	8.40	9.02	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										6.5	5.8	7.5	

DAKOTA CREEK BASIN

Dakota Creek near Blaine, Wash.

Location.—Lat. 48°57'25", long. 122°39'30", in NW¼SW¼ sec. 14, T. 40 N., R. 1 E., on right bank, 50 ft. upstream from county road crossing, 3½ miles upstream from mouth, and 4½ miles southeast of Blaine.

Drainage area.—15.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map).

Average discharge.—5 years (1948-53), 31.6 cfs.

Extremes.—1948-53: Maximum discharge, 669 cfs Dec. 27, 1949 (gage height, 9.16 ft.); maximum gage height, 9.92 ft. Feb. 10, 1951; minimum discharge, 0.1 cfs Aug. 11, 1950, Sept. 22, 1952.

Remarks.—Probably some small diversion for minor irrigation and domestic use above station. Some diurnal fluctuation at low flow from unknown cause.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										3.09	3.71	3.57	.....
1949	12.3	111	76.4*	10.7*	48.8*	37.0	16.4	12.5	3.29	2.61	1.52	2.35	28.1*
1950	3.24	21.9	117	65.5*	166	132	56.3	17.8	5.87	3.25	3.88	2.28	48.9*
1951	3.90	25.2	96.4	120	124	82.8	12.8	14.9	4.94	1.65*	1.52*	1.41	40.4*
1952	4.14	10.8	33.0	51.0	52.8	35.6	13.7	8.04	4.26	2.70	1.79	1.66	18.2
1953	1.83	1.66	6.51	121	60.2	30.6	25.6	9.39	7.32	2.76	2.03	2.06	22.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										2.4	1.9	2.4	.....
1949	3.9	2.4	19*	6.4*	6*	11.5	10.5	4.2	2.7	.8	.7	1.2	0.7
1950	1.9	27	13.5	18*	50*	44	22	10	3.5	2.2	2.6	1.6	1.6
1951	1.8	3.7	20	38	24	20*	6.5	5.2	2*	.....	1.2	1.0	1.0
1952	1.9	2.9	15	13*	19	17	6.5	3.5	1.4	.9	.7	.6	.6
1953	1.4	1.0	1.9	10.5	18.5	11	13	3.9	3.2	2.1	1.8	1.8	1.0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1948							
1949	612	Nov. 23, 1948	0.7	25.1	20,360	23.6	17,570
1950	669	Dec. 27, 1949	1.6	43.9	35,900	47.5	34,360
1951	753	Feb. 10, 1951	1.0	40.4	29,260	33.9	24,510
1952	309	Jan. 30, 1952	.6	18.2	13,240	15.0	10,920
1953	401	Jan. 23, 1953	1.0	22.4	16,240	.....	.....

* Estimated.

FRAZIER RIVER BASIN

419

Sumas River near Sumas, Wash.

Location.—Lat. 48°58'30", long. 122°15'00", in NE¼ sec. 11, T. 40 N., R. 4 E., on left bank, 1½ miles south of Sumas.

Drainage area.—32.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 40 ft. (from topographic map).

Extremes.—1948-50: Maximum discharge, 800 cfs Dec. 28, 1949 (gage height, 8.89 ft.); minimum, 13.5 cfs Sept. 27 to Oct. 4, 1949.

Remarks.—Probably some small diversions for minor irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...										21.6	26.8	27.2	
1949...	38.9	127	114	50.8	122	104	59.8	39.1	24.0	20.0	21.8	19.9	61.3
1950...	23.2	39.1	129	102*	198	209	153	71.7	34.0	22.5	20.3	18.9	84.3*
1951...	35.9												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...										19.0	16.5	18.5	
1949...	23	30	62	26*	24*	67	49	28	22	18.5	18.5	13.5	13.5
1950...	13.5	19.5	31	54	110*	112	79	38	27	19.5	18.5	16	13.5
1951...	16.5												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1948...							
1949.....	660	Feb. 17, 1949	13.5	61.3	44,400	54.0	39,120
1950.....	800	Dec. 28, 1949	13.5	84.3	61,020		

* Estimated.

FRAZIER RIVER BASIN

Saar Creek near Sumas, Wash.

Location.—Lat. 49°00'00", long. 122°11'50", in E½ sec. 31, T. 41 N., R. 5 E., on left bank at road crossing, a quarter of a mile upstream from international boundary, and 3 miles east of Sumas.

Drainage area.—11 sq. mi., approximately.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 30 ft. (from topographic map).

Extremes.—July to September 1948: Maximum discharge, 30 cfs Sept. 22 (gage height, 2.32 ft.); minimum, 0.9 cfs Aug. 13 (gage height, 1.38 ft.).

Remarks.—Probably some small diversions for domestic use. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	2.50	4.32	6.90	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	6.5	5.8	7.5	.....

Annual mean discharge in cubic feet per second

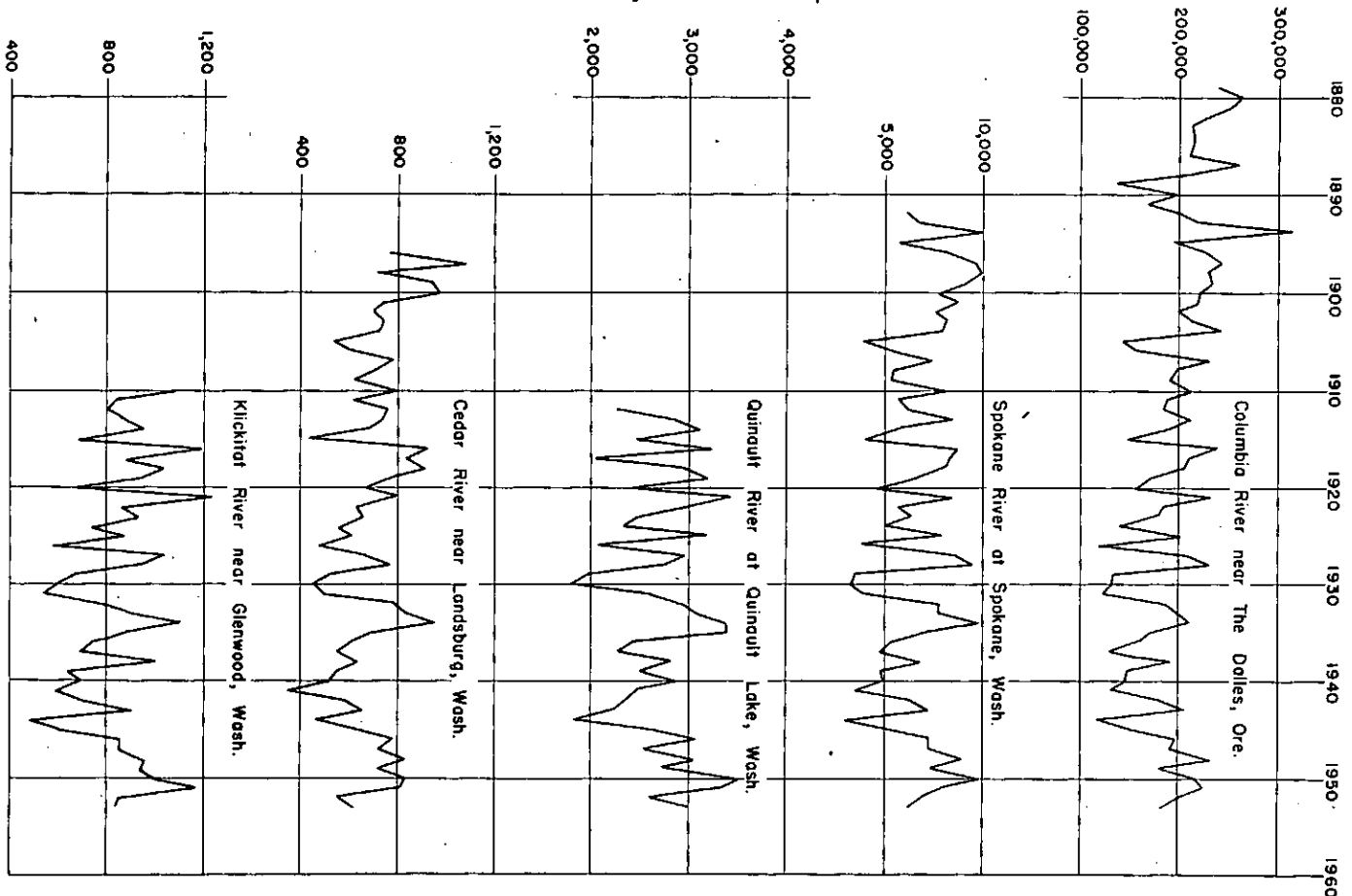


Figure 12. Hydrographs showing annual mean discharge for selected gaging stations, showing long-term trends and variations in streamflow.

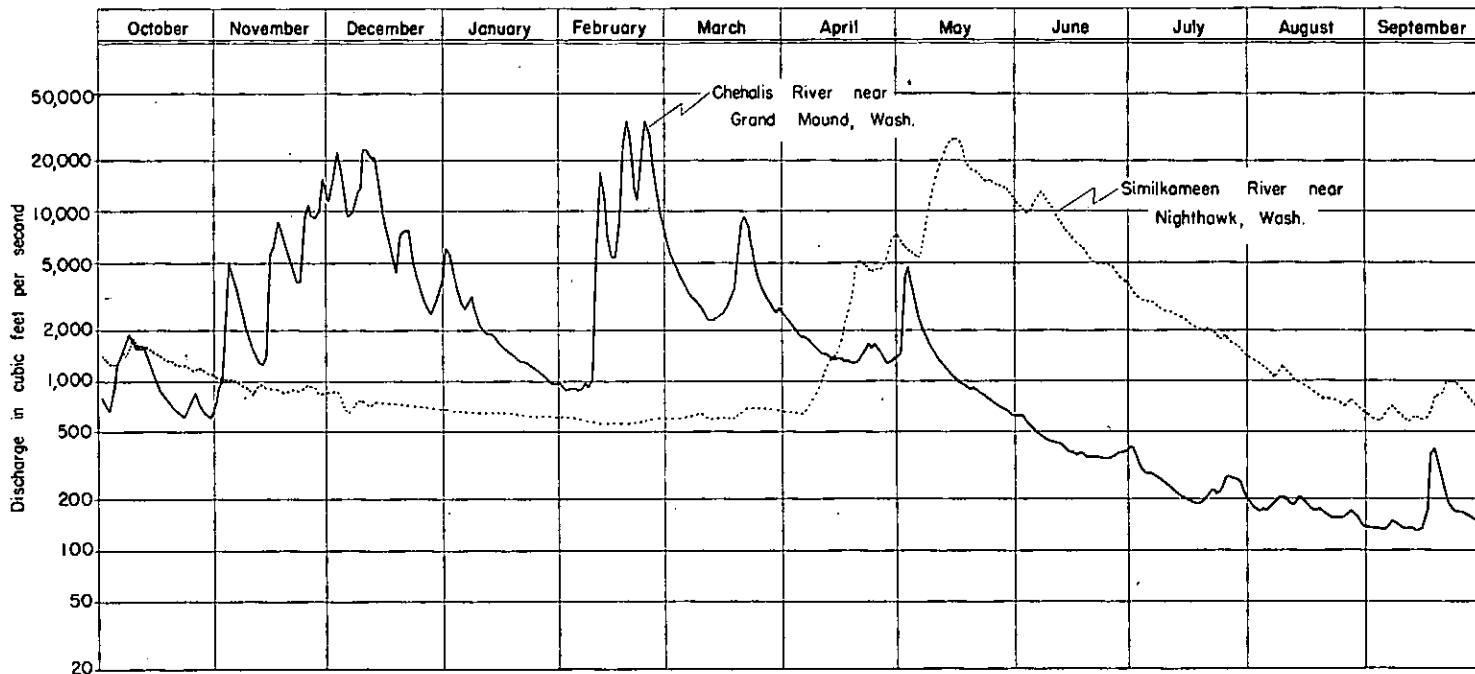


Figure 13. Hydrographs of daily discharge for gaging stations showing typical runoff characteristics of eastern and western Washington streams. Records shown are for water year 1949.

Columbia River at Birchbank, British Columbia[Ⓞ]

(International gaging station)

Location.—Lat. 49°10', long. 117°43', on right bank at Birchbank, British Columbia, 7 miles upstream from Trail, 11 miles downstream from Kootenay River, and 17 miles upstream from international boundary.

Drainage area.—34,000 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,329.90 ft. above mean sea level, 1947 international joint adjustment, published as 1,338.00 ft. prior to 1949. Prior to Oct. 1, 1937, chain or wire-weight gage on highway bridge at Trail, British Columbia, 7 miles downstream at datum 16.27 ft. lower.

Average discharge.—40 years (1913-53), 69,440 cfs.

Extremes.—1913-53: Maximum discharge, 370,000 cfs June 11, 1948 (gage height, 50.62 ft.); minimum observed, 8,940 cfs Feb. 3, 1937 (gage height, 6.27 ft., site and datum then in use).

Remarks.—Many small diversions above station for irrigation of about 25,000 acres. Fluctuation at low flow caused by powerplant on Kootenay River. Flow affected by internationally controlled storage in Kootenay Lake as well as by natural and controlled regulation in other lakes.

Cooperation.—Station is one of the international gaging stations maintained by Canada under agreement with the United States. Prior to 1930, all records furnished by Dominion Water and Power Bureau of Canada.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913	.....	.....	.....	.....	.....	.....	.....	86,400	262,000	181,000	125,000	83,500	.....
1914	46,900	32,200	22,600	20,700	16,800	17,800	43,900	125,000	190,000	200,000	112,000	65,700	74,900
1915	49,300	45,900	30,500	19,900	16,400	17,300	45,500	110,000	123,000	140,000	132,000	76,800	67,600
1916	38,200	35,000	25,400	16,300	13,700	23,000	45,000	99,400	192,000	262,000	136,000	86,700	81,300
1917	42,300	29,100	19,600	14,100	12,400	10,600	17,300	79,200	198,000	205,000	115,000	68,600	67,900
1918	53,500	29,600	27,100	27,900	20,800	18,400	41,500	113,000	200,000	186,000	113,000	75,900	75,900
1919	53,600	34,500	25,800*	19,900	21,100	16,200	34,400	107,000	195,000	179,000	119,000	72,500	73,200*
1920	34,700	21,800	15,700	15,200	13,300	11,700	15,400	74,100	146,000	240,000	144,000	71,300	66,900
1921	70,900	40,700	28,700	22,400	21,400	22,700	30,600	117,000	245,000	190,000	127,000	61,200	82,300
1922	42,500	40,800	29,200	20,800	16,700	14,600	20,700	79,400	221,000	168,000	113,000	82,200	71,300
1923	46,700	31,200	18,800	19,400	15,800	13,400	29,000	109,000	220,000	183,000	116,000	80,300	73,900
1924	38,900	23,200	17,700	13,900	16,900	17,700	19,300	115,000	158,000	134,000	103,000	74,400	61,000
1925	40,600	37,000	28,100	25,300	25,200	25,000	63,900	164,000	215,000	181,000	114,000	60,900	81,700
1926	34,100	20,600	17,400	14,000	12,600	13,400	37,400	102,000	103,000	121,000	83,000	65,400	52,800
1927	47,000	44,200	29,300	19,700	15,300	15,400	23,000	87,100	217,000	199,000	127,000	101,000	77,400
1928	76,700	60,600	37,600	26,700	22,200	22,500	40,700	152,000	223,000	187,000	112,000	60,700	85,400
1929	37,800	26,500	19,000	14,500	11,000	11,800	16,700	65,300	190,000	128,000	94,400	58,900	56,200
1930	31,100	20,200	15,100	13,900	12,700	14,500	38,600	103,000	164,000	157,000	107,000	63,400	62,000
1931	32,000	20,200	14,900	12,200	12,000	12,800	20,400	99,300	167,000	135,000	89,000	66,600	67,000
1932	35,100	25,900	19,900	18,800	14,500	24,200	45,000	143,000	234,000	180,000	109,000	64,700	78,300
1933	35,090	30,090	23,950	21,370	16,030	15,540	25,450	103,500	239,800	238,000	132,500	74,980	80,550
1934	47,750	52,490	39,510	37,050	28,500	26,470	78,050	202,400	226,100	139,300	97,980	61,920	86,780
1935	34,300	37,000	28,900	20,700	23,600	20,200	25,200	89,760	212,000	190,000	119,000	65,900	73,200
1936	35,500	22,200	17,000	14,800	11,800	13,000	33,300	149,000	207,000	132,000	88,600	54,100	65,000
1937	31,200	18,400	13,500	10,500	9,620	11,400	19,700	68,400	163,000	144,000	85,300	55,100	52,500
1938	31,300*	43,700	27,400	21,600	17,300	17,600	36,900	115,000	232,000	175,000	79,200	58,800	71,500*
1939	30,800	24,000	19,600	18,200	15,900	14,600	35,300	137,000	158,000	148,000	89,300	54,600	63,300
1940	87,800	37,800	31,200	22,100	19,700	22,900	43,300	114,000	177,000	131,000	82,300	64,800	65,400

* Estimated.

Ⓞ Published as Columbia River at Trail, British Columbia, prior to May 1937.

COLUMBIA RIVER MAIN STEM

Columbia River at Birchbank, British Columbia—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	48,200	84,200	21,300	18,100	17,300	21,600	45,500	98,900	136,000	108,000	79,200	66,600	58,000
1942...	50,400	40,700	40,300	22,800	22,100	21,600	30,900	92,500	155,000	170,000	99,200	48,300	69,500
1943...	35,700	25,100	20,400	17,800	10,700	16,100	55,100	91,200	159,000	184,000	100,000	46,200	84,300
1944...	33,000	24,200	20,600	17,900	15,400	14,200	19,900	69,200	140,000	91,300	77,400	52,500	48,000
1945...	39,900	29,900	21,000	17,500	17,600	17,500	18,200	75,500	177,000	135,000	70,100	45,600	66,100
1946...	28,200	23,500	18,100	16,700	16,700	22,100	38,300	156,000	250,000	178,000	95,700	58,700	75,300
1947...	31,500	20,900	19,600	18,100	21,300	26,100	44,100	156,000	216,000	161,000	85,700	50,800	71,200
1948...	63,300	41,900	24,200	21,300	19,400	20,200	29,500	123,000	318,000	155,000	98,900	62,300	81,400
1949...	40,500	29,100	22,300	17,900	15,900	17,000	35,400	148,000	167,000	99,800	75,600	48,500	60,000
1950...	30,300	25,700	27,700	19,300	20,000	27,300	31,000	83,700	230,000	245,000	100,000	62,000	75,900
1951...	44,600	37,200	33,100	30,000	35,200	25,800	40,700	154,000	191,000	202,000	98,700	53,700	79,200
1952...	48,600	29,700	23,800	21,200	19,800	21,600	39,300	142,000	196,000	159,000	87,900	40,100	69,800
1953...	35,800	21,800	16,900	17,100	20,600	22,500	22,300	101,000	207,000	178,000	91,700	58,200	66,300

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913...	.....	.....	.....	.....	.....	.....	.....	56,800	191,000	150,000	98,400	62,100	.....
1914...	39,300	27,800	18,600	19,600	15,500	15,500	23,700	71,800	163,000	144,000	87,200	52,200	15,500
1915...	44,400	39,600	22,500	17,000	16,000	15,500	23,100	74,600	127,000	130,000	110,000	47,200	16,500
1916...	34,000	29,500	21,500	13,000	12,000	16,000	34,000	59,800	113,000	192,000	104,000	50,100	12,000
1917...	34,700	23,100	15,600	12,500	11,400	9,600	10,200	28,200	173,000	104,000	98,600	58,000	9,600
1918...	37,000	25,300	23,600	24,100	18,200	16,200	26,200	67,000	113,000	144,000	88,300	67,000	16,200
1919...	43,100	28,500	.....	13,000	18,000	15,200	19,000	84,800	167,000	139,000	97,600	53,000	18,000
1920...	25,900	18,300	14,200	14,300	11,900	11,000	13,000	21,500	98,000	198,000	94,400	59,400	11,600
1921...	64,500	35,100	23,900	19,700	19,800	22,400	23,500	55,600	207,000	160,000	93,000	44,100	19,700
1922...	40,400	39,500	23,500	18,500	15,000	14,200	15,100	31,600	158,000	122,000	98,400	61,600	14,200
1923...	36,900	23,900	16,100	18,200	13,000	13,000	15,100	55,200	159,000	159,000	102,000	52,600	18,000
1924...	30,400	19,200	16,100	13,000	14,000	16,100	16,000	27,100	130,000	104,000	94,700	50,900	18,000
1925...	35,200	29,200	24,200	23,300	23,500	24,000	26,000	89,800	194,000	138,000	80,300	48,600	23,300
1926...	24,500	18,400	16,300	12,700	12,400	12,500	15,200	62,600	96,100	97,000	79,300	49,800	12,400
1927...	37,600	37,900	23,200	13,200	14,200	14,700	16,400	47,400	132,000	163,000	102,000	57,600	13,200
1928...	67,600	47,400	29,900	24,200	19,600	18,100	32,500	52,300	191,000	158,000	76,400	42,500	18,100
1929...	32,800	22,500	16,400	12,400	10,000	10,900	14,400	25,600	138,000	105,000	74,400	45,400	10,000
1930...	24,800	16,000	14,100	12,300	11,600	14,100	16,300	84,600	123,000	126,000	82,500	46,000	11,600
1931...	28,800	17,400	13,000	11,700	11,700	11,600	15,200	33,800	122,000	117,000	72,900	43,200	11,600
1932...	27,200	23,200	18,200	16,700	18,400	17,300	28,400	70,100	178,000	138,000	98,000	43,700	18,400
1933...	31,300	29,000	23,300	18,400	14,800	15,200	16,900	56,700	170,000	184,000	99,800	55,300	14,800
1934...	41,700	42,900	35,800	31,900	25,300	23,300	34,700	181,000	163,000	120,000	76,800	41,700	23,300
1935...	31,300	33,100	22,500	17,800	21,400	18,800	19,100	42,600	173,000	184,000	76,800	46,800	17,800
1936...	29,100	18,800	15,600	13,800	10,200	11,200	12,400	92,500	165,000	107,000	71,000	39,200	10,200
1937...	24,400*	15,700	12,600	9,600	8,940	11,000	12,000	25,500	128,000	116,000	60,000	44,500	8,940
1938...	26,700	32,000	21,100	19,600	16,100	15,700	19,700	72,600	217,000	121,900	59,000	52,700	15,700
1939...	29,400	21,400	17,700	17,600	14,200	12,900	20,600	72,700	143,000	122,900	70,700	40,200	12,900
1940...	28,500	27,400	25,800	19,100	18,700	19,300	36,500	58,900	164,000	112,000	64,700	51,300	18,700
1941...	35,100	23,800	19,500	17,100	16,700	16,800	31,400	68,000	112,000	92,300	68,000	59,000	16,700
1942...	50,000	31,500	25,400	19,900	20,400	19,300	21,400	48,800	156,000	185,000	69,300	37,700	19,900
1943...	30,200	22,200	19,200	15,500*	15,200*	14,300	20,500	77,000	142,000	157,000	62,000	35,700	14,800
1944...	29,000	21,600	18,600	16,100	14,300	18,000	14,300	31,800	111,000	78,200	59,300	46,300	13,000
1945...	32,000	24,500	17,700	17,100	16,600	16,300*	16,600	21,900	155,000	100,000	57,000	33,600	16,300*
1946...	25,700	19,900	15,500	14,600	14,000	18,600	28,100	68,300	231,000	137,000	72,900	41,600	14,000
1947...	24,200	18,200	16,200	14,700	17,100	20,200	32,100	79,200	185,000	135,000	59,100	44,400	14,700
1948...	47,200	30,200	19,100	18,400	16,800	17,300	18,600	67,000	244,000	110,000	89,800	46,100	16,900
1949...	33,700	25,800	18,700	16,100	14,000	16,300	17,200	68,200	118,000	92,000	58,300	36,600	14,000
1950...	24,800	22,800	22,300	17,000	17,300	22,700	25,000	42,000	141,000	170,000	81,600	48,100	17,000
1951...	36,400	28,000	25,000	21,600	20,700	23,300	22,200	57,600	162,000	163,000	70,200	42,900	20,700
1952...	39,100	23,600	19,400	18,800	19,200	19,400	23,100	91,600	170,000	116,000	62,400	37,600	18,300
1953...	26,200	17,600	16,000	16,100	18,600	19,600	19,600	41,200	153,000	131,000	77,000	41,500	16,000

* Estimated.

Columbia River at Birchbank, British Columbia—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1913	312,000†	June 14, 15, 1913								
1914	222,000†	July 16, 1914	15,500	74,900	2.20	29.82	54,200,000	76,800	30.62	55,600,000
1915	149,000†	July 11, 12, 1915	15,500	67,600	1.99	26.98	48,900,000	65,300	26.08	47,300,000
1916	306,000†	June 30, 1916	12,000	81,300	2.39	32.54	59,000,000	80,700	32.28	58,500,000
1917	224,000†	July 8, 1917	9,600	67,900	2.00	27.10	49,200,000	69,600	27.75	50,400,000
1918	274,000†	June 26, 1918	16,200	75,900	2.23	30.29	54,900,000	76,200	30.42	55,100,000
1919	229,000†	June 29, 30, 1919	13,000	73,200	2.15	29.37	53,200,000	69,900	27.06	50,600,000
1920	263,000†	July 19, 1920	11,000	66,900	1.97	26.91	48,900,000	73,000	29.21	53,000,000
1921	270,000†	June 13, 1921	19,700	82,300	2.42	32.89	59,600,000	80,500	32.14	58,300,000
1922	244,000†	June 17, 18, 1922	14,200	71,300	2.10	28.54	51,700,000	69,500	27.81	50,300,000
1923	253,000†	June 16, 1923	13,000	73,900	2.17	29.61	53,800,000	72,600	29.06	52,700,000
1924	199,000†	May 26, 1924	13,000	61,000	1.80	24.50	44,400,000	63,300	25.36	46,000,000
1925	245,000†	May 27, 1925	23,300	81,700	2.40	32.71	59,400,000	79,200	31.59	57,800,000
1926	133,000†	July 12, 1926	12,400	52,300	1.54	20.90	37,800,000	56,300	22.47	40,800,000
1927	235,000†	June 19, 1927	13,200	77,400	2.28	30.00	50,000,000	81,800	32.73	59,300,000
1928	306,000†	May 30, 1928	18,100	85,400	2.51	34.76	62,000,000	77,700	31.11	55,400,000
1929	224,000†	June 16, 17, 1929	10,000	56,200	1.65	22.49	40,800,000	54,900	21.91	39,300,000
1930	189,000†	June 14, 1930	11,600	62,000	1.82	24.75	44,900,000	62,100	24.78	44,900,000
1931	189,000†	June 13, 1931	11,600	57,000	1.68	22.80	41,300,000	58,200	28.25	42,100,000
1932	270,000†	June 25, 1932	13,400	76,300	2.24	30.49	55,400,000	77,500	31.00	56,200,000
1933	288,000†	June 23, 24, 1933	14,800	80,550	2.37	32.19	58,310,000	84,360	33.70	61,070,000
1934	274,000†	June 2, 1934	23,300	86,730	2.55	34.63	62,750,000	83,400	33.32	60,370,000
1935	238,000†	June 20, 1935	17,800	73,200	2.15	29.18	53,000,000	71,000	28.38	51,490,000
1936	271,000†	June 4, 1936	10,200	65,000	1.91	26.03	47,200,000	64,000	25.64	46,500,000
1937	183,000†	June 24, 25, 1937	8,940	52,500	1.54	20.95	38,000,000	55,700	22.26	40,400,000
1938	260,000	June 27, 1938	15,700	71,500	2.10	28.59	51,800,000	70,000	27.98	50,700,000
1939	196,000	June 1, 1939	12,900	63,300	1.86	25.28	45,800,000	65,200	26.04	47,200,000
1940	197,000	May 29, 1940	18,700	65,400	1.92	26.18	47,600,000	65,200	26.10	47,360,000
1941	153,000	June 19, 1941	16,700	58,000	1.70	23.21	41,970,000	60,800	24.33	44,040,000
1942	208,000	June 11, 1942	19,900	69,500	2.04	27.76	50,320,000	64,800	25.87	46,900,000
1943	206,000	July 12, 1943	14,800	64,300	1.89	25.65	46,520,000	63,000	25.51	46,270,000
1944	159,000	June 14, 1944	13,000	48,000	1.41	19.22	34,850,000	49,100	19.68	35,680,000
1945	198,000	June 10, 1945	16,300	56,100	1.65	22.42	40,640,000	54,400	21.71	39,370,000
1946	267,000	June 6, 1946	14,000	75,300	2.21	30.05	54,540,000	75,520	30.13	54,670,000
1947	236,000	June 14, 1947	14,700	71,200	2.09	28.45	51,540,000	76,000	30.38	55,030,000
1948	370,000	June 11, 1948	16,900	81,400	2.39	32.59	59,710,000	78,300	31.35	56,830,000
1949	210,000	May 24, 1949	14,000	60,000	1.76	23.88	43,430,000	59,300	23.68	42,500,000
1950	325,000	June 24, 1950	17,000	75,900	2.23	30.32	54,930,000	78,600	31.33	56,870,000
1951	229,000	May 27, 1951	20,700	79,200	2.33	31.61	57,320,000	78,100	31.19	56,560,000
1952	221,000	June 10, 1952	18,300	69,800	2.05	27.97	56,660,000	67,500	27.04	48,970,000
1953	250,000	June 17, 1953	16,000	66,300	1.95	26.47	48,020,000			

† Maximum daily mean discharge.

Pend Oreille River (formerly Clark Fork) at Newport, Wash.①

Location.—Lat. 48°11'00", long. 117°02'00", in SE¼SW¼ sec. 24, T. 56 N., R. 6 W., on left bank at Newport, 0.2 mile upstream from U. S. Highway 2, and 1.6 miles below Albèni Falls Dam.

Drainage area.—24,200 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 2,000.00 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Sept. 22, 1928, staff or wire-weight gages at Priest River, Idaho, Newport or Metaline Falls, Wash. at various datums. Sept. 22, 1928, to Sept. 30, 1941, water-stage recorder at Priest River at datum 2,000 ft. above mean sea level, datum of 1929.

Average discharge.—38 years (1903-41), 24,820 cfs (unadjusted).

Extremes.—1903-41, 1952-53: Maximum discharge, 136,000 cfs June 15, 1913, June 21, 1933; minimum, 2,200 cfs Dec. 12, 1919 (but may have been less during periods of ice effect).

Maximum elevation known, about 2,064 ft., present datum, June 1894, from water-surface profile (discharge, about 200,000 cfs).

Remarks.—Diversions above station for irrigation of about 337,600 acres in 1946. Flow regulated at Albèni Falls Dam. Storage reservoirs in the Pend Oreille River basin have a combined capacity of about 289,750 acre-ft., most of which is used for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903...										71,400	28,600	15,500	.....
1904...	15,200	15,700	16,100	13,000	10,900	13,300	31,300	73,200	82,000	50,000	21,100	11,500	29,500
1905...	9,030	8,420	8,140	7,640	7,170	9,980	12,600	21,700	44,500	30,300	13,000	9,030	16,200
1906...	9,500	9,640	8,710	7,700	8,420	9,480	17,500	36,700	42,200	28,700	13,900	10,300	16,900
1907...	8,810	15,400	18,900*	16,300*	14,500*	17,000	28,400	57,300	90,200	73,700	45,200	22,600	34,100*
1908...	14,200*	12,800*	13,200*	10,500*	9,600*	11,500	22,200	59,400	103,000	60,600	25,500	13,300	29,700*
1909...	11,300	12,400	9,770	9,850	12,000	12,000	17,300	32,300	91,100	67,000	28,500	14,200	26,500
1910...	11,200	15,000	22,800	17,500	10,400	27,400	47,000	72,600	59,800	31,500	15,900	10,400	28,600
1911...	10,600	15,300	18,900	12,200	10,400	10,700	20,200	49,300	68,900	54,000	23,700	14,000	25,800
1912...	10,000	9,760	10,000	8,200*	10,500	9,090	21,500	53,300	84,100	60,200	24,700	16,500	25,700*
1913...	13,900	15,800	15,500*	10,700*	10,800*	12,500*	25,900*	58,300*	122,000*	70,900*	29,000*	15,900*	33,500*
1914...	11,800*	13,000*	11,800*	11,800*	10,200*	14,700*	27,000*	52,900*	62,100*	39,200*	18,000*	10,700*	23,700*
1915...	12,200*	19,200*	16,000*	11,000*	9,410*	10,600*	19,800*	35,900*	41,900*	35,300*	22,900*	13,100*	20,700*
1916...	11,500*	11,500*	11,700*	8,290*	10,800*	22,100*	41,400*	64,800*	86,000*	113,000*	45,000*	23,200*	37,500*
1917...	16,500*	12,900*	10,500*	9,260*	9,380*	8,630*	17,800*	54,300*	112,000*	83,700*	29,700*	14,200*	31,700*
1918...	10,400*	9,140*	11,300*	31,000*	18,900*	16,000*	29,500*	63,900*	70,200*	62,500*	20,800*	12,800*	29,700*
1919...	10,100*	10,200*	9,550*	10,000*	12,900*	11,600*	23,000*	48,800*	65,800*	31,100*	13,300*	7,990*	21,200*
1920...	6,470*	6,730*	5,160*	6,460*	8,330*	8,010*	12,400*	40,800*	69,200*	54,600*	13,000*	13,000*	21,100*
1921...	13,900*	13,400*	13,300*	13,900*	14,300*	19,900*	28,000*	62,300*	101,000*	62,000*	19,600*	10,900*	30,800*
1922...	9,150*	8,880*	11,300*	10,800*	9,160*	8,510*	15,100*	43,100*	96,900*	47,500*	15,200*	11,100*	24,100*
1923...	8,530*	7,890*	6,880*	11,600*	8,090*	9,090*	19,300*	49,600*	84,100*	64,500*	21,800*	11,500*	24,500*
1924...	6,520*	8,050*	8,100*	6,240*	11,500*	12,000*	12,900*	50,300*	61,400*	32,500*	15,000*	9,100*	19,600*
1925...	7,700*	8,880*	8,780*	11,800*	18,500*	17,000*	41,500*	81,600*	93,200*	62,600*	20,700*	12,900*	31,300*
1926...	10,300*	9,110*	8,950*	8,650*	9,160*	10,400*	17,900*	45,200*	131,000*	62,000*	19,800*	9,750*	15,800*
1927...	12,000*	15,200*	17,000*	14,800*	12,300*	14,300*	18,400*	59,500*	113,000*	82,200*	29,500*	19,400*	34,100*
1928...	20,500*	27,900*	29,900*	20,600*	17,800*	18,300*	27,600*	60,600*	104,000*	59,200*	27,200*	14,400*	37,400*
1929...	10,100	10,500	8,870	6,550*	6,400*	8,390	12,100	33,600	67,100	35,600	14,600	8,080	18,600*
1930...	6,660	6,220	6,680	5,490	7,320	8,730	22,200	47,400	46,400	26,500	12,800	7,810	17,100
1931...	7,570	7,960	7,600	6,650	7,850	9,060	15,200	33,600	42,100	21,000	9,860	6,350	15,000
1932...	6,210	6,500	6,170	6,680	6,370	14,700	29,400	70,700	84,300	48,200	18,700	10,200	25,700
1933...	7,920	10,400	12,700*	11,700	8,780*	10,200	17,000	48,500	115,000	71,700	23,700	12,800	29,300*
1934...	11,430	23,890	32,120	40,010	27,600	24,760	54,830	87,470	63,630	27,960	13,560	7,997	34,610
1935...	7,563	13,200	13,710	12,000	13,800	13,290	17,550	47,610	77,920	43,230	18,420	9,900	24,060

* Estimated.

① Published as at Priest River, Idaho, prior to 1952.

Pend Oreille River (formerly Clark Fork) at Newport, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	7,097	6,574	6,282	6,597	4,380*	8,865	20,160	73,450	67,030	26,790	12,390	7,978	20,670*
1937...	6,757	6,049	6,987	4,271*	4,932*	6,622	11,410	34,900	55,690	33,530	14,620	8,376	16,140*
1938...	6,974	8,883	10,700	11,860	10,130	12,170	23,100	57,620	83,320	40,440	12,230	10,750*	23,980*
1939...	9,642*	8,613	8,045	9,887	9,811*	11,270	23,140	65,750	56,330	26,160	11,320	8,770*	20,700*
1940....	8,574*	8,309*	8,370	8,367	9,422	12,750	23,280	43,390	39,370	14,980	8,148	7,323	16,060*
1941...	8,497	8,767	8,198	10,420	10,820	11,690	14,630	21,340	26,990	15,740	8,735	9,294	12,920
1953.....				14,740	17,790	13,850	15,150	37,680	68,400	30,170	11,170	13,740	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903.....										44,800	19,000	14,100	.....
1904....	14,100	14,900	14,900	11,700	10,300	10,700	13,300	60,400	69,700	32,000	14,100	9,700	9,700
1905....	8,510	7,940	7,940	4,260	4,090	8,220	11,400	16,100	30,200	19,400	10,300	8,160	4,260
1906....	8,390	9,340	7,940	7,500	7,720	6,370	10,600	28,700	36,900	19,000	11,600	9,100	6,870
1907....	8,620	8,620				15,100	18,600	38,000	82,200	48,100	31,600	15,400	8,620
1908.....						9,340	13,900	44,900	69,200	41,200	16,500	10,600	.....
1909....	9,710	11,600	8,700	5,780	9,980	11,300	13,700	21,000	57,400	42,300	18,300	12,000	5,760
1910....	10,300	10,600	17,900	13,500	8,400	12,400	38,800	68,700	45,900	20,600	11,300	10,000	8,400
1911....	9,110	9,110	15,700	11,000	9,340	8,400	16,200	30,600	54,700	33,700	15,800	12,300	8,400
1912....	9,340	8,760	6,700		10,000	8,280	10,000	33,000	71,700	38,500	18,200	15,300	.....
1913....	12,600	13,000			7,430*	11,400*	13,200*	45,700*	91,700*	42,400*	20,900*	12,800*	.....
1914....	11,400*	11,600*	9,390*	9,920*	7,600*	11,680*	18,400*	39,200*	53,000*	20,700*	12,500*	10,000*	7,600*
1915....	10,400*	14,900*	12,200*	8,570*	9,080*	9,220*	13,400*	30,000*	40,300*	29,900*	16,400*	11,900*	8,570*
1916....	11,200*	10,900*	10,500*	6,760*	7,180*	13,600*	36,500*	50,100*	65,500*	71,600*	29,000*	19,800*	6,760*
1917....	13,600*	11,500*	5,730*	8,030*	8,010*	8,010*	9,570*	23,200*	104,000*	49,200*	18,400*	11,600*	5,730*
1918....	9,310*	8,690*	8,700*	24,300*	15,200*	14,600*	21,000*	41,400*	59,500*	29,500*	16,500*	10,800*	8,690*
1919....	9,560*	9,210*	8,700*	7,220*	11,400*	10,400*	14,700*	36,500*	49,300*	18,600*	9,490*	6,870*	6,870*
1920....	6,150*	6,450*	2,200*	4,780*	7,490*	6,780*	8,800*	18,400*	60,800*	34,800*	14,200*	.....	2,200*
1921....	12,300*	12,300*	11,700*	12,100*	11,400*	16,600*	23,400*	38,400*	83,300*	30,000*	13,700*	9,060*	9,060*
1922....	8,650*	9,490*	9,650*	8,660*	7,020*	7,730*	10,100*	21,100*	82,800*	26,800*	13,400*	9,320*	7,020*
1923....	8,070*	7,440*	3,460*	8,860*	4,710*	8,550*	11,000*	28,800*	77,200*	32,700*	15,600*	9,100*	3,460*
1924....	8,180*	7,700*	7,400*	3,820*	8,310*	10,700*	10,200*	17,900*	47,400*	21,600*	11,000*	7,780*	3,820*
1925....	7,460*	8,080*	6,380*	10,300*	12,600*	15,600*	18,300*	61,900*	77,500*	29,900*	15,000*	11,800*	6,380*
1926....	9,300*	8,500*	8,510*	8,270*	8,080*	9,480*	11,900*	35,500*	24,900*	12,900*	7,900*	8,310*	7,900*
1927....	9,470*	14,100*	15,700*	11,600*	10,890*	13,900*	15,100*	33,400*	84,800*	47,500*	19,900*	18,100*	9,470*
1928....	18,700*	21,700*	22,600*	19,400*	15,000*	14,100*	27,000*	34,800*	74,200*	40,600*	18,300*	10,800*	10,800*
1929....	10,300	9,880	8,080				10,500	17,600	57,500	21,300	9,880	6,880	.....
1930....	6,410	5,700	5,570		5,440	7,370	10,600	42,400	38,000	17,300	9,230	7,140	.....
1931....	7,140	7,510	6,790	6,460	6,960	7,140	11,700	20,000	31,400	13,800	6,960	6,150	6,150
1932....	5,930	5,990	5,710	4,880	4,100	11,500	20,000	40,600	75,500	28,400	12,600	8,490	4,100
1933....	7,290	8,110				9,200	12,500	37,700	75,000	38,200	16,200	11,000	7,290
1934....	10,100	16,600	21,300	32,300	28,000	22,400	34,000	80,700	42,900	18,600	10,300	6,550	6,550
1935....	6,550	8,980	13,000	9,420	13,600	12,100	13,400	28,000	63,200	26,900	13,400	7,690	6,550
1936....	6,600	6,080	5,920	5,500*	3,380	6,250	6,970	52,200	43,600	17,000	9,170	6,940	3,380
1937....	6,360	5,600	5,000	3,000*	4,000*	5,500*	7,610	16,700	51,400	20,700	10,400	6,920	3,000*
1938....	6,720	6,650	6,630	7,400*	7,350	9,470	14,400	43,400	70,400	20,000	9,700*	9,600*	6,630
1939....	9,360*	7,720	7,530	9,000*	5,800*	9,760	16,200	38,800	41,900	15,600	8,860	6,540	5,800*
1940....	8,400*	7,530	7,500	4,700	8,420	11,100	17,900	31,100	24,200	9,880	6,960	6,750	4,700
1941....	7,380	8,260	4,190	9,710	10,300	11,100	12,400	17,400	21,800	10,300	7,910	7,720	4,190
1953.....				11,700	14,900	6,160	12,500	24,700	30,900	15,300	6,660	3,850	.....

* Estimated.

PEND OREILLE RIVER BASIN

Pend Oreille River (formerly Clark Fork) at Newport, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1903										
1904			9,700	29,500	1.22	16.59	21,400,000	27,700	15.59	20,100,000
1905			4,260	15,200	.623	8.54	11,000,000	15,400	8.64	11,200,000
1906			6,870	16,000	.698	9.50	12,300,000	18,200	10.22	13,200,000
1907			8,620	34,100	1.41	19.12	24,700,000	33,800	18.99	24,600,000
1908				29,700	1.23	16.70	21,600,000	29,200	16.38	21,200,000
1909			5,760	26,500	1.10	14.86	19,200,000	27,800	15.59	20,100,000
1910			8,400	28,600	1.18	16.01	20,700,000	28,200	15.81	20,400,000
1911			8,400	25,800	1.07	14.46	18,700,000	24,500	13.76	17,700,000
1912				25,700	1.06	14.44	18,600,000	27,000	15.16	19,600,000
1913	136,000†	June 15, 1913		33,500	1.38	18.78	24,200,000	32,800	18.37	23,700,000
1914			7,600	23,700	.979	13.28	17,100,000	24,600	13.78	17,900,000
1915			8,570	20,700	.855	11.57	15,000,000	19,600	10.99	14,200,000
1916			8,760	37,500	1.55	21.12	27,300,000	38,000	21.36	27,600,000
1917			5,730	31,700	1.31	17.76	22,900,000	30,900	17.34	22,400,000
1918			8,690	20,700	1.23	16.65	21,500,000	29,600	16.60	21,400,000
1919			6,570	21,200	.876	11.92	15,400,000	20,200	11.38	14,700,000
1920			2,200	21,100	.672	11.38	15,300,000	23,000	12.92	16,700,000
1921	109,000†	June 14, 1921	9,060	30,300	1.25	16.96	21,900,000	29,300	16.44	21,200,000
1922			7,020	24,100	.996	13.53	17,400,000	23,600	13.24	17,100,000
1923			3,460	24,500	1.01	13.74	17,700,000	24,600	13.81	17,600,000
1924			3,820	19,600	.810	11.04	14,300,000	19,700	11.07	14,300,000
1925			6,350	31,300	1.29	17.54	22,700,000	31,500	17.68	22,800,000
1926			7,900	15,800	0.653	8.88	11,500,000	17,200	9.66	12,500,000
1927			9,470	34,100	1.41	19.14	24,700,000	36,900	20.71	20,700,000
1928			10,800	37,400	1.55	21.02	27,200,000	33,400	18.74	24,200,000
1929	73,200	June 18, 1929		18,600	.769	10.41	13,400,000	17,700	9.93	12,600,000
1930	50,100	June 5, 6, 1930		17,100	.707	9.58	12,300,000	17,300	9.74	12,600,000
1931	50,800	①	6,150	15,000	.620	8.40	10,800,000	14,600	8.20	10,600,000
1932	98,000	May 27, 1932	4,100	25,700	1.06	14.44	18,700,000	26,700	15.02	19,400,000
1933	136,000	June 21, 1933	7,290	29,300	1.21	16.44	21,200,000	32,300	18.14	23,400,000
1934	91,200	May 12-14, 1934	6,550	34,610	1.43	19.41	25,050,000	31,840	17.86	23,050,000
1935	83,600	June 9-11, 1935	6,550	24,050	.994	13.49	17,410,000	22,830	12.81	16,830,000
1936	86,400	May 21, 1936	3,530	20,670	.854	11.63	15,010,000	20,570	11.57	14,930,000
1937	59,100	June 7, 1937	3,000	16,140	.667	9.05	11,690,000	16,780	9.41	12,150,000
1938	93,400	June 9, 1938	6,630	23,980	.991	13.45	17,360,000	23,970	13.45	17,380,000
1939	75,300	May 23, 1939	5,800	20,700	.855	11.61	14,950,000	20,650	11.53	14,950,000
1940	55,100	②	4,700	10,060	.664	9.03	11,660,000	16,040	9.02	11,646,000
1941	30,200	③	4,190	12,920	.534	7.25	9,856,000			
1953	96,500	June 17, 1953								

† Maximum observed.

① May 28-31, June 1, 3, 1931. ② May 30, 31, 1940. ③ June 8, 11, 12, 1941.

PEND OREILLE RIVER BASIN

429

Calispell Creek near Dalkena, Wash.

Location.—Lat. 48°14'40", long. 117°20'30", in SW¼ sec. 26, T. 32 N., R. 43 E., on left bank, 2 miles upstream from Calispell Lake, 4.8 miles west of Dalkena, and 9 miles upstream from mouth.

Drainage area.—67.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,070 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 877 cfs Apr. 26, 1952 (gage height, 6.65 ft.); minimum, 6.0 cfs Oct. 3, 1950; minimum gage height, 2.75 ft. Nov. 30, 1952.

Remarks.—Some diversion for irrigation above station. Regulation by Power Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950											16.5	14.4	
1951	23.7	33.5	80.6	59.0	115	68.6	356	276	64.4	26.8	19.4	18.3	95.3
1952	20.7	24.8	53.1	26.7	50.6	58.4	406	276	77.9	37.6	20.6	16.1	89.5
1953	14.7	14.1	13.7	34.3	51.5	54.6	180	211	107	32.9	20.2	16.2	62.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950											15.5	13	
1951	6.5	20	33	41	40*	54	127	104	38	21	18.5	17	6.5
1952	14	24	24	20*	40	33*	117	133	49	25	16.5	15	14
1953	14	13.5	13.5	14	27	27	64	136	50	24	17	15.5	13.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1950							
1951	515	April 14, 1951	6.5	95.3	68,970	92.3	66,790
1952	877	April 26, 1952	14	89.6	65,030	84.1	61,010
1953	755	April 28, 1953	13.5	62.4	45,170		

* Estimated.

PEND OREILLE RIVER BASIN

Sullivan Creek near Metaline Falls, Wash.

Location.—Lat. 48°51'10", long. 117°17'20", in sec. 30, T. 39 N., R. 44 E., on right bank, an eighth of a mile downstream from Outlet Creek, half a mile downstream from Sullivan Lake, and 4 miles east of Metaline Falls.

Drainage area.—122 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,550 ft. (from topographic map).

Average discharge.—13 years (1912-25), 191 cfs.

Extremes.—1912-25: Maximum discharge observed, 1,650 cfs June 2, 1913 (gage height, 4.2 ft.); minimum observed, 15 cfs Aug. 27, 28, Sept. 14-17, 1924 (gage height, 0.5 ft.).

Remarks.—Flow regulated by storage in Sullivan Lake for power purposes.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912								451	347	160	106	103	.....
1913	122	122	117	83.5*	96.7	102	190	526	982*	283	155	140	242*
1914	116	97.3	91.6	107	88.1	91.2	290	903	707	222	107	118	246
1915	116	157	92.9	88.6	90.1	108	346	433	272	123	98.4	109	169
1916	103	105	104	83.2	90.0	126	201	469	846	425	141	118	235
1917	102	98.2	87.0	76.2	81.2	79.0	104	433	890	390	125	91.6	216
1918	105	104	115	111	99.1	105	165	327	375	151	101	79.1	153
1919	84.6	81.6	78.1	90.4	91.4	71.9	221	749	642	203	111	117	212
1920	97.1	119	105	113	103	84.5	72.6	188	325	144	184	181	141
1921	109	131	114	95.3	98.9	135	232	663	767	222	118	101	232
1922	77.1	82.5	83.3	72.0	153	205	82.9	297	461	129	85.5	87.8	151
1923	89.7	95.9	117	113	86.4	66.2	114	433	419	160	93.8	78.9	155
1924	60.0	65.6	95.3	127	121	103	114	338	126	56.7	52.8	37.8	108
1925	58.5	65.7	76.6	78.0*	121*	122*	451*	775*	580*	222*	90.2*	45.7*	225*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912								300*	168	85	85	96	.....
1913	96	96	96	54*	53	85	85	222	500*	164	100	120	53
1914	94	83	74	83	60*	74	74	395	420	106	94	83	60*
1915	94	148	74	64	74	83	164	336	145	106	85	95	64
1916	94	84	84	75	75	84	144	316	430	180	120	108	75
1917	97	86	77	69	77	77	77	120	574	193	88	79	69
1918	92	97	99	88	90	83	118	173	166	90	90	74	74
1919	77	64	67	64	84	46	74	278	361	109	98	98	46
1920	87	84	100	89	75	67	56	59	138	128	92	111	56
1921	100	109	100	76	87	121	142	272	352	148	102	77	77
1922	75	75	75	68	72	85	41	50	286	96	61	74	41
1923	82	78	109	100	75	50	61	199	276	113	84	68	56
1924	.....	57	62	116	108	84	84	64	73	35	15	15	15
1925	45	35	58										

* Estimated.

Sullivan Creek near Metaline Falls, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1912							
1913	1,650†	June 2, 1913	53	242	176,000	238	173,000
1914	1,340†	May 16, 1914	60	246	178,000	251	181,000
1915	635†	April 24, 1915	64	169	123,000	166	120,000
1916	1,540†	June 17, 1916	75	235	170,000	232	168,000
1917	1,400†	June 19, 1917	69	216	156,000	219	159,000
1918	646†	June 9, 1918	74	153	111,000	146	106,000
1919	1,580†	May 23, 1919	46	272	154,000	219	158,000
1920	495†	June 10, 19, 1920	56	141	103,000	144	105,000
1921	1,540†	June 8, 1921	77	232	168,000	223	161,000
1922	850†	June 4, 1922	41	151	109,000	156	113,000
1923	682†	May 12, 1923	56	155	113,000	149	108,000
1924	495†	May 15, 1924	15	108	78,600	107	77,400
1925				225	163,000		

† Maximum observed.

Pend Oreille River (formerly Clark Fork) below Z Canyon, near Metaline Falls, Wash.

(International gaging station)

Location.—Lat. 48°58'50", long. 117°20'40", in lot 2, sec. 11, T. 40 N., R. 43 E., on right bank, three-quarters of a mile downstream from Z Canyon, 1½ miles south of international boundary, 5 miles downstream from Slate Creek, and 10 miles downstream from Metaline Falls.

Drainage area.—25,200 sq. mi., approximately. At site prior to October 1928, 25,100 sq. mi., approximately.

Supplemental records available.—November 1908 to September 1910, gage heights only.

Records of chemical analyses and water temperatures for the period January 1949 to September 1950 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is 1,721.80 ft. above mean sea level, datum of 1929 (levels by Corps of Engineers). Nov. 4, 1908, to Sept. 4, 1910 and Oct. 1, 1912, to Dec. 18, 1928, staff gages at Metaline Falls 10 miles upstream at datum 262.2 ft. higher.

Average discharge.—41 years (1912-53), 26,160 cfs.

Extremes.—1912-53: Maximum discharge, 171,300 cfs June 13, 1948 (gage height, 60.25 ft.); minimum, 2,500 cfs Dec. 12, 1919 (gage height, —2.4 ft., site and datum then in use).

Flood of June 1894 reached a stage of 69.0 ft., from floodmarks.

Remarks.—Many diversions for municipal use and irrigation of about 340,000 acres above station. Flow partly regulated by several reservoirs upstream (combined capacity, 1,528,800 acre-ft. in 1950).

Cooperation.—This station is one of the international gaging stations maintained by the United States under agreement with Canada.

PEND OREILLE RIVER BASIN

Pend Oreille River (formerly Clark Fork) below Z Canyon,
near Metaline Falls, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913...	14,200	16,100	15,800	11,000	11,100	12,800	26,500	59,900	126,000	71,600	29,500	16,300	34,300
1914...	12,100	13,300	12,100	12,100	10,500	15,000	27,900	55,600	64,200	39,900	18,300	11,100	24,400
1915...	12,500	19,700	16,300	11,300	9,630	10,900	20,200	37,200	42,700	35,700	23,200	13,400	21,200
1916...	11,900	11,800	12,000	8,540	11,100	22,500	42,000	36,200	88,500	114,000	45,400	23,600	36,200
1917...	16,500	13,200	10,800	9,400	9,620	8,870	18,100	55,700	115,000	84,900	30,100	14,500	32,400
1918...	10,700	9,450	11,600	81,300	19,200	16,300	30,300	64,800	50,300	53,000	21,100	13,100	30,200
1919...	10,400	10,400	9,780	10,300	13,200	11,500	23,700	51,000	67,700	31,700	13,600	8,340	21,800
1920...	6,760	7,090	5,470	6,300	8,640	8,200	12,600	41,400	70,200	55,000	22,200	13,500*	21,600*
1921...	14,200	13,500	13,600	14,200	14,600	20,300	28,700	64,300	103,000	52,700	20,200	11,200	30,900
1922...	9,380	9,130	11,500	11,000	9,540	9,020	15,300	44,000	97,600	47,900	18,500	11,400	24,500
1923...	8,300	8,180	7,230	11,900	8,350	9,290	19,600	51,100	85,400	55,000	22,100	11,800	25,000
1924...	8,700	8,250	8,390	6,540	11,900	12,300	13,200	51,300	61,800	32,700	15,200	9,210	20,000
1925...	7,900	9,140	9,020	12,100	19,000	17,400	42,400	83,700	95,000	53,000	21,000	13,200	31,900
1926...	10,600	9,370	9,200	8,850	9,400	10,600	13,300	46,500	34,500	17,300	9,640	8,960	16,200
1927...	12,300	15,600	15,400	14,600	12,600	14,600	18,800	61,000	115,000	53,000	30,300	19,900	34,800
1928...	21,000	28,700	30,700	21,100	18,300	18,700	25,500	82,700	106,000	59,800	27,600	14,700	38,200
1929...	11,000	11,000	9,100	6,800	6,630	8,650	12,400	33,400	69,100	39,200	15,900	8,250	19,300
1930...	6,330	6,350	6,730	5,550	7,350	8,840	21,500	48,100	47,900	28,100	13,200	7,980	17,400
1931...	7,740	8,050	7,710	6,770	7,680	9,430	15,400	37,700	44,000	22,600	10,200	6,640	15,400
1932...	6,200	6,600	6,270	6,790	6,690	15,500	31,300	71,900	87,500	52,000	19,800	10,600	28,800
1933...	8,330	10,700	14,200	13,400	10,200	10,600	13,800	50,300	116,000	77,900	25,500	13,200	30,500
1934...	11,620	24,510	32,580	42,960	30,460	27,060	58,740	90,600	66,610	30,460	14,120	8,524	36,270
1935...	7,744	13,600	14,270	12,450	14,460	14,110	19,470	48,800	80,470	46,700	19,820	10,300	25,210
1936...	7,778	7,366	6,895	7,183	4,585*	9,367	19,940	73,870	70,070	29,230	12,590	8,220	21,460*
1937...	6,930	6,278	6,222	4,627*	5,195*	7,047	11,800	34,380	57,400	36,540	15,260	8,759	16,760*
1938...	7,258	8,674	10,870	12,950	10,770	13,590	25,390	69,040	86,430	44,660	13,060	11,030	25,350
1939...	9,745	8,788	8,116	9,971	9,601	11,220	24,040	65,700	57,160*	27,340*	11,630	8,899	21,090*
1940...	8,877	8,608	8,925	8,542	9,780	13,910	25,660	44,500	42,370	16,270	8,296	7,595	16,930
1941...	8,715	9,161	8,789	10,500	11,350	12,900	15,680	22,770	29,110	16,570	8,914	9,431	13,680
1942...	12,220	14,750	23,560	26,650	16,310	12,620	20,320	42,530	64,510	40,250	16,060	11,070	25,120
1943...	9,262	10,930	12,840	13,040	17,890	13,700	46,310	69,820	92,920	70,020	22,620	13,200	32,750
1944...	13,120	12,470	11,430	9,795	8,893	9,050	12,180	22,750	35,600	21,380	9,645	8,140	14,540
1945...	8,656	9,014	8,904	10,850	12,360	13,670	15,440	39,510	67,220	36,140	12,360	8,748	20,250
1946...	9,617	11,310	13,560	15,810	15,450	18,050	30,160	70,110	76,770	38,410	15,120	10,590	27,140
1947...	10,830	14,260	22,860	21,580	21,300	24,030	32,390	89,070	86,930	39,420	15,700	12,450	32,620
1948...	17,750	24,530	18,150	19,409	17,440	17,150	25,210	76,660	150,500	53,580	23,300	12,640	37,670
1949...	10,580	11,210	11,000	13,940*	14,550	17,020	29,350	79,430	76,630	28,020	13,150	8,921	26,190*
1950...	10,780	13,350	17,160	16,430	19,250	24,510	31,310	54,540	108,900	89,680	28,310	13,790	35,650
1951...	13,680	23,310	23,670	29,790	30,150	27,500	35,960	60,230	87,370	57,050	22,510	14,410	37,170
1952...	19,190	19,620	19,870	17,070*	20,340	17,780	30,100	80,120	50,090	23,540	9,626	10,950	26,520*
1953...	13,210	26,260	16,730	16,130	19,900	10,280	17,400	40,220	73,380	33,170	12,630	13,770	24,660

* Estimated.

Pend Oreille River (formerly Clark Fork) below Z Canyon,
near Metaline Falls, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913...	12,900	13,300	.....	.....	7,720	11,700	13,500	46,400	95,800	42,900	21,300	13,300	.....
1914...	11,700	11,900	9,870	10,200	7,800*	11,900	18,600	40,400	54,300	27,000	12,800	10,400	7,800*
1915...	10,800	15,400	12,400	8,760	9,330	9,500	13,900	31,300	40,700	30,300	16,700	12,200	8,760
1916...	11,600	11,300	10,800	6,980	7,400	13,900	36,900	51,000	67,100	72,100	29,400	20,200	6,980
1917...	13,900	11,800	5,960	8,240	8,240	8,240	9,850	25,600	106,000	49,900	18,700	11,900	5,960
1918...	9,650	9,070	9,070	24,600	15,500	14,900	21,400	41,900	60,400	29,300	16,800	11,000	9,070
1919...	9,800	9,500	8,900	7,460	11,700	10,600	14,900	35,100	59,400	18,900	9,800	7,200	7,200
1920...	6,440	6,720	2,500	5,190	7,730	7,000	8,970	18,600	61,800	35,200	15,400	.....	2,500
1921...	12,600	12,800	12,000	12,400	11,700	17,000	23,900	39,200	84,400	30,400	14,000	9,290	9,290
1922...	8,880	8,740	9,920	8,880	7,780	8,320	10,400	21,300	83,500	27,100	13,700	9,600	7,780
1923...	8,320	7,780	3,500	9,160	4,960	8,740	11,200	29,400	78,600	33,000	15,900	9,900	3,800
1924...	8,320	7,900	7,600	4,120	8,740	1,000	10,500	18,700	47,600	21,900	11,200	7,340	4,120
1925...	7,650	8,360	6,600	10,600	13,100	16,000	18,700	63,400	78,700	30,200	15,400	12,100	6,600
1926...	9,580	8,800	8,800	8,510	8,370	9,750	12,700	36,300	25,300	13,000	8,090	8,510	8,090
1927...	9,750	14,000	16,200	11,900	11,200	14,300	15,400	34,200	86,700	48,000	20,400	13,500	9,750
1928...	19,300	22,500	23,400	20,000	15,500	14,500	27,600	35,600	75,300	41,100	18,800	12,100	12,100
1929...	10,400	10,200	8,350	.....	5,470	7,190	10,900	17,200	60,700	24,400	10,900	7,010	.....
1930...	6,600	5,880	5,630	4,350	5,310	7,800	10,800	41,400	40,500	18,500	9,540	7,390	4,350
1931...	7,390	7,550	7,010	6,450	7,200	7,780	11,900	16,900	33,700	14,900	7,200	6,270	6,270
1932...	6,050	5,540	5,200	5,990	5,000*	12,100	21,500	42,900	80,400	30,400	13,600	9,960	5,000*
1933...	8,050	8,050	11,400	10,300	7,840	9,280	13,700	32,500	71,800	41,500	16,100	11,100	7,840
1934...	10,600	16,100	22,200	35,500	26,100	25,100	35,300	83,900	46,000	19,500	10,300	6,770	6,770
1935...	6,710	9,770	13,300	7,500*	13,300	12,700	14,700	30,700	67,600	29,800	13,600	8,020	6,710
1936...	7,600	7,030	6,460	5,700*	3,800*	6,650	8,580	52,200	46,900	17,800	9,250	7,410	3,800*
1937...	6,480	5,990	5,620	8,500*	4,300*	5,900*	8,090	26,600	54,400	22,400	10,900	7,090	3,500*
1938...	6,970	7,330	7,520	10,300*	8,670	10,200	16,200	46,400	74,100	22,200	9,980	9,740	6,970
1939...	9,350	8,120	7,700*	9,700*	5,000*	9,900	16,400	38,000	44,000	16,400	9,060	8,700	5,000*
1940...	5,550	5,320	7,860	4,850	8,850	11,300	20,000	32,700	28,300	10,000	7,240	7,180	4,850
1941...	7,900	8,660	5,930	10,100	10,900	11,400	14,200	18,500	24,000	10,500	8,060	7,880	5,930
1942...	10,800	13,100	15,700	21,300	13,100	12,300	12,400	34,800	52,300	24,000*	12,400	10,300	10,300
1943...	8,820	9,840	12,200	9,210	15,800	12,100	19,500	61,700	79,500	38,900	14,700	12,300	8,820
1944...	12,600	17,000	10,300	9,160	8,360	8,050	9,690	14,200	32,100	12,100	8,580	7,640	7,640
1945...	8,450	8,760	7,510	8,320	11,300	11,800	14,700	17,600	56,600	13,600	8,990	8,050	7,510
1946...	9,160	10,500	13,100	15,000	15,000	16,000	21,900	49,300	58,400	22,500	11,500	10,200	9,160
1947...	10,100	12,500	17,300	19,100	19,200	22,100	27,800	45,800	62,000	23,600	12,400	11,800	10,100
1948...	11,600	20,300	16,800	18,100	12,000	15,000	16,500	44,700	108,000*	29,500	16,800*	10,000	10,600
1949...	10,500	10,600	9,000*	10,500*	12,900	15,900	18,500	46,700	43,500	17,500	10,400	8,300	8,300
1950...	8,190	11,700	16,300	13,700*	16,300*	20,700	24,800	39,000	87,900	43,600	19,200	11,000	8,190
1951...	10,800	21,100	19,800	20,700	21,000	24,000	24,700	45,600	76,000	35,000	15,300	13,500	10,800
1952...	13,900	18,700	15,200*	15,600*	17,900	16,400	18,200	59,200	33,500	13,900	5,910	5,010	5,010
1953...	7,480	23,000	13,500	13,100	17,000	13,500	15,300	27,900	37,700	16,700	7,700	5,150	5,150

* Estimated.

PEND ORELLE RIVER BASIN

Pend Orelle River (formerly Clark Fork) below Z Canyon,
near Metaline Falls, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1913	139,000	June 16, 1913	.....	34,300	1.37	18.56	24,600,000	33,600	18.17	24,300,000
1914	70,100	June 1, 1914	7,800	24,400	.972	13.22	17,700,000	25,300	13.71	15,300,000
1915	44,000	May 31, 1915	8,760	21,200	.845	11.46	15,300,000	20,100	10.87	14,600,000
1916	133,000	July 9, 1916	6,980	33,200	1.52	20.72	27,700,000	33,700	20.97	28,100,000
1917	122,100	June 25, 1917	5,960	32,400	1.29	17.53	23,400,000	31,600	17.08	22,900,000
1918	99,100	June 24, 1918	9,070	30,200	1.20	16.82	21,800,000	30,100	16.27	21,800,000
1919	79,100	June 5, 1919	7,200	21,800	.609	11.79	16,800,000	20,900	11.27	16,100,000
1920	82,600	June 25, 1920	2,500	21,500	.857	11.65	15,600,000	23,400	12.66	17,000,000
1921	111,000	June 14, 1921	9,290	30,900	1.23	16.71	22,400,000	30,000	16.20	21,700,000
1922	107,000	June 15, 1922	7,780	24,600	.976	13.23	17,800,000	24,100	13.00	17,400,000
1923	91,900	June 17, 1923	3,890	25,000	.906	13.48	18,100,000	25,100	13.55	18,100,000
1924	81,000	May 28, 1924	4,120	20,000	.797	10.22	14,500,000	20,000	10.84	14,500,000
1925	114,000	May 30, 1925	6,600	31,900	1.27	17.26	23,100,000	32,200	17.41	23,300,000
1926	50,400	May 11, 1926	8,090	16,200	.645	8.75	11,700,000	17,600	9.52	12,700,000
1927	133,000	June 23, 1927	9,750	34,800	1.39	18.51	25,200,000	37,600	20.35	27,200,000
1928	137,000	June 4, 1928	12,100	38,200	1.52	20.69	27,700,000	34,100	18.46	24,700,000
1929	74,500	June 19, 1929	.....	19,300	.768	10.43	14,000,000	18,400	9.92	13,300,000
1930	60,900	June 7, 1930	4,350	17,400	.690	9.37	12,600,000	17,700	9.53	12,900,000
1931	51,500	June 1, 1931	6,270	15,400	.611	8.27	11,100,000	15,000	8.08	10,900,000
1932	98,000	May 28, 1932	5,000	26,500	1.05	14.45	19,500,000	23,000	15.11	20,300,000
1933	137,000	June 22, 1933	7,840	30,800	1.22	16.61	22,300,000	33,500	18.22	24,500,000
1934	94,400	May 14, 1934	6,710	36,270	1.44	19.54	26,260,000	33,400	18.03	24,250,000
1935	85,500	June 12, 1935	6,710	25,210	1.00	13.58	18,250,000	24,070	12.99	17,430,000
1936	87,200	May 22, 1936	3,800	21,460	.852	11.61	15,580,000	21,240	11.46	15,420,000
1937	59,900	June 8, 1937	3,500	16,760	.665	9.01	12,130,000	17,360	9.34	12,580,000
1938	96,500	June 10, 1938	6,970	25,350	1.01	13.84	18,350,000	25,330	13.64	18,340,000
1939	76,400	May 26, 1939	5,000	21,090	.837	11.35	15,270,000	21,070	11.34	15,250,000
1940	56,800	May 31, 1940	4,850	16,930	.672	9.16	12,290,000	16,950	9.17	12,310,000
1941	32,000	June 13, 1941	5,930	13,650	.543	7.37	9,902,000	15,600	8.45	11,360,000
1942	70,300	June 14, 1942	10,300	25,120	.997	13.54	18,180,000	23,640	12.74	17,110,000
1943	103,000	June 28, 1943	8,820	32,760	1.30	17.62	23,710,000	33,060	17.80	23,650,000
1944	38,100	June 20, 1944	7,640	14,540	.577	7.55	10,560,000	13,670	7.39	9,922,000
1945	79,500	June 11, 1945	7,510	20,250	.804	10.93	14,660,000	20,020	11.28	15,140,000
1946	88,000	June 8, 1946	9,160	27,140	1.08	14.63	19,650,000	28,280	15.25	20,470,000
1947	107,000	May 18, 1947	10,100	32,620	1.29	17.57	23,610,000	33,650	18.12	24,360,000
1948	171,300	June 13, 1948	10,600	37,970	1.51	20.62	27,570,000	35,670	19.27	25,900,000
1949	104,400	May 26, 1949	8,300	26,190	1.04	14.69	18,960,000	26,910	14.48	19,480,000
1950	128,000	June 28, 1950	8,190	35,650	1.41	19.22	25,310,000	37,270	20.09	26,980,000
1951	109,400	①	10,800	37,170	1.48	20.02	26,910,000	37,010	19.94	26,800,000
1952	81,600	May 26, 1952	6,010	26,520	1.05	14.33	19,250,000	26,290	14.20	19,090,000
1953	100,700	June 16, 1953	5,150	24,880	.987	13.40	18,010,000	.....	.....	.....

① May 31, June 1, 1951.

Salmo River near Waneta, British Columbia

Location.—Lat. 49°01'30", long. 117°22'30", on left bank, three-quarters of a mile upstream from mouth and 15 miles east of Waneta.

Drainage area.—500 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 1,750 ft. above mean sea level (from topographic map).

Average discharge.—10 years (1936-46), 1,013 cfs.

Extremes.—1936-46: Maximum discharge observed, 9,600 cfs May 30, 1945 (gage height, 14.95 ft.); minimum, 78 cfs Feb. 19, 1937 (result of discharge measurement during period of ice effect), but may have been less during other periods of ice effect.

Remarks.—No known regulation.

Cooperation.—Records furnished and published by Dominion Water and Power Bureau, Department of Mines and Resources, Canada. Published here as an auxiliary to the international gaging stations.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936						169	2,760	3,840	1,070	341	181	158	.....
1937	135	123	131	95*	81*	134	588	2,990	2,240	623	226	158	630*
1938	216	464	382	383	297	565	2,410	4,810	3,130	572	183	125	1,130
1939	229	254	240*	273	187*	453	2,750	3,890	2,060	794	223	175	962*
1940	233	291	579	324*	281	790	2,460	3,940	1,690	344	171	164	940*
1941	309	304	260	264	267	1,030	2,230	3,210	1,740	806	303	1,070	985
1942	1,200	994	1,480	486*	371	357	1,930	3,560	3,500	1,330	429	229	1,330*
1943	195	225	204	169	186*	260	3,070	3,330	3,440	1,350	333	151	1,050*
1944	341	248	298	221	164	175	1,240	2,680	1,580	429	199	211	643
1945	215	362	245	204	224	329	955	5,110	3,350	682	209	227	1,030
1916	227	444	335	283	242	504	2,850	6,580	3,520	1,130	291	306	1,400

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936						124*	172	2,080	491	195	143	141	.....
1937	123	107	110	80*	78*	90*	266	1,450*	1,450	279	168	137	78*
1938	152	237	219	199	252	302	634	2,460	1,260	246	130	108	108
1939	126	161	118*	154*	90*	154	1,330	2,570	1,660	327	163	151	90*
1940	151	233	259	214*	241*	333	1,600	2,370	561	240	129	119	119
1941	151	211	127*	186	190	554	1,740	1,640	1,260	373	218	376	127*
1942	847	759	787*	354*	238	312	680	1,770	2,600	739	292	181	181
1943	168	161	186	145*	155*	132	915	1,870	2,710	477	223	153	132
1944	141	209	177	134*	132	130	273	1,900	735	236	149	116	116
1945	113	246	197	143	151	199	516	2,420	1,640	309	147	147	113
1946	163	303	172	233	216	293	1,120	4,780	2,150	409	195	211	163

* Estimated.

PEND OREILLE RIVER BASIN

Salmo River near Waneta, British Columbia—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1936	7,630†	April 25, 1936								
1937	4,840†	May 27, 1937	78	630	1.26	17.12	457,000	688	18.65	495,000
1938	9,060†	May 26, 1938	108	1,130	2.26	30.74	819,000	1,110	30.04	801,000
1939	6,720†	April 30, 1939	90	962	1.92	26.15	697,000	991	26.96	718,000
1940	6,190†	May 11, 1940	119	940	1.88	25.60	688,000	921	25.07	668,500
1941	6,820†	May 18, 1941	127	985	1.97	26.75	713,100	1,220	33.15	684,500
1942	9,340†	May 27, 1942	181	1,330	2.66	36.01	900,800	1,070	29.03	774,300
1943	6,600†	May 27, 1943	132	1,080	2.16	29.29	751,500	1,090	29.67	791,400
1944	3,840†	May 16, 1944	116	643	1.29	17.51	466,700	646	17.57	468,600
1945	9,600†	May 30, 1945	113	1,030	2.06	27.94	745,900	1,046	23.38	757,000
1946	8,760†	May 6, 1946	163	1,400	2.80	38.02	1,013,000			

† Maximum observed.

COLUMBIA RIVER MAIN STEM

Columbia River at international boundary

(International gaging station)

Location.—Lat. 49°00'03", long. 117°37'40", in SE¼ sec. 4, T. 40 N., R. 41 E., on left bank at international boundary, half a mile downstream from Pend Oreille River.

Drainage area.—59,700 sq. mi., approximately.

Supplemental records available.—Gage-height records, except 1916-20, collected at Northport, Kettle Falls, Marcus, or international boundary since 1895 are contained in reports of U. S. Weather Bureau. Records of chemical analyses since November 1951 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is at mean sea level. (Bureau of Reclamation 1937 datum). Mar. 26, 1938, to Apr. 26, 1939, staff gage at same site and datum.

Auxiliary water-stage recorder 2.2 miles downstream from base gage.

Average discharge.—16 years (1937-53), 93,710 cfs.

Extremes.—1937-53: Maximum discharge, 550,100 cfs June 12, 1948 (elevation, 1,338.13 ft.); minimum, 20,700 cfs Mar. 9, 1944 (elevation, 1,289.91 ft.).

Flood of June 1894 reached a stage of 1,346 ft., from information by the Bureau of Reclamation (discharge, 680,000 cfs).

Flow of about 12,900 cfs occurred Jan. 30 or 31, 1937, based on information from other gaging stations (elevation, 1,287.9 ft.), from rating curve extended below 1,291.6 ft., may have been as low sometime in January 1930.

Remarks.—Many diversions above station for irrigation. It was estimated that 346,700 acres were under irrigation in the United States in 1946. Water is diverted for the irrigation of an additional 25,000 acres in Canada. The flow is affected by internationally controlled storage in Kootenay Lake as well as by natural and controlled regulation in other lakes and reservoirs in Kootenay and Pend Oreille River basins.

Cooperation.—This station is one of the international gaging stations maintained by the United States under agreement with Canada.

COLUMBIA RIVER MAIN STEM

Columbia River at international boundary—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938...	36,510*	50,060*	36,060*	33,400*	26,430*	31,660*	64,970	175,500	310,500	214,400	91,490	68,910	65,260*
1939...	49,430	33,540	27,870	28,390	26,250	26,530	62,000	201,500	212,000	173,700	101,000	62,550	84,140
1940...	46,140	46,860	41,050	30,920	29,410	37,570	70,870	159,700	215,700	145,400	89,160	71,280	82,080
1941...	56,930	44,010	30,260	28,890	28,580	36,060	63,630	125,800	160,000	126,500	87,210	75,590	72,640
1942...	68,710	55,910	65,180	49,850	39,330	35,250	53,800	138,400	251,600	210,500	114,300	59,680	95,560
1943...	45,589	36,500	33,530	31,040	34,140	29,550	103,600	162,100	251,400	254,300	121,700	59,690	97,270
1944...	46,370	37,090	31,790	27,960	24,300	22,940	33,570	94,950	178,900	116,100	88,890	60,980	63,630
1945...	49,170	39,830	30,700	29,270	30,310	31,540	35,430	122,900	247,900	174,500	89,750	53,950	78,180
1946...	38,350	35,350	31,720	32,510	32,140	40,540	72,160	230,800	323,400	216,500	113,500	67,970	103,300
1947...	68,710	55,160	42,120	38,600	42,170	50,740	78,860	245,600	297,100	201,900	102,700	63,240	103,800
1948...	82,840	67,550	42,500	40,630	36,770	37,540	57,100	203,300	477,400	208,900	123,000	74,960	121,200
1949...	50,290	39,990	33,000	31,720	29,890	33,740*	66,620	229,900	258,900	125,000	85,180	55,690	85,270*
1950...	40,450	33,610	43,450	35,290	39,120	50,000	61,030	138,000	340,400	335,600	131,000	73,260	111,000
1951...	57,270	59,390	56,400	60,910	65,980	53,020	78,090	235,900	275,900	256,200	124,000	68,440	116,300
1952...	68,610	50,060	44,320	38,760	39,840	38,850	71,470	224,100	244,600	182,000	98,380	55,370	96,400
1953...	49,280	48,110	33,160	32,250	39,950	37,410	39,940	144,400	280,800	219,700	103,700	74,650	93,310

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938...	.....	.....	.....	.....	.....	25,500*	37,300	125,200	296,000	142,300	68,300	61,900	.....
1939...	38,800	29,700	24,000	27,000	21,800	23,200	38,500	115,000	191,000	133,100	79,200	48,300	21,800
1940...	37,600	35,300	34,600	25,500	28,500	30,800	58,000*	92,700	187,500	121,400	71,100	57,900	25,500
1941...	44,400	33,300	25,800	27,600	27,300	29,600	49,100	89,600	142,700	101,600	76,300	70,260	25,800
1942...	62,800	43,800	49,000	45,300	34,500	33,400	35,800	84,800	216,000	160,000	82,600	48,100	33,400
1943...	40,600	34,500	32,600	27,400*	31,500	26,500	40,800	141,000	224,000	190,000	77,700	48,100	26,500
1944...	43,000	32,800	29,800*	25,600	22,400	21,200	23,900	48,900	149,600	99,600	68,500	55,100	21,200
1945...	41,300	34,560	26,600	26,400	28,400	28,800	33,000	43,100	223,700	122,300	66,800	43,300	26,400
1946...	35,500	31,600	28,500	29,800	28,600	33,800	51,900	123,100	256,700	162,900	86,100	52,400	28,500
1947...	36,900	31,800*	35,500	34,900	36,700	43,700	61,500	130,000	244,400	160,000	73,000	55,800	31,800*
1948...	59,000	52,000	38,500	37,600	30,400	35,400	36,000	106,600	360,300	145,800	107,900	56,100	30,400
1949...	43,700	36,500	29,300	29,800	27,700	32,200*	35,700	178,100	157,200	107,600	66,000	43,700	27,700
1950...	36,100	34,600	38,800	31,400	34,800	41,600	48,200*	80,700	225,000	211,900	105,100	56,800	31,400
1951...	47,600	49,500	45,300	42,100	42,100	45,900	46,400	106,400*	234,900	202,300	87,500	56,400	42,100
1952...	61,500	43,400	35,800	34,800	37,100	35,600	42,100	156,100	207,800	129,400	66,000	51,400	34,500
1953...	42,600	43,500	29,200	28,400	36,600	34,100	35,000	69,900	214,300	155,400	92,200	66,400	28,400

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1938.....	334,400	①	.....	95,260	1.60	21.66	68,970,000	94,270	21.43	68,260,000	
1939.....	259,600	②	.....	21,300	1.41	19.13	60,920,000	86,070	19.57	62,320,000	
1940.....	248,000	May 30, 1940	.....	25,500	1.37	18.71	59,580,000	81,850	18.65	59,410,000	
1941.....	185,400	June 19, 1941	.....	25,800	1.22	16.51	52,590,000	77,580	17.64	56,170,000	
1942.....	275,000	③	.....	33,400	1.60	21.74	69,180,000	89,320	20.32	64,660,000	
1943.....	291,000	July 7, 1943	.....	28,500	1.63	22.13	70,420,000	97,240	22.12	70,400,000	
1944.....	196,700	June 15, 1944	.....	21,200	1.07	14.50	46,190,000	64,000	14.53	46,460,000	
1945.....	280,800	June 11, 1945	.....	26,400	1.31	17.77	56,600,000	76,980	17.50	55,730,000	
1946.....	360,200	June 6, 1946	.....	28,500	1.73	23.47	74,760,000	104,500	23.78	75,660,000	
1947.....	324,200	June 14, 1947	.....	31,800	1.74	23.69	75,120,000	109,900	24.87	79,520,000	
1948.....	550,100	May 12, 1948	.....	30,400	2.03	27.61	88,060,000	115,400	26.29	83,760,000	
1949.....	314,500	May 24, 1949	.....	27,700	1.43	19.39	61,730,000	85,220	19.37	61,690,000	
1950.....	461,000	June 24, 1950	.....	31,400	1.86	25.23	80,330,000	115,200	26.20	83,400,000	
1951.....	332,800	May 27, 1951	.....	42,160	1.85	26.47	84,220,000	115,500	26.28	83,620,000	
1952.....	306,200	May 29, 1952	.....	34,800	1.61	21.99	69,980,000	93,660	21.36	67,990,000	
1953.....	367,300	June 18, 1953	.....	28,400	1.56	21.22	67,560,000	.....	.....	.....

* Estimated.

① June 27, 28, 1938. ② May 31, June 1, 1939. ③ June 12, 16, 1942.

SHEEP CREEK BASIN

Sheep Creek near Velvet, Wash.

Location.—Lat. 48°57'10", long. 117°52'50", in SE¼NW¼ sec. 20, T. 40 N., R. 39 E., on right bank about 3½ miles upstream from confluence with Little Sheep Creek and 4 miles southwest of Velvet.

Drainage area.—171 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,094.78 ft. above mean sea level (river-profile survey). Nov. 3, 1928, to Sept. 30, 1929, staff gage at same site and datum.

Extremes.—1929-32: Maximum discharge, 1,470 cfs Apr. 15, 1932 (gage height, 8.66 ft.); minimum, 1.7 cfs Nov. 24, 1930, but may have been less during winter of 1930 when complete ice cover was reported.

Remarks.—No diversion above station. Some regulation by operation of flash dam half a mile above gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	18.4	12.3	5.92*	3.71*	9.93*	25.3*	263	231	202	55.9	27.6	20.4	72.4*
1931	22.8	16.8	16.6	18.0*	14.4*	64.5	321	548	204	121	38.4*	24.3	118*
1932	23.0	25.1	27.2*	25.3*	28.5*	125*	318	1,030	389	65.4	29.9	20.7	218*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	7.3		3.9				46	83	106	5.9	2.6	2.8	
1931	8.6	2.3				18	126	151	39	6.9		10	9.3
1932	20						350*	560	121	37	25		

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1929													
1930	1,190	June 1, 1930		72.4	0.423	5.76	52,300	74.1	5.89	53,500			
1931	954	May 3, 1931	3.3	118	.690	9.31	85,100	119	9.47	86,300			
1932	1,470	April 15, 1932		218	1.27	17.27	153,000						

* Estimated.

Sheep Creek near Northport, Wash.

Location.—Lat. 48°56'40", long. 117°46'40", in NE¼NE¼ sec. 25, T. 40 N., R. 39 E., on right bank at county highway bridge, 1 mile upstream from mouth, and 1½ miles north of Northport.

Drainage area.—225 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,294.78 ft. above mean sea level, datum of 1929. June 12, 1928, to Oct. 2, 1929, staff gage at same site and datum.

Average discharge.—13 years (1929-42), 219 cfs.

Extremes.—1929-42: Maximum discharge, 2,450 cfs Apr. 29, 1933 (gage height, 27.46 ft.); minimum not determined, probably less than 8 cfs sometime during period of ice effect, Dec. 25, 1929 to Apr. 7, 1930.

Remarks.—No diversion above station. Flow partly regulated by flash dam 6½ miles upstream used in logging operations.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...									331*	99.5*	37.8	29.0	.....
1930...	25.0	16.0	11.9*	9.32*	15.0*	30.2*	256	248	213	69.2	28.9	25.0	81.4*
1931...	29.1	24.0	22.5	22.4	22.4	73.5	390	669	235	140	45.5	31.0	143
1932...	30.4	30.1	28.1*	26.5*	29.0*	125*	1,150	1,350*	440	86.5	41.8	31.7	286*
1933...	32.5	42.8*	76.5*	59.0	41.2*	61.6	759	1,400	715	125	35.8	31.8	282*
1934...	44.6	113	122*	131	164	360	1,300	491	131	53.8	29.5	24.4	246*
1935...	27.2	57.7	69.6	58.5*	122	110	544*	1,124	396	125	53.7	33.6	227*
1936...	31.1	26.7	25.0	24.1	15.9*	26.1	754	619	181	63.0	30.5	26.4	152*
1937...	25.3	23.4*	20.6*	15.8*	16.4*	21.9*	154	715	415	190	53.4	30.4	141*
1938...	30.0	70.4	85.1	96.2	74.7	223	983	1,300	456	98.6	37.3	27.2	291
1939...	33.6	32.0	28.3*	34.7	27.1*	110	781	564	233	132	35.2	25.0	170*
1940...	27.5	28.4	47.2	34.4*	41.9	248	980	931	228	52.4	30.1	24.4	223*
1941...	35.0	74.5*	51.0*	70.1*	84.5	528	941	823	456	211	64.3	174	293*
1942...	210	218	311	133*	109	101	684	949	655	250	90.5	44.4	313*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...									190*	48*	30	28	.....
1930...	13							124	123	15	12	11	.....
1931...	11	11	14	19*		24	151	163	54	23	21	23	11
1932...	27						529	641	150	52	35	29	.....
1933...	28					40*	156	1,040	260	48	28	27	27
1934...	30	80*	60*	105	105	181	820*	242	75	35	25	23	23
1935...	24	29	56*	20*	107	100	111	822	167	75	40	29	20*
1936...	26	21*	20	17*	10*	23	25	204	102	37	26	23	10*
1937...	23						31	482	223	84	37	13	.....
1938...	23	30	55	76	61	74	286	965	184	47	29	24	24
1939...	23	24*	20*	30*	20*	28	495	210	167	53	27	23	20*
1940...	24	25	27	20*	25*	50	705	434	83	25	23	22	20*
1941...	27	57*	27*	66*	76	185	705	490	323	83	46	63	27
1942...	165	158	190*	110*	88	86	192	727	472	162	59	37	37

* Estimated.

SHEEP BREEK BASIN

Sheep Creek near Northport, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1929.....										
1930.....	1,100	June 1, 1930		81.4	0.362	4.92	58,900	83.3	5.04	60,300
1931.....	1,260	May 3, 1931	11	143	.636	8.60	103,000	144	8.66	104,000
1932.....	2,130	April 15, 1932		286	1.27	17.29	207,000	291	17.61	211,000
1933.....	2,460	April 29, 1933	27	262	1.25	17.04	205,000	293	17.68	212,000
1934.....	1,920	April 25, 1934	23	246	1.09	14.84	178,100	236	14.22	170,500
1935.....	1,640	May 7, 1935	20	227	1.01	13.72	164,500	221	13.35	160,100
1936.....	2,210	April 20, 1936	10	152	.676	9.17	110,100	151	9.11	109,300
1937.....	975	June 25, 1937		141	.627	8.50	102,000	151	9.08	109,100
1938.....	2,080	May 2, 1938	24	291	1.29	17.57	210,900	234	17.11	205,400
1939.....	1,420	April 30, 1939	20	170	.756	10.24	123,000	171	10.28	123,500
1940.....	1,620	May 12, 1940	20	223	.891	13.47	161,700	227	13.78	165,100
1941.....	1,540	May 18, 1941	27	293	1.30	17.66	211,800	341	20.57	246,500
1942.....	1,920	May 27, 1942	37	313	1.39	18.88	226,700			

KETTLE RIVER BASIN

Myers Creek near Myncaster, British Columbia
(International gaging station)

Location.—Lat. 49°00'00", long. 119°01'15", on left bank, 50 ft. north of international boundary, a quarter of a mile south of Myncaster, British Columbia, and 4½ miles downstream from Mary Ann Creek.

Drainage area.—85.7 sq. mi.

Supplemental records available.—Scattered discharge available about June 1923 to September 1924 in the Canadian Department of Resources and Development publication Nos. 43 and 47. (No records published for 1925.)

Gage.—Water-stage recorder and 4-foot Cippoletti weir or concrete rectangular section. Altitude of gage is 2,620 ft., above mean sea level (from international boundary strip map, publication of 1913). Prior to October 1929, staff gage at same site and datum.

Cone formula used when weir is in place; stage-discharge relation defined by current-meter measurements when concrete section acts as control.

Extremes.—1923-50: Maximum discharge not determined; maximum discharge recorded, 109 cfs (discharge measurement of June 7, 1942); no flow July 16-18, 25, 1926, Aug. 13-25, 1939, and may have occurred during nonirrigation seasons.

Remarks.—Small diversions for irrigation above station. No regulation.

Cooperation.—Records 1926-29 furnished by Canadian Department of Resources and Development. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

KETTLE RIVER BASIN

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Myers Creek near Myncaster, British Columbia—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926								8.5*	3.5*	1.0	0.9*	4.2*	
1927								28.4*	29.9*	6.0*	1.3*	5.5*	
1928								41.1*	19.9*	18.5*	6.4	5.5*	
1929								9.0	9.1	1.4	0.4	0.9	
1930	2.4*						4.3	2.3	2.8	1.0	0.5	0.7	
1931	1.8						3.9	5.7	3.0	1.5	0.4	1.0	
1932	1.7						11.1	29.3	13.3	2.7	1.5	1.2	
1933	2.1	3.9*					12.4	23.8	27.2	6.7	1.8	2.0	
1934	3.2						12.8	10.8	4.7	1.1	0.6	1.3	
1935	2.2	3.8						16.8	10.4	4.1	1.8	1.8	
1936	1.8						11.3*	12.4	15.8	3.8	0.9	1.0	
1937	1.3							7.5*	15.5	6.0	1.8	1.5	
1938	2.2	3.5								6.6	2.0	1.7	
1939	2.9								3.8	1.5	0.1	0.4	
1940	1.1						8.6	24.6	13.4	3.4	1.1	2.0	
1941													13.2
1942										44.7	22.3	14.8	
1943	13.2							14.4	16.9	8.0	4.6	3.8	
1944	6.32							16.5	16.8	6.47	2.57	2.74	
1945	3.91							61.1	52.8	9.42	4.09	4.64	
1946								39.8	27.5	8.29	3.45	3.43	
1947	5.4							14.6	4.4	4.4	2.6	2.9	
1948	7.0							58.0	76.0	25.4	21.6*	13.0*	
1949									9.8	4.5	3.2		
1950								26.7	38.5	7.1			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926								5.2*	1.0	0	0.3*	0.9	0
1927								18.5	13.4*	1.0*	1.0	2.0	
1928								27.0*	13.0	9.0*	5.2	5.2	
1929								8.2	5.3	.1	.1	.4	
1930	2.1						2.9	1.5	1.5	.5	.3	.4	
1931	1.0						3.1	2.6	1.0	.7	.2	.3	
1932	.7						8.4	17.4	4.8	1.2	1.1	.8	
1933	1.3	2.7					8.1	14.9	13.9	2.0	1.1	1.2	
1934	2.3						10.6	5.0	1.4	.4	.2	.2	
1935	1.7	2.8*						9.7	5.7	2.4	.9	.9	
1936	1.1						5.4*	6.6	7.4	1.3	.6	.8	
1937	.9							5.1*	6.2	2.7	1.0	.9	
1938	1.9	2.2								2.4	1.1	.9	
1939	1.8								2.4	.3	0	.2	0
1940	.4						2.8	14.4	5.0	2.1	.8	.7	
1941							19.1	23.5	27.6	11.8	6.6	10.0	
1942										34.2	16.7	13.2	
1943	12.4							12.5	13.1	4.6	3.6	3.4	
1944	3.9							11.1	9.5	2.9	1.4	1.3	
1945	3.1							20.8	21.6	5.6	3.0	2.9	
1946								27.7	18.5	4.0	2.2	2.4	
1947	3.6								8.2	2.2	1.9	1.9	
1948	4.8							19.7	39.4	14.8	11.6	11.2*	
1949								15.1	7.0	3.2	2.5	2.1	
1950								17.0	17.5	2.8		3.1	

* Estimated.

KETTLE RIVER BASIN

Kettle River near Ferry, Wash.

(International gaging station)

Location.—Lat. 48°58'40", long. 118°46'10", in lot 7, sec. 10, T. 40 N., R. 32 E., on right bank, 1¼ miles south of international boundary and Ferry and 3 miles upstream from Toroda Creek.

Drainage area.—2,220 sq. mi., approximately:

Supplemental records available.—Discharge records, collected in this vicinity at Nicholson's Bridge near Midway, Canada, from March 1914 to May 1922, are published in the Canadian Department of the Interior, Water Resources publication for Pacific drainage area, W. P. R. Nos. 14, 18, 21, 23, 25, 30, 35, and 39.

Gage.—Water-stage recorder. Datum of gage is 1,836.8 ft. above mean sea level, international joint adjustment of 1947.

Average discharge.—25 years (1928-53), 1,427 cfs.

Extremes.—1928-53: Maximum discharge, 21,200 cfs May 29, 1948 (gage height, 21.15 ft.); minimum 14 cfs (discharge measurement) Jan. 23, 1930, but may have been less during period of ice effect Jan. 18-23, 1930.

Remarks.—A few small diversions for irrigation above station. No regulation.

Cooperation.—This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928												214	.....
1929	220*	153*	126	85.3*	87.2*	118	300	2,050	3,930	571	123	68.7	733*
1930	96.0	84.3	78.2	40.3*	72.5*	110	1,570	2,220	2,730	664	147	90.7	659*
1931	107	110	90.6	88.2	92.9	144	651	4,830	2,770	964	178	202	875
1932	159	179	150	126	121	307	3,450	7,560	5,580	922	298	208	1,560
1933	247	418	404	284*	201*	231	2,850	7,410	8,140	2,530	349	227	1,910*
1934	410	731	473	327	356	821	6,351	5,454	1,834	346	149	132	1,449
1935	220	730	410	326	626	462	1,672	0,386	5,668	2,754	544	249	1,676
1936	213	219	158	145	81.5*	147	3,480	6,694	3,877	927	220	152	1,360*
1937	141	112	101	64.3*	74.8*	127	604	4,834	5,252	1,024	275	141	1,065*
1938	202	241	157	195	185	415	3,464	7,375	3,850	722	182	124	1,488
1939	194	174	114*	134	88.2*	227	2,588	6,284	3,530	1,163	205	121	1,241*
1940	193	202	203	86.5*	127	540	3,230	6,181	2,962	410	174	98.7	1,202*
1941	173	187	151	156	141	970	3,746	5,033	3,537	1,787	480	1,941*	1,526*
1942	2,065	1,280	1,161	640	523	432	3,462	7,062	5,978	2,189	803	314	2,168
1943	219	192	155	157*	161	169	2,194	3,766	4,645	1,414	306	136	1,127*
1944	178	184	27.9*	81.4*	90.6*	160	1,120	4,862	4,003	800	448	430	1,044*
1945	725	791	297*	325	288	340	1,295	8,958	6,189	951	221	146	1,719*
1946	168	264	199	175	177	316	3,562	9,459	5,166	1,389	269	179	1,760
1947	172	158	162	149	148	234	1,973	4,991	2,664	785	307	201	1,004
1948	330	588	373	252	197	213	1,477	10,060	8,219	1,524	1,987	746	2,185
1949	609	303	244	205*	189*	302	3,046	7,857	2,331	506	353	200	1,869*
1950	263	276	229	154*	179	220	802	5,271	7,794	1,492	378	159	1,431*
1951	382	387	436	333*	375*	451	3,023	9,094	4,049	1,295	285	291	1,758*
1952	855	494	329	275*	263	310	5,707	9,676	4,451	1,489	311	159	1,930*
1953	116	110	102	119	124	160	703	5,675	6,244	2,214	591	421	1,837

* Estimated.

KETTLE RIVER BASIN

443

Kettle River near Ferry, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928													
1929		157	86			96	114	1,160	1,360	207	92	80	
1930	87	69	68			80	200	1,620	1,620	270	106	84	
1931	87	83	61	65	70	94	230	3,060	1,660	331	104	95	61
1932	142	94	115	80		216	602	4,710	2,300	345	208	151	
1933	174	287				215	445	5,560	5,890	642	182	172	
1934	238	484	184	140*	297	353	2,420	3,700	603	181	89	81	
1935	168	301	160*	140*	511	404	389	3,550	2,450	904	292	185	140*
1936	160*	100*	69	84	50*	117	124	4,320	1,420	373	158	139	50*
1937	135	83	64	55*	60*	99	172	2,000	2,550	442	163	115	55*
1938	135	183	90*	120*	120*	203	575	4,970	1,040	231	125	102	90*
1939	118	90*	70*	90*	70*	110*	634	4,790	2,410	402	120	94	70*
1940	144	138	50*	30*	80*	166	1,850	3,820	848	269	97	84	30*
1941	169	120*	60*	130*	100*	210	2,910	3,560	2,450	645	315	700*	60*
1942	1,400	1,040	440*	420*	403	403	634	3,190	3,190	1,440	450	218	218
1943	203	210	87	120*	147	115	325	2,060	3,260	469	192	101	87
1944	98	136	70*	65*	75*	105*	237	3,000*	1,760	350	314	188	65*
1945	489	450	110*	210*	240*	220*	494	4,110	2,330	385	145	106	106
1946	127	154	115	106	160	208	864	5,840	3,100	467	178	160	106
1947	148	90	103	90*	95*	157	704	3,430	1,320	395	184	160	90*
1948	172	395	246	140*	184	197	250	4,460	2,730	923	960	524	140*
1949	457	220	174	200*	130*	220*	377	3,900	1,060	421	245	155	155
1950	160	206	143	150*	150*	174	227	1,640	4,050	607	245	117	117
1951	183	301	200*	160*	160*	340*	730	4,520	2,160	402	188	287	160*
1952	301	331	190	210*	210*	227	552	5,470	3,020	565	213	112	112
1953	95	67	67	79	82	107	190	2,720	4,220	742	343	293	67

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1928							
1929	7,420	May 24, 1929		733	530,000	719	514,000
1930	6,000	June 1, 1930		659	476,000	661	479,000
1931	9,020	May 15, 1931	61	875	633,000	889	644,000
1932	10,300	May 22, 1932		1,590	1,150,000	1,640	1,190,000
1933	14,000	June 17, 1933		1,910	1,380,000	1,960	1,420,000
1934	11,500	April 28, 1934	81	1,449	1,049,000	1,427	1,033,000
1935	11,100	May 23, 1935	140	1,675	1,212,000	1,611	1,166,000
1936	11,100	April 26, 1936	50	1,360	987,600	1,341	973,200
1937	9,940	June 3, 1937	60	1,065	771,300	1,088	788,000
1938	12,200	May 26, 1938	60	1,433	1,038,000	1,421	1,029,000
1939	10,400	May 17, 1939	70	1,241	898,100	1,250	905,200
1940	9,930	May 26, 1940	30	1,202	872,500	1,194	867,200
1941	9,310	May 2, 1941	60	1,526	1,105,000	1,864	1,349,000
1942	18,200	May 27, 1942	218	2,168	1,569,000	1,834	1,328,000
1943	7,950	May 27, 1943	87	1,127	816,900	1,118	809,100
1944	8,250	June 2, 1944	65	1,044	758,200	1,158	840,600
1945	12,900	May 31, 1945	106	1,719	1,244,000	1,620	1,173,000
1946	13,600	May 29, 1946	106	1,780	1,288,000	1,768	1,250,000
1947	9,970	May 8, 1947	90	1,004	726,700	1,087	787,300
1948	21,200	May 29, 1948	140	2,185	1,386,000	2,165	1,572,000
1949	14,400	May 14, 1949	155	1,869	991,300	1,324	958,600
1950	12,000	June 15, 1950	117	1,431	1,026,000	1,473	1,066,000
1951	15,000	May 13, 1951	160	1,758	1,273,000	1,768	1,301,000
1952	14,800	May 21, 1952	112	1,929	1,437,000	1,667	1,355,000
1953	11,300	June 14, 1953	67	1,357	1,004,000		

* Estimated.

KETTLE RIVER BASIN

Curlew Creek near Malo, Wash.

Location.—Lat. 48°46'00", long. 118°39'10", in NW¼ sec. 28, T. 38 N., R. 33 E., on left bank, a quarter of a mile downstream from Curlew Lake and 3 miles southwest of Malo.

Drainage area.—66.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,330 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge observed, 169 cfs Apr. 16, 1951 (gage height, 4.35 ft., result of discharge measurement); practically no flow Mar. 4, 1953 (gage height, 1.14 ft.), as a result of regulation during building of weir 300 yards above gage.

Remarks.—At high stage and during irrigation season, water from Sanpoil River is sometimes diverted into this basin above Curlew Lake. At extreme stages there may be some flow into Sanpoil River basin. Occasional regulation at small crib dam at lake outlet.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....								107	45.0	25.6	10.3*	6.56	.....
1952.....	9.20	8.66	14.2	18.0	24.8	16.5	70.1	92.5	44.2	21.6	8.22	6.30	27.8
1953.....	6.33	6.41	6.66	8.67	7.89	6.14	12.5	42.9	45.9	27.7	10.7	3.46	15.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....								66	33	15	6.8*	3.4	.....
1952.....	7.8	7.8	13	12*	18.5	15.5	19	69	31	13.5	4.8	5.1	4.8
1953.....	5.1	5.8	5.8	6.5	6.5	1.7	9.3	30	41	15.5	7.5	.2	.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1951.....							
1952.....	124	April 30, 1952	4.8	27.8	20,210	26.8	19,430
1953.....	51	May 30, 1953	.2	15.4	11,170		

* Estimated.

KETTLE RIVER BASIN

445

Curlew Creek near Curlew, Wash.

Location.—Lat. 48°46'25", long. 118°38'45", in sec. 21, T. 38 N., R. 33 E., on right bank, half a mile downstream from Curlew Lake, 9 miles upstream from mouth, and 9 miles southwest of Curlew.

Drainage area.—89.8 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,330 ft. (from topographic map).

Extremes.—1917-21: Maximum discharge, 65 cfs May 27-30, June 1, 2, 5, 6, 1917; maximum gage height, 3.09 ft., from graph based on gage readings, May 30, 1917; no flow at times during 1919 and 1920.

Remarks.—No diversions bypass station. Diversion of 3 cfs by water rights from Sanpoil River near headwaters may exceed this allotted amount at time; an estimated 30 cfs has been observed entering the basin by this route and may be somewhat greater during periods of extreme high water.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1917									46.4	11.7	2.60	1.69	.....
1918	1.31	1.69	3.47	5.23	4.91	5.88	9.51	9.85	6.03	2.44	1.68	0.89	4.40
1919	1.05	1.50	1.40*	1.98*	5.10	8.28	26.0	44.0	20.5	4.62	1.84	1.25	9.80*
1920	.61	1.97	.85*	1.69*	2.48	2.39	3.77	8.72	6.61	2.83	.64	.21	2.74*
1921	.14	.42	.75	1.09	3.22	5.96	20.5	50.1	35.0	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1917									26	3.9	1.6	1.4	.....
1918	1.1	1.5	1.8	3.9	3.9	4.1	7.5	8.4	3.4	1.6	1.2	0.7	0.7
1919	.9	1.1			3.9	4.0	15.7	39	7.1	2.6	1.0	.9	.....
1920	.7	.9			1.8*	1.9	2.1	6.1	4.4	1.7	.3	0	0
1921	.1	.2	.5	.7	1.4	3.5	6.1	36	13.5	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1917	65	①					
1918	11.2	April 20, 1918	0.7	4.40	3,190	4.19	3,030
1919	50	②		9.80	7,100	9.78	7,080
1920	12	③	0	2.74	1,090	2.65	1,850
1921	61	May 25, 1921					

* Estimated.

① May 27, 28, 29, 30, June 1, 2, 5, 6, 1917. ② May 22, 23, 24, 1919. ③ May 14, 15, 1920.

KETTLE RIVER BASIN

Kettle River at Cascade, British Columbia
(International gaging station)

Location.—Lat. 49°01'35", long. 118°12'20", on left bank at highway bridge on road to Christina Lake, half a mile downstream from Cascade Falls, at Cascade.

Drainage area.—3,550 sq. mi., approximately.

Gage.—Staff gage. Datum of gage is 1,449.79 ft. above mean sea level (Geodetic Survey of Canada, datum of 1928).

Average discharge.—18 years (1916-34), 2,497 cfs.

Extremes.—1916-34: Maximum discharge observed, 29,300 cfs June 8, 1921 (gage height not available); minimum, 60 cfs Jan. 24, 25, 1930 (gage height not available).

Remarks.—Diversions above station for irrigation of about 650 acres in the United States and 2,150 acres in Canada (as of 1934). Slight regulation on the North Fork by dam at Grand Forks, British Columbia.

Cooperation.—Records 1916-30 furnished by Canadian Department of Resources and Development. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916...							3,760	9,350	9,250	4,350	1,270	530	.....
1917...	410	365	245	200*	250*	270	309	11,900	12,300	3,500	550	310	2,600*
1918...	350	380	365	515	450	600	4,550	9,200	7,900	1,600	820	460	2,200
1919...	430	500	410	420	400	440	5,200	12,500	8,400	2,400	430	410	2,650
1920...	391	425	350	300*	300*	350	1,210	6,510	9,340	3,390	572	821	2,000*
1921...	2,160	1,100	750*	700*	760*	970	4,120	15,000	12,200	2,230	498	465	3,410*
1922...	575	1,050	590*	380*	300*	350*	2,010	9,820	12,200	1,360	506	433	2,460*
1923...	589	562	400*	375*	325*	366*	3,750	8,730	10,300	2,610	657	251	2,410*
1924...	220	210	210	210*	325*	450	1,470	9,470	3,260	580	210	140	1,400*
1925...	276	463	300*	400*	400*	500*	7,350	14,000	6,940	1,000	411	360	2,700*
1926...	252	202	269	230*	250*	690	6,050	8,380	3,260	862	283	308	1,760*
1927...	1,170	846	1,100*	500*	500*	600	3,350	11,300	17,100	4,320	840	6,030	5,970*
1928...	5,600	2,920	1,830*	1,110*	870	2,230	7,020*	18,800	9,380	4,340	1,020	433	4,690*
1929...	371	313	300*	217*	161*	245*	792	5,530	6,130	1,160	232	184	1,310*
1930...	167	191	146*	71*	90*	188	3,360	3,950	4,190	1,180	288	163	1,170*
1931...	205	221	202	189	206	554	2,400	8,000	4,510	1,910	358	350	1,600
1932...	324	363	302*	219*	236*	589	6,150	12,800	9,020	1,700	463	351	2,710*
1933...	367	650	909*	509*	487*	570	4,500	12,000	13,100	4,060	630	383	3,190*
1934...	797	1,490	1,010	781	873	1,850	11,600	8,960	3,380	643	263	223	2,650

* Estimated.

Kettle River at Cascade, British Columbia—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916							1,400	6,000	5,800	2,800	630	410	.....
1917	410	330	200			260	270	2,500	7,150	870	340	260	.....
1918	280	310	270	360	420	330	1,800	4,550	3,200	830	620	310	270
1919	310	460	280	310	360	310	1,300	0,400	5,900	560	320	320	310
1920	375	350					500	3,460	4,590	1,000	400	400	.....
1921	1,550	800				810	1,320	4,590	4,720	900	350	350	350
1922	500	730					500	5,550	3,460	650	400	400	.....
1923	260	400					540	4,160	6,650	1,060	435	200	.....
1924	200	200	200			365	470	4,340	1,270	260	156	120	.....
1925	150	309					1,060	8,660	2,550	530	350	335	.....
1926	218	230	230			275	1,380	4,050	1,770	390	242	260	.....
1927	284	660					740	6,220	8,980	1,340	610	1,020	.....
1928	3,910	2,220	1,400*	970	770	770	3,960	10,200	6,030	1,510	612	360	360
1929	295	280	260*	128*	129*	220*	275	3,050	3,000	285	196	177	126*
1930	150	162	125*	60*	73*	135*	320	2,970	2,690	490	186	138	60*
1931	172	196	130	175	160	230	601	5,170	2,380	637	222	206	130
1932	295	295*	259*	189*	188*	313	1,580	7,720	4,140	665	375	295	188*
1933	300	470	650*	520*	400*	415*	583	9,080	8,370	993	345	318	300
1934	492	1,020	546	492	670	878	5,280	6,230	1,190	320	200	182	162

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1916								
1917					2,600	1,580,000	1,400	1,010,000
1918				270	2,260	1,640,000	1,350	874,000
1919				310	2,650	1,940,000	2,650	1,820,000
1920					2,000	1,450,000	2,230	1,620,000
1921	29,300†	June 8, 1921	350		3,418	2,480,000	3,300	2,390,000
1922					2,480	1,790,000	2,420	1,750,000
1923					2,410	1,750,000	2,330	1,690,000
1924					1,400	1,020,000	1,430	1,040,000
1925					2,700	1,960,000	2,680	1,940,000
1926					1,760	1,220,000	1,960	1,420,000
1927					3,970	2,880,000	4,590	3,320,000
1928				360	4,690	3,410,000	3,910	2,840,000
1929				126	1,310	945,000	1,270	917,000
1930				60	1,170	846,000	1,130	853,000
1931	12,800†	May 16, 1931	130		1,600	1,160,000	1,630	1,180,000
1932	17,400†	May 11, 1932	188		2,710	1,970,000	2,790	2,020,000
1933	22,500†	June 17, 1933	300		3,190	2,310,000	3,310	2,390,000
1934	20,700†	Sept. 4, 1934	182		2,650	1,920,000		

* Estimated.

† Maximum observed

KETTLE RIVER BASIN

Kettle River near Laurier, Wash.
(International gaging station)

Location.—Lat. 48°59'10", long. 118°13'00", in NW¼ sec. 11, T. 40 N., R. 36 E., on right bank, 500 ft. downstream from Deep Creek, 1½ miles southeast of Laurier, and 12 miles upstream from Boulder Creek.

Drainage area.—About 3,800 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,425.5 ft. above mean sea level, international joint adjustment of 1947. Prior to Jan. 3, 1930, staff gage at same site and datum.

Average discharge.—24 years (1929-53), 2,775 cfs.

Extremes.—1929-53: Maximum discharge recorded, 35,000 cfs May 29, 1948 (gage height, 17.25 ft.); minimum not determined, probably occurred during winter of 1929-30.

Maximum stage known, about 22 ft. in 1894, from information furnished by local residents.

Remarks.—North Fork regulated by reservoir at Grand Forks, British Columbia. Numerous diversions for irrigation of about 720 acres in the United States for 1946, from United States reports, and 2,090 acres in Canada from the Canada Year Book for 1940. Some diversions for domestic use above station.

Cooperation.—This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929												174	
1930	184	202	154	76.5*	97.9*	212*	3,500	4,250	4,450	1,340	348	194	1,250*
1931	210	225	208	194	222	575	2,680	6,590	5,310	2,110	437	398	1,800
1932	340	400	339*	230*	338*	705	6,940	14,200	9,590	1,850	540	358	2,090*
1933	290	692	916*	636*	519*	670	4,790	13,500	14,000	4,440	768	458	3,490*
1934	500	1,562	1,101	590	975	2,041	12,170	9,898	3,783	759	307	231	2,875
1935	322	1,551	971	807*	1,407	1,163	3,766	11,570	9,683	4,855	1,089	462	3,101*
1936	381	402	311	274	215*	330	6,672	10,820	6,286	1,636	455	313	2,342*
1937	265	206	173	131*	131*	260	1,478	8,608	8,862	2,073	552	293	1,925*
1938	334	567	540	609	518	1,270	7,017	13,940	7,768	1,583	431	311	2,910
1939	358	366	324*	392	384*	712	6,118	10,710	5,959	2,148	445	276	2,352*
1940	247	323	574	433*	446	1,616	7,239	11,640	5,486	781	370	223	2,451*
1941	350	506	457	486	497	2,822	7,999	9,304	6,545	3,161	998	3,773	3,073
1942	3,515	2,600	2,652	1,450*	1,164	983	6,767	11,900	10,640	3,836	1,490	627	4,005*
1943	443	384	373	371*	321*	390	5,226	7,047	7,995	2,600	580	333	2,173*
1944	318	338	283*	264*	278*	340	2,728	3,509	6,794	1,381	648	602	1,874*
1945	1,096	1,319	657*	615*	600	777	2,921	15,710	11,170	1,841	468	334	3,137*
1946	310	450	440*	485*	426	862	7,100	17,390	9,004	2,541	564	200	3,340*
1947	379	346	345*	393*	599	1,031	4,769	9,477	4,885	1,536	685	428	2,078*
1948	1,349	1,650	956	681	497*	550	3,938	18,000	14,760	2,767	2,922	1,270	4,112*
1949	1,092	824	577*	455*	448*	844	6,687	13,820	4,363	1,119	571	359	2,609*
1950	344	470	578	373*	426*	671	2,392	10,150	13,460	2,931	735	331	2,784*
1951	703	956	1,253	1,074*	1,008	1,244	7,776	16,390	7,801	2,558	581	567	3,511*
1952	1,624	1,063	840*	776*	673	756	9,732	16,770	7,946	2,806	674	355	3,672*
1953	248	233	232*	276	308	439	2,144	11,210	12,200	4,220	1,080	794	2,791*

* Estimated.

KETTLE RIVER BASIN

Kettle River near Laurier, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													155
1930	158		124				360	3,180	2,910	618	223	165	
1931	173	205				255	985	5,800	3,180	760	240	232	
1932	318						1,740	8,450	4,300	700			306
1933	300	548					819	10,200	5,960	1,160	402	351	300
1934	504	1,160	682	490*	805	1,020	5,800	7,000	1,510	416	224	178	178
1935	250	500	450*	300*	1,200	900	1,020	7,800	4,660	1,560	620	366	250
1936	325	320*	210*	200*	160*	270*	263	7,000	2,480	801	335	238	160*
1937	245	136	130*	110*	110*	150*	330	4,060	5,120	955	350	251	110*
1938	283	350	330*	490*	430	552	1,700	9,400*	3,800	617	345	270	270
1939	585	250*	250*	310*	290	340	1,850	7,760	4,300	819	305	240	240
1940	193	303	303	330*	393	502	4,860	8,000*	1,560	512	269	193	193
1941	220	360*	250*	430*	412	663	6,370	6,570	4,860	1,340	692	1,470	220
1942	2,730	2,240	1,550*	1,240*	942	942	1,380	5,780	6,370	2,500	872	471	471
1943	417	303	290*	305*	290	303	907	4,190	5,970	907	412	286	286
1944	220	299	220*	200*	250*	308	371	6,070	3,100	651	502	358	200*
1945	784	862	390*	460*	546	491	1,300*	7,350	4,370	705	344	299	299
1946	233	350*	350*	340*	395*	518	2,600	11,300	5,280	965	395	290	233
1947	261	305	300*	310*	380*	477	2,300	6,540	2,530	827	425	357	251
1948	371	1,170*	703	540*	470*	470*	890	9,170	5,360	1,740	1,660	920	371
1949	920	540*	460*	450*	440*	490*	1,220	7,850	1,900*	766	446	297	297
1950	306	389	410	350*	350*	467	644	4,240	7,640	1,180	534	257	257
1951	325	819	700*	500*	500*	1,000*	1,910	8,730	4,400	889	399	399	325
1952	562	847	600*	600*	560*	562	1,450	10,400	5,460	1,150	445	297	297
1953	226	200*	200*	223	273	281	678	6,630	8,010	1,510	696	558	200*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1929							
1930	7,820	June 1, 1930		1,250	905,000	1,260	912,000
1931	14,800	May 16, 1931		1,800	1,300,000	1,830	1,328,000
1932	19,200	May 11, 1932		2,990	2,170,000	3,000	2,230,000
1933	23,600	June 17, 1933	300	3,490	2,530,000	3,610	2,610,000
1934	21,100	April 26, 1934	178	2,875	2,081,000	2,823	2,143,000
1935	19,300	May 24, 1935	250	3,101	2,245,000	2,956	2,400,000
1936	19,000	April 26, 1936	160	2,342	1,700,000	2,304	1,673,000
1937	15,400	June 4, 1937	110	1,925	1,394,000	1,975	1,430,000
1938	21,700	May 27, 1938	270	2,016	2,111,000	2,383	2,087,000
1939	16,300	May 17, 1939	240	2,352	1,703,000	2,361	1,709,000
1940	17,200	May 26, 1940	193	2,451	1,779,000	2,464	1,789,000
1941	15,700	May 3, 1941	220	3,078	2,228,000	3,731	2,701,000
1942	27,400	May 28, 1942	471	4,065	2,839,000	3,342	2,420,000
1943	13,800	May 28, 1943	288	2,173	1,573,000	2,151	1,557,000
1944	12,800	June 3, 1944	200	1,874	1,361,000	2,052	1,490,000
1945	21,700	June 1, 1945	299	3,137	2,271,000	2,960	2,158,000
1946	22,000	May 10, 1946	233	3,340	2,418,000	3,329	2,410,000
1947	16,000	May 9, 1947	261	2,072	1,500,000	2,314	1,675,000
1948	35,000	May 29, 1948	371	4,112	2,985,000	3,990	2,897,000
1949	25,200	May 14, 1949	297	2,608	1,869,000	2,516	1,822,000
1950	20,400	June 15, 1950	257	2,734	1,979,000	2,862	2,072,000
1951	26,700	May 13, 1951	325	3,511	2,542,000	3,563	2,580,000
1952	24,700	May 20, 1952	297	3,672	2,666,000	3,436	2,466,000
1953	21,700	June 14, 1953	200	2,791	2,021,000		

* Estimated.

KETTLE RIVER BASIN

Kettle River at Boyds, Wash.

Location.—Lat. 48°43'20", long. 118°07'20", in NW¼ sec. 9, T. 37 N., R. 37 E., on right-bank at Boyds, 1¼ miles upstream from Sherwood Creek, and 4 miles upstream from mouth.

Drainage area.—4,070 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,240 ft. (from topographic map). Sept. 10 to Oct. 17, 1913, staff gage 1 mile downstream at railroad bridge at different datum.

Extremes.—1913-15: Maximum discharge, 18,000 cfs May 17, 1914 (gage height, 10.00 ft.); minimum, 288 cfs Aug. 30, 1914 (gage height, 0.28 ft.).

Remarks.—Flow slightly regulated by powerplant at Cascade, British Columbia. Minor diversion for irrigation and domestic use above station. An estimated 365 acres was irrigated in the United States upstream from the mouth of the Kettle River in 1915.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914...	954	923	692	800	640	976	7,010	12,000	8,300	2,150	512	459	2,960
1915...	987	1,420	847*	800*	930*	878	6,410	10,700	6,590	4,300	1,750	701	3,040*
1916...	636	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914...	755	830	548	548*	490*	617	1,560	7,860	4,760	795	238	295	288
1915...	671	1,120	590*	.....	.....	411	1,950	7,860	3,760	3,150	910	580	.....
1916...	552	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mle	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1914.....	18,000	May 17, 1914	288	2,960	0.727	9.89	2,140,000	3,020	10.03	2,180,000	
1915.....	14,500	May 21, 1915	.....	3,040	.747	10.75	2,200,000	.....	.....	.....
1916.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

COLUMBIA RIVER MAIN STEM

Columbia River at Kettle Falls, Wash.

Location.—Lat. 48°37'20", long. 118°07'00", in northwest corner lot 1, sec. 14, T. 36 N., R. 37 E., on right bank at Kettle Falls, 3¼ miles upstream from Colville River.

Drainage area.—64,500 sq. mi., approximately.

Supplemental records available.—Gage-height records, except 1916-20, collected at Northport, Kettle Falls, Marcus, or international boundary since 1895 are contained in reports of U. S. Weather Bureau.

Gage.—Water-stage recorder. Datum of gage is mean sea level, unadjusted. Apr. 1, 1916, to June 4, 1921, staff gages at Marcus 1¾ miles upstream and June 5, 1921, to May 2, 1931, staff gage at Kettle Falls ferry all at different datums.

Average discharge.—28 years (1913-41), 98,040 cfs.

Extremes.—1913-41: Maximum discharge, 468,000 cfs June 14, 15, 1913 (gage height, 34.2 ft. from floodmarks, referred to U. S. Weather Bureau gage at Marcus, at datum 1,205.55 ft. above mean sea level, unadjusted; minimum, 13,000 cfs (estimated because of ice effect) Jan. 18-21, 1930, Jan. 31, 1937.

Maximum discharge known 700,000 cfs during flood of 1894 (based on best available information from several sources). Floods subsequent to date station was discontinued are disregarded as the site became submerged by backwater from Franklin D. Roosevelt Lake.

Remarks.—Many diversions above station for irrigation. In 1941 an estimated 334,500 acres were irrigated in the United States and an estimated 20,000 acres were irrigated in Canada. The flow is affected by internationally controlled storage in Kootenay Lake as well as by natural and controlled regulation in other lakes and reservoirs in Kootenay and Pend Oreille River basins.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913							42,500*	160,000*	412,000*	272,000*	153,000*	97,300*	.....
1914	53,200*	47,000*	34,700*	31,500*	27,200*	34,900*	79,200*	201,000*	285,000*	249,000*	129,800*	74,400*	105,000*
1915	59,800*	61,700*	45,100*	29,800*	25,700*	29,500*	72,300*	164,900*	181,000*	180,000*	153,000*	88,500*	91,400*
1916	47,900*	46,000*	36,000*	24,600*	24,600*	44,800*	86,400	175,000	298,000	402,000	185,000	107,000	124,000*
1917	57,500	42,900	29,900*	22,900*	22,100*	29,200*	36,600	146,000	337,000	394,000	145,000	77,600	104,000*
1918	57,600	37,200	35,200*	57,800*	41,100*	55,700	72,000	190,900	297,000	253,000	133,000	88,100	169,000*
1919	62,300*	44,700*	33,200*	29,200*	35,300*	31,200	63,300	181,000	283,000	222,000	135,000	77,900*	100,000*
1920	43,600	27,400	20,200*	20,400*	21,700*	21,600	30,300	121,000	227,000	311,000	174,000	88,300	92,500*
1921	83,200	59,300	40,400*	35,900*	34,100*	43,700	70,200	195,000	376,000	240,000	135,000	67,600	116,000*
1922	48,500	56,500	39,400	30,500	24,600	22,000	37,200	132,000	339,000	215,000	124,000	86,100	95,900
1923	52,200	36,600	23,300	29,400	22,200	22,100	53,200	168,000	324,000	247,000	130,900	86,300	99,700
1924	44,300	29,500	24,600	19,600*	28,000	29,700	32,900	173,000	220,000	163,000	112,000	78,700	79,800*
1925	44,500	42,700	34,400	35,900	43,900	41,700	115,000	261,000	319,000	240,000	133,000	72,500	116,000
1926	43,400	29,600	25,500	22,500	22,200	24,600	56,700	159,000	136,000	138,000	86,900	68,000	68,000
1927	57,100	56,100	47,400	33,800	28,700	30,200	47,600	161,000	351,000	291,000	156,000	121,000	115,000
1928	99,900	91,400	71,100	47,900	41,300	44,000	74,300	259,000	341,000	252,000	136,000	72,000	128,000
1929	46,200	35,100	26,900	21,200	18,000*	21,300	29,100	105,000	204,000	164,000	105,000	64,000	76,200*
1930	36,500	25,100	20,500	15,900*	18,600*	21,700	60,000	155,000	217,000	189,000	119,000	71,700	79,500*
1931	41,500	29,400	23,400	19,200	20,100	23,500	40,700	156,000	218,000	163,000	101,600	74,900	75,700
1932	39,300	31,100	25,300	25,100	20,100	39,600	57,200	226,000	321,000	227,000	127,000	74,100	104,000
1933	44,300	42,000	43,600	35,300	25,700	26,900	52,500	169,000	370,000	326,000	159,000	88,900	116,000
1934	59,890	78,230	73,540	82,860	61,400	57,590	148,500	304,700	302,200	169,300	112,100	70,420	127,000
1935	42,850	62,650	45,060	34,640	40,950	38,830	51,470	154,400	368,000	253,300	139,500	76,830	103,800
1936	44,280*	30,600	24,640	22,350	17,060*	22,940	63,420	236,200	257,400	163,700	102,400	62,920	89,880*
1937	38,910*	25,700	20,560	15,560*	15,410*	19,130	31,600	116,900	232,300	185,600	104,400	65,710	72,950*
1938	29,660*	54,720	39,680	36,170	29,110	34,700	77,070	198,500	330,700	241,500	95,600	70,780*	102,700*
1939	52,030	34,660	28,570	29,150	26,850	27,540	69,870	217,700	224,400	180,300	104,900	65,400	88,830
1940	46,760	47,910	42,080	31,600	30,150	36,870	81,580	174,900	232,900	149,600	92,030	72,670	86,890
1941	57,710	45,870	31,130	30,000	29,640	40,150	74,360	137,900	181,000*	138,200*	93,900*	81,070*	78,580*

* Estimated.

COLUMBIA RIVER MAIN STEM

Columbia River at Kettle Falls, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916							68,700	114,000	200,000	278,000	129,000	77,200	
1917	47,600	37,800					21,600	60,000	300,000	222,000	113,000	61,500	
1918	47,600	32,600				32,000	37,900	111,000	184,000	179,000	97,500	83,400	
1919						29,900	32,600	18,000	252,000	156,000	111,000		
1920	32,000	24,900				19,600	24,000	44,200	163,000	256,000	132,000	81,600	
1921	78,900	47,600				37,300	51,500	97,500	332,000	184,000	99,700	49,700	
1922	46,200	41,000	34,300	26,900	21,600	20,900	24,000	59,200	256,000	141,000	104,000	66,300	20,900
1923	42,300	29,400		25,400		21,200	25,900	92,000	244,000	189,000	113,000	53,500	
1924	30,100	26,400			21,400	26,600	25,600	50,600	177,000	122,000	102,000	54,300	
1925	35,000	35,900	31,700	34,400	35,000	39,260	44,200	123,000	293,000	169,000	94,300	59,600	31,700
1926	82,800	26,600	24,600	21,000	21,000	22,400	30,200	134,000	128,000	107,000	77,500	49,100	21,000
1927	44,900	47,700	39,300		27,100	29,500	32,700	93,200	227,000	218,000	117,000	110,000	
1928	62,100	82,200	53,600	44,900	36,600	33,400	67,700	107,000	278,000	197,000	90,000	52,000	38,300
1929	35,700	31,100	24,400			18,600	21,900	45,100	210,000	124,000	82,200	49,900	
1930	30,500	21,000	19,800			20,400	24,900	129,000	172,000	146,000	91,000	55,100	
1931	33,000	26,400	20,300	18,400	19,100	19,500	29,000	62,800	183,000	134,000	80,500	50,800	13,400
1932	32,300	26,600	23,300			30,600	51,300	132,000	273,000	161,000	111,000	61,300	
1933	40,800	39,400	38,800	28,400	23,400*	24,700	33,400	107,000	259,000	224,000	116,000	68,500	23,400*
1934	53,400	68,000	62,600	69,500	68,400	51,300	81,700	287,000	211,000	138,000	88,000	49,900	
1935	38,800	43,400	37,600	27,500*	38,200	33,400	36,400	83,000	271,000	215,000	91,000	56,200	27,500*
1936	38,800	26,800	22,800	20,500*	14,800*	17,700	21,800	161,000	217,000	126,000	80,200	47,200	14,800*
1937	31,600	22,700	19,200	13,000*	18,500*	17,000*	21,200	49,500	194,000	142,000	79,800	53,500	13,000*
1938	35,000	45,800	32,700	32,000	20,900	27,700	41,600	149,000	314,000	148,000	70,500*	65,000	26,900
1939	41,500	30,600	26,100	25,200	23,700	23,800	41,700	133,000	202,000	144,000	82,800	51,000	22,700
1940	38,200	36,300	35,100	26,500	29,400	31,800	66,200	106,100	192,900	124,600	72,600	59,300	26,500
1941	44,900	34,100	26,800	28,600	28,400	30,600	59,000	102,200	153,600				28,800

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1913	468,000	June 14, 1913				22.03	75,900,000	107,000	22.51	77,500,000
1914				105,000	1.63	19.22	66,200,000	88,300	18.57	64,000,000
1915				91,400	1.42					
1916	458,000†	①		124,600	1.92	26.07	89,700,000	124,000	26.06	89,700,000
1917	367,000†	June 23-25, 1917		104,000	1.61	21.84	75,200,000	104,000	21.85	75,300,000
1918	396,000†	June 25-27, 1918		109,000	1.69	22.84	78,600,000	109,000	23.01	79,300,000
1919	309,000†	June 1, 2, 1919		100,000	1.55	21.06	72,400,000	95,900	20.22	69,400,000
1920	332,000†	July 15-19, 1920		92,500	1.43	19.54	67,200,000	100,000	21.17	72,800,000
1921	420,000†	June 11, 1921		116,000	1.80	24.38	83,900,000	112,000	23.68	81,200,000
1922	373,000†	June 17, 18, 1922	20,900	95,900	1.49	20.18	69,500,000	93,500	19.72	67,900,000
1923	371,000†	June 18, 1923		99,700	1.55	21.00	72,200,000	98,600	20.76	71,400,000
1924	287,000†	May 25, 26, 1924		79,800	1.24	16.84	57,900,000	81,700	17.25	59,300,000
1925	373,000†	May 28, 30, 1925	31,700	116,000	1.80	24.35	88,700,000	114,000	23.95	82,400,000
1926	168,000†	May 7, 8, 1926	21,000	68,000	1.05	14.33	49,200,000	73,200	15.42	53,000,000
1927	413,000†	June 18, 19, 1927		115,000	1.73	24.30	83,600,000	124,000	26.10	89,500,000
1928	466,000†	May 30, 31, 1928	33,300	128,000	1.98	26.99	92,800,000	115,000	24.27	83,400,000
1929	313,000†	June 16, 17, 1929		75,200	1.17	15.83	54,400,000	73,000	15.36	52,900,000
1930	246,000†	June 18, 1930		79,500	1.23	16.72	57,500,000	80,500	16.94	59,800,000
1931	241,000	June 13, 1931	18,400	75,700	1.17	15.93	54,800,000	75,800	15.95	54,900,000
1932	354,000	June 15, 1932		104,000	1.61	21.91	75,400,000	107,000	22.52	77,400,000
1933	438,000	June 22, 1933	23,400	116,000	1.59	24.36	83,800,000	123,000	25.79	88,700,000
1934	371,000	June 2, 1934	49,900	127,000	1.97	26.72	91,940,000	121,000	25.48	87,620,000
1935	337,000	June 19, 1935	27,500	103,300	1.60	21.76	74,820,000	99,920	21.03	72,340,000
1936	374,000	June 4, 1936	14,800	89,980	1.40	19.00	65,320,000	88,780	18.75	64,450,000
1937	258,000	June 24, 1937	13,000	72,900	1.13	15.37	52,810,000	77,050	16.23	55,770,000
1938	345,000	June 8, 1938	26,900	102,700	1.59	21.63	74,300,000	101,200	21.30	73,230,000
1939	280,000		22,700	83,880	1.38	18.70	64,310,000	90,620	19.08	65,610,000
1940	273,200	June 2, 1940	26,500	86,890	1.35	18.34	63,080,000	86,680	18.29	62,930,000
1941				26,800	1.22	16.55	56,930,000			

* Estimated.

† Maximum daily mean discharge, equivalent to momentary maximum.

① June 30, July 5, 1916. ② May 31, June 1, 1939.

COLVILLE RIVER BASIN

Sheep Creek at Loon Lake, Wash.

Location.—Lat. 48°03'35", long. 117°39'10", in NE¼ sec. 32, T. 30 N., R. 41 E., on right bank, 0.7 mile downstream from outlet of Loon Lake, and 1 mile west of town of Loon Lake.

Drainage area.—36.2 sq. mi. At site 1950, 36.1 sq. mi.

Gage.—Water-stage recorder and, since Oct. 3, 1951, wooden control. Altitude of gage is 2,370 ft. (from topographic map). Prior to October 1950, water-stage recorder a quarter of a mile upstream at different datum.

Extremes.—1950, 1951-53: Maximum discharge, 42 cfs Apr. 9, 1952 (gage height, 2.83 ft.); no flow at times each year.

Remarks.—Some small diversions for irrigation of lawns and gardens. Flow regulated by dam at outlet of Loon Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950								5.36	2.48	0.50	0.01	0	
1952	0	0	0.53	10.4*	14.2*	2.77	25.0	4.62	.23	0	0	0	5.07*
1953	0	0	0	3.74	1.48	0	0	1.75	2.56	0	0	0	.79

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950								3.6	0.3	0.1	0	0	0
1952	0	0	0	7*	0	0	1.9	1.3	0	0	0	0	0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1950							
1952	42	April 9, 1952	0	5.07	3,680	5.02	3,650
1953	41	May 25, 1953	0	.79	572		

* Estimated.

COLVILLE RIVER BASIN

Sheep Creek at Springdale, Wash.

Location.—Lat. 48°03'30", long. 117°45'00", in SE¼NW¼ sec. 34, T. 30 N., R. 40 E., on right bank, 15 ft. upstream from bridge on State Highway 3, half a mile west of Springdale, and 4½ miles upstream from mouth.

Drainage area.—46.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,980 ft. (from topographic map).

Extremes.—January to September 1953: Maximum discharge, 64 cfs June 9 or 10 (gage height, 2.04 ft., from recorded range in stage); minimum, 6.2 cfs Sept. 6 (gage height, 1.22 ft.).

Remarks.—Some diversion for domestic use. Flow partly regulated at outlet of Loon Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...				20.0	17.1	12.3	12.7*	11.5*	16.1*	10.5	9.75	9.40	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...				11*	18.5	10.5*	11.5	9.3	10*	9.3	8.3	8.3	.....

Colville River at Blue Creek, Wash.

Location.—Lat. 48°19'10", long. 117°49'10", in NW¼ sec. 31, T. 33 N., R. 40 E., on left bank upstream from small dam at sawmill just downstream from Blue Creek, a quarter of a mile upstream from Great Northern Railway bridge, and 5.4 miles north-west of Chewelah.

Drainage area.—435 sq. mi.

Gage.—Staff gage and wooden spillway of sawmill dam. Altitude of gage is 1,620 ft. (from topographic map and local benchmark elevation).

Extremes.—1922-24: Maximum discharge observed, 468 cfs Apr. 8, 1923 (gage height, 4.5 ft.); minimum observed, 5.3 cfs Aug. 13, 1924 (gage height, 0.09 ft.).

Remarks.—A large part of the summer flow is diverted above the station by numerous users for irrigation. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923...		56.0	71.9*	172	110*	166	377	175*	125	60.4	41.6	40.1	.....
1924...							126	40.5	22.8	15.7	22.3	28.0	.....

* Estimated.

Colville River at Blue Creek, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923		32						119	86	23	24	23	
1924							81	32	11	8.8	6.0	20	

Mill Creek near Colville, Wash.

Location.—Lat. 48°34'45", long. 117°51'50", in SW¼NW¼ sec. 35, T. 36 N., R. 39 E., on right bank, 3 miles northeast of Colville, and 5 miles downstream from North Fork.

Drainage area.—82 sq. mi., approximately.

Gage.—Staff gage. Datum of gage is 1,950 (from topographic map). Prior to Nov. 2, 1952, water-stage recorder half a mile upstream at different datum.

Average discharge.—14 years (1939-53), 49.3 cfs.

Extremes.—1939-53: Maximum discharge, 570 cfs Apr. 29, 1953 (gage height, 6.65 ft., from graph based on gage readings); minimum recorded, 3.6 cfs Aug. 28, 31, Sept. 1, 1940, but may have been less during period of no gage-height record in February 1940.

Remarks.—Small diversions for irrigation of about 50 acres above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940	4.59	5.59	9.08	5.64	9.89	76.0	186	86.6	28.6	11.0	6.20	7.22	36.3
1941	14.5	13.9	17.0	19.0	23.2	133	119	78.8	68.6	31.0	17.7	22.9	46.2
1942	19.1	27.6	83.7	48.5*	44.0	45.8	166	151	132	58.5	25.5	15.9	68.2*
1943	15.7	22.3	15.8	11.3	11.5	19.8	124	66.7	35.1	18.6	8.10	6.85	29.4
1944	9.82	12.1	10.3	8.78	9.29	15.6	46.5	40.7	35.9	14.5	6.45	8.08	18.1
1945	7.43	10.2	9.17	10.5	15.3	44.2	114	214	70.9	22.4	11.2	12.2	46.5
1946	11.9*	19.3	19.6	16.3	14.5	48.0	264	173	63.9	31.5	11.7	11.8	57.2*
1947	13.6	21.8	20.5	13.0	27.7	55.9	142	77.8	39.1	16.0	14.4	10.6	38.0
1948	22.7	21.9	18.0	16.1	16.0	25.1	205	318	121	56.5	34.3	21.1	73.1
1949	20.5	22.1	17.1	13.8*	18.0	53.3	273	143	41.2	20.4	13.2	9.21	53.6*
1950	14.4	13.5	13.1*	11.2*	12.8	36.1	156	204	69.1	34.6	16.0*	8.18	49.3*
1951	18.1	22.2	44.1	46.5	66.0	66.7	284	174	58.3	24.8	12.3	11.7	68.8
1952	17.3	17.3	23.3	17.6	19.9	30.9	269	166	57.5	28.1	13.8	10.9*	55.7*
1953	10.1*	11.7	11.7	20.5	19.6	27.9	115	184	127	47.0	20.6	14.9	50.9*

* Estimated.

COLVILLE RIVER BASIN

Mill Creek near Colville, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940					5.0*	21	130	47	15	8.4	4.2	4.2	.....
1941	10	12	7.6	16	20	97	68	58	46	21	13	13	7.6
1942	16	16*	30	40*	35	37	103	101	94	35	20	14	14
1943	15	16*	11	8.2	10*	11	78	43	24	9.7	6.4	6.4	6.4
1944	6.7	11	7.6	8.2	8.2	8.5	33	24	25	7*	4.7	5.8	4.7
1945	6.7	8.8	7.3	7.7	9.4	11	59	114	40	14	8.5	9.1	6.7
1946	10*	10	15	10	12	21	138	84	47	15*	6.9	10	6.9
1947	10	15	11	10	13	25	105	39	26	10	12	7.3	7.3
1948	12	18	16	12	13	15	63	180	30	37	24	19	12
1949	19	19	13	12*	12*	24	94	69	27	16	10	7.8	7.8
1950	8.1	9.1	12*	9.0*	9.0*	16	51	105	44	26*	9.1	7.5	7.5
1951	9.7	16.5	15.5	30	31*	53	126	92	36	14.5	10.5	9.3	9.3
1952	14*	14.5	15	15	15	17	63	76	44	17	11.5*	9.0	9.0
1953	9.0*	8.6	8.6	11.5	15.5	15.5	39	128	90	26	16.5	13.5	8.6

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1940	353	Mar. 27, 1940	.....	86.3	.448	6.03	26,330	38.5	6.89	27,930
1941	222	Mar. 2, 1941	7.6	46.2	.563	7.66	33,450	53.4	8.66	28,640
1942	395	May 27, 1942	14	68.2	.832	11.30	49,390	61.7	10.21	44,690
1943	211	April 15, 1943	6.4	29.4	.359	4.87	21,320	27.6	4.57	20,010
1944	97	May 24, 1944	4.7	18.1	.221	2.99	13,170	17.7	2.92	12,840
1945	361	May 5, 1945	6.7	45.5	.555	7.54	32,940	47.5	7.89	34,480
1946	460	April 19, 1946	6.9	57.2	.698	9.47	41,420	58.0	9.60	42,000
1947	230	April 20, 1947	7.3	33.0	.463	6.29	27,520	38.2	6.31	27,660
1948	538	May 4, 1948	12	73.1	.891	12.12	53,160	72.8	12.08	62,890
1949	430	April 20, 1949	7.8	53.6	.654	8.88	38,820	52.1	8.61	37,690
1950	338	May 13, 1950	7.5	49.3	.601	8.14	35,660	52.9	8.75	33,300
1951	413	April 14, 1951	9.3	63.8	.839	11.38	49,780	66.5	11.02	48,170
1952	538	April 19, 1952	9.0	55.7	.679	9.25	40,460	53.7	8.90	35,960
1953	570	April 29, 1953	8.6	50.9	.621	8.42	36,860	.....	.....	.....

* Estimated.

COLVILLE RIVER BASIN

Colville River at Kettle Falls (formerly Meyers Falls), Wash.

Location.—Lat. 48°35'40", long. 118°03'30", in sec. 29, T. 36 N., R. 38 E., on right bank, 600 ft. downstream from Stevens County Light and Power Co.'s plant at foot of Meyers Falls, half a mile south of town of Kettle Falls, and 2 miles upstream from Franklin D. Roosevelt Lake.

Drainage area.—1,050 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,500 ft. (from topographic map). Prior to Oct. 21, 1932, staff gage 500 ft. upstream at different datum. Oct. 21, 1932, to Sept. 19, 1938, staff gages 200 ft. upstream at datum 5 ft. lower. Sept. 20, 1938, to Mar. 20, 1949, staff gage at present site and datum.

Average discharge.—31 years (1922-53), 281 cfs.

Extremes.—1922-53: Maximum discharge, 2,690 cfs Apr. 19, 1938 (gage height, 6.20 ft., site and datum then in use, from graph based on gage readings); minimum observed, 0.5 cfs Aug. 15, 1930.

Remarks.—Several small diversions for irrigation above station. Slight regulation by powerplant and small reservoir above falls.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923...	106*	111	107*	243	151*	254	718	533	345	184	90.4	76.7	243*
1924...	96.5	122	125	86.9*	324	244	239	167	74.7	23.7	33.7	39.3	131*
1925...	65.6	139	91.0*	87.7*	502	545	979	453	219	63.7	47.9	51.1	266*
1926...	73.4	104	138	122	222	219	239	119	48.4	25.3	29.0	63.7	117
1927...	90.7	111	173*	148*	217*	406	739	880	571	225	77.1	237	323*
1928...	301	401	394*	354*	383	617	1,080	850	348	209	108	89.4	428*
1929...	115	148	138	93.6*	73.6*	239	249	214	132	52.2	29.3	38.2	127*
1930...	54.2	68.1	95.5	32.9*	96.5*	127	128	93.8	50.5	33.2	14.0	24.2	70.5*
1931...	43.2	64.6	68.1	84.6	90.3	151	205	112	49.5	27.8	12.0	22.7	77.3
1932...	35.8	49.5	56.3	77.7*	93.4	408	1,410	900*	450*	100*	45.0*	35.0*	304*
1933...	64.7*	145	89.5*	126	99.6*	376	888	956	336	113	53.1	78.2	278*
1934...	103	139	346	557	668	653	815	364	148	62.7	41.3	59.1	327
1935...	102	166	169	184*	368	470	886	818	277	147	80.8	65.7	310*
1936...	90.2	111	126	155	91.8*	245	398	343	165	57.3	29.5	52.7	156*
1937...	62.2	74.5	88.5	51.9*	65.8*	211*	472	434	207	113	59.5	64.0	159*
1938...	79.6	164	192	435	335	1,181	1,776	1,076	362	137	64.0	84.8	492
1939...	130	142	123*	190	116*	319	522	225	147	59.2	25.8	38.4	170*
1940...	62.9*	80.0*	135	92.6*	164	544	1,058	462	144	42.5	39.7	62.3	240*
1941...	103	341	155*	248	340	715	636	435	372	160	103	184	299*
1942...	131	233	463	355*	459	421	797	757	862	351	152	115	423*
1943...	116	203	218	159	180*	276	816	491	255	130	69.7	65.3	250*
1944...	103	148	116	111	155	262	337	225	178	61.2	40.5	42.2	148
1945...	90.3	95.4	85.5	128	216	381	530	863	357	107	57.2	67.3	252
1946...	77.4	132	161	198	188	497	1,234	862	352	183	80.0	101	339
1947...	120	160	188	150*	261	312	515	315	193	72.5	44.5	74.5	200*
1948...	146	179	173	155*	209*	310	880	1,744	1,035	467	258	181	479*
1949...	194	239	206	138*	251*	821	1,326	842	305	132	93.5	94.8	387*
1950...	132	167	139	120*	193*	632	1,019	1,032	482	205	116	91.1	361*
1951...	157	233	355	455	727	823	1,801	1,098	398	184	113	129	538
1952...	192	201	260	259	405	642	1,878	1,083	398	232	133	128	453
1953...	137	157	194	338	328	348	581	904	589	203	114	113	334

* Estimated.

COLVILLE RIVER BASIN

Colville River at Kettle Falls (formerly Meyers Falls), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1923		95		110*		171	404	322	250	95	78	68	
1924	73	102			238	214	214	81	47	19	18	17	17
1925	46					422	557	295	93	44	38	31	31
1926	65	84	111	92	121	196	185	68	28	13	15	44	13
1927	74	80				372	445	625	402	93	62	87	
1928	245	253			258	299	960	520	250	115	92	46	46
1929	84	123	82			132	165	15	101	23	24	23	23
1930	38	43	64			107	101	66	51	18	.6	17	.5
1931	33	36	52	63		88	178	54	31	10	10	12	10
1932	21	28				205	820						21
1933		90				175	600	575	178	60	41	44	
1934	76	70	120	378	652	529	552	195	88	34	34	48	34
1935	72	136	120*	70*	330	358	478	453	153	76	51	58	51
1936	69	72	84	82	75*	136	160	138	64	40	21	42	21
1937	49	57	62	40*	50*	100*	266	100	124	64	39	40	39
1938	68	77	88	244	290*	350	1,340	620	220	83	51	77	51
1939	69	85*	85*	120*	70*	133	414	150	92	27	19	26	19
1940	43		65*	40*	80*	332	706	233	45	38	34	35	33
1941	77	100*	30*	177	283	389	372	389	288	77	39	103	30*
1942	154	177	244	290*	332	382	410	608	633	248	112	104	104
1943	104	152	152	85*	135*	218	560	332	218	70	57	47	47
1944	48	131	82	95*	112	121	264	131	131	40	30	31	30
1945	43	67	50	72	114	141	428	584	190	63	42	44	42
1946	48	62	91	122	132	369	858	448	268	107	66	73	48
1947	92	126	92	118	160	238	493	160	132	33	36	42	33
1948	63	138	73	100*	80*	253	443	1,350	610	300	208	164	63
1949	185	196	180*	111*	128*	538	890	488	194	97	70	74	70
1950	82	138	95	100*	110*	358	685	935	356	142	88	74	74
1951	85	179	140*	240*	260*	562	1,380	572	251	129	96	110	85
1952	161	173	166	150*	251	340	1,230	548	342	152	117	110	110
1953	119	101	114	138	270	251	380	652	415	168	95	97	95

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1923	916	April 20, 1923		243	176,000	245	177,000
1924	422	Feb. 8, 1924	17	131	94,900	127	92,000
1925	1,290	April 19, 1925	31	266	194,000	270	195,000
1926	285	①	13	117	84,600	121	87,900
1927	1,280	May 1, 1927		323	234,000	383	273,000
1928	1,260	②	46	423	310,000	360	268,000
1929	356	Mar. 14, 1929	23	127	92,000	112	80,000
1930	220	Feb. 25, 1930	.5	70.5	51,000	66.9	48,400
1931	237	③	10	77.3	56,000	74.5	53,000
1932	1,760	April 27, 1932	21	304	221,000	317	230,000
1933	1,540	April 30, 1933		278	201,000	302	219,000
1934	1,040	April 3, 1934	34	327	236,500	314	227,400
1935	1,380	April 28, 1935	51	310	224,600	301	218,000
1936	753	April 27, 1936	21	156	112,900	147	106,700
1937	703	April 22, 1937	39	159	115,300	177	128,000
1938	2,690	April 19, 1938	51	492	356,400	469	354,000
1939	620	Mar. 28, 1939	19	170	122,900	160	115,800
1940	1,450	April 4, 1940	33	240	174,200	280	181,800

* Estimated. ① Feb. 12, April 19, 1926. ② April 3, May 1, 1925. ③ Mar. 23, April 9, 1931.

COLVILLE RIVER BASIN

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Colville River at Kettle Falls (formerly Meyers Falls), Wash.—Continued

Summary—Continued

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1941.....	932	Mar. 13, 1941	30	299	216,400	339	245,400
1942.....	1,270	May 29, 1942	104	425	309,700	399	288,500
1943.....	973	April 16, 1943	47	250	181,200	236	170,900
1944.....	470	Mar. 10, 1944	30	143	107,400	137	99,750
1945.....	1,060	May 6, 1945	42	252	182,600	263	190,500
1946.....	1,710	April 22, 1946	48	339	245,200	347	251,100
1947.....	668	April 21, 1947	33	200	144,600	202	146,400
1948.....	2,240	May 14, 1948	63	479	347,500	491	356,000
1949.....	1,720	April 21, 1949	76	387	289,000	370	267,800
1950.....	1,370	April 22, 1950	74	361	281,500	390	282,100
1951.....	2,240	Apr. 14, 15, 1951	85	538	389,800	529	352,800
1952.....	2,550	April 21, 1952	110	483	350,600	469	340,500
1953.....	1,660	April 30, 1953	95	334	241,800		

HALL CREEK BASIN

Hall Creek at Inchelium, Wash.

Location.—Lat. 48°18'20", long. 118°11'10", in NE¼ sec. 6, T. 32 N., R. 37 E., on right bank, three-quarters of a mile upstream from highway bridge, about 1 mile upstream from mouth, and 1 mile northwest of Inchelium.

Drainage area.—About 170 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,250 ft. (from river-profile map). Dec. 18, 1912, to May 15, 1913 and Aug. 1, 1915, to Jan. 27, 1916, staff gage half a mile downstream at different datum. May 16, 1913, to July 31, 1915, staff gage at Wires bridge 2 miles upstream at different datum.

Average discharge.—9 years (1913-22), 81.4 cfs.

Extremes.—1912-29: Maximum discharge, 1,010 cfs Apr. 16, 1914 (gage height, 3.24 ft., from graph based on gage readings); minimum not determined, stage-discharge relation affected by ice most winters.

Remarks.—No diversion or regulation noted although operation of mill upstream caused slight fluctuations during low water, at times.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913.....				32.1	31.2	33.8	231	256	143	63.5	37.9	39.9	.....
1914.....	32.1	45.1	39.3	39.4	45.5	136	507	350	113	44.4	22.3	26.1	121
1915.....	36.0*	38.6*	27.6*	29.3	28.8	81.1	292	282	162	57.7	29.6*	20.5	90.5*
1916.....	20.1	20.2	19.2	16.1	21.4	76.8	359	406	245	112	47.5	29.9	114
1917.....	25.4	26.9	22.6*	19.7*	21.1	22.1	701	400	109	56.2	22.8	19.1	78.3*
1918.....	17.1	20.6	20.3*	19.6	14.6*	35.1	114	83.0	34.3	15.7	13.3	9.60	33.4*
1919.....	13.7	20.5*	12.4*	33.7*	49.4	73.5	450	382	193	38.7	22.0	18.5	103*
1920.....	18.5	18.9	17.0*	18.0*	15.0*	15.7*	34.5	66.9	41.4	15.5	9.51	13.0	23.7*
1921.....	18.4	29.7	29.2	20.6*	41.4*	109	334	419	141	41.7	17.7	18.0	103*
1922.....	22.9*	25*	27*	24*	22*	30*	130	316	121	31.6	19.7	16.6	65.8*
1923.....							205	170	146	69.2	30.3	19.5	.....
1924.....	19.7	20.2					110	101	36.6	12.7	9.83	9.30	.....
1925.....							427	224	76.3	23.1	13.5	12.1	.....
1926.....							99.5	59.5	21.2	9.06	7.41	12.1	.....
1927.....							281	342	153	57.5	23.4	39.3	.....
1928.....							232	264	81.9	44.3	19.1*	15.0*	.....
1929.....							55.1	64.9	34.6	11.5	6.59	6.07*	.....

* Estimated.

HALL CREEK BASIN

Hall Creek at Inchelium, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913				27	25	31	39	100	112	54	28	27	25
1914	24	32	25	36	25	69	152	163	68	28	20	18	16
1915					26	34	189	126	50	39	24	19	19
1916	20	17	15		16	30	142	284	188	62	33	26	
1917	24						24	185	113	37	18	17	17
1918	16	19				17	79	51	18	11	11	8	8
1919	10					43	212	254	64	26	17	16	
1920	16						17	48	26	10	7.6	9.3	7.6
1921	13	14				56	150	255	72	22	15	16	13
1922								233	54	22	15	15	
1923							178	122	96	35	22	16	
1924	15	17					55	59	20	9.2	8.2	8.2	
1925							142	120	36	14	12*	11	
1926							54	29	14	6.4	6.2	8.8	
1927							120	223	89	29	20	24	
1928							165	134	54	24	15*		
1929							17		20	6.8	5.6	5.6	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1913	485	April 22, 1913	25			83.0	60,100
1914	1,010	April 16, 1914	18	121	87,500	120	80,700
1915	519	May 25, 1915	19	90.5	65,500	86.9	62,900
1916	649	May 5, 1916		114	83,200	116	84,100
1917	634	May 14, 1917	17	78.3	56,709	76.9	55,700
1918	165	April 10, 1918	8	33.4	24,200	32.4	23,500
1919	730	April 29, 1919		103	74,600	104	75,100
1920	92	May 11, 1920	7.6	23.7	17,200	25.6	13,600
1921	577	May 11, 1921	13	103	74,300	102	74,200
1922	531	May 18, 1922		65.8	47,600		
1923	306	April 19, 1923					
1924	158	April 14, 1924					
1925	700	April 12, 1925					
1926	155	①					
1927	800	②					
1928	425	April 28, 1928					
1929	171	May 6, 1929					

* Estimated.

① April 17, 18, 19, 1926. ② Between April 24 and May 2, 1927.

Stranger Creek at Meteor, Wash.

Location.—Lat. 48°15'40", long. 118°17'00", in NW¼ sec. 21, T. 32 N., R. 36 E., on right bank, at townsite of Meteor, just downstream from road bridge about 6 miles downstream from Twin Lakes, and about 6 miles southwest of Inchelium.

Drainage area.—About 56 sq. mi.

Gage.—Staff gage and concrete control. Altitude of gage is 1,850 ft. (from Indian Service irrigation project map).

Average discharge.—6 years (1916-22), 16.7 cfs.

Extremes.—1916-29: Maximum discharge, 180 cfs Apr. 20, 1925 (gage height, 1.84 ft.); no flow during periods in 1924, 1926, 1929.

Remarks.—A major part of flow is diverted above station for irrigation most seasons. Regulation by natural storage in Twin Lakes about 6 miles upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916												7.27	.....
1917	4.67	5.47	6.30	5.86	5.55	7.41	29.7	122	56.1	15.4	5.79	3.27	22.4
1918	2.48	2.90	4.71	5.51	5.31	7.53	19.6	19.1	9.22	3.92	1.87	.73	8.94
1919	1.03	2.74	3.38	4.03*	11.1	18.6	147	92.5	25.4	9.42	3.91	2.36	26.7*
1920	1.68	1.96	2.0*	2.0*	2.0*	5.85*	10.1	9.75	7.10	2.96	.70	1.17	3.92*
1921	1.44	2.83	6.20	6.00*	10.0*	25.7	102	91.2	31.7	12.4	4.13	1.78	24.6*
1922	1.85	2.91	4.0*	4.0*	3.0*	5.0*	24.9	94.5	29.8	7.84	3.25	1.05	15.4*
1923							37.5	39.6	20.8	12.4	5.68	2.98	.....
1924							11.7	11.0	5.84	1.73	.23	0	.....
1925							108	50.2	15.0	5.33	.61	.50	.....
1926							8.74	6.94	2.68	1.03	.07	.26	.....
1927							52.1	93.4	24.7	8.96	3.42	2.79	.....
1928							38.2	41.9	13.2	6.76	1.96	.57	.....
1929							3.62	3.69	2.96	1.28	.45	.12	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916												5.6	.....
1917	4.4						9.1	77	26	8.7	3.7	3.0	3.0
1918	2.3	2.3	3.0			5.6	12.4	13.3	6.2	2.8	1.0	.6	.6
1919	.8	1.0				13.3	49	48	14.7	5.9	2.3	2.0	.....
1920	1.4						7.0	6.4	5.0	1.4	.6	.6	.....
1921	1.0	.9				12.0	61	55	19.0	7.6	2.0	1.6	.9
1922	1.6	2.5					20	67	13	4.3	2.0	1.7	.....
1923							20	25	15.6	7.4	4.0	2.3	.....
1924							10	8.4	2.5	.6	0	0	0
1925							29	23	6.8	2.1	.2	.2	.....
1926							6.3	5.0	1.0	0	0	0	0*
1927							17	46	13.4	5.6	1.9	1.6	.....
1928							30	21	9.4	3.4	.9	.4	.....
1929							2.9	2.9	2.4	.1	.1	0	0

* Estimated.

STRANGER CREEK BASIN

Stranger Creek at Meteor, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1916							
1917	164†	May 15-18, 1917	3.0	22.4	16,200	21.9	15,800
1918	25†	①	.6	6.94	5,020	6.60	4,840
1919	164†	②		26.7	19,300	26.6	19,300
1920	16.3	April 18, 1920		3.92	2,850	4.33	3,140
1921	140	April 19, 1921	.9	24.6	17,600		
1922	128	May 19, 1922		15.4	11,100	24.5	17,700
1923	56†	April 26, 1923					
1924	14.1†	April 27, 1924					
1925	180†	April 20, 1925					
1926							
1927	151†	April 30, 1927					
1928	61.0†	May 1, 1928					
1929	7.5†	April 14, 1929					

† Maximum observed. ‡ Maximum for water year.

① April 28 to May 2, 1918. ② April 7-12, April 20 to May 3, 1919.

Stranger Creek at Inchelium, Wash.

Location.—Lat. 48°17'50", long. 118°11'20", in sec. 5, T. 32 N., R. 37 E., on right bank, half a mile upstream from mouth, and half a mile south of Inchelium.

Drainage area.—About 74 sq. mi.

Gage.—Staff gage and wooden control. Altitude of gage is 1,200 ft. (from topographic map). Prior to Nov. 22, 1915 at datum 0.78 ft. lower.

Extremes.—1914-17: Maximum discharge, 210 cfs Apr. 18, 1914 (gage height, 3.81 ft.); minimum not determined, probably occurred during period of ice effect in winter of 1914-15.

Remarks.—Several small diversions above station for irrigation above and below station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914							145	81.2	33.2	14.9	6.98	5.96	
1915	8.43	9.19	5.11*	5.85	6.29	16.5	58.1	34.1	28.2	14.7	8.41	4.02	10.6*
1916	5.34	5.71	8.16	9.12	10.3	29.5	129	125	51.1	29.3	14.6	9.45	35.6
1917	6.65	7.07	8.71	8.28	11.3	13.7	39.9	106	54.9	16.9*	7.49*	5.27*	23.9*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914							80	47	22	11	4.6	4.6	
1915	5.5	7.2			3.9	9	32	26	18	11	6.4	4.7	
1916	5.1	4.9				14	56	73	38	17	12	7.5	
1917	6.1	6.1	7.0	5.0*	8.5	8.0	21	68	24				

* Estimated.

STRANGER CREEK BASIN

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Stranger Creek at Inchelium, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet.
	Dis-charge	Date					
1914.....	210	April 18, 1914					
1915.....	89	April 12, 1915		16.6	12,100	16.4	11,800
1916.....	195	May 8, 1916		35.6	25,800	35.8	26,000
1917.....	142	May 18, 1917		23.9	17,300		

SPOKANE RIVER BASIN

Spokane River above Liberty Bridge, near Otis Orchards, Wash.

Location.—Lat. 47°40'55", long. 117°05'05", in NW¼ sec. 11, T. 25 N., R. 45 E., on left bank, 1.2 miles upstream from Liberty Bridge, 1¼ miles southeast of Otis Orchards, and 3.3 miles northeast of Greenacres.

Drainage area.—3,880 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 2,000 ft. above mean sea level (levels by Washington Water Power Co.).

Extremes.—1950-53: Maximum discharge, 30,400 cfs May 1, 1952 (gage height, 18.95 ft.); minimum, 61 cfs Aug. 7, 1951 (gage height, 7.77 ft.).

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal, and several smaller diversions, for irrigation of about 15,000 acres, part of which is above station and part below. Flow partly regulated by Coeur d'Alene Lake and by powerplant at Post Falls, Idaho.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...	2,115	4,339	9,079	7,673	15,150	7,071	14,920	16,250	5,490	1,251	150	298	6,926
1952...	2,670	3,460	5,107	4,073	4,835	3,754	17,330	22,050	5,839	1,650	335	1,177	6,049
1953...	1,274	1,578	1,784	5,975	10,990	5,787	8,697	16,540	12,630	1,140	452	1,052	5,779

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...	240*	1,090	2,620	3,420	3,650	5,810	7,360	13,000	1,150	103	67	94	67
1952...	271	2,970	3,420	2,920	2,840	3,240	7,670	15,200	1,620	589	95	95	95
1953...	225	1,190	1,460	1,460	5,240	5,020	6,040	16,700	2,510	119	111	111	111

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1951.....	26,200	Feb. 15, 1951	67	6,926	5,614,000	6,566	4,754,000
1952.....	30,400	May 1, 1952	95	6,049	4,392,000	5,493	3,988,000
1953.....	21,800	May 2, 1953	111	5,779	4,184,000		

* Estimated.

SPOKANE RIVER BASIN

Spokane River at Greenacres, Wash.

Location.—Lat. 47°40'45", long. 117°09'25", on east line of sec. 7, T. 25 N., R. 45 E., on downstream side of center pier of county road bridge, half a mile north of Greenacres, 12 miles upstream from Spokane.

Drainage area.—4,150 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,975.82 ft. above mean sea level (levels by Bureau of Reclamation). Prior to Apr. 1, 1949, water-stage recorder 1 mile downstream at different datum.

Extremes.—1948-52: Maximum discharge not determined, probably occurred May 30, 1948 during period of no gage-height record (on the basis of records for nearby stations discharge probably exceeded 40,000 cfs); minimum, 52 cfs Aug. 26, 27, 1949 (gage height, 1.04 ft.).

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal and several smaller diversions, for irrigation of about 15,000 acres, part of which is above station and part below. Flow partly regulated by Coeur d' Alene Lake and by powerplant at Post Falls, Idaho.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948						6,471	15,580	29,510*	22,900	1,999*	1,391*	716*	.....
1949	1,497	1,499	3,052	2,728*	3,145*	10,090	19,440	27,710	6,573	1,071	504	132	6,551*
1950	865	2,505	3,453	4,569*	6,437	16,490	19,520	24,030	22,650	6,216	1,001	349	9,028*
1951	2,195	4,435	9,128	7,735	15,440	7,296	15,160	16,550	5,645	1,324	199*	329	7,059*
1952	2,788	3,600	5,185	4,241	5,176	3,988	17,829	21,870	5,814				

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948						3,060	7,180	22,900	7,200	250*	200*	170*	.....
1949	160*	200*	1,910	500*	550*	3,700	10,600	19,600	227	578	55	55	55
1950	152	874	1,860	9,680	4,260	13,700	13,700	17,300	17,900	242	342	97	97
1951	255	2,070	2,510	3,340	3,900	6,020	7,190	14,400	1,150	180*	136*	112	112
1952	312	3,020	3,450	3,050	3,040	3,380	3,260	15,200	1,580				

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Discharge	Date						
1948								
1949	34,500	May 16, 1949	55	6,551	4,744,000	6,639	4,807,000	
1950	31,600	May 19, 1950	97	9,028	6,536,000	9,757	7,064,000	
1951	26,200	Feb. 15, 1951	112	7,059	5,110,000	6,716	4,862,000	
1952								

* Estimated.

SPOKANE RIVER BASIN

Spokane River below Trent Bridge, near Spokane, Wash.

Location.—Lat. 47°41'50", long. 117°14'35", in NE¼ sec. 4, T. 25 N., R. 44 E., on right bank, half a mile downstream from Trent Bridge, and 9 miles east of Spokane.

Drainage area.—4,210 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,907.49 ft. above mean sea level (levels by Bureau of Reclamation).

Average discharge.—5 years (1948-53), 7,322 cfs.

Extremes.—1948-53: Maximum discharge, 40,100 cfs May 30 or 31, 1948 (gage height, 18.5 ft., from high-water mark on gage); minimum, 615 cfs Oct. 24, 1949, Sept. 4, 1952; minimum gage height, 4.15 ft. Sept. 12, 1953.

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal and several smaller diversions, for irrigation of about 15,000 acres, part of which is above station and part below. Flow partly regulated by Coeur d'Alene Lake and by powerplant at Post Falls, Idaho.

Mean Discharge, in Cubic Feet Per Second

Year	Mar.	Feb.	Jan.	Dec.	Nov.	Oct.	YEAR	April	May	June	July	Aug.	Sept.	Annual
1948					8,372*	5,027	6,628	15,400	29,640	22,960	2,838	2,048	1,256	.....
1949	1,944	1,970	3,361	3,072	3,387	10,960	19,590	27,760	7,630	1,643	1,038	676	6,934	.....
1950	1,256	3,003	3,634	4,642	6,624	16,880	19,860	24,300	23,000	7,009	1,682	921	9,399	.....
1951	2,557	4,748	9,478	8,253	15,820	7,873	15,500	16,860	6,387	2,038	780	850	7,636	.....
1952	3,110	3,982	5,089	4,585	5,497	4,313	18,250	22,040	6,530	2,877	885	1,593	6,642	.....
1953	1,690	1,922	2,094	6,119	11,040	6,005	8,836	18,750	13,060	1,754	975	1,453	6,100	.....

Minimum Discharge, in Cubic Feet Per Second

Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948				4,350	3,330	3,820	7,160	23,100	2,700	1,860	1,040	750	.....
1949	729	695	2,260	1,160	1,140	9,060	11,100	20,000	1,220	1,100	658	642	642
1950	615	1,260	2,200	3,750	4,340	13,900	14,200	17,600	15,300	1,340	1,000	685	615
1951	827	2,700	3,160	4,050	4,190	6,620	8,150	14,900	2,240	772	685	674	674
1952	878	3,450	4,010	3,470	3,410	3,770	8,330	15,900	2,520	1,220	640	625	625
1953	765	1,750	1,870	1,800	5,540	5,210	6,300	16,900	3,260	805	702	678	678

Summary

Year	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1948	40,100	①				8,452	6,136,000	
1949	33,700	May 16, 1949	642	6,934	5,020,000	6,934	5,056,000	
1950	31,800	May 20, 1950	615	9,399	6,805,000	10,150	7,348,000	
1951	27,100	Feb. 14, 15, 1951	674	7,556	5,456,000	7,100	5,211,000	
1952	31,900	April 30, 1952	625	6,642	4,822,000	6,049	4,391,000	
1953	21,900	May 2, 1953	678	6,100	4,416,000			

* Estimated.

① May 30 or 31, 1948.

SPOKANE RIVER BASIN

467

Spokane River below Green Street, at Spokane, Wash.

Location.—Lat. 47°40'40", long. 117°22'20", in W½ sec. 10, T. 25 N., R. 43 E., on right bank at Spokane, 250 ft. downstream from Green Street bridge, and 5½ miles upstream from Latah Creek.

Drainage area.—4,230 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,864.31 ft. above mean sea level (levels by Bureau of Reclamation).

Extremes.—1948-52: Maximum discharge, 34,400 cfs May 16, 1949 (gage height, 18.54 ft.); minimum, 702 cfs Sept. 10, 1949 (gage height, 4.09 ft.); minimum daily, 889 cfs Sept. 4, 1952.

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal and several smaller diversions, for irrigation of about 15,000 acres, part of which is above station and part below. Flow partly regulated by Coeur d'Alene Lake and by powerplants at Post Falls, Idaho and near Spokane.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....			3,706	3,466*	3,677	11,000	20,040	28,750	8,335	2,145	1,408	979	.....
1950.....	1,567	3,282	4,013	4,915	6,942*	17,520	20,650	25,210	24,490	7,727	2,022	1,272	9,968*
1951.....	2,877	4,995	9,614	8,587	16,360	8,185	16,060	17,570	6,557	2,370	1,030	1,154	7,906
1952.....	3,363	4,241	5,834	4,817	5,682	4,595	18,340	23,310	6,980	2,768	1,174	1,858	6,914

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....			2,720	1,550*	1,620	8,980	11,000	21,100	1,910	1,520	952	918	.....
1950.....	970	1,750	2,670	4,030	4,900*	14,200	14,700	18,200	19,600	3,910	1,300	1,010	970
1951.....	1,180	3,040	3,550	4,540	4,700	6,920	8,290	15,500	2,970	1,110	976	990	976
1952.....	1,200	3,730	4,230	3,630	3,730	4,110	8,190	16,400	3,040	1,480	925	889	889

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30		Minimum day	Mean	Runoff in acre-feet	CALENDAR YEAR	
	Momentary maximum Dis-charge	Date				Mean	Runoff in acre-feet
1949.....	34,400	May 16, 1949				7,409	5,363,000
1950.....	32,600	May 20, 1950	970	9,968	7,215,000	10,700	7,742,000
1951.....	28,500	Feb. 15, 1951	976	7,906	5,723,000	7,568	5,479,000
1952.....	31,900	May 1, 1952	889	6,914	5,019,000		

* Estimated.

SPOKANE RIVER BASIN

Spokane River at Spokane, Wash.

Location.—Lat. 47°39'35", long. 117°26'50", in SW¼ sec. 13, T. 25 N., R. 42 E., on right bank at Cochran Street in Spokane and half a mile upstream from Latah Creek.

Drainage area.—4,290 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,696.6 ft. above mean sea level, datum of 1929 (from river-profile survey). Prior to July 1, 1921, staff or wire-weight gages, or water-stage recorders at several sites within 4 miles of present site, at various datums.

Average discharge.—62 years (1891-1953), 6,765 cfs (unadjusted).

Extremes.—1891-1953: Maximum discharge, 49,000 cfs (estimated) May 31, 1894 (gage height, 12.42 ft., site and datum then in use); minimum, 156 cfs Nov. 14, 1948 (gage height, 16.18 ft.); minimum daily, 740 cfs Sept. 7, 1947.

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal, Rathdrum Prairie Canal and several smaller diversions, for irrigation of about 15,000 acres above station. Flow partly regulated by Coeur d'Alene Lake and by powerplants at Post Falls, Idaho, and at Spokane.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1891							6,700	11,100	5,640	3,010	1,660*	1,560*	.....
1892	1,510*	2,680	3,530	2,980	3,160	8,480	9,210	15,000	15,900	6,640	2,940*	1,600*	6,140*
1893	1,300	1,588	2,690	3,060	2,090	2,400	11,000	25,100	19,400	8,380	3,140	1,530	6,820
1894	3,810	6,930	6,250	6,640	3,430	3,230	14,500	28,900	29,900	10,400	4,360	2,360	10,000
1895	2,350	4,370	4,670	5,090	4,620	7,350	10,100	14,400	8,120	3,390	1,790	1,350	5,630
1896	1,300	1,470	2,050	3,300	7,070	12,700	15,400	17,000	20,300	9,960	3,400	2,030	6,030
1897	1,600	6,630	12,890	7,370	6,000	5,180	20,100	27,400	12,500	7,790	3,560	2,450	9,610
1898	1,970	5,480	10,000	7,900	11,100	12,000	14,500	24,600	19,100	7,320	3,470	2,460	9,990
1899	2,400	3,040	2,800	5,840	7,610	6,170	14,000	23,500	24,800	11,900	4,740	3,230	9,170
1900	2,870	3,800	8,460	11,900	7,450	12,700	15,700	12,900	7,360	3,950	2,390	2,150	7,640
1901	2,760	5,330	10,300	6,690	7,150	14,500	10,900	19,400	13,200	6,320	3,150	2,440	8,780
1902	2,330	2,850	4,490	6,620	5,360	8,060	9,420	18,100	14,500	11,000	4,370	2,570	7,560
1903	2,200	3,910	4,990	10,000	6,880	5,740	13,400	19,900	19,300	7,330	3,160	2,250	8,200
1904	2,460	4,060	6,710	5,010	4,100	8,880	18,800	22,100	13,500	5,710	2,600	1,620	7,970
1905	1,370	1,380	1,770	2,090	2,050	5,220	7,380	8,710	7,970	3,560	1,790	1,560	8,770
1906	2,470	2,410	2,450	2,600	5,320	7,050	34,300	12,800	8,440	3,790	1,920	1,610	5,410
1907	1,620	3,600	5,210	6,150	6,790	11,000	15,000	18,000	12,300	4,190	2,220	2,800	7,360
1908	2,300	2,090	1,890	2,000	2,090	7,880	13,100	16,400	10,800	2,820	2,000	1,750	5,410
1909	1,820	2,160	2,280	4,250	4,840	5,660	8,660	12,600	18,000	3,870	2,620	2,200	5,310
1910	2,030	5,640	10,600	3,620	4,560	17,700	23,300	18,800	5,950	3,180	2,220	2,000	8,340
1911	2,170	3,770	5,480	3,310	2,940	5,460	11,700	15,900	9,260	3,750	2,220	2,260	5,690
1912	1,950	2,550	2,650	2,590	7,030	4,730	14,000	19,000	13,100	3,140	1,890	3,300	6,300
1913	2,520	4,510	3,820	4,200	4,140	5,890	19,500	26,600	21,600	5,190	1,960	1,870	8,490
1914	2,470	3,650	3,730	3,000	5,350	9,910	15,800	15,000	4,990	2,060	1,860	1,070	5,700
1915	1,560	3,900	3,350	2,430	1,980	5,160	10,200	6,320	4,630	2,360	1,950	1,910	3,860
1916	1,910	2,000	2,470	2,750	4,740	13,700	21,500	22,700	18,300	11,000	2,380	2,130	8,800
1917	2,070	2,800	2,330	2,330	2,780	2,890	14,200	32,900	25,800	6,470	2,730	2,430	8,290
1918	2,280	1,980	6,500	24,400	9,210	7,730	16,300	15,100	7,550	2,200	1,790	1,750	6,070
1919	1,760	2,180	3,890	5,330	6,390	8,210	19,100	18,400	7,750	2,250	1,780	1,700	6,550
1920	1,700	1,680	1,700	1,720	2,280	6,770	6,840	15,300	8,340	2,370	1,810	1,710	4,620
1921	2,840	4,160	4,450	9,830	9,190	14,600	17,200	22,600*	11,300	2,330	1,780	1,640	8,480
1922	1,810	2,080	6,590	2,980	1,840	2,620	10,560	20,500	13,300	2,150	1,660	1,540	6,640
1923	1,560	1,820	2,050	7,370	3,200	3,660	16,100	19,500	14,200	3,210	1,730	1,910	6,360
1924	1,710	1,870	2,760	2,220	10,000	7,150	8,220	15,000	3,200	1,650	1,620	1,400	4,720
1925	1,440	2,300	5,100	4,000	14,800	10,500	23,800	19,600	9,360	2,180	2,060	1,910	8,030
1926	1,820	1,760	1,870	2,470	6,060	7,280	10,300	7,370	2,140	1,900	1,530	1,510	3,820
1927	2,160	4,750	10,600	5,330	7,140	9,050	12,400	24,700	18,600	3,530	2,180	2,040	8,540
1928	5,640	13,100	15,900	9,300	6,840	11,700	15,600	23,000	8,960	2,430	1,770	1,600	9,620
1929	1,600	1,760	1,750	1,560	1,490	2,050	7,160	13,500	5,730	1,870	1,540	1,720	3,490
1930	1,480	1,460	1,360	1,590	2,650	4,030	11,300	7,510	4,400	1,520	1,440	1,420	3,840

* Estimated.

SPOKANE RIVER BASIN

Spokane River at Spokane, Wash.—Continued
 Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	1,390	1,350	1,340	1,340	2,080	6,610	13,900	11,500	2,620	1,360	1,370	1,390	3,860
1932...	1,370	1,230	1,230	2,660	2,500	11,600	23,300	29,300	14,100	2,600	1,610	1,440	7,820
1933...	1,560	5,690*	5,220	5,040	3,020	5,670	14,100	22,900	21,800	4,440	1,600	1,530	7,720*
1934...	3,037	7,195	22,910	25,430	14,310	12,960	20,930	9,957	3,073	1,666	1,480	1,433	10,360
1935...	1,434	4,271	4,675	5,690	6,609	8,084	14,010	23,000	11,200	2,412	1,745	1,958	7,090
1936...	1,735	1,261	1,815	2,027	2,829	5,791	16,430	22,640	6,443	1,932	1,731	1,840	5,478
1937...	1,938	1,374	1,353	1,750	1,575	2,714	11,920	19,300	6,351	2,137	1,628	1,836	4,702
1938...	1,494	2,408	5,664	7,645	4,954	9,646	15,890	19,830	6,030	2,024	1,634	1,666	6,990
1939...	1,798	1,605	2,605	2,140	2,965	5,142	16,360	16,630	3,999	1,976	1,930	1,783	4,846
1940...	1,533	1,151	1,645	2,310	5,252	13,070	15,140	10,830	3,116	1,679	1,506	1,498	4,889
1941...	1,584	1,798	3,812	4,780	4,285	4,876	4,261	6,915	4,617	1,557	1,517	1,661	3,470
1942...	2,123	3,572	9,652	4,303	5,175	5,139	12,400	9,135	6,143	2,958	1,212	1,244	5,254
1943...	1,495	4,060	4,570	4,445	4,315	4,986	23,030	19,100	14,220	3,477	1,577	1,514	7,383
1944...	1,851	2,220	3,312	2,645	2,934	2,512	6,843	6,026	2,884	1,449	1,521	1,526	2,974
1945...	1,735	1,581	1,754	3,201	5,341	6,753	9,320	18,430	6,967	2,672	1,019	1,378	5,036
1946...	1,845	3,391	5,326	8,295	4,497	8,439	17,479	22,850	9,727	2,576	1,059	1,190	7,239
1947...	1,691	4,632	13,090	7,191	9,887	9,785	13,900	16,200	5,860	2,842	1,134	1,516	7,313
1948...	3,349	4,095*	5,830*	9,049*	5,489	7,021	15,120	29,030	22,740	3,330	2,416	1,519	9,086*
1949...	2,148	2,116	3,659	3,444	3,746	11,090	20,090	28,590	8,271	2,068	1,362	1,007	7,324
1950...	1,524	3,238	3,934	4,907	6,546	17,490	20,670	25,250	24,280	7,706	2,025	1,280	9,929
1951...	2,752	4,965	9,681	8,783	16,420	8,311	16,000	17,530	6,840	2,302	1,035	1,156	7,921
1952...	3,421	4,299	6,006	5,118	5,908	4,790	16,220	23,270	6,989	2,719	1,206	1,833	6,975
1953...	1,934	2,227	2,408	6,429	11,600	6,425	9,164	19,330	13,570	2,098	1,261	1,669	6,466

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1891.....							2,740	8,460	3,960	1,860			
1892.....		1,600	3,070	2,740	2,900	4,540	8,460	10,300	10,300	3,600		1,300	1,300
1893.....	1,300	1,300	2,280	2,430	1,990	1,990	5,360	16,100	13,200	4,540	1,860	1,400	1,300
1894.....	1,600	3,960	3,960	3,780	2,280	2,280	7,720	22,200	16,400	6,760	2,740	2,280	1,500
1895.....	2,130	3,240	3,420	2,900	3,420	5,800	7,000	11,700	5,360	2,280	1,500	1,300	1,300
1896.....	1,800	1,300	1,840	2,260	6,520	10,900	13,900	15,800	18,500	4,940	2,430	1,730	1,300
1897.....	1,500	1,780	8,330	6,400	5,070	4,240	8,850	21,300	9,630	5,070	2,580	2,250	1,500
1898.....	1,660	1,860	8,080	4,650	4,440	7,830	7,340	22,500	12,200	4,650	2,750	2,410	1,860
1899.....	2,410	2,750	2,580	3,460	6,400	5,950	17,300	19,700	6,400	6,400	3,400	2,750	2,410
1900.....	2,350	3,280	6,400	8,330	5,950	6,630	13,400	10,400	5,510	2,750	2,090	2,010	2,010
1901.....	2,250	4,040	5,950	7,580	5,070	10,400	9,370	13,000	9,370	4,240	2,750	2,410	2,250
1902.....	2,090	2,250	3,840	5,070	4,240	6,400	6,170	12,200	8,330	6,860	3,100	2,410	2,090
1903.....	1,930	2,250	4,050	5,070	4,650	4,240	11,000	18,300	12,100	4,550	2,260	2,100	1,930
1904.....	2,100	2,910	5,160	4,550	3,780	4,750	8,450	18,500	6,660	3,660	1,970	1,420	1,420
1905.....	1,300	1,300	1,620	1,890	1,600	2,560	6,720	7,650	5,840	2,550	1,340	1,240	1,240
1906.....	1,390	2,070	2,240	2,190	3,470	5,860	8,720	9,380	6,000	2,460	1,690	1,410	1,390
1907.....	1,260	1,560	4,060	3,570	3,620	8,860	10,900	14,600	6,670	2,370	1,980	2,090	1,360
1908.....	2,130	1,860	1,860	1,890	1,810	2,980	7,390	13,600	4,260	2,040	1,810	1,610	1,610
1909.....	1,600	1,900	2,070	1,710	2,910	4,410	7,700	10,600	8,040	2,510	2,430	1,860	1,660
1910.....	1,800	1,940	5,210	3,050	3,250	3,120	20,200	13,100	3,320	2,920	1,860	1,810	1,300
1911.....	1,810	2,070	3,820	2,670	1,960	2,310	9,590	14,200	4,950	2,190	1,650	1,750	1,650
1912.....	1,760	1,850	2,190	2,070	5,120	3,730	6,510	15,300	5,120	1,750	1,650	2,430	1,650
1913.....	1,960	2,550	3,050	3,050	3,310	4,800	8,360	20,300	11,300	2,250	1,510	1,700	1,700
1914.....	1,100	2,360	2,140	2,140	3,920	6,680	3,360	9,380	2,140	1,810	1,800	1,600	1,500
1915.....	1,400	1,500	2,140	2,140	1,700	1,700	6,300	2,470	2,220	1,780	1,590	1,840	1,400
1916.....	1,840	1,390	2,390	2,450	3,060	5,700	19,600	18,400	17,000	3,330	2,160	2,110	1,840
1917.....	2,000	2,060	2,180	2,180	2,240	2,540	3,360	9,780	2,140	1,810	1,600	1,500	1,500
1918.....	2,120	1,620	1,570	10,800	6,700	5,410	14,400	10,900	3,050	1,830	1,620	1,720	1,570
1919.....	1,720	1,940	2,200	2,410	3,210	5,590	13,700	15,560	9,280	2,008	1,670	1,620	1,620
1920.....	1,620	1,620	1,670	1,650	1,680	1,680	6,190	12,100	3,780	1,460	1,640	1,560	1,460
1921.....	1,550	1,380	2,320	6,640	4,990	10,200	14,300	18,500	3,080	1,470	1,640	1,480	1,470
1922.....	1,670	1,640	4,330	1,900	1,970	1,800	4,530	14,700	3,220	1,660	1,470	1,440	1,440
1923.....	1,460	1,680	1,580	3,680	1,980	2,560	8,720	16,760	4,690	1,690	1,580	1,600	1,450
1924.....	1,480	1,620	1,750	1,980	3,970	2,710	2,600	5,620	1,560	1,470	1,400	1,250	1,250
1925.....	1,360	1,360	1,910	2,200	8,060	8,310	13,600	17,400	3,690	1,600	1,810	1,720	1,360

* Estimated.

SPOKANE RIVER BASIN

Spokane River at Spokane, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1926...	1,520	1,630	1,560	1,850	3,330	6,060	6,770	2,340	1,860	1,620	1,160	1,140	1,140
1927...	1,550	2,940	5,220	3,090	3,530	7,880	9,480	21,000	.....	1,870	1,920	1,820	1,580
1928...	2,180	4,660	7,440	6,410	4,540	2,900	12,800	17,700	3,320	1,880	1,400	1,500	1,600
1929...	1,500	1,550	1,330	1,290	1,420	1,460	3,630	11,900	2,460	1,370	1,300	1,550	1,290
1930...	1,310	1,340	1,310	1,240	1,340	2,460	9,760	5,000	1,860	1,160	1,310	1,340	1,160
1931...	1,250	1,240	1,260	1,260	1,260	2,110	10,400	4,070	1,510	1,100	1,130	1,150	1,130
1932...	1,120	1,140	1,170	1,390	.....	7,940	10,660	24,200	4,040	1,700	1,380	1,360	1,120
1933...	1,350	.....	2,090	2,400	2,180	2,560	9,630	20,400	14,100	1,760	1,350	1,370	1,350
1934...	1,450	2,990	2,740	18,400	9,990	9,600	17,200	4,450	1,060	1,460	1,260	1,290	1,260
1935...	1,260	1,580	1,740	4,340	5,500	4,670	7,970	29,700	3,370	1,610	1,500	1,740	1,260
1936...	1,500	1,040	1,100	1,210	2,250	2,020	4,030	18,400	2,100	1,400	1,420	1,600	1,040
1937...	1,660	1,160	1,150	1,300	1,230	1,580	5,360	10,400	4,160	1,360	1,310	1,560	1,160
1938...	1,070	1,560	2,560	3,490	3,270	4,440	10,000	16,160	2,050	1,440	1,280	1,510	1,070
1939...	1,620	1,620	1,300	1,340	2,230	2,280	13,500	7,020	2,450	1,450	1,750	1,440	1,340
1940...	1,260	1,060	1,340	1,620	2,210	11,200	13,800	4,760	1,410	1,330	1,160	1,240	1,060
1941...	1,120	1,320	1,420	2,140	3,140	2,880	1,530	2,590	1,800	1,050	1,060	1,220	1,050
1942...	1,590	2,370	3,160	2,090	3,100	3,150	5,240	4,370	4,430	1,450	990	917	917
1943...	1,140	941	3,490	3,060	2,420	3,180	15,300	15,300	9,040	1,370	1,200	1,050	941
1944...	1,350	1,550	1,940	1,050	1,810	2,060	2,760	3,960	1,720	1,050	1,020	1,280	1,020
1945...	1,250	1,250	937	1,000	3,940	4,400	8,080	12,000	1,710	1,810	834	950	834
1946...	1,130	2,100	3,880	4,360	2,940	6,160	13,000	18,400	3,320	1,650	850	705	705
1947...	1,180	1,860	5,700	5,450	7,390	7,810	11,960	4,690	3,450	1,650	763	740	740
1948...	1,350	3,340*	3,190*	4,560*	3,350	4,400	7,360	22,300	9,300	2,140	1,460	854	954
1949...	900	940	2,650	1,730	1,510	9,160	11,400	20,900	1,820	1,400	855	850	855
1950...	864	1,900	2,670	4,000	4,700	14,200	14,600	13,360	19,600	2,020	1,370	970	864
1951...	1,060	2,300	3,510	4,650	4,750	7,110	8,380	15,600	2,920	1,020	871	980	871
1952...	1,350	3,800	4,300	3,980	3,810	4,250	8,410	16,300	2,010	1,460	900	930	900
1953...	1,060	2,050	2,120	2,150*	6,020	5,680	6,670	17,400	3,830	1,050	800	770	770

* Estimated.

SPOKANE RIVER BASIN

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Spokane River at Spokane, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1891	12,800	May 15, 1891					
1892	21,800	May 31, 1892	1,300	6,140	4,450,000	5,950	4,320,000
1893	37,500	May 21, 1893	1,300	6,320	4,930,000	7,660	5,570,000
1894	49,000	May 31, 1894	1,500	10,000	7,260,000	9,640	6,980,000
1895	17,100	May 10, 1895	1,300	5,630	4,070,000	5,050	3,680,000
1896	21,400	June 7, 1896	1,300	5,030	5,840,000	9,400	6,530,000
1897	33,000	April 23, 1897	1,500	9,510	6,590,000	9,210	6,670,000
1898	27,200	May 1, 1898	1,800	9,990	7,230,000	9,220	6,680,000
1899	23,000	May 29, 1899	2,410	9,170	6,640,000	9,730	7,050,000
1900	17,000	April 10, 1900	2,010	7,640	5,530,000	7,890	5,730,000
1901	22,200	May 20, 1901	2,250	8,750	6,360,000	8,030	5,820,000
1902	24,800	May 26, 1902	2,090	7,500	5,450,000	7,630	5,520,000
1903	23,900	June 6, 1903	1,930	8,200	5,930,000	9,370	6,060,000
1904	27,900	April 23, 1904	1,420	7,970	5,780,000	7,210	5,260,000
1905	9,510	June 8, 1905	1,800	3,770	2,730,000	4,000	2,900,000
1906	18,400	April 27, 1906	1,390	5,410	3,920,000	5,670	4,100,000
1907	21,400	May 25, 1907	1,360	7,360	5,330,000	7,020	5,080,000
1908	21,700	April 27, 1908	1,610	5,410	3,930,000	5,400	3,920,000
1909	17,700	June 6, 7, 1909	1,660	5,310	3,840,000	6,320	4,520,000
1910	28,100	Mar. 25, 1910	1,800	8,340	6,040,600	7,760	5,620,000
1911	17,200	May 9, 1911	1,650	5,690	4,120,000	5,340	3,860,000
1912	21,200	May 24, 1912	1,650	6,300	4,580,000	6,610	4,800,000
1913	33,600	June 1, 1913	1,700	8,490	6,160,000	8,340	6,040,000
1914	19,600	April 19, 1914	1,500	5,700	4,130,000	5,700	4,120,000
1915	11,500	May 23, 1915	1,400	3,860	2,790,000	3,650	2,640,000
1916	28,400	May 9, 1916	1,840	8,860	6,300,000	8,830	6,410,000
1917	41,900	May 17, 1917	2,000	8,290	6,000,000	8,630	6,250,000
1918	39,600	Jan. 4, 1918	1,570	8,070	5,810,000	7,220	5,660,000
1919	24,600	May 1, 1919	1,620	6,550	4,750,000	6,830	4,580,000
1920	18,200	May 19, 20, 1920	1,490	4,520	3,280,000	6,060	3,670,000
1921	26,200	May 21, 22, 1921	1,470	5,430	6,130,000	8,390	6,080,000
1922	26,300	May 22, 1922	1,440	5,640	4,080,000	5,210	3,770,000
1923	22,000	May 13, 1923	1,450	6,360	4,600,000	6,430	4,660,000
1924	17,800	May 16-18, 1924	1,250	4,720	3,420,000	4,930	3,580,000
1925	31,700	April 20, 1925	1,360	8,030	5,530,000	7,760	5,620,000
1926	15,500	April 22, 1926	1,140	3,820	2,770,000	4,830	3,500,000
1927	25,200	May 20, 1927	1,580	8,510	6,130,000	9,980	7,230,000
1928	20,600	May 14-16, 1928	1,500	9,620	6,380,000	7,150	5,190,000
1929	14,700	May 25, 1929	1,290	3,490	2,530,000	3,420	2,480,000
1930	12,900	April 17, 1930	1,160	3,340	2,420,000	3,320	2,400,000
1931	15,800	April 15, 1931	1,130	3,860	2,790,000	3,830	2,780,000
1932	33,500	May 15, 1932	1,120	7,820	5,680,000	8,550	6,200,000
1933	28,500	May 1, 1933	1,350	7,720	5,590,000	9,480	6,860,000
1934	47,800	Dec. 26, 1933	1,260	10,360	7,498,000	8,420	6,103,000
1935	25,400	May 10, 1935	1,260	7,090	5,132,000	6,584	4,766,000
1936	33,700	April 27, 1936	1,040	5,478	3,977,000	5,508	3,998,000
1937	22,100	May 8-13, 1937	1,160	4,702	3,404,000	5,115	3,706,000
1938	32,700	April 22, 1938	1,070	6,990	5,060,000	6,621	4,793,000
1939	23,300	May 5, 6, 1939	1,340	4,846	3,508,000	4,774	3,456,000
1940	16,500	April 17, 1940	1,060	4,889	2,549,000	5,130	3,724,000
1941	16,100	May 19, 1941	1,050	3,470	2,512,000	4,157	3,010,000
1942	12,400	May 26, 1942	917	5,354	3,804,000	4,809	3,482,000
1943	32,400	April 22, 1943	841	7,283	5,344,000	7,155	5,130,000
1944	11,400	April 15, 1944	1,020	2,974	2,159,000	2,893	2,035,000
1945	22,200	May 11, 1945	834	5,036	3,646,000	5,473	3,963,000
1946	28,400	May 10, 1946	795	7,229	5,242,000	7,992	5,756,000
1947	25,000	Dec. 18, 1947	710	7,313	5,294,000	6,780	4,914,000
1948	39,600	May 31, 1948	934	9,086	6,593,000	8,641	6,273,000
1949	34,200	May 16, 1949	855	7,324	5,302,000	7,384	6,348,000
1950	32,700	May 20, 1950	864	9,329	7,159,000	10,660	7,721,000
1951	28,200	Feb. 15, 1951	871	7,921	5,735,000	7,609	5,500,000
1952	32,100	May 1, 1952	900	6,978	5,066,000	6,377	4,630,000
1953	22,400	May 5, 1953	770	6,466	4,681,000		

SPOKANE RIVER BASIN

Latah Creek at Tekoa, Wash.

Location.—Lat. 47°13'20", long. 117°04'35", in N½ sec. 23, T. 20 N., R. 45 E., on right bank bent of foot bridge in town of Tekoa, 1,000 ft. upstream from mouth of North Fork of Latah Creek.

Drainage area.—About 133 sq. mi.

Gage.—Staff gage. Datum of gage is 2,474.89 ft. above mean sea level, unadjusted.

Extremes.—1904-05: Maximum discharge, 994 cfs Apr. 16, 1904 (gage height, 7.05 ft., from graph based on gage readings); no flow Feb. 9-14, Aug. 8 to Sept. 16, 1905.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904.....							465	49.6	29.5	5.6	0.35	0.28	.....
1905....	4.6	6.2	0.2	30.7	17.8	78.5	81.2	57.1	51.3	6.6	.10	.64	23.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904.....							146	14	4.5	1.0	0.2	0.2	.....
1905....	0.2	3.0	6.0	4.5	0.2	30	38	18	18	1.0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1904.....	994	April 16, 1904					
1905....	218†	Mar. 27, 1905	0	28.7	20,800		

† Maximum observed.

North Fork Latah Creek at Tekoa, Wash.

Location.—Lat. 47°13'35", long. 117°04'30", in S½ sec. 14, T. 20 N., R. 45 E., on right bank bridge abutment of Oregon-Washington Railroad and Navigation Co.'s bridge over North Fork of Latah Creek in Tekoa, and about 25 ft. upstream from highway bridge.

Drainage area.—About 60 sq. mi.

Gage.—Staff gage. Datum of gage is 2,478.71 ft. above mean sea level, unadjusted.

Extremes.—1904-05: Maximum discharge observed, 336 cfs Mar. 26, 1905 (gage height, 2.9 ft.); no flow for part of February and July 1905.

Remarks.—No known diversion or regulation above station.

SPOKANE RIVER BASIN

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North Fork Latah Creek, at Tekoa, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904.....							99.4	5.23	1.61	0.62	0.36	0.30	.....
1905....	1.58	2.57	3.57	5.37	19.9	79.1	167	113	93.8	7.23	.48	.78	41.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904.....							13	0.1	0.1	0.2	0.3	0.3	.....
1905....	0.3	2.2	2.5	0.5	0	3.5	100	87	9.4	0	.1	.7	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis charge	Date					
1904.....	232	April 3, 1904					
1905....	336†	Mar. 26, 1905	0	41.0	29,800		

† Maximum observed.

Latah Creek at Spokane, Wash.

Location.—Lat. 47°39'10", long. 117°26'55", in NW¼ sec. 24, T. 25 N., R. 42 E., on left bank in Spokane, three-quarters of a mile upstream from mouth.

Drainage area.—619 sq. mi.

Supplemental records available.—Records of suspended-sediment loads for the period April to August 1953 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Altitude of gage is 1,720 ft. (from topographic map). Apr. 9 to Nov. 21, 1948, wire-weight gage half a mile upstream at different datum.

Average discharge.—5 years (1948-53), 284 cfs.

Extremes.—1948-53: Maximum discharge, 11,900 cfs May 24, 1948 (gage height, 18.73 ft., from floodmarks, site and datum then in use), from rating curve extended above 7,300 cfs on basis of slope-area and contracted opening determinations of peak flow; minimum, 10 cfs Sept. 3, 1949, minimum gage height, 2.36 ft. Aug. 1, 14, 1953.

Remarks.—A few small diversions for irrigation above station. No regulation.

SPOKANE RIVER BASIN

Latah Creek at Spokane, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948							598	1,025	391	77.7	38.1	26.5	
1949	29.0	50.2	72.7*	52.7*	1,165*	1,667	465	124	32.8	17.5	13.3	15.1	304*
1950	17.8	27.2	36.6	33.7*	1,322	1,829	556	184	143	37.8	21.0	18.2	346*
1951	25.8	53.4	272	571	979	667	231	86.3	59.9	21.8	13.2	14.5	245
1952	32.4	41.9	138	106	1,004	1,499	742	130	46.3	34.5	17.5	10.9	315
1953	18.7	22.0	34.3	818*	664	392	200	215	119	20.0	13.3	13.1	206*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948							355	296	134	43	26	24	
1949	26	32	54*	50*	50*	655	212	51	23	15	12	11	11
1950	15	18	26	23*	23*	632	217	67	51	25	19	17	15
1951	18	30	60	191	196	140	86	47	28	14	12	14	12
1952	19	27	69	76*	237	299	305	50	40	18	16	14	14
1953	15	20*	22*	33	259	170	104	70	42	11.5	11.5	11.5	11.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1948	11,900	May 24, 1948								
1949	6,210	Feb. 24, 1949	11	304	0.491	6.60	220,100	298	6.52	215,500
1950	9,150	Feb. 26, 1950	15	346	.559	7.53	250,600	369	7.96	267,100
1951	6,080	Mar. 15, 1951	12	245	.396	5.39	177,000	234	5.13	169,100
1952	9,140	Mar. 26, 1952	14	315	.509	6.92	225,500	303	6.65	220,100
1953	8,500	Jan. 18, 1953	11.5	208	.338	4.55	150,000			

* Estimated.

Spokane River above Seven-Mile Bridge, near Spokane, Wash.

Location.—Lat. 47°43'05", long. 117°29'55", in E½ sec. 28, T. 26 N., R. 42 E., on left bank, 5 miles northwest of Spokane.

Drainage area.—4,970 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,630 ft. (from topographic map).

Extremes.—1948-52: Maximum discharge, 34,400 cfs May 1, 1952; maximum gage height, 14.62 ft. May 16, 1949; minimum discharge, 302 cfs Sept. 9, 11, 12, 1949 (gage height, 3.57 ft.); minimum daily, 1,010 cfs Aug. 22, 1952.

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal, and many smaller diversions for irrigation of several thousand acres above station. Flow partly regulated by Coeur d'Alene Lake and by powerplants at Post Falls, Idaho, and at Spokane.

Spokane River above Seven-Mile Bridge, near Spokane, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949...		2,301*	3,980*	3,589*	5,023	12,670	20,320	28,570	8,603	2,350	1,595	1,195	.....
1950...	1,750	3,352	4,088	5,038	8,322	19,390	21,130	25,490	24,470*	7,991*	2,336	1,537	10,400*
1951...	2,899	5,119	0,922	9,411	17,689	9,082	16,369	17,900	7,185	2,578	1,207	1,217	8,314
1952...	3,387	4,308	6,133	5,054	7,027	6,224	19,200	23,940	7,346	3,018	1,370	1,932	7,405

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949...		1,100*	3,110	2,000*	1,500	10,900	11,700	21,200	2,210	1,770	1,100	1,090	.....
1950...	1,120	2,190	2,920	4,160	5,000*	15,600	16,000	18,600	19,700*	2,400	1,620	1,220	1,120
1951...	1,250	3,110	3,820	5,150	5,060	7,690	9,600	15,800	3,410	1,240	1,020	1,070	1,020
1952...	1,270	3,760	4,340	4,160	4,580	4,640	9,700	16,800	3,320	1,680	1,010	1,060	1,010

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1949.....	34,300	May 16, 1949	.....	.....	.....	7,775	5,629,000
1950.....	32,800	May 20, 1950	1,120	10,400	7,530,000	11,130	8,054,000
1951.....	30,000	Feb. 15, 1951	1,020	8,314	6,019,000	7,967	5,768,000
1952.....	34,400	May 1, 1952	1,010	7,405	5,375,000	.....	.....

Deep Creek near Spokane, Wash.

Location.—Lat. 47°40'30", long. 117°41'00", in sec. 7, T. 25 N., R. 41 E., near left bank at county road bridge, 10 miles west of Spokane.

Drainage area.—76.6 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,140 ft. (from topographic map). Mar. 2 to June 15, 1949, staff gage at different datum.

Extremes.—1949-50: Maximum and minimum discharges not determined.

Remarks.—All water diverted above station for irrigation during summer. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....						80.6	14.9	8.28					
1950.....						145							

* Estimated.

SPOKANE RIVER BASIN

Deep Creek near Spokane, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949						6.2	11	3.6					
1950						8.6							

Spokane River below Nine-Mile Dam, near Spokane, Wash.

Location.—Lat. 47°46'50", long. 117°32'40", in SW ¼ NE ¼ sec. 6, T. 26 N., R. 42 E., half a mile downstream from Nine-Mile Dam, 1 ¼ miles upstream from Little Spokane River, and 9 ½ miles northwest of Spokane.

Drainage area.—5,110 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,530.44 ft. above mean sea level, datum of 1929. Prior to Nov. 22, 1948, at site 1,000 ft. upstream at different datum.

Extremes.—1948-50: Maximum discharge not determined, probably occurred May 24, 1948, during period of no gage-height record; minimum, 296 cfs Sept. 14, 1948 (gage height, 0.79 ft.).

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal and many smaller diversions, for irrigation of several thousand acres above station. Flow partly regulated by Coeur d'Alene Lake and by several powerplants above gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948						8,030	16,440	32,010	24,520*	3,858	2,782	1,822	.....
1949	2,515	2,527	4,087	3,617*	5,804	12,950	20,470	28,540	8,894	2,419	1,828	1,266	7,377*
1950	1,814	3,501	4,501	5,440	8,864	19,150	20,660	25,080	24,200	8,291	2,375	1,583	10,450

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948						5,210	5,360	24,200	11,100	2,750	946	336	.....
1949	1,140	748	2,550	1,930*	1,200	11,400	12,400	20,900	2,440	944	372	358	858
1950	905	2,400	3,270	4,450	5,250	15,800	15,400	18,300	19,500	1,780	1,620	704	704

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1948								
1949	34,000	May 18, 1949	358	7,877	5,703,000	7,937	5,747,000	
1950	32,400	May 20, 1950	704	10,450	7,566,000			

* Estimated

SPOKANE RIVER BASIN

Little Spokane River at Scotia, Wash.

Location.—Lat. 48°06'20", long. 117°09'10", in SW¼ sec. 8, T. 30 N., R. 45 E., on right bank abutment of county road bridge at Scotia and about 7 miles southwest of Newport.

Drainage area.—74.2 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,060 ft. (from topographic map).

Extremes.—July to September 1948: Maximum and minimum discharges not determined.

Remarks.—No regulation or diversion upstream from station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										37.6	33.1	30.3*	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										35	31	29*	

Little Spokane River at Elk, Wash.

Location.—Lat. 48°01'20", long. 117°16'20", in SE¼ sec. 8, T. 29 N., R. 44 E., on right bank, half a mile downstream and northeast of Elk.

Drainage area.—115 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,875 ft. (from topographic map).

Extremes.—1948-53: Maximum discharge, 141 cfs Mar. 19, 1950 (gage height, 1.83 ft.); minimum not determined, probably occurred during winter of 1950 when water-stage recorder was not operating; minimum daily, 37 cfs Jan. 31 to Feb. 4, 1950.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948										61.3	50.5	46.5	
1949	46.1	47.4	46.8*	43.8*	54.0*	30.3	101	82.0	62.5	52.6	47.3	46.6	59.2*
1950	47.3	49.2	47.2	41.0*	44.6*	93.7	111	91.0	71.5	57.5	50.9	49.1	63.0*
1951	53.4	53.7	58.3	61.5*	75.9	78.7	93.1	80.9	65.6	52.7	48.9	48.3	64.6*
1952	56.9	54.4	56.5	52.7*	63.5	70.4	123	93.7	77.3	64.7	54.0	52.2	69.2*
1953	50.4	51.5	51.8*	72.9	77.2	68.5	69.3	66.1	62.3	49.0	44.5	42.9	58.8*

* Estimated.

SPOKANE RIVER BASIN

Little Spokane River at Elk, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948.....										55	46	46	.....
1949.....	44	44	43*	42	44*	65	94	70	57	48	46	45	42
1950.....	46	46	45	37*	37*	55	101	77	64	53	49	48	37*
1951.....	50	50	50	52*	53*	69	88	70	55	49	48	47	47
1952.....	52	51	51*	50*	57	59	114	83	72	57	51	51	50*
1953.....	50	49	50	52	70	66	65	63	55	45	42	42	42

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Min- imum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1948.....													
1949.....	110		42	59.2	0.515	6.98	42,880	59.5	7.02	43,100			
1950.....	141	Mar. 19, 1950	37	63.0	.548	7.43	45,590	64.8	7.64	46,890			
1951.....	114	April 4, 1951	47	64.6	.562	7.03	46,740	64.8	7.66	46,890			
1952.....	128		50	69.2	.602	8.20	50,210	68.0	8.06	49,330			
1953.....	89	Jan. 23, 1953	42	58.8	.511	6.94	42,520						

① Mar. 21, April 19-20, 1949. ② April 8, 9, 14, 15, 18-22, 1952.

Little Spokane River at Milan, Wash.

Location.—Lat. 47°58'00", long. 117°20'00", in NE¼ sec. 35, T. 29 N., R. 43 E., under bridge near left bank at Milan and 1 mile downstream from West Branch Little Spokane River.

Drainage area.—274 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,770 ft. (from topographic map).

Extremes.—July to October 1948: Maximum discharge not determined; minimum observed, 80 cfs Aug. 31, 1948 (gage height, 1.20 ft.).

Remarks.—Some small diversions for irrigation and domestic purposes above station. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948.....									186	111	87.8	91.7	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948.....									133	80	88	88	.....

* Estimated.

SPOKANE RIVER BASIN

Little Spokane River at Chattaroy, Wash.

Location.—Lat. 47°53'30", long. 117°21'30", in NE¼ sec. 34, T. 28 N., R. 43 E., on left bank, 200 ft. downstream from highway bridge at Chattaroy, and 300 ft. upstream from Deer Creek.

Drainage area.—300 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,700 ft. (from topographic map).

Extremes.—July to October 1948: Maximum discharge not determined; minimum observed, 94 cfs Aug. 31, 1948 (gage height, 0.28 ft.).

Remarks.—Some diversion for irrigation and domestic use above station. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948									222	128	103	103	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948									158	94	96	100	.....

Wethey Creek near Deer Park, Wash.

Location.—Lat. 47°53'00", long. 117°28'30", in NW¼ sec. 35, T. 28 N., R. 42 E., on left bank, a quarter of a mile upstream from mouth, and 5 miles south of Deer Park.

Drainage area.—12.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,980 ft. (from topographic map).

Extremes.—July to October 1948: Maximum discharge, 4.2 cfs Sept. 27 (gage height, 1.48 ft., from recorded range in stage); minimum, 0.7 cfs sometime during period Aug. 4-11 (gage height, 1.05 ft., from recorded range in stage).

Remarks.—Some small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948									1.82	1.17	1.64	2.15	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948									1.2	1.0	0.9	2.0	.....

SPOKANE RIVER BASIN
Deep Creek at Colbert, Wash.

Location.—Lat. 47°49'15", long. 117°20'45" in SE¼ sec. 22, T. 27 N., R. 43 E., on left bank at highway crossing at Colbert, 2½ miles upstream from mouth, and 4½ miles northeast of Dartford.

Drainage area.—32.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,800 ft. (from topographic map).

Extremes.—July to October 1948: Maximum discharge not determined; no flow Sept. 14-17.

Remarks.—Small diversion for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948...									4.65	1.09	0.55	0.56	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1948...									1.9	0.4	0	0.7	.....

Little Spokane River at Dartford, Wash.

Location.—Lat. 47°47'00", long. 117°24'50", in NE¼ sec. 6, T. 26 N., R. 43 E., on right bank at Dartford, 50 ft. downstream from highway bridge, and 6 miles upstream from mouth.

Drainage area.—665 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,580 ft. (from topographic map). Prior to Mar. 16, 1951, staff gage at same site and datum.

Average discharge.—9 years (1929-32, 1947-53), 323 cfs.

Extremes.—1929-32, 1946-53: Maximum discharge, 2,240 cfs Mar. 18, 1950 (gage height, 5.1 ft., from graph based on gage readings); minimum observed, 63 cfs July 24, 1930 (gage height, 1.07 ft.).

Remarks.—Small diversions for irrigation and domestic use above station. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...													.....
1930...	110	113	159	99.6*	242	167	170	203	146	124	106	102	.....
									105	80.5	78.5	89.1	128*
1931...	106	121	122	136	160	221	210	133	96.2	80.8	67.8	50.3	128
1932...	87.0	117	149	206	347	903	1,130	589	258	124	111	108	348
1947...				256	335	354	368	213	155	113	112	127	.....
1948...	187	206	228	339	449	417	850	1,176	710	331	193	169	437
1949...	185	223	222	185*	328	958	906	476	228	159	138	141	346*
1950...	166	205	185	172*	313	1,211	975	583	341	206	165	153	391*
1951...	209	235	348	425	676	669	951	480	270	180	149	162	394
1952...	234	248	322	270	521	751	1,235	575	299	225	175	176	418
1953...	177	191	216	420	499	454	504	504	376	193	161	151	518

* Estimated.

Little Spokane River at Dartford, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929								132	127	103	88	87	.....
1930	96	101	130		110	146	146	110	85	63	69	83	63
1931	92	112	117	119	123	183	172	101	90	71	65	68	65
1932	80	94	96	140	.....	358	950	425	146	108	104	104	80
1947			188	159	188	278	326	152	129	104	106	110	.....
1948	129	177	130	226	200	342	555	850	490	233	166	156	129
1949	180	197	180	175*	183	602	652	322	191	140	127	132	127
1950	142	166	154	140*	140*	506	760	394	262	177	152	149	140*
1951	152	200	177	343	377	413	642	327	207	156	140	152	140
1952	188	210	246	220*	369	386	958	352	264	183	166	164	164
1953	164	164	189	207	360	328	390*	391	272	148	134	142	134

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1929	439†	April 25, 1929								
1930	730	Feb. 5, 1930	63	128	0.192	2.63	92,600	125	2.55	90,600
1931	260†	April 2, 1931	65	128	.192	2.61	92,500	128	2.61	92,500
1932	1,900	Feb. 27, 1932	80	343	.516	7.02	249,000	.....	.....	.....
1947	640	Jan. 26, 1947						220	4.50	159,400
1948	1,660	May 24, 1948	129	437	.657	8.96	317,600	438	8.96	318,100
1949	1,620	Mar. 22, 1949	127	346	.520	7.03	250,100	340	6.93	246,800
1950	2,240	Mar. 18, 1950	140	391	.688	7.99	283,000	410	8.79	296,700
1951	1,406†	Feb. 11, 1951	140	394	.592	8.03	285,000	395	8.07	285,900
1952	1,530	Mar. 26, 1952	164	418	.629	8.55	303,400	399	8.16	289,900
1953	950*	April 29, 1953	134	318	.478	6.49	230,400	.....	.....	.....

* Estimated.

† Maximum observed.

Little Spokane River near Dartford, Wash.

Location.—Lat. 47°46'50", long. 117°29'45", in NW¼ sec. 3, T. 26 N., R. 42 E., in left center of stream on downstream side of highway bridge, 3 miles upstream from mouth, and 4 miles west of Dartford.

Drainage area.—698 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,550 ft. (from topographic map).

Extremes.—1948-52: Maximum discharge, 2,220 cfs Mar. 18, 1950 (gage height, 7.40 ft.); minimum, 377 cfs Sept. 3, 1949 (gage height, 2.89 ft.).

Remarks.—Many small diversions for irrigation and domestic use above station. No known regulation.

SPOKANE RIVER BASIN

Little Spokane River near Dartford, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948							1,022	1,381	945	573	436	414	
1949	421	454	472*	458	588	1,154	1,168	755	503	418	389	387	596*
1950	415	438	435	433*	538	1,257	1,152	909	557	448	412	406	609*
1951	446	476	536	666	866	878	1,171	733	508	418	394	405	627
1952	489	500	577	522	776	986							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948							840*	1,020	748	470	411	406	
1949	418	432	455*	448	453	903	944	577	456	400	379	378	378
1950	501	469	409	405	420*	729	966	616	495	423	405	401	401
1951	390	452	433	569	618	648	893	566	448	395	388	396	388
1952	440	461	500	482	616	650							

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Min- imum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1948	1,960	May 24, 1948											
1949	1,780	Mar. 22, 1949	378	596	0.854	11.61	431,600	591	11.51	428,000			
1950	2,220	Mar. 18, 1950	401	609	.872	11.84	440,000	627	12.87	454,000			
1951	1,660	Feb. 12, 1951	388	627	.898	12.19	453,800	682	12.28	457,300			
1952													

* Estimated.

Little Spokane River near Spokane, Wash.

Location.—Lat. 47°47'25", long. 117°31'40", in SE¼ sec. 32, T. 27 N., R. 42 E., on right bank, 150 ft. downstream from county road bridge, half a mile upstream from mouth, and 12 miles northwest of Spokane.

Drainage area.—701 sq. mi.

Supplemental records available.—August 1903 to March 1905, and January 1911 to February 1913, gage-heights and miscellaneous discharge measurements only.

Gage.—Water-stage recorder. Datum of gage is 1,500 ft. above mean sea level, unadjusted. Aug. 3, 1903, to Mar. 13, 1905, wire-weight gage 1½ miles upstream at different datum. Jan. 24, 1911, to Feb. 3, 1913, staff gage at described site at different datum.

Extremes.—April to December 1913: Maximum discharge, 2,140 cfs Apr. 15 (gage height, 41.30 ft.); minimum, 426 cfs June 17 (gage height, 38.81 ft.).

Remarks.—No regulation. Probably little diversion at time of record.

Little Spokane River near Spokane, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913							1,410	693	499	429	375	391	.....
1914	394	440											.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913							935	554	437	386	362	355	.....
1914	362	379											.....

Long Lake at Long Lake, Wash.

Location.—Lat. 47°50'15", long. 117°50'20", in NW ¼SW ¼ sec. 13, T. 27 N., R. 39 E., at left end of spillway at Long Lake dam and 12 miles north of Reardan.

Drainage area.—5,920 sq. mi., approximately.

Gage.—Water stage recorder and staff gage, and long-distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Washington Water Power Co.).

Extremes.—1913-53: Maximum contents, 104,200 acre-ft. on many days each year since 1950 (elevation, 1,536.0 ft.); minimum contents not determined.

Remarks.—Reservoir is formed by concrete dam completed in 1913 and raised 5 ft. in 1950. Capacity, 104,200 acre-ft. between elevations 1,512 ft. (lower limit of normal operation) and 1,536 ft. (top of gates). Contents at elevation 1,512 ft. by capacity table used prior to October 1915, 148,600 acre-ft. Water is used for power. Diversions for irrigation of about 25,000 acres above station in Idaho and Washington. Flow regulated in Coeur d'Alene Lake and by several powerplants on Spokane River.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914	0	546	672	2,490	10,170	12,630	18,430	12,790	7,600	9,510	12,820	19,840	.....
1915	24,500	68,380	130,580	154,220	154,140	163,490	163,020	169,460	162,260	155,800	153,200	153,780	.....
1916	400†	4,900	4,700	5,950	7,200	12,900	33,500	31,000	25,700	24,300	7,050	4,500	.....
1917	4,090	5,100	5,400	5,190	5,250	5,830	9,620	33,540	44,000	23,660	10,640	9,540	.....
1918	8,700	8,780	8,300	42,300	20,000	14,200	25,360	29,600	20,500	2,000	2,500	400	.....
1919	4,000	5,250	8,400	8,700	24,500	9,020	32,300	35,020	53,000	59,800	59,750	58,400	.....
1920	69,700	60,500	60,650	57,700	59,750	48,600	55,250	60,000	56,800	62,950	63,850	67,550	.....
1921	67,300	67,300	65,700	49,500	52,800	48,600	48,150	47,700	47,700	77,450	79,400	77,950	.....
1922	77,700	79,200	77,200	75,000	78,950	77,200	72,250	65,700	60,650	79,200	79,600	77,450	.....
1923	79,200	77,260	78,200	78,950	70,600	77,950	71,000	66,950	64,500	77,760	77,200	78,700	.....
1924	79,600	77,950	78,950	78,950	75,550	67,300	74,150	71,500	72,000	77,950	78,700	78,700	.....
1925	79,850	77,950	77,950	77,000	73,650	68,500	71,700	68,300	63,500	79,400	77,950	79,400	.....
1926	78,450	77,200	78,950	79,200	76,050	75,800	73,000	68,500	77,450	78,950	77,700	78,200	.....
1927	78,700	78,950	73,900	73,900	76,550	70,100	69,900	65,700	63,650	74,800	79,200	78,950	.....
1928	78,700	77,450	70,100	71,500	72,000	74,800	68,950	70,600	65,900	79,400	79,200	78,450	.....
1929	78,450	76,300	79,200	78,700	74,800	58,200	68,050	67,100	67,800	78,700	78,700	77,700	.....
1930	79,200	74,400	63,600	74,150	68,050	62,700	9,900	29,800	66,150	77,450	76,550	78,700	.....
1931	73,200	78,450	78,700	74,600	76,450	77,200	73,400	72,250	76,300	74,600	78,700	77,700	.....
1932	75,050	77,000	77,000	75,550	72,000	63,200	66,150	60,200	64,500	79,400	79,400	76,800	.....
1933	76,300	79,200	75,550	76,800	74,500	75,300	70,850	71,500	64,500	72,500	77,700	78,450	.....
1934	68,700	73,200	65,700	65,500	75,550	70,350	72,250	78,950	78,450	77,200	73,200	77,200	.....
1935	77,200	74,150	72,000	64,750	69,900	71,750	69,700	71,750	77,000	77,760	73,000	76,550	.....

SPOKANE RIVER BASIN

Long Lake at Long Lake, Wash.—Continued

Contents in Acre-feet on Last Day of Month—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	75,800	77,000	78,950	77,000	72,250	63,200	64,500	73,200	78,450	77,200	74,150	74,800	.....
1937...	73,200	74,400	74,800	65,900	49,050	51,200	73,200	70,600	78,200	73,000	65,500	74,500	.....
1938...	71,750	74,150	77,700	74,400	76,050	65,500	60,900	69,450	78,950	77,950	72,750	73,200	.....
1939...	76,300	73,200	77,200	71,750	68,300	66,400	66,150	77,450	79,400	76,800	68,700	67,100	.....
1940...	77,700	67,300	70,850	74,400	69,900	75,050	75,300	79,200	75,550	77,700	73,000	77,000	.....
1941...	74,600	72,750	74,800	78,200	77,700	77,950	65,250	78,700	78,950	73,200	75,050	77,200	.....
1942...	75,300	77,950	76,300	76,300	69,200	76,300	73,400	78,950	79,200	73,900	70,600	67,600	.....
1943...	79,600	77,000	77,000	75,800	77,200	71,500	63,850	75,300	78,200	73,000	70,300	68,700	.....
1944...	73,650	69,700	68,950	77,700	80,200	10,200	78,950	77,200	68,700	75,300	74,600	77,500	.....
1945...	78,800	75,400	76,800	77,450	76,300	76,200	78,300	66,900	72,500	78,700	79,800	79,480	.....
1946...	75,050	76,800	73,400	78,050	78,450	77,950	75,050	78,800	78,400	76,800	81,350	77,450	.....
1947...	82,100	79,600	80,350	78,700	78,950	80,600	74,150	81,600	78,450	78,800	78,350	79,300	.....
1948...	73,080	80,630	78,200	78,700	71,300	77,200	70,850	63,200	77,000	88,400	80,250	80,400	.....
1949...	85,650	84,150	77,450	79,200	65,000	70,100	68,700	68,500	85,000	88,400	82,300	84,500	.....
1950...	87,550	87,800	87,550	79,600	82,000	73,500	54,800	59,300	72,950	99,500	100,600	101,600	.....
1951...	103,250	103,300	87,140	101,800	98,700	102,450	97,200	96,200	102,400	102,750	98,800	103,500	.....
1952...	100,750	93,940	95,300	102,200	102,350	101,900	84,790	97,500	103,250	101,500	101,700	104,200	.....
1953...	104,200	103,400	102,100	97,500	102,800	102,650	96,800	100,900	99,700	102,350	96,950	102,700	.....

† Contents by capacity table used beginning Oct. 1, 1915; contents Sept. 30, 1915, by capacity table used since Oct. 1, 1915, was 5,220 acre-feet.

Spokane River at Long Lake, Wash.

Location.—Lat. 47°50'15", long. 117°50'25", in SW¼ sec. 13, T. 27 N., R. 39 E., on left bank at Long Lake powerplant, 1½ miles upstream from Chamokane Creek, and 12 miles north of Reardan.

Drainage area.—5,920 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,299.00 ft. above mean sea level, datum of 1929.

Average discharge.—14 years (1939-53), 7,727 cfs (unadjusted).

Extremes.—1939-53: Maximum discharge recorded, 49,400 cfs May 24, 1948 (gage height, 78.66 ft.); minimum recorded, 115 cfs Oct. 6, 1939 (gage height, 57.66 ft.), but may have been less sometime during periods of backwater; minimum daily, 144 cfs Sept. 15, 1946, Aug. 24, 1947 (determined from powerplant records).

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal and many smaller diversions, for irrigation of several thousand acres above station. Flow partly regulated by Coeur d'Alene Lake, by Long Lake and by several powerplants above gage. Capacity of Long Lake, 104,200 acre-ft. between elevations 1,512 and 1,536 ft. above mean sea level, adjustments of 1912. Discharge for part of each year computed from powerplant records.

Spokane River at Long Lake, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1939							17,400	17,900	4,854	2,750	2,772	2,516	.....
1940	1,066	2,059	2,341	2,091	7,914	15,250	16,960	12,140	4,103	2,358	2,345	2,108	6,026
1941	2,358	2,689	5,415	6,777	5,975	6,322	5,573	7,743	5,595	2,316	2,106	2,249	4,588
1942	2,774	4,315	10,940	5,410	7,004	6,473	13,850	10,200	7,226	3,899	1,891	1,895	6,311
1943	1,863	5,013	5,737	5,552	5,648	7,327	29,410	21,000	15,200	4,444	2,120	2,397	8,789
1944	2,490	3,032	3,974	3,217	4,740	3,966	6,751	7,049	3,932	1,942	2,090	2,072	3,784
1945	2,326	2,571	2,364	3,912	6,399	8,759	10,630	20,070	8,268	3,226	1,600	2,043	6,032
1946	2,409	4,021	6,583	9,843	6,166	10,810	19,970	25,180	10,990	3,394	1,618	2,115	8,613
1947	2,244	5,323	14,190	8,617	11,300	11,280	15,360	17,750	7,015	3,600	1,791	2,161	8,373
1948	4,281	4,949	7,427	11,390	7,790	3,701	17,870	33,520	25,650	4,275	3,178	2,250	10,940
1949	3,030	3,048	4,527	4,681	6,026	14,110	21,710	30,500	9,072	2,633	2,098	1,529	8,547
1950	2,164	3,914	4,678	5,739	9,055	21,530	23,000	26,440	25,330	7,951	2,664	1,936	11,190
1951	3,487	5,867	11,150	10,230	18,880	10,090	17,810	19,000	8,073	3,011	1,859	1,769	9,205
1952	4,278	5,254	7,058	5,739	8,001	7,492	20,780	24,530	3,595	1,821	2,374	2,374	8,243
1953	2,576	2,951	3,269	8,318	13,250	7,755	10,260	20,890	14,870	2,870	2,157	2,232	7,575

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1939							14,200	6,600	3,080	1,410	1,760	1,260	.....
1940	523	650	696	1,200	2,450	9,170	14,800	5,673	1,140	836	858	604	523
1941	691	1,010	2,260	2,740	3,940	3,770	2,840	3,820	2,130	161	322	511	161
1942	1,850	2,500	3,510	3,730	4,930	4,130	5,650	5,710	5,440	1,610	161	232	161
1943	413	769	4,020	2,920	4,020	3,380	20,700	15,700	8,330	1,660	634	373	373
1944	673	251	1,520	160	399	1,610	3,700	5,030	1,590	396	174	161	160
1945	691	541	161	610	4,530	5,160	8,090	9,520	1,640	707	202	624	161
1946	782	1,940	5,160	6,870	3,960	8,600	13,000	13,300	4,910	1,110	528	144	144
1947	174	873	6,010	5,600	7,050	8,500	11,300	5,590	4,950	1,170	144	202	144
1948	288	2,910	4,940	5,970	4,500	5,640	9,410	18,400	10,300	1,560	214	241	214
1949	1,140	694	3,160	2,140	855	10,400	12,900	21,700	1,340	350	212	212	212
1950	212	1,540	1,450	3,630	4,470	8,160	12,800	15,600	18,900	606	450	202	202
1951	650	3,000	4,820	4,950	5,760	6,240	8,600	15,900	3,690	1,080	415	222	222
1952	202	3,850	4,830	4,730	5,290	6,090	11,000	11,200	3,060	202	174	772	174
1953	1,500	1,990	2,950	1,790	6,360	6,900	7,140	15,500	5,280	832	447	202	202

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1939	29,300	May 6, 1939						
1940	26,100	Mar. 8, 1940	523	6,026	4,374,000	6,369	4,623,000	
1941	19,800	May 19, 1941	161	4,588	3,322,600	5,226	3,784,000	
1942	22,200	May 27, 1942	161	6,311	4,560,000	5,850	4,235,000	
1943	38,900	April 22, 1943	373	8,739	6,393,000	8,530	6,175,000	
1944			160	3,764	2,732,000	3,576	2,596,000	
1945			161	6,012	4,352,000	6,505	4,709,000	
1946	41,800	May 15, 1946	144	8,613	6,285,000	9,345	6,765,000	
1947	42,200	May 12, 1947	144	8,373	6,062,000	7,940	5,749,000	
1948	49,400	May 24, 1948	214	10,940	7,940,000	10,430	7,572,000	
1949	36,400	May 17, 1949	212	8,547	6,183,000	8,567	6,185,000	
1950	48,200	May 23, 1950	202	11,190	8,102,000	12,010	8,993,000	
1951	44,900	April 15, 1951	222	9,205	6,663,000	8,874	6,424,000	
1952	38,000	May 9, 1952	174	8,243	5,983,000	7,591	5,510,000	
1953	34,100	April 30, 1953	202	7,575	5,484,000			

SPOKANE RIVER BASIN

Spokane River below Little Falls, near Long Lake, Wash.

Location.—Lat. 47°49'30", long. 117°56'25", in W½ sec. 19, T. 27 N., R. 39 E., on left bank, 1½ miles downstream from Little Falls powerplant of Washington Water Power Co., and 4½ miles west of Long Lake.

Drainage area.—6,220 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,200 ft. above mean sea level, unadjusted.

Average discharge.—28 years (1912-40), 7,588 cfs (unadjusted).

Extremes.—1912-40: Maximum discharge, 48,000 cfs Dec. 26, 1933 (gage height, 93.10 ft.); minimum observed, 169 cfs Sept. 30, 1931 (discharge measurement).

Remarks.—Diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal and many smaller diversions, for irrigation of several thousand acres above station. Flow partly regulated by Coeur d'Alene Lake, by Long Lake, and by several powerplants above gage. Capacity of Long Lake, 79,600 acre-ft. between elevations 1,512 and 1,531 ft. above mean sea level, adjustment of 1912.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913...	3,400*	5,540	4,740	5,260	5,220*	8,060	22,600	21,300	22,500	6,120	2,920	2,700	9,850*
1914...	3,200	4,380	3,510	4,300	7,210	12,400	17,800	17,000	8,430	2,830	2,500	2,300*	7,000*
1915...	2,370	3,680	2,660	2,550	2,940	6,250	11,700	3,350	5,310	3,100	2,000	2,520	4,540
1916...	2,650	2,690	3,250	3,460	6,740	17,000	23,900	24,000	19,700	13,200	3,330	2,830	10,200
1917...	2,610	2,970	3,040	2,960	3,580	4,230	16,700	34,500	29,200	3,190	3,550	3,110	9,580
1918...	2,920	2,760	6,280	25,700	10,700	8,910	18,000	17,100	3,850	2,570	2,200	2,120	9,050
1919...	2,200	2,530	4,320	6,000	7,500	10,400	22,400	21,000	9,160	3,060	2,650	2,570	7,880
1920...	2,500	2,030	2,700	2,650	3,410	6,030	11,000	16,600	9,120	3,600	2,310	2,240	5,400
1921...	3,340	4,720	5,430	11,100	12,000	17,600	19,800	24,500	11,900	2,900	2,440	2,320	9,840
1922...	2,430	2,680	7,200	3,450	2,420	4,240	13,800	22,500	14,100	2,770	2,260	2,200	6,600
1923...	2,220	2,270	2,700	5,630	3,540	5,230	18,500	21,300	16,200	3,840	2,300	2,450	7,450
1924...	2,410	2,540	3,310	3,270	11,900	7,920	8,950	15,900	3,390	2,420	2,410	2,260	5,580
1925...	2,220	3,040	5,900	5,730	18,600	12,400	25,400	21,600	10,200	2,940	2,710	2,620	9,360
1926...	2,500	2,420	2,630	3,220	5,130	8,640	11,400	5,190	2,750	2,600	2,200	2,210	4,720
1927...	2,850	5,330	11,700	6,750	10,400	11,600	14,300	29,600	20,000	4,510	2,930	3,000	10,000
1928...	6,720	15,100	13,300	11,600	9,040	14,700	18,000	23,100	10,100	3,400	2,600	2,410	11,500
1929...	2,450	2,560	2,620	2,440	2,640	3,520	8,360	14,400	6,510	2,550	2,270	2,410	4,400
1930...	2,260	2,890	1,900	2,280	3,980	5,720	12,000	7,700	4,570	2,250	2,150	2,150	4,140
1931...	2,940	2,040	2,060	2,030	2,940	8,070	15,600	13,400	3,440	1,850	1,970	2,060	4,710
1932...	1,930	1,840	2,020	3,550	4,980	15,700	26,500	30,300	13,200	3,420	2,250	2,150	9,220
1933...	2,160	6,140	6,350	6,710	3,860	9,210	16,500	24,600	22,600	5,250	2,240	2,250	9,000
1934...	3,724	7,314	25,580	23,270	16,420	14,970	22,910	11,360	3,917	2,357	2,254	1,994	11,700
1935...	2,193	5,165	5,553	7,901	5,467	10,320	16,420	24,230	12,240	3,205	2,569	2,473	8,407
1936...	2,466	1,943	2,035	3,247	3,477	7,960	17,030	23,240	7,355	2,630	2,442	2,434	6,368
1937...	2,610	1,979	1,934	2,395	2,657	4,511	13,550	21,390	9,273	2,921	2,294	2,312	5,670
1938...	2,163	3,025	6,710	9,753	6,567	13,570	20,441	20,900	9,041	2,757	2,200	2,312	8,304
1939...	2,457	2,626	2,322	3,152	4,015	7,503	17,490	17,370	4,951	2,731	2,753	2,501	5,831
1940...	2,061	2,045	2,318	2,993	7,760	15,560	16,050	11,950	4,114	2,359	2,267	2,191	6,635

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913...			3,820	4,080	4,350*	5,910	14,000	22,600	13,500	3,460	2,560	2,420*	2,420*
1914...	2,470	3,140	2,470	2,840	4,930	9,870	5,570	11,700	8,040	2,470	1,930	1,910*	1,910*
1915...	2,030	2,250	2,310	2,000	2,550	2,720	10,100	3,320	2,930	2,580	2,400	2,700	2,000
1916...	2,180	1,820	2,660	3,040	3,820	7,150	21,800	20,300	15,900		2,940	2,740	1,820
1917...	2,610	2,080	2,800	2,790	2,780	3,410	6,100	25,500	19,700	3,950	3,120	2,290	2,080
1918...	2,650	2,340	2,260	12,200	7,650	6,560	15,600	12,400	3,650	2,320	1,920	1,720	1,720
1919...	1,850	2,110	2,600	2,830		4,690	17,700	15,800	3,730	2,550	2,100	2,220	1,880
1920...	2,000	1,860	2,050	2,160	2,340	2,210	5,760	12,500	3,210	2,300	2,020	1,910	1,860

* Estimated.

Spokane River below Little Falls, near Long Lake, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	2,050	2,380	2,830	7,920	5,690	11,700	15,800	20,600	2,450	2,100	1,870	2,000	1,370
1922...	1,940	2,020	4,460	2,170	1,980	2,220	8,350	17,100	1,890	2,090	1,900	1,860	1,860
1923...	7,770	1,600	1,020	3,900	2,370	3,690	12,000	18,800	5,500	1,960	1,860	1,940	1,600
1924...	1,940	1,820	2,150	1,950	8,730	5,040	3,170	6,350	2,070	1,150	1,990	1,760	1,750
1925...	1,790	1,380	2,390	2,330	12,400	9,260	14,800	18,800	4,470	2,110	2,290	2,290	1,790
1926...	1,870	1,820	1,530	2,430	4,050	7,200	7,360	2,930	2,170	2,000	1,670	1,480	1,480
1927...	1,910	3,130	5,910	3,560	5,330	9,980	10,160	22,560	12,700	2,450	2,260	2,360	1,910
1928...	2,590	5,520	9,190	7,460	6,000	4,510	14,100	19,400	3,720	2,370	2,040	1,970	1,970
1929...	1,980	1,190	1,810	1,690	1,640	1,320	4,730	12,200	3,130	1,820	1,270	1,660	1,270
1930...	1,110	745	530	1,400	2,190	2,690	6,860	3,060	2,510	1,760	1,770	1,560	530
1931...	1,120	1,300	1,400	1,240	1,830	2,610	12,200	2,820	2,120	1,290	1,380	1,070	1,070
1932...	942	1,290	1,060	1,750	1,850	9,830	20,700	26,000	4,630	2,120	1,510	1,600	942
1933...	1,200	1,600	3,230	3,690	2,260	4,580	13,200	21,600	14,600	2,320	1,710	1,560	1,920
1934...	1,600	2,950	3,720	21,800	10,900	11,000	19,400	5,560	2,090	1,660	1,310	1,100	1,100
1935...	1,350	1,990	2,650	4,910	6,060	5,060	9,610	21,760	4,000	1,910	1,580	1,200	1,200
1936...	1,630	1,170	1,120	2,150	2,670	6,160	4,480	12,500	3,230	1,750	1,300	1,500	1,120
1937...	1,560	927	854	1,080	1,680	3,090	4,140	17,500	4,920	1,180	442	1,010	442
1938...	900	1,250	2,800	4,340	3,450	7,120	11,800	16,800	3,020	1,260	1,110	860	860
1939...	1,190	1,260	937	1,630	2,520	2,090	14,600	6,770	3,150	1,430	1,720	1,130	937
1940...	550	538	492	1,250	2,550	10,600	14,600	5,730	1,110	1,010	848	802	492

Summary

WATER YEAR ENDING SEPTEMBER 30

CALENDAR YEAR

Year	Observed					Adjusted			Observed		Adjusted		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches	
	Dis-charge	Date											
1913...	31,900	June 1, 1913	2,420	9,550	7,130,000	9,940	1.60	21.72	9,640	6,980,000	9,650	21.04	
1914...	22,500	April 18, 1914	1,910	7,000	5,070,000	6,990	1.12	15.20	6,820	4,940,000	7,030	16.34	
1915...	15,300	May 22, 1915	2,000	4,540	3,310,000	4,690	.754	10.24	4,550	3,290,000	4,600	10.05	
1916...	29,800	Mar. 25, 1916	1,820	10,200	7,430,000	10,300	1.68	22.60	10,300	7,440,000	10,200	22.32	
1917...	41,300	May 13, 1917	2,080	9,580	6,940,000	9,520	1.53	20.77	9,550	7,130,000	10,400	22.67	
1918...	39,400	Jan. 3, 1918	1,720	9,050	6,540,000	9,070	1.46	19.82	8,790	6,370,000	8,210	17.92	
1919...	27,900	May 3, 1919	1,830	7,830	5,660,000	7,840	1.26	17.10	7,720	5,590,000	7,740	16.83	
1920...	21,900	Mar. 13, 1920	1,860	5,400	3,920,000	5,520	.887	12.07	5,820	4,270,000	6,010	13.15	
1921...	29,300	May 21, 1921	1,870	9,840	7,120,000	9,810	1.58	21.45	9,740	7,050,000	9,680	21.18	
1922...	23,200	May 23, 1922	1,860	6,690	4,840,000	6,680	1.07	14.52	6,250	4,520,000	6,250	13.57	
1923...	30,400	June 18, 1923	1,600	7,450	5,390,000	7,460	1.20	16.29	7,540	5,460,000	7,550	16.42	
1924...	20,300	May 12, 1924	1,750	5,580	4,050,000	5,530	.889	12.10	5,820	4,220,000	5,840	12.78	
1925...	36,500	April 16, 1925	1,790	9,360	6,780,000	9,350	1.50	20.36	9,050	6,560,000	9,060	19.68	
1926...	18,800	April 22, 1926	1,480	4,720	3,420,000	4,750	.764	10.37	5,790	4,170,000	5,730	12.50	
1927...	34,000	May 19, 1927	1,910	10,000	7,240,000	10,000	1.61	21.85	11,700	8,500,000	11,800	25.79	
1928...	31,500	①	1,970	11,500	8,540,000	11,400	1.83	24.91	8,710	6,320,000	8,660	18.92	
1929...	18,200	May 2, 1929	1,270	4,400	3,180,000	4,360	.701	9.52	4,310	3,120,000	4,290	93.66	
1930...	26,200	Mar. 26, 1930	530	4,140	2,990,000	4,160	.669	9.03	4,100	2,970,000	4,130	90.13	
1931...	21,300	May 5, 1931	1,070	4,710	3,410,000	4,700	.756	10.26	4,680	3,390,000	4,710	10.28	
1932...	34,400	May 16, 1932	942	9,220	6,690,000	9,250	1.49	20.25	9,950	7,230,000	9,940	21.78	
1933...	38,500	May 1, 1933	1,200	9,000	6,510,000	9,040	1.45	19.63	10,960	7,590,000	11,600	25.25	
1934...	48,000	Dec. 20, 1933	1,100	11,780	8,536,000	11,770	1.88	25.52	9,766	7,071,000	9,714	19.95	
1935...	26,100	May 9, 1935	1,200	8,407	6,067,000	8,404	1.35	18.33	7,846	5,680,000	7,807	17.10	
1936...	36,000	April 28, 1936	1,120	6,368	4,622,000	6,350	1.02	13.88	6,373	4,626,000	6,325	13.88	
1937...	25,600	May 13, 1937	442	5,670	4,105,000	5,688	.911	12.41	6,121	4,431,000	6,246	13.57	
1938...	35,300	April 22, 1938	840	8,304	6,011,000	8,301	1.33	18.05	7,926	5,738,000	7,893	17.10	
1939...	25,400	May 6, 1939	937	5,831	4,222,000	5,750	.924	12.54	5,747	4,161,000	5,731	12.50	
1940...	25,400	Feb. 6, 1940	492	6,035	4,381,000	6,069	.931	13.35					

① Nov. 30, Dec. 2, 1927, May 15, 1928.

SANPOIL RIVER BASIN

Lost Creek near Aeneas, Wash.

Location.—Lat. 48°29'30", long. 119°01'00", in W½ sec. 36, T. 35 N., R. 30 E., on left bank, a quarter of a mile downstream from Sheep Creek, 5 miles south of Aeneas, and 23 miles north of Nespelem.

Drainage area.—About 84 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,780 ft. (by barometer).

Extremes.—1920-21: Maximum discharge observed, 290 cfs May 16, 1921 (gage height, 3.0 ft.); minimum observed, 2.3 cfs Aug. 30, to Sept. 1, 1921 (gage height, 0.47 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	4.89	13.7	10.3*	7.18	14.5	37.8	89.5	186	45.7	7.32	2.79	8.00	84.9*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	2.5	.....	.....	.....	5.4	11	36	94	16	3.4	2.3	2.3	2.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1921.....	290†	May 16, 1921	2.3	34.9	25,600	.....	.....

* Estimated.

† Maximum observed.

Sanpoil River near Keller, Wash.

Location.—Lat. 48°06'30", long. 118°41'50", in SE¼ sec. 7, T. 30 N., R. 33 E., on right bank, 0.3 mile upstream from Brush Creek and 2¼ miles north of Keller.

Drainage area.—890 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,464.08 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.—1952-53: Maximum discharge, 2,210 cfs Apr. 29, 1953 (gage height, 8.08 ft.); minimum, 43 cfs Sept. 22, 1952 (gage height, 3.76 ft.).

Remarks.—At high stage and during irrigation season water is sometimes diverted into Kettle River basin through Curlew Lake and Creek. At extreme stages there may be some flow from Curlew Creek into Sanpoil River basin. No regulation. Town of Keller moved 3 miles upstream to present location in 1941.

SANPOIL RIVER BASIN

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Sanpoil River near Keller, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952												47.3	
1953	47.0	55.1	62.5	187	179	353	785	1,168	640	211	80.5	53.8	314

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952												44	
1953	44	52	55	58	129	120	442	826	433	102	67	48	44

Summary.

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1952							
1953	2,210	April 29, 1953	44	314	227,300		

Sanpoil River at Keller, Wash.

Location.—Lat. 48°02'00", long. 118°40'10", in SW¼ sec. 4, T. 29 N., R. 33 E., on right bank at Keller, 100 ft. downstream from highway bridge.

Drainage area.—940 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 1,200 ft. (estimated).

Average discharge.—6 years (1911-17), 266 cfs.

Extremes.—1911-17: Maximum discharge, 2,310 cfs Apr. 17, 1914 (gage height, 4.25 ft., from graph based on gage readings); minimum, 26 cfs Sept. 1, 1914 (gage height, 0.45 ft.).

Remarks.—Small diversions for irrigation and domestic use above and below station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911								667	333	146	53.6	36.0	
1912	36.0	36.0*	46.5*	77.8*	80.6	81.6	415	547	242	94.9	54.6	54.1	147*
1913	53.6	143	97.7	100*	90*	217	657	586	349	160	54.5	45.0	213*
1914	52.2	73.5	92.3	225	134	544	1,220	705	304	95.6	34.9	40.3	294
1915	71.8	95.8	80.5*	84.8*	105*	389	766	719	541	197	96.0	59.2	266*
1916	59.2	65.9	74.4	60.7*	103*	598	1,560	1,190	651	389	120	64.4	414*
1917	59.5	79.5	76.6*	80.0*	79.4*	82.9*	622	1,220	582	147	49.3	38.2	256*
1918	36.4												

* Estimated.

SANPOIL RIVER BASIN

Sanpoil River at Keller, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....								380	180	58	36	36	.....
1912.....	36	36	36	58*	72	56	241	427	120	61	44	45	38
1913.....	46	65	59*			100*	147	510	252	82	38	40	.....
1914.....	45	51	68	68	56	273	583	428	160*	47	26	26	26
1915.....	40	78				130	500	425	263	127	62	57	40
1916.....	57	56				158	1,090	740	484	195	74	53	.....
1917.....	55	53					101	852	270	73	34	33	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis charge	Date					
1911.....	1,420	May 20, 1911					
1912.....	690	May 4, 1912	36	147	107,000	162	117,000
1913.....	1,060	April 15, 1913	38	213	154,000	206	160,000
1914.....	2,310	April 17, 1914	26	294	212,000	297	214,000
1915.....	1,330	April 4, 1915	40	268	194,000	263	191,000
1916.....	1,920	April 13, 1916		414	300,000	415	301,000
1917.....	1,720	May 15, 1917		258	187,000		
1918.....							

COLUMBIA RIVER MAIN STEM

Feeder canal at Grand Coulee, Wash.

Location.—Lat. 47°57'00", long. 118°59'40", on line between secs. 1 and 2, T. 28 N., R. 30 E., on left bank of Grand Coulee, a quarter of a mile downstream from intake, and half a mile southwest of Grand Coulee Dam.

Gage.—Water stage recorder. Datum of gage is 1,550.0 ft. above mean sea level, Bureau of Reclamation, adjustment of 1937.

Auxiliary water-stage recorder 0.6 mile downstream from base gage.

Extremes.—1952-53: Maximum daily discharge, 10,100 cfs May 30, 1953; no flow except during irrigation season.

Remarks.—Water is pumped from Franklin D. Roosevelt Lake behind Grand Coulee Dam, through a lift of about 280 ft. into Feeder canal for a distance of 2 miles into an equalizing reservoir. From equalizing reservoir it is distributed through a system of canals to the Columbia Basin Project.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....								93,770	144,000	215,800	185,400	543	.....
1953.....	1,190	0	0	0	0	0	0	182,200	339,500	234,800	0	0	763,700

* Estimated.

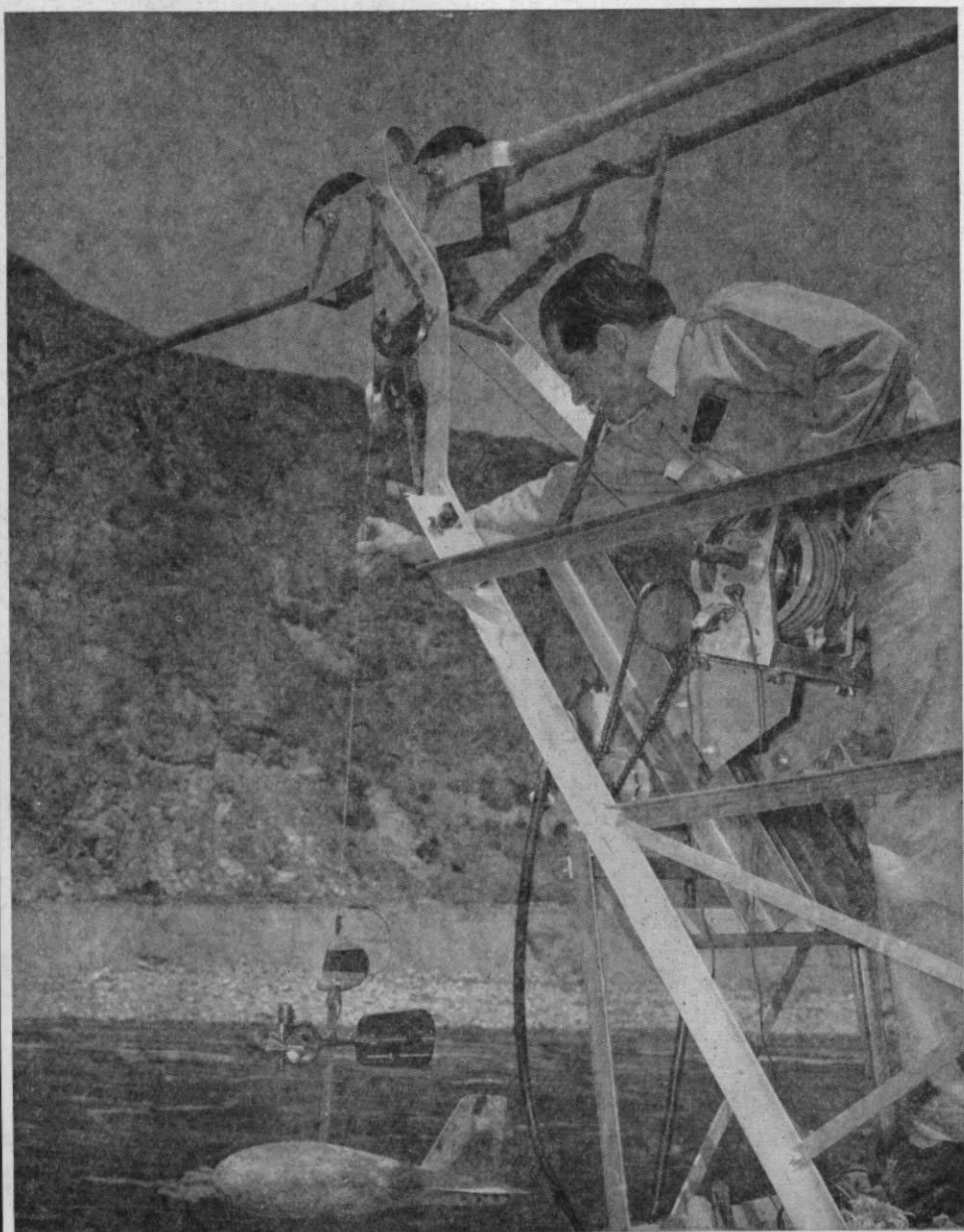


Figure 16. Discharge measurement with battery-powered reel on
Columbia River at Grand Coulee Dam.

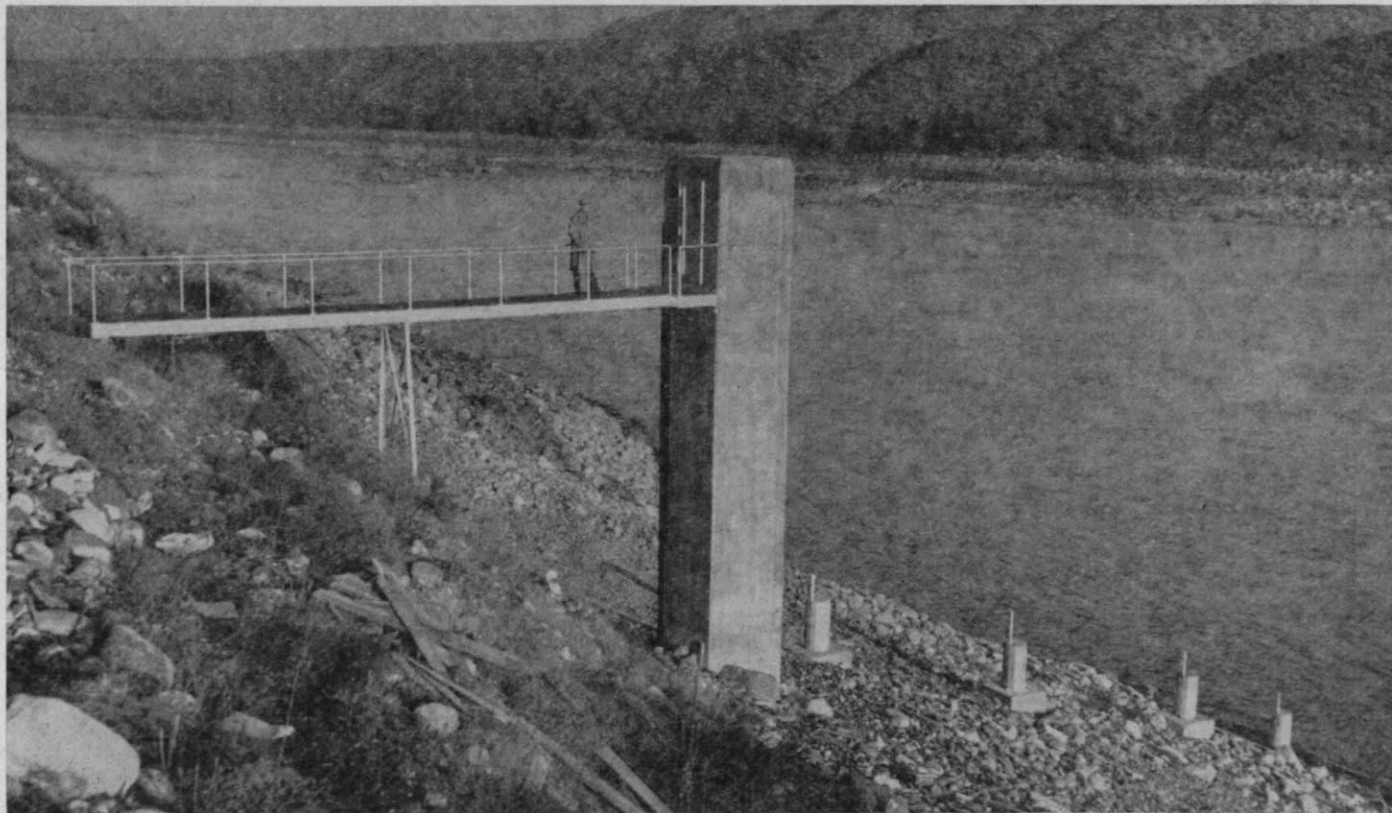


Figure 17. Concrete water-stage recorder structure, commonly called a "gage house and well," on Columbia River at Bridgeport. Note outside vertical staff reference gage in several sections.

Franklin D. Roosevelt Lake at Grand Coulee Dam, Wash.

Location.—Lat. 47°57'20", long. 118°59'10", in lot 3, sec. 1, T. 28 N., R. 30 E., in block 12 of Grand Coulee Dam at Grand Coulee.

Drainage area.—74,100 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, Bureau of Reclamation datum, or 1.425 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Bureau of Reclamation). Apr. 23, 1938, to Apr. 24, 1942, staff gage 2,000 ft. upstream at same datum.

Extremes.—1938-53: Maximum contents recorded, 9,586,200 acre-ft. July 17, 1942, June 3, 1945 (elevation, 1,290.3 ft.); minimum observed, 16,200 acre-ft. Aug. 29, 1938 (elevation, 956.1 ft.).

Remarks.—Reservoir formed by concrete dam; construction of dam began in 1934, completed in 1941; storage began early in construction period. Capacity, 5,071,700 acre-ft. between elevations 1,208 ft. (proposed lower limit of operation) and 1,288 ft. (top of gates). Storage below 1,208 ft., 4,330,000 acre-ft. Figures given herein represent total contents. Water is used for power development and, since May 1951, is diverted by pumping for irrigation of Grand Coulee project of Bureau of Reclamation.

Contents on Last Day of Month in Thousand Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1938							31.6	68.0	68.0	29.6	18.4	30.8	.....
1939	28.0	41.6	60.0	66.0	118.0	133.4	165.0	203.0	200.5	205.5	212.5	241.0	.....
1940	236.2	239.2	232.6	242.2	232.6	552.0	583.0	2,577.6	2,269.0	1,556.4	1,589.6	1,549.8	.....
1941	1,839.6	1,814.0	1,819.0	1,821.5	1,814.0	1,830.6	2,181.7	2,320.2	4,611.0	6,032.4	7,069.2	7,055.4	.....
1942	7,117.5	6,844.5	6,234.3	6,228.0	6,202.8	6,034.9	6,366.8	7,794.0	9,206.4	9,469.0	9,606.6	9,389.0	.....
1943	9,857.0	9,397.0	8,269.6	9,174.8	9,269.6	9,841.0	9,525.6	9,622.8	9,655.4	9,630.9	9,639.0	9,655.4	.....
1944	9,655.0	9,382.4	9,300.4	8,455.0	7,903.0	7,842.0	8,054.8	9,563.7	9,638.4	9,655.0	9,646.7	9,671.6	.....
1945	9,456.2	9,357.8	8,355.8	8,576.6	8,553.8	8,684.0	9,096.2	9,663.2	9,655.0	9,646.7	9,630.1	9,382.4	.....
1946	9,366.0	9,357.8	9,357.8	9,349.6	9,382.4	9,513.9	9,646.7	9,633.4	9,621.8	9,630.1	9,613.5	9,390.6	.....
1947	9,316.8	9,328.8	9,472.6	9,456.2	9,439.8	9,374.2	9,536.8	9,638.4	9,630.1	9,635.4	9,464.4	9,456.2	.....
1948	9,646.7	9,646.7	9,396.9	9,415.2	9,023.3	8,919.0	9,347.1	9,646.7	9,646.7	9,646.7	9,655.0	9,638.4	.....
1949	9,563.7	9,513.9	9,316.8	8,951.0	8,707.4	9,135.7	9,210.2	9,613.6	9,646.7	9,407.0	9,456.2	9,423.4	.....
1950	9,308.6	9,333.2	9,243.0	8,477.8	8,171.8	8,801.0	8,762.0	8,432.5	9,613.5	9,646.7	9,655.0	9,472.6	.....
1951	9,472.6	9,407.0	9,431.6	9,287.6	9,374.2	8,999.0	9,210.2	9,572.0	9,646.7	9,638.4	9,480.8	9,489.0	.....
1952	9,464.4	9,226.6	8,715.2	7,389.8	6,683.4	6,381.5	7,598.0	8,808.8	9,638.4	9,621.8	9,456.2	9,456.2	.....
1953	9,288.7	9,287.3	8,600.1	8,445.8	7,868.3	6,886.8	5,367.6	8,770.0	9,567.7	9,549.1	9,548.3	9,310.2	.....

COLUMBIA RIVER MAIN STEM

Columbia River at Grand Coulee Dam, Wash.

Location.—Lat. 47°58'00", long. 118°58'45", opposite lot 4 sec. 36, T. 29 N., R. 30 E., in pier 3 of highway bridge, 2,500 ft. downstream from Grand Coulee Dam. and 14 miles upstream from Nespelem River.

Drainage area.—74,100 sq. mi., approximately.

Supplemental records available.—Records of chemical analyses since November 1950 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is mean sea level, Bureau of Reclamation adjustment of 1937. June 27 to December 31, 1923, June 12, 1928, to March 31, 1931, staff gages at site about half a mile upstream at datum 2.4 ft. lower. April 1, 1931, to December 31, 1935, water-stage recorder 850 ft. downstream at present datum.

Average discharge.—40 years (1913-53), 107,800 cfs (adjusted for diversion by pumping from Franklin D. Roosevelt Lake since May 1951, and change in contents in Franklin D. Roosevelt Lake since April 1938).

Extremes.—1913-53: Maximum discharge, 637,800 cfs June 12, 1948 (elevation, 987.90 feet); minimum may have been less than 15,300 cfs (estimated) in January or February 1937, when stage-discharge relation was affected by ice.

Maximum discharge known, 725,000 cfs (estimated) during flood of June 1894.

Remarks.—Records from April 1913 to June 1923 and January 1924 to May 1928 were determined from records at gaging stations on the Columbia River at Kettle Falls, Spokane River below Little Falls, Colville River at Meyers (Kettle) Falls, Hall and Stranger Creeks at Inchelium, and Sanpoil River at Keller, along with estimated inflow from other minor tributaries.

Flow regulated by Franklin D. Roosevelt Lake (see p. 493) and reservoirs in Kootenai, Pend Oreille, and Spokane River basins. Feeder Canal (see p. 490) diverts water by pumping from Franklin D. Roosevelt Lake for Columbia Basin Project. Other diversions above station for irrigation are a small percentage of flow past gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913							67,700*	190,000*	436,000*	279,000*	156,000*	100,000*	.....
1914	61,800*	51,700*	38,500*	36,200*	34,700*	48,300*	99,600*	220,000*	293,000*	252,000*	132,000*	76,600*	112,000*
1915	62,500*	65,700*	48,300*	32,700*	28,900*	36,700*	86,000*	175,000*	188,000*	184,000*	156,000*	91,200*	96,800*
1916	50,800*	49,000*	39,600*	28,400*	31,600*	62,500*	113,000*	201,000*	320,000*	419,000*	189,000*	110,000*	135,000*
1917	60,600*	48,200*	32,300*	26,200*	26,000*	25,400*	55,900*	133,000*	368,000*	313,000*	149,000*	80,900*	114,000*
1918	61,600*	40,300*	41,900*	28,800*	62,100*	45,600*	92,600*	209,000*	307,000*	256,000*	136,000*	90,400*	116,000*
1919	64,800*	47,600*	37,800*	35,500*	43,400*	42,600*	88,300*	204,000*	294,000*	228,000*	138,000*	80,700*	109,000*
1920	46,400*	30,300*	23,200*	23,400*	25,400*	29,200*	43,900*	140,000*	237,000*	315,000*	177,000*	90,700*	93,800*
1921	46,800*	64,300*	46,100*	47,300*	46,400*	62,300*	92,000*	222,000*	300,000*	250,000*	138,000*	70,100*	127,000*
1922	51,200*	53,500*	46,900*	34,200*	27,300*	27,200*	53,600*	157,000*	354,000*	213,000*	127,000*	88,500*	103,000*
1923	54,700*	39,200*	26,300*	38,300*	26,300*	28,300*	74,300*	189,000*	342,000*	257,000*	136,000*	82,600*	109,000*
1924	48,200	32,800	23,800	23,200*	40,200*	32,600*	44,500*	101,000*	225,000*	166,000*	115,000*	81,200*	86,200*
1925	47,000*	46,000*	40,600*	41,900*	62,700*	55,100*	143,000*	285,000*	330,000*	244,000*	136,000*	75,300*	126,000*
1926	46,200*	32,300*	28,700*	26,000*	30,600*	34,200*	70,700*	169,000*	340,000*	141,000*	89,400*	70,400*	73,500*
1927	60,300*	61,700*	59,400*	40,900*	39,400*	42,300*	64,500*	109,000*	372,000*	296,000*	159,000*	124,000*	126,000*
1928	107,000*	107,000*	89,700*	69,800*	60,600*	59,700*	94,900*	266,000*	355,000*	260,000*	144,000*	76,000*	141,000*
1929	54,000	41,300	32,100	25,200	21,300*	25,600	38,200	116,000	270,000	163,000	111,000	69,500	81,100*
1930	41,100	29,200	23,700	18,800*	23,000*	28,500	71,600	160,000	222,000	195,000	124,000	77,000	84,000*
1931	45,100	32,600	26,800	22,600	24,300	32,100	55,500	158,000	221,000	166,000	104,000	77,900	80,800
1932	43,000	34,100	28,200	20,900	25,900*	56,300	115,000	354,000	334,000	237,000	130,000	78,800	114,000*
1933	47,500	48,200	51,200	42,600	30,800	37,500	68,700	194,000	392,000	337,000	167,000	98,100	126,000
1934	63,280	86,630	96,480	113,900	79,670	72,430	168,600	315,200	311,700	176,100	117,200	73,800	140,000
1935	45,170	56,960	51,010	42,770	60,180	47,800	67,330	178,100	322,000	259,400	145,000	80,610	112,500

* Estimated.

Columbia River at Grand Coulee Dam, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	47,280	33,370	27,400	26,590	21,470*	31,640	77,470	258,300	301,300	170,800	106,700	65,950	97,670*
1937...	41,970	28,480	23,200	18,220*	18,200*	23,840	44,060	135,500	243,800	194,500	109,500	67,810	79,400*
1938...	42,570	57,270	46,970	47,310	37,110	51,070	99,800	213,000	344,900	235,500	101,100	72,920	113,200
1939...	54,690	87,670	81,100	32,810	30,480	35,150	86,210	234,200	235,100	188,500	110,200	67,410	95,700
1940...	48,180	50,650	44,510	34,890	38,420	50,510	100,600	152,300	241,000	167,000	94,720	76,180	91,690
1941...	54,730	48,490	36,640	37,090	36,640	47,870	75,620	145,300	141,700	92,890	89,290	83,390	74,300
1942...	75,930	69,040	93,410	68,760	49,740	47,190	73,610	143,700	256,800	221,000	119,800	66,510	106,600
1943...	48,600	41,690	42,150	38,830	39,010	37,860	139,600	195,400	286,200	271,300	123,400	62,240	111,200
1944...	49,800	44,960	37,430	45,890	40,880	38,210	32,020	88,450	192,500	118,900	91,830	63,060	70,190
1945...	55,910	45,700	41,900	39,020	38,460	40,600	44,600	156,900	278,900	184,300	92,540	61,430	90,250
1946...	41,360	40,530	39,660	43,790	39,600	52,420	103,500	235,200	357,500	227,400	116,600	75,080	118,900
1947...	46,870	40,510	55,970	48,680	54,860	65,470	96,920	272,500	814,900	208,700	110,000	67,010	115,600
1948...	86,480	74,880	52,940	56,430	53,660	49,980	72,940	268,400	528,600	221,300	131,100	79,410	139,600
1949...	56,620	46,800	42,800	43,730	42,550	45,740	100,100	268,300	254,800	135,200	88,600	58,870	98,870
1950...	45,700	43,390	51,290	54,390	56,220	65,170	91,960	184,900	367,600	355,600	134,000	78,700	127,800
1951...	61,940	68,250	69,510	76,640	86,850	74,350	111,200	231,700	306,400	272,400	129,600	69,140	134,400
1952...	74,230	60,710	60,950	69,980	63,440	74,130	73,810	261,200	256,800	191,900	89,560	58,710	112,400
1953...	62,270	51,050	47,910	44,350	64,170	73,890	75,130	122,200	308,300	226,600	111,800	81,170	105,000

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928...									286,000	202,000	99,000	57,700	.....
1929...	48,400	36,000	23,600	.....	.....	21,200	33,200	60,400	213,000*	129,000	87,100	56,000	.....
1930...	34,500	22,800	20,800	.....	.....	24,600	39,000	139,000	178,000	155,000	97,600	60,400	.....
1931...	36,400	29,200	24,400	21,600	23,000	24,400	40,800	71,700	168,000	138,000	84,100	53,700	21,600
1932...	35,400	30,400	26,300	24,500	.....	45,400	72,900	162,000	299,000	168,000	112,000	59,900	.....
1933...	44,000	43,000	44,000	34,600	.....	30,100	48,400	141,000	280,000	235,000	124,000	71,000	.....
1934...	56,200	72,800	68,000	96,200	65,600	63,800	103,000	302,000	220,000	143,000	91,100	54,000	54,000
1935...	41,600	44,000	45,000	37,400	47,600	41,600	47,000	115,000	290,000	221,000	85,400	60,200	31,400
1936...	40,600	29,300	24,900	24,500*	19,500*	26,000*	27,700	191,000	226,000	131,000	83,300	49,600	19,500*
1937...	35,400	25,300	21,200	16,000*	15,300*	20,800*	26,300	67,100	211,000	147,000	83,700	67,800	15,300*
1938...	37,400	43,800	41,000	41,400	34,800	35,000	57,400	178,000	325,000	157,000	71,500	67,100	34,800
1939...	43,700	33,600	28,100	31,200	26,400	27,900	56,500	150,000	209,000	149,000	83,900	53,300	26,400
1940...	39,800	38,800	37,000	27,400	32,900	36,000	83,900	102,800	212,600	123,800	75,200	61,200	27,400
1941...	45,900	35,300	32,700	31,700	33,800	33,800	65,100	82,500	111,100	73,600	77,800	80,400	31,700
1942...	71,200	55,400	74,700	46,000	39,300	37,800	61,000	96,100	202,700	180,000	89,500	61,200	37,800
1943...	42,500	39,900	37,900	31,900	36,500	31,000	67,600	167,800	263,700	209,000	78,700	47,500	31,000
1944...	46,600	36,300	34,200	36,800	31,600	30,900	26,000	57,000	157,900	95,100	69,600	57,800	28,000
1945...	46,800	38,600	35,800	33,600	35,300	35,300	38,100	56,500	242,000	129,500	88,600	47,200	33,600
1946...	36,300	34,600	34,600	38,000	35,800	44,200	71,000	175,000	314,000	168,000	90,900	57,900	34,600
1947...	38,100	36,200	39,000	41,000	45,500	55,800	72,900	154,000	261,000	163,000	75,600	57,000	36,200
1948...	57,400	52,200	47,800	49,600	40,500	42,400	44,600	151,400	347,300	168,000	113,200	57,500	40,500
1949...	50,900	39,200	41,400	39,600	37,300	38,900	40,200	162,700	165,300	110,700	64,500	47,400	37,300
1950...	38,400	35,300	40,900	43,200	48,900	56,800	60,100	109,000	266,300	224,600	103,200	53,200	35,300
1951...	50,600	48,700	49,600	63,000	51,100	61,400	64,500	146,800	252,600	208,700	87,000	50,500	48,700
1952...	65,500	45,000*	45,200	60,400	49,200*	66,800	65,200	86,000	221,200	134,000	61,400	47,500	45,000*
1953...	41,400	42,700	38,300	28,400	45,500	60,400	64,200	54,800	223,700	160,000*	94,200	67,300	28,400

* Estimated.

Columbia River at Grand Coulee Dam, Wash.—Continued

Summary

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Observed					Adjusted			Observed		Adjusted		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches	
Dls-charge	Date												
1913.	492,000	June 15, 1913											
1914.			32,000	112,000	81,400,000				114,000	82,900,000			
1915.			25,000	96,900	70,100,000				93,700	67,800,000			
1916.				135,000	98,000,000				135,000	98,000,000			
1917.				114,000	82,800,000				116,000	83,000,000			
1918.			35,000	118,000	85,700,000				119,000	86,100,000			
1919.			25,000	109,000	78,300,000				105,000	75,700,000			
1920.				98,900	71,800,000				107,000	77,700,000			
1921.			37,000	127,000	91,700,000				123,000	83,900,000			
1922.			24,000	103,000	74,900,000				101,000	73,000,000			
1923.	395,000	June 17, 1923		109,000	79,000,000				108,000	78,300,000			
1924.				86,200	62,600,000				85,300	64,100,000			
1925.			35,000	126,000	91,000,000				124,000	89,400,000			
1926.			25,000	73,500	53,200,000				79,700	57,700,000			
1927.				126,000	91,400,000				136,000	93,900,000			
1928.	490,000	June 1, 1928	40,000	141,000	103,000,000				120,000	91,800,000			
1929.	819,000	June 18, 1929		81,100	58,700,000				78,500	56,800,000			
1930.	251,000	June 14-16, '30		84,900	61,400,000				85,700	62,000,000			
1931.	243,000	June 14, 1931	21,600	80,800	58,500,000				80,900	58,600,000			
1932.	363,000	June 19, 20, '32		114,000	82,800,000				118,000	85,400,000			
1933.	469,000	June 23, 1933		126,000	91,400,000				135,000	97,600,000			
1934.	378,000	June 3, 1934	54,000	140,000	101,400,000				132,000	95,670,000			
1935.	355,000	June 18, 1935	31,400	112,500	81,440,000				108,700	78,720,000			
1936.	387,000	June 4, 1936	19,500	97,570	70,830,000				96,370	69,060,000			
1937.	271,000	June 25, 1937	15,300	79,400	57,500,000				83,640	60,710,000			
1938.	304,000	June 8, 1938	34,800	113,200	81,960,000	113.300	1.53	20.74	111,300	80,570,000	111.400	20.40	
1939.	290,000	June 1, 2, 1939	26,400	95,700	69,280,000	96,000	1.30	17.59	97,350	70,480,000	97,590	17.88	
1940.	205,600	June 5, 6, 1940	27,400	91,590	66,490,000	93,390	1.26	17.18	91,310	66,280,000	93,490	17.18	
1941.	170,000	May 9, 1941	31,700	74,300	53,790,000	81,900	1.11	14.98	82,610	59,810,000	88,710	16.24	
1942.	315,100	June 13, 1942	37,800	106,600	77,210,000	99,900	1.48	20.12	97,730	70,750,000	101,900	16.66	
1943.	319,900	June 21, 1943	31,000	111,200	80,540,000	111,600	1.51	20.45	111,200	80,510,000	111,200	20.38	
1944.	218,000	June 16, 1944	28,000	70,190	50,950,000	70,190	.947	12.89	71,130	51,640,000	70,520	12.95	
1945.	333,700	June 6, 1945	33,600	90,250	65,340,000	89,840	1.21	16.46	88,400	64,000,000	89,090	16.32	
1946.	402,000	June 1, 1946	34,600	118,900	86,080,000	118,900	1.60	21.78	120,800	87,420,000	120,800	22.13	
1947.	362,000	June 10, 1947	36,200	115,500	83,050,000	115,600	1.56	21.15	121,500	87,940,000	121,600	22.26	
1948.	637,800	June 12, 1948	40,500	139,600	101,300,000	139,800	1.89	25.69	133,200	97,150,000	138,400	24.51	
1949.	362,800	May 21, 1949	37,800	93,870	71,580,000	98,570	1.33	18.06	98,470	71,200,000	99,330	18.02	
1950.	507,600	June 25, 1950	35,300	127,800	92,520,000	127,900	1.73	23.42	132,800	96,140,000	133,000	24.37	
1951.	376,800	May 29, 1951	48,700	134,400	97,270,000	135,100	1.82	24.75	134,000	97,030,000	133,900	24.54	
1952.	354,700	May 25, 1952	45,000	112,400	81,580,000	113,400	1.53	20.82	103,600	78,850,000	103,600	19.94	
1953.	374,000	June 17, 1953	28,400	105,000	76,000,000	105,900	1.43	19.41					

Note.—Prior to 1938 records not affected by Coulee Dam.

Nespelem Canal at Nespelem, Wash.

Location.—Lat. 48°10'20", long. 118°58'40", in NE¼ sec. 24, T. 31 N., R. 30 E., on right bank, 2,000 ft. downstream from intake, and three-quarters of a mile northwest of Nespelem.

Gage.—Staff gage. Altitude of gage is 1,830 ft. (from topographic map).

Extremes.—1921-29: Maximum discharge, 13.9 cfs June 16-18, 1929 (gage height, 1.85 ft.); no flow in canal during winter.

Remarks.—Canal diverts from right bank a third of a mile upstream from station for irrigation of about 1,100 acres.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...							337	440	456	406	357	321	.....
1922...	0	0	0	0	0	0	111	413	549	344	281	244	1,940
1923...	253	250	41.8	0	0	0	52.4	408	499	554	365	280	2,700
1924...	306	190	5.55	0	0	0	169	596	589	313	254	248	2,670
1925...	274	317	139	0	0	0	135	315	625	453	304	266	2,530
1926...	296	274	283	0	0	128	183	530	340	220	157	212	2,620
1927...	228	18.0	50.3	0	0	0	127	314	497	552	280	302	2,430
1928...	324	377	122	0	0	0	39.7	414	607	521	271	284	2,960
1929...	230	291	9.22	0	0	0	55.9	409	696	282	192	183	2,540

Nespelem River at Nespelem, Wash.

Location.—Lat. 48°10'20", long. 118°58'40", in NE¼ sec. 24, T. 31 N., R. 30 E., on left bank near Indian Service bridge, half a mile upstream from millpond, and three-quarters of a mile northwest of Nespelem.

Drainage area.—107 sq. mi.

Gage.—Staff gage and concrete control. Altitude of gage is 1,820 ft. (from topographic map). May 1, 1911, to July 28, 1913, staff gage 1,000 ft. upstream at different datum.

Average discharge.—18 years (1911-29), 39.3 cfs.

Extremes.—1911-29: Maximum discharge, 483 cfs Apr. 5, 1919 (gage height, 4.9 ft., from high-water mark); minimum observed, 2.7 cfs July 26 to Aug. 1, 1926.

Remarks.—Nespelem Canal (see above) has diverted water above station since April 1921. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...								143	72.1	27.4	11.1	8.7	.....
1912...	12.1	11.2	9.6	9.3	11.8	17.8	74.8	124	52.6	22.9	15.6	14.8	31.4
1913...	15.4	21.9	19.6	11.6*	7.95*	34.4*	113	117	62.4	28.8	9.65	7.03	37.8*
1914...	9.45	14.4	11.1	29.8	34.2	138	266	177	70.7	21.3	10.8	10.5	66.1
1915...	11.5	17.6	14.9	14.6	16.0	88.2	183	113	73.7	35.0	13.2	11.2	49.4
1916...	12.0	14.0*	16.7	12.3	14.3	87.6	295	221	115	46.3	19.7	12.5	72.1*
1917...	10.9	14.6	14.7	8.17	13.5	14.1	83.3	257	190	26.0	10.9	8.65	48.7
1918...	8.79	9.74	10.7	12.3	13.7	21.5	42.3	30.5	14.2	9.12	8.31	8.01	15.8
1919...	8.27	10.3	11.1	2.09	44.2	84.7	309	164	53.9	17.6	11.6	10.7	61.9
1920...	10.3	11.5	10.7	9.70	10.2	11.5	15.3	21.2	15.7	9.00	7.24	7.71	11.7
1921...	8.57	22.0	25.6	27.2	32.4	146	283	215	63.5	12.9	6.78	6.19	71.1
1922...	10.1	11.1	11.8	10.4	9.80	14.3	80.6	149	49.7	11.6	5.70	4.59	30.8
1923...	10.6*	11.0*	12.3*	29.8*	20.9*	31.3*	77.7	55.7	54.5	20.7	7.67	4.00	28.0*
1924...	17.4*	22.1*	24.1*	22.1*	69.0*	55.0*	54.4	32.6	8.51	3.59	3.39	4.28	26.2*
1925...	12.5*	27.8*	27.3*	17.4*	124*	139*	243	108	34.9	6.73	5.09	5.51	61.1*
1926...	5.42	4.92	4.80	7.86	12.5	13.3	20.9	16.2	5.79	2.79	3.37	3.99	9.19
1927...	4.11	5.98	8.33	8.56*	32.6*	117*	183	185	78.8	17.0	6.70	7.35	54.5*
1928...	9.00	10.9	11.7	13.2	15.9	35.8	75.2	71.5	17.6	6.98	4.94	3.91	23.0
1929...	4.28	4.46	8.03	7.70	6.98	11.2	18.1	25.1	13.1	6.44	4.16	4.21	9.34

* Estimated.

NESPELEM RIVER BASIN

Nespelem River at Nespelem, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911								94	40	12	8	8	
1912	9	10	9	9	10	11	37	84	28	17	13	14	9
1913	14	16	16				31	96	46	17	7.0	7.0	7.0
1914	7.0	10.2	9.0	10.2	27	64	152	88	43	13.6	9.2	9.5	7.0
1915	9.6	14	12	13	13	28	124	89	46	18	9.1	9.1	9.1
1916	12	12	15	7.5	12	15	202	147	76	26	14	12	7.5
1917	10.1	10.1	10.1	6.7	10.1	6.7	16.0	174	55	14.5	9.0	8.5	6.7
1918	8.5	9.0	9.6	11.2	11.2	13.8	88	21	11.2	8.2	6.2	8.0	8.0
1919	8.0	8.2	10.1	9.0	28	37	258	107	27	11.2	9.0	9.0	8.0
1920	10.1	10.6	8.5	9.0	9.6	10.6	11.7	17.4	11.7	7.8	6.7	.1	6.7
1921	7.1	9.6	25	22	27	56	209	130	34	7.8	6.0	5.6	5.6
1922	9.6	10	11	9.6	9.0	9.6	31	87	20	6.3	5.0	3.7	3.7
1923							43	40	36	9.0	6.3	4.5	4.5
1924							42	15	5.1	3.1	2.1	3.8	3.1
1925							141	60	12	5.4	4.7	5.0	4.7
1926	5.0	4.7	4.7	7.7	7.7	10.4	17.8	10.4	3.0	2.7	2.7	3.7	2.7
1927	4.0	5.4					130	115	46	6.5	6.0	6.0	4.0
1928	8.3	8.9	8.8	12	15	15	64	37	6.5	4.7	4.4	3.5	3.5
1929	4.2	4.2	4.7	7.2	5.8	6.3	10	15	8.8	4.0	4.0	4.0	4.0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1911	234	May 19, 1911					
1912	162	May 1, 1912	9.0	31.4	22,800	33.6	24,400
1913	176	April 20, 1913	7.0	37.8	27,300	35.7	25,800
1914	404	April 16, 1914	7.0	66.1	47,800	66.8	48,400
1915	255	April 4, 1915	9.1	49.4	35,700	49.3	35,700
1916	379	April 11, 1916	7.5	72.1	52,400	72.0	52,300
1917	397	May 14, 1917	6.7	48.7	35,200	47.6	34,600
1918	51	Mar. 3, 1918	8.0	15.8	11,400	15.8	11,400
1919	483	April 5, 1919	8.0	61.9	44,900	62.2	45,100
1920	34	May 10, 1920	6.7	11.7	8,470	13.9	10,100
1921	387	April 15, 1921	5.6	71.1	51,400	65.9	49,800
1922	189	May 4, 1922	3.7	36.8	22,300	36.8	22,400
1923	102	April 19, 1923	4.5	28.0	20,800	30.5	22,100
1924	66	April 15, 1924	3.1	26.2	19,000	25.7	18,600
1925	334	April 12, 1925	4.7	61.1	44,300	57.6	41,700
1926	38	April 17, 18, 1926	2.7	9.19	6,650	9.47	6,856
1927	327	April 27, 1927	4.0	54.5	39,500	55.6	40,300
1928	107	May 1, 2, 1928	3.5	23.0	16,700	21.6	15,800
1929	46	Mar. 10, 1929	4.0	9.34	6,760		

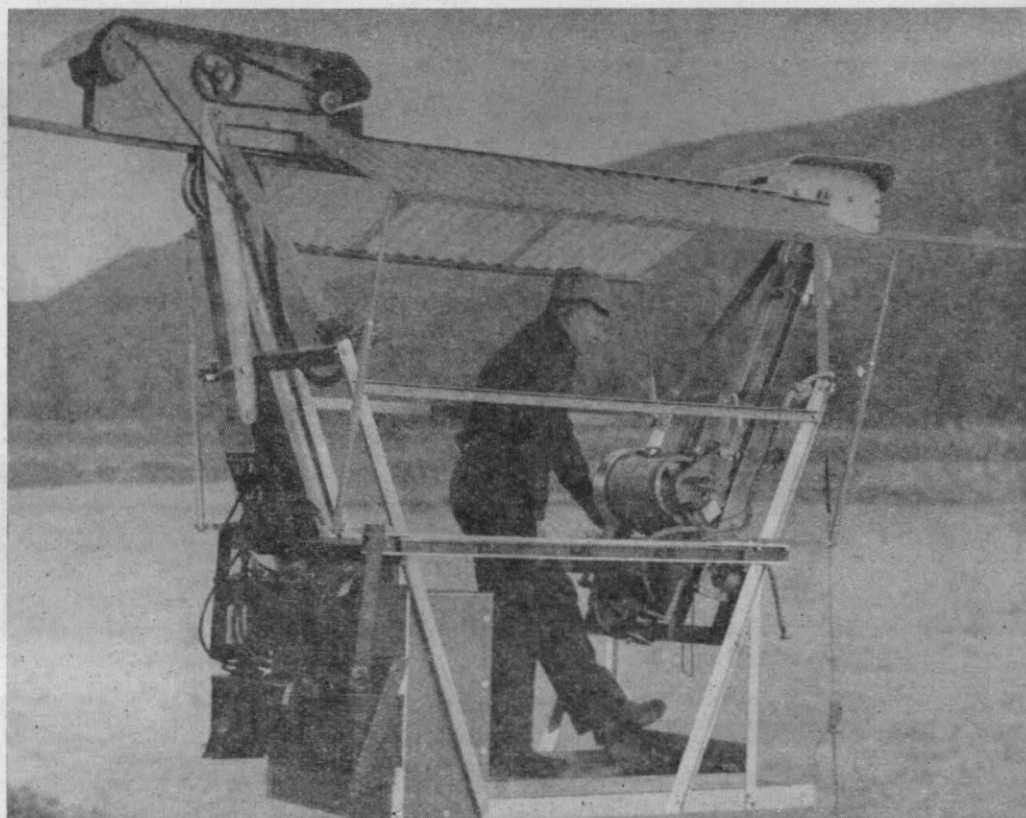


Figure 18. Discharge measurement with completely electric gaging equipment on Columbia River at Bridgeport.

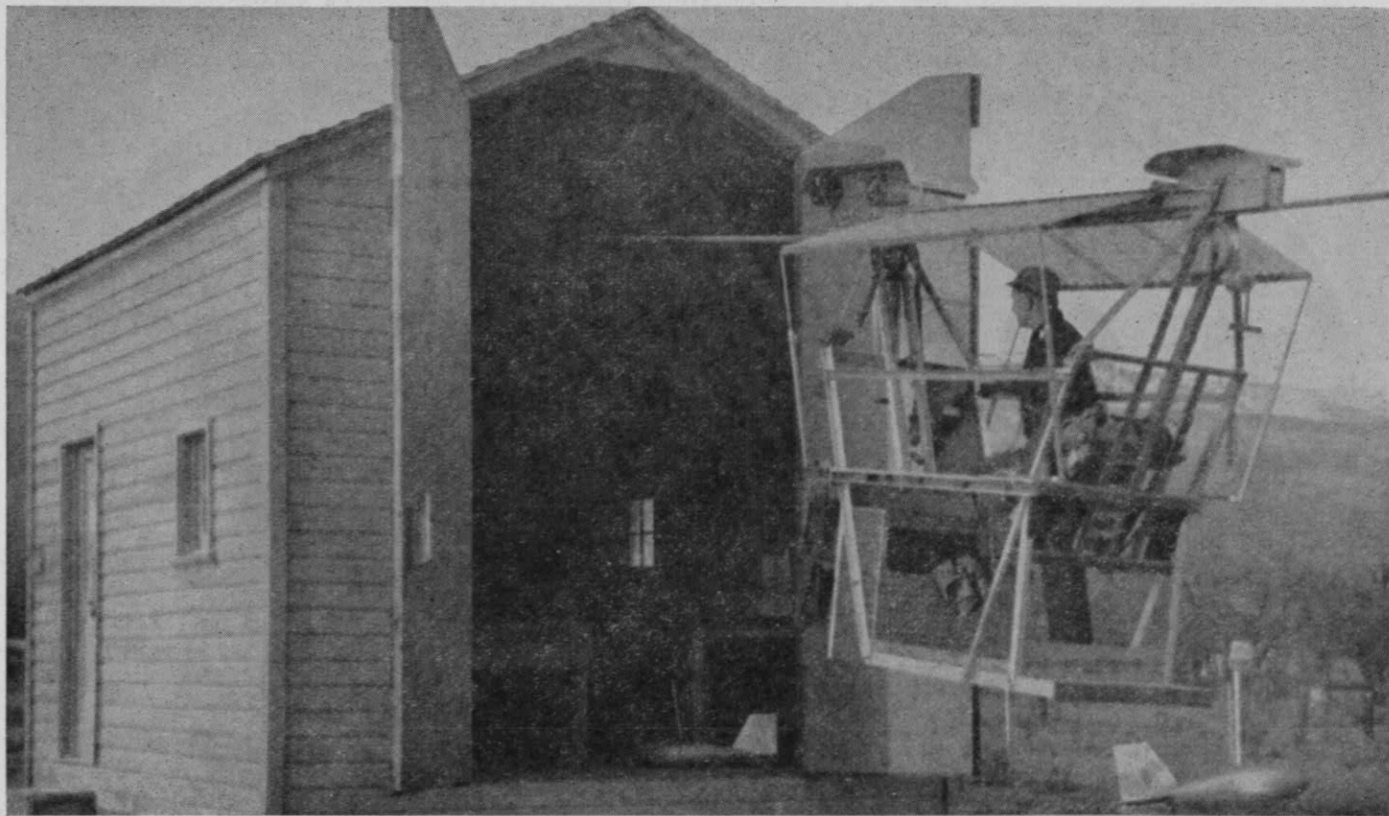


Figure 19. Electrically driven gaging car entering car shelter, Columbia River at Bridgeport.

Columbia River at Bridgeport, Wash.

Location.—Lat. 48°00'25", long. 119°39'50", in SW¼SW¼ sec. 14, T. 29 N., R. 25 E., on left bank at Bridgeport, 1 mile downstream from Foster Creek, and 1½ miles downstream from Chief Joseph Dam.

Drainage area.—75,000 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.—1952-53: Maximum discharge, 374,500 cfs June 17 (elevation, 784.70 ft.); minimum not determined, occurred during period when stage was below intakes.

Remarks.—Feeder Canal (see p. 490) diverts water by pumping from Franklin D. Roosevelt Lake for Columbia basin project. Other diversions above station for irrigation is small percentage of flow past gage. Flow regulated by Franklin D. Roosevelt Lake (see p. 493) and reservoirs in Kootenai, Pend Oreille, and Spokane River basins.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....							78,030	260,300	257,600	194,800	102,800	61,690	.....
1953....	54,890	53,370	50,020	46,710	66,640	76,040	77,830	122,000	309,100	227,400	114,300	83,850	106,900

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....							71,700	82,700	223,600	136,200	70,800	52,300	.....
1953....	45,900	46,400	40,800	31,000*	48,500	66,400	69,900	59,800	228,700	163,900	94,600	71,000	31,000*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1952.....	349,700	May 26, 1952					
1953.....	374,500	June 17, 1953	31,000	106,900	77,390,000		

* Estimated.

OKANOGAN RIVER BASIN

Okanagan River at Okanagan Falls, British Columbia
(International gaging station)

Location.—Lat. 49°21', long. 119°35', on right bank, 400 ft. downstream from falls at Okanagan Falls, British Columbia, and 800 ft. downstream from Skaha Lake.

Drainage area.—2,650 sq. mi., approximately.

Supplemental records available.—April 1914 to March 1915, fragmentary records at Okanagan River near Fairview, British Columbia.

Gage.—Water-stage recorder. Datum of gage is 1,092.82 ft. above mean sea level (Geodetic Survey of Canada, 1947 joint adjustment). Mar. 18, 1915, to Oct. 1, 1933, staff gages about 400 and 500 ft. upstream between highway bridge and crest of falls at different datums. Oct. 2, 1933, to Apr. 14, 1936, staff gage at same site and datum.

Average discharge.—38 years (1915-53), 502 cfs.

Extremes.—1915-53: Maximum discharge observed, 2,680 cfs June 10, 1928; minimum observed, 4.6 cfs Mar. 14, 1931.

Remarks.—Numerous diversions for irrigation of approximately 38,000 acres above station. Flow regulated by control dam at outlet of Okanagan Lake for navigation and storage.

Cooperation.—This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records for March 1915 to September 1930 furnished by Canadian Department of Resources and Development.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915.....				485*	433*	426*	497	850	966	857	737	510	.....
1916....	473	451	429	200*	270*	510*	350	770	1,110	1,230	970	850	619*
1917....	410	285	265	227	213	223	306	449	1,050	1,010	671	495	459
1918....	410	300	190	190	190	170	195	650	1,060	800	450	250	410
1919....	205	190	190	170	170	155	195	550	1,150	1,050	570	300	410
1920....	235	230	200	160	120	125	120	165	470	970	510	200	290
1921....	178	152	132	130	126	132	193	935	2,360	1,540	407	228	545
1922....	206*	190*	350*	520*	500*	650*	600*	770*	750*	269	215	170*	430*
1923....	256*	380*	500*	540*	500*	505	485	725	1,040	900	680	475	552*
1924....	500	454	409	430	522	471	349	385	170	125	110	122	340
1925....	104	90	72	62	66	223	323	350	475	212	189	165	270
1926....	155	125	138	170	361	623	391	262	177	127	93	68	224
1927....	49	48	48	42	250	562	503	591	291	97	140	352	247
1928....	734	820	967	1,130	1,020	1,090	1,120	1,940	2,580	2,320	1,610	1,680	1,370
1929....	911	851	259	45.7	33.4	29.3	34.7	473	347	134	136	72.0	284
1930....	33.8	24.8	9.1	7.7	5.0	10.1	57.0	289	209	110	99.0	61.0	77.0
1931....	57.0	48.0	9.6	6.7	6.2	27.1	6.6	86.0	66.0	93.0	88.0	67.0	50.0
1932....	47.7	68.0	9.8	38.4	367	639	49.7	883	846.	624	470	458	427
1933....	470.	376.	640.	625.	267.	386.	751.	1,050.	1,160.	954.	747.	560.	668.
1934....	562	661	706.	719	744	724	946	933	918.	125	421	343	691
1935....	434	504	481	568	619	660	656	237	556	866	508	798	691
1936....	807	792	567	374	251	246	377	790	876	579	647	541	592
1937....	554	514	400	232*	161*	379	634	766	915	508	310	273	473*
1938....	279	355	599	666	634	595	642	1,020	751	318	178	197	522
1939....	192	176	221*	145	126	189	428	512	464	390	372	269	293*
1940....	233	209	214	156*	65	145	172	260	221	164	154	163	177*
1941....	167	179	216	230	246	448	415	269	310	252	322	424	285
1942....	533	613	156	751	657	215	346	468	1,070	1,250	1,070	662	727
1943....	858	591	705	354	409	530	728	732	546	353	225	190	564
1944....	164	161	146	138	142	127	121	216	735	424	178	147	225
1945....	165	225	580	527	447	573	629	1,000	1,030	673	522	300	557
1946....	466	556	795	611*	536*	763	806	1,240	1,180	1,000	918	590	519*
1947....	692	744	710	500	272	137	178	325	286	208	324	335	411
1948....	259	274	421	625	320	168	435	904	1,370	1,350	1,400	1,390	745
1949....	1,250	1,420	1,220	1,040*	904*	844*	856	1,100	735	575	564	565	928*
1950....	522	406	389	369*	476*	835	785	682	1,170	728	614	478	647*
1951....	498	545	646	686	721	836	893	1,230	1,240	1,180	865	711	636
1952....	765	787	791	637	800	560	815	1,270	953	832	729	742	611
1953....	598	235	173	170	182	192	201	534	483	684	620	601	396

* Estimated.

Okanagan River at Okanagan Falls, British Columbia—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915				465	420	400	400	600	880	810	660	520	
1916	460	430	400				300	500	980	1,150	770	520	
1917	315	265	265	210	210	200	200	210	940	850	570	450	200
1918	400	190	190	190	160	160	170	500	90	620	290	240	160
1919	190	190	190	150	170	150	150	300	1,150	860	350	250	150
1920	230	230	190	130	120	120	100	120	240	500	280	190	100
1921	170	140	130	130	120	105	155	255	2,200	820	230	180	105
1922	180	180	240*	470*	450	590*	50	600*	390	230	180	130	130
1923						450	450	570	820	725	630	420	
1924	462	420	390	360	493	402	305	245	140	100	85	76	76
1925	80	53	53	45	55	93	465	715	245	190	167	140	45
1926	106	106	93	133	126	454	339	190	145	101	74	52	52
1927	30	38	30	30	38	516	436	622	119	73	119	130	30
1928	585	730	880	1,010	1,000	952	1,020	1,370	2,410	1,970	1,260	960	585
1929	887	652	43	25*	23	19	11	146	185	102	108	26	11
1930	12.2	12.2	8.1	5.3	6.0	6.4	9.0	83.0	92.0	92.0	60.0	18.8	5.3
1931	7.7	11.5	6.0	5.6	5.1	4.6	36.0	39.0	42.5	42.0	74.0	42.5	4.6
1932	12.9	9.9	8.2	7.7	129.0	596	567	528	793	432	444	429	7.7
1933	299	307	504	362	118	152	701	948	1,060	815	646	496	118
1934	454	594	613	693	707	686	777	852	742	574	371	208	208
1935	396	463	429	457	594	607	613	727	871	669	757	772	396
1936	697	749	504	285	211	217	178	587	670	779	537	630	178
1937	546	449	340	96*	120*	148	614	640	733	349	256	243	96*
1938	248	287	482	653	602	573	572	591	420	186	165	172	165
1939	169	153	150*	128	117*	117	364	488	433	371	343	271	117*
1940	169	186	169	88	52	88	151	165	172	176	140	151	52
1941	148	162	203	207	113	406	300	83	260	176	283	352	83
1942	437	565	702	752	312	123	148	359	665	1,210	934	865	123
1943	837	871	606	460	384	393	669	659	450	268	195	180	180
1944	134	147	134	130	132	113	82	70	652*	285	152	127	70
1945	147	147	480	416	421	416	614	060	802	520	328	257	147
1946	396	450	766	509	492	727*	751	968	1,080	948	870	875*	396
1947	884	376	682	410	126	114	137	257	284	155	266	308	114
1948	209	213	321	475	206	140	227	656	1,200	1,280	1,330	1,360	140
1949	845	1,320	1,140	940	560	822	778	996	572	560	548	542	542
1950	445	280	355	321	321	800	696	785	876	676	492	458	321
1951	475	519	566	590	590	800	815	1,040	1,120	1,130	729	629	475
1952	716	746	762	554	618	524	524	1,150	650	772*	709	709	524
1953	336	164	164	152	170	180	170	312	233	611	597	502	152

* Estimated.

OKANOGAN RIVER BASIN

Okanagan River at Okanagan Falls, British Columbia—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30		Minimum day	Mean	Runoff in acre-feet	CALENDAR YEAR	
	Momentary maximum Dis-charge	Date				Mean	Runoff in acre-feet
1915						598	434,000
1916				619	440,000	585	425,000
1917			300				
1918			160	459	333,000	456	330,000
1919			150	410	297,000	384	278,000
1920			100	410	299,000	419	303,000
1921	2,500†	June 15, 1921	105	299	213,000	277	201,000
1922			130	545	395,000	569	412,000
1923				430	312,000	463	335,000
1924			76	582	422,000	605	438,000
1925			45	340	246,000	245	178,000
1926			52	270	196,000	283	205,000
1927			30	224	162,000	200	145,000
1928	2,660†	June 10, 1928	585	247	179,000	446	323,000
1929			11	1,370	963,000	1,340	971,000
1930			5.3	284	205,000	115	83,200
1931	167†	Oct. 30, 1930	4.6	77.0	55,700	80.9	58,600
1932	910†	May 7, 1932	7.7	50.0	36,300	51.0	36,900
1933	1,300†	May 30, 31, 1933	118	427	310,000	536	389,000
1934	1,160†	April 24, 1934	208	668	483,000	709	513,000
1935	1,110†	May 24, 1935	396	691	501,000	649	470,000
1936	2,340	May 15, 1936	178	691	500,000	753	545,000
1937	1,080	June 3, 1937	96	592	429,000	534	387,000
1938	1,270	May 28, 1938	165	473	343,000	456	330,000
1939	543	May 8, 1939	117	522	278,000	465	337,000
1940	292	⊙	52	293	212,000	298	216,000
1941	571	Sept. 26, 1941	83	177	128,000	169	122,500
1942	1,310	July 4, 1942	123	285	206,100	397	287,600
1943	913	Nov. 19, 1942	180	727	526,200	773	559,600
1944	802	June 4, 1944	70	594	408,100	397	287,700
1945	1,250	June 7, 1945	147	255	168,100	267	193,600
1946	1,360	May 13, 1946	396	557	403,400	631	456,600
1947	956	Oct. 25, 1946	114	819	592,700	861	623,600
1948	1,550	June 15, 1948	140	411	297,000	293	212,300
1949	1,510	Nov. 7, 1948	542	745	540,600	990	713,300
1950	1,310	June 15, 1950	321	928	671,800	712	515,800
1951	1,440	May 18, 1951	475	647	468,300	678	490,200
1952	1,410	May 20, 1952	524	838	607,000	883	646,800
1953	1,040	May 22, 1953	152	511	588,500	699	507,400
				396	286,800		

† Maximum observed. ⊙ Oct. 1, 2, 6, 12, 1939.

Okanagan River at Oroville, Wash.

Location.—Lat. 48°55'55", long. 119°25'05", in SW¼ sec. 27, T. 40 N., R. 27 E., on left bank at Oroville, 20 ft. downstream from Great Northern railroad trestle, half a mile downstream from Tonasket Creek, and 1½ miles downstream from Osoyoos Lake.

Drainage area.—3,210 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 900 ft. above mean sea level, datum of 1929, or 899.77 ft. above mean sea level, supplementary adjustment of 1947. Prior to Oct. 26, 1944, staff gage 200 ft. upstream at same datum. Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder 20 ft. upstream at same datum.

May 15, 1946, to Apr. 9, 1948, auxiliary staff gage and, since Apr. 10, 1948, auxiliary water-stage recorder half a mile downstream at same datum.

Average discharge.—11 years (1942-53), 724 cfs.

Okanogan River at Oroville, Wash.—Continued

Extremes.—1942-53: Maximum discharge recorded, 3,430 cfs June 2, 1948 (gage height, 15.28 ft.); maximum gage height, 16.50 ft. May 31, 1948 (backwater from Similkameen River); maximum daily reverse flow, 2,270 cfs May 29, 1948; minimum gage height, 3.98 ft. Mar. 1, 1948.

Remarks.—Diversions irrigate approximately 44,000 acres above station in Canada and minor diversions in United States above station. Natural regulation in several large lakes and artificial regulation in Okanogan Lake for navigation and storage; pondage by Zosel's mill dam, 200 ft. above gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...	962	1,047	891*	584*	597*	505	977	1,020*	802*	380	156	140	667*
1944...	201	224	193	184	229*	130*	135	323	911	501	167	81.7	277*
1945...	188	258	436	530	500	543	660	1,475*	1,501*	689	449	289	625*
1946...	473	649	921	822	641	783	924	1,711*	1,523*	1,074	825	836	934*
1947...	903	836	763	612	413	243	175	457*	336	126	193	311	448*
1948...	373	366	465	624	419	274	475	693	2,454*	1,509	1,456	1,432	882*
1949...	1,430	1,551	1,404	1,190	1,139	1,040	930	1,339*	763*	452	465	539	1,020*
1950...	548	743	468	403*	610	884	877	1,200*	1,565*	748	572	424	737*
1951...	559	807	674	769*	869*	879	1,180	1,930	1,387	1,198	868	806	977*
1952...	856	872	745	737*	917*	749	1,035	1,818	1,024	845	632	701	911*
1953...	713	341	260	231	282	213	256	870	788	618	546	643	483

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...	822	970*	692	400*	490*	421	778	922	592*	228	116	123	116
1944...	170	210	174	178	178	66	110	255	760	291	100	69	59
1945...	123	214	291	470	450*	448	612	764	973	498	343	260	123
1946...	327	608	810	600	616	691	819	1,200	1,350*	864	776	776	327
1947...	855	691	725	496	333	205	12	7	244	59	83	254	7
1948...	333	316	390	564	4	3	188	-2,270*	1,800*	1,340	1,340	1,430	-2,270*
1949...	1,050	1,300	1,250	1,100	1,120	935	658	-359*	390	390	442	513	-359*
1950...	500	488	406	390*	380*	658	658	854	-844	600	506	400	-844
1951...	426	519	628	590*	600*	827	863	951	1,190	1,100	722	748	426
1952...	772	852	502	550*	650*	716	584	1,550	804	692	572	663	502
1953...	448	259	168	141	273	168	150	470	436	522	478	485	141

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1943.....		May 6, 1943	116	667	482,800	475	344,100
1944.....	1,130†	June 3, 1944	59	277	201,000	299	217,200
1945.....		June 8, 1945	123	625	452,700	723	523,300
1946.....		May 17, 1946	327	934	676,300	973	704,100
1947.....			7	448	324,300	339	245,400
1948.....	3,430	June 2, 1948	-2,270	882	640,000	1,148	835,200
1949.....	2,350	May 19, 1949	-359	1,020	738,400	783	566,600
1950.....	2,950	June 23, 1950	-844	737	533,400	760	550,500
1951.....	2,500	May 15, 1951	426	977	707,600	1,030	746,000
1952.....	2,080	May 22, 1952	502	911	661,300	816	592,300
1953.....	1,250	May 21, 1953	141	483	349,600		

* Estimated.

† Maximum observed.

OKANOGAN RIVER BASIN

Sinlahekin Creek above Blue Lake, near Loomis, Wash.

Location.—Lat. 48°41'30", long. 119°43'00", in NE¼ sec. 20, T. 37 N., R. 25 E., on right bank, 1,800 ft. upstream from Blue Lake diversion dam, and 9½ miles southwest of Loomis.

Drainage area.—41.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,100 ft. (from topographic map).

Extremes.—1924-30: Maximum discharge, 284 cfs June 7, 1927 (gage height, 2.08 ft.); minimum, 0.4 cfs Sept. 20, 1930 (gage height, 0.42 ft.), but may have been less during period of no gage-height record.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924								18.0	7.10	2.65	2.57	2.43	
1925							29.0	49.7	26.0	6.22	2.79	2.70	
1926	2.73						9.59	8.11	4.37	1.74			
1927								56.2	61.6	15.6	7.83	8.88	
1928	10.1						15.2	59.7	25.7	29.3	7.93	3.97	
1929	4.13	3.30						11.9	18.0	5.66	1.51	1.64	
1930	1.85							5.84	10.2	5.28	1.45	1.11	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924								9.5	3.5	2.0			
1925							3.7	36	13	3.2	2.4	2.4	
1926	2.6						3.5	5.2	2.9	.9			
1927								21	23	8.7	6.2	6.7	
1928	8.1						4.5	28	20	12	4.8	3.6	
1929	3.2	1.8						6.6	10	2.7	1.2	1.3	
1930	1.3							4.1	5.2	2.3	1.0	.5	

Annual Flood Peaks

Water year	Date	Gage height (feet)	Discharge (cfs)
1924	May 12, 1924	1.31	34
1925	May 19, 1925	1.46	99
1926	April 19, 1926	1.04	20
1927	June 7, 1927	2.08	284
1928	May 8, 1928	1.55	118
1929	June 10, 1929	1.22	37
1930	①	1.12	26

① June 22, 23, 1930.

Sinlahekin Creek at Blue Lake, near Loomis, Wash.

Location.—Lat. 48°41'40", long. 119°42'20", in NW¼ sec. 21, T. 37 N., R. 25 E., on left bank, three-quarters of a mile northwest of Blue Lake, and 9½ miles southwest of Loomis.

Drainage area.—42.9 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,580 ft. (from topographic map).

Extremes.—June to October 1920: Not determined.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1920								8.17*	4.07*	1.36*	2.12*	3.90	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1920									2.0*	.7	1.1	3.2	

* Estimated.

Sinlahekin Creek at Twin Bridges, near Loomis, Wash.

Location.—Lat. 48°44'10", long. 119°40'20", in NE¼ sec. 3, T. 37 N., R. 25 E., on right bank, 100 ft. upstream from lower of twin bridges, half a mile downstream from Sarsapkin Creek, and 6 miles southwest of Loomis.

Drainage area.—75.5 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,580 ft. (from topographic map).

Extremes.—1921-23: Maximum discharge, 399 cfs May 17, 1922 (gage height, 2.78 ft., from graph based on gage readings); minimum observed, 1.6 cfs Aug. 7, 8, 1922, but may have been less during period of no gage-height record.

Remarks.—Several small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921								151	75.9	10.4	2.99	3.58	
1922	4.58						12.1	129	30.6	7.27	4.76	5.03	
1923									47.7	17.7	4.12	3.85	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921									27	3.7	2.4	2.8	
1922	3.3						5.5	34	20	2.4	1.6	1.8	
1923									25	3.4	1.9	1.9	

OKANOGAN RIVER BASIN

Sinlahekin Creek at Twin Bridges, near Loomis Wash.—Continued

Annual Flood Peaks

Water year	Date	Gage height (feet)	Discharge (cfs)
1921.....	May 16, 1921	2.44	339
1922.....	May 17, 1922	2.78	399
1923.....	June 24, 1923	1.08	59

Sinlahekin Creek near Loomis, Wash.

Location.—Lat. 48°46'50", long. 119°39'00", in NE¼ sec. 23, T. 38 N., R. 26 E., near bridge on main highway, 3 miles south of Loomis and 19 miles north of Conconully.

Drainage area.—86 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,450 ft. (from topographic map).

Extremes.—1903-5: Maximum discharge, 272 cfs Apr. 29, 1904 (gage height, 8.14 ft., from graph based on gage readings); minimum observed, 8 cfs Dec. 31, 1903 (gage height, 2.20 ft.).

Remarks.—Small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903.....										21.2	11.3	11.0	
1904....	17.9	22.2	15.3	16.1	39.6	13.5	134	214	107	29.7	14.5	13.2	53.0
1905....	19.4	22.6	19.7	21.8	31.3	20.2							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903.....										13	9	9	
1904....	13	19	8	11	2	11	25	132	40	19	13	13	8
1905....	13	22	19	19	16	16							

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1903.....							
1904....	272	April 29, 1904	8	53.0	38,500	53.5	38,900
1905....							

Toats Coulee Creek near Loomis, Wash.

Location.—Lat. 48°50'00", long. 119°41'30", in SE¼ sec. 33, T. 39 N., R. 25 E., on left bank just downstream from Deer Creek, 1,200 ft. upstream from intake of White-stone Irrigation District flume, and 3 miles northwest of Loomis.

Drainage area.—132 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,780 ft. (from topographic map). May 11 to June 2, 1920, staff gage 400 ft. downstream at datum about 25 ft. lower.

Extremes.—1920-26: Maximum discharge, 925 cfs June 3, 1922 (gage height, 4.80 ft.); minimum, 1.6 cfs Sept. 13, 14, 1926 (gage height, 0.72 ft.), but may have been less sometime during periods of no gage-height record during most winters, or between Aug. 1 and Sept. 9, 1926, when recorder was not operating satisfactorily.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920								73.8	83.6	34.6	6.77	8.84	
1921	21.9	12.1	8.92	7.13*	7.08	8.31*	13.4	264	258	46.9*	8.75	7.41*	55.5*
1922	8.7						13.3	199	239	23.7	10.9	8.47	
1923	13.3								246	90.3	24.1	10.4	
1924	13.2	9.4						109	44.2	10.3	6.4	4.1	
1925							25.7	147	78.0	13.8	5.37*	3.88	
1926							31.7	39.0	16.7	8.98			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920									44	11.6	4.0	5.2	
1921	11.6	8.4			6.2		8.6	15.2	166	17	6.0	6.0	
1922	4.8						7.0	28	57	11	5.1	4.2	
1923	10								136	26	13	8	
1924	7	7						41	19	6	4	3	
1925							3.7	40	33	6.3	3.7	2.5	
1926							6.8	25	9.8	2.5			

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1920	183	June 15, 1920					
1921	607	May 19, 1921		55.5	40,200		
1922	985	June 3, 1922					
1923	480	June 2-9, 1923					
1924	274	May 16, 1924					
1925	313	May 20, 1925					
1926	51	April 30, 1926					

* Estimated.

OKANOGAN RIVER BASIN

Similkameen River near Nighthawk, Wash.

(International gaging station)

Location.—Lat. 48°59'10", long. 119°37'00", in NW¼ sec. 7, T. 40 N., R. 26 E., on left bank, three-quarters of a mile upstream from Oroville-Tonasket Irrigation District canal intake, about 1¼ miles northeast of Nighthawk, and 12 miles upstream from mouth.

Drainage area.—3,550 sq. mi., approximately.

Supplemental records available.—Records of chemical analyses obtained near Oroville for the period January 1949 to September 1950 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is 1,137.70 ft. above mean sea level, international joint adjustment of 1947.

Average discharge.—25 years (1928-53), 2,202 cfs.

Extremes.—1928-53: Maximum discharge, 38,700 cfs May 30, 1948 (gage height, 17.62 ft.); minimum, 120 cfs Jan. 6, 1930 (gage height, 2.05 ft.).

Remarks.—Several diversions above station for irrigation of about 2,900 acres in the United States in 1946 and approximately 1,600 acres in Canada. Flow at high stages regulated by natural pondage in Palmer Lake.

Cooperation.—This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	656	517	371	247*	217*	345	427	3,960	5,220	1,160	370	269	1,150*
1930...	330	300	255	215*	442*	466	3,470	5,230	5,620	1,740	533	391	1,590*
1931...	416	454	353	352	473	490	611	6,060	2,760	945	328	411	1,170
1932...	395	332	387*	344	774*	1,370	2,290	7,260	6,090	1,650	568	374	1,900*
1933...	523	1,410	1,070	702	496*	531	1,480	6,210	12,200	5,030	1,260	631	2,640*
1934...	1,595	2,699	1,661	1,302	1,741	2,200	13,510	11,070	5,377	1,516	645	441	3,558
1935...	489	1,287	838	779*	2,235	1,703	1,315	8,704	0,508	3,675	1,243	617	2,654*
1936...	498	490	462	405	265*	409	2,724	8,003	5,257	1,158	385	323	1,703*
1937...	311	310	313	218*	222*	408	594	5,922	11,220	2,650	791	539	1,971*
1938...	665	963	702	643	535	670	2,336	11,400	9,325	2,168	599	457	2,481
1939...	462	458	502	624	424	614	2,513	6,861	5,115	2,054	335	335	1,717
1940...	307	575	911	393*	440	525	2,060	5,065	2,795	665	295	219	1,194*
1941...	489	440	418	375	345	575	2,422	3,424	3,378	1,317	587	1,076	1,243
1942...	2,780	1,516	1,441	705	661	544	2,496	7,037	8,725	2,489	892	468	2,459
1943...	406	474	605	432*	590*	544	2,934	5,994	9,769	5,128	1,161	640	2,381*
1944...	478	470	393	327	319	373	722	4,786	6,659	1,815	690	479	1,475
1945...	577	578	501	545	635	473	933	7,261	9,123	1,139	604	484	1,990
1946...	678	1,152	666	554	491	539	1,954	12,250	8,447	2,987	834	529	2,603
1947...	529	521*	419	442*	515	756	2,969	9,277	5,598	1,612	684	480	1,997*
1948...	769	837	652	514	466	446	1,131	11,130	17,130	3,668	2,625	1,605	3,413
1949...	1,344	926	736*	639*	550*	635	2,509	14,680	7,528	2,283	944	713	2,634*
1950...	762	1,737	1,398	749*	735*	735	1,013	7,626	17,980	5,323	1,418	618	3,383*
1951...	811	1,120	1,600	1,115	1,393	968	3,515	13,920	9,288	3,561	651	851	3,276
1952...	862	814	542	450*	537	540	2,121	8,616	5,365	2,265	752	446	1,947*
1953...	330	328	320	448	609	493	1,191	8,531	9,530	3,932	1,042	609	2,288

* Estimated.

Similakameen River near Nighthawk, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual	
1929	346	430	279				297	1,090	2,460	552	291	252		
1930	263	231	194			358	1,130	3,750	3,400	521	375	334		
1931		331	238	252	404	396	478	4,220	1,660	448	260	257	238	
1932		350	348			973	996	5,690	3,250	875	442	328		
1933		318	586	450		493	503	3,990	9,070	2,120	957	586	318	
1934		713	2,070	1,100	1,100	1,040	1,140	5,080	2,550	935	420	358	358	
1935		412	635	420	250*	1,360	514	3,400	5,080	1,870	752	518	280*	
1936		421	368	310	280*	230*	330*	347	6,600	2,170	549	326	297	230*
1937		292	262	248	200*	200*	335	443	900	6,800	1,080	561	468	200*
1938		477	775	369	390	402	532	692	6,400	3,990	873	416	377	369
1939		401	330*	365*	437	255*	328	1,200	5,260	3,990	943	371	292	285*
1940		264	460	550	260*	393	397	933	2,940	1,160	481	215	202	202
1941		276	273	256	309	296	360	1,620	2,700	2,200	702	461	643	256
1942		1,290	1,070	593	571	570*	509	561	3,300	4,750	1,470	582	382	382
1943		378	414	321	230*	400*	490	643	3,170	7,960	2,040	721	442	230*
1944		392	374	252	250*	280	296	327	2,140	3,700	545	499	356	250*
1945		446	475	321	432	442	448	442	1,290	4,280	950	423	396	321
1946		414	510	500*	423	437	494	678	4,910	5,080	1,420	566	461	414
1947		451	435*	272	305*	456	465	1,240	6,530	2,910	990	475	437	272
1948		423	672	600	350	320	418	504	2,040	6,340	2,260	2,080	1,200	320
1949		1,070	895	656	610*	500*	590	640	5,230	3,560	1,410	644	578	560*
1950		602	578	1,000*	670*	660*	680	668	1,590	11,700	2,340	857	500	500
1951		560	759	1,150	495	500*	750*	948	5,760	6,610	1,460	650	614	495
1952		766	604	350*	350*	462	489	522	3,900	3,220	1,220	538	360	350*
1953		310	352	239	204	470	436	536	3,190	6,150	1,420	792	485	239

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1929	8,500	May 23, 1929		1,150	834,000	1,100	796,000
1930	8,500	June 8, 1930		1,590	1,160,000	1,610	1,170,000
1931	9,360	May 15, 1931	238	1,170	848,000	1,180	852,000
1932	10,200	May 11, 1932		1,900	1,370,000	2,040	1,480,000
1933	20,900	June 17, 1933	318	2,640	1,970,000	2,880	2,680,000
1934	27,200	April 26, 1934	328	3,528	2,598,000	3,317	2,401,000
1935	14,600	May 31, 1935	280	2,654	1,922,000	2,558	1,852,000
1936	11,400	May 15, 1936	230	1,703	1,236,000	1,660	1,205,000
1937	16,100	June 4, 1937	200	1,971	1,427,000	2,088	1,512,000
1938	21,900	May 27, 1938	369	2,481	1,796,000	2,405	1,741,000
1939	70,000	May 16, 1939	285	1,777	1,243,000	1,753	1,269,000
1940	7,550	May 25, 1940	202	1,194	867,000	1,152	836,100
1941	4,750	①	256	1,243	899,800	1,562	1,131,000
1942	20,000	May 27, 1942	322	2,459	1,750,000	2,151	1,557,000
1943	13,400	②	230	2,331	1,724,000	2,369	1,715,000
1944	9,740	June 2, 1944	250	1,475	1,071,000	1,502	1,090,000
1945	17,600	June 1, 1945	321	1,990	1,441,000	2,060	1,491,000
1946	15,900	May 28, 1946	414	2,603	1,884,000	2,523	1,826,000
1947	14,300	May 9, 1947	272	1,997	1,445,000	2,059	1,491,000
1948	38,700	May 30, 1948	320	3,413	2,472,000	3,475	2,522,000
1949	26,900	③	560	2,834	2,052,000	2,950	2,138,000
1950	29,700	June 17, 1950	500	3,353	2,440,000	3,312	2,398,000
1951	22,700	May 24, 1951	495	3,276	2,372,000	3,164	2,291,000
1952	14,400	May 20, 1952	350	1,947	1,474,000	1,844	1,339,000
1953	16,200	June 14, 1953	239	2,228	1,656,000		

* Estimated.

① May 2, 1941. ② May 27, June 10, 1943. ③ May 15, 17, 1940.

Oroville-Tonasket Irrigation District Canal near Oroville, Wash.

Location.—Lat. 48°57', long. 119°28', in SE¼ sec. 20, T. 40 N., R. 27 E., on left side of flume, 50 ft. downstream from undercrossing of road to powerplant, and 1½ miles northwest of Oroville.

Gage.—Float gage. Altitude of gage is 1,100 ft. (from topographic map). Prior to July 16, 1923, staff gage 1,500 ft. downstream at different datum.

Extremes.—1922-28: Maximum daily discharge, 182 cfs June 27 to July 1, 1924; no flow at times each year.

Remarks.—Canal diverts water for irrigation from left bank of Similkameen River in sec. 7, T. 40 N., R. 26 E., for irrigation of about 7,000 acres.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916...	0	0	0	0	0	0	1,190	3,690	4,170	4,610	4,610	3,270	21,500
1917...	0	0	0	0	0	0	1,190	4,000	4,760	5,230	5,230	3,570	24,000
1918...	0	0	0	0	0	0	1,490	4,610	5,060	5,840	5,530	3,870	26,400
1919...	0	0	0	0	0	0	1,490	4,920	5,650	6,460	6,150	4,170	28,800
1920...	0	0	0	0	0	0	1,790	5,330	6,250	7,070	6,760	4,760	32,200
1921...	0	0	0	0	0	0	1,790	6,150	6,840	7,690	7,380	5,060	34,900
1922...	0	0	0	0	0	0	313	5,780	8,510	9,960	8,420	2,360	35,300
1923...	0	0	0	0	0	0	71	5,870	5,940	7,930	9,100	6,900	35,800
1924...	0	0	0	0	0	0	2,450	8,670	9,760	8,670	9,040	7,910	46,500
1925...	0	0	0	0	0	0	3,060	8,420	8,450	10,100	9,040	8,510	47,000
1926...	0	0	0	0	0	0	3,580	7,810	8,150	9,840	9,160	5,750	44,800
1927...	107	0	0	0	0	139	2,260*	6,760	7,620	9,780	10,100	4,320	41,100*
1928...	0	0	0	0	0	0	3,120*	7,570	8,630	8,300	8,730	7,560	44,600*

* Estimated.

Similkameen River near Oroville, Wash.

Location.—Lat. 48°57'40", long. 119°30'00", in SE¼ sec. 13, T. 40 N., R. 26 E., on right bank at powerplant, 4 miles northwest of Oroville, and 5 miles upstream from mouth.

Drainage area.—3,570 sq. mi., approximately.

Gage.—Staff gage. Datum of gage is at mean sea level, datum of 1912. Prior to Jan. 31, 1921, 500 ft. upstream at datum 964.75 ft. higher. Jan. 31, 1921, to Mar. 3, 1924, 40 ft. downstream at datum 962.65 ft. higher.

Average discharge.—17 years (1911-28), 2,132 cfs, unadjusted; 2,170 cfs, adjusted for Oroville-Tonasket Irrigation District Canal.

Extremes.—1911-28: Maximum discharge, 21,500 cfs (including canal) June 5, 1922 (gage height, 18.5 ft., from graph based on gage readings), from rating curve extended above 18,600 cfs; no flow Dec. 5, 1920 while filling reservoir above gage.

Remarks.—Several diversions above station for irrigation of about 11,600 acres in 1928, of which 1,600 acres were in Canada; 7,000 acres below station was served by the Oroville-Tonasket Irrigation District Canal. Flow regulated, at powerplant upstream and at high stages, by natural pondage in Palmer Lake. Discharge records for this station combined with those for Oroville-Tonasket District Canal (see above) are equivalent to records for Similkameen River near Nighthawk (see p. 510).

Similkameen River near Oroville, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									10,500	3,190	1,040	955	.....
1912	662	554	518	523*	509	425	1,040	7,450	6,130	2,350	964	707	1,820*
1913	578	528	507	438*	439*	443	1,090	6,670	10,600	3,140	976	766	2,190*
1914	883	802	868	671	520	595	2,370	8,540	7,140	2,310	671	512	2,140
1915	675	840	553*	343*	410	452	2,400	4,280	2,920	1,470	914	475	1,320*
1916	632	825	461*	404*	629	1,110	2,140	8,740	13,600	6,800	1,710	829	3,160*
1917	592	583*	475*	429*	395*	430	519	5,330	11,400	4,380	927	449	2,200*
1918	441	690	799	1,790	746*	661	2,240	8,840	10,600	2,540	986	446	2,540*
1919	636	658	563	500	444	444	2,080	9,820	9,780	3,980	973	514	2,540
1920	453	817	649*	602*	838	578	589	4,360	7,540	4,480	839	608	1,800*
1921	1,610	902	595	537	796	907	1,360	9,110	11,800	2,700	703	558	2,630
1922	911	1,230	1,160	752	663	520	732	6,180	10,700	1,670	589	500	2,130
1923	644	596	418	515	412	410	2,030	8,470	10,600	3,800	892	479	2,450
1924	521	462	430	369	871	678	1,060	9,940	4,540	1,280	400	279	1,740
1925	567	613	1,090	768	760	730	3,180	11,100	6,280	1,630	452	264	2,290
1926	348	382	526	402	369	518	2,810	3,030	1,290	395	127	155	864
1927	509	471	368	318*	349	371	677	4,490	9,500	2,170	624	1,410	1,770*
1928	2,210	1,690	1,440	1,440	1,110	1,050	2,080	12,700	5,050	2,090	503	260	2,600

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									5,700	1,330	642	642	.....
1912	564	420*	490	388	454	388	526	1,760	3,070	1,210	775	602	388
1913	526	564	454	304	317	304	404	1,690	6,850	1,330	642	602	304
1914	564	602	404	490	470*	454	655	2,990	4,350	1,010	464	420	404
1915	564	642				388	602	2,760	1,810	1,110	526	454	.....
1916	437	564				642	820	4,950	9,720	2,990	970	617	.....
1917	531						435	758	8,260	1,640	531	382	.....
1918	382	453				617	809	5,380	4,740	1,380	709	348	348
1919	380	361					558	5,600	7,610	1,520	510	400	.....
1920	400	343			583	534	433	1,370	3,600	1,700	490	378	.....
1921	910	710	432	279	530	770	770	1,680	5,820	1,290	445	405	279
1922	575	670	575	575	485	530	1,320	3,840	770	770	465	405	405
1923	508	508	330	260	278	385	508	3,500	7,240	1,290	630	383	260
1924	427	427	132	123		551	551	3,090	2,550	628	266	219	123
1925	334	369	351	551	628	528	655	4,240	3,580	655	316	235	235
1926	282	282	351	369	316	334	840	1,860	744	169	75	114	75
1927	250	387	220	100*	250	318	235	1,700	3,910	840	484	840	100*
1928	1,360	1,360	655	551	713	744	1,240	4,020	3,220	825	218	218	218

Estimated.

OKANOGAN RIVER BASIN

Similkameen River near Oroville, Wash.—Continued

Summary

Year.	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Observed					Adjusted		Observed		Adjusted	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Discharge	Date										
1911.	16,500	June 15, 1911									
1912.	12,800	May 22, 1912	388	1,820	1,820,000			1,820	1,320,000		
1913.	18,300	June 4, 1913	304	2,190	1,590,000			2,340	1,620,000		
1914.	18,000	May 17, 1914	404	2,140	1,550,000			2,120	1,530,000		
1915.	5,920	May 30, 1915		1,320	952,000			1,310	940,000		
1916.	20,600	June 19, 1916		3,160	2,290,000	3,190	2,320,000	3,130	2,270,000	3,170	2,300,000
1917.	16,400	May 29, 1917		2,200	1,590,000	2,230	1,620,000	2,230	1,610,000	2,260	1,640,000
1918.	17,200	June 14, 1918	348	2,540	1,820,000	2,580	1,850,000	2,510	1,820,000	2,550	1,850,000
1919.	20,100	May 28, 1919		2,540	1,840,000	2,580	1,870,000	2,550	1,840,000	2,590	1,870,000
1920.	10,400	June 22, 1920		1,860	1,350,000	1,900	1,390,000	1,860	1,420,000	2,010	1,460,000
1921.	20,800	May 26, 1921	279	2,630	1,910,000	2,680	1,940,000	2,650	1,920,000	2,700	1,950,000
1922.	21,400	June 5, 1922	405	2,130	1,550,000	2,180	1,580,000	2,000	1,450,000	2,040	1,480,000
1923.	16,200	June 10, 1923	260	2,450	1,770,000	2,500	1,810,000	2,430	1,760,000	2,470	1,790,000
1924.	18,300	May 17, 1924	128	1,740	1,260,000	1,810	1,310,000	1,810	1,320,000	1,880	1,370,000
1925.	18,300	May 21, 1925	384	2,290	1,660,000	2,350	1,700,000	2,200	1,600,000	2,270	1,640,000
1926.	5,840	April 30, 1926	224	864	625,000	925	670,000	870	630,000	933	675,000
1927.	17,300	June 9, 1927	100	1,770	1,280,000	1,830	1,320,000	2,100	1,520,000	2,160	1,570,000
1928.	20,700	May 28, 1928	343	2,600	1,890,000	2,660	1,930,000	2,280	1,650,000	2,340	1,700,000

Bonaparte Creek near Anglin, Wash.

Location.—Lat. 48°39'40", long. 119°15'40", in SE¼ sec. 35, T. 37 N., R. 28 E., on right bank, a quarter of a mile downstream from headgate of Anglin ditch, 1½ miles northeast of Anglin post office, and 4 miles downstream from South Fork.

Drainage area.—110 sq. mi., approximately.

Gage.—Staff gage and wooden weir control. Altitude of gage is 2,200 ft. (from topographic map).

Extremes.—1920-21: Maximum discharge, 119 cfs Feb. 11, 1921 (gage height, 2.04 ft.); practically no flow Oct. 24-26, 1920.

Remarks.—Several diversions above station for irrigation above and below station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	0.09	2.00	3.05	3.40	11.7	14.3	17.1						

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	0	0.1	2.5	1.9	2.8	5.7	12						0

OKANOGAN RIVER BASIN

Okanogan River near Tonasket, Wash.

(International gaging station)

Location.—Lat. 48°38'00", long. 119°27'50", in lot 3, sec. 8, T. 36 N., R. 27 E., on right bank, 1,000 ft. upstream from Chewiliken Creek, and 5½ miles south of Tonasket.

Drainage area.—7,270 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 860.78 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—24 years (1929-53), 2,816 cfs.

Extremes.—1929-53: Maximum discharge, 40,900 cfs May 31, 1948 (gage height, 21.79 ft. from floodmark); minimum recorded, 126 cfs Sept. 5, 1931 (gage height, 3.43 ft.).

Remarks.—Diversions above station for irrigation of about 10,700 acres in the United States and 45,580 acres in Canada. Flow subject to natural regulation by several lakes and artificial regulation by Okanogan Lake for navigation and storage. Some diurnal fluctuation at low flow caused by power plant on Similkameen River.

Cooperation.—This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929													
1930	416	413	399	360	581	529	3,240	3,890 5,090	5,530 5,660	1,330 1,840	406 515	270 365	1,620
1931	442	588	443	439	600	525	770	5,630	2,730	908	231	335	1,140
1932	403	663	491	398*	883*	2,060	2,920	8,620	6,540	2,270	915	696	2,260*
1933	857	1,870	1,850	1,500	1,040	916	1,930	7,300	13,300	5,940	1,810	1,090	3,280
1934	2,113	3,233	2,437	2,011	1,861	2,855	13,220	12,270	6,214	2,114	1,055	626	4,168
1935	950	2,203	1,755	1,385*	2,889	1,896	2,011	9,283	10,710	4,727	1,881	1,251	3,406*
1936	1,312	1,359	1,199	944	613*	701	2,043	8,845	6,484	1,930	885	706	2,330*
1937	842	895	828	504*	532*	704	1,268	6,485	11,950	3,382	958	731	2,424*
1938	1,059	1,496	1,415	1,394	1,345	1,658	3,841	11,860	9,384	2,388	711	574	3,100
1939	736	784	821*	927*	611*	849	2,040	7,356	5,535	2,321	696	516	2,015*
1940	668	929	1,253	715*	675	704	2,236	5,210	2,964	605	310	231	1,377*
1941	710	712	739	700	687	957	3,054	3,790	3,720	1,553	662	1,492	1,565
1942	2,756	2,181	2,307	1,800	1,515	1,008	2,897	8,632	9,640	3,832	2,084	1,406	3,352
1943	1,352	1,576	1,598	1,115*	1,317*	1,101	3,766	6,467	10,170	5,423	1,270	575	2,980*
1944	655	731	594*	492*	656	539	944	4,747	7,925	2,005	601	515	1,697*
1945	764	893	1,026	1,193	1,262	1,121	1,339	8,148	11,250	2,796	1,030	707	2,629
1946	1,117	1,807	1,551	1,414	1,176	1,408	2,064	13,320	9,787	3,042*	1,615	1,335	3,466*
1947	1,455	1,445	1,326	1,144	951	1,023	2,941	9,161	5,761	1,742	824	757	2,386
1948	1,194	1,223	1,188	1,259	1,051	748	1,620	10,950	20,450	5,025	3,928	3,039	4,302
1949	2,788	2,556	2,171*	1,865*	1,805*	1,768	3,689	15,330	8,336	2,659	1,349	1,197	3,824*
1950	1,386	2,200	2,626	1,160*	1,568*	2,382	2,575	8,762	19,360	6,152	1,966	964	4,246*
1951	1,384	1,312	2,342	1,984	2,380	2,027*	4,583	15,710	11,600	4,696	1,705	1,659	4,224*
1952	1,746	1,765	1,359	1,246*	1,527	1,929	3,695	16,560	6,459	3,074	1,233	1,055	2,882*
1953	1,072	778	674	757	950	770	1,384	9,323	10,510	4,607	1,557	1,211	2,807

* Estimated.

OKANOGAN RIVER BASIN

Okanogan River near Tonasket, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929								1,040	2,730	577	268	253	.....
1930	262	320	316	292	325	410	1,110	3,770	3,620	818	335	298	202
1931	506	447	341	335	462	447	518	2,320	1,670	370	152	132	132
1932	359	403	348			1,720	1,720	5,040	4,150	1,310	755	636	.....
1933	660	1,040				840	1,000	5,110	10,000	2,780	1,120	1,000	660
1934	1,200	2,710	1,960	1,800*	1,460	1,840	6,060	9,190	3,330	1,440	640	514	.....
1935	748	1,230	1,300	430*	2,130	1,660	1,480	4,320	6,270	2,710	1,380	1,100	430*
1936	1,100	1,170	920	722	450*	612	558	6,800	3,260	1,200	605	656	450*
1937	735	760	660	450*	450*	560*	960	1,610	8,070	1,330	692	648	450*
1938	782	1,200	1,260*	1,280*	1,200*	1,300	1,760	7,600	4,650	1,030	520	493	473
1939	625	648	720*	730*	520*	648	1,300	5,910	4,360	1,160	520	476	476
1940	507	804	869	610*	630	581	1,070	3,170	1,110	427	203	182	182
1941	413	565	550*	648	630	602	1,940	3,050	2,530	776	550	950	413
1942	1,330	1,760	1,670*	1,630	1,220	808	782	3,360	6,260	2,920	1,510	1,250	782
1943	1,240	1,460	1,360	720	1,120	953	1,460	4,090	8,160	2,360	785	479	479
1944	524	561	371	225	420*	455	488	2,220	5,030	752	482	415	225
1945	645	810	720	960	932	1,010	1,160	1,520	5,150	1,370	706	533	533
1946	848	1,540	1,370	1,210	1,090	1,250	1,620	5,980	6,330	2,240*	1,250	1,290	848
1947	1,330	1,290	1,190*	823	733	760	1,450	5,980	3,230	879	654	670	670
1948	733	1,050	1,050	1,120*	580	492	950	2,580	8,500	3,590	3,350	2,720	492
1949	2,330	2,380	1,970*	1,700*	1,700*	1,700	1,610	6,360	3,850	1,800	1,100	1,010	1,010
1950	1,160	1,480	1,700	980*	1,000*	1,630*	2,280	2,740	13,700	2,920	1,350	815	815
1951	980	1,390	1,300*	1,150*	1,200*	1,600*	2,060	6,540	7,860	2,380	1,310	1,350	950
1952	1,480	1,560	930*	940*	1,400	1,260	1,320	5,670	3,960	1,840	1,080	1,030	930*
1953	800	614	592	534	805	658	744	3,820	6,840	2,040	1,220	950	534

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1929	8,500†	June 10, 1929					
1930	8,370	June 9, 1930	262	1,620	1,170,000	1,640	1,190,000
1931	2,480	May 16, 1931	132	1,140	828,000	1,150	831,000
1932	10,600	May 12, 1932		2,260	1,650,000	2,520	1,830,000
1933	20,200	June 18, 1933	660	3,280	2,380,000	3,550	2,570,000
1934	26,600	April 27, 1934	514	4,168	3,018,000	3,927	2,843,000
1935	14,900	June 2, 1935	430	3,409	2,468,000	3,323	2,406,000
1936	11,800	May 16, 1936	450	2,330	1,691,000	2,221	1,612,000
1937	15,100	June 5, 1937	460	2,424	1,755,000	2,542	1,840,000
1938	21,400	May 28, 1938	493	3,100	2,244,000	2,964	2,146,000
1939	11,200	May 17, 1939	476	2,015	1,459,000	2,057	1,489,000
1940	7,540	May 26, 1940	162	1,377	999,500	1,320	958,500
1941	5,150	May 3, 1941	413	1,565	1,133,000	1,992	1,442,000
1942	18,900	May 28, 1942	782	3,352	2,427,000	3,123	2,261,000
1943	13,500	June 11, 1943	479	2,960	2,157,000	2,766	2,002,000
1944	10,200	June 3, 1944	225	1,697	1,232,000	1,756	1,275,000
1945	18,200	June 2, 1945	533	2,629	1,903,000	2,778	2,011,000
1946	16,000	May 29, 1946	648	3,466	2,509,000	3,446	2,495,000
1947	18,400	May 10, 1947	670	2,386	1,727,000	2,333	1,689,000
1948	40,060	May 31, 1948	492	4,302	3,123,000	4,629	3,301,000
1949	27,200	May 17, 1949	1,010	3,824	2,769,000	3,702	2,680,000
1950	29,600	June 18, 1950	515	4,246	3,074,000	4,202	3,043,000
1951	23,600	May 25, 1951	920	4,324	3,131,000	4,268	3,089,000
1952	16,200	May 21, 1952	930	2,882	2,093,000	2,686	1,950,000
1953	15,800	June 15, 1953	534	2,807	2,032,000	.....	.....

* Estimated. † Maximum for water year.

Johnson Creek near Riverside, Wash.

Location.—Lat. 48°29'50", long. 119°31'30", in SE¼ sec. 26, T. 35 N., R. 26 E., at Sogle's Ranch, 1 mile southwest of Riverside, and 11 miles southeast of Conconully.

Drainage area.—68.2 sq. mi.

Gage.—Staff gage and weir-type wooden control. Datum of gage is 1,228.63 ft. above mean sea level, adjustment of 1912.

Extremes.—1903-7: Maximum discharge observed, 30.7 cfs Dec. 16, 1903 (gage height, 1.12 ft.); minimum observed, 1.0 cfs July 29, 30, Aug. 1, 4, 5, 1906 (gage height, 0.01 ft.).

Remarks.—Discharge values obtained directly from weir formulas without benefit of gaging. Many small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903...									3.6	4.2	3.6	5.2	
1904...	5.1	6.2	8.0	6.10	5.47	8.58	15.9	10.4	8.48	8.33			
1905...								8.64	8.36	6.48	5.99	7.19	
1906...	7.81	8.56	8.65	8.54	10.4	9.02	8.16	3.88	6.18	2.12	1.88	3.84	6.48
1907...	4.44	6.22	6.78	4.06	5.28	8.04	6.94	3.77	2.84	2.49	2.21	3.43	4.70
1908...	3.90	4.88	7.37										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903...									2.2	3.0	1.9	4.2	
1904...	3.2	4.8	4.4	4.9	3.2	5.8	12.8	7.5	7.2	7.2			
1905...								4.6	6.3	4.6	5.4	6.8	
1906...	6.8	7.9	7.6	4.6	8.1	7.6	5.6	1.8	3.1	1.0	1.0	2.6	1.0
1907...	4.1	4.8	3.4	2.8	2.6	7.6	5.6	1.3	1.7	1.7	1.4	2.8	1.3
1908...	3.4	4.4	4.2										

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30		Minimum day	Mean	Runoff in acre-feet	CALENDAR YEAR	
	Momentary maximum Discharge	Date				Mean	Runoff in acre-feet
1903...							
1904...							
1905...							
1906...			1.0	6.45	4,090	5.83	4,220
1907...			1.3	4.70	3,400	4.60	3,330

OKANOGAN RIVER BASIN

Okanogan River at Okanogan, Wash.

Location.—Lat. 48°21'40", long. 119°34'50", in NW¼ sec. 16, T. 33 N., R. 26 E., on right bank, at highway bridge at Okanogan, a quarter of a mile upstream from Salmon Creek, and 4 miles downstream from Omak.

Drainage area.—7,900 sq. mi., approximately.

Gage.—Chain gage. Datum of gage is 810.06 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. May 10, 1911, to Oct. 20, 1915, staff gage at same site and datum. Oct. 21, 1915, to June 10, 1920, staff gage 300 ft. upstream at same datum.

Average discharge.—17 years (1911-28), 2,854 cfs.

Extremes.—1911-25: Maximum discharge, 22,200 cfs June 20, 1916 (gage height, 12.21 ft.); minimum recorded, 385 cfs Feb. 13, 1923 (gage height, 0.96 ft.), but may have been less in December 1922 during period of ice effect.

Remarks.—Diversions above station in 1925 for irrigation of an estimated 11,100 acres in the United States and 22,000 acres in Canada.

Flow subject to natural regulation by several lakes and to artificial regulation at Okanogan Lake for navigation and storage. Some diurnal fluctuation at low flow caused by powerplant on Similkameen River.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									11,100	4,460	1,750	1,380	.....
1912	1,070	997	1,050	1,020	1,000	869	1,530	8,120	7,630	4,100	2,160	1,590	2,600
1913	1,250	1,280	1,130	1,000*	900*	948	1,950	7,160	12,200	5,150	2,300	1,610	3,060*
1914	1,630	1,590	1,370	1,520	1,230	1,250	3,330	9,480	8,650	3,990	1,610	1,160	3,070
1915	1,290	1,500	1,110*	972*	1,070*	1,080	3,180	5,420	4,580	2,670	1,900	1,180	2,170*
1916	1,190	1,430	1,050	771*	1,120*	1,860	2,850	9,640	15,500	8,730	2,980	1,710	4,070*
1917	1,200	988	841	794	803	863	886	5,980	13,100	5,760	1,850	1,140	2,860
1918	1,020*	1,170	1,000	2,320*	1,180	979	2,330	9,170	11,400	3,640	1,800	928	3,080*
1919	1,020	1,080*	890	996	857	904	2,380*	10,100	11,700	5,340	1,760	1,070	3,180*
1920	853	1,160	903	868	1,100	788	844	4,740	8,290	5,750	1,060	940	2,330
1921	1,870	1,180	897	818	919	1,170	1,760	9,330	14,660	5,110	1,600	823	3,380
1922	1,230	1,640	1,990	1,610	1,290	1,380	1,550	7,000	11,900	2,610	961	516	2,880
1923	967	1,110	979*	1,260	956	1,030	2,840	9,050	11,700	5,240	1,870	1,220	3,160*
1924	1,160	1,160	1,040	858*	1,660	1,330	1,440	10,200	5,340	1,600	629	462	2,240*
1925	755	806	1,230*	1,290*	1,470	800	3,600	11,400	6,930	2,170	743	476	2,640*
1926	578*	568*	764*	715*	920*	1,340*	3,520*	3,390*	1,690*	750*	424*	358*	1,250*
1927	642*	602*	478*	450*	755*	1,090*	1,320*	5,140*	10,400*	2,670*	1,070*	2,050*	2,220*
1928	3,890*	2,910*	2,770*	3,210*	2,760*	2,500*	3,510*	14,000*	8,170*	5,000*	2,500*	1,640*	4,380*
1929	1,860*	1,610*	764*	362*	310*	446*	500*						

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									7,200	2,260	1,180	720	.....
1912	1,020	880	1,020	1,020	960	820	950	2,500	5,150	2,750	1,660	1,270	820
1913	1,180	1,180	1,100			880	880	2,500	8,340	3,270	1,680	1,370	.....
1914	1,270	1,470				1,100	1,370	4,400	6,060	2,110*	1,180	1,100	.....
1915	1,270	1,270				965	1,270	3,850	3,160	2,180	1,360	1,110	.....
1916	1,040	1,130				1,290	1,840	5,480	10,500	4,570	2,000	1,420	.....
1917	1,030	890	660	660	660	770	770	1,180	10,200	2,830	1,340	960	660
1918		960	520	1,180	960	890	1,100	6,270	6,370*	2,470	1,300*	770	820
1919	770	770	660	610	710	710	986*	6,240	9,200	2,410	1,100	826	610
1920	826	745	615	700	868*	745	745	1,650	4,950	2,920	1,010	765	615
1921	1,160	1,010	765	570	715	1,080	1,080	2,830	8,990	2,880*	870*	570	570
1922	780	720	1,140	1,430	1,140	1,140	1,330	2,240	5,600	1,330	840	720	720
1923	840*	970		720	385	780	780	4,320	8,130	2,490	1,030	1,050	335
1924	1,100	1,140	765*		1,320	1,140	1,050	2,740	2,870	900	465*	412	412
1925	580	615	530		798	705	1,320	4,160	4,750*	1,060	528	450	450

* Estimated.

Okanogan River at Okanogan, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1911	16,100	June 16, 1911					
1912	13,160	May 22, 1912	820	2,600	1,380,000	2,650	1,920,000
1913	13,890	June 6, 1913		3,060	2,270,000	3,130	2,270,000
1914	14,300	May 15, 1914		3,070	2,230,000	3,020	2,180,000
1915	7,220	May 26, 1915		2,170	1,570,000	2,150	1,550,000
1916	22,200	June 20, 1916		4,070	2,900,000	4,020	2,920,000
1917	16,500	June 18, 1917	660	2,860	2,070,000	2,870	2,060,000
1918	16,200	June 15, 1918	520	3,080	2,230,000	3,070	2,220,000
1919	18,700	May 30, 1919	610	3,180	2,300,000	3,170	2,300,000
1920	11,000	June 19, 1920	615	2,330	1,690,000	2,410	1,750,000
1921	21,000	June 9, 1921	570	3,360	2,450,000	3,460	2,510,000
1922	20,600	June 7, 1922	720	2,850	2,070,000	2,680	1,940,000
1923	16,200	June 12, 1923	385	3,160	2,280,000	3,180	2,300,000
1924	17,800	May 20, 1924	412	2,240	1,630,000	2,200	1,590,000
1925	19,200	May 22, 1925	450	2,640	1,970,000	2,570	1,800,000
1926				1,250	906,000	1,240	898,000
1927				2,220	1,610,000	2,830	2,050,000
1928				4,380	3,160,000	3,970	2,880,000
1929							

Salmon Creek near Conconully, Wash.

Location.—Lat. 48°32'00", long. 119°44'50", in sec. 18, T. 35 N., R. 25 E., on right bank, half a mile downstream from Conconully Reservoir, 2 miles south of Conconully, and about 14 miles upstream from Okanogan.

Drainage area.—121 sq. mi.

Gage.—Staff gage and weir-type control. Altitude of gage is 2,200 ft. (from topographic map).

Average discharge.—12 years (1910-22), 31.2 cfs (unadjusted).

Extremes.—1910-22: Maximum discharge observed, 410 cfs July 3, 1916 (gage height, 3.00 ft.); no flow Oct. 3-11, 1910, Nov. 20-21, 1919, when water was being stored in Salmon Lake and Conconully Reservoirs.

Remarks.—Flow completely regulated by Conconully and Salmon Lake Reservoirs (capacities 13,000 and 2,600 acre-ft., respectively). 10,100 acres are irrigated by the Bureau of Reclamation and various private canals. Records not adjusted for reservoir storage because of insufficient data.

OKANOGAN RIVER BASIN

Salmon Creek near Conconully, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910										61.5	60.8	12.9	
1911	2.67	1.50	1.50	2.54	2.02	1.80	12.2	43.4	68.1	81.8	28.0	1.18	20.0
1912	4.61	2.71	1.50	1.26	.60	1.21	2.29	24.9	90.8	86.7	68.7	2.15	24.6
1913	5.27	1.70	1.78	1.71	1.69	2.96	5.86	46.4*	67.0*	92.3*	99.9*	5.33	28.0*
1914	3.47	2.04	1.90	2.07	2.10	2.27	3.01	114*	156*	104*	108	5.66	42.4*
1915	1.93	2.08	2.10	2.71	2.80	2.81	11.5	152*	128*	97.7*	118*	14.8	45.0*
1916	4.47	6.88	3.60	3.60	3.66	3.81	6.67	191	241	158	119	54.5*	66.0*
1917	8.38	12.5	2.80	2.80	2.80	2.80	2.65	29.5	165*	139	126*	30.7	44.0*
1918	5.69	2.39	1.49	1.60	1.70	1.85	3.02	42.8	54.4	31.0	20.0	15.9	15.2
1919	10.8	.80	.80	1.00	.81	1.15	1.35	46.6	55.2	67.7	53.4	17.4	21.6
1920	.84	.75	.82	.88	.82	1.18	1.32	13.0	29.4	34.2	28.2	13.2	10.4
1921	1.66	.01	.04	1.18	1.38	1.39	1.70	46.4	63.5	87.7	85.9	43.8	30.4
1922	2.76	1.84	1.47	1.60	1.60	1.65	6.07	50.3	74.0	78.4	68.2	22.0	26.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910										8	50.0	6.5	
1911	0	1.5	1.5	1.0	1.8	1.8	2.1	5.1	9.4	9.4	4.3	.4	0
1912	1.2	1.5	1.5	.8	.8	.8	1.5	2.1	8.6	6.5	1.9	1.3	.8
1913	1.7	1.7	1.7	1.5	1.7	1.9	2.1	8.9	9.4	32*	94*	1.9	1.5
1914	1.9	1.9	1.9	1.9	2.1	2.1	2.5	3.9	93*	91*	72*	1.7	1.7
1915	1.7	1.7	2.1	2.1	2.8	2.8	3.2	52*	105*	22*	110	1.9	1.7
1916	2.5	3.2	3.6	3.6	3.6	3.6	4.0	62*	120*	95	110	3.6	2.5
1917	3.6	2.8	2.8	2.8	2.8	2.8	2.8	8.2	118	118	112	1.3	1.3
1918	1.3	1.3	1.3	1.5	1.7	1.7	1.9	2.5	12	12	5.4	0.3	1.3
1919	2.1	.8	.8	1.0	.8	.8	1.3	1.9	7.9	8.2	7.2	.8	.8
1920	.8	0	.8	.8	.8	.8	.8	1.3	5.1	2.1	4.7	0.8	0
1921	.8	.8	.8	1.0	1.3	1.3	1.5	2.1	67	74	63	1.3	.8
1922	1.5	1.2	1.2	1.5	1.5	1.5	1.9	1.9	34	66	34	1.7	1.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1910								
1911	107†	July 21-23, 1911	0	20.6	15,000	21.0	15,200	
1912	126†	June 9, 10, 1912	.8	24.6	17,800	24.6	17,800	
1913	120†	July 24, 1913	1.5	28.0	20,300	27.0	20,200	
1914	247†	May 24, 1914	1.7	42.4	30,700	42.3	30,600	
1915	202†	May 29, 1915	1.7	45.0	32,700	45.9	33,200	
1916	410†	July 3, 1916	2.5	66.6	48,200	67.2	48,800	
1917	252†	June 1, 2, 1917	1.3	44.0	31,900	42.8	31,000	
1918	143†	⊙	1.3	15.2	11,000	15.5	11,200	
1919	200†	June 11, 1919	.8	21.6	15,600	20.8	15,000	
1920	68†	Aug. 4-9, 1920	0	10.4	7,560	11.0	8,000	
1921	104†	July 20-22, 1921	.8	30.4	22,000	30.1	21,800	
1922	100†	May 20, 21, 1922	1.2	26.1	18,900			

* Estimated. † Maximum observed. ⊙ June 12, 13, 1918.

OKANOGAN RIVER BASIN

Salmon Creek near Okanogan, Wash.

Location.—Lat. 48°24', long. 119°37', in sec. 31, T. 34 N., R. 26 E., on left bank at Jones Ranch, about 3 miles northwest of Okanogan, and 3½ miles upstream from mouth.

Drainage area.—156 sq. mi.

Supplemental records available.—July 1910 to March 1912, gage heights only.

Gage.—Staff gage. Altitude of gage is 1,350 ft. (from topographic map).

Average discharge.—6 years (1903-9), 48.9 cfs.

Extremes.—1903-10: Maximum discharge, 609 cfs Apr. 28, 1904 (gage height, 3.70 ft., from graph based on gage readings); minimum observed, 2.9 cfs Jan. 13, Oct. 11-13, 1909 (gage height, 0.38 ft.).

Remarks.—Diversions small in proportion to total flow prior to 1910. Regulation by Conconully and Salmon Lake reservoirs after Mar. 24, 1910.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903								124	170	38	24	23	
1904	24	22	21	14.7	13.5	15.7	224	332	195	51.1	20.0	15.1	75.9
1905	20.1	19.3	16.2	15.0	14.1	36.3	87.5	146	215	85.4	30.3	16.2	58.6
1906	18.3	13.7	12.8	12.6	12.2	16.4	70.3	109	158	43.5	12.0	7.63	40.5
1907	10.1	19.9	11.5	9.29	9.54	10.8	35.3	214	166	42.6	26.1	17.2	47.9
1908	11.6	12.9	11.1	10.1	9.16	15.7	35.7	125	131	20.0	22.5	8.17	34.4
1909	9.11	14.2	7.62	5.20	9.99	23.7	27.9	83.0	116	31.3	46.1	24.2	33.3
1910	6.27	21.7	11.6	8.4	9.4	25.4	8.6	61.2	66.8				

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903									45	21	18	20	
1904	21	17	16	11	11	11	17	231	108	19	12	11	11
1905	11	16		11	10	25	24	116	134	31	16	10	10
1906	10	7	8	11.1	8.2	10.8	41	52	91	19.1	7.0	5.8	5.8
1907	7.8	11.7	6.2	8.4	8.6	8.6	11.1	78	91	12.5	11.7	11.7	6.2
1908	11.1	7.8	8.6	6.2	6.2	9.6	10.8	61.0	35.0	6.2	10.8	7.4	6.2
1909	3.0	10.8	5.0	2.9	7.4	7.4	18	26	35	12	41	12	2.9
1910	2.9	5.6	8.0	3	6	5	5	17	55				

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1903	429†	June 3, 1903						
1904	609	April 28, 1904	11	78.9	57,300	78.0	56,600	
1905	410	June 4, 1905	10	58.6	42,400	57.6	41,700	
1906	386	May 27, 1906	5.8	40.5	29,300	40.2	29,100	
1907	363	May 20, 1907	6.2	47.9	34,700	47.4	34,300	
1908	214	June 9-10, 1908	6.2	34.4	23,000	34.0	24,700	
1909	166	①	2.9	33.3	24,100	33.9	24,600	
1910	150	Mar. 3, 1910						

† Maximum observed. ① May 28, 29, June 18, 1909.

METHOW RIVER BASIN

Chewack Creek below Boulder Creek, near Winthrop, Wash.

Location.—Lat. 48°34'30", long. 120°10'40", in sec. 35, T. 36 N., R. 21 E., on left bank at sawmill of Chewack Lumber Co., 400 ft. downstream from Boulder Creek, and 7½ miles north of Winthrop.

Drainage area.—475 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,050 ft. (from river-profile map).

Extremes.—1920-21: Maximum discharge observed, 4,700 cfs June 5, 1921 (gage height, 10.5 ft.); minimum, 29 cfs (estimated) Jan. 11, 1921, when stage-discharge relation was affected by ice.

Remarks.—Small diversion above station from Boulder Creek used primarily for irrigation. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920.....							52*	320*	615	309	81.0	79.9	.....
1921....	240	152	98.8	61.5*	52.8*	84.5	210	1,990	2,380	443	136*	70*	495*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1920.....										128	58	56	.....
1921....	128	112	64	.....	.....	0.48	120	250*	1,020	228	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1920.....	1,160†	June 16, 1920
1921.....	4,700†	June 5, 1921	495	1.04	14.14	358,000

* Estimated. † Maximum observed.

Chewack Creek at Winthrop, Wash.

Location.—Lat. 48°28'30", long. 120°11'00", in NW¼ sec. 2, T. 34 N., R. 21 E., on right bank at county bridge at Winthrop, a quarter of a mile upstream from mouth.

Drainage area.—544 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,740 ft. (from river-profile map).

Extremes.—1912-13: Maximum discharge observed, 2,930 cfs June 2, 1913 (gage height, 5.70 ft.); minimum observed, 68 cfs Sept. 24-27, 1913 (gage height, 1.00 ft.), but may have occurred during period of no gage-height record.

Remarks.—Small diversions for irrigation and domestic use above station. No regulation.

Chewack Creek at Winthrop, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...								1,080	931	286	131	126	
1913...	94.1						230	986	1,620	480	137	111	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...								187	377	136	90	90	
1913...	82						82	252	905	195	82	68	

Methow River near Winthrop, Wash.

Location.—Lat. 48°27'30", long. 120°10'10", in sec. 11; T. 34 N., R. 21 E., on left bank, 1 mile downstream from West Fork Methow River and Winthrop.

Drainage area.—1,020 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 1,700 ft. (from topographic map).

Extremes.—1912: Maximum discharge observed, 9,250 cfs May 21, 1912 (gage height, 6.10 ft.); minimum observed, 144 cfs Feb. 29, Mar. 1, 1912 (gage height, 0.48 ft.).

Remarks.—Many diversions above station for irrigation above and below station. About 1,000 acres are irrigated above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1912...			204	173	177	922	4,250	3,050	941	459	364	285	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1912...			166	144	144	238	1,670	1,360	510	360	288	252	

Methow River at Twisp, Wash.

Location.—Lat. 48°21'40", long. 120°06'50", in NW¼ sec. 17, T. 33 N., R. 22 E., on left bank, a quarter of a mile downstream from Twisp River, and 0.3 mile east of center of Twisp.

Drainage area.—1,330 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 1,580 ft. (from topographic map), June 11, 1919, to Sept. 30, 1929, staff or chain gages at same site and datum. Oct. 31 to Dec. 18, 1933, chain or staff gage at present site at different datum.

Average discharge.—34 years (1919-53), 1,266 cfs.

METHOW RIVER BASIN

Methow River at Twisp, Wash.—Continued

Extremes.—1919-29, 1933-53: Maximum discharge, 40,800 cfs May 29, 1948 (gage height, 12.94 ft.), from rating curve extended above 18,000 cfs on basis of slope-area determination of peak flow; minimum observed, 134 cfs Sept. 4, 5, 1926, Sept. 9, 10, 1929, but may have been less during period of ice effect Jan. 6 to Mar. 4, 1937.

Remarks.—Many diversions above station for irrigation of about 9,000 acres of which about 2,000 acres are below station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1919...									5,270	2,670	646	403	.....
1920...	287	304	222*	227	209	240	246	1,550	2,990	1,750	392	351	731*
1921...	588	569	375	325	319	490	1,250	6,120	7,410	2,150	617	323	1,740
1922...	436	596	643	408	305	259	727	3,765	6,000	1,210	469	341	1,260
1923...	357	316	281	250	239	245	1,590	4,480	5,320	2,250	563	311	1,360
1924...	320	307	264	227	238	312	737	4,950	2,150	723	267	192	891
1925...	262	291	371	309*	286	384	1,900	5,910	3,700	1,110	321	210	1,260*
1926...	242	247	222	190	193	238	1,230	1,580	846	289	162	168	467
1927...	345	342	303	257	229	222	571	2,520	5,480	1,810	469	692	1,060
1928...	909	710	693	587	395	570	1,030	6,110	2,810	1,270	316	214	1,300
1929...	268	274	253	199*	153*	205	150	2,020	2,790	565	185	145	609*
1930...	209*	233*	205*	183*	238*	280*	2,270*	3,100*	3,440*	1,060*	314*	225*	950*
1931...	245*	301*	234*	229*	249*	279*	772*	3,540*	2,080*	588*	223*	236*	752*
1932...	236*	319*	247*	226*	356*	990*	1,550*	4,540*	3,670*	1,010*	329*	222*	1,140*
1933...	259*	676*	507*	345*	257*	313*	1,090*	3,650*	6,590*	3,020*	633*	321*	1,480*
1934...	732*	1,183	876	552	611	1,773	7,692	5,974	3,544	968	323	212	2,030*
1935...	258	705	613	516	958	730	1,218	5,312	6,257	2,185	561	302	1,646
1936...	262	304	251	230	209*	204	1,372	3,481	3,368	532	185	190	883*
1937...	189	244	223	178*	155*	212	310	3,110	6,851	1,674	338	270	1,145*
1938...	392	574	415	361	322	498	2,052	6,655	5,772	1,379	297	230	1,583
1939...	283	311	280	275	248	311	1,405	2,955	1,981	883	221	198	779
1940...	204	234	261	209*	230	331	1,353	4,506	2,540	463	205	176	895*
1941...	330	406	314	281	270	619	2,765	3,180	2,777	726	318	269	1,054
1942...	845	666	577	335	356	355	1,883	5,576	4,648	1,528	422	210	1,480
1943...	233	300	261	228	275	311	2,265	3,405	5,496	3,051	504	220	1,358
1944...	260	312	267	243	231	248	631	3,970	3,321	765	257	174	808
1945...	258	292	204	261	254	269	495	4,035	5,198	1,199	271	194	1,084
1946...	282	453	308*	287	287	341	1,645	7,695	5,003	1,926	482	363	1,597*
1947...	350	351	292*	248*	250	733	2,229	5,190	3,300	965	340	238	1,216*
1948...	439	523	438	310	298	282	876	6,652	7,885	1,971	1,185	565	1,743
1949...	634	434	343*	269*	240	344	2,208	7,491	3,683	1,258	430	260	1,480*
1950...	355	636	748*	399*	358*	357	947	4,761	11,030	3,043	865	257	2,036*
1951...	525	612	558*	491	762	616	3,632	9,385	6,538	2,426	668	493	2,231*
1952...	566	504	356	324*	297	363	1,991	5,770	3,434	1,441	404	255	1,317*
1953...	301	285	247	257	261	378	1,052	5,621	6,503	3,181	673	276	1,592

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1919...										1,020		343	.....
1920...	267			165	177	203	217	472	1,260	619	384	285	267
1921...	495	449	304	249	233	363	519	1,260	4,480	1,140	344	304	233
1922...	324	453	408	285	249	249	304	1,310	3,050	549	408	267	249
1923...	324	267	202	203	203	217	453	2,120	3,840	815	453	285	203
1924...	275	275	204		191	256	335	1,800	1,220	356	204	178	.....
1925...	238	238	204		256	275	525	2,120	2,620	550	238	204	204
1926...	204	231	204	178	178	191	378	990	475	178	144	134	134
1927...	226	306	265	195*	210	210	285	1,200	2,610	550	347	578	195*
1928...	605	605	500	455	306	368	635	1,770	2,350	500	228	195	195
1929...	195	245	223			160	144	245	1,280	246	155	134	134
1934...		974	645	493	543	710	3,260	4,340	1,560	578	212	171	171
1935...	204	300*	406	250*	759	634	703	2,540	3,620	1,090	313	252	204

* Estimated.

Methow River at Twisp, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	244	276	218	180*	190*	194	202	2,270	1,050	221	170	175	170
1937...	162	201	190	140*	160*	190*	260	405	4,900	562	238	225	140*
1938...	329	470	345	299	292	325	616	3,260	3,100	514	195	192	182
1939...	235	298	240	240*	230*	235*	850	2,230	1,460	366	188	181	181
1940...	187	221	220*	190*	190	235	724	1,990	938	301	166	162	162
1941...	222	354	265*	260*	261	325	1,760	2,230	1,430	350	235	426	222
1942...	690	580	320*	268	327	319	486	1,840	2,660	715	268	188	188
1943...	188	257	224	160*	257	276	474	1,770	3,870	1,140	339	184	160*
1944...	188	268	225*	210*	213	216	276	1,560	1,720	355	172	145	145
1945...	223	272	227	220	234	220	292	1,100	2,250	467	177	180	177
1946...	220	366	250*	249	277	284*	511	3,200	2,550	890	302	315	220
1947...	333	302	200*	195*	265	285*	1,130	3,360	1,500	628	188	201	188
1948...	315	451	356	255*	265	257	285	1,350	3,550	1,280	820	460	255*
1949...	506	316	300*	240*	230*	280*	478	2,760	1,640	652	283	271	230*
1950...	307	389	540*	380*	290*	290*	420	1,500	6,600	1,370	486	166	166
1951...	311	542	490*	310*	360*	508	892	3,500	4,720	1,000	399	360	310*
1952...	560	417	280*	250*	279	279	550	3,250	1,850	726	303	220	220
1953...	210	245	213*	230	245	265	442	1,930	3,090	1,130	442	220	210

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1919.....							
1920.....	4,480	June 16, 1920		731	531,000	817	593,000
1921.....	13,660	June 5, 1921	233	1,740	1,260,000	1,730	1,250,000
1922.....	12,560	June 4, 1922	219	1,260	914,000	1,200	871,000
1923.....	8,420	June 9, 1923	203	1,360	882,000	1,350	975,000
1924.....	10,800	May 16, 1924		897	651,000	900	653,000
1925.....	11,400	May 20, 1925	204	1,260	911,000	1,240	898,000
1926.....	3,050	April 30, 1926	134	467	339,000	491	356,000
1927.....	12,400	June 8, 1927	195	1,060	768,000	1,170	845,000
1928.....	10,400	May 21, 1928	195	1,300	946,000	1,180	845,000
1929.....	5,010	①	134	609	441,000	597	432,000
1930.....				980	710,000	991	717,000
1931.....				752	544,000	754	546,000
1932.....				1,140	829,000	1,200	869,000
1933.....				1,480	1,070,000	1,590	1,150,000
1934.....	15,200	②	171	2,036	1,474,000	1,934	1,400,000
1935.....	10,400	June 7, 1935	204	1,645	1,191,000	1,562	1,145,000
1936.....	12,000	June 3, 1936	170	883	640,800	869	630,900
1937.....	12,300	June 17, 1937	140	1,148	831,100	1,209	875,000
1938.....	13,300	May 27, 1938	192	1,683	1,146,000	1,541	1,115,000
1939.....	5,020	May 17, 1939	151	779	563,900	764	553,300
1940.....	9,020	May 24, 1940	162	695	649,400	924	640,700
1941.....	5,240	May 2, 1941	222	1,054	763,400	1,142	826,700
1942.....	21,300	May 26, 1942	188	1,480	1,072,000	1,371	992,900
1943.....	8,850	May 26, 1943	160	1,388	1,005,000	1,394	1,009,000
1944.....	5,570	May 16, 1944	145	808	586,600	804	583,800
1945.....	11,700	May 31, 1945	177	1,084	785,000	1,103	798,800
1946.....	10,700	May 28, 1946	220	1,597	1,156,000	1,696	1,155,000
1947.....	8,920	May 8, 1947	188	1,216	850,400	1,248	903,200
1948.....	46,800	May 29, 1948	255	1,743	1,265,000	1,745	1,266,000
1949.....	15,590	May 13, 1949	230	1,480	1,071,000	1,507	1,091,000
1950.....	19,800	June 18, 1950	166	2,056	1,488,000	2,052	1,455,000
1951.....	17,600	May 12, 1951	310	2,231	1,615,000	2,209	1,599,000
1952.....	10,000	May 19, 1952	220	1,317	956,000	1,267	919,900
1953.....	12,700	June 13, 1953	210	1,592	1,153,000		

* Estimated. ① May 23, June 8, 1929. ② April 24, 25, 1934.

METHOW RIVER BASIN

Methow River at Pateros, Wash.

Location.—Lat. 48°02'50", long. 119°54'40", in sec. 2, T. 29 N., R. 23 E., on left bank at Pateros, three-quarters of a mile upstream from highway bridge, and 1 mile upstream from mouth.

Drainage area.—1,810 sq. mi., approximately.

Supplemental records available.—May 3 to June 16, 1903, gage heights and discharge measurements only.

Gage.—Staff gage. Datum of gage is 738.74 ft. above mean sea level, adjustment of 1912. May 3 to June 16, 1903, staff gage three-quarters of a mile downstream at different datum.

Average discharge.—17 years (1903-20), 1,660 cfs.

Extremes.—1903-20: Maximum discharge, 15,400 cfs May 11, 1910 (gage height, 11.8 ft., from graph based on gage readings); minimum, 204 cfs (estimated) Jan. 5, 6, 1919, when stage-discharge relation was affected by ice.

Remarks.—Several large diversions for irrigation above station. In 1920, about 12,580 acres were irrigated above station resulting in an estimated depletion of 22,020 acre-ft. of flow. Only minor changes in irrigation have occurred since that time. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903									3,150	1,140	854		
1904	1,000	961	516	606	595	485	3,980	6,330	7,000	8,610	832	509	2,270
1905	479	476	451	421	347*	1,210	2,500	4,210	5,250	2,830	847	408	1,830*
1906	719	614	454	424	370	398	1,920	5,250	4,940	1,970	592	453	1,510
1907	461	722	525	343*	430*	555	1,560	7,190	6,120	2,760	882	602	1,900*
1908	531	468	448	395	411	434	1,140	4,520	7,250	3,250	763	478	1,670
1909	392	444	404	317*	327*	405	871	3,250	7,520	3,210	798	432	1,530*
1910	428	485	516	360*	361*	1,420	4,590	9,320	6,360	3,090	880	520	2,370*
1911	827	704	519	389*	398*	583	1,440	3,660	7,320	2,210	728	654	1,620*
1912	439	396	333	315*	309	318	960	4,780	4,980	1,590	675	526	1,300*
1913	424	420	363	305*	324*	350	1,100	4,260	7,400	2,480	704	505	1,560*
1914	425	419	364	353	378	419	2,360	6,230	5,690	2,470	559	492	1,680
1915	671	828	492*	403*	394	503	2,550	3,550	2,790	1,150	621	416	1,200*
1916	406	450	439	394*	422*	636	2,770	0,120	9,260	5,520	1,490	686	2,380*
1917	512	485	453	399*	379*	387	454	3,550	6,560	3,050	723	432	1,460*
1918	399	422	426	578*	383*	437	1,610	4,360	5,320	1,510	576	310	1,360*
1919	398	415	410	361*	302*	356	2,190	5,060	5,470	2,630*	756*	492*	1,550*
1920	414	443	336*	370*	366	361	348	1,740	3,140	2,070	471	404	873*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1903										1,690	820	685	
1904	320	735	685	520	520	475	4,640	4,200	1,350	570	435	435	
1905	435	465	345	320*		435	1,270	3,040	5,260	1,500	545	475	
1906	570	475	395	360	330	360	655	3,220	3,220	790	480	420	330
1907	400	584	420			534	2,360	4,200	1,480	638	442		
1908	463	442	369	330	315	362	534	2,210	4,000	1,220	638	400	315
1909	380	409	345		300	345	558	1,220	3,800	1,540	534	380	
1910	460	420				420	2,060	6,360	4,000	1,380	534	486	
1911	486	509	420	315		380	1,030	2,690	4,110	1,020	448	448	
1912	401	294	280		294	294	401	1,430	2,400	770	530	424	
1913	401	401	310			320	361	1,380	5,020	1,220	448	401	
1914	351	351	294	252	310	326	625	2,070	3,940	850	401	361	252
1915	580	755			360	360	870	2,500	1,540	750	456	372	
1916	372	409	380				910	3,040	5,910	2,290	870	506	
1917	486	440				376	376	486	4,820	1,120	456	392	
1918	381	413					586	2,510	2,436	768	406	260	
1919	295	366	366	214			665	2,860	3,560		472	449	
1920	386	366		295	329	312	295	406	1,420	713	301	320	

* Estimated.

METHOW RIVER BASIN

Methow River at Pateros, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1903			485	2,270	1,650,000	2,160	1,570,000
1904				1,850	1,360,000	1,910	1,380,000
1905							
1906	12,600	May 26, 1906	330	1,510	1,100,000	1,510	1,090,000
1907	13,200	June 1, 1907		1,900	1,380,000	1,880	1,360,000
1908	11,600	June 9-11, 1908	315	1,670	1,210,000	1,660	1,200,000
1909	12,600	June 2, 1909		1,530	1,110,000	1,550	1,120,000
1910	15,400	May 11, 1910		2,370	1,720,000	2,420	1,750,000
1911	12,900	June 13, 1911		1,620	1,170,000	1,550	1,120,000
1912	10,500	May 21, 1912		1,300	846,000	1,310	943,000
1913	11,400	June 3, 1913		1,560	1,130,000	1,560	1,130,000
1914	10,100	June 3, 1914	252	1,660	1,220,000	1,750	1,270,000
1915	5,400	April 20, 1915		1,200	870,000	1,140	823,000
1916	14,500	①		2,380	1,730,000	2,400	1,740,000
1917	10,000	②		1,460	1,050,000	1,440	1,040,000
1918	9,730	June 14, 1918		1,360	987,000	1,360	966,000
1919	9,510	May 27, 1919		1,580	1,140,000	1,580	1,140,000
1920	4,550	June 22, 1920		573	633,000		

① June 17, 18, 1916. ② May 29, June 16, 1917.

CHELAN RIVER BASIN

Stehekin River at Stehekin, Wash.

Location.—Lat. 48°19'30", long. 120°41'20", in SE¼ sec. 26, T. 33 N., R. 17 E., on left bank, 1,200 ft. upstream from Boulder Creek; 1¼ miles upstream from Lake Chelan, and 2 miles northwest of Stehekin.

Drainage area.—372 sq. mi., including that of Boulder Creek.

Gage.—Water-stage recorder. Datum of gage is 1,100 ft. above mean sea level, unadjusted. Dec. 6, 1910, to Aug. 16, 1911, staff gage 1 mile downstream at different datum. Aug. 17, 1911, to Oct. 31, 1915, staff gage a quarter of a mile downstream from Boulder Creek at different datum.

Average discharge.—32 years (1910-15, 1926-53), 1,352 cfs.

Extremes.—1910-15, 1927-53: Maximum discharge, 18,900 cfs May 29, 1948 (gage height, 29.00 ft.), from rating curve extended above 9,000 cfs on basis of slope-area determination of peak flow; minimum, 56 cfs Jan. 21, 1930.

Remarks.—At very high stages, small part of flow is diverted above station by natural sloughs; flow diverted included in discharge records. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911	1,900	1,100	650	320	320	718	1,890	4,190	5,650	3,030	1,250	889	1,830
1912	303	311	295	214	217	263	1,189	3,700	4,580	1,880	1,130	583	1,220
1913	303	292	264	228	305	357	1,760*	3,820*	4,020*	3,220	1,530	877	1,420*
1914	627	434	283	351	238	596	1,916	3,550	3,620	2,590	1,160	636	1,340
1915	589	946	456*	220	190	499	2,140	1,890	1,620	1,270	1,240	492	971*
1916	433												

* Estimated.

CHELAN RIVER BASIN

Stehekin River at Stehekin, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927 ...	331*	466*	393*	324	233	269	1,030	2,800	5,230	2,480	1,200	927	1,310*
1928 ...	1,280	965	1,030	843	448	488	1,110	5,040	3,430	2,330	1,010	585	1,570
1929 ...	7.5	325	224	157	128	271	625	2,820	3,220	1,650	937	457	970
1930 ...	253	148	125	86.0	260	536	2,130	2,190	2,650	2,110	957	583	1,000
1931 ...	416	324	191	182	275	427	1,200	4,120	3,220	1,590	742	627	1,110
1932 ...	327	479	253	278	973	1,080	1,810	3,590	4,380	2,190	1,030	486	1,410
1933 ...	492	1,410	916	517	287	277	1,190	2,420	4,900	4,100	1,930	807	1,620
1934 ...	1,551	1,734	1,260	784	659	1,540	4,444	4,289	3,506	2,153	1,212	664	2,007
1935 ...	406	1,188	638	1,057	1,115	682	1,040	3,336	4,428	2,885	1,271	901	1,596
1936 ...	424	217	177	156	116	264	2,078	4,501	3,563	1,384	841	524	1,183
1937 ...	337	157	108	114	115	194	622	2,824	5,228	2,547	830	566	1,145
1938 ...	583	561	424	395	268	410	1,721	4,312	5,097	2,318	759	601	1,458
1939 ...	395	309	418	553	275	466	1,806	3,400	2,736	2,315	987	511	1,187*
1940 ...	540	543	578	290*	279	654	1,844	3,538	3,100	1,477	774	580	1,210*
1941 ...	991	411	371	258	238	807	2,341	2,276	2,028	1,205	682	656	1,025
1942 ...	1,085	641	757	320	249	284	1,560	2,540	2,806	2,004	890	409	1,169
1943 ...	246	198	271	267	235*	367	2,050	2,993	4,362	3,790	1,354	638	1,403*
1944 ...	408*	250	356	182	159	302	1,099	2,610	2,674	1,267	681	740	895*
1945 ...	493	370	400	445	400	328	717	3,507	3,244	1,870	794	551	1,098
1946 ...	741	664	356	244*	204*	346*	1,385	5,318	4,010	2,824	1,928	561	1,496*
1947 ...	477	307	353	298*	389	901*	1,996	4,293	3,119	1,933	921	577	1,302*
1948 ...	881	615	448	300	255	259	1,017*	4,198	6,110	2,205	1,245	651	1,510*
1949 ...	691	359	287	189*	211	316	1,627	5,066	3,375	2,392	1,210	818	1,427*
1950 ...	636	1,658	1,129	426	264	378	728	2,737	7,738	5,479	2,002	839	2,008
1951 ...	889	844	991	637	913	430	1,899	4,678	4,773	3,382	1,269	756	1,792
1952 ...	788	553	325	219	195	258	1,622	3,929	3,252	2,175	1,086	522	1,247
1953 ...	324	175	150	311	563	439	1,098	2,623	3,655	3,536	1,492	743	1,345

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911 ...			320	230	320	150*	1,070	2,880	2,790	1,620	840	396	150*
1912 ...	272	175	235	189	203	189	620	1,550	2,240	1,280	620	344	175
1913 ...	265	242	229	209	219	310	510*	2,260*	3,650	2,610	760	474	209
1914 ...	291	352	219	189	203	235	620	2,480	2,030	1,400	782	398	189
1915 ...	370	675				194	1,220	1,400	1,310	858	1,050	311	
1916 ...	221												
1927 ...			225*	215	221	436	1,390	3,120	1,820	673	630	215	
1928 ...	584	728	340*	350*	378	373	652	1,550	2,190	1,450	714	392	340*
1929 ...	375	276	186	125	118	130	303	1,550	2,020	1,030	622	218	118
1930 ...	180	110	82	58	90	267	1,350	1,450	1,820	1,110	540	304	58
1931 ...	254	260	127	125	234	244	580	2,050	1,590	1,000	505	340	125
1932 ...	255	305	205	184	178	679	1,030	2,070	2,700	1,290	605	334	178
1933 ...	280	384	438	379	264	236	357	1,470	2,660	2,270	962	545	236
1934 ...	588	916	918	542	592	637	2,160	2,660	2,090	1,300	1,060	320	320
1935 ...	256	754	532		652	484	477	1,940	2,860	1,790	948	458	
1936 ...	253	194	141	99	87	194	214	2,690	1,740	996	608	294	87
1937 ...	192	134	134	94	94	123	410	958	3,320	1,020	515	237	94
1938 ...	239	445	260	314	243	270	437	1,970	3,320	1,130	590	475	289
1939 ...	288	236	236	340*	232	207	1,130	2,220	2,160	1,460	530	345	207
1940 ...	291	378	390*	250*	240*	295	1,080	1,860	1,980	873	607	378	240*
1941 ...	272	294	314	230	221	306	1,540	1,390	1,240	737	420	425	221
1942 ...	569	514	401	263	229	229	543	1,300	1,730	1,160	426	301	229
1943 ...	179	171	171	180*	200*	271	704	1,530	2,700	2,220	805	421	171
1944 ...	300*	212	200	125	142	140	508	1,620	1,830	830	508	497	125
1945 ...	327	298	204	287	298	287	376	1,740	1,700	840	582	353	237
1946 ...	234	412	300	210*	195*	220	566	2,080	2,140	1,750	932	326	195*
1947 ...	194	248	244	180*	304	370*	944	2,380	1,800	1,180	614	382	180*
1948 ...	514	422	339	260	220	216	350*	1,000	8,870	1,570	946	460	216
1949 ...	398	307	220*	180*	180*	222	394	1,680	1,840	1,620	790	452	180*
1950 ...	421	522	588	297	250*	256	394	1,050	3,640	2,250	1,230	426	250*
1951 ...	368	525	644	390*	400*	360	495	1,820	2,860	1,870	782	515	360
1952 ...	510	412	258	191	176	167	470	1,830	1,860	1,410	590	392	167
1953 ...	218	145	145	153	320	324	474	1,850	2,460	1,930	828	458	145

* Estimated.

Stehekin River at Stehekin, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1911	12,200	June 13, 1911	150	1,830	4.92	66.78	1,830,000	1,600	58.37	1,160,000
1912	7,590	May 20, 1912	175	1,220	3.28	44.65	885,000	1,210	44.24	882,000
1913	6,420†	May 25, 1913	209	1,420	3.82	51.85	1,030,000	1,460	53.21	1,060,000
1914	7,290	June 2, 1914	189	1,340	3.60	48.87	973,000	1,400	51.04	1,010,000
1915	3,530	May 9, 1915	.....	971	2.61	35.43	702,000	.....	.....	.....
1916	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1927	11,100	June 8, 1927	215	1,310	3.52	47.80	946,000	1,490	54.33	1,070,000
1928	11,400	May 22, 1928	340	1,570	4.22	57.37	1,140,000	1,410	51.30	1,020,000
1929	6,050	May 23, 1929	118	970	2.61	35.42	702,000	903	32.96	654,000
1930	4,720	May 16, 1930	58	1,000	2.69	36.65	728,000	1,040	37.89	753,000
1931	7,670	May 14, 1931	125	1,110	2.98	40.67	806,000	1,120	41.05	814,000
1932	10,200	Feb. 27, 1932	178	1,410	3.79	51.42	1,020,000	1,550	56.78	1,130,000
1933	12,100	June 15, 1933	236	1,620	4.35	58.99	1,170,000	1,770	64.42	1,280,000
1934	10,000	April 24, 1934	320	2,007	5.40	73.24	1,453,000	1,809	66.02	1,310,000
1935	7,620	June 8, 1935	.....	1,596	4.29	58.25	1,156,000	1,479	53.96	1,071,000
1936	12,900	June 2, 1936	87	1,188	3.19	43.50	862,700	1,175	43.02	853,200
1937	9,150	June 3, 1937	94	1,145	3.08	41.81	823,700	1,221	44.58	883,700
1938	9,150	①	239	1,458	3.92	53.21	1,055,000	1,421	51.85	1,026,000
1939	9,150	May 29, 1939	207	1,187	3.19	43.28	850,000	1,232	44.03	891,700
1940	7,990	②	240	1,210	3.25	44.27	878,300	1,220	44.63	855,500
1941	4,210	Oct. 19, 1940	221	1,025	2.76	37.39	742,000	1,084	39.57	735,100
1942	8,370	May 25, 1942	229	1,159	3.12	42.30	839,100	1,010	36.87	731,300
1943	8,160	May 26, 1943	171	1,403	3.77	51.19	1,015,000	1,428	52.11	1,034,000
1944	5,420	May 15, 1944	125	895	2.41	32.75	649,500	916	33.51	664,600
1945	5,590	May 31, 1945	237	1,098	2.95	40.06	794,600	1,139	41.57	824,600
1946	7,530	May 27, 1946	195	1,496	4.02	54.59	1,033,000	1,444	52.70	1,046,000
1947	7,960	May 8, 1947	180	1,302	3.50	47.52	942,800	1,370	49.98	991,800
1948	13,800	May 29, 1948	216	1,516	4.08	55.46	1,100,000	1,465	53.61	1,064,000
1949	10,600	May 15, 1949	180	1,427	3.84	52.09	1,093,000	1,601	58.42	1,159,000
1950	13,400	Nov. 27, 1949	250	2,008	5.40	73.25	1,453,000	1,950	71.10	1,412,000
1951	12,700	May 11, 1951	360	1,792	4.82	65.39	1,296,000	1,703	62.15	1,233,000
1952	7,400	June 5, 1952	107	1,247	3.35	45.64	905,200	1,162	42.52	843,400
1953	6,730	May 17, 1953	145	1,348	3.62	49.18	975,900	.....	.....	.....

† Maximum observed. ① June 22, 24, 1938. ② May 23, 24, 1940.

Railroad Creek at Lucerne, Wash.

Location.—Lat. 48°11'45", long. 120°35'50", in sec. 9, T. 31 N., R. 18 E., on left bank, half a mile upstream from mouth, and half a mile southwest of Lucerne.

Drainage area.—64.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,250 ft. (from topographic map). Dec. 6, 1910, to June 30, 1913, staff gage 1,800 ft. downstream at different datum.

Average discharge.—30 years (1910-13, 1926-53), 197 cfs.

Extremes.—1910-13, 1927-53: Maximum discharge, 3,900 cfs May 28, 1948 (gage height, 8.1 ft., from floodmarks), from rating curve extended above 1,300 cfs on basis of slope-area and contracted-opening determinations of peak flow; minimum, less than 9.4 cfs sometime during period of ice effect Jan. 15-25, 1930.

Remarks.—No diversion or regulation above station.

CHELAN RIVER BASIN

Railroad Creek at Lucerne, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	168*	168*	97.2	83.9	47.8	74.6	198	346	608	400	240	146	214*
1912...	52.5	62.6	41.9	37.6	31.9	34.7	145	445	595	339	211	88.3	174
1913...	44.0	35.4*	28.4*	16.7	33.4*	37.9*	148*	424*	659*	454*	269*	152*	193*
1927...	40.7*	41.9*	40.0*	36.4*	22.2	17.6	66.2	373	868	415	233	151	195*
1928...	175	126	146	118	76.7	97.5	153	741	515	383	157	114	235
1929...	56.3	42.9	34.1	27.6*	21.0	29.4	73.5	382	500	247	166	864	140*
1930...	38.9	21.2	24.5	14.2*	26.4*	59.6	234	317	357	296	162	105	141*
1931...	56.4	39.8	27.3*	28.5	34.3	41.0	101	485	485	238	130	95.6	147
1932...	42.6	50.5	33.2	35.3*	96.9	132	214	566	635	352	178	80.4	196*
1933...	72.0	188	101	64.7*	40.5	38.1	158	334	737	656	304	104	284*
1934...	110	193	163	104	97.0	198	717	657	520	316	180	90.9	279
1935...	69.0	176	114	161	155	105	136	484	701	435	181	138	288
1936...	65.8	33.5	27.6	28.4	18.1*	29.6	262	589	570	227	135	86.0	168*
1937...	53.5	26.7	27.3	20.4	20.1	24.5	61.1	334	843	455	137	76.0	174
1938...	88.4	54.7	51.5	48.0	36.9	46.4	216	613	510	345	124	71.2	212
1939...	63.2*	46.4*	46.6*	60.2	32.5	59.8	216	433	392	355	160	77.7	163*
1940...	66.7	65.9	67.0	40.0*	35.7	62.3	208	490	496	251	120	92.6	166*
1941...	125	67.6	47.8	33.9	31.2	88.6	312	272	335	231	141	109	158
1942...	132	99.3	114	56.8	38.9	36.5	174	397	389	396	185	68.9	175
1943...	39.7	35.5	37.4	40.3*	40.0	57.2	237	332	547	532	202	101	184*
1944...	62.0	38.3	49.5	32.0	27.3	39.9	100	330	407	205	117	122	128
1945...	74.2	65.6	62.0*	62.9	62.6	44.2	79.0	389	483	269	134	86.2	151*
1946...	88.7*	93.9	52.4*	34.3*	29.6*	43.9	136	707	628	435	213	103	215*
1947...	82.9	62.6	53.3	42.4	48.4	105	258	668	521	311	150	84.2	200
1948...	145	106	73.0	46.3	42.7	37.8	116	682	1,075*	419	229	116	258*
1949...	104	60.3	49.4*	36.3*	42.2*	53.9	226	700	612	354	166	103	210*
1950...	99.1	178	143	63.6*	45.5*	43.5	61.7	465	1,000	663	317*	126	268*
1951...	141	136	135	94.5*	123*	64.6*	332	817	807	564	218	118	297*
1952...	121	76.9	50.0	34.1*	28.7	34.3	203	596	539	333	164	91.1	190*
1953...	68.5	32.2	26.2	43.4	55.3	63.7	149*	536*	627	648	260	127	220*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...			68	57	40	40	146	295	427	325	188	68	40
1912...	40	36	36	27	22	22	51	238	353	236	150	61	22
1913...	31	31	22	15	18*	20*	34	222	507				15
1927...					18	14	27	196	462	305	127	96	14
1928...	94	98			61	57	106	215	341	290	87	70	
1929...	49	37			14	18	33	122	295	158	129	28	14
1930...	28	11	10			28	140	209	258	170	114	58	
1931...	40	32				28	53	275	239	159	103	53	
1932...	36					91	128	314	492	214	101	54	
1933...	46	54	67	50*		33	39	220	418	365	177	55*	
1934...	60	115	53	77	87	99	296	395	256	190	112	47	47
1935...	43	105	91	35*	107	88	79	238	450*	258	138	85	35*
1936...	56	27	22	23*	12*	25*	25	358	286	162	96	50	12*
1937...	35	23	21	18	18	20	37	105	552	205	74	57	15
1938...	42	66	45*	38*	32	37	50	324	464	206	95*	52	32
1939...	40*	26*	28*	34*	26	26	158	304	309	224	94	56	26
1940...	39	32	45*	31*	26*	31	128	236	389	162	104	65	26*
1941...	48	59	30*	27	27	50	236	276	241	156	97	83	27
1942...	97	78	75*	45	30	30	65	178	271	271	94	51	30
1943...	32	29	28	26*	32*	45	53	183	318	333	129	70	26*
1944...	44	33	36	20*	24	24	52	175	322	148	100	94	20*
1945...	54	54	48	42*	44	41	46	162	201	164	97	61	41
1946...	32*	62*	42*	28*	27*	36	54	228	345	319	170	56	27*
1947...	42	50	43*	28*	40*	52	134	387	324	207	100	58	28*
1948...	58	63	50	40*	39*	35*	48	151	670*	284	171	82	35*
1949...	62	46	44*	33	32	47*	54	272	254	218	110	63	32
1950...	63	60	91	50*	43*	37	45	149	543	200*	200*	68	37
1951...	49	89	87	65*	66*	56*	80*	350	474	330	160	94	49
1952...	78	58	42*	31	26	25	53	250*	281	203	98	75	25
1953...	42	23	16	19.5	38	33	60	270*	430	347	136	80	16

* Estimated.

Railroad Creek at Lucerne, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911	924	June 14, 1911	40	214	3.30	44.77	155,000	101	39.93	133,000
1912	900	May 20, 1912	22	174	2.69	36.50	126,000	170	35.04	123,000
1913	806	June 10, 1913	15	193	2.98	40.34	139,000			
1927	1,910	June 8, 1927	14	195	3.01	40.34	141,000	222	46.58	161,000
1928	1,860	May 22, 1928		235	3.63	49.35	171,000	211	44.34	153,000
1929	981	May 24, 1929	14	140	2.16	29.30	102,000	134	28.00	96,900
1930	674	June 10, 11, 1930		141	2.18	29.50	102,000	144	30.18	104,000
1931	843	May 14, 1931		147	2.27	30.69	107,000	143	30.83	107,000
1932	956	June 14, 1932		196	3.02	41.25	142,000	216	45.35	157,000
1933	1,460	June 15, 1933		234	3.61	49.01	169,000	243	50.53	178,000
1934	1,580	April 24, 1934	47	279	4.31	58.49	202,100	270	56.62	195,700
1935	1,230	June 8, 1935	35	238	3.67	49.87	172,300	219	45.80	153,300
1936	1,070	June 2, 3, 1936	12	168	2.59	35.27	121,900	166	34.92	120,700
1937	1,389	May 17, 1937	18	174	2.69	36.39	125,700	183	38.42	132,800
1938	1,700	June 23, 1938	32	212	3.27	44.38	153,400	206	43.18	149,200
1939	1,309	May 29, 1939	26	161	2.48	33.75	116,600	165	34.51	119,300
1940	1,250	May 23, 24, 1940	26	166	2.56	34.97	120,900	170	35.69	123,400
1941	622	June 13, 1941	27	158	2.44	33.17	114,600	167	35.02	121,000
1942	1,620	May 25, 1942	30	175	2.70	36.59	123,400	155	32.49	112,300
1943	1,160	July 2, 1943	26	184	2.84	38.55	133,200	187	39.22	135,600
1944	688	May 15, 1944	20	128	1.98	26.62	92,700	132	27.71	95,770
1945	1,530	May 31, 1945	41	151	2.33	31.55	109,000	153	32.13	111,000
1946	1,190	May 28, 1946	27	215	3.32	45.04	155,700	212	44.42	153,500
1947	1,200	May 8, 1947	28	200	3.09	41.32	144,500	210	44.07	152,300
1948	3,000	May 28, 1948	35	258	3.96	54.16	187,200	248	52.17	180,300
1949	1,340	May 12, 1949	32	210	3.24	43.05	151,000	227	47.57	164,400
1950			37	268	4.14	56.22	194,300	268	56.10	193,900
1951	2,440	May 11, 1951	49	297	4.58	62.18	214,900	283	59.29	204,900
1952	1,160	June 5, 1952	25	190	2.93	39.89	137,500	179	37.64	130,100
1953	1,180	July 8, 1953	16	220	3.40	46.02	159,000			

Lake Chelan at Chelan, Wash.

Location.—Lat. 47°50'00", long. 120°03'40", in lot 3, sec. 15, T. 27 N., R. 22 E., on south shore of Lake Chelan at Lakeside, 2 miles west of Chelan.

Drainage area.—952 sq. mi.

Supplemental records available.—September 1897 to December 1899, January to June 1905, December 1910 to September 1911, fragmentary gage heights only.

Gage.—Water-stage recorder. Datum of gage is mean sea level, adjustment of 1912. Sept. 1 to Oct. 15, 1897, and Jan. 1, 1898, to Dec. 31, 1899, staff gage at pier half a mile upstream from steamboat landing at Lakeside at datum 1,070.18 ft. above mean sea level, adjustment of 1912. Jan. 1, to June 30, 1905, staff gage at upper highway bridge at Chelan at different datum. Dec. 5, 1910, to Nov. 13, 1927, staff gage at Forest Service boat landing at Chelan at datum 1,076.07 ft. above mean sea level, adjustment of 1912.

Extremes.—1897-99, 1905, 1910-53: Maximum contents, 677,800 acre-ft. July 19, 1947 (elevation, 1,100.05 ft.); minimum, 22,800 acre-ft. Jan. 27, 28, Dec. 2, 3, 1898 (elevation, 1,076.78 ft.).

Remarks.—Reservoir is formed by low concrete dam at lake outlet completed Sept. 3, 1927. Capacity, 676,100 acre-ft. between elevations 1,079 and 1,100 ft., which are lower and upper limits of regulation allowed by Federal Power Commission. Water is used for power development and irrigation.

CHELAN RIVER BASIN

Lake Chelan at Chelan, Wash.—Continued

Contents on Last Day of Month in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	90,000	96,900	93,200	92,700	93,000	93,000	93,000	149,000	158,000	96,000	100,500	88,000	.....
1913...	82,000	82,000	83,500	82,000	79,000	88,600	63,000	166,000	168,000	122,000	111,000	103,500	.....
1914...	100,500	102,000	90,300	99,000	95,700	65,000	101,000	150,000	130,000	90,000	97,500	104,000	.....
1915...	110,000	115,000	104,000	96,000	88,500	112,000	101,000	96,000	101,000	99,000	90,200	87,000	.....
1916...	93,000	97,500	90,000	80,500	87,000	66,500	97,500	142,500	209,500	136,500	107,500	90,500	.....
1917...	82,500	84,000	82,500	81,000	76,500	34,200	61,000	153,000	157,000	112,000	116,000	103,500	.....
1918...	86,500	93,000	139,500	73,500	60,400	43,500	54,500	140,500	148,500	106,500	108,500	108,500	.....
1919...	102,000	93,000	102,600	105,000	94,500	97,800	124,000	165,500	169,800	127,900	105,000	87,000	.....
1920...	75,700	97,800	97,500	103,300	90,000	83,500	73,500	77,350	161,050	136,550	106,750	113,250	.....
1921...	116,500	106,750	96,000	96,400	109,100	101,100	93,000	198,000	185,500	121,600	91,800	99,000	.....
1922...	130,300	116,200	117,400	83,500	64,100	59,000	72,050	152,900	150,300	95,400	97,500	74,500	.....
1923...	63,500	51,000	55,650	76,000	73,450	67,100	90,000	144,000	101,600	121,300	114,650	92,100	.....
1924...	88,500	78,100	87,000	87,300	110,000	61,000	56,300	157,100	137,460	124,300	105,350	82,300	.....
1925...	77,200	74,800	122,200	112,900	114,000	77,500	97,200	186,700	174,100	110,900	91,500	62,900	.....
1926...	40,800	32,500	44,700	50,100	50,900	78,100	132,100	116,500	140,100	111,500	99,000	76,400	.....
1927...	111,850	109,400	115,300	93,600	90,000	39,800	74,500	121,900	179,200	170,200	116,150	222,800	.....
1928...	97,670†	138,250	154,310	221,430	222,390	257,270	316,340	351,670	650,540	663,160	633,450	570,580	.....
1929...	550,370	454,190	401,020	280,310	170,960	154,450	116,710	391,300	640,040	660,380	601,660	487,400	.....
1930...	381,250	261,110	170,670	97,340	111,940	157,950	322,460	499,510	657,100	664,900	604,620	540,910	.....
1931...	473,480	400,690	298,310	241,270	240,630	266,230	335,389	612,160	658,740	655,460	575,790	401,030	.....
1932...	388,380	341,130	293,480	300,880	348,200	413,280	310,270	577,750	648,270	663,060	656,110	604,940	.....
1933...	532,110	606,580	539,280	518,740	437,310	355,330	430,330	569,600	620,590	651,850	659,060	642,010	.....
1934...	615,440	556,230	537,650	459,090	362,460	452,240	632,170	627,580	661,360	663,000	621,670	545,800	.....
1935...	466,260	526,570	537,000	536,670	399,400	340,490	383,520	574,160	639,380	660,380	622,000	551,670	.....
1936...	446,380	342,420	229,110	153,180	78,700	80,920	230,710	575,780	669,560	658,740	582,980	483,540	.....
1937...	371,530	252,150	161,130	83,120	35,180	24,490	35,180	246,070	664,310	609,560	592,810	505,380	.....
1938...	418,840	355,660	312,800	280,630	261,750	203,670	382,350	596,740	670,220	664,970	590,180	508,640	.....
1939...	405,550	297,990	204,790	201,270	184,030	170,030	271,670	510,590	658,740	673,170	601,660	504,400	.....
1940...	404,580	314,410	244,470	163,040	141,100	143,640	241,270	541,890	667,920	642,340	557,210	476,690	.....
1941...	421,750	327,670	287,680	245,430	216,950	237,110	120,780	627,900	672,510	647,970	582,330	532,440	.....
1942...	563,410	568,620	587,970	508,960	457,130	419,490	492,990	612,490	671,530	661,360	629,870	555,260	.....
1943...	449,960	384,490	360,520	306,040	260,470	201,270	335,980	537,000	654,800	668,260	627,250	544,170	.....
1944...	443,460	331,800	243,510	167,810	174,490	191,670	280,630	502,770	664,970	665,620	612,490	537,980	.....
1945...	445,730	352,740	259,190	231,350	269,110	200,260	301,210	552,970	666,280	656,440	596,740	500,160	.....
1946...	419,810	379,240	326,970	269,750	191,350	146,820	183,070	561,450	666,040	668,250	619,700	524,940	.....
1947...	434,390	352,420	299,270	218,550	177,030	170,030	279,350	562,750	600,330	665,620	591,500	503,420	.....
1948...	524,290	518,740	484,190	389,680	320,530	262,710	287,040	584,290	647,260	672,840	632,170	556,690	.....
1949...	497,550	423,370	316,660	191,030	119,560	96,720	187,210	557,860	663,660	665,650	615,110	537,330	.....
1950...	446,050	490,710	504,070	413,010	363,760	332,120	355,070	466,880	650,540	664,310	663,660	633,150	.....
1951...	654,470	663,330	656,770	622,330	484,190	402,960	449,630	557,540	664,970	670,870	661,660	607,240	.....
1952...	629,870	554,930	468,210	271,670	189,750	133,170	191,030	543,870	640,700	670,870	643,320	549,060	.....
1953...	460,060	343,390	257,590	210,870	166,830	85,650	82,490	320,200	620,360	669,560	664,310	592,150	.....

† Contents by capacity table used Oct. 1, 1927; contents Sept. 30, 1927, by capacity table used since Oct. 1, 1927, was 135,080 acre-ft.

Note—Contents prior to June 1920 obtained from gage readings made generally within 1 to 5 days of last day of month.

Chelan River at Chelan, Wash.

Location.—Lat. 47°50'05", long. 120°00'40", in SE¼ sec. 13, T. 27 N., R. 22 E., near right bank in forebay upstream from control dam at outlet of Lake Chelan and a quarter of a mile south of Chelan.

Drainage area.—951 sq. mi.

Gage.—Water-stage recorder and concrete power dam control. Datum of gage is at mean sea level, adjustment of 1912. Prior to Nov. 11, 1928, staff gages at several sites on river in the vicinity of outlet of Lake Chelan at same datum. Nov. 11, 1928, to Mar. 19, 1939, water-stage recorder 2½ miles downstream at same datum.

Average discharge.—49 years (1904-53), 1,990 cfs, unadjusted.

Extremes.—1903-53: Maximum daily discharge, 16,000 cfs May 30, 1948; no flow part of day Jan. 30, 1917 when lake outlet was blocked with ice, and at other times owing to artificial regulation.

Remarks.—Washington Water Power Co. diverts water above station for powerplant capacity of 54,000 horsepower and for irrigation of 1,000 acres with return flow to the Columbia River. This quantity is included in the records of daily discharge. Water is pumped from Lake Chelan to irrigate 250 acres below station with return flow to the Columbia River. Diversions from tributaries, streams, and from pumpage out of Lake Chelan irrigate an additional 5,030 acres with return flow to Chelan River above station. Values given are for the year 1946. Flow regulated by Lake Chelan (see p. 532).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904	.....	1,710	1,280	935	904	1,050	2,730	5,730	7,020	6,520	3,060	1,330	.....
1905	910	807	786	742	757	1,900	2,330	3,870	7,160	5,080	2,190	1,300	2,330
1906	1,760	1,160	816	854	913	1,220	2,080	4,580	4,120	4,020	1,740	1,200	2,050
1907	911	1,950	1,870	746	841	1,060	1,600	5,340	6,840	4,990	2,270	1,190	2,480
1908	975	579	395	502	456	1,580	1,890	3,860	6,790	6,340	2,390	1,180	2,250
1909	677	641	717	542	560	1,210	1,500	2,760	6,880	4,980	1,420	1,150	1,920
1910	755	915	1,740	760	620	2,390	3,030	7,430	6,770	5,060	1,740	762	2,680
1911	2,850	1,910	871	362	389	727	2,260	3,360	6,300	4,060	2,060	996	2,190
1912	618	402	464	437	486	454	1,940	4,800	6,230	4,320	1,370	848	1,870
1913	477	453	432	460	477	1,120	1,370	3,510	7,960	5,360	2,170	1,310	2,100
1914	715	678	530	677	544	1,340	2,670	5,140	6,730	4,520	1,280	706	2,050
1915	783	1,250	903	535	423	579	3,410	3,330	2,630	1,900	1,520	601	1,490
1916	388	560	607	500	513	1,960	2,610	4,900	7,550	7,450	3,530	1,390	2,650
1917	541	347	345	297	398	986	559	3,340	6,310	6,260	2,040	1,180	1,940
1918	756	495	817	3,410	1,120	874	1,720	4,270	6,590	4,700	1,660	1,070	2,300
1919	1,020	731	932	266	769	615	2,070	4,900	6,410	6,060	2,380	1,260	2,350
1920	578	460	565*	595	539	1,050*	1,020*	2,350*	2,930	4,790	2,170	1,130	1,590*
1921	1,720	1,090	822	850	938	1,350	1,980	5,170	9,230	5,790	2,580	641	2,690
1922	829	1,570	1,370	1,110	720	558	1,010	3,340	7,080	3,800	1,540	1,250	2,060
1923	717	496	376	369	344	581	2,290	4,850	6,310	5,060	1,740	1,130	2,030
1924	638	433	352	330	573	1,820	1,490	5,220	4,240	2,690	1,470	1,060	1,700
1925	766	634	818	934	864	1,500	2,770	5,840	5,880	4,330	1,640	1,030	2,260
1926	651	384	320	305	321	702	2,100	3,330	2,300	2,030	1,030	542	1,200
1927	700	730	664	716	589	1,110	1,010	3,050	6,480	3,350	429	972	1,650
1928	2,100	657	597	671	677	539	657	3,550	2,860	2,850	1,420	1,650	1,530
1929	1,250	1,520	1,790	2,340	2,310	654	356	163	235	1,600	2,090	2,410	1,300
1930	2,370	2,310	1,840	1,430	138	42.6	71.6	154	890	2,210	2,200	1,760	1,390
1931	1,550	1,650	2,040	1,400	427	209	171	770	3,280	2,020	2,270	2,280	1,510
1932	2,160	1,360	1,200	336*	473	665	880	3,970	4,950	2,570	1,800	1,390	1,790
1933	1,790	764	2,270	1,160	1,820	1,850	588	1,240	6,520	5,200	2,300	1,350	2,250
1934	2,457	3,227	2,604	2,577	2,953	1,043	4,416	6,731	4,462	2,765	2,196	2,005	3,138
1935	2,007	787	844	1,516	3,949	2,047	872	2,490	5,796	3,593	2,155	2,237	2,344
1936	2,183	1,997	2,110	1,581	1,461	367	386	538	3,867	1,919	2,156	2,183	1,727
1937	2,150	2,106	1,610	1,338	1,178	676	299	544	1,268	3,387	2,197	2,166	1,647
1938	2,125	2,050	1,475	1,155	906	368	746	3,137	6,293	3,193	2,140	2,126	2,188
1939	2,165	2,164	2,130	899	694	931	765	863	1,193	2,670	2,133	2,105	1,566
1940	2,198	2,221	2,189	1,738	990	1,073	916	597	2,319	2,308	2,200	2,086	1,742

* Estimated.

CHELAN RIVER BASIN

Chelan River at Chelan, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	2,148	2,111	1,999	1,204	962	931	350	118	2,170	1,791	1,841	1,652	1,374
1942...	715	839	1,158	1,418	1,302	1,050	989	2,491	3,249	2,677	1,374	1,640	1,567
1943...	1,884	1,426	902	1,395	1,302	1,076	979	960	4,691	5,117	2,188	1,995	2,046
1944...	2,059	2,116	1,891	1,478	210	174	23.0	60.0	1,068	1,475	1,467	1,941	1,167
1945...	1,984	2,022	1,957	1,144	146	199	820	893	3,051	2,504	1,741	2,065	1,550
1946...	2,124	1,652	1,294	1,399	1,829	1,442	1,549	1,934	4,238	3,786	2,222	2,183	2,137
1947...	2,024	1,898	1,465	1,783	1,535	1,667	1,182	1,901	3,018	2,468	2,220	2,005	1,943
1948...	969	914	1,236	2,087	1,749	1,430	1,140	2,368	9,566	2,802	2,251	2,027	2,341
1949...	1,842	1,890	2,365	2,320	1,798	1,191	1,200	1,766	3,635	3,102	2,202	2,157	2,124
1950...	2,160	1,649	1,371	2,125	1,512	1,379	965	4,040	6,713	6,451	2,477	1,355	2,698
1951...	952	1,258	1,725	1,679	4,308	2,200	2,657	6,295	5,576	4,305	1,651	1,729	2,855
1952...	651	1,938	1,855	3,651	1,733	1,446	1,472	1,400	1,499	2,237	1,628	2,063	1,805
1953...	1,737	2,067	1,675	1,651	1,722	2,016	1,700	1,196	797	4,073	1,967	1,065	1,910

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	.....	1,440	1,060	830	555	830	1,060	4,620	6,920	4,140	765	765	.....
1905...	765	765	765	765	765	765	1,940	3,370	5,420	4,140	975	1,060	765
1906...	1,330	900	765	765	900	900	1,060	3,670	3,070	2,920	1,230	1,060	765
1907...	765	765	915	600	650	975	900	2,770	5,580	3,980	1,140	1,140	600
1908...	830	418	364	448	418	448	1,440	2,770	4,940	4,040	1,440	900	364
1909...	418	.18	555	460	515	460	600	1,940	5,200	3,520	418	900	418
1910...	600	600	900	650	515	830	3,490	4,780	5,260	3,950	480	555	480
1911...	900	1,680	364	317	364	364	1,940	2,490	5,160	2,490	830	765	317
1912...	360	340	390	390	448	418	480	2,490	5,900	900	975	555	340
1913...	418	418	418	418	418	390	833	2,050	6,820	4,250*	1,020	833	390
1914...	598	598	424	454*	463	484	1,920	3,280	4,260	2,500	424	550	424
1915...	673	1,040*	602	418	403	433	1,360	2,990	2,330	1,210	1,260	418	403
1916...	349	482	465	303	465	500	2,070	3,250	5,150	5,340	1,580	571	303
1917...	370	330	330	.....	370	392	370	565	6,250	4,380*	1,020	940	.....
1918...	495	465	530	1,700	565	330	1,250	3,100	4,150	2,839	845	980	330
1919...	845	630	662*	678	630	547	730	3,970	5,410	4,150	1,740	730	547
1920...	427	381	547	512	630	211	379*	2,050*	1,660	2,900	845	980	211
1921...	1,240	910	678	730	960	1,340	2,370	7,700	4,450	585	845	585	566
1922...	630	1,150	1,150	845	630	512	512	2,010	5,529	1,550	1,440	730	612
1923...	588	351	960	340	340	289	1,890	3,040	5,090	2,130	1,560	800	289
1924...	528	355	330	320	330	810	1,200	1,850	1,850	1,010	1,200	865	320
1925...	700	515	528	810	810	810	1,550	2,520	4,970	1,739	1,200	925	625
1926...	482	330	310	290	275	440	1,610	2,820	1,730	1,200	925	755	275
1927...	660	710	612	612	547	612	820	1,970	3,700	850	75	.....	.....
1928...	602	781	211	403	578	0	399	571	401	1,120	742	1,090	0
1929...	604	1,020	999	2,100	2,180	261	131	147	147	273	1,490	2,380	131
1930...	2,160	2,010	784	778	28	28	36	48	150	941	1,620	1,430	28
1931...	1,020	672	1,420	554	252	100	156	176	657	1,170	1,640	1,250	156
1932...	1,080	683	707	249	395	42	505	720	1,600	1,430	1,050	948	42
1933...	1,260	254	1,700	703	702	152	292	46	3,550	2,490	1,090	1,120	46
1934...	940	2,180	1,340	1,660	1,730	6.0	6.5	4,400	1,920	2,000	1,440	910	6.0
1935...	1,370	555	680	916	3,210	944	516	897	2,780	1,400	1,730	2,090	555
1936...	1,870	1,020	1,850	450	391	14	250	267	688	1,050	1,570	2,180	14
1937...	1,800	1,980	1,040	592	150	1	134	138	2,020	2,120	2,090	1	1
1938...	1,800	650	626	460	430	467	404	469	1,260	1,750	1,690	1,960	464
1939...	2,060	2,070	1,700	248	404	510	480	487	1,300	838	2,100	1,920	330
1940...	2,120	2,200	2,080	768	376	0	238	154	174	2,080	1,940	1,700	0
1941...	1,460	342	132	510	266	345	76	76	97	690	1,410	753	66
1942...	106	213	378	865	694	413	352	201	1,690	1,550	243	420	106
1943...	1,880	100	180	310	472	622	246	185	1,220	2,260	1,960	1,110	180
1944...	1,720	1,960	454	209	47	47	1	24	63	501	133	1,050	1
1945...	1,600	1,780	1,600	154	47	47	.....	.....	.....	.....	.....	.....	.....
1946...	1,890	447	274	712	1,040	820	986	1,100	1,560	2,260	1,190	1,780	33
1947...	1,630	1,040	1,020	1,340	958	1,390	622	1,450	1,560	2,220	2,200	1,620	274
1948...	55	79	51	816	50	134	144	150	3,650	697	1,570	1,330	50
1949...	56	503	763	2,160	430	428	112	460	2,000	727	2,070	1,820	56
1950...	1,930	193	55	189	51	537	61	94	1,250	2,750	1,200	82	51
1951...	55	56*	527	877	804	1,040	1,530	2,470	1,950	2,210	294	277	55
1952...	258	1,240	154	2,140	1,480	909	934	472	715	309	395	922	154
1953...	1,090	1,600	1,580	1,230	1,440	1,740	31	782	268	506	832	916	31

* Estimated.

CHELAN RIVER BASIN

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Chelan River at Chelan, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30		Minimum day	Mean	Runoff in acre-feet	CALENDAR YEAR	
	Dis-charge	Date				Mean	Runoff in acre-feet
1904	8,380	June 7, 1904	555			2,700	1,960,000
1905	8,280†	June 12-14, 1905	705	2,330	1,680,000	2,430	1,760,000
1906	5,100†	May 13-15, 1906	765	2,050	1,480,000	2,130	1,540,000
1907	8,460†	June 4, 5, 1907	600	2,480	1,790,000	2,240	1,620,000
1908	8,820†	June 17, 1908	364	2,250	1,630,000	2,260	1,640,000
1909	7,600†	June 16-21, 1909	418	1,920	1,390,000	2,040	1,430,000
1910	8,460†	May 14, 1910	480	2,680	1,940,000	2,360	2,070,000
1911	7,260†	June 17, 18, 1911	317	2,190	1,580,000	1,840	1,330,000
1912	7,260†	Ⓞ	340	1,870	1,350,000	1,860	1,350,000
1913	9,070†	June 10, 11, 1913	390	2,100	1,520,000	2,150	1,550,000
1914	6,820†	May 26, 1914	424	2,050	1,490,000	2,140	1,550,000
1915	3,980†	April 7, 1915	403	1,400	1,080,000	1,380	997,000
1916	9,780†	June 20, 1916	303	2,680	1,940,000	2,650	1,920,000
1917	7,490†	June 22, 1917		1,940	1,400,000	2,000	1,450,000
1918	8,140†	June 14, 15, 1918	330	2,300	1,690,000	2,350	1,700,000
1919	7,600†	May 29, 1919	547	2,350	1,700,000	2,250	1,630,000
1920	5,580†	July 4, 1920	211	1,500	1,150,000	1,760	1,280,000
1921	11,600†	June 8, 1921	586	2,690	1,950,000	2,740	1,980,000
1922	8,420†	June 7-8, 1922	512	2,060	1,490,000	1,330	1,330,000
1923	7,520†	June 11-13, 1923	289	2,030	1,470,000	2,020	1,460,000
1924	7,950†	May 22-24, 1924	320	1,700	1,230,000	1,760	1,280,000
1925	8,760†	May 21-23, 1925	528	2,260	1,640,000	2,190	1,580,000
1926	3,800†	May 4, 1926	275	1,200	867,000	1,200	911,000
1927	7,730†	June 15, 17, 1927		1,650	1,200,000	1,760	1,270,000
1928	9,700†	May 27, 1928	0	1,530	1,110,000	1,630	1,180,000
1929	3,790†	July 15, 1929	131	1,360	1,010,000	1,550	1,120,000
1930	5,650†	July 14, 1930	28	1,300	937,000	1,190	859,000
1931	7,880†	June 9, 1931	156	1,510	1,090,000	1,470	1,060,000
1932	10,200†	June 15, 1932	42	1,790	1,300,000	1,800	1,310,000
1933	8,710†	June 18, 1933	46	2,250	1,630,000	2,560	1,850,000
1934	12,300†	April 27, 1934	6.0	3,139	2,273,000	2,729	1,976,000
1935	7,920†	June 1, 1935	555	2,344	1,697,000	2,567	1,858,000
1936	12,800†	June 3, 1936	14	1,727	1,254,000	1,707	1,239,000
1937	10,000†	June 30, 1937	1	1,647	1,193,000	1,612	1,167,000
1938	11,900†	June 23, 1938	404	2,188	1,584,000	2,257	1,634,000
1939	6,500†	June 30, 1939	130	1,568	1,134,000	1,579	1,143,600
1940	7,260†	June 20, 1940	0	1,742	1,205,000	1,653	1,200,000
1941	5,610†	June 13, 1941	66	1,374	995,000	1,136	822,600
1942	8,510†	May 27, 1942	106	1,537	1,134,600	1,693	1,226,000
1943	8,950†	July 1, 1943	180	2,046	1,482,000	2,202	1,564,000
1944	2,130†	Ⓞ	1	1,167	847,400	1,159	841,200
1945	6,690†	June 22, 1945	33	1,550	1,122,000	1,476	1,068,000
1946	7,220†	June 21, 1946	274	2,337	1,547,000	2,184	1,566,000
1947	7,680†	June 19, 1947	622	1,943	1,406,000	1,753	1,269,000
1948	16,000†	May 30, 1948	30	2,341	1,717,000	2,015	1,838,000
1949	5,370†	June 23, 1949	56	2,124	1,538,000	2,047	1,482,000
1950	14,100†	June 22, 1950	51	2,693	1,950,000	2,588	1,874,000
1951	10,400†	June 16, 1951	55	2,855	2,067,000	2,901	2,100,000
1952	7,490†	Jan. 6, 1952	154	1,805	1,310,000	1,888	1,371,000
1953	10,600†	July 8, 1953	31	1,910	1,383,000		

† Maximum observed. ‡ Maximum daily.

Ⓞ June 29, 30, July 1, 2, 1912.

Ⓢ Nov. 3, 6, 7, 14, 24, 27, 28, 1948; Jan. 13, 1944.

ENTIAT RIVER BASIN

Entiat River at Entiat, Wash.

Location.—Lat. 47°39'40", long. 120°13'30", in SE¼ sec. 17, T. 25 N., R. 21 E., on right bank at Entiat, and a quarter of a mile upstream from mouth.

Drainage area.—419 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 690 ft. (from topographic map). Oct. 5, 1910, to Sept. 30, 1925, staff gage three-quarters of a mile upstream at different datum.

Average discharge.—17 years (1910-25, 1951-53), 489 cfs.

Extremes.—1910-25, 1951-53: Maximum discharge, 5,380 cfs June 18, 1916 (gage height, 5.07 ft., from graph based on gage readings); minimum observed, 32 cfs Jan. 30, 1923 (result of discharge measurement), but may have been less during period of ice effect.

Remarks.—Several diversions for irrigation of an estimated 2,560 acres above station in 1946 with a resulting estimated depletion of 4,480 acre-ft. Occasional regulation by millpond 10 miles upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	250*	255	218	112*	112*	228	533	1,070	1,860	586	207	193	471*
1912...	125	135	118	118*	116	137	391	1,710	1,760	501	227	146	457*
1913...	119	128	125	108*	186*	149	409	1,450	2,680	1,040	301	186	569*
1914...	155	161	140	171	136	233	725	1,770	1,580	736	196	146	514
1915...	167	239	161*	127*	111	179	840	960	704	275	163	96.0	338*
1916...	98.4	114	98.7*	91.8*	116*	367	853	1,330	3,160	2,060	609	226	804*
1917...	163	121	107*	107*	112	105	195	1,190	2,220	1,230	323	182	506*
1918...	127	121	230*	497	193	145	524	1,330	1,750	527	203	122	458*
1919...	170	119	150	147	121	152	458	1,380	1,580	1,100	328	165	517
1920...	110	131	114*	127*	124	121	158	639	829	590	177	171	275*
1921...	309	106	148	128*	195	276	500	1,990	2,800	1,050	320	161	675*
1922...	153	210	417	183*	100*	113	250	1,100	1,870	457	179	114	432*
1923...	109	97.8	79.8*	124	60.4*	123	492	1,460	1,890	898	235	123	476*
1924...	125	110	103	104*	195	190	271	1,860	756	277	135	87.4	352*
1925...	109	126	155	147*	143	178	656	2,150	1,440	543	181	101	496*
1951...									2,288	1,082	295	173	
1952...	234	201	148*	103*	123*	161	530	1,486	1,294	534	183	103	425*
1953...	90.8*	90.1*	93.8*	153	201	183	305	1,396	1,869	1,269	355	151	515*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...		228	150			112	335	650	950	285	150	150	
1912...	112	90	80		70	92	265	515	950	265	165	105	70
1913...	100	112	102			112	150	450	1,720	491	186	143	
1914...	134	134	119	119	65	156	250	870	1,010	311	134	123	65
1915...	146	205			104	112	250	780	360	179	124	83	83
1916...	83	73				137	415	1,110	2,060	1,000	388	169	73
1917...	142	62				90	92	222	1,680	473	232	142	62
1918...	100	95				126	276	990	938	289	141	109	
1919...	114	64				104	332	728	1,350	512	193	127	64
1920...	97	53			79	106	111	310	488	268	122	101	
1921...	177	167	116			252	332	518	1,830	563	167	124	
1922...	132		149				132	458	984	229	149	83	
1923...	83	81				83	355	633	1,290	332	177	101	
1924...	108	99			113	187	161	458	404	155	83	78	
1925...	86	67	59		127	156	219	745	1,070	311	111	91	
1951...									1,700*	484	166	134	
1952...	202	102	120*	90*	105*	168	202	637	823	271	116	95*	90*
1953...		80*	85*	88*	130	137	156	595	1,400	539	203	122	80*

* Estimated.

ENTIAT RIVER BASIN

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Entiat River at Entiat, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1911.....	3,060	June 13, 1911	.....	471	341,000	440	310,000
1912.....	3,150	May 21, 1912	70	457	332,000	456	332,000
1913.....	3,300	June 3, 1913	.....	569	412,000	576	417,000
1914.....	2,960	June 3, 1914	65	514	372,000	523	379,000
1915.....	1,640	May 10, 1915	83	338	245,000	316	229,000
1916.....	5,380	June 18, 1916	73	804	585,000	813	590,000
1917.....	3,120	May 30, 1917	62	566	366,000	513	371,000
1918.....	3,290	June 11, 1918	.....	488	353,000	485	351,000
1919.....	2,950	May 29, 1919	64	517	374,000	509	368,000
1920.....	1,030	①	.....	275	199,000	300	218,000
1921.....	4,360	June 6, 1921	.....	675	488,000	688	498,000
1922.....	3,640	June 5, 1922	.....	432	313,000	388	371,000
1923.....	3,120	June 9-11, 1923	.....	476	344,000	479	347,000
1924.....	3,460	②	.....	352	265,000	356	259,000
1925.....	3,670	③	.....	496	359,000	.....	.....
1951.....	3,460†	June 14, 1951	.....	.....	.....	.....	.....
1952.....	2,360	May 19, 1952	90	425	306,850	400	290,200
1953.....	2,660	June 13, 1953	80	515	372,500	.....	.....

† Maximum during period June to September, 1951.

① June 19, 22, 23, 1920. ② May 15, 16, 1924. ③ May 20, 21, 1925.

PINE CANYON CREEK BASIN

Pine Canyon Creek near Waterville, Wash.

Location.—Lat. 47°40'10", long. 120°06'40", in SW ¼ SW ¼ sec. 8, T. 25 N., R. 22 E., on right bank, 2½ miles northwest of Waterville, and 7 miles upstream from mouth.

Drainage area.—11.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,750 ft. (from topographic map).

Extremes.—1945-47: Maximum discharge, 265 cfs Feb. 22, 1947 (gage height, 4.10 ft.); minimum, 0.03 cfs June 14, 1947 (gage height, 0.42 ft.).

Maximum discharge during 1948 flood, 5,350 cfs June 10 (gage height, 15.04 ft.), on basis of slope-area determination.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....	.....	.....	.....	.....	.....	.....	.....	.....	0.328	0.218	0.132	0.113	.....
1946...	0.136	0.220†	0.177*	0.166*	0.192	0.330	0.362	0.215	.149	.112	.099	.096	0.188*
1947...	.114	.120*	.126	.124	10.1	5.01	.259	.150	.125	.108	.120	.135	1.32*
1948...	.176	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....	.....	.....	.....	.....	.....	.....	.....	.....	0.30	0.19	0.09	0.09	.....
1946...	0.09	0.22	0.15*	0.13*	0.19	0.22	0.29	0.17	.12	.10	.08	.08	0.08
1947...	.10	.12	.12	.12	.13	.25	.17	.12	.10	.10	.11	.12	.10
1948...	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

PINE CANYON CREEK BASIN

Pine Canyon Creek near Waterville, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30		CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1945.....							
1946.....	0.61	Mar. 26, 1946	0.08	0.158	136	0.173	125
1947.....	265	Feb. 22, 1947	.10	1.32	951		
1948.....							

WENATCHEE RIVER BASIN

White River near Chiwaukum, Wash.

Location.—Lat. 47°52'30", long. 120°52'10", in NE ¼ sec. 5, T. 27 N., R. 16 E., on left abutment of county highway bridge, 6 miles upstream from Wenatchee Lake, and 14 miles northwest of Chiwaukum.

Drainage area.—150 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,880 ft. (from river-profile map).

Extremes.—1911-14: Maximum discharge observed, 3,780 cfs June 13, 1911 (gage height, 9.0 ft.); minimum observed, 114 cfs Nov. 1-3, 1911 (gage height, -0.34 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....									2,190	1,290	510	317	
1912.....	150	325	239	209	222	196	701	2,100*	2,300*	1,200*	510*	280*	701*
1913.....											771*		
1914.....	330*	280*	190*	290*	160*	380*	1,000*	1,850*	1,600*	1,280	430*	250*	671*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....									1,390	730	358	187	
1912.....	120	114	194	204	204	150	532						

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1911.....												
1912.....				701	4.67	63.60	500,000					
1913.....												
1914.....				671	4.47	60.74	487,000					

* Estimated.

Wenatchee River below Wenatchee Lake, Wash.

Location.—Lat. 47°49'50", long. 120°46'30", in sec. 19, T. 27 N., R. 17 E., on north (left) shore of Wenatchee Lake, 2¾ miles upstream from outlet, 7½ miles northwest of Plain, and 33 miles upstream from Leavenworth.

Drainage area.—276 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,860.00 ft. above mean sea level, datum of 1912. Jan. 23, 1932, to Jan. 3, 1935, staff gage at same site and datum.

Average discharge.—21 years (1932-53), 1,274 cfs.

Extremes.—1932-53: Maximum discharge recorded, 13,700 cfs May 29, 1948 (elevation of lake surface, 1,879.65 ft.); minimum discharge, 96 cfs Nov. 30, Dec. 1, 2, 3, 1952; minimum elevation of lake surface, 1,869.27 ft. Dec. 1, 1936.

Remarks.—No diversions. Natural regulation by Wenatchee Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1932				415*	906	1,161	1,647	3,080	3,382	1,653	609	290	.....
1933	462	2,123	1,349	620	461	529	1,054	1,873	4,508	3,659	1,255	572	1,520
1934	1,565	1,821	2,237	1,549	1,185	2,113	4,735	3,312	2,444	1,117	508	287	1,900
1935	475	1,657	777	1,528	1,209	741	925	3,061	3,983	2,181	655	428	1,462
1936	241	198	197	222	186	369	1,956	4,467	3,783	1,044	398	289	1,113
1937	204	147	317	222	200	303	766	2,303	4,901	2,057	440	289	1,056
1938	318	812	737	605	331	424	1,844	3,303	3,906	1,500	367	260	1,245
1939	260	355	588	887	367	537	1,813	3,381	2,545	1,732	496	251	1,105
1940	343	711	970	384	415	818	1,048	3,385	2,356	759	385	265	1,058
1941	516*	400	532	298	262	504	1,907	1,840	1,338	538	323	457	778*
1942	1,037	759	1,036	358	300	363	1,536	2,201	2,274	1,291	432	230	1,000
1943	171	321	464	466	364	461	2,355	2,919	4,208	3,502	932	356	1,380
1944	256	238	695	274	273	482	1,095	2,332	2,128	702	293	355	765
1945	337	392	613	926	776	453	629	1,077	2,813	1,241	391	312	1,003
1946	615	566	347	360	295*	418	1,349	4,935	3,995	2,344	684	309	1,349*
1947	408	359	875	657	844	1,194	2,173	4,102	2,971	1,541	550	312	1,335
1948	1,045	947	634	459	419	395	1,039	3,834	5,773	1,807	747	442	1,461
1949	665	487	480	265*	336*	540	1,709	4,807	3,811	2,082	731	468	1,371*
1950	606	1,936	1,383	651	438*	812	971	2,913	3,806	4,171	1,303	464	1,793*
1951	1,124	1,350	1,608	962	1,698	599	1,026	4,162	3,733	2,004	597	346	1,601
1952	537	784	400	274	309	334	1,031	3,378	2,924	1,674	557	259	1,115
1953	184	153	168	1,077	1,376	614	1,220	3,191	3,225	2,976	944	385	1,293

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1932					238	577	1,090	2,070	2,440	1,020	460	250	.....
1933	190	532	558	471	448	471	639	1,260	2,070	1,970	577	394	190
1934	538	858	810	1,130	962	1,180	2,660	2,320	1,400	728	416	187	187
1935	165	954	577	426	660	532	519	1,770	2,600	1,090	471	270	165
1936	212	175	172	183	175	228	273	3,000	1,820	533	298	209	172
1937	158	138	136	190*	191	215	468	1,020	3,530	735	277	209	136
1938	170	349	580	403	277	289	426	2,090	2,830	610	285	222	170
1939	183	257	298	462	307	257	1,350	2,270	1,900	1,080	304	175	175
1940	183	460	570*	314	354	414	1,320	1,950	1,360	438	276	214	153
1941	100*	273	375	256	243	344	1,370	1,170	358	338	252	273	190*
1942	511	493	479	309	268	263	456	1,100	1,590	608	247	192	192
1943	154	306	273	264	319	319	1,090	1,670	2,920	1,720	595	268	154
1944	220	250*	273	235	235	224	558	1,540	1,390	419	235	223	220
1945	252	295	323	300	473	414	448	1,320	1,770	545	264	220	220
1946	183	319	273	304	270*	328	558	2,240	2,300	1,290	436	202	183
1947	172	294	350	359	338	664	1,210	2,700	1,920	892	361	235	172
1948	172	551	538	373	335	340*	490	1,130	3,570*	1,040	560	340	272
1949	413	345	304	270*	200*	407	678	1,870	2,040	1,230	445	324	200*
1950	304	552	695	470	373	470	656	1,130	3,010	1,980	695	330	304
1951	309	695	938	600	550*	518	618	1,820	2,750	1,010	373	242	242
1952	540	502	300*	257	277	265*	556	1,690	1,910	910	302	212	212
1953	143	100	100	160	532	487	613	2,080	2,290	1,500	509	260	100

* Estimated.

WENATCHEE RIVER BASIN

Wenatchee River below Wenatchee Lake, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mle	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1932	7,550	Feb. 28, 1932						1,403	69.15	1,016,000
1933	8,310	June 16, 1933	190	1,520	5.51	74.79	1,101,000	1,686	82.94	1,221,000
1934	7,550	April 24, 1934	187	1,906	6.91	93.80	1,380,000	1,670	82.12	1,269,000
1935	7,700	Jan. 27, 1935	165	1,462	5.30	71.94	1,059,000	1,278	62.55	925,300
1936	6,640	June 3, 1936	172	1,113	4.03	54.85	897,700	1,115	54.89	809,800
1937	6,290	June 3, 1937	136	1,056	3.88	51.99	764,400	1,156	56.88	836,800
1938	6,630	May 26, 1938	170	1,245	4.51	61.22	901,100	1,180	58.51	861,200
1939	6,090	May 16, 1939	175	1,105	4.00	54.30	800,300	1,174	57.69	850,100
1940	5,690	May 24, 1940	153	1,058	3.83	52.13	768,100	1,010	49.82	733,300
1941	2,750	May 1, 1941	190	773	2.80	35.01	559,900	894	43.98	647,400
1942	5,010	May 26, 1942	192	1,000	3.62	49.14	723,900	838	41.27	606,300
1943	6,490	May 26, 1943	154	1,380	5.00	67.88	999,300	1,404	69.06	1,017,000
1944	3,490	May 16, 1944	220	785	2.77	37.70	555,300	773	38.13	561,400
1945	5,680	May 31, 1945	220	1,003	3.63	49.33	726,100	1,010	49.66	731,100
1946	6,520	May 27, 1946	183	1,349	4.89	66.35	976,800	1,368	67.33	990,400
1947	6,120	May 28, 1947	172	1,335	4.84	65.70	966,400	1,417	69.64	1,026,000
1948	13,700	May 29, 1948	272	1,461	5.29	72.01	1,061,000	1,378	67.92	1,000,000
1949	9,030	May 16, 1949	200	1,371	4.97	67.46	992,400	1,561	76.83	1,131,000
1950	11,000	Nov. 27, 1949	304	1,793	6.50	88.23	1,298,000	1,808	88.94	1,309,600
1951	7,990	May 12, 1951	242	1,661	6.02	71.70	1,203,000	1,488	73.17	1,077,000
1952	5,180	May 19, 1952	212	1,115	4.04	54.99	809,200	988	48.73	717,300
1953	5,050	July 9, 1953	100	1,293	4.63	63.57	935,800			

Nason Creek near Nason, Wash.

Location.—Lat. 47°46'10", long. 120°48'10", in sec. 11, T. 26 N., R. 16 E., at mouth of Roaring Creek and two-thirds of a mile northwest of Nason.

Drainage area.—88.7 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,100 ft. (from topographic map).

Extremes.—June to September 1911: Maximum discharge observed, 1,490 cfs June 13 (gage height, 5.0 ft.); minimum observed, 44 cfs Sept. 1-3 (gage height, 1.15 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									780	237	72.7	80.9	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									314	105	43	44	.....

Phelps Creek near Plain, Wash.

Location.—Lat. 48°04'25", long. 120°50'55", on right bank, a quarter of a mile upstream from mouth, and 25 miles northeast of Plain.

Drainage area.—16.0 sq. mi.

Gage.—Staff gage and artificial control. Datum of gage is 2,772.75 ft. above mean sea level, adjustment of 1912. Prior to June 4, 1930, staff gage 300 ft. downstream at same datum.

Extremes.—1926-31: Maximum discharge, 1,140 cfs June 7, 1927 (gage height, 4.00 ft., from graph based on gage readings); no flow Feb. 20-23, Mar. 1-12, 1927, because of snow slides.

Remarks.—A few second-feet diverted past gage for operation of mine powerplant.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927...	18.6*	19.5	17.2	12.7	7.70	5.40	28.8	161	368	161	50.2	25.6	73.1*
1928...	58.6	41.1	37.7*	22.6	16.8	24.3	45.1	345	188	99.1	25.2	12.3	76.7*
1929...	17.9	10.3	6.28	5.26	3.81*	6.10	13.2	125	161	68.5	13.9	5.01	36.5*
1930...	3.64	2.26	1.83	1.92	4.08	8.01	79.5	112	113	58.0	11.5	5.49	33.5
1931...	6.50	3.85	2.39	3.01	4.22	5.35	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927...	.....	17	16	.....	0	0	9.4	46	200	100	28	14	0
1928...	20	26	.....	.....	15	14	23	80	134	49	17	9.1	9.1
1929...	9.7	6.7	5.1	4.8	.....	4.3	4.4	47	115	26	7.2	4.0	4.0
1930...	2.5	1.5	1.2	1.8	2.0	2.0	29	56	72	23	4.1	2.8	1.2
1931...	1.8	1.4	1.1	1.1	2.3	2.8	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1927.....	1,140	June 7, 1927	0	73.1	52,900	30.0	57,900
1928.....	668	May 24, 1928	9.1	76.7	55,700	68.0	49,400
1929.....	270	May 22, 1929	.....	36.5	26,400	34.3	24,800
1930.....	208†	May 14, 1930	1.2	33.5	24,300	33.9	24,600
1931.....	.....	.....	.....	.....	.....	.....	.....

* Estimated. † Maximum observed.

WENATCHEE RIVER BASIN

Chiwawa River near Plain, Wash.

Location.—Lat. 47°50'30", long. 120°39'40", in SE¼ sec. 13, T. 27 N., R. 17 E., on right bank, half a mile upstream from Goose Creek, 6 miles north of Plain, 7 miles upstream from mouth, and 11 miles northeast of Chiwaukum.

Drainage area.—170 sq. mi. At site 1911-14, 181 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,100 ft. above mean sea level (river-profile survey). May 29, 1911, to Oct. 31, 1914, staff gage 3 miles downstream at different datum.

Average discharge.—13 years (1936-49), 443 cfs.

Extremes.—1911-14, 1936-49: Maximum discharge, 5,880 cfs May 29, 1948 (gage height, 9.17 ft.); minimum, 56 cfs Oct. 24-27, 1942 (gage height, 3.73 ft.), but may have been less during periods of ice effect.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									1,540	530	321	231	.....
1912	139	205	159	148*	151	147	622	1,900*	1,900*	730*	330*	190*	552*
1913	140*	150*	150*	140*	180*	190*	680*	1,700*	2,700*	1,240	457	351	976*
1914	295	308	222	257	164*	364	1,270	1,650	1,370	530	302	224	604*
1915	242												.....
1936											175	115	.....
1937	90.5	77.5	96.5	78.4*	76.2*	93.7	214	1,053	2,041	837	298	128	417*
1938	133	196	176*	174*	101	180	643	1,890	1,968	668	169	113*	532*
1939	114	124	133*	152	98.6*	149	603	1,272	966	617	207	109	380*
1940	106	126	210	111*	94.0	208	705	1,494	1,109	369	145	98.7	400*
1941	179	125	113*	90.6*	84.0	240	791	573	660	256	106	146	306*
1942	238	217	253	101*	101	113	560	1,036	973	540	160	80.5	365*
1943	63.5	85.5	95.6*	78.9*	68.6*	101	621	1,267	1,941	1,382	388	158	523*
1944	115	106	154*	107*	759	117	325	826	803	268	129	124	264*
1945	110	124*	145*	263*	175*	117	252	1,228	1,326	607	176	122	388*
1946	148	172	133*	101*	80.4	105	398	2,202	1,723	923	301	145	539*
1947	143	122	148	212*	169*	306	886	1,972	1,244	593	233	133	515*
1948	282	256	165	129*	113*	112	344	1,756	2,679	762	317	179	592*
1949	203	150	122*	80.5*	94.4*	105	564	2,327	1,504	727	269	169	536*
1950	151	351											.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911													.....
1912	123	123			125	114	290		988	470	230	150	.....
1913													.....
1914	221	240	193			193	368	1,170	910	444	210	160	.....
1915	173												.....
1936											179	86	.....
1937	74	71	69	70*	70*	80*	142	359	1,450	333	139	95	69
1938	84	140	120*	100*	95	104	130	1,040	1,350	292	132	100*	84
1939	90*	100*	90*	100*	70*	86	390	930	797	410	125	86	70*
1940	84	97	139	85*	86	100*	410	567	660	208	170	51	81
1941	73	80*	75*	84	70*	126	584	620	420	132	86	93	70*
1942	170	170	120*	80*	92	94	194	566	715	263	99	69	69
1943	56	67	85	60*	65*	73	175	651	1,350	700	226	111	56
1944	109	93	95	85*	65	60	165	565	511	175	100*	76	60
1945	80*	90*	110*	110*	118	99	132	566	843	272	112	92	80
1946	77	120	100*	85	75	85	147	748	934	542	202	99	75
1947	85	94	94	115*	120*	150	464	1,800	754	360	159	112	85
1948	107	190	153	105*	90*	102	135	453	1,620	453	229	141	90*
1949	138	126	100*	66*	62*	77	129	836	760	405	176	126	62*
1950	107	123											.....

* Estimated.

Chiwawa River near Plain, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911										
1912				552	3.05	41.52	401,000	547	41.13	397,000
1913				676	3.73	50.72	491,000	710	53.15	514,000
1914				604	3.34	45.67	440,000			
1915										
1936										
1937	2,580	June 3, 1937	69	417	2.45	33.28	301,800	437	34.90	316,400
1938	3,210	①	84	532	3.13	42.45	354,900	520	41.55	376,700
1939	2,170	May 16, 1939	70	330	2.24	30.35	275,200	386	30.84	279,600
1940	2,540	May 24, 1940	81	400	2.35	32.04	200,500	308	31.87	289,000
1941	1,360	May 2, 1941	70	306	1.80	24.41	221,300	333	26.56	240,800
1942	2,510	May 26, 1942	69	368	2.16	29.39	266,500	327	26.08	236,500
1943	3,060	May 26, 1943	56	523	3.08	41.73	378,300	534	42.60	336,200
1944	1,360	May 16, 1944	60	284	1.55	21.16	191,800	265	21.19	192,100
1945	2,700	May 31, 1945	80	388	2.28	30.99	231,000	394	31.48	255,500
1946	3,060	May 27, 1946	75	539	3.17	43.04	390,200	536	42.77	337,700
1947	3,000	May 8, 1947	85	515	3.03	41.14	373,000	541	43.21	391,800
1948	5,880	May 29, 1948	90	592	3.48	47.44	430,100	572	45.79	415,100
1949	4,250	May 16, 1949	62	536	3.15	42.83	388,400			
1950										

① May 25, 26, 1938.

Wenatchee River at Plain, Wash.

Location.—Lat. 47°45'50", long. 120°39'30", in lot 8, sec. 12, T. 26 N., R. 17 E., on left bank at Plain, a quarter of a mile downstream from Beaver Creek, 7½ miles downstream from Nason Creek, and 12 miles north of Leavenworth.

Drainage area.—591 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,805 ft. above mean sea level (river-profile survey). Prior to Jan. 8, 1932, staff gages a quarter of a mile downstream at different datum.

Average discharge.—49 years (1904-53), 2,179 cfs.

Extremes.—1910-29, 1931-53: Maximum discharge, 22,700 cfs May 29, 1948 (gage height, 12.43 ft., from high-water mark in well); minimum, 168 cfs Nov. 30, 1952 (gage height, 1.31 ft.).

Remarks.—Water diverted from Chiwawa River for irrigation of 1,400 acres near Plain since 1923. Natural regulation by Wenatchee Lake.

WENATCHEE RIVER BASIN

Wenatchee River at Plain, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904													
1905	593*	792*	871*	594*	653*	2,750*	3,030*	4,430*	7,100*	3,180*	1,560*	752*	2,170*
1906	2,000*	1,010*	647*	686*	1,000*	914*	3,760*	5,320*	3,660*	2,350*	907*	706*	1,920*
1907	1,650*	5,110*	1,470*	686*	1,600*	1,290*	3,000*	8,440*	6,430*	3,110*	1,200*	851*	2,900*
1908	770*	836*	1,160*	917*	799*	1,500*	2,940*	5,450*	7,770*	6,500*	1,570*	693*	2,610*
1909	559*	792*	616*	628*	508*	693*	2,010*	5,030*	9,180*	3,950*	1,180*	675*	2,150*
1910	750*	3,790*	2,710*	1,080*	937*	2,870*	4,570*	8,510*	5,200*	3,430*	1,370*	639*	3,000*
1911	2,000*	3,000*	1,240	876	591	950	2,540	4,210	6,220	2,720	951	756	2,170*
1912	400	1,310	890	732	755	662	2,330	6,760	6,090	2,600	1,070	602	2,070
1913	483	733	698	621	809	815	2,140	5,900	9,570	5,260	1,700	1,130	2,500
1914	1,240	1,290	830	1,160	666	1,510	3,410	5,920	4,560	2,760	951	710	2,060
1915	949	2,230	893	491	431	1,030	3,630	2,610	1,560	1,060	764	402	1,380
1916	618	940	559	548*	736*	1,660	3,090	6,160	9,370	6,440	2,590	961	2,810*
1917	485	557	408	429	604	487	913	5,210	8,020	6,150	1,740	754	2,160
1918	517	676	3,640	3,940	1,250	976	2,880	4,810	6,720	2,770	1,070	647	2,500
1919	937	993	1,970	1,140	868	792	3,000	6,010	6,470	4,990	1,700	759	2,450
1920	456	1,400	1,060	1,500	1,200	1,020	1,260	3,480	4,160	3,280	1,010	1,540	1,780
1921	2,470	1,250	932	1,390	2,180	2,100	2,540	7,230	9,150	4,330	1,570	917	3,030
1922	1,330	1,590	3,770	915*	723*	643	1,670	5,140	6,900	2,010	850	621	2,190*
1923	533	579	651*	1,260	592	699	4,080	6,380	6,050	3,720	1,600*	625*	2,240*
1924	477*	647*	907*	689*	3,010	1,930	1,930	7,130	3,950	1,930	756*	507*	1,990*
1925	677*	880*	2,060	1,280	1,290	1,300	3,810	7,820	5,600	2,770	950*	523*	2,420*
1926	420	549	1,310*	743*	925*	1,990*	3,800*	3,500	2,220	976	530	406	1,450*
1927	1,360	864	1,170	601	492	523	1,770	4,920	8,770	3,550	1,130	958	2,160
1928	1,740	2,390	2,100	2,200	956	1,560	2,330	8,350	5,120	2,470	753	467	2,550
1929	915	509	410	335*	306*	561	1,010	4,550	4,650	1,920	683	406	1,300*
1930	290*	240*	340*	310*	650*	1,180*	3,500*	3,670*	3,160*	1,770*	670*	400*	1,350*
1931	450*	500*	350*	520*	830*	1,050*	1,960*	6,000*	3,600*	1,260*	559	490	1,490*
1932	446	955	483	707	1,500	2,470	3,230	5,960	6,460	3,020	1,200	504	2,240
1933	651	3,160	1,960	1,230	680	656	2,040	4,320	8,040	6,090	2,120	988	2,070
1934	2,527	3,066	3,720	2,537	1,994	3,719	8,762	6,576	4,434	1,953	913	536	3,344
1935	785	2,716	1,269	2,399	2,162	1,433	1,920	5,941	7,007	3,749	1,168	716	2,604
1936	470	401	392	426	387*	688	3,279	7,480	5,956	1,625	651	471	1,855*
1937	344*	238	571	352*	332*	595	1,395	4,628	8,075	3,315	819	621	1,768*
1938	544	1,340	1,240	1,059	630	838	3,272	6,589	6,599	2,494	692	432	2,196
1939	462	635	1,011	1,421	659	946	3,055	5,082	4,129	2,671	827	424	1,830
1940	465	857	1,446	643	676	1,328	3,260	5,521	3,847	1,258	523	400	1,686
1941	807	617	828	499	444	1,313	3,240	3,174	2,236	886	456	671	1,266
1942	1,528	1,243	1,654	631	519	635	2,614	3,972	3,518	2,029	644	312	1,038
1943	251	526	765	805*	635	800	3,858	5,064	7,276	5,627	1,435	582	2,307*
1944	458	502	1,093	476	491	826	1,823	3,376	3,461	1,154	468	557	1,266
1945	562	636*	905*	1,625*	1,292	766	1,231	5,344	4,956	2,060	643	606	1,713*
1946	736	1,080	611	619	486	746	2,309	8,640	6,893	3,759	1,120	542	2,310
1947	663	599	1,348	1,010	1,272	1,945	3,835	7,266	5,033	2,359	878	504	2,234
1948	1,600	1,529	1,064	715	665	643	1,744	6,615	10,080	3,000	1,235	712	2,466
1949	1,072	832	768	469*	575*	569	3,154	8,736	6,570	3,307	1,174	756	2,369*
1950	966*	2,869	2,149	1,090*	760*	1,325	1,770	5,413	10,350	6,968	2,071	798	3,052*
1951	1,678	2,113	2,544	1,531	2,895	1,192	3,719	8,119	6,943	3,426	1,036	627	2,975
1952	1,296	1,223	713	525	573	656	2,781	5,966	4,906	2,535	870	427	1,874
1953	300	271	296	1,532	2,064	1,071	2,057	5,666	5,798	4,891	1,472	645	2,172

* Estimated.

WENATCHEE RIVER BASIN

Wenatchee River at Plain, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911			970	708	468	468	1,810	3,070	3,560		714	476	468
1912	340	335	630		612	513	1,430	3,230	4,110	1,380	714	442	335
1913	402	476	550			735	712	2,380	6,710	2,760	1,050	714	402
1914	590	852	599	591	575	817	1,350	3,510	2,970	1,370	700	482	482
1915	575	1,520	615		398	426	2,140	2,140	1,130	745	658	316	316
1916	316	515	515			790	1,030	3,900	5,540	3,440	1,630	625	316
1917	418	438		357		438	488	1,790	5,550	2,610	1,030	580	
1918	405	412	505	1,300	930	745	1,060	2,700	3,920	1,540	790	505	405
1919	540	745	745	745	700	620	1,920	3,560	4,690	2,760	950	540	540
1920	405	424		790	880	790	930	2,320	2,320	1,360	660	580	405
1921	1,480	835	660	880	790	1,700	2,050	2,610	6,230	2,760	790	505	505
1922	620	880	1,190		620	620	745	2,760	4,300	1,030	745	505	505
1923	438	470		620		549	2,050		4,110				
1924				1,580		1,580	1,400	3,120	2,510	1,010			
1925				1,140	930	1,030	1,240	3,390	3,560	1,660			
1926	250	403						2,200	1,600	550	480	344	250
1927	451*	715	890	425	425	458	715	2,090	5,380	1,920	675	675	425
1928	950	1,150	770	800	815	770	1,510	3,300	3,850	1,260	560	399	399
1929	391	450				328	560	2,420	3,430	982	480	335	
1930													
1931											475	408	
1932	387	504		442	435	1,400	2,170	3,840	4,730	1,680	626	431	
1933	373	796	934	368	594	600	780	2,750	5,480	3,260	1,040	695	373
1934	828	1,030	1,480	1,780	1,580	1,900	4,790	4,740	2,550	1,300	707	399	399
1935	370	1,070	1,070	660*	1,300	1,050	1,080	3,400	4,010	1,920	825	490	370
1936	416	458	338	350*	350*	451	495	5,170	2,500	893	470	348	338
1937	261	204	207	310*	300*	398	586	1,830	5,900	1,300	513	370	204
1938	298	667	1,000	748	543	569	853	3,900	4,950	1,120	465	380	298
1939	326	473	547	305	547	489	2,250	4,100	3,300	1,640	506	339	326
1940	316	518	952	506	575	634	2,110	3,400	2,130	740	430	324	316
1941	300	452	618	435	415	612	2,360	2,030	1,350	512	358	305	300
1942	590	827	764	544	462	457	862	2,030	2,690	986	370	262	202
1943	226	312	457	450*	550	550	1,810	2,940	5,070	2,500*	896	420	226
1944	390	435	484	380	410	385	1,000	2,610	2,200	674	360	317	317
1945	400*	475*	525*	550*	799	680	778	2,490	2,370	914	435	360	360
1946	599	729	425	514	430	589	954	3,810	3,970	2,030	750	370	299
1947	290	481	565	554	970	1,090	2,200	4,890	3,000	1,410	574	400	290
1948	431	986	898	540*	520*	554	815	1,920	6,190	1,710	922	554	431
1949	733	621	607	380*	350*	603	1,030	3,500	3,360	1,980	740	542	350*
1950	490*	898	1,130	810*	680*	845	1,230	2,200	6,790	3,070	1,130	580	490*
1951	556	1,180	1,510	1,000*	950*	1,030	1,370	3,700	5,290	1,700	690*	460	460
1952	916	868	550*	484	526	520	964	3,940	3,200	1,310	510	351	351
1953	255	186	196	283	962	808	1,030	3,440	3,970	2,330	850	451	186

* Estimated.

WENATCHEE RIVER BASIN

Wenatchee River at Plain, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1905				2,170	3.67	49.82	1,570,000	2,280	52.35	1,650,000
1906				1,920	3.25	44.12	1,390,000	2,290	52.60	1,660,000
1907				2,900	4.91	66.65	2,100,000	2,460	56.47	1,780,000
1908				2,610	4.42	60.16	1,890,000	2,530	58.39	1,840,000
1909				2,150	3.64	49.41	1,560,000	2,580	59.38	1,870,000
1910				3,000	5.08	68.96	2,170,000	2,910	66.94	2,110,000
1911	10,400	June 14, 1911	468	2,176	3.67	49.91	1,570,000	1,870	42.92	1,350,000
1912	11,500	May 21, 1912	335	2,070	3.50	47.60	1,500,000	2,010	46.28	1,460,000
1913	14,500	June 4, 1913	402	2,500	4.23	57.37	1,810,000	2,620	60.15	1,900,000
1914	8,540	May 16, 1914	482	2,090	3.54	48.05	1,520,000	2,150	49.40	1,560,000
1915	6,020	April 3, 1915	316	1,360	2.30	31.31	987,000	1,200	27.63	871,000
1916	16,700	June 18, 1916	316	2,810	4.75	64.83	2,040,000	2,760	63.50	2,000,000
1917	11,000	May 28, 1917	540	2,160	3.65	49.52	1,560,000	2,440	56.10	1,770,000
1918	18,700	Dec. 30, 1917	405	2,500	4.23	57.43	1,810,000	2,420	55.01	1,750,000
1919	11,800	May 28, 1919	540	2,480	4.20	56.92	1,800,000	2,400	54.95	1,730,000
1920	6,470	July 1, 1920	405	1,780	3.01	41.04	1,220,000	1,930	44.45	1,400,000
1921	14,300	June 7, 1921	505	3,030	5.13	69.62	2,190,000	3,200	73.57	2,320,000
1922	21,160	Dec. 13, 1921	505	2,190	3.71	50.26	1,560,000	1,770	40.71	1,480,000
1923	10,400	June 10, 1923	300	2,240	3.79	51.34	1,620,000	2,260	51.85	1,640,000
1924	13,000	May 15, 1924	300	1,990	3.37	45.78	1,440,000	2,120	48.88	1,540,000
1925	12,600	May 20, 1925	300	2,420	4.09	55.53	1,750,000	2,300	52.94	1,670,000
1926	6,200	April 29, 1926	250	1,450	2.45	33.29	1,050,000	1,540	35.43	1,120,000
1927	14,900	June 9, 1927	425	2,180	3.69	50.06	1,580,000	2,420	55.49	1,750,000
1928	14,300	May 23, 1928	398	2,550	4.31	55.57	1,850,000	2,180	50.13	1,550,000
1929	5,460	May 24, 1929	300	1,360	2.30	31.32	986,000	1,280	29.45	927,000
1930				1,350	2.28	30.98	977,000	1,390	31.60	1,000,000
1931				1,490	2.52	34.37	1,080,000	1,540	35.40	1,120,000
1932	10,800	Feb. 28, 1932	300	2,240	3.79	51.64	1,630,000	2,570	59.09	1,860,000
1933	13,800	June 16, 1933	373	2,670	4.52	61.27	1,930,000	2,970	68.17	2,150,000
1934	13,500	April 24, 1934	399	3,344	5.66	70.74	2,421,000	2,959	67.91	2,142,000
1935	11,500	Jan. 27, 1935	370	2,604	4.41	59.91	1,855,000	2,312	53.21	1,674,000
1936	11,200	June 3, 1936	338	1,855	3.14	42.75	1,347,000	1,846	42.54	1,340,000
1937	10,600	June 3, 1937	204	1,768	2.99	40.67	1,280,000	1,933	44.45	1,399,000
1938	11,700	May 26, 1938	298	2,196	3.72	50.48	1,589,000	2,111	48.53	1,528,000
1939	9,060	May 16, 1939	326	1,830	3.10	42.02	1,325,000	1,855	43.31	1,365,000
1940	8,770	May 24, 1940	316	1,686	2.85	38.86	1,224,000	1,643	37.85	1,193,000
1941	4,850	May 1, 1941	300	1,260	2.14	29.07	916,800	1,449	33.29	1,049,000
1942	8,720	May 26, 1942	262	1,638	2.77	37.65	1,186,000	1,395	32.06	1,010,000
1943	11,200	May 9, 1943	226	2,307	3.90	53.00	1,671,000	2,351	54.00	1,702,000
1944	6,000	May 16, 1944	317	1,266	2.14	29.15	910,300	1,270	29.24	922,000
1945	9,900	May 31, 1945	360	1,713	2.90	39.33	1,240,000	1,748	40.03	1,262,000
1946	11,400	May 27, 1946	299	2,310	3.91	53.05	1,672,000	2,322	53.34	1,681,000
1947	10,400	May 8, 1947	290	2,234	3.78	51.28	1,617,000	2,365	54.31	1,712,000
1948	22,700	May 29, 1948	431	2,466	4.17	56.78	1,790,000	2,341	53.02	1,700,000
1949	16,000	May 16, 1949	350	2,369	4.01	54.40	1,715,000	2,642	60.67	1,913,000
1950	16,300	Nov. 27, 1949	490	3,052	5.16	70.10	2,210,000	3,084	70.83	2,288,000
1951	15,300	May 12, 1951	460	2,975	5.03	66.33	2,154,000	2,714	62.34	1,965,000
1952	9,060	May 19, 1952	351	1,874	3.17	43.17	1,360,000	1,678	38.61	1,217,000
1953	8,540	May 19, 1953	186	2,172	3.68	49.88	1,572,000			

① May 30, June 9, 1917.

Chiwaukum Creek near Chiwaukum, Wash.

Location.—Lat. 47°40'50", long. 120°43'50", in NW¼ sec. 9, T. 25 N., R. 17 E., on left bank at trail crossing, half a mile upstream from mouth, and 1 mile southeast of Chiwaukum.

Drainage area.—49.6 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,750 ft. (from topographic map).

Extremes.—June to October 1911: Maximum discharge observed, 803 cfs June 12, 1911 (gage height, 2.90 ft.); minimum observed, 24 cfs Oct. 4, 5, 1911 (gage height, 0.55 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1911								382	154	45.1	34.4	20	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1911								255	67	33	27		

Icele Creek above Snow Creek, near Leavenworth, Wash.

Location.—Lat. 47°32'25", long. 120°42'55", in SE¼ sec. 28, T. 24 N., R. 17 E., on right bank, three-eighths of a mile upstream from Snow Creek, and 4½ miles southwest of Leavenworth.

Drainage area.—193 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,450 ft. (from river-profile map).

Average discharge.—17 years (1936-53), 589 cfs.

Extremes.—1936-53: Maximum discharge, 11,600 cfs May 28, 1948 (gage height, 13.93 ft.), from rating curve extended above 7,000 cfs on basis of slope-area determination of peak flow; minimum not determined, may have been less than 45 cfs, estimated daily discharge for Nov. 30, 1952, during period of ice effect.

Remarks.—No diversion. Some regulation in headwater lakes for irrigation below station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936													110
1937	84.0	67.3	121	72.4*	72.5*	112	293	1,392	2,577	839	184	121	495*
1938	122	344	342	277	153	191	852	2,040	2,150	633	196	117	817
1939	111	147	221*	289*	143	290	919	1,711	1,242	699	130	106	507*
1940	121	224	423	152*	173	340	821	1,714	1,941	351	124	93.8	460*
1941	177	138*	193*	123	119	385	887	984	779	269	121	238	368*
1942	443*	337	307	171	131	154	779	1,294	1,550	598	157	92.8	499*
1943	74.7	192	253	286	204	247	1,099	1,336	2,157	1,495	327	125	631
1944	112	113	264	121	97.8*	190	511	1,342	1,190	345	132	194	384*
1945	157	152	238*	415	397	209	330	1,610	1,353	432	150	153	471*
1946	176	252	160*	155	115	174	688	2,564	1,996	940	245	134	636*
1947	224	191	389	265	347	534	1,018	2,311	1,550	691	229	148	662
1948	567	555*	366*	220	189	176	425	2,214	3,429	924	333	180	798*
1949	315*	208*	217*	165*	176	237	847	2,599	2,006	991	326	207	694*
1950	358	894	556	227*	162*	290	406	1,474	3,096	1,838	419	172	829*
1951	417	508	697	408	797	324	1,008	2,253	2,118	891	239	145	821
1952	359	216	175*	123*	144	154	827	1,739	1,362	660	192	120	515*
1953	77.0	60.2	72.9*	366	515	266	333	1,630	1,731	1,481	411	160	610*

* Estimated.

WENATCHEE RIVER BASIN

Icicle Creek above Snow Creek, near Leavenworth, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936												86*	
1937	72	44*	55*	65*	85*	70	150	500	1,730	300	121	104	44*
1938	70	134	235	170*	138	150	201	650	1,350	293	115	88	70
1939	78	94	120	150*	110*	121	612	1,150	930	344	121	87	78
1940	78	118	235*	115*	130*	172	404	835	508	167	104	70	70
1941	78	95*	145*	113	99	226	622	606	456	135	100	114	78
1942	228	219	185	145	106	114	293	579	834	245	104	75	75
1943	50	91	158	150	182	174	520*	640	1,340	664	182	94	50
1944	85	92	119	89	90*	89	236	664	717	181	105	95	85
1945	106	107	110*	105*	219	182	100	854	717	211	109	105	105
1946	81	176	120*	115*	110	131	245	1,050	1,100	448	159	104	81
1947	94	133	157	150*	273	264	518	1,390	875	396	144	110	94
1948	113	340*	233	170*	161	157	193	448	2,110	517	224	140	113
1949	170	135*	140	150*	123	184	251	868	931	570	198	140	123
1950	136	289	320	150*	180	180	260*	454	1,950	683	251	125	125
1951	125	260	427	240*	240*	283	338	870	1,450	358	136	110	110
1952	219	215	130*	115*	126	121	222	818	822	283	124	100*	100*
1953	68	45*	48*	75*	230*	224	226	885	1,100	646	230*	113	45*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1936										
1937	4,320	June 3, 1937	44	495	2.56	34.70	358,100	539	37.93	390,500
1938	4,080	May 25, 1938	70	617	3.20	43.38	446,400	569	41.45	426,400
1939	3,630	May 29, 1939	78	507	2.63	35.65	366,800	531	37.36	384,500
1940	3,170	May 23, 1940	70	460	2.38	32.45	333,900	438	30.93	318,200
1941	1,640	May 31, 1941	78	368	1.91	25.92	266,600	438	30.82	317,000
1942	3,310	May 25, 1942	75	499	2.59	35.08	361,000	490	30.23	311,100
1943	3,530	June 17, 1943	50	651	3.37	45.76	471,100	648	45.59	469,300
1944	2,400	May 15, 1944	85	384	1.99	27.12	279,100	389	27.46	282,600
1945	3,530	May 31, 1945	105	471	2.44	33.13	341,000	474	33.35	343,400
1946	3,530	June 14, 1946	81	636	3.30	44.76	460,700	655	46.06	474,000
1947	4,000	May 28, 1947	94	662	3.43	46.53	478,900	719	50.55	520,300
1948	11,660	May 28, 1948	113	798	4.13	56.27	579,000	735	51.87	538,700
1949	5,110	May 15, 1949	123	694	3.60	48.81	502,500	780	54.88	564,900
1950	8,020	Nov. 27, 1949	125	829	4.30	58.29	600,100	822	57.77	594,800
1951	6,110	May 11, 1951	110	821	4.25	57.72	594,100	751	52.79	543,400
1952	3,000	May 19, 1952	100	515	2.67	36.28	373,600	462	32.56	335,200
1953	2,940	July 8, 1953	45	610	3.16	42.94	441,900			

* Estimated.

Icicle Creek near Leavenworth, Wash.

Location.—Lat. 47°33'30", long. 120°40'00", in sec. 24, T. 24 N., R. 17 E., on left bank, 2½ miles upstream from mouth, and 2½ miles south of Leavenworth.

Drainage area.—211 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,110 ft. (from river-profile map).

Extremes.—1911-14: Maximum discharge, 4,760 cfs June 3, 1913 (gage height, 8.10 ft., from graph based on gage readings); minimum observed, 84 cfs Nov. 2-3, 1911 (gage height, 0.18 ft.).

Remarks.—Diversions for irrigation of about 1,000 acres above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									1,870	676	225	215	
1912	111	328	237	220*	223	188	552	1,976	2,030	664	273	195	582*
1913	144	503	182	176*	305	227	605	1,740	2,970	1,460	424	300	728*
1914	360	374	231	424	210	392	950	1,520	1,420	706	226	173	609
1915	189												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911										350	139	189	
1912	87	84	186		195	130	420	620	1,000	345	200	110	84
1913	106	141	130			176	214	620	1,930	725	248	200	
1914	153	195	176	176	140*	224	395	1,110	780	320	130	110	110
1915	130												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
Discharge	Date							
1911								
1912	4,700	May 20, 1912	84	582	423,000	570	414,000	
1913	4,760	June 3, 1913		728	530,000	765	564,000	
1914	3,140	May 15, 1914	130	609	441,000			
1915								

* Estimated.

WENATCHEE RIVER BASIN

Wenatchee River at Peshastin, Wash.

Location.—Lat. 47°34'50", long. 120°37'00", in SE¼SW¼ sec. 8, T. 24 N., R. 18 E., on right bank, 1 mile northwest of Peshastin, and 3½ miles upstream from Peshastin Creek.

Drainage area.—1,000 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,028.04 ft. above mean sea level, datum of 1929. Prior to Mar. 24, 1932, staff gage 1¼ miles downstream at different datum.

Average discharge.—25 years (1928-53), 2,900 cfs.

Extremes.—1929-53: Maximum discharge, 32,300 cfs May 28, 1948 (gage height, 15.88 ft.); minimum, 183 cfs Oct. 14, 1939; minimum gage height, 1.24 ft. Nov. 1, 1952; minimum daily, 270 cfs Oct. 2, 1929, Nov. 30, 1936, Dec. 1, 1952.

Remarks.—Numerous diversions upstream for irrigation of an estimated 3,200 acres above station, and domestic use above and below station. Icicle irrigation canal, which bypasses station, supplies a substantial part of remaining 22,000 acres irrigated in basin. Some regulation by powerplant in Tumwater Canyon and by millpond at Leavenworth prior to 1930.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	1,170*	710*	570*	450*	450*	806	1,480	0,360	6,080	2,670	862	442	1,890*
1930...	376	329	474	421*	953*	1,680	4,930	5,030	4,510	2,420	783	458	1,860*
1931...	577	697	482	700	1,220	1,540	2,760	8,230	5,590	1,730	572	506	2,050
1932...	509	1,290	627	895	2,160	3,530	4,410	8,130	8,980	4,050	1,300	602	3,030
1933...	807	4,460	2,710	1,080	901	971	2,000	5,020	11,700	8,580	2,820	1,250	3,740
1934...	3,040	4,546*	5,648	3,697	3,042	5,172	11,250	8,911	6,079	2,644	1,119	983	4,706*
1935...	1,080	3,897	1,888	3,506	3,131	2,095	2,750	8,208	9,941	4,945	1,447	854	3,044
1936...	612	525	497	550	480*	1,018	4,693	11,090	8,934	2,257	790	585	2,671*
1937...	475	339	728	493*	476*	839	1,923	6,602	11,440	4,451	1,071*	637	2,463*
1938...	720	1,778	1,697	1,445	872	1,294	4,696	9,777	10,070	3,345	816	522	3,091
1939...	622	845	1,310	1,841	901	1,372	4,234	7,447	5,516	3,481	981	495	2,429
1940...	611	1,151	2,037	883	923	1,856	4,385	7,773	5,214	1,586	660	543	2,304
1941...	1,045	776	1,072	643	618	1,867	4,334	4,414	3,101	1,164	587	953	1,725
1942...	2,089	1,761	2,308	887*	705	880	3,661	5,770	5,489	2,801	789	426	2,305*
1943...	336	782	1,122	1,190*	972	1,239	5,501	6,854	10,070	7,572	1,895	688	3,186*
1944...	627	647	1,444	616	651	1,126	2,518	5,677	5,062	1,578	577	706	1,776
1945...	780	846	1,293	2,125	1,555	1,090	1,712	7,404	6,809	2,667	785	682	2,339
1946...	1,044	1,452	820	849*	657	1,118	3,418	12,110	9,592	4,993	1,394	683	3,101*
1947...	930	849	1,863	1,457*	1,822	2,884	5,250	10,140	7,097	3,265	1,125	733	3,125*
1948...	2,300	2,288	1,576	1,050*	979	972	2,441	9,433	14,750	4,234	1,639	933	3,547*
1949...	1,507	1,161	1,175	689*	989*	1,450	4,572	12,410	9,379	4,560	1,533	1,046	3,385*
1950...	1,455	4,001	2,965	1,495*	1,121*	1,843	2,539	7,445	14,650	9,491	2,687	1,017	4,237*
1951...	2,255	2,893	3,563	2,194	3,944	1,862	5,379	11,250	9,754	4,651	1,357	802	4,164
1952...	1,848	1,765	1,081	809*	830	948	3,979	8,314	6,723	3,307	1,061	615	2,016*
1953...	463	384	421	2,076	2,917	1,588	2,883	7,955	8,183	6,888	1,967	802	3,046

* Estimated.

Wenatchee River at Peshastin, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929							\$10	8,310	4,870	1,310	535	310	.....
1930	270	290	300			900	2,250	3,730	3,560	1,210	492*	349	270
1931	385	555			850	980	1,840	4,630	3,080	862	470	430	.....
1932	390	595		540	470	1,950	3,000	5,200	6,300	2,110	785	534	390
1933	479	1,120	1,310	1,150		840	1,190	3,780	7,670	4,380	1,290	885	479
1934	1,170			2,600	2,400	2,720		6,430	3,560	1,670	862	531	531
1935	479	2,340	1,500	850*	1,900	1,500	1,620	4,690	6,660	2,530	968	628	479
1936	525	448	390	420*	430*	855	757	7,100	3,630	1,120	564	470	390
1937	355	270	274	440*	430*	550*	1,320	2,600	9,180	1,720	700*	470	270
1938	426	348	1,350	998	764	895	1,400	5,220	7,089	1,400	569	464	426
1939	454	660	731	1,060	757	668	3,070	5,420	4,380	2,140	580*	405	405
1940	405	686	1,240	672	798	938	2,860	4,650	2,790	908	547	442	405
1941	416	542	794	576	576	992	3,180	2,920	1,940	636	504	498	416
1942	1,020	1,110	1,090*	729	630	630	1,350	2,790	3,720	1,210	476	347	347
1943	276	440	696	703	827	862	2,790	3,860	7,010	3,580	960*	559	276
1944	525	558	580*	525	542	526	1,280	3,890	3,780	582	460	395	395
1945	569	640	760*	712	1,110	974	1,070	3,460	3,320	1,150	580	520	520
1946	481	966	600*	710*	598	819	1,530	5,350	5,530	2,600	889	476	476
1947	425	692	777	900*	1,380	1,680	2,980	6,810	4,790	1,000	731	634	425
1948	666	1,480	1,280	800*	850*	847	1,200	2,600	8,830	2,360	1,160	724	666
1949	1,020	854	800*	560*	530*	1,070	1,670	4,970	4,740	2,570	626	741	530*
1950	741	1,290	1,620	1,100*	966	1,160	1,770	2,960	9,560	4,110	1,470	755	741
1951	822	1,570	2,160	1,380*	1,300*	1,570	2,160	4,910	7,160	2,210	870	613	613
1952	1,380	1,270	900*	740*	722	678	1,430	4,000	4,230	1,650	696	475	475
1953	376	274	270	400*	1,390	1,310	1,450	4,810	5,640	3,170	1,100	557	270

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1929	11,900	May 24, 1929	.....	1,890	1,370,000	1,790	1,290,000
1930	8,310	May 17, 1930	270	1,890	1,350,000	1,910	1,380,000
1931	12,500	May 15, 1931	.....	2,050	1,490,000	2,100	1,520,000
1932	16,000	Feb. 28, 1932	990	3,080	2,200,000	3,500	2,540,000
1933	20,400	June 16, 1933	479	3,740	2,770,000	4,230	3,070,000
1934	18,400	April 24, 1934	531	4,706	3,407,000	4,716	2,980,000
1935	15,400	June 8, 1935	479	3,644	2,638,000	3,209	2,323,000
1936	16,600	May 29, 1936	390	2,671	1,939,000	2,663	1,933,000
1937	14,800	June 3, 1937	270	2,463	1,783,000	2,684	1,943,000
1938	17,500	May 26, 1938	426	3,091	2,238,000	2,973	2,152,000
1939	12,700	May 16, 1939	405	2,429	1,759,000	2,515	1,821,000
1940	12,700	May 24, 1940	405	2,364	1,672,000	2,228	1,617,000
1941	6,730	May 1, 1941	416	1,725	1,249,000	1,999	1,447,000
1942	13,100	May 26, 1942	347	2,305	1,669,000	1,975	1,430,000
1943	15,700	May 26, 1943	274	3,166	2,307,000	3,227	2,330,000
1944	8,800	May 16, 1944	395	1,775	1,262,000	1,791	1,301,000
1945	13,900	May 31, 1945	520	2,339	1,694,000	2,371	1,717,000
1946	15,900	May 27, 1946	476	3,191	2,310,000	3,221	2,332,000
1947	14,500	May 28, 1947	425	3,125	1,669,000	3,330	2,415,000
1948	32,300	May 28, 1948	666	3,547	2,575,000	3,353	2,434,000
1949	22,700	May 16, 1949	530	3,355	2,460,000	3,766	2,726,000
1950	21,800	June 21, 1950	741	4,237	3,067,000	4,264	3,087,000
1951	20,000	May 12, 1951	613	4,154	3,007,000	3,816	2,763,000
1952	12,900	May 19, 1952	475	2,616	1,879,000	2,329	1,691,000
1953	12,200	⊙	270	3,045	2,204,000	.....	.....

* Estimated. ⊙ May 19, July 9, 1953.

WENATCHEE RIVER BASIN

Peshastin Creek at Blewett, Wash.

Location.—Lat. 47°25'10", long. 120°39'20", in sec. 12, T. 22 N., R. 17 E., on left bank at Blewett, 1½ miles downstream from Tronsen Creek, 1½ miles upstream from Negro Creek, and 13 miles upstream from mouth.

Drainage area.—40.0 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,320 ft. (from topographic map).

Extremes.—1911-12: Maximum discharge observed, 221 cfs May 12, 13, 1912 (gage height, 3.05 ft.); minimum observed, 2.4 cfs Aug. 25-31, 1911 (gage height, 0.42 ft.), but may have been less during periods of no gage-height record.

Remarks.—Small diversions for mining reenter stream above station. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911											3.05	3.63	
1912	3.34	18.7	8.69*					120*	21.4*	0.35*			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911											2.4	2.7	
1912	3.2	3.8											

Peshastin Creek below Ingalls Creek, near Leavenworth, Wash.

Location.—Lat. 47°28'10", long. 120°39'20", in NE¼ sec. 24, T. 23 N., R. 17 E., on right bank at Allen ranch, three-eighths of a mile downstream from Ingalls Creek, and 9 miles south of Leavenworth.

Drainage area.—102 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,750 ft. (from topographic map).

Extremes.—1911-12: Maximum discharge, 1,560 cfs May 20, 1912 (gage height, 4.54 ft., from graph based on gage readings); minimum observed, 18 cfs Oct. 25 to Nov. 4, 11, 1911 (gage height, 0.60 ft.), but may have been less during periods of no gage-height record.

Remarks.—Small diversions for mining and domestic use reenter stream above station. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911											47.8	43.7	
1912	24.0	65*	40*	35*	35*	35*	245	506	378	111	60*	40*	139*

* Estimated.

Peshastin Creek below Ingalls Creek, near Leavenworth, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911											26	26	
1912	18							335	180				

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1912	1,560	May 20, 1912		139	1.36	18.56	101,000			

Wenatchee Valley Canal at Dryden, Wash.

Location.—Lat. 47°32'40", long. 120°33'20", in sec. 26, T. 24 N., R. 18 E., on left bank, a quarter of a mile downstream from Dryden powerhouse, a quarter of a mile north of Dryden, and 1½ miles downstream from intake.

Supplemental records available.—Estimated discharges July 1904 to June 1911 are published in Geological Survey Water-Supply Paper 492.

Gage.—Staff gage. Altitude of gage is 850 ft. (from topographic map).

Average discharge.—6 years (1911-17), 52.1 cfs.

Extremes.—1911-17: Maximum discharge observed, 189 cfs Aug. 27 to Sept. 30, 1917 (gage height, 3.20 ft.); no flow except during irrigation seasons.

Remarks.—Canal operates during irrigation season only. Served approximately 11,500 acres in 1917.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911									3,940	6,560	6,890	4,210	.....
1912	2,950	0	0	0	0	0	1,770	4,220	5,530	6,520	7,260	5,350	33,600
1913	2,790	0	0	0	0	0	0	0	6,430	7,130	7,260	7,140	30,900
1914	4,230	672	0	0	0	0	1,090	5,340	6,010	6,400	6,050	5,390	37,000
1915	2,230	0	0	0	0	0	1,270	6,050	7,260	6,400	7,870	6,070	38,000
1916	2,700	0	0	0	0	0	0	4,300	7,440	7,440	7,690	6,130	35,700
1917	735	345	0	0	0	0	2,230	7,130	8,870	10,000	10,900	11,200	51,400

WENATCHEE RIVER BASIN

Wenatchee River at Dryden, Wash.

Location.—Lat. 47°32'40", long. 120°33'40", in SW¼ sec. 26, T. 24 N., R. 18 E., on left bank, a quarter of a mile northwest of Dryden, 1 mile downstream from intake of Wenatchee Valley Canal, and 4 miles northwest of Cashmere.

Drainage area.—1,160 sq. mi., approximately. At site below Mission Creek, 1904-9, 1,280 sq. mi., approximately. At site above Mission Creek, 1910-11, 1,200 sq. mi., approximately.

Supplemental records available.—Gage-height records collected at Dryden power-plant, April 1909 to September 1911, by Wenatchee Valley Gas and Electric Co., most of which are contained in Geological Survey water-supply papers.

Gage.—Staff gage. Altitude of gage is 905 ft. (from river-profile map). Prior to Oct. 13, 1909, staff and chain gages 4 miles downstream (half a mile below Mission Creek) at different datum. Oct. 13, 1909, to Sept. 30, 1911, staff gage 3 miles downstream at different datum.

Average discharge.—13 years (1904-17), 3,389 cfs (unadjusted).

Extremes.—1904-17: Maximum discharge observed, 24,500 cfs June 17, 18, 1916 (gage height, 9.85 ft.); minimum observed, 470 cfs Sept. 14-16, 1915 (gage height, —0.3 ft.), but may have been less during period of no gage-height record Sept. 17 to Oct. 28, 1915.

Maximum discharge known, 27,100 cfs Dec. 30 or 31, 1917 (gage height, 11.1 ft., from high-water mark).

Remarks.—Many diversions above station for irrigation and domestic use above and below station. The Wenatchee Valley Canal bypassed the gage (see p. 553). Slight regulation by millpond operation at Leavenworth and by powerplant directly upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...											2,080	1,080	.....
1905...	855	1,300	1,300	900	900	4,370	4,710	6,550	10,500	4,450	1,560	1,000	3,210
1906...	2,950	1,400	965	1,040	1,520	1,450	5,860	7,860	5,890	3,260	1,160	1,000	2,830
1907...	2,420	7,100*	2,200*	1,040	2,420	2,040	4,670	12,500	9,500	4,330	1,560	1,220	4,250*
1908...	1,110*	1,300*	1,730	1,890	1,210	2,380	4,560	9,650	11,500	9,500	2,960	970*	3,830*
1909...	750*	1,100*	930*	800*	770*	1,100*	3,100*	7,420	13,600	5,510	1,510	930	3,130*
1910...	1,070	5,260	4,050	1,630	1,420	4,550	7,100	12,600	7,650	4,770	1,770	576	4,410
1911...	2,980	4,160	1,560	1,840	900	1,540	3,470	5,600	9,490	3,580	1,340	1,160	3,120
1912...	644	1,740	1,250	1,060	1,080	1,040	3,250	9,720	10,000	3,370	1,270	784	2,930
1913...	687	1,650	1,000	981	1,280	1,380	3,950	9,010	13,800	7,530	2,100	1,430	3,700
1914...	1,570	1,710	1,200	1,790	1,040	2,340	5,510	9,210	7,030	3,760	1,150	904	3,110
1915...	1,290	2,960	1,240	787	705	1,550	5,530	3,900	2,590	1,360	931	545	1,950
1916...	897*	1,350	975	803	1,110	3,300	6,290	9,750	14,000	9,840	3,660	1,430	4,450*
1917...	795	795	690	705*	901	790	1,450	7,730	11,700	8,826	2,140	959	3,140*

* Estimated.

Wenatchee River at Dryden, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904											1,280	830	
1905	730	690	1,030	730	650	1,820	2,210	4,740	6,900	2,500	1,030	890	650
1906	1,190	1,190	780	780	1,190	1,190	3,000	4,740	3,800	1,500	890	830	780
1907	830	1,940	1,380	890	960	1,280	1,820	6,320	5,500	2,500	1,110	890	830
1908	1,110	1,120*	1,190	960	890	1,380	2,070	5,760	6,320	3,800	1,700		
1909								4,380	7,500	2,660	1,030	730	
1910	870	1,020	1,720	1,220	1,060	1,050	2,600	7,020	5,120	2,720	965	670	670
1911	710	1,920	1,390	1,010	670	670	2,140	3,890	5,320	1,470	1,020	760	670
1912	580	580	880	710	880	760	2,250	4,150	5,450	1,610	820	580	580
1913	580	710	820	760	830	1,200	1,290	3,730	9,720	3,610	1,120	720	580
1914	775	900	835	900	900	1,200	2,120	5,420	4,150	1,130	840	675	675
1915	780	1,350	940	620	660	660	2,710	3,030	1,200	880	760		
1916		860	770		690	1,300	3,820	6,550	8,730	5,190	2,110	1,040	
1917	710	600				600	600	2,460	8,220	3,440	1,110	750	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Dis-charge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1904							
1905	14,900	June 4, 1905	650	3,210	2,320,000	3,380	2,450,000
1906	11,600	May 3, 1906	780	2,830	2,040,000	3,350	2,430,000
1907			830	4,250	3,080,000	3,620	2,620,000
1908				3,830	2,780,000	3,710	2,700,000
1909				3,130	2,270,000	3,760	2,720,000
1910	20,900	Nov. 30, 1909	670	4,470	3,190,000	4,300	3,110,000
1911	15,560	June 14, 1911	670	3,120	2,260,000	2,670	1,930,000
1912	18,400	May 21, 1912	580	2,930	2,130,000	2,860	2,070,000
1913	24,100	June 3, 4, 1913	580	3,700	2,680,000	3,850	2,780,000
1914	14,600	May 16, 1914	675	3,110	2,250,000	3,200	2,310,000
1915	9,880	April 3, 1915		1,950	1,410,000	1,750	1,270,000
1916	24,500	June 17, 18, 1916		4,450	3,230,000	4,390	3,180,000
1917	16,200	June 17, 1917		3,140	2,270,000		

* Estimated.

Wenatchee River near Wenatchee, Wash.

Location.—Lat. 47°29'10", long. 120°24'50", in SE¼ sec. 14, T. 23 N., R. 19 E., in midstream at highway bridge, 6 miles upstream from mouth, and 6½ miles northwest of Wenatchee.

Drainage area.—1,310 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 680 ft. (from river-profile map).

Extremes.—August to November 1897: Maximum discharge observed, 13,300 cfs Nov. 20; minimum observed, 700 cfs Oct. 4-12, 16-21, 29, 31, Nov. 1-7.

Remarks.—A few small diversions for irrigation above station. No known regulation.

WENATCHEE RIVER BASIN

Wenatchee River near Wenatchee, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1897										2,100*	1,000	755	.....

DOUGLAS CREEK BASIN

Douglas Creek near Alstown, Wash.

Location.—Lat. 47°35'00", long. 120°00'50", in S½ sec. 12, T. 24 N., R. 22 E., on left bank, 1½ miles northwest of Alstown, and 2.9 miles south of Douglas.

Drainage area.—114 sq. mi.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 2,260 ft. (by barometer).

Extremes.—1949-53: Maximum discharge, 1,350 cfs June 18, 1950 (gage height, 6.70 ft., from high-water mark), from rating curve extended above 60 cfs on basis of slope-area determination at gage height 13.05 ft.; minimum recorded, 0.1 cfs Oct. 19, 1949, but may have been less during period of no gage-height record Jan. 21-24, 1950.

Flood of June 10, 1948 reached a stage of 13.05 ft., from floodmarks (discharge, 6,420 cfs), on basis of slope-area determination.

Remarks.—Possible minor diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										0.41	0.38	0.29	.....
1950	0.33	0.58	0.58	0.32	0.66	84.1*	35.3	2.75	20.6	1.00*	0.70*	0.65	12.6*
1951	.65	.88	.70	1.18*	5.20*	43.3*	25.0*	3.41	1.76	1.15	.50	.68	7.05*
1952	.77	1.16	1.70*	1.50*	2.14	10.3	3.78	2.24	1.41	.69	.54	.58	2.27*
1953	.67	.52	.74*	2.62	2.27	1.87	1.67	1.59	1.53	1.01*	.84	.60	1.32*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949									0.4	0.4	0.3	0.2	.....
1950	0.2	0.4	0.4	0.2	0.2	1.9	3.7	1.5	1.5	.7*	.7	.6	0.2
1951	.4	.6	.7						1.2	.8	.4	.6	.....
1952	.6	.7			1.7	1.9	2.1	1.5	1.0	.4	.4	.8	.....
1953	.4	.4		.4	1.7	1.7	1.3	1.2	1.3			.6	.....

* Estimated.

Douglas Creek near Alstown, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1950.....	1,350	June 18, 1950	0.2	12.6	9,140	12.7	9,190
1951.....	293	Mar. 26, 1951	.....	7.05	5,110	7.17	6,190
1952.....	214	Mar. 25, 1952	.....	2.27	1,640	2.13	1,540
1953.....	73	Aug. 26, 1953	.....	1.32	958	.....	.....

Douglas Creek near Palisades, Wash.

Location.—Lat. 47°28'00", long. 119°52'30", in NW¼ sec. 30, T. 23 N., R. 24 E., on right bank, just upstream from Great Northern Railway (Mansfield Branch) bridge, 1.3 miles upstream from mouth, and 3.8 miles northeast of Palisades.

Drainage area.—206 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,360 ft. (by barometer).

Extremes.—1949-52: Maximum discharge, 1,960 cfs June 18, 1950 (gage height, 6.30 ft., from high-water mark in well), from rating curve extended above 70 cfs on basis of slope-area determination of peak flow; minimum, 3.1 cfs Dec. 25, 26, 1951 (gage height, 1.74 ft.), but may have been less during period of no gage-height record Jan. 2-30, 1952.

Remarks.—A few minor diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....	.....	6.37	6.64	6.45	42.7	270	67.7	11.0	20.7	7.09	6.85	6.87	.....
1951.....	7.65	7.90	8.35	7.86	29.8	135	93.3*	14.3	9.33*	7.94	7.37	7.38	28.0*
1952.....	7.57	7.62	6.56	4.51*	8.14	24.2	13.8	9.45	7.91	8.71	7.70	8.28	9.57*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....	.....	6.2	6.3	6.2	6.3	6.4	13.5	9.0	7.7	6.9	6.8	6.8	.....
1951.....	7.2	7.7	7.7	7.2	7.7	8.7	.....	9.2	.....	.....	6.8	7.2	6.8
1952.....	7.2	7.2	3.1	.....	7.7	8.2	11	8.2	6.8	7.7	7.7	7.7	.....

* Estimated.

DOUGLAS CREEK BASIN

Douglas Creek near Palisades, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1950.....	1,960	June 18, 1950	.....	.....	.....	38.7	27,990
1951.....	1,520	Mar. 26, 1951	6.8	28.0	20,250	27.8	20,130
1952.....	408	Mar. 25, 1952	.....	9.57	6,940	.....	.....

Douglas Creek at Palisades, Wash.

Location.—Lat. 47°25', long. 119°56', in SE¼ sec. 10, T. 22 N., R. 23 E., on left bank, three-quarters of a mile south of Palisades.

Drainage area.—844 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 955 ft. (by barometer).

Extremes.—1951-53: Maximum discharge, 1,990 cfs Mar. 26, 1951 (gage height, 7.22 ft.), from rating curve extended above 260 cfs by logarithmic plotting; no flow for long periods each year.

Remarks.—A few diversions for irrigation and domestic use above station. No regulation. Records of daily discharge are inadequate to give monthly figures or allow reliable estimates. Station operated to obtain flood flows only.

Annual Flood Peaks

WATER YEAR	Date	Gage height (feet)	Discharge (cfs)
1951.....	March 26, 1951	7.22	1,990
1952.....	March 25, 1952	4.55	442
1953.....	No flow during year		



Figure 20. Concrete gage house and well on Columbia River at Trinidad.

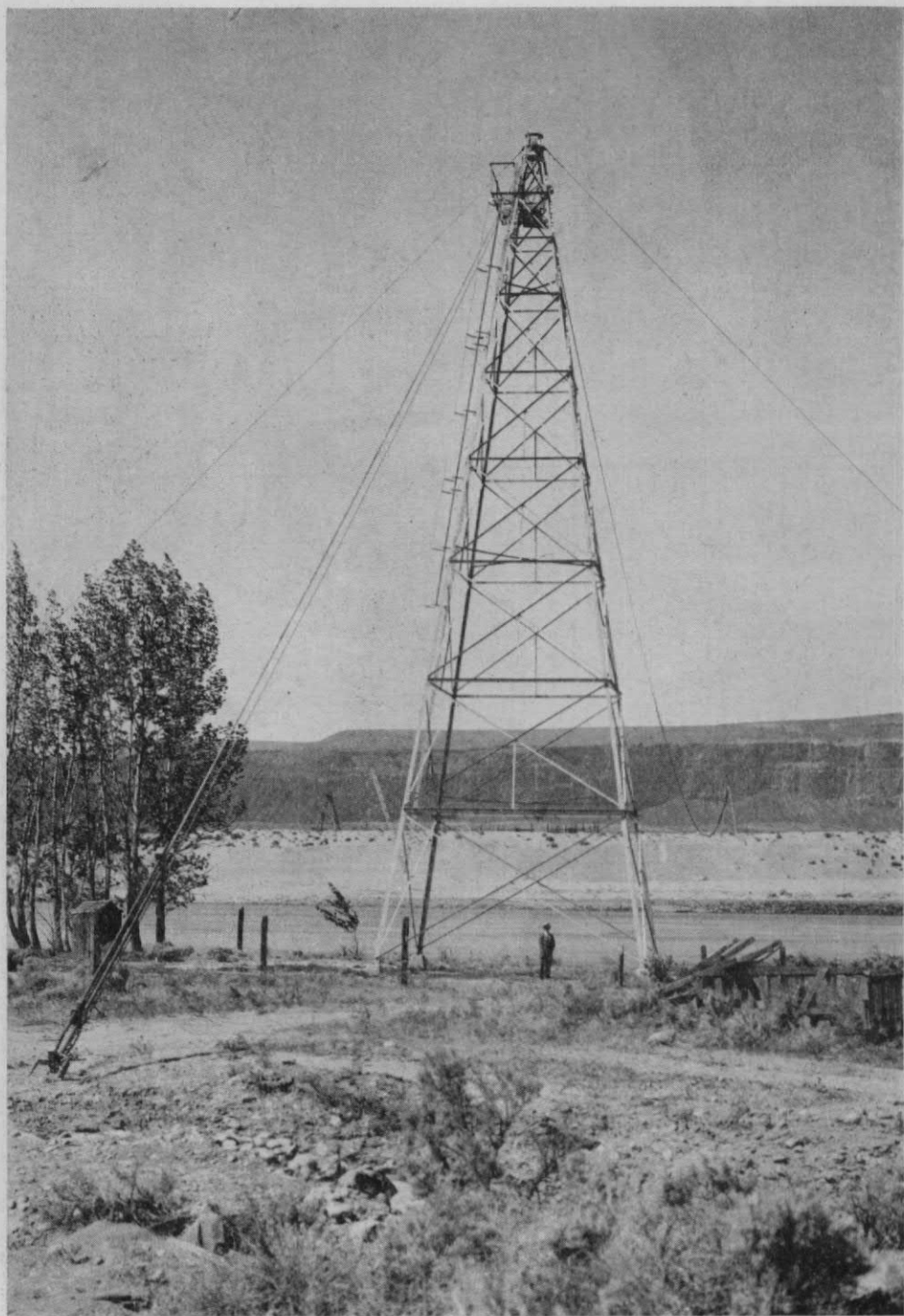


Figure 21. Cableway on Columbia River at Trinidad, viewed from left bank. Cable support tower is 84 feet high. Span is 1,654 feet.

Columbia River at Trinidad, Wash.

Location.—Lat. 47°13'30", long. 120°00'50", in SE¼ sec. 13, T. 20 N., R. 22 E., on left bank, half a mile southwest of Trinidad, 8½ miles downstream from Colocham Creek, and 12 miles downstream from Rock Island Dam.

Drainage area.—89,700 sq. mi., approximately; 88,500 sq. mi., approximately, at Wenatchee; 95,500 sq. mi., approximately, at Vernita.

Supplemental records available.—Gage-height records collected at Wenatchee, 1900-31 and, since 1933, at Trinidad, are contained in reports of U. S. Weather Bureau.

Gage.—Water-stage recorder. Datum of gage is 499.3 ft. above mean sea level (river-profile survey). May 1, 1913, to Dec. 31, 1916, staff gages at Wenatchee about 24 miles upstream at different datums. Jan. 14, 1917, to Sept. 30, 1930, staff gage at Vernita about 50 miles downstream at datum 388.7 ft. above mean sea level, unadjusted.

Average discharge.—40 years (1913-53), 117,700 cfs.

Extremes.—1913-53: Maximum discharge, 692,600 cfs June 12, 1948 (gage height, 59.35 ft.); minimum, 4,120 cfs Feb. 10, 1932 (gage height, 11.40 ft.).

Maximum discharge known, about 740,000 cfs June 7, 1894 (from high-water marks at Wenatchee).

Remarks.—Diversion above station for irrigation of about 500,000 acres is small percentage of flow past gage. Some diurnal fluctuation caused by powerplants at Rock Island and Grand Coulee Dams. Flow regulated by Franklin D. Roosevelt Lake (see p. 493) and reservoirs in Kootenai, Pend Oreille, Spokane, Okanogan, and Chelan River basins.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913								209,000	480,000	323,000	174,000	116,000	.....
1914	70,500	60,200	46,600	41,500	39,600*	55,000	111,000	249,000	332,000	282,000	147,000	87,600	127,000*
1915	69,900	71,500	56,500	35,800	32,600	41,200	88,200	189,000	202,000	196,000	172,000	104,000	106,000
1916													
1917	50,000	54,500	46,000*	32,400*	36,200*	70,400	135,000	241,000	361,000	459,000	219,000	127,000	153,000*
1918	67,700	48,200*	37,200	29,400	30,400	28,900	55,000	191,000	410,000	356,000	168,000	95,800	127,000*
1919	72,100	45,700	50,800	99,000	61,400	50,800	103,000	233,000	335,000	286,000	154,000	89,400	133,000
1920	73,200	53,100	45,100	40,700	50,700	46,100	96,600	221,000	335,000	261,000	154,000	92,200	123,000
1921	49,700	36,400	28,100*	27,500*	31,100*	32,100	44,400	146,000	253,000	333,000	192,000	99,500	107,000*
1922													
1923	97,600	65,600	53,100	53,300	52,700	69,400	101,000	246,000	439,000	286,000	153,000	81,900	142,000
1924	56,100	61,300	58,300	38,600*	29,700*	31,100	54,800	165,000	391,000	245,000	136,000	97,900	114,000*
1925	61,300	44,900	31,600*	44,100	30,200*	31,900	79,000	203,000	375,000	287,000	148,000	99,400	120,000*
1926	53,800	37,800	33,000	26,200*	47,100	45,800	47,500	208,000	251,000	175,000	119,000	88,300	94,600*
1927	51,700	50,700	47,700	46,900	69,400	61,400	145,000	509,000	366,000	269,000	145,000	83,400	137,000
1928													
1929	53,800	37,800	33,000	26,200*	47,100	45,800	47,500	208,000	251,000	175,000	119,000	88,300	94,600*
1930	51,700	50,700	47,700	46,900	69,400	61,400	145,000	509,000	366,000	269,000	145,000	83,400	137,000
1931													
1932	53,800	37,800	33,000	26,200*	47,100	45,800	47,500	208,000	251,000	175,000	119,000	88,300	94,600*
1933	51,700	50,700	47,700	46,900	69,400	61,400	145,000	509,000	366,000	269,000	145,000	83,400	137,000
1934													
1935	53,800	37,800	33,000	26,200*	47,100	45,800	47,500	208,000	251,000	175,000	119,000	88,300	94,600*
1936	51,700	50,700	47,700	46,900	69,400	61,400	145,000	509,000	366,000	269,000	145,000	83,400	137,000
1937													
1938	53,800	37,800	33,000	26,200*	47,100	45,800	47,500	208,000	251,000	175,000	119,000	88,300	94,600*
1939	51,700	50,700	47,700	46,900	69,400	61,400	145,000	509,000	366,000	269,000	145,000	83,400	137,000
1940													
1941	52,110	37,690	31,500	29,940	24,270*	23,450	18,790	271,500	319,000	173,800	108,900	70,250	102,800*
1942	46,050	32,200	26,840	21,710*	20,900*	26,500	46,770	143,000	269,700	202,500	112,600	72,200	85,400*
1943	47,070	62,040	61,890	51,300	40,450	54,600	104,700	297,700	362,900	243,200	105,700	75,900	120,100
1944	59,540	42,000	35,570	36,400	32,880	37,380	90,080	240,600	244,000	193,000	113,000	71,480	100,100
1945	51,960	56,660	50,630	39,350	40,190	53,710	106,800	164,400	248,060	170,300	88,550	79,170	96,670

* Estimated.

Columbia River at Trinidad, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Dis-charge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1913.....	528,000†	June 15, 16, 1913					
1914.....	343,000†	June 21, 1914		127,000	91,600,000	128,000	92,900,000
1915.....	232,000†	May 31, 1915		106,000	70,900,000	103,000	74,400,000
1916.....	520,000†	①		153,000	112,000,000	153,000	111,000,000
1917.....	432,000†	June 23, 1917	24,600	127,000	91,900,000	125,000	92,800,000
1918.....	432,000†	June 25, 1918	41,300	133,000	96,200,000	133,000	96,400,000
1919.....	365,000†	June 1, 2, 1919		123,000	88,800,000	118,000	85,300,000
1920.....	359,000†	July 15-18, 1920	23,900	107,000	77,600,000	116,000	83,800,000
1921.....	484,000†	June 11, 1921	41,900	142,000	103,000,000	133,000	100,000,000
1922.....	424,000†	June 16, 1922	27,200	114,000	82,600,000	111,000	80,300,000
1923.....	429,000†	June 19, 1923		120,000	87,200,000	119,000	86,400,000
1924.....	339,000†	May 25, 1924		94,600	68,600,000	96,700	70,200,000
1925.....	434,000†	May 28, 1925	39,300	137,000	99,400,000	135,000	98,000,000
1926.....	197,000†	May 8, 1926	29,000	80,200	58,100,000	88,500	62,600,000
1927.....	411,000†	June 19, 1927	36,300	148,000	99,700,000	150,000	108,000,000
1928.....	523,000†	May 31, 1928	48,800	156,000	113,000,000	139,000	101,000,000
1929.....	347,000†	June 18, 1929		88,300	64,000,000	85,700	62,000,000
1930.....	270,000†	June 15, 1930		91,900	66,400,000	92,100	66,700,000
1931.....	259,000	June 16, 1931	23,800	85,900	62,200,000	86,000	62,200,000
1932.....	367,000	June 18, 1932	22,900	121,000	87,500,000	125,000	90,900,000
1933.....	508,000	June 23, 1933	31,500	136,000	98,500,000	146,000	106,000,000
1934.....	404,000	June 2, 3, 1934	58,800	153,100	110,800,000	143,900	104,200,000
1935.....	378,000	June 18, 1935		122,300	88,520,000	118,300	85,610,000
1936.....	413,000	June 5, 1936	22,000	102,800	74,620,000	101,400	73,620,000
1937.....	290,000	June 22, 25, 1937	20,000	85,400	61,820,000	90,000	65,200,000
1938.....	393,000	June 8, 1938	37,600	120,100	86,940,000	118,100	85,510,000
1939.....	298,000	June 1, 1939	27,000	100,100	72,450,000	101,900	73,780,000
1940.....	274,000	June 5, 1940	29,800	96,670	70,180,000	98,180	69,820,000
1941.....	173,300	May 10, 1941	34,200	79,700	57,700,000	88,300	63,930,000
1942.....	321,000	June 16, 1942	41,600	114,000	82,520,000	105,200	76,140,000
1943.....	355,300	July 3, 1943	38,000	124,200	89,950,000	124,200	89,940,000
1944.....	239,700	June 17, 1944	34,700	78,050	56,600,000	78,290	57,290,000
1945.....	366,500	June 7, 1945	39,200	99,260	71,860,000	97,410	70,520,000
1946.....	425,500	June 2, 1946	39,400	129,300	93,570,000	131,200	94,960,000
1947.....	368,900	June 11, 1947	41,700	125,800	91,050,000	131,700	95,320,000
1948.....	692,600	June 12, 1948	44,900	153,800	111,700,000	148,600	107,900,000
1949.....	406,100	May 22, 1949	44,000	113,100	81,870,000	112,700	81,570,000
1950.....	525,300	②	44,000	142,700	103,300,000	147,800	107,000,000
1951.....	408,000	May 28, 1951	57,300	149,800	106,400,000	149,000	107,900,000
1952.....	369,800	May 27, 1952	53,800	121,900	88,520,000	117,600	85,360,000
1953.....	395,700	June 17, 1953	36,200	115,400	83,510,000		

† Maximum discharge observed. † Maximum daily mean discharge.

① June 30, July 1, 1916. ② June 24, July 1, 1950.

CRAB CREEK BASIN

Crab Creek at Irby, Wash.

Location.—Lat. 47°21'40", long. 118°51'00", in NW¼ sec. 31, T. 22 N., R. 32 E., on right bank, 8 ft. upstream from highway bridge at Irby, 5 miles downstream from Lake Creek, and 7 miles west of Odessa.

Drainage area.—974 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,386.30 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—11 years (1942-53), 81.9 cfs.

Extremes.—1942-53: Maximum discharge, 3,640 cfs Mar. 5, 1950 (gage height, 8.96 ft.), from rating curve extended above 1,200 cfs by logarithmic plotting; minimum, 2.0 cfs Jan. 12, 1948 (gage height, 1.80 ft.).

Remarks.—A few small diversions for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942...													11.6
1943...	8.79	8.52	9.01	11.7	69.9	122	202	96.5	35.0	39.9	29.3	19.7	56.0
1944...	15.5	15.4	17.0	29.7	160	138	61.0	27.3	24.1	18.7	14.6	10.2	48.9
1945...	7.93	6.45	6.04	12.0	181	61.5	59.2	23.5	19.8	19.1	12.4	9.84	33.8
1946...	6.98	6.20	35.1	106	290	228	112	59.0	44.5	28.6	18.7	14.3	77.8
1947...	12.7	11.2	13.3	28.5	103	68.4	32.2	23.9	16.2	11.5	8.48	7.08	27.5
1948...	6.29	5.31	4.55	14.0	241	132	61.0	164	451	109	61.2	41.9	106
1949...	34.7	28.9	35.8	34.8*	514*	447	156	78.0	42.1	29.0	20.5	15.3	140*
1950...	14.1	15.7	14.0	13.0*	529	967	193	87.8	70.1	42.2	29.7	22.8	165*
1951...	19.2	17.1	22.0	49.4	478	558	195	91.9	55.9	32.1	25.3	20.2	128
1952...	20.0	22.3	24.8	34.8	279	260	195	81.7	46.0	30.7	21.7	15.9	85.0
1953...	16.8	17.1	22.0	53.1	91.6	88.6	59.8	34.8	28.4	18.9	18.2	9.89	37.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942...													9.4
1943...	8.4	8.4	7.9	10*	12	79	145	48	44	34	24	17	7.9
1944...	15	16	16	19	58	84	41	25	21	17	13	8.6	8.6
1945...	5.9	5.9	5.9	6.4	15	42	28	17	16	16	11	8.0	5.9
1946...	6.0	6.0	6.4	46	87	132	69	41	37	22	15	13	6.0
1947...	11	11	12	13*	68	56	22	21	14	9.2	7.4	6.0	6.0
1948...	6.0	4.8	4.0	3.0*	17*	72	34	36	212	66	47	38	3.0*
1949...	29	26	28	30*	26*	273	84	51	36	24	18	14	14
1950...	13	14.5	11.5	11	16	337	97	65	58	34	26	21	11
1951...	17.5	15.5	14.5	31	49*	199	108	60	36	26	20	18.5	14.5
1952...	19	21	21	20*	98	150	97	45	34	27	18	14.5	14.5
1953...	16	15*	19	27	77	84	26	24	22	15.5	11	9.1	9.1

* Estimated.

CRAB CREEK BASIN

Wilson Creek at Wilson Creek, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1951.....	1,420†	Mar. 10, 1951	0				
1952.....	421	April 9, 1952	0	1.25	908	1.25	908
1953.....		No flow during year					

† For period February to September.

Crab Creek at Adrian, Wash.

Location.—Lat. 47°23'20", long. 119°22'30", in sec. 24, T. 22 N., R. 27 E., on left bank, 800 ft. upstream from Great Northern railroad bridge and a quarter of a mile northeast of Adrian.

Drainage area.—About 1,950 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,200 ft. (estimated from elevation at Adrian).

Extremes.—1909-12: Maximum discharge observed, 2,100 cfs Jan. 27, 1910 (gage height, 3.7 ft.); no flow for long periods each year.

Remarks.—Minor diversions for irrigation and domestic use above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	0	0	0	106	17.8	277	49.7	5.0	0	0	0	0	38.4
1911...	0	0	0	0	0	162	16.3	0	0	0	0	0	15.1
1912...	0	0	0	0	32.9	25.7	4.8	0	0	0	0	0	5.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	0	0	0	0	0	95	22	0	0	0	0	0	0
1911...	0	0	0	0	0	0	0	0	0	0	0	0	0
1912...	0	0	0	0	0	15	0	0	0	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1910.....	2,100†	Jan. 27, 1910	0	38.4	27,800	38.4	27,800
1911.....			0	15.1	10,800	15.1	10,900
1912.....			0	5.2	3,700		

† Maximum observed.

CRAB CREEK BASIN

567

Crab Creek near Moses Lake, Wash.

Location.—Lat. 47°11'25", long. 119°16'00", in SW¼SE¼ sec. 26, T. 20 N., R. 28 E., on right bank, 3 miles upstream from Parker Horn and 4 miles north of town of Moses Lake.

Drainage area.—About 2,040 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,070.39 ft. above mean sea level (Bureau of Reclamation benchmark).

Average discharge.—11 years (1942-53), 35.2 cfs.

Extremes.—1942-53: Maximum discharge, 2,810 cfs Feb. 27, 1949 (gage height, 5.57 ft.); no flow during several months each year prior to 1952, and part of each day Jan. 14, 15, 1953.

Remarks.—Numerous small diversions for irrigation and domestic use above station. Most of natural flow from upper basin passes this station underground. No regulation. Beginning in 1952, return flow from irrigation on Columbia Basin Project has increased runoff during summer months.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...	0.10	0.12	0.09	0.05	0.25	0.06	1.20	4.16	0.14	0.29	0.32	0.31	0.60
1944...	.32	.30	.15	.24	.24	.09	.36	0	0	0	0	0	.14
1945...	0	.003	.10	.12	.11	.15	0	0	0	0	0	0	.04
1946...	0	0	0	0	.6	188	78.2	10.5	.68	.63	.50	.89	23.5
1947...	.25*	.30*	.13	0	0	0	0	0	0	0	0	0	.06*
1948...	0	0	0	0	0	0	0	0	280	69.7	6.16	.67	29.4
1949...	.89	.81	.54	.04	316	416	192	36.2	3.62	1.53	1.05	.59	74.4
1950...	.41	.28	.10	0	42.2	938	139	68.2	17.6	4.00	1.42	.83	102
1951...	1.11	.36	.29	.15	220	389	188	65.0	13.6	1.45	.92	.43	72.0
1952...	.28	.19*	.13*	.03	51.6	85.1	141	41.8	42.1	54.6	67.0	75.4	46.4*
1953...	67.2	15.8	10.3	8.00	4.31	3.00	9.14	25.9	57.5	76.0	93.6	90.5	37.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1943...	0.1	0.1	0	0	0.1*	0	0	0.1	0	0.2	0.3	0.3	0
1944...	.3	.3	.1	0	0	0	0	0	0	0	0	0	0
1945...	0	0	0	0	0	0	0	0	0	0	0	0	0
1946...	0	0	0	0	0	94	44*	.5	.6	.5	.4	.3	0
1947...	.2	.3*	0	0	0	0	0	0	0	0	0	0	0
1948...	0	0	0	0	0	0	0	0	45	4.3	.7	.5	0
1949...	.7	.6	.1	0	0	114	73	9.1	1.8	1.1	.8	.4	0
1950...	.3	.2	0	0	0	302	75	23	7.6	1.7	1.0	.6	0
1951...	.8	.2	.2	0	0	121	107	9.8	2.2	1.1	.8	.2	0
1952...	.1	.1	0	0	0	44	86	14.5	23	52	58	70	0
1953...	44	10*	7*	.2	2.6	2.1	2.1	7.0	50	67	80	83*	.2

* Estimated.

CRAB CREEK BASIN

Crab Creek near Moses Lake, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1943.....	6.9	⊙	0	0.60	432	0.84	461
1944.....	1.8	April 1, 1944	0	.14	103	.09	62.1
1945.....	0.4	Dec. 1, 1944	0	.04	29.0	.03	22.5
1946.....	420	Mar. 2, 1946	0	23.5	17,000	23.6	17,050
1947.....	0.4	Oct. 20, 1946	0	.00	41.9	0	0
1948.....	618	June 16, 1948	0	29.4	21,350	29.6	21,490
1949.....	2,810	Feb. 27, 1949	0	74.4	53,900	74.3	53,810
1950.....	2,620	Mar. 8, 1950	0	102	73,990	102	74,050
1951.....	1,590	Mar. 18, 1951	0	72.0	52,140	71.9	52,070
1952.....	195	April 6, 1952	0	46.4	33,660	54.2	39,330
1953.....	109	Aug. 27, 1953	.2	38.7	28,040	.....	.....

⊙ April 28, 29, 1943.

Park Creek near Coulee City, Wash.

Location.—Lat. 47°35'20", long. 119°23'00", in SE¼ sec. 11, T. 24 N., R. 27 E., on right bank, 2,000 ft. upstream from Park Lake, and 4½ miles southwest of Coulee City.

Drainage area.—About 400 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,105 ft. (estimated from elevation of Park Lake).

Extremes.—1942-45: Maximum discharge not determined, probably occurred sometime in February 1945 during period of no gage-height record; minimum, 0.9 cfs Aug. 17, 1944 (gage height, 0.83 ft.).

Remarks.—Small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.78	.....
1943...	2.22	3.35	3.42	2.90	3.33	3.59	3.60*	2.50	2.89*	2.16	1.52	1.76	2.75*
1944...	2.33*	2.72	2.94	2.99	3.27	3.34	3.78	2.70	2.71	1.86	1.35	2.01	2.67*
1945...	2.97	3.00	2.71*	2.91*	4.45*	4.65*	3.60*	3.53*	3.15	1.57	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.6	.....
1943...	2.1	2.3	2.9	1.9	2.6	3.2	2.9	2.0	2.0*	1.9*	1.8	1.7	1.7
1944...	1.9	2.6	2.8	2.8	3.0	2.9	3.2	2.1	1.6	1.4	1.0	1.4	1.0
1945...	2.7	2.6	2.7*	2.7*	3.1*	3.7*	3.0*	2.9*	2.2	1.0	.....	.....	.....

* Estimated.

Park Creek near Coulee City, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1942.....							
1943.....			1.7	2.75	1,990	2.66	1,930
1944.....	4.7	April 19, 1944	1.0	2.67	1,940	2.73	1,980
1945.....							

Park Creek below Park Lake, near Coulee City, Wash.

Location.—Lat. 47°34'20", long. 119°25'10", in SW¼ sec. 15, T. 24 N., R. 27 E., on left bank at highway crossing, 100 ft. upstream from mouth, 500 ft. downstream from Park Lake, and 6½ miles southwest of Coulee City.

Drainage area.—About 400 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,091.52 ft. above mean sea level (Bureau of Reclamation benchmark).

Average discharge.—8 years (1945-53), 7.47 cfs.

Extremes.—1945-53: Maximum discharge, 47 cfs Feb. 9, 1951 (gage height, 2.71 ft.); maximum gage height, 3.05 ft. Jan. 28, 1950 (backwater from ice); minimum discharge not determined, probably less than 0.1 cfs during period Aug. 17 to Sept. 21, or Oct. 1-17, 1945 (gage height, less than 1.4 ft.).

Remarks.—Some diversion for irrigation above and from Park Lake. Minor regulation at fish screens 400 ft. upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....											0.16*	0.13*	.....
1946....	0.94*	3.44	6.90	8.15	7.28	7.44	6.01	4.69	4.36	2.29	.70	1.80	4.48*
1947....	2.72	5.18	7.85	8.90	9.64	8.87	8.09	6.77	4.25	1.93	1.59	2.29	5.65
1948....	2.72	6.01	9.46	9.56	9.02	8.90	8.49	9.74	11.3	4.47	2.99	2.87	7.12
1949....	4.17	6.11	5.76	9.11	13.1	18.8	9.76	6.23	2.00	.82	.57	1.24	6.44
1950....	2.91	8.67	5.51	4.99	13.3	16.4	9.78	8.45	5.53	1.60	1.09	1.53	6.60
1951....	6.58	9.38	10.9	8.27	13.0	14.3	11.4	8.78	6.67	3.16	1.20	3.75	8.08
1952....	8.73	9.69	10.5	13.3	18.2	14.4	10.6	8.77	4.90	3.56	2.54	6.56	9.27
1953....	10.8	6.03	20.7	21.8	16.1	12.3	14.0	12.5	11.8	5.31	6.59	7.15	12.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....											0.1*	0.1	.....
1946....	0.2*	2.0	5.8	7.2	6.8	6.4	5.2	4.2	3.2	1.2	.4	1.0	0.2*
1947....	2.1	3.5	7.4	7.7	8.9	8.1	7.4	5.0	2.6	1.5	1.2	1.4	1.2
1948....	.3	5.2	3.5	7.2	6.0	7.7	7.9	8.4	7.9	2.9	1.9	2.1	.3
1949....	3.2	4.0	1.5	8.4	8.4	14.5	1.6	1.8	.8	.7	.5	.6	.5
1950....	2.1	4.3	.9	1.4	3.0*	13.5	1.6	6.5	.8	1.1	.9	.6	.6
1951....	4.8	8.0	1.0	2.1*	2.0*	8.6	3.2	3.0	1.5	1.2	.9	1.2	.9
1952....	7.7	1.2	2.6	8.3	14	11.5	7.4	6.6	2.8	2.7	2.0	2.2	1.2
1953....	7.4	.1	5.2	21	8.9	3.1	11	11	9.3	.5	.5	6.6	.1

* Estimated.

Park Creek below Park Lake, near Coulee City, Wash—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1945.....							
1946.....	9.2	Jan. 7, 1946	.2	4.48	3,240	4.86	3,520
1947.....	10.4	①	1.2	5.65	4,090	5.85	4,240
1948.....	24	Feb. 10, 1948	.3	7.12	5,170	6.94	5,040
1949.....	26	Feb. 25, 1949	.5	6.44	4,670	6.52	4,730
1950.....	25	Feb. 12, 1950	.6	6.60	4,780	7.43	5,380
1951.....	47	Feb. 9, 1951	.9	8.08	5,850	8.25	5,980
1952.....	24	②	1.2	9.27	6,730	10.0	7,270
1953.....	27	Dec. 17, 1952	.1	12.1	8,760		

① Dec. 17, 1946, Feb. 16, 1947. ② Dec. 13, 14, 1951.

Rocky Ford Creek near Ephrata, Wash.

Location.—Lat. 47°18'20", long. 119°26'50", in NW ¼NW ¼ sec. 21, T. 21 N., R. 27 E., on right bank, 1½ miles downstream from source at Rocky Ford Springs, 5 miles east of Ephrata, and 7 miles upstream from mouth.

Drainage area.—About 500 sq. mi., most of which is noncontributing.

Gage.—Water-stage recorder. Datum of gage is 1,064.88 ft. above mean sea level (Bureau of Reclamation benchmark). June 21, 1909, to Dec. 31, 1911, staff gages 4½ to 5½ miles downstream at different datums. Aug. 19, 1942, to May 23, 1945, water-stage recorder 3½ miles downstream at datum 5.37 ft. lower.

Average discharge.—11 years (1942-53), 69.5 cfs.

Extremes.—1909-11, 1942-53: Maximum discharge, 143 cfs Apr. 23, 1949 (gage height, 2.84 ft.); minimum observed, 20 cfs Aug. 13-18, 1911.

Remarks.—A few small diversions for domestic use above station. Slight regulation by fish hatchery.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....										84.8	82.1	79.4	.....
1910.....	73.1	69.4	.....	71.9	74.6	76.1	.....	.....	.....	.....	.....	.....	.....
1911.....										59.2	49.4	54.2	.....
1912.....	46.3	43.6	41.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1942.....											70.1	71.6	.....
1943.....	68.7	62.8	57.3	50.5	50.8	47.2	44.6	48.3	53.6	57.9	59.8	54.8	54.7
1944.....	53.8	53.8*	52.6	47.1	43.9	39.6	46.7	53.4	51.7	52.1	50.1	47.6	49.4*
1945.....	17.2	47.4	44.4	41.0	36.3	37.2	41.0	48.7	55.2	58.7	58.6	56.4	47.9
1946.....	51.7	47.6	44.5	41.0	38.6	40.6	53.4	66.8	76.9	80.4	81.0	76.8	58.4
1947.....	72.5	64.9	58.1	52.4	47.4	43.8	43.6	44.0	44.0	40.6	39.1	39.1	49.1
1948.....	37.1	35.7	38.6	31.9	31.1	30.5	37.0	47.3	59.3	75.3	85.2	87.6	49.3
1949.....	83.9	79.2	76.2	70.7	67.1	63.5	127	130	120	113	103	81.9	95.6
1950.....	83.9	78.5	71.2	65.6	60.1	71.8	119	133	125	117	110	101	94.8
1951.....	61.8	82.9	75.1	68.6	66.7	67.4	82.5	98.4	101	98.9	94.5	90.8	85.0
1952.....	87.6	84.1	78.7	72.8	71.7	78.1	85.2	89.6	92.9	96.6	103	103	87.0
1953.....	106	104	94.0	83.6	78.9	84.8	89.2	98.8	95.5	94.4	93.8	89.9	93.6

* Estimated.

CRAB CREEK BASIN

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Rocky Ford Creek near Ephrata, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909										83	79	79	
1910	67	67		67	69	69							
1911										58	20	46	
1912	46	42	38										
1942											60	71	
1943	68	61	53	49	49	45	44	47	49	54	56*	54	44
1944	53	53	50	45	41	38	42	52	50	51	48	47	38
1945	46	47	42	39	37	37	38	44	53	57	57	55	37
1946	49	40	42	40	38	38	47	61	72	78	80	74	38
1947	68	62	55	49	46	42	43	48	42	39	39	38	38
1948	36	35	33	31	31	30	33	41	52	67	82	84	30
1949	82	77	72	69	66	65	111	125	117	108	99	86	65
1950	82	75	69	62	58	58	98	130	120	114	106	97	58
1951	87	79	72	67	66	67	70	95	100	96	93	88	66
1952	85	82	76	70	70	74	82	87	91	95	100	103	70
1953	103	99	89	79	77	79	93	97	95	94	91	88	77

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Discharge	Date						
1909							
1910							
1911							
1912							
1942							
1943	71	Oct. 1-4, 1942	44	54.7	39,630	52.3	37,890
1944	57	①	38	49.4	35,570	47.6	34,580
1945	73	July 4, 1945	37	47.9	34,680	48.3	34,990
1946	94	Sept. 22, 1946	38	58.4	42,270	62.7	45,410
1947	86	Oct. 1, 1946	38	49.1	35,580	41.7	30,160
1948	109	Aug. 20, 1948	30	49.3	35,810	60.5	43,890
1949	143	April 23, 1949	65	95.6	69,180	95.1	68,840
1950	135	②	58	94.8	68,600	96.1	69,530
1951	108	June 28, 1951	66	85.0	61,540	85.0	61,580
1952	106	Aug. 31, 1952	70	87.0	63,120	91.4	60,360
1953	109	Oct. 13, 1952	77	93.6	67,780		

* Estimated.

① May 14-15, 1944. ② April 27, May 1-9, 12, 1950.

CRAB CREEK BASIN

Crab Creek near Warden, Wash.

Location.—Lat. 46°58'45", long. 119°15'45", in NE¼ sec. 11, T. 17 N., R. 28 E., on right bank, a quarter of a mile downstream from O'Sullivan Dam, 0.4 mile downstream from Lind Coulee, and 10 miles west of Warden.

Drainage area.—About 4,150 sq. mi., of which 500 sq. mi. in the vicinity of Soap Lake is probably noncontributing.

Gage.—Water-stage recorder and, since Feb. 15, 1952, concrete control. Datum of gage is 923.90 ft. above mean sea level (levels by Bureau of Reclamation). June 23, 1909, to June 26, 1912, staff gages within 5 miles downstream at different datums. Oct. 1, 1942, to Sept. 30, 1950, water-stage recorder 0.4 mile downstream from present site at different datum.

Average discharge.—10 years (1942-50, 1951-53), 40.7 cfs.

Extremes.—1909-12, 1942-53: Maximum discharge, 3,000 cfs Feb. 7, 1943 (gage height, 4.25 ft., site and datum then in use), from rating curve extended above 20 cfs on basis of slope-area measurement of flood flow in Lind Coulee; no flow for short periods in June and July 1948 during construction of O'Sullivan Dam and part of each day Feb. 2-21, 1952.

Remarks.—Many small diversions for irrigation above station. Flow regulated to some extent by Potholes Reservoir after start of construction of O'Sullivan Dam in Spring of 1948. Prior to that time, flow was slightly regulated at intermittent intervals by Moses Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...										47.8	37.1	29.3	.....
1910...	30.0*	32.7	37.4			202	131	69.2	55.6	44.8*	35.7*	35.3*	.....
1911...	33.0*	23.5*	24.0*		43.5	32.5	24.8	21.0	21.0	15.0	14.2	16.4	.....
1912...	15.0*	21.0*	25.9*		30.0*	31.5*	24.9*	18.8*	13.0*				.....
1943...	15.5	19.9	23.8	23.3*	223*	32.1	26.3	22.4	20.5	17.5	16.2	15.2	36.7*
1944...	15.0*	15.7*	22.8	24.3	25.9	24.4	21.4	17.9*	16.1	13.9	14.1	15.0	18.8*
1945...	18.0	19.7	20.8*	20.0	25.8	24.1	20.0	16.4	15.4	13.2	11.9	15.0	18.3*
1946...	15.9	20.1	21.8	31.3	36.1	89.2	92.2	21.3	16.1	13.4	11.9	13.4	31.8
1947...	18.6	21.3	19.9	18.8*	18.0*	16.6	15.8	10.6	8.63	3.52	11.3	13.6*	14.7*
1948...	18.8*	17.4	17.2	17.9	20.2	18.3	15.2	18.7	13.2	9.62	6.40	6.80	15.2*
1949...	2.36	7.20	55.2	38.4*	342*	669*	202*	99.0*	20.0	13.9	11.8	13.4	122*
1950...	20.9	28.9	28.0	42.7*	220	359	522	237*	91.7*	17.9*	12.4*	15.1*	135*
1951...								8.80	22.0	21.8	24.1	23.1*	.....
1951...	19.6*	18.6	20.4	22.3*	4.45	11.7	11.5	12.2	15.1	16.8	16.5	4.27	14.5*
1953...	.104	.170	.194	.170	.141	.120	.130	.164	.214	.258	.352	.301	.204

* Estimated.

Crab Creek near Warden, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909										40	32	26	
1910	29	29				160	83	55	42	36	33	30	
1911	26*	20	24		35	27	21	21	21	16	11	15	
1912													
1943	10	14	19	15*	18*	27	24	20	18	16	16	15	10
1944			18	24	25	23	18		14	13	14	14	13
1945	17	19	20*	20	20	23	18	15	14	12	11	13	11
1946	13	16*	19.5	15	16	14	37	16	14	13	10.5	11	10.5
1947	14.5	17	18*	17*	3.0	3.2	14	8.6	.8	.2	.2	11	.2
1948	17.5	12.5	15	0.2	15	13.5	14	15	3.9	4.3	4.7	5.1	3.9
1949	1.0	2.4	20*	30*	30*	550*	55*	26	15	12.5	11	12.5	1.0
1950	15.5	26	17.5	30*	42	29	55	160*	45*	12*	5*	5*	5*
1951							4.7	.1	14	19	24	22	
1952	18*	18	19	21*	0	11.5	11.5	11.5	13	16	12	.1	0
1953	.14	.17	.17	.14	.12	.12	.12	.14	.20	.23	.30	.34	.12

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1909							
1910							
1911							
1912							
1943	3,000	Feb. 7, 1943	10	36.7	26,530	36.2	26,190
1944	27	①	13	18.8	13,690	19.3	13,930
1945	120	Feb. 3, 1945	11	18.3	13,250	18.3	13,210
1946	617	Feb. 7, 1946	10.5	31.8	23,020	32.0	23,140
1947	596	Feb. 25, 1947	.2	14.7	10,640	14.2	10,260
1948	96	July 17, 1948	3.9	35.2	11,060	16.2	11,760
1949	855	Feb. 18, 1949	1.0	122	88,160	123	88,930
1950	750	April 7, 1950	5	135	97,400		
1951							
1952			0	14.5	10,560	9.66	7,010
1953	12	May 22, 1953	.12	.204	148		

* Estimated.

① Feb. 3, 15, Mar. 14, 1944.

Crab Creek near Smyrna, Wash.

Location.—Lat. 46°50'35", long. 119°36'25", in SE¼ sec. 30, T. 16 N., R. 26 E., on left bank at county road bridge, 2½ miles east of Smyrna, and 17 miles upstream from mouth.

Drainage area.—About 4,500 sq. mi., of which about 500 sq. mi. in the vicinity of Soap Lake is probably noncontributing.

Gage.—Water-stage recorder. Datum of gage is 530.83 ft. above mean sea level (Bureau of Reclamation benchmark).

Average discharge.—11 years (1942-53), 41.0 cfs.

Extremes.—1942-53: Maximum discharge, 3,300 cfs Feb. 8, 1943 (gage height, 7.5 ft., estimated by observer), from rating curve extended above 1,000 cfs; possibly no flow at times during summer of 1947.

Remarks.—Many diversions for irrigation above station. Some regulation by Pot-holes Reservoir, Moses Lake and lakes on headwaters.

CRAB CREEK BASIN

Crab Creek near Smyrna, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942													0.55
1943	0.74	5.54	14.4	17.8	554	51.6	27.0	15.4	10.8	3.10	2.14	3.48	55.3
1944	7.13	12.1	11.2	10.6	23.7	20.0	17.7	9.03	4.05	.48	.80	1.31	9.74
1945	4.41	10.7	9.23	14.8	27.0	8.32	7.15	10.7	4.00	.193	.126	.468*	7.97*
1946	3.44	8.44*	7.25	9.58	26.3	70.7	84.2	14.0	6.13	1.07	.93	3.15	19.6*
1947	7.22	11.2	9.25	4.93	14.3	9.55	7.31	4.67	2.11	.55*	.50*	1.72	6.05*
1948	5.16	10.0	12.3	10.5	17.9	13.6	8.57	11.5	7.23	.54	.30	.26	8.17
1949	.25	2.88	3.51	1.20	233	644	202	91.7	10.6	3.63	3.29	4.83	99.4
1950	5.32	13.1	18.5	19.1	176	417	505	241	91.7	10.9	4.10	10.1	125
1951	14.4	28.2	36.3	41.8	204	306	394	32.7	12.4	3.89	3.74	7.69	89.3
1952	12.2	17.6	13.7	12.1	22.5	14.4	9.74	7.52	7.78	8.17	11.3	12.4	12.4
1953	14.0	16.8	19.9	24.8	18.7	21.5	20.2	13.3	14.0	11.8	19.0	25.4	18.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1942													0.5
1943	0.5	0.8	4.6	9.7	23*	32	20	8.4	6.0	1.6	1.5	2.8	6.5
1944	4.6	9.6	5.4	7.8	14	16	13	4.8	2.4	.1	.1	.3	.1
1945	2.9	6.0	3.6	5.6	13.0	3.0	3.5	5.3	.60	.15	.11	.12	.11
1946	1.9	5*	3.1	5*	7.9	6.5	27	6.5	2.2	.6	.3	1.9	.3
1947	5.0	4.8	3.4	2.5	7.0	5.4	5.3	2.1	1*	.1	.2*	.8	.1
1948	3.0	7.2	6.8	5.0*	4.0*	8.3	6.2	6.7	.6	.3	.2	.2	.2
1949	.2	.2	1.5	.8	1.1	529	52	17.5	5.4	2.4	2.7	3.3	.2
1950	6.3	8.4	6.5	7.1	22*	72	61	161	42	5.4	.1	.1	.1
1951	10	12	18.5	23*	25*	182	154	11	4.1	1.2	1.5	5.9	1.2
1952	8.4	13.5	8.0*	7.5*	11	12.5	6.5	6.3	5.8	5.6	8.6	10.5	5.0
1953	10.5	10*	9.0*	15*	16	18.5	17	7.2	11.6	8.0	15	22	7.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Momentary maximum			Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis- charge	Date	Minimum day				
1942							
1943	3,300	Feb. 8, 1943	0.5	55.3	40,050	56.1	40,640
1944	32	Feb. 17, 1944	.1	9.74	7,060	9.22	6,690
1945	87	Feb. 5, 1945	.11	7.97	5,770	7.53	5,450
1946	302	Feb. 9, 1946	.3	19.6	14,160	20.3	14,050
1947	32	Feb. 15, 1947	.1	6.03	4,400	6.06	4,390
1948	46	Feb. 18, 1948	.2	8.17	5,930	6.43	4,860
1949	1,010	Feb. 25, 1949	.2	99.4	72,000	162	74,030
1950	831	April 9, 1950	.1	125	90,810	129	93,180
1951	620	Feb. 10, 1951	1.2	89.3	4,660	86.3	62,500
1952	98	Feb. 3, 1952	5.6	12.4	9,090	13.0	9,450
1953	84	Jan. 21, 1953	7.2	13.3	13,220		

* Estimated.

Keechelus Lake near Martin, Wash.

Location.—Lat. 47°19'20", long. 121°20'20", at dam on Yakima River in NE¼ sec. 12, T. 21 N., R. 11 E., at outlet of Keechelus Lake, 3½ miles northwest of Martin, and 9½ miles northwest of Easton.

Drainage area.—55.8 sq. mi.

Gage.—Staff gage. Datum of gage is mean sea level (Bureau of Reclamation benchmark). Jan. 12, 1906, to Mar. 19, 1919, staff gage and Mar. 20, 1919, to May 31, 1920, water-stage recorder at several sites at same datum.

Extremes.—1906-53: Maximum contents observed, 160,570 acre-ft. May 16, 1925 (elevation 2,518.09 ft.); minimum observed, 448 acre-ft. Sept. 6, 12, 13, 1906 (original crib dam); minimum elevation observed, 2,428.30 ft. Sept. 20, 1926.

Remarks.—Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1917. Original crib dam creating a capacity of 19,000 acre-ft. used Jan. 12, 1906, to Aug. 19, 1914. Storage above present dam began Aug. 19, 1914. Present capacity, 157,800 acre-ft. between gate sill (elevation, 2,425.00 ft.), and spillway crest (elevation, 2,517.00 ft.). Spillway raised 2 ft.; construction completed Sept. 12, 1952. Records given herein represent usable contents. Water used for irrigation. Contents obtained by using mean gage height for the last day of the month prior to October 1952 and for the midnight gage height thereafter.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906				2,550	2,210	2,180	4,230	3,530	2,550	1,190	570	630	
1907	3,320	4,370	8,570	5,130	6,550	4,340	10,620	17,470	16,450	16,210	11,660	9,390	
1908	5,130	10,480	10,210	5,580	4,790	15,940	17,780	17,500	17,420	16,510	6,750	1,310	
1909	5,290	12,190	16,800	16,560	16,500	16,780	17,220	18,150	17,290	16,400	8,910	3,220	
1910	3,080	19,750	16,540	16,990	16,660	16,930	17,420	17,640	16,690	16,120	9,680	3,610	
1911	5,500	14,460	12,720	16,510	16,330	16,890	15,400	18,350	16,900	11,580	2,610	10,560	
1912	16,480	14,770	16,570	17,260	16,480	16,570	17,170	16,080	14,060	16,180	7,110	4,950	
1913	5,970	5,450	14,420	16,620	16,500	11,600	16,420	17,060	14,880	9,880	10,960	15,070	
1914	9,000	13,400	11,500	12,610	12,380	9,100	17,080	11,520	7,170	2,100	40,330	38,590	
1915	33,600	31,400	29,150	27,440	27,010	13,060	12,300	16,520	19,590	19,420	16,930	19,420	
1916	25,250	11,180	11,650	9,680	10,640	14,640	23,600	18,840	30,950	20,100	24,460	30,150	
1917	34,250	31,050	8,900	13,530	28,020	27,100	27,350	39,330	60,460	60,680	61,120	58,590	
1918	57,640	21,760	63,320	31,750	43,940	53,330	60,310	96,090	96,330	93,510	17,220	7,820	
1919	19,060	7,940	10,420	29,000	27,100	32,910	60,350	79,030	96,210	98,620	76,460	33,170	
1920	7,980	27,680	45,600	75,500	85,230	97,550	109,920	138,550	147,400	72,370	23,110	12,320	
1921	21,630	37,100	53,770	78,700	103,820	94,660	111,850	135,380	149,770	120,380	50,340	29,760	
1922	31,740	46,620	89,560	106,430	110,070	115,310	119,090	146,360	153,760	103,830	18,030	5,640	
1923	10,160	20,270	38,360	72,290	76,680	83,490	111,740	152,410	156,210	145,740	53,990	9,270	
1924	15,770	29,920	49,010	63,500	96,670	105,960	122,210	159,210	155,600	115,110	36,280	5,780	
1925	14,550	29,740	62,690	77,840	97,610	108,560	138,070	159,240	158,700	109,880	46,830	21,490	
1926	21,720	30,330	63,880	77,380	89,740	114,340	144,400	142,540	94,210	38,590	5,560	4,290	
1927	23,010	36,160	53,480	60,210	64,930	70,180	86,210	126,230	146,980	128,070	62,080	46,270	
1928	46,960	94,130	73,740	85,080	79,160	97,880	115,620	157,160	157,210	107,500	21,790	8,960	
1929	25,020	32,730	38,150	41,060	42,670	53,080	68,290	118,130	153,500	100,930	47,130	9,700	
1930	4,820	6,840	13,830	20,460	44,020	61,460	97,690	123,480	137,170	85,610	35,890	6,800	
1931	11,700	21,800	27,620	40,450	54,330	76,060	100,700	139,730	131,810	76,760	16,050	4,850	
1932	12,140	31,620	39,680	67,070	79,200	111,330	143,590	159,930	159,390	128,430	48,630	6,160	
1933	15,620	70,880	104,730	130,380	135,070	134,760	142,050	149,440	153,930	149,700	96,010	68,680	
1934	99,280	106,780	118,640	105,020	90,530	137,970	154,410	148,070	128,240	103,320	37,490	32,770	
1935	55,396	87,680	96,390	106,200	91,710	103,070	105,570	134,830	153,550	127,590	84,040	48,870	
1936	38,830	44,540	51,170	63,390	69,840	84,470	119,020	154,460	149,620	100,500	55,050	37,710	
1937	40,700	36,850	58,350	63,690	70,230	81,450	103,070	126,000	154,590	116,690	73,370	64,170	
1938	64,220	104,650	127,310	123,140	117,360	125,470	149,100	154,490	152,460	121,750	86,980	67,600	
1939	70,330	86,370	112,540	138,640	147,050	153,980	147,300	153,960	150,020	113,170	81,280	62,510	
1940	42,480	56,090	84,470	91,570	106,950	129,560	154,110	148,770	124,670	82,210	44,890	24,180	

YAKIMA RIVER BASIN

Keechelus Lake near Martin, Wash.—Continued

Contents in Acre-feet on Last Day of Month—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	20,090	31,080	48,340	54,420	59,700	77,200	97,050	92,780	77,040	37,760	13,540	10,470	.....
1942...	17,310	36,530	56,480	62,150	67,770	77,320	106,590	121,730	128,840	98,210	57,420	33,100	.....
1943...	29,870	53,090	73,420	85,960	93,100	106,510	139,080	154,380	154,380	137,390	69,210	42,930	.....
1944...	27,340	36,280	60,690	60,570	75,540	86,990	107,900	144,110	134,260	104,670	57,220	29,900	.....
1945...	23,340	37,550	52,440	84,060	102,350	111,140	120,810	153,780	137,050	96,590	52,100	23,460	.....
1946...	25,330	46,190	62,290	76,030	82,250	93,800	115,950	152,310	154,760	140,580	109,030	80,970	.....
1947...	96,030	91,710	101,070	118,960	136,480	154,360	155,250	154,330	148,670	105,400	59,240	35,820	.....
1948...	55,000	85,030	86,990	96,730	101,340	105,000	118,930	154,360	154,710	140,120	111,440	64,820	.....
1949...	53,520	66,420	56,350	64,740	60,290	63,280	63,420	111,980	121,100	139,130	145,310	126,920	.....
1950...	112,780	112,690	87,070	83,350	77,390	71,220	64,590	87,010	155,400	138,960	122,480	85,270	.....
1951...	72,710	79,750	91,020	69,140	76,060	65,670	95,230	148,240	154,030	136,090	97,790	55,610	.....
1952...	54,970	70,540	76,740	77,060	80,080	85,890	100,520	141,800	147,670	116,010	87,820	62,280	.....
1953...	48,180	49,910	53,830	102,620	117,930	121,120	116,760	147,950	154,610	136,770	102,390	77,060	.....

Yakima River near Martin, Wash.

Location.—Lat. 47°19'10", long. 121°20'10", in NE¼ sec. 12, T. 21 N., R. 11 E., on left bank, 800 ft. downstream from dam at outlet of Keechelus Lake, 3½ miles northwest of Martin, and 12 miles upstream from Easton.

Drainage area.—55.8 sq. mi.

Gage.—Water-stage recorder and masonry channel. Datum of gage is 2,422.40 ft. above mean sea level (Bureau of Reclamation benchmark). Prior to July 20, 1923, staff gages at several sites within 2 miles of present site at different datums.

Average discharge.—50 years (1903-53), 326 cfs (unadjusted).

Extremes.—1903-53: Maximum discharge, 7,370 cfs Mar. 26, 1915, when temporary crib dam was washed out; practically no flow when gates in Keechelus Lake dam are closed.

Remarks.—No diversion. Flow regulated by Keechelus Lake (see p. 575). Spillway discharge, which bypasses gage, is added to flow at station.

YAKIMA RIVER BASIN

Yakima River near Martin, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	256*	256*	321*	225*	165	159	498	730	785	339	100	60.3	324*
1905...	68.9	227	339	143	124	522	419	603	534	169	79.7	80.9	270
1906...	430	191	173	250	255	200	581	682	416	177	67.3	65.9	291
1907...	265	979	272	249	490	360	267	886	548	163	172	130	397
1908...	144	153	343	265	147	319	466	695	864	463	261	190	362
1909...	88.7	117	46.6	209	162	148	305	664	942	308	228	204	285
1910...	121	1,010	375	179	167	553	623	871	408	138	144	178	397
1911...	419	511	257*	130	103	153	250	539	686	293	199	20*	298*
1912...	3*	827	105*	298	253	122	283	917	614	173	248	151	332*
1913...	127	276	48.7	209	254	236	287	773	1,050	470	86	38	321
1914...	383	204	165	334	144	395	509	1,010	527	202	106	104	342
1915...	294	549	172	116	86.5	551	667	200	73.3	80.8	62.9	49.2	241
1916...	138	695	281	196	207	447	338	556	1,090	1,090	176	4.03	452
1917...	3.35	272	457	112	1.00	135	196	515	820	912	174	190	318
1918...	.23	741	799	1,270	8.07	4.58	158	153	606	214	1,450	237	474
1919...	123	490	636	124	212	27.7	14.9	451	356	231	433	804	325
1920...	530	142	4.00	7.97	20.4	22.3	25.0	29.4	273	1,480	1,040	822	369
1921...	240	2.00	2.00	3.97	2.29	483	109	379	617	777	1,220	486	364
1922...	213	3.00	3.13	3.00	3.00	3.00	154	308	639	926	1,480	271	337
1923...	20.1	0	0	5.97	18.4	20.7	30.1	113	666	446	1,630	876	321
1924...	29.9	15.8	22.5	25.4	34.8	32.7	38.6	193	380	733	1,380	583	290
1925...	68.7	13.9	20.2	24.7	29.1	31.8	35.0	551	440	900	1,070	529	312
1926...	90.6	17.0	32.3	22.3	2.0	2.3	3.0	342	883	957	584	101	255
1927...	45.8	27.1	31.7	35.9	38.0	42.7	52.0	73.5	620	570	826	795	264
1928...	363	23.4	640	288	210	47.6	52.9	231	343	906	1,470	249	405
1929...	21.6	14.0	16.0	21.8	28.4	14.9	3.00	3.77	49.9	1,040	907	668	235
1930...	124	13.0	6.00	6.84	7.29	11.1	13.4	15.5	55.9	933	860	536	217
1931...	57.8	1.00	1.60	1.00	1.00	1.00	25.8	80.4	473	1,000	1,000	266	245
1932...	36.6	1.00	1.00	1.00	1.07	1.16	2.17	561	598	646	1,500	787	379
1933...	37.1	1.10	1.00	2.19	55.9	142	183	486	1,020	671	986	688	357
1934...	98.7	410	1,110	823	581	4.00	534	467	454	440	1,000	127	513
1935...	1.3	2.0	188	481	522	51.0	211	240	364	649	780	661	346
1936...	241	3.1	22.0	6.0	6.2	7.0	7.0	630	831	920	798	348	320
1937...	2.0	114	11.5	10.0	10.0	11.5	13.3	203	636	845	679	287	237
1938...	100	6.73	14.9	301	201	26.5	186	670	479	594	610	355	297
1939...	19.6	7.13	8.26	9.90	8.80	118	804	601	490	754	572	539	312
1940...	273	6.6	3.1	3.0	3.0	3.7	149	666	614	771	670	382	297
1941...	156	10.3	10.2	10.0	10.0	11.0	45.8	401	431	720	458	237	210
1942...	792	1.0	1.0	1.0	1.0	1.0	27.3	284	360	628	704	458	222
1943...	110	.21	3.71	5.62	6.20	6.76	109	507	850	651	910	788	330
1944...	333	4.5	5.7	7.0	7.1	8.3	9.5	14.1	474	537	855	609	240
1945...	124	3.1	4.3	6.6	9.0	10.0	123	381	776	792	792	635	306
1946...	206	.60	.85	3.11	6.53	7.61	13.8	500	960	620	624	549	297
1947...	8.39	271	472	84.7	8.06	122	692	751	513	828	772	473	419
1948...	165	72.9	232	3.78	31.8	91.6	61.2	468	1,209	513	574	397	364
1949...	375	52.2	400	176	63.7	155	519	380	655	79.3	11.1	395	272
1950...	549	634	780	287	302	453	434	385	172	890	414	700	502
1951...	569	442	381	680	476	335	12.1	77.1	537	435	677	758	444
1952...	337	12.3	77.1	99.4	115	50.8	114	321	372	716	523	491	270
1953...	274	6.46	5.14	7.82	174	126	481	209	501	630	635	473	294

* Estimated.

Yakima River near Martin, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904					127	127	127	454	528	148	76	51	51
1905	51	76	194	166	90	274	208	388	810	90	67	66	51
1906	153	138	138	134	185	161	326	438	806	86	56	52	52
1907	83	0	0	0	0	149	0	452	321	88	68	0	0
1908	0	103	268	169	136	0	0	479	548	180	101	99	0
1909	69	0	0	134	125	112	198	426	465	144	90	116	0
1910	108	0	146	88	123	239	266	484	207	60	62	76	0
1911	100	0	196	3*	80	77	133	32	316	135	100	3*	0
1912	3*	3*	3*	135	38	95	196	412	275	92	106	3	3
1913	5	77	15	80	120	162	27	299	725	154	12	8	5
1914	266	16	112	111	111	21	23	317	45	36	47	70	16
1915	112	290	15*	71	69	76	300	4	1	67	43	29	1
1916	0	286	199	144	161	21	22	645	692	742	5	3	0
1917	3	7	148	1	1	1	1	1	256	316	5	1	1
1918	0	0	0	9	5	4	5	24	221	78	508	107	0
1919	.2	.4	289	3	3	15	14	14	18	24	189	547	.2
1920	118	5	4	4	18	21	24	24	24	30	206	0	0
1921	0	2	2	2	2	10	10	8	107	24	560	462	0
1922	3	3	3	3	3	3	3	12	41	550	828	114	3
1923	0	0	0	0	17	19	24	40	55	65	1,160	77	0
1924	12	12	20	24	31	82	10	10	287	255	927	109	10
1925	12	12	18	24	26	30	33	35	285	455	692	416	12
1926	1	1	22	2	2	2	3	3	620	756	103	68	1
1927	25	25	27	34	38	38	46	64	17	15	817	100	15
1928	87	2	3	174	45	45	51	55	274	274	471	43	2
1929	14	14	15	16	24	3	3	3	4	224	14	381	3
1930	61	1	5	5	6	10	12	14	18	191	643	164	1
1931	3	1	1	1	1	1	1	2	4	580	878	85	1
1932	1	1	1	1	1	1	2	2	647	387	1,670	131	1
1933	1	1	1	1	8	142	112	466	486	512	512	484	1
1934	1	1	596	258	4	4	4	299	449	449	449	1	1
1935	1	2	2	269	199	4	4	233	219	400	718	453	1
1936	2	2	6	6	6	7	7	7	369	691	691	1	1
1937	1	45	10	10	10	10	12	15	5	430	441	235	1
1938	1	6	9	201	201	5	5	452	298	584	610	261	1
1939	1	6	8	9	8	8	394	297	297	279	358	489	1
1940	16	3	2	3	3	3	5	442	376	588	588	288	2
1941	1	1	10	10	10	10	14	284	421	442	482	206	1
1942	0	1	1	1	1	1	1	110	298	368	692	232	0
1943	.1	0	.2	5.5	5.8	6.2	7.9	322	646	420	877	748	0
1944	0	1	5	7	7	7	7	7	212	528	528	408	0
1945	0	2	4	5	8	10	3	4	583	792	792	512	0
1946	.4	.5	.7	1.0	6.2	6.9	7.9	102	618	517	614	178	.4
1947	1.0	17	258	7.9	7.2	8.7	306	562	336	614	772	370	1.0
1948	.4	.7	4.6	3.6	3.3	91	4.9	4.9	293	389	481	481	.4
1949	161	4.2	325	91	30	116	515	15	468	8.8	11	11	4.2
1950	289	565	189	179	280	307	307	10	9.0	528	393	540	9.6
1951	94	3.1	12	457	169	7.8	7.4	7.8	98	280	280	604	3.1
1952	2.2	6.5	71	83	108	8.1	7.7	9.9	153	465	400	400	2.2
1953	.8	6.1	4.6	4.3	12.5	53	10.5	11	152	322	440	433	.8

* Estimated.

YAKIMA RIVER BASIN

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Yakima River near Martin, Wash.—Continued

Summary

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Observed					Adjusted			Observed		Adjusted		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches	
Dis-charge	Date												
1904..	1,040	①	51	324	235,000	.....	.....	.....	307	223,000	.....	.....
1905..	1,060	②	51	276	200,000	.....	.....	.....	289	209,000	.....	.....
1906..	1,010	May 1, 1906	52	291	211,000	200	5.20	70.54	350	254,000	361	87.83	
1907..	6,500	Nov. 15, 1906	0	397	285,000	410	7.35	99.77	325	236,000	327	79.55	
1908..	1,780	June 11, 1908	0	362	263,000	351	6.29	85.62	323	238,000	337	82.21	
1909..	1,950	June 2, 1909	0	285	206,000	287	5.14	69.77	339	232,000	368	94.34	
1910..	4,670	Nov. 23, 1909	0	397	288,000	398	7.13	96.81	372	299,000	366	89.05	
1911..	2,590	Nov. 21, 1910	0	296	215,000	307	5.50	74.66	275	199,000	280	68.14	
1912..	4,910	Nov. 19, 1911	3	332	241,000	324	5.81	79.08	293	212,000	290	70.78	
1913..	1,720	June 2, 3, 1913	5	321	232,000	335	6.00	81.45	347	251,000	343	83.48	
1914..	1,660	May 15, 1914	16	342	248,000	318	5.70	77.37	363	263,000	330	80.22	
1915..	7,370	Mar. 28, 1915	1	241	175,000	214	3.84	52.13	242	175,600	217	52.80	
1916..	1,650	May 5, 1916	0	452	328,000	467	8.37	113.93	429	311,000	425	103.72	
1917..	1,860	Sept. 13, 1917	1	318	230,000	349	6.25	84.84	385	279,000	463	112.67	
1918..	1,840	Aug. 9-16, 1918	0	474	343,000	417	7.37	100.04	450	336,000	375	91.22	
1919..	1,400	Sept. 4-6, 1919	2	325	235,000	360	6.45	87.65	277	201,000	326	79.27	
1920..	2,370	July 19, 1920	0	369	265,000	340	6.09	82.89	332	241,000	344	83.85	
1921..	1,790	Aug. 1-10, 1921	0	364	263,000	388	6.05	94.34	361	262,000	425	103.44	
1922..	1,840	Aug. 6-14, 1922	3	337	244,000	304	5.45	73.98	320	232,000	236	57.42	
1923..	4,680	June 14, 1923	0	321	231,000	325	5.82	79.00	325	235,000	339	82.53	
1924..	1,730	Aug. 31, 1924	10	290	211,000	286	5.13	69.83	294	213,000	312	76.09	
1925..	1,630	May 16, 1925	12	312	226,000	335	6.00	81.45	316	228,000	318	77.37	
1926..	1,220	Aug. 5, 1926	1	255	185,000	232	4.10	56.47	252	182,000	236	57.96	
1927..	1,420	Aug. 31, 1927	15	264	191,000	321	5.75	78.05	342	248,000	370	90.00	
1928..	1,890	Aug. 9, 1928	2	405	294,000	354	6.34	86.30	323	234,000	274	68.83	
1929..	1,980	Aug. 13, 1929	3	235	170,000	233	4.23	57.42	248	176,000	209	60.90	
1930..	1,590	⑥	1	217	157,000	213	3.82	51.85	210	152,000	229	55.65	
1931..	1,190	July 20, 1931	1	245	178,000	242	4.34	58.91	243	176,000	259	62.98	
1932..	1,610	④	1	379	275,000	381	6.33	92.97	379	275,000	469	114.47	
1933..	1,890	June 15, 1933	1	357	258,000	443	7.91	107.78	400	354,000	509	123.80	
1934..	1,500	⑤	1	513	371,600	464	8.32	112.94	393	284,600	362	88.10	
1935..	1,230	Jan. 27, 1935	1	346	250,800	369	6.61	89.73	353	255,400	290	70.59	
1936..	1,630	May 27, 1936	1	320	232,400	305	5.47	74.46	308	223,700	318	77.50	
1937..	1,320	⑦	1	237	171,400	273	4.89	66.38	237	171,300	232	60.77	
1938..	1,260	⑦	1	297	214,800	301	5.39	73.17	289	209,400	269	65.43	
1939..	1,390	July 9-14, 1939	1	312	226,000	291	5.22	70.86	333	241,300	294	71.54	
1940..	1,030	May 11, 1940	2	297	215,600	253	4.62	62.89	258	209,100	238	58.12	
1941..	1,720	July 11, 1941	1	210	152,200	191	3.42	46.42	212	153,400	223	54.30	
1942..	747	⑧	0	222	160,400	253	4.53	61.40	215	155,500	238	57.06	
1943..	1,270	June 9, 1943	0	330	233,200	344	6.16	83.62	350	253,300	332	80.77	
1944..	1,020	Aug. 12-30, 1944	0	240	173,900	222	3.98	54.17	222	160,900	210	51.18	
1945..	1,300	May 31, 1945	0	306	221,700	297	5.32	72.22	313	226,400	326	79.27	
1946..	1,650	June 15, 1946	4	297	215,200	377	6.76	91.76	343	245,000	396	96.38	
1947..	1,490	April 29, 1947	1.0	419	303,200	356	6.35	86.60	390	289,400	376	91.49	
1948..	4,150	May 29, 1948	4	364	263,300	404	7.24	98.55	394	285,900	352	85.89	
1949..	1,030	June 6-12, 1949	4.2	272	196,800	358	6.42	87.15	367	265,600	409	99.50	
1950..	1,930	June 30, 1950	9.6	502	365,400	444	7.96	108.05	454	328,600	459	111.73	
1951..	1,220	Aug. 18-21, 1951	3.1	444	321,400	403	7.22	98.02	363	262,900	343	83.54	
1952..	789	July 13, 19, 1952	2.2	270	196,100	270	5.00	68.15	258	187,500	223	55.49	
1953..	1,170	June 13, 14, 1953	8	294	212,700	315	5.65	76.63	.....	.....	.....	.....

† Maximum observed. ‡ Maximum daily. § Determined from hourly gage heights of lake surface and estimated natural inflow to lake. ° Computed from gate opening. / Computed from spillway overflow and tunnel discharge. 8 Computed from combined flow past gage and lake spillway.

① May 23, June 5-7, 1904. ② May 31, June 3, 1905. ③ July 19-28, 1930. ④ July 28, Aug. 15, 1932. ⑤ Dec. 14, 1933 to Jan. 9, 1934. ⑥ June 20, 21, 1937. ⑦ May 24 25, 1938. ⑧ Aug. 8, 24-29, 1942.

YAKIMA RIVER BASIN

Cabin Creek near Easton, Wash.

Location.—Lat. 47°14'30", long. 121°13'40", in sec. 9, T. 20 N., R. 13 E., on right bank at Northern Pacific railway bridge, half a mile upstream from mouth, and 2¾ miles west of Easton.

Drainage area.—31.7 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,250 ft. (from topographic map).

Extremes.—1909-11: Maximum discharge observed, 1,380 cfs Mar. 19-21, 1910 (gage height, 3.80 ft.); minimum observed, 2 cfs Feb. 17-23, 1910, and Aug. 29 to Sept. 5, 1911 (gage height, 1.00 ft.).

Maximum stage known, 6.00 ft. Nov. 20, 1911 (discharge, 3,610 cfs, from rating curve extended above 540 cfs).

Remarks.—One small diversion above station for railroad water supply. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....									272	47.1	12.6	8.77	.....
1910....	20.1	190	132	39.5	21.3	622	414	343	64.8	15.3	8.6	5.7	157
1911....	41.9	261	66.4	84.9	34.0	44.5	64.9	207	169	46.4	10.5	31.0	88.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....									84	25	7.8	3.0	.....
1910....	15	46	60	8	2	54	133	78	28	10	8	4	2
1911....	28	36	28	28	28	16	36	78	122	22	2	2	2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1909.....													
1910.....	1,380†	Mar. 19-21, 1910	2	157	4.95	67.26	114,000	159	68.21	115,000			
1911.....	770†	Nov. 23-26, 1910	2	88.4	2.79	37.84	64,600	.....	.....	.....

† Maximum observed.

Kachess Lake near Easton, Wash.

Location.—Lat. 47°15'50", long. 121°12'00", at dam on Kachess River, in SW ¼ sec. 34, T. 21 N., R. 13 E., at outlet of Kachess Lake and 2½ miles northwest of Easton.

Drainage area.—63.6 sq. mi.

Gage.—Staff and slope gage. Datum of gage is mean sea level (Bureau of Reclamation benchmark). Sept. 20, 1905, to Sept. 30, 1921, staff gage and water-stage recorder at site in vicinity of Bureau of Reclamation reservoir dam at same datum.

Extremes.—1905-53: Maximum contents observed, 241,890 acre-ft. June 13, 1953 (elevation, 2,262.64 ft.); minimum observed, 525 acre-ft. Sept. 14, 15, 1910 (original crib dam); minimum elevation observed, 2,197.73 ft. Sept. 26, 27, 1915.

Remarks.—Reservoir formed on natural lake by earth- and gravel-fill dam completed in 1912. Original crib dam creating capacity of 21,000 acre-ft. used Sept. 20, 1905, to June 30, 1911. Storage above present dam began June 30, 1911. Capacity, 239,000 acre-ft. between gate sill (elevation, 2,192.75 ft.) and top of spillway gate (elevation, 2,262.00 ft.). Records given herein represent usable contents. Water used for irrigation. Contents obtained by using mean gage height for the last day of the month prior to October 1952 and for the midnight gage height thereafter.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1905												95,520	
1906	99,020	96,580	99,380	102,520	101,820	100,250	107,520	114,300	114,120	106,550	100,080	96,750	
1907	103,580	109,060	101,030	100,420	102,520	99,550	104,450	110,750	116,740	114,300	108,980	101,720	
1908	96,120	98,550	101,300	97,450	97,100	103,400	105,500	113,220	113,580	113,110	105,460	97,730	
1909	97,100	99,440	98,500	97,870	97,800	99,020	102,350	106,830	113,370	114,260	102,770	97,170	
1910	96,360	116,100	100,530	100,420	99,940	104,620	109,350	106,380	108,820	110,030	96,720	96,360	
1911	100,920	105,180	99,480	98,500	97,030	100,150	102,800	106,440	113,940	109,800	98,300	80,000	
1912	83,000	108,800	92,000	92,000	82,900	70,400	65,300	106,400	106,480	102,780	76,190	67,830	
1913	64,450	63,850	36,320	27,430	25,180	22,700	33,980	53,440	88,060	104,560	102,460	90,010	
1914	53,050	53,350	47,450	56,500	53,500	73,300	95,650	115,900	122,200	106,800	60,700	27,920	
1915	20,500	20,580	26,820	30,900	33,080	48,030	79,070	96,000	79,970	10,740	16,140	13,980	
1916	19,970	34,820	45,770	52,830	62,050	88,070	106,580	156,540	205,930	220,370	200,470	156,260	
1917	130,500	129,930	135,430	145,050	157,140	165,600	178,430	211,210	213,320	220,420	163,080	119,020	
1918	99,670	94,560	173,060	183,910	197,690	206,460	226,200	227,500	228,610	185,350	174,840	112,700	
1919	111,190	123,360	154,600	178,550	176,130	163,890	170,420	187,510	218,910	209,330	119,970	113,860	
1920	114,520	120,750	124,880	148,900	159,260	172,480	187,000	212,920	229,870	220,150	142,270	98,140	
1921	117,050	124,360	140,620	165,310	185,050	165,680	191,380	210,730	220,020	234,910	167,440	107,000	
1922	111,510	124,250	171,780	178,710	182,990	187,500	200,560	218,650	234,630	189,300	103,980	41,830	
1923	30,870	36,720	49,440	80,920	88,440	98,770	132,500	180,180	216,180	165,520	125,290	70,350	
1924	74,540	84,530	102,420	116,330	143,060	160,540	179,300	227,140	207,190	112,340	62,340	28,500	
1925	33,750	45,660	73,500	87,920	107,040	120,260	153,410	205,720	230,720	225,180	154,120	89,170	
1926	92,250	98,730	126,400	139,820	151,440	174,470	203,470	221,400	179,680	87,460	32,070	21,000	
1927	35,290	47,520	66,620	75,050	82,820	89,780	111,500	157,290	309,310	202,680	156,500	119,300	
1928	120,870	159,940	162,030	159,460	144,510	157,020	179,670	220,240	231,400	188,820	132,060	116,890	
1929	126,730	133,050	138,710	143,040	146,760	158,500	169,480	213,540	237,580	185,600	158,180	156,140	
1930	139,360	140,660	147,110	150,950	170,260	189,160	223,460	231,170	203,630	119,860	73,650	44,730	
1931	41,190	49,100	53,700	62,280	74,880	96,390	120,600	161,110	161,150	91,910	44,700	21,740	
1932	25,070	37,730	45,150	56,980	62,650	116,470	150,620	193,660	234,460	197,460	155,530	114,190	
1933	100,590	148,590	176,330	170,300	163,530	155,030	158,020	165,880	213,900	215,910	160,840	98,940	
1934	88,880	110,330	109,320	163,730	172,110	199,670	207,720	216,650	205,540	175,220	149,720	93,920	
1935	97,050	125,580	144,400	162,110	147,500	158,980	169,560	177,800	174,840	123,070	99,050	91,390	
1936	89,290	91,940	97,510	107,680	114,410	127,020	137,520	149,170	144,350	106,220	106,550	87,800	
1937	70,090	71,550	85,830	90,920	98,170	109,390	130,160	174,970	194,150	150,770	118,360	100,560	
1938	91,630	120,560	141,770	155,230	161,020	171,250	203,980	226,350	238,340	202,850	168,250	124,920	
1939	110,110	121,040	140,280	162,020	171,990	173,640	193,300	232,970	237,620	185,860	121,850	101,860	
1940	97,230	106,440	127,510	133,880	145,720	165,760	196,000	226,250	212,400	170,420	131,700	96,980	

YAKIMA RIVER BASIN

Kachess Lake near Easton, Wash.—Continued

Contents in Acre-feet on Last Day of Month—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	98,100	105,400	118,550	124,920	129,450	140,520	107,360	159,980	149,130	96,390	75,650	75,050	.....
1942...	78,270	93,530	111,980	117,620	123,660	132,650	160,460	167,720	203,670	159,780	96,400	64,080	.....
1943...	56,650	72,640	90,630	103,100	111,400	124,640	165,520	210,070	240,210	227,500	195,670	169,150	.....
1944...	165,480	170,710	188,440	193,850	200,990	211,960	223,170	217,500	210,640	184,660	87,750	55,690	.....
1945...	54,700	61,230	72,610	99,790	116,290	126,690	143,310	190,950	202,090	166,020	133,350	132,100	.....
1946...	139,680	155,550	168,950	183,110	189,630	200,820	213,620	217,940	230,410	214,240	164,910	136,340	.....
1947...	127,560	132,710	164,010	185,560	201,940	220,460	230,540	238,070	230,410	207,550	175,010	141,580	.....
1948...	158,060	168,700	169,010	177,840	187,840	196,810	210,250	229,470	238,840	199,090	162,460	163,450	.....
1949...	160,620	174,300	174,800	170,220	176,660	175,130	194,880	222,910	225,400	182,880	120,740	98,350	.....
1950...	104,200	135,240	157,940	171,330	180,970	187,510	174,470	207,320	240,020	227,900	169,520	129,820	.....
1951...	144,080	172,150	177,170	173,890	182,320	174,550	201,830	234,410	231,260	162,310	121,110	123,770	.....
1952...	137,750	152,880	162,640	166,580	176,500	184,250	213,190	240,250	226,470	180,050	123,700	93,530	.....
1953...	91,600	92,700	96,670	134,630	158,980	170,670	193,960	235,360	239,710	221,530	177,500	143,230	.....

Kachess River near Easton, Wash.

Location.—Lat. 47°15'30", long. 121°11'50", in NE¼ sec. 3, T. 20 N., R. 13 E., on left bank, three-quarters of a mile downstream from Kachess Lake and 2 miles northwest of Easton.

Drainage area.—63.6 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,188.10 ft. above mean sea level (Bureau of Reclamation benchmark). Prior to Oct. 8, 1927, staff or water-stage recorder at several sites within half a mile of present gage at different datums. Oct. 9, 1927, to Sept. 30, 1951, water-stage recorder at present site at datum 1.33 ft. higher than present datum.

Average discharge.—50 years (1903-53), 282 cfs (unadjusted), 284 cfs (adjusted for storage since October 1905).

Extremes.—1903-53: Maximum discharge, 2,530 cfs May 28, 1948 (gage height, 8.45 ft., present datum); no flow when gates in dam are closed.

Remarks.—No diversion above station. Flow regulated by Kachess Lake (see p. 581).

YAKIMA RIVER BASIN

583

Kachess River near Easton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	145*	364*	426	286	153	227	473	578	745	305	113	147	330*
1905...	138	141	376	179	98.9	427	330	324	451	147	146	203	247
1906...	257	192	161	173	203	206	434	401	325	211	131	92.8	237
1907...	168	695	337	202	303	229	301	780	368	143	123	170	318
1908...	111	113	226	185	92.5	365	432	456	713	393	193	167	290
1909...	69.5	119	140	134	116	121	232	526	612	192	230	145	220
1910...	86.9	674	618	192	206	407	614	855	294	80.0	248	30.7	367
1911...	193	467	277	194	122	125	264	518	432	219	211	467	292
1912...	0	201	620	340	530	399	428	239	562	203	465	186	347
1913...	123	199	567	409	277	216	187	483	369	88.7	119	286	350
1914...	790	212	219	165	150	6.2	134	334	275	400	795	559	342
1915...	224	202	134	18.0	0	1.19	17.4	3.19	404	840	257	88.2	186
1916...	30.9	0	0	0	0	37.9	204	20.5	306	466	491	768	193
1917...	455	139	0	0	0	0	0	256	999	516	993	750	344
1918...	465	61.3	.32	633	0	0	107	541	500	634	237	1,050	372
1919...	244	0	0	0	216	337	360	471	24.9	408	1,460	125	307
1920...	43.5	217	137	0	0	0	0	0	38.1	279	1,280	902	242
1921...	21.9	58.7	0	0	34.0	608	0	456	576	0	1,170	1,100	337
1922...	65.2	1	1	2	2	2	3	447	341	1,320	1,020	1,060	358
1923...	217	1	1	2	2	2	3	3	3	727	922	927	242
1924...	17.2	1	1	2	2	3	3	4	683	1,630	872	619	322
1925...	24.9	1	1	1	1	1	2	2	2	150	1,180	1,100	209
1926...	7.5	1.2	1.0	1.0	1.0	2.5	5.0	4.2	840	1,520	908	248	297
1927...	1.0	1.0	1.0	1.0	1.0	1.0	6.5	6.5	1.8	835	810	765	162
1928...	286	0	540	488	204	137	109	109	173	769	911	292	368
1929...	1.48	0	0	0	0	2.74	83.3	11.9	244	878	451	39.4	144
1930...	288	1.00	1.00	1.00	1.89	2.97	3.67	265	633	1,620	757	505	335
1931...	130	1.00	1.00	1.00	1.00	1.00	1.57	.19	298	1,210	792	416	240
1932...	29.70	2.13	0	0	.28	2.10	5.57	3.23	89.10	833	727	717	202
1933...	328	2.47	8.74	482	266	258	286	504	169	427	1,010	1,180	411
1934...	614	2.57	372	664	188	183	931	142	307	528	427	962	444
1935...	204	2.8	10.6	340	514	69.0	104	608	652	957	502	170	344
1936...	70.2	14.4	.7	1.3	1.1	39.7	479	984	754	740	63.8	344	292
1937...	313	.1	0	0	2.0	1.4	3.4	1.6	503	907	594	315	222
1938...	182	4.6	2.7	2.4	1.0	2.2	4.8	226	417	604	585	733	232
1939...	276	2.6	4.3	3.7	2.1	217	175	3.3	266	969	1,060	365	281
1940...	144	2.0	1.5	1.0	1.9	3.0	1.7	68.5	437	712	644	590	218
1941...	52.5	.7	.9	1.0	1.0	1.3	41.0	403	320	683	369	127	186
1942...	141	6.6	.9	.8	1.0	1.1	1.2	.4	72.4	802	1,055	671	224
1943...	155	.5	1.0	.7	1.3	2.4	5.4	2.1	222	470	533	458	155
1944...	103	0	.2	1.0	1.1	2.2	164	574	368	779	1,263	592	323
1945...	76.1	.5	1.8	2.8	1.5	1.2	2.7	1.1	178	800	373	101	131
1946...	8.04	3.29	3.21	2.99	2.05	3.63	270	1,034	545	538	835	496	314
1947...	318	83.6	54.1	3.59	3.06	91.5	398	509	445	449	557	613	295
1948...	85.6	297	246	3.0	2.6	2.9	86.4	684	884	835	652	23.9*	321*
1949...	156	4.03	224	184	84.9	215	216	742	674	990	1,075	411	418
1950...	113	4.97	4.42	2.03	2.01	216	530	248	684	682	1,046	704	346
1951...	23.7	4.35	437	341	422	301	84.6	348	590	1,222	677	*0.30	373
1952...	.31*	1.04	1.28	.76	1.25	1.73	6.06	288	646	897	942	540	278*
1953...	48.6	1.01	.65	4.00	3.74	2.83	3.01	2.55	488	596	781	623	214

* Estimated.

YAKIMA RIVER BASIN

Kachess River near Easton, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...			245	185	0	0	0	0	220	145	65	33	0
1905...	73	57		44	26	167	17	37	193	68	57	130	17
1906...	130	154	130	140	214	176	227	140	214	71	62	62	62
1907...	62	62	240	176	201	164	164	442	42	29	29	159	29
1908...	42	54	176	96	76	67	240	253	350	201	76	12	12
1909...	39	45	122	111	92	106	175	366	64	69	96	97	39
1910...	78	81	244	131	181	294	436	698	10	9	80	4	4
1911...	5	25	181	160	94	84	238	112	25	13	12	0	0
1912...	0	0	421	152	507	0	419	0	0	3.2	4.0	0	0
1913...	0	0	0	210	158	183	178	207	78	80	76	13	0
1914...	350	23	126	100	64	2	6	2	10	152	218	269	2
1915...	2	132	0	0	0	0	1	0	0	581	137	0	0
1916...	0	0	0	0	0	0	7.4	17.4	16.2	199	19.2	280	0
1917...	308	0	0	0	0	0	0	0	492	184	236	161	0
1918...	297	0	0	0	0	0	0	167	260	109	167	455	0
1919...	0	0	0	0	0	155	0	0	0	0	1,120	0	0
1920...	0	0	0	0	0	0	0	0	0	0	913	0	0
1921...	0	0	0	0	0	0	0	0	0	0	122	388	0
1922...	1	1	1	2	2	2	3	3	3	696	655	728	1
1923...	1	1	1	2	2	2	3	3	3	3	501	152	1
1924...	1	1	1	2	2	3	3	4	4	1,560	438	382	1
1925...	0	1	0	1	1	1	2	2	2	?	557	0	0
1926...	0	1	1	1	1	1	5	4	4	1,400	562	1	0
1927...	1	1	1	1	1	1	2	4	1	1	739	1	1
1928...	0	0	0	168	137	185	99	6	6	489	766	2	0
1929...	0	0	0	0	0	0	3	1	1	736	1	7	0
1930...	1	1	1	1	1	2	2	1	1	823	194	156	1
1931...	1	1	1	1	1	1	1	0	0	781	613	179	0
1932...	2	0	0	0	0	1	5	2	2	387	206	93	0
1933...	1	1	1	193	269	256	256	504	1	5	424	1,140	1
1934...	1	1	1	265	2	3	540	19	114	404	246	452	1
1935...	0	2	3	9	201	24	2	3	555	443	190	140	0
1936...	1	1	0	1	1	2	14	955	164	499	31	37	0
1937...	0	0	0	0	0	1	2	1	1	360	397	225	0
1938...	1	1	1	1	1	1	2	4	165	386	555	708	1
1939...	39	0	0	2	1	1	3	2	6	316	602	188	0
1940...	25	0	0	1	1	2	1	2	320	499	470	215	0
1941...	0	0	0	1	1	1	1	215	196	526	82	61	0
1942...	0	0	0	0	1	1	1	0	0	317	912	394	0
1943...	0	0	0	0	1	2	4	1	1	262	449	327	0
1944...	0	0	0	1	1	1	3	440	71	436	876	274	0
1945...	0	0	0	1	1	1	1	1	1	456	239	1	0
1946...	.9	2.3	2.3	2.3	1.9	2.3	3.7	642	3.0	247	710	440	.9
1947...	156	4.8	3.2	.8	2.4	3.0	322	375	302	3.8	164	600	.8
1948...	1.6	2.0	3.0	2	2	2	3	99	642	642	274	2	1.6
1949...	2	3	41	56	56	208	177	26	253	334	973	78	2
1950...	110	2.4	2.5	2.4	1.7	2.4	512	103	110	14.5	790	211	1.7
1951...	2.6	2.7	2.0	221	298	6.2	6.9	7.9	138	940	0.5	0.2	0.2
1952...		.5	.8	.6	.9	1.0	2.0	79	365	365	814	262	
1953...	1.5	.6	.4	.5	1.5	1.2	2.0	2.0	2.2	404	572	486	.4

YAKIMA RIVER BASIN

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Kachess River near Easton, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
Year	Observed					Adjusted			Observed		Adjusted	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
	Dis-charge	Date										
1903..												
1904..	1,020†	June 6, 1904	0	330	240,000				307	223,000		
1905..	932†	June 1-2, 1905	17	247	179,000				242	176,000	248	58.49
1906..	735†	May 2-4, 1906	62	237	171,000	238	3.78	51.36	285	207,000	289	62.15
1907..	1,760†	Nov. 16, 1906	29	318	230,000	325	5.16	69.95	256	185,000	255	54.99
1908..	1,230†	June 12, 1908	12	290	211,000	285	4.52	61.45	280	203,000	276	59.57
1909..	1,020†	June 4, 1909	39	229	159,000	219	3.48	47.20	307	223,000	310	66.79
1910..	1,530†	Dec. 1, 1909	4	367	266,000	366	5.81	78.80	330	239,000	329	70.87
1911..	1,120†	Nov. 23, 1910	0	292	212,000	267	4.24	57.38	233	205,000	269	58.05
1912..	1,040†	Aug. 1-2, 1912	0	347	252,000	330	5.24	71.35	355	257,000	281	60.76
1913..	92†	June 3-9, 1913	0	280	202,000	311	4.94	66.98	306	222,000	319	68.75
1914..	1,040	Oct. 6, 1913	2	342	248,000	256	4.06	55.19	287	206,000	259	55.82
1915..	985	July 2, 1915	0	186	134,000	166	2.63	35.84	140	101,000	166	35.66
1916..	1,080	Aug. 3, 1916	0	193	140,000	390	6.13	84.14	241	175,000	364	78.64
1917..	1,460	Sept. 6, 1917	0	344	249,000	293	4.61	62.29	338	245,000	300	63.22
1918..	1,290	Sept. 6, 1918	0	372	270,000	365	5.74	77.78	349	253,000	324	69.11
1919..	1,770	Aug. 2, 1919	0	307	222,000	308	4.84	65.94	319	231,000	278	59.39
1920..	2,240	Aug. 27, 1920	0	242	176,000	221	3.47	47.23	216	157,000	238	50.86
1921..	1,840	Aug. 24, 1921	0	337	244,000	349	5.49	74.51	336	243,000	379	60.91
1922..	1,610	July 20, 1922	1	358	259,000	268	4.61	57.36	371	269,000	302	43.19
1923..	1,920	July 22, 1923	1	242	175,000	281	4.42	60.03	225	163,000	298	63.64
1924..	1,720	June 30, 1924	1	322	233,000	263	4.14	56.42	323	233,000	282	60.39
1925..	1,660	Sept. 12, 1925	0	209	151,000	293	4.61	62.51	208	150,000	231	59.91
1926..	1,600	July 18, 1926	0	297	215,000	293	3.79	43.40	297	215,000	214	45.76
1927..	958	Sept. 9, 1927	1	182	117,000	299	4.70	63.64	232	163,000	350	74.58
1928..	1,310	Jan. 13, 1928	0	338	245,000	332	5.22	71.12	268	194,000	249	53.38
1929..	1,730	Aug. 9, 1929	0	144	104,000	200	3.14	42.67	169	122,000	180	38.52
1930..	1,940	July 16, 1930	1	335	243,000	181	2.85	38.60	322	233,000	193	41.16
1931..	1,400	July 18, 1931	0	240	174,000	208	3.27	44.43	232	168,000	220	47.04
1932..	1,360	July 25-27, 1932	0	202	147,000	330	5.19	70.57	228	165,000	407	87.05
1933..	1,590	Aug. 14, 1933	1	411	298,000	390	6.13	83.23	467	338,000	458	97.77
1934..	1,590	Dec. 24-25, 1933	1	444	321,700	437	6.87	93.39	379	274,200	344	73.43
1935..	1,540	Jan. 25, 1935	0	344	249,200	341	5.30	72.78	333	241,100	269	57.41
1936..	1,090	①	0	292	211,600	287	4.51	61.34	311	225,700	295	63.08
1937..	1,380	July 21-22, 1937	0	222	160,700	240	3.77	51.19	212	153,100	269	61.69
1938..	1,530	June 6, 1938	1	232	168,000	266	4.18	56.66	240	173,700	238	50.70
1939..	1,570	July 30, 1939	0	281	203,300	249	3.92	53.15	260	195,000	262	53.75
1940..	795	July 6-15, 1940	0	218	158,200	211	3.32	45.18	210	152,500	198	42.20
1941..	1,960	July 11, 1941	0	186	134,300	155	2.44	33.13	194	140,100	134	39.35
1942..	1,300	Aug. 20, 1942	0	224	161,900	208	3.27	44.48	224	162,400	195	41.63
1943..	748	June 27, 1943	0	155	112,500	300	4.72	64.13	151	109,200	268	61.02
1944..	1,360	Aug. 8-23, 1944	0	323	234,200	166	2.61	35.57	321	232,700	161	34.45
1945..	950	July 15, 1945	0	131	94,610	236	3.71	50.47	125	90,670	258	55.14
1946..	1,240	May 27-28, 1946	.9	314	227,400	320	5.03	68.27	351	254,400	345	73.54
1947..	890	May 2, 1947	.8	295	213,600	302	4.75	64.52	309	223,900	216	67.17
1948..	2,830	May 28, 1948	1.6	321	235,600	351	5.52	75.14	301	218,600	310	66.29
1949..	1,690	Oct. 26, 1949	2	418	302,900	328	5.16	70.04	396	289,800	373	79.57
1950..	1,260	June 22, 1950	1.7	346	250,500	390	6.13	83.22	376	271,500	402	85.81
1951..	1,320	July 17-19, 1951	0.2	373	269,800	364	5.72	77.74	333	241,300	313	66.87
1952..	1,560	June 16, 1952	.....	278	202,100	237	3.73	50.69	282	205,000	192	41.07
1953..	1,170	July 20, 1953	.4	214	154,700	283	4.45	60.33	.....	.....	.....	.....

† Maximum observed. ① May 25 to June 13, 1936.

YAKIMA RIVER BASIN

Kittitas Canal at Easton, Wash.

Location.—Lat. 47°14', long. 121°11', in SW¼ sec. 11, T. 20 N., R. 13 E., on left bank at Easton and a quarter of a mile downstream from diversion dam.

Gage.—Water-stage recorder. Altitude of gage is 2,170 ft. (from topographic map).

Average discharge.—23 years (1930-53), 328 cfs.

Extremes.—1930-53: Maximum daily discharge, 1,240 cfs July 20-23, 1945; no flow at times each year.

Remarks.—Canal operated by Kittitas Reclamation District. Station operated by Bureau of Reclamation. Approximately 55,000 acres are irrigated currently.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...								5,820	9,160	13,300	17,700	31,500	.....
1931...	3,310	0	0	0	0	0	163	3,970	23,300	34,500	21,300	6,650	92,100
1932...	0	0	0	0	0	0	0	7,390	24,300	36,800	27,390	22,300	119,000
1933...	9,960	0	0	0	0	0	0	5,830	22,300	41,700	33,300	19,100	132,000
1934...	10,310	0	0	0	0	0	6,390	25,100	43,070	50,790	36,050	30,290	212,000
1935...	10,360	0	0	0	0	0	597	24,470	34,930	53,800	36,680	34,270	197,100
1936...	16,100	0	0	0	0	0	0	23,120	29,880	65,070	44,280	31,190	209,600
1937...	15,690	0	0	0	0	0	0	20,900	33,900	57,590	47,010	30,520	211,700
1938...	0	0	0	0	0	0	0	7,950	33,070	39,720	64,750	52,050	234,200
1939...	11,420	0	0	0	0	0	16,480	48,370	45,570	65,790	58,610	35,970	285,200
1940...	12,340	206	359	0	0	0	7,310	37,930	54,280	64,980	52,540	85,020	265,600
1941...	9,150	0	0	0	0	0	6,290	46,130	42,700	64,200	47,470	18,720	234,700
1942...	12,560	547	0	0	0	0	8,480	33,830	35,450	63,200	58,790	42,920	258,800
1943...	15,620	0	0	0	0	0	1,290	33,130	35,060	60,060	61,570	46,310	256,900
1944...	16,300	0	0	0	0	0	5,190	48,230	51,330	67,550	60,750	41,650	291,000
1945...	12,040	0	0	0	0	0	3,340	34,330	52,170	69,230	63,810	37,910	272,800
1946...	11,430	0	0	0	0	0	953	35,030	39,740	59,690	66,560	29,480	242,900
1947...	13,940	0	0	0	0	0	11,860	49,790	44,690	68,060	53,450	34,710	282,400
1948...	12,190	0	0	0	0	0	1,190	9,050	23,860	65,040	55,480	43,100	214,600
1949...	8,320	0	0	0	0	0	3,790	41,540	53,470	67,990	57,710	41,210	274,000
1950...	15,560	0	0	0	0	0	420	35,630	37,750	66,410	69,320	51,960	277,100
1951...	11,510	0	0	0	0	0	12,610	37,760	53,290	66,670	68,590	42,760	263,200
1952...	16,340	0	0	0	0	0	16,500	51,000	58,330	66,160	65,750	50,800	324,900
1953...	14,410	0	0	0	0	0	12,110	36,500	41,960	67,990	65,760	52,860	291,600

Yakima River at Easton, Wash.

Location.—Lat. 47°14'20", long. 121°10'40", in SE¼ sec. 11, T. 20 N., R. 13 E., on right bank at Easton, 20 ft. downstream from highway bridge, a quarter of a mile downstream from Easton dam, and 1½ miles downstream from Kachess River.

Drainage area.—182 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,140 ft. (from river-profile map). Prior to Oct. 10, 1915, staff or chain gages at several sites in vicinity of present site at various datums.

Average discharge.—17 years (1910-15, 1941-53), 587 cfs.

Extremes.—1904, 1910-15, 1941-53: Maximum discharge, 9,050 cfs May 28, 1948 (gage height, 9.20 ft.); minimum, 1.2 cfs Nov. 10, 1952 (gage height, 1.31 ft.).

Remarks.—Diversion above station for several thousand acres downstream by Kittitas Canal (see above). Flow regulated (see Keechelus Lake near Martin and Kachess Lake near Easton).

YAKIMA RIVER BASIN

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Yakima River at Easton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904									1,370	690	316	311	
1905	257												
1910						1,740	2,030	2,490	913	294	436	250	
1911	753	1,280	646	500	268	396	828	1,330	1,140	568	622	563	735
1912	50.7	1,170	1,050	800	844	536	1,030	1,900	1,610	619	879	402	698
1913	309	687	727	751	782	653	828	1,680	1,810	722	290	348	818
1914	1,210	540	478	607	388	636	959	1,610	909	599	920	683	799
1915	484	871	354	160	108	670	1,069	309	536	968	316	67.8	496
1941				101	99.1	147	239	170	98.2	600	51.8	79.9	
1942	277	214	272	85.3	95.9	123	254	79.5	69.0	540	965	326	277
1943	108	188	307	224	103	170	881	882	1,326	359	591	583	482
1944	299	67.6	259	51.3	138	194	359	214	121	353	1,419	640	347
1945	52.0	103	91.5	501	309	120	200	337	300	666	183	128	249
1946	111	210	204	235	102	230	355	2,006	1,333	317	428	564	551
1947	243	425	1,218	410	335	608	1,295	878	347	303	591	635	609
1948	355	926	883	184	271	341	540	1,978	2,226	463	371	213	729
1949	512	238	801	482	316	652	1,428	1,787	1,089	117	240	159	654
1950	634	1,126	1,247	528	497	1,072	1,428	1,004	1,229	887	480	635	898
1951	596	1,084	1,413	1,360	1,550	922	482	713	502	700	283	90.5	813
1952	219	394*	229	176	236	190	297	425	288	663	442	172	296*
1953	132	23.6	39.3	421	688	325	620	225	664	246	403	247	333

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904									910	402	185	176	
1905	195												
1910						882	1,260	1,700	330	145	227	97	
1911	114	336	424	348	184	202	620	803	551	443	220	99	99
1912	37	59	495	303	295	177	801	910	1,006	282	493	60	37
1913	210	282	249	405	448	405	405	875	1,130	472	104*	25*	25*
1914	657	265	321	233	334	292	595	774	292	323	423	423	233
1915	142	643	168	106*	93	98	511	113	72	707	148	38*	38*
1941				91	67	74	79	47	31	25	24	24	24
1942	50	78	126	62	70	49	41	52	45	76	777	25	25
1943	34	70	137	104	91	70	350	425	805	62	483	509	34
1944	104	45	78	66	74	94	49	65	59	194	522	152	45
1945	29	89	40	88	130	23	22	50	58	226	151	49	22
1946	67	112	83	112	91	89	48	1,270	293	50	367	377	48
1947	73	79	432	174	182	217	262	381	106	194	162	569	73
1948	41	153	245	192	137	276	124	518	660	375	118	116	41
1949	143	82	599	245	184	523	925	890	177	52	81	42	42
1950	120	738	354	312	418	571	1,010	424	206	185	293	190	120
1951	108	391	553	1,100	511	293	150	131	146	255	67	42	42
1952	42	36	190	168	200	102	145	75	169	257	336	79	38
1953	23	2.4	28	41	248	244	319	71	212	142	339	114	2.4

* Estimated.

YAKIMA RIVER BASIN

Yakima River at Easton, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Djs. charge	Date					
1904.....							
1905.....							
1910.....	4,360†	April 26, 1910					
1911.....	3,220†	Nov. 23, 1910	99	735	533,000	701	508,000
1912.....	5,900†	Nov. 19, 1911	87	898	652,000	553	619,000
1913.....	3,480†	June 2, 3, 1913	25	518	592,000	861	623,000
1914.....	2,570†	May 16, 1914	233	799	519,000	754	546,000
1915.....	7,280†	Mar. 26, 1915	38	496	359,000		
1941.....	2,900	July 11, 1941				197	142,600
1942.....	1,920	Nov. 24, 1941	25	277	200,600	264	190,900
1943.....	2,410	June 18, 1943	34	482	349,000	484	350,000
1944.....	8,400	June 29, 1944	45	347	252,000	315	223,600
1945.....	2,010	Jan. 13, 1945	22	249	180,400	272	197,300
1946.....	2,660	June 3, 1946	48	551	399,000	666	482,200
1947.....	3,250	Dec. 14, 1946	73	609	440,800	631	458,900
1948.....	9,050	May 28, 1948	41	129	528,800	679	492,500
1949.....	2,910	June 6, 1949	42	654	473,200	775	560,900
1950.....	3,130	Nov. 27, 1949	120	898	650,300	900	655,700
1951.....	2,750	⊙	42	513	558,700	608	440,400
1952.....	1,200	May 27, 1952	38	296	215,100	258	187,300
1953.....	604	Feb. 1, 1953	2.4	333	240,800		

† Maximum observed. ⊙ Dec. 24, 1950, Feb. 11, 1951.

Cle Elum Lake near Roslyn, Wash.

Location.—Lat. 47°14'40", long. 121°04'00", at dam on Cle Elum River, in NE¼ sec. 10, T. 20 N., R. 14 E., at outlet of Cle Elum Lake and 4 miles northwest of Roslyn.

Drainage area.—203 sq. mi.

Gage.—Slope gage. Datum of gage is mean sea level (Bureau of Reclamation benchmark). Prior to Mar. 31, 1906, staff gage several hundred feet upstream at different datum. May 4, 1906, to Nov. 7, 1916, staff gage and Nov. 8, 1916, to Sept. 4, 1931, water-stage recorder at approximate site of original gage at datum 2,122.75 ft. higher.

Extremes.—1906-53: Maximum contents observed, 443,700 acre-ft. May 31, 1945 and May 28, 1949 (elevation, 2,241.40 ft.); minimum observed, 2,380 acre-ft. Aug. 31, 1906; minimum elevation observed, 2,114.35 ft. Oct. 14, 1932. Storage was uncontrolled Oct. 3, 1931, to Feb. 26, 1932.

Remarks.—Reservoir formed by earth- and gravel-fill dam completed in 1933; storage began above present dam Feb. 26, 1932. Capacity, 436,000 acre-ft. between gate sill (elevation, 2,110.00 ft.) and top of spillway gate (elevation, 2,240.00 ft.). Records represent usable contents. Water used for irrigation. Contents obtained by using mean gage height for the last day of the month prior to October 1952 and for the midnight gage height thereafter.

Cle Elum Lake near Roslyn, Wash.—Continued

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906				6,100	5,120	7,770	10,700	8,550	6,700	3,790	2,840	3,600	
1907	6,900	5,500	4,920	4,360	4,030	3,030	9,390	12,400	7,920	6,700	6,700	6,400	
1908	5,310	7,710	8,340	6,100	6,100	27,740	29,420	30,380	30,620	27,950	22,460	14,120	
1909	12,790	26,760	26,540	25,220	24,950	26,420	27,350	29,540	27,620	21,670	6,040	5,800	
1910	5,210	40,000	18,600	12,570	12,900	26,660	28,460	28,700	26,600	25,460	4,080	3,030	
1911	17,340	22,460	6,500	16,640	19,520	26,660	25,100	29,780	27,020	18,720	5,310	19,980	
1912	3,220	22,820	24,930	25,940	24,740	26,180	27,740	28,340	26,730	24,500	10,760	3,600	
1913	9,160	11,860	24,080	25,400	25,360	8,290	27,450	31,900	29,110	26,560	14,000	5,420	
1914	8,420	25,800	6,500	8,550	9,730	21,280	23,840	27,720	26,780	21,380	6,150	8,420	
1915	13,520	24,310	19,180	16,360	16,810	26,860	25,550	25,060	14,840	6,960	6,510		
1916	11,100	22,510	23,990	16,320	15,670	24,400	28,530	28,810	29,260	26,640	18,260	8,040	
1917	7,580	13,060	15,310	17,630	23,050	26,220	25,140	31,900	29,540	26,750	8,350	11,850	
1918	5,140	18,610	35,590	23,560	25,370	26,760	29,610	30,190	27,590	25,160	13,060	7,190	
1919	20,790	25,280	25,460	26,450	25,050	26,290	30,290	29,550	28,430	24,040	11,420	6,250	
1920	7,900	26,170	27,010	27,190	25,260	25,550	23,950	25,010	31,680	28,220	16,900	20,090	
1921	15,610	25,900	27,780	25,100	26,840	26,170	26,680	29,900	28,620	26,150	13,250	25,710	
1922	27,660	24,810	25,330	14,920	21,010	24,350	26,710	29,920	27,290	10,890	7,650	6,040	
1923	8,920	13,210	26,500	24,960	24,670	26,960	28,710	28,200	26,810	25,420	10,150	6,350	
1924	8,100	19,920	25,300	25,510	26,080	25,260	27,360	27,400	25,810	24,780	10,040	7,490	
1925	16,800	24,350	25,400	25,440	25,370	25,740	27,560	28,290	27,520	17,760	7,360	9,070	
1926	9,770	8,990	25,900	24,810	25,440	27,310	26,850	25,550	13,920	7,550	7,170	11,320	
1927	25,120	26,540	25,170	24,720	24,690	25,280	28,740	28,290	28,120	24,580	7,700	9,620	
1928	25,580	27,260	24,810	25,280	24,670	26,220	28,010	26,270	26,590	25,080	24,330	9,920	
1929	10,110	14,560	21,840	19,980	24,200	26,310	28,050	28,060	27,010	24,780	10,090	5,950	
1930	11,550	15,840	24,350	24,260	25,550	23,480	27,700	26,980	26,010	20,670	6,630	5,450	
1931	13,400	24,600	24,130	27,170	25,300	25,970	30,550	28,220	25,940	10,900	6,080	4,990	
1932	25,720	23,540	23,150	24,120	38,960	27,380	31,590	29,060	27,940	20,600	12,880	9,870	
1933	14,460	113,120	33,430	22,050	13,450	12,400	39,660	64,490	124,290	87,940	89,620	103,950	
1934	152,340	248,400	266,960	224,250	194,370	293,820	319,110	290,460	257,900	172,140	110,860	85,970	
1935	108,070	192,220	230,900	299,630	288,740	305,400	320,210	373,270	368,480	363,450	297,400	212,960	
1936	169,620	177,340	184,600	198,540	207,330	234,770	350,610	376,820	367,010	326,030	233,440	166,870	
1937	145,450	148,540	170,650	179,330	188,930	211,260	259,410	371,390	371,170	351,480	260,280	206,340	
1938	206,230	261,670	306,520	334,760	346,360	362,560	388,820	432,670	434,890	365,050	252,160	160,420	
1939	203,320	223,350	258,300	301,200	317,420	350,650	422,410	438,850	431,000	370,260	270,290	199,890	
1940	194,050	220,170	274,720	290,660	312,250	358,180	433,340	437,430	401,320	290,910	169,960	95,190	
1941	101,050	117,540	148,270	161,180	170,890	219,570	296,830	298,930	277,510	205,170	79,990	39,380	
1942	76,570	110,420	170,480	183,440	193,980	212,920	294,390	348,070	363,700	280,880	197,650	113,200	
1943	93,200	121,240	155,920	184,850	201,450	230,330	340,670	430,870	434,400	414,900	322,080	266,610	
1944	272,060	261,770	318,770	327,860	341,670	368,350	470,310	434,400	396,370	275,000	195,020	145,150	
1945	136,420	155,220	183,370	243,500	281,930	302,240	333,950	443,660	432,530	321,140	161,900	79,690	
1946	67,260	98,000	121,150	147,120	159,150	179,960	360,440	392,490	435,750	400,940	276,370	251,570	
1947	262,060	267,680	313,510	345,840	372,910	412,410	485,940	438,730	423,360	319,240	198,990	146,070	
1948	202,110	262,220	239,560	269,130	276,010	294,350	343,840	432,630	439,160	358,360	252,710	196,130	
1949	218,000	241,370	262,650	177,060	167,650	176,710	253,530	440,760	437,090	389,370	277,220	149,990	
1950	56,220	127,360	183,080	209,610	226,850	267,000	316,280	345,360	440,560	421,420	342,360	228,360	
1951	214,960	235,330	274,520	261,590	266,560	256,320	333,900	437,720	438,680	373,810	245,910	158,680	
1952	182,800	218,300	236,490	240,640	247,930	257,980	342,320	438,780	421,650	352,060	220,690	112,420	
1953	83,180	55,690	90,830	156,830	213,740	239,100	283,560	428,590	439,450	392,440	234,330	198,440	

YAKIMA RIVER BASIN

Cle Elum River near Roslyn, Wash.

Location.—Lat. 47°14'30", long. 121°03'50", in NW¼ sec. 11, T. 20 N., R. 14 E., on left bank, 1,000 ft. downstream from dam at Cle Elum Lake, and 4 miles northwest of Roslyn.

Drainage area.—203 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,102.10 ft. above mean sea level (Bureau of Reclamation benchmark). Oct. 10, 1903, to Apr. 19, 1933, staff gages or water-stage recorder at several sites within half a mile at same datum.

Average discharge.—50 years (1903-53), 899 cfs (unadjusted); 905 cfs (adjusted for storage since January 1906).

Extremes.—1903-53: Maximum discharge, 18,700 cfs Nov. 15, 1906 (gage height, 14.05 ft); no flow at times when gates in dam are closed.

Remarks.—No diversion above station. Flow regulated by Cle Elum Lake (see p. 588).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	893*	746	1,020	567	867	867	1,970	2,630	2,680	1,510	517	250	1,130*
1905...	234	391	527	209	211	1,160	1,010	1,460	1,840	733	438	314	717
1906...	857	452	352	401	644	494	1,590	2,020	1,230*	675*	318	239	796*
1907...	831	2,650	522	426	726	509	1,070	3,210	1,880	706	349	292	1,100
1908...	170	228	489	351	216	605	1,430	2,240	2,870	1,750	544	339	933
1909...	203	334	282	248	224	321	938	2,000	2,740	1,020	569	270	764
1910...	287	2,160	1,230	558	436	1,220	2,060	2,700	1,410	735	610	206	1,140
1911...	753	1,440	702	238	157	385	1,160	1,640	2,130	851	484	127	636
1912...	417	671	467	471	469	304	1,090	2,850	2,210	737	454	453	883
1913...	166	339	173	380	470	613	925	2,580	3,380	1,480	665	453	972
1914...	485	309	561	575	245	501	1,630	2,480	1,010	554	409	222	889
1915...	317	956	443	204	130	491	1,860	389	743	446	252	156	535
1916...	240	356	845	380	375	654	1,450	2,760	3,860	2,470	900	573	1,230
1917...	164	143	140	167	307	203	603	2,640	3,390	2,330	938	221	962
1918...	242	55.1	2,710	1,860	487	394	1,420	2,030	2,540	868	581	365	1,140
1919...	275	438	1,190	760	411	339	1,410	2,440	2,160	1,300	648	297	976
1920...	147	448	635	880	534	453	651	1,550	1,220	801	474	601	697
1921...	1,160	443	451	834	971	880	1,160	2,840	2,990	1,080	553	154	1,130
1922...	434	514	1,720	401	54.2	92.4	565	2,140	2,410	846	288	231	817
1923...	148	172	252	960	282	348	1,710	2,650	2,080	1,710	520	255	679
1924...	219	137	421	390	1,400	511	899	2,910	1,220	529	471	164	774
1925...	235	263	1,160	405	684	519	1,790	3,240	1,860	928	419	114	970
1926...	358	224	634	542	385	949	1,370	1,230	750	350	171	104	605
1927...	467	523	773	326	233	253	1,000	2,310	3,330	1,710	611	330	941
1928...	678	1,440	892	1,080	324	745	1,030	3,370	1,700	693	228	391	1,060
1929...	561	177	78.1	173	47.9	387	711	2,380	1,910	701	486	170	648
1930...	12.8	12.0	16.0	110	621	701	1,900	1,420	1,010	566	408	135	573
1931...	103	86.7	159	280	570	692	1,070	2,390	1,240	626	201	169	632
1932...	370	621	246	525	965	1,720	1,530	2,730	2,040	1,140	503	254	1,100
1933...	237	134	1,620	1,710	408	299	855	1,710	2,430	2,680	621	209	1,080
1934...	150	296	2,330	1,850	1,310	153	2,550	2,680	1,640	1,860	1,140	697	1,380
1935...	208	10.1	5.4	335	1,000	283	596	1,700	2,457	1,086	1,427	1,689	696
1936...	535	9.5	20.2	23.0	23.0	33.0	37.3	3,322	2,480	1,318	1,707	1,246	931
1937...	465	17.7	0	21.9	28.4	28.0	21.5	663	3,142	1,296	1,780	1,017	705
1938...	202	17.2	31.1	34.0	36.4	127	1,261	2,138	2,214	1,902	1,951	968	906
1939...	41.1	10.3	34.6	37.4	40.0	41.0	382	2,148	1,497	1,755	1,847	1,265	765
1940...	234*	2.0*	2.0*	26.3	37.3	39.1	289	2,071	1,757	2,151	2,107	1,317	845*

* Estimated.

Cle Elum River near Roslyn, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	159	16.9	21.2	29.9	31.0	31.7	133	1,128	1,044	1,405	2,221	1,086	614
1942...	15.5	22.0	27.3	28.0	29.3	26.6	80.9	802	1,047	1,914	1,559	1,552	596
1943...	40.4	22.9	25.0	27.4	28.8	30.3	33.0	1,003	2,784	1,615	1,908	1,073	767
1944...	58.0	35.6	36.6	37.7	36.0	35.4	225	1,480	1,747	2,302	1,444	1,148	718
1945...	258	29.6	31.0	32.3	33.6	35.1	179	857	1,789	2,483	2,822	1,708	869
1946...	522	36.3	22.8	28.4	27.2	29.3	30.3	1,605	1,896	1,791	2,384	577	753
1947...	246	252	392	118	264	293	1,315	2,775	1,905	2,338	2,230	1,136	1,116
1948...	171	111	959	36.0	86.0	88.4	33.5	1,841	3,833	2,366	2,113	1,128	1,059
1949...	32.6	33.6	1,072	619	153	656	282	843	2,592	1,857	2,164	2,399	1,067
1950...	2,083	350	2	17.9	26.1	31.3	3.63	2,030	2,525	2,427	1,970	2,165	1,144
1951...	972	800	616	835	948	924	373	1,422	2,339	1,876	2,476	1,639	1,271
1952...	263	12.6	98.4	149	174	139	75.0	909	1,902	1,984	2,426	1,955	843
1953...	535	45.8	64.9	53.6	44.0	46.1	308	63.8	1,973	2,268	2,262	1,644	777

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	460*	478	425	375	240	270	285	1,240	1,670	725	330	190	190
1905...	165	190	390	215	140	495	255	965	1,100	545	330	270	140
1906...	442	360	300	296	460	328	1,170	1,170	.....	392	130	265	180
1907...	296	650	460	328	.....	392	392	1,500	1,110	392	296	236	236
1908...	106	130	360	265	208	208	530	1,570	1,450	650	392	175	106
1909...	85	200	200	200	175	175	565	1,130	1,330	645	296	203	85
1910...	224	245	613	412	385	419	922	1,670	210	422	347	158	158
1911...	70	670	474	160	125	145	710	1,270	1,090	615	200	77	70
1912...	177	152	354	270	325	225	745	1,340	1,210	425	355	220	182
1913...	68	72	73	241	228	320	72	1,100	2,070	875	493	270	68
1914...	228	61	270	256	56	69	770	1,470	1,000	560	394	28	26
1915...	61	183	174	126	128	94	1,090	813	385	319	213	113	61
1916...	117	329	329	323	221	297	758	1,600	2,530	1,250	622	348	117
1917...	114	131	135	139	152	159	191	1,030	2,390	1,930	522	52	52
1918...	12	17	65	704	126	256	793	1,130	1,320	513	390	206	12
1919...	206	262	365	282	297	124	853	1,390	1,620	785	393	200	124
1920...	44	33	205	338	329	296	437	820	792	395	305	326	33
1921...	544	50	262	364	308	661	682	975	1,740	689	282	50	50
1922...	224	316	403	39	39	63	172	1,060	1,290	441	59	174	89
1923...	28	159	159	332	245	256	1,320	1,260	1,500	529	498	165	28
1924...	133	47	70	279	636	392	374	1,460	765	329	265	112	47
1925...	122	144	222	288	393	358	597	1,860	1,320	807	193	9	9
1926...	28	34	29	288	266	490	836	807	544	186	151	26	26
1927...	60	269	370	228	166	209	397	1,220	1,520	780	263	217	60
1928...	117	549	340	358	263	242	549	1,250	1,140	393	160	118	117
1929...	243	62	40	30	36	101	417	1,420	1,290	362	254	15	15
1930...	12	12	12	72	144	298	1,350	1,030	779	499	176	111	12
1931...	46	28	104	104	319	409	637	1,120	752	371	113	115	28
1932...	136	316	201	211	351	1,000	874	1,600	1,210	754	354	205	186
1933...	152	0	0	643	0	272	346	1,520	2,180	1,200	0	11	0
1934...	0	0	1,180	1,200	18	18	34	592	1,120	1,600	640	253	0
1935...	19	5	6	6	630	252	0	0	1,600	602	476	950	0
1936...	334	0	13	10	28	23	35	42	1,340	826	1,620	945	0
1937...	23	0	0	0	26	28	58	32	2,260	762	1,520	600	0
1938...	15	1	1	34	34	24	156	467	1,290	1,560	1,600	300	1
1939...	11	2	18	37	39	41	41	525	960	1,460	1,420	1,020	2
1940...	2*	2*	2*	2*	37	39	41	1,080	1,360	1,750	1,670	537	2*
1941...	21	2	2	28	81	31	34	960	816	2*	1,790	660	2
1942...	14	9	26	28	28	23	33	33	388	1,560	1,490	1,150	9
1943...	22	22	23	27	28	30	32	35	1,920	1,530	1,450	478	22
1944...	3	35	36	36	38	35	35	453	1,530	2,220	1,160	356	3
1945...	3*	3*	31	31	33	35	36	36	1,400	1,700	2,040	970	3*

* Estimated.

YAKIMA RIVER BASIN

Cle Elum River near Roslyn, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916...	11	20	22	27	27	29	29	23	850	1,400	2,040	428	20
1947...	36	35	257	23	34	37	S30	1,760	1,640	2,300	2,160	416	23
1948...	25	11	265	36	36	37	2.3*	2.5*	2,060	2,100	679	37	2.3*
1949...	24	23	34	103	103	154	3	3	66	1,290	1,880	2,100	3
1950...	170.	0	0	0	25	29	0	190	2,020	801	1,800	1,400	0
1951...	126	520	404	732	236	358	85	236	1,610	1,530	1,560	900	88
1952...	27	0	0	120	172	66	39	39	1,050	1,030	2,360	1,570	0
1953...	57	0	53	51	25	24	34	31	202	1,770	1,630	1,130	0

Summary

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Observed					Adjusted			Observed		Adjusted	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
	Dis-charge	Date										
1904..	4,520†	May 24, 1904	190	1,130	818,000	.....	.....	.....	1,000	726,000	.....	.....
1905..	2,990†	①	140	717	519,000	.....	.....	.....	760	552,000	.....	.....
1906..	3,320†	②	130	796	576,000	796	3.92	53.21	990	715,000	969	66.11
1907..	18,700	Nov. 15, 1906	236	1,100	798,000	1,110	5.47	74.25	848	811,000	848	56.74
1908..	5,320†	June 11, 1908	106	933	677,000	942	4.64	63.13	927	673,000	950	63.72
1909..	5,380†	June 3, 1909	85	764	553,000	750	3.69	50.20	1,000	724,000	1,020	63.20
1910..	9,940†	Nov. 24, 1909	158	1,140	822,000	1,170	5.76	77.83	1,070	776,000	1,060	70.86
1911..	4,650†	Nov. 22, 1910	70	836	605,000	857	4.22	57.28	724	524,000	750	50.09
1912..	4,950†	May 21, 1912	152	883	641,000	860	4.24	57.71	810	588,000	810	54.31
1913..	6,300†	June 3, 1913	68	972	704,000	973	4.79	65.02	1,030	747,000	1,010	67.60
1914..	4,050	May 16, 1914	26	839	607,000	841	4.16	56.47	809	625,000	836	59.18
1915..	4,230	April 3, 1915	61	585	423,000	579	2.85	38.60	519	375,000	525	35.16
1916..	6,650	June 18, 1916	117	1,230	894,000	1,240	6.11	83.17	1,190	865,000	1,180	79.08
1917..	5,650	May 29, 1917	82	962	696,000	969	4.77	64.75	1,130	855,000	1,210	80.90
1918..	14,800	Dec. 29-30, 1918	12	1,140	820,000	1,180	5.57	75.61	1,040	756,000	1,030	68.82
1919..	5,230	May 28, 1919	124	976	706,000	975	4.80	65.16	918	604,000	921	61.63
1920..	2,700	Jan. 19, 1920	33	697	506,000	716	3.53	48.05	787	557,000	768	51.45
1921..	5,060	③	50	1,180	816,000	1,140	5.62	76.29	1,160	857,000	1,160	78.87
1922..	13,300	Dec. 13, 1921	39	817	591,000	789	3.89	52.60	635	460,000	636	42.49
1923..	5,030	May 10, 1923	28	879	637,000	886	4.38	58.78	896	649,000	895	59.56
1924..	6,720	Feb. 13, 1924	47	774	562,000	775	3.82	52.00	845	616,000	848	56.90
1925..	5,370	May 17, 1925	9	970	702,000	971	4.78	64.89	920	665,000	920	61.49
1926..	2,910	April 17, 1926	26	605	438,000	608	3.00	40.72	663	480,000	662	44.25
1927..	6,090	June 8, 1927	60	941	681,000	939	4.63	62.55	1,050	762,000	1,050	70.18
1928..	5,790	May 22, 1928	117	1,060	769,000	1,060	5.22	71.05	863	626,000	868	57.58
1929..	4,180	May 24, 1929	15	648	468,000	641	3.16	42.59	583	425,000	590	39.50
1930..	3,010	April 23, 1930	12	573	415,000	572	2.82	38.28	599	434,000	598	40.04
1931..	4,510	May 2, 1931	28	632	458,000	632	3.11	42.22	701	508,000	700	46.83
1932..	6,450	Feb. 28, 1932	136	1,100	797,000	1,100	5.49	73.77	1,170	848,000	1,250	83.85
1933..	3,260	④	0	1,080	785,000	1,220	6.01	81.58	1,150	832,000	1,410	84.34
1934..	3,610	April 26, 1934	0	1,350	1,000,000	1,356	6.65	90.68	1,165	845,100	1,116	74.66
1935..	3,730	June 8, 1935	0	896	648,700	1,071	5.28	71.67	951	658,200	827	59.32
1936..	4,070	May 16, 1936	0	931	676,100	868	4.28	58.26	899	652,600	880	58.94
1937..	4,170	June 3, 4, 1937	0	705	510,600	760	3.74	50.77	655	496,300	873	58.37
1938..	5,690	April 18, 1938	1	906	656,000	893	4.40	59.73	892	646,000	826	55.25
1939..	4,220	May 16, 1939	2	765	553,600	769	3.79	51.45	787	566,000	804	53.75
1940..	4,100	May 11, 1940	2	845	613,200	791	3.45	46.96	832	607,600	663	44.51
1941..	2,530	July 31, 1941	2	614	444,400	537	2.65	35.97	603	436,300	633	42.35
1942..	2,200	July 12, 1942	9	596	431,300	698	3.44	46.70	629	455,100	609	40.72
1943..	5,500	May 27, 1943	22	767	554,900	878	4.82	65.43	739	535,100	964	64.48
1944..	2,470	June 30, 1944	3	718	521,600	671	2.71	36.89	743	539,400	556	37.30
1945..	4,250	May 31, 1945	3	869	629,400	779	3.84	52.13	833	639,300	797	53.35

* Estimated. † Maximum observed.

① June 1, 2, 4, 1906. ② April 23, May 2, 1906. ③ May 17, June 5, 1921. ④ Dec. 19, 20, 1933.

Cle Elum River near Roslyn, Wash.—Continued

Summary—Continued

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Observed					Adjusted			Observed		Adjusted	
	Momentary maximum		Mini- mum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run- off in inches	Mean	Runoff in acre-feet	Mean	Run- off in inches
Dis- charge	Date											
1946..	3,970	Ⓢ	20	753	545,000	890	4.88	66.24	779	563,600	1,044	69.77
1947..	4,450	May 9, 1947	28	1,118	807,600	970	4.78	64.89	1,146	829,500	1,044	69.77
1948..	11,000	May 28, 1948	2.3	1,059	768,600	1,128	5.56	75.68	1,050	762,400	999	66.97
1949..	4,690	June 7, 1949	3	1,067	772,800	1,004	4.95	67.19	1,177	851,300	1,149	76.83
1950..	4,290	Ⓢ	0	1,144	828,000	1,252	6.17	83.75	1,139	824,400	1,265	84.60
1951..	3,800	May 25, 1951	28	1,271	920,200	1,175	5.79	78.56	1,102	797,900	1,050	70.19
1952..	3,150	June 5, 1952	0	843	611,700	779	3.84	52.22	805	627,500	664	44.65
1953..	3,760	June 13, 1953	0	777	562,700	598	4.42	60.03	.....	.....	.....	.....

Ⓢ May 27, 28, 1946. Ⓢ June 23, July 1, 2, 1950.

Yakima River at Cle Elum, Wash.

Location.—Lat. 47°11'20", long. 120°56'40", in sec. 27, T. 20 N., R. 15 E., on left bank at highway bridge at Cle Elum, just upstream from Roslyn Creek, and 7 miles upstream from Teanaway River.

Drainage area.—500 sq. mi.

Supplemental records available.—Records of chemical analyses since December 1952 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is 1,902.27 ft. above mean sea level (levels by Bureau of Reclamation). Aug. 24, 1906, to Oct. 21, 1924, staff or chain gages, or water-stage recorder at approximately the same site and datum.

Average discharge.—47 years (1906-53), 1,957 cfs (adjusted for storage since 1906 and Kittitas Canal diversions since 1930).

Extremes.—1906-53: Maximum discharge, 25,600 cfs Nov. 14, 1906 (gage height, 12.5 ft., from floodmarks); minimum not determined, may have been less than 60 cfs estimated for daily discharge Nov. 20, 21, 1952.

Remarks.—Kittitas high-line canal diverts water from River at Easton for irrigation below station. Several smaller diversions for irrigation of several hundred acres above station. Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes (see elsewhere in this report).

YAKIMA RIVER BASIN

Yakima River at Cle Elum, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906													484
1907	1,420	5,580*	1,400*	1,060	1,820	1,310	2,430	6,570	3,350	1,170	644	593	2,280*
1908	445	519	1,220	858	565	2,180	3,460	4,760	5,290	3,050	1,080	783	2,020
1909	411	712	650	755	609	890	2,080	3,820	5,060	1,780	1,120	672	1,650
1910	495	4,740	3,060	1,260	1,080	3,820	4,960	5,600	2,520	1,060	1,050	514	2,520
1911	1,670	3,000	1,530	910	564	1,010	2,280	3,560	3,870	1,530	1,010	667	1,800
1912	458	2,410	1,560	1,480	1,680	1,050	2,500	5,180	4,030	1,680	1,270	889	1,980
1913	513	1,080	1,040	1,300	1,000	1,530	2,420	5,500	6,270	2,810	1,050	915	2,160
1914	1,860	676	1,210	1,450	834	1,670	3,360	4,750	2,770	1,610	1,460	986	1,920
1915	914	2,090	955	434	294	1,340	3,160	1,430	1,300	1,430	628	286	1,190
1916	494	1,120	856	715	663	2,580	3,610	5,140	6,540	4,550	1,830	1,450	2,460
1917	746	686	817	587	742	564	1,400	4,930	6,600	4,320	2,160	1,260	2,070
1918	763	803	5,010	5,170	1,050	785	2,370	3,470	4,110	2,020	2,130	1,660	2,480
1919	784	1,100	2,490	1,430	1,150	1,130	2,940	4,540	3,160	2,190	2,680	1,350	2,090
1920	768	1,270	1,080*	1,530	945	854	1,220	2,220	1,990	2,600	2,810	2,010	1,610*
1921	1,720	758	776	1,570	1,680	8,000	2,220	4,940	5,290	2,250	3,020	1,910	2,430
1922	957	807	3,080	612	195	240	1,260	3,970	4,120	3,170	2,750	1,690	1,920
1923	466	318	437	1,830	520	753	2,590	3,920	3,340	2,500	2,850	1,930	1,820
1924	374	341	840	889	2,210	1,050	1,650	4,390	2,660	3,110	2,790	1,400	1,810
1925	443	450	1,760	759	1,330	1,200	2,920	4,790	2,650	2,200	2,770	1,820	1,930
1926	349	354	1,210	920	825	1,680	2,330	1,890	2,670	2,940	1,750	541	1,460
1927	710	841	1,300	660	496	635	1,890	3,600	4,700	2,180	2,310	1,950	1,790
1928	1,660	2,370	3,090	2,640	968	1,660	1,940	4,910	2,630	2,650	2,670	963	2,350
1929	616	341	230	281	204	779	1,300	3,620	2,790	2,820	2,050	972	1,350
1930	422	64.2	157	323	1,060	1,880	3,130	2,220	1,780	2,920	1,610	690	1,340
1931	338	233	239	404	840	1,140	1,900	3,500	1,860	2,850	1,560	706	1,250
1932	453	311	350	848	1,200	2,670	2,720	4,330	3,750	2,250	2,500	1,480	1,950
1933	605	1,170	2,180	2,940	1,000	1,040	1,970	3,900	4,500	3,460	2,270	1,900	2,250
1934	1,280	1,340	6,930	4,800	3,130	1,620	4,910	3,110	1,700	2,100	2,130	1,420	2,800
1935	582	648	772	2,179	2,797	981	1,553	3,165	3,463	2,030	2,277	2,052	1,868
1936	967	185	166	259	324	619	1,929	6,488	4,338	2,191	1,975	1,460	1,747
1937	628	192	212	173*	237*	425	762	1,563	4,654	2,347	2,365	1,198	1,231*
1938	357	564	593	799	472	588	2,279	3,720	3,024	2,084	2,390	1,611	1,545
1939	252	237	491	711	360	858	1,771	2,761	1,847	2,585	2,612	1,762	1,370
1940	473	168	401	192	366	548	379	2,809	2,005	2,590	2,616	1,875	1,274
1941	321	176	324	178	188	322	598	1,469	1,254	2,070	2,274	1,240	874
1942	373	323	438	236	227	275	718	1,099	1,287	2,497	2,447	1,918	992
1943	544	319	473	471	306	467	1,553	2,008	4,005	2,359	2,529	1,689	1,399
1944	440	191	388	202	262	378	768	1,858	1,971	2,695	2,662	1,771	1,136
1945	470	198	255	629	492	327	760	1,636	2,206	2,963	3,021	1,836	1,244
1946	705	372	319	407	213	469	1,279	4,207	3,442	2,119	2,910	1,267	1,406
1947	565	752	2,030	710	840	1,256	2,923	3,802	2,159	2,654	2,887	1,801	1,872
1948	581	1,157	1,947	342	477	521	815	4,130	7,105	2,837	2,579	1,606	2,009
1949	673	369	2,024	1,403	620	1,567	2,414	3,333	3,992	2,925	2,565	2,768	2,006
1950	2,814	1,568	1,401	700	768	1,266	1,928	3,801	4,141	3,533	2,650	2,828	2,292
1951	1,615	2,070	2,267	2,298	2,658	2,084	1,450	2,601	2,091	2,651	3,108	1,661	2,315
1952	658*	300	413	393	571	571	895	1,751	2,398	2,742	2,940	2,306	1,331*
1953	825	108*	132	614	1,069	578	1,309	712	2,574	2,602	2,760	1,959	1,294*

* Estimated.

YAKIMA RIVER BASIN

Yakima River at Cle Elum, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906													440
1907	472	981		713	688	970	1,020	3,350	1,780	569	394	408	394
1908	357	332	910	592	510	452	1,670	2,510	2,600	1,140	910	439	332
1909	260	368	485	593	478	554	1,330	2,920	2,560	1,160	864	461	280
1910	425	495	1,510	922	938	1,450	2,740	3,900	1,350	785	800	330	330
1911	338	1,346	1,040	650	470	423	1,560	2,560	2,020	1,030	752	196	196
1912	269	242	1,120	742	1,260	815	1,000	2,940	2,640	1,020	1,020	500	242
1913	306	446	515	790	700	1,130	860	2,320	3,900	1,600	768	475	366
1914	1,220	428	676	637	615	718	1,980	2,980	1,720	1,260	885	670	428
1915	361	839	529	348	267	331	1,730	1,060	579	1,100	403	199	199
1916	202	812	675				2,420	3,400	4,360	2,630	1,160	853	202
1917	707	350	503	327	551	441	524	2,120	5,010	1,830	1,680	726	327
1918	421	286	604	1,550	717	527	1,260	2,060	2,120	1,600	1,520	989	286
1919	516	611	827	582	791	629	2,260	2,380	2,260	1,880	2,350	784	516
1920	511	659	723	582	588	532	813	1,390	1,340	1,660	2,450	1,140	511
1921	757	320	410	717	605	1,600	1,440	1,380	2,710	1,820	2,710	1,200	320
1922	445	554	803	197	183	178	580	1,910	2,000	2,400	2,470	1,070	178
1923	200*	265	262	592	406	406	2,210	2,150	2,250	1,740	2,340	534*	200*
1924	235	144	449	574	895	786	752	2,440	2,050	2,910	2,380	739	144
1925	298	310	400	562	835	902	1,240	2,630	2,140	1,920	2,500	786	298
1926	136	282	270	550	508	934	1,320	1,200	1,020	2,700	918	274	136
1927	278	466	713	405	360	520	942	2,380	2,770	1,600	2,030	574	278
1928	458	918	1,070	835	705	671	1,200	2,090	1,970	2,030	1,480	506	506
1929	452	261	151	151	164	265	501	2,410	1,760	2,480	841	601	151
1930	70	66	76	230	443	534	2,370	1,630	1,130	2,630	482	174	66
1931	133	142	162	166	548	575	1,260	1,880	1,060	1,670	1,300	406	133
1932	193	470	330	322	303	1,260	1,850	2,590	2,260	2,020	1,960	1,170	193
1933	266	539	539	1,400	716	551	932	3,470	3,800	1,990	1,740	1,640	266
1934	432	568	2,130	2,620	644	735	585	858	1,300	2,020	2,080	756	432
1935	136	410	328	594	1,300	782	803	1,170	2,270	1,610	2,020	1,200	136
1936	589	119	132	166	252	427	533	2,280	2,290	2,010	1,820	1,130	119
1937	127	120	70	106*	163*	271	483	610	3,100	1,760	1,880	724	70
1938	112	152	394	518	426	410	716	1,700	1,730	1,730	2,150	994	112
1939	92	126	211	430	299	234	1,090	1,240	1,240	2,180	2,050	1,460	92
1940	160	125	180	164	164	400	578	2,110	1,560	2,240	2,300	780	125
1941	103	103	180	166	169	220	288	1,250	982	1,510	1,860	1,040	103
1942	144	179	280	186	186	190	304	328	756	1,980	2,300	1,250	144
1943	220	192	269	257	273	304	992	918	2,300	1,940	2,140	1,230	192
1944	261	150	177	177	169	228	366	1,280	1,650	2,520	2,100	1,110	150
1945	113	172	158	151	292	241	287	503	1,500	2,310	2,310	1,130	113
1946	352	225	162	230	192	328	514	1,730	1,550	1,550	2,440	1,030	182
1947	159	412	1,010	335	424	560	1,450	2,240	1,600	2,430	2,330	1,020	159
1948	229	389	788	236	279	428	345	733	2,700	2,480	1,970	557	220
1949	320	174	744	552	408	849	1,060	1,460	737	1,560	2,200	2,520	174
1950	643	821	552	564	651	821	1,330	1,540	2,640	1,200	2,380	1,730	552
1951	695	1,160	1,260	1,800*	1,800*	1,120	1,070	842	2,080	3,020	2,320	1,400	695
1952	366	179	310	300*	497	372	550	614	1,560	1,480	2,800	1,960	179
1953	120*	60*	120	134	504	472	826	466	728	2,190	2,080	1,400	60*

* Estimated.

Yakima River at Cle Elum, Wash.—Continued

Summary

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Observed				Runoff in acre-feet	Adjusted			Observed		Adjusted	
	Momentary maximum		Min- imum day	Mean		Mean	Per square mile	Run- off in inches	Mean	Runoff in acre-feet	Mean	Run- off in inches
Dis- charge	Date	Dis- charge			Date							
1906..												
1907..	25,600	Nov. 14, 1906	394	2,230	1,650,000	2,310	4.62	62.60	1,770	1,250,000	1,780	48.20
1908..	9,480	June 11, 1908	332	2,020	1,470,000	2,020	4.04	54.54	1,990	1,440,000	2,020	54.95
1909..	9,720	June 3, 1909	250	1,550	1,120,000	1,550	3.10	43.01	2,000	1,510,000	2,090	66.67
1910..	17,300	Nov. 24, 1909	330	2,520	1,820,000	2,510	6.02	68.25	2,340	1,700,000	2,320	63.12
1911..	10,000	Nov. 22, 1910	196	1,600	1,310,000	1,810	3.62	49.17	1,660	1,120,000	1,670	45.42
1912..	9,410	①	242	1,980	1,440,000	1,940	3.88	52.63	1,840	1,330,000	1,760	47.81
1913..	11,300	June 3, 1913	366	2,160	1,560,000	2,210	4.42	69.95	2,240	1,650,000	2,260	61.40
1914..	6,850	May 17, 1914	423	1,920	1,390,000	1,810	3.62	49.30	1,910	1,350,000	1,870	50.68
1915..	7,360	Mar. 27, 1915	199	1,190	861,000	1,140	2.28	30.94	1,070	772,000	1,070	29.10
1916..	10,800	June 18, 1916	202	2,460	1,700,000	2,690	5.38	73.00	2,450	1,730,000	2,560	69.59
1917..	10,100	May 30, 1917	327	2,070	1,500,000	2,060	4.12	55.85	2,450	1,770,000	2,610	70.71
1918..	19,900	Dec. 30, 1917	288	2,480	1,790,000	2,400	4.80	65.14	2,280	1,650,000	2,170	58.85
1919..	8,690	May 28, 1919	516	2,090	1,510,000	2,120	4.24	57.50	1,980	1,430,000	1,990	53.89
1920..	4,870	Jan. 19, 1920	511	1,610	1,170,000	1,580	3.16	43.07	1,630	1,180,000	1,660	45.20
1921..	8,820	May 25, 1921	320	2,430	1,760,000	2,480	4.96	67.21	2,570	1,860,000	2,670	72.45
1922..	19,500	Dec. 13, 1921	178	1,920	1,390,000	1,770	3.54	45.03	1,610	1,170,000	1,360	36.97
1923..	7,330	Jan. 8, 1923	200	1,820	1,320,000	1,860	3.72	50.59	1,859	1,340,000	1,930	52.51
1924..	8,570	Feb. 13, 1924	144	1,810	1,310,000	1,760	3.60	47.50	1,900	1,380,000	1,880	51.23
1925..	8,590	May 17, 1925	298	1,930	1,400,000	2,040	4.08	55.36	1,870	1,350,000	1,940	52.78
1926..	3,840	April 17, 1926	186	1,460	1,060,000	1,350	2.70	36.53	1,540	1,110,000	1,440	39.08
1927..	7,490	June 8, 1927	278	1,790	1,200,000	1,950	3.96	53.76	2,150	1,560,000	2,290	62.26
1928..	10,660	Jan. 13, 1928	506	2,350	1,710,000	2,300	4.60	62.61	1,860	1,350,000	1,780	46.56
1929..	5,530	May 24, 1929	151	1,350	974,000	1,400	2.80	39.97	1,310	944,000	1,290	34.92
1930..	4,490	April 23, 1930	66	1,340	972,000	1,290	2.58	35.02	1,350	979,000	1,350	36.77
1931..	6,820	May 2, 1931	138	1,250	965,000	1,340	2.68	36.44	1,320	966,000	1,460	39.60
1932..	9,420	Feb. 28, 1932	193	1,950	1,420,000	2,270	4.54	61.71	2,150	1,560,000	2,680	72.87
1933..	5,690	June 16, 1933	266	2,250	1,630,000	2,620	5.24	71.35	2,640	1,910,000	3,090	88.58
1934..	14,000	Dec. 22, 1933	432	2,800	2,026,000	3,010	6.02	81.78	2,245	1,625,000	2,422	65.78
1935..	7,160	Jan. 26, 1935	186	1,868	1,352,000	2,335	4.67	63.42	1,811	1,311,000	1,901	51.64
1936..	8,880	May 15, 1936	119	1,747	1,268,000	1,952	3.90	53.13	1,723	1,251,000	1,986	54.04
1937..	7,160	June 22, 1937	70	1,231	891,400	1,632	3.26	44.32	1,271	920,300	1,002	51.65
1938..	8,760	April 18, 1938	112	1,545	1,119,000	1,893	3.79	51.43	1,509	1,092,000	1,759	47.79
1939..	5,200	May 17, 1939	92	1,370	991,700	1,716	3.43	46.59	1,384	1,002,000	1,747	47.44
1940..	5,560	May 11, 1940	125	1,274	925,100	1,450	2.90	39.49	1,239	899,200	1,362	37.08
1941..	3,200	July 12, 1941	103	874	632,700	1,072	2.14	29.07	900	651,600	1,262	34.25
1942..	2,740	July 27, 1942	144	992	718,100	1,467	2.93	30.32	1,009	730,500	1,344	36.47
1943..	6,360	②	192	1,399	1,073,000	2,124	4.25	57.67	1,372	993,400	2,070	56.21
1944..	5,570	June 30, 1944	150	1,136	825,100	1,196	2.39	32.56	1,128	810,100	1,166	31.75
1945..	5,640	May 31, 1945	113	1,244	900,900	1,628	3.26	44.19	1,292	935,200	1,728	46.92
1946..	7,010	③	182	1,496	1,083,000	2,154	4.31	58.46	1,653	1,197,000	2,364	62.55
1947..	6,130	May 9, 1947	159	1,872	1,355,000	2,061	4.12	55.85	1,899	1,375,000	2,171	48.41
1948..	16,700	May 29, 1948	220	2,009	1,458,000	2,444	4.89	66.53	1,958	1,422,000	2,168	58.96
1949..	8,100	June 7, 1949	174	2,096	1,452,000	2,316	4.63	62.89	2,233	1,617,000	2,613	70.96
1950..	6,800	④	552	2,292	1,659,000	2,768	5.54	75.15	2,305	1,669,000	2,641	77.11
1951..	4,880	May 25, 1951	695	2,315	1,676,000	2,575	5.15	69.89	1,931	1,398,000	2,250	61.07
1952..	3,520	June 6, 1952	179	1,331	966,500	1,633	3.37	45.81	1,306	948,200	1,431	38.96
1953..	6,010	June 14, 1953	60	1,204	936,900	1,906	3.82	51.80				

† Maximum observed.

① Nov. 19, 20, 1911. ② May 27-29, 1943. ③ May 26, 28, 1946. ④ June 30, July 1, 1950.

Teanaway River below Forks, near Cle Elum, Wash.

Location.—Lat. 47°14', long. 120°51', in NW¼ sec. 9, T. 20 N., R. 16 E., on left up-stream side of diversion dam, 1 mile downstream from North Fork, 5 miles northeast of Cle Elum, and 15 miles upstream from mouth.

Drainage area.—174 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,160 ft. (from topographic map).

Extremes.—1911-12: Maximum discharge, 1,590 cfs Nov. 20, 1911 (gage height, 5.70 ft., from graph based on gage readings), but may have been greater in April 1912 during period of no-gage height record; minimum observed, 4.9 cfs Aug. 31, 1911 (gage height 0.27 ft.).

Remarks.—Numerous small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...									378	72.1	22.5	42.9	.....
1912...	28.4	356	205	325	273	307	989	979	491	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...									188	21	5.3	5.3	.....
1912...	24	20	108	71	188	97	770	575	.....	.....	.....	.....	.....

Teanaway River near Cle Elum, Wash.

Location.—Lat. 47°11'40", long. 120°46'50", in SW¼ sec. 25, T. 20 N., R. 16 E., on right bank, 100 ft. upstream from highway bridge, 4 miles upstream from mouth, and 8 miles east of Cle Elum.

Drainage area.—200 sq. mi. At site 1909-14, 205 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,931.91 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Apr. 2, 1909, to Sept. 30, 1914, chain gage 3½ miles downstream at different datum. Oct. 2, 1946, to Oct. 20, 1949, water-stage recorder 100 ft. downstream at datum 32.08 ft. lower.

Average discharge.—11 years (1909-14, 1946-52), 374 cfs.

Extremes.—1909-14, 1946-52: Maximum discharge, 4,330 cfs Mar. 20, 1910 (gage height, 7.35 ft., from graph based on gage readings, site and datum then in use); minimum observed, 1 cfs part of each day Aug. 6, 1914, Sept. 22-27, 30, 1952.

Remarks.—Several small diversions for irrigation above station. No regulation.

YAKIMA RIVER BASIN

Teanaway River near Cle Elum, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							646	857	647	96.6	8.83	8.29	
1910	40.1	865	306	150*	120*	1,470	1,350	974	329	62.4	8.25	7.81	475*
1911	141	439	239	179	112	598	655	697	420	46.2	13.0	31.9	323
1912	25.6*	339*	231*	373*	305*	345*	1,093*	903*	347	63.5	14.4	25.7	342*
1913	31.0	104	89.7	68	325	386	1,150	1,270	748	165	22.4	21.9	365
1914	68	103	79	204	114	657	980	725	276	53	4	14	274
1947	69.4	90.0	535	279*	446	763	829	695	210	34.5	7.85	20.0	331*
1948	189	313	205	142*	134*	245	746	1,617	1,000	119	36.5	28.2	308*
1949	56.5	100	131	93.7*	156*	530	1,656	1,722	526	93.8	20.5	21.2	429*
1950	71.6*	354	291	126*	121*	451	945	1,628	1,213	275	35.2	15.3	461*
1951	112	360	514	274	705	434	1,313	1,223	501*	108*	14.8*	21.0	462*
1952	139	167	154	67.9*	147	527	1,062	733	237	67.6	6.26	4.53	253*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							200	634	184	32	3.5	3.0	
1910	32	48	66			404	508	558	114	23	2.9	6.8	2.9
1911	7.4	63	156	109	62	73	468	460	132	17	4.4	4.6	4.4
1912	20							495	123	19	9	16	9
1913	17	56	39				253	345	730	349	10	10	
1914	15	47	43	51	67	243	355	320	147	12	1	6	1
1947	50	61	98	117	234	332	467	432	69	4.6	3.9	9.1	3.9
1948	18	173	158	100*	84*	141	345	502	332	25	23	22	18
1949	32	40	49	50*	75*	307	495	930	161	29	17.5	17.5	17.5
1950	20*	62	141	80*	80*	244	600	790	575	88	6.0	9.6	6.0
1951	21	122	222	170*	170*	242	810	525	250*	28*	7.0	11	7.0
1952	52	113	80*	60	89	99	375	420	112	3	2	1	1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1909							
1910	4,330	Mar. 20, 1910	2.9	475	344,000	443	320,000
1911	2,620	Nov. 21, 1910	4.4	323	234,000	308	223,000
1912			9	342	248,000	307	223,000
1913				365	264,000	367	265,000
1914	1,460†	April 15, 1914	1	274	198,000	274	198,000
1947	3,170	Dec. 11, 1946	3.9	331	239,900	332	240,300
1948	4,170	May 28, 1948	18	393	288,900	363	263,500
1949	3,160	May 14, 1949	17.5	429	310,700	464	336,200
1950	3,820	May 13, 1950	6.0	461	334,100	454	350,700
1951	2,880	Feb. 11, 1951	7.0	462	334,500	417	302,000
1952	2,030	April 26, 1952	1	253	183,700		

* Estimated.

† Maximum observed.

YAKIMA RIVER BASIN

599

Swauk Creek near Cle Elum, Wash.

Location.—Lat. 47°09'50", long. 120°40'00", in SE¼ sec. 5, T. 19 N., R. 17 E., on right bank, 1 mile south of south edge of Swauk Prairie, 2½ miles upstream from mouth, and 12 miles east of Cle Elum.

Drainage area.—87.8 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,920 ft. (from topographic map). Apr. 3, 1909, to Aug. 6, 1914, staff gage several hundred feet downstream at different datum.

Average discharge.—5 years (1909-14), 61.2 cfs.

Extremes.—1909-14: Maximum discharge, 989 cfs Mar. 19, 20, 1910 (gage height, 6.0 ft., from graph based on gage readings); no flow for parts of August and September 1914.

Remarks.—Several diversions above station for irrigation with returned flow above station. Entire flow of one small tributary is diverted completely out of drainage basin during irrigation seasons. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							76.3	48.6	17.3	4.94	1.99	1.34	.....
1910	6.73	68.0	67.1	80*	70*	564	278	89.4	18.1	2.25	.90	1.81	104*
1911	11.7	43.8	24.7	26.9	19.7	98.5	117	81.1	37.2	5.58	3.08	3.99	39.5
1912	10.3	26.0	14.3	42.9	68.7	93.1	237	142	29.3	8.8	5.1	6.7	56.7
1913	8.7	16.6	13.1	17.0*	50.3*	70.0	286	232	78	13	4	4	65.8*
1914	7	12	11	16	16	107	142	143	18	7	1	1	40.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							55	29	7.2	2.4	1.6	1.3	.....
1910	1.4	9.2	24			257	206	32	8.6	.7	.5	.5	.5
1911	7	13	20	20	12	12	74	67	20	1.1	.5	.5	.5
1912	6.1	11	8.9	7*	43	41	131	48	9	6	4	6	4
1913	7	12	10	1*	1*	14*	80	172	28	7	2	2	1*
1914	4	7	8	9	15	40	74	55	7	3	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1909								
1910	989	⊙		0.5	104	75,500	99.0	71,700
1911	242	Mar. 24, 1911		.5	39.5	28,600	37.1	26,800
1912	442	April 11, 1912		4	56.7	41,200	55.7	40,500
1913				1	65.8	47,700	65.0	47,100
1914				0	40.2	29,100		

* Estimated

⊙ Mar. 19, 20, 1910.

YAKIMA RIVER BASIN

Taneum Creek near Thorp, Wash.

Location.—Lat. 47°05'10", long. 120°46'40", in sec. 1, T. 18 N., R. 16 E., on left bank, a quarter of a mile upstream from Bruton Canal and 5¾ miles northwest of Thorp.

Drainage area.—76.3 sq. mi.

Supplemental records available.—November 1910 to September 1912, gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 2,040 ft. (from topographic map).

Extremes.—1909-10: Maximum discharge, 694 cfs Mar. 21, 1910 (gage height, 6.40 ft., from graph based on gage readings); minimum observed, 4 cfs Sept. 1-6, 26, 27, 1909 (gage height, 2.15 ft.), but may have been less during period of no gage-height record.

Remarks.—Above all diversions. Supplemental records were obtained from gage a quarter of a mile downstream and below Bruton Canal which, at times, carries as much as 40 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							54.0	95.5	101	24.9	7.61	6.87	.....
1910	14.3	84.5	55.6*	25.0*	22.0*	245	297	167	50.8	14.5	6.8	8.9	82.9*
1911	18.0												.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							27	70	34	12	5.3	4.0	.....
1910	7.8	50				69	212	88	24	7.5	6	7.5	6
1911	9												.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1909							
1910	694	Mar. 21, 1910	6	82.9	60,000		
1911							

* Estimated.

Manastash Creek near Ellensburg, Wash.

Location.—Lat. 46°58'00", long. 120°41'40", in sec. 15, T. 17 N., R. 17 E., on left bank, 1½ miles upstream from mouth of Manastash Canyon, 2 miles downstream from North Fork, and 8½ miles west of Ellensburg.

Drainage area.—75.8 sq. mi.

Gage.—Staff gage. Datum of gage is 2,117.70 ft. above mean sea level, adjustment of 1912.

Average discharge.—5 years (1909-14), 60.4 cfs.

Extremes.—1909-14: Maximum discharge, 1,360 cfs Mar. 20, 1910 (gage height, 4.20 ft., from graph based on gage readings); minimum, 6 cfs Aug. 27, 28, 1913 (gage height, 1.19 ft.).

Remarks.—Station is above all important diversions. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909	.....	.....	.....	.....	.....	.....	64.9	94.1	94.3	27.1	14.0	13.2	.....
1910	10.2	48.8	33.3	43.1	30.2	205	234	234	79.8	27.5	15.3	13.8	91.5
1911	14.2	21.0	17.2	17.2	10.8	52.1	74.7	101	114	32.9	14.4	14.7	40.4
1912	11.3	18.8	17.1	20.6	21.3	31.6	131	245	107	34.1	18.2	11.4	55.8
1913	11.1*	14.7	11.8	15.2*	28.8	34.5	129	204	210	54.8	19.6	12.8	62.2*
1914	15.1	15.5	12.6	23.0	26.2	94.7	160	173	73.1	27.5	13.3	11.9	54.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909	.....	.....	.....	.....	.....	.....	37*	66	41	16	9.2	7.2	.....
1910	8.4	10	20*	24	24	55	142	139	44	17	12	11	8.4
1911	12	12	15	10	9.5	13	43	71	51	22	7.9	8.3	7.9
1912	9.5	13	13	15	18	16	98	149	51	18	12	9	9
1913	10*	9	11	.....	.....	22	31	98	92	36	6	9	6
1914	10.	13	7	13	13	34	56	108	43	18	9	9	7

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1909	.....	.....	.....	.....	.....	.....	.....
1910	1,360	Mar. 20, 1910	8.4	91.5	60,200	37.8	63,500
1911	264	June 2, 1911	7.9	40.4	29,300	40.0	28,900
1912	430	May 15, 1912	9	55.8	40,500	55.0	39,900
1913	430	June 3, 1913	6	62.2	44,900	62.6	45,300
1914	300	May 15, 1914	7	54.0	39,000	.....	.....

* Estimated.

YAKIMA RIVER BASIN

Yakima River at Umtanum, Wash.

Location.—Lat. 46°51'45", long. 120°28'30", in NW¼ sec. 20, T. 16 N., R. 19 E., on right bank at Umtanum, half a mile upstream from Umtanum Creek, and 10 miles south of Ellensburg.

Drainage area.—1,590 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 1,300.00 ft. above mean sea level, datum of 1929. Prior to Sept. 28, 1911, staff or chain gages at approximately same site at different datums. Sept. 28, 1911, to Nov. 23, 1936, water-stage recorder 300 ft. upstream at datum 26.70 ft. higher.

Average discharge.—47 years (1906-53), 2,350 cfs.

Extremes.—1906-53: Maximum discharge, 41,000 cfs Nov. 15 or 16, 1906 (gage height, 41.1 ft., from floodmarks, present datum); minimum recorded, 138 cfs Oct. 3, 1915 (gage height, 2.86 ft., datum then in use), but may have been less during period of no gage-height record.

Remarks.—Diversions for irrigation of about 105,000 acres above station. Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes (see elsewhere in this report).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906													368
1907	1,370	5,080	2,570	1,590	3,490	2,740	4,150	5,420	3,520*	1,170*	577	691	3,280*
1908	554	676	1,460	1,160	580	3,440	4,740	5,730	5,400	3,060	979	770	2,410
1909	510	564	518	586	942	1,350	2,840	5,060	5,420	1,640	900	547	1,820
1910	523	6,400	3,980	1,500	1,320	7,840	7,420	6,800	2,690	922	917	503	3,420
1911	1,590	3,340	2,000	1,170	669	1,560	2,720	3,510	4,070	1,440	537	818	2,000
1912	622	2,690	1,920	1,560	2,460	1,510	3,910	6,750	4,160	1,320	1,160	956	2,440
1913	596	1,390	1,330	1,650	2,170	2,250	4,160	6,980	7,130	2,500	975	865	2,660
1914	1,710	1,200	1,440	1,640	1,210	2,920	4,590	5,160	2,850	1,500	1,440	1,150	2,250
1915	1,080	2,500	1,420	675	605	2,180	4,320	1,640	1,150	1,230	483	208	1,460
1916	486	1,340*	1,170*	1,020*	964*	4,530*	6,960	7,550	5,440	5,480	1,730	1,450	3,460*
1917	815	806*	1,080*	858*	1,140*	856*	2,430	7,290	7,970	4,630	2,030	1,360	2,610*
1918	505	1,050*	7,630*	7,320*	1,440*	1,430*	3,910	4,490	4,620	1,830	2,090	1,490	3,200*
1919	583	1,830	3,390*	1,850*	1,540*	2,010*	4,690	5,390	3,370	1,920	2,230	1,300	2,510*
1920	927*	1,350*	1,170*	1,570*	1,240*	1,240	1,340	2,560	1,930	2,340	2,510	2,060	1,730*
1921	2,090	925*	854*	1,750*	2,320*	4,540*	3,970	6,040	6,340	2,260	2,940	1,890	3,080*
1922	1,070	1,090*	4,090*	744*	336*	425*	2,500	5,200	4,500	2,890	2,550	1,570	2,270*
1923	601	476*	604*	2,310*	701*	1,580*	5,370	5,370	3,790	2,300	2,920	1,940	2,340*
1924	574	441*	976*	930*	2,970*	1,580*	2,400	5,420	2,480	2,640	2,400	1,320	2,000*
1925	510	610*	2,330*	982*	1,840*	1,910*	4,710	6,170	2,770	1,830	2,540	1,830	2,340*
1926	434	387*	1,630*	1,220*	1,100*	2,320*	2,950	1,930	2,400	2,600	1,500	440	1,590*
1927	730	1,080*	1,660*	923*	781*	1,480*	3,480	4,850	5,390	2,040	2,120	1,950	2,220*
1928	1,990	2,970*	4,130*	3,840*	1,400*	2,770*	3,060	5,770	2,670	2,310	2,430	963	2,870*
1929	724	635*	326*	366*	286*	1,140*	1,680	4,060	2,900	2,470	1,800	789	1,430*
1930	502	133*	180*	335*	1,140*	1,580*	3,380	2,360	1,740	2,690	1,530	1,010	1,460*
1931	531	336*	322*	590*	1,140*	1,530	2,360	3,560	1,930	2,040	1,560	839	1,400*
1932	523	1,040	563	1,270	1,670	4,530	4,530	5,610	4,260	2,170	2,400	1,480	2,530
1933	847	1,890	2,730	3,450	1,310	1,690	3,850	5,240	5,720	3,330	2,330	2,030	2,820
1934	1,050	2,020	9,210	7,170	4,720	3,930	6,910	3,760	1,920	2,120	2,160	1,560	3,930
1935	979	1,450	1,370	3,590	4,040	1,870	3,030	4,810	4,360	2,090	2,300	2,150	2,660
1936	1,276	438	333	494	846	1,753	5,024	8,099	5,329	2,278	2,092	1,726	2,476
1937	980	380	465	436*	479*	1,344	2,179	2,994	6,192	2,547	2,639	1,518	1,849*
1938	678	1,096	1,278	1,533	933	2,138	4,967	5,436	3,713	2,166	2,607	1,958	2,331
1939	649	636	860	1,249	708	1,528	2,948	3,553	2,159	2,659	2,768	1,860	1,844
1940	576	411	802	458	883	1,587	2,038	3,572	2,241	2,777	2,760	2,239	1,736

* Estimated.

YAKIMA RIVER BASIN

Yakima River at Umtanum, Wash.—Continued
 Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	701	495	777	466	771	1,389	1,738	1,810	1,656	2,075	2,573	1,612	1,835
1942...	729	778	1,032	570	730	923	2,025	1,927	1,703	2,706	2,560	2,120	1,488
1943...	907	793	1,178	1,178	970	1,647	4,481	3,391	5,122	2,637	2,769	2,012	2,260
1944...	860	663	674	362	463	798	1,466	2,308	2,326	2,736	2,816	2,143	1,467
1945...	887	447	524*	1,160	1,194	763	1,713	2,935	2,728	3,139	3,330	2,217	1,754*
1946...	1,075	696	695	871	640	1,602	3,369	6,562	4,553	2,584	3,200	1,758	2,311
1947...	1,013	1,050	3,085	1,337	1,895	2,691	4,321	4,995	2,936	2,926	3,133	2,255	2,648
1948...	1,256	1,800	2,484	760*	901	1,115	2,307	7,221	9,077	3,233	3,114	1,964	2,943*
1949...	1,111	771	2,420	1,687*	1,027*	3,534	5,569	6,227	5,005	2,454	2,935	3,123	2,998*
1950...	3,197*	2,193	1,904*	923*	1,096*	2,762	3,792	6,355	6,546	3,594	2,832*	3,235	3,211*
1951...	2,148	2,761	3,651	3,025	4,613	3,873	4,323	5,293	4,132	3,022	3,226*	2,405	3,494*
1952...	1,245	782*	870*	703	1,033	1,421	2,416	2,929	2,996	2,896	3,255	2,598	1,930*
1953...	1,212	352	331*	1,454	2,367	1,873	2,592	2,779	3,996	2,986	3,204	2,360	2,079*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906.....													302
1907.....	470	1,260	1,690			1,900	1,740	5,050			398	494	398
1908.....	478	494	1,130	910	790	910	2,460	4,450	3,100	1,260	810	510	478
1909.....	390	542	658			850	2,030	3,370	2,380	950	750	410	390
1910.....	490	678	1,740	990	990	3,520	4,650	4,260	1,250	604	622	358	358
1911.....	365	1,600	1,490	825	577	563	1,420	2,650	2,000	1,060	630	359	359
1912.....	418	427	1,600	970	1,680	1,150	3,260	4,050	2,820	970	1,070	500	418
1913.....	450	690	930	1,040	1,100	1,570	1,840	3,500	4,180	1,440	700	498	460
1914.....	690	745	940	745	990	1,570	2,680	3,070	1,950	1,230	1,220	1,010	690
1915.....	437	1,140	795	514	478	1,020	1,910	1,250	662	961	284	167	167
1916.....	139	1,100*					4,760	5,030	6,170	2,600	1,070	977	139
1917.....	714						870	3,640	6,170	2,020	1,550	656	
1918.....	536	501					2,610	2,270	1,490	1,660	974	501	
1919.....	630	820					3,370	3,040	2,370	1,680	1,820	731	630
1920.....						820	1,036	1,560	1,440	1,350	2,110	1,340	
1921.....	1,440						2,790	2,790	3,200	1,610	2,430	1,100	
1922.....	636						1,330	3,030	1,860	1,760	2,220	936	
1923.....	405						3,380	2,870	2,130	1,580	2,300	1,070	
1924.....	465						1,260	2,670	2,000	2,480	1,970	752	
1925.....	394						2,220	3,300	2,090	1,600	2,230	695	394
1926.....	226					1,800*	1,760	1,130	1,760	2,420	714	226	226
1927.....	233					930*	1,800	3,360	3,060	1,990	1,960	704	233
1928.....	1,190	1,150					2,150	2,770	1,920	1,520	1,430	507	507
1929.....	418						1,120	2,740	1,960	2,200	696	648	
1930.....	201						2,060	1,800	1,010	2,490	743	743	
1931.....	314					900*	1,640	1,890	1,320	1,690	1,390	485	
1932.....	406	762	508	473	581	2,230	3,270	2,410	1,940	1,950	1,230	406	
1933.....	548	849	1,170	1,820	1,050	1,060	2,120	4,130	4,470	1,980	2,000	1,090	548
1934.....	898	1,290	2,410	3,800	1,920	1,890	3,370	1,690	1,630	2,080	2,000	968	898
1935.....	342	1,020	782	811	2,080	1,350	1,540	2,500	2,590	1,740	2,060	1,440	342
1936.....	935	306	275	350	652	1,170	1,360	5,190	2,290	2,050	1,980	1,390	275
1937.....	486	344	311	382	435*	795	1,400	1,890	4,060	1,950	2,420	1,020	311
1938.....	400	435	906	1,060	805	1,440	1,950	2,930	1,950	1,880	2,330	1,330	400
1939.....	371	405	513	763	574	691	1,880	2,100	1,540	2,100	2,250	1,660	371
1940.....	426	351	455	378	378	1,030	1,460	2,670	1,710	2,420	2,500	1,370	351
1941.....	399	294	510*	401	509	1,080	970	1,020	1,360	1,600	2,300	1,270	294
1942.....	404	404	731	390	490	580	950	1,540	1,310	2,130	2,360	1,550	390
1943.....	485	456	632	624	751*	817	2,290	1,920	3,150	2,070	2,460	1,710	485
1944.....	601	391	365	317	320	396	1,090	1,780	2,140	2,540	2,220	1,600	317
1945.....	370	401	332*	320*	625	642	921	1,730	1,350	2,920	2,800	1,580	320*
1946.....	640	500	420	544	472	1,240	1,550	3,560	2,270	1,850	3,000*	1,350	420
1947.....	607	709	1,330	750*	1,040	1,430	2,570	3,260	2,350	2,600	2,310	1,500	607
1948.....	772	1,030	1,200*	580*	661	860	1,760	1,940	3,430	3,030	2,580	1,190	580
1949.....	718	487	1,150	670*	600*	1,670	3,420	3,010	1,670	1,710	2,630	2,720	487
1950.....	1,000*	1,050	750*	800*	900*	1,670	3,100	3,500	5,090	1,600*	2,400*	2,380	750*
1951.....	1,280	1,590	1,910	2,100*	2,100*	2,910	2,730	2,300	2,820	2,730	3,100	1,840	1,280
1952.....	800*	660*	630*	600*	730	860	1,450	1,760	2,570	2,330	3,100	2,320	600*
1953.....	401	272	296	308	1,140	1,080	1,310	1,380	2,250	3,380	2,690	2,000	272

* Estimated.

YAKIMA RIVER BASIN

Yakima River at Umtanum, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1906.....							
1907.....	41,000	①	398	3,250	2,380,000	2,450	1,770,000
1908.....	9,960	April 21, 1908	478	2,410	1,750,000	2,360	1,720,000
1909.....	10,600	June 4, 1909	390	1,820	1,310,000	2,550	1,850,000
1910.....	22,900	Nov. 25, 1909	358	3,420	2,480,000	3,080	2,230,000
1911.....	10,700	Nov. 23, 1910	359	2,000	1,450,000	1,860	1,350,000
1912.....	13,600	Nov. 20, 1911	413	2,440	1,770,000	2,280	1,660,000
1913.....	13,100†	June 3, 4, 1913	450	2,660	1,930,000	2,750	1,990,000
1914.....	7,740	May 16, 1914	630	2,250	1,630,000	2,300	2,670,000
1915.....	9,350	April 4, 1915	167	1,460	1,060,000	1,290	935,000
1916.....	14,000	May 5, 1916	139	3,460	2,510,000	3,430	2,490,000
1917.....	13,100	May 30, 1917		2,610	1,890,000	3,190	2,310,000
1918.....			501	3,200	2,320,000	2,870	2,080,000
1919.....	9,960	May 28, 1919	630	2,510	1,810,000	2,830	1,680,000
1920.....				1,730	1,260,000	1,770	1,290,000
1921.....	11,700	②		3,080	2,230,000	3,280	2,370,000
1922.....				2,270	1,640,000	1,860	1,360,000
1923.....	9,480	May 10, 1923		2,340	1,600,000	2,360	1,703,000
1924.....				2,000	1,450,000	2,130	1,550,000
1925.....	10,000	May 17, 1925	394	2,340	1,690,000	2,250	1,630,000
1926.....	4,960	April 17, 1926	226	1,580	1,160,000	1,670	1,210,000
1927.....	8,770	May 17, 1927	233	2,220	1,600,000	2,680	1,940,000
1928.....			507	2,870	2,090,000	2,240	1,630,000
1929.....	6,150	May 24, 1929		1,430	1,040,000	1,370	890,000
1930.....	5,350	April 1, 1930		1,450	1,050,000	1,450	1,070,000
1931.....	6,940	May 3, 1931		1,400	1,010,000	1,950	1,410,000
1932.....	12,200	③	406	2,530	1,840,000	2,510	2,040,000
1933.....	8,450	April 29, 1933	648	2,920	2,120,000	3,550	2,670,000
1934.....	32,200	Dec. 23, 1933	898	3,930	2,850,000	3,160	2,290,000
1935.....	13,700	Jan. 26, 1935	342	2,660	1,920,000	2,512	1,819,000
1936.....	10,200	May 15, 1936	275	2,476	1,797,000	2,457	1,784,000
1937.....	10,200	June 22, 1937	311	1,849	1,339,000	1,951	1,413,000
1938.....	13,000	April 19, 1938	400	2,331	1,723,000	2,305	1,669,000
1939.....	5,900	May 17, 1939	371	1,844	1,335,000	1,848	1,338,000
1940.....	6,770	May 12, 1940	351	1,736	1,260,000	1,717	1,247,000
1941.....	3,700	April 2, 1941	294	1,335	966,300	1,332	1,000,000
1942.....	3,450	July 17, 1942	390	1,458	1,077,000	1,517	1,098,000
1943.....	8,330	④	456	2,250	1,629,000	2,176	1,575,000
1944.....	4,620	June 30, 1944	317	1,457	1,057,600	1,441	1,046,000
1945.....	6,690	June 1, 1945	320	1,754	1,270,000	1,809	1,310,000
1946.....	9,930	May 27, 1946	420	2,311	1,673,000	2,538	1,837,000
1947.....	8,920	Dec. 14, 1946	607	2,646	1,917,000	2,679	1,940,000
1948.....	27,800	May 29, 1948	550	2,943	2,136,000	2,840	2,069,000
1949.....	8,900	May 12, 1949	437	2,998	2,171,000	3,248	2,352,000
1950.....	9,650	May 13, 1950	750	3,211	2,325,000	3,317	2,402,000
1951.....	12,000	Feb. 12, 1951	1,260	3,494	2,529,000	3,018	2,185,000
1952.....	4,220	June 6, 1952	600	1,930	1,401,000	1,847	1,341,000
1953.....	7,430	June 14, 1953	272	2,079	1,505,000		

† Maximum daily. ① Nov. 15 or 16, 1906. ② May 17, 19, 1921. ③ Feb. 28, 29, 1932. ④ May 27, 28, 1943.

YAKIMA RIVER BASIN

Wenas Creek near Selah, Wash.

Location.—Lat. 46°42', long. 120°30', in SE¼ sec. 18, T. 14 N., R. 19 E., on left bank, half a mile upstream from mouth and 3½ miles northwest of Selah.

Drainage area.—190 sq. mi.

Supplemental records available.—January 1910 to April 1912, gage heights only.

Gage.—Staff gage. Altitude of gage is 1,140 ft. (from topographic map).

Extremes.—1909: Maximum discharge not determined; minimum, 2.0 cfs Aug. 8-12, 14-17, 19-21, Oct. 26, Dec. 28, 29, 1909 (gage height, 1.2 ft.).

Flood in March 1910 reached a stage of 8.74 ft., from high-water marks.

Remarks.—A few small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1900...							18.5*	12.0*	11.5	3.20	4.45	7.73	.....
1910...	4.22	12.5	23.7										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...											2.0	8.2	.....
1910...	2.0	5.0	2.0										

Taylor Canal near Selah, Wash.

Location.—Lat. 46°41', long. 120°29', in sec. 19, T. 14 N., R. 19 E., on left bank, 100 ft. upstream from dividing gates and about 3 miles upstream from mouth of Naches River.

Supplemental records available.—August to September 1905, gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 1,125 ft. (from topographic map).

Extremes.—1909-11: Maximum daily discharge, 45 cfs May 2, 1911 (gage height, 2.70 ft.); no flow at times each year.

Remarks.—Canal diverts from right bank of Yakima River for irrigation of an estimated 1,000 acres (in 1905).

Run-off in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...										1,530	1,240	607	.....
1910...	0	0	0	0	0	0	550	1,510	1,060	958	1,090	379	5,540
1911...	442	0	0	0	0	0	555	1,720	1,610	1,410	1,350	595	7,680
1912...	510												

* Estimated.

Yakima River at Selah Gap, near Yakima, Wash.

Location.—Lat. 46°38', long. 120°31', in NW¼ sec. 12, T. 13 N., R. 18 E., on right bank bridge pier, a quarter of a mile upstream from Naches River and 1½ miles north of Yakima.

Drainage area.—2,130 sq. mi., approximately.

Supplemental records available.—June to October 1905, gage heights only.

Gage.—Staff gage. Altitude of gage is 1,070 ft. (from river-profile map). May 19 to Dec. 31, 1897, wire-weight gage 7 miles upstream at different datum. May 5 to Nov. 30, 1904, July 1 to Oct. 15, 1911, staff gages at same site and datum.

Extremes.—1897, 1904, 1911-12: Maximum discharge observed, 19,800 cfs Nov. 19, 1897 (gage height, 12.30 ft., site and datum then in use); minimum observed, 285 cfs Sept. 16-24, 1904.

Remarks.—Many diversions for irrigation above station. Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes (see elsewhere in this report).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1897								9,030*	4,020	2,060	735	503*	
1898	682*	3,980	2,700										
1904								5,930	5,700	2,430	663	376	
1905	608	955											
1911										1,400	748	755	
1912	571*								1,290	1,100		991	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1897								6,140	2,880	1,010			
1898		828	1,470										
1904								4,820	3,500	1,140	441	285	
1905	522	522											
1911										987	577	450	
1912										880	960	670	

* Estimated.

YAKIMA RIVER BASIN

Bumping Lake near Nile, Wash.

Location.—Lat. 46°52', long. 121°18', at dam on Bumping River in SW¼ sec. 23 (unsurveyed), T. 16 N., R. 12 E., at outlet of Bumping Lake, 1½ miles upstream from American River, and 19 miles west of Nile.

Drainage area.—68.6 sq. mi.

Supplemental records available.—April to November 1909, gage heights only.

Gage.—Staff gage. Datum of gage is mean sea level (Bureau of Reclamation benchmark). Prior to Nov. 22, 1909, staff gage a quarter of a mile upstream at different datum. Nov. 3, 1910, to Nov. 2, 1922, staff gage on gate tower 100 ft. upstream at same datum.

Extremes.—1909-53: Maximum contents observed, 39,840 acre-ft. June 21, 22, 1925 (elevation, 3,430.55 ft.); minimum observed, 1,130 acre-ft. Feb. 5-9, 1949 (elevation, 3,900.80 ft.).

Remarks.—Reservoir formed by earth-fill dam completed in 1910; storage began Nov. 3, 1910. Capacity, 33,800 acre-ft. between gate sill (elevation, 3,389.00 ft.) and spillway crest (elevation, 3,426.00 ft.). Records represent usable contents. Water used for irrigation. Contents obtained by using mean gage height for the last day of the month prior to October 1952 and for the midnight gage height thereafter.

Contents, in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	4,040	7,850	2,720	2,750	2,730	3,090	4,670	6,950	30,450	34,230	15,130	5,340	.....
1912...	6,740	5,490	2,800	3,820	3,130	2,560	3,970	19,710	34,760	33,710	26,100	9,900	.....
1913...	4,110	4,270	2,530	2,930	2,800	2,640	4,590	15,130	35,550	34,620	14,740	4,310	.....
1914...	3,950	4,690	3,490	4,290	3,350	3,650	5,960	35,290	34,760	31,400	15,040	2,950	.....
1915...	5,490	14,460	2,670	2,250	2,220	4,860	14,370	33,000	36,560	23,180	3,510	1,770	.....
1916...	2,870	2,870	3,840	2,770	3,470	5,460	5,210	10,030	35,490	34,960	28,850	11,280	.....
1917...	7,110	5,390	5,810	3,030	2,800	3,730	6,740	26,530	35,790	34,430	16,400	2,380	.....
1918...	2,090	5,740	37,100	32,570	21,630	13,220	30,170	37,640	36,960	32,100	12,570	2,220	.....
1919...	5,530	10,650	19,030	30,270	20,750	9,800	14,570	38,360	37,600	36,790	21,450	5,340	.....
1920...	2,290	11,510	18,910	27,220	26,760	23,400	26,440	31,310	35,960	33,290	16,190	9,550	.....
1921...	19,570	19,180	12,420	10,650	10,510	3,900	5,350	30,340	35,250	38,040	27,180	11,750	.....
1922...	8,690	8,810	25,540	9,500	3,150	2,370	3,400	32,330	37,700	34,020	15,490	2,300	.....
1923...	2,960	3,790	11,600	19,950	7,520	2,970	17,440	37,640	38,190	33,660	24,440	8,990	.....
1924...	8,590	13,960	14,750	12,340	23,760	14,150	14,710	38,540	39,040	25,710	7,860	2,800	.....
1925...	3,350	11,930	17,120	17,360	26,520	26,460	35,770	36,680	39,150	26,610	10,000	7,010	.....
1926...	7,850	8,480	17,820	19,640	20,600	31,820	38,590	38,810	32,190	15,700	2,660	2,700	.....
1927...	7,450	13,110	24,360	17,460	16,500	15,480	17,780	32,440	37,110	28,190	4,830	4,100	.....
1928...	5,440	14,180	13,170	19,810	20,650	21,040	19,140	37,820	38,490	37,860	31,370	9,010	.....
1929...	11,490	4,750	2,050	2,730	2,690	4,870	5,540	34,230	30,450	29,970	12,150	3,790	.....
1930...	4,760	4,820	5,810	2,720	12,860	20,590	35,050	37,100	31,350	31,850	15,010	2,650	.....
1931...	2,670	2,700	2,640	7,530	13,830	20,450	31,660	35,510	87,200	22,450	4,650	2,560	.....
1932...	2,910	4,470	5,760	8,190	13,200	32,020	35,020	35,370	35,690	37,630	21,610	4,680	.....
1933...	6,590	25,400	24,140	18,290	10,900	8,280	14,260	34,950	35,620	34,770	25,790	18,310	.....
1934...	20,330	25,950	34,490	39,330	21,650	38,850	35,390	35,240	26,820	13,440	2,730	4,450	.....
1935...	18,720	31,210	28,370	32,170	27,050	14,430	12,420	35,900	35,350	34,190	31,460	10,780	.....
1936...	2,720	2,620	2,700	2,720	2,800	4,780	25,490	36,030	34,810	31,140	20,180	9,770	.....
1937...	2,590	2,600	5,660	5,480	5,410	5,040	15,270	35,350	35,670	23,090	7,470	2,480	.....
1938...	2,880	14,480	18,260	16,150	8,730	2,790	20,660	35,780	34,990	20,860	4,900	3,340	.....
1939...	4,620	3,740	5,620	8,950	6,570	7,750	18,530	35,540	34,160	23,200	11,440	2,770	.....
1940...	2,610	2,680	15,660	17,460	23,300	34,820	34,510	35,060	29,710	15,210	2,830	2,540	.....
1941...	2,310	5,390	12,520	11,150	9,520	18,750	24,960	25,300	18,430	8,710	2,680	2,570	.....
1942...	2,600	11,730	27,960	20,150	18,330	21,680	34,410	35,020	34,200	25,780	14,640	3,440	.....
1943...	3,320	12,340	17,200	13,190	8,000	6,970	29,580	35,790	35,910	33,250	18,750	3,900	.....
1944...	3,680	4,440	13,020	14,600	17,610	24,530	28,900	35,210	33,150	21,470	6,940	2,020	.....
1945...	2,510	3,880	3,180	15,210	31,860	34,160	33,620	35,970	33,970	28,740	13,220	3,410	.....
1946...	3,000	3,110	5,570	3,260	3,100	3,180	13,440	35,380	35,540	30,430	11,000	2,590	.....
1947...	4,240	6,320	13,470	9,630	22,360	34,300	35,650	33,760	33,760	23,490	12,000	6,650	.....
1948...	23,780	27,840	28,220	18,690	15,040	13,270	11,570	36,160	35,630	32,820	20,760	7,960	.....
1949...	9,080	13,660	5,440	1,160	3,020	7,350	18,250	36,160	35,210	29,710	5,740	2,640	.....
1950...	4,090	14,850	15,600	14,290	16,590	11,630	9,560	20,900	36,180	35,080	12,890	4,540	.....
1951...	17,470	32,480	13,420	7,850	12,890	5,160	18,770	35,710	35,550	23,900	11,830	2,980	.....
1952...	3,750	3,260	4,450	4,070	5,230	4,740	25,060	36,280	35,470	20,650	9,730	4,850	.....
1953...	2,500	2,490	2,580	21,250	14,000	14,050	19,940	35,740	35,750	30,770	16,380	6,600	.....

† Used Nov. 3, 1910 reading.

YAKIMA RIVER BASIN

609

Bumping River near Nile, Wash.

Location.—Lat. 46°52', long. 121°18', in NE¼ sec. 23, T. 16 N., R. 12 E., on left bank, a quarter of a mile downstream from spillway of Bumping Lake Dam and 19 miles west of Nile.

Drainage area.—68.6 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 3,367.10 ft. above mean sea level (Bureau of Reclamation benchmark). Prior to June 17, 1913, staff gages at several sites within half a mile of present site at different datums.

Average discharge.—44 years (1909-53), 289 cfs (unadjusted); 290 cfs (adjusted for storage since November 1910).

Extremes.—1906, 1909-53: Maximum discharge, 5,180 cfs Dec. 29, 1917 (gage height, 9.33 ft.); practically no flow when gates in outlet conduit are closed.

Remarks.—No diversion. Flow regulated by Bumping Lake (see p. 608).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906										195			
1909									1,090	406	102	63.6	
1910	62.2	719	390	247	164	413	519	1,040	675	268	86.0	59.9	392
1911	202	456	232	137	138	152	299	479	435	181	410	332	238
1912	34.5	219	182	189	216	126	215	534	657	363	230	402	251
1913	189	200	169	176	158	144	207	496	771	624	491	312	329
1914	163	201	161	426	119	208	440	263	554	251	394	325	295
1915	111	347	355	87.7	69.8	120	399	37.9	122	345	420	63.1	207
1916	59.4	185	143	108	107	286	371	656	907	1,220	559	478	429
1917	156	127	56.4	113	68.3	51.7	50.7	213	1,010	945	496	311	303
1918	64.4	4.23	446	690	351	263	17.2	413	850	273	402	221	326
1919	43.3	27.0	118	315	347	281	225	359	797	405	366	352	303
1920	93.6	32.1	132	142	207	199	61.2	325	347	283	341	279	204
1921	152	317	332	343	331	438	317	360	1,170	567	338	367	421
1922	174	146	384	338	171	69.1	92.6	202	791	247	369	268	282
1923	63.9	70.1	47.5	232	348	162	123	600	817	429	344	335	284
1924	84.6	11.0	143	161	369	342	180	413	334	333	374	132	239
1925	51.6	28.9	238	162	180	123	304	1,030	676	431	350	82.3	305
1926	35.1	31.1	66.2	156	118	13.1	345	360	266	325	243	45.0	167
1927	96.4	88.2	96.1	352	167	133	211	478	1,130	553	483	88.6	324
1928	179	265	291	271	111	232	312	759	583	201	175	455	320
1929	36.3	228	95.1	56.9	46.7	28.4	101	143	563	346	367	183	183
1930	16.4	23.0	48.6	96.5	57.0	8.71	239	569	500	102	342	243	179
1931	34.4	60.1	45.4	35.3	56.8	55.1	122	754	289	333	354	60.1	185
1932	42.5	112	72.4	89.0	135	14.7	329	500	938	341	379	373	305
1933	29.3	143	310	284	234	139	107	194	1,310	919	373	349	366
1934	202	252	936	611	502	371	855	656	455	342	236	25.7	454
1935	6.1	399	281	235	371	414	248	359	1,010	335	139	457	353
1936	185	54.5	53.9	77.4	51.5	50.2	73.7	984	905	244	273	256	268
1937	163	31.8	41.2	48.6	48.2	53.4	32.9	329	1,150	550	367	132	249
1938	61.0	162	288	304	263	196	135	694	922	456	349	69.8	325
1939	38.9	95.9	110	79.6	126	101	137	510	558	404	273	205	229
1940	46.3	59.0	66.1	146	76.5	73.8	440	671	408	342	262	38.6	220
1941	46.5	56.4	62.2	130	124	12.8	250	400	314	238	140	50.0	162
1942	52.9	36.4	92.1	253	109	22.3	133	485	456	284	257	248	206
1943	37.1	103	150	216	204	156	172	553	989	627	357	313	324
1944	61.4	77.2	50.9	47.0	42.8	22.0	145	467	352	200	318	106	163
1945	43.8	46.6	114	23.8	9.9	59.4	143	807	611	338	246	263	227
1946	62.6	118	98.4	234	82.0	90.8	133	696	1,027	611	464	207	321
1947	58.2	180	341	225	8.63	16.9	430	843	535	355	276	171	291
1948	112	265	256	227	202	184	165	307	1,223	372	299	291	329
1949	67.0	51.1	267	123	74.6	121	132	840	1,021	594	543	130	334
1950	107	301	261	164	179	391	327	445	1,055	902	600	242	416
1951	6.74	157	886	492	349	310	188	680	848	504	305	208	405
1952	178	179	151	96.0	110	92.1	84.4	677	660	480	235	126	253
1953	66.6	31.7	43.6	174	470	107	125	406	774	677	363	227	287

YAKIMA RIVER BASIN

Bumping River near Nile, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906										122			
1909								332	578	178	68	53	
1910	49	18	178	159	0	0	269	534	300	137	50	39	0
1911	64	79	138	121	129	103	188	412	242	0	37	0	0
1912	0	123	123	105	189	105	143	154	165	143	177	253	0
1913	23	0	112	143	143	123	123	305	141	280	228	169	0
1914	126	159	118	97	0	21	197	24	376	126	336	154	0
1915	2	5	124	68	64	4	15	14	19	28	244	33	2
1916	33	111	82	50.7	6.4	13.0	300	452	427	717	324	107	6.4
1917	124	2.0	1.5	.9	1.3	32.2	38.8	59.8	249	322	261	132	.9
1918	45	1.6	1.7	327	306	8.2	11	24	413	204	276	55	1.6
1919	3	2	67	263	314	243	151	209	560	160	142	253	2
1920	2	4	5	7	65	127	8	64	21	23	293	144	2
1921	50	108	17	147	92	200	223	106	589	272	293	268	17
1922	70	26	38	268	87	61	62	23	203	90	333	63	23
1923	44	55	13	12	241	82	24	27	520	23	294	206	12
1924	7	5	52	77	268	293	15	10	108	116	316	50	5
1925	58	5	133	110	103	116	139	424	275	414	92	39	5
1926	20	31	28	62	19	6	15	225	212	316	52	31	6
1927	64	6	12	76	9	63	151	273	37	481	244	1	1
1928	2	212	160	58	42	42	23	26	371	86	55	393	2
1929	4	4	74	45	46	4	4	12	180	164	272	3	3
1930	2	19	18	48	9	7	17	30	15	44	71	36	2
1931	19	35	35	3	3	5	7	68	28	206	206	81	3
1932	28	0	2	3	36	6	17	521	657	226	242	242	0
1933	1	2	206	260	210	89	93	156	841	418	349	108	1
1934	6	10	468	404	408	22	522	442	118	207	64	2	2
1935	2	14	150	171	262	414	14	26	640	135	64	366	2
1936	70	50	47	54	49	5	7	36	394	193	255	255	5
1937	37	27	26	48	48	49	9	31	895	630	107	60	9
1938	44	5	277	296	224	97	40	241	532	463	71	47	5
1939	4	4	83	72	72	8	16	20	479	273	273	57	4
1940	38	42	3	105	5	6	293	448	382	302	92	32	3
1941	32	10	3	66	121	6	17	356	314	149	63	40	3
1942	43	2	6	236	63	5	9	239	213	257	257	125	2
1943	26	10	8	8	176	137	149	121	725	356	356	55	8
1944	59	65	48	45	11	10	10	29	283	290	290	4	4
1945	35	2	3	6	6	7	6	105	450	229	232	183	2
1946	41	84	58	114	66	78	28	60	692	465	460	52	28
1947	45	67	274	7.8	5.0	7.4	210	592	407	370	270	124	5.0
1948	14	17	233	213	196	170	121	188	760	264	288	274	14
1949	3.4	3.0	165	75	54	113	118	131	570	490	362	49	3.0
1950	71	116	158	138	168	214	262	252	615	455	344	4.3	4.3
1951	4.4	9.8	739	211	214	206	12	268	646	380	170	114	4.4
1952	83	116	98*	89	92	46	16	38	390	377	160	120	16
1953	31	24	24	11	9.8	48	18	25	604	433	288	185	9.8

* Estimated.

YAKIMA RIVER BASIN

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Bumping River near Nile, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
Year	Observed					Adjusted			Observed		Adjusted	
	Momentary maximum		Minim- um day	Mean	Runoff in acre-feet	Mean	Per square mile	Run- off in inches	Mean	Runoff in acre-feet	Mean	Run- off in inches
	Dis- charge	Date											Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1906..												
1909..												
1910..	3,330†	Nov. 23, 1909	0	392	284,000				309	267,000	367 73.11	
1911..	1,040	Nov. 24, 1910	0	288	209,000	290	4.23	57.36	250	161,000	250 49.52	
1912..			0	281	204,000	287	4.18	57.03	291	212,000	291 57.79	
1913..			0	329	238,000	322	4.69	63.58	326	236,000	327 64.75	
1914..	1,050	June 3, 1914	0	295	214,000	293	4.27	57.99	318	231,000	318 62.92	
1915..	932	Aug. 8, 1915	2	207	150,000	206	3.00	40.66	172	124,000	173 34.21	
1916..	1,830	July 3, 1916	6.4	429	312,000	442	6.44	87.66	425	309,000	428 84.94	
1917..	1,610	June 17, 1917	.9	303	219,000	291	4.24	57.59	318	230,000	301 71.40	
1918..	5,180	Dec. 29, 1917	1.6	336	243,000	335	4.88	66.24	308	223,000	284 56.20	
1919..	1,280	May 29, 1919	2	303	219,000	307	4.48	60.81	303	223,000	305 60.95	
1920..	846	June 15, 1920	2	204	148,000	210	3.00	41.65	252	183,000	242 48.05	
1921..	1,890	June 7, 1921	17	421	305,000	424	6.18	83.89	411	297,000	429 84.84	
1922..	1,270	June 9, 1922	23	282	204,000	265	3.92	53.21	288	172,000	218 43.17	
1923..	1,480	①	12	284	206,000	293	4.27	57.98	229	209,000	294 58.23	
1924..	1,190	May 18, 1924	5	239	174,000	231	3.37	45.37	249	180,000	252 49.96	
1925..	1,760	May 21, 1925	5	305	221,000	312	4.55	61.76	286	207,000	287 56.74	
1926..	862	April 18, 1926	6	167	121,000	160	2.33	31.63	160	130,000	169 37.47	
1927..	2,020	June 8, 1927	1	324	234,000	326	4.75	64.48	362	262,000	346 68.42	
1928..	1,820	May 22, 1928	2	320	232,000	328	4.75	64.05	288	209,000	274 54.31	
1929..	1,000	June 15, 1929	3	183	133,000	176	2.57	34.89	160	116,000	165 32.71	
1930..	890	May 21, 1930	2	179	130,000	177	2.58	35.02	183	133,000	179 35.43	
1931..	1,220	May 14, 1931	3	185	134,000	185	2.70	36.65	192	139,000	196 38.82	
1932..	1,020	June 15, 1932	0	306	222,000	308	4.49	61.12	327	228,000	362 69.83	
1933..	2,140	June 15, 1933	1	366	265,000	378	5.51	74.79	443	321,000	457 90.41	
1934..	3,710	Dec. 22, 1933	2	454	328,500	442	6.44	87.42	394	285,000	385 76.15	
1935..	1,630	June 8, 1935	2	353	255,600	362	5.28	71.67	321	232,700	285 56.33	
1936..	1,740	May 28, 1936	5	268	194,800	267	3.89	52.95	264	191,300	268 53.22	
1937..	1,660	②	9	249	180,200	239	3.48	47.24	272	196,800	289 57.15	
1938..	1,880	May 28, 1938	5	325	235,600	327	4.77	64.75	303	219,400	286 56.61	
1939..	1,890	May 29, 1939	4	229	165,500	228	3.32	45.07	222	161,000	226 46.70	
1940..	956	May 11, 1940	3	220	159,600	219	3.19	43.42	219	159,200	215 42.60	
1941..	666	April 23, 1941	3	152	110,200	152	2.22	30.14	156	113,000	177 35.02	
1942..	919	③	2	206	142,800	207	3.02	40.60	212	153,500	197 38.66	
1943..	1,520	May 26, 1943	8	324	234,400	324	4.72	64.07	315	228,300	310 61.36	
1944..	661	May 16, 1944	4	163	118,300	162	2.36	32.12	164	119,300	151 29.95	
1945..	1,250	May 31, 1945	2	227	164,500	228	3.32	45.07	233	169,000	237 46.83	
1946..	1,550	May 27, 1946	28	321	232,100	319	4.65	63.12	348	252,300	359 70.99	
1947..	1,340	May 8, 1947	5.0	201	210,800	207	4.33	58.78	300	210,400	304 60.13	
1948..	1,860	June 8, 1948	14	329	239,100	331	4.82	65.61	318	227,200	288 57.17	
1949..	1,900	May 36, 1949	3.0	334	241,700	327	4.77	64.75	356	257,500	369 73.03	
1950..	1,960	June 21, 1950	4.3	416	301,000	418	6.09	82.67	449	324,700	446 88.31	
1951..	1,240	June 16, 1951	4.4	405	293,000	403	5.87	79.65	359	259,600	346 68.50	
1952..	1,370	June 6, 1952	16	253	183,600	256	3.73	50.68	222	161,400	220 43.60	
1953..	1,240	June 18, 1953	9.8	287	207,900	290	4.23	57.33				

† Maximum observed. ① June 9, 10, 1923. ② June 21, 22, 1937. ③ May 23-25, 1942.

YAKIMA RIVER BASIN

American River near Nile, Wash.

Location.—Lat. 46°58'30", long. 121°10'10", in SW¼ sec. 12, T. 17 N., R. 13 E., on right bank, 300 ft. upstream from Bumping Lake road crossing, three-quarters of a mile upstream from mouth, and 16 miles northwest of Nile.

Drainage area.—78.9 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,700.00 ft. above mean sea level (Washington State Highway Department benchmark). Apr. 25, 1909, to Sept. 11, 1915, staff gage 300 ft. down stream at different datum.

Average discharge.—16 years (1909-11, 1939-53), 239 cfs.

Extremes.—1909-11, 1913-15, 1939-53: Maximum discharge, 2,600 cfs May 27, 1948 (gage height, 76.6 ft., from high-water mark in well), from rating curve extended above 1,400 cfs; minimum, 20 cfs Nov. 22, 1940.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							340*	603	980	455	117	56.3	.....
1910	53.2	690*	875*	237*	148*	398*	555*	1,000*	541	272	99.4	62.5	370*
1911	170	433	182*	132*	132*	150*	303*	538*	792	280	80.2	84.6	273*
1912	54.0	190*	144*	190*	201*	116*							
1913										751*	325*	267	
1914										236	65.0		
1915										119	62.9	44.2*	
1940	31.7	38.2	160	140	127	225	416	725	366	107	54.0	41.2	203
1941	61.7	58.7	113	75.4	70.8	181	349	429	263	72.0	41.1	49.6	147
1942	62.9	118	267	88.5*	55.1	69.3	341	425	426	164	57.7	37.8	176*
1943	31.9	133	128	72.2*	79.1	134	595	564	698	428	97.2	50.9	251*
1944	53.7	65.2	107	54.1*	67.7	110	195	378	320	86.7	42.1	35.0	126*
1945	31.8	46.3	52.9*	133	174	88.5	162	675	497	172	59.1	53.8	179*
1946	43.2	78.9	80.0	98.3	66.1	91.2	246	985	755	443	109	60.3	264
1947	72.8	119	288	120	203	246	403	603	406	167	69.4	57.0	237
1948	248	246	162	127*	104	94.6	197	893	1,014	275	90.3	59.0	285*
1949	75.3	74.8	72.1*	53.8*	57.1*	100	410	1,029	723	353	106	63.5	261*
1950	67.5	270	177	80.3*	98.4	185	211	687	1,060	600	146	70.0	305*
1951	141	272	362	162	296	138	429	821	725	279	81.4	55.9	315
1952	107	102	119*	68.6*	87.4	92.8	409	639	480	239	74.2	47.0	206*
1953	33.8	32.7	33.2*	197	266	116	228	608	588	400	111	52.5	222*

* Estimated.

American River near Nile, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909								377	520	233	74	52	
1910	45							344	344	180	75	56	
1911	60	82						432	432	118	57	57	
1913										448	205	177	
1914										95	48	48	
1915										76	49	39*	
1940	27*	30	64	81	83	133	273	522	187	73	40	32	27*
1941	40	27	73*	56	58	140	248	266	128	44	34	39	27
1942	42	48	113	62	47	48	146	209	293	81	46	28	28
1943	25	53	98	64*	66*	76	320	300	514	171	68	43	28
1944	40	56	56*	43*	45	48	135	259	183	52	33	30	30
1945	27	33	38*	41	72	74	82	429	277	80	44	41	27
1946	32	67	55	61	60	77	109	514	488	203	71	74	33
1947	44	53	143*	83	117	134	209	470	238	98	53	47	44
1948	50	155	134	95*	86	76	83	220	575	122	71	52	50
1949	56	52	63*	46*	41*	79	102	427	372	184	70	51	41*
1950	50	53	106	70*	70*	113	137	213	678	263	83	58	50
1951	63	93	240	70*	70*	115*	142	345	505	113	62	46	46
1952	67	76	81*	57	76	63	143	335	284	103	56	37	37
1953	31	26	26	32	104	139	95	381	441	185	70	44	26

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1909	1,580†	June 9, 1909								
1910				370	4.69	63.66	268,000	343	59.05	248,000
1911				273	3.46	46.94	198,000			
1912										
1913										
1914										
1915										
1940	1,100	May 24, 1940	27	203	2.57	34.98	147,300	203	34.98	147,500
1941	745	May 17, 1941	27	147	1.86	25.25	106,600	165	28.37	119,700
1942	1,240	Dec. 2, 1941	28	176	2.23	30.27	127,400	183	28.10	117,800
1943	1,340	May 26, 1943	29	251	3.18	43.17	157,500	246	42.35	177,800
1944	517	May 29, 1944	30	126	1.60	21.78	91,650	118	20.42	85,840
1945	1,100	May 31, 1945	27	179	2.27	30.81	129,400	185	31.76	138,700
1946	1,300	May 27, 1946	33	264	3.35	45.47	191,200	287	49.41	208,100
1947	1,020	May 8, 1947	44	237	3.00	40.72	171,600	252	43.30	182,700
1948	2,600	May 27, 1948	50	285	3.61	49.14	206,800	249	43.01	186,500
1949	1,880	May 16, 1949	41	281	3.31	44.93	188,800	285	49.00	206,400
1950	2,120	Nov. 27, 1949	50	305	3.87	52.53	220,900	329	56.57	238,000
1951	1,700	May 11, 1951	46	315	3.99	54.14	227,800	276	47.40	199,500
1952	972	May 20, 1952	37	206	2.61	35.50	149,800	187	32.29	135,900
1953	1,060	June 13, 1953	26	222	2.81	38.22	160,960			

* Estimated.

† Maximum observed.

YAKIMA RIVER BASIN

Naches River at Anderson Ranch, near Nile, Wash.

Location.—Lat. 46°55', long. 121°03', in SE¼ sec. 35, T. 17 N., R. 14 E. (unsurveyed), on left bank at Anderson Ranch, half a mile downstream from Lost Creek, and 11 miles north of Nile.

Drainage area.—392 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,300 ft. (from river-profile map).

Average discharge.—5 years (1909-14), 1,030 cfs (unadjusted).

Extremes.—1909-14: Maximum discharge, 9,500 cfs Nov. 24, 1909 (gage height, 6.0 ft., from graph based on gage readings); minimum observed, 120 cfs Oct. 8-26, 1911, and Nov. 1-5, 1912 (gage height, 0.9 ft.).

Remarks.—Small diversion for irrigation above station. Flow partly regulated by Bumping Lake since 1910 (see p. 608).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...								2,040	2,880	1,050	320	209	.....
1910...	189	2,160	1,480	660*	530	2,430	2,920	3,410	1,780	718	233	188	1,390*
1911...	409	1,190	666	459	269	571	1,340	2,170	2,290	797	610	473	935
1912...	165	598	413	545	528	958	1,310	2,650	2,060	707	400	522	856
1913...	274	469	345	421*	444	362	1,450	3,000	3,370	1,520	769	458	1,050*
1914...	336	395	287	970	310	973	2,010	2,110	1,090	696	502	426	895

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...								1,340	1,500	505	246	189	.....
1910...	167	212	800	400*	275	885	1,410	2,450	910	810	160	160	160
1911...	290	275	425	345	165	192	870	1,640	1,190	280	260	192	165
1912...	120	290	280	160*	312	220	870	1,500	1,260	345	312	359	120
1913...	165	120	250	295	233	263	340	1,450	2,330	690	474	294	120
1914...	233	294	156	156	251	400	800	1,680	1,150	354	392	311	156

Summary

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Observed					Adjusted			Observed		Adjusted		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches	
1909..	9,500	Nov. 24, 1909											160
1911..	4,350	Nov. 21, 1910	165	938	673,000	939	2.40	32.55	847	612,000	847	29.32	
1912..	4,290†	May 16, 1912	120	856	622,000	864	2.20	29.94	840	617,000	850	29.46	
1913..	6,020†	June 2, 1913	120	1,080	782,000	1,070	2.73	37.15	1,070	778,000	1,050	37.28	
1914..	3,050†	June 3, 1914	156	895	648,000	892	2.25	30.92					

* Estimated.

† Maximum observed.

YAKIMA RIVER BASIN

Naches River at Oak Flat, near Nile, Wash.

Location.—Lat. 46°45'10", long. 120°49'10", in NW¼ sec. 34, T. 15 N., R. 16 E., on left bank just upstream from Oak Flat, 2 miles upstream from Tieton River, and 7 miles northwest of Naches.

Drainage area.—638 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,660 ft. (from river-profile map). June 25, 1904, to Apr. 12, 1909, staff and chain gages 800 ft. downstream at different datum. Apr. 13, 1909, to Sept. 19, 1911, chain gage at same site and datum.

Average discharge.—13 years (1904-17), 1,230 cfs, unadjusted.

Extremes.—1904-17: Maximum discharge, 21,900 cfs Nov. 15, 1906 (gage height, 10.3 ft., from high-water mark); minimum recorded, 138 cfs Oct. 1, 1915 (gage height, 3.44 ft.).

Remarks.—Several small diversions for irrigation above station. Regulation by Bumping Lake after 1910 (see p. 608).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904										1,660	390	173	.....
1905	234	713	553	421	364	1,730	1,470	1,550	2,360	899	487	371	830
1906	778	467	422	513	1,010	996	3,250	2,310	1,530	676	289	267	1,080
1907	458	3,620	902	569	1,420	997	2,020	4,050	2,660	1,060	419	325	1,540
1908	320	325	392	438	337	1,110	2,350	2,850	3,720	2,570	568	294	1,280
1909	277	642	411	576*	476	595	1,250	2,240	3,520	1,400	370	225	998*
1910	229	2,620	1,650	716	558	3,190	3,600	4,320	2,320	919	346	261	1,730
1911	522	1,360	754	401	269	633	1,580	2,570	3,040	879	575	481	1,100
1912	226	662	417	585	628	432	1,710	3,690	2,730	797	436	542	1,090
1913	317	516	353	441	534	548	1,660	3,460	3,950	1,720	849	561	1,250
1914	415	483	354	1,120	407	1,280	2,460	2,720	1,970	832	535	493	1,090
1915	356	1,140	658	259	228	747	2,290	1,100	794	560	436	172	732
1916	201	421*	681*	457*	639*	2,270*	3,150	4,470	5,380	3,970	1,350	668	1,990*
1917	311	310*	278*	377*	373*	262*	612	3,240	4,190	2,700	811	511	1,170*
1918	203												.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904										760	274	139	.....
1905	181	208	425	316	208	975	364	1,090	1,530	600	390	320	.....
1906	390	390	330	390	585	730	2,020	1,600	1,090	390	235	235	235
1907	235	460	468	372	685	725	772	2,520	1,750	555	330	265	235
1908	185	210	330	265	265	330	662	2,150	2,150	1,020	398	224	185
1909	224	332	274	202*	371	338	650	1,470	2,030	640	270	195	195
1910	195	270	640	443	443	944	1,840	3,010	1,230	490	268	244	195
1911	244	363	546	325	190	190	950	2,200	1,420	325	325	220	190
1912	154	227	270	183	466	308	1,060	2,080	1,480	416	328	393	154
1913	253	163	280	300	260	367	466	1,810	2,620	848	549	367	163
1914	280	390	290	241	339	521	1,030	2,100	1,330	440	440	369	241
1915	157	256	348	147	178	243	1,200	843	486	353	298	141	141
1916	138	267					2,020	2,820	3,940	1,830	920	426	138
1917	236						216	1,160	2,560	932	640	306	.....
1918	174												.....

* Estimated.

YAKIMA RIVER BASIN

Naches River at Oak Flat, near Nile, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
Year	Observed				Adjusted			Observed		Adjusted		
	Momentary maximum Dis-charge	Date	Mini- mum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run- off in inches	Mean	Runoff in acre-feet	Mean	Run- off in inches
1904.												
1905..	4,350	June 3, 1905		930	673,000				945	684,000		
1906..	4,880	April 22, 1906	235	1,080	733,000				1,370	984,000		
1907..	21,900	Nov. 15, 1906	235	1,540	1,110,000				1,220	862,000		
1908..	6,340	June 12, 1908	185	1,280	930,000				1,300	941,000		
1909..	5,770	June 2, 1909	195	998	723,000				1,260	913,000		
1910..	11,000	Nov. 23, 1909	195	1,730	1,250,000				1,580	1,140,000	1,570	33.48
1911..	5,220	June 2, 1911	190	1,100	794,000	1,100	1.72	23.36	983	712,000	982	20.00
1912..	6,210	May 21, 1912	154	1,090	789,000	1,090	1.71	23.29	1,080	784,000	1,080	23.00
1913..	6,900	June 4, 1913	163	1,250	904,000	1,240	1.94	26.39	1,250	906,000	1,250	26.64
1914..	3,910	May 15, 1914	241	1,090	790,000	1,090	1.71	23.14	1,170	844,000	1,160	24.74
1915..	4,480	April 3, 1915	141	782	530,000	731	1.15	15.57	662	470,000	664	14.15
1916..	8,070	July 3, 1916	138	1,900	1,440,000	2,000	3.13	42.71	1,950	1,420,000	1,960	41.77
1917..	6,550	June 17, 1917		1,170	847,000	1,160	1.82	24.66				

YAKIMA RIVER BASIN

Selah Valley Canal near Naches, Wash.

Location.—Lat. 46°44'40", long. 120°47'50", in NW¼ sec. 35, T. 15 N., R. 16 E., on left bank, 800 ft. downstream from headgate and 5 miles west of Naches.

Gage.—Water-stage recorder. Altitude of gage is 1,640 ft. (from topographic map). Prior to Apr. 17, 1922, staff gages at several sites approximately 1 mile downstream at same and different datums.

Average discharge.—33 years (1920-53), 64.0 cfs.

Extremes.—1904, 1909-14, 1920-53: Maximum daily discharge, 139 cfs Aug. 20, 1937; no flow at times each year.

Remarks.—Canal diverts from left bank of Naches River above Tieton River for irrigation of approximately 10,000 acres. Canal was constructed in 1890 but no records are available prior to 1904.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904.							1,340*	3,510*	4,960	4,270	5,330	4,810	
1905..	1,780												
1909.										6,580	6,520	5,410	
1910..	0	10	0	0	0	0	1,560	6,150	6,600	7,070	7,560	6,720	35,700
1911..	4,100	0	0	0	0	0	3,530	6,700	6,550	7,810	8,180	6,010	42,900
1912..	2,850	0	0	0	0	0	1,050	5,450	6,430	7,010	7,130	6,370	36,300
1913..	5,260	0	0	0	0	0	4,570	6,870	6,860	6,340	7,110	6,270	43,000
1914..	3,970	0	0	0	0	0	0	6,060	7,250	7,700	7,580	6,960	39,500
1915..	4,710												
1920.										6,960	7,010	6,250	

* Estimated.

YAKIMA RIVER BASIN

Selah Valley Canal near Naches, Wash.—Continued

Run-off in Acre-feet—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1921...	0	0	0	0	0	0	2,680	6,660	6,650	7,350	7,330	6,740	37,400
1922...	1,990	0	0	0	0	0	1,100	6,510	7,069	7,250	7,710	7,070	33,700
1923...	3,030	0	0	0	0	0	0	1,590	7,350	7,350	7,540	6,960	41,000
1924...	655	0	0	0	0	0	1,640	5,620	7,750	7,550	7,350	7,570	44,700
1925...	2,330	0	0	0	20	1,810*	5,150	6,950	7,740	8,160	8,160	6,950	47,300*
1926...	1,730	0	0	0	64	1,770	5,320	7,750	7,590	7,830	7,370	4,710	44,100
1927...	1,520	0	0	0	0	559	4,320	7,540	7,260	7,820	8,130	5,990	33,400
1928...	3,150	0	0	0	0	1,620	3,850	7,340	7,500	8,060	8,150	6,540	46,200
1929...	4,180	0	0	0	0	0	2,900	7,610	7,330	7,900	8,110	5,950	44,200
1930...	2,700	417	0	0	0	2,200	6,160	7,940	7,760	8,270	8,470	5,630	49,500
1931...	3,060	0	0	0	579	3,070	6,790	7,640	7,310	7,570	7,510	5,870	49,700
1932...	3,470	246	0	0	0	1,070	4,690	7,620	7,620	8,019	8,100	6,960	47,600
1933...	3,830	377	0	0	0	2,130	5,680	7,370	7,770	8,000	8,330	6,860	50,400
1934...	3,180	460	0	0	0	2,680	6,460	7,320	7,810	8,170	8,310	5,400	50,320
1935...	4,150	0	0	0	0	2,000	5,830	7,640	7,660	8,230	8,430	7,660	51,670
1936...	5,060	1,120	0	0	0	1,220	5,850	7,470	7,270	8,140	8,210	6,370	50,770
1937...	4,380	155	0	0	0	724	4,860	7,340	7,500	7,960	8,410	6,750	48,080
1938...	3,230	797	0	0	0	1,260	6,010	7,310	7,230	8,140	8,260	7,210	49,450
1939...	3,200	93	0	0	0	2,040	5,970	7,470	7,340	7,870	7,960	8,660	48,500
1940...	3,250	627	0	0	0	1,440	5,540	7,300	7,600	8,240	8,240	6,140	48,660
1941...	3,160	682	0	0	0	1,970	5,250	7,420	6,910	7,660	7,840	5,590	46,430
1942...	3,300	690	0	0	0	1,110	5,160	7,190	7,270	7,910	8,100	7,150	47,830
1943...	4,610	1,100	0	0	0	1,200	5,660	7,060	7,320	8,160	8,200	6,940	50,270
1944...	3,470	712	0	0	0	1,940	4,540	7,070	7,330	7,890	8,180	6,130	47,240
1945...	4,030	975	0	0	0	1,360	6,050	7,040	7,300	8,030	8,170	6,920	49,350
1946...	3,570	597	0	0	0	589	4,430	7,320	7,170	7,760	8,150	6,000	45,590
1947...	2,670	75	0	0	0	1,820	5,489	7,520	7,430	8,070	8,150	5,700	46,920
1948...	2,640	52	0	0	0	813	3,780	6,110	6,060	7,550	7,060	8,530	40,620
1949...	2,720	0	0	0	0	615	3,430	6,900	7,190	7,720	7,860	5,850	42,320
1950...	3,320	30	0	0	0	722	2,750	6,820	7,030	7,710	8,240	6,910	43,540
1951...	3,290	0	0	0	0	758	4,780	6,720	7,160	7,950	7,980	6,060	45,300
1952...	2,960	0	0	0	0	1,030	5,870	7,490	7,470	7,910	6,370	6,920	45,720
1953...	4,170	635	0	0	0	2,240	5,100	6,550	6,770	7,550	7,710	6,990	47,720

North Fork Tieton River below Clear Creek, near Naches, Wash.

Location.—Lat. 46°38'40", long. 121°16'10", in sec. 12, T. 13 N., R. 12 E. (unsurveyed), on left bank, 1,000 ft. downstream from Clear Creek Dam, a quarter of a mile downstream from Clear Creek, a quarter of a mile upstream from Cold Creek, 7 miles upstream from South Fork, and 30 miles southwest of Naches.

Drainage area.—61.5 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,960 ft. (from topographic map).

Extremes.—1914, 1915: Maximum discharge observed, 780 cfs June 1, 2, 1914, gage height, 3.70 ft.); minimum observed, 106 cfs Sept. 13, 1914 (gage height, 0.62 ft.).

Remarks.—Flow regulated by Clear Creek Reservoir (capacity, 5,300 acre-ft.). Maximum storage in 1915 was 1,680 acre-ft.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914	.....	.....	.....	.....	.....	.....	.....	477	410	308	221	164	.....
1915	178	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

YAKIMA RIVER BASIN

North Fork Tieton River below Clear Creek, near Naches, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1914	.....	.....	.....	.....	.....	.....	.....	330	254	210	178	108	.....
1915	123	.....	.....	.....	.....	.....	.....	.....	.....	326	167	157	.....

Tieton Reservoir at Tieton Dam, near Naches, Wash.

Location.—Lat. 46°39'10", long. 121°07'30", in SW¼ sec. 31 (unsurveyed), T. 14 N., R. 14 E., on face of dam on Tieton River at spillway, 2,000 ft. upstream from Wildcat Creek, 7½ miles upstream from headworks of Tieton Canal, and 22½ miles southwest of Naches.

Drainage area.—187 sq. mi.

Gage.—Staff gage. Datum of gage is mean sea level (Bureau of Reclamation benchmark).

Extremes.—1925-53: Maximum contents observed, 201,380 acre-ft. June 21, 1937 (elevation, 2,927.33 ft.); minimum observed, 89 acre-ft. Oct. 12, 1926 (elevation, 2,766.77 ft.).

Remarks.—Reservoir formed by earth-fill dam completed in 1925; storage began Apr. 27, 1925. Capacity, 197,000 acre-ft. between sill of tunnel entrance (elevation, 2,766.00 ft.) and crest of spillway gates (elevation, 2,926.00 ft.). Records herein represent usable contents. Water used for irrigation. Contents obtained by using mean gage height for the last day of the month prior to October 1952 and for the mid-night gage height thereafter.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1925	.....	.....	.....	.....	.....	.....	84,120	99,550	101,060	64,280	38,290	17,560	.....
1926	21,390	15,350	35,140	48,770	63,790	85,610	112,290	96,170	83,910	66,010	27,770	171	.....
1927	11,860	24,340	49,400	64,410	80,120	99,480	125,560	162,600	188,390	138,550	157,100	134,260	.....
1928	151,860	150,610	150,160	153,780	140,420	155,250	175,780	188,930	195,480	175,390	138,190	94,340	.....
1929	84,320	88,480	89,560	90,260	90,090	98,430	91,100	130,410	173,440	166,780	103,000	25,340	.....
1930	19,220	18,690	19,760	23,500	44,420	65,540	105,070	123,620	133,810	114,390	68,680	14,780	.....
1931	11,060	11,490	9,900	18,680	30,120	45,080	77,230	131,580	138,870	98,020	40,890	257	.....
1932	2,120	8,990	18,540	30,590	48,230	84,230	116,340	171,640	200,050	177,240	153,970	130,450	.....
1933	121,340	140,070	143,170	144,170	138,530	129,380	157,650	199,850	197,060	197,290	163,270	115,600	.....
1934	126,800	139,510	171,910	147,590	128,320	131,040	198,020	199,460	187,170	149,460	103,110	68,400	.....
1935	67,750	113,250	120,950	122,690	126,840	139,080	150,510	177,800	199,970	172,950	117,790	99,270	.....
1936	57,220	61,300	81,620	86,860	85,280	96,580	138,050	180,990	196,360	157,220	98,140	74,590	.....
1937	75,520	72,730	71,640	72,340	73,460	79,350	104,610	153,900	200,840	168,930	137,450	97,180	.....
1938	87,160	107,050	136,640	143,120	139,300	155,860	190,560	200,300	199,720	170,600	140,840	90,740	.....
1939	85,740	89,590	102,910	116,260	126,920	144,400	171,870	199,040	189,120	167,660	129,990	94,140	.....
1940	91,690	91,660	110,460	124,210	141,750	168,140	196,860	199,690	184,690	154,230	114,730	90,640	.....
1941	80,180	81,820	99,320	110,340	119,360	138,290	159,060	153,170	123,580	63,990	33,460	14,040	.....
1942	16,030	30,480	62,650	75,200	84,250	95,620	124,710	143,730	164,210	143,040	91,560	62,500	.....
1943	59,940	79,820	104,450	123,080	137,450	153,500	184,460	200,460	200,610	198,240	170,920	145,140	.....
1944	139,260	139,600	153,040	160,200	166,550	180,640	188,630	188,910	168,540	136,860	93,170	54,330	.....
1945	40,050	48,180	57,810	80,700	102,590	114,660	126,940	174,740	195,410	169,870	139,570	114,840	.....
1946	113,700	119,930	110,860	118,820	114,640	118,380	139,640	180,990	199,160	180,260	159,920	119,760	.....
1947	114,660	103,800	111,510	119,090	142,560	170,350	198,930	199,740	195,930	169,180	130,810	108,310	.....
1948	135,050	147,180	120,200	138,710	140,900	140,070	156,710	195,610	200,200	184,340	168,030	111,510	.....
1949	110,880	108,220	89,970	86,440	85,870	79,070	104,620	159,420	195,460	165,380	131,680	108,700	.....
1950	102,790	124,880	133,670	130,470	121,800	110,030	96,650	124,720	189,960	182,650	137,270	112,160	.....
1951	115,190	114,660	119,700	101,440	116,540	106,120	142,000	190,860	199,080	167,820	115,240	80,530	.....
1952	91,240	99,180	109,760	111,950	118,250	123,060	156,140	190,820	196,760	167,890	102,130	60,320	.....
1953	49,480	48,340	49,680	66,300	117,150	133,260	151,470	190,460	189,210	180,230	141,440	104,700	.....

Tieton River at Tieton Dam, near Naches, Wash.

Location.—Lat. 46°39'30", long. 121°07'20", in sec. 31, T. 14 N., R. 14 E. (unsurveyed), on left bank, 900 ft. upstream from Wildcat Creek, 1,200 ft. downstream from Tieton Dam, 19 miles upstream from Oak Creek, and 22 miles southwest of Naches.

Drainage area.—187 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,680.99 ft. above mean sea level (Bureau of Reclamation benchmark). Prior to Oct. 1, 1914, staff gage at McAllister Meadows 2,000 ft. upstream at different datum. June 15, 1918, to Mar. 31, 1921, Apr. 27, 1925, to Apr. 23, 1933, staff gages or water stage recorder 800 ft. downstream at different datums.

Average discharge.—34 years (1908-12, 1918-20, 1925-53), 477 cfs (unadjusted); 480 cfs (adjusted for storage since October 1925).

Extremes.—1908-14, 1918-20, 1925-53: Maximum discharge, 8,450 cfs Dec. 22, 1933 (gage height, 9.24 ft.); no flow Apr. 4-6, 10, 1930.

Remarks.—No diversion. Flow regulated after Apr. 27, 1925 by Tieton Reservoir (see p. 618).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1905...													287
1909...	239	349*	190*	300*	230*	300*	471	788	1,170	570	304	229	428*
1910...	184	1,190	554*	326	281	1,050	1,070	1,340	904	523	292*	235	664*
1911...	391	576	282	227*	150*	258*	461*	708	1,180	591	305	306	456*
1912...	175*	536*	211*	399*	355*	234*	508	1,130	1,220	579	367	268	481*
1913...	185	264	189*										
1914										588	325	246	
1915...									1,180	535	815	297	
1919...	247	308	306	677	304	243	602	967	933	649	378	295	485
1920...	184	249	225*	333	313	208	280	548	724	511	338	345	359*
1921...	417	394	339	529	570	703							
1925								1,170	1,050	1,300	761	525	
1926...	168	179	56.1	2.4	2.7	13.8*	231	695	637	604	977	575	364
1927...	85.0	61.4	4.94	3.00	4.76	8.94	17.4	405	1,170	705	844	667	333
1928...	174	99.0	960	578	488	229	161	1,050	936	853	893	919	613
1929...	408	117	138	123	122	41.5	375	249	219	630	1,340	1,500	440
1930...	230	129	50.2	71.9	9.61	7.26	84.0	310	553	748	1,260	934	374
1931...	202	123	106	45.7	5.07	5.03	17.3	180	492	1,010	1,110	833	347
1932...	128	37.2	4.45	11.9	15.3	5.77	32.5	181	718	997	692	596	286
1933...	359	405	358	294	390	286	66.2	200	1,760	1,120	1,000	1,060	608
1934...	357	276	1,610	1,560	931	*8.68	797	823	738	1,070	1,050	775	842*
1935...	286	14.6	288	446	387	114	243	546	832	1,103	1,164	529	498
1936...	350	155	125	91.0	158	37.8	34.6	720	960	1,164	1,233	568	470
1937...	134	140	111	109	708	78.5	17.7	160	687	1,245	899	906	385
1938...	277	73.7	8.9	366	324	11.1	125	1,255	1,356	1,050	763	915	545
1939...	356	122	68.6	12.6	7.0	18.1	165	462	842	793	849	771	375
1940...	195	155	42.6	9.0	8.7	9.4	122	668	825	809	852	655	381
1941...	281	143	8.1	9.0	10.0	10.0	140	673	936	1,256	712	569	398
1942...	159	54.5	8.2	9.7	12.0	12.0	64.6	404	386	817	1,096	679	311
1943...	153	32.4	14.4	12.0	13.8	47.2	490	711	1,306	1,103	733	674	443
1944...	312	200	44.9	40.7	75.0	24.4	198	447	781	1,138	891	810	414
1945...	297	128	34.3	4.0	4.0	4.0	104	203	445	803	697	696	279
1946...	169	122	379	214	219	224	226	776	848	1,115	671	887	489
1947...	313	596	733	214	30.3	4.71	219	1,210	954	939	897	632	565
1948...	114	302	751	4.83	290	330	160	619	1,846	935	807	1,063	603
1949...	288	303	532	233	237	407	343	390	1,334	1,297	907	665	560
1950...	372	598	171	438	525	711	855	764	795	1,431	1,272	725	690
1951...	406	639	595	792	527	589	248	558	1,222	1,171	1,168	842	757
1952...	231	174	151	172	184	168	151	592	856	1,220	1,233	914	505
1953...	331	151	126	19.6	7.01	8.33	150	245	895	1,207	1,081	698	437

* Estimated.

YAKIMA RIVER BASIN

Tieton River at Tieton Dam, near Naches, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908													205
1909	198						375	515	150	402	197	162	162
1910	138	174	150*	127	210*	500*	614	917	620	360	196	206	127
1911	220	205*	229	160*		162	308	560	650	400	250*	100*	
1912	157	157	176	177	263*	192	362*	560	840*	430	244	200	157
1913	1.4	174	172										
1914										400	259	197	
1918									706	335	254	254	
1919	166	166	166	185	229	206	426	638	706	490	367	140*	140*
1920	149	149	100*	229	239	105	206	376	391	341	302	302	100*
1921	318	185	229	335	275	574							
1925								158	424	1,110	576	404	
1926	112	167	3	2	2	8*	12	318	445	504	409	65	2
1927	2	36	3	3	3	8	6	141	440	557	632	513	2
1928	4	5	304	13	342	12	6	808	808	630	808	475	4
1929	263	10	21	88	104	9	9*	210	252	306	510	376	9
1930	120	56	9	9	5	4	0	246	270	337	651	496	0
1931	134	78	82	4	5	5	3	84	182	799	1,020	119	4
1932	34	3	4	4	11	2	1	123	227	757	517	451	1
1933	172	230	255	270	282	285	5	6	1,110	822	792	1,060	5
1934	4	5	318	606	7*	7*	15	639	644	836	832	494	4
1935	6	6	42	279	113	113	8	149	548	698	814	477	6
1936	165	123	113	50	158	8	5	160	391	651	970	348	8
1937	123	113	111	106	106	10	9	19	176	955	776	691	9
1938	113	6	7	9	9	7	6	507	620	678	554	742	6
1939	205	7	7	7	7	7	7	257	576	625	715	415	5
1940	159	121	9	9	8	9	10	265	582	554	786	425	8
1941	225	104	7	9	10	10	9	316	420	793	604	473	7
1942	122	8	8	8	12	12	11	210	254	473	684	375	8
1943	108	6	11	12	12	47	51	346	1,000	791	504	592	6
1944	106	106	38	40	40	11	23	124	456	1,000	760	552	11
1945	130	75	4	4	4	4	3	95	252	617	644	407	3
1946	156	3.4	188	211	217	178	223	149	527	923	567	588	3.4
1947	181	214	381	4.2	4.6	4.6	4.6	850	718	724	724	373	4.2
1948	4.4	4.3	4.8	4.6	4.8	211	108	113	897	345	655	580	4.3
1949	79	304	124	174	174	405	228	42	803	793	488	490	42
1950	361	5.5	5.5	405	475*	609	828	561	528	735	1,000	645	5.5
1951	336	455	795	780*	9.2	282	150	346	810	750	930	575	9.2
1952	151	151	146	151	180	86	84	404	532	500	1,110	696	84
1953	136	127	120	6.2	6.0	6.0	6.5	76	335	759	902	669	6.0

* Estimated.

Tieton River at Tieton Dam, near Naches, Wash.—Continued

Summary

Year	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Observed					Adjusted			Observed		Adjusted	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
Dis-charge	Date											
1908..												
1909..	1,930	June 2, 1909		428	310,000				524	379,000		
1910..	4,380	Nov. 23, 1909	127	664	480,000				608	440,000		
1911..	2,800	Nov. 10, 1910		456	330,000				412	298,000		
1912..	1,770†	May 15, 1912	157	481	350,000				474	344,000		
1913..												
1914..												
1919..	2,770	Jan. 23, 1919	140	485	351,000				447	345,000		
1920..	1,100	June 15, 1920	100	359	260,000				400	290,000		
1925..	2,390	May 28-30, 1925										
1926..	1,860	May 14, 1926	2	364	264,000	340	1.82	24.68	343	248,000	303	26.34
1927..	3,530	June 22, 1927	2	333	241,000	518	2.77	37.60	424	307,000	564	40.92
1928..	5,260	June 1, 1928	4	613	445,000	558	2.95	40.60	564	410,000	481	35.04
1929..	2,590	Aug. 17, 1929	9	449	325,000	354	1.89	25.70	431	312,000	334	24.25
1930..	2,060	Sept. 1, 1930	0	374	270,000	359	1.92	26.05	372	269,000	358	26.01
1931..	1,630	Sept. 3, 1931	4	347	251,000	327	1.75	23.74	325	235,000	337	24.47
1932..	3,220	July 6, 1932	1	286	207,000	465	2.49	33.89	365	265,000	537	39.11
1933..	6,180	June 10, 1933	5	608	441,000	588	3.14	42.65	704	510,000	744	53.95
1934..	8,450	Dec. 22, 1933	4	842	609,400	774	4.14	56.15	702	508,400	632	45.80
1935..	1,820	May 25, 1935	6	498	360,500	543	2.90	39.42	501	362,700	447	32.40
1936..	1,930	May 28, 1936	8	470	341,200	436	2.33	31.73	449	326,200	436	31.70
1937..	2,210	June 22, 1937	9	385	278,400	416	2.22	30.17	383	277,000	472	34.28
1939..	3,280	April 30, 1938	6	545	394,600	544	2.91	39.53	561	406,100	514	37.33
1939..	1,610	May 29, 1939	5	375	271,200	371	1.95	26.92	361	261,600	372	26.07
1940..	1,320	May 24, 1940	8	381	276,300	376	2.01	27.34	384	278,700	309	26.84
1941..	1,820	July 17, 1941	7	398	288,500	293	1.57	21.26	381	275,700	330	23.98
1942..	1,320	Aug. 19, 1942	8	311	225,200	378	2.02	27.44	309	229,900	367	26.65
1943..	1,870	June 15, 1943	6	443	320,500	357	2.28	40.42	472	342,700	540	39.15
1944..	1,240	July 12, 13, 1944	11	414	300,600	289	1.55	21.04	406	294,800	275	20.03
1945..	1,120	June 28, 1945	3	279	202,100	362	1.94	26.30	297	216,100	370	26.89
1946..	1,960	May 27, 1946	3.4	489	354,200	497	2.66	36.06	570	413,000	571	41.49
1947..	1,910	May 28, 1947	4.2	565	409,100	549	2.94	39.89	528	382,400	540	39.22
1948..	2,930	June 11, 1948	4.3	603	437,900	608	3.25	44.23	597	433,700	556	40.45
1949..	1,900	July 14, 1949	42	580	420,200	576	3.08	41.84	548	396,600	615	44.64
1950..	2,110	July 12, 1950	5.5	690	499,400	695	3.72	50.42	786	569,100	760	55.17
1951..	2,240	June 10, 1951	9.2	757	548,300	714	3.82	51.80	645	467,300	632	45.84
1952..	1,530	July 17, 1952	84	505	366,700	477	2.55	34.74	510	370,000	427	31.11
1953..	1,600	June 13, 1953	6.0	437	316,500	499	2.67	36.22				

† Maximum observed.

YAKIMA RIVER BASIN

Tieton Canal near Naches, Wash.

Location.—Lat. 46°40'10", long. 121°00'20", in sec. 30, T. 14 N., R. 15 E. (unsurveyed), on left bank, 500 ft. downstream from canal intake and 16 miles southwest of Naches.

Gage.—Water-stage recorder. Datum of gage is 2,294.82 ft. above mean sea level (Bureau of Reclamation benchmark). Prior to Mar. 18, 1944, float gage at same site and datum.

Average discharge.—43 years (1910-53), 127 cfs.

Extremes.—1910-53: Maximum daily discharge, 345 cfs. Sept. 5-7, 1952, July 24-26, 28, July 30 to Aug. 30, 1953; no flow at times each year.

Remarks.—Canal diverted from right bank for irrigation of about 25,000 acres in 1950. Irrigated acreage in 1910 was about 1,650 acres.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910								1,700	2,570	2,540	1,090	0	.....
1911	0	0	0	0	0	0	1,360	2,770	6,070	7,690	6,270	2,960	27,100
1912	117	1,270	563	0	0	0	628	8,670	11,000	10,200	11,300	5,220	49,000
1913	0	0	0	0	0	0	1,240	10,990	10,900	13,900	14,600	8,210	59,890
1914	1,360	969	0	0	0	0	2,780	12,600	11,100	16,500	15,600	9,080	70,000
1915	0	2,030	0	0	0	0	5,370	12,200	14,500	15,800	13,600	4,990	68,500
1916	0	2,090	310	0	0	0	2,330	13,900	15,500	15,500	17,500	12,500	79,700
1917	0	1,780	0	0	0	0	2,830	14,500	16,200	17,700	17,400	14,200	85,100
1918	0	2,620	0	0	0	1,240	3,290	13,300	18,100	16,800	15,300	14,000	94,600
1919	0	1,400	571	0	0	0	6,160	19,000	18,500	19,500	19,400	14,900	93,400
1920	0	198	2,440	1,810	0	0	6,430	16,600	18,000	18,600	18,900	15,300	100,000
1921	0	1,740	0	0	0	0	3,430	15,400	18,000	19,700	19,700	15,100	98,100
1922	3,650	0	0	0	0	0	738	16,500	15,400	19,700	19,800	15,900	95,000
1923	939	2,220	0	0	0	0	2,770	18,600	15,100	18,600	19,500	15,900	98,600
1924	1,470	832	458	0	0	454	7,740	19,500	19,200	19,800	19,600	9,750	98,800
1925	0	1,270	0	0	233	504	5,580	18,600	18,700	19,800	19,400	13,300	97,700
1926	0	1,110	133	0	0	1,260	12,500	19,300	18,600	19,100	19,100	7,570	98,700
1927	0	953	198	0	0	0	3,300	16,700	19,600	18,800	18,900	12,400	87,900
1928	0	1,300	0	0	938	238	2,660	16,900	17,900	18,600	18,700	14,000	91,100
1929	9,350	1,820	55	0	0	824	4,900	18,100	18,300	19,200	19,500	17,300	109,600
1930	2,320	3,640	58	0	510	391	5,330	18,600	17,800	19,100	19,300	16,500	107,000
1931	0	611	541	0	492	1,710	3,890	12,800	13,200	17,900	18,500	13,400	83,000
1932	0	1,320	28	0	0	216	4,800	15,700	17,300	19,100	19,100	16,200	93,300
1933	0	1,110	0	0	749	227	3,230	13,300	17,300	17,900	18,800	16,200	87,600
1934	0	1,090	0	0	0	3,020	11,650	17,970	13,490	19,070	19,230	14,960	105,500
1935	0	936	631	0	0	2,290	5,950	17,770	17,610	18,660	18,840	17,750	100,400
1936	2,830	928	248	0	0	635	4,130	14,840	16,150	18,770	18,890	15,150	94,670
1937	0	1,350	0	0	0	1,060	1,890	15,970	15,960	19,240	19,500	16,110	91,080
1938	0	1,090	0	0	0	468	2,220	16,080	17,660	18,850	19,560	17,960	94,020
1939	1,850	912	0	0	0	1,550	5,510	19,250	18,720	19,340	19,660	16,920	106,500
1940	0	684	282	0	0	750	6,150	15,770	15,750	19,870	20,050	16,100	98,440
1941	0	992	0	0	0	762	4,300	17,860	14,210	18,170	18,400	12,760	87,450
1942	0	733	0	0	347	454	5,360	17,400	17,370	19,400	19,600	18,740	89,690
1943	0	1,240	257	0	137	740	2,900	15,210	18,110	19,050	20,110	16,090	97,500
1944	2,440	1,120	0	0	1,450	1,290	5,700	17,790	19,100	19,790	19,680	15,020	105,800
1945	0	855	562	0	194	864	4,740	16,680	18,210	19,810	19,940	18,630	105,600
1946	0	1,220	373	0	912	952	6,100	17,460	18,000	19,360	19,800	16,710	100,000
1947	0	976	998	0	0	1,410	7,650	18,590	15,740	19,970	20,090	14,430	102,960
1948	0	1,430	954	0	559	1,090	3,200	11,370	15,450	20,350	20,440	13,230	93,050
1949	0	1,440	89	0	135	567	3,260	18,240	19,710	20,370	20,320	16,560	100,700
1950	0	1,150	0	0	42	653	892	14,490	17,410	20,430	20,870	19,720	95,660
1951	0	1,040	0	0	802	323	5,230	17,960	17,750	20,320	20,700	18,220	102,300
1952	0	930	0	0	563	778	4,700	16,920	19,650	20,760	21,040	19,130	103,900
1953	0	890	59	0	776	2,150	4,400	14,560	16,980	20,950	21,210	20,110	102,100



Figure 22. Early type wooden gage house and well on Tieton River at headworks of Tieton Canal, near Naches.



Figure 23. Concrete block well and aluminum-covered gage house on Walla Walla River near Touchet. Note outside vertical staff reference gage in two sections.

Tieton River at headworks of Tieton Canal, near Naches, Wash.

Location.—Lat. 46°40'10", long. 121°00'20", in sec. 30, T. 14 N., R. 15 E. (unsurveyed), on right bank, 1,000 ft. downstream from headworks of Tieton Canal, 12 miles upstream from Oak Creek, and 16 miles southwest of Naches.

Drainage area.—239 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 2,280.44 ft. above mean sea level, unadjusted. Prior to July 28, 1909, staff gages at same site or within 1½ miles downstream referred to same datum.

Average discharge.—47 years (1906-53), 552 cfs, adjusted for diversion since 1910 and for storage since October 1924.

Extremes.—1906-53: Maximum discharge, 8,910 cfs Dec. 22, 1933 (gage height, 9.70 ft.); no flow at times in 1926, 1929, 1931, 1932, 1934, 1945.

Remarks.—Diversions for irrigation by Tieton Canal since 1910. Flow regulated by Tieton Reservoir (see p. 618), 7 miles above station, since 1924.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906							885*	895*	410*	560*	350*	250*	.....
1907	285*	1,820*	940*	400*	800*	515*	790*	1,370*	1,100*	652	266	289	779*
1908	243	223	334	259	228	764	965	1,040	1,590	1,250*	496	320	638*
1909	279	312	224	339	265	350	595	829	1,360	685	358	283	506
1910	204	1,320	670	361*	325	1,350	1,190	1,380	919	567	330	256	741*
1911	400	563	331	251	195	341	548	745	1,190	512	252	276	469
1912	201	328	239	439	464	314	663	1,180	1,060	424	193	189	474
1913	190	218	190	252	296	300	677	1,160	1,730	788	263	219	533
1914	254	231	215	529	240	550	573	1,000	745	347	95	136	435
1915	304	493	220*	171	166	319	712	441	242	123	103	149	287*
1916	200	172	277	160*	450*	882	1,140	1,270	1,800	1,410	464	184	700*
1917	232	231*	150*	206*	238*	176*	322	1,180	1,470	1,080	218	95.2	456*
1918	116*	165*	944*	994*	367*	320*	576	541	897	273	55.9	22.7	440*
1919	260*	197*	330*	730*	350*	300*	648	787	673	352	61.0	62.3	396*
1920	174	246	215*	354	329	223	210	323	403	221	46.3	105	237*
1921	420	355	355	617	675	823	781	1,040	1,580	628	165	104	623
1922	259	292	966	400	216	195	407	710	1,240	265	61.0	80.4	420
1923	200	153	286	669	295	354	576	991	911	649	121	56.2	466
1924	231	228	312	332	615	424	350	893	322	71.3	17.2	38.4	338
1925	223	214	465	221	201	183	270	1,000	739	599	482	349	440
1926	182	176	51.5	24.6	44.6	56.3	92.1	631	344	304	670	448	256
1927	101	61.4	53.7*	30.9*	45.0*	61.5*	98.6	223	1,030	405	560	471	262*
1928	196	138	1,130	689	519	325	193	911	683	586	605	729	562
1929	335	115	159	167	148	62.0	342	26.3	15.1	398	1,110	1,250	344
1930	204	79.2	70.9*	73.8*	32.1	57.2	20.9	47.5	279	440	973	724	252*
1931	221	117	99.5*	53.5*	12.6	5.00	15.7	24.1	291	785	919	672	270*
1932	132	23.9	10.1	10.6*	67.2	93.3	46.2	32.9	459	716	406	347	194*
1933	377	400	393	354*	409	339	167	106	1,640	854	747	860	555*
1934	363	268	1,580	1,840	1,170	104	731	529	457	804	764	559	706
1935	309	53.4	338	607	491	138	233	456	616	562	998	259	445
1936	324	154	136	109	255	77.9	120	598	762	880	961	325	393
1937	130	119	122	119*	113	97.2	77.0	40.3	522	919	573	628	289*
1938	277	70.3	47.5	413	371	72.9	250	1,244	1,150	782	474	620	434
1939	358	129	115	31.5	26.0	50.9	195	225	514	456	517	481	252
1940	189	133	52.6	23.2*	40.3	66.8	94.8	667	516	475	517	361	262*
1941	293	152	26.1	16.7*	26.6	43.1	119	408	607	983	408	337	294*
1942	177	56.6	33.9	19.6	19.3	36.7	56.7	166	107	495	781	348	193
1943	160*	50.8	63.1	71.7*	58.0	123	662	504	1,129	872	438	370	384*
1944	278	185	68.7	52.1	68.3	38.0	149	191	485	814	596	532	289
1945	274	118	30.5*	25.0	23.2	11.7	75.7	20.7	163	539	416	319	170*
1946	270	111	416	246	230	277	272	641	650	846	387	645	409
1947	322	593	850	266	93.2	75.0	190	1,069	726	635	610	424	492
1948	140	309	796	36.1*	340	375	227	670	1,753	624	430	740	510*
1949	294	311	569	238*	249	481	526	332	1,023	946	597	415	500*
1950	301	236	203	446	546	812	1,043	773	654	1,097	900	385	625
1951	380	702	858	810	617	633	346	455	950	800	865	571	666
1952	253	179	190	195	244	234	226	416	590	901	906	575	410
1953	314	109	133	109	74.8	16.8	169	143	743	824	675	642	322

* Estimated.

Tieton River at headworks of Tieton Canal, near Naches, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													
1908	203	146	180	152	162	203	510	845	910	600*	334	224	146
1909	227	206	150	230	230	224	470	735	840	515	273	204	150
1910	152	191	404	200*	251	789	772	1,010	669	352	258	218	152
1911	246	225	265	180	175	177	328	585	645	300	208	130	130
1912	175	175	186	185	331	243	563	654	429	158	109	119	109
1913	168	152	152	215	171	266	304	563	1,170	424	74	90	74
1914	117	185	171	185	220	340	360	630	400	120	47	25	25
1915	235	266	154*	141*	154	173	360	294	63	25	36	45	25
1916	138	76	123			292	750	744	1,100	670	266	69	69
1917	182						160*	443	990	438	61	50	50
1918							489	267	444	21	13	13	13
1919							516	404	466	111	33	22	22
1920	142	150	92*	131	244	109	100	111	121	53	11	17	11
1921	343	175	211	390	309	668	592	455	910	357	16	19	18
1922	153	265	564*	245	184	178	259	380	662	73	31	26	26
1923	118	20	116*	380	236	229	630	465	493	211	70	26	20
1924	139	175	204	214	419	804	173	172	128	6	2	2	2
1925	194	16	207	134	145	101	34	48	184	769	317	304	15
1926	126	109	17	15	16	0	5	48	140	195	134	52	0
1927	18	0					7	15	311	290	334	316	0
1928	13	12	324	172	324	104	85	551	564	371	534	347	12
1929	212	16	38	104	119	2	1	4	5	18	216	210	1
1930	8	3	11*	11*	1	28	2	7	6	61	673	245	1
1931	140	60	82*		0	0	0	1	1	538	762	118	0
1932	15	2	8*	9*	15	47	0	3	2	461	143	172	0
1933	212	241	265	328	237	237	48	8	940	592	496	846	8
1934	14	31	344	761	90	29	1	37*	350	640	541	312	1
1935	39	0	0	350	155	108	46	24	251	420	529	162	0
1936	173	138	125	61	176	17	14	56	213	405	665	148	14
1937	112	102	114	107*	107*	37	13	14	12	645	470	481	12
1938	100	8	20	62	31	30	06	475	694	453	272	453	8
1939	222	8	38	17	21	15	15	34	276	285	377	307	8
1940	155	108	23	15*	26	38	21	173	262	220	446	239	15*
1941	233	120	5*	10*	23	8	26	49	127	500	300	295	8
1942	132	4	24	17*	1	1	14	14	16	146	544	161	1
1943	123*	8	26	37	37*	68	163	183	770	550	164	269	8
1944	122	120	50	50	50	6	8	18	128	631	464	332	3
1945	135	6	7*	7*	1	2	4	6	11	323	356	118	1
1946	154	6.6	140	233	204	199	148	60	323	688	269	257	6.6
1947	200	224	323	25	49	33	31	673	447	424	447	327	25
1948	23	28	29	28	25*	241	94	88	615	57	333	374	23
1949	16	262	165*	150*	170*	420	270	55	642	476	198	279	16
1950	365	72	50*	390	459	656	964	454	405	464	621	310	50*
1951	310	420	788	780	206	350	202	206	551	420	642	405	202
1952	170	136	178	178	181	178	127	230	282	220	772	454	127
1953	100	91	130	15	39	6.5	27	25	216	442	558	400	6.5

* Estimated.

Tieton River at headworks of Tieton Canal, near Naches, Wash.—Continued

Summary

Year	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Observed					Adjusted			Observed		Adjusted	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
Discharge	Date											
1906												
1907				779	564,000				593	429,000		
1908	3,930	Mar. 15, 1902	146	636	462,000				641	466,000		
1909	2,450	June 2, 1909	150	506	266,000				616	446,000		
1910	5,400	Nov. 24, 1909	152	741	536,000	752	3.15	42.76	668	484,000	679	38.55
1911	2,290	June 13, 1911	130	469	340,000	507	2.12	28.78	424	307,000	464	26.33
1912	1,880	June 9, 1912	109	474	344,000	542	2.27	30.90	465	337,000	530	30.22
1913	2,740	June 3, 1913	74	533	386,000	610	2.52	35.02	537	389,000	623	35.43
1914	1,950	Jan. 6, 1914	25	425	315,000	532	2.23	30.27	461	334,000	557	31.03
1915	1,550	April 3, 1915	25	287	207,000	382	1.60	21.72	257	186,000	351	19.95
1916	3,530	June 18, 1916	69	700	508,000	810	3.39	46.14	699	508,000	809	45.90
1917	2,230	June 17, 1917	50	456	330,000	574	2.40	32.63	501	362,000	620	35.21
1918			13	440	319,000	571	2.38	32.40	408	295,000	538	30.54
1919	1,940	May 27, 1919	22	306	287,000	594	2.23	30.32	383	277,000	521	29.61
1920	850	Jan. 28, 1920	11	237	172,000	376	1.57	21.42	279	203,000	416	23.68
1921	2,580	June 7, 1921	18	623	451,000	756	3.16	42.89	656	475,000	792	44.03
1922	6,150	Dec. 13, 1921	26	430	312,000	562	2.35	31.80	356	258,000	487	27.69
1923	2,260	Jan. 7, 1923	20	466	337,000	600	2.51	34.07	479	347,000	612	34.75
1924	2,600	Feb. 12, 1924	2	338	245,000	474	1.93	26.89	348	252,000	551	30.22
1925	2,460	Dec. 24, 1924	15	440	319,000	599	2.51	34.07	401	290,000	535	30.41
1926	1,690	May 14, 1926	0	256	185,000	368	1.54	20.90	238	172,000	393	22.37
1927	3,580	June 22, 1927	0	262	190,000	569	2.38	32.35	309	267,000	629	35.76
1928	4,000	May 28, 1928	12	562	409,000	634	2.65	36.07	491	356,000	547	31.17
1929	2,410	Aug. 17, 1929	1	344	249,000	400	1.67	22.64	323	234,000	370	21.04
1930	1,510	Sept. 1, 1930	1	252	183,000	385	1.61	21.85	259	187,000	385	21.85
1931	1,770	Sept. 3, 1931	0	270	196,000	365	1.53	20.77	247	179,000	374	21.18
1932	2,430	July 6, 1932	0	194	141,000	502	2.10	28.58	278	202,000	578	32.94
1933	6,120	June 10, 1933	8	555	402,000	656	2.74	37.19	669	485,000	831	47.24
1934	8,610	Dec. 22, 1933	1	798	576,500	874	3.66	49.68	643	465,200	718	40.72
1935	1,980	May 26, 1935	0	445	321,900	629	2.63	35.70	437	316,400	525	29.86
1936	1,560	May 28, 1936	14	303	285,300	489	2.05	27.00	373	270,400	486	27.63
1937	2,240	June 21, 1937	12	289	209,300	446	1.87	25.38	291	210,800	506	28.78
1938	3,340	April 30, 1938	8	484	350,200	613	2.56	34.75	501	362,900	637	33.39
1939	1,260	May 29, 1939	8	252	182,400	396	1.66	22.53	233	168,400	388	21.96
1940	1,100	May 24, 1940	15	262	190,500	393	1.64	22.30	271	196,400	391	22.32
1941	1,540	June 17-20, 1941	8	294	213,000	369	1.29	17.50	277	200,700	347	19.62
1942	954	Aug. 21, 1942	1	193	140,000	398	1.67	22.67	194	140,400	390	22.13
1943	1,780	June 18, 1943	8	384	278,200	633	2.65	35.97	406	285,800	610	34.61
1944	920	July 24, 1944	3	289	209,700	300	1.20	17.37	280	203,100	291	16.61
1945	770	June 28, 1945	1	170	122,300	391	1.64	22.26	193	139,600	405	22.94
1946	1,840	May 27, 1946	6.6	409	296,100	550	2.33	31.03	499	361,500	640	36.38
1947	1,540	May 28, 1947	25	492	355,800	613	2.59	35.16	448	324,100	602	34.21
1948	2,960	June 11, 1948	23	540	391,800	672	2.81	38.25	534	387,400	619	35.25
1949	1,460	July 16, 1949	16	500	362,100	635	2.66	36.11	471	341,000	637	38.45
1950	1,950	July 13, 1950	50	625	452,400	762	3.19	43.27	718	519,800	824	46.79
1951	2,150	June 10, 1951	202	666	482,300	764	3.20	43.38	556	402,300	663	38.80
1952	1,200	July 22, 1952	127	410	297,700	525	2.20	29.93	405	293,800	488	26.54
1953	1,410	June 13, 1953	6.5	322	233,400	525	2.20	29.63				

YAKIMA RIVER BASIN

Tieton River above and below Oak Creek, near Naches, Wash.

Location.—Lat. 46°43'30", long. 120°48'20", in SE¼ sec. 3, T. 14 N., R. 16 E., on left bank, 200 ft. downstream from Oak Creek, 2 miles upstream from mouth, and 8 miles northwest of Naches.

Drainage area.—296 sq. mi.; 264 sq. mi. at sites upstream from Oak Creek.

Gage.—Chain or staff gages. Altitude of gage is 1,690 ft. (from river-profile map). Prior to Apr. 21, 1909, staff gages within 1 mile upstream at various datums.

Extremes.—1902-13: Maximum discharge, 22,400 cfs Nov. 14, 1906 (gage height, 16.1 ft., from graph based on gage readings, site and datum then in use); minimum observed, 56 cfs Aug. 23, 1913 (gage height, 3.47 ft.).

Remarks.—Tieton Canal (see p. 622) has diverted water above station during irrigation seasons since 1910.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1902...										783	470	328	.....
1903...	201	323	356	857	398	468	768	1,300	2,200	518	452	362	715
1904...	422	552	510	360	293	337	1,580	1,610	1,460	961	468	329	739
1905...	278	413	357	293	253	747	564	617	895	524	369	305	471
1906...	359	536	220	232	867	881	1,000	956	618	560	850	250	461
1907...	289	2,220	921	403	786	511	887	1,470	1,220	680*	375*	295*	835*
1908...	241*	295*	344*	239*	229*	629*	1,120*	1,060*	1,560*	1,400*	518*	322*	675*
1909...	285*	350*	230*	350*	275*	390*	1,030	1,030	1,560	678	384	285	540*
1910...	207	1,580	648	370*	335*	1,640	1,390	1,480	976	583	320	260	817*
1911...	410*	600*	340*	260*	205*	350*	563	785	1,060	550	249	276	472*
1912...	201	327	227	444	438	366	740	1,390	1,170	406	186	190	502
1913...	183	293	197	265	366	831	760	1,170	1,600	702	226	252	532

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1902...										568	342	260	.....
1903...	240	240	238	462	350	330	587	919	1,150	528	376	297	235
1904...	281	330	319	306	258	277	330	1,030	1,000	540	853	237	258
1905...	238	220	287	233	208	447	430	493	692	415	263	249	205
1906...	246	200	196	207	258	285	606	563	452	308	223	168	168
1907...	188	212	536	315	315	358	410	990	840				
1908...													
1909...								705	705	475	300	295	
1910...	166	180	210			870	840	1,060	630	360	240		
1911...							380	630	630	305	192		
1912...		172	172	156	339	235	570	720	570	168	120	134	120
1913...	168	172	168	218	221	270	339	594	938	384	56	97	56

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1902								
1903	4,340	June 16, 1903	238	718	520,000	761	551,000	
1904	3,270	April 14, 1904	258	739	536,000	703	510,000	
1905	1,750	June 3, 1905	208	471	341,000	452	327,000	
1906	1,460	May 4, 1906	168	461	334,000	677	490,000	
1907	22,400	Nov. 14, 1906		835	605,000	619	445,000	
1908				675	490,000	622	495,000	
1909				540	391,000	667	483,000	
1910	8,010	Nov. 23, 1909	156	817	592,000	725	527,000	
1911				472	341,000	422	305,000	
1912	2,150†	⊙	120	502	364,000	494	359,000	
1913	3,080†	June 2, 3, 1913	56	532	386,000			

* Estimated. † Maximum daily. ⊙ May 15, 16, 1912.

YAKIMA RIVER BASIN

Wapatox Canal near Naches, Wash.

Location.—Lat. 46°44'50", long. 120°46'30", in NW¼ sec. 36, T. 15 N., R. 16 E., on right bank, 200 ft. downstream from canal headgate, and ¾ miles northwest of Naches.

Supplemental records available.—July to October 1905, gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 1,575 ft. (from river-profile map). Apr. 16, 1904, to Sept. 30, 1905, July 3, 1909, to October 1914, and April 1916 to December 1939, staff gages at approximately same site and datum. Jan. 1, 1940, to Sept. 6, 1941, water-gate recorder at same site and datum.

Average discharge.—39 years (1912-14, 1916-53), 431 cfs.

Extremes.—1904, 1909-14, 1916-50: Maximum daily discharge, 709 cfs Feb. 4, 1917 (gage height, 5.35 ft.); no flow at times when gates are closed.

Remarks.—Canal diverts from left bank of Naches River, half a mile upstream from the Naches River below Tieton River near Naches gaging station, for power development and irrigation of about 3,000 acres.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904								2,480	2,210	1,550	2,280	1,550	.....
1905	440												.....
1909										10,600	10,600	10,700	.....
1910							10,200	11,900	12,900	14,000	14,300	15,600	.....
1911	16,300						15,200	19,100	19,900	21,300	23,900	22,900	.....
1914	19,800						22,500	23,700	21,800	24,200	21,500	20,300	.....
1913	21,400	22,400	22,500	23,700	20,500	6,110	0	13,400	22,600	24,400	25,600	25,900	229,000
1914	21,400	19,200	22,400	18,600	15,400	23,000	26,160	16,500	18,000	35,100	23,800	26,300	271,000
1915	9,150												.....
1916							12,400	29,800	29,800	29,600	33,400	27,400	.....
1917	16,600	25,300	22,200	19,100	21,000	20,100	21,700	31,200	29,800	32,700	36,100	28,000	304,000
1918	19,100	17,600	21,600	26,300	26,800	31,300	18,400	29,900	33,900	32,900	30,300	16,500	305,000
1919	21,800	25,600	31,300	27,000	23,100	29,300	23,700	31,600	33,000	32,200	28,400	23,900	331,000
1920	20,500	27,500	10,400	22,300	26,600	20,200	27,800	29,800	31,900	31,300	22,300	24,000	295,000
1921	30,100	23,000	28,200	28,100	25,700	24,200	26,600	30,200	34,600	35,500	33,900	24,900	345,000
1922	19,400	19,800	25,200	20,000	15,400	10,500	6,950	28,300	25,300	18,700	27,800	18,500	238,000
1923	11,400	21,300	9,200	20,500	16,800	22,800	23,600	34,400	34,400	34,000	29,000	21,700	260,000
1924	23,900	21,600	27,700	22,200	22,900	18,500	38,800	32,400	32,200	24,600	16,200	10,600	254,000
1925	21,600	25,300	25,600	15,100	18,600	22,600	12,600	25,700	29,900	33,900	27,900	23,400	282,000
1926	11,200	18,900	25,300	26,700	25,100	30,300	27,000	32,300	30,400	29,000	29,500	16,700	302,000
1927	17,800	22,500	26,500	22,200	23,100	28,600	32,000	32,000	30,900	31,900	33,400	30,900	328,000
1928	26,700	28,800	26,100	21,500	20,800	20,400	23,000	24,200	27,900	30,800	30,500	29,500	310,000
1929	24,700	24,100	18,100	15,600*	12,500*	17,800	13,500	25,100	25,500	29,400	30,100	31,200	288,000*
1930	16,800	12,000	16,600	14,000	19,400	19,700	25,500	31,000	33,100	33,600	32,700	27,700	282,000
1931	15,900	16,800	14,500	17,000	19,800	22,700	31,600	32,600	32,100	34,600	33,600	26,800	298,000
1932	12,900	18,900	15,600	20,500	18,300	25,400	22,200	33,400	33,100	33,900	33,800	32,600	304,000
1933	27,200	26,900	23,800	24,000	19,300	21,600	21,700	24,200	18,500	27,800	28,100	28,100	290,000
1934	27,720	28,260	24,000	16,490	9,300	16,950	23,070	19,250	30,230	33,840	34,020	29,600	292,800
1935	23,270	26,770	26,740	28,140	26,710	28,480	28,310	30,730	31,990	33,560	33,720	32,420	350,800
1936	30,170	18,580	19,790	21,620	21,390	24,430	26,740	30,310	32,240	34,320	33,020	27,180	319,700
1937	19,860	14,680	19,560	17,640	17,570	26,770	27,040	29,170	33,700	34,820	33,260	28,970	303,000
1938	24,280	27,510	26,960	29,150	26,320	29,980	30,220	32,710	32,370	31,500	30,950	31,960	355,300
1939	27,810	23,720	26,700	23,700	16,830	25,710	31,890	32,800	32,460	32,220	32,860	31,530	340,900
1940	15,320	17,810	27,510	26,510	26,840	29,390	24,880	32,950	33,180	32,950	31,920	20,840	317,200
1941	22,940	20,700	22,430	22,250	22,390	31,280	30,590	33,200	25,170	31,760	24,620	20,620	307,800
1942	23,830	23,710	30,640	25,560	19,590	23,320	30,120	33,670	33,000	34,400	34,120	25,920	337,900
1943	12,330	23,760	29,060	25,320	24,620	31,090	31,660	33,400	32,930	34,400	34,520	32,810	347,400
1944	26,660	21,420	24,580	16,530	19,270	22,510	30,780	34,720	32,700	34,200	35,030	30,520	328,900
1945	21,550	15,070	19,100	23,280	23,120	20,300	23,510	21,370	28,360	33,870	31,510	28,500	290,000
1946	17,500	25,600	29,030	28,840	23,990	26,580	30,830	35,030	32,240	29,590	30,290	29,650	339,200
1947	26,200	29,230	29,730	23,850	20,110	20,690	30,490	33,520	30,870	29,930	27,370	31,530	334,600
1948	30,940	31,070	32,060	26,230	25,580	27,370	30,790	29,740	27,570	30,900	31,920	31,510	357,700
1949	27,560	29,380	28,280	24,110	22,280	26,130	19,800	29,110	30,060	31,530	32,560	27,900	328,600
1950	30,160	32,340	27,380	23,120	20,500	29,730	30,690	24,470	28,000	31,530	31,470	28,860	338,300
1951	31,470	31,100	30,050	28,510	26,340	29,490	29,660	32,030	30,920	30,770	31,680	30,430	362,400
1952	30,500	30,510	24,270	21,230	24,670	28,690	31,070	24,190	31,680	32,760	28,340	27,830	330,800
1953	21,970	13,520	16,580	20,030	24,840	21,050	26,960	23,350	30,360	31,700	29,880	28,760	289,500

* Estimated.

YAKIMA RIVER BASIN

Naches River below Tieton River, near Naches, Wash.

Location.—Lat. 46°44'40", long. 120°46'00", in SW ¼ NE ¼ sec. 36, T. 15 N., R. 16 E., on left bank, half a mile downstream from Wapatox power canal, three-quarters of a mile downstream from Tieton River, and 3½ miles northwest of Naches.

Drainage area.—941 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,549.67 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Sept. 10, 1936, staff gages or water-stage recorder five-eighths of a mile upstream and upstream from Wapatox power canal intake at different datums.

Average discharge.—45 years (1908-53), 1,682 cfs (adjusted for Selah Valley and Tieton Canals since 1909, city of Yakima diversion at Oak Flat since 1929, and by Wapatox Canal since 1936, and for change in contents in Bumping Lake since 1910, and in Tieton Reservoir since 1924).

Extremes.—1905, 1908-53: Maximum discharge, 32,200 cfs Dec. 22, 23, 1933 (gage height, 14.33 ft., site and datum then in use); minimum, 1 cfs Nov. 7, 1942, and on many days during winter of 1943-44 as a result of regulation and diversion.

Remarks.—Natural flow of stream affected by diversions, Selah Valley, Tieton and Wapatox Canals and by storage reservoirs, Bumping Lake and Tieton Reservoir (see elsewhere in this report). Several small unmeasured diversions above station for irrigation and domestic use above and below station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1905													459
1909	570*	1,040*	655*	945*	765*	1,000	1,950	3,550	5,840	2,060	700	476	1,030*
1910	406	4,620	2,580	1,090	983	4,880	4,780	5,670	3,250	1,370	537	404	2,550
1911	853	2,560	1,100	642	456	1,040	1,060	3,270	4,180	1,200	801	693	1,570
1912	363	1,020	638	963*	1,060	757	2,350	5,030	3,860	1,120	536	630	1,530*
1913	435	805*	555*	706*	900*	878*	2,420	4,840*	5,600*	2,420*	1,050*	814*	1,770*
1914	666*	715*	570*	1,640*	646*	1,630*	3,330*	3,720*	2,710*	1,150*	629*	629*	1,530*
1915	441*	1,450*	836*	355*	303*	965*	3,000*	1,430	532	618	479	247	907*
1916	270*	626*	1,100*	788*	1,180*	3,330*	4,140	5,510	7,000	5,250	1,600	741	2,630*
1917	463	473	406*	406*	552	403	894	4,150	5,760	3,690	904	476	1,560*
1918	362	297	4,050	4,090	1,610	1,260	2,260	2,640	3,140	504	519	300	1,780
1919	531	494	921	2,270	1,190	1,100	2,580	3,410	2,060	1,470	557	442	1,500
1920	349	539	688*	1,010	974	800	845	1,770	1,600	874	427	548	877*
1921	1,070	1,180	1,180	1,700	1,910	2,550	2,850	4,830	5,510	2,170	765	614	2,220
1922	619	696	2,620	1,210	637	496	1,340	3,680	4,450	841	607	367	1,460
1923	336	408	590	1,070	892	1,030	3,120	4,240	3,430	1,890	617	412	1,560
1924	508	477	892	860	2,060	1,430	1,590	3,690	1,300	580	376	208	1,210
1925	392	636	1,440	794	1,150	951	2,710	4,700	2,600	1,660	340	421	1,530
1926	290	294	518	502	491	950	1,850	1,720	821	589	850	469	750
1927	356	530	903	720	575	725	1,750	9,160	5,160	1,800	1,220	706	1,470
1928	743	1,340	2,380	1,930	965	1,390	1,500	4,720	2,310	1,050	735	1,110	1,690
1929	537	488	379	263	249	407	915	2,000	1,840	1,010	1,330	1,350	900
1930	266	207	275	256	501	602	1,960	1,640	1,480	665	1,130	888	825
1931	271	295	246	297	370	358	1,100	2,690	1,070	1,090	1,090	669	803
1932	193	317	251	322	772	1,150	1,880	3,250	3,220	1,550	801	678	1,210
1933	442	1,510	1,310	1,030	844	717	1,760	2,540	6,250	3,270	1,380	1,290	1,860
1934	876	1,130	5,820	4,710	2,780	2,500	4,050	2,610	1,580	1,270	1,020	955*	2,530*
1935	593*	1,630*	1,370	1,970	1,840	1,100	1,630	3,470	3,660	1,730	1,110	761	1,730*
1936	542	385	363	875	405	503	2,300	4,895	3,443	1,389	1,254	571	1,379
1937	12.4	S.S.	10.0	12.4*	8.9	42.4	609	2,308	3,557	1,558	471	339	754*
1938	38.7	312	586	1,042	562	523	2,123	4,488	3,440	1,112	390	187	1,236
1939	62.6	24.0	76.1	64.1	15.4	303	1,360	1,835	1,317	547	222	157	496
1940	41.8	25.9	86.0	20.1	53.6	578	1,599	2,771	1,075	369	243	79.8	580

* Estimated.

Naches River below Tieton River, near Naches, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	56.1	47.4	79.6	9.4	10.6	214	1,058	1,263	1,056	730	94.4	70.2	392
1942...	16.2	44.8	382	87.6*	10.4	20.3	1,145	1,429	1,125	506	477	125	448*
1943...	21.1	156	251	332	206	411	3,340	3,023	4,038	1,903	385	166	1,184
1944...	32.8	109	55.1	1.4	8.1	38.5	456	1,201	1,048	668	336	132	341
1945...	24.0	34.9	24.0	157	245	55.2	534	2,787	1,471	522	129	115	510
1946...	42.0	76.6	342	370	145	418	1,584	4,417	3,024	1,706	450	438	1,090
1947...	106	564	1,748	531	584	924	1,910	3,811	1,891	827	494	110	1,138
1948...	319	834	1,189	274	527	552	1,090	4,055	6,210	1,302	447	697	1,444
1949...	165	145	661	119*	267*	865	2,562	5,058	3,790	1,757	829	153	1,872*
1950...	165	718	603	563*	719	1,514	2,120	4,030	5,284	3,194	1,320	269	1,712*
1951...	273	1,346	2,829	1,650	2,064	1,256	2,518	4,239	3,160	1,813	752	280	1,807
1952...	163	140	301*	168*	344	289	1,506	2,839	1,013	1,301	823	252	833*
1953...	71.5	35.0	29.5	688	1,011	264	902	2,566	2,920	2,004	758	352	965

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1905...												385	
1908...						750*	1,430	2,300	2,960	1,110	518	410	
1910...	360	460	850	660	740	1,140	2,670	4,110	1,830	740	418	360	360
1911...	465	565	725	545	410	410	1,350	2,740	1,830	545	495	410	410
1912...	320	450	450	350*	730	555	1,690	2,580	1,760	505	402	515	320
1913...	344												
1914...								980	420	400	298	188	
1915...							2,750	3,250	4,590	2,390	927	471	
1916...	409	307				845	360	1,460	3,700	1,200	503	327	
1918...	284	205	271	1,460	1,200	1,010	1,650	1,550	1,350	432	386	202	202
1919...	411	365	502	661	940	873	1,750	2,260	2,140	570	449	322	322
1920...	225	322	350*	640	743	595	601	1,060	1,140	375	326	331	225
1921...	858	576	771	1,020	829	1,680	2,140	2,260	3,700	1,140	647	467	467
1922...	450	380	1,220	778	433	433	681	2,020	1,970	514	444	225	225
1923...	194	273	229	814	750	715	2,320	2,020	2,260	660	508	273	194
1924...	355	331	621	532	1,650	1,020	822	1,650	934	417	269	57	57
1925...	259	334	531	618	823	673	1,020	2,280	1,700	1,340	416	354	259
1926...	204	230	323	411	406	432	867	1,130	519	458	363	121	121
1927...	136	368	543	502	463	637	791	1,960	2,700	1,200	1,090	608	136
1928...	579	598	859	837	627	596	1,170	2,400	1,590	784	522	751	522
1929...	300	358	285	135	169	296	281	1,050	1,260	435	464	304	135
1930...	153	172	216	185*	250*	285	1,040	982	473	512	774	292	153
1931...	184	209	163	124	296	281	569	1,420	575	838	917	146	124
1932...	149	258	151	226	273	569	1,160	1,820	2,040	960	575	485	149
1933...	321	357	880	842	635	635	721	1,420	4,570	1,520	1,230	1,230	321
1934...	505	632	1,060	2,890	1,320	1,270	2,300	1,820	1,180	1,120	864	417	417
1935...	410*	533*	932	950	1,140	880	948	2,350	2,220	1,460	712	615	410*
1936...	359	311	266	274	357*	346	335	3,100	2,220	1,200	952	420	266
1937...	5	5	5	5	5	10	19	1,440	2,360	737	148	74	5
1938...	12	19	228	656	157	330	304	2,150	1,900	704	215	76	12
1939...	12	5	6	10	9	9	64	1,000	1,020	227	96	50	5
1940...	25	18	8	7	9	23	905	1,580	743	96	86	41	7
1941...	30	8	3	3	7	38	532	370	570	296	53	36	3
1942...	7	7	46	18	6	6	350	576	625	101	213	47	6
1943...	5	3	63	110	119	45	1,400	1,520	2,570	918	194	89	3
1944...	5	4	1	1	1	1	28	613	734	487	188	15	1
1945...	7	8	3	3	13	7	68	1,650	810	100	114	50	3
1946...	19	12	19*	141	58	226	337*	1,960	1,790	920	282	242	12
1947...	14	23	542	143	162	165	725	2,580	950	665	168	60	14
1948...	27	287	323	180*	100*	302	302	1,190	2,720	570	272	357	27
1949...	28	43	149	55*	50*	625	794	1,780	1,780	1,310	229	134	28
1950...	90	44	330	430*	600*	1,070	1,000	1,760	3,820	1,840	624	113	44
1951...	105	522	2,050	1,190	768	1,040	1,020	1,660	2,050	1,000	358	112	105
1952...	60	56	140*	117	122	83	262	1,730	1,070	996	536	127	56
1953...	40	24	25	26	370	168	284	1,340	1,820	1,240	472	178	24

* Estimated.

YAKIMA RIVER BASIN

Naches River below Tieton River, near Naches, Wash.—Continued

Summary

Year	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Observed					Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
1905.												
1909.	9,180†	June 3, 1909		1,630	1,180,000	1,680	1.79	24.17	2,080	1,500,000	2,120	30.65
1910.	19,400	Nov. 24, 1909	360	2,550	1,850,000	2,620	2.78	37.84	2,800	1,660,000	2,860	34.10
1911.	7,500	June 13, 1911	410	1,570	1,130,000	1,670	1.77	23.97	1,360	982,000	1,460	20.96
1912.	7,960†	May 15, 1912	320	1,530	1,110,000	1,660	1.75	23.91	1,540	1,120,000	1,630	23.60
1913.				1,770	1,280,000	1,910	2.03	27.52	1,780	1,290,000	1,930	27.83
1914.				1,530	1,110,000	1,680	1.79	24.18	1,490	1,150,000	1,740	25.18
1915.				907	656,000	1,060	1.13	15.23	844	611,000	998	14.30
1916.	11,700†	June 18, 1916		2,630	1,910,000	2,810	2.99	40.50	2,580	1,870,000	2,740	39.61
1917.	8,440	June 17, 1917		1,560	1,130,000	1,720	1.83	24.78	1,840	1,340,000	2,060	29.67
1918.	10,800	Dec. 30, 1917	202	1,780	1,200,000	1,960	2.08	28.23	1,550	1,120,000	1,700	24.57
1919.	11,100	Jan. 23, 1919	322	1,500	1,080,000	1,690	1.80	24.43	1,470	1,060,000	1,660	23.03
1920.	2,860	May 9, 1920	225	877	637,000	1,070	1.14	15.52	1,030	747,000	1,210	17.50
1921.	9,800	June 8, 1921	467	2,220	1,610,000	2,410	2.56	34.66	2,260	1,640,000	2,470	35.60
1922.	14,500	Dec. 13, 1921	225	1,460	1,060,000	1,630	1.73	23.52	1,240	897,000	1,410	20.26
1923.	7,380	May 10, 1923	194	1,560	1,130,000	1,760	1.87	25.32	1,600	1,160,000	1,790	25.86
1924.	7,840	Feb. 12, 1924	57	1,210	875,000	1,390	1.48	20.14	1,250	906,000	1,500	21.64
1925.	8,000	May 21, 1925	259	1,530	1,110,000	1,760	1.87	25.40	1,420	1,030,000	1,620	23.37
1926.	3,190	April 18, 1926	121	780	584,000	945	1.00	13.61	838	606,500	1,060	15.32
1927.	9,560	June 9, 1927	136	1,470	1,060,000	1,840	1.96	26.61	1,470	1,230,000	2,000	28.61
1928.	8,470	May 25, 1928	522	1,690	1,280,000	1,830	1.94	26.50	1,480	1,040,000	1,550	22.32
1929.	3,820	May 24, 1929	135	900	652,000	1,020	1.08	14.73	845	612,000	970	13.96
1930.	3,800	April 23, 1930	153	825	597,000	1,040	1.11	15.07	880	601,000	1,040	15.07
1931.	4,680	May 3, 1931	124	803	581,000	981	1.04	14.13	801	580,000	1,020	14.65
1932.	4,500	⊙	149	1,210	876,000	1,600	1.70	23.09	1,410	1,030,000	1,820	26.26
1933.	10,600	June 15, 1933	321	1,860	1,350,000	2,050	2.18	29.59	2,340	1,690,000	2,590	37.31
1934.	32,200	Dec. 22, 23, 1933	417	2,830	1,831,000	2,615	2.84	38.57	2,076	1,503,000	2,225	32.07
1935.	0,350	May 30, 1935	410	1,730	1,251,000	2,004	2.13	28.38	1,544	1,118,000	1,681	24.30
1936.	6,880	May 14, 1936	266	1,370	1,001,000	1,557	1.65	22.45	1,274	924,700	1,646	22.33
1937.	6,650	June 22, 1937	5	754	546,100	1,400	1.49	20.23	890	601,100	1,597	23.08
1938.	8,400	May 28, 1938	12	1,236	894,600	1,934	2.06	27.90	1,171	847,700	1,801	25.93
1939.	3,900	May 29, 1939	5	493	359,100	1,184	1.26	17.04	495	353,600	1,186	17.07
1940.	4,820	May 11, 1940	7	580	421,100	1,224	1.30	17.67	582	422,000	1,221	17.70
1941.	1,740	May 17, 1941	3	392	288,800	907	.964	13.09	414	299,800	1,021	14.80
1942.	2,880	May 25, 1942	6	448	324,000	1,196	1.27	17.22	444	321,700	1,154	16.70
1943.	6,650	April 20, 1943	3	1,184	857,400	1,993	2.12	28.78	1,166	844,500	1,933	27.81
1944.	1,800	May 31, 1944	1	341	247,800	889	.945	12.66	382	240,000	838	12.13
1945.	4,720	May 5, 1945	3	510	369,200	1,212	1.29	17.45	542	392,400	1,258	18.19
1946.	7,200	May 27, 1946	12	1,080	789,000	1,785	1.90	25.79	1,254	907,600	1,975	28.51
1947.	5,630	May 8, 1947	14	1,138	823,900	1,810	1.92	26.06	1,131	818,700	1,849	26.62
1948.	12,600	May 28, 1948	27	1,444	1,048,000	2,139	2.27	30.89	1,330	965,400	1,939	28.00
1949.	9,090	May 16, 1949	28	1,372	993,600	2,026	2.15	29.17	1,415	1,024,000	2,167	31.21
1950.	7,530	June 21, 1950	44	1,712	1,239,000	2,390	2.54	34.43	1,962	1,420,000	2,011	37.65
1951.	9,370	May 11, 1951	105	1,807	1,308,000	2,473	2.63	35.75	1,483	1,074,000	2,164	31.22
1952.	4,180	May 20, 1952	56	898	608,400	1,486	1.58	21.50	790	570,800	1,344	19.44
1953.	5,740	June 13, 1953	24	965	699,000	1,648	1.75	23.78				

† Maximum observed. ⊙ May 10, 11, June 16, 1932.

YAKIMA RIVER BASIN

Naches River near Yakima, Wash.

Location.—Lat. 46°37'30", long. 120°31'10", in sec. 12, T. 13 N., R. 18 E., on right bank, half a mile upstream from mouth, and 2 miles north of Yakima.

Drainage area.—1,100 sq. mi., approximately.

Supplemental records available.—August 1893 to July 1896, gage heights and discharge measurements only.

Gage.—Chain gage. Altitude of gage is 1,070 ft. (from river-profile map). Prior to June 19, 1908, staff gages about 800 ft. downstream at different datums.

Extremes.—1896, 1898-1915: Maximum discharge, 28,000 cfs Nov. 24, 1909 (gage height, 9.95 ft., from graph based on gage readings); minimum observed, 30 cfs Aug. 24, Sept. 5, 1906 (gage height, 1.90 ft.).

Remarks.—Natural flow of stream affected by interbasin diversions, storage reservoirs, power development and diversions for irrigation, and return flow from irrigated areas, for most of the period of record.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1896											849	417	
1897	347	1,710	1,940										
1898				500*	3,000*	1,610	3,160	5,190	4,500	1,800	694	362	
1899	445	510	580	1,420	1,400	841	1,760	3,660	6,070	4,570	1,440	703	1,970
1900	748	2,490	2,760	2,900	1,240	2,650	2,890	3,080	1,840	616	346	386	1,830
1901	684	1,240	2,670	1,590	1,610	3,380	2,220	5,440	3,940	1,960	662	322	2,150
1902	271	1,090	1,600	1,040	1,210	1,210	2,640	5,280	3,780	1,840	589	263	1,810
1903	390	820	975	2,350	1,050	1,360	2,620	5,700	5,460	2,490	585	296	2,260
1904	1,670	1,970	2,240	1,100	719	977	6,360	5,480	4,160	2,060	436	189	2,280
1905	284	532	816	577	637	1,960	1,370	1,520	2,280	832	268	184	961
1906	730	432	350	305	1,030	982	3,120	3,040	1,550	646	87.6	74.8	1,030
1907	388	4,290*	2,440*	950*	2,520*	1,630	3,490	6,100	3,600	830	224	184	2,210*
1908	105	231	840	620	527	2,100	4,090	4,570	4,970	3,230	492	218	1,830
1909	268	762	366	880	547	799	1,640	3,160	4,940	1,540	249	146	1,270
1910	270	4,700	2,300	1,000	783	4,750	4,570	5,110	2,550	961	234	102	2,800
1911	693	1,810	927	652	458	1,020	1,710	2,690	3,580	952	370	533	1,280
1912	223	826	556	965	1,010	724	2,150	4,470	3,470	834	171	342	1,310
1913	322	660	453	643	809	725	2,156	4,540	5,810	2,030	584	418	1,500
1914	502	609	471	1,430	668	1,790	3,300	3,820	2,400	686	176	240	1,320
1915	421	1,340	857	509	394	999							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1896											490	350	
1897	310	305	1,450										
1898						913	1,020	4,120	2,480	1,020	355	325	
1899	325	385	225	445	1,020	709	913	1,970	4,750	2,580	920	570	225
1900	498	735	1,120	1,470	1,020	1,120	1,736	1,600	1,120	425	250	300	250
1901	300	920	1,350	920	828	1,730	1,600	3,160	2,670	1,120	362	300	300
1902	250	362	735	735	650	1,020	1,120	2,310	2,760	1,120	300	200	200
1903	300	495	650	1,240	920	920	1,860	3,150	5,330	1,120	300	200	200
1904	250	1,350	1,020	874	652	570	1,020	2,950	2,150	780	210	160	160
1905	200	230	670	478	360	1,170	698	1,170	1,640	478	100	100	100
1906	237	334	254	285	525	720	1,900	1,470	910	185	30	30	30
1907	45	625	1,800*			1,180	1,280	3,660	1,820	375	90	105	45
1908	90	120	425	475	450	565	1,520	3,460	2,900	860	248	178	90
1909	148	343	120	348	890	455	1,160	1,910	2,630	645	118	93	93
1910	142	235	1,020	492	526	2,670	2,500	3,740	1,480	268	91	72	72
1911	145	430	560	560	430	373	995	2,040	1,760	263	145	373	145
1912	115	319	430	342*	840	545	1,610	2,210	2,210	228	87	61	61
1913	204	228	327	430	492	560	697	1,890	3,560	820	358	262	204
1914	212	537	349	379	569	892	1,420	2,390	1,310	219	38	26	26
1915	210	569	600	383	300	358							

* Estimated.

YAKIMA RIVER BASIN

Naches River near Yakima, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1896							
1897							
1898						1,830	1,330,000
1899			225	1,970	1,420,000	2,340	1,700,000
1900	10,700	Jan. 13, 1900	250	1,830	1,330,000	1,770	1,240,000
1901	9,550	Mar. 1, 1901	300	2,150	1,560,000	2,010	1,460,000
1902	8,010	May 28, 1902	200	1,810	1,310,000	1,750	1,270,000
1903	11,300	June 10, 1903	200	2,260	1,640,000	2,570	1,860,000
1904	12,000	April 14, 1904	160	2,280	1,660,000	1,950	1,420,000
1905	3,690	June 4, 1905	100	961	696,000	925	671,000
1906	5,000	May 4, 1906	30	1,030	748,000	1,500	1,080,000
1907	26,000	Nov. 14, 1906	45	2,210	1,600,000	1,730	1,250,000
1908	10,100	April 20, 1908	90	1,830	1,330,000	1,850	1,340,000
1909	10,000	June 2, 1909	93	1,270	922,000	1,780	1,200,000
1910	28,000	Nov. 24, 1909	72	2,300	1,660,000	1,960	1,420,000
1911			145	1,250	929,000	1,130	818,000
1912	7,800	May 15, 1912	81	1,310	950,000	1,300	940,000
1913	9,920†	June 24, 1913	204	1,590	1,160,000	1,610	1,160,000
1914	5,390†	June 3, 1914	26	1,320	956,000		

† Maximum daily.

North Fork Ahtanum Creek near Tampico, Wash.

Location.—Lat. 46°33'40", long. 120°55'10", in NW¼ sec. 2, T. 12 N., R. 15 E., on left bank, 150 ft. downstream from Nasty Creek, 3½ miles northwest of Tampico and confluence with South Fork, and 20 miles west of Yakima.

Drainage area.—68.9 sq. mi.

Gage.—Water-stage recorder and sharp-crested weir. Altitude of gage is 2,450 ft. (from topographic map). Prior to Apr. 2, 1913, and Aug. 20, 1915, to Sept. 5, 1916, staff gage, Apr. 2, 1913, to Aug. 19, 1915, and Sept. 6, 1916, to Sept. 20, 1934, water-stage recorder 50 ft. upstream at different datum. Concrete control since Nov. 11, 1915.

Average discharge.—29 years (1909-15, 1930-53), 66.8 cfs.

Extremes.—1907-53: Maximum discharge, 770 cfs May 27, 1948 (gage height, 2.97 ft.); maximum gage height, 4.6 ft., June 18, 1916 (site and datum then in use); minimum discharge, 5.0 cfs Nov. 14, 15, 1944, Jan. 20, 1945 (gage height, 0.18 ft.), but may have been less during periods of ice effect.

Remarks.—No diversions of importance. No regulation.

YAKIMA RIVER BASIN

North Fork Ahtanum Creek near Tampico, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													27.0*
1908	25.5							200	201	110	33.5		22.0
1909	24.7*							188	188	60.2	28.7		21.4*
1910	17.0*	82.4*	99.1	113	64	303*	222*	246*	126	44.1	21.7		28.2
1911	28.5	33.5	31.7	31.6	28.9	50.1	127	156	217	56.8	20.0	22.0*	66.8*
1912	20.0*	24.0	29.0*	32.8	43.7	65.6	176	335	204	49.7	28.2	24.9	90.3*
1913	21.8	26.5	23.5	31.3	34.1	36.5	110	216	240	58.7	31.5	20.3	73.8
1914	26.2	22.8	19.1	42.0*	34.0*	120*	224	249	157	54.5	25.0	23.2	83.7*
1915	23.6	42.3	27.5*	37.6	21.8	67.6	167	132	30.9	30.0	18.8	15.9*	55.5*
1916	16.5*							337*	418*	226*	60.7*	34.5	
1917	29.8	26.0	23.6				43.7	198	279	113	32.5	23.2	
1918								160	152	37.8	24.1	18.9	
1919								139	144	55.9	25.7	23.3	
1920	22.0	25.1					45.4	111	85.3	31.1	17.3	17.4	
1921	17.9							305	310	69.2	30.3	22.2	
1922	20.5							198	202	44.9	23.3*	17.2	
1923										83.4	31.7	19.1	
1924								169	56.5	23.4	16.1	13.6	
1925										41.2	26.0*		
1926							113	82.6	34.8	14.3	10.0	9.1*	
1927										63.3	31.3	25.5	
1928									103	37.2	19.4	15.0	
1929								134	109	37.1	17.6	12.9	
1930	14.0*						121*	114	70	26	15.4*	12.8	
1931	11.9*	11.3*	11.1*	13.6*	14.9*	11.6	60.8	118	38.0	17.3	10.4	9.56	27.4*
1932	11.8	12.7	18.3	15.0	27.1	62.5	94.3	188	153	45.3	21.3	15.1	55.0
1933	15.4	31.3	26.4	16.5	15.0*	25.2	103	169	280	112	34.1	23.0	70.1*
1934	23.8	26.6	175	163	103	117	184	142	71.6	30.0	18.1	16.3	89.2
1935	27.3	72.2	51.3	81.1	60.6	62.2	99.1	210	169	52.1	24.4*	16.7	77.9*
1936	15.5	15.7	14.1	13.7	7.80*	24.2	113	200	112	33.5	17.3	15.0	43.5*
1937	13.6	14.5	15.7	10.5*	12.1*	25.4	88.3	182	160	51.3	22.9	19.3	51.9*
1938	16.7	25.1	31.1*	48.8*	23.9	73.1	196	283	209	63.3	23.6	19.3	85.6*
1939	20.1*	18.7	16.8*	16.5	16.0	39.6	82.4	110	60.4	22.2	13.5	12.2*	36.0*
1940	11.8	12.1	18.2	12.8	29.6	70.9	114	168	81.5	25.7	15.8	13.8	47.8
1941	15.0	17.2	16.1	15.5	19.2	73.2	112	106	59.5	20.5	15.0	13.5	40.3
1942	13.6*	17.0	47.3	20.6	19.2	47.8	134	143	105	37.6	17.6	13.5	51.5*
1943	13.5	25.9	35.1	31.9*	36.3	64.1	178	169	200	62.0	33.6	21.3	75.0*
1944	20.6	21.2	16.4*	14.4*	14.8*	27.9	45.6	83.9	51.4	17.5	11.9	9.67	28.1*
1945	10.7	10.7	8.51*	12.4	26.0	22.1	64.6	145	93.5	24.0	14.5	13.4	37.1*
1946	11.5	12.8	15.8	15.5	15.9	43.3	60.6	220	152	58.1	23.5	16.7	56.5
1947	16.5	26.4	95.4	21.3*	55.7	68.0	112	216	114	37.1	20.1	13.5	66.0*
1948	30.3	42.2	31.6	25.3*	32.8*	44.5	107	237	363	31.6	42.1	25.0	93.6*
1949	24.2	23.7*	21.7*	19.1*	31.0*	65.5	165	308	205	66.0	30.3	23.5	82.4*
1950	21.9	23.7	25.9	13.7*	21.6*	53.8	123	228	300	131	38.2	26.1	84.9*
1951	52.2	56.1	104	65.9	136	71.4	216	308	232	72.4	35.0	24.9	112
1952	27.8	25.3	31.0*	22.0*	33.2	49.0	158	204	138	49.6	24.4	19.8	65.1*
1953	16.2	13.7	16.4	71.2*	61.1	40.9	98.8	209	182	92.1	32.5	21.7	71.3*

* Estimated.

YAKIMA RIVER BASIN

North Fork Ahtanum Creek near Tampico, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907												27*	
1908	20								166	40	27	20	
1909	20								116	35	24	14	
1910	17*	20*	68	68	51				68	28	17	23	17*
1911	23	23	23	23	23	23	87	100	103	31			
1912				15	22	31	145	197	92	33	21	21	15
1913	21	16	17	23	20	24	40	122	143	44	25	23	16
1914	22	20	16*			40*	82	212	92	33	21	20	16*
1915	18	29	22	22	20	22	134	111	40	22	16	14	14
1916													30
1917	28	10.6					20	63	215	47	25	19.5	
1918								108	62	27	19	18	
1919								124	96	32	22	20	
1920	18.5	14.5					27	68	54	19.5	14.7	14.1	
1921	14.1						117	115	186	42	23	20	
1922	19							106	91	31*	17		
1923										42	23	16	
1924								92	32	18	13	12	
1925										29	25		
1926							72*	51	18	11	8	7	
1927										44	25	20	
1928									61	25	15.6	13.8	
1929								64	63	22	13	12	
1930	13						86*	86	41	17	13	11	
1931						8.6	36	51	29	12	9.0	7.4	
1932	9.4	6.0	11	9.8	9.4	34	61	131	81	29	17	13	6.0
1933	13	16	17	9.4		13	44	86	200	49	25	20	9.4
1934	17	17	17	50	07	70	125	116	41	22	11	12	11
1935	14	41	29	22	50	42	52	165	90	33	19*	15	14
1936	13	11	7.3	7*	6*	13	76	145	52	22	14	14	6*
1937	13	9.7	9.1	10*	10*	14	41	118	110	29	18	16	9.1
1938	16	18	19*	30*	26	35	67	193	124	37	21	16	16
1939	17	9.5	9*	11	8*	14	63	87	38	14	12	9.5	8*
1940	11	12	7.0	7.0*	14	38	76	131	33	20	14	12	7.0
1941	13	11	7.9	11	14	58	84	83	35	15	13	12	7.9
1942	13	12	23	18	17	19	90	88	67	24	14	12	12
1943	12	14	19	15*	30*	34	125	100	152	41	26	19	12
1944	16	19	11*	11*	12*	13	26	61	23	13	9.0	8.4	8.4
1945	9.6	7.0*	6.0*	7.0*	11.0	9.0	29	88	42	17.0	12.5	11.5	6.0*
1946	9.6	7.8	6.5*	7.8	11.0	32	37	119	95	33	18.0	14.5	6.5*
1947	13	14	24	12*	25*	33	61	165	57	26	18	13.5	12*
1948	17.5	33	22	22*	20*	31	50	102	153	48	34	22	17.5
1949	20*	22	17*	15*	13	41	69	144	107	37	23	21	13
1950	20	19	13.5	10*	9*	40	90	96	221*	57	27	23	9*
1951	25	23	65*	35*	35*	35	103	166	142	40	23	22	22
1952	23	18	25*	20	26	22	74	121	90	31	21	18	16
1953	16	8.6	9.0*	14.5	33	32	41	144	131	42	25	19	8.6

* Estimated.

YAKIMA RIVER BASIN

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North Fork Ahtanum Creek near Tampico, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mlie	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1908	407	June 11, 1908								
1909										
1910	766	Mar. 1, 1910	17	114	1.65	22.48	52,800	106	20.76	76,200
1911	411	June 1, 2, 1911		66.8	.970	13.17	48,400	65.1	12.83	47,100
1912	629	May 20, 1912	15	90.3	1.31	17.50	65,600	90.2	17.78	65,600
1913	427	June 3, 1913	16	73.8	1.07	14.52	53,500	73.6	14.50	53,300
1914	340	April 14, 1914	16	83.7	1.21	16.49	60,600	85.8	16.90	62,100
1915	272	April 2, 1915	14	55.5	.806	10.91	40,100			
1916	728	June 15, 1916								
1917	412	June 8, 1917								
1918	275	June 10, 1918								
1919	354	May 27, 1919								
1920	208	May 8, 1920								
1921	512	June 5, 1921								
1922										
1923										
1924										
1931				27.4	0.388	5.40	19,900	27.7	5.46	20,100
1932	255	May 9, 12, 1932	6.0	55.0	.793	10.85	39,900	57.9	11.43	42,100
1933	433	June 14, 1933	9.4	70.1	1.02	13.79	50,800	83.0	16.34	60,100
1934	755	Dec. 22, 1933	11	89.2	1.29	17.57	64,540	82.7	16.30	59,900
1935	292	Jan. 24, 1935	14	77.9	1.13	15.33	56,390	69.1	13.59	50,000
1936	289	May 13, 14, 1936	6	48.5	.704	9.58	35,240	45.4	9.56	35,150
1937	273	June 3, 1937	9.1	51.9	.753	10.22	37,580	54.6	10.75	39,520
1938	446	May 24, 1938	16	85.6	1.24	16.86	61,950	84.1	16.56	60,840
1939	158	May 16, 1939	8	36.0	.522	7.07	26,040	34.7	6.34	25,110
1940	233	May 10, 11, 1940	7.0	47.8	.694	9.45	34,720	48.3	9.54	35,080
1941	173	April 1, 1941	7.9	40.3	.585	7.94	29,180	42.9	8.40	31,030
1942	258	May 22, 1942	12	51.5	.747	10.14	37,260	51.1	10.07	37,000
1943	336	May 25, 1943	12	75.0	1.09	14.75	54,320	73.6	14.47	53,330
1944	127	May 15, 1944	8.4	28.1	.408	5.55	20,440	25.8	5.09	18,720
1945	232	May 31, 1945	6.0	37.1	.538	7.30	26,890	38.0	7.49	27,450
1946	320	May 26, 1946	6.5	56.5	.820	11.13	40,890	64.8	12.76	46,920
1947	439	Dec. 11, 1946	12	66.9	.971	13.18	48,360	64.4	12.69	46,610
1948	770	May 27, 1948	17.5	93.6	1.38	18.44	67,940	90.2	17.76	65,600
1949	547	May 16, 1949	13	82.4	1.20	16.29	59,640	82.9	16.35	60,040
1950	392	June 16, 1950	9	84.9	1.23	16.71	61,430	64.6	18.65	63,520
1951	655	May 11, 1951	22	112	1.63	22.16	81,390	103	20.25	74,790
1952	293	May 13, 1952	18	65.1	.945	12.87	47,270	61.9	12.24	44,960
1953	323	April 27, 1953	8.6	71.3	1.03	14.02	51,600			

YAKIMA RIVER BASIN

South Fork Ahtanum Creek at Conrad Ranch, near Tampico, Wash.

Location.—Lat. 46°30'30", long. 120°54'50", in SW¼ sec. 23, T. 12 N., R. 15 E., on left bank at Conrad Ranch, 2½ miles upstream from confluence with North Fork, 2¾ miles southwest of Tampico, and 20 miles southwest of Yakima.

Drainage area.—24.8 sq. mi.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 2,400 ft. (from topographic map). Prior to Aug. 9, 1918, staff gage at datum 1.00 ft. lower. Aug. 9, 1918, to Mar. 22, 1951, staff gage at present site and datum.

Average discharge.—23 years (1930-53), 18.3 cfs.

Extremes.—1915-53: Maximum discharge observed, 424 cfs Dec. 23, 1933 (gage height, 3.10 ft.), from rating curve extended above 80 cfs; minimum observed, 2.6 cfs Aug. 23, 25, 1931 (gage height, 0.35 ft.).

Remarks.—Small diversion for irrigation of about 55 acres above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915							42.7	30.9	17.5	9.13	6.03	5.16	
1916	5.90								112	55.1	18.5	12.8	
1917	10.4	9.60					15.9	43.5	84.3	20.8	9.67	8.50	
1918	7.23							41.2	32.0	11.0	8.58	6.54	
1919	6.45						37.5	48.4	30.3	12.1	7.54	6.64	
1920	6.20						13.0	25.5	16.7	7.74	5.14	5.19	
1921	5.42						42.6	87.2	83.7	19.5	10.1	8.25	
1922	7.89						29.3	55.2	65.0	12.0	8.06	6.01	
1923							49.6	61.0	45.2	23.4	11.5	7.79	
1924								40.2	14.1	7.03	5.05	4.40	
1925							31.5	52.6	25.4	12.4	6.92		
1926							23.6	18.0	8.40	4.92	3.35	3.35	
1927										16.4	11.1	9.58	
1928	9.30								25.4	10.4	7.69	6.34	
1929							11.9	29.0	22.4	8.72	5.23	4.55	
1930							23.5	24.7	13.1	7.29	4.50	3.76	
1931	4.53*	4.15*	4.46*	4.96*	5.52*	6.10	12.8	21.8	9.21	5.07	3.56	3.70	7.17*
1932	4.44	4.37	4.13	5.25	13.6	23.7	23.6	46.0	31.8	12.5	7.97	6.23	15.3
1933	5.89	5.19	6.80*	6.90	4.89	10.6	29.6	37.1	72.1	22.7	10.8	7.97	18.6*
1934	7.55	7.94	72.3	72.1	31.9	30.2	54.3	36.3	16.1	8.52	5.72	5.27	29.1
1935	8.60	19.8	18.9	36.9	26.8	19.7	30.4	56.6	44.0	14.4	8.87	6.80	24.3
1936	6.34	6.55	5.72	6.03	4.66*	11.3	27.9	48.0	23.8	9.97	5.74	5.77	13.9*
1937	4.80	4.01	5.57	4.10*	4.23	14.1	40.0	45.6	37.1	12.9	6.80	6.05	15.6*
1938	5.30	6.67	11.1	16.5	8.89	33.5	62.0	68.3	49.6	15.4	8.76	6.69	24.4
1939	7.07	7.33	6.15	5.82	5.58	11.7	18.0	29.4	14.6	6.69	4.40	3.80	10.1
1940	4.34	5.27	5.71	4.69*	11.2	25.6	25.8	37.1	15.8	7.25	4.72	4.30	12.7*
1941	4.49	4.97	5.23*	5.15	7.54	20.7	23.1	22.3	11.0	5.96	5.05	4.67	10.0*
1942	4.57	5.89	14.3	7.12	8.03	21.0	35.9	35.7	25.4	10.5	6.78	5.56	15.1
1943	5.10	9.50	11.8	10.5*	13.2	25.7	59.6	47.1	63.4	24.6	11.9	8.41	24.2*
1944	8.33	7.85	5.96*	4.42*	4.74*	7.80	12.5	20.4	12.6	6.25	4.33	3.60	8.25*
1945	3.90	4.47	3.50*	4.43	8.10	7.76	16.7	32.2	21.3	8.18	5.73	4.93	10.1*
1946	5.11	5.15	5.83	6.00	7.17	16.8	25.1	60.7	38.0	15.0	8.07	6.50	15.8
1947	6.39	8.53	37.3	3.94*	22.9	21.1	28.1	52.9	28.7	11.2	7.42	6.33	20.0*
1948	5.52	8.87	7.73	6.40*	12.0*	10.8	47.2	9.01	1.71	9.52	7.11	3.11	8.06
1949	9.49	8.68	7.76*	7.77*	12.7	28.6	47.2	30.9	60.0	16.8	10.5	8.49	24.9*
1950	7.33	7.40	7.39	4.71*	7.85	26.7	35.1	52.1	31.3	33.4	12.4	8.28	23.7*
1951	10.1	17.1	33.5	19.6	56.4	23.0	53.8	79.1	57.8	19.5	11.6	9.23	32.3
1952	9.10	8.52	9.42*	6.40	14.3	17.2	40.5	47.0	32.0	13.4	8.68	6.92	17.8*
1953	5.85	5.88	6.09	26.7	19.9	12.5	23.4	48.1	49.4	21.5	11.3	8.07	19.9

* Estimated.

South Fork Ahtanum Creek at Conrad Ranch, near Tampico, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915							33	26	11	6.8	5.1	4.3	
1916	5.1								76	26	14	11	
1917	9.5						8.7	21	42	12.2	6.3	8.0	
1918	6.8							35	16.1	9.0	6.8	5.6	
1919	5.6						23.4	33	18.3	8.8	6.5	5.0	
1920	5.9						7.8	16.7	11.2	5.4	4.5	4.8	
1921	4.8						35	31	35	13	8.2	7.7	
1922	7.3						17	28	21	9.7	6.2	5.4	
1923							33	35	27	15	8.9	7.3	
1924								24	10	5.1	4.2	3.9	
1925							15.9	29.0	18.0	8.6	6.0		
1926								11.2	6.0	3.0	2.9	2.9	
1927										12.7	9.9	8.3	
1928									14.9	7.7	6.4	5.3	
1929							8.9	14.9	12.0	6.4	4.4	3.8	
1930							17.2	20.1	9.2	5.6	3.5	3.7	
1931						4.4	8.4	10	7.2	4.1	3.2	3.2	
1932	3.9					12	17	34	17	9.3	6.6	6.0	
1933	5.3	5.9	5.3	5.3		5.6	15	24	44	13	8.9	7.3	
1934	6.2	6.5	6.2	32	21	20	35	24	12	6.8	4.8	4.2	4.2
1935	4.8	11	11	12	16	15	20	42	22	11	7.4	6.2	4.8
1936	5.9	5.9*	4.5	5.3*	4.1*	5.3	6.2*	30	14	5.8	5.1	5.1	4.1*
1937	4.7	4*	4*	4*	4*	4.7	19	31	24	8.5	5.3	5.3	4*
1938	5.3	5.3	6.9	11	7.3	11	26	44	23	11	6.9	6.1	5.3
1939	6.6	5*	3*	4*	4*	5.2	14	24	9.0	4.9	4.1	3.5	3*
1940	3.8	4.9	3*	3*	4*	14	20	29	8.8	5.8	4.2	3.9	3*
1941	4.2	4.2	4.0*	4.4*	5.5	16	18	17	8.1	5.2	4.2	4.2	4.0*
1942	4.4	5.2	6.4	6.0*	7.0	8.4	25	22	15	7.7	6.0	5.2	4.4
1943	4.9	5.8	7.7	5.0*	7.5*	10	37	26	43	14	9.8	7.6	4.9
1944	7.6	6.9	5*	3*	3.5*	5.6	10	15	8.7	4.6	3.7	3.0	3.0
1945	3.4	3.4	3.0*	3.0*	4.9	4.7	9.6	23	11	6.5	4.9	4.9	3.0*
1946	4.7	4.0	4.0*	4.0*	5.0*	12	14	26	25	9.8	6.7	6.0	4.0
1947	5.6	6.0	8.4	7.0*	10*	12	16.5	44	15	9.0	6.0	5.7	5.6
1948	6.0	7.8	6.4*	6.3*	6.3*	13.6	16.5	31	45	17	12	10	6.0
1949	8.4	8.4	7.0*	7.0*	6.5	18	26	35	25	12.5	8.4	7.0	5.5
1950	6.4	5.8	4.5*	4.0*	4.0*	17.5	26	22	62	15.5	9.6	7.6	4.0*
1951	7.8	9.0	18	11*	11*	12*	35	35	34	14	10.5	8.4	7.8
1952	8.0	7.3	8.1*	8.0*	8.4	9.1	23	28	19	10.5	7.3	6.0	6.0
1953	5.7	5.0*	5.0*	6.0	12	11	11.5	39	34	18	10.5	6.7	5.0*

* Estimated.

YAKIMA RIVER BASIN

South Fork Ahtanum Creek at Conrad Ranch, near Tappico, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Dis-charge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1915.....	62	April 3, 1915					
1916.....	216	June 19, 1916					
1917.....	100	May 29, 1917					
1918.....	50	May 15, 1918					
1919.....	85	May 27, 1919					
1920.....	34	May 9, 1920					
1921.....	151	June 7, 1921					
1922.....	144	June 4, 1922					
1923.....	90	May 10, 1923					
1924.....	61	May 33, 1924					
1925.....							
1926.....							
1927.....							
1928.....							
1929.....							
1930.....							
1931.....	40†	May 3, 1931		7.17	5,190	7.15	5,150
1932.....	125†	Feb. 26, 1932		15.3	11,100	16.0	11,600
1933.....	110†	June 16, 1933		18.6	13,400	24.2	17,600
1934.....	424†	Dec. 23, 1933	4.2	29.1	21,060	25.6	18,550
1935.....	121†	Jan. 25, 1935	4.8	24.3	17,590	21.9	15,850
1936.....	76†	May 14, 1936	4.1	13.9	10,100	13.6	9,900
1937.....	108†	April 14, 1937	4	15.6	11,260	16.2	11,730
1938.....	127†	April 18, 1938	5.3	24.4	17,690	24.2	17,540
1939.....	24†	May 15-17, 1939	3	10.1	7,280	9.61	9,960
1940.....	45†	May 11, 1940	3	12.7	9,190	12.6	9,160
1941.....	34†	Mar. 1, 1941	4.0	10.0	7,260	10.9	7,850
1942.....	64†	May 25, 1942	4.4	15.1	10,930	15.2	11,020
1943.....	109	Mar. 29, 1943	4.9	24.2	17,530	23.9	17,270
1944.....	25†	May 8, 9, 1944	3.0	8.25	5,990	7.42	5,390
1945.....	40†	May 5-7, 1945	3.0	10.1	7,340	10.5	7,570
1946.....	79†	May 27, 1946	4.0	15.8	11,450	15.9	13,660
1947.....	249†	Dec. 11, 1946	5.6	20.0	14,490	17.7	12,830
1948.....	263†	June 16, 1948	6.0	28.4	20,660	28.5	20,710
1949.....	133†	May 14-16, 1949	5.5	24.9	18,050	24.6	17,820
1950.....	108†	June 18, 1950	4.0	23.7	17,140	26.0	19,500
1951.....	365†	Feb. 10, 1951	7.8	32.3	23,430	29.5	21,370
1952.....	70	May 19, 20, 1952	6.0	17.8	12,890	17.0	12,330
1953.....	70	June 6, 1953	5.0	19.9	14,380		

† Maximum observed.

South Fork Ahtanum Creek near Tampico, Wash.

Location.—Lat. 46°31'10", long. 120°53'20", in NE¼ sec. 24, T. 12 N., R. 15 E., on right bank at Shannafelt Ranch, 1½ miles upstream from confluence with North Fork, and 2 miles southwest of Tampico.

Drainage area.—29.1 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,200 ft. (from topographic map). Prior to Mar. 16, 1914, staff gage 100 ft. downstream at different datum.

Average discharge.—6 years (1908-14), 23.7 cfs.

Extremes.—1908-14: Maximum discharge, 362 cfs Mar. 2, 1910 (gage height, 5.50 ft., site and datum then in use, from graph based on gage readings); minimum, 0.3 cfs Sept. 3, 1911 (gage height, 2.52 ft., site and datum then in use).

Remarks.—Two or three small ditches divert and utilize water above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908				18.7*				57.3	75.1	25.6	11.3	9.07	
1909	7.55	8.13	9.74	8.26	10.4	28.4	30.2	40.7	52.5	8.48	4.94	4.32	17.8
1910	4.46	28.3	30.0	28.7	22.8	145	65.4	86.0	26.3	10.7	5.8	5.6	38.3
1911	4.06	7.16	8.46	8.25	8.66	25.4	22.5	27.6	46.2	10.6	3.58	4.97	14.8
1912	5.07	7.93	7.83	10.7*	15.6	14.3	36.1	51.4	29.2	10.7	7.48	6.23	16.9*
1913	7.42	9.87	9.52	13.5	11.9	13.5	36.4	67.4	78.5	16.1	7.30	7.00	23.2
1914	7.49	7.60	6.61	13.3	10.9	63.2	95.2	107	42.1	10.6	5.71	5.33	31.3
1915	5.89												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908				17				45	32	15	9	8	
1909	6.0	8.0	4.0	4.5	7.5	13	20	20	18	5.5	4.4	4.2	4.2
1910	4.3	5.0	12	8	15	56							
1911	1.6	5.1	6.9	6.9	7.8	6.9	38	44*	17	8	4	4	4
1912	4.2	7.1	7.8	8*	7	6	15	19	20	6.0	1.4	.3	.3
1913	5	6	8	8.0	5.5	9	27	27	18	7	6	5	4.2
1914	7.2	7.0	4.1	6.0	6.2	25	14.2	25	35	8.4	6.1	6.6	5
1915	3.1						52	67	21	5.8	4.5	4.5	4.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1908							
1909					17.8	20.9	15,100
1910	362	Mar. 2, 1910	4	38.3	27,800	34.8	25,200
1911	141	June 13, 1911	.3	14.8	10,700	14.9	10,600
1912	74	May 20, 1912	4.2	10.9	12,200	17.4	12,600
1913	153	May 28, 1913	5	23.2	16,500	22.8	16,500
1914	162	May 15, 1914	4.1	31.3	22,700		

* Estimated.

YAKIMA RIVER BASIN

Ahtanum Creek at The Narrows, near Tampico, Wash.

Location.—Lat. 46°31'40", long. 120°48'20", in NE¼ sec. 15, T. 12 N., R. 16 E., on right bank at The Narrows, 3 miles downstream from confluence of North and South Forks, 3½ miles east of Tampico, and 18 miles southwest of Yakima.

Drainage area.—121 sq mi.

Gage.—Staff gage. Altitude of gage is 1,830 ft. (from topographic map).

Average discharge.—5 years (1908-13), 95.7 cfs.

Extremes.—1908-13: Maximum discharge observed, 1,900 cfs Mar. 1, 1910 (gage height, 4.85 ft., from high-water mark), from rating curve extended above 600 cfs; minimum observed, 16 cfs Oct. 23 to Nov. 7, 1910; minimum gage height, 0.35 ft. Oct. 26 to Nov. 7, 1910.

Remarks.—Many small diversions above and below station. John Cox ditch diverts up to 8 cfs past gage during early irrigation seasons. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908...										105	26.6	24.4	.....
1909...	23.8	33.2	31.8	41.5	41.7	106	125	188	217	61.1	25.5	23.5	76.8
1910...	24.6	128	129	121	95.9	501	285	333	141	44.6	21.8	23.3	155
1911...	18.9	45.5	38.4	32.8	31.6	70.0	94.4	152	269	53.7	25.2	34.5	72.2
1912...	25.2	25.1	24.2	39.8	64.9	57.4	157	299	180	52.8	26.8	21.6	81.0
1913...	23.5	32.7	28.5	46.6	55.2	63.8	141	286	317	81.8	34.0	26.2	94.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908...										35	23	24	.....
1909...	19	27	17	19	33	49	91	130	106	30	24	22	17
1910...	24	25	39	66	71	242	183	228	73	24	19	18	18
1911...	16	16	28	24	26	30	56	126	98	28	20	17	16
1912...	24	20	20	17	44	33	126	169	94	27	21	19	17
1913...	19	25	19	32	36	47	59	121	161	42	27	21	19

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Discharge	Date						
1908...							
1909.....	419	June 3, 1909	17	75.8	54,900	81.8	66,600
1910.....	1,000	Mar. 1, 1910	18	155	112,000	140	101,000
1911.....	1,390	June 12, 1911	18	72.2	52,200	69.7	50,500
1912.....	430	May 15, 1912	17	81.0	58,500	81.8	59,400
1913.....	615	May 27, 1913	19	94.8	68,600		

Ahtanum Creek at Union Gap, Wash.

Location.—Lat. 46°32'10", long. 120°28'15", in SW¼ sec. 8, T. 12 N., R. 19 E., on left bank just upstream from Union Pacific Railway bridge, a quarter of a mile upstream from mouth, and 1 mile south of Union Gap.

Drainage area.—171 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map). May 11 to Nov. 30, 1904, Aug. 27, 1907, to July 31, 1908, and Mar. 2 to Oct. 31, 1910, Apr. 1, 1911, to Sept. 30, 1914, staff gages at approximately same site at various datums.

Extremes.—1904, 1907-8, 1910-14, 1951-53: Maximum discharge observed, 1,530 cfs Mar. 3, 1910 (gage height, 8.9 ft., site and datum then in use); no flow on many days during September and October 1904.

Remarks.—Natural flow of stream affected by small diversions and by return flow from land irrigated by diversion from this and adjacent basins. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904								368	346	87.8	19.4	2.7	
1905	3.6	14.9											
1907												12.9	
1908	13.0	16.7	30.8	38.8	37.3	189	136	146	261	26.5			
1910						590	246	371	102	10.5	8.1*	8.0*	
1911	8.9*						63.4	74.6	167	21.3	7.0	8.0	
1912	7.3	10.1	18.7	33.9	59.0	56.3	100	163	104	15.5	9.88	9.79	48.8
1913	9.61	17.4	26.6	43.3	58.3	72.6	111	160	250	34.9	10.4	9.5	66.8
1914	14.9	16.1	27.5	53.4	96.9	156	206	232	130	10.4	8.2	9.6	85.8
1951									272	31.6	19.1	27.6	
1952	26.6	48.7	60.3	51.4	108	120	158	145	106	30.7	20.5	21.8	75.2
1953	20.0	24.8	31.7	152	134	65							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904									200	30	10	0	
1905	0	6											
1907												10.3	
1908	13	15	22	32	27	55	96	98	110	4.2			
1910						275	176	212	14*	8	7.8	7.8*	
1911	8*						23	23	93	6	5	6	
1912	6	6	11	11.6	35.8	47.0	53.5	47.0	11.8	9.4	7.0	7.0	6.0
1913	8.0	11.8	19.8	34	18	61	61	68	136	5	5	7	5
1914	12	9	21	43	48	112	93	133	14	8	8	8	8
1951						90			65	21	12.5	24	
1952	34	41	45	43*	60	90	105	62	50	14.5	11	18.5	11
1953	18.5	22	26	35	88	45							

* Estimated.

YAKIMA RIVER BASIN

Ahtanum Creek at Union Gap, Wash.—Continued

Summary

YEAR.	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Maximum observed		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1904.....							
1905.....							
1907.....							
1908.....	419	①					
1910.....	1,530	Mar. 3, 1910					
1911.....							
1912.....	258	May 17, 23, 1912	6.0	48.8	35,400	50.3	36,400
1913.....	447	June 4, 1913	5.0	66.8	48,400	67.2	48,600
1914.....	369	May 25, 1914	8.0				
1951.....				85.8	62,200		
1952.....	255	May 20, 21, 1952	11	75.2	54,590	69.4	50,880
1953.....							

① Mar. 16, June 12-15, 1908.

Yakima River at Union Gap, Wash.

Location.—Lat. 46°31'40", long. 120°28'20", in NW¼ sec. 17, T. 12 N., R. 19 E., on right bank, 600 ft. downstream from mouth of Ahtanum Creek, 600 ft. upstream from New Reservation Canal intake, and 1 mile south of Union Gap.

Drainage area.—3,640 sq. mi., approximately.

Supplemental records available.—October 1893 to February 1896, gage heights only.

Gage.—Water-stage recorder. Altitude of gage is 930 ft. (from river-profile map). Prior to Dec. 31, 1909, and Apr. 1, 1911, to July 28, 1912, staff gages at approximately same site at various datums.

Average discharge.—23 years (1896-1919), 4,582 cfs, unadjusted.

Extremes.—1896-1914: Maximum discharge observed, about 63,900 cfs Nov. 15, 1906 (gage height, 15.68 ft., site and datum then in use); minimum observed, 635 cfs Aug. 23, 27, 28, Sept. 3-6, 1906 (gage height, 3.35 ft.).

Remarks.—Natural flow of stream affected by inter-basin diversions, storage reservoirs, power development and return flow from irrigated areas all above station. After 1905 an estimated mean of 20 to 25 cfs bypassed this station in Union Gap Canal.

Comparable records for this station, 1920-53, may be obtained by combining records for Yakima River near Parker and diversion records for Old Reservation, New Reservation and Sunnyside Canals (see elsewhere in this report).

YAKIMA RIVER BASIN

Yakima River at Union Gap, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1896											1,650	1,070	.....
1897	260	7,650	5,160	2,100*	3,000*	2,470	15,000	15,700	7,110	3,290	1,170	817	5,360*
1898	510	5,270	3,970	3,350	6,800	4,540	6,900	12,400	9,510	3,480	1,360	855	4,920
1899	1,300	1,970	1,990	4,660	4,770	2,780	4,210	9,390	14,100	5,470	3,720	2,000	4,940
1900	1,990	5,290	6,070	8,910	3,530	7,280	7,500	6,870	3,910	1,720	942	1,120	4,680
1901	2,260	3,580	6,950	4,400	3,780	6,390	5,080	11,400	8,480	4,430	1,770	1,200	5,170
1902	920	2,860	5,650	4,800	3,450	3,620	6,440	13,100	7,800	4,060	1,620	925	4,630
1903	1,200	2,120	2,870	6,980	2,620	3,460	6,420	12,700	19,200	5,500	1,500	1,450	5,500
1904	3,670	3,920	5,030	3,170	2,190	3,150	16,400	14,400	11,500	4,940	1,290	808	5,870
1905	1,040	2,080	2,780	1,830	1,730	7,540	4,750	4,990	8,320	2,770	922	904	3,300
1906	3,200	1,380	1,700	1,620	3,880	3,480	9,900	7,910	4,410	1,970	694	705	3,450
1907	2,220	12,400	3,920	2,430	6,740	5,040	8,430	14,100	7,640	2,470	930	1,110	5,590
1908	884	1,170	2,160	1,710	1,340	5,570	7,990	9,750	10,400	6,490	1,580	1,100	4,120
1909	1,120	2,100	1,610	2,010	1,860	2,190	4,320	7,350	9,770	3,240	1,300	919	3,150
1910	1,110	6,800	6,520	3,170	2,030	14,000	12,600	12,200	5,780	2,070	1,120	841	5,940
1911	2,700	5,800	3,430	2,120	1,410	3,000	5,190	7,090	7,760	2,470	1,830	1,640	3,660
1912	1,150	3,620	2,700	3,160	4,030	2,760	6,320	10,900	7,370	2,410	1,600	1,770	4,010
1913	1,190	2,290	1,860	2,570	3,590	3,460	7,000	11,900	14,200	5,000	1,530	1,540	4,670
1914	2,530	1,990	2,120	3,780	2,210	5,800	8,950	9,910	5,760	2,410	1,620	1,490	4,060
1915	1,690	4,190	2,360	1,160	1,130	3,700	7,510	3,030	1,830	1,610	841	386	2,460
1916	800	2,040	1,950	1,560	3,020	9,820	12,000	13,700	16,500	11,000	3,270	2,220	6,500
1917	1,400	1,460	1,400	1,360	1,770	1,380	8,260	11,300	13,700	7,940	2,660	1,760	4,130
1918	1,150	1,450	11,800	19,200	3,910	3,020	5,970	6,640	7,620	2,580	2,470	1,770	5,150
1919	1,490	2,150	4,330	5,140	3,160	3,160	7,440	8,560	6,380	3,250	2,640	1,790	4,130

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1896											1,170	910	.....
1897	840	910	2,320			1,650	4,740	11,600	4,740	1,650	915	705	705
1898	705	915	2,320	1,890	1,780	2,820	3,000	8,270	5,250	2,170	885	685	685
1899	685	1,320	985	1,770	3,390	2,170	2,320	4,500	10,800	5,310	2,600	1,640	685
1900	1,390	2,420	2,250	4,060	3,170	3,600	4,800	3,890	2,970	1,170	790	910	790
1901	990	2,970	4,300	2,750	2,090	4,220	3,980	6,550	5,950	2,810	1,230	1,020	990
1902	920	1,020	2,810	1,940	1,610	2,080	2,650	6,850	5,950	2,810	1,020	820	820
1903	1,020	1,230	1,810	2,500	2,350	2,350	4,210	8,500	11,200	2,650	920	820	820
1904	1,810	2,500	2,650	1,940	1,620	1,690	2,360	9,170	7,030	2,180	820	800	800
1905	920	920	2,040	1,280	920	3,830	3,420	3,830	5,310	1,290	795	795	795
1906	1,290	1,520	1,400	1,180	2,500	2,670	7,590	4,260	3,020	965	635	635	635
1907	725	2,180	2,500	1,640	1,890	3,350	3,530	9,350	4,780	1,110	765	900	725
1908	810	900	1,530	1,220	1,160	1,450	3,530	7,570*	6,140*	2,320*	1,260*	1,030*	810
1909	915*	1,140*	1,160*	1,470*	1,390*	1,460*	3,160*	4,360*	4,740*	1,760*	1,020*	769*	769*
1910	991*	240*	2,800*	1,930*	2,180*	4,350*	5,070*	8,970*	2,920*	1,030*	1,000*	672*	240*
1911	839*	2,310*	2,390*	1,720*	1,120*	1,140*	3,590	5,640	4,300	1,550	1,210	1,280	839*
1912	928	928	2,240	1,320	2,950	2,010	4,300	6,500	4,800	1,390	1,400	1,240	928
1913	1,030	1,250	1,400	1,540	1,760	2,600	2,980	5,760	8,600	2,600	1,210	1,040	1,030
1914	1,210	1,470	1,470	1,400	1,840	3,490	4,510	6,030	3,180	1,210	1,220	875	875

* Estimated.

Note—Records May 1908 to March 1911, October 1915 to September 1919 were obtained by combining records for Yakima River near Parker and diversion records for Old Reservation, New Reservation and Sunny-side Canals.

YAKIMA RIVER BASIN

Yakima River at Union Gap, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1896							
1897	15,600†	Nov. 16, 1896	705	5,360	3,880,000	5,060	3,680,000
1898	25,100†	Nov. 20, 1897	685	4,920	3,560,000	4,540	3,270,000
1899	18,400†	①	685	4,940	3,580,000	5,670	4,110,000
1900	21,400†	②	790	4,680	3,390,000	4,590	3,820,000
1901	23,900†	Mar. 2, 1901	990	5,170	3,740,000	4,880	3,540,000
1902	18,600†	May 28, 1902	820	4,030	3,350,000	4,340	3,140,000
1903	26,200†	June 11, 1903	820	5,500	3,980,000	6,040	4,370,000
1904	27,900†	April 10, 1904	800	5,270	4,260,000	5,370	3,850,000
1905	14,700†	June 4, 1905	785	3,300	2,390,000	3,370	2,440,000
1906	13,800†	April 24, 1906	635	3,450	2,500,000	4,440	3,200,000
1907	63,900†	Nov. 15, 1906	725	5,590	4,050,000	4,480	3,190,000
1908	17,600†	Mar. 10, 1908	810	4,120	2,990,000	4,180	3,020,000
1909	17,000†	June 3, 1909	769	3,150	2,280,000	4,110	2,980,000
1910	83,400†	Nov. 25, 1909	240	5,940	4,390,000	5,570	4,030,000
1911	15,700†	Nov. 23, 1910	839	3,660	2,650,000	3,300	2,890,000
1912	15,500†	③	928	4,010	2,970,000	3,830	2,780,000
1913	22,900	June 3, 4, 1913	1,030	4,670	3,380,000	4,760	3,460,000
1914	14,400	April 16, 1914	875	4,060	2,940,000	4,190	3,030,000
1915				2,400	1,730,000	2,170	1,570,000
1916				6,500	4,720,000	6,460	4,690,000
1917				4,130	2,990,000	4,990	3,610,000
1918				5,150	3,730,000	4,600	3,330,000
1919				4,130	2,990,000		

† Maximum observed. ① June 13, 14, 1899. ② Jan. 12, 14, 15, 1900. ③ May 16, 22, 1912.

New Reservation Canal near Parker, Wash.

Location.—Lat. 46°31'10", long. 120°28'40", in NW¼ sec. 20, T. 12 N., R. 19 E., on left bank, 1,000 ft. downstream from intake, three-quarters of a mile northwest of Parker, and 5½ miles northwest of Wapato.

Gage.—Water-stage recorder. Altitude of gage is 920 ft. (from topographic map). May 6, 1904, to Sept. 30, 1923, staff gages at various sites in vicinity of canal intake at different datums.

Average discharge.—49 years (1904-53), 608 cfs.

Extremes.—1904-53: Maximum daily discharge, 2,260 cfs May 6, 1937; no flow at times each year.

Remarks.—Canal diverts water from right bank of Yakima River to irrigate approximately 106,000 acres in Yakima Indian Reservation.

YAKIMA RIVER BASIN

647

New Reservation Canal near Parker, Wash.—Continued

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904							595	1,660	2,920	5,310	4,110	4,380	.....
1905	1,490	0	0	0	0	0	0	0	5,810	8,420	7,990	0	23,700
1906	0	0	0	0	0	0	2,450	11,800	10,300	0	4,170	4,940	33,700
1907	5,440	0	0	0	0	0	0	14,400	16,100	15,700	14,100	0	65,700
1908	0	0	0	0	0	0	7,870	18,200	15,200	16,000	12,400	9,040	78,700
1909	6,460	1,550	1,480	0	0	0	12,200	17,500	14,300	17,700	11,400	8,330	90,900
1910	9,780	0	0	0	0	0	14,900	21,300	17,600	17,000	7,870	6,130	94,600
1911	9,750	0	0	0	0	0	17,900	22,500	23,400	21,700	15,100	10,100	120,000
1912	8,390	0	0	0	0	0	23,800	33,100	26,100	26,400	14,400	15,100	148,000
1913	10,900	0	0	0	0	0	10,800	39,800	26,600	30,600	21,400	17,100	152,000
1914	9,780	0	0	0	0	0	25,000	35,200	31,700	30,200	26,700	10,900	169,000
1915	4,330	0	0	0	0	0	16,000	30,000	32,200	28,800	19,400	7,130	144,000
1916	10,400	4,570	0	0	0	0	20,600	43,000	37,200	31,000	33,200	19,600	200,000
1917	7,250	0	0	0	0	0	11,400	43,900	44,500	45,300	40,900	21,500	215,000
1918	5,830	0	0	0	0	0	14,000	49,400	55,900	60,000	42,600	31,800	250,000
1919	6,660	0	0	0	0	0	23,700	67,300	59,200	57,400	60,700	36,000	311,000
1920	13,590	0	0	0	0	0	15,700	69,200	59,600	65,900	59,500	39,100	322,000
1921	5,630	0	0	0	0	0	28,400	72,600	69,400	71,900	71,900	40,900	361,000
1922	10,900	0	0	0	0	0	11,600	76,200	79,100	79,900	69,500	41,100	368,000
1923	6,390	0	0	0	0	0	33,500	93,200	79,900	75,100	74,000	55,200	418,000
1924	0	0	0	0	0	18,300	77,400	89,100	82,900	81,800	74,300	44,000	466,000
1925	23,400	0	0	0	0	21,900	57,000	99,600	86,500	92,000	83,700	47,300	511,000
1926	14,700	1,340	0	0	0	12,200	74,100	97,500	83,600	91,000	69,000	27,700	471,000
1927	0	0	0	0	0	3,820	39,600	104,000	83,600	97,300	88,600	49,700	467,000
1928	9,100	0	0	0	0	1,540	25,400	102,000	102,000	90,900	89,700	45,600	466,000*
1929	27,200	0	0	0	0	0	52,900	115,000	95,000	97,800	94,300	60,500	543,000
1930	24,400	11,700	0	0	0	6,020	83,100	112,000	96,000	98,100	85,200	47,000	564,000
1931	19,600	0	0	0	1,600	35,400	85,600	115,000	84,900	102,000	88,900	46,100	578,000
1932	27,400	7,290	0	0	0	7,110	63,600	118,000	97,400	103,000	93,300	54,200	571,000
1933	31,100	0	0	0	0	4,400	59,800	122,000	103,000	109,300	106,000	66,900	604,000
1934	24,900	0	0	0	0	17,060	84,600	96,710	96,860	101,600	92,710	63,460	578,000
1935	16,900	0	0	0	0	10,670	95,210	124,960	103,100	111,700	103,400	81,030	646,600
1936	26,020	0	0	0	0	7,070	71,430	122,400	95,960	106,100	95,940	64,250	589,200
1937	45,670	0	0	0	0	3,850	49,730	131,000	79,880	119,300	107,300	65,170	601,900
1938	20,850	0	0	0	0	6,010	58,990	123,800	105,300	111,000	104,600	71,730	602,300
1939	22,860	0	0	0	0	9,630	104,600	119,300	99,470	110,100	103,500	79,180	648,600
1940	39,310	1,320	0	0	0	6,370	73,010	116,800	101,300	111,400	107,200	81,620	638,300
1941	29,930	0	0	0	0	14,560	80,880	114,100	90,640	104,500	95,460	69,260	599,300
1942	13,740	0	0	0	0	13,020	90,360	117,900	101,300	114,700	110,800	82,910	645,200
1943	31,280	0	0	0	0	12,070	59,870	122,200	102,890	117,500	109,800	74,090	629,600
1944	34,510	0	0	0	0	11,370	47,510	120,200	104,100	116,500	109,300	82,710	646,200
1945	36,870	0	0	0	0	10,460	64,880	127,600	104,800	119,300	111,680	74,070	649,600
1946	33,210	0	0	0	0	11,330	75,250	132,000	105,700	114,600	112,100	71,780	656,000
1947	31,730	0	0	0	0	25,860	105,700	128,200	100,500	110,100	113,600	73,570	687,200
1948	29,820	0	0	0	0	7,010	51,170	113,500	98,260	116,200	104,400	78,870	694,300
1949	25,700	0	0	0	0	4,520	49,540	126,700	117,100	121,300	105,600	80,780	692,200
1950	22,790	0	0	0	0	9,460	49,310	127,200	105,000	118,000	108,200	81,990	620,000
1951	21,290	0	0	0	0	3,790	63,060	123,800	100,800	115,300	108,500	84,120	623,700
1952	19,360	0	0	0	0	6,250	87,630	128,000	111,100	114,700	108,200	84,890	668,100
1953	25,290	0	0	0	0	15,760	83,860	114,000	107,600	121,300	106,500	70,080	660,400

* Estimated.

YAKIMA RIVER BASIN

Old Reservation Canal near Parker, Wash.

Location.—Lat. 46°29'40", long. 120°27'00", in SW¼ sec. 28, T. 12 N., R. 19 E., on left bank, 1,200 ft. downstream from headgate, 1½ miles southeast of Parker and 3½ miles northwest of Wapato.

Gage.—Water-stage recorder. Altitude of gage is 905 ft. (from topographic map). June 7, 1904, to April 1930, staff gages at approximately same site at different datums.

Average discharge.—47 years (1906-53), 53.3 cfs.

Extremes.—1904-53: Maximum daily discharge, 386 cfs May 21, 1919 (gage height, 6.05 ft.); no flow at times most years.

Remarks.—Canal diverts water from right bank of Yakima River half a mile upstream from Sunnyside Dam and headworks of Sunnyside Canal. Approximately 1,900 acres on Yakima Indian Reservation are currently irrigated.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904							2,980	7,990	5,630	10,100	9,160	5,950	.....
1905	2,680												.....
1906								9,780	6,600	8,180	2,800	3,470	.....
1907	2,210	0	0	0	0	0	0	16,200	14,700*	13,800	6,460	3,240	58,100*
1908	0	0	0	0	0	0	5,030	15,700	12,300	12,500	8,730	6,430	63,700
1909	3,720	2,500	1,740	0	0	0	0	0	13,100	12,900	6,520*	3,620*	44,100*
1910	5,570*	0	0	0	0	0	9,640	15,200	12,600	9,220*	4,930	3,730	60,980*
1911	5,960	0	0	0	0	0	13,800	17,500	14,100	11,300	6,520	5,950	75,100
1912	4,970	2,340*	0	0	0	0	13,200	15,700	14,600	10,900	8,150	7,440	77,300*
1913	5,470	0	0	0	0	0	6,950	17,800	14,500	16,500	8,360	7,910	77,500
1914	0,400	0	0	0	0	0	12,900	16,300	15,300	11,200	8,210	5,320	75,700
1915	2,230	0	0	0	0	0	7,730	14,500	9,060	8,250	2,660	305	44,700
1916	0	0	0	0	0	0	9,250	17,500	16,400	10,200	12,200	5,060	70,600
1917	1,920	0	0	0	0	0	6,830	18,000	17,700	17,100	12,000	7,220	51,400
1918	2,200	0	0	0	0	0	8,000	16,400	17,200	10,700	10,300	6,720	71,500
1919	2,700	0	0	0	0	0	8,690	20,200	17,000	12,400	11,500	5,690	78,200
1920	1,010	0	0	0	0	0	9,160	15,600	13,900	10,200	8,790	5,930	63,000
1921	1,730	0	0	0	0	0	10,800	13,700	15,600	11,000	9,350	5,500	68,700
1922	0	0	0	0	0	0	5,350	17,600	16,200	14,400	11,700	7,860	73,100
1923	0	0	0	0	0	0	8,520	15,500	8,000	9,930	9,320	6,960	58,300
1924	151	0	0	0	0	208*	5,290*	9,400*	4,600*	2,460*	2,310*	1,350*	25,800*
1925	167*	0	0	0	0	1,870*	6,660*	9,900*	7,980*	4,160	1,680*	1,240*	33,700*
1926	311*	0	0	0	0	1,400*	6,330*	6,850*	3,500*	363*	0	0	18,800*
1927	0	0	0	0	0	0	5,540*	9,230*	6,880*	5,390*	0	0	27,000*
1928	0	0	0	0	0	0	8,020*	12,300*	7,220*	1,250*	0	0	28,500*
1929	0	0	0	0	0	0	4,620*	9,010	4,140	4,350	0	0	22,100*
1930	111	0	0	0	0	1,020	8,490	2,560	0	0	0	0	12,200
1931	0	0	0	0	728	3,920	6,610	8,720	4,700	3,350	0	0	27,600
1932	0	0	0	0	0	1,910*	5,450	8,960	7,470	7,790	4,500	0	36,400*
1933	0	0	0	0	0	415*	6,590	5,330	2,570	3,270	4,060	1,050*	26,600*
1934	154*	59.3*	0	0	71.4	1,490	10,620	11,940	4,670	4,320	3,310	1,500	38,190*
1935	200	0	0	0	0	3,210	0,470	5,910	2,940	3,730	4,220	3,170	32,750
1936	325	0	0	0	0	1,400	5,690	10,640	3,110	1,490	922	244	26,520
1937	160	0	0	0	0	51	3,320	9,060	3,330	5,670	4,460	1,220	29,200
1938	431	653	417	246	160	269	2,310	9,410	4,140	5,090	3,090	1,480	27,700
1939	415	420	466	469	187	1,450	7,650	7,050	4,140	5,160	2,790	609	30,530
1940	612	505	712	698	232	1,350	6,290	7,910	4,430	8,590	2,430	513	29,650
1941	70	629	318	113	138	664	3,330	3,900	1,090	839	533	248	10,970
1942	250	503	349	285	255	455	3,020	330	705	697*	315	247	7,410*
1943	151	236	222	113*	457*	841	1,140	5,890	3,750	1,240	375	357	14,800*
1944	204	206	289	265	234	444	1,010	591	397	237	259	279	4,620
1945	238	346	173*	213	227	111	554	3,310	944	1,160	297	313	7,920*
1946	353	246	51	200	208	477	2,000	4,300	1,740	2,560	2,030	484	14,650
1947	329	464	1,640	3,930*	5,060	2,230	2,400	936	558	462	341	274	13,730*
1948	452	357	244	117*	288	301	1,610	3,370	803	2,580	381	179	10,660*
1949	131	242	422	375*	293*	576	1,070	5,750	2,540	1,780	580*	412	14,130*
1950	0	0	0	83	355*	2,710	2,920	6,320	3,050	4,060	695	270	20,970*
1951	97*	410	434	1,580	1,040	1,210	4,120	7,150	3,180	3,500	3,150	719	26,540*
1952	561	872	613	1,330	3,580	4,020	4,200	4,780	3,470	2,389	704	300	26,310
1953	359	741	826	999	2,130	3,650	2,310	4,370	965	1,630	994	233	19,650

* Estimated.

YAKIMA RIVER BASIN

649

Sunnyside Canal near Parker, Wash.

Location.—Lat. 46°29'40", long. 120°25'40", in SW¼ sec. 27, T. 12 N., R. 19 E., on right bank, 0.6 mile downstream from intake, 1½ miles east of Parker, and 3½ miles northwest of Wapato.

Gage.—Water-stage recorder. Datum of gage is 890.097 ft. above mean sea level, datum of 1929. Apr. 22, 1904, to Apr. 19, 1909, staff gages, and Apr. 20, 1909, to April 1935, water-stage recorder at sites within 1,000 ft. of canal headworks at various datums.

Average discharges.—49 years (1904-53), 570 cfs.

Extremes.—1904-53: Maximum daily discharge, 1,320 cfs occurred many days during 1931, 1933, 1949 and 1950; no flow at times most years.

Remarks.—Canal diverts water from left bank of Yakima River just upstream from gaging station half a mile downstream from intake of Old Reservation Canal. 1904-43, irrigation from this canal expanded steadily. Since 1943 a slight decrease in coverage is noted. Approximately 80,000 acres are irrigated currently.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904							14,800	32,500	33,400	30,200	37,500	31,200	.....
1905	13,600	0	0	0	0	0	16,800*	33,000*	30,800	37,900	39,400	29,900	201,000*
1906	21,400	0	0	0	0	0	18,900	35,800	29,700	42,100	29,300	24,600	202,000
1907	23,700	0	0	0	0	0	16,600	30,500	29,200	32,300	32,600	25,200	190,000
1908	23,800	0	0	0	0	0	24,900	36,900	35,900	37,300	39,700	36,800	235,000
1909	30,700	4,400	0	0	0	0	31,000	37,400	36,900	40,900	42,100	35,900	259,000
1910	34,100	0	0	0	0	2,550	34,800	38,900	41,800	44,200	39,500	37,600	273,000
1911	35,600	7,800	1,330*	892	6,830	5,100	37,100	47,400	45,300	47,700	51,300	42,100	331,000*
1912	39,500	0	0	0	0	6,250	34,500	51,600	51,700	56,000	50,500	34,200	324,000
1913	29,060	587	0	0	0	2,840	40,000	54,800	40,900	63,300	54,500	41,300	326,000
1914	26,700	2,550	0	0	0	6,630	37,100	52,900	51,400	56,900	55,000	37,500	327,000
1915	22,000	1,090	0	0	0	11,300	39,900	52,400	53,000	56,100	29,100	14,800	260,000
1916	27,200	0	0	0	0	7,560	35,000	57,100	57,100	59,000	65,200	48,000	356,000
1917	27,700	0	0	0	0	6,250	31,800	60,400	61,900	74,400	72,600	49,400	354,000
1918	34,600	397	0	0	0	5,720	44,600	71,300	67,500	73,200	71,300	56,300	425,000
1919	30,700	0	0	0	0	7,030	46,700	71,900	69,000	76,200	75,000	49,900	426,000
1920	33,400	1,790	0	0	0	2,240	46,800	72,600	67,800	70,100	75,600	54,100	424,000
1921	30,500	0	0	0	0	6,090	55,800	74,400	71,400	76,200	76,200	55,700	446,000
1922	30,400	0	0	0	0	1,350	37,000	75,000	74,400	79,900	77,500	58,000	434,000
1923	30,400	0	0	0	0	8,420	55,600	73,800	77,400	76,000	76,200	59,200	452,000
1924	20,300	0	0	0	0	17,100	63,100	76,200	76,200	76,800	76,200	46,900	456,000
1925	17,300	0	0	0	0	19,300	61,300	75,000	74,400	80,000	78,700	56,800	463,000
1926	19,400	0	0	0	0	32,100	66,600	73,200	73,800	76,200	66,400	33,200	441,000
1927	14,700	0	0	0	0	10,800	53,800	76,200	73,800	79,300	79,300	63,100	441,000
1928	19,200	0	0	0	0	14,400	48,200	78,100	76,200	79,300	77,500	67,000	450,000
1929	22,000	0	0	0	0	13,000	54,300	78,100	75,000	79,300	78,100	66,000	466,000
1930	26,500	0	0	0	0	22,600	65,600	79,300	75,600	79,300	76,200	57,100	482,000
1931	25,800	0	0	0	4,110	40,800	64,300	79,900	68,400	67,000	61,400	45,100	457,000
1932	14,900	0	0	0	0	12,900	54,100	79,300	76,600	79,900	77,500	63,100	457,000
1933	29,300	0	0	0	0	12,700	53,900	77,500	76,800	80,600	79,900	60,100	471,000
1934	27,600	0	0	0	0	22,900	71,100	79,730	75,310	78,620	75,710	64,420	495,000
1935	29,730	0	0	0	0	19,900	65,080	80,490	75,380	79,120	77,850	67,340	495,000
1936	33,360	0	0	0	0	10,670	53,790	78,680	73,240	79,110	77,520	61,930	468,300
1937	32,220	0	0	0	0	12,500	53,450	78,970	73,800	78,510	78,210	61,010	468,700
1938	29,750	0	0	0	0	9,820	45,640	79,260	75,010	78,480	76,910	66,770	461,600
1939	30,350	0	0	0	0	13,040	68,210	79,800	75,950	79,060	77,780	63,120	487,900
1940	30,610	0	0	0	60	13,160	58,180	77,900	75,920	78,610	75,700	62,560	472,600
1941	26,700	0	0	0	0	13,740	56,360	70,220	63,430	67,470	65,130	40,300	403,400
1942	10,200	0	0	0	0	11,940	58,770	74,350	69,760	72,730	74,700	58,380	431,000
1943	24,320	0	0	0	0	7,980	50,060	76,030	75,960	73,980	76,640	60,870	451,100
1944	26,310	0	0	0	0	10,600	48,330	73,030	73,860	77,260	77,110	59,390	445,900
1945	27,000	0	0	0	0	15,840	52,180	79,720	70,070	79,870	77,910	60,070	468,700
1946	27,220	0	0	0	0	12,610	51,390	79,950	75,820	73,450	78,770	57,830	463,600
1947	26,070	0	0	0	0	11,530	66,780	80,010	75,730	79,110	76,230	59,030	474,500
1948	27,960	0	0	0	0	14,390	54,500	74,150	72,890	77,780	76,920	60,690	469,600
1949	26,750	0	0	0	0	7,280	58,000	76,920	75,630	79,200	78,180	61,270	463,200
1950	30,360	0	0	0	0	13,390	56,340	76,460	77,870	80,010	77,690	64,980	477,000
1951	29,450	0	0	0	0	10,820	59,800	78,770	76,700	28,270	78,210	61,230	423,200
1952	29,450	0	0	0	0	10,660	59,030	78,820	77,560	79,630	74,990	63,150	473,300
1953	30,360	0	0	0	0	18,780	56,490	75,100	73,550	78,990	77,250	61,560	472,100

* Estimated.

YAKIMA RIVER BASIN

Yakima River near Parker, Wash.

Location.—Lat. 46°29'40", long. 120°26'10", in sec. 28, T. 12 N., R. 19 E., on left bank, 700 ft. downstream from Sunnyside diversion dam, 1½ miles east of Parker, and 3 miles downstream from Ahtanum Creek.

Drainage area.—3,650 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 886.23 ft. above mean sea level (Bureau of Reclamation benchmark). Apr. 25, 1908, to Aug. 16, 1915, staff or chain gages, and Aug. 17, 1915, to Feb. 2, 1919, Oct. 21, 1940, to Aug. 9, 1953, water-stage recorder at several sites within 1,000 ft. upstream, and Feb. 3, 1919, to Oct. 20, 1940, water-stage recorder at present site, at different datums prior to Jan. 1, 1914, and 0.18 ft. lower than present datum thereafter.

Average discharge.—1908-53: Maximum discharge, 65,000 cfs Dec. 23, 1933 (gage height, 15.0 ft., from high-water marks); practically no flow for several days during latter part of irrigation season in most years as result of diversions.

Remarks.—Diversions above station for irrigation of about 200,000 acres above and 220,000 acres below station. Roza, Sunnyside, New and Old Reservation Canals (see elsewhere in this report), and Union Gap Canal, which carries an estimated mean annual discharge of 20 cfs, bypass the station. During the irrigation seasons subsequent to 1935 as much as 18 cfs has been released from Sunnyside Canal upstream from the fish screens and bypassed the river and canal gaging stations unmeasured. Flow regulated by Keechelus, Kachess, Cle Elum, and Bumping Lakes and Tieton Reservoir which have a combined capacity of about 1,060,000 acre-ft. (see elsewhere in this report).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908								8,020	9,390	5,470	599	316	.....
1909	459	1,950	1,560	1,010	1,560	2,190	3,600	6,230	8,690	2,060	324	115	2,580
1910	312	8,800	6,520	3,170	2,830	13,900	11,000	11,000	4,570	916	273	401	5,350
1911	1,820	5,660	3,400	2,100	1,300	2,020	4,050	6,770	6,890	1,240	146	751	3,000
1912	219	3,330	2,980	3,170	3,940	2,890	5,370	10,270	6,440	854	300	642	3,390
1913	375	2,400	2,210	2,620	3,770	3,690	6,460	10,900	12,300	3,530	284	885	4,070
1914	2,020	1,640	2,060	3,740	2,220	5,360	6,960	7,590	3,910	649	111	513	3,050
1915	1,230	4,170	2,360	1,160	1,130	3,520	6,440	1,400	242	80.2	9.55	12.0	1,510
1916	189	1,960	1,950	1,560	3,020	9,750	11,000	11,800	14,600	9,370	1,470	994	5,640
1917	803	1,460	1,460	1,360	1,770	1,280	2,420	9,340	11,600	5,720	623	448	3,190
1918	461	1,440	11,800	13,200	3,910	2,930	4,340	4,410	5,250	404	451	177	4,120
1919	840	2,150	4,380	5,140	3,160	3,050	6,110	5,970	3,940	873	243	249	8,000
1920	524	1,800	2,130*	3,040	2,490	2,100	1,120	1,450	964	482	374	905	1,450*
1921	2,540	2,400	2,250	4,540	5,400	8,050	5,500	9,340	9,840	1,050	710	670	4,400
1922	961	1,950	7,070	2,070	1,260	1,330	3,250	5,940	5,770	650	823	123	2,570
1923	397	877	1,330	4,350	2,010	2,670	6,990	6,600	4,560	1,580	767	367	2,700
1924	824	1,120	2,190	2,300	7,030	3,100	1,350	5,980	800	211	169	50	2,080
1925	320	1,290	3,860	2,060	3,590	2,800	5,530	7,940	2,340	322	367	59	2,580
1926	398	909	2,150	1,580	2,080	3,040	1,910	436	174	87	20	23	1,090
1927	831	1,600	2,970	1,300	1,370	2,680	3,900	5,030	8,050	497	356	1,010	2,540
1928	2,620	4,470	6,740	5,990	3,020	4,370	3,550	7,500	1,670	324	250	449	3,430
1929	801	1,040	903	859	900	1,470	589	2,510	1,060	199	111	46	925
1930	170	462	701	700	2,140	2,020	3,100	611	170	147	111	96	857
1931	268	765	813	947	1,580	692	709	2,750	222	56	23	23	734
1932	315	1,620	1,070	1,940	2,900	6,220	4,310	5,620	4,290	373	144	144	2,420
1933	511	3,850	4,300	4,580	2,550	2,440	3,650	4,450	5,770	3,610	382	1,250	3,360
1934	1,990	3,500	16,030	12,300	8,190	5,760	8,390	-3,190	276	121	155	146	4,905
1935	1,078	3,524	2,932	5,913	6,011	2,642	1,641	-4,599	4,865	377	106	242	2,358
1936	1,067	1,036	845	1,052	868	2,227	5,033	9,221	5,801	266	155	155	2,312
1937	216	933	1,041	845	843	1,724	1,756	1,879	7,648	1,005	219	205	1,620
1938	468	2,067	2,067	3,336	2,209	3,794	6,243	7,157	4,749	302	133	154	2,788
1939	535	1,310	1,523	1,875	1,250	2,279	1,526	2,470	907	207	245	185	1,191
1940	291	840	1,862	1,001	1,718	2,535	1,727	3,345	465	166	130	120	1,142

* Estimated.

YAKIMA RIVER BASIN

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Yakima River near Parker, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	892	1,070	1,584	1,059	1,360	1,574	965	158	110	107	142	196	744
1942...	801	1,394	2,245	1,290	1,448	1,165	1,024	571	247	206	190	179	903
1943...	383	1,559	2,101	2,203	1,941	2,441	7,128	3,403	6,633	1,505	248	178	2,466
1944...	532	1,288	1,397	837	1,047	1,033	325	471	406	191	157	164	655
1945...	306	994	1,053	1,918	2,107	934	442	2,109	1,088	178	219	190	955
1946...	464	1,514	1,791	2,058	1,493	2,478	3,145	7,710	4,731	733	197	234	2,216
1947...	717	2,329	5,856	2,583	3,169	3,458	3,222	5,014	1,591	255	190	254	2,386
1948...	1,214	3,396	4,497	1,689	2,129	1,834	1,862	8,660	12,490	852	304	266	3,293
1949...	981	1,648	3,657	2,038*	2,003	5,000	6,207	7,584	5,806	360	397	827	5,004*
1950...	2,883	3,636	3,212	1,588*	2,622	4,642	4,495	6,491	8,720	3,488	652	933	3,613*
1951...	2,184	4,917	7,517	5,733	8,238	5,468	5,138	5,962	4,198	364	318	191	4,159
1952...	1,051	1,706	1,784	1,841	2,115	2,115	1,450	1,901	1,353	387	501	207	1,824
1953...	560	884	866	2,841	4,218	1,281	1,004	2,108	3,795	948	396	224	1,574

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1908...								6,420	5,160	1,390	290	146	.....
1909...	138	977	1,110	1,470	1,390	1,460	2,500	4,100	3,540	685	156	12	12
1910...	214	240	2,800	1,930	2,180	4,350	7,480	7,720	1,930	152	100	10	10
1911...	26	1,850	2,380	1,690	1,050	1,090	2,310	4,380	2,920	196	10	120	10
1912...	0	564	2,050	1,320	2,990	1,950	4,000	5,460	2,730	68	132	249	0
1913...	174	913	1,720	1,800	1,800	2,800	2,640	4,240	6,510	1,080	2	20	2
1914...	401	1,340	1,230	1,340	1,680	3,300	4,040	4,440	1,560	37	23	18	18
1915...	267	2,060	1,230	786	900	1,800	1,650	823	8	7	0	2	0
1916...	15	1,560	1,340	940	1,060	2,720	6,380	6,550	8,580	3,400	323	694	15
1917...	380	1,080	986	995	924	968	942	3,220	7,950	1,120	374	101	101
1918...	5	857	1,350	4,650	2,810	2,330	3,240	1,650	1,450	65	137	7	5
1919...	319	1,000	1,860	1,860	2,290	2,190	3,030	2,550	2,190	100	63	79	63
1920...	128	945	1,000*	1,730	1,790	1,510	383	51	48	19	109	66	19
1921...	1,370	1,370	1,500	2,260	1,920	5,490	3,630	2,190	4,440	520	463	48	48
1922...	405	1,610	2,550	1,490	965	995	1,610	2,260	1,000	357	57	10	10
1923...	156	697	601	1,690	1,210	2,030	3,340	1,840	1,530	224	416	153	153
1924...	374	753	1,530	1,410	4,230	1,370	486	1,240	82	90	10	5	5
1925...	7	871	1,280	1,540	2,440	1,840	1,270	2,160	1,360	26	170	161	7
1926...	200	835	827	1,350	1,420	1,660	164	43	21	7	5	1	1
1927...	1	218	1,780	928	1,370	2,110	1,550	2,110	2,600	210	248	387	1
1928...	1,910	1,910	2,880	1,850	2,240	2,110	1,850	2,110	509	96	176	200	96
1929...	164	919	685	644	624	945	3	279	164	2	8	1	1
1930...	1	301	522	552	617*	529	1,450	20	33	14	18	9	1
1931...	27	557	550	571	892	25	0	61	0	1	4	1	0
1932...	1	1,220	772	900	1,110	3,170	1,730	1,960	2,090	15	9	6	1
1933...	8	1,610	3,270	2,950	1,950	1,690	1,320	2,220	5,950	962	25	198	8
1934...	770	2,290	3,770	7,210	8,840	3,390	4,230	737	21	33	13	12	12
1935...	8	2,290	2,160	1,620	3,600	1,420	567	1,110	1,470	12	46	103	8
1936...	67	546	702	745	637	695	728	4,080	787	60	37	32	32
1937...	43	770	812	531	637	1,270	449	53	3,200	59	48	81	31
1938...	34	1,050	2,040	2,650	1,920	2,580	2,370	2,300	1,090	72	41	45	34
1939...	53	1,040	1,040	1,310	1,060	924	438	564	56	82	39	24	24
1940...	26	740	000	788	908	1,570	170	1,260	11	12	23	22	11
1941...	18	880	1,120	920	1,080	681	20	30	31	28	22	22	18
1942...	17	864	1,460	964*	1,010	186	33	43	49	51	111	57	33
1943...	14	1,100	1,520	1,380	1,570	1,000	2,870	661	4,050	128	79	77	34
1944...	16	1,090	1,506	698	766	219	44	54	74	59	53	44	44
1945...	13	854	685	776	1,080	573	68	302	95	79	69	78	63
1946...	8	1,190	1,050	1,400	1,160	1,600	1,300	2,100	910	106	80	51	51
1947...	30	1,350	2,650	1,476	1,830	2,000	970	2,050	67	40	61	62	49
1948...	30	2,050	2,510	1,280	1,240	1,010	194	320	3,160	73	72	78	72
1949...	58	1,240	2,160	1,968*	832*	3,280	3,320	1,060	604	103	188	217	58
1950...	33	1,940	1,870	1,100*	1,410*	3,500	1,940	2,060	5,720	265	334	561	265
1951...	51	3,420	5,000	4,800	4,130	4,040	1,890	612	1,350	70	65	52	62
1952...	70	1,380	1,260	1,070	1,660	1,010	154	38	160	94	170	63	38
1953...	54	751	776	709	1,970	151	65	288	1,140	101	81	83	54

* Estimated.

YAKIMA RIVER BASIN

Yakima River near Parker, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1908.....	16,400†	June 11, 1908					
1909.....	16,300	June 8, 1909	12	2,580	1,870,000	3,560	2,570,000
1910.....	35,000	Nov. 25, 1909	10	5,350	3,370,000	4,940	3,590,000
1911.....	16,400	Nov. 23, 1910	10	3,000	2,150,000	2,660	1,940,000
1912.....	16,200†	May 16, 1912	0	3,390	2,450,000	3,180	2,310,000
1913.....	22,600†	June 2, 3, 1913	2	4,070	2,940,000	4,150	3,000,000
1914.....	11,400†	May 16, 1914	18	3,080	2,230,000	3,240	2,340,000
1915.....	15,500†	April 4, 1915	0	1,810	3,310,000	1,510	1,090,000
1916.....	24,800	June 19, 1916	15	5,640	4,090,000	5,600	4,060,000
1917.....	19,500	May 30, 1917	101	3,150	2,310,000	4,040	2,930,000
1918.....	52,900	Dec. 30, 1917	5	4,120	2,950,000	3,580	2,590,000
1919.....	20,600	Jan. 23, 1919	63	3,000	2,170,000	2,770	2,000,000
1920.....	6,650	Jan. 20, 1920	19	1,450	1,050,000	1,670	1,220,000
1921.....	17,600	May 17, 1921	48	4,400	3,160,000	4,640	3,360,000
1922.....	35,800	Dec. 13, 1921	10	2,570	1,860,000	1,950	1,410,000
1923.....	15,600	Jun. 8, 1923	163	2,700	1,950,000	2,820	2,050,000
1924.....	18,400	Feb. 13, 14, 1924	5	2,080	1,510,000	2,190	1,590,000
1925.....	15,500	May 21, 1925	7	2,580	1,510,000	2,410	1,740,000
1926.....	5,990	Mar. 16, 1926	1	1,090	788,000	1,250	906,000
1927.....	16,200	June 9, 1927	1	2,540	1,840,000	3,250	2,350,000
1928.....	19,600	Jan. 17, 1928	98	3,430	2,490,000	2,500	1,810,000
1929.....	6,050	May 24, 1929	1	925	670,000	807	584,000
1930.....	6,400	Mar. 30, 1930	1	857	621,000	900	652,000
1931.....	7,850	May 3, 1931	0	734	531,000	830	601,000
1932.....	17,100	Feb. 28, 29, 1932	1	2,420	1,750,000	2,890	2,100,000
1933.....	14,500	June 16, 1933	8	3,380	2,450,000	4,480	3,240,000
1934.....	65,000	Dec. 23, 1933	12	4,995	3,616,000	5,808	2,757,000
1935.....	19,600	Jan. 26, 1935	8	2,858	2,069,000	2,475	1,792,000
1936.....	13,600	May 15, 1936	32	2,312	1,679,000	2,248	1,632,000
1937.....	10,200	June 22, 1937	31	1,520	1,100,000	1,774	1,284,000
1938.....	17,200	April 19, 1938	34	2,786	2,017,600	2,631	1,906,000
1939.....	6,300	⊙	24	1,191	861,960	1,117	808,700
1940.....	7,760	May 12, 1940	11	1,142	829,100	1,184	859,800
1941.....	3,850	April 3, 1941	18	744	538,600	874	632,000
1942.....	4,440	Dec. 8, 1942	33	903	653,400	860	622,500
1943.....	13,600	April 16, 1943	34	2,406	1,785,000	2,397	1,735,000
1944.....	3,500	Dec. 5, 1943	44	655	475,700	583	423,100
1945.....	7,300	June 1, 1945	63	955	691,500	1,074	777,500
1946.....	13,600	May 27, 1946	51	2,215	1,604,000	2,650	1,918,000
1947.....	14,400	Dec. 15, 16, 1947	49	2,385	1,727,000	2,400	1,735,000
1948.....	37,700	May 29, 1948	72	3,263	2,369,000	3,029	2,199,000
1949.....	14,500	May 16, 1949	58	3,004	2,174,000	3,291	2,382,000
1950.....	13,000	May 13, 1950	265	3,613	2,615,000	4,024	2,913,000
1951.....	19,300	Feb. 12, 1951	52	4,159	3,011,000	3,312	2,398,000
1952.....	6,570	Aug. 10, 1952	38	1,324	960,500	1,137	825,200
1953.....	10,200	Feb. 1, 1953	54	1,574	1,133,000		

† Maximum observed. ⊙ Mar. 25, 26, May 17, 1939.

Reservation drain at Alfalfa, Wash.

Location.—Lat. 46°19'10", long. 120°13'20", in sec. 29, T. 10 N., R. 21 E., on right bank at highway bridge, a quarter of a mile southeast of Alfalfa, and 2 miles upstream from mouth.

Gage.—Water-stage recorder. Altitude of gage is 700 ft. (from topographic map). Prior to Oct. 9, 1922, staff gages at same site and datum.

Average discharge.—9 years (1913-15, 1916-23), 287 cfs.

Extremes.—1913-23: Maximum discharge, 1,500 cfs Jan. 2, 1918 (gage height, 8.2 ft., from floodmarks); minimum observed, 131 cfs Mar. 18, 1922, but may have been less some time between Mar. 19 and Apr. 11, 1922 when water was below gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913				193	200	194	190	212	206	182	174	188	.....
1914	284	215	192	210	223	215	199	220	207	196	175	207	208
1915	229	206	198	187	200	193	179	178	170	161	151	151	184
1916	178	183	164	178	246			405	339	293	232	259	.....
1917	221	199	200	194	158	177	183	235	334	286	268	304	237
1918	246	208	344	450	266	240	247	262	312	273	312	319	237
1919	258	243	203	231	281	218	268	296	407	360	346	407	295
1920	331	259	219	223	219	190	200	238	445	410	363	448	296
1921	306	242	220	247	275	278	269	333	574	496	471	515	357
1922	369	279	292	228	223	183	203	256	459	472	523	475	334
1923	366	297	231	252	220	212*	246	353	570	564	550*	600*	372*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913				190	190	184	155	177	186	169	159	173	.....
1914	199	191	188	190	214	186	177	204	199	179	164	183	184
1915	213	203	183	178	189	178	167	167	156	145	145	145	145
1916	156	178	177	167	178			308	303	230	220	230	.....
1917	202	193	193	184	184	166	166	220	290	255	234	255	166
1918	214	255	277	299	266	224	214	224	266	255	266	299	214
1919	255	204	194	175	244	184	224	244	389	299	299	322	175
1920	262	251	200	210	200	190	190	190	317	362	339	407	190
1921	266	236	216	216	216	236	196	301	506	436	436	436	196
1922	329	254	243	223	213	131		223	374	420	510	442	131
1923	329	264	194	223			213	203	465	465			194

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1913						198	144,000
1914	250	May 23, 26, 1914	164	208	151,000	207	150,000
1915	254	Oct. 13, 1914	145	184	133,000	176	127,000
1916	590	⊙					
1917	389	May 31, 1917	166	237	171,000	257	186,000
1918	1,500	Jan. 2, 1918	214	297	215,000	287	208,000
1919	457	Sept. 5-12, 1919	175	295	214,000	302	218,000
1920	546	June 16-18, 1920	190	295	214,000	292	212,000
1921	624	June 10-15, 1921	196	357	258,000	371	269,000
1922	556	⊙	131	334	242,000	330	239,000
1923	717	July 9, 10, 1923	184	372	270,000		

* Estimated.

⊙ Date not known; occurred during period when water was over gage. ⊙ Aug. 2, 3, 12-18, 1922.

YAKIMA RIVER BASIN

Toppenish Creek near Fort Simcoe, Wash.

Location.—Lat. 46°18'40", long. 120°47'10", in sec. 35, T. 10 N., R. 16 E., on left bank, 30 ft. upstream from dam and headworks of Toppenish feeder canal, 3 miles southeast of Fort Simcoe, and 5½ miles southeast of White Swan.

Drainage area.—120 sq. mi. At sites 1909-22, 122 sq. mi.

Gage.—Inclined staff gage. Altitude of gage is 1,300 ft. (from topographic map). Feb. 27, 1909, to July 22, 1913, chain gage 1¼ miles downstream at different datum. July 23, 1913, to Aug. 18, 1915, staff gage and Aug. 19, 1915, to Sept. 30, 1922, water-stage recorder 1½ miles downstream at different datum.

Average discharge.—15 years (1909-24), 93.4 cfs (unadjusted); 95.7 cfs (adjusted for diversion since March 1920).

Extremes.—1909-24: Maximum discharge, 1,680 cfs May 4, 1916 (gage height, 5.52 ft.); minimum observed, 2.4 cfs Sept. 18, 1924 (gage height, 0.04 ft.).

Remarks.—Diversions for irrigation above station prior to 1920 were a small percentage of the flow. Since March 1920, Toppenish feeder canal has diverted water past the station during irrigation seasons. Annual runoffs for this canal are: 1920, 3,110 acre-ft.; 1921, 3,280 acre-ft.; 1922, 5,570 acre-ft.; 1923, 6,940 acre-ft.; 1924, 5,810 acre-ft.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909						195	363	263	63.8	21.5	13.7	21.0	
1910	22.1	199	197	153	155	771	369	103	36.2	24.9	15.2	17.2	175
1911	24.0	39.5	58.5	41.1	39.1	196	225	216	69.2	22.2	15.5	17.4	81.5
1912	16.4	21.1	23.3	66.8	102	61.4	245	184	33.6	17.8	13.3	13.1	67.8
1913	16.6	40.7	61.8	86.0	93.0	92.0	327	315	65.2	21.0	14.9	13.3	96.2
1914	20.9	26.0	28.2	259	152	335	462	271	82.4	29.0	13.2	17.2	141
1915	23.0	39.1	31.6	12.8	70.2	185	180*	68.2	34.2	12.8	7.05	8.64	50.4*
1916	15.5	24.7	108	82.8*	248	528	743	528	172	77.7	26.7	19.8	214*
1917	23.3	30.7	29.8	35.4	33.7	42.3	161	353	106	24.5	15.4	15.9	72.9
1918	14.7	21.0	157	122	125*	132	164	109	32.1	16.6	12.3	12.8	76.5*
1919	16.4	20.8	23.5	184	57.9	92.9	307	143	26.7	15.0	12.7	14.0	76.2
1920	15.5	18.7	29.1*	57.3	46.0	91.0	90.9	72.6*	16.7*	8.55	5.87	8.39	38.4*
1921	16.0*	39.4	70.5	134	242	384	331	269	52.0	9.16	8.21	6.72	126*
1922	15.2	29.3	86.9	25.1*	31.5	66.0	211	259	35.4	4.77	4.71	4.78	64.7*
1923	8.71	12.7	38.5	248	64.0	198	259	110	20.1	0.64	5.39	4.47	73.4
1924	12.9	15.7	45.1	37.8	181	71.3	73.8	30.1	8.88	5.65	5.65	6.04	40.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909						88	249	121	26	12	12	14	
1910	15	19	144	67	124	306	211	56	30	23	13	13	13
1911	22	26	40	32	26	25	144	140	39	16	13	13	13
1912	14	17	21	17	62	44	178	71	16	12	11	12	11
1913	12.4	18.8	30.2	46.8	45.8	66.0	96.0	171	32.0	17.0	14.0	14.0	12.4
1914	17.6	25	29	29	121	222	204	124*	48	16.5	10.8	10.9	10.8
1915	21.7	32	23	3.5	27	86		51	28	8	5.9	6.7	3.5
1916	10.0	19.7				133	424	235	126	35	20	17.4	10.0
1917	17.5	27	26			31	64	221	42	18.7	13.7	14.2	13.7
1918	14.0	17.8	23			58		55	21	13.0	11.0	11.0	11.0
1919	12.5	17.8	19.2	17.1	38	33	195	55	18.0	13.4	12.1	12.9	12.1
1920	14			37	33	40	63	32*	8.6	4.7	3.2	4.4	3.2
1921	14*	18	33	43	43	146	241	121	25	5.5	6	8	5.5
1922	11		41				87	90	7	3.1	3.1	3.4	3.1
1923	7	9			39	70	183	42	4	3	4	3	3
1924	8.5	13	15	27	94	54	44	7.0	4.8	4.8	4.8		

* Estimated.

Toppenish Creek near Fort Simcoe, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30		CALENDAR YEAR				
	Momentary maximum Dis-charge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1909							
1910	1,260†	Mar. 3, 1910	13	175	127,000	151	109,000
1911	450†	Mar. 31, 1911	13	81.5	59,100	76.4	55,800
1912	373†	April 11, 1912	11	67.6	49,300	72.7	52,800
1913	530†	April 21, 20, 1913	12.4	98.2	69,700	92.6	67,000
1914	1,000†	Jan. 6, 1914	10.8	141	102,000	143	104,000
1915			3.5	56.4	40,300	60.6	43,900
1916	1,680	May 4, 1916	10.0	214	155,000	208	161,000
1917	585	May 11, 1917	13.7	72.9	52,700	82.1	59,400
1918	1,000	Dec. 18, 1917	11.0	76.5	55,300	65.2	47,200
1919	1,630	Jan. 23, 1919	12.1	76.2	55,100	76.4	55,800
1920	390	Mar. 14, 1920	3.2	38.4	27,900	44.2	32,100
1921	1,070	Dec. 30, 1920	6.5	120	91,000	126	91,000
1922	532	May 18, 1922	3.1	64.7	46,800	58.7	42,500
1923	1,030†	Jan. 7, 1923	3	73.4	53,100	74.5	53,900
1924	340†	Feb. 13, 1924		40.5	29,400		

† Maximum observed.

Simcoe Creek below Spring Creek, near Fort Simcoe, Wash.

Location.—Lat. 46°23'40", long. 120°48'30", in sec. 34, T. 11 N., R. 16 E., on left bank just downstream from Spring Creek, 4 miles northeast of Fort Simcoe, and 4 miles west of White Swan.

Drainage area.—81.5 sq. mi. At site prior to November 1915, 79.9 sq. mi.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 1,150 ft. (from topographic map). Prior to Nov. 20, 1915, staff or chain gages 600 ft. upstream and above Spring Creek at different datum.

Average discharge.—14 years (1909-23), 28.6 cfs.

Extremes.—1909-23: Maximum discharge observed, 1,750 cfs Mar. 1, 1910 (gage height, 7.2 ft.); no flow Sept. 13 to Oct. 10, 1909, Sept. 30, 1923.

Remarks.—Several diversions for irrigation above station. Simcoe Creek flume diverted up to 8 cfs past station after April 1920. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909						61.9	63.5	58.9	12.6	1.59	0.10	0.04	.....
1910	.47	21.9	36.0	121	60	852	108	46.6	7.9	4.5	.83	.4	66.6
1911	1.41	3.5	5.5	4.0	6.9	26.8	43.3	44.2	28.2	3.3	1.6	1.0	14.1
1912	1.1	2.0	2.0	33.4	72.3	36.1	81.0	63.9	6.3	2.0	1.9	1.0*	25.0*
1913	1.90	3.20	4.61	16.8	33.3	21.5	108	36.1	14.6	3.61	1.87*	1.44*	25.4*
1914	6.87*	4.58*	4.74*	133*	94.7*	114*	129*	33.3*	3.70*	.51*	.66*	.82*	43.4*
1915	1.64*	6.07*	3.75*	4.75*	53.2*	85.5*	81.8	22.4	7.20	2.22*	.52*	.40*	22.2*
1916	.54*	.90*	29.7	16.7*	157	231	145	97.5	41.2	14.7	4.69	2.60	61.4*
1917	2.14	3.75	5.68	7.10	7.38	8.57	18.4	61.9	24.0	4.50	1.63	.65	12.2
1918	.25	.65	79.1	20.7*	48.8	40.2	46.5	25.1	8.19	3.15	1.04	.27	27.8*
1919	.35	1.36	3.02	47.8	35.4	50.6	64.6	31.0	7.84	3.43	1.25	.60	20.5
1920	.35	.90	2.07*	6.29*	9.43	15.3	18.7	15.4	3.13	.95	.15	.14	6.07*
1921	.10*	.28	9.56	57.1	99.2	102	76.1	61.9	15.8	3.24	1.88	.66	35.3*
1922	.67	1.56	36.4	13.1	13.2	27.0	66.4	62.9	9.11	3.07	1.10	.16	18.8
1923	.20	.91	2.10	72.6	22.2	46.1	67.6	40.5*	5.62	3.43	.90	.51	21.9*

* Estimated.

YAKIMA RIVER BASIN

Simcoe Creek below Spring Creek, near Fort Simcoe, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909						35	49	35	3	0.1	0	0	
1910	0	0.7	2S	11	25	114	89	17	4	4	.4	.4	0
1911	.4	2	4	4	4	7	2S	36	7	2	1	1	.4
1912	1	2	2	2	30	24	66	13	2	2	1	1	1
1913	1	3	3	13	14	14	23	74	6	1		.3	.3
1914	3	3	4	5	2	40	50	3	2	.3	.1	.3	.1
1915	.4	2.4	2.4	4.2	7.4*	53	53	11.5	2.7	.9*	.4	.4	.4
1916	.5	.2	2.3		19	65	64	52	24	8.3	3.4	1.7	.2
1917	1.7	2.3			6.6	7.5	7.5	28	7.0	2.9	.7	.3	.3
1918	.2	.3	2.5	25	29	29	31	13.4	4.8	2.2	.3	.2	.2
1919	.2				25	32	45	13.4	5.0	2.4	.6	.3	.2
1920	.3	.4		3.2	8.9	10.0	14.9	6.5	1.8	.2	.1	.1	.1
1921		.2	.2	22	22	65	53	32	6.8	1.7	1.0	.5	.....
1922	.4	.4	13	3.8	10	14	33	31	3.8	2.0	.2	.1	.1
1923	.1	.5	1.3	3.8	15	34	48	10	3.0	1.3	.5	.1	.1

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1909	95†	Mar. 29, 1909	0				
1910	1,750†	Mar. 1, 1910	0	66.6	47,900	62.2	45,000
1911	86†	June 13, 14, 1911	.4	14.1	10,300	13.7	9,830
1912	142†	Feb. 17, 18, 1912	1	25.0	18,200	25.4	18,400
1913	156†	Apr. 25, 26, 1913	.3	25.4	18,400	26.1	18,900
1914	462†	Jan. 7, 1914	.1	43.4	31,500	43.1	31,200
1915	192†	Mar. 1, 1915	.4	22.2	16,700	23.9	17,300
1916	73†	Feb. 10, 1916	.2	61.4	44,600	59.8	43,400
1917	131	May 23, 29, 1917	.3	12.2	7,820	18.0	13,000
1918	206	Dec. 30, 1917	.2	27.3	20,100	21.4	15,500
1919	379	Jan. 23, 1919	.2	20.5	14,300	20.4	14,800
1920	30	May 10, 1920	.1	6.07	4,390	6.63	4,800
1921	296	Feb. 13, 1921	.....	35.3	25,500	37.7	27,300
1922	357	Dec. 1, 1921	.1	18.6	13,600	15.8	11,400
1923	.....	.....	.1	21.9	15,900	.....	.....

* Estimated.

† Maximum observed.

Toppenish Creek near White Swan, Wash.

Location.—Lat. 46°22'30", long. 120°37'10", in sec. 7, T. 10 N., R. 18 E., on left bank, 1,000 ft. downstream from confluence with Simcoe Creek, 5½ miles east of White Swan, and 11 miles southwest of Wapato.

Drainage area.—409 sq. mi.

Supplemental records available.—October 1911 to March 1912, gage heights and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 820 ft. (from topographic map).

Extremes.—1909-11: Maximum discharge, 1,480 cfs Mar. 3, 1910 (gage height, 20.9 ft., from graph based on gage readings); minimum observed, 8.8 cfs Oct. 12, 1910 (discharge measurement).

Remarks.—Numerous small diversions for irrigation above station.

YAKIMA RIVER BASIN

Toppenish Creek near White Swan, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							332*	248			30.1	26.1	
1910					287	907	462	170	61.5	46.3	18.7	11.0	
1911	11.0	12.2	26.2	28.3	41.6	133	247	238	113	29.2	14.1	11.6	75.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909							264	137			26	26	
1910					188	523	320	81	51	36	11	11	
1911	11	11	18	26	36	46	179	189	58	18	11	11	11

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR	
YEAR	Maximum observed		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis charge	Date						
1909								
1910	1,480	Mar. 3, 1910						
1911	396	April 2, 1911	11	75.9	54,600			

Toppenish Creek at Alfalfa, Wash.

Location.—Lat. 46°18'50", long. 120°13'00", in sec. 32, T. 10 N., R. 21 E., on right side of highway bridge, 300 ft. upstream from railroad bridge, 1 mile southeast of Alfalfa, and 2½ miles upstream from mouth.

Drainage area.—580 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 690 ft. (from topographic map).

Extremes.—1909-12: Maximum discharge observed, 1,600 cfs Mar. 22, 23, 1910 (gage height, 4.6 ft.); minimum observed, 28 cfs Aug. 8, 1910 (gage height, 0.4 ft.).

Remarks.—Many diversions above station utilize a major part of the natural flow for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909						356	459	387	287	160	153	92.6	
1910	125	300	451	446	513	1,130	537	298	115	56.9	46.4	66.5	340
1911	82.8	144	214	182	193	215	297	325	249	113	82.0	92.2*	182*
1912	159	176	165	199	297	209	354	413	278	205	177	229	238

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909						300	406	296	173	128	110	77	
1910	77	95	262	139	360	678	350	184	72	46	28	46	28
1911	72	72	184	160	184	184	154	270	162	94	69		
1912		162	142	141	226	110	265	344	212	181	167	191	

* Estimated.

YAKIMA RIVER BASIN

Toppenish Creek at Alfalfa, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Maximum observed		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1909.....	766	May 2, 1909					
1910.....	1,600	Mar. 22, 23, 1910	28	340	246,000	303	220,000
1911.....	400	May 26, 1911		182	132,000	187	185,000
1912.....	495	May 23, 1912		238	173,000		

Satus Creek near Toppenish, Wash.

Location.—Lat. 46°14'20", long. 120°24'40", in NW ¼ sec. 26, T. 9 N., R. 19 E., on left bank, 1 mile upstream from Dry Creek, 4 miles downstream from Logy Creek, and 10½ miles southwest of Toppenish.

Drainage area.—271 sq. mi.

Gage.—Staff gage. Altitude of gage is 950 ft. (from topographic map).

Extremes.—1908-13: Maximum discharge, 2,950 cfs probably Feb. 18, 1913 (gage height, 6.5 ft., from high-water mark), from rating curve extended above 700 cfs; minimum observed, 7 cfs Aug. 27, 28, 1927.

Remarks.—Entire flow of Satus Creek is diverted for irrigation above Lazy Creek during each summer. Return flow reenters stream above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....			36.4*	133*	173*	168*	170*	155*	110*	38.0*	21.9*	16.6*	.....
1910.....	29.0*	146*	222*	390*	237*	578*	229*	165*	04.9*	29.6*	16.2*	21.2*	177*
1911.....	30.5*	59.0*	125*	73.9*	73.4*	196*	175*	158*	88.2*	18.9*	18.8*	18.6*	88.4*
1912.....	21.5*	31.6*	32.4*	165*	244*	123*	215*	217*	112*	32.7*	18.5*	18.2*	102*
1913.....	21.9*	67.2*	61.5*	266*	225*	134*	236*	211*	176*				

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....			32	41	67*	142	142*	142	52*	30	15*	15	.....
1910.....	22	40	100	49	141	277	210	119	49	25	11	16	11
1911.....	25	36	80	49	40	56*	92	115	35*	10	7	9*	7
1912.....	15	29	29	20*	128*	97	169	169	59	22	16	16	15
1913.....	17*	26*	44	175*	129*	96*	180*	155*	87*				

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1909.....	538†	Feb. 17, 1909				115	83,200
1910.....			11	177	128,000	162	117,000
1911.....			7	86.4	62,600	75.5	64,700
1912.....	520†	Feb. 17, 1912	15	102	73,300	102	73,300
1913.....	2,950†	Feb. 18, 1913					

* Estimated.

† Maximum observed.

YAKIMA RIVER BASIN

Satus Creek below Dry Creek, near Toppenish, Wash.

Location.—Lat. 46°15'00", long. 120°22'40", in sec. 24, T. 9 N., R. 19 E., on left bank at dam site, 1 mile downstream from Dry Creek, 6 miles downstream from Logy Creek, and 9 miles southwest of Toppenish.

Drainage area.—434 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 880 ft. (from topographic map).

Average discharge.—11 years (1913-24), 125 cfs.

Extremes.—1913-24: Maximum discharge, 3,870 cfs Dec. 22, 1915 (gage height, 9.15 ft., from high-water mark in well), from rating curve extended above 1,600 cfs; minimum, 1.9 cfs Sept. 4, 5, 1924 (gage height, 1.19 ft.).

Remarks.—Entire flow of Satus Creek above Lazy Creek is diverted for irrigation each summer. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913										30.9*	15.8*	14.8*	131*
1914	19.1	28.2	31.6	300	226	446	264	168	57.7	18.4*	9.51	11.4	131*
1915	20.9*	32.1	20.5	31.0	113	342	212	94.9	31.2	13.4	8.35	9.99	77.7*
1916	12.8*	24.0	373	218	714	780	482	284	249	119	34.4	24.2	275*
1917	30.5	35.0	40.1	51.5	61.1	77.6	300	293	193	44.7	15.0	13.8	101
1918	15.7	24.6	338	315*	263*	252	169	122	40.5	16.6	13.7*	14.9	132*
1919	18.3	32.6	49.5*	360*	192	309	362	208*	77.4	21.5	13.4	18.3	138*
1920	29.1	46.9	50.0*	120*	88.5*	118	127	90.5	34.6	11.1	9.33	11.4	61.3*
1921	14.3	43.1	109	245	439*	409	196	170	99.7	23.9	13.8	14.8	146*
1922	28.1	50.5	160	44.8*	64.7	219	351	218	105	18.3	11.6	10.5	109*
1923	19.1*	25.3*	81.9*	569*	138	271	247	167	94.9*	33.6	21.0	18.3	142*
1924	17.8	30.0*	73.3	77.6	365	88.5	65.5	48.7	18.2*	9.20*	7.10	6.48	66.0*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913										22*	13	13	8.0
1914	15.0	23.5	29.4	35.2	90	204	182	102	28.5	12.3	8.0	9.4	8.0
1915	13	25	15	26	34	226	130	59	17	10	7.2	8.2	7.2
1916	10	16	30	71		298	307	216	174	57	23	21	10
1917	24	22	28		31	36	150	224	98	22	12	12	12
1918	13	21	26			128	133	73	22	12			
1919		23	28			152	247		38	15	11	13	11
1920	22				49	54	81	48	20	8.5	8.2	9.9	8.2
1921	9.6	19	35	99	97	215	150	131	40	10	13	14	9.6
1922	15		76			57	203	166	34	14	10	9	9
1923	12			124	115	164	164	119	53*	22	19	17	12
1924	15			72	144	59	59	26			3.3	2.0	2.0

* Estimated.

YAKIMA RIVER BASIN

Satus Creek below Dry Creek, near Toppenish, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1913.....							
1914.....	997	Feb. 27, 1914	8.0	131	95,100	131	95,200
1915.....	1,000	Mar. 16, 1915	7.2	77.7	56,300	108	76,500
1916.....	3,370	Dec. 22, 1916	10	275	199,000	249	181,000
1917.....	635	Mar. 29, 1917	12	101	73,200	124	39,900
1918.....	1,320	Dec. 19, 1918		132	95,500	108	78,400
1919.....	2,160	Jan. 23, 1919	11	135	100,000	140	102,000
1920.....	548	Mar. 14, 1920	8.2	61.3	44,500	64.7	47,000
1921.....	2,400	Feb. 11, 1921	9.6	146	106,000	155	112,000
1922.....			9	109	78,800	97.1	70,300
1923.....	3,400	Jan. 6 or 7, 1923	12	142	102,000	141	102,000
1924.....	1,430	⊙	2.0	66.0	48,000		

⊙ Exact date not known, occurred between Feb. 1 and 13, 1924.

Yakima River near Mabton, Wash.

Location.—Lat. 46°13'00", long. 119°55'10", in SE¼ sec. 34, T. 9 N., R. 23 E., on left bank at Rocky Ford rapids, 2,000 ft. upstream from Mabton-Grandview highway bridge, 3 miles south of Grandview, and 4 miles east of Mabton.

Drainage area.—5,380 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 630 ft. (from topographic map). June 26 to July 31, 1911, staff gage 2,000 ft. downstream at different datum.

Extremes.—1911-14: Maximum discharge observed, 3,190 cfs July 1, 1911; maximum gage height observed, 7.90 ft. Oct. 15-18, 1913; minimum discharge observed, 258 cfs Aug. 20, 21, 1911; minimum gage height observed, 2.90 ft. July 26, 1911.

Remarks.—Natural flow of stream affected by storage in five reservoirs and by diversions above station for irrigation above and below station and by return flow from irrigated areas (see Yakima River at Kiona, p. 663).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....										1,460	321	1,020	
1912.....											551	1,040	
1913.....										1,900	671	781	
1914.....	2,500									1,100	324	805	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911.....										491	258	276	
1912.....											479	651	
1913.....										1,316	420	400	
1914.....	653									350	315	390	

YAKIMA RIVER BASIN

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Yakima River near Prosser, Wash.

Location.—Lat. 46°13'00", long. 119°45'00", in SE¼ sec. 36, T. 9 N., R. 24 E., on right bank, ¼ miles northeast of Prosser and ¼ miles downstream from Prosser Falls.

Drainage area.—5,440 sq mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. (from topographic map). Prior to Jan. 31, 1906, chain gage 600 ft. downstream from Prosser Falls, ¼ miles upstream at different datum. Feb. 1 to Oct. 12, 1906, staff gage at approximately same site at different datum.

Average discharge.—20 years (1905-6, 1913-32), 3,270 cfs.

Extremes.—1904-6, 1913-32: Maximum discharge, 53,800 cfs Dec. 31, 1917 (estimated by comparison with records for Yakima River near Parker); minimum observed, about 40 cfs Aug. 13, 19, 26, 30, 31, Sept. 30, 1906.

Flood of Nov. 17, 1906 reached a stage of about 20.2 ft. on basis of gage-height relationship extended above 11.0 ft. (discharge, 62,800 cfs result of float measurement). Flood of December 1933 known to be higher.

Remarks.—Natural flow of stream affected by storage in five reservoirs and by diversions above station for irrigation above and below station and by return flow from irrigated areas (see Yakima River at Kiona, elsewhere in this report).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904							16,700*	13,800*	11,500	5,510	658	282	.....
1905									7,140	1,670	264	314	.....
1906	2,270	1,770	1,540	1,770	4,150	3,880	9,130	6,580	3,600	1,080	106	98	2,980
1913													761
1914	2,260	2,450	2,620	4,380	2,880	6,340	7,860	8,060	4,490	1,220	399	858	3,660
1915	1,680	4,320	2,710	1,600	1,630	4,160	7,140	1,950	689	404	354	333	2,240
1916	438	2,170*	2,340*	1,940*	3,710*	10,200*	12,400	13,100	14,800	10,500	2,160	1,540	6,270*
1917	1,350	1,760*	1,700*	1,620*	2,030*	1,788*	3,030	9,370	12,500	6,580	1,150	995	3,660*
1918	934	1,800*	11,300*	15,200*	4,900*	3,700*	5,460	4,990	5,740	1,050	927	835	4,740*
1919	1,330	2,560*	4,730*	5,660*	3,990*	3,530*	6,990	6,830	4,900	1,730	919	1,150	3,690*
1920	1,170	2,330	2,530	3,400	3,040	2,540	1,670	1,650	1,600	1,150	972	1,690	2,000
1921	3,000	2,760	2,530	5,190	6,100	8,980	6,260	10,000	10,100	2,650	1,550	1,670	5,070
1922	1,630	2,170	7,390	2,500	1,540	1,670	4,150	6,570	6,870	1,500	1,340	1,100	3,210
1923	1,110	1,430	1,900	5,640	2,520	3,150	7,730	7,220	5,610	2,720	1,740	1,450	3,530
1924	1,640	1,620	2,690	2,520	7,400	3,850	2,290	6,540	1,910	1,100	1,100	1,040	2,800
1925	1,100	2,080	4,300	2,910	5,010	3,900	6,440	8,920	3,740	1,500	1,460	1,770	3,580
1926	1,260	1,560	2,620	2,440	2,810	3,830	2,690	1,450	1,210	940	931	832	1,880
1927	1,440	2,190	3,640	2,500	3,430	3,960	4,790	6,370	9,200	1,700	1,390	2,260	3,590
1928	3,400	4,800	7,220	6,830	3,850	5,170	4,560	8,240	2,390	1,490	1,260	1,530	4,300
1929	1,060	1,750	1,490	1,360	1,360	2,316	1,440	3,360	3,020	1,210	1,100	1,260	1,780
1930	1,160	1,180	1,310	1,330	2,670	2,890	4,110	1,830	1,360	1,160	1,110	1,140	1,770
1931	1,220	1,480	1,420	1,380	2,020	1,370	1,430	3,960	1,510	1,020	832	906	1,550
1932	976	1,970	1,480	2,400	2,930	7,600	5,850	6,570	6,380	1,520	1,080	679	3,160
1933	686	2,960	3,760	4,320	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

YAKIMA RIVER BASIN

Yakima River near Prosser, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904									7,750*	1,610	230	250	
1905									4,230	454	175	175	
1906	481	1,460	1,200	1,220	2,720	3,160	7,740	3,010	1,320	230	40	40	40
1913													413
1914	596	1,940	1,990	1,940	2,340	4,290	4,990	5,170	2,100	454	332	454	332
1915	541	2,440	1,840	1,140	1,420	2,330	2,330	1,230	359	358	307	301	301
1916	317						7,970	8,200	10,200	4,120	1,080	1,340	317
1917	959						1,620	3,930	9,510	1,650	836	660	660
1918	563						3,820	2,250	2,430	753	765	699	563
1919	1,010						4,950	3,520	3,300	946	795	914	785
1920	920	1,520	1,570	2,090	2,260	1,980	955	760	730	701	709	920	701
1921	1,700	1,760	1,920	2,860	2,520	6,760	4,440	3,080	5,740	1,520	1,390	1,160	1,180
1922	1,220	1,520	3,120	2,050	1,380	1,240	2,520	3,220	2,200	1,390	1,030	920	920
1923	992	1,260	1,310	2,860	1,670	2,060	4,440	2,860	2,060	1,480	1,440	1,140	992
1924	1,180	1,310	1,980	1,570	4,280	2,460	1,440	2,390	810	850	880	845	810
1925	810	1,610	1,980	2,150	3,620	2,830	2,500	2,760	2,900	1,210	1,250	1,340	810
1926	1,030	1,490	1,490	1,890	1,890	2,540	1,070	1,070	158	855	855	730	730
1927	661	1,530	2,350	2,050	2,350	3,300	2,740	3,420	3,990	1,270	1,220	1,490	661
1928	2,540	2,540	3,760	2,480	3,020	2,670	2,950	3,160	1,630	1,070	1,110	1,220	1,070
1929	1,140	1,530	1,850	1,070	1,220	1,630	742	1,180	1,970	953	993	1,110	742
1930	1,030	1,110	1,140	1,160	1,850	1,530	2,480	1,310	1,110	1,030	1,030	1,030	1,030
1931	1,030	1,350	1,180	1,140	1,440	851	838	1,440	988	854	763	825	763
1932	756	1,680	1,100	1,340	1,390	3,990	2,740	3,510	2,443	1,060	950	302	302
1933	180	1,100	2,660	2,660									

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Dis-charge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1904							
1905							
1906	11,700	April 24, 1906	40	2,980	2,160,000		
1913							
1914	11,300	April 17, 1914	332	3,660	2,650,000	3,770	2,780,000
1915	14,200	April 5, 1915	301	2,240	1,620,000	1,930	1,400,000
1916	24,000	May 7, 1916	317	6,270	4,550,000	6,260	4,540,000
1917	18,200	June 1, 1917	660	3,660	2,650,000	4,440	3,220,000
1918	53,600*	Dec. 31, 1917	563	4,740	3,440,000	4,280	3,110,000
1919			795	3,690	2,670,000	3,470	2,520,000
1920	6,590	Jan. 20, 1920	701	2,000	1,450,000	2,190	1,590,000
1921	18,300	May 21, 1921	1,180	5,070	3,670,000	5,300	3,840,000
1922	32,000	Dec. 15, 1921	920	3,210	2,330,000	2,650	1,920,000
1923	12,760	May 11, 1923	992	3,530	2,550,000	3,650	2,640,000
1924	16,900	Feb. 15, 1924	810	2,800	2,030,000	2,630	2,120,000
1925	15,560	May 22, 1925	810	3,580	2,470,000	3,410	2,470,000
1926	6,250	Mar. 17, 1926	730	1,880	1,360,000	2,030	1,470,000
1927	16,000	June 10, 1927	661	3,690	2,590,000	4,280	3,100,000
1928	18,400	Jan. 15, 1928	1,070	4,300	3,150,000	3,410	2,470,000
1929	6,690	May 25, 1929	742	1,780	1,290,000	1,680	1,310,000
1930	7,520	Mar. 31, 1930	1,030	1,770	1,250,000	1,810	1,310,000
1931	8,720	May 5, 1931	763	1,550	1,120,000	1,570	1,140,000
1932	18,300	Mar. 1, 1932	302	3,160	2,200,000	3,410	2,480,000
1933	8,540	Nov. 19, 1932					

* Estimated.

Yakima River at Kiona, Wash.

Location.—Lat. 46°15'10", long. 119°28'50", in sec. 19, T. 9 N., R. 27 E., on left bank just upstream from highway bridge at Kiona, 3½ miles downstream from intake of Kiona Canal, and 25 miles upstream from mouth.

Drainage area.—5,600 sq. mi.

Supplemental records available.—August to December 1895, gage heights only. Records of chemical analyses since December 1952 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is 454.41 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 31, 1915, several staff or chain gages at approximately same site and datum. Feb. 6, 1933, to July 26, 1934, steel tape gage at same site and datum.

Extremes.—1896-1915, 1933-53: Maximum discharge, 67,000 cfs Dec. 23, 1933 (gage height, 21.57 ft., from high-water marks); minimum observed, 105 cfs Sept. 11, 1906 (gage height, 2.35 ft.).

Remarks.—Natural flow of stream affected by diversions (approximately 425,000 acres irrigated above station), and by Keechelus, Kachess, Cle Elum, and Bumping Lakes, and Tieton Reservoir (see elsewhere in this report), power development, ground-water withdrawals and return flow from irrigated areas. Mean flow of Kiona Canal, which bypasses station, is approximately 23 cfs during irrigation season.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1896											1,510	917	
1897	790	6,560	9,100	4,620	3,990*	3,300	13,000	15,700	7,420	3,380	1,030	771	5,310*
1898	740	5,240	5,170	4,320	8,100*	5,200	7,460	12,900	9,910	3,240	1,240	695	5,330*
1899	1,190	1,840	1,790	5,310	5,400	3,180	4,980	9,430	13,500	9,040	3,240	1,670	5,040
1900	1,650	4,460	7,770	7,910	3,960	7,560	7,500	6,400	3,360	1,220	515	626	4,410
1901	1,190	4,210	9,390	6,890	6,300	11,800	7,420	14,000	8,770	3,480	1,050	481	6,260
1902	643	3,200	4,320	6,410	3,660	4,280	6,870	13,400	7,420	4,240	1,010	303	4,850
1903	895	2,130	2,920	6,940	2,950	4,020	7,430	12,800	18,200	5,190	1,120	924	5,450
1904	3,010	2,980	5,000	3,140	2,230	3,800	15,800	13,900	10,700	4,650	551	232	6,490
1905	620	1,890	3,170	2,130	1,970	8,480	5,000	4,720	7,140	1,760	240	304	3,120
1906	2,470	1,860	1,710	1,850	3,840	3,710	9,400	6,620	3,440	923	172	162	3,000
1907	1,120	12,400	5,010	3,080	7,770	6,220	9,000	13,700	7,970	2,190	350	593	5,750
1908	437	1,100	2,590	2,180	1,690	6,010	7,950	8,420	9,920	6,070	965	630	4,050
1909	613	1,740	1,680	2,460	2,580	3,030	4,500	7,030	9,200	2,430	545	285	3,060
1910	640	8,570	8,810	3,950	3,780	15,200	12,200	11,500	4,950	1,060	408	399	5,970
1911	1,970	5,370	3,750	2,380	1,740	3,300	4,690	6,530	7,790	1,560	380	1,110	3,380
1912	912	3,820	3,220	3,390	4,760	3,060	6,080	10,600	7,350	1,550	623	1,040	3,850
1913	898	2,540	2,240	2,510	4,270	4,000	6,830	10,300	12,360	3,730	649	726	4,260
1914	2,230	2,210	2,370	4,210	2,610	6,300	7,960	7,990	4,290	1,160	405	862	3,590
1915	1,550	4,260	2,520	1,520	1,590								
1933						3,280	4,480	5,940	10,500	5,110	1,600	2,580	
1934	2,988	4,133	17,330	14,100	9,617	6,502	8,865	4,503	1,307	1,063	1,244	1,404	6,085
1935	2,107	4,508	3,771	6,367	7,916	3,749	2,737	5,826	6,644	1,718	1,344	1,675	4,000
1936	2,328	1,961	1,546	1,879	1,450	3,115	5,851	10,330	7,976	1,434	1,185	1,416	3,373
1937	1,371	1,784	1,638	1,355*	1,400*	2,700	3,430	3,055	9,552	2,597	1,551	1,861	2,684*
1938	1,686	2,692	3,769	4,886	3,384	5,671	7,824	8,927	7,041	1,730	1,469	1,490	4,231
1939	1,895	2,143	2,216	2,491	1,839	2,890	2,472	3,178	2,389	1,348	1,357	1,475	2,144
1940	1,594	1,704	2,129	1,702	2,854	4,155	3,067	4,712	1,893	1,332	1,393	1,593	2,340

* Estimated.

YAKIMA RIVER BASIN

Yakima River at Kiona, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	1,815	1,958	2,370	2,002	2,235	2,860	2,076	1,273	1,392	1,228	1,318	1,622	1,848
1942...	1,985	2,187	3,091	1,920	2,366	2,241	2,101	1,925	1,845	1,512	1,435	1,568	2,013
1943...	1,685	2,510	3,259	3,411	3,332	3,516	3,779	4,829	8,120	3,109	1,655	1,487	3,796
1944...	1,860	2,158	2,160	1,536	1,636	1,743	1,026	1,339	1,840	1,394	1,410	1,552	1,642
1945...	1,569	1,926	1,719	2,432	2,838	1,714	1,480	3,153	2,876	1,389	1,636	1,560	2,021
1946...	1,658	2,228	2,319	3,098	2,211	3,585	4,233	8,775	7,281	2,345	1,541	1,973	3,442
1947...	2,167	3,238	7,011	3,567	4,366	4,768	4,064	6,828	3,765	1,585	1,520	1,848	3,762
1948...	2,794	4,286	5,432	2,938	3,432	3,417	3,782	9,150	16,470	2,350	1,867	1,864	4,820
1949...	2,464	2,584	4,270	2,543*	2,965	6,615	8,325	9,148	7,299	1,785	1,864	2,350	4,354*
1950...	4,252	4,402	4,213	2,418*	3,605*	6,562	6,630	7,841	11,430	5,100	1,911	2,118	5,039*
1951...	3,598	5,855	9,015	7,031	10,080	6,908	7,150	3,101	6,722	1,830	1,722	1,961	5,801
1952...	2,811	2,739	2,747	2,125	3,656	3,809	3,144	3,740	3,275	1,912	1,692	1,899	2,775
1953...	1,976	1,843	1,678	4,681	5,625	2,714	2,154	4,012	5,999	2,373	1,837	1,761	3,030

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1896											990	830	
1897	780	850	2,880	2,960	2,960	2,330	4,100	11,300	4,990	1,440	780	680	680
1898	648	533	2,510	1,769	2,000	3,120	3,120	9,400	5,500	1,940	780	612	612
1899	916	1,160	813	2,030	3,310	2,580	2,720	4,910	10,600	5,330	2,130	1,220	813
1900	1,090	1,330	2,890	4,370	2,100	3,660	4,560	3,580	2,460	663	450	525	450
1901	749	2,380	5,430	4,040	3,590	7,000	5,830	8,470	5,230	1,830	525	465	465
1902	525	940	1,770	560	1,990	3,630	4,160	10,100	6,060	2,290	262	224	224
1903	641	1,170	1,760	3,900	2,420	2,700	4,740	9,320	11,100	2,150	655	320	320
1904	1,070	2,820	2,700	2,150	1,900	1,900	3,400	10,100	6,770	1,350	205	205	205
1905	355	620	2,080	1,250	1,120	4,440	3,320	3,650	3,890	440	142	142	142
1906	680	1,560	1,450	1,250	2,490	3,050	7,490	3,000	1,670	228	120	105	105
1907	228	2,160	3,560			4,540	4,540	9,590	5,550	620	245	250	228
1908	245	355	1,670	1,560	1,070	1,780	3,990	7,270	5,760	1,840	315	391	245
1909	298	805	1,370	1,420	1,730	2,050	3,430	4,080	5,020	564	252	123	123
1910	210	714	3,850	2,500	2,930	4,900	8,980	8,150	2,000	410	110	251	110
1911	363	2,140	2,680	1,900	1,350	1,380	2,960	5,000	3,990	189	250	306	189
1912	712	1,040	2,270	1,290	3,920	2,400	4,230	6,000	4,280	684	510	522	510
1913	605	1,250	1,710	2,050	2,050	3,170	3,330	4,580	7,000	1,930	305	285	285
1914	670	1,710	1,710	1,600	2,050	4,350	4,860	5,040	1,930	475	325	448	325
1915	725	2,300	1,410	1,000	1,890	2,270							
1923						2,680		2,360	4,000	7,400	2,420	1,220	1,500
1924	1,080	3,180	4,300	8,850	4,850	4,200	5,360	2,300	732	613	1,060	1,240	732
1925	1,180	3,270	3,050	2,360	4,680	2,500	1,560	2,560	2,770	1,230	1,140	1,450	1,140
1926	1,480	1,620	1,350	1,460	1,200*	2,100	1,920	5,190	1,800	1,180	1,100	1,150	1,100
1927	1,270	1,576	1,460	1,100*	1,300*	2,040	1,920	1,410	4,850	1,270	1,270	1,570	1,100*
1928	1,360	1,969	2,840	3,960	2,986	3,420	4,040	4,360	3,200	1,320	1,270	1,360	1,270
1929	1,570	1,860	1,860	1,920	1,820	1,620	1,320	1,460	1,180	1,180	1,140	1,360	1,140
1929	1,410	1,620	1,570	1,460	1,576	2,980	1,270	2,980	1,030	1,060	1,270	1,360	1,030
1941	1,460	1,740	1,860	1,680	1,960	1,080	840	870	1,100	1,100	1,060	1,270	840
1942	1,320	1,860	2,100	1,620	1,740	1,460	1,060	1,060	1,360	1,270	1,270	1,410	1,060
1943	1,360	1,980	2,500	2,360	2,560	2,170	5,190	2,560	5,530	1,460	1,410	1,360	1,360
1944	1,410	1,860	1,860	1,360	1,410	1,220	730	930	1,360	1,220	1,270	1,360	730
1945	1,360	1,620	1,330	1,360	1,680	1,220	1,030	1,270	1,270	1,180	1,360	1,460	1,030
1946	1,360	1,860	1,650	2,100	1,920	2,690	2,550	3,370	2,830	1,600	1,360	1,760	1,360
1947	1,700	2,360	3,640	1,020	2,900	3,120	2,420	3,880	1,360	1,360	1,260	1,650	1,260
1948	1,810	3,270	3,960	2,290	2,040	2,550	1,860	1,860	5,030	1,700	1,650	1,650	1,550
1949	1,800	2,180	2,960	1,300*	1,290*	4,670	5,120	2,890	2,360	1,420	1,050	1,160	1,290*
1950	2,480	2,890	2,620	1,660*	1,980*	4,840	3,780	3,700	5,820	2,020	1,700	1,850	1,660*
1951	2,420	4,500	6,250	5,400*	5,400*	6,070	3,550	2,550	2,750	1,550	1,600	1,650	1,550
1952	2,220	2,350	2,200	1,750	2,740*	2,860	1,750	1,790	1,730	1,300	1,430	1,630	1,390
1953	1,650	1,620	1,620	1,620	3,140	2,060	1,240	2,140	2,670	1,420	1,500	1,500	1,240

* Estimated.

YAKIMA RIVER BASIN

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Yakima River at Kiona, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis charge	Date					
1896							
1897	38,000	Nov. 18, 1896	680	5,810	4,200,000	5,360	3,880,000
1898	23,100	Feb. 17, 1898	012	5,330	3,860,000	4,800	3,480,000
1899	16,400	June 20, 1899	813	5,040	3,650,000	5,510	4,200,000
1900	19,000	Jan. 15, 1900	450	4,410	3,200,000	4,490	3,260,000
1901	26,400	Mar. 3, 1901	465	6,260	4,630,000	5,700	4,130,000
1902	16,900	May 13, 1902	224	4,650	3,370,000	4,460	3,230,000
1903	26,400	June 14, 1903	320	5,450	3,950,000	5,890	4,260,000
1904	32,000	April 17, 1904	205	5,490	3,900,000	5,050	3,660,000
1905	13,200	June 5, 1905	142	3,120	2,260,000	3,150	2,280,000
1906	11,800	April 24, 1906	105	3,000	2,170,000	4,030	2,920,000
1907	66,000	Nov. 17, 1906	228	5,750	4,160,000	4,560	3,300,000
1908	16,600	June 13, 1908	245	4,050	2,940,000	4,040	2,930,000
1909	18,000	June 5, 1909	123	3,060	2,210,000	4,220	3,000,000
1910	30,600	Nov. 26, 1909	110	5,970	4,320,000	5,390	3,900,000
1911	13,600	Nov. 23, 1910	189	3,350	2,450,000	3,120	2,260,000
1912	16,100	May 23, 1912	510	3,850	2,800,000	3,670	2,660,000
1913	20,900†	June 5, 1913	285	4,260	3,090,000	4,360	3,160,000
1914	11,300†	April 17, 1914	325	3,560	2,570,000	3,660	2,660,000
1915							
1933							
1934	67,000	Dec. 23, 1933	733	6,085	4,405,000	4,889	3,540,000
1935	18,100	Jan. 28, 1935	1,140	4,000	2,896,000	3,620	2,621,000
1936	14,100	May 16, 1936	1,100	3,373	2,449,000	3,288	2,385,000
1937	17,100	June 24, 1937	1,100	2,684	1,943,000	2,983	2,160,000
1938	15,500	April 21, 1938	1,270	4,231	3,064,000	4,058	2,936,000
1939	7,140	Mar. 27, 1939	1,140	2,144	1,552,000	2,082	1,507,000
1940	8,850	May 13, 1940	1,030	2,349	1,706,000	2,402	1,744,000
1941	4,520	April 3, 1941	840	1,843	1,334,000	1,938	1,403,000
1942	4,680	Dec. 5, 1941	1,060	2,013	1,457,000	2,028	1,468,000
1943	13,400	April 21, 1943	1,360	3,786	2,748,000	3,669	2,671,000
1944	3,960	Dec. 6, 1944	730	1,642	1,192,000	1,561	1,133,000
1945	8,470	June 2, 1945	1,030	2,021	1,403,000	2,104	1,523,000
1946	15,300	May 29, 1946	1,260	3,442	2,492,000	3,967	2,872,000
1947	15,100	Dec. 16, 1946	1,260	3,762	2,723,000	3,767	2,727,000
1948	57,000	May 31, 1948	1,550	4,820	3,499,000	4,554	3,306,000
1949	15,500	May 15, 1949	1,290	4,354	3,152,000	4,650	3,367,000
1950	15,000	June 28, 1950	1,660	5,039	3,648,000	5,511	3,990,000
1951	20,900	Feb. 13, 1951	1,550	5,801	4,200,000	4,946	3,581,000
1952	6,270	Mar. 23, 1952	1,390	2,775	2,014,000	2,540	1,844,000
1953	11,500	June 15, 1953	1,240	3,030	2,193,000		

† Maximum observed.

YAKIMA RIVER BASIN

Yakima River near Richland, Wash.

Location.—Lat. 46°15'10", long. 119°15'30", in sec. 24, T. 9 N., R. 28 E., near left bank on highway bridge, half a mile upstream from mouth, and 1 mile south of Richland.

Drainage area.—6,120 sq. mi., approximately.

Supplemental records available.—August to December 1907, August to December 1908, gage heights only.

Gage.—Staff gage. Altitude of gage is 335 ft. (from topographic map). July 28, 1906, to Oct. 31, 1909, staff gages each year during the low-water season at several sites between this and a site 2 miles upstream at ferry landing, all at different datums.

Extremes.—1906, 1909-11: Maximum discharge observed, 2,900 cfs Oct. 10, 1910; minimum, 8.0 cfs Aug. 18 to Sept. 24, 1906.

Remarks.—Natural flow of stream affected by four storage reservoirs, power development, ground-water withdrawals, diversions for irrigation of an estimated 200,000 acres above station in 1911, and return flow from irrigated areas.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906											24.6	10.7	
1909											268	140	
1910	530										124	176	
1911	1,790										111	821	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1906											8	8	
1909											64	38	
1910	375										33	35	
1911	240										40	103	

ESQUATZEL COULEE BASIN

Providence Coulee at Cunningham, Wash.

Location.—Lat. 46°49'20", long. 118°48'30", near township line in NW¼ sec. 4, T. 15 N., R. 32 E., on west side of Northern Pacific railroad tracks at Cunningham.

Drainage area.—27.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,160 ft. (from topographic map).

Extremes.—January to September 1953: No flow since establishment.

Remarks.—No known diversion or regulation above station.

Esquatzel Coulee at Connell, Wash.

Location.—Lat. 46°39'40", long. 118°51'40", in NE¼ sec. 36, T. 14 N., R. 31 E., on right bank 30 ft. downstream from Main Street in Connell.

Drainage area.—240 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 840 ft. (from topographic map).

Extremes.—January to September 1953: No flow since establishment.

Remarks.—No known diversion or regulation above station.

Esquatzel Coulee at Eltopia, Wash.

Location.—Lat. 46°27'40", long. 119°01'00", in SE¼ sec. 2, T. 11 N., R. 30 E., on left bank at upstream side of railroad bridge at Eltopia.

Drainage area.—394 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 580 ft. (from topographic map).

Extremes.—January to September 1953: No flow since establishment.

Remarks.—No known diversion or regulation above station.

GRANDE RONDE RIVER BASIN

Grande Ronde River at Zindel, Wash.

Location.—Lat. 46°03'50", long. 116°59'40", in SE¼ sec. 23, T. 7 N., R. 46 E., on left bank just downstream from Zindel Ferry, 1½ miles downstream from Joseph Creek, 2 miles upstream from mouth, and 12 miles southeast of Anatone.

Drainage area.—3,950 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 840 ft. (from topographic map).

Average discharge.—8 years (1904-12), 3,270 cfs.

Extremes.—1904-12: Maximum discharge, 34,600 cfs Mar. 4, 1910 (gage height, 10.7 ft., from graph based on gage readings); minimum observed, 280 cfs Jan. 11-14, 1909, result of freezeup.

Remarks.—Numerous diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904										3,310	1,050	787	
1905	871	781	802	1,010	1,150	2,720	3,320	3,900	3,510	1,240	697	584	1,730
1906	829	787	754	834	1,480	3,440	7,930	4,480	6,010	1,780	704	677	2,470
1907	756	2,980	3,680	2,730	9,100	6,870	11,900	8,590	5,820	3,400	1,160	929	4,770
1908	745	876	1,640	1,150	1,170	7,310*	7,850	4,660	5,270	2,310	637	859	2,870*
1909	1,130	999	801	1,460	1,800	3,440	4,770	5,220	6,720	2,360	914	667	2,530
1910	722	2,290	1,230	600	1,240	15,500	11,100	7,250	3,100	1,040	667	626	4,040
1911	824	1,860	2,040	1,330	1,420	4,700	3,370	5,850	5,800	2,060	780	620	2,600
1912	727	899	707	2,680	5,480	4,490	11,900	15,900	12,500	3,580	1,600	1,430	5,150
1913	1,530	2,320	1,100										

* Estimated.

GRANDE RONDE RIVER BASIN

Grande Ronde River at Zindel, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904										1,580	805	720	
1905	720	762	680	720	720	1,960	2,580	2,950	2,100	720	565	530	530
1906	780	720	565	720	762	1,330	5,850	2,760	2,760	720	565	640	565
1907	640	805	1,450	1,450	3,850	3,610	5,850	6,180	3,160	2,100	805	805	640
1908	720	720	1,000	900	805	1,330	3,300	3,160	2,760	1,000	435	720	435
1909	720	900	565	280	1,100	1,700	3,160	3,610	3,610	1,580	640	565	280
1910	565	900	565	380	720	7,230	6,870	4,920	1,450	720	565	565	380
1911	640	720	1,330	1,100	1,000	2,250	1,580	3,160	2,950	1,580	565	565	565
1912	640	640	495	435	2,250	1,580	7,420	7,000	6,520	2,250	1,220	1,330	435
1913	1,390	1,220	1,000										

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1904							
1905	6,520	June 9, 1905	530	1,730	1,260,000	1,720	1,250,000
1906	11,400	April 1, 1906	565	2,470	1,790,000	2,890	2,090,000
1907	20,100	April 10, 1907	640	4,770	3,450,000	4,420	3,200,000
1908	25,000†	Mar. 18, 1908	435	2,870	2,090,000	2,850	2,070,000
1909	12,300	June 2, 1909	280	2,530	1,830,000	2,630	1,900,000
1910	34,600	Mar. 4, 1910	380	4,040	2,830,000	4,090	2,960,000
1911	10,000	May 20, 1911	565	2,600	1,650,000	2,410	1,740,000
1912	21,800	May 19, 1912	435	5,150	3,740,000	5,350	3,890,000
1913							

† Maximum daily estimated.

ASOTIN CREEK BASIN

669

Asotin Creek near Asotin, Wash.

Location.—Lat. 46°19'30", long. 117°12'30", in SE¼ sec. 19, T. 10 N., R. 45 E., on left bank, half a mile upstream from Washington Water Power Co.'s diversion for water supply and irrigation, 5 miles upstream from George Creek, and 8 miles west of Asotin.

Drainage area.—156 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,380 ft. (from topographic map). Prior to Jan. 11, 1934, staff gages within a quarter of a mile of present site at different datums.

Average discharge.—25 years (1923-53), 65.5 cfs.

Extremes.—1904-6, 1910-11, 1928-53: Maximum discharge observed, 1,180 cfs Apr. 15, 1904 (gage height, 4.3 ft., datum then in use); minimum observed, 16 cfs Jan. 5, 1937.

Remarks.—Several diversions for irrigation and domestic use above station. Washington Water Power Co., at times, diverts practically entire flow half a mile below station for water supply, irrigation, and power.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904							469	276	159	70.8	47.0	47.3	.....
1905	50.5						80.3	91.8	139	43.1	34.0	36.2	.....
1906	40.7	39.1	38.9	45.5					89.0	41.8	35.0	29.0	.....
1907	39.3	82.5											.....
1911											28.7	80.6	.....
1928													30.3
1929	33.5	35.0	33.1	31.9	33.0*	52.6	65.2	114	91.6	42.7	29.3	29.5	49.3*
1930	30.5	31.2	39.6	26.7*	72.3	57.3	90.5	86.0	47.0	32.7	20.5	28.6	47.2*
1931	33.6	33.2	32.4	35.6	33.0	45.5	113	87.3	39.7	26.5	21.5	23.8	43.8
1932	27.5	30.1	27.2	38.3	57.0	115	162	222	97.3	42.1	28.8	26.7	72.9
1933	29.0	44.2	38.2*	48.4	36.3*	70.6	153	162	201	49.4	31.6	33.6	74.7*
1934	34.1	46.7	112	108	86.7	109	109	67.3	41.5	30.0	25.3	27.1	66.3
1935	33.9	40.3	45.5	44.9	49.9	46.5	96.6	118	73.2	35.4	27.7	26.0	53.2
1936	29.4	30.5	30.2	36.3	35.0*	84.7	214	162	62.2	32.3	25.3	27.6	64.0*
1937	27.9	29.6	30.5	26.9*	30.4	43.0	84.7	114	74.4	37.2	23.4	28.2	46.3*
1938	29.3	35.4	45.4	49.9	43.7	95.7	151	163	63.3	37.4	29.8	29.2	66.2
1939	32.3	37.3	40.9	33.5	36.7	100	101	108	63.4	30.4	24.2	25.4	52.8
1940	30.5	30.7	33.5	30.1*	62.7	79.2	93.4	83.7	40.0	27.0	24.5	31.4	47.1*
1941	32.8	38.0	54.1	46.5	43.6	51.2	68.1	94.5	87.0	48.7	32.6	34.1	52.6
1942	35.2	48.2	119	57.2	54.0	53.6	119	130	88.1	41.4	28.5	27.6	66.6
1943	31.3	48.7	61.2	67.9	85.8	81.2	240	135	128	36.6	34.1	31.5	83.1
1944	34.7	37.4	35.1	33.3	35.8	38.8	54.1	58.3	47.6	30.4	26.1	27.0	38.2
1945	29.0	30.5	28.1	36.2	37.5	41.6	63.6	121	77.8	34.0	27.4	29.1	46.4
1946	30.1	40.4	59.9	56.5	44.5	78.1	137	186	97.3	42.0	30.5	30.5	69.6
1947	32.8	55.4	137	57.1	114	81.5	172	129	60.0	34.4	27.4	30.8	72.3
1948	37.3	51.6	53.7	116	84.6	70.2	156	295	205	52.8	37.8	33.5	99.3
1949	34.4	37.9	36.5	29.1	61.6	130	187	241	97.2	40.9	33.4	34.0	81.7
1950	34.6	38.8	37.4	38.7*	83.0	126	158	176	188	70.0	42.1	36.6	85.6*
1951	49.8	77.7	95.1	64.6	155	93.8	176	198	118	50.5	38.8	37.7	95.8
1952	46.0	47.5	65.4	47.2	78.0	70.1	205	244	113	63.8	42.3	39.5	88.4
1953	37.6	35.8	36.4	90.9	92.6	72.8	116	155	134	54.3	40.8	36.3	75.0

* Estimated.

ASOTIN CREEK BASIN

Asotin Creek near Asotin, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904							198	219	78	50	44	44	
1905	47						62	78	54	34	34	84	
1906	40	34	34	34					54	40	29	29	
1907	29	40											
1911											27.4	28.7	
1928													
1929	31	33	29			34	46	81	58	33	27	25	27
1930	30	29	29		36*	41	75	57	40	28	24	24	
1931	32	32	30	31	31	32	58	50	33	23	20	21	20
1932	24	26		31		54	103	108	63	32	25	24	
1933	25	30		38		40	71	85	84	35	27	28	25
1934	29	41	41	48	69	72	95	44	33	27	24	25	24
1935	28	36	35	30*	42	40	49	103	44	29	25	25	25
1936	25	30	27*	30*	24*	62	48	87	41	26	24	25	24*
1937	26	28	28	16*	29	31	44	75	57	30	26	27	16*
1938	28	30	33	38	40	59	75	109	50	30	28	27	27
1939	29	32	36	31	28	31	70	75	36	25	19	23	19
1940	25	30	25*	17*	38	56	82	62	28	23	21	23	17*
1941	29	32	32*	39	39	42	56	77	64	36	29	31	29
1942	32	35	41	45*	43	43	73	76	57	33	26	26	26
1943	29	33	48	49	47	47	119	86	91	26	30	30	29
1944	30	35	32	30*	33	34	44	43	89	25	25	25	25
1945	27	29	24	30	32	28	44	97	45	29	23	25	23
1946	29	31	35	37	36	60	79	140	58	33	29	28	28
1947	27	32	55	47	68	57	77	70	42	30	25	26	25
1948	29	40	46	48	42	55	86	128	74	43	34	31	29
1949	33	33	30	25	25	78	77	172	65	35	31	31	25
1950	31	34	36	26*	25*	84	109	110	123	49	36	34	25*
1951	37	66	70	40*	40*	59	114	130	66	41	36	36	36
1952	39	44	41	43	51	47	100	164	82	46	39	36	36
1953	38	32	32	35	55	52	63	120	81	42	37	35	32

* Estimated.

ASOTIN CREEK BASIN

Asotin Creek near Asotin, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Dis-charge	Date						
1904.....	1,180†	April 15, 1904					
1905.....							
1906.....							
1907.....							
1911.....							
1928.....							
1929.....	187	May 24, 1929	27	49.3	35,700	49.3	35,700
1930.....	160	May 3, 1930		47.2	34,200	47.0	34,000
1931.....	540	April 1, 1931	20	43.8	31,700	42.5	30,800
1932.....	340	May 13, 1932		72.9	52,800	75.0	54,400
1933.....	323‡	June 10, 1933	25	74.7	54,100	81.7	59,100
1934.....	500‡	Dec. 23, 1933	24	66.3	48,010	60.1	43,530
1935.....	174	April 16, 1935	25	53.2	38,490	50.7	36,090
1936.....	372	Apr. 17-19, 1936	24	64.0	46,460	63.8	46,330
1937.....	220	April 15, 1937	18	46.3	33,500	48.1	34,850
1938.....	345	April 19, 1938	27	66.2	47,910	66.2	47,940
1939.....	343	Mar. 30, 1939	19	52.3	38,230	51.5	37,260
1940.....	236	Feb. 29, 1940	17	47.1	34,200	49.7	36,050
1941.....	128	May 1, 1941	29	52.6	38,090	59.1	42,810
1942.....	416	Dec. 3, 1941	26	66.0	48,210	61.4	44,470
1943.....	373	April 16, 1943	29	83.1	60,170	80.3	58,120
1944.....	142	Mar. 9, 1944	25	38.2	27,750	36.6	26,550
1945.....	152	May 26, 1945	23	46.4	33,570	50.0	36,170
1946.....	303	Dec. 29, 1945	28	69.6	50,370	77.6	56,180
1947.....	562	Dec. 15, 1946	25	72.3	52,320	65.3	47,300
1948.....	674	Jan. 7, 1948	29	99.3	72,110	96.5	70,070
1949.....	378	May 15, 1949	25	81.7	59,160	81.9	59,280
1950.....	277	Feb. 27, 1950	25	85.6	61,960	95.0	63,760
1951.....	490	Feb. 11, 1951	38	95.3	60,000	90.0	66,140
1952.....	360	April 28, 1952	36	88.4	64,190	84.3	61,190
1953.....	270	April 29, 1953	32	75.0	54,280		

† Maximum observed. ‡ Maximum during period April to September. ¶ Maximum daily estimated.

SNAKE RIVER MAIN STEM

Snake River near Clarkston, Wash.①

Location.—Lat. 46°25'30", long. 117°10'30", in lot 1, sec. 16, T. 11 N., R. 45 E., on right bank, 2 miles upstream from Alpowa Creek, 7 miles downstream from Clarkston, and 134 miles upstream from mouth.

Drainage area.—103,200 sq. mi., approximately. At site prior to October 1935, 104,000 sq. mi., approximately.

Supplemental records available.—Gage-height records collected at Riparia, 1900-16 and 1935-48, are contained in reports of U. S. Weather Bureau. Records of chemical analyses since November 1951 are published in reports of Geological Survey.

Gage.—Water-stage recorder. Datum of gage is 670 ft. above mean sea level (Corps of Engineers benchmark). Prior to Sept. 12, 1917, staff gage and Sept. 12, 1917, to Sept. 30, 1922, Aug. 6, 1928 to Sept. 30, 1935, chain gage at Riparia, 66 miles downstream at different datum.

Extremes.—1909-53: Maximum discharge, 369,000 cfs May 29, 1948 (gage height, 40.36 ft., from high-water mark in well); minimum observed, 10,600 cfs Aug. 14, 18, 20, 24-28, 30, 31, Sept. 1, 2, 5, 1931, but may have been less during period of ice effect in January 1937.

Maximum stage known, 24.7 ft., Riparia site and datum, June 5, 1894, determined from floodmarks by U. S. Weather Bureau (discharge, 409,000 cfs).

Remarks.—Over 2,840,000 acres are irrigated above station from numerous large irrigation projects. Regulation from many storage reservoirs upstream and fluctuations during low-water periods from powerplant on Clearwater River at Lewiston, Idaho.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	26,400*	46,100*	39,200*	35,300*	32,700*	157,000*	157,000*	153,000*	75,500*	23,600*	12,900*	14,200*	64,600*
1911...	21,600*	34,500*	34,000*	25,200*	35,300*	54,200*	70,300*	119,000*	177,000*	61,100*	18,800*	16,000*	55,500*
1912...	24,700*	23,800*	25,300*	33,500*	47,500*	39,500*	95,600*	177,000*	200,000*	55,800*	22,000*	26,400*	64,500*
1913...	25,300*	32,600*	22,300*	23,000*	27,400*	42,800*	119,000*	160,000*	151,000*	57,600*	23,400*	17,600*	61,200*
1914...	27,700*	31,100*	23,600*	31,000*	31,500*	62,100*	88,800*	125,000*	92,560*	30,400*	18,000*	15,700*	47,800*
1915...	28,500*	33,100*	22,500*	22,300*	27,000*	33,100*	54,000*	71,500*	61,600*	28,300*	15,600*	13,300*	34,200*
1916...	20,700	23,900	27,100	26,500	50,500*	86,200	109,000	128,000	157,000	92,900	26,400	21,000	64,100
1917...	25,400	26,600	25,200	23,000	25,600	29,400	97,400	177,000	201,000	93,900	22,200	18,500	63,800
1918...	24,500	25,500	60,800	69,100	43,300	59,300	89,900	110,000	145,000	40,700	19,900	17,400	58,800
1919...	25,400	27,000	22,200	24,400	26,000	41,900	96,800	114,000	59,300	15,100	12,000	11,800	40,000
1920...	16,500	22,100	24,400*	30,500	29,200	35,800	56,400	108,000	114,000	39,900	15,900	17,600	42,500*
1921...	29,700	35,600	32,300	46,400	48,600	82,200	98,600	191,000	179,000	43,500	19,700	18,800	68,800
1922...	22,200	29,600	39,300	25,600	25,800	39,600	81,400	156,000	164,000	34,900	18,600	15,600	64,400
1923...	15,100*	26,700*	27,500*	30,300*	25,900*	34,500*	67,100*	109,600*	120,000*	45,700*	19,100*	16,100*	45,300*
1924...	25,600*	27,600*	27,100*	25,000*	36,300*	29,900*	46,700*	104,000*	35,000*	17,500*	12,300*	11,700*	33,200*
1925...	14,000*	24,100*	24,200*	20,400*	50,400*	47,000*	120,000*	166,000*	93,800*	28,500*	18,200*	19,400*	58,600*
1926...	27,700*	29,400*	31,800*	25,700*	35,600*	43,600*	75,000*	74,000*	31,700*	18,200*	13,200*	14,800*	35,000*
1927...	10,000*	26,200*	34,600*	28,500*	39,400*	42,900*	75,700*	128,000*	185,000*	64,600*	21,400*	23,200*	57,300*
1928...	29,900*	58,700*	52,600*	48,500*	38,800*	69,300*	81,000*	208,000*	93,600*	35,500*	18,200	17,600	62,800
1929...	24,100	24,600	21,100	21,400	18,800*	59,100	53,800	89,000	93,500	29,900	15,600	15,600	37,300*
1930...	18,700	23,100	27,400	20,300*	30,900	33,300	71,000	74,900	60,800	21,900	16,800	16,000	34,500
1931...	19,900	21,400	20,800	20,200	20,800	32,700	55,200	76,100	35,900	14,600	11,000	12,800	28,400
1932...	15,900	17,900	18,000	17,900	18,800	62,200	89,400	152,000	111,000	37,300	17,300	16,700	47,900
1933...	18,000	26,000	23,200	22,800	19,200	34,700	64,600	91,400	163,000	37,700	18,000	17,600	45,100
1934...	21,700	30,140	50,400	52,650	37,230	55,730	98,360	69,810	32,620	17,060	12,930	13,460	40,600
1935...	17,090	22,090	21,290	20,870	21,840	28,010	57,700	90,850	80,120	25,440	14,920	14,400	34,560

* Estimated.

① Published as Snake River at Riparia prior to 1936.

SNAKE RIVER MAIN STEM

Snake River near Clarkston, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	15,910	17,680	16,270	20,610	18,220*	22,490	114,000	146,800	77,480	22,110	15,920	16,580	43,330*
1937...	16,580	17,020	17,370	14,950*	17,960	27,510	50,610	93,230	62,500	22,160	14,810	14,470	30,810*
1938...	16,740	20,190	27,220	25,160	27,620	52,880	103,300	142,300	124,100	47,140	18,930	17,380	51,860
1939...	21,120	22,790	24,090	23,000	23,620	53,920	80,760	102,100	46,340	23,270	14,990	15,960	37,740
1940...	18,200	18,460	22,030	23,900	36,610	57,190	88,940	102,700	56,720	20,080	14,180	17,880	39,690
1941...	22,970	24,470	27,140	25,290	27,720	37,260	47,720	78,080	74,040	28,880	10,370	22,770	36,310
1942...	26,630	33,370	46,190	29,160	33,080	34,850	95,500	96,820	98,260	39,700	19,080	18,860	47,640
1943...	20,090	28,440	32,080	35,720	43,760	62,050	161,200	133,000	162,600	84,820	25,580	21,140	67,730
1944...	25,600	27,050	24,700	21,760	21,780	28,050	53,010	75,050	77,020	29,450	18,570	18,160	35,180
1945...	19,350	22,190	19,490	26,120	33,420	33,800	51,300	118,800	111,200	36,350	19,080	19,640	42,540
1946...	21,930	30,460	33,840	36,420	30,740	60,580	112,400	132,700	90,530	34,750	19,740	22,600	52,300
1947...	26,230	36,120	61,610	39,830	45,970	49,820	74,900	154,500	104,900	35,530	20,600	21,460	55,810
1948...	29,820	33,690	35,690	41,620	37,420	37,220	56,170	186,160	185,200	47,420	23,150	21,650	63,900
1949...	23,750	25,850	26,350	26,360	35,270	70,260	92,490	168,100	89,900	29,610	19,010	19,580	63,020
1950...	24,550	27,110	26,200	26,900	41,310	61,450	94,080	119,300	163,900	74,140	26,870	23,020	69,020
1951...	31,920	39,320	42,290	39,300	61,770	54,020	106,600	146,200	102,800	45,700	24,180	20,890	59,480
1952...	35,130	31,560	35,970	31,950	40,490	52,520	149,000	185,000	118,300	47,250	23,220	22,150	64,170
1953...	22,110	20,670	20,960	40,400	43,350	41,690	63,930	101,600	164,600	60,760	24,320	21,860	52,090

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916...	15,200	21,000	21,000	20,200	.....	39,800	84,900	103,000	108,600	37,800	20,200	18,900	15,200
1917...	18,800	21,200	21,200	19,400	22,600	.....	47,600	111,000	162,000	30,000	17,200	16,200	16,200
1918...	21,900	23,300	23,300	44,600	34,200	35,100	68,500	72,400	83,500	24,000	16,800	15,000	15,000
1919...	18,400	20,300	17,300	16,800	23,200	25,100	63,500	71,100	29,000	13,400	10,900	10,900	10,900
1920...	12,300	17,400	.....	.....	23,200	23,200	33,200	64,600	71,100	19,200	13,900	.....	.....
1921...	21,800	26,200	27,800	35,000	29,600	52,900	72,400	95,300	89,800	24,400	16,700	17,300	16,700
1922...	17,500	21,700	27,300	19,900	24,500	23,100	48,700	110,000	77,400	20,500	16,000	14,500	14,500
1928...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,100	16,100	.....
1929...	18,000	20,100	16,100	.....	.....	22,500	39,100	60,000	64,800	15,000	13,800	13,100	13,100
1930...	16,000	18,500	19,500	.....	.....	23,800	46,600	61,400	35,400	15,500	13,900	13,100	13,100
1931...	16,400	19,800	16,400	17,400	19,200	19,800	40,700	50,000	19,800	11,200	10,600	10,600	10,600
1932...	14,400	15,400	15,800	.....	.....	29,400	64,800	99,500	80,900	21,000	15,400	15,800	14,400
1933...	16,700	20,400	15,400	18,700	.....	21,000	38,000	62,400	78,100	20,400	16,700	15,800	.....
1934...	16,700	23,600	22,200	34,400	33,500	33,500	66,000	47,400	21,600	14,400	12,200	12,200	12,200
1935...	14,400	19,800	17,200	15,000*	18,700	21,000	25,700	68,600	38,000	17,700	13,100	13,100	13,100
1936...	14,300	15,800	12,200	14,500*	13,000*	29,400	26,300	112,000	31,900	17,100	14,200	14,000	12,200
1937...	15,600	14,400	14,100	10,800*	16,900	19,800	32,800	52,500	38,100	16,700	13,400	13,600	10,800*
1938...	15,200	17,400	17,000*	20,200	23,700	32,100	42,000	100,000	76,700	23,600	17,400	16,700	15,200
1939...	17,400	20,700	20,700	21,900	21,500	23,000	59,800	69,400	32,100	17,000	14,000	14,600	14,000
1940...	15,900	17,300	17,700	17,700	21,400	26,700	77,800	77,800	26,400	16,500	13,000	13,300	13,000
1941...	19,000	20,200	15,500	20,200	23,500	30,700	33,200	60,400	48,000	19,800	16,800	19,400	15,500
1942...	22,200	25,800	30,800	23,100	24,800	24,800	44,600	70,500	69,700	22,600	16,600	17,900	16,800
1943...	17,000	22,700	25,800	25,800	36,000	41,400	134,000	80,600	140,000	35,600	21,000	16,800	17,900
1944...	20,500	24,700	20,900	18,200	19,000	20,100	34,000	55,100	53,000	20,800	16,800	16,400	16,400
1945...	18,600	19,700	16,100	19,300	21,300	22,500	36,600	77,000	68,400	21,700	17,100	17,100	16,100
1946...	20,100	26,500	23,000	28,500	27,000	45,100	73,400	108,000	53,000	22,500	17,800	20,100	17,800
1947...	21,800	28,000	36,200	27,600	32,800	34,400*	53,360	118,000	63,500	23,500	19,000	19,000	19,000
1948...	21,800	28,000	30,600	29,000	25,200	29,600	50,500	93,700	93,700	30,000	21,600	20,200	20,200
1949...	21,900	22,400	22,400	23,200	26,300	51,500	51,500	105,500	48,700	22,300	17,400	17,200	17,200
1950...	20,600	21,500	23,000	19,200	26,000*	41,200	71,700	70,800	133,000	33,000	21,100	19,700	19,200
1951...	24,000	31,400	34,600	33,600	31,900	40,600	68,400	96,500	71,600	28,100	20,600	19,200	19,200
1952...	23,400	28,200	26,300	28,200	32,900	34,400	77,100	162,000	77,400	26,900	20,700	20,900	20,700
1953...	20,700	15,600	16,700	21,000	20,600	30,000	37,600	72,900	107,000	28,200	20,900	20,900	15,600

* Estimated.

SNAKE RIVER MAIN STEM

Snake River near Clarkston, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			CALENDAR YEAR			
	Dis-charge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1910.....				64,600	46,500,000	62,600	45,300,000
1911.....				55,500	40,200,000	54,000	39,500,000
1912.....				64,500	46,800,000	65,000	47,200,000
1913.....				61,200	44,300,000	61,200	44,300,000
1914.....				47,500	34,600,000	47,900	34,700,000
1915.....				34,200	24,500,000	33,200	24,000,000
1916.....	230,000†	June 20, 1916	15,200	64,700	48,500,000	64,500	46,600,000
1917.....	256,000†	May 30, 1917	18,200	63,800	46,300,000	60,800	45,300,000
1918.....	216,000†	①	15,000	58,800	42,600,000	55,700	40,300,000
1919.....	167,000†	May 30, 1919	10,900	40,000	25,900,000	39,000	25,200,000
1920.....	148,000†	June 17, 1920		42,500	30,800,000	45,400	32,900,000
1921.....	270,000†	May 20, 1921	16,700	68,500	49,800,000	68,200	49,400,000
1922.....	283,000†	June 7, 1922	14,500	54,400	39,400,000	52,300	38,200,000
1923.....				45,300	32,800,000	46,000	33,300,000
1924.....				23,200	24,100,000	31,800	23,100,000
1925.....				53,600	38,800,000	56,700	40,400,000
1926.....				35,000	25,400,000	34,300	24,800,000
1927.....				57,300	41,500,000	62,400	45,200,000
1928.....				62,800	45,600,000	56,800	41,200,000
1929.....	155,000†	May 25, 1929	13,100	37,300	27,000,000	37,300	27,000,000
1930.....	95,600†	April 26, 1930	13,100	34,500	25,000,000	33,800	24,500,000
1931.....	107,000†	April 2, 1931	10,600	28,400	20,600,000	27,600	20,000,000
1932.....	219,000†	May 23, 1932	14,400	47,000	34,800,000	49,300	35,600,000
1933.....	245,000†	June 11, 1933		45,700	32,700,000	48,000	34,800,000
1934.....	149,000†	Dec. 23, 1933	12,200	40,600	29,400,000	37,070	26,840,000
1935.....	130,000†	May 25, 1935	13,100	34,500	25,020,000	33,670	24,370,000
1936.....	219,000	May 16, 1936	12,200	43,330	31,460,000	43,430	31,530,000
1937.....	114,000	May 19, 1937	10,800	30,810	22,310,000	31,920	23,110,000
1938.....	219,000	②	15,200	51,860	37,840,000	62,180	37,770,000
1939.....	149,000	May 4, 1939	14,000	37,740	27,320,000	36,960	26,760,000
1940.....	126,000	③	13,000	39,690	28,510,000	41,020	29,760,000
1941.....	102,000	May 14, 1941	15,500	36,310	26,290,000	39,010	28,240,000
1942.....	162,000	May 27, 1942	16,800	47,040	34,490,000	45,430	32,800,000
1943.....	209,000	April 20, 1943	17,900	67,730	49,030,000	67,510	48,680,000
1944.....	109,600	May 16, 1944	16,400	35,130	25,500,000	38,700	24,460,000
1945.....	149,000	May 7, 1945	16,100	42,540	30,800,000	44,660	32,830,000
1946.....	109,000	April 20, 1946	17,800	52,330	37,860,000	55,820	40,410,000
1947.....	239,000	May 10, 1947	19,000	55,810	40,410,000	53,300	38,650,000
1948.....	309,000	May 29, 1948	20,200	63,900	46,390,000	61,930	44,970,000
1949.....	248,900	May 16, 1949	17,200	53,020	38,390,000	53,180	38,500,000
1950.....	212,000	June 17, 1950	19,200	59,020	42,730,000	61,400	43,500,000
1951.....	182,000	④	19,200	56,480	43,060,000	58,400	42,280,000
1952.....	250,000	⑤	20,700	64,170	46,590,000	61,070	44,340,000
1953.....	232,000	June 13, 1953	15,600	52,090	37,710,000	.....	.....

† Maximum observed.

① June 14, 15, 1918. ② May 29, 30, 1938. ③ May 12, 13, 1940. ④ May 24, 25, 1951. ⑤ April 29 or 30, 1952.

TUCANNON RIVER BASIN

675

Tucannon River near Pomeroy, Wash.

Location.—Lat. 46°26'30", long. 117°44'50", in sec. 13, T. 11 N., R. 40 E., on left abutment of highway bridge at Marengo, 7½ miles southwest of Pomeroy, and 14 miles upstream from Petaha Creek.

Drainage area.—160 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,470 ft. (from topographic map). Aug. 31, 1913, to June 30, 1915, at datum about 2.27 ft. higher.

Average discharge.—7 years (1913-14, 1924-30), 130 cfs.

Extremes.—1913-15, 1924-30: Maximum discharge, 1,740 cfs Jan. 13, 1928 (gage height, 6.46 ft., from graph based on gage readings); minimum observed, 25 cfs Dec. 24, 1914 (gage height, 1.2 ft.).

Remarks.—Several small diversions for irrigation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913													74.8
1914	82.9	81.0	78.9	86.4	129	204	229	202	108	07.5	54.6	07.9	116
1915	72.1	84.7	80.3	69.1	105	125	171	199	94.0				
1924						181	184	252	89.0	59.0	50.6	54.9	
1925	59.8	115	100	153	251	169	273	289	132	68.8	57.2	61.8	142
1926	66.5	70.1	86.1	80.0	154	123	163	120	66.8	47.6	46.0	58.9	89.9
1927	68.0	118	162	131	226	205	244	324	292	94.2	65.3	87.6	167
1928	101	257	205	403	124	275	289	379	151	79.8	58.7	60.0	199
1929	71.5	78.8	74.5	75.5	66.1*	168	164	219	150	61.9	51.4	53.6	103*
1930	57.3	62.1	79.4	66.5	195	158	188	182	78.0	49.6	42.8	50.0	95.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913													
1914	70	78	78	78	70	137	137	135	82	55	48	70	
1915	56	72	27	51	37	87	135	148	66			53	48
1924						110	122	122	63	51	44	49	
1925	50	73		98	134	120	172	212	84	57	51	55	
1926	63	68	71	72	79	103	110	85	51	42	42	51	42
1927	59	65	87		124	158	149	222	143	71	61	62	59
1928	83	89	110*	115*	68	63	210	251	96*	58	56	56	56
1929	65	73	71			73	102	162	79	54	50	50	50
1930	55	50	62	43	111	98	154	95	63	42	41	42	41

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1913							
1914	370	April 15, 1914	48	116	83,700	113	82,100
1915	307	May 20, 1915					
1924							
1925	642	Feb. 5, 1925		142	102,000	137	99,300
1926	305	Feb. 8, 1926	42	89.9	65,000	100	72,800
1927	602	April 28, 1927	59	167	121,000	185	134,000
1928	1,740	Jan. 13, 1928	56	189	145,000	171	124,000
1929	300	May 23, 1929	50	103	74,500	101	73,100
1930	345	Feb. 1, 1930	41	95.7	69,300		

* Estimated.

TUCANNON RIVER BASIN

Tucannon River near Starbuck, Wash.

Location.—Lat. 46°30'20", long. 118°01'00", in sec. 23, T. 12 N., R. 38 E., on left bank, three-quarters of a mile downstream from Petaha Creek and 5½ miles east of Starbuck.

Drainage area.—409 sq. mi.

Gage.—Staff gage. Altitude of gage is 795 ft. (from topographic map). Nov. 8, 1914, to Sept. 30, 1917, staff gage a quarter of a mile upstream at different datum. Aug. 9, 1928, to Mar. 8, 1930, staff gages at described site at different datum.

Average discharge.—6 years (1914-17, 1928-31), 164 cfs.

Extremes.—1914-17, 1928-31: Maximum discharge, 6,000 cfs Feb. 2, 1930 (gage height, 8.08 ft., from floodmarks), from rating curve extended above 350 cfs on basis of slope-area determination of peak flow; minimum, 15 cfs July 11, 12, 1930 (gage height, 1.12 ft.).

Remarks.—Many small diversions for irrigation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...	84.0*	94.3	66.8*	93.5	155	132	180	210	113	63.3	43.4	50.2	107*
1916...	60.3	84.2	138	153*	700	627	355	415	402	168	72.0	71.1	271*
1917...	55.2	131	157	162	204	206	668	986	577	161	70.0*	77.0	290*
1928...													53.2
1929...	67.5	80.5	77.6	92.2	117*	226	153	205	161	51.0	34.9	44.4	109*
1930...	51.7	60.0	84.8	49.3*	203	207	209	123	58.9	32.9	25.6	51.0	102*
1931...	64.4	75.4	51.5	141	84.0	133	343	168	74.6	34.5	21.5	42.2	105

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...		78	44*	76*	102	100	142	152	74	52	39	41	39
1916...	51	61	88			197	270	232	251	51	65	69	51
1917...	68				126	122	270	500	288			53	58
1928...													50
1929...	56	74	67			152	117	167	60	32	32	36	32
1930...	47	53	56	21*	172	115	172	72	31	15	16	16	15
1931...	56	56	65	80	68	77	139	102	62	17	18	26	17

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1915.....	975	Feb. 1, 1915		39	107	77,200	110	76,600
1916.....	5,740	Feb. 10, 1916		51	271	197,000	279	202,000
1917.....	1,940	May 14, 1917		58	200	210,000		
1928.....								
1929.....	681	Mar. 2, 1929		32	169	79,300	107	77,500
1930.....	6,000	Feb. 2, 1930		15	162	74,100	165	75,800
1931.....	3,060	April 1, 1931		17	105	76,200		

* Estimated.

PALOUSE RIVER BASIN

Palouse River near Potlatch, Idaho

Location.—Lat. 46°55'00", long. 116°57'00", in S½ sec. 3, T. 41 N., R. 5 W., of the Boise meridian, on right bank, a quarter of a mile upstream from Kennedy Ford, three-quarters of a mile downstream from Deep Creek, and 2½ miles west of Potlatch.

Drainage area.—312 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is about 2,450 ft. (estimated from Coast and Geodetic Survey benchmark near Kennedy Ford).

Average discharge.—5 years (1914-19), 272 cfs.

Extremes.—1914-19: Maximum discharge, 5,090 cfs Mar. 21, 1916 (gage height, 13.98 ft.); minimum, about 1 cfs Dec. 21, 1914 (gage height, 0.02 ft.).

Remarks.—No known diversions. Flow partly regulated by Potlatch Lumber Co.'s reservoir about 8 miles above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...	8.49*	33.2	14.0*	12.9*	90.4	351	285	447	9.31	18.4	8.15	5.43	114*
1916...	12.0	96.0	83.4	44.0*	521	1,970	1,100	500	128	60.9	19.0	16.3	373*
1917...	13.8	22.8	34.4*	34.9*	97.4	120	2,060	1,710	315	30.4	10.6	8.28	372*
1918...	9.90	10.2	372	686	573	918	532	123	40.5	13.3	9.55	6.02	273
1919...	10.4	24.4	24.2	137*	102*	1,000	1,200	195	33.7	12.3	4.23	3.79*	230*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...		10.5				128	76	88	10.9	6.7	4.4	3.2	3.2
1916...	6.4	9.3				200	399	236	37	30	13.4	13.0	6.4
1917...	11	11			42	40	299	944	65	16	3.6	4.0	3.6
1918...	4.8	4.0	14		186	190	217	70	22	7.3	6.2	2.9	2.9
1919...	2.4	8.4				124	565	92	18.8	5.8	1.4		

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1915.....	2,780	May 21, 1915	3.2	114	82,800	120	86,800
1916.....	5,000	Mar. 21, 1916	6.4	373	271,000	368	288,000
1917.....	3,670	April 24, 1917	3.6	372	269,000	399	289,000
1918.....	2,780	Mar. 26, 1918	2.9	273	198,000	245	177,000
1919.....	3,360	Mar. 19, 1919		230	166,000		

* Estimated.

PALOUSE RIVER BASIN

Palouse River at Elberton, Wash.

Location.—Lat. 46°58'50", long. 117°13'10", in SE¼ sec. 11, T. 17 N., R. 44 E., on left bank at highway bridge, 450 ft. upstream from railroad bridge, and half a mile upstream from Elberton railroad station.

Drainage area.—406 sq. mi.

Supplemental records available.—January to September 1905, gage heights and discharge measurements only.

Gage.—Staff gage. Datum of gage is 2,192.25 ft. above mean sea level, unadjusted.

Extremes.—May to December 1904: Maximum daily discharge, 1,000 cfs (estimated) May 1, 1904; minimum observed, 2 cfs Aug. 24, 25. (gage height, 0.70 ft.).

Remarks.—Small diversions for irrigation and domestic use above station. Slight regulation by millpond above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904								478	162	45.6	10.1	10.7	
1905	23.1	31.1	54.4										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904								169	62	14	5	5	
1905	9	9	21										

South Fork Palouse River above Paradise Creek, near Pullman, Wash.

Location.—Lat. 46°42'20", long. 117°09'55", in SE¼ sec. 8, T. 14 N., R. 45 E., on right bank, 1 mile upstream from Paradise Creek, and 2 miles southeast of Pullman.

Drainage area.—84.4 sq. mi.

Supplemental records available.—Records of suspended sediment loads for the period April 1934 to June 1940 are contained in reports of Soil Conservation Service.

Gage.—Water-stage recorder and Parshall flume. Altitude of gage is 2,380 ft. (from topographic map). Prior to Aug. 8, 1934, staff gage three-quarters of a mile downstream at different datum.

Average discharge.—6 years (1934-40), 16.6 cfs.

Extremes.—1934-40: Maximum discharge, 533 cfs Mar. 21, 1939 (gage height, 4.89 ft.); frequently no flow during late summer months.

Remarks.—No diversion above station. Slight regulation by pondage at Robinson Park Dam on headwaters.

PALOUSE RIVER BASIN

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South Fork Palouse River above Paradise Creek, near Pullman, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934									2.45	0.351	0.052	0.199	
1935	1.37	2.46	12.7	58.3	35.9	54.9	71.4	13.8	2.58	.514	.041	.067	21.1
1936	.406	.822	2.01	29.4	32.1*	85.9	26.8	8.84	1.67	.152	0	.016	15.7*
1937	.187	.330	.927	.506*	6.90*	103	77.6	10.7	3.71	.394	.004	.034	17.1*
1938	.637	1.73	8.23	27.9	48.6	85.1	36.5	8.56	1.68	.357	0	0	18.1
1939	1.08	1.11	1.65	3.11	25.5	133	19.8	4.12	1.03	.186	0	0	15.9
1940	.097	.371	.971	3.23	48.4	54.3	25.9	4.33	.503	0	0	0	11.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934									0.4	0.04	0.03	0.04	
1935	0.36	1.3	2.3	9.0	15.6	19.8	27	5.5	1.0	.04	.01	.04	9.91
1936	.10	.56	.79	4.2	2.6*	20	14	1.8	.23	0	0	0	--0
1937	.03	.25	.26			32	27	3.7	1.5	0	0	0	0
1938	.22	.56	.81	4.0	14	43	17	3.0	.69	0	0	0	0
1939	C	.59	.69	1.6	1.2	13	9.1	1.2	.26	0	0	0	0
1940	0	.19	.36	.89	4.1	13	8.6	1.2	0	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1934												
1935	394	Jan. 25, 1935	0.01	21.1	0.250	3.39	15,250	19.9	3.20	14,440		
1936	517	Feb. 28, 1936	0	15.7	.188	2.53	11,380	15.5	2.50	11,270		
1937	429	April 15, 1937	0	17.1	.203	2.76	12,370	17.9	2.88	12,930		
1938	285	Mar. 18, 1938	0	18.1	.214	2.90	13,120	17.6	2.81	12,700		
1939	533	Mar. 21, 1939	0	15.9	.188	2.55	11,510	15.7	2.52	11,360		
1940	432	Mar. 8, 1940	0	11.4	.135	1.84	8,240					

* Estimated.

Paradise Creek near Pullman, Wash.

Location.—Lat. 46°43'10", long. 117°09'30", in SW ¼ sec. 4, T. 14 N., R. 45 E., on left bank, 2,500 ft. upstream from mouth, and 1 mile southeast of Pullman.

Drainage area.—34.5 sq. mi.

Gage.—Water-stage recorder and modified Parshall flume. Altitude of gage is 2,400 ft. (from topographic map). Prior to Sept. 10, 1934, staff gage three-eighths of a mile downstream at different datum.

Extremes.—1934-38: Maximum discharge, 326 cfs Mar. 2, 1936 (gage height, 2.91 ft.); minimum, 0.04 cfs Aug. 22, 1938.

Remarks.—Small diversions for domestic use above station. Slight regulation caused by operation of sewage disposal plant at Moscow, Idaho.

PALOUSE RIVER BASIN

Paradise Creek near Pullman, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934								1.63	2.37	0.87	0.62	0.666	.....
1935	1.21	1.31	6.87	36.6	21.9	29.2	38.0	3.43	1.10	.687	.537	.714	11.7
1936	.932	1.03	1.44	12.5	11.1*	46.5	8.46	2.60	1.10	.497	.435	.685	7.31*
1937	.703	.742	1.12	.826	2.75	55.2	36.7	3.65	1.75	.745	.503	.704	8.82
1938	.860	1.32	5.36	19.3	32.3	40.0	14.7	2.65	1.02	.623	.332	.577	9.80

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934								0.2	0.8	0.4	0.4	0.43	.....
1935	0.60	0.84	1.2	4.1	7.7	9.9	9.1	1.5	.74	.56	.29	.51	0.29
1936	.74	.70	.86	1.2*	1.2*	8.4	3.4	.98	.64	.26	.32	.43	.20
1937	.47	.51	.64	.26	.70	9.1	10	1.3	.91	.47	.29	.47	.20
1938	.66	.76	.87	2.4	7.9	18	4.6	1.3	.69	.36	.23	.32	.23

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1934												
1935	262	Jan. 25, 1935	0.29	11.7	0.339	4.60	3,490	11.2	4.41	8,120		
1936	326	Mar. 2, 1936	.26	7.31	.212	2.89	5,310	7.24	2.86	5,260		
1937	260	April 15, 1937	.26	8.32	.256	3.48	6,380	9.24	3.64	6,060		
1938	197	Mar. 19, 1938	.23	9.80	.284	3.56	7,100					

Dry Fork of South Fork Palouse River at Pullman, Wash.

Location.—Lat. 46°43'25", long. 117°11'10", in NE¼SE¼ sec. 6, T. 14 N., R. 45 E., on right bank, 250 ft. upstream from South State Street crossing in Pullman, and half a mile upstream from mouth.

Drainage area.—7.28 sq. mi.

Gage.—Water-stage recorder and modified Parshall flume with sharp-crested weir. Altitude of gage is 2,400 ft. (from topographic map).

Extremes.—1934-38: Maximum discharge, 159 cfs Feb. 27, 1936 (gage height, 2.76 ft.); no flow at times each year.

Remarks.—No diversions or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935			2.00	6.36	3.22	5.05	5.76	0.290	0.023	0	0	0	.....
1936	0	0.021	.321	4.68	6.74*	4.15	.824	.196	.003	0	0	0	1.40*
1937	0	0	.028	0	3.05	10.2	5.19	.101	.081	0	0	0	1.55
1938	0	.058	1.48	2.46	4.68	7.89	1.95	.154	.002	0	0	0	1.64

* Estimated.

Dry Fork of South Fork Palouse River at Pullman, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935...			.2	1.1	1.5	1.4	.84	.06	0	0	0	0	.....
1936...	0	0	0	.20	.17*	.36	.10	0	0	0	0	0	0
1937...	0	0	0	0	0	1.1	.50	0	0	0	0	0	0
1938...	0	0	.02	.43	1.1	2.4	.30	.01	0	0	0	0	0

Summary

WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mle	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1935.....	91	Mar. 28, 1935						1.74	3.24	1,260	
1936.....	159	Feb. 27, 1936	0	1.40	0.192	2.61	1,010	1.37	2.56	994	
1937.....	127	Mar. 2, 1937	0	1.55	.213	2.89	1,120	1.68	3.14	1,210	
1938.....	80	Mar. 18, 1938	0	1.54	.212	2.88	1,120				

South Fork Palouse River at Pullman, Wash.

Location.—Lat. 46°43'50", long. 117°11'00", in NE¼ sec. 6, T. 14 N., R. 45 E., at State Street crossing in Pullman, 600 ft. upstream from Missouri Flat Creek.

Drainage area.—132 sq. mi.

Gage.—Water-stage recorder and sharp-crested weir after Mar. 18, 1934. Altitude of gage is 2,350 ft. (from topographic map). Prior to Mar. 19, 1934, staff gage 30 ft. upstream.

Average discharge.—8 years (1934-42), 28.4 cfs.

Extremes.—1934-42: Maximum discharge, 968 cfs Mar. 21, 1939 (gage height, 4.01 ft.); minimum, 0.1 cfs Sept. 23, 1942 (gage height, 0.50 ft.).

Remarks.—Minor diversions for domestic use above station. Slight regulation caused by pondage at Robinson Park Dam on headwaters and by Moscow sewage disposal plant on Paradise Creek.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar	April	May	June	July	Aug.	Sept.	Annual
1934.....					44.4	94.2	25.0	5.75	7.29	1.80	1.10	1.11	.....
1935...	2.91*	4.32	23.4	109	63.6	92.1	124	17.8	3.99	1.56	.747	.814	36.8*
1936...	1.39	2.04	4.31	49.6	52.6	140	35.4	12.1	3.46	.900	.542	1.09	25.3
1937...	1.30	1.56	2.70	1.77	13.5	177	122	15.2	6.75	1.62	.730	.825	28.8
1938...	1.73	3.43	16.7	51.7	88.7	135	54.7	11.3	3.06	1.30	.606	.733	30.4
1939...	2.25	2.85	4.05	6.57	47.2	218	28.2	5.95	2.21	1.19	.532	.680	26.5
1940...	1.08	1.44	3.04	7.01	57.2	90.5	42.3	4.86	1.52	.855	.499	1.24	20.0
1941...	3.70	19.5	70.0	115	61.3	36.1	41.8	26.8	18.5	4.29	1.10*	1.62	33.2*
1942...	2.19	6.94	64.8	39.9	88.6	62.5	20.9	17.9	8.30	1.94	.68	.49	25.9

* Estimated.

PALOUSE RIVER BASIN

South Fork Palouse River at Pullman, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934					24	19.7	7.9	2.7	1.9	1.5	0.7*	0.6	.....
1935		2.2	4.0	15.1	32	35	43	7.1	2.2	.68	.48	.63	0.43
1936	.89	1.5	1.6	6.4*	6.0*	30	17	3.4	1.1	.39	.39	.68	.39
1937	.79	1.1	1.4	.48	2.4	46	39	6.0	3.0	.93	.51	.60	.43
1938	1.1	1.8	2.0	8.2	24	65	22	4.5	1.9	.60	.43	.47	.43
1939	.83	1.7	1.9	3.6	3.2	22	11	2.5	1.4	.56	.48	.47	.33
1940	.69	1.2	1.4	2.1	5.9	19	13	2.3	.69	.51	.39	.51	.39
1941	1.4	3.1	3.5	19	33	14	9.7	8.2	4.2	1.2	.....	.....	.....
1942	1.5	1.9	4.4	8.4	18	26	13	9.3	4.2	.8	.4	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1934										
1935	940	Jan. 24, 1935	0.48	36.8	6.279	3.79	26,660	34.9	3.58	25,260
1936	830	Feb. 28, 1936	.39	25.3	.192	2.61	15,400	25.1	2.59	16,260
1937	731	April 15, 1937	.48	28.8	.218	2.96	20,850	30.2	3.11	21,580
1938	482	Mar. 15, 1938	.43	30.4	.230	3.13	22,020	29.3	3.02	21,230
1939	968	Mar. 21, 1939	.33	26.5	.201	2.72	19,170	26.2	2.69	18,960
1940	743	Mar. 3, 1940	.39	20.0	.152	2.06	14,540	27.4	2.82	19,690
1941	785	Jan. 18, 1941	.....	33.2	.252	3.41	24,040	31.6	3.25	22,680
1942	780	Jan. 27, 1942	.....	25.9	.196	2.69	18,760	.....	.....	.....

* Estimated.

Missouri Flat Creek at Pullman, Wash.

Location.—Lat. 46°43'50", long. 117°11'00", in NE¼ sec. 6, T. 14 N., R. 45 E., on left bank at State Street crossing in Pullman, 600 ft. upstream from mouth.

Drainage area.—27.1 sq. mi.

Supplemental records available.—Records of suspended sediment loads for the period April 1934 to June 1940 are contained in reports of Soil Conservation Service.

Gage.—Water-stage recorder and, after Aug. 20, 1934, Parshall flume and sharp-crested weir. Altitude of gage is 2,350 ft. (from topographic map).

Average discharge.—6 years (1934-40), 6.00 cfs.

Extremes.—1934-40: Maximum discharge, 432 cfs Mar. 19, 1939 (gage height, 3.25 ft.); practically no flow at times each year.

Remarks.—No diversion or regulation above station.

Missouri Flat Creek at Pullman, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934.....					7.90	14.2	3.00	0.60	0.840	0.046	0.023*	0.010	.....
1935....	0.346	0.377	4.90	31.9	18.0	23.0	24.5	1.08	.185	.027	.004	.010	3.64
1936....	.010	.089	.435	12.5	11.3*	34.5	3.84	.549	.147	0	0	.001	5.30*
1937....	.010	.011	.114	0	1.58	46.0	22.2	.709	.811	.031	.010	.003	5.99
1938....	.012	.159	2.65	12.7	24.2	31.0	6.61	.624	.061	.002	0	.001	6.41
1939....	.010	.128	.452	1.16	8.65	52.2	2.62	.288	.083	.012	.009	.010	5.49
1940....	.015	.019	.214	1.19	22.5	19.2	7.45	.442	.027	.007	.008	.039	4.18

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934.....					2.5	2.5	0.7.	0.1.	0.02	0.02	0.01	0.01	.....
1935....	0.01	0.12	0.29	3.3	6.6	6.9	3.4	.28	.04	0	0	.01	0
1936....	.01	.01	.03	.78	.48*	4.1	.88	.04	0	0	0	0	0
1937....	.01	0	.01	0	0	8.2	3.1	.14	.03	.01	0	0	0
1938....	0	.01	.10	.98	4.6	10	1.3	.16	0	0	0	0	0
1939....	0	.02	.06	.42	.35	3.9	.41	.14	.01	.01	0	.01	0
1940....	.01	.01	.02	.16	1.6	2.5	1.0	.06	0	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1934.....												
1935.....	290	Jan. 24, 1935	0	8.64	0.819	4.33	6,250	8.21	4.11	5,940		
1936.....	368	Mar. 2, 1936	0	5.30	.196	2.67	3,840	5.27	2.64	3,820		
1937.....	328	April 15, 1937	0	5.99	.221	3.00	4,340	6.22	3.12	4,510		
1938.....	262	Mar. 19, 1938	0	6.41	.237	3.22	4,650	6.22	3.12	4,510		
1939.....	432	Mar. 19, 1939	0	5.49	.203	2.76	3,980	5.47	2.74	3,960		
1940.....	331	Mar. 7, 1940	0	4.18	.154	2.10	3,040					

* Estimated.

Fourmile Creek at Shawnee, Wash.

Location.—Lat. 46°49'55", long. 117°16'20", in SW¼NE¼ sec. 33, T. 16 N., R. 44 E., on right bank, half a mile upstream from mouth, three-quarters of a mile north of Shawnee, and 5½ miles southwest of Colfax.

Drainage area.—71.6 sq. mi.

Supplemental records available.—Records of suspended sediment loads for the period April 1934 to June 1940 are contained in reports of Soil Conservation Service.

Gage.—Water-stage recorder and modified Parshall flume with sharp-crested weir. Altitude of gage is 2,210 ft. (from topographic map). Prior to Sept. 10, 1934, at datum 0.55 ft. lower.

Average discharge.—6 years (1934-40), 14.9 cfs.

Extremes.—1934-40: Maximum discharge, 786 cfs Jan. 24, 1935 (gage height, 4.13 ft.); no flow for long periods each year.

Remarks.—No diversion or regulation above station.

PALOUSE RIVER BASIN

Fourmile Creek at Shawnee, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934							8.62	1.79	1.65	0.068	0	0	
1935	0.357	1.34	13.8	74.0	42.4	57.4	60.9	5.64	.619	.077	0	0	21.3
1936	0	.200	1.31	31.8	37.8*	63.5	10.4	2.19	2.01	0	0	0	12.4*
1937	0	.004	.483	.031	7.31	103	55.4	3.13	1.77	.045	0	0	14.3
1938	0	.480	11.2	31.2	62.7	83.6	22.5	2.64	.512	.021	0	0	17.7
1939	0	.236	2.09	3.45	22.4	118	11.3	1.39	.389	.009	0	0	13.3
1940	0	.0003	.470	2.41	51.6	47.3	20.4	1.92	.158	0	0	0	10.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1934							2.3	0.5	0.1	0	0	0	
1935	0	0.56	1.2	9.2	21	24	18.5	1.4	.14	0	0	0	0
1936	0	0	.25	2.2	1.8*	13	3.9	.99	0	0	0	0	0
1937	0	0	.02	0	0	23	14	.04	.18	0	0	0	0
1938	0	0	.45	8.4	15	38	5.5	.89	.08	0	0	0	0
1939	0	0	.23	.89	.79	12	2.1	.04	.02	0	0	0	0
1940	0	0	.03	.43	2.2	8.6	3.9	.30	0	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1934												
1935	750	Jan. 24, 1935	0	21.3	0.297	4.03	15,300	20.1	3.81	14,530		
1936	727	Feb. 28, 1936	0	12.4	.173	2.35	9,000	12.3	2.34	8,930		
1937	437	Mar. 3, 1937	0	14.3	.200	2.71	10,370	15.3	2.90	11,060		
1938	414	Mar. 19, 1938	0	17.7	.247	3.35	12,790	16.9	3.20	12,220		
1939	740	Mar. 19, 1939	0	13.3	.188	2.52	9,620	13.1	2.48	9,510		
1940	767	Mar. 7, 1940	0	10.2	.142	1.93	7,430					

* Estimated.

Rock Creek near Ewan, Wash.

Location.—Lat. 47°08'10", long. 117°43'30", in sec. 13, T. 19 N., R. 40 E., on downstream side of highway bridge, 200 ft. downstream from Rock Lake, 2½ miles east of Ewan, and 9 miles northeast of St. John.

Drainage area.—About 520 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,720 ft. (estimated from benchmark at Ewan). Oct. 15, 1903, to Sept. 30, 1905, at different datum.

Average discharge.—5 years (1903-5, 1914-17), 109 cfs.

Extremes.—1903-5, 1914-17: Maximum discharge, 1,980 cfs Mar. 9, 1904 (gage height, 15.6 ft., from graph based on gage readings, datum then in use); no flow at times during 1904, 1905, 1914.

Remarks.—No diversion. Infrequent regulation by low dam at outlet of Rock Lake.

Rock Creek near Ewan, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	0.48	3.66	20.0	109	268	969	345	113	49.7	19.1	4.9	0.42	158
1905...	.06	.22	3.3	59.2	110	75.2	69.0	39.6	23.7	11.8	.80	0	32.2
1914.....	.....											
1915...	.05	.61	1.30	3.30	179	93.9	36.5	41.6	43.2	30.4	15.5	4.30	36.5
1916.....	.....											
1917...	1.88	4.43	14.6	26.2	542	763	391	117	63.0	50.1	34.2	18.3	168
1917...	8.83	10.0	26.2	32.4	343	397	669	167	67.2	25.0	14.2	6.15	149

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904...	0.3	0.4	8	40	149	575	183	64	28	10	1.5	0	0
1905...	0	.2	.5	12	82	64	57	25	19	5	0	0	0
1914.....	.....											
1915...	0	.1	1.0	1.6	5	39	76	35	9	6	.1	0	0
1916...	1.5	1.5	9.0	21	49	275	210	76	57	44	23	13	1.5
1917...	7.3	7.3	18	26	40	105	245	150	34	20	9.5	2.7	2.7

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1904.....	1,980	Mar. 9, 1904	0	158	115,000	157	114,000
1905.....	203	Jan.28-30,1905	0	32.2	23,300		
1914.....	.....					
1915.....	383	Feb. 12, 1915	0	36.5	26,400	38.1	27,800
1916.....	1,520	Feb. 17, 1916	1.5	168	122,000	170	123,000
1917.....	1,450	Mar.29,30,1917	2.7	149	108,000		

Palouse River near Winona, Wash.

Location.—Lat. 46°54'35", long. 117°55'40", in NE¼ sec. 5, T. 16 N., R. 39 E., on right bank, 1,000 ft. downstream from Rock Creek and 6½ miles southwest of Winona.

Drainage area.—About 2,100 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,270 ft. (from topographic map). Prior to Nov. 12, 1915, staff gage 800 ft. upstream at different datum.

Extremes.—1915-17: Maximum discharge, 11,800 cfs, Apr. 8 or 9, 1917 (gage height, 12.9 ft., from high-water mark); minimum observed, 9 cfs, Sept. 9-10, 26-29, 1915; minimum gage height observed, 0.48 ft. Sept. 27, 1915.

Remarks.—Numerous small diversions for irrigation and domestic use above station. Slight regulation from splash dam operation on headwaters in Idaho.

PALOUSE RIVER BASIN

Palouse River near Winona, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...	30*	65*	30*	47.5	703	455	420	546	187	52.1	22.9	11.0	214*
1916...	18.9	51.8	156	218	2,760	4,140	1,860	664	222	127	63.8	49	861
1917...	37.9	77.6	146	275	1,200	1,300	4,740	2,350	547	81.7	34.1	20.1	894

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1915...				24	233		166	180	82	37	13	9	
1916...	11	20	69			928	1,080	340	144	68	55	31	11
1917...	28	44	64	92	226	420	2,760	1,470	129	46	24	14	14

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean.	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1915.....	2,800	May 21, 1915		214	155,000	224	162,000
1916.....	11,200	Feb. 11, 1916	11	861	620,000	364	628,000
1917.....	11,800	Apr. 8 or 9, 1917	14	894	646,000		

* Estimated.

Palouse River at Hooper, Wash.

Location.—Lat. 46°45'30", long. 118°08'50", in SE¼ sec. 27, T. 15 N., R. 37 E., on left bank, 150 ft. downstream from State Highway 11B bridge at Hooper and 0.4 mile upstream from Cow Creek.

Drainage area.—2,540 sq. mi., approximately.

Supplemental records available.—April to August 1897, gage heights only.

Gage.—Water-stage recorder. Altitude of gage is 1,040 ft. (from topographic map). Prior to Sept. 1, 1897, staff gage 2½ miles upstream at different datum. Sept. 9, 1897, to March 1916, various staff gages 1½ miles upstream at different datums.

Average discharge.—15 years (1897-99, 1900-6, 1908-11, 1913-15, 1951-53), 612 cfs.

Extremes.—1897-1916, 1951-53: Maximum discharge observed, 29,800 cfs Mar. 2, 1910 (gage height, 22.0 ft., from graph based on gage readings, site and datum then in use); no flow June 25, 1910 when entire flow was diverted for part of day.

Remarks.—Several small diversions for irrigation, domestic and municipal use above station. No regulation.

PALOUSE RIVER BASIN

Palouse River at Hooper, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898...	56.8	285	1,290	901	4,490	2,010	2,270	655	307	114	53.2	50.6	1,020
1899...	64.7	98.5	113	1,050	1,310	1,150	1,750	728	187	67.1	37.7	44.1	547
1900...	63.8	125	639				574	457	192	69.8	44.4	40.6	
1901...	136	242	1,320	1,820	2,490	3,190	1,380	604	479	287	78.3	66.3	1,000
1902...	74.5	143	280	424	1,510	1,070	673	516	283	291	85.8	46.8	463
1903...	63.3	211	714	3,330	1,130	1,560	2,120	1,110	460	61.9	30.4	33.6	903
1904...	48.7	110	228	400	873	4,300	3,360	678	255	78.8	24.5	17.3	804
1905...	27.8	39.6	63.0	181	225	348	380	294	288	73.9	27.2	22.2	161
1906...	82.2	76.9	126	319	678	964	943	263	279	74.8	27.4	30.0	334
1907...	34.1	235	1,470	1,240	4,820	3,550							
1908...										55.7	26.5	24.6	
1909...	52.6	66.6	82.1	2,530	1,190	961	568	351	117	43.6	21.9	16.7	497
1910...	30.0	186	355	1,180	1,800	6,660	1,710	328	112	46.9	31.5	21.2	1,030
1911...	26.7	125	244	218	308	1,470	559	400	142	36.1	6.83	13.9	297
1912...	29.4	78.2	78.3	835	1,470	1,040	1,130	1,150	270	63.5			
1913...							4,130	1,070	317	143	31.7	28.2	
1914...	51.7	104	114	667	1,160	1,370	925	281	67.1	27.2	6.61	12.5	395
1915...	31.8	69.8	36.9	46.6	847	605	442	586	185	45.6	16.4	12.1	227
1916...	17.7	58.2	167	345	3,540	5,520							
1951...					3,173	1,845	1,104	431	252	72.5	22.5	26.7	
1952...	117	168	354	329*	2,791	2,634	2,345	715	198	135	52.9	40.6	813*
1953...	44.9	64.1	118	1,960	2,029	1,291	790	736	376	85.0	36.5	29.5	622

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1898...	50	60	275	500	581	1,090	1,590	398	160	73	43	47	43
1899...	51	33	73	89	443	787	931	341	95	30	30	36	30
1900...	36	68	256				286	335	90	53	41	32	
1901...	38	145	584	740	482	1,260	933	466	348	122	49	45	38
1902...	68	84	145	188	170	550	452	362	145	122	53	41	41
1903...	58	63	179	570	602	823	1,360	782	133	46	25	25	25
1904...	32	46	193	158	283	1,260	1,400	259	118	41	17	15	15
1905...	19	28	86	74	150	198	218	159	109	33	22	19	19
1906...	30	52	88	102	363	485	420	136	118	40	24	30	24
1907...	30	36	102	558	1,440	2,000							
1908...										24	20	22	
1909...	29	52	67	60	375	517	307	176	46	23	15	12	12
1910...	22	32	155	118	430	1,200	575	138	0	11	9	16	0
1911...	25	42	155	85	176	246	368	271	65	2.0	4.4	5.0	2.0
1912...	24	20	46	20	690	540	770	377	63	20			
1913...							1,560	591	200	54	28	26	
1914...	28	70	80	107	272	677	379	156	38	8	6	6	6
1915...	14	28	22	29	432	346	166	166	76	25	3	6	6
1916...	6	25	90	70	196	1,040							
1951...					1,000	715	510	256	122	35	17	22	
1952...	46	115	200*	205*	946	1,050	1,520	264	165	57	37	36	36
1953...	36	57*	62*	125*	862	630	516	352	146	41	26	25	25

* Estimated.

PALOUSE RIVER BASIN

Palouse River at Hooper, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1898.....	15,000†	Feb. 16, 1898	43	1,020	735,000	901	652,000
1899.....	6,060	April 14, 1899	30	547	390,000	594	430,000
1900.....							
1901.....	9,110	Feb. 17, 1901	38	1,000	724,000	898	650,000
1902.....	4,150	Feb. 19, 1902	41	468	339,000	510	369,000
1903.....	10,500	Jan. 6, 1903	25	903	654,000	853	617,000
1904.....	16,600	Mar. 9, 1904	15	864	627,000	843	612,000
1905.....	836	Mar. 28, 1905	19	161	117,000	175	126,000
1906.....	2,650	Mar. 21, 1906	24	334	241,000	450	331,000
1907.....	9,500	Feb. 10, 1907					
1908.....							
1909.....	17,700*	Jan. 30, 1909	12	497	360,000	529	382,000
1910.....	20,500	Mar. 2, 1910	0	1,030	748,000	1,020	738,000
1911.....	3,830	Mar. 10, 1911	2.0	297	215,000	270	202,000
1912.....	3,330	Jan. 27, 1912					
1913.....	16,800	Mar. 30, 1913					
1914.....	5,260	Feb. 26, 1914	6	395	286,000	384	278,000
1915.....	2,670	May 21, 1915	0	227	165,000	237	172,000
1916.....	19,400	Feb. 11, 1916					
1951.....							
1952.....	12,000	Feb. 5, 1952	36	813	590,300	779	565,800
1953.....	6,920	Jan. 23, 1953	25	622	450,300		

† Maximum observed. * Estimated.

Cow Creek at Hooper, Wash.

Location.—Lat. 46°45'57", long. 118°08'45", in NW¼ sec. 26, T. 15 N., R. 37 E., on left bank at downstream side of county highway bridge, half a mile upstream from mouth, and half a mile north of Hooper.

Drainage area.—670 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is about 1,070 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 966 cfs Feb. 5 (gage height, 662 ft.). from rating curve extended above 350 cfs; no flow July 27 to Aug. 3, 1951, Sept. 29, 1952.

Remarks.—Possibly some small diversions for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....					43.3	81.5	109	85.0	53.7	19.9	4.59	4.04	.....
1952.....	8.44	7.49	10.7*	22.1	132	71.3	131	94.2	51.1	20.5	8.54	5.10	46.4*
1953.....	0.66	8.65	10.6	24.4	24.6	21.9	56.0	20.3	18.6	16.1	8.11	9.48	19.2
1954.....	8.23	10.7											

* Estimated.

Cow Creek at Hooper, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....					24	45	99	54	39	0	0	1.5	.....
1952.....	6.2	6.7	3*	3*	55	57	109	65	39	12	6.0	.4	0.4
1953.....	3.5	6.2*	7.0*	16.5	18.5	15	34	11	10.5	6.0*	3.5	5.6	3.6
1954.....	6.4	8.0											

Summary

WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1951.....							
1952.....	966	Feb. 5, 1952	0.4	46.4	33,710	46.9	34,030
1953.....	79	April 13, 1953	3.5	19.2	13,880		

SNAKE RIVER MAIN STEM

Snake River near Burbank, Wash.

Location.—Lat. 46°14'20", long. 118°56'30", in sec. 28, T. 9 N., R. 31 E., on left bank, a quarter of a mile upstream from Five-Mile Rapids, a third of a mile upstream from intake of Burbank Co. Canal, 4½ miles northeast of Burbank, and 6½ miles upstream from mouth.

Drainage area.—109,000 sq. mi., approximately.

Supplemental records available.—Gage-height records collected in this vicinity, 1904, are contained in reports of U. S. Weather Bureau.

October 1907 to August 1909, fragmentary gage heights only.

Gage.—Staff gage. Datum of gage is 300.00 ft. above mean sea level, unadjusted.

Average discharge.—7 years (1909-16), 58,660 cfs.

Extremes.—1909-17: Maximum discharge observed, 298,000 cfs May 29, 1913 (gage height, 51.8 ft.); minimum observed, 11,800 cfs Aug. 26, 27, 1910 (gage height, 34.3 ft.).

Remarks.—Numerous large diversions above station in southern Idaho for irrigation of approximately 2 million acres in 1915, with return flow from irrigated areas re-entering stream above station. Flow regulated by storage in Jackson Lake, Arrowrock and Deer Flat Reservoirs and in other small reservoirs on upstream tributaries.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....													26,600
1910.....	28,100	47,800	40,800	37,500	34,400	165,000	164,000	159,000	78,900	25,200	13,900	15,400	67,600
1911.....	23,000	35,800	35,400	26,800	37,100	56,800	73,500	124,000	165,000	65,100	20,200	17,400	58,300
1912.....	26,300	29,400	26,400	35,600	49,900	41,400	100,000	184,000	209,000	59,500	23,700	28,700	67,600
1913.....	30,100	33,800	23,200	24,400	28,500	44,900	124,000	166,000	189,000	61,400	25,200	19,100	64,200
1914.....	29,500	32,300	24,800	32,800	33,400	65,100	92,900*	130,000*	96,700*	32,400*	14,000*	17,100	50,100*
1915.....	30,700	34,300	23,400*	23,700*	28,400*	34,700	56,500	74,300	64,400	30,200	16,800	14,400	36,000*
1916.....	21,100*	24,200	27,700*	27,100*	51,500*	89,500	114,000*	138,000*	164,000	99,000	28,400*	22,800*	66,800*
1917.....	28,000	28,200*	26,800*	25,500	28,500	31,700							

* Estimated.

SNAKE RIVER MAIN STEM

Snake River near Burbank, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909												19,300	.....
1910	25,500	27,200	25,500	29,100	27,200	69,000	108,000	124,000	39,400	17,400	11,800	13,000	11,800
1911	15,600	21,500	26,400	23,000	25,500	21,500	51,700	95,600	118,000	27,200	16,100	15,600	15,600
1912	18,700	23,000	23,800	15,000	36,100	35,000	69,000	119,000	122,000	26,000	17,200	22,000	15,000
1913	26,000	26,000	17,200	18,500	23,500	26,000	86,000	89,400	114,000	31,700	16,100	15,500	15,500
1914	21,500	30,800	20,800	23,000	20,800	44,500	47,100	57,300*	59,400*	18,000*	13,400	13,000	13,000
1915	21,200	27,700	.....	.....	23,200	26,100	43,000	44,300	39,400	21,200	13,400	13,000	13,000
1916	.....	.....	.....	.....	.....	38,300	.....	.....	99,400	.....	.....	.....	.....
1917	.....	.....	.....	17,600	24,400	27,300	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1909	.....	.....	.....	.....	.....	.....	.....
1910	252,000†	Mar.23,24,1910	11,800	67,600	49,000,000	65,700	47,600,000
1911	242,000†	June 15, 1911	15,600	58,300	42,200,000	57,300	41,600,000
1912	289,000†	June 10, 1912	15,000	67,600	49,100,000	68,000	49,400,000
1913	298,000†	May 29, 1913	15,500	64,200	46,400,000	64,200	46,400,000
1914	175,000†	May25,26,1914	13,000	50,100	36,300,000	50,300	36,400,000
1915	122,000†	May20,21,1915	13,000	36,000	26,000,000	34,700	25,160,000
1916	249,000†	June 20, 1916	.....	66,800	48,500,000	67,600	49,100,000
1917	.....	.....	.....	.....	.....	.....	.....

* Estimated.

† Maximum observed.

WALLA WALLA RIVER BASIN

Mill Creek near Walla Walla, Wash.

Location.—Lat. 46°00'30", long. 118°07'00", in SE¼SE¼ sec. 12, T. 6 N., R. 37 E., on left bank, 4 miles downstream from city of Walla Walla diversion dam, 4½ miles upstream from Blue Creek, and 11½ miles southeast of Walla Walla.

Drainage area.—60 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 2,000 ft. above mean sea level, unadjusted. Aug. 27, 1913, to Sept. 30, 1917 and Apr. 11 to Sept. 30, 1938, staff gages at practically same site at different datums.

Average discharge.—18 years (1913-17, 1939-53), 99.2 cfs.

Extremes.—1913-17, 1938, 1939-53: Maximum discharge, 1,920 cfs Feb. 24, 1950 (gage height, 17.10 ft.), from rating curve extended above 620 cfs by logarithmic plotting; minimum observed, 16 cfs Oct. 11-15, 1939.

Remarks.—City of Walla Walla diverts about 22 cfs 4 miles above station for municipal use. No regulation.

WALLA WALLA RIVER BASIN

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Mill Creek near Walla Walla, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913													29.3
1914	47.0	66.0	43.3	120	141	182	134	80.4	50.3	35.5	32.6	36.4	80.2
1915	38.0	50.1	33.8	40.5	101	124	130	148	49.5	29.8	24.4	24.1	65.9
1916	28.4	72.1	118	64.8	201	315	197	168	98.5	50.9	30.7	29.1	114
1917	28.9	38.7	72.6	81.3	116	71.4	420	495	213	61.0	31.3	30.8	138
1938							156	95.6	45.0	26.1	24.1	24.2	
1940	19.4	24.1	37.5	49.9	199	173	104	75.5	33.4	27.7	26.7	28.9	71.0
1941	28.8	57.0	87.0	80.1	49.7	45.4	46.5	83.5	79.7	35.8	26.3	28.7	54.1
1942	35.8	86.1	112	54.0	98.6	101	110	116	105	44.4	24.6	22.6	75.6
1943	27.0	89.9	173	105	168	137	242	160	93.9	41.7	29.0	26.9	107
1944	40.5	48.3	56.1	33.7	71.2	120	156	86.3	46.6	26.7	24.6	28.4	62.2
1945	26.8	33.6	34.4	103	186	138	188	165	33.9	32.7	27.8	31.3	83.0
1946	31.4	102	145	166	143	202	190	153	85.1	53.4	34.1	32.7	111
1947	48.8	137	240	159	114	147	180	84.8	51.1	36.4	30.5	33.9	105
1948	60.7	165	146	158	195	110	205	306	119	53.9	41.7	41.1	133
1949	38.8	81.2	105	58.7*	149	260	284	211	75.1	46.7	38.7	36.4	115*
1950	40.8	51.5	68.9	90.7	267	317	226	226	164	60.2	46.0	44.4	133
1951	58.0	144	174	168	241	150	160	104	110	45.3	41.4	39.9	119
1952	105	196	128	80.4	175	140	277	163	76.7	61.9	38.2	36.9	115
1953	37.9	35.6	38.9	225	184	180	177	147	93.9	46.1	38.4	36.6	103

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913													29
1914	29	38	36	49	50	83	83	60	40	32	32	32	29
1915	34	35	30*	34	61	61	64	66	32	27	22	22	22
1916	23	27	50		46	92	146	117	66	32	27	26	23
1917	28	29	40	39	47	43	105	230	106	36	28	28	28
1938								71	32	23	23	23	
1940		23	23	31	50	95	88	40	29	26	26	26	
1941	24	32	39	44	42	38	39	45	46	26	25	25	24
1942	25	35	39	35	40	39	74	78	45	29	23	22	22
1943	23	46	64	41	41	62	112	109	64	31	26	26	23
1944	26	30	34	30	36	47	113	58	31	24	23	24	23
1945	25	26	25	26	40	40	192	120	40	29	27	27	25
1946	28	43	36	91	83	137	115	107	57	45	29	30	26
1947	30	66	89	37*	80	76	126	52	42	32	29	29	29
1948	34	62	54	62	47	70	132	135	72	42	39	39	34
1949	36	42	60*	45*	45*	125	125	125	57	42	36	35	35
1950	35	39	48	45*	43*	134	140*	140	88	49	43	42	35
1951	43	81	96	96	92	72	101	70	54	40	39	39	39
1952	46	67	65*	55*	70	67	183	95	60	42	37	35	35
1953	36	30*	35	39	86	101	52	116	56	40	35	35	30*

* Estimated.

WALLA WALLA RIVER BASIN

Mill Creek near Walla Walla, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30				CALENDAR YEAR		
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
1913							
1914	442†	Feb. 27, 1914	29	80.2	58,100	77.3	56,100
1915	440†	May 19, 1915	22	65.9	47,700	74.0	53,600
1916	778†	Mar. 10, 1916	28	114	82,900	108	78,000
1917	1,120†	May 13, 1917	28	138	100,000		
1938							
1940	763	Feb. 28, 1940		71.0	51,540	78.7	57,120
1941	542	Nov. 29, 1940	24	54.1	39,150	59.2	42,830
1942	902	June 26, 1942	22	75.6	54,730	80.4	58,200
1943	628	Jan. 1, 1943	23	107	77,590	95.0	68,760
1944	721	Mar. 9, 1944	23	62.2	45,180	58.0	42,130
1945	659	Feb. 8, 1945	25	83.0	60,100	98.5	71,280
1946	1,880	Dec. 28, 1945	28	111	80,640	124	89,570
1947	1,310	Dec. 12, 1946	29	105	76,140	101	72,800
1948	1,470	Feb. 26, 1948	34	133	96,710	121	87,360
1949	602	Mar. 19, 1949	35	115	83,320	110	79,440
1950	1,920	Feb. 24, 1950	35	133	96,070	151	109,100
1951	1,330	Feb. 11, 1951	39	110	85,950	116	83,740
1952	606	Oct. 24, 1951	35	115	83,650	96.2	69,840
1953	1,400	Feb. 8, 1953	30	103	74,540		

† Maximum observed.

Blue Creek near Walla Walla, Wash.

Location.—Lat. 46°03'30", long. 118°08'10", in SW¼NW¼ sec. 25, T. 7 N., R. 37 E., on right bank, 1 mile upstream from mouth and 10 miles east of Walla Walla.

Drainage area.—17.0 sq. mi.

Gage.—Water-stage recorder and, since July 25, 1948, concrete control. Datum of gage is 1,700 ft. above mean sea level, unadjusted. Prior to Oct. 1, 1950, at datum 1,700 ft. lower.

Average discharge.—14 years (1939-53), 16.0 cfs.

Extremes.—1939-53: Maximum discharge, 725 cfs Dec. 28, 1945 (gage height, 1,743.35 ft., present datum), from rating curve extended above 400 cfs; minimum observed, 0.1 cfs Oct. 14, 1939, but may have been less during periods of no gage-height record Oct. 1-11, 15, 1939.

Remarks.—No known diversion or regulation above station.

WALLA WALLA RIVER BASIN

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Blue Creek near Walla Walla, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	0.62*	0.85	2.82	6.64	47.0	35.2	33.6	7.21	1.15	0.82	0.75	1.58	11.4*
1941...	1.68	9.64	16.5	18.9	8.66	6.16	5.15	11.8	22.1	4.43	1.04	1.94	8.99
1942...	4.70	20.1	25.5	12.7*	23.1	21.5	11.6	16.1	19.9	4.06	.48	.68	13.3*
1943...	1.34	27.6	65.5*	27.2*	30.2*	23.8	34.8	24.6	5.70	1.73	1.11	.99	20.3*
1944...	2.95	3.21	5.32	3.04	11.5	41.7	31.0	5.31	1.72	.75	.56	.83	8.97
1945...	1.08	1.93	2.22	24.5	21.8	22.9	25.3	13.4	11.0	.82	.82	.82	10.5
1946...	.93	13.0	37.1	51.5	35.6	37.4	28.0	10.9	6.31	1.34	.75	1.03	13.6
1947...	2.99	22.1	37.4	44.8	18.2	28.6	31.2	2.99	2.26	1.00	.52	.80	16.1
1948...	6.41	29.9	32.0	47.0	36.0	30.5	37.3	73.6	12.3*	2.38*	1.13	1.22	25.8*
1949...	1.49	9.25	31.7	10.4*	58.7*	59.5	41.4	11.5	1.68	.88	.75	.84	18.7*
1950...	1.31	2.61	7.25	20.6*	71.6	61.8	39.2	22.7	19.4	1.79	.90	.82	20.5*
1951...	3.05	21.7	33.7	39.0	56.3	40.0	20.2	5.99	14.1	.887	.532	.700	19.4
1952...	11.7	10.7	20.3	18.5	52.1	30.0	33.8	7.11	2.34	1.98	.85	1.11	15.7
1953...	1.06	1.26	1.70	41.8	41.1	41.5	32.3	14.5	9.15	1.17	1.01	.370	15.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	.....	0.6	0.8	2.5	7.3	11	6.7	1.9	0.7	0.6	0.6	0.8	.....
1941...	0.8	3.6	4.3*	7.6	6.8	4.2	2.6	3.1	5.9	1.1	.8	1.1	0.8
1942...	2.3	4.5	2.8	5*	3.2	2.6	4.4	5.3	.7	.5	.4	.4	.4
1943...	.8	8.4	35*	2.7*	2.7*	7.5	12	6.5	3.3	1.2	1.0	.9	.8
1944...	1.1	1.6	2.7	2.1	3.6	12*	15	1.9	1.0	.5	.4	.4	.4
1945...	.8	1.1	1.4	1.9	2.9	2.9	13	7.3	1.9	.5	.3	.4	.3
1946...	.5	1.6	3.5*	23	15	26*	16	3.3	2.2	.8	.6	.7	.5
1947...	1.0	7.5	10	7.8	9.7	9.2	8.6	1.4	1.4	.6	.4	.5	.4
1948...	1.0	11	18	3.1	1.8	14	23	26	4*	1.0	1.0	.8	.8
1949...	1.2	1.9	7.0*	5.5*	5.5*	21	21	2.8	1.3	.7	.6	.5	.5
1950...	.7	1.4	2.0	3.0*	3.0*	18.5	16	3.0	2.2	1.0	.7	.7	.7
1951...	1.0	8.8	12	15*	12*	10	7.7	2.8	1.9	.5	.4	.5	.4
1952...	1.6	3.9	11	5.0*	11.5	13	12.5	2.8	1.6	.8	.7	1.0	.7
1953...	1.0	.9*	1.2	1.9	14	17	15.5	6.3	2.4	.8	.3	.7	.7

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1940.....	226	Feb. 28, 1940	.....	11.4	0.671	9.09	8,230	13.3	10.66	9,670
1941.....	235	June 7, 1941	0.8	8.99	.529	7.18	6,510	10.9	8.69	7,870
1942.....	600	June 26, 1942	.4	13.3	.782	10.61	9,620	17.0	13.58	12,310
1943.....	.....	.....	.8	20.3	1.19	16.22	14,720	13.4	10.65	9,660
1944.....	579	Mar. 9, 1944	.4	8.97	.528	7.18	6,500	8.44	6.76	6,120
1945.....	197	Feb. 8, 1945	.3	10.5	.618	8.35	7,570	14.3	11.44	10,370
1946.....	725	Dec. 28, 1945	.5	13.6	1.09	14.84	13,450	19.5	15.58	14,140
1947.....	378	Jan. 24, 1947	.4	16.1	.947	12.34	11,640	20.0	15.96	14,480
1948.....	670	Jan. 7, 1948	.8	25.8	1.52	20.67	18,760	23.7	18.97	17,200
1949.....	522	Feb. 22, 1949	.5	18.7	1.10	14.97	13,650	16.1	12.86	11,670
1950.....	550	Feb. 24, 1950	.7	20.5	1.21	16.33	14,810	24.4	19.61	17,670
1951.....	450	Feb. 11, 1951	.4	19.4	1.14	15.54	14,020	18.1	14.48	13,130
1952.....	253	Feb. 2, 1952	.7	15.7	.924	12.56	11,470	12.5	9.96	9,050
1953.....	253	Feb. 3, 1953	.7	15.5	.912	12.34	11,190	.....	.....	.....

* Estimated.

WALLA WALLA RIVER BASIN

Yellowhawk Creek at Walla Walla, Wash.

Location.—Lat. 46°04'20", long. 118°16'55", in NW¼SW¼ sec. 23, T. 7 N., R. 36 E., on right bank, 1 mile downstream from point of diversion from Mill Creek, and 1 mile east of Walla Walla.

Gage.—Water-stage recorder. Altitude of gage is 1,140 ft. (from topographic map). Prior to July 1, 1941, staff gage 300 ft. downstream at datum 0.62 ft. lower.

Average discharge.—11 years (1941-52), 44.5 cfs.

Extremes.—1941-52: Maximum discharge, 320 cfs June 7, 1941 (gage height, 4.00 ft., site and datum then in use); no flow part of Nov. 30, Dec. 1, 1949.

Remarks.—This stream and Garrison Creek divert from left bank of Mill Creek in sec. 23, T. 7 N., R. 36 E., 1 mile upstream for irrigation and farm use on land adjacent to Walla Walla River which receives return flow. Flow regulated at dam upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941								54.5	61.0	21.8	10.8	15.5	
1942	34.0	47.9	71.4*	11.9*	36.4	33.7	64.4	46.1	43.8	29.3	6.82	10.4	30.7*
1943	10.8	52.1	60.9	59.3*	35.4	45.0	56.9	57.5	53.4	19.5	14.0	15.2	40.8*
1944	24.0	35.9	39.1	33.4	37.2	47.6	46.8	50.1	35.2	15.4	12.8	13.3	32.5
1945	21.5	34.1	32.4	28.5	35.5	38.2	39.1	47.5	47.1	21.6	14.1	15.8	31.2
1946	21.4	42.8	35.8	22.8	64.0	71.8	120	80.8	56.0	35.0	17.8	20.8	49.8
1947	41.9	68.8	82.1	73.9	96.2	130	150	68.4	43.3	21.9	18.4	20.2	67.7
1948	45.3	67.7	85.1	79.4	80.2	77.6	58.2	22.7	76.7	43.9	28.5	24.3	62.9
1949	42.8	76.1	103	10.6*	22.7	33.3	66.1	61.9	46.5	26.0	20.0	23.5	44.6*
1950	34.2	63.1	45.8	10.8*	31.6	56.0	47.6	71.4	51.8	39.0	26.0	24.9	41.1*
1951	39.1	37.6	45.3	33.1	22.0	47.8	46.1	38.4	40.1	25.0	19.7	21.8	34.8
1952	24.8	66.0	52.5	42.3	66.9	61.7	60.8	74.3*	53.8	39.0	21.7	21.3	47.8*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941								39	36	5.5	6.6	11	
1942	21	11	31	3*	19	16	43	33	25	11	4.3	8.9	3*
1943	14	34	46	35*	22	26	40*	45	36	10	11	18	10
1944	14	29	33	14	28	34	41	38	22	10	10	9.3	9.3
1945	14	29	20	20	26	22	27	36	33	15	10	10	10
1946	13	2.8	23*	9.6	12	16	87	69	36	21	13	20	2.8
1947	25	32	22	22	60	53	76	43	27	18	17	17	17
1948	20	35	35	47	43	53	7.5	33	53	32	24	20	7.5
1949	32	51	8*	6*	9.8	19	10	38	39	20	18	18	3.8
1950	23	40	13	1.2*	1.2*	22	34	34	25	30	22	22	1.2*
1951	29	13	29	1.1*	1.1*	24	27	22	29	17	18	10	1.1*
1952	11	40	20*	1*	38	40	10.5	32	41	24	18	18	1*

* Estimated.

Yellowhawk Creek at Walla Walla, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30			Mean	Runoff in acre-feet	CALENDAR YEAR	
	Discharge	Date	Minimum day			Mean	Runoff in acre-feet
1941.....	320†	June 7, 1941					
1942.....	186	Nov. 14, 1941	3	36.7	26,570	35.0	23,300
1943.....	155	Jan. 15, 1943	10	40.8	29,520	37.9	27,480
1944.....	88	Mar. 11, 1944	9.3	32.5	23,610	31.6	22,930
1945.....	73	June 29, 1945	10	31.2	22,600	32.2	23,320
1946.....	284	Dec. 28, 1945	2.8	40.8	38,090	57.7	41,760
1947.....	318	Jan. 23, 1947	17	67.7	49,020	68.2	49,330
1948.....	294	Feb. 26, 1948	7.5	62.9	45,630	65.0	47,190
1949.....	233	Dec. 2, 1948	3.8	44.0	32,290	37.0	26,760
1950.....	182	Feb. 24, 1950	1.2	41.1	29,750	40.2	29,100
1951.....	133	Oct. 29, 1950	1.1	34.8	25,170	36.5	26,430
1952.....	125	Feb. 2, 1952	1	47.8	34,730		

† Maximum during period April to September.

Garrison Creek at Walla Walla, Wash.

Location.—Lat. 46°04'25", long. 118°17'10", in NE¼ sec. 22, T. 7. N., R. 36 E., on left bank, 30 ft. downstream from county bridge, 0.9 mile east of Walla Walla, and 1 mile downstream from point of diversion from Mill Creek.

Gage.—Water-stage recorder and, after Nov. 23, 1946, wooden control. Altitude of gage is 1,130 ft. (from topographic map). Prior to June 27, 1941, staff gage at same site and datum.

Average discharge.—11 years (1941-52), 6.88 cfs.

Extremes.—1941-52: Maximum discharge, 60 cfs May 9, 1948 (gage height, 3.28 ft.); maximum gage height, 3.29 ft. Dec. 28, 1948 (backwater from ice); no flow part of May 10, 1941.

Remarks.—This stream and Yellowhawk Creek divert from left bank of Mill Creek in sec. 23, T. 7 N., R. 36 E., 1 mile upstream for irrigation and farm use on land adjacent to Walla Walla River which receives return flow. Flow regulated at dam upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941.....								2.30	4.33	1.64	2.51	4.11	.....
1942.....	4.23	3.74	1.20	1.94*	5.23	8.47	17.3	11.8	5.41	4.28	1.86	1.54	5.57*
1943.....	1.20	7.14	7.48	12.7	7.92	9.25	13.1	12.9	0.83	3.40	1.94	2.84	7.46
1944.....	4.76	4.34	4.34	3.72	4.51	5.51	5.16	5.67	2.83	1.51	1.51	3.45	3.94
1945.....	1.81	4.48	5.78	7.07	6.19	5.28	4.55	4.26	3.87	1.27	2.50	6.67	4.48
1946.....	4.95	6.29	3.06	1.78	3.14	5.60	9.36	6.90	4.86	1.22	1.74	2.68	4.33
1947.....	5.00	6.90	12.4	9.61	13.3	23.6	27.3	7.20	2.26	1.33	1.63	5.36	9.62
1948.....	10.0	13.0	15.5	14.0	15.7	21.3	15.8	20.0	9.71	2.02	3.40	8.23	12.5
1949.....	2.59	8.92	14.7	1.14*	1.69*	4.26	9.35	6.62	4.92*	3.96*	5.61	10.9	6.23*
1950.....	13.3	4.31	2.44	.390*	1.84	3.26	5.45	10.4	3.84	4.37	5.04	5.90	5.07*
1951.....	8.99	8.65	11.1	5.20	7.12	10.7	13.8	6.52	7.20	4.96	4.42	7.64	8.02
1952.....	10.1	15.5	8.23	9.05	17.6	6.71	10.9	8.62	4.99	3.13	2.04	5.40	8.46

* Estimated.

WALLA WALLA RIVER BASIN

Garrison Creek at Walla Walla, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941.....								0.6	1.5	0.6	1.0	2.3	.....
1942... 2.3	0.1	0.8	0.8	2.9	3.1	9.7	7.1	1.9	1.9	1.4	1.4	.9	0.1
1943... .7	1.6	4.2	7.7	4.0	5.0	7.7	5.9	5.9	1.8	1.7	1.9	1.9	.7
1944... 1.9	3.4	3.4	3.0	3.0	3.4	3.9	3.0	1.1	1.2	1.4	1.3	1.1	1.1
1945... .8	3.0	4.9	4.1	4.6	3.4	3.0	2.2	2.4	.6	1.2	2.3	.6	.6
1946... 3.0	3.0	1.3*	.7	1.0	2.4	2.6	4.4	1.8	.8	1.0	1.9	.7	.7
1947... 2.6	2.7	2.9	3*	8.2	7.5	2.4	2.0	1.1	.6	1.3	1.5	.5	.5
1948... 6.0	.2	.3	7.9	7.5	13	6.8	9.1	.1	.9	1.9	5.0	.1	.1
1949... .4	1.0	.8	.7*	.6*	1.9	1.8	4.4	4.1	3.5	3.4	5.7	.4	.4
1950... 4.0	2.6	.2	.2*	.2*	.2	3.5*	4.9	2.1	3.4	3.0	4.9	.2	.2
1951... 6.8	5.4	5.4	.7*	.7*	1.9	5.8	4.8	4.8	3.7	3.9	4.9	.7*	.7*
1952... 4.3	8.3	1.5	.4	13	1.8	5.8	5.6	4.1	1.0	1.2	2.8	.4	.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1941.....							
1942.....			0.1	5.57	4,040	6.12	4,440
1943.....	32	Jan. 15, 1943	.7	7.46	5,400	7.27	5,260
1944.....	17	Oct. 21, 1943	1.1	3.94	2,860	3.82	2,770
1945.....	15	Jan. 9, 1945	.6	4.46	3,230	4.64	3,360
1946.....	25	Feb. 25, 1946	.7	4.33	3,140	5.18	3,750
1947.....	52	Dec. 11, 1946	.5	9.62	6,970	10.8	7,830
1948.....	60	May 9, 1948	.1	12.5	9,650	11.4	9,300
1949.....	49	Dec. 13, 1948	.4	6.23	4,510	5.71	4,140
1950.....	35	May 13, 1950	.2	5.07	3,670	5.30	4,200
1951.....	26	April 5, 1951	.7	8.02	5,610	8.44	6,110
1952.....	40	Oct. 20, 1951	.4	8.46	6,140		

* Estimated.

Mill Creek at Walla Walla, Wash.

Location.—Lat. 46°04'40", long. 118°17'00", in NE¼ sec. 22, T. 7 N., R. 36 E., on left bank at bridge, 0.9 mile downstream from diversion dam, and 1.0 mile east of Walla Walla.

Drainage area.—96 sq. mi., approximately.

Gage.—Water-stage recorder and wire-encased rock or concrete control. Altitude of gage is 1,120 ft. (from topographic map).

Average discharge.—12 years (1941-53), 80.3 cfs (unadjusted); 11 years (1941-52), 131 cfs adjusted for Yellowhawk and Garrison Creek diversions.

Extremes.—1941-53: Maximum discharge, 2,760 cfs Dec. 28, 1945 (gage height, 4.0 ft.); maximum gage height, 5.04 ft. Jan. 22, 1950, from high-water mark on outside gage; minimum discharge, 0.5 cfs May 10, 1947, July 23, 24, 1949, Aug. 12, 13, 1952.

Remarks.—Flow regulated at dam 0.9 mile above station where water is diverted for irrigation and farm use into Yellowhawk and Garrison Creeks (see elsewhere in this report) and at times some high flow is diverted out of the basin into flood-control reservoir that releases storage into Russell Creek. City of Walla Walla diverts water for municipal supply several miles upstream. Other small diversions for irrigation above station.

WALLA WALLA RIVER BASIN

Mill Creek at Walla Walla, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941								49.1	34.4	5.87	3.19	9.57	.....
1942	6.35	43.6	90.9	81.5*	118	97.9	55.0	71.3	65.0	9.02	5.53	7.77	53.9*
1943	10.7	61.7	190	95.6	208	111	239	129	33.9	3.42	5.18	3.80	90.1
1944	18.2	24.0	34.9	15.8	62.3	140	157	39.6	7.04	2.29	2.74	2.52	42.0
1945	6.29	5.84	4.95	63.8	138	148	189	113	37.1	3.14	2.16	4.39	62.8
1946	4.16	45.1	157	273	163	244	100	82.9	27.0	6.01	5.15	5.79	95.0
1947	6.97	88.6	131	130	16.2	3.21	9.70	14.9	6.54	2.55	4.49	8.28	35.4
1948	17.0*	147*	112*	144	119	115	247	344	57.8	5.74*	5.89	4.12	112*
1949	3.92	19.8	46.5*	52.7*	206*	319	248	153	20.7	4.44	4.94	5.03	89.6*
1950	7.00	11.3	32.7*	80.9*	329	337	190	108	116	3.68*	1.26*	1.73*	101*
1951	13.7	137*	155	211*	332	167	134	71.5	87.9	5.03	5.05	3.88	109*
1952	96.0	46.6	113	58.7	137	115	276	97.0	12.1	9.94	1.15	1.97	85.9
1953	3.08	3.60	4.81	261	227	208	159	123	67.4	7.62	5.56	6.11	85.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941								6.0	7.0	2.2	2.0	2.8	.....
1942	4.4	6.5	6.5	50*	36	34	33	37	2.8	4.2	4.2	4.5	2.8
1943	6.6	9.6	26	22	42	29	30	38	7.0	1.7	3.0	2.3	1.7
1944	3.0	7.7	9.0	12	20	45	97	11	1.8	1.3	1.8	.8	.8
1945	2.8	4.8	3.3	3.8	9.0	6.3	24	25	5.4	1.6	1.1	1.6	1.1
1946	1.8	5.7	21	120*	66	129	54	31	7.0	4.0	4.0	5.1	1.8
1947	4.0	4.0	26	25*	2.0	2.0	5.7	2.6	2.4	1.8	2.2	4.0	1.8
1948	5.0*	5.0*	12	15	6.1	64	140	140	16*	1.0*	1.0	1.0	1.0
1949	2.2	3.5	15*	40*	40*	116	112	50	2.8	2.2	2.5	3.4	2.2
1950	5.4	6.2	3*	20*	20*	80	16	18	16	2*	1*	1*	1*
1951	3.6	27*	56	95*	82	68	68	36	7.6	3.0	3.1	1.7	1.7
1952	14	6.0	30	17	40	39	151	37	6.0	1.0	.8	1.1	.8
1953	2.3	2.8	3.0	3.6	47	92	36	67	20	4.4	4.0	4.7	2.3

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1941							
1942	573	June 27, 1942	2.8	53.9	39,060	64.2	46,520
1943	714	April 1, 1943	1.7	90.1	65,240	74.4	53,900
1944	766	Mar. 9, 1944	.8	42.0	30,500	37.0	26,840
1945	864	Feb. 8, 1945	1.1	62.8	45,480	78.8	57,030
1946	2,760	Dec. 28, 1945	1.8	95.0	68,780	96.6	69,920
1947	1,600	Dec. 12, 1946	1.8	35.4	25,610	39.4	28,550
1948	1,480	Jan. 7, 1948	1.0	112	61,610	95.3	69,210
1949			2.2	89.6	64,910	88.0	63,740
1950	1,730	Jan. 22, 1950	1	101	72,820	122	83,200
1951	1,810	Feb. 11, 1951	1.7	109	78,640	105	75,690
1952	764	Oct. 23, 1951	.8	83.9	60,880	63.4	46,040
1953	1,630	Jan. 18, 1953	2.3	88.9	64,350		

* Estimated.

WALLA WALLA RIVER BASIN

Dry Creek near Walla Walla, Wash.

Location.—Lat. 46°07'20", long. 118°14'10", on south line SW¼ sec. 31, T. 8 N., R. 37 E., on right bank, 1 mile downstream from Spring Creek, and 6 miles northeast of Walla Walla.

Drainage area.—48.4 sq. mi.

Gage.—Water-stage recorder and, since July 25, 1949, concrete control. Altitude of gage is 1,200 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 3,340 cfs Feb. 22, 1949 (gage height, 11.6 ft., from high-water mark in well), from rating curve extended above 310 cfs on basis of slope-area and contracted-opening determinations of peak flows at gage heights 9.0 and 11.6 ft.; minimum, 0.2 cfs Aug. 4, 1949.

Remarks.—Several small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....					147*	62.3	55.5	27.4	3.50	1.47	0.76	1.61	.....
1950....	3.08	5.48	12.7	17.5*	89.1	85.6	50.2	33.6	27.9	9.20	1.41	1.51	27.2*
1951....	4.51	31.0	102	89.4*	77.1	63.9	33.6	13.9	20.6	3.06	1.50	2.03	36.7*
1952....	16.2	16.2	20.5	24.5	71.4	40.8	52.6	17.9	5.80	3.79	1.00	1.65	23.0
1953....	2.05	3.36	4.99	46.7	52.2	49.8	45.2	25.8	16.2	2.02	1.26	1.21	20.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....					11*	31	31	6.9	2.2	0.7	0.5	0.6	.....
1950....	2.0	3.4	5.4	4.0*	4.0*	44	25	14	7.3	1.8	.9	.8	0.8
1951....	2.5	12	20	32	28	22	16.5	7.6	5.1	1.7	1.2	1.3	1.2
1952....	4.2	9.2	14*	10*	21	22	28	7.0	3.6	1.0	.7	1.3	.7
1953....	1.5	2.6	4.2	4.4	19.5	26	19.5	12	4.7	1.1	.8	.8	.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1949.....	3,340	Feb. 22, 1949					
1950....	752	Feb. 24, 1950	0.8	27.2	19,700	37.0	26,500
1951....	870†	Jan. 21, 1951	1.2	36.7	26,590	30.1	21,790
1952....	1,070	Feb. 2, 1952	.7	23.0	18,710	18.9	13,750
1953....	552	Jan. 31, 1953	.8	20.7	14,980		

* Estimated.

† Maximum recorded.

East Fork Touchet River near Dayton, Wash.

Location.—Lat. 46°16'45", long. 117°54'05", in NW¼NW¼ sec. 11, T. 9 N., R. 39 E., on right bank, 250 ft. downstream from city of Dayton's water-supply headworks, 1,000 ft. upstream from Hatley Creek, three-quarters of a mile downstream from Wolf Creek, 3 miles upstream from confluence with South Fork, and 4 miles southeast of Dayton.

Drainage area.—102 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,868.3 ft. above mean sea level river-profile survey).

Average discharge.—10 years (1941-51), 124 cfs.

Extremes.—1941-51: Maximum discharge, 1,530 cfs probably Jan. 7, 1948 (gage height, 5.28 ft., from recorded range in stage); minimum, 29 cfs Sept. 9, 12, 13, 14, 1944.

Remarks.—Small diversions for irrigation during summer months above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941							77.1	104	89.8	57.0	41.1	44.7	.....
1942	47.5	86.2	145	72.6*	105	119	140	144	92.8	60.7	37.9	36.5	90.5*
1943	39.5	88.9	208	162	218	168	311	179	125	54.2	40.3	36.4	135
1944	45.8	52.7	69.3	51.0	75.9	115	138	97.8	58.1	38.2	32.9	34.5	67.4
1945	35.7	41.1	42.6	80.3	118	132	172	177	85.5	39.6	34.1	38.0	82.7
1946	39.1	78.3	134	197	144	218	237	200	111	57.2	40.1	40.7	125
1947	52.7	111	251	146	145	152	188	116	63.3	44.4	38.7	42.7	112
1948	67.2	140	155	212	236	232*	263*	417	174	72.2	55.4	53.3	173*
1949	50.8	70.7	100	58.5*	249*	249	353	308	108	54.5	46.8	47.4	140*
1950	57.6	63.1	75.9	84.0*	292	346	318	280	217	60.4	62.0	49.6	150*
1951	71.1	102	275	201	303	198	215	171	134	65.5	51.1	60.9	160

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941							68	76	58	42	39	42	.....
1942	42	48	57	40*	55*	55*	92	87	56	42	36	35	35
1943	35	52	122	63*	64*	100	165	144	81	42	38	32	32
1944	34	46	51	47	51	65	117	70	44	34	31	30	30
1945	35	38	38*	42	54	64	123	119	53	36	32	32	32
1946	35	46	45*	119	96	170	160	167	77	45	38	38	35
1947	39	60	111	82	101	107	167	67	43	39	36	32	32
1948	46	72	107	96	78*	190*	175	172	84	56	50	45	45
1949	45	49	60*	45*	45*	143	161	161	70	50	43	43	43
1950	47	54	62	43*	40*	185	190	199	118	63	51	45	40*
1951	54	114	180	120*	110*	109	151	124	78	54	47	47	47

* Estimated.

WALLA WALLA RIVER BASIN

East Fork Touchet River near Dayton, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Min- imum day	Men- u	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1941.....			35	90.6	0.887	12.04	65,510	95.4	12.09	69,040
1942.....			32	135	1.32	17.99	97,920	121	16.10	87,630
1943.....	357	Mar. 9, 1944	30	67.4	.661	9.00	48,900	63.3	8.45	45,930
1945.....	376	Feb. 8, 1945	32	82.7	.511	11.00	59,880	93.3	12.48	67,920
1946.....	1,190	Dec. 28, 1945	35	125	1.23	16.59	90,270	133	18.42	100,200
1947.....	1,280	Dec. 15, 1946	32	112	1.10	14.98	81,410	108	14.38	78,110
1948.....	1,530	Jan. 7, 1948	45	173	1.70	23.09	125,500	162	21.52	117,100
1949.....	1,260	Feb. 17, 1949	43	140	1.37	18.68	101,700	133	18.41	100,100
1950.....	1,480	Feb. 24, 1950	40	159	1.56	21.20	115,400	183	25.01	136,100
1951.....	1,370	Feb. 12, 1951	47	160	1.57	21.23	115,500			

Touchet River at Bolles, Wash.

Location.—Lat. 46°16'30", long. 118°13'15", on line between secs. 7 and 8, T. 9 N., R. 37 E., on right bank just downstream from bridge on State Highway 3-E, a quarter of a mile southeast of Bolles, and 3 miles west of Waitsburg.

Drainage area.—362 sq. mi. At site February 1924 to October 1929, 372 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,150 ft. (from topographic map). Prior to Oct. 5, 1929, water-stage recorder half a mile upstream at different datum.

Average discharge.—7 years (1924-29, 1951-53), 223 cfs.

Extremes.—1924-29, 1951-53: Maximum discharge, 4,470 cfs Jan. 13, 1928 (gage height, 7.04 ft., site and datum then in use); minimum, 1.4 cfs July 30, 1926.

Remarks.—Numerous small ditches divert water for municipal and domestic use, and for irrigation above station. Considerable fluctuation in stage at extremely low water caused by operation of flour mill at Waitsburg.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924.....					471	174	206	145	45.5	21.8	17.6	26.0	.....
1935....	45.2	292	221*	437	646	276	338	206	91.4*	17.2	14.2	35.3	210*
1926....	56.7	75.4	92.6	105	397	179	161	78.1*	28.8	12.2	16.1	45.6	103*
1927....	54.9	271	359*	383	780	590	435	337	173	48.0*	32.2	50.0	292*
1928....	107	630	322	919	252	748	784	365	85.7	39.5	19.5	37.7	351
1929....	55.3	69.5	68.2	69.7*	62*	335	262	275	115	38.8	19.3	31.2	119*
1951.....							453	274	212	63.4	40.7	47.6	.....
1952....	124	147	292	833*	664	336	657	333	137	70.8	50.0*	54.4	269*
1953....	53.5	55.3	69.5	539	466	424	375	280	198	60.6	42.1	37.6	215

* Estimated.

Touchet River at Bolles, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924					255			58	21	14	11		
1925	34	80		201	239	201	196	140		6.2	3.8	24	3.8
1926	44	67	56	44	150	131	101	47	9.2	2.6	3.0	23	2.6
1927	18	18	216	175*	344	414	264	207	83	28	20	44	18
1928	70	83	85*	120*	152	137	498	161	45	12	14	23	12
1929	40	61	63	67			168	184	63	17	11	15	11
1951							254	153	85	44	35	39	
1952	63	85	171	180*	283	236	433	236	80	52	48	50*	48
1953	51	37*	44*	68	206	315	198	198	94	42	28	28	28

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1924							
1925	2,910	Feb. 4, 1925	3.8	210	152,000	187	136,000
1926	2,850	Feb. 7, 1926	2.6	103	74,900	142	103,000
1927	3,690	Feb. 21, 1927	18	292	211,000	315	228,000
1928	4,470	Jan. 13, 1928	12	351	255,000	288	209,000
1929	879	Mar. 10, 1929	11	119	86,000		
1951							
1952	4,030	Feb. 2, 1952	48	269	195,100	236	171,600
1953	2,600	Jan. 18, 1953	26	115	155,800		

* Estimated.

Touchet River near Touchet, Wash.

Location.—Lat. 46°05'25", long. 118°39'40", in NE¼ sec. 15, T. 7 N., R. 33 E., on right bank, 100 ft. downstream from site of old county road bridge, a quarter of a mile above diversion dam, 3½ miles north of Touchet, and 4½ miles upstream from mouth.

Drainage area.—736 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 490 ft. (from topographic map). Prior to July 3, 1941, staff gage at same site and datum.

Average discharge.—12 years (1941-53), 251 cfs.

Extremes.—1941-53: Maximum discharge, 13,300 cfs Feb. 10, 1949 (gage height, 14.7 ft., from high-water mark in gage house), by contracted-opening determination of peak flow at Johnson Bridge, 3 miles upstream; minimum, 6.0 cfs Sept. 11, 1951.

Remarks.—Many diversions for irrigation of an estimated 3,500 acres above station. Occasional regulation from unknown source.

WALLA WALLA RIVER BASIN

Touchet River near Touchet, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941							104	160	180	69.3	27.4	38.5	.....
1942	57.4	154	326	154*	358	299	257	323	193	84.9	17.6	18.8	186*
1943	29.7	170	334*	257*	485*	296	654	319	171	49.0	20.8	22.4	232*
1944	51.9	75.7	108*	72.4	162	312	293	140	64.7	20.6	11.3	16.1	110*
1945	29.8	44.9	5.05	167	282*	354*	376*	293	121	29.6	10.2	20.0	148*
1946	38.7	136	403	580*	355	565*	434	304	150	49.0	18.2	32.7	255*
1947	62.6	226	436*	450*	425	391*	434*	204	83.3	27.3	19.5	38.7	282*
1948	102	266*	316*	510*	711*	437	638	960	251	70.1	43.5	40.7	366*
1949	58.6	163	402*	237*	1,718*	811	655	491	128	43.5	27.2	42.8	389*
1950	64.0	81.4	128	192*	860	939	622	452	362	87.8	36.9	37.9	318*
1951	89.5	345	493	493	795*	578	423	348	206	50.8	20.0	33.2	312*
1952	109	136	295	347*	666	320	586	306	167	54.3*	30.1	37.2	243*
1953	42.1	52.2	68.1	559	621*	414	384	292	181	57.0*	29.4	28.1	225*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941							72	79	87	26	22	28	.....
1942	38	53	87	40*	158	156	168	158	78	32	18	17	13
1943	21	52	220	75*	75*	186*	300	238	95	25	17	20	17
1944	24	60	66	59*	77	181	226	72	34	11	8.4	7.0	7.0
1945	28	34	24	46	88	130*	270*	162	49	20	13	14	13
1946	33	49	80*	250*	229	400*	319	212	74	26	11	19	11
1947	34	78	162	150*	218	205	319	68	39	19	16	15	15
1948	40	110*	200*	129	180*	323	476	492	111	51	34	31	31
1949	50	70	160*	160*	150*	402	381	257	72	33	22	23	22
1950	52	64	82	50*	50*	410	345	320	168	44	30	27	27
1951	47	176	264	296	296	223	246	161	86	18	14.5	24	14.5
1952	53	88	168	140*	189	175	430	177	76	32	24	30	24
1953	36	33	40*	70	210*	260	211	211	90	32*	22	21	21

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1941								
1942	2,880	May 23, 1942	13	188	184,600	185	134,200	
1943			17	232	167,700	207	149,600	
1944	1,910	Mar. 10, 1944	7.0	310	80,130	161	73,420	
1945			13	148	107,500	187	135,100	
1946	3,070	Dec. 29, 1945	11	255	184,900	268	193,900	
1947	2,000	Jan. 26, 1947	15	232	188,100	230	166,000	
1948	4,850	Feb. 26, 1948	31	366	265,900	300	261,100	
1949	13,300	Feb. 10, 1949	22	359	251,500	359	260,200	
1950	2,510	Mar. 19, 1950	27	313	230,800	384	270,000	
1951	4,370	Feb. 12, 1951	14.5	312	225,900	250	202,500	
1952	4,440	Feb. 2, 1952	24	343	176,700	212	153,700	
1953	3,070	Jan. 19, 1953	21	225	162,800			

* Estimated.

Attalia Irrigation District canal near Wallula, Wash.

Location.—Lat. 46°04'00", long. 118°51'30", in NW¼ sec. 30, T. 7 N., R. 32 E., at upstream end of flume, at trestle that crosses Walla Walla River, 3 miles east of Wallula, and about 4½ miles downstream from canal headworks.

Gage.—Staff gage. Altitude of gage is 340 ft. (from topographic map).

Extremes.—1924-25: Maximum discharge observed, 34 cfs June 20, 1925 (gage height, 2.26 ft.); no flow during winter and on many days during irrigation seasons.

Remarks.—Canal diverts from left bank of Walla Walla River about on line between secs. 22 and 23, T. 7 N., R. 32 E. Water is used for irrigation of land adjacent to Columbia River near Attalia.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924.....									1,110	640	633	750	.....
1925....	640	0	0	0	0	494	1,810*	1,976*	1,420	947	607	626	8,510*

Walla Walla River near Touchet, Wash.

Location.—Lat. 46°01'45", long. 118°43'40", in NW¼SE¼ sec. 6, T. 6 N., R. 33 E., on left bank, 2¾ miles southwest of Touchet and 3 miles downstream from Touchet River.

Drainage area.—1,660 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 405 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 16,300 cfs Feb. 2, 1952 (gage height, 12.10 ft.); from rating curve extended above 6,000 cfs on basis of contracted-opening determination at gage height 13.81 ft.; minimum, 11.5 cfs Aug. 23, 1953 (gage height, 1.88 ft.).

Maximum stage known, 13.81 ft. in February 1949, from floodmarks (discharge, 23,800 cfs).

Remarks.—Some diversions for irrigation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....		447	873	1,048	1,836	993	1,525	800	137	94.3	22.9	58.6	.....
1953....	62.8	124	295	1,555	1,609	1,173	1,076	768	365	35.2	17.9	22.3	580

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....		285	640*	500	640	585	1,050	296	88	31	17	26	.....
1953....	49	88	160	324	660	660	448	407	87	17	12	15.5	12

* Estimated.

WALLA WALLA RIVER BASIN

Walla Walla River near Touchet, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1952.....	16,300	Feb. 2, 1952	.....	.....	.....	577	419,200
1953.....	9,850	Jan. 19, 1953	12	580	419,600	.....	.....

Walla Walla River near Wallula, Wash.

Location.—Lat. 46°04'00", long. 118°51'30", in NW¼ sec. 30, T. 7 N., R. 32 E., on left bank, 400 ft. upstream from highway bridge and 3 miles east of Wallula.

Drainage area.—1,760 sq. mi.

Gage.—Staff gage. Altitude of gage is 330 ft. (from topographic map).

Extremes.—1924-25: Maximum discharge, 5,740 cfs Feb. 5, 1925 (gage height, 9.1 ft., from graph based on gage readings); no flow Aug. 1-15, 1924, June 28-30, 1925.

Remarks.—Entire flow diverted above station at times by Attalia Irrigation District canal (see p. 703) for irrigation of land adjacent to the Columbia River near Attalia.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924.....	.....	.....	.....	.....	.....	.....	.....	.....	19.0	2.8	0.4	5.6	.....
1925....	96.7	545	519	1,220	1,560	640	805	451	127	3.65	3.95	11.3	491

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924.....	.....	.....	.....	.....	.....	.....	.....	.....	0.6	0.2	0	0.3	0
1925....	12	164	.....	605	700	385	385	290	0	.....	.1	.3	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1924.....	.....	.....	0	.....	.....	.....	.....
1925.....	5,740	Feb. 5, 1925	0	491	356,000	.....	.....

ROCK CREEK BASIN

705

Rock Creek near Goldendale, Wash.

Location.—Lat. 45°48'10", long. 120°30'10", in W½ sec. 25, T. 4 N., R. 18 E., on right bank, 2 miles upstream from Squaw Creek and 15 miles east of Goldendale.

Drainage area.—120 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 796 ft. (by barometer).

Extremes.—1911-13: Maximum discharge observed, 1,850 cfs Feb. 16, 1913 (gage height, 5.8 ft.), from rating curve extended above 250 cfs; practically no flow July 28, 1912.

Remarks.—Probably some small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	1.41	2.01	5.45	199	176	52.4	44.1	12.3	2.73	1.33*	0.36*	0.86*	51.8*
1913...	2.20*	26.9*	90.4*	189	238	120	79.3	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	1.2	0.9	3.0	1.9	86	29	21	5.0	0.6	0.1	0.2	0.4	0.1
1913...	.9	3.6*	5.0	38	17	69	48	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
Discharge	Date						
1912.....	1,030	Feb. 16, 1912	0.1	51.8	29,800	50.4	36,500
1913.....	1,850†	Feb. 16, 1913	.....	.....	.....	.....	.....

* Estimated.

† Maximum observed.

COLUMBIA RIVER MAIN STEM

Columbia River near The Dalles, Oreg.

Location.—Lat. 45°39'00", long. 120°58'00", in NE¼ sec. 20, T. 2 N., R. 15 E., on left bank, 300 ft. upstream from staff gage in entrance to Celilo Canal, just upstream from Celilo Falls, 3 miles downstream from Deschutes River, 11 miles east of The Dalles, and at mile 201.

Drainage area.—237,000 sq. mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 0.12 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1931, records based on staff gage at The Dalles, supplemented for a few periods by gage-height records at Umatilla and Cascade Locks; datum of gage at The Dalles was 46.86 ft. higher than present datum. Oct. 1, 1931, to May 1, 1935, staff gage in entrance to Celilo Canal 300 ft. downstream from present site at datum 37.59 ft. higher.

Average discharge.—75 years (1878-1953), 194,700 cfs.

Extremes.—1858-1953: Maximum discharge, 1,240,000 cfs June 6, 1894 (gage height, 106.5 ft. on gage at The Dalles, 160.1 ft. at present site); minimum observed, 35,000 cfs Jan. 12, 1937 (gage height, 126.0 ft.).

Remarks.—Storage and diversion for irrigation of about 4,000,000 acres above station are only a small part of the total flow. Some regulation by Franklin D. Roosevelt Lake above Grand Coulee Dam since about 1940 and by reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Chelan, Yakima, and Snake River basins.

Mean Discharge, in Second-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1878									426,000	273,000	184,000	124,000	
1879	89,800	83,500	91,000	65,900	87,200	151,000	360,000	335,000	612,000	501,000	215,000	154,000	242,000
1880	110,000	85,400	85,400	98,400	77,200	75,200	151,000	404,000	698,000	793,000	380,000	198,000	264,000
1881	131,000	104,000	89,700	107,000	211,000	221,000	386,000	426,000	546,000	431,000	244,000	141,000	252,000
1882	110,000	112,000	86,400	78,400	66,700	95,600	229,000	330,000	770,000	477,000	263,000	150,000	232,000
1883	110,000	94,400	121,000	87,100	87,500	178,000	197,000	404,000	584,000	397,000	202,000	120,000	212,000
1884	90,500	74,300	73,500	71,900	71,900	105,000	203,000	404,000	648,000	403,000	255,000	166,000	214,000
1885	133,000	135,000	80,600	93,400	164,000	189,000	259,000	372,000	445,000	340,000	203,000	155,000	214,000
1886	122,000	103,000	103,000	92,400	178,000	122,000	269,000	342,000	577,000	351,000	201,000	125,000	210,000
1887	55,900	69,700	75,300	99,100	75,300	176,000	259,000	422,000	809,000	585,000	289,000	171,000	260,000
1888	114,000	100,000	99,200	69,700	144,000	120,000	189,000	362,000	515,000	335,000	214,000	153,000	201,000
1889	102,000	93,200	85,500	69,400	63,700	88,700	152,000	254,000	268,000	183,000	149,000	96,400	134,000
1890	87,500	77,400	64,600	51,400	117,000	120,000	192,000	559,000	437,000	326,000	194,000	121,000	196,000
1891	89,100	77,600	69,600	65,900	62,600	73,700	137,000	342,000	420,000	306,000	205,000	132,000	165,000
1892	88,300	108,000	99,500	79,000	73,000	127,000	153,000	298,000	544,000	447,000	219,000	145,000	198,000
1893	117,000	98,200	88,000	77,700	81,900	71,000	170,000	441,000	597,000	465,000	273,000	150,000	219,000
1894	122,000	142,000	166,000	145,000	114,000	163,000	323,000	550,000	①	553,100	271,000	175,000	313,600
1895	133,000	136,000	114,000	102,000	94,000	119,000	182,000	376,000	351,000	348,000	209,000	129,000	194,000
1896	96,500	78,600	75,300	90,300	92,600	134,000	180,000	268,000	679,000	639,000	256,000	157,000	229,000
1897	89,300	122,000	163,000	115,000	123,000	109,000	239,000	624,000	540,000	372,000	210,000	137,000	243,000
1898	97,100	114,000	141,000	119,000	147,000	147,000	201,000	420,000	603,000	399,000	237,000	143,000	230,000
1899	97,400	83,600	68,500	68,500	98,000	106,000	192,000	309,000	638,000	614,000	307,000	193,000	234,000
1900	140,000	130,000	157,000	168,000	125,000	187,000	272,000	450,000	411,000	323,000	187,000	136,000	224,000
1901	114,000	125,000	188,000	129,000	122,000	187,000	165,000	420,000	516,000	340,000	219,000	132,000	219,000
1902	85,500	83,900	92,500	88,300	101,000	110,000	143,000	358,000	537,000	407,000	231,000	125,000	197,000
1903	83,600	84,800	84,800	117,000	87,700	97,400	191,000	309,000	683,000	496,000	216,000	149,000	211,000
1904	155,000	133,000	122,000	99,600	100,000	168,000	337,000	508,000	559,000	327,000	200,000	122,000	242,000
1905	84,700	72,600	71,800	66,500	62,900	106,000	131,000	206,000	337,000	246,000	175,000	95,500	140,000
1906	103,000	79,000	67,400	63,500	75,700	92,200	203,000	296,000	332,000	273,000	168,000	115,000	157,000
1907	91,700	136,000	123,000	105,000	158,000	167,000	234,000	370,000	532,000	431,000	230,000	162,000	229,000
1908	116,000	88,100	88,300	75,200	66,200	116,000	183,000	344,000	537,000	413,000	204,000	121,000	196,000
1909	90,400	88,000	78,300	70,300	103,000	108,000	150,000	231,000	592,000	422,000	203,000	129,000	190,000
1910	104,000	128,000	141,000	108,000	92,400	272,000	322,000	493,000	397,000	238,000	160,000	93,200	213,000

Columbia River near The Dalles, Oreg.—Continued

Mean Discharge, in Second-feet—Continued

Table with 14 columns: YEAR, Oct., Nov., Dec., Jan., Feb., Mar., April, May, June, July, Aug., Sept., Annual. Rows list years from 1911 to 1936 with corresponding monthly discharge values in second-feet.

① 1,002,000.

Minimum Discharge, in Cubic Feet Per Second

Table with 14 columns: YEAR, Oct., Nov., Dec., Jan., Feb., Mar., April, May, June, July, Aug., Sept., Annual. Rows list years from 1878 to 1890 with corresponding monthly minimum discharge values in cubic feet per second.

* Estimated.

WALLA WALLA RIVER BASIN

709

Columbia River near The Dalles, Oreg.—Continued

Annual Flood Peaks

WATER YEAR	Gage height (feet)	Discharge (cfs)	WATER YEAR	Gage height (feet)	Discharge (cfs)
1858.....	84.3	563,000	1868.....	81.8	483,000
1859.....	93.8	874,000	1869.....	76.6	328,000
1860.....	87.5	668,000	1870.....	80.8	777,000
1861.....	86.0	618,000	1871.....	93.1	856,000
1862.....	95.7	948,000	1872.....	89.6	737,000
1863.....	90.8	777,000	1873.....	86.6	638,000
1864.....	87.1	654,000	1874.....	84.9	582,000
1865.....	88.9	714,000	1875.....	88.0	684,000
1866.....	92.6	839,000	1876.....	96.0	958,000
1867.....	87.6	671,000	1877.....	81.9	456,000

Summary

WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff	Runoff
	Discharge	Date			Mean		Acre-feet
1878.....	485,000	June 12, 1878				
1879.....	643,000	June 18, 1879	59,600	242,000	175,000,000	243,000
1880.....	914,000	①	68,300	264,000	192,000,000	267,000
1881.....	598,000	June 17, 1881	73,800	252,000	183,000,000	252,000
1882.....	883,000	June 13, 14, 1882	60,400	232,000	168,000,000	233,000
1883.....	873,000	June 14, 1883	58,500	212,000	154,000,000	205,000
1884.....	698,000	June 13, 1884	45,900	214,000	155,000,000	223,000
1885.....	482,000	June 23, 1885	44,300	214,000	155,000,000	212,000
1886.....	678,000	June 9, 1886	64,400	210,000	152,000,000	202,000
1887.....	896,000	June 19, 1887	62,000	260,000	189,000,000	267,000
1888.....	564,000	June 18, 1888	49,400	201,000	146,000,000	199,000
1889.....	302,000	June 5, 8, 1889	57,400	134,000	96,900,000	130,000
1890.....	633,000	May 14, 1890	41,900	196,000	142,000,000	197,000
1891.....	448,000	June 2, 1891	57,400	165,000	120,000,000	170,000
1892.....	607,000	June 22, 23, 1892	66,200	198,000	144,000,000	198,000
1893.....	679,000	June 14, 1893	61,300	219,000	159,000,000	231,300
1894.....	1,240,000	June 6, 1894	88,300	313,600	227,000,000	309,600
1895.....	475,000	May 31, 1895	80,100	194,000	140,000,000	183,000
1896.....	785,000	June 22, 1896	70,000	229,000	166,000,000	240,000
1897.....	780,000	May 24, 1897	78,000	243,000	176,000,000	241,000
1898.....	649,000	June 20, 21, 1898	82,000	230,000	167,000,000	222,000
1899.....	787,000	June 22, 1899	58,000	234,000	170,000,000	249,000
1900.....	547,000	June 19, 1900	103,000	224,000	163,000,000	220,000
1901.....	662,000	June 1, 1901	81,100	219,000	158,000,000	209,000
1902.....	644,000	June 1, 1902	58,000	197,000	143,000,000	197,000
1903.....	787,000	June 18, 19, 1903	72,200	211,000	153,000,000	224,000
1904.....	629,000	May 26, 1904	80,200	242,000	176,000,000	227,000
1905.....	412,000	June 15, 1905	52,600	140,000	101,000,000	142,000
1906.....	374,000	June 1, 1906	59,200	157,000	114,000,000	165,000
1907.....	587,000	June 5, 1907	77,800	229,000	166,000,000	224,000
1908.....	659,000	June 18, 1908	59,900	158,000	143,000,000	193,000
1909.....	675,000	June 19, 1909	63,400	190,000	137,000,000	199,000
1910.....	566,000	May 14, 1910	70,400	213,000	154,000,000	210,000
1911.....	574,000	June 17, 18, 1911	62,700	188,000	136,000,000	179,000
1912.....	568,000	June 1, 1912	52,000	183,000	133,000,000	185,000
1913.....	759,000	June 12, 1913	63,400	213,000	154,000,000	216,000
1914.....	493,000	May 27, 1914	70,600	187,000	135,000,000	189,000
1915.....	323,000	June 1, 1915	56,500	147,000	106,000,000	141,000
1916.....	727,000	July 1, 1916	57,000	233,000	173,000,000	239,000
1917.....	727,000	June 20, 1917	56,500	210,000	151,000,000	213,000
1918.....	578,000	June 25, 1918	70,600	205,000	148,000,000	201,000
1919.....	558,000	June 1, 1919	60,000	172,000	124,000,000	167,000
1920.....	423,000	June 26, 1920	41,500	157,000	114,000,000	168,000

① June 30, July 1, 2, 1880.

WALLA WALLA RIVER BASIN

Columbia River near The Dalles, Oreg.—Continued

Summary—Continued

WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR		
YEAR	Momentary maximum		Minimum day	Mean	Runoff		
	Discharge	Date			Mean	Runoff	
					Acre-feet	Acre-feet	
1921	773,000	June 11, 1921	86,600	230,000	167,000,000	227,000	165,000,000
1922	677,000	June 9, 1922	64,400	183,000	133,000,000	177,000	123,000,000
1923	581,000	June 14, 15, 1923	56,000	179,000	130,000,000	179,000	130,000,000
1924	433,000	May 25-27, 1924	60,800	137,000	99,300,000	137,000	99,500,000
1925	642,000	May 24, 25, 1925	68,000	201,000	146,000,000	201,000	145,000,000
1926	269,000	May 8, 9, 1926	63,200	118,000	85,500,000	125,000	90,400,000
1927	590,000	June 18, 1927	74,000	206,000	149,000,000	225,000	163,000,000
1928	766,000	May 29, 1928	86,800	231,000	168,000,000	205,000	149,000,000
1929	460,000	June 19, 1929	43,200	183,000	96,100,000	130,000	93,800,000
1930	332,000	June 14, 1930	40,000	181,000	95,200,000	132,000	95,500,000
1931	308,000	May 19, 1931	50,600	122,000	88,400,000	122,000	83,200,000
1932	578,000	May 24, 1932	43,200	186,000	135,000,000	191,000	139,000,000
1933	722,000	June 18, 19, 1933	47,200	198,000	143,000,000	213,000	154,000,000
1934	458,000	May 2, 3, 1934	86,400	211,500	133,100,000	196,700	142,400,000
1935	480,000	June 10, 1935	61,600	170,200	123,200,000	164,600	119,200,000
1936	529,000	May 17, 1936	45,100	158,900	115,400,000	157,400	114,200,000
1937	379,000	June 24, 1937	36,900	123,700	93,190,000	135,800	98,300,000
1938	609,000	May 31, 1938	66,700	190,200	137,700,000	187,800	136,000,000
1939	387,000	May 21, 22, 1939	61,000	149,700	108,400,000	150,400	108,900,000
1940	370,000	June 5, 1940	61,700	148,500	107,800,000	150,500	109,300,000
1941	273,000	June 10, 1941	68,700	130,000	94,130,000	141,800	102,700,000
1942	431,000	June 17, 1942	82,000	178,600	129,300,000	167,100	121,000,000
1943	546,000	June 21, 1943	70,400	207,300	150,100,000	205,700	148,900,000
1944	327,000	June 19, 1944	62,700	119,600	86,830,000	118,600	86,180,000
1945	508,000	June 8, 1945	68,200	150,800	109,200,000	151,700	109,800,000
1946	583,000	May 30, 1946	71,900	196,100	142,000,000	202,700	146,700,000
1947	542,000	May 11, 1947	80,800	193,700	140,200,000	197,000	142,600,000
1948	1,010,000	May 31, 1948	91,100	235,500	170,900,000	227,800	165,400,000
1949	624,000	May 18, 1949	74,400	180,100	130,400,000	179,800	130,100,000
1950	744,000	June 25, 1950	78,600	217,100	157,200,000	226,500	164,000,000
1951	602,000	May 30, 1951	94,300	226,400	163,900,000	223,400	161,700,000
1952	561,000	May 28, 1952	87,900	198,200	143,800,000	190,000	137,900,000
1953	612,000	June 17, 1953	70,600	179,300	129,800,000	.....	.....

Klickitat River Basin

Klickitat River above Pearl Creek, near Glenwood, Wash.

Location.—Lat. 46°18'50", long. 121°15'30", in SE¼ sec. 25, T. 10 N., R. 12 E., on right bank, a quarter of a mile upstream from Pearl Creek and 21 miles north of Glenwood.

Drainage area.—131 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,950 ft. (from river-profile map). Prior to Dec. 3, 1910, staff gage 500 ft. downstream at different datum. Aug. 23 to Sept. 15, 1916, water-stage recorder at present site and datum.

Extremes.—1910, 1916: Maximum discharge observed, 767 cfs June 1, 1910 (gage height, 2.8 ft., site and datum then in use); minimum observed, 110 cfs Oct. 23, 24, 1916 (gage height, 1.52 ft.).

Remarks.—No diversion or regulation above station.

Klickitat River above Pearl Creek, near Glenwood, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910									475	250	160	148	
1911	195	312											
1916												149	
1917	120												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910									334	179	148	142*	
1911	142	155											
1916												125	
1917	110												

Pearl Creek near Glenwood, Wash.

Location.—Lat. 46°18'50", long. 121°15'50", in NW¼ sec. 36, T. 10 N., R. 12 E., on left bank, a quarter of a mile upstream from mouth and 20 miles north of Glenwood.

Drainage area.—4.0 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 3,100 ft. (from river-profile map).

Extremes.—August to November 1916: Maximum discharge observed, 3.4 cfs Aug. 24 (gage height, 0.80 ft.); minimum observed, 0.9 cfs Oct. 24, 26 and 28 (gage height, 0.57 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916											2.19	1.23	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916											1.6	0.9	

* Estimated.

KLICKITAT RIVER BASIN

Klickitat River above West Fork, near Glenwood, Wash.

Location.—Lat. 46°15'40", long. 121°14'30", in S½ sec. 18, T. 9 N., R. 13 E., on right bank, half a mile upstream from Swamp Creek, 1½ miles upstream from West Fork, and 17 miles north of Glenwood.

Drainage area.—151 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,720 ft. (from river-profile map).

Average discharge.—9 years (1944-53), 347 cfs.

Extremes.—1944-53: Maximum discharge, 3,280 cfs May 27, 1948 (gage height, 4.28 ft.); minimum, 48 cfs Nov. 14, 15, 1944, but may have been less sometime during periods of ice effect; minimum gage height, 0.98 ft. Nov. 14, 15, 1944, Nov. 22, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	80*	80.2	91.6*	160	208	122	263	843	435	164	86.2	77.1	215*
1946...	73.0	104	124*	143*	108	144	468	1,302	766	358	133	94.3	321*
1947...	119	228	494	203*	297	342	630	936	456	201	108	97.5	343*
1948...	263	291	211	155*	184	194	327	1,165	1,209	304	161	106	880*
1949...	148	145	124*	114*	140*	177	607	1,572	884	317	163	115	376*
1950...	120	225	223	138*	159*	256	353	1,051	1,357	626	202	129	395*
1951...	208	342	522	800	472	260	748	1,364	804	287	146	114	463
1952...	195	186	200*	131*	153*	163	672	1,001	525	236	123	90.3	306*
1953...	84.2	82.0	87.8	318	301	186	406	1,063	749	365	159	104	320

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	.....	61	50*	60*	90*	101	123	624	232	103	73	69	50*
1946...	63	76	75*	105*	95	115	173	696	478	187	106	81	63
1947...	78	106	220*	145*	199	212	329	720	278	145	88	78	78
1948...	90	105	180	100*	100*	145	159	374	604	187	120	93	90
1949...	105	105	106*	100*	101*	144	206	680	408	208	121	97	97
1950...	97	86	159	110*	117*	173	238	352	841	269	150	113	86
1951...	121	197	303	190*	210*	230	277	706	471	183	124	105	105
1952...	126	138	150*	120*	135	116	250	608	343	150	97	84	84
1953...	81	70	77	86	173	166	183	640	454	212	129	93	70

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945.....	1,300	May 4, 1945	50	218	1.44	19.57	157,600	222	19.95	160,600	
1946.....	1,710	May 17, 1946	63	321	2.13	28.87	232,400	367	32.95	265,400	
1947.....	1,600	Dec. 15, 1946	78	343	2.27	30.82	248,200	336	30.23	243,400	
1948.....	3,280	May 27, 1948	90	380	2.52	34.26	276,500	351	31.64	254,700	
1949.....	2,800	May 15, 1949	97	376	2.49	33.51	272,100	358	34.93	281,200	
1950.....	1,960	June 5, 1950	86	395	2.62	35.53	286,100	438	39.37	316,900	
1951.....	2,490	May 11, 1951	105	463	3.07	41.67	335,600	422	37.94	305,600	
1952.....	1,560	April 26, 1952	84	306	2.03	27.62	222,400	279	25.16	202,600	
1953.....	1,620	May 16, 1953	70	329	2.12	28.79	231,900	.....	.....	.....

* Estimated.

Swamp Creek near Glenwood, Wash.

Location.—Lat. 46°15'20", long. 121°14'00", in NE¼ sec. 19, T. 9 N., R. 13 E., on left bank, a quarter of a mile upstream from mouth, and 17 miles north of Glenwood.

Drainage area.—11.2 sq mi.

Gage.—Staff gage. Altitude of gage is 2,750 ft. (from river-profile map).

Extremes.—August to November 1916: Maximum discharge observed, 10.5 cfs Nov. 4 (gage height, 2.77 ft.); minimum observed, 5.66 cfs Sept. 21 (discharge measurement).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916											7.65	7.15	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916											6.7	6.1	

West Fork Klickitat River near Glenwood, Wash.

Location.—Lat. 46°15'30", long. 121°16'20", in SE¼ sec. 14, T. 9 N., R. 12 E., on right bank at road bridge, 2 miles upstream from mouth, and 17 miles north of Glenwood.

Drainage area.—87.0 sq. mi. At site 1910, 83.2 sq. mi.; at site 1916, 89.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,800 ft. (from river-profile map). June 17 to Nov. 30, 1910, staff gage 2 miles upstream. Datum of gage is 2,988.89 ft. above mean sea level (unadjusted). Aug. 25 to Sept. 14, 1916, staff gage, and Sept. 15 to Nov. 9, 1916, water-stage recorder 1 mile downstream at different datum.

Extremes.—1910, 1916, 1944-48: Maximum discharge, 1,560 cfs May 26, 1948 (gage height, 4.23 ft.); minimum recorded, 148 cfs Oct. 17, 18, 19, 1945, may have been less during period of ice effect Dec. 11-25, 1944.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910										348	295	273	
1911	298	410											
1916													293
1917	265												
1945	125*	131	128	172	237	161	225	643	371	209	180	173	230*
1946	158	185	196	217	183	194	329	796	612	368	270	216	311
1947	219	293	458	233	294	232	385*	590	396	277	244	213	324*
1948	302	353	275	267	252	252	267	621	865	355	236	202	353
1949	205	215											

* Estimated.

KLUCKITAT RIVER BASIN

West Fork Klickitat River near Glenwood, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910										295	276	257	
1911	257	257											
1916												277	
1917	255												
1945		118	100*	118	138	146	157	460	240	182	166	149	100*
1946	148	163	159*	184	168	182	213	466	470	296	243	109	148
1947	182	199	240*	200	245	245	257	492	326	262	218	106	182
1948	182	274	253	226	214	233	214	257	536	274	210	186	186
1949	178	182											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mfe	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1910													
1911													
1916													
1917													
1945	800	May 5, 6, 1945	100	230	2.64	35.81	166,200	243	37.83	175,600			
1946	950	May 26, 1946	148	311	3.57	48.53	225,200	347	54.20	251,500			
1947	1,210	Dec. 14, 1946	182	324	3.72	50.54	234,500	321	50.02	232,100			
1948	1,560	May 26, 1948	186	353	4.06	55.24	256,300						
1949													

Cunningham Creek near Glenwood, Wash.

Location.—Lat. 46°10'40", long. 121°17'20", in SW¼ sec. 15, T. 8 N., R. 12 E., on right bank, 200 ft. upstream from crossing, 1 mile upstream from mouth, and 11 miles north of Glenwood.

Drainage area.—16.0 sq. mi.

Gage.—Staff gage. Altitude of gage is 2,700 ft. (from topographic map).

Extremes.—August to November 1916: Maximum discharge observed, 28 cfs Aug. 28-30 (gage height, 0.50 ft.); minimum observed, 19 cfs Oct. 21-23, 27, Nov. 3, 5-8.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916											24.2	21.2	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916											22	19	

* Estimated.

Big Muddy Creek near Glenwood, Wash.

Location.—Lat. 46°09'00", long. 121°17'30", in W½ sec. 27, T. 8 N., R. 12 E., on left bank, 200 ft. downstream from road bridge, 1½ miles upstream from Cougar Creek, 1¾ miles upstream from mouth, and 9½ miles north of Glenwood.

Drainage area.—22.5 sq. mi. At site 1916-18, 23 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,230 ft. (from river-profile map). Aug. 28 to Nov. 12, 1916, water-stage recorder 1¾ miles upstream at different datum. Nov. 12, 1916, to Dec. 18, 1917, and Mar. 30 to Sept. 30, 1918, water-stage recorders 1¼ miles downstream at different datums.

Extremes.—1916-18, 1944-49: Maximum discharge not determined, probably occurred in December 1917; minimum recorded, 18 cfs Sept. 26-28, 1948.

Remarks.—Possibly as much as 120 cfs diverted above station by Hellroaring ditch for varying periods between April and September for irrigation and farm use in vicinity of Glenwood. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916													182
1917	121	92.4	65*	55*	50*	45*	44.4	119	195	259	244	194	124*
1918	115	73.1					117	131*	254*	258*	221*	200*	
1945	34*	37.0	35.7	62.0	82.7	48.9	69.3	184	173	70.0*	53.1*	51.8*	75.0*
1946	57.8	45.7											
1947	44.0	111	112	68.4	71.9	65.5	88.0*	254	218	129	56.5	57.0	107*
1948	140	88.1	82.0	64.3	61.8	57.2	67.0	194	396	169	85.0*	35.7	116*
1949	64.6	54.2	50.9*	41.8*	49.4*	55.0	114	246	230	150	77.5	53.1	99.1*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1916													120
1917	103	69					37	59	137	220	225	158	37
1918	69	60											
1945		21	30	32	40	41	45	128	90*	50	45*	45*	30
1946	33	39											
1947	38	49	62	59	58	60	62*	174	140	62	45	40	33
1948	53	66	56	54	48	45	45	72	231	108	44	18	18
1949	44	49	42*	38*	40*	48	57	134	128	98	46	31	31

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1916							
1917	362	July 19, 1917	37	124	89,800		
1918							
1945			30	75.0	54,260		
1946							
1947	853	Nov. 18, 1946	33	107	77,180	109	78,600
1948	1,190	June 8, 1948	18	118	85,880	108	78,560
1949	395	May 15, 1949	31	90.1	71,780		

* Estimated.

Klickitat River Basin

Cougar Creek near Glenwood, Wash.

Location.—Lat. 46°08'30", long. 121°18'00", in NE¼ sec. 33, T. 8 N., R. 12 E., on left bank, 1½ miles upstream from mouth and 9 miles north of Glenwood.

Drainage area.—3.8 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 2,700 ft. (from topographic map).

Extremes.—August to November 1916: Maximum discharge observed, 4.8 cfs Aug. 28 (gage height, 0.90 ft.); minimum observed, 1.5 cfs Oct. 13-28.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916	2.43	1.63	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1916	1.8	1.5	.....

Klickitat River near Glenwood, Wash.

Location.—Lat. 46°05'20", long. 121°15'30", in SE¼ sec. 14, T. 7 N., R. 12 E., on left bank, half a mile downstream from Dairy Creek, 5 miles north of Glenwood, and 7 miles upstream from Trout Creek.

Drainage area.—360 sq. mi. At site October 1909 to December 1910, 350 sq. mi.

Supplemental records available.—June 1905 to September 1909, discharge measurements, and fragmentary record of daily gage heights and discharge only; published as Klickitat River above and below Big Muddy River near Klickitat, Wash.

Gage.—Water-stage recorder. Datum of gage is 1,703 ft. above mean sea level, datum of 1929. Prior to July 19, 1910, staff gages, and July 19 to Dec. 16, 1910, water-stage recorder 1½ miles upstream at different datum. Dec. 17, 1910, to Sept. 30, 1918, water-stage recorder at datum 1.50 ft. higher, and Oct. 1, 1918, to Nov. 6, 1928, water-stage recorder at datum 0.50 ft. higher, 50 ft. downstream. Nov. 7, 1928, to Sept. 30, 1934, water-stage recorder at present site at datum 1.00 ft. higher.

Average discharge.—44 years (1909-53), 840 cfs.

Extremes.—1909-53: Maximum discharge, 9,870 cfs Dec. 22, 1933 (gage height, 7.9 ft., present datum), from rating curve extended above 2,000 cfs; minimum, 204 cfs Nov. 28, 1931.

Remarks.—At times, entire flow of Hellroaring Creek, a tributary of Big Muddy Creek, is diverted above station for irrigation of about 7,000 acres below station in the vicinity of Glenwood. No regulation.

KLICKITAT RIVER BASIN

717

Klickitat River near Glenwood, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	435*	1,710*	1,020	782	682	2,020	2,120	2,170	1,130*	782	599	495	1,160*
1911...	579	757	612	491	481	621	1,090	1,610	1,620	688	603	512	835
1912...	417	618	449	611	699	515	1,000	1,980	1,550	908	573	484	800
1913...	420	546	460	521	490	515	1,120	1,910	2,150	1,130	717	590	881
1914...	535	544	441	1,030	802	1,030	1,840	2,110	1,240	895	625	537	954
1915...	581	754	491*	406	406	640	1,440	1,060	745	577	505	397	667*
1916...	388	414	505	399*	517*	1,070	1,690	2,250	3,020	2,300	1,130	719	1,200*
1917...	576	580	472	404	437	377	569	1,770	2,470	1,460	807	578	877
1918...	461	406*	1,690	1,730	966	803	1,260	1,520	1,140	839	630	585	1,030*
1919...	578	566	614	1,120	821	781*	1,460	2,010	1,280	877	614	472	934*
1920...	442	524	657	703	592	638	628*	1,210	996	698	523	524	670*
1921...	645*	758	660*	990*	830*	1,080*	1,730*	2,750*	2,610	1,320	806	574	1,230*
1922...	566	610	1,240*	490*	430*	430*	769	1,800	1,960	844	595	506*	856*
1923...	469	456*	540*	1,110*	610*	590*	1,800	2,050	1,600	1,120	711	538*	925*
1924...	519	535	700*	560*	1,010*	570*	852*	1,510	878	631	594	493*	736*
1925...	470*	619*	570*	770*	1,000*	670*	1,220*	1,820*	1,350	920*	547	455	866*
1926...	406	405	499	450	531	716*	1,140	916	570*	460*	390*	360*	570*
1927...	450*	590*	720*	720*	1,180*	860	1,070	2,250	2,360	1,060	667*	550*	1,040*
1928...	601	835	828*	740*	530*	970*	1,220*	2,280	1,240	806	613	470	935*
1929...	465	494*	428	399*	318*	446	650	1,650	1,400	748	624	400	662*
1930...	320	327	404	343*	718	659	1,230	1,010	726	532	412	338*	583*
1931...	316	306	322	304	400	458	995	1,380	692	478	382	318	537
1932...	290	338	326	350	443	894	1,290	2,030	1,540	811	493	396	767
1933...	381	565	593	500	388	430	1,050	1,780	2,540	1,130	652	513	902
1934...	589	625	2,248	1,846	1,261	1,495	1,729	1,128	793	625	517	441	1,109
1935...	564	1,011	717	688	710	635	877	1,963	1,533	709	535	393	881
1936...	354	354	347	377	323*	438	1,276	2,125	1,400	728	491	395	718*
1937...	340	308	372	354*	310*	374	833	1,683	1,754	922	503	431	636*
1938...	387	611	709	548	559	663	1,596	2,796	1,917	905	578	464	1,005
1939...	469	471	501	430	388	558	1,216	1,563	559	566	409	347	640
1940...	305	304	546*	469	630	977	1,494	1,501	797	494	399	373	690*
1941...	369	394	467	405	425	702	1,120	1,020	606	470	373	368*	561*
1942...	358	329	974	490*	444	490	1,271	1,381	949	672	416	309	675*
1943...	288	574	609	467	478	650	1,845	1,878	1,924	1,124	501	433	903
1944...	396	392	424	362	388*	455	663	924	630	421	323	305	475*
1945...	265	298	302	438	537	420	676*	1,777	1,042	564	408	359	591*
1946...	311	373*	426*	515*	410*	514	1,227	2,665	1,793	1,032*	562	416	849*
1947...	432	647	1,272	612*	886	864	1,233	1,731	1,058	638	449	438*	855*
1948...	821	327	646	640	646	679	597	2,021	2,356	956	551	412	954
1949...	469	474	428	389*	455*	642	1,463	3,059	1,966	890	520	455	935*
1950...	435	705	572	423	574	828	1,041	2,168	2,603	1,372	676	472	991
1951...	644	902	1,374	836	1,228	807	1,738	2,647	1,756	911	561	471	1,155
1952...	651	613	614	465	501	560	1,510	2,155	1,300	774	489	379	847
1953...	329	328	355	977	937	631	995	2,030	1,609	963	514	394	837

* Estimated.

KLUCKITAT RIVER BASIN

Klickitat River near Glenwood, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...		458	463	463	590	1,100	1,370	1,650	824*	691	515	447	447
1911...	478	457	519	429	389	397	646	1,350	1,070	700	538	438	389
1912...	388	379	396	380	564	456	700	1,260	286	644	456	432	379
1913...	598	387	396	432	382	462	5.4	1,220	1,480	8.0	599	461	382
1914...	456	481	391	414	555	745	924	1,510	980	762	557	480	391
1915...	503	600*	441	335	370	424	1,160	920	602	490	460	358	335
1916...	353	315	358			508	1,160	1,460	2,280	1,340	904	640	315
1917...	540	540	404	330	386		398		1,880	904		494	330
1918...	425*	375	340	826	782	086	992	1,120	938	710	575	540	340
1929...	500	525	385	365	672	651	1,110	1,640	1,010	702	515	445	365
1920...	422	427		432	456	466		846	770	544	445	429	
1921...	470	417					1,370		1,390	940	680	516	417
1922...	492	444					516	1,350			522		
1923...	440							1,330	1,330	762	655		
1924...	486	466						1,120	734	544	511		
1925...									1,150		479	391	391
1926...	391	391	485	407	414		745	768					
1927...							672	1,450	1,450	788			
1928...	471	471						1,570		740	513		
1929...						296	475*	1,080	1,060	577	452	332	296
1930...	296	283	324	264	452	510	979	832	590	440	368	302	264
1931...	270	282	285	306	338	344	750	892	500	427	359	255	270
1932...	245	536	245	295	265	563	956	1,400	1,220	563	412	359	236
1933...	343	404	445	435	291	347	550	1,150	1,490	770	580	463	291
1934...	414	494	468	1,240	1,030	1,040	1,420	898	660	530	477	396	396
1935...	389	649	517	430*	601	535	571	1,400	1,030	619	475	352	352
1936...	333	317	299	299	285*	392	364	1,670	912	555	406	357	285*
1937...	314	278	301	278	300*	300*	435	1,060	1,460	517	426	360	278
1938...	345	360	475	674	500	536	620	2,040	1,300	655	530	400	345
1939...	378	360	383	351	329	342	655	1,120	709	450	356	311	311
1940...	495	495	320	301	361	689	1,220	1,100	580	400	370	352	295
1941...	338	334	345	340	400	612	929	778	480	395	320	330	320
1942...	316	310	516	415*	397	403	712	1,090	742	428	316	283	283
1943...	268	321	519	340*	350*	434	1,340	1,240	1,440	750	460	397	268
1944...	333	349	360*	330*	316	299	546	733	510	350	297	284	284
1945...	238	257	241	268	309	345	415*	1,330	679	423	332	300	238
1946...	284	320*	280*	360*	350*	460	588	1,760	1,200	720*	456	372	280*
1947...	339	372*	650*	470	693	693	555	1,420	744	503	410*	400*	339
1948...	412	636	588	522	484	595	609	935	1,570	707	460	365	365
1949...	394	360	348	310*	310*	510	664	1,670	1,070	664	447	406	310*
1950...	376	406	435	343	440*	629	788	1,050	1,890	871	555	423	343
1951...	429	516	1,020	672	714	729	848	1,780	1,280	686	466	406	406
1952...	532	502	454	424	496	442	778	1,570	994	581	400	346	346
1953...	315	288	326	337	614	565	579	1,560	1,060	649	418	332	288

* Estimated.

KLICKITAT RIVER BASIN

Klickitat River near Glenwood, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acres-feet		Inches	Acres-feet
1910.....	6,250†	Nov. 24, 1909	447	1,160	3.31	45.12	842,000	1,060	41.20	769,000
1911.....	2,910†	June 1, 2, 1911	389	835	2.32	31.65	605,000	788	29.69	570,000
1912.....	2,790†	①	379	800	2.22	30.25	581,000	804	30.39	583,000
1912.....	3,310†	June 3, 1913	382	881	2.46	33.22	638,000	889	33.53	644,000
1914.....	2,890	Jan. 7, 1914	391	954	2.65	35.99	691,000	979	36.92	709,000
1915.....	2,200	April 3, 1915	335	667	1.85	25.15	483,000	624	23.48	452,000
1916.....	4,620	June 18, 1916	315	1,200	3.33	45.52	872,000	1,230	46.55	891,000
1917.....	3,300	June 9, 1917	330	877	2.44	33.06	635,000	957	36.11	692,000
1918.....	6,260	②	340	1,030	2.86	38.50	745,000	961	36.24	695,000
1919.....	4,600	Jan. 23, 1919	365	934	2.59	35.23	676,000	923	34.75	688,000
1920.....	1,640	May 17, 1920	.....	670	1.86	25.33	427,000	707	26.73	513,000
1921.....	3,770	③	417	1,230	3.42	46.39	891,000	1,260	47.51	913,000
1922.....	3,420	June 5, 1922	.....	856	2.38	32.27	620,000	774	29.19	561,000
1923.....	3,160	May 9, 1923	.....	925	2.57	34.88	670,000	951	35.86	688,000
1924.....	2,230	May 13, 1924	.....	736	2.04	27.84	534,000	728	27.54	623,000
1925.....	3,030	④	391	866	2.41	32.67	627,000	837	31.56	606,000
1926.....	1,750	April 18, 1926	.....	570	1.58	21.50	413,000	608	22.93	440,000
1927.....	4,490	June 8, 1927	.....	1,040	2.89	39.12	750,000	1,080	40.70	721,000
1928.....	2,190	May 21, 1928	.....	835	2.60	35.36	678,000	802	32.58	625,000
1929.....	2,560	May 24, 1929	296	662	1.84	24.94	479,000	633	23.89	459,000
1930.....	1,520	April 23, 1930	264	583	1.62	21.99	422,000	574	21.58	416,000
1931.....	2,200	May 2, 1931	279	537	1.49	20.26	389,000	538	20.23	390,000
1932.....	2,700	⑤	236	787	2.13	29.02	558,000	842	31.85	611,000
1933.....	3,950	⑥	291	692	2.51	34.01	653,000	1,040	39.23	753,000
1934.....	9,870	Dec. 22, 1933	396	1,109	3.08	41.82	802,900	1,099	38.04	780,300
1935.....	2,680	Nov. 6, 1934	352	801	2.39	32.47	623,500	758	28.58	543,700
1936.....	3,070	May 14, 1936	285	718	1.99	27.15	521,200	715	27.04	519,200
1937.....	2,330	June 21, 1937	278	683	1.80	25.77	494,800	741	28.21	536,400
1938.....	3,960	May 27, 1938	345	1,005	2.79	37.89	727,400	974	36.69	704,800
1939.....	2,140	May 16, 1939	311	640	1.78	24.13	463,600	626	23.59	453,000
1940.....	2,040	⑦	295	690	1.92	26.71	501,200	697	26.34	505,700
1941.....	1,540	May 17, 1941	320	561	1.56	21.17	406,100	606	22.87	438,600
1942.....	2,050	May 23, 1942	283	675	1.88	25.44	488,300	650	24.49	470,300
1943.....	3,280	May 25, 1943	268	903	2.51	34.04	653,700	881	33.24	638,200
1944.....	1,220	May 3, 1944	284	475	1.32	17.96	344,500	445	16.85	323,300
1945.....	2,380	⑧	238	591	1.64	22.29	427,800	612	23.08	442,800
1946.....	3,210	May 19, 1946	280	849	2.36	32.03	614,500	953	35.96	690,200
1947.....	3,970	Dec. 14, 1946	339	855	2.58	32.23	618,900	849	32.03	615,000
1948.....	4,710	May 26, 1948	365	954	2.65	36.08	692,700	877	33.14	636,300
1949.....	4,710	May 15, 1949	310	935	2.60	35.25	676,700	963	36.33	697,500
1950.....	3,410	June 5, 1950	343	891	2.75	37.35	717,400	1,093	41.21	791,400
1951.....	3,830	May 11, 1951	406	1,155	3.21	43.56	886,200	1,067	40.25	772,600
1952.....	2,610	May 10, 1952	346	847	2.35	32.02	614,800	774	29.27	562,000
1953.....	2,830	May 18, 1953	288	837	2.32	31.55	605,900	.....	.....	.....

† Maximum observed.

① May 14, 15, 1912. ② Probably Dec. 29, 1917. ③ May 25, June 4, 5, 7, 1921. ④ Probably Feb. 3, 1925.
 ⑤ Sometime May 9-14, 1932. ⑥ June 9, 15, 1933. ⑦ May 10, 11, 1940. ⑧ Sometime May 4-6, 1945.

Klickitat River Basin

Indian Ford Springs No. 1 near Glenwood, Wash.

Location.—Lat. 46°02'30", long. 121°10'50", in N½ sec. 4, T. 6 N., R. 13 E., on left bank, 200 ft. above mouth, a quarter of a mile downstream from source at spring, and 5¼ miles northeast of Glenwood.

Gage.—Water-stage recorder. Altitude of gage is 1,300 ft. (from river-profile map).

Extremes.—1946-48: Maximum discharge, 21.3 cfs Feb. 28 to Mar. 2, 1948 (gage height, 1.12 ft.); minimum, 13.7 cfs June 29, 1947.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	16.7	16.4*	16.2*	16.2*	17.6*	17.8*	17.7*	16.9	14.9	14.4	15.2	15.7	16.3*
1948...	16.6	15.8	16.0	17.2	17.8	18.7	16.1	15.1	14.4	15.0	15.4	15.8	16.2
1949...	16.7	16.3											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	16.5						17.3*	15.3	13.7	14.2	14.2	14.7	13.7*
1948...	15.9	15.3	15.9	15.9	16.6	17.2	15.3	14.7	14.2	14.2	14.7	15.3	14.2
1949...	16.3*	15.9											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1947.....			13.7	16.3	11,790	16.2	11,740
1948.....	21.3	①	14.2	16.2	11,740		

* Estimated.

① February 28 to March 2, 1948.

Klickitat River below Glenwood, Wash.

Location.—Lat. 45°56'30", long. 121°07'40", in N½ sec. 12, T. 5 N., R. 13 E., 40 ft. upstream from road bridge and 9 miles southeast of Glenwood.

Drainage area.—747 sq. mi.

Gage.—Staff gage. Altitude of gage is 850 ft. (from river-profile map).

Extremes.—July to October 1914: Maximum discharge not determined, occurred July 3 or 4 during period of no gage-height record; minimum observed, 766 cfs Sept. 16 (gage height, 0.88 ft.).

Remarks.—Small diversions for irrigation above station. No regulation.

KLICKITAT RIVER BASIN

Klickitat River below Glenwood, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1914...									1,190	929	855	886*	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1914...									1,010	850	786		.....

Little Klickitat River near Goldendale, Wash.

Location.—Lat. 45°50'50", long. 120°47'50", in NW¼ sec. 10, T. 4 N., R. 16 E., on right bank just below highway bridge, 2½ miles northeast of Goldendale, 7½ miles downstream from Emerson Creek, and 13 miles upstream from mouth.

Drainage area.—78.0 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 1,688 ft. (by barometer). Oct. 3, 1910, to June 30, 1912, staff gage at approximately same site at different datum. Oct. 21, 1946, to Feb. 11, 1951, water-stage recorder 60 ft. downstream at different datum, destroyed by flood of Feb. 11, 1951.

Average discharge.—6 years (1910-11, 1946-51), 71.3 cfs.

Extremes.—1910-12, 1946-51: Maximum discharge, 1,760 cfs Jan. 7, 1948 (gage height, 5.55 ft., site and datum then in use), from rating curve extended above 665 cfs; minimum, 0.6 cfs Aug. 28, 1947 (gage height, 1.13 ft.).

Remarks.—Several small diversions for domestic use and minor irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	12.3*	31.2*	65.6	61.4	38.1	132	76.8	52.7	34.8*	6.77*	1.5*	4.64*	43.3*
1912...	5.29*	11.0*	9.85*	104	207	63.4	111	76.5	30.3				.....
1947...	6.46*	49.9	106	66.4*	153	80.5	54.7	34.1	13.6	2.91	1.09	2.01	52.0*
1948...	19.1	21.3	27.7	153	156	133	121	102	51.3	11.2	4.32	3.18	66.6
1949...	5.08	11.4	35.8	18.4*	201*	315	200	113	39.0	9.19	3.38	3.14	79.1*
1950...	4.89	10.0	15.5	23.5*	213	255	156	88.4	67.0	18.9	5.30	3.70	70.7*
1951...	14.3	51.8	275	191	296*	160*	211	107	44.9	12.8	4.35	4.17	116*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	9	12	23	33	23	28	49	40	19	1.5			.....
1912...	4.8	7.2*	9	28	90	43	72	56	9.5			2.4*	.....
1947...	4.0*	5.3	40*	15*	86	58	43	17	6.0	1.6	0.7	.8	0.7
1948...	2.0	15	16	49	50*	77*	33	76	19	4.8	2.5	1.8	1.8
1949...	4.1	5.4	18.5	15.5*	19*	154	111	72	18.5	4.9	2.2	2.0	2.0
1950...	3.0	5.3	10*	14*	27*	112	82	62	40	9.7	3.8	3.2	3.0
1951...	4.7	26	112	80	90*	80*	112	31	20	6.4	2.4	2.7	2.4

* Estimated.

KLICKITAT RIVER BASIN

Little Klickitat River near Goldendale, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1911.....	230†	Mar. 21, 1911		43.3	31,300	36.3	26,300
1912.....							
1947.....	1,330	Dec. 15, 1946	0.7	52.0	37,620	39.0	28,200
1948.....	1,760	Jan. 7, 1948	1.8	66.6	48,350	65.3	47,410
1949.....	888	Feb. 17, 1949	2.0	79.1	57,240	77.2	55,000
1950.....	1,300	Feb. 24, 1950	3.0	70.7	51,210	99.5	72,010
1951.....			2.4	116	83,780		

† Maximum observed.

Little Klickitat River near Wahkiacus, Wash.

Location.—Lat. 45°50'30", long. 121°03'20", in SE¼ sec. 9, T. 4 N., R. 14 E., on right bank, half a mile downstream from Bowman Creek, three-quarters of a mile upstream from mouth, and 2 miles northeast of Wahkiacus.

Drainage area.—280 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 580 ft. (by barometer). Prior to Dec. 29, 1950, staff gage and crest-stage indicator at same site and datum.

Average discharge.—8 years (1945-53), 212 cfs.

Extremes.—1944-53: Maximum discharge, 7,000 cfs Jan. 7, 1948 (gage height, 9.4 ft., from high-water mark); minimum observed, 17 cfs Aug. 3-6, 11, 16-27, Aug. 29 to Sept. 3, 1945, Aug. 30, 1947; minimum gage height observed, 1.24 ft. Aug. 25, 26, 27, 1945.

Remarks.—Some small diversions for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....			26.8	56.8	185	132	137	122	55.4	21.0	17.4	18.5	.....
1946.....	19.6	47.7	317	461*	421	394	269	237	112	60.1	36.0	30.5	200*
1947.....	35.3	116	263	144	852	225	173	97.3	55.4	24.3	19.9	23.3	126
1948.....	54.6	76.5	70.8	415	512	330	258	242	146	49.3	33.1	29.4	184
1949.....	35*	47*	200*	60*	570*	930*	490*	320*	120*	45*	35*	36*	230*
1950.....	32*	46*	60*	53*	630*	700*	420*	280*	170*	66*	37*	31*	211*
1951.....	54.3*	290*	778	804	968	500	54	297	125	59.3	42.3	42.4	372*
1952.....	63.9	95.4*	225	117	683	271	321	177	89.7	46.9	31.9	33.1	178*
1953.....	36.0	43.2	51.8	790	511	215	183	177	113	40.5	35.3	34.4	185

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....			20*	26	43	60	116	84	29	18	17	17	.....
1946.....	18	25	45	176	189	310	217	164	76	44	31	28	18
1947.....	27	31	75*	55*	189	164	127	65	31	20	17	19	17
1948.....	24	52	53	86	69	155	200	200	73	33	30	26	24
1949.....													
1950.....													
1951.....	30*	85*	450*	346	366	300*	346	181	77	44	40	38	30*
1952.....	48	58	110*	90	249	269	262	125	66	34	30	30	30
1953.....	33	40	41	61	252	196	133	144	79	35	31	33	31

* Estimated.

Little Klickitat River near Wahkiacus, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1945.....	932	Feb. 8, 1945				93.7	67,850
1946.....	6,600	Dec. 28, 1945	18	200	144,400	202	146,500
1947.....	1,530	Dec. 15, 1946	17	126	91,470	108	78,130
1948.....	7,000	Jan. 7, 1948	24	184	133,200	190	138,200
1949.....	5,520†	Feb. 17, 1949		239	172,800	227	164,300
1950.....				211	152,400	293	212,400
1951.....	3,700	Feb. 9, 1951	30	312	269,200	310	224,400
1952.....	4,450	Feb. 4, 1952	30	178	128,900	156	113,300
1953.....	4,140	Jan. 9, 1953	31	185	134,000		

† Maximum observed.

Klickitat River near Pitt, Wash.

Location.—Lat. 45°45'30", long. 121°12'30", in SW¼ sec. 8, T. 3 N., R. 13 E., on left bank, 2½ miles south of Pitt, 5 miles upstream from Silvias Creek, and 7 miles upstream from mouth.

Drainage area.—1,290 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 285 ft. (from river-profile map). July 3, 1909, to Jan. 31, 1912, staff gage at Klickitat, just downstream from Snider Creek, 7 miles upstream, at different datum. Sept. 29, 1928, to Sept. 30, 1935, staff gage 3.5 miles upstream from present site at different datum.

Average discharge.—27 years (1909-11, 1928-53), 1,551 cfs.

Extremes.—1909-12, 1928-53: Maximum discharge 25,500 cfs Dec. 22, 1933 (gage height, 12.50 ft. site and datum then in use, from graph based on gage readings), from rating curve extended above 3,400 cfs on basis of velocity-area study and gage-height curve of relation; minimum, 466 cfs Feb. 4, 1937.

Remarks.—Several small diversions above station for irrigation of about 7,500 acres above station, mostly in the vicinity of Glenwood. The largest of these is Hell-roaring Irrigation Canal which, at times, diverts the entire flow of Hellroaring Creek, a tributary to Big Muddy Creek. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909.....										1,490	1,030	847	.....
1910.....	777	2,760	2,400	2,670	2,730	6,110	3,630	3,140	1,920	1,320	1,010	871	2,450
1911.....	1,020	1,330	1,520	1,190	1,050	1,960	2,280	2,430	2,460	1,280	910	385	1,530
1912.....	753	872	766	1,510									.....
1929.....	778	785	751	725	894	1,370	1,340	2,090	1,700	970	746	644	1,070
1930.....	597	563	739	622*	2,180	1,300	1,790	1,370	1,030	792	660	594	1,010*
1931.....	556	555	521	669	723	1,070	2,120	1,790	963	685	598	564	900
1932.....	564	627	668	1,260	1,690	3,020	2,400	2,700	1,940	1,130	822	690	1,460
1933.....	648	1,180	1,160	1,380	1,150	2,020	2,740	2,840	3,480	1,650	971	756	1,670
1934.....	931	1,005	6,100	5,600	2,383	2,375	2,350	1,566	1,177	993	896	733	2,193
1935.....	917	1,658	1,874	2,111	1,979	1,740	1,960	2,571	1,971	1,154	890	779	1,631

* Estimated.

KLICKITAT RIVER BASIN

Klickitat River near Pitt, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1936...	711	697	695	1,818	947	1,784	2,265	2,702	1,870	991	759	694	1,329
1937...	641	593	666	607	846	1,745	2,356	2,400	2,182	1,128	666	607	1,203
1938...	607	1,024	2,380	3,132	2,013	3,664	3,570	3,660	2,540	1,368	957	851	2,150
1939...	774	764	855	885	1,116	1,846	1,693	1,750	1,117	824	671	618	1,029
1940...	679	561	815	782	2,404	2,599	2,161	1,993	1,136	779	683	638	1,263
1941...	626	606	632	1,244	1,346	1,455	1,651	1,385	619	718	612	606	1,011
1942...	617	715	1,567	896	2,085	1,269	1,800	1,670	1,255	826	669	679	1,157
1943...	542	959	1,873	1,935	2,734	2,565	4,942	3,028	2,581	1,513	943	809	2,029
1944...	792	799	817	758	927	921	1,062	1,243	923	662	558	549	834
1945...	501	521	562	744	1,123	994	1,269	2,198	1,324	757	597	599	931
1946...	532	717	1,465	2,124	1,713	2,285	2,302	3,395	2,274	1,419	824	684	1,645
1947...	704	1,072	2,374*	1,234*	2,354	2,103	2,098	2,430	1,584	1,012	760	721	1,531*
1948...	1,201	1,201	1,089	2,355	2,136	1,935	2,076	3,217	3,173	1,351	896	785	1,783
1949...	825	862	1,204	691	2,463	3,654	3,270	4,039	2,434	1,314	938	846	1,825
1950...	614	1,113	1,045	1,106	2,504	3,048	3,251	3,402	3,441	1,528	1,075	854	2,001
1951...	1,069	1,856	3,973	3,800	4,841	2,858	4,161	3,957	2,410	1,342	951	896	2,665
1952...	1,109	1,116	1,700	1,097	3,352	1,906	3,173	3,042	1,899	1,216	901	778	1,766
1953...	744	766	831	4,210	3,250	1,663	1,943	2,661	2,195	1,385	868	748	1,781

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,180	900	778	.....
1910...	742	778	1,460	1,240	1,700	3,600	3,230	2,540	1,520	1,130	882	835	742
1911...	835	635	1,130	978	610	610	1,560	2,120	1,620	1,020	850	770	770
1912...	695	695	695	620	1,700	.....	.....	.....	.....	.....	.....	.....	.....
1920...	740	740	670	688	605	960	960	1,510	1,310	810	670	594	594
1930...	584	510	535	.....	870	950	1,500	1,120	832	692	618	535	510
1931...	530	510	490	520	589	660	1,280	1,190	795	642	567	520	490
1932...	510	505	505	638	626	1,740	2,020	1,960	1,540	578	727	638	505
1933...	608	671	762	806	590	1,280	1,970	2,000	2,220	1,150	790	720	590
1934...	685	790	755	3,400	1,750	1,850	1,950	1,350	1,020	880	840	720	685
1935...	720	1,200	1,090	970	1,950	1,450	1,650	2,350	1,450	925	840	720	720
1936...	667	640	640	843	712	1,350	1,190	2,190	1,220	816	706	662	640
1937...	606	558	532	522	570	1,460	1,540	1,090	1,760	724	590	532	522
1938...	555	620	854	2,060	1,560	2,580	2,510	2,930	1,860	1,040	912	763	555
1939...	729	668	736	729	694	846	1,410	1,410	932	701	615	595	595
1940...	560	540	565	600	608	1,930	1,930	1,466	910	701	644	610	540
1941...	595	575	600	687	1,030	1,210	1,400	1,090	790	626	570	570	570
1942...	575	580	782	694	1,190	1,110	1,380	1,390	1,010	665	590	555	555
1943...	530	572	1,190	900*	950*	1,420	3,320	2,220	1,960	1,110	824	768	530
1944...	718	746	688	676	732	739	920	776	684	580	515	515	515
1945...	492	483	483	515	627	634	1,020	1,770	896	641	535	545	483
1946...	496	565	615	1,190	1,210	2,040	1,730	2,506	1,730	1,000	718	610*	496
1947...	594	630	1,210	900*	1,560	1,670	1,730	2,040	1,180	819	692	660	594
1948...	716	1,000	950	1,210	850	1,400	1,610	1,730	1,070	1,090	869	700	700
1949...	718	709	820	574	645	2,600	2,600	2,620	1,510	1,070	850	794	574
1950...	746	770	834	762	1,040	2,300	2,520	2,280	2,520	1,220	915	798	746
1951...	770	1,160	2,360	2,360	2,280	1,780	3,350	2,760	1,726	1,100	915	826	770
1952...	935	945	1,280	986	1,650	1,460	2,500	2,420	1,400	1,030	788	742	742
1953...	733	715	751	846	1,790	1,450	1,350	2,260	1,550	-1,030	770	697	697

* Estimated.

KLUCKITAT RIVER BASIN

Klickitat River near Pitt, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acro-feet		Inches	Acro-feet	
1909.....											
1910.....	11,100*	Nov. 24, 1909	742	2,450	1.90	25.79	1,770,000	2,270	23.01	1,650,000	
1911.....	3,610	June 2, 1911	770	1,580	1.19	16.09	1,110,000	1,410	14.79	1,020,000	
1912.....											
1929.....	3,430	May 24, 1929	594	1,070	.829	11.23	773,000	1,030	10.86	748,000	
1930.....	6,120	Feb. 20, 1930	510	1,010	.783	10.63	732,000	988	10.40	715,000	
1931.....	18,500	Mar. 31, 1931	490	900	.698	9.48	652,000	920	9.68	666,000	
1932.....	8,020	Feb. 26, 1932	505	1,460	1.13	15.41	1,060,000	1,550	16.33	1,130,000	
1933.....	5,580	June 9, 1933	590	1,670	1.29	17.58	1,210,000	2,104	22.14	1,523,000	
1934.....	25,600	Dec. 22, 1933	685	2,193	1.70	23.08	1,557,000	1,838	19.34	1,331,000	
1935.....	7,030	Dec. 21, 1934	720	1,631	1.26	17.17	1,181,000	1,435	15.10	1,039,000	
1936.....	5,460	Jan. 12, 1936	640	1,329	1.03	14.02	985,000	1,312	13.85	952,700	
1937.....	6,780	April 15, 1937	522	1,203	.933	12.66	871,200	1,381	14.54	1,009,000	
1938.....	17,800	Dec. 30, 1937	555	2,159	1.67	22.62	1,556,000	2,013	21.18	1,457,000	
1939.....	3,060	Feb. 15, 1939	595	1,029	.798	10.83	745,200	993	10.45	718,600	
1940.....	8,120	Feb. 23, 1940	540	1,263	.979	12.33	917,100	1,286	13.57	933,400	
1941.....	2,870	Jan. 18, 1941	570	1,011	0.784	10.64	732,000	1,070	11.26	774,600	
1942.....	5,010	Feb. 4, 1942	555	1,157	.897	12.16	837,700	1,198	12.60	867,000	
1943.....	14,500	Mar. 31, 1943	530	2,029	1.67	21.35	1,469,000	1,945	20.47	1,408,000	
1944.....	2,150	Feb. 6, 1944	615	834	.647	8.50	605,200	765	8.07	555,000	
1945.....	2,940	Feb. 8, 1945	483	931	.722	9.79	673,900	1,026	10.80	743,000	
1946.....	11,400	Dec. 28, 1945	496	1,645	1.28	17.31	1,121,000	1,706	18.59	1,279,000	
1947.....	7,660	Dec. 14, 1946	594	1,531	1.19	16.11	1,109,000	1,475	15.52	1,068,000	
1948.....	15,700	Jan. 7, 1948	500	1,783	1.38	18.81	1,295,000	1,733	18.29	1,256,000	
1949.....	17,300	Feb. 17, 1949	574	1,866	1.45	19.63	1,350,000	1,871	19.69	1,355,000	
1950.....	10,200	Feb. 24, 1950	746	2,001	1.55	21.05	1,449,000	2,332	24.54	1,639,000	
1951.....	12,400	Feb. 11, 1951	770	2,665	2.07	28.05	1,929,000	2,415	25.43	1,748,000	
1952.....	18,600	Feb. 4, 1952	742	1,760	1.37	18.63	1,282,000	1,633	17.22	1,185,000	
1953.....	10,900	Jan. 9, 1953	697	1,781	1.38	18.75	1,289,000				

WHITE SALMON RIVER BASIN

Trout Creek at Guler, Wash.

Location.—Lat. 46°00'10", long. 121°32'10", in SE¼ sec. 15, T. 6 N., R. 10 E., on left bank at Guler, 500 ft. downstream from highway bridge, and a quarter of a mile downstream from Trout Lake.

Drainage area.—59 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 2,000 ft. (from river-profile map).

Extremes.—1909-11: Maximum discharge, 1,580 cfs Nov. 25, 1909 (gage height, 7.31 ft., from graph based on gage readings); minimum observed, 46 cfs Sept. 11-20, 1910, Aug. 22-27, Aug. 30 to Sept. 3, Oct. 22-28, 1911.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	71.9	729	602	425	253	642	638	543	254	86.6	52.8	47.4	362
1911...	72.4	435	447	148	145	245	388	671	377	116	53.2	73.3	265
1912...	55.0												

* Estimated.

WHITE SALMON RIVER BASIN

Trout Creek at Guler, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	48	205	250	189	157	414	568	414	115	56	48	46	46
1911...	49	62	390	115	142	157	300	463	173	60	46	46	46
1912...	46												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1910.....	1,530	Nov. 25, 1909	46	362	262,000	325	235,000	
1911.....	1,470	Nov. 21, 1910	46	265	192,000			
1912.....								

White Salmon River near Trout Lake, Wash.

Location.—Lat. 45°59'30", long. 121°29'30", in SE¼ sec. 24, T. 6 N., R. 10 E., on left bank, a quarter of a mile downstream from Trout Creek and 2 miles southeast of town of Trout Lake.

Drainage area.—170 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage was 1,870 ft. (from river-profile map). July 17 to Sept. 30, 1918, chain gage half a mile downstream at different datum.

Extremes.—1918, 1928-31: Maximum discharge, 3,000 cfs Apr. 1, 1931 (gage height, 5.2 ft.); minimum, 35 cfs Aug. 26, 1931 (gage height, -0.06 ft.).

Remarks.—Diversions above station for irrigation of an estimated 3,100 acres in 1918 and about 4,000 acres 1928-31.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929...	175	236	246	175	146	237	430	831	531	160	94.8	90.6	284
1930...	104	104	202	142*	726	413	707	353	153	77.5	54.6	59.3	254*
1931...	105	123	110	176	229	426	875	601	203	87.3	44.7	60.5	253

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929.....		136	150	150	136	152	231	670	277	103	81	74	74
1930.....	97	95	102	.....	245	246	362	245	96	59	48	44	44
1931...	63	105	92	100	150	197	540	265	140	60	36	42	36

* Estimated.

White Salmon River near Trout Lake, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1929.....	1,220†	May 23, 1929	74	284	206,000	264	101,000
1930.....	1,780†	Feb. 20, 1930	44	254	184,000	248	180,000
1931.....	3,000†	April 1, 1931	36	253	183,000	.....	.....

† Maximum observed.

White Salmon River at splash dam, near Trout Lake, Wash.

Location.—Lat. 45°57'00", long. 121°28'20", in E½ sec. 6, T. 5 N., R. 11 E., on right bank at splash dam, 4 miles downstream from Trout Creek, and 5 miles southeast of town of Trout Lake.

Drainage area.—240 sq. mi., approximately.

Gage.—Staff gage. Altitude of gage is 1,640 ft. (from river-profile map). June 1 to Sept. 30, 1912, and May 23 to June 28, 1913, staff gage just below dam at different datum.

Average discharge.—5 years (1912-17), 443 cfs.

Extremes.—1912-17: Maximum discharge observed, 2,160 cfs. Apr. 3, 1915 (gage height, 7.65 ft.); minimum observed, 52 cfs Aug. 1, 4, 5, 6, 1915 (gage height, 1.05 ft.).

Remarks.—Several diversions above station for irrigation of about 3,800 acres, most of which is above station; reported in 1913. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912.....	.....	.....	.....	.....	.....	.....	.....	.....	368	190	174	206	.....
1913...	203	558	316	411	288	335	622	897	965	416	230	271	450
1914....	227	368	293	764	380	703	843	870	445	234	170	208	463
1915....	303	554	275	220	216	538	1,110	519	165	97.1	63.1	69.6	344
1916....	85.2	201	398	276*	473	782	1,070	1,190	1,310	962	250	177	598*
1917....	155	202	157	154	164	149	400	957	994	496	175	169	345

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912.....	.....	.....	.....	.....	.....	.....	.....	.....	250	133	128	170	.....
1913...	160	193	235	275	220	255	435	605	635	235	205	190	160
1914....	190	198	220	235	275	515	515	605	315	160	152	152	152
1915....	190	380	198	168	190	255	635	410	85	59	55	56	55
1916....	67	111	172	.....	.....	357	875	945	1,100	467	190	156	67
1917....	135	160	117	123	135	125	173	575	810	202	158	158	117

* Estimated.

WHITE SALMON RIVER BASIN

White Salmon River at splash dam, near Trout Lake, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1912.....							
1913.....			160	469	332,000	444	321,000
1914.....			152	468	339,000	488	353,000
1915.....	2,160†	April 3, 1915	55	344	249,000	307	222,000
1916.....	1,890†	June 18, 1916	67	598	434,000	563	423,000
1917.....	1,370†	May 30, 1917	117	345	250,000		

† Maximum observed.

White Salmon River at Husum, Wash.

Location.—Lat. 45°47'50", long. 121°29'00", in SW¼ sec. 30, T. 4 N., R. 11 E., on right bank at Husum, 500 ft. upstream from Rattlesnake Creek.

Drainage area.—239 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 360 ft. (from river-profile map). Sept. 23, 1909, to Oct. 11, 1912 and Feb. 21, 1915, to Oct. 31, 1919, staff gages, and Oct. 12, 1912, to Feb. 20, 1915, water-stage recorder at sites within a quarter of a mile of described site at different datums.

Average discharge.—22 years (1909-19, 1929-41), 960 cfs.

Extremes.—1909-19, 1929-41: Maximum discharge, 10,800 cfs Dec. 22, 1933 (gage height, 11.0 ft.), from rating curve extended above 2,500 cfs; minimum, 340 cfs Dec. 30, 1930 (gage height, 0.64 ft.).

Remarks.—Diversions above station for irrigation of 3,800 acres, reported in 1913. An estimated 4,500 acres was under irrigation, 1929-41. Prior to 1914, flow was affected occasionally by operation of splash dam 10 miles upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	568	1,730	1,229	1,010	1,010	2,110	1,760	1,740	1,220	917	635	608	1,220
1911...	614	1,120	1,100	919	376	900	1,300	1,410	1,450	732	654	646	680
1912...	513	733	596	1,040	1,720	986	1,160	1,450	1,230	805	640	603	952
1913...	533	820	709	953	864	907	1,340	1,620	1,610	1,100	853	755	1,010
1914...	656	750*	660	1,250	949	1,260	1,430	1,370	1,070	870	717	673	973*
1915...	712	883	628*	590*	642	1,000	1,430	1,940	760	637	560	503	768*
1916...	479	602	902	706	1,070	1,600	1,820	1,990	2,230	1,860	1,150	927	1,280
1917...	731	704	630	591	607	613	933	1,360	1,740	1,310	885	751	927
1918...	606	551	2,280	2,080	1,580	1,220	1,250	1,040	535	743	598*	573	1,110*
1919...	589	650*	792*	1,390	1,200	1,250	1,360*	1,370*	1,030*	687	739	621	969*
1920...	519												
1929...	432*	395	486	416	1,150	863	1,190	868	648	522	450	424	650*
1931...	409	357	566	447	485	766	1,360	1,090	759	511	427	406	618
1932...	421	465	501	661	684	1,430	1,550	1,810	1,530	991	734	580	948
1933...	543	1,040	817	953	719	943	1,240	1,570	2,030	1,300	887	809	1,070
1934...	797	945	3,101	3,083	1,893	1,795	1,335	983	813	694	627	587	1,383
1935...	692	1,218	1,209	1,187	1,169	1,053	1,005	1,473	1,348	918	731	642	1,059
1936...	574	535	517	988	662	950	1,237	1,735	1,415	658	685	595	901
1937...	515	459	557	490	485	769	1,290	1,450	1,558	909	721	639	825
1938...	547	1,004	1,409	1,655	1,153	1,310	1,568	1,723	1,412	948	780	657	1,181
1939...	610	585	677	758	794	855	1,038	1,099*	781*	638*	506*	473	741*
1940...	465	431	730	637	1,163	1,559	1,484	1,130	506	638	511	497	840
1941...	486	533	702	761	800	366	918	864	636	522	465	505	671

* Estimated.

WHITE SALMON RIVER BASIN

White Salmon River at Husum, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	496	620	908	785	818	1,500	1,420	1,460	1,060	755	645	570	496
1911...	545	520	883	850	785	785	1,140	1,160	1,110	655	615	570	520
1912...	475	475	520	452	1,200	915	980	1,160	915	620	620	520	452
1913...	484	511	545	775	740	775	1,140	1,260	1,350	890	760	652	484
1914...	585	585	585	630*	820	1,120	1,120	1,170	970	770	675	630	585
1915...	630	720	585	495	565*	770	1,080	970	675	540	540	450	450
1916...	450	450	585	585	675	970	1,620	1,700	1,940	1,300	1,080	870	450
1917...	675	630	565	545	565	545	720	1,110	1,440	990	820	630	545
1918...	565	505	505	1,420	1,270	1,070	1,130	840	790	672	.....	545	505
1919...	525	520*	540*	530	1,150	1,150	1,000*	1,210*	870*	790	620	500	500
1920...	460	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1930.....	.....	378	383	392	442	685	1,060	745	595	472	424	416	378
1931.....	383	370	344	360	398	464	985	795	655	454	402	393	344
1932.....	379	400	367	477	504	940	1,270	1,510	1,900	785	.....	537	367
1933.....	502	567	665	755	.....	795	1,060	1,300	1,540	1,010	795	775	502
1934.....	630	630	630	2,410	1,480	1,360	1,160	855	735	835	571	556	556
1935.....	564	797	816	915	1,080	938	915	1,270	1,100	797	680	605	564
1936...	546	500	470	695	593	855	818	1,490	975	743	634	532	470
1937...	481	435	429	450	450	560	807	1,110	1,280	784	663	552	429
1938...	519	521	734	1,290	1,060	1,110	1,160	1,430	1,130	839	708	617	519
1939...	552	538	566	662	648	700	920	980*	702*	546*	469*	423	423
1940...	433	406	411	496	543	1,230	1,300	882	706	588	465	456	406
1941...	462	454	499	552	707	730	717	710	582	483	435	443	435

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1910.....	4,340	Nov. 24, 1909	496	1,220	879,000	1,160	538,000
1911.....	3,260	Nov. 21, 1910	520	980	710,000	897	349,000
1912.....	2,760	Feb. 17, 1912	452	852	601,000	971	705,000
1913.....	2,070	June 2-4, 1913	484	1,010	725,000	1,010	726,000
1914.....	2,370	Jan. 6, 1914	585	973	704,000	985	713,000
1915.....	2,260	April 3, 4, 1915	450	788	570,000	768	550,000
1916.....	3,200	June 18, 1916	450	1,280	927,000	1,280	932,000
1917.....	2,220	May 29, 1917	645	927	672,000	1,040	756,000
1918.....	7,500	Dec. 29, 1917	505	1,110	806,000	893	719,000
1919.....	.....	.....	500	989	716,000	.....	.....
1930.....	2,410	Feb. 20, 1930	378	650	471,000	637	461,000
1931.....	4,720	April 1, 1931	344	618	447,000	637	461,000
1932.....	2,330	Mar. 19, 1932	367	948	687,000	1,030	748,000
1933.....	3,060	June 9, 1933	502	1,070	776,000	1,270	921,000
1934.....	10,600	Dec. 22, 1933	556	1,383	1,001,000	1,244	900,600
1935.....	2,770	Dec. 21, 1934	564	1,059	766,500	934	676,000
1936.....	2,180	May 5, 1936	470	901	653,900	893	648,200
1937.....	3,070	April 15, 1937	429	825	687,400	945	684,200
1938.....	6,370	Dec. 30, 1937	519	1,181	855,300	1,090	789,300
1939.....	1,240	Feb. 15, 1939	423	741	636,500	720	521,200
1940.....	2,180	Mar. 1, 1940	406	840	609,800	849	616,000
1941.....	1,280	Mar. 18, 1941	435	671	485,700	.....	.....

* Estimated.

WHITE SALMON RIVER BASIN

White Salmon River near Underwood, Wash.

Location.—Lat. 45°45'00", long. 121°31'30", in NW¼ sec. 14, T. 3 N., R. 10 E., on right bank, 300 ft. downstream from bridge, 1,000 ft. downstream from Northwestern Electric Co.'s Condit powerplant, and 2 miles north of Underwood and mouth.

Drainage area.—390 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 150 ft. (from river-profile map). Oct. 18, 1912, to Feb. 26, 1913, reference point at dam, 1 mile upstream at different datum. Mar. 1, 1915, to July 16, 1918, water-stage recorder 200 ft. upstream at datum 3.24 ft. higher, and July 17, 1918, to Sept. 30, 1930, at datum 2.24 ft. higher than present datum.

Average discharge.—33 years (1915-30, 1935-53), 1,075 cfs.

Extremes.—1912-13, 1915-30, 1935-53: Maximum discharge, 9,700 cfs Dec. 29, 1917 (gage height, 9.5 ft., site and datum then in use), from rating curve extended above 2,700 cfs; practically no flow at times when powerplant is shut down.

Remarks.—Diversions above station for irrigation of 3,800 acres reported in 1913. Estimated 4,500 acres under irrigation, 1935-53. Low and medium flow regulated by powerplant. Records adjusted slightly for pondage, 1915-30. Observed monthly figures 1935-53 represent very nearly the natural flow of the basin.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913		908	820	1,110									
1915						1,230	1,610	1,140	812*	637*	596	557	
1916	517	668	1,110*	874*	1,400*	2,360	2,310	2,210	2,340	1,910	1,220	1,000	1,400*
1917	775	719	716	744	757	821	1,370	1,720	1,840	1,340	964	836	1,050
1918	645	575	2,980*	2,780*	2,110*	1,630*	1,370*	1,140*	918	817	651	620	1,350*
1919	633	706	865	1,510	1,330	1,570	1,660	1,530	1,140	933	774	700	1,110
1920	552	630	816	1,120	946	942	1,040	1,090	860	634	573	683	830
1921	861	1,020	1,170	1,870	1,840	2,140	1,690	1,870	1,650	1,120	895	777	1,410
1922	691	732	1,520	816	760	897	1,360	1,720	1,610	940	779	643	1,040
1923	568	594	816	1,980	1,210	1,200	1,400	1,410	1,080	808	659	590	1,030
1924	535	560	778	733	1,750	1,060	915	840	628	489	448	425	760
1925	461	512	562	1,300	2,210	1,530	1,590	1,660	1,130	858	693	599	1,140
1926	536	531	668	649	1,310	1,110	1,060	848	626	526	479	477	732
1927	587	789	1,170	1,360	2,020	1,450	1,380	1,700	1,630	989	815	745	1,210
1928	752	1,340	1,160	1,400	936	2,050	1,730	1,820	1,150	878	695	631	1,220
1929	584	595	612	558	508	824	1,090	1,350	1,060	680	581	486	738
1930	450	396	527	446	1,400	1,020	1,250	915	682	538	451	434	712
1935													676
1936	606	573	562	1,322	773	1,280	1,456	1,792	1,474	890	711	597	1,004
1937	551	496	584	487	549	1,032	1,627	1,612	1,641	987	742	654	914
1938	570	1,101	1,732	1,994	1,340	1,805	1,727	1,736	1,416	962	784	603	1,320
1939	634	635	730	825	964	1,049	1,112	1,118	803	644	518	490	793
1940	475	431	760	680	1,557	1,892	1,695	1,291	823	651	537	520	940
1941	500	659	771	579	941	964	966	910	666	533	469	513	723
1942	505	647	1,502	889	1,317	960	1,147	1,067	901	634	588	458	878
1943	448	961	1,384	1,318	1,446	1,544	2,516	1,845	1,703	1,178	825	717	1,321
1944	679	623*	725	657	810	742	822	804	642	514	457	437	859*
1945	437	496	452	724	1,130	1,040	1,134	1,603	1,001	730	598	560	824
1946	468	612	1,137	1,623	1,318	1,480	1,376	1,814	1,572	1,079	761	704	1,164
1947	682	654	2,184	1,835	1,774	1,459	1,877	1,049	899	650	685	604	1,127
1948	955*	1,036*	949	1,679	1,543	1,355	1,267	1,541	1,681	910	752	669	1,216*
1949	630	793	1,117	982*	1,406*	1,974	1,878	2,354	1,761	1,140	821	739*	1,273*
1950	699*	968	1,021	991	1,464	2,399	2,096	1,094	2,165	1,420	1,005	812	1,417*
1951	1,003	1,583	2,504	2,203	2,675	1,813	2,018	2,085	1,537	1,055	844	761	1,667
1952	991	1,901	1,495	997	1,813	1,269	1,558	1,656	1,307	859	757	642	1,201
1953	566	568	581	2,542	2,132	1,418	1,317	1,608	1,400	1,046	770	649	1,211

* Estimated.

White Salmon River near Underwood, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1913...		568	658	908									
1915...						920	1,350	1,040	725*	590*	508	522	
1916...	469	492	658*	735*	825*	1,300	2,040	1,910	2,030	1,340	1,020	858	469
1917...	702	572	608	624	644	632	1,120	1,370	1,560	1,070	890*	702	572
1918...	564	496	504*	1,890*	1,090*	1,430*	1,230*	900*	342	726	592	568	498
1919...	561	573	569	600	1,220	1,350	1,340	1,340	950	840	718	618	561
1920...	516	490	460	662	732	722	872	918	684	534	500	542	460
1921...	626	550	870	1,120	1,240	1,510	1,300	1,540	1,330	944	788	682	550
1922...	610	491	875	742	650	676	1,060	1,360	1,080	794	693	578	491
1923...	435	704	484	1,040	943	943	1,240	1,090	886	733	616	544	464
1924...	466	447	547	594	1,230	814	832	696	524	436	400	387	387
1925...	397	548	656	848	1,170	1,250	1,200	1,320	926	792	620	577	397
1926...	491	489	527	584	619	942	874	689	586	475	453	437	437
1927...	467	471	813	958	1,130	1,320	1,190	1,390	1,260	878	741	647	467
1928...	647	651	827		862	885	1,450	1,400	924	726	595	587	587
1929...	464	475	451	458	405	616	692	1,150	738	610	524	414	405
1930...	421	375	366	401	500	784	1,130	795	611	470	421*	410	366
1935...												556	
1936...	470	519	443	764	538	1,070	748	1,570	912	728	580	476	443
1937...	505	378	447	404	440	730	1,000	1,300	1,330	714	605	501	378
1938...	269	466	679	1,440	1,100	1,360	1,360	1,450	1,180	850	502	580	269
1939...	560	504	528	688	616	778	812	970	652	845	440	316	316
1940...	408	350	404	504	531	1,300	1,430	911	707	495	370	400	350
1941...	327	278	457	509	754	814	720	698	576	421	406	423	278
1942...	379	408	690	750	865	707	925	877	665	398	351	304	304
1943...	332	472	1,030	888	880	910	1,900	1,540	1,400	932	607	522	332
1944...	346	500*	556	560	612	620	734	649	486	326	270	332	270
1945...	374	402	321	401	512	624	988	1,230	703	634	405	372	321
1946...	376	346	529	1,000	1,110	1,320	1,130	1,450	1,370	792	602	492	348
1947...	484	502	1,170	985*	1,370	1,260	1,170	865	646	584	501	496	484
1948...	540*	820	767	1,080	911	1,110	1,110	1,230	1,060	776	648	496	496
1949...	504	512	760*	550*	600*	1,590	1,530	2,020	1,410	963	711	640*	504
1950...	580*	618	673	158	796	1,710	1,740	1,650	1,840	1,160	812	706	158
1951...	740	1,050	1,800	1,720	1,770	1,470	1,730	1,720	1,290	910	602	666	602
1952...	732	768	1,160	884	1,150	992	1,380	1,310	1,090	804	682	575	575
1953...	474	411	485	552	1,530	1,320	1,070	1,400	1,150	800	673	519	411

* Estimated.

WHITE SALMON RIVER BASIN

White Salmon River near Underwood, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1913.....							
1915.....							
1916.....	4,100.	Mar. 21, 1916	469	1,490	1,080,000	1,450	1,050,000
1917.....	2,130	June 9, 1917	572	1,050	760,000	1,220	852,000
1918.....	9,700	Jan. 17, 1918	495	1,350	878,000	1,160	855,000
1919.....	5,800	Jan. 23, 1919	561	1,110	805,000	1,100	797,000
1920.....	3,820	Jan. 26, 1920	460	830	603,000	911	662,000
1921.....	4,300	Mar. 18, 1921	550	1,410	1,020,000	1,400	1,010,000
1922.....	3,930	Dec. 1, 1921	491	1,040	752,000	957	693,000
1923.....	6,800	Jan. 7, 1923	484	1,030	747,000	1,020	740,000
1924.....	3,060	Feb. 1, 1924	387	760	552,000	787	571,000
1925.....	5,190	Feb. 3, 1925	397	1,140	829,000	1,110	801,000
1926.....	2,780	Feb. 6, 1926	457	782	529,000	799	573,000
1927.....	4,410	Feb. 22, 1927	467	1,210	879,000	1,270	921,000
1928.....	5,820	Nov. 25, 1927	587	1,220	882,000	1,090	784,000
1929.....	2,720	May 3, 1929	405	738	534,000	703	509,000
1930.....	3,220	Feb. 20, 1930	366	712	515,000		
1935.....							
1936.....	3,490	May 18, 1936	443	1,004	728,800	995	722,200
1937.....	4,210	April 15, 1937	378	914	662,600	1,063	769,700
1938.....	7,300	Dec. 29, 1937	269	1,320	955,600	1,202	870,200
1939.....	2,260	Feb. 15, 1939	316	793	578,800	765	553,600
1940.....	3,920	Feb. 23, 1940	350	940	682,600	954	692,400
1941.....	1,750	Jan. 19, 1941	278	723	523,300	793	573,900
1942.....	3,790	Dec. 19, 1941	304	878	535,500	888	643,100
1943.....	6,000	Mar. 31, 1943	332	1,321	956,200	1,257	910,400
1944.....	1,720	Dec. 3, 1943	270	659	478,500	605	439,000
1945.....	3,440	Feb. 3, 1945	321	824	596,200	896	649,000
1946.....	5,280	Dec. 29, 1945	348	1,164	843,000	1,298	939,600
1947.....	6,910	Dec. 13, 1946	484	1,127	815,700	1,053	762,100
1948.....	6,480	Jan. 7, 1948	496	1,216	882,900	1,181	857,600
1949.....	7,200	①	504	1,273	922,000	1,286	930,800
1950.....	5,260	Feb. 24, 1950	158	1,417	1,026,000	1,620	1,178,000
1951.....	6,240	Feb. 11, 1951	692	1,667	1,207,000	1,533	1,116,000
1952.....	5,900	Feb. 4, 1952	575	1,201	872,100	1,052	784,000
1953.....	7,170	Jan. 18, 1953	411	1,211	876,800		

① Probably Feb. 17, 1949.

Little White Salmon River near Willard, Wash.

Location.—Lat. 45°48'00", long. 121°38'30", in SW ¼ sec. 26, T. 4 N., R. 9 E., on left bank, 300 ft. upstream from Moss Creek and 1½ miles north of Willard.

Drainage area.—40.6 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,340 ft. (from topographic map).

Extremes.—1944-49: Maximum discharge, 2,900 cfs Dec. 15, 1946 (gage height, 8.00 ft., from graph based on gage readings); minimum observed, 11 cfs Sept. 1-6, 1947.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...			36.6	118	298	215	174	135	66.5	31.0	15.8	16.8	.....
1946...	16.0	130	343	477	314	307	181	110	71.0	48.1	24.0	16.2	169
1947...	28.9	205	573	247	327	178	99.7	48.0	33.3	19.0	12.8	15.7	148
1948...	125	120	125	408	321	197	161	182	66.5	36.4	20.4	18.2	148
1949...	23.4	145	260	61.0	404	406	334	233	63.8	32.9	18.3	15.9	165

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...			18	19	59	83	116	102	47	21	12	13	.....
1946...	16	21	83	189	215	202	136	81	61	35	16	12	12
1947...	12	21	169	97	138	105	69	36	25	15	12	11	11
1948...	14	77	59	119	85	107	125	91	47	25	16	15	14
1949...	16	25*	93	41	41	258	218	95	47	25	14.5	12.5	12.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....	2,010	Feb. 8, 1945	.....	.....	.....	.....	.....	129	43.06	93,270
1946.....	2,200	Dec. 28, 1945	12	169	4.16	56.61	122,600	196	65.58	142,000
1947.....	2,900	Dec. 15, 1946	11	148	3.65	49.54	107,300	111	37.22	80,580
1948.....	2,390	Jan. 7, 1948	14	148	3.65	49.65	107,500	153	51.27	111,000
1949.....	2,330	Feb. 17, 1949	12.5	165	4.06	55.07	119,200	.....	.....	.....

* Estimated.

LITTLE WHITE SALMON RIVER BASIN

Little White Salmon River at Willard, Wash.

Location.—Lat. 45°46'50", long. 121°37'30", in NW¼ sec. 1, T. 3 N., R. 9 E., on right bank at Willard, a quarter of a mile downstream from Lava Creek.

Drainage area.—117 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,230 ft. (from river-profile map). Nov. 3, 1903, to Aug. 5, 1906, staff gage and rectangular weir at practically same site at different datum.

Average discharge.—8 years (1945-53), 466 cfs.

Extremes.—1903-6, 1944-53: Maximum discharge, 4,140 cfs Dec. 15, 1946 (gage height, 9.50 ft.), from rating curve extended above 2,500 cfs; minimum, 1.6 cfs Dec. 3, 1952 (gage height, 0.73 ft.).

Remarks.—Only discharges under 350 cfs published 1903-6. Records for 1944-53 do not include flow of Broughton Lumber Co. flume, which diverts from right bank in SW¼ sec. 36, T. 4 N., R. 9 E., a quarter of a mile upstream, and at times carries as much as 30 cfs out of the basin to Columbia River. Other diversions above this station for water supply, irrigation and hatchery operation. Slight regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904		245			329						199	131	
1905	70.1	120										31.9	
1906	44.5	48.9	174				319	284	267	186			
1945			79.7*	292	612*	522*	501	506	452	262	107	34.7	
1946	16.1	204	609	909	651	685	478	466	489	418	270	114	442
1947	69.4	374	1,445	781	805	560	406	277	218	137	54.5	21.2	427
1948	220	411	470	819	642	557	463	547	459	362	177	71.0	428
1949	47.8*	281*	597	206	606	722	701	846	587	379	205	93.9	433*
1950	52.4	150	505	539	718	1,161	989	750	628	500	294	137	536
1951	205	744*	1,058*	1,088*	1,117	593	700	513	448	345	180	75.5	586*
1952	209	472	799	405	788	423	580	458	403	322	174	60.5	428
1953	19.3	7.01	59.2	1,538	1,319	638	400	372	410	323	220	104	446

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1904		70*			280						150	92	
1905	54	44										26	
1906	26	38	68				291	280	243	130			
1945			60*	64	248	310*	400	400	358	178	53	15	
1946	10	12	276	578	499	521	422	444	444	368	181	65	10
1947	38	70	642	498	534	440	332	241	184	88	33	11	11
1948	11	360	310*	407	321	407	440	440	440	270	107	49	11
1949	40*	40*	332	140*	140*	558	558	744	498	290	140	56	40*
1950	40	34	385	407	352	771	800	668	582	407	198	93	34
1951	82	450*	760*	800	642	498	582	475	396	270	119	46	46
1952	55	272	572	298	374	215	501	434	422	254	110	38	38
1953	8.2	1.8	1.8	108	742	522	329	327	370	275	160	68	1.8

* Estimated.

Little White Salmon River at Willard, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1945.....	2,820	Feb. 8, 1945				342	247,200
1946.....	3,200	Dec. 28, 1945	10	442	329,000	532	384,800
1947.....	4,140	Dec. 15, 1946	11	427	309,200	355	256,900
1948.....	3,070	Jan. 7, 1948	11	429	310,500	418	303,700
1949.....	2,820	Feb. 17, 1949	40	438	317,400	420	304,200
1950.....	2,580	Feb. 24, 1950	34	530	358,100	645	466,800
1951.....	2,700	Feb. 11, 1951	40	586	424,000	542	392,100
1952.....	3,070	Feb. 4, 1952	38	428	311,000	311	226,100
1953.....	3,330	Jan. 18, 1953	1.3	446	322,900		

Little White Salmon River below Lapham Creek, near Willard, Wash.

Location.—Lat. 45°46'00", long. 121°37'40", in NW ¼ sec. 12, T. 3 N., R. 9 E., on right bank, 0.3 mile downstream from mouth of Lapham Creek and 1.2 miles south of Willard.

Drainage area.—123 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 980 ft. (from river-profile map).

Extremes.—1949-53: Maximum discharge, 3,610 cfs Jan. 9, 1953 (gage height, 5.98 ft.); minimum, 59 cfs Oct. 31, 1952 (gage height, 1.35 ft.).

Remarks.—Broughton Lumber Co. flume, which diverts from right bank in SW ¼ sec. 36, T. 4 N., R. 9 E., 1¼ miles upstream, may at times carry as much as 30 cfs out of the basin to Columbia River. Other diversions above station for water supply, irrigation, and hatchery operation. Possibly some regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....												149	
1950.....	107	212	583	610	785	1,256	1,080	829	694	558	338	188	601
1951.....	267	867	1,205	1,222	1,195	689	822	579	507	384	230	138	672
1952.....	230	494	864	418	865	489	662	524	527	370	231	130	482
1953.....	84.3	69.4	130	1,601	1,416	741	461	425	475	372	261	159	511

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....												110	
1950.....	95	93	438	400*	394	851	880	712	640	451	241	149	93
1951.....	142	544	880	910	739	576	660	534	443	306	176	110	110
1952.....	120	276	605	302	414	348	572	494	485	296	174	104	104
1953.....	71	63	65	200	865	590	377	377	429	316	202	133	63

* Estimated.

LITTLE WHITE SALMON RIVER BASIN

Little White Salmon River below Lapham Creek, near Willard, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1949.....							
1950.....	2,540	Feb. 24, 1950	93	601	435,000	721	522,100
1951.....	2,540	Feb. 11, 1951	110	672	456,700	610	441,800
1952.....	3,080	Feb. 4, 1952	104	482	350,300	373	270,500
1953.....	3,610	Jan. 9, 1953	63	511	370,300		

WIND RIVER BASIN

Falls Creek near Carson, Wash.

Location.—Lat. 45°54'20", long. 121°56'20", in SW¼ sec. 21, T. 5 N., R. 7 E., on left bank a third of a mile upstream from mouth, and 14 miles northeast of Carson.

Drainage area.—24.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,390 ft. (from topographic map).

Extremes.—1944-48: Maximum discharge, 710 cfs Dec. 15, 1946 (gage height, 4.38 ft.); minimum observed, 8.7 cfs Oct. 29, 1944 (gage height, 1.60 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....			44.2*	107	142	86.3	53.1	190	55.3	33.0	19.0	19.4	.....
1946.....	18.9	69.0	144	207	103	111	116	203	148	81.6	85.9	24.8	105
1947.....	27.9	105	252	91.0	135	125	115	65.9	44.4	27.3	15.6	18.9	85.2
1948.....	99.3	104	84.0	165	97.7	88.9	108	172	128	46.4	29.2	24.5	95.7
1949.....	30.5	80.4											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945.....			23*	23*	47*	53	62	122	48	25	17	15	.....
1946.....	9.9	18	56*	111	72	85	69	155	115	51	28	20	9.9
1947.....	16.5	24	101	46*	92	87	92	44	34	23	14.5	13	13
1948.....	13.5	64	49	70	43*	61	74	90	68	34	25	19.5	13.5
1949.....	23	33											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....								82.4	46.05	59,660
1946.....	536	Dec. 29, 1945	9.9	105	4.82	58.67	76,030	118	66.13	85,710
1947.....	710	Dec. 15, 1946	13	65.2	3.51	47.59	61,680	78.9	42.95	65,670
1948.....	570	Jan. 7, 1948	13.5	95.7	3.94	53.58	69,460			
1949.....										

* Estimated.

WIND RIVER BASIN

737

Wind River above Trout Creek, near Carson, Wash.

Location.—Lat. 45°48'30", long. 121°54'30", in NE¼ sec. 26, T. 4 N., R. 7 E., on left bank, 30 ft. downstream from bridge, three-quarters of a mile upstream from Trout Creek, and 7 miles northwest of Carson.

Drainage area.—108 sq. mi.

Gage.—Staff gage and, since Sept. 7, 1950, crest-stage indicator. Altitude of gage is 850 ft. (from topographic map).

Average discharge.—9 years (1944-53), 571 cfs.

Extremes.—1944-53: Maximum discharge, 8,880 cfs Feb. 8, 1945 (gage height, 15.5 ft., from high-water mark), from rating curve extended above 5,000 cfs; minimum observed, 52 cfs Oct. 27-30, 1945.

Remarks.—No diversion which is not returned to stream above station. Slight regulation at low flow by fish hatchery dam above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	59.9	257	321	336	1,086	723	686	917	327	135	93.1	103	458
1946...	79.1	609	1,171	1,265	748	875	731	772	491	282	127	95.3	604
1947...	166	798	1,683	613	906	673	593	274	182	112	80.4	80.2	512
1948...	679	748	599	1,079	753	565	729	675	459	181	114	100	575
1949...	155	605	848	235	726	948	1,022	1,175	447	198	107	95.6	545
1950...	147	664	737	646	964	1,329	1,100	1,065	885	335	139	99.7	673
1951...	450	1,144	1,460	989	1,242	506	909	737	341	147	93.6	89.2	672
1952...	611	745	1,022	328	962	505	962	755	373	169	95.2	77.2	549
1953...	66.1	73.5	234	2,405	1,133	576	549	668	458	221	120	90.9	553

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	52	72	174	174	350	330	565	590	200	106	84	84	52
1946...	60	120	375	590	466	590	466	615	355	166	104	82	60
1947...	80	137	444	260	494	444	444	185	137	97	72	68	68
1948...	72	420	314	354	260	354	494	545	260	137	97	80	72
1949...	95	139	381	155*	155*	685	626	640	297	138	89	80	80
1950...	76	116	370	317	392	715	842	842	611	189	110	84	76
1951...	93	464	935	611	502	348	640	451	200	112	88	74	74
1952...	147	278	470	229	373	321	769	548	261	115	86	69	69
1953...	64	60	63	234	446	348	379	513	312	134	95	78	60

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....	8,880	Feb. 8, 1945	52	458	4.24	57.60	331,700	561	70.51	406,100
1946.....	6,210	Dec. 28, 1945	60	604	5.59	75.91	437,200	670	84.25	485,300
1947.....	6,370	Dec. 13, 1946	68	612	4.74	64.30	370,400	459	57.70	332,300
1948.....	5,300	Jan. 7, 1948	72	575	5.32	72.45	417,300	540	68.03	391,800
1949.....	3,020	May 2, 1949	80	545	5.05	65.53	394,800	540	67.88	391,100
1950.....	4,770	Nov. 27, 1949	76	673	6.23	84.63	487,600	800	100.55	579,200
1951.....	4,560	Dec. 23, 1950	74	672	6.22	84.47	486,500	616	77.38	445,700
1952.....	4,620	Dec. 1, 1951	69	549	5.03	69.15	398,200	381	47.98	276,300
1953.....	6,260	Jan. 9, 1953	60	553	5.12	69.51	400,300	.....	.....	.....

* Estimated.

WIND RIVER BASIN

Trout Creek near Carson, Wash.

Location.—Lat. 45°48'00", long. 121°55'00", in SW¼ sec. 26, T. 4 N., R. 7 E., on right bank, a quarter of a mile upstream from Martha Creek, half a mile upstream from mouth, and 7 miles northwest of Carson.

Drainage area.—30.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 900 ft. (from topographic map).

Extremes.—1944-48: Maximum discharge, 3,040 cfs Feb. 7, 1945 (gage height, 9.10 ft.), from rating curve extended above 950 cfs; minimum, 3.0 cfs Oct. 1, 1945 (gage height, 1.25 ft.).

Remarks.—No diversion which is not returned to stream above station. Some regulation at Forest Service powerplant.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945			139*	353	401	258	298	360	75.9	21.9	7.85	23.9	
1946	22.5	393	441	459	294	350	296	237	133	82.4	19.4	10.5	225
1947	126	455	601	267	349	245	251	84.5	67.6	35.3	11.8	24.1	205
1948	416	338	241	372	322	192	313	323	108	31.8	18.9	18.9	224
1949	89.7	354											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945			45*	44	85*	80	199	172	38	12	5.2	5.0	
1946	11	68	85*	142	123	199	157	169	93	33	12	6.9	6.9
1947	8.2	67	100	66*	133	114	119	32	38	19	8.5	6.2	6.2
1948	14.5	110	98	85*	55*	91	173	173	47	20	10.5	5.8	5.8
1949	26	65											

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945	3,040	Feb. 7, 1945						220	98.62	159,400	
1946	2,690	Dec. 23, 1945	6.9	226	7.52	102.03	194,900	256	114.35	134,800	
1947	2,620	Dec. 13, 1946	6.2	205	6.77	92.01	148,700	190	85.04	137,400	
1948	2,030	Jan. 7, 1948	5.8	224	7.39	100.59	162,500				
1949											

* Estimated.

WIND RIVER BASIN

739

Panther Creek near Carson, Wash.

Location.—Lat. 45°48'00", long. 121°52'00", in SW¼ sec. 25, T. 4 N., R. 7½ E., on left bank, a third of a mile upstream from Cedar Creek, and 6 miles northeast of Carson.

Drainage area.—30.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 800 ft. (from topographic map).

Average discharge.—9 years (1944-53), 181 cfs.

Extremes.—1944-53: Maximum discharge, 2,400 cfs Jan. 9, 1953 (gage height, 5.18 ft.); minimum, 40 cfs Oct. 30, 1944, discharge measurement (gage height, 0.90 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	51*	82*	82.3	224	298	217	198	212	104	70.9	51.9	52.4	36*
1946...	49.4	200	354	355	273	267	194	148	118	106	82.4	68.6	184
1947...	75.9	250	438	222	254	199	164	94.5	84.5	65.2*	57.1	53.9	163*
1948...	211	196	177	346	305	187	211	205	103	80.9	65.7	61.7	179
1949...	61.1	194	255	80.4	284	304	276	304	114	87.7	69.2	62.3	173
1950...	66.3	190	221	186	373	440	335	277	190	122	94.7	78.5	214
1951...	181	266	423	355	443	193	252	160	111	90.6	75.9	66.8	227
1952...	192	228	320	134	332	171	226	141	103	85.1	70.4	63.3	172
1953...	57.3	56.0	114	709	325	214	155	162	123	93.4	80.3	66.9	180

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	40	.....	51	53	86*	79	138	136	84	58	47	47	40
1946...	48	58	102	153	165	163	131	127	110	91	77	62	48
1947...	59	65	143	106	135	125	111	86	70	62*	53	50	50
1948...	60	117	100	121	98	113	167	127	91	74	58	56	50
1949...	52	66	109	63*	61	175	168	136	101	78	63	58	52
1950...	56	58	110	100*	110	177	227	219	142	109	85	73	56
1951...	71	136	252	182	160	124	153	122	101	83	70	62	62
1952...	74	94	162	98	122	120	180	114	94	76	66	60	60
1953...	56	52	54	155	160	130	123	125	109	84	72	62	52

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mille	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1945.....	2,150	Feb. 7, 1945	40	136	4.52	61.27	93,390	169	75.99	122,000
1946.....	2,030	Dec. 28, 1945	48	184	6.11	83.16	133,500	198	59.26	143,300
1947.....	1,830	Dec. 15, 1946	50	183	5.42	78.37	117,800	147	66.50	106,800
1948.....	2,220	Jan. 7, 1948	50	179	5.95	80.85	129,800	173	78.02	125,200
1949.....	1,500	①	52	173	5.75	78.24	125,600	171	77.04	123,600
1950.....	1,880	Feb. 24, 1950	56	214	7.11	96.42	154,800	257	115.83	185,900
1951.....	1,920	Feb. 9, 1951	62	227	7.54	102.20	164,000	206	92.78	148,900
1952.....	1,770	Feb. 4, 1952	60	172	5.71	77.66	124,500	129	53.20	93,400
1953.....	2,400	Jan. 9, 1953	52	180	5.98	81.12	130,200			

* Estimated.

① Feb. 17, May 12, 1949.

WIND RIVER BASIN

Wind River near Carson, Wash.

Location.—Lat. 45°44'10", long. 121°48'10", in SW¼NE¼ sec. 21, T. 3 N., R. 8 E., on right bank, three-quarters of a mile upstream from Little Wind River, 1 mile north-east of Carson, and 2½ miles upstream from mouth. Records include flow of Little Wind River.

Drainage area.—225 sq. mi., includes that of Little Wind River.

Gage.—Water-stage recorder. Altitude of gage is 150 ft. (from topographic map).

Average discharge.—19 years (1934-53), 1,129 cfs.

Extremes.—1934-53: Maximum discharge, 20,000 cfs Dec. 29, 1937 (gage height, 17.30 ft.), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum, 123 cfs Nov. 30, 1952; minimum gage height, 2.21 ft. Nov. 29, Dec. 1, 1936.

Remarks.—No diversion above station. Low flow occasionally affected by pondage at Forest Service powerplant on Trout Creek.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935...	700*	2,500*	2,483	1,764	1,542	1,345	1,448	1,411	703	342	241	196	1,220*
1936...	188	296	723	3,371	655	1,819	1,449	1,312	670	364	234	205	977
1937...	164	149	923	408	836	2,008	3,056	1,605	1,392	526	297	243	966
1938...	266	2,606	3,325	2,381	1,006	2,119	2,165	1,223	585	319	218	157	1,371
1939...	227	643	1,336	1,669	1,576	1,526	1,107	649	393	243	172	157	804
1940...	174	151	1,767	1,205	2,974	2,444	1,299	884	323	214	168	163	977
1941...	249	803	1,255	1,495	1,100	793	550	750	380	224	194	447	686
1942...	496	1,005	3,170	2,177	1,706	977	905	731	690	344	211	164	931
1943...	170	2,476	2,695	1,413	1,911	1,995	2,974	1,259	825	393	250	194	1,373
1944...	449	643	952	805*	1,003*	806	1,000	658	434	222	167	164	607*
1945...	168	650	664	1,336	2,350	1,683	1,505	1,519	612	297	211	234	997
1946...	205	1,553	2,698	2,684	1,861	2,033	1,500	1,306	846	550	278	219	1,316
1947...	430	2,037	3,606	1,499*	2,037	1,463	1,267	557	438	284	204	215	1,165*
1948...	1,662	1,649	1,317	2,447	1,869	1,320	1,627	1,756	514	372	248	234	1,277
1949...	383	1,548	2,114	517	2,042	2,157	2,192	2,317	774	391	233	219	1,238
1950...	339	1,479	1,697	1,507	2,528	3,122	2,426	2,182	1,541	604	304	228	1,469
1951...	1,172	2,690	3,238	2,566	2,830	1,224	1,977	1,351	622	315	222	201	1,625
1952...	1,545	1,813	2,479	826	2,488	1,273	2,072*	1,492	697	357	220	179	1,282*
1953...	147	152	674	5,840	2,561	1,425	1,172	1,328	581	417	275	213	1,254

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1935...	.....	.....	822	735	1,080	805	960	1,000	470	273	212	176	176
1936...	175	169	252	910	456	1,050	655	838	485	276	208	182	169
1937...	150	142	142	280	280	1,210	1,400	900	715	364	251	206	142
1938...	193	301	930	1,210	892	1,090	1,300	838	405	267	194	174	174
1939...	176	390	526	800*	750*	779	906	470	304	190	162	141	141
1940...	143	161	257	541	722	1,120	816	322	250	192	149	146	143
1941...	157	252	534	597	680	581	392	378	292	186	157	233	157
1942...	270	294	894	484	663	595	716	544	456	261	187	141	141
1943...	144	530	1,400	655	638	742	1,700	930	562	223	228	178	144
1944...	187	316	418	500*	550	505	795	505	273	163	154	146	146
1945...	146	269	316	339	672	672	1,110	1,050	369	235	192	186	146
1946...	175	233	708	1,090	1,070	1,210	930	1,030	655	351	235	163	175
1947...	180	327	1,000*	570*	975	870	850	389	380	226	185	177	177
1948...	184	330	680	715	540	750	1,120	1,100	496	304	211	177	177
1949...	232	364	790	372*	376	1,370	1,250	1,100	550	290	204	187	187
1950...	185	269	760	810*	780	1,460	1,670	1,740	1,020	384	247	195	185
1951...	216	925	2,020	1,250	1,020	720	1,250	820	307	249	206	168	163
1952...	364	550	1,150	523	848	772	1,700*	1,020	494	253	197	161	161
1953...	184	126	131	1,040	980	752	824	970	568	292	212	151	126

* Estimated.

WIND RIVER BASIN

741

Wind River near Carson, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1935	12,200	Dec. 21, 1934	176	1,220	5.42	73.62	883,600	846	51.05	632,800
1936	10,900	Jan. 12, 1936	109	977	4.34	59.13	709,600	981	59.32	711,800
1937	14,900	April 14, 1937	142	966	4.29	53.27	699,300	1,380	83.26	999,200
1938	20,000	Dec. 29, 1937	174	1,371	6.09	82.72	992,600	1,037	62.59	751,000
1939	7,309	Feb. 15, 1939	141	804	3.57	48.51	582,200	798	48.17	578,000
1940	10,100	Feb. 6, 1940	143	977	4.34	59.14	709,700	992	60.01	720,200
1941	5,860	Nov. 29, 1940	157	686	3.05	41.39	496,600	886	53.44	641,200
1942	15,800	Dec. 19, 1941	141	931	4.14	56.16	674,000	994	59.35	712,300
1943	17,600	Nov. 23, 1942	144	1,373	6.10	82.31	993,700	1,098	66.22	794,600
1944	4,910	Feb. 6, 1944	146	607	2.70	36.73	440,700	559	33.84	406,100
1945	17,600	Feb. 8, 1945	146	997	4.43	60.12	721,600	1,238	74.70	896,500
1946	15,800	Dec. 28, 1945	175	1,316	5.85	79.41	953,000	1,461	88.12	1,058,000
1947	15,000	Dec. 13, 1946	177	1,165	5.18	70.26	843,000	1,043	62.94	755,000
1948	13,500	Jan. 7, 1948	177	1,277	5.68	77.25	926,900	1,223	74.27	891,300
1949	9,460	Feb. 17, 1949	187	1,238	5.50	74.65	896,000	1,193	71.94	863,500
1950	10,800	Nov. 27, 1949	185	1,489	6.62	89.81	1,078,000	1,790	107.99	1,296,000
1951	9,460	Dec. 23, 1950	168	1,525	6.78	92.01	1,104,000	1,420	85.66	1,028,000
1952	13,800	Feb. 4, 1952	161	1,282	5.70	77.55	930,400	874	52.89	634,600
1953	15,600	Jan. 9, 1953	126	1,254	5.57	75.62	907,500			

WASHOUGAL RIVER BASIN

West Fork Washougal River near Washougal, Wash.

Location.—Lat. 45°37'00", long. 122°13'00", near center sec. 32, T. 2 N., R. 5 E., on right bank, 100 ft. downstream from road crossing, 1,000 ft. upstream from mouth, and 7 miles northeast of Washougal.

Drainage area.—30.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 440 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 855 cfs. Sept. 30 (gage height, 4.35 ft.); minimum, 15 cfs Sept. 16, 22 (gage height, 2.03 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										30.6	28.1	42.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										25	19	15.5	

WASHOUGAL RIVER BASIN

Washougal River near Washougal, Wash.

Location.—Lat. 45°37'20", long. 122°18'00", in SE¼ sec. 27, T. 2 N., R. 4 E., on right bank, half a mile upstream from Cougar Creek, and 5½ miles northeast of Washougal.

Drainage area.—108 sq. mi.

Gage.—Staff gage and, since Sept. 8, 1950, crest-stage indicator. Altitude of gage is 1,175 ft. (from topographic map).

Average discharge.—9 years (1944-53), 895 cfs.

Extremes.—1944-53: Maximum discharge, 17,600 cfs Feb. 17, 1949, Feb. 24, 1950 (gage height, 15.5 ft., from graph based on gage readings), from rating curve extended above 12,000 cfs by logarithmic plotting; minimum observed, 45 cfs Oct. 7, 1952 (gage height, 1.38 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	137	874	584	1,732	1,597	1,451	1,370	1,060	237	103	67.1	216	750
1946...	149	1,941	1,714	1,810	1,681	1,637	810	365	346	305	101	86.8	907
1947...	724	2,042	2,598	1,458	1,254	615	1,086	241	494	215	101	212	934
1948...	1,511	1,737	1,042	1,617	1,566	1,031	1,188	860	286	139	89.7	175	918
1949...	456	1,552	2,065	830	2,142	1,529	1,017	786	168	121	74.0	118	854
1950...	457	1,296	1,605	1,241	2,519	2,332	1,472	771	257	123	77.8	102	1,012
1951...	1,043	1,926	1,988	2,132	1,583	1,093	790	409	183	89.6	64.2	143	943
1952...	1,677	1,020	1,612	660	1,646	1,269	1,042	437	194	144	74.0	59.0	817
1953...	63.7	78.6	930	4,320	1,913	1,185	672	735	444	145	136	91.1	890

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1945...	66	215	209	306	392	614	724	461	140	77	58	59	58
1946...	81	486	438	588	781	696	510	215	186	185	81	67	67
1947...	69	309	414	256	306	286	369	156	187	185	83	77	69
1948...	108	461	414	326	249	461	668	306	170	102	79	65	65
1949...	151	268	485	200*	193	845	762	215	125	84	68	58	58
1950...	72	202	595	430	273	790	708	356	170	87	82	54	54
1951...	91	555	790	790	535	360	334	248	109	62	62	40	46
1952...	273	370	545	304	465	600	655	241	140	84	62	51	51
1953...	46	61	177	1,080	595	451	451	331	241	101	72	70	46

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1945.....	15,700	Feb. 7, 1945	58	780	7.22	93.06	564,800	965	121.27	698,500	
1946.....	14,000	Dec. 28, 1945	67	907	8.40	114.02	656,800	1,039	130.65	762,500	
1947.....	15,300	Dec. 11, 1946	69	934	8.65	117.35	676,100	844	106.01	610,800	
1948.....	8,300	Feb. 22, 1948	65	918	8.50	115.65	666,200	900	113.40	653,200	
1949.....	17,600	Feb. 17, 1949	58	854	7.91	107.39	615,600	794	89.55	575,100	
1950.....	17,600	Feb. 24, 1950	54	1,012	9.37	127.14	732,300	1,146	143.99	829,300	
1951.....	9,650	Dec. 23, 1950	46	943	8.73	118.51	682,500	890	111.91	644,500	
1952.....	13,000	Feb. 3 or 4, 1952	51	817	7.56	103.02	593,400	645	68.67	396,700	
1953.....	13,100	Jan. 18, 1953	46	890	8.24	111.85	644,300	.....	.....	.....

* Estimated.

WASHOUGAL RIVER BASIN

743

Little Washougal River near Washougal, Wash.

Location.—Lat. 45°36'45", long. 122°21'30", in SE¼ sec. 31, T. 2 N., R. 4 E., on right bank, 20 ft. downstream from road bridge, 1 mile upstream from mouth, and 2½ miles north of Washougal.

Drainage area.—23.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 115 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 1,620 cfs Jan. 18, 1953 (gage height, 7.73 ft.); minimum, 4.1 cfs Nov. 28, 1952 (gage height, 3.16 ft.).

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...										10.7	7.25	9.29	
1952...	147	122	224	121	195	190	71.5	32.9	23.3	15.2	8.31	7.01	96.3
1953...	6.71	8.12	45.3	442	232	158	76.5	99.1	64.9	18.4	15.3	9.61	97.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...										7.4	6.1	4.9	
1952...	26	50	92	68	65	74	35	24	16.5	9.4	7.1	5.2	5.2
1953...	5.2	6.4	11.5	87	85	53	48	48	35	11	6.8	5.8	5.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1951.....													
1952.....	1,130	Oct. 23, 1951	5.2	96.3	4.05	55.08	69,900	60.0	34.30	43,550			
1953.....	1,620	Jan. 18, 1953	5.2	97.6	4.10	55.64	70,640						

Lacamas Creek at Proebstel, Wash.

Location.—Lat. 45°40'30", long. 122°29'15", in W½ sec. 7, T. 2 N., R. 3 E., on right bank, 150 ft. upstream from road crossing at Proebstel.

Drainage area.—22.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 210 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 58 cfs Sept. 30 (gage height, 1.96 ft.); minimum, 0.1 cfs Aug. 12 (gage height, 1.04 ft.).

Remarks.—Some diversion for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....										3.54	1.58	3.74	

WASHOUGAL RIVER BASIN

Lacamas Creek at Proebstel, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...										0.9	1.1	0.5	.....

LAKE RIVER BASIN

Salmon Creek near Battleground, Wash.

Location.—Lat. 45°46'25", long. 122°26'35", in NE¼SW¼ sec. 4, T. 3 N., R. 3 E., on left bank, 100 ft. upstream from highway bridge, 150 ft. downstream from Rock Creek, and 4 miles east of Battleground.

Drainage area.—18.3 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 354.88 ft. above mean sea level (river-profile survey). Prior to Oct. 1, 1950, staff gage at same site at datum 1.0 ft. higher. Oct. 1, 1950, to June 24, 1953, staff gage and crest-stage indicator at present site and datum.

Average discharge.—10 years (1943-53), 60.2 cfs.

Extremes.—1943-53: Maximum discharge, 1,440 cfs Feb. 17, 1949 (gage height, 3.10 ft., from graph based on gage readings), from rating curve extended above 520 cfs; minimum observed, 1.3 cfs Aug. 20, 22, 28-30, Sept. 5-9, 13, 14, 1949, Sept. 14-16, 22, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944...	13.2*	16.2	54.7	42.1	82.6	48.9	63.7	23.2	27.0	7.31	3.69	4.11	32.1*
1945...	4.46	36.0	46.7	122	110	126	79.1	62.1	18.1	5.51	3.04	5.28	52.9
1946...													
1946...	7.90	166	119	134	131	115	35.2	15.9	15.1	9.61	3.63	3.57	62.5
1947...	32.8	142	207	115	105	60.1	81.4	16.8	14.6	6.15	3.76	3.62	65.4
1948...	42.0	159	94.4	142	110	97.5	69.3	79.6	16.9	6.98	5.51	7.59	69.0
1949...	11.3	110	218	41.0	258	68.9	26.4	35.0	6.55	2.96	1.72	2.21	62.6
1950...	6.83	56.6	129	187	179	128	88.0	29.6	10.4	4.94	2.83	2.84	68.1
1951...	32.7	168	173	214	126	109	26.2	22.0	8.61	4.29	2.26	3.00	74.0
1952...	83.4	85.5	155	79.7	98.9	124	32.8	14.7	8.97	5.82	3.11	2.64	68.0
1953...	2.36	3.18	41.7	286	121	80.8	41.8	57.8	34.7	8.14	5.51	3.97	57.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1944...		8.4	16	26	34	26	24	13	12	4.4	2.1	1.6*	1.6*
1945...	2.8	10	18	30	32	63	30	21	9.3	3.5	1.9	2.0	1.9
1946...	2.4	21	59	40	45	59	19	9.4	10	4.8	2.4	2.6	2.4
1947...	3.0	23	30	21	30	28	33	9.0	9.0	4.3	3.2	2.9	2.9
1948...	3.3	33	36	23	17	42	45	25	8.2	4.5	4.2	2.8	2.8
1949...	6.2	15.5	45	12.5	13*	33	16	11	4.5	1.7	1.3	1.3	1.3
1950...	2.4	4.3	42	48	45	72	33	12.5	6.4	3.0	1.6	1.6	1.6
1951...	2.5	35	60	64	45	35	14	12.5	4.6	2.5	1.5	1.3	1.3
1952...	6.4	23	42	38	35	38	13.5	9.3	6.8	3.3	2.6	2.0	2.0
1953...	1.8	2.2	5.4	65	36	21	23	21	14	5.4	3.6	2.8	1.8

* Estimated.

Salmon Creek near Battleground, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1944.....	380	Feb. 6, 1944	1.8	32.1	1.75	23.84	23,260	32.3	23.93	23,420
1945.....	395	①	1.9	52.9	2.89	39.23	38,300	70.0	51.90	50,670
1946.....	1,050	Dec. 28, 1945	2.4	62.5	3.42	46.33	45,230	70.1	52.03	50,790
1947.....	1,200	Dec. 11, 1946	2.9	65.4	3.57	48.58	47,380	58.0	43.03	41,990
1948.....	728	Jan. 7, 1948	2.8	69.0	3.77	51.30	50,060	72.4	53.88	52,590
1949.....	1,440	Feb. 17, 1949	1.3	62.6	3.42	46.43	45,310	50.7	37.60	38,700
1950.....	709	Jan. 21, 1950	1.6	68.1	3.72	50.52	49,320	83.2	61.74	60,270
1951.....	844	Dec. 23, 1950	1.3	74.0	4.04	54.87	53,550	69.9	51.89	50,630
1952.....	855	Oct. 23, 1951	2.0	58.0	3.17	43.14	42,090	34.8	25.87	25,240
1953.....	925	Jan. 18, 1953	1.8	57.1	3.12	42.37	41,360			

① Probably Feb. 7, 1945.

Salmon Creek near Brush Prairie, Wash.

Location.—Lat. 45°43'45", long. 122°35'50", in NW¼SW¼ sec. 20, T. 3 N., R. 2 E., on right bank, 300 ft. downstream from small tributary, 1½ miles upstream from Mill Creek, 2½ miles west of Brush Prairie, and 7 miles northeast of Vancouver.

Drainage area.—63.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 160 ft. (from topographic map).

Extremes.—August to November 1941: Maximum discharge, 151 cfs Oct. 10 or 11 (gage height, 1.63 ft., from recorded range in stage), from rating curve extended above 80 cfs; minimum, 8.0 cfs Aug. 20 (gage height, 0.58 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1941.....										11.8	25.1	54.5	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1941.....										8.0	15	27	

LAKE RIVER BASIN

Salmon Creek near Vancouver, Wash.

Location.—Lat. 45°42'30", long. 122°38'30", in SE¼ sec. 26, T. 3 N., R. 1 E., on left bank, a quarter of a mile upstream from Highway 99 crossing, and 4 miles north of Vancouver.

Drainage area.—76.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 75 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 107 cfs Sept. 30 (gage height, 2.82 ft.); minimum, 12.5 cfs Aug. 19, 21 (gage height, 2.07 ft.).

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...										20.5	15.1	19.5	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...										15.5	12.5	18.5	.....

LEWIS RIVER BASIN

Big Creek below Skookum Meadow, near Guler, Wash.

Location.—Lat. 46°05'30", long. 121°51'30", in NE¼ sec. 13, T. 7 N., R. 7 E., on right bank just downstream from Skookum Meadow, 3 miles upstream from Lewis River, and 17 miles northwest of Guler.

Drainage area.—13.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 3,200 ft. (from topographic map).

Extremes.—1927-31: Maximum discharge recorded, 766 cfs Mar. 31, 1931 (gage height, 5.1 ft.), from rating table extended above 250 cfs, probably higher Nov. 25, 1927 during period of no gage-height record; minimum, 4 cfs Nov. 20, 21, Dec 2, 1929, Sept. 2-4, 19-26, 29, 30, Oct. 1-5, 1930.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928...	88.8*	138	58.9	68.4	28.6	109	88.9	157	43.0	23.0	10.7	9.06	67.1*
1929...	23.8	44.9	40.4	18.3	14.1	32.3	70.7	177	55.0	17.0	8.1	6.5	45.4
1930...	5.7	5.2	32.9	20.4	189	49.9	125	74.6	31.1	11.1	5.8	4.6	41.3
1931...	9.0	11.6	12.7	29.8	38.4	83.6	130*	72.3*	27.9	15.4	8.7	8.8	37.3*

* Estimated.

Big Creek below Skookum Meadows, near Guler, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928...	28	36	18	32	19	18	51	70	26	13	8.9	8.0	8.0
1929...	9	14	21	14	11	13	28	109	35	10	7	6	6
1930...	5	4	4	14	50	28	73	52	17	8	5	4	4
1931...	4	7	11	11	20	24	.....	27	19	11	7	7	4

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1928	.....	.....	8.0	67.1	48,700	54.6	39,600
1929	271	May 20, 1929	6	45.4	32,900	39.6	28,700	
1930	349	Feb. 19, 1930	4	41.3	29,900	40.4	29,300	
1931	766	Mar. 31, 1931	4	87.3	27,000	.....	.....

Rush Creek above Meadow Creek, near Guler, Wash.

Location.—Lat. 46°02'30", long. 121°51'30", in NE¼, sec. 1, T. 6 N., R. 7 E., on left bank, an eighth of a mile upstream from Meadow Creek and 16 miles west of Guler.

Drainage area.—10.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 3,000 ft. (from topographic map).

Extremes.—1929-30: Maximum discharge, 271 cfs Feb. 20, 1930 (gage height, 2.73 ft.); minimum, 0.1 cfs Nov. 23, 24, Dec. 1-5, 1929.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929	.....	.....	.....	.....	.....	.....	.....	.....	.....	17.8	2.45	0.78	.....
1930	0.23	0.22	11.0	1.68*	63.7	9.71	41.1	48.8	37.3	1.76	.82	.26	17.6*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1929	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.1	1.4	0.4	.....
1930	0.2	0.1	0.1	0.6	3.3	2.2	15	14	6.7	1.1	0.6	0.2	0.1

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR	
YEAR	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1929	.....	.....	.....	.....	.....	.....	.....
1930	271	Feb. 20, 1930	0.1	17.6	12,600	.....	.....

* Estimated.

LEWIS RIVER BASIN

Meadow Creek below Lone Butte Meadow, near Guler, Wash.

Location.—Lat. 46°02'50", long. 121°51'20", in E½ sec. 36, T. 7 N., R. 7 E., on right bank, just downstream from Lone Butte Meadow, half a mile upstream from mouth, and 16 miles northwest of Guler.

Drainage area.—11.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 3,200 ft. (from topographic map).

Extremes.—1927-31: Maximum discharge not determined, probably occurred Nov. 25, 1927 when recorder was not operating; minimum, 47 cfs Dec. 29-31, 1930, Jan. 1-3, 19-21, 1931 (gage height, 0.76 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928				99.1	80.4	107	100	140	95.3*	87.4	77.2	72.1	
1929	71.0	51.8	80.9	71.0	60.0	61.7	71.3	112	128	79.5	68.6	63.0	79.1
1930	58.8	56.5	67.9	60.3	111	73.2	106	95.3	79.5	64.0	59.4	54.5	73.6
1931	54.9	51.7	49.3	57.0	58.6	78.8*	116*	95.9	69.0	60.4	55.9	52.1	66.2*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928					75	75	85	102	89	80	74	68	
1929	67	68		63	68		61	85	100	72	66	61	56
1930		55	53	58	70	65	83	82	68	62	56	53	53
1931	52	49	47	47	51	60		74	65	58	54	50	47

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1928						91.2	66,100
1929	185	June 15, 1929	56	79.1	57,300	74.9	54,800
1930	197	Feb. 20, 1930	53	73.6	53,300	71.3	51,600
1931	232	Mar. 31, 1931	47	66.2	47,900		

* Estimated.

Rush Creek above falls, near Cougar, Wash.

Location.—Lat. 46°03'20", long. 121°54'20", on line between secs. 27 and 34, T. 7 N., R. 7 E., on right bank, 500 ft. above falls, 2 miles upstream from mouth, and 18 miles east of Cougar.

Drainage area.—26.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,450 ft. (from topographic map).

Extremes.—1927-31: Maximum discharge, 578 cfs Apr. 1, 1931 (gage height, 2.56 ft.); minimum, 79 cfs Jan. 24-27, 29, Nov. 6, 7, 1930.

Remarks.—No diversion or regulation above station.

LEWIS RIVER BASIN

749

Rush Creek above falls, near Cougar, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928...				155	128*	191	172*	206	217	145	120	108	.....
1929...	116	121	107	91.6	87.9	100	107	206	296	156	127	111	136
1930...	95.1	87.6	108	84.6	212	113	193	180	154	102	96.7	83.7	125
1931...	86.2	86.6	83.5	99.9	105	132	204	220	130	106	97.6	93.4	120

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1928...				118	117	121	.....	200	172	124	115	104	.....
1929...	100	92	89	90	86	.....	89	125	219	136	115	107	86
1930...	91	84	84	79	111	93	135	130	111	99	93	84	79
1931...	82	79	60	80	84	89	128	155	113	101	96	89	79

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1928.....						156	114,000	
1929.....	555	June 15, 1929	86	136	98,200	131	95,000	
1930.....	515	Feb. 20, 1930	79	125	90,900	123	88,800	
1931.....	578	April 1, 1931	79	120	87,100	.....	.....

Lewis River above Muddy River, near Cougar, Wash.

Location.—Lat. 46°03'30", long. 121°58'50", in SE¼ sec. 30, T. 7 N., R. 7 E., on right bank, 1 mile upstream from Pepper Creek, 2 miles upstream from Muddy River, and 15 miles east of Cougar.

Drainage area.—227 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,080 ft. (from river-profile map).

Average discharge.—7 years (1927-34), 1,203 cfs.

Extremes.—1927-34: Maximum discharge, 27,000 cfs Dec. 21, 1933 (gage height, 13.2 ft., from high-water marks), from rating curve extended above 6,000 cfs; minimum, 175 cfs Nov. 21, 1929; minimum gage height, —0.13 ft. Sept. 28, 29, 1934.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927.....												509	.....
1928...	1,110	2,390	1,320	1,070	842	2,180	1,780	2,550	1,050	625	394	317	1,460
1929...	527	854	877	509	336	795	1,330	2,410	1,700	597	360	270	888
1930...	234	208	679	487	2,510	1,090	1,780	1,220	730	375	250	232	805
1931...	241	277*	331	886	1,100	1,780	2,280	1,570	669	396	259	224	835*
1932...	371	836	904	1,140	1,100	2,430	2,310	2,730	2,340	1,040	451	327	1,330
1933...	359*	1,770*	1,340*	1,450	544	1,030	1,560	2,450	3,580	1,770	646*	595*	1,450*
1934...	1,222	1,363	6,954*	3,794*	1,314	2,109	1,563	784	434	360	291	256	1,716*

* Estimated.

LEWIS RIVER BASIN

Lewis River above Muddy River, near Cougar, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927												344	
1928	532	663	549	781	582	560	1,200	1,470	768	460	343	290	200
1929	236	347	455	364	308	336	647	1,700	1,080	430	319	234	234
1930	218	186	192	333	820	600	1,500	875	454		244	202	186
1931	200		245	292	505	718	1,280	935	516	311	233	206	200
1932	180	465	333	620	398	1,100	1,590	1,980	1,830	555	373	281	180
1933	245		510	664	450	571	1,110	1,730	2,240	930	450		245
1934	425	582	571	1,500*	841	925	883	627	388	310	205	229	229

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1927													
1928	14,500	Nov. 25, 1927	290	1,400	6.17	83.03	1,010,000	1,140	68.45	830,000			
1929	3,630	May 22, 1929	234	883	3.91	53.11	643,000	794	47.44	575,000			
1930	6,120	Feb. 20, 1930	186	805	3.64	46.22	583,000	782	46.82	566,000			
1931	11,600	Mar. 31, 1931	200	835	3.68	49.85	604,000	940	56.17	680,000			
1932	7,100	Feb. 26, 1932	180	1,330	5.86	79.82	988,000	1,440	86.56	1,050,000			
1933	10,300	June 9, 1933	245	1,450	6.39	86.50	1,050,000	1,960	117.35	1,420,000			
1934	27,000	Dec. 21, 1933	229	1,710	7.56	102.53	1,242,000						

Muddy River near Cougar, Wash.

Location.—Lat. 46°04'30", long. 122°00'00", in SE¼ sec. 24, T. 7 N., R. 6 E., on left bank, half a mile upstream from mouth and 14 miles east of Cougar.

Drainage area.—136 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,050 ft. (from river-profile map).

Average discharge.—7 years (1927-34), 829 cfs.

Extremes.—1927-34: Maximum discharge, 17,500 cfs Dec. 21, 1933 (gage height, 14.0 ft., from high-water marks), from rating curve extended above 4,500 cfs; minimum, 94 cfs Dec. 5-7, 1929; minimum gage height recorded, 0.15 ft. Sept. 29, 1934.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927												269	
1928	622	1,310	861	1,160	671	1,510	1,200	1,360	480	270	167	134	855
1929	224	624	740	441	254	638	1,060	1,500	969	308	158	123	590
1930	113	102	739	487	1,880	847	1,110	750	418	183	136	126	566
1931	145	211	313	1,010	1,000*	1,500	1,720	1,040	391	255	153	132	653*
1932	325	755	969	1,030	887	1,980	1,830	1,760	1,470	590	238	175	988
1933	194	1,820	1,120	1,080	422*	1,040	1,270	1,820*	2,340*	1,380*	438*	354*	1,090*
1934	750*	1,059*	4,200*	2,600*	968*	1,159*	694	425	232	162	124	122	1,048*

* Estimated.

LEWIS RIVER BASIN

Muddy River near Cougar, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927												220	
1928	383	440	357	388	420	396	889	730	354	193*	146	118	118
1929	127	166	341	302	215	240	492	950	614	194	132	113	113
1930	105	96	94	276	695	413	872	505	244	147	123	118	94
1931	113	120	237	248		639	940	506	297	180	131	115	118
1932	116	413	293	518	301	828	1,320	1,200	1,120	298	190	159	118
1933	135	582	562	446			834	1,430	1,700*				135
1934		560*				570*	414	292	189	138	116		

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acres-feet		Inches	Acres-feet	
1927											
1928	7,240	Nov. 25, 1927	116	855	6.29	85.52	621,000	713	71.40	518,000	
1929	2,780	Dec. 10, 1928	113	590	4.34	58.92	427,000	538	53.69	389,000	
1930	4,570	Feb. 20, 1930	94	566	4.16	56.35	409,000	640	58.90	391,000	
1931	5,000	Mar. 31, 1931	113	653	4.80	65.14	473,000	770	76.66	558,000	
1932	5,150	Feb. 26, 1932	118	993	7.34	99.85	724,000	1,080	108.62	788,000	
1933			135	1,090	8.01	108.55	787,000	1,330	133.11	965,000	
1934	17,500	Dec. 21, 1933		1,048	7.71	104.53	758,400				

Lewis River above Swift Creek, near Cougar, Wash.

Location.—Lat. 46°03'40", long. 122°11'20", in SE¼ sec. 28, T. 7 N., R. 5 E., on right bank, a quarter of a mile upstream from Swift Creek; and 5 miles east of Cougar.

Drainage area.—454 sq. mi.

Supplemental records available.—November 1909 to June 1910, gage heights only.

Gage.—Staff gage. Altitude of gage is 630 ft. (from river-profile map).

Extremes.—July to October 1909. Maximum discharge observed, 1,320 cfs July 27 and Oct. 21 (gage height, 3.5 ft.); minimum observed, 510 cfs Oct. 18 (gage height, 2.51 ft.).

Flood of Nov. 22, 1909 reached a stage of 16.3 ft., from graph based on gage readings.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1909										804	604	712	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1909										645	560	510	

* Estimated.

LEWIS RIVER BASIN

Swift Creek near Cougar, Wash.

Location.—Lat. 46°03'50", long. 122°11'30", in NE¼ sec. 28, T. 7 N., R. 5 E., on left bank, 200 ft. upstream from Forest Service trail bridge, an eighth of a mile upstream from mouth, and 5 miles east of Cougar.

Drainage area.—26 sq. mi., approximately.

Gage.—Water-stage recorder. Altitude of gage is 660 ft. (from river-profile map).

Average discharge.—9 years (1924-33), 199 cfs.

Extremes.—1924-33: Maximum discharge, 1,900 cfs Nov. 24, 1927 (gage height, 3.7 ft.), from rating curve extended above 300 cfs; minimum, 80 cfs Sept. 17, 21, Oct. 7, 1924, Oct. 20, 1931.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924										92.9	93.9*	98.9	
1925	129	248	248	306	402	201	227	229	188	159	142	116	214
1926	116	160	250	172	272	202	168	179	144	125	113	121	168
1927	204	227	217	246	276	209	198	247	246	171	137	144	210
1928	191	349	214*	259*	205	201	303	308	224	171	143	117	231*
1929	161	181	182	165	120	163	192	217	213	168	129	108	166
1930	98.8	94.5	178	126*	298	191	187	174	148	119	102	96.1	150*
1931	97.9	114	121	178	178	252	258	187	152	127	104	95.7	155
1932	146	188	182	208	189	346	385	306	307	266	185	144	234
1933	159	380	307	310	171	288	205	281	395	317	233	203	267
1934	260	246											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924										87	84	80	
1925	80	150		101	191	185	103	106	166	151	127	106	80
1926	112	114	159	150	159	176	147	147	133	119	106	100	106
1927	129	140	159	163	176	176	176	208	199	149	123	116	116
1928	142	155	152		160	156	231	273	176	161	118	102	102
1929	118	119	112		114	124	139	168	180	144	117	102	102
1930	95	92	91		182	140	164	146	182	107	98	94	91
1931	94	93	101	104	120	140	190	153	136	114	97	92	92
1932	81	118	109	131	101	173	278	282	275	200	160	133	81
1933	123	215	202	185	148	163	176	212	302	259	185	168	123
1934	146												

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1924										
1925	1,470	Feb. 3, 1925	80	214	8.23	112.05	155,000	207	108.05	150,000
1926	1,060	Dec. 23, 1925	100	168	6.46	87.68	122,000	178	93.01	129,000
1927	1,380	Oct. 16, 1926	116	210	8.08	109.50	152,000	218	113.99	158,000
1928	1,900	Nov. 24, 1927	102	231	8.88	121.02	168,000	212	111.08	154,000
1929	537	Dec. 10, 1928	102	160	6.38	86.69	120,000	153	80.05	111,000
1930	620	Dec. 14, 1929	91	150	5.77	78.38	109,000	147	76.65	106,000
1931	1,450	Mar. 31, 1931	92	155	5.96	81.04	112,000	171	89.01	123,000
1932	965	Feb. 26, 1932	81	234	9.00	122.27	170,000	261	136.65	190,000
1933	1,130	Nov. 13, 1932	123	267	10.3	139.38	193,000			
1934										

* Estimated.

LEWIS RIVER BASIN

753

Lewis River near Cougar, Wash.

Location.—Lat. 46°03'30", long. 122°12'40", in SE¼ sec. 29, T. 7 N., R. 5 E., on left bank, 1 mile downstream from Swift Creek and 4 miles east of Cougar.

Drainage area.—481 sq. mi.

Supplemental records available.—July, 1910, to March, 1912; gage heights and one discharge measurement only.

Gage.—Water-stage recorder. Datum of gage is 576.4 ft. above mean sea level (river-profile survey). July 1, 1910, to Mar. 2, 1912, staff gage at approximately same location at different datum. June 19 to Aug. 25, 1924, staff gage and Aug. 26, 1924, to Dec. 27, 1934, water-stage recorder on right bank opposite present gage at datum 2.0 ft. higher.

Average discharge.—29 years (1924-53), 2,818 cfs.

Extremes.—1924-53: Maximum discharge, 54,400 cfs Dec. 21, 1933 (gage height, 15.7 ft., datum then in use), from rating curve extended above 17,000 cfs; minimum, 454 cfs Oct. 21, 1931 (gage height, 0.01 ft., datum then in use).

Flood of Dec. 17 or 18, 1917, reached a stage of 14.0 ft. (discharge, 45,000 cfs).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924										811	676	631	
1925	1,250	5,010	3,740	4,690	6,840	2,640	4,020	4,230	2,600	1,260	904	739	3,130
1926	661	1,090	3,620	2,370	4,750	2,970	2,350	2,060	1,150	793*	671	736	1,920*
1927	2,430	3,730*	3,700	4,060	4,430	2,710	3,100	4,890*	4,370	1,780	976	1,220	3,110*
1928	2,500	6,590	3,500	4,120	2,350	5,660	4,450	5,070	2,120	1,360	905	714	3,250
1929	1,180	2,160	2,440	1,670	998	2,320	3,490	4,810	3,420	1,310	846	673	2,120
1930	581	523	2,120	1,460*	5,750	2,660	3,450	2,460	1,550	873	705	608	1,870*
1931	650	856	1,100	2,700	2,940	4,330	5,020	3,000	1,480	1,050	715	657	2,030
1932	1,140	2,490	2,690	3,270	2,730*	6,180	5,500	5,640	4,630	2,240	1,130	857	3,210*
1933	1,010	5,830	3,620	3,750	1,630	3,390	3,930	5,580	7,580	3,570	1,510	1,460	3,580
1934	2,761	3,243	18,390	3,641*	3,431	4,032	3,217	1,385	1,161	981	761*	693	3,741*
1935	2,257	6,793	4,840	3,813*	3,689	2,863*	3,173	5,123	3,852	1,631	949	809	3,310*
1936	739	944	1,826	5,256	1,933	3,092	3,314	5,521	3,770	1,585	964	827	2,530
1937	671	596	2,603	1,259	1,275	3,189	5,536	5,019	5,245	1,970	1,023	820	2,436
1938	559	5,036	5,655	4,643	2,153*	3,007	5,037	4,868	2,962	1,319	878	709	3,147*
1939	890	1,630	3,104	3,704	2,389	2,779	3,720	3,570	2,135	1,179	853	766	2,224
1940	765	509	5,073	3,058	5,369	5,291	3,495	2,955	1,253	872	731	679	2,526
1941	842	1,792	3,276	3,169	2,315	2,042	1,993	2,378	1,367	911	764	1,236	1,829
1942	1,713	2,520	6,099	1,838	2,688	2,026	2,517	2,545	2,550	1,272	861	706	2,507
1943	706	5,042	4,357	2,629	2,305*	3,456*	6,612	4,150	3,731	1,899	1,050	326	3,098*
1944	1,205	1,731	2,383	2,284	2,663	1,970	2,701	2,910	1,743	869	681	654	1,313
1945	637	1,824	1,955	4,086	4,441	3,004*	2,040	5,581	2,589	1,180	791	898	2,483*
1946	784	2,985*	4,882*	3,935*	2,653	3,483	3,038	5,729	4,828	2,893	1,200	886	3,196*
1947	1,336	4,343	8,258	2,936	4,638	3,466	3,789	2,636	1,774	1,133	875	989	3,605
1948	4,290	4,346	3,427	4,487	3,119	2,766	3,590	5,512	4,396	1,655	1,093	991	3,309
1949	1,364	2,940	2,979	1,183	2,825	3,764	4,722	7,093	4,004	1,990	1,032	954	2,906
1950	1,156	4,257	3,442	3,817	4,037	5,889	4,070	5,569	6,287	3,166	1,427	1,053	3,753
1951	3,122	6,077	7,710	4,056	6,515	2,323	4,560	5,115	2,893	1,459	997	923	3,793
1952	3,658	3,420	4,101	1,611	4,079	2,216	4,742	5,141	3,097	1,574	960	779	2,941
1953	648	648	1,320	10,460	5,392	2,585	3,179	4,034	3,805	2,300	1,172	882	3,098

* Estimated.

LEWIS RIVER BASIN

Lewis River near Cougar, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1924										720	619	500	.....
1925	656	2,180	2,120	2,120	2,460	2,080	2,260	2,760	1,860	1,070	772	677	656
1926	679	672	1,860	1,920	2,020	2,210	1,840	1,610	906	664	620	542	542
1927	806		1,960	1,840	2,280	2,220	2,220		2,610	1,170	852	844	806
1928	1,560	1,700	1,600	1,660	1,710	1,660	3,000		1,610	1,060	827	656	656
1929	688	819	1,230	1,100	882	1,100	1,960	3,230	2,300	980	777	598	588
1930	540	495	490		2,800*	1,460	2,860	1,620	1,110*	798		550	490
1931	550	566	845	878	1,510	1,940	2,940	1,880		524	644		550
1932	464		1,100			2,940		4,110	3,680	1,340		771	464
1933	708	2,820	1,960	1,780	1,300	1,840	2,860	4,460	4,350	2,020	1,120	1,020	708
1934	1,080	1,530	1,480	8,500*	2,270	2,800*	2,000	1,370	1,020	840	690	625	625
1935	677	2,380	2,500*	1,700*	2,520	1,910	2,200*	4,260	2,580	1,070	862	709	577
1936	668	614	901	2,070	1,230	2,250	1,740	3,870	2,130	1,150	852	723	614
1937	618	550	562	880	873	2,120	3,380	3,460	3,460	1,230	832	646	550
1938	614	1,040	2,500	2,720	1,870	2,200*	2,360	3,570	1,930	1,020	769	638	614
1939	622	1,080	1,560	2,250	1,560	1,440	2,910	2,880	1,670	924	810	704	622
1940	679	780	1,160	1,440	1,560	2,960	2,540	1,700	982	808	656*	630	630
1941	597	822	1,660	1,720	1,560	1,660	1,610	1,560	1,130	770	680	841	597
1942	1,060	1,130	2,060	1,290	1,520	1,460	2,160	1,980	1,740	966	774	644	644
1943	678	1,350*	3,100	1,560	1,560	1,550*	4,600	2,860	2,860	1,190	932	750	578
1944	722	1,100	1,240	1,500	1,400	1,260	1,800	3,390	1,100	737	620	588	588
1945	570	1,076	1,100	1,030	1,680	1,500*	2,320	3,700*	1,560	913	702	695	570
1946	659	1,090	2,200*	2,400*	1,870	2,560	2,110	4,630	3,850	1,650	972	769	659
1947	745	1,120*	2,260	1,500	2,680	2,610	3,120	1,860	1,340	965	600	800	745
1948	832	2,640	1,920	1,800	1,390	1,500	2,400	2,970	2,520	1,240	965	892	832
1949	978	1,140	1,560	994	970	2,700	2,410	4,610	2,700	1,360	933	825	825
1950	780	1,050	1,840	1,600*	2,020	3,240	3,400	3,660	4,410	1,840	1,180	916	780
1951	945	2,580	4,680	2,800	2,440	1,870	2,580	3,100	2,110	1,150	908	798	798
1952	1,400	1,800	1,880	1,220	1,900	1,630	3,080	3,460	2,170	1,080	843	704	704
1953	606	652	688	1,430	2,060	1,740	1,870	3,960	2,660	1,320	990	757	552

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1924										
1925	26,500	Feb. 3, 1925	656	3,130	6.61	88.41	2,270,000	2,750	77.05	1,990,000
1926	11,100	Feb. 7, 1926	542	1,920	3.99	54.15	1,390,000	2,290	64.61	1,660,000
1927	14,869	Oct. 16, 1926	806	3,110	6.47	87.66	2,250,000	3,330	93.33	2,410,000
1928	31,500	Nov. 25, 1927	656	3,280	6.82	92.88	2,350,000	2,720	76.81	1,870,000
1929	8,200	Dec. 10, 1928	598	2,120	4.41	59.69	1,530,000	1,900	53.62	1,800,000
1930	11,160	Feb. 7, 1930	490	1,870	3.89	52.82	1,850,000	1,820	51.31	1,310,000
1931	22,700	Mar. 31, 1931	550	2,030	4.22	57.40	1,470,000	2,340	65.97	1,700,000
1932	15,000	Feb. 26, 1932	464	3,210	6.67	90.82	2,330,000	3,550	100.45	2,580,000
1933	17,900	June 9, 1933	708	3,550	7.44	100.94	2,590,000	4,340	122.44	3,140,000
1934	54,460	Dec. 21, 1933	625	3,741	7.78	105.57	2,768,000	3,264	92.11	2,368,000
1935	21,800	Nov. 5, 1934	577	3,310	6.83	93.41	2,396,000	2,444	68.98	1,770,000
1936	12,300	Jan. 12, 1936	614	2,580	5.26	71.58	1,837,000	2,561	72.47	1,859,000
1937	24,400	April 14, 1937	550	2,486	5.06	68.74	1,763,000	3,125	88.20	2,262,000
1938	30,200	Dec. 29, 1937	614	3,147	6.54	88.81	2,278,000	2,601	73.40	1,888,000
1939	9,440	Jan. 2, 1939	622	2,224	4.62	62.77	1,610,000	2,316	65.86	1,677,000
1940	20,200	Dec. 15, 1939	830	2,526	5.25	71.48	1,834,000	2,461	69.65	1,787,000
1941	11,800	Nov. 29, 1940	597	1,839	3.82	51.90	1,332,000	2,213	62.45	1,602,000
1942	22,760	Dec. 19, 1941	644	2,307	4.80	65.10	1,070,000	2,280	64.35	1,651,000
1943	30,300	Nov. 28, 1942	578	3,098	6.44	87.41	2,243,000	2,701	76.21	1,955,000
1944	8,690	Dec. 3, 1943	586	1,813	3.77	51.31	1,316,000	1,736	49.13	1,260,000
1945	24,300	Feb. 7, 1945	570	2,483	5.16	70.07	1,797,000	2,839	80.12	2,055,000

* Estimated.

Lewis River near Cougar, Wash.—Continued

Summary—Continued

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1946.....			659	3,196	6.04	90.19	2,314,000	3,642	102.75	2,636,000
1947.....	32,300	Dec. 13, 1946	745	3,008	6.25	84.89	2,178,000	2,549	80.40	2,063,000
1948.....	15,000	Oct. 17, 1947	862	3,309	6.88	93.65	2,402,000	2,908	82.31	2,111,000
1949.....	12,200	May 2, 1949	825	2,906	6.04	82.02	2,104,000	3,036	85.68	2,198,000
1950.....	26,800	Nov. 27, 1949	780	3,753	7.80	105.91	2,717,000	4,432	125.08	3,209,000
1951.....	25,800	Feb. 11, 1951	798	3,793	7.89	107.04	2,746,000	3,313	93.51	2,399,000
1952.....	18,800	Dec. 1, 1951	704	2,941	6.11	83.23	2,135,000	2,223	62.91	1,614,000
1953.....	23,900	Jan. 18, 1953	552	3,098	6.44	87.41	2,243,000			

Yale Reservoir near Yale, Wash.

Location.—Lat. 45°57'50", long. 122°20'00", in NE¼ sec. 32, T. 6 N., R. 4 E., on left bank of Lewis River just above intake, 500 ft. upstream from powerhouse, 1 mile upstream from Canyon Creek, and 3 miles southeast of Yale.

Drainage area.—596 sq. mi.

Gage.—Reservoir level indicator. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.).

Extremes.—1952-53: Maximum contents observed, 401,860 acre-ft. June 8, 1953 (elevation, 490.02 ft.); minimum observed since reservoir first filled in June 1953, 346,860 acre-ft. Sept. 30, 1953 (elevation, 474.78 ft.).

Remarks.—Reservoir is formed by rock-fill dam completed in 1952; storage began July 31, 1952. Usable capacity, 189,530 acre-ft. between gage heights 430 ft. (lower limit for economic operation) and 490 ft. (top of spillway gates). Dead storage, 212,230 acre-ft. Figures given herein represent total contents. Water is used for power.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952.....											65,650	121,700	.....
1953.....	166,090	205,500	307,610	331,120	307,300	312,350	315,800	393,800	401,030	400,270	401,780	346,980	.....

LEWIS RIVER BASIN

Canyon Creek near Amboy, Wash.

Location.—Lat. 45°56'30", long. 122°19'15", in SW ¼ sec. 4, T. 5 N., R. 4 E., on left bank just downstream from county road bridge, a quarter of a mile downstream from Fly Creek, 2 miles upstream from mouth, and 6 miles northeast of Amboy.

Drainage area.—63.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 520 ft. (from topographic map). Prior to Sept. 26, 1924, staff or chain gages at same site and datum.

Average discharge.—12 years (1922-34), 424 cfs.

Extremes.—1922-34: Maximum discharge, 11,700 cfs Dec. 21, 1933 (gage height, 12.6 ft.); minimum, 12 cfs Sept. 8, 1934; minimum gage height, 0.14 ft. Oct. 19-24, 1925, Oct. 8, 9, 1932.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1922...											43.1	66.6	.....
1923...	186	242	1,330	2,190	235	562	427	290	157	137	40.1	23.6	493
1924...	64.3	212	922	539	1,030	229	286	124	56.1	35.0	34.1	40.3	295
1925...	332	982	912	1,350	1,270	429	418	247	203	61.1	31.9	23.2	517
1926...	22.8	238	825	451	1,030	306	162	284	122	33.8	39.5	169	303
1927...	477	706	603	791	999	433	349	417	283	81.3	40.6	234	457
1928...	538	1,290	418	849	250	896	676	359	103	95.2	33.7	31.2	465
1929...	265	452	527	399	217	596	611	391	270	80.9	37.8	23.2	324
1930...	27.6	26.7	406	255*	1,340	392	245	311	167	50.1	30.6	26.5	274*
1931...	50.0	238	238	585	366	637	665	136	147	86.5	32.8	34.3	259
1932...	290	782	582	771	649	1,610	720	370	209	84.0	43.3	28.7	512
1933...	98.6*	1,089*	946	996	488	997	517	657	660	163	64.4	227	578*
1934...	610	475	2,770*	1,537	273	643	321	201	58.0	35.1	22.0	20.9	657*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1922...											35	39	.....
1923...	50	122	110	240	122	346	276	150	92	55	31	19	19
1924...	19	30	245	208	383	127	155	66	41	30	27	26	19
1925...	114	324	.....	340	399	273	262	154	96	33	26	20	20
1926...	17	20	301	239	384	176	104	98	57	29	23	29	17
1927...	192	152	286	228	237	278	250	294	134	52	38	52	33
1928...	196	267	147	200	168	149	383	155	72	53	29	23	23
1929...	24	95	172	172	.....	364	264	211	147	50	33	26	24
1930...	26	25	25	.....	345	130	170	144	77	37	25	24	24
1931...	24	42	110	153	185	267	200	69	53	44	26	27	24
1932...	31	206	158	222	142	.....	474	259	117	48	40	22	22
1933...	19	297	175	228	191	421	.....	493	259	76	45	45	19
1934...	87	163	.....	619	124	129	134	96	42	27	17	12	12

* Estimated.

Canyon Creek near Amboy, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1922.....										
1923.....	9,500	Dec. 24, 1922	19	493	7.73	104.82	357,000	440	94.55	323,000
1924.....	4,350	Dec. 6, 1923	19	295	4.02	63.00	214,000	380	81.12	276,000
1925.....	5,560	Feb. 3, 1925	20	517	8.10	109.06	374,000	422	89.73	306,000
1926.....	5,120	Feb. 6, 1926	17	303	4.75	64.46	219,000	366	77.92	265,000
1927.....	5,890	Feb. 1, 1927	33	457	7.16	97.23	331,000	450	103.08	354,000
1928.....	10,000	Nov. 25, 1927	23	465	7.29	99.14	338,000	382	81.53	278,000
1929.....	3,140	April 14, 1929	24	324	5.08	68.84	234,000	266	56.61	192,000
1930.....	4,350	Feb. 7, 1930	24	274	4.29	58.21	198,000	271	57.69	196,000
1931.....	9,370	Mar. 31, 1931	24	289	4.53	61.40	209,000	383	81.45	277,000
1932.....	6,840	Feb. 26, 1932	22	512	8.03	109.20	371,000	551	117.60	400,000
1933.....			19	578	9.06	122.09	419,000	726	154.75	526,000
1934.....	11,700	Dec. 21, 1933	12	587	9.20	124.88	424,900			

Lewis River near Amboy, Wash.

Location.—Lat. 45°57'50", long. 122°23'00", in NW¼ sec. 36, T. 6 N., R. 3 E., on left bank at abandoned Cresap Ferry, 2 miles downstream from Canyon Creek, and 5 miles northeast of Amboy.

Drainage area.—665 sq. mi.

Gage.—Staff gage. Altitude of gage is 180 ft. (from river-profile map).

Average discharge.—20 years (1910-30), 4,030 cfs.

Extremes.—1911-31: Maximum discharge, 79,300 cfs Dec. 18, 1917 (gage height, 16.4 ft., from high-water mark); minimum observed, 660 cfs Sept. 5-14, 19-22, 1924 (gage height, -0.20 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	2,500*	8,400*	4,800*	2,590*	1,720	3,110	3,780	6,410	4,060	1,500	853	1,210	3,420*
1912...	1,030	4,950	3,700	7,430	7,640	2,510	3,370	5,359	3,450	1,700	1,660	2,390	3,760
1913...	2,390	7,860	4,490	5,370	3,970	4,389	6,160	6,740	6,190	3,000	1,780	2,210	4,530
1914...	2,610	5,450	3,610	11,100	5,220	6,240	6,420	5,800	3,320	1,740	1,150	1,750	4,510
1915...	3,490	5,920	2,560	3,850	3,830	4,890	5,440	3,050	2,010	1,280	918	769	3,120
1916...	1,340	6,170	7,920	3,550	7,700	9,180	7,110	7,450	7,410	5,500	2,160	1,840	5,550
1917...	969	3,840	3,370	3,570	3,350	2,770	6,640	7,430	7,960	4,000	1,320	1,060	3,840
1918...	852	1,080	19,100	9,810	6,460	5,140	5,100	3,410	1,950	1,190	979	805	4,670
1919...	1,420	4,080	6,610	9,190	4,680	5,200	7,240	6,340	4,230	2,190	1,250	1,160	4,470
1920...	1,310	5,240	5,390	5,570	3,160	4,010	4,950	4,070	3,690*	1,760	1,100	4,120	3,690*
1921...	7,470	6,060	8,110	8,540	7,300	7,220	6,020	5,930	4,630	2,150	1,300	1,210	5,490
1922...	2,700	6,900	5,730	2,290	2,310	2,660	5,110	7,960	6,200	1,850	1,250	1,280	4,110
1923...	1,850	2,080	6,300	13,100	2,310	3,680	5,830	5,080	3,390	2,000	1,140	913	4,000
1924...	1,220	1,820	5,290	4,100	9,990	2,800	2,840	2,850	1,290	912	807	760	2,870
1925...	2,090	7,560	6,530	8,270	10,400	3,960	5,340	4,950	3,170	1,490	1,040	876	4,510
1926...	781	1,800	5,940	3,560	7,600	4,070	2,920	2,920	1,570	1,020	874	1,290	2,330
1927...	3,800	5,760	5,850	0,340	7,400	4,310	4,440	6,250	5,300	2,030	1,150	1,930	4,520
1928...	4,020	9,990	4,820	6,830	3,540	8,260	7,000	6,540	2,570	1,710	1,060	857	4,770
1929...	1,990	3,530	4,020	2,940	1,720	4,190	5,390	6,080	4,150	1,630	999	772	3,130
1930...	763	807	3,890	2,440	9,550	7,430	4,440*	3,060*	2,240*	1,120	344	739	2,850*
1931...	891	1,680	2,130	4,770	4,910	4,400	7,430						

* Estimated.

LEWIS RIVER BASIN

Lake Merwin Reservoir at Ariel, Wash.

Location.—Lat. 45°57'25", long. 122°33'15", in SW¼ sec. 34, T. 6 N., R. 2 E., near left bank on upstream side of dam of Pacific Power & Light Co. at Ariel.

Drainage area.—730 sq. mi.

Gage.—Water-stage recorder and long-distance indicator in powerhouse. Datum of gage is mean sea level (levels by Pacific Power & Light Co.). May 13 to Sept. 9, 1931, staff gage and Sept. 10, 1931, to Mar. 18, 1940, water-stage recorder, for stages above 191 ft., on upstream face of dam at same datum. Mar. 19, 1940, to Feb. 8, 1953, water-stage recorder on downstream side of dam.

Extremes.—1931-53: Maximum contents not determined, contents known to have been greater than 422,400 acre-ft. (elevation, 239.5 ft.), several times during period of record; minimum observed since reservoir was first filled in January 1932, 164,500 acre-ft. Dec. 5, 1936 (elevation, 166.7 ft.).

Remarks.—Reservoir is formed by concrete arch dam completed in 1931; storage began in March 1931. Usable capacity, 246,000 acre-ft. between elevations 165 ft. (lower limit of regulation set by Federal Power Commission) and 235 ft. (top of spillway gates) above mean sea level. Dead storage, 159,000 acre-ft. Figures given herein represent total contents. Water is used for power.

Runoff in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931								97,620	215,000	298,800	341,600	345,800	
1932	365,250	375,700	389,200	389,000	385,200	384,800	402,600	402,450	402,450	401,500	377,200	322,000	
1933	290,900	400,700	400,700	400,700	388,200	384,800	385,200	385,200	404,500	411,400	409,700	411,400	
1934	399,900	404,600	401,100	397,200	396,800	403,400	414,800	406,900	389,000	384,400	333,200	234,500	
1935	385,000	400,300	402,400	402,300	402,100	404,400	406,600	407,100	418,000	412,800	379,500	292,900	
1936	190,600	190,200	224,400	404,400	404,600	405,000	405,200	404,800	410,400	407,100	375,900	292,300	
1937	180,400	166,600	348,700	258,200	246,100	406,600	404,200	404,200	417,300	419,600	399,900	310,500	
1938	239,530	404,600	404,600	404,600	404,400	404,600	404,600	404,600	415,600	420,200	394,650	333,300	
1939	260,300	321,600	404,600	404,600	404,200	416,800	416,600	419,600	412,800	407,100	388,600	322,600	
1940	247,500	189,100	406,200	383,900	404,200	404,600	418,200	408,600	407,500	420,000	417,600	400,300	
1941	360,500	404,600	404,600	405,000	400,700	403,000	418,000	420,400	419,600	420,400	405,400	382,200	
1942	387,100	411,200	412,400	392,900	400,700	397,200	420,500	420,600	416,000	420,400	420,800	400,300	
1943	374,200	416,400	416,400	406,000	416,400	415,600	416,400	420,000	423,200	419,200	411,200	366,400	
1944	360,800	308,100	309,600	398,700	388,400	373,400	420,400	422,000	413,700	420,400	421,200	395,200	
1945	330,000	323,200	337,000	411,700	407,700	418,000	419,200	420,400	421,200	420,800	420,000	420,400	
1946	390,610	416,040	415,250	416,440	416,040	416,440	416,440	416,440	422,800	418,820	420,020	415,640	
1947	421,210	420,410	417,630	420,410	420,810	420,410	420,410	417,630	422,010	419,220	422,010	411,690	
1948	416,040	414,850	416,440	409,320	416,440	416,440	416,440	417,230	421,210	420,020	419,220	414,060	
1949	413,270	414,350	404,990	349,700	415,250	414,850	411,290	422,400	421,610	420,810	420,410	418,030	
1950	421,210	420,410	422,010	422,010	422,010	420,410	417,230	422,010	422,010	421,210	418,030	420,410	
1951	421,210	420,410	422,400	418,820	408,920	367,730	420,810	416,440	416,040	422,010	418,820	400,690	
1952	412,080	392,150	309,240	349,700	335,660	289,480	422,400	419,620	418,820	423,200	383,700	341,120	
1953	296,980	251,880	315,390	422,800	353,440	302,740	327,810	417,630	418,820	418,030	413,660	399,410	

LEWIS RIVER BASIN
Lewis River at Ariel, Wash.

Location.—Lat. 45°57'10", long. 122°33'45", in NW¼NE¼ sec. 4, T. 5 N., R. 2 E., on right bank at Ariel, half a mile downstream from Ariel Dam and powerplant, and 3 miles upstream from Cedar Creek.

Supplemental records available.—November 1909, gage heights only.

Drainage area.—731 sq. mi. At site 1909, 713 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 44 ft. above mean sea level, unadjusted (levels by Pacific Power & Light Co.) July 7 to Nov. 30, 1909, staff gage 4 miles upstream at different datum. July 27 to Oct. 28, 1922, and July 31, 1923, to April 20, 1930, staff gages half a mile downstream at datums 3.90 ft. and 0.90 ft. higher than present datum.

Average discharge.—30 years (1923-53), 4,562 cfs (unadjusted); 4,596 cfs, adjusted for storage in Lake Merwin Reservoir since March 1931, and Yale Reservoir since August 1952.

Extremes.—1909, 1922-53. Maximum discharge, 129,000 cfs Dec. 22, 1933 (gage height, 35.0 ft., from floodmarks), from rating curve extended above 56,000 cfs on basis of computation of peak flow over dam; no flow part of each day June 30, July 1-3, 6-9, 1931 (regulation caused by construction of Ariel Dam); minimum daily discharge, 1 cfs July 6, 1931.

Remarks.—No diversion above station. Flow regulated by Lake Merwin and Yale Reservoirs (see elsewhere in this report). At times, discharge determined from combined flow through turbines and spillway.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909...										3,100	1,400	1,110	.....
1910...	1,510												.....
1922...											1,250	1,300	.....
1923...	1,870										1,130	949	.....
1924...	1,210	1,080	6,270	4,650	12,000	2,920	2,950	2,920	1,290*	913	840	822	3,210*
1925...	2,390	8,690	6,760	9,970	12,700	4,620	5,700	5,170	3,240	1,520	1,070	914	5,170
1926...	871	2,100	8,100	4,390	9,720	4,830	2,330	3,100	1,580	1,060	988	1,390	3,390
1927...	4,490	6,700	6,920	7,490	5,410	4,670	4,670	6,360	5,460	2,020	1,200	2,010	5,010
1928...	4,250	12,300	5,920	7,240	3,900	9,360	9,080	7,270*	2,850*	1,190	1,000	833	5,300*
1929...	2,340	3,960	4,050	3,440	1,940	4,870	6,180	6,730	4,420	1,720	1,040	807	3,530
1930...	815	838	4,500	2,760	11,300	4,600	4,720	3,850	2,330	1,170	879	770	3,150
1931...	893	1,790	2,370	5,270	4,770	7,010	8,920	1,980	183	121	200	793	2,840
1932...	1,040	5,220	5,020	6,490	5,950	12,300	8,670	7,290	5,570	2,570	1,760	1,970	5,390
1933...	2,140	8,790	7,510	8,160	3,540	7,160	6,270	8,530	10,300	4,310	1,830	2,290	5,910
1934...	5,445	5,221	28,359	16,739	4,838	7,139	4,244	2,842	1,746	1,245	1,813	2,579	6,908
1935...	1,865	11,180	8,829	6,686	6,047	4,763	4,679	6,148	4,107	2,023	1,698	2,544	5,012
1936...	2,881	2,134	3,125	8,200	3,911	5,444	5,212	7,112	4,837	2,134	1,737	2,372	4,102
1937...	2,729	1,063	2,526	3,206	3,022	3,929	10,200	7,447	7,691	2,461	1,605	2,547	4,030
1938...	2,632	9,062	10,920	8,333	3,991	6,347	8,170	6,207	3,254	1,563	1,587	2,068	5,345
1939...	2,558	2,869	4,691	7,192	5,560	5,167	5,374	4,371	2,968	1,834	1,440	2,081	3,833
1940...	2,427	2,390	5,177	4,599	10,070	8,427	4,837	4,305	1,263	901	1,041	1,281	3,900
1941...	2,247	3,415	5,378	5,014	3,459	2,797	2,362	3,310	1,900	1,118	1,163	2,948	2,976
1942...	3,145	4,145	10,710	3,501	4,980	3,565	3,454	3,880	3,956	1,682	1,211	1,178	3,783
1943...	1,553	8,682	8,694	4,822	6,381	6,014	9,726	5,208	4,522	2,271	1,329	1,875	5,092
1944...	2,144	3,587	3,477	3,010	4,582	3,666	3,747	3,734	2,598	1,031	847	1,382	2,858
1945...	2,023	4,373	3,062	6,517	7,698	5,308	5,192	8,241	3,150	1,398	991	1,388	4,012
1946...	1,682	6,449	8,399	8,872	6,052	6,661	5,988	7,036	5,588	3,754	1,415	1,165	5,304
1947...	2,473	8,206	15,070	5,863	7,949	5,367	5,937	8,246	2,371	1,554	1,017	1,479	5,026
1948...	7,319	8,127	5,835	8,045	6,060	4,017	5,806	8,032	5,215	1,900	1,223	1,947	5,299
1949...	2,203	5,922	6,766	2,806	5,488	6,819	7,110	9,591	4,686	2,294	1,134	1,123	4,664
1950...	2,079	7,698	7,243	7,295	9,369	11,200	8,774	7,866	8,007	3,928	1,838	1,384	6,361
1951...	5,223	10,100	11,930	8,283	10,550	4,778	5,427	6,615	3,573	1,687	1,242	1,503	5,879
1952...	6,846	0,250	8,100	3,450	7,909	5,160	4,913	6,931	3,822	1,028	757	792	4,736
1953...	696	920	704	16,030	11,060	5,562	4,390	4,156	5,156	2,748	1,526	2,597	4,641

* Estimated.

Lewis River at Ariel, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1909										1,950	1,030	960	
1910	960												
1922											1,090	1,030	
1923	1,070										1,070	860	
1924	890	955	2,400	2,350	5,560	1,880	2,140	1,410	1,010	870	785	760	760
1925	1,180	3,960	2,700	3,440	4,060	3,370	3,370	3,000	2,150	1,200	950	860	860
1926	626	610	3,600	2,930	3,600	2,930	2,240	2,240	1,190	950	874	794	794
1927	1,620	1,810	3,600	3,150	3,600	3,600	3,600	4,520	2,940	1,470	1,050	1,200	1,050
1928	2,200	2,550	2,920	3,140	2,400	2,040	6,460	4,290	1,960	1,200	935	770	770
1929	810	1,180	2,150	1,900	1,430	2,890	3,180	4,340	2,890	1,180	922	740	740
1930	740	795	795	1,670	4,920	2,250	3,780	2,600	1,530	999	790	715	715
1931	715	838	1,630	1,730	2,350	3,220	4,000	747	34	1	60	243	1
1932	806	1,020	1,940	2,390	2,020	4,880	5,110	4,680	4,000	1,030	759	597	597
1933	658	2,220	2,850	2,900	1,870	3,930	4,180	6,300	6,300	2,560	1,040	555	555
1934	1,460	2,160	2,070	7,110	2,710	2,180	1,050	972	528	513	432	333	333
1935	935	3,070	2,400	1,970	3,740	2,430	3,090	4,820	1,930	616	616	266	266
1936	1,530	1,380	1,990	2,320	2,170	3,410	2,620	4,320	1,730	985	1,210	1,410	985
1937	1,540	757	961	2,720	2,550	1,360	5,360	5,370	3,040	1,420	910	1,560	757
1938	1,410	1,250	2,700	4,290	2,610	3,900	4,210	4,000	1,630	775	431	859	431
1939	1,330	1,430	1,600	4,170	3,120	2,760	4,060	3,450	1,620	755	970	705	705
1940	1,280	1,389	1,010	1,900	1,490	4,060	2,670	2,090	820	654	655	892	654
1941	1,070	1,630	2,980	2,910	1,900	1,560	1,480	1,050	1,150	748	730	1,540	730
1942	2,370	3,140	3,610	2,630	2,590	2,700	2,550	2,520	2,530	708	808	608	608
1943	1,170	2,080	5,720	3,250	3,500	3,140	6,060	3,330	2,720	840	550	458	458
1944	770	3,300	1,400	2,930	3,800	3,330	2,320	2,410	553	500	515	527	500
1945	1,090	2,580	1,610	570	2,910	3,420	4,010	5,410	1,130	618	488	501	488
1946	490	570	3,840	3,940	3,620	4,140	3,670	5,740	3,700	1,740	474	626	474
1947	727	1,080	3,830	3,110	3,780	3,610	4,400	997	656	849	640	642	640
1948	1,950	4,060	3,070	3,050	2,710	3,540	3,950	4,360	2,330	646	591	593	591
1949	620	1,640	2,770	672	2,960	3,950	3,930	5,360	2,640	590	568	582	568
1950	745	1,970	3,420	5,680	5,180	5,710	5,770	5,080	5,110	776	749	732	732
1951	872	4,140	7,250	4,880	4,500	668	1,020	3,720	800	730	751	744	668
1952	739	4,570	5,410	800	5,370	3,550	1,310	4,720	756	716	700	756	700
1953	660	675	630	665	7,060	4,360	2,330	2,200	1,310	691	639	641	630

Summary

Year	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minim-um day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1909										
1910										
1922										
1923										
1924	29,800	Jan. 31, 1924	760	3,210	4.39	59.58	2,330,000	3,890	72.41	2,830,000
1925	44,000	Feb. 3, 1925	860	5,170	7.07	96.08	3,740,000	4,620	85.79	3,340,000
1926	26,500	Feb. 6, 1926	794	3,390	4.64	62.90	2,450,000	3,970	73.71	2,880,000
1927	27,800	Oct. 19, 1926	1,050	5,010	6.85	93.02	3,630,000	5,370	99.77	3,890,000
1928	62,600	Nov. 25, 1927	770	5,500	7.52	102.37	3,980,000	4,540	84.53	3,300,000
1929	16,400	Dec. 10, 1928	740	5,530	4.83	65.51	2,500,000	3,130	58.10	2,270,000
1930	21,500	Feb. 7, 1930	715	3,150	4.31	58.58	2,290,000	3,060	56.88	2,220,000

LEWIS RIVER BASIN

Lewis River at Ariel, Wash.—Continued

Summary—Continued

Year	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Observed			Adjusted			Observed		Adjusted			
	Momentary maximum		Min-imum day	Mean	Runoff in acre-feet	Mean	Per square mile	Run-off in inches	Mean	Runoff in acre-feet	Mean	Run-off in inches
Dis-charge	Date											
1931..	30,600	April 1, 1931	1	2,840	2,000,000	3,320	4.54	61.63	3,440	2,490,000	3,970	73.71
1932..	41,700	Feb. 26, 1932	597	5,390	3,910,000	5,360	7.35	99.77	5,910	4,200,000	5,930	110.39
1933..	34,700	Jan. 8, 1933	555	5,910	4,280,000	6,040	8.26	112.12	7,670	5,550,000	7,670	141.97
1934..	129,000	Dec. 22, 1933	933	6,903	4,095,000	6,660	9.11	123.66	5,405	3,914,000	5,407	100.45
1935..	38,000	Nov. 6, 1934	266	5,012	3,629,000	5,093	6.97	94.61	3,896	2,821,000	3,650	67.61
1936..	34,100	Jan. 12, 1936	985	4,102	2,978,000	4,101	5.61	76.33	3,950	2,865,000	4,122	76.76
1937..	49,100	April 14, 1937	757	4,030	2,917,000	4,055	5.55	75.31	5,384	3,897,000	5,461	101.39
1938..	61,500	Dec. 30, 1937	431	5,910	3,870,000	5,377	7.36	99.91	4,309	3,120,000	4,309	79.95
1939..	24,600	Feb. 15, 1939	705	3,833	2,775,000	3,819	5.22	70.56	3,824	2,768,000	3,825	70.87
1940..	36,900	Feb. 6, 1940	654	3,900	2,831,000	4,006	5.48	74.60	3,996	2,693,000	3,985	74.19
1941..	29,200	Nov. 29, 1940	730	2,976	2,165,000	2,951	4.04	54.81	3,565	2,681,000	3,576	66.43
1942..	40,600	Dec. 19, 1941	608	3,783	2,739,000	3,809	5.21	70.73	3,874	2,805,000	3,880	72.04
1943..	57,600	Nov. 23, 1942	458	5,092	3,686,000	5,031	6.88	93.41	4,255	3,081,000	4,191	77.81
1944..	18,700	Feb. 6, 1944	500	2,858	2,075,000	2,912	3.98	54.22	2,800	2,033,000	2,755	51.31
1945..	42,800	Feb. 7, 1945	488	4,012	2,904,000	4,046	5.63	75.14	4,735	3,428,000	4,842	89.92
1946..	39,500	Dec. 28, 1945	474	5,304	3,840,000	5,298	7.25	98.38	6,031	4,367,000	6,035	112.06
1947..	67,300	Dec. 13, 1946	640	5,028	3,639,000	5,021	6.87	93.22	4,647	3,364,000	4,646	86.26
1948..	30,800	Jan. 7, 1948	591	5,299	3,847,000	5,303	7.25	98.73	4,769	3,462,000	4,754	88.50
1949..	26,200	Feb. 23, 1949	663	4,664	3,376,000	4,669	6.39	86.70	4,835	3,500,000	4,858	90.21
1950..	49,000	Nov. 27, 1949	732	6,361	4,605,000	6,364	8.71	118.16	7,223	5,229,000	7,224	134.15
1951..	40,200	Dec. 23, 1950	668	5,879	4,256,000	5,851	8.00	108.65	5,380	3,695,000	5,307	98.53
1952..	24,900	Oct. 23, 1951	700	4,736	3,438,000	4,818	6.59	89.71	3,347	2,284,000	3,492	65.03
1953..	47,800	Jan. 17, 1953	680	4,641	3,360,000	5,028	6.88	93.36	.....	.....	.....	.....

Chelatchie Creek at Amboy, Wash.

Location.—Lat. 45°54'45", long. 122°26'45", in SW ¼ sec. 16, T. 5 N., R. 3 E., on left bank, 300 ft. upstream from confluence with Cedar Creek, at Amboy.

Drainage area.—12.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 375 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 55 cfs Sept. 30 (gage height, 2.10 ft.); minimum, 1.4 cfs Sept. 22 (gage height, 1.20 ft.).

Remarks.—Some diversion for domestic use and irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951..	5.21	3.39	4.33	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951..	3.7	3.0	2.8	.....

Cedar Creek near Ariel, Wash.

Location.—Lat. 45°55'50", long. 122°31'40", in W½ sec. 11, T. 5 N., R. 2 E., on right bank of downstream side of highway bridge, 1½ miles upstream from Pup Creek, and 2½ miles southeast of Ariel.

Drainage area.—41.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 290 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 1,720 cfs Jan. 22, 1953 (gage height, 7.21 ft.); minimum, 4.6 cfs Sept. 16, 1951; minimum gage height, 1.65 ft. Nov. 25, 1952.

Remarks.—Some diversion for irrigation and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										16.0	10.7	13.5	
1952	151	262	456	237	347	251	134	55.1	34.5	21.0	13.9	10.7	164
1953	9.82	13.3	105	735	417	214	150	122	149	37.3	21.3	14.3	165

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951										11	9.2	5.4	
1952	24	120	224	143	143	133	70	38	28	13.5	11	8.3	8.3
1953	7.2	9.4	16.5	163	156	97	90	76	73	22	15	12	7.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1951													
1952	1,120	Feb. 4, 1952	8.3	164	3.97	54.07	119,100	102	33.60	74,000			
1953	1,720	Jan. 22, 1953	7.2	165	4.00	54.08	119,100						

East Fork Lewis River near Yacolt, Wash.

Location.—Lat. 45°49'00", long. 122°15'30", in NE¼ sec. 24, T. 4 N., R. 4 E., on left bank directly beneath downstream side of Forest Service bridge at Sunset Guard Station and 8 miles southeast of Yacolt.

Drainage area.—31.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 960 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 368 cfs Sept. 30 (gage height, 2.77 ft.); minimum, 9.3 cfs Sept. 15, 16, 21, 22 (gage height, 0.94 ft.).

Remarks.—No diversion or regulation above station.

LEWIS RIVER BASIN

East Fork Lewis River near Yacolt, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...									63.4	26.9	16.0	24.0	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951...									34	18.5	12	10	.....

East Fork Lewis River near Heisson, Wash.

Location.—Lat. 45°50'10", long. 122°27'50", in N½, sec. 17, T. 4 N., R. 3 E., on right bank, 60 ft. downstream from Basket Creek, 1½ miles northeast of Heisson, and 20 miles upstream from mouth.

Drainage area.—125 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 366.8 ft. above mean sea level (river-profile survey).

Average discharge.—24 years (1929-53), 731 cfs.

Extremes.—1929-53: Maximum discharge, 15,600 cfs Dec. 22, 1933 (gage height, 12.3 ft.), from rating curve extended above 12,000 cfs; minimum, 29 cfs Nov. 3, 1935 (gage height, 0.04 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	54.2	54.8	1,010	615*	2,130	731	455	557	334	109	66.6	59.7	605*
1931...	145*	433	437	1,030*	672	1,460	1,200	198	282	141	62.8	77.3	515*
1932...	514	1,340	1,050	1,450	1,140	2,430	1,340	542	219	94.6	61.3	50.4	558
1933...	191	1,800	1,740	1,750	837	1,650	949	1,250	914	203*	96.8	365	986*
1934...	925	836	3,957	2,356	424	894	541	328	113	71.7	48.5	58.1	876
1935...	573	1,931	1,339	1,833	334	1,045	902	440	163	99.4	57.2	48.2	760
1936...	73.9	285	622	2,184	919	1,153	710	648	592	189	31.5	67.4	623
1937...	63.6	63.7	1,279	324	1,172	1,531	1,818	657	761	195	97.9	116	608
1938...	295	2,180	2,222	1,402	938	1,431	1,341	473	155	70.4	49.7	46.4	533
1939...	156	957	1,191	1,409	1,495	1,199	551	241	352	146	66.7	63.8	648
1940...	192	257	1,532	674	2,161	1,309	819	567	117	72.4	47.4	60.3	648
1941...	257	351	911	1,009	471	405	312	520	276	112	103	555	482
1942...	579	234	2,067	601	1,131	614	468	770	659	237	100	60.3	676
1943...	145	2,252	1,918	950	1,724	1,078	1,243	527	367	149	54.8	53.3	566
1944...	337*	421	768	608	512	695	330	408	422	119	66.1	83.9	462*
1945...	95.2*	332*	556*	1,446	1,413	1,239	1,105	1,068	259	94.7	53.6	102	657*
1946...	127*	1,523*	1,312*	1,436*	1,325*	1,334	717	407	311	243	85.7	68.7	742*
1947...	511	1,709	2,294	1,241	1,262	732	976	219	379*	170	83.2	105	803*
1948...	1,104	1,016	1,014	1,441	1,332	947	1,032	996	267	126	58.6	143	840
1949...	355	1,407	1,312	365*	1,684*	1,274	839	777	169	95.2	60.1	75.5	736*
1950...	316	1,006*	1,349	1,593	2,169	1,818	1,298	708	331	119	65.0	63.8	895*
1951...	801	1,834	1,803	2,101	1,531	1,000	528	452	178	51.1	51.8	79.0	886
1952...	1,316	1,027	1,664	749	1,398	973	900*	323	225	145	63.0	47.0	751*
1953...	40.1*	55.7	663	3,460	1,332	1,036	697	778	503	138	121	82.0	767*

* Estimated.

LEWIS RIVER BASIN

East Fork Lewis River near Heisson, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	46	47	47	.....	725	315	320	282	163	78	51	50	46
1931...	54	108	232	.....	264	450	340	112	90	79	50	50	50
1932...	50	339	.....	451	339	765	890	380	108	66	53	44	44
1933...	42	528	339	493	.....	715	546	968	364	.....	53	68	42
1934...	139	396	364	855	251	248	234	157	55	56	40	35	35
1935...	50	495	585	378	460	430	688	256	90	64	42	37	37
1936...	35	57	163	428	347	498	398	374	236	104	62	49	35
1937...	51	47	47	200*	281	590	720	200*	198	104	64	65	47
1938...	78	307	478	532	610	765	675	234	100	49	38	37	37
1939...	39	363	368	692	648	624	365	164	138	81	51	53	39
1940...	66	170	412	316	474	491	313	186	73	56	39	40	39
1941...	65	352	368	525	296	252	199	199	199	73	55	227	55
1942...	256	237	556	339	351	348	389	375	366	147	72	51	51
1943...	51	575	849	404	497	295	575	300	228	61	60	45	45
1944...	45*	174	266	366	414	394	497	289	181	60	49	45	45
1945...	55*	200*	219	297	407	479	659	555	136	70	47	48	47
1946...	70*	400*	470*	500*	682	682	497	262	212	121	64	54	54
1947...	61	329	430	308	370	351	441	126	163	109	65	62	51
1948...	70	466	444	320	235	462	675	444	164	89	73	52	52
1949...	137	356	509	200*	190*	717	587	240	118	65	45	43	43
1950...	55	180*	567	509	350*	740	650	420	228	78	50	38	38
1951...	59	567	787	787	509	332	338	248	94	57	39	32	32
1952...	210	387	693	364	417	502	595	267	160	75	51	34	34
1953...	32*	35	61	642	524	407	497	391	249	92	59	56	32*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1930.....	6,000	Dec. 14, 1929	46	505	4.04	54.79	365,000	499	54.17	361,000	
1931.....	15,500	Mar. 31, 1931	50	515	4.12	55.91	378,000	671	72.90	486,000	
1932.....	8,740	Mar. 5, 18, 1932	44	858	6.86	93.40	622,000	923	100.59	670,000	
1933.....	7,860	Jan. 8, 1933	42	926	7.89	107.06	713,000	1,160	126.10	840,000	
1934.....	15,600	Dec. 22, 1933	35	876	7.01	95.09	633,900	756	82.09	547,200	
1935.....	10,500	Dec. 21, 1934	37	780	6.24	84.71	564,700	495	53.74	358,200	
1936.....	7,670	Jan. 12, 1936	35	628	5.02	68.36	455,700	664	72.26	481,900	
1937.....	9,260	Dec. 23, 1936	47	668	5.34	72.54	483,700	943	102.35	682,300	
1938.....	11,400	Dec. 29, 1937	37	883	7.06	95.86	639,000	683	74.15	494,400	
1939.....	8,450	Feb. 14, 1939	39	648	5.18	70.32	468,800	622	67.55	460,300	
1940.....	7,670	Dec. 15, 1939	39	648	5.18	70.55	470,300	649	70.72	471,500	
1941.....	7,670	Nov. 29, 1940	55	482	3.86	52.32	348,800	606	65.78	433,600	
1942.....	9,930	Dec. 19, 1941	51	675	5.40	73.28	488,500	743	80.56	537,000	
1943.....	12,300	Nov. 23, 1942	45	866	6.93	94.06	627,000	634	68.90	459,300	
1944.....	4,730	Feb. 6, 1944	45	462	3.70	50.36	335,700	421	45.81	305,400	
1945.....	9,710	Feb. 7, 1945	47	657	5.26	71.29	475,300	817	88.75	591,600	
1946.....	9,500	Nov. 27, 1945	54	742	5.94	80.53	536,900	873	94.78	631,900	
1947.....	11,900	Dec. 11, 1946	61	803	6.42	87.23	581,500	737	80.08	533,800	
1948.....	7,320	Jan. 7, 1948	52	840	6.72	91.51	610,000	827	90.07	600,500	
1949.....	14,000	Feb. 17, 1949	43	736	5.89	79.95	533,100	661	71.74	478,300	
1950.....	8,990	Feb. 24, 1950	38	895	7.16	97.10	648,000	1,047	113.76	768,400	
1951.....	6,690	Dec. 23, 1950	32	888	7.10	96.44	642,000	849	92.21	614,800	
1952.....	7,320	Feb. 4, 1952	34	751	6.01	81.51	545,400	479	52.14	347,600	
1953.....	9,360	Jan. 18, 1953	32	757	6.06	82.21	548,100	.....	.....	.....

* Estimated.

KALAMA RIVER BASIN

Kalama River near Kalama, Wash.

Location.—Lat. 46°01'10", long. 122°43'50", in N½ sec. 7, T. 6 N., R. 1 E., on right bank, 150 ft. downstream from powerplant of Puget Sound Power & Light Co., seven-tenths of a mile upstream from Italian Creek, and 5 miles east of Kalama.

Drainage area.—179 sq. mi.

Gage.—Staff gage. Altitude of gage is 150 ft. (from topographic map). July 6 to Dec. 31, 1911, staff gage at datum 2.0 ft. lower, and Jan. 1, 1912, to Sept. 30, 1913, staff gage at datum 3.0 ft. lower.

Average discharge.—17 years (1912-13, 1916-32), 1,090 cfs.

Extremes.—1911-13, 1916-32: Maximum discharge, 13,200 cfs Nov. 25, 1927 (gage height, 11.0 ft.); minimum observed, 156 cfs Dec. 4, 1929 (gage height, 0.55 ft.).

Remarks.—Slight fluctuations from powerplant above station. Practically no storage at intakes and observed discharge represents natural runoff.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...										356	248	345	.....
1912...	314	1,430	1,150										
1913...	810*	3,100*	2,040	2,880	1,790	1,780	1,840	1,420	1,230	542	325	599	1,500*
1916...													822
1917...	275	940	1,280	1,420	1,310	1,210	2,240	1,620	1,380	710	356	293	1,050
1918...	233	402	3,930	2,590	2,290	1,670	1,340	698	333	261	238	194	1,190
1919...	404	1,320	1,890	2,600	1,850	1,900	1,690	1,060	691	391	810	256	1,200
1920...	351	1,250	1,470	1,210	902	1,090	1,620	789	653	330	202	1,210	920
1921...	2,010	1,610	2,720	2,930	2,610	2,280	1,820	1,440	926	521	311	344	1,620
1922...	775	2,200	2,290	759	1,150	1,400	1,660	1,670	1,030	390	320	359	1,170
1923...	498	525	1,860	3,520	776	1,200	1,120	763	598	419	249	211	963
1924...	284	350	1,250	1,260	2,250	788	700	415	274	207	195	205	677
1925...	990	2,250	1,840	2,780	3,170	1,260	1,230	749	565	306	239	208	1,290
1926...	183	639	1,870	1,160	2,510	1,040	534	726	398	261	246	329	820
1927...	1,100	1,600	1,770	2,200	2,490	1,860	1,140	1,260	790	850	273	512	1,230
1928...	1,090	2,400	1,320	1,870	934	2,160	2,210	1,120	458	376	252	220	1,200
1929...	485	694	1,190	1,060	663	1,390	1,540	919	682	340	244	200	789
1930...	187	175	1,190	722	2,560	1,150	514	751	472	231	203	151	714
1931...	230	488	573	1,480	1,170	1,820	1,760	527	460	315	211	212	708
1932...	725	1,530	1,780	2,080	1,500	2,970	2,090	1,240	337	504	318	293*	1,320*
1933...	421	2,330	2,310										

* Estimated.

KALAMA RIVER BASIN

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Kalama River near Kalama, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911										276	232	232	
1912	246	246	700										
1913			700	1,460	930	870	990	810	810	360	276	246	246
1916													276
1917	246	360	700	700	645	565	1,460	1,250	1,050	455	292	261	246
1918	205	218	930	1,460	1,130	930	930	532	310	240	210	175	175
1919	178	532	630	580	1,110	1,110	1,050	715	508	340	265	228	178
1920	250	665	440*	552	465	445	990	600	326	259	179	166	166
1921	783	482	1,610	1,180	1,390	1,110	990	830	765	355	280	265	265
1922	227	756	760	660	660	970	1,210	1,090	542	325	277	271	227
1923	280	395	360	975	590	915	825	520	475	288	223	195	195
1924	190	200	435	715	1,000	520	542	295	229	100	171	158	158
1925	269	1,000	900	1,310	1,240	900	900	495	370	258	212	191	191
1926	173	178	720	630	1,170	605	412	395	310	233	212	207	173
1927	360	396	1,030	1,100	1,000	900	900	900	495	300	246	270	246
1928	405	750	725	880	535	515	1,290	825	378	292	218	197	197
1929	208	276	455	558	415	880	775	550	455	276	213	187	187
1930	173	163	156	380	1,230	595	620	480	360	281	185	165	156
1931	170	198	400	440	480	840	780	360	325	248	188	182	170
1932	185	502	645	900	620	1,300	1,460	900	595	360	272	246	185
1933	237	840	698										

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minim-um day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1911										
1912										
1913			246	1,500	8.38	113.78	1,090,000			
1916										
1917	4,430	Jan. 5, 1917	246	1,080	6.08	82.15	784,000	1,260	85.56	912,000
1918	11,700	Dec. 18, 1917	175	1,190	6.65	89.88	858,000	1,100	83.48	796,000
1919	10,700	Jan. 23, 1919	178	1,200	6.70	90.74	867,000	1,150	87.15	834,000
1920	5,770†	Dec. 24, 1919	166	920	5.14	69.96	668,000	1,200	91.20	869,000
1921	11,500	Dec. 30, 1920	265	1,620	9.05	123.10	1,180,000	1,530	116.06	1,110,000
1922	8,370	Dec. 12, 1921	227	1,170	6.54	88.35	845,000	968	73.44	701,000
1923	12,300	Jan. 6, 1923	195	983	5.49	74.58	712,000	899	68.14	651,000
1924	7,470	Jan. 31, 1924	158	677	3.78	51.47	491,000	941	71.60	683,000
1925	9,200	Feb. 3, 1925	191	1,290	7.21	97.54	931,000	1,090	82.67	791,000
1926	5,980	Dec. 21, 23, 1925	173	820	4.58	62.22	583,000	963	73.03	697,000
1927	6,550	Feb. 1, 1927	246	1,230	6.87	93.41	891,000	1,260	95.56	911,000
1928	13,200	Nov. 25, 1927	197	1,300	6.70	91.34	873,000	1,020	77.59	738,000
1929	5,490	Dec. 10, 1928	187	789	4.41	59.84	571,000	705	53.48	510,000
1930	6,510	Dec. 14, 1929	156	714	3.99	54.18	517,000	691	42.40	500,000
1931	10,900	Mar. 31, 1930	170	768	4.29	53.20	556,000	998	75.87	722,000
1932	8,730	Feb. 26, 1931	185	1,320	7.37	100.56	959,000	1,410	106.99	1,020,000
1933										

* Estimated.

† Maximum observed.

KALAMA RIVER BASIN

Kalama River below Italian Creek, near Kalama, Wash.

Location.—Lat. 46°02'40", long. 122°48'50", in NE¼SW¼ sec. 33, T. 7 N., R. 1 W., on right bank, 2½ miles northeast of Kalama, 3 miles upstream from mouth, and 5 miles downstream from Italian Creek.

Drainage area.—201 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Prior to Oct. 7, 1952, staff gage and crest-stage indicator 70 ft. downstream at same datum.

Average discharge.—7 years (1946-53), 1,258 cfs.

Extremes.—1946-53: Maximum discharge, 14,400 cfs Dec. 13, 1946 (gage height, 13.40 ft., from graph based on gage readings), from rating curve extended above 6,700 cfs by logarithmic plotting; minimum, 174 cfs Nov. 8-10, 1952; minimum gage height observed, 1.76 ft. Sept. 13, 1951.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	797	2,111	3,460	1,612	2,059	1,196	1,301	503	507	336	253	312	1,198
1948...	1,689	2,279	1,848	2,079	1,862	1,394	1,617	1,720	714	391	301	335	1,326
1949...	631	1,619	2,287	624	2,428	1,895	1,347	1,432	611	366	258	251	1,137
1950...	451	1,487	1,848	1,936	3,019	2,885	2,040	1,435	1,075	524	328	250	1,429
1951...	1,136	2,405	2,639	2,736	2,511	1,337	1,277	903	440	289	227	259	1,340
1952...	1,734	1,473	2,286	1,112	2,102	1,856	1,430	1,103	597	377	278	232*	1,171*
1953...	199	245	1,330	4,546	2,289	1,463	1,132	1,229	925	464	348	308	1,204

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	271	533	942	701	821	761	821	362	384	286	234	223	223
1948...	246	942	881	701	587	821	1,140	1,000	481	321	271	234	234
1949...	299	304	835	400*	390*	1,130	1,010	725	485	320	223	206	208
1950...	254	299	835	725	890	1,340	1,270	1,130	730	387	266	204	204
1951...	242	780	1,500	1,340	1,010	725	725	560	320	254	208	189	189
1952...	610	608	1,060	636	800	848	1,160	740	470	295	258	200*	200*
1953...	182	174	226	1,380	955	754	824	803	623	360	280	266	174

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1947.....	14,400	Dec. 13, 1946	223	1,198	5.06	80.94	867,800	1,126	76.02	814,900	
1948.....	7,460	Jan. 7, 1948	234	1,326	6.60	89.78	962,400	1,245	84.29	903,500	
1949.....	9,300	Feb. 17, 1949	208	1,137	5.66	76.81	823,300	1,074	72.52	777,400	
1950.....	11,600	Feb. 24, 1950	204	1,429	7.11	96.52	1,035,000	1,630	110.09	1,180,000	
1951.....	8,660	Feb. 11, 1951	189	1,340	6.67	90.49	969,000	1,284	86.71	929,500	
1952.....	9,140	Feb. 4, 1952	200	1,171	5.83	79.30	850,000	859	58.20	623,700	
1953.....	9,660	Jan. 18, 1953	174	1,204	5.99	81.30	871,500	.....	.....	.....

* Estimated.

Ohanapecosh River near Lewis (now Packwood), Wash.

Location.—Lat. 46°40'30", long. 121°35'10", in N½ sec. 29, T. 14 N., R. 10 E., on left bank, 900 ft. upstream from confluence with Clear Fork Cowlitz River, and 7 miles northeast of Packwood.

Drainage area.—103 sq. mi.

Supplemental records available.—October 1913 to September 1917, fragmentary discharge and discharge measurements only.

Gage.—Staff gage. Altitude of gage is 1,250 ft. (from topographic map).

Average discharge.—5 years (1907-12), 572 cfs.

Extremes.—1907-13: Maximum discharge not determined, occurred Nov. 23, 1909 when water was over gage (gage height above 8.0 ft.); minimum not determined.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													146
1908	100	372	571	243	204	650	736	883	1,510	1,360	251	119	584
1909	160	474	223	468	303	273	402	927	1,700	822	237	140	511
1910	110	1,950	615	448	319	1,030	1,100	1,590	1,090	566	215	125	704
1911	532	870	343	154	82.5	216	379	758	1,360	656	174	212	479
1912	120	469	352	561	521	188	428	1,300	1,420	520*	199	201	522*
1913	142	684	340					1,120	1,890	1,200	330	230	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													111
1908	91	91	255	132	132	155	255	500	770	420	144	72	72
1909	72	111	163	168	180	210	288	480	990	420	155	101	72
1910	82	144	252	111	165		485	670	690	310	90	90	82
1911	188	221	166	89	69	58	192	480	760	260	140	115	56
1912	88*	84	178	148	225	182	335	505		242*	140	115	84
1913	93	167	260					438	1,310	575	168*	115	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1907										
1908	3,730†	Mar. 15-16, 1908	72	584	5.67	77.21	424,000	568	75.09	412,000
1909	3,060†	June 2, 1909	72	511	4.96	67.30	369,000	661	87.14	478,000
1910			82	764	7.42	100.74	553,000	688	80.69	498,000
1911	2,930†	Nov. 7, 1911	58	479	4.65	63.06	347,000	411	54.21	298,000
1912	2,300†	May 15, 1912	84	522	5.07	68.98	379,000	540	71.42	392,000
1913	2,540†	June 3, 1913								

* Estimated.

† Maximum observed.

COWLITZ RIVER BASIN

Clear Fork Cowlitz River near Packwood (formerly Lewis), Wash.

Location.—Lat. 46°40'50", long. 121°34'30", in NE¼ sec. 29, T. 14 N., R. 10 E., on left bank, three-quarters of a mile upstream from confluence with Ohanapecosh River and 7 miles northeast of Packwood.

Drainage area.—55.7 sq. mi.

Supplemental records available.—October 1913 to September 1917, discharge measurements and fragmentary record of discharge only.

Gage.—Water-stage recorder. Altitude of gage is 1,290 ft. (from topographic map). Aug. 20, 1907, to Sept. 30, 1917, staff gages within a quarter of a mile downstream at different datums.

Average discharge.—17 years (1907-12, 1930-42), 241 cfs.

Extremes.—1907-13, 1930-42, 1950: Maximum discharge, 8,030 cfs Dec. 22, 1933 (gage height, 11.7 ft.), from rating curve extended above 1,200 cfs; minimum, 30 cfs Nov. 2, 1935, Nov. 29, 30, Dec. 1, 1936.

Remarks.—Small diversion above station for fish hatchery, 1930-42. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907...													89.1
1908...	63.5	156	258	130	97.2	316	265	304	461	394	125		220
1909...	85.8	157	87.4	194	119	95.5	132	280	408	220	83.0		165
1910...	61.6	768	296	192	169	517	434	585	387	211	101		74.4
1911...	252	391	215	133	82.3	129	194	360	528	242	96.4		268
1912...	72.4	354	193	277	288	118	164	537	542	252	143		257
1913...	100	311	204					547	873	459	192		168
1930											72.6*		63.9
1931...	65.6	81.5	75.3	203	183	216	308	483	248	100	57.7		173
1932...	89.2	175	146	165*	177*	331	344	544	616	299	118		257*
1933...	106	549	301	242	88.7	128	218	414	862	534	209		318
1934...	387	380	1,230	646	271	498	441	334	212	115	66.4		54.7
1935...	246	500	280	258	276	166	168	455	582	274	108		281
1936...	52.7	50.8	77.2	154	83.0	197	357	690	566	209	93.2		216
1937...	47.6	36.5	156	63.6*	69.1	182	284	531	755	306	101		216*
1938...	91.7	427	355	309	123	182	414	587	502	196	86.8		276
1939...	92.6	153	274	231	99.2	194	365	514	372	213	86.9		222
1940...	70.0	88.0	300	164	250*	276	258	343	169	80.4	55.6		176*
1941...	63.1	129	202	150	105	118	180	236	144	64.5	47.3		128
1942...	180	230	391*	120	106	112	251	312	324*	184	76.0		196*
1943...	58.8	354											
1950										563	204		109

* Estimated.

COWLITZ RIVER BASIN

Clear Fork Cowlitz River near Packwood (formerly Lewis), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907												71	
1908	53	62	117	71	71	86	104	203	266	165	81	53	53
1909	53	62	62	76	76	81	98	174	266	124	62	49	49
1910	49	71	153	83	89	263	228	380	270	135	77	60	49
1911	83	128	144	89	66	61	126	276	313	135	72	77	61
1912	56	56	112	103	135	85	135	216	283	132	100	83	56
1913	77	89	153					239	536	276	144	103	
1930											56	46	
1931	42	42	52	54	94	128	170	238	159	70	48	45	42
1932		82	64				215	338	363	153	90	64	
1933	59	168	140	112	76	91	129	224	570	290	129	102	50
1934	91	217	190*	342	183	253	514	234	145	84	49	41	41
1935	34*	234	169	87	182	106	93	294	339	153	51	51	34*
1936	41	33	47	93	52*	100	80	449	314	127	70	50	33
1937	38	30	31	50*	55	100	119	319	563	132	81	62	30
1938	56	83	179	187	98	119	113	318	356	113	67	52	52
1939	50	85	123	114	79	68	248	341	283	128	69	52	50
1940	53	60	113	87	102	187	194	208	105	66	51	42	42
1941	42	55	115	88	73	92	125	137	95	48	42	64	42
1942	85	82			74	70	155	157		100	63	47	47
1943	40	77											
1950										270*	131	84	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1907													
1908	1,840†	Mar. 15, 1908	33	220	3.95	53.77	160,000	208	50.73	151,000			
1909	95†	June 2, 1909	49	165	2.96	40.28	120,000	231	56.33	167,000			
1910	3,740†	Nov. 23, 1909	49	316	5.67	77.12	229,000	295	71.84	213,000			
1911			61	228	4.09	55.60	165,000	208	50.69	150,000			
1912			56	257	4.61	62.90	187,000	257	62.82	187,000			
1913													
1930													
1931	1,050	Mar. 31, 1931	42	173	3.11	42.04	125,000	188	45.88	136,000			
1932	2,270	Feb. 26/27, 1932		257	4.61	62.70	166,000	302	73.76	219,000			
1933	2,830	Nov. 13, 1932	59	318	5.71	77.53	230,000	407	99.17	295,000			
1934	8,030	Dec. 22, 1933	41	388	6.97	94.63	281,100	306	74.48	221,200			
1935	2,900	Oct. 25, 1934	34	281	5.04	68.59	203,700	211	51.37	152,600			
1936	1,290	June 8, 1936	33	216	3.88	52.87	157,000	221	54.12	160,800			
1937	1,410	April 14, 1937	30	218	3.88	52.57	156,200	268	65.42	194,300			
1938	2,600	April 18, 1938	52	276	4.96	67.24	199,800	247	60.10	178,500			
1939	1,160	May 29, 1939	50	222	3.99	54.18	161,600	217	52.96	157,300			
1940	1,410	Dec. 15, 1939	42	176	3.16	42.94	127,600	170	41.58	123,500			
1941	1,610	Nov. 29, 1940	42	123	2.30	31.29	92,970	163	39.65	117,800			
1942			47	196	3.52	47.68	141,600						
1943	4,020	Nov. 23, 1942											
1950													

* Estimated.

† Maximum observed.

COWLITZ RIVER BASIN

Coal Creek near Lewis (now Packwood), Wash.

Location.—Lat. 46°38'40", long. 121°36'40", in SW¼ sec. 6, T. 13 N., R. 10 E., on left bank, half a mile upstream from mouth and 4 miles northeast of Packwood.

Drainage area.—10.5 sq. mi.

Supplemental records available.—April 1914 to September 1915, discharge measurements and fragmentary record of discharge only.

Gage.—Staff gage. Altitude of gage is 1,300 ft. (from topographic map).

Extremes.—1910-14: Maximum discharge observed, 580 cfs Nov. 19, 1911 (gage height, 3.6 ft.); minimum observed, 3.0 cfs Sept. 8, 1911 (gage height, 0.5 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911			45.0	23.6	12.1	33.3	42.2	71.7	100	28.9	6.81	14.6	
1912	9.88	103	37.2	93.0	71.9	18.0	33.3	130	137	27.4	12.3	19.2	57.4
1913	12.5	53.5	30.0					167	191	80.5	15.8	11.1	
1914	38.4	46.2	27.0	88.1	24.4	69.5							

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911			24	13	8.5	8.5	21	40	36	10	3.8	3.0	
1912	7.0	7.0	16	13	17	12	25	31	32	12*	7.0	10	7.0
1913	8.5	5.8	17					40	62	26	9.8*	5.8	
1914	7.0	22	15	16	16	26							

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	
	Dis-charge	Date						
1911	206†	Nov. 11, 1910				40.3	29,100	
1912	580†	Nov. 19, 1911	7.0	57.4	41,700	63.0	33,500	
1913	404†	June 1, 1913						
1914	460†	Jan. 5, 1914						

† Maximum observed.
* Estimated.

COWLITZ RIVER BASIN

773

Lake Creek near Packwood (formerly Lewis), Wash.

Location.—Lat. 46°35'45", long. 121°34'05", in SW¼ sec. 21, T. 13 N., R. 10 E., on left bank, 500 ft. downstream from outlet of Packwood Lake and 5 miles east of Packwood.

Drainage area.—18.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 2,850 ft. (from topographic map). Prior to Aug. 3, 1918, staff gages and, until Dec. 17, 1917, sharp-crested weir with end contractions at same site at different datums: Aug. 3, 1918, to Sept. 30, 1924, water-stage recorder and wooden control 110 ft. upstream at different datum.

Average discharge.—29 years (1911-24, 1930-42, 1949-53), 99.9 cfs.

Extremes.—1911-24, 1930-42, 1949-53: Maximum discharge, 1,400 cfs Dec. 22, 1933 (gage height, 5.9 ft.); minimum, 18 cfs Nov. 30, Dec. 1, 2, 1952 (gage height, 1.51 ft.).

Maximum stage, estimated by observer, 6.0 ft. (datum then in use) Dec. 18, 1917 (discharge not determined).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	47.1	109	81.9	96.3	119	68.7	59.1	159	244	139	97.4	75.4	107
1913...	50.1	72.9	63.0	86.5	64.8	60.2	69.7	160	316	215	110	75.5	112
1914...	75.0	70.2	67.1	101	55.7	83.8	109	154	152	125	70.5	59.9	93.0
1915...	63.9	137	55.3	42.1	34.3	38.0	86.1	83.8	95.5	90.9	69.4	51.4	70.7
1916...	46.5	94.9	94.8	53.9	78.4	121	98.6	149	260	270	134	80.2	124
1917...	40.0	54.0	53.6	45.7	54.6	42.4	48.9	119	299	310	124	76.4	106
1918...	47.0	41.6	325	175*	105	54.2	71.3	115	255	151	86.6	52.2	124*
1919...	66.2	69.8*	104	122	61.7	44.6	83.1	101	109	152	70.1	49.8	96.4*
1920...	31.9	66.4	70.5	107	69.7	45.0	45.5	103	182	164	85.8	84.7	88.0
1921...	108	102	77.0	135	113	118	94.1	182	305	208	120	63.7	136
1922...	57.6	127	217	53.1	36.6	34.2	38.1	130	245	116	74.0	67.4	101
1923...	43.6	43.8	64.9	223	67.5	46.9	112	169	199	195	79.0	50.6	107
1924...	55.5	49.8	70.0	60.8	154	58.9	50.7	169	139	97.5	58.3*	39.4	84.8*
1930...													40.4
1931...	39.3	35.2	36.0	49.4	60.9*	60.9	90.7	175	140	70.3	45.0	41.8	70.3*
1932...	41.4	45.5*	40.6*	56.0	53.0	107	101	176	226	174	85.5*	54.3	97.5*
1933...	58.6	230	118	85.0	50.2	51.5	60.5	125	301	229	114	75.1	125
1934...	147	134	305	201	85.5	128	154	134	98.5	66.2	47.7	39.2	134
1935...	68.5	138	106	89.1	87.8	53.7	52.7	133	213	135	65.1	45.3	98.8
1936...	31.4	26.2	23.4	60.2	35.6	55.0	109	257	237	105	51.3	43.5	86.8
1937...	31.0	21.5	49.4	32.9	31.2	40.1	71.6	161	309	172	65.3	50.6	86.5
1938...	42.9	115	114	91.5	48.3	50.3	115	106	205	121	50.5	35.5	99.2
1939...	44.0	52.0	81.6	74.7*	49.0	53.3	103	173	102	136	60.4	44.3	86.3*
1940...	39.4	45.5*	98.0	78.7	85.2	82.8	90.8	156	121	70.1	43.7	34.2	78.9*
1941...	34.6	39.0	70.9	51.8	40.7	35.9	47.7	99.5	95.3	62.5	39.0	59.9	56.5
1942...	93.5	90.1	144	53.9	48.2	43.4	70.0	116	164	140	46.1	31.2	87.0
1943...	28.6												
1950...	61.5*	131	91.1	72.2	74.2	99.9	91.9	154	324	278	122	62.2	130*
1951...	122	152	184	96.8	151	65.4	104	190	181	126	61.3	49.0	123
1952...	173	81.1	81.4	37.9	57.9	42.7	91.9	175	169	145	64.8	37.1	91.5
1953...	29.4	23.2	28.7	145	139	54.4	67.3	147	170	200	89.0	45.0	94.5

* Estimated.

COWLITZ RIVER BASIN

Lake Creek near Packwood (formerly Lewis), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	40	40	64	57	78	50	52	63	168	105	73	50	40
1913...	45	48	55	66	52	56	52	78	202	152	80	52	45
1914...	50	63	46	48	48	64	70	92	105	81	57	48	46
1915...	50	78	46	36	33	33	48	68	83	73	64	39	33
1916...	36	68	68	43	48	77	82	112	124	152	94	56	36
1917...	33	41*	42	38	40*	38	38	64	204	173	88	65	33
1918...	36	36	45	117*	84	29	53	80	121	106	67	46	29
1919...	45	57	58	45	49	38	44	114	135	98	49	33	33
1920...	30	35	38	44	40	38	40	46	81	101	51	40	30
1921...	51	38	45	61	49	74	57	104	218	166	60	43	38
1922...	34	41	61	42	35	38	35	52	189	78	57	41	33
1923...	34	35	32	76	52	42	81	97	127	118	48	39	32
1924...	36	33	54	.....	92	46	43	52	107	78	.....	34	33
1930	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1931...	33	30	33	33	.....	.....	39	105	98	54	40	39	30
1932...	35	.....	.....	46	38	66	75	116	150	104	65*	47	.....
1933...	44	75	69	.....	.....	60	51	82	226	159	.....	55	44
1934...	51	68	70	104	54	73	104	91	64	53	43	33	33
1935...	26	82	59	47	54	42	40	72	148	87	51	30	26
1936...	27	24	23	37	20	42	33	158	133	64	43	32	23
1937...	22	20	20	25*	25*	30	41	66	172	86	47	30	20
1938...	27	36	62	61	42	43	40	102	159	70	38	32	27
1939...	27	38	46	48*	40	34	76	113	113	102	47	34	27
1940...	29	30*	39	47	45	63	70	118	92	55	34	24	24
1941...	20	24	48	43	34	33	41	57	74	42	34	40	20
1942...	51	51	69	47	38	36	41	64	101	58	38	26	26
1943	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1950...	55*	52	58	46*	54	67	69	70	211	161	80	41	35*
1951...	49	72	122	70	67	58	57	92	125	82	45	40	40
1952...	53	55	46	33	38	31	50	89	114	88	41	34	31
1953...	25	18	18	24	59	46	42	107	133	116	66	33	18

* Estimated.

COWLITZ RIVER BASIN

775

Lake Creek near Packwood (formerly Lewis), Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1912	324	June 8, 9, 1912	40	107	5.69	77.45	77,000	103	74.59	74,500
1913	465	June 3, 4, 1913	45	112	5.96	80.91	81,200	113	81.53	82,200
1914	229	Jan. 7, 8, 1914	46	93.0	4.95	67.19	67,300	97.4	70.32	70,500
1915	247	Nov. 14, 1914	33	70.7	3.76	51.04	51,200	69.1	49.95	50,000
1916	532	June 15, 1916	36	124	6.60	89.84	89,700	116	83.98	84,400
1917	506	June 17, 1917	33	106	5.64	76.56	77,000	129	93.12	93,400
1918			29	124	6.60	89.59	89,600	109	78.73	78,800
1919	419	Jan. 23, 1919	33	96.4	5.13	69.64	69,800	60.4	65.29	65,500
1920	272	July 5, 1920	30	88.0	4.68	63.70	63,900	97.9	70.89	71,100
1921	452	June 7, 1921	33	136	7.23	97.95	98,200	145	104.87	105,000
1922	631	Dec. 12, 1921	33	101	5.37	72.46	72,700	79.5	57.37	57,600
1923	521	Jan. 9, 1923	32	107	5.69	77.69	77,800	110	79.65	79,700
1924	278	May 14, 1924	33	84.3	4.51	61.42	61,600			
1930										
1931	241	May 14, 1931	30	70.3	3.74	50.81	51,000	71.7	51.84	52,000
1932	366	June 15, 1932		97.5	5.19	70.71	70,800	121	87.43	87,600
1933	815	Nov. 17, 1932	44	125	6.65	90.40	90,700	146	105.30	106,000
1934	1,400	Dec. 22, 1933	33	134	7.13	96.51	97,030	106	76.35	76,510
1935	517†	⊙	26	98.8	5.26	71.35	71,530	79.9	57.67	57,810
1936	512	June 8, 1936	23	86.8	4.62	62.57	63,000	88.2	63.86	63,990
1937	529	June 21, 1937	20	86.5	4.60	62.38	62,600	101	72.63	72,860
1938	423	April 19, 1938	27	99.2	5.25	71.70	71,840	81.4	66.04	66,160
1939	365	May 29, 1939	27	86.3	4.59	62.37	62,470	86.8	62.71	62,810
1940	234	Dec. 17, 1939	24	78.9	4.20	57.11	57,250	75.6	54.76	54,900
1941	137	May 25, 1941	20	56.5	3.01	40.77	40,900	71.9	51.89	52,040
1942	305	Dec. 20, 1941	26	87.0	4.63	62.83	63,000			
1950	548	Nov. 27, 1949	35	130	6.91	94.15	94,400	145	104.77	105,000
1951	543	Feb. 11, 1951	40	123	6.54	89.02	89,260	108	77.97	78,190
1952	276	May 20, 1952	31	91.5	4.87	66.26	66,460	75.1	54.37	54,620
1953	443	Feb. 1, 1953	18	94.5	5.03	68.26	68,410			

† Maximum recorded. ⊙ Between Nov. 5 and 9, 1934.

COWLITZ RIVER BASIN

Lake Creek at mouth, near Lewis (now Packwood), Wash.

Location.—Lat. 46°38'00", long. 121°38'20", in NE¼ sec. 11, T. 13 N., R. 9 E., on right bank, a quarter of a mile upstream from mouth and 2½ miles northeast of Packwood.

Drainage area.—26.0 sq. mi.

Gage.—Staff gage. Altitude of gage is 1,120 ft. (from topographic map).

Average discharge.—8 years (1907-15), 121 cfs.

Extremes.—1907-15: Maximum discharge observed, 1,440 cfs Mar. 15, 16, 1908 (gage height, 4.00 ft.), from rating curve extended above 420 cfs; minimum observed, 36 cfs Sept. 8-19, 1910, Oct. 30 to Nov. 3, 1911 (gage height, 0.20 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													73.6
1908	52.9	81.2	151	96.9	69.8	215	132	148	245	306	105	55.5	133
1909	52.5	69.6	69.5	111	79.0	62.4	62.0	105	273	168	82.8	61.8	99.6
1910	51.8	306	160	81.3	70.0	247	170	239	170	117	66.3	42.5	144
1911	99.0	184	116	74.9	50.7	51.0	62.1	117	244	171	78.2	72.0	110
1912	42.4	147	95.8	149	174	64.8	59.9	155	280	150	101	78.4	124
1913	51.6	93.0	83.9	99.8*	80*	78.8*	107	232	380	267	134	91.8	142*
1914	86.7	92.0	75.7	151	80.8	121	152*	195*	179*	147*	80.8*	72.2*	120*
1915	80.5*	202	62.9	57.9*	48.5	54.6	130	99.2*	110*	89.5*	74.5*	58.2*	90.5*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907													63
1908	46	46	87	68	63	54	72	122	102	145	72	40	40
1909	40	40	51	47	51	51	51	66	184	112	66	43	40
1910	43	51	66	43	40	102	102	170	102	85	51	36	36
1911	56	72	78	80	40	40	51	66	170	122	60	47	40
1912	36	36	71	60	100	56	51	60	172*	112	70	50	36
1913	47	51	66	60		56	72	85	290	158	95	60	47
1914	56	78	57	50	66	94	99	141*	130*	95*	60*	58	56
1915	58	95	47	51	40	40	71	80	90*	80*	70	49	40

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1907													
1908	1,440†	Mar. 15-16, 1908	40	138	5.31	72.40	100,000	130	68.29	94,600			
1909	428†	June 2-3, 1909	40	99.6	3.83	62.07	72,100	127	66.13	91,700			
1910	905†	Nov. 24, 1909	36	144	5.54	75.06	104,000	134	69.95	96,900			
1911	399†	⊙	40	110	4.23	57.50	79,700	101	52.50	72,800			
1912	464†	Nov. 19, 1911	36	124	4.77	65.10	90,300	120	62.67	86,900			
1913	592†	June 3, 1913	47	142	5.46	74.04	103,000	144	75.14	104,000			
1914	358†	Jan. 7, 1914	56	120	4.62	62.50	86,700	127	66.38	92,100			
1915	358†	Nov. 14, 1914	40	90.5	3.48	47.29	65,500						

* Estimated.

† Maximum observed. ⊙ Nov. 11, 22, 23, 1910, June 13, 14, 1911.

COWLITZ RIVER BASIN

777

Cowlitz River at Packwood (formerly Lewis), Wash.

Location.—Lat. 46°36'40", long. 121°40'45", in SE¼ sec. 16, T. 13 N., R. 9 E., on right bank, 100 ft. upstream from Forest Service bridge, half a mile upstream from Skate Creek, and half a mile northwest of Packwood.

Drainage area.—287 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,048.0 ft. above mean sea level (Bureau of Public Roads benchmark). July 1, 1911, to Dec. 31, 1919, staff gages 1 mile upstream at different datums. Sept. 30, 1929, to Jan. 1, 1930, staff gage at same site and datum.

Average discharge.—32 years (1911-19, 1929-53), 1,594 cfs.

Extremes.—1911-19, 1929-53: Maximum discharge, 36,600 cfs Dec. 21, 1933 (gage height, 13.0 ft.), from rating curve extended above 12,600 cfs; minimum, 130 cfs Nov. 29, 1952 (gage height, 2.55 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...										1,740	731	658	.....
1912...	390	1,740*	1,020	1,640	1,550	577	1,040	2,680	8,100	1,400	916	876	1,410*
1913...	509	1,590	849	1,020	968	821	1,530	2,570	8,980	2,470	1,060	762	1,540
1914...	1,080	1,230	708	2,450	874	1,400	1,980*	2,370*	1,810*	1,380*	770*	560*	1,390*
1915...	983	3,630	584	597	573	1,030	2,069	1,220	1,090	809	721	451	1,150
1916...	873	1,370	1,460	704	1,900	2,680	2,180	3,010	4,900	4,690	1,840	772	2,210
1917...	397	614	564	614	905	477	1,170	2,910	5,120	4,820	1,390	760	1,650
1918...	525	516	6,800	3,500	1,230	850	1,680	1,860	3,440	1,510*	733	572	1,950*
1919...	790	930	1,920	2,770	783	711	1,630	2,700	3,030	2,200*	967	510	1,590*
1920...	265	1,390	2,000										
1930...	298	201	706	512	2,280	1,180	2,300	2,150	2,140	1,120	616	431	1,150
1931...	354	599	684	1,650	1,120	1,310	1,900	3,050	1,860	860	564	381	1,200
1932...	543	1,219	1,050	1,180	1,520	2,090	2,050	3,030	3,910	2,400	929	505	1,700
1933...	646	3,390	1,580	1,440	396	798	1,460	2,560	5,180	4,260	1,690	839	2,030
1934...	2,566	1,939	6,025	3,572	1,499	3,157	2,662	2,220	1,351	858	618	397	2,254
1935...	1,901	3,205	1,679	1,709	1,617	954	1,172	2,968	3,904	1,868	789	690	1,862
1936...	411	401	603	1,318	614	1,270	2,393	4,547	3,922	1,459	752	504	1,518
1937...	405	326	613	364	396	1,081	1,884	3,204	4,898	1,963	757	551	1,398
1938...	601	2,708	2,002	1,608	688	938	2,572	3,319	2,879	1,159	553	451	1,625
1939...	441	804	1,601	1,384	658	1,173	2,980	3,401	2,593	1,648	759	467	1,423
1940...	400	576	2,037	1,134	1,639	1,753	1,620	2,443	1,408	772	545	397	1,227
1941...	499	921	1,270	971	689	811	1,160	1,590	1,130	752	522	745	923
1942...	1,092	1,411	2,278	761	753	700	1,482	1,976	2,506	1,389	677	425	1,290
1943...	330	2,167	1,666	1,036	944	1,122	2,555	2,729	3,495	2,509	806	522	1,657
1944...	435	574	1,272	758	841	939	1,200	2,071	1,802	862	504	586	987
1945...	520	773	941	1,682	1,668	854	1,045	3,340	2,243	1,214	605	753	1,318
1946...	999	1,167	1,621	1,395	982	1,154	1,948	4,232	4,054	2,770	995	569	1,829
1947...	966	1,912*	3,058	1,324	1,561	1,413	2,203	3,338	2,453	1,229	674	646	1,734*
1948...	2,451	2,295	1,750	1,270	1,110	974	1,249	3,337	5,041	1,844	860	572	1,896
1949...	933	1,182	882	479	810	1,270	2,166	5,209	4,386	2,750	1,027	614	1,811
1950...	1,001	3,077	1,532	1,421	1,514	1,950	1,757	2,987	4,902	3,942	1,544	700	2,191
1951...	1,905	2,966	3,429	1,462	2,499	966	2,133	3,169	2,985	1,491	657	510	2,011
1952...	1,671	1,388	1,240	487*	1,207	736	2,273	3,410	2,885	1,796	730	386	1,516*
1953...	327	196	319	3,651	2,009	816	1,422	2,748	2,884	2,880	1,050	597	1,575

* Estimated.

COWLITZ RIVER BASIN

Cowlitz River at Packwood (formerly Lewis), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...										950	570	390	.....
1912...	285	285	640	430	720	465	855	1,200	1,630	900	370	430	285
1913...	355	535	656	500	500	570	810	1,200	2,600	1,440	720	479	355
1914...	378	740	433	491	732	832						390	378
1915...	588	1,260	425	455	488	520	1,140	920	776	654	600	375	375
1916...	360	575	846	575	.....	1,040	1,540	2,000	2,440	2,420	1,020	546	360
1917...	323	366	413	413	490	390	546	1,220	2,530	1,760	970	547	323
1918...	420	420	500	1,200	545	395	950	1,150	1,770		580	332	320
1919...	295	545	603	487	572	514	980	1,430	2,210		603	275	275
1920...	184	424	455										
1930...	224	164	180	336	990	594	1,620	1,220	1,460	741	468	260	164
1931...	225	269	499	504	630	820	1,030	1,340	1,140	672	457	253	225
1932...	208	666	558	654	450	1,120	1,460	1,850	2,250	1,130	546	363	208
1933...	309	1,050	650	478	320	435	795	1,310	3,560	2,500	740	534	309
1934...	421	720	720	1,670	961	1,660	1,800	1,420	848	594	524	240	240
1935...	241	1,190	891	551	954	841	616	1,960	2,440	1,010	641	473	241
1936...	310	280	393	647	421	674	563	2,520	2,000	959	540	353	280
1937...	346	301	274	258	262	664	868	1,560	3,440	856	557	367	258
1938...	313	525	968	944	528	730	702	1,690	1,920	666	477	356	313
1939...	294	455	667	734	515	444	1,480	1,960	1,930	959	480	304	294
1940...	253	278	758	464	730	1,110	1,120	1,560	944	564	470	323	253
1941...	194	346	647	569	431	569	812	842	804	509	385	416	194
1942...	492	447	930	609	432	432	995	988	1,840	832	386	316	316
1943...	211	609	1,200	652	645	570	1,530	1,330	2,450	1,320	590	402	211
1944...	395	396	544	532	430	396	909	1,470	1,340	565	411	479	395
1945...	458	442	458	416	754	708	714	2,150	1,350	728	447	447	416
1946...	773	773	580	950	792	839	930	2,290	2,520	1,340	721	468	468
1947...	362	683	800	620	1,000	830	1,240	2,120	1,690	775	580	466	362
1948...	550	1,420	1,240	850	728	800	800	1,000	3,410	1,240	664	430	430
1949...	496	512	512	385	370	879	808	2,150	2,290	1,760	605	420	370
1950...	390	698	815	660*	792	940	1,130	1,160	3,170	2,180	950	467	390
1951...	400	859	1,510	951	825	600	1,120	1,660	2,090	915	470	312	312
1952...	608	687	520*	340*	540	420*	879	1,520	1,610	998	477	330*	830*
1953...	242	144	153	332	746	636	594	1,710	2,190	1,340	609	418	144

* Estimated.

COWLITZ RIVER BASIN

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Cowlitz River at Packwood (formerly Lewis), Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1911										
1912	14,000†	Nov. 19, 1911	285	1,410	4.91	66.83	1,020,000	1,390	65.83	1,010,000
1913	6,520†	June 3, 1913	355	1,540	5.37	72.89	1,110,000	1,540	72.89	1,120,000
1914	13,100†	Jan. 5, 1914	378	1,360	4.84	65.70	1,010,000	1,570	74.25	1,140,000
1915	13,400†	Nov. 3, 1914	375	1,150	4.01	54.44	820,000	1,030	48.73	743,000
1916	13,000	July 2, 1916	360	2,210	7.70	104.81	1,600,000	2,030	96.23	1,470,000
1917	9,400	July 17, 1917	323	1,650	5.75	78.05	1,190,000	2,180	103.16	1,580,000
1918	28,800*	Dec. 18, 1917	332	1,950	6.79	92.17	1,420,000	1,600	75.61	1,160,000
1919			275	1,690	5.84	75.20	1,150,000	1,690	75.20	1,150,000
1920										
1930	5,070	Feb. 20, 1930	164	1,150	4.01	54.25	830,000	1,180	55.92	556,000
1931	7,440	Jan. 28, 1931	225	1,200	4.18	56.49	808,000	1,290	61.11	936,000
1932	16,100	Feb. 26, 1932	208	1,700	5.92	80.66	1,240,000	1,930	91.66	1,400,000
1933	20,500	Nov. 13, 1932	309	2,030	7.07	96.07	1,410,000	2,460	116.10	1,760,000
1934	26,600	Dec. 21, 1933	240	2,254	7.85	106.60	1,632,000	1,931	91.31	1,398,000
1935	26,500	Nov. 5, 1934	241	1,862	6.49	88.01	1,348,000	1,414	66.77	1,023,000
1936	9,560	June 7, 1936	280	1,518	5.29	71.99	1,102,000	1,538	72.93	1,116,000
1937	9,220	April 14, 1937	258	1,398	4.87	66.20	1,012,000	1,703	80.62	1,233,000
1938	15,700	April 18, 1938	313	1,625	5.66	76.88	1,176,000	1,421	67.22	1,029,000
1939	11,700	May 29, 1939	294	1,423	4.96	67.36	1,030,000	1,438	68.06	1,041,000
1940	9,420	Dec. 15, 1939	253	1,227	4.28	58.20	891,000	1,200	56.85	870,400
1941	9,150	Nov. 29, 1940	194	923	3.22	43.66	668,300	1,099	52.00	795,900
1942	10,100	Dec. 2, 1941	316	1,290	4.49	61.01	933,900	1,235	53.44	894,400
1943	20,300	Nov. 23, 1942	211	1,657	5.77	78.38	1,200,000	1,501	71.02	1,087,000
1944	14,100	Dec. 3, 1943	305	987	3.44	46.82	716,500	983	46.61	713,300
1945	14,100	Jan. 7, 1945	416	1,318	4.59	62.36	954,400	1,449	68.54	1,019,000
1946	14,900	Dec. 28, 1945	468	1,829	6.87	86.53	1,324,000	2,010	95.06	1,455,000
1947	19,000	Dec. 11, 1946	362	1,734	6.04	82.00	1,255,000	1,750	84.20	1,229,000
1948	18,800	Oct. 19, 1947	430	1,896	6.61	89.93	1,376,000	1,599	75.87	1,161,000
1949	9,850	May 13, 1949	370	1,311	6.31	85.66	1,311,000	2,031	96.07	1,470,000
1950	22,900	Nov. 27, 1949	390	2,191	7.63	103.61	1,586,000	2,419	134.42	1,762,000
1951	12,400	Feb. 9, 1951	312	2,011	7.01	95.12	1,456,000	1,676	79.25	1,213,000
1952	6,410	June 4, 1952	330	1,516	5.28	71.93	1,101,000	1,227	58.20	890,900
1953	12,500	Jan. 31, 1953	144	1,575	5.49	74.48	1,140,000			

* Estimated.

† Maximum observed.

Skate Creek near Packwood, Wash.

Location.—Lat. 46°37'15", long. 121°41'30", in NW¼ sec. 16, T. 13 N., R. 9 E., on right bank, 40 ft. below road crossing, 1 mile upstream from mouth, and 1½ miles northwest of Packwood.

Drainage area.—33.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,110 ft. (from topographic map).

Extremes.—July to October 1950: Maximum discharge not determined, probably occurred July 1 or 2 before gage was installed; minimum, 20 cfs Sept. 23 (gage height, 0.49 ft.).

Remarks.—No diversion or regulation above station.

COWLITZ RIVER BASIN

Skate Creek near Packwood, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										21.8	48.6	29.3	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										90*	33	20	

Hagar Creek near Lewis (now Packwood), Wash.

Location.—Lat. 46°35'00", long. 121°39'00", in SW ¼ sec. 26, T. 13 N., R. 9 E., on right bank, half a mile upstream from North Fork, and 2 miles southeast of Packwood.

Drainage area.—3.81 sq. mi.

Gage.—Staff gage and rectangular weir. Altitude of gage was 2,050 ft. (from topographic map).

Extremes.—1911-14: Maximum discharge observed, 55 cfs Feb. 18, 1912 (gage height, 1.75 ft.); minimum observed, 4.0 cfs Sept. 27, 29, 1912 (gage height, 0.29 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912	7.45	21.2	15.8	20.4*	26.6	9.27	12.1	22.0	15.9	9.30	8.62	6.25	14.5*
1913	8.09	18.7	11.9					31.1	32.9*	15.0	9.10	8.55*	
1914	11.1	13.6	11.7	19.7	11.7*	22.6	25.5*	17.6*	13.3*	8.33*	6.89*	6.76*	14.1*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912	6.7	6.7	11.7	9.0	11.8*	8.5	9.2*	14.0	11.1	8.5	7.4	4.0	4.0
1913	5.2	8.3	9.6*					14.0	24.2	10.8	8.3	7.4	
1914	7.4	9.3	9.3	10.4*	9.8	16.6	15.6	15.2*	9.8	7.2*	6.8*	6.4	6.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1912	55†	Feb. 18, 1912	4.0	14.5	10,500	14.1	10,200
1913							
1914	47†	Jan. 6, 1914	6.4	14.1	10,200		

* Estimated.

† Maximum observed.

COWLITZ RIVER BASIN

North Fork Hagar Creek near Lewis (now Packwood), Wash.

Location.—Lat. 46°35'20", long. 121°38'40", in NW¼ sec. 26, T. 13 N., R. 9 E., on right bank, half a mile upstream from Hagar Creek and 1¼ miles southeast of Packwood.

Drainage area.—1.45 sq. mi.

Gage.—Staff gage and rectangular weir. Altitude of gage was 2,000 ft. (from topographic map).

Extremes.—1911-14: Maximum discharge observed, 16.8 cfs Feb. 16, 18, 1912 (gage height, 0.90 ft.), by weir formula; minimum observed, 2.5 cfs Sept. 13, 1911, Aug. 25, Sept. 1, 7, 1914 (gage height, 0.25 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	3.08	6.59	5.21	8.28*	9.84	5.00	5.10	5.88	6.15	4.29	3.45	3.42	5.50*
1913...	3.27	5.76	4.90	.....	.....	.....	.....	8.76	8.75*	5.74	4.26	3.46*	.....
1914...	3.71	4.41	4.38	6.48	5.21*	6.88	6.21*	4.66*	4.95*	3.16*	2.75*	3.01*	4.65*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	3.0	3.0	4.5*	4.3	6.2*	4.6	4.6	4.9	4.9	3.9	3.0	3.2	3.0
1913...	3.2	3.2	3.4*	.....	.....	.....	.....	5.0	6.9	4.9	3.4	3.2	.....
1914...	3.2	3.2	3.4	3.6*	4.3	4.9	4.9	4.1	3.2	2.9*	2.5	2.5	2.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1912.....	16.8†	Feb. 16, 18, 1912	3.0	5.50	3,990	5.42	3,940
1913.....	.....	.....	.....	.....	.....	.....	.....
1914.....	11.7†	Jan. 6, 1914	2.5	4.65	3,360	.....	.....

* Estimated.

† Maximum observed.

Hall Creek near Packwood, Wash.

Location.—Lat. 46°34'50", long. 121°14'10", in NW¼ sec. 33, T. 13 N., R. 9 E., on right bank, 800 ft. upstream from highway bridge, and 2 miles southwest of Packwood.

Drainage area.—10.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,050 ft. (from topographic map).

Extremes.—1946-48, 1950: Maximum discharge, 604 cfs Dec. 13, 1946 (gage height, 6.63 ft.); minimum, 3.7 cfs probably Oct. 17, 18, 1946 (gage height, 1.59 ft., from recorded range in stage).

Remarks.—No diversion above station. Some regulation for power at dam 1 mile upstream.

COWLITZ RIVER BASIN

Hall Creek near Packwood, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	13.5*	56.8	146	64.8	71.1	40.4	40.2	31.0	23.4	15.2	7.73	6.63	42.0*
1948...	35.1	66.4	45.8	76.3	76.1	48.9	40.3	69.2	61.0	24.3	12.4	7.27	46.5
1949...	14.0	44.1											
1950...										35.9	20.4	12.9	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	3.7*	16	39	25	41	34	33	26	19	11.5	6.1	6.1	3.7*
1948...	6.4	37	33	39	80	31	27	37	37	16.5	3.6	5.4	5.4
1949...	8.0	11											
1950...										27	15.5	10.5	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1947.....	604	Dec. 13, 1946	3.7	42.9	3.94	53.45	31,070	37.1	46.15	26,840	
1948.....	286	Oct. 19, 1947	5.4	46.8	4.29	58.43	33,890				
1949.....											
1950.....											

Johnson Creek below West Fork, near Lewis (now Packwood), Wash.

Location.—Lat. 46°31'50", long. 121°37'00", in E½ sec. 13, T. 12 N., R. 9 E., on right bank, 100 ft. downstream from Deception Creek (formerly West Fork), 6 miles upstream from mouth, and 6 miles southeast of Packwood.

Drainage area.—33.3 sq. mi.

Supplemental records available.—May 1913 to September 1914, fragmentary gage heights and discharge, and discharge measurements only.

Gage.—Staff gage and sharp-crested weir with full end contractions. Altitude of gage is 2,100 ft. (from topographic map).

Extremes.—1911-12: Maximum discharge not determined; minimum observed, 20 cfs Oct. 3, 1912 (gage height, 2.40 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	30.2	135	76.0	191*	187	44.2	75.7	218	381	108	39.0	51.5	125*
1913...	33.8	121	67.3										

* Estimated.

Johnson Creek below West Fork, near Lewis (now Packwood), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912...	22	22	34*	25*	70*	36	50*	76*	220*	46*	30*	24	22
1913...	20	36	50*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Dis-charge	Date					
1912.....	22	128	92,700	126	91,400
1913.....

Johnson Creek below Glacier Creek, near Packwood, Wash.

Location.—Lat. 46°32'30", long. 121°37'15", in sec. 12, T. 12 N., R. 9 E., near right bank, 4½ miles upstream from mouth, and 5 miles southeast of Packwood.

Drainage area.—42.8 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,980 ft. (from topographic map).

Extremes.—1951-53: Maximum discharge, 894 cfs Jan. 31, 1953 (gage height, 5.82 ft.), from rating curve extended above 400 cfs; minimum, 21 cfs probably Nov. 27 to Dec. 2, 1952 (gage height, 2.85 ft., from recorded range in stage).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52.4*	37.6	.....
1952.....	155	160	162	67.6	139	89.8*	258*	367	253	134	53.9	34.3	156*
1953.....	26.0	23.2*	34.8	338	262	105	166	323*	340	259	82.8	46.8	167*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	32	.....
1952.....	61	96	84	56	85	56*	115*	198	176	73	40	29	29
1953.....	24	21*	21	33	100	84	78	224	260	118	62	38	21*

* Estimated.

COWLITZ RIVER BASIN

Johnson Creek below Glacier Creek, near Packwood, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1951.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1952.....	754	Nov. 30, 1951	29	156	3.64	49.58	113,200	123	39.13	89,350
1953.....	894	Jan. 31, 1953	21	167	3.90	52.83	120,600	.....	.....	.....

Johnson Creek near Packwood (formerly Lewis), Wash.

Location.—Lat. 46°34', long. 121°41', in SW ¼ sec. 33, T. 13 N., R. 9 E., on left bank, 1 mile upstream from mouth and 2½ miles southwest of Packwood.

Drainage area.—49.1 sq. mi. At site 1946-48, 1950, 49.6 sq. mi.

Supplemental records available.—April to September 1914, fragmentary record of discharge only.

Gage.—Water-stage recorder. Altitude of gage is 1,100 ft. (from topographic map). Aug. 14, 1907, to Sept. 23, 1914, staff gage and Oct. 1, 1918, to Sept. 30, 1924, water-stage recorder at approximately same site and datum. Oct. 1, 1946, to Nov. 30, 1948, July 6 to Oct. 24, 1950, water-stage recorder 1 mile downstream at different datum.

Average discharge.—14 years (1907-13, 1918-24, 1946-48), 201 cfs.

Extremes.—1907-14, 1918-24, 1946-48, 1950-51: Maximum discharge recorded, 2,990 cfs Dec. 11, 1946, probably higher Dec. 12, 1921; maximum gage height, 8.22 ft. Dec. 11, 1946 (backwater from drift, datum then in use); minimum discharge, 15 cfs Oct. 17-19, 1946.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	55.6
1908... 44.8	86.2	239	136	104	278	266	298	439	333	95.0	54.9	198	198
1909... 64.3	102	89.4	106	131	117	128	245	445	177	74.3	53.9	162	162
1910... 53.9	533	250	153	110	534	380	425	250	121	54.7	41.1	243	243
1911... 123	335	200	124	74.9	126	150	314	433	169	62.5	57.4	183	183
1912... 48.3	210	156	335	328	111	158	409	432	169	81.4	94.6	210	210
1913... 65.3	182	142	213	164	153	320	478	687	327	108	70.2	243	243
1914... 119	141	110	234	107	233	.....	.....	.....	.....	.....	.....	.....	.....
1919... 60.2	98.2	205	370	118	112	273	360	390	160	64.0	55.3	183	183
1920... 37.6	106	169	193	144*	102	125	249	282	150	58.1	141	147*	147*
1921... 230	168	244	328	318	276	280	366	462	204	79.8	64.1	247	247
1922... 55.9	165	692	83.7	53.2	40.7	119	402	513	126	58.6	44.5	197	197
1923... 39.1	58.9	128	651	136	146	326	469	392	255	105	45.5	225	225
1924... 59.4	77.3	199	179	357	123	139	319	151	69.9	40.1*	28.6*	152*	152*
1947... 68.5	262	571	197*	203*	201	284	399	247	115	63.5	45.2	216*	216*
1948... 216	321	184	185	160	118	151	425	623	170	81.1	62.1	224	224
1949... 112	159	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1950.....	.....	.....	.....	.....	.....	.....	.....	.....	350	102	60.9	.....	.....
1951.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53.3	37.8	.....	.....

* Estimated.

Johnson Creek near Packwood (formerly Lewis), Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1907												48	
1908	37	37	124	80	90	80	124	232	232	154	63	48	37
1909	42	46	63	63	90	100	100	139	154	112	63	42	42
1910	37	63	80	80	72	232	189	339	139	63	48	33	33
1911	63	80	70	92	60	60	118	189	258	81	51	44	44
1912	36	36	113	88	167*	92	118	152	278*	92	51	51	86
1913	51	66	105	81	70	105	118	189	465	180*	70	51	51
1914	50	94*	76*	80*	82	154*							
1919	32	74	79	68	46	52	161	220	223	98	46	44	32
1920	32	51	65	68	88	66	81	154	185	75	46	44	32
1921	114	81	101	110	99	156	132	202	238	128*	58	45	45
1922	32	58	119	84	46	38		184	257	74	41	36	32
1923	27	41	33	150	107	103	268	247	276	126	61	35	27
1924	31	38	110	110	196	88	58	218	119	48		24	24
1947	15	35	162*	108*	181*	130*	157	239	160	84	50	41	15
1948	44	161	137	99	74	89	86	120	365	111	67	54	44
1949	70	79											
1950										100	72	52	
1951											43	32	

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR							
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1907													
1908	1,510†	Mar. 15, 1908	37	198	4.03	54.85	144,000	188	52.25	137,000			
1909	770†	June 2, 3, 1909	42	152	3.10	41.66	110,000	200	55.29	145,000			
1910	1,830†	Nov. 22, 1909	33	243	4.95	67.19	176,000	228	63.06	165,000			
1911	1,030†	Nov. 10, 1910	44	183	3.73	50.63	133,000	163	45.13	118,000			
1912	810†	May 20, 1912	36	210	4.28	58.35	153,000	208	57.71	151,000			
1913	1,120†	June 2, 1913	51	243	4.95	67.08	176,000	241	66.65	175,000			
1914													
1919	2,500	Jan. 23, 1919	32	163	3.73	50.46	132,000	176	49.27	129,000			
1920	760	Dec. 24, 1919	32	147	2.99	50.62	106,000	174	48.18	126,000			
1921	1,560	Dec. 31, 1920	45	247	5.03	68.29	179,000	270	74.66	186,000			
1922			32	197	4.01	54.52	143,000	199	38.42	101,000			
1923	2,610	Jan. 6, 1923	27	225	4.58	62.24	163,000	234	64.75	170,000			
1924	969	Jan. 31, 1924	24	152	3.10	42.12	110,000						
1947	2,890	Dec. 11, 1946	15	216	4.35	59.12	156,400	205	56.23	148,700			
1948	1,270	May 27, 1948	44	224	4.52	61.55	162,800						

* Estimated.
† Maximum observed.

Cowlitz River at Randle, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	833	1,140	1,110	1,020	628	628	1,380	3,000	3,390	1,520	1,020	714	628
1912...	530	514	1,520										

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR				
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1911.....	30,200†	Nov. 11, 1910	628	2,910	5.33	72.96	2,100,000	2,480	62.21	1,790,000	
1912.....											

† Maximum observed.

Siler Creek near Randle, Wash.

Location.—Lat. 46°30'15", long. 121°55'15", in NW¼ sec. 27, T. 12 N., R. 7 E., on right bank at county road crossing, 2½ miles southeast of Randle.

Drainage area.—10.1 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 890 ft. (from topographic map).

Extremes.—June to October 1950: Maximum discharge, 24 cfs June 23 (gage height, 2.07 ft.); minimum, 2.4 cfs Sept. 23 (gage height, 1.25 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										9.69	4.68	3.10	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										6.2	3.5	2.6	

COWLITZ RIVER BASIN

Niggerhead Creek near Randle, Wash.

Location.—Lat. 46°25'45", long. 121°50'00", in SE¼ sec. 20, T. 11 N., R. 8 E., on left bank, 1 mile upstream from mouth, and 8½ miles southeast of Randle.

Drainage area.—66.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,390 ft. (from river-profile map).

Extremes.—1950-53: Maximum discharge, 4,150 cfs probably Jan. 12, 1953 (gage height, 6.00 ft., from high-water mark in well), from rating curve extended above 2,900 cfs; minimum, 24 cfs Nov. 8-10, 26-28, Dec. 1-2, 1952; minimum gage height, 0.57 ft. Dec. 1-2, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										246	70.3	45.0	
1951	297	655	772	308	671	212	497	538	255	91.6	44.9	36.2	362
1952	255	347	376	124	405	204	581	611	293	119	49.8	33.5	232
1953	27.3	28.0	57.2*	591*	425	209	379	568	437	210	74.3	51.0	279*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										110	50	36	
1951	45	208	439	200	193	135	245	278	162	57	38	31	31
1952	67	126	124	76	167	113	260	362	183	63	40	29	29
1953	25	24	25	75*	151	124	147	396	268	95	57	42	24

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950													
1951	2,940	Feb. 9, 1951	31	362	5.46	74.16	262,200	300	61.35	217,000			
1952	3,080	Dec. 1, 1951	29	282	4.25	57.02	204,800	210	43.05	152,200			
1953	4,150	①	24	279	4.21	57.14	202,100						

* Estimated.

① Probably Jan. 12, 1953.

Cispus River near Randle, Wash.

Location.—Lat. 46°26'50", long. 121°51'35", in NW¼ sec. 18, T. 11 N., R. 8 E., (unsurveyed) on left bank, 60 ft. upstream from bridge to Tower Rock ranger station, 4 miles downstream from North Fork, and 8 miles southeast of Randle.

Drainage area.—321 sq. mi. At site 1910-12, 319 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 1,221.60 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Oct. 25, 1910, to Feb. 29, 1912, staff gage 1 mile upstream at different datum. Sept. 28, 1929, to Nov. 26, 1949, Oct. 1-24, 1950, water-stage recorder 450 ft. upstream from present site at datum 0.26 ft. higher.

Average discharge.—25 years (1910-11, 1929-53), 1,294 cfs.

Extremes.—1910-12, 1929-53: Maximum discharge, 20,000 cfs Dec. 22, 1933 (gage height, 12.7 ft., site and datum then in use), from rating curve extended above 8,000 cfs; minimum, 183 cfs Dec. 30, 1936; minimum gage height, 2.55 ft. Oct. 25, 1942, site and datum then in use.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	1,130*	1,950	1,510	1,220	939	1,470	1,800	2,470	1,950	687	378	300	1,330*
1912...	329	956	913	1,870	2,130	.....	.....	.....	.....	.....	.....	.....	.....
1930...	308	265	942	551	2,140	1,180	1,920	1,540	1,100	609	394	311	930
1931...	327	398	416	1,050	1,160	1,290	2,100	1,960	967	620	413	340	919
1932...	471	908	939	1,020	995	1,940	2,140	3,140	2,630	1,160	554	371	1,300
1933...	433	2,940	1,580	1,320	601	1,010	2,700	2,700	4,320	2,010	843	611	1,670
1934...	1,248	1,497	5,567	3,759	1,517	2,273	2,004	1,300	880	665	403	306	1,797
1935...	861	2,567	1,734	1,357	1,444	913	1,263	2,665	2,220	960	532	344	1,403
1936...	266	294	454	1,253	590	1,123	2,466	3,674	2,728	955	546	391	1,230
1937...	319	262	850	300	328	1,154	2,415	3,143	3,221	1,261	629	460	1,198
1938...	414	2,062	2,317	2,025	833	1,234	2,378	2,964	2,021	796	470	378	1,494
1939...	374	697	1,251	1,232	754	1,308	2,105	2,456	1,559	836	445	348	1,116
1910...	306	320	1,782	1,153	1,785	1,948	1,832	1,805	840	501	368	331	1,061
1941...	362	671	1,248	1,001	738	844	1,021	1,331	784	505	374	485	785
1942...	786	1,091	2,581*	816	902	721	1,531	1,594	1,468	793	469	349	1,093*
1943...	298	1,783	1,555	1,148*	1,115	1,359	3,252*	2,439*	2,194	1,305*	647*	428	1,458*
1944...	449	573	804	634	779	761	1,206	1,651	1,059	537	374	369	766
1945...	331	527	702	1,145*	1,435	917	1,186	2,783*	1,582*	707*	420*	393	1,009*
1946...	334	976	1,693	1,712	971	1,187	1,856	3,872	2,873	1,649	661	431	1,522
1947...	641	1,764	3,548	1,366	2,127	1,370	1,692	1,907	1,176	680	453	409	1,419
1948...	1,579	1,896	1,424	1,465	1,052	1,007	1,413	3,175	3,455	1,097	628	502	1,558
1949...	673	1,004	913	564	987	1,453	2,220	4,292	2,458	1,191	832	484	1,407
1950...	534	1,359	1,152	1,189	1,660	2,021	1,779	2,804	3,772	1,975	796	520	1,635
1951...	1,204	2,451*	2,943*	1,514	2,458	976	2,020	2,745	1,788	875	538	407	1,655*
1952...	1,135	1,300	1,523	659	1,216*	841	2,152	2,656	1,724	934	510	374	1,251*
1953...	289	251	350	2,893	1,773	883	1,434	2,453	2,239	1,472	646	443	1,258

* Estimated.

COWLITZ RIVER BASIN

Cispus River near Randle, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911		705	1,250	1,020	820	820	1,250	1,810	1,030	460	325	325	325
1912	295	295	650	600	1,440								
1913													
1930		248	242	373	770	675	1,560	1,090	753	459	338	261	242
1931	261	272	337	349	645	769	1,230	1,190	701	495	367	298	261
1932	261	574	435	645	401	1,070	1,370	1,640	1,060	668	423	323	261
1933	296	941	956	745	526	632	910	1,660	2,740	1,100	600	498	296
1934	450	775	752	1,560	1,070	1,290	1,390	1,100	760	417	382	250	250
1935	226	1,130	1,020	636	973	656	656	2,040	1,420	677	396	292	226
1936	215	205	322	668	417	722	596	2,750	1,840	671	461	327	205
1937	266	235	235	276	260	542	1,050	1,540	2,320	604	452	394	235
1938	343	401	890	1,130	650	933	944	1,880	1,300	550	401	339	339
1939	309	488	672	711	562	494	1,500	1,860	1,280	568	340	292	292
1940	271	279	368	656	839	1,290	1,440	1,070	598	416	345	285	271
1941	254	412	713	652	592	707	766	870	598	379	340	353	254
1942	470	523	1,200*	615	581	570	1,040	1,120	1,230	538	371	305	305
1943	230	451	1,160	740*	720*	615	1,900*	1,650*	1,730	810*	496	357	230
1944	346	415	481	481	472	427	840	1,220	744	406	326	330*	326
1945	297	359	431	413	600*	625	856	1,500*	1,050*	500	360*	324	297
1946	293	518	776	1,010	725	956	848	2,390	2,120	920	508	372	293
1947	349	499	1,210	508	1,310	983	1,070	1,420	864	518	405	363	349
1948	394	1,240	974	690	566	760	816	1,190	2,120	768	524	455	394
1949	482	500	635	488	452	1,030	955	2,520	1,410	888	518	410	410
1950	377	506	691	520*	811	1,090	1,240	1,350	2,580	1,100	616	427	377
1951	428	1,300*	2,000*	1,160	1,010	770	1,040	1,620	1,350	648	417	362	362
1952	498	791	728	510*	700*	546	1,100	1,630	1,230	620	407	323	323
1953	261	206	218	371	790	648	710	1,830	1,730	814	539	358	206

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acres-feet		Inches	Acres-feet
1911	6,400	Nov. 10, 1910	325	1,330	4.17	56.61	963,000	1,130	48.06	818,000
1912										
1930	4,820	Feb. 20, 1930	242	930	2.90	39.31	672,000	597	37.87	649,000
1931	6,610	Mar. 31, 1931	261	919	2.86	38.85	665,000	1,020	43.17	736,000
1932	5,260	Feb. 26, 1932	261	1,360	4.24	57.69	983,000	1,580	66.97	1,150,000
1933	5,080	June 9, 1933	296	1,670	5.20	70.50	1,210,000	1,955	82.67	1,416,000
1934	20,000	Dec. 22, 1933	250	1,797	5.60	75.99	1,301,000	1,520	64.55	1,106,000
1935	11,800	Nov. 5, 1934	226	1,403	4.37	69.35	1,016,000	1,057	44.71	765,600
1936	6,190	June 7, 1936	205	1,230	3.83	52.14	892,600	1,265	53.64	918,200
1937	11,400	April 14, 1937	235	1,198	3.78	50.65	867,200	1,478	62.52	1,070,000
1938	10,900	Dec. 29, 1937	339	1,494	4.65	63.18	1,029,000	1,288	54.46	832,200
1939	3,640	May 15, 16, 1939	292	1,116	3.48	47.21	868,200	1,125	47.66	814,200
1940	7,120	Dec. 16, 1939	271	1,081	3.37	45.86	785,200	1,070	45.36	770,700
1941	3,110	Nov. 29, 1940	254	765	2.45	33.19	568,200	969	40.96	701,200
1942			308	1,093	3.40	46.22	791,400	1,021	43.20	739,500
1943	13,200	Nov. 28, 1942	239	1,458	4.54	61.66	1,056,000	1,309	55.30	946,800
1944	2,460	Dec. 3, 1943	326	766	2.39	32.48	556,100	744	31.58	539,900
1945	8,240	⊙	297	1,009	3.14	42.67	730,400	1,130	47.80	818,200
1946	6,870	Dec. 29, 1945	293	1,522	4.74	64.37	1,102,000	1,771	74.87	1,282,000
1947	11,500	Dec. 14, 1946	349	1,419	4.42	60.01	1,027,000	1,329	56.21	962,400
1948	6,650	May 27, 1948	394	1,558	4.85	66.06	1,131,000	1,365	57.86	990,700
1949	7,790	May 13, 1949	410	1,407	4.38	59.61	1,019,000	1,445	61.10	1,046,000
1950	6,850	Nov. 27, 1949	377	1,635	5.09	69.14	1,184,000	1,934	81.60	1,400,000
1951	8,570	Feb. 11, 1951	362	1,655	5.16	69.95	1,198,000	1,433	60.58	1,037,000
1952	7,440	Dec. 1, 1951	323	1,251	3.90	53.04	907,800	994	42.13	721,300
1953	7,000	Jan. 11, 1953	206	1,258	3.92	53.27	910,800			

* Estimated. ⊙ Probably Feb. 8, 1945.

COWLITZ RIVER BASIN

791

Tower Rock Springs near Randle, Wash.

Location.—Lat. 46°26'45", long. 121°52'00", in NE¼ sec. 13, T. 11 N., R. 7 E., on right bank at outlet of springs at culvert on road to Tower Rock ranger station, 8 miles southeast of Randle.

Gage.—Water-stage recorder. Altitude of gage is 1,220 ft. (from river-profile map).

Extremes.—1950-51: Maximum discharge, 13.5 cfs Feb. 11, 1951; maximum gage height, 3.36 ft. Aug. 24, 1951 (backwater from weeds and debris); minimum discharge not determined, probably occurred sometime during period of backwater in September 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										5.46	4.73	3.81	.....
1951....	4.78	8.05	10.0	10.3	10.8	8.34	8.09	8.85	6.18	4.54	3.46	3.19	7.15

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										4.0	3.3	3.4	.....
1951....	3.3	6.1	9.4	9.3	9.3	7.2	7.0	7.4	5.0	4.2	2.9	2.7	2.7

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1950.....							
1951....	13.5	Feb. 11, 1951	2.7	7.15	5,180		

COWLITZ RIVER BASIN

Cowlitz River near Kosmos, Wash.

Location.—Lat. 46°28'00", long. 122°07'20", in SE¼ sec. 1, T. 11 N., R. 5 E., on right bank, half a mile downstream from Tumwater Creek, 1½ miles downstream from Cispus River, and 4 miles southeast of Kosmos.

Drainage area.—1,042 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 759.29 ft. above mean sea level (levels by city of Tacoma). Prior to Dec. 3, 1948, staff gage half a mile upstream at different datum.

Average discharge.—6 years (1947-53), 5,143 cfs.

Extremes.—1947-53: Maximum discharge, 33,800 cfs Feb. 11, 1951 (gage height, 16.60 ft.); minimum, 518 cfs Nov. 29, 1952 (gage height, 2.34 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	5,045*	7,510*	5,121	5,139	4,007	3,251	4,207	9,995	11,700	4,323	2,248	1,481	5,333*
1949...	2,449	4,008	4,196	1,947	3,018	5,660	7,497	13,760	8,735	4,739	2,227	1,623	5,045
1950...	2,291	6,146	4,912	4,744	5,934	7,679	6,474	9,090	12,750	7,532	2,925	1,669	6,009
1951...	4,275	8,589	10,550	5,823	9,486	3,783	6,791	3,443	5,957	3,008	1,607	1,199	5,764
1952...	4,209	4,356	5,179	2,087	5,014	2,958	7,007	8,597	5,039	3,508	1,655	1,117	4,800
1953...	844	648	1,100	11,230	7,720	3,116	4,715	7,615	7,119	5,433	2,179	1,355	4,409

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948...	1,100*	4,460	2,370	2,450	1,690	2,340	2,340	3,700	7,940	3,010	1,800	1,110	1,100*
1949...	1,410	1,590	2,340	1,500	1,460	3,770	3,360	8,260	5,190	3,220	1,680	1,310	1,310
1950...	1,140	1,820	2,660	2,100*	2,810	4,230	4,600	4,400	3,640	4,090	2,030	1,380	1,140
1951...	1,270	3,530	6,640	4,180	3,590	2,580	3,960	4,990	4,810	2,020	1,210	1,000	1,000
1952...	1,710	2,760	2,610	1,620	2,660	1,990	3,830	4,850	4,160	2,160	1,210	978	978
1953...	705	532	540	1,230	2,880	2,350	2,500	5,570	5,480	2,850	1,670	1,100	532

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1948.....			1,100	5,333	5.13	69.80	3,872,000	4,748	62.14	3,447,000
1949.....	24,100	May 13, 1949	1,310	5,045	4.85	65.85	3,653,000	5,268	68.76	3,814,000
1950.....	27,600	Nov. 27, 1949	1,140	6,009	5.78	78.43	4,350,000	6,857	89.45	4,964,000
1951.....	33,800	Feb. 11, 1951	1,000	5,764	5.63	75.10	4,173,000	4,957	64.59	3,589,000
1952.....	18,000	Dec. 1, 1951	978	4,300	4.13	56.17	3,122,000	3,363	43.92	2,441,000
1953.....	25,600	Feb. 1, 1953	532	4,409	4.23	57.44	3,192,000			

* Estimated.



Figure 24. Gaging station in isolated area, Smay Creek near Lester. Note shelter cabin, also artificial control below gage,

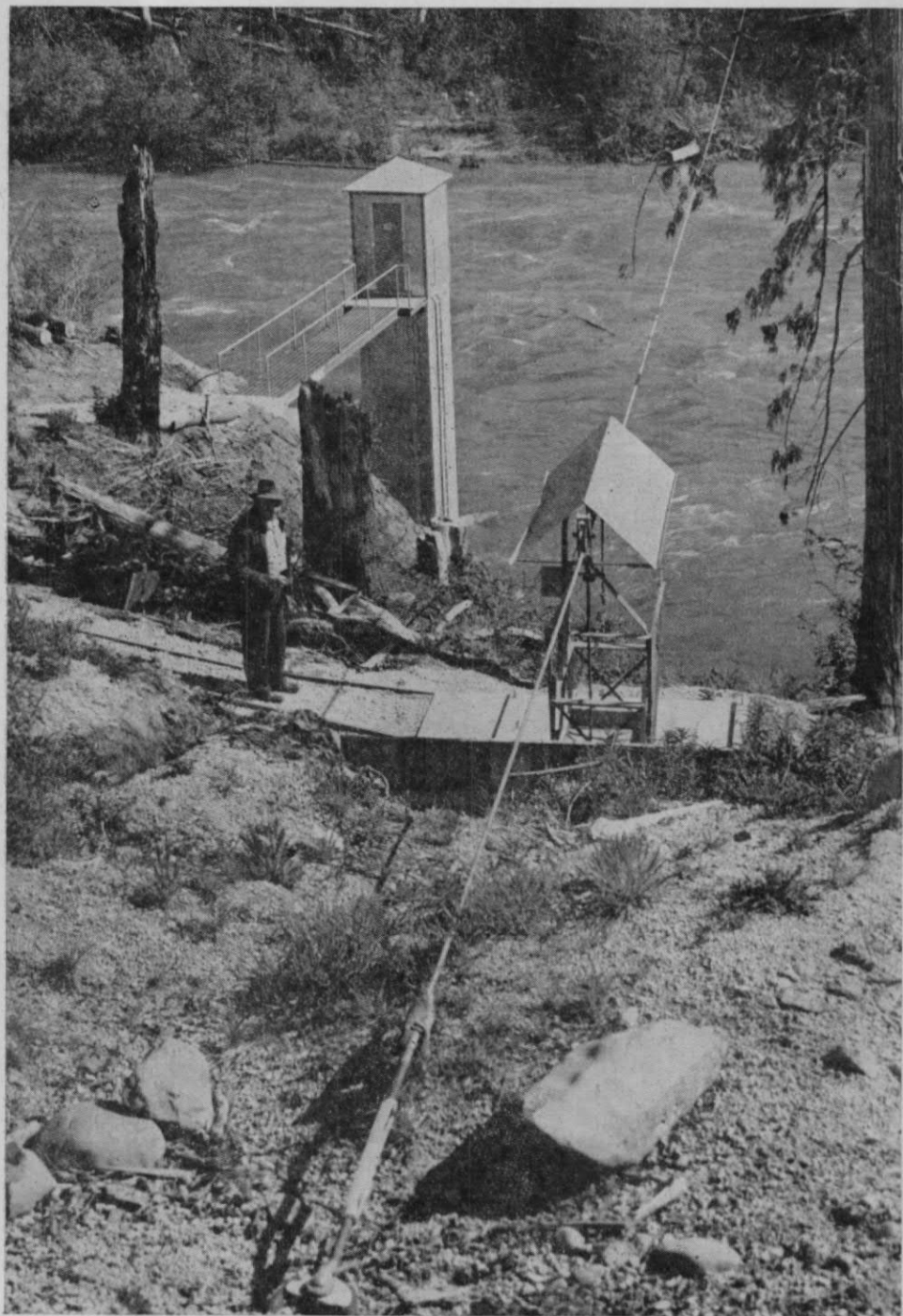


Figure 25. Gaging station on Cowlitz River near Kosmos. Cable span is 411 feet.
Gage structure has overall height of 52 feet.

COWLITZ RIVER BASIN

795

Rainy Creek near Kosmos, Wash.

Location.—Lat. 46°30'30", long. 122°09'15", at west line sec. 23, T. 12 N., R. 5 E., on left bank, 25 ft. upstream from county bridge, and 2 miles northeast of Kosmos.

Drainage area.—17.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 800 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 552 cfs Jan. 31, 1953 (gage height, 4.59 ft.); minimum, 0.3 cfs Sept. 14-24, 1951; minimum gage height, 1.05 ft. Oct. 4, 5, 6, 7, 8, 15-17, 1952.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										13.6	6.17	3.67	.....
1951....	22.9	91.0	103	158	173	94.6	75.6	38.5	13.8	4.99	1.97	1.21	69.3
1952....	42.9	62.3	108	64.6	116	61.2	72.8	45.5	19.8	9.54	3.08	1.04	49.3
1953....	.61	2.65	9.92	169	135	58.5	62.5	54.8	42.3	20.2	10.2	6.69	46.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										7.0	4.2	1.0	.....
1951....	3.9	35	88	93	74	53	44	21	7.4	3*	.7	.8	0.3
1952....	8.8	29*	71	38	55	44	60	29	14	4.7	1.8	.6	.6
1953....	.4	1.1	1.6	12	58	45	52	43	33	12	7.4	4.2	.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950.....													
1951.....	525	Feb. 11, 1951	0.3	69.3	3.87	52.58	60,190	63.9	48.50	46,300			
1952.....	390	Feb. 4, 1952	.6	49.3	2.75	37.51	35,800	32.6	24.76	23,630			
1953.....	552	Jan. 31, 1953	.4	46.3	2.59	35.14	33,550						

* Estimated.

COWLITZ RIVER BASIN

Landers Creek near Kosmos, Wash.

Location.—Lat. 46°27'30", long. 122°14'15", in NW¼NW¼ sec. 7, T. 11 N., R. 5 E., on left bank, 1,000 ft. upstream from road crossing, 1½ miles upstream from mouth, and 3 miles southwest of Kosmos.

Drainage area.—9.61 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 780 ft. (from topographic map).

Extremes.—June to October 1950: Maximum discharge, 44 cfs Oct. 6 (gage height, 2.22 ft.); minimum, 3.3 cfs Sept. 21-24 (gage height, 1.26 ft.).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										12.6	6.36	5.24	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950.....										7.3	4.7	3.3	.....

Cowlitz River at Mossyrock, Wash.

Location.—Lat. 46°33'00", long. 122°29'30", in SE¼ sec. 1, T. 12 N., R. 2 E., on left bank, 200 ft. upstream from Harmony Bridge, and 1½ miles north of Mossyrock.

Drainage area.—1,170 sq mi., approximately.

Gage.—Water-stage recorder. Datum of gage is 357.31 ft. above mean sea level (levels by city of Tacoma). Jan. 1, 1912, to Sept. 30, 1917 and Mar. 12, 1926, to Sept. 30, 1935, staff, chain, or wire-weight gages within 200 ft. of present site at different datums.

Average discharge.—21 years (1912-17, 1926-35, 1946-53), 5,290 cfs.

Extremes.—1912-17, 1926-35, 1946-53: Maximum discharge, 83,500 cfs Dec. 22, 1933 (gage height, 37.53 ft., average of high-water marks, site and datum then in use), from rating curve extended above 20,000 cfs; minimum, 543 cfs Nov. 30, 1952 (gage height, 3.06 ft.).

Flood of November 1906 reached a stage of 29.4 ft., datum in use 1913-34 (discharge, 61,300 cfs).

Remarks.—No known diversion or regulation above station.

COWLITZ RIVER BASIN

Cowlitz River at Mossyrock, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912				8,610	8,880	2,790							
1913				5,819	4,640	3,310	6,750	10,300	11,400				5,680
1914	2,990	4,060	3,230	9,300	3,510	5,870	7,870	7,590	4,170	2,370	1,500	1,160	4,480
1915	2,910	8,440	1,790	1,780	1,910	2,510	6,030	3,850	2,900	1,990	1,530	1,019	3,050
1916	1,410	4,730	7,200	2,660	7,760	10,200	7,380	9,420	12,900	10,800	4,390	2,080	6,730
1917	1,130	2,520	3,120	3,180	4,660	2,820	6,120	9,900	13,600	10,200	3,020	1,790	5,170
1926							4,690	4,000	2,550	1,620	1,300	1,250	
1927	3,820	5,030	6,280	6,070	5,840	4,060	5,290	8,720	17,000	4,470	2,070	2,210	5,450
1928	5,560	10,700	6,830	9,900	3,500	6,680	6,270	10,500	4,920	3,300	1,780	1,920	5,940
1929	2,200	2,490	2,860	2,460	1,620	4,030	4,500	11,100	9,660	3,610	1,880	1,160	3,980
1930	909	710	2,930	2,340*	9,480	4,760	7,000	5,620	4,480	2,410	1,430	1,010	3,550*
1931	1,140	1,540	1,820	4,960	4,470	4,940	8,040	6,750	3,660	1,990	1,320	1,040	3,460
1932	1,560	3,310	3,620	4,760	4,950	9,650	8,280	10,100	9,690	4,700	1,900*	1,090*	5,310*
1933	1,580*	10,100*	6,340*	8,710*	2,640*	4,395	5,762	8,271	14,140	7,680	3,244	2,352	6,108*
1934	5,844	6,390	24,520	15,800	6,255	8,147	7,106	4,860	2,803	1,809	1,360	1,090	7,204
1935	3,712	9,647	7,712	6,881	6,397	4,263	4,716	8,100	7,797	3,962	1,793	1,262	5,513
1946												1,459	
1947	2,412	6,032	12,470*	5,884	7,169	5,449	6,301	7,019	4,951	2,760	1,520*	1,401*	5,277*
1948	6,561	8,508	5,811	6,390	5,160	4,304	5,236	11,140	11,880	4,173	2,263	1,568	6,082
1949	2,716	4,655	5,392	2,260*	4,402	6,604	8,232	15,230	9,157	4,706	2,233	1,540	5,592*
1950	2,305	6,706	5,641	5,689	7,430	9,443	7,621	9,702	13,070	7,871*	2,872	1,712	6,659*
1951	4,365	9,799	12,300	7,168	11,040	4,548	7,429	8,687	6,026	3,049	1,637	1,200	6,403
1952	4,544	4,855	5,941	2,308	5,729	3,173	7,486*	9,246*	6,087	3,544	1,765	1,138	4,643*
1953	891	711	1,270*	12,830*	8,554*	3,350	4,977	8,203	7,756	5,765	2,275	1,388	4,817*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1912				2,590	4,690	1,070							
1913		5,320		3,380	3,240	2,850	3,800	5,480	6,490				
1914		2,420	2,040	2,040	2,870	3,630	3,790	4,470	3,310	1,740	1,320	975	975
1915	1,140	3,630	1,320	1,220	1,520	1,740	3,290	3,000	2,210	1,610	1,400	862	862
1916	825	1,650	3,760	2,090	2,210	4,430	5,650	7,290	8,010	5,900	2,870	1,420	825
1917	975	1,420	2,130	2,090	2,870	2,210	3,470	6,440	9,760	4,450	2,150	1,520	975
1926							3,350	3,200	1,950	1,240	1,090	910	
1927	1,350	1,840	3,390	2,880	3,950	3,390	2,820	5,780	6,500	2,880	1,680	1,580	1,350
1928	2,710	2,380	2,430	2,710	2,570	2,430	4,560	6,580	3,920	2,300	1,490	950	950
1929	1,050	1,330	1,560	1,680	1,220	2,500	3,360	5,780	6,460	2,360	1,380	870	870
1930	790	630	630		2,640	2,500	5,760	3,850	3,080	1,760	1,130	775	630
1931	740	890	1,490	1,390	2,500	2,220	3,670	3,670	2,640	1,590	1,080	840	740
1932	760	2,000	1,590	2,040	1,790	5,150	5,790	6,480	6,750				
1933							4,040	5,150	9,560	4,580	2,190	1,670	
1934	1,800	3,140	3,000	8,140	3,660	4,250	5,300	3,520	1,730	1,310	1,190	857	857
1935	804	5,800	4,700	3,130	4,400	2,870	3,000	6,440	5,300	2,390	1,320	920	804
1946												1,230	
1947	1,040	2,000	4,400*	3,250*	4,800*	4,400*	4,430	5,130	3,760	1,940	1,150*	1,206*	1,040
1948	1,400	4,990	4,000*	3,130	2,700*	2,890	3,070	4,430	7,070	2,950	1,840	1,310	1,310
1949	1,720	1,840	2,900	1,750*	1,600*	4,330	3,840	9,550	5,380	3,250	1,610	1,180	1,180
1950	1,050	1,900	2,960	2,400*	3,450	5,040	5,200	4,960	9,280	3,950*	2,040	1,350	1,050
1951	1,400*	3,950	7,510	4,890	4,140	3,000*	4,860	5,340	4,890*	2,040	1,280	1,020	1,020
1952	1,840	3,130	2,940	1,800	2,860	2,110	4,000*	5,400*	4,220	2,230	1,240	990	990
1953	760	599	567	1,300*	3,180	2,640	2,770	5,920	6,070	3,090	1,690	1,130	569

* Estimated.

COWLITZ RIVER BASIN

Cowlitz River at Mossyrock, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1912										
1913	19,000	June 4, 1913		5,680	4.85	65.95	4,120,000	5,570	64.63	4,030,000
1914	30,300†	Jan. 6, 7, 8, 1914	975	4,480	3.53	51.96	3,240,000	4,710	54.69	3,410,000
1915	17,900	April 3, 1915	862	3,050	2.61	35.40	2,210,000	3,070	35.67	2,220,000
1916	23,700	July 3, 1916	825	6,730	5.75	75.33	4,850,000	6,180	71.92	4,490,000
1917	18,200	June 19, 1917	975	5,170	4.42	59.94	3,740,000			
1926										
1927	22,100	Oct. 16, 1926	1,350	5,450	4.66	63.21	3,940,000	6,060	70.31	4,390,000
1928	35,100	Nov. 25, 1927	950	5,940	5.08	69.11	4,310,000	4,050	54.03	3,370,000
1929	17,300	May 24, 1929	870	3,950	3.40	46.20	2,580,000	3,730	43.30	2,700,000
1930	20,100	Feb. 20, 1930	630	3,550	3.03	41.13	2,570,000	3,540	41.06	2,560,000
1931	31,600	April 1, 1931	740	3,460	2.90	40.17	2,510,000	3,790	43.93	2,740,000
1932	31,600	Feb. 27, 28, 1932		5,310	4.54	61.78	3,860,000	6,110	71.07	4,440,000
1933				6,108	5.22	70.89	4,423,000	7,711	89.50	5,582,000
1934	83,500	Dec. 23, 1933	857	7,204	6.16	83.60	5,216,000	5,868	68.07	4,248,000
1935	32,200	Nov. 6, 1934	504	5,513	4.71	63.96	3,991,000			
1946										
1947			1,040	5,277	4.51	61.23	3,820,000	5,263	61.12	3,313,000
1948	24,200	Oct. 19, 1947	1,310	6,082	5.20	70.75	4,415,000	5,405	62.83	3,923,000
1949	24,700	May 13, 1949	1,180	5,592	4.78	64.39	4,048,000	5,747	66.69	4,161,000
1950	30,700	Nov. 27, 1949	1,050	6,659	5.69	77.26	4,821,000	7,654	88.79	5,541,000
1951	37,300	Feb. 11, 1951	1,020	6,403	5.47	74.27	4,636,000	5,472	63.47	3,962,000
1952	20,300	Dec. 1, 1951	990	4,648	3.97	54.01	3,370,000	3,598	41.86	2,612,000
1953			559	4,317	4.12	35.88	3,488,000			

† Maximum observed.

West Fork Tilton River near Morton, Wash.

Location.—Lat. 46°36'45", long. 122°14'45", in NE ¼ sec. 13, T. 13 N., R. 4 E., on left bank, three-quarters of a mile upstream from mouth, and 4 miles northeast of Morton.

Drainage area.—16.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 1,150 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 2,460 cfs Feb. 9, 1951 (gage height, 6.05 ft., from high-water mark in well); minimum, 4.6 cfs Oct. 29, 1952; minimum gage height, 0.87 ft. Aug. 25, Sept. 20-24, 1951.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										30.5	25.0	20.2	
1951	144	286*	261*	191	343	117	160	88.5	22.8	9.85	6.75	22.2	136*
1952	199	159	149	103	211	105	184	107	36.7	18.2	3.60	6.90	107
1953	5.86	11.4	94.1	549	193	107	98.1	105	63.2	23.8	16.5	16.5	107

* Estimated.

West Fork Tilton River near Morton, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										13.5	10.6	8.6	.....
1951	22	60*	130*	85	54	32	68	36	13	7.1	5.1	4.8	4.8
1952	42	48	74	27	51	53	124	53	24	9.5	6.5	5.8	5.8
1953	4.8	5.8	7.2	82	54	45	50	65	42	16.5	10	9.3	4.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1950												
1951	2,460	Feb. 9, 1951	4.8	136	8.29	112.66	83,530	121	100.09	87,530		
1952	1,820	Feb. 4, 1952	5.8	107	6.52	88.77	77,640	73.8	61.21	53,550		
1953	1,680	Jan. 22, 1953	4.8	107	6.52	88.85	77,710					

Tilton River at Morton, Wash.

Location.—Lat. 46°33'30", long. 122°17'00", in NW¼NW¼ sec. 2, T. 12 N., R. 4 E., on right bank, 500 ft. upstream from highway, and half a mile west of Morton.

Drainage area.—70.2 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 900 ft. (from topographic map).

Extremes.—June to October 1950: Maximum discharge, 522 cfs Oct. 6 (gage height, 2.78 ft.); minimum, 28 cfs Sept. 21-24 (gage height, 0.84 ft.).

Remarks.—Several diversions on tributaries for domestic and municipal use above station. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950									88.6	59.0	48.4	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1950									46	39	29	.....	.....

* Estimated.

COWLITZ RIVER BASIN

Tilton River near Cinebar, Wash.

Location.—Lat. 46°34'35", long. 122°31'15", in SW¼ sec. 26, T. 13 N., R. 2 E., on left bank, 1,000 ft. downstream from Cinnebar Creek, 2 miles southeast of Cinebar, and 2½ miles upstream from mouth.

Drainage area.—158 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 397.6 ft. above mean sea level (river-profile survey).

Average discharge.—12 years (1941-53), 887 cfs.

Extremes.—1941-53: Maximum discharge, 14,500 cfs probably Dec. 11 or 14, 1946 (gage height, 14.36 ft., from high-water mark in well), from rating curve extended above 4,000 cfs; minimum, 60 cfs Sept. 21-24, 1951 (gage height, 3.54 ft.).

Remarks.—Several small diversions for municipal and domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...					445*	390	288	426	308	130	93.9	506	.....
1942...	788	1,026	1,763	665	955	665	498	515	914	392	155	82.4	703
1943...	203	1,931	1,970	959	1,844	1,119	1,391	615	397	181	104	81.4	891
1944...	252	417	1,084	985	901	785	341	524	326	140	89.7	177	543
1945...	199	693	712	1,718	1,447	1,147	1,358	1,239	324	138	92.0	200	760
1946...	245	1,640	1,763	2,015	1,619	1,633	1,152	782*	691	360*	145	136	1,011*
1947...	563*	1,737	2,623	1,602	1,459	370	1,218*	343	373	221	115	234	943*
1948...	1,235	1,887	1,424	1,629	1,584	962	1,276	1,317	510	211	176	270	1,027
1949...	469	1,536	1,698	608	1,488	1,836	1,378	1,368	396	178	116	118	939
1950...	506	1,431	1,946	1,674	2,355	2,291	1,736	1,167	752	235	171	145	1,193
1951...	781	1,923	2,214	1,922	2,409	1,046	1,082	569	190	101	77.0	123	1,028
1952...	1,210	1,135	1,325	691	1,637	942	1,196	719	299*	203	101	81.6*	792*
1953...	70.3	95.0	527	3,576	1,899	853	825	832	609	265	162	132	816

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...					248	262	176	170	207	88	70	140	.....
1942...	304	288	686	469	408	408	330	314	370	234	112	80	60
1943...	78	561	1,080	506	496	436	730	453	260	115	89	70	70
1944...	68	176	311	512	494	451	590	377	198	102	74	66	66
1945...	123	232	282	362	535	564	905	672	198	106	75	76	75
1946...	92	616	540	872	840	1,000	698	476	388	184	124*	102	92
1947...	110*	463	638	467	564	494	850*	198	208	154	94	92	92
1948...	125	720	702	530	392	503	740	722	303	156	140	137	128
1949...	205	204	670	305	285	875	774	570	258	141	94	81	81
1950...	94	270	605	450	665	970	870	900	484	140	126	97	94
1951...	140	570	1,120	935	640	874	550	282	121	82	60	62	62
1952...	253	434	738	326	550	513	820	419	210*	112	88	70*	70*
1953...	62	69	77	427	580	472	550	514	482	162	112	99	62

* Estimated.

COWLITZ RIVER BASIN

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Tilton River near Cinebar, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1941										
1942	8,090	Dec. 19, 1941	80	793	4.45	60.40	508,800	743	63.89	588,100
1943	9,850	Nov. 23, 1942	70	831	5.04	76.51	644,800	695	59.71	503,300
1944	9,050	Dec. 3, 1943	66	543	3.44	46.75	394,000	529	45.60	334,200
1945	8,660	Jan. 7, 1945	75	760	4.81	65.29	550,100	931	79.98	673,800
1946	9,250	Dec. 28, 1945	92	1,011	6.40	86.88	732,200	1,119	96.16	810,400
1947	14,500	Dec. 11/14, 1946	92	943	5.97	81.00	682,600	910	78.21	659,200
1948	6,800	Nov. 7, 1947	128	1,027	6.50	88.45	745,500	973	83.85	706,700
1949	7,210	Feb. 17, 1949	81	939	5.94	80.64	679,700	937	80.51	678,700
1950	12,200	Feb. 24, 1950	94	1,193	7.55	102.51	863,800	1,280	109.95	926,400
1951	12,200	Feb. 9, 1951	62	1,028	6.51	88.23	743,800	924	79.36	668,700
1952	9,780	Feb. 4, 1952	70	792	5.01	68.21	574,800	542	46.72	393,800
1953	11,700	Jan. 31, 1953	62	816	5.16	70.09	590,800			

Klickitat Creek at Mossyrock, Wash.

Location.—Lat. 46°31'15", long. 122°28'05", on line between secs. 17 and 18, T. 12 N., R. 3 E., near left bank at upstream side of highway bridge, 1 mile southeast of Mossyrock and 4¼ miles upstream from mouth.

Drainage area.—3.45 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 668.41 ft. above mean sea level (levels by city of Tacoma).

Average discharge.—5 years (1948-53), 8.97 cfs.

Extremes.—1948-53: Maximum discharge, 165 cfs Feb. 17, 1949 (gage height, 3.62 ft.), from rating curve extended above 35 cfs; no flow for long periods each year.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948													0.90
1949	3.12	14.9	34.0	10.1	23.3	12.8	6.11	5.24	1.00	0.18	0.03	.01	9.54
1950	.88	8.03	21.4	26.5	32.2	25.3	14.6	4.79	1.10	.04	.03	.05	11.1
1951	2.74	16.1	28.3	31.1	24.9	17.7	6.75	2.46	.68	0	0	0	11.0
1952	3.97	10.8	21.0	10.3	16.3	10.4	6.69	2.88	.92	.11	0	0	6.93
1953	0	0	1.60	23.0	20.3	9.08	8.27	6.15	5.87	1.41	.44	.29	6.28

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1948													0.1
1949	0.7	3.0	14.5	4.4	4.4	9.8	4.0	1.3	0.6	0	0	0	0
1950	0	.5	11	7*	13*	14.5	7.5	1.9	.1	0	0	0	0
1951	0	5.7	15.5	18	12	9.0	3.2	1.0	0	0	0	0	0
1952	0	1.2	13	6.6	10.5	6.0	2.7	1.1	.4	0	0	0	0
1953	0	0	0	3.0	9.3	6.2	5.2	3.6	3.7	.3	0	0	0

* Estimated.

COWLITZ RIVER BASIN

Klickitat Creek at Mossyrock, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1948										
1949	165	Feb. 17, 1949	0	9.54	2.77	40.45	6,900	7.72	33.28	5,590
1950	95	Feb. 24, 1950	0	11.1	3.22	43.78	8,060	12.7	50.13	9,230
1951	82	Jan. 2, 1951	0	11.0	3.19	43.47	8,000	9.89	38.92	7,160
1952	64	Dec. 5, 1951	0	6.93	2.01	27.34	5,030	4.06	16.01	2,950
1953	60	Jan. 31, 1953	0	6.28	1.82	24.72	4,560			

Winston Creek near Mayfield, Wash.

Location.—Lat. 46°29'00", long. 122°31'15", about center of sec. 35, T. 12 N., R. 2 E., on left bank, 100 ft. downstream from bridge, 3 miles southeast of Mayfield, and 3¼ miles upstream from mouth.

Drainage area.—40.0 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 470 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 1,960 cfs Feb. 24, 1950 (gage height, 6.94 ft.); minimum, 0.6 cfs Aug. 24, 1951 (gage height, 1.63 ft.).

Remarks.—Slight regulation by lumber company for millpond.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950	42.7	131	260	309	396	279	180	69.3	26.2	12.3	8.09	8.35	142
1951	81.3	274	264	299	270	196	89.9	47.5	19.5	6.70	4.36	5.82	129
1952	101	169	235	103	195	131	92.2	53.7	24.0	11.6	5.90	4.27	93.4
1953	4.16	6.84	55.5	384	217	125	105	91.5	74.1	28.1	14.6	11.6	92.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950	8.0*	26	106	90	119	142	80	35	16	5.9	3.6	2.8	2.8
1951	9.7	92	121	137	100	65	39	29	10.5	3.7	1.5	2.0	1.5
1952	15.5	57	115	56	90	78	47	30	16	4.9	3.9	2.6	2.6
1953	1.9	3.4	8.4	66	86	67	68	53	54	14	7.4	6.8	1.9

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	1,960	Feb. 24, 1950	2.8	142	3.55	48.21	102,900	157	53.42	114,000
1951	1,010	Jan. 2, 1951	1.5	129	3.22	43.77	93,420	120	40.60	86,640
1952	760	Feb. 4, 1952	2.6	93.4	2.34	31.80	67,840	56.7	19.30	41,170
1953	955	Jan. 19, 1953	1.9	92.6	2.32	31.45	67,070			

* Estimated.

Cowlitz River near Mayfield, Wash.

Location.—Lat. 46°30'40", long. 122°36'50", in NE¼ sec. 24, T. 12 N., R. 1 E., on right bank, 1 mile upstream from Mill Creek, 2 miles downstream from Winston Creek, and 2¼ miles west of Mayfield.

Drainage area.—1,400 sq. mi. At site 1910-11, 1,350 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 226.6 ft. above mean sea level, datum of 1929. Aug. 25, 1910, to Nov. 30, 1911, staff gage 2½ miles upstream at different datum.

Average discharge.—19 years (1934-53), 5,856 cfs.

Extremes.—1910-11, 1934-53: Maximum discharge, 58,000 cfs Dec. 13, 1946 (gage height, 24.75 ft.); minimum, 698 cfs Nov. 30, 1952; minimum gage height, 7.18 ft. Nov. 30, Dec. 1, 1936.

Flood of December 1933 is known to have exceeded that of Dec. 13, 1946.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...													1,260
1911...			7,660	5,930	3,690	4,430	5,210	7,870	7,950	4,050	1,900	2,160	.....
1912...	1,710	9,430											.....
1934...							7,412*	5,563	3,169	2,001	1,496	1,226	.....
1935...	4,852	12,190	10,080	9,276	7,651	5,327	5,540	8,075	8,061	4,047	1,931	1,611	6,584
1936...	1,205	1,556	2,644	3,927	3,980	7,485	9,160	13,320	10,100	3,590	1,899	1,443	5,449
1937...	1,122	826	6,242	2,441	3,550	7,233	10,340	11,210	12,720	5,004	2,174	1,806	5,808
1938...	1,838	11,610	10,780*	10,870	4,646	5,874	9,939	10,030	6,985	3,199	1,776	1,340	6,584*
1939...	1,615	3,394	7,021	7,617	6,128	6,705	7,784	8,536	6,172	3,598	1,739	1,367	5,186
1940...	1,462	2,020	7,860	4,873	9,268	8,785	6,685	7,375	3,235	1,830	1,349	1,210	4,652
1941...	1,562	3,152	5,472	4,879	3,292	3,115	3,546	4,781	2,227	1,945	1,368	2,337	3,224
1942...	4,199	5,391	11,500	4,148	4,821	3,866	5,527	6,004	7,140	3,849	1,997	1,291	4,981
1943...	1,178	9,905	10,100	6,230	8,152	9,085	11,550	7,914	8,317	5,493	2,198	1,458	6,521
1944...	1,676	2,498	4,960	4,051	4,519	4,116	5,126	6,386	4,589	2,216	1,424	1,574	3,537
1945...	1,497	2,722	3,908	6,174	3,052	5,241	6,432	12,240	6,283	2,943	1,650	1,821	5,064
1946...	1,818	6,292	8,804	9,609	6,469	7,405	7,657	12,580	10,140	6,439	2,476	1,615	6,761
1947...	3,096	7,651	17,400	7,454	9,172	6,152	7,764	7,445	5,392	3,050	1,639	1,655	6,476
1948...	7,642	10,550	7,584	8,294	6,792	6,456	6,528	12,300	12,410	4,473	2,433	1,897	7,191
1949...	3,297	6,511	7,996	2,898	6,300	8,504	9,475	15,500	9,430	5,183	2,528	1,834	6,621
1950...	3,020	7,665	7,868*	7,783	10,120	11,970	9,461	10,789	13,350	8,236	3,164	1,858	7,959*
1951...	5,279	11,810	15,220	9,558	18,990	5,850	8,552	9,486	6,330	3,175	1,703	1,345	7,648
1952...	5,817	6,080	7,633	3,371	7,733	4,465	8,612	9,684	6,437	3,798	1,831	1,249	5,547
1953...	1,049	888	1,879	17,320	11,060*	4,571	6,328	9,228	8,471	6,073	2,486	1,650	5,692*

* Estimated.

COWLITZ RIVER BASIN

Cowlitz River near Mayfield, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910			5,880	5,000	3,160	3,020	4,200	5,960	5,400	2,370	1,770	1,040	
1911	1,660	1,710										1,770	
1931							5,660	4,010	2,480	1,600	1,380	960	
1935	940	6,090	5,090	3,700	5,120	3,300	3,620	6,930	5,310	2,400	1,610	1,210	940
1936	1,060	922	1,550	3,340	2,220	4,600	3,390	2,930	5,140	2,430	1,520	1,200	922
1937	914	773	773	1,030	1,720	4,300	5,470	7,010	9,130	2,660	1,650	1,300	773
1938	1,130	2,210	4,800*	6,430	3,700	4,560	4,300	6,720	5,220	2,180	1,520	1,170	1,130
1939	1,150	2,040	3,470	4,960	3,590	3,470	5,720	6,110	4,010	2,320	1,400	1,140	1,140
1940	1,080	1,300	2,350	2,470	3,090	5,720	5,050	4,150	2,220	1,570	1,230	1,020	1,020
1941	924	1,790	3,090	3,240	2,250	2,440	2,870	2,930	2,440	1,450	1,220	1,340	924
1942	2,310	2,150	5,170	3,150	2,510	2,840	4,200	4,480	5,610	2,490	1,440	1,120	1,120
1943	890	2,780	7,220	3,680	3,010	2,940	7,220	4,930	6,730	3,210	1,690	1,160	890
1944	1,150	1,560	2,320	2,760	2,780	2,500	3,690	5,090	3,280	1,720	1,210	1,200	1,150
1945	1,150	1,390	2,090	2,030	3,330	3,500	4,310	9,060	3,710	1,980	1,390	1,340	1,150
1946	1,280	3,680	3,680	4,040	4,400	5,360	4,190	8,500	7,060	3,530	1,990	1,300	1,280
1947	1,090	2,350	4,810	3,440	5,410	4,580	5,590	5,450	4,090	2,160	1,270	1,310	1,090
1948	1,570	6,180	4,770	3,780	2,810	3,540	3,960	5,230	3,080	3,100	2,070	1,350	1,350
1949	1,090	2,220	3,820	2,110	1,950	5,540	4,890	10,700	5,900	3,660	1,850	1,510	1,510
1950	1,370	1,870	3,860*	3,120	4,400	6,470	6,230	6,120	9,990	4,520	2,240	1,480	1,370
1951	1,500	4,950	10,100	6,570	4,950	3,460	6,000	5,830	5,040	2,120	1,390	1,130	1,130
1952	2,080	3,730	4,150	2,400	3,760	2,940	5,560	5,860	4,670	2,300	1,340	1,140	1,140
1953	912	709	732	2,060	4,120	3,340	3,800	7,000	6,430	3,180	2,040	1,340	709

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acres-feet		Inches	Acres-feet
1910										
1911										
1912										
1934										
1935	36,900	Nov. 6, 1934	940	6,564	4.70	63.85	4,767,000	4,768	46.24	3,452,000
1936	23,400	June 8, 1936	922	5,449	3.80	52.97	3,956,000	5,603	54.45	4,097,000
1937	29,900	April 15, 1937	773	5,308	3.70	51.47	3,642,000	6,724	65.22	4,568,000
1938	36,100	Dec. 30, 1937	1,180	6,584	4.70	63.85	4,766,000	5,620	54.51	4,069,000
1939	19,400	Feb. 15, 1939	1,140	5,186	3.70	50.28	3,754,000	5,032	49.26	3,679,000
1940	25,900	Dec. 17, 1939	1,020	4,652	3.32	45.22	3,378,000	4,551	44.25	3,304,000
1941	17,700	Nov. 29, 1940	924	3,224	2.30	31.25	2,234,000	4,144	40.20	3,000,000
1942	33,600	Dec. 20, 1941	1,120	4,951	3.56	48.29	3,606,000	4,976	48.24	3,602,000
1943	42,600	Nov. 24, 1942	890	6,521	4.66	63.22	4,721,000	5,518	53.49	3,995,000
1944	22,500	Dec. 4, 1943	1,150	3,587	2.56	34.87	2,604,000	3,501	34.04	2,542,000
1945	29,200	Feb. 18, 1945	1,150	5,064	3.62	49.11	3,666,000	5,801	56.25	4,199,000
1946	37,600	Dec. 29, 1945	1,280	6,781	4.84	65.75	4,910,000	7,732	74.97	5,598,000
1947	58,000	Dec. 13, 1946	1,090	6,476	4.63	62.81	4,689,000	6,267	60.77	4,537,000
1948	27,100	Oct. 20, 1947	1,350	7,191	5.14	60.90	5,220,000	6,527	63.46	4,735,000
1949	25,400	May 13, 1949	1,510	6,621	4.73	64.21	4,794,000	6,681	64.70	4,537,000
1950	38,900	Nov. 28, 1949	1,370	7,959	5.68	77.18	5,762,000	9,117	88.87	6,600,000
1951	51,200	Feb. 11, 1951	1,180	7,648	5.46	74.09	5,537,000	6,578	63.73	4,762,000
1952	23,500	Feb. 4, 1952	1,140	5,547	3.96	53.69	4,927,000	4,280	41.13	3,971,000
1953	37,100	Feb. 1, 1953	709	5,892	4.21	57.12	4,266,000			

* Estimated.

Salmon Creek near Toledo, Wash.

Location.—Lat. 46°24'45", long. 122°49'05", in NW¼ sec. 28, T. 11 N., R. 1 W., on right bank, 100 ft. downstream from Little Salmon Creek, 2¼ miles southeast of Toledo, and 3 miles upstream from mouth.

Drainage area.—79.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from topographic map).

Extremes.—June to September 1949: Maximum discharge, 20 cfs Sept. 17 (gage height, 2.31 ft.); minimum, 2.0 cfs Aug. 21 (gage height, 1.94 ft.).

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										4.13	3.02	4.97	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										2.6	2.3	2.6	

Olequa Creek at Winlock, Wash.

Location.—Lat. 46°29'20", long. 122°56'20", in NW¼ sec. 33, T. 12 N., R. 2 W., on left bank, at Winlock, 7 miles upstream from Stillwater Creek, and 10 miles upstream from mouth.

Drainage area.—33.7 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 260 ft. (from topographic map).

Extremes.—1949-50: Maximum discharge, 2,470 cfs Nov. 27, 1949 (gage height, 7.10 ft.); minimum, 0.4 cfs July 1, 1950 (gage height, 0.67 ft.).

Remarks.—Some diversion for domestic use. Possible slight regulation from mill-pond above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							28.3	24.9	8.47	5.00	5.17	5.02	
1950	6.91	133	211	293	380	226	70.3	18.3	8.69	4.53	5.71	4.72	112

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							17	10.5	1.0	2.9	4.4	3.6	
1950	2.2	6.3	6.6	80*	80*	68	32	8.8	4.4	.6	1.3	.6	0.6

* Estimated.

COWLITZ RIVER BASIN

Olequa Creek at Winlock, Wash.—Continued

Summary

WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR			
YEAR	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1949										
1950	2,470	Nov. 27, 1949	0.6	112	3.32	45.07	80,980			

Stillwater Creek near Vader, Wash.

Location.—Lat. 46°24'55", long. 122°59'40", in NE¼ sec. 25, T. 11 N., R. 3 W., on right bank, 1¼ miles northwest of Vader and 2½ miles upstream from mouth.

Drainage area.—25.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 170 ft. (from topographic map).

Extremes.—June to October 1949: Maximum discharge, 200 cfs Oct. 28 (gage height, 4.05 ft.), from rating curve extended above 12 cfs; minimum, 2.6 cfs Sept. 4, 5 (gage height, 1.69 ft.).

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									6.70	4.35	4.45	12.8	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949									4.2	3.4	2.6	4.0	

* Estimated.

North Fork Toutle River at St. Helen, Wash.

Location.—Lat. 46°20'40", long. 122°32'00", in SE¼ sec. 15, T. 10 N., R. 2 E., on left bank at highway crossing, half a mile northwest of St. Helen, and 3¼ miles upstream from confluence with Green River.

Drainage area.—124 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 878.03 ft. above mean sea level, unadjusted. Sept. 11 to Oct 2, 1909, staff gage at datum 9.00 ft. higher. Sept. 26, 1929, to Aug. 12, 1930, staff gage at same site and datum.

Extremes.—1909, 1929-33: Maximum discharge, 6,450 cfs Mar. 31, 1931 (gage height, 6.64 ft.), from rating curve extended above 1,600 cfs; minimum recorded, 153 cfs Oct. 19, 1931 (gage height, 1.39 ft.).

Flood of December 1933 reached a stage of 11.6 ft. (from high-water marks).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	183	176	733	433	1,170	590	575	653	489	254	190	172	463
1931...	219*	508	350	742	622	854	1,040	539	378	251	165	162	471*
1932...	324	654	700	626	672	1,330	1,060	934	907	554	303	235	710
1933...	311	1,590	1,160	1,130	505	837	718	930	1,500	790	418	443	861

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1930...	170	170	170	262	647	334	500	420	344	212	174	166	166
1931...	.....	508	270	304	407	500	494	385	236	208	172	170	.....
1932...	155	374	320	470	339	714	852	756	763	364	257	210	155
1933...	202	722	.....	636	398	578	564	750	1,010	508	306	279	202

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet	
1930.....	3,830†	Dec. 14, 1929	166	463	3.73	50.72	336,000	445	48.69	322,000	
1931.....	6,450	Mar. 31, 1931	.....	471	3.80	51.69	341,000	538	58.94	380,000
1932.....	4,080	Mar. 5, 1932	155	710	5.73	77.98	516,000	825	90.50	599,000	
1933.....	4,600	Dec. 2, 1932	202	861	6.94	94.23	624,000	.....	.....	.....

* Estimated.

† Maximum observed.

COWLITZ RIVER BASIN

Green River near Toutle, Wash.

Location.—Lat. 46°22'30", long. 122°33'50", in SW ¼ sec. 4, T. 10 N., R. 2 E., on left bank, 1 mile upstream from mouth, and 7 miles northeast of Toutle.

Drainage area.—131 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 740 ft. (from topographic map).

Extremes.—1946-50: Maximum discharge, 12,000 cfs Dec. 11, 1946 (gage height, 13.23 ft.), from rating curve extended above 2,600 cfs by logarithmic plotting; minimum, 52 cfs probably Sept. 4, 1947 (gage height, 2.63 ft., from recorded range in stage).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	358	945	1,061	594*	796	414	529	327	291	143	66.3	63.3*	540*
1948...	767*	1,185*	760	930	627	595	934	934	694	215	129	131	641*
1949...	254	800	917	239	861	713	599	934	440	226	95.4	76.9	515
1950...	229	599	791	916	1,194	1,134	805	674	549*	450	132	79.5	651*
1951...	474	1,066	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1947...	106	271	380*	275*	321	306	402	239	202	90	54*	52*	52*
1948...	65	490	406	275	208	268	376	424	456	127	97	72	65
1949...	141	233	302	154	133	411	348	471	251	154	67	57	57
1950...	56	148	352	255	406	556	461	420	604	224	84	56	56
1951...	74	364	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1947.....	12,000	Dec. 11, 1946	52	540	4.12	55.95	390,900	492	51.02	356,400
1948.....	3,870	Jan. 7, 1948	65	941	4.89	66.61	465,400	587	60.97	426,000
1949.....	4,630	Feb. 17, 1949	57	513	3.95	53.67	375,000	451	49.86	348,300
1950.....	4,900	Feb. 24, 1950	56	651	4.97	67.46	471,300	.....	.....	.....

* Estimated.

South Fork Toutle River at Toutle, Wash.

Location.—Lat. 46°19'20", long. 122°41'45", in SW¼NW¼ sec. 28, T. 10 N., R. 1 E., on left bank, half a mile southwest of Toutle, 1½ miles upstream from mouth, and 3 miles downstream from Johnson Creek.

Drainage area.—118 sq. mi.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (river-profile survey).

Average discharge.—14 years (1939-53), 588 cfs.

Extremes.—1939-53: Maximum discharge, 8,710 cfs Dec. 11, 1946 (elevation, 458.54 ft.), from rating curve extended above 4,500 cfs; minimum, 62 cfs Nov. 29, 1952; minimum elevation, 451.46 ft. Aug. 18, 19, 1940.

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	112	152	1,085	529	1,463	1,045	659	535	132	97.2	78.8	94.5	496
1941...	165	504	710	794	381	297	257	417	226	116	119	409	366
1942...	453	551	1,375	507	731	449	399	467	523	237	123	83.7	491
1943...	134	1,322	1,106	650	981	670	1,020	448	361	175	118	89.7	585
1944...	279	353	686	663	549	466	564	376	287	116	81.8	119	378
1945...	122	552	389	908	1,016	927	773	1,033	320	132	88.6	214	537
1946...	218	1,086	1,241	1,374	1,040	860	685	708	629	387	143	129	707
1947...	396	1,347	2,021	800	1,039	556	588	211	243	151	89.4	135	629
1948...	924	1,840	781	1,145	987	672	734	1,097	521	204	156	170	781
1949...	373	1,029	1,224	340	1,306	1,036	716	892	327	156	104	105	630
1950...	196	888	1,006	1,156	1,628	1,647	1,036	761	725	274	127	110	791
1951...	660	1,356	1,452	1,298	1,537	690	740	536	215	115	87.7	96.8	727
1952...	832	836	967	449	993	579	760	699	354	170	101	86.1	569
1953...	75.3	106	490	2,448	1,044	533	573	723	521	284	148	126*	592*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1940...	81	107	242	231	346	428	324	180	103	84	68	74	68
1941...	76	234	294	398	227	195	172	172	169	91	81	244	76
1942...	215*	216	459	291	291	235	327	291	311	160	97	74	74
1943...	74	344	712	330	375	210	576	339	262	118	90	78	74
1944...	74	158	248	352	314	283	389	273	167	89	71	67	67
1945...	82	194	175	206	385	350	557	714	181	102	76	76	76
1946...	123	415	420	538	578	554	372	548	491	194	122	104	104
1947...	101	256	384*	262	349	311	362	130	155	113	67	64	64
1948...	99	411	349	336	252	319	467	450	296	140	124	99	99
1949...	203	277	411	225	206	530	454	425	216	130	69	86	86
1950...	85	147	422	333	440*	708	580	628	524	159	106	94	85
1951...	103	380	790	550	468	303	398	285	138	92	82	69	69
1952...	197	256	400	224	376	320	536	500	242	108	92	72	72
1953...	68	72	85	514	345	280	400	458	397	144	104	96*	68

* Estimated.

COWLITZ RIVER BASIN

South Fork Toutle River at Toutle, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1940.....	5,820	Dec. 15, 1939	68	496	4.20	57.20	300,100	498	57.38	361,200
1941.....	3,880	Jan. 18, 1941	76	366	3.10	42.14	265,200	451	51.90	326,600
1942.....	6,770	Dec. 19, 1941	74	481	4.16	56.43	355,300	504	57.95	365,000
1943.....	6,490	Nov. 23, 1942	74	585	4.96	67.82	423,700	482	55.47	349,100
1944.....	4,560	Dec. 3, 1943	67	378	3.20	43.60	274,400	356	41.04	253,300
1945.....	7,290	Feb. 7, 1945	76	537	4.55	61.72	383,500	661	76.04	475,600
1946.....	6,140	Dec. 23, 1945	104	707	5.99	81.29	511,500	809	93.11	585,900
1947.....	8,710	Dec. 11, 1946	64	629	5.83	72.31	455,100	568	65.29	410,900
1948.....	4,720	①	99	731	6.19	84.27	530,400	696	80.27	505,200
1949.....	5,800	Feb. 17, 1949	86	630	5.34	72.42	455,700	584	67.23	423,000
1950.....	7,670	Mar. 5, 1950	85	791	6.70	90.04	572,300	906	104.25	650,100
1951.....	6,180	Feb. 11, 1951	69	727	6.16	83.62	526,200	669	75.55	477,300
1952.....	4,600	Feb. 4, 1952	72	569	4.82	65.64	413,000	403	46.50	292,500
1953.....	7,030	Jan. 19, 1953	65	592	5.02	68.10	425,500	.....	.....	.....

① Jan. 7, Mar. 22, 1948.

Toutle River near Silver Lake, Wash.

Location.—Lat. 46°20'10", long. 122°43'30", in SE¼ sec. 19, T. 10 N., R. 1 E., on right bank at highway bridge half a mile downstream from confluence of North and South Forks and 5 miles northeast of Silver Lake.

Drainage area.—474 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 407.3 ft. above mean sea level (river-profile survey). Sept. 4, 1909, to Aug. 3, 1912, staff gage 2 miles downstream at datum 100 ft. lower. Oct. 9, 1919, to Dec. 14, 1923, water-stage recorder 300 ft. downstream at different datum. Sept. 25, 1929, to Oct. 5, 1938, Oct. 30, 1950, to Apr. 16, 1952, water-stage recorder on left bank 50 ft. upstream at same datum. Oct. 6, 1938, to Oct. 29, 1950, water-stage recorder at same site and datum.

Average discharge.—29 years (1909-11, 1919-21, 1922-23, 1929-53), 1,986 cfs.

Extremes.—1909-12, 1919-23, 1929-53: Maximum discharge, 37,600 cfs Mar. 2, 1910 (gage height, 11.3 ft., from graph based on gage readings, site and datum then in use); maximum gage height recorded, 22.7 ft. Dec. 23, 1933; minimum discharge, 240 cfs Nov. 21, 1929.

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	649	7,380	3,320	2,970	3,450	6,440	2,890	1,510	974	609	415	393	2,600
1911...	1,150	4,350	2,470	2,200	1,260	1,350	1,360	2,630	1,720	765	393	610	1,690
1912...	510	3,090	1,970	4,220	3,760	1,240	1,310	1,930	1,560	938	.....	.....	.....
1920...	574	1,990	2,430*	2,430	1,550	2,060	2,910	1,940	1,840	569	410*	1,530	1,710*
1921...	3,300	2,550	3,330	4,630	4,130	3,890	2,720	2,620	2,210	1,570	760	775	2,720
1922...	1,300*	.....	.....	.....	.....	.....	.....	3,350	2,750	967*	482	518	.....
1923...	609	961	3,150*	6,740	1,830	2,200	2,250	2,150	1,860	1,040*	537	388	1,990*
1924...	690	838	2,300*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1930...	368	301	2,060	1,820	4,330	2,010	1,860	1,890	1,280	553	348	308	1,370

COWLITZ RIVER BASIN

Toutle River near Silver Lake, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second—Continued

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1931...	492	504	1,070	2,350	1,590	2,590	3,570	1,420	1,150	739	372	395	1,410
1932...	1,050	2,350	2,640	3,150	2,410	4,950	3,670	2,430	2,000	1,070	553	426	2,230
1933...	703	4,590	3,950	4,050	1,550	3,450	2,280	2,740	3,740	1,810	264	1,040	2,620
1934...	1,891	2,411	12,560	6,551	2,150	2,504	1,796	1,297	731	473	377	882	2,733
1935...	1,840	4,653	3,892	3,955	2,669	2,240	1,967	1,872	1,467	863	514	457	2,201
1936...	465	786	1,223	4,705	2,228	2,676	2,173	2,641	2,559	945	494	464	1,788
1937...	450	379	2,421	1,044	1,918	2,639	4,035	2,641	2,953	1,120	565	600	1,729
1938...	653	4,307	4,515	3,559	2,062	2,615	2,767	2,151	1,308	590	402	367	2,136
1939...	575	1,129	2,612	3,007	3,307	2,605	1,855	1,485	1,380	780	411	392	1,675
1940...	455	588	3,092	1,736	4,556	3,347	2,396	2,092	703	444	364	407	1,673
1941...	550	1,443	2,109	2,119	1,312	1,129	1,045	1,481	976	500	480	1,091	1,182
1942...	1,434	1,787	4,603	1,618	2,064	1,467	1,335	1,604	1,911*	921	501	360	1,634*
1943...	460	4,014	3,533	2,202	3,181	2,334	3,249	1,723	1,576	942	518	406	2,000
1944...	780	1,090	2,073	1,919	1,783	1,537	1,781	1,607	1,201	520	334	463	1,247
1945...	419	1,668*	1,368*	2,648	3,000	2,542	2,456	3,190	1,496	723	429	700	1,718*
1946...	633	3,237	3,939*	4,229	3,113	2,823	2,208	2,435	2,304	1,563	590	474*	2,293*
1947...	1,261	3,385	6,822	3,716	3,519	1,924	2,106	1,214	1,128	634	392	501*	2,160*
1948...	2,302	4,387	2,756	3,505	3,185	2,323*	2,595	3,444	2,300	925	662	665	2,421*
1949...	1,131	2,842	3,655*	1,219	3,893	2,949	2,256	3,117	1,500	833	497	460	2,017*
1950...	910	2,453	3,102	3,949	4,834	4,855	3,225	2,517	2,711	1,387	614	486	2,573
1951...	1,929*	4,054	4,583	4,189	4,379	2,215	2,271	1,950*	1,187	598	407	414	2,325*
1952...	2,231	2,549	3,353	1,661	3,098	1,935	2,315	2,228	1,375	816	443	362	1,864
1953...	314	369	1,219	6,657	3,526	1,876	1,871	2,250	1,732	1,075	581	481	1,827

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1910...	410	1,560	1,380	1,150	1,850	1,910	1,770	1,360	674	500	330	342	330
1911...	415	636	1,270	1,360	900	750	1,080	1,280	1,060	550	320	320	320
1912...	360	280	1,340	1,230	1,550	958	1,130	1,400	1,230	568			
1920...	399	1,220		1,100	996	996	2,100	1,530	1,320	457	209	347	289
1921...	1,630	996	2,030	1,960	2,170	1,820	1,620	2,170	1,620	948	666	601	601
1922...								2,520	1,680	480	371	327	
1923...	337	644		1,960	1,410	1,720	1,960	1,720	1,440		431	334	334
1924...	334	420	1,200										
1930...	280	255	255	743	2,290	1,020	1,460	1,120	804	410	300	270	255
1931...	273	365	761	885	995	1,320	1,530	1,000	792	468	325	320	273
1932...	295	1,100	1,110	1,510	1,080	2,690	2,770	1,770	1,530	677	452	355	295
1933...	325	1,380	1,570	1,960	1,200	2,210	1,716	2,130	2,610	1,010	581	539	325
1934...	689	1,170	1,130	3,310	1,210	1,170	1,150	824	617	400	320	305	305
1935...	315	2,050	2,050	1,580	2,000	1,430	1,530	1,680	1,040	555	460	368	315
1936...	342	359	640	1,600	1,060	1,550	1,450	1,930	1,270	618	400	354	342
1937...	372	355	355	730	813	1,420	2,246	1,840	1,940	655	492	469	255
1938...	439	737	1,650	2,300	1,700	1,700	1,740	1,700	970	418	366	328	328
1939...	336	966	1,190	2,050*	1,680	1,630	1,530	1,200	1,020	494	359	313	313
1940...	336	428	664	935	1,150	1,760	1,510	950	481	392	327	331	327
1941...	333	775	1,160	1,340	880	831	852	859	719	378	329	644	329
1942...	747	726	1,530	1,100	1,090	1,090	1,160	1,120	1,300*	610	406	329	329
1943...	308	1,060	2,400	1,360	1,540	960	2,020	1,400	1,270	602	415	350	308
1944...	316	628	960	1,210	1,190	1,090	1,340	1,250	778	375	289	272	272
1945...	320	760*	687	757	1,310	1,310	1,830	2,500	1,010	502	371	371	320
1946...	441	1,170	1,550*	1,970	1,950	2,000	1,480	1,940	1,830	548	455*	411	411
1947...	399	1,029	1,929	1,410	1,600	1,410	1,660	1,890	800	490	315*	310*	310*
1948...	325	1,950	1,710	1,280*	1,060*	1,270*	1,920	1,280	1,570	630	553	446	356
1949...	654	911	1,660	752	737	1,810	1,560	1,770	1,110	639	423	394	394
1950...	415	653	1,590	1,450	1,730	2,590	1,990	1,990	2,130	342	495	400	400
1951...	462	1,450	3,040	2,430	1,660	1,300	1,500	1,350	862	440	380	320	320
1952...	713	1,070	1,710	1,110	1,660	1,240	1,890	1,660	1,020	506	320	325	325
1953...	283	292	355	1,360	1,480	1,150	1,420	1,820	1,440	614	463	387	288

* Estimated.

COWLITZ RIVER BASIN

Toutle River near Silver Lake, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1910	37,600	Mar. 2, 1910	330	2,600	5.49	74.47	1,850,000	2,330	66.47	1,650,000
1911			320	1,690	3.57	48.37	1,220,000	1,490	42.63	1,050,000
1912	14,700	Jan. 14, 1912								
1920			299	1,770	3.61	49.05	1,240,000	2,100	60.36	1,530,000
1921										
1921	14,700	Dec. 30, 1920	601	2,720	5.74	77.82	1,970,000			
1922										
1923	16,500	Jan. 6, 1923	334	1,990	4.20	57.12	1,440,000	1,910	54.74	1,350,000
1924										
1930	10,800	Dec. 14, 1929	255	1,370	2.89	39.17	990,000	1,340	38.38	970,000
1931										
1931	20,000	Mar. 31, 1931	275	1,410	2.97	40.32	1,020,000	1,710	49.07	1,240,000
1932	15,600	Mar. 5, 1932	295	2,230	4.70	64.09	1,620,000	2,520	72.43	1,830,000
1933	13,300	Dec. 2, 1932	325	2,620	5.53	74.99	1,900,000	3,240	92.89	2,350,000
1934	34,300	Dec. 23, 1933	305	2,783	5.87	79.70	2,015,000	2,230	63.85	1,614,000
1935	19,500	Nov. 5, 1934	315	2,201	4.64	63.04	1,594,000	1,537	44.03	1,113,000
1936										
1936	15,700	Jan. 12, 1936	342	1,786	3.77	51.23	1,296,000	1,852	53.20	1,345,000
1937	17,400	Dec. 22, 1936	355	1,726	3.64	49.44	1,250,000	2,245	64.28	1,625,000
1938	20,300	Dec. 28, 1937	328	2,136	4.51	61.17	1,546,000	1,756	50.28	1,271,000
1939	15,400	Feb. 15, 1939	313	1,675	3.53	47.95	1,232,000	1,611	46.14	1,166,000
1940	12,800	Dec. 15, 1939	327	1,673	3.53	48.05	1,215,000	1,669	47.92	1,211,000
1941										
1941	9,410	Nov. 29, 1940	329	1,152	2.49	33.86	855,600	1,497	42.89	1,084,000
1942	21,400	Dec. 19, 1941	329	1,634	3.45	46.79	1,133,000	1,644	47.09	1,190,000
1943	20,500	Nov. 23, 1942	308	2,000	4.22	57.28	1,448,000	1,061	47.57	1,203,000
1944	12,300	Dec. 3, 1943	272	1,247	2.63	35.82	905,400	1,204	34.60	874,400
1945	14,900	Feb. 7, 1945	320	1,718	3.62	49.20	1,244,000	2,063	59.66	1,508,000
1946			411	2,293	4.84	65.67	1,660,000	2,604	74.56	1,685,000
1947	29,800	Dec. 11, 1946	310	2,160	4.56	61.86	1,584,000	1,991	57.00	1,441,000
1948	14,100	Nov. 8, 1947	356	2,421	5.11	69.51	1,758,000	2,266	65.07	1,645,000
1949	17,800	Feb. 17, 1949	394	2,017	4.26	57.74	1,460,000	1,919	54.94	1,390,000
1950	17,200	Feb. 24, 1950	400	2,573	5.43	73.66	1,862,000	2,919	83.58	2,113,000
1951										
1951	14,100	Feb. 11, 1951	320	2,338	4.93	66.94	1,692,000	2,137	61.20	1,547,000
1952	11,000	Feb. 4, 1952	325	1,664	3.98	53.53	1,353,000	1,338	38.42	971,100
1953	15,600	Jan. 19, 1953	288	1,827	3.85	52.32	1,323,000			

Cowlitz River at Castle Rock, Wash.

Location.—Lat. 46°16'30", long. 122°54'50", in SE¼ sec. 10, T. 9 N., R. 2 W., on right bank at highway bridge in Castle Rock, 2½ miles downstream from Toutle River, and 14 miles upstream from mouth.

Drainage area.—2,238 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 19.73 ft. above mean sea level, datum of 1929. Prior to Dec. 18, 1933, staff gage 2 miles upstream at datum 14.93 ft. higher. Dec. 18, 1933, to June 13, 1934, staff or wire-weight gages, and June 14 to Sept. 30, 1934, water-stage recorder at present site at datum 5.0 ft. higher.

Average discharge.—26 years (1927-53), 8,772 cfs.

Extremes.—1926-53: Maximum discharge, 139,000 cfs Dec. 23, 1933 (gage height, 31.6 ft., present datum), from rating curve extended above 65,000 cfs; minimum, 998 cfs Nov. 7, 8, 1935.

Remarks.—Small diversions for municipal and domestic use above station. No regulation.

COWLITZ RIVER BASIN

Cowlitz River at Castle Rock, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927				14,400	14,100	8,450	8,370	12,800	13,600	5,290	2,660	3,770	.....
1928	9,550	20,400	12,300	17,600	5,680	13,300	12,900	14,000	6,310	4,280	2,670	1,820	10,100
1929	3,300	3,920	6,080	5,650	4,250	9,050	10,000	14,200	12,560	4,760	2,320	1,660	6,450
1930	1,530	1,400	7,090	5,070	13,400	8,450	9,780	8,580	6,110	3,100	1,370	1,460	5,980
1931	1,990	3,240	3,910	10,600	8,600	10,600	16,000	8,920	5,660	3,070	1,830	1,590	6,300
1932	3,560	9,040	9,920	11,700	11,200	20,600	14,800	13,400	12,100	6,090	2,510	1,570	9,710
1933	2,330	29,400	16,700	17,100	7,010	12,000	9,510	12,700	10,200	9,760	4,160	3,890	11,500
1934	9,101	10,390	52,650	28,070	9,720	13,610	10,320	7,143	3,988	2,553	1,919	1,641	12,650
1935	7,275	20,290	17,350	17,030	11,660	9,009	8,068	10,640	9,515	5,419	3,184	2,295	10,140
1936	1,825	2,558	4,415	17,350	8,491	11,970	11,720	16,040	13,410	4,658	2,419	1,944	8,075
1937	1,578	1,233	8,435	3,891	8,300	10,920	16,540	14,220	10,420	6,321	2,671	2,366	7,726
1938	2,433	18,060	19,040	16,870	8,166	10,560	13,640	12,700	6,369	3,823	2,133	1,757	9,851
1939	2,213	6,334	11,120	13,010	12,550	10,450	10,130	10,310	7,913	4,560	2,294	1,857	7,723
1940	2,016	2,696	12,680	7,887	17,050	13,570	10,330	10,580	4,107	2,313	1,798	1,077	7,199
1941	2,172	5,004	9,031	8,537	5,175	4,822	4,966	6,704	4,396	2,448	1,863	3,430	4,881
1942	5,729	7,953	18,560	6,614	8,395	6,017	7,181	7,997	9,720	4,951	2,437	1,697	7,268
1943	1,627	16,190	16,170	9,880	13,910	9,289	10,340	9,828	9,990	6,373	2,699	1,951	9,468
1944	2,580	3,679	7,965	7,317	7,513	6,464	7,645	8,104	5,953	2,730	1,855	2,086	5,318
1945	2,040	4,229	5,651	12,390	13,230	9,518	9,594	15,510	8,012	3,659	2,095	2,591	7,415
1946	2,272	10,900	14,710	17,100	12,890	12,140	10,690	15,150	12,640	8,223	3,099	2,054	10,160
1947	4,436	13,320	26,760	12,090	14,800	9,123	10,970	9,078	6,758	4,018	2,170	2,199	9,615
1948	11,010	17,220	11,930	14,550	12,350	9,213	9,926	17,010	15,180	5,314	3,145	2,568	10,770
1949	4,505	10,930	15,000	4,865	14,050	12,960	12,030	19,290	11,220	6,093	3,051	2,346	9,665
1950	3,791	11,570	14,550	14,800	18,360	19,520	13,740	13,440	16,610	9,834	3,956	2,474	11,880
1951	7,845	18,170	21,980	17,000	21,520	10,050	11,660	12,120	7,082	4,094	2,305	1,843	11,270
1952	8,615	10,059	13,480	6,216	13,000	7,433	11,850	12,600	8,215	4,866	2,403	1,699	8,349
1953	1,362	1,301	3,586	26,710*	13,430*	7,406	8,626	12,290	10,680	7,293	3,158	2,206	6,539*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1927				6,550	6,150	6,150	5,450	9,450	7,750	3,480	2,140	2,450	.....
1928	4,590	4,860	5,800	5,800	3,880	3,680	8,550	8,550	4,860	2,940	1,990	1,620	1,620
1929	1,690	1,990	2,770	3,480	2,770	5,600	6,150	10,460	9,450	3,020	1,930	1,390	1,390
1930	1,390	1,230	1,340	3,020	9,000	3,870	7,750	5,600	4,110	2,260	1,510	1,280	1,230
1931	1,280	1,580	3,020	3,020	4,110	5,600	7,210	5,490	4,000	2,200	1,610	1,340	1,280
1932	1,270	4,390	3,870	6,020	3,870	10,100	10,100	8,500	8,800	3,210	1,980	1,340	1,270
1933	1,430	5,660	6,640	7,770	4,580	8,169	7,000	8,940	12,500	5,970	3,070	2,640	1,430
1934	3,070	4,530	4,780	16,100	6,050	6,740	7,430	5,380	2,870	2,120	1,760	1,290	1,290
1935	1,260	8,900	8,320	5,820	7,760	5,270	5,600	8,610	6,280	4,080	2,500	1,660	1,260
1936	1,380	1,050	2,200	6,040	3,750	6,780	5,480	11,600	6,530	3,090	2,040	1,570	1,050
1937	1,320	1,120	1,110	2,690	2,850	6,060	9,150	9,910	11,100	3,430	2,070	1,700	1,110
1938	1,520	2,920	7,300	9,470	6,240	6,660	7,350	9,200	6,220	2,610	1,890	1,520	1,520
1939	1,540	3,190	5,290	8,410	6,900	5,680	7,190	7,710	6,390	3,000	1,950	1,500	1,540
1940	1,520	1,030	2,890	3,330	4,880	8,130	7,250	5,450	2,710	2,040	1,660	1,480	1,480
1941	1,300	2,760	4,670	5,230	3,460	3,700	4,060	4,200	3,190	1,930	1,720	1,910	1,390
1942	2,670	2,900	7,190	4,420	4,240	4,120	5,520	5,650	6,730	3,060	1,880	1,560	1,560
1943	1,320	3,890	11,300	6,050	6,530	3,930	9,930	6,530	8,170	3,680	2,180	1,660	1,320
1944	1,670	2,990	3,450	4,480	4,670	4,250	5,420	6,650	4,020	2,230	1,660	1,550	1,550
1945	1,600	2,270	2,980	3,200	5,190	5,220	7,290	11,800	4,010	2,510	1,820	1,740	1,600
1946	1,610	4,990	5,950	8,040*	7,600*	8,820	6,410	11,300*	10,400	4,550	2,510	1,600	1,600
1947	1,340	3,670	7,450	5,840	7,590	6,720	8,460	6,750	5,250	2,920	1,660	1,340	1,340
1948	2,070	9,190	7,080	4,340	4,340	5,280	6,270	7,450*	9,720	3,770	2,620	1,710	1,710
1949	2,650	3,120	6,280	3,300*	3,050*	8,460	7,000	13,100	7,440	4,820	2,330	1,970	1,970
1950	1,810	3,070	8,520	6,080	7,590	10,600	8,800	8,530	11,900	5,920	2,930	2,000	1,810
1951	2,070	6,900	14,400	9,940	7,930	5,750	8,290	8,230	6,120	2,800	1,940	1,550	1,550
1952	3,050	5,150	7,210	4,220	6,860	4,840	8,830	8,080	5,090	2,960	1,860	1,480	1,480
1953	1,240	1,100	1,140	4,540	6,270	4,820	5,520	9,460	8,290	3,860	2,600	1,780	1,100

* Estimated.

COWLITZ RIVER BASIN

Cowlitz River at Castle Rock, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR				
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet
1927								10,400	63.26	7,550,000
1928	74,000	Nov. 25, 1927	1,620	10,100	4.51	61.09	7,300,000	7,650	46.47	5,560,000
1929	21,800	May 25, 1929	1,930	0,480	2.69	39.27	4,690,000	6,220	31.74	4,500,000
1930	30,200	Feb. 8, 1930	1,230	5,960	2.07	30.20	4,340,000	5,900	35.75	4,270,000
1931	65,900	April 1, 1931	1,280	6,300	2.81	38.21	4,570,000	7,430	45.00	5,380,000
1932	50,900	Mar. 6, 1932	1,270	9,710	4.33	59.00	7,050,000	11,300	68.71	8,210,000
1933	53,000	Nov. 14, 1932	1,430	11,500	5.13	69.51	8,300,000	14,100	85.33	10,200,000
1934	139,000	Dec. 23, 1933	1,290	12,680	5.66	76.35	9,182,000	10,340	62.69	7,490,000
1935	61,800	Nov. 6, 1934	1,260	10,140	4.53	61.42	7,339,000	7,114	43.11	5,150,000
1936	48,200	Jan. 12, 1936	1,050	8,075	3.60	49.07	5,892,000	8,290	50.37	6,018,000
1937	49,000	April 15, 1937	1,110	7,726	3.45	46.82	5,593,000	10,130	61.37	7,381,000
1938	62,900	Dec. 30, 1937	1,520	9,851	4.40	59.70	7,131,000	8,148	49.38	5,899,000
1939	43,600	Feb. 15, 1939	1,540	7,728	3.45	46.38	5,595,000	7,545	45.72	5,462,000
1940	41,900	Dec. 16, 1939	1,480	7,189	3.21	43.75	5,226,000	7,093	43.10	5,149,000
1941	26,400	Nov. 29, 1940	1,390	4,881	2.18	29.58	3,534,000	6,235	37.79	4,514,000
1942	58,100	Dec. 20, 1941	1,560	7,269	3.24	44.07	5,262,000	7,394	44.82	5,353,000
1943	60,500	Nov. 24, 1942	1,320	9,468	4.23	57.85	6,254,000	8,243	47.42	5,664,000
1944	37,100	Dec. 4, 1943	1,550	5,318	2.37	32.32	3,560,000	5,121	31.13	3,717,000
1945	45,300	Feb. 8, 1945	1,600	7,418	3.31	44.90	5,370,000	8,755	53.06	6,338,000
1946	54,700	Dec. 29, 1945	1,600	10,160	4.54	61.55	7,352,000	11,560	70.07	8,370,000
1947	85,100	Dec. 18, 1946	1,340	9,615	4.29	58.27	6,960,000	9,234	55.97	6,885,000
1948	38,500	Oct. 20, 1947	1,710	10,770	4.81	65.45	7,820,000	9,964	60.54	7,234,000
1949	51,600	Feb. 17, 1949	1,970	9,865	4.31	58.57	6,997,000	9,618	58.29	5,963,000
1950	54,800	Feb. 25, 1950	1,810	11,880	5.30	72.00	8,601,000	13,360	80.96	9,570,000
1951	67,200	Feb. 12, 1951	1,550	11,270	5.04	68.36	8,160,000	9,989	60.69	7,232,000
1952	41,400	Feb. 4, 1952	1,480	8,349	3.73	50.78	6,061,000	6,179	37.59	4,468,000
1953	60,000	Ⓢ	1,100	5,539	3.82	51.81	6,183,000			

Ⓢ Probably Feb. 1, 1953.

Arkansas Creek near Castle Rock, Wash.

Location.—Lat. 46°15'50", long. 122°58'00", in W½ sec. 17, T. 9 N., R. 2 W., on right bank, 3 miles upstream from mouth, and 3 miles west of Castle Rock.

Drainage area.—19.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 75 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 1,790 cfs Feb. 24, 1950 (gage height, 5.77 ft.); minimum, 1.3 cfs Aug. 22, 1951 (gage height, 0.63 ft.).

Remarks.—Minor diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949									13.2	7.19	4.65	5.00	.....
1950	16.2	111	242	205*	338	268	143	50.9	16.8	9.06	5.33	4.22	118*
1951	66.6	180	286	272	229	163	70.6	28.2	10.6	4.64	2.69	5.11	105
1952	83.1	139	200	104	165	94.6	54.6	22.1	11.3	5.52	3.55	2.89	73.5
1953	3.20	6.59	63.4	359	203	89.4	64.7	50.7	26.1	9.81	7.96	6.19	76.2

* Estimated.

Arkansas Creek near Castle Rock, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....									10.5	4.6	3.3	2.9	.....
1950....	4.0	12.5	83	111	135*	113	80	23	10.5	7.0	3.3	2.6	2.6
1951....	4.1	55	118	119	77	58	33	15	6.1	2.9	1.5	1.6	1.5
1952....	12	46	80	54	67	65	31	14.5	8.0	3.7	2.6	1.9	1.9
1953....	2.0	4.1	5.8	85	69	46	46	35	18	6.0	3.2	3.2	2.0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Minim- um day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1949.....												
1950.....	1,790	Feb. 24, 1950	2.6	116	5.98	81.21	84,030	125	87.79	90,830		
1951.....	950	Dec. 22, 1950	1.5	105	5.41	73.54	76,080	100	70.01	72,440		
1952.....	772	Feb. 4, 1952	1.9	73.5	3.79	51.59	53,380	44.3	31.12	32,190		
1953.....	1,250	Jan. 22, 1953	2.0	76.2	3.93	53.28	55,140					

Ostrander Creek near Kelso, Wash.

Location.—Lat. 46°11'45", long. 122°53'00", in NW¼ sec. 12, T. 8 N., R. 2 W., on left bank, 1 mile upstream from mouth, and 4 miles northeast of Kelso.

Drainage area.—25.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 30 ft. (from topographic map).

Extremes.—June to November 1949: Maximum discharge, 61 cfs Oct. 28 (gage height, 3.36 ft.); minimum, 1.7 cfs Aug. 28.

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1949.....								3.64	3.03	3.35	8.61		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1949.....								2.3	1.7	2.0	3.0		

* Estimated.

COWLITZ RIVER BASIN

Coweman River above Mulholland Creek, near Kelso, Wash.

Location.—Lat. 46°10'15", long. 122°43'00", in SW¼ sec. 17, T. 8 N., R. 1 E., on right bank, 300 ft. upstream from mouth of Mulholland Creek, and 9½ miles east of Kelso.

Drainage area.—50.5 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 450 ft. (from topographic map).

Extremes.—June to September 1951: Maximum discharge, 256 cfs Sept. 30 (gage height, 2.63 ft.); minimum, 17 cfs Sept. 15, 16, 22 (gage height, 1.20 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									61.1	33.2	23.9	30.4	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1951									37	25	19	18	

Coweman River near Kelso, Wash.

Location.—Lat. 46°07'40", long. 122°50'10", in S½ sec. 32, T. 8 N., R. 1 W., on right bank, 3 miles downstream from Goble Creek, 3.8 miles southeast of Kelso, and 7 miles upstream from mouth.

Drainage area.—119 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map).

Extremes.—1950-53: Maximum discharge, 4,910 cfs Jan. 22, 1953 (gage height, 11.15 ft.); minimum, 22 cfs Sept. 22, 1951; minimum gage height, 3.75 ft. Sept. 22, 1951, Oct. 7, 1952.

Flood of Feb. 24, 1950 reached a stage of 12.8 ft., from floodmarks (discharge, 7,730 cfs, from rating curve extended above 2,400 cfs on basis of slope-area determination of peak flow).

Remarks.—No known diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950										63.5*	44.3	37.5	
1951	299	883	892	1,274	876	687	335	198	54.6	44.6	31.4	38.5	472
1952	438	554	989	450*	721	599	363	219	104	56.4	37.5	30.3	380*
1953	31.0	51.3	418	1,615	781	532	385	378	262	95.8	67.1	53.3	383

* Estimated.

COWLITZ RIVER BASIN

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Coweman River near Kelso, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1950...										44	31	27	.....
1951...	37	540	430	464	370	271	169	113	50	32	24	22	22
1952...	87	171	398	250*	286	304	220	129	78	36	31	23	23
1953...	24	30	50*	433	325	235	280	205	167	66	45	40	24

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950.....													
1951.....	3,390	Jan. 2, 1951	22	472	3.97	53.82	341,700	462	52.63	334,200			
1952.....	3,840	Dec. 4, 1951	23	380	3.19	43.41	275,500	255	29.23	185,400			
1953.....	4,010	Jan. 22, 1953	24	338	3.26	44.28	281,000						

GERMANY CREEK BASIN

Germany Creek near Longview, Wash.

Location.—Lat. 46°11'50", long. 123°07'35", in NW¼ sec. 12, T. 8 N., R. 4 W., on left bank, half a mile upstream from mouth and 10 miles northwest of Longview.

Drainage area.—22.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 10 ft. (by barometer).

Extremes.—June to October 1949: Maximum discharge, 83 cfs Oct. 9 (gage height, 2.27 ft.), from rating curve extended above 30 cfs; minimum, 3.7 cfs Sept. 13, 14 (gage height, 1.28 ft.).

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949.....									10.5	6.70	6.91	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Annual
1949.....									7.2	5.1	4.0	.....	.....

* Estimated.

ABERNATHY CREEK BASIN

Abernathy Creek near Longview, Wash.

Location.—Lat. 46°12'10", long. 123°09'15", in SE¼ sec. 3, T. 8 N., R. 4 W., on left bank, 1 mile upstream from mouth and 11 miles northwest of Longview.

Drainage area.—20.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map).

Extremes.—1949-53: Maximum discharge, 2,700 cfs Feb. 24, 1950 (gage height, 6.66 ft.), from rating curve extended above 650 cfs; minimum, 3.6 cfs Oct. 5, 1952; minimum gage height, 0.94 ft. Sept. 4, 14, 1949, Oct. 5, 1952.

Remarks.—Some diversion for domestic use above station. Possibly slight regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....								53.4	10.1	11.5	8.37	9.09	.....
1950.....	29.7	148	278	166	372	324	160	55.4	24.9	13.7	11.3	9.42	182
1951.....	83.0	209	301	321	275	179*	76.3	34.8	17.7	9.89	7.34	11.2	127*
1952.....	112	160*	209*	100	220	128	71.9	29.5	16.7	9.47*	7.40	5.90	88.9*
1953.....	6.14	9.83	78.1	405	215	98.5	79.9	62.9	36.1	16.6	13.7	11.6	85.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949.....								25	16	8.6	6.7	5.7	.....
1950.....	7.2	21	110	65*	70*	154	84	32	15	10	7.8	6.0	6.0
1951.....	8.8	66	147	131	95	65*	39	24	10.5	7.9	5.7	5.2	5.2
1952.....	19	50*	90*	54	84	91	39	20	12	7.2	5.8	4.4	4.4
1953.....	4.2	6.6	8.0	86	78	53	33	47	26	11	8.6	8.0	4.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1949.....												
1950.....	2,700	Feb. 24, 1950	6.0	132	6.50	88.04	95,320	143	95.79	103,790		
1951.....	1,350	Dec. 22, 1950	5.2	127	6.26	84.61	91,610	117	78.36	84,830		
1952.....	1,220	Feb. 4, 1952	4.4	83.9	4.33	59.60	64,510	56.4	37.85	40,970		
1953.....	1,650	Jan. 22, 1953	4.2	85.6	4.22	57.26	62,000	.....	.....	.....

* Estimated.

Mill Creek near Cathlamet, Wash.

Location.—Lat. 46°11'40", long. 123°11'25", in NW¼ sec. 9, T. 8 N., R. 4 W., on left bank, 40 ft. downstream from small tributary, 50 ft. downstream from bridge, three-quarters of a mile upstream from mouth, and 9½ miles east of Cathlamet.

Drainage area.—27.6 sq mi.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (by barometer).

Extremes.—1949-53: Maximum discharge, 4,460 cfs Feb. 24, 1950 (gage height, 6.23 ft.); minimum, 4.6 cfs Aug. 21, 22, 1951 (gage height, 1.19 ft.).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										12.8	9.40	9.83	.....
1950	26.4	118	275	193*	524	349	154	59.8	27.9	14.2	10.2	9.22	144*
1951	62.7	215	326	380	257	211	81.6	34.7	17.8	10.2	6.51	9.23	184
1952	82.8	152	242	125	262	145	75.9	32.7	19.4	10.5	7.69	6.83	96.3
1953	6.28	10.4*	80.2	406	229	113	89.9	64.2*	42.0	18.7	14.5	11.4	89.6*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949										9.4	8.2	6.9	.....
1950	7.7	18*	103	72*	80*	183	88*	35	18.6	10.5	7.4	5.8	5.8
1951	8.0	68	165	146	112	75	41	24	10.5	7.1	5.0	5.2	5.0
1952	15	45	108	78	110	102	43	22	14	8.0	6.0	5.5	5.5
1953	4.8	6.6*	9.6	92	93	60	62	46*	30	12.5	9.2	8.3	4.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1949													
1950	4,460	Feb. 24, 1950	5.5	144	5.22	70.95	104,400	160	78.58	115,700			
1951	1,230	Dec. 23, 1950	5.0	134	4.86	65.88	96,990	123	60.61	89,230			
1952	1,170	Feb. 4, 1952	6.5	96.3	3.49	47.49	89,900	64.5	31.83	40,860			
1953	1,710	Jan. 22, 1953	4.8	89.9	3.26	44.22	65,090						

* Estimated.

ELOKOMIN RIVER BASIN

Elokomin River near Cathlamet, Wash.

Location.—Lat. 46°13'10", long. 123°20'30", in SE¼ sec. 31, T. 9 N., R. 5 W., on right bank, 125 ft. upstream from railroad bridge, 2½ miles northeast of Cathlamet, and 4½ miles upstream from mouth.

Drainage area.—65.8 sq. mi.

Gage.—Water-stage recorder. Datum of gage is 29.60 ft. above mean sea level, datum of 1929. Prior to June 25, 1941, staff gage at same site and datum.

Average discharge.—13 years (1940-53), 359 cfs.

Extremes.—1940-53: Maximum discharge, 7,300 cfs Feb. 17, 1949 (gage height, 12.66 ft.), from rating curve extended above 2,000 cfs on basis of slope-area determination of peak flow; minimum, 18 cfs Oct. 6, 7, 15, 16, 1952 (gage height, 1.80 ft.).

Maximum stage known, 17.2 ft. in December 1933, from information by local residents.

Remarks.—Some small diversion for irrigation above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1941...	151	343	415	563	232	186	137	207	96.4	48.7	45.9	194	219
1942...	251	485	926	326	466	324	170	175	234	112	58.4	36.0	298
1943...	123	990	958	359	926	367	496	168	118	55.7	42.5	30.9	357
1944...	105	206	563	463	417	379	357	151	108	54.9	35.0	69.6	242
1945...	89.7	347	302	756	712	765	398	199	82.6	43.9	29.5	77.7	316
1946...	66.4	704	898	958	980	590	402	128	103	100	44.2	45.5	417
1947...	195	792*	1,128*	747	730	335	308	111	112	69.8	42.5	59.5	384*
1948...	549	704	526	732	715	488	309	406	111	57.3	43.0	72.7	397
1949...	176	679	1,215	237	1,160	537	211	203	70.3	46.2	34.3	36.5	379
1950...	140	682	950	691	1,331	1,146	568	208	84.6	52.1	51.3	40.1	490
1951...	411	818	1,022	1,053	1,299*	640*	245	111	56.0	35.2	24.8	43.7*	467*
1952...	481	492	728	479	761	475	276	113	63.9	41.5	31.0	25.1	329
1953...	28.4	44.4	406	1,622	805	371	275	244	138	61.9	46.7	43.0	339

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1911...	35*	139	206	252	146	123	56	54	72	37	31	105	31
1942...	138	134	333	206	195	199	117	125	110	77	44	31	31
1943...	33	235	428*	160*	253	148	211	121	69	42	32	26	26
1944...	25	96	146	226	265	213	180	110	71	42	30	25	25
1945...	51	144	136	220	226	241	180	125	58	35	24	24	24
1946...	33	151	266	316	405	316	205	57	69	60	36	25	33
1947...	38	140*	229	167	229	191	187	72	75	51	35	33	33
1948...	43	248	241	182	152	210	266	174	70	42	36	26	26
1949...	96	144	346	143	180	316	171	95	57	36	28	25	25
1950...	27	102	349	251	298	507	308	109	58	40	35	26	26
1951...	24	250	408	423	340*	232	127	75	38	28	20	19*	19*
1952...	81	192	312	223	295	304	141	73	49	30	25	20	20
1953...	18	28	38	437	288	185	190	141	96	45	32	28	18

* Estimated.

Elokomin River near Cathlamet, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR			
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet
1941	3,400	Jan.17or18, 1941	31	219	3.33	45.11	153,300	282	53.21	204,300
1942	3,880	Dec. 19, 1941	31	298	4.53	61.45	215,700	334	68.37	241,700
1943	4,510	Nov. 23, 1942	26	337	5.83	79.80	280,000	285	58.75	206,200
1944	4,510	Dec. 3, 1943	25	242	3.68	50.14	175,900	231	47.69	167,300
1945	5,140	Feb. 7, 1945	24	315	4.79	64.91	227,800	393	81.00	284,300
1946	5,230	Dec. 28, 1945	33	417	6.34	86.12	302,200	455	93.88	329,500
1947	5,410	Jan. 25, 1947	33	384	5.84	79.16	277,500	355	73.33	257,300
1948	3,900	Jan. 1, 1948	26	397	6.03	82.12	289,200	422	87.23	306,100
1949	7,300	Feb. 17, 1949	25	379	5.76	78.16	274,300	354	72.95	256,000
1950	7,020	Feb. 24, 1950	26	490	7.45	101.11	354,300	530	109.21	384,000
1951	6,080	Feb. 9, 1951	19	467	7.10	96.29	337,900	421	86.82	304,700
1952	4,040	Feb. 4, 1952	20	320	5.00	68.16	239,200	227	46.92	164,600
1953	5,040	Jan. 22, 1953	18	339	5.15	69.87	245,200			

SKAMOKAWA CREEK BASIN

Skamokawa Creek near Skamokawa, Wash.

Location.—Lat. 46°18'00", long. 123°26'30", on line between sec. 32, T. 10 N., R. 6 W., and sec. 5, T. 9 N., R. 6 W., on left bank, three-quarters of a mile upstream from Wilson Creek, and 2 miles north of Skamokawa.

Drainage area.—17.4 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 29 ft. (by barometer).

Extremes.—1949-50: Maximum discharge, 2,400 cfs Feb. 24, 1950 (gage height, 8.06 ft.), from rating curve extended above 400 cfs on basis of slope-area determination; minimum 4.5 cfs Sept. 12-14, 1949.

Remarks.—Some diversion for domestic use above station. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							53.9	57.4	16.0	9.78	7.72	8.04	.....
1950	43.5	215	267	228	425	331	156	53.7	20.2	12.5	17.0	13.3	147

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							39	22	12	7.2	5.7	4.5	.....
1950	5.4	31	102	80*	80*	182	70	28	14	7.5	7.5	7.1	6.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1949													
1950	2,400	Feb. 24, 1950	5.4	147	8.45	114.50	106,200						

* Estimated.

GRAYS RIVER BASIN

Grays River near Grays River, Wash.

Location.—Lat. 46°22'40", long. 123°31'50", near center of sec. 3, T. 10 N., R. 7 W., on right bank, 1½ miles upstream from West Branch Grays River, and 4¼ miles north-east of town of Grays River.

Drainage area.—60.6 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 97 ft. (by barometer).

Extremes.—1949-51: Maximum discharge, 13,600 cfs Feb. 9, 1951 (gage height, 12.1 ft., from recorded range in stage); minimum, 27 cfs Sept. 13, 14, 1949 (gage height, 1.01 ft.).

Flood, of Feb. 22, 1949 reached a stage of 12.2 ft., from floodmarks (discharge, 14,000 cfs on basis of slope-area determination of peak flow).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							257	254	65.0	50.4	43.6	60.0	.....
1950	222	760*	1,103	707*	1,378*	1,275	713	262	94.8	79.6	166	94.3	567*
1951	774	1,154	1,383	1,277									

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							170	84	49	39	34	27	.....
1950	36	150*	464	240*	300*	536	274	124	73	46	52	55	38
1951	82	416	698	635									

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR						
	Momentary maximum		Min-imum day	Mean	Per square mile	Runoff		Mean	Runoff				
	Dis-charge	Date				Inches	Acre-feet		Inches	Acre-feet			
1949													
1950	5,670	Feb. 24, 1950	38	567	9.36	126.95	410,800	669	149.91	484,500			
1951													

* Estimated.

West Branch Grays River near Grays River, Wash.

Location.—Lat. 46°23'10", long. 123°33'30", on line between sec. 33, T. 11 N., R. 7 W., and sec. 4, T. 10 N., R. 7 W., on right bank, 1 mile upstream from mouth, and 3¼ miles northeast of town of Grays River.

Drainage area.—16.3 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 71 ft. (by barometer).

Extremes.—1949-53: Maximum discharge, 2,970 cfs Feb. 9, 1951 (gage height, 6.45 ft.), from rating curve extended above 460 cfs on basis of slope-area determination of peak flow at gage height 6.89 ft.; minimum, 4.2 cfs Sept. 5, 1951 (gage height, 1.78 ft.).

Flood of Feb. 22, 1949, reached a stage of 6.89 ft., from floodmarks (discharge, 3,700 cfs, from rating curve extended above 460 cfs on basis of slope-area determination of peak flow).

Remarks.—No diversion or regulation above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							48.7	57.8	16.5	13.0	12.3	14.0	.....
1950	58.6	322	284	256*	365*	347	156	52.9	22.2	16.8	54.1	26.5	162*
1951	114*	264	349	304	373	138	55.8	27.7	14.6	9.12	5.94	33.6	139*
1952	208	150	197*	192	206	156	78.0	40.7	34.2	18.0	15.6	10.6	109*
1953	9.51	28.0	189	598	220	112*	66.3*	80.8	43.0	19.9	14.0	24.6*	117*

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1949							33	19	13	8.6	9.3	8.1	.....
1950	10	51	63	76*	76*	111	62	25	15.5	8.1	13	13	8.1
1951	21	69	130	111	72	48	23	19	9.8	7.4	4.7	4.7	4.7
1952	52	55	70*	59	72	80	33	25	23	11.5	9.3	7.4	7.4
1953	5.7	9.5	18	160	56*	38*	45*	36	31	12	9.0	9*	5.7

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30						CALENDAR YEAR					
	Momentary maximum		Mini- mum day	Mean	Per square mile	Runoff		Mean	Runoff			
	Dis- charge	Date				Inches	Acre-feet		Inches	Acre-feet		
1949												
1950	2,830	Nov. 12, 1949	8.1	162	9.94	135.06	117,400	168	139.64	121,400		
1951	2,970	Feb. 9, 1951	4.7	139	8.53	116.94	100,900	125	104.17	90,560		
1952	2,070	Jan. 30, 1952	7.4	109	6.69	90.56	79,000	81.3	67.88	59,020		
1953	2,190	Jan. 22, 1953	5.7	117	7.18	97.52	84,770					

* Estimated.

GRAYS RIVER BASIN

Hull Creek at Grays River, Wash.

Location.—Lat. 46°21'20", long. 123°36'15", in NE¼ sec. 13, T. 10 N., R. 8 W., on right bank, a quarter of a mile east of Grays River, and half a mile upstream from mouth.

Drainage area.—11.9 sq. mi.

Gage.—Water-stage recorder. Altitude of gage is 5 ft. (by barometer).

Extremes.—July to November 1949: Maximum discharge recorderd, 309 cfs Nov. 11 (gage height, 5.05 ft.); minimum, 1.8 cfs Sept. 13, 14 (gage height, 2.03 ft.).

Indications are that stage was above 11 ft. Nov. 12, 1949 (discharge not determined).

Mean Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1949...								4.52	3.56	4.37	26.1		

Minimum Discharge, in Cubic Feet Per Second

YEAR	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Annual
1949...								3.1	2.6	2.0	3.2		

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