WASHINGTON STATE DEPARTMENT OF ECOLOGY

Marine Water Column Ambient Monitoring Wateryear 1995 Long-Term Monitoring Implementation Plan

Introduction

The Washington State Department of Ecology conducts a long-term, ambient water quality monitoring program in the marine waters of Puget Sound, Grays Harbor, and Willapa Bay. The Marine Water Column Ambient Monitoring Plan (Janzen, 1992) describes the program objectives, sampling strategy, methods, data quality objectives, and other features of the program. Specific annual implementation details are provided separately as an annual update to that plan. The following material represents the annual implementation update for Wateryear 1995 (WY 1995 = October 1994 through September 1995).

The WY 1995 implementation plan for long-term monitoring encompasses 40 stations within Puget Sound (Figure 1) and the Washington coast estuaries (Figure 2). Of these, 22 are core stations (sampled every month, every year), 15 are rotating stations (sampled every month for one year out of a multiple year rotation schedule), and 3 are floating stations (sampled as desired, to augment Ecology's seasonal monitoring studies). The coordinates and description of each station to be sampled in WY 1995 are listed in Appendix A.

The Marine Water Column Ambient Monitoring Plan (Janzen, 1992) lists 30 stations in Puget Sound to be sampled over a three-year rotation schedule, and four stations on the coast to be sampled over a two-year rotation schedule. During WY 1995, the central portion of Puget Sound is scheduled for rotation. Ten rotating stations are located in central Puget Sound: CMB006, QMH001, EAP001, DYE004, POD006, PMA001, PSS008, SUZ001, SKG003, SKG001 (Figure 1). One station, EAS001, from WY 1994 was retained for discrete sampling since this station had been sampled for CTD parameters only and showed low dissolved oxygen during WY 1994.

Rotating stations in Grays Harbor and Willapa Bay are also scheduled for sampling during WY 1995. These comprise Willapa Bay stations WPA003 and WPA007, and Grays Harbor stations GYS009 and GYS015 (Figure 2). In the coastal estuaries, it has been possible to monitor CTD parameters and Secchi depths at these rotating stations every year. Discrete sampling for nutrients and chlorophyll has occurred every other year.

Floating stations HCB003 and HCB007 (Figure 1) will be added to supplement Ecology's seasonal monitoring effort planned in Hood Canal during 1995. Floating station BUD002 will

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be sampled to monitor the response of dissolved oxygen in Budd Inlet, subsequent to nitrogen-removal from LOTT effluent, as a follow-up to 1994 seasonal monitoring. Only CTD parameters and a Secchi disk depth are recorded for these three floating stations.

The 40 stations to be monitored during WY 1995 will be separated into four different marine flight surveys. Stations visited during each marine flight are shown in Table 1.

Table 1. Monitoring stations sampled during marine flight surveys during WY 1995. Bold type indicates rotating stations, parentheses indicate floating stations, and * indicates quality assurance (QA) stations.

Marine flight 1	Marine flight 2	Marine flight 3	Marine flight 4
GYS004	BLL009	ADM001	(BUD002)
GYS008	**EAS001**	ADM002	BUD005
GYS009	GRG002	ELB015*	CMB003*
GYS015	**PSS008**	**PMA001**	**CMB006**
GYS016	PSS019*	**POD006**	DNA001
WPA001	SAR003	PSB003	**DYE004**
WPA003	**SKG001**	PTH005	(HCB003)
WPA004*	**SKG003**		HCB004
WPA006	**SUZ001**		HCB006
WPA007			(HCB007)
			OAK004
			QMH001
			SIN001

Data Collection

At each of the 40 stations, the Secchi disk depth will be determined and a cast will be conducted to the sea bed using a Sea-Bird Electronics, Inc. Seacat® model SBE-19 conductivity-temperature-depth sensor system (CTD). Sampling will be done by Ambient Monitoring Section (AMS) staff from a floatplane piloted by Kenmore Air Harbor. A duplicate CTD cast will be conducted at least once each month to estimate sensor and field variability. At five stations only CTD/Secchi disk measurements will be made: BUD002, GYS009, GYS015, HCB003, and HCB007. At the remaining 35 stations, water samples also will be collected at discrete depths using a Niskin® bottle and analyzed for bacteria, nutrients, chlorophyll, dissolved oxygen, conductivity, and phytoplankton. Fecal coliform bacteria

samples are collected with a holder for a sterile bottle. Not all parameters will be collected or analyzed at each sampling station. The parameters and depths to be sampled from discrete water samples for stations monitored during WY 1995 are listed in Table 2. Sampling design is as follows:

- CTD casts will be used to obtain vertical profiles of conductivity, temperature, depth, salinity, density, pH, dissolved oxygen, and light transmissivity.

- Fecal coliform bacteria samples will be collected from just below the surface (0.1 m).

- Nutrient samples will be collected from 0.5, 10, and 30 m (depending on total water depth). Nutrient samples will be analyzed for dissolved nitrate+nitrite-N, ammonium-N, and orthophosphate-P. Additionally, dissolved nitrite-N will be determined from samples from three urban bays: BUD005, CMB003, and BLL009.

- Chlorophyll samples will be collected from the 0.5 and 10 m water samples only, except at the largely river-influenced stations GYS004 and WPA001, where no chlorophyll samples will be taken. Chlorophyll samples will be analyzed for both chlorophyll a and phaeopigments.

- Dissolved oxygen samples will be collected from one or two stations on each marine flight to verify the in situ dissolved oxygen sensor on the CTD unit. Samples will be collected from 10 or 30 m and will be chosen to avoid dissolved oxygen concentrations greater than 10 mg/L or steep concentration gradients. Selection of stations and depths will be at the discretion of AMS field staff.

- Conductivity samples will be collected from one depth on each marine flight for comparison with the CTD sensor. Selection of station and depth will be at the discretion of AMS field staff.

- Phytoplankton samples will be collected from 0.5 m at ten stations. Samples from the following five stations are scheduled to be analyzed: BUD005, PSB003, GRG002, WPA004, and HCB006. Samples from the following five stations are scheduled to be archived: EAS001, HCB004, QMH001, SAR003, SKG003.

- QA station (Table 1) sampling is designed to assess field and sampling technique variability for nutrients. Samples will be taken for nutrient analysis from three consecutive surface Niskin® bottle casts. Variability from laboratory analyses on these samples is assessed from splits of the same sample done by lab personnel.

Table 2. Parameters and depths sampled at long-term monitoring stations in Grays Harbor and Willapa Bay (marine flight 1) and in Puget Sound (marine flights 2, 3, and 4) during WY 1995. See text for explanation of parameters sampled.

STATION	TYPE	PARAMETERS SAMPLED	DEPTHS SAMPLED (m)
Marine flight 1:			
GYS004	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
GYS008	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
GYS016	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
WPA001	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
WPA004	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
WPA006	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
GYS009	Rotating	-------(CTD/Secchi only)-------	
GYS015	Rotating	-------(CTD/Secchi only)-------	
WPA003	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
WPA007	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10

Table 2. Continued.

STATION	TYPE	PARAMETERS SAMPLED	DEPTHS SAMPLED (m)
Marine flight 2:			
BLL009	Core	Fecal coliform	0.1
		Nutrients (incl. nitrite-N)	0.5, 10
		Chlorophyll	0.5, 10
GRG002	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
PSS019	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
SAROO3	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
EAS001	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
PSS008	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
SKG001	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
SKG003	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
SUZ001	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10

Table 2. Continued.

STATION	TYPE	PARAMETERS SAMPLED	DEPTHS SAMPLED (m)
Marine flight 3:			
ADM001	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
ADM002	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
ELB015	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
PSB003	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
PTH005	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
EAP001	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
PMA001	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
POD006	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10

Table 2. Continued.

STATION	TYPE	PARAMETERS SAMPLED	DEPTHS SAMPLED (m)
Marine flight 4:			
BUD005	Core	Fecal coliform	0.1
		Nutrients (incl. nitrite-N)	0.5, 10
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
CMB003	Core	Fecal coliform	0.1
		Nutrients (incl. nitrite-N)	0.5, 10, 30
		Chlorophyll	0.5, 10
DNA001	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
HCB004	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
HCB006	Core	Fecal coliform	0.1
		Nutrients	0.5, 10, 30
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
OAK004	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
SIN001	Core	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
CMB006	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
DYE004	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10

Table 2. Continued.

STATION	TYPE	PARAMETERS SAMPLED	DEPTHS SAMPLED (m)
Marine flight 4, continued			
QMH001	Rotating	Fecal coliform	0.1
		Nutrients	0.5, 10
		Chlorophyll	0.5, 10
		Phytoplankton	0.5
BUD002	Floating	-------(CTD/Secchi only)-------	
HCB003	Floating	-------(CTD/Secchi only)-------	
HCB007	Floating	-------(CTD/Secchi only)-------	

Data Processing

The raw CTD data collected during WY 1995 will be stored on disk and then processed using Sea-Bird Electronics, Inc. SEASOFT® version 4.207 software. During processing, the raw CTD data will be truncated into the down-cast data only; the processed down-cast data will be stored on disk as well as hardcopy. Because negative spiking in the salinity data across temperature gradients has been observed in the data collected by the SBE-19 CTD, two additional processing steps available in Sea-Bird Electronics' software package will be used to correct for this.

Data for 0.5-, 10- and 30-m depths from both the CTD down-cast and the discrete sample analyses will be entered into Ecology's AMS database (Dbase 4®), and then downloaded to the PC STORET and US-EPA national environmental STORET databases.

Sample Analysis

Analyses for fecal coliform bacteria, chlorophyll *a*/phaeopigments, and nutrients (nitrite-N, nitrite+nitrate-N, ammonium-N, orthophosphate-P) will continue to be done by Manchester Enviromental Laboratories using their previously established analytical methods (Ecology, 1994).

Water samples will continue to be analyzed for dissolved oxygen concentrations by AMS staff. The analysis of water samples for conductivity will be conducted by the Routine Chemistry Lab of the University of Washington's School of Oceanography. The samples are analyzed using an Autosal® Salinometer calibrated with a complete suite of seawater standards. Phytoplankton samples will continue to be sent to Dr. R. Horner at the University of Washington for cell counts and speciation.

Projected Costs of Sample Analysis

Water samples collected for the long-term monitoring program are analyzed for eight parameters through contracts at various labs: conductivity, chlorophyll *a*/phaeopigments, fecal coliform bacteria, phytoplankton, and four nutrients: ammonium-N, nitrite-N, nitrate+nitrite-N, and orthophosphate-P.

A summary of the total analytical costs projected for WY 1995 is presented in Table 3, based on estimates of sample number and unit analytical costs. For the sample number, the number of those which are QA samples is indicated in parentheses.

Table 3. Projected analytical costs for long-term marine water column monitoring in WY 1995.

PARAMETER	UNIT COST	# SAMPLES (#QA)	TOTAL COST
Conductivity	$ 6	(48)	$288
Chlorophyll *a*	$ 30	888 (96)	$26,640
Fecal coliform bacteria	$ 28	468 (48)	$13,104
Phytoplankton	$ 100	60	$6,000
Ammonium-N	$ 16	1116 (96)	$17,856
Nitrite-N	$ 16	84	$1,344
Nitrate+nitrite-N	$ 16	1116 (96)	$17,856
Orthophosphate-P	$ 16	1116 (96)	$17,856
		GRAND TOTAL	$100,944

References

Ecology, Washington State Department of, 1994. Laboratory Users Manual, Fourth Edition. Manchester Environmental Laboratory, Manchester, WA.

Janzen, C.D., 1992. Marine Water Column Ambient Monitoring Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Publication #92-23, Olympia, WA.

Appendix A

Positions and Descriptions for Marine Water Column Stations to be Monitored During Wateryear 1995

Appendix A. Positions and descriptions for marine water-column stations to be monitored during Wateryear 1995.

MARINE FLIGHT 1

GYS004 46 58.3N, 123 46.8W
GRAYS HARBOR - CHEHALIS RIVER AT STANDARD OIL DOCK
Located in Grays Harbor on the Chehalis River, 1.4 miles from the mouth, 200 yards south of the Standard Oil pier in the right angle turn of the river.

GYS008 46 56.2N, 123 54.7W
GRAYS HARBOR - MID-SOUTH CHANNEL
Located in Grays Harbor midway down South Channel at a flashing, green, 4-second light (No. 13).

GYS009 46 57.8N, 123 57.0W
GRAYS HARBOR - AT MOON ISLAND REACH
Located in Grays Harbor in the middle of Moon Island Reach in the North Channel, directly adjacent to a flashing, green, 4-second light (No. 41).

GYS015 46 55.3N, 124 04.0W
GRAYS HARBOR - NORTH WHITCOMB FLATS
Located in Grays Harbor, north of Whitcomb Flats, near a flashing, green, 4-second light (No. 17).

GYS016 46 57.3N, 124 06.0W
GRAYS HARBOR - NEAR DAMON POINT
Located in Grays Harbor off Damon Point

WPA001 46 41.2N, 123 44.9W
WILLAPA RIVER AT RAYMOND
Located 6.4 miles from the mouth of the Willapa River at the town of Raymond, between the upper and lower range No. 61, about .25 mile west of the Weyerhaeuser Mill.

WPA003 46 42.2N, 123 50.1W
WILLAPA RIVER AT JOHNSON SLOUGH
Located 0.4 mile from the mouth of the Willapa River at the black can buoy No. 31, midstream, at the mouth of Johnson Slough.

WPA004 46 41.7N, 123 57.8W
WILLAPA BAY AT TOKE POINT
Located in Willapa Bay at Toke Point, adjacent to a flashing, red, 4-second light (No. 16).

WPA006 46 32.7N, 123 58.7W
WILLAPA BAY - MID-NAHCOTTA CHANNEL
Located in Willapa Bay, in the middle of Nahcotta Channel, south of Riddle Spit, adjacent to red buoy marker #12.

WPA007 46 26.9N, 124 00.6W
WILLAPA BAY - OFF LONG ISLAND, WILLAPA NATIONAL WILDLIFE REFUGE
Located in Willapa Bay, southwest of Jensen Point on Long Island (in the Willapa National Wildlife Refuge), adjacent to flashing, green, 2.5 second light.

MARINE FLIGHT 2

BLL009 48 40.4N, 122 35.5W
BELLINGHAM BAY NEAR POINT FRANCES
Located in Bellingham Bay, south of Point Frances, Portage Island and east of Lummi Island, adjacent to flashing red buoy No. 2.

EAS001 48 38.6N, 122 52.8W
EAST SOUND, ORCAS ISLAND
Located off Rosario Point in the middle of East Sound, Orcas Island.

GRG002 48 49.1N, 122 58.1W
GEORGIA STRAIT - PATOS ISLAND
Located in Georgia Strait, north of Patos Island.

PSS008 47 58.9N, 122 13.3W
PORT GARDNER BAY AT PIER 3
Located on Possession Sound in Port Gardner Bay in the East Waterway, directly adjacent to the Port of Everett Pier No. 3 and standing off about 50 feet from the end of the pier.

PSS019 48 00.9N, 122 18.4W
POSSESSION SOUND - GEDNEY ISLAND
Located in Possession Sound on northeast side of Gedney Island, adjacent to flashing, 2.5 second light No. 1.

SAR003 48 06.5N, 122 29.5W
SARATOGA PASSAGE
Located in Saratoga Passage, midway between Lowell Point on Camano Island and East Point on Whidbey Island.

SKG001 48 23.8N, 122 34.8W
SKAGIT BAY AT HOPE ISLAND
Located in Skagit Bay, mid-channel between Hope Island and Whidbey Island, adjacent to the Hope Island flashing, 4-second light.

SKG003 48 17.8N, 122 29.3W
SKAGIT BAY AT STRAWBERRY POINT
Located just south of #4 red channel marker off Strawberry Point, Whidbey Island.

SUZ001 48 08.1N, 122 22.2W
PORT SUSAN AT KAYAK POINT
Located in Port Susan; northwest of Everett, 200 yards west of Kayak Point.

MARINE FLIGHT 3

ADM001 48 01.9N, 122 36.6W
ADMIRALTY INLET AT BUSH POINT, WHIDBEY ISLAND
Located in Admiralty Inlet on the lower, west end of Whidbey Island at Bush Point, about 300 meters off Bush Point Light - a 10 second, intermittent flashing light.

ADM002 48 11.4N, 122 50.0W
STRAIT OF JUAN DE FUCA - QUIMPER PENINSULA
Located in the Strait of Juan de Fuca, north of McCurdy Point on the Quimper Peninsula, and adjacent to a yellow, flashing, 4-second buoy.

EAP001 47 26.1N, 122 23.4W
EAST PASSAGE - SOUTH THREE TREE POINT
Located in East Passage, southwest of Three Tree Point and southeast of Point Heyer.

ELB015 47 35.6N, 122 22.7W
ELLIOTT BAY
Located in Elliott Bay, east of Duwamish Head.

PMA001 47 44.3N, 122 31.9W
PORT MADISON
Located in Port Madison, southwest off Indianola Pier.

POD006 47 43.4N, 122 38.7W
LIBERTY BAY
Located in Liberty Bay, on west side of south speed limit buoy.

PSB003 47 39.6N, 122 26.1W
PUGET SOUND AT WEST POINT
Located in Puget Sound directly off West Point at Fort Lawton, adjacent to black can buoy No. 1.

PTH005 48 05.0N, 122 45.8W
PORT TOWNSEND HARBOR
Located in Port Townsend Harbor, east of Glen Cove, about midway between the shores of Glen Cove and the entrance to Kilisut Harbor.

MARINE FLIGHT 4

BUD002 47 03.1N, 122 54.3W
BUDD INLET - PORT OF OLYMPIA
Located in the West Bay of Budd Inlet near the Port of Olympia off buoy #18.

BUD005 47 05.6N, 122 55.0W
BUDD INLET NEAR OLYMPIA SHOALS AT THE HORN
Located in Budd Inlet on the east side of the Olympia Shoals, on the southern side and adjacent to the flashing red light at the horn.

CMB003 47 17.2N, 122 26.8W
COMMENCEMENT BAY
Located in the center of Commencement Bay between Browns Point and Old Tacoma.

CMB006 47 15.7N, 122 26.2W
COMMENCEMENT BAY AT THE MOUTH OF THE CITY WATERWAY
Located in Commencement Bay at the mouth of the City Waterway, directly adjacent to the flashing, 6-second light and bell and 5 mph sign on east side.

DNA001 47 09.7N, 122 52.1W
DANA PASSAGE
Located in the middle of Dana Passage, south of Brisco Point.

DYE004 47 37.2N, 122 41.2W
DYES INLET
Located in northeast Chico Bay off Erland Peninsula.

HCB003 47 32.2N, 123 01.3W
HOOD CANAL AT ELDON, HAMMA HAMMA RIVER
Located on Hood Canal at the City of Eldon, midchannel between Cummings and Chinom Points.

HCB004 47 21.6N, 123 01.3W
HOOD CANAL AT S ISTERS POINT
Located in the Great Bend of Hood Canal at Sisters Point, midchannel.

HCB006 47 43.8N, 122 45.3W
HOOD CANAL - KING SPIT
Located in Hood Canal, midchannel between King Spit and Brown Point.

HCB007 47 23.9N, 122 55.9W
HOOD CANAL
Located in Hood Canal, about 2/3 around the Great Bend towards Lynch Cove.

OAK004 47 12.9N, 123 04.4W
OAKLAND BAY NEAR EAGLE POINT
Located in Oakland Bay at midbay between Eagle Point and Shell Oil storage tanks.

QMH001 47 22.7N, 122 28.2W
QUARTERMASTER HARBOR
Located in Quartermaster Harbor between Dockton and Shawnee.

SIN001 47 33.0N, 122 38.1W
SINCLAIR INLET AT BREMERTON NAVAL SHIPYARDS
Located in Sinclair Inlet, 500 yards off the drydock at the Bremerton Naval Shipyards.

Appendix B

Data Availability for Marine Water Column Long-Term Monitoring Stations

Appendix B. Station data availability from Washington State Department of Ecology's Marine Water Column Ambient Monitoring Program for current and historical stations. An "X" denotes monthly data in Ecology's Ambient Monitoring Section database and in PC Storet for the listed wateryear (WY). Wateryears begin in October and end in September of the year named. Some wateryear records are incomplete due to missed surveys or isolated sampling events; sampling during winter months did not commence until WY1989. Station type: "C"=core; "R"=rotating (3 y rotation); blank = historical, not currently sampled.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Admiralty Inlet																					
ADM001	Admiralty Inlet-Bush Pt.	C	48 01.8	122 37.0					X	X	X	X	X	X	X	X	X	X	X	X	X
ADM002	N. Adm. Inlet-Quimper Pen.	C	48 11.3	122 50.5																	X
ADM003	S. Adm. Inlet		48 52.8	122 28.9																	X
Bellingham Bay																					
BLL002	Std Oil Dock		48 45.1	122 29.2		X	X	X	X	X											
BLL003	S. Whatcom WW		48 44.7	122 29.6		X	X	X													
BLL004	Yacht Harbor		48 45.2	122 30.4		X	X	X													
BLL006	Nun Buoy 4		48 44.1	122 30.1					X	X	X	X	X	X	X	X	X	X	X	X	X
BLL007	Cannery Shipyard		48 43.4	122 30.8					X	X											
BLL008	Post Point		48 42.8	122 31.8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLL009	Pt. Frances	C	48 41.2	122 35.9							X	X	X	X	X	X	X	X	X	X	X
BLL010	Eliza Island		48 38.3	122 34.7						X	X	X	X								
Burley-Minter Lagoon																					
BML001	Burley-Minter Lagoon	R	47 22.7	122 38.0																	X
Budd Inlet																					
BUD001	Yacht Basin		47 02.9	122 54.3		X	X	X													
BUD002	S. End Oly Port	R	47 03.1	122 54.3						X	X	X	X	X	X	X	X	X	X	X	X
BUD003	Spar Buoy 10		47 03.6	122 54.4		X	X	X		X											
BUD004	Light Buoy 6		47 04.0	122 54.5						X											
BUD005	Olympia Shoal	C	47 05.5	122 55.0		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Commencement Bay																					
CMB003	Browns Point	C	47 17.4	122 26.9						X	X	X	X	X	X	X	X	X	X	X	X
CMB006	Mouth of City WW	R	47 15.7	122 26.2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CMB010	Puyallup R. Mouth		47 16.2	122 25.6		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CMB012	Puyallup R. I-5		47 14.5	122 23.9		X	X	X													
CMB013	Blair WW Mouth		47 16.7	122 24.8		X	X	X	X	X											
CMB016	Hylebos WW 11th St.		47 16.7	122 23.6		X	X	X	X	X											
Carr Inlet																					
CRR001	Off Green Point	R	47 16.6	122 42.5						X	X	X	X	X	X	X	X	X	X	X	X

Appendix B. Continued.

Station Number	Station Name		Latitude (deg min N)	Longitude (deg min W)	WY:	89	90	91	92	93	94	95
Admiralty Inlet												
ADM001	Admiralty Inlet-Bush Pt.	C	48 01.8	122 37.0						X	X	X
ADM002	N. Adm. Inlet-Quimper Pen.	C	48 11.3	122 50.5		X	X	X	X	X	X	X
ADM003	S. Adm. Inlet		48 52.8	122 28.9		X	X	X				
Bellingham Bay												
BLL002	Std Oil Dock		48 45.1	122 29.2								
BLL003	S. Whatcom WW		48 44.7	122 29.6								
BLL004	Yacht Harbor		48 45.2	122 30.4								
BLL006	Nun Buoy 4		48 44.1	122 30.1								
BLL007	Cannery Shipyard		48 43.4	122 30.8								
BLL008	Post Point		48 42.8	122 31.8								
BLL009	Pt. Frances	C	48 41.2	122 35.9		X	X	X	X	X	X	X
BLL010	Eliza Island		48 38.3	122 34.7								
Burley-Minter Lagoon												
BML001	Burley-Minter Lagoon	R	47 22.7	122 38.0		X	X	X				
Budd Inlet												
BUD001	Yacht Basin		47 02.9	122 54.3								
BUD002	S. End Oly Port	R	47 03.1	122 54.3		X	X	X				
BUD003	Spar Buoy 10		47 03.6	122 54.4								
BUD004	Light Buoy 6		47 04.0	122 54.5								
BUD005	Olympia Shoal	C	47 05.5	122 55.0		X	X	X	X	X	X	X
Commencement Bay												
CMB003	Browns Point	C	47 17.4	122 26.9		X	X	X	X	X	X	X
CMB006	Mouth of City WW	R	47 15.7	122 26.2								X
CMB010	Puyallup R. Mouth		47 16.2	122 25.6								
CMB012	Puyallup R. I-5		47 14.5	122 23.9								
CMB013	Blair WW Mouth		47 16.7	122 24.8								
CMB016	Hylebos WW 11th St.		47 16.7	122 23.6								
Carr Inlet												
CRR001	Off Green Point	R	47 16.6	122 42.5		X	X	X		X		

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Case Inlet																					
CSE001	S. Heron Island	R	47 15.9	122 50.6							X	X	X	X	X	X	X	X	X	X	X
CSE002	Off Rocky Point		47 21.2	122 48.8																	
Discovery Bay																					
DIS001	Near Mill Point	R	48 01.1	122 50.8																	
Dana Passage																					
DNA001	S. of Brisco Point	C	47 09.7	122 52.2														X			X
Drayton Harbor																					
DRA001	Entrance Channel		48 58.0	122 45.7		X	X			X	X	X	X	X	X	X	X	X	X	X	X
Dyes Inlet																					
DYE002	Windy Point		47 38.1	122 40.9					X												
DYE003	Wash. Narrows		47 35.2	122 39.0		X	X		X		X	X	X	X	X	X	X	X	X	X	X
DYE004	NE of Chico Bay	R	47 37.4	122 41.3																	
East Passage																					
EAP001	SW of Three Tree Point	R	47 25.0	122 22.8																	X
East Sound - Orcas Island																					
EAS001	Rosario Point	R	48 38.6	122 52.9																	
Elliott Bay																					
ELB001	Pier 91		47 37.6	122 22.5		X	X	X													
ELB002	Pier 66		47 36.7	122 21.0		X	X	X													
ELB003	Pier 51		47 36.1	122 20.4		X	X	X													
ELB004	East WW Mouth		47 35.4	122 20.6		X	X	X													
ELB005	Near Harbor Island		47 35.4	122 21.1									X	X	X	X	X	X	X	X	X
ELB006	West WW Mouth		47 35.4	122 21.5		X	X	X													
ELB008	Duwamish Head		47 36.1	122 23.2		X	X	X													
ELB009	Duw. WW Spok. St. Br.		47 34.3	122 21.2		X	X	X													
ELB010	Duw. WW 16th St. Br.		47 31.3	122 18.8		X	X	X					X	X	X	X	X	X	X	X	X
ELB012	Duw. R. Marg. Way		47 30.1	122 17.3		X	X	X													
ELB015	E. of Duwamish Head	C	47 35.8	122 22.1																	
Eld Inlet																					
ELD001	Flapjack Point	R	47 06.4	122 56.9						X	X	X	X	X	X	X	X	X	X	X	X
ELD002	S. Flapjack Point		47 05.8	122 58.5																	X
Fidalgo Bay																					
FID001	E. of Anacortes (see also PAD002)	R	48 30.8	122 35.6																	

Appendix B. Continued.

Station Number	Station Name		Latitude (deg min N)	Longitude (deg min W)	WY:	89	90	91	92	93	94	95
Case Inlet												
CSE001	S. Heron Island	R	47 15.9	122 50.6		X	X	X		X		
CSE002	Off Rocky Point		47 21.2	122 48.8				X				
Discovery Bay												
DIS001	Near Mill Point	R	48 01.1	122 50.8				X				
Dana Passage												
DNA001	S. of Brisco Point	C	47 09.7	122 52.2		X	X	X	X	X	X	X
Drayton Harbor												
DRA001	Entrance Channel		48 58.0	122 45.7								
Dyes Inlet												
DYE002	Windy Point		47 38.1	122 40.9								
DYE003	Wash. Narrows		47 35.2	122 39.0								
DYE004	NE of Chico Bay	R	47 37.4	122 41.3					X			X
East Passage												
EAP001	SW of Three Tree Point	R	47 25.0	122 22.8		X	X	X				X
East Sound - Orcas Island												
EAS001	Rosario Point	R	48 38.6	122 52.9				X	X	X	X	X
Elliott Bay												
ELB001	Pier 91		47 37.6	122 22.5								
ELB002	Pier 66		47 36.7	122 21.0								
ELB003	Pier 51		47 36.1	122 20.4								
ELB004	East WW Mouth		47 35.4	122 20.6								
ELB005	Near Harbor Island		47 35.4	122 21.1								
ELB006	West WW Mouth		47 35.4	122 21.5								
ELB008	Duwamish Head		47 36.1	122 23.2								
ELB009	Duw. WW Spok. St. Br.		47 34.3	122 21.2								
ELB010	Duw. WW 16th St. Br.		47 31.3	122 18.8								
ELB012	Duw. R. Marg. Way		47 30.1	122 17.3								
ELB015	E. of Duwamish Head	C	47 35.8	122 22.1					X	X	X	X
Eld Inlet												
ELD001	Flapjack Point	R	47 06.4	122 56.9		X	X	X		X		
ELD002	S. Flapjack Point		47 05.8	122 58.5		X	X	X				
Fidalgo Bay												
FID001	E. of Anacortes (see also PAD002)	R	48 30.8	122 35.6							X	

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Georgia Strait																					
GRG001	Birch Bay		48 53.7	122 47.8		X	X			X											
GRG002	N. of Patos Island	C	48 48.5	122 57.2																	X
Grays Harbor																					
GYS004	Chehalis R.	C	46 58.7	123 47.0				X	X	X	X	X	X	X	X	X	X	X	X	X	X
GYS006	E. Rennie Island		46 57.4	123 50.5						X	X	X	X	X	X						
GYS007	N. Ch. Rayonier		46 58.1	123 52.3						X	X	X	X	X	X	X	X	X	X	X	X
GYS008	Mid-S. Channel	C	46 56.3	123 54.7				X	X						X	X	X	X	X	X	X
GYS009	Moon Island Reach	R	46 57.9	123 56.9				X	X	X	X	X	X	X	X	X	X	X	X	X	X
GYS014	At the Bar		46 55.5	124 07.0		X	X	X	X												
GYS015	N. Whitcomb Flats	R	46 55.4	124 04.5											X	X	X	X	X	X	X
GYS016	Damon Point	C	46 57.2	124 05.5											X	X	X	X	X	X	X
Hood Canal																					
HCB002	Dabob Bay Pulali Point	R	47 44.8	122 50.8					X		X	X	X	X	X	X	X	X	X	X	X
HCB003	Eldon, Hamma Hamma R.	R	47 32.3	123 00.5						X	X	X	X	X	X	X	X	X	X	X	X
HCB004	Gt. Bend, Sisters Point	C	47 21.4	123 01.4					X	X	X	X	X	X	X	X	X	X	X	X	X
HCB006	King Spit, Bangor	C	47 44.9	122 43.8					X	X	X	X	X	X	X	X	X	X	X	X	X
HCB007	Lynch Cove	R	47 23.9	122 55.7																	
Holmes Harbor																					
HLM001	Honeymoon Bay	R	48 03.8	122 31.9		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Henderson Inlet																					
HND001	Cliff Point	R	47 09.1	122 50.0																	
Haro Strait																					
HRO001	Skipjack Island		48 44.1	123 02.4				X		X	X	X	X	X	X	X	X	X	X	X	X
Strait of Juan de Fuca (Sequim Bay)																					
JDF005	Sequim Bay	R	48 03.7	123 01.8						X	X	X	X	X	X	X	X	X	X	X	X
JDF007	Sequim Bay, Goose Point		48 02.9	123 00.5																	
Lopez Sound - Lopez Island																					
LOP001	Decatur Island	R	48 30.8	122 51.0																	
Tacoma Narrows																					
NRR001	Point Defiance		47 19.0	122 32.9						X	X	X	X	X	X	X	X	X	X	X	X

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	89	90	91	92	93	94	95
Georgia Strait												
GRG001	Birch Bay		48 53.7	122 47.8								
GRG002	N. of Patos Island	C	48 48.5	122 57.2		X	X	X	X	X	X	X
Grays Harbor												
GYS004	Chehalis R.	C	46 58.7	123 47.0		X	X	X	X	X	X	X
GYS006	E. Rennie Island		46 57.4	123 50.5								
GYS007	N. Ch. Rayonier		46 58.1	123 52.3								
GYS008	Mid-S. Channel	C	46 56.3	123 54.7		X	X	X	X	X	X	X
GYS009	Moon Island Reach	R	46 57.9	123 56.9		X	X	X	X	X	X	X
GYS014	At the Bar		46 55.5	124 07.0								
GYS015	N. Whitcomb Flats	R	46 55.4	124 04.5					X	X	X	X
GYS016	Damon Point	C	46 57.2	124 05.5				X	X	X	X	X
Hood Canal												
HCB002	Dabob Bay Pulali Point	R	47 44.8	122 50.8								
HCB003	Eldon, Hamma Hamma R.	R	47 32.3	123 00.5		X	X	X			X	X
HCB004	Gt. Bend, Sisters Point	C	47 21.4	123 01.4				X	X	X	X	X
HCB006	King Spit, Bangor	C	47 44.9	122 43.8		X	X	X	X	X	X	X
HCB007	Lynch Cove	R	47 23.9	122 55.7				X	X	X	X	X
Holmes Harbor												
HLM001	Honeymoon Bay	R	48 03.8	122 31.9								
Henderson Inlet												
HND001	Cliff Point	R	47 09.1	122 50.0						X		
Haro Strait												
HRO001	Skipjack Island		48 44.1	123 02.4								
Strait of Juan de Fuca (Sequim Bay)												
JDF005	Sequim Bay	R	48 03.7	123 01.8				X			X	
JDF007	Sequim Bay, Goose Point		48 02.9	123 00.5				X			X	
Lopez Sound - Lopez Island												
LOP001	Decatur Island	R	48 30.8	122 51.0				X	X	X	X	
Tacoma Narrows												
NRR001	Point Defiance		47 19.0	122 32.9		X	X	X				

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Nisqually Reach																					
NSQ001	Nisqually R. Delta		47 06.8	122 41.8						X	X	X	X	X	X	X	X	X	X	X	X
NSQ002	Devils Head		47 10.1	122 47.2														X			
Oakland Bay																					
OAK001	At Eagle Point		47 12.5	123 04.8												X	X				
OAK004	Near Eagle Point	C	47 12.8	123 04.6				X			X	X	X	X	X	X	X	X	X	X	X
Padilla Bay																					
PAD001	Near Hat Island		48 30.9	122 33.5		X	X	X													
PAD002	Capsante Head (see also FID001)		48 30.7	122 35.7		X	X	X	X												
PAD003	E. Guemes Channel		48 30.5	122 36.4					X												
Port Angeles Harbor																					
PAH003	Ediz Hook Head		48 08.1	123 27.6		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PAH006	Rayonier Mill		48 07.4	123 24.5		X	X	X													
PAH007	Rayonier Pier		48 07.2	123 24.3		X	X	X	X	X											
PAH008	Morse Creek	R	47 07.3	123 21.0		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pickering Passage																					
PCK001	Harstene Island	R	47 14.9	122 55.4						X	X	X	X	X	X	X	X	X	X	X	X
Port Madison																					
PMA001	S. of Buoy 65	R	47 44.1	122 32.0																	
Penn Cove (Whidbey Island)																					
PNN001	Penn Cove Park	R	48 13.9	122 40.5		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Port Orchard																					
POD004	Liberty Bay/Poulsbo		47 43.8	122 38.7					X												
POD005	Brownsville		47 39.1	122 36.5					X		X	X	X	X	X	X	X	X	X	X	X
POD006	Liberty Bay/Virg. Point	R	47 42.9	122 38.0							X	X	X	X	X	X	X	X	X	X	X
Puget Sound Main Basin / Lk Wash. Ship Canal																					
PSB002	Alki Point		47 34.6	122 25.4		X	X	X													
PSB003	West Point	C	47 39.6	122 26.5						X	X	X	X	X	X	X	X	X	X	X	X
PSB006	Ballard Bridge		47 39.6	122 22.5		X	X	X	X												
PSB007	Lake Union/Gas Works		47 38.6	122 13.3		X	X	X	X												
PSB008	Fremont Bridge		47 38.9	122 20.9		X	X	X	X												
Possession Sound - Port Gardner																					
PSS002	Tulalip Bay		48 03.3	122 17.5		X	X	X	X												
PSS005	PG Bay Weyerhaeuser Dk		47 58.6	122 13.6		X	X	X	X												
PSS008	PG Bay Pier 3	R	47 58.9	122 13.3									X	X	X	X	X	X	X	X	X

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	89	90	91	92	93	94	95
Nisqually Reach												
NSQ001	Nisqually R. Delta		47 06.8	122 41.8		X	X	X				
NSQ002	Devils Head		47 10.1	122 47.2								
Oakland Bay												
OAK001	At Eagle Point		47 12.5	123 04.8								
OAK004	Near Eagle Point	C	47 12.8	123 04.6		X	X	X	X	X	X	X
Padilla Bay												
PAD001	Near Hat Island		48 30.9	122 33.5								
PAD002	Capsante Head (see also FID001)		48 30.7	122 35.7								
PAD003	E. Guemes Channel		48 30.5	122 36.4								
Port Angeles Harbor												
PAH003	Ediz Hook Head		48 08.1	123 27.6								
PAH006	Rayonier Mill		48 07.4	123 24.5								
PAH007	Rayonier Pier		48 07.2	123 24.3								
PAH008	Morse Creek	R	47 07.3	123 21.0		X	X	X			X	
Pickering Passage												
PCK001	Harstene Island	R	47 14.9	122 55.4					X			
Port Madison												
PMA001	S. of Buoy 65	R	47 44.1	122 32.0				X	X			X
Penn Cove (Whidbey Island)												
PNN001	Penn Cove Park	R	48 13.9	122 40.5							X	
Port Orchard												
POD004	Liberty Bay/Poulsbo		47 43.8	122 38.7								
POD005	Brownsville		47 39.1	122 36.5								
POD006	Liberty Bay/Virg. Point	R	47 42.9	122 38.0					X			X
Puget Sound Main Basin / Lk Wash. Ship Canal												
PSB002	Alki Point		47 34.6	122 25.4								
PSB003	West Point	C	47 39.6	122 26.5		X	X	X	X	X	X	X
PSB006	Ballard Bridge		47 39.6	122 22.5								
PSB007	Lake Union/Gas Works		47 38.6	122 13.3								
PSB008	Fremont Bridge		47 38.9	122 20.9								
Possession Sound - Port Gardner												
PSS002	Tulalip Bay		48 03.3	122 17.5								
PSS005	PG Bay Weyerhaeuser Dk		47 58.6	122 13.6								
PSS008	PG Bay Pier 3	R	47 58.9	122 13.3								X

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Possession Sound - Port Gardner (cont'd)																					
PSS009	PG Bay at Scott Dk		47 59.1	122 13.2		X	X	X	X												
PSS015	Snohomish R. HWY 99		48 01.0	122 11.2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PSS016	Snohomish R. Smith Island		47 59.0	122 10.1		X	X	X													
PSS018	Snohomish R. Lowell		48 57.6	122 11.2		X	X	X	X	X											
PSS019	Gedney Island	C	48 00.7	122 18.0									X	X	X	X	X	X	X	X	X
PSS020	Ebey Slough		48 02.6	122 11.6		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Port Townsend Harbor																					
PTH002	Crown Zeller		48 05.5	122 47.5				X													
PTH003	Yacht Basin		48 06.4	122 46.1				X													
PTH005	Walan Point	C	48 05.0	122 45.8							X	X	X	X	X	X	X	X	X	X	X
Quartermaster Harbor																					
QMH001	Burton	R	47 22.8	122 27.9																	
Samish Bay																					
SAM001	Williams Point		48 35.3	122 31.9					X												
Saratoga Passage																					
SAR002	Crescent Harbor		48 16.0	122 33.3		X	X	X	X												
SAR003	East Point	C	48 06.5	122 29.4							X	X	X	X	X	X	X	X	X	X	X
Sequim Bay (see Strait of Juan de Fuca)																					
Sinclair Inlet																					
SIN001	Naval Shipyards	C	47 33.0	122 38.5		X	X		X		X	X	X	X	X	X	X	X	X	X	X
San Juan Islands																					
SJI001	SJ Chan. at Reid Rock		48 33.0	122 59.3				X		X	X	X	X	X	X	X	X	X	X	X	X
Skagit Bay																					
SKG001	Hope Island	R	48 23.8	122 34.8		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
SKG002	Strawberry Point		48 17.9	122 30.0					X	X											
SKG003	Str. Point Red Buoy	R	48 17.8	122 29.3																	
Steilacoom																					
STL001	Off Chambers Creek		47 11.1	122 36.6																	
Port Susan																					
SUZ001	Kayak Point	R	48 08.1	122 22.2		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Totten Inlet																					
TOT001	Windy Point	R	47 09.9	122 57.8							X	X	X	X	X	X	X	X	X	X	X

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	89	90	91	92	93	94	95
Possession Sound - Port Gardner (cont'd)												
PSS009	PG Bay at Scott Dk		47 59.1	122 13.2								
PSS015	Snohomish R. HWY 99		48 01.0	122 11.2								
PSS016	Snohomish R. Smith Island		47 59.0	122 10.1								
PSS018	Snohomish R. Lowell		48 57.6	122 11.2								
PSS019	Gedney Island	C	48 00.7	122 18.0		X	X	X	X	X	X	X
PSS020	Ebey Slough		48 02.6	122 11.6								
Port Townsend Harbor												
PTH002	Crown Zeller		48 05.5	122 47.5								
PTH003	Yacht Basin		48 06.4	122 46.1								
PTH005	Walan Point	C	48 05.0	122 45.8					X	X	X	X
Quartermaster Harbor												
QMH001	Burton	R	47 22.8	122 27.9					X			X
Samish Bay												
SAM001	Williams Point		48 35.3	122 31.9								
Saratoga Passage												
SAR002	Crescent Harbor		48 16.0	122 33.3								
SAR003	East Point	C	48 06.5	122 29.4		X	X	X	X	X	X	X
Sequim Bay (see Strait of Juan de Fuca)												
Sinclair Inlet												
SIN001	Naval Shipyards	C	47 33.0	122 38.5					X	X	X	X
San Juan Islands												
SJI001	SJ Chan. at Reid Rock		48 33.0	122 59.3								
Skagit Bay												
SKG001	Hope Island	R	48 23.8	122 34.8								X
SKG002	Strawberry Point		48 17.9	122 30.0								
SKG003	Str. Point Red Buoy	R	48 17.8	122 29.3				X				X
Steilacoom												
STL001	Off Chambers Creek		47 11.1	122 36.6				X	X			
Port Susan												
SUZ001	Kayak Point	R	48 08.1	122 22.2								X
Totten Inlet												
TOT001	Windy Point	R	47 09.9	122 57.8		X	X	X		X		

Appendix B. Continued.

Station Number	Station Name	Station Type	Latitude (deg min N)	Longitude (deg min W)	WY:	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Willapa Bay																					
WPA001	Willapa R., Raymond	C	46 41.3	123 44.9		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
WPA002	Willapa R., South B.		46 39.8	123 47.8		X	X	X		X											
WPA003	Willapa R., John. Slough	R	46 42.3	123 50.2		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
WPA004	Toke Point	C	46 41.2	123 58.3		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
WPA005	Oysterville		46 32.3	123 58.9		X	X	X													
WPA006	Nahcotta Channel	C	46 32.7	123 58.7																	
WPA007	Long Isl., S. Jenson Point	R	46 27.2	124 00.5																	

Appendix B. Continued.

Station Number	Station Name	Station Tupe	Latitude (deg min N)	Longitude (deg min W)	WY:	89	90	91	92	93	94	95
Willapa Bay												
WPA001	Willapa R., Raymond	C	46 41.3	123 44.9		X	X	X	X	X	X	X
WPA002	Willapa R., South B.		46 39.8	123 47.8								
WPA003	Willapa R., John. Slough	R	46 42.3	123 50.2		X	X	X	X	X	X	X
WPA004	Toke Point	C	46 41.2	123 58.3		X	X	X	X	X	X	X
WPA005	Oysterville		46 32.3	123 58.9								
WPA006	Nahcotta Channel	C	46 32.7	123 58.7				X	X	X	X	X
WPA007	Long Isl., S. Jenson Point	R	46 27.2	124 00.5				X	X	X	X	X