STATE OF WASHINGTON

DEPARTMENT OF CONSERVATION

EARL COE, Director

Water-Supply Bulletin No. 15

Monthly and Yearly Summaries of Hydrographic Data

IN THE

State of Washington

October, 1953 to September, 1960

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

STATE PRINTING PLANT OLYMPIA, WASH., 1962

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Little White Salmon River near Cook, Washington.

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PURPOSE OF REPORT

Because of the increasing use of water for domestic and industrial supply, irrigation, fish propagation, power development, and many other purposes, up-to-date streamflow data are needed. Water-Supply Bulletin No. 6 summarized streamflow records in the State of Washington to the end of September 1953. The present volume supplements those records with the period October 1953 to September 1960 and the 1953 calendar year.

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 Evelyn Hartfiel, Dianne Findley, and Teresa Borra under the direction of Marian L. Hollander with general supervision by William H. Krabler, 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 U. S. Geological Survey Water-Supply Papers. For records of daily discharge and other detailed information, reports listed in the following section should be consulted.

PUBLICATIONS

Numbers of Geological Survey water-supply papers in Pacific slope basins and upper Columbia River basin (Part 12), Snake River basin (Part 13), and lower Columbia River basin (Part 14), 1954-1960

YEAR	Part 12	Part 13	Part 14
1954	1346	1347	1348
1955	1396	1397	1398
1956	1446	1447	1448
1957	1516	1517	1518
1958	1566	1567	1568
1959	1636	1637	1638
1960	1716	1717	1718

MONTHLY AND YEARLY SUMMARIES
of
HYDROGRAPHIC DATA
STATE OF WASHINGTON

WATER-SUPPLY BULLETIN NO. 13

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 at downstream side of highway bridge, 1½ miles upstream from Salmon Creek, and 3½ miles east of Naselle.

Drainage area.—55.3 sq. mi.

Records available.—May 1929 to September 1960.

Gage.—Wire-weight gage, usually read twice daily, and crest-stage gage. Altitude of gage is 24 ft. (by barometer). Prior to Jan. 11, 1957, staff gage and crest-stage gage at site 150 ft. downstream at same datum.

Average discharge.—31 years (1929-60), 431 cfs (312,000 acre-ft. per year).

Extremes.—1929-60: Maximum discharge, 11,100 cfs Jan. 22, 1935 (gage height, 15.9 ft., from floodmarks), from rating curve extended above 4,000 cfs on basis of slope-area measurement at gage height 15.2 ft.; minimum observed, 19 cfs Sept. 12-14, 1949, Sept. 21-24, 1951; minimum gage height observed, 1.60 ft. Sept. 8, 1956.

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
1954...	260	735	1,106	1,045	1,412	403	464	97.6	197	131	85.7	111	498
1955...	242	847	640	584	559	550	770	186	96.0	124	101	71.1	396
1956...	526	1,166	1,262	1,092	502	1,213	315	82.0	215	72.6	47.6	86.9	550
1957...	639	478	930	309	817	743	402	107	75.1	66.3	98.2	42.9	390
1958...	159	429	1,035	943	1,007	332	560	125	73.3	38.4	27.9	55.3	395
1959...	245	1,095	840	1,160	550	548	560	337	211	90.0	45.7	363	503
1960...	519	790	697	590	897	532	548	378	148	55.7	45.1	36.6	434

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	133	293	350	323	444	165	146	72	87	82	60	82	60
1955...	78	136	293	326	205	245	302	122	70	67	56	49	49
1956...	55	290	427	311	205	396	124	56	55	47	37	29	29
1957...	75	193	170	129	239	332	185	71	53*	41	41	35	35
1958...	34	114	349	281	433	208	238	76	52	29	20*	23	20*
1959...	35	176	364	486	337	301	129	151	119	51	38	40	35
1960...	197	162	238	164	216	194	256	182	91	38	31	29	29

* Estimated.

Naselle River near Naselle, 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
1953								515	126.48	373,000
1954	5,630	Feb. 19, 1954	60	498	9.01	122.19	360,400	466	114.37	337,300
1955	4,640	Nov. 18, 1954	49	396	7.16	97.12	286,400	499	122.44	361,100
1956	5,990	Dec. 11, 1955	29	550	9.95	135.32	399,100	476	116.87	344,700
1957	6,990	①	35	390	7.05	95.83	282,600	355	87.03	256,700
1958	3,560	Jan. 15, 1958	20	395	7.14	97.00	286,100	441	108.16	319,000
1959	5,310	Jan. 23, 1959	35	503	9.10	123.41	364,000	489	119.97	353,800
1960	5,950	Nov. 22, 1959	29	434	7.85	106.94	315,400			

① Probably Dec. 10, 1956.

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.

Records available.—June 1953 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 80 ft. (from topographic map). Prior to Aug. 20, 1958, datum 0.26 ft. lower.

Average discharge.—7 years (1953-60), 117 cfs (85,430 acre-ft. per year).

Extremes.—1953-60: Maximum discharge (revised), 1,970 cfs Dec. 21, 1955 (gage height, 7.94 ft.); maximum gage height, 8.03 ft. Nov. 22, 1959; minimum discharge, 2.4 cfs Sept. 20, 1953 (gage height, 0.90 ft).

Remarks.—Slight regulation from millpond. Possibly some diversion for domestic use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	69.4	179*	283	297	365	100	126	18.0	39.9	25.4	14.9	26.7	127
1955	59.6	235	162	135	140	160	203	39.0	18.5	24.1	17.7	15.6	100
1956	179	317	365	289	166	332	71.0	14.6	46.0	14.1	8.00	19.2	152
1957	160	120	220	81.5	203*	191	93.9	24.7	13.9	9.79	17.8	5.91	94.6
1958	29.3	106	281	254	244	74.2	135	26.2	13.5	5.04	3.36	9.29	97.6
1959	58.9	300	212	300	125	135	138	74.3	45.0	18.5	6.08	71.4	124
1960	128	217	170	163	254	140	157	96.5	32.2	6.92	5.55	5.00	114

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	36	66*	80	86	102	34	38	12	12.5	13	9.2	18	9.2
1955	16	32	68	65	43	65	75	24	12.5	10.5	8.9	6.8	6.8
1956	11	70	111	80*	44	85	23	8.3	8.6	6.3	4.5	3.1	3.1
1957	17	43	39	33*	56	88	41	14	8.6	5.5	5.8	3.8	3.8
1958	4.1	24	83	65	92	45	51	13.5	8.2	2.6	1.3	2.7	1.3
1959	7.3	42	79	106	78	61	77	30	26	8.0	4.6	5.1	4.6
1960	51	37	52	38	48	42	63	42	14.5	4.0	2.8	3.4	2.8

* Estimated.

Naselle River near Naselle, 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
1954	1,440	Jan. 4, 1954	9.2	127	7.74	105.28	92,070	121	99.88	87,360
1955	1,600	Nov. 18, 1954	6.8	100	6.10	82.96	72,580	134	111.21	97,280
1956	1,970	Dec. 21, 1955	3.1	152	9.27	126.29	110,400	122	101.30	88,600
1957	1,050	Dec. 10, 1956	3.8	94.6	5.77	78.27	68,460	87.6	72.48	63,390
1958	1,590	Jan. 14, 1958	1.3	97.6	5.95	80.79	70,660	110	91.18	79,770
1959	1,740	Nov. 12, 1958	4.6	124	7.56	102.24	89,440	119	98.51	86,160
1960	1,880	Nov. 22, 1959	2.8	114	6.95	94.63	82,760	.....	.....	.....

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.

Records available.—February 1946 to September 1954. Annual maximum discharge only, water years, 1955-58, 1960.

Gage.—Water-stage recorder. Altitude of gage is 60 ft. (from topographic map). After September 1954, stilling well and crest-stage gage only, at same site and datum.

Average discharge.—8 years (1946-54), 122 cfs (88,320 acre-ft. per year).

Extremes.—1946-58, 1960: Maximum discharge, 1,700 cfs Jan. 23, 1953 (gage height, 8.58 ft.).

1946-54: Minimum discharge, 4.7 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
1954	56.5	184	329	336	368	119	118	29.2	53.7	41.0	26.7	31.5	140

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	28	66	107	102	117	51	43	22	23	24	18	24	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
1953	.....	.....	.....	.....	.....	.....	.....	138	104.33	100,200
1954	1,490	Dec. 9, 1953	18	140	7.78	105.31	101,100	.....	.....	.....

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.

Records available.—June 1948 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 154.0 ft. above mean sea level, datum of 1959, supplementary adjustment of 1947.

Average discharge.—12 years (1948-60), 196 cfs (141,900 acre-ft. per year).

Extremes.—1948-60: 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, Sept. 7, 1958.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	76.1	262	456	628	772	213	202	37.9	45.9	26.8	17.1	26.9	227
1955...	91.5	344	294	256	246	272	345	80.8	27.4	26.1	14.5	13.4	167
1956...	161	633	688	610	270	605	169	39.8	56.5	16.3	10.0	18.6	274
1957...	104	180	345	145	422	341	182	52.5	24.6	13.9	11.5	4.80	156
1958...	29.8	110	443	450	424	160	254	55.4	21.0	8.07	5.70	5.99	163
1959...	46.7	403	322	531	231	235	214	136	51.3	19.5	11.0	58.7	188
1960...	116	285	269	234	431	272	285	160	44.4	14.9	13.2	12.7	177

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	35	91	138	169	222	82	65	26	26	15.5	12	17	12
1955...	17	47	130	126	91	158	150	43	18	14.5	7.4	5.6	5.6
1956...	9.8	133	250	178	112	228	70	21	22	7.6	6.3	6.9	6.3
1957...	14.5	74	68	69*	115	176	97	32	13.5	8.6	5.3	3.0	3.0
1958...	4.7	24	118	129	197	116	125	27	11.5	4.7	4.3	3.0	3.0
1959...	4.7	29	139	186	141	116	60	56	31	10.5	8.5	8.5	4.7
1960...	38	48	94	65*	103	92	122	80	24	10.5	8.5	9.8	8.5

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
1953								215	70.47	155,600
1954	2,910	Feb. 19, 1954	12	227	5.48	74.42	164,300	221	72.55	160,200
1955	1,890	Nov. 18, 1954	5.6	167	4.03	54.66	120,700	230	75.32	166,300
1956	2,850	Dec. 21, 1955	6.3	274	6.62	89.95	198,600	208	68.27	150,700
1957	3,340	Dec. 9, 1956	3.0	156	3.77	51.02	112,600	147	48.15	106,300
1958	2,940	Dec. 25, 1957	3.0	163	3.94	53.28	117,700	178	58.26	128,700
1959	2,240	Nov. 18, 1958	4.7	188	4.54	61.63	136,100	180	58.92	130,100
1960	2,890	Nov. 21, 1959	8.5	177	4.28	58.18	128,500			

* Estimated.

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.

Records available.—June 1953 to September 1960.

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

Average discharge.—7 years (1953-60), 151 cfs (109,300 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 3,500 cfs Dec. 9, 1956 (gage height, 7.75 ft.), from rating curve extended above 940 cfs on basis of slope-area measurement of peak flow; minimum, 3.4 cfs Sept. 6-8, 1958; minimum gage height, 1.57 ft. Aug. 26, 27, Sept. 6-8, 1958.

Remarks.—Small diversion to State fish hatchery 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
1954...	102	232	350	402	558	156*	168	30.5	52.5*	27.4*	18.3*	29.2	175
1955...	88.3	258	212	170	185	202	250	69.6	26.0	36.2	22.1	20.9	128
1956...	180	435	426	416	158	466	131	31.3	65.6	19.2	11.0	21.2	197
1957...	192	138	307	98.5	287	254	127	34.9	18.9	22.0	19.9	7.34	125
1958...	47.9	107	347	327	307	107	195	37.4	19.0	7.77	5.37	10.4	125
1959...	68.1	357	254	398	169	189	217	105	50.7	20.0	8.03	90.8	160
1960...	123	243	229	187	340	214	216	121	46.4	16.8	14.7	11.2	146

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	41	88	90	101	135	66	48	21	26	16*	13	19	13
1955...	18.5	38	87	89	64	85	104	38	17	14.5	10	9.0	9.0
1956...	13.5	77	138	103	72	119	56	17	16	10.5	7.2	6.6	6.6
1957...	16	53	48	46	65	109	62	20	12.5	9.6	9.0	5.4	5.4
1958...	6.3	23	86	81	132	83	79	21	11	5.3	3.6	3.4	3.4
1959...	5.6	38	91	129	85	79	41	42	27	9.2	5.9	7.1	5.6
1960...	35	37	60	52	75	66	85	66	27	10.5	7.1	6.7	6.7

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
1954	2,430	Feb. 19, 1954	13	175	8.58	116.32	126,600	164	109.16	118,800
1955	1,820	Nov. 18, 1954	9.0	128	6.27	84.99	92,490	168	111.97	121,900
1956	2,270	Mar. 23, 1956	6.6	197	9.66	131.66	143,300	164	109.29	118,900
1957	3,500	Dec. 9, 1956	5.4	125	6.13	82.98	90,320	113	75.44	82,100
1958	1,920	Dec. 25, 1957	3.4	125	6.13	83.44	90,800	140	93.04	101,200
1959	2,450	Nov. 12, 1958	5.6	160	7.84	106.68	116,100	153	102.11	111,100
1960	2,320	Feb. 6, 1960	6.7	146	7.16	97.31	105,900	.....	.....	.....

* Estimated.

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.

Records available.—August 1947 to December 1954 (fragmentary prior to August 1948). Annual maximum discharge only, water years, 1955-56, 1958-59.

Gage.—Water-stage recorder. Datum of gage is 5.69 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to July 28, 1948, at site 60 ft. upstream at different datum. After December 1954, stilling well at same site and datum.

Average discharge.—6 years (1948-54), 706 cfs (511,100 acre-ft. per year).

Extremes.—1947-56, 1958-59: Maximum discharge, 11,400 cfs Feb. 22, 1949 (gage height, 24.22 ft.), from rating curve extended above 7,300 cfs.
1947-54: Minimum discharge, 15.5 cfs Sept. 22, 1951 (gage height, 2.93 ft.).

Remarks.—Some diversion for domestic use and irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	281	917	1,786	2,133*	2,523*	750*	730	145	208	126	73.5	109	805
1955	316	1,141	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	131	345	624	650*	750*	290*	235	98	111	66	50	74	50
1955	69	167	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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
1953	.....	.....	.....	.....	.....	.....	.....	756	78.96	547,500
1954	8,240	Feb. 19, 1954	50	805	6.19	84.00	582,500	.....	.....	.....
1955	①6,150	Nov. 18, 1954	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.
① Maximum during period October to December.

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.

Records available.—May 1953 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 155 ft. (from topographic map). Prior to Aug. 7, 1957, at site 40 ft. upstream at same datum.

Average discharge.—7 years (1953-60), 167 cfs (120,900 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 2,060 cfs Dec. 11, 1955 (gage height, 6.92 ft.); minimum discharge, 18.5 cfs Sept. 22-26, Oct. 12, 1957; minimum gage height, 1.38 ft. Sept. 20-22, 1953.

Remarks.—Some slight 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
1954...	66.7	184	441	428	491	195	170	64.7	64.6	47.5	40.7	50.9	185
1955...	63.3*	202	234	250	241	249	294	92.6	53.8	49.1	42.1	30.5	149
1956...	121	354	502	482	285*	454	153	62.3	69.0	41.0*	30.5*	36.3	216
1957...	171	193	345	148	251	286	156	72.4	46.1	33.1	27.0	21.1	145
1958...	39.5	91.5	279	301	328	163	204	82.9	47.0	29.8	24.0	28.4	134
1959...	70.0	327	250	364	209	199	225	150	90.1	52.3	34.5	93.0	172
1960...	160	262	269	191	353	200	203	170	85.3	43.5	32.1	27.5	166

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	44	92	172	190	192	106	95	48	46	36	30	36*	30
1955...	29*	53	135	150	120	138	143	66	45	36	31	26	26
1956...	30	133	254	180	115*	175	85	46	44	32*	22*	22	22
1957...	20	102	97	98	117	180*	98	52	37	26*	21	18.5	18.5
1958...	20	27	80	146	185	119	113	57	38	25	20	19.5	19.5
1959...	23	55	151	201	164	151	89	93	69	36	29	30	23
1960...	76	87	122	103	139	130	126	107	60	34	26	22*	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
1954	1,960	Dec. 9, 1953	30	185	6.78	92.11	134,100	169	83.93	122,200
1955	1,330	Feb. 8, 1955	26	149	5.46	74.26	108,100	190	94.26	137,200
1956	2,060	Dec. 11, 1955	22	216	7.91	107.73	156,800	194	96.63	140,700
1957	1,900	Dec. 9, 1956	18.5	145	5.31	72.33	105,300	120	59.82	87,120
1958	956	Jan. 24, 1958	19.5	134	4.91	66.50	96,830	153	76.21	111,000
1959	1,370	Nov. 12, 1958	23	172	6.30	85.31	124,200	176	87.29	127,100
1960	1,390	Dec. 15, 1959	22	166	6.08	82.58	120,200	.....	.....	.....

* Estimated.

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.

Records available.—June 1953 to September 1960.

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

Average discharge.—7 years (1953-60), 113 cfs (81,810 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 2,640 cfs Dec. 9, 1956 (gage height, 8.69 ft.); minimum, 5.4 cfs Aug. 22, 23, 1958, Aug. 8, 9, 10, 1960; minimum gage height, 0.34 ft. Aug. 22, 23, 1958.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	31.2	147	339	322	374	133	124	33.2	32.5	19.1	20.3	42.6	133
1955...	49.3*	157*	174	165	169	175	173	53.9	25.8	20.3	11.6*	12.0*	98.3
1956...	108	292	366	316	155*	306*	94.8	29.1	33.5	13.3	10.3*	14.8	145
1957...	110	123	256	78.4	192	194	103	39.4	20.2	12.2	9.62	6.87	95.0
1958...	22.1	62.9	212	214	206	105	144	43.1	24.4	10.7	8.24	12.4	88.0
1959...	46.8	284	202	279	130	123	148	94.6	40.6	17.8	11.0	43.5	118
1960...	91.6	233	240	141	255	148	139	98.2	35.3	12.0	10.4	8.74	117

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	12.5	58	112	122	152	64	53	24	22	12.5	12	20	12
1955...	19*	38*	96	98	71	98	83	35	18	12.5	7.9*	7.5*	7.5*
1956...	11	83	154	110	89	115*	45	19	18	9.1	7	6.2	6.2
1957...	11	56	52	31	67	98	63	24	14	8.7	6.3	6.0	6.0
1958...	7.0	13	59	86	121	73	63	28	13	6.2	5.4	6.2	5.4
1959...	9.0	28	107	137	107	84	43	43	26	11.5	9.4	12	9.0
1960...	24	35	79	55	84	75	69	57	19.5	7.6	5.8	6.7	5.8

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
1954	1,490	Dec. 9, 1953	12	133	4.46	60.79	96,590	122	55.47	88,140
1955	1,200	Feb. 8, 1955	7.5	98.3	3.30	44.77	71,170	131	59.55	94,650
1956	2,270	Dec. 11, 1955	6.2	145	4.87	66.38	105,500	122	55.86	88,770
1957	2,640	Dec. 9, 1956	6.0	95.0	3.19	43.26	68,760	78.8	35.88	57,030
1958	879	Dec. 25, 1957	5.4	88.0	2.95	40.09	63,700	108	49.05	77,940
1959	1,950	Nov. 12, 1958	9.0	118	3.96	53.90	85,670	121	55.09	87,570
1960	2,160	Dec. 15, 1959	5.8	117	3.93	53.48	85,040	.....	.....	.....

* Estimated.

North River near Raymond, Wash.

Location.—Lat. 46°48'30", long. 123°51'00", in sec. 6, T. 15 N., R. 8 W., on left bank 1¼ miles upstream from Salmon Creek and 10 miles northwest of Raymond.

Drainage area.—219 sq. mi.

Records available.—August 1927 to September 1960.

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

Average discharge.—33 years (1927-60), 954 cfs (690,700 acre-ft. per year).

Extremes.—1927-60: Maximum discharge, 35,000 cfs Dec. 10, 1933 (gage height, 15.8 ft., from floodmarks), from rating curve extended above 7,500 cfs; minimum, 21 cfs Aug. 24, 1951 (gage height, 1.01 ft.).

Remarks.—Some diversion for farm and domestic use. No regulation.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water years 1952 and 1953, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff		Momentary maximum		Minimum day
			Inches	Acre-feet	Discharge	Date	
December 1951	1,980						687
Calendar year 1951	1,103	5.49	74.48	798,400			
January 1952	1,567						628
February	1,708						567
March	890						522
April	608						300
May	351						178
June	161						116
July	78.7						56
August	63.9						44
September	46.4						37
Water year 1951-52	817	4.06	55.31	592,900	5,640	Feb. 5, 1952	37
October 1952	42.4						32
November	120						
December	1,292						83
Calendar year 1952	575	2.86	38.95	417,500			
January 1953	4,649						
February	2,289						674
March	940						435
April	622						440
May	592						319
June	314						236
July	129						78
August	90.0						56
September	79.8						
Water year 1952-53	926	4.61	62.53	670,300	9,040	Jan. 24, 1953	32

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	346	1,434	2,958	2,926	3,247	1,064	1,021	254	279	192	150	378	1,175
1955	494	1,682	1,436	1,479	1,419	1,522	1,827	416	191	175	131	94.1	901
1956	1,112	2,734	3,151	2,756	1,367	2,882	848	210	329	115	75.8	107	1,310
1957	1,154	1,187*	2,305	811	1,771	1,899	911	318	170	99.4	79.5	52.4*	893
1958	206	616	2,047	2,187	2,121	894	1,129*	342*	184*	71.1*	45.1*	101	822
1959	474	2,714	1,746	2,586	1,212	1,098	1,449	876	374	150	69.3	505	1,102
1960	874	2,208	1,986	1,396	2,286	1,221	1,280	888	330	106	82.3*	69.1	1,055

* Estimated.

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
1954...	144	555	932	994	1,110	495	400	176	174	104	76	213	76
1955...	187	300	778	828	561	771	729	271	129	93	65	58	58
1956...	84	820	1,230	1,000	648	948	315	133	133	70	55	42	42
1957...	81	470*	430	450*	591	986	500	187	118	70	50*	41*	41*
1958...	55*	131	533	743	1,090	620*	500*	220*	85*	41*	32	40	32
1959...	61	289	940	1,210	902	736	355	360	240	86	61	81	61
1960...	271	323	708	511	641	555	622	533	178	65	54*	54	54

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
1953								1,201	74.45	869,600
1954	9,240	Jan. 6, 1954	76	1,175	5.37	72.82	850,600	1,079	66.86	780,800
1955	6,710	Nov. 19, 1954	58	901	4.11	55.83	652,100	1,185	73.47	858,200
1956	7,940	Dec. 13, 1955	42	1,310	5.98	81.43	951,100	1,115	69.33	809,600
1957	8,840	Dec. 9, 1956	41	893	4.08	55.35	646,300	743	46.08	538,300
1958	5,560	Dec. 27, 1957	32	822	3.75	50.91	594,800	991	61.41	717,500
1959	8,480	Nov. 13, 1958	61	1,102	5.03	68.28	797,700	1,115	69.08	806,900
1960	11,500	Nov. 22, 1959	54	1,055	4.82	65.54	765,600			

CHEHALIS RIVER BASIN

Chehalis River near Doty, Wash.

Location.—Lat. 46°37'00", long. 123°16'40", in NW¼ sec. 14, T. 12 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.

Records available.—October 1939 to September 1960.

Gage.—Staff gage, read twice daily, and crest-stage gage. Datum of gage is 302.1 ft. above mean sea level (river-profile survey).

Average discharge.—21 years (1939-60), 571 cfs (413,400 acre-ft. per year).

Extremes.—1939-60: Maximum discharge, 18,100 cfs Feb. 7, 1945 (gage height, 17.80 ft., water over gage, discharge based on observer's estimate of maximum gage height); minimum observed, 18 cfs Oct. 14, 1952, Aug. 25-28, 1958; minimum gage height, 0.84 ft. Aug. 25-27, Sept. 21, 22, 1951, Aug. 25-28, 1958.

Remarks.—No regulation or diversion above station.

Revision.—The momentary maximum discharge for the water year 1946 published in State WSB No. 6 has been revised to 8,170 cfs Dec. 28, 1945.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	335	835	1,505	1,634	2,354	613	726	127	172	97.2	60.0	122	704
1955...	290	1,084	892	810	795	805	1,069	332	119	100	68.7	82.3	535
1956...	761	2,131	2,289	2,004	509	1,870	747	178	224	74.9	47.7	48.2	911
1957...	536	537	1,134	412	1,330	1,144	520	165	99.1	71.1	54.1	32.9	498
1958...	143	385	1,485	1,412	1,342	444	778	175	90.5	41.8	24.0	40.3	520
1959...	244	1,508	934	1,695	733	758	846	412	182	79.8	39.4	357	647
1960...	514	967	961	650	1,333	965	961	454	171	60.9	57.1	45.5	591

* Estimated.

Chehalis River 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
1954...	128	344	380	480	702	275	198	92	92	60	44	60	44
1955...	68	132	376	395	267	309	470	175	85	57	41	33	33
1956...	57	340	822	470	300	495	309	96	92	46	31	27	27
1957...	34	198	184	210*	323	480	271	109	68	48	35	26	26
1958...	33	88	332	376	575	332	340	99	62	27	18	20	18
1959...	28	115	440	545	412	349	182	166	112	48	32	43	28
1960...	151	146	267	195	302	267	344	259	101	40	32	35	32

* 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
1953								690	82.90	499,800
1954	9,100	Jan. 5, 1954	44	704	6.23	84.57	509,800	669	80.34	484,200
1955	6,400	Feb. 8, 1955	33	535	4.73	64.23	387,100	779	93.63	564,200
1956	11,000	Dec. 11, 1955	27	911	8.06	109.69	661,100	663	79.85	481,200
1957	12,600	①	26	498	4.41	59.86	360,800	482	57.94	349,200
1958	6,540	②	18	526	4.65	63.13	380,600	580	69.62	419,600
1959	③7,940	Nov. 12, 18, 1958	28	647	5.73	77.77	468,700	628	75.47	454,800
1960	9,180	Dec. 15, 1959	32	591	5.23	71.25	429,400			

① Probably Dec. 9, 1956.
② Probably Dec. 24, 1957.
③ Maximum observed.

South Fork 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 right bank 0.9 mile upstream from Lost Creek and 1¾ miles east of Onalaska.

Drainage area.—42.4 sq. mi. (revised).

Records available.—July to October 1942, July to October 1943, July 1944 to November 1948, June 1957 to September 1960. October 1943 to September 1958, published as Newaukum River near Onalaska.

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.

Average discharge.—7 years (1944-48, 1957-60), 208 cfs (150,600 acre-ft. per year).

Extremes.—1942-48, 1957-60: Maximum discharge, 3,810 cfs Dec. 11, 1946 (gage height, 8.40 ft.); minimum, 17.5 cfs Sept. 6-8, 1958 (gage height, 1.26 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
1957...									84.7*	50.4*	38.1*	26.3*	
1958...	53.1*	168*	389*	352	374	189	280	93.8	65.6	39.5	23.3	29.3	170
1959...	60.7	429	348	458	262	257	250	187	128	60.8	37.5	119	216
1960...	226	408	308	195	361	265	329	272	102	43.3	47.0	40.9	215

* Estimated.

South Fork 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
1957	.....	.....	.....	.....	.....	.....	.....	.....	59	36*	27*	23*	.....
1958	28*	49*	160*	180	229	142	110	60	39	28	19	18.5	18.5
1959	21	46	168	233	190	175	98	100	82	40	31	35	21
1960	75	89	168	110	140	127	180	158	60	34	30	31	30

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
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1958	1,060	Dec. 26, 1957	18.5	170	4.01	54.46	123,200	189	60.42	136,600
1959	2,190	Nov. 12, 1958	21	216	5.09	69.14	156,400	225	71.99	162,800
1960	2,190	Nov. 23, 1959	30	215	5.07	69.18	156,400	.....	.....	.....

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 left bank 1¼ miles upstream from Lucas Creek and 5½ miles northeast of Forest.

Drainage area.—31.5 sq. mi. (revised).

Records available.—July to November 1944. July 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 380 ft. (from topographic map). July 25 to Nov. 6, 1944, at site 150 ft. upstream at different datum.

Extremes.—1944, 1957-60: Maximum discharge, 1,720 cfs Nov. 12, 1958 (gage height, 5.17 ft.); minimum, 1.2 cfs Aug. 20, probably 26, 1958 (gage height, 0.96 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	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	15.6	13.6	4.83	.....
1958	16.5	75.0	210	190	215	99.1	142	44.7	26.7	7.84	2.70	7.26	85.6
1959	25.4	242	213	313	169	141	128	96.0	61.0	25.9	13.0	35.4	122
1960	82.8	208	183	117	215	174	182*	131	44.2	13.9	15.3	10.4	114

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.3	5.8	2.8	.....
1958	4.0	12	72	92	120	64	50	26	12	3.0	1.3*	1.5	1.3*
1959	4.2	20	91	150	118	93	50	49	38	13.5	8.9	11	4.2
1960	24	39	88	60	74	66	90*	78	25	7.6	5.0	6.8	5.0

* Estimated.

North Fork Newaukum River near Forest, 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
1957										
1958	594	Dec. 25, 1957	1.3	35.6	2.72	36.91	61,960	100	43.38	72,610
1959	1,720	Nov. 12, 1958	4.2	122	3.87	52.38	87,960	121	52.18	87,640
1960	1,490	Nov. 20, 1959	5.0	114	3.62	49.35	82,900			

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.—155 sq. mi. (revised).

Records available.—March 1929 to September 1931, July 1942 to September 1960.

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

Average discharge.—20 years (1929-31, 1942-60), 506 cfs (366,300 acre-ft. per year), unadjusted.

Extremes.—1929-31, 1942-60: Maximum discharge, 7,400 cfs Dec. 9, 1953 (gage height, 13.62 ft.), from rating curve extended above 3,800 cfs by logarithmic plotting; minimum observed, 12 cfs Sept. 13, 14, 1949.

Remarks.—Cities of Chehalis and Centralia divert about 15 cfs 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
1954	200	730	1,803	1,602	1,518	499	582	157	287	148	74.7	94.0	636
1955	149	656	835	859	861	801	1,022	344	189	137	69.7	69.8	497
1956	613	1,717	1,861	1,493	753	1,444	536	179	187	76.4	49.4	48.6	748
1957	302	495	1,145	472	1,041	1,220	498	252	142	78.0	60.6	38.6	476
1958	91.5	397	1,195	1,078	1,210	491	654*	192*	135	63.7	30.0	46.1*	461
1959	116	1,121	976	1,480	738	684	574	429	265	109	56.7	167	559
1960	486	1,043	869	555	1,101	831	943	680	185	63.0	63.7	65.4	571

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	72	143	588	555	605	227	211	102	158	70	56	62	56
1955	58*	104	300*	450	312	382	445	230	124	83	42	34	34
1956	65	445	720	529	377	700	255	110	112	46	32	30	30
1957	39	212	202	265	398	578	245	151	97	51	42	30	30
1958	40	77	378	406	610	306	290*	125*	74	35*	23*	22	22
1959	55	78*	438	594	506	410	203	200	160	60	47	57	47
1960	105*	180*	427	251	304	269	381	334	118	39	33	48*	33

* Estimated.

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					
1953						628	454,900
1954	7,400	Dec. 9, 1953	56	636	460,800	544	393,700
1955	4,780	Feb. 8, 1955	34	497	359,500	710	514,200
1956	6,360	Dec. 12, 1955	30	748	542,900	561	407,000
1957	4,300	①	30	476	344,600	454	329,000
1958	3,290	Dec. 26, 1957	22	461	333,700	504	364,900
1959	5,410	Nov. 12, 1958	47	559	404,500	574	415,900
1960	5,150	Nov. 21, 1958	33	571	414,500		

① Probably Dec. 10, 1956.

Skookumchuck River near Centralia, Wash.

Location.—Lat. 46°47'15", long. 122°42'45", in SW¼NW¼ sec. 17, T. 15 N., R. 1 E., on left bank half a mile upstream from Bloody Run Creek, 4¼ miles upstream from Thompson Creek, and 12 miles northeast of Centralia.

Drainage area.—61.7 sq. mi. (revised).

Records available.—April 1929 to November 1933, October 1939 to December 1958, October 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 300.00 ft. above mean sea level (river-profile survey). Apr. 1, 1929, to Sept. 30, 1931, and Feb. 1, 1932, to Dec. 6, 1933, staff gage at site a quarter of a mile downstream at different datum. Oct. 9 to Nov. 29, 1939, staff gage at present site and datum.

Average discharge.—24 years (1929-33, 1939-58, 1959-60), 247 cfs (178,800 acre-ft. per year).

Extremes.—1929-33, 1939-58, 1959-60: Maximum discharge, 6,710 cfs Dec. 9, 1953 (gage height, 48.59 ft.); minimum, 15.5 cfs Nov. 28, 29, 1952 (gage height, 39.22 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
1954	139	313	769	662	840	274	373	104	156	83.3	50.5	53.3	315
1955	96.2	349	426	406*	382	333	524	246	140	88.8	49.3	53.1	257
1956	319	715	908	662	346*	667	376	148	116	47.7	35.1	33.0	365
1957	146	229	481	166	529*	512	271	140	77.3	47.8	39.1	27.4	220
1958	56.9	186	523	505	536	210	338	96.9	54.3	32.7	22.6	26.2	214
1959	71.8	591	398	750*	300*	320*	290*	185*	115*	50.0*	34.0*	88.0*	266*
1960	167	433	386	239	505	389	434	260	99.4	46.4	45.5	40.2	274

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	54	128	192	220	323	148	122	75	93	51	43	41	41
1955	43	66	157	210*	146	125	230	166	91	58	35	32	32
1956	44	179	301	220	185	217	207	83	69	36	31	29	29
1957	31	96	87	92	150*	251	163	79	51	34	29	25	25
1958	26	41	174	213	284	150	129	63	37	25	20	21	20
1959	23	46	210										
1960	85*	100*	166	103	148	134	200	155	66	36	29	30	29

* Estimated.

Skookumchuck River near Centralia, 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
1953								314	69.02	227,100
1954	6,710	Dec. 9, 1953	41	315	5.11	69.25	227,900	285	62.70	206,300
1955	4,010	Feb. 8, 1955	32	257	4.17	56.49	185,900	347	76.26	250,900
1956	6,230	Dec. 11, 1955	29	365	5.92	80.51	264,900	274	60.53	199,200
1957	3,390	Dec. 9, 1956	25	220	3.57	48.49	159,600	213	46.84	154,100
1958	1,950	Dec. 25, 1957	20	214	3.47	47.01	154,700	238	52.28	172,000
1959	4,260	Nov. 12, 1958	.....	266	4.31	58.46	192,400	260	57.15	188,100
1960	3,860	①	29	252	4.08	55.68	183,200	.....	.....	.....

① Nov. 22 or 23, 1959.

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 downstream side of highway bridge at Meadows, 1½ miles southwest of Grand Mound, and 6 miles downstream from Skookumchuck River.

Drainage area.—895 sq. mi.

Records available.—October 1928 to September 1960.

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 same site and at datum 3.0 ft. higher.

Average discharge.—32 years (1928-60), 2,777 cfs (2,010,000 acre-ft. per year).

Extremes.—1928-60: Maximum discharge, 48,400 cfs Dec. 29, 1937 (gage height, 18.39 ft.); minimum, 90 cfs Aug. 23-26, 1951; minimum gage height, 0.83 ft. Aug. 27, 1958.

Remarks.—Many small diversions for irrigation and domestic use above station, including about 15 cfs for 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
1954	1,097	3,753	9,070	9,070	11,100	3,163	3,452	1,766	1,033	538	312	481	3,662
1955	854	4,058	4,227	5,098	4,302	4,877	5,554	1,590	717	534	297	319	2,094
1956	2,630	9,697	12,400	9,791	3,829	9,060	3,343	826	803	322	228	229	4,444
1957	1,580	2,542	5,987	2,253	6,030	6,470	2,746	971	556	305	245	155	2,468
1958	399	1,488	6,595	6,465	6,911	2,645	3,806	967	589	229	129	184	2,509
1959	657	6,750	5,375	9,044	4,589	3,668	3,002	2,263	912	422	205	876	3,187
1960	1,754	5,177	4,962	3,281	6,908	4,937	5,171	2,629	857	327	283	252	3,026

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	470	1,330	2,500	2,640	4,020	1,470	1,130	540	665	295	230	315	230
1955	323	565	1,830	2,350	1,600	2,360	2,560	958	525	327	190	160	160
1956	233	1,980	4,790	3,020	2,130	3,590	1,370	480	489	208	165	142	142
1957	223	1,030	934	1,020	1,970	2,820	1,330	648	361	210	160	135	135
1958	155	266	1,310	2,240	3,250	1,830	1,570	570	324	150	99	117	99
1959	137	440	2,400	3,120	3,250	2,070	1,000	912	631	219	184	229	137
1960	520	653	1,830	1,200	1,740	1,520	2,150	1,430	515	204	173	201	173

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
1953								3,394	51.46	2,457,000
1954	34,700	Jan. 6, 1954	230	3,662	4.09	55.52	2,651,000	3,255	49.36	2,356,000
1955	18,100	Feb. 9, 1955	160	2,694	3.01	40.86	1,951,000	4,003	60.71	2,898,000
1956	35,100	Dec. 22, 1955	142	4,444	4.97	67.57	3,226,000	3,224	49.03	2,341,000
1957	20,900	Feb. 27, 1957	135	2,468	2.76	37.43	1,787,000	2,333	35.38	1,689,000
1958	18,500	Dec. 27, 1957	99	2,509	2.80	38.06	1,816,000	2,860	43.37	2,070,000
1959	22,500	Nov. 13, 1958	137	3,187	3.56	48.33	2,307,000	3,116	47.25	2,256,000
1960	24,700	Nov. 24, 1959	173	3,026	3.38	46.01	2,196,000			

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.

Records available.—July to October 1942, July to October 1943, June 1944 to September 1960.

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.—16 years (1944-60), 88.4 cfs (64,000 acre-ft. per year).

Extremes.—1942-60: Maximum discharge, 1,660 cfs Feb. 9, 1951 (gage height, 13.77 ft.), from rating curve extended above 850 cfs; minimum, 0.3 cfs Sept. 25, 1946.

Remarks.—No regulation. Some diversion for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	14.3	125	281	260	340*	92.1	99.2	16.8	14.8	7.52	6.39	21.3	105
1955	37.0	164	155*	136	141	118	137	29.6	11.7	8.49	4.52	4.14	78.4
1956	84.5	286	291	245	117	252	73.7	15.4	13.8	4.04	3.05	4.46	116
1957	81.3	102	216	70.4	175	178	82.7	22.7	9.38	4.40	3.36	1.80	78.5
1958	10.6	45.3	202	215	208	82.0	120	26.6	10.7	3.91	1.76	3.35	76.8
1959	23.3	264	199	279	126	116	121	65.4	22.4	7.81	3.10	19.3	104
1960	65.2	211	170	141	224	124	133	76.2	22.8	5.47	3.58	2.58	97.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	4.6	43	72	80	125*	40	30	10.5	8.8	3.6	3.0	8.5	3.0
1955	8.5	19	72	77	47	64	51	19	7.9	4.5	2.7	2.4	2.4
1956	2.9	66	111	74	54	113	26	8.5	6.3	1.9	1.6	1.1	1.1
1957	7.0	39	34	33	52	79	42	11.5	5.4	3.0	2.1	1.5	1.5
1958	2.6	5.4	48	66	103	56	42	11	5.0	2.1	.9	1.1	.9
1959	1.3	11	86	112	93	68	26	22	14	3.3	2.4	3.5	1.3
1960	10.5	24	55	40	52	46	51	40	11.5	2.6	1.6	1.7	1.6

* 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
1953								106	57.76	76,400
1954	1,020	Dec. 9, 1953	3.0	105	4.23	57.51	76,030	99.5	54.48	72,050
1955	878	Feb. 8, 1955	2.4	78.4	3.16	42.92	56,800	104	56.93	75,300
1956	1,220	Dec. 11, 1955	1.1	116	4.68	63.69	84,200	94.4	51.79	68,510
1957	1,380	Dec. 9, 1956	1.5	78.5	3.17	42.95	56,810	66.6	36.46	48,220
1958	770	Dec. 26, 1957	.9	76.8	3.10	42.01	55,570	95.5	52.25	69,130
1959	1,260	Nov. 12, 1958	1.3	104	4.19	56.74	75,040	100	54.98	72,720
1960	1,460	Nov. 21, 1959	1.6	97.6	3.94	53.59	70,880			

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 left bank pier of Chehalis River bridge at mouth of Porter Creek, 700 ft. west of Porter.

Drainage area.—1,294 sq. mi. (revised).

Records available.—January 1952 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 23.64 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—8 years (1952-60), 4,262 cfs (3,086,000 acre-ft. per year).

Extremes.—1952-60: Maximum discharge, 34,600 cfs Jan. 7, 1954 (gage height, 22.27 ft.); minimum, 164 cfs Oct. 17, 1952 (gage height, 2.25 ft.).

Flood of December 1933 reached a stage of 23.13 ft., from river profile by U.S.C.E.

Remarks.—Cities of Centralia and Chehalis divert about 15 cfs from Newaukum River, a tributary, for municipal use. Other small diversions 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
1954	1,355	5,079	12,880	12,780	14,650	4,985	4,852	1,293	1,451	819	487	729	5,058
1955	1,210	5,540	5,597	7,095	6,051	6,440	7,371	2,320	1,072	774	465	448	3,680
1956	3,117	12,490	16,090	13,390	5,222	12,170	4,747	1,374	1,258	549	351	344	5,942
1957	2,107	3,655	8,811	3,466	7,754	9,486	4,009	1,519	802	477	392	276	3,543
1958	547	1,906	8,396	8,689	9,655	4,198	5,299	1,525	815	371	230	277	3,457
1959	864	9,151	7,589	12,420	6,729	4,941	5,329	3,549	1,411	634	338	1,151	4,493
1960	2,261	7,347	7,652	4,893	10,160	6,376	6,929	3,718	1,428	565*	432	386	4,317

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	614	2,150	4,520	4,440	6,100	2,580	1,330	920	975	484	398	484	398
1955	487	860	2,960	3,670	2,680	3,610	3,070	1,480	798	502	329	285	285
1956	407	3,000	6,940	5,080	3,460	5,250	2,130	875	795	343	253	225	225
1957	339	1,770	1,600	1,840	3,080	4,390	3,190	968	570	355	319	236	236
1958	257	448	1,620	3,440	5,140	2,960	2,360	850	494	249	197	197	197
1959	219	566	3,990	5,120	4,990	3,360	1,800	1,550	960	386	310	367	219
1960	700	975	3,130	2,200	3,160	2,740	3,270	2,380	870*	365*	304	328	304

* Estimated.

Chehalis River at Porter, 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
1953								4,899	51.39	3,547,000
1954	34,600	Jan. 7, 1954	398	5,058	3.91	53.06	3,662,000	4,465	46.84	3,233,000
1955	19,200	Jan. 2, 1955	285	3,680	2.84	38.61	2,664,000	5,305	55.65	3,841,000
1956	33,700	Dec. 23, 1955	225	5,942	4.59	62.50	4,314,000	4,516	47.50	3,278,000
1957	23,000	Dec. 12, 1956	236	3,543	2.74	37.17	2,565,000	3,232	33.90	2,340,000
1958	22,000	Dec. 28, 1957	197	3,457	2.67	36.27	2,503,000	4,011	42.08	2,904,000
1959	24,300	Jan. 26, 1959	219	4,493	3.47	47.14	3,253,000	4,469	46.88	3,235,000
1960	28,300	Nov. 23, 1959	304	4,317	3.34	45.39	3,134,000			

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 bridge, half a mile east of Elma, and 1.8 miles downstream from Wildcat Creek.

Drainage area.—65.8 sq. mi.

Records available.—July 1942 to October 1943 (fragmentary), July 1944 to September 1960. Published as Cloquallum Creek at Elma 1942.

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

Average discharge.—16 years (1944-60), 269 cfs (194,700 acre-ft. per year).

Extremes.—1942-60: Maximum discharge, 4,470 cfs Feb. 9, 1951 (gage height, 11.04 ft.); minimum, 6.8 cfs Sept. 15, 1945 (gage height, 1.43 ft.).

Remarks.—Several small diversions on minor tributaries above station and some regulation by log 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
1954	91.3	345	751	714	844	355	346	92.0	76.5	57.0	40.5	56.3	311
1955	106	414	343	389	366	370	421	122	65.9	56.3	40.6	30.6	226
1956	314	798	944	739	302	739	255	88.2	98.6	47.7	33.4	36.4	367
1957	279	270	671	253	454	580	247	93.6	56.2	39.0	33.5	24.7	250
1958	64.5	155	526	582	557	263	312	97.6	55.8	33.6	24.6	27.9	223
1959	82.9	697	536	815	434	354	478	276	103	49.2	32.4	75.4	332
1960	192	660	695*	533	678	333	398	230	94.6	43.0	36.1	32.3	325

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	39	122	258	290	366	189	130	68	57	39	33	42	33
1955	37	59	179	265	145	195	192	88	50	40	25	21	21
1956	25	218	417	308	185	330	118	64	61	35	25	23	23
1957	31	116	109	124	180	312	136	63	44	30	24	22	22
1958	25	44	154	225	354	193	135	66	40	26	22	20	20
1959	21	60	299	386	326	218	125	97	69	31	29	31	21
1960	48	87	335	262	235	176	210*	151	61	33	30	29	29

* Estimated.

Cloquallum River at Elma, 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
1953								323	66.56	233,500
1954	2,820	Dec. 12, 1953	33	311	4.73	64.09	224,900	283	58.38	204,900
1955	2,080	Feb. 8, 1955	21	226	3.43	46.56	163,400	326	67.25	236,000
1956	3,400	Dec. 11, 1955	23	367	5.58	76.01	266,700	298	61.68	216,400
1957	4,010	Dec. 9, 1956	22	250	3.80	51.48	180,700	210	43.21	151,700
1958	1,800	Jan. 16, 1958	20	223	3.39	46.03	161,500	275	56.77	199,200
1959	2,810	April 30, 1959	21	332	5.05	68.47	240,300	346	71.49	250,800
1960	4,150	Dec. 15, 1959	29	325	4.94	67.31	236,300			

East Fork Satsop River near Elma, Wash.

Location.—Lat. 47°07'40", long. 123°25'00", in SW¼ sec. 15, T. 19 N., R. 6 W., on right bank 1½ miles downstream from Bingham Creek, 4½ miles upstream from mouth, and 8½ miles north of Elma.

Drainage area.—65.9 sq. mi. (revised).

Records available.—February 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 205 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 3,650 cfs Dec. 15, 1959 (gage height, 7.19 ft.); minimum, 63 cfs Oct. 10, 1957; minimum gage height, 1.24 ft. Sept. 28, 29, 30, 1960.

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
1957						699	368	196	139*	110*	96.9*	74.5	
1958	80.9	174	559	748	701	368	388	218	148	110	86.7	79.9	303
1959	117	547	670	909	506	444	584	413	205	137	104	112	395
1960	137	742	768	617	884	465	544	355	237	146	113	95.1	429

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957						430	255	155	118	90*	78	71	
1958	65	78	211	352	500	299	259	174	128	98	80	73	65
1959	68	115	370*	530	425	335	255	225	167	110	88	88	68
1960	103	160	410	312	410	350	390	304	185	121	107	86	86

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
1957										
1958	2,090	Jan. 17, 1958	65	303	4.60	62.41	219,400	346	71.29	250,600
1959	3,580	April 30, 1959	68	395	5.99	81.37	286,000	425	87.62	308,000
1960	3,650	Dec. 15, 1959	86	429	6.51	88.60	311,400			

* Estimated.

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.—299 sq. mi. (revised).

Records available.—March 1929 to September 1960.

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

Average discharge.—31 years (1929-60), 1,968 cfs (1,425,000 acre-ft. per year).

Extremes.—1929-60: Maximum discharge, 46,600 cfs Jan. 22, 1935 (elevation, 38.9 ft., from floodmarks); minimum, 166 cfs Sept. 21, 1938; minimum elevation, 21.66 ft., present datum, Sept. 3-6, 1934.

Flood in November 1909 reached a stage of 37.1 ft. (from high-water mark) at railroad bridge 300 ft. downstream.

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
1954...	1,004	3,211	5,345	4,733	6,672	2,451	2,205	688	588	550	346	432	2,325
1955...	1,092	4,780	3,163	2,892	2,938	2,128	3,499	1,116	575	542	508	348	1,954
1956...	2,490	5,845	5,404	4,998	1,843	4,914	2,388	913	1,033	471	317	447	2,595
1957...	2,541	2,162	4,575	1,632	3,544	3,710	1,987	724	464	412	419	294	1,865
1958...	623	1,376	3,799	4,644	4,211	1,830	2,250	752	426	300	242	294	1,715
1959...	912	3,635	3,903	5,106	2,460	2,553	3,279	1,880	849	462	297	1,001	2,192
1960...	1,407	4,350	4,013	3,417	4,683	2,427	2,959	1,606	862	417	354	335	2,224

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	528	1,530	2,040	1,840	2,380	1,220	920	536	465	385	313	319	313
1955...	331	620	1,930	1,930	1,190	1,130	1,460	801	470	358	320	271	271
1956...	292	1,700	2,080	2,140	1,250	2,020	1,210	633	577	345	255	236	236
1957...	406	986	894	894	968	2,100	1,100	490	371	328	312	252	252
1958...	252	452	1,520	2,060	2,610	1,310	1,160	520	362	252	232	212	212
1959...	252	720	1,770	2,530	1,700	1,640	1,010	817	568	335	258	258	252
1960...	541	670	1,600	1,110	1,450	1,270	1,560	1,240	560	340	292	292	292

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
1953								2,516	114.24	1,822,000
1954	24,300	Dec. 12, 1953	313	2,325	7.78	105.54	1,683,000	2,276	103.34	1,648,000
1955	29,300	Nov. 18, 1954	271	1,954	6.54	88.71	1,415,000	2,350	106.69	1,701,000
1956	27,800	Nov. 3, 1955	236	2,595	8.68	118.11	1,883,000	2,227	101.37	1,616,000
1957	32,000	Dec. 10, 1956	252	1,865	6.24	84.69	1,350,000	1,572	71.37	1,138,000
1958	14,200	①	212	1,715	5.74	77.88	1,242,000	1,934	87.82	1,401,000
1959	26,100	April 30, 1959	252	2,192	7.33	99.54	1,587,000	2,303	104.54	1,667,000
1960	28,700	Nov. 20, 1959	292	2,224	7.44	101.22	1,614,000			

① Dec. 26, 1957, Jan. 17, 1958.

Wynoochee River above Save Creek, near Aberdeen, Wash.

Location (revised).—Lat. 47°18'00", long. 123°39'05", in NE¼ sec. 23, T. 21 N., R. 8 W., on left bank 0.8 mile upstream from Save Creek, 3 miles downstream from Oxbow, and 22 miles northeast of Aberdeen.

Drainage area.—74.1 sq. mi. (revised).

Records available.—May 1925 to September 1960. Published as "at Oxbow, near Aberdeen" 1925-52, where drainage area was 70.7 sq. mi. (revised). Records published for both sites October 1951 to October 1952.

Gage.—Water-stage recorder at present site and datum since Oct. 5, 1951. Datum of gage is 401 ft. above mean sea level (stadia traverse). Prior to Nov. 7, 1925, staff gage at site 1,200 ft. downstream from Oxbow, 3 miles upstream from present site at different datum. Nov. 7, 1925, to Sept. 3, 1947, water-stage recorder at site 1 mile downstream from Oxbow at datum 444.0 ft. above mean sea level (levels by city of Aberdeen). Sept. 4, 1947, to Oct. 13, 1952, water-stage recorder at Oxbow at datum 91 ft. higher.

Average discharge.—35 years (1925-60), 801 cfs (579,900 acre-ft. per year).

Extremes.—1925-60: Maximum discharge, 23,600 cfs Dec. 9, 1956 (gage height, 16.95 ft.), from rating curve extended above 9,000 cfs; minimum, 64 cfs Jan. 27, 1949.

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
1954...	672	1,523	1,970	1,500	2,393	939	883	467	453	433	194	247	963
1955...	700	2,542	1,274	882	1,083	613	1,061	607	575	456	311	219	856
1956...	1,098	2,457	1,511	1,410	463	1,290	1,078	836	968	495	208	302	1,010
1957...	1,224	883	2,335	895	1,652*	1,313	834	485	274	274	269	156	880
1958...	404	664	1,503	1,966	1,894	698	887	433	248	143	112	161	753
1959...	559	1,598	1,739	1,970	869	941	1,353	838	513	243	134	713	956
1960...	750	1,723	1,600	1,188	1,577	864	1,190*	804	496	222	171	173	893

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	301	755	713	472	806	454	395	355	336	233	172	172	172
1955...	188	299	821	598	466	382	493	482	446	302	184	168	168
1956...	177	634	793	569	382	396	748	592	537	288	157	141	141
1957...	235	445	406	500	500	701	512	336	193	178	175	132	132
1958...	130	263	614	1,000	1,040	446	518	333	186	118	109	107	107
1959...	130	593	742	982	572	586	434	424	320	165	112	116	112
1960...	290	278	628	300	500	434	700*	579	316	165	125	135	125

* Estimated.

Wynoochee River above Save Creek, near Aberdeen, Wash.—Continued

(Wynoochee River at Oxbow, near Aberdeen, Wash.)

WATER YEAR	Water year ending Sept. 30		Calendar year
	Per square mile	Runoff (inches)	Runoff (inches)
1926	8.88	120.65	133.32
1927	12.0	162.45	154.01
1928	11.2	152.86	143.42
1929	7.67	104.07	84.17
1930	7.24	98.32	102.24
1931	10.4	140.50	174.59
1932	13.1	177.78	171.79
1933	12.5	170.28	203.74
1934	14.0	189.47	172.09
1935	14.9	201.78	162.46
1936	9.62	130.94	127.27
1937	9.26	125.69	177.12
1938	11.6	157.88	123.69
1939	9.55	129.66	147.17
1940	11.4	155.66	149.66
1941	10.2	138.39	143.26
1942	9.39	127.40	118.54
1943	11.0	148.77	127.27
1944	7.40	100.67	110.57
1945	11.2	152.44	167.90
1946	12.0	163.58	150.78
1947	9.87	134.03	156.40
1948	12.5	170.39	153.19
1949	9.94	135.00	159.35
1950	14.4	196.12	200.30
1951	12.6	171.55	148.07
1952	10.6	143.75	.....

NOTE—Not previously published.

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
1953	.....	.....	.....	.....	.....	.....	.....	1,079	197.72	781,400
1954	12,300	Dec. 11, 1953	172	963	13.0	176.45	697,400	990	181.38	716,900
1955	20,400	Nov. 18, 1954	168	856	11.6	156.77	619,600	903	165.37	653,500
1956	22,400	Nov. 3, 1955	141	1,010	13.6	185.61	733,600	962	176.71	698,400
1957	23,600	Dec. 9, 1956	132	880	11.9	161.27	637,400	722	132.27	522,700
1958	8,890	Dec. 25, 1957	107	753	10.2	137.96	545,200	868	158.11	624,800
1959	14,800	April 29, 1959	112	956	12.9	175.04	691,700	970	177.72	702,300
1960	15,800	Nov. 20, 1959	125	893	12.1	163.99	648,100	.....	.....	.....

Wynoochee River above Black Creek, near Montesano, Wash.

Location.—Lat. 47°00'40", long. 123°39'35", in SE¼SE¼ sec. 27, T. 18 N., R. 8 W., 2,000 ft. upstream from mouth of Black Creek and 3½ miles northwest of Montesano.

Drainage area.—179 sq. mi.

Records available.—October 1956 to September 1960.

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

Extremes.—1956-60: Maximum discharge, 24,500 cfs Dec. 10, 1956 (gage height, 20.54 ft.); minimum, 23 cfs Aug. 22, 23, 1958 (gage height, 3.11 ft.).

Remarks.—City of Aberdeen diverts about 56 cfs for municipal supply at intake 2¼ miles upstream. Other small diversions for irrigation and domestic use. No regulation.

Wynoochee River above Black Creek, 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
1957...	1,914	1,437	3,301	1,083	2,396	2,272	1,277	570	262	239	229	99.3	1,253
1958...	428	1,030	2,630	3,129	2,996	1,084	1,459	535	252	97.4	41.5	112	1,139
1959...	688	2,605	2,623	3,136	1,276	1,486	2,011	1,179	605	225	71.7	770	1,389
1960...	1,029	2,682	2,372	1,908	2,074	1,321	1,721	1,137	599	178	98.3	95.6	1,311

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	261	598	532	540	643	1,180	694	332	167	135	113	62	62
1958...	59	280	963	1,420	1,680	662	706	421	148	54	24	32	24
1959...	58	662	1,060	1,500	792	882	540	520	367	106	44	48	44
1960...	328	380	786	505	734	624	930	810	329	81	54	54	54

Summary

YEAR	WATER YEAR ENDI NG SEPTEMBER 30					CALENDAR YEAR	
	Momentary Maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1957.....	24,500	Dec. 10, 1956	62	1,253	906,800	1,036	749,900
1958.....	11,100	Dec. 26, 1957	24	1,139	824,700	1,290	934,000
1959.....	18,400	April 30, 1959	44	1,389	1,006,000	1,403	1,016,000
1960.....	21,900	Nov. 20, 1959	54	1,311	951,800	.....	.....

HUMPTULIPS RIVER BASIN

Humptulips River near Humptulips, Wash.

Location.—Lat. 47°13'45", long. 123°56'25", in NE¼ sec. 17, T. 20 N., R. 10 W., on right bank 1 mile southeast of Humptulips, 2.5 miles upstream from Stevens Creek, and 3¼ miles downstream from confluence of East and West Forks. Prior to Oct. 1, 1959 at site 400 ft. downstream.

Drainage area.—130 sq. mi.

Records available.—May 1933 to January 1935, July 1942 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map). Prior to Jan. 14, 1935, and Mar. 1, 1950, to Jan. 15, 1953, water-stage recorder and July 1, 1942, to Feb. 28, 1950, and Jan. 17, 1953, to Sept. 30, 1959, staff gage; all at sites 400 ft. downstream at different datums.

Average discharge.—19 years (1933-34, 1942-60), 1,320 cfs (955,600 acre-ft. per year).

Extremes.—1933-35, 1942-60: Maximum discharge, 33,000 cfs Jan. 22, 1935 (gage height, 12.7 ft., site and datum then in use, from floodmarks), from rating curve extended above 16,500 cfs; minimum discharge observed, 82 cfs Sept. 11, 1944.

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

Revisions.—The momentary maximum discharge for the water year 1946 published in State WSB No. 6 has been revised to 13,200 cfs.

Humptulips River near Humptulips, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	938	2,275	3,413	2,557	3,901	1,292	1,359	419	468	511	248	391	1,465
1955...	920	3,462	1,865	1,542	1,847	1,236	1,937	716	527	524	473	246	1,267
1956...	1,754	3,335	2,545	2,542	950	2,815	1,427	739	895	390	226	428	1,507
1957...	1,933	1,362	3,468	843	2,125	2,263	1,175	502	335	339	341	200	1,238
1958...	527	1,084	2,656	3,105	2,943	1,025	1,512	434	255	151	110	218	1,158
1959...	906	2,691	2,419	3,195	1,364	1,763	2,257	1,078	576	263	157	1,134	1,483
1960...	1,270	2,775	2,384	1,944*	2,739	1,337	1,759	1,186	603	223	210	231	1,377

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	368	1,120	1,100	836	1,190	560	504	310	296	277	199	233	199
1955...	242	392	1,040	908	707	605	758	568	380	286	225	195	195
1956...	203	867	1,160	885	606	849	831	513	432	255	188	171	171
1957...	360	576	520	421	517	1,100	644	336	248	215	207	165	165
1958...	151	346	1,000	1,210	1,340	660	740	300	188	122	94	97	94
1959...	148	821	821	1,230	767	1,040	483	476	320	181	138	148	138
1960...	480	462	870*	510*	776	631	906	776	322	166	138	172	138

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
1953								1,622	169.40	1,175,000
1954	14,600	Dec. 11, 1953	199	1,465	11.3	153.97	1,061,000	1,430	149.27	1,035,000
1955	23,600	Nov. 18, 1954	195	1,267	9.75	132.29	917,400	1,385	144.63	1,003,000
1956	25,000	Nov. 3, 1955	171	1,507	11.6	157.74	1,094,000	1,438	150.57	1,044,000
1957	32,900	Dec. 9, 1956	165	1,238	9.52	129.31	896,500	1,027	107.26	743,500
1958	11,000	Jan. 16, 1958	94	1,158	8.91	130.94	838,400	1,302	136.00	942,800
1959	21,100	April 29, 1959	138	1,483	11.4	154.84	1,073,000	1,513	158.03	1,096,000
1960	21,500	Nov. 20, 1959	138	1,377	10.6	144.24	999,900			

* Estimated.

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 on U. S. Highway 101 and 4 miles southwest of Quinault.

Drainage area.—264 sq. mi.

Records available.—October 1911 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 184.60 ft. above mean sea level (Washington State Highway bench mark). Prior to Jan. 1, 1913, staff gage on south shore of Quinault Lake 3 miles northeast of present site and Jan. 1, 1913, to Sept. 30, 1916, staff gage at mouth of Canoe Creek, 4 miles northeast of present site, at datum 1.06 ft. higher. Oct. 1, 1916, to May 2, 1935, water-stage recorder at site 300 ft. downstream from present site at datum 0.36 ft. higher than present datum.

Average discharge.—49 years (1911-60), 2,777 cfs (2,010,000 acre-ft. per year).

Quinault River at Quinault Lake, Wash.—Continued

Extremes.—1911-22, 1926-60: Maximum discharge, 50,200 cfs Nov. 4, 1955 (gage height, 20.51 ft.); 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.—Natural regulation by Quinault Lake. No diversion above station.

Corrections.—The mean discharge for calendar year 1916 and some monthly figures for water year 1917 were corrected; the records published in State WSB No. 6 thus affected are given herewith:

MONTH	Mean	Per square mile	Inches	Acre feet
Calendar year 1916	2,710			
April 1917	2,820			168,000
July	3,070			189,000
September	993			59,100
Water year 1916-17	2,220	8.41	113.98	1,610,000
Calendar year 1917	2,820		145.15	2,050,000

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	2,754	5,858	6,743	4,500	6,694	2,773	2,717	2,458	2,723	2,999	1,518	1,247	3,561
1955	3,244	8,465	4,116	2,568	3,072	1,438	3,144	2,234	3,735	2,393	1,691	845	3,111
1956	3,735	7,592	4,389	3,809	1,695*	2,963	3,034	3,888	5,116	3,396	1,370	1,242	3,523
1957	4,347	2,966	6,229	1,687	3,829	3,729	2,822	2,879	1,980	1,374	1,041	644	2,793
1958	1,189	2,327	4,682	5,985	5,962	2,344	2,771	2,612	2,071	900	453	547*	2,634
1959	2,216	5,261	5,449	5,682	2,186	2,673	4,044	3,786	2,830	1,672	706*	2,291	3,255
1960	2,616	5,068	4,431	3,311	4,942	2,303	3,605	3,140	2,979	1,577	850	803	2,956

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,380	3,690	2,800	1,660	2,280	1,310	1,200	1,360	2,240	2,020	1,230	924	924
1955	716	1,530	2,930	1,620	1,290	994	1,350	1,280	2,550	2,320	916	604	604
1956	578	2,260	2,620	1,790	1,300*	1,220	1,850*	2,360	3,270	1,940	880	669	578
1957	1,210	1,610	1,450	960	928	2,000	1,900*	2,280	1,360	1,010	712	487	487
1958	484	1,110	1,710	3,150	2,800*	1,480	1,690	1,890	1,430	598	390*	360*	360*
1959	505	1,690	2,510	3,120	1,680	1,810	1,570	2,370	2,070	1,050*	536	616	505
1960	1,280	1,100	1,940	1,040	1,590	1,340	2,480	2,290	2,220	1,010	603	616	603

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
1953								3,879	199.43	2,808,000
1954	17,000	Dec. 12, 1953	924	3,561	13.5	183.11	2,578,000	3,594	184.80	2,602,000
1955	30,500	Nov. 18, 1954	604	3,111	11.8	159.95	2,252,000	3,104	159.60	2,247,000
1956	50,200	Nov. 4, 1955	578	3,523	13.3	181.04	2,557,000	3,351	172.78	2,433,000
1957	32,400	Dec. 10, 1956	487	2,793	10.6	143.59	2,022,000	2,341	120.34	1,695,000
1958	15,300	Jan. 17, 1958	360	2,634	9.98	135.43	1,907,000	3,028	155.68	2,192,000
1959	29,700	April 30, 1959	505	3,255	12.3	167.34	2,356,000	3,186	163.82	2,307,000
1960	25,800	Nov. 23, 1959	603	2,956	11.2	152.43	2,146,000			

* Estimated.

Hoh River near Forks, Wash.

Location.—Lat. 47°48'20", long. 124°06'20", in SW¼NE¼ sec. 34, T. 27 N., R 11 W., on left bank 1 mile downstream from Maple Creek, 5 miles downstream from South Fork, and 16½ miles southeast of Forks.

Drainage area.—208 sq. mi.

Records available.—August 1926 to September 1960. Prior to October 1958, published as "near Spruce."

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

Average discharge.—34 years (1926-60), 2,012 cfs (1,457,000 acre-ft. per year).

Extremes.—1926-60: Maximum discharge, 38,700 cfs Nov. 26, 1949 (gage height, 22.2 ft., from high-water mark), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 247 cfs Nov. 14, 15, 1929; minimum gage height, 0.66 ft. Oct. 6, 18, 1957.

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

Remarks.—No artificial regulation or diversion above station. Large diurnal fluctuation during summer months caused by melting glaciers at source.

Revision.—The momentary maximum discharge for water year 1945 published in State WSB No. 6 has been revised to 31,200 cfs (estimated).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,257	3,736	4,702*	3,159*	4,771*	1,819*	1,824*	1,889*	1,943*	2,277	1,479	1,220	2,576
1955...	2,339	5,912*	2,859	1,638	1,895	1,094	2,051	1,498	2,563	2,193	1,410	930	2,194
1956...	2,369	4,665	2,955	2,736	1,441	2,232	2,113	2,354	3,201	2,423	1,348	1,359	2,434
1957...	3,076	2,078	3,892	1,260	2,479	2,431	1,714	1,973	1,656	1,509	1,176	1,026	2,023
1958...	1,270	1,546	3,077	3,726	3,524	1,460	1,647	1,744	1,767	1,293	944	1,004	1,908
1959...	2,112	3,615	3,693	3,569	1,409	1,899	2,614	2,367	2,041	1,599	923	2,030	2,327
1960...	2,650	2,899	2,826	2,100	2,886	1,650	2,223	2,195	2,105	1,531	1,056	821	2,024

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	939	2,250	2,000*	1,300*	1,600*	916	930	880*	1,600*	1,610	1,210	808	808
1955...	644	1,100*	1,740	1,010	840	708	912	894	1,590	1,720	916	565	565
1956...	554	1,720	1,840	1,440	1,100	885	1,390	1,490	2,120	1,390	1,010	714	554
1957...	975	1,110	1,040	692	674	1,500	1,160	1,550	1,180	1,090	764	692	674
1958...	496	804	1,330	2,000	1,750	955	828	1,080	1,210	1,100	836	660	496
1959...	596	1,800	1,740	2,010	1,020	1,190	1,030	1,620	1,420	992	692	769	596
1960...	894	700	1,240	650	1,030	870	1,660	1,460	1,520	1,060	737	580	580

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
1953								2,669	174.17	1,932,000
1954	17,600	Jan. 4, 1954	808	2,576	12.4	168.12	1,865,000	2,606	170.04	1,886,000
1955	25,800	Nov. 18, 1954	565	2,194	10.5	143.18	1,588,000	2,192	137.18	1,522,000
1956	33,600	Nov. 3, 1955	554	2,434	11.7	159.29	1,767,000	2,361	154.52	1,714,000
1957	20,400	Dec. 9, 1956	674	2,023	9.73	132.03	1,465,000	1,757	114.66	1,272,000
1958	13,800	Dec. 25, 1957	496	1,908	9.17	124.54	1,381,000	2,202	143.72	1,594,000
1959	19,000	April 29, 1959	596	2,327	11.2	151.88	1,685,000	2,190	142.89	1,585,000
1960	23,200	Nov. 22, 1959	580	2,024	9.73	132.45	1,469,000			

* Estimated.

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.

Records available.—October 1917 to September 1921, October 1933 to September 1960.

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

Average discharge.—31 years (1917-21, 1933-60), 622 cfs (450,300 acre-ft. per year).

Extremes.—1917-21, 1933-60: Maximum discharge, 23,500 cfs Nov. 26, 1949 (gage height, 16.42 ft., from high-water mark in well), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 51 cfs Sept. 11, 12, 1944; minimum gage height, 0.97 ft. Oct. 17-20, 1952.

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
1954...	578	1,177	1,575	1,057	1,726	575	596	662	659	607	334	218	808
1955...	524	1,758	1,021	571	691	305	688	623	979	624	287	135	682
1956...	641	1,622	957	769	258	565	803	1,036	1,000	638	224	247	738
1957...	976	753	1,442	344	946	776	896	599	367	222	150	111	606
1958...	232	388	1,039	1,375	1,132	465	579	509	356	148	80.4	122	532
1959...	462	1,246	1,267	1,257	469	640	967	773	572	304	123	341	703
1960...	569	969	1,029	767	997	584	820	803	632	301	163	126	645

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	248	660	605	352	477	280	277	309	536	427	237	142	142
1955...	123	260	630	340	273	176	255	288	635	446	176	103	103
1956...	98	492	506	322	201	227	390	580	660	313	152	119	98
1957...	180	375	353	180*	176	458	405	417	234	156	115	95	95
1958...	89	181	401	635	610	300	257	345	257	103	62	60	60
1959...	76	441	630	615	304	393	329	525	391	169	96	92	76
1960...	182	216	416	202	322	279	600	600	460	185	114	90	90

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
1953								834	135.04	603,500
1954	8,080	Jan. 5, 1954	142	808	9.64	130.82	584,700	804	130.21	582,000
1955	10,800	Nov. 18, 1954	103	682	8.14	110.43	493,500	675	109.35	488,700
1956	18,000	Nov. 3, 1955	98	738	8.81	119.88	535,700	736	119.57	534,400
1957	16,300	Dec. 9, 1956	95	606	7.23	98.11	438,500	478	77.48	346,200
1958	7,000	Dec. 25, 1957	60	532	6.35	86.24	385,500	642	103.96	464,700
1959	9,260	April 29, 1959	76	703	8.39	113.84	508,900	669	108.35	484,300
1960	9,010	Jan. 29, 1960	90	645	7.70	104.70	468,000			

* Estimated.

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

Location.—Lat. 48°00'05", long. 123°36'00", on Elwha River, 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.

Records available.—April 1927 to September 1960. Prior to October 1953 monthly change in contents published in State WSB No. 6.

Gage.—Staff gage read twice daily. Datum of gage is 19.67 ft. below mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.—1927-60: 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. Total capacity, 37,790 acre-ft. at gage height 608 ft. (top of gates). Figures given herein represent total contents. Water is used for power by Crown Zellerbach Corp.

Contents in Acre-feet, on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	38,860	38,350	38,310	37,330	38,520	36,780	35,940	38,180	38,520	39,080	38,480	36,990	.....
1955...	37,450	39,170	38,130	37,830	37,240	36,150	34,200	38,350	38,130	38,860	37,750	36,190	.....
1956...	38,610	37,540	36,320	36,360	36,700	37,160	38,910	38,910	38,390	38,820	37,540	38,090	.....
1957...	38,440	36,450	38,860	37,580	36,280	35,860	37,200	38,220	38,690	37,710	37,920	37,540	.....
1958...	38,650	37,540	38,480	38,310	39,040	36,280	35,190	37,830	38,690	37,880	37,660	35,650	.....
1959...	37,500	38,820	38,690	38,520	37,620	37,370	38,220	38,690	37,960	38,000	37,790	37,160	.....
1960...	37,880	39,040	38,820	38,440	38,310	38,740	37,830	37,920	38,000	38,520	37,120	37,330	.....

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 site of McDonald Bridge (now removed), half a a mile upstream from Little River, 7 miles from mouth, and 8 miles southwest of Port Angeles.

Drainage area.—269 sq. mi.

Records available.—October 1897 to December 1901, October 1918 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 200.00 ft. above mean sea level, datum of 1929. Oct. 1, 1897, to Dec. 21, 1901, wire-weight gage at McDonald Bridge at different datum. Dec. 9, 1918, to May 1, 1936, water-stage recorder under McDonald Bridge at datum 7.4 ft. higher.

Average discharge.—46 years (1897-1901, 1918-60), 1,487 cfs (1,077,000 acre-ft. per year), adjusted for storage since April 1927.

Extremes.—1897-1901, 1918-60: 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 determinations of flow over dam at discharge 26,700 cfs and 30,100 cfs, referred to 1897 datum; minimum daily, 10 cfs Oct. 3, 1938.

Remarks.—Water is diverted through Glines Canyon powerhouse and returned to river above gage. Flow partly regulated by Lake Mills (see preceding page).

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
1954...	1,167	2,502	3,035	2,107	3,211	1,517	1,292	2,219	2,418	2,701	1,544	980	2,051
1955...	1,307	3,560	2,062	1,124	1,259	654	1,218	1,452	3,126	2,110	1,142	696	1,640
1956...	1,254	3,240	1,940	1,541	746	1,005	1,731	3,333	3,754	2,802	1,288	864	1,960
1957...	1,834	1,574	2,592	939	1,984	1,661	1,334	2,329	1,751	1,077	654	508	1,519
1958...	526	769	1,423	2,560	2,549	1,264	1,125	2,413	2,160	1,060	573	506	1,405
1959...	901	2,209	2,939	2,638	1,093	1,060	1,943	2,324	2,372	1,566	703	806	1,717
1960...	963	2,136	2,112	1,530	2,227	1,210	1,746	1,949	2,436	1,486	759	465	1,580

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	702	1,220	1,630	992	1,120	801	801	1,000	1,910	1,820	1,080	545	545
1955...	580	871	1,510	842	722	538	715	715	1,780	1,610	799	500	500
1956...	401	1,230	1,370	968	680	548	1,170	1,960	2,650	1,640	982	360	360
1957...	656	974	800	565	505	491	1,020	1,760	1,110	507	441	301	301
1958...	280	491	637	1,280	1,250	910	788	964	1,140	683	495	310	280
1959...	306	711	1,270	1,660	614	783	1,090	1,680	1,660	925	483	426	306
1960...	454	513	1,010	581	917	781	1,230	1,420	1,620	949	477	304	304

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	1,942	1,406,000	1,942	97.99
1954.....	9,820	Dec. 11, 1953	545	2,051	1,485,000	2,049	7.62	103.42	2,067	1,497,000	2,067	104.31
1955.....	14,300	Nov. 18, 1954	500	1,640	1,187,000	1,639	6.09	82.71	1,599	1,158,000	1,597	80.56
1956.....	21,400	Nov. 3, 1955	360	1,960	1,423,000	1,963	7.30	99.34	1,928	1,400,000	1,933	97.73
1957.....	22,100	Dec. 9, 1956	301	1,519	1,099,000	1,517	5.64	76.56	1,242	899,400	1,242	62.66
1958.....	10,500	Jan. 16, 1958	280	1,405	1,017,000	1,402	5.21	70.76	1,683	1,219,000	1,684	84.98
1959.....	15,400	April 29, 1959	306	1,717	1,243,000	1,720	6.39	86.74	1,646	1,191,000	1,646	83.05
1960.....	22,900	Nov. 22, 1959	304	1,580	1,147,000	1,580	5.87	79.97	.....	.....	.....	.....

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.

Records available.—July 1951 to September 1954 (discharge measurements only December 1951 to August 1952).

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

Extremes.—1951-54: Maximum discharge recorded, 12,600 cfs Jan. 9, 1953 (gage height, 5.88 ft.); minimum recorder, 62 cfs Nov. 28, 1952 (gage height, 0.29 ft.).

Remarks.—Flow affected by Lake Mills and Lake Aldwell. Flow diverted through Glines Canyon powerhouse and returned to river above gage. Port Angeles industrial canal diverts water above gage.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water year 1953, superseding figures published in State WSB No. 6, are given herewith:

Elwha River below diversion, near Port Angeles, Wash.—Continued

MONTH	Mean	Runoff in acre ft.
July 1953	2,125	
Water year 1952-53	1,535	1,111,000

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,081	2,485	3,116	2,358	3,689	1,644	1,321	2,227	2,429	2,735	1,499	849	2,111

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	632	1,230	1,450	1,020	1,150	840	864	939	1,020	1,860	965	243	243

Summary

YEAR	WATER YEAR ENDI NG SEPTEMBER 30					CALENDAR YEAR	
	Momentary Maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1953						1,967	1,424,000
1954	10,800	Jan. 5, 1954	243	2,111	1,528,000		

SIEBERT CREEK BASIN

Siebert Creek near Port Angeles, Wash.

Location (revised).—Lat 48°05'00", long. 123°16'52", in SW¼NE¼ sec. 23, T. 30 N., R. 5 W., on right bank 300 ft. downstream from Emery Creek, 3¼ miles upstream from mouth, and 6½ miles southeast of Port Angeles. Prior to Apr. 22, 1960, at site about three-quarters of a mile downstream.

Drainage area.—15.5 sq. mi. Area at site used prior to Apr. 22, 1960, 16.1 sq. mi. (revised).

Records available.—June 1952 to September 1960

Gage.—Water-stage recorder. Altitude of gage is 280 ft. (from topographic map). Prior to Apr. 22, 1960, at sites within three-quarters of a mile downstream at different datums.

Average discharge.—8 years (1952-60), 20.6 cfs. (14,910 acre-ft. per year).

Extremes.—1952-60: Maximum discharge, 1,620 cfs Nov. 3, 1955 (gage height, 10.26 ft., former datum), rating curve extended above 260 cfs on basis of computations of peak flow through culvert; maximum gage height, 14.49 ft. Jan. 29, 1960, former site and datum, backwater from plugged culvert; 4.90 ft. present site and datum; from outside high-water marks; minimum, 2.0 cfs Sept. 3-5, 1952, Aug. 19-26, 1958, Aug. 25, 26, 1959.

Remarks.—No regulation or diversion above station.

Revisions.—The momentary maximum discharge for the water year 1953 published in State WSB No. 6 has been revised to 303 cfs.

Siebert Creek 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
1954...	5.45	11.5	31.2	141	185	20.0	8.87	7.93	7.56	6.77	4.82	8.86	35.6
1955...	11.0	36.3	33.7	17.4	37.3	18.5	31.3	14.9	14.8	17.4	4.90	3.71	19.9
1956...	7.14	121	78.5	54.7	25.6*	47.4	27.4	11.0	12.5	5.35	3.81	3.81	33.1
1957...	16.8	13.7	45.9	9.43	56.4	40.0	20.9	11.6*	6.06*	4.59	4.65	3.36	19.2
1958...	3.45	4.51	19.7	23.3	25.8	13.8	14.0	6.36	6.57	3.22	2.51	2.93	10.4
1959...	5.43	20.7	29.2	40.4	14.8	14.5	16.7	17.6	7.50	3.86	2.61	3.05	14.7
1960...	4.23	12.6	29.4	42.7	54.2	28.3	14.4	14.7	6.49	3.37	3.25	2.71	17.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.6	6.3	11	23	48	8*	6.5*	6.5*	6.2	4.4	3.8	4.4	3.6
1955...	4.8	6.2	14	8.8	9.4	10*	13	10.5	8.5	7.5	3.8	3.6	3.6
1956...	3.6	5.7*	19.5	15	12*	14.5	16	7.3*	7.0*	3.9	3.1	2.9	2.9
1957...	3.9	9.4	9.0	5.6	8.0*	18	12.5	9.0*	4.8*	3.8	3.6	2.9	2.9
1958...	3.0	3.4	4.4	10.5	12.5	9.9	8.7	4.3	4.0	2.6	2.0	2.4	2.0
1959...	2.8	4.0	18	22	12	10.5	7.1	10.5	5.0	2.6	2.2	2.2	2.2
1960...	2.4	3.7	5.3	6.4	18.5	16.5	9.1	10	4.6	2.8	2.6	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
1953								16.9	14.28	12,260
1954	1,400	Jan. 5, 1954	3.6	35.6	2.21	30.02	25,780	38.3	32.31	27,750
1955	480	Feb. 7, 1955	3.6	19.9	1.24	16.80	14,430	30.4	25.59	22,000
1956	1,620	Nov. 3, 1955	2.9	33.1	2.06	28.01	24,060	22.4	18.94	16,260
1957	1,230	Dec. 9, 1956	2.9	19.2	1.19	16.23	13,920	15.1	12.76	10,940
1958	304	Dec. 25, 1957	2.0	10.4	.646	8.80	7,540	12.7	10.74	9,200
1959	137	Jan. 24, 1959	2.2	14.7	.913	12.42	10,650	14.0	11.80	10,120
1960	924	Jan. 29, 1960	2.4	17.9	1.13	15.27	13,010			

* Estimated.

Dungeness River near Sequim, Wash.

Location.—Lat. 48°00'50", long. 123°07'55", in NW¼NE¼ sec. 13, 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.

Records available.—June 1923 to September 1930, June 1937 to September 1960. July 1897 to July 1898 at site below Canyon Creek, published as "near Sequim," records not equivalent.

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

Average discharge.—30 years (1923-30, 1937-60), 371 cfs (268,600 acre-ft. per year).

Extremes.—1923-30, 1937-60: 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 measurement of peak flow; minimum observed, 77 cfs Sept. 10, 1928.

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
1954...	290	581	571	493	815	384	311	638	747	840	521	364	545
1955...	429	866	468	259	271	166	265	404	913	652	351	215	443
1956...	259	773	460	351	181	213	309	893	1,151	837	401	235	522
1957...	452*	344*	524	201	451	387	312	829	642	373	235	180	411
1958...	174	174	246	436	583	290	254	869	894	432	223	160	393
1959...	210	393	561	567	235*	205	404	661	727	511	246	198	411
1960...	188	387	490*	388	533	282	364	566	786	456*	230	139	400

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	186	304	340	250	312	240	230	270	535	589	383	240	186
1955...	203	270	383	203	176	146	178	181	491	486	256	153	146
1956...	148	300	259	206	158	139	183	452	806	479	278	180	139
1957...	161	198	195	145*	180	239	236	642	420	277	174	146	130
1958...	118	141	136	215	239	208	190	334	488	308	174	128	118
1959...	110	183	330	350*	183	160	238	440	554	319	175	151	110
1960...	148	113	208	150	235	181	278	415	490	310*	170	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
1953								491	42.69	355,100
1954	3,990	Jan. 5, 1954	186	545	3.49	47.40	394,400	571	49.72	413,600
1955	3,570	Nov. 18, 1954	146	443	2.84	38.57	321,000	420	36.58	304,400
1956	6,750	Nov. 3, 1955	139	522	3.35	45.57	379,000	509	44.40	369,400
1957	4,270	Dec. 9, 1956	130	411	2.63	35.75	297,500	350	30.43	253,200
1958	2,640	Feb. 24, 1958	118	393	2.52	34.23	284,700	441	38.39	319,300
1959	3,280	April 29, 1959	110	411	2.63	35.78	297,500	403	35.05	291,500
1960	6,380	Jan. 29, 1960	106	400	2.56	34.86	290,000			

* Estimated.

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 600 ft. upstream from Andrews Creek and 3¼ miles south of Maynard.

Drainage area.—13.2 sq. mi.

Records available.—May 1952 to September 1960.

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

Average discharge.—8 years (1952-60), 17.4 cfs (12,600 acre-ft. per year).

Extremes.—1952-60: Maximum discharge, 733 cfs about Jan. 8, 1959 (gage height, 4.07 ft., from high-water mark), from rating curve extended above 40 cfs on basis of slope-area measurement; minimum, 1.1 cfs Aug. 7-11, 1959.

Remarks.—Some small diversion 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
1954...	6.73	20.4	21.3	37.4*	62.5*	20.6	16.0	14.2	15.8	13.8	5.77	9.41	20.7
1955...	7.45	26.3	28.0	16.6	18.6	15.1	32.1	24.2	24.0	19.9	5.99	3.89	18.5
1956...	4.71	24.1	47.9	45.3*	16.5*	30.2	46.0	19.7	20.6	6.40	4.25	3.67	22.5
1957...	11.3	8.17	16.9	6.55*	21.4	33.0*	27.4	13.3	7.50	8.21	4.43	2.80	13.4
1958...	3.31	4.70	16.0	24.2	46.7	15.4	18.2	8.14	10.2	3.70	2.54	2.51	12.7
1959...	3.45	7.41	15.7	94.7	22.8	23.0	21.9	33.6	12.7	4.65	2.13	2.79	20.5
1960...	3.00	9.05	18.9	29.0	37.7	14.4	16.7	30.6	11.2	3.85	2.74	2.61	14.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.9	8.3	14	15*	25*	12	11.5	9.5	9.5	4.8	3.4	5.4	3.4
1955...	4.5	6.1	14.5	12.5	12	10*	18.5	17	8.6	8.6	3.9	3.1	3.1
1956...	3.1	5.4	20	20*	14*	13.5	27	8.6	8.2	3.4	2.9	2.7	2.7
1957...	2.9	5.1	4.8	3.8*	4.3*	20*	18.5	6.8	5.4	5.8	3.1	2.2	2.2
1958...	2.3	3.1	3.7	10*	13.5	10.5	11	4.0	4.5	2.7	2.1	2.1	2.1
1959...	2.2	2.7	6.1	13.5	6.6	10.5	9.7	11.5	5.9	1.5	1.1	1.5	1.1
1960...	1.9	2.6	4.0	6.0	5.8	10	9.3	10	6.5	1.8	1.4	2.2	1.4

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
1953								17.8	18.37	12,920
1954			3.4	20.7	1.57	21.26	14,960	21.8	22.40	15,770
1955	129	Dec. 6, 1954	3.1	18.5	1.40	19.00	13,380	19.8	20.31	14,300
1956	216	Jan. 6, 1956	2.7	22.5	1.70	23.16	16,310	19.1	19.68	13,860
1957	256	Feb. 24, 1957	2.2	13.4	1.02	13.75	9,680	12.3	12.69	8,930
1958	179	Feb. 24, 1958	2.1	12.7	.962	13.08	9,230	12.9	13.29	9,370
1959	733	①	1.1	20.5	1.55	21.09	14,840	20.9	21.46	15,100
1960	331	Jan. 29, 1960	1.4	14.9	1.13	15.37	10,820			

* Estimated.
① About Jan. 8, 1959.

Chimacum Creek near Chimacum, Wash.

Location.—Lat. 47°58'25", long. 122°46'35", in SW¼ sec. 26, T. 29 N., R. 1 W., on right bank 100 ft. downstream from culvert, 3 miles south of Chimacum, and 3¼ miles upstream from mouth of East Fork.

Drainage area.—12.6 sq. mi.

Records available.—June 1952 to December 1957.

Average discharge.—5 years (1952-57), 15.3 cfs (11,080 acre-ft. per year).

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

Extremes.—1952-57: Maximum discharge, 222 cfs Jan. 6, 1956 (gage height, 5.69 ft.); minimum, 0.2 cfs Aug. 2, 1953, July 7, 1956, June 9, 1957; minimum gage height, 1.11 ft. Aug. 2, 1953.

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
1954...	4.49	12.0	13.0	42.1	69.0	19.6	10.5	7.10	7.49	5.22	4.36	5.89	16.4
1955...	5.22	15.8	23.7	16.2	15.4	19.4	23.8	11.3	10.3	9.10	3.39	3.71	13.3
1956...	6.23*	20.1	61.0	70.0	32.7	36.2	11.0	5.15*	3.06	3.53	3.56	4.21	21.9
1957...	9.66	6.39	13.5	12.5	33.1	43.2	20.0	7.78	4.82	5.37	4.40	3.88	13.6
1958...	6.31	7.37	25.2*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.3	5.3	10	14	24	8.8	7.0	4.4	4.8	3.0	2.8	4.2	2.8
1955...	4.2	4.8	10.5	13	10.5	10	11	6.7	5.1	3.6	2.9	2.2	2.2
1956...	4.0	4.9	13.5	21	14.5	19	7.0*	4.0	3.8	2.3	2.6	2.6	2.3
1957...	4.2	4.0	4.2	6.7	8.1	20	11	4.4	3.8	4.2	3.5	3.3	3.3
1958...	4.0	5.9	6.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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
1953.....	.....	.....	.....	.....	.....	.....	.....	11.1	11.94	8,020
1954.....	213	Feb. 18, 1954	2.8	16.4	1.30	17.64	11,860	17.7	19.02	12,780
1955.....	125	April 12, 1955	2.2	13.3	1.06	14.28	9,590	16.9	18.17	12,210
1956.....	222	Jan. 6, 1956	2.3	21.9	1.74	23.61	15,880	17.0	18.36	12,350
1957.....	167	Feb. 26, 1957	3.3	13.6	1.08	14.64	9,860	14.4	15.49	10,430
1958.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

Little Quilcene River near Quilcene, Wash.

Location.—Lat. 47°50'15", long. 122°33'15", 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.

Records available.—August 1926 to October 1927, July 1951 to December 1957.

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.

Average discharge.—7 years (1926-27, 1951-57), 53.9 cfs (39,020 acre-ft. per year).

Extremes.—1926-27, 1951-57: Maximum discharge, 820 cfs Feb. 13, 1954; maximum gage height, 4.40 ft. Feb. 13, 1954 (backwater from debris); minimum discharge, 4.1 cfs Sept. 1, 1926 (gage height, 0.86 ft., site and datum then in use).

Maximum stage known since 1937, 4.6 ft. Jan. 8, 1959, from high-water mark in well (discharge, 1,000 cfs).

Remarks.—Undetermined amount of inflow at times during summer of 1956 and September to December 1957 from drainage of Lords Lake during period of construction of dams at the two lake outlets. Undetermined amount of flow was diverted to Lords Lake starting about Sept. 3, 1957. Some diversion for irrigation. No known regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	26.3	79.0*	71.3	122	207	68.5	46.1	45.3	47.6	43.5	26.4	29.1	66.7
1955...	30.8	90.4	87.5	46.3	44.6	33.1	60.0	54.4	65.1	65.5	25.3	16.0	51.6
1956...	17.7	80.7	115	122	45.1	82.9	113	83.8	94.6	41.1	23.2	16.6	69.7
1957...	37.4	32.8	49.7	25.9	69.6	102	74.9	57.1	33.4	32.8*	22.3	9.84	45.5
1958...	10.6	14.0	43.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	19.5	23	39	44	75	41	37	35	35	27	22	22	19.5
1955...	21	23	52	35	31	26	39	40	36	39	19	13	13
1956...	13.5	18	54	53	38	39	65	65	70	26	18	14.5	13.5
1957...	14	24	24	18.5	19.5	68	63	38	25*	26*	16	6.0	6.0
1958...	6.6	8.2	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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
1953.....	.....	.....	.....	.....	.....	.....	.....	59.8	41.39	43,270
1954.....	820	Feb. 13, 1954	19.5	66.7	3.40	46.20	48,280	69.4	48.05	50,230
1955.....	407	Nov. 19, 1954	13	51.6	2.63	35.72	37,360	52.0	36.04	37,680
1956.....	545	Jan. 5, 1956	13.5	69.7	3.56	48.43	50,630	61.9	43.00	44,950
1957.....	480	Feb. 24, 1957	6.0	45.5	2.32	31.52	32,940	41.1	28.48	29,770
1958.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

Duckabush River near Brinnon, Wash.

Location.—Lat. 47°41'00", long. 123°00'40", in SW¼SW¼ 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.

Records available.—August to December 1910 (gage heights and discharge measurements only), December 1910 to December 1911, June 1938 to September 1960. Published as "near Duckabush" 1910-11.

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 same site at different datum.

Average discharge.—22 years (1938-60), 409 cfs (296,100 acre-ft. per year).

Extremes.—1910-11, 1938-60: 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 measurement of peak flow; minimum, 45 cfs Oct. 26, 28, 29, 1942; minimum gage height, 1.32 ft. Sept. 30, 1939.

Remarks.—No regulation or diversions above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	392	967	662	448	868	382	362	546	544	585	303	188	518
1955...	400	1,254	625	266	330	162	323	412	737	512	234	143	449
1956...	329	714	500	451	148	297	626	1,043	1,088	766	294	182	537
1957...	455	348	540	170	541	490	459	742	452	290	163	109	396
1958...	266	284	482	711	1,015	357	396	720	608	240	102	81.7	435
1959...	242	531	690	919	262	265	516	609	625	369	137	293	456
1960...	235	525	565	516	621	327	479	516	573	341	147	86.1	410

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	173	351	312	173	273	182	176	218	418	408	215	116	116
1955...	91	187	380	192	146	117	156	166	408	404	153	92	91
1956...	87	247	270	193	118	123	228	550	690	404	188	120	87
1957...	112	190	182	105	91	255	286	555	286	179	107	79	79
1958...	84	133	168	329	304	210	277	406	343	148	85	70	70
1959...	63	210	311	393	190	158	229	427	467	197	98	96	63
1960...	130	104	211	136	182	162	348	368	372	203	111	68	68

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
1953								558	114.02	404,300
1954	3,560	Nov. 13, 1953	116	518	7.79	105.69	374,900	539	110.01	390,200
1955	5,260	Nov. 19, 1954	91	449	6.75	91.64	325,000	388	79.18	280,800
1956	5,800	Nov. 3, 1955	87	537	8.08	109.99	390,100	521	106.74	378,600
1957	4,290	Dec. 9, 1956	79	396	5.95	80.85	286,800	370	75.47	267,700
1958	4,910	Feb. 24, 1958	70	435	6.54	88.75	314,800	471	96.08	340,800
1959	4,750	Jan. 8, 1959	63	456	6.86	93.08	330,100	444	90.71	321,700
1960	6,500	Jan. 29, 1960	68	410	6.17	83.88	297,500			

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 northwest of Eldon, and 6 miles upstream from mouth.

Drainage area.—51.3 sq. mi.

Records available.—June 1951 to September 1960.

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

Average discharge.—9 years (1951-60), 370 cfs (267,900 acre-ft. per year).

Extremes.—1951-60: Maximum discharge, 4,980 cfs Nov. 3, 1955 (gage height, 6.58 ft.), from rating curve extended above 1,100 cfs; minimum, 42 cfs Oct. 21-23, Nov. 9, 1952; minimum gage height, 0.33 ft. Sept. 15, 16, 1958.

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
1954...	287	720	560	392	728	360	319	413	384	374	180	139	402
1955...	343	1,038	502	233	281	141	288	332	528	346	165	106	358
1956...	285	633	433	391	115*	260	591	903	900	612	245	137	459
1957...	393	330	495	150	449	468	407	548	286*	175	119	77.9	324
1958...	226	296	448	685	1,011	326	354	559	391	146	70.0	52.8	376
1959...	177	434	617	795	247	233	409	497	428	225	92.5	224	366
1960...	201	476*	488	463	595	316*	430	420	422	218	90.8	63.9	348

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	164	272	283	158	230	179	173	201	326	251	136	108	108
1955...	88	173	331	162	130	98	147	153	344	267	101	77	77
1956...	75	214	245	168	81	78	253	543	598	354	151	109	75
1957...	101	176	163	92	78	237	265	400*	169	127	84	64	64
1958...	67	144	177	341	377	192	257	341	233	93	58	48	48
1959...	53	150	265	337	182	152	197	378	306	131	70	70	53
1960...	131	115*	193	107	200*	180*	331	317	295	132	77	55	55

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
1953								436	115.42	315,800
1954	2,320	Nov. 13, 1953	108	402	7.84	106.43	291,200	428	113.31	310,000
1955	4,280	Nov. 19, 1954	77	358	6.98	94.68	259,000	314	83.00	227,100
1956	5,810	Nov. 3, 1955	75	459	8.95	121.90	333,500	449	119.13	325,900
1957	3,340	Feb. 24, 1957	64	324	6.32	85.81	234,800	303	80.25	219,600
1958	4,440	Feb. 24, 1958	48	376	7.33	99.60	272,500	398	105.30	288,100
1959	4,030	Jan. 8, 1959	53	366	7.13	96.77	264,800	360	95.31	260,800
1960	5,410	Jan. 29, 1960	55	348	6.78	92.25	252,400			

* Estimated.

Jefferson Creek near Eldon, Wash.

Location.—Lat. 47°35'00", long. 123°06'15", in SE¼ sec. 7, T. 24 N., R. 3 W., on right bank a quarter of a mile upstream from mouth and 4 miles northwest of Eldon.

Drainage area.—21.6 sq. mi.

Records available.—October 1957 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 500 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 2,660 cfs Jan. 8, 1959 (gage height, 8.32 ft.), from rating curve extended above 1,600 cfs on basis of slope-area measurement at gage height 7.84 ft.; minimum, 9.7 cfs Sept. 27-30, 1960 (gage height, 2.78 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
1958...	116	132	197*	426	478	142	158	101	80.5	34.6	17.5	14.0	156
1959...	57.3	186	287	457	129	145	180	156	92.9	47.8	22.7	102	156
1960...	69.9	206	257	248	328	153	197	120	82.0	42.4	22.6	14.1	144

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	20*	53	67	156	188	70	87	84	60	22	15	13	13
1959...	12.5	62	84	140	67	65	73	92	68	32	17.5	16.5	12.5
1960...	41	29	73	37	71	58	124	82	56	27	17	9.7	9.7

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
1958	2,270	Feb. 18, 1958	13	156	7.22	98.08	113,000	163	102.51	118,100
1959	2,660	Jan. 8, 1959	12.5	156	7.22	97.82	112,700	156	97.93	112,800
1960	2,190	Jan. 29, 1960	9.7	144	6.67	90.90	104,700	.....	.....	.....

* Estimated.

North Fork Skokomish River below Staircase Rapids, near Hoodsport, 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, 2 miles upstream from Dry Creek, and 11½ miles northwest of Hoodsport.

Drainage area.—58.1 sq. mi.

Records available.—July 1924 to September 1960.

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

Average discharge.—36 years (1924-60), 489 cfs (354,000 acre-ft. per year).

Extremes.—1924-60: Maximum discharge, 27,000 cfs Nov. 5, 1934 (gage height, 14.4 ft., from high-water mark), from rating curve extended above 9,800 cfs on basis of slope-area measurement at gage height 12.2 ft.; minimum recorded, 16 cfs Sept. 23, 1930 (gage height, 1.12 ft.).

Remarks.—No regulation or diversion above station.

Note.—The maximum discharge for the water year 1940, not previously published, has been estimated as 9,000 cfs Dec. 15, 1939.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	441	1,134	928	571	1,016	515	494	674	625	616	250	173	617
1955...	519	1,655	806	360	430	190	412	525	886	524	224	143	555
1956...	564	1,131	677	558	182	314	738	1,304	1,332	915	321	206	688
1957...	630	500	826	233	713	632	611	737	369	224	159	104	477
1958...	297	398	693	1,027	1,381	480	525	772	506	178	83.9	81.1	530
1959...	310	737	987	1,047	338	342	684	703	652	304	114	341	548
1960...	337	730	767	758	838	438	625	654	665	312	140	87.5	528

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	203	406	418	211	318	246	240	284	480	382	151	118	118
1955...	102	211	466	225	195	129	200	208	500	390	144	94	94
1956...	90	302	373	270	135	122	248	706	846	460	184	122	90
1957...	122	270	240	136	120	319	370	539	207	143	101	80	80
1958...	82	177	265	487	579	271	342	487	207	108	71	63	63
1959...	58	257	411	468	253	209	279	532	439	167	81	84	58
1960...	161	142	312	184	251	221	444	448	430	187	105	65	65

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
1953								702	164.07	508,400
1954	4,510	Mar. 9, 1954	118	617	10.6	144.07	446,400	656	153.23	474,800
1955	9,400	Nov. 18, 1954	94	555	9.55	129.65	401,800	505	117.89	365,300
1956	13,600	Nov. 3, 1955	90	688	11.8	161.12	499,300	654	153.29	475,000
1957	9,430	Dec. 9, 1956	80	477	8.21	111.48	345,400	429	100.26	310,700
1958	6,690	Feb. 24, 1958	63	530	9.12	123.83	383,700	584	136.45	422,800
1959	7,210	Dec. 1, 1958	58	548	9.43	127.96	396,500	531	123.97	384,100
1960	8,850	Jan. 29, 1960	65	528	9.09	123.63	383,000			

Lake Cushman Reservoir near Hoodsport, Wash.

Location.—Lat. 47°25'05", long. 123°13'20", in SW¼ sec. 5, T. 22 N., R. 4 W., on upstream face of Cushman Dam No. 1, 4 miles northwest of Hoodsport.

Drainage area.—93.7 sq. mi.

Records available.—October 1925 to September 1960.

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

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

Extremes.—1952-60: Maximum contents observed, 459,200 acre-ft. Dec. 22, 1933 and Nov. 19, 1954 (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
1954...	407,710	417,200	422,600	412,430	432,000	432,480	436,700	445,100	451,930	452,980	448,790	434,850	.....
1955...	418,160	436,240	429,440	402,860	401,640	369,610	387,480	426,280	452,270	453,270	443,970	417,600	.....
1956...	431,600	424,160	424,960	425,200	392,440	380,970	417,440	450,630	451,130	452,220	448,790	417,040	.....
1957...	410,170	394,840	398,640	361,840	409,940	438,620	444,850	452,310	451,550	449,580	434,850	390,590	.....
1958...	378,320	356,510	380,820	429,200	440,800	438,130	441,980	451,130	451,970	451,030	435,300	412,860	.....
1959...	370,400	379,570	435,550	436,450	416,880	430,800	454,910	453,480	451,130	451,060	432,240	432,760	.....
1960...	431,040	431,040	425,840	410,010	405,880	406,150	435,180	447,560	449,910	453,320	441,570	429,200	.....

North Fork Skokomish River near Hoodsport, Wash.

Location.—Lat. 47°25'20", long. 123°13'10", in SW¼ sec. 5, T. 22 N., R. 4 W., at city of Tacoma dam, 4 miles northwest of Hoodsport.

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

Records available.—August 1910 to September 1911 (fragmentary), October 1913 to September 1960 (monthly discharge only).

Gage.—Discharge determined from record of power output and Lake Cushman elevations, plus spillway discharge when crest is exceeded. Prior to Sept. 23, 1911, staff gage and February 1913 to September 1923, water-stage recorder, at approximately same site. At datum 486.4 ft. above mean sea level (levels by city of Tacoma) prior to Sept. 2, 1918, and at datum 5.00 ft. higher Sept. 2, 1918, to September 1923. October 1923 to September 1930 water-stage recorder 1 mile downstream at different datum.

Average discharge.—49 years (1911-60), 741 cfs (536,500 acre-ft. per year), adjusted for storage.

Extremes.—Not determined since regulation began in Lake Cushman.

Remarks.—No diversion of consequence. Flow regulated in Lake Cushman since October 1925 for power by city of Tacoma.

Cooperation.—Records of power output and elevation of Lake Cushman furnished by city of Tacoma.

North Fork Skokomish River near Hoodsport, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,024	1,409	1,317	1,231	1,507	797	705	649	592	693	385	434	891
1955...	900	2,151	1,353	995	721	910	427	55.7	524	578	422	616	811
1956...	611	1,879	1,149	1,114	924	938	426	997	1,551	951	396	789	975
1957...	1,070	896	1,175	970	505	645	789	747	443	310	429	871	739
1958...	652	946	807	981	1,980	766	754	732	539	205	365	490	759
1959...	1,130	1,004	708	1,788	958	435	635	868	794	368	442	503	802
1960...	497	1,137	1,277	1,436	1,488	799	544	668	716	295	355	334	789

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	536	447	114	178	257	0	0	0	189	232	0	0	0
1955...	169	652	560	756	123	330	0	0	0	275	0	0	0
1956...	128	318	388	380	255	0	0	0	623	282	0	51	0
1957...	202	300	0	170	0	0	0	0	0	0	0	0	0
1958...	0	330	245	0	1,120	0	0	0	0	0	0	0	0
1959...	347	228	0	551	0	0	0	0	0	0	0	0	0
1960...	0	66	298	616	408	0	0	0	0	0	0	0	0

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953			0						906	655,900	969	140.33
1954			0	891	645,300	892	9.52	129.20	953	689,600	962	139.35
1955			0	811	587,400	788	8.41	114.08	740	535,400	733	106.23
1956			0	975	708,000	975	10.4	141.57	936	679,400	900	130.69
1957			0	739	535,200	703	7.50	101.82	677	489,800	652	94.45
1958			0	759	549,500	790	8.43	114.40	796	576,300	872	126.26
1959			0	802	580,700	830	8.86	120.20	808	584,800	794	115.08
1960			0	789	572,800	784	8.37	113.91				

Deer Meadow Creek near Hoodsport, 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 Hoodsport.

Records available.—August 1950 to August 1951, October 1952 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 688.28 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by city of Tacoma). Prior to Oct. 1, 1952, at datum 0.48 ft. higher.

Average discharge.—8 years (1950-51, 1952-60), 7.28 cfs (5,270 acre-ft. per year).

Extremes.—1950-51, 1952-60: Maximum discharge, 355 cfs Nov. 3, 1955 (gage height, 2.98 ft.); minimum, 0.2 cfs Oct. 8-11, 1952, Oct. 2, 4, 6, 7, 1958.

Remarks.—Since October 1953, records include large part of flow of McTaggart Creek, from which water is diverted at city of Tacoma diversion dam in N½ sec. 7, T. 22 N., R. 4 W. When flow of McTaggart Creek exceeds about 80 cfs, there is undiverted spill over dam. For discharges less than about 80 cfs the city allows up to 2 cfs to flow through pipe in dam and continue in McTaggart Creek, not to exceed the natural flow of stream. No regulation.

Deer Meadow Creek near Hoodsport, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1.60	8.16	13.2	15.9	33.3	7.55	5.12	2.22	1.86	1.48	1.16	1.07	7.56
1955...	1.81	20.8	9.65	8.05	11.8	4.85	11.9	2.55	1.84	1.40	.92	.84	6.29
1956...	3.29	34.2	26.7*	26.4*	8.87*	23.9*	11.7	2.45	2.22	1.66	1.22	.80	12.0
1957...	4.35	5.81	11.9	3.29	19.3	18.8	6.55	2.83	2.18	1.33	1.00	.58	6.42
1958...	.98	3.25	14.8	27.7	27.8	7.50	6.20	3.21	1.75	1.27	.56	.45	7.86
1959...	.46	4.99	15.3	26.3	7.51	6.09	9.81	6.04	2.55	1.84	1.00	1.08	6.93
1960...	1.49	12.6	14.8	13.9	22.3	7.83	12.2	4.79	2.00	1.34	.97	.85	7.86

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0.5	1.6	5.6	5.6	6.0	3.2	2.9	1.9	1.6	1.3	1.0	0.9	0.5
1955...	.8	1.8	3.2	5.1	4.6	3.0	5.1	.7	1.2	1.0	.8*	.7	.7
1956...	.6	7.4	12*	12.5	7.2*	7.3*	3.1	1.9	1.9	1.0	.9	.6	.6
1957...	.4	2.7	2.5	2.3	2.1	7.2	3.7	2.3	1.4	.9	.7	.4	.4
1958...	.3	1.5	2.3	9.2	15	4.4	3.0	1.9	1.5	.9	.4	.4	.3
1959...	.2	.4	5.3	10.5	4.7	3.7	3.7	3.0	2.1	1.2	.6	.6	.2
1960...	.7	1.2	4.4	2.3	5.6	4.4	6.5	2.7	1.5	1.0	.7	.4	.4

Summary

YEAR	WATER YEAR ENDI NG SEPTEMBER 30					CALENDAR YEAR	
	Momentary Maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1953						4.81	3,480
1954	167	Jan. 5, 1954	.5	7.56	5,470	8.30	6,020
1955	244	Nov. 19, 1954	.7	6.29	4,560	8.97	6,500
1956	355	Nov. 3, 1955	.6	12.0	8,690	8.47	6,160
1957	150	Feb. 26, 1957	.4	6.42	4,650	6.17	4,470
1958	111	Dec. 25, 1957	.3	7.86	5,700	7.99	5,790
1959	78	April 29, 1959	.2	6.93	5,020	7.62	5,520
1960	108	①	.4	7.86	5,710		

* Estimated.
① Nov. 20, 1959, Jan. 29, 1960.

Dow Creek near Hoodsport, 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 Hoodsport.

Drainage area.—1.67 sq. mi.

Records available.—August 1950 to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. (from topographic map).

Extremes.—1950-54: 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 about one-third cubic foot per second for use of Cushman power plant operator's village. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1.96	13.5	21.5	25.2	53.7	13.3	9.16	1.81	1.01	.66	.38	.41	11.6

Dow Creek near Hoodsport, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0.6	3.7	9.6	4.6	10	4.2	2.8	1.1	0.8	0.4	0.3	0.3	0.3

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
1953								10.5	85.61	7,620
1954	225	Jan. 5, 1954	0.3	11.6	0.95	94.28	8,400			

North Fork Skokomish River near Potlatch, 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 Potlatch, and 7 miles downstream from city of Tacoma's Cushman Dam No. 2.

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

Records available.—March 1944 to December 1949, February 1950 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 63.49 ft. above mean sea level (levels by city of Tacoma). Prior to Nov. 27, 1949 (destroyed by flood of Nov. 27, 1949), and Mar. 18 to May 8, 1950, water-stage recorder at site 200 ft. downstream at present datum.

Extremes.—1944-60: Maximum discharge, 7,740 cfs Nov. 4, 1955 (gage height, 10.45 ft.); minimum recorded, 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 to supply powerplant which discharges directly into sea (Hood Canal). Main portion of McTaggart Creek is diverted into Cushman Reservoir No. 2 and may bypass this station. Flow regulated by Lake Cushman (see p. 40) and by pondage in Cushman Reservoir No. 2, from which spill releases are infrequent.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	25.9	141	235	279	496	106	83.3	24.0	14.7	22.2	8.86	7.32	118
1955...	29.1	852	229	122	121	83.7	147	43.6	23.1	26.1	10.9	10.2	140
1956...	87.1	936	250	257	89.0	227	88.2	31.9	39.0	18.9	14.8	11.8	170
1957...	82.7	77.2	189	68.9	185	140	75.2	37.0	23.2	16.8	10.2	6.06	75.4
1958...	22.2	60.4	154	224	508	85.3	103	41.5	21.0	14.3	6.45	7.59	101
1959...	15.7	109	174	509	106	83.0	240	136	32.9	18.7	9.26	22.4	122
1960...	41.7	256	225	192	226	117	148	59.5	29.7	17.6	13.8	10.6	111

North Fork Skokomish River near Potlatch, Wash.

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.6	48	80	71	97	46	38	17.5	10.5	8.5	7.4	5.8	5.8
1955...	5.8	21	112	91	54	46	70	30	19.5	13	7.4	6.4	5.8
1956...	7.4	118	131	115	64	87	46	25	24	15.5	11.5	9.1	7.4
1957...	9.6	41	34	47	44	77	48	28	16.5	11	6.6	4.6	4.6
1958...	4.9	21	55	81	135	67	62	28	16	8.1	4.6	5.2	4.6
1959...	7.0	18	69	105	74	55	45	30	22	9.0	7.0	7.0	7.0
1960...	13	27	61	48	72	63	81	40	23	14	10	7.0	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
	Discharge	Date					
1953						142	102,600
1954	2,770	Feb. 21, 1954	5.8	118	85,310	176	127,400
1955	6,100	Nov. 19, 1954	5.8	140	101,600	154	111,400
1956	7,740	Nov. 4, 1955	7.4	170	123,600	94.3	68,470
1957	3,060	Dec. 9, 1956	4.6	75.4	54,560	65.8	47,670
1958	2,300	Feb. 25, 1958	4.6	101	73,270	106	76,980
1959	3,980	April 29, 1959	7.0	122	88,100	140	101,600
1960	2,680	Nov. 20, 1959	7.0	111	80,460		

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.

Records available.—October 1923 to September 1932, September 1946 to September 1960.

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

Average discharge.—23 years (1923-32, 1946-60), 597 cfs (432,200 acre-ft. per year).

Extremes.—1923-32, 1946-60: Maximum discharge, 19,300 cfs Nov. 26, 1949 (gage height, 17.75 ft.), from rating curve extended above 5,600 cfs on basis of logarithmic plotting; minimum, 38 cfs Sept. 15, 1926; minimum gage height, 0.51 ft. Sept. 2, 3, 1959.

Remarks.—No regulation or diversion above station.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water year 1952, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff	
			Inches	Acre-feet
October 1951	850			
Calendar year 1951	630		130.44	456,400
Water year 1951-52	594	9.05	123.27	431,300

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
1954...	497	1,291	1,321	995	1,796	768	758	470	352	308	141	147	729
1955...	554	1,932	1,004	588	782	364	773	563	486	293	183	150	636
1956...	782	1,831	1,314	1,223	353	828	992	981	867	427	181*	200	833
1957...	756*	519*	1,109*	308	1,077	937*	705	405	208	185	163	108*	537
1958...	322	485	1,094	1,583	1,704	588	764	379	194	111	77.4	90.3	610
1959...	362	1,077	1,279	1,489	554	642	941	587	351	157	98.9	400	662
1960...	433	1,019	986	958	1,195	688	909	624	372	160	111	102	627

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	217	555	464	314	597	363	354	331	280	177	121	116	116
1955...	107	219	589	342	301	205	359	381	336	191	116	99	99
1956...	108	529	669	481	280*	294	548	721	485	242	130*	116	108
1957...	156	276	257	210*	205	460*	418	269	156	139	105*	92	92
1958...	88	196	370	792	968	322	422	264	143	89	69	68	68
1959...	86	338	455	730	328	334	342	342	219	114	86	84	84
1960...	179	184	325	193	370	303	599	472	240	115	91	83	83

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
1953								805	166.59	582,800
1954	8,470	Jan. 5, 1954	116	729	11.1	150.95	528,100	760	157.28	550,200
1955	14,800	Nov. 18, 1954	99	636	9.70	131.60	460,500	673	139.33	487,500
1956	17,800	Nov. 3, 1955	108	833	12.7	172.76	604,500	706	146.40	512,200
1957	16,700	Dec. 9, 1956	92	537	8.19	111.17	388,900	496	102.69	359,300
1958	9,000	Dec. 25, 1957	68	610	9.30	126.13	441,200	677	140.14	490,300
1959	8,880	April 29, 1959	84	662	10.1	136.98	497,300	639	132.12	462,200
1960	11,300	Nov. 20, 1959	83	627	9.56	130.13	455,300			

* Estimated.

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 confluence with North Fork and Vance Creek and 8 miles west of Union.

Drainage area.—79.6 sq. mi.

Records available.—August 1931 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (by barometer). Prior to Sept. 19, 1931, staff gage at same site at datum 2.32 ft. higher.

Average discharge.—29 years (1931-60), 712 cfs (515,500 acre-ft. per year).

Extremes.—1931-60: Maximum discharge, 21,600 cfs Jan. 22, 1935, Nov. 26, 1949 (gage height, 11.0 ft.), from rating curve extended above 11,000 cfs; minimum, 62 cfs Sept. 18, 1938; minimum gage height, 86 cfs Sept. 29-30, 1960 (gage height, 1.38 ft.).

Remarks.—No regulation or diversion above station.

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
1954...	522	1,470	1,835	1,326	2,248	894	831	480	369	322	418	158	874
1955...	598	2,337	1,284	752	954	463	914	598	505	309	195	167	752
1956...	885	2,162	1,569	1,472	414	1,075	1,146	1,012	909	442	185	197	957
1957...	898	597	1,291	350	1,299	1,122	788	470	233	201	180	115	625
1958...	360	574	1,309	1,805	1,939	659	815	405	210	117	84.0	97.9	691
1959...	369	1,294	1,600	1,949	687	761	1,185	621	337	173	91.5	455	794
1960...	493	1,395	1,292	1,288	1,583	780	1,045*	652	378	173	124	106	772

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	242	522	557	425	781	432	382	336	294	186	124	121	121
1955...	118	254	300	470	365	281	416	430	365	201	126	112	112
1956...	122	659	812	563	328	340	686	731	514	245	133	114	114
1957...	149	285	260	225	215	530	488	318	165	145*	131	101	101
1958...	110	221	481	850	1,010	404	484	301	146	95	76	69	69
1959...	82	348	513	720	410	378	370	270	230	119	84	90	82
1960...	193	210*	414	257	420	358	660*	496	248	130	100	86	86

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
1953										
1954	10,600	Jan. 5, 1954	121	874	11.0	149.68	633,000	1,018	173.51	736,000
1955	15,500	Nov. 18, 1954	112	752	9.45	128.28	544,600	905	154.34	655,300
1956	17,900	Nov. 3, 1955	114	957	12.0	163.67	694,700	786	134.13	569,300
1957	14,700	Dec. 9, 1956	101	625	7.85	106.66	452,700	806	137.89	585,300
1958	9,490	Dec. 25, 1957	69	691	8.68	117.78	500,000	579	98.82	419,500
1959	13,500	April 29, 1959	82	794	9.97	135.41	574,800	775	132.21	561,300
1960	16,100	Nov. 20, 1959	86	772	9.70	131.97	560,200	787	134.16	569,500

* Estimated.

Vance Creek near Potlatch, Wash.

Location.—Lat. 47°19'45", long. 123°18'48", in NE¼NE¼ sec. 9, T. 21 N., R. 5 W., 1 mile downstream from Aristine Creek and 8½ miles southwest of Potlatch.

Drainage area.—15.6 sq. mi.

Records available.—March 1955 to September 1956.

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

Extremes.—1955-56: Maximum discharge, 1,500 cfs Nov. 4, 1955 (gage height, 7.00 ft.); minimum, 12 cfs Sept. 4-9, 17-23, 1956; minimum gage height, 2.86 ft. Sept. 12, 13, 1955.

High water of Nov. 18, 1954 reached a stage of 8.1 ft., from floodmarks (discharge, 3,840 cfs), by slope-area determination.

Remarks.—No diversion or regulation above station.

Vance Creek 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
1955	.....	.....	.....	.....	.....	.....	307	70.5	26.0	27.4	28.5	24.9	.....
1956	307*	599	182	156*	71.4	297*	309*	56.5	58.0	24.6	15.5	24.4	175

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	70	39	20	15.5	16.5	15	.....
1956	20	216	52	48	54	66	105	25	23	17.5	13	12	12

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
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1956	1,500	Nov. 4, 1955	12	175	31.2	152.58	127,000	.....	.....	.....

* Estimated.

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 right 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.

Records available.—July 1943 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 16.47 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 24, 1956, water-stage recorders or staff gages at about present site at datum 2.88 ft. higher except Oct. 1, 1947, to Apr. 18, 1951, at present datum. Mar. 24, 1956, to July 21, 1958, at site 200 ft. downstream at datum 2.88 ft. higher.

Extremes.—1943-60: Maximum discharge, 27,000 cfs Nov. 3, 1955 (gage height, 15.5 ft., present datum); minimum, 125 cfs Sept. 14-17, 1944 (gage height, minus 0.01 ft., datum then in use).

Flood of December 1933 reached a stage of 11.4 ft. (revised), present datum (discharge, 18,600 cfs).

Remarks.—Flow partly regulated by Lake Cushman and Cushman Reservoir No. 2. In normal years practically entire flow of North Fork is diverted at dam No. 2 and returned to sea through Cushman powerplant No. 2.

Revisions.—The momentary maximum discharge for the water year 1950 published in State WSB No. 6 has been revised to 21,400 cfs.

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
1954...	772	2,255	2,752	2,256	3,760	1,340	1,237	675	543	470	261	266	1,366
1955...	883	3,710	1,754	1,190	1,511	815	1,520	812	618	436	305	244	1,143
1956...	1,332	3,788	2,341	2,419	780	1,953	1,762	1,309	1,213	557	224	327	1,502
1957...	1,956	1,364	2,433	729	2,167*	1,948	1,201	642	367	314	283	196	1,129
1958...	462	773	2,061	2,980	3,373	1,039	1,424	683	322*	225*	186	174	1,130
1959...	508	1,898	2,356	3,176	1,126	1,181	1,976	1,162	616	351	229	620	1,268
1960...	711	2,151	2,009	1,774	2,262	1,359	1,659	1,015	608	320	250*	221*	1,189

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	334	990	1,080	749	1,170	707	635	555	445	290	236	227	227
1955...	218	386	971	771	610	502	728	640	468	315	201	159	159
1956...	196	844	1,200	1,070	656	726	1,270	1,020	726	255	200	200	196
1957...	240	537	481	460*	440*	1,060	776	498	270	250	215	175	175
1958...	171	295	547	1,510	1,780	696	816	420	250*	208	154	131	131
1959...	128	455	871	1,330	694	619	559	655	470	255	204	218	128
1960...	340	395	853	442	864	800	1,040	818	411	260*	204	180*	180*

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					
1953						1,497	1,084,000
1954	15,000	Jan. 5, 1954	227	1,366	988,900	1,410	1,021,000
1955	20,000	Nov. 18, 1954	159	1,143	827,600	1,237	895,700
1956	27,000	Nov. 3, 1955	196	1,502	1,090,000	1,364	990,100
1957	17,200	Dec. 9, 1956	175	1,129	817,300	923	668,500
1958	12,400	Dec. 25, 1957	131	1,130	818,200	1,250	904,800
1959	23,600	April 30, 1959	128	1,268	917,600	1,276	924,000
1960	22,100	Nov. 20, 1959	180	1,189	863,500		

* Estimated.

Purdy Creek near Union, Wash.

Location.—Lat. 47°18'05", long. 123°10'50", in NW¼NW¼ sec. 22, T. 21 N., R. 4 W., on left bank immediately downstream from county road bridge, 1 mile upstream from Weaver Creek, and 5½ miles southwest of Union.

Drainage area.—1.43 sq. mi.

Records available.—September 1954 to July 1960.

Gage.—Water-stage recorder. Datum of gage is 28.76 ft. above mean sea level (State Fisheries Department reference mark).

Average discharge.—5 years (1954-59), 23.5 cfs (17,010 acre-ft. per year).

Extremes.—1954-60: Maximum discharge, 111 cfs Dec. 15, 1959; maximum gage height, 2.21 ft. Apr. 22, 1960; minimum daily, 5.9 cfs Dec. 9, 1959.

Remarks.—Flow affected by springs. Regulation resulting from construction of fish hatchery began October 1959.

Purdy Creek 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
1954	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15.7	.....
1955	12.4	21.8	22.1	24.5	31.4	27.3	30.2	25.7	22.9	20.0	16.1	14.8	22.4
1956	17.0	29.2	41.4	49.8	36.3	43.8	37.2	26.4	22.0	18.8	18.2	15.5	29.6
1957	17.2	16.1	30.4	20.9	25.6	34.9	26.5	22.5	19.8	18.3	16.4	15.0	22.0
1958	13.2	13.4	16.9	28.4	32.7	28.6	26.4	22.9	20.6	18.4	15.2	13.0	20.7
1959	11.8	13.8	19.6	35.4	28.8	26.4	31 2	31.3	22.0	19.5	16.5*	15.5*	22.6
1960	14.8	20.2	22.3	25.1	41.2	33.2	38.5	36.7	25.2	19.4	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	.....
1955	11	11	19	23	26	25	28	23	22	19	15	14	11
1956	13.5	13.5	29	35	33	36	31	22	19.5	16.5	17.5	14.5	13.5
1957	14.5	11.5	11.5	19.5	19	29	24	21	19	16	15.5	13.5	11.5
1958	11	11.5	12.5	16	30	27	24	21	19	17	14	11	11
1959	14	10	14	25	27	23	25	23	20	18	15	14	10
1960	12	11	5.9	13.5	32	28	25	32	23	16*	.....	.....	.....

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					
1954	.....	.....	.....	.....	.....	.....	.....
1955	70	Feb. 7, 1955	11	22.4	16,190	25.0	18,090
1956	81	Dec. 22, 1955	13.5	29.6	21,500	27.7	20,070
1957	106	Dec. 10, 1956	11.5	22.0	15,920	20.3	14,680
1958	60	Jan. 16, 1958	11	20.7	14,990	20.9	15,100
1959	99	April 30, 1959	10	22.6	16,380	23.6	17,100
1960	111	Dec. 15, 1959	.....	.....	.....	.....	.....

* Estimated.

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 highway bridge, 1¼ miles upstream from Hazel Creek, and 7 miles west of Bremerton.

Drainage area.—3.16 sq. mi.

Records available.—October 1945 to September 1959.

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 (closed stadia traverse).

Average discharge.—14 years (1945-59), 12.2 cfs (8,830 acre-ft. per year).

Extremes.—1945-59: Maximum discharge, 476 cfs Feb. 22, 1949 (gage height, 3.85 ft., site and datum then in use), from rating curve extended above 160 cfs by logarithmic plotting; minimum daily, 0.2 cfs June 2, 1955.

Remarks.—Regulation by Casad Dam 1 mile upstream since sometime in 1956. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	6.85	24.3	27.5	32.5	52.3	12.6	10.5	3.16	1.95	1.29	.88	.96	14.3
1955...	1.18	30.9	22.7	14.9	14.6	10.0	15.9	3.55	2.23	2.08	1.49	1.14	9.99
1956...	9.45*	47.1*	36.3	50.8*	14.1*	29.4*	8.48	1.70	3.44	1.79	1.24	.96	17.1
1957...	3.71	14.3	8.89	8.42	5.24	8.96	8.74	9.22*	10.5	10.6	12.0*	18.9	9.96
1958...	6.84	4.86*	5.01	5.87	17.0	10.7	7.75	10.7	11.1	14.9	9.08	6.05	9.11
1959...	7.06	20.1	12.5	7.75	7.70	8.81	14.5	16.3	9.62	12.8	10.6	10.6	11.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1.8	14	11*	8.8	15	4.8	4.8	2.4	1.3	0.8	0.7	0.7	0.7
1955...	.8	1.2	10.5	10	5.8	5.4	8.0*	.3	.2	1.2	1.3	.5	.2
1956...	2.8	9*	12.5	23*	8.5*	18*	3.0	1.1	1.0	1.1	1.0	.7	.7
1957...	.6	.6	1.3	4.5	.8	8.0	7.6	.....	8.0	8.0	11	11.5	.6
1958...	1.5	.7*	.9	.8	10.5	7.6	6.2	7.6	8.0	9.8	5.8	5.8	.7*
1959...	4.8	6.4	4.5	4.8	5.6	6.9	6.0	7.9	6.4	6.4	6.9	6.9	4.5

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
1953.....	.....	.....	.....	.....	.....	.....	.....	15.9	68.33	11,520
1954.....	254	Jan. 5, 1954	0.7	14.3	4.53	61.53	10,380	14.0	60.01	10,120
1955.....	348	Nov. 19, 1954	.2	9.99	3.16	42.91	7,230	13.2	56.61	9,540
1956.....	386	Nov. 3, 1955	.7	17.1	5.41	73.67	12,420	11.6	49.99	8,430
1957.....	52	①	.6	9.96	3.15	42.77	7,210	9.12	39.18	6,600
1958.....	26	②	.7	9.11	2.88	39.12	6,590	11.0	47.31	7,980
1959.....	46	May 2, 3, 1959	4.5	11.5	3.64	49.56	8,350	.....	.....	.....

* Estimated.
① Oct. 31 to Nov. 1, 1956.
② Feb. 25 to Mar. 1, 1958.

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, 2 miles upstream from mouth, and 6 miles downstream from Casad Dam.

Drainage area.—19.2 sq. mi.

Records available.—July 1947 to September 1959.

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

Average discharge.—12 years 1947-59, 54.7 cfs (39,600 acre-ft. per year).

Extremes.—1947-59: Maximum discharge, 1,610 cfs Feb. 22, 1949 (gage height, 7.81 ft.), from rating curve extended above 700 cfs; minimum, 11 cfs Aug. 15, 1959; minimum gage height, 1.06 ft. Sept. 5, 6, 1949.

Remarks.—City of Bremerton diverts annually about 4,000 acre-ft. from a point about 5 miles above station for municipal use. The diversion varies from almost no flow in August and September to as much as 10 cfs during winter months. Regulation by dam 6 miles upstream.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	25.8	61.2	87.5	123	179	61.7	53.6	34.8	28.1	26.1	22.4	21.5	59.7
1955...	21.2	92.9	69.9	47.6	55.0	45.3	66.9	33.8	24.7	23.3	20.5	19.0	43.2
1956...	50.2	145	141	156	73.3*	134	59.7	37.9	37.7	26.0	22.8	21.7	75.6
1957...	39.9	37.6	78.1	43.2	76.9	85.4	43.5	34.5	29.1	25.1	24.1	22.8	44.9
1958...	24.3	29.7*	66.1*	92.9	94.2	49.4	48.2	33.3	26.4	19.6	16.2	15.9	42.7
1959...	22.7	51.1	73.4	112	63.2	43.8	64.9	56.3	30.8	22.2	19.1	25.3	48.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	17	29	44	45	63	42	40	31	27	22	22	19	17
1955...	17.5	17.5	36	34	33	33	38	28	22	19	18.5	16.5	16.5
1956...	19	28	48	73	53*	74	43	34	29	23	21	20	19
1957...	20	24	28	31	32	51	36	32	27*	24	22	20	20
1958...	19.5	20	26	40*	62	40	37	29	24	17.5	14	14	14
1959...	17.5	23	32	41	48	38	34	32	28	18	17.5	17.5	17.5

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					
1953.....	.....	.....	.....	.....	.....	60.0	43,450
1954.....	834	Jan. 5, 1954	17	59.7	43,260	60.4	43,730
1955.....	665	Nov. 19, 1954	16.5	43.2	31,270	56.0	40,540
1956.....	1,040	Nov. 3, 1955	19	75.6	54,880	60.6	43,960
1957.....	788	Dec. 9, 1956	20	44.9	32,490	41.9	30,330
1958.....	340	Dec. 25, 1957	14	42.7	30,940	45.0	32,560
1959.....	499	April 30, 1959	17.5	48.7	35,230	.....	.....

* Estimated.

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.

Records available.—October 1945 to September 1960.

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

Average discharge.—15 years (1945-60), 6.03 cfs (4,370 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 203 cfs Feb. 22, 1949 (gage height, 3.27 ft.); minimum, 0.1 cfs July 29, Sept. 9, 1958; minimum gage height, 0.72 ft. Sept. 9, 1958.

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
1954...	2.73	9.83	12.1	16.2	25.4	8.13	5.67	2.14	1.47	1.00	.65	.69	7.05
1955...	.80	12.1	10.6	7.95	7.35	5.68	8.84	2.74	1.45	1.24	.78	.82	5.00
1956...	5.00	22.7*	17.8	18.5	7.11*	19.1*	6.31	2.46	2.75	1.36	.85	.82	8.74
1957...	4.76	6.83	15.0*	6.47*	13.0	12.0	5.38	2.55	1.42	.77	.65	.44	5.74
1958...	.97	3.94*	9.97	14.5	14.7	5.24	7.22	2.46	1.19	.72	.43	.61	5.10
1959...	1.34	6.57	10.7	15.9	7.88	5.85	6.98	4.37	1.78	.96	.57	1.03	5.32
1960...	1.59	10.1	11.5	12.6	13.8	8.89	9.77	4.64	1.92	.83	.75	.66	6.39

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1.1	5.5	4.8	5.0	10	3.5	3.0	1.6	1.1	0.6	0.6	0.6	0.6
1955...	.6	.7	5.3	5.3	3.6	2.8	3.8	1.9	1.0	.7	.5	.5	.5
1956...	.6	5.8*	8.6	7.5	4.5*	7.9	3.3	1.7	1.6	.6	.5	.5	.5
1957...	.8	3.0*	3.0*	3.4	3.0	6.5	3.8	1.6	.9	.4	.5	.3	.3
1958...	.3	1.0	2.9	5.0	8.8	3.0	3.7	1.7	.8	.3	.3	.3	.3
1959...	.4	2.7	4.4	6.7	4.8	4.0	2.8	2.2	1.2	.8	.4	.4	.4
1960...	.8	1.6	4.0	3.8	5.0	4.7	5.7	3.2	1.1	.6	.6	.5	.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
1953								6.90	60.86	5,000
1954	149	Jan. 5, 1954	0.6	7.05	4.58	62.17	5,100	6.94	61.21	5,020
1955	97	Nov. 19, 1954	.5	5.00	3.25	44.07	3,620	6.84	60.23	4,950
1956	175	Nov. 3, 1955	.5	8.74	5.68	77.24	6,350	7.19	63.54	5,230
1957	157	Dec. 10, 1956	.3	5.74	3.73	50.62	4,160	4.75	41.90	3,440
1958	77	Dec. 25, 1957	.3	5.10	3.31	44.95	3,690	5.41	47.66	3,920
1959	77	Jan. 24, 1959	.4	5.32	3.45	46.89	3,850	5.71	50.29	4,130
1960	138	Nov. 20, 1959	.5	6.39	4.15	56.45	4,640			

* Estimated.

Tahuya River near Bremerton, Wash.

Location.—Lat. 47°33'00", long. 122°50'50", in SE¼ sec. 19, T. 24 N., R. 1 W., on right bank 100 ft. downstream from bridge, 1½ miles downstream from Tahuya Lake, and 10 miles west of Bremerton.

Drainage area.—6.16 sq. mi. At site prior to September 1954, 6.12 sq. mi.

Records available.—May 1945 to October 1956. Published as Tahuyeh Creek near Bremerton, 1945, and as Tahuya Creek near Bremerton, 1946.

Gage.—Water-stage recorder. Altitude of gage is 540 ft. (from topographic map). Prior to Sept. 16, 1954, at site a quarter of a mile upstream at datum 539 ft. above mean sea level (closed stadia traverse).

Average discharge.—11 years (1945-56), 22.3 cfs (16,140 acre-ft. per year).

Extremes.—1945-56: Maximum discharge, 504 cfs Nov. 3, 1955 (gage height, 5.93 ft.); minimum, 0.1 cfs Sept. 22-26, 1947, Sept. 1-10, 12, 13, 1949, Oct. 4-10, 1952.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	5.12	34.8	44.5	71.5	116	27.1	20.2	5.33	2.58	1.87	1.02	1.17	27.0
1955...	1.71	42.8	36.9*	25.8*	25.0	18.0*	28.9*	6.64	3.11	2.17	1.80	2.62	16.0
1956...	14.6*	84.0	76.3	75.8	22.4	66.8	19.3	5.20	5.76	2.13	1.05	.82	31.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1.2	16	16.5	17	35	8.1	8.1	3.1	1.7	1.0	0.8	0.8	0.8
1955...	1.5	1.4	17	17*	10.5	8.2	10.5	4.2	2.3	1.4	1.7	1.6*	1.4
1956...	1.6*	20*	35	25	11.5	23	6.7	2.3	2.1	.9	.7	.7	.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
1953								24.7	54.72	17,860
1954	424	Jan. 5, 1954	0.8	27.0	4.41	59.93	19,570	26.8	59.22	19,370
1955	330	Nov. 19, 1954	1.4	16.0	2.60	35.28	11,600	23.8	52.51	17,260
1956	504	Nov. 3, 1955	.7	31.3	5.08	69.09	22,700			

* Estimated.

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.

Records available.—May 1945 to October 1956. Published as Tahuyeh Creek near Belfair, 1945 and as Tahuya Creek near Belfair, 1946.

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

Average discharge.—11 years (1945-56), 48.4 cfs (35,040 acre-ft. per year).

Extremes.—1945-56: Maximum discharge, 1,210 cfs Nov. 3, 1955 (gage height, 8.43 ft.); no flow at times most years.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	8.30*	83.4	105	142	215	51.7	39.4	7.11	2.22	1.41	.37	.19*	53.6
1955...	.21	107	90.7	63.4	57.9	41.5	66.7	11.1	2.98	1.55	.43	.12	36.8
1956...	28.5	202	172	177	44.2	153	38.1	6.02	7.91	1.78	.53	.35	69.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1*	29	32	35	60	16	14.5	3.6	1.0	.07	0.2	0.1*	0.1*
1955...	.1	.4	42	42	22	19	20	5.8	1.2	.6	.2	.1	.1
1956...	.1	45*	67	54	16.5	51	10	2.4	1.7	.7	.3	.3	.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
1953								56.8	47.87	41,100
1954	845	Jan. 5, 1954	0.1	53.6	3.33	45.22	38,850	53.7	45.27	38,870
1955	794	Nov. 19, 1954	.1	36.8	2.29	31.01	26,610	53.8	45.39	38,970
1956	1,210	Nov. 3, 1955	.1	69.4	4.31	58.72	50,410			

* Estimated.

Dewatto Creek near Dewatto, Wash.

Location.—Lat. 47°28'10", long. 123°01'30", in SE¼ 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.

Records available.—July 1947 to October 1954, May 1958 to September 1960. Annual maximum discharge only, water years 1955 to 1957.

Gage.—Water-stage recorder. Altitude of gage is 55 ft. (from topographic map). July 1947 to October 1954, water-stage recorder and August 1955 to May 1958, crest-stage gage only, at same site and datum. May to September 1958 water-stage recorder at datum 0.92 ft. higher.

Average discharge.—9 years, (1947-54, 1958-60), 69.6 cfs (50,390 acre-ft. per year).

Extremes.—1947-60: Maximum discharge, 2,110 cfs Nov. 3, 1955 (gage height, 7.42 ft.).

1947-54, 1958-60: Minimum discharge, 9.6 cfs Sept. 22, 1950, Sept. 11, 12, 14, 15, 1959; minimum gage height, 1.57 ft. Sept. 20, 21, 22, 1951.

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
1954...	20.1	88.0	124	185	263	80.4	66.7	30.9	23.9	19.4	16.7	16.5	76.7
1958...	.....	.....	.....	.....	.....	.....	.....	.....	23.4	17.0	13.9	13.6	.....
1959...	17.4	59.0	126	188	94.4	69.7	81.0	54.1	26.6	18.1	17.2	15.7	63.9
1960...	20.2	116	119	138	160	91.9	101	48.8	28.7	18.9	17.5	15.9	72.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	13.5	23	57	62	89	43	39	26	19	16	15.5	14.5	13.5
1958...	.....	.....	.....	.....	.....	.....	.....	.....	19.5	15	13.5	12	.....
1959...	13.5	20	40	68	60	45	40	29	22	14	15	9.6	9.6
1960...	15.5	15.5	35	39	53	49	57	38	23	16	15	15	15

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
1953.....	.....	.....	.....	.....	.....	.....	.....	72.1	55.90	52,190
1954.....	1,280	Jan. 5, 1954	13.5	76.7	4.38	59.48	55,530	.....	.....	.....
1959.....	650	Jan. 24, 1959	9.6	63.9	3.65	49.52	46,220	68.2	52.90	49,370
1960.....	1,060	Nov. 20, 1959	15	72.6	4.15	56.46	52,680	.....	.....	.....

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.

Records available.—July 1947 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Prior to Nov. 2, 1950, at site 200 ft. downstream at datum 1.75 ft. lower.

Average discharge.—13 years (1947-60), 8.85 cfs (6,410 acre-ft. per year).

Extremes.—1947-60: Maximum discharge, 333 cfs Feb. 22, 1949 (gage height, 8.07 ft., present datum, from high-water mark on gage house), from rating curve extended above 50 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.7 cfs Aug. 6, 1959.

Remarks.—Small diversions for irrigation. Slight regulation at times from unknown source.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water years 1948-53, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
Water year 1947-48					108	Jan. 1, 1948
Water year 1948-49					333	Feb. 22, 1949
Water year 1949-50					127	Jan. 21, 1950
January 1951	15.3					
February	20.5					
Water year 1950-51	8.63	1.27	17.29	6,250	104	Feb. 9, 1951
November 1951	11.9					
December	16.7					
Calendar year 1951	8.69		17.42	6,300		
February 1952	11.6					
Water year 1951-52	7.98	1.18	16.04	5,800	77	Nov. 30, 1951
Calendar year 1952	6.81		13.68	4,940		
January 1953	27.5					
Water year 1952-53	7.75	1.14	15.53	5,610	126	Jan. 8, 1953

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	6.10	10.1	9.50	25.1	37.4	10.2	8.52	5.15	5.30	3.94	4.02	5.17	10.7
1955	4.87	12.5	13.0	8.88	7.72	7.94	7.76	5.20	4.63	4.38	3.28	3.47	6.95
1956	6.52	16.0	28.6	29.5	11.4	17.5	7.97	5.30	7.05	4.12	4.35	4.88	12.0
1957	8.03	7.08	8.56	8.69	19.6	17.9	11.6	5.87	4.80	3.91	3.46	3.92	8.55
1958	7.27	7.66	13.4	24.4	23.9	10.1	10.1	5.18	4.12	3.20	3.18	4.34	9.65
1959	7.17	9.34	11.3	14.4*	12.3*	11.5	9.28	8.89	4.25	2.48	2.97	5.10	8.23
1960	6.12*	9.67	13.4	17.0	17.0	11.2	10.8	7.35	4.86	3.46	4.86	4.96	9.20

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	4.4	6.2	6.9	5.2	8.6	6.6	6.0	3.9	3.5	2.7	2.7	3.9	2.7
1955	3.9	4.9	7.7	6.9	6.1	6.1	5.4	4.4	3.3	2.9	3.0	2.7	2.7
1956	3.5	4.8	7.4	8.2	6.5	6.8	6.0	4.2	4.4	3.5	3.5	3.9	3.5
1957	4.7	5.5	4.9	5.1	6.2	8.2	6.8	4.2	4.2	3.0	3.0	3.2	3.0
1958	4.2	5.3	5.1	10.5	13.5	7.9	6.8	3.5	3.4	2.8	2.9	3.2	2.8
1959	4.8	6.0	6.6	5.8*	7.5*	7.0	5.6	5.0	2.4	1.2	1.4	3.4	1.2
1960	3.6	5.0	8.1	6.2	8.5	7.4	7.7	5.7	4.0	3.0	3.4	4.3	3.0

* Estimated.

Dogfish Creek near Poulsbo, 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
1953	.....	.....	.....	.....	.....	.....	.....	8.09	16.22	5,860
1954	159	Feb. 21, 1954	2.7	10.7	1.58	21.45	7,730	11.1	22.21	8,010
1955	102	Nov. 19, 1954	2.7	6.95	1.03	13.93	5,030	8.71	17.47	6,310
1956	269	Dec. 20, 1955	3.5	12.0	1.77	24.04	8,690	9.65	19.41	7,020
1957	130	Feb. 25, 1957	3.0	8.55	1.26	17.15	6,190	8.94	17.93	6,470
1958	109	Dec. 25, 1957	2.8	9.65	1.43	19.35	6,990	9.60	19.25	6,960
1959	124	Jan. 24, 1959	1.2	8.23	1.22	16.50	5,960	8.35	16.73	6,040
1960	193	Jan. 29, 1960	3.0	9.20	1.36	18.50	6,680	.....	.....	.....

PURDY CREEK BASIN

Purdy Creek at Purdy, Wash.

Location.—Lat. 47°23'18", long. 122°37'30", in NW¼ sec. 24, T. 22 N., R. 1 E., on left bank at downstream side of culvert, 400 ft. upstream from mouth at Purdy, and 2 miles south of Burley.

Drainage area.—3.44 sq. mi.

Records available.—November 1959 to September 1960.

Gage.—Staff gage read once daily. Datum of gage is about 10 ft. above mean sea level (from reconnaissance).

Extremes.—1959-60: Maximum discharge, 113 cfs Dec. 15, 1959 (gage height, 1.6 ft. from graph based on gage readings); minimum observed, 1.5 cfs Aug. 10, 1960 (gage height, 0.20 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
1960	.....	.....	12.9	14.5	11.9	8.11	8.96	7.61	4.02	2.43	2.54	2.61	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960	.....	.....	4.4	4.4	6.0	5.4	5.4	5.6	3.0	1.9	1.5	2.1	.....

Burley Creek at Burley, Wash.

Location.—Lat. 47°24'55", long. 122°37'50", in NE¼ sec. 11, T. 22 N., R. 1 E., on left bank at county road bridge, 0.1 mile west of Burley, and 0.3 mile upstream from mouth.

Drainage area.—10.0 sq. mi.

Records available.—July 1947 to September 1950, November 1959 to September 1960.

Gage.—Staff gage. Altitude of gage is 10 ft. (from topographic map). July 1947 to September 1950, water-stage recorder at same site but different datum.

Extremes.—1947-50, 1959-60: Maximum discharge, 291 cfs Mar. 3, 1950 (gage height, 4.53 ft., datum then in use); 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
1960	.....	.....	42.0	37.6	38.9	39.4	37.7	31.0	21.2	16.3	17.7	17.9	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960	.....	.....	26	23	29	29	28	25	18	12	12	14.5	.....

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., on right bank at downstream side of bridge, an eighth of a mile upstream from mouth and 2½ miles west of Wauna.

Drainage area.—5.51 sq. mi.

Records available.—July 1947 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map). Prior to June 26, 1951, at same site at datum 0.86 ft. higher.

Average discharge.—12 years (1947-60), 11.8 cfs (8,540 acre-ft. per year).

Extremes.—1947-60: Maximum discharge, 391 cfs Feb. 9, 1951 (gage height, 3.64 ft.); minimum, 3.2 cfs Sept. 1, 1950; minimum gage height, 0.49 ft. May 18, 20, 21, 1956.

Remarks.—No regulation or diversion above station.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water year 1953, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff			
			Inches	Acre-feet	Discharge	Date
January 1953	42.8	.....	.....	.....	.....	.....
Water year 1952-53.....	10.4	1.89	25.63	7,530	128	Jan. 31, 1953

Huge Creek near Wauna, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	6.00	10.1	24.4	37.0	36.7	13.4	10.3	7.08	6.03	5.20	4.65	4.59	13.7
1955...	4.55	13.8	11.8	10.9*	12.9*	9.74	10.7	6.15	4.90	4.67	4.35	4.49	8.20
1956...	5.91	23.0	36.9	43.4	13.5	32.2	13.8	8.89	8.25	5.94	5.48	5.37	16.9
1957...	8.91	10.0	20.9	10.5	17.1	21.4	10.4	7.25	6.45	6.03	5.64	5.30	10.8
1958...	5.57	5.74	9.76	23.8	23.2	10.3	9.65	6.34	4.59	4.44	4.56	4.57	9.30
1959...	5.36	9.52	15.3	37.2	15.6	10.2	16.5	12.4	7.27	5.76	4.83	5.39	12.1
1960...	5.69	12.1	22.2	21.8	25.3	16.0	15.6	9.76	7.25	5.73	5.33	5.00*	12.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	5.0	5.6	11.5	11	11.5	8.4	8.1	6.3	5.3	4.6	4.4	4.0	4.0
1955...	4.0	4.6	7.2	8.2	7.9	8.2	7.6	5.3	4.5	4.1	4.1	4.0	4.0
1956...	4.3	5.5	13.5	16.5	10.5	15	10	7.4	6.5	5.3	4.9	4.1	4.1
1957...	6.2	8.2	8.6	8.4	8.1	11.5	8.1	6.3	5.8	5.4	5.4	4.8	4.8
1958...	4.5	5.0	5.6	9.0	16	8.1	7.6	5.0	4.1	4.1	4.0	4.1	4.0
1959...	4.3	5.1	7.8	14	11	8.3	7.5	7.8	6.4	4.9	4.5	4.7	4.3
1960...	4.9	5.1	7.8	7.4	11.5	11	10.5	8.3	6.3	5.3	4.9	4.8*	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
1953								12.7	31.31	9,200
1954	138	Feb. 21, 1954	4.0	13.7	2.49	33.67	9,890	12.8	31.47	9,250
1955	87	Feb. 8, 1955	4.0	8.20	1.49	20.23	5,940	11.2	27.61	8,120
1956	154	Dec. 21, 1955	4.1	16.9	3.07	41.87	12,310	14.8	36.53	10,730
1957	106	Dec. 10, 1956	4.8	10.8	1.96	26.62	7,820	9.22	22.73	6,680
1958	85	Jan. 16, 1958	4.0	9.30	1.69	22.91	6,730	10.1	24.79	7,280
1959	205	April 30, 1959	4.3	12.1	2.20	29.82	8,770	12.9	31.86	9,360
1960	212	Dec. 15, 1959	4.8	12.6	2.29	31.12	9,140			

* Estimated.

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.

Records available.—June 1951 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 205 ft. (from topographic map).

Average discharge.—9 years (1951-60), 117 cfs (84,700 acre-ft. per year).

Extremes.—1951-60: Maximum discharge, 1,390 cfs Dec. 15, 1959 (gage height, 7.42 ft.); maximum gage height, 8.51 ft. Dec. 10, 1956; minimum discharge, 16 cfs Sept. 23, 1951, Sept. 22-25, 1952, Aug. 25, 27, Sept. 8, 9, 12-14, 1958.

Remarks.—No regulation or diversion above station.

Goldsborough 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
1954...	44.9	144	265	283	396	205	175	58.7	46.1	34.5	27.0	27.9	141
1955...	48.7	217	156	159	162	156	175	66.9	39.8	34.9	27.1	24.0	105
1956...	110	290	351	367	167	321	150	62.6	54.1	32.5	26.3	23.1*	163
1957...	87.1	91.9	196	96.2	171	227	116	63.5	40.5	29.6	25.5	20.9	96.8
1958...	34.8	70.4	180	223	245	120	124	57.6	36.0	23.2	19.5	20.3	95.2
1959...	36.0	177	218	313	174	138	184	152	59.4	34.1	24.0	30.9	128
1960...	46.8*	211	238	212	326	174	188	108	60.1	32.7	29.5	26.3	137

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	26	62	116	125	145	112	82	46	38	27	24	24	24
1955...	23	36	88	105	83	91	101	52	34	29	23	21	21
1956...	23	85*	199	212	115	175	82	47	39	25	23	21	21
1957...	25	54	51	60*	68	130	52	47	33	25	20	20	20
1958...	20	29	71	89	155	90	77	44	28	20	17	16	16
1959...	18	32	102	145	139	103	77	71	43	26	22	22	18
1960...	26*	36	114	96	148	119	129	85	44	26	25	24	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
1953								130	41.92	93,920
1954	972	Feb. 22, 1954	24	141	3.36	45.46	101,800	138	44.52	99,730
1955	775	Nov. 19, 1954	21	105	2.50	33.94	76,000	133	42.92	96,120
1956	712	Nov. 3, 1955	21	163	3.88	52.89	118,500	132	42.75	95,770
1957	977	Dec. 10, 1956	20	96.8	2.30	31.30	70,100	89.2	28.83	64,560
1958	552	Jan. 17, 1958	16	95.2	2.27	30.80	68,960	107	34.72	77,730
1959	871	April 30, 1959	18	128	3.05	41.42	92,750	133	43.15	96,630
1960	1,390	Dec. 15, 1959	24	137	3.26	44.36	99,320			

* Estimated.

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.

Records available.—June 1951 to November 1958.

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

Average discharge.—7 years (1951-58), 54.0 cfs (39,090 acre-ft. per year).

Extremes.—1951-58: Maximum discharge, 795 cfs Jan. 31, 1953; maximum gage height, 11.14 ft. Dec. 10, 1956; minimum discharge, 0.7 cfs Sept. 16, 1951; minimum gage height, 1.00 ft. Aug. 21, 22, 24, 27, 1958.

Remarks.—No regulation. Probably some diversion for irrigation and farm use.

Skookum Creek at Kamilche, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	13.1	87.6	194	167	181	67.4	64.3	15.5	10.5	6.14	4.03	6.18*	67.5
1955...	16.3	94.8	85.9	90.3	89.5	82.6*	88.1	22.6	8.51	5.75	3.52	2.69	48.9
1956...	53.9	180	191	157	69.8	149	53.2	12.4	11.3	4.87	3.02	2.47	74.1
1957...	39.3	58.0	139	48.5*	96.9*	107	45.4	13.4	5.04	2.89	2.70	2.17	46.5
1958...	5.90	25.1	117	123	125	57.1	72.0	17.1	6.63	3.05	1.60	2.50	46.0
1959...	8.27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.6	32	50	51	71	34	26	9.6	7.5	3.7	2.8	4.5*	2.8
1955...	4.5	11	44	58	36	51*	39	13	5.8	3.7	2.1	1.7	1.7
1956...	2.5	50*	86	69	47	62	20	7.2	6.6	2.8	2.2	2.0	2.0
1957...	2.2	25	22	20*	40	51	24	6.9	3.1	2.5	2.2	1.9	1.9
1958...	2.1	5.2	28	59	82	40	34	8.5	4.2	1.7	1.2	1.3	1.2
1959...	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
1953	.....	.....	.....	.....	.....	.....	.....	74.9	59.09	54,200
1954	676	Dec. 12, 1953	2.8	67.5	3.92	53.24	48,830	59.1	46.67	42,800
1955	429	Feb. 8, 1955	1.7	48.9	2.84	38.58	35,390	68.0	53.65	49,230
1956	621	Dec. 12, 1955	2.0	74.1	4.31	58.66	53,830	58.5	46.31	42,500
1957	715	Dec. 10, 1956	1.9	46.5	2.70	36.71	33,670	39.1	30.89	28,310
1958	332	Dec. 26, 1957	1.2	46.0	2.67	36.28	33,280	.....	.....	.....
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

KENNEDY CREEK BASIN

Kennedy Creek near Kamilche, Wash.

Location.—Lat. 47°04'40", long. 123°07'35", in SW¼NE¼ sec. 1, T. 18 N., R. 4 W., on left bank 100 ft. upstream from Kennedy Falls, 2 miles upstream from mouth at Oyster Bay, and 4 miles south of Kamilche.

Drainage area.—15.3 sq. mi.

Records available.—February to September, 1960.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from topographic map).

Extremes.—Maximum discharge not determined; minimum discharge, 2.8 cfs Aug. 10, 13, 1960, (gage height, 0.32 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
1960...	.....	.....	.....	.....	185	87.6	104	41.8	17.1	6.34	3.76	3.28	.....

Kennedy Creek near Kamilche, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	.....	.....	.....	.....	45	40	45	32	9.3	3.6	3.0	3.0	.....

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 outlet of Reichel Lake, and 2½ miles southeast of Rainier.

Drainage area.—89.8 sq. mi.

Records available.—June 1949 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 350 ft. (from topographic map).

Average discharge.—11 years (1949-60), 275 cfs (199,100 acre-ft. per year).

Extremes.—1949-60: Maximum discharge, 5,620 cfs Dec. 12, 1955 (gage height, 13.06 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. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	135	280	709	738	943	835	405	125	137	77.6	50.4	51.3	328
1955...	90.9	332	373	327	381	355	517	248	141	79.6	46.8	52.3	244
1956...	274	719	1,063	784	303	735	366	129*	118	53.6	42.3	35.4	387
1957...	138	188	461	162*	614	576	267	139	80.3	47.3	40.2	32.4	226
1958...	58.1	149	522	562	506	232	345	106	66.9	39.9	30.3	31.0	223
1959...	68.9	536	435	752	306	328	297	191	116*	53.4	39.2	88.7	267
1960...	172	391	351	246	551	415	455	287	103	53.5	50.2	43.5	258

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	65	87	247	261	397	180	150	98	95	53	46	40	40
1955...	39	57	152	208	156	165	246	176	98	55	38	36	36
1956...	44	169	388	311	233	271	220*	109	76	43	36	33	33
1957...	35	92	83	70*	150*	265	163	92	53	40	33	29	29
1958...	31	42	133	218	273	165	181	76	49	34	28	28	28
1959...	28	46	229	239	242	190	123	101	78*	42	36	36	28
1960...	58	64	139	93	172	152	211	178	71	44	36	33	33

* Estimated.

Deschutes River near Rainier, 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
1953								297	44.98	215,400
1954	4,740	Dec. 9, 1953	40	328	3.65	49.64	237,600	300	45.41	217,400
1955	3,260	Feb. 8, 1955	36	244	2.72	36.89	176,600	350	52.91	253,400
1956	5,620	Dec. 12, 1955	33	387	4.31	58.59	280,600	280	42.51	203,600
1957	3,760	Feb. 24, 1957	29	226	2.52	34.24	163,900	222	33.53	160,500
1958	2,620	Dec. 26, 1957	28	223	2.48	33.70	161,400	248	37.52	179,800
1959	3,050	Nov. 12, 1958	28	267	2.97	40.42	193,600	257	38.86	186,100
1960	3,360	Nov. 21, 1959	33	258	2.87	39.17	187,600			

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.

Records available.—April 1945 to November 1954, June 1957 to September 1960. Annual maximum discharge only, water years 1955 to 1957.

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. November 1954 to June 1957, crest-stage gage only, at same site and datum.

Average discharge.—12 years (1945-54, 1957-60), 409 cfs (296,100 acre-ft. per year).

Extremes.—1945-54, 1957-60: Maximum discharge, 4,780 cfs Dec. 10, 1953 (gage height, 7.96 ft.); minimum, 66 cfs Oct. 11, 1945; minimum gage height, 1.90 ft. Oct. 18, Nov. 11, 1952.

1945-60: Maximum discharge, 6,080 cfs Dec. 13, 1955 (gage height, 8.46 ft.).

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

Revisions.—Revised figures of discharge, in cubic feet per second, for the water years 1946, 1947, and 1949, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
November 1945	489					
December	636					
January 1946	855					
Water year 1945-46	393	2.46	33.36	284,800	3,270	Dec. 29, 1945
December 1946	963					
Calendar Year 1946	423	2.68	36.31	309,900		
January 1947	639					
Water year 1946-47	355	2.22	30.07	256,700	4,760	Jan. 26, 1947
Calendar year 1947	329	2.06	27.90	238,200		
Water year 1948-49					4,750	Feb. 18, 1949

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
1954	196	357	893	1,015	1,246	583	604	262	246	162	118	115	478
1955	156	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1957	.....	.....	.....	.....	.....	.....	.....	.....	193	130	115	96.1	.....
1958	129	226	658	732	780	408	497	217	155	109	86.6	84.2	338
1959	130	709	630	990*	579	517	489	346	207	137	106	152	415
1960	238	554	581*	419	799	626	676	423	212	148	127	116	408

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	121	166	356	366	577	400	320	218	194	128	106	95	95
1955	95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1957	.....	.....	.....	.....	.....	.....	.....	.....	145	115	96	90	.....
1958	90	110	195	354	449	307	246	170	129	94	77	78	77
1959	80	112	363	415	483	352	349	210	167	112	99	102	80
1960	121	127	310	224	374	346	381	318	158	129	112	107	107

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	.....	.....	.....	.....	.....	.....	.....	424	35.96	307,000
1954	4,780	Dec. 10, 1953	95	478	2.99	40.58	346,400	.....	.....	.....
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1958	2,720	Dec. 26, 1957	77	338	2.11	28.04	244,400	375	31.83	271,600
1959	3,040	Nov. 13, 1958	80	415	2.59	35.21	300,400	407	34.55	294,800
1960	3,340	Nov. 21, 1959	107	408	2.55	34.72	296,200	.....	.....	.....

* Estimated.

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. Prior to Nov. 3, 1959, at site 15 ft. upstream.

Drainage area.—24.3 sq. mi.

Records available.—June 1949 to April 1959, May to October 1959 (monthly discharge only), November 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 25 ft. (from topographic map). June 29, 1949, to Apr. 28, 1959, at site 15 ft. upstream at datum 0.75 ft. higher.

Average discharge.—11 years (1949-60), 27.7 cfs (20,050 acre-ft. per year).

Extremes.—1949-60: Maximum discharge, 204 cfs Feb. 9, 1951 (gage height, 4.46 ft., datum then in use); minimum recorded, 8.0 cfs Dec. 17-21, 1952, Sept. 29, Oct. 4, 5, 1958; minimum gage height recorded, 1.07 ft., datum then in use, Sept. 29, Oct. 4, 5, 1958.

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

Woodland Creek 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
1954...	11.3	18.8	31.4	52.0	58.9	50.3	39.4	30.3	25.6	21.4	18.3	15.6	30.9
1955...	14.6	20.7	24.6	24.0	27.8	28.2	27.7	22.6	18.0	14.8	14.1	12.2	20.7
1956...	14.9	29.5	68.4	92.5	62.9	68.2	52.2	38.7	32.4	26.5	21.6	18.9	43.9
1957...	19.7	20.6	30.0	26.2	31.2	44.7	35.0	26.0	20.1	18.2	15.7	13.7*	25.1
1958...	13.4	12.9	16.6	25.5	31.5	30.1	26.5	20.4	15.6	11.6	9.05	9.18	18.5
1959...	9.74	16.2	25.9	37.9	41.4	34.9	30.6	24*	20*	16*	14*	13*	23.7
1960...	21*	15.5	26.8	27.3	44.2	38.8*	39.5	32.0	24.1	18.7	17.1	15.3	26.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	10.5	13	19.5	28	43	41	34	27	23	19	17.5	13	10.5
1955...	13	14	21	22	22	26	25	21	16	13.5	12.5	11.5	11.5
1956...	12	17	39	72	58	58	44	34	29	23	19.5	17.5	12
1957...	16.5	17.5	21	25	25	36	30	22	19.5	16	14	12.5*	12.5*
1958...	12*	11	11	17.5	23*	26	24	17.5	14	9.8	8.7	8.7	8.7
1959...	8.7	9.4	18	26	37	32	25	.....	.....	.....	.....	.....	.....
1960...	.....	8.3	16	20*	34*	34*	35	29	20	18	16	14	8.3

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
1953.....	.....	.....	.....	.....	.....	.....	.....	20.3	11.31	14,690
1954.....	105	Feb. 21, 1954	10.5	30.9	1.27	17.29	22,400	30.8	17.22	22,290
1955.....	64	Feb. 8, 1955	11.5	20.7	.852	11.58	15,010	25.2	14.09	18,260
1956.....	150	Dec. 21, 1955	12	43.9	1.81	24.62	31,900	40.3	22.60	29,290
1957.....	91	Dec. 9, 1956	12.5	25.1	1.03	14.01	18,150	22.8	12.73	16,480
1958.....	54	Mar. 21, 1958	8.7	18.5	.761	10.32	13,360	19.4	10.82	14,020
1959.....	152	Nov. 18, 1959	.....	23.7	.975	13.23	17,160	24.5	13.69	17,750
1960.....	101	Dec. 15, 1959	8.3	26.6	1.09	14.92	19,330	.....	.....	.....

* Estimated.

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.

Records available.—March 1951 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is about mean sea level. Auxiliary water-stage recorder 30 ft. downstream from base gage.

Average discharge.—9 years (1951-60), 24.0 cfs (17,380 acre-ft. per year), unadjusted.

Extremes.—1951-60: Maximum daily discharge, 46 cfs Jan. 26, 1956; minimum daily, 12.5 cfs Aug. 9, 1960.

Remarks.—City of Olympia diverts an average of about 4 cfs per day just above station. Gage pool regulated by low dam and flashboards. Backwater from tides occurs daily.

McAllister Springs 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
1954	20.0	21.2	22.7	29.9	33.6	31.3	30.4	28.1	27.3	25.5	24.3	23.6	26.4
1955	23.0	23.8	24.3	24.9	26.6	27.2	25.2	25.1	23.6	23.3	21.2	20.7	24.1
1956	22.5	24.9	30.7	40.8	39.9	37.4*	35.2	31.9	30.6	27.1	26.6*	23.7	30.9
1957	22.5	22.9	28.1	28.2	28.2	30.6	30.4	28.7	26.2	24.0	23.4	22.2	26.3
1958	23.0*	22.0*	18.2	19.2	19.1	21.8	21.7	20.6	19.1	16.5	15.8	16.4	19.4
1959	17.8	19.8	20.8	21.4	22.9	25.3	24.8	24.2	20.6	18.0	16.8	16.9	20.8
1960	18.3	19.4	20.1	21.2	23.0	25.1	24.6	23.9	21.5	18.2	17.4	17.2	20.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	19	19	19.5	24	30	29	29	25	26	23	23	22	19
1955	22	21	21	23	23	25	24	24	22	18.5	19.5	20	18.5
1956	21	23	26	36	38	34	34	27	26	24	25	21	21
1957	21	21	25	26	26	28	29	21	24	21	22	20	20
1958	.....	.....	14.5	17	15	18.5	17	18	17	14	14.5	13.5	13.5
1959	14.5	14.5	16.5	16	20	23	20	23	17.5	14.5	15.5	14	14
1960	16.5	16.5	17.5*	17	20	22	22	21	18	16.5	12.5	15.5	12.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953	.....	.....	.....	.....	.....	.....	.....	.....	22.6	16,360	.....	.....
1954	36	①	19	26.4	19,140	.....	.....	.....	27.0	19,570	.....	.....
1955	30	②	18.5	24.1	17,410	.....	.....	.....	24.7	17,840	.....	.....
1956	46	Jan. 26, 1956	21	30.9	22,440	.....	.....	.....	30.5	22,160	.....	.....
1957	37	Dec. 10, 1956	20	26.3	19,040	.....	.....	.....	25.4	18,410	.....	.....
1958	25	Feb. 28, 1958	13.5	19.4	14,080	23.2	.....	.....	19.0	13,790	23.1	.....
1959	28	③	14	20.8	15,030	24.7	.....	.....	20.7	14,990	24.7	.....
1960	29	Mar. 16, 1960	12.5	20.8	15,110	25.1	.....	.....	.....	.....	.....	.....

* Estimated.
① Maximum during period March to June.
② Feb. 5, 13, 21, 1954.
③ Feb. 8, 28, Mar. 29, 1955.
④ Mar. 15-20, Apr. 15, 16, 1959.

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.

Records available.—May 1942 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,450 ft. (from river-profile map).

Average discharge.—18 years (1942-60), 775 cfs (561,100 acre-ft. per year).

Extremes.—1942-60: Maximum discharge, 10,900 cfs Nov. 23, 1959 (gage height, 11.77 ft.), from rating curve extended above 5,900 cfs on basis of slope-area measurement at gage height 11.86 ft.; minimum, 108 cfs Dec. 1, 3, 1952 (gage height, 2.76 ft.).

Remarks.—Small diversion for domestic use. Slight regulation at low water by powerplant of Mount Rainier National Park on Paradise River.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water years 1943, 1947 and 1950, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff Inches	Runoff Acre-feet	Momentary maximum Discharge	Momentary maximum Date
Water year 1942-43					7,500	Nov. 23, 1942
Water year 1946-47					8,100	Dec. 11, 1946
November 1949	979					
Calendar year 1949	788	5.92				
Water year 1949-50	913	6.86	80.41	570,400	7,310	Nov. 27, 1949
February 1950	1,354		93.19	661,000		
Water year 1950-51	853	6.41	87.05	617,400	6,050	Feb. 11, 1951

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	389	645	1,436	761	1,080	617	764	1,128	1,179	1,092	666	464	851
1955...	388	752	540	520	656	296	608	949	1,695	1,217	728	467	733
1956...	1,034	1,522	1,372	763	331	537	1,111	1,594	1,410	1,140	627	429	991
1957...	541	707	1,211	351	599	878	863	1,164	862	551	405	440	715
1958...	301	399	765	903	1,072*	504*	857*	1,101	1,041	828	669	437	738
1959...	483	1,440	1,248	1,209	495	526	806	914	1,026	741*	488*	739	844
1960...	1,155	1,634	821	435	772	619	909	1,179	1,092	804	532	470	867

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	283	321	716	435	546	862	358	480	935	776	470	336	283
1955...	262	314	379	317	321	231	392	401	930	774	544	280	231
1956...	325	699	618	425	260	257	537	918	974	672	450	317	257
1957...	268	476	396	230*	188	471	542	823	582	435	305	321	188
1958...	179	215	450	471	630	350*	350*	642	690	666	515	309	179
1959...	293	301	728	605	345	394	421	669	722	570*	410*	381	293
1960...	457	734	400	266	312	282	596	760	722	574	390	362	266

* Estimated.

Nisqually River near National, 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
1953								858	87.59	621,300
1954	6,640	Dec. 9, 1953	283	851	6.40	86.82	616,000	784	79.95	567,200
1955	3,740	June 10, 1955	231	733	5.51	74.85	530,900	922	94.12	667,600
1956	8,280	Dec. 12, 1955	257	991	7.45	101.45	719,600	869	88.94	630,900
1957	3,680	Feb. 26, 1957	188	715	5.38	72.99	517,800	632	64.47	457,300
1958	2,790	April 20, 1958	179	738	5.55	75.28	533,900	879	89.74	636,500
1959	5,450	Nov. 12, 1958	293	844	6.35	86.11	610,800	881	89.88	637,600
1960	10,900	Nov. 23, 1959	266	867	6.52	88.74	629,500			

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.

Records available.—June 1942 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,340 ft. (from topographic map).

Average discharge.—18 years (1942-60), 378 cfs (273,700 acre-ft. per year).

Extremes.—1942-60: Maximum discharge, 7,600 cfs Dec. 9, 1953 (gage height, 9.02 ft.), from rating curve extended above 3,400 cfs; minimum, 19.5 cfs Sept. 22, 23, Oct. 6-10, 13, 14, 1952; minimum gage height, 1.40 ft. Sept. 22, 23, 1950.

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
1954	148	423	1,006	624	1,063	390	673	468	382	154	89.8	91.0	455
1955	194	633	474	390	600	257	562	656	552	187	62.6	65.0	384
1956	527	1,219	1,122	739	192	590	814	647	266	94.1*	48.3	40.9	525
1957	252	350	922	202	577	773	522	291	129	58.9	40.7	32.1	345
1958	79.1	242	689	768	796	285	671	205	115	60.0	34.6	40.8	329
1959	90.6	946	681	981	320	416	587	405	235	69.7	37.0	192	413
1960	421	763	530	308	621	450	559	560	214	67.1	76.1	76.7	386

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	82	137	341	262	485	200	206	262	224	81	65	69	65
1955	66	110	262	206	202	151	291	331	258	101	48	43	43
1956	63	320	336	259	149	162	460	336	178	55*	41	34	34
1957	34	170*	150*	106	129	390	333	164	82	42	32	29	29
1958	34	62	256	301	499	193	214	102	84	44	28	25	25
1959	30	68	406	388	227	259	221	200	114	42	30	32	30
1960	121	180	203	152	188	174	366	393	180	42	24	39	24

* Estimated.

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	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1953								448	81.82	324,200
1954	7,600	Dec. 9, 1953	65	455	6.12	83.13	329,400	431	78.75	312,100
1955	5,000	Feb. 8, 1955	43	384	5.17	70.09	277,700	515	94.12	372,900
1956	7,400	Dec. 11, 1955	34	525	7.07	96.26	381,500	414	75.83	300,500
1957	5,360	Dec. 10, 1956	29	345	4.64	63.01	249,700	301	55.07	218,300
1958	2,400	Dec. 25, 1957	25	329	4.43	60.11	238,300	387	70.74	280,400
1959	4,860	Jan. 24, 1959	30	413	5.56	75.49	299,200	413	75.53	299,300
1960	4,880	Nov. 20, 1959	24	386	5.20	70.66	280,000			

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.

Records available.—November 1944 to September 1960.

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, staff gage at same site and datum.

Extremes.—1944-60: Maximum contents, 232,700 Aug. 1, 2, 1960; minimum observed since reservoir first filled, 93,990 acre-ft. Feb. 16, 1949 (gage height, 1,147.61 ft.).

Remarks.—Reservoir is formed by concrete arch dam; storage began Nov. 7, 1944; dam completed in 1945. Capacity, 99,170 acre-ft. between gage heights 1,114 ft. (lower limit of operating range) and 1,177 ft. (gage height of spillway). Water can be controlled by spillway gates to gage height 1,207 ft., usable capacity, 179,600 acre-ft. Dead storage, 52,100 acre-ft. Figures given herein represent total contents. Water is used by city of Tacoma for power production.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	163,900	181,740	217,540	208,520	216,350	210,840	225,640	220,840	229,260	228,950	226,540	217,240	.....
1955	190,000	211,400	220,500	187,900	175,900	135,200	147,200	172,300	225,900	231,700	220,600	207,100	.....
1956	222,300	219,600	220,800	216,600	162,800	177,400	205,600	228,600	230,500	229,600	225,000	198,600	.....
1957	185,100	170,000	208,500	131,700	153,100	196,900	202,400	218,400	219,900	230,500	224,100	210,600	.....
1958	159,000	133,500	172,800	213,200	222,600	193,900	223,500	218,700	225,600	230,800	216,600	159,900	.....
1959	130,000	227,700	228,600	221,100	188,700	170,800	193,100	222,000	229,900	231,100	217,200	214,900	.....
1960	222,300	217,500	203,000	159,000	171,300	167,500	192,100	226,800	223,800	232,400	210,300	191,300	.....

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.

Records available.—January 1945 to September 1960.

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, month-end gage heights furnished by city of Tacoma from temporary gages in pool above dam.

Extremes.—1947-60: Maximum contents, 2,760 acre-ft. May 14, 1950 (gage height, 936.4 ft.); minimum observed (since reservoir first filled), 1,370 acre-ft. Aug. 24, 1956 (gage height, 900.0 ft.).

Remarks.—Reservoir is formed by concrete arch dam completed in 1944; storage began February 1945. Usable storage, 1,050 acre-ft. between gage heights 910 ft. (minimum practical head) and 935 ft. (normal reservoir level). Dead storage, 1,630 acre-ft. Figures given herein represent total contents. Water used by city of Tacoma for power production.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,308	2,372	2,347	2,323	2,246	2,270	2,323	2,323	2,333	2,232	2,362	2,494	.....
1955...	2,313	2,342	2,458	2,318	2,352	2,294	2,407	2,422	2,299	2,407	2,333	2,284	.....
1956...	2,367	2,280	2,382	2,328	2,045	2,362	2,228	2,237	2,504	2,280	2,484	2,347	.....
1957...	2,442	2,256	2,453	2,432	2,463	2,328	2,473	2,417	2,265	2,412	2,422	2,478	.....
1958...	2,525	2,323	2,515	2,357	2,382	2,453	2,494	2,448	2,437	2,289	2,318	2,557	.....
1959...	2,494	2,499	2,223	2,412	2,478	2,484	2,143	2,362	2,442	2,432	2,504	2,478	.....
1960...	2,546	2,333	2,504	2,338	2,589	2,478	2,367	2,382	2,478	2,644	2,412	2,568	.....

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.

Records available.—September 1906 to October 1911, November to December 1911 (gage heights only), October 1919 to September 1931, October 1943 to September 1960. Published as "below Little Nisqually River, near La Grande" 1906-10, and as "near La Grande" 1912, 1919-31.

Gage.—Water-stage recorder. Altitude of gage is 490 ft. (from river-profile map). Sept. 5, 1906, to Sept. 8, 1910, staff gage just below site of diversion dam 4 miles upstream at different datum. January 1910 to December 1911, staff gage at La Grande powerhouse site; datum at mean sea level (levels by city of Tacoma). January 1920 to September 1931 (water-stage recorder at approximately same site as that of first staff gage at datum 921.17 ft. above mean sea level (levels by city of Tacoma). Dec. 7, 1943, to Feb. 8, 1945, water-stage recorder 600 ft. downstream from La Grande powerhouse at different datum.

Average discharge.—34 years (1906-11, 1919-31, 1943-60), 1,395 cfs (1,010,000 acre-ft. per year), adjusted for storage.

Nisqually River at La Grande, Wash.—Continued

Extremes.—1906-11, 1919-31, 1943-60: Maximum discharge, 20,700 cfs Nov. 23, 1959 (gage height, 9.63 ft.); practically no flow on many occasions at site near La Grande as result of regulation.

Remarks.—Flow regulated by city of Tacoma powerplant at La Grande since December 1943, by Alder Reservoir (see p. 69) since November 1944, and by La Grande Reservoir (see preceding page) since February 1945. All diversions returned to river above gage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,355	1,182	2,939	2,320	3,209	1,511	1,758	2,020	1,716	1,394	883	788	1,749
1955...	1,161	1,533	1,281	1,783	1,906	1,523	1,658	1,682	1,748	1,535	1,104	928	1,484
1956...	1,831	4,000	3,964	2,537	1,693	1,702	2,024	2,383	2,000	1,360	828	903	2,103
1957...	1,215	1,620	2,159	1,976	1,613	1,790	1,751	1,473	1,163	587	663	784	1,398
1958...	1,374	1,316	1,497	1,835	2,555	1,497	1,473	1,570	1,110	780	976	1,448	1,445
1959...	1,170	1,741	2,813	3,779	1,785	1,793	1,665	1,306	1,471	1,047	907	1,233	1,728
1960...	1,796	3,047	2,104	1,698	1,780	1,611	1,503	1,641	1,490	840	1,077	970	1,633

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	608	602	886	1,370	1,620	623	690	648	1,080	834	621	460	460
1955...	497	637	778	1,080	1,040	746	918	1,130	1,010	840	742	532	497
1956...	876	1,400	1,540	823	1,340	1,480	1,580	1,470	1,090	562	514	455	455
1957...	639	783	716	1,190	1,010	924	830	563	541	392	446	645	392
1958...	850	856	666	1,510	1,870	754	904	896	564	432	468	892	432
1959...	587	748	1,500	1,190	1,170	1,130	773	545	667	524	538	538	524
1960...	1,270	1,590	1,260	1,010	966	790	885	936	882	660	793	540	540

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953									1,528	1,106,000	1,684	78.29
1954	14,500	Dec. 12, 1953	460	1,749	1,266,000	1,768	6.05	82.19	1,620	1,173,000	1,625	75.53
1955	6,740	①	497	1,484	1,074,000	1,469	5.03	68.29	1,971	1,427,000	1,971	91.62
1956	19,200	Dec. 12, 1955	455	2,103	1,527,000	2,092	7.16	97.49	1,703	1,236,000	1,686	78.61
1957	6,160	Mar. 4, 1957	392	1,398	1,012,000	1,414	4.84	65.81	1,331	963,500	1,282	59.58
1958	8,900	Feb. 17, 1958	432	1,445	1,046,000	1,375	4.71	63.89	1,574	1,140,000	1,652	76.74
1959	14,500	Jan. 24, 1959	524	1,728	1,251,000	1,804	6.18	83.83	1,828	1,323,000	1,793	83.34
1960	20,700	Nov. 23, 1959	540	1,633	1,185,000	1,599	5.48	74.61				

① Nov. 2, 1954, to Jan. 2, 1955.

Mashel River near La Grande, Wash.

Location.—Lat. 46°51'25", long. 122°18'05", in NW¼SE¼ sec. 21, T. 16 N., R. 4 E., on right bank 50 ft. below bridge, 1¾ miles northeast of La Grande, and 3¼ miles upstream from mouth.

Drainage area.—80.7 sq. mi.

Records available.—October 1940 to September 1957.

Gage.—Water-stage recorder. Datum of gage is 619.53 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—17 years (1940-57), 232 cfs (168,000 acre-ft. per year).

Extremes.—1940-57: 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. Some regulation at low water 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
1954...	137	203	697	612	703	228	356	172	294	111	70.6	115	313
1955...	121	254	235	231*	356	233	475	340	255	173	39.5	49.9	229
1956...	307	68*	832	489	195	551	440	216	224	45.8	27.8	24.5	337
1957...	176	241	411	113	530	544	295	220	89.7	35.2	21.5	16.9	223

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	71	89	262	194	332	118	116	99	141	43	40	59	40
1955...	50	56	108	115*	126	98	248	219	117	66	29	32	29
1956...	40	170	284	154	141	156	255	124	92	23	17	17.5	17
1957...	20	97	83	50*	91	222	144	73	50	23	15	6.9	6.9

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
1953								280	47.03	202,400
1954	4,640	Dec. 9, 1953	40	313	3.88	52.68	226,700	269	45.31	195,000
1955	2,960	Feb. 8, 1955	29	229	2.84	38.48	165,600	331	55.66	239,600
1956	3,760	Dec. 21, 1955	17	337	4.18	56.89	244,900	254	42.85	184,400
1957	3,110	Mar. 7, 1957	6.9	223	2.76	37.47	161,300			

* Estimated.

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.

Records available.—June 1927 to September 1932, September 1941 to September 1960.

Gage.—Water-stage recorder and concrete control. Datum of gage is 519.8 ft. above mean sea level (stadia traverse). June 1, 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 site and datum.

Average discharge.—24 years (1927-32, 1941-60), 67.3 cfs (48,720 acre-ft. per year).

Extremes.—1927-32, 1941-60: Maximum discharge, 1,740 cfs Dec. 9, 1953; maximum gage height, 5.97 ft. Dec. 11, 1946; minimum discharge, 2.3 cfs Aug. 22, 23, 1944; minimum gage height observed, 1.12 ft. Sept. 26, 1947.

Remarks.—Possible small diversions for domestic use. Natural regulation in Ohop Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	33.8	82.1	224	191	160	84.5	88.4	31.7	80.8	36.6	23.6	49.4	90.1
1955...	38.1	59.4	70.5	101	97.6	87.8	141	63.4	42.4	47.7	18.2	19.7	64.8
1956...	86.7	185	267	169	90.6	170	88.6	33.9	48.0	16.2	11.0	13.3	98.4
1957...	54.6	60.9	134	44.2	135	175	76.9	62.8	31.8	14.2	12.9	8.22	67.2
1958...	20.3	56.4	113	112	143	69.7	114	34.4	33.0	14.7	6.25	9.52	59.9
1959...	25.9	151	143	160	87.8	88.6	71.1	76.7	69.2	18.4	10.8	25.6	77.1
1960...	76.0	156	115	62.3	103	78.0	96.9	138	44.0	14.1	14.8	17.6	76.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	16.5	29	91	81	92	60	38	20	51	17	10.5	26	10.5
1955...	22	24	37	58	46	50	85	46	23	22	6.3	4.8	4.8
1956...	18	57	164	82	68	87	50	19.5	18.5	8.8	7.9	9.7	7.9
1957...	12.5	29	26	24	47	82	42	27	20	9.7	8.8	5.9	5.9
1958...	9.2	17	41	54	67	47	36	20	18	7.5	5.2	5.9	5.2
1959...	8.3	18	65	84	57	57	81	41	36	9.2	7.5	13	7.5
1960...	17	25	58	37	44	38	54	58	26	8.5	6.0	12.5	6.0

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
1953								80.4	30.75	58,230
1954	1,740	Dec. 9, 1953	10.5	90.1	2.54	34.47	65,250	75.5	28.90	54,680
1955	480	Feb. 8, 1955	4.8	64.8	1.83	24.81	46,930	95.9	36.68	69,460
1956	824	Dec. 12, 1955	7.9	98.4	2.77	37.73	71,440	74.3	28.48	53,910
1957	605	Mar. 7, 1957	5.9	67.2	1.89	25.70	48,660	62.2	23.79	45,030
1958	339	Dec. 26, 1957	5.2	59.9	1.69	22.89	43,340	70.6	26.98	51,090
1959	720	Nov. 12, 1958	7.5	77.1	2.17	29.48	55,830	79.4	30.37	57,520
1960	805	Nov. 22, 1959	6.0	76.1	2.14	29.16	55,240			

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.

Records available.—August 1941 to September 1960.

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.—19 years (1941-60), 1,798 cfs (1,302,000 acre-ft. per year).

Extremes.—1941-60: Maximum discharge, 20,800 cfs Dec. 12, 1955 (gage height, 12.06 ft.); minimum, 85 cfs Oct. 19, 1945 (gage height, 2.57 ft.); minimum daily, 176 cfs Jan. 30, 1945.

Remarks.—No diversion above station. Yelm Irrigation District Canal, abandoned in 1950, diverted water 3.6 miles above station. Major portion of flow regulated by Alder Reservoir and city of Tacoma powerplant at La Grande (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
1954	1,557	1,607	3,877	3,230	3,932	1,852	2,160	2,121	2,033	1,500	908	913	2,132
1955	1,318	1,856	1,646	2,207	2,486	1,969	2,426	2,126	2,059	1,780	1,142	968	1,832
1956	2,238	4,586	4,938	3,197	2,128	2,588	2,620	2,564	2,207	1,441	886	1,006	2,540
1957	1,444	1,849	2,714	2,119	2,254	2,574	2,124	1,725	1,249	575	635	755	1,665
1958	1,420	1,552	2,094	2,396	3,120	1,750	2,022	1,707	1,245	797	954	1,422	1,697
1959	1,259	2,483	3,263	4,193	2,068	2,135	1,942	1,585	1,675	997	858	1,275	1,980
1960	2,079	3,529	2,600	1,993	2,327	2,086	2,205	2,248	1,697	883	1,142	1,005	1,980

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	828	803	1,640	1,820	2,420	854	944	693	1,310	862	557	498	498
1955	543	903	1,080	1,530	2,080	1,030	1,810	1,270	1,270	984	793	526	526
1956	1,250	1,970	2,230	1,400	1,800	1,910	2,140	1,730	1,210	657	520	535	520
1957	770	1,010	799	1,360	1,330	1,480	1,300	680	648	348	414	580	348
1958	869	1,110	1,520	1,670	2,240	1,060	1,080	960	784	440	424	847	424
1959	722	832	1,950	1,770	1,460	1,770	932	1,010	878	438	519	580	438
1960	1,350	1,790	1,800	1,420	1,730	1,170	1,300	1,270	1,030	697	840	529	529

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					
1953						1,936	1,402,000
1954	16,700	Dec. 9, 1953	498	2,132	1,543,000	1,943	1,400,000
1955	6,620	Jan. 1, 1955	526	1,832	1,326,000	2,414	1,748,000
1956	20,800	Dec. 12, 1955	520	2,540	1,844,000	2,060	1,495,000
1957	5,890	Mar. 7, 1957	348	1,665	1,205,000	1,586	1,148,000
1958	5,820	Feb. 26, 1958	424	1,697	1,228,000	1,859	1,345,000
1959	14,100	Jan. 24, 1959	438	1,980	1,433,000	2,079	1,505,000
1960	19,300	Nov. 23, 1959	529	1,980	1,437,000		

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.

Records available.—October 1947 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 275 ft. (from topographic map).

Extremes.—1947-60: Maximum discharge, 20,500 cfs Nov. 23, 1959 (gage height, 11.78 ft.), from rating curve extended above 10,700 cfs by logarithmic plotting; maximum gage height, 12.38 ft. Dec. 12, 1955; minimum discharge, 37 cfs July 14, 15, Sept. 19, 1960 (gage height, 1.15 ft.); minimum gage height, 0.98 ft. Sept. 19, 1948.

Remarks.—Major portion of flow regulated by Alder Reservoir and city of Tacoma powerplants at Alder Dam and at La Grande. Centralia power canal diverts 4.4 miles above station; water is returned to river at powerplant 4.5 miles below station. Minor amount of diversion 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
1954...	1,194	1,258	3,595	3,070	3,816	1,646	1,879	1,765	1,717	1,302	743	988	1,904
1955...	1,299	1,797	1,611	1,963*	2,105	1,611	2,028	1,845	1,652*	1,308	646	503	1,526
1956...	1,693	4,071	4,675	2,902	1,730	2,177	2,119	2,001	1,684	843	391	453	2,063
1957...	910	1,290	2,142	1,521	1,737	2,089	1,550	1,129	669	248	249	328	1,153
1958...	858	1,023	1,671	1,910	2,611	1,284	1,575	1,219	702	333	498	884	1,209
1959...	744	1,875	2,717	3,708	1,593	1,576	1,396	1,096	1,125	479	340	715	1,448
1960...	1,459	3,068	2,072	1,445	1,855	1,556	1,630	1,754	1,170	295	731	521	1,459

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	493	414	1,330	1,460	2,180	702	752	436	1,090	597	362	629	362
1955...	637	914	1,150	1,280*	1,660	640	1,590	800	800*	612	321	116	116
1956...	796	1,530	1,940	1,110	1,420	1,470	1,720	1,220	707	186	88	75	75
1957...	339	611	339	776	876	894	896	373	198	64	84	214	64
1958...	308	588	922	1,180	1,700	755	596	518	383	125	99	390	99
1959...	262	326	1,540	1,390	1,040	1,340	500	601	323	51	126	191	51
1960...	692	1,160	1,310	968	1,310	723	898	746	504	121	310	46	46

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					
1953						1,595	1,155,000
1954	16,200	Dec. 10, 1953	362	1,904	1,378,000	1,788	1,294,000
1955	6,020	①	116	1,526	1,105,000	2,007	1,453,000
1956	20,200	Dec. 12, 1955	75	2,063	1,493,000	1,554	1,128,000
1957	5,190	Mar. 7, 1957	64	1,153	834,400	1,086	786,400
1958	4,980	Feb. 26, 1958	99	1,209	875,500	1,358	983,500
1959	13,900	Jan. 24, 1959	51	1,448	1,048,000	1,552	1,123,000
1960	20,500	Nov. 23, 1959	46	1,459	1,059,000		

* Estimated.
① Probably Jan. 1, 1959.

Muck Creek at Roy, Wash.

Location.—Lat. 47°00'20", long. 122°32'30", in SW¼NW¼ sec. 34, T. 18 N., R. 2 E., on right bank 0.3 mile downstream from Muck Lake at north edge of Roy.

Drainage area.—87.8 sq. mi.

Records available.—May 1956 to September 1960.

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

Extremes.—1956-60: Maximum discharge observed, 351 cfs Jan. 25, 1959 (gage height, 4.16 ft.); no flow for many days in each year.

Remarks.—Some regulation in lakes above station. Small amount of diversion above station for domestic use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956	.....	.....	.....	.....	.....	.....	.....	.....	6.55	1.10	0	0	.....
1957	0	0	26.7	49.0	65.4	191	75.1	21.2	5.74	1.00	.06	0	36.2
1958	.5	1.60	29.1	107	213	108	77.9	38.6	16.5	3.28	1.71	0	48.7
1959	0	25.0	143	204	170	78.8	55.4	36.4	13.8	6.64	3.62	2.74	61.2
1960	1.05	39.7	130	101	182	124	85.5	86.6	52.6	17.9	12.4	7.37	69.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956	.....	.....	.....	.....	.....	.....	.....	.....	2.9	0	0	0	.....
1957	0	0	0	25	30	117	42	9.3	2.7	0	0	0	0
1958	0	0	3.8	70	169	57	44	7.0	8.3	.3	0	0	0
1959	0	0	62	54	107	62	28	19.5	6.4	3.4	2.3	.6	0
1960	0	0	96	73	130	96	42	68	28	10.5	6.8	5.1	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					
1956	.....	.....	.....	.....	.....	.....	.....
1957	332	Mar. 11, 1957	0	36.2	26,230	36.6	26,470
1958	308	Feb. 27, 1958	0	48.7	35,260	60.3	43,670
1959	351	Jan. 25, 1959	0	61.2	44,320	61.4	44,450
1960	226	Feb. 16, 1960	0	69.7	50,600	.....	.....

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.

Records available.—June 1949 to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 270 ft. (from topographic map).

Average discharge.—5 years (1949-54), 47.3 cfs (34,240 acre-ft. per year).

Extremes.—1949-54: 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. Probably some regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	4.00	14.5	88.1	155	138	103	73.5	44.2	29.5	18.0	8.42	9.35	56.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2.6	4.8	32	89	113	74	57	36	24	13.0	6.5	5.9	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
1953								32.7	6.32	23,700
1954	263	Jan. 7, 1954	2.6	56.7	0.807	10.97	41,090			

Flett Creek at 74th Street, at Tacoma, Wash.

Location.—Lat. 47°11'26", long. 122°29'08", in SE¼ sec. 25, T. 20 N., R. 2 E., on right bank just downstream from South 74th Street crossing in Tacoma 3 miles upstream from mouth.

Drainage area.—5 sq. mi., approximately.

Records available.—May 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 235 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge, 6.5 cfs Nov. 21, 1959 (gage height, 2.34 ft.); no flow for long periods each year.

Remarks.—No regulation or diversion above station.

Flett Creek at 74th Street, at Tacoma, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	0.17*	0.03	0	0	.....
1960	0.003	0.96	0.61	0.67	1.38	0.46	0.23	0.14	0	0	0	0	0.37

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	0.1	0	0	0	.....
1960	0	0	0	0.1	0.4	0.2	0.1	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
	Discharge	Date					
1960	6.5	Nov. 21, 1959	0	0.37	266	.....	.....

* Estimated.

Flett Creek below Flett Springs, at Tacoma, Wash.

Location.—Lat. 47°10'50", long. 122°30'10", in NW¼ sec. 36, T. 20 N., R. 2 E., on left bank 20 ft. downstream from Flett Springs, a quarter of a mile south of city limits of Tacoma, and 1½ miles upstream from mouth.

Drainage area.—8 sq. mi., approximately.

Records available.—July 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is about 230 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge, 30 cfs Nov. 21, 1959 (gage height, 1.98 ft.); maximum gage height, 2.14 ft. Nov. 20, 1959 (backwater caused by work on control); no flow for part of Aug. 12, 1960.

Remarks.—Storm sewer drainage above station. Several diversions for irrigation and industrial use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.97	2.02	2.78	.....
1960	2.23	6.22	12.1	11.3	19.5	12.7	10.4	8.57	5.72	2.93	1.96	2.47	7.97

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.9	1.6	2.2	.....
1960	1.3	1.9	8.4	8.4	16	10	8.8	6.0	3.8	1.4	.7	2.2	0.7

Flett Creek below Flett Springs, at Tacoma, 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					
1960.....	30	Nov. 21, 1959	0.7	7.97	5,780	.....	.....

Flett Creek at Tacoma, Wash.

Location.—Lat. 47°11'23", long. 122°31'08", in SW¼ sec. 26, T. 20 N., R. 2 E., on right bank at 75th Street half a mile west of city limits of Tacoma and 0.6 mile upstream from mouth.

Drainage area.—10 sq. mi., approximately.

Records available.—June 1959 to September 1960.

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

Extremes.—1959-1960: Maximum discharge, 36 cfs Feb. 6, 1960 (gage height, 2.48 ft.); maximum gage height, 2.64 ft. June 19, 1959 (backwater from debris); minimum discharge, 1.3 cfs Aug. 12, 1960 (gage height, 1.47 ft.).

Remarks.—Storm sewer drainage above station. Several diversions for irrigation and industrial use. At times during winter months 1,000 g.p.m. are pumped into creek for short intervals from Mountain View Memorial Park.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	.....	.....	.....	.....	.....	.....	.....	.....	6.02	3.80	2.95	3.73	.....
1960...	3.31	7.49	14.6	13.9	23.1	15.3	12.6	10.8	6.78	3.80	2.65	2.95	9.73

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	.....	.....	.....	.....	.....	.....	.....	.....	4.0	2.8	2.8	3.1	.....
1960...	2.4	2.7	10.5	10	18	12.5	10.5	8.0	5.3	2.3	1.6	2.7	1.6

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					
1960.....	36	Feb. 6, 1960	1.6	9.73	7,070	.....	.....

Leach Creek near Fircrest, Wash.

Location.—Lat. 47°13'15", long. 122°30'30", in lot 24, block 14, SE¼NE¼ sec. 14, T. 20 N., R. 2 E., on right bank 1¼ miles south of Fircrest and 2 miles upstream from mouth.

Drainage area.—6.01 sq. mi., of which 2.53 sq. mi. is noncontributing.

Records available.—March 1957 to September 1960.

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

Extremes.—1957-60: Maximum discharge, 66 cfs Nov. 20, 1959 (gage height, 2.43 ft.); minimum, 1.8 cfs Aug. 12, 14, 17, 18, 19, 20, 1960 (gage height, 1.18 ft.); minimum gage height, 0.75 ft. Aug. 2, 5, 13, 14, Sept. 5, 6, 1957.

Remarks.—Drainage into upper end of basin influenced by urbanizing of area. 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
1957	.....	.....	.....	.....	.....	5.54	4.19	4.08	3.52	3.39	3.80	3.27	.....
1958	4.03	4.47	4.79	5.91	5.12	4.03	3.58	3.63	3.68	3.45	3.26	3.29	4.10
1959	3.85	5.41	6.04	7.48	4.76	4.54	4.28	3.49	3.30	2.87	2.99	3.60	4.38
1960	3.66	5.82	5.52	5.18	5.80	4.42	4.82	3.25	3.02	2.61	2.57	2.56	4.09

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	3.4	3.4	3.4	3.0	2.6	3.0	3.0	.....
1958	3.2	3.6	3.6	3.6	3.9	3.6	2.8	3.4	3.4	3.2	3.2	3.0	2.8
1959	3.2	3.8	4.4	3.8	3.6	3.8	3.3	2.6	2.6	2.6	2.8	3.0	2.6
1960	3.0	3.0	2.8	2.6	2.6	2.6	3.3	2.6	2.8	2.4	2.0	2.2	2.0

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					
1958	28	Jan. 16, 1958	2.8	4.10	2,970	4.27	3,090
1959	41	Jan. 24, 1959	2.6	4.38	3,170	4.36	3,150
1960	66	Nov. 20, 1959	2.0	4.09	2,970	.....	.....

Leach Creek near Steilacoom, Wash.

Location.—Lat. 47°11'55", long. 122°31'15", in NW¼NW¼ sec. 26, T. 20 N., R. 2 E., on left bank a third of a mile upstream from mouth and 4 miles northeast of Steilacoom.

Drainage area.—7.63 sq. mi., of which 2.53 sq. mi. is noncontributing.

Records available.—February 1957 to September 1960.

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

Extremes.—1957-60: Maximum discharge, 94 cfs Nov. 21, 1959 (gage height, 3.59 ft.); minimum 4.5 cfs July 13, 1958; minimum gage height, 1.36 ft. Sept. 19, 1957.

Remarks.—Drainage into upper end of basin influenced by urbanizing of area. Some pumping for domestic use above gage. No regulation.

Leach Creek near Steilacoom, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	11.1	13.0	11.4	10.5	9.97	9.79	9.93	9.62	.....
1958...	10.6	9.78	10.1	14.6	14.3	10.0	10.4	10.3	9.88	7.28	7.06	7.61	10.1
1959...	8.41	11.4	12.1	17.6	11.3	10.2	9.94	8.60	7.61	6.85	7.32	8.08	10.0
1960...	8.88	12.8	13.0	11.4	12.4	10.2	11.4	8.43	7.91	6.81	7.83	7.38	9.87

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	9.5*	8.9	10.5	9.2	9.2	9.2	9.2	8.9	.....
1958...	9.6	7.6	7.9	10.5	12	8.9	8.9	9.6	8.9	6.2	6.5	7.0	6.2
1959...	7.0	7.5	7.2	7.6	9.2	9.2	8.4	7.6	6.8	6.4	6.4	7.6	6.4
1960...	7.6	7.6	8.7	7.4	8.3	8.0	7.7	7.4	6.8	6.2	6.2	6.8	6.2

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					
1958.....	44	Jan. 16, 1958	6.2	10.1	7,340	10.3	7,430
1959.....	66	Jan. 24, 1959	6.4	10.0	7,240	10.2	7,400
1960.....	94	Nov. 21, 1959	6.2	9.87	7,160	.....	.....

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. Prior to Jan. 13, 1960, at site 150 ft. upstream.

Drainage area.—104 sq. mi.

Records available.—December 1937 to September 1940, July 1943 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map). Prior to Jan. 13, 1960, at sites 100 and 150 ft. upstream at datum 0.95 ft. higher.

Average discharge.—19 years (1938-40, 1943-60), 113 cfs (81,810 acre-ft. per year).

Extremes.—1937-40, 1943-60: Maximum discharge, 792 cfs Jan. 5, 1956 (gage height, 3.58 ft., site and datum then in use); minimum, 28 cfs Oct. 17, 18, 19, 1959.

Remarks.—Some regulation by gates at outlet of Steilacoom Lake. Some diversions from tributaries for domestic use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	53.5	69.2	172	305	275	232	165	114	97.7	77.1	51.2	61.7	139
1955...	54.8	63.9	96.0	126	144	137	164*	126	80.1	62.9	51.5	44.6	95.5
1956...	57.3	89.0	357	496	242	233	194*	123	103	72.1	58.5	46.7	173
1957...	62.7	69.5	99.1	115	121	233	156	110	77.9	65.3	56.0*	45.3	101
1958...	50.1	46.4	59.0	110	203	172	120	109	81.3	55.9	38.0	38.1	89.6
1959...	42.0	85.0	141	249	241	164	146*	115	87.0	59.5	45.0	42.7	117
1960...	59.6	57.1	132	137	236	175	162	149	103	65.9	56.9	51.0	113

* Estimated.

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
1954...	46	53	90	199	244	183	132	99	89	62	45	50	45
1955...	51	48	83	109	120	125	150*	95	63	59	39	39	39
1956...	51	59	204	352	195	198	162	103	89	58	52	40	40
1957...	49	63	71	104	102	164	126	87	72	56	50*	41	41
1958...	41	38	48	80	180	120	98	73	70	37	33	33	33
1959...	37	42	109	178	180	150*	.....	87	72	44	42	39	37
1960...	28	31	42	109	183	158	138	109	48	44	53	43	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					
1953.....	.....	.....	.....	.....	.....	97.9	70,890
1954.....	418	Jan. 27, 1954	45	139	100,500	132	95,620
1955.....	245	Feb. 8, 1955	39	95.5	69,170	120	86,890
1956.....	792	Jan. 5, 1956	40	173	125,000	150	108,900
1957.....	320	Mar. 12, 1957	41	101	72,990	94.5	68,370
1958.....	253	Feb. 24, 1958	33	89.6	64,800	99.1	71,730
1959.....	368	Jan. 24, 1959	37	117	85,010	114	82,630
1960.....	313	Feb. 6, 1960	28	113	82,190	.....	.....

* Estimated.

PUYALLUP RIVER BASIN

Puyallup River near Electron, Wash.

Location.—Lat. 46°54'15", long. 122°02'05", in N½ sec. 3, T. 16 N., R. 6 E., on left bank 1,000 ft. upstream from Puget Sound Power & Light Co.'s flume headworks, a third of a mile downstream from Mowich River, and 10 miles southeast of Electron. Prior to Nov. 1, 1959, at site 100 ft. upstream.

Drainage area.—92.8 sq. mi.

Records available.—October 1908 to September 1926, October 1944 to September 1949, and October 1957 to September 1960 in reports of Geological Survey. October 1908 to September 1933 and October 1944 to September 1949 (monthly discharge only) in State Water-Supply Bulletin No. 6.

Gage.—Water-stage recorder. Altitude of gage is 1,640 ft. (from river-profile map). Prior to Jan. 1, 1913, staff gage and Jan. 1, 1913, to Sept. 30, 1926, Oct. 1, 1944, to Sept. 30, 1949, and Oct. 1, 1957, to Oct. 31, 1959, water-stage recorder, all at sites within 125 ft. upstream at different datums.

Average discharge.—33 years (1908-33, 1944-49, 1957-60), 529 cfs (383,000 acre-ft. per year).

Extremes.—1908-26, 1944-49, 1957-60: Maximum discharge, 10,800 cfs Nov. 22, 1959 (gage height, 11.9 ft., from floodmarks, site and datum in use Oct. 1, 1957, to Oct. 31, 1959), result of slope-area measurement; minimum not determined, probably occurred during period of ice effect in December 1914 or December 1922.

Remarks.—No regulation or diversion above station.

Correction.—The momentary maximum discharge for the water year 1945, published in error in State W.S.B. No. 6, has been corrected to 5,060 cfs Jan. 7, 1945.

Puyallup River near Electron, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	333	343	536	560	632	290	467	729	718	610	516	327	504
1959...	434	1,083	881	797	329	368	569	652	806	580	371	709	632
1960...	1,015	1,178*	656*	312*	480*	384*	510*	817*	739*	563*	435*	382	622

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	190	184	301	355	372	222	202	422	545	475	350	198	184
1959...	206	234	438	394	228	270	267	454	570	362	248	290	206
1960...	312	520*	284*	183*	216*	193*	334*	415*	560*	420*	199	252	183*

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
1958.....	1,870	Dec. 6, 1957	184	504	5.43	73.79	365,200	603	88.23	436,700
1959.....	4,840	Nov. 12, 1958	206	632	6.81	92.50	457,800	670	98.06	485,300
1960.....	10,800	Nov. 22, 1959	183	622	6.70	91.30	451,900	.....	.....	.....

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.

Records available.—June 1927 to October 1932, October 1941 to September 1957.

Gage.—Water-stage recorder and log control. Datum of gage is 561 ft. above mean sea level (from stadia traverse). Prior to Oct. 8, 1932, water-stage recorder at same site and datum 3.23 ft. higher. Oct. 1, 1941, to Mar. 31, 1942, staff gage at present site and datum.

Average discharge.—21 years (1927-32, 1941-57), 49.7 cfs (35,980 acre-ft. per year).

Extremes.—1927-32, 1941-57: Maximum discharge, 610 cfs Dec. 12, 1955 (gage height, 5.37 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 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
1954...	21.5	50.9	164	129	115	62.7	77.2	23.1	53.6	23.5	12.9	29.7	63.4
1955...	28.5	50.1	51.0	79.9	79.5	66.1	118	48.9	22.8	24.9	11.1	9.77	48.9
1956...	69.9	133	198	134	62.8	130	62.4	24.2	27.5	14.5	3.33	4.47	72.3
1957...	29.0	44.1	107	38.9	86.6	148	57.0	36.5	24.2	8.11	6.85	3.60*	49.0

* Estimated.

Kapowsin Creek near Kapowsin, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	11	23	69	63	70	40	36	12	35	9.4	3.8	13.5	3.8
1955...	13	21	30	49	43	36	74	32	12.5	8.1	6.4	5.8	5.8
1956...	10.5	49	94	69	53	64	30	16	16	4.7	1.9	2.4	1.9
1957...	4.7	26	27	25*	31	73	30	19	16	3.8	3.3	2.9	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
1953								56.4	33.27	40,810
1954	574	Dec. 10, 1953	3.8	63.4	2.76	37.40	45,860	54.2	32.03	39,270
1955	293	Feb. 8, 1955	5.8	48.9	2.13	28.89	35,440	71.8	42.37	51,970
1956	610	Dec. 12, 1955	1.9	72.3	3.14	42.80	52,460	53.8	31.87	39,060
1957	364	Mar. 7, 1957	2.9	49.0	2.13	28.92	35,470			

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.

Records available.—September 1931 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 357.5 ft. above mean sea level, unadjusted. Prior to Feb. 6, 1946, at site 600 ft. upstream at datum 3.93 ft. higher. Supplementary water-stage recorder 200 ft. upstream at datum 2.1 ft. higher than present gage datum used at times during periods in 1942-46.

Average discharge.—29 years (1931-60), 710 cfs (514,000 acre-ft. per year).

Extremes.—1931-60: Maximum discharge, 12,900 cfs Nov. 22, 1959 (gage height, 7.25 ft., in gage well, 8.47 ft., from outside gage), from rating curve extended above 8,600 cfs on basis of slope-area measurement of peak flow; minimum, 25 cfs Nov. 28, 1952; minimum gage height, 1.22 ft. Jan. 6, 7, 8, 9, 20, 1960; minimum daily, 59 cfs Nov. 29, 1952.

Remarks.—Water diverted for Electron powerplant of Puget Sound Power & Light Co., returned to river above gage. Some regulation by Electron powerplant.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	417	616	1,526	895	1,018	565	649	681	994	843	561	500	771
1955...	416	694	577	639	683	404	700	697	1,244	1,034	544	415	669
1956...	950	1,324	1,520	1,003*	469	826	831	1,036	1,136	842	512	386	905
1957...	553	658	1,369	373	759	937	664	936	738	488	373	377	685
1958...	366	459	887	847	975	422	737	831	786	649	577*	385	658
1959...	495	1,457	1,260	1,104	546*	611	733	780	878	645	429	700	800
1960...	1,291	1,702*	937	456	766	586	695	1,099	827	603	491	426	823

* Estimated.

Puyallup River near Orting, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	243	320	619	500*	672	355	360	330	720	558	466	320	243
1955...	255	286	345	365	310	251	455	433	664	720	355	260	251
1956...	239	450*	660*	452	426	426	586	573	780	497	381	243	243
1957...	235	405	383	200*	300*	441	405	600	472	306	260	273	200*
1958...	239	268	441	424	510*	365	278	447	630	517	450*	286	239
1959...	223	264	802	742	400	455	380	590	650	435	320	328	223
1960...	445	720*	384	237	301	269	491	545	617	445	316	280	237

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
1953								785	61.97	568,500
1954	10,100	Dec. 9, 1953	243	771	4.48	60.85	558,200	697	54.99	504,400
1955	4,420	Feb. 8, 1955	251	669	3.89	52.83	484,600	847	66.82	613,000
1956	12,100	Dec. 11, 1955	243	905	5.26	71.64	657,100	804	63.64	583,800
1957	4,360	Dec. 9, 11, 1956	200	685	3.98	54.10	496,300	612	48.32	443,300
1958	2,740	Dec. 25, 1957	239	658	3.83	51.95	476,600	783	61.80	566,900
1959	5,460	Nov. 12, 1958	223	809	4.70	63.83	585,600	869	68.59	629,200
1960	12,900	Nov. 22, 1959	237	823	4.78	65.10	597,200			

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.

Records available.—November 1910 to July 1912, March 1929 to September 1960. Published as "at Fairfax" 1910-12.

Gage.—Water-stage recorder. Datum of gage is 1,212.6 ft. above mean sea level (river profile survey). Prior to July 13, 1912, staff gage at railroad crossing 1.7 miles upstream at different datum.

Average discharge.—31 years (1929-60), 422 cfs (305,500 acre-ft. per year).

Extremes.—1910-12, 1929-60: Maximum discharge, 11,000 cfs Dec. 9, 1933 (gage height, 10.2 ft.), from rating curve extended above 4,200 cfs; minimum, 36 cfs Nov. 28, 29, 1952; minimum gage height recorded, 0.75 ft. Nov. 20, 1944.

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
1954...	215	412	883	371	461	239	375	517	706	656	400	273	459
1955...	264	413	316	299	354	168	336	511	1,007	763	381	217	419
1956...	596	920	733	437	181	269	506	774	750	637	311	218	529
1957...	387	515	878	170*	286	428	402	618	544	349	240	207	420
1958...	204	296	487	466	466	204	401	567	571	406	299	241	383
1959...	301	981	844	659	270	313	454	518	636	472	291	538	529
1960...	830	1,014	540	224	326	308	413	709	684	443	326	257	506

* Estimated.

Carbon River near Fairfax, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	106	161	383	162	335	140	138	185	515	478	248	173	106
1955...	114	157	188	150	139	112	204	209	508	552	231	123	112
1956...	148	339	310	250	136	144	256	372	468	336	238	142	136
1957...	151	222	196	110	118	234	252	463	390	268	164	162	110
1958...	116	157	244	274	251	151	140	305	445	337	238	140	116
1959...	156	204	381	353	174	223	212	390	515	301	232	268	156
1960...	304	256	206	159	150*	133	290	370	520	318	229	179	133

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
1953								462	79.46	334,400
1954	6,860	Dec. 9, 1953	106	459	5.82	79.01	332,400	415	71.46	300,600
1955	2,490	Feb. 8, 1955	112	419	5.31	72.09	303,400	524	90.18	379,500
1956	6,320	Dec. 11, 1955	136	529	6.70	91.24	383,900	490	84.60	355,900
1957	5,280	Dec. 10, 1956	110	420	5.32	72.23	303,900	353	60.75	255,600
1958	1,610	Dec. 6, 1957	116	383	4.85	65.97	277,600	483	83.16	349,900
1959	4,310	Nov. 12, 1958	156	529	6.70	90.99	382,800	546	93.85	394,900
1960	9,970	Nov. 23, 1959	133	506	6.41	87.33	367,500			

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.

Records available.—June 1949 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 430 ft. (from topographic map).

Average discharge.—11 years (1949-60), 251 cfs (181,700 acre-ft. per year).

Extremes.—1949-60: Maximum discharge, 6,850 cfs Dec. 11, 1955 (gage height, 9.78 ft.), from rating curve extended above 3,000 cfs; minimum, 22 cfs Nov. 29, 1952 (gage height, 1.25 ft.).

Remarks.—Small amount of 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
1954...	129	293	678	388	434	212	318	215	350	197	131	165	292
1955...	126	221	235	258	340	209	361*	324	356	246	84.7	50.5*	233
1956...	316*	566	728	490	168	424	362	279	282	110	52.2	54.4	320
1957...	203	250	569	126	301	461	295	272	147	71.3	57.1	56.4	234
1958...	105	163	342	386	399	165	332	150	119	58.9	36.8	56.6	191
1959...	101	613	467	495	228	259	282	267	273	96.1	46.2	188	276
1960...	349	566	384	207	300	212	296	463	203	70.7	88.2	81.6	268

* Estimated.

South Prairie Creek at South Prairie, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	74	110	296	211	303	134	141	126	219	98	69	92	69
1955...	65	79	118	131	126	107	238	215	176	132	54	43*	43*
1956...	43*	140	299	205	136	181	235	193	169	55	41	39	39
1957...	53	110	100	80*	120*	225	151	180	97	52	43	38	38
1958...	48	74	139	185	222	106	103	105	62	37	27	28	27
1959...	43	66	230	241	166	168	135	173	177	52	34	52	34
1960...	108	103	171	104	119	110	225	248	122	45	42	42	42

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
1953								277	47.80	200,400
1954	5,470	Dec. 9, 1953	69	292	3.72	50.35	211,100	248	42.78	179,400
1955	3,440	Feb. 8, 1955	43	233	2.96	40.26	168,800	320	55.19	231,300
1956	6,850	Dec. 11, 1955	39	320	4.07	55.46	232,500	271	46.97	196,900
1957	2,750	Dec. 9, 1956	38	234	2.98	40.44	169,500	199	34.46	144,400
1958	1,710	Jan. 17, 1958	27	191	2.43	33.06	138,600	239	41.22	172,700
1959	3,160	Nov. 12, 1958	34	276	3.51	47.68	199,800	286	49.43	207,200
1960	3,900	Nov. 20, 1959	42	268	3.41	46.41	194,500			

* Estimated.

Puyallup River at Alderton, Wash.

Location.—Lat. 47°11'05", long. 122°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 bridge 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.

Records available.—October 1914 to February 1927, October 1943 to April 1957.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Feb. 2, 1927, staff or chain gages at practically same site. Prior to Aug. 5, 1918, at datum 49.77 ft. higher; Aug. 5, 1918, to Feb. 1, 1927, at datum 48.77 ft. higher; Oct. 1, 1943, to Sept. 30, 1955, at datum 0.23 ft. lower.

Average discharge.—25 years (1914-26, 1943-56), 1,614 cfs (1,168,000 acre-ft. per year).

Extremes.—1914-27, 1943-57: Maximum discharge, 23,300 cfs Dec. 12, 1955 (elevation, 56.84 ft.); minimum daily, 150 cfs Nov. 29, Dec. 1, 1952.

Flood of 1906 reached a stage of 66.3 ft., from floodmarks (discharge not determined).

Remarks.—Minor diversions for farm and domestic use. Some regulation by Electron powerplant of Puget Sound Power & Light Co. Since 1912 the city of Tacoma pipe-line diversion from Green River has spilled 0 to 110 cfs daily (an average of 40 cfs, or 2,380 acre-ft. per month) into Puyallup River at south line of sec. 7, T. 19 N., R. 5 E., half a mile east of McMillin.

Puyallup River at Alderton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	842	1,516	3,831	2,169	2,365	1,298	1,672	1,678	2,433	1,891	1,153	1,230	1,837
1955...	1,028	1,619	1,344	1,543	1,732	1,155	7,934	1,800	2,839	2,376	1,256	888	1,623
1956...	2,191	3,268	3,836	2,578	1,308	2,097	2,251	2,458	2,540	1,841	1,043	851*	2,195
1957...	1,374	1,599	3,024	830*	1,745*	2,169	1,493*	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	344	628	1,830	1,200	1,750	800	822	780	1,790	1,150	844	750	344
1955...	512	610	780	901	865	724	1,260	1,160	1,620	1,780	748	500*	500*
1956...	578	1,430	1,910	1,540	1,210	1,220	1,790	1,690	1,820	1,100*	850*	600*	578
1957...	650*	950*	850*	500*	850*	1,200*	900*	.....	.....	.....	.....	.....	.....

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
1953.....	.....	.....	.....	.....	.....	.....	.....	1,804	55.89	1,306,000
1954.....	21,900	Dec. 9, 1953	244	1,837	4.19	56.93	1,330,000	1,650	51.14	1,194,000
1955.....	9,550	Feb. 8, 1955	500	1,623	3.71	50.31	1,175,000	2,071	64.19	1,499,000
1956.....	23,300	Dec. 12, 1955	578	2,195	5.01	68.21	1,593,000	1,918	59.61	1,393,000
1957.....	11,000	Dec. 10, 1956	.....	.....	.....	.....	.....	.....	.....	.....

* 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.

Records available.—December 1911 to May 1912 (fragmentary), March 1929 to September 1960. Published as "near Enumclaw" 1911-12.

Gage.—Water-stage recorder. Altitude of gage is 1,725 ft. (from river-profile map). Prior to May 6, 1912, staff gage at site 2 miles upstream at different datum.

Average discharge.—31 years (1929-60), 855 cfs (619,000 acre-ft. per year).

Extremes.—1911-12, 1929-60: 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 regulation or diversion above station.

Note.—The momentary maximum discharge for the water year 1930 not published in State WSB No. 6, has been estimated as 2,000 cfs Feb. 19, 1930.

White River at Greenwater, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	490	598	1,372	647	843*	552	690	1,352	1,416	1,531	758	529	900
1955...	432	624	514	525	688	320	572	985	2,395	1,573	846	591	838
1956...	863	1,592	1,490	726	400	457	1,280	2,225	2,200	1,791	898	569	1,208
1957...	520	690	1,515	605	535	854	917	1,753	1,395	817	609	520	897
1958...	377	416	648	776	852	504	734	1,744	1,562	950	720	449	811
1959...	559	1,579	1,569	1,422	677	597	961	1,216	1,806	1,398	749	731	1,107
1960...	1,196	1,847	1,210	557	799	630	912	1,245	1,630	1,078	655	462	1,017

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	340	365	728	360*	550*	395	390	522	939	975	575	410	340
1955...	345	325	395	365	355	268	417	417	1,030	1,070	686	403	268
1956...	395	830	698	474	330	314	504	1,060	1,680	1,020	720	464	314
1957...	375	442	469	350*	327	594	634	1,240	910	641	484	419	327
1958...	249	317	440	464	548	385	380	740	964	826	573	340	249
1959...	245	255	943	862	484	484	634	918	1,470	934	573	509	345
1960...	567	701	687	409	442	388	715	825	1,120	802	436	368	368

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
1953								886	55.68	641,800
1954	5,560	Dec. 9, 1953	340	900	4.17	56.54	651,300	824	51.79	596,600
1955	5,160	June 11, 1955	268	838	3.88	52.64	606,500	1,037	65.14	750,500
1956	10,100	Dec. 12, 1955	314	1,208	5.59	76.14	876,900	1,107	69.79	803,700
1957	6,860	Dec. 10, 1956	327	897	4.15	56.40	649,600	789	49.60	571,200
1958	3,360	May 25, 1958	249	811	3.75	50.96	587,200	1,000	62.85	724,200
1959	5,230	Nov. 12, 1958	345	1,107	5.12	69.56	801,400	1,153	72.43	834,500
1960	14,300	Nov. 28, 1959	368	1,617	4.71	64.10	738,600			

* Estimated.

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.

Records available.—September 1911 to August 1912 (fragmentary), May 1929 to September 1960. Published as "near Enumclaw" 1911-12.

Gage.—Water-stage recorder. Altitude of gage is 1,725 ft. (from topographic map). Prior to Aug. 10, 1912, staff gages at approximately same site at different datums. May 1, 1929, to Aug. 14, 1934, water-stage recorder at site 900 ft. upstream at different datum.

Average discharge.—31 years (1929-60), 209 cfs (151,300 acre-ft. per year).

Extremes.—1911-12, 1929-60: Maximum discharge, 5,360 cfs Nov. 22, 1959 (gage height, 7.67 ft.), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum, 23 cfs Oct. 7, 1934; minimum gage height, 2.00 ft. Nov. 28 to Dec. 2, 1952.

Remarks.—No regulation or diversion above station.

Revisions.—The momentary maximum discharge for the water year 1947 published in state WSB No. 6 has been revised to 5,000 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	48.0	89.4	483	228	290	153	227	517	452	283	97.4	64.4	244
1955...	70.8	93.2	116	155	235	90.6	162	363	736	301	102	67.3	208
1956...	172	457	406	211	113	149	457	764	544	241	88.9	61.0	306
1957...	80.1	167	427	145	124	221	322	511	231	89.1	53.9	33.1	202
1958...	41.2	58.7	172	219	222	147	263	429	198	77.0	45.5	42.3	159
1959...	104	436*	484	441	205	182	292	381	397	151	65.6	129	272
1960...	347	567	345	129	183	189	300	368	312	120	72.4	61.9*	249

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	41	40	218	125	156	106	102	177	378	136	74	54	40
1955...	49	64	86	83	104	73	114	127	405	161	78	56	49
1956...	56	218	200	140	87	89	160	410	374	128	68	52	52
1957...	50	78	119	80*	85	148	221	354	127	63	41	34	34
1958...	34	40*	96	113	148	105	109	251	122	55	38	34	34
1959...	32	70*	248	248	129	142	187	304	262	85	50	50	32
1960...	132	187	178	98	108	87	226	248	188	85	61	44*	44*

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
1953								213	39.06	153,900
1954	2,000	Dec. 9, 1953	40	244	3.30	44.90	177,000	216	39.59	156,100
1955	1,580	June 11, 1955	49	208	2.81	38.23	150,900	272	49.90	196,600
1956	2,230	Dec. 12, 1955	52	306	4.14	56.31	221,900	276	50.80	200,200
1957	1,000	Dec. 13, 1956	34	202	2.73	37.02	145,900	168	30.80	121,400
1958	816	April 21, 1958	34	159	2.15	29.26	115,300	222	40.81	160,800
1959	1,610	Jan. 24, 1959	32	272	3.68	50.02	197,200	292	53.62	211,400
1960	5,360	Nov. 22, 1959	44	249	3.37	45.92	181,000			

* Estimated.

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.

Records available.—October 1943 to September 1960.

Gage.—Staff gage. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.—1943-60: Maximum contents observed since dam was completed, 37,300 acre-ft. June 20, 1956 (elevation, 1,117.1 ft.); no pool at times some years.

Remarks.—Reservoir, for flood control, is formed by earth-fill dam. Embankment completed and storage began on small scale in 1942. Capacity, 106,000 acre-ft. between elevations 895 (invert of outlet tunnel) and 1,215 ft. (spillway crest). Storage is not retained but is dissipated as soon after a flood as is possible without creating damaging flows downstream in order to have the maximum capacity available for any following flood which might develop.

Cooperation.—Records of reservoir elevations and capacity table furnished by Corps of Engineers.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,930	72	107	107	191	95	62	160	4,880	89	77	72	.....
1955...	43	43	3,160	62	107	127	107	17,540	11,440	5,160	83	43	.....
1956...	7,070	1,610	451	698	107	62	3,960	31,400	8,690	667	107	1,900	.....
1957...	2,090	2,080	168	2,060	11,490	3,540	3,190	10,150	28,370	116	43	43	.....
1958...	43	43	141	141	12,870	9,000	134	9,280	2,890	11,830	3,570	138	.....
1959...	107	587	11,040	464	572	235	2,470	22,380	120	120	1,880	2,310	.....
1960...	3,060	18,800	12,840	1,260	508	519	519	1,000	609	609	168	168	.....

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, 4 miles east of Buckley, and 8 miles downstream from Clearwater River.

Drainage area.—401 sq. mi. At site prior to 1934, 400 sq. mi.

Records available.—October 1928 to November 1933, October 1938 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929 (Corps of Engineers bench mark). Oct. 26 to Dec. 9, 1928, staff gage and Dec. 9, 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.—27 years (1928-33, 1938-60), 1,434 cfs (1,038,000 acre-ft. per year), adjusted for storage since December 1943.

Extremes.—1928-33, 1938-60: 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; probably no flow part of each day Oct. 1, 2, 7, 8, Nov. 14, Dec. 1, 5, 15, 1958, Jan. 3, Mar. 24, June 8, Aug. 19, 1959; minimum daily, 59 cfs June 25, 1957, Mar. 26, 1958.

White River near Buckley, Wash.—Continued

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.—Diversion for some community use within basin. Flow regulated by Mud Mountain Reservoir for flood control (see preceding page). Storage is not retained and observed annual runoff closely represents natural runoff of basin

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	630	1,018	2,996	1,491	1,840	1,066	1,511	2,406	2,335	2,244	1,116	790	1,621
1955...	736	1,108	976	1,136	1,486	735	1,287	1,738	3,704	2,347	1,161	749	1,427
1956...	1,477	3,119	2,963	1,620	779	1,210	2,064	3,553	3,573	2,390	1,029	642	2,068
1957...	937	1,374	2,888	757	875	1,767	1,797	2,519	1,544	1,362	734	592	1,435
1958...	515	681	1,410	1,634	1,469	1,016	1,754	2,396	2,094	1,063	946	726	1,307
1959...	841	2,915	2,635	2,799	1,115	1,169	1,753	1,702	2,817	1,602	809	1,277	1,787
1960...	2,159	2,937	2,175	1,043	1,403	1,145	1,569	2,179	2,137	1,222	889	637	1,624

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	480	596	1,500	850	1,160	770	790	1,020	850	1,300	865	623	480
1955...	544	558	715	665	745	578	800	60	2,120	1,520	792	520	60
1956...	380	1,650	1,060	688	324	645	1,190	2,110	2,310	999	834	169	169
1957...	463	834	735	270*	509	1,090	1,170	1,770	59	794	560	183	59
1958...	352	422	839	978	263	59	834	1,440	1,770	106	726	498	59
1959...	214	498	1,330	1,380	760	422	1,050	167	1,730	1,030	301	683	167
1960...	809	919	313	445	685	635	1,180	376	1,600	939	702	494	313

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	1,582	1,145,000	1,582	53.54
1954.....	10,100	Dec. 9, 1953	480	1,621	1,173,000	1,618	4.03	54.77	1,465	1,061,000	1,470	49.74
1955.....	7,210	June 10, 1955	60	1,427	1,033,000	1,427	3.56	48.27	1,824	1,320,000	1,820	61.58
1956.....	13,700	Dec. 12, 1955	169	2,088	1,516,000	2,090	5.21	70.94	1,893	1,374,000	1,893	63.23
1957.....	6,910	Dec. 10, 1956	59	1,435	1,038,000	1,431	3.57	48.46	1,216	880,400	1,216	41.15
1958.....	3,620	May 26, 1958	59	1,307	946,500	1,308	3.26	44.27	1,623	1,175,000	1,638	55.45
1959.....	10,700	Jan. 25, 1959	167	1,787	1,294,000	1,790	4.46	60.58	1,862	1,348,000	1,865	63.09
1960.....	13,000	Nov. 23, 1959	313	1,624	1,179,000	1,621	4.04	55.01	.....	.....	.....	.....

* Estimated.

White 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.

Records available.—January 1945 to September 1960. Published as Stuck River near Sumner 1945-59.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (Intercounty River Improvement Commission bench mark).

Average discharge.—15 years (1945-60), 623 cfs (451,000 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 15,100 cfs Dec. 12, 1955 (elevation, 61.40 ft.); minimum, 28 cfs Nov. 1, 1958; minimum elevation, 48.48 ft. Feb. 1, 1945 (channel affected by dredging).

Remarks.—An average of 600 to 900 cfs diverted above station into Lake Tapps for Dieringer powerplant of Puget Sound Power & Light Co. High flow influenced by regulation in Mud Mountain Reservoir (see p. 91).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	114	238	2,051	430	406	200	263	759	868	729	110	100	525
1955...	106	142*	166	228	550	147	256	653*	2,204	603	174	60.0	437
1956...	475	1,772	2,182	616	260	346	1,173	2,101	1,853	827	216	156	1,000
1957...	123	259	2,092	134	200	423	432	946	368	126	216	60.9	452
1958...	98.7	89.8	253	505	371	159	412	865	438	148	85.8	140	297
1959...	278	2,018	1,053	2,229	578	425	815	894	1,860	101	61.2	321	962
1960...	792	2,177	1,188	275	314	233	255	1,459	831	59.9	72.0	110	647

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	89	112	246	194	252	127	118	159	288	146	90	89	89
1955...	78	72	114	124	134	120	127	189	344	186	92	40	40
1956...	87	232	449	270	148	174	209	716	430	176	130	94	87
1957...	68	100	94	69	82	190	106	130	83	63	53	53	53
1958...	58	66	96	111	154	124	76	87	188	56	62	56	56
1959...	32	34	420	356	192	97	94	50	45	59	40	56	32
1960...	62	42	94	146	96	94	146	217	79	41	45	46	41

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					
1953						577	417,700
1954	11,700	Dec. 9, 1953	89	525	380,000	356	257,900
1955	7,380	June 12, 1955	40	437	316,500	774	560,200
1956	15,100	Dec. 12, 1955	37	1,000	725,600	838	608,400
1957	6,460	Dec. 18, 1956	53	452	327,400	280	202,800
1958	2,900	Feb. 27, 1958	56	297	214,900	615	445,200
1959	11,900	Jan. 25, 1959	32	962	696,300	954	690,200
1960	14,700	Nov. 24, 1959	41	647	469,500		

* Estimated.

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.

Drainage area.—12.5 sq. mi.

Records available.—November 1911 to September 1960.

Gage.—Staff gage. Datum of gage is 0.70 ft. above mean sea level (levels by Puget Sound Power & Light Co.).

Extremes.—1911-60: Maximum contents observed, 51,710 acre-ft. June 30, 1958 (gage height, 541.57 ft.; capacity table dated Jan. 19, 1920); maximum gage height, 543.00 ft. Oct. 17, 1959; minimum contents observed, 458 acre-ft. June 24, 1912 (gage height, 505.70 ft.).

Remarks.—Reservoir is formed by diking of a natural lake into which a great part of the low-water flow of White River is diverted. Usable capacity, 46,660 acre-ft. between elevations 515 and 543 ft. from capacity table dated July 28, 1959. Storage 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
1954...	44,320	46,800	45,260	35,320	39,610	21,940	25,200	39,350	47,920	45,830	42,620	46,120	.....
1955...	42,600	56,320	42,340	26,870	15,300	12,620	15,070	32,220	43,790	46,980	45,460	42,490	.....
1956...	50,220	49,710	49,300	42,950	17,840	24,930	44,620	45,570	47,040	44,430	45,170	45,860	.....
1957...	45,660	42,910	39,810	21,780	21,320	37,670	37,650	47,260	30,600	48,080	46,870	45,130	.....
1958...	46,560	42,200	47,220	48,010	49,320	18,740	39,320	47,150	51,460	44,670	49,360	44,140	.....
1959...	36,580	42,160	42,820	43,800	33,340	41,580	43,530	41,720	43,670	40,760	45,140	45,670	.....
1960...	45,600	39,640	34,440	37,320	23,680	24,580	37,530	43,400	44,670	45,650	45,400	43,110	.....

Lake Tapps diversion at Dieringer, Wash.

Location.—Lat. 47°14'20", long. 122°13'40", in NW¼ sec. 7, T. 20 N., R. 5 E., on right bank 900 ft. downstream from Dieringer powerplant, 1,200 ft. upstream from mouth and 2½ miles north of Sumner.

Records available.—April 1958 to September 1960.

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

Extremes.—1958-60: Maximum discharge, 2,310 cfs Nov. 23, 1959 (gage height, 6.00 ft.); minimum daily, 19.5 cfs Aug. 22, 23, 1959.

Remarks.—Regulation by White River powerplant.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	.....	.....	.....	.....	.....	.....	.....	1,534	1,605	1,057	779	609	.....
1959...	560	1,516	1,273	1,529	1,112	899	1,277	1,118	1,576	1,625	693	1,065	1,185
1960...	1,443	1,341	1,459*	909	1,604	1,007	1,344	1,183	1,704	1,228	783	560	1,211

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	.....	.....	.....	.....	.....	.....	.....	235	1,170	130	123	80	.....
1959...	75	71	81	738	273	73	84	322	1,160	1,260	19.5	431	19.5
1960...	860	749	1,240*	42	1,300	61	536	37	1,380	39	84	82	32

* Estimated.

Lake Tapps diversion at Dieringer, 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					
1958	①2,050	May 27-29, 1958					
1959	2,230	May 28, 1959	19.5	1,185	857,800	1,261	913,200
1960	2,310	Nov. 23, 1959	32	1,211	879,300		

① Maximum daily during period April to September.

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 bridge at Clark Creek, 1 mile northeast of Puyallup, and 7 miles upstream from mouth.

Drainage area.—948 sq. mi.

Records available.—May 1914 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Dec. 3, 1919, at sites 1¼ 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 than present datum.

Average discharge.—46 years, 3,350 cfs (2,425,000 acre-ft. per year), adjusted for storage in Lake Tapps since October 1934, and Mud Mountain Reservoir October 1944 to September 1947.

Extremes.—1914-60: Maximum discharge, 57,000 cfs Dec. 10, 1933 (elevation, 31.0 ft., present datum); minimum, 306 cfs Sept. 25, 1955 (elevation, 8.23 ft.); minimum daily, 400 cfs Nov. 30, 1952.

Remarks.—All diverted water returned to river above gage. Large part of flow of White River diverted into Lake Tapps (see p. 94) returned via White River (formerly Stuck River) above station. Flood flow regulated by Mud Mountain Reservoir on White River (see p. 91). Some pondage on tributaries and upper Puyallup River. Diurnal fluctuations caused by powerplants and glacial melts above station. Since 1912 the city of Tacoma pipeline diversion from Green River has spilled as much as 110 cfs daily (an average of 40 cfs, or 2,380 acre-ft. per month) into Puyallup River at south line of sec. 7, T. 19 N., R. 5 E., half a mile east of McMillin.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,714	2,987	7,465	4,363	4,397	3,068	3,458	3,957	4,934	4,513	2,574	1,995	3,785
1955	1,837	2,906	2,730	3,355	3,948	2,146	3,749	3,700	6,330	4,850	2,493	1,621	3,337
1956	3,663	6,925	7,646	4,708	2,588	3,673	4,634	5,905	6,369	4,593	2,244	1,498	4,544
1957	2,523	3,288	6,667	2,121	2,960	4,436	3,820	4,855	3,686	2,340	1,687	1,457	3,341
1958	1,401	2,068	3,699	4,335	4,354	2,782	2,567	4,260	3,934	2,620	1,960	1,598	3,040
1959	2,068	7,153	6,423	6,706	3,042	2,779	3,772	4,017	5,266	3,319	1,682	3,340	4,131
1960	6,689	8,796	6,613	3,937	5,318	3,896	4,879	6,102	6,159	4,032	3,158	2,706	5,185

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
1954...	801	1,190	3,560	2,920	3,640	2,470	2,530	2,020	3,590	3,100	1,410	1,250	801
1955...	766	1,240	1,170	1,420	2,470	994	2,820	2,350	3,860	3,710	1,250	432	432
1956...	609	3,410	3,740	3,240	1,290	1,560	2,380	2,900	4,720	2,920	1,280	816	609
1957...	779	1,980	1,400	1,100	968	2,790	2,650	3,650	2,880	1,160	804	657	657
1958...	677	711	1,710	2,780	3,120	2,230	1,610	2,630	3,330	1,590	1,190	1,220	677
1959...	802	828	3,860	3,620	2,090	1,590	1,310	1,960	3,220	2,460	772	1,760	772
1960...	3,560	3,840	4,450	2,420	3,030	2,480	4,100	2,140	4,710	2,280	2,130	1,930	1,930

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953									3,724	2,696,000	3,725	
1954	34,500	Dec. 9, 1953	801	3,785	2,740,000	3,787	3.99	54.23	3,387	2,452,000	3,383	
1955	15,000	Feb. 8, 1955	432	3,337	2,416,000	3,332	3.51	47.70	4,240	3,069,000	4,249	
1956	37,600	Dec. 12, 1955	609	4,544	3,299,000	4,549	4.80	65.32	4,067	2,952,000	4,064	
1957	17,300	Dec. 11, 1956	657	3,341	2,418,000	3,339	3.52	47.80	2,893	2,094,000	2,902	
1958	10,700	Jan. 17, 1958	677	3,040	2,201,000	3,039	3.21	43.51	3,746	2,712,000	3,752	
1959	22,600	Jan. 24, 1959	772	4,131	2,991,000	4,147	4.37	59.37	4,675	3,385,000	4,665	
1960	35,600	Nov. 23, 1959	1,930	5,185	3,764,000	5,181	5.47	74.39				

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 60 ft. upstream from bridge, a quarter of a mile upstream from mouth, and 5½ miles northeast of Lester.

Drainage area.—11.9 sq. mi.

Records available.—October 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,950 ft. (from topographic map). Prior to Apr. 17, 1957, at site 140 ft. upstream at datum 3.84 ft. higher. Apr. 17, 1957, to Jan. 5, 1960, at site 60 ft. downstream at present datum.

Average discharge.—15 years (1945-60), 69.1 cfs (50,030 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 3,400 cfs Nov. 23, 1959 (gage height, 8.0 ft.), from rating curve extended above 1,300 cfs; minimum, 3.0 cfs Nov. 29, 30, 1952; minimum gage height, 1.00 ft. Sept. 12, 13, 1958.

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
1954...	13.2	57.5	173	52.0*	64.1*	38.7	89.3	179	165	79.1	17.5	11.1	78.4
1955...	25.2	67.5	31.7	42.5	79.2	18.3	48.1	141	226	107	23.4	10.0	68.0
1956...	93.9	125	89.4*	24.5*	17.3*	27.6	153	262	148	58.2	11.5	9.19	85.1
1957...	60.3	69.7	237	23.3*	20.4*	36.1*	120*	135	41.7	12.9	7.17	5.09	64.5
1958...	8.01	31.2	80.3	56.9	94.1	46.4	104	116	27.0	10.0	5.40	11.6	49.1
1959...	53.4	187	149*	127*	41.0	62.5	126	121	78.0	24.5	9.34	88.5*	89.0
1960...	104	166	119*	15.6*	45.4	67.4	116	132	75.9	15.4	9.32	11.0	73.1

* Estimated.

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
1954...	7.8	22	58	21*	24*	26	26	48	128	29	12.5	9.7	7.8
1955...	8.2	14.3	16.4	16.4	21	13.1	24	38	126	48	10.7	7.8	7.8
1956...	11.3	32	25	15*	13*	13.9	34	138	85	18.5	8.7	6.4	6.4
1957...	8.7	33	31	.....	.....	28*	57*	79	21	8.2	6.2	4.4	4.4
1958...	4.0	10.2	44	27	48*	27	46	56	15.2	6.6	4.5	4.2	4.0
1959...	9.7	20	65*	65*	18.3	40	48	81	32	11.7	7.4	12.2	7.4
1960...	33	36	28*	10*	18	12.5	56	92	32	9*	6.5	8.7	6.5

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
1953.....	.....	.....	.....	.....	.....	.....	.....	73.7	84.10	53,370
1954.....	1,130	Dec. 9, 1953	7.8	78.4	6.59	89.42	56,740	68.3	77.87	49,420
1955.....	950	Feb. 8, 1955	7.8	68.0	5.71	77.62	49,270	83.5	95.25	60,440
1956.....	1,210	Dec. 11, 1955	6.4	85.1	7.15	97.33	61,770	90.3	103.22	65,530
1957.....	1,730	Dec. 9, 1956	4.4	64.5	5.42	73.55	46,670	43.5	49.07	31,500
1958.....	449	April 20, 1958	4.0	48.9	4.11	55.81	35,490	71.5	81.52	51,740
1959.....	716	Nov. 12, 1958	7.4	89.0	7.48	101.50	64,440	88.9	101.45	64,400
1960.....	3,400	Nov. 23, 1959	6.5	73.1	6.14	83.59	53,050	.....	.....	.....

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.

Records available.—October 1945 to September 1960.

Gage.—Water-stage recorder. Concrete control Aug. 9, 1951 to Nov. 22, 1959. Altitude of gage is 1,760 ft. (from topographic map).

Average discharge.—15 years (1945-60), 28.1 cfs (20,340 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 1,370 cfs Nov. 22, 1959 (gage height, 6.04 ft., from high-water mark in well), from rating curve extended above 230 cfs on basis of slope-area measurement of peak flow; minimum, 1.2 cfs Sept. 6, 1958; minimum gage height, 1.64 ft. Aug. 14, 20, 21, 22, Sept. 30, 1960.

Remarks.—Small diversion above gage of about 1,000 gallons per day 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
1954...	4.92	23.4	75.1	23.8	26.8	16.8	32.1	60.8	71.4	30.9	7.83	6.00	31.7
1955...	9.03	22.3*	14.6*	19.1	34.4	9.89	19.3	41.8	85.0	47.8	11.0	5.97	26.5
1956...	37.2	55.2	37.3	12.2	7.43	13.1	52.9	86.6	70.5	28.8	6.08	4.20	34.3
1957...	17.7	25.5	90.4	13.0*	12.4	17.8	43.4	66.1	17.8	5.93	3.25	2.21	26.4
1958...	3.68	11.0	28.8	22.7	31.7	14.5	39.9	43.6	9.59	3.65	2.40	3.65	17.8
1959...	22.6	82.8	62.3	53.6	17.2	22.8	40.9	50.8	32.5	9.66	3.73	37.8	36.4
1960...	45.7	66.5	36.4	9.08	19.4	21.7*	39.0	54.3	35.1	7.36	4.77	4.35	28.6

* Estimated.

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
1954...	3.0	7.4	29	9.7	12.5	11.5	11.5	17.2	52	11.0	6.5	5.4	3.0
1955...	4.8	7.0*	7.7*	7.8	9.7	7.8	10.1	16.0	44	21	6.2	4.8	4.8
1956...	6.0	15.6	13.2	7.6	5.7	6.3	13.2	44	46	9.6	4.2	3.5	3.5
1957...	3.5	13.8	13.2	9*	7.5	12.8	26	38	9.8	3.8	2.4	2.0	2.0
1958...	2.0	3.2	15.1	9.8	16.9	8.8	13.9	19.7	5.9	3.0	1.8	1.6	1.6
1959...	2.8	7.9	21	22	9.3	16.9	16.3	33	12.8	4.8	2.8	3.5	2.8
1960...	14.5	14	13	5.9	7*	5*	23	33	15	4.6	3.6	3.6	3.6

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
1953								29.8	88.98	21,590
1954	412	Dec. 9, 1953	3.0	31.7	6.97	94.49	22,930	26.8	79.93	19,401
1955	424	Feb. 8, 1955	4.8	26.5	5.82	79.18	19,220	33.6	100.15	24,310
1956	406	Dec. 11, 1955	3.5	34.3	7.54	102.65	24,910	34.7	103.84	25,200
1957	424	Dec. 10, 1956	2.0	26.4	5.80	78.89	19,150	18.8	56.20	13,640
1958	181	April 20, 1958	1.6	17.8	3.91	53.21	12,910	28.2	84.10	20,410
1959	590	Nov. 12, 1958	2.8	36.4	8.00	108.67	26,370	34.8	103.96	25,230
1960	1,370	Nov. 22, 1959	3.6	28.6	6.29	85.61	20,770			

Green River near Lester, Wash.

Location.—Lat. 47°12'25", long. 121°33'15", in NE¼SE¼ sec. 20, T. 20 N., R. 10 E., on left bank 0.3 mile upstream from Champion Creek, 1¼ miles downstream from McCain Creek and 3 miles west of Lester.

Drainage area.—104 sq. mi.

Records available.—October 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,480 ft. (from river-profile map). Prior to Nov. 22, 1959, at site 300 ft. upstream at different datum (gage destroyed by flood of Nov. 22, 1959). December 1959 to September 1960 staff gage at site 400 ft. downstream at different datum.

Average discharge.—15 years (1945-60), 436 cfs (315,700 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 22,000 cfs Nov. 22, 1959 (gage height, about 16.0 ft., from floodmarks, site and datum then in use), result of slope-area measurement of peak flow; minimum, 22 cfs Nov. 30, 1952, site then in use.

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
1954...	57.3	270	1,133	410	443	305	61.6	1,009	839	326	91.3	64.9	464
1955...	109	296	227	316	539	178	428	875	1,201	458	122	69.0	399
1956...	510	811	686	226	130	299	1,169	1,596	789	257	67.8	49.5	550
1957...	214	399	1,343	167*	179	361	782	804	203	76.7	46.9	31.8	386
1958...	42.0	127	447	405	569	264	667	676	167	68.5	38.8	49.6	291
1959...	294	1,345	1,002	945	291	377	717	688	423	132	57.9	412	557
1960...	750	1,683*	811*	185*	403*	382*	573*	709	379*	114*	65.8*	80.4*	510

* 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
1954...	42	94	472	155	178	215	359	317	615	129	72	56	42
1955...	48	80	118	131	168	123	248	317	695	208	73	57	48
1956...	68	240	218	140	104	135	334	866	461	101	49	41	41
1957...	41	195	204	80*	95*	251	470	403	114	54	38	28	28
1958...	28	44	232	163	333	154	248	337	102	49	32	30	28
1959...	37	125	398	416	161	280	295	483	192	72	47	50	37
1960...	232	270*	210*	110*	175*	140*	350*	468	200*	60*	46*	60*	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
1953								446	58.16	322,600
1954	6,020	Dec. 9, 1953	42	464	4.46	60.59	336,000	394	51.40	285,000
1955	5,280	Feb. 8, 1955	48	399	3.84	52.12	289,100	515	67.17	372,600
1956	7,630	Dec. 12, 1955	41	550	5.29	71.94	399,100	547	71.53	396,800
1957	7,400	Dec. 9, 1956	28	386	3.71	50.37	279,400	273	35.62	197,600
1958	2,860	April 20, 1958	28	291	2.80	38.05	211,000	460	60.06	333,100
1959	6,840	Nov. 12, 1958	37	557	5.36	72.74	403,500	608	79.29	439,800
1960	22,000	Nov. 22, 1959	46	510	4.90	66.74	370,200			

Green Canyon Creek near Lester, Wash.

Location.—Lat. 47°13'10", long. 121°34'30", in SE¼ sec. 18, T. 20 N., R. 10 E., on left bank a quarter of a mile upstream from mouth and 4 miles west of Lester.

Drainage area.—3.23 sq. mi.

Records available.—April to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,480 ft. (from topographic map).

Extremes.—April to September 1960: Maximum discharge, 52 cfs May 20 (gage height, 1.71 ft., from recorded range in stage); minimum daily, 2.4 cfs Sept. 15-20, 22.

Maximum stage known, 3.36 ft. Nov. 22, 1959, from floodmarks (discharge, 359 cfs, result of indirect measurement made 150 ft. upstream).

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
1960...							18.2	17.8	9.55	4.52	4.10*	2.97*	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...							14	12	6.0	3.8	3*	2.4	

* Estimated.

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.

Records available.—September 1946 to September 1960.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 1,900 ft. (from topographic map). Prior to Dec. 11, 1946, water-stage recorder at site 200 ft. upstream at datum 4.28 ft. higher (destroyed by high water of Dec. 11, 1946).

Average discharge.—14 years (1946-60), 53.0 cfs (38,370 acre-ft. per year).

Extremes.—1946-60: Maximum discharge, 2,380 cfs Nov. 23, 1959 (gage height, 8.14 ft.), from rating curve extended above 310 cfs on basis of slope-area measurement of peak flow; minimum, 4.2 cfs Nov. 21 to Dec. 1, 1952.

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
1954...	9.14	41.6	131	56.9	60.2	37.5	60.8	101	106	51.2	18.2	15.8	57.4
1955...	10.1	47.2	33.9	41.4	63.5	19.0	36.2	78.7	144	78.0	26.2	12.9	49.8
1956...	61.5	103	81.7	34.1	17.8	25.2	89.9	157	105	42.2	13.8	10.2	61.8
1957...	38.4	55.8	154	28.7*	22.3	39.5	90.5	95.5	33.0	15.3	9.81	6.52	48.6
1958...	7.29	21.1	60.0	59.1	73.6	33.9	66.9	62.4	22.9	12.3	7.55	7.72	36.0
1959...	41.0	150	129*	115*	40.0	48.5*	73.3	78.0	54.0	22.3	11.3	69.0	69.3
1960...	89.5	166	77.5*	24.0*	50.0	39.6*	78.2*	87.6	56.9	18.6	10.5	9.76	58.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	7.2	18.8	71	25	26	24	24	40	86	24	15.6	13.9	7.2
1955...	12.4	15.6	21	21	23	14.4	22	28	97	44	15.0	10.4	10.4
1956...	11.4	43	34	22	13.9	13.9	31	94	66	19.5	10.9	8.8	8.8
1957...	8.8	40	36	16*	16*	30	54	55	22	11.8	7.4	6.1	6.1
1958...	5.8	7.4	34	28	46	25	27	42	16.2	9.4	6.4	5.8	5.8
1959...	6.7	22	60*	60*	23	35*	37	61	28	14.7	8.6	9.0	6.7
1960...	48	40	35*	17*	18*	12*	51	54	31	12.3	8.9	8.6	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
1953								52.5	81.82	38,010
1954	534	Dec. 9, 1953	7.2	57.4	6.59	89.51	41,590	50.5	78.74	36,580
1955	422	Feb. 8, 1955	10.4	49.8	5.72	77.59	36,040	62.0	96.65	44,890
1956	478	Dec. 12, 1955	8.8	61.8	7.10	96.58	44,860	62.1	97.09	45,100
1957	617	Dec. 10, 1956	6.1	48.6	5.58	75.67	35,150	35.1	54.67	25,390
1958	230	April 20, 1958	5.8	36.0	4.13	56.10	26,060	55.3	86.11	40,010
1959	702	Nov. 12, 1958	6.7	69.3	7.96	107.96	50,100	70.3	109.63	50,940
1960	2,380	Nov. 23, 1959	8.6	58.8	6.75	91.93	42,700			

* Estimated.

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.

Records available.—September 1946 to November 1955.

Gage.—Water-stage recorder. Altitude of gage is 1,350 ft. (from topographic map).

Average discharge.—9 years (1946-55), 72.4 cfs (52,420 acre-ft. per year).

Extremes.—1946-55: Maximum discharge, 2,440 cfs Dec. 9, 1953 (gage height, 6.6 ft.), from rating curve extended above 570 cfs by logarithmic plotting; minimum, 7.2 cfs Oct. 19, 1946; minimum gage height, 1.12 ft. Sept. 23, 24, 1951.

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
1954...	30.2	80.3	223	94.2	104	56.5	97.1	80.9	103	46.3	25.7	34.1	81.1
1955...	25.2	62.2	73.0	82.0*	114	37.2	76.1	122	153	70.2	35.4	17.5	71.9
1956...	89.4	130	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	19.3	28	84	39	60	34	41	42	64	22	17.1	19.2	17.1
1955...	14.0	17.1	31	32*	34	21	44	48	98	31	17.5	13.7	13.7
1956...	17.5	54*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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
1953.....	.....	.....	.....	.....	.....	.....	.....	83.8	103.47	60,720
1954.....	2,440	Dec. 9, 1953	17.1	81.1	7.37	100.02	58,670	66.4	81.98	48,080
1955.....	1,280	Feb. 8, 1955	13.7	71.9	6.54	88.74	52,060	.....	.....	.....

* Estimated.

North Fork Green River near Eagle Gorge, Wash.

Location.—Lat. 47°18'40", long. 122°46'20", in SW¼NE¼ sec. 15, T. 21 N., R. 8 E., on right bank 2.4 miles upstream from mouth and 3 miles northwest of Eagle Gorge.

Drainage area.—16.5 sq. mi.

Records available.—September 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,320 ft. (from topographic map). Prior to June 25, 1959, at site 1,000 ft. upstream at different datum.

Extremes.—1956-60: Maximum discharge, about 2,000 cfs Nov. 23, 1959; minimum, 3.1 cfs Aug. 9, 10, 11, 12, 13, 1960; minimum gage height, 1.18 ft. Aug. 25, 26, 1959, present datum.

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
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14.5	.....
1957...	92.5	105	269	42.5	64.9	118	143	94.7	61.3	29.8	16.9	14.7	88.0
1958...	24.8	80.4	174	157	132	52.1	86.8	49.4	24.7	14.9	8.51	16.7	68.0
1959...	60.4	212	151	207	53.5	77.2	132	88.6	56.3	35.6	11.4	156	104
1960...	153	237	143	50.7	113	83.8	130	132	62.2	13.2	11.7	14.6	95.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.6	.....
1957...	15	51	47	22*	22	62	86	59	33	16	12.5	12.5	12.5
1958...	8.6	20	61	62	86	37	35	29	18	9.6	6.5	6.2	6.2
1959...	13	32	70	102	22	47	63	64	36	14	7.2	13	7.2
1960...	53	52	39	18	35	27	83	83	30	5.3	3.4	7.2	3.4

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
1957.....	1,100	Dec. 10, 1956	12.5	88.0	5.33	72.37	63,710	72.1	59.28	52,170
1958.....	645	Jan. 17, 1958	6.2	68.0	4.12	55.96	49,240	80.0	65.81	57,900
1959.....	1,350	April 1, 1959	7.2	104	6.30	85.22	74,970	113	92.72	81,580
1960.....	2,000*	Nov. 23, 1959	3.4	95.0	5.76	78.40	68,970	.....	.....	.....

* Estimated.

Bear Creek near Eagle Gorge, Wash.

Location.—Lat. 47°17'00", long. 121°48'10", in NW¼ 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.

Records available.—September 1946 to January 1956.

Gage.—Water-stage recorder. Altitude of gage is 1,000 ft. (from topographic map). Prior to Sept. 8, 1949, water-stage recorder at site 25 ft. upstream at same datum.

Average discharge.—9 years (1946-55), 25.7 cfs (18,610 acre-ft. per year).

Extremes.—1946-56: Maximum discharge, 1,010 cfs Dec. 11, 1955 (gage height, 4.46 ft.), from rating curve extended above 110 cfs on basis of slope-area determination at gage height, 4.00 ft.; minimum daily, 0.5 cfs Oct. 17, 18, 1946; minimum gage height, 0.41 ft. Sept. 16-24, 1951.

Peak of Nov. 22, 1959 reached a stage of 4.01 ft., from flood marks (discharge, 710 cfs from slope-area measurement of peak flow).

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
1954...	16.0	38.4	84.6*	35.9*	48.1*	23.3	43.1	18.7	31.6	12.0	6.01	9.32*	30.5
1955...	10.4	28.9	33.6	29.6	39.7	19.7	39.6	47.7	29.6	15.8	9.31	5.02	25.6
1956...	44.2	54.6*	69.9	32.0	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	6.5	10.2	31*	15*	23*	12.2	12.7	10.2	13.3	4.2	2.8	5.2*	2.8
1955...	4.0	5.8	13.3	10.2	10.5	7.6	19.6	25	12.5	5.3	3.8	3.1	3.1
1956...	6.8	15*	13.9	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
1953.....	.....	.....	.....	.....	.....	.....	.....	31.9	101.84	23,080
1954.....	.....	.....	2.8	30.5	7.18	97.27	22,040	24.9	79.42	18,000
1955.....	432	Feb. 7, 1955	3.1	25.6	6.02	81.85	18,540	33.7	107.59	24,380
1956.....	1,010	Dec. 11, 1955	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

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 miles 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.

Records available.—October 1931 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 912.6 ft. above mean sea level (river-profile survey). Prior to Nov. 18, 1931, staff gage at same site and datum.

Average discharge.—29 years (1931-60), 1,095 cfs (792,700 acre-ft. per year).

Extremes.—1931-60: Maximum discharge, 27,800 cfs Nov. 23, 1959 (gage height, 21.00 ft.); minimum, 81 cfs Sept. 4, 5, 1934; minimum gage height, 3.35 ft. Sept. 2, 3, 1945.

Flood in 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 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
1954...	287	992	3,363	1,447	1,644	1,017	1,690	1,919	1,850	759	298	282	1,294
1955...	341	938	855	1,099	1,695	689	1,362	2,037	2,479	1,096	404	246	1,097
1956...	1,346	2,276	2,341	1,067	629	1,133	2,590	2,898	1,678	603	216	179	1,407
1957...	796	1,179	3,285	675	753	1,288	1,876	1,522	532	284*	197	153	1,048
1958...	202	571	1,469	1,527	1,731	760	1,569	1,141	395	194	126	139	817
1959...	789	3,282	2,581	2,653	921	1,226	1,861	1,644	983	412	207	1,487	1,504
1960...	2,033	3,214	2,040	644	1,344	1,190	1,694	1,838	992	329	231	230	1,312

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	197	389	1,410	648	749	732	780	805	1,320	357	254	234	197
1955...	197	280	457	499	613	485	356	937	1,500	604	255	212	197
1956...	247	924	1,020	550	381	487	1,180	1,910	1,020	279	182	154	154
1957...	171	615	565	400*	450*	875	1,110	770	370	215*	163	141	141
1958...	134	212	700	650	1,090	555	635	655	267	143	111	108	108
1959...	140	395	1,310	1,170	415	820	815	1,110	507	243	171	213	140
1960...	788	853	736	395	572	460	1,180	1,140	554	228	178	178	178

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
1953								1,281	75.58	927,100
1954	17,600	Dec. 9, 1953	197	1,294	5.63	76.35	936,700	1,081	63.78	782,600
1955	14,100	Feb. 8, 1955	197	1,097	4.77	64.73	794,000	1,418	83.70	1,027,000
1956	18,300	Dec. 11, 1955	154	1,407	6.12	83.23	1,021,000	1,350	79.69	980,000
1957	14,500	Dec. 10, 1956	141	1,048	4.56	61.87	759,100	794	46.84	574,700
1958	5,700	April 20, 1958	108	817	3.55	48.21	592,400	1,184	69.88	857,200
1959	15,800	Nov. 12, 1958	140	1,504	6.54	88.78	1,089,000	1,558	91.97	1,128,000
1960	27,800	Nov. 23, 1959	178	1,312	5.70	77.67	952,600			

* Estimated.

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.

Records available.—July 1944 to November 1950, September 1952 to September 1960. Annual maximum discharge only, water years 1951-52.

Gage.—Water-stage recorder. Altitude of gage is 310 ft. (from topographic map). November 1950 to September 1952, stilling well with staff gage only.

Average discharge.—14 years (1944-50, 1952-60), 65.7 cfs (47,560 acre-ft. per year).

Extremes.—1944-60: Maximum discharge, 1,820 cfs probably Feb. 17, 1949 (gage height, 3.54 ft., from recorded range in stage), from rating curve extended above 600 cfs.

1944-50, 1952-60: Minimum discharge, 8.0 cfs Oct. 13, 14, 1952; minimum gage height, 0.62 ft. Aug. 26, 1958.

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

Revision.—The momentary maximum discharge for the water year 1946 published in State WSB No. 6 has been revised to 570 cfs Jan. 5, 1946.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	27.4	97.0	193	141	107	71.8	75.9	34.5	42.4	33.8*	24.8	30.2	73.0
1955...	27.5	57.8	70.8	72.0	90.9	71.2	109	62.6	40.1	36.6	25.1	19.5	56.6
1956...	58.9	141	225	172	78.6	131	70.9	40.0	40.7	26.7	21.5	20.4	85.9
1957...	33.5	45.6	128	63.8	106	140	78.1	45.3	33.8	26.1	22.5	19.6	61.6
1958...	19.4	26.8	66.7	117*	102	54.2	63.6	33.3	25.4	17.7	12.8	14.4	45.8
1959...	17.7	94.0	128	150	87.2	80.8	73.6	57.0	49.8	29.7	22.3	39.2	69.0
1960...	53.9	138	126	91.5	102	71.9	72.6	81.3	45.6	27.4	23.8	21.6	71.1

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	18	38	82	76	71	48	41	29	29	24	21	21	18
1955...	21	24	37	47	48	46	69	42	30	25	19.5	18	18
1956...	18	54*	101	76	59	74	47	33	32	22	20	19.5	18
1957...	19	32	32	37*	59	71	50	36	29	22	19.5	18.5	18.5
1958...	16	17.5	35	43	60*	43	37	28	22	13.5	11.5	13	11.5
1959...	12.5	18	81	80	70	62	46	39	37	23	21	22	12.5
1960...	31	44	74	58	58	53	54	52	36	22	18	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
1953								77.1	41.03	55,820
1954	1,260	Dec. 9, 1953	18	73.0	2.86	38.88	52,890	59.5	31.65	43,070
1955	860	Feb. 7, 1955	18	56.6	2.22	30.16	41,000	79.3	42.21	57,400
1956	1,320	Dec. 11, 1955	18	85.9	3.37	45.83	62,350	67.6	36.11	49,110
1957	554	Mar. 7, 1957	18.5	61.6	2.42	32.81	44,610	53.7	28.57	38,860
1958	596	①	11.5	45.8	1.80	24.38	33,150	56.4	30.03	40,830
1959	528	Jan. 24, 1959	12.5	69.0	2.71	36.72	49,940	75.5	40.17	54,640
1960	878	Nov. 21, 1959	18	71.1	2.79	37.96	51,630			

* Estimated.
① Probably Jan. 17, 1958.

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.

Records available.—January 1953 to October 1959.

Gage.—Water-stage recorder. Datum of gage is 526.5 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—6 years (1953-59), 26.5 cfs (19,190 acre-ft. per year).

Extremes.—1953-59: Maximum discharge, 210 cfs Dec. 12, 1955 (gage height, 4.04 ft.); no flow at times each year.

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
1954...	0.016	24.7	80.5	75.4	58.2	41.0	35.1	12.8	8.80	6.48	1.13	1.83	28.7
1955...	.18	10.9	23.9	38.9	45.0	30.0	50.9	33.2	15.3	11.1	2.76	.09*	21.7
1956...	10.4	54.3	118	95.0	41.7	60.1	39.9	15.6	10.5	2.48	0	0	37.5
1957...	.68	13.8	56.5	36.7	51.5	72.0	38.8	17.0	6.60	1.27	0	0	24.5
1958...	0	.26	14.5	52.0	60.5	32.1	30.4	18.9	5.10	.35	0	0	17.6
1959...	0	11.3	59.8	83.5	54.2	36.2	37.4	33.5	17.3	7.13	.76	6.80	28.9
1960...	15.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0.9	51	53	46	26	19.5	6.7	4.3	1.0	0.2	0	0
1955...	0	0	15.5	25	24	26	40	23	9.9	4.1	.7	0	0
1956...	0	21	80	57	36	42	22	86	4.6	0	0	0	0
1957...	0	8.8	10.5	23*	28	44	26	11	4.0	0	0	0	0
1958...	0	0	1.6	23	50	22	17	11	1.6	0	0	0	0
1959...	0	0	32	54	43	30	22	18.5	9.8	3.2	.1	.2	0
1960...	7.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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					
1954.....	149	Dec. 11, 1953	0	28.7	20,790	22.8	16,500
1955.....	104	Feb. 9, 1955	0	21.7	15,710	34.2	24,730
1956.....	210	Dec. 12, 1955	0	37.5	27,200	28.1	20,390
1957.....	114	Mar. 10, 1957	0	24.5	17,730	19.7	14,290
1958.....	112	Jan. 18, 1958	0	17.6	12,730	22.3	16,180
1958.....	158	Jan. 26, 1959	0	28.9	20,930	.....	.....
1960.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

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 basin since about 1935).

Records available.—August 1944 to February 1951, August 1951 to April 1956.

Gage.—Staff gage. Altitude of gage is 170 ft. (from topographic map). Aug. 26, 1944, to Feb. 10, 1951, water-stage recorder at site 700 ft. upstream at different datum (gage destroyed by flood of Feb. 1951). Aug. 1, 1951, to Dec. 22, 1955, water-stage recorder at same site and datum.

Average discharge.—10 years (1944-50, 1951-55), 117 cfs (34,700 acre-ft. per year).

Extremes.—1944-56: Maximum discharge observed, 1,570 cfs Feb. 10, 1951 (gage height, 5.57 ft.); minimum, 20 cfs July 23, 24, Sept. 19 to Oct. 12, 1952.

Remarks.—Several small diversions for farm use above station. City of Seattle diverts between 2 and 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	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	42.5	108	296	340	241	157	132	71.7	57.1	47.8	35.2	37.8	130
1955...	39.3	70.6	114	162	196	132	194	122	68.1	50.9	35.9	34.8	101
1956...	60.7	206	423	435	157	247	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	32	60	192	210	178	106	92	59	45	35	32	32	32
1955...	32	31	81	127	120	114	143	96	54	38	31	31	31
1956...	34	88	268	207	122	147	.....	.....	.....	.....	.....	.....	.....

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
1953	.....	.....	.....	.....	.....	.....	.....	115	31.47	82,920
1954	764	Jan. 6, 1954	32	130	2.63	35.74	94,160	111	30.58	80,550
1955	545	Feb. 8, 1955	31	101	2.04	27.75	73,090	140	38.53	101,500
1956	932†	Jan. 7, 1956	.....	.....	.....	.....	.....	.....	.....	.....

† Maximum observed.

Green River near Auburn, Wash.

Location.—Lat. 47°18'45", long. 122°12'10", in lot 3, 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 the vicinity of Youngs Lake, flow from which has been diverted to Cedar River basin since about 1935).

Records available.—August 1936 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Oct. 19, 1936, staff gage at same site and datum.

Average discharge.—24 years (1936-60), 1,334 cfs (965,800 acre-ft. per year).

Extremes.—1936-60: Maximum discharge, 28,100 cfs Nov. 23, 1959 (elevation, 69.75 ft.); minimum, 81 cfs Sept. 23, 1952; minimum elevation, 53.85 ft. Aug. 26, 1958.

Remarks.—City of Tacoma diverts about 110 cfs from river near Palmer, several miles above station, for municipal use. Minor diversions for domestic use. 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
1954...	355	1,261	4,184	2,343	2,300	1,451	2,002	1,987	1,962	917	379	356	1,622
1955...	400	1,085	1,118	1,563	2,272	1,020	1,880	2,308	2,750*	1,274*	500	272	1,363
1956...	1,447	2,845	3,491	2,075	1,032	1,655	2,905	3,042	1,748	680	251	186	1,782
1957...	825	1,302	3,586	872	1,127	1,971	2,239	1,696	655	346	220	148	1,252
1958...	217	654	1,692	2,098	2,352	1,103	1,841	1,303	466	217	139	104	1,015
1959...	791	3,470	3,017	3,392	1,577	1,650	2,133	1,865	1,176	558	262	1,528	1,783
1960...	2,125	3,679	2,806	1,158	1,950	1,541	2,043	2,154	1,227	446	289	273	1,638

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	255	554	2,220	1,340	1,470	1,030	1,060	1,060	1,430	472	316	264	255
1955...	225	340	680	822	973	750	1,250	1,300	1,700*	726	305	210	210
1956...	255	1,350	1,830	1,200	886	942	1,730	2,100	1,090	350	194	146	146
1957...	163	739	690	535	607	1,340	1,400	895	490	246	165	132	132
1958...	134	238	849	918	1,610	800	828	779	312	153	123	131	123
1959...	145	410	1,730	1,820	1,020	1,240	1,120	1,260	694	329	216	259	145
1960...	912	984	1,370	761	996	856	1,500	1,440	754	285	221	189	189

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					
1953	.....	.....	.....	.....	.....	1,566	1,134,000
1954	18,300	Dec. 10, 1953	255	1,622	1,174,000	1,351	977,800
1955	15,500	Feb. 8, 1955	210	1,363	986,700	1,798	1,302,000
1956	20,300	Dec. 12, 1955	146	1,782	1,294,000	1,611	1,170,000
1957	13,900	Dec. 10, 1956	132	1,252	906,200	986	713,800
1958	5,780	April 20, 1958	123	1,015	734,700	1,407	1,019,000
1959	15,900	Nov. 13, 1958	145	1,783	1,291,000	1,896	1,373,000
1960	28,100	Nov. 23, 1959	189	1,638	1,189,000	.....	.....

* Estimated.

North Fork Cedar River near Lester, Wash.

Location.—Lat. 47°19'10", long. 121°30'05", in SW¼ sec. 11, T. 21 N., R. 10 E., on left bank 400 ft. upstream from falls, 1½ miles upstream from confluence with South Fork, and 7½ miles north of Lester.

Drainage area.—8.81 sq. mi.

Records available.—October 1944 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,360 ft. (from topographic map). Oct. 12, 1944, to Nov. 30, 1951, at site 420 ft. downstream at different datum. Dec. 1, 1951, to Sept. 23, 1953, at site 450 ft. downstream at different datum. Sept. 24, 1953, to Nov. 22, 1959, at site 520 ft. downstream at different datum (gage destroyed by flood of Nov. 22, 1959).

Average discharge.—16 years (1944-60), 72.2 cfs (52,270 acre-ft. per year).

Extremes.—1944-60: Maximum discharge, 3,160 cfs Nov. 22, 1959 (gage height, about 8.4 ft., from floodmarks site and datum then in use), result of slope-area measurement of peak flow; maximum gage height, 8.9 ft., datum then in use, probably Jan. 31, 1953 (from high-water mark, backwater from logjam); minimum daily discharge, 5.4 cfs Nov. 27-30, 1952.

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
1954...	21.7	65.4	132	43.9	45.1	32.1	58.1	155	191	146	40.0	26.2	80.0
1955...	27.7	70.6	30.0	34.9	50.7	16.4	31.3	97.4	266	175	45.8	15.6	71.6
1956...	95.6	113	85.9	21.9	14.5	17.7	91.6	222	189	119	21.3	13.6	83.8
1957...	58.3	68.2	179	25.2	21.1	35.6	93.3	179*	90.4	22.0	11.9	8.31	66.4
1958...	12.6	33.6	69.1	51.4	71.7	37.4	87.5	165	61.2	18.7	9.37	18.4	52.8
1959...	62.7	154	134	101	36.4	47.2	107	124	147	50.9	14.9	97.6	89.8
1960...	90.7	185*	113*	24.8*	48.3	53.0*	96.2*	169*	141	27.3	13.7	15.6	81.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	11.5	31	49	22	24	22	22	36	142	67	31	19.1	11.5
1955...	13.8	19.4	17.2	17.9	21	12.9	17.6	23	109	101	18.6	11.8	11.8
1956...	16.2	34	24	15	12.6	11.4	21	86	122	36	14.1	11.2	11.2
1957...	12.0	31	29	14.8	12.5	25	54	130*	37	14.0	9.5	7.2	7.2
1958...	7.4	14.5	41	25	37	23	36	89	32	11.5	8.2	7.4	7.4
1959...	12.8	30	46	51	20	33	44	74	77	18.4	11.5	14	11.5
1960...	35	35*	30*	13*	18*	16*	40*	55*	68	14.3	11.2	11.8	11.2

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
1953								76.4	117.68	55,290
1954	858	Dec. 9, 1953	11.5	80.0	9.08	123.21	57,890	72.3	111.35	52,330
1955	754	June 9, 1955	11.8	71.6	8.13	110.34	51,860	85.5	131.73	61,910
1956	1,280	Dec. 11, 1955	11.2	83.8	9.51	129.55	60,870	85.0	131.38	61,730
1957	2,320	Dec. 9, 1956	7.2	66.4	7.54	102.32	48,080	50.3	77.55	36,450
1958	402	April 20, 1958	7.4	52.8	5.99	81.39	38,260	72.6	111.63	52,470
1959	962	Nov. 6, 1958	11.5	89.8	10.2	138.43	65,030	93.5	144.03	67,660
1960	3,160	Nov. 22, 1959	11.2	81.7	9.27	126.30	59,340			

* Estimated.

South Fork Cedar River near Lester, Wash.

Location.—Lat. 47°18'30", long. 121°31'00", in SW¼NE¼ sec. 15, T. 21 N., R. 10 E., on left bank about 0.6 mile upstream from confluence with North Fork and 7 miles northwest of Lester.

Drainage area.—6.00 sq. mi.

Records available.—October 1944 to September 1960.

Gage.—Water-stage recorder. Concrete control Aug. 31, 1951, to Dec. 9, 1956 and Oct. 8, 1957 to date. Altitude of gage is 2,300 ft. (from topographic map).

Average discharge.—16 years (1944-60), 40.7 cfs (29,470 acre-ft. per year).

Extremes.—1944-60: Maximum discharge, 2,340 cfs Dec. 9, 1956 (gage height, 10.41 ft. from floodmarks), from rating curve extended above 300 cfs on basis of slope-area measurement of peak flow; minimum, 1.9 cfs Nov. 27, 28, 1952; minimum gage height, 1.25 ft. Oct. 17-19, 1946.

Remarks.—No regulation or diversion above station.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water years 1950, 1951 and 1953, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
Water year 1949-50					511	Nov. 27, 1949
Water year 1950-51					556	Feb. 9, 1951
January 1953	92.8					
February	55.5					
Water year 1952-53	32.3	5.38	72.97	23,360	520	Jan. 31, 1953

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	10.0*	37.8	93.1	31.5	32.6	21.3	33.8	95.8	111	51.4	13.0	10.3	45.6
1955	15.8	39.8	18.6	22.3	43.8	9.29	18.7	59.2	145	78.7	20.8	7.38	39.8
1956	53.3	65.0	50.1	13.0	7.65	9.55	56.3	136	105	48.1	7.95	5.24	46.5
1957	37.3	45.7	125*	14.2*	13.0*	21.6*	70.4	87.5*	29.4	8.72	4.27	3.02	38.6
1958	3.98	18.6	45.8*	35.1*	52.8	23.5	64.1	74.6	20.9	7.58	3.71	5.46	29.5
1959	36.6	81.9	65.7	65.6*	21.1	28.2	61.1	68.2	50.9	15.6	5.57	46.7	45.6
1960	56.3	108*	56.1*	12.9*	27.6*	30.7*	56.3*	88.6	49.5	8.57*	5.98	7.25	42.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	4.8	17.8	35	13.8	13.8	12.8	12.8	24	92	21	9.6	8.2	4.8
1955	7.0	9.7	10.1	10.4	12.0	7.6	8.5	14.8	69	38	9.3	5.3	5.3
1956	7.6	19.7	15.3	9	6.7	5.8	12.9	53	65	16.0	4.8	4.5	4.5
1957	5.5	24	22*	9*	8.5*	15*	32*	51	14.8	5.3	3.4	2.8	2.8
1958	2.4	5.7	25*	10*	25	12.5	25	42	12.5	4.6	2.8	2.6	2.4
1959	5.7	13	31	35*	11	19.3	28	44	23	7.1	4.5	6.0	4.5
1960	22	21*	17*	6.4*	11*	9.2*	32*	48*	19.7	5.2*	4.1	5.5	4.1

* Estimated.

South Fork Cedar River near Lester, 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
1953								43.3	97.91	31,330
1954	596	Dec. 9, 1953	4.8	45.6	7.60	103.21	33,020	39.9	90.40	28,920
1955	497	Feb. 8, 1955	5.3	39.8	6.63	90.10	28,820	47.7	108.03	34,570
1956	511	Dec. 11, 1955	4.5	46.5	7.75	105.50	33,770	49.9	113.25	36,260
1957	2,340	Dec. 9, 1956	2.8	38.6	6.43	87.29	27,950	26.8	60.61	19,390
1958	284	April 20, 1958	2.4	29.5	4.92	66.78	21,370	39.2	88.63	28,370
1959	542	Nov. 12, 1958	4.5	45.6	7.60	103.25	33,030	48.7	110.10	35,220
1960	1,940	Nov. 22, 1959	4.1	42.3	7.05	95.95	30,700			

Cedar River below Bear Creek, near Cedar Falls, Wash.

Location (revised).—Lat. 47°20'30", long. 121°32'50", in SE¼SE¼ sec. 32, T. 22 N., R. 10 E., on right bank 500 ft. downstream from Bear Creek and 12½ miles southeast of Cedar Falls.

Drainage area.—25.4 sq. mi.

Records available.—October 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,880 ft. (from topographic map). Prior to Sept. 16, 1960, at site 25 ft. upstream at datum 2.35 ft. higher.

Average discharge.—15 years (1945-60), 183 cfs (132,500 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 7,620 cfs Nov. 22, 1959 (gage height, 6.98 ft., site and datum then in use), from rating curve extended above 890 cfs on basis of slope-area measurement of peak flow; maximum gage height, 7.08 ft. Dec. 9, 1956, site and datum then in use; minimum discharge, 12.5 cfs Nov. 27, 1952.

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
1954	49.0	167	387	134	149	94.9	168	404	456	265	73.5	52.9	202
1955	67.4*	180	92.1	101	169*	49.4*	102	293	594	352	92.0	36.0	177
1956	234	280	231	81.5	43.9	70.9	313	599	458	220	42.2	27.5	217
1957	150	180	448	71.8*	64.4*	102	296	393	157	47.7	27.7	18.9	164
1958	26.0	80.9	190	157	224	98.1	237	308	101	39.8	21.9	35.2	126
1959	152	443	384	339	108	144	274	294	294	106	33.9	231	234
1960	262	466	267*	60.3*	132*	160*	288*	332	253	51.5*	32.8*	33.6*	194

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	29	74	152	57	60	65	63	109	378	113	57	44	29
1955	36	49	51	52	57*	40*	62	86	315	184	43	28	28
1956	35	88	75	45*	36	35	100	300	277	69	29	22	22
1957	27	98	93	44*	44*	71	173	258	72	33	21	17	17
1958	16	33	105	69	133	63	95	198	58	27	18	16	16
1959	29	67	193	190	61	98	114	198	159	43	26	32	26
1960	103	93	70*	38*	59*	50*	150*	190*	110*	29*	28*	25	25

* Estimated.

Cedar River below Bear Creek, near Cedar 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
1953								198	105.67	143,200
1954	1,770	Dec. 9, 1953	29	202	7.95	107.88	146,100	179	95.93	129,900
1955	1,530	Feb. 8, 1955	28	177	6.97	94.49	128,000	211	112.76	152,800
1956	2,200	Dec. 12, 1955	22	217	8.54	116.42	157,700	220	118.05	159,900
1957	3,260	Dec. 9, 1956	17	164	6.46	87.55	118,600	123	65.85	89,200
1958	938	April 20, 1958	16	126	4.96	67.30	91,180	183	97.72	132,400
1959	2,140	Nov. 12, 1958	26	234	9.21	124.90	169,200	235	125.63	170,200
1960	7,620	Nov. 22, 1959	25	194	7.64	104.25	141,200			

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 left bank (revised) 2 miles upstream from Chester Morse Lake (formerly Cedar Lake) and 8 miles southeast of Cedar Falls.

Drainage area.—41.8 sq. mi.

Records available.—October 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,560 ft. (from topographic map). Prior to Oct. 26, 1957, at site 80 ft. downstream at same datum.

Average discharge.—15 years (1945-60), 284 cfs (205,600 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 9,490 cfs Nov. 22, 1959 (gage height, 11.34 ft., from high-water mark in well), from rating curve extended above 4,300 cfs on basis of slope-area measurements at gage heights 10.16 and 11.34 ft.; maximum gage height, 11.4 ft. Feb. 11, 1951 (backwater from Chester Morse Lake, formerly Cedar Lake); minimum discharge, 20 cfs Nov. 30 to Dec. 1, 1952; minimum gage height recorded, 1.84 ft. Sept. 30, 1957.

Remarks.—No regulation or diversion above station.

Revisions.—The figures of maximum discharge for some water years, superseding figures published in State WSB No. 6, are given herewith:

WATER YEAR	Date	Discharge (cfs)
1946	Dec. 28, 1945	2,600
1947	Dec. 11, 1946	4,930
1948	Nov. 7, 1947	2,150
1950	Nov. 27, 1949	2,990
1951	Feb. 9, 1951	3,620
1953	Jan. 31, 1953	3,860

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	85.9	273	649	247	310	178	317	532	597	327	101	87.2	309
1955	113	293	172	198	316	99.1	214	450	768	472	143	58.6	274
1956	366	486	499	163	88.9	162	470	834	639	295	66.8	44.6	344
1957	238	287	745*	119	123	218	449	556	222	74.7	43.9	29.2	260
1958	40.5*	139	336	303	378	159	390*	420	133	56.4	32.9	51.7	202
1959	234	759	620	532*	189	268	486	450	380	140	51.1	365	373
1960	391	688*	412	101	232	233	401	471	341	73.3	46.7	51.1	286

* Estimated.

Cedar River near Cedar Falls, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	49	125	255	106	118	122	123	178	484	146	78	66	49
1955...	61	80	94	96	110	72	141	157	457	265	65	47	47
1956...	59	171	157	81	74	75	177	448	400	110	45	35	35
1957...	43	162	151	72	72	154	263	350	115	51	34	26	26
1958...	25*	49	183	127	226	97	150*	259	73	39	28	27	25*
1959...	42	104	329	278	105*	180	180*	326	200	61	44	49	42
1960...	162	140*	113	60	94	68	218	262	159	42	40	42	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
1953								309	100.44	223,900
1954	4,710	Dec. 9, 1953	49	309	7.39	100.22	223,400	272	88.35	197,000
1955	3,620	Feb. 8, 1955	47	274	6.56	88.87	198,200	339	110.03	245,300
1956	5,590	Dec. 11, 1955	35	344	8.23	111.86	249,400	337	109.79	244,800
1957	6,090	Dec. 10, 1956	26	260	6.22	84.43	188,200	196	63.76	142,100
1958	1,810	April 20, 1958	25	202	4.83	65.65	146,300	294	95.36	212,600
1959	5,040	Nov. 12, 1958	42	373	8.92	121.12	270,000	363	117.85	262,700
1960	9,490	Nov. 22, 1959	40	286	6.84	93.20	207,800			

* 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 Chester Morse Lake (formerly Cedar Lake) and 7 miles southeast of Cedar Falls.

Drainage area.—13.0 sq. mi.

Records available.—October 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,600 ft. (from topographic map).

Average discharge.—15 years (1945-60), 106 cfs (76,740 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 4,200 cfs Nov. 22, 1959 (gage height, 8.20 ft.), from rating curve extended above 1,600 cfs on basis of contracted-opening measurement at gage height 7.19 ft. and slope-area measurement of peak flow; minimum, 4.3 cfs Nov. 29, 1952 (gage height, 2.43 ft.).

Remarks.—No regulation or diversion above station.

Revisions.—Revised figures of discharge, in cubic feet per second, for the water years 1946, 1951, and 1953 superseding figures published in State WSB No. 6 are given herewith:

MONTH	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
Water year 1945-46					1,580	Feb. 26, 1945
February 1951	210					
Water year 1950-51	108	8.31	112.67	78,130	1,660	Feb. 11, 1951
Calendar year 1951	88.8		92.70	64,280		
Water year 1952-53					1,640	Jan. 23, 1953

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
1954...	50.2	123	261	91.4	145	60.0	128	181	218	90.5	28.5	38.6	118
1955...	38.0	115	72.4	70.1	128	28.7	70.8	167	269	174	49.5	20.5	99.8
1956...	155	184	193	63.2	31.7*	56.3	168	256	205	91.0	14.7	13.8	120
1957...	120	125	321	32.6*	47.9*	104	166	171	72.8	26.2	17.8	10.4	102
1958...	27.2	74.0	141	136	148	56.2	152	95.8	28.7	12.3	7.37	23.7	74.6
1959...	101	316	233	208	65.6	104	178	151	107	38.2	14.7	189	142
1960...	159	261	158	45.1	98.2	89.1	150	190	116	19.7	19.4	26.6	111

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	25	42	85	31	42	37	36	51	148	31	17.6	24	17.6
1955...	19	24	36	29	32	20	40	49	153	87	19.5	14	14
1956...	24	64	55	33	21	20	54	143	119	24	9.8	7.9	7.9
1957...	14.7	56	50	21*	.....	59	92	99	40	16.5	12.5	7.6	7.6
1958...	7.6	24	64	53	79	33	50	50	15.3	7.9	5.9	6.1	5.9
1959...	15.5	38	90	70	30	60	57	101	42	14.7	9.7	20	9.7
1960...	52	42	33	16*	29*	23*	85	101	47	11	8.2	15	8.2

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
1953.....	.....	.....	.....	.....	.....	.....	.....	120	125.16	86,770
1954.....	1,870	Dec. 9, 1953	17.6	118	9.06	122.78	85,120	99.9	104.28	72,300
1955.....	1,570	Feb. 8, 1955	14	99.8	7.68	104.17	72,210	126	131.14	90,910
1956.....	2,160	Dec. 11, 1955	7.9	120	9.23	125.11	86,760	123	128.26	88,940
1957.....	2,550	Dec. 9, 1956	7.6	102	7.85	106.18	73,610	74.4	77.66	53,830
1958.....	1,070	April 19, 1958	5.9	74.6	5.74	77.85	53,980	109	113.30	78,580
1959.....	2,160	Nov. 12, 1958	9.7	142	10.9	148.37	102,900	136	142.20	98,590
1960.....	4,200	Nov. 22, 1959	8.2	111	8.54	115.96	80,410	.....	.....	.....

* 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 Chester Morse Lake (formerly Cedar Lake).

Drainage area.—84.2 sq. mi.

Records available.—April 1914 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 910 ft. (from river-profile map).

Average discharge.—46 years (1914-60), 309 cfs (223,700 acre-ft. per year).

Extremes.—1914-60: 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, 0.5 cfs Oct. 6, 1958.

Remarks.—All artificially diverted water returned to river above station. Some regulation by Chester Morse Lake (formerly Cedar Lake) for power.

Correction.—In State WSB No. 6 the monthly mean for October 1928 is listed in error. It should be 168 cfs.

Cedar River at 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
1954...	205	344	677	481	270	378	299	419	667	423	424	192	400
1955...	204	111	204	181	395	298	364	471	610	515	243	146	311
1956...	352	494	692	470	359*	317	433	753	777	255	115	287	442
1957...	.47	407	842	421	191	438	512	540	271	71.0	45.9	28.3	336
1958...	47.5	88.2	453	495	522	228	280	421	88.0	47.2	60.3	40.5	230
1959...	49.4	960	817	865	483	388	462	560	400	68.4	107	324	456
1960...	547	1,031	831	334	419	276	604	458	439	191	83.8	102	442

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	67	128	410	107	95	103	80	107	355	101	101	73	67
1955...	25	24	45	101	101	69	63	63	192	105	65*	36	24
1956...	236	101	118	75	59	66	176	87	221	90	52	166	52
1957...	35	69	66	70*	62	62	305	158	72	37	28	25	25
1958...	24	26	224	115	178	40	41	97	54	30	52	1.4	1.4
1959...	.5	65	290	82	67	50	74	162	99	28	16.5	16.5	.5
1960...	228	475	315	27	47	44	500	294	360	25	28	20	20

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					
1953						367	265,700
1954	1,370	June 7, 1954	67	400	289,300	340	246,200
1955	1,240	July 1, 1955	24	311	225,300	397	287,200
1956	1,760	May 20, 1956	52	442	320,800	439	318,400
1957	2,140	Dec. 18, 1956	25	336	243,300	260	188,100
1958	958	Apr. 21, 22, 1958	1.4	230	166,200	332	240,600
1959	1,980	Jan. 26, 1959	.5	456	330,000	505	365,700
1960	3,560	Nov. 24, 1959	20	442	320,900		

* Estimated.

Middle Fork Taylor Creek near Selleck, Wash.

Location.—Lat. 47°21'15", long. 121°47'30", in NW¼ sec. 33, T. 22 N., R. 8 E., on left bank 0.7 mile upstream from mouth and 4 miles southeast of Selleck.

Drainage area.—4.85 sq. mi.

Records available.—August 1956 to September 1960.

Gage.—Water-stage recorder; concrete control since Aug. 15, 1958. Altitude of gage is 1,440 ft. (from topographic map).

Extremes.—1956-60: Maximum discharge, 823 cfs Dec. 15, 1959 (gage height, 4.08 ft.); minimum, 4.7 cfs Sept. 7-9, 1958.

Remarks.—No regulation or diversion above station.

Middle Fork Taylor Creek near Selleck, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.08	8.87	.....
1957...	27.9	39.2	91.5	19.8	28.7	51.4	56.8	38.3	25.1	14.4	9.01	6.76	34.1
1958...	9.98	19.7	43.9	62.9	50.1	22.0	39.4	16.8	9.66	6.79	5.51	7.05	24.3
1959...	21.6	90.2	78.9	84.0	39.2*	49.8	67.7	46.3	30.2	21.0	10.5	61.0	50.0
1960...	49.5	87.6	74.3	30.5	51.5	35.3	53.6	54.0	27.6	12.1	11.2	11.6	41.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.0	7.4	.....
1957...	6.5	22	22	11*	10.5	31	36	22	16.5	9.6	7.1	5.6	5.6
1958...	5.6	9.2	20	27	35	17	16	10.5	7.7	5.9	5.0	4.7	4.7
1959...	5.0	13*	40	45	22	33	30	33	20	12	8.7	9.6	5.0
1960...	22	21	26	14	22	17.5	40	39	18	9.2	7.6	7.6	7.6

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
1957.....	460	Dec. 9, 1956	5.6	34.1	7.03	95.55	24,720	27.0	75.49	19,540
1958.....	231	April 19, 1958	4.7	24.3	5.01	68.14	17,640	34.1	95.44	24,690
1959.....	452	April 1, 1959	5.0	50.0	10.3	139.93	36,200	51.7	144.83	37,460
1960.....	823	Dec. 15, 1959	7.6	41.5	8.56	116.35	30,090	.....	.....	.....

North Fork Taylor Creek near Selleck, Wash.

Location.—Lat. 47°22'20", long. 121°48'20", in NE¼ sec. 29, T. 22 N., R. 8 E., on left bank at upstream side of bridge, 1 mile upstream from mouth, and 3 miles east of Selleck.

Drainage area.—3.16 sq. mi.

Records available.—June 1956 to September 1960.

Gage.—Water-stage recorder and log control. Altitude of gage is 1,500 ft. (from topographic map).

Extremes.—1956-60: Maximum discharge, 522 cfs Dec. 15, 1959 (gage height, 4.17 ft.); minimum, 0.8 cfs Aug. 21, 1958; minimum gage height, 0.57 ft. July 28, 1958.

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
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.13	2.93	3.15*	.....
1957...	20.9	26.6	58.0	12.3	30.4	36.0	28.9	17.1	14.6	6.94	3.88	1.97	21.4
1958...	5.61	14.8	32.4	38.0	29.3	10.1	24.8	8.20	3.91	2.05	1.14	1.82	14.2
1959...	9.75	52.1*	47.1	55.2	25.0	30.2	38.8	24.5	16.8	11.5	3.57	39.7	29.5
1960...	28.0	48.8	43.6	19.7	31.2	26.7	32.2	32.1	14.4	4.58	4.57	5.31	24.2

* Estimated.

North Fork Taylor Creek near Selleck, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.4	2.0	1.8*	.....
1957...	4.4	15	13.5	6*	6.5*	17.5	15.5	9.3	6.4	4.4	2.6	1.4	1.4
1958...	1.5	4.5	10.5	13.5	16.5	7.6	6.5	4.1	2.6	1.0	.9	.9	.9
1959...	1.4	7.5*	20*	22	12.5	20	13.5	13.5	8.9	3.6	2.2	4.7	1.4
1960...	11.5	11.5	13.5	8.3	13	12	24	18.5	7.0	3.4	2.6	3.2	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
1956.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1957.....	185	Dec. 10, 1956	1.4	21.4	6.77	91.98	15,510	17.0	72.91	12,290
1958.....	108	Jan. 17, 1958	.9	14.2	4.49	61.21	10,310	18.9	81.25	13,690
1959.....	243	Jan. 24, 1959	1.4	29.5	9.34	126.57	21,340	30.5	130.81	22,040
1960.....	522	Dec. 15, 1959	2.6	24.2	7.66	104.32	17,580	.....	.....	.....

Taylor Creek near Selleck, Wash.

Location.—Lat. 47°23'10", long. 121°50'45", in NW¼NW¼ sec. 19, T. 22 N., R. 8 E., on left bank half a mile upstream from mouth and 1¼ miles (revised) northeast of Selleck.

Drainage area.—16.4 sq. mi. (revised).

Records available.—June to October 1945. August 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map). June to October 1945 on right bank 350 ft. downstream at different datum.

Extremes.—1945, 1956-60: Maximum discharge, 2,170 cfs Dec. 15, 1959 (gage height, 5.20 ft.); minimum, 16 cfs Oct. 2-7, 1958.

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
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30.0*	25.4	.....
1957...	91.7	120	207	85.4	103	149	139	102	73.7	44.6	32.0	22.8	97.5
1958...	29.1	54.1	119	152	155	83.6	109	61.5	38.6	25.6	19.7	20.0	71.8
1959...	41.7	201	204	239	145	138	158	127	91.6	65.9	37.0	128	131
1960...	132	229	221	115	157	117	151	144	87.4	44.0	36.4	34.3	122

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26	21	.....
1957...	20	78	76	53	58	109	105	69	56	36	26	20	20
1958...	19.5	25	57	84	120	65	58	47	32	23	16.5	17	16.5
1959...	16	30	128	150	103	113	100	93	72	42	32	34	16
1960...	86	93	124	67	86	71	124	112	63	35	30	25	25

* Estimated.

Taylor Creek at Selleck, 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
1957	1,090	Dec. 9, 1956	20	97.5	5.95	80.71	70,610	79.3	65.67	57,450
1958	425	Jan. 17, 1958	16.5	71.8	4.38	59.45	52,000	92.2	76.30	66,740
1959	1,240	Nov. 12, 1958	16	131	7.99	108.58	94,980	143	117.98	103,200
1960	2,170	Dec. 15, 1959	25	122	7.44	101.30	88,590	.....	.....	.....

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 Landsburg and intake of Seattle water-supply system, 4¾ miles east of Maple Valley, 5 miles downstream from Taylor Creek, and 12 miles downstream from Chester Morse Lake (formerly Cedar Lake).

Drainage area.—125 sq. mi., excludes that of Rock Creek. At sites 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.

Records available.—July 1895 to September 1960 (prior to October 1948, flow of Rock Creek included). Published as "near Seattle" 1895-98, "near Maple Valley" 1902, and as "near Ravensdale" 1898-1901, 1903-12.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. (from river-profile map). Prior to Oct. 1, 1898, staff gage at site 2¼ miles downstream at different datum. Mar. 24, 1901, to May 15, 1913, staff gage at site 2 miles downstream at datum 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 at different datum.

Average discharge.—65 years (1895-1960), 694 cfs (502,400 acre-ft. per year), unadjusted.

Extremes.—1895-98, 1901-60: 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), from computation of peak flow over dam, peak caused by failure of flashboards at Chester Morse Lake (formerly Cedar Lake); minimum observed, 83 cfs Sept. 19, 1898.

Remarks.—All diversions except Rock Creek returned to river above station. Rock Creek which entered naturally just above station prior to 1932, has been diverted to enter river at a point about 2 miles downstream from Seattle municipal water-supply intake. Some regulation by Chester Morse Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	438	688	1,252	1,049	868	870	761	795	1,079	778	735	477	816
1955	426	372	487	539	882	686	873	928	1,052	886	555	434	675
1956	743	1,064	1,431	1,074	779	787	916	1,123	1,126	551	379	512	874
1957	568	767	1,468	837	638	962	968	899	604	345	288	231	716
1958	228	301	746	907	1,010	623	660	755	379	309	285	240	535
1959	241	1,445	1,442	1,598	1,013	875	972	1,015	790	398	383	716	906
1960	1,015	1,672	1,467	784	907	690	1,034	886	779	479	355	328	865

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
1954...	344	387	873	610	623	548	521	475	754	427	409	398	344
1955...	232	225	290	446	515	432	505	500	620*	436	382	317	225
1956...	526	702	832	595	451	516	700	483	610	370*	316	300*	300*
1957...	277	472	366	428	405	548	714	498	383	292	250	207	207
1958...	190	194	436	430	695	379	349	419	345	300	280	197	190
1959...	189	231	874	703	535	640	530	602	457	341	290	329	189
1960...	672	912	860	421	449	412	888	715	676	325	301	198	198

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					
1953						759	549,700
1954	2,770	Dec. 9, 1953	344	816	590,800	724	524,200
1955	2,720	Feb. 8, 1955	225	675	488,600	839	607,300
1956	3,280	Dec. 11, 1955	300	874	634,400	838	608,300
1957	3,240	Dec. 18, 1956	207	716	518,400	588	425,400
1958	1,570	Jan. 17, 1958	190	535	387,000	689	496,600
1959	3,460	Jan. 24, 1959	189	906	655,600	992	718,300
1960	4,840	Nov. 24, 1959	198	865	628,000		

Rock Creek near Ravensdale, Wash.

Location.—Lat. 47°21'45", long. 121°59'45", in E½SE¼ sec. 26, T. 22 N., R. 6 E., on right bank half a mile upstream from State Highway 5A and 1 mile northwest of Ravensdale.

Records available.—August 1956 to October 1958.

Gage.—Water-stage recorder. Altitude of gage is 580 ft. (from topographic map).

Extremes.—1956-58: Maximum discharge, 46 cfs Mar. 11-13, 1957 (gage height, 2.34 ft.); minimum, 0.1 cfs Sept. 18, 20, 22-25, Sept. 29 to Oct. 3, Oct. 8-16, 1958; minimum gage height, 0.37 ft. Sept. 24, 1958.

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
1956...												0.93	
1957...	1.01	3.63	16.6*	16.5	17.9	35.6	21.4	8.85	4.18	2.37	1.50	0.88	10.8
1958...	0.53	0.67	2.34	13.6	26.2	17.1	9.07	7.68	3.65	1.83	0.72*	0.26	6.85

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...												0.8	
1957...	0.7	2.2	4*	12.5	11.5	28	13.5	5.8	3.1	1.8	1.2	.6	0.6
1958...	.5	.5	.9	6.5	21	10	6.5	5.1	2.6	1.3	.4*	.1	.1

* Estimated.

Rock Creek near Ravensdale, 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					
1957	46	Mar. 11-13, 1957	0.6	10.8	7,860	9.35	6,770
1958	30	①	.1	6.85	4,960	.....	.....

Rock Creek at State Highway 5A, near Ravensdale, Wash.

Location.—Lat. 47°21'45", long. 122°00'35", in NE¼SW¼ sec. 26, T. 22 N., R. 6 E., on left bank near upstream ends of culverts on State Highway 5A, 1½ miles northeast of Ravensdale.

Records available.—June 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 530 ft. (from topographic map).

Extremes.—1956-60: Maximum discharge, 114 cfs Dec. 16, 1959 (gage height, 2.89 ft.); minimum, 2.7 cfs Sept. 13-15, 1958; minimum gage height, 1.07 ft. Oct. 12, 14, 1956.

Remarks.—No regulation. Occasional diversion of 1 cfs above station during summer months by city of Kent.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.2	8.92	7.65	.....
1957	7.05	10.7	24.4	25.2	26.4	39.9	28.3	17.6	13.2	10.0	7.55	6.84*	18.1
1958	6.45	5.67	10.1	20.0	29.4	20.6	14.0	12.4	7.59	5.51	4.85	3.86	11.6
1959	3.66	7.27	26.4	46.5	37.9	23.1	21.6	18.4	13.1	10.4	8.86	7.92	18.7
1960	11.6	28.9	48.7	29.0	33.7	23.9	23.5	21.3	16.5	9.80	7.40	6.30	21.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.6	8.4	6.8	.....
1957	6.4	9.1	9.8	20	19.5	33	22	15	12	7.5	.....	6.0	6.0
1958	5.7	4.8	6.6	13	26	13	10	10	6.4	4.2	4.6	2.7	2.7
1959	3.3	3.7	14.5	28	28	20	17.5	15	12	8.6	8.4	7.1	3.3
1960	9.4	13	33	23	27	22	20	17.5	12.5	7.4	6.7	5.9	5.9

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					
1957	50	Mar. 11,12, 1957	0.0	18.1	13,080	4.8	11,860
1958	33	Feb. 15, 1958	2.7	11.6	8,400	12.9	9,330
1959	98	Jan. 25, 1959	3.3	18.7	13,530	23.0	16,690
1960	114	Dec. 16, 1959	5.9	21.7	15,740	.....	.....

① Feb. 16-18, 26-28, 1958.
* Estimated.

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.

Records available.—June 1945 to September 1960.

Gage.—Water-stage recorder and woodbox culvert control. Altitude of gage is 425 ft. (from topographic map). Prior to Mar. 16, 1953, at site 50 ft. downstream at datum 0.82 ft. higher.

Average discharge.—15 years (1945-60), 21.7 cfs (15,710 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 165 cfs Feb. 11, 1951 (gage height, 4.26 ft., datum then in use, from recorded range in stage); minimum, 2.7 cfs Dec. 23, 24, 1952; minimum gage height, 0.19 ft. Oct. 9-12, 14, 15, 1952, datum then in use.

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
1954...	7.41	15.5	42.1	50.2	40.4	31.1	26.1	16.4	11.2	9.98	8.24	7.40	22.1
1955...	7.65	9.49	13.3	23.1	27.4	20.8	33.5	27.4	16.9	12.6	9.70	7.43	17.4
1956...	9.55	27.6	82.8	81.0	38.9	41.7	35.5	17.1	11.7	9.29	7.70	6.84	30.9
1957...	7.19	13.1	30.5	29.5	30.6	47.5	30.7	17.8	12.0	9.28	6.41	5.64	20.0
1958...	5.78	6.82	9.59	24.7	40.1	24.2	16.3	14.2	8.18	5.65	4.95	3.85	13.5
1959...	3.53	9.38	31.8	56.5	48.0	28.3	27.1	23.0	16.5	11.0	7.97	8.32	22.5
1960...	14.5	38.4	58.3	33.7	39.0	26.8	26.5	24.5	18.4	10.7	7.08	5.90	25.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	5.9	12	25	39	38	25	23	12.5	10.5	9.0	7.8	7.0	5.9
1955...	7.2	7.2	11.5	19.5	18	19.5	25	22	13.5	11	8.4	6.5	6.5
1956...	6.2	16	56	57	32	33	24	12.5	11	8.2	7.0	6.6	6.2
1957...	5.5	11	12.5	23	21	36	24	15	10	7.6	5.2	5.5	5.2
1958...	5.2	5.5	6.8	16	36	14.5	11.5	9.9	6.9	4.4	4.3	2.8	2.8
1959...	3.3	3.8	17.5	37*	35	24	21	18.5	14	7.4	7.0	6.7	3.3
1960...	13	17	41	26	30	24	23	20	13.5	7.4	6.3	5.3	5.3

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
1953	.....	.....	.....	.....	.....	.....	.....	18.6	18.04	13,470
1954	75	Jan. 9, 1954	5.9	22.1	1.58	21.42	16,000	19.2	18.59	13,880
1955	39	April 21, 1955	6.5	17.4	1.24	16.83	12,570	24.9	24.16	18,030
1956	146	Dec. 12, 1955	6.2	30.9	2.21	30.03	22,410	25.1	24.37	18,200
1957	59	Mar. 11-13, 1957	5.2	20.0	1.43	19.38	14,460	17.6	17.04	12,710
1958	45	Feb. 17, 18, 1958	2.8	13.5	.964	13.12	9,800	15.4	14.97	11,190
1959	111	Jan. 26, 1959	3.3	22.5	1.61	21.87	16,330	28.1	27.27	20,360
1960	131	Dec. 17, 1959	5.3	25.3	1.81	24.56	18,350	.....	.....	.....

* Estimated.

Cedar River at Renton, Wash.

Location.—Lat. 47°29'00" (revised), long. 122°12'10", in NW¼ sec. 17, T. 23 N., R. 5 E., on left bank 125 ft. downstream from bridge on U. S. Highway 10 at Renton and 1½ miles (revised) upstream from mouth.

Drainage area.—197 sq. mi. (includes 4 sq. mi. in vicinity of Youngs Lake in Big Soos Creek basin).

Records available.—March 1901 to July 1903 (fragmentary), September 1906 to December 1907 (monthly discharge only), August 1945 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 15.20 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Jan. 1, 1908, staff gage within 1 mile of present site, at datum 10.67 ft. below mean sea level, unadjusted. Aug. 7, 1945, to Aug. 15, 1947, water-stage recorder at site 700 ft. upstream at datum 20.13 ft. above mean sea level and Aug. 16, 1947, to Dec. 7, 1950, at datum 19.13 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—15 years (1945-60), 722 cfs (522,700 acre-ft. per year).

Extremes.—1901-03, 1906-07, 1945-60: 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 recorded, 39 cfs Sept. 5, 6, 11, 12, 1957 (gage height, 2.51 ft.).

Remarks.—Flow partly regulated by Chester Morse Lake (formerly Cedar Lake) for operation of powerplant. More than 250 cfs is diverted at Landsburg at times by the city of Seattle for municipal use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	354	674	1,363	1,197	962	879	747	659	1,014	640	582	402	789
1955...	332	336	510	565	981	658	940	917	916	785	405	270	632
1956...	711	1,103	1,769	1,336	779	876	907	1,008	1,043	373	167	432	876
1957...	517	701	1,595	785	740	1,151	992	832	467	200	123	66.9	682
1958...	152	229	716	992	1,110	584	642	609	168	44.9*	41.1*	52.9*	441
1959...	105*	1,386	1,380	1,740	952	804	874	931	648	182	138*	587	809
1960...	864	1,761	1,556	779	1,007	714	1,203	935	677	270	129	210	840

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	249	307	919	797	566	580	481	330	622	263	252	304	249
1955...	178	159	228	416	524	361	561	488	508	346	250	136	136
1956...	412	624	977	800	430	538	368	460	652	158	102	302	102
1957...	187	430	346	460	377	678	754	520	251	116	60	42	42
1958...	105	107	304	424	836	294	272	232	110	.....	.....	.....	.....
1959...	45*	124	865	1,070	604	545	425	505	314	85	72*	194	45
1960...	510	706	736	364	508	274	970	754	514	86	50	102	50

* Estimated.

Cedar River at Renton, 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					
1953						715	517,400
1954	3,250	Dec. 9, 1953	249	789	571,100	687	497,200
1955	3,480	Feb. 8, 1955	136	632	457,500	834	603,900
1956	3,640	Dec. 11, 1955	102	876	636,000	812	589,300
1957	3,460	Dec. 18, 1956	42	682	493,500	537	388,900
1958	2,160	Jan. 17, 1958		441	319,600	589	426,400
1959	3,520	Jan. 25, 1959	45	809	585,500	919	665,300
1960	5,860	Dec. 15, 1959	50	840	609,700		

May Creek near Renton, Wash.

Location.—Lat. 47°31'25", long. 122°11'45", in SW¼SE¼ sec. 32, T. 24 N., R. 5 E., on left bank 1 mile upstream from mouth and 2½ miles north of Renton.

Drainage area.—12.5 sq. mi. (revised).

Records available.—June 1945 to October 1950, June 1955 to September 1958.

Gage.—Water-stage recorder. Altitude of gage is 60 ft. (from topographic map). Prior to June 1955 at different datum.

Average discharge.—8 years (1945-50, 1955-58), 21.2 cfs (15,350 acre-ft. per year).

Extremes.—1945-50, 1955-58: Maximum discharge, 401 cfs Feb. 17, 1949 (gage height, 3.98 ft., datum then in use); minimum, 1.7 cfs on many days during July, August, and September 1958.

Remarks.—Some small diversions 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
1955										3.31	2.73	2.58	
1956	8.24	43.8	87.1	76.9	21.2*	41.2	19.2	6.07	5.10	2.95	2.89	3.45	26.6
1957	11.5	15.4	38.7	25.1	49.5	50.1	22.0	8.24	4.79	3.15	3.31	2.67	19.4
1958	3.71	5.43	19.4	44.2	37.2	15.2	10.3	6.87	2.94	1.95	1.86	2.12	13.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955										2.4	2.4	2.3	
1956	2.3	12	40	30*	16*	19.5	8.4	4.2	3.6	2.5	2.5	2.7	2.3
1957	3.6	9.9	9.4	14*	3.1	20	10.5	5.3	3.5	2.7	2.4	2.2	2.2
1958	2.7	2.7	5.4	13.5	27	12	9.0	3.3	2.2	1.7	1.7	1.7	1.7

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
1956	240	Dec. 21, 1955	2.3	26.6	2.13	29.01	19,320	20.5	22.31	14,860
1957	194	Feb. 26, 1957	2.2	19.4	1.55	21.04	14,040	16.3	17.65	11,780
1958	180	Jan. 17, 1958	1.7	13.0	1.04	14.08	9,380			

* Estimated.

Mercer Creek near Bellevue, Wash.

Location.—Lat. 47°36'10", long. 122°10'55", in NW¼NW¼ sec. 4, T. 24 N., R. 5 E., on left bank 40 ft. upstream from Northern Pacific Railway trestle, 1 mile southeast of Bellevue, and 1½ miles upstream from mouth.

Drainage area.—12.0 sq. mi. (revised).

Records available.—June to October 1945, June 1955 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 20 ft. (from topographic map). Prior to June 5, 1959, at site 600 ft. downstream at different datums.

Average discharge.—5 years (1955-60), 20.8 cfs (15,060 acre-ft. per year).

Extremes.—1945, 1955-60: Maximum discharge, 242 cfs Dec. 20, 1955 (gage height, 5.08 ft., site and datum then in use); minimum, 1.9 cfs Aug. 6, 1958 (gage height, 1.52 ft., site and datum then in use).

Remarks.—Many small diversions 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
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.25	4.26	5.05	.....
1956	15.5	37.1	59.5	60.5	25.4	37.7	18.6	11.0	11.1	5.75	5.57	7.76	24.7
1957	17.4	18.2	25.7	21.1	47.6	38.9	21.9	8.79	8.51	5.86	6.08	5.72	18.6
1958	10.9	13.2	29.0	56.3	47.2	22.9	20.6	8.45	5.34	3.22	3.44	5.39	18.7
1959	8.78	26.4	36.7	61.7	32.8	24.1	22.5	15.8	9.53*	7.04	5.50	11.7*	21.8
1960	13.0	30.7	43.0	30.6	36.4	23.5	21.4	15.7	7.83	4.76*	6.97*	6.95	20.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.2	3.7	3.7	.....
1956	5.3	12	23	22	18	18.5	12.5	7.8	6.8	4.8	5.0	4.4	4.4
1957	7.5	12.5	13.5	13*	17	18	6.5	3.4	4.8	4.4	4.8	4.8	3.4
1958	5.8	4.6	13.5	11.5	29	14.5	12.5	5.6	3.5	2.5	3.0	3.7	2.5
1959	5.2	10	16	17	21	17	13.5	7.4	7*	4.5	3.5	7.2	3.5
1960	7.5	13	16	14	15	14.5	11.5	10.5	5.6	4.3	4.5*	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
1956	242	Dec. 20, 1955	4.4	24.7	2.06	28.00	17,930	20.4	23.19	14,840
1957	180	Feb. 25, 1957	3.4	18.6	1.55	21.07	13,480	18.0	20.29	12,990
1958	238	Jan. 17, 1958	2.5	18.7	1.56	21.14	13,520	20.2	22.91	14,660
1959	220	Jan. 24, 1959	3.5	21.8	1.82	24.72	15,800	23.1	26.13	16,700
1960	210	Dec. 15, 1959	4.3	20.0	1.67	22.71	14,520	.....	.....	.....

* 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 Issaquah Creek.

Drainage area.—26.4 sq. mi. (revised).

Records available.—June 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 210 ft. (from topographic map). Prior to Oct. 1, 1948, at datum 0.99 ft. higher. Oct. 1, 1948, to July 6, 1952, at site 70 ft. upstream at datum 0.41 ft. lower.

Average discharge.—15 years (1945-60), 70.3 cfs (50,900 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 2,610 cfs Feb. 9 or 10, 1951 (gage height, 6.08 ft., site and datum then in use); minimum, 9.4 cfs Aug. 21, 1958 (gage height, 0.58 ft.).

Remarks.—Many small diversions for irrigation and domestic use. No regulation.

Revisions.—The momentary maximum discharge for the water year 1953 published in State WSB No. 6 has been revised to 580 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	28.0	98.7	164	157	137	75.7	72.1	33.7	48.5	38.0	23.3	29.9	75.1
1955...	21.4	52.4	74.0	85.9	109	66.9	113	70.3	43.0	38.6	26.2	20.0	59.7
1956...	67.2	157	211	186	83.9	143	74.4	33.0	33.9	21.6	17.5	18.9	87.4
1957...	55.5	58.5	130	69.5	143	140	69.0	39.9*	29.5	21.6	18.4	14.8	65.5
1958...	22.7	39.8	82.6	139	127	55.5	65.0	28.3	19.8	14.1	12.1	13.8	51.2
1959...	19.1	77.8	129	185	90.7	81.0	92.2	66.7	40.9	26.0	16.7	39.8	72.1
1960...	49.8	140	144	88.9	105	77.3	81.1	80.1	33.5	20.8	20.0	19.8	71.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	15.5	34	74	77	83	45	43	27	33	20	18	20	15.5
1955...	18.5	18.5	42	56	55	50	70	47	28	24	18.5	17.5	17.5
1956...	18.5	59	101	91	78	89	41	26	26	17.5	15.5	15.5	15.5
1957...	17.5	37	32	46*	47	68	41*	28*	24	18	14.5	14	14
1958...	15.5	19.5	34	52	85	42	36	19.5	15.5	12.5	11.5	12	11.5
1959...	13	18.5	65	85	67	65	46	37	31	18.5	15	18	13
1960...	27	38	68	49	49	43	52	45	26	18	16.5	16	16

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
1953								70.3	36.68	50,850
1954	781	Dec. 9, 1953	15.5	75.1	2.89	39.21	54,370	63.1	32.95	45,700
1955	740	Feb. 8, 1955	17.5	59.7	2.30	31.19	43,230	83.8	43.10	60,670
1956	1,050	Dec. 11, 1955	15.5	87.4	3.31	45.06	63,440	71.5	36.88	51,920
1957	596	Feb. 25, 1957	14	65.5	2.48	33.66	47,380	57.1	29.35	41,320
1958	566	Jan. 17, 1958	11.5	51.2	1.94	26.32	37,080	58.0	29.81	41,990
1959	680	Jan. 24, 1959	13	72.1	2.73	37.07	52,190	81.0	41.68	58,660
1960	1,130	Dec. 15, 1959	16	71.6	2.71	36.91	51,960			

* Estimated.

Cottage Lake Creek near Redmond, Wash.

Location (revised).—Lat. 47°44'15", long. 122°04'45", in NE¼SE¼ 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.

Records available.—June to September 1945, June 1955 to September 1960. Prior to June 1955, at different datum.

Gage.—Water-stage recorder. Altitude of gage is 210 ft. (from topographic map).

Average discharge.—5 years (1955-60), 14.2 cfs (10,280 acre-ft. per year).

Extremes.—1945, 1955-60: Maximum discharge, 132 cfs Jan. 6, 1956, and on or about Feb. 26, 1957; maximum gage height, 2.19 ft. Jan. 6, 1956; minimum discharge, 3.3 cfs Aug. 2, 1959; minimum gage height, 0.68 ft. Aug. 19, 1956.

Remarks.—Several small diversions for irrigation and domestic use above station. Some natural regulation in small lakes above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.62	5.64	6.22	.....
1956	9.10	20.2*	50.1*	47.8	16.9*	19.8	15.7	9.07	10.1	6.10	6.07	6.78	18.2
1957	10.0	11.7*	14.3*	12.3	30.8	29.2	16.4	8.36	7.36	6.39	5.93	5.87	13.1
1958	7.56	9.75	15.1	21.1	27.6	15.2	14.2	7.87	5.92	4.31	4.23	4.91	11.4
1959	6.84	13.4	17.6	37.3	21.7	19.2	17.0	13.8	9.45	7.33*	5.48	6.70	14.6
1960	7.85	18.3	24.9	18.8	31.8	13.7	11.9	12.8	9.05	5.65	5.59	5.98	13.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.8	4.8	5.0	.....
1956	5.4	10*	30*	20	12*	12	9.2	6.8	6.8	5.4	4.8	5.4	4.8
1957	6.4	9.0*	9.0*	8.7	11	16	9.1	6.8	6.8	5.8	5.6	5.6	5.6
1958	5.8	6.5	11.5	9.5	18.5	11	9.1	7.0	4.6	3.9	3.9	4.1	3.9
1959	5.0	8.0*	12	14.5	18.5	15.5	10.5	11.5	7.6	6.2	4.4	4.7	4.4
1960	5.9	8.0	13	11	14	10	9.5	9.5	7.5	4.7	4.7	5.5	4.7

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
1956	132	Jan. 6, 1956	4.8	18.2	1.65	22.52	13,220	14.6	18.01	10,570
1957	132	①	5.6	13.1	1.19	16.17	9,490	12.8	15.80	9,270
1958	59	Jan. 16, 1958	3.9	11.4	1.04	14.02	8,230	11.8	14.59	8,560
1959	85	Jan. 24, 1959	4.4	14.6	1.33	18.05	10,580	15.7	19.41	11,390
1960	110	Nov. 20, 1959	4.7	13.8	1.25	17.07	10,020	.....	.....	.....

* Estimated.
① Probably Feb. 26, 1957.

Evans Creek above mouth, near Redmond, Wash.

Location.—Lat. 47°40'30", long. 122°04'50", on line between secs. 6 and 7, T. 25 N., R. 5 E., on right bank 25 ft. upstream from county bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Redmond.

Drainage area.—13.0 sq. mi.

Records available.—June 1955 to September 1960.

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

Average discharge.—5 years (1955-60), 22.8 cfs (16,510 acre-ft. per year).

Extremes.—1955-60: Maximum discharge, 145 cfs Dec. 22, 1955 (gage height, 3.49 ft.); minimum, 5.3 cfs Aug. 8, 1959; minimum gage height, 1.46 ft. Sept. 1, 2, 2, 1957.

Remarks.—Several small diversions 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
1955...	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.65	7.81	8.09	.....
1956...	16.0	41.4	68.7	67.2	29.3*	42.5	24.9	13.8	13.2*	8.69	7.89	9.93	28.7
1957...	13.8	15.8	25.2	21.0	46.2	47.0	26.3*	13.4	10.3	8.45	7.73	7.44*	20.1
1958...	10.3	13.4	18.1	42.0	45.0	25.7*	27.7	12.8	8.63	6.36	6.17	7.37	18.5
1959...	9.16	24.5*	42.4	62.1	41.3	34.3	26.6	18.7	12.7	7.79	7.00	10.3	24.7
1960...	11.5	26.6	47.5	30.6	41.2	23.4	23.3	22.7	12.7	7.46	8.52*	9.51	22.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955...	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.6	6.8	7.0	.....
1956...	8.8	18.5	39	30	22*	26	14.5	10	9.8	7.8*	7.2	7.8	7.2
1957...	9.4	12.5	13	11*	21	24*	14.5	10.5	9.0	7.6	7.1	6.9	6.9
1958...	8*	9.4	10.5	16.5	31	19	15.5	9.6	6.7	6.0	5.8	6.2	5.8
1959...	7.4	8.5*	26	28	30	25	15.5	13.5	10	5.8	5.8	7.9	5.8
1960...	9.5	12.5	23	19.5	21	18.5	17.5	15.5	9.2	6.5*	7.0*	8.4	6.5*

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
1956.....	145	Dec. 22, 1955	7.2	28.7	2.21	30.03	20,820	22.7	23.79	16,490
1957.....	136	Feb. 26, 1957	6.9	20.1	1.55	20.96	14,530	19.0	19.79	13,720
1958.....	103	Jan. 17, 1958	5.8	18.5	1.42	19.26	13,360	21.3	22.27	15,450
1959.....	127	Jan. 25, 1959	5.8	24.7	1.90	25.75	17,860	25.5	26.60	18,440
1960.....	137	Dec. 16, 1959	6.5	22.0	1.69	23.07	15,990	.....	.....	.....

* Estimated.

Bear Creek at Redmond, Wash.

Location.—Lat. 47°40'10", long. 122°06'30", at SW¼NE¼ sec. 12, T. 25 N., R. 5 E., on right bank 300 ft. downstream from State Highway 2 crossing, half a mile east of Redmond, and three-quarters of a mile upstream from mouth.

Drainage area.—47.5 sq. mi.

Records available.—June 1945 to November 1950, June 1955 to October 1958.

Gage.—Water-stage recorder. Altitude of gage is 30 ft. (from topographic map). Prior to June 1955, at different datum.

Average discharge.—8 years (1945-50, 1955-58), 82.4 cfs (59,660 acre-ft. per year).

Extremes.—1945-50, 1955-58: Maximum discharge, 654 cfs Mar. 5, 1950; maximum gage height, 6.53 ft. Jan. 22, 1950, datum then in use; minimum discharge, 13 cfs Aug. 26, 1947; minimum gage height, 1.49 ft. Sept. 7, 1958.

Remarks.—Many small diversions for irrigation and domestic use. Minor regulation by fish trap half a mile above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	38.5	25.1	22.8	.....
1956	49.1	129	249	257	105	137	94.2	47.6	45.9	26.7	24.1	29.6	99.8
1957	49.9	60.0	83.9	73.0	182	182	106	50.5	32.4	24.2	25.8	20.9	73.5
1958	34.1	46.3	73.5	171	192	96.5	99.0	40.3	24.2	17.8	18.9	21.1	68.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	24	21	18.5	.....
1956	22	59	133	109	76	82	51	34	33	20	22	19	19
1957	27	48	47	45*	68	95	59	32	25	22	20	18.5	18.5
1958	20	28	40	61	122	68	54	28	19	16	17.5	17.5	16

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
1956	560	Dec. 22, 1955	19	99.8	2.10	28.60	72,440	80.2	22.99	58,230
1957	573	Feb. 26, 1957	18.5	73.5	1.55	21.01	53,240	70.2	20.06	50,810
1958	492	Jan. 17, 1958	16	68.7	1.45	19.64	49,750	.....	.....	.....

* Estimated.

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.—148 sq. mi. (revised).

Records available.—January 1939 to April 1957.

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 1¾ miles or 2 miles uplake on west shore of lake at datum 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.—17 years (1939-56), 287 cfs (207,800 acre-ft. per year).

Extremes.—1939-57: Maximum discharge, 1,520 cfs Feb. 11, 1951 (gage height, 9.17 ft.); minimum, 43 cfs Aug. 20, 21, 24, 1951.

Remarks.—Some small diversions from tributaries for irrigation and domestic use. 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
1954...	128	259	602	729	700	538	370	215	169	155	105	106	338
1955...	100	187	319	409	475	357	429	350	199	144	109	91.7	263
1956...	163	439	878	1,924	552	545	478	227*	150	97.8	73.1	76.9	392
1957...	127	236	359	363	450	720	468	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	90	181	489	536	599	377	304	161	143	114	96	91	90
1955...	96	97	232	361	364	313	379	301	143	120	95	87	87
1956...	90	261	707	748	472	461	329	155*	118	78	67	63	63
1957...	84	210	213	291	307	562	310*	.....	.....	.....	.....	.....	.....

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
1953.....	.....	.....	.....	.....	.....	.....	.....	272	25.62	196,800
1954.....	858	Jan. 8, 1954	90	338	2.35	31.86	244,600	306	28.83	221,300
1955.....	602	Feb. 9, 1955	87	263	1.83	24.79	190,300	336	30.86	243,600
1956.....	1,340	Jan. 7, 1956	63	392	2.65	36.09	284,900	329	30.24	238,600
1957.....	878	Mar. 10, 1957	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

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.—23.7 sq. mi. (revised).

Records available.—June 1945 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map). Apr. 5, 1950, to Sept. 30, 1951, at datum 0.59 ft. higher.

Average discharge.—15 years (1945-60), 36.2 cfs (26,210 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 680 cfs Mar. 5 or 6, 1950 (gage height, 7.0 ft., present datum, from high-water mark, from information by local resident); minimum, 1.0 cfs Aug. 10, 1946 (gage height, 0.45 ft., present datum).

Remarks.—Many small diversions for irrigation and domestic use. Slight regulation for farm use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	21.4	49.6	73.4	104	129	51.6	27.8	14.9	21.4	16.9	11.4	11.6	43.9
1955...	10.9	51.5	67.2	51.6	54.0	37.0	45.5	29.3	17.0	15.4	7.54	8.20	32.8
1956...	24.2	53.6	129	136	64.2	59.0	31.7	17.8	26.6	8.68	8.58	11.6	47.7
1957...	25.5	31.6	41.6	39.8	99.7	104	47.8	19.3	13.1	9.43	9.03	8.17	37.0
1958...	15.3	19.5	36.5	76.1	103	47.9	39.8	13.2	9.71	7.06*	5.41	7.32	31.3
1959...	13.3	33.8	43.4	115*	64.5	51.4	39.6	31.5	19.0	8.32	6.40	10.3	36.3
1960...	16.1	39.0	65.7	56.4	78.1	36.6	33.6	24.9	12.4	6.38	10.6	9.67	32.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.7	23	35	42	50	23	18.5	10	10.5	8.5	8.5	8.9	8.5
1955...	8.3	10.5	32	31	28	28	29	22	9.9	6.9	6.5	5.9	5.9
1956...	8.7	15*	46	50	48	31	16	11	11.5	7.2	7.2	7.2	7.2
1957...	9.1	19.5	19	22*	25*	52	25	11.5	9.5	7.6	7.6	6.9	6.9
1958...	8.7	11	13	22	50	29	18.5	9.0	8.7	5.1	4.8	5.8	4.8
1959...	7.5	13.5	18	20	40*	34	15	13	10	6.2	5.7	7.0	5.7
1960...	7.8	13	24	24	25	20	18	14.5	8.4	5.7	6.0	7.8	5.7

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
1953								31.3	17.64	22,670
1954	346	Jan. 6, 1954	8.5	43.9	1.82	24.75	31,790	42.6	24.02	30,870
1955	258	Feb. 8, 1955	5.9	32.8	1.36	18.46	23,740	39.3	22.53	28,480
1956	360	Jan. 6, 1956	7.2	47.7	2.01	27.40	34,620	38.6	22.17	28,020
1957	337	Feb. 24, 1957	6.9	37.0	1.56	21.20	26,810	34.7	19.88	25,140
1958	266	Jan. 16, 1958	4.8	31.3	1.32	17.88	22,630	32.8	18.80	23,790
1959	319	Jan. 9, 1959	5.7	36.3	1.53	20.78	26,260	38.8	22.25	28,120
1960	289	Dec. 15, 1959	5.7	32.3	1.36	18.57	23,450			

* Estimated.

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.—209 sq. mi. (revised).

Records available.—October 1939 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean lower low water at Seattle (Corps of Engineers bench mark), 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.—21 years (1939-60), 367 cfs (265,700 acre-ft. per year).

Extremes.—1939-60: Maximum discharge, 1,910 cfs Jan. 6, 1956 (gage height, 32.22 ft.), but may have been higher Feb. 12 or 13, 1951; minimum, 62 cfs Aug. 22, 23, 1951 (gage height, 22.92 ft.).

Remarks.—Some small diversions from tributaries for irrigation and domestic use. 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
1954...	171	356	768	992	990*	680	455	269	243	194	140	148	448
1955...	136	307	464	517	614	446	538	415	252	200	136	114	343
1956...	215	544	1,152	1,334	675	688	569	283	215	130	102	115	502
1957...	188	305	446	447	681	944	588	286	185	126	103	92.3	364
1958...	129	186	301	675	902	599	450	253	148	101	72.3	82.0	321
1959...	117	280	582	1,017	848	620	533	400	223	171	129	141	420
1960...	193	394	791	624	781*	496	450	368	236	150	121	129	393

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	113	244	620	635	760*	440*	309	219	181	140	120	126	113
1955...	129	130	305	433	460	391	458	343	201	158	111	105	105
1956...	111	308	866	882	572	554	385	192	162	105	92	92	92
1957...	110	260	272	344	380	688	388	213	153	103	92	87	87
1958...	96	131	198	373	762	436	356	167	125	80	64	68	64
1959...	89	123	413	588	676	543	385	286	178	141	116	118	89
1960...	159	205	515	433	558	413	385	324	185	117	107	124	107

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
1953								344	22.78	249,000
1954	1,500	Jan. 6, 1954	113	448	2.19	29.66	324,300	415	27.48	300,400
1955	1,100	Feb. 8, 1955	105	343	1.67	22.72	248,400	428	27.78	309,600
1956	1,910	Jan. 6, 1956	92	502	2.40	32.72	364,700	421	27.41	305,500
1957	1,530	Feb. 26, 1957	87	364	1.74	23.66	263,700	337	21.89	244,000
1958	1,160	Jan. 17, 1958	64	321	1.54	20.87	232,600	352	22.87	254,800
1959	1,400	Jan. 10, 25, 1959	89	420	2.01	27.27	303,900	453	29.43	328,100
1960	1,310	Dec. 15-16, 1959	107	393	1.88	25.61	285,500			

* Estimated.

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 confluence with North Fork. Discharge measurements made about 2 miles upstream from gage.

Drainage area.—355 sq. mi.

Records available.—October 1902 to September 1905, April 1911 to September 1960.

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, at site 300 ft. downstream. 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.—52 years (1902-05, 1911-60), 2,405 cfs (1,741,000 acre-ft. per year).

Extremes.—1902-05, 1911-60: Maximum discharge, 55,000 cfs Dec. 12, 1921 (gage height, 22.8 ft., from high-water marks, site then in use), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 165 cfs Nov. 29, 1952 (gage height, 1.35 ft.).

Flood in 1897 reached a stage of about 5 ft. higher than that of Dec. 12, 1921 (discharge, about 70,000 cfs).

Remarks.—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
1954...	1,410	2,843	4,652	2,126	2,778	1,593	2,564	4,893	5,477	5,075	2,007	1,264	3,059
1955...	1,534	3,502	1,948	1,354	2,188	913	1,964	3,710	6,865	4,643	1,663	668	2,575
1956...	3,383	5,022	3,373	1,450	746	1,429	4,031	6,929	6,034	4,032	948	885	3,193
1957...	2,928	2,625	5,679	1,029	1,652	1,887	3,214	5,694	3,825	1,403	622	403	2,588
1958...	603	1,251	2,600	2,429	2,455	1,334	2,522	5,026	2,642	832	434	714	1,900
1959...	1,655	5,603	4,860	4,146	1,446	2,055	4,621	4,491	5,509	3,096	831	2,971	3,460
1960...	3,875	6,040	4,051	1,170	1,997	1,655	3,041	3,860	4,043	1,516	709	610	2,710

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	640	1,330	2,090	870	1,060	1,070	1,120	1,440	3,000	2,940	1,410	768	640
1955...	600	792	1,250	780	864	678	1,230	1,390	3,440	2,950	828	465	465
1956...	502	1,480	1,330	745	602	617	1,500	3,540	3,880	1,540	617	455	455
1957...	629	1,540	1,400	700*	682	1,240	2,040	3,580	2,080	758	425	333	333
1958...	351	530	1,390	1,150	1,480	870	1,170	2,890	1,570	540	375	324	324
1959...	400	974	2,550	2,090	835	1,280	1,560	2,950	3,330	1,260	575	625	400
1960...	1,260	1,280	1,160	539	765	627	1,750	2,110	2,560	770	470	428	428

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
1953								2,967	113.45	2,148,000
1954	17,800	Dec. 9, 1953	640	3,059	8.62	116.98	2,215,000	2,894	110.67	2,095,000
1955	18,900	Feb. 8, 1955	465	2,575	7.25	98.47	1,864,000	2,978	113.87	2,156,000
1956	27,900	Nov. 4, 1955	455	3,193	8.99	122.42	2,318,000	3,153	120.90	2,289,000
1957	31,900	Dec. 10, 1956	333	2,588	7.29	98.98	1,874,000	2,017	77.11	1,460,000
1958	8,520	May 25, 1958	324	1,900	5.35	72.65	1,376,000	2,556	97.73	1,850,000
1959	24,400	Nov. 12, 1958	400	3,460	9.75	132.28	2,505,000	3,599	137.60	2,606,000
1960	51,800	Dec. 15, 1959	428	2,710	7.63	103.91	1,967,000			

* Estimated.

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.

Records available.—September 1920 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 209.26 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—32 years (1928-60), 3,899 cfs (2,823,000 acre-ft. per year).

Extremes.—1928-60: 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 regulation. Some small diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,648	4,728	7,437*	3,535*	4,595*	2,553	3,844	7,310	8,428	7,841	3,304	2,220	4,873
1955...	2,591	5,938	3,207	2,204	3,465	1,469	3,099	5,590	10,590	7,304	2,741	1,150	4,106
1956...	5,516	7,903	5,362	2,475	1,348	2,378	6,177	10,720	9,534	6,326	1,620	1,586	5,086
1957...	5,020	4,320	9,154	1,652	2,793	2,965	4,761	8,818	5,737	2,127	1,006	635	4,095
1958...	1,076	2,157	4,229	3,883	3,895	2,037	3,907	7,988	4,237	1,291	654	1,226	3,043
1959...	3,204	8,915	7,779	6,557	2,255	3,203	7,553	7,079	8,835	5,035	1,422	4,942	5,570
1960...	6,565	10,200	6,737	2,063	3,258	2,685	4,845	6,354	6,628	2,547	1,215	1,064	4,507

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,190	2,280	3,400*	1,500*	1,850	1,730	1,790	2,180	5,840	4,640	2,350	1,340	1,190
1955...	1,030	1,380	2,140	1,300	1,430	1,100	1,920	2,160	5,030	4,660	1,380	825	825
1956...	868	2,420	2,290	1,360	1,120	1,150	2,380	5,220	6,040	2,450	1,110	814	814
1957...	1,110	2,480	2,220	1,010	1,060	2,010	2,990	5,430	2,860	1,240	648	528	528
1958...	516	855	2,240	1,860	2,260	1,350	1,710	4,480	2,380	836	570	499	499
1959...	704	1,540	3,960	3,220	1,350	1,990	2,320	4,710	5,220	1,990	989	1,110	704
1960...	2,130	2,310	1,850	948	1,310	1,100	2,800	3,440	4,210	1,260	786	738	738

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
1953.....	.....	.....	.....	.....	.....	.....	.....	4,794	121.62	3,470,000
1954.....	27,500	Dec. 9, 1953	1,190	4,873	9.11	123.66	3,528,000	4,609	116.93	2,337,000
1955.....	30,600	Feb. 8, 1955	825	4,106	7.67	104.17	2,972,000	4,699	119.23	3,402,000
1956.....	46,900	Dec. 11, 1955	814	5,086	9.51	129.39	3,692,000	5,071	129.02	3,681,000
1957.....	59,100	Dec. 10, 1956	528	4.095	7.65	103.91	2,965,000	3,164	80.28	2,291,000
1958.....	14,100	Jan. 17, 1958	499	3,043	5.69	77.22	2,203,000	4,081	103.55	2,955,000
1959.....	42,100	Nov. 12, 1958	704	5,570	10.4	141.32	4,033,000	5,873	149.01	4,252,000
1960.....	78,800	Nov. 23, 1959	738	4,507	8.42	114.66	3,272,000	.....	.....	.....

* 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 right bank 30 ft. downstream from highway bridge, a quarter of a mile north of Gold Bar, and 1¼ miles upstream from Olney Creek.

Drainage area.—19.8 sq. mi.

Records available.—October 1928 to September 1933, July 1946 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 200 ft. (from topographic map). December 1928 to Sept. 30, 1933, staff gage 50 ft. upstream at different datum.

Average discharge.—19 years (1928-33, 1946-60), 161 cfs (116,600 acre-ft. per year).

Extremes.—1928-33, 1946-60: Maximum discharge, 3,220 cfs Dec. 14, 1959 (gage height, 8.22 ft.), from rating curve extended above 1,000 cfs on basis of slope-area measurement of peak flow; minimum recorded, 9.2 cfs Oct. 18, 19, 1952; minimum gage height observed, 0.32 ft. Aug. 27, Sept. 3-5, 1930, site and datum then in use.

Remarks.—Some natural regulation in Wallace Lake. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	154	213	350	171	223	107	142	205	287	164	91.7	121	185
1955...	92.3	263	168	109	158	60.2	172	260	394	257	83.9	37.8	171
1956...	228	263	248*	152	63.5	105	260	301	264	105	26.3	72.4	174
1957...	242	215	359	59.5	174	180	267	298	148	61.0	30.4	19.2	171
1958...	82.7	147	188	214	230	110	209	193	84.0	30.7*	12.8*	49.3*	128
1959...	200*	379*	311	332	117	155	330	273	226	88.0	38.2	227	223
1960...	240	402	264	132	143	105	170	304	172	37.6	62.0	62.0	174

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	43	79	145	56	125	53	50	63	173	64	36	51	36
1955...	36	35	91	52	57	45	96	109	101	107	29	21	21
1956...	35	78	83	58	44	42	103	168	130	32	18.5	13.5	13.5
1957...	40	84	73	31*	38	89	132	183	68	30	17	11.5	11.5
1958...	15	42	92	100	101	62	86	110	42	14*	10*	12*	10*
1959...	21	70*	133	131	51	85	89	108	114	28	19	32	19
1960...	66	70	66	34	48	38	104	131	89	15.5	11	26	11

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
1953								191	131.26	138,600
1954	1,890	Oct. 31, 1953	36	185	9.34	127.07	134,200	169	115.74	122,200
1955	1,720	Nov. 16, 1954	21	171	8.64	117.17	123,800	189	129.66	136,900
1956	1,930	Nov. 9, 1955	13.5	174	8.79	119.69	126,400	181	124.31	131,300
1957	1,890	Oct. 15, 1956	11.5	171	8.64	117.28	123,900	137	93.89	99,140
1958	1,720	Oct. 30, 1957	10	128	6.46	87.75	92,660	168	115.19	121,600
1959	1,890	April 29, 1959	19	223	11.3	152.98	161,600	224	153.78	162,400
1960	3,220	Dec. 14, 1959	11	174	8.79	119.75	126,400			

* Estimated.

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.

Records available.—May 1934 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 750 ft. (from topographic map). Prior to July 2, 1934, staff gage at same site and datum.

Average discharge.—26 years (1934-60), 794 cfs (574,800 acre-ft. per year).

Extremes.—1934-60: Maximum discharge, 34,600 cfs Feb. 9, 1951 (gage height, 17.22 ft., from high-water mark in well), from rating curve extended above 5,000 cfs on basis of slope-area measurement 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 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
1954...	990	1,099	1,839	799	1,196	502	845	1,136	1,378	929	499	517	976
1955...	606	1,618	806	487	902	260	749	1,353*	1,741	1,128	472	216	859
1956...	1,567	1,624*	1,526*	683	279*	514	1,176	1,482	1,220	645	190	443	948
1957...	1,325	962	2,077	251	729	776	1,194	1,270	778	365	194	116	838
1958...	390	666	1,060	1,037	991	465	898	853	506	170	89.5	390	623
1959...	987	1,981	1,533	1,517	483	733	1,923	1,178	1,141	539	264	1,407	1,141
1960...	1,313	2,202	1,446	631	762	570	881	1,290	906	301	373*	319*	915

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	268	387	602	212	562	272	330	339	832	448	278	219	212
1955...	146	192	390	217	225	148	342	427	909	620	201	125	125
1956...	193	350*	400*	300*	160*	148	441	865	592	250	134	92	92
1957...	215	380	338	110*	120	420*	627	840	389	196	109	83	83
1958...	93	209	525	448	465	246	348	506	264	90	67	87	67
1959...	150	348	595	580*	245	380	448	690	584	209	130	234	130
1960...	300	265	234	121	207	160	512	552	516	145*	94	150*	94

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
1953								1,051	191.53	761,100
1954	14,100	Oct. 30, 1953	212	976	13.1	177.79	706,500	898	163.08	650,400
1955	15,000	Feb. 7, 1955	125	859	11.5	156.50	621,900	1,002	182.56	725,400
1956	①34,300	Dec. 11, 1955	92	948	12.7	173.11	687,900	919	167.99	667,500
1957	24,000	Dec. 9, 1956	83	838	11.2	152.72	606,800	648	118.09	469,200
1958	6,500	Oct. 30, 1957	67	623	8.36	113.60	451,400	822	149.84	595,400
1959	20,000	April 29, 1959	130	1,141	15.3	207.83	825,800	1,179	214.83	853,600
1960	28,000	Dec. 15, 1959	94	915	12.3	167.20	664,300			

* Estimated.
① May have been less because of indeterminate amount of surge.

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 right bank 0.4 mile downstream from West Fork and 2 miles northeast of Monroe.

Drainage area.—55.0 sq. mi.

Records available.—July 1946 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map). Prior to June 6, 1957, at site 0.4 mile upstream at same datum.

Average discharge.—14 years (1946-60), 156 cfs (112,900 acre-ft. per year).

Extremes.—1946-60: Maximum discharge, 2,220 cfs Nov. 21, 1959 (gage height 6.60 ft.); maximum gage height, 7.18 ft. Feb. 26, 1950; minimum discharge, 10.5 cfs Aug. 26, 1958 (gage height, 1.11 ft.).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	87.2	203	429	325	359	147	132	67.3	239	85.4	47.3	55.0	180
1955...	54.2	332	264	246	236	188*	281	136	78.9	87.7	44.1	29.3	164
1956...	127	339*	548*	504*	207	245	155	68.8	92.6	42.5	27.0	27.3	199
1957...	138	223	307	183	345*	315	175	66.5	48.2	27.2	21.9	19.2	155
1958...	31.6	105	232	277	338	157	177	58.3	28.2	20.7	14.7	17.8	120
1959...	45.4	229	260	463	228	233	212	142	90.0	51.3	28.0	65.5	170
1960...	202	455	341	221	260	99.2	120	188	61.6	25.1	25.6	29.9	169

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	31	102	194	145	198	75	78	43	89	41	31	36	31
1955...	33	47	153	150	134	135*	184	86	42	39	29	26	26
1956...	28	140*	250*	162	128	148	71	41	40	29	23	19	19
1957...	28	114	105	84*	130*	180	100	40	28*	21	18.5	16	16
1958...	17	37	88	116	143	106	82	38	17.5	15	11.5	13	11.5
1959...	14	39	143	184	152	152	87	98	60	32	25	25	14
1960...	59	116	175	118	103	79	82	70	37*	18.5	17	22	17

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
1953								168	41.36	121,300
1954	1,250	Dec. 6, 1953	31	180	3.27	44.47	130,400	174	42.95	126,000
1955	1,310	Nov. 17, 1954	26	164	2.98	40.45	118,700	195	48.07	141,000
1956	1,450	Dec. 21, 1955	19	199	3.62	49.27	144,500	170	42.10	123,500
1957			16	155	2.82	38.17	112,000	130	31.96	93,760
1958	905	Jan. 17, 1958	11.5	120	2.18	29.64	86,960	134	33.02	96,850
1959	1,350	Jan. 24, 1959	14	170	3.09	42.05	123,300	209	51.62	151,400
1960	2,220	Nov. 21, 1959	17	169	3.07	41.72	122,300			

* Estimated.

Snoqualmie River near Snoqualmie, Wash.

Location.—Lat. 47°32'45", long. 121°50'35", in SW¼SW¼ 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.

Records available.—May 1898 to July 1899; August to September 1899 (monthly discharge only); January to July 1900, September 1902 to July 1904; August to September 1904 (monthly discharge only); October 1904 to September 1905 and November to December 1906 (gage heights only); August 1907 to May 1926 (monthly discharge only); June 1926 to September 1927; October 1927 to September 1932 (monthly discharge only); August 1958 to September 1960. Published as "near Snoqualmie Falls" 1904-06.

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.—30 years (1898-99, 1902-04, 1907-32, 1958-60), 2,504 cfs (1,813,000 acre-ft. per year).

Extremes.—1898-1900, 1902-04, 1926-27, 1958-60: Maximum discharge, 61,000 cfs Nov. 23, 1959 (gage height, 19.78 ft.); minimum, 12 cfs Sept. 16, 1960 (gage height, -0.37 ft.).

Remarks.—Medium and low flows affected by powerplant above station. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	938	.....
1959	2,355	6,126	5,288	5,286	1,909	2,623	4,678	4,163	4,156	2,013	764	3,937	3,615
1960	3,931	6,958	4,782	1,635	2,612	2,184	3,140	4,119	3,537	1,212	829	861	2,978

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	245	.....
1959	491	1,070	2,620	2,450	1,180	1,750	1,720	2,830	2,360	865	524	782	491
1960	1,380	1,560	1,400	778	1,070	925	2,070	2,060	2,200	598	88	540	88

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					
1958	.....	.....	.....	.....	.....	.....	.....
1959	26,000	Nov. 12, 1958	491	3,615	2,617,000	3,774	2,732,000
1960	61,000	Nov. 23, 1959	88	2,978	2,162,000	.....	.....

Patterson Creek near Fall City, Wash.

Location (revised).—Lat. 47°34'50", long. 121°56'25", in SW¼NE¼ sec. 8, T. 24 N., R. 7 E., 2 miles upstream from mouth and 2¾ miles northwest of Fall City.

Drainage area.—15.5 sq. mi. (revised).

Records available.—February 1947 to October 1950, June 1955 to September 1960. Records for June to October 1945 at site 1¼ miles downstream not equivalent owing to intervening drainage area.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (from topographic map). Prior to June 1955 at different datum.

Average discharge.—8 years (1947-50, 1955-60), 34.7 cfs (25,120 acre-ft. per year).

Extremes.—1947-50, 1955-60: Maximum discharge, 480 cfs Feb. 17, 1949 (gage height, 4.81 ft., datum then in use), from rating curve extended above 130 cfs; maximum gage height, 6.46 ft. Dec. 15, 1959; minimum discharge, 6.4 cfs July 22, 1956, July 26, 1958; minimum gage height, 1.12 ft. July 22, 1956.

Remarks.—Many small diversions 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
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.3	8.93	9.47	.....
1956	32.1	80.1	101	88.1	40.4	61.2	32.1	17.2	16.5	9.48	9.37	13.6	41.8
1957	26.9	32.0	48.6	26.9	74.0	61.2	33.7	17.0	12.6	9.90	9.27*	8.92	29.8
1958	12.3	14.2	29.9	65.8	59.4	33.0	37.5	13.2	9.07	7.36	6.97	8.53	24.6
1959	10.9	36.0	57.5	80.7	46.4	46.4	38.1	26.7	15.6	12.9	9.25	13.5	32.8
1960	19.3	57.7	79.5	45.0	57.4	33.3	39.5	34.1	13.6	9.63	9.60	10.1	34.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.5	7.6	7.8	.....
1950	9.6	27	51	41	27	32	22	14.5	11.5	7.6	8.0	9.4	7.6
1957	11.5	15.5	13.5	14.5	24	31	19	13.5	10.5	8.9	8.4	8.4	8.4
1958	8.7	10	11	18.5	39	23	19	9.5	8.2	6.6	6.6	7.4	6.6
1959	8.1	9.0	36	30*	37	35	22	15.5	12.5	9.6	8.6	8.8	8.1
1960	9.5	16.5	30	23	24	21	26	22	11	9.0	8.5	9.0	8.5

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
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1956	194	Dec. 22, 1955	7.6	41.8	2.70	36.70	30,320	33.0	29.00	23,960
1957	206	Feb. 26, 1957	8.4	29.8	1.92	26.10	21,590	25.5	22.34	18,480
1958	209	Jan. 16, 1958	6.6	24.6	1.59	21.51	17,780	28.6	25.02	20,670
1959	196	Jan. 24, 1959	8.1	32.8	2.12	28.71	23,730	37.2	32.54	26,900
1960	258	Dec. 15, 1959	8.5	34.0	2.19	29.83	24,660	.....	.....	.....

* Estimated.

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.

Records available.—June 1945 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map). Prior to Sept. 21, 1951, at site 1,000 ft. downstream at different datum.

Average discharge.—15 years (1945-60), 42.9 cfs (31,060 acre-ft. per year).

Extremes.—1945-60: Maximum discharge, 764 cfs Nov. 21, 1959 (gage height, 4.41 ft.), from rating curve extended above 200 cfs; maximum gage height, 5.03 ft. Feb. 10, 1951 (site and datum then in use); minimum discharge, 1.1 cfs Aug. 14, 15, 21, 23, 25, 26, 1958; minimum gage height, 0.75 ft. Aug. 22, 23, 1945 (site and datum then in use).

Remarks.—Some small diversions 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
1954...	14.7	56.3	111	84.6	87.5	37.6*	28.0	12.8	46.3	18.5	6.44	13.2	42.8
1955...	7.70	51.7	59.5	50.3	67.9	45.5	70.1	46.8	20.0	20.1	12.2	7.45	38.0
1956...	60.2	114	157	124	38.9	98.2	40.8	13.1	15.5	6.73	3.59	5.10	56.7
1957...	39.7	55.5	64.0	35.9	104	81.7	53.3	19.6	12.2	6.59	5.52*	4.55	39.8
1958...	8.34	32.6	57.6	97.0	83.4	40.3	55.1	14.8	4.71	2.05	1.49	2.30	33.0
1959...	6.35	62.9	101	142	56.1	70.4	49.8	47.4	24.9	9.11	3.48	12.2	48.9
1960...	31.4	112	102	54.1	64.5	34.8	41.8	47.6	14.8	4.18	3.63	4.20	42.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.7	20	45	39	47*	18	17	8.1	20	6.7	4.4	4.9	3.7
1955...	6.1	5.9	36	31	30	24	48	23	11.5	8.2	6.2	5.3	5.3
1956...	7.0	48	68	38	26	41	17.5	8.8	8.4	3.5	3.2	3.0	3.0
1957...	6.8	24	21	21*	36	33	24	11.5	8.5	4.5	4.3	4.0	4.0
1958...	4.3	9.7	24	34	52	27	22	6.2	3.2	1.7	1.3	1.4	1.3
1959...	1.8	8.0	52	60*	41	48	20	24	12	4.1	2.5	3.1	1.8
1960...	11	34	37	29	27	23	26	18	6.0	3.2	2.6	3.2	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
1953								43.2	34.28	31,280
1954	343	Jan. 6, 1954	3.7	42.8	2.50	33.96	30,970	37.4	29.71	27,110
1955	257	Feb. 8, 1955	5.3	38.0	2.22	30.20	27,550	55.9	44.40	40,490
1956	393	Dec. 12, 22, 1955	3.0	56.7	3.32	45.10	41,160	42.2	33.61	30,670
1957	407	Feb. 25, 1957	4.0	39.8	2.33	31.60	28,810	34.7	27.56	25,140
1958	347	Jan. 17, 1958	1.3	33.0	1.93	26.21	23,900	39.0	31.00	28,260
1959	530	Jan. 24, 1959	1.8	48.9	2.86	38.81	35,410	55.1	43.71	39,880
1960	764	Nov. 21, 1959	2.6	42.7	2.50	34.03	31,030			

* Estimated.

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.

Records available.—October 1952 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is about 600 ft. above mean sea level (from river-profile map).

Average discharge.—8 years (1952-60), 394 cfs (285,200 acre-ft. per year).

Extremes.—1952-60: Maximum discharge, 9,560 cfs Dec. 15, 1959 (gage height, 13.15 ft.), from rating curve extended above 2,800 cfs; minimum, 38 cfs Sept. 13, 14, 1958 (gage height, 3.53 ft.); but may have been less sometime during period of no gage-height record in October 1952.

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
1954...	328	459	919	465	554	301	354	398	520	315	198	282	424
1955...	194	506	398	315	456	178	373	550	731	496	222*	109*	376
1956...	505*	760*	747*	465	247	320	549	624	520	249	103	182	440
1957...	509	504*	766	222	370	448	522	484	320	159	112	62.0	373
1958...	120	307	440	554	503	257	388	286	159	80.1	48.7	98.7	269
1959...	301	798	817	898	376	463	709	599	495	237	114	563	526
1960...	536	800	687	329	437	340	436	573	373	142	148	138	411

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	117	225	414	210	315	186	182	202	337	169	121	155	117
1955...	123	107	251	186	194	140	251	260	407	242	110*	90*	90*
1956...	90*	270*	350*	260	184	176	317	416	288	133	73	48	48
1957...	125	250*	230*	145	143	283	326	323	182	110	70	50	50
1958...	51	85	232	326	326	192	192	188	114	55	39	39	39
1959...	53	172	404	408	226	307	283	424	283	124	92	109	53
1960...	217	226	257	145	219	192	314	278	222	92	71	82	71

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
1953								447	154.90	323,600
1954	5,310	Dec. 9, 1953	117	424	10.8	146.68	306,600	372	128.74	269,100
1955	4,640	Feb. 7, 1955	90	376	9.59	130.23	272,300	453	156.89	328,000
1956	7,360	Dec. 11, 1955	48	440	11.2	152.63	319,100	420	146.01	305,200
1957	3,610	Dec. 9, 1956	50	373	9.52	129.27	270,200	296	102.65	214,600
1958	2,250	Jan. 16, 1958	39	269	6.86	92.98	194,400	356	123.39	258,000
1959	4,360	Nov. 20, 1958	53	526	13.4	182.11	380,700	535	185.20	387,200
1960	9,560	Dec. 15, 1959	71	411	10.5	142.72	298,400			

* Estimated.

South Fork Tolt River near Index, Wash.

Location.—Lat. 47°42'25", long. 121°35'55", in NE¼SW¼ sec. 25, T. 26 N., R. 9 E., on left bank half a mile upstream from Phelps Creek, 8 miles south of Index, and 15 miles east of Carnation.

Drainage area.—5.34 sq. mi.

Records available.—December 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,850 ft. (from topographic map).

Extremes.—December 1959 to September 1960: Maximum discharge, 1,780 cfs Dec. 14, 1959 (gage height, 6.28 ft.), from rating curve extended above 120 cfs on basis of slope-area measurements at gage heights 5.5 and 6.28 ft.; minimum, 4.7 cfs Aug. 14, 1960 (gage height, 0.29 ft.).

Peak discharges of 1,330 cfs occurred on Jan. 23 (stage unknown), and 1,200 cfs on Apr. 29 (gage height, 5.5 ft., from floodmarks), results of slope-area measurements.

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
1960...	.....	.....	128	44.2	62.9	56.6	79.2	111	82.6	19.4	22.5	20.3	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	.....	.....	24	11.5*	19*	14*	34	52	39	7.2	4.9	7.0	.....

South Fork Tolt River at upper station, near Carnation, Wash.

Location.—Lat. 47°42'30", long. 121°36'50", in SE¼ sec. 26, T. 26 N., R. 9 E., on right bank 10 miles upstream from mouth and 14½ miles east of Carnation.

Drainage area.—8.82 sq. mi.

Records available.—October 1957 to September 1959.

Gage.—Water-stage recorder. Altitude of gage is 1,850 ft. (from topographic map).

Extremes.—1957-59: Maximum discharge, 2,760 cfs Nov. 12, 1958 (gage height, 6.13 ft.), from rating curve extended above 800 cfs on basis of slope-area measurements at gage heights 5.77 and 5.05 ft.; minimum, 1.1 cfs Aug. 27, 1958.

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
1958...	36.0*	74.9	113	127	93.2	37.4	95.8*	97.1	39.5	8.57	2.78	29.9	62.7
1959...	110	310	255	206	58.1	60.3	157	128	131	48.4	11.7*	131*	134

* Estimated.

South Fork Tolt River at upper station, 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
1958...	7*	12.5	29	41	38	16	25*	50	19	2.7	1.2	2.4	1.2
1959...	6.0	29	47	42	33	31	41	64	55	12*	5*	15*	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
1958.....	773	Jan. 15, 1958	1.2	62.7	7.11	96.48	45,380	100	154.42	72,660
1959.....	2,760	Nov. 12, 1958	5	134	15.2	206.18	97,010	.....	.....	.....

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.

Records available.—October 1952 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,300 ft. (from river-profile map).

Average discharge.—8 years (1952-60), 204 cfs (147,700 acre-ft. per year).

Extremes.—1952-60: Maximum discharge, 6,500 cfs Dec. 15, 1959 (gage height, 7.45 ft.), from rating curve extended above 2,700 cfs; maximum gage height, 7.62 ft. Nov. 20, 1958 (backwater from debris); minimum discharge, 12.5 cfs Aug. 23-27, 1958 (gage height, 0.81 ft.).

Remarks.—No regulation except by coffer dam at reservoir site on a few days. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	185	249	473	195	287	124	189	206	278	143	86.8	128	211
1955...	94.6	280	182	132	246	65.0	192	305	390	252	95.4	48.7	189
1956...	307	384	352	191	90.2	154	300	350	284	129	43.9	102	224
1957...	289	257	428	74.6	187	215	276	262	163	72.6	54.1	28.7	192
1958...	77.6	177	247	284	242	108	208	146	69.7	28.2	16.7	60.6	138
1959...	195	535	404	495	222	268	478	283*	239	115*	43.8	345	301
1960...	287	487	405	139	192	163	216	292	181	56.3	72.3	85.1	214

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	61	95	158	64	146	64	63	77	162	67	44	58	44
1955...	46	41	91	61	64	44	100	110	198	112	41	32	32
1956...	45	113	120	87	58	58	137	211	141	56	31	25	25
1957...	67	111	98	44	48	123	159	170	85	43	30	22	22
1958...	22	52	108	128	132	72	80	88	46	17.5	12.5	15	12.5
1959...	28	84	143	165	124	145	136	185	128	46	25	51	25
1960...	102	89	74	35	66	39	139	127	98	28	23	47	23

* Estimated.

South Fork Tolt River near Carnation, 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
1953								227	156.30	164,200
1954	3,180	Dec. 9, 1953	44	211	10.7	145.63	153,000	182	125.10	131,400
1955	3,230	Feb. 8, 1955	32	189	9.59	130.54	137,200	230	158.73	166,800
1956	5,900	Dec. 11, 1955	25	224	11.4	154.87	162,700	219	151.14	158,800
1957	2,290	Dec. 10, 1956	22	192	9.75	132.61	139,300	153	105.10	110,400
1958	1,130	Jan. 17, 1958	12.5	138	7.01	95.13	99,920	191	131.48	138,100
1959	5,000	Nov. 12, 1958	25	301	15.3	207.73	218,300	305	210.47	221,100
1960	6,500	Dec. 15, 1959	23	214	10.9	148.15	155,600			

Tolt River near Carnation, 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.

Records available.—August 1928 to January 1932, September 1937 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.—Water-stage recorder. Datum of gage is 348 ft. above mean sea level (river-profile survey). Prior to Oct. 31, 1928, staff gage and Oct. 31, 1928, to Jan. 3, 1932, water-stage recorder, at site 350 ft. upstream at datum 7.1 ft. higher (river-profile survey). Sept. 1 to Oct. 6, 1937, staff gage at present datum 1.64 ft. higher.

Average discharge.—26 years (1928-31, 1937-60), 608 cfs (440,200 acre-ft. per year).

Extremes.—1928-32, 1937-60: Maximum discharge, 17,400 cfs Dec. 15, 1959, (gage height, 13.04 ft.), from rating curve extended above 7,600 cfs on basis of slope-area measurement of peak flow; minimum, 53 cfs Sept. 22, 23, 1951 (gage height, 3.84 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
1954	522	846	1,648	810	975	487	498	626	887	504	301	460	720
1955	333	892	709	572	860	333	702	996	1,177	802	358	177	657
1956	896	1,317	1,274	831	420	623	996	1,078	894	406	155	310	767
1957	903	819	1,854	361	688	774	893	806	525	248	175	93.8	637
1958	203	545	792	994	918	438	719	485	244	120	74.9	166	472
1959	538	1,478	1,405	1,533	679	823	1,275	1,022	809	381	166	954	922
1960	933	1,485	1,382	554	765	580	739	987	604	211	233	227	720

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	188	376	704	344	529	270	264	297	560	242	172	234	172
1955	199	175	427	335	339	253	468	472	646	370*	177	132	132
1956	149	465	558	427	315	305	605	690	468	197	118	94	94
1957	199	413	377	228	253	476	540	535	293	162	105	74	74
1958	75	147	388	535	585	320	317	301	170	82	61	63	61
1959	90	279	650	690	418	550	476	707	460	182	126	165	96
1960	336	365	407	231	336	280	530	444	350	140	118	144	118

* Estimated.

Tolt River near Carnation, 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
1953								767	130.63	555,200
1954	9,870	Dec. 9, 1953	172	720	9.03	122.67	521,400	628	106.99	454,800
1955	9,190	Feb. 8, 1955	132	657	8.24	111.82	475,400	787	134.09	570,000
1956	15,000	Dec. 11, 1955	94	767	9.62	131.02	557,000	734	125.32	532,700
1957	6,780	Dec. 10, 1956	74	637	7.99	108.45	461,000	507	86.36	367,000
1958	3,840	Jan. 17, 1958	61	472	5.92	80.38	341,700	629	107.13	455,400
1959	8,960	Nov. 20, 1958	96	922	11.6	156.96	667,200	950	161.73	687,500
1960	17,400	Dec. 15, 1959	118	720	9.03	122.97	522,800			

Stossel Creek near Carnation, Wash.

Location.—Lat. 47°41'45", long. 121°49'50", in SW¼NE¼ sec. 31, T. 26 N., R. 8 E., on right bank 550 ft. upstream from mouth and 5 miles northeast of Carnation.

Drainage area.—5.58 sq. mi.

Records available.—July 1957 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 340 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 311 cfs Nov. 21, 1959 (gage height, 2.53 ft.); minimum, 0.2 cfs Sept. 6, 1958 (gage height, 0.81 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
1957											2.12	1.72	
1958	3.20	17.0	40.8	38.0	34.7	16.4	18.3	5.83	2.59	1.25	.75	.91	14.9
1959	2.82	28.5	38.7	55.0	26.0	30.1	23.5	21.3	15.1	4.81	2.16	6.39	21.2
1960	14.9	43.4	46.4	24.4	35.8	16.4	17.1	24.9	7.33	2.09	1.94	2.05	19.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957											1.1	1.1	
1958	1.4	2.2	15.5	12	17.5	10.5	8.5*	3.3*	1.9	0.9	0.6	0.3	0.3
1959	.6	2.9	23	26	22	25	9.9	13	7.2	2.8	2.0	2.2	.6
1960	5.4	10.5	22	13	13.5	12	11	8.2	3.6	1.3	1.2	1.5	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
1957										
1958	173	Dec. 29, 1957	0.3	14.9	2.67	36.18	10,780	15.6	37.95	11,310
1959	297	Jan. 24, 1959	.6	21.2	3.80	51.52	15,340	24.1	58.61	17,440
1960	311	Nov. 21, 1959	1.2	19.7	3.53	47.97	14,280			

* Estimated.

Snoqualmie River near Carnation, 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.

Records available.—October 1928 to September 1960. Prior to October 1951, published as "near Tolt."

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 than present datum. Auxiliary water-stage recorder 1¼ miles upstream from base gage.

Average discharge.—32 years (1928-60), 3,777 cfs (2,734,000 acre-ft. per year).

Extremes.—1928-60: Maximum discharge, 59,500 cfs Feb. 27, 1932 (elevation, 59.88 ft., from graph based on gage readings); maximum elevation observed, 59.93 ft. Nov. 13, 1932; minimum discharge, 239 cfs Aug. 21, 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 diverted for operation of powerplant at Snoqualmie Falls but returned to river above station. Some pondage at Snoqualmie Falls and some diurnal fluctuation caused by power plant.

Revisions.—The momentary maximum discharge for the water year 1934 published in State WSB No. 6 has been revised to 48,700 cfs Nov. 3, 1933.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,518	5,133	9,176	5,017	6,044	3,181	3,962	4,856	6,254	4,221	2,030	2,150	4,535
1955...	1,843	4,716	3,518	3,172	4,684	2,212	4,208	5,676	7,871	5,629	2,226	1,125	3,894
1956...	5,444	7,885	7,906	4,544	2,279	3,817	5,704	7,103	6,273	3,698	1,138	1,436	4,777
1957...	4,722	4,568	8,388	2,116	3,674	4,287	4,929	5,701	3,452	1,534	910	576	3,742
1958...	1,026	2,625	4,547	5,208	4,974	2,446	4,022	4,152	2,246	895	517	1,170	2,805
1959...	3,067	8,931	7,641	8,424	3,323	4,211	6,793	5,985	5,272	2,617	1,019	5,128	5,202
1960...	5,248	9,342	6,965	2,845	4,241	3,137	4,692	6,040	4,627	1,594	1,197*	1,236	4,256

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,260	2,060	4,200	2,560	3,870	2,010	1,920	2,010	4,340	2,230	1,430	1,310	1,260
1955...	1,040	1,020	2,440	1,830	2,120	1,690	2,680	2,720	4,950	3,310	1,120	874	874
1956...	1,100	3,260	3,760	2,340	1,780	1,870	3,470	4,240	4,050	1,610	856	620	620
1957...	1,120	2,410	2,100	1,160	1,450	2,610	3,040	4,000*	2,070	979	574	486	486
1958...	546	818	2,280	2,800	3,200	1,750	1,800*	2,730	1,600	614	446	446	446
1959...	656	1,450	4,210	4,000	2,110	3,050	2,620	4,110	3,030	1,240	788	1,110	656
1960...	1,950	2,200	2,380	1,320	1,620	1,360	3,230	3,040	2,820	900	480*	805	480*

* Estimated.

Snoqualmie River near Carnation, 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
1953								4,708	105.09	3,408,000
1954	35,700	Dec. 10, 1953	1,260	4,535	7.46	101.24	3,283,000	3,963	88.46	2,869,000
1955	25,300	Feb. 8, 1955	874	3,894	6.40	86.90	2,819,000	4,833	107.87	3,499,000
1956	40,800	Dec. 12, 1955	620	4,777	7.86	106.93	3,468,000	4,483	100.36	3,255,000
1957	27,500	Dec. 10, 1956	486	3,742	6.15	83.53	2,709,000	2,943	65.71	2,131,000
1958	15,400	Jan. 17, 1958	446	2,806	4.61	62.63	2,030,000	3,759	83.94	2,721,000
1959	31,200	Jan. 24, 1959	656	5,202	8.56	116.14	3,766,000	5,363	119.73	3,883,000
1960	49,400	Nov. 23, 1959	480	4,256	7.00	95.27	3,090,000			

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

Records available.—May to October 1911, January 1943 to November 1957. Annual maximum discharge only, water year 1958 to 1960.

Gage.—Water-stage recorder and crest-stage gage. Altitude of gage is 340 ft. (from topographic map). Prior to Oct. 13, 1911, staff gage at approximately same site at different datum. Jan. 14, 1943, to July 9, 1946, several staff gages within 150 ft. of present site at same datum.

Average discharge.—14 years (1943-57), 344 cfs (249,000 acre-ft. per year).

Extremes.—1911, 1943-57: 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.

1911, 1943-57: Minimum discharge 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 from manipulation of diversion gates.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	360	483	866	571	646	256	341	210	452	223	185	217	399
1955	152	654	475	437	521	294	553	419	399	301	144	74.6	367
1956	503	627	669	656	272	439	428	261	346	117	49.7	115	374
1957	495	443	824	263	562	563	463	285	193	85.2	63.2	39.4	356
1958	116	307											

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	117	191	341	211	274	142	186	154	214	92	66	102	66
1955	78	75	245	220	208	156	314	248	200	134	67	57	57
1956	69	200*	249	206	168	191	238	155	145	59	41	36	36
1957	63	160	148	115*	155	332	274	174	106	56	38	34	34
1958	34	67											

* Estimated.

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
	Discharge	Date					
1953						409	296,300
1954	3,950	Jan. 5, 1954	66	399	289,000	362	262,400
1955	5,530	Nov. 16, 1954	57	367	265,500	411	297,400
1956	4,600	Oct. 26, 1955	36	374	271,600	371	269,600
1957	4,480	Dec. 16, 1956	34	356	257,400		
1958							

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.

Records available.—June 1946 to September 1951, September 1952 to September 1960.

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

Average discharge.—13 years (1946-51, 1952-60), 32.4 cfs (23,460 acre-ft. per year).

Extremes.—1946-60: Maximum discharge, 625 cfs Nov. 21, 1959 (gage height, 6.02 ft., from floodmarks); no flow for part of Aug. 31, 1959.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	12.8	46.8	113	84.5	78.0	43.8	27.5	10.7	31.2	12.2	5.23	7.66	39.3
1955	5.51	81.3	66.0	76.3	54.4	41.1	40.0	24.2	17.6	15.3	4.92	2.55	35.6
1956	29.8	63.3*	82.2*	92.8	47.4	46.2	19.4	7.37	16.9	3.39	1.75	2.33	34.4
1957	29.2	47.1	78.4	44.3	93.8*	71.5	30.4	12.2	6.00	3.17	1.78	1.70	34.6
1958	2.93	14.6	38.5	57.9	89.3	36.6	42.2	6.26	2.86	1.71	1.09	1.82	24.2
1959	3.31	24.2	52.0	108	65.0	56.6	41.2	21.5	11.1	2.17	1.23	4.05	32.4
1960	29.7	107	80.6	61.2	60.8	18.7	23.2	27.9	8.19	1.93	2.68	2.85	35.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	2.1	19	40	32*	39	16.5	17.5	6.0	11.5	2.9	1.6	4.3	1.6
1955	3.7	4.5	31	33	28	26	26	13	5.1	3.2	2.3	2.0	2.0
1956	2.8	17*	30*	26*	22*	22	9.4	3.4	3.6	2.0	1.2	1.1	1.1
1957	2.4	24	22	18*	35*	32	18	5.1	3.2	1.8	1.2	1.3	1.2
1958	1.7	2.8	14	19	29	22	17	1.8	1.5	1.2	.6	1.1	.6
1959	1.8	2.0	19	25	40	32	17	13.5	3.8	.9	.4	.4	.4
1960	3.8	17	40	26	21	12.5	12.5	9.2	3.7	1.3	1.1	2.0	1.1

* Estimated.

Little Pinchuck 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
1953								33.6	26.05	24,300
1954	279	Jan. 6, 1954	1.6	39.3	2.25	30.46	28,440	37.5	29.06	27,140
1955	382	Jan. 1, 1955	2.0	35.6	2.03	27.63	25,790	37.6	29.15	27,200
1956	339	①	1.1	34.4	1.97	26.77	25,000	32.7	25.44	23,760
1957	288	②	1.2	34.6	1.98	26.85	25,070	26.3	20.43	19,080
1958	200	Feb. 10, 1958	.6	24.2	1.38	18.77	17,540	26.2	20.31	18,960
1959	324	Jan. 25, 1959	.4	32.4	1.85	25.16	23,470	43.9	34.05	31,780
1960	625	Nov. 21, 1959	1.1	35.3	2.02	27.43	25,590			

① Probably Dec. 22, 1955.
② Probably Feb. 25, 1957.

Snohomish River at Snohomish, Wash.

Location (revised).—Lat. 47°54'45", long. 122°06'30", NE¼SW¼ sec. 13, T. 28 N., R. 5 E., in right bank pier of bridge on State Highway 1A in Snohomish. Prior to Feb. 3, 1960, at site half a mile upstream.

Drainage area.—1,720 sq. mi., approximately.

Records available.—February 1941 to September 1960 (high-water discharges only). Highwater elevations prior to 1932 and high-water profiles on flood peaks since that time are available at the Seattle office of Corps of Engineers.

Gage.—Water-stage recorder. Datum of base gage is 9.86 ft. below mean sea level, datum of 1929. Prior to Feb. 3, 1960, at site half a mile upstream at datum 0.14 ft. higher. Auxiliary water-stage recorder 2 miles downstream from base gage.

Extremes.—1941-60: Maximum discharge, 136,000 cfs Feb. 10, 1951 (gage height, 30.12 ft.). 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.—Large diurnal fluctuation because of tides. No appreciable regulation or diversion at stages for which discharges are published. Station operated for flood flows only; discharge below 10,000 cfs not generally computed.

Revisions.—The momentary maximum discharge for the water year 1951, published in State WSB No. 6 has been revised to 136,000 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954			22,930						18,690				
1955									22,080				
1956								20,440	18,320				
1957								17,330					
1958													
1959			20,380	22,140				17,490	16,520				
1960													

Annual Flood Peaks

WATER YEAR	Date	Gage height (feet)	Discharge (cfs)
1954	Dec. 10, 1953	27.18	54,000
1955	Feb. 8, 1955	27.40	54,800
1956	Nov. 4, 1955	28.10	58,600
1957	Dec. 10, 1956	28.21	59,000
1958	Jan. 17, 1958	23.75	37,500
1959	April 29, 1959	28.40	59,800
1960	Nov. 23, 1959	30.89	113,300

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.

Records available.—June 1946 to September 1960.

Gage.—Water-stage recorder and wooden control. Datum of gage is 28.2 ft. above mean sea level (stadia traverse).

Average discharge.—14 years (1946-60), 25.6 cfs (18,530 acre-ft. per year).

Extremes.—1946-60: Maximum discharge, 240 cfs Nov. 21, 1959 (gage height, 6.83 ft.); minimum, 2.2 cfs July 16, 1951; minimum gage height, 1.49 ft. Sept. 19, 1953, July 29, Aug. 2, 1958.

Remarks.—Several diversions above station for irrigation and domestic use. Some regulation during low flow.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	10.4	31.7	67.2	66.3	54.9	35.3	24.8	12.4	22.2	12.4	7.60	9.80	29.4
1955...	8.35	51.1	52.4	59.0	46.6*	36.8*	33.6*	21.6*	17.8	13.5	6.78	5.38	29.3
1956...	16.6	41.9	76.2	78.6	41.9	37.6	17.9	9.95	15.1	6.36	4.26	5.11	29.3
1957...	22.9	32.6	60.3	37.8	76.0	60.3	32.2	12.9	8.95	7.00	5.22	4.81	29.8
1958...	7.32	20.4	26.0	47.0	71.0	31.7	31.6	8.78	6.92	5.09	3.26	5.77	21.7
1959...	6.61	16.9	36.3	70.4	52.6	47.2	36.9	17.5	12.0	9.17	5.99	5.96	26.3
1960...	17.7	57.0	63.5	50.7	50.8	19.9	24.6	19.4	10.3	5.20	4.86	6.00	27.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	5.1	16	27	30*	28	16.5	15	9.2	11.5	6.0	5.3	7.1	5.1
1955...	7.2	8.0	22	32	27*	24	23	13*	9.3	6.8	5.1	4.6	4.6
1956...	5.4	17	30	25	22	22	11	7.9	7.7	4.7	3.7	3.8	3.7
1957...	5.0	19	18	17.5*	32	35	19	9.5	7.5	6.0	4.4	4.4	4.4
1958...	4.2	9.2	12.5	17	29	19.5	15	6.7	5.2	4.2	2.7	3.0	2.7
1959...	3.5	5.0	13.5	22	34	31	16	12	7.4	6.5	3.0	3.4	3.0
1960...	6.2	15	34	25	22	15	14.5	11.5	7.1	3.7	3.1	5.5	3.1

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
1953	.....	.....	.....	.....	.....	.....	.....	22.8	22.29	16,550
1954	199	Jan. 6, 1954	5.1	29.4	2.12	28.75	21,320	29.6	29.91	21,440
1955	229	Dec. 31, 1954	4.6	29.3	2.11	28.59	21,210	31.3	30.51	22,640
1956	215	Dec. 20, 1955	3.7	29.3	2.11	28.71	21,290	27.8	27.18	20,150
1957	193	Feb. 24, 1957	4.4	29.8	2.14	29.11	21,590	24.6	24.00	17,790
1958	162	Jan. 17, 1958	2.7	21 7	1.56	21.23	15,730	22.3	21.74	16,120
1959	206	Jan. 24, 1959	3.0	26.3	1.89	25.72	19,060	32.9	32.12	23,810
1960	240	Nov. 21, 1959	3.1	27.4	1.97	26.84	19,960	.....	.....	.....

* Estimated.

South Fork Stillaguamish River near Granite Falls, Wash.

Location.—Lat. 48°06'10", long. 121°56'40", in SW¼NW¼ 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 Granite Falls.

Drainage area.—119 sq. mi.

Records available.—December 1902 to July 1903 (gage heights only), July 1928 to September 1960. Published as "at Robe" 1902-03.

Gage.—Water-stage recorder. Altitude of gage is 310 ft. (from river-profile map). Prior to Aug. 31, 1928, staff gage at site 8 miles upstream at different datum.

Average discharge.—32 years (1928-60), 1,062 cfs (768,900 acre-ft. per year).

Extremes.—1928-60: Maximum discharge, 38,800 cfs Feb. 26, 1932 (gage height, 19.7 ft., from graph based on gage readings), from rating curve extended above 15,000 cfs; minimum, 55 cfs Sept. 23, 24, 1938; minimum gage height, 2.99 ft. Aug. 19-21, 1941.

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

Revisions.—The momentary maximum discharges for the water years 1932-35, 1938, 1944-48, and 1951 published in State WSB No. 6 have been revised as follows:

WATER YEAR	MOMENTARY MAXIMUM	
	Discharge (cfs)	Date
1932	32,400	Feb. 26, 1932
1933	22,800	Nov. 13, 1932
1934	19,000	Dec. 21, 1933
1935	24,300	Jan. 24, 1935
1938	17,200	April 18, 1938
1944	21,400	Dec. 3, 1943
1945	20,700	Jan. 7, 1945
1946	16,500	Oct. 25, 1945
1947	22,600	Oct. 25, 1946
1948	19,500	Oct. 19, 1947
1951	27,600	Feb. 9, 10, 1951

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,316	1,594	2,441	1,307	1,915	752	1,159	1,402	1,681	1,150	679	687	1,336
1955...	750	2,174	1,211	777	1,212	454	1,214	1,597	2,079	1,425	590	288	1,144
1956...	2,097	2,224	1,737	1,193	450	856	1,401	1,665	1,543	812	258	558	1,235
1957...	1,729	1,236	2,668	466	1,387	1,209	1,455	1,494	931	454	259	149	1,119
1958...	504	848	1,505	1,592	1,422	654	1,115	941	579	210	114	417	821
1959...	1,132	2,506	2,057	2,129	764	1,178	2,350	1,302	1,235	568	375	1,566	1,430
1960...	1,609	2,750	1,712	1,020	1,214	846	1,224	1,698	1,104	382	423	413	1,197

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	351	552	874	404	846	381	520	474	1,030	592	364	274	274
1955...	198	242	574	368	364	259	592	682	1,110	792	249	168	168
1956...	239	484	604	427	300	304	753	993	765	323	186	126	126
1957...	273	480	405	230*	297	644	812	966	450	245	134	111	111
1958...	113	241	754	665	695	355	468	570	324	132	89	95	89
1959...	151	432	750	743	465	602	590	893	647	226	168	296	151
1960...	367	365	420	215	334	273	737	737	643	203	133	191	133

* Estimated.

South Fork Stillaguamish River near Granite 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
1953								1,419	161.81	1,027,000
1954	13,000	Dec. 9, 1953	274	1,336	11.2	152.42	967,500	1,231	140.47	891,500
1955	16,300	Feb. 8, 1955	168	1,144	9.61	130.49	828,100	1,307	149.09	946,200
1956	20,600	Dec. 11, 1955	126	1,235	10.4	141.24	896,500	1,201	137.43	872,200
1957	25,000	Dec. 9, 1956	111	1,119	9.40	127.65	810,300	885	100.88	640,400
1958	11,100	Dec. 25, 1957	89	821	6.90	93.67	594,500	1,058	120.65	765,700
1959	22,100	Nov. 12, 1958	151	1,430	12.0	163.17	1,036,000	1,462	166.74	1,058,000
1960	24,800	Dec. 15, 1959	133	1,197	10.1	136.97	869,400			

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.

Records available.—October 1936 to October 1957.

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.—21 years (1936-57), 1,592 cfs (1,153,000 acre-ft. per year).

Extremes.—1936-57: Maximum discharge, 27,700 cfs Feb. 9, 1951 (gage height, 27.26 ft.); minimum, 110 cfs Sept. 23, 24, 1951; minimum gage height, 10.44 ft. Oct. 19, 20, 1952.

Peak of Nov. 22, 1959 reached a stage of 27.84 ft., from high-water mark in well (discharge, 28,800 cfs).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,882	2,313	3,946	2,205	3,054	1,241	1,801	1,987	2,401	1,563	999	1,070	2,032
1955	993	3,382	1,914	1,391	1,975	830*	1,930	2,387	2,999	2,085	911	444	1,764
1956	3,025	3,306	2,831	2,075	827*	1,355	2,123	2,321	2,190	1,088	346	832	1,863
1957	2,601	1,839	4,061	753	2,246	2,011*	2,366*	2,332*	1,364	654	391	198	1,735
1958	761												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	454	785	1,530	766	1,410	631	713	657	1,380	720	454	444	444
1955	330	370	914	694	694	560*	939	1,080	1,600	1,060	393	304	304
1956	408	921	1,060	780	560	540	1,170	1,380	1,090	432	264	164	164
1957	404	698	602	290*	350*	1,050*	1,350	1,400*	642	350	198	155	155
1958	176												

* Estimated.

South Fork Stillaguamish River above Jim Creek, near Arlington, Wash.—Cont.

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
1953								2,122	144.73	1,536,000
1954	18,900	Dec. 9, 1953	444	2,032	10.2	138.59	1,471,000	1,871	127.66	1,355,000
1955	20,000	Feb. 8, 1955	304	1,764	8.86	120.32	1,277,000	2,008	136.98	1,454,000
1956	23,400	Dec. 11, 1955	164	1,863	9.36	127.40	1,352,000	1,813	123.96	1,316,000
1957	26,800	①	155	1,735	8.72	118.37	1,256,000			
1958										

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.

Records available.—October 1937 to September 1951, September 1952 to April 1957.

Gage.—Water-stage recorder. Datum of gage is 103.4 ft. above mean sea level (stadia traverse).

Average discharge.—18 years (1937-51, 1952-56), 206 cfs (149,100 acre-ft. per year).

Extremes.—1937-51, 1952-57: 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.—Small diversions 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
1954	220	309	623	391	491	228	275	159	230	126	96.1	119	271
1955	68.5	404	337	316	325	169*	223	228	239	175	81.5	32.9	224
1956	315	424	509	496	168	303	227	147	201	59.3	22.2	56.4	245
1957	350	251	561	212	408	367	263						

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	70	148	274	180*	216	95	103	105	132	38	24	60	24
1955	41	39	170	151	118	91*	138	142	111	55	26	19	19
1956	31	170*	184	170	111	129	133	90	93	28	12.5	12	12
1957	46	107	93	115*	146	210	160						

① Probably Dec. 9, 1956.
* Estimated.

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
1953								248	66.91	179,700
1954	3,520	Dec. 9, 1953	24	271	5.54	75.17	196,100	241	67.02	174,800
1955	2,600	Dec. 31, 1954	19	224	4.58	62.12	162,000	261	72.42	188,900
1956	2,920	Oct. 29, 1955	12	245	5.01	68.09	177,600	238	66.22	172,700
1957	3,650	Dec. 9, 1956								

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.

Records available.—June 1950 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 490 ft. (from topographic map).

Average discharge.—10 years (1950-60), 188 cfs (136,100 acre-ft. per year).

Extremes.—1950-60: 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 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
1954	206	251	357	204	336	150	184	232	268	249	121	94.3	220
1955	126	245*	168	95.1	143	74.5*	174	220	304	261	128	58.8	166
1956	350	344	260	184	59.0	117	221	301	304	224	65.6	130	214
1957	307	169	368	58.7	211	182	198	253	195	96.2	49.0	29.1	176
1958	82.5	104	198	248	234	110	156	214	154	48.1	21.2	63.0	136
1959	172	435	320	281	101	146	366	215	248	151	60.9	242	228
1960	320	501	292	176	199	119	194	266	219	105	67.6	65.9	210

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	54	110	139	64	121	72	78	85	166	141	86	49	49
1955	32	35*	79	50	58	40*	82	90	186	184	58	33	32
1956	44	65	82	84	46	46	108	148	159	87	47	34	34
1957	55	81	75	29*	30	102	122	168	90	50	23	19	19
1958	12	33	77	118	121	66	76	116	84	31	17	14	12
1959	20	76	147	138	68	92	107	138	153	66	38	50	20
1960	58	73	70	33	62	54	131	133	143	56	33	35	33

* Estimated.

Squire Creek near Darrington, 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
1953								226	163.47	163,900
1954	2,460	Dec. 19, 1953	49	220	11.7	159.13	159,600	197	142.26	142,600
1955	1,610	Feb. 7, 1955	32	166	8.83	120.01	120,400	201	145.28	145,700
1956	4,450	Nov. 3, 1955	34	214	11.4	154.77	155,200	205	148.40	148,800
1957	3,700	Dec. 9, 1956	19	176	9.36	127.33	127,600	137	99.29	99,530
1958	2,120	Dec. 25, 1957	12	136	7.23	97.92	98,170	181	130.46	130,800
1959	3,840	Nov. 20, 1958	20	228	12.1	164.72	165,200	244	176.04	176,500
1960	4,490	Nov. 20, 1959	33	210	11.2	152.15	152,600			

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 pier at left bank at highway bridge, 1 mile downstream from Squire Creek and 5 miles northwest of Darrington.

Drainage area.—82.2 sq. mi.

Records available.—June 1950 to September 1957.

Gage.—Water-stage recorder. Altitude of gage is 410 ft. (from topographic map).

Average discharge.—7 years (1950-57), 593 cfs (429,300 acre-ft.).

Extremes.—1950-57: Maximum discharge, 17,500 cfs Nov. 3, 1955 (gage height, 9.55 ft.); minimum, 28 cfs Oct. 18-24, 1952; minimum gage height, 0.70 ft. Sept. 23-30, 1957.

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
1954	553	840	1,264*	716	1,248	497	642	751	701	505	231	232	678
1955	336	1,054	556*	378	614	232	713	749	882	525	238	98.4	529
1956	884	1,267	1,002	710	236	482	890	972	809	422	121	210	668
1957	859	557	1,400	251	701	670	747	710	380	172	92.3	54.6	549

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	187	371	600*	223	425	253	265	286	479	274	155	136	136
1955	99	133	250*	184	222	154	316	344	568	320	108	62	62
1956	71	302	461	341	171	207	500	584	434	158	91	76	71
1957	128	297	260	105*	110*	405	440	420	184	98	56	44	44

* Estimated.

North Fork Stillaguamish River near Darrington, 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
1953								706	116.56	510,900
1954	7,290	①	136	678	8.25	111.95	490,800	617	101.89	446,700
1955	7,750	Feb. 7, 1955	62	529	6.44	87.36	383,000	631	104.18	456,700
1956	17,500	Nov. 3, 1955	71	668	8.13	110.63	485,000	641	106.23	465,700
1957	16,000	Dec. 9, 1956	44	549	6.68	90.73	397,800			

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.

Records available.—July 1928 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 89.34 ft. above mean sea level, datum of 1929. Prior to Sept. 18, 1928, staff gage at same site and datum.

Average discharge.—32 years (1928-60), 1,808 cfs (1,309,000 acre-ft. per year).

Extremes.—1928-60: Maximum discharge, 30,600 cfs Feb. 9, 1951; 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 regulation. 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
1954	2,122	2,839	4,723	2,592	3,787	1,593	2,317	2,375	2,514	1,611	926	1,019	2,359
1955	1,109	3,474*	2,198	1,704	2,440	1,208	2,491	2,480	3,159	1,963	874	418	1,950
1956	2,876	3,750	3,310	2,502	910	1,684	2,516	2,781	2,488	1,185	454	805	2,104
1957	2,999	2,023	4,686	1,041	2,344	2,379	2,383	2,212	1,236	639	452	275	1,890
1958	591	1,350	2,538	3,169	3,046	1,348	1,865	1,356	737	374	231	488	1,416
1959	1,934	4,480	4,057	4,312	1,769	2,440	4,040	2,558	2,059	844	469	2,418	2,615
1960	2,440	4,719	3,493	2,218	2,867	1,720	2,677	2,812	1,740	639	648	669	2,214

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	634	1,260	2,140	900*	1,600*	818	909	1,090	1,670	766	500	540	500
1955	425	500*	1,070	846	1,060	825	1,140	1,260	1,930	1,080	395	280	280
1956	359	1,320	1,370	985	694	778	1,590	1,680	1,330	560	376	265	265
1957	580	1,010	901	500*	624	1,340	1,450	1,370	686	446	292	214	214
1958	217	410	1,210	1,540	1,570	820	892	991	510	293	198	206	198
1959	269	802	1,770	1,760	1,110	1,420	1,200	1,520	944	447	320	405	269
1960	768	753	1,170	589	897	778	1,800	1,570	1,080	390	297	328	297

① Probably Dec. 20, 1953.
* 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	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1953								2,314	116.79	1,676,000
1954	19,500	Dec. 20, 1953	500	2,359	8.77	119.03	1,707,000	2,110	106.50	1,528,000
1955	21,100	Feb. 8, 1955	280	1,950	7.25	98.42	1,412,000	2,218	111.91	1,605,000
1956	26,500	Nov. 8, 1955	265	2,104	7.82	106.50	1,527,000	2,090	105.75	1,517,000
1957	26,800	Dec. 10, 1956	214	1,890	7.03	95.35	1,368,000	1,448	73.04	1,048,000
1958	15,700	Jan. 16, 1958	198	1,416	5.26	71.47	1,025,000	1,916	96.72	1,388,000
1959	28,400	Nov. 12, 1958	269	2,615	9.72	131.97	1,893,000	2,630	132.71	1,904,000
1960	29,400	Nov. 23, 1959	297	2,214	8.23	112.04	1,607,000			

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.

Records available.—June 1950 to September 1951, September 1952 to December 1957.

Gage.—Water-stage recorder and wooden control on concrete base. Datum of gage is 56.6 ft. (stadia traverse).

Average discharge.—6 years (1950-51, 1952-57), 15.9 cfs (11,510 acre-ft. per year).

Extremes.—1950-1957: Maximum discharge, 129 cfs Dec. 10, 1956 (gage height, 1.10 ft.), but may have been higher sometime in December 1953; maximum gage height, 3.26 ft. Feb. 9, 1951 (backwater from Stillaguamish River); minimum discharge, 1.2 cfs Sept. 14, 1951; minimum gage height, 0.14 ft. July 5, 1951 (from outside gage, control leaking).

Remarks.—Some regulation in Armstrong Lake. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	5.01	19.1	47.3*	31.8	25.9	16.6	20.5	11.2	16.2	10.2	8.15	10.7	18.5
1955	7.13	21.7	21.3	27.6	27.3	24.6	21.4	15.5	14.9	12.2*	8.23	5.58	17.2
1956	15.8	31.0	31.0	27.6	24.3	25.2	14.8	7.73	8.57	4.29	3.82	3.86	16.5
1957	15.1	17.2	31.2	21.5	32.3	32.4	20.7*	12.2	7.34	5.44	4.54	3.90	16.9
1958	4.47	8.14	20.4										

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	3.1	9.8	20*	17.5	19	10.5	11.5	8.9	9.3	5.5*	4.8	6.6	3.1
1955	5.7	6.6	16	19	21	19	12.5	11.5	7.7	6.3*	5.7	4.8	4.8
1956	5.1	18	22	20	18	20	10	5.7	5.4	3.6	3.4	3.0	3.0
1957	3.4	11	10.5	9.5	13.5	22	11.5	7.3	5.4	4.3	3.6	3.4	3.4
1958	3.6	4.0	7.8										

* Estimated.

Armstrong 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
1953								14.8	27.44	10,740
1954			3.1	18.5	2.52	34.30	13,420	16.7	30.93	12,100
1955	53	Feb. 8, 1955	4.8	17.2	2.35	31.88	12,460	19.5	36.19	14,160
1956	63	Dec. 1, 1955	3.0	16.5	2.25	30.62	11,970	15.3	28.44	11,110
1957	129	Dec. 10, 1956	3.4	16.9	2.31	31.28	12,230	14.3	26.53	10,370

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 ft. upstream from highway bridge and 2 miles north of Bryant.

Drainage area.—49.7 sq. mi.

Records available.—March 1929 to September 1931, June 1950 to September 1951, September 1952 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 119.8 ft. above mean sea level (stadia traverse). Prior to Oct. 1, 1931, staff gage at site 100 ft. downstream at different datum.

Average discharge.—11 years (1929-31, 1951-60), 280 cfs (202,700 acre-ft. per year).

Extremes.—1929-31, 1950-60: Maximum discharge, 6,240 cfs Dec. 9, 1956 (gage height, 7.60 ft.), from rating curve extended above 3,900 cfs; minimum observed, 0.5 cfs Aug. 29 to Sept. 1, 1931 (gage height, 0.90 ft., site and datum then in use).

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
1954	292	502	883	494	573	240	328	166	256	106	121	162	342
1955	133	490	449	428	463	248	458	293	286	228	88.5	33.3	298
1956	467	552	565	649	203	434	329	147	178	36.1	7.51	79.9	305
1957	537	332	722	205	397	511	296	127	60.2	37.8	32.2	8.89	272
1958	65.7	245	487	502	552	209	276	63.9	23.8	7.47	1.59	39.3	204
1959	352	666	591	719	403	478	519	237	159	41.2	32.5	348	378
1960	271	741	531	434	551	323	460	304	103	13.6	57.6	73.1	320

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	29	201	355	157	236	79	110	94	112	24	12.5	54	12.5
1955	39	52	168	168	150	94	186	160	102	39	14.5	8.5	8.5
1956	30	127	171	170*	112	132	139	68	66	4.4	2.4	4.0	2.4
1957	35	109	93	70*	100	267	125	51	26	13	7.9	5.8	5.8
1958	5.8	30	174	194	258	129	101	14	6.0	1.5	1.1	3.4	1.1
1959	9.4	140	190	222	193	271	117	76	54	6.5	4.6	40	4.6
1960	83	106	150	82	117	90	182	140	45	3.4	3.1	31	3.1

* 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
1953								338	92.20	244,400
1954	3,870	Dec. 20, 1953	12.5	342	6.88	93.44	247,700	291	79.41	210,500
1955	4,370	Feb. 8, 1955	8.5	298	6.00	81.46	215,900	341	93.26	247,200
1956	3,570	Nov. 3, 1955	2.4	305	6.14	83.43	221,200	306	83.79	222,100
1957	6,240	Dec. 9, 1956	5.8	272	5.47	74.39	197,100	205	56.04	148,500
1958	2,540	Dec. 25, 1957	1.1	204	4.10	55.68	147,600	272	74.18	199,600
1959	5,980	Nov. 12, 1958	4.6	378	7.61	103.24	273,700	372	101.66	269,500
1960	6,030	Nov. 22, 1959	3.1	320	6.44	87.72	232,500			

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.

Records available.—June 1950 to November 1953. Annual maximum discharge only, water years 1955-60.

Gage.—Water-stage recorder. Altitude of gage is 50 ft. (from topographic map). Prior to Mar. 13, 1952, at site 250 ft. upstream with artificial control and at different datum. October 1954 to September 1960, crest-stage gage 250 ft. upstream at different datum.

Extremes.—1950-53: Maximum discharge, 66 cfs (revised) Jan. 2, 1951 (gage height, 2.17 ft.); minimum, 0.3 cfs part of each day Aug. 20-26, Sept. 4-7, 1951; minimum gage height, 0.5 ft. July 25, Aug. 14, 15, 16, 18, 1953, present datum.

1950-53, 1955-60: Maximum discharge, 207 cfs Dec. 20, 1955, may have been affected by failure of beaver dam upstream (gage height, 12.09 ft., from crest-stage gage, at different datum).

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
1954	2.15												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1.0												

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 the international boundary, and 27 miles southeast of Hope.

Drainage area.—357 sq. mi.

Records available.—April to December 1915, April 1916 to September 1922, October 1934 to September 1955.

Gage.—Chain gage. Altitude of gage is 1,670 ft. (from topographic map). Prior to October 1934, water-stage recorder at site 550 ft. downstream at different datum. October 1934 to June 11, 1955, water-stage recorder at present site and datum.

Average discharge.—27 years (1916-22, 1934-55), 999 cfs (723,200 acre-ft. per year).

Extremes.—1915-22, 1934-55: 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.

Cooperation.—This station is 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
1954...	679	960	785	549	766	593	885	3,570	4,010*	3,970	1,480	892	1,600
1955...	576	1,360	930	496	351	289	665	1,710	4,430*	2,530*	847	420	1,220

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	438	728	610	426	412	462	448	770	2,710*	2,100	1,040	656	412
1955...	484	457	680	373	310*	272	334	564	1,940	1,370	563	280*	272

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
1953	.....	.....	.....	.....	.....	.....	.....	1,190	45.30	862,200
1954	6,820	May 19, 1954	412	1,600	4.48	60.88	1,158,000	1,640	62.27	1,185,000
1955	9,760	June 12, 1955	272	1,220	3.42	46.34	882,300	.....	.....	.....

* 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., (unsurveyed) 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.

Records available.—September 1948 to September 1956.

Gage.—Water-stage recorder. Altitude of gage is 1,640 ft. (by barometer).

Average discharge.—8 years (1948-56), 744 cfs (538,600 acre-ft. per year).

Extremes.—1948-56: 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 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
1954...	351	369	302	226*	271	221	367	2,006	2,445	2,599	980	448	887
1955...	298	757	393	226	168	86.8	295	957	2,361*	1,676	520	221	665
1956...	557	943	297	174	115*	113*	844	2,421	2,536	1,592	499	284	866

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	215	235	258	150*	154	188	182	367	1,600	1,470	622	279	150
1955...	184	293	293	178	100	59	122	262	1,180	760*	296	104	59
1956...	92	332	237	133*	105*	80*	181	810	1,830	640	321	188	80*

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
1953								665	45.36	481,200
1954	4,630	July 1, 1954	150	887	4.46	60.51	642,000	922	62.89	667,400
1955	6,540	①	59	665	3.34	45.34	481,300	694	47.34	502,400
1956	6,240	Oct. 25, 1955	80	866	4.35	59.21	628,400			

* Estimated.
① About June 11, 1956.

Ross Reservoir near Newhalem, Wash.
(International gaging station)

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.

Records available.—March 1940 to September 1960. Prior to October 1945, published as Ruby Reservoir near Newhalem.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (city of Seattle Ross Dam datum); 1.79 ft. above mean sea level, U. S. Coast and Geodetic Survey datum of 1929, 1947 adjustment; and 0.88 ft. above mean sea level, Geodetic Survey of Canada 1959 datum (by water level transfer of elevation from the international boundary). Prior to Sept. 24, 1940, staff gage on west shore at site just uplake from Ross Dam at same datum. Sept. 24, 1940, to June 28, 1943, water-stage recorder at present site and datum. June 29, 1943, to Apr. 29, 1948, staff gage on right bank at site 500 ft. uplake from dam at present datum.

Extremes.—1940-60: Maximum contents observed, 1,406,500 acre-ft. Aug. 23, 1954 (elevation, 1,600.10 ft., from plant log); minimum not determined.

Remarks.—Reservoir is formed by concrete dam completed to elevation 1,615 ft. in 1949; storage began Mar. 11, 1940. Capacity, 1,202,920 acre-ft. between elevations 1,250 ft. (lowest outlet) and 1,582 ft. (spillway crest). Dead storage negligible. Water used for power and to supplement low flow of Skagit River through city of Seattle's Diablo and Newhalem powerplants.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1954	1,258,500	1,202,000	1,081,900	943,000	821,530	622,300	488,820	763,070	1,157,400	1,400,700	1,403,000	1,379,800
1955	1,309,500	1,245,300	1,148,000	969,200	802,630	589,970	496,660	625,180	1,258,500	1,399,500	1,391,400	1,244,400
1956	1,314,000	1,247,500	1,128,100	943,900	731,890	530,590	571,110	1,006,600	1,278,400	1,403,000	1,397,200	1,352,400
1957	1,326,300	1,250,800	1,181,700	930,000	746,570	608,760	602,440	1,191,300	1,384,400	1,394,900	1,398,300	1,323,000
1958	1,199,800	1,055,700	918,100	787,350	723,020	604,530	616,570	1,188,100	1,372,900	1,400,700	1,401,800	1,355,800
1959	1,276,200	1,205,200	1,168,000	1,009,500	801,780	603,140	582,490	846,740	1,363,800	1,403,000	1,379,800	1,393,700
1960	1,305,000	1,251,900	1,116,700	895,500	748,200	677,400	731,900	933,700	1,329,700	1,405,300	1,342,200	1,325,800

NOTE—All contents are from elevations at 12 p. m.

Thunder Creek below McAllister Creek, near Newhalem, Wash.

Location.—Lat. 48°39', long. 121°03', in SE¼ sec. 1, T. 36 N., R. 13 E. (unsurveyed), on right bank a quarter of a mile downstream from McAllister Creek, 4 miles upstream from mouth, and 10 miles east of Newhalem.

Drainage area.—96 sq. mi., approximately.

Records available.—October 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,700 ft. (from river-profile map). Prior to Mar. 22, 1959, at datum 0.99 ft. higher.

Extremes.—1957-60: Maximum discharge, 4,320 cfs Nov. 23, 1959 (gage height, about 9.50 ft., from high-water mark in well), from rating curve extended above 2,300 cfs by logarithmic plotting; minimum, 82 cfs Mar. 14, 1960 (gage height, 0.73 ft.).

Remarks.—No regulation or diversion above station.

Thunder Creek below McAllister 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
1958...	302*	204*	151	177	191	144*	212	1,185	1,400	1,323	984	603	576
1959...	546	401	584	267	126*	131*	460	759	1,384	1,476	880	833	657
1960...	755	764	309	137	172	165	376	649	1,312	1,389	886	543	622

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	125*	130*	135*	125*	130*	115*	130*	415	698	686	674	260*	115*
1959...	215	219	269	189	100*	110*	260	421	882	818	543	487	100*
1960...	322	217	154	100	102	82	235	406	658	906	385	397	82

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	charge	Date				Inches	Acre-feet		Inches	Acre-feet
1958.....	4,010	Oct. 30, 1957	115	576	6.00	81.42	416,900	649	91.83	470,200
1959.....	3,660	Dec. 2, 1958	100	657	6.84	92.88	475,600	681	96.30	493,100
1960.....	4,320	Nov. 23, 1959	82	622	6.48	88.25	451,800	.....	.....	.....

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 high-water line of Diablo Reservoir at elevation 1,205 ft., 8 miles east of Newhalem, and 20 miles northeast of Marblemount.

Drainage area.—105 sq. mi. (revised).

Records available.—October 1930 to September 1960. Published as "above Colonial Creek, near Marblemount" 1930-31.

Gage.—Water-stage recorder. Altitude of gage is 1,220 ft. (from river-profile map).

Average discharge.—30 years (1930-60), 620 cfs (448,900 acre-ft. per year).

Extremes.—1930-60: Maximum discharge, 10,800 cfs Oct. 25, 1955 (gage height, 12.68 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 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
1954...	526	391	379	216	270	194	288	958	1,190	1,591	1,166	744	603
1955...	364	777	296	162	127	92.3	211	568	1,475	1,457	1,031	636	602
1956...	777	732	247	140	89.3	91.1	458	1,168	1,462	1,709	1,066	794	730
1957...	602	339	448	143*	149	173	46	1,336	1,372	997	739	679	613
1958...	356	239	178	220	233	179	257	1,345	1,518	1,424	1,095	684	647
1959...	624	477	609	336	164	162	523	836	1,476	1,576	927	879	727
1960...	827	810	352	157	193	188	439	706	1,407	1,485	926	543	671

* Estimated.

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
1954...	217	252	261	110	122	146	144	247	698	1,140	779	338	110
1955...	219	378	205	120	100	84	110	184	568	797	606	247	84
1956...	243	228	165	102*	80*	72	122	406	955	995	694	470	72
1957...	308	241	232	86*	92	142	191	828	747	731	459	385	86
1958...	152	150	156	150	161	142	159	516	816	794	780	313	142
1959...	240	236	317	249	128	138	287	499	970	880	555	496	128
1960...	331	216	189	114	123	100	288	449	706	960	386	389	100

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
1953								623	76.86	450,900
1954	2,850	Aug. 23, 1954	110	363	6.03	81.77	479,600	673	83.12	487,600
1955	3,160	July 16, 1955	84	602	5.47	74.23	435,500	629	77.60	455,300
1956	10,800	Oct. 25, 1955	72	730	6.64	90.31	529,900	700	86.59	508,100
1957	2,790	June 11, 1957	86	613	5.57	75.66	443,900	561	69.23	406,200
1958	4,060	Oct. 30, 1957	142	647	5.88	79.84	468,400	734	90.53	531,100
1959	4,730	Dec. 2, 1958	128	727	6.61	89.66	526,000	742	91.53	537,000
1960	5,880	Nov. 23, 1959	100	671	6.10	82.97	486,800	.....	.....	.....

Diablo Reservoir near Newhalem, Wash.

Location.—Lat. 48°43'00", long. 121°08'00", in SE¼ sec. 5, T. 37 N., R. 13 E. (unsurveyed), in Diablo Dam on Skagit River, 1 mile downstream from Thunder Creek and 6 miles northeast of Newhalem.

Drainage area.—1,100 sq. mi., approximately.

Records available.—October 1929 to September 1960.

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.—1929-60: Maximum contents, 90,600 acre-ft. July 14, 1933 (elevation, 1206.5 ft.); minimum since storage began, not determined.

Remarks.—Reservoir is formed by concrete dam, completed in 1930; storage began October 1929. Usable capacity, 76,220 acre-ft. between elevations 1,040 (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 power plants. 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
1954...	87,410	88,400	82,940	86,430	86,960	88,670	87,230	85,020	86,430	89,130	88,130	86,520	.....
1955...	86,700	87,140	85,640	88,490	88,400	87,860	85,200	84,760	85,820	87,140	87,950	86,430	.....
1956...	86,790	87,410	85,200	88,400	87,410	85,990	85,200	86,960	86,700	85,990	86,080	85,110	.....
1957...	87,230	87,320	86,790	86,790	85,200	83,890	87,590	85,020	84,240	83,800	89,130	84,060	.....
1958...	83,550	82,770	84,760	87,590	85,460	83,290	86,340	83,980	75,110	87,860	85,460	88,220	.....
1959...	89,220	84,670	85,820	86,340	83,630	88,040	85,290	83,800	82,170	83,800	84,150	84,320	.....
1960...	84,240	84,240	87,320	84,150	88,760	88,950	83,980	78,750	80,060	79,900	87,950	83,290	.....

* Estimated.

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.

Records available.—December 1913 to November 1915 (fragmentary), September 1933 to September 1960. Published as "near Marblemount" 1913-15.

Gage.—Water-stage recorder. Altitude of gage is 925 ft. (by barometer). Dec. 19, 1913, to Nov. 14, 1915, staff gage at site about half a mile downstream at different datum. Sept. 7 to Oct. 20, 1933, staff gage and Oct. 21, 1933, to Aug. 26, 1937, water-stage recorder, at site 750 ft. (revised) upstream at datum 1.69 ft. higher. Aug. 27, 1937, to Nov. 20, 1957, water-stage recorder at site 600 ft. upstream at same datum.

Average discharge.—27 years (1933-60), 179 cfs (129,600 acre-ft. per year).

Extremes.—1913-15, 1933-60: Maximum discharge, 8,580 cfs Nov. 26, 1949 (gage height, 9.70 ft.), from rating curve extended above 1,600 cfs on basis of slope-area measurement of peak flow; minimum, 9 cfs Nov. 9-11, 1936.

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
1954...	202	195	169	80.4	143	77.6	150	380	411	481	276	184	230
1955...	169	360	110	51.8	53.8	30.5*	117	272	464	396	182	93.1	192
1956...	310	245	120	52.7	26.6*	45.5*	233	455	431	396	169	174	222
1957...	267	139	216	45.5*	85.9*	93.1	205	428	328	204	118	86.7	185
1958...	94.7	81.9	109	146	150	74.5	136	412	339	162	81.8	118	159
1959...	194	222	303	160	52.6	91.8	310	309	455	380	163	285	244
1960...	279	266	128	73.9	98.8	104	207	288	430	287	125	88.3	198

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	54	94	88	34	51	52	53	75	182	312	165	75	34
1955...	46	78	62	33	34	26	59	81	192	241	94	43	26
1956...	54	60*	55*	34*	21*	18*	65	171	268	179	110	60*	18*
1957...	90	77	75	19*	21*	60*	116	214	169	124	72	55*	19*
1958...	29*	42	63	60	70	40	73	190	147	104	58	42	29*
1959...	37	76	113	91	36	58	129	156	271	163	101	99	36
1960...	77	52	50	25	36	30	101	148	178	145	70	51	25

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
1953								214	135.52	154,700
1954	1,710	Oct. 30, 1953	34	230	10.7	145.75	166,400	235	149.37	170,500
1955	1,620	Nov. 22, 1954	26	192	8.97	121.92	139,200	196	124.07	141,600
1956	4,330	Oct. 25, 1955	18	222	10.4	141.16	161,100	218	138.50	158,100
1957	1,710	Oct. 20, 1956	19	185	8.64	117.64	134,300	157	99.63	113,700
1958	1,100	Oct. 30, 1957	29	159	7.43	100.75	115,000	195	123.80	141,300
1959	2,050	Dec. 2, 1958	36	244	11.4	155.08	177,000	241	152.63	174,200
1960	1,690	Nov. 24, 1959	25	198	9.25	125.92	143,700			

* Estimated.

Gorge Reservoir near Newhalem, Wash.

Location.—Lat. 48°41'55", long. 121°12'20", in N½NW¼ sec. 14, T. 37 N., R. 12 E., on Skagit River 2 miles upstream from city of Seattle Gorge powerplant at Newhalem.

Drainage area.—1,110 sq. mi., approximately.

Records available.—June to September 1960.

Gage.—Reference point on Gorge Dam. Datum of gage is at mean sea level, Gorge High Dam datum, and 1,792 ft. below mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers).

Extremes.—June to September 1960: Maximum contents observed, 1,621 acre-ft. Aug. 10 (elevation, 820.6 ft.); minimum not determined.

Remarks.—Reservoir is formed by concrete dam, completed Dec. 27, 1960; storage began June 27, 1960. Usable capacity, 6,700 acre-ft. between elevations 820 and 875 ft. (storage between normal operating elevations 870 and 875 ft., 1,033 acre-ft.). Dead storage, 7,235 acre-ft. Crest of spillway is at elevation 825 ft. Water is used by city of Seattle for power development at Gorge powerplant. Figures given herein represent total contents.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960	.....	.....	.....	.....	.....	.....	.....	.....	183	1,464	1,013	1,609	.....

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 upstream from Bacon Creek, and 13 miles northeast of Marblemount.

Drainage area.—1,160 sq. mi., approximately, of which 400 sq. mi. is in Canada.

Records available.—October 1908 to May 1914 and October 1920 to September 1960 in reports of Geological Survey. October 1908 to September 1953 (monthly discharge only), in State Water-Supply Bulletin 6. Published as "near Marblemount" 1908-14, 1920-31.

Gage.—Water-stage recorder. Datum of gage is 401.5 ft. above mean sea level (river-profile survey). Prior to May 24, 1914, staff gages at site half a mile upstream at datum 91 ft. higher. Nov. 15, 1920, to June 4, 1923, staff gage at site about 500 ft. upstream at same datum.

Average discharge.—52 years (1908-60), 4,430 cfs (3,207,000 acre-ft. per year), adjusted for storage in Diablo Reservoir since October 1929, Ross Reservoir since March 1940, and Gorge Reservoir since June 1960.

Extremes.—1908-14, 1920-60: 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.

Remarks.—Water is diverted 3 miles above station and is returned to river at Seattle powerplant just above station. Flow regulated for power at Gorge Dam since August 1924 and by Diablo, Ross, and Gorge Reservoirs (see elsewhere in this report), having a combined capacity of 1,280,000 acre-ft.

Skagit River at Newhalem, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	4,720	4,807	5,676	4,618	5,477	5,498	5,804	7,208	6,071	9,855	6,392	4,196	5,920
1955...	3,705	7,563	4,916	4,710	4,529	4,578	4,337	4,269	4,644	7,557	4,340	3,184	4,870
1956...	5,575	7,670	4,561	4,495	4,759	4,591	5,387	7,230	9,529	7,630	4,192	3,834	5,784
1957...	5,049	4,586	5,614	5,731	5,121	4,523	3,996	4,772	6,080	4,279	2,487	3,415	4,635
1958...	3,560	3,910	3,929	4,400	3,779	4,026	2,710	3,439	5,575	3,843	2,853	3,113	3,761
1959...	4,799	5,349	6,862	6,489	5,687	5,289	5,922	5,472	5,917	8,642	4,049	4,209	5,724
1960...	6,918	6,695	5,797	5,413	4,816	3,612	4,456	4,495	5,311	6,006	4,246	2,409	5,019

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,850	3,320	4,300	2,720	3,640	3,810	4,160	3,810	4,660	5,690	3,320	2,740	2,720
1955...	2,500	3,720	3,400	3,580	2,460	2,990	2,640	1,530	3,000	4,090	1,660	1,190	1,190
1956...	1,800	3,590	2,440	2,920	3,700	1,180	3,420	4,310	6,850	4,730	2,720	1,100	1,100
1957...	2,720	3,190	4,450	5,560	3,170	2,680	1,620	3,280	2,950	1,980	1,390	1,180	1,180
1958...	2,140	2,620	1,160	3,440	2,470	2,100	1,410	1,530	3,080	1,350	1,190	1,330	1,160
1959...	2,930	3,420	4,540	4,100	4,560	2,830	5,090	3,270	3,360	3,970	2,080	2,670	2,080
1960...	2,800	3,250	2,950	2,560	2,890	1,230	2,450	2,050	3,660	1,320	2,280	1,150	1,150

Summary

YEAR	WATER YEAR ENDING SEPTEMBER								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	4,289	3,105,000	4,884	57.10
1954.....	18,600	July 3, 1954	2,720	5,920	4,286,000	5,969	5.15	69.85	6,003	4,346,000	6,098	71.35
1955.....	20,100	July 16, 1955	1,190	4,870	3,526,000	4,821	4.16	56.41	5,000	3,620,000	4,972	58.18
1956.....	17,500	Oct. 25, 1955	1,100	5,784	4,199,000	5,794	4.99	67.99	5,576	4,048,000	5,652	66.32
1957.....	10,900	June 7, 1957	1,180	4,635	3,356,000	4,594	3.96	53.75	4,310	3,120,000	3,942	46.15
1958.....	7,030	June 20, 1958	1,160	3,761	2,722,000	3,811	3.29	44.59	4,233	3,065,000	4,580	53.58
1959.....	11,900	July 2, 1959	2,080	5,724	4,144,000	5,771	4.98	67.54	5,924	4,289,000	5,855	.....
1960.....	15,000	Nov. 23, 1959	1,150	5,019	3,644,000	4,927	.....	.....	.....	.....	.....	.....

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., approximately, of which 400 sq. mi. is in Canada.

Records available.—October 1950 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 358.8 ft. above mean sea level (river-profile survey).

Average discharge.—10 years (1950-60), 5,747 cfs (4,161,000 acre-ft. per year).

Extremes.—1950-60: Maximum discharge, 29,400 cfs Oct. 25, 1955 (gage height, 14.64 ft.); minimum, 990 cfs Dec. 29, 1957 (gage height, 4.55 ft.); minimum daily, 1,360 cfs Mar. 18, 1956.

Remarks.—All diversions returned to river above gage. Flow partly regulated by powerplants on upper Skagit River, and by Ross, Diablo and Gorge Reservoirs (see elsewhere in this report).

Skagit River above Alma Creek, near Marblemount, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	5,477	5,640	6,559	5,065	6,122	5,864	6,285	8,517	7,813*	11,770	7,384	4,850	6,792
1955...	4,467	9,329	5,522	5,019	4,861	4,732	4,826	5,203	6,511	9,212	5,117	3,555	5,699
1956...	6,896	9,382	5,254	4,926	4,970	4,897	6,385	9,066	11,590	9,255	4,740	4,237*	6,798
1957...	6,234	5,351	6,793	6,117	5,705	5,073	4,867	6,555	7,512	5,181	2,976	3,834	5,516
1958...	4,126	4,448	4,615	5,389	4,674	4,509	3,344	5,098	7,043	4,580	3,207	3,687	4,558
1959...	5,893	6,705	8,425	7,370	5,784	5,495	6,930	6,596	7,603	10,490	4,513	5,189	6,759
1960...	8,129	7,985	6,691	5,926	5,516	4,128	5,406	5,797	6,778	6,876	4,609	2,762	5,886

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3,370	3,940	4,800	3,460	4,360	4,270	4,570	4,100	5,500*	7,240	4,040	3,400	3,370
1955...	2,870	4,240	3,820	4,110	2,580	3,220	3,040	2,360	4,520	5,530	2,220	1,530	1,530
1956...	2,720	4,330	3,020	3,440	3,920	1,360	3,840	5,020	8,120	5,420	3,200	1,500	1,360
1957...	3,100*	3,750	4,970	5,840	3,390	3,050	2,300	4,580	3,760	2,800	1,680	1,450	1,450
1958...	2,390	3,070	1,900	4,130	3,160	2,520	1,940	2,610	4,010	2,400	1,480	1,890	1,480
1959...	3,370	4,160	5,470	5,270	4,560	3,660	5,420	4,370	4,540	4,780	2,400	3,220	2,400
1960...	3,160	3,650	3,630	2,720	3,550	1,600	3,530	3,130	4,460	2,080	2,800	1,430	1,430

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					
1953						5,141	3,722,000
1954	19,400	July 3, 1954	3,370	6,792	4,917,000	6,921	5,011,000
1955	24,600	July 16, 1955	1,530	5,699	4,126,000	5,887	4,262,000
1956	29,400	Oct. 25, 1955	1,360	6,798	4,935,000	6,542	4,749,000
1957	16,800	Oct. 17, 1956	1,450	5,516	3,993,000	5,078	3,676,000
1958	10,100	June 20, 1958	1,480	4,558	3,300,000	5,218	3,777,000
1959	19,100	Dec. 2, 1958	2,400	6,759	4,893,000	6,906	5,000,000
1960	20,100	Nov. 23, 1959	1,430	5,886	4,273,000		

*Estimated.

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.

Records available.—September 1928 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 380.3 ft. above mean sea level (river-profile survey). Prior to Oct. 10, 1928, staff gage at same site at datum 0.76 ft. higher.

Average discharge.—32 years (1928-60), 1,017 cfs (736,300 acre-ft. per year).

Extremes.—1928-60: 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 regulation or diversion above station.

Cascade 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
1954...	898	1,064	1,210	717	1,071	581	750	1,829	2,213	2,790	1,794	1,195	1,345
1955...	754	1,468	693	441	407	257	619	1,153	2,780	2,275*	1,178	640	1,057
1956...	1,202	1,604*	918*	466	257	311	1,113	2,278	2,363	2,056	919	761	1,189
1957...	1,134	761	1,165	381	485	593	847	2,283	1,969	1,217	718	529	1,011
1958...	477	484	547	775	729	472	651	2,111	1,868	1,005	691	717	883
1959...	1,017	1,191	1,655	1,065	452	491	1,178	1,637	2,609	2,370	1,000	1,439	1,345
1960...	1,512	1,797	964	481	666	556	1,047	1,490	2,225	1,800	909	635	1,174

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	414	616	768	349	411	394	400	512	1,390	1,900	1,280	630	349
1955...	436	456	543	330	285	222	387	425	1,140	1,600*	690	354	222
1956...	363	600*	520*	324	218	208	378	872	1,570	1,020	656	481	208
1957...	507	548	469	248	212	421	370	1,420	1,170	815	429	374	212
1958...	235	332	394	464	492	349	370	992	1,050	855	544	388	235
1959...	391	500	815	745	312	372	576	1,020	1,860	1,130	694	622	312
1960...	640	464	486	272	359	305	715	988	1,280	1,140	554	443	272

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								1,147	91.03	830,300
1954	5,470	Aug. 23, 1954	349	1,345	7.87	106.72	973,600	1,322	104.96	957,400
1955	6,290	June 11, 1955	222	1,057	6.18	83.93	765,400	1,126	89.37	814,900
1956	10,800	Oct. 25, 1955	208	1,189	6.95	94.68	863,500	1,135	90.36	824,200
1957	4,650	Oct. 17, 1956	212	1,011	5.91	80.24	731,900	880	69.86	637,100
1958	5,060	Oct. 30, 1957	235	883	5.16	70.10	639,300	1,081	85.82	782,700
1959	9,110	Dec. 3, 1958	312	1,345	7.87	106.82	974,100	1,379	109.45	998,100
1960	10,600	Nov. 23, 1959	272	1,174	6.87	93.43	852,000			

* 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.

Records available.—August to November 1910 (fragmentary gage heights only), October 1917 to September 1922, August 1928 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 930 ft. (from river-profile map). Prior to Nov. 18, 1910, staff gage three-eighths of a mile downstream at different datum.

Average discharge.—37 years (1917-22, 1928-60), 1,136 cfs (822,400 acre-ft. per year).

Extremes.—1917-22, 1928-60: Maximum discharge, 30,200 cfs Nov. 27, 1949 (gage height, 14.90 ft., in gage well), from rating curve extended above 15,000 cfs; minimum 115 cfs Nov. 15, 16, 30, Dec. 1, 1936.

Remarks.—No regulation or diversion above station.

Sauk River above 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
1954...	901	1,314	1,687	919	1,328	697	949	2,101	2,494	2,875	1,393	843	1,460
1955...	818	1,715	760*	472	669	293	724	1,429	3,117	2,357	982	431	1,147
1956...	1,692	2,255	1,308	647	286	483	1,398	2,875	2,948	2,345	739	639	1,471
1957...	1,435	1,062	1,986	437	765	774	1,168	2,724	1,938	918	456	328*	1,170
1958...	427	595	924	1,117*	1,006	580	987	2,464	1,784	712	324	493	951
1959...	1,010	1,999	2,018	1,504	525	722	1,718	1,895	2,675	1,975	638	1,480	1,516
1960...	1,845	2,268	1,483	612	811	610	1,232	1,760	2,188	1,289	524	383	1,250

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	402	703	836	380	510	408	444	570	1,610	1,830	940	444	380
1955...	300	396	600*	311	315	228	432	468	1,370	1,680	493	254	228
1956...	261	670	583	354	228	220	482	1,250	1,960	1,020	459	307	220
1957...	400	673	659	220	184	496	776	1,690	1,090	549	295	260*	184
1958...	181	317	498	620*	582	387	471	1,200	979	444	278	205	181
1959...	257	533	1,080	876	320	467	777	1,230	1,810	852	400	416	257
1960...	628	456	541	251	320	255	750	1,050	1,320	729	315	239	239

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
1953								1,414	126.23	1,023,000
1954	5,600	Oct. 31, 1953	380	1,460	9.61	130.39	1,057,000	1,407	125.68	1,019,000
1955	6,400	June 10, 1956	228	1,147	7.55	102.47	830,600	1,312	117.21	950,100
1956	14,400	Nov. 4, 1955	220	1,471	9.68	131.70	1,068,000	1,408	126.14	1,022,000
1957	9,650	Dec. 10, 1956	184	1,170	7.70	104.45	846,700	955	85.32	691,600
1958	4,440	May 20, 1958	181	951	6.26	84.88	688,200	1,208	107.91	874,900
1959	11,200	Nov. 20, 1958	257	1,516	9.97	135.43	1,098,000	1,564	139.69	1,132,000
1960	14,700	Dec. 15, 1959	239	1,250	8.22	111.94	907,400			

* Estimated.

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.

Records available.—August to October 1910 (fragmentary gage heights), March 1911 to August 1912, July 1928 to September 1960. Published as "near Suiattle Crossing, near Sauk", 1910-12.

Gage.—Water-stage recorder. Datum of gage is 266 ft. above mean sea level (from river-profile survey). Prior to Aug. 4, 1912, staff or chain gages at several sites from 1 mile downstream to 5 miles upstream from present site at various datums.

Average discharge.—32 years (1928-60), 4,304 cfs (3,116,000 acre-ft. per year).

Extremes.—1910-12, 1928-60: Maximum discharge, 82,400 cfs Nov. 27, 1949 (gage height, 16.93 ft.); minimum, 572 cfs Dec. 5, 1929, but may have been less during period of ice effect Jan. 10-27, 1930.

Remarks.—No regulation. Small diversion for millpond at Darrington and for domestic use.

Correction.—In State WSB No. 6 the mean discharge for February 1948 was listed in error; it should be 2,975 cfs.

Sauk River near Sauk, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3,152	4,284	6,140	3,929	5,686	3,049	3,707	7,119	8,471	10,140	5,452	3,583	5,394
1955...	2,942	6,513	3,832	2,532	3,083	1,523*	3,311	5,212	11,480	9,099	4,173*	2,070	4,648
1956...	5,580	7,752	5,055	3,273	1,627	2,328	4,970	9,054	9,709	8,068	3,122	2,562	5,267
1957...	4,780	3,832	6,922*	2,238	3,594	3,696	4,175	9,197	7,326	3,975	2,211	1,648	4,476
1958...	1,704	2,040	3,213	4,275	3,945	2,412	3,369	8,184	6,741	3,195	1,882	2,115*	3,583
1959...	3,744*	7,046*	7,571*	5,952*	2,506	2,950	5,934	6,626	9,347	7,673	3,015	4,941	5,621
1960...	6,380	8,827	5,832	2,714	3,756*	2,769*	4,527	6,074	7,762	5,575	2,655	1,981	4,901

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,600	2,550	3,370	1,880	2,340	2,630	2,140	2,390	5,460	6,680	3,910	2,210	1,600
1955...	1,690	1,800	2,750	1,760	1,720	1,400*	2,000*	2,180	5,130	6,200*	2,700*	1,270	1,270
1956...	1,220	3,000*	2,910	1,980	1,380	1,360	2,240	4,120	6,650	3,850	2,270	1,650	1,220
1957...	1,830	2,800*	2,600*	1,580	1,480	2,480	2,080	5,800	4,740	2,730	1,500	1,300	1,300
1958...	921	1,240	1,650	2,450	2,670	1,840	1,870	3,870	4,150	2,430	1,530	1,210	921
1959...	1,000*	2,300*	4,000*	3,590	1,750*	2,220*	2,670	4,500	6,620	3,890	2,200	2,000	1,000*
1960...	2,530	2,250	2,490	1,460*	1,950*	1,650*	3,050	3,740	4,740	3,360	1,810	1,460	1,460

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
1953							4,852	92.24	3,513,000
1954	15,600	Dec. 20, 1953	1,600	5,394	7.55	102.54 / 3,906,000	5,364	101.97	3,883,000
1955	23,900	June 11, 1955	1,270	4,648	6.51	88.36 / 3,365,000	5,077	96.52	3,676,000
1956	40,600	Oct. 25, 1955	1,220	5,267	7.38	100.42 / 3,824,000	5,036	96.03	3,656,000
1957	28,500	Dec. 10, 1956	1,300	4,476	6.27	85.10 / 3,240,000	3,752	71.34	2,716,000
1958	14,000	May 20, 1958	921	3,583	5.02	68.10 / 2,594,000	4,538	86.26	3,285,000
1959	36,100	Nov. 20, 1958	1,000	5,621	7.87	106.87 / 4,070,000	5,844	111.09	4,231,000
1960	44,600	Nov. 23, 1959	1,460	4,901	6.86	93.42 / 3,558,000			

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 1¾ miles upstream from mouth and 10½ miles northeast of Concrete.

Drainage area.—10.8 sq. mi.

Records available.—March 1953 to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map).

Extremes.—1953-54: Maximum discharge, 597 cfs Dec. 20, 1953 (gage height, 2.36 ft.); minimum, 25 cfs Sept. 18, 1953 (gage height, 0.85 ft.).

Remarks.—No diversions or regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	119	138	139	85.0	124	63.5	81.0	167	173	150	91.0	68.2	117

* Estimated.

Sandy 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
1954...	51	78	78	33	54	37	39	49	118	89	70	43	33

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
1954.....	597	Dec. 20, 1953	33	117	10.8	146.46	84,370	.....	.....	.....

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 right bank 100 ft. downstream from Anderson Creek and 9½ miles northeast of Concrete.

Drainage area.—211 sq. mi.

Records available.—September 1910 to October 1925, August 1928 to November 1931, January 1955 to September 1959 (drowned out by storage in Baker Lake beginning July 9, 1959).

Gage.—Water-stage recorder. Datum of gage is 521 ft. above mean sea level (river-profile survey). Prior to Oct. 22, 1910, staff gage at site an eighth of a mile upstream at different datum. Oct. 22, 1910, to Oct. 3, 1925, Aug. 30, 1928, to Nov. 11, 1931, staff gages and water-stage recorder at site 250 ft. downstream at different datum.

Average discharge.—22 years (1910-25, 1928-31, 1955-59), 2,011 cfs (1,456,000 acre-ft. per year).

Extremes.—1910-25, 1928-31, 1955-59: Maximum discharge, 36,800 cfs Dec. 29, 1917 (gage height, 13.7 ft., site and datum then in use), from rating curve extended above 8,100 cfs; minimum recorded, 219 cfs Dec. 15, 16, 1919.

Flood in about 1815 reached stage about 2 ft. higher than that of Dec. 29, 1917. Flood in 1897 reached a stage about equal to that of Dec. 29, 1917 (discharge, 46,200 cfs).

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
1955...	.....	.....	.....	963*	893	523	1,200	2,264	4,228	3,905	2,381	1,395	.....
1956...	2,861	2,951	1,580	1,104	553	731	2,080	3,435	4,425	3,903	1,906	1,662	2,270
1957...	2,827	1,545	2,235*	697*	1,217*	1,301	1,953	3,475*	2,892	2,254	1,456*	1,166*	1,924
1958...	1,069	1,036	1,484	2,126*	2,093*	995	1,213	3,032	2,804	1,700	1,096	1,204	1,652
1959...	1,995	2,268	3,272	2,375	911	1,118	2,444	2,892*	3,951	3,276*	1,621*	2,635*	2,404

* 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
1955	.....	.....	.....	642	566	450	730	805	2,060	2,980	1,290	750	.....
1956	878	866	890	684	468	439	901	1,480	2,720	2,000	1,220	805	439
1957	1,210	944	888	400*	350*	830	1,060	2,370	1,890	1,450*	920*	800*	350*
1958	464	614	894	1,070	1,110	678	770	1,570	1,500	1,350	954	738	464
1959	593	1,220	1,580	1,410	720	730	998	1,780*	2,800	1,580*	1,030*	973*	593

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
1955	8,180	June 10, 11, 1955	.....	.....	.....	.....	.....	2,109	135.67	1,527,000
1956	20,100	Nov. 3, 1955	439	2,270	10.8	146.42	1,648,000	2,207	142.38	1,602,000
1957	12,200	Oct. 20, 1956	350	1,924	9.12	123.81	1,393,000	1,669	107.41	1,209,000
1958	7,710	Jan. 16, 1958	464	1,652	7.83	106.26	1,196,000	1,983	127.60	1,436,000
1959	15,700	April 29, 1959	593	2,404	11.4	154.65	1,740,000	.....	.....	.....

Baker Lake at Upper Baker Dam, near Concrete, Wash.

Location.—Lat. 48°38'55", long. 121°41'25", in NW¼SW¼ sec. 31, T. 37 N., R. 9 E., at upper Baker Dam on Baker River near center of dam, 0.3 mile upstream from Sulphur Creek, and 8 miles north of Concrete.

Drainage area.—215 sq. mi., approximately.

Records available.—July 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, adjustment of 1947.

Extremes.—Maximum contents, 286,520 acre-ft. Aug. 29, 1960 (elevation, 724.21 ft.); minimum, not determined.

Remarks.—Reservoir is formed by concrete dam, completed in June 1959; storage began July 9, 1959. Usable capacity, 220,630 acre-ft. between elevations 724 (normal full pool) and 655 ft. (minimum operating pool). Dead storage, 64,840 acre-ft. Crest of spillway is at elevation 694 ft. Water is used by Puget Sound Power & Light Co. for power development. Figures given herein represent total contents.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	98,210	80,920	130,090	.....
1960	214,890	221,610	223,780	168,640	103,150	106,960	104,300	151,670	283,440	284,080	284,780	268,220	.....

* Estimated.

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.

Records available.—March 1953 to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 925 ft. (from topographic map).

Extremes.—1953-54: Maximum discharge, 1,080 cfs Dec. 20, 1953 (gage height, 4.00 ft.), from rating curve extended above 570 cfs; minimum, 6.2 cfs Sept. 14-17, 1953 (gage height, 1.33 ft.).

Remarks.—No known regulation or diversion.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	67.0	127	152	91.8*	150*	68.6	86.3	88.0	99.7	69.0	35.3	28.3	88.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	29	76	90	28	60*	39	40	38	66	42	23	17	17

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
1954.....	1,080	Dec. 20, 1953	17	88.2	8.82	119.69	63,850	.....	.....	.....

* Estimated.

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 mouth 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.

Records available.—March 1953 to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 1,040 ft. (from topographic map).

Extremes.—1953-54: Maximum discharge, 185 cfs Dec. 20, 1953 (gage height, 3.84 ft.), from rating curve extended above 90 cfs; minimum, 10 cfs Aug. 27, 1954 (gage height, 0.80 ft.).

Remarks.—Regulation at diversion dams on Rocky and Sulphur Creeks. Not all high-water flow diverted from Rocky and Sulphur Creeks.

North Fork Bear 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
1954...	55.0	79.0	85.2	52.5	54.2	27.7	60.5	69.2	73.2	68.5	70.7	47.3	62.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	35	52	62	23	26	16.5	33	33	68	63	48	24	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
	Discharge	Date					
1954.....	185	Dec. 20, 1953	16.5	62.0	44,850	.....	.....

Lake Shannon at Concrete, Wash.

Location.—Lat. 48°32'55", long. 121°44'25", in SW¼ sec. 2, T. 35 N., R. 8 E., at 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.

Records available.—November 1925 to September 1960.

Gage.—Water-stage recorder; prior to Nov. 11, 1959, water-stage indicator in powerplant. Datum of gage is at mean sea level, datum of 1929, adjustment of 1947. Prior to March 1959, at datum 1.72 ft. lower.

Extremes.—Maximum contents, 160,780 acre-ft. Nov. 24, 1959 (elevation, 439.19 ft.); minimum not determined.

Contents in Acre-feet, on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	152,400	159,640	157,460	116,910	156,830	123,220	114,730	159,360	159,750	159,140	159,040	156,780	.....
1955...	141,230	160,200	140,900	78,610	64,880	106,150	140,840	151,080	159,610	159,700	152,270	123,020	.....
1956...	160,130	156,580	156,060	148,840	71,750	49,790	133,810	158,610	159,820	158,950	156,850	159,320	.....
1957...	155,680	132,760	151,000	86,760	112,300	106,910	130,520	146,260	154,510	159,860	155,810	141,880	.....
1958...	146,660	126,060	151,000	160,200	159,390	126,500	153,720	159,700	159,070	154,870	159,410	151,420	.....
1959...	149,550	156,240	160,130	159,270	132,500	120,840	159,450	158,430	158,820	159,470	158,760	154,650	.....
1960...	159,470	156,730	144,980	160,150	142,030	104,470	122,170	149,150	143,340	156,600	159,890	155,830	.....

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 just upstream from fish barrier, 1,500 ft. (revised) 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.

Baker River at Concrete, Wash.—Continued

Records available.—September 1910 to March 1915, September 1943 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 5, 1915, staff gage at site half a mile downstream at different datum. Sept. 1, 1943, to Jan. 22, 1958, at site 700 ft. upstream at datum 172.6 ft. above mean sea level (from river-profile survey). Supplementary water-stage recorder on left bank about 40 ft. downstream from fish barrier and on tailrace of powerhouse at same datum.

Average discharge.—21 years (1910-14, 1943-60), 2,621 cfs (1,898,000 acre-ft. per year), adjusted for storage in Lake Shannon since November 1925, and Baker Lake since July 1959.

Extremes.—1910-15, 1943-60: Maximum discharge, 35,200 cfs Nov. 27, 1949 (gage height, 20.32 ft., from high-water mark, datum then in use), from rating curve extended above 16,000 cfs by computation of peak flow over dam and through the powerplant by Puget Sound Power and Light Co.; minimum, 21 cfs Feb. 7, 1949 (gage height, 0.20 ft., datum then in use); minimum daily, 55 cfs Feb. 17, 1957.

Remarks.—No diversions which are not returned to river above gage. Flow regulated by Baker River powerplant and Baker and Shannon 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
1954...	3,177	3,308	3,635	2,740	2,244	2,169	2,163	3,097	4,612	5,130	3,221	2,311	3,150
1955...	2,660	4,951	2,535	2,328	1,596	160	1,349	2,852	5,403	4,768	2,731	1,943	2,776
1956...	3,014	4,178	2,398	1,940	2,164	1,590	1,535	4,363	5,704	4,808	2,198	2,097	3,000
1957...	3,873	2,548	2,996	2,040	1,296	2,036	2,085	4,510	3,573	2,577	1,516	1,574	2,564
1958...	1,293	1,717	1,727	2,869	2,902	1,923	1,474	4,337	3,932	2,224	1,307	1,714	2,281
1959...	2,945	3,410	4,528	3,409	1,848	1,890	2,948*	3,734*	4,985	2,547	2,182	2,279	3,065
1960...	1,498	3,778	2,608	2,624	3,909	2,304	2,546	2,338	2,200	3,275	1,828	1,860	2,561

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,460	2,490	2,520	1,730	1,670	1,660	1,780	1,620	2,500	3,430	2,320	1,470	1,470
1955...	2,060	2,210	2,480	1,980	101	73	90	712	2,650	3,260	1,430	862	73
1956...	730	1,250	1,730	1,580	1,780	1,410	736	1,120	3,460	2,430	1,440	446	446
1957...	2,450	2,380	1,460	982	55	1,570	1,390	2,840	2,430	1,850	452	472	55
1958...	452	1,120	472	2,050	1,770	1,730	114	114	2,040	1,650	142	379	114
1959...	824	1,680	2,330	1,810	1,430	158	1,030*	1,680*	2,450	402	1,510	599	158
1960...	264	1,320	762	1,750	2,490*	997	1,950	365	94	97	510	436	94

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953									3,000	2,172,000	3,013	137.70
1954	14,200	Oct. 31, 1953	1,470	3,150	2,280,000	3,145	10.6	143.73	3,156	2,285,000	3,133	143.20
1955	18,500	Nov. 18, 1954	73	2,776	2,010,000	2,729	9.19	124.73	2,731	1,977,000	2,751	125.75
1956	26,900	Nov. 4, 1955	446	3,000	2,178,000	3,050	10.3	139.76	2,989	2,170,000	2,983	136.68
1957	20,400	Oct. 17, 1956	55	2,564	1,856,000	2,539	8.55	116.04	2,168	1,570,000	2,168	99.09
1958	11,400	Jan. 17, 1958	114	2,281	1,651,000	2,294	7.72	104.85	2,798	2,026,000	2,811	128.46
1959	23,500	Apr. 29, 30, 1959	158	3,065	2,219,000	3,249	10.9	148.50	2,814	2,037,000	3,102	.....
1960	20,600	Nov. 24, 1959	94	2,561	1,859,000	2,752	.....	.....	.....	.....	.....	.....

* Estimated.

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 dalles 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.

Records available.—September 1924 to September 1960.

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 Sept. 30, 1937, water-stage recorder at present site; both gages at datum 12.7 ft. higher.

Average discharge.—36 years (1924-60), 14,810 cfs (10,720,000 acre-ft. per year).

Extremes.—1924-60: 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, at site 200 ft. upstream, from floodmarks (discharge, about 500,000 cfs); occurred about 1815.

Remarks.—Flow regulated by powerplants on Baker and upper Skagit Rivers, by Ross, Diablo, and Gorge Reservoirs, Baker Lake, and Lake Shannon (see elsewhere in this report).

Correction.—In State WSB No. 6 the mean discharge for Dec. 1947 was listed in error; it should be 16,810 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	14,490	17,410	21,310	14,930	18,590	13,390	14,790	23,620	26,720	33,360	20,370	13,360	19,380
1955...	12,480	24,980	14,880	11,980	11,640	7,664	12,250	16,750	29,550	28,110	14,980	9,023	16,200
1956...	18,100	26,630	15,970	12,330	9,355	9,946	16,120	27,370	32,470	26,890	12,270	10,810	18,200
1957...	18,870	14,530	21,070	11,950	12,430	13,520	14,130	26,070	22,940	14,350	8,006	7,784	15,500
1958...	7,802	9,526	11,820	15,950	14,790	10,570	10,240	22,310	21,530	12,090	7,440	8,581	12,710
1959...	14,860	20,770	25,330	21,150	12,250	12,620	19,970	22,450	28,110	25,480	12,180	16,400	19,330
1960...	20,460	26,040	19,030	13,270	16,460	11,140	16,100	18,910	22,730	19,790	10,800	7,858	16,870

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9,300	12,000	13,900	9,160	10,600	10,800	11,400	9,540	18,700	25,000	13,200	9,860	9,160
1955...	8,740	9,580	11,900	10,100	6,020	5,930	8,720	7,890	16,700	20,600	8,640	5,600	5,600
1956...	7,220	12,400	11,500	9,980	8,090	4,950	8,880	13,600	23,900	14,200	9,130	5,320	4,950
1957...	9,430	11,900	11,400	9,500	6,260	10,800	9,420	19,800	14,400	10,800	4,930	4,230	4,230
1958...	4,120	6,320	6,700	11,700	10,300	8,730	7,320	10,200	13,000	9,960	4,560	4,660	4,120
1959...	5,910	10,600	13,600	15,300	10,600	10,000	11,800	17,300	20,700	14,400	8,630	9,310	5,910
1960...	9,300	11,000	10,900	9,500	10,800	6,830	12,600	12,200	13,200	11,300	6,660	4,050	4,050

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					
1953						16,530	11,970,000
1954	58,000	Oct. 31, 1953	9,160	19,380	14,030,000	19,290	13,960,000
1955	56,300	June 11, 1955	5,600	16,200	11,730,000	16,900	12,240,000
1956	106,000	Nov. 3, 1955	4,950	18,200	13,210,000	17,710	12,850,000
1957	61,000	Oct. 20, 1956	4,230	15,500	11,220,000	13,370	9,676,000
1958	41,400	Jan. 17, 1958	4,120	12,710	9,198,000	15,380	11,130,000
1959	90,700	April 30, 1959	5,910	19,330	14,000,000	19,700	14,260,000
1960	89,300	Nov. 23, 1959	4,050	16,870	12,250,000		

Alder Creek near Hamilton, Wash.

Location.—Lat. 48°31'40", long. 121°56'55" (revised), in NW¼NE¼ sec. 18, T. 35 N., R. 7 E., on left bank 3 ft. downstream from logging road culvert, a quarter of a mile upstream from highway bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Hamilton. Prior to Jan. 14, 1960, at site 350 ft. downstream.

Drainage area.—10.7 sq. mi.

Records available.—August 1943 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 125 ft. (by barometer). Prior to Jan. 14, 1960, at several sites within 350 ft. downstream of present site at various datums.

Average discharge.—17 years (1943-60), 35.7 cfs (25,850 acre-ft. per year).

Extremes.—1943-60: Maximum discharge, 714 cfs Dec. 9, 1956 (gage height, 5.28 ft., site and datum then in use); minimum, 4.3 cfs Sept. 16, 1956, site then in use; minimum gage height, 1.08 ft. Dec. 9, 10, 1959, site and datum then in use.

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
1954...	15.5	48.6	111	70.7	77.2	43.0	51.5	27.5	27.6	18.7	14.9	14.5	43.2
1955...	14.7	57.5	43.5	62.7	69.3	40.4	68.3	48.8	33.8	22.5	15.3	10.8	40.4
1956...	45.4	91.0	75.1	67.5	35.0	47.4	50.7	26.6	20.2	14.0	11.1	9.75	41.2
1957...	65.1	37.1	94.3	32.2	36.9	67.1	46.1	23.3	17.3	12.6	9.92	9.75	37.8
1958...	11.7	13.5	35.2	51.5	46.7	30.0	24.3	13.6	9.64	7.58	5.93	6.92	21.3
1959...	19.6	70.4	65.0	90.4	52.8	59.6	76.4	44.3	22.1	15.1	11.7	23.2	45.8
1960...	35.5	74.1	65.2*	42.7	75.2	40.2	51.3	42.2	23.2	14.5	12.8	14.0	40.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	7.5	24	71	31	46	26	32	22	21	14.5	13.5	12.5	7.5
1955...	10.5	14.5	28	42	36	30	39	39	23	17.5	14	9.5	9.5
1956...	9.4	31	37	35	26	23	38	18	17	7.8	9	4.5	4.5
1957...	14.5	21	22	22	20	48	29	19.5	15	9.5	9.0	9.0	9.0
1958...	9.0	7.6	14	26	35	21	16.5	10.5	8.3	6.7	5.3	6.0	5.3
1959...	7.1	16	43	50	40	44	34	23	17.5	12.5	10.5	10.5	7.1
1960...	17.5	16.5	29	20	38	32	36	30	19	11.5	9.6	12	9.6

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
1953								38.0	48.26	27,550
1954	239	Dec. 11, 1953	7.5	43.2	4.04	54.75	31,250	38.1	48.36	27,590
1955	300	Feb. 8, 1955	9.5	40.4	3.78	51.23	29,230	48.4	61.43	35,060
1956	①363	Nov. 3, 1955	4.5	41.2	3.85	52.37	29,870	40.0	50.94	29,060
1957	714	Dec. 9, 1956	9.0	37.8	3.53	47.90	27,340	26.3	33.33	19,020
1958	166	Jan. 16, 1958	5.3	21.3	1.99	27.00	15,390	29.1	36.99	21,080
1959	410	Nov. 12, 1958	7.1	45.8	4.28	58.12	33,150	47.5	60.23	34,370
1960	681	Nov. 22, 1959	9.6	40.7	3.80	51.81	29,570			

* Estimated.
① Maximum recorded.

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 bank at highway bridge, 1 mile upstream from mouth, and 1¾ miles southeast of Lyman.

Drainage area.—36.3 sq. mi.

Records available.—July 1943 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 90 ft. (from topographic map).

Average discharge.—17 years (1943-60), 266 cfs (192,600 acre-ft. per year).

Extremes.—1943-60: Maximum discharge, 5,570 cfs Dec. 28, 1949, from rating curve extended above 3,000 cfs on basis of logarithmic plotting; maximum gage height, 8.80 ft. Dec. 9, 1956; minimum discharge, 5.9 cfs Feb. 1, 1945.

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
1954...	374	484	634	336	516	200	307	278	255	113	87.7*	86.6*	304
1955...	143*	476	388	254	310	133	392	419	428	269	90.1	51.4	279
1956...	501	631*	468*	418	105	269	368	323	300	84.9	22.8	114	301
1957...	449	258	601	113	276	341	333	210	78.8	58.3	50.7	20.6	233
1958...	69.8	173	404	500	462	176	245	96.1	36.6	14.1	9.23	60.0	186
1959...	312	536	540	546	183	315	586	244	172	45.8	43.5	363	324
1960...	284	621	442	330	378	306	442	344	131	27.8	85.9	66.2	287

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	68	248	265	104	214	76	85	106	150	38*	29*	43	29*
1955...	35*	57*	123	92	90	67	157	219	228	92	27	18.5	18.5
1956...	36	120*	200*	101	73	70	205	220*	118	27	15	14	14
1957...	54	99	81	51	63	169	193	106	40	30	18.5	15	15
1958...	18	30	169	223	250	87	103	50	17.5	9.1	7.8	12	7.8
1959...	18	170	241	159	64	111	105	125	64	22	20	42	18
1960...	72	72	103	49	64	53	229	171	59	16	12.5	25	12.5

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
1953	.....	.....	.....	.....	.....	.....	.....	332	124.23	240,600
1954	4,180	Oct. 30, 1953	29	304	8.37	113.85	220,400	263	98.44	190,600
1955	3,750	Feb. 7, 1955	18.5	279	7.69	104.14	201,600	328	122.78	237,700
1956	4,750	Nov. 3, 1955	14	301	8.29	112.84	218,500	277	103.98	201,300
1957	5,300	Dec. 9, 1956	15	233	6.42	87.01	168,500	177	66.11	128,000
1958	3,250	Jan. 16, 1958	7.8	186	5.12	69.36	134,300	248	92.53	179,200
1959	5,440	April 29, 1959	18	324	8.93	121.21	234,700	320	119.79	231,900
1960	4,700	Nov. 22, 1959	12.5	287	7.91	107.71	208,600	.....	.....	.....

* Estimated.

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 drawrest 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, of which 400 sq. mi. is in Canada.

Records available.—October 1940 to September 1960.

Gage.—Water-stage recorder and crest-stage gage. Datum of gage is at mean sea level, datum of 1929. Supplementary water-stage recorder in bridge pier a quarter of a mile downstream from base gage.

Average discharge.—20 years (1940-60), 16,340 cfs (11,830,000 acre-ft. per year).

Extremes.—1940-60: Maximum discharge, 144,000 cfs Feb. 11, 1951 (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 regulated by powerplants on Baker and upper Skagit Rivers, and by Ross, Diablo and Gorge Reservoirs, Lake Shannon and Baker Lake (see elsewhere in this report). Small diversions for domestic and municipal use.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	14,810	19,540	24,900	17,730	21,230	15,290	16,640	25,150	27,770	34,840	20,290	13,950	21,030
1955...	12,840	27,200	15,810	13,550	13,560	9,192	13,990	17,250	31,010	28,420	15,010	9,201	17,250
1956...	20,430	29,620	18,580	15,120	10,500	11,460	17,590	28,420	34,460	26,050	12,220	10,890	19,700
1957...	21,100	15,110	23,770	12,230	13,270	15,010	14,790	26,660	23,240	14,240	8,486	7,962	16,360
1958...	8,086	10,170	12,770	17,420	16,540	11,570	11,600	22,410	21,080	12,080	7,677	8,838	13,330
1959...	16,040	23,450	27,720	24,420	13,680	14,170	21,730	24,760	27,960	25,360	12,510	17,540	20,820
1960...	20,850	29,350	21,190	14,530	18,110	12,330	17,470	19,510	22,140	18,980	11,050	8,383	17,810

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	10,200	13,300	16,700	11,400	13,100	12,300	12,600	11,300	20,000	23,900	13,600	10,800	10,200
1955...	9,130	9,440	12,800	11,300	7,960	7,540	9,820	9,170	17,500	21,000	8,450	6,320	6,320
1956...	7,450	13,400	13,300	11,500	8,980	6,510	10,100	15,800	24,300	15,000	9,810	6,900	6,510
1957...	9,630	12,400	11,600	9,600*	7,150	11,200	10,200	19,600	14,700	11,000	5,970	5,140	5,140
1958...	5,110	7,280	8,340	12,000	12,400	9,460	7,900	11,000	13,100	10,400	5,600	5,380	5,110
1959...	6,980	11,500	19,500	17,600*	11,700	11,700	13,200	17,600	21,500	15,100	9,350	9,870	6,980
1960...	10,300	11,800	12,300	10,400	11,600	8,350	13,800	13,500	14,400	11,000	7,550	4,740	4,740

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					
1953						17,910	12,970,000
1954	57,900	Nov. 1, 1953	10,200	21,030	15,220,000	20,720	15,000,000
1955	60,800	Nov. 20, 1954	6,320	17,250	12,490,000	18,330	13,270,000
1956	107,000	Nov. 4, 1955	6,510	19,700	14,300,000	19,010	13,800,000
1957	64,000	Oct. 20, 1956	5,140	16,360	11,840,000	13,910	10,070,000
1958	43,900	Jan. 17, 1958	5,110	13,330	9,651,000	16,370	11,850,000
1959	92,300	April 30, 1959	6,980	20,820	15,070,000	21,160	15,320,000
1960	91,600	Nov. 24, 1959	4,740	17,810	12,930,000		

* Estimated.

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.

Records available.—July 1943 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 45 ft. (from topographic map). Prior to Dec. 1, 1948, at site 500 ft. upstream at different datum. Dec. 1, 1948 to Jan. 7, 1949, staff gage 200 ft. upstream at datum 3.14 ft. higher than present datum.

Average discharge.—17 years (1943-60), 244 cfs (176,600 acre-ft. per year).

Extremes.—1943-60: 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
1954...	117*	408	854	615	490	234	221	133	124	91.4	83.5	69.2	286
1955...	92.9	410	328	401	467	333	345	240	181	119	64.9	37.1	250
1956...	155	496	558	462	262	424	292	123	115	54.8	30.6	45.3	252
1957...	497	326	805	293*	401	474	264	120	65.7	43.1	30.2	24.6	279
1958...	39.5	92.0	266	404	445	205	199	84.3	41.2	23.0	19.1	21.8	152
1959...	206	594	389	603	376	373	477	262	121	51.0	31.4	134	301
1960...	214	548	487*	401*	475	266	304	235	128	43.0	36.5	41.3	284

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	35*	179	350	279	297	110	120	91	76	43	35	49	35*
1955...	52	60	192	205	238	195	192	133	108	58	39	30	30
1956...	34	194	295	222	189	224	141	81	78	32	27	26	26
1957...	60	149	143	150*	236	236	162	71	49	32	25	23	23
1958...	26	33	66	173	263	116	90	48	27	19	16.5	18	16.5
1959...	18.5	143	233	287	248	223	165	126	69	30	25	29	18.5
1960...	69	150	259	176	197	174	216	168	74	28	27	30	27

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
1953								290	44.76	209,700
1954	2,330	Dec. 9, 1953	35	286	3.26	44.21	207,000	239	37.01	173,300
1955	2,420	Feb. 8, 1955	30	250	2.85	38.65	180,900	282	43.58	204,000
1956	2,000	Nov. 3, 1955	26	252	2.87	39.01	182,600	237	44.58	208,700
1957	3,670	Dec. 9, 1956	23	279	3.18	43.11	201,800	175	27.06	126,600
1958	1,490	Jan. 16, 1958	16.5	152	1.73	23.45	109,800	217	33.62	157,500
1959	2,670	Nov. 12, 1958	18.5	301	3.43	46.46	217,600	306	47.26	221,300
1960	2,690	Dec. 15, 1959	27	264	3.01	40.90	191,500			

* Estimated.

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 right bank 200 ft. downstream from bridge on Whatcom Lake Blvd., three-quarters of a mile upstream from mouth, and 5 miles southwest of Bellingham.

Drainage area.—7.80 sq. mi.

Records available.—July to September 1948, June to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 330 ft. (from topographic map). July to September 1948 at different datum.

Extremes.—1948, 1954: Maximum discharge, 17.5 cfs Aug. 22, 1954 (gage height, 2.92 ft.); minimum, 0.6 cfs Aug. 12-15 (gage height, 2.10 ft.); minimum gage-height, 0.78 ft. Aug. 12, 13, 17, 18, 1948, datum then in use.

Remarks.—No diversion or regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	6.98	3.15	2.75	2.39	5.51	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	3.0	0.9	0.6	1.3	1.3	.....	.....	.....

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.

Records available.—October 1945 to November 1956.

Gage.—Water-stage recorder. Datum of gage is 252.55 ft. above mean sea level, city of Bellingham datum.

Average discharge.—11 years (1945-56), 84.8 cfs (61,390 acre-ft. per year).

Extremes.—1945-56: Maximum discharge, 1,350 cfs about Dec. 29, 1949 (gage height, 6.0 ft., from recorded range in stage); minimum, 0.7 cfs Nov. 24, 1952; minimum gage height, 1.31 ft. Oct. 11, 1956.

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 lake for municipal supply.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	5.37	8.45	419	325	226	13.9	8.59	8.10	7.93	6.73	4.35	3.26	86.1
1955...	2.40	5.94	24.0	212	261	16.6	134	16.6	14.6	10.9	9.58	7.03	58.1
1956...	6.30	33.1	397	229	19.6	199	88.7	10.8	8.44	7.09	5.90	5.41	85.1
1957...	22.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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
1954...	4.0	7.5	9.5	20	12.5	8.7	3.8	6.7	7.1	6.0	3.1	1.3	1.3
1955...	1.4	2.3	5.3	12	14	14.5	15.5	13	12	8.7	8.2	6.2	1.4
1956...	5.3	4.5	351	14	9.1	19	14.5	5.9	7.7	5.9	4.7	3.3	3.3
1957...	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					
1953.....	.....	.....	.....	.....	.....	69.8	50,500
1954.....	821	Dec. 12, 1953	1.3	86.1	62,340	52.1	37,740
1955.....	614	Feb. 8, 1955	1.4	58.1	42,080	92.4	66,860
1956.....	432	Dec. 12, 1955	3.3	85.1	61,740	.....	.....
1957.....	.....	.....	.....	.....	.....	.....	.....

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, 200 ft. upstream (revised) from railroad bridge, and 3½ miles upstream from mouth.

Drainage area.—12.0 sq. mi.

Records available.—July to December 1948, May to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 120 ft. (from topographic map). July to December 1948 at different datum.

Extremes.—1948, 1954: Maximum discharge, 269 cfs Dec. 1, 1948, (gage height, 4.21 ft., datum then in use), from rating curve extended above 77 cfs by logarithmic plotting; minimum, 0.2 cfs for several days during each period; minimum gage height, 0.99 ft. July 1, 1954.

Remarks.—No diversion or regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	1.05	0.69	0.53	0.51	0.77	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	0.4	0.2	0.2	0.3	0.3	.....	.....	.....

Nooksack River below Cascade Creek, near Glacier, Wash.

Location (revised).—Lat. 48°54'20", long. 121°50'30", in SE¼SW¼ sec. 36, T. 40 N., R. 7 E., on right bank a quarter of a mile downstream 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.

Records available.—October 1937 to September 1960. Prior to October 1958, published as "above Cascade Creek, near Glacier."

Gage.—Water-stage recorder. Altitude of gage is 1,245 ft. (from river-profile map). Supplementary water-stage recorder on left bank at datum 1.19 ft. lower (principal gage prior to Oct. 1, 1953, and used Oct. 8, 1958, to Sept. 30, 1959).

Average discharge.—23 years (1937-60), 755 cfs (546,600 acre-ft. per year).

Extremes.—1937-60: Maximum discharge, 10,300 cfs Nov. 26, 1949 (gage height, 10.50 ft., supplementary gage), from rating curve extended above 2,900 cfs on basis of contracted-opening measurement at gage height, 8.13 ft. (supplementary gage); minimum, 73 cfs Feb. 16, 1949.

Remarks.—No diversion above station. Some regulation at low flow 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
1954...	1,001	1,019	746	433*	651	393	427	1,115	1,470	1,917	1,244	784	936
1955...	755	1,553	576	304	251	192	328	764	1,967	1,759	955	566	833
1956...	817	1,015	438	326	165*	202	644	1,604	2,194	1,834	847	638	895
1957...	916	570	706	244*	341*	383	510	1,532	1,364	974	623	543	728
1958...	526	398	439	629	763	366	389	1,175	1,262	815	555	470	648
1959...	739	638	1,126	642	260	337*	708	1,108	1,851	1,606	677	901	891
1960...	896	921	584	391	536	370	685	1,014	1,551	1,281	699	482	784

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	420	638	475	230*	318	266	258	308	916	1,520	848	322	230*
1955...	225	341	429	243	202	169	246	261	824	1,150	550	347	169
1956...	362	368	300	210	145*	129	220	588	1,230	895	612	436	129
1957...	350*	359	341	160*	140*	291	359	1,090	870	620	408	341	140*
1958...	295*	312	360*	420*	452	236	251	529	637	620	402	320	236
1959...	254	396	656	350	190	220*	310	620	1,260	728	516	472	190
1960...	420	384	320	177	217	180	392	606	852	786	425	338	177

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
1953								875	113.11	633,400
1954	4,040	Oct. 10, 1953	230	936	8.91	120.97	677,400	944	122.06	683,600
1955	6,460	Nov. 22, 1954	169	833	7.93	107.64	602,800	782	101.10	566,100
1956	6,960	Nov. 3, 1955	129	895	8.52	116.07	649,900	890	115.37	646,000
1957	6,040	Oct. 17, 1956	140	728	6.93	94.18	527,400	658	85.12	476,700
1958	3,460	Oct. 30, 1957	236	648	6.17	83.80	469,300	744	96.24	538,900
1959	5,860	Dec. 1, 1958	190	891	8.49	115.22	645,200	882	114.00	638,400
1960	4,810	Nov. 23, 1959	177	784	7.47	101.63	569,100			

* Estimated.

Kendall Creek above mouth, at Kendall, Wash.

Location.—Lat. 48°54'20", long. 122°08'20", in NE¼ sec. 3, T. 39 N., R. 5 E., on left bank at Mt. Baker highway crossing, three-quarters of a mile upstream from mouth, and three-quarters of a mile south of Kendall.

Drainage area.—29.2 sq. mi., of which 5.6 sq. mi. is in Canada.

Records available.—May to November 1954.

Gage.—Water-stage recorder. Altitude of gage is 410 ft. (from topographic map).

Extremes.—May to November 1954: Maximum discharge, 100 cfs Nov. 19 (gage height, 2.04 ft.); minimum discharge, 5.7 cfs Oct. 16, 18, Oct. 31 to Nov. 4 (gage height, 0.55 ft.).

Remarks.—No known regulation or diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954						37.2	26.4	16.6	11.8	8.02			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954						32	19	13	7.8	6.0			

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.

Records available.—July to September 1948, May to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 400 ft. (from river-profile map). Prior to May 26, 1954 at different datum.

Extremes.—1948, 1954: Maximum discharge, 331 cfs Aug. 22, 1954 (gage height, 3.89 ft.) from rating curve extended above 40 cfs by logarithmic plotting; minimum, 0.7 cfs Aug. 13, 1948 (gage height, 0.78 ft., datum then in use).

Remarks.—No known regulation or diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954						3.7	1.0	0.8	2.7	1.8			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954						13.1	4.47	15.3	8.19	8.22			

Middle Fork Nooksack River near Deming, Wash.

Location (revised).—Lat. 48°47'05", long. 122°06'40", in NW¼ sec. 13, T. 38 N., R. 5 E., near left bank on downstream side of county bridge, a quarter of a mile downstream from Heislers Creek, and 5½ miles southeast of Deming.

Drainage area.—70.5 sq. mi. Area at site 1934-35, 68.4 sq. mi.

Records available.—October 1910 to March 1911 (fragmentary gage heights and discharge measurements only), August 1920 to September 1921, February 1934 to September 1935, June to October 1954.

Gage.—Wire-weight gage. Altitude of gage is 590 ft. (from river-profile map). Oct. 11, 1910, to Mar. 14, 1911, Aug. 28, 1920, to Sept. 30, 1921, staff gages at present site at different datums. Feb. 18 to Apr. 6, 1934, Nov. 16, 1934, to Sept. 30, 1935, staff gage and Apr. 7 to Nov. 5, 1934, water-stage recorder at site three-quarters of a mile upstream at different datum.

Extremes.—1920-21, 1934-35, 1954: Maximum discharge not determined, probably occurred Nov. 5, 1934 (gage height, 15.0 ft., from floodmarks, site and datum then in use); minimum observed, 127 cfs Apr. 9, 1935.

Remarks.—No regulation or diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	592	422	376	200	185	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	877	539	573	380	456	.....	.....	.....

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 a quarter of a mile upstream from mouth.

Drainage area.—8.70 sq. mi.

Records available.—July 1948 to November 1954 (fragmentary).

Average discharge.—5 years (1948-53), 52.3 cfs (37,860 acre-ft. per year).

Gage.—Water-stage recorder. Altitude of gage is 350 ft. (from river-profile map).

Extremes.—1948-53, 1954: Maximum discharge not determined, occurred Feb. 11, 1951 (gage height, 8.44 ft., from high-water mark in well); minimum, 1.0 cfs Sept. 15-24, 1951; minimum gage height, 0.59 ft. Sept. 12-14, 1949.

Remarks.—No diversion or regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	79.9	53.8	40.7	22.2	28.1	.....	.....	.....

Summary

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	56	25	12	12	10.5	.....	.....	.....

South Fork Nooksack River near Wickersham, Wash.

Location.—Lat. 48°39'50", long. 122°07'50", in lot 2, SW¼ sec. 26, T. 37 N., R. 5 E., on bank three-quarters of a mile upstream from Skookum Creek and 4 miles east of Wickersham.

Drainage area.—103 sq. mi.

Records available.—October 1933 to September 1960.

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.—27 years (1933-60), 731 cfs (529,200 acre-ft. per year).

Extremes.—1933-60: Maximum discharge, 19,300 cfs Nov. 3, 1955 (gage height, 13.40 ft.), from rating curve extended above 11,000 cfs; minimum, 66 cfs Oct. 9, 1940, Sept. 11-13, 1944; minimum gage height, 1.91 ft. Aug. 26, 27, 1958.

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
1954...	902	1,174	1,430	846	1,211	580	813	1,187	1,280	919	501	375	933
1955...	621	1,570	764	531	603	324	814	1,045	1,546	949	356	183	774
1956...	970	1,434	920	747	288	523	975	1,386	1,347	629	201	346	814
1957...	1,255	766	1,223	302	506	767	893	1,230	615	312	190	116	684
1958...	245	501	875	1,326	1,316	507	673	892	432	137	81.5	236	598
1959...	831	1,314	1,302	1,233	510	684	1,456	1,117	1,021	490	202	791	913
1960...	780	1,238	951	654	875	614	947	1,059	839	357	280	260	736

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	303	612	791	311	622	307	328	390	920	529	315	213	213
1955...	174	244	372	230	272	220	380	518	888	529	165	123	123
1956...	152	391	496	352	224	245	472	683	645	263	159	112	112
1957...	231	433	405	200*	147	449	524	791	310	183	118	90	90
1958...	87	148	466	477	616	282	367	505	209	95	70	70	70
1959...	109	529	643	590	333	403	476	828	556	215	144	159	109
1960...	296	304	401	193	288	252	690	729	559	184	111	143	111

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
1953	.....	.....	.....	.....	.....	.....	.....	901	118.71	652,100
1954	8,590	Oct. 31, 1953	213	933	9.06	122.93	675,300	885	116.62	640,600
1955	8,840	Nov. 18, 1954	123	774	7.51	102.05	560,600	806	106.21	583,400
1956	19,300	Nov. 3, 1955	112	814	7.90	107.62	591,200	810	106.98	587,700
1957	9,640	Dec. 9, 1956	90	684	6.64	90.11	495,000	547	72.05	395,700
1958	8,020	Jan. 16, 1958	70	598	5.81	78.76	432,600	750	98.89	543,200
1959	12,600	April 29, 1959	109	913	8.86	120.36	661,200	873	115.04	632,000
1960	10,800	Nov. 22, 1959	111	736	7.15	97.28	534,400	.....	.....	.....

* Estimated.

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.

Records available.—July 1948 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 400 ft. (from river-profile map).

Average discharge.—12 years (1948-60), 134 cfs (97,010 acre-ft. per year).

Extremes.—1948-60: 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 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
1954...	162	232	255	151	225	99.3	130	204	202	143	96.5	75.5	164
1955...	106	274	139	100	103	55.7	131	184	286	169	72.8	48.2	139
1956...	146	211*	177	155	49.5	104	189	265	231	105	44.2	62.6	145
1957...	217	138	217	67.5	93.9*	166	171	198	105	69.2	46.6	29.0	127
1958...	54.1	86.4	142	225	235	93.8	122	129	78.1	35.5	21.1	44.6	105
1959...	132	188	261*	213*	90.0	111	222	194	162	87.6	47.1	138	154
1960...	124	182	167	112	145	112	161	172	146	70.2	56.8	50.7	125

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	57	124	128	44	121	43	46	60	132	72	45	42	42
1955...	36	41	72	49	46	37	64	73	161	95	39	34	34
1956...	34	67	83	62	36	36	83	130	101	52	34	19	19
1957...	44	66	61	43*	35*	88	88	121	65	46	28	23	23
1958...	23	34	70	88	120	53	58	74	49	26	18.5	17.5	17.5
1959...	25	80	120*	110*	62	69	90*	138	92	48	35	38	25
1960...	53	56	68	34	47	40	110	112	99	45	27	30	27

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
1953								159	93.43	115,100
1954	1,070	Oct. 31, 1953	42	164	7.10	96.39	118,800	153	89.82	110,700
1955	1,040	Nov. 19, 1954	34	139	6.02	81.66	100,600	140	82.48	101,600
1956	1,290	Nov. 3, 1955	19	145	6.28	85.48	105,300	149	87.54	107,900
1957	1,880	Oct. 20, 1956	23	127	5.50	74.60	91,910	103	60.24	74,230
1958	1,010	Jan. 16, 1958	17.5	105	4.55	61.58	75,910	130	76.32	94,060
1959	1,320	April 30, 1959	25	154	6.67	90.55	111,600	145	85.13	104,900
1960	1,180	Nov. 22, 1959	27	125	5.41	73.42	90,480			

* Estimated.

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.

Records available.—September 1910 to March 1911 (gage heights only), July 1955 to September 1957, October 1957 to September 1960 (discharges above 3,500 cfs only). Published as "near Deming" 1910-11.

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 at site 1⅛ miles downstream at different datum. Dec. 5, 1910, to Mar. 31, 1911, staff gage at site 5 miles downstream at different datum. July 20 to Sept. 19, 1935, staff gage at same site and datum.

Average discharge.—22 years (1935-57), 3,244 cfs (2,349,000 acre-ft. per year).

Extremes.—1935-60: Maximum discharge, 43,200 cfs Feb. 10, 1951 (gage height, 15.69 ft.), from rating curve extended above 25,000 cfs; minimum recorded, 502 cfs Nov. 29, 1952 (gage height, 3.72 ft.).

Remarks.—No diversion. Slight regulation by powerplant at Excelsior.

Revisions.—The momentary maximum discharge for the water year 1937 published in State WSB No. 6 has been revised to 20,900 cfs June 21, 1957.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	3,923	5,616	6,552	4,055	5,229	2,622	2,930	4,694	5,568	5,288	3,319	2,371	4,342
1955	2,608	6,986	3,409	2,656	2,686	1,609	3,069	4,238	7,228	5,365	2,817	1,716	3,696
1956	3,779	5,967	4,063	3,032*	1,473*	2,368	4,061	5,993	7,091	4,152*	2,133	1,950*	3,841
1957	5,835	3,517	5,801	1,791*	2,595*	3,723	3,464	5,496	3,751	2,032	1,870	1,569	3,516
1959	.....	.....	.....	.....	.....	.....	.....	5,377	.....	.....	.....	.....	.....
1960	.....	.....	.....	.....	.....	.....	.....	.....	5,233	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,570	3,650	3,760	1,710	2,740	1,470	1,540	1,790	3,970	3,270	2,290	1,370	1,370
1955	1,110	1,340	2,350	1,680	1,460	1,230	1,660	1,910	4,240	3,400	1,510	990	990
1956	1,000	2,220	2,150	1,750*	1,300*	1,280	2,360	2,870	3,800*	2,100*	1,600	1,200*	1,000
1957	1,970	1,830	1,780	1,250*	1,200*	2,510	2,450	4,000	2,530	1,800*	1,230	1,080	1,060
1959	.....	.....	.....	.....	.....	.....	.....	3,590	.....	.....	.....	.....	.....
1960	.....	.....	.....	.....	.....	.....	.....	.....	3,940	.....	.....	.....	.....

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
1953	.....	.....	.....	.....	.....	.....	.....	4,069	95.23	2,946,000
1954	24,900	Oct. 31, 1953	1,370	4,342	7.49	101.63	3,144,000	4,076	95.41	2,951,000
1955	23,300	Nov. 19, 1954	990	3,696	6.37	86.48	2,676,000	3,767	88.15	2,727,000
1956	38,500	Nov. 3, 1955	1,000	3,841	6.62	90.15	2,788,000	3,962	92.97	2,878,000
1957	27,500†	Oct. 20, 1956	1,060	3,516	6.06	82.28	2,545,000	.....	.....	.....
1958	22,000	Jan. 16, 1958	.....	.....	.....	.....	.....	.....	.....	.....
1959	31,400	April 30, 1959	.....	.....	.....	.....	.....	.....	.....	.....
1960	25,700	Nov. 23, 1959	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.
† Maximum recorded.

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, half a mile upstream from mouth.

Drainage area.—12.9 sq. mi.

Records available.—July to September 1948, May to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 145 ft. (from topographic map). July to September 1948, at different datum.

Extremes.—1948, 1954: Maximum discharge, 35 cfs June 6, 1954 (gage height 2.63 ft.); minimum, 0.3 cfs Aug. 1-3, 9-15, 1954; minimum gage height, 0.79 ft. Aug. 18, 1948 (datum then in use).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	2.5	0.4	0.3	1.1	1.3	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	7.01	3.24	3.44	2.35	7.20	.....	.....	.....

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.

Records available.—October 1944 to September 1960.

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.—16 years (1944-60), 3,728 cfs (2,699,000 acre-ft. per year).

Extremes.—1944-60: 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 diversion above station. Slight regulation 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
1954...	3,997	5,688	6,730	4,348	5,422	2,753	3,066	4,741	5,639	5,298	3,414	2,423	4,455
1955...	2,655	7,454	3,737	2,938	2,970	1,695	3,315	4,423	7,300	5,500	2,799	1,608	3,862
1956...	3,744	6,644	4,549	3,401	1,568	2,496	4,127	5,935	7,028	4,539	2,028	2,040	4,011
1957...	5,556	3,544	6,347	1,922*	2,679	3,710	3,424	5,496	4,016	2,685	1,675	1,356	3,546
1958...	1,793	1,724	2,978	4,767	5,040	2,400	2,854	4,451	3,580	2,238	1,515	1,614	2,900
1959...	3,677	5,441	6,220	6,057	2,609	3,169	5,900	5,634	5,778	4,109	2,113	4,035	4,570
1960...	3,972	5,772	4,892	3,253	4,105	2,631	3,935	4,604	5,002	3,216	2,141	1,719	3,765

* Estimated.

Nooksack River near Lynden, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,630	3,520	3,440	1,760	2,920	1,570	1,620	1,830	4,090	3,260	2,340	1,550	1,550
1955...	1,250	1,380	2,410	1,790	1,600	1,380	1,780	1,940	4,340	3,760	1,580	1,060	1,060
1956...	1,140	2,420	2,410	1,810	1,370	1,360	2,240	2,890	4,070	2,230	1,660	1,190	1,140
1957...	1,580	1,800	1,640	1,300*	1,240	2,320	2,080	3,080	2,590	1,800	1,100*	900*	900*
1958...	1,120	780	1,340	2,170	2,730	1,570	1,570	2,670	2,110	1,900	1,260	970	780
1959...	928	2,390	3,550	3,500*	1,910	2,200	2,300	4,020	3,770	2,260	1,510	1,530	928
1960...	1,660	1,820*	2,280	1,280	1,660	1,480	2,750	2,940	3,410	2,060	1,430	1,210	1,210

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
1953								4,256	90.85	3,081,000
1954	26,200	Oct. 31, 1953	1,550	4,455	7.00	95.08	3,225,000	4,232	90.31	3,064,000
1955	25,300	Nov. 10, 1954	1,060	3,862	6.07	82.43	2,796,000	3,957	84.46	2,865,000
1956	42,600	Nov. 3, 1955	1,140	4,011	6.31	85.85	2,912,000	4,063	86.95	2,949,000
1957	27,200	Dec. 10, 1956	900	3,546	5.58	75.69	2,567,000	2,791	59.57	2,021,000
1958	20,900	Jan. 17, 1958	780	2,900	4.56	61.91	2,100,000	3,641	77.73	2,636,000
1959	37,800	April 30, 1959	928	4,570	7.19	97.54	3,309,000	4,569	96.25	3,265,000
1960	27,900	Nov. 23, 1959	1,210	3,765	5.92	80.58	2,733,000			

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 on 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.

Records available.—July 1948 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 110 ft. (from topographic map).

Average discharge.—12 years (1948-60), 35.8 cfs (25,920 acre-ft. per year).

Extremes.—1948-60: Maximum discharge, 550 cfs Feb. 11, 1951 (gage height, 6.59 ft.); minimum, 0.4 cfs Sept. 10, 1949 (gage height, 1.00 ft.).

Remarks.—Small diversions for minor irrigation and domestic use above station. Regulation from unknown source.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	14.3	58.4	106	80.3*	92.9	50.6	40.5	18.7	16.7	11.0	8.30	7.97	41.8
1955...	7.11	74.9	46.1	48.3	61.1	38.3	52.3	29.4	18.7	11.0	7.66	5.36	33.1
1956...	14.9	60.1	83.1	74.9	44.0*	60.6	41.1*	16.8	16.9	8.61	5.39	6.81*	36.1
1957...	34.0	44.1	92.0	39.7*	63.5	80.7	42.5	18.5	11.2	7.93	6.26	4.96	37.0
1958...	5.33	10.2	24.6	64.1	71.1	33.0	31.1	13.9	7.64	4.15	2.55	2.97	22.3
1959...	7.84	37.8	66.0	91.3	57.7	55.4	70.1	47.3	20.9	10.3	6.41	11.1	40.1
1960...	22.5	59.8	74.2	71.7	73.4	50.9	41.3	46.7	22.8	9.11	6.62	10.0	40.7

* Estimated.

Fishtrap Creek at Lynden, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	7.2	24	57	31*	48	29	25	13.5	12	7.6	6.4	6.4	6.4
1955...	6.0	6.0	29	31	35*	27	28	21	13	8.7	6.0	4.7	4.7
1956...	5.5	23	40	36	32	32	20*	12	12	5.9	4.1	3.8*	3.8
1957...	8.4	20	19	25*	24	49	25	12.5	9.2	6.4	4.7	4.3	4.3
1958...	4.1	5.1	13	20	42	25	19.5	9.5	6.2	3.2	1.9	1.9	1.9
1959...	3.1	7.5	39	35*	36	38	26	21	13	6.8	5.5	5.5	3.1
1960...	8.6	18	32	31	35	30	23	22	13.5	5.8	4.2	8.6	4.2

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					
1953						41.9	30,340
1954	266	Dec. 20, 1953	6.4	41.8	30,300	37.5	27,160
1955	354	Nov. 22, 1954	4.7	33.1	23,950	35.7	25,810
1956	299	Nov. 3, 1955	3.8	36.1	26,200	37.2	26,980
1957	406	Dec. 9, 1956	4.3	37.0	26,810	26.1	18,880
1958	214	Jan. 24, 1958	1.9	22.3	16,110	28.3	20,460
1959	386	Jan. 24, 1959	3.1	40.1	29,030	43.8	31,740
1960	432	Dec. 15, 1959	4.2	40.7	29,510		

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 400 ft. upstream from road crossing, 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.

Records available.—July to September 1948, May to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 35 ft. (from topographic map). July to September 1948, at datum 0.79 ft. higher.

Extremes.—1948, 1954: Maximum discharge, 198 cfs Aug. 23, 1954 (gage height, 4.49 ft.); minimum, 7.6 cfs Aug. 12, 1954 (gage height, 1.83 ft.).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	26.1	17.8	16.7	14.1	14.3	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	16.5	10.5	8.7	11.5	10.5	.....	.....	.....

* Estimated.

Tenmile Creek near Ferndale, Wash.

Location.—Lat. 48°51'15", long. 122°32'25", in NE¼SW¼ sec. 22, T. 39 N., R. 2 E., right bank 100 ft. downstream from county bridge and 2 miles east of Ferndale.

Drainage area.—22.7 sq. mi.

Records available.—July to September 1948, May to October 1954.

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

Extremes.—1948, 1954: Maximum discharge, 19 cfs July 2, 1954 (gage height, 3.32 ft.); minimum, 3.2 cfs Aug. 2, 1954 (gage height, 1.97 ft.).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	12.4	8.63	7.15	8.48	8.88	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	9.9	5.2	4.6	7.0	6.8	.....	.....	.....

CALIFORNIA CREEK BASIN

California Creek near Custer, Wash.

Location.—Lat. 48°55'15", long. 122°39'35", in SE¼ sec. 27, T. 40 N., R. 1 E., on right bank 10 ft. downstream from county bridge on Porter Road, 1 mile west of Custer, and 4½ miles upstream from mouth.

Drainage area.—6.85 sq. mi.

Record savailable.—May to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 15 ft. (from topographic map).

Extremes.—May-October 1954: Maximum discharge, 4.2 cfs July 1 (gage height, 2.12 ft.); minimum, 0.8 cfs. Aug. 10-15 (gage height, 1.88 ft.).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	2.56	1.85	1.10	1.38	1.27	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	1.6	1.2	0.8	1.2	1.0	.....	.....	.....

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.

Records available.—July 1948 to September 1953, May to October 1954.

Gage.—Water-stage recorder and V-notch log control. Altitude of gage is 20 ft. (from topographic map).

Average discharge.—5 years (1948-53), 31.6 cfs (22,880 acre-ft. per year).

Extremes.—1948-53, 1954: Maximum discharge, 669 cfs Dec. 27, 1949; maximum gage height, 9.92 ft. Feb. 10, 1951; minimum discharge, 0.1 cfs Aug. 11, 1950, Sept. 22, 1952.

Remarks.—Probably some small diversions for domestic use. Some diurnal fluctuation at low flow from unknown cause.

Corrections.—In State WSB No. 6 the following figures of acre-ft. were listed in error. They should be corrected as follows:

Calendar year 1949	17,070
Water year 1949-50	35,400

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	4.86	3.87	2.55	3.05	2.32	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	2.4	2.4	1.8	2.1	1.6	.....	.....	.....

FRASER RIVER BASIN

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 at Clear Brook road crossing 1½ miles south of Sumas, and 2 miles upstream from Johnson Creek.

Drainage area.—32.1 sq. mi.

Records available.—July 1948 to November 1950, May to October 1954.

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

Extremes.—1948-50, 1954: Maximum discharge, 800 cfs Dec. 28, 1949 (gage height, 8.89 ft.); minimum, 13.5 cfs Sept. 27 to Oct. 4, 1949.

Remarks.—No regulation. Probably some small diversions for minor irrigation and domestic use above station.

Sumas River near Sumas, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	25	16.5	16	18	17	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	37.3	25.0	32.6	22.8	22.1	.....	.....	.....

Johnson Creek at Sumas, Wash.

Location.—Lat. 48°59'50", long. 122°15'40", in SW¼ sec. 35, T. 41 N., R. 4 E., near right bank, on upstream side of bridge on Sumas Avenue in city park at Sumas, one mile upstream from mouth.

Drainage area.—23.0 sq. mi., of which 6.6 sq. mi. is in Canada.

Records available.—May to October 1954.

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

Extremes.—May to October 1954: Maximum discharge, 38 cfs May 31 (gage height 1.99 ft.); minimum gage height 2.14 ft. Aug. 20; minimum discharge 17 cfs Oct. 3-7 (gage height, 1.58 ft.); minimum gage height 1.46 ft. July 27.

Remarks.—Small diversions for irrigation and domestic use above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	23	18	18	18	17	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954	.....	.....	.....	.....	.....	30.1	22.1	20.5	18.8	19.2	.....	.....	.....

Saar Creek near Sumas, Wash.

Location.—Lat. 48°59'35", long. 122°12'35", on north line sec. 6, T. 40 N., R. 5 E., on left bank 20 ft. upstream from county bridge on Rock road, three-quarters of a mile south of international boundary, and 2½ miles east of Sumas.

Drainage area.—9.76 sq. mi. At site prior to May 1954, 11 sq. mi., approximately.

Records available.—July to September 1948, May to October 1954.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 30 ft. (from topographic map). July 1 to Sept. 30, 1948, at site 1 mile downstream at different datum.

Extremes.—1948, 1954: Maximum discharge, 57 cfs Aug. 23, 1954 (gage height, 5.22 ft.); minimum, 0.6 cfs Aug. 12, 1954.

Remarks.—Probably some small diversions for domestic use. No regulation.

Saar Creek near Sumas, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	7.92	3.58	4.90	5.00	4.93	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1954...	.....	.....	.....	.....	.....	3.7	1.2	0.9	2.8	2.0	.....	.....	.....

COLUMBIA RIVER MAIN STEM

Columbia River at Birchbank, British Columbia
(International gaging station)

Location.—Lat. 49°11', 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.

Records available.—April 1913 to September 1960. Published as "at Trail, British Columbia" 1913-37.

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 October 1948. Prior to Oct. 1, 1937, chain or wire-weight gage on highway bridge at site 7 miles downstream at datum 16.27 ft. lower.

Average discharge.—47 years (1913-60), 70,700 cfs (51,180,000 acre-ft. per year).

Extremes.—1913-60: 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.—This station is 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
1954...	40,200	36,300	28,800	22,600	19,900	26,000	27,200	116,000	242,000	277,000	139,000	84,600	88,700
1955...	45,100	38,200	33,100	23,600	21,800	18,900	24,800	60,200	214,000	242,000	115,000	64,100	74,600
1956...	39,400	39,600	26,200	24,200	19,100	22,600	48,200	151,000	282,000	180,000	98,800	50,000	81,900
1957...	43,400	27,500	21,400	17,900	19,400	20,900	27,500	189,000	221,000	124,000	76,500	44,800	69,700
1958...	35,600	24,200	18,900	18,700	21,000	25,100	33,800	142,000	238,000	131,000	82,800	53,300	68,900
1959...	44,300	32,000	22,800	24,200	20,200	22,500	36,200	117,000	246,000	228,000	114,000	90,400	83,400
1960...	66,300	49,000	33,500	23,800	22,800	25,300	60,500	97,600	192,000	204,000	104,000	53,800	77,900

Columbia River at Birchbank, British Columbia—Continued
(International gaging station)

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	38,200	33,000	24,800	20,200	19,400	19,800	17,400	36,300	235,000	199,000	114,000	54,800	17,400
1955...	38,300	33,900	25,000	21,300	19,600	16,900	17,200	23,500	116,000	187,000	73,800	36,400*	16,900
1956...	30,400*	28,800	21,700	19,000	17,000	18,400	29,500	89,600	217,000	153,000	82,300	42,300	17,000
1957...	35,300	22,500	18,300	15,800	17,100	18,400	20,400	48,800	156,000	99,800	54,200	40,100	15,800
1958...	27,900	19,000	17,200	15,100	18,400	20,400	26,600	42,000	184,000	105,000	73,800	47,200	15,100
1959...	38,800	24,100	20,300	18,600	17,800	19,000	21,400	61,300	180,000	131,000	82,700	73,000	17,800
1960...	58,600	35,700	26,200	18,700	19,500	18,300	42,400	57,100	117,000	140,000	59,700	48,700	18,300

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
1953	.....	.....	.....	.....	.....	.....	.....	68,900	27.50	49,880,000
1954	326,000	July 12, 1954	17,400	88,700	2.61	35.45	64,250,000	89,700	35.82	64,920,000
1955	324,000	June 29, 1955	16,900	74,600	2.19	29.77	53,980,000	73,600	29.39	53,300,000
1956	334,000	June 7, 1956	17,000	81,900	2.41	32.75	59,470,000	80,900	32.34	58,700,000
1957	260,000	May 24, 1957	15,800	69,700	2.05	27.84	50,440,000	68,500	27.38	49,610,000
1958	290,000	June 1, 1958	15,100	69,900	2.03	27.51	49,900,000	70,600	28.18	51,120,000
1959	300,000	June 26, 1959	17,800	83,400	2.45	33.31	60,420,000	87,600	34.99	63,440,000
1960	237,000	July 4, 1960	18,300	77,900	2.29	31.20	56,570,000	.....	.....	.....

* Estimated.

PEND OREILLE RIVER BASIN

Pend Oreille River at Newport, Wash.

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 bridge on U. S. Highway 2, a quarter of a mile east of Idaho-Washington State line, and 1.6 miles downstream from Albeni Falls Dam.

Drainage area.—24,200 sq. mi., approximately.

Records available.—June 1903 to September 1941, October 1952 to September 1960. Prior to October 1921, published as Clark Fork at Newport, Wash., October 1921 to September 1937, as Clark Fork at Priest River, Idaho, and October 1937 to September 1941, as Pend Oreille River at Priest River, Idaho.

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, Newport, or Metaline Falls at various datums. Sept. 22, 1928, to Sept. 30, 1935, water-stage recorder at Priest River at datum 2,040.14 ft. above mean sea level, and Oct. 1, 1935, to Sept. 30, 1941, at datum 2,000 ft. above mean sea level, datum of 1929. Since December 1952, auxiliary water-stage recorder 2.74 miles downstream from base gage.

Average discharge.—46 years (1903-41, 1952-60), 25,370 cfs (18,370,000 acre-ft. per year).

Pend Oreille River at Newport, Wash.—Continued

Extremes.—1903-41, 1952-60: Maximum discharge, 136,000 cfs June 15, 1913, June 21, 1933; minimum, 2,200 cfs Dec. 12, 1919.

Maximum stage known, about 64.0 ft. in June 1894, present site and datum, from water-surface profiles (discharge, about 200,000 cfs).

Remarks.—Flow regulated at Albeni Falls Dam and affected by storage in Pend Oreille and Flathead Lakes, Hungry Horse Reservoir, and several smaller reservoirs. Diversions above station for irrigation of about 337,600 acres (1946 determination).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	22,380	20,590	14,950	12,450	14,650	20,580	23,570	65,560	77,800	48,730	14,620	12,320	29,090
1955...	13,060	21,150	18,420	18,130	18,920	20,130	25,780	35,580	63,430	46,630	12,000	14,920	25,670
1956...	17,680	20,510	22,960	21,720	23,270	26,540	56,940	83,730	89,980	30,960	11,540	16,850	35,170
1957...	15,510	23,290	21,250	19,360	17,570	19,510	22,640	67,310	57,000	18,390	8,717	14,120	25,420
1958...	18,790	25,310	20,380	12,560	10,910	20,310	21,380	53,780	49,310	18,710	6,902	9,444	22,410
1959...	12,440	18,630	23,360	27,690	29,540	20,980	38,060	68,040	91,170	37,000	12,830	17,990	33,080
1960...	31,330	32,280	23,840	17,420	19,260	27,490	50,590	57,570	58,110	27,090	11,170	10,350	30,520

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	10,600	15,500	13,500	9,500	12,700	17,400	16,400	35,300	65,400	7,800	11,400	7,660	7,660
1955...	8,330	11,000	16,000	15,400	17,800	12,400	16,100	19,700	51,600	22,100	7,020	7,700	7,020
1956...	10,200	9,200	15,200	17,200	8,400	12,800	31,100	63,200	48,000	16,100	7,500	6,210	6,210
1957...	11,500	15,500	14,300	12,800	11,900	13,000	19,200	36,500	29,600	9,060	5,650	3,860	3,860
1958...	12,100	13,800	12,100	7,800	8,650	10,300	13,500	25,400	28,900	10,000	3,780	4,840	3,780
1959...	8,190	12,600	15,600	16,500	20,900	17,000	5,150	51,900	73,500	19,800	6,280	10,200	5,150
1960...	17,300	24,800	12,100	10,100	14,800	16,300	31,300	31,300	49,200	11,000	4,180	7,170	4,180

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					
1953						23,360	16,910,000
1954	103,000	May 29, 1954	7,660	29,090	21,060,000	28,640	20,730,000
1955	86,200	June 20, 1955	7,020	25,670	18,590,000	26,400	19,110,000
1956	127,000	June 4-7, 1956	6,210	35,170	25,530,000	35,070	25,460,000
1957	97,900	May 26, 1957	3,860	25,420	18,400,000	25,790	18,670,000
1958	94,100	May 30, 1958	3,780	22,410	16,220,000	21,570	15,620,000
1959	100,000	①	5,150	33,080	23,950,000	35,850	25,960,000
1960	71,000	June 7, 1960	4,180	30,520	22,160,000		

① June 22, 23, 24, 25, 1959.

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.

Records available.—August 1950 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,070 ft. (from topographic map).

Average discharge.—10 years (1950-60), 76.5 cfs (55,380 acre-ft. per year).

Extremes.—1950-60: Maximum discharge, 1,070 cfs Feb. 25, 1958; maximum gage height, 7.33 ft. Mar. 30, 1960; minimum discharge, 3.5 cfs Sept. 1, Oct. 19, 1957.

Remarks.—No diversion above station. Regulation at low flow by Power Lake (capacity, 1,000 acre-ft.) since September 1956.

Calispell Creek near Dalkena, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	13.8	14.3	23.3	23.7	25.1	60.3	190	210	88.9	34.4	20.8	19.2	60.4
1955...	14.0	26.4	22.2	19.5	19.3	18.6	147	239	134	57.8	23.3	19.0	61.9
1956...	26.2	28.4*	71.8	71.2	43.1	78.7	482	357	99.4	35.5	20.5	15.3	111
1957...	23.0	19.3	18.2	16.9*	19.8*	47.0	154	206	55.4	24.5	10.6	8.89	50.5
1958...	18.3	19.0	17.1	26.1	151	130	336	195	45.7	22.4	9.86	11.9	81.1
1959...	12.5	20.7	16.9	58.6	36.8	51.1	255	244	101	28.7	14.1	22.7	71.9
1960...	24.0	23.5	30.7	24.7*	41.6	126	299	249	91.8	29.6	14.8	14.8	80.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.5	11.5	19	18	18.5	28	54	104	51	19	15.5*	15.5	9.5
1955...	9.6	12.5	19.5	18.5	18.5	17.5	24	159	63	33	18	15.5	9.6
1956...	17.5	22	18.5	52*	32	31	177	185	41	9.2	13.5	10	9.2
1957...	7.9	6.8	6.4	7.2	8.0	33	120	120	10.5	4.6	3.7	3.5	3.5
1958...	3.8	3.9	6.0	8.2	10	50	182	69	11.5	5.0	4.5	5.0	3.8
1959...	4.9	5.9	5.9	13.5	13.5	11.5	199	165	46	9.7	5.9	5.9	4.9
1960...	5.9	5.4	13.5	8.0*	20	11	154	158	40	12.5	11	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
	Discharge	Date					
1953						63.2	45,720
1954	456	May 11, 1954	9.5	60.4	43,770	61.4	44,430
1955	426	April 22, 1955	9.6	61.9	44,780	67.3	48,690
1956	904	April 22, 1956	9.2	111	80,280	105	76,200
1957	485	May 20, 1957	3.5	50.5	36,550	49.9	36,170
1958	1,070	Feb. 25, 1958	3.8	81.1	58,710	80.7	58,440
1959	444	Jan. 12, 1959	4.9	71.9	52,060	74.3	53,760
1960	918	Mar. 30, 1960	4.0	80.7	58,590		

Winchester Creek near Cusick, Wash.

Location.—Lat. 48°16'50", long. 117°21'40", on right bank 10 ft. above county road, 5 miles southwest of Cusick.

Drainage area.—18.7 sq. mi.

Records available.—April to July 1957.

Gage.—Staff and crest-stage gages. Altitude of gage is 2,100 ft. (from topographic map).

Extremes.—April to July 1957: Maximum discharge observed, 72 cfs May 20 (gage height, 3.33 ft.); minimum observed, 3.0 cfs July 30, 31 (gage height, 0.45 ft.).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...							21.3	33.1	11.7	4.46			

* Estimated.

Winchester Creek near Cusick, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	.....	.....	13.5	20	5.8	3.0	.....	.....	.....

Smalle Creek near Cusick, Wash.

Location.—Lat. 48°19'40", long. 117°21'00", in SW¼ sec. 27, T. 33 N., R. 43 E., on left bank on downstream side of county road bridge 2¼ miles southwest of Cusick.

Drainage area.—25.1 sq. mi.

Records available.—April to July 1957.

Gage.—Staff gage. Altitude of gage is 2,060 ft. (from topographic map).

Extremes.—April to July 1957: Maximum discharge observed, 128 cfs May 20 (gage height, 2.68 ft.); minimum observed, 4.7 cfs July 31 (gage height, 0.62 ft.).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	.....	.....	27.9	64.4	21.7	7.57	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	.....	.....	19	42	12.5	4.9	.....	.....	.....

Trimble Creek near Cusick, Wash.

Location.—Lat. 48°21'20", long. 117°20'25", in NW¼ sec. 14, T. 33 N., R. 43 E., on right bank 200 ft. below county road 2¼ miles northwest of Cusick.

Drainage area.—3.50 sq. mi.

Records available.—April to July 1957.

Gage.—Staff gage. Altitude of gage is 2,080 ft. (from topographic map).

Extremes.—April to July 1957: Maximum discharge observed, 29 cfs May 20 (gage height, 2.60 ft.); minimum daily, 0.1 cfs July 8-14, 23, 26-31; minimum gage height, 0.30 ft. July 8, 9, 11, 29-31.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	.....	.....	4.42	3.30	1.27	0.22	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	.....	.....	2.2	0.8	0.7	0.1	.....	.....	.....

Pend Oreille River below Box Canyon, near Ione, Wash.

Location.—Lat. 48°46'50", long. 117°24'40", in SE¼NE¼ sec. 19, T. 38 N., R. 43 E., on left bank 1,000 ft. downstream from Box Canyon Dam and 4 miles north of Ione.

Drainage area.—25,000 sq. mi., approximately.

Records available.—October 1952 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 29, 1954, staff gage at site 300 ft. upstream at same datum. Mar. 29 to Aug. 25, 1954, staff gage, at present site and datum.

Extremes.—1952-60: Maximum discharge, 125,700 cfs June 6, 1956 (elevation, 2,011.74 ft.); minimum, 3,190 cfs Aug. 17, 18, 20, 1958 (elevation, 1,980.5 ft., from hourly tailwater readings at Box Canyon Dam).

Flood of June 1948 reached elevation of 2,018.0 ft., from floodmarks (discharge, 167,000 cfs).

Remarks.—In 1946 there were diversions for irrigation of about 340,000 acres, and there probably has not been any appreciable change since that time. Flow regulated at Box Canyon and Albeni Falls Dams and affected by storage in Pend Oreille and Flathead Lakes, and by Hungry Horse Reservoir and smaller reservoirs in Pend Oreille River basin in Montana.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	12,430*	25,790	15,840	15,050	18,590	14,390	16,070	40,300	70,500	32,530	11,760	13,500	23,860
1954...	23,510	21,070	15,200	12,790*	15,300	21,830	24,810	65,770	81,650	53,110	14,890	13,140	30,330
1955...	12,810	21,880	13,880	18,390	19,250	19,990	27,750	36,070	62,260	47,870	12,350	14,360	25,980
1956...	17,620	20,060	23,310	21,600	22,840	25,950	58,300	84,370	91,960	32,450	11,670	16,360	35,490
1957...	15,320	24,330	22,490	20,160	18,940	21,090	24,720	68,500	60,060	19,280	8,797	14,240	26,510
1958...	12,100	15,000	15,600	6,980	8,070	10,900	23,530	54,810	52,120	19,450	6,728	9,339	23,460
1959...	11,790	18,950	23,810	28,350	30,780	21,480	39,070	68,510	91,530	39,050	11,870	16,120	33,380
1960...	31,000	32,970	25,130	17,730	19,760	27,960	51,510	58,130	57,610	28,270	11,450	10,560	30,990

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953...	7,000*	22,500	12,400	11,900	15,400	10,000*	13,800	27,100	36,000*	15,700	6,760	5,000*	5,000*
1954...	15,900	16,200	13,600	10,000	13,400	18,500	16,900	38,000	70,000	14,400	11,400	8,320	8,320
1955...	8,890	12,300	16,700	16,400*	19,200	12,100	17,500	18,500	50,000	23,800	6,320	8,440	6,320
1956...	10,200	8,630	17,300	15,900	10,800	14,300	33,800	65,000	51,700	16,300	7,370	6,780	6,780
1957...	11,200	14,900	14,300	15,000	12,300	14,900	20,100	33,500	26,900	7,730	4,070	4,370	4,070
1958...	12,100	15,000	15,600	6,980	8,070	10,900	15,400	27,900	31,300	7,500	4,440	4,180	4,180
1959...	4,740	12,900	15,900	16,800	21,700	18,000	9,440	54,700	74,900	29,600	7,160	7,700	4,740
1960...	21,900	25,800	13,900	12,000	15,200	17,700	42,800	31,100	49,700	10,300	4,850	6,760	4,850

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					
1953	† 95,100	June 17, 1953	5,000	23,860	17,270,000	24,360	17,630,000
1954	†103,000	May 29, 1954	8,320	30,330	21,950,000	29,800	21,570,000
1955	80,900	June 20, 1955	6,320	25,980	18,810,000	26,620	19,270,000
1956	125,700	June 6, 1956	6,780	35,490	25,760,000	35,570	25,830,000
1957	97,100	May 26, 1957	4,070	26,510	19,190,000	26,940	19,510,000
1958	97,100	May 29, 1958	4,180	23,460	16,990,000	22,400	16,220,000
1959	99,200	June 26, 1959	4,740	33,380	24,160,000	36,270	26,260,000
1960	69,200	May 22, 1960	4,850	30,990	22,500,000	.....	.....

* Estimated.
† Maximum observed.

Sullivan Creek above Outlet Creek, near Metaline Falls, Wash.

Location.—Lat. 48°50'45", long. 117°17'10", in SW¼SE¼ sec. 30, T. 39 N., R. 44 E., on right bank 30 ft. downstream from road bridge, 1,000 ft. upstream from Outlet Creek, and 4 miles southeast of Metaline Falls.

Drainage area.—70.2 sq. mi.

Records available.—January 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,540.09 ft. above mean sea level (Pend Oreille County Public Utility District levels).

Extremes.—1959-60: Maximum discharge, 1,040 cfs June 6, 1959 (gage height, 12.67 ft.); minimum, 18 cfs Jan. 20-23, 1959 (gage height, 10.00 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
1959	.....	.....	.....	37.3*	32.3	31.8	96.4	396	578	126	49.7	64.7	.....
1960	95.7	75.5*	70.8	57.8	43.4	59.5*	212	399	498	118	46.5	35.4	143

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	18	27	29	34	196	252	63	39	37	.....
1960	68	45*	53	41	30*	31*	140	168	257	60	38	29	29

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
1959	1,040	June 6, 1959	.....	.....	.....	.....	.....	139	26.78	100,300
1960	958	June 3, 1960	29	143	2.04	27.74	103,900	.....	.....	.....

* Estimated.

Outlet Creek near Metaline Falls, Wash.

Location.—Lat. 48°50'45", long. 117°17'15", in SW¼SE¼ sec. 30, T. 39 N., R. 44 E., on right bank 600 ft. upstream from mouth, half a mile below Sullivan Lake Dam, and 4 miles east of Metaline Falls.

Drainage area.—52.3 sq. mi.

Records available.—January 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,550 ft. above mean sea level (Pend Oreille County Public Utility District levels).

Extremes.—1959-60: Maximum discharge, 616 cfs Dec. 9, 1959 (gage height, 11.49 ft.); minimum, 4.4 cfs May 11, 1959 (gage height, 8.85 ft.); minimum daily, 4.7 cfs May 8-15, 1959.

Remarks.—Flow regulated by Sullivan Lake. No diversion.

Outlet Creek 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
1959	.....	.....	.....	16.4*	106	823	100	44.1	218	19.0	18.4	17.0	.....
1960	19.5	28.3	382	137	45.0	82.3	7.31	124	212	54.1	25.4	23.8	91.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	16*	16.5	150	86	4.7	15.5	19	17	16	.....
1960	18.5	21	102	63	29	24	5.1	7.4	29	29	24	23	5.1

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					
1959	528	Feb. 27, 1959	.....	.....	.....	108	78,020
1960	616	Dec. 9, 1959	95.1	91.3	66,280	.....	.....

Sullivan Creek at Metaline Falls, Wash.

Location.—Lat. 48°51'40", long. 117°21'50", in SW¼SW¼ sec. 22, T. 39 N., R. 43 E., on right bank 100 ft. downstream from State highway bridge, half a mile upstream from mouth, and half a mile east of Metaline Falls.

Drainage area.—142 sq. mi.

Records available.—October 1953 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,050 ft. (from topographic map). Prior to Aug. 24, 1956, staff gage at site 120 ft. upstream at datum 3.70 ft. higher.

Average discharge.—7 years (1953-60), 240 cfs (173,800 acre-ft. per year).

Extremes.—1953-60: Maximum discharge observed, 3,550 cfs June 12, 1955 (gage height, 3.90 ft., site and datum then in use); minimum, 7.3 cfs Jan. 1, 1958, result of freezup; minimum daily, 27 cfs Jan. 1, 1958.

Remarks.—Some regulation by storage in Sullivan Lake. Small diversions above station for municipal and mine water supply.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	109*	105	107	102	96.0	111	165	986	937	343	107	97.9	273
1955	97.0	115	112	107	109	108	144	267	1,404	394	115	95.1	255
1956	96.0*	90.0*	100*	140*	100*	138	463*	1,071*	564	231	79.4	60.2	261
1957	58.9	52.7	223*	230*	65.5*	63.9	183*	879	391*	138*	80.9*	202	220
1958	271	79.8	44.6	40.8	75.8	124	191	754	285	125	61.0	54.9	177
1959	55.4	56.6	53.4	64.1	147	360	254	481	865	142	78.9	94.9	221
1960	126	118	465	205	99.3	128	290	617	821	203	89.8	79.2	270

* Estimated.

Sullivan Creek at 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
1954...	106*	87	100	85	80	96	109	186	660	119	86	80	80
1955...	90	94	102	100	100	100	117	153	406	155	79	77	77
1956...	.....	.....	.....	.....	.....	100*	234	550*	273	120*	62	59	59
1957...	53	41*	36*	95*	56*	58*	73	350*	240*	90*	70	62	36*
1958...	142	49	30	27	42	97	146	165	219	78	53	49	27
1959...	52	44	48	44	54	208	193	264	273	89	69	68	44
1960...	99	75*	169	120	80*	78	193	239	421	104	80	73	73

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					
1954.....	†1,860	May 19, 1954	80	273	197,600	273	197,800
1955.....	†3,650	June 12, 1955	77	255	184,500	252	182,100
1956.....	.....	.....	59	261	189,800	266	193,000
1957.....	1,410	May 14, 1957	36	220	159,500	225	163,200
1958.....	1,340	May 20, 1958	27	177	128,000	157	113,800
1959.....	1,580	June 6, 1959	44	221	159,700	267	193,000
1960.....	1,960	June 3, 1960	73	270	196,400	.....	.....

* Estimated.
† Maximum observed.

Pend Oreille River 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 town of Metaline Falls.

Drainage area.—25,200 sq. mi., approximately.

Records available.—November 1908 to September 1910 (gage heights only), October 1912 to September 1960. Prior to October 1928, published as Clark Fork at Metaline Falls and October 1928 to September 1937 as Clark Fork below Z Canyon, near Metaline Falls.

Gage.—Water-stage recorder. Datum of gage is 1,721.18 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers). Prior to Dec. 19, 1928, staff gages at Metaline Falls 10 miles upstream at datum approximately 262.2 ft. higher.

Average discharge.—48 years (1912-60), 26,830 cfs (19,420,000 acre-ft. per year).

Extremes.—1912-60: 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).

Maximum stage known, 69.0 ft. in June 1894, from floodmarks.

Remarks.—In 1946 there were diversions for irrigation of about 340,000 acres, and there probably has not been any appreciable change since that time. Flow regulated at Albeni Falls and Box Canyon Dams and affected by storage in Pend Oreille and Flathead Lakes, Hungry Horse Reservoir, and several smaller reservoirs in Pend Oreille River basin in Montana.

Pend Oreille River below Z Canyon, near Metaline Falls, Wash.—Continued
(International gaging station)

Cooperation.—This station is maintained by the United States under agreement with Canada.

Correction.—In State WSB No. 6, the mean for September 1934 is listed in error. It should be 8,254 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	24,390	21,720	16,260	14,000*	16,290	22,890	25,810	67,690	83,920	53,970	15,300	13,510	31,380
1955...	13,510	22,490	19,340	18,920	20,050	20,610	29,310	87,890	65,330	50,150	13,350	15,250	27,180
1956...	19,090	21,290	24,900	23,750	24,660	28,420	61,360	87,930	95,180	33,490	12,240	17,380	37,420
1957...	15,800	24,590*	22,690	20,400	19,180	21,490	25,280	68,970	61,020	20,030	9,679	15,020	27,030
1958...	20,020	26,680	22,570	13,760	13,830	25,610	25,510	55,960	53,230	21,110	8,618	10,710	24,760
1959...	12,440	19,940	24,590	29,240	31,480	22,980	40,250	70,660	94,480	40,280*	13,440	17,550	34,710
1960...	31,490	33,630	26,090	19,370	21,630	29,080	53,190	60,940	60,410	30,160	13,620	11,220	32,600

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	18,000	14,200	14,800	11,000*	14,600	19,900	18,600	38,200	71,200	19,200	11,700	8,790	8,790
1955...	8,950	13,300	17,100	16,900	19,900	12,000	19,000	20,200	52,400	25,400	6,180	7,950	6,180
1956...	11,200	9,500	18,400	17,800	12,300	17,200	36,000	68,100	52,600	17,500	9,280	7,500	7,500
1957...	12,000	14,900	15,300	15,500*	13,000*	15,700	19,900	34,000	29,700	8,340	5,850	4,940	4,940
1958...	13,000	15,300	16,200	8,360	10,400	14,600	17,400	29,800	33,300	8,840	6,050	5,530	5,530
1959...	4,290	14,500	16,000	18,100	23,700	18,900	13,200	56,000	77,200	22,000*	8,720	10,200	4,290
1960...	22,900	26,900	17,200	14,000	17,700	19,800	43,700	33,000	51,600	12,300	5,900*	7,300	5,900*

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
1953								25,420	13.69	18,400,000
1954	106,700	May 29, 1954	8,790	31,380	1.25	16.91	22,720,000	30,780		22,290,000
1955	88,900	June 20, 1955	6,180	27,180			19,670,000	28,020		20,290,000
1956	129,800	June 5, 1956	7,500	37,420			27,170,000	37,220		27,020,000
1957	101,100	May 26, 1957	4,940	27,030			19,570,000	27,550		19,940,000
1958	99,300	May 29, 1958	5,530	24,760			17,930,000	23,730		17,180,000
1959	102,100	June 25, 1959	4,290	34,710			25,130,000	37,630		27,250,000
1960	72,000	May 21, 1960	5,900	32,600			23,670,000			

* Estimated.

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.

Records available.—October 1937 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation 1937 datum). Prior to Apr. 27, 1939, staff gage at same site and datum.

Columbia River at international boundary—Continued
(International gaging station)

Since May 31, 1942, auxiliary water-stage recorder 2.2 miles downstream from base gage. Jan. 1 to May 30, 1942, auxiliary staff gage at same site.

Average discharge.—23 years (1937-60), 98,270 cfs (71,140,000 acre-ft. per year).

Extremes.—1937-60: Maximum discharge, 550,100 cfs June 12, 1948 (elevation, 1,338.13 ft.); minimum, 18,000 cfs Feb. 7, 1954 (elevation, 1,289.38 ft.).

Flood in June 1894 reached a stage of 1,346 ft., from information by 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 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 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
1954...	65,600	59,700	45,420	35,790	35,460	48,580	53,680	189,300	331,800	338,600	161,400	101,800	122,800
1955...	60,110	61,940	53,640	42,460	41,110	38,740	54,620	100,300	288,400	300,400	131,800	71,330	104,100
1956...	59,680	61,990*	51,250	47,330	43,200	49,700	110,900	240,500	380,900	217,900	113,100	67,950	120,400
1957...	59,680	52,490*	43,060*	36,830	37,500*	41,540	53,100	258,000	278,000	143,900	84,380	58,470	95,880
1958...	54,630	49,550	40,140	30,960	33,270	47,690	57,790	193,700	282,600	149,200	87,910	61,590	90,980
1959...	56,120	51,040	46,120	52,330	50,910	45,300	78,190	186,700	335,500	263,800	127,400	108,100	117,000
1960...	97,580	82,240	60,320	42,710*	43,420*	53,950	116,300	160,800	250,000	227,500	115,500	64,690	109,700

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	58,600	52,100	32,100	28,500	33,000	39,800	35,900	76,200	315,300	228,400	132,400	65,000	28,500
1955...	54,300	51,000	45,000	38,300	39,000	27,700	46,600	54,700	173,100	224,200	83,300	62,500	27,700
1956...	48,200	52,000*	41,000	36,500	29,300	33,400	65,800	158,700	273,100	175,800	94,500	59,900	29,300
1957...	52,900	36,900*	34,700*	30,900*	31,400*	33,600	40,100	85,300	188,600	110,200	60,500	50,900	30,900*
1958...	51,200	38,200	33,500	25,100	27,000	38,000	44,400	70,200	213,700	113,700	78,300	55,200	25,100
1959...	49,600	42,500	39,000	35,100	41,100	38,200	41,700	128,900	255,100	206,500	93,000	87,100	35,100
1960...	85,900	62,500	44,000	36,200*	39,000*	36,100*	90,000*	97,200	184,100	151,100	65,800	60,200	36,100*

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
1953								96,700	22.00	70,010,000
1954	413,000	July 12, 1954	28,500	122,800	2.06	27.93	88,890,000	123,200	.....	89,190,000
1955	403,600	June 29, 1955	27,700	104,100	1.74	23.67	75,350,000	130,800	.....	75,180,000
1956	463,900	June 6, 1956	29,300	120,400	2.02	27.45	87,400,000	118,900	.....	86,340,000
1957	357,100	May 26, 1957	30,900	95,880	.....	.....	69,420,000	94,970	.....	68,750,000
1958	370,500	May 30, 1958	25,100	90,980	.....	.....	65,870,000	91,740	.....	66,420,000
1959	396,600	June 26, 1959	35,100	117,000	.....	.....	84,730,000	124,300	.....	90,010,000
1960	281,800	June 20, 1960	36,100	109,700	.....	.....	79,660,000	.....	.....	.....

* Estimated.

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.

Records available.—August 1928 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,836.8 ft. above mean sea level, international joint adjustment of 1947. Prior to Nov. 23, 1928, staff gage at present site and datum.

Average discharge.—32 years (1928-60), 1,494 cfs (1,082,000 acre-ft. per year).

Extremes.—1928-60: 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.—Several small diversions above station for irrigation. No regulation.

Cooperation.—This station is 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
1954...	441	518	302*	223*	267	270	782	7,789	6,168	3,365	938	1,182	1,863
1955...	768	972	785	488	367	291	764	4,436	8,273	2,809	635	248	1,738
1956...	506	450	298	253	179*	282	4,033	9,455	5,909	1,408	323	220	1,945
1957...	329	271	207	155*	174*	237	1,009	10,440	3,151	825	627	247	1,486
1958...	251	283	201	186	323	661	2,412	8,740	3,613	974	214	203	1,513
1959...	491	344	286	270	244	310	2,664	8,281	7,790	1,943	342	968	1,998
1960...	1,353	896	438	306	272	502	2,033	5,464	5,619	1,092	252	237	1,588

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	366	394	200*	150*	200*	203	281	1,090	4,250	1,050	508	924	150*
1955...	618	570	480	380	266	187	317	962	5,510	1,230	290	177	177
1956...	290	190*	190*	160*	160*	180*	468	4,870	2,390	506	237	165	160*
1957...	268	155*	110*	115*	150*	201	344	5,330	1,250	506	366	177	110*
1958...	180	189	92	90	188	404	1,320	3,280	1,310	404	137	126	90
1959...	216	100*	250*	100*	226	240	560	4,480	4,700	626	257	291	100*
1960...	682	300*	210	230*	160*	160*	1,510	2,450	2,960	344	164	176	160*

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					
1953						1,465	1,060,000
1954	15,600	May 20, 1954	150	1,863	1,349,000	1,969	1,426,000
1955	14,400	June 13, 1955	177	1,738	1,258,000	1,631	1,181,000
1956	17,100	May 21, 1956	160	1,945	1,412,000	1,908	1,385,000
1957	16,300	May 20, 1957	110	1,486	1,076,000	1,480	1,072,000
1958	12,400	May 23, 1958	90	1,513	1,096,000	1,546	1,119,000
1959	12,400	May 24, 1959	100	1,998	1,447,000	2,130	1,542,000
1960	11,200	May 13, 1960	160	1,588	1,152,000		

* Estimated.

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.

Records available.—April 1951 to October 1954.

Gage.—Water-stage recorder. Altitude of gage is 2,330 ft. (from topographic map).

Extremes.—1951-54: Maximum discharge observed, 169 cfs Apr. 16, 1951 (gage height, 4.35 ft., discharge measurement); practically no flow Mar. 4, 1953 (gage height, 1.14 ft.), as result of regulation during building of weir 300 yards above gage.

Remarks.—Occasional regulation at small crib dam at lake outlet. 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.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	.39	3.82	6.74	8.24	7.25*	10.5	17.8	23.6	22.3	12.5	6.40	6.09	10.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0.3	0.7	5.7	7*	5*	8.5	14.5	14.5	20	6.3	4.9	3.9	0.3

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					
1954.....	28	May 13-19, 1954	.3	10.5	7,570	.....	.....

* Estimated

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.—3,800 sq. mi., approximately.

Records available.—September 1929 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,425 ft. above mean sea level, international joint adjustment of 1947. Prior to Jan. 3, 1930, staff gage at same site and datum.

Average discharge.—31 years (1929-60), 2,889 cfs (2,092,000 acre-ft. per year).

Kettle River near Laurier, Wash.—Continued
(International gaging station)

Extremes.—1929-60: Maximum discharge, 35,000 cfs May 29, 1948 (gage height, 17.25 ft.; minimum, 88 cfs Dec. 1, 1936 (gage height, 2.20 ft.), but was probably less during winter of 1929-30.

Maximum stage known, about 22 ft. in May or June 1894, from information 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 diversion for domestic use.

Cooperation.—This station is 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
1954...	834	999	690	573	673	752	2,303	14,350	10,440	5,765	1,660	2,203	3,454
1955...	1,400	1,918	1,695	1,035*	869	661	2,043	8,600	14,480	5,273	1,330	497	3,321
1956...	807	899	656*	602*	421*	667	8,486	17,760	11,210*	2,973*	683	425	3,802
1957...	584	508	449	337*	370*	542*	2,631	18,070	5,553	1,479	1,002	424	2,686
1958...	430	482	399	395	898	2,127	5,577	16,020	6,672	1,826	424	351	2,960
1959...	777	594	523*	558*	516*	690	5,544	14,450	13,910	3,629	656	1,590	3,626
1960...	2,344	1,732	951*	656*	610	1,363	5,930	10,210	10,330	2,232	519	413	3,105

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	727	811	505	400*	550*	546	860	2,810	7,380	1,930	994	1,720	400*
1955...	1,110	1,030	1,150	888	760*	460	672	2,690	9,880	2,490	642	415	415
1956...	505	470*	450*	400*	370*	490	1,190	9,420	5,000*	1,120	490	341	341
1957...	490	320*	300*	280*	310*	460*	902	10,500	2,340	903	654	304	280*
1958...	314	350	270*	250*	417	1,290	3,800	6,360	2,600	769	293	265	250*
1959...	390	200*	440*	180*	470*	525	1,360	8,440	8,440	1,210	495	535	180
1960...	1,560	700*	500*	500*	350*	360*	3,980	5,020	5,720	739	351	323	323

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					
1953						2,942	2,130,000
1954	27,000	May 20, 1954	400	3,454	2,501,000	3,663	2,652,000
1955	24,400	June 13, 1955	415	3,321	2,404,000	3,099	2,243,000
1956	31,700	May 22, 1956	341	3,802	2,760,000	3,734	2,710,000
1957	25,400	May 20, 1957	280	2,686	1,944,000	2,666	1,930,000
1958	22,000	May 23, 1958	250	2,980	2,158,000	3,029	2,193,000
1959	21,300	June 4, 1959	180	3,626	2,625,000	3,889	2,816,000
1960	18,900	May 13, 1960	323	3,105	2,254,000		

* Estimated.

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.

Records available.—April to September 1950, October 1951 to September 1959.

Gage.—Water-stage recorder and wooden control. Altitude of gage is 2,370 ft. (from topographic map). Prior to October 1950, water-stage recorder at site a quarter of a mile upstream at different datum.

Average discharge.—8 years (1951-59), 2.27 cfs (1,640 acre-ft. per year).

Extremes.—1950, 1951-59: Maximum discharge, 43 cfs Apr. 23, 1956 (gage height, 2.84 ft.); maximum gage height, 3.43 ft. Feb. 4, 1954 (ice jam); no flow at times each year.

Remarks.—Flow regulated by dam at outlet of Loon Lake. Some small diversions for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	.003	0	0	6.38	1.02	4.29	0	0	0	0	0	.93
1955...	0	.003	0	0	0	0	.19	2.32	.40	0	0	0	.25
1956...	0	0	0	14.8*	12.5*	9.17	26.9	4.46	.52	0	0	0	5.65
1957...	0	0	0	1.24*	5.60*	0	0	.139	.033	0	0	0	.55
1958...	0	0	0	0	9.27	11.0	9.30	4.87*	.25	0	0	0	2.84
1959...	0	.21	0	.97	18.8*	2.16	.04	2.56	1.75	0	0	0	2.09

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0	0	0	0*	0	0	0	0	0	0	0	0
1955...	0	0	0	0	0	0	0	1.7	0	0	0	0	0
1956...	0	0	0	0*	3.0*	0	5.3	2.5	0	0	0	0	0
1957...	0	0	0	1.5*	1.0*	0	0	0	0	0	0	0	0
1958...	0	0	0	0	0	0	2.0	1.5*	0	0	0	0	0
1959...	0	0	0	0	12*	0	0	.6	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
	Discharge	Date					
1953						0.79	572
1954	34	April 6, 1954	0	.93	672	.93	672
1955	6.3	Nov. 8, 1954	0	.25	178	.25	178
1956	43	April 23, 1956	0	5.65	4,100	5.65	4,100
1957	14.0	Feb. 26, 1957	0	.55	398	.55	398
1958	41	Mar. 4, 1958	0	2.84	2,060	2.86	2,070
1959	27	Jan. 31, 1959	0	2.09	1,510		

* Estimated.

Sheep Creek at Springdale, Wash.

Location (revised).—Lat. 48°03'30", long. 117°45'05", in SW¼NW¼ sec. 34, T. 30 N., R. 40 E., on right bank 45 ft. upstream from railroad trestle on State Highway 3, half a mile west of Springdale, and 4 miles upstream from mouth.

Drainage area.—46.4 sq. mi. (revised).

Records available.—January 1953 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,980 ft. (from topographic map). Prior to Sept. 30, 1958 at site 500 ft. upstream at different datum.

Average discharge.—7 years (1953-60), 13.7 cfs (9,920 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 78 cfs Feb. 26, 1958 (gage height, 2.30 ft., site and datum then in use); maximum gage height recorded, 5.22 ft. Jan. 30 to Feb. 7, 1956 (backwater from ice), site and datum then in use; minimum discharge, 1.6 cfs Jan. 21, 1955.

Remarks.—Some small diversions for domestic use. Flow partly 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
1954...	10.2	10.7	9.01	9.23*	16.2	13.8	17.7	9.92	8.85	7.93	7.83	7.34	10.7
1955...	7.30	7.59	7.02*	6.63	6.96	7.20	11.1	12.1	7.07	6.83	6.56	6.52	7.79
1956...	7.25	7.57	13.6*	30.5*	23.4*	29.8*	52.8	18.1	14.4	15.6	16.5	16.2	20.5
1957...	15.3	13.9	14.2	11.5*	14.3*	16.6	15.3	13.7	12.8	10.6	10.3	9.34	13.1
1958...	8.89	9.33	9.39	9.38	27.1	29.7	25.8	19.0	13.9	12.6	11.4	11.4	15.6
1959...	11.7	11.7	10.6	14.1	30.9	17.5	15.5	16.7	13.7	10.7	11.5	11.9	14.6
1960...	9.63	11.0	12.3	11.1*	32.3	19.4	16.1	12.5	10.9	9.90	10.7	11.0*	13.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.3	8.8	8.2	7*	7.5*	11.5	10.5	8.2*	7.9	7.6	7.2	7.2	7*
1955...	6.8	6.8	6.5*	6.0*	6.4*	5.8	8.4	11	6.5	5.5	5.8	5.8	5.5
1956...	6.2	6.0*	5.8	15*	13*	13*	22	15	13.5	14.5	16	15.5	5.8
1957...	14.5	13	12	9.0	10.5*	15.5	12.5	11.5	11.5	10	9.8	8.6	8.6
1958...	8.3	8.7	8.7	8.3	9.5	15.5	17	15	12.5	11.5	10.5	11	8.3
1959...	11	10*	9.8	10*	24	12.5	13.5	14	10.5	9.8	10.5	10.5	9.8
1960...	8.7	9.1	11.5	9.5*	24*	11	12.5	11.5	10	9.8	10	10.5	8.7

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					
1953						12.4	8,980
1954	49	Apr. 9, 17, 1954	7	10.7	7,730	10.0	7,250
1955	26	May 19, 1955	5.5	7.79	5,640	8.35	6,040
1956	72	Mar. 30, 1956	5.8	20.5	14,840	21.7	15,760
1957	42	Feb. 26, 1957	8.6	13.1	9,510	11.8	8,550
1958	78	Feb. 26, 1958	8.3	15.6	11,270	16.1	11,650
1959	46	Jan. 12, 1959	9.8	14.6	10,570	14.5	10,510
1960	71	Feb. 7, 1960	8.7	13.8	10,030		

* Estimated.

Deer Creek near Valley, Wash.

Location.—Lat. 48°07'25", long. 117°48'05", in SE¼SE¼ sec. 6, T. 30 N., R. 40 E., on left bank at downstream side of county road bridge, 2 miles upstream from confluence with Sheep Creek, and 5 miles southwest of Valley.

Drainage area.—36.0 sq. mi.

Records available.—July 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,060 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge, 425 cfs Mar. 29, 1960 (gage height, 2.33 ft.); maximum gage height, 3.24 ft. Feb. 29, 1960 (backwater from ice); minimum discharge, 5.6 cfs Aug. 18, 1959, Sept. 29, 30, 1960.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.54	7.49	.....
1960	8.59	9.77	10.8	7.92*	13.8	49.0	66.4	50.0	19.8	8.42	7.11	6.31	21.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.9	6.7	.....
1960	7.1	6.0*	6.0*	6.0*	7.0	6.0*	41	30	11	6.7	6.3	5.8	5.8

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
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1960	425	Mar. 29, 1960	5.8	21.5	0.597	8.13	15,600	.....	.....	.....

* Estimated.

Chewelah Creek at Chewelah, Wash.

Location.—Lat. 48°17'00", long. 117°43'00", on line between SE¼ sec. 11 and SW¼ sec. 12, T. 32 N., R. 40 E., on left bank of stream below small road bridge to highway north of the city park, in northern part of Chewelah, and 2 miles upstream from mouth.

Drainage area.—94 sq. mi.

Records available.—March 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,660 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge 355 cfs Mar. 30, 1960 (gage height, 3.50 ft.); minimum, 4.1 cfs Aug. 23, 1957 (gage height, 1.11 ft.).

Remarks.—No regulation. Most of flow in South Fork used for irrigation during summer months.

Chewelah Creek at Chewelah, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	37.0	85.5	45.9	10.2	6.27	7.13	.....
1958	15.2	17.8	18.9	19.3	48.9	64.7	121	96.2	34.3	18.0	6.78	9.56	39.0
1959	13.8	17.5	19.5	25.8	19.9	32.7	78.5	104	72.9	20.3	9.69	17.5	36.0
1960	18.1	20.0	22.5	18.0	22.8	56.8	136*	132	72.5	18.5	12.3	15.0	45.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	30	46	24	5.8	4.9	4.7	.....
1958	11	12	14	9.6	16	48	85	56	20	7.4	5.8	6.2	5.8
1959	12	9.9	14	8.0*	17*	23	66	78	42	9.2	6.8	11	6.8
1960	16.5	8.5*	13.5	13*	12*	11*	105*	104	32	11	9.6	13	8.5*

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
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1958	259	Feb. 25, 1958	5.8	39.0	0.415	5.63	28,270	38.9	5.62	28,210
1959	153	May 26, 1959	6.8	36.0	.383	5.21	26,090	36.8	5.33	26,690
1960	355	Mar. 30, 1960	8.5	45.4	.483	6.58	32,980	.....	.....	.....
1957	191	May 20, 1957	.....	.....	.....	.....	.....	.....	.....	.....

Little Pend Oreille River near Colville, Wash.

Location.—Lat. 48°27'50", long. 117°44'40", in NE¼ sec. 10, T. 34 N., R. 40 E., on right bank 400 ft. upstream from abandoned railroad bridge, half a mile downstream from Bear Creek, 6 miles east of Arden, and 9 miles southeast of Colville.

Drainage area.—129 sq. mi.

Records available.—December 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,010 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge 668 cfs Apr. 7, 1960 (gage height, 3.17 ft.); minimum, 7.0 cfs Jan. 6, 1958 (gage height, 0.14 ft.).

Remarks.—Minor regulation by fish screens at outlet of Lake Sherry. No diversions.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	23.1	70.6*	138*	309*	156*	49.6	25.6	14.8	16.9	.....
1959	19.5	25.0	25.0	37.1*	25.8	41.7	199	233	113	35.3	19.0	24.3	66.6
1960	26.9	28.4	30.1*	23.9*	30.1*	81.5	349	262	107	38.9	29.1	20.2	85.5

* Estimated.

Little Pend Oreille River 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
1958	.....	.....	.....	15	23	88*	214	71	31	17.5	13	14.5	.....
1959	17	18.5*	23	18*	22*	31	99	190	60	18*	16*	18	16*
1960	23	18*	21*	19*	19*	19*	220*	198	59	26	21	16.5	16.5

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
1958	512	April 20, 1958	.....	.....	.....	.....	.....	72.5	7.41	52,470
1959	329	May 3, 1959	16	66.6	0.516	7.00	48,200	67.9	7.15	49,180
1960	668	April 7, 1960	16.5	85.5	.663	9.02	62,040	.....	.....	.....

Haller Creek near Arden, Wash.

Location.—Lat. 48°28'05", long. 117°54'30", in SW¼SW¼ sec. 4, T. 34 N., R. 39 E., on left bank 10 ft. downstream from county road bridge, three-quarters of a mile upstream from mouth, and 1½ miles northwest of Arden. Prior to Sept. 23, 1960, at site 30 ft. upstream.

Drainage area.—37.0 sq. mi.

Records available.—August 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,600 ft. (from topographic map). Prior to Sept. 23, 1960, at site 30 ft. upstream at datum about 1.24 ft. higher.

Extremes.—1959-60: Maximum discharge, 148 cfs Mar. 29, 1960 (gage height, 2.65 ft.); minimum, 0.5 cfs Aug. 12, 1960.

Remarks.—No regulation. 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
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.53	2.68	.....
1960	2.84	3.25*	3.48*	3.17*	3.81*	21.7	39.9	28.4	11.2	2.20	1.00	1.45	10.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.8	1.9	.....
1960	2.1	2.1*	2.5*	2.4*	2.5*	2.3*	26	22	5.0	0.7	.6	1.0	0.6

* Estimated.

Haller Creek near Arden, 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
1959										
1960	148	Mar. 29, 1960	0.6	10.2	0.276	3.75	7,390			

Mill Creek below Forks, near Colville, Wash.

Location.—Lat. 48°36'45", long. 117°46'50", in SW¼SW¼ sec. 16, T. 36 N., R. 40 E. on left bank 200 ft. above road crossing, half a mile downstream from North Fork, and 6½ miles northeast of Colville.

Drainage area.—67.9 sq. mi.

Records available.—March to September 1959.

Gage.—Staff gage. Altitude of gage is 2,160 ft. (from topographic map).

Extremes.—March to September 1959: Maximum discharge observed, 215 cfs May 1 (gage height, 16.24 ft.); minimum observed, 5.7 cfs Sept. 13 (gage height, 14.40 ft.).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959							144	152	82.6	25.2	8.89	9.45	

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959							62	122	48	12	6.9	6.0	

Mill Creek near Colville, Wash.

Location.—Lat. 48°34'45", long. 117°52'00", 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. Prior to Oct. 6, 1959 at site 300 ft. upstream.

Drainage area.—85.1 sq. mi. (revised).

Records available.—October 1939 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,950 ft. (from topographic map). Prior to Mar. 2, 1940, staff gage and Mar. 2, 1940, to Oct. 5, 1959, water-stage recorder (Nov. 2, 1952, to Oct. 5, 1959, used as supplementary gage) at site half a mile upstream at different datum. Nov. 2, 1952, to Oct. 5, 1959, staff gage and crest-stage indicator at site 300 ft. upstream at datum 0.47 ft. higher.

Mill Creek near Colville, Wash.—Continued

Average discharge.—21 years (1939-60), 50.3 cfs (36,420 acre-ft. per year).

Extremes.—1939-60: Maximum discharge, 609 cfs Apr. 22, 1956 (gage height, 7.16 ft., site and datum then in use); minimum 3.6 cfs Aug. 28, 31, Sept. 1, 1940, but may have been less during period of no gage-height record Feb. 1-4, 1940.

Remarks.—No regulation. Diversions for irrigation of about 50 acres above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	14.0	14.6	16.2	15.5	17.3	27.9	105	145	70.3	31.9	16.2	14.0	40.7
1955...	12.3	17.0	13.4	13.1	12.7	12.9	76.9	210	91.2	50.2	21.5	12.5	45.5
1956...	16.3	14.7	20.4	24.5	18.8	33.0	320	192	59.8	26.1	14.5	10.9	62.4
1957...	12.1	12.1	11.9	10.0*	11.9*	20.9	66.8	181	83.7	28.9	15.0	9.30	38.8
1958...	14.0	15.1	14.8	17.5	80.4	119	260	161	51.5	22.6	10.1	11.2	64.4
1959...	13.8	14.4*	13.9	23.4	13.8*	24.9	151	168	102	35.7	16.5*	17.5	49.6
1960...	19.2	21.1	20.3	17.5	22.2	85.2	237	201	99.7	31.7	16.5	14.3	65.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	13.5	13.5	14	13.5	13.5	18	29	87	46	18	13.5	12	12
1955...	11.5	12	10.5	12	11	10	31	114	57	33	13	10.5	10
1956...	14	10*	13	16*	16*	14	91	93	35	16.5	11.5	9.6	9.6
1957...	10.5	10	10.5	9.0*	8.5*	15	34	81	44	18.5	10	8.1	8.1
1958...	11	12.5	12.5	12.5	16.5	63	190	64	36	13.5	7.8	9.2	7.8
1959...	11.5	10*	13	8.5*	12	17	71	138	63	22	14	14	8.5*
1960...	14	12*	14*	13*	12.5*	12*	150	159	50	19	14	12.5	12*

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
1953								51.9	8.59	37,550
1954	301	May 12, 1954	12	40.7	.496	6.76	29,480	40.5	6.72	29,340
1955	272	May 13, 1955	10	45.5	.555	7.53	32,940	46.2	7.66	33,470
1956	609	April 22, 1956	9.6	62.4	.761	10.36	45,300	61.1	10.14	44,370
1957	526	May 20, 1957	8.1	38.8	.473	6.42	28,070	39.4	6.54	28,540
1958	460	Feb. 25, 1958	7.8	64.4	.785	10.67	46,620	64.3	10.62	46,520
1959	227	May 1, 1959	8.5	49.6	.583	7.92	35,930	51.2	8.16	37,050
1960	433	Mar. 30, 1960	12	65.4	.769	10.46	47,480			

* Estimated.

Mill Creek at mouth, near Colville, Wash.

Location.—Lat. 48°34'25", long. 117°56'40", in NE¼SW¼ sec. 31, T. 36 N., R. 39 E., on left bank at upstream side of bridge on U. S. Highway 395, 2 miles northwest of Colville.

Drainage area.—146 sq. mi.

Records available.—July 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,540 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge, 542 cfs Apr. 6, 1960 (gage height, 3.14 ft.); minimum, 16.5 cfs Sept. 14, 1959.

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

Mill Creek at mouth, near Colville, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959										46.8	21.7	23.4	
1960	25.4	28.0	28.4	28.4*	37.7	114	327	267	132	41.6	24.1	24.9	89.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959										28	18	17.5	
1960	21*	17*	20*	21*	23	23*	190	196	73	27	18.5	21	17*

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
1959										
1960	542	April 6, 1960	17	89.8	0.616	8.36	65,210			

Colville River at Kettle 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 Washington Water 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.—1,007 sq. mi. (revised).

Records available.—October 1922 to September 1960. Published as "at Meyers Falls" 1922-38.

Gage.—Water-stage recorder. Altitude of gage is 1,500 ft. (from topographic map). Prior to Oct. 21, 1932, staff gage at site 500 ft. upstream at different datum. Oct. 21, 1932, staff gages at site 200 ft. upstream at different datum. Sept. 20, 1938, to Mar. 20, 1949, staff gage at present site and datum.

Average discharge.—38 years (1922-60), 297 cfs (215,000 acre-ft. per year).

Extremes.—1922-60: Maximum discharge, 3,230 cfs Apr. 23, 1956 (gage height, 10.17 ft.); minimum observed, 0.5 cfs Aug. 15, 1930.

Remarks.—Several ditches above station divert water for irrigation. Prior to Apr. 30, 1960, slight regulation for power by 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
1954	126	149	184	163	319	420	653	648	385	175	95.1	128	286
1955	127	156	144	151	149	183	554	867	420	272	121	96.5	271
1956	137	140	205	341	269	725	2,128	1,137	380	199	136	132	493
1957	147	149	161	141*	202	395	477	787	447	159	98.3	88.6	271
1958	137	152	178	223	608	695	1,421	849	321	168	85.1	99.5	426
1959	126	158	180	392	296	540	1,006	947	580	197	110	154	390
1960	183	205	218	199*	338	590	1,459	1,074	553	189	136	134	439

* Estimated.

Colville 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
1954...	112	128	148	70*	136	294	373	392	255	82	58	102	58
1955...	121	126	93	108	122	93	351	685	210	169	86	78	78
1956...	124	81	100*	200*	200*	306	1,460	562	244	136	118	123	81
1957...	136	127	105*	98*	135	319	420	438	265	98	80	78	78
1958...	112	116	115	118	242	546	1,040	455	214	106	66	74*	66
1959...	109	75	144	120*	246	408	762	748	349	112	86	115	75
1960...	160	112	140	140*	180*	175*	1,010	883	322	131	115	117	112

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					
1953						332	240,100
1954	1,050	May 13, 1954	58	286	207,300	284	205,300
1955	990	May 22, 1955	78	271	195,900	275	199,400
1956	3,230	April 23, 1956	81	493	538,000	491	356,400
1957	1,590	May 21, 1957	78	271	196,400	272	197,000
1958	1,750	Mar. 2, 1958	66	426	308,300	426	308,200
1959	1,120	April 15, 1959	75	390	282,600	402	291,100
1960	2,300	April 29, 1960	112	439	318,400		

* Estimated.

Harvey Creek near Cedonia, Wash.

Location.—Lat. 48°10'25", long. 118°06'55", in SW¼NE¼ sec. 23, T. 31 N., R. 37 E., on right bank, downstream side of farm bridge, 400 ft. downstream from confluence of North and South Forks, 3½ miles upstream from mouth, and 3 miles northeast of Cedonia.

Drainage area.—29.9 sq. mi.

Records available.—July to October 1958.

Gage.—Staff gage. Altitude of gage is 2,100 ft. (from topographic map).

Extremes.—July to October 1958: Maximum discharge observed, 5.2 cfs Oct. 19 (gage height, 0.74 ft.); minimum observed, 0.5 cfs Aug. 17 (gage height, 0.36 ft.).

Remarks.—No known regulation. A substantial percentage of the flow is diverted for irrigation above the station during the summer months.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.05	1.15	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.6	0.6	.....

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, 1¾ miles southeast of Otis Orchards, and 3.3 miles northeast of Greenacres.

Drainage area.—3,880 sq. mi., approximately.

Records available.—October 1950 to September 1960 in reports of the Geological Survey. January 1929 to September 1950 in reports of Washington Water Power Co.

Gage.—Water-stage recorder. Datum of gage is 2,000 ft. above mean sea level (levels by Washington Water Power Co.).

Average discharge.—10 years, 6,834 cfs (4,948,000 acre-ft. per year), unadjusted.

Extremes.—1950-60: Maximum discharge, 38,800 cfs Apr. 26, 1956 (gage height, 20.43 ft.); minimum, 61 cfs Aug. 7, 1951; minimum gage height observed, 7.67 ft. Sept. 2, 1955.

Maximum stage known since 1932, 22.24 ft. Dec. 25, 1933 (discharge, 50,100 cfs), determined from unpublished records collected by Washington Water Power Co. at this station.

Remarks.—Flow partly regulated by powerplant at Post Falls, Idaho, and by Coeur d'Alene Lake. Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal divert water above station for irrigation.

Spokane River above Liberty Bridge, near Otis Orchards, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,844	1,873*	3,452	4,112*	6,692*	8,976	14,040	23,210	14,620	2,401	992	1,000	6,927
1955...	2,900	3,725	3,289	2,120	2,694	2,379	9,087	19,200	16,540	2,907	690	918	5,539
1956...	3,037	5,875	12,520	10,300	4,382	6,889	24,180	28,580	13,820	1,688	775	985	9,474
1957...	2,286	2,787	3,565	3,496	2,156	9,821	16,270	27,980	11,630	1,185	441	553*	6,875
1958...	1,961	2,363	2,578	2,826	8,643	8,265	14,390	19,360	5,356	1,043	159*	863	5,625
1959...	1,300	5,428	8,479	12,590	7,888	6,770	16,410	12,410	14,480	1,254	410	1,597	8,155
1960...	2,981	7,913*	6,073*	4,135	5,429	7,146	12,170	16,580	9,396	1,250	565	1,591	6,995

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,570	1,450*	2,350	3,820	4,380	6,800	6,280	16,300	7,000	330	176	255	176
1955...	690	1,460	2,100	1,500	1,330	2,060	3,440	11,900	8,600	1,360	100*	100*	100*
1956...	1,210	3,470	5,150	5,530	4,000*	4,320	14,800	25,500	602	225	132	105	105
1957...	1,380	1,560	1,620	2,150*	1,610*	6,000	11,500	18,200	300	201	125*	125	125*
1958...	870*	1,620	1,380	1,280	4,030	5,140	7,240	16,700	430	110	70*	523	70*
1959...	90*	1,730	5,620	6,100*	5,500*	4,210	10,700	18,800	1,770	159	90*	930	90*
1960...	745	3,200*	4,380	2,740	1,860	4,000	15,000	14,100	825	150*	143	464	143

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					
1953						5,993	4,339,000
1954	29,700	May 22, 1954	176	6,927	5,014,000	7,155	5,179,000
1955	26,100	May 25, 1955	100	5,539	4,010,000	6,511	4,714,000
1956	38,800	April 26, 1956	105	9,474	6,878,000	8,399	6,098,000
1957	35,400	May 25, 1957	125	6,875	4,977,000	6,729	4,871,000
1958	24,000	April 24, 1958	70	5,625	4,072,000	6,322	4,576,000
1959	26,500	May 5, 1959	90	8,155	5,904,000	8,298	6,007,000
1960	26,700	April 12, 1960	143	6,995	5,078,000		

* Estimated.

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.

Records available.—January 1948 to September 1954.

Gage.—Water-stage recorder. Datum of gage is 1,907.49 ft. above mean sea level (levels by Bureau of Reclamation). Prior to Dec. 4, 1948, at site 20 ft. upstream at same datum.

Average discharge.—6 years (1948-54), 7,332 cfs (5,308,000 acre-ft. per year).

Extremes.—1948-54: 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.

Remarks.—Flow partly regulated by powerplant of Washington Water Power Co. at Post Falls, Idaho, and by Coeur d'Alene Lake, which has a usable capacity of 157,000 acre-ft. Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal divert water above station for irrigation. In 1946 approximately 22,600 acres were under irrigation above Spokane, of which about 15,000 acres utilized surface water.

Spokane River below Trent 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
1954...	2,194	2,218	3,732	4,374	7,079	9,447	14,670	24,210	14,940	2,900	1,485	1,392	7,379

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,930	1,800	2,610	4,110	4,640	7,320	6,790	16,900	7,800	965	816	736	736

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					
1953.....	.....	.....	.....	.....	.....	6,306	4,566,000
1954.....	31,300	May 23, 1954	736	7,379	5,343,000	.....	.....

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, half a mile upstream from Latah Creek.

Drainage area.—4,290 sq. mi., approximately.

Records available.—April 1891 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,696.6 ft., above mean sea level, datum of 1929 (river-profile survey). Prior to July 1, 1921, water-stage recorders and staff or wire-weight gages at several sites within 4 miles of present site at various datums.

Average discharge.—69 years (1891-1960), 6,864 cfs (4,969,000 acre-ft. per year), unadjusted.

Extremes.—1891-1960: Maximum discharge, 49,000 cfs (estimated) May 31, 1894 (gage height, 12.42 ft., site and datum then in use); minimum, 95 cfs Sept. 19, 1956 (gage height, 15.60 ft.); minimum daily, 740 cfs Sept. 7, 1947.

Remarks.—Flow partly regulated by powerplant of Washington Water Power Co. at Post Falls, Idaho, and at Spokane, and by Coeur d'Alene Lake. Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal divert water above station for irrigation. In 1946, approximately 22,600 acres (of which about 15,000 acres utilized surface water) were under irrigation upstream from Spokane.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,387	2,422	3,830	4,541	7,248	9,645	14,370	23,920	15,110	3,487	1,939	1,773	7,549
1955...	3,396	4,230	3,901	2,762	3,195	2,919	9,287	20,000	17,560	3,695	1,565	1,598	6,106
1956...	3,527	6,142	12,360	10,950	5,598	7,262	23,810	29,390	15,100	2,849	1,712	1,849	10,050
1957...	3,030	3,586	4,165	4,155	2,794	9,768	16,090	28,060	12,590	2,277	1,349	1,344	7,462
1958...	2,537	2,981	3,139	3,424	8,595	9,120	15,060	20,290	6,801	1,987	1,002	1,534	6,375
1959...	1,911	5,885	8,946	13,160	8,865	7,538	16,930	21,850	15,190	2,349	1,315	2,279	8,838
1960...	3,521	8,164	6,931	5,003	6,068	7,608	21,920	17,350	10,590	2,181	1,452	2,303	7,734

Spokane River at Spokane, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,050	2,040	2,830	4,230	4,910	7,720	7,220	16,800	8,480	1,390	1,340	1,000	1,000
1955...	1,450	2,360	2,820	2,220	2,060	2,470	3,680	12,400	10,100	2,400	910	841	841
1956...	1,970	3,940	5,920	6,540	4,510	4,890	14,700	26,000	2,660	1,400	1,150	1,100	1,100
1957...	2,140	2,920	2,580	2,840	2,220	5,790	11,500	17,700	2,430	1,280	903	972	903
1958...	1,710	2,490	2,150	2,610	4,490	6,080	7,980	17,500	2,200	1,080	814	1,220	814
1959...	966	2,290	6,130	7,010	6,680	5,310	10,800	19,600	3,200	1,410	858	1,440	858
1960...	1,630	3,790	4,990	3,530	2,910	4,940	15,900	15,000	2,210	1,120	1,060	1,160	1,060

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					
1953						6,641	4,808,000
1954	31,000	May 21, 1954	1,000	7,549	5,465,000	7,789	5,639,000
1955	27,000	May 25, 1955	841	6,196	4,486,000	7,082	5,128,000
1956	37,800	April 27, 1956	1,100	10,050	7,297,000	9,106	6,610,000
1957	35,600	May 25, 1957	903	7,462	5,402,000	7,283	5,272,000
1958	24,400	April 24, 1958	814	6,375	4,615,000	7,053	5,106,000
1959	26,500	May 4, 1959	858	8,838	6,399,000	8,991	6,509,000
1960	27,400	April 12, 1960	1,060	7,734	5,614,000		

Hangman 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.

Records available.—April 1948 to September 1960. Prior to October 1958, published as Latah Creek at Spokane.

Gage.—Water-stage recorder. Altitude of gage is 1,720 ft. (from topographic map). Prior to Nov. 22, 1948, wire-weight gage at site half a mile upstream at different datum.

Average discharge.—12 years (1948-60), 271 cfs (196,200 acre-ft. per year).

Extremes—1948-60: Maximum discharge, 16,200 cfs Jan. 24, 1959 (gage height, 12.30 ft.); minimum, 3.8 cfs Sept. 4, 5, 8, 1955 (gage height, 2.12 ft.).

Remarks.—No regulation. 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
1954...	15.2	25.4	123	306	1,233	434	222	64.7	61.1	21.6	12.5	20.8	205
1955...	17.6	28.5	51.6	83.1	309	317	564	169	28.7	15.1	5.38	5.38	131
1956...	16.2	188	1,251	855	248	1,763	519	168	66.1	27.6	20.1	20.2	432
1957...	26.0	32.5	45.9	41.7*	668	1,123	490	960	157	26.5	18.6	12.9	299
1958...	19.2	33.6	134	650	1,370	299	723	110	37.8	20.0	12.4	13.6	277
1959...	16.9	58.6	419	1,574	399	779	297	157	53.4	23.0	16.4	21.6	320
1960...	30.5	123	78.2	161*	648	439	329	137	36.9	9.22	9.60	10.6	166

* Estimated.

Hangman Creek at Spokane, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	13.5	17	31*	65	302	170	121	42	29	11	7.5	13.5	7.5
1955...	14.5	18.5	25	31*	52*	48	349	64	15.5	7.4	4.6	4.0	4.0
1956...	8.0	15*	125	170*	111	282	177	67	39	20	17.5	19	8.0
1957...	20	28	24*	30*	35*	400	144	117	41	19.5	15	11.5	11.5
1958...	15	19.5	40	43	320	151	305	50*	26*	13	11.5	12	11.5
1959...	13.5	18.5	47	110*	218	282	167	97	34	18	13.5	16	13.5
1960...	25	20*	40	25*	30*	30*	159	61	16.5	5.1	7.0*	9.0	5.1

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
1953								216	4.73	156,400
1954	6,500	Feb. 22, 1954	7.5	205	.331	4.49	148,200	199	4.36	144,100
1955	4,730	Feb. 8, 1955	4.0	131	.212	2.88	95,000	246	5.40	178,100
1956	11,300	Dec. 22, 1955	8.0	432	.698	9.50	313,600	318	7.00	230,900
1957	9,320	Feb. 27, 1957	11.5	299	.483	6.54	216,200	306	6.69	221,200
1958	6,090	Feb. 13, 1958	11.5	277	.447	6.07	200,600	313	6.64	219,500
1959	16,200	Jan. 24, 1959	13.5	320	.517	7.01	231,400	297	6.52	215,100
1960	2,710	Feb. 7, 1960	5.1	166	.268	3.66	120,200			

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 upstream and northeast of Elk.

Drainage area.—115 sq. mi.

Records available.—July 1948 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,870 ft. (from topographic map).

Average discharge.—12 years (1948-60), 59.8 cfs (43,290 acre-ft. per year).

Extremes.—1948-60: Maximum discharge, 148 cfs Apr. 7, 1956 (gage height, 1.87 ft.); maximum gage height, 2.98 ft. Jan. 16, 1957 (backwater from ice); minimum discharge, 28 cfs Jan. 16, 1954 (gage height, 1.01 ft.).

Remarks.—No regulation or diversion.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	44.4	45.8	46.7	46.4	52.6	71.5	78.0	68.1	55.8	43.7	42.8	43.8	53.3
1955...	41.2	39.5	42.4	44.8	44.6	47.1	67.1	70.3	51.9	45.1	40.4	40.1	47.9
1956...	45.6	45.3	61.8	69.7	56.3*	81.9	137	95.2	78.6	63.8	51.9	50.1	69.7
1957...	48.8	48.2	53.7	49.0*	49.1*	61.6	98.1	70.9	62.1	48.1	45.0	42.8	54.0
1958...	46.2	44.1	45.5	63.1	76.5	86.5	89.3	71.7	57.1	51.0	46.7	45.8	59.3
1959...	45.1	48.2	47.2	62.5	58.1	66.9	80.3	71.6	63.4	48.0	42.3	44.5	56.5
1960...	43.2	47.9	53.9	47.6	64.7	72.3	101	88.7	71.2	55.5	51.0	50.2	62.2

* Estimated.

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
1954...	43	43	43	42	43	59	70	63	48	40	40	42	40
1955...	39	38	38	43*	43*	43*	55	60	48	42	39	37	37
1956...	42	38*	46	56*	45*	55	116	80	72	50	49	48	38*
1957...	46	47	45	43*	42*	55	64	58	54	46	42	42	42*
1958...	45	40	41	45	58	78	80	60	54	47	45	44	40
1959...	43	43	45	43*	54	61	72	66	57	41	40	42	40
1960...	41	36*	49	40	50*	48*	89	82	60	52	49	49	36*

Summary

YEAR	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
1953								57.3	6.76	41,510
1954	86	Mar. 10, 11, 1954	40	53.3	0.463	6.29	38,580	52.1	6.15	37,730
1955	94	April 23, 1955	37	47.9	0.417	5.62	34,640	50.3	5.92	36,430
1956	148	April 7, 1956	38	69.7	0.606	8.25	50,600	69.6	8.24	50,500
1957	108	May 20, 1957	42	54.0	0.470	6.36	39,080	52.7	6.21	38,180
1958	113	Feb. 26, 27 1958	40	59.3	0.516	7.00	42,960	59.7	7.04	43,230
1959	101	Jan. 12, 1959	40	56.5	0.491	6.66	40,880	56.8	6.70	41,160
1960	137	Mar. 31, 1960	36	62.2	0.541	7.36	45,150			

* Estimated.

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 50 ft. downstream from highway bridge at Dartford, 6 miles upstream from mouth, and 8 miles north of Spokane.

Drainage area.—665 sq. mi.

Records available.—April 1929 to September 1932, December 1946 to September 1960.

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.—16 years (1929-32, 1947-60), 331 cfs (239,600 acre-ft. per year).

Extremes.—1929-32, 1946-60: Maximum discharge 2,460 cfs Feb. 7, 1960 (gage height, 5.07 ft.); 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.

Revisions.—The momentary maximum discharge for the water year 1951 published in State WSB No. 6 has been revised to 1,560 cfs.

Little Spokane River at Dartford, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	161	177	223	233	384	569	567	373	265	183	151	160	286
1955...	156	180	187	193	205	279	665	556	271	183	138	135	262
1956...	172	201	353	557	375	844	1,259	552	334	234	174	169	435
1957...	189	193	239	173	311	501	509	523	324	162	130	142	283
1958...	170	184	207	330	869	694	842	443	240	173	140	151	366
1959...	166	204	222	616	424	658	704	544	357	188	151	174	367
1960...	188	247	288	248	624	568	929	679	421	203	175	171	393

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	154	154	185	179	195	429	448	302	211	145	131	148	131
1955...	150	153	155*	165*	160*	160*	470	422	194	153	129	126	126
1956...	144	145	207	350*	240*	378	900	382	277	174	159	157	144
1957...	167	172	150	135*	145*	396	382	333	207	136	120	129	120
1958...	150	158	178	191	386	505	575	286	201	150	133	142	133
1959...	155	153	188	130	359	575	565	456	255	158	136	147	130
1960...	172	147	214	197	328	300	736	520	288	174	159	162	147

Summary

YEAR	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
1953								316		229,100
1954	1,110	Mar. 10, 1954	131	286			207,300	283	5.77	205,000
1955	1,320	April 23, 1955	126	262	.394	5.34	189,800	279	5.70	202,300
1956	1,720	Mar. 26, 1956	144	435	.654	8.91	315,800	419	8.59	304,100
1957	2,060	Feb. 27, 1957	120	283	.426	5.77	204,600	278	5.67	200,900
1958	2,040	Feb. 26, 1958	133	366	.550	7.46	265,300	369	7.51	267,200
1959	2,060	Jan. 12, 1959	130	367	.552	7.48	265,700	378	7.72	273,700
1960	2,460	Feb. 7, 1960	147	393	.591	8.06	285,500			

* Estimated.

Long Lake at Long Lake, Wash.

Location.—Lat. 47°50'15", long. 117°50'20", in NW¼SW¼ sec. 13, T. 27 N., R. 39 E., at left end of spillway at Long Lake dam, 12 miles north of Reardan.

Drainage area.—5,920 sq. mi., approximately.

Records available.—October 1913 to September 1960.

Gage.—Water-stage recorder and staff gage, with long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Washington Water Power Co.).

Extremes.—1913-60: Maximum contents, 104,200 acre-ft. for many days in 1950-56 (elevation 1,536.0 ft.); minimum, since filling reservoir in 1920, 7,950 acre-ft. Mar. 31, 1955 (elevation, 1,514.20 ft.).

Remarks.—Reservoir is formed by concrete dam, completed in 1913 and raised 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. Records given herein represent usable contents. Water used for power. Diversions above station for irrigation of about 25,000 acres in Idaho and Washington. Other regulation in Coeur d'Alene Lake and at powerplants along Spokane River.

Revisions.—Revised figures of contents for the water years 1916 to 1933, superseding those published in State WSB No. 6, are given herewith:

Long Lake at Long Lake, 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
1916...	400	4,900	4,700	7,200	12,900	33,500	31,000	25,700	24,300	7,050	4,500	4,090	.....
1917...	5,100	5,400	5,190	5,250	5,830	9,620	33,540	44,000	23,660	10,640	9,540	8,700	.....
1918...	8,780	6,300	42,300	20,000	14,200	25,500	29,000	20,500	2,000	2,500	400	4,000	.....
1919...	5,250	8,400	8,700	24,500	9,020	32,300	35,020	53,000	59,600	59,750	58,400	59,100	.....
1920...	60,800	60,650	57,700	59,750	48,800	55,250	60,000	56,800	62,950	63,850	67,550	67,300	.....
1921...	67,300	65,700	49,500	52,300	48,600	48,150	47,700	47,700	77,450	79,400	77,950	77,700	.....
1922...	79,200	77,200	75,050	78,950	77,200	72,250	65,700	60,650	79,200	79,600	77,450	79,200	.....
1923...	77,200	78,200	78,950	70,600	77,950	77,000	68,950	64,500	77,700	77,200	78,700	79,000	.....
1924...	77,950	78,950	78,950	75,550	67,300	74,150	71,500	72,000	77,950	78,700	78,700	79,850	.....
1925...	77,950	77,950	77,000	73,650	68,500	71,100	68,300	68,500	79,400	77,950	79,400	78,450	.....
1926...	77,200	78,950	79,200	76,050	75,800	73,000	68,500	77,450	78,950	77,700	78,200	78,700	.....
1927...	78,700	72,500	73,900	76,550	70,100	69,900	65,700	63,850	74,800	79,200	78,950	78,700	.....
1928...	77,450	70,100	71,500	72,000	74,800	68,950	70,600	65,900	79,400	79,200	78,450	78,450	.....
1929...	76,300	79,200	78,700	74,800	58,200	68,050	67,100	67,800	78,700	78,700	77,700	79,200	.....
1930...	74,400	63,600	74,150	68,050	62,700	9,900	29,800	66,150	77,450	76,550	78,700	78,200	.....
1931...	78,450	78,700	74,600	78,450	77,200	73,400	72,250	76,300	74,600	78,700	77,700	75,050	.....
1932...	77,000	77,000	75,550	72,000	63,200	66,150	60,200	64,500	79,400	79,400	76,800	76,300	.....
1933...	79,200	75,550	76,800	74,800	75,300	70,850	71,500	64,500	72,500	77,700	78,450	77,450	.....

NOTE: Contents based on 8 a. m. readings for the first day of the following month fom October 1915 to December 1923 and January 1927 to September 1933 and from mean daily elevations from January 1924 to December 1926.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	98,500	103,050	99,200	99,600	96,350	101,450	98,200	89,950	102,300	93,350	103,450	103,200	.....
1955...	103,700	100,950	84,900	54,450	40,950	7,950	102,700	100,350	99,700	103,350	103,800	102,000	.....
1956...	102,300	103,400	99,100	103,650	98,250	93,700	88,600	91,400	98,200	103,000	100,750	103,350	.....
1957...	101,950	87,400	101,050	66,600	58,600	97,200	100,700	89,300	97,300	103,250	102,150	103,200	.....
1958...	102,450	102,150	101,300	96,350	98,250	102,700	97,850	99,700	101,200	101,100	101,600	103,150	.....
1959...	98,200	103,350	101,700	92,100	101,600	101,700	99,650	98,850	101,750	98,550	103,350	103,250	.....
1960...	101,450	99,200	103,600	90,450	90,900	72,450	65,500	101,650	102,100	102,500	103,150	92,800	.....

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 powerhouse, 1½ miles upstream from Chamokane Creek and 12 miles north of Reardan.

Drainage area.—5,920 sq. mi., approximately.

Records available.—April 1939 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,299.00 ft. above mean sea level, datum of 1929.

Average discharge.—21 years (1939-60), 8,122 cfs (5,880,000 acre-ft. per year), adjusted for storage.

Extremes.—1939-60: Maximum discharge recorded, 49,400 cfs May 24, 1948 (gage height, 78.66 ft.); minimum not determined, occurred sometime during periods of backwater; minimum daily, 114 cfs Sept. 2, 1956.

Remarks.—Flow partly regulated above station by Coeur d'Alene Lake and Long Lake (see preceding page), and by powerplants of Washington Water Power Co. Many diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal for irrigation of several thousand acres above station.

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
1954...	3,250	3,148	4,945	5,747	9,611	11,180	16,000	25,550	16,180	4,212	2,368	2,481	8,708
1955...	3,996	4,957	4,979	4,166	4,664	4,688	8,756	20,370	18,000	4,384	2,068	2,257	6,942
1956...	3,889	6,815	14,760	13,140	6,506	10,660	26,850	31,820	16,770	3,342	2,464	2,375	11,630
1957...	3,636	4,413	4,554	5,474	4,683	10,720	17,440	30,660	13,920	2,658	2,006	1,909	8,529
1958...	3,309	3,760	3,974	5,115	11,540	10,510	17,120	21,070	7,539	2,758	1,646	2,158	7,508
1959...	2,683	6,498	10,200	16,430	10,180	9,766	18,290	23,000	16,420	3,296	1,889	3,105	10,140
1960...	4,327	9,065	7,780	6,170	7,841	9,417	23,370	17,800	11,530	2,887	2,084	3,122	8,756

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	214	202	3,740	4,810	5,480	8,100	7,610	18,100	9,900	1,000	174	144	144
1955...	1,080	2,240	3,400	2,900	3,070	3,860	5,500	9,350	11,300	1,080	1,010	144	144
1956...	1,200	4,220	6,670	6,960	6,060	6,080	16,000	23,600	3,300	379	372	114	114
1957...	544	3,590	828	5,030	3,220	6,420	12,600	20,500	3,240	152	144	144	144
1958...	2,080	1,330	1,260	2,790	6,220	7,150	9,320	17,200	367	150	150	210	150
1959...	210	1,030	6,730	7,700	6,600	6,850	13,500	20,800	5,040	580	150	1,190	150
1960...	1,260	4,120	6,780	3,270	6,840	6,940	17,300	12,700	1,930	330	548	614	330

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	7,789	5,639,000	7,785	17.85
1954.....	44,400	May 25, 1954	144	8,708	6,304,000	8,709	.....	19.97	8,922	6,459,000	8,902	20.41
1955.....	28,600	June 15, 1955	144	6,942	5,026,000	6,941	.....	15.92	7,917	5,732,000	7,937	18.20
1956.....	45,100	April 25, 1956	114	11,630	8,440,000	11,630	.....	26.73	10,540	7,654,000	10,550	24.25
1957.....	47,400	May 24, 1957	144	8,529	6,174,000	8,529	.....	19.55	8,398	6,080,000	8,398	19.26
1958.....	32,600	April 23, 1958	150	7,508	5,436,000	7,508	.....	17.22	8,209	5,944,000	8,209	18.83
1959.....	38,100	Jan. 25, 1959	150	10,140	7,339,000	10,140	.....	23.24	10,280	7,444,000	10,280	23.58
1960.....	29,700	Mar. 31, 1960	330	8,756	6,357,000	8,743	.....	20.10	.....	.....	.....	.....

SANPOIL RIVER BASIN

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.

Records available.—August 1952 to September 1955. Annual maximum discharge only, water years 1956-59.

Gage.—Water-stage recorder. Datum of gage is 1,464.08 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. October 1955 to September 1959, stilling well only, at same site and datum.

Extremes.—1952-59: Maximum discharge, 3,920 cfs Apr. 23, 1956 (gage height, 10.02 ft. from high-water mark in well).

1952-55: Minimum discharge, 32 cfs Sept. 13, 1955 (gage height, 3.72 ft.).

Remarks.—No regulation. 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.

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
1954...	57.2	62.3	62.7	67.9*	113	274	678	637	298	119	54.6	56.4	207
1955...	52.7	83.5	70.0*	63.3*	63.3*	73.5	608	773	379	196	81.9	39.3	207

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	54	56	57*	54*	68*	142	258	398	204	61	46	44	44
1955...	51	52	60*	56*	53*	54*	188	605	223	126	48	32	32

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					
1953						315	228,300
1954	1,200	May 12, 1954	44	207	149,700	209	151,100
1955	1,120	April 23, 1955	32	207	150,100		
1956	3,920	April 23, 1956					
1957	1,420	May 21, 1957					
1958	1,350						
1959	1,080						

* Estimated.

DIVERSION AT GRAND COULEE DAM

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 at Grand Coulee, a quarter of a mile downstream from intake and half a mile southwest of Grand Coulee Dam.

Records available.—October 1951 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,550.0 ft. above mean sea level, Bureau of Reclamation, adjustment of 1937. Supplementary water-stage recorder 3,100 ft. downstream from base gage at same datum. Auxiliary water-stage recorder 1 mile downstream from base gage.

Extremes.—1951-60: Maximum daily discharge, 11,000 cfs July 11, 1954; no flow except during pumping seasons.

Remarks.—Water is pumped (beginning May 1951) 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 Banks Lake (formerly called equalizing reservoir). From Banks Lake it is distributed through a system of canals to the Columbia Basin project.

Feeder canal at Grand Coulee, Wash.—Continued

Monthly and Yearly Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1952...	117,000	1,000	0	0	0	0	0	93,770	144,600	215,800	185,400	543	758,100
1953...	1,190	0	0	0	0	0	0	188,200	339,500	234,800	0	0	763,700
1954...	0	0	0	0	0	0	0	160,300	552,700	435,400	195,900	124,600	1,469,000
1955...	3,120	135,300	12,260	0	0	0	0	95,030	538,700	373,900	247,100	70,800	1,476,000
1956...	48,380	224,500	52,540	0	0	0	83,530	225,400	240,700	281,700	239,100	15,910	1,412,000
1957...	0	0	0	0	0	0	101,600	289,200	412,300	270,200	128,300	0	1,202,000
1958...	0	0	0	0	236,400	140,100	0	249,200	466,300	347,400	283,100	136,000	1,858,000
1959...	0	103,100	0	0	0	0	0	140,300	372,600	315,400	329,900	85,610	1,347,000
1960...	0	0	0	0	0	0	78,270	353,400	346,500	408,900	314,100	140,400	1,606,000

COLUMBIA RIVER MAIN STEM

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.

Records available.—April 1938 to September 1960. Prior to October 1943, published as Columbia River Reservoir at Grand Coulee Dam.

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). Prior to Apr. 24, 1942, staff gage at site 2,000 ft. upstream at same datum.

Extremes.—1938-60: 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 is 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) above mean sea level. Storage below 1,208 ft., 4,330,000 acre-ft. Figures given herein represent total contents. Water is used for power development and diversion by pumping for irrigation of Grand Coulee project (began in May 1951) of Bureau of Reclamation.

Correction.—In State WSB No. 6 the contents for December 1942 was erroneously published as 8,269,600 acre-ft.; it should be 9,269,600 acre-ft.

Contents on Last Day of Month in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9,305.4	9,306.2	9,069.8	7,955.0	7,492.5	7,263.6	8,183.5	8,412.3	8,702.7	9,554.0	9,558.0	9,396.1	.....
1955...	9,338.0	9,371.4	9,083.1	8,194.4	6,955.9	5,083.4	4,960.1	8,305.5	9,547.5	9,554.0	9,468.1	9,378.6	.....
1956...	9,451.3	9,393.7	9,548.3	9,314.1	8,493.8	8,379.5	7,473.8	8,724.1	9,556.4	9,554.0	9,554.0	9,385.0	.....
1957...	9,356.3	9,119.1	8,800.7	7,130.6	6,132.4	6,433.7	6,743.0	9,097.2	9,550.0	9,539.5	9,242.8	9,352.3	.....
1958...	9,374.6	9,306.2	8,975.4	8,056.1	7,275.1	6,367.2	6,525.4	9,201.7	9,552.4	9,548.3	9,555.6	9,536.3	.....
1959...	9,370.6	9,529.1	9,476.9	9,529.1	8,804.6	7,003.0	6,741.1	7,733.2	9,547.5	9,540.3	9,555.6	9,545.9	.....
1960...	9,551.6	9,466.5	8,930.4	7,701.5	6,972.4	7,057.6	7,217.3	8,035.1	9,545.9	9,549.1	9,510.6	9,379.4	.....

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.

Records available.—April 1913 to June 1923 (monthly discharge only), July to December 1923, January 1924 to May 1928 (monthly discharge only), June 1928 to September 1960. Published as "at Grand Coulee, near Nespelem" prior to 1936 and as "at Grand Coulee" 1936-42.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, Bureau of Reclamation adjustment of 1937. June 27 to Dec. 31, 1923, June 12, 1928, to Mar. 31, 1931, staff gages at site half a mile upstream at datum 2.4 ft. lower. Apr. 1, 1931, to Dec. 31, 1935, water-stage recorder at site 850 ft. downstream at present datum. Since June 12, 1955, auxiliary water-stage recorder 6 miles downstream from base gage.

Average discharge.—47 years (1913-60), 109,500 cfs (79,270,000 acre-ft. per year), unadjusted.

Extremes.—1913-60: Maximum discharge, 637,800 cfs June 12, 1948 (elevation, 987.90 ft.); minimum, 14,900 cfs Dec. 17, 1956 (elevation, 934.37 ft.); minimum daily, 15,300 cfs Feb. 1, 1937.

Maximum discharge known, 725,000 cfs (estimated) during flood of June 1894.

Remarks.—Feeder canal 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. Flow regulated by Franklin D. Roosevelt Lake (see preceding page) 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
1954...	68,500	61,920	54,640	61,640	56,180	66,030	58,430	232,500	358,100	329,600	164,300	107,000	135,400
1955...	65,640	65,110	64,300	63,310	71,710	79,200	71,520	75,320	290,700	300,200	133,700	72,470	113,000
1956...	62,210	66,190	62,320	65,480	65,810	66,740	176,400	277,900	399,400	219,600	113,000	72,030	137,200
1957...	64,200	61,400	54,430	73,280	64,760	49,230	69,460	274,500	289,400	143,700	92,690	60,160	108,300
1958...	59,240	57,510	52,780*	56,920	62,730	78,530	85,110	196,000	298,700	153,600	87,520	63,840	104,500
1959...	62,130	54,610	58,800	70,980	75,000	89,840	110,000	211,400	336,700	269,100	124,100	110,400	131,300
1960...	104,700	95,530	77,430	70,680	67,100	65,980	147,100	171,800	245,900	231,500	113,300	69,360	121,800

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	56,600	43,100	38,700	48,700	40,000	57,000	46,200	99,000	306,000	232,500	135,100	79,500	38,700
1955...	56,300	52,500	49,200	43,800	57,700	74,500	63,700	53,100	138,800	224,900	88,800	61,800	43,800
1956...	53,000	52,900	42,200	48,700	52,900	45,400	101,500	240,700	280,600	175,700	82,700	53,900	42,200
1957...	49,200	47,400	27,300	42,900	38,600	38,700	54,000	90,700	189,600	118,200	66,700	49,900	27,300
1958...	50,700	49,000	36,700*	48,600	41,700	47,700	63,900	94,000	217,200	112,200*	76,900	50,400	36,700*
1959...	48,100	37,400	47,100	42,000	60,500	79,400	85,600	162,600	265,200	202,300	85,400	80,900	37,400
1960...	91,300	71,100	60,900	51,800	53,100	49,800	102,900	103,500	215,400	144,400	71,400	56,700	49,800

* Estimated.

Columbia River at Grand Coulee Dam, Wash.—Continued

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Observed					Observed	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1953	.....	.....	.....	.....	.....	107,800	78,060,000
1954	403,500	July 10, 1954	38,700	135,400	98,030,000	136,300	98,640,000
1955	414,100	June 28, 1955	43,800	113,000	81,790,000	112,600	81,520,000
1956	522,000	June 8, 1956	42,200	137,200	99,600,000	136,300	98,960,000
1957	401,800	May 26, 1957	27,300	108,300	78,430,000	107,400	77,790,000
1958	387,100	June 6, 1958	36,700	104,500	75,640,000	105,000	76,020,000
1959	426,400	June 28, 1959	37,400	131,300	95,050,000	139,900	101,250,000
1960	297,700	July 1, 1960	49,800	121,800	88,420,000	.....	.....

Rufus Woods Lake at Bridgeport, Wash.

Location.—Lat. 47°59'40", long. 119°38'05", in SW¼ sec. 24, T. 29 N., R. 25 E., in intake structure of Chief Joseph Dam, half a mile upstream from Foster Creek and 1½ miles southeast of Bridgeport.

Drainage area.—75,000 sq. mi., approximately.

Records available.—November 1954 to September 1960.

Gage.—Water-stage transmitter and recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 28, 1955, staff gage at same site and datum.

Extremes.—1954-60: Maximum contents, 532,200 acre-ft. June 27, 1956 (elevation, 948.1 ft.); minimum since normal low operating level reached in November 1954, 380,500 acre-ft. July 6, 1958 (elevation, 927.0 ft.).

Remarks.—Reservoir is formed by concrete gravity-type dam completed in June 1955; storage began in November 1954. Capacity, 287,600 acre-ft. between elevations 901.5 (spillway crest and lower limit of operation) and 946.0 ft. (normal maximum operating pool). Storage below 901.5 ft., 228,600 acre-ft. Records given herein represent total contents. Water used 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
1955	.....	40,000	249,000	269,300	288,600	281,500	282,600	299,400	516,300	442,800	452,900	424,400	.....
1956	458,700	447,100	499,100	452,200	402,300	437,100	429,300	427,200	427,200	425,800	435,700	428,600	.....
1957	432,900	435,700	433,600	427,900	419,500	441,400	435,700	508,800	493,200	426,500	516,300	508,000	.....
1958	499,800	505,000	508,000	508,800	505,000	487,200	435,700	452,900	435,700	488,000	422,300	470,300	.....
1959	504,300	492,400	473,300	489,500	474,000	459,400	470,300	495,400	505,000	485,000	496,100	493,900	.....
1960	494,600	496,900	514,000	477,600	502,000	482,800	493,200	483,500	491,700	511,800	503,600	468,200	.....

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.

Records available.—April 1952 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Average discharge.—8 years (1952-60), 119,900 cfs (86,800,000 acre-ft. per year).

Extremes.—1952-60: Maximum discharge, 488,600 cfs June 7, 1956 (elevation, 792.20 ft.); minimum recorded, 31,000 cfs Dec. 21, 1956 (elevation 753.88 ft.); minimum daily, 31,000 cfs (estimated) Jan. 11, 1953.

Remarks.—Feeder canal diverts water by pumping from Franklin D. Roosevelt Lake for Columbia Basin project. Other diversions above station for irrigation are small percentage of flow past gage. Flow regulated by Rufus Woods Lake (see preceding page), Franklin D. Roosevelt Lake (see p. 228) and reservoirs in Kootenai, Flathead, 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
1954...	70,390	63,320	56,380	63,480	57,660	67,800	60,170	225,600	356,500	329,800	165,900	107,900	135,900
1955...	68,020	65,460	62,230	63,160	71,890	79,550	72,500	75,090	285,300	305,300	131,400	76,110	113,200
1956...	62,710	67,420	63,080	68,020	67,550	68,320	173,600	279,200	393,000	222,200	112,500	74,210	137,600
1957...	64,880	61,440	55,510	73,050	65,950	51,160	69,870	270,400	290,600	145,000	90,620	60,670	108,500
1958...	59,530	56,610	52,060	55,320	62,650	80,530	86,350	192,000	295,500	150,300	88,600	63,280	103,700
1959...	61,610	54,560	58,060	70,660	75,690	90,190	109,400	210,900	334,300	217,000	123,800	110,500	131,200
1960...	104,500	95,140	77,630	71,040	66,710	66,260	147,100	172,600	246,000	231,300	113,800	69,330	121,900

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	60,400	48,400	39,100	51,500	43,200	58,700	48,100	81,800	305,400	241,400	133,400	83,500	39,100
1955...	59,700	54,300	47,700	46,100	62,800	75,600	66,200	55,500	123,400	230,600	86,500	65,000*	46,100
1956...	53,400	57,600	47,000*	52,100	59,400	51,400	91,800	242,400	294,300	179,000	85,500	64,000	47,000*
1957...	54,100	45,200	36,600	53,200	38,000	40,400	52,500	77,100	194,600	116,400	70,900	53,300	36,600
1958...	48,700	49,100	36,400	44,000	41,700	53,400	61,900	90,400	225,400	111,300	77,600	56,900	36,400
1959...	52,200	42,000*	48,100	43,600	62,500	83,500	84,000	163,400	272,100	202,400	90,400	86,300	42,000*
1960...	91,600	71,200	60,400	51,600	53,100	50,100	99,800	104,900	211,600	139,200	71,400	57,700	50,100

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					
1953						109,600	79,330,000
1954	393,800	July 14, 1954	39,100	135,900	98,400,000	136,400	98,740,000
1955	418,000	June 30, 1955	46,100	113,200	81,960,000	113,000	81,800,000
1956	488,600	June 7, 1956	47,000	137,600	99,900,000	136,700	99,210,000
1957	398,000	May 25, 1957	36,600	108,500	78,530,000	107,300	77,700,000
1958	376,000	June 5, 1958	36,400	103,700	75,040,000	104,200	75,450,000
1959	397,500	June 27, 1959	42,000	131,200	94,950,000	139,800	101,200,000
1960	288,300	July 5, 1960	50,100	121,900	88,520,000		

* Estimated.

Okanagan River at Okanagan Falls, British Columbia
(International gaging station)

Location.—Lat. 49°20′, long. 119°35′, on right bank 0.1 mile downstream from dam at outlet of Skaha Lake at Okanagan Falls.

Drainage area.—2,650 sq. mi., approximately.

Records available.—January 1915 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,092.82 ft. above mean sea level (Geodetic Survey of Canada, 1947 joint adjustment). Prior to Oct. 2, 1933, staff gages at sites about 600 to 700 ft. upstream at different datums. Oct. 2, 1933, to Apr. 13, 1936, staff gage and Apr. 14, 1936, to Nov. 12, 1954, water-stage recorder, at site 200 ft. upstream at same datum.

Average discharge.—45 years (1915-60), 529 cfs (383,000 acre-ft. per year).

Extremes.—1915-60: Maximum discharge, 2,790 cfs Apr. 25, 1958 (gage height, 2.88 ft.); minimum observed, 4.6 cfs Mar. 14, 1931.

Remarks.—Diversions above station for irrigation of approximately 38,000 acres. Flow regulated by control dams at outlets of Okanagan and Skaha Lakes.

Cooperation.—This station is 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
1954...	561	578	606	508	846	637	399	519	714	1,080	1,030	824	691
1955...	645	772	773	690	680	664	644	024	938	883	834	846	750
1956...	467	297	281	475	575	679	809	1,130	1,310	1,310	692	500	711
1957...	437	406	542	526	487	459	448	769	740	734	646	679	574
1958...	621	533	522	516	515	506	873	664	584	548	551	506	578
1959...	350	356	420	452	669	808	825	1,380	1,700	999	621	551	761
1960...	491	1,090	1,150	903	612	356	423	430	417	541	573	558	629

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	468	564	343	382*	532	388	68	357	484	978	980	760	68
1955...	45	665	314	647	667	640	589	512	884	864	796	694	45
1956...	342	282	276	282	570	570	744	987	1,290	810	549	467	276
1957...	373	373	454	490	478	424	223	348	720	518	539	664	223
1958...	511	511	511	511	511	497	504	648	656	535	549	442	442
1959...	315	348	348	326	448	778	778	925	856	645	538	407	315
1960...	381	420	1,080	770	413	338	381	363	315	508	557	508	315

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					
1953	.....	.....	.....	.....	.....	458	331,600
1954	1,190	July 11, 1954	68	691	500,400	729	527,500
1955	1,030	June 10, 1955	45	750	542,600	653	473,100
1956	1,540	July 15, 1956	276	711	515,800	739	536,600
1957	1,670	Aug. 27, 1957	223	574	415,300	598	432,900
1958	2,790	April 25, 1958	442	578	418,600	532	385,200
1959	2,150	May 25, 1959	315	761	550,500	895	647,900
1960	1,380	Nov. 26, 1959	315	629	456,600	.....	.....

* Estimated.

Okanogan 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 in Oroville, 20 ft. downstream from Great Northern Railway trestle, half a mile downstream from Tonasket Creek, and 1½ miles downstream from Osoyoos Lake.

Drainage area.—3,210 sq. mi., approximately.

Records available.—October 1942 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 899.77 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 26, 1944, staff gage at Zosel's milldam 200 ft. upstream at same datum. Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft. upstream at same datum. Auxiliary water-stage recorder half a mile downstream used during high-water periods since Apr. 10, 1948. May 15, 1946, to Apr. 9, 1948, auxiliary staff gage at same site and datum.

Average discharge.—18 years (1942-60), 737 cfs (533,600 acre-ft. per year).

Extremes.—1942-60: 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 made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States above station. Natural regulation in several large lakes and artificial regulation in Okanagan Lake as an aid to navigation in that lake; also variations in pondage back of Zosel's milldam at Oroville, 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
1954...	572	615	662	628	869	749	26	725	905	1,071	880	920	759
1955...	746	811	874	830	779	664	650	802	1,212	918	784	827	824
1956...	526	394	339	511	565	800	1,045	1,643	1,778	1,522	704	455	858
1957...	495	475	556	561	491	475	503	1,195	829	626	464	657	612
1958...	769	572	616	586	557	578	1,082	1,289	683	467	427	521	679
1959...	489	458*	471	609	632	849	909	1,767	2,122	1,178	542	576	884
1960...	555	1,047	1,281	1,114	844	333	527	684	477	351	449	561	685

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	492	515	435	250*	690	448	174	140	697	786	794	842	140
1955...	421	634	770	778	762	586	515	602	-540	818	722	690	-540
1956...	381	150	310*	345	448	650	738	500	1,420	1,080	455	435	150
1957...	470	441	70*	441	421	300	421	541	658	515	401	628	70*
1958...	530	421	570	570	428	530	721	907	475	421	367	445	367
1959...	439	427*	427	100	535	793	823	1,130	1,700	595	499	505	100
1960...	494	751	1,210	981	616	3	418	388	-100*	316	362	529	-100*

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					
1953						526	380,700
1954	1,710	July 2, 1954	140	759	549,900	808	585,200
1955	2,320	June 16, 17, 1955	-540	824	596,800	726	525,600
1956	2,480	May 29, 1956	150	858	622,700	880	639,000
1957	1,800†	May 23, 1957	70	612	442,800	648	469,000
1958	2,010	April 28, 1958	367	679	491,900	634	459,000
1959	2,610	May 30, 1959	100	884	640,200	1,007	729,100
1960	1,410	Nov. 30, 1959	-100	685	497,100		

* Estimated.
† Maximum recorded.

Toats Coulee Creek near Loomis, Wash.

Location.—Lat. 48°50'00", long. 119°41'50", in SE¼ sec. 33, T. 39 N., R. 25 E., on left bank 600 ft. upstream from Deer Creek, 1,800 ft. upstream from intake of Whitestone Irrigation Canal, and 3 miles northwest of Loomis.

Drainage area.—130 sq. mi. At site prior to April 1957, 132 sq. mi.

Records available.—May 1920 to September 1926 (fragmentary), April 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,880 ft. (from topographic map). May 11 to June 2, 1920, staff gage 1,000 ft. downstream at different datum. June 3, 1920, to Sept. 30, 1926, water-stage recorder 600 ft. downstream at different datum.

Extremes.—1920-26, 1957-60: Maximum discharge, 1,100 cfs May 19, 1957 (gage height, 5.67 ft.); minimum, 1.6 cfs Sept. 13, 14, 1926 (gage height, 0.72 ft., site and datum then in use).

Flood of May 28, 1948, 6,010 cfs, result of slope-area measurement of peak flow.

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
1957	.....	.....	.....	.....	.....	.....	.....	482	140	37.4	20.0	7.11	.....
1958	10.4*	9.44*	9.44	9.21*	11.8	11.6	18.6	377	168	45.3	13.8*	9.52	58.3
1959	11.5	11.6	12.1	20.1*	11.8*	11.6	29 0	242	322	75.2	17.9	26.7	66.1
1960	25.5	14.6	11.0	7.40*	9.58	17.1*	35.8	154	199	34.4	15.0	9.00	44.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	230	59	18	11.5	4.7	.....
1958	8.5*	6.0*	7.0*	7.0	10	9.8	10.5	44	66	19	7.8*	7.8	6.0*
1959	7.3	6.0*	11.5	9.5*	8.5*	10.5	13	54	173	30	13	12	6.0
1960	16.5	5.0*	9.0	4.7	8.0*	8.0*	17.5	57	91	12.5	7.2	6.3	4.7

Summary

YEAR	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
1957	1,100	May 19, 1957	.....	.....	.....	.....	.....	.....	.....	.....
1958	852	May 29, 1958	6.0	58.3	0.448	6.06	42,200	58.8	6.12	42,550
1959	640	June 2, 1959	6.0	66.1	.508	6.91	47,840	67.4	7.06	48,820
1960	626	May 12, 1960	4.7	44.3	.341	4.66	32,200	.....	.....	.....

* Estimated.

Whitestone Irrigation Canal near Loomis, Wash.

Location.—Lat. 48°49'50", long. 119°41'25", in SW¼ sec. 34, T. 39 N., R. 25 E., on right bank 200 ft. downstream from headworks and 2½ miles northwest of Loomis.

Records available.—April 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,650 ft. (from topographic map).

Extremes.—1957-60: Maximum daily discharge, 48 cfs May 21, 1958, May 14-16, June 2, 3, July 12, 13, 1959; no flow during nonirrigation season.

Remarks.—Canal diverts from Toats Coulee Creek for irrigation of about 2,000 acres in Whitestone Irrigation District.

Whitestone Irrigation Canal near Loomis, Wash.—Continued

Monthly and Yearly Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	2,040	2,070	1,840	1,030	507	.....
1958	357	0	0	0	0	0	369	2,650	2,190	1,530	687	500	8,283
1959	505	228	0	0	0	0	239	2,450	2,260	2,400	1,020	822	9,924
1960	244	16	0	0	0	0	726*	1,850	2,320	1,050	910	582	8,298

Sinlahekin Creek above Chopaka Creek, near Loomis, Wash.

Location.—Lat. 48°51'10", long. 119°38'50", in NE¼ sec. 26, T. 39 N., R. 25 E., on right bank 400 ft. upstream from mouth of Chopaka Creek, 2 miles above mouth, and 2¼ miles north of Loomis.

Drainage area.—256 sq. mi.

Records available.—April 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,150 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 1,680 cfs May 19, 1957 (gage height, 8.62 ft.); minimum, 8.6 cfs Sept. 18, 1957.

Remarks.—No regulation. Diversion above station by Whitestone Irrigation Canal (see preceding page) and other smaller diversions for irrigation.

Contents on Last Day of Month in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	774	183	20.6	14.7	11.2	.....
1958	21.5	24.6	27.5	27.3	32.0	30.3	35.6	495	191	49.1	17.4	17.7	81.3
1959	23.5	27.3	29.9	43.5	28.8	36.8	51.4	352	406	62.2	19.7	38.9	93.4
1960	47.1	38.7	32.6	24.8	29.1	35.0	30.5	114	162	22.0	14.1	13.6	47.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	322	31	12	11	8.8	.....
1958	17	18.5	21*	20*	26	27	25	52	60	21	13.5	14.5	13.5
1959	19	22	28	22*	22*	33	38	64	176	25	17.5	17.5	17.5
1960	40	25*	29	20*	24	24	11.5	21	47	16	10.5	11*	10.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1957	1,680	May 19, 1957	.....	.....	.....	.....	.....
1958	792	May 22, 1958	13.5	81.3	58,870	81.9	59,310
1959	679	June 3, 1959	17.5	93.4	67,610	96.6	69,900
1960	494	June 4, 1960	10.5	47.0	34,110	.....	.....

* Estimated.

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 1¾ miles downstream from and northeast of Nighthawk, and 12 miles upstream from mouth.

Drainage area.—3,550 sq. mi., approximately.

Records available.—May 1911 to September 1960 (prior to September 1928, mean monthly discharge included Oroville-Tonasket Irrigation District canal). Published as "near Oroville" 1911-28.

Gage.—Water-stage recorder. Datum of gage is 1,137.70 ft. above mean sea level, international joint adjustment of 1947. Prior to Sept. 11, 1928, staff gages at sites 7 miles downstream (below Oroville-Tonasket Irrigation District canal) at various datums.

Average discharge.—49 years (1911-60), 2,271 cfs (1,644,000 acre-ft. per year).

Extremes.—1928-60: 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.—Flow at high stages regulated by natural diversion into and release from Palmer Lake. Several small diversions above station for irrigation of about 2,900 acres in the United States in 1946 and approximately 10,500 acres in Canada in 1957.

Cooperation.—This station is maintained by the United States under agreement with Canada.

Correction.—In State WSB No. 6 the mean discharge for July 1945 was listed in error; it should be 2,139 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	822	914	740	524	670	622	1,014	9,548	11,650	8,004	2,195	1,614	3,207
1955...	1,185	1,692	1,370	778	599	533	744	4,060	14,090	6,278	1,490	618	2,788
1956...	1,181	2,212	1,019*	802	540	598	2,903	13,800	11,140	3,784	1,058	665	3,318
1957...	1,091	1,071	1,016	589*	607*	655	1,228	14,900	6,654	1,655	826	491	2,584
1958...	453	579	502	513	474	526	1,059	8,986	4,795	1,337	422	364	1,677
1959...	796	973	1,438	1,256	736	727	1,957	9,801	14,330	4,837	1,087	1,203	3,276
1960...	2,265	2,166	1,656	735	751	878	3,157	6,500	8,436	2,328	684	509	2,503

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	658	785*	577	240*	604	560	599	1,230	9,260	3,040	1,700	1,270	240*
1955...	1,050	1,010	935	688	480	426	536	718	7,210	3,050	774	568	426
1956...	558	1,230	750*	400*	300*	536	624	5,190	6,490	1,450	774	541	300*
1957...	720	690*	430*	430*	520	600	720	6,640	2,730	934	612	404	404
1958...	415	354	376	309	435	470	669	1,640	2,070	711	294	272	272
1959...	350	586	800*	600*	646*	646	735	4,720	10,100	1,650	848	761	350
1960...	1,370	814	900	550*	490*	440*	1,640	3,070	5,170	930	534	425	425

* Estimated.

Similkameen River near Nighthawk, Wash.—Continued
(International gaging station)

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					
1953						2,413	1,747,000
1954	19,700	May 21, 1954	240	3,207	2,322,000	3,356	2,429,000
1955	28,200	June 13, 1955	426	2,788	2,018,000	2,800	2,027,000
1956	24,500	May 22, 1956	300	3,313	2,405,000	3,212	2,332,000
1957	23,200	May 21, 1957	404	2,584	1,870,000	2,445	1,770,000
1958	15,500	May 25, 1958	272	1,677	1,214,000	1,819	1,316,000
1959	19,700	June 4, 1959	350	3,276	2,371,000	3,516	2,546,000
1960	15,200	June 4, 1960	425	2,503	1,817,000		

Whitestone Creek near Tonasket, Wash.

Location.—Lat. 48°47'05", long. 119°26'00", in NE¼NE¼ sec. 21, T. 38 N., R. 27 E., 1,000 ft. above Greenaway Diversion and 6 miles north of Tonasket.

Drainage area.—39.5 sq. mi.

Records available.—October 1958 to September 1960.

Gage.—Water-stage recorder. Artificial weir control since Mar. 31, 1960. Altitude of gage is 1,180 ft. (from topographic map).

Extremes.—1958-60: Maximum discharge, 25 cfs Jan. 9, 1959 (gage height, 7.27 ft.); minimum, 0.1 cfs Apr. 27 to May 1, 1960.

Remarks.—Flow regulated by headworks on Whitestone Lake by Whitestone Water Users' Association. Some diversion 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
1959	2.30	1.14	1.24	7.28	7.45	4.73	0.93*	4.22	2.99	4.14	5.09	4.28	3.80
1960	.72	.61	6.63	5.86	5.62	1.30*	.82	1.68	3.24	3.64	4.15	5.95	3.35

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	1.0	1.0	1.0	1.0*	7.1	0.7	0.5	2.5	2.3	3.5	4.3	0.9	0.5
1960	.6	.2	.8	5.6	5.0*	.6*	.1	.1	1.7	3.3	3.2	5.5	.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					
1959	25	Jan. 9, 1959	0.5	3.80	2,750	4.08	2,960
1960	8.3	Dec. 3, 1959	.1	3.35	2,430		

* Estimated.

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.

Records available.—April 1929 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 860.78 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.—31 years (1929-60), 2,975 cfs (2,154,000 acre-ft. per year).

Extremes.—1929-60: 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 affected by regulation of Okanagan and Skaha Lakes, and by natural storage in other lakes. Some diurnal fluctuation at low flow caused by powerplant on Similkameen River.

Cooperation.—This station is 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
1954...	1,441	1,635	1,459	1,141*	1,570*	1,307	1,343	9,937	12,940	9,510	3,031	2,513	3,998
1955...	2,093	2,618	2,419	1,745	1,469	1,265	1,508	4,627	15,160	7,179	2,317	1,402	3,655
1956...	1,782	2,653*	1,365	1,450	1,120*	1,541	3,553	14,460	13,020	4,953	1,693	1,097	4,062
1957...	1,657	1,629	1,691	1,164*	1,262*	1,322	1,694	16,010	7,601	2,325	1,265	1,138	3,249
1958...	1,325	1,206	1,205	1,169	1,188	1,194	2,060	9,863	5,522	1,689	728	814	2,339
1959...	1,318	1,432	1,988	1,825*	1,459	1,814*	3,058	10,970	16,660	6,081	1,590	1,810	4,172
1960...	2,849	3,194	3,105	1,895*	1,681	1,344	3,655	6,968	8,717	2,630	1,019	993	3,168

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,280	1,310	1,340	520*	1,240*	960	990	1,420	10,400	3,880	2,460	2,130	520*
1955...	1,720	1,860	1,960	1,590	1,300	1,000	1,200	1,440	8,450	3,920	1,530	1,250	1,000
1956...	1,220	1,700*	880	1,100*	850*	1,300*	1,430	6,160	7,030	2,510	1,270	980	850*
1957...	1,300	1,270	980*	940*	960*	1,160	1,290	4,500	3,460	1,540	1,030	1,100	940*
1958...	1,130	980*	1,120	980*	1,130	1,080	1,430	3,130	2,710	1,000	590	614	590
1959...	928	1,000*	1,300*	640*	1,250*	1,630	1,900	5,900	12,500	2,440	1,250	1,230	640*
1960...	1,960	1,800*	2,400	1,450*	1,250	1,050*	2,110	3,370	5,350	1,210	865	872	865

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					
1953						2,976	2,154,000
1954	19,100	May 22, 1954	520	3,998	2,895,000	4,216	3,052,000
1955	27,600	June 14, 1955	1,000	3,655	2,644,000	3,539	2,562,000
1956	25,000	May 26, 1956	850	4,062	2,940,000	3,995	2,900,000
1957	23,600	May 22, 1957	940	3,249	2,352,000	3,144	2,276,000
1958	16,100	May 26, 1958	590	2,339	1,693,000	2,423	1,754,000
1959	21,500	June 6, 1959	640	4,172	3,020,000	4,542	3,288,000
1960	14,100	June 5, 1960	865	3,168	2,300,000		

* Estimated.

Okanogan River near Malott, Wash.

Location.—Lat. 48°14'20", long. 119°43'50", in SE¼ sec. 30, T. 32 N., R. 25 E., on left bank, 2 miles downstream from Chiliwist Creek, 4 miles southwest of Malott, and 13 miles upstream from mouth.

Drainage area.—8,210 sq. mi., approximately.

Records available.—April 1958 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, supplementary adjustment of 1947.

Extremes.—1958-60: Maximum discharge, 21,400 cfs June 6, 1959 (elevation, 791.28 ft.); minimum, 610 cfs Aug. 27, 1958 (elevation, 778.54 ft.).

Remarks.—Diversions above station for irrigation of about 15,000 acres in the United States and 45,580 acres in Canada. Flow affected by regulation of Okanagan Lake and Skaha Lake, and by natural storage in other lakes.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	2,340	10,330	5,830	1,826	789	860	.....
1959	1,398	1,520	2,118*	1,885*	1,499*	1,904	3,005	11,120	16,860	6,463	1,728	1,915	4,290
1960	2,955	3,305	3,221	1,942*	1,770	1,388	3,598	6,877	8,841	2,724	1,074	1,067	3,228

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	1,750*	3,460	2,860	1,050	620	652	.....
1959	1,000	1,100*	1,300*	700*	1,300*	1,660	1,920	6,030	13,000	2,700	1,350	1,340	700*
1960	2,090	2,000*	2,500*	1,500*	1,400	1,100*	2,190	3,240	5,300	1,280	920	972	920

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					
1958	.....	.....	.....	.....	.....	.....	.....
1959	21,400	June 6, 1959	700	4,290	3,106,000	4,663	3,376,000
1960	14,100	June 5, 1960	920	3,228	2,343,000	.....	.....

* Estimated.

METHOW RIVER BASIN

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.

Records available.—June 1919 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,580 ft. (from topographic map). Prior to Oct. 3, 1919, several staff gages in the immediate vicinity at different datum. Oct. 3, 1919, to Sept. 30, 1929, and Oct. 31 to Nov. 6, 1933, chain gage on road bridge 40 ft. upstream at same datum as staff gages. Nov. 7 to Dec. 18, 1933, staff gage at present site at different datum.

Methow River at Twisp, Wash.—Continued

Average discharge.—41 years (1919-60), 1,335 cfs (966,500 acre-ft. per year).

Extremes.—1919-29, 1933-60: Maximum discharge, 40,800 cfs May 29, 1948 (gage height, 12.94 ft. in gage well), from rating curve extended above 18,000 cfs on basis of slope-area measurement 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.—A large part of the flow diverted above station for irrigation by two canals of Methow Valley Irrigation District, by Risley ditch, and by many other smaller ditches. Diversions for irrigation of 7,410 acres above station (1946 estimate).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	456	456	371	302*	318	349	855	5,880	6,063	4,392*	1,205	694	1,788
1955...	572	702	627	416*	336*	316	637	2,501	7,721	2,937	721	323	1,484
1956...	548	989*	526	377	274*	321	2,910	9,256	7,006	2,461	697	394	2,149
1957...	536	521	459	322*	338*	363	1,124	9,515	3,825	942	362	195	1,553
1958...	342	349	292	268	299	404	1,144	8,202	3,793	981	282	235	1,392
1959...	380	439	526	435*	367*	452	2,030	4,892	7,285	2,913	644	727	1,759
1960...	1,383	1,115	923	511	390	644	2,011	3,659	5,489	1,767	464	282	1,552

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	335	408	335	277*	290*	307	335	985	4,230	1,800*	918	536	277*
1955...	511	502	500*	350*	307	300	356	662	3,860	1,330	400	233	283
1956...	283	670*	420*	280*	250*	262	456	3,240	3,580	952	560	316	250*
1957...	427	400*	388	240*	310*	296	539	6,850	1,590	476	248	159	159
1958...	310	295	240	253	253	325	690	1,690	1,630	470	206	206	206
1959...	286	350*	410*	300*	320*	368	780	2,550	5,100	1,180	409	385	296
1960...	893	610*	610*	430*	305*	300*	1,290	1,880	3,160	717	336	236	236

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					
1953						1,630	1,180,000
1954	12,900	May 19, 1954	277	1,788	1,294,000	1,840	1,332,000
1955	16,600	June 12, 1955	283	1,484	1,074,000	1,497	1,083,000
1956	17,400	①	250	2,149	1,560,000	2,104	1,528,000
1957	19,000	May 19, 1957	159	1,553	1,124,000	1,508	1,092,000
1958	15,900	May 25, 1958	206	1,392	1,007,000	1,422	1,029,000
1959	10,700	June 3, 1959	296	1,759	1,274,000	1,934	1,400,000
1960	11,000	June 4, 1960	236	1,552	1,127,000		

Beaver Creek below South Fork, near Twisp, Wash.

Location.—Lat. 48°25'45", long. 120°01'10", in center sec. 24, T. 34 N., R. 22 E., on right bank 300 ft. downstream from South Fork Beaver Creek and 6½ miles northeast of Twisp.

Drainage area.—58 sq. mi., approximately.

Records available—April to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,800 ft. (from topographic map).

Extremes.—April to September 1960: Maximum discharge, 166 cfs May 12 (gage height, 5.96 ft.); minimum, 6.9 cfs Sept. 19 (gage height, 4.65 ft.).

Remarks.—No regulation or diversion above station.

Beaver Creek below South Fork, near Twisp, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	.....	.....	.....	.....	.....	.....	23.7	74.1	61.0	21.8	11.6	8.09	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	.....	.....	.....	.....	.....	.....	14.5	33	36	13.5	9.4	7.0*	.....

Beaver Creek near Twisp, Wash.

Location.—Lat. 48°23'50", long. 120°02'20", in SE¼ sec. 35, T. 34 N., R. 22 E., on left bank 3 miles downstream from South Fork and 4 miles northeast of Twisp.

Drainage area.—62 sq. mi., approximately.

Records available.—May 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,250 ft. (from topographic map).

Extremes.—1956-60: Maximum discharge, 966 cfs May 18, 1957; maximum gage height, 3.35 ft. May 16, 1956; minimum discharge, 3.1 cfs Nov. 13, 1959 (gage height, 1.27 ft., result of freezup).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	55.7	25.7	15.0	14.0	.....
1957...	13.7	11.0*	10.7*	9.48*	11.1	10.3	18.4	258	67.7	26.2	12.8	9.01	38.5
1958...	11.0	9.42	10.4	10.7	13.1	14.5	21.2	161	68.1	24.0	11.2	8.70	30.5
1959...	8.45	9.95	12.7	10.7	9.21	9.25	27.5	90.6	100	32.0	11.0	16.5	28.2
1960...	14.6	10.6	10.9	8.84	8.72	12.3	25.9	80.7	63.7	19.0	11.1	7.92	22.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	36	13	10.5	11.5	.....
1957...	11	5.6*	9.0*	8.5*	9.6*	9.3	12.5	74	37	16.5	10	8.6	5.6*
1958...	9.8	8*	8*	8*	11	12.5	16.5	37	40	15.5	8.0	7.2	7.2
1959...	7.0	5.0*	9.0*	7.0*	8.6	8.6	12.5	52	62	12.5	8.3	8.9	5.0*
1960...	12	4.0	9.0*	8.0*	7.0	7.3	15	35	36	12.5	9.1	6.5	4.0

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
1956.....	412	May 19, 1956	.....	.....	.....	.....	.....	.....	.....	.....
1957.....	966	May 18, 1957	5.6	38.5	0.621	8.44	27,890	38.1	8.35	27,610
1958.....	370	May 21, 1958	7.2	30.5	0.492	6.68	22,080	30.5	6.70	22,090
1959.....	169	June 1, 1959	5.0	28.2	0.455	6.17	20,420	28.6	6.25	20,740
1960.....	160	May 11, 1960	4.0	22.9	0.369	5.02	16,620	.....	.....	.....

* Estimated.
① May 21, June 1, 1956.

Methow River near Pateros, Wash.

Location.—Lat. 48°04'40", long. 119°59'00", in SE¼SW¼ sec. 20, T. 30 N., R. 23 E., on right bank 1.2 miles downstream from Black Canyon Creek and 4 miles northwest of Pateros.

Drainage area.—1,780 sq. mi., approximately.

Records available.—April 1959 to September 1960.

Gage.—Staff gage. Altitude of gage is 900 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge observed, 12,400 cfs June 4, 1959 (gage height, 8.86 ft.); minimum observed, 364 cfs Sept. 21, 1960 (gage height, 2.79 ft.).

Maximum discharge known, 46,700 cfs May 29, 1948, from slope-area measurement of peak flow at site 1 mile downstream.

Remarks.—No regulation. Diversions for irrigation of about 11,000 acres above station (1959 Bureau of Reclamation land classification).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	.....	.....	.....	.....	.....	.....	2,082	5,246	8,200	3,241*	866*	872	.....
1960...	1,458	1,246	1,097	652	479	812	2,294	4,029	6,516	2,185	643*	435	1,819

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	.....	.....	.....	.....	.....	.....	750*	2,760	5,550	1,550*	584*	541	.....
1960...	1,010	720*	730*	565	400*	370*	1,660	2,200*	3,760	920	500*	364	364

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					
1959.....	12,400†	June 4, 1959	.....	.....	.....	.....	.....
1960.....	10,800†	May 12, 1960	364	1,819	1,320,000	.....	.....

* Estimated.
† Maximum observed.

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, 1¾ miles upstream from Lake Chelan, and 2 miles northwest of Stehekin. Records include flow of Boulder Creek.

Drainage area.—372 sq. mi., includes that of Boulder Creek.

Records available.—October 1910 to October 1915, October 1926 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,100 ft. above mean sea level (unadjusted). Prior to Aug. 17, 1911, staff gage three-eighths of a mile upstream from

Stehekin River at Stehekin, Wash.—Continued

mouth at Lake Chelan at different datums (datum change made June 13, 1911). Aug. 17, 1911, to Oct. 31, 1915, staff gage a quarter of a mile downstream from Boulder Creek at different datum.

Average discharge.—39 years (1910-15, 1926-60) 1,406 cfs (1,018,000 acre-ft. per year).

Extremes.—1910-15, 1926-60: Maximum discharge, 18,900 cfs May 29, 1948 (gage height, 29.00 ft.), from rating curve extended above 11,000 cfs on basis of slope-area measurement of peak flow; minimum, 56 cfs Jan. 21, 1930.

Remarks.—No regulation or diversion.

Correction.—The momentary maximum discharge for the water year 1912 (erroneously published as 7,590 cfs) has been revised to 7,090 cfs, superseding figure published in State WSB No. 6.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	771	747	523	422	333	372	946	4,110	4,637	4,940	2,343	1,163	1,786
1955...	570	1,246	761	367	289	260	549	2,024	5,462	3,686	1,566	801	1,469
1956...	1,185	1,877	504	270	181	204	1,828	5,528	5,166	4,115	1,576	960	1,953
1957...	901	712	1,018	398	250	326	1,333	5,653	3,751	1,679	931	699	1,479
1958...	486	478	353	241	346	468	1,006	5,810	3,874	1,716	971	650	1,379
1959...	867	834*	1,167*	634	380	445	1,884	3,602	5,302	3,769	1,395	1,399	1,812
1960...	1,869	1,475*	1,188*	431	282	517*	1,634	2,887*	4,786	3,196	1,219	637	1,679

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	465	530	442	296	272	332	376	994	3,010	2,960	1,310	606	272
1955...	492	497	600	290	250	240	280	762	2,800	1,980	960	396	240
1956...	368	708	350	150	150	150	320	2,040	3,490	1,800	1,090	655	150
1957...	566	538	500	260	205	286	494	3,280	1,990	1,100	579	512	205
1958...	250	295	280	222	222	348	446	1,960	1,740	1,370	660	450	222
1959...	424	474	700	460	320	380	859	2,160	3,530	1,880	808	727	320
1960...	749	610*	640*	293	220*	210*	1,040*	1,900*	2,380	1,740	568	468	210*

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
1953								1,465	53.44	1,060,000
1954	9,440	May 19, 1954	272	1,786	4.80	65.19	1,293,000	1,831	66.81	1,325,000
1955	12,400	June 11, 1955	240	1,469	3.95	53.60	1,063,000	1,551	56.59	1,123,000
1956	13,100	June 1, 1956	150	1,953	5.25	71.47	1,418,000	1,878	68.69	1,363,000
1957	8,890	May 6, 1957	205	1,479	3.98	53.98	1,071,000	1,368	49.95	990,600
1958	12,100	May 25, 1958	222	1,379	3.71	50.33	998,000	1,509	55.09	1,093,000
1959	9,190	June 20, 1959	320	1,812	4.87	66.12	1,312,000	1,952	71.20	1,413,000
1960	10,300	June 3, 1960	210	1,679	4.51	61.45	1,219,000			

* Estimated.

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.

Records available.—October 1910 to September 1913, October 1926 to September 1957.

Gage.—Water-stage recorder. Altitude of gage is 1,250 ft. (from topographic map). Dec. 6, 1910, to June 30, 1913, staff gage at site 1,800 ft. downstream at different datum. Nov. 18, 1956 to Apr. 19, 1957, staff gage half a mile downstream at different datum.

Average discharge.—34 years (1910-13, 1926-57), 204 cfs (147,700 acre-ft. per year).

Extremes.—1910-13, 1926-57: Maximum discharge, 3,900 cfs May 28, 1948 (gage height, 8.1 ft., from floodmarks), by slope-area and contracted-opening measurements of peak flow; minimum, less than 9.4 cfs sometime during period of ice effect Jan. 15-25, 1930.

Remarks.—No regulation or diversion above station.

Correction.—In State WSB No. 6 the mean discharge for September 1929 is listed in error; it should be 86.4 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	118	100	70.4	55.5	51.6	52.1	120	625	671	746	353	172	263
1955...	91.5	158	91.4	59.2	51.8	50.0	80.1	286	1,000	590	247	131	237
1956...	132*	231	80.7*	44.0*	28.7*	30.9*	230	787	877	625	270	149	291
1957...	108	82.8	102*	55.1*	47.4*	50.5*	154*	824	561*	283	144	117	212

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	80	77	58	47	42	49	.3	139	430	454	200	113	42
1955...	82	82	73	48	43	46	.2	71	375	318	155	60*	43
1956...	60*	116	60*	26*	25*	25*	40*	299	572	306	205	109	25*
1957...	75*	64	60*	40*	40*	48	60*	616	280*	181	99	94	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
1953								234	48.95	169,200
1954	1,340	July 1, 1954	42	263	4.06	55.09	190,400	267	55.99	193,500
1955	2,820	June 12, 1955	43	237	3.66	49.59	171,400	245	51.36	177,500
1956	3,030	May 31, 1956	25	291	4.49	61.07	211,100	279	58.50	202,200
1957	1,560	May 18, 1957	40	212	3.27	44.42	153,400			

* Estimated.

Antilon Lake Feeder System near Manson, Wash.

Location.—Lat. 47°58'30", long. 120°09'30", in SE¼ sec. 26, T. 29 N., R. 21 E., on left bank at tunnel outlet 500 ft. upstream from Antilon Lake and 6 miles north of Manson.

Records available.—March 1958 to September 1960 (seasonal records only).

Gage.—Water-stage recorder. Altitude of gage is 2,500 ft. (from topographic map).

Extremes.—1958-60: Maximum daily discharge, 68 cfs May 17-20, 1958; minimum daily determined, 0.5 cfs Sept. 26, Nov. 26-30, 1958, Apr. 11-16, 1959.

Remarks.—Flow at site represents total diversion from headwaters of 10 streams, which have a drainage area of 52 sq. mi. and are tributaries to Lake Chelan. Water stored in Antilon Lake is used for irrigation of 4,000 acres near Manson.

Mean Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1958	.....	.....	.....	9.27*	52.5*	40.7	24.4	10.4	5.32	4.43	0.87*	.....	.....
1959	.....	.....	.....	6.19	38.5	51.7	32.9	12.1	11.0	8.77	.....	.....	.....
1960	.....	.....	.....	23.1	17.3	38.3	28.0	13.7	6.04	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1958	.....	.....	.....	7.2*	14*	27	15	5.1	0.5	1.0*	0.5	.....	.....
1959	.....	.....	.....	0.5	1.5	29	19	9.1	7.7	5.5	.....	.....	.....
1960	.....	.....	.....	4.4	4.6	22	19	11.5	0.9	.....	.....	.....	.....

* Estimated.

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.—951 sq. mi. (revised).

Records available.—September 1897 to December 1899, January to June 1905 and December 1910 to September 1911 (fragmentary gage heights only); October 1911 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, adjustment of 1912. Prior to Jan. 1, 1900, staff gage at Lakeside about 1 mile west of Chelan 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, 1910-60: Maximum elevation, 1,100.05 ft. July 19, 1947 (contents, 677,800 acre-ft.); minimum since completion of dam in 1927, 1,079.68 ft. Apr. 3, 4, 1937 (contents, 21,400 acre-ft.). Minimum elevation, 1,076.78 ft. Jan. 27, 28, Dec. 2-5, 1898.

Remarks.—Reservoir is formed by low concrete dam at lake outlet, completed Sept. 3, 1927. Usable capacity between elevations 1,079 and 1,100 ft., 676,100 acre-ft. Regulation between these elevations is allowed by stipulation of Federal Power Commission. Water is used for power development. Elevation of lake maintained between 1,092 and 1,100 ft. during period Aug. 16 to Sept. 15 for scenic effect and recreational purposes. Diversions for irrigation of about 6,280 acres with an annual depletion of about 11,000 acre-ft. (1946 estimate).

Lake Chelan at Chelan, 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
1954...	540,590	475,390	391,620	306,360	242,870	157,630	182,120	421,110	640,040	669,560	669,890	630,860	.....
1955...	538,300	515,160	437,950	335,340	247,350	140,780	107,500	297,660	648,570	672,180	640,040	568,010	.....
1956...	550,690	621,670	564,380	498,530	348,220	247,350	363,430	583,310	657,100	672,180	663,660	605,270	.....
1957...	533,740	453,540	401,990	301,530	211,830	137,300	190,070	640,370	666,280	661,030	655,130	571,560	.....
1958...	475,710	377,370	281,270	180,530	147,770	82,810	109,400	580,690	672,180	669,560	670,540	577,100	.....
1959...	512,220	481,910	489,400	435,360	282,230	198,390	300,240	485,820	602,340	673,170	673,170	663,000	.....
1960...	663,700	661,700	625,900	504,100	412,700	343,400	382,200	551,000	665,300	674,800	673,800	579,700	.....

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, a quarter of a mile south of Chelan.

Drainage area.—951 sq. mi.

Records available.—November 1930 to September 1960. Published as "below Chelan Lake" 1904-05.

Gage.—Water-stage recorder and concrete power dam. Datum of gage is at mean sea level, adjustment of 1912. Prior to Jan. 7, 1927, staff gage at site 800 ft. downstream at same datum. Jan. 7 to Sept. 30, 1927, staff gage about 500 to 1,000 ft. below dam at same datum. Oct. 1, 1927, to Nov. 10, 1928, staff gage and Nov. 11, 1928, to Mar. 19, 1939, water-stage recorder at sites 2½ miles downstream at same datum.

Average discharge.—56 years (1904-60), 2,058 cfs (1,490,000 acre-ft. per year), adjusted for storage since October 1911.

Extremes.—1903-60: 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.—Unmeasured water that is diverted for irrigation above station is small percentage of total runoff. Chelan County Public Utility District No. 1 diverts water at Chelan to develop about 54,000 horsepower and to irrigate an unknown area near Chelan, which quantity is included in records of daily discharge. Diversions for irrigation of about 6,280 acres with an annual depletion of about 11,000 acre-ft. (1946 estimate). Flow regulated by Lake Chelan (see preceding page).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,623	2,070	2,206	2,197	1,933	2,072	1,089	2,333	3,284	6,340	2,980	2,137	2,531
1955...	2,188	2,213	2,232	2,227	2,192	2,155	1,563	97.2	2,502	4,590	2,366	2,098	2,203
1956...	1,647	1,247	1,886	1,761	3,047	2,325	1,624	5,660	7,133	5,386	2,126	2,033	2,989
1957...	2,224	2,283	2,307	2,302	2,239	2,093	1,179	1,302	5,053	2,292	1,160	2,236	2,217
1958...	2,286	2,317	2,303	2,222	1,504	1,910	1,273	772	4,063	2,178	977	2,130	1,994
1959...	2,059	1,755	1,522	1,874	3,479	2,369	1,106	2,212	5,182	5,373	1,674	1,882	2,534
1960...	2,491	2,331	2,365	2,754	2,316	2,332	1,902	1,611	5,125	3,975	1,346	2,187	2,559

Chelan River at Chelan, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,040	1,040	1,850	1,770	1,460	1,620	51	52	1,100	2,680	2,200	1,830	51
1955...	2,070	2,110	2,160	2,210	2,110	2,120	402	28	39	2,200	2,190	1,760	28
1956...	52	52	718	1,320	2,270	1,840	881	1,210	3,620	2,400	1,680	1,420	52
1957...	2,210	2,240	2,280	2,240	1,890	1,680	467	30	2,360	1,750	70	1,830	30
1958...	2,250	2,290	2,270	1,400	963	1,500	2	69	1,260	1,010	71	1,480	2
1959...	1,740	679	594	1,210	2,260	2,140	225	65	365	2,320	305	1,140	65
1960...	454	1,370	1,750	2,300	2,290	2,270	.8	61	1,120	1,900	70	1,860	.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					
1953						1,946	1,409,000
1954	10,100	July 6, 1954	51	2,531	1,832,000	2,593	1,877,000
1955	10,100	July 14, 1955	28	2,208	1,596,000	2,048	1,483,000
1956	12,100	June 3, 1956	52	2,989	2,170,000	3,158	2,293,000
1957	10,500	June 3, 1957	30	2,217	1,605,000	2,225	1,611,000
1958	7,600	June 9, 1958	2	1,994	1,443,000	1,862	1,348,000
1959	12,500	June 21, 1959	65	2,534	1,834,000	2,689	1,947,000
1960	8,510	June 14, 1960	.8	2,559	1,858,000		

ENTIAT RIVER BASIN

Entiat River near Ardenvoir, Wash.

Location.—Lat. 47°48'30", long. 120°24'50", in N½NE¼NE¼ sec. 27, T. 27 N., R. 19 E., on left bank, 6 miles northwest of Ardenvoir.

Drainage area.—207 sq. mi.

Records available.—September 1957 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,563.22 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947 (from Conservation Division plan-table survey).

Extremes.—1957-60: Maximum discharge, 4,110 cfs May 25, 1958 (gage height, 7.72 ft.); minimum, 52 cfs Jan. 1, 1958 (gage height, 0.83 ft.).

Remarks.—No known regulation or diversion.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...												104	
1958...	92.6	95.0	78.9	70.8	91.5	104	183	1,862	1,260	325	142	91.0	369
1959...	109	121	175*	132	96.0	113	393	1,053	1,774	963	237	174	446
1960...	202	288*	364	142*	108	156	498	900	1,506	677	193	105	436

* Estimated.

Entiat River near Ardenvoir, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	.....
1958	73	61	62	54	68	86	117	292	540	212	108	76	54
1959	72	85*	137	95*	80*	97	160*	631	1,290	395	143	131	72
1960	143	130*	200*	110*	75*	80*	284	420	946	316	128	83	75*

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
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1958	4,110	May 25, 1958	54	369	1.78	24.18	266,900	380	24.95	275,400
1959	2,560	June 22, 1959	72	446	2.15	29.25	322,900	491	32.21	355,700
1960	2,470	June 4, 1960	75	436	2.11	28.64	316,200	.....	.....	.....

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.

Records available.—October 1910 to September 1925, June 1951 to September 1958.

Gage.—Water-stage recorder. Altitude of gage is 690 ft. (from topographic map). October 1910 to Sept. 30, 1925, staff gage at site three-quarters of a mile upstream at different datum.

Average discharge.—22 years (1910-25, 1951-58), 507 cfs (367,100 acre-ft. per year), unadjusted.

Extremes.—1910-25, 1951-58: Maximum discharge, 5,380 cfs June 18, 1916; maximum gage height, 5.71 ft. June 1, 1956; minimum discharge, 29 cfs Jan. 26, 1956, result of freeze-up.

Maximum discharge known, 10,800 cfs May 29, 1948, on basis of conveyance-slope measurement of peak flow.

Remarks.—Occasional regulation by millpond 10 miles upstream. Many diversions above station for irrigation of an estimated 2,560 acres in 1946 with a resulting estimated depletion of 4,480 acre-ft. of flow.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	De .	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	170	166	165	122	150*	160	271	1,430	1,965	1,689	519	266	592
1955	194	288	254	173	160	128	224	711	2,534	1,163	335	159	527
1956	213	441*	187*	153	110*	180*	959	2,605	2,615	1,239	362	188	772
1957	183	172	226	123*	108*	151*	380	2,335	1,391	382	177	123	482
1958	142	144	126	112	109	185	512	2,268	1,493	408	168	121	473

* Estimated.

Entiat River at Entiat, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	147	153	140	70*	120*	144	153	301	1,420	770	346	217	70*
1955...	171	178	153	115	116	115	140	212	1,260	569	191	111	111
1956...	104	283	130*	42	100	105*	310	977	1,780	499	253	158	42
1957...	152	132	110*	72*	80*	130*	180*	1,730	663	224	125	112	72*
1958...	119	100	110	98	109	140	215	410	672	248	129	102*	98

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					
1953.....	.....	.....	.....	.....	.....	534	386,300
1954.....	3,210	July 1, 1954	70	592	428,800	612	443,000
1955.....	4,800	June 13, 1955	111	527	381,500	535	387,600
1956.....	4,960	June 1, 1956	42	772	560,100	750	544,600
1957.....	3,790	May 19, 1957	72	482	348,800	468	338,500
1958.....	4,500	May 26, 1958	98	473	342,100	.....	.....

WENATCHEE RIVER BASIN

White River near Plain, Wash.

Location.—Lat. 47°52'30", long. 120°52'10", in NE¼ sec. 5, T. 27 N., R. 16 E., on left bank at downstream side of Forest Service bridge, 1¼ miles downstream from Sears Creek, 4 miles upstream from Wenatchee Lake, and 12½ miles northwest of Plain.

Drainage area.—150 sq. mi.

Records available.—May 1911 to April 1912; May to September 1912, July to August 1913, and October 1913 to March 1914 (monthly discharge only); April to September 1914; August 1954 to September 1960. Published as "near Chiwaukum" 1911-14.

Gage.—Water-stage recorder. Altitude of gage is 1,880 ft. (from river-profile map). May 1911 to September 1914, staff gage at same site at different datum.

Average discharge.—6 years (1954-60), 878 cfs (635,600 acre-ft. per year).

Extremes.—1911-14, 1954-60: Maximum discharge, 5,780 cfs May 26, 1958 (gage height, 13.25 ft.); minimum, 104 cfs Mar. 10, 1956; minimum observed gage height, 2.16 ft. Oct. 18, 1957.

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
1954...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	601	.....
1955...	336	821	388	219	205	162	306	1,191	3,005	2,217	831	332	837
1956...	612	1,072	335*	197	140	141	963	2,846	2,826	2,427	701	354	1,053
1957...	467	458	792	234*	171*	248	744	2,812	2,053	880	385	250	795
1958...	210	212	197	157	248	306	646	2,987	2,147	681	321	221	697
1959...	400	549	867	441	262	300	1,142	1,763	2,816	2,234	679	657	1,012
1960...	995	921	816	253*	178	328	931	1,453	2,278	1,625	479	239	876

* Estimated.

White River near Plain, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...												325	
1955...	232	288	280*	187	172	144	159	322	1,440	1,220	447	163	144
1956...	156	359	250*	150*	125*	121	173	1,060	1,990	996	419	218	121
1957...	195	325	309	120*	135*	216	301	1,840	1,120	505	227	188	120
1958...	110*	139	160*	137	148	219	336	1,290	830	472	217	150	110
1959...	154	204	469	322	210	265	735	1,170	1,920	1,050	358	334	154
1960...	361	270*	417	190*	140*	140*	527	954	1,300	910	208	182	140

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
1954										
1955	5,360	June 12, 1955	144	837	5.58	75.67	605,600	876	79.27	634,200
1956	5,700	June 1, 1956	121	1,053	7.02	95.61	764,600	1,029	93.43	747,200
1957	4,460	May 9, 1957	120	795	5.30	71.99	575,800	703	63.59	508,700
1958	5,780	May 26, 1958	110	697	4.65	63.03	504,400	798	72.17	577,400
1959	4,590	June 22, 1959	154	1,012	6.75	91.60	732,800	1,089	98.54	788,400
1960	4,320	Dec. 15, 1959	140	876	5.84	79.49	636,000			

Wenatchee River below Wenatchee Lake, Wash.

Location (revised).—Lat. 47°48'30", long. 120°43'20", in sec. 28, T. 27 N., R. 17 E., on left bank 0.1 mile downstream from lake outlet, 4¾ miles northwest of Plain, and 17 miles northwest of Leavenworth.

Drainage area.—276 sq. mi.

Records available.—January 1932 to September 1958.

Gage.—Water-stage recorder. Datum of gage is at sea level, datum of 1912. Prior to Jan. 5, 1935, staff gage, and Jan. 5, 1935, to Sept. 6, 1956, water-stage recorder, at site 2¾ miles uplake from outlet at same datum.

Average discharge.—26 years (1932-58), 1,317 cfs (953,500 acre-ft. per year).

Extremes.—1932-58: Maximum discharge recorded, 13,700 cfs May 29, 1948 (elevation of lake surface, 1,879.65 ft.); minimum, 96 cfs Nov. 30, Dec. 1-3, 1952; minimum elevation of lake surface, 1,869.27 ft. Dec. 1, 1936.

Remarks.—Natural regulation in lake. No diversion.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	506	890	1,057	697	504	533	1,108	3,827	4,218	4,556	1,971	887	1,789
1955...	618	1,457	779	425	494	324	647	2,043	5,137	3,338	1,218	470	1,414
1956...	965	2,020	725	435	298	318	1,848	5,126	5,066	3,584	911	495	1,818
1957...	924	876	1,717	507	390	564	1,319	4,788	3,211	1,185	500*	312	1,365
1958...	253	384	439	357	515	628	1,237	5,017	3,236	955	424	342	1,153

* Estimated.

Wenatchee River below Wenatchee Lake, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	338	634	807	478	412	492	392	1,110	3,000	2,850	1,200	568	338
1955...	348	508	540	348	336	266	316	604	2,540	1,950	628	242	242
1956...	219	736	497	301	273	256	427	2,100	3,570	1,400	590*	394	219
1957...	362	588	564	280*	300*	470	644	3,100	1,550	676	322	245	245
1958...	174	255	339	280	344	458	700	1,810	1,600	644	334	241	174

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
1953.....	.....	.....	.....	.....	.....	.....	.....	1,456	71.61	1,054,000
1954.....	6,990	May 20, 1954	338	1,739	6.30	85.53	1,259,000	1,772	87.12	1,283,000
1955.....	9,620	June 13, 1955	242	1,414	5.12	69.55	1,024,000	1,485	73.06	1,075,000
1956.....	9,400	May 21, 1956	219	1,818	6.59	89.68	1,320,000	1,805	89.02	1,310,000
1957.....	7,040	May 9, 1957	245	1,365	4.95	67.13	988,200	1,159	57.00	839,100
1958.....	8,490	May 26, 1958	174	1,153	4.18	56.67	834,400	.....	.....	.....

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.

Records available.—May 1911 to October 1914, August 1936 to November 1949, August 1954 to September 1957. Prior to August 1936 (published as Chiwawa Creek near Leavenworth).

Gage.—Water-stage recorder. Altitude of gage is 2,100 ft. (from river-profile map). May 29, 1911, to Oct. 31, 1914, staff gage at site 3 miles downstream at different datum.

Average discharge.—19 years (1911-14, 1936-49, 1954-57), 501 cfs (362,700 acre-ft. per year).

Extremes.—1911-14, 1936-49, 1954-57: Maximum discharge, 5,880 cfs May 29, 1948 (gage height, 9.17 ft.); minimum recorded, 56 cfs Oct. 24-27, 1942 (gage height, 3.73 ft.), but may have been less during some periods of ice effect.

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
1954...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	359	.....
1955...	239	420	282	176	163	148	233	942	2,637	1,459	481	198	616
1956...	347	571*	197*	142*	96.0*	107*	763	2,683	2,398	1,439	419	218	783
1957...	229	206	328*	153*	131*	173*	550*	2,277	1,446	512	219	141	533

* Estimated.

Chiwawa River near Plain, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954												259	
1955	204	212	220*	158	132	130*	152	263	1,340	748	275	123	123
1956	119	260*	150*	110*	90*	90*	143	1,100	1,720	598	268	180	90*
1957	150	165*	140*	100*	105*	150*	200*	1,710	796	300	147	116	100*

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
1954										
1955	4,730	June 13, 1955	123	616	3.62	49.15	445,600	630	50.30	456,100
1956	5,080	June 1, 1956	90	783	4.61	62.71	568,600	754	60.39	547,600
1957	3,460	May 19, 1957	100	533	3.14	42.56	385,900			

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.

Records available.—October 1910 to September 1960. Published as "near Leavenworth" 1910-31.

Gage.—Water-stage recorder. Altitude of gage is 1,805 ft. (from river-profile map). Prior to Jan. 8, 1932, staff gages at site a quarter of a mile downstream at different datum.

Average discharge.—56 years (1904-60), 2,242 cfs (1,623,000 acre-ft. per year).

Extremes.—1910-29, 1931-60: 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.—Wenatchee Park Land & Irrigation Co. diverts a maximum of about 12 cfs from Chiwawa River for irrigation of 1,400 acres near Plain. 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
1954	810	1,301	1,594	1,054	817	901	1,995	6,868	7,549	7,540	3,045	1,383	2,920
1955	1,026	2,232	1,309	768*	852	628	1,196	3,945	9,442	5,733	1,974	791	2,496
1956	1,594	3,316	1,379	800*	584	636	3,654	9,771	9,198	6,094	1,618	825	3,293
1957	1,462	1,424	2,801	888*	687*	998	2,566	8,855	5,769	2,006	851	527	2,415
1958	480	689	750	636	889	1,089	2,214	8,843	5,621	1,536	687	533	2,003
1959	1,089	2,028*	2,687	1,689	1,040	1,190	3,572	6,029	8,227	5,372	1,499	1,573	3,006
1960	2,722	3,193	3,056	1,068*	801	1,132	3,371	4,901	6,707	3,680	1,047	698	2,692

* Estimated.

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
1954...	586	978	1,250	775	658	834	882	2,000	5,520	4,480	1,830	938	586
1955...	670	874	922	630*	620*	544	664	1,240	5,030	3,280	1,040	490	490
1956...	443	1,390	940*	590*	510*	507	858	4,540	6,540	2,480	1,050	653	443
1957...	621	986	970	600*	510*	882	1,260	6,040	3,320	1,170	548	426	426
1958...	340	487	600	517	607	810	1,300	3,280	2,600	1,020	535	404	340
1959...	420	800*	1,620	1,220	848	1,030	2,060	4,260	6,160	2,500	922	834	420
1960...	1,090	1,000*	1,580	800*	580*	570*	2,160	3,340	4,110	1,850	633	471	475

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
1953.....	.....	.....	.....	.....	.....	.....	.....	2,410	55.36	1,745,000
1954.....	12,400	May 20, 1954	586	2,920	4.94	67.09	2,114,000	2,991	68.70	2,165,000
1955.....	17,000	June 13, 1955	490	2,495	4.22	57.29	1,806,000	2,638	60.59	1,910,000
1956.....	17,100	May 21, 1956	443	3,293	5.57	75.86	2,391,000	3,247	74.80	2,357,000
1957.....	12,700	May 9, 1957	426	2,415	4.09	55.45	1,748,000	2,097	48.15	1,518,000
1958.....	14,700	May 26, 1958	340	2,003	3.39	46.02	1,450,000	2,330	53.51	1,687,000
1959.....	11,400	June 22, 1959	420	3,006	5.09	69.03	2,176,000	3,272	75.14	2,369,000
1960.....	11,500	Nov. 25, 1959	475	2,692	4.55	61.98	1,954,000	.....	.....	.....

Icicle 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.

Records available.—September 1936 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,450 ft. (from river-profile map).

Average discharge.—24 years (1936-60), 628 cfs (454,700 acre-ft. per year).

Extremes.—1936-60: 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 measurement of peak flow; minimum daily, 44 cfs Nov. 30, 1936.

Remarks.—No diversion. Some regulation in headwater lakes for irrigation.

Revisions.—The momentary maximum discharge for the water year 1943 published in State WSB No. 6 has been revised to 3,880 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	156	252	403	246	206	251	496	2,018	2,244	2,292	764	335	810
1955...	261	517	323	200	205	149	276	1,019	2,957	1,573	443	180	676
1956...	383	919	343	207*	158*	162	1,016*	2,798	2,055	1,609	385	211	905
1957...	340	332	736	213*	161*	240	569	2,428	1,422	454	166	149	606
1958...	127	146	165	157	224	273	495	2,627	1,453	373	151	137	530
1959...	274	594	801*	506	312	304	891	1,506	2,494	1,364	342*	380	815
1960...	703	1,049	925	281	197	322	813	1,303	1,923	712	208	124	713

* Estimated.

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
1954...	124	179	231	160*	150*	222	224	486	1,410	1,180	470	224	124
1955...	164	192	224	160	146	138	159	262	1,310	854	228	128	128
1956...	114	370	270*	170*	145	127	204	1,030	1,840	570	252	157	114
1957...	167	232	220	160*	110*	215	269	1,440	733	257	124	124	100
1958...	90	88	124	110	137	210	290	840	674	227	127	103	88
1959...	95	203	456	369	250	272	610	1,020	1,580	582	192	173	95
1960...	274	261	434	202	140*	140*	483	804	968	345	151	97	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
1953								660	46.45	478,100
1954	4,910	May 19, 1954	124	810	4.20	56.94	586,300	834	58.63	603,600
1955	6,010	June 12, 1955	128	676	3.50	47.56	489,300	721	50.72	521,900
1956	6,470	June 1, 1956	114	905	4.69	63.80	656,700	886	62.49	643,200
1957	4,020	May 9, 1957	100	606	3.14	42.60	438,700	524	36.85	379,400
1958	5,040	May 25, 1958	88	530	2.75	37.24	383,400	633	44.50	458,200
1959	8,900	June 20, 1959	95	815	4.22	57.33	590,100	900	63.27	651,200
1960	8,020	Nov. 23, 1959	97	713	3.69	50.30	517,800			

* Estimated.

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.

Records available.—October 1928 to February 1929 (monthly discharge only), March 1929 to September 1960.

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 at site 1¼ miles downstream at different datum.

Average discharge.—32 years (1928-60), 3,070 cfs (2,223,000 acre-ft. per year).

Extremes.—1929-60: 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 discharge, 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. Diversion by Icicle Creek irrigation canal 8 miles upstream from station is used for irrigation of a substantial part of the 22,000 acres irrigated below station.

Wenatchee River at Peshastin, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	979	1,558	2,043	1,371	1,143	1,325	2,729	9,400	10,230	10,350	4,003	1,746	3,928
1955...	1,329	2,889	1,732	1,019	1,140	880	1,706	5,305	13,320	7,695	2,420	942	3,369
1956...	2,034	4,511	2,107	1,213	906*	1,001	5,719	13,800	13,030	8,358	2,149	1,105	4,666
1957...	1,901	1,853	3,794	1,199*	932*	1,474	3,348	12,430	7,723	2,577	1,069	699	3,267
1958...	655	903	992	873	1,330	1,594	3,009	12,390	7,734	2,019	808	653	2,755
1959...	1,453	2,392	3,855	2,448	1,512	1,845	5,008	8,160	11,430	7,076	1,840	1,997	4,134
1960...	3,654	4,622	4,305	1,440*	1,081	1,640	4,432	6,537	9,141	4,538	1,215	704	3,616

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	736	1,150	1,570	1,030*	890	1,200	1,230	2,660	7,280	5,930	2,360	1,170	736
1955...	833	1,130	1,230	841	793	755	1,900	1,660	7,050	4,240	1,240	588	588
1956...	552	1,900	1,410	860*	790	726	1,560	6,240	9,260	3,180	1,430	858	552
1957...	905	1,310	1,320	660*	680*	1,280	1,880	8,260	4,280	1,490	688	616	616
1958...	463	632	794	704	843	1,160	1,860	4,380	3,660	1,260	645	432	432
1959...	554	1,040	2,300	1,760	1,210	1,610	3,020	5,880	8,320	3,130	1,100	995	554
1960...	1,490	1,380*	2,240	1,100	800*	750*	2,810	4,160	5,390	2,190	775	572	572

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					
1953						3,323	2,406,000
1954	17,900	May 20, 1954	736	3,928	2,844,000	4,040	2,925,000
1955	23,400	June 13, 1955	588	3,369	2,439,000	3,593	2,602,000
1956	24,200	May 21, 1956	552	4,666	3,387,000	4,579	3,324,000
1957	17,300	May 9, 1957	616	3,267	2,366,000	2,846	2,060,000
1958	21,000	May 26, 1958	432	2,755	1,994,000	3,229	2,338,000
1959	15,700	June 22, 1959	554	4,134	2,993,000	4,507	3,263,000
1960	16,400	Dec. 16, 1959	572	3,616	2,625,000		

* Estimated.

Mission Creek above Sand Creek, near Cashmere, Wash.

Location.—Lat. 47°25'45", long. 120°30'45", in SE¼NW¼ sec. 6, T. 22 N., R. 19 E., on left bank 400 ft. upstream from Sand Creek, 3 miles downstream from East Fork, and 7 miles south of Cashmere.

Drainage area.—40 sq. mi.

Records available.—December 1958 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,750 ft. (from topographic map).

Extremes.—1958-60: Maximum discharge, 240 cfs Nov. 22, 1959 (gage height, 3.10 ft.); maximum gage height, 4.31 ft. Jan. 7, 1959 (backwater from ice); minimum discharge, 2.1 cfs Sept. 12, 13, 1959 (gage height, 1.14 ft.).

Remarks.—No regulation or diversion.

Mission Creek above Sand Creek, near Cashmere, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	.....	.....	.....	18.4*	12.9*	33.8	43.6	35.6	20.1	7.89	3.65	4.19	.....
1960...	5.85	12.6	6.71	5.00*	8.60	29.4*	48.3	68.0	27.0	8.77	4.78	2.68	19.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	.....	.....	.....	6*	5*	27	26	27	12	5.1	2.9	2.4	.....
1960...	3.3	2.5*	4.0*	5.0*	5.0*	7.0*	18.5	35	12.5	6.2	3.0	2.3*	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
1959.....	144†	April 1, 1959	.....	.....	.....	.....	.....	17.1	5.82	12,400
1960.....	240	Nov. 22, 1959	2.3	19.0	0.475	6.45	13,800	.....	.....	.....

Sand Creek near Cashmere, Wash.

Location.—Lat. 47°25'50", long. 120°30'45", in NW¼ sec. 6, T. 22 N., R. 19 E., 800 ft. upstream from mouth and 6¾ miles southwest of Cashmere.

Drainage area.—18.6 sq. mi. (revised).

Records available.—May 1954 to September 1956. Annual maximum discharge, water years 1954, 1957-60.

Gage.—Water-stage recorder. Altitude of gage is 1,730 ft. (from topographic map). October 1953 to September 1960, crest-stage gages a quarter of a mile downstream at different datum.

Extremes.—1954-60: Maximum discharge, 425 cfs Aug. 15, 1956 (gage height, 5.95 ft.), estimated on basis of computation of peak flow through culvert 600 ft. downstream, adjusted for channel storage.

1954-56: Minimum discharge, 0.4 cfs Sept. 10, 1955 (gage height, 1.06 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
1954...	.....	.....	.....	.....	.....	.....	.....	.....	4.14	1.67	1.06	0.94	.....
1955...	0.92	1.65	1.29	1.31	2.61*	3.39*	14.2	19.6	5.53	1.82	.68*	.53	4.46
1956...	.84*	1.25*	4.77*	9.30*	3.77*	23.4*	93.4	44.1	7.43	3.87	3.13*	1.66*	16.4

* Estimated.
† Maximum during period December to September.

Sand Creek near Cashmere, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	.....	.....	.....	.....	.....	.....	.....	.....	2.6	1.1	0.9	0.8	.....
1955	0.9	0.9	1.0*	1.2	1.1	1.0*	8.6	12	3.1*	1.0	.5	.5	0.5
1956	.5	.6*	1.2*	3.0*	2.3*	5.9	37	13.5	4.8	2.8	1.5*	1.3*	.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
1954	67.4	April 18, 1954	.....	.....	.....	.....	.....	.....	.....	.....
1955	71	Feb. 7, 1955	0.5	4.46	0.225	3.07	3,230	4.72	3.25	3,410
1956	425	Aug. 15, 1956	.5	16.4	.828	11.26	11,890	.....	.....	.....
1957	112	April 12, 1957	.....	.....	.....	.....	.....	.....	.....	.....
1958	68.5	April 20, 1958	.....	.....	.....	.....	.....	.....	.....	.....
1959	115	Jan. ..., 1959	.....	.....	.....	.....	.....	.....	.....	.....
1960	120	Nov. 22, 1959	.....	.....	.....	.....	.....	.....	.....	.....

Mission Creek near Cashmere, Wash.

Location.—Lat. 47°30'15", long. 120°28'30", in SE¼NE¼ sec. 8, T. 23 N., R. 19 E., on right bank 1½ miles upstream from mouth and 1½ miles south of Cashmere.

Drainage area.—77.9 sq. mi.

Records available.—May 1954 to November 1958.

Gage.—Water-stage recorder. Altitude of gage is 850 ft. (from topographic map).

Extremes.—1954-58: Maximum discharge, 463 cfs Apr. 22, 1956 (gage height, 2.78 ft.); minimum daily, 0.1 cfs Aug. 25 to Sept. 12, 1955.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	.....	.....	.....	.....	.....	.....	.....	.....	19.8	7.53	4.71	5.21	.....
1955	4.44*	10.8	6.37	6.52*	14.5	11.6	35.4	59.7	34.7	9.63	2.00	1.97	16.4
1956	6.12	11.2	11.9*	22.3	17.2*	65.1*	224	131	53.6	17.1	11.0	9.35	48.3
1957	8.65	10.1	37.3	8.14*	13.0	36.4	73.1	72.5	17.3	6.62	4.46	3.96	24.4
1958	8.82	8.92	10.2	11.2	42.0	41.8	71.5	70.4	20.4	6.41	2.35	3.27	24.6
1959	4.06	18.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	.....	.....	.....	.....	.....	.....	.....	.....	13.5	2.8	2.1	1.5	.....
1955	4.0*	4.1	3.3*	4.9	6.0*	6.0*	22	32	16	5.4	.1*	.1*	0.1*
1956	3.7	3.8*	7.0*	12*	6.0*	25*	134	96	30	9.8	7.7	8.0*	3.7
1957	7.4	5.5*	4.0	3.5*	4.0*	22	54	30	10.5	3.8	3.1	2.6	2.6
1958	4.4	4.6	5.6	8.6	15	24	58	36	11.5	2.5	1.9	1.9	1.9
1959	2.6	3.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

Mission Creek near Cashmere, 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					
1954							
1955	215	Feb. 8, 1955	0.1	16.4	11,900	17.1	12,360
1956	463	April 22, 1956	3.7	48.3	35,030	50.6	36,690
1957	192	May 1, 1957	2.6	24.4	17,640	22.0	15,920
1958	151	Feb. 25, 1958	1.9	24.6	17,820		
1959							

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.

Records available.—June 1949 to September 1955.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 2,260 ft. (by barometer).

Average discharge.—6 years (1949-55), 5.74 cfs (4,160 acre-ft. per year).

Extremes.—1949-55: Maximum discharge, 3,160 cfs Feb. 25, 1954 (gage height, 6.47 ft.), from rating curve extended above 760 cfs; minimum 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.—No regulation. Possible minor diversions 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
1954	0.67*	0.95*	1.10	1.10	50.8	9.81	2.10	1.94	1.30	.62	.50	.57	5.64
1955	.60	.71	.75*	.70*	34.2*	19.8*	8.70	1.37	.82	.69	.35	.46	5.56

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	0.6*	0.8*	1.1	1.1	1.2	2.5	2.0	1.8	0.9	0.5	0.5	0.5	0.5
1955	.6	.6	.7*	.7*	.7*	.7*	1.6	1.2	.6	.5	.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
	Discharge	Date					
1953						1.39	1,010
1954	3,160	Feb. 25, 1954	0.5	5.64	4,080	5.58	4,040
1955	563	Feb. 8, 1955	.2	5.56	4,030		

* Estimated.

Douglas Creek at Palisades, Wash.

Location.—Lat. 47°25'00", long. 119°56'00", 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.

Records available.—January 1951 to September 1955 (fragmentary).

Gage.—Water-stage recorder. Altitude of gage is 955 ft. (by barometer).

Extremes.—1951-55: 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 at times each year.

Remarks.—No regulation. A few diversions for irrigation and domestic use above station. Station operated to obtain flood flows only.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0	0	0	27.1	12.8	3.83	0.75	0	0	0	2.70	3.77
1955...	0	.86	0	0	0	21.9	4.40	0	0	0	0	0	2.30

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0	0	0	0	3.7	2.2	0.1	0	0	0	0	0
1955...	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
	Discharge	Date					
1953						0	0
1954	1,020	Feb. 25, 1954	0	3.77	2,728	3.84	2,780
1955	347	Mar. 29, 1955	0	2.30	1,660		

COLUMBIA RIVER MAIN STEM

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.

Records available.—January to December 1910 (gage heights only), May 1913 to September 1960. Published as "at Wenatchee" 1910, 1913-16, and as "at Vernita" 1917-30.

Gage.—Water-stage recorder. Datum of gage is 499.3 ft. above mean sea level (river-profile survey). Prior to Jan. 1, 1916, staff gage 1 mile upstream from highway

Columbia River at Trinidad, Wash.—Continued

bridge at Wenatchee (24 miles upstream) at datum 583 ft. above mean sea level, unadjusted. Jan. 1 to Dec. 31, 1916, staff gage on pier of highway bridge at Wenatchee at datum 579.30 ft. above mean sea level, unadjusted. Jan. 14, 1917, to Sept. 30, 1930, staff gages at ferry at Vernita (50 miles downstream) at datum 388.7 ft. above mean sea level, unadjusted.

Average discharge.—47 years (1913-60), 120,300 cfs (87,090,000 acre-ft. per year), unadjusted.

Extremes.—1913-60: 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 (based on information obtained at other points).

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, Chief Joseph, and Grand Coulee Dams. Flow regulated by Rufus Woods and Franklin D. Roosevelt Lakes (see elsewhere in this report) and reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Okanogan, and Chelan River basins.

Corrections.—In State WSB No. 6, the monthly mean discharges for June 1914 and September 1923 are listed in error; they should be 322,000 cfs and 99,900 cfs, respectively.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	75,670	69,200	62,530	68,150	62,770	72,510	66,530	247,000	387,300	359,100	178,900	117,800	147,800
1955...	75,360	75,320	71,380	69,310	78,210	86,700	90,220	89,580	326,000	342,000	149,300	83,760	127,500
1956...	69,050	78,510	69,440	73,590	73,650	74,450	188,700	322,100	447,400	248,300	123,000	80,640	154,000
1957...	71,690	68,640	64,590	78,590	72,420	56,010	77,230	305,600	319,100	156,500	96,490	64,900	119,600
1958...	63,750	61,150	56,750	59,540	66,750	86,920	95,380	221,500	320,500	160,800	93,200	67,580	112,900
1959...	67,500	61,640	67,230	78,520	84,400	99,630	123,400	239,800	375,900	299,100	134,900	118,100	146,100
1960...	117,600	108,900	92,560	78,160	74,670	72,680	163,500	194,300	278,400	250,500	122,800	75,000	135,900

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	67,500	51,500	46,600	55,500	43,800	57,300	51,900	79,300	342,500	265,100	150,100	89,100	46,600
1955...	64,600	65,800	54,700	54,200	64,200	83,000	73,200	73,500	134,600	248,100	95,400	73,700	54,200
1956...	58,500	68,300	49,000	54,900	63,600	55,300	109,600	274,100	337,400	191,700	88,900	69,400	49,000
1957...	57,500	49,700	47,700	58,000	54,200	45,800	55,700	104,400	211,100	124,800	82,300	53,900	45,800
1958...	51,800	52,200	41,600	48,400	44,200	56,000	69,100	102,000	238,600	116,300	80,900	60,500	41,600
1959...	59,800	54,700	52,400	51,700	69,900	92,400	91,200	186,000	318,900	224,400	95,500	94,600	51,700
1960...	101,100	81,000*	70,300	60,100	57,500	53,300	108,800	125,100	238,900	157,300	74,200	61,700	53,300

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					
1953						118,900	86,090,000
1954	420,800	July 15, 1954	46,600	147,800	107,000,000	149,100	107,900,000
1955	448,500	July 1, 1955	54,200	127,500	92,320,000	127,100	92,000,000
1956	553,900	June 6, 1956	49,000	154,000	111,800,000	153,000	11,070,000
1957	427,400	May 26, 1957	45,800	119,600	86,560,000	117,600	85,140,000
1958	397,800	June 5, 1958	41,600	112,900	81,760,000	114,200	82,670,000
1959	438,600	June 28, 1959	51,700	146,100	105,800,000	156,400	113,200,000
1960	311,400	July 8, 1960	53,300	135,900	98,630,000		

* Estimated.

Crab Creek at Irby, Wash.

Location.—Lat. 47°21'30", 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.

Records available.—September 1942 to September 1960.

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.—18 years (1942-60), 91.4 cfs (66,170 acre-ft. per year).

Extremes.—1942-60: Maximum discharge, 8,370 cfs Feb. 27, 1957 (gage height, 11.94 ft.); minimum, 2.0 cfs Jan. 12, 1948 (gage height, 1.80 ft.).

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

Revisions.—Some periods for the water years 1949, 1950, 1951 have been revised; the records published in State WSB No. 6 thus affected are given herewith:

MONTH	Mean	Runoff in acre-feet	Momentary maximum	
			Discharge	Date
February 1949	744			
Water year 1948-49	135	97,560	2,970	Feb. 24, 1949
Calendar year 1949	130	94,170		
February 1950	490			
March	908			
Water year 1949-50	157	113,300	3,070	Mar. 5, 1950
Calendar year 1950	158	114,200		
February 1951	424			
March	497			
Water year 1950-51	119	85,870	2,410	Mar. 16, 1951
Calendar year 1951	119	86,390		

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.55	12.0	13.5	20.1	128	140	64.3	29.3	26.2	17.5	10.9	9.83	39.5
1955...	10.6	13.3	19.7	72.3*	303	166	78.5	42.1	22.1	18.3	13.6	9.98	62.5
1956...	7.76	7.83*	295*	1,163*	510*	1,141	248	82.9	47.4	29.3	22.4	14.4	299
1957...	14.8	21.2	28.5	27.7*	691*	288	95.4	47.1	55.7	26.8	23.2	12.6	107
1958...	10.1	11.3	13.8	129	151	186	101	45.2	28.6	21.5	13.6	9.89	59.6
1959...	8.95	9.00	18.7	779	339	289	111	52.6	32.5	24.4	15.5	11.0	140
1960...	11.7	13.9	24.6	76.2*	342	93.2	63.2	38.1	27.6	17.9	12.3	8.75	59.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.1	10.5	12.5	16.5	21	92	28	18	20	13.5	9.8	9.1	9.1
1955...	9.1	12	15	33*	33*	60*	63	28	21	15	11	8.4	8.4
1956...	7.2	6.6*	8.2*	300*	50*	457	120	53	29	28	17.5	13.5	6.6
1957...	13.5	15.5	25	18*	13*	124	38	31	34	21	18	9.5	9.5
1958...	9.5	9.5	12	16	90	119	87	29	24	18	11	8.8	8.8
1959...	8.2	8.2	9.4	30*	162	144	77	39	28	20	12	9.9	8.2
1960...	10.5	12*	17	30	70*	65*	43	32	22	15	9.5	7.4	7.4

* Estimated.

Crab Creek at Irby, 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					
1953						35.8	25,880
1954	744	Feb. 23, 1954	9.1	39.5	28,600	40.2	29,120
1955	2,160	Feb. 8, 1955	8.4	62.5	45,260	85.2	61,710
1956	4,170	Mar. 2, 1956	6.6	299	216,800	278	201,700
1957	8,370	Feb. 27, 1957	9.5	107	77,440	104	75,660
1958	832	Jan. 19, 1958	8.8	59.6	43,140	59.7	43,230
1959	5,550	Jan. 24, 1959	8.2	140	101,600	141	102,400
1960	1,290	Feb. 8, 1960	7.4	59.6	43,250		

Wilson Creek at Wilson Creek, Wash.

Location.—Lat. 47°26′, long. 119°06′, in SW¼ sec. 6, T. 22 N., R. 30 E., on right bank 1 mile upstream from mouth and 1 mile northeast of town of Wilson Creek.

Drainage area.—About 470 sq. mi.

Records available.—February 1951 to March 1957, October 1958 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,280 ft. (from Great Northern Railway). Feb. 28 to Mar. 25, 1957, staff gage at same site and datum. Prior to flood of Feb. 26, 1957, water-stage recorder at same site and datum.

Extremes.—1951-57, 1958-60: Maximum discharge, 12,900 cfs Feb. 26, 1957 (gage height, 20.74 ft.), result of slope-area measurement of peak flow; no flow for long periods each year.

Remarks.—Some regulation by small dams above station. Numerous diversions for irrigation above station.

Revision.—The momentary maximum discharge for the water year 1951 published in State WSB No. 6 has been revised to 1,690 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	0	0	0	0	17.2	.16	.24	0	0	0	0	0	1.35
1955	0	0	0	0	0	.39	3.70	.1	0	.61	0	0	.39
1956	0	0	0	0	1.88	239	74.6	15.6	0	0	0	0	27.8
1957	0	0	2.34*	0*	294*	96.2							
1959	0	0	1.94	457	54.1	233	9.70*	0	0	0	0	0	63.7
1960	0	0	2.03	19.4	239	1.25	1.63	0	0	0	0	0	21.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	32	.1	0	0	0	0	0
1957	0	0	0*	0*	0*	1							
1959	0	0	0	4*	16*	31*	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0	0	0	0	0	0

* Estimated.

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
	Discharge	Date					
1954	811	Feb. 22, 1954	0	1.35	980	1.35	980
1955	234	Mar. 31, 1955	0	.39	282	.39	282
1956	1,270	Mar. 23, 1956	0	27.8	20,210	28.0	20,350
1957	12,900	Feb. 26, 1957					
1959	4,620	Jan. 24, 1959	0	63.7	46,090	63.7	46,090
1960	2,900	Feb. 7, 1960	0	21.0	15,230		

Crab Creek near Moses Lake, Wash.

Location (revised).—Lat. 47°11'25", long. 119°16'00", in NW¼NE¼ sec. 35, T. 20 N., R. 28 E., on left bank on downstream side of highway bridge, 3 miles upstream from Parker Horn and 4 miles north of town of Moses Lake.

Drainage area.—About 2,040 sq. mi.

Records available.—September 1942 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,070.39 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to July 14, 1956, at site 300 ft. upstream at same datum.

Extremes.—1942-60: Maximum discharge, 10,400 cfs Feb. 28, 1957 (gage height, 6.81 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
1954	65.7	24.0	12.6	9.69*	9.47	7.39	11.9	29.0	42.1	63.2	80.1	78.1	36.3
1955	66.2	30.5	14.2*	12.7	73.4	87.0	46.8	21.0	20.2	36.4	38.7	44.2	40.7
1956	33.8	24.2	18.5*	351	193*	1,012	287	100	42.9	34.8	41.6	45.6	183
1957	41.0	26.9	19.8	11.5*	228*	802	56.8	30.3	25.7	31.4	35.2	35.6	112
1958	32.6	21.7	14.9	12.7	24.9	123	74.0	25.8	19.7	33.7	39.9	37.0	38.4
1959	31.7	23.2	17.4	.779	235	482	95.6	39.2	18.4	25.4	39.7	47.1	157
1960	31.9	20.4	13.8	9.91*	422	50.5	43.2	21.7	16.6	32.0	42.8	40.4	60.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	42	17	10.5	9.0*	6.9	5.3	5.9	22	34	51	73	74	5.3
1955	52	19	11*	10*	10.5*	18	32	16	16	30	35	41	10*
1956	29	19*	14*	14*	14*	386	105	48	33	29	37*	44	14*
1957	36	21	15.5	8*	8*	96	38	23	23	28	34	34	8*
1958	28	16	11	10.5	9.8	88	61	10	13	29	36	34	9.8
1959	27	15	15	11.5	134	130	35	22	17	19.5	32	38	11.5
1960	24	16*	11.5	8.0*	12.5	31	24	14	12.5	24	40	33	8.0*

* Estimated.

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					
1953						39.5	28,580
1954	95	Aug. 20, 1954	5.3	36.3	26,280	37.0	26,800
1955	355	Feb. 14, 1956	10	40.7	29,510	37.8	27,390
1956	3,090	Mar. 5, 1956	14	183	132,700	184	133,400
1957	10,400	Feb. 28, 1957	3	112	80,990	110	79,870
1958	166	Mar. 8, 1958	9.8	38.4	27,810	38.7	27,990
1959	5,000	Jan. 27, 1959	11.5	157	113,700	157	113,400
1960	1,230	Feb. 9, 1960	8.0	60.5	43,910		

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.—38.4 sq. mi. (revised).

Records available.—July 1945 to September 1960.

Gage.—Water-stage recorder and concrete control. Datum of gage is 1,091.52 ft. above mean sea level (Bureau of Reclamation bench mark).

Average discharge.—15 years (1945-60), 9.76 cfs (7,070 acre-ft. per year).

Extremes.—1945-60: 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 during summer months for irrigation above Park Lake. Occasional regulation by operation of fish screen at outlet of Park Lake.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	8.85	13.0	13.2	14.8	15.9	9.82	10.3	7.65	8.24	5.11	4.95	7.98	9.94
1955	9.27	12.2	13.8	12.8	14.5	9.53	11.4	12.8	5.52	5.65	6.29	8.55	10.2
1956	10.0	8.82	15.3	15.7	14.6	17.1	10.6	12.5	11.3	5.21	6.98	7.71	11.3
1957	11.4	15.2	12.5	12.3*	14.2	19.1	12.2	14.5	11.5	6.23	6.15	7.88	11.9
1958	10.3	13.4	15.1	16.0	16.0	15.2	14.7	11.5	6.58	8.02	6.90	8.34	11.8
1959	10.5	16.1	15.1	23.5	25.2	19.4	14.4	11.6	9.36	9.45	17.2	16.2	15.6
1960	18.2	18.9	21.2	19.1	21.3	18.7	15.0	15.7	12.3	8.63	8.64	13.0	15.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	6.3	10.5	12	0.5	14	3.2	8.9	6.5	5.8	1.8	1.3	0.1	0.1
1955	5.4	9.6	8.4	11	9.2	.9	3.4	2.6	1.8	1.4	2.1	7.7	.9
1956	7.3	.7*	14	14.5	13*	13.5	3.7	1.4	6.5	1.3	6.2	5.1	.7
1957	9.2	13.5	6*	10*	10*	14.5	1.0	9.8	7.7	1.1	1.1	1.1	1.0
1958	6.2	12.5	14.5	14.5	13	14.5	13	10.5	3.8	4.1	6.2	5.8	3.8
1959	8.9	10.5	11.5	3.0*	22	16.5	8.5	5.2	6.2	4.0	7.3	5.6	3.0*
1960	17	4.2	18	18	19	17	5.6	12.5	9.1	7.0	6.7	8.5	4.2

* Estimated.

Park Creek below Park Lake, 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					
1953						11.9	8,580
1954	27	Jan. 22, 1954	0.1	9.94	7,190	9.96	7,210
1955	19.5	Dec. 1, 1954	.9	10.2	7,360	10.1	7,300
1956	24	Feb. 29, 1956	.7	11.3	8,220	11.7	8,510
1957	23	Mar. 15, 1957	1.0	11.9	8,590	11.8	8,570
1958	24	July 1, 1958	3.8	11.8	8,540	12.0	8,720
1959	38	Jan. 12, 1959	3.0	15.6	11,310	17.0	12,320
1960	①	Nov. 24, 1959	4.2	15.9	11,520		

Rocky Ford Creek near Ephrata, Wash.

Location.—Lat. 47°18'20", long. 119°26'50", in NW¼NW¼ sec. 21, T. 21 N., R. 27 E., on right bank 1½ miles downstream from source at Rocky Ford Springs, 5 miles upstream from mouth, and 5 miles east of Ephrata.

Drainage area.—11.7 sq. mi. (revised).

Records available.—June 1909 to April 1910, July to December 1911, August 1942 to September 1960. Prior to January 1910, published as Upper Crab Creek near Ephrata.

Gage.—Water-stage recorder. Datum of gage is 1,064.88 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1912, staff gages at sites 4½ to 5½ miles downstream at different datums. Aug. 19, 1942, to May 23, 1945, water-stage recorder at site 3½ miles downstream at datum 5.37 ft. lower.

Average discharge.—18 years (1942-60), 82.4 cfs (59,660 acre-ft. per year).

Extremes.—1909-11, 1942-60: Maximum discharge, 212 cfs Apr. 15-18, 1956 (gage height, 3.58 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
1954	38.8	85.5	77.6	71.2	67.5	66.9	78.1	89.5	89.9	91.3	94.9	93.1	82.9
1955	91.0	83.0	89.2	77.8	73.4	76.2	89.6	94.8	97.0	105	102	101	89.3
1956	98.0	86.3	76.8	75.0	110	169	206	199	179	165	155	144	139
1957	138	129	117	104	94.7	100	122	129	125	118	114	107	117
1958	109	96.6	90.2	84.8	88.5	103	103	98.6	93.6	92.5	91.7	94.4	94.7
1959	92.9	85.3	79.9	74.8*	88.6	117	144	138	122	112	108	103	106
1960	97.5	93.6	86.1	74.1	69.8	85.5	98.3	93.5	87.2	90.9	99.9	100	89.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	87	81	74	70	66	65	71	87	88	91	94	90	65
1955	88	79	77	77	71	72	83	94	94	100	100	98	71
1956	92	82	74	72	85	140*	197	188	171	160	151	138	72
1957	136	123	110	96*	89	89	115	127	122	117	110	104	89
1958	98	94	87	82	83	96	100	96	92	91	91	90	82
1959	90	81	78	72*	79	99	137	132	114	110	106	99	72*
1960	96	91	82	68	67	77	94	90	85	88	97	97	67

① About 40 cfs.
* Estimated.

Rocky Ford Creek near Ephrata, 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					
1953	.....	.....	.....	.....	.....	89.3	64,630
1954	100	Aug. 20, 1954	65	82.9	60,050	83.0	60,080
1955	109	July 24, 1955	71	89.3	64,630	90.0	65,160
1956	212	Apr. 15-18, 1956	72	139	100,600	149	108,100
1957	142	Oct. 5, 1956	89	117	84,400	108	78,490
1958	108	April 2, 1958	82	94.7	68,600	92.3	66,870
1959	148	Apr. 17-19, 1959	72	106	76,410	107	77,550
1960	106	Aug. 15, 1960	67	89.8	65,170	.....	.....

Crab Creek near Warden, Wash.

Location (revised).—Lat. 46°57'00", long. 119°15'20", in SW¼NW¼ sec. 24, T. 17 N., R. 28 E., on left bank half a mile east of Goose Lake, 2¼ miles downstream from O'Sullivan Dam, 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.

Records available.—June to December 1909, March to December 1910, February to December 1911, February to June 1912, October 1942 to September 1952, October 1955 to September 1960. Published as Lower Crab Creek near Warden 1909-12. Prior to September 1952 the records are for natural flow. Records for September 1952 to September 1955 at site 2 miles upstream not equivalent owing to seepage bypassing gage.

Gage.—Water-stage recorder and timber control; prior to May 8, 1958, rock and culvert control. Altitude of gage is 880 ft. (from topographic map). Prior to June 27, 1912, staff gages at several sites within 3 miles of present station at various datums. October 1942 to September 1950, water-stage recorder at site 1.6 miles upstream at different datum. October 1950 to September 1952, water-stage recorder at site 2 miles upstream at different datum.

Extremes.—1909-12, 1942-60: 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 in Lind Coulee; no flow for short intervals in June and July 1948, and part of each day Feb. 2-21, 1952, when water was shut off at O'Sullivan Dam.

Remarks.—Many diversions for irrigation. Flow regulated by Potholes Reservoir and partially by Fish and Wildlife Service Dam since January 1958. Storage began in Potholes Reservoir in September 1952 and from this time until September 1955 the flow consisted of a small part of dam seepage. Discharge at present location includes essentially all of the seepage.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956	29.0*	29.8	30.1	30.5	32.4	33.4	32.3	31.2	31.0	31.1	31.1	32.0	31.2
1957	32.6	33.0	33.0	31.3	32.0*	33.0	32.7	31.0	29.5	28.6	29.2	31.2	31.4
1958	30.0	30.9	29.0	29.3	28.9	29.8	33.2	19.2	25.2	25.8	22.1	22.3	27.1
1959	23.6	25.2	28.7	29.6	32.7	28.5	24.4	25.4	25.5	21.4	20.2	22.4	25.6
1960	26.2	31.6	35.8	19.8*	31.3	27.7	28.9	25.9	20.3	20.9	23.8*	25.0	26.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956	29	29	29	30	30	33	32	30	31	31	31	31	29
1957	32	33	32	31	32*	33	32	30	29	28	28	30	28
1958	29	30	25	22	17.5	11.5	27	12	22	23	18.5	21	11.5
1959	21	22	25	22	29	26	11.5	18.5	24	19.5	18	19.5	11.5
1960	22	26	32	10*	26	25	27	20	18.5	19.5	22*	23	10*

* Estimated.

Crab Creek near Warden, 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					
1956	37	Feb. 21, 1956	.....	.....	.....	.....	.....
1957	35	June 1, 1957	28	31.4	22,750	30.7	22,230
1958	392	May 24, 1958	11.5	27.1	19,650	26.1	18,880
1959	174	April 30, 1959	11.5	25.6	18,510	26.9	19,490
1960	372	Oct. 21, 1959	10	26.4	19,190	.....	.....

Note.—Discharge for water years 1954 and 1955 consisted entirely of seepage from O'Sullivan Dam. The average seepage was 0.3 cfs.

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 highway 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.

Records available.—August 1942 to November 1959.

Gage.—Water-stage recorder. Datum of gage is 530.83 ft. above mean sea level (Bureau of Reclamation bench mark).

Extremes.—1942-59: 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 above station for irrigation. Flow is entirely regulated by Potholes Reservoir. Flow by station is essentially seepage from Potholes Reservoir and return flow from part of the Columbia Basin project.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	37.4	40.9	35.8	26.3	41.0	35.1	36.0	32.8	30.0	27.2	26.3	33.7	33.5
1955	44.9	42.7	37.4	39.4	37.9	33.0	34.9	31.5	21.2	23.5	29.9	35.8	34.3
1956	51.1	40.0	49.9	54.1	49.4	47.2	39.1	35.5	40.8	38.6	33.4	42.3	43.4
1957	54.5	52.3	53.0	35.4*	65.3	55.0	40.4	59.2	47.4	58.6	48.7	58.8	52.8
1958	67.9	51.5	56.0	65.2	65.2	53.3	48.7	34.7	35.9	37.2	41.2	51.4	50.6
1959	54.3	55.5	62.4	68.7	74.0	59.1	50.0	55.9	51.3	33.1	59.4	82.9	59.2
1960	74.7	63.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	32	38	33	10*	32	30	29	27	13.5	24	17	26	10*
1955	41	40	24	34	33	29	28	25	16.5	13.5	27	32	13.5
1956	48	19	26	27	25*	43	18	21	27	30	14.5	39	14.5
1957	41	50	15*	15*	21*	44	28	29	28	51	37	45	15*
1958	35	46	52	50	51	43	39	13	19	26	26	46	13
1959	49	44	57	21	62	53	38	43	39	27	30	60	21
1960	66	34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

Crab Creek near Smyrna, 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					
1953	.....	.....	.....	.....	.....	23.6	17,070
1954	98	April 18, 1954	10	33.5	24,220	34.4	24,890
1955	53	Oct. 22, 1954	13.5	34.3	24,840	35.7	25,830
1956	134	Feb. 23, 1956	14.5	43.4	31,540	45.0	32,670
1957	110	Feb. 13, 1957	15	52.8	38,210	54.1	39,180
1958	83	Oct. 10, 1957	13	50.6	36,650	50.3	36,440
1959	143	Jan. 13, 1959	21	59.2	42,820	.....	.....
1960	84†	Nov. 22, 1959	.....	.....	.....	.....	.....

Crab Creek near Beverly, Wash.

Location.—Lat. 46°49'45", long. 119°49'45", in NW¼SW¼ sec. 33, T. 16 N., R. 24 E., on right bank 4½ miles upstream from mouth and 5 miles east of Beverly.

Drainage area.—About 4,550 sq. mi., of which about 500 sq. mi. in the vicinity of Soap Lake is probably noncontributing.

Records available.—February 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 500 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge, 177 cfs Feb. 4, 1960 (gage height, 3.62 ft.), from rating curve extended about 100 cfs by logarithmic plotting; maximum gage height, 3.88 ft. Jan. 4, 1960 (backwater from ice); minimum discharge, 14.5 cfs Mar. 2, 1960 (gage height, 1.39 ft.), result of freezeup.

Remarks.—Many diversions above station for irrigation. Flow is entirely regulated by Potholes Reservoir. Flow by station is essentially seepage from Potholes Reservoir and return flow from part of the Columbia Basin project.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	62.7	51.6	52.9	48.4	32.6	48.9	71.6	.....
1960	79.0	66.0	58.7	63.6*	88.7	55.0	52.3	50.8	62.3	51.2	56.7	68.0	62.6

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	58	36	41	37	19.5	26	54	.....
1960	75	40*	45*	33*	40*	35*	46	44	42	39	40	59	33*

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					
1959	105	Feb. 19, 1959	.....	.....	.....	.....	.....
1960	177	Feb. 4, 1960	33	62.6	45,420	.....	.....

† Maximum during period October to November.
* Estimated.

Columbia River below Priest Rapids Dam, Wash.

Location.—Lat. 46°37'45", long. 119°52'00", in SE¼NW¼ sec. 7, T. 13 N., R. 24 E., on left bank 2½ miles downstream from Priest Rapids Dam and 14 miles south of Beverly.

Drainage area.—95,500 sq. mi., approximately.

Records available.—January 1917 to September 1930, at site 3 miles downstream, published as "at Vernita." October 1930 to July 1959, at site 47 miles upstream, published as "at Trinidad." July 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1930, staff gages at ferry at Vernita (3 miles downstream) at datum 388.7 ft. above mean sea level, unadjusted. Oct. 1, 1930, to July 27, 1959, water-stage recorder at Trinidad (47 miles upstream) at datum 499.3 ft. above mean sea level (river-profile survey).

Extremes.—1959-60: Maximum discharge, 325,000 cfs July 7, 1960 (elevation, 418.30 ft.), from rating curve extended above 140,000 cfs; minimum, 40,100 cfs Mar. 15, 1960 (elevation, 396.84 ft.); minimum daily, 52,100 cfs Mar. 12, 1960.

Remarks.—Diversion above station for irrigation of about 500,000 acres is small percentage of flow past gage. Some diurnal fluctuation caused by Priest Rapids Dam. Flow regulated by Franklin D. Roosevelt Lake (see p. 228) and reservoirs in Kootenai, Flathead, 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
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	136,300	118,000	.....
1960	118,100	108,900	92,760	77,340	75,130	68,940	163,600	193,800	278,900	251,700	122,400	74,190	135,600

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	97,000	90,000	.....
1960	100,900	79,200	70,800	59,800	56,200	52,100	107,000	125,800	242,800	159,200	72,500	60,500	52,100

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					
1959	251,100†	July 28, 1959	.....	.....	.....	.....	.....
1960	325,000	July 7, 1960	52,100	135,600	98,430,000	.....	.....

† Maximum daily during period July 28 to Sept. 30, 1959.
NOTE.—For records prior to August 1959 see Columbia River at Trinidad (p. 259).

Keechelus Lake near Martin, Wash.

Location.—Lat. 47°19'20", long. 121°20'20", in NE¼ sec. 12, T. 21 N., R. 11 E., at dam on Yakima River at outlet of Keechelus Lake, 3½ miles northwest of Martin and 9½ miles northwest of Easton.

Drainage area.—55.8 sq. mi.

Records available.—January 1906 to September 1960.

Gage.—Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 20, 1919, staff gage and Mar. 20, 1919, to May 31, 1920, water-stage recorder at several sites in vicinity of dam at same datum.

Extremes.—1906-60: 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-filled dam completed in 1917; storage began above crib dam Jan. 12, 1906, above present dam Aug. 19, 1914. To aid in construction and clearing of reservoir site, the water surface was kept low and present reservoir was not filled until June 15, 1920. 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 midnight gage-height readings.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	61,680	81,260	114,210	83,090	78,370	82,500	86,240	127,840	158,300	145,930	115,400	68,100	.....
1955...	43,490	66,420	76,400	86,260	101,420	109,370	107,840	125,720	158,230	147,000	101,590	63,460	.....
1956...	76,380	97,750	82,210	68,810	66,160	54,010	73,980	137,530	157,180	131,410	76,220	64,290	.....
1957...	77,590	85,270	117,780	114,410	121,190	131,600	156,570	155,700	138,330	82,890	34,900	11,800	.....
1958...	15,230	24,800	44,030	57,160	75,750	87,200	115,310	148,270	134,070	87,130	36,350	14,290	.....
1959...	33,830	83,510	122,960	143,940	118,730	119,090	155,020	154,710	159,080	139,610	93,820	90,120	.....
1960...	103,090	129,580	107,420	82,300	93,600	108,920	138,380	152,560	158,750	121,750	66,130	33,320	.....

YAKIMA RIVER BASIN

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 9½ miles northwest of Easton.

Drainage area.—55.8 sq. mi.

Records available.—October 1903 to September 1960.

Gage.—Water-stage recorder and masonry channel. Datum of gage is 2,422.40 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to July 20, 1923, staff gages at several sites within 2 miles of present site at various datums.

Average discharge.—57 years (1903-60), 334 cfs (241,800 acre-ft. per year), adjusted for storage since January 1906.

Extremes.—1903-60: 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.—Records excellent except those for periods of spill, which are good. Flow regulated by Keechelus Lake (see preceding page). Keechelus Lake spillway discharge, computed from reservoir elevations and spillway rating, bypassed gage and is added to flow at station. No diversion above station.

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
1954...	373	10.5	95.5	775	280	104	307	224	460	855	701	922	427
1955...	573	3.22	4.66	5.39	6.92	7.56	225	315	594	824	897	722	350
1956...	262	269	606	375	161	340	200	230	729	969	1,002	284	460
1957...	110	188	387	194	10.3	8.3	75.1	918	658	1,002	842	432	406
1958...	17.9	5.69	6.23	8.04	10.8	13.0	19.6	358	544	832	896	443	265
1959...	2.91	5.57	8.62	153	650	273	66.7	712	678	609	801	519	372
1960...	342	497	891	528	13.7	7.06	9.15	520	507	739	974	629	475

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0.8	4.6	6.9	535	5.0	5.0	110	11	10.5	777	560	560	0.8
1955...	1.4	1.4	3.8	5.3	5.9	7.2	8.2	166	164	598	806	618	1.4
1956...	2.0	11.5	128	147	85	143	7.4	10	222	461	283	280	2.0
1957...	1.6	7.6	148	121	8.3	8.3	8.6	506	506	947	688	121	1.6
1958...	1.7	4.8	4.8	6.8	9.2	12.5	14	83	498	545	646	57	1.7
1959...	1.2	1.0	6.8	8.8	648	51	52	157	159	311	586	480	1.0
1960...	11	20	21	272	6.8	6.4	8.0	10.5	337	258	782	487	6.4

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	310	224,500	394	95.75
1954.....	1,250†	July 1, 1954	.8	427	309,000	414	7.42	100.82	436	315,300	383	93.24
1955.....	1,300†	June 23, 1955	1.4	350	253,700	344	6.16	83.70	402	291,100	410	99.77
1956.....	1,240	Aug. 12, 13, 1956	2.0	460	333,800	461	8.26	112.45	417	302,400	466	113.59
1957.....	1,360†‡	May 9, 1957	1.6	406	293,900	333	5.97	81.10	351	254,000	249	60.54
1958.....	998	July 27, 1958	1.7	265	191,900	269	4.82	65.31	264	191,100	373	90.78
1959.....	1,290	June 4, 1959	1.0	372	269,000	476	8.53	115.87	516	373,300	494	120.22
1960.....	1,310†	May 20, 1960	6.4	475	344,500	396	7.10	96.66	.....	.....	.....	.....

† Computed from combined flow at gage and over spillway.
‡ Maximum observed.

Kachess Lake near Easton, Wash.

Location.—Lat. 47°15'50", long. 121°12'00", in SW¼ sec. 34, T. 21 N., R. 13 E., at dam on Kachess River at outlet of Kachess Lake, 2½ miles northwest of Easton.

Drainage area.—63.6 sq. mi.

Records available.—September 1905 to September 1960.

Gage.—Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1921, staff gages and water-stage recorder at sites in vicinity of Bureau of Reclamation reservoir dam at same datum.

Extremes.—1905-60: Maximum contents observed, 244,850 acre-ft. May 9, 1957 (elevation, 2,263.29 ft.); minimum observed, 525 acre-ft. Sept. 14, 15, 1910 (original crib dam); minimum elevation observed, 2,197.73 ft. Sept. 26, 27, 1915.

Kachess Lake near Easton, Wash.—Continued

Remarks.—Reservoir is 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 midnight gage-height readings.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	144,580	157,060	189,330	178,710	179,470	183,110	186,450	231,220	240,070	227,900	179,800	168,300	.....
1955...	169,690	182,860	187,630	193,420	203,070	206,540	197,540	226,380	239,750	229,470	183,410	151,870	.....
1956...	177,540	191,160	176,210	158,820	153,450	141,690	168,210	230,050	239,430	221,710	186,570	153,530	.....
1957...	153,210	166,460	193,940	189,500	196,470	206,190	234,100	235,180	222,420	180,220	131,400	88,440	.....
1958...	78,470	84,010	100,030	110,940	128,840	140,050	166,410	214,550	208,370	177,750	138,440	103,660	.....
1959...	111,080	152,380	189,060	205,890	174,550	190,610	218,430	235,900	240,750	206,800	172,770	172,150	.....
1960...	197,330	225,930	194,970	178,420	189,030	203,980	230,860	231,710	238,440	190,310	155,110	135,660	.....

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.

Records available.—October 1903 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,188.10 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to July 22, 1913, staff gage and July 22, 1913, to Aug. 14, 1916, water-stage recorder, at site a quarter of a mile upstream at different datum. Aug. 15, 1916, to Oct. 8, 1927, water-stage recorder at site half a mile downstream at different datum. Oct. 9, 1927, to Oct. 30, 1951, staff gage and water-stage recorder at present site at datum 1.33 ft. higher.

Average discharge.—57 years (1903-60), 290 cfs (210,000 acre-ft. per year), adjusted for storage since October 1905.

Extremes.—1903-60: Maximum discharge, 2,530 cfs May 28, 1948 (gage height, 8.45 ft., present datum); no flow at times when gates in dam are closed.

Remarks.—No diversion. Flow regulated by Kachess Lake (see preceding page).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	61.7	4.21	6.59	451	196	100	330	176	702	754	927	264	332
1955...	80.6	79.4	80.3	25.9	80.3	80.2	358	139	790	649	841	581	316
1956...	13.1	289	625	455	221	343	151	264	702	682	627	604	416
1957...	220	2.24	356	219	4.83	5.66	19.5	849	537	734	806	735	378
1958...	218	15.0	2.95	3.08	5.02	3.23	4.05	102	411	556	644	648	219
1959...	88.1	5.53	4.70	172	757	12.1	130	369	591	789	615	325	318
1960...	58.9	398	989	405	5.94	6.59	55.5	592	414	887	612	361	402

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
1954...	2.3	1.7	2.5	4.6	6.6	4.6	136	5.5	300	620	668	240	1.7
1955...	3.6	2.3	3.8	1.7	7.5	7.5	188	10.5	136	504	720	136	1.7
1956...	.6	2.6	147	173	171	143	9.4	10.5	352	364	572	512	.6
1957...	.6	2.0	2.1	5.4	4.6	5.2	6.6	300	426	622	738	646	.6
1958...	1.4	1.5	2.2	2.6	3.1	2.6	2.7	2.6	158	462	526	502	1.4
1959...	2.1	2.0	3.1	3.2	6.4	6.4	7.6	160	350	510	558	79	2.0
1960...	3.5	28	30	4.7	4.7	5.6	6.1	152	65	735	326	323	3.5

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	216	156,100	344	73.34
1954.....	1,220	Aug. 2, 1954	1.7	332	240,600	367	5.77	78.33	346	250,800	344	73.43
1955.....	1,570	June 12, 1955	1.7	316	228,700	293	4.61	62.56	374	270,400	358	76.37
1956.....	1,050	June 8, 1956	.6	416	301,600	418	6.57	89.43	387	280,800	411	88.01
1957.....	3,390	May 11, 1957	.6	378	273,300	288	4.53	61.38	348	252,200	219	46.68
1958.....	714	Aug. 24, 25, 1958	1.4	219	158,400	240	3.77	51.20	207	150,000	330	70.48
1959.....	1,360	July 18, 1959	2.0	318	230,000	412	6.48	88.02	431	312,100	439	93.76
1960.....	1,290	Dec. 22, 1959	3.5	402	291,800	352	5.53	75.26	.....	.....	.....	.....

Kittitas Canal at Easton, Wash.

Location.—Lat. 47°14'20", long. 121°11'00", 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.

Records available.—May 1930 to September 1960 (monthly diversion only).

Gage.—Water-stage recorder. Altitude of gage is 2,170 ft. (from topographic map).

Extremes.—1930-60: Maximum daily discharge, 1,270 cfs July 25-27, 1960; 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.

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	12,770	0	0	0	0	0	11,500	48,740	46,500	62,770	66,090	40,130	288,500
1955...	20,570	0	0	0	0	0	3,150	44,690	56,600	61,900	72,220	48,870	308,000
1956...	11,460	0	0	0	0	0	1,040	29,710	40,400	67,730	68,410	47,160	265,900
1957...	15,980	0	0	0	0	0	1,320	42,450	59,140	71,090	62,360	50,830	303,200
1958...	10,300	0	0	0	0	0	3,050	46,410	56,200	70,580	69,400	48,390	304,300
1959...	218	0	0	0	0	0	9,000	51,000	53,730	66,700	69,210	44,580	294,400
1960...	1,060	0	0	0	0	0	3,290	45,500	59,390	75,390	68,040	51,330	304,000

Cle Elum Lake near Roslyn, Wash.

Location.—Lat. 47°14'40", long. 121°04'00", in NE¼ sec. 10, T. 20 N., R. 14 E., at dam on Cle Elum River at outlet of Cle Elum Lake, 4 miles northwest of Roslyn.

Drainage area.—203 sq. mi.

Records available.—May 1906 to September 1960.

Gage.—Staff gage read twice daily. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). 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.—1906-60: Maximum contents observed, 446,520 acre-ft. May 8, 9, 1957 (elevation, 2,241.98 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 is formed on natural lake by earth- and gravel-fill dam completed in 1933; storage began above present dam Feb. 26, 1932. Capacity 436,900 acre-ft. between gate sill (elevation, 2,110.00 ft.) and top of spillway gate (elevation, 2,240.00 ft.). Records given herein represent usable contents. Water used for irrigation. Contents obtained by using midnight gage-height readings.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	190,140	217,710	275,100	282,050	269,290	256,440	275,000	394,840	440,800	423,170	341,500	263,340	.....
1955...	235,730	282,870	298,180	304,940	328,040	331,970	316,540	390,560	436,080	413,820	306,390	219,240	.....
1956...	247,420	318,900	302,240	270,210	242,410	179,020	229,680	408,950	414,380	415,180	307,810	226,660	.....
1957...	234,050	264,770	345,060	338,510	347,110	367,190	412,410	426,790	401,180	277,220	151,180	50,120	.....
1958...	45,180	58,840	84,750	104,630	134,600	170,270	229,530	421,270	415,890	281,080	126,770	46,820	.....
1959...	54,650	141,270	229,990	288,660	312,000	342,190	420,090	406,620	432,820	383,980	248,170	192,540	.....
1960...	262,020	375,470	332,920	278,140	291,440	326,460	387,310	404,330	427,130	328,800	214,330	115,360	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	26	0.2	42	115	516	275	272	342	1,090	1,320	1,840	1,440	0.2
1955...	254	30	35	71	78	71	345	202	511	1,370	2,200	1,010	30
1956...	51	43	269	506	498	792	130	353	2,140	1,040	2,030	1,160	43
1957...	85	68	68	248	98	98	105	1,000	1,330	2,310	2,190	1,210	68
1958...	13	1.4	20	21	1.4	1.4	39	41	748	2,020	2,130	968	1.4
1959...	1.4	1.4	1.4	1.4	39	1.2	1.6	1,050	1,240	1,670	2,320	836	1.2
1960...	24	33	535	276	2.6	26	30	770	792	2,050	1,870	1,130	2.6

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.

Records available.—October 1903 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,102.10 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 14, 1913, and Sept. 4, 1931, to Apr. 19, 1933, several staff gages and Oct. 14, 1913, to Sept. 3, 1931, water-stage recorder, at about same sites at same datum.

Cle Elum River near Roslyn, Wash.—Continued

Average discharge.—57 years (1903-60), 925 cfs (669,700 acre-ft. per year), adjusted for storage since 1906.

Extremes.—1903-60: 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 preceding page).

Revisions.—The mean discharge for October 1942 published in State WSB No. 6 has been revised to 404 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	396	42.0	69.1	414	620	629	649	1,028	2,204	2,666	2,160	1,714	1,052
1955...	789	109	158	164	82.0	206	777	647	2,895	2,201	2,358	1,749	1,015
1956...	317	459	1,187	908	707	1,352	938	1,185	3,109	1,848	2,247	1,651	1,327
1957...	513	81.3	502	448	123	99.9	485	3,064	1,988	2,539	2,301	1,870	1,177
1958...	257	15.4	21.5	21.0	19.3	10.6	40.9	380	1,686	2,637	2,684	1,633	789
1959...	442	6.19	2.31	32.8	39.5	23.1	271	2,514	2,470	2,241	2,658	1,760	1,045
1960...	178	310	2,048	1,288	29.6	27.1	276	1,676	1,796	2,386	2,134	1,831	1,172

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	766	554,800	1,021	68.26
1954.....	3,940	July 1, 1954	0.2	1,052	761,400	1,141	5.62	76.33	1,098	795,000	1,130	75.55
1955.....	6,620	June 12, 1955	30	1,015	734,800	954	4.70	63.78	1,091	789,800	1,097	73.32
1956.....	3,630	June 23, 1956	43	1,327	963,000	1,337	6.59	89.64	1,254	910,500	1,313	88.06
1957.....	5,000	May 9, 1957	68	1,177	852,200	933	4.60	62.42	1,109	803,100	750	50.14
1958.....	3,040	July 17, 1958	1.4	789	571,400	785	3.87	52.49	803	581,100	1,003	67.09
1959.....	3,570	June 22, 1959	1.2	1,045	756,900	1,247	6.14	83.38	1,222	884,500	1,364	91.22
1960.....	2,850	June 16, 1960	2.6	1,172	851,100	1,066	5.25	71.49	.....	.....	.....	.....

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, 7 miles upstream from Teanaway River.

Drainage area.—500 sq. mi.

Records available.—August 1906 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,902.27 ft. above mean sea level (levels by Bureau of Reclamation). Prior to Aug. 12, 1910, chain gage on highway bridge at different datum. Aug. 12, 1910, to July 11, 1911, staff gage; July 12, 1911, to June 27, 1923, water-stage recorder; June 28, 1923 to Oct. 21, 1924, staff gages; all at various locations within vicinity of bridge at datum 2.0 ft. higher.

Average discharge.—54 years (1906-60), 2,004 cfs (1,451,000 acre-ft. per year), adjusted for storage since October 1906 and Kittitas Canal diversion since 1930.

Extremes.—1906-60: Maximum discharge, 25,600 cfs Nov. 14, 1906 (gage height, 12.5 ft., from floodmarks); minimum, 46 cfs Nov. 17, 1953.

Yakima River at Cle Elum, Wash.—Continued

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. Considerable regulation 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
1954...	891	180	1,086	2,063	1,484	1,272	1,857	2,064	3,406	3,729	2,914	2,328	1,943
1955...	1,334	472	493	449	664	595	1,750	1,519	4,577	3,140	3,063	2,431	1,709
1956...	895	1,895	3,059	2,053	1,279	2,305	2,803	3,269	4,824	2,664	2,891	1,896	2,489
1957...	876	542	2,574	1,808*	879	469	1,556	5,237	2,492	3,180	3,122	2,387	2,027
1958...	518	165	345	326	652	477	804	1,105	1,987	2,983	3,181	2,112	1,225
1959...	832	1,128	1,093	1,349	1,981	894	1,286	3,647	3,418	2,703	3,095	2,181	1,967
1960 ..	1,262	2,531	4,883	2,599	405	549	1,125	2,906	2,299	3,015	2,831	2,167	2,226

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	156	116	360	1,410	1,030	930	930	1,600	2,540	1,810	2,450	1,920	116
1955...	450	149	280	350	330	310	1,120	996	1,090	2,280	2,690	1,500	149
1956...	410	669	2,220	970	960	1,540	2,120	2,400	2,600	1,980	2,240	1,560	410
1957...	289	275	412	700*	251	390	700	2,530	1,840	2,760	3,000	1,530	251
1958...	126	126	176	248	346	320	398	579	1,130	2,360	2,690	1,240	126
1959...	168	150	556	683	1,170	570	625	1,780	1,920	1,950	2,780	1,360	150
1960...	546	1,190	3,460	901	238	253	490	1,130	1,220	2,320	2,240	1,420	238

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	1,386	1,004,000	2,253	61.18
1954.....	5,720	July 2, 1954	116	1,943	1,407,000	2,454	4.91	66.61	1,955	1,415,000	2,341	63.55
1955.....	10,000	June 12, 1955	149	1,709	1,238,000	2,045	4.09	55.50	2,007	1,453,000	2,418	65.63
1956.....	5,740	June 11, 1956	410	2,489	1,807,000	2,869	5.74	78.11	2,335	1,695,000	2,840	77.33
1957.....	8,280	May 9, 1957	251	2,027	1,467,000	2,039	4.08	55.37	1,776	1,286,000	1,597	43.33
1958.....	3,460	July 26, 1958	126	1,225	887,200	1,666	3.33	45.21	1,395	1,010,000	2,234	60.63
1959.....	4,980	May 15, 1959	150	1,967	1,424,000	2,774	5.55	75.32	2,441	1,767,000	2,977	80.83
1960.....	14,000	Nov. 23, 1959	238	2,226	1,616,000	2,411	4.62	65.62	.....	.....	.....	.....

* Estimated.

Wilson Creek near Ellensburg, Wash.

Location.—Lat. 47°07'35", long. 120°29'35", in NW¼ sec. 20, T. 19 N., R. 19 E., on right bank at downstream side of Pope farm bridge, three-quarters of a mile above Naneum Creek and 9 miles north of Ellensburg.

Drainage area.—13.6 sq. mi.

Records available.—March 1957 to May 1960 (flood seasons only).

Gage.—Water-stage recorder. Altitude of gage is 2,650 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 244 cfs May 18, 1957 (gage height, 2.96 ft.); minimum, 0.8 cfs Nov. 21, 1957.

Remarks.—About 1 cfs is diverted above station for irrigation. No regulation.

Wilson Creek near Ellensburg, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	20.7	66.6	.....	.....	.....	.....	.....
1958	.....	1.48	2.69	2.69	7.91	8.35	13.7	70.5	.....	.....	.....	.....	.....
1959	.....	4.50	10.9	11.3	6.36	8.65	31.3	45.8	.....	.....	.....	.....	.....
1960	.....	8.10	6.04	3.87*	2.86	9.26	25.7	42.8	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	11.5	30	.....	.....	.....	.....	.....
1958	.....	1.2	1.7	2.4	2.8	5.0	9.0	27	.....	.....	.....	.....	.....
1959	.....	1.7	6.1	6.0*	4.7	7.0	20	34	.....	.....	.....	.....	.....
1960	.....	2.0	4.0	2.6*	2.1*	2.1*	12	18.5	.....	.....	.....	.....	.....

Naneum Creek near Ellensburg, Wash.

Location.—Lat. 47°07'30", long. 120°28'40", in NE¼ sec. 20, T. 19 N., R. 19 E., on right bank 10 ft. upstream from intake of Ellensburg water-supply system and 9 miles north of Ellensburg.

Drainage area.—69.5 sq. mi

Records available.—March 1957 to September 1960.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 2,500 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 700 cfs May 18, 1957 (gage height, 3.36 ft.); minimum observed, less than 5 cfs Nov. 29, 1957, result of freezeup.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	95.9	297	88.6	35.8	24.0	17.1	.....
1958	19.3	16.0	17.7	19.2	37.1	38.8	76.3	311	91.7	32.9	20.3	15.4	58.3
1959	17.1	33.0	38.1	44.8	36.7	39.3	131	215	174	54.7	26.9	23.0	69.6
1960	24.3	42.6	42.0	23.9*	23.5*	50.1*	126	213	161	45.9	25.8	19.0	66.5

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	60*	159	52	28	20	16	.....
1958	15	10*	11*	12*	17.5	28	45	121	48	25	17.5	14.5	10*
1959	12.5	17.5	32	33	31	35	73	160	97	34	23	19	12.5
1960	21	7.9	29*	20*	18*	18*	78	134	76	31	21	17	7.9

* Estimated.

Naneum Creek near Ellensburg, 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
1957	700	May 18, 1957	.....	.....	.....	.....	.....	.....	.....	.....
1958	553	May 20, 1958	10	58.3	0.839	11.38	42,180	61.2	11.96	44,300
1959	293	May 15, 1959	12.5	69.6	1.00	13.59	50,340	71.3	13.93	51,590
1960	666	May 12, 1960	7.9	66.5	.957	13.01	48,260	.....	.....	.....

Cooke Creek near Ellensburg, Wash.

Location.—Lat. 47°05'40", long. 120°22'40", in SE¼NW¼ sec. 31, T. 19 N., R. 20 E., on left bank 4 miles upstream from mouth and 10 miles northeast of Ellensburg.

Drainage area.—19.3 sq. mi.

Records available.—November 1957 to May 1960 (flood seasons only).

Gage.—Water-stage recorder. Altitude of gage is 2,550 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 267 cfs May 11, 1960 (gage height, 2.50 ft.); minimum, 1.2 cfs Dec. 30, 1957.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	2.27	2.39	2.24	10.0	7.24	27.8	48.6	.....	.....	.....	.....	.....
1959	.....	3.54	3.83	7.75	5.36	11.1	51.8	31.6	.....	.....	.....	.....	.....
1960	.....	3.86	2.94	2.63*	3.48	17.3	39.1	50.3	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	2.0	1.5	1.6*	2.8	4.0	10.5	12	.....	.....	.....	.....	.....
1959	.....	2.8	3.0*	2.9*	4.5*	9.8	19	14	.....	.....	.....	.....	.....
1960	.....	2.4*	2.4*	2.1*	2.5*	2.4*	17	17.5	.....	.....	.....	.....	.....

* Estimated.

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.

Records available.—August 1906 to September 1960.

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 various datums. Sept. 28, 1911, to Nov. 23, 1936, water-stage recorder at site about 300 ft. upstream at datum 26.70 ft. higher.

Yakima River at Umtanum, Wash.—Continued

Extremes.—1906-60: 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).

Remarks.—Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes (see elsewhere in this report). Water diverted above station for irrigation of about 105,000 acres.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,294	523	1,641	2,666	2,512*	2,216	3,398	4,546	4,861	4,280	3,291	2,853	2,842
1955...	1,864	970*	903*	745*	1,091*	972	2,713	3,468	6,476	3,690	3,351	2,659	2,411
1956...	1,439*	2,671	4,025	2,779	1,823	4,465	7,398	7,058	6,694	3,102	3,368	2,413	3,938
1957...	1,429	1,001	3,566	1,601	775*	1,506	3,260	7,255	3,124	3,364	3,501	2,696	2,777
1958...	1,042	475	716	709	1,770	1,460	2,389	3,033	2,634	3,133	3,438	2,539	1,946
1959...	1,249	2,012	2,245	2,689	2,951	2,142	3,221	5,433	4,644	2,909	3,346	2,797	2,968
1960...	1,873	3,596	5,826	3,050	1,050	1,803	2,985	4,484	3,197	3,159	3,229	2,688	3,089

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	499	436	780	2,020	1,670*	1,760	1,690	2,780	4,000	1,780	3,780	2,400	436
1955...	1,100*	500*	600*	550*	620*	500*	1,670	2,490	2,800	2,990	3,050	1,500*	500*
1956...	800*	1,360	3,340	1,420	1,360*	2,140	5,600	4,810	3,320	1,960	2,770	2,100	800*
1957...	790	726	850	540*	540*	1,180	2,450	3,300	2,610	3,140	3,280	2,250	540*
1958...	513	415	464	513	880	880	1,710	2,110	2,160	2,640	3,030	1,770	415
1959...	520	478	1,420	1,700*	2,120	1,610	2,220	2,930	2,950	2,590	3,160	2,110	478
1960...	1,360	1,530	5,070	1,210	650*	600*	1,900*	2,500	1,960	2,620	2,710	2,080	600*

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					
1953						2,211	1,601,000
1954	6,900	May 19, 1954	436	2,842	2,058,000	2,864	2,074,000
1955	12,800	June 13, 1955	500	2,411	1,745,000	2,780	2,012,000
1956	11,900	April 22, 1956	800	3,938	2,859,000	3,762	2,731,000
1957	12,000	May 10, 1957	540	2,777	2,011,000	2,459	1,780,000
1958	4,890	April 21, 1958	415	1,946	1,409,000	2,219	1,607,000
1959	7,460	May 16, 1959	478	2,968	2,149,000	3,455	2,502,000
1960	19,100	Nov. 23, 1959	600	3,089	2,242,000		

* Estimated.

Roza Canal near Moxee City, Wash.

Location.—Lat. 46°29'40", long. 120°20'20", in SE¼ sec. 29, T. 12 N., R. 20 E., on right bank 4½ miles southeast of Moxee City and at mile 29.3 on Roza Canal.

Records available.—October 1941 to September 1960 (monthly diversion only).

Gage.—Water-stage recorder. Datum of gage is 1,144.8 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 20, 1948, water-stage recorder at mile 26.9, 2.4 miles upstream at datum 6.3 ft. higher. Measurements made at bridge at mile 29.6.

Extremes.—1941-60: Maximum daily discharge, 1,100 cfs July 6, 1958; no flow at times each year.

Roza Canal near Moxee City, Wash.—Continued

Remarks.—Canal diverts water from Yakima River in NW¼ sec. 33, T. 15 N., R. 19 E., for irrigation of 58,000 acres above and below station above Naches River. Capacity of canal at headworks, approximately 2,300 cfs (corrected). Discharge at present site corrected to include the flows of laterals 28.2 and 28.7 to give equivalent records to those published prior to 1949. This is one of 5 canals by-passing the Yakima River near Parker gaging station.

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	17,510	0	0	0	0	9,450	34,710	51,270	47,230	51,550	49,250	33,990	295,000
1955...	18,180	0	0	0	0	8,860	33,860	41,820	52,090	52,810	50,760	37,550	295,900
1956...	19,660	0	0	0	0	6,760	32,040	48,570	46,160	58,290	51,540	34,400	297,400
1957...	21,180	0	0	0	0	2,270	27,950	53,160	55,400	57,690	53,080	40,220	311,000
1958...	15,360	0	0	0	0	11,070	29,830	50,010	57,170	60,520	58,280	38,670	321,500
1959...	16,600	0	0	0	0	5,300	43,290	54,560	55,890	63,040	61,140	41,680	341,500
1960...	16,370	0	0	0	0	9,230	38,970	54,340	61,700	64,010	62,440	46,760	353,800

Bumping Lake near Nile, Wash.

Location.—Lat. 46°52′, long. 121°18′, in SW¼ sec. 23 (unsurveyed), T. 16 N., R. 12 E., at dam on Bumping River at outlet of Bumping Lake, 11½ miles upstream from American River, and 19 miles west of Nile.

Drainage area.—68.6 sq. mi.

Records available.—June to July 1906, April 1909 to September 1960.

Gage.—Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Nov. 22, 1909, staff gage at site 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.—1906, 1909-60: 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 3,390.80 ft.).

Remarks.—Reservoir is formed on natural lake by earth-fill dam completed in 1910; storage began Nov. 3, 1910. Capacity, 33,700 acre-ft. between gate sill (elevation, 3,389.00 ft.) and spillway crest (elevation, 3,426.00 ft.). Records given herein represent usable contents. Water used for irrigation. Contents obtained by using midnight gage-height readings.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,680	5,890	10,880	12,790	12,370	13,580	14,420	33,980	36,410	34,110	22,510	11,420	.....
1955...	7,440	7,180	8,060	11,000	15,550	19,610	20,520	35,610	36,500	28,160	14,260	9,040	.....
1956...	16,000	15,840	7,000	3,340	3,200	3,220	13,780	36,380	35,370	28,420	17,180	12,370	.....
1957...	8,970	4,090	15,540	15,930	20,030	27,110	32,060	34,240	25,640	18,460	14,690	10,070	.....
1958...	6,800	5,680	6,830	10,450	18,700	27,140	34,430	35,090	27,480	17,970	13,230	10,160	.....
1959...	7,700	19,580	14,110	10,230	5,860	8,170	24,180	28,870	34,530	27,300	12,540	10,700	.....
1960...	7,820	18,060	10,000	5,730	7,440	14,370	18,900	30,980	35,430	16,470	9,810	4,930	.....

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.

Records available.—June to July 1906, April 1909 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 3,367.10 ft. above mean sea level (Bureau of Reclamation bench mark). June 13 to July 31, 1906, staff gage at site half a mile upstream at different datum. Apr. 27 to Aug. 6, 1909, June 24, 1912, to June 13, 1913, staff gage at site three-eighths of a mile upstream at different datum.

Average discharge.—51 years (1909-60), 295 cfs (213,600 acre-ft. per year), adjusted for storage since November 1910.

Extremes.—1906, 1909-60: 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 dam at Bumping Lake (see preceding page).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	127	101	258	145	128	122	267	545	901	887	426	295	352
1955...	198	268	139	62.4	19.7	18.1	66.8	144	1,131	702	374	176	275
1956...	199	500	548	255	109	94.6	191	775	1,231	908	352	178	446
1957...	193	265	214	110	55.8	56.5	206	1,072	788	273	132	124	292
1958...	125	108	105	101	30.4	10.2	154	1,191	786	305	143	105	265
1959...	132	302	669	388	235	81.0	99.2	523	808	455	339	182	352
1960...	375	262	504	210	172	62.9	320	407	728	543	183	135	326

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	62	61	126	142	108	108	142	235	648	505	330	238	61
1955...	108	123	90	13.5	6.2	6.1	33	34	571	555	232	168	6.1
1956...	177	237	455	166	88	86	111	326	814	570	206	140	86
1957...	153	145	102	69	51	53	61	450	555	161	125	116	51
1958...	118	86	96	54	8.4	8.9	10	545	576	153	135	98	8.4
1959...	94	140	505	334	6.7	71	40	51	66	300	284	138	6.7
1960...	6.9	6.2	13	126	52	54	84	205	377	200	161	105	6.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	316	228,900	328	64.86
1954.....	1,400	June 23, 1954	61	352	254,500	358	5.22	70.89	361	261,500	357	70.72
1955.....	2,100	June 12, 1955	6.1	275	199,400	272	3.97	53.85	329	238,400	328	64.86
1956.....	2,510	June 1, 1956	86	446	323,800	451	6.57	89.40	398	288,900	410	81.29
1957.....	1,840	May 9-10,1957	51	292	211,600	289	4.21	57.19	264	191,300	252	49.91
1958.....	2,160	May 26, 1958	8.4	265	192,000	265	3.86	52.51	330	238,700	340	67.23
1959.....	1,450	June 5, 1959	6.7	352	254,900	353	5.15	69.80	355	257,300	350	69.20
1960.....	1,150	June 17, 1960	6.2	326	236,400	318	4.64	63.06	.....	.....	.....	.....

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.

Records available.—April 1909 to March 1912, July to September 1913, June to September 1914, June to September 1915, October 1939 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,700.0 ft. above mean sea level (Washington State Highway Department bench mark). Prior to Sept. 12, 1915, staff gage at site 300 ft. downstream at different datum. Oct. 12 to Dec. 7, 1939, staff gage at present site and datum.

Average discharge.—23 years (1909-11, 1939-60), 246 cfs, (178,100 acre-ft. per year).

Extremes.—1909-12, 1913-15, 1939-60: 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 regulation or diversion.

Correction.—In State WSB No. 6 the date of the 1909 maximum discharge is listed in error; it should be June 2, 1909.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	71.0	96.8	223	133	100	130	298	838	719	649	214	96.7	299
1955...	98.2	194	114	80.2	75.7	62.5	103	406	886	375	113	66.3	215
1956...	166	326	229	116	72.5	84.6	451	1,172	1,016	624	151	75.0	374
1957...	84.9	104	205	73.4*	87.3*	132	270	861	498	145	64.9	40.9	215
1958...	53.1	69.6	75.6	99.8	153	156	243	1,022	589	146	57.5	42.9	226
1959...	59.8	229	363	277	142	99.1	325	561	764	341	84.0	86.0	278
1960...	141	229	236	106	163	171	348	487	622	227	73.1	52.8	238

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	49	52	129	84*	83	94	128*	285	506	348	129	75	49
1955...	62	82	92*	67	59	51	57	91	488	205	72	56	51
1956...	56	146	109	71*	62*	63	113	502	680	248	93	61	56
1957...	55	73	84	40*	45*	100	144	496	230	84	50	36	36
1958...	35	45	53	66	88	112	138	337	267	79	43	37	35
1959...	32	50	209	160	89	91	152	400	480	134	58	66	32
1960...	66	65	127	70*	60*	55*	179	271	352	105	60	43	43

* Estimated.

American River near Nile, 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
1953								247	42.46	178,700
1954	1,760	May 19, 1954	49	299	3.79	51 44	216,500	300	51.61	217,200
1955	1,790	June 12, 1955	51	215	2.72	36.93	155,400	241	41.47	174,500
1956	2,440	May 20, 1956	56	374	4.74	64.56	271,700	347	59.90	252,000
1957	1,380	May 9, 1957	36	215	2.72	36.96	155,500	198	34.10	143,500
1958	1,800	May 25, 1958	35	226	2.86	38.91	163,700	264	45.46	191,300
1959	1,020	June 5, 1959	32	278	3.52	47.81	201,200	274	47.13	198,300
1960	1,080	June 4, 1960	43	238	3.02	40.98	172,400			

Rimrock Lake 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, at Rimrock, 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.

Records available.—April 1925 to September 1960. Published as "Tieton Reservoir" prior to October 1959.

Gage.—Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark).

Extremes.—1925-60: 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 is formed by earth- and gravel-fill dam completed in 1925; storage began Apr. 27, 1925. Capacity, 198,000 acre-ft. between sill of tunnel entrance (elevation, 2,766.00 ft.) and crest of spillway gates (elevation, 2,926.00 ft.). Records given herein represent usable contents. Water used for irrigation. Contents obtained by using midnight gage-height readings.

Contents in Acre-feet on Last Day of Month

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	100,760	106,770	127,430	124,370	119,970	122,030	128,660	175,500	199,390	188,120	153,710	134,400	.....
1955	134,760	128,020	129,460	131,410	136,840	140,750	141,620	170,720	199,670	188,980	143,190	112,190	.....
1956	127,810	136,120	127,410	108,460	102,340	95,380	120,950	190,250	195,310	181,300	148,140	116,580	.....
1957	114,730	128,920	134,070	133,630	139,840	160,580	189,100	195,910	188,440	128,200	69,650	32,470	.....
1958	37,020	44,810	59,020	75,030	94,840	114,090	146,510	200,020	187,080	125,820	60,880	31,890	.....
1959	37,630	79,070	133,220	136,390	129,830	140,590	165,330	189,290	195,480	160,160	104,270	85,580	.....
1960	94,630	105,780	127,410	134,660	153,090	176,460	187,660	180,730	196,130	142,160	67,080	23,210	.....

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.

Tieton River at Tieton Dam, near Naches, Wash.—Continued

Records available.—August 1908 to December 1912, June to September 1914, June 1918 to March 1921, April 1925 to September 1960. Published as "at McAllister Meadows" 1908-14 and as "at Rimrock" 1918-19.

Gage.—Water-stage recorder. Datum of gage is 2,680.99 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1914, staff gage at site a third of a mile upstream at different datum. Oct. 1, 1918, to Mar. 31, 1919, Apr. 27 to Sept. 4, 1925, staff gage and reference point, and Sept. 5, 1925, to Apr. 23, 1933, water-stage recorder, at site about 800 ft. downstream at different datum. Apr. 24, 1933, to Dec. 11, 1934, water-stage recorder at present site at datum 2.0 ft. higher.

Average discharge.—41 years (1908-12, 1918-20, 1925-60), 496 cfs (359,100 acre-ft. per year), adjusted for storage since October 1925.

Extremes.—1908-14, 1918-21, 1925-60: Maximum discharge, 8,450 cfs Dec. 22, 1933 (gage height, 9.24 ft.); no flow Apr. 4-6, 10, 1930.

Remarks.—No diversion above station. Flow regulated by Rimrock Lake (formerly Tieton Reservoir), see preceding page.

Correction.—The momentary maximum discharge for the water year 1935 published in State WSB No. 6 has been corrected to 2,090 cfs.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	285	150	168	384	377	327	518	585	866	1,369	1,012	718	565
1955...	279	467	231	190	147	133	246	258	1,121	1,073	1,195	776	511
1956...	159	567	876	682	368	396	501	863	1,824	1,442	1,042	830	798
1957...	293	43.8	493	244	137	27.4	100	1,346	1,030	1,432	1,214	841	605
1958...	152	66.0	36.7	10.5	19.5	10.0	10.0	715	1,227	1,492	1,332	771	490
1959...	168	23.5	24.9	601	495	126	190	392	1,048	1,220	1,219	692	517
1960...	470	538	126	150	39.0	9.82	583	962	868	1,425	1,555	957	643

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	151	128	111	327	327	320	331	290	485	982	740	454	111
1955...	174	318	128	153	109	108	96	109	322	764	997	560	96
1956...	110	92	216	226	295	122	14.5	10.5	848	898	914	659	10.5
1957...	8.0	7.4	150	173	9.4	9.4	71	221	724	1,170	1,150	522	7.4
1958...	74	54	10	10	10	10	10	10	935	1,250	1,050	366	10
1959...	64	8.4	8.4	8.4	319	33	55	304	418	418	1,080	202	8.4
1960...	11	268	7.2	106	8.4	8.4	36	535	283	1,280	1,360	367	7.2

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953									437	316,200	545	39.54
1954	1,750	June 27, 1954	111	565	408,900	606	3.24	43.99	590	431,300	599	43.46
1955	2,960	June 12, 1955	96	511	369,900	480	2.57	34.87	566	409,400	563	40.86
1956	2,980	June 9, 1956	10.5	798	579,600	805	4.30	58.56	733	531,900	742	53.98
1957	2,480	May 9, 1957	7.4	605	438,000	489	2.61	35.48	556	402,600	453	32.85
1958	2,460	May 26, 1958	10	490	355,000	490	2.62	35.51	487	352,700	590	42.78
1959	1,610	July 16, 1959	8.4	517	374,400	591	3.16	42.92	594	429,800	586	42.51
1960	2,080	June 16, 1960	7.2	643	466,400	557	2.98	40.50				

Tieton Canal near Naches, Wash.

Location (corrected).—Lat. 46°40'10", long. 121°00'30", in SW¼ sec. 30, T. 14 N., R. 15 E., on left bank 500 ft. downstream from canal intake and 16 miles southwest of Naches.

Records available.—May 1910 to September 1929; October 1929 to September 1960 (monthly diversion only).

Gage.—Water-stage recorder. Datum of gage is 2,294.82 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 18, 1944, float gage at same site and datum.

Extremes.—1910-60: Maximum daily discharge, 349 cfs Sept. 9-13, 1955; 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.

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	1,160	0	0	204	889	3,400	16,900	19,520	20,880	21,250	17,430	101,600
1955...	149	1,080	0	0	1,060	819	4,270	11,160	19,810	20,800	21,210	19,760	100,100
1956...	161	1,270	369	0	0	242	573	12,560	16,760	20,830	21,020	16,570	90,360
1957...	0	1,260	58	6	901	940	2,750	11,170	19,530	21,150	21,220	17,180	96,160
1958...	251	194	996	60	744	1,290	1,650	12,800	19,960	20,680	20,890	16,460	95,980
1959...	65	322	781	0	476	268	3,090	15,160	18,940	20,910	21,100	16,060	97,170
1960...	0	601	589	0	1,060	196	2,820	12,780	19,560	21,020	20,810	17,170	96,610

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, 7 miles downstream from Tieton Dam, 12 miles upstream from Oak Creek, and 16 miles southwest of Naches.

Drainage area.—239 sq. mi.

Records available.—April 1906 to September 1960.

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 sites within 1½ miles downstream referred to same datum.

Average discharge.—54 years (1906-60), 561 cfs (406,100 acre-ft. per year), adjusted for diversion since 1910 and for storage since October 1924.

Extremes.—1906-60: Maximum discharge, 8,910 cfs Dec. 22, 1933 (gage height, 9.70 ft.); no flow at times in 1926, 1929, 1931-32, 1934, 1945.

Remarks.—Records good. Diversion for irrigation by Tieton Canal. Flow regulated by Rimrock Lake (formerly Tieton Reservoir), see p. 283.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	305	135	211	416	424	383	601	492	621	979	625	382	405
1955...	303	479	253	203	147	136	230	210	903	728	783	466	404
1956...	186	602	1,008	755	400	480	857	993	1,532	1,121	695	576	768
1957...	312	39.4	541	260*	146	76.0	180	1,282	741	1,051	923	596	517
1958...	155	65.5	38.8	36.5	83.0	47.4	97.5	662	938	1,107	990	558	401
1959...	193	105	112	668	544	189	252	231	792	884	864	436	439
1960...	483	577	159	172	56.2	86.7	628	829	595	1,075	1,165	652	542

* Estimated.

Tieton River at headwaters 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
1954...	145	94	120	362	358	354	362	203	276	577	391	200	94
1955...	192	354	145	156	118	109	112	132	142	508	639	318	109
1956...	108	119	448	370	322	198	448	165	679	672	587	542	108
1957...	10	15	133	170*	84	56	125	344	442	826	866	464	10
1958...	78	50	23	25	28	11.5	51	45	671	898	712	283	11.5
1959...	81	56	50	20*	389	79	86	125	103	123	733	114	20*
1960...	81	270	37	123	33	28	98	486	70	954	986	287	28

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....									330	239,100	579	32.87
1954.....	1,430	June 26, 1954	94	465	336,700	647	2.71	36.71	497	359,600	640	36.34
1955.....	2,380	June 13, 1955	109	404	292,600	512	2.14	29.06	468	339,200	605	34.34
1956.....	2,330	June 3, 1956	108	768	557,300	898	3.76	51.16	593	502,900	826	47.04
1957.....	2,480	May 9, 1957	10	517	374,100	533	2.23	30.31	463	335,100	492	27.97
1958.....	2,420	May 26, 1958	11.5	401	290,000	532	2.23	30.23	413	299,200	648	36.80
1959.....	1,280	July 16, 1959	20	439	317,600	647	2.71	36.77	506	366,400	632	35.92
1960.....	1,740	June 16, 1960	28	542	393,100	589	2.46	33.53	.....	.....	.....	.....

* Estimated.

Wapatox Canal near Naches, Wash.

Location.—Lat. 46°44'50", long. 120°46'20", in NW¼ sec. 36, T. 15 N., R. 16 E., on right bank 100 ft. downstream from canal headgate and 3¾ miles northwest of Naches.

Records available.—May to October 1904; July to October 1905 (gage heights and discharge measurements only); July to September 1909 (monthly diversion only); April to October 1910; April to October 1911; April 1912 to October 1914, and April 1916 to September 1960 (monthly diversion only).

Gage.—Water-stage recorder. 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 sites approximately 100 ft. downstream at same datum. Jan. 1, 1940, to Oct. 17, 1954, staff gage with water-stage recorder at site 100 ft. downstream at same datum.

Average discharge.—46 years (1912-14, 1916-60), 429 cfs (310,600 acre-ft. per year).

Extremes.—1904, 1909-14, 1916-60: Maximum daily discharge, 709 cfs Feb. 4, 1917; 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.

Wapatox Canal near Naches, Wash.—Continued

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	26,610	24,940	30,790	27,060	24,450	26,910	29,960	23,630	30,520	30,580	27,470	29,490	332,400
1955...	26,820	21,840	22,950	21,830	19,270	20,270	27,320	23,000	28,270	27,010	28,310	27,240	294,100
1956...	29,360	24,980	23,500	22,300	18,500	24,140	21,210	30,450	27,240	28,410	28,020	28,380	306,500
1957...	26,840	26,200	26,330	19,820	12,970	25,790	20,860	18,020	21,600	27,400	25,640	26,760	278,800
1958...	23,710	20,830	22,970	24,080	24,310	25,690	17,990	30,540	28,810	27,460	28,760	26,530	301,700
1959...	19,760	25,600	27,240	26,740	23,920	24,940	18,130	30,950	30,800	32,210	32,260	29,750	322,300
1960...	31,870	30,530	29,560	23,330	24,680	23,480	24,010	26,570	31,460	32,460	32,010	29,300	339,300

Naches River below Tieton River, near Naches, Wash.

Location.—Lat. 46°44'40", long. 120°46'00", in SW¼NE¼ 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.

Records available.—August to October 1905, October 1908 to September 1960.

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 Dec. 7, 1916, staff gage and Dec. 7, 1916, to Sept. 9, 1936, water-stage recorder, at site five-eighths of a mile upstream at different datums. Sept. 10 to Oct. 30, 1936, staff gage at present site and datum.

Average discharge.—52 years, (1908-60), 1,719 cfs (1,245,000 acre-ft. per year), adjusted for diversions by Selah Valley and Tieton Canals since 1909, city of Yakima at Oak Flat since 1929, by Wapatox Canal since 1936, for change in contents in Bumping Lake since November 1910, and in Rimrock Lake (formerly Tieton Reservoir) since October 1924.

Extremes.—1905, 1908-60: 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 for many days during winter of 1943-44, result of regulation and diversion.

Remarks.—Flow regulated by Bumping Lake and Rimrock Lake, formerly Tieton Reservoir, (see elsewhere in this report), by diversion at Oak Flat for municipal supply of city of Yakima below station, and by diversion of Selah Valley, Tieton, and Wapatox Canals. Small unmeasured diversions for irrigation of approximately 420 acres above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	118	60.1	643	627	625	671	1,792	4,190	3,514	3,049	1,053	411	1,402
1955...	294	797	304	154*	86.9*	43.0*	268*	1,718	4,653	1,907	898	276	951
1956...	331	1,835	2,155	1,113	528	788	3,831	6,791	5,797	2,908	863	371	2,278
1957...	256	218	1,224	340	297	253	1,460	5,428	2,309	1,158	680	246	1,164
1958...	24.9	17.6	24.3	63.7	419	326	1,326	4,902	2,568	1,259	710	238	1,001
1959...	152	1,000	1,761	1,815	1,019	436	1,642	2,292	3,149	1,472	798	293	1,319
1960...	864	1,472	1,074	383*	299	601	2,228	2,625	2,504	1,504	909	375	1,237

* Estimated.

Naches River below Tieton River, 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
1954...	46	36	73	534	488	522	499	2,140	2,440	1,650	583	120	36
1955...	123	526	130*	60*	30	25*	60	545	2,190	1,380	490	173	25*
1956...	153	641	1,530	430	388	267	1,470	4,070	3,310	1,400	500	296	153
1957...	177	141	160	160*	67	164	534	2,880	1,380	874	513	106	67
1958...	12	14*	15	17.5	25	64	370	2,000	1,620	916	464	56	12
1959...	42	48	1,040	1,000*	420	290	786	1,610	1,380	1,080	564	159	42
1960...	148	136	202	162*	35*	30*	1,030	2,000	1,230	1,020	703	117	30*

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953.....	.....	.....	.....	.....	.....	.....	.....	.....	1,023	741,000	1,801	25.99
1954.....	7,520	May 19, 1954	36	1,402	1,015,000	2,121	2.25	30.60	1,449	1,049,000	2,102	30.32
1955.....	9,740	June 12, 1955	25	951	688,600	1,530	1.63	22.05	1,197	866,400	1,816	26.18
1956.....	13,300	June 1, 1956	153	2,278	1,654,000	2,904	3.09	42.01	2,060	1,495,000	2,696	39.01
1957.....	10,600	May 10, 1957	67	1,164	842,600	1,635	1.74	23.58	1,026	742,700	1,486	21.41
1958.....	9,350	May 25, 1958	12	1,001	725,100	1,622	1.72	23.39	1,240	898,200	1,982	28.60
1959.....	4,850	June 5, 1959	42	1,319	955,300	2,051	2.18	29.60	1,360	984,800	2,030	29.29
1960.....	9,120	Nov. 23, 1959	30	1,237	898,200	1,818	1.93	26.29	.....	.....	.....	.....

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 upstream from Tampico and confluence with South Fork, and 20 miles west of Yakima.

Drainage area.—68.9 sq. mi

Records available.—August 1907 to September 1960 (no winter records in water years 1908-09, 1916-30).

Gage.—Water-stage recorder. Concrete control Nov. 11, 1915, to December 1933, and sharp-crested weir since September 1934. Altitude of gage is 2,450 ft. (from topographic map). Prior to Sept. 20, 1934, staff gage or water-stage recorder at site 50 ft. upstream at different datum.

Average discharge.—36 years (1909-15, 1930-60), 68.7 cfs (49,740 acre-ft. per year).

Extremes.—1907-60: Maximum discharge, 823 cfs May 20, 1956 (gage height, 3.00 ft.); minimum, 4.3 cfs Nov. 13 (gage height, 0.13 ft.), result of freezeup.

Remarks.—No diversion of importance. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	20.8	22.6	30.6	29.1	45.0	57.6	128	245	298	130	42.2	26.4	82.3
1955...	25.6	32.1	23.8	20.9	20.9	22.0	37.7	125	210	59.1	27.7	20.7	52.2
1956...	27.0	37.4	65.1	41.9	29.1	72.6	295	427	328	128	47.2	30.8	128
1957...	26.6	26.9	35.9	18.7*	27.0*	50.7	118	271	118	36.5	24.8	18.5	64.7
1958...	23.1	19.4	22.9	24.6	74.0	64.1	126	331	162	57.4	27.0	20.7	79.4
1959...	20.9	40.3	65.4	61.0	43.1	54.7	141	157	164	57.5	26.6	22.9	71.2
1960...	27.5	29.2	23.5	18.3*	24.7	60.4	120	156	158	42.0	22.9	17.4	58.3

* Estimated.

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
1954...	18	17	20	16*	25	44	48	107	163	68	28	23	16*
1955...	23	25	13*	14*	16*	19	26	33	107	36	22	19	13*
1956...	19*	20*	27	18	17*	29	124	254	215	64	35	27	17*
1957...	24	21	16	13*	11*	40	70	188	54	28	21	17	11*
1958...	17	10	15	17*	28	37	84	165	72	35	22	18	10
1959...	17	19	43	20*	34	45	108	126	99	34	23	20	17
1960...	19.5	8.9	8.9	13*	16*	14*	76	110*	79	28	21	14.5	8.9

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
1953								73.6	14.49	53,280
1954	438	May 18, 1954	16	82.3	1.19	16.23	59,570	82.9	16.35	60,020
1955	360	June 5, 1955	13	52.2	.758	10.29	37,760	56.2	11.09	40,690
1956	823	May 20, 1956	17	128	1.86	25.20	92,530	124	24.53	90,090
1957	520	May 9, 1957	11	64.7	.939	12.74	46,820	62.6	12.34	45,360
1958	531	May 23, 1958	10	79.4	1.15	15.63	57,460	84.5	16.64	61,190
1959	239	June 3, 1959	17	71.2	1.03	14.02	51,570	67.3	13.25	48,740
1960	364	May 12, 1960	8.9	58.3	.846	11.51	42,290			

* Estimated.

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.

Records available.—March 1915 to September 1960 (no winter records prior to water year 1931).

Gage.—Water-stage recorder. Concrete control effective Sept. 6, 1916, to December 1933. Altitude of gage is 2,400 ft. (from topographic map). Prior to Aug. 9, 1918, staff gage at same site at datum 1.00 ft. lower. Aug. 9, 1918, to Mar. 22, 1951, staff gage at present site and datum.

Average discharge.—30 years (1930-60), 19.1 cfs (13,830 acre-ft. per year).

Extremes.—1915-60: 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.—Diversion for irrigation of about 55 acres above station. No regulation.

Revisions.—The momentary maximum discharge for the water year 1918 published in State WSB No. 6 has been revised to 53 cfs May 4, 1918.

South Fork Ahtanum Creek at Conrad Ranch, 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
1954...	7.25	7.09	9.05	9.81	15.7	18.8	32.6	58.2	56.7	30.9	13.4	9.46	22.4
1955...	8.94	9.79	8.26*	7.39	7.37	7.51	11.6	25.8	47.0	14.6	7.70	6.64	13.5
1956...	8.37*	10.1	24.4	15.1	10.8*	38.6	91.9	99.9	85.6	33.8	15.8	11.9	37.2
1957...	10.5	10.4	12.7	6.76*	10.5*	22.0	35.1	56.4	25.3	10.7	8.19	6.81	18.0
1958...	8.07	7.08	8.48	9.26	34.9	23.4	39.6	79.2	43.5	18.2	10.9	9.25	24.2
1959...	8.38	11.8	14.6	25.8	15.5	23.0	39.9	36.0	36.6	15.9	9.73	8.49	20.5
1960...	8.44	8.15	7.64	6.34*	7.97	20.2	32.0	39.6	41.2	14.2	8.76	7.23	16.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	6.4	6.9	6.7	7	6.5	14.5	15	25	48	17	9.9	8.7	6.0
1955...	8.4	8.7	6.8*	6.0	6.7	7.0	8.7	10.5	24	9.9	6.7	6.0	6.0
1956...	6.2	7.0*	9.5	8.0*	8.0*	10.5	47	49	54	20	13.5	10.5	6.2
1957...	9.8	8.7*	6.0*	4.9*	5.3	13.5	26	42	14.0	8.7	7.2	6.3	4.9*
1958...	6.6	6.4*	6.8	7.3*	12.5	13.5	27	31	23	13.5	8.2	8.2	6.3
1959...	7.4	7.8	11.5	10*	11.5	18	28	30	24	11.5	8.2	7.8	7.4
1960...	7.4	5.0	6.0*	4.6*	5.5*	5.0*	20	29	23	10	7.8	6.6	4.6*

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
1953								20.3		14,720
1954	107	May 19, 1954	6.0	22.4			16,250	22.7		16,460
1955	84	June 9, 1955	6.0	13.5			9,820	14.9		10,790
1956	196	May 20, 1956	6.2	37.2			27,010	36.4		26,440
1957	96	May 9, 1957	4.9	18.0			13,020	17.2		12,420
1958	168	Feb. 25, 1958	6.3	24.2			17,550	25.2	18.79	18,230
1959	68	Jan. 24, 1959	7.4	20.5	0.827	11.21	14,840	19.6	10.72	14,200
1960	85	June 3, 1960	4.6	16.8	.677	9.22	12,180			

* Estimated.

Ahtanum Creek at Union Gap, Wash.

Location.—Lat. 46°32'10", long. 120°28'20" (revised), 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.

Records available.—May to November 1904, August 1907 to July 1908, March to October 1910, April 1911 to September 1914, May 1951 to April 1953, August to September 1960. Published as "near Yakima" 1904, 1907-08, 1910-12.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map). Prior to Sept. 30, 1914, staff gages, at approximately same site at various datums; May 12, 1951, to Apr. 23, 1953, water-stage recorder, at same site and datum.

Extremes.—1904, 1907-08, 1910-14, 1951-53: Maximum discharge observed, 1,530 cfs Mar. 3, 1910 (gage height, 8.9 ft., datum then in use); no flow on many days during September and October 1904.

Remarks.—No regulation. Water diverted for irrigation of about 9,000 acres above station.

Ahtanum Creek 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
1960...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15.7	20.7	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12*	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					
1960.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

New Reservation Canal near Parker, Wash.

Location (corrected).—Lat. 46°31'05", long. 120°28'40", in NW¼ sec. 20, T. 12 N., R. 19 E., on left bank 1,800 ft. downstream from intake, three-quarters of a mile northwest of Parker, and 5½ miles northwest of Wapato.

Records available.—April 1904 to September 1921; October 1921 to September 1960 (monthly diversion only).

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.

Extremes.—1904-60: 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.

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	21,750	0	0	0	0	9,750	78,280	123,500	114,500	117,700	109,300	81,860	656,600
1955...	20,980	0	0	0	0	9,400	68,030	115,100	114,300	118,400	106,500	84,400	637,700
1956...	20,380	0	0	0	0	0	54,270	129,900	117,400	116,000	109,400	80,810	623,200
1957...	22,470	0	0	0	0	6,640	47,490	115,800	111,200	119,300	108,500	82,140	613,500
1958...	19,630	0	0	0	0	9,270	45,120	115,500	117,800	119,500	107,300	78,560	612,700
1959...	19,920	0	0	0	0	11,460	64,300	116,600	118,100	119,500	109,700	78,860	638,400
1960...	20,280	0	0	0	0	4,460	62,800	112,100	117,400	119,700	109,300	79,790	625,800

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.

Old Reservation Canal near Parker, Wash.—Continued

Records available.—April to May 1904 (monthly diversion only); June to October 1904; May to October 1905 (gage heights and discharge measurements only); April 1906 to September 1921; October 1921 to September 1960 (monthly diversion only).

Gage.—Water-stage recorder. Altitude of gage is 905 ft. (from topographic map). June 7, 1904, to April 1930, staff gages at present site or at sites within half a mile of present site at various datums.

Average discharge.—54 years (1906-60), 48.6 cfs (35,180 acre-ft. per year).

Extremes.—1904-60: Maximum daily discharge, 386 cfs May 21, 1919; 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.

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	687	756	822	968	907	2,450	3,620	5,670	4,120	2,600	489	292	23,380
1955...	268	816	752	712	655	1,230	1,450	3,180	2,330	0	0	0	11,390
1956...	188	444	811	623	506	395	1,790	4,570	837	1,960	0	0	12,120
1957...	126	475	1,710	1,330	1,240	827	0	1,520	1,500	0	0	0	8,730
1958...	165	755	1,580	1,710	1,570	917	166	1,580	2,000	0	0	0	10,440
1959...	378	1,550	1,740	1,460	1,010	1,260	1,170	2,580	1,250	0	0	0	12,400
1960...	107	666	942	838	705	641	1,070	2,130	1,030	0	0	0	8,130

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.

Records available.—April 1904 to September 1921; October 1921 to September 1960 (monthly diversion only).

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.

Extremes (corrected).—1904-60: Maximum daily discharge, 1,320 cfs, occurred usually on several days during 1925, 1931, 1933, 1935, 1947, 1949-52, 1958, 1960; 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.

Monthly and Annual Diversion, in Acre-feet

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	28,360	0	0	0	0	14,520	60,890	75,550	73,790	75,340	77,380	60,510	466,300
1955...	31,000	0	0	0	0	12,690	55,580	76,540	76,130	78,390	78,110	61,340	469,800
1956...	26,550	0	0	0	0	8,040	52,010	74,780	72,650	77,890	77,750	61,510	451,800
1957...	30,790	0	0	0	0	4,440	40,560	73,000	74,340	77,000	77,760	60,850	439,400
1958...	19,400	0	0	0	0	6,840	36,430	70,690	75,630	79,860	78,270	60,670	427,800
1959...	24,620	0	0	0	0	7,290	52,070	76,380	75,670	78,850	77,850	60,100	453,000
1960...	24,360	0	0	0	0	6,030	47,480	72,200	76,670	79,820	77,380	61,600	445,500

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.

Records available.—April 1908 to September 1960. Prior to October 1916, published as "near Wapato".

Gage.—Water-stage recorder. Datum of gage is 886.23 ft. above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1909, hook gage at site 25 ft. above headgate of Sunnyside Canal at different datum. Jan. 1, 1909, to Dec. 31, 1913, chain gage at site 500 ft. downstream from Sunnyside Canal at datum 1.82 ft. higher than present datum. Jan. 1, 1914, to Aug. 16, 1915, chain or staff gage and Aug. 17, 1915, to Feb. 2, 1919, water-stage recorder, at site 500 ft. downstream from headgate of Sunnyside Canal at datum 0.18 ft. lower than present datum. Feb. 3, 1919, to Oct. 20, 1940, water-stage recorder at present site at datum 0.18 ft. lower than present datum. Oct. 21, 1940, to Aug. 9, 1953, water-stage recorder at site 1,000 ft. downstream from headgate of Sunnyside Canal at datum 0.18 ft. lower than present datum.

Extremes.—1908-60: Maximum discharge, 65,000 cfs Dec. 23, 1933 (gage height, 15.0 ft., from high-water marks); minimum, less than 10 cfs for several days during latter part of irrigation season in most years prior to 1936.

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 season as much as 18 cfs, depending upon the stage of the canal, is released from Sunnyside Canal ahead of the fish screens and passes river and canal gaging stations unmeasured. Some regulation by diversions and by Keechelus, Kachess, Cle Elum, and Bumping Lakes, and Rimrock Lake, (formerly Tieton Reservoir). 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
1954...	950	1,257	3,018	3,685	3,731	3,045	2,824	4,927	4,773	3,590	718	836	2,775
1955...	1,652	2,450	1,815	1,538	1,752	991	790	1,568	7,144	1,746	458	410	1,851
1956...	1,369	5,251	7,082	4,710	2,942	6,581	10,640	10,760	9,344	2,104	384	278	5,118
1957...	1,162	1,953	5,261	2,418	1,782	2,478	3,542	9,327	1,598	347	347	283	2,555
1958...	893	1,096	1,339	1,404	3,184	2,242	2,780	4,860	1,316	286	328	247	1,655
1959...	947	3,689	4,835	5,513	4,831	3,012	2,756	4,209	4,060	275	366	620	2,912
1960...	2,537	5,828	7,579	4,096	2,090	2,769	3,176	3,512	1,722	452	297	318	2,870

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	170	1,110	1,640	3,000*	2,940	1,430	1,100	1,370	2,770	74	477	71	71
1955...	489	1,870	1,370	1,340	1,210	391	204	370	1,060	480	263	209	204
1956...	183	2,860	5,540	2,650	2,500*	3,310	7,430	6,110	3,280	284	202	92	92
1957...	306	1,640	1,490	1,200	1,080	1,760	2,200	2,690	145	169	53	101	53
1958...	199	922	1,010	1,060	1,570	620	1,270	1,720	220	49	193	108	49
1959...	38	1,090	3,090	3,640	3,410	1,630	580	886	715	55	196	123	38
1960...	594	2,640	5,630	1,920	1,220	1,120	559	755	121	211	87	74	74

* Estimated.

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
	Discharge	Date					
1953						1,820	1,318,000
1954	10,700	May 19, 1954	71	2,775	2,010,000	2,831	2,050,000
1955	18,400	June 12, 1955	204	1,851	1,340,000	2,505	1,813,000
1956	19,600	May 20, 1956	92	5,118	3,716,000	4,676	3,395,000
1957	18,300	May 10, 1957	53	2,555	1,850,000	2,129	1,541,000
1958	9,210	Feb. 25, 1958	49	1,655	1,198,000	2,170	1,571,000
1959	11,000	Jan. 25, 1959	38	2,912	2,108,000	3,456	2,502,000
1960	27,400	Nov. 24, 1959	74	2,870	2,084,000		

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., approximately.

Records available.—August to December 1895 (gage heights only, fragmentary), August 1896 to March 1915, February 1933 to September 1960.

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, tape gage at present site and datum.

Extremes.—1896-1915, 1933-60: 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., datum then in use).

Remarks.—Water diverted above gage for irrigation of about 424,000 acres. Some regulation by diversions and by Keechelus, Kachess, Cle Elum and Bumping Lakes, and Rimrock Lake (formerly Tieton Reservoir), see elsewhere in this report. The Kiona Canal bypasses station with a mean flow of approximately 23 cfs for irrigation of about 1,100 acres below station. Diversion by the Kennewick Canal was 92,990 acre-ft. in water year 1960.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	2,303	2,162	3,717	4,419	5,002	4,819	4,872	6,896	6,920	5,398	2,266	2,509	4,269
1955	3,224	3,317	2,633	2,225	2,434	1,881	1,998	3,249	3,520	3,525	1,809	2,062	3,068
1956	2,965	6,133	9,009	6,860	4,166	8,452	13,190	13,090	12,780	3,729	2,019	2,235	7,055
1957	2,823	2,965	6,017	3,118	2,542	3,856	5,662	11,190	3,121	1,418	1,590	1,886	3,864
1958	2,720	2,088	2,199	2,392	4,410	3,919	4,810	5,985	2,607	1,225	1,436	1,814	2,957
1959	2,445	4,701	5,945*	6,748	6,090	4,633	4,419	5,855	5,560	1,415	1,503	2,539	4,307
1960	4,128	6,293	8,306	4,988	3,108	3,691	4,874	4,969	3,171	1,224	1,500	1,939	4,020

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,650	2,050	2,400	2,900*	3,840	3,740	3,280	3,190	5,210	1,860	1,800	1,730	1,650
1955	2,460	2,840	2,110	1,990	1,910	1,330	1,180	2,020	3,160	2,040	1,460	1,790	1,180
1956	2,370	4,000	6,710	4,160	2,990	4,850	10,300	8,580	5,430	2,000	1,760	2,010	1,760
1957	2,080	2,680	2,370	1,400*	1,840	3,030	3,880	4,640	1,060	1,160	1,280	1,510	1,060
1958	2,360	1,870	1,920	1,930	2,630	2,250	3,240	2,970	1,020	914	1,150	1,530	914
1959	1,550	2,290	4,300*	4,160	4,650	3,300	2,200	2,850	2,850	1,050	1,250	1,950	1,050
1960	2,660	3,720	6,620	2,820	2,140	1,940	2,400	2,280	1,210	959	1,060	1,700	959

* Estimated.

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
	Discharge	Date					
1953						3,257	2,358,000
1954	12,000	May 21, 1954	1,650	4,269	3,091,000	4,350	3,150,000
1955	18,300	June 14, 1955	1,180	3,068	2,222,000	3,827	2,771,000
1956	20,100	May 22, 1956	1,760	7,055	5,121,000	6,522	4,735,000
1957	19,600	May 12, 1957	1,060	3,864	2,798,000	3,459	2,504,000
1958	10,200	Feb. 26, 1958	914	2,957	2,140,000	3,466	2,509,000
1959	10,800	Jan. 26, 1959	1,050	4,307	3,118,000	4,781	3,461,000
1960	18,700	Nov. 25, 1959	959	4,020	2,919,000		

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 right bank on upstream side of Northern Pacific Railway bridge at Cunningham.

Drainage area.—27.8 sq. mi.

Records available.—January 1953 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,160 ft. (from topographic map).

Average discharge.—7 years (1953-60), 0.38 cfs (275 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 2,160 cfs Feb. 21, 1956 (gage height, 10.04 ft.); no flow most of each year.

Remarks.—No known regulation or diversion.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	2.09	0	0	0	0	0	0	0	.16
1956	0	0	.66	3.07	24.6	0	0	.09	0	0	0	0	2.27
1957	0	0	0	0	1.96	0	0	0	0	0	0	0	.15
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	.87	0	0	0	0	0	0	0	0	.07
1960	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	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1954	No flow during year.									
1955	106	Feb. 7, 1955	0	0.160	0.0058	0.08	116	0.22	0.11	157
1956	2,160	Feb. 21, 1956	0	2.27	.082	1.11	1,640	2.21	1.08	1,600
1957	250	Feb. 24, 1957	0	.15	.0054	.07	109	.151	.07	109
1958	No flow during year.									
1959	83	Jan. 24, 1959	0	.07	.0032	.04	54	.074	.04	54
1960	No flow during year.									

Esquatzel Coulee at Connell, Wash.

Location (revised).—Lat. 46°39'30", long. 118°52'10", in SE¼NW¼ sec. 36, T. 14 N., R. 31 E., on right bank 400 ft. below outlet of local sewage plant and half a mile southwest of Connell.

Drainage area.—240 sq. mi.

Records available.—January 1953 to September 1960.

Gage.—Water-stage recorder. Concrete control since Aug. 7, 1959. Altitude of gage is 840 ft. (from topographic map). Prior to Aug. 7, 1959, at site half a mile upstream at different datum.

Extremes.—1953-60: Maximum discharge, 5,560 cfs Feb. 21, 1956 (gage height, 12.68 ft.); no flow most of each year prior to and at times since August 1959.

Remarks.—No known regulation or diversion. Since August 1959, all of flow is discharge from local sewage plant.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0	0	0	0	0	0	0	0	0	0	0	0
1955...	0	0	0	0	2.1	0	0	0	0	0	0	0	.2
1956...	0	0	1.39	16.5	91.6	0	0	8.3	0	.16	0	0	9.49
1957...	0	0	0	0	11.5	0	0	0	0	0	0	0	.88
1958...	0	0	0	0	0	0	0	0	0	0	0	0	0
1959...	0	0	0	.31	0	0	0	0	0	0	.11	.10	.04
1960...	.10	.10	.10	.12*	.10	.10	.10	.10	.10	.10	.09*	.09	.10

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0	0	0	0	0	0	0	0	0	0	0	0
1955...	0	0	0	0	0	0	0	0	0	0	0	0	0
1956...	0	0	0	0	0	0	0	0	0	0	0	0	0
1957...	0	0	0	0	0	0	0	0	0	0	0	0	0
1958...	0	0	0	0	0	0	0	0	0	0	0	0	0
1959...	0	0	0	0	0	0	0	0	0	0	0	.1	0
1960...	0	.1	.1	.1	.1	.1	.1	.1	.1	.1	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
1954	No flow	during year.								
1955	229	Feb. 7, 1955	0	0.2	0.00083	0.009	117	.028	0.016	203
1956	5,560	Feb. 21, 1956	0	9.49	.040	.5378	6,890	9.37	.5308	6,800
1957	1,350	Feb. 24, 1957	0	.88	.0037	.050	640	.88	.050	640
1958	No flow	during year.								
1959	16	Jan. 24, 1959	0	.043	.00018	.002	32	.07	.0035	50
1960	.2†	①	0	.10	.00042	.0059	72.3	.....	.....	.....

* Estimated.
† Maximum daily.
① Jan. 25-30, Feb. 1, 1960.

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 on upstream side of Northern Pacific Railway bridge at Eltopia.

Drainage area.—394 sq. mi.

Records available.—January 1953 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 580 ft. (from topographic map).

Average discharge.—7 years (1953-60), 1.07 cfs (775 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 3,740 cfs Feb. 22, 1956 (gage height, 18.23 ft.); no flow during most of each year.

Remarks.—Considerable regulation by natural pondage in Esquatzel Coulee near Mesa. No known diversions. No flow for water years 1954-55 and 1957-60.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0	0	0	0	0	0	0	0	0	0	0	0	0
1955...	0	0	0	0	0	0	0	0	0	0	0	0	0
1956...	0	0	0	2.87	91.4	0	0	0	0	0	0	0	7.48
1957...	0	0	0	0	0	0	0	0	0	0	0	0	0
1958...	0	0	0	0	0	0	0	0	0	0	0	0	0
1959...	0	0	0	0	0	0	0	0	0	0	0	0	0
1960...	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
	Discharge	Date					
1954.....	No flow	during year.					
1955.....	No flow	during year.					
1956.....	3,740	Feb. 22, 1956	0	7.48	5,440	7.48	5,440
1957.....	No flow	during year.					
1958.....	No flow	during year.					
1959.....	No flow	during year.					
1960.....	No flow	during year.					

ASOTIN CREEK BASIN

Asotin Creek near Asotin, Wash.

Location (revised).—Lat. 46°19'40", long. 117°12'20", in SE¼ sec. 20, T. 10 N., R. 45 E., on left bank 350 ft. upstream from the 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.

Records available.—March to November 1904, April 1905 to February 1906, May to November 1906, August to September 1910, July to October 1911, August 1928 to November 1959. Published as "at Shelman's Ranch, near Asotin" 1904-05.

Gage.—Staff and crest-stage gages. Datum of gage is 1,435.78 ft. above mean sea level (Washington Water Power Co.'s bench mark). Prior to Jan. 11, 1934, staff gages within 0.3 mile of present site at different datums. Jan. 11, 1934, to May 17, 1957, at site 0.3 mile upstream at same datum.

Asotin Creek near Asotin, Wash.—Continued

Average discharge.—31 years (1928-59), 68.4 cfs (49,520 acre-ft. per year).

Extremes.—1904-06, 1910-11, 1928-59: Maximum discharge observed, 1,180 cfs Apr. 15, 1904 (gage height, 4.3 ft., site and datum then in use); minimum observed, 16 cfs Jan. 5, 1937.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	37.2	43.0	54.9	53.1	122	84.5	151	166	96.7	51.3	43.8	40.6	78.2
1955...	38.8	40.5	38.6	39.9	42.1	49.2	92.5	126	129	56.0	38.5	36.7	60.6
1956...	37.4	44.6	130	80.3	44.1	142	245	317	139	54.4	42.6	39.6	110
1957...	41.3	43.6	50.5	39.3*	96.2	87.5	96.0	274	90.3	53.9	41.7	35.1	79.1
1958...	40.5	38.0	44.2	43.8	77.9	67.5	141	170	90.8	52.9	37.7	37.0	70.0
1959...	40.9	66.8	98.8	139	83.0	87.7	129	129	108	47.8	36.2	40.3	83.8
1960...	52.4	55.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	36	38	40	45*	73	56	60	103	69	42	38	38	36
1955...	37	39	35	37	35	35*	71	85	68	45	36	34	34
1956...	34	32	48*	40*	35*	48	115	165	70	46	38	38	32
1957...	39	41*	42	25*	40*	64	76	134	63	49	37	34	25*
1958...	37	37	39	41	53	53	84	126	65	39	35	35	35
1959...	36	41	62	75*	70	70	96	100	61	38	31	34	31
1960...	40	42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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					
1953.....	.....	.....	.....	.....	.....	77.1	55,830
1954.....	315†	Feb. 13, 1954	36	78.2	56,630	76.8	55,570
1955.....	215†	June 11, 1955	34	60.6	43,890	68.6	49,670
1956.....	1,040	Dec. 22, 1955	32	110	79,780	103	75,060
1957.....	1,000	May 8, 1957	25	79.1	57,260	78.0	56,500
1958.....	895	July 18, 1958	35	70.0	50,680	77.0	55,770
1959.....	370†	Jan. 12, 1959	31	83.8	60,710	.....	.....
1960.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.
† Maximum observed.

Asotin Creek below Kearney Gulch, near Asotin, Wash.

Location.—Lat. 46°19'30", long. 117°08'55", in SW¼SE¼ sec. 22, T. 10 N., R. 45 E., on left bank 0.3 mile downstream from Kearney Gulch and 5 miles west of Asotin.

Drainage area.—170 sq. mi.

Records available.—October 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,090 ft. (from topographic map).

Extremes.—Maximum discharge, 315 cfs Mar. 7, 1960 (gage height, 3.24 ft.); minimum, 14 cfs Nov. 16, 1959 (gage height, 1.38 ft.), result of freezeup.

Remarks.—No regulation. Several diversions for irrigation and domestic use. Prior to Nov. 20, 1959, the City of Asotin diverted about 30 cfs for municipal use. Natural low flows nearly equivalent to those of former station 2½ miles upstream.

Asotin Creek below Kearney Gulch, near Asotin, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	32.4*	42.0	51.6	41.8*	54.3	97.1	147	128	82.5	42.3	39.1	37.8	66.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960...	22*	16*	46	25*	35*	35*	108	103	53	38	35	35	16*

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					
1960.....	315	Mar. 7, 1960	16	66.3	48,100	.....	.....

* Estimated.

SNAKE RIVER MAIN STEM

Snake River near Clarkston, Wash.

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.

Records available.—October 1915 to September 1960 in reports of Geological Survey. Prior to October 1935, published as "at Riparia." Gage-height records collected at Riparia, 1900-1916 (fragmentary), 1935-48, are contained in reports of U. S. Weather Bureau.

Gage.—Water-stage recorder. Datum of gage is 670 ft. above mean sea level (Corps of Engineers bench mark). 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.—1909-60: Maximum discharge, 369,000 cfs May 29, 1948 (gage height, 40.36 ft., from high-water mark in well); minimum, 6,660 cfs Sept. 2, 1958 (gage height, 6.79 ft.).

Maximum stage known, 24.7 ft., Riparia site and datum, June 5, 1894, determined from flood marks 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 powerplants on Clearwater River at Lewiston, Idaho, and Snake River at Brownlee Dam.

Revisions.—The momentary maximum discharges for the water years 1931 and 1934 published in State WSB No. 6 have been revised to 116,000 cfs Apr. 1, 1931 and 164,000 cfs Dec. 23, 1933, respectively.

Snake River near Clarkston, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	22,630	23,970	26,590	26,950	37,540	39,690	74,100	131,300	103,500	52,240	24,330	22,460	48,790
1955...	22,770	25,100	22,200	22,050	20,780	23,330	51,980	99,740	128,600	51,520	21,550	20,070	42,670
1956...	23,640	29,560	52,170	44,420	35,340	64,300	125,000	186,500	149,300	42,330	25,040	23,280	66,750
1957...	27,400	28,100	30,850	23,960	36,500	66,650	86,180	199,300	127,600	35,930	21,860	22,120	58,980
1958...	25,560	23,570	26,550	25,630	51,050	44,460	87,790	161,400	104,000	30,200	19,210	22,580	51,760
1959...	23,540	36,150	43,530	45,420	39,760	42,040	72,570	95,320	121,300	38,450	21,690	30,390	50,780
1960...	46,930	40,790	32,700	28,830	33,890	50,730	77,620	94,560	102,500	29,530	22,380	21,700	48,460

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	21,400	20,900	23,400	23,900	29,800	30,700	31,400	67,800	83,800	27,200	21,900	20,500	20,500
1955...	22,300	22,500	18,900	20,700	18,800	19,600	35,100	65,000	84,500	29,200	18,400	17,500	17,500
1956...	20,400	21,500	25,800	34,400	30,000*	38,900	75,200	114,800	73,100	28,700	21,300	21,800	20,400
1957...	24,100	23,400	24,000	18,300	22,500	50,800	73,400	114,700	59,600	25,200	19,300	21,000	18,300
1958...	21,600	21,300	22,200	22,200	29,200	34,100	55,900	82,300	46,200	23,700	9,380	9,320	9,320
1959...	13,400	23,300	30,400	29,900	30,100	32,700	53,400	69,200	70,100	23,800	19,800	20,400	13,400
1960...	31,800	31,200	26,700	26,100	28,400	28,100	55,700	56,900	52,800	20,100	15,900	16,800	15,900

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					
1953						52,880	38,280,000
1954	210,000	May 21, 1954	20,500	48,790	35,320,000	48,690	35,250,000
1955	204,000	June 13, 1955	17,500	42,670	30,890,000	45,490	32,930,000
1956	292,100	May 24, 1956	20,400	66,750	48,460,000	65,140	47,290,000
1957	322,900	May 20, 1957	18,300	58,980	42,700,000	58,080	42,060,000
1958	247,600	May 22, 1958	9,320	51,760	37,470,000	54,060	39,140,000
1959	171,400	June 6, 1959	13,400	50,780	36,760,000	52,230	37,810,000
1960	163,500	June 4, 1960	15,900	48,960	35,180,000		

* Estimated.

Tucannon River near Starbuck, Wash.

Location (revised).—Lat. 46°30'20", long. 118°03'55", in NE¼SW¼ sec. 21, T. 12 N., R. 38 E., on right bank 180 ft. downstream from county road bridge, 3 miles east of Starbuck, and 3½ miles downstream from Pataha Creek.

Drainage area.—431 sq. mi. (revised).

Records available.—October 1914 to September 1917, August 1928 to September 1931, October 1958 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 730 ft. (from topographic map). Nov. 8, 1914, to Sept. 30, 1917, staff gage at site 2¾ miles upstream at different datum. Aug. 9, 1928, to Sept. 30, 1931, staff gages at site 2½ miles upstream at various datums.

Average discharge.—8 years (1914-17, 1928-31, 1958-60), 167 cfs (120,900 acre-ft. per year).

Extremes.—1914-17, 1928-31, 1958-60: 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 measurement of peak flow; minimum, 15 cfs July 11, 12, 1930 (gage height, 1.12 ft.).

Remarks.—No regulation. 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
1959...	72.5*	173*	319	334	260	233	280	265	219	83.9	72.3*	96.0*	200
1960...	125	137	132	107*	183	237	290	249	160	71.7	67.1	69.3	152

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	64*	68*	165	190*	214	198	211	204	129	62	60	80*	60
1960...	102	80*	119	50*	90*	90*	222	222	91	56	58	62	50*

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					
1959.....	1,040	Dec. 12, 1958	60	200	144,900	186	134,500
1960.....	516	Mar. 7, 1960	50	152	110,400	.....	.....

* Estimated.

Palouse River near Colfax, Wash.

Location.—Lat. 46°55'30", long. 117°19'10", in NW¼SW¼ sec. 31, T. 17 N., R. 44 E., on right bank 3½ miles northeast of Colfax and 4 miles upstream from mouth of South Fork.

Drainage area.—491 sq. mi.

Records available.—September 1955 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,010 ft. (from topographic map).

Average discharge.—5 years (1955-60), 357 cfs (258,500 acre-ft. per year).

Extremes.—1955-60: Maximum discharge, 6,310 cfs Jan. 25, 1959 (gage height, 8.18 ft.); minimum, 2.7 cfs Aug. 23, 1958 (gage height, 1.30 ft.).

Remarks.—Small diversions for irrigation and domestic use above station. Slight regulation by millponds above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	49.8	189	725	695*	310*	1,286	1,404	616	150	33.1	13.7	12.2	458
1957...	31.4	53.8	169	54.5*	407*	1,116	1,021	862	145	21.9	9.49	4.46	324
1958...	18.4	40.5	174	412	1,536	451	1,107	322	71.2	24.4	5.66	11.1	343
1959...	22.0	140	346	1,449	579	837	817	415	125*	28.7*	8.53*	27.2	399
1960...	67.7	168*	99.5	126*	668	814	801	292	85.1	12.4	8.86	9.42	260

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	13	29*	59	250*	220*	234	623	183	78	15	7.4	8.4	7.4
1957...	11.5	32	26*	27*	40*	603	443	308	47	12.5	5.4	3.2	3.2
1958...	6.6	14.5*	44	60*	442	208	504	95	32	9.9	3.2	3.2	3.2
1959...	7.9	18.5	105	250*	273	439	505	193	52*	9*	5.3	6.6	5.3
1960...	26	40*	53	45*	70*	75*	362	198	27	5.8	4.7	4.7	4.7

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					
1956.....	4,790	Dec. 22, 1955	7.4	458	332,400	398	289,100
1957.....	4,280	May 21, 1957	3.2	324	234,600	322	233,300
1958.....	2,950	Feb. 18, 1958	3.2	343	248,500	366	265,200
1959.....	6,310	Jan. 25, 1959	5.3	399	289,100	385	278,400
1960.....	2,990	April 1, 1960	4.7	260	189,100	.....	.....

* Estimated.

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., on right bank at State Street crossing in Pullman, 600 ft. upstream from Missouri Flat Creek.

Drainage area.—132 sq. mi.

Records available.—February 1934 to September 1942, December 1959 to September 1960.

Gage.—Water-stage recorder and concrete control. Altitude of gage is 2,350 ft. (from topographic map). Prior to Mar. 19, 1934, staff gage at site 30 ft. upstream.

Average discharge.—8 years (1934-42), 28.4 cfs (20,560 acre-ft. per year).

Extremes.—1934-42, 1959-60: Maximum discharge, 968 cfs Mar. 21, 1939 (gage height, 4.01 ft.); minimum, 0.1 cfs Sept. 23, 1942 (gage height, 0.50 ft.).

Maximum stage known since 1910, 9.5 ft. Feb. 26, 1948 (discharge, 5,000 cfs). Flood of Jan. 24, 1959 reached a stage of 6.5 ft. from floodmarks (discharge, 1,860 cfs). Flood of Dec. 22, 1933 reached a stage of 60 ft. from gage readings furnished by Washington State University (discharge, 1,800 cfs).

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
1960	.....	.....	.....	19.8*	99.7	90.8	53.5	19.6	6.43*	1.80*	2.13	1.88	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960	.....	.....	.....	5.0*	10*	10*	27	11.5	3.0*	1.2	1.0	1.4	.....

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					
1960	511	Feb. 7, 1960	.....	.....	.....	.....	.....

* 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.

Records available.—February 1934 to September 1940, January to September 1960.

Gage.—Water-stage recorder and concrete control with 2-ft. Parshall flume. Altitude of gage is 2,350 ft. (from topographic map). Prior to Mar. 15, 1934 staff gage at site 20 ft. upstream.

Average discharge.—6 years (1934-40), 6.00 cfs (4,340 acre-ft. per year).

Extremes.—1934-40, 1960: Maximum discharge, 432 cfs Mar. 19, 1939 (gage height, 3.25 ft.); practically no flow for long periods each year.

Flood of Feb. 26, 1948, reached a stage of 6.3 ft. (discharge, 1,500 cfs by a slope-area measurement, 0.9 miles upstream). Flood of Jan. 24, 1959 reached a stage of 4.57 ft., from floodmarks (discharge, 870 cfs by slope-area measurement, 0.25 mile upstream from gage).

Remarks.—No regulation or diversion.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960	.....	.....	.....	4.13	28.8	18.9	8.35	2.44	0.57	0.46	0.25	0.16	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1960	.....	.....	.....	0.8*	1.5*	1.5*	3.0	1.0	0.2	0.1	0.1	0.1	.....

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
1960	265	Feb. 7, 1960	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

Union Flat Creek near Colfax, Wash.

Location.—Lat. 46°49'00", long. 117°26'05", in SW¼SW¼ sec. 5, T. 15 N., R. 43 E., on right bank above county highway bridge and 5½ miles southwest of Colfax.

Drainage area.—189 sq. mi.

Gage.—Water-stage recorder. Artificial channel since Nov. 12, 1957, and concrete control since Aug. 20, 1958. Altitude of gage is 1,865 ft. (from topographic map).

Average discharge.—7 years (1953-60), 41.3 cfs (29,900 acre-ft. per year).

Extremes.—1953-60: Maximum discharge, 2,080 cfs Feb. 13, 1958 (gage height, 5.52 ft., see **Gage**); maximum gage height, 8.04 ft. Jan. 27, 1959; no flow Aug. 15 to Sept. 13, 1955.

Remarks.—No known regulation. Small diversions above station for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.07	.61	.....
1954	1.90	5.44	25.4	50.9	78.5	35.7	24.7	9.72	7.87	1.04	.74	1.53	19.9
1955	2.42	4.31	13.4	26.1	66.6	141	82.3	14.4	3.64	1.35	.18	.18	29.4
1956	2.68	27.6	140	154	75.5	454	68.7	44.4	12.7	4.00	2.09	1.48	83.0
1957	3.62	5.73	23.5	10.8	85.4	148	53.7	35.5	10.2	2.12	.76	1.07	31.4
1958	2.67*	6.18	32.3	72.1	165	52.1	105	30.0	8.98	3.99	.75	1.31	39.1
1959	3.06	17.7	76.6	231	177	109	35.8	28.0	14.4	4.04	2.15	4.12	58.1
1960	7.12	15.1	8.20*	17.8*	103	102	51.5	22.9	6.28	1.44	1.13	2.06	27.9

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1953	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.2	0.3	.....
1954	1.0	2.6	8.1	15	35	23	14	5.3	3.8	0.5	.2	.6	0.2
1955	1.5	2.6	3.3	6.0	14	12	26	9.0	1.3	.5	0	0	0
1956	.5	2.5	18.5	30	25	86	25	11.5	6.3	1.5	1.3	1.1	.5
1957	2.4	3.7	4.5	6.4	8.2	48	26	14	4.8	.8	.4	.6	.4
1958	1.5*	3.0*	7.0*	7.5*	30	37	44	10.5	5.5	1.1	.4	.5	.4
1959	1.7	3.0*	14	20*	90	54	21	7.9	6.6	1.4	1.2	2.8	1.2
1960	4.6	2.5*	6.0*	5.0*	10*	15*	28	12.5	3.2	.6	.5	1.2	.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
1953	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1954	509	Dec. 19, 1953	0.2	19.9	.....	.....	14,480	18.9	.....	13,710
1955	926	Feb. 9, 1955	0	29.4	.....	.....	21,280	42.1	.....	30,480
1956	1,790	Dec. 21, 1955	.5	83.0	.....	.....	60,240	71.4	5.13	51,800
1957	826	Feb. 27, 1957	.4	31.4	0.166	2.25	22,740	32.1	2.32	23,250
1958	2,080	Feb. 13, 1958	.4	39.1	.207	2.81	28,330	43.9	3.14	31,750
1959	1,730	Jan. 27, 1959	1.2	58.1	.307	4.15	42,030	52.4	3.74	37,920
1960	564	Feb. 7, 1960	.5	27.9	.148	2.01	20,260	.....	.....	.....

* 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 bridge on State Highway 11B at Hooper and 0.4 mile upstream from Cow Creek.

Drainage area.—2,540 sq. mi., approximately.

Records available.—April to August 1897 (gage heights only), September 1897 to December 1899, April 1900 to April 1907, June 1908 to July 1912, March 1913 to March 1916, February 1951 to September 1960. Prior to 1904, sometimes published as "near Hooper".

Gage.—Water-stage recorder. Altitude of gage is 1,040 ft. (from topographic map). Apr. 1 to Aug. 31, 1897, staff gage at site 2½ miles upstream at different datum. Sept. 9, 1897, to March 1916, various staff gages at site 1½ miles upstream from present site at different datums. Feb. 8 to Mar. 28, 1951, staff gage at present site and datum.

Average discharge.—22 years (1897-99, 1900-1906, 1908-11, 1913-15, 1951-60), 625 cfs (452,500 acre-ft. per year).

Extremes.—1897-1916, 1951-60: Maximum discharge, 29,800 cfs Mar. 2, 1910 (gage height, 22.00 ft., from graph based on gage readings, site and datum then in use); no flow for part of June 25, 1910.

Remarks.—No regulation. Diversions above station for irrigation and domestic and municipal use.

Revisions.—Reivsed figures of discharge, in cubic feet per second, for the water year 1910, superseding figures published in State WSB No. 6, are given herewith:

MONTH	Mean	Runoff in acre-feet
January 1910	1,220	.....
February	1,940	.....
Water year 1909-10	1,050	762,000
Calendar year 1910	1,040	752,000

Correction.—The date of the maximum discharge for water year 1906 is published in error in State WSB No. 6; it should be Feb. 21, 1906.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	45.9	99.4	392	675	1,809	1,135	970	417	254	81.3	36.7	59.9	489
1955	72.5	120	153	513	754	896	1,523	898	226	80.8	16.7	21.2	437
1956	92.6	349	2,101	2,145	1,181	3,488	2,051	961	282	93.8	35.4	38.2	1,072
1957	75.9	119	283	146*	1,469	2,191	1,451	1,335	319	71.5	31.0	20.4	621
1958	60.7	89.1	311	862	2,687	1,036	2,042	648	174	63.7	12.8	17.9	651
1959	59.1	224	723	3,014	1,707	1,844	1,204	672	258	62.8	29.1	72.3	819
1960	151	319	251	270*	1,324	1,273	1,252	492	182	34.8	15.6	34.5	462

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	32	58	147	190*	926	680	615	248	130	45	23	35	23
1955	58	85	90*	196	291	200*	992	491	94	39	6.3	9.0	6.3
1956	38	73*	364	750*	450*	1,130	1,060	384	178	44	23	31	23
1957	42	99	68	75*	130*	1,110	660	553	131	40	16	15	15
1958	37	63	96	160*	1,020	645	1,040	240	99	25	68	7.2	6.6
1959	33	65	224	350*	1,040	1,240	818	374	122	22	15	40	15
1960	106	80*	180*	110*	200*	200*	675	370	84	9.7	7.4	18.5	7.4

* Estimated.

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
	Discharge	Date					
1953						648	469,300
1954	4,260	Jan. 31, 1954	23	489	353,900	472	342,000
1955	4,140	Feb. 8, 1955	0.3	437	316,400	623	451,200
1956	15,200	Dec. 22, 1955	23	1,072	778,200	898	651,700
1957	11,100	Feb. 27, 1957	15	621	449,300	619	448,300
1958	7,760	Feb. 13, 1958	6.6	651	471,500	697	504,800
1959	11,400	Jan. 28, 1959	15	819	593,200	795	575,500
1960	3,990	Feb. 9, 1960	7.4	462	335,600		

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.

Records available.—August 1913 to September 1917, April to September 1938, October 1939 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,000 ft. above mean sea level, unadjusted. Prior to Oct. 1, 1938, staff gages at about same site at different datums.

Average discharge.—25 years (1913–17, 1939–60), 98.4 cfs (71,240 acre-ft. per year).

Extremes.—1937-17, 1938, 1939-60: Maximum discharge, 2,610 cfs Dec. 28, 1945 (gage height, 17.85 ft.), from rating curve extended above 620 cfs by logarithmic plotting; minimum observed, 16 cfs Oct. 11-15, 1939.

Remarks.—No regulation. City of Walla Walla diverts about 22 cfs 4 miles above station for municipal use.

Revision.—The momentary maximum discharge for the water years 1914-16 published in State WSB No. 6 have been revised to 499, 460, and 840 cfs, respectively.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	37.5	51.0	154	136	148	93.8	165	88.3	123	41.5	37.8	36.6	92.2
1955	38.5	42.4	45.3	57.7	70.2	80.5	170	177	89.3	38.9	29.3	30.1	72.3
1956	35.2	78.5	198	147	80.3*	174	222	156	58.8	35.5	31.7	30.4	104
1957	38.0	49.8	127	43.5*	129	188	198	156	50.6	38.7	34.9	34.2	90.4
1958	37.8	53.1	132	148	271	95.6	270	183	56.1	37.3	33.4	34.0	111
1959	35.6	103	222	256	135	150	167	131	72.3	41.5	35.8	47.5	116
1960	69.8	115	74.7	67.7	141*	152	153	123	62.5	34.4	40.7	40.8	89.2

* Estimated.

Mill Creek near 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
1954	34	35	68	65*	113	64	63	64	55	36	34	36	34
1955	35	35	37	40	48	41	112	123	48	34	28	28	28
1956	27	35*	73	90	55*	82	151	69	42	32	30	29	27
1957	34	40	35*	34*	39*	101	115	72	43	37	34	34	34
1958	36	36	50	62	164	62	90	80	43	34	33	33*	33*
1959	32	33	56	100*	92	107	94	84	49	37	32	34	32
1960	47	66	64	35*	60*	55*	102	84	40	29	38	39	29

YEAR	WATER YEAR ENDING SEPTEMBER 30					CALENDAR YEAR	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1953							
1954	678	Dec. 20, 1953	34	92.2	66,710	114	82,490
1955	410	April 10, 1955	28	72.3	52,350	82.3	59,590
1956	1,300	Dec. 22, 1955	27	104	75,570	88.0	63,670
1957	874	Dec. 11, 1956	34	90.4	65,450	96.0	69,680
1958	1,380	April 20, 1958	33	111	80,580	91.1	65,960
1959	924	Dec. 11, 1958	32	116	84,330	123	88,940
1960	386	Mar. 30, 1960	29	89.2	64,790	108	78,090

* Estimated.

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.

Records available.—October 1939 to September 1960.

Gage.—Water-stage recorder. Concrete control since July 25, 1948. 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.—21 years (1939-60), 15.7 cfs (11,370 acre-ft. per year).

Extremes.—1939-60: Maximum discharge, 725 cfs Dec. 28, 1945 (gage height, 53.35 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 regulation or diversion.

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
1954...	1.13	3.75	26.8	31.7	27.2	11.6	23.1	4.02	14.6	1.55	1.31	1.12	12.2
1955...	1.38	2.59	3.93	8.96	10.3	11.9	38.3	21.9	2.68	1.50	.71	1.05	8.73
1956...	2.50	17.0	44.9	37.8	18.0	49.0	35.8	22.2	3.34	.97	.98	.89	19.5
1957...	2.02	5.55	18.4	5.54*	34.9	51.9	36.0	24.3	3.44	1.00	.96	1.04	15.3
1958...	1.45	5.11	26.1	33.8	47.0	21.2	69.6	11.7	2.99	1.20	.95	1.30	18.3
1959...	1.52	10.9	33.5	57.2	39.8	35.9	34.6	22.3	5.23*	1.13*	.99*	2.56*	20.4
1960...	5.49	9.51	6.73*	9.15*	30.1	29.0	28.1	22.8	6.53	1.09	.85*	.84	12.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0.8	1.2	7.0	8.8	16	7.4	6.6	1.9	3.1	1.0	0.7	1.0	0.7
1955...	.9	1.9	2.4	3.5	4.2	4.0	23	6.0	1.8	.9	.6	.6	.6
1956...	1.2	2.0*	18.5	17	10*	24	17.5	4.8	1.4	.6	.5	.7	.5
1957...	1.3	3.4	3.0*	2.0*	6.9	26	13.5	8.5	1.4	.8	.8	.8	.8
1958...	1.2	1.2	5.7	12	30	11.5	25	3.9	1.9	.8	.8	1.0	.8
1959...	1.3	1.4	4.5	18*	29	22	18.5	8.9	1.8*	.9*	.7*	1.1*	.7*
1960...	3.3	2.0*	5.5*	2.0*	5.0*	3.5*	12	10.5	2.8	.5	.5	.6	.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
1953								17.8	14.22	12,880
1954	215	Jan. 28, 1954	.7	12.2	.718	9.75	8,840	10.2	8.13	7,380
1955	64	April 22, 1955	.6	8.73	.514	6.99	6,319	13.5	10.80	9,760
1956	403	Dec. 12, 1955	.5	19.5	1.15	15.64	14,170	16.3	13.05	11,830
1957	240	Dec. 11, 1956	.8	15.3	.900	12.24	11,070	15.9	12.70	11,490
1958	262	April 21, 1958	.8	18.3	1.08	14.61	13,250	19.4	15.48	14,050
1959	222	Jan. 27, 1958	.7	20.4	1.20	16.28	14,760	18.3	14.65	13,280
1960	90	Feb. 8, 1959	.5	12.4	.729	9.95	9,020			

* Estimated.

Mill Creek at Walla Walla, Wash.

Location.—Lat. 46°04'40", long. 118°16'10", in NE¼NW¼ sec. 23, T. 7 N., R. 36 E., on left bank 400 ft. downstream from diversion dam and 1½ miles east of Walla Walla.

Drainage area.—96 sq. mi., approximately.

Records available.—April 1941 to September 1960.

Gage.—Water-stage recorder and artificial control. Datum of gage is 1,165.49 ft. above mean sea level (Corps of Engineers bench mark). April 1941 to June 11, 1941, staff gage and June 11, 1941, to Jan. 22, 1957, water-stage recorder, at sites 0.8 mile downstream at different datum.

Extremes.—1941-60: Maximum discharge, 2,760 cfs Dec. 28, 1945 (gage height, 4.0 ft., site and datum then in use); no flow on Nov. 2, 1954, Oct. 3-5, 1957, and part of each day Oct. 15, 18-20, Oct. 29 to Nov. 1, Nov. 3, 1954, Feb. 19, 20, 1958.

Mill Creek at Walla Walla, Wash.—Continued

Remarks.—Some regulation at diversion dam 400 ft. above station where water is diverted into Yellowhawk and Garrison Creeks for stock and irrigation. Water is diverted 1 mile upstream into Mill Creek Reservoir for flood control with release of stored waters after flood into Russell Creek and is also diverted as required to replenish losses from seepage and evaporation from small recreation pool maintained in the reservoir. City of Walla Walla diverts water for municipal supply several miles upstream. Other small diversions above station for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	6.03	11.4	142	122	153	60.4	143	32.7	114	4.48	4.29	3.60	65.5
1955...	2.29	6.90	12.9	25.6	30.0	45.5	179	160	26.0	6.35	2.34	3.43	41.7
1956...	3.63	51.2	247	180	83.5*	234	193	107	23.2	6.68	1.25	0.69*	94.7
1957...	5.22	8.40	110*	33.7*	169	243	194	125	8.74	2.60	2.29	2.16	74.9
1958...	1.00	7.51	119	169	295	75.0	293	121	25.3	4.0*	2.0*	2.37	91.3
1959...	.74	63.6	205	277	152	180	167	97.2	17.4	1.26	1.24	8.11	97.4
1960...	21.8	56.2	42.2	44.6*	149	154	148	95.8	13.0	3.03	3.99	2.67	60.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.2	3.2	40	45	77	31	31	10	8.2	2.7	2.6	3.2	2.6
1955...	1.0	0	3.7	5.2	8.7	4.5*	65	91	5.9	2.6	1.3	1.3	0
1956...	1.6	1.0	65	74	35*	78	74	31	11	1.9	.3	.4*	.3
1957...	0	3.3	2.0*	30*	35*	125	49	34	2.6	2.1	1.7	1.7	0
1958...	.4	.7	11	49	128	51	89	47	.....	.....	.....	1.2	.4
1959...	.2	.3	6.5	112	89	112	30	34	1.6	1.0	1.0	.7	.2
1960...	1.6	15*	35	20*	40*	40*	70	21	2.4	2.4	2.9	2.4	1.6

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					
1953.....	.....	.....	.....	.....	.....	101	73,410
1954.....	594	①	2.6	65.5	47,430	53.9	39,010
1955.....	456	April 10, 1955	.0	41.7	30,170	65.3	47,290
1956.....	967	Dec. 22, 1955	.3	94.7	68,760	79.8	57,900
1957.....	908	Dec. 11, 1956	.0	74.9	54,210	75.2	54,420
1958.....	1,220	April 20, 1958	.4	91.3	66,110	103	74,760
1959.....	908	Jan. 27, 1959	.2	97.4	70,550	84.8	61,380
1960.....	444	Feb. 8, 1960	1.6	60.7	44,100	.....	.....

* Estimated.
① Dec. 20, 1953, Jan. 29, 1954.

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.

Records available.—January 1949 to September 1960.

Gage.—Water-stage recorder. Concrete control since July 25, 1949. Altitude of gage is 1,200 ft. (from topographic map).

Dry Creek near Walla Walla, Wash.—Continued

Average discharge.—11 years (1949-60), 23.4 cfs (16,940 acre-ft. per year).

Extremes.—1949-60: 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 measurements of peak flows at gage heights 9.0 and 11.6 ft., minimum, 0.2 cfs Aug. 4, 1949.

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

Revisions.—Some figures of discharge for the water years 1952 and 1953 have been revised; the records published in State WSB No. 6 thus affected are given herewith:

MONTH	Mean	Runoff in acre-feet	Discharge (cfs)	Date
February 1952	78.8			
Water year 1951-52	23.6	17,130	1,360	Feb. 2, 1952
Calendar year 1952	19.5	14,170		
January 1953	50.0			
March	53.3			
Water year 1952-53	21.3	15,400	875	Jan. 31, 1953

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	2.31	7.35*	35.8	43.0	41.1	21.7	30.6	9.26	21.5	3.22	2.19	2.07	18.2
1955	2.97	5.05	6.57	12.0	15.3	16.6	46.4	32.6	8.80*	2.34	0.75	1.79	12.6
1956	4.52	20.7	68.4	53.9	28.5*	77.8	50.3	26.7	7.92	2.68*	1.68	1.76	28.8
1957	3.98	7.48	22.5	6.48*	52.1	68.5	46.6	32.9	7.95	2.56	1.73	1.78	21.0
1958	4.58	8.49	33.9	46.2*	64.9	31.0	98.9	33.6	9.07*	3.65	1.64	2.71	27.9
1959	3.71	12.9	38.0	68.5	48.7	53.2	45.7	26.1	10.5	3.03*	2.56	5.61	26.4
1960	5.95	13.6	12.0	14.3*	36.9	37.3	32.5	28.6	7.84	1.91	1.80	2.18	16.2

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1.4	2.7	12*	13*	27	14.5	14	5.3	6.3	1.1	0.8	1.4	0.8
1955	1.9	3.4	3.6	5.6	8.6	5.0*	30	15*	3.1*	1.1	.4	.4	.4
1956	2.5	4.5*	24	24	15.5*	34	21	9.4	4.2	1.6*	.8	1.4	.8
1957	2.5	5.3	3.0	2.3*	13	36	23	11	3.6	1.4	1.1	.9	.9
1958	3.7	3.7	7.2	13	35	18	41	12	5.5*	1.5	1.2	1.6	1.2
1959	2.1	3.4	8.8	17*	34	36	26	13	5.5	2.1	1.8	2.5	1.8
1960	3.2	3.0*	9.6	3.5*	4.0*	3.0*	19.5	13	3.4	1.1	1.1	1.6	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					
1953						24.2	17,540
1954			.8	18.2	13,180	15.6	11,280
1955	127	April 22, 1955	.4	12.6	9,090	19.2	13,920
1956	590	Dec. 12, 1955	.8	28.8	20,930	23.8	17,270
1957	615	May 17, 1957	.9	21.0	15,200	22.1	16,010
1958	955	Feb. 12, 1958	1.2	27.9	20,200	28.5	20,670
1959	635	April 1, 1959	1.8	26.4	19,140	24.5	17,720
1960	124	May 20, 1960	1.1	16.2	11,720		

* Estimated.

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., 50 ft. upstream from Dayton water-supply headworks, three-quarters of a mile downstream from mouth of Wolf Creek, 3 miles upstream from confluence with South Fork, and 4 miles southeast of Dayton.

Drainage area.—102 sq. mi.

Records available.—April 1941 to September 1951, September 1956 to September 1960. April to September 1941 published as Touchet River near Dayton.

Gage.—Water-stage recorder. Datum of gage is 1,868.3 ft. above mean sea level (river-profile survey). April 1941 to September 1951 at site 200 ft. upstream at same datum.

Average discharge.—14 years (1941-51, 1956-60), 124 cfs (89,770 acre-ft. per year).

Extremes.—1941-51, 1956-60: Maximum discharge, 1,530 cfs about Jan. 7, 1948 (gage height, 5.28 ft., from recorded range in stage); minimum, that of Jan. 4, 1960.

Remarks.—No regulation. Small diversions above station for irrigation during summer months. City of Dayton diverts about 1.2 mgd in summer and 0.4 mgd in winter for municipal water supply at the station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40.9	.....
1957...	49.1	66.2	123	51.5*	162*	252	248	228	87.9	52.8	45.8	42.8	117
1958...	48.7	49.0	120	141	247	125	315	256	103	55.9	44.0	43.7	128
1959...	54.1	142	252	236	179	180	197	158*	102*	52.4*	53.8	56.9	139
1960...	61.1	102	82.0	66.3*	160	157	215	173	88.8	51.2	50.1	48.1	104

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	38	.....
1957...	42	55	60*	27*	55*	171	164	125	61	50	42	40	27
1958...	42	42	53	88	140	107	142	152	78	47	42	40	40
1959...	42	46	121	120*	149	159	146	110*	63*	46	50	46	42
1960...	49	60*	69	20*	30	40*	147	136	64	46	45	45	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
1956.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1957.....	965	Feb. 26, 1957	27	117	1.15	15.67	84,760	115	15.36	83,560
1958.....	958	April 20, 1958	40	128	1.25	17.05	92,750	147	19.61	106,700
1959.....	1,010	Dec. 11, 1956	42	139	1.36	18.48	100,600	122	16.21	88,190
1960.....	330	Mar. 30, 1960	20	104	1.02	13.90	75,570	.....	.....	.....

* Estimated.

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 3E, a quarter of a mile southeast of Bolles and 3 miles west of Waitsburg.

Drainage area.—372 sq. mi.

Records available.—February 1924 to October 1929, April 1951 to September 1960.

Average discharge.—14 years (1924-29, 1951-60), 220 cfs (159,300 acre-ft. per year).

Gage.—Water-stage recorder. Altitude of gage is 1,150 ft. (from topographic map). Prior to Oct. 5, 1929, water-stage recorder at site half a mile upstream at different datum. Apr. 1 to May 6, 1951, staff gage at present site and datum.

Extremes.—1924-29, 1951-60: 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 (gage height, 0.42 ft., site and datum then in use).

Remarks.—Diurnal fluctuation and some regulation at low flow caused by operation of flour mill at Waitsburg. Numerous small diversions for municipal and domestic use and for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	49.1	107	334	377	476	237	408	192	201	58.3	46.4	53.6	210
1955...	58.4	68.9	75.5	105	137	190	454	376	163	53.4	28.7	39.1	145
1956...	69.6	209	690	545	181*	600	626	418	158	61.3	45.8	47.0	305
1957...	69.8	82.6	210	79.4*	356	574	503	367	95.0	40.5	36.8	34.2	203
1958...	51.7	68.3	243	315*	533*	245	607	377	70.9	39.3	28.6	37.8	216
1959...	59.6	248	545	595	419	391	350	231	130	45.8	41.5	64.1	259
1960...	97.7	167	129	107*	310*	406	457	327	133	43.9	39.6	37.9	187

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	34	57	90	20*	300	134	168	112	87	40	31	45	20
1955...	45	54	54	57	83	45	295	256	61	34	20	22	20
1956...	45	30*	240	150*	80*	230	379	255	84	37	31	26	26
1957...	61	68	70*	44*	100*	368	293	173	54	30	30	26	26
1958...	39	39	66	176*	270*	173	149	105	52	30	26	29	26
1959...	43	55	151	230*	296	264	171	138	69	34	34	42	34
1960...	67	60*	90*	50*	60*	70*	279	240	61	36	31	30	30

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					
1953						242	174,800
1954	1,810	Jan. 28, 1954	20	210	151,800	185	134,200
1955	925	April 10, 1955	20	145	105,300	210	152,100
1956	3,410	Dec. 12, 1955	26	305	221,700	254	184,700
1957	2,390	Feb. 26, 1957	26	203	147,000	203	147,100
1958	2,420	April 20, 1958	26	216	156,200	257	185,900
1959	2,790	Jan. 27, 1959	34	259	187,700	221	159,700
1960	1,220	Mar. 30, 1960	30	187	135,900		

* Estimated.

Touchet River near Touchet, Wash.

Location.—Lat. 46°07'25", long. 118°39'00", in SE¼SW¼ sec. 35, T. 8 N., R. 33 E., at Johnson Bridge, 6 miles north of Touchet, and 7 miles upstream from mouth.

Drainage area.—733 sq. mi.

Records available.—April 1941 to September 1955. Annual maximum discharge only, water years 1956-59.

Gage.—Wire-weight gage read once daily. Altitude of gage is 530 ft. (from topographic map). Prior to July 3, 1941, staff gage and July 3, 1941, to June 23, 1954, water-stage recorder at site 2½ miles downstream at different datum. October 1955 to 1959, stilling well and crest-stage gage only, at same site and datum.

Average discharge.—14 years (1941-55), 242 cfs (175,200 acre-ft. per year).

Extremes.—1941-59: Maximum discharge, 13,300 cfs Feb. 10, 1949 (gage height, 14.7 ft., from high-water mark in gage house, site and datum then in use), by contracted-opening method at Johnson Bridge.
1941-55: Minimum discharge, 6.0 cfs Sept. 11, 1951.

Remarks.—Many large diversions above station for irrigation of an estimated 3,500 acres. Occasional regulation from unknown source.

Revisions.—The momentary maximum discharge for the water year 1950 published in State WSB No. 6 has been revised to 4,050 cfs, from high-water mark.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	47.3	89.5	365	436*	480	251	402	201	199	47.5	36.5	45.8	215
1955...	54.1	69.3	84.6	146	155	208	539	419	161*	55.2	22.6	32.7	162

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	42	50	113	80*	330*	164	164	140	84	26	23	35	23
1955...	42	56	62	80	98	80*	334	217	60*	25	14.5	15.5	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					
1953						254	183,600
1954			23	215	155,700	190	137,600
1955	952	April 13, 1955	14.5	162	117,200		

* Estimated.

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.

Records available.—October 1951 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 405 ft. (from topographic map). Prior to Nov. 27, 1951, staff gage at same site and datum.

Average discharge.—8 years (1952-60), 596 cfs (431,500 acre-ft. per year).

Extremes.—1951-60: 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 measurement at gage height 13.81 ft.; minimum, that of Aug. 18, 1960.

Maximum stage known, 13.81 ft. in February 1949, from floodmarks (discharge, 23,800 cfs).

Remarks.—Records good except those below 25 cfs or those for periods of ice effect, which are fair. Many diversions above station for irrigation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	77.6	172	924	964	1,300	770	974	298	471	41.0	34.4	70.7	503
1955...	103	171	287	484	503	518	1,134	1,048	296	45.6	11.7	32.7	392
1956...	139	528	1,807	1,576	861*	1,686	1,539	1,052	189	35.5	22.6	48.8	792
1957...	103	215	805	334*	1,177	1,730	1,559	1,217	142	15.7	12.6	20.4	608
1958...	164	184	711	963*	1,872	737	2,165	1,147	166	26.3	6.58	28.8	672
1959...	64.9	436	1,317	1,888	1,389	1,287	1,154	687	207	27.6	16.3	181	718
1960...	336	531	490	470*	1,069	1,157	1,076	761	162	9.72	11.3	35.1	507

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	51	89	262	350*	950*	465	412	186	84	20	18.5	38	18.5
1955...	74	120	180	392	480	282	686	600	76	14	5.3	7.7	5.3
1956...	83	100*	730	700	250*	844	748	437	67	12.5	12	31	12
1957...	67	138	228	200*	420*	1,020	620	393	30	10	9.2	9.6	9.2
1958...	114	104	187	420*	1,130	482	910	450	53	5.3	3.5	5.8	3.5
1959...	37	72	350	650*	844	862	560	362	51	11	5.8	24	5.8
1960...	240	250*	427	300*	400*	380*	555	463	28	4.2	6.0	18.5	4.2

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					
1953						638	462,100
1954	3,680	①	18.5	503	364,000	451	326,300
1955	2,390	April 10, 1955	5.3	392	283,700	553	400,600
1956	8,240	Feb. 22, 1956	12	792	575,200	679	492,700
1957	5,480	Feb. 27, 1957	9.2	608	439,900	602	436,000
1958	5,980	April 21, 1958	3.5	672	486,300	735	532,500
1959	5,950	Jan. 28, 1959	5.8	718	520,000	679	491,500
1960	3,010	Jan. 30, 1960	4.2	507	367,800		

* Estimated.
① Jan. 29 or 30, 1954.

Columbia River at The Dalles, Ore.

Location.—Lat. 45°36'10", long. 121°10'40", in NW¼ sec. 3, T. 1 N., R. 13 E., at upstream end of Port of The Dalles dock at The Dalles, 3.2 miles downstream from The Dalles Dam and at mile 189.3. Prior to Mar. 16, 1957, at site 11.7 miles upstream.

Drainage area.—237,000 sq. mi., approximately.

Records available.—June 1878 to September 1960. Published as "near The Dalles" 1936-56. Maximum discharge only for each year in period 1858 to 1877 at Lower Cascades Landing, published in State WSB No. 6.

Gage.—Water-stage recorder. Auxiliary water-stage recorder 19.3 miles downstream at Hood River. Datum of both gages is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1931, records based on staff gage near present site at datum 46.98 ft. higher, supplemented for a few short periods by gage-height records at Umatilla and Cascade Locks. Oct. 1, 1931, to May 1, 1935, staff gage in entrance to Celilo Canal 11.6 miles upstream at datum 37.71 ft. higher. May 2, 1935, to Mar. 15, 1957, water-stage recorder at site 11.7 miles upstream at datum 0.12 ft. higher.

Average discharge.—82 years (1878-1960), 195,300 cfs (141,400,000 acre-ft. per year).

Extremes.—1858-1960: Maximum discharge, 1,240,000 cfs June 6, 1894 (gage height, 59.6 ft., site and datum then in use); minimum observed, 35,000 cfs Jan. 12, 1937 (gage height, 126.0 ft., site and datum then in use).

Remarks.—Some regulation by Franklin D. Roosevelt Lake and by reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Chelan, Yakima, and Snake River basins. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many 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
1954...	100,900	102,300	103,900	112,400	124,700	131,800	159,100	376,600	502,800	421,400	215,400	151,900	209,100
1955...	109,600	112,800	103,200	102,200	108,400	118,600	142,500	200,600	448,100	403,400	181,300	113,500	179,000
1956...	103,300	124,800	152,900	153,900	129,200	167,600	340,000	530,000	639,100	306,000	158,700	115,400	243,400
1957...	109,400	109,400	113,000	112,600	120,300	149,500	188,900	517,700	479,400	203,300	125,900	96,230	194,100
1958...	99,550	95,330	96,650	99,970	148,900	152,100	210,200	395,500	453,400	201,200	120,600	96,530	180,700
1959...	99,260	109,900	128,800	146,700	144,700	159,400	209,300	349,000	511,500	359,400	166,300	152,700	211,600
1960...	174,800	162,700	143,000	117,400	125,200	132,500	261,400	299,300	386,200	287,500	151,400	102,500	195,300

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	90,400	89,900	85,200	99,500	110,000	113,000	121,000	175,000	473,000	313,000	186,000	121,000	85,200
1955...	99,200	102,000	86,700	92,500	99,000	114,000	128,000	145,000	243,000	277,000	122,000	105,000	86,700
1956...	95,900	106,000	111,000	123,000	116,000	119,000	219,000	414,000	445,000	232,000	130,000	103,000	95,900
1957...	103,000	95,900	91,800	87,400	91,500	92,000	160,000	206,000	284,000	158,000	108,000	77,000	77,000
1958...	85,000	80,000	82,000	88,000	102,000	120,000	152,000	216,000	296,000	144,000	102,000	93,000	80,000
1959...	94,200	95,400	106,000	104,000	121,000	151,000	166,000	274,000	415,000	266,000	119,000	123,000	94,200
1960...	147,000	124,000	116,000	104,000	103,000	96,200	185,000	188,000	308,000	178,000	98,200	85,600	85,600

Columbia River at The Dalles, Ore.—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
1953								184,000	10.54	133,200,000
1954	570,000	May 23, 1954	85,200	209,100	.882	11.97	151,400,000	210,600	12.06	152,500,000
1955	548,000	June 26, 1955	86,700	179,000	.755	10.25	129,600,000	183,600		133,000,000
1956	823,000	June 2, 1956	95,900	243,400			176,700,000	239,300		173,700,000
1957	705,000	May 22, 1957	77,000	194,100			140,500,000	190,700		138,100,000
1958	593,000	May 31, 1958	80,000	180,700			130,800,000	184,700		133,700,000
1959	555,000	June 23, 1959	94,200	211,600			153,200,000	223,600		161,800,000
1960	470,000	June 6, 1960	85,600	195,300			141,800,000			

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.

Records available.—October 1944 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,720 ft. (from river-profile map).

Average discharge.—16 years (1944-60), 344 cfs (249,000 acre-ft. per year).

Extremes.—1944-60: Maximum discharge, 3,280 cfs May 27, 1948 (gage height, 4.28 ft.); minimum, 4.4 cfs Feb. 1, 1957 (result of freezeup, discharge measurement); minimum gage height recorded, 0.89 ft. Nov. 27, 1957.

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
1954	100	143	263	173*	167	227	480	1,176	908	538	221	129	378
1955	130	182	142	129	128	116	170	607	1,009	351	142	103	267
1956	206	404	424	230	161*	164	735	1,714	1,190	494	207	138	506
1957	131	161	295	106*	269	231	444	1,027	405	162	104	78.6	285
1958	93.2	96.1	131	138	250	232	418	1,238	567	190	100	90.8	296
1959	118	304	420	381	219	187	499	689	660	267	119	134	338
1960	242	291	204	146*	202	245	523	751	716	237	117	89.8	313

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	91	94	151	120*	135*	162	176	458	782	310	158	105	91
1955	105	110	110*	116	110*	102	106	158	520	211	106	88	88
1956	99	254	224	160*	138	115*	220	965	736	264	165	115	99
1957	109	124	140*	5*	4.5*	186	235	647	232	120	87	72	4.5*
1958	78	80	93	108	131	167	211	609	271	128	85	78	78
1959	83	104	259	251	160	170	318	531	401	153	102	97	83
1960	118	118	147	118	147	118	323	475	412	144	100	77	77

* Estimated.

Klickitat River above West Fork, near Glenwood, 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
1953								342	30.71	247,300
1954	2,150	May 19, 1954	91	378	2.50	34.03	274,000	374	33.61	270,700
1955	1,730	June 10, 1955	88	267	1.77	24.03	193,500	316	28.39	228,800
1956	3,220	May 20, 1956	99	506	3.35	45.62	367,400	469	42.28	340,400
1957	1,980	May 9, 1957	4.5	285	1.89	25.59	206,000	262	23.57	189,800
1958	1,830	May 23, 1958	78	296	1.96	26.57	214,100	344	30.95	249,300
1959	1,100	Dec. 3, 1958	83	338	2.24	30.40	244,800	324	29.16	234,800
1960	1,470	May 12, 1960	77	313	2.07	28.22	227,400			

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.

Records available.—June to September 1905 and July 1907 to June 1908 (discharge measurements only), October 1909 to September 1960 (November 1956 to June 1957, monthly discharge only). Prior to Oct. 29, 1909, published as "above and below Big Muddy River, near Klickitat."

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, at site 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, at site 50 ft. downstream. Nov. 7, 1928, to Sept. 30, 1934, at present site at datum 1 ft. higher.

Average discharge.—51 years (1909-60), 847 cfs (613,200 acre-ft. per year).

Extremes.—1909-60: 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.—All low-water flow of Hellroaring Creek, a tributary of Big Muddy Creek, is diverted for irrigation of about 7,000 acres below station in the 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
1954	414	507	782	557	575	792	1,315	2,277	1,933	1,391	702	510	982
1955	497	602	485	441	415	381	516	1,260	2,222	1,031	509	401	730
1956	608	1,106*	1,280*	734	529	580	1,694	2,989	2,445	1,355	690	517	1,212
1957	487	550	860	410	810	720	1,160	2,130	1,090	560	398	355	794
1958	395	406	482	502	903	725	1,073	2,565	1,442	711	491	409	842
1959	444	900	1,035	1,035	688	595	1,148	1,503	1,390	714	448	462	864
1960	709	745	601	451	634	683	1,245	1,645	1,660	720	460	387	828

* Estimated.

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
1954...	388	388	537	400	450	586	649	1,270	1,690	924	555	466	388
1955...	440	433	378	396	338	344	390	520	1,380	735	408	354	338
1956...	372	740*	850*	506	466	426	780	2,150	1,810	850	592	473	372
1957...	456	.....	.....	.....	.....	.....	.....	.....	.....	.....	350	320*	.....
1958...	350	358	406	397	498	555	651	1,380	847	550	396	364	350
1959...	376	418	710	650	556	555	858	1,260	922	515	390	386	376
1960...	430	422	450	370	446	454	898	1,110	1,010	535	418	363	363

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
1953	.....	.....	.....	.....	.....	.....	.....	897	33.74	648,000
1954	3,380	May 19, 1954	388	982	2.73	37.02	710,000	972	36.63	703,400
1955	3,500	June 10, 1955	338	730	2.03	27.52	528,700	849	32.00	614,500
1956	4,920	May 20, 1956	372	1,212	3.37	45.82	879,700	1,120	42.35	813,300
1957	.....	.....	.....	794	2.21	29.93	574,900	742	27.99	537,400
1958	3,700	May 23, 1958	350	842	2.34	31.74	609,300	933	35.20	675,700
1959	2,230	Dec. 3, 1958	376	864	2.40	32.58	625,300	837	31.55	605,700
1960	2,800	May 12, 1960	363	828	2.30	31.28	600,800	.....	.....	.....

* Estimated.

Little Klickitat River near Goldendale, Wash.

Location.—Lat. 45°48'45", long. 120°46'50", in SW¼ sec. 10, T. 4 N., R. 16 E., on left bank 150 ft. upstream from highway bridge, 2½ miles northeast of Goldendale, 7½ miles downstream from Emerson Creek, and 13 miles upstream from mouth.

Drainage area.—78 sq. mi., approximately.

Records available.—October 1910 to June 1912, October 1946 to September 1951. October 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,690 ft. (by altimeter). Prior to July 1, 1912, staff gage 40 ft. upstream from present highway bridge at different datum. Oct. 21, 1946, to Feb. 11, 1951, water-stage recorder at site 250 ft. downstream at different datum, destroyed by flood of Feb. 11, 1951. Apr. 11 to Sept. 30, 1951, staff gage just downstream from highway bridge at different datum. Oct. 27, 1957, to Sept. 30, 1958, staff gage just upstream from highway bridge at same datum.

Average discharge.—9 years (1910-11, 1946-51, 1957-60), 64.5 cfs (46,700 acre-ft. per year).

Extremes.—1910-12, 1946-51, 1957-60: 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.

Remarks.—Several small diversions for domestic use and irrigation of 35 acres above station. No regulation.

Little Klickitat River near Goldendale, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	4.88*	7.90	58.1	170	302	81.1	108	83.6	24.5	6.05	1.99	2.65	69.5
1959...	3.89	31.8	3.2	178	72.1	80.5	101	37.5	18.4	4.16	1.36	2.84	49.5
1960...	4.40	5.57	9.16	8.58*	50.8	106	120	62.3	28.6	4.83	1.60	1.29	33.4

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958...	4*	4.0	8.4	29	133	46	68	54	12.5	33	1.3	1.4	1.3
1959...	2.5	4.4*	25	37	47	54	48	25	9.6	1.8	1.0	1.0	1.0
1960...	2.6	3.5*	5.4	6.0*	15	18*	64	39	11	2.1	1.1	1.0	1.0

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
1958.....	1,020	Feb. 15, 1958	1.3	69.5	.891	12.09	50,300	71.8	12.50	51,980
1959.....	692	Jan. 11, 1959	1.0	49.5	.635	8.60	35,850	42.8	7.45	30,990
1960.....	511	Mar. 29, 1960	1.0	33.4	.428	5.84	24,250	.....	.....	.....

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.

Records available.—November 1944 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 576.2 ft. above mean sea level (river-profile survey). Prior to Dec. 29, 1950, staff gage and crest-stage indicator at same site and datum.

Average discharge.—15 years (1945-60), 190 cfs (137,600 acre-ft. per year).

Extremes.—1944-60: Maximum discharge, 7,000 cfs Jan. 7, 1948 (gage height, 9.40 ft., from high-water mark), from rating curve extended above 2,600 cfs; minimum observed, 15.5 cfs Aug. 11, 1960; minimum gage height observed, 1.24 ft. Aug. 25, 26, 27, 1945.

Remarks.—Small diversions above station for irrigation of 600 acres. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	38.2	53.4	191	288	606	447	371	225	122	62.0	37.3	38.6	204
1955...	43.6	46.8	40.2*	63.7	72.9	99.0	187	204	109	42.4	21.8	26.2	79.6
1956...	40.6	188	881	897	353	556	587	325	149	61.4	45.6	43.1	345
1957...	46.4	51.1	69.1	52.4*	155*	525	303	161	59.5	32.2	26.3	28.1	126
1958...	42.5	45.4	149	418	743	259	259	194	77.6	36.1	24.9	31.6	180
1959...	35.6	82.1	143	394	225	200	203	90.6	51.2	25.8	20.8	29.3	125
1960...	38.0	39.9	44.5	43.4*	165	263	261	161	74.4	24.6	19.1	24.2	96.1

* Estimated.

Little Klickitat River near Wahkiacus, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	35	37	52	110	206	272	255	162	88	40	35	35	35
1955...	38	32	29*	54	54	54	132	154	64	29	18	17.5	17.5
1956...	32	45	212	400*	220*	280	406	225	82	49	37	39	32
1957...	39	47	46	45*	44*	280	185	92	42	26	24	24	24
1958...	36	40	46	94	349	178	195	131	52	27	23	26	23
1959...	28	40	71	88	160	142	129	64	37	18.5	18.5	19.5	18.5
1960...	33	34	37	32*	59	65	160	112	38	16.5	16	22	16

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					
1953						198	143,300
1954	2,410	Feb. 21, 1954	35	204	147,800	191	138,400
1955	304	April 13, 1955	17.5	79.6	57,600	162	117,600
1956	5,500	Dec. 21, 1955	32	345	250,400	265	192,700
1957	2,290	Mar. 9, 1957	24	126	90,970	132	95,330
1958	2,830	Feb. 16, 1958	23	186	135,000	188	136,300
1959	1,910	Jan. 12, 1959	18.5	125	90,560	113	82,180
1960	1,050	Mar. 29, 1960	16	96.1	69,780		

* Estimated.

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 3½ miles south of Pitt, 5 miles upstream from Silvias Creek, and 7 miles upstream from mouth at Lyle.

Drainage area.—1,290 sq. mi., approximately.

Records available.—July 1909 to January 1912, October 1928 to September 1960. Published as "at Klickitat" 1909-12 and as "at Pitt" 1928-35.

Gage.—Water-stage recorder. Datum of gage is 288.9 ft. above mean sea level (river-profile survey). July 3, 1909, to Jan. 31, 1912, staff gage at Klickitat just downstream from Snider Creek, 7 miles upstream at different datum. Oct. 1, 1928, to Sept. 30, 1935, staff gage at site 175 ft. downstream from highway bridge at Pitt, 3.5 miles upstream from present site at different datum.

Average discharge.—34 years (1909-11, 1928-60), 1,591 cfs (1,152,000 acre-ft. per year).

Extremes.—1909-12, 1928-60: 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 mostly in vicinity of Glenwood. The largest of these is Hellroaring Irrigation Canal which, at times, diverts the entire flow of Hellroaring Creek, a tributary of Big Muddy Creek. No regulation.

Klickitat River near Pitt, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	747	870	1,510	1,756	2,941	2,779	3,398	3,348	2,619	1,833	1,041	874	1,969
1955...	904	1,047	936	932	935	1,018	1,478	2,025	2,539	1,335	844	703	1,230
1956...	972	1,825	4,231	3,773	1,940	3,030	4,926	5,235	3,595	1,963	1,208	1,027	2,815
1957...	903	915	1,175	867	1,214*	2,730	2,498	2,926	1,518	967	769	711	1,435
1958...	796	766	1,204	2,072	3,889	2,036	2,361	3,374	1,928	1,097	842	764	1,747
1959...	789	1,400	1,700	2,655	1,757	1,676	2,201	2,099	1,876	1,113	800*	867	1,576
1960...	1,118	1,130	974	803	1,562	1,857	2,656	2,470	2,140	1,075	785	712	1,437

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	715	715	935	1,130	1,400	2,080	2,060	2,330	2,330	1,270	925	826	715
1955...	827	854	791	863	836	755	1,240	1,350	1,620	1,020	746	702	702
1956...	728	1,080	1,910	2,100	1,550	1,770	3,600	3,930	2,650	1,360	1,110	970	728
1957...	845	827	827	740*	700*	1,980	2,010	2,080	1,160	800	718	673	673
1958...	719	693	755	960	2,260	1,510	1,810	2,380	1,240	910	728	702	693
1959...	719	755	1,160	1,220	1,510	1,410	1,730	1,850	1,390	881	720*	728	719
1960...	818	873	836	719	971	935	2,080	2,020	1,420	872	728	676	676

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
1953	.....	.....	.....	.....	.....	.....	.....	1,847	19.45	1,337,000
1954	7,980	Feb. 21, 1954	715	1,969	1.53	20.72	1,425,000	1,948	20.51	1,410,000
1955	4,020	June 11, 1955	702	1,230	.953	12.95	890,200	1,579	16.62	1,143,000
1956	19,800	Dec. 22, 1955	728	2,815	2.18	29.70	2,043,000	2,476	26.12	1,797,000
1957	6,800	Mar. 9, 1957	673	1,435	1.11	15.09	1,039,000	1,416	14.89	1,025,000
1958	7,410	Feb. 16, 1958	693	1,747	1.35	18.38	1,265,000	1,840	19.37	1,332,000
1959	6,470	Jan. 12, 1959	719	1,576	1.22	16.58	1,141,000	1,520	15.99	1,101,000
1960	5,530	Mar. 30, 1960	676	1,437	1.11	15.18	1,043,000	.....	.....	.....

* Estimated.

WHITE SALMON RIVER BASIN

White Salmon River below Cascades Creek, near Trout Lake, Wash.

Location.—Lat. 46°06'10", long. 121°36'10", in SW¼ sec. 7, T. 7 N., R. 10 E., on right bank 100 ft. downstream from Cascades Creek and 7½ miles northwest of Trout Lake.

Drainage area.—32.4 sq. mi.

Records available.—July 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 3,080 ft. (from topographic map).

Extremes.—1957-60: Maximum discharge, 551 cfs May 26, 1958 (gage height, 3.27 ft.); minimum, 60 cfs Nov. 29, 1957; minimum gage height, 1.39 ft. Oct. 31, 1958.

Remarks.—No regulation or diversion above station.

White Salmon River below Cascades Creek, near Trout Lake, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	106	94.7	.....
1958	78.9	84.1	106	113	166	115	165	294	273	188	129	92.9	150
1959	85.4	176	199	221	119	90.6	142	184	219	167	122	124	154
1960	161	158	133	97.6	132	114	177	228	260	167	116	87.9	153

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	76	.....
1958	65	62	74	84	106	90	93	190	215	158	99	80	62
1959	72	73	144	150	93	82	115	148	186	131	99	89	72
1960	102	102	106	83	95	78	124	167	207	140	95	76	76

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
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1958	551	May 26, 1958	62	150	4.67	63.53	108,800	166	69.63	120,300
1959	452	Dec. 2, 1958	72	154	4.75	64.59	111,600	154	64.32	111,200
1960	431	Oct. 22, 1959	76	153	4.72	64.12	110,800	.....	.....	.....

White Salmon River above Trout Lake Creek, near Trout Lake, Wash.

Location.—Lat. 46°01'50", long. 121°31'50", in SE¼ sec. 3, T. 6 N., R. 10 E., on right bank 2 miles north of town of Trout Lake, 2½ miles downstream from Wicky Creek, and 3 miles upstream from Trout Lake Creek.

Drainage area.—64.9 sq. mi.

Records available.—June 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,050 ft. (from topographic map).

Extremes.—1959-60: Maximum discharge, 523 cfs Oct. 22, 1959 (gage height, 3.07 ft.); minimum, 137 cfs Jan. 10, 1960 (gage height, 1.84 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
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	236	200	203	.....
1960	246	240	219	175	238	216	356	385	392	261	204	169	258

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	207	177	170	.....
1960	178	164	136	150	178	161	272	318	307	227	180	155	150

White Salmon River above Trout Lake, near Trout 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
1959										
1960	615	Oct. 22, 1959	150	258	3.98	54.19	187,500			

Trout Lake Creek near Trout Lake, Wash.

Location.—Lat. 46°00'20", long. 121°32'20", in SW¼ sec. 15, T. 6 N., R. 10 E., on right bank a quarter of a mile downstream from Trout Lake and 1 mile northwest of town of Trout Lake.

Drainage area.—69.3 sq. mi. (revised).

Records available.—September 1909 to October 1911 (published as Trout Creek at Guler), June 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 2,000 ft. (from river-profile map). Sept. 16, 1909, to Oct. 31, 1911, staff gage at about same site at different datum.

Extremes.—1909-11, 1959-60: Maximum discharge, 1,580 cfs Nov. 25, 1909 (gage height, 7.31 ft., from graph based on gage readings, datum then in use); minimum, 38 cfs Sept. 30, 1960 (gage height, 0.86 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
1959										88.9	45.2	86.0	
1960	215	257	239	127*	333	239	111	622	450	105	59.9	45.1	266

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959										51	40	40	
1960	69	80	144	90*	160*	122	327	430	207	66	47	39	39

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
1959										
1960	985	Nov. 23, 1959	39	266	3.84	52.24	193,100			

* Estimated.

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 Lake Creek and 2 miles southeast of town of Trout Lake.

Drainage area.—185 sq. mi. (revised).

Records available.—July to September 1918 (published as "near Guler"), October 1928 to September 1931, August 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,870 ft. (from river-profile map). July 17 to Sept. 30, 1918, chain gage half a mile downstream at different datum. Oct. 14, 1928 to Sept. 30, 1931, staff gage 250 ft. upstream at different datum.

Average discharge.—6 years (1928-31, 1957-60), 348 cfs (251,900 acre-ft. per year).

Extremes.—1918, 1928-31, 1957-60: Maximum discharge observed, 3,000 cfs Apr. 1, 1931 (gage height, 5.2 ft., site and datum then in use); minimum observed, 35 cfs Aug. 26, 1931 (gage height, -0.06 ft., site and datum then in use).

Remarks.—Very slight regulation. Diversions above station for irrigation of about 3,100 acres of farm land.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.9	85.0	.....
1958	147	237*	419	462	836	472	753	890	472	185	117	99.6	421
1959	142	677	657	875	461	350	597	580	432	167	104	193	436
1960	416	456	429	278	548	433	797	904	667	198	115	90.8	443

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	71	74	.....
1958	109	147	220*	288	499	338	382	703	275	133	102	83	83
1959	83	142	465	441	328	295	435	429	244	110	93	91	83
1960	188	234	312	214	318	277	553	690	355	125	101	81	81

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					
1957	.....	.....	.....	.....	.....	.....	.....
1958	2,480	April 20, 1958	83	421	304,900	477	345,400
1959	1,540	Nov. 21, 1958	83	436	315,300	421	304,900
1960	1,260	Nov. 23, 1959	81	443	321,600	.....	.....

* Estimated.

White Salmon River at B-Z Corner, Wash.

Location.—Lat. 45°51'45", long. 121°30'15", in NW¼SW¼ sec. 1, T. 4 N., R. 10 E., on left bank 0.8 mile north of B-Z Corner and 1¼ miles downstream from Wieberg Creek.

Drainage area.—269 sq. mi.

Records available.—July 1958 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 705.30 ft. above mean sea level (levels by Klickitat County Public Utility District No. 1).

Extremes.—1958-60: Maximum discharge, 2,410 cfs Jan. 12, 1959 (gage height, 4.26 ft.), from rating curve extended above 1,100 cfs; minimum, 320 cfs Oct. 6, 1958 (gage height, 0.88 ft.).

Remarks.—Diversions for irrigation of about 4,500 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
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	479	412	.....
1959	380	932	978	1,467	1,028	877	1,056	1,000*	599	562	415	487	838
1960	626	640	627	466	898	823	1,322	1,502	1,129*	658	515	394	799

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	441	384	.....
1959	335	342	760	790	875	805	880*	865	713	465	365	362	335
1960	414	399	500	405	622	598	1,100	1,250	830*	552	472	355	355

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					
1958	.....	.....	.....	.....	.....	.....	.....
1959	2,410	Jan. 12, 1959	335	838	607,000	806	583,200
1960	1,900	May 13, 1960	355	799	580,000	.....	.....

* Estimated.

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.—294 sq. mi. (revised).

Records available.—September 1909 to October 1919, October 1929 to October 1941, August 1957 to September 1960.

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 at different datums.

White Salmon River at Husum, Wash.—Continued

Average discharge.—25 years (1909-19, 1929-41, 1957-60), 969 cfs (701,500 acre-ft. per year).

Extremes.—1909-19, 1929-41, 1957-60: 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.—Several diversions for irrigation of about 4,500 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
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	642	566	.....
1958	593	611	935	1,147	1,775	1,322	1,588	1,609	1,250	828	665	602	1,072
1959	575	1,107	1,195	1,648	1,239	1,120	1,258	1,194	1,080	759	618	686	1,038
1960	825	821*	829	674	1,202	1,108	1,521	1,610	1,324	877	722	604	1,008

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	576	548	.....
1958	548	522	586	795	1,260	1,190	1,200	1,390	1,020	712	619	579	522
1959	530	533	924	1,040	1,120	1,030	1,080	1,060	910	658	576	578	530
1960	616	599	700	602	866	827	1,320	1,400	1,070	756	685	563	563

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					
1957	.....	.....	.....	.....	.....	.....	.....
1958	3,610	April 20, 1958	522	1,072	776,100	1,133	820,600
1959	2,730	Jan. 12, 1959	530	1,038	751,700	1,005	727,500
1960	2,210	Feb. 8, 1960	563	1,008	731,800	.....	.....

* Estimated.

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 Pacific Power and Light Co.'s Condit powerplant, and 2 miles north of Underwood and mouth.

Drainage area.—386 sq. mi. (revised).

Records available.—October 1912 to February 1913 (published as "at Condit Dam, near Underwood"), March 1915 to September 1930, September 1935 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 112.96 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to March 1913, reference point at dam, 1 mile upstream at different datum. March 1915 to July 16, 1918, water-stage recorder at site 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.—40 years (1915-30, 1935-60), 1,106 cfs (800,700 acre-ft. per year).

White Salmon River near Underwood, Wash.—Continued

Extremes.—1912-13, 1915-30, 1935-60: 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.—Water diverted to irrigate about 4,500 acres in the Trout Lake area. Low and medium flows regulated by powerplant of the Pacific 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
1954...	666	811	1,463	1,442	1,838	1,808	1,833	1,797	1,680	1,210	880	774	1,347
1955...	751	911*	813	899	960	925	1,149	1,257	1,608	1,076	778	734*	987
1956...	900	1,607	2,349	2,010	1,313	1,812	2,269	2,565	2,506	1,640	1,136	936	1,755
1957...	851	835	1,252	812	1,056	1,915	1,793	1,748	1,090	807	677	594	1,120
1958...	619	641	1,121	1,521	2,433	1,494	1,804	1,728	1,279	852	692	629	1,226
1959...	613	1,226	1,375	2,056	1,454	1,377	1,488	1,299	1,137	795	655	711	1,180
1960...	870	870	873	719	1,528	1,411	1,928	1,775	1,401	890	750	623	1,134

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	542	580	926	1,110	1,050	1,430	1,390	1,350	1,460	910	820	688	542
1955...	678	569*	719	781	765	780*	1,000	978	1,260	913	696	650*	569*
1956...	625	936	1,460	1,520	1,200	1,230	1,860	2,140	2,130	1,250	980	854	625
1957...	778	743	711	696	642	1,430	1,510	1,240	936	696	564	410	410
1958...	416	406	558	900	1,600	1,280	1,290	1,460	1,030	714	624	566	406
1959...	534	568	970	1,170	1,240	1,170	1,140	1,090	958	617	610	485	485
1960...	652	546	686	558	931	849	1,640	1,520	1,080	721	672	550	546

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					
1953						1,314	951,600
1954	4,410	Feb. 21, 1954	542	1,347	975,300	1,307	946,500
1955	2,330	June 11, 1955	569	987	714,900	1,188	859,800
1956	6,420	Dec. 22, 1955	625	1,755	1,274,000	1,595	1,158,000
1957	4,250	Feb. 26, 1957	410	1,120	810,900	1,073	777,100
1958	5,130	Jan. 29, 1958	406	1,226	887,700	1,295	937,700
1959	4,780	Jan. 12, 1959	485	1,180	854,600	1,130	818,300
1960	3,790	Feb. 8, 1960	546	1,134	822,800		

* Estimated.

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 a quarter of a mile downstream from Lava Creek at Willard.

Drainage area.—114 sq. mi. (revised).

Records available.—November 1903 to March 1905 (fragmentary), August 1905 to August 1906 (fragmentary), December 1944 to September 1960. Published as "below Lava Creek, near Cooks" 1903-06.

Gage.—Water-stage recorder. Altitude of gage is 1,230 ft. (from river-profile map). Prior to Aug. 6, 1906, nonrecording gage near present site at different datum.

Average discharge.—15 years (1945-60), 447 cfs (323,600 acre-ft. per year).

Extremes.—1903-06, 1944-60: Maximum discharge, 4,140 cfs Dec. 15, 1946 (gage height, 9.50 ft.), from rating curve extended above 2,500 cfs; minimum daily, 1.5 cfs Nov. 7, 1957.

Remarks.—Broughton Lumber Co. diversion, a quarter of a mile upstream, may at times carry as much as 30 cfs out of the basin to Columbia River. Slight regulation. Other diversions for water supply, irrigation, and hatchery purposes above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	42.4	109	799*	838*	772	639	780	511	483	403	259	124	483
1955...	67.1*	152*	350	421	440	308	529	464	481	432	266	136	337
1956...	206*	696*	1,153*	907	462	662	936	794	753	510	339	192*	635
1957...	109	148	402	330	416	711	684	443	338	207	87.5	28.2	325
1958...	16.2*	77.7	559	778*	1,038	557*	608*	492	379	256	109	32.5	405
1959...	14.1	392	662	942	634	586	539	405	309	233	115	61.2	407
1960...	154	216	327	260	734	514	770	545	464	318	156	64.4	375

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	24	16	280*	600*	434	530	538	483	448	332	182	77	16
1955...	52*	50*	242	299	268	246	403	414	436	342	193	95*	50*
1956...	75*	390*	830*	625	358	360	736	742	640	423	260	140*	75*
1957...	80	119	131	265	246	530	535	408	288	130	49	14.5	14.5
1958...	3.5*	1.5*	122	500*	781	450	420*	403	352	174	59	12.5	1.5*
1959...	4.8	5.7	441	592	473	461	363	345	281	178	73	48	4.8
1960...	49	137	209	197	393	281	612	459	593	239	101	38	38

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					
1953						519	375,900
1954	3,560	Dec. 9, 1953	16	483	349,600	450	326,100
1955	1,560	Dec. 30, 1954	50	337	243,600	461	333,900
1956			75	635	461,000	518	376,200
1957	2,160	Feb. 26, 1957	14.5	325	235,100	324	234,900
1958	2,140	Dec. 26, 1957	1.5	405	293,100	439	318,100
1959	2,240	Jan. 12, 1959	4.8	407	294,500	376	272,000
1960	2,110	Feb. 7, 1960	38	375	272,100		

* Estimated.

Little White Salmon River above Lapham Creek, near Willard, Wash.

Location (revised).—Lat. 45°46'00", long. 121°37'40", on line between secs. 11 and 12, T. 3 N., R. 9 E., on right bank 0.2 mile upstream from Lapham Creek and 1.2 miles south of Willard.

Drainage area.—117 sq. mi. (revised).

Records available.—September 1949 to September 1960. Prior to October 1957, published as "below Lapham Creek, near Willard."

Gage.—Water-stage recorder. Altitude of gage is 980 ft. (from river-profile map).

Average discharge.—11 years (1949-60), 538 cfs (389,500 acre-ft. per year).

Extremes.—1949-60: Maximum discharge, 3,610 cfs Jan. 9, 1953 (gage height, 5.98 ft.); minimum, 28 cfs Oct. 29, 1958; minimum gage height, 1.35 ft. Oct. 31, 1952.

Remarks.—Broughton Lumber Co. diversion, 1¼ miles upstream, may at times carry as much as 30 cfs out of 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
1954...	106	165	912	957	860	777	889	569	539	456	314	188	560
1955...	136	219	422	488	506	375	598	519	531	479	321	194	398
1956...	262	832	1,408	1,074	522	785	1,095	901	853	569	408	255	748
1957...	164	204	474	429	535	818	777	741	451	281	170	99.9	411
1958...	84.5	158	732	963	1,281	690	746	593	463	317	160	88.4	519
1959...	69.3	498	818	1,145	790	738	685	515	397	312	184	122	522
1960...	235	303	426	344	908	665	963	678	576	442	270	149	494

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	86	70	318	685	504	605	615	540	494	356	238	149	70
1955...	120	116	307	363	328	300	470	470	490	398	250	149	116
1956...	139	454	1,010	690	423	441	859	835	722	488	319	205	139
1957...	132	170	183	350*	325	595	610	520	366	208	130	82	82
1958...	70	68	212	590	978	545	505	490	427	222	116	68	68
1959...	58	60	535	730	590	575	475	435	364	254	135	101	58
1960...	108	216	293	268	500	380	762	585	505	368	198	111	108

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					
1953	.....	.....	.....	.....	.....	587	425,300
1954	2,750	Dec. 9, 1953	70	560	406,200	525	380,200
1955	1,770	Feb. 8, 1955	116	398	288,200	543	393,100
1956	3,520	Nov. 27, 1955	139	748	543,100	609	442,200
1957	2,310	Feb. 26, 1957	82	411	297,800	423	306,000
1958	2,080	Dec. 26, 1957	68	519	375,400	553	400,000
1959	2,180	Jan. 12, 1959	58	522	377,700	486	352,200
1960	2,230	Feb. 7, 1960	108	494	358,900	.....	.....

* Estimated.

Little White Salmon River near Cook, Wash.

Location.—Lat. 45°43'30", long. 121°38'05", in NE¼NE¼ sec. 36, T. 3 N., R. 9 E., on left bank 1 mile upstream from mouth and 1½ miles northeast of Cook.

Drainage area.—134 sq. mi.

Records available.—September 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 150 ft. (from topographic map). Oct. 4 to Nov. 10, 1909, staff gage at hatchery half a mile downstream at different datum.

Extremes.—1956-60: Maximum discharge, 2,330 cfs Feb. 26, 1957 (gage height, 5.98 ft.); minimum, 98 cfs Oct. 29, 1958 (gage height, 0.58 ft.).

Remarks.—Broughton Lumber Co. diversion above station at times, carry as much as 30 cfs out of basin into Columbia River. Other diversions above station for water supply, irrigation, and hatchery purposes. Slight regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	209	252	579	474	587	1,004	917	629	485	326	194	137	482
1958...	128	197	770	973	1,311	751	789	648	511	365	210	140	562
1959...	120	553	840	1,159	835	806*	756	576	450	305	235	175	571
1960...	282	340	456	305	947	725	1,001	724	604	434	270	172	524

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	183	220	232	330*	382	786	744	566	425	240	159	126	126
1958...	116	114	259	664	975	611	569	545	470	275	166	121	114
1959...	109	109	604	768	674	660*	536	494	415	301	187	153	109
1960...	159	256	330	310	553	455	814	628	514	358	210	145	145

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					
1957	2,580	Feb. 26, 1957	126	482	349,100	487	352,600
1958	2,060	Dec. 26, 1957	114	562	406,600	596	431,700
1959	2,110	Jan. 12, 1959	109	571	413,100	534	386,700
1960	2,170	Feb. 7, 1960	145	524	380,500	.....	.....

* Estimated.

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.

Records available.—October 1944 to September 1960.

Gage.—Staff gage and crest-stage indicator. Datum of gage is 890.3 ft. (from river-profile survey).

Average discharge.—16 years (1944-60), 590 cfs (427,100 acre-ft. per year).

Extremes.—1944-60: 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.—Slight regulation by fish hatchery dam above station. All upstream diversions returned to stream above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	112	508	1,416	917	1,064	845	1,059	764	574	287	138	106	647
1955...	151	512	589	563	620	407	829	866	873	382	153	128	504
1956...	561	1,382	1,643	1,193	403	942	1,302	1,206	669	283	170	126	825
1957...	258	449	1,032	323	696	1,332	1,159	633	246	126	88.8	65.5	533
1958...	92.3	326	1,226	1,225	1,676	590	1,056	470	274	128	84.6	74.6	595
1959...	110	1,140*	1,050*	1,595	584	809	866	516*	325	157	96.0	223*	623
1960...	485*	554*	623*	387*	1,262	835	1,143	800	467*	183	120	97.8	576

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	85	95	611	536	390	542	561	552	454	172	114	92	85
1955...	89	119	356	337	353	296	573	573	558	234	114	98	89
1956...	123	470	781	650	335	351	842	888	411	180*	140	114	114
1957...	115*	285	249	219	236	696	722	343	166	101	74	60	60
1958...	66	79	390	462	932	430	502	366	176	102	72	69	66
1959...	62	92	540*	572	368	512	425	270*	232	112	82	82*	62
1960...	170	140*	270*	180*	434	355	845	600*	280*	132	102	82	82

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								693	87.12	501,700
1954	6,460	Dec. 9, 1953	85	647	5.99	81.29	468,200	580	72.92	420,000
1955	3,050	Dec. 31, 1954	89	504	4.67	63.41	365,200	700	88.02	506,900
1956	6,480	Dec. 21, 1955	114	825	7.64	104.01	599,000	671	84.61	487,300
1957	6,320	Feb. 26, 1957	60	533	4.94	67.02	386,100	526	66.05	380,500
1958	4,040	Dec. 26, 1957	66	595	5.51	74.79	430,700	648	81.51	469,400
1959	4,480	Jan. 12, 1959	62	623	5.77	78.29	450,900	570	71.68	412,800
1960	4,460	Feb. 7, 1960	82	576	5.33	72.62	418,300			

* Estimated.

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 northeast 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.

Records available.—October 1934 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 112.6 ft. above mean sea level (from river-profile survey).

Average discharge.—26 years (1934-60), 1,174 cfs (849,900 acre-ft. per year).

Extremes.—1934-60: 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.—Low flow occasionally affected by pondage at Forest Service powerplant on Trout Creek. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	278	1,268	3,241	2,054	2,484	1,744	2,239	1,305	1,014	556	323	259	1,390
1955...	367	1,136	1,411	1,244	1,413	973	1,823	1,740	1,660*	723	336	299	1,090
1956...	1,292	2,895	3,704	2,882	856	2,373	2,693	2,293	1,136	535	355	275	1,779
1957...	530	969*	2,028	650	1,618	2,585	2,076	1,043	503	291	214	174	1,053
1958...	248*	733	2,574	2,651	3,388	1,183	2,026	828	461*	265*	202*	183*	1,215
1959...	270	2,399	2,108	3,094	1,254	1,728	1,709	1,083	662	344	218	503	1,286
1960...	1,246	1,271	1,461	793	2,928	1,913	2,298	1,559	822	367	260	219	1,254

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	214	243	1,180	1,080	804	1,080	1,140	1,020	800	377	278	231	214
1955...	221	301	793	760	731	629	1,180	1,190	1,050*	471	267	237	221
1956...	203	924	1,680	1,210	720	862	1,790	1,550	730	378	300	260	260
1957...	258	580*	500*	444	560*	1,340	1,280	640	362	241	185	166	166
1958...	182	205	814	902	1,870	824	981	585	330*	220*	180*	170*	170*
1959...	163	251	1,200	1,320	850	1,090	801	611	430	263	192	188	163
1960...	339	305	650	362	836	709	1,580	1,170	516	278	220	188	188

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
1953								1,575	95.00	1,140,000
1954	14,600	Dec. 9, 1953	214	1,390	6.18	83.87	1,007,000	1,231	74.28	891,600
1955	8,330	Dec. 31, 1954	221	1,090	4.84	65.75	789,000	1,508	90.96	1,091,000
1956	18,500	Dec. 21, 1955	260	1,779	7.91	107.63	1,292,000	1,415	85.58	1,027,000
1957	12,300	Feb. 26, 1957	166	1,053	4.68	63.54	762,700	1,057	63.74	764,900
1958	9,160	Dec. 26, 1957	170	1,215	5.40	73.29	879,600	1,319	79.58	955,100
1959	9,500	Jan. 12, 1958	163	1,286	5.72	77.57	931,100	1,216	73.36	880,500
1960	11,500	Feb. 7, 1960	188	1,254	5.57	75.84	909,900			

* Estimated.

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 4 miles northeast of Washougal.

Drainage area.—108 sq. mi.

Records available.—September 1944 to September 1960.

Gage.—Staff gage and crest-stage gage. Altitude of gage is 175 ft. (from topographic map).

Average discharge.—16 years (1944-60), 900 cfs (651,600 acre-ft. per year).

Extremes.—1944-60: Maximum discharge, 17,700 cfs Dec. 9, 1953 (gage height, 15.56 ft.); minimum observed, 41 cfs Sept. 10, 1958; minimum gage height observed, 1.38 ft. Oct. 7, 1952, Sept. 10, 1953.

Remarks.—No regulation or diversion above station.

Revisions.—The momentary maximum discharge for the water year 1948 published in State WSB No. 6 has been revised to 8,900 cfs Jan. 7, 1948.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	251	1,268	2,920*	1,501	1,837	880	1,061	292	676	306	129	128	932
1955...	390	1,023	1,143	1,197*	1,134	953	1,747	1,046	452	253	127	160	799
1956...	2,269	2,431	2,262	2,161	763	2,132	1,328	534	336	149	153	112	1,139
1957...	921	888	1,894	413*	1,547	1,990	1,093	342	257	127	87.1	58.7	798
1958...	217	728	2,364	1,757	1,844	704	1,543	285	260	116	59.2	95.4	820
1959...	294	2,471	1,842*	1,951	959	1,351	1,074	760	530	167	75.1	727	1,015
1960...	1,342	985	910	623	1,762	1,296	1,290	1,104	355	132	127	127	834

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	121	265	950*	710	760	462	346	164	406	158	104	89	89
1955...	82	206	492	685	436	370	990	646	206	133	82	70	70
1956...	185	746	858	620	441	664	680	261	238	104	91	89	89
1957...	86	332	310	200*	746	996	485	244	176	80	66	48	48
1958...	64	128	563	464	884	505	464	165	128	76	48	42	42
1959...	66	225	677	850*	655	758	351	426	234	100	60	58	58
1960...	289	289	444	275	464	389	666	499	212	91	66	78	66

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
1953								1,174	147.50	849,600
1954	17,700	Dec. 9, 1953	89	932	8.63	117.10	674,000	772	97.10	559,200
1955	11,000	Feb. 8, 1955	70	799	7.40	100.42	578,400	1,084	136.27	784,900
1956	14,100	Dec. 11, 1955	89	1,139	10.5	143.51	826,600	952	119.94	690,900
1957	12,700	Mar. 7, 1957	48	798	7.39	100.30	577,800	765	96.15	553,800
1958	11,800	April 20, 1958	42	820	7.59	103.04	593,500	925	116.28	669,900
1959	12,500	Nov. 19, 1958	58	1,015	9.40	127.58	734,900	903	113.49	653,700
1960	10,100	Oct. 22, 1959	66	834	7.72	105.18	605,800			

* Estimated.

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.

Records available.—June 1951 to November 1955. Annual maximum discharge only, water years 1957 to 1960.

Gage.—Water-stage recorder. Altitude of gage is 115 ft. (from topographic map). December 1955 to 1960, stilling well or crest-stage gage only, at same site and datum.

Extremes.—1951-60: Maximum discharge, 1,620 cfs Jan. 18, 1953 (gage height, 7.73 ft.); 1951-55: Minimum discharge, 4.1 cfs Nov. 28, 1952 (gage height, 3.16 ft.).

Remarks.—Some 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
1954...	23.6	123	360	224	211	88.3	82.5	30.6	107	34.2	15.3	11.7	109
1955...	20.2	90.1	147*	150	151	121	224	67.6	32.4	22.8	14.1	17.2	87.6
1956...	132	335	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	7.8	23	105	82	106	42	38	18.5	53	18.5	12	7.4	7.4
1955...	7.0*	15.5	50	84	62	72	107	43	22	15	8.6	7.8	7.0*
1956...	13.5	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
1953.....	.....	.....	.....	.....	.....	.....	.....	135	77.12	97,900
1954.....	1,360	Dec. 9, 1953	7.4	109	4.58	62.08	78,800	87.7	50.02	63,480
1955.....	915	Feb. 8, 1955	7.0	87.6	3.68	49.98	63,440	.....	.....	.....
1956.....	1,260	Nov. 26, 1955	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

LAKE RIVER BASIN

Salmon Creek near Battle Ground, 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 Battle Ground.

Drainage area.—18.3 sq. mi.

Records available.—October 1943 to September 1960.

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 same site and datum.

Salmon Creek near Battle Ground, Wash.—Continued

Average discharge.—17 years (1943-60), 61.6 cfs (44,600 acre-ft. per year).

Extremes.—1943-60: Maximum discharge, 1,500 cfs Jan. 22, 1954 (gage height, 4.02 ft.), from rating curve extended above 440 cfs; minimum observed, 1.3 cfs Aug. 20, 22, 28-30, Sept. 5-9, 13, 14, 1949, Sept. 14-16, 22, 1951.

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
1954...	8.82	82.9*	226	185	121	53.9	52.2	15.9	49.0*	15.7	6.23	4.87	68.2
1955...	10.5	74.6	94.7*	98.2	98.9	81.1	134	31.1	16.9	12.4	4.95	5.55	54.8
1956...	84.5	200	201	181	110	154	48.6	19.0	19.2	6.98	7.09	4.88	86.4
1957...	48.7	70.8	113	51.5	106	139	70.7	21.2	14.7	5.63	3.33	2.25	53.7
1958...	4.98	25.5	180	124	138	55.9	104	21.0	14.6	6.52	2.41	4.47	56.3
1959...	5.90	122	117	170	121	74.8	52.6	58.8	48.4	12.0	4.23	9.09	66.0
1960...	53.8	84.7	80.3	71.4	116	85.1	102	91.9	21.4	6.53	4.89	5.00	60.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3.8	8.5*	71	56	47	24	20	9.0*	25	7.1	5.0	3.2	3.2
1955...	2.9	7.6	45*	52	36	44	62	18.5*	9.2	7.4	3.6	2.8	2.8
1956...	5.2	55	90	55	43	64	19.5	10.5	10.5	4.3	3.6	4.0*	3.6
1957...	4.1	29	25	23*	40	70	24	15*	8.4	3.2	2.2	1.8	1.8
1958...	2.4	3.7	43	41	68	38	30	10.5	6.5	2.7	2.0	1.9	1.9
1959...	3.0	4.7	49	70	70	40	18	25	18	4.9	3.0	3.1	3.0
1960...	7.4	18	46	34	38	34	43	40	10.5	4.1	2.9	3.3	2.9

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	.....	.....	.....	.....	.....	.....	.....	79.9	59.26	57,840
1954	1,500	Jan. 22, 1954	3.2	68.2	3.73	50.60	49,390	56.5	41.91	40,910
1955	708	Feb. 8, 1956	2.8	54.8	2.99	40.67	39,700	80.4	59.66	58,230
1956	1,080	Jan. 4, 1956	3.6	86.4	4.72	64.31	62,770	65.4	48.67	47,520
1957	588	Mar. 7, 1957	1.8	53.7	2.93	39.82	38,860	51.9	38.52	37,600
1958	525	April 20, 1958	1.9	56.3	3.08	41.76	40,780	59.0	43.73	42,690
1959	610	Jan. 23, 1959	3.0	60.0	3.61	48.94	47,780	63.9	47.36	46,250
1960	674	Nov. 22, 1959	2.9	60.0	3.28	44.65	43,570	.....	.....	.....

* Estimated.

Lewis River near Trout Lake, Wash.

Location.—Lat. 46°09'55", long. 121°52'10", in NW¼ sec. 24, T. 8 N., R. 7 E., on right bank half a mile downstream from Copper Creek, 1½ miles downstream from Quartz Creek, and 20 miles northwest of Trout Lake.

Drainage area.—120 sq. mi., approximately.

Records available.—October 1958 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,500 ft. above mean sea level, unadjusted.

Extremes.—1958-60: Maximum discharge, 4,610 cfs Nov. 23, 1959; minimum, 91 cfs about Oct. 6 or 7 (gage height, 18.30 ft., from recorded range in stage).

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
1959...	157*	1,510	1,178	1,339	454	457	976	1,126*	961*	350	171	328	751
1960...	910	934	684	379*	947	677	1,101	1,363	1,076*	331	179	134	724

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959...	100*	126	774	660	272	330	530	891	540	214	138	135	100*
1960...	280*	272	386	195*	310	252	666	898	580*	215*	152	111	111

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
1959.....	4,300	Nov. 12, 1958	100	751	6.26	84.93	543,500	725	82.06	525,200
1960.....	4,610	Nov. 23, 1959	111	724	6.03	82.12	525,600	.....	.....	.....

* Estimated.

Big Creek below Skookum Meadow, near Trout Lake, Wash.

Location.—Lat. 46°05'30", long. 121°51'30", in NE¼ sec. 13, T. 7 N., R. 7 E., on left bank just downstream from Skookum Meadow, 3 miles upstream from Lewis River and 17 miles northwest of Trout Lake.

Drainage area.—13.2 sq. mi.

Records available.—September 1927 to September 1931 (published as "below Skookum Meadow"), September 1955 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 3,213.00 ft. above mean sea level (levels by Pacific Power & Light Co.). Prior to September 1955, at site 100 ft. upstream at different datum.

Average discharge.—9 years (1927-31, 1955-60), 58.7 cfs (42,500 acre-ft. per year).

Big Creek below Skookum Meadow, near Trout Lake, Wash.—Continued

Extremes.—1927-31, 1955-60: Maximum discharge recorded, 766 cfs Mar. 31, 1931 (gage height, 5.1 ft., site and datum then in use), from rating curve extended above 230 cfs, but may have been 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 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
1956...	87.5	141	123	60.2	28.3*	43.6*	104	218	188	54.2	22.9	14.2	90.4
1957...	43.1	55.2	125	27.2*	31.0*	67.6	104	143	43.6	16.0	12.4	8.04	56.6
1958...	12.3	33.9	68.0	64.1	124	46.3	136	136	47.5	14.2	8.65	6.94	57.8
1959...	15.1	167	111	121*	39.2*	34.6	98.1	111	68.0	18.3*	9.90	30.3	68.7
1960...	76.2	79.1	56.2	26.7	62.4	47.0	88.7*	156	120	23.0	14.4	11.7	63.3

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	15.5	49	54	45*	24*	25*	40*	135	108	25	15.5	11	11
1957...	10.5	30	30	18*	.....	38	59	75	23	11	9.5	6.8	6.8
1958...	7.2	8.9	28	31	60	28	41	83	23	10	7.5	7.0	7.0
1959...	6.6	13	62	65*	28*	27*	52	77	29	11.5	11.5	8.7	6.6
1960...	26	22	31	16.5	25	22	53	79	46	14	10	8.4	8.4

Summary

YEAR	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
1956.....	489	Nov. 26, 1955	11	90.4	6.85	93.26	65,650	79.9	82.35	57,980
1957.....	502	Dec. 11, 1956	6.8	56.6	4.29	58.22	40,970	47.4	48.76	34,300
1958.....	579	April 20, 1958	7.0	57.8	4.38	59.50	41,880	72.7	74.79	52,650
1959.....	718	Nov. 12, 1958	6.6	68.7	5.20	70.65	49,750	62.0	63.72	44,870
1960.....	376	Nov. 23, 1959	8.4	63.3	4.80	65.28	45,950	.....	.....	.....

* Estimated.

Rush Creek above Meadow Creek, near Trout Lake, Wash.

Location.—Lat. 46°02'30", long. 121°50'30", in NE¼ sec. 6, T. 6 N., R. 8 E., on left bank 1 mile upstream from Meadow Creek, and 15 miles west of Trout Lake.

Drainage area.—5.97 sq. mi.

Records available.—September 1955 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 3,400 ft. (from topographic map).

Average discharge.—5 years (1955-60), 25.4 cfs (18,390 acre-ft. per year).

Extremes.—1955-60: Maximum discharge, 640 cfs Dec. 2, 1958 (gage height, 3.08 ft.); no flow Sept. 21-24, 28-30, 1960.

Remarks.—No regulation or diversion above station.

Rush Creek above Meadow Creek, near Trout Lake, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	45.8	47.6	39.2	3.43	1.09*	3.11*	14.4	69.4	97.9	96.3	7.87	0.28	35.7
1957...	11.7	14.5	49.8	1.14*	3.39*	15.2*	15.3	76.9	39.5*	0.61*	0.10	0.10	19.2
1958...	4.57	13.3	18.4	13.8	22.8	5.58	25.3	86.9	83.5	3.46	0.10	0.10	23.1
1959...	3.21	63.4	34.1	34.8*	3.19	2.75	18.1	44.7	78.6	14.5	0.10	18.9	26.4
1960...	32.1	29.5	12.6	4.79*	12.7	3.61*	16.5	43.1	95.0	23.0	1.09*	0.35	22.8

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	0.5	5*	3.0	1.4	0.9	0.8*	1.4	19	52	15	0.2	0.2	0.2
1957...	.1	1.5	.7*	.....	.....	1.3	1.7	4.0*	2.0*	.....	.1	.1	.1
1958...	.1	.1	1.2	1.4	3.0	1.2	1.2	30	18.5	.1	.1	.1	.1
1959...	.1	5.6	3.4	7*	.5	.9	2.6	13	42	.1	.1	.1	.1
1960...	.7	.7*	1.0	.4*	.9*	.8*	2.2	9.1	38	.1	.1	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
1956.....	499	Oct. 9, 1955	0.2	35.7	5.98	81.35	25,900	31.0	70.60	22,480
1957.....	451	Dec. 11, 1956	.1	19.2	3.22	43.59	13,870	15.8	35.92	11,430
1958.....	428	June 6, 1958	.1	23.1	3.87	52.45	16,710	28.4	64.58	20,570
1959.....	640	Dec. 2, 1958	.1	26.4	4.42	59.92	19,080	24.2	55.05	17,530
1960.....	560	Oct. 11, 1959	0	22.8	3.82	51.97	16,550	.....	.....	.....

* Estimated

Meadow Creek below Lone Butte Meadow, near Trout Lake, 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 Trout Lake.

Drainage area.—11.7 sq. mi.

Records available.—September to December 1927 (fragmentary), January 1928 to September 1931, September 1955 to September 1960. Prior to September 1955, published as "below Lone Butte Meadow."

Gage.—Water-stage recorder. Datum of gage is 3,226.84 ft. above mean sea level (levels by Pacific Power & Light Co.).

Average discharge.—8 years (1928-31, 1955-60), 91.2 cfs (66,030 acre-ft. per year).

Extremes.—1927-31, 1955-60: Maximum discharge, 330 cfs Dec. 11, 1956 (gage height, 2.20 ft.); minimum, 47 cfs Dec. 29-31, 1930, Jan. 1-3, 19-21, 1931.

Remarks.—No regulation or diversion above station.

Meadow Creek below Lone Butte Meadow, near Trout Lake, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	113	137	134	107	99.7	94.7	103	151	169	126	101	91.2	119
1957...	92.3	91.7	126	84.7	87.0	105	123	159	113	88.5	78.0	69.8	101
1958...	68.2	70.2	86.1	88.1	111	84.9	112	125	107	87.7	82.9	78.3	91.6
1959...	73.5	130	122	125	93.1	85.1	102	109	112	87.6	79.2	81.7	100
1960...	97.5	97.3	91.1	80.0	89.6	79.8	103	132	138	101	92.2	82.9	98.7

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	76	100*	104	100	93	89	91	115	146	105	95	88	76
1957...	81	84	79	81	79	93	99	130*	94	84	73	68	68
1958...	62	61	67	73	87	77	79	105	93	86	80	74	61
1959...	69	69	99	99	87	81	89	95	97	83	75	73	69
1960...	75	73	79	75	73	71	89	99	113	95	89	79	71

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
1956.....	273	Dec. 22, 1955	76	119	10.2	138.42	86,360	113	131.20	81,870
1957.....	330	Dec. 11, 1956	68	101	8.63	117.74	73,480	94.3	109.43	68,290
1958.....	292	April 20, 1958	61	91.6	7.83	106.23	66,280	100	115.97	72,360
1959.....	302	Nov. 12, 1958	69	100	8.55	115.98	72,380	96.7	112.21	70,020
1960.....	215	Nov. 23, 1959	71	98.7	8.44	114.87	71,690	.....	.....	.....

* 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. upstream from falls, 2 miles upstream from mouth, and 18 miles east of Cougar.

Drainage area.—26.0 sq. mi.

Records available.—December 1927 to September 1931 (published as Rush Creek above falls), October 1955 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,260.51 ft. above mean sea level (levels by Pacific Power & Light Co.). December 1927 to September 1931, water-stage recorder at same site at different datum.

Average discharge.—8 years (1928-31, 1955-60), 166 cfs (120,200 acre-ft. per year).

Extremes.—1927-31, 1955-60: Maximum discharge, 846 cfs Dec. 11, 1956 (gage height, 3.69 ft.); minimum, 79 cfs Jan. 24-27, 29, Nov. 6, 7, 1930.

Remarks.—No regulation or diversion above station.

Revisions.—The momentary maximum discharge for the water year 1929 published in State WSB No. 6 has been revised to 578 cfs Nov. 9, 1928.

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
1956...	215	272	258*	188*	171	168	162	295	384	333	189	158	235
1957...	167	163	238	145*	151*	179	195	303	226	145	126	111	179
1958...	109	120	150	146*	186*	142*	192*	297	265	138	123	112	165
1959...	109	268	223	239	156	137	181	221	260	153	123	145	184
1960...	177	160	162	136*	171	142	195	249	313	181	142	126	181

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	140	168	180	175*	164	154	164	185	351	206	165	151	140
1957...	144	141	140	140*	140*	144	153	254	158	134	118	108	108
1958...	100	97	108	116	141	130*	135*	208	167	129	117	105	97
1959...	99	108	150	156	136	127	138	176	198	128	118	112	99
1960...	113	112	132	125*	127	120	160*	172	246	146	134	118	112

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
1956.....	762	Oct. 9, 1955	140	235	9.04	122.80	170,300	220	115.15	159,700
1957.....	846	Dec. 11, 1956	108	179	6.88	93.66	129,900	163	85.32	118,300
1958.....	690	June 6, 1958	97	165	6.35	86.07	119,400	183	95.63	132,600
1959.....	762	Nov. 20, 1958	99	184	7.08	96.27	133,500	178	92.83	128,700
1960.....	718	Oct. 11, 1959	112	181	6.96	94.84	131,500	.....	.....	.....

Curly Creek near Cougar, Wash.

Location.—Lat. 46°02'05", long. 121°54'30", in NW¼ sec. 3, T. 6 N., R. 7 E., on right bank half a mile downstream from confluence of Hardtime and Outlaw Creeks, 4 miles upstream from mouth, and 18 miles east of Cougar.

Drainage area.—12.6 sq. mi.

Records available.—September 1955 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,489.85 ft. above mean sea level (levels by Pacific Power & Light Co.).

Average discharge.—5 years (1955-60), 65.0 cfs (4,710 acre-ft. per year).

Extremes.—1955-60: Maximum discharge, 417 cfs Dec. 22, 1955; maximum gage height, 3.25 ft. Apr. 20, 1958; minimum 8.8 cfs Oct. 4-7, 1958 (gage height, 0.83 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
1956...	72.8	132	129	77.8	41.4*	50.6*	88.8	167	162	74.6	27.6	20.0	87.0
1957...	28.9	53.3	109	35.5*	33.6*	86.3	104	127	45.1	21.1	13.5	12.4	56.1
1958...	10.4	29.2*	88.4	87.1	140	52.8	116	90.8	52.3	18.0	11.6	9.87	58.3
1959...	10.5	124	103	141	48.2	37.3	88.4	84.5	61.1	23.9	12.9	19.3	62.9
1960...	56.3	62.3	65.1	29.1	81.6	52.1*	110	124	85.9*	28.3	17.7	15.2	60.5

* Estimated.

Curly Creek 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
1956...	17.5	66	65	57	37*	37*	56*	109	117	35	22	18.5	17.5
1957...	17.5	39	33	23*	23*	48	78	72	28	16	12	10	10
1958...	9*	9*	30*	44	77	32	52	59	26	13	10.5	9.2	9*
1959...	8.8	10	64	73	27	26	53	55	40	15.5	11.5	11.5	8.8
1960...	19	27	39	20	39	26	75	81	54*	18.5	16	13	13

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
1956	417	Dec. 22, 1955	17.5	87.0	6.90	94.03	63,190	75.2	81.28	54,610
1957	345	Dec. 11, 1956	10	56.1	4.45	60.42	40,600	50.7	54.69	36,740
1958	412	April 20, 1958	9	58.3	4.63	62.78	42,160	67.3	72.53	48,730
1959	390	Nov. 20, 1958	8.8	62.9	4.99	67.70	45,510	58.4	62.93	42,300
1960	280	Nov. 22, 1959	13	60.5	4.80	65.34	43,900	.....	.....	.....

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.

Records available.—August 1927 to September 1934, October 1954 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,080 ft. (from river-profile map). August 1927 to September 1934 at datum 2.61 ft. lower.

Average discharge.—13 years (1927-34, 1954-60), 1,231 cfs (927,400 acre-ft. per year).

Extremes.—1927-34, 1954-60: Maximum discharge, 27,000 cfs Dec. 21, 1933 (gage height, 10.6 ft., from high-water marks, present datum), from rating curve extended above 6,000 cfs; minimum, 175 cfs Nov. 21, 1929; minimum gage height, -0.13 ft. Sept. 28, 29, 1934, datum then in use.

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
1955...	577	1,517	1,004	934	1,067	558	1,035	1,922	3,269	1,561	612	455	1,212
1956...	1,761	2,918	2,762	1,602	754	1,196	2,243	3,585	2,955	1,599	651	434	1,875
1957...	738	1,147	2,206	706*	988*	1,726	2,155	2,480*	1,035	511	373	295	1,200
1958...	331	671	1,579	1,714	2,529	1,029	2,162	2,243	1,184	521	356	297	1,209
1959...	337	2,678	2,117	2,661*	957*	960	1,771	1,847	1,587	654	374	619	1,381
1960...	1,478	1,597	1,386	775	1,830	1,314	2,104	2,453	1,936	679	423	344	1,356

* Estimated.

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
1955...	365*	473	830	635	620	473	740	850	2,110	974	455	362	362
1956...	410	1,150*	1,310	1,040	620	595	1,200	2,230	2,120	836	491	386	386
1957...	346	728	680	460*	500*	1,010	1,530	1,400*	635	406	309	271	271
1958...	256	274	734	818	1,460	698	954	1,610	692	414	320	262	256
1959...	253	306	1,350	1,350	645	734	1,010	1,390	921	446	326	323	253
1960...	545	561	819	480	732	610	1,420	1,640	1,150	475	373	300	300

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
1955.....	6,390	June 10, 1955	362	1,212	5.34	72.46	877,100	1,571	93.98	1,138,000
1956.....	9,500	Nov. 27, 1955	386	1,875	8.26	112.39	1,361,000	1,596	95.07	1,158,000
1957.....	6,900	Dec. 11, 1956	271	1,200	5.29	71.75	868,400	1,073	64.16	776,500
1958.....	8,210	April 20, 1958	256	1,209	5.33	72.27	874,900	1,420	84.89	1,028,000
1959.....	7,880	Nov. 12, 1958	253	1,381	6.08	82.54	999,500	1,327	79.32	960,400
1960.....	7,340	Nov. 23, 1959	300	1,356	5.97	81.31	984,300	.....	.....	.....

Muddy River below Clear Creek, near Cougar, Wash.

Location.—Lat. 46°06'50", long. 122°00'30", in SE¼SW¼ sec. 1, T. 7 N., R. 6 E., on right bank a quarter of a mile downstream from Clear Creek, 4 miles upstream from mouth, and 14¾ miles northeast of Cougar.

Drainage area.—131 sq. mi. At site August 1927 to September 1934, 136 sq. mi.

Records available.—August 1927 to September 1934, October 1954 to September 1960. Published as "near Cougar" 1927-34.

Gage.—Water-stage recorder. Altitude of gage is 1,200 ft. above mean sea level (from river-profile map). August 1927 to September 1934 at site 3 miles downstream at different datum.

Average discharge.—13 years (1927-34, 1954-60), 866 cfs (627,000 acre-ft. per year).

Extremes.—1927-34, 1954-60: Maximum discharge, 17,500 cfs Dec. 21, 1933 (gage height, 14.0 ft., from high-water marks, site and datum then in use), from rating curve extended above 4,500 cfs; minimum recorded, 94 cfs Dec. 5-7, 1929.

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
1955...	290	1,053	812	665	814	386	790	1,252	1,819*	789	292	228	763
1956...	958	2,057*	2,128	1,263	482	966	1,696	2,467	1,818	1,076	386	231	1,297
1957...	413	789	1,374	464	905	1,437	1,392	1,276	451	220	168	132	751
1958...	199	488	1,202	1,441	2,279	758	1,403	1,227	549	235	166	143	831
1959...	181	1,504	1,478	2,263	676	745	1,184	1,160	947	342	188	343	919
1960...	906	1,166	1,030	614	1,512	1,033	1,513	1,372	945	314	200	159*	893

* Estimated.

Muddy River below Clear Creek, 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
1955...	176	256	676	435	455	310	500*	622	1,150*	450	214	182	176
1956...	218	800*	980	767	369	364	886	1,590	1,260	542	258	199	199
1957...	179	527	432	280*	290	716	928	769	266	185	143	121	121
1958...	126	167	515	610	1,220	486	716	888	311	188	148	126	126
1959...	118	182	942	1,050	455	497	696	330	533	220	166	166	118
1960...	346	370	551	301	503	411	998	1,010	503	238	175*	140*	140*

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
1955	4,660	Nov. 19, 1954	176	763	5.82	79.06	552,400	1,014	105.08	734,200
1956	7,550	Dec. 22, 1955	199	1,297	9.90	134.72	941,400	1,063	112.49	786,000
1957	7,650	Feb. 26, 1957	121	751	5.73	77.85	543,900	694	71.88	502,200
1958	4,220	Feb. 25, 1958	126	831	6.34	86.11	601,700	937	97.04	678,100
1959	5,900	Jan. 12, 1959	118	919	7.02	95.20	665,200	915	94.76	662,100
1960	4,660	Feb. 7, 1960	140	893	6.82	92.78	648,200	.....	.....	.....

* Estimated.

Pine Creek near Cougar, Wash.

Location.—Lat. 46°02'30", long. 122°05'30", in E½ sec. 15, T. 7 N., R. 6 E., on right bank 2 miles upstream from mouth and 12½ miles east of Cougar.

Drainage area.—21.4 sq. mi.

Records available.—August 1957 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,330 ft. (from topographic map). Supplementary water-stage recorder on right bank at same datum used July 17 to Sept. 30, 1959.

Extremes.—1957-60: Maximum discharge, 921 cfs Jan. 24, 1959 (gage height, 4.06 ft.); minimum, 116 cfs Oct. 21, 1957 (gage height, 2.05 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
1957...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	132	.....
1958...	133	179	242	230	272	177	245	191	157	154	144	139	188
1959...	137	306	271	326	191	220	254	208	179	150	138	156	211
1960...	232	213	199	157	249	202	256	236	176	148	139	127	194

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	127	.....
1958...	116	122	180	161	199	160	180	173	145	145	141	133	116
1959...	121	134	201	218	175	191	191	178	158	142	136	131	121
1960...	152	143	146	135	158	150	217	207	156	141	133	117	117

Pine Creek near Cougar, Wash.—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
1957										
1958	710	April 19, 1958	116	188	8.79	119.23	136,100	201	127.65	145,700
1959	921	Jan. 24, 1959	121	211	9.86	134.12	153,100	206	130.54	149,000
1960	801	Feb. 7, 1960	117	194	9.07	123.66	141,100			

Swift Creek near Cougar, Wash.

Location.—Lat. 46°03'50", long. 122°11'30", in SW¼NE¼ sec. 28, T. 7 N., R. 5 E., on left bank 5 ft. downstream from logging road bridge, 0.1 mile upstream from mouth, and 5 miles east of Cougar.

Drainage area.—26 sq. mi., approximately.

Records available.—June 1924 to November 1933 (destroyed by flood of December 1933), August 1954 to July 1956.

Gage.—Water-stage recorder. Datum of gage is 652.55 ft. above mean sea level, datum of 1929. June 18, 1924, to Sept. 8, 1924, staff gage and Sept. 9, 1924, to Dec. 21, 1933, water-stage recorder at site 200 ft. upstream at different datum.

Average discharge.—10 years (1924-33, 1954-55), 201 cfs (145,500 acre-ft. per year).

Extremes.—1924-33, 1954-56: Maximum discharge 1,900 cfs Nov. 24, 1927 (gage height, 3.7 ft., site and datum then in use), from rating curve extended above 300 cfs; minimum, 80 cfs Sept. 17, 21, Oct. 7, 1924, Oct. 20, 1931.

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
1954											180	153	
1955	157	242	222	217	251	174	211	234	287	227	175	153	212
1956	272	424	423	384	230	291	288	326	312	234			

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954											163	141	
1955	134	139	166	190	190	154	187	187	228	187	163	129	129
1956	132	200	261	260	206	196	231	269	280	184			

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
1954										
1955	1,100	Feb. 8, 1955	129	212	8.15	110.70	153,500	254	132.55	183,800
1956	1,710	Dec. 11, 1955								

Swift Reservoir near Cougar, Wash.

Location.—Lat. 46°03'40", long. 122°11'45", in SW¼ sec. 28, T. 7 N., R. 5 E., near left bank in control room of Swift powerhouse on Lewis River, 5 miles east of Cougar.

Drainage area.—481 sq. mi.

Records available.—September 1958 to September 1960.

Gage.—Duplex water-stage recorder and long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.).

Extremes.—1958-60: Maximum contents, 755,600 acre-ft. on many days during each year; maximum elevation, 1,000.05 ft. Oct. 15, 1959, Apr. 15, 1960; minimum contents since reservoir was first filled, 533,400 acre-ft. Jan. 28 (elevation, 946.62 ft.).

Remarks.—Reservoir is formed by rock- and earth-fill dam completed in December 1958; storage began Sept. 29, 1958. Usable capacity, 447,000 acre-ft. between elevations 878 ft. (lower limit for economic operation) and 1,000 ft. (maximum operating limit). Dead storage, 308,580 acre-ft. Records given herein represent total contents. Water used for power. Records of stage and data from which capacity table was computed furnished by Pacific Power & 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
1959...	59,800	413,300	695,900	753,300	701,600	734,700	755,100	741,900	746,000	752,800	754,700	751,900	.....
1960...	728,900	746,900	729,800	571,200	700,800	687,100	750,500	754,200	738,800	751,400	755,100	732,900	.....

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.

Records available.—July 1910 to March 1912 (gage heights only), June 1924 to September 1958.

Gage.—Water-stage recorder. Datum of gage is 576.4 ft. above mean sea level (river-profile survey). July 1910 to March 1912, staff gage at approximately present site at different datum. June 19 to Aug. 25, 1924, staff gage, and Aug. 26, 1924, to Dec. 27, 1934, water-stage recorder, at present site at datum 2.0 ft. higher.

Average discharge.—34 years (1924-58), 2,888 cfs (2,091,000 acre-ft. per year).

Extremes.—1910-12, 1924-58: Maximum discharge, 54,000 cfs Dec. 21, 1933 (gage height, 15.7 ft., datum then in use), from rating curve extended above 17,000 cfs; no flow Sept. 30, 1958.

Maximum stage known since 1917, that of Dec. 21, 1933. Flood of Dec. 17 or 18, 1917, reached a stage of 14.0 ft. (discharge, 45,000 cfs).

Remarks.—Slight regulation at times from Swift Dam construction until Sept. 29, 1958 when dam was completed and reservoir began filling. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,154	3,404	6,477	3,774	5,029	3,623	4,718	5,166	4,742	2,958	1,364	1,048	3,611
1955...	1,310	3,451	2,951	2,500	2,971	1,593	3,062	4,335	6,106	2,945	1,315	1,092	2,794
1956...	3,753	7,078	7,115	5,106	2,236	3,847	5,457	7,205	5,887	3,519	1,625	1,038	4,497
1957...	1,843	2,836	4,935	1,805	2,715	4,715	4,213	4,687	2,077	1,122	905	733	2,718
1958...	885	1,740*	3,948*	4,478	6,820	2,610	4,934	4,104	2,287	1,222	906	777	2,865

* Estimated

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
1954...	922	1,050	2,680	2,370	2,410	2,270	2,230	2,900	3,980	1,760	1,130	915	915
1955...	892	1,090	2,270	1,630	1,710	1,280	2,280	2,280	4,200	1,920	1,070	910	892
1956...	1,030	3,020	3,940	3,130	1,870	1,860	3,500	5,230	4,380	2,060	1,200	934	934
1957...	878	1,890	1,680	1,200*	1,300	2,510	3,140	3,000	1,350	937	748	685	685
1958...	650	727	2,100*	2,250*	3,800	1,700	2,290	3,100	1,510	1,030	848	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
1953								3,805	107.39	2,755,000
1954	21,400	Dec. 9, 1953	915	3,611	7.51	101.92	2,615,000	3,329	93.95	2,410,000
1955	12,900	Nov. 18, 1954	892	2,794	5.81	78.85	2,023,000	3,653	103.10	2,645,000
1956	21,400	Nov. 27, 1955	934	4,497	9.35	127.26	3,265,000	3,803	107.62	2,761,000
1957	17,300	Feb. 26, 1957	685	2,718	5.65	76.72	1,968,000	2,463	69.51	1,783,000
1958			0	2,865	5.96	80.86	2,075,000			

Yale Reservoir near Yale, Wash.

Location.—Lat. 45°57'50", long. 122°20'00", in NE¼ sec. 32, T. 6 N., R. 4 E., at left end of Yale Dam on Lewis River just upstream from intake, 500 ft. upstream from powerhouse, 1 mile upstream from Canyon Creek, and 3 miles southeast of Yale.

Drainage area.—596 sq. mi.

Records available.—August 1952 to September 1960.

Gage.—Water-stage recorder and long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.). Prior to Feb. 1, 1954, indicating gage at same site and datum.

Extremes.—1952-60: Maximum contents 402,200 acre-ft. Jan. 17-19, Apr. 6, Oct. 15, 1959; maximum elevation, 490.12 ft. Jan. 18, 1959; minimum contents observed since reservoir was filled, 227,600 acre-ft. Feb. 22, 1957 (elevation, 435.65 ft.).

Remarks.—Reservoir is formed by rock-fill dam; storage began July 31, 1952. Usable capacity, 189,530 acre-ft. between elevations 430 ft. (lower limit for economic operation) and 490 ft. (top of spillway gates). Dead storage, 212,250 acre-ft. Records given herewith represent total contents. Water used by Pacific Power & Light Co. for power development. Records of stage and data from which capacity table was computed furnished by Pacific Power & 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
1954...	253,240	351,050	358,700	319,070	399,520	325,870	362,940	380,200	395,760	391,640	396,880	396,140	.....
1955...	317,500	368,300	352,100	278,200	292,100	289,700	316,800	325,500	394,600	390,200	399,900	380,200	.....
1956...	401,400	401,000	396,100	380,200	266,900	399,100	399,100	401,600	393,500	386,800	393,900	380,900	.....
1957...	337,400	269,900	374,400	353,800	329,500	353,500	371,500	388,300	388,700	398,800	396,900	397,600	.....
1958...	362,200	286,600	397,600	401,800	400,600	300,100	390,500	396,100	387,600	395,000	401,000	398,000	.....
1959...	322,600	297,300	335,100	401,000	359,400	359,400	401,800	392,800	397,600	399,100	401,000	399,900	.....
1960...	393,100	386,400	353,800	362,300	366,500	383,100	394,600	401,400	399,500	392,800	401,000	394,300	.....

* Estimated.

Speelyai Creek near Cougar, Wash.

Location.—Lat. 46°00'25", long. 122°20'40", in NW¼ sec. 17, T. 6 N., R. 4 E., on right bank 3¾ miles upstream from mouth and 4 miles southwest of Cougar. Prior to Nov. 21, 1959, at site 250 ft. downstream.

Drainage area.—12.6 sq. mi.

Records available.—May 1959 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 500 ft. (from topographic map). May 15 to Nov. 21, 1959, at site 250 ft. downstream at different datum.

Extremes.—1959-60: Maximum discharge, 1,260 cfs Nov. 23, 1959 (gage height, 5.26 ft.); minimum, 3.4 cfs Aug. 19, 20, 1960.

Remarks.—No regulation or diversion above station. Greater part of flow diverted into Yale Reservoir beginning Mar. 30, 1959, 240 ft. below station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	86.8	16.8	6.60	88.3	.....
1960	158	177	141	83.4	218	146	192	151	28.8	7.03	14.7	14.1	110

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959	.....	.....	.....	.....	.....	.....	.....	.....	30	8.8	4.7	4.7	.....
1960	40	40	46	25	34	28	106	73	11.5	4.6	3.6	7.7	3.6

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
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1960	1,260	Nov. 23, 1959	3.6	110	8.73	119.23	80,130	.....	.....	.....

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., on dam on Lewis River at Ariel.

Drainage area.—730 sq. mi.

Records available.—March 1931 to September 1960.

Gage.—Water-stage recorder and long distance indicator in powerhouse. Datum of gage is at mean sea level (levels by Pacific Power & Light Co.).

Extremes.—1931-60: Maximum contents not determined; minimum observed since reservoir was first filled, 164,200 acre-ft. Dec. 5, 1936 (elevation, 166.7 ft.).

Remarks.—Reservoir is formed by concrete-arch dam completed in 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. Records given herein represent total contents. Water used for power.

Lake Merwin Reservoir at Ariel, 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
1954...	372,650	393,310	422,800	412,480	421,610	399,910	393,310	415,250	422,010	414,850	415,250	411,290	.....
1955...	360,200	376,800	395,600	381,400	389,800	394,900	386,800	414,100	422,400	413,300	421,600	393,300	.....
1956...	422,400	422,400	419,600	421,200	382,600	416,000	422,800	422,400	416,000	415,200	422,400	396,000	.....
1957...	404,600	373,000	404,200	384,900	391,400	405,400	382,600	408,100	416,000	418,800	422,400	415,600	.....
1958...	385,200	400,700	421,200	422,400	422,800	396,800	416,000	420,000	413,700	416,400	420,800	422,400	.....
1959...	417,200	412,900	408,500	421,200	399,500	410,900	421,600	415,600	412,500	419,200	422,800	403,000	.....
1960...	411,700	418,000	391,800	411,700	389,800	405,400	419,600	421,600	422,000	407,300	422,400	289,500	.....

NOTE.—Records previously published only in conjunction with Lewis River at Ariel.

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.

Drainage area.—731 sq. mi. At site 1909, 713 sq. mi.

Records available.—July to October 1909, November 1909 (gage heights only), July to October 1922, July 1923 to September 1960. Published as "near Ariel" 1922-29. Prior to October 1952, discharge measurements made at site half a mile downstream; low discharges not equivalent due to local inflow.

Gage.—Water-stage recorder. Datum of gage is 44.0 ft. above mean sea level, unadjusted (levels by Pacific Power & Light Co.). July to November 1909, staff gage at site 4 miles upstream at different datum. July 27 to Oct. 28, 1922, and July 31, 1923, to Apr. 20, 1930, staff gages at site half a mile downstream at datums 3.90 ft. and 0.90 ft. higher, respectively, than present datum.

Average discharge.—37 years (1923-60), 4,694 cfs (3,398,000 acre-ft. per year) unadjusted; 4,747 cfs (3,437,000 acre-ft. per year), adjusted for storage in Lake Merwin Reservoir since March 1931, Yale Reservoir since August 1952, and Swift Reservoir since October 1958.

Extremes.—1909, 1922-60: 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 at times June 30, July 1-3, 6-9, 1931 (caused by regulation during construction of Ariel Dam); minimum daily, 1 cfs July 6, 1931.

Remarks.—No diversion. Flow regulated by Lake Merwin and Yale and Swift Reservoirs (see preceding stations).

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	3,807	4,504	11,750	8,442	8,068	7,239	6,841	5,735	5,942	3,896	1,646	1,450	5,770
1955...	4,286	4,781	5,715	6,050	5,266	3,107	5,671	4,547	7,714	4,211	1,464	2,449	4,594
1956...	6,187	12,470	12,370	9,932	6,556	6,342	7,134	9,008	7,090	3,911	1,704	2,049	7,065
1957...	4,196*	6,707	7,323	5,375	4,174	8,346	7,372	5,028	2,644	1,232	1,087	969	4,542
1958...	2,462	5,030	7,028	8,980	10,780	6,585	6,308	5,140	3,105	1,281	852	1,012	4,843
1959...	2,000	5,944	3,645	9,463	6,807	4,715	5,501	6,186	4,672	1,615	1,032	3,258	4,548
1960...	6,555	6,641	7,543	5,984	6,887	5,774	6,944	7,547	4,812	1,884	893	4,106	5,455

* 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
1954...	1,290	888	7,800	7,940	5,190	6,160	5,900	2,630	2,360	800*	750*	750*	750*
1955...	795	1,960	2,200	2,380	2,750	760	2,120	1,570	4,060	1,250	804	864	760
1956...	862	6,660	7,430	6,210	4,840	5,340	5,790	6,820	5,380	832	808	808	808
1957...	800*	4,790	1,440	1,850	838	2,950	5,980	772	777	705	690	650	650
1958...	685	1,880	2,240	6,850	6,280	3,890	1,730	1,670	778	715	680	730	680
1959...	766	880	886	1,260	3,250	957	2,060	2,950	1,600	736	701	766	701
1960...	1,270	3,900	5,720	1,370	1,130	866	3,130	4,880	734	686	638	746	638

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30								CALENDAR YEAR			
	Momentary maximum		Observed			Adjusted			Observed		Adjusted	
	Discharge	Date	Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches
1953									6,138	4,444,000	6,357	
1954	41,700	Dec. 9, 1953	750	5,770	4,177,000	5,859	8.02		5,321	3,852,000	5,274	
1955	20,200	June 11, 1955	760	4,594	3,326,000	4,547	6.22		5,953	4,310,000	6,047	
1956	49,100	Dec. 12, 1955	808	7,065	5,129,000	7,072	9.67		5,996	4,353,000	5,945	
1957	27,100	Mar. 9, 1957	680	4,542	3,288,000	4,589	6.28		4,232	3,064,000	4,287	
1958	18,300	Feb. 12, 1958	680	4,843	3,506,000	4,852	6.64		4,591	3,324,000	5,449	
1959	32,800	Jan. 24, 1959	701	4,548	3,293,000	5,561			5,324	3,854,000	5,373	
1960	21,400	Oct. 12, 1959	638	5,455	3,960,000	5,265						

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 at downstream side of highway bridge, 1½ miles upstream from Pup Creek and 2½ miles southeast of Ariel.

Drainage area.—41.3 sq. mi.

Records available.—June 1951 to September 1955.

Gage.—Water-stage recorder. Datum of gage is 286.9 ft. above mean sea level (by plane table traverse).

Extremes.—1951-55: Maximum discharge, 1,900 cfs Dec. 9, 1953 (gage height, 7.54 ft.); minimum, 4.6 cfs Sept. 16, 1951; minimum gage height, 1.65 ft. Nov. 25, 1952.

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	36.0	191	654	498	426	209	192	57.7	62.4	52.5	24.6	19.1	203
1955...	31.7	171	278	311	323	251	363	113	42.9	34.2	16.6	25.3	162

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	16.5	31	268	234	219	118	89	39	49	32	18.5	15	15
1955...	14.5	27	161	190	137	162	223	64	30	23	14.5	17.5	14.5

* Estimated.

Cedar Creek near Ariel, 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
1953								228	74.93	165,100
1954	1,900	Dec. 9, 1953	15	203	4.92	66.61	146,700	169	55.47	122,100
1955	1,240	Feb. 8, 1955	14.5	162	3.92	53.30	117,400			

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.

Records available.—September 1929 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 366.8 ft. above mean sea level (from river-profile survey).

Average discharge.—31 years (1929-60), 748 cfs (541,500 acre-ft. per year).

Extremes.—1929-60: 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 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
1954	254	1,155	2,390	1,606	1,837	817	953	325	607	266	113	102	863
1955	299	935	1,149	953	1,115	760	1,489	950	523	292	116	120	722
1956	1,118	2,189	2,249	1,952	801	1,921	1,196	601	375	135	127	87.4	1,065
1957	632	813	1,551	450	1,229	1,613	1,037	371	247	104	75.2	49.5	678
1958	142	564	1,868	1,495	1,693	643	1,286	279	180	110	54.3	72.5	694
1959	203	1,765	1,440	1,891	940	1,071	937	750	571	169	75.6	425	852
1960	1,045	1,016	899	594	1,458	1,048	1,284	1,098	301	116	90.3	95.0	756

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	104	207	820	614	795	414	360	210	369	137	90	75	75
1955	70	179	526	502	393	342	845	660	258	151	73	61	61
1956	132	620*	905	623	460*	636	708	313	240	87	71	73	71
1957	72	333	294	240*	506	860	490	242	148	75	55	42	42
1958	50	96	522	486	875	448	458	150	108	65	46	41	41
1959	54	142	606	775	660	655	381	452	256	88	61	60	54
1960	242	275	438	278	414	351	668	674	197	78	59	66	59

* Estimated.

East Fork Lewis River near Heisson, 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
1953								1,012	109.91	732,800
1954	12,400	Dec. 9, 1953	75	863	6.90	93.67	624,400	743	80.68	537,800
1955	7,930	Dec. 30, 1954	61	722	5.78	78.34	522,400	988	107.24	715,000
1956	10,200	Dec. 11, 1955	71	1,065	8.52	115.99	773,200	852	92.79	618,500
1957	6,860	Mar. 7, 1957	42	678	5.42	73.63	490,800	645	69.99	466,600
1958	6,110	April 20, 1958	41	694	5.55	75.42	502,800	760	82.56	550,400
1959	5,990	Nov. 18, 1958	54	852	6.82	92.49	616,600	816	88.59	590,600
1960	5,540	Oct. 11, 1959	59	756	6.05	82.27	548,600			

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.

Records available.—September 1946 to September 1960.

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 at site about 70 ft. downstream at same datum.

Average discharge.—14 years (1946-60), 1,259 cfs (911,500 acre-ft. per year).

Extremes.—1946-60: Maximum discharge, 16,000 cfs Dec. 9, 1953 (gage height, 14.93 ft.); minimum, 155 cfs Oct. 3, 5-7, 1958; minimum gage height observed, 1.76 ft. Sept. 13, 1951.

Remarks.—Small diversions for fish hatchery returned to stream above gage. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	615	1,478	3,198	2,303	2,963	1,412	1,535	863	991	613	358	306	1,377
1955	496	1,354	1,662	1,491	1,715	1,077	1,328	1,208	1,116	661	382	381	1,109
1956	1,600	2,904	3,472	3,077	1,282	2,622	1,361	1,343	850	478	379	332	1,688
1957	908	1,065	1,947	767	1,637	2,228	1,423	791	487	324	273	191	1,001
1958	361	985	2,477	2,296	2,639	1,193	1,522	722	519	324	223	194	1,137
1959	328	2,242	1,925	3,175	1,539	1,507	1,596	1,128	941	429	281	737	1,317
1960	1,305	1,597	1,621	1,006	2,224	1,486	1,945	1,522	672	351	323	297	1,191

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	402	435	1,300	1,180	1,590	897	820	729	736	421	310	258	258
1955	226	400	827	967	778	673	1,080	1,020	785	463	310	258	226
1956	393	1,000	1,820	1,340	895	1,040	1,440	913	592	384	318	285	285
1957	378	604	546	560*	663	1,150	871	578	390	260	206	170	170
1958	211	272	876	1,000	1,610	884	996	486	402	259	200	170	170
1959	155	298	1,080	1,290	1,230	1,040	812	703	570	317	247	241	155
1960	584	570	812	564	860	780	1,220	1,040	465	290	255	245	245

* Estimated.

Kalama River below Italian Creek, near Kalama, 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
1953								1,499	101.24	1,085,000
1954	16,000	Dec. 9, 1953	258	1,377	6.85	92.96	996,500	1,226	82.79	887,500
1955	9,140	Feb. 8, 1955	226	1,109	5.52	74.89	802,800	1,484	100.19	1,074,000
1956	12,100	Dec. 11, 1955	285	1,088	8.40	114.28	1,225,000	1,349	91.37	979,300
1957	8,310	Feb. 26, 1957	170	1,001	4.98	67.58	724,400	993	67.04	718,600
1958	8,080	Dec. 19, 1957	179	1,137	5.66	76.78	823,100	1,191	80.40	862,000
1959	8,850	Jan. 24, 1959	155	1,317	6.55	88.93	953,300	1,321	89.21	956,300
1960	6,990	Nov. 23, 1959	245	1,191	5.93	80.64	864,500			

COWLITZ RIVER BASIN

Lake Creek near Packwood, Wash.

Location.—Lat. 46°35'45", long. 121°34'05", in SW¼ sec. 21, T. 13 N., R. 10 E. (unsurveyed) on left bank 500 ft. downstream from outlet of Packwood Lake and 5 miles east of Packwood.

Drainage area.—18.8 sq. mi.

Records available.—September 1911 to September 1924 (published as "at outlet of Packwood Lake, near Lewis"), September 1930 to October 1942, October 1949 to May 1954, August 1959 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 2,844.62 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Washington Public Power Supply System from USAE bench mark). Prior to Aug. 3, 1918, staff gages at several sites at or within 100 ft. of present site at various datums. Aug. 3, 1918, to Sept. 30, 1924, water-stage recorder at site 110 ft. upstream at different datum.

Average discharge.—30 years (1911-24, 1930-42, 1949-53, 1959-60), 100 cfs (72,400 acre-ft. per year).

Extremes.—1911-24, 1930-42, 1949-54, 1959-60: 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. Dec. 18, 1917, datum then in use (discharge not determined).

Remarks.—Natural regulation in Packwood Lake. No diversion above station.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1959												124*	
1960	189*	197*	104	47.7	65.6	52.4	94.7	147	221	125	66.3	51.8	113

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	38	42	95	55	53	51	50						
1959												57*	
1960	71*	66*	61	39	43	38	67	75	143	83	50	42	38

* Estimated.

Lake 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
1953								112	81.35	81,340
1954	379	Dec. 20, 1953								
1959										
1960	1,000	Nov. 23, 1959	38	113	6.01	82.11	82,330			

Cowlitz River at Packwood, 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 Slate Creek, half a mile northwest of Packwood.

Drainage area.—287 sq. mi.

Records available.—July 1911 to December 1919, September 1929 to September 1960. Published as "at Lewis" 1911-19.

Gage.—Water-stage recorder. Datum of gage is 1,048.0 ft. above mean sea level (Bureau of Public Roads bench mark). July 1, 1911, to Dec. 31, 1919, staff gages at sites about 1 mile upstream at different datums. Sept. 30, 1929, to Jan. 1, 1930, staff gage at present site and datum.

Average discharge.—39 years (1911-19, 1929-60), 1,639 cfs (1,187,000 acre-ft. per year).

Extremes.—1911-19, 1929-60: Maximum discharge, 36,600 cfs Dec. 21, 1933 (gage height, 13.0 ft.), from rating curve extended above 12,600 cfs; maximum gage height, 13.54 ft. Nov. 23, 1959; minimum discharge, 130 cfs Nov. 29, 1952; minimum gage height, 2.47 ft. Sept. 26, 1955.

Remarks.—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
1954	613	1,296	2,587	1,170	1,692	1,141	1,625	3,367	3,822	3,699	1,478	795	1,943
1955	894	1,822	1,105	951	950	495	1,010	2,791	5,128	3,023	1,095	648	1,660
1956	2,683	3,533	2,716	1,475	634	931	2,456	4,571	4,524	3,451	1,204*	688*	2,411
1957	960	1,355	2,919	728*	1,032	1,557	1,950	3,750	2,683	1,149	638	518	1,606
1958	490	620	1,374	1,545	1,816	826	1,603	3,874	2,717	1,153	691	485	1,430
1959	617	3,726	3,073	2,374	832	945	2,100	2,307	3,724	2,118	740	1,527	2,025
1960	2,513	3,138	1,036	831	1,432	1,158	1,745	2,720*	3,747	1,652	676*	521	1,837

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	442	562	1,320	660	746	648	624	1,030	2,220	2,130	926	510	442
1955	394	556	648	600	477	394	589	642	3,090	1,730	630	410	394
1956	468	1,580	1,450	893	485	455	1,050*	2,450	3,260	1,700	780*	500*	455
1957	427	776	895	450*	431	930	1,210	2,270	1,530	720	463	415	415
1958	274	347	742	812	972	551	606	1,740	1,460	856	547	358	274
1959	372	535	1,500	1,370	535	705	953	1,460	2,400	1,050	511	539	372
1960	737	580	819	450	585	510	1,020	1,400*	2,140	1,000*	529	417	417

* Estimated.

Cowlitz River at 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
1953								1,882	89.02	1,363,000
1954	10,900	Dec. 9, 1953	442	1,943	6.77	91.90	1,407,000	1,884	89.12	1,364,000
1955	10,100	June 10, 1955	394	1,660	5.78	78.52	1,202,000	2,090	98.84	1,513,000
1956	15,900	Dec. 11, 1955	455	2,411	8.40	114.35	1,750,000	2,104	99.78	1,527,000
1957	9,940	Dec. 10, 1956	415	1,608	5.60	76.04	1,164,000	1,376	65.08	996,300
1958	7,240	May 25, 1958	374	1,430	4.98	67.65	1,036,000	1,858	87.85	1,345,000
1959	15,400	Dec. 3, 1958	372	2,025	7.06	95.78	1,466,000	2,024	95.75	1,466,000
1960	34,300	Nov. 23, 1959	417	1,837	6.40	87.11	1,333,000			

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.

Records available.—July 1951 to May 1954.

Gage.—Water-stage recorder. Altitude of gage is 1,980 ft. (from topographic map).

Extremes.—1951-54: 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.).

Remarks.—No known diversion. No regulation.

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	44.6	95.9	292	139	212*	161	204	410					

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	37	41	145	90*	96*	98	96	153					

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
1953								196	62.15	141,900
1954	815	May 18, 1954								

* Estimated.

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.

Records available.—October 1910 to February 1912, September 1929 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 1,221.60 ft. above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 1, 1912, staff gage at site 1 mile upstream at different datum. Sept. 28 to Oct. 31, 1929, staff gage and Nov. 1, 1929, to Nov. 26, 1949, Oct. 1-24, 1950, water-stage recorder, at site 450 ft. upstream at datum 0.26 ft. higher.

Average discharge.—32 years (1910-11, 1929-60), 1,319 cfs (954,900 acre-ft. per year).

Extremes.—1910-12, 1929-60: 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 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
1954...	486	1,038	2,299	1,370	1,906	1,345*	1,521	2,981	2,873	2,046	918	583	1,637
1955...	619	1,227	1,073	900	999	600	1,196	2,128	3,521	1,598*	700*	470*	1,251
1956...	1,418	2,586	3,043	1,608	782	1,074*	2,488*	4,166	3,346	1,812	761	499	1,969
1957...	623	1,003	1,806	721	1,203	1,751	1,826	2,756	1,301	663	461	363	1,207
1958...	377	543	1,178	1,409	1,992	998	1,700	2,736	1,496	682	475	368	1,157
1959...	444	2,084	1,901	2,285	946	900	1,552	2,050	1,915	849	488	614	1,337
1960...	1,367	1,768	1,299	795	1,459	1,208	1,794	2,301	2,042	851	533	424	1,317

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	382	424	1,350	876	982	801	761	1,310	2,320	1,250	708	469	382
1955...	422	518	868	640	640	504	893	973	2,120	1,090	490*	375*	375*
1956...	410	1,440	1,500*	1,030	640	618	1,100*	2,500	2,460	956	581	436	410
1957...	394	662	734	510	459	992	1,300	1,920	830	517	361	325	325
1958...	300	319	586	788	1,160	673	788	1,760	843	552	424	325	300
1959...	310	378	1,360	1,280	689	754	1,000	1,490	1,150	573	411	394	310
1960...	567	670	822	507	702	611	1,210	1,610	1,320	644	471	366	366

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
1953	.....	.....	.....	.....	.....	.....	.....	1,505	63.65	1,090,000
1954	5,980	Dec. 9, 1953	382	1,637	5.10	69.24	1,185,000	1,560	65.98	1,129,000
1955	7,100	June 11, 1955	375	1,251	3.90	52.89	905,600	1,598	67.55	1,157,000
1956	8,660	Dec. 22, 1955	410	1,969	6.13	83.49	1,429,000	1,667	70.69	1,210,000
1957	7,880	Feb. 26, 1957	325	1,207	3.76	51.05	874,200	1,095	46.31	793,000
1958	4,840	April 20, 1958	300	1,157	3.60	48.96	837,800	1,351	57.16	978,200
1959	5,320	Jan. 12, 1959	310	1,337	4.17	56.51	967,800	1,338	56.56	968,700
1960	7,810	Nov. 23, 1959	366	1,317	4.10	55.86	956,400	.....	.....	.....

* Estimated.

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. (revised).

Records available.—October 1947 to September 1960.

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 at site half a mile upstream at different datum.

Average discharge.—13 years (1947-60), 5,205 cfs (3,768,000 acre-ft. per year).

Extremes.—1947-60: Maximum discharge, 47,500 cfs Nov. 24, 1959 (gage height, 19.50 ft.); minimum, 518 cfs Nov. 29, 1952 (gage height, 2.34 ft.).

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

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,576	3,571	9,416	5,076	7,136	4,716	5,999	9,431	9,274	7,177	3,091	1,904	5,691
1955...	2,179	4,397	3,639	3,535	4,251	2,270	4,184	7,630	12,440	6,800	2,709	1,688	4,584
1956...	5,604	10,470	10,900	5,847	2,729	4,129	8,670	13,560	11,080	6,775	2,564	1,581	7,005
1957...	2,491	4,024	8,937*	2,568	3,959	6,429	6,302	9,420	5,189	2,402	1,501	1,159	4,545
1958...	1,171	1,949	4,860	5,643	7,084	3,385	6,106	9,609	5,626	2,377	1,517	1,157	4,189
1959...	1,835	10,370	8,984	9,302	3,611	3,574	6,300	7,215	7,620	3,805	1,677	2,881	5,601
1960...	6,302	9,007	5,966	2,702	5,597	4,339	6,291	8,160	7,729	3,191	1,716	1,383	5,187

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	1,270	1,490	5,050	3,230	3,030	2,850	2,730	4,120	7,360	4,320	2,270	1,510	1,270
1955...	1,290	1,690	2,860	2,380	2,340	1,850	2,940	3,000	6,950	4,220	1,860	1,220	1,220
1956...	1,400	4,980	5,060	3,700	2,230	2,240	4,100	7,680	7,300	3,460	1,880	1,320	1,320
1957...	1,230	2,500	2,660	1,600*	1,640	3,640	4,350	6,150	3,290	1,760	1,180	996	996
1958...	851	1,010	2,200	3,240	4,150	2,300	2,530	5,570	3,220	1,830	1,320	986	851
1959...	980	1,330	5,180	4,880	2,430	2,950	3,520	5,280	4,880	2,190	1,360	1,340	980
1960...	2,140	2,410	3,070	1,680	2,530	2,200	4,390	5,520	5,050	2,140	1,480	1,160	1,160

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
1953								5,418	70.58	3,922,000
1954	24,800	Dec. 10, 1953	1,270	5,691	5.46	74.13	4,120,000	5,319	69.30	3,851,000
1955	24,300	June 11, 1955	1,220	4,584	4.40	59.73	3,319,000	5,991	78.05	4,337,000
1956	33,200	Dec. 12, 1955	1,320	7,005	6.72	91.50	5,085,000	6,061	79.04	4,393,000
1957	22,300	Dec. 12, 1956	996	4,545	4.36	59.21	3,290,000	3,911	50.97	2,832,000
1958	20,500	April 20, 1958	851	4,189	4.02	54.58	3,033,000	5,287	68.88	3,828,000
1959	23,500	Nov. 13, 1958	980	5,001	5.38	72.96	4,055,000	5,612	73.10	4,063,000
1960	47,500	Nov. 24, 1959	1,160	5,187	4.98	67.75	3,765,000			

* Estimated.

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.

Records available.—January to April 1912, November 1912 to June 1913 (fragmentary), October 1913 to September 1917, March 1926 to September 1935, August 1946 to October 1959 (destroyed by flood of November 1959). Estimated means October to December 1912 and July to September 1913, published in State Water-Supply Bulletin 5, have been found to be unreliable and should not be used.

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.—27 years (1912-17, 1926-35, 1946-59), 5,413 cfs (3,919,000 acre-ft. per year).

Extremes.—1912-17, 1926-35, 1946-59: Maximum discharge, 83,500 cfs Dec. 23, 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.).

Maximum stage known since 1906, that of Dec. 23, 1933. Flood of November 1906 reached a stage of 29.4 ft., datum in use 1913-34 (discharge, 61,300 cfs).

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

Revisions.—Some figures of discharge for the water year 1949 have been revised; revised records superseding those published in State WSB No. 6 are given herewith:

MONTH	Mean	Per square mile	RUNOFF	
			Inches	Acre-feet
May 1949	14,860			
Water year 1948-49	5,561	4.75	64.52	4,026,000
Calendar year 1949	5,716		66.32	4,183,000

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,625	3,868	11,650	6,229	8,533	5,419	6,628	10,280	10,270	7,844	3,247	1,982	6,456
1955	2,265	4,844	4,128	4,255	5,052	2,627	4,947	8,065*	13,780*	7,508	2,780	1,787	5,158
1956	5,925	12,170	12,620	7,021	3,494	5,109	9,308	14,010	11,660	6,833	2,696	1,642	7,720
1957	2,625	4,197	9,834	3,159	4,593	7,633	6,391	9,827	5,552	2,643	1,607*	1,198	4,989
1958	1,207	2,190	5,554	6,352	7,889	3,990	6,385	9,978	5,870	2,618	1,600*	1,253	4,595
1959	1,994	11,530	9,992	10,760	4,284	4,036	6,711	7,826	7,986	3,937	1,826	3,034	6,162
1960	6,814												

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,280	1,560	5,870	3,950	4,430	3,280	3,170	4,360	7,920	4,550	2,350	1,600	1,280
1955	1,350	1,840	3,280	2,970	2,600	2,170	3,600*	3,600*	8,000*	4,250	1,930	1,320	1,320
1956	1,540	6,160	6,630	4,570*	2,020	2,930	4,790	8,220	7,740	3,560	2,000*	1,370	1,370
1957	1,260	2,750	2,790	2,000*	2,100*	4,390	4,860	6,620	3,680	1,900*	1,220	1,050*	1,050*
1958	894	1,020	2,000	3,820	4,860	2,790	2,940	5,970	3,580	2,040	1,450*	1,050*	894
1959	1,050	1,470	5,820	5,500	2,930	3,420	3,770	5,750	5,010	2,390	1,500	1,470	1,050
1960	2,330												

* Estimated.

Cowlitz River at Mossyrock, 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
1953								6,021	69.84	4,359,000
1954	29,800	Dec. 10, 1953	1,280	6,456	5.52	74.90	4,674,000	5,952	69.05	4,309,000
1955	26,800	June 11, 1955	1,320	5,158	4.41	59.85	3,734,000	6,792	78.81	4,917,000
1956	34,800	Dec. 13, 1955	1,370	7,720	6.60	89.81	5,604,000	6,551	76.21	4,755,000
1957	28,300	Dec. 12, 1956	1,050	4,989	4.26	58.86	3,612,000	4,340	50.33	3,142,000
1958	22,600	April 21, 1958	894	4,595	3.93	53.32	3,327,000	5,807	67.39	4,204,000
1959	26,800	Nov. 13, 1958	1,050	6,162	5.27	71.51	4,461,000			

West Fork Tilton River near Morton, Wash.

Location.—Lat. 46°36'45", long. 122°14'45", in NE¼ 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.

Records available.—June 1950 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 1,150 ft. (from topographic map).

Average discharge.—10 years (1950-60), 129 cfs (93,390 acre-ft. per year).

Extremes.—1950-60: Maximum discharge, 6,620 cfs Dec. 11, 1955 (gage height, 7.55 ft., from high-water mark in gage well), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum, 4.7 cfs Oct. 29, 1952; minimum gage height, 0.87 ft. Aug. 25, Sept. 20-24, 1951.

Remarks.—Logging company diverts small amount for sprinkling system. No regulation.

Revisions.—Some figures of discharge for the water year 1953 have been revised; revised records superseding those published in State WSB No. 6 are given herewith:

MONTH	Mean	Per square mile	Runoff		Momentary maximum		Minimum day
			Inches	Acre-feet	Discharge	Date	
December 1952	95.5						
Calendar year 1952	74.1		61.32	53,640			
January 1953	561						
February	212						59
March	115						49
April	107						58
May	109						
June	64.5						69
July	28.9						17
August	16.7						11.5
September	16.7						9.2
Water year 1952-53	112	6.83	92.65	81,040	1,570	Jan. 22, 1953	

West Fork Tilton River near Morton, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	73.0	176	370	176	316	120	208	104	96.5*	38.5	16.1	25.7*	142
1955...	60.2	150	147	108	201	80.8*	200	224	146	48.5	19.6	25.2	117
1956...	237	336	490	207	66.8*	221	324	175	76.1	23.0	10.3	10.4	182
1957...	136	143	353	41.0	208	244	163	66.0	36.9	17.7	13.1	7.89	119
1958...	35.6	137	345*	246*	238	79.5	193	38.1	20.8	12.7	6.64*	11.5*	113
1959...	46.2	368	229	294	96.9	155	196	100	80.1	17.7	8.87	101	141
1960...	171	256	180	108	176	150	170	154	51.2	14.6	28.8	25.7	123

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	32	58	93	71	136	54*	63	58	50	17.5	13	14.5	13
1955...	14.5	25	36	40	46	33*	86	110*	64	24	11.5	9.5	9.5
1956...	23	70*	95	70*	46*	42	165	85	36	14	7.7	6.8	6.8
1957...	13.5	44	40	25	32	100	80	81	21	12.5	8.8	6.6	6.6
1958...	7.7	21	90*	101	151	48	48	20	12.5	7.8	5.2*	5.5*	5.2*
1959...	8.2	27	90	88	60	87	55	47	30	9.9	7.2	8.9	7.2
1960...	40	37	56	24	46	37	94	86	26	10.5	8.5	14.5	8.5

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
1953								154	127.85	111,800
1954	3,240	Dec. 9, 1953	13	142	8.66	117.51	102,800	120	99.22	86,780
1955	2,340	Feb. 8, 1955	9.5	117	7.13	96.69	84,590	176	145.91	127,600
1956	6,020	Dec. 11, 1955	6.8	182	11.1	151.10	132,200	146	121.20	106,000
1957	2,980	Dec. 9, 1956	6.6	119	7.26	98.31	86,000	109	90.21	78,900
1958	2,210	Dec. 25, 1957	5.2	113	6.89	93.43	81,720	123	101.91	89,150
1959	2,850	Nov. 12, 1958	7.2	141	8.60	116.79	102,200	138	114.34	100,000
1960	2,120	Nov. 20, 1959	8.5	123	7.50	102.44	89,610			

* Estimated.

Tilton River above Bear Canyon Creek, near Cinebar, Wash.

Location.—Lat. 46°35'40", long. 122°27'30", in NE¼SW¼ sec. 20, T. 13 N., R. 3 E., on right bank 0.8 mile upstream from Bear Canyon Creek and 1 mile southeast of Cinebar.

Drainage area.—141 sq. mi.

Records available.—October 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 600 ft. (from topographic map).

Extremes.—1956-60: Maximum discharge, 16,400 cfs Nov. 23, 1959 (gage height, 12.73 ft.), from rating curve extended above 7,000 cfs; minimum, 58 cfs Aug. 25-27, Sept. 8, 9, 13, 1958 (gage height, 2.05 ft.).

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

Tilton River above Bear Canyon Creek, near Cinebar, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	760	897	2,206	466	1,218	1,759	1,133	489	295	142	111	75.6	795
1958...	185	675	1,795	1,600	1,646	683	1,345	350	208	126	70.3	103	726
1959...	349	2,492	1,759	2,256	898	1,134	1,355	898	674	206	110	667	1,065
1960...	1,240	2,037	1,365	846*	1,421	1,070	1,246	1,204	476	172	208	180	953

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	94	378	343	272	347	902	599	269	184	102	80	68	68
1958...	73	122	640	795	1,060	464	408	194	126	79	58	58	58
1959...	74	219	975	928	596	754	465	506	314	125	88	109	74
1960...	322	369	596	300*	505	421	778	676	279	120	92	112	92

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
1957.....	11,800	Dec. 9, 1956	68	795	5.64	76.49	575,400	693	66.67	501,500
1958.....	5,610	April 19, 1958	58	726	5.15	69.94	525,900	887	85.37	641,900
1959.....	15,600	Nov. 12, 1958	74	1,065	7.55	102.58	771,200	1,070	103.04	774,700
1960.....	16,400	Nov. 23, 1959	92	953	6.76	91.96	691,500	.....	.....	.....

Cinnabar Creek near Cinebar, Wash.

Location.—Lat. 46°36'20", long. 122°30'30", in SW¼SW¼ sec. 13, T. 13 N., R. 2 E., on left bank 1 mile east of Cinebar and 2 miles upstream from mouth.

Drainage area.—4.79 sq. mi.

Records available.—October 1956 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 940 ft. (from topographic map).

Extremes.—1956-60: Maximum discharge, 498 cfs Nov. 22, 1959 (gage height, 3.27 ft.); minimum, 3.1 cfs Aug. 25-27, 1958 (gage height, 0.83 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
1957...	35.1	34.0	69.1	28.0	52.2	59.5*	36.3	20.8*	18.6*	9.02	6.34	4.05	31.0
1958...	9.21	27.4	52.1	42.0	45.4	26.8	39.4	13.4*	10.0	8.15	4.27	6.14	23.5
1959...	12.3	63.0	51.1	59.6	30.2	37.4	44.8	35.5	23.1	11.3	6.89	28.6	33.6
1960...	40.4	65.3	39.1	23.7	41.3	33.1	43.1	43.6	15.7	8.24	10.7	9.43	31.1

* Estimated.

Cinnabar Creek near Cinebar, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1957...	6.4	14*	12*	15.5	20	34*	15	9.3*	13*	6.6	4.3	3.6	3.6
1958...	3.6	7.2	23	22	31	19.5	16.5	9*	5.5*	5.9	3.1	3.8	3.1
1959...	4.2	8.6	20	30	21	21	17	10	13.5	7.2	4.6	5.9	4.2
1960...	13	11.5	15	11	13	12.5	22	23	11	7.0	5.8	6.4	5.8

Summary

YEAR	WATER YEAR ENDING SEPTEMBER 30							CALENDAR YEAR		
	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
	Discharge	Date				Inc	Acre-feet		Inches	Acre-feet
1957.....	313	Dec. 9, 1956	3.6	31.0	6.47	8(	22,440	28.8	75.94	19,400
1958.....	135	①	3.1	22.5	4.91	6(	17,040	26.7	75.53	19,280
1959.....	412	Nov. 12, 1958	4.2	33.6	7.01	9(	24,330	35.2	99.66	25,460
1960.....	498	Nov. 22, 1959	5.8	31.1	6.49	8(	22,550	.....	.....	.....

Tilton River near Cinebar, Wash.

Location.—Lat. 46°34'35", long. 122°31'15", in SW½ sec. 26, T. 13 N., R. 2 E., on left bank 1,000 ft. downstream from Cinnabar Creek, 2 miles southeast of Cinebar, and 2½ miles upstream from mouth.

Drainage area.—158 sq. mi.

Records available.—February 1941 to March 1958.

Gage.—Water-stage recorder. Datum of gage is 397.6 ft. above mean sea level (river-profile survey). Prior to Apr. 18, 1941, staff gage at same site and datum.

Average discharge.—16 years (1941-57), 927 cfs (671,100 acre-ft. per year).

Extremes.—1941-58: Maximum discharge, 23,200 cfs Dec. 11, 1955 (gage height, 15.13 ft.), from rating curve extended above 9,200 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
1954...	438	1,002	3,266	1,634	2,119	973	1,355	650	799	380	198	264	1,084
1955...	377	1,095	1,258	1,309	1,646	836	1,646	1,387	1,118	494	209	189	958
1956...	1,374	2,573	2,886	1,941	686	1,663	1,773	1,025	602	206	127	118	1,251
1957...	808	983	2,390	590	1,396	2,007	1,343	556	345*	175	134	84.6	899
1958...	220	818	2,137	1,929	1,878	836	.....	.....	.....	.....	.....	.....	.....

* Estimated.
① Dec. 19, 1957, Apr. 20, 1958.

Tilton River near Cinebar, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	205	366	1,080	860	1,240	520	540	472	520	199	145	165	145
1955...	160	235	615	765	570	439	879	928	630	255	133	114	114
1956...	177	819	1,100	760	527	600	1,180	610	325	132	102	87	87
1957...	113	469	420	345	460	1,090	672	320*	220*	124	94	74	72
1958...	78	182	720	998	1,170	555	.....	.....	.....	.....	.....	.....	.....

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
1953	.....	.....	.....	.....	.....	.....	.....	1,154	99.17	835,700
1954	22,500	Dec. 9, 1953	145	1,084	6.86	93.12	784,800	916	78.68	663,100
1955	13,700	Feb. 8, 1955	114	958	6.06	82.25	693,200	1,302	111.84	942,500
1956	23,200	Dec. 11, 1955	87	1,251	7.92	107.75	908,000	1,030	88.77	748,100
1957	12,700	Dec. 9, 1956	74	899	5.69	77.25	651,000	814	69.96	589,500
1958	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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.

Records available.—August 1948 to September 1960.

Gage.—Water-stage recorder. Datum of gage is 668.41 ft. above mean sea level (levels by city of Tacoma).

Average discharge.—12 years (1948-60), 9.71 cfs (7,030 acre-ft. per year).

Extremes.—1948-60: Maximum discharge, 165 cfs Feb. 17, 1949 (gage height, 3.62 ft.), from rating curve extended above 42 cfs; maximum gage height, 4.95 ft. Nov. 22, 1959, from high-water mark in well; no flow for long periods in most years.

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
1954...	3.37	9.23	39.5	27.7	20.6	10.8	10.5	2.84	4.73	2.28	1.25	.81	11.1
1955...	2.14	11.6	13.7	17.3	20.1	13.1	18.2	7.78	2.41	1.48	.37	.69	9.00
1956...	10.3	35.0	41.8	30.4	16.7	24.6	9.21	1.92	2.49	.48	.17	.17	14.4
1957...	4.08	8.52	22.5	9.11	15.7	20.6	13.0	4.73	2.99	.54	.60	0	9.01
1958...	0.32	3.51	14.2	20.1	22.5	10.0	14.4	4.67	2.05	.30	.003	.07*	7.59
1959...	1.09	17.1	23.0	26.3	14.6	12.7	10.9	8.15	8.67	1.62	.05	1.18	10.4
1960...	6.23	22.3	16.2	10.0	19.5	12.5	14.2	16.0	4.77	.49	.22	.25	10.2

* Estimated.

Klickitat Creek at Mossyrock, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	0.5	3.0	15	14.5	13.5	5.4	4.7	1.1	1.8	0.6	0.3	0.2	0.2
1955...	.3	1.6	8.7	11.5	8.0	7.7	12	4.2	1.1	.6	.2	.2	.2
1956...	.3	13.5	22	16	12.5	13.5	3.1	.5	.8	.1	0	0	0
1957...	.2	4.1	5.5	5.2	5.8	13.5	4.0	1.0	.4	0	0	0	0
1958...	0	.3	4.3	10.5	17.5	4.8	2.7	1.4	.4	0	0	0	0
1959...	0	.3	15	14	9.0	9.7	4.4	4.0	3.8	.2	0	0	0
1960...	.5	3.8	10.5	6.9	8.7	7.1	7.7	7.1	1.2	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
1953								10.5	41.48	7,640
1954	148	Dec. 9, 1953	.2	11.1	3.22	43.70	8,030	9.01	35.45	6,510
1955	93	Feb. 8, 1955	.2	9.00	2.61	35.41	6,520	14.0	55.07	10,130
1956	127	Dec. 11, 1955	0	14.4	4.17	57.00	10,480	10.1	39.93	7,340
1957	81	Mar. 7, 1957	0	9.01	2.61	35.44	6,520	7.57	29.80	5,490
1958	45	Dec. 25, 1957	0	7.59	2.20	29.85	5,500	9.52	37.43	6,890
1959	93	Jan. 24, 1959	0	10.4	3.01	40.98	7,540	10.7	42.13	7,760
1960	138	Nov. 22, 1959	0	10.2	2.96	40.13	7,390			

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

Records available.—October 1949 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 470 ft. (from topographic map).

Average discharge.—11 years (1949-60), 121 cfs (87,600 acre-ft. per year).

Extremes.—1949-60: Maximum discharge, 3,510 cfs Dec. 9, 1953 (gage height, 8.58 ft.), from rating curve extended above 550 cfs; minimum, 0.6 cfs Aug. 24, 1951 (gage height, 1.63 ft.).

Remarks.—Small diversion by Howard Lumber Co. for millpond. Diverted water is returned to stream 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
1954...	49.3	142	450	295	289	129	166	42.7	88.8	41.0	22.4	20.5	144
1955...	37.0	129	156	178	218	148	256	122	52.7	53.8	15.7	14.1	114
1956...	135	357	404	282	137	290	141	35.1	50.0	18.4	12.9*	11.8	156
1957...	67.4	107	203	80.1	136*	276	134	59.0	47.2	15.6	9.33	5.40	94.9
1958...	13.9	57.8	263	255	265	107	233	46.8	34.5	13.7	4.94	21.4	109
1959...	30.6	358*	235*	317*	152	153	120	115	98.1	24.0	7.01	29.2	136
1960...	129	250	189	109	232	148	176	177	50.7	12.1	12.8	12.6	124

* Estimated.

Winston Creek 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
1954	19	41	149	139	145	75	61	25	53	21	12	14	12
1955	13.5	32	87	120	81	69	161	73	32	32	8.9	6.5	6.5
1956	11	116	189	122	93	144	58	21	22	9.7	8*	6*	6*
1957	11	61	55	50*	55*	146	57	31	28	8.8	5.5	4.4	4.4
1958	5.9	11	86	106	139	74	57	22	15.5	6.9	1.9	2.0	1.9
1959	9.8	14	120*	120*	96	117	47	75	48	9.5	6.0	7.0	6.0
1960	21	46	94	58	81	69	84	86	24	6.4	4.5	7.8	4.5

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					
1953						141	102,100
1954	3,510	Dec. 9, 1953	12	144	104,100	117	84,550
1955	1,200	Feb. 8, 1955	6.5	114	82,640	162	117,400
1956	1,740	Dec. 11, 1955	6	156	113,500	113	82,210
1957	849	Mar. 7, 1957	4.4	94.9	68,700	91.3	66,130
1958	795	Dec. 25, 1957	1.9	109	78,570	132	95,790
1959	1,590	Nov. 12, 1958	6.0	136	98,720	132	95,490
1960	1,390	Nov. 23, 1959	4.5	124	90,170		

* 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.

Records available.—August to October 1910, December 1910 to September 1911, October to November 1911 (monthly discharge only), April 1934 to September 1960. Published as "at Mayfield" 1910-11.

Gage.—Water-stage recorder. Datum of gage is 226.6 ft. above mean sea level, datum of 1929. August 1910 to November 1911 staff gage at site 2½ miles upstream at different datum. Apr. 27 to June 30, 1934, staff gage at present site and datum.

Average discharge.—26 years (1934-60), 6,170 cfs (4,467,000 acre-ft. per year).

Extremes.—1910-11, 1934-60: Maximum discharge, 67,000 cfs (revised) Dec. 13, 1946 (gage height, 24.75); minimum, 698 cfs Nov. 30, 1952; minimum gage height, 7.18 ft. Nov. 30, Dec. 1, 1936.

Flood in December 1933 is known to have exceeded that of Dec. 13, 1946.

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

Revisions.—The monthly mean discharge for June 1941 is listed in error in State WSB No. 6; it should be 3,227 cfs. Some figures of discharge for the water years 1943 and 1947 have been revised; revised records superseding those published in State WSB No. 6 are given herewith:

Cowlitz River near Mayfield, Wash.—Continued

MONTH	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
November 1942	10,050					
Calendar year 1942	4,989		48.36	3,611,000		
Water year 1942-43	6,532	4.67	63.34	4,729,000	47,500	Nov. 24, 1942
December 1946	18,700					
Calendar year 1946	7,843		76.04	5,678,000		
Water year 1946-47	6,587	4.70	63.88	4,759,000	67,000	Dec. 13, 1946

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	2,233	4,973	15,680	8,469	11,050	6,566	8,353	11,200*	10,750	7,988	3,521	2,375	7,749
1955	2,746	6,055	5,457	5,729	7,124	3,828	7,096	9,133	14,630	7,729	3,062	2,041	6,198
1956	7,326	15,080	16,480	9,428	4,434	7,250	11,040	14,230	11,730	7,165	2,936	1,890	9,093
1957	3,644	5,582	12,420	3,812	6,027	9,875	8,348	10,240	6,012	2,803	1,772	1,316	5,994
1958	1,505	3,081	7,906	8,496	10,020	4,857	8,457	10,420	6,198	2,723	1,675	1,346	5,529
1959	2,368	14,060	12,120	13,360	5,716	5,786	8,376	8,882	8,828	4,364	2,135	3,845	7,487
1960	8,052	12,740	8,756	4,219	8,563	6,389	8,743	10,450	8,670	3,685*	2,134	1,760	6,995

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	1,660	2,190	7,250	5,390	6,430	4,060	4,000	5,060	8,640	4,770	2,670	1,930	1,660
1955	1,630	2,200	4,120	3,820	3,460	2,900	4,550	4,640	8,920	4,790	2,100	1,540	1,540
1956	1,790	7,460	8,040	5,540	3,760	3,870	6,600	9,160	8,060	3,890	2,130	1,540	1,540
1957	1,420	3,920	3,580	2,500	2,740	5,470	5,590	7,380	3,910	2,080	1,390	1,160	1,160
1958	1,030	1,310	4,070	4,880	6,240	3,450	3,450	6,910	3,930	2,070	1,510	1,110	1,030
1959	1,110	1,700	7,260	6,720	3,930	4,730	4,650	6,840	5,670	2,660	1,800	1,760	1,110
1960	2,900	3,450	4,580	2,550	3,860	3,390	6,730	7,180	5,700*	2,460	1,780	1,450	1,450

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
1953								7,500	72.71	5,430,000
1954	47,600	Dec. 10, 1953	1,660	7,749	5.54	75.14	5,610,000	7,013	68.01	5,077,000
1955	28,600	June 11, 1955	1,540	6,198	4.43	60.11	4,487,000	8,266	80.15	5,984,000
1956	49,900	Dec. 12, 1955	1,540	9,093	6.50	88.40	6,600,000	7,658	74.46	5,559,000
1957	30,700	Dec. 11, 1956	1,160	5,994	4.28	58.12	4,340,000	5,224	50.65	3,782,000
1958	26,500	April 21, 1958	1,030	5,529	3.95	53.62	4,003,000	6,863	66.55	4,968,000
1959	37,400	Nov. 12, 1958	1,110	7,487	5.35	72.59	5,421,000	7,576	73.45	5,485,000
1960	60,800	Nov. 24, 1959	1,450	6,995	5.00	69.01	5,078,000			

* Estimated.

Mill Creek near Salkum, Wash.

Location.—Lat. 46°30'50", long. 122°37'20", in SW¼NE¼ sec. 24, T. 12 N., R. 1 E., on right bank half a mile upstream from mouth and 1¼ miles southeast of Salkum.

Drainage area.—20.9 sq. mi.

Records available.—May 1955 to April 1959.

Gage.—Water-stage recorder. Altitude of gage is 520 ft. (from topographic map).

Extremes.—1955-59: Maximum discharge, 940 cfs Dec. 11, 1955 (gage height, 5.16 ft.); minimum, 1.7 cfs sometime Aug. 18 to Sept. 10, 1958; minimum gage height, 1.41 ft. Sept. 6, 7, 10, 12, 13, 1955.

Remarks.—No known regulation or diversion above station.

Mill Creek near Salkum, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955...	.....	.....	.....	.....	.....	.....	.....	45.6	20.9	16.6	8.18	5.97	.....
1956...	62.1	165	201	159	90.0	148	62.5	17.7	18.5	8.36	6.05	4.50	78.6
1957...	36.5	51.6	126	50.5	117*	137*	65.9	30.7	18.6	5.85	4.31	2.39	53.6
1958...	6.96	30.8	107	112	118	61.8	83.6	20.4*	15.8*	6.28	2.69	3.74	47.0
1959...	9.78	114	113	156	89.9	76.1	57.5	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1955...	.....	.....	.....	.....	.....	.....	.....	28	12.5	8.5	4.3	3.4	.....
1956...	5.4	55*	93	68	57	83	29	9.2	9.7	5.8	3.7	3.0*	3.0
1957...	4.3	28	29	24*	50*	68	27	15	10	3.7	2.3	2.2	2.2
1958...	2.3	6.5	41	55	74	38	24	13*	5.0	3.2	2.2	2.1*	2.1
1959...	2.2	7.3	60	62	53	49	18.5	.....	.....	.....	.....	.....	.....

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
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1956	940	Dec. 11, 1955	3.0	78.6	3.76	51.22	57,090	60.8	39.59	44,140
1957	414	Feb. 26, 1957	2.2	53.6	2.56	34.79	38,790	47.8	31.03	34,600
1958	366	Dec. 26, 1957	2.1	47.0	2.25	30.53	34,030	54.6	35.47	39,520
1959	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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

Records available.—October 1939 to December 1957.

Gage.—Water-stage recorder. Datum of gage is at mean sea level (from river-profile survey).

Average discharge.—18 years (1939-57), 616 cfs (446,000 acre-ft. per year).

Extremes.—1939-57: Maximum discharge, 14,300 cfs Dec. 9, 1953 (elevation, 458.91 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 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
1954...	367	826	1,838	1,284	1,702	701	859	534	665	344	172	152	781
1955...	264	824	796	671	864	504	906	682	772	414	168	171	583
1956...	837	1,656	2,004	1,457	545	1,260	980	867	627	248	159	130	900
1957...	440	584	1,226	355	909	1,365	1,001	621	268	134	115	82.1	590
1958...	180	423	1,159*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

South Fork Toutle River at Toutle, Wash.—Continued

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	173	200	698	554	837	360	360	338	454	186	152	125	125
1955...	127	179	421	384	349	300	495	468	510	252	133	125	125
1956...	179	488	882	581	449	484	750	646	393	147	112	106	106
1957...	112	302	257	220*	235	698	576	366	172	102	87	72	72
1958...	87	135*	420*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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
1953.....	.....	.....	.....	.....	.....	.....	.....	790	90.91	572,100
1954.....	14,300	Dec. 9, 1953	125	781	6.62	89.86	565,500	684	78.64	495,000
1955.....	6,340	Feb. 8, 1955	125	583	4.94	67.05	422,100	803	92.33	581,100
1956.....	9,580	Dec. 11, 1955	106	900	7.63	103.80	653,200	712	82.18	517,200
1957.....	5,520	Feb. 26, 1957	72	590	5.00	67.90	427,300	549	63.20	397,600
1958.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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 just downstream from 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.

Records available.—September 1909 to August 1912, October 1919 to October 1921, May to November 1922, December 1922 (monthly discharge only), January to December 1923, September 1929 to September 1960. Published as "near Castle Rock" 1909-12.

Gage.—Water-stage recorder. Datum of gage is 407.3 ft. above mean sea level (from river-profile survey). Prior to Aug. 4, 1912, staff gage at site 2 miles downstream at datum 307.3 ft. above mean sea level, unadjusted. Oct. 9, 1919, to Dec. 14, 1923, water-stage recorder at site 300 ft. downstream at different datum. Sept. 25 to Nov. 10, 1929, chain gage; Nov. 11, 1929, to Oct. 5, 1938, and Oct. 4, 1950, to Apr. 16, 1952, water-stage recorder; all at site 50 ft. upstream at present datum. Oct. 6, 1938, to Oct. 3, 1950, and since Apr. 17, 1952, water-stage recorder at present site and datum.

Average discharge.—36 years (1909-11, 1919-21, 1922-23, 1929-60), 2,024 cfs (1,465,000 acre-ft. per year).

Extremes.—1909-12, 1919-23, 1929-60: 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 regulation or diversion above station.

Toutle River near Silver Lake, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	958	2,225	5,641	4,098	5,000	2,325	2,605	1,895	2,346	1,478	713	634	2,478
1955...	882	2,380	2,432	2,315	2,908	1,800	3,026	2,360	2,912	1,740	689	564	1,991
1956...	2,505	5,492	6,429	4,667*	1,774	3,770	3,069	2,800	2,192	1,283	672	492	2,936
1957...	1,286	1,817	3,702	1,282	2,717	3,775	2,585	2,006	1,129	557	432	333	1,794
1958...	471	1,130	3,644	3,520	3,880	1,738*	2,841	1,693	1,204	616	417*	381*	1,782
1959...	749*	4,202	3,569	5,564	2,192	2,165	2,365*	2,280	1,901	866	446	1,059	2,279
1960...	2,245	2,985	2,622	1,562	3,308	2,344	3,012	2,249	1,566	658	541	524*	2,011

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	559	709	2,440	2,050	2,820	1,420	1,380	1,270	1,800	824	614	536	536
1955...	480	668	1,530	1,540	1,330	1,200	1,840	1,740	2,030	1,130	480	420	420
1956...	552	2,000	3,200*	2,000	1,530	1,730	2,440	2,090	1,690	722	526	432	432
1957...	441	1,130	1,020	812	1,070	1,810	1,590	1,440	732	430	356	300	300
1958...	325	391	1,450	1,800	2,400	1,300*	1,280	1,350	874	460*	370*	330*	325
1959...	330*	584	2,100	2,160	1,550*	1,630	1,400*	1,490	1,290	531	386	386	330*
1960...	850	908	1,350*	914	1,310	1,190	2,190	1,900	1,030	483	386	420*	386

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
1953	.....	.....	.....	.....	.....	.....	.....	2,410	69.01	1,745,000
1954	25,200	Dec. 9, 1953	536	2,478	5.23	70.98	1,794,000	2,212	63.35	1,602,000
1955	16,200	Feb. 8, 1955	420	1,991	4.20	57.02	1,441,000	2,724	78.02	1,972,000
1956	20,400	Dec. 12, 1955	432	2,936	6.19	84.32	2,131,000	2,301	66.07	1,670,000
1957	12,800	Feb. 26, 1957	300	1,794	3.78	51.37	1,299,000	1,663	47.62	1,204,000
1958	11,800	Dec. 26, 1957	325	1,782	3.76	51.03	1,290,000	2,052	58.76	1,485,000
1959	17,600	Jan. 24, 1959	330	2,279	4.81	65.26	1,650,000	2,226	63.74	1,611,000
1960	14,100	Nov. 23, 1959	386	2,011	4.24	57.76	1,460,000	.....	.....	.....

* Estimated.

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.

Records available.—December 1926 to September 1960.

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 at site 2 miles upstream at datum 14.93 ft. higher. Dec. 18, 1933, to June 13, 1934, staff or wire-weight gage and June 14 to Sept. 30, 1934, water-stage recorder, at present site at datum 5 ft. higher.

Average discharge.—33 years (1927-60), 9,069 cfs (6,566,000 acre-ft. per year).

Extremes.—1926-60: Maximum discharge observed, 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.—Minor diversions for domestic and farm use above station. No regulation.

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
1954...	3,485	8,615	24,150	15,670	19,190	10,150	12,250	12,790	13,680	9,808	4,385	3,198	11,410
1955...	3,805	9,674	9,267	9,835	11,650	7,107	11,780	11,880	17,310	9,745	3,873	2,725	9,018
1956...	10,340	23,190	25,950	17,340	7,388	13,740	15,090	17,330	14,750	8,077	3,564	2,492	13,350
1957...	5,366	8,027	17,590	5,776	10,270	15,710	11,510	12,660	7,217	3,412	2,376	1,887	8,483
1958...	2,167	4,522	13,440	14,300	16,180	7,680	12,460	11,980	7,535	3,381	2,239	1,966	8,105
1959...	3,211	19,900	17,380	21,600	9,620	8,994	11,630	12,110	11,130	5,395	2,568	5,000	10,710
1960...	10,920	16,690	13,200	6,971	14,510	10,350	13,830	14,630	10,920	4,545	2,854	2,463	10,120

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	2,400	3,000	11,000	8,740	12,600	6,040	5,910	6,620	11,100	5,700	3,550	2,630	2,400
1955...	2,330	3,040	6,520	6,570	5,600	4,910	7,240	6,980	11,500	6,120	2,750	2,140	2,140
1956...	2,330	9,550	13,000	8,740	6,200	6,390	10,100	11,900	10,300	4,490	2,810	2,280	2,280
1957...	2,120	5,160	4,740	3,570	4,430	7,940	7,440	9,060	4,770	2,620	2,000	1,720	1,720
1958...	1,690	1,960	6,490	7,340	9,710	5,380	5,160	8,470	5,000	2,600	2,020	1,720	1,690
1959...	1,690	2,460	10,300	10,100	6,460	6,990	6,430	8,770	7,200	3,190	2,210	2,190	1,690
1960...	3,820	4,410	7,220	4,030	5,930	5,110	10,500	9,710	7,080	3,050	2,360	2,070	2,070

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
1953								11,070	67.14	8,013,000
1954	73,000	Dec. 9, 1953	2,400	11,410	5.10	69.18	8,255,000	10,260	62.20	7,425,000
1955	50,100	Feb. 8, 1955	2,140	9,018	4.03	54.69	6,529,000	12,100	73.40	8,762,000
1956	67,400	Dec. 12, 1955	2,280	13,350	5.97	81.18	9,690,000	10,970	66.74	7,967,000
1957	43,200	Dec. 11, 1956	1,720	8,483	3.79	51.45	6,141,000	7,571	45.92	5,481,000
1958	35,200	April 21, 1958	1,690	8,105	3.62	49.15	5,868,000	9,792	59.38	7,088,000
1959	57,800	Jun. 24, 1959	1,690	10,710	4.79	64.96	7,753,000	10,750	65.19	7,780,000
1960	62,700	Nov. 24, 1959	2,070	10,120	4.52	61.58	7,350,000			

Delameter 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.

Records available.—May 1949 to September 1960. Prior to October 1958 published as Arkansas Creek near Castle Rock.

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

Average discharge.—11 years (1949-60), 94.2 cfs (68,200 acre-ft. per year).

Extremes.—1949-60: Maximum discharge, 2,270 cfs Dec. 9, 1953 (gage height, 6.26 ft.), from rating curve extended above 700 cfs on basis of summation of culvert measurements on two main tributaries a quarter of a mile upstream from station; minimum, 1.3 cfs Aug. 22, 1951; minimum gage height, 0.37 ft. Aug. 25, 26, 1958.

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

Delameter Creek near 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
1954...	26.7	111	310	211	292	92.6	122	26.4	22.8	13.4	7.68	10.3	103
1955...	21.4	127	150	150	167	171	164	45.9	16.8	13.1	7.49	9.31	86.4
1956...	116*	306*	316	251*	99.1*	255	104	25.0	19.0	8.79	7.17*	6.57*	127
1957...	57.9	86.3	239	77.3	160	162	72.9	29.3	16.9	9.21	8.52	3.86	76.6
1958...	10.8	53.2	235	187	181	90.7	116	37.2	19.2	6.61	3.41	4.03	78.1
1959...	16.4	239	158	258	118	120	180	92.8	32.1	12.7	5.70	34.6	105
1960...	77.5	167	145	73.3	205	134	145	75.6	29.2	8.56	7.77*	7.40	89.0

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	9.7	24	82	90	140	53	42	18	16.5	7.3	6.3	6.3	6.3
1955...	6.4	16	63	81	59	65	88	25	12.5	8.0	6.6	5.6*	5.6*
1956...	7.2	80*	141	90*	60*	103	40	15	12.5	4.5*	4*	3.5*	3.5*
1957...	6.3	45	41	42	74	94	41	18	11.5	5.5	4.4	2.9	2.9
1958...	3.9	10.5	77	82	112	67	53	21	10.5	3.1	1.6	2.1	1.6
1959...	2.9	15	94	114	103	79	38	31	20	6.4	4.5	5.4	2.9
1960...	2.3	30	60	38	60	53	70	43	15.5	5*	3.2	4.4	3.2

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
1953	.....	.....	.....	.....	.....	.....	.....	108	75.31	77,930
1954	2,270	Dec. 9, 1953	6.3	103	5.31	71.83	74,310	90.0	62.97	65,140
1955	1,070	Feb. 8, 1955	5.6	86.4	4.45	60.47	62,540	123	86.25	89,230
1956	1,390	Dec. 11, 1955	3.5	127	6.55	88.79	91,860	97.0	68.09	70,440
1957	2,200	Dec. 9, 1956	2.9	76.6	3.95	53.62	55,470	69.5	48.67	50,330
1958	824	Dec. 19, 1958	1.6	78.1	4.03	54.64	56,550	87.4	61.14	63,300
1959	1,210	Nov. 12, 1958	2.9	105	5.41	73.76	76,330	104	72.44	74,940
1960	1,260	Nov. 22, 1959	3.2	89.0	4.59	62.42	64,580	.....	.....	.....

* Estimated.

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.

Records available.—July 1950 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 100 ft. (from topographic map).

Average discharge.—10 years (1950-60), 436 cfs (315,700 acre-ft. per year).

Extremes.—1950-60: Maximum discharge, 7,490 cfs Dec. 9, 1953 (gage height, 12.75 ft.), from rating curve extended above 3,900 cfs as explained below; minimum, 22 cfs Sept. 22, 1951; minimum gage height, 3.62 ft. Aug. 25, 26, Sept. 8, 1958.

Flood of Feb. 24, 1950, reached a stage of 12.8 ft., from floodmarks (discharge, 7,730 cfs, from rating curve extended above 3,900 cfs on basis of slope-area measurement of peak flow).

Remarks.—No regulation or diversion above station.

Coweman River near Kelso, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	172	532	1,292	754*	1,129	490	505	167	301	136	68.5	71.1	464
1955...	113	471	673	680	834	676	893	348	189	129	54.5	73.3	417
1956...	589	1,257	1,595	1,231	564	1,289	518	202	162	62.3	59.5	53.3	629
1957...	263	348	870	299	693	877	424	229	129	61.8	51.6	32.9	355
1958...	68.0	243	1,080	851	893	415	641	190	146	68.1	38.0	45.3	387
1959...	86.8	885	704	1,194	610	531	512	386	245	97.8	50.4	108	455
1960...	389	621	646	368	831	560	741	514	176	67.6	66.1	57.2	418

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	67	102	370*	325*	506	268	198	115	181	71	57	50	50
1955...	46	77	248	375	284	287	479	216	125	74	40	35	35
1956...	70	345	672	426	341	475	260	125	100	39*	32	32	32
1957...	44	176	162	155	188	422	234	130	84	44	34	27	27
1958...	33	48	208	354	479	289	295	116	85	43	29	29	29
1959...	36	79	354	445	442	354	194	194	149	59	42	42	36
1960...	107	141	286	222	208	246	340	327	105	45	37	39	37

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
1953								514	58.60	371,900
1954	7,490	Dec. 9, 1953	50	464	3.90	52.97	336,200	402	45.83	290,900
1955	4,680	Dec. 30, 1954	35	417	3.50	47.58	301,900	595	67.92	431,000
1956	5,260	Dec. 11, 1955	32	629	5.29	71.90	456,400	470	53.77	341,300
1957	3,790	Dec. 10, 1956	27	355	2.98	40.48	257,000	348	39.65	251,700
1958	4,690	Dec. 19, 1957	29	387	3.25	44.14	280,200	409	46.70	296,500
1959	4,570	Nov. 12, 1958	36	455	3.82	51.86	329,100	454	51.76	328,400
1960	3,460	Nov. 22, 1959	37	418	3.51	47.79	303,200			

* 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.

Records available. April 1949 to December 1957.

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

Average discharge.—8 years (1949-57), 109 cfs (78,910 acre-ft. per year).

Extremes.—1949-57: Maximum discharge, 2,530 cfs Dec. 9, 1956 (gage height, 7.30 ft.), from rating curve extended above 650 cfs on basis of slope-area measurement of peak flow; 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. Possibly slight regulation.

Revisions.—Some figures of discharge for the water years 1950 and 1953 were revised; the records published in State WSB No. 6 thus affected are given herewith:

Abernathy Creek near Longview, Wash.—Continued

MONTH	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
February 1950	362					
Water year 1949-50	131	6.45	87.55	94,780	2,080	Feb. 24, 1950
Calendar year 1950			95.30	103,200		
Water year 1952-53					1,420	Jan. 22, 1953

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	32.9	123	327	220	315	110	134	31.0	30.7	19.8	15.1	16.1	113
1955	30.0	134	161	180	156	166	177	58.0	27.4	23.1	14.1	13.7	94.6
1956	117	302	366	282	113	283	132	31.4	24.8	12.9	11.8	13.4	141
1957	86.9	116	248	80.9	165	190	95.9	39.6	24.6*	14.0	13.2	7.34	89.8
1958	14.3	64.8	329										

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954	15.5	35	91	96	155	57.	47	23	23	14	12.5	14	12.5
1955	14	22	70	100	70	80	101	35	21	15.5	11	8.6	8.6
1956	10.5	88	149	112	67	123	49	20	17	8.9	7.4	6.0	6.0
1957	12.5	56*	51	51*	57	106	58	23*	17.5	10.5	8.0	5.9	5.9
1958	6.6	12.5	100										

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
1953								118	79.11	85,660
1954	1,840	Dec. 9, 1953	12.5	113	5.57	75.82	82,100	100	66.88	72,420
1955	1,190	Dec. 30, 1954	8.6	94.6	4.67	63.26	68,500	133	88.99	96,300
1956	1,610	Dec. 11, 1955	6.0	141	6.95	94.58	102,400	113	76.02	82,290
1957	2,530	Dec. 9, 1956	5.9	89.8	4.42	60.07	65,030	86.3	57.69	62,470
1958										

* Estimated.

MILL CREEK BASIN

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.

Records available.—June 1949 to January 1956.

Gage.—Water-stage recorder. Altitude of gage is 70 ft. (by barometer).

Average discharge.—6 years (1949-55), 115 cfs (83,260 acre-ft. per year).

Extremes.—1949-56: Maximum discharge, 4,460 cfs Feb. 24, 1950 (gage height, 6.23 ft.), from rating curve extended above 590 cfs by logarithmic plotting; minimum, 4.6 cfs Aug. 21, 22, 1951 (gage height, 1.19 ft.).

Remarks.—No regulation or diversion above station.

Mill Creek near Cathlamet, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	26.3	105	349	279	340	116	141	36.0	43.4	23.5	15.0	17.4	123
1955...	24.9	127	177*	206*	179	197	169	51.6	27.9	24.4	11.5	13.9	100
1956...	109	341*	403	322	.....	.....	.....	.....	.....	.....	.....	.....	.....

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	13.5	22	112	136	156	64	54	25	29	13.5	11.5	13	11.5
1955...	12	20	79	110*	74	98	95	34	21	15	8.8	7.6	7.6
1956...	11.5	120*	183	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
1953	.....	.....	.....	.....	.....	.....	.....	122	60.14	88,520
1954	2,000	Dec. 9, 1953	11.5	123	4.46	60.49	89,060	110	54.11	79,660
1955	1,240	Dec. 30, 1954	7.6	100	3.62	49.32	72,580	144	70.92	104,400
1956	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Estimated.

ELOCHOMAN RIVER BASIN

Elochoman 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.

Records available.—October 1940 to September 1960. Published as "Elokomin River" prior to October 1959.

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.—20 years (1940-60), 375 cfs (271,500 acre-ft. per year).

Extremes.—1940-60: Maximum discharge, 7,300 cfs Feb. 17, 1949 (gage height, 12.66 ft.), from rating curve extended above 2,100 cfs on basis of slope-area determination of peak flow; minimum, 18 cfs Oct. 6, 7, 15, 16, 1952; minimum gage height, 1.01 ft. Sept. 22-26, 1957.

Maximum stage known, 17.2 ft. in December 1933, from information by local residents.

Remarks.—Some diversions for irrigation and domestic use. No regulation.

Elochoman River near Cathlamet, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	168	571	1,202	878	1,142	415	490	112	135	79.5	51.3	80.0	439
1955...	147	551	565	613	569	576	628	199	98.7	87.4	52.0	56.6	343
1956...	482	1,181	1,250	983	357	1,072	443	117	100	53.4	46.1	48.4	513
1957...	378	409	948	301	670	693	374	133	85.7	46.2	41.4	25.5	341
1958...	57.6	275	966	794	788	332	540	157	85.2	42.4	34.3	53.5	337
1959...	172	1,116	723	1,078	552	500	621	329	158	71.2	44.2	259	467
1960...	508	787	654	355	849	545	583	327	130	52.2	51.0	41.1	405

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	66	218	348	425	545	212	175	80	82	49	39	52	39
1955...	54	96	282	324	225	246	330	124	72	54	37	30	30
1956...	44	296	496	335	205	459	176	74	66	36	32	27	27
1957...	44	185	167	172	278	361	208	80	59	32	28	21	21
1958...	23	45	326	319	387	250	223	101	56	28	22	26	22
1959...	38	122	391	480	394	318	149	136	98	45	37	43	37
1960...	166	150	249	163	249	224	284	187	80	38	32	32	32

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
1953								462	95.28	334,300
1954	6,220	Dec. 9, 1953	30	439	6.67	90.62	318,000	382	78.75	276,300
1955	3,830	Dec. 30, 1954	30	343	5.21	70.85	248,600	482	99.41	348,900
1956	6,040	Dec. 11, 1955	27	513	7.80	106.07	372,200	415	85.84	301,200
1957	7,190	Dec. 9, 1956	21	341	5.18	70.25	246,600	304	62.71	220,100
1958	3,060	Jan. 15, 1958	22	337	5.12	69.60	244,300	396	81.59	286,300
1959	4,550	Nov. 12, 1958	37	467	7.10	96.35	338,200	463	95.46	335,100
1960	5,440	Nov. 22, 1959	32	405	6.16	83.70	293,700			

GRAYS RIVER BASIN

Grays River above South Fork, near Grays River, Wash.

Location.—Lat. 46°23'35", long. 123°28'35", in NW¼ sec. 31, T. 11 N., R. 6 W., on right bank 500 ft. upstream from the South Fork and 7 miles northeast of town of Grays River.

Drainage area.—33.4 sq. mi.

Records available.—October 1955 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is about 350 ft. (from topographic map).

Average discharge.—5 years (1955-60), 353 cfs (255,600 acre-ft. per year).

Extremes.—1955-60: Maximum discharge, 7,050 cfs Dec. 9, 1956 (gage height, 10.23 ft.), from rating curve extended above 1,600 cfs on basis of contracted-opening measurement of peak flow; minimum 18.5 cfs Aug. 23-27, 1958 (gage height, 2.89 ft.).

Remarks.—No regulation or diversion above station.

Grays River above South Fork, near Grays River, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	540	946	952	879	281	975	407	90.0	159	57.6	40.7	66.9	451
1957...	460	380	729	202	604	573	302	91.7	68.9	67.3	51.6	30.3	291
1958...	119	304	827	699	657	221	445	86.8	54.5	30.7	23.5	45.1	291
1959...	217	880	543	856	386	448	559	274	140	65.7	35.1	378	398
1960...	421	610	539	331	652	475	462	272	110	45.6	43.2	39.2	332

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	43	167	343	239	152	253	154	52	51	38	32	29	29
1957...	55	131	116	95*	146	277	135	64	50	40	36	26	26
1958...	26	67	233	198	314	166	185	54	40	24	18.5	20	18.5
1959...	32	110	246	319	198	211	90	101	81	43	29	32	29
1960...	122	90	152	95	150	132	191	144	66	32	24	27	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
1956	6,360	Dec. 11, 1955	29	451	13.5	183.84	327,400	375	152.82	272,200
1957	7,050	Dec. 9, 1956	26	291	8.71	118.34	210,800	268	109.10	194,300
1958	3,730	Dec. 25, 1957	18.5	291	8.71	118.18	210,500	322	130.96	233,300
1959	5,970	Nov. 12, 1958	29	398	11.9	161.60	287,800	392	159.47	284,000
1960	5,230	Dec. 15, 1959	24	332	9.94	135.22	240,900			

* Estimated.

Grays River below South Fork, near Grays River, Wash.

Location.—Lat. 46°23'30", long. 123°28'35", in SW¼ sec. 31, T. 11 N., R. 6 W., on right bank 400 ft. downstream from the South Fork and 7 miles northeast of town of Grays River.

Drainage area.—56.3 sq. mi.

Records available.—September 1955 to September 1960.

Gage.—Water-stage recorder. Altitude of gage is 350 ft. (from topographic map).

Average discharge.—5 years (1955-60), 527 cfs (381,500 acre-ft. per year).

Extremes.—1955-60: Maximum discharge, 10,700 cfs Dec. 9, 1956 (gage height, 10.4 ft., from high-water mark in well), from rating curve extended above 2,400 cfs by logarithmic plotting; minimum, 23 cfs Aug. 20-27, 1958; minimum gage height, 2.03 ft. Aug. 20, 21, 1959.

Remarks.—No regulation or diversion above station.

Grays River below South Fork, near Grays River, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	794	1,423	1,422	1,277	404	1,465	597	131	227	79.6	57.5	92.2	666
1957...	691	494	1,035*	302*	899	869	450	138	114	91.5	70.3	34.7	430
1958...	176	473	1,251	1,026	970	317	649	119	76.7	39.9	29.9	82.7	430
1959...	332	1,290	804	1,288	578	704	851	391	218	96.8	54.1	578	597
1960...	675	944	787	491	1,020	732	731	426	152	55.0	68.2	62.6	510

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1956...	76	261	457	329	212	372	223	72	70	54	45	38	38
1957...	84	185	166	145	248	428	214	95	64	54	43	28	28
1958...	29	115	354	302	435	251	258	71	53	31	23	27	23
1959...	65	176	329	410	309	321	140	158	120	60	46	53	46
1960...	202	148	234	140	240	209	297	234	90	38	29	41	29

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
1956.....	10,000	Dec. 11, 1955	38	666	11.8	161.11	483,700	549	132.66	398,300
1957.....	10,700	Dec. 9, 1956	28	430	7.64	103.73	311,500	403	97.20	291,900
1958.....	5,700	Dec. 25, 1957	23	430	7.64	103.77	311,600	473	113.99	342,300
1959.....	8,340	Nov. 12, 1958	46	597	10.6	144.02	432,400	597	143.84	431,900
1960.....	8,120	Dec. 15, 1959	29	510	9.06	123.23	370,000	.....	.....	.....

* Estimated.

West Fork 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.

Records available.—April 1949 to September 1960. Prior to October 1958, published as "West Branch Grays River."

Gage.—Water-stage recorder. Altitude of gage is 71 ft. (by barometer).

Average discharge.—11 years (1949-60), 129 cfs (93,390 acre-ft. per year).

Extremes.—1949-60: 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 measurement at gage height 6.89 ft.; minimum, 3.7 cfs Sept. 20, 1960 (gage height, 2.21 ft., result of bulldozing upstream); minimum gage height 1.78 ft. Sept. 5, 1951.

Flood of Feb. 22, 1949, reached a stage of 6.89 ft., from flood marks (discharge, 3,700 cfs, from rating curve extended above 460 cfs on basis of slope-area measurement of peak flow).

Remarks.—No regulation of diversion above station.

West Fork Grays River near Grays River, Wash.—Continued

Mean Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	81.6	204	332	288	338	107	129	23.0	60.6	32.8	21.1	40.5	137
1955...	77.2	217	173	151	158	176	203	62.7	36.3	55.9	37.9	23.3	114
1956...	209	360	342	280	123	306	106	24.5	74.0	22.9	14.2	28.4	163
1957...	187	123	266	75.1	241*	197	108	33.0	24.1	24.3	22.0	8.46	109
1958...	34.6	104*	297*	239	206	69.5	134	28.4	22.2	10.2	7.87	21.0	97.2
1959...	80.2	326	214	306	115	135	198*	91.3	57.6	28.8	15.7	143	142
1960...	161	254	180	133	254	160	157	114	48.0	16.1	22.2	16.9	126

Minimum Discharge, in Cubic Feet Per Second

YEAR	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Annual
1954...	34	65	94	82	104	41	36	16	23	16.5	12	24	12
1955...	23	32	68	76	51	60*	80	36	22	20	14	10.5	10.5
1956...	15	94	107	77	58	107	41	15	16	13	10.5	9.1	9.1
1957...	22	45	40	41*	60*	90	52	22	16	11	11	5.6	5.6
1958...	6.2	24	85*	66	83	50	53	18	13.5	7.3	4.4	4.9	4.4
1959...	13.5	42	98	125	69	62	31	44	31	16	12.5	17	12.5
1960...	53	40	53	33	54	47	73	60	28	11	7.9	10	7.9

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
1953.....	.....	.....	.....	.....	.....	.....	.....	150	124.77	108,500
1954.....	1,070	Dec. 9, 1953	12	137	8.40	113.84	98,980	124	103.20	89,780
1955.....	1,790	Nov. 18, 1954	10.5	114	6.99	94.78	82,400	151	125.82	109,400
1956.....	2,080	Dec. 11, 1955	9.1	163	10.0	135.96	118,200	135	112.82	98,100
1957.....	2,320	Dec. 9, 1956	5.6	109	6.69	90.36	78,560	96.6	80.48	69,960
1958.....	1,520	Jan. 14, 1958	4.4	97.2	5.96	80.97	70,390	112	93.54	81,310
1959.....	2,890	Nov. 12, 1958	12.5	142	8.71	118.60	103,100	140	116.96	101,700
1960.....	2,680	Feb. 6, 1960	7.9	126	7.73	104.98	91,250	.....	.....	.....

* Estimated.

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