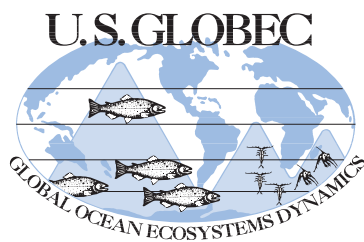
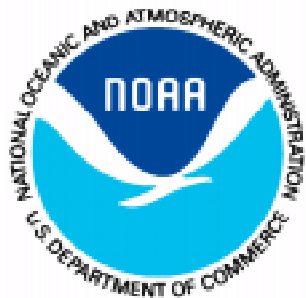


GLOBEC Northeast Pacific California Current

Cruise Report, F/V *Sea Eagle* (SE0005)

May 29 – June 18, 2000



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Chief Scientist:

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Cruise Goals

To determine the meso-scale and fine-scale distribution of juvenile salmon along with their prey, predators and potential competitors in the California Current System (CCS) region from Crescent City, CA to Newport, OR, relative to environmental conditions.

Summaries of each of the GLOBEC projects may be found at the web site:
<http://globec.oce.orst.edu/groups/nep/projs.html>.

Table 1. GLOBEC Cruise Participants

Richard Brodeur	Northwest Fisheries Science Center, Newport
Robert Emmett	Northwest Fisheries Science Center, Newport
Jackie Noskov	Cooperative Institute for Marine Resource Studies, Newport
Joseph Fisher	College of Oceanic and Atmospheric Sciences, OSU, Corvallis

GLOBEC Principal Investigators: Richard Brodeur, Robert Emmett, William Pearcy, and Edmundo Casillas.

Methods

Surveys were conducted from May 29-June 18, 2000. Each survey consisted of a mesoscale grid along 5 lines (off Newport, Heceta Head, Coos Bay, the Rogue River and Crescent City, CA), which were designated GLOBEC transects that have been monitored for the previous several years by the GLOBEC Northeast Pacific Long-Term Observation Program (LTOP). This mesoscale survey was followed by fine-scale process stations at locations of interest based on either features observed in the physical environment (fronts or eddies) or acoustic sampling conducted by two accompanying oceanographic vessels (R/V *Wecoma* [W0005A] and R/V *New Horizon* [NH0005]).

For the mesoscale survey, stations were established at 1, 5, 10, 15, 20, 25 and 30 miles from shore on each of five transects. Inclement weather prevented us from sampling all the stations along each transect. At each station, a Nordic 264-rope trawl built by Nor'Eastern Trawl Systems, Inc. was towed in surface waters by a chartered fishing vessel (F/V *Sea Eagle*). This rope trawl has a maximum mouth opening of approximately 30-m wide x 18-m deep. Mesh sizes ranged from 162.6-cm in the throat of the trawl near the jib lines to 8.9-cm in the codend. To maintain catches of small fish and squid, a 6.1-m long, 0.8-cm knotless liner was sewn into the codend. All tows were 30 minutes in duration. All fish and squid caught were counted and measured at sea. All juvenile salmon caught were immediately frozen for later analysis of growth, condition, pathology, genetic analysis, and food habits. We also enumerated and measured the large invertebrates (e.g., jellyfish) collected in the trawl. Locations of all trawls are listed in Table 3.

The physical and biological environment was monitored and sampled at each station immediately prior to setting the trawl. A CTD cast was made with a Sea-Bird SBE 19 Seacat profiler to 100-m or within 10-m of the bottom (if shallower) (Table 4). Chlorophyll and nutrient samples were collected from 3-m depth using a 2-l Niskin water sampler

(Table 5). A neuston tow with a 1-m² mouth containing 0.333-mm mesh net was towed for 5 minutes out of the wake of the vessel at each station (Table 6). General Oceanics or TSK flow meters were placed inside the net to measure the amount of water sampled.

Cruise Summary (Narrative) / Results

Figure 1 shows the locations of the trawl stations during the meso-scale and fine-scale portions of the survey. We collected a total of 5,658 fish from 36 species (Table 2). The catch in June was dominated by forage fishes such as Pacific herring (13.6%), surf and whitebait smelt (36.4%), and juvenile rockfishes (18%), sablefish and flatfishes. Salmonids comprised a relative minor proportion of the catches (only 111 juvenile salmonids; 2 % of the total) and were mainly juvenile chinook and coho salmon and steelhead. Of the 36 species of fish collected, eight species were represented by a single individual only.

Juvenile chinook salmon were broadly distributed latitudinally during June 2000, but their distribution was mainly constricted close to shore, mostly at stations within the 100 m isobath (Figure 1). Coho salmon juveniles were more common north of Cape Blanco and were found generally farther offshore than juvenile chinook salmon. In contrast, steelhead juveniles were found mainly south of Cape Blanco, but their zonal distribution overlapped that of coho salmon juveniles.

Table 2. Vertebrate catch from GLOBEC cruises in June 2000. Species shown without any catches are shown because they were captured in trawl surveys from a later mid-summer (August 2000) cruise.

Family	Common name	Scientific name	Catch
Agnatha			
	Pacific lamprey	<i>Lampetra tridentata</i>	1
Chondrichthyes			
Alopiidae	Common thresher shark	<i>Alopias vulpinus</i>	1
Carcharhinidae	Blue shark	<i>Prionace glauca</i>	
Osteichthyes			
Xenocoelidae	Eel leptocephalus	<i>Thalassenchelys coheni</i>	3
Clupeidae	Pacific herring	<i>Clupea pallasii</i>	770
	Pacific sardine	<i>Sardinops sagax</i>	7
Engraulidae	Northern anchovy	<i>Engraulis mordax</i>	
Salmonidae	Chinook salmon	<i>Oncorhynchus tshawytscha</i>	55
	Coho salmon	<i>Oncorhynchus kisutch</i>	35
	Cutthroat trout	<i>Oncorhynchus clarki</i>	1
	Steelhead trout	<i>Oncorhynchus mykiss</i>	20
Osmeridae	Smelt (juv.)	Osmeridae	265
	Surf smelt	<i>Hypomesus pretiosus</i>	846
	Whitebait smelt	<i>Allosmerus elongatus</i>	946
Myctophidae	Northern lampfish	<i>Stenobrachius leucopsarus</i>	
Gadidae	Pacific tomcod (juv.)	<i>Microgadus proximus</i>	39
Scomberesocidae	Pacific saury	<i>Cololabis saira</i>	26
Atherinidae	Jacksmelt	<i>Atherinopsis californiensis</i>	1
Trachipteridae	King-of-the-salmon (juv.)	<i>Trachipterus altivelis</i>	2
Gasterosteidae	Threespine stickleback	<i>Gasterosteus aculeatus</i>	1
Scorpaenidae	Rockfishes (juv.)	<i>Sebastes</i> spp.	1,040
	Darkblotched rockfish	<i>Sebastes cramerii</i>	533
	Yellowtail rockfish	<i>Sebastes flavidus</i>	59
	Black rockfish	<i>Sebastes melanops</i>	
	Canary rockfish	<i>Sebastes pinniger</i>	1
Hexagrammidae	Lingcod (juv.)	<i>Ophiodon elongatus</i>	19
Anoplopomatidae	Sablefish (juv.)	<i>Anoplopoma fimbria</i>	190
Cottidae	Cabezon (juv.)	<i>Scorpaenichthys marmoratus</i>	13
	Pacific staghorn sculpin	<i>Leptocottus armatus</i>	1
Agonidae	Sturgeon poacher	<i>Podothecus acipenserinus</i>	
Cyclopteridae	Pacific spiny lump sucker	<i>Eumicrotremus orbis</i>	
Carangidae	Jack mackerel	<i>Trachurus symmetricus</i>	111
Bramidae	Pacific pomfret	<i>Brama japonica</i>	
Anarrhichadidae	Wolf eel (juv.)	<i>Anarrhichthys felis</i>	14
Ammodytidae	Pacific sand lance	<i>Ammodytes hexapterus</i>	4
Zaprodidae	Prowfish (juv.)	<i>Zaprora silenus</i>	
Scombridae	Chub mackerel	<i>Scomber japonicus</i>	61
Centrolophidae	Medusafish	<i>Icichthys lockingtoni</i>	2
Flatfishes	Flatfish larvae (unid.)	Flatfishes	55
Bothidae	Pacific sanddab	<i>Citharichthys sordidus</i>	109
Pleuronectidae	Sand sole (larvae)	<i>Psettichthys melanostictus</i>	2
	Slender sole	<i>Eopsetta exilis</i>	
	Starry flounder	<i>Platichthys stellatus</i>	
	Curlfin sole	<i>Pleuronichthys decurrens</i>	4
	English sole	<i>Parophrys vetulus</i>	1
	Rex sole (juv.)	<i>Errex zachirus</i>	420
Molidae	Ocean sunfish	<i>Mola mola</i>	

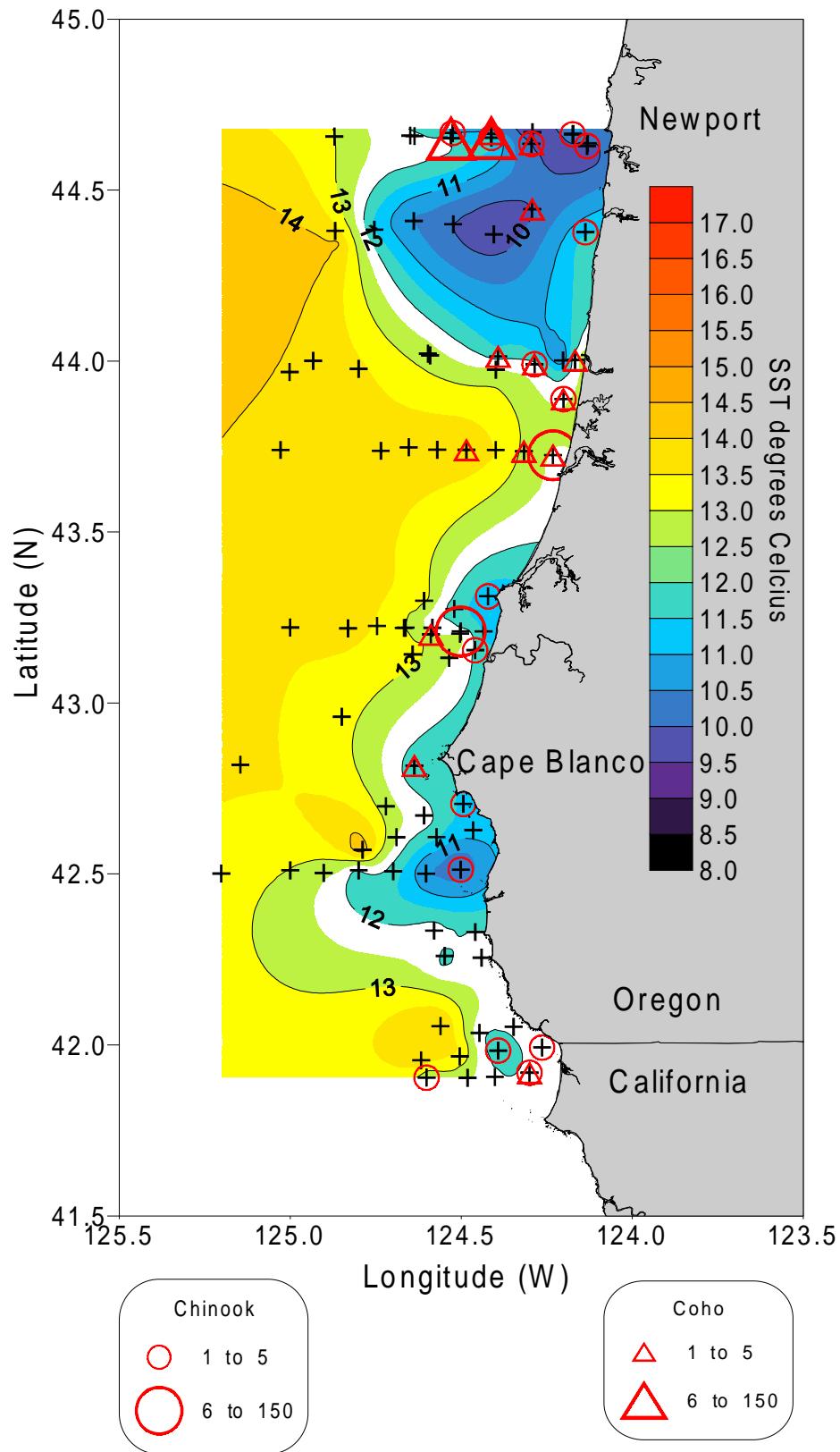


Figure 1. Location of trawl stations and abundances of juvenile salmon during the mesoscale and fine-scale surveys in August 2000.

Table 3: Trawls

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15000.05	Trawl	1	1	CR-1	29	5	0708	S	41.91895	-124.30025	38	18	
SE15000.05	Trawl	1	1	CR-1	29	5	0738	E	41.89683	-124.29895	40	18	
SE15000.09	Trawl	2	2	CR-2	29	5	0913	S	41.90675	-124.40140	69	18	
SE15000.09	Trawl	2	2	CR-2	29	5	0943	E	41.87218	-124.40002	64	18	
SE15000.13	Trawl	3	3	CR-3	29	5	1127	S	41.90362	-124.48115	134	18	
SE15000.13	Trawl	3	3	CR-3	29	5	1157	E	41.86755	-124.49710	154	18	
SE15000.17	Trawl	4	4	CR-4	29	5	1358	S	41.90427	-124.60123	519	18	
SE15000.17	Trawl	4	4	CR-4	29	5	1428	E	41.86868	-124.60032	558	18	
SE15100.04	Trawl	5	5	RR-1	30	5	0759	S	42.51265	-124.50113	37	18	
SE15100.04	Trawl	5	5	RR-1	30	5	0829	E	42.47652	-124.49848	33	18	
SE15100.08	Trawl	6	6	RR-2	30	5	0954	S	42.50077	-124.60247	88	18	
SE15100.08	Trawl	6	6	RR-2	30	5	1024	E	42.47085	-124.60342	86	18	
SE15100.12	Trawl	7	7	RR-3	30	5	1200	S	42.50787	-124.69880	165	18	
SE15100.12	Trawl	7	7	RR-3	30	5	1230	E	42.47735	-124.70077	124	18	
SE15100.16	Trawl	8	8	RR-4	30	5	1357	S	42.66055	-124.79962	558	18	
SE15100.16	Trawl	8	8	RR-4	30	5	1427	E	42.46158	-124.79742	nd	18	
SE15100.20	Trawl	9	9	RR-5	30	5	1608	S	42.51112	-124.90177	1097	18	
SE15100.20	Trawl	9	9	RR-5	30	5	1638	E	42.47855	-124.90010	1097	18	
SE15100.24	Trawl	10	10	RR-6	30	5	1808	S	42.50912	-124.99982	1829	18	
SE15100.24	Trawl	10	10	RR-6	30	5	nd	E	42.47875	-125.00143	1829	18	
SE15100.25	Trawl	11	11	RR-7	30	5	2021	S	42.50128	-125.20170	2743	18	
SE15100.25	Trawl	11	11	RR-7	30	5	2051	E	42.47335	-125.19922	2743	18	
SE15200.04	Trawl	12	12	FM-3	31	5	0650	S	43.20922	-124.50130	66	18	
SE15200.04	Trawl	12	12	FM-3	31	5	0720	E	43.17680	-124.50110	59	18	
SE15200.08	Trawl	13	13	FM-4	31	5	0842	S	43.20045	-124.58873	91	18	
SE15200.08	Trawl	13	13	FM-4	31	5	0912	E	43.21918	-124.58370	88	18	
SE15200.11	Trawl	14	14	FM-5	31	5	1023	S	43.21962	-124.66732	161	18	
SE15200.11	Trawl	14	14	FM-5	31	5	1053	E	43.18792	-124.66648	148	18	
SE15200.15	Trawl	15	15	FM-6	31	5	1215	S	43.22507	-124.74590	304	18	
SE15200.15	Trawl	15	15	FM-6	31	5	1245	E	43.19442	-124.74827	316	18	
SE15200.19	Trawl	16	16	FM-7	31	5	1410	S	43.21848	-124.83042	357	18	
SE15200.19	Trawl	16	16	FM-7	31	5	1440	E	43.18803	-124.83765	305	18	
SE15200.23	Trawl	17	17	FM-8	31	5	1635	S	43.22092	-125.00022	1006	18	
SE15200.23	Trawl	17	17	FM-8	31	5	1705	E	43.18923	-125.00278	1006	18	
SE15300.04	Trawl	18	18	HH-1	1	6	0559	S	44.00172	-124.20200	51	18	
SE15300.05	Trawl	18	18	HH-1	1	6	0629	E	43.97182	-124.21212	51	18	
SE15300.09	Trawl	19	19	HH-2	1	6	0822	S	44.01358	-124.39222	117	18	
SE15300.09	Trawl	19	19	HH-2	1	6	0852	E	43.98505	-124.38745	119	18	
SE15300.12	Trawl	20	20	HH-3	1	6	1048	S	44.02148	-124.59730	146	18	
SE15300.12	Trawl	20	20	HH-3	1	6	1118	E	43.99172	-124.59548	159	18	
SE15400.04	Trawl	21	21	NH-35	2	6	0558	S	44.65650	-124.87078	474	18	
SE15400.04	Trawl	21	21	NH-35	2	6	0628	E	44.62617	-124.88652	549	18	
SE15400.08	Trawl	22	22	NH-25	2	6	0839	S	44.65942	-124.64888	304	18	
SE15400.08	Trawl	22	22	NH-25	2	6	0909	E	44.62807	-124.64870	nd	18	
SE15400.12	Trawl	23	23	NH-20	2	6	1049	S	44.66705	-124.52498	139	18	
SE15400.12	Trawl	23	23	NH-20	2	6	1119	E	44.63542	-124.52150	132	18	
SE15400.16	Trawl	24	24	NH-15	2	6	1246	S	44.66460	-124.41202	99	18	
SE15400.16	Trawl	24	24	NH-15	2	6	1316	E	44.63635	-124.40968	75	18	

Table 3: Trawls (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15400.20	Trawl	25	25	NH-10	2	6	1448	S	44.66887	-124.29147	82	18	
SE15400.20	Trawl	25	25	NH-10	2	6	1518	E	44.63488	-124.28985	80	18	
SE15400.24	Trawl	26	26	NH-5	2	6	1641	S	44.66435	-124.17253	59	18	
SE15400.24	Trawl	26	26	NH-5	2	6	1711	E	44.64002	-124.17332	53	18	
SE15400.28	Trawl	27	27	NH-3	2	6	1818	S	44.65282	-124.13073	46	18	
SE15400.28	Trawl	27	27	NH-3	2	6	1848	E	44.62900	-124.13142	nd	18	
SE15500.04	Trawl	28	28	NH-3	3	6	1230	S	44.63725	-124.13017	48	18	
SE15500.04	Trawl	28	28	NH-3	3	6	1258	E	44.75150	-124.13087	48	18	
SE15500.08	Trawl	29	29	NH-5	3	6	1352	S	44.66340	-124.17370	60	18	
SE15500.08	Trawl	29	29	NH-5	3	6	1422	E	44.64335	-124.17012	55	18	
SE15500.12	Trawl	30	30	NH-10	3	6	1538	S	44.63517	-124.29437	80	18	
SE15500.12	Trawl	30	30	NH-10	3	6	1608	E	44.63732	-124.29625	82	18	
SE15500.16	Trawl	31	31	NH-15	3	6	1724	S	44.65285	-124.41153	95	18	
SE15500.16	Trawl	31	31	NH-15	3	6	1754	E	44.62205	-124.41267	57	18	
SE15500.20	Trawl	32	32	NH-20	3	6	1916	S	44.65197	-124.52958	143	18	
SE15500.20	Trawl	32	32	NH-20	3	6	1946	E	44.62777	-124.52203	132	18	
SE15500.21	Trawl	33	33	NH-25	3	6	2048	S	44.65782	-124.63630	287	18	
SE15500.21	Trawl	33	33	NH-25	3	6	2118	E	44.65782	-124.63630	276	18	
SE15600.01	Trawl	34	34	2A-1	4	6	0646	S	44.37683	-124.13665	37	18	
SE15600.01	Trawl	34	34	2A-1	4	6	0716	E	44.34833	-124.13485	37	18	
SE15600.08	Trawl	35	35	2A-2	4	6	0909	S	44.44447	-124.29263	69	18	
SE15600.08	Trawl	35	35	2A-2	4	6	0939	S	44.38333	-124.29305	69	18	
SE15600.12	Trawl	36	36	2A-3	4	6	1128	S	44.37040	-124.40442	82	18	
SE15600.12	Trawl	36	36	2A-3	4	6	1158	E	44.39353	-124.40843	79	18	
SE15600.16	Trawl	37	37	2A-4	4	6	1314	S	44.40020	-124.52335	95	18	
SE15600.16	Trawl	37	37	2A-4	4	6	1344	E	44.37568	-124.52030	97	18	
SE15600.20	Trawl	38	38	2A-5	4	6	1528	S	44.40950	-124.63848	123	18	
SE15600.20	Trawl	38	38	2A-5	4	6	1558	E	44.37758	-124.63440	108	18	
SE15600.24	Trawl	39	39	2A-6	4	6	1719	S	44.38407	-124.75373	152	18	
SE15600.24	Trawl	39	39	2A-6	4	6	1749	E	44.35583	-124.75312	139	18	
SE15600.25	Trawl	40	40	2A-6	4	6	1900	S	44.38053	-124.86802	366	18	
SE15600.25	Trawl	40	40	2A-6	4	6	1930	E	44.35467	-124.86327	366	18	
SE15700.04	Trawl	41	41	HH-5	5	6	0602	S	43.96792	-125.00163	695	18	
SE15700.04	Trawl	41	41	HH-5	5	6	0632	E	43.98852	-125.00153	768	18	
SE15700.05	Trawl	42	42	HH-4A	5	6	0725	S	44.00047	-124.93303	192	18	
SE15700.05	Trawl	42	42	HH-4A	5	6	0755	E	43.96800	-124.93205	141	18	
SE15700.12	Trawl	43	43	HH-4	5	6	0943	S	43.97707	-124.79980	121	18	
SE15700.12	Trawl	43	43	HH-4	5	6	1013	E	43.99858	-124.80113	110	18	
SE15700.16	Trawl	44	44	HH-3	5	6	1156	S	44.01640	-124.59090	146	18	
SE15700.16	Trawl	44	44	HH-3	5	6	1226	E	46.56200	-124.58535	159	18	
SE15700.20	Trawl	45	45	HH-2	5	6	1404	S	43.97453	-124.39842	121	18	
SE15700.20	Trawl	45	45	HH-2	5	6	1434	E	43.99833	-124.39875	121	18	
SE15700.24	Trawl	46	46	HH-1A	5	6	1602	S	43.99060	-124.28527	90	18	
SE15700.24	Trawl	46	46	HH-1A	5	6	1632	E	44.01392	-124.28052	86	18	
SE15700.28	Trawl	47	47	HH-0	5	6	1742	S	44.00283	-124.16653	29	18	
SE15700.29	Trawl	47	47	HH-0	5	6	1812	E	43.97350	-124.17275	31	18	
SE15700.30	Trawl	48	48	4A-1	5	6	1909	S	43.88857	-124.20090	46	18	
SE15700.30	Trawl	48	48	4A-1	5	6	1939	E	43.85717	-124.20843	49	18	

Table 3: Trawls (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15800.04	Trawl	49	49	UR-1	6	6	0603	S	43.72462	-124.23162	42	18	
SE15800.04	Trawl	49	49	UR-1	6	6	0635	E	43.74430	-124.22887	46	18	
SE15800.08	Trawl	50	50	UR-2	6	6	0747	S	43.73627	-124.31640	104	18	
SE15800.08	Trawl	50	50	UR-2	6	6	0817	E	43.75600	-124.31750	104	18	
SE15800.12	Trawl	51	51	UR-3	6	6	0930	S	43.73998	-124.39883	115	18	
SE15800.12	Trawl	51	51	UR-3	6	6	1000	E	43.76147	-124.39752	113	18	
SE15800.16	Trawl	52	52	UR-4	6	6	1122	S	43.74037	-124.48462	123	18	
SE15800.16	Trawl	52	52	UR-4	6	6	1152	E	43.76147	-124.48292	130	18	
SE15800.20	Trawl	53	53	UR-5	6	6	1334	S	43.74055	-124.56998	214	18	
SE15800.20	Trawl	53	53	UR-5	6	6	1404	S	43.76230	-124.56833	208	18	
SE15800.24	Trawl	54	54	UR-6	6	6	1515	S	43.74778	-124.65340	379	18	
SE15800.24	Trawl	54	54	UR-6	6	6	1545	E	43.77180	-124.65210	366	18	
SE15800.28	Trawl	55	55	UR-7	6	6	1701	S	43.73762	-124.73488	521	18	
SE15800.28	Trawl	55	55	UR-7	6	6	1731	E	43.76140	-124.73433	512	18	
SE15800.32	Trawl	56	56	UR-8	6	6	1950	S	43.74002	-125.02802	1426	18	
SE15800.32	Trawl	56	56	UR-8	6	6	2020	E	43.76158	-125.03368	1426	18	
SE15900.04	Trawl	57	57	6B-1	7	6	0559	S	43.31217	-124.42130	37	18	
SE15900.04	Trawl	57	57	6B-1	7	6	0629	E	43.29337	-124.38723	29	18	
SE15900.08	Trawl	58	58	FM-1	7	6	0759	S	43.20980	-124.43472	33	18	
SE15900.08	Trawl	58	58	FM-1	7	6	0829	E	43.24718	-124.43423	40	18	
SE15900.12	Trawl	59	59	7AA-1	7	6	0954	S	43.15435	-124.45923	26	18	
SE15900.12	Trawl	59	59	7AA-1	7	6	1024	E	43.17995	-124.45582	42	18	
SE15900.16	Trawl	60	60	7AA-2	7	6	1139	S	43.13222	-124.53513	69	18	
SE15900.16	Trawl	60	60	7AA-2	7	6	1209	E	nd	nd	66	18	
SE15900.20	Trawl	61	61	FM-3	7	6	1316	S	43.20258	-124.50315	64	18	
SE15900.20	Trawl	61	61	FM-3	7	6	1346	E	43.22527	-124.50415	64	18	
SE15900.24	Trawl	62	62	6B-2	7	6	1450	S	43.27478	-124.52018	88	18	
SE15900.24	Trawl	62	62	6B-2	7	6	1520	E	43.29643	-124.51880	99	18	
SE15900.28	Trawl	63	63	6B-3	7	6	1632	S	43.29902	-124.60843	128	18	
SE15900.28	Trawl	63	63	6B-3	7	6	1702	E	43.26923	-124.60927	123	18	
SE15900.32	Trawl	64	64	FM-4	7	6	1800	S	43.21998	-124.58420	84	18	
SE15900.32	Trawl	64	64	FM-4	7	6	1830	E	43.19130	-124.58295	101	18	
SE15900.36	Trawl	65	65	7AA-3	7	6	1936	S	43.14238	-124.64177	143	18	
SE15900.36	Trawl	65	65	7AA-3	7	6	2000	E	44.16050	-124.63977	144	18	
SE16000.04	Trawl	66	66	9-1	8	6	0613	S	42.70482	-124.49368	38	18	
SE16000.04	Trawl	66	66	9-1	8	6	0639	E	42.68517	-124.49607	57	18	
SE16000.08	Trawl	67	67	9A-1	8	6	0825	S	42.62807	-124.46410	60	18	
SE16000.08	Trawl	67	67	9A-1	8	6	0855	E	42.60208	-124.46067	nd	18	
SE16000.12	Trawl	68	68	9A-2	8	6	1025	S	42.60770	-124.57177	95	18	
SE16000.12	Trawl	68	68	9A-2	8	6	1055	E	42.58997	-124.56948	93	18	
SE16000.16	Trawl	69	69	9-2	8	6	1220	S	42.67097	-124.60833	112	18	
SE16000.16	Trawl	69	69	9-2	8	6	1250	E	42.69678	-124.60915	nd	18	
SE16000.20	Trawl	70	70	9-3	8	6	1445	S	42.69787	-124.72005	234	18	
SE16000.20	Trawl	70	70	9-3	8	6	1515	E	42.34085	-124.72517	256	18	
SE16000.24	Trawl	71	71	9A-3	8	6	1625	S	42.60733	-124.69430	166	18	
SE16000.24	Trawl	71	71	9A-3	8	6	1655	E	42.58260	-124.68552	150	18	
SE16000.28	Trawl	72	72	9A-4	8	6	1820	S	42.57065	-124.78817	475	18	
SE16000.28	Trawl	72	72	9A-4	8	6	1850	E	42.59687	-124.79298	585	18	

Table 3: Trawls (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE16100.04	Trawl	73	73	10A-1	9	6	0610	S	42.33013	-124.45882	38	18	
SE16100.04	Trawl	73	73	10A-1	9	6	0640	E	42.35197	-124.45743	31	18	
SE16100.08	Trawl	74	74	10A-2	9	6	0804	S	42.33427	-124.57905	139	18	
SE16100.08	Trawl	74	74	10A-2	9	6	0834	E	42.35617	-124.57613	119	18	
SE16100.11	Trawl	75	75	10AA-2	9	6	1011	S	42.26040	-124.54847	148	18	
SE16100.11	Trawl	75	75	10AA-2	9	6	1041	E	42.28455	-124.54967	141	18	
SE16100.14	Trawl	76	76	10AA-1	9	6	1154	S	42.25492	-124.44047	38	18	
SE16100.14	Trawl	76	76	10AA-1	9	6	1224	E	42.27563	-124.43623	29	18	
SE16200.04	Trawl	77	77	11B-1	10	6	0831	S	41.99253	-124.26338	26	18	
SE16200.04	Trawl	77	77	11B-1	10	6	0901	E	41.96813	-124.25942	22	18	
SE16200.08	Trawl	78	78	11A-1	10	6	1030	S	42.05323	-124.34673	38	18	
SE16200.08	Trawl	78	78	11A-1	10	6	1100	E	42.02875	-124.35862	42	18	
SE16200.12	Trawl	79	79	11A-2	10	6	1205	S	42.03523	-124.44663	97	18	
SE16200.12	Trawl	79	79	11A-2	10	6	1235	E	42.05418	-124.44740	99	18	
SE16200.16	Trawl	80	80	11B-2	10	6	1251	S	41.98348	-124.39187	73	18	
SE16200.16	Trawl	80	80	11B-2	10	6	1321	E	41.85995	-124.38618	71	18	
SE16200.20	Trawl	81	81	11B-3	10	6	1548	S	41.96647	-124.50423	121	18	
SE16200.20	Trawl	81	81	11B-3	10	6	1618	E	41.93595	-124.50225	124	18	
SE16200.24	Trawl	82	82	11A-3	10	6	1808	S	42.05477	-124.56030	146	18	
SE16200.25	Trawl	82	82	11A-3	10	6	1838	E	42.02540	-124.55475	144	18	
SE16200.29	Trawl	83	83	11B-4	10	6	1956	S	41.95523	-124.61725	457	18	
SE16200.30	Trawl	83	83	11B-4	10	6	2032	S	41.98033	-124.61932	421	18	
SE16300.04	Trawl	84	84	8A-1	11	6	0546	S	42.81672	-124.63702	51	18	
SE16300.04	Trawl	84	84	8A-1	11	6	0616	E	42.84605	-124.63900	62	18	

Table 4: CTD Casts

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15000.01	CTD_SBE19	1	1	CR-1	29	5	0620	S	41.90288	-124.29895	38	30	
SE15000.04	CTD_SBE19	2	1	CR-1	29	5	0649	S	41.90312	-124.29957	38	30	
SE15000.06	CTD_SBE19	3	2	CR-2	29	5	0832	S	41.89928	-124.40298	69	60	
SE15000.10	CTD_SBE19	4	3	CR-3	29	5	1047	S	41.90568	-124.50415	139	90	
SE15000.14	CTD_SBE19	5	4	CR-4	29	5	1325	S	41.91890	-124.60213	494	82	
SE15100.01	CTD_SBE19	6	5	RR-1	30	5	0723	S	42.52905	-124.50283	40	30	
SE15100.05	CTD_SBE19	7	6	RR-2	30	5	0920	S	42.51017	-124.60125	90	84	
SE15100.09	CTD_SBE19	8	7	RR-3	30	5	1124	S	42.51047	-124.70225	183	85	
SE15100.13	CTD_SBE19	9	8	RR-4	30	5	1330	S	42.51342	-124.80277	604	82	
SE15100.17	CTD_SBE19	10	9	RR-5	30	5	1543	S	42.52433	-124.90277	1097	94	
SE15100.21	CTD_SBE19	11	10	RR-6	30	5	1741	S	42.52255	-124.00203	1829	92	
SE15100.26	CTD_SBE19	12	11	RR-7	30	5	2114	S	42.46248	-125.19840	2743	95	
SE15200.01	CTD_SBE19	13	12	FM-3	31	5	0625	S	43.22772	-124.50240	59	40	
SE15200.05	CTD_SBE19	14	13	FM-4	31	5	0807	S	43.18560	-124.58573	110	79	
SE15200.09	CTD_SBE19	15	14	FM-5	31	5	0955	S	43.23500	-124.66770	152	93	
SE15200.12	CTD_SBE19	16	15	FM-6	31	5	1150	S	43.23918	-124.75148	329	95	
SE15200.16	CTD_SBE19	17	16	FM-7	31	5	1342	S	43.23715	-124.83353	364	98	
SE15200.20	CTD_SBE19	18	17	FM-8	31	5	1600	S	43.23860	-125.00310	1006	95	
SE15300.01	CTD_SBE19	19	18	HH-1	1	6	0535	S	44.01485	-124.20490	51	45	
SE15300.06	CTD_SBE19	20	19	HH-2	1	6	0757	S	44.02622	-124.40210	117	88	
SE15300.10	CTD_SBE19	21	20	HH-3	1	6	1030	S	44.03462	-124.60185	143	97	
SE15400.01	CTD_SBE19	22	21	NH-35	2	6	0528	S	44.67165	-124.89048	497	98	
SE15400.05	CTD_SBE19	23	22	NH-25	2	6	0711	S	44.67348	-124.64907	307	nd	
SE15400.09	CTD_SBE19	24	23	NH-20	2	6	1014	S	44.66888	-124.52787	143	90	
SE15400.13	CTD_SBE19	25	24	NH-15	2	6	1222	S	44.67945	-124.41183	93	80	
SE15400.17	CTD_SBE19	26	25	NH-10	2	6	1417	S	44.67843	-124.29453	82	68	
SE15400.21	CTD_SBE19	27	26	NH-5	2	6	1620	S	44.67082	-124.17678	60	56	
SE15400.25	CTD_SBE19	28	27	NH-3	2	6	1751	S	44.66138	-124.13167	48	35	
SE15500.01	CTD_SBE19	29	28	NH-3	3	6	1208	S	44.62338	-124.13273	49	40	
SE15500.05	CTD_SBE19	30	29	NH-5	3	6	1330	S	44.66987	-124.17868	64	60	
SE15500.09	CTD_SBE19	31	30	NH-10	3	6	1514	S	44.63285	-124.29703	82	68	
SE15500.13	CTD_SBE19	32	31	NH-15	3	6	1655	S	44.66618	-124.41360	101	90	
SE15500.17	CTD_SBE19	33	32	NH-20	3	6	1850	S	44.66003	-124.53177	148	96	
SE15500.22	CTD_SBE19	34	33	NH-25	3	6	2140	S	44.62177	-124.64613	283	98	
SE15600.02	CTD_SBE19	35	34	2A-1	4	6	0730	S	44.33738	-124.13538	35	30	
SE15600.05	CTD_SBE19	36	35	2A-2	4	6	0845	S	44.42673	-124.29105	69	69	
SE15600.09	CTD_SBE19	37	36	2A-3	4	6	1029	S	44.40210	-124.40583	79	78	
SE15600.13	CTD_SBE19	38	37	2A-4	4	6	1249	S	44.40927	-124.52313	95	88	
SE15600.17	CTD_SBE19	39	38	2A-5	4	6	1447	S	44.42705	-124.64125	95	100	
SE15600.21	CTD_SBE19	40	39	2A-6	4	6	1656	S	44.39792	-124.75292	161	98	
SE15600.26	CTD_SBE19	41	40	2A-6	4	6	1945	S	44.34377	-124.85480	366	88	
SE15700.01	CTD_SBE19	42	41	HH-5	5	6	0536	S	43.95985	-124.00318	695	100	
SE15700.06	CTD_SBE19	43	42	HH-4A	5	6	0820	S	43.95418	-124.92710	132	100	
SE15700.09	CTD_SBE19	44	43	HH-4	5	6	0915	S	43.96923	-124.80012	124	98	
SE15700.13	CTD_SBE19	45	44	HH-3	5	6	1131	S	44.02702	-124.60012	146	95	
SE15700.17	CTD_SBE19	46	45	HH-2	5	6	1338	S	43.96417	-124.39787	121	nd	
SE15700.21	CTD_SBE19	47	46	HH-1A	5	6	1536	S	43.98352	-124.28445	91	84	
SE15700.25	CTD_SBE19	48	47	HH-0	5	6	1722	S	44.01173	-124.16390	27	20	

Table 4: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15700.31	CTD_SBE19	49	48	4A-1	5	6	1955	S	43.84547	-124.20537	44	45	
SE15800.01	CTD_SBE19	50	49	UR-1	6	6	0537	S	43.70943	-124.23083	35	30	
SE15800.05	CTD_SBE19	51	50	UR-2	6	6	0720	S	43.73053	-124.31778	104	100	
SE15800.09	CTD_SBE19	52	51	UR-3	6	6	0907	S	43.73248	-124.40048	115	98	
SE15800.13	CTD_SBE19	53	52	UR-4	6	6	1100	S	43.73415	-124.48272	124	99	
SE15800.17	CTD_SBE19	54	53	UR-5	6	6	1302	S	43.73925	-124.56343	205	100	
SE15800.21	CTD_SBE19	55	54	UR-6	6	6	1450	S	43.73238	-124.65215	384	98	
SE15800.25	CTD_SBE19	56	55	UR-7	6	6	1635	S	43.73193	-124.73590	512	100	
SE15800.29	CTD_SBE19	57	56	UR-8	6	6	1926	S	43.73107	-125.03513	1426	95	
SE15900.01	CTD_SBE19	58	57	6B-1	7	6	0535	S	43.31643	-124.42392	42	25	
SE15900.05	CTD_SBE19	59	58	FM-1	7	6	0730	S	43.19913	-124.43247	31	22	
SE15900.09	CTD_SBE19	60	59	7AA-1	7	6	0935	S	43.14578	-124.45960	31	30	
SE15900.13	CTD_SBE19	61	60	7AA-2	7	6	1115	S	43.12787	-124.53290	66	56	
SE15900.17	CTD_SBE19	62	61	FM-3	7	6	1251	S	43.19498	-124.50047	60	58	
SE15900.21	CTD_SBE19	63	62	6B-2	7	6	1427	S	43.26878	-124.51712	84	73	
SE15900.25	CTD_SBE19	64	63	6B-3	7	6	1602	S	43.30588	-124.61223	132	91	
SE15900.29	CTD_SBE19	65	64	FM-4	7	6	1732	S	43.23243	-124.58388	95	94	
SE15900.33	CTD_SBE19	66	65	7AA-3	7	6	1910	S	43.15668	-124.64180	130	96	
SE16000.01	CTD_SBE19	67	66	9-1	8	6	0547	S	42.71120	-124.49452	33	30	
SE16000.05	CTD_SBE19	68	67	9A-1	8	6	0800	S	42.63265	-124.46695	60	60	
SE16000.09	CTD_SBE19	69	68	9A-2	8	6	1005	S	42.60623	-124.56948	97	90	
SE16000.13	CTD_SBE19	70	69	9-2	8	6	1158	S	42.66252	-124.60857	113	100	
SE16000.17	CTD_SBE19	71	70	9-3	8	6	1420	S	42.70000	-124.71835	229	95	
SE16000.21	CTD_SBE19	72	71	9A-3	8	6	1600	S	42.61547	-124.68708	168	99	
SE16000.25	CTD_SBE19	73	72	9A-4	8	6	1756	S	42.56783	-124.79343	494	86	
SE16100.01	CTD_SBE19	74	73	10A-1	9	6	0543	S	42.31983	-124.45607	40	30	
SE16100.05	CTD_SBE19	75	74	10A-2	9	6	0741	S	42.32750	-124.57860	144	92	
SE16100.09	CTD_SBE19	76	75	10AA-2	9	6	0952	S	42.24987	-124.55315	154	84	
SE16100.12	CTD_SBE19	77	76	10AA-1	9	6	1142	S	42.24737	-124.44035	42	28	
SE16200.01	CTD_SBE19	78	77	11B-1	10	6	0810	S	41.99987	-124.26527	26	21	
SE16200.05	CTD_SBE19	79	78	11A-1	10	6	1008	S	42.06250	-124.33980	38	30	
SE16200.09	CTD_SBE19	80	79	11A-2	10	6	1140	S	42.03328	-124.44785	97	89	
SE16200.13	CTD_SBE19	81	80	11B-2	10	6	1228	S	41.98773	-124.39400	75	71	
SE16200.17	CTD_SBE19	82	81	11B-3	10	6	1520	S	41.97788	-124.50027	115	97	
SE16200.21	CTD_SBE19	83	82	11A-3	10	6	1742	S	42.06797	-124.55945	148	100	
SE16200.26	CTD_SBE19	84	83	11B-4	10	6	1931	S	41.94907	-124.61618	457	99	
SE16300.01	CTD_SBE19	85	84	8A-1	11	6	0522	S	42.80395	-124.63233	49	48	

Table 5: Niskin3m Tows

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15000.02	Niskin3m	1	1	CR-1	29	5	0620	S	41.90288	-124.29895	38	3	
SE15000.07	Niskin3m	2	2	CR-2	29	5	0832	S	41.89928	-124.40298	69	3	
SE15000.11	Niskin3m	3	3	CR-3	29	5	1047	S	41.90568	-124.50415	139	3	
SE15000.15	Niskin3m	4	4	CR-4	29	5	1325	S	41.91890	-124.60213	494	3	
SE15100.02	Niskin3m	5	5	RR-1	30	5	0723	S	42.52905	-124.50283	40	3	
SE15100.06	Niskin3m	6	6	RR-2	30	5	0920	S	42.51017	-124.60125	90	3	
SE15100.10	Niskin3m	7	7	RR-3	30	5	1124	S	42.51047	-124.70225	183	3	
SE15100.14	Niskin3m	8	8	RR-4	30	5	1330	S	42.51342	-124.80277	604	3	
SE15100.18	Niskin3m	9	9	RR-5	30	5	1553	S	42.52433	-124.90277	1097	3	
SE15100.22	Niskin3m	10	10	RR-6	30	5	1741	S	42.52255	-124.00203	1829	3	
SE15100.27	Niskin3m	11	11	RR-7	30	5	2114	S	42.46248	-125.19840	2743	3	
SE15200.02	Niskin3m	12	12	FM-3	31	5	0625	S	43.22772	-124.50240	59	3	
SE15200.06	Niskin3m	13	13	FM-4	31	5	0807	S	43.18560	-124.58573	110	3	
SE15200.09	Niskin3m	14	14	FM-5	31	5	0955	S	43.23500	-124.66770	152	3	
SE15200.13	Niskin3m	15	15	FM-6	31	5	1150	S	43.23918	-124.75148	329	3	
SE15200.17	Niskin3m	16	16	FM-7	31	5	1342	S	43.23715	-124.83353	364	3	
SE15200.21	Niskin3m	17	17	FM-8	31	5	1600	S	43.23860	-125.00310	1006	3	
SE15300.02	Niskin3m	18	18	HH-1	1	6	0535	S	44.01485	-124.20490	51	3	
SE15300.07	Niskin3m	19	19	HH-2	1	6	0757	S	44.02622	-124.40210	117	3	
SE15300.11	Niskin3m	20	20	HH-3	1	6	1030	S	44.03462	-124.60185	143	3	
SE15400.02	Niskin3m	21	21	NH-35	2	6	0528	S	44.67165	-124.89048	497	3	
SE15400.06	Niskin3m	22	22	NH-25	2	6	0711	S	44.67348	-124.64907	307	3	
SE15400.10	Niskin3m	23	23	NH-20	2	6	1014	S	44.66888	-124.52787	143	3	
SE15400.14	Niskin3m	24	24	NH-15	2	6	1222	S	44.67945	-124.41183	93	3	
SE15400.18	Niskin3m	25	25	NH-10	2	6	1417	S	44.67843	-124.29453	82	3	
SE15400.22	Niskin3m	26	26	NH-5	2	6	1620	S	44.67082	-124.17678	60	3	
SE15400.26	Niskin3m	27	27	NH-3	2	6	1751	S	44.66138	-124.13167	48	3	
SE15500.02	Niskin3m	28	28	NH-3	3	6	1208	S	44.62338	-124.13273	49	3	
SE15500.06	Niskin3m	29	29	NH-5	3	6	1330	S	44.66987	-124.17868	64	3	
SE15500.10	Niskin3m	30	30	NH-10	3	6	1514	S	44.63285	-124.29703	82	3	
SE15500.14	Niskin3m	31	31	NH-15	3	6	1655	S	44.66618	-124.41360	101	3	
SE15500.18	Niskin3m	32	32	NH-20	3	6	1850	S	44.66003	-124.53177	148	3	
SE15500.23	Niskin3m	33	33	NH-25	3	6	2140	S	44.62177	-124.64613	283	3	
SE15600.03	Niskin3m	34	34	2A-1	4	6	0730	S	44.33738	-124.13538	35	3	
SE15600.06	Niskin3m	35	35	2A-2	4	6	0845	S	44.42673	-124.29105	69	3	
SE15600.10	Niskin3m	36	36	2A-3	4	6	1029	S	44.40210	-124.40583	79	3	
SE15600.14	Niskin3m	37	37	2A-4	4	6	1249	S	44.40927	-124.52313	95	3	
SE15600.18	Niskin3m	38	38	2A-5	4	6	1447	S	44.42705	-124.64125	126	3	
SE15600.22	Niskin3m	39	39	2A-6	4	6	1656	S	44.39792	-124.75292	161	3	
SE15600.27	Niskin3m	40	40	2A-6	4	6	1945	S	44.34377	-124.85480	366	3	
SE15700.02	Niskin3m	41	41	HH-5	5	6	0536	S	43.95985	-125.00318	695	3	
SE15700.07	Niskin3m	42	42	HH-4A	5	6	0820	S	43.95418	-124.92710	132	3	
SE15700.10	Niskin3m	43	43	HH-4	5	6	0915	S	43.96923	-124.80012	124	3	
SE15700.14	Niskin3m	44	44	HH-3	5	6	1131	S	44.02702	-124.60012	146	3	
SE15700.18	Niskin3m	45	45	HH-2	5	6	1338	S	43.96417	-124.39787	121	3	
SE15700.22	Niskin3m	46	46	HH-1A	5	6	1536	S	43.98352	-124.28445	91	3	
SE15700.26	Niskin3m	47	47	HH-0	5	6	1722	S	44.01173	-124.16390	27	3	
SE15700.32	Niskin3m	48	48	4A-1	5	6	1955	S	43.84547	-124.20537	44	3	

Table 5: Niskin3m Tows

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15800.02	Niskin3m	49	49	UR-1	6	6	0537	S	43.70943	-124.23083	35	3	
SE15800.06	Niskin3m	50	50	UR-2	6	6	0720	S	43.73053	-124.31778	104	3	
SE15800.10	Niskin3m	51	51	UR-3	6	6	0907	S	43.73248	-124.40048	115	3	
SE15800.14	Niskin3m	52	52	UR-4	6	6	1100	S	43.73415	-124.48272	124	3	
SE15800.18	Niskin3m	53	53	UR-5	6	6	1302	S	43.73925	-124.56343	205	3	
SE15800.22	Niskin3m	54	54	UR-6	6	6	1450	S	43.73238	-124.65215	384	3	
SE15800.26	Niskin3m	55	55	UR-7	6	6	1635	S	43.73193	-124.73590	512	3	
SE15800.30	Niskin3m	56	56	UR-8	6	6	1926	S	43.73107	-125.03513	1426	3	
SE15900.02	Niskin3m	57	57	6B-1	7	6	0535	S	43.31643	-124.42392	42	3	
SE15900.06	Niskin3m	58	58	FM-1	7	6	0730	S	43.19913	-124.43247	31	3	
SE15900.10	Niskin3m	59	59	7AA-1	7	6	0935	S	43.14578	-124.45960	31	3	
SE15900.14	Niskin3m	60	60	7AA-2	7	6	1115	S	43.12787	-124.53290	66	3	
SE15900.18	Niskin3m	61	61	FM-3	7	6	1251	S	43.19498	-124.50047	60	3	
SE15900.22	Niskin3m	62	62	6B-2	7	6	1427	S	43.26878	-124.51712	84	3	
SE15900.26	Niskin3m	63	63	6B-3	7	6	1602	S	43.30588	-124.61223	132	3	
SE15900.30	Niskin3m	64	64	FM-4	7	6	1732	S	43.23243	-124.58388	95	3	
SE15900.34	Niskin3m	65	65	7AA-3	7	6	1910	S	43.15668	-124.64180	130	3	
SE16000.02	Niskin3m	66	66	9-1	8	6	0547	S	42.71120	-124.49452	33	3	
SE16000.06	Niskin3m	67	67	9A-1	8	6	0800	S	42.63265	-124.46695	60	3	
SE16000.10	Niskin3m	68	68	9A-2	8	6	1005	S	42.60623	-124.56948	97	3	
SE16000.14	Niskin3m	69	69	9-2	8	6	1158	S	42.66252	-124.60857	113	3	
SE16000.18	Niskin3m	70	70	9-3	8	6	1420	S	42.70000	-124.71835	229	3	
SE16000.22	Niskin3m	71	71	9A-3	8	6	1600	S	42.61547	-124.68708	168	3	
SE16000.26	Niskin3m	72	72	9A-4	8	6	1756	S	42.56783	-124.79343	494	3	
SE16100.02	Niskin3m	73	73	10A-1	9	6	0543	S	42.31983	-124.45607	40	3	
SE16100.06	Niskin3m	74	74	10A-2	9	6	0741	S	42.32750	-124.57860	144	3	
SE16100.10	Niskin3m	75	75	10AA-2	9	6	0952	S	42.24987	-124.55315	154	3	
SE16100.13	Niskin3m	76	76	10AA-1	9	6	1142	S	42.24737	-124.44035	42	3	
SE16200.02	Niskin3m	77	77	11B-1	10	6	0810	S	41.99987	-124.26527	26	3	
SE16200.06	Niskin3m	78	78	11A-1	10	6	1008	S	42.06250	-124.33980	38	3	
SE16200.10	Niskin3m	79	79	11A-2	10	6	1140	S	42.03328	-124.44785	97	3	
SE16200.14	Niskin3m	80	80	11B-2	10	6	1228	S	41.98773	-124.39400	75	3	
SE16200.18	Niskin3m	81	81	11B-3	10	6	1520	S	41.97788	-124.50027	115	3	
SE16200.22	Niskin3m	82	82	11A-3	10	6	1742	S	42.06797	-124.55945	148	3	
SE16200.27	Niskin3m	83	83	11B-4	10	6	1931	S	41.94907	-124.61618	457	3	
SE16300.02	Niskin3m	84	84	8A-1	11	6	0522	S	42.80395	-124.63233	49	3	

Table 6: Neuston Tows

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15000.03	Neuston	1	1	CR-1	29	5	0627	S	41.90388	-124.30017	40	0	
SE15000.08	Neuston	2	2	CR-2	29	5	0840	S	41.89737	-124.40207	69	0	
SE15000.12	Neuston	3	3	CR-3	29	5	1057	S	41.90193	-124.50387	141	0	
SE15000.16	Neuston	4	4	CR-4	29	5	1338	S	41.91498	-124.60117	508	0	
SE15100.03	Neuston	5	5	RR-1	30	5	0731	S	42.52822	-124.50217	38	0	
SE15100.07	Neuston	6	6	RR-2	30	5	0928	S	42.50823	-124.60197	90	0	
SE15100.11	Neuston	7	7	RR-3	30	5	1135	S	42.50875	-124.70105	166	0	
SE15100.15	Neuston	8	8	RR-4	30	5	1340	S	42.51000	-124.80035	602	0	
SE15100.19	Neuston	9	9	RR-5	30	5	1551	S	42.52167	-124.90403	1097	0	
SE15100.23	Neuston	10	10	RR-6	30	5	1750	S	42.51987	-124.00340	1829	0	
SE15100.28	Neuston	11	11	RR-7	30	5	2118	S	42.46052	-125.19958	2743	0	
SE15200.03	Neuston	12	12	FM-3	31	5	0630	S	43.22740	-124.50265	60	0	
SE15200.07	Neuston	13	13	FM-4	31	5	0816	S	43.18225	-124.58835	112	0	
SE15200.10	Neuston	14	14	FM-5	31	5	1004	S	43.23332	-124.66867	152	0	
SE15200.14	Neuston	15	15	FM-6	31	5	1158	S	43.23710	-124.75152	327	0	
SE15200.18	Neuston	16	16	FM-7	31	5	1350	S	43.23643	-124.83237	364	0	
SE15200.22	Neuston	17	17	FM-8	31	5	1613	S	43.23473	-125.00372	1006	0	
SE15300.03	Neuston	18	18	HH-1	1	6	0543	S	44.01535	-124.20547	51	0	
SE15300.08	Neuston	19	19	HH-2	1	6	0805	S	44.02442	-124.40133	117	0	
SE15400.03	Neuston	20	21	NH-35	2	6	0538	S	44.66977	-124.89392	501	0	
SE15400.07	Neuston	21	22	NH-25	2	6	0720	S	44.67195	-124.64810	311	0	
SE15400.11	Neuston	22	23	NH-20	2	6	1022	S	44.66698	-124.52780	143	0	
SE15400.15	Neuston	23	24	NH-15	2	6	1228	S	44.67812	-124.41343	93	0	
SE15400.19	Neuston	24	25	NH-10	2	6	1423	S	44.67610	-124.29600	80	0	
SE15400.23	Neuston	25	26	NH-5	2	6	1624	S	44.67110	-124.17792	62	0	
SE15400.27	Neuston	26	27	NH-3	2	6	1758	S	44.66195	-124.13347	48	0	
SE15500.03	Neuston	27	28	NH-3	3	6	1212	S	44.62530	-124.13222	48	0	
SE15500.07	Neuston	28	29	NH-5	3	6	1335	S	44.67008	-124.17673	62	0	
SE15500.11	Neuston	29	30	NH-10	3	6	1520	S	44.62957	-124.29740	82	0	
SE15500.15	Neuston	30	31	NH-15	3	6	1708	S	44.66452	-124.41378	101	0	
SE15500.19	Neuston	31	32	NH-20	3	6	1856	S	44.65903	-124.53217	148	0	
SE15500.24	Neuston	32	33	NH-25	3	6	2150	S	44.62197	-124.64705	282	0	
SE15600.04	Neuston	33	34	2A-1	4	6	0735	S	44.33653	-124.13548	35	0	
SE15600.07	Neuston	34	35	2A-2	4	6	0850	S	44.42605	-124.29095	69	0	
SE15600.11	Neuston	35	36	2A-3	4	6	1033	S	44.39957	-124.40578	79	0	
SE15600.15	Neuston	36	37	2A-4	4	6	1300	S	44.40917	-124.52182	95	0	
SE15600.19	Neuston	37	38	2A-5	4	6	1457	S	44.42635	-124.64275	126	0	
SE15600.23	Neuston	38	39	2A-6	4	6	1701	S	44.39755	-124.75340	159	0	
SE15700.03	Neuston	39	41	HH-5	5	6	0545	S	43.95815	-125.00330	695	0	
SE15700.08	Neuston	40	42	HH-4A	5	6	0825	S	43.95310	-124.92642	132	0	
SE15700.11	Neuston	41	43	HH-4	5	6	0923	S	43.96923	-124.79817	123	0	
SE15700.15	Neuston	42	44	HH-3	5	6	1139	S	44.02775	-124.59713	143	0	
SE15700.19	Neuston	43	45	HH-2	5	6	1345	S	43.96493	-124.39507	121	0	
SE15700.23	Neuston	44	46	HH-1A	5	6	1544	S	43.98365	-124.28095	90	0	
SE15700.27	Neuston	45	47	HH-0	5	6	1725	S	44.01010	-124.16283	24	0	
SE15700.33	Neuston	46	48	4A-1	5	6	2000	S	43.84385	-124.20395	42	0	
SE15800.03	Neuston	47	49	UR-1	6	6	0545	S	43.70720	-124.23552	38	0	
SE15800.07	Neuston	48	50	UR-2	6	6	0729	S	43.73028	-124.31905	104	0	

Table 6: Neuston Tows (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15800.11	Neuston	49	51	UR-3	6	6	0914	S	43.73332	-124.40070	115	0	
SE15800.15	Neuston	50	52	UR-4	6	6	1105	S	43.73380	-124.48127	123	0	
SE15800.19	Neuston	51	53	UR-5	6	6	1313	S	43.73952	-124.56177	203	0	
SE15800.23	Neuston	52	54	UR-6	6	6	1457	S	43.73458	-124.65382	379	0	
SE15800.27	Neuston	53	55	UR-7	6	6	1642	S	43.73025	-124.73150	512	0	
SE15800.31	Neuston	54	56	UR-8	6	6	1935	S	43.73162	-125.03503	1426	0	
SE15900.03	Neuston	55	57	6B-1	7	6	0540	S	43.31588	-124.42358	42	0	
SE15900.07	Neuston	56	58	FM-1	7	6	0733	S	43.19992	-124.43370	31	0	
SE15900.11	Neuston	57	59	7AA-1	7	6	0938	S	43.14583	-124.46060	33	0	
SE15900.15	Neuston	58	60	7AA-2	7	6	1121	S	43.12602	-124.53108	66	0	
SE15900.19	Neuston	59	61	FM-3	7	6	1256	S	43.19358	-124.49957	59	0	
SE15900.23	Neuston	60	62	6B-2	7	6	1432	S	43.26953	-124.51875	84	0	
SE15900.27	Neuston	61	63	6B-3	7	6	1610	S	43.30408	-124.61543	134	0	
SE15900.31	Neuston	62	64	FM-4	7	6	1740	S	43.23090	-124.58430	95	0	
SE15900.35	Neuston	63	65	7AA-3	7	6	1918	S	43.15535	-124.64467	130	0	
SE16000.03	Neuston	64	66	9-1	8	6	0555	S	42.71225	-124.49722	35	0	
SE16000.07	Neuston	65	67	9A-1	8	6	0806	S	42.63193	-124.46818	60	0	
SE16000.11	Neuston	66	68	9A-2	8	6	1014	S	42.60628	-124.57615	97	0	
SE16000.15	Neuston	67	69	9-2	8	6	1201	S	42.66113	-124.60545	110	0	
SE16000.19	Neuston	68	70	9-3	8	6	1425	S	42.69925	-124.71963	234	0	
SE16000.23	Neuston	69	71	9A-3	8	6	1607	S	42.61552	-124.68513	163	0	
SE16000.27	Neuston	70	72	9A-4	8	6	1803	S	42.56767	-124.79177	494	0	
SE16100.03	Neuston	71	73	10A-1	9	6	0550	S	42.32037	-124.45830	42	0	
SE16100.07	Neuston	72	74	10A-2	9	6	0749	S	42.32642	-124.57673	143	0	
SE16200.03	Neuston	73	77	11B-1	10	6	0812	S	42.00135	-124.26522	26	0	
SE16200.07	Neuston	74	78	11A-1	10	6	1011	S	42.06290	-124.33880	37	0	
SE16200.11	Neuston	75	79	11A-2	10	6	1145	S	42.02002	-124.44857	97	0	
SE16200.15	Neuston	76	80	11B-2	10	6	1235	S	41.98818	-124.39343	75	0	
SE16200.19	Neuston	77	81	11B-3	10	6	1525	S	41.97818	-124.50195	117	0	
SE16200.23	Neuston	78	82	11A-3	10	6	1750	S	42.06833	-124.56020	148	0	
SE16200.28	Neuston	79	83	11B-4	10	6	1936	S	41.94803	-124.61648	494	0	
SE16300.03	Neuston	80	84	8A-1	11	6	0527	S	42.80567	-124.63413	49	0	

APPENDIX I

SE0005 EVENT LOG

EVENT LOG CONTENTS

Column Label

Event#

Instrument (Instr)

Cast

Station (Sta)

Station Standard (Sta std)

Day

Month (Mos)

Time

Start/End (S/E) flag

Latitude (Lat)

Longitude (Long)

Water Depth

Cast Depth

Comments

Description

Unique identifier for each line of event log.

Trawl: Nordic 264 Rope Trawl; 30-m wide; 18-m deep mesh size ranges from 162.6 cm in the throat to 8.9 cm in the codend; 6.1-m long, 0.8 cm knotless liner sewn into codend; towed for 30 min.

Niskin3m: Samples from 3m with 2-L Niskin for nutrients and chlorophyll.

Neuston: 1m² mouth area neuston net with 0.335 mm mesh; towed for 5-min out of vessel wake.

CTD: SeaBird SBE 19 Seacat Profiler; generally deployed to 100-m or within 10-m of bottom if shallower.

Sequence # for a particular instrument

Local time basis

Local time basis

Local time

S=Start of event; E=End of event

Decimal degrees; north is positive

Decimal degrees; east is positive

Depth of bottom

Maximum depth of deployment

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15000.01	CTD_SBE19	1	1	CR-1	29	5	0620	S	41.90288	-124.29895	38	30	
SE15000.02	Niskin3m	1	1	CR-1	29	5	0620	S	41.90288	-124.29895	38	3	
SE15000.03	Neuston	1	1	CR-1	29	5	0627	S	41.90388	-124.30017	40	0	
SE15000.04	CTD_SBE19	2	1	CR-1	29	5	0649	S	41.90312	-124.29957	38	30	
SE15000.05	Trawl	1	1	CR-1	29	5	0708	S	41.91895	-124.30025	38	18	
SE15000.05	Trawl	1	1	CR-1	29	5	0738	E	41.89683	-124.29895	40	18	
SE15000.06	CTD_SBE19	3	2	CR-2	29	5	0832	S	41.89928	-124.40298	69	60	
SE15000.07	Niskin3m	2	2	CR-2	29	5	0832	S	41.89928	-124.40298	69	3	
SE15000.08	Neuston	2	2	CR-2	29	5	0840	S	41.89737	-124.40207	69	0	
SE15000.09	Trawl	2	2	CR-2	29	5	0913	S	41.90675	-124.40140	69	18	
SE15000.09	Trawl	2	2	CR-2	29	5	0943	E	41.87218	-124.40002	64	18	
SE15000.10	CTD_SBE19	4	3	CR-3	29	5	1047	S	41.90568	-124.50415	139	90	
SE15000.11	Niskin3m	3	3	CR-3	29	5	1047	S	41.90568	-124.50415	139	3	
SE15000.12	Neuston	3	3	CR-3	29	5	1057	S	41.90193	-124.50387	141	0	
SE15000.13	Trawl	3	3	CR-3	29	5	1127	S	41.90362	-124.48115	134	18	
SE15000.13	Trawl	3	3	CR-3	29	5	1157	E	41.86755	-124.49710	154	18	
SE15000.14	CTD_SBE19	5	4	CR-4	29	5	1325	S	41.91890	-124.60213	494	82	
SE15000.15	Niskin3m	4	4	CR-4	29	5	1325	S	41.91890	-124.60213	494	3	
SE15000.16	Neuston	4	4	CR-4	29	5	1338	S	41.91498	-124.60117	508	0	
SE15000.17	Trawl	4	4	CR-4	29	5	1358	S	41.90427	-124.60123	519	18	
SE15000.17	Trawl	4	4	CR-4	29	5	1428	E	41.86868	-124.60032	558	18	
SE15100.01	CTD_SBE19	6	5	RR-1	30	5	0723	S	42.52905	-124.50283	40	30	
SE15100.02	Niskin3m	5	5	RR-1	30	5	0723	S	42.52905	-124.50283	40	3	
SE15100.03	Neuston	5	5	RR-1	30	5	0731	S	42.52822	-124.50217	38	0	
SE15100.04	Trawl	5	5	RR-1	30	5	0759	S	42.51265	-124.50113	37	18	
SE15100.04	Trawl	5	5	RR-1	30	5	0829	E	42.47652	-124.49848	33	18	
SE15100.05	CTD_SBE19	7	6	RR-2	30	5	0920	S	42.51017	-124.60125	90	84	
SE15100.06	Niskin3m	6	6	RR-2	30	5	0920	S	42.51017	-124.60125	90	3	
SE15100.07	Neuston	6	6	RR-2	30	5	0928	S	42.50823	-124.60197	90	0	
SE15100.08	Trawl	6	6	RR-2	30	5	0954	S	42.50077	-124.60247	88	18	
SE15100.08	Trawl	6	6	RR-2	30	5	1024	E	42.47085	-124.60342	86	18	
SE15100.09	CTD_SBE19	8	7	RR-3	30	5	1124	S	42.51047	-124.70225	183	85	
SE15100.10	Niskin3m	7	7	RR-3	30	5	1124	S	42.51047	-124.70225	183	3	
SE15100.11	Neuston	7	7	RR-3	30	5	1135	S	42.50875	-124.70105	166	0	
SE15100.12	Trawl	7	7	RR-3	30	5	1200	S	42.50787	-124.69880	165	18	
SE15100.12	Trawl	7	7	RR-3	30	5	1230	E	42.47735	-124.70077	124	18	
SE15100.13	CTD_SBE19	9	8	RR-4	30	5	1330	S	42.51342	-124.80277	604	82	
SE15100.14	Niskin3m	8	8	RR-4	30	5	1330	S	42.51342	-124.80277	604	3	
SE15100.15	Neuston	8	8	RR-4	30	5	1340	S	42.51000	-124.80035	602	0	
SE15100.16	Trawl	8	8	RR-4	30	5	1357	S	42.66055	-124.79962	558	18	
SE15100.16	Trawl	8	8	RR-4	30	5	1427	E	42.46158	-124.79742	nd	18	
SE15100.17	CTD_SBE19	10	9	RR-5	30	5	1543	S	42.52433	-124.90277	1097	94	
SE15100.18	Niskin3m	9	9	RR-5	30	5	1553	S	42.52433	-124.90277	1097	3	
SE15100.19	Neuston	9	9	RR-5	30	5	1551	S	42.52167	-124.90403	1097	0	
SE15100.20	Trawl	9	9	RR-5	30	5	1608	S	42.51112	-124.90177	1097	18	
SE15100.20	Trawl	9	9	RR-5	30	5	1638	E	42.47855	-124.90010	1097	18	
SE15100.21	CTD_SBE19	11	10	RR-6	30	5	1741	S	42.52255	-124.00203	1829	92	
SE15100.22	Niskin3m	10	10	RR-6	30	5	1741	S	42.52255	-124.00203	1829	3	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15100.23	Neuston	10	10	RR-6	30	5	1750	S	42.51987	-124.00340	1829	0	
SE15100.24	Trawl	10	10	RR-6	30	5	1808	S	42.50912	-124.99982	1829	18	
SE15100.24	Trawl	10	10	RR-6	30	5	nd	E	42.47875	-125.00143	1829	18	
SE15100.25	Trawl	11	11	RR-7	30	5	2021	S	42.50128	-125.20170	2743	18	
SE15100.25	Trawl	11	11	RR-7	30	5	2051	E	42.47335	-125.19922	2743	18	
SE15100.26	CTD_SBE19	12	11	RR-7	30	5	2114	S	42.46248	-125.19840	2743	95	
SE15100.27	Niskin3m	11	11	RR-7	30	5	2114	S	42.46248	-125.19840	2743	3	
SE15100.28	Neuston	11	11	RR-7	30	5	2118	S	42.46052	-125.19958	2743	0	
SE15200.01	CTD_SBE19	13	12	FM-3	31	5	0625	S	43.22772	-124.50240	59	40	
SE15200.02	Niskin3m	12	12	FM-3	31	5	0625	S	43.22772	-124.50240	59	3	
SE15200.03	Neuston	12	12	FM-3	31	5	0630	S	43.22740	-124.50265	60	0	
SE15200.04	Trawl	12	12	FM-3	31	5	0650	S	43.20922	-124.50130	66	18	
SE15200.04	Trawl	12	12	FM-3	31	5	0720	E	43.17680	-124.50110	59	18	
SE15200.05	CTD_SBE19	14	13	FM-4	31	5	0807	S	43.18560	-124.58573	110	79	
SE15200.06	Niskin3m	13	13	FM-4	31	5	0807	S	43.18560	-124.58573	110	3	
SE15200.07	Neuston	13	13	FM-4	31	5	0816	S	43.18225	-124.58835	112	0	
SE15200.08	Trawl	13	13	FM-4	31	5	0842	S	43.20045	-124.58873	91	18	
SE15200.08	Trawl	13	13	FM-4	31	5	0912	E	43.21918	-124.58370	88	18	
SE15200.09	CTD_SBE19	15	14	FM-5	31	5	0955	S	43.23500	-124.66770	152	93	
SE15200.09	Niskin3m	14	14	FM-5	31	5	0955	S	43.23500	-124.66770	152	3	
SE15200.10	Neuston	14	14	FM-5	31	5	1004	S	43.23332	-124.66867	152	0	
SE15200.11	Trawl	14	14	FM-5	31	5	1023	S	43.21962	-124.66732	161	18	
SE15200.11	Trawl	14	14	FM-5	31	5	1053	E	43.18792	-124.66648	148	18	
SE15200.12	CTD_SBE19	16	15	FM-6	31	5	1150	S	43.23918	-124.75148	329	95	
SE15200.13	Niskin3m	15	15	FM-6	31	5	1150	S	43.23918	-124.75148	329	3	
SE15200.14	Neuston	15	15	FM-6	31	5	1158	S	43.23710	-124.75152	327	0	
SE15200.15	Trawl	15	15	FM-6	31	5	1215	S	43.22507	-124.74590	304	18	
SE15200.15	Trawl	15	15	FM-6	31	5	1245	E	43.19442	-124.74827	316	18	
SE15200.16	CTD_SBE19	17	16	FM-7	31	5	1342	S	43.23715	-124.83353	364	98	
SE15200.17	Niskin3m	16	16	FM-7	31	5	1342	S	43.23715	-124.83353	364	3	
SE15200.18	Neuston	16	16	FM-7	31	5	1350	S	43.23643	-124.83237	364	0	
SE15200.19	Trawl	16	16	FM-7	31	5	1410	S	43.21848	-124.83042	357	18	
SE15200.19	Trawl	16	16	FM-7	31	5	1440	E	43.18803	-124.83765	305	18	
SE15200.20	CTD_SBE19	18	17	FM-8	31	5	1600	S	43.23860	-125.00310	1006	95	
SE15200.21	Niskin3m	17	17	FM-8	31	5	1600	S	43.23860	-125.00310	1006	3	
SE15200.22	Neuston	17	17	FM-8	31	5	1613	S	43.23473	-125.00372	1006	0	
SE15200.23	Trawl	17	17	FM-8	31	5	1635	S	43.22092	-125.00022	1006	18	
SE15200.23	Trawl	17	17	FM-8	31	5	1705	E	43.18923	-125.00278	1006	18	
SE15300.01	CTD_SBE19	19	18	HH-1	1	6	0535	S	44.01485	-124.20490	51	45	
SE15300.02	Niskin3m	18	18	HH-1	1	6	0535	S	44.01485	-124.20490	51	3	
SE15300.03	Neuston	18	18	HH-1	1	6	0543	S	44.01535	-124.20547	51	0	
SE15300.04	Trawl	18	18	HH-1	1	6	0559	S	44.00172	-124.20200	51	18	
SE15300.05	Trawl	18	18	HH-1	1	6	0629	E	43.97182	-124.21212	51	18	
SE15300.06	CTD_SBE19	20	19	HH-2	1	6	0757	S	44.02622	-124.40210	117	88	
SE15300.07	Niskin3m	19	19	HH-2	1	6	0757	S	44.02622	-124.40210	117	3	
SE15300.08	Neuston	19	19	HH-2	1	6	0805	S	44.02442	-124.40133	117	0	
SE15300.09	Trawl	19	19	HH-2	1	6	0822	S	44.01358	-124.39222	117	18	
SE15300.09	Trawl	19	19	HH-2	1	6	0852	E	43.98505	-124.38745	119	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15300.10	CTD_SBE19	21	20	HH-3	1	6	1030	S	44.03462	-124.60185	143	97	
SE15300.11	Niskin3m	20	20	HH-3	1	6	1030	S	44.03462	-124.60185	143	3	
SE15300.12	Trawl	20	20	HH-3	1	6	1048	S	44.02148	-124.59730	146	18	
SE15300.12	Trawl	20	20	HH-3	1	6	1118	E	43.99172	-124.59548	159	18	
SE15400.01	CTD_SBE19	22	21	NH-35	2	6	0528	S	44.67165	-124.89048	497	98	
SE15400.02	Niskin3m	21	21	NH-35	2	6	0528	S	44.67165	-124.89048	497	3	
SE15400.03	Neuston	20	21	NH-35	2	6	0538	S	44.66977	-124.89392	501	0	
SE15400.04	Trawl	21	21	NH-35	2	6	0558	S	44.65650	-124.87078	474	18	
SE15400.04	Trawl	21	21	NH-35	2	6	0628	E	44.62617	-124.88652	549	18	
SE15400.05	CTD_SBE19	23	22	NH-25	2	6	0711	S	44.67348	-124.64907	307	nd	
SE15400.06	Niskin3m	22	22	NH-25	2	6	0711	S	44.67348	-124.64907	307	3	
SE15400.07	Neuston	21	22	NH-25	2	6	0720	S	44.67195	-124.64810	311	0	
SE15400.08	Trawl	22	22	NH-25	2	6	0839	S	44.65942	-124.64888	304	18	
SE15400.08	Trawl	22	22	NH-25	2	6	0909	E	44.62807	-124.64870	nd	18	
SE15400.09	CTD_SBE19	24	23	NH-20	2	6	1014	S	44.66888	-124.52787	143	90	
SE15400.10	Niskin3m	23	23	NH-20	2	6	1014	S	44.66888	-124.52787	143	3	
SE15400.11	Neuston	22	23	NH-20	2	6	1022	S	44.66698	-124.52780	143	0	
SE15400.12	Trawl	23	23	NH-20	2	6	1049	S	44.66705	-124.52498	139	18	
SE15400.12	Trawl	23	23	NH-20	2	6	1119	E	44.63542	-124.52150	132	18	
SE15400.13	CTD_SBE19	25	24	NH-15	2	6	1222	S	44.67945	-124.41183	93	80	
SE15400.14	Niskin3m	24	24	NH-15	2	6	1222	S	44.67945	-124.41183	93	3	
SE15400.15	Neuston	23	24	NH-15	2	6	1228	S	44.67812	-124.41343	93	0	
SE15400.16	Trawl	24	24	NH-15	2	6	1246	S	44.66460	-124.41202	99	18	
SE15400.16	Trawl	24	24	NH-15	2	6	1316	E	44.63635	-124.40968	75	18	
SE15400.17	CTD_SBE19	26	25	NH-10	2	6	1417	S	44.67843	-124.29453	82	68	
SE15400.18	Niskin3m	25	25	NH-10	2	6	1417	S	44.67843	-124.29453	82	3	
SE15400.19	Neuston	24	25	NH-10	2	6	1423	S	44.67610	-124.29600	80	0	
SE15400.20	Trawl	25	25	NH-10	2	6	1448	S	44.66887	-124.29147	82	18	
SE15400.20	Trawl	25	25	NH-10	2	6	1518	E	44.63488	-124.28985	80	18	
SE15400.21	CTD_SBE19	27	26	NH-5	2	6	1620	S	44.67082	-124.17678	60	56	
SE15400.22	Niskin3m	26	26	NH-5	2	6	1620	S	44.67082	-124.17678	60	3	
SE15400.23	Neuston	25	26	NH-5	2	6	1624	S	44.67110	-124.17792	62	0	
SE15400.24	Trawl	26	26	NH-5	2	6	1641	S	44.66435	-124.17253	59	18	
SE15400.24	Trawl	26	26	NH-5	2	6	1711	E	44.64002	-124.17332	53	18	
SE15400.25	CTD_SBE19	28	27	NH-3	2	6	1751	S	44.66138	-124.13167	48	35	
SE15400.26	Niskin3m	27	27	NH-3	2	6	1751	S	44.66138	-124.13167	48	3	
SE15400.27	Neuston	26	27	NH-3	2	6	1758	S	44.66195	-124.13347	48	0	
SE15400.28	Trawl	27	27	NH-3	2	6	1818	S	44.65282	-124.13073	46	18	
SE15400.28	Trawl	27	27	NH-3	2	6	1848	E	44.62900	-124.13142	nd	18	
SE15500.01	CTD_SBE19	29	28	NH-3	3	6	1208	S	44.62338	-124.13273	49	40	
SE15500.02	Niskin3m	28	28	NH-3	3	6	1208	S	44.62338	-124.13273	49	3	
SE15500.03	Neuston	27	28	NH-3	3	6	1212	S	44.62530	-124.13222	48	0	
SE15500.04	Trawl	28	28	NH-3	3	6	1230	S	44.63725	-124.13017	48	18	
SE15500.04	Trawl	28	28	NH-3	3	6	1258	E	44.75150	-124.13087	48	18	
SE15500.05	CTD_SBE19	30	29	NH-5	3	6	1330	S	44.66987	-124.17868	64	60	
SE15500.06	Niskin3m	29	29	NH-5	3	6	1330	S	44.66987	-124.17868	64	3	
SE15500.07	Neuston	28	29	NH-5	3	6	1335	S	44.67008	-124.17673	62	0	
SE15500.08	Trawl	29	29	NH-5	3	6	1352	S	44.66340	-124.17370	60	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15500.08	Trawl	29	29	NH-5	3	6	1422	E	44.64335	-124.17012	55	18	
SE15500.09	CTD_SBE19	31	30	NH-10	3	6	1514	S	44.63285	-124.29703	82	68	
SE15500.10	Niskin3m	30	30	NH-10	3	6	1514	S	44.63285	-124.29703	82	3	
SE15500.11	Neuston	29	30	NH-10	3	6	1520	S	44.62957	-124.29740	82	0	
SE15500.12	Trawl	30	30	NH-10	3	6	1538	S	44.63517	-124.29437	80	18	
SE15500.12	Trawl	30	30	NH-10	3	6	1608	E	44.63732	-124.29625	82	18	
SE15500.13	CTD_SBE19	32	31	NH-15	3	6	1655	S	44.66618	-124.41360	101	90	
SE15500.14	Niskin3m	31	31	NH-15	3	6	1655	S	44.66618	-124.41360	101	3	
SE15500.15	Neuston	30	31	NH-15	3	6	1708	S	44.66452	-124.41378	101	0	
SE15500.16	Trawl	31	31	NH-15	3	6	1724	S	44.65285	-124.41153	95	18	
SE15500.16	Trawl	31	31	NH-15	3	6	1754	E	44.62205	-124.41267	57	18	
SE15500.17	CTD_SBE19	33	32	NH-20	3	6	1850	S	44.66003	-124.53177	148	96	
SE15500.18	Niskin3m	32	32	NH-20	3	6	1850	S	44.66003	-124.53177	148	3	
SE15500.19	Neuston	31	32	NH-20	3	6	1856	S	44.65903	-124.53217	148	0	
SE15500.20	Trawl	32	32	NH-20	3	6	1916	S	44.65197	-124.52958	143	18	
SE15500.20	Trawl	32	32	NH-20	3	6	1946	E	44.62777	-124.52203	132	18	
SE15500.21	Trawl	33	33	NH-25	3	6	2048	S	44.65782	-124.63630	287	18	
SE15500.21	Trawl	33	33	NH-25	3	6	2118	E	44.65782	-124.63630	276	18	
SE15500.22	CTD_SBE19	34	33	NH-25	3	6	2140	S	44.62177	-124.64613	283	98	
SE15500.23	Niskin3m	33	33	NH-25	3	6	2140	S	44.62177	-124.64613	283	3	
SE15500.24	Neuston	32	33	NH-25	3	6	2150	S	44.62197	-124.64705	282	0	
SE15600.01	Trawl	34	34	2A-1	4	6	0646	S	44.37683	-124.13665	37	18	
SE15600.01	Trawl	34	34	2A-1	4	6	0716	E	44.34833	-124.13485	37	18	
SE15600.02	CTD_SBE19	35	34	2A-1	4	6	0730	S	44.33738	-124.13538	35	30	
SE15600.03	Niskin3m	34	34	2A-1	4	6	0730	S	44.33738	-124.13538	35	3	
SE15600.04	Neuston	33	34	2A-1	4	6	0735	S	44.33653	-124.13548	35	0	
SE15600.05	CTD_SBE19	36	35	2A-2	4	6	0845	S	44.42673	-124.29105	69	69	
SE15600.06	Niskin3m	35	35	2A-2	4	6	0845	S	44.42673	-124.29105	69	3	
SE15600.07	Neuston	34	35	2A-2	4	6	0850	S	44.42605	-124.29095	69	0	
SE15600.08	Trawl	35	35	2A-2	4	6	0909	S	44.44447	-124.29263	69	18	
SE15600.08	Trawl	35	35	2A-2	4	6	0939	S	44.38333	-124.29305	69	18	
SE15600.09	CTD_SBE19	37	36	2A-3	4	6	1029	S	44.40210	-124.40583	79	78	
SE15600.10	Niskin3m	36	36	2A-3	4	6	1029	S	44.40210	-124.40583	79	3	
SE15600.11	Neuston	35	36	2A-3	4	6	1033	S	44.39957	-124.40578	79	0	
SE15600.12	Trawl	36	36	2A-3	4	6	1128	S	44.37040	-124.40442	82	18	
SE15600.12	Trawl	36	36	2A-3	4	6	1158	E	44.39353	-124.40843	79	18	
SE15600.13	CTD_SBE19	38	37	2A-4	4	6	1249	S	44.40927	-124.52313	95	88	
SE15600.14	Niskin3m	37	37	2A-4	4	6	1249	S	44.40927	-124.52313	95	3	
SE15600.15	Neuston	36	37	2A-4	4	6	1300	S	44.40917	-124.52182	95	0	
SE15600.16	Trawl	37	37	2A-4	4	6	1314	S	44.40020	-124.52335	95	18	
SE15600.16	Trawl	37	37	2A-4	4	6	1344	E	44.37568	-124.52030	97	18	
SE15600.17	CTD_SBE19	39	38	2A-5	4	6	1447	S	44.42705	-124.64125	95	100	
SE15600.18	Niskin3m	38	38	2A-5	4	6	1447	S	44.42705	-124.64125	126	3	
SE15600.19	Neuston	37	38	2A-5	4	6	1457	S	44.42635	-124.64275	126	0	
SE15600.20	Trawl	38	38	2A-5	4	6	1528	S	44.40950	-124.63848	123	18	
SE15600.20	Trawl	38	38	2A-5	4	6	1558	E	44.37758	-124.63440	108	18	
SE15600.21	CTD_SBE19	40	39	2A-6	4	6	1656	S	44.39792	-124.75292	161	98	
SE15600.22	Niskin3m	39	39	2A-6	4	6	1656	S	44.39792	-124.75292	161	3	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15600.23	Neuston	38	39	2A-6	4	6	1701	S	44.39755	-124.75340	159	0	
SE15600.24	Trawl	39	39	2A-6	4	6	1719	S	44.38407	-124.75373	152	18	
SE15600.24	Trawl	39	39	2A-6	4	6	1749	E	44.35583	-124.75312	139	18	
SE15600.25	Trawl	40	40	2A-6	4	6	1900	S	44.38053	-124.86802	366	18	
SE15600.25	Trawl	40	40	2A-6	4	6	1930	E	44.35467	-124.86327	366	18	
SE15600.26	CTD_SBE19	41	40	2A-6	4	6	1945	S	44.34377	-124.85480	366	88	
SE15600.27	Niskin3m	40	40	2A-6	4	6	1945	S	44.34377	-124.85480	366	3	
SE15700.01	CTD_SBE19	42	41	HH-5	5	6	0536	S	43.95985	-124.00318	695	100	
SE15700.02	Niskin3m	41	41	HH-5	5	6	0536	S	43.95985	-125.00318	695	3	
SE15700.03	Neuston	39	41	HH-5	5	6	0545	S	43.95815	-125.00330	695	0	
SE15700.04	Trawl	41	41	HH-5	5	6	0602	S	43.96792	-125.00163	695	18	
SE15700.04	Trawl	41	41	HH-5	5	6	0632	E	43.98852	-125.00153	768	18	
SE15700.05	Trawl	42	42	HH-4A	5	6	0725	S	44.00047	-124.93303	192	18	
SE15700.05	Trawl	42	42	HH-4A	5	6	0755	E	43.96800	-124.93205	141	18	
SE15700.06	CTD_SBE19	43	42	HH-4A	5	6	0820	S	43.95418	-124.92710	132	100	
SE15700.07	Niskin3m	42	42	HH-4A	5	6	0820	S	43.95418	-124.92710	132	3	
SE15700.08	Neuston	40	42	HH-4A	5	6	0825	S	43.95310	-124.92642	132	0	
SE15700.09	CTD_SBE19	44	43	HH-4	5	6	0915	S	43.96923	-124.80012	124	98	
SE15700.10	Niskin3m	43	43	HH-4	5	6	0915	S	43.96923	-124.80012	124	3	
SE15700.11	Neuston	41	43	HH-4	5	6	0923	S	43.96923	-124.79817	123	0	
SE15700.12	Trawl	43	43	HH-4	5	6	0943	S	43.97707	-124.79980	121	18	
SE15700.12	Trawl	43	43	HH-4	5	6	1013	E	43.99858	-124.80113	110	18	
SE15700.13	CTD_SBE19	45	44	HH-3	5	6	1131	S	44.02702	-124.60012	146	95	
SE15700.14	Niskin3m	44	44	HH-3	5	6	1131	S	44.02702	-124.60012	146	3	
SE15700.15	Neuston	42	44	HH-3	5	6	1139	S	44.02775	-124.59713	143	0	
SE15700.16	Trawl	44	44	HH-3	5	6	1156	S	44.01640	-124.59090	146	18	
SE15700.16	Trawl	44	44	HH-3	5	6	1226	E	46.56200	-124.58535	159	18	
SE15700.17	CTD_SBE19	46	45	HH-2	5	6	1338	S	43.96417	-124.39787	121	nd	
SE15700.18	Niskin3m	45	45	HH-2	5	6	1338	S	43.96417	-124.39787	121	3	
SE15700.19	Neuston	43	45	HH-2	5	6	1345	S	43.96493	-124.39507	121	0	
SE15700.20	Trawl	45	45	HH-2	5	6	1404	S	43.97453	-124.39842	121	18	
SE15700.20	Trawl	45	45	HH-2	5	6	1434	E	43.99833	-124.39875	121	18	
SE15700.21	CTD_SBE19	47	46	HH-1A	5	6	1536	S	43.98352	-124.28445	91	84	
SE15700.22	Niskin3m	46	46	HH-1A	5	6	1536	S	43.98352	-124.28445	91	3	
SE15700.23	Neuston	44	46	HH-1A	5	6	1544	S	43.98365	-124.28095	90	0	
SE15700.24	Trawl	46	46	HH-1A	5	6	1602	S	43.99060	-124.28527	90	18	
SE15700.24	Trawl	46	46	HH-1A	5	6	1632	E	44.01392	-124.28052	86	18	
SE15700.25	CTD_SBE19	48	47	HH-0	5	6	1722	S	44.01173	-124.16390	27	20	
SE15700.26	Niskin3m	47	47	HH-0	5	6	1722	S	44.01173	-124.16390	27	3	
SE15700.27	Neuston	45	47	HH-0	5	6	1725	S	44.01010	-124.16283	24	0	
SE15700.28	Trawl	47	47	HH-0	5	6	1742	S	44.00283	-124.16653	29	18	
SE15700.29	Trawl	47	47	HH-0	5	6	1812	E	43.97350	-124.17275	31	18	
SE15700.30	Trawl	48	48	4A-1	5	6	1909	S	43.88857	-124.20090	46	18	
SE15700.30	Trawl	48	48	4A-1	5	6	1939	E	43.85717	-124.20843	49	18	
SE15700.31	CTD_SBE19	49	48	4A-1	5	6	1955	S	43.84547	-124.20537	44	45	
SE15700.32	Niskin3m	48	48	4A-1	5	6	1955	S	43.84547	-124.20537	44	3	
SE15700.33	Neuston	46	48	4A-1	5	6	2000	S	43.84385	-124.20395	42	0	
SE15800.01	CTD_SBE19	50	49	UR-1	6	6	0537	S	43.70943	-124.23083	35	30	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15800.02	Niskin3m	49	49	UR-1	6	6	0537	S	43.70943	-124.23083	35	3	
SE15800.03	Neuston	47	49	UR-1	6	6	0545	S	43.70720	-124.23552	38	0	
SE15800.04	Trawl	49	49	UR-1	6	6	0603	S	43.72462	-124.23162	42	18	
SE15800.04	Trawl	49	49	UR-1	6	6	0635	E	43.74430	-124.22887	46	18	
SE15800.05	CTD_SBE19	51	50	UR-2	6	6	0720	S	43.73053	-124.31778	104	100	
SE15800.06	Niskin3m	50	50	UR-2	6	6	0720	S	43.73053	-124.31778	104	3	
SE15800.07	Neuston	48	50	UR-2	6	6	0729	S	43.73028	-124.31905	104	0	
SE15800.08	Trawl	50	50	UR-2	6	6	0747	S	43.73627	-124.31640	104	18	
SE15800.08	Trawl	50	50	UR-2	6	6	0817	E	43.75600	-124.31750	104	18	
SE15800.09	CTD_SBE19	52	51	UR-3	6	6	0907	S	43.73248	-124.40048	115	98	
SE15800.10	Niskin3m	51	51	UR-3	6	6	0907	S	43.73248	-124.40048	115	3	
SE15800.11	Neuston	49	51	UR-3	6	6	0914	S	43.73332	-124.40070	115	0	
SE15800.12	Trawl	51	51	UR-3	6	6	0930	S	43.73998	-124.39883	115	18	
SE15800.12	Trawl	51	51	UR-3	6	6	1000	E	43.76147	-124.39752	113	18	
SE15800.13	CTD_SBE19	53	52	UR-4	6	6	1100	S	43.73415	-124.48272	124	99	
SE15800.14	Niskin3m	52	52	UR-4	6	6	1100	S	43.73415	-124.48272	124	3	
SE15800.15	Neuston	50	52	UR-4	6	6	1105	S	43.73380	-124.48127	123	0	
SE15800.16	Trawl	52	52	UR-4	6	6	1122	S	43.74037	-124.48462	123	18	
SE15800.16	Trawl	52	52	UR-4	6	6	1152	E	43.76147	-124.48292	130	18	
SE15800.17	CTD_SBE19	54	53	UR-5	6	6	1302	S	43.73925	-124.56343	205	100	
SE15800.18	Niskin3m	53	53	UR-5	6	6	1302	S	43.73925	-124.56343	205	3	
SE15800.19	Neuston	51	53	UR-5	6	6	1313	S	43.73952	-124.56177	203	0	
SE15800.20	Trawl	53	53	UR-5	6	6	1334	S	43.74055	-124.56998	214	18	
SE15800.20	Trawl	53	53	UR-5	6	6	1404	S	43.76230	-124.56833	208	18	
SE15800.21	CTD_SBE19	55	54	UR-6	6	6	1450	S	43.73238	-124.65215	384	98	
SE15800.22	Niskin3m	54	54	UR-6	6	6	1450	S	43.73238	-124.65215	384	3	
SE15800.23	Neuston	52	54	UR-6	6	6	1457	S	43.73458	-124.65382	379	0	
SE15800.24	Trawl	54	54	UR-6	6	6	1515	S	43.74778	-124.65340	379	18	
SE15800.24	Trawl	54	54	UR-6	6	6	1545	E	43.77180	-124.65210	366	18	
SE15800.25	CTD_SBE19	56	55	UR-7	6	6	1635	S	43.73193	-124.73590	512	100	
SE15800.26	Niskin3m	55	55	UR-7	6	6	1635	S	43.73193	-124.73590	512	3	
SE15800.27	Neuston	53	55	UR-7	6	6	1642	S	43.73025	-124.73150	512	0	
SE15800.28	Trawl	55	55	UR-7	6	6	1701	S	43.73762	-124.73488	521	18	
SE15800.28	Trawl	55	55	UR-7	6	6	1731	E	43.76140	-124.73433	512	18	
SE15800.29	CTD_SBE19	57	56	UR-8	6	6	1926	S	43.73107	-125.03513	1426	95	
SE15800.30	Niskin3m	56	56	UR-8	6	6	1926	S	43.73107	-125.03513	1426	3	
SE15800.31	Neuston	54	56	UR-8	6	6	1935	S	43.73162	-125.03503	1426	0	
SE15800.32	Trawl	56	56	UR-8	6	6	1950	S	43.74002	-125.02802	1426	18	
SE15800.32	Trawl	56	56	UR-8	6	6	2020	E	43.76158	-125.03368	1426	18	
SE15900.01	CTD_SBE19	58	57	6B-1	7	6	0535	S	43.31643	-124.42392	42	25	
SE15900.02	Niskin3m	57	57	6B-1	7	6	0535	S	43.31643	-124.42392	42	3	
SE15900.03	Neuston	55	57	6B-1	7	6	0540	S	43.31588	-124.42358	42	0	
SE15900.04	Trawl	57	57	6B-1	7	6	0559	S	43.31217	-124.42130	37	18	
SE15900.04	Trawl	57	57	6B-1	7	6	0629	E	43.29337	-124.38723	29	18	
SE15900.05	CTD_SBE19	59	58	FM-1	7	6	0730	S	43.19913	-124.43247	31	22	
SE15900.06	Niskin3m	58	58	FM-1	7	6	0730	S	43.19913	-124.43247	31	3	
SE15900.07	Neuston	56	58	FM-1	7	6	0733	S	43.19992	-124.43370	31	0	
SE15900.08	Trawl	58	58	FM-1	7	6	0759	S	43.20980	-124.43472	33	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE15900.08	Trawl	58	58	FM-1	7	6	0829	E	43.24718	-124.43423	40	18	
SE15900.09	CTD_SBE19	60	59	7AA-1	7	6	0935	S	43.14578	-124.45960	31	30	
SE15900.10	Niskin3m	59	59	7AA-1	7	6	0935	S	43.14578	-124.45960	31	3	
SE15900.11	Neuston	57	59	7AA-1	7	6	0938	S	43.14583	-124.46060	33	0	
SE15900.12	Trawl	59	59	7AA-1	7	6	0954	S	43.15435	-124.45923	26	18	
SE15900.12	Trawl	59	59	7AA-1	7	6	1024	E	43.17995	-124.45582	42	18	
SE15900.13	CTD_SBE19	61	60	7AA-2	7	6	1115	S	43.12787	-124.53290	66	56	
SE15900.14	Niskin3m	60	60	7AA-2	7	6	1115	S	43.12787	-124.53290	66	3	
SE15900.15	Neuston	58	60	7AA-2	7	6	1121	S	43.12602	-124.53108	66	0	
SE15900.16	Trawl	60	60	7AA-2	7	6	1139	S	43.13222	-124.53513	69	18	
SE15900.16	Trawl	60	60	7AA-2	7	6	1209	E	nd	nd	66	18	
SE15900.17	CTD_SBE19	62	61	FM-3	7	6	1251	S	43.19498	-124.50047	60	58	
SE15900.18	Niskin3m	61	61	FM-3	7	6	1251	S	43.19498	-124.50047	60	3	
SE15900.19	Neuston	59	61	FM-3	7	6	1256	S	43.19358	-124.49957	59	0	
SE15900.20	Trawl	61	61	FM-3	7	6	1316	S	43.20258	-124.50315	64	18	
SE15900.20	Trawl	61	61	FM-3	7	6	1346	E	43.22527	-124.50415	64	18	
SE15900.21	CTD_SBE19	63	62	6B-2	7	6	1427	S	43.26878	-124.51712	84	73	
SE15900.22	Niskin3m	62	62	6B-2	7	6	1427	S	43.26878	-124.51712	84	3	
SE15900.23	Neuston	60	62	6B-2	7	6	1432	S	43.26953	-124.51875	84	0	
SE15900.24	Trawl	62	62	6B-2	7	6	1450	S	43.27478	-124.52018	88	18	
SE15900.24	Trawl	62	62	6B-2	7	6	1520	E	43.29643	-124.51880	99	18	
SE15900.25	CTD_SBE19	64	63	6B-3	7	6	1602	S	43.30588	-124.61223	132	91	
SE15900.26	Niskin3m	63	63	6B-3	7	6	1602	S	43.30588	-124.61223	132	3	
SE15900.27	Neuston	61	63	6B-3	7	6	1610	S	43.30408	-124.61543	134	0	
SE15900.28	Trawl	63	63	6B-3	7	6	1632	S	43.29902	-124.60843	128	18	
SE15900.28	Trawl	63	63	6B-3	7	6	1702	E	43.26923	-124.60927	123	18	
SE15900.29	CTD_SBE19	65	64	FM-4	7	6	1732	S	43.23243	-124.58388	95	94	
SE15900.30	Niskin3m	64	64	FM-4	7	6	1732	S	43.23243	-124.58388	95	3	
SE15900.31	Neuston	62	64	FM-4	7	6	1740	S	43.23090	-124.58430	95	0	
SE15900.32	Trawl	64	64	FM-4	7	6	1800	S	43.21998	-124.58420	84	18	
SE15900.32	Trawl	64	64	FM-4	7	6	1830	E	43.19130	-124.58295	101	18	
SE15900.33	CTD_SBE19	66	65	7AA-3	7	6	1910	S	43.15668	-124.64180	130	96	
SE15900.34	Niskin3m	65	65	7AA-3	7	6	1910	S	43.15668	-124.64180	130	3	
SE15900.35	Neuston	63	65	7AA-3	7	6	1918	S	43.15535	-124.64467	130	0	
SE15900.36	Trawl	65	65	7AA-3	7	6	1936	S	43.14238	-124.64177	143	18	
SE15900.36	Trawl	65	65	7AA-3	7	6	2000	E	44.16050	-124.63977	144	18	
SE16000.01	CTD_SBE19	67	66	9-1	8	6	0547	S	42.71120	-124.49452	33	30	
SE16000.02	Niskin3m	66	66	9-1	8	6	0547	S	42.71120	-124.49452	33	3	
SE16000.03	Neuston	64	66	9-1	8	6	0555	S	42.71225	-124.49722	35	0	
SE16000.04	Trawl	66	66	9-1	8	6	0613	S	42.70482	-124.49368	38	18	
SE16000.04	Trawl	66	66	9-1	8	6	0639	E	42.68517	-124.49607	57	18	
SE16000.05	CTD_SBE19	68	67	9A-1	8	6	0800	S	42.63265	-124.46695	60	60	
SE16000.06	Niskin3m	67	67	9A-1	8	6	0800	S	42.63265	-124.46695	60	3	
SE16000.07	Neuston	65	67	9A-1	8	6	0806	S	42.63193	-124.46818	60	0	
SE16000.08	Trawl	67	67	9A-1	8	6	0825	S	42.62807	-124.46410	60	18	
SE16000.08	Trawl	67	67	9A-1	8	6	0855	E	42.60208	-124.46067	nd	18	
SE16000.09	CTD_SBE19	69	68	9A-2	8	6	1005	S	42.60623	-124.56948	97	90	
SE16000.10	Niskin3m	68	68	9A-2	8	6	1005	S	42.60623	-124.56948	97	3	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE16000.11	Neuston	66	68	9A-2	8	6	1014	S	42.60628	-124.57615	97	0	
SE16000.12	Trawl	68	68	9A-2	8	6	1025	S	42.60770	-124.57177	95	18	
SE16000.12	Trawl	68	68	9A-2	8	6	1055	E	42.58997	-124.56948	93	18	
SE16000.13	CTD_SBE19	70	69	9-2	8	6	1158	S	42.66252	-124.60857	113	100	
SE16000.14	Niskin3m	69	69	9-2	8	6	1158	S	42.66252	-124.60857	113	3	
SE16000.15	Neuston	67	69	9-2	8	6	1201	S	42.66113	-124.60545	110	0	
SE16000.16	Trawl	69	69	9-2	8	6	1220	S	42.67097	-124.60833	112	18	
SE16000.16	Trawl	69	69	9-2	8	6	1250	E	42.69678	-124.60915	nd	18	
SE16000.17	CTD_SBE19	71	70	9-3	8	6	1420	S	42.70000	-124.71835	229	95	
SE16000.18	Niskin3m	70	70	9-3	8	6	1420	S	42.70000	-124.71835	229	3	
SE16000.19	Neuston	68	70	9-3	8	6	1425	S	42.69925	-124.71963	234	0	
SE16000.20	Trawl	70	70	9-3	8	6	1445	S	42.69787	-124.72005	234	18	
SE16000.20	Trawl	70	70	9-3	8	6	1515	E	42.34085	-124.72517	256	18	
SE16000.21	CTD_SBE19	72	71	9A-3	8	6	1600	S	42.61547	-124.68708	168	99	
SE16000.22	Niskin3m	71	71	9A-3	8	6	1600	S	42.61547	-124.68708	168	3	
SE16000.23	Neuston	69	71	9A-3	8	6	1607	S	42.61552	-124.68513	163	0	
SE16000.24	Trawl	71	71	9A-3	8	6	1625	S	42.60733	-124.69430	166	18	
SE16000.24	Trawl	71	71	9A-3	8	6	1655	E	42.58260	-124.68552	150	18	
SE16000.25	CTD_SBE19	73	72	9A-4	8	6	1756	S	42.56783	-124.79343	494	86	
SE16000.26	Niskin3m	72	72	9A-4	8	6	1756	S	42.56783	-124.79343	494	3	
SE16000.27	Neuston	70	72	9A-4	8	6	1803	S	42.56767	-124.79177	494	0	
SE16000.28	Trawl	72	72	9A-4	8	6	1820	S	42.57065	-124.78817	475	18	
SE16000.28	Trawl	72	72	9A-4	8	6	1850	E	42.59687	-124.79298	585	18	
SE16100.01	CTD_SBE19	74	73	10A-1	9	6	0543	S	42.31983	-124.45607	40	30	
SE16100.02	Niskin3m	73	73	10A-1	9	6	0543	S	42.31983	-124.45607	40	3	
SE16100.03	Neuston	71	73	10A-1	9	6	0550	S	42.32037	-124.45830	42	0	
SE16100.04	Trawl	73	73	10A-1	9	6	0610	S	42.33013	-124.45882	38	18	
SE16100.04	Trawl	73	73	10A-1	9	6	0640	E	42.35197	-124.45743	31	18	
SE16100.05	CTD_SBE19	75	74	10A-2	9	6	0741	S	42.32750	-124.57860	144	92	
SE16100.06	Niskin3m	74	74	10A-2	9	6	0741	S	42.32750	-124.57860	144	3	
SE16100.07	Neuston	72	74	10A-2	9	6	0749	S	42.32642	-124.57673	143	0	
SE16100.08	Trawl	74	74	10A-2	9	6	0804	S	42.33427	-124.57905	139	18	
SE16100.08	Trawl	74	74	10A-2	9	6	0834	E	42.35617	-124.57613	119	18	
SE16100.09	CTD_SBE19	76	75	10AA-2	9	6	0952	S	42.24987	-124.55315	154	84	
SE16100.10	Niskin3m	75	75	10AA-2	9	6	0952	S	42.24987	-124.55315	154	3	
SE16100.11	Trawl	75	75	10AA-2	9	6	1011	S	42.26040	-124.54847	148	18	
SE16100.11	Trawl	75	75	10AA-2	9	6	1041	E	42.28455	-124.54967	141	18	
SE16100.12	CTD_SBE19	77	76	10AA-1	9	6	1142	S	42.24737	-124.44035	42	28	
SE16100.13	Niskin3m	76	76	10AA-1	9	6	1142	S	42.24737	-124.44035	42	3	
SE16100.14	Trawl	76	76	10AA-1	9	6	1154	S	42.25492	-124.44047	38	18	
SE16100.14	Trawl	76	76	10AA-1	9	6	1224	E	42.27563	-124.43623	29	18	
SE16200.01	CTD_SBE19	78	77	11B-1	10	6	0810	S	41.99987	-124.26527	26	21	
SE16200.02	Niskin3m	77	77	11B-1	10	6	0810	S	41.99987	-124.26527	26	3	
SE16200.03	Neuston	73	77	11B-1	10	6	0812	S	42.00135	-124.26522	26	0	
SE16200.04	Trawl	77	77	11B-1	10	6	0831	S	41.99253	-124.26338	26	18	
SE16200.04	Trawl	77	77	11B-1	10	6	0901	E	41.96813	-124.25942	22	18	
SE16200.05	CTD_SBE19	79	78	11A-1	10	6	1008	S	42.06250	-124.33980	38	30	
SE16200.06	Niskin3m	78	78	11A-1	10	6	1008	S	42.06250	-124.33980	38	3	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE16200.07	Neuston	74	78	11A-1	10	6	1011	S	42.06290	-124.33880	37	0	
SE16200.08	Trawl	78	78	11A-1	10	6	1030	S	42.05323	-124.34673	38	18	
SE16200.08	Trawl	78	78	11A-1	10	6	1100	E	42.02875	-124.35862	42	18	
SE16200.09	CTD_SBE19	80	79	11A-2	10	6	1140	S	42.03328	-124.44785	97	89	
SE16200.10	Niskin3m	79	79	11A-2	10	6	1140	S	42.03328	-124.44785	97	3	
SE16200.11	Neuston	75	79	11A-2	10	6	1145	S	42.02002	-124.44857	97	0	
SE16200.12	Trawl	79	79	11A-2	10	6	1205	S	42.03523	-124.44663	97	18	
SE16200.12	Trawl	79	79	11A-2	10	6	1235	E	42.05418	-124.44740	99	18	
SE16200.13	CTD_SBE19	81	80	11B-2	10	6	1228	S	41.98773	-124.39400	75	71	
SE16200.14	Niskin3m	80	80	11B-2	10	6	1228	S	41.98773	-124.39400	75	3	
SE16200.15	Neuston	76	80	11B-2	10	6	1235	S	41.98818	-124.39343	75	0	
SE16200.16	Trawl	80	80	11B-2	10	6	1251	S	41.98348	-124.39187	73	18	
SE16200.16	Trawl	80	80	11B-2	10	6	1321	E	41.85995	-124.38618	71	18	
SE16200.17	CTD_SBE19	82	81	11B-3	10	6	1520	S	41.97788	-124.50027	115	97	
SE16200.18	Niskin3m	81	81	11B-3	10	6	1520	S	41.97788	-124.50027	115	3	
SE16200.19	Neuston	77	81	11B-3	10	6	1525	S	41.97818	-124.50195	117	0	
SE16200.20	Trawl	81	81	11B-3	10	6	1548	S	41.96647	-124.50423	121	18	
SE16200.20	Trawl	81	81	11B-3	10	6	1618	E	41.93595	-124.50225	124	18	
SE16200.21	CTD_SBE19	83	82	11A-3	10	6	1742	S	42.06797	-124.55945	148	100	
SE16200.22	Niskin3m	82	82	11A-3	10	6	1742	S	42.06797	-124.55945	148	3	
SE16200.23	Neuston	78	82	11A-3	10	6	1750	S	42.06833	-124.56020	148	0	
SE16200.24	Trawl	82	82	11A-3	10	6	1808	S	42.05477	-124.56030	146	18	
SE16200.25	Trawl	82	82	11A-3	10	6	1838	E	42.02540	-124.55475	144	18	
SE16200.26	CTD_SBE19	84	83	11B-4	10	6	1931	S	41.94907	-124.61618	457	99	
SE16200.27	Niskin3m	83	83	11B-4	10	6	1931	S	41.94907	-124.61618	457	3	
SE16200.28	Neuston	79	83	11B-4	10	6	1936	S	41.94803	-124.61648	494	0	
SE16200.29	Trawl	83	83	11B-4	10	6	1956	S	41.95523	-124.61725	457	18	
SE16200.30	Trawl	83	83	11B-4	10	6	2032	S	41.98033	-124.61932	421	18	
SE16300.01	CTD_SBE19	85	84	8A-1	11	6	0522	S	42.80395	-124.63233	49	48	
SE16300.02	Niskin3m	84	84	8A-1	11	6	0522	S	42.80395	-124.63233	49	3	
SE16300.03	Neuston	80	84	8A-1	11	6	0527	S	42.80567	-124.63413	49	0	
SE16300.04	Trawl	84	84	8A-1	11	6	0546	S	42.81672	-124.63702	51	18	
SE16300.04	Trawl	84	84	8A-1	11	6	0616	E	42.84605	-124.63900	62	18	