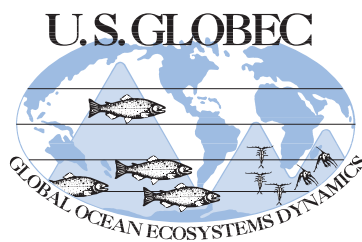
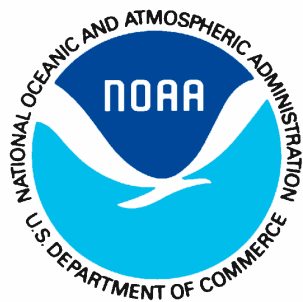


GLOBEC Northeast Pacific California Current

Cruise Report, F/V *Sea Eagle* (SE0007)

July 29 – August 12, 2000



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Chief Scientist:

Jackie Popp Noskov
Cooperative Institute for Marine Resource Studies
Hatfield Marine Science Center
Newport, OR 97365-5296
541-867-0195
jackie.popp@noaa.gov

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

Jackie Noskov	Cooperative Institute for Marine Resource Studies, Newport
Paul Bentley	Northwest Fisheries Science Center, Hammond
Joseph Fisher	College of Oceanic and Atmospheric Sciences, OSU, Corvallis
Todd Miller	Cooperative Institute for Marine Resource Studies, Newport
Marcia House	Cooperative Institute for Marine Resource Studies, Newport

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

Methods

Surveys were conducted from July 28 – August 15, 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* and R/V *New Horizon*).

For the mesoscale survey, stations were established at 1, 5, 10, 15, 20, 25 and 30 miles from shore on each of five transects. Some stations were not sampled due to inclement weather, although overall, the weather during this particular cruise was reasonably good. 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 meso-scale and fine-scale portions of the survey. We collected a total of 12,315 fish, representing 31 species. This is more than twice as many fish as were captured during an earlier (June 2000) cruise. Of these, 10,324 (84% of catch) were Pacific sardine (Table 2), which were captured in several net sets. The catch in August 2000 was dominated by several large catches of Pacific sardine (Table 2). Jack mackerel was the next most common fish (6.3% of catch). Unlike June 2000, when many juvenile and adult rockfish were captured (29% of June 2000 total), only 2 individual rockfish (neither juvenile) were captured in August. Osmerids were far less abundant in August than in June, as well. Mesopelagic fishes of the family Bathylagidae and Myctophidae were collected only during this cruise, mainly due to the inclusion of more offshore stations and occasional collections during non-daylight hours. As in the June 2000 cruise, salmonids comprised a relatively minor percentage of the catch (3.0%) but were more common and abundant during this survey. Of the 31 fish species captured in the cruise, 10 species were represented by a single individual only.

Juvenile chinook salmon were broadly distributed latitudinally, 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.

Table 2. Vertebrate catch from GLOBEC cruises in August 2000. Species shown without any catches are shown because those species were captured in trawl surveys from an earlier spring (June 2000) cruise.

Family	Common name	Scientific name	Catch
Agnatha	Pacific lamprey	<i>Lampetra tridentata</i>	
Chondrichthyes			
Alopiidae	Common thresher shark	<i>Alopias vulpinus</i>	
Carcharhinidae	Blue shark	<i>Prionace glauca</i>	18
Osteichthyes			
Xenocoelidae	Eel leptocephalus	<i>Thalassenchelys coheni</i>	1
Clupeidae	Pacific herring	<i>Clupea pallasii</i>	
	Pacific sardine	<i>Sardinops sagax</i>	10,324
Engraulidae	Northern anchovy	<i>Engraulis mordax</i>	7
Salmonidae	Chinook salmon	<i>Oncorhynchus tshawytscha</i>	252
	Coho salmon	<i>Oncorhynchus kisutch</i>	111
	Cutthroat trout	<i>Oncorhynchus clarki</i>	1
	Steelhead trout	<i>Oncorhynchus mykiss</i>	39
Osmeridae	Smelt (juv.)	Osmeridae	35
	Surf smelt	<i>Hypomesus pretiosus</i>	314
	Whitebait smelt	<i>Allosmerus elongatus</i>	79
Myctophidae	Northern lampfish	<i>Stenobrachius leucopsarus</i>	185
Gadidae	Pacific tomcod (juv.)	<i>Microgadus proximus</i>	13
Scomberesocidae	Pacific saury	<i>Cololabis saira</i>	66
Atherinidae	Jacksmelt	<i>Atherinopsis californiensis</i>	
Trachipteridae	King-of-the-salmon (juv.)	<i>Trachipterus altivelis</i>	11
Gasterosteidae	Threespine stickleback	<i>Gasterosteus aculeatus</i>	
Scorpaenidae	Rockfishes (juv.)	<i>Sebastes</i> spp.	
	Darkblotched rockfish	<i>Sebastes cramerii</i>	1
	Yellowtail rockfish	<i>Sebastes flavidus</i>	
	Black rockfish	<i>Sebastes melanops</i>	1
	Canary rockfish	<i>Sebastes pinniger</i>	
Hexagrammidae	Lingcod (juv.)	<i>Ophiodon elongatus</i>	
Anoplopomatidae	Sablefish (juv.)	<i>Anoplopoma fimbria</i>	4
Cottidae	Cabezon (juv.)	<i>Scorpaenichthys marmoratus</i>	
	Pacific staghorn sculpin	<i>Leptocottus armatus</i>	
Agonidae	Sturgeon poacher	<i>Podothecus acipenserinus</i>	1
Cyclopteridae	Pacific spiny lumpsucker	<i>Eumicrotremus orbis</i>	1
Carangidae	Jack mackerel	<i>Trachurus symmetricus</i>	772
Bramidae	Pacific pomfret	<i>Brama japonica</i>	5
Anarrhichadidae	Wolf eel (juv.)	<i>Anarrhichthys felis</i>	8
Ammodytidae	Pacific sandlance	<i>Ammodytes hexapterus</i>	
Zaprodidae	Prowfish (juv.)	<i>Zaprora silenus</i>	1
Scombridae	Chub mackerel	<i>Scomber japonicus</i>	
Centrolophidae	Medusafish	<i>Icichthys lockingtoni</i>	8
Flatfishes	Flatfish larvae (unid.)	Flatfishes	
Bothidae	Pacific sanddab	<i>Citharichthys sordidus</i>	3
Pleuronectidae	Sand sole (larvae)	<i>Psettichthys melanostictus</i>	1
	Slender sole	<i>Eopsetta exilis</i>	1
	Starry flounder	<i>Platichthys stellatus</i>	2
	Curlfin sole	<i>Pleuronichthys decurrens</i>	
	English sole	<i>Parophrys vetulus</i>	
	Rex sole (juv.)	<i>Errex zachirus</i>	49
Molidae	Ocean sunfish	<i>Mola mola</i>	1

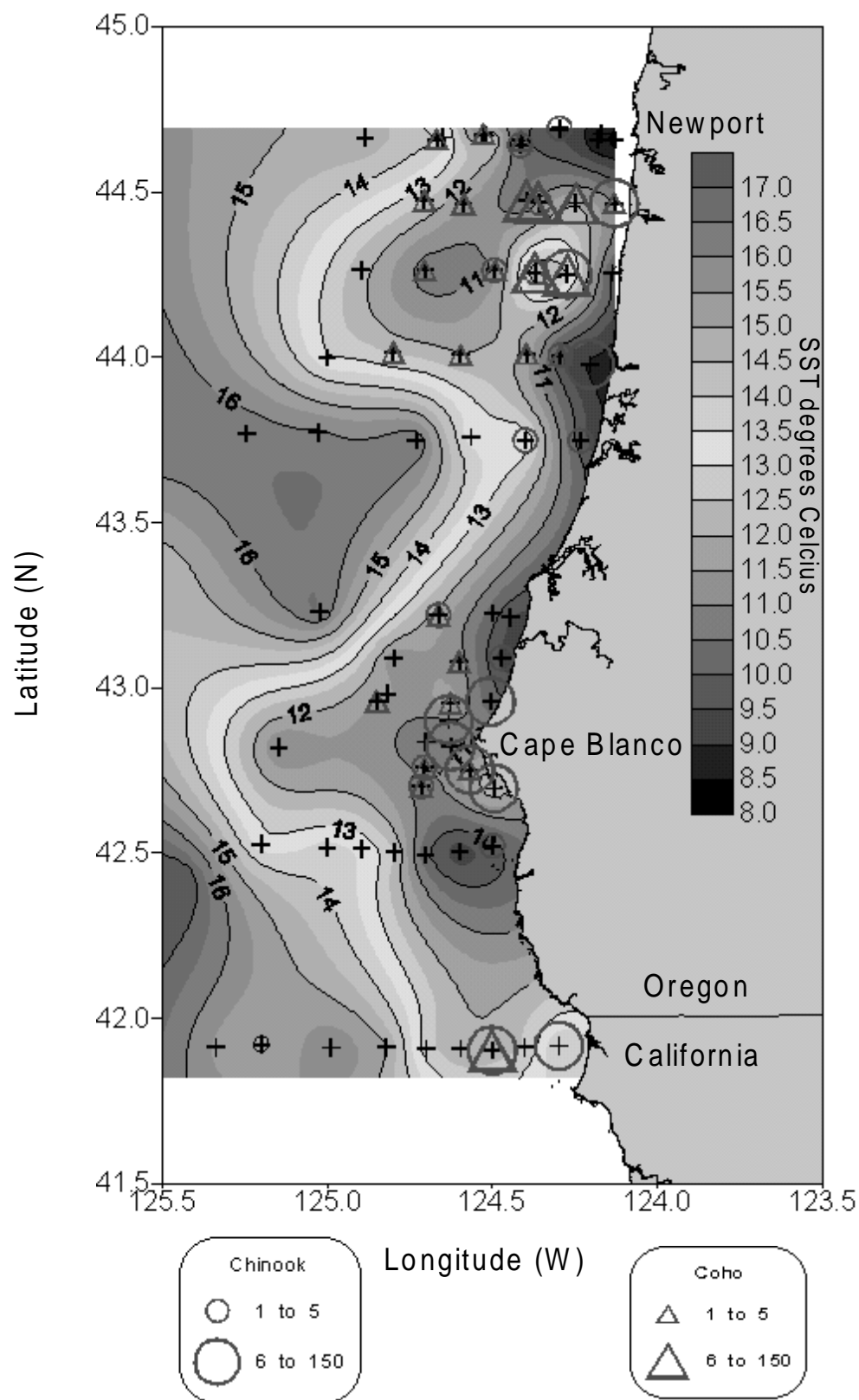


Figure 1. Abundance (# of fish caught) of coho and chinook salmon at trawl stations occupied during the mesoscale and fine-scale surveys in August 2000.

Table 3: Trawls

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21100.01	Trawl	1	1	NT-1	29	7	0006	S	42.42200	-125.44800	2743	18	
SE21100.01	Trawl	1	1	NT-1	29	7	0055	E	42.36432	-125.43427	2743	18	
SE21100.05	Trawl	2	2	CR-11	29	7	0653	S	41.81887	-126.00695	2926	18	
SE21100.05	Trawl	2	2	CR-11	29	7	0723	E	41.79178	-126.00630	2926	18	
SE21100.09	Trawl	3	3	CR-10	29	7	1009	S	41.91318	-125.67332	2926	18	
SE21100.09	Trawl	3	3	CR-10	29	7	1039	E	41.87845	-125.67585	2926	18	
SE21100.13	Trawl	4	4	CR-9	29	7	1326	S	41.90427	-124.60123	2926	18	
SE21100.13	Trawl	4	4	CR-9	29	7	1356	E	41.88515	-125.34195	2926	18	
SE21100.17	Trawl	5	5	CR-8	29	7	1533	S	41.92173	-125.19780	2560	18	
SE21100.17	Trawl	5	5	CR-8	29	7	1603	E	41.89753	-125.19602	2560	18	
SE21100.21	Trawl	6	6	CR-7	29	7	1752	S	41.91170	-124.98835	914	18	
SE21100.21	Trawl	6	6	CR-7	29	7	1822	E	41.88560	-124.98808	914	18	
SE21200.04	Trawl	7	7	CR-6	30	7	0635	S	41.91288	-124.82067	786	18	
SE21200.04	Trawl	7	7	CR-6	30	7	0705	E	41.88578	-124.81950	786	18	
SE21200.08	Trawl	8	8	CR-5	30	7	0830	S	41.90743	-124.70028	695	18	
SE21200.08	Trawl	8	8	CR-5	30	7	0900	E	41.88000	-124.69950	695	18	
SE21200.12	Trawl	9	9	CR-4	30	7	1019	S	41.90877	-124.59615	494	18	
SE21200.12	Trawl	9	9	CR-4	30	7	1049	E	41.88375	-124.59483	530	18	
SE21200.16	Trawl	10	10	CR-3	30	7	1159	S	41.90280	-124.50047	137	18	
SE21200.16	Trawl	10	10	CR-3	30	7	1229	E	41.87603	-124.49695	148	18	
SE21200.20	Trawl	11	11	CR-2	30	7	1342	S	41.91258	-124.40278	71	18	
SE21200.20	Trawl	11	11	CR-2	30	7	1412	E	41.88483	-124.40315	68	18	
SE21200.24	Trawl	12	12	CR-1	30	7	1534	S	41.91727	-124.29870	38	18	
SE21200.24	Trawl	12	12	CR-1	30	7	1604	E	41.89273	-124.29345	37	18	
SE21300.04	Trawl	13	13	RR-1	31	7	0628	S	42.52220	-124.49970	37	18	
SE21300.04	Trawl	13	13	RR-1	31	7	0658	E	42.49088	-124.49817	33	18	
SE21300.08	Trawl	14	14	RR-2	31	7	0829	S	42.50517	-124.59787	84	18	
SE21300.08	Trawl	14	14	RR-2	31	7	0859	E	42.47178	-124.59747	86	18	
SE21300.11	Trawl	15	15	RR-3	31	7	1016	S	42.49427	-124.70407	123	18	
SE21300.11	Trawl	15	15	RR-3	31	7	1046	E	42.46422	-124.70247	121	18	
SE21300.15	Trawl	16	16	RR-4	31	7	1212	S	42.50345	-124.79578	604	18	
SE21300.15	Trawl	16	16	RR-4	31	7	1242	E	42.47520	-124.79270	238	18	
SE21300.19	Trawl	17	17	RR-5	31	7	1409	S	42.51387	-124.89602	1097	18	
SE21300.19	Trawl	17	17	RR-5	31	7	1439	E	42.48808	-124.89005	1097	18	
SE21300.23	Trawl	18	18	RR-6	31	7	1607	S	42.51667	-125.00105	1792	18	
SE21300.23	Trawl	18	18	RR-6	31	7	1637	E	42.49063	-124.99985	1792	18	
SE21300.27	Trawl	19	19	RR-7	31	7	1830	S	42.52755	-125.20073	2432	18	
SE21300.27	Trawl	19	19	RR-7	31	7	1901	E	42.49843	-125.20025	2743	18	
SE21400.04	Trawl	20	20	FM-8	1	8	0627	S	43.22858	-125.02352	1774	18	
SE21400.04	Trawl	20	20	FM-8	1	8	0657	E	43.20067	-125.02945	1774	18	
SE21400.14	Trawl	21	24	FM-3	1	8	1232	S	43.19982	-124.50422	66	18	
SE21400.14	Trawl	21	24	FM-3	1	8	1248	E	43.18558	-124.50678	64	18	
SE21400.18	Trawl	22	25	FM-1	1	8	1359	S	43.21422	-124.44528	44	18	
SE21400.18	Trawl	22	25	FM-1	1	8	1429	E	43.18890	-124.45078	44	18	
SE21500.04	Trawl	23	26	HH-1	2	8	0704	S	43.97813	-124.20428	51	18	
SE21500.04	Trawl	23	26	HH-1	2	8	0734	E	43.94352	-124.20912	55	18	
SE21500.08	Trawl	24	27	HH-1A	2	8	0917	S	44.00567	-124.29457	90	18	
SE21500.08	Trawl	24	27	HH-1A	2	8	0947	E	43.97852	-124.28542	90	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
SE21500.12	Trawl	25	28	HH-2	2	8	1117	S	44.01060	-124.39597	119	18	
SE21500.12	Trawl	25	28	HH-2	2	8	1147	E	43.98430	-124.39723	121	18	
SE21500.16	Trawl	26	29	HH-3	2	8	1349	S	44.00735	-124.59693	154	18	
SE21500.16	Trawl	26	29	HH-3	2	8	1419	E	44.00000	-124.60000	166	18	
SE21500.20	Trawl	27	30	HH-4	2	8	1612	S	44.01373	-124.80098	108	18	
SE21500.20	Trawl	27	30	HH-4	2	8	1642	E	43.98657	-124.80472	115	18	
SE21500.24	Trawl	28	31	HH-5	2	8	1831	S	43.99862	-125.00028	914	18	
SE21500.24	Trawl	28	31	HH-5	2	8	1901	E	43.97133	-124.99930	914	18	
SE21600.04	Trawl	29	32	NH-25	3	8	0629	S	44.65937	-124.66825	278	18	
SE21600.04	Trawl	29	32	NH-25	3	8	0659	E	44.62992	-124.67225	263	18	
SE21600.08	Trawl	30	33	NH-20	3	8	0846	S	44.67443	-124.52745	139	18	
SE21600.08	Trawl	30	33	NH-20	3	8	0916	E	44.64562	-124.52462	137	18	
SE21600.12	Trawl	31	34	NH-15	3	8	1034	S	44.65542	-124.41187	97	18	
SE21600.12	Trawl	31	34	NH-15	3	8	1104	E	44.62583	-124.41015	64	18	
SE21600.16	Trawl	32	35	NH-10	3	8	1235	S	44.68722	-124.29690	79	18	
SE21600.16	Trawl	32	35	NH-10	3	8	1305	E	44.66010	-124.29435	82	18	
SE21600.20	Trawl	33	36	NH-5	3	8	1424	S	44.67553	-124.16842	60	18	
SE21600.20	Trawl	33	36	NH-5	3	8	1454	E	44.64902	-124.17547	59	18	
SE21600.24	Trawl	34	37	NH-3	3	8	1555	S	44.65627	-124.12813	48	18	
SE21600.24	Trawl	34	37	NH-3	3	8	1625	E	44.63137	-124.13015	48	18	
SE21700.04	Trawl	35	38	NH-5	4	8	0759	S	44.65848	-124.18190	60	18	
SE21700.04	Trawl	35	38	NH-5	4	8	0759	E	44.63330	-124.18102	53	18	
SE21700.08	Trawl	36	39	NH-10	4	8	0933	S	44.69202	-124.29665	80	18	
SE21700.08	Trawl	36	39	NH-10	4	8	1003	E	44.66275	-124.28983	77	18	
SE21700.12	Trawl	37	40	NH-15	4	8	1127	S	44.64070	-124.41597	71	18	
SE21700.12	Trawl	37	40	NH-15	4	8	1157	E	44.61327	-124.41183	55	18	
SE21700.16	Trawl	38	41	NH-20	4	8	1325	S	44.67023	-124.52220	135	18	
SE21700.16	Trawl	38	41	NH-20	4	8	1355	E	44.64233	-124.52427	139	18	
SE21700.20	Trawl	39	42	NH-25	4	8	1519	S	44.66457	-124.65298	309	18	
SE21700.20	Trawl	39	42	NH-25	4	8	1549	E	44.63608	-124.65127	278	18	
SE21700.24	Trawl	40	43	NH-35	4	8	1743	S	44.66405	-124.88543	494	18	
SE21700.24	Trawl	40	43	NH-35	4	8	1813	E	44.63555	-124.88405	530	18	
SE21800.04	Trawl	41	44	BOB-5	5	8	0645	S	44.26353	-124.89752	179	18	
SE21800.04	Trawl	41	44	BOB-5	5	8	0715	E	44.23570	-124.90078	141	18	
SE21800.08	Trawl	42	45	BOB-4	5	8	0912	S	44.26302	-124.70408	93	18	
SE21800.08	Trawl	42	45	BOB-4	5	8	0942	E	44.23813	-124.70788	108	18	
SE21800.12	Trawl	43	46	BOB-3	5	8	1134	S	44.26327	-124.49420	102	18	
SE21800.12	Trawl	43	46	BOB-3	5	8	1204	E	44.23825	-124.48832	101	18	
SE21800.16	Trawl	44	47	BOB-2	5	8	1323	S	44.25698	-124.36880	88	18	
SE21800.16	Trawl	44	47	BOB-2	5	8	1353	E	44.23295	-124.36827	88	18	
SE21800.20	Trawl	45	48	BOB-1	5	8	1620	S	44.25467	-124.13680	27	18	
SE21800.20	Trawl	45	48	BOB-1	5	8	1650	E	44.23173	-124.13388	24	18	
SE21800.24	Trawl	46	49	BOB-1A	5	8	1910	S	44.25118	-124.27373	75	18	
SE21800.24	Trawl	46	49	BOB-1A	5	8	1940	E	44.24968	-124.23397	68	18	
SE21900.04	Trawl	47	50	UR-1	6	8	0637	S	43.74732	-124.23370	55	18	
SE21900.04	Trawl	47	50	UR-1	6	8	0652	E	43.73593	-124.23145	48	18	
SE21900.08	Trawl	48	51	UR-3	6	8	0839	S	43.74878	-124.40043	115	18	
SE21900.08	Trawl	48	51	UR-3	6	8	0909	E	43.72132	-124.40315	117	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
SE21900.12	Trawl	49	52	UR-5	6	8	1043	S	43.75810	-124.56475	208	18	
SE21900.12	Trawl	49	52	UR-5	6	8	1113	E	43.73043	-124.55688	198	18	
SE21900.16	Trawl	50	53	UR-7	6	8	1254	S	43.74880	-124.73057	494	18	
SE21900.16	Trawl	50	53	UR-7	6	8	1324	E	43.71763	-124.72623	512	18	
SE21900.20	Trawl	51	54	UR-8	6	8	1547	S	43.77273	-125.02835	1372	18	
SE21900.20	Trawl	51	54	UR-8	6	8	1617	E	43.74777	-125.02898	1372	18	
SE21900.24	Trawl	52	55	UR-10	6	8	1808	S	43.76815	-125.24363	1737	18	
SE21900.24	Trawl	52	55	UR-10	6	8	1838	E	43.74305	-125.24742	1737	18	
SE21900.28	Trawl	53	56	NFS-1	6	8	2307	S	43.75763	-125.69378	2926	18	
SE21900.28	Trawl	53	56	NFS-1	6	8	2337	E	43.73463	-125.69333	2926	18	
SE22000.04	Trawl	54	57	NFS-2	7	8	1422	S	43.78388	-126.00260	3018	18	
SE22000.04	Trawl	54	57	NFS-2	7	8	1452	E	43.75930	-126.00308	3018	18	
SE22000.12	Trawl	55	59	NFS-3	7	8	1900	S	43.50345	-125.80645	3018	18	
SE22000.12	Trawl	55	59	NFS-3	7	8	1930	E	43.47782	-125.81273	3018	18	
SE22000.17	Trawl	56	60	NFS-3	7	8	2234	S	43.51067	-125.80102	3018	18	
SE22000.17	Trawl	56	60	NFS-3	7	8	2304	E	43.48678	-125.80128	3018	18	
SE22100.02	Trawl	57	61	NFS-4	8	8	0209	S	43.35192	-125.50540	3018	18	
SE22100.02	Trawl	57	61	NFS-4	8	8	0239	E	43.33542	-125.50773	3018	18	
SE22100.10	Trawl	58	63	NFS-8	8	8	1038	S	42.81917	-125.14570	2012	18	
SE22100.10	Trawl	58	63	NFS-8	8	8	1110	E	42.79015	-125.14665	2012	18	
SE22100.15	Trawl	59	64	NFS-9	8	8	1408	S	42.95993	-124.84932	117	18	
SE22100.15	Trawl	59	64	NFS-9	8	8	1438	E	42.93325	-124.85140	155	18	
SE22100.20	Trawl	60	65	NFS-10	8	8	1749	S	43.22017	-124.66270	152	18	
SE22100.20	Trawl	60	65	NFS-10	8	8	1819	E	43.20800	-124.65962	144	18	
SE22200.04	Trawl	61	66	7A-1	9	8	0728	S	43.09023	-124.47200	42	18	
SE22200.04	Trawl	61	66	7A-1	9	8	0758	E	43.05763	-124.47108	37	18	
SE22200.08	Trawl	62	67	7A-2	9	8	0924	S	43.08027	-124.59983	117	18	
SE22200.08	Trawl	62	67	7A-2	9	8	0954	E	43.04983	-124.60115	117	18	
SE22200.12	Trawl	63	68	7A-3	9	8	1140	S	43.08902	-124.79848	232	18	
SE22200.12	Trawl	63	68	7A-3	9	8	1210	E	43.06630	-124.79770	188	18	
SE22200.16	Trawl	64	69	8-3	9	8	1319	S	42.98182	-124.81715	123	18	
SE22200.16	Trawl	64	69	8-3	9	8	1349	E	42.95887	-124.81775	134	18	
SE22200.20	Trawl	65	70	8-2	9	8	1529	S	42.95403	-124.62722	95	18	
SE22200.20	Trawl	65	70	8-2	9	8	1559	E	42.92685	-124.62777	84	18	
SE22200.24	Trawl	66	71	8-1	9	8	1720	S	42.95835	-124.50560	31	18	
SE22200.24	Trawl	66	71	8-1	9	8	1750	E	42.93525	-124.51518	26	18	
SE22300.04	Trawl	67	72	8A-1	10	8	0655	S	42.82355	-124.62648	46	18	
SE22300.04	Trawl	67	72	8A-1	10	8	0725	E	42.79580	-124.63027	49	18	
SE22300.08	Trawl	68	73	8A-2	10	8	0842	S	42.83608	-124.70052	121	18	
SE22300.08	Trawl	68	73	8A-2	10	8	0912	E	42.81162	-124.69950	130	18	
SE22300.12	Trawl	69	74	8B-2	10	8	1010	S	42.75960	-124.70595	190	18	
SE22300.12	Trawl	69	74	8B-2	10	8	1040	E	42.73698	-124.69980	179	18	
SE22300.16	Trawl	70	75	8B-1	10	8	1201	S	42.75222	-124.56828	46	18	
SE22300.16	Trawl	70	75	8B-1	10	8	1231	E	42.73037	-124.57113	73	18	
SE22300.20	Trawl	71	76	9-1	10	8	1340	S	42.69570	-124.49580	48	18	
SE22300.20	Trawl	71	76	9-1	10	8	1410	E	42.71870	-124.49333	59	18	
SE22300.24	Trawl	72	77	9-3	10	8	1602	S	42.70210	-124.71530	221	18	
SE22300.24	Trawl	72	77	9-3	10	8	1632	E	42.67998	-124.70917	205	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
SE22300.28	Trawl	73	78	Birds-1	10	8	1905	S	42.90325	-124.63278	80	18	
SE22300.28	Trawl	73	78	Birds-1	10	8	1935	E	42.88053	-124.62830	68	18	
SE22500.04	Trawl	74	79	2-6	12	8	0647	S	44.47498	-124.70605	168	18	
SE22500.04	Trawl	74	79	2-6	12	8	0717	E	44.46337	-124.70657	154	18	
SE22500.09	Trawl	75	80	2-5	12	8	0847	S	44.46455	-124.58732	124	18	
SE22500.09	Trawl	75	80	2-5	12	8	0917	E	44.43975	-124.58348	115	18	
SE22500.14	Trawl	76	81	2-4	12	8	1101	S	44.47327	-124.39637	60	18	
SE22500.14	Trawl	76	81	2-4	12	8	1131	E	44.44658	-124.39738	73	18	
SE22500.19	Trawl	77	82	2-3	12	8	1247	S	44.46762	-124.35855	64	18	
SE22500.19	Trawl	77	82	2-3	12	8	1317	E	44.43965	-124.36170	73	18	
SE22500.24	Trawl	78	83	2-2	12	8	1447	S	44.46640	-124.24707	69	18	
SE22500.24	Trawl	78	83	2-2	12	8	1517	E	44.44107	-124.24255	69	18	
SE22500.29	Trawl	79	84	2-1	12	8	1643	S	44.46557	-124.13075	42	18	
SE22500.29	Trawl	79	84	2-1	12	8	1653	E	44.44788	-124.13158	42	18	

Table 4: CTD Casts

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21000.02	CTD_SBE19	1	1	NT-1	28	7	2345	S	42.43883	-125.45382	2743	90	
SE21100.02	CTD_SBE19	2	2	CR-11	29	7	0625	S	41.82757	-126.01307	2926	100	
SE21100.06	CTD_SBE19	3	3	CR-10	29	7	0944	S	41.93237	-125.67038	2926	100	
SE21100.10	CTD_SBE19	4	4	CR-9	29	7	1259	S	41.92618	-125.33582	2926	100	
SE21100.14	CTD_SBE19	5	5	CR-8	29	7	1507	S	41.93098	-125.20168	2560	96	Blew hydraulics.
SE21100.18	CTD_SBE19	6	6	CR-7	29	7	1732	S	41.92200	-124.99038	914	92	
SE21200.01	CTD_SBE19	7	7	CR-6	30	7	0611	S	41.92782	-124.81962	786	91	
SE21200.05	CTD_SBE19	8	8	CR-5	30	7	0804	S	41.92038	-124.70063	695	96	
SE21200.09	CTD_SBE19	9	9	CR-4	30	7	0952	S	41.91923	-124.59938	494	95	
SE21200.13	CTD_SBE19	10	10	CR-3	30	7	1135	S	41.91440	-124.50138	134	100	
SE21200.17	CTD_SBE19	11	11	CR-2	30	7	1319	S	41.92265	-124.40132	71	60	
SE21200.21	CTD_SBE19	12	12	CR-1	30	7	1512	S	41.92857	-124.30067	38	28	
SE21300.01	CTD_SBE19	13	13	RR-1	31	7	0556	S	42.51643	-124.50057	37	18	
SE21300.05	CTD_SBE19	14	14	RR-2	31	7	0800	S	42.52085	-124.60212	91	78	
SE21300.09	CTD_SBE19	15	15	RR-3	31	7	0957	S	42.50807	-124.70413	176	88	
SE21300.12	CTD_SBE19	16	16	RR-4	31	7	1146	S	42.51285	-124.80333	640	94	
SE21300.16	CTD_SBE19	17	17	RR-5	31	7	1343	S	42.52433	-124.91147	1280	89	
SE21300.20	CTD_SBE19	18	18	RR-6	31	7	1536	S	42.52482	-124.99415	1737	89	
SE21300.24	CTD_SBE19	19	19	RR-7	31	7	1801	S	42.53703	-125.20240	2432	94	
SE21400.01	CTD_SBE19	20	20	FM-8	1	8	0604	S	43.24152	-125.01605	1774	88	
SE21400.05	CTD_SBE19	21	21	FM-6	1	8	0922	S	43.22547	-124.76013	329	81	
SE21400.07	CTD_SBE19	22	22	FM-5	1	8	1012	S	43.24003	-124.66782	146	82	
SE21400.09	CTD_SBE19	23	23	FM-4	1	8	1054	S	43.23227	-124.58333	91	67	
SE21400.11	CTD_SBE19	24	24	FM-3	1	8	1155	S	43.22485	-124.49977	57	48	
SE21400.15	CTD_SBE19	25	25	FM-1	1	8	1335	S	43.22945	-124.43975	33	26	
SE21500.01	CTD_SBE19	26	26	HH-1	2	8	0609	S	44.01132	-124.19818	53	48	
SE21500.05	CTD_SBE19	27	27	HH-1A	2	8	0850	S	44.01578	-124.30258	91	85	
SE21500.09	CTD_SBE19	28	28	HH-2	2	8	1052	S	44.02110	-124.40087	119	86	
SE21500.13	CTD_SBE19	29	29	HH-3	2	8	1322	S	44.01970	-124.60093	148	92	
SE21500.17	CTD_SBE19	30	30	HH-4	2	8	1548	S	44.02528	-124.80510	102	88	
SE21500.21	CTD_SBE19	31	31	HH-5	2	8	1806	S	44.01053	-125.00353	914	98	
SE21600.01	CTD_SBE19	32	32	NH-25	3	8	0603	S	44.67533	-124.66048	316	90	
SE21600.05	CTD_SBE19	33	33	NH-20	3	8	0817	S	44.67917	-124.52878	144	100	
SE21600.09	CTD_SBE19	34	34	NH-15	3	8	1010	S	44.66928	-124.41073	95	85	
SE21600.13	CTD_SBE19	35	35	NH-10	3	8	1211	S	44.70107	-124.29520	80	72	
SE21600.17	CTD_SBE19	36	36	NH-5	3	8	1402	S	44.68585	-124.16772	62	50	
SE21600.21	CTD_SBE19	37	37	NH-3	3	8	1531	S	44.66760	-124.13050	49	40	
SE21700.01	CTD_SBE19	38	38	NH-5	4	8	0703	S	44.66563	-124.17883	60	50	
SE21700.05	CTD_SBE19	39	39	NH-10	4	8	0905	S	44.70432	-124.29535	80	70	
SE21700.09	CTD_SBE19	40	40	NH-15	4	8	1057	S	44.65997	-124.41435	95	80	
SE21700.13	CTD_SBE19	41	41	NH-20	4	8	1300	S	44.67430	-124.52922	143	100	
SE21700.17	CTD_SBE19	42	42	NH-25	4	8	1453	S	44.67440	-124.65213	311	100	
SE21700.21	CTD_SBE19	43	43	NH-35	4	8	1716	S	44.66868	-124.88557	457	100	
SE21800.01	CTD_SBE19	44	44	BOB-5	5	8	0618	S	44.27260	-124.89842	196	100	
SE21800.05	CTD_SBE19	45	45	BOB-4	5	8	0847	S	44.27535	-124.69778	84	70	
SE21800.09	CTD_SBE19	46	46	BOB-3	5	8	1107	S	44.27865	-124.49872	101	84	
SE21800.13	CTD_SBE19	47	47	BOB-2	5	8	1258	S	44.26507	-124.36925	86	70	
SE21800.17	CTD_SBE19	48	48	BOB-1	5	8	1532	S	44.26582	-124.14163	33	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
SE21800.21	CTD_SBE19	49	49	BOB-1A	5	8	1847	S	44.25337	-124.28797	77	70	
SE21800.25	CTD_SBE19	50	49	BOB-1A	5	8	1958	S	44.24388	-124.22637	64	59	
SE21900.01	CTD_SBE19	51	50	UR-1	6	8	0611	S	43.75353	-124.23823	62	54	
SE21900.05	CTD_SBE19	52	51	UR-3	6	8	0812	S	43.76412	-124.40000	115	98	
SE21900.09	CTD_SBE19	53	52	UR-5	6	8	1016	S	43.76578	-124.56788	208	100	
SE21900.13	CTD_SBE19	54	53	UR-7	6	8	1229	S	43.76292	-124.40205	494	100	
SE21900.17	CTD_SBE19	55	54	UR-8	6	8	1523	S	43.77875	-125.03367	1372	92	
SE21900.21	CTD_SBE19	56	55	UR-10	6	8	1743	S	43.77595	-125.25157	1737	100	
SE21900.25	CTD_SBE19	57	56	NFS-1	6	8	2243	S	43.76850	-125.69617	2926	99	
SE22000.01	CTD_SBE19	58	57	NFS-2	7	8	1331	S	43.77418	-125.99400	3018	90	
SE22000.05	CTD_SBE19	59	57	NFS-2	7	8	1521	S	43.75752	-126.00508	3018	95	
SE22000.06	CTD_SBE19	60	58	NFS-1A	7	8	1600	S	43.78042	-125.91938	3018	95	
SE22000.09	CTD_SBE19	61	59	NFS-3	7	8	1823	S	43.49667	-125.80243	3018	88	
SE22000.13	CTD_SBE19	62	59	NFS-3	7	8	1950	S	43.46553	-125.81618	3018	95	
SE22000.14	CTD_SBE19	63	60	NFS-3	7	8	2207	S	43.52212	-125.80533	3018	96	
SE22000.18	CTD_SBE19	64	60	NFS-3	7	8	2304	S	43.48678	-125.80128	3018	100	
SE22000.19	CTD_SBE19	65	61	NFS-4	7	8	2325	S	43.47553	-125.79318	3018	94	
SE22100.03	CTD_SBE19	66	61	NFS-4	8	8	0313	S	43.31268	-125.50165	3018	94	
SE22100.04	CTD_SBE19	67	62	NFS-5	8	8	0500	S	43.23727	-125.80317	3018	97	
SE22100.07	CTD_SBE19	68	63	NFS-8	8	8	1005	S	42.82990	-125.15253	2012	98	
SE22100.11	CTD_SBE19	69	63	NFS-8	8	8	1127	S	42.77973	-125.14683	2012	100	
SE22100.12	CTD_SBE19	70	64	NFS-9	8	8	1341	S	42.97217	-124.85077	123	98	
SE22100.16	CTD_SBE19	71	64	NFS-9	8	8	1454	S	42.92232	-124.85475	192	100	
SE22100.17	CTD_SBE19	72	65	NFS-10	8	8	1723	S	43.23140	-124.67102	159	100	
SE22100.21	CTD_SBE19	73	65	NFS-10	8	8	1835	S	43.18880	-124.64823	139	94	
SE22200.01	CTD_SBE19	74	66	7A-1	9	8	0705	S	43.10013	-124.46925	37	28	
SE22200.05	CTD_SBE19	75	67	7A-2	9	8	0859	S	43.09452	-124.60157	117	100	
SE22200.09	CTD_SBE19	76	68	7A-3	9	8	1115	S	43.09783	-124.79968	249	100	
SE22200.13	CTD_SBE19	77	69	8-3	9	8	1255	S	42.98952	-124.81578	119	100	
SE22200.17	CTD_SBE19	78	70	8-2	9	8	1506	S	42.96448	-124.62727	101	90	
SE22200.21	CTD_SBE19	79	71	8-1	9	8	1700	S	42.96443	-124.50995	38	30	
SE22200.25	CTD_SBE19	80	71	8-1	9	8	1809	S	42.92665	-124.52043	26	22	
SE22300.01	CTD_SBE19	81	72	8A-1	10	8	0632	S	42.83210	-124.63067	51	40	
SE22300.05	CTD_SBE19	82	73	8A-2	10	8	0816	S	42.84475	-124.70190	124	100	
SE22300.09	CTD_SBE19	83	74	8B-2	10	8	0945	S	42.76807	-124.70347	163	100	
SE22300.13	CTD_SBE19	84	75	8B-1	10	8	1140	S	42.76152	-124.56897	38	30	
SE22300.17	CTD_SBE19	85	76	9-1	10	8	1320	S	42.70287	-124.49737	40	36	
SE22300.21	CTD_SBE19	86	77	9-3	10	8	1536	S	42.70835	-124.71878	230	98	
SE22300.25	CTD_SBE19	87	78	Birds-1	10	8	1842	S	42.91045	-124.63583	84	80	
SE22500.01	CTD_SBE19	88	79	2-6	12	8	0622	S	44.49917	-124.70130	168	100	
SE22500.05	CTD_SBE19	89	79	2-6	12	8	0732	S	44.45272	-124.70483	146	90	
SE22500.06	CTD_SBE19	90	80	2-5	12	8	0820	S	44.47610	-124.58675	128	100	
SE22500.10	CTD_SBE19	91	80	2-5	12	8	0930	S	44.43182	-124.58243	113	95	
SE22500.11	CTD_SBE19	92	81	2-4	12	8	1040	S	44.48270	-124.39913	57	48	
SE22500.15	CTD_SBE19	93	81	2-4	12	8	1147	S	44.43663	-124.39853	79	30	
SE22500.16	CTD_SBE19	94	82	2-3	12	8	1226	S	44.47765	-124.35913	62	50	
SE22500.20	CTD_SBE19	95	82	2-3	12	8	1336	S	44.42897	-124.36167	73	50	
SE22500.21	CTD_SBE19	96	83	2-2	12	8	1424	S	44.47712	-124.24585	69	58	

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
SE22500.25	CTD_SBE19	97	83	2-2	12	8	1535	S	44.43218	-124.24023	69	50	
SE22500.26	CTD_SBE19	98	84	2-1	12	8	1622	S	44.47592	-124.12973	40	30	
SE22500.30	CTD_SBE19	99	84	2-1	12	8	1720	S	44.44035	-124.13250	42	30	

Table 5: Niskin3m Tows

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21100.03	Niskin3m	1	2	CR-11	29	7	0625	S	41.82757	-126.01307	2926	3	
SE21100.07	Niskin3m	2	3	CR-10	29	7	0944	S	41.93237	-125.67038	2926	3	
SE21100.11	Niskin3m	3	4	CR-9	29	7	1259	S	41.92618	-125.33582	2926	3	
SE21100.15	Niskin3m	4	5	CR-8	29	7	1507	S	41.93098	-125.20168	2560	3	
SE21100.19	Niskin3m	5	6	CR-7	29	7	1732	S	41.92200	-124.99038	914	3	
SE21200.02	Niskin3m	6	7	CR-6	30	7	0611	S	41.92782	-124.81962	786	3	
SE21200.06	Niskin3m	7	8	CR-5	30	7	0804	S	41.92038	-124.70063	695	3	
SE21200.10	Niskin3m	8	9	CR-4	30	7	0952	S	41.91923	-124.59938	494	3	
SE21200.14	Niskin3m	9	10	CR-3	30	7	1135	S	41.91440	-124.50138	134	3	
SE21200.18	Niskin3m	10	11	CR-2	30	7	1319	S	41.92265	-124.40132	71	3	
SE21200.22	Niskin3m	11	12	CR-1	30	7	1512	S	41.92857	-124.30067	38	3	
SE21300.02	Niskin3m	12	13	RR-1	31	7	0556	S	42.51643	-124.50057	37	3	
SE21300.06	Niskin3m	13	14	RR-2	31	7	0800	S	42.52085	-124.60212	91	3	
SE21300.10	Niskin3m	14	15	RR-3	31	7	0957	S	42.50807	-124.70413	176	3	
SE21300.13	Niskin3m	15	16	RR-4	31	7	1146	S	42.51285	-124.80333	640	3	
SE21300.17	Niskin3m	16	17	RR-5	31	7	1343	S	42.52433	-124.91147	1280	3	
SE21300.21	Niskin3m	17	18	RR-6	31	7	1536	S	42.52482	-124.99415	1737	3	
SE21300.25	Niskin3m	18	19	RR-7	31	7	1801	S	42.53703	-125.20240	2432	3	
SE21400.02	Niskin3m	19	20	FM-8	1	8	0604	S	43.24152	-125.01605	1774	3	
SE21400.06	Niskin3m	20	21	FM-6	1	8	0922	S	43.22547	-124.76013	329	3	
SE21400.08	Niskin3m	21	22	FM-5	1	8	1012	S	43.24003	-124.66782	146	3	
SE21400.10	Niskin3m	22	23	FM-4	1	8	1054	S	43.23227	-124.58333	91	30	
SE21400.12	Niskin3m	23	24	FM-3	1	8	1155	S	43.22485	-124.49977	57	3	
SE21400.16	Niskin3m	24	25	FM-1	1	8	1335	S	43.22945	-124.43975	33	3	
SE21500.02	Niskin3m	25	26	HH-1	2	8	0609	S	44.01132	-124.19818	53	3	
SE21500.06	Niskin3m	26	27	HH-1A	2	8	0850	S	44.01578	-124.30258	91	3	
SE21500.10	Niskin3m	27	28	HH-2	2	8	1052	S	44.02110	-124.40087	119	3	
SE21500.14	Niskin3m	28	29	HH-3	2	8	1322	S	44.01970	-124.60093	148	3	
SE21500.18	Niskin3m	29	30	HH-4	2	8	1548	S	44.02528	-124.80510	102	3	
SE21500.22	Niskin3m	30	31	HH-5	2	8	1806	S	44.01053	-125.00353	914	3	
SE21600.02	Niskin3m	31	32	NH-25	3	8	0603	S	44.67533	-124.66048	316	3	
SE21600.06	Niskin3m	32	33	NH-20	3	8	0817	S	44.67917	-124.52878	144	3	
SE21600.10	Niskin3m	33	34	NH-15	3	8	1010	S	44.66928	-124.41073	95	3	
SE21600.14	Niskin3m	34	35	NH-10	3	8	1211	S	44.70107	-124.29520	80	3	
SE21600.18	Niskin3m	35	36	NH-5	3	8	1402	S	44.68585	-124.16772	62	3	
SE21600.22	Niskin3m	36	37	NH-3	3	8	1531	S	44.66760	-124.13050	49	3	
SE21700.02	Niskin3m	37	38	NH-5	4	8	0703	S	44.66563	-124.17883	60	3	
SE21700.06	Niskin3m	38	39	NH-10	4	8	0905	S	44.70432	-124.29535	80	3	
SE21700.10	Niskin3m	39	40	NH-15	4	8	1057	S	44.65997	-124.41435	95	3	
SE21700.14	Niskin3m	40	41	NH-20	4	8	1300	S	44.67430	-124.52922	143	3	
SE21700.18	Niskin3m	41	42	NH-25	4	8	1453	S	44.67440	-124.65213	311	3	
SE21700.22	Niskin3m	42	43	NH-35	4	8	1716	S	44.66868	-124.88557	457	3	
SE21800.02	Niskin3m	43	44	BOB-5	5	8	0618	S	44.27260	-124.89842	196	3	
SE21800.06	Niskin3m	44	45	BOB-4	5	8	0847	S	44.27535	-124.69778	84	3	
SE21800.10	Niskin3m	45	46	BOB-3	5	8	1107	S	44.27865	-124.49872	101	3	
SE21800.14	Niskin3m	46	47	BOB-2	5	8	1258	S	44.26507	-124.36925	86	3	
SE21800.18	Niskin3m	47	48	BOB-1	5	8	1532	S	44.26582	-124.14163	33	3	
SE21800.22	Niskin3m	48	49	BOB-1A	5	8	1847	S	44.25337	-124.28797	77	3	

Table 5: Niskin3m Tows (cont'd)

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21900.02	Niskin3m	49	50	UR-1	6	8	0611	S	43.75353	-124.23823	62	3	
SE21900.06	Niskin3m	50	51	UR-3	6	8	0812	S	43.76412	-124.40000	115	3	
SE21900.10	Niskin3m	51	52	UR-5	6	8	1016	S	43.76578	-124.56788	208	3	
SE21900.14	Niskin3m	52	53	UR-7	6	8	1229	S	43.76292	-124.40205	494	3	
SE21900.18	Niskin3m	53	54	UR-8	6	8	1523	S	43.77875	-125.03367	1372	3	
SE21900.22	Niskin3m	54	55	UR-10	6	8	1743	S	43.77595	-125.25157	1737	3	
SE21900.26	Niskin3m	55	56	NFS-1	6	8	2243	S	43.76850	-125.69617	2926	3	
SE22000.02	Niskin3m	56	57	NFS-2	7	8	1331	S	43.77418	-125.99400	3018	3	
SE22000.07	Niskin3m	57	58	NFS-1A	7	8	1600	S	43.78042	-125.91938	3018	3	
SE22000.10	Niskin3m	58	59	NFS-3	7	8	1823	S	43.49667	-125.80243	3018	3	
SE22000.15	Niskin3m	59	60	NFS-3	7	8	2207	S	43.52212	-125.80533	3018	3	
SE22000.20	Niskin3m	60	61	NFS-4	7	8	2325	S	43.47553	-125.79318	3018	3	
SE22100.05	Niskin3m	61	62	NFS-5	8	8	0500	S	43.23727	-125.80317	3018	3	
SE22100.08	Niskin3m	62	63	NFS-8	8	8	1005	S	42.82990	-125.15253	2012	3	
SE22100.13	Niskin3m	63	64	NFS-9	8	8	1341	S	42.97217	-124.85077	123	3	
SE22100.18	Niskin3m	64	65	NFS-10	8	8	1723	S	43.23140	-124.67102	159	3	
SE22200.02	Niskin3m	65	66	7A-1	9	8	0705	S	43.10013	-124.46925	37	3	
SE22200.06	Niskin3m	66	67	7A-2	9	8	0859	S	43.09452	-124.60157	117	3	
SE22200.10	Niskin3m	67	68	7A-3	9	8	1115	S	43.09783	-124.79968	249	3	
SE22200.14	Niskin3m	68	69	8-3	9	8	1255	S	42.98952	-124.81578	119	3	
SE22200.18	Niskin3m	69	70	8-2	9	8	1506	S	42.96448	-124.62727	101	3	
SE22200.22	Niskin3m	70	71	8-1	9	8	1700	S	42.96443	-124.50995	38	3	
SE22300.02	Niskin3m	71	72	8A-1	10	8	0632	S	42.83210	-124.63067	51	3	
SE22300.06	Niskin3m	72	73	8A-2	10	8	0816	S	42.84475	-124.70190	124	3	
SE22300.10	Niskin3m	73	74	8B-2	10	8	0945	S	42.76807	-124.70347	163	3	
SE22300.14	Niskin3m	74	75	8B-1	10	8	1140	S	42.76152	-124.56897	38	3	
SE22300.18	Niskin3m	75	76	9-1	10	8	1320	S	42.70287	-124.49737	40	3	
SE22300.22	Niskin3m	76	77	9-3	10	8	1536	S	42.70835	-124.71878	230	3	
SE22300.26	Niskin3m	77	78	Birds-1	10	8	1842	S	42.91045	-124.63583	84	3	
SE22500.02	Niskin3m	78	79	2-6	12	8	0622	S	44.49917	-124.70130	168	3	
SE22500.07	Niskin3m	79	80	2-5	12	8	0820	S	44.47610	-124.58675	128	3	
SE22500.12	Niskin3m	80	81	2-4	12	8	1040	S	44.48270	-124.39913	57	3	
SE22500.17	Niskin3m	81	82	2-3	12	8	1226	S	44.47765	-124.35913	62	3	
SE22500.22	Niskin3m	82	83	2-2	12	8	1424	S	44.47712	-124.24585	69	3	
SE22500.27	Niskin3m	83	84	2-1	12	8	1622	S	44.47592	-124.12973	40	3	

Table 6: Neuston Tows

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21000.01	Neuston	1	1	NT-1	28	7	2330	S	42.43958	-125.45483	2743	0	
SE21100.04	Neuston	2	2	CR-11	29	7	0635	S	41.82492	-126.01253	2926	0	
SE21100.08	Neuston	3	3	CR-10	29	7	0951	S	41.92728	-125.67017	2926	0	
SE21100.12	Neuston	4	4	CR-9	29	7	1304	S	41.92822	-125.33615	2926	0	
SE21100.16	Neuston	5	5	CR-8	29	7	1516	S	41.93083	-125.19747	2560	0	
SE21100.20	Neuston	6	6	CR-7	29	7	1740	S	41.92262	-124.98945	914	0	
SE21200.03	Neuston	7	7	CR-6	30	7	0618	S	41.92467	-124.81998	786	0	
SE21200.07	Neuston	8	8	CR-5	30	7	0813	S	41.91957	-124.70057	695	0	
SE21200.11	Neuston	9	9	CR-4	30	7	1000	S	41.91905	-124.59935	494	0	
SE21200.15	Neuston	10	10	CR-3	30	7	1142	S	41.91498	-124.49877	130	0	
SE21200.19	Neuston	11	11	CR-2	30	7	1324	S	41.92317	-124.40183	71	0	
SE21200.23	Neuston	12	12	CR-1	30	7	1515	S	41.92992	-124.30087	38	0	
SE21300.03	Neuston	13	13	RR-1	31	7	0600	S	42.51507	-124.50123	37	0	
SE21300.07	Neuston	14	14	RR-2	31	7	0804	S	42.51947	-124.60250	91	0	
SE21300.14	Neuston	15	16	RR-4	31	7	1154	S	42.51187	-124.80298	640	0	
SE21300.18	Neuston	16	17	RR-5	31	7	1351	S	42.52327	-124.90962	1280	0	
SE21300.22	Neuston	17	18	RR-6	31	7	1545	S	42.52305	-124.99173	1737	0	
SE21300.26	Neuston	18	19	RR-7	31	7	1810	S	42.53593	-125.20267	2432	0	
SE21400.03	Neuston	19	20	FM-8	1	8	0611	S	43.24017	-125.00193	1774	0	
SE21400.13	Neuston	20	24	FM-3	1	8	1202	S	43.22485	-124.49977	59	0	
SE21400.17	Neuston	21	25	FM-1	1	8	1339	S	43.22728	-124.44007	31	0	
SE21500.03	Neuston	22	26	HH-1	2	8	0620	S	44.00633	-124.20002	51	0	
SE21500.07	Neuston	23	27	HH-1A	2	8	0857	S	44.01400	-124.30392	91	0	
SE21500.11	Neuston	24	28	HH-2	2	8	1100	S	44.01945	-124.40117	119	0	
SE21500.15	Neuston	25	29	HH-3	2	8	1330	S	44.01903	-124.60045	148	0	
SE21500.19	Neuston	26	30	HH-4	2	8	1600	S	44.02475	-124.80160	106	0	
SE21500.23	Neuston	27	31	HH-5	2	8	1815	S	44.01045	-125.00103	914	0	
SE21600.03	Neuston	28	32	NH-25	3	8	0611	S	44.67202	-124.66172	315	0	
SE21600.07	Neuston	29	33	NH-20	3	8	0825	S	44.67773	-124.53040	146	0	
SE21600.11	Neuston	30	34	NH-15	3	8	1017	S	44.66757	-124.41228	97	0	
SE21600.15	Neuston	31	35	NH-10	3	8	1218	S	44.70080	-124.29547	80	0	
SE21600.19	Neuston	32	36	NH-5	3	8	1407	S	44.68618	-124.16858	60	0	
SE21600.23	Neuston	33	37	NH-3	3	8	1535	S	44.66738	-124.12985	49	0	
SE21700.03	Neuston	34	38	NH-5	4	8	0710	S	44.66700	-124.17883	60	0	
SE21700.07	Neuston	35	39	NH-10	4	8	0911	S	44.70465	-124.29743	80	0	
SE21700.11	Neuston	36	40	NH-15	4	8	1104	S	44.65833	-124.41163	97	0	
SE21700.15	Neuston	37	41	NH-20	4	8	1308	S	44.67567	-124.52895	143	0	
SE21700.19	Neuston	38	42	NH-25	4	8	1501	S	44.67332	-124.65305	311	0	
SE21700.23	Neuston	39	43	NH-35	4	8	1725	S	44.66913	-124.88837	494	0	
SE21800.03	Neuston	40	44	BOB-5	5	8	0627	S	44.27203	-124.90018	199	0	
SE21800.07	Neuston	41	45	BOB-4	5	8	0852	S	44.27480	-124.69830	86	0	
SE21800.11	Neuston	42	46	BOB-3	5	8	1115	S	44.27662	-124.49745	102	0	
SE21800.15	Neuston	43	47	BOB-2	5	8	1304	S	44.26595	-124.37048	86	0	
SE21800.09	Neuston	44	48	BOB-1	5	8	1536	S	44.26730	-124.14120	33	0	
SE21800.23	Neuston	45	49	BOB-1A	5	8	1852	S	44.25337	-124.28600	77	0	
SE21900.03	Neuston	46	50	UR-1	6	8	0616	S	43.75258	-124.23880	62	0	
SE21900.07	Neuston	47	51	UR-3	6	8	0821	S	43.76387	-124.40198	117	0	
SE21900.11	Neuston	48	52	UR-5	6	8	1025	S	43.76648	-124.56862	208	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
SE21900.15	Neuston	49	53	UR-7	6	8	1237	S	43.76172	-124.73627	494	0	
SE21900.19	Neuston	50	54	UR-8	6	8	1530	S	43.77762	-125.03382	1372	0	
SE21900.23	Neuston	51	55	UR-10	6	8	1750	S	43.77550	-125.25083	1737	0	
SE21900.27	Neuston	52	56	NFS-1	6	8	2248	S	43.76802	-125.69707	2926	0	
SE22000.03	Neuston	53	57	NFS-2	7	8	1343	S	43.77358	-125.99457	3018	0	
SE22000.08	Neuston	54	58	NFS-1A	7	8	1614	S	43.78082	-125.91485	3018	0	
SE22000.11	Neuston	55	59	NFS-3	7	8	1835	S	43.49518	-125.80567	3018	0	
SE22000.16	Neuston	56	60	NFS-3	7	8	2217	S	43.52212	-125.80667	3018	0	
SE22100.01	Neuston	57	61	NFS-4	8	8	0140	S	43.35143	-125.50640	3018	0	
SE22100.06	Neuston	58	62	NFS-5	8	8	0500	S	43.23727	-125.80317	3018	0	
SE22100.09	Neuston	59	63	NFS-8	8	8	1013	S	42.82932	-125.15363	2012	0	
SE22100.14	Neuston	60	64	NFS-9	8	8	1350	S	42.97258	-124.84972	123	0	
SE22100.19	Neuston	61	65	NFS-10	8	8	1735	S	43.22813	-124.66483	148	0	
SE22200.03	Neuston	62	66	7A-1	9	8	0710	S	43.10047	-124.46945	37	0	
SE22200.07	Neuston	63	67	7A-2	9	8	0908	S	43.09387	-124.60227	117	0	
SE22200.11	Neuston	64	68	7A-3	9	8	1121	S	43.09840	-124.80043	249	0	
SE22200.15	Neuston	65	69	8-3	9	8	1303	S	42.99000	-124.81712	123	0	
SE22200.19	Neuston	66	70	8-2	9	8	1514	S	42.96198	-124.62742	99	0	
SE22200.23	Neuston	67	71	8-1	9	8	1705	S	42.96848	-124.50957	42	0	
SE22300.03	Neuston	68	72	8A-1	10	8	0635	S	42.83218	-124.63150	51	0	
SE22300.07	Neuston	69	73	8A-2	10	8	0824	S	42.84467	-124.70232	126	0	
SE22300.11	Neuston	70	74	8B-2	10	8	0952	S	42.76798	-124.70385	165	0	
SE22300.15	Neuston	71	75	8B-1	10	8	1143	S	42.76110	-124.56858	38	0	
SE22300.19	Neuston	72	76	9-1	10	8	1325	S	42.70300	-124.49550	42	0	
SE22300.23	Neuston	73	77	9-3	10	8	1541	S	42.70835	-124.71878	230	0	
SE22300.27	Neuston	74	78	Birds-1	10	8	1847	S	42.91340	-124.63613	84	0	
SE22500.03	Neuston	75	79	2-6	12	8	0629	S	44.49788	-124.70153	168	0	
SE22500.08	Neuston	76	80	2-5	12	8	0827	S	44.47535	-124.58708	130	0	
SE22500.13	Neuston	77	81	2-4	12	8	1045	S	44.48258	-124.40042	55	0	
SE22500.18	Neuston	78	82	2-3	12	8	1230	S	44.47770	-124.36057	60	0	
SE22500.23	Neuston	79	83	2-2	12	8	1429	S	44.47653	-124.24728	69	0	
SE22500.28	Neuston	80	84	2-1	12	8	1625	S	44.47593	-124.13082	40	0	

APPENDIX I

SE0007 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 0.333 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

Sequence # for stations occupied

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
SE21000.01	Neuston	1	1	NT-1	28	7	2330	S	42.43958	-125.45483	2743	0	
SE21000.02	CTD_SBE19	1	1	NT-1	28	7	2345	S	42.43883	-125.45382	2743	90	
SE21100.01	Trawl	1	1	NT-1	29	7	0006	S	42.42200	-125.44800	2743	18	
SE21100.01	Trawl	1	1	NT-1	29	7	0055	E	42.36432	-125.43427	2743	18	
SE21100.02	CTD_SBE19	2	2	CR-11	29	7	0625	S	41.82757	-126.01307	2926	100	
SE21100.03	Niskin3m	1	2	CR-11	29	7	0625	S	41.82757	-126.01307	2926	3	
SE21100.04	Neuston	2	2	CR-11	29	7	0635	S	41.82492	-126.01253	2926	0	
SE21100.05	Trawl	2	2	CR-11	29	7	0653	S	41.81887	-126.00695	2926	18	
SE21100.05	Trawl	2	2	CR-11	29	7	0723	E	41.79178	-126.00630	2926	18	
SE21100.06	CTD_SBE19	3	3	CR-10	29	7	0944	S	41.93237	-125.67038	2926	100	
SE21100.07	Niskin3m	2	3	CR-10	29	7	0944	S	41.93237	-125.67038	2926	3	
SE21100.08	Neuston	3	3	CR-10	29	7	0951	S	41.92728	-125.67017	2926	0	
SE21100.09	Trawl	3	3	CR-10	29	7	1009	S	41.91318	-125.67332	2926	18	
SE21100.09	Trawl	3	3	CR-10	29	7	1039	E	41.87845	-125.67585	2926	18	
SE21100.10	CTD_SBE19	4	4	CR-9	29	7	1259	S	41.92618	-125.33582	2926	100	
SE21100.11	Niskin3m	3	4	CR-9	29	7	1259	S	41.92618	-125.33582	2926	3	
SE21100.12	Neuston	4	4	CR-9	29	7	1304	S	41.92822	-125.33615	2926	0	
SE21100.13	Trawl	4	4	CR-9	29	7	1326	S	41.90427	-124.60123	2926	18	
SE21100.13	Trawl	4	4	CR-9	29	7	1356	E	41.88515	-125.34195	2926	18	
SE21100.14	CTD_SBE19	5	5	CR-8	29	7	1507	S	41.93098	-125.20168	2560	96	
SE21100.15	Niskin3m	4	5	CR-8	29	7	1507	S	41.93098	-125.20168	2560	3	
SE21100.16	Neuston	5	5	CR-8	29	7	1516	S	41.93083	-125.19747	2560	0	
SE21100.17	Trawl	5	5	CR-8	29	7	1533	S	41.92173	-125.19780	2560	18	
SE21100.17	Trawl	5	5	CR-8	29	7	1603	E	41.89753	-125.19602	2560	18	
SE21100.18	CTD_SBE19	6	6	CR-7	29	7	1732	S	41.92200	-124.99038	914	92	
SE21100.19	Niskin3m	5	6	CR-7	29	7	1732	S	41.92200	-124.99038	914	3	
SE21100.20	Neuston	6	6	CR-7	29	7	1740	S	41.92262	-124.98945	914	0	
SE21100.21	Trawl	6	6	CR-7	29	7	1752	S	41.91170	-124.98835	914	18	
SE21100.21	Trawl	6	6	CR-7	29	7	1822	E	41.88560	-124.98808	914	18	
SE21200.01	CTD_SBE19	7	7	CR-6	30	7	0611	S	41.92782	-124.81962	786	91	
SE21200.02	Niskin3m	6	7	CR-6	30	7	0611	S	41.92782	-124.81962	786	3	
SE21200.03	Neuston	7	7	CR-6	30	7	0618	S	41.92467	-124.81998	786	0	
SE21200.04	Trawl	7	7	CR-6	30	7	0635	S	41.91288	-124.82067	786	18	
SE21200.04	Trawl	7	7	CR-6	30	7	0705	E	41.88578	-124.81950	786	18	
SE21200.05	CTD_SBE19	8	8	CR-5	30	7	0804	S	41.92038	-124.70063	695	96	
SE21200.06	Niskin3m	7	8	CR-5	30	7	0804	S	41.92038	-124.70063	695	3	
SE21200.07	Neuston	8	8	CR-5	30	7	0813	S	41.91957	-124.70057	695	0	
SE21200.08	Trawl	8	8	CR-5	30	7	0830	S	41.90743	-124.70028	695	18	
SE21200.08	Trawl	8	8	CR-5	30	7	0900	E	41.88000	-124.69950	695	18	
SE21200.09	CTD_SBE19	9	9	CR-4	30	7	0952	S	41.91923	-124.59938	494	95	
SE21200.10	Niskin3m	8	9	CR-4	30	7	0952	S	41.91923	-124.59938	494	3	
SE21200.11	Neuston	9	9	CR-4	30	7	1000	S	41.91905	-124.59935	494	0	
SE21200.12	Trawl	9	9	CR-4	30	7	1019	S	41.90877	-124.59615	494	18	
SE21200.12	Trawl	9	9	CR-4	30	7	1049	E	41.88375	-124.59483	530	18	
SE21200.13	CTD_SBE19	10	10	CR-3	30	7	1135	S	41.91440	-124.50138	134	100	
SE21200.14	Niskin3m	9	10	CR-3	30	7	1135	S	41.91440	-124.50138	134	3	
SE21200.15	Neuston	10	10	CR-3	30	7	1142	S	41.91498	-124.49877	130	0	
SE21200.16	Trawl	10	10	CR-3	30	7	1159	S	41.90280	-124.50047	137	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21200.16	Trawl	10	10	CR-3	30	7	1229	E	41.87603	-124.49695	148	18	
SE21200.17	CTD_SBE19	11	11	CR-2	30	7	1319	S	41.92265	-124.40132	71	60	
SE21200.18	Niskin3m	10	11	CR-2	30	7	1319	S	41.92265	-124.40132	71	3	
SE21200.19	Neuston	11	11	CR-2	30	7	1324	S	41.92317	-124.40183	71	0	
SE21200.20	Trawl	11	11	CR-2	30	7	1342	S	41.91258	-124.40278	71	18	
SE21200.20	Trawl	11	11	CR-2	30	7	1412	E	41.88483	-124.40315	68	18	
SE21200.21	CTD_SBE19	12	12	CR-1	30	7	1512	S	41.92857	-124.30067	38	28	
SE21200.22	Niskin3m	11	12	CR-1	30	7	1512	S	41.92857	-124.30067	38	3	
SE21200.23	Neuston	12	12	CR-1	30	7	1515	S	41.92992	-124.30087	38	0	
SE21200.24	Trawl	12	12	CR-1	30	7	1534	S	41.91727	-124.29870	38	18	
SE21200.24	Trawl	12	12	CR-1	30	7	1604	E	41.89273	-124.29345	37	18	
SE21300.01	CTD_SBE19	13	13	RR-1	31	7	0556	S	42.51643	-124.50057	37	18	
SE21300.02	Niskin3m	12	13	RR-1	31	7	0556	S	42.51643	-124.50057	37	3	
SE21300.03	Neuston	13	13	RR-1	31	7	0600	S	42.51507	-124.50123	37	0	
SE21300.04	Trawl	13	13	RR-1	31	7	0628	S	42.52220	-124.49970	37	18	
SE21300.04	Trawl	13	13	RR-1	31	7	0658	E	42.49088	-124.49817	33	18	
SE21300.05	CTD_SBE19	14	14	RR-2	31	7	0800	S	42.52085	-124.60212	91	78	
SE21300.06	Niskin3m	13	14	RR-2	31	7	0800	S	42.52085	-124.60212	91	3	
SE21300.07	Neuston	14	14	RR-2	31	7	0804	S	42.51947	-124.60250	91	0	
SE21300.08	Trawl	14	14	RR-2	31	7	0829	S	42.50517	-124.59787	84	18	
SE21300.08	Trawl	14	14	RR-2	31	7	0859	E	42.47178	-124.59747	86	18	
SE21300.09	CTD_SBE19	15	15	RR-3	31	7	0957	S	42.50807	-124.70413	176	88	
SE21300.10	Niskin3m	14	15	RR-3	31	7	0957	S	42.50807	-124.70413	176	3	
SE21300.11	Trawl	15	15	RR-3	31	7	1016	S	42.49427	-124.70407	123	18	
SE21300.11	Trawl	15	15	RR-3	31	7	1046	E	42.46422	-124.70247	121	18	
SE21300.12	CTD_SBE19	16	16	RR-4	31	7	1146	S	42.51285	-124.80333	640	94	
SE21300.13	Niskin3m	15	16	RR-4	31	7	1146	S	42.51285	-124.80333	640	3	
SE21300.14	Neuston	15	16	RR-4	31	7	1154	S	42.51187	-124.80298	640	0	
SE21300.15	Trawl	16	16	RR-4	31	7	1212	S	42.50345	-124.79578	604	18	
SE21300.15	Trawl	16	16	RR-4	31	7	1242	E	42.47520	-124.79270	238	18	
SE21300.16	CTD_SBE19	17	17	RR-5	31	7	1343	S	42.52433	-124.91147	1280	89	
SE21300.17	Niskin3m	16	17	RR-5	31	7	1343	S	42.52433	-124.91147	1280	3	
SE21300.18	Neuston	16	17	RR-5	31	7	1351	S	42.52327	-124.90962	1280	0	
SE21300.19	Trawl	17	17	RR-5	31	7	1409	S	42.51387	-124.89602	1097	18	
SE21300.19	Trawl	17	17	RR-5	31	7	1439	E	42.48808	-124.89005	1097	18	
SE21300.20	CTD_SBE19	18	18	RR-6	31	7	1536	S	42.52482	-124.99415	1737	89	
SE21300.21	Niskin3m	17	18	RR-6	31	7	1536	S	42.52482	-124.99415	1737	3	
SE21300.22	Neuston	17	18	RR-6	31	7	1545	S	42.52305	-124.99173	1737	0	
SE21300.23	Trawl	18	18	RR-6	31	7	1607	S	42.51667	-125.00105	1792	18	
SE21300.23	Trawl	18	18	RR-6	31	7	1637	E	42.49063	-124.99985	1792	18	
SE21300.24	CTD_SBE19	19	19	RR-7	31	7	1801	S	42.53703	-125.20240	2432	94	
SE21300.25	Niskin3m	18	19	RR-7	31	7	1801	S	42.53703	-125.20240	2432	3	
SE21300.26	Neuston	18	19	RR-7	31	7	1810	S	42.53593	-125.20267	2432	0	
SE21300.27	Trawl	19	19	RR-7	31	7	1830	S	42.52755	-125.20073	2432	18	
SE21300.27	Trawl	19	19	RR-7	31	7	1901	E	42.49843	-125.20025	2743	18	
SE21400.01	CTD_SBE19	20	20	FM-8	1	8	0604	S	43.24152	-125.01605	1774	88	
SE21400.02	Niskin3m	19	20	FM-8	1	8	0604	S	43.24152	-125.01605	1774	3	
SE21400.03	Neuston	19	20	FM-8	1	8	0611	S	43.24017	-125.00193	1774	0	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21400.04	Trawl	20	20	FM-8	1	8	0627	S	43.22858	-125.02352	1774	18	
SE21400.04	Trawl	20	20	FM-8	1	8	0657	E	43.20067	-125.02945	1774	18	
SE21400.05	CTD_SBE19	21	21	FM-6	1	8	0922	S	43.22547	-124.76013	329	81	
SE21400.06	Niskin3m	20	21	FM-6	1	8	0922	S	43.22547	-124.76013	329	3	
SE21400.07	CTD_SBE19	22	22	FM-5	1	8	1012	S	43.24003	-124.66782	146	82	
SE21400.08	Niskin3m	21	22	FM-5	1	8	1012	S	43.24003	-124.66782	146	3	
SE21400.09	CTD_SBE19	23	23	FM-4	1	8	1054	S	43.23227	-124.58333	91	67	
SE21400.10	Niskin3m	22	23	FM-4	1	8	1054	S	43.23227	-124.58333	91	30	
SE21400.11	CTD_SBE19	24	24	FM-3	1	8	1155	S	43.22485	-124.49977	57	48	
SE21400.12	Niskin3m	23	24	FM-3	1	8	1155	S	43.22485	-124.49977	57	3	
SE21400.13	Neuston	20	24	FM-3	1	8	1202	S	43.22485	-124.49977	59	0	
SE21400.14	Trawl	21	24	FM-3	1	8	1232	S	43.19982	-124.50422	66	18	
SE21400.14	Trawl	21	24	FM-3	1	8	1248	E	43.18558	-124.50678	64	18	
SE21400.15	CTD_SBE19	25	25	FM-1	1	8	1335	S	43.22945	-124.43975	33	26	
SE21400.16	Niskin3m	24	25	FM-1	1	8	1335	S	43.22945	-124.43975	33	3	
SE21400.17	Neuston	21	25	FM-1	1	8	1339	S	43.22728	-124.44007	31	0	
SE21400.18	Trawl	22	25	FM-1	1	8	1359	S	43.21422	-124.44528	44	18	
SE21400.18	Trawl	22	25	FM-1	1	8	1429	E	43.18890	-124.45078	44	18	
SE21500.01	CTD_SBE19	26	26	HH-1	2	8	0609	S	44.01132	-124.19818	53	48	
SE21500.02	Niskin3m	25	26	HH-1	2	8	0609	S	44.01132	-124.19818	53	3	
SE21500.03	Neuston	22	26	HH-1	2	8	0620	S	44.00633	-124.20002	51	0	
SE21500.04	Trawl	23	26	HH-1	2	8	0704	S	43.97813	-124.20428	51	18	
SE21500.04	Trawl	23	26	HH-1	2	8	0734	E	43.94352	-124.20912	55	18	
SE21500.05	CTD_SBE19	27	27	HH-1A	2	8	0850	S	44.01578	-124.30258	91	85	
SE21500.06	Niskin3m	26	27	HH-1A	2	8	0850	S	44.01578	-124.30258	91	3	
SE21500.07	Neuston	23	27	HH-1A	2	8	0857	S	44.01400	-124.30392	91	0	
SE21500.08	Trawl	24	27	HH-1A	2	8	0917	S	44.00567	-124.29457	90	18	
SE21500.08	Trawl	24	27	HH-1A	2	8	0947	E	43.97852	-124.28542	90	18	
SE21500.09	CTD_SBE19	28	28	HH-2	2	8	1052	S	44.02110	-124.40087	119	86	
SE21500.10	Niskin3m	27	28	HH-2	2	8	1052	S	44.02110	-124.40087	119	3	
SE21500.11	Neuston	24	28	HH-2	2	8	1100	S	44.01945	-124.40117	119	0	
SE21500.12	Trawl	25	28	HH-2	2	8	1117	S	44.01060	-124.39597	119	18	
SE21500.12	Trawl	25	28	HH-2	2	8	1147	E	43.98430	-124.39723	121	18	
SE21500.13	CTD_SBE19	29	29	HH-3	2	8	1322	S	44.01970	-124.60093	148	92	
SE21500.14	Niskin3m	28	29	HH-3	2	8	1322	S	44.01970	-124.60093	148	3	
SE21500.15	Neuston	25	29	HH-3	2	8	1330	S	44.01903	-124.60045	148	0	
SE21500.16	Trawl	26	29	HH-3	2	8	1349	S	44.00735	-124.59693	154	18	
SE21500.16	Trawl	26	29	HH-3	2	8	1419	E	44.00000	-124.60000	166	18	
SE21500.17	CTD_SBE19	30	30	HH-4	2	8	1548	S	44.02528	-124.80510	102	88	
SE21500.18	Niskin3m	29	30	HH-4	2	8	1548	S	44.02528	-124.80510	102	3	
SE21500.19	Neuston	26	30	HH-4	2	8	1600	S	44.02475	-124.80160	106	0	
SE21500.20	Trawl	27	30	HH-4	2	8	1612	S	44.01373	-124.80098	108	18	
SE21500.20	Trawl	27	30	HH-4	2	8	1642	E	43.98657	-124.80472	115	18	
SE21500.21	CTD_SBE19	31	31	HH-5	2	8	1806	S	44.01053	-125.00353	914	98	
SE21500.22	Niskin3m	30	31	HH-5	2	8	1806	S	44.01053	-125.00353	914	3	
SE21500.23	Neuston	27	31	HH-5	2	8	1815	S	44.01045	-125.00103	914	0	
SE21500.24	Trawl	28	31	HH-5	2	8	1831	S	43.99862	-125.00028	914	18	
SE21500.24	Trawl	28	31	HH-5	2	8	1901	E	43.97133	-124.99930	914	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21600.01	CTD_SBE19	32	32	NH-25	3	8	0603	S	44.67533	-124.66048	316	90	
SE21600.02	Niskin3m	31	32	NH-25	3	8	0603	S	44.67533	-124.66048	316	3	
SE21600.03	Neuston	28	32	NH-25	3	8	0611	S	44.67202	-124.66172	315	0	
SE21600.04	Trawl	29	32	NH-25	3	8	0629	S	44.65937	-124.66825	278	18	
SE21600.04	Trawl	29	32	NH-25	3	8	0659	E	44.62992	-124.67225	263	18	
SE21600.05	CTD_SBE19	33	33	NH-20	3	8	0817	S	44.67917	-124.52878	144	100	
SE21600.06	Niskin3m	32	33	NH-20	3	8	0817	S	44.67917	-124.52878	144	3	
SE21600.07	Neuston	29	33	NH-20	3	8	0825	S	44.67773	-124.53040	146	0	
SE21600.08	Trawl	30	33	NH-20	3	8	0846	S	44.67443	-124.52745	139	18	
SE21600.08	Trawl	30	33	NH-20	3	8	0916	E	44.64562	-124.52462	137	18	
SE21600.09	CTD_SBE19	34	34	NH-15	3	8	1010	S	44.66928	-124.41073	95	85	
SE21600.10	Niskin3m	33	34	NH-15	3	8	1010	S	44.66928	-124.41073	95	3	
SE21600.11	Neuston	30	34	NH-15	3	8	1017	S	44.66757	-124.41228	97	0	
SE21600.12	Trawl	31	34	NH-15	3	8	1034	S	44.65542	-124.41187	97	18	
SE21600.12	Trawl	31	34	NH-15	3	8	1104	E	44.62583	-124.41015	64	18	
SE21600.13	CTD_SBE19	35	35	NH-10	3	8	1211	S	44.70107	-124.29520	80	72	
SE21600.14	Niskin3m	34	35	NH-10	3	8	1211	S	44.70107	-124.29520	80	3	
SE21600.15	Neuston	31	35	NH-10	3	8	1218	S	44.70080	-124.29547	80	0	
SE21600.16	Trawl	32	35	NH-10	3	8	1235	S	44.68722	-124.29690	79	18	
SE21600.16	Trawl	32	35	NH-10	3	8	1305	E	44.66010	-124.29435	82	18	
SE21600.17	CTD_SBE19	36	36	NH-5	3	8	1402	S	44.68585	-124.16772	62	50	
SE21600.18	Niskin3m	35	36	NH-5	3	8	1402	S	44.68585	-124.16772	62	3	
SE21600.19	Neuston	32	36	NH-5	3	8	1407	S	44.68618	-124.16858	60	0	
SE21600.20	Trawl	33	36	NH-5	3	8	1424	S	44.67553	-124.16842	60	18	
SE21600.20	Trawl	33	36	NH-5	3	8	1454	E	44.64902	-124.17547	59	18	
SE21600.21	CTD_SBE19	37	37	NH-3	3	8	1531	S	44.66760	-124.13050	49	40	
SE21600.22	Niskin3m	36	37	NH-3	3	8	1531	S	44.66760	-124.13050	49	3	
SE21600.23	Neuston	33	37	NH-3	3	8	1535	S	44.66738	-124.12985	49	0	
SE21600.24	Trawl	34	37	NH-3	3	8	1555	S	44.65627	-124.12813	48	18	
SE21600.24	Trawl	34	37	NH-3	3	8	1625	E	44.63137	-124.13015	48	18	
SE21700.01	CTD_SBE19	38	38	NH-5	4	8	0703	S	44.66563	-124.17883	60	50	
SE21700.02	Niskin3m	37	38	NH-5	4	8	0703	S	44.66563	-124.17883	60	3	
SE21700.03	Neuston	34	38	NH-5	4	8	0710	S	44.66700	-124.17883	60	0	
SE21700.04	Trawl	35	38	NH-5	4	8	0759	S	44.65848	-124.18190	60	18	
SE21700.04	Trawl	35	38	NH-5	4	8	0759	E	44.63330	-124.18102	53	18	
SE21700.05	CTD_SBE19	39	39	NH-10	4	8	0905	S	44.70432	-124.29535	80	70	
SE21700.06	Niskin3m	38	39	NH-10	4	8	0905	S	44.70432	-124.29535	80	3	
SE21700.07	Neuston	35	39	NH-10	4	8	0911	S	44.70465	-124.29743	80	0	
SE21700.08	Trawl	36	39	NH-10	4	8	0933	S	44.69202	-124.29665	80	18	
SE21700.08	Trawl	36	39	NH-10	4	8	1003	E	44.66275	-124.28983	77	18	
SE21700.09	CTD_SBE19	40	40	NH-15	4	8	1057	S	44.65997	-124.41435	95	80	
SE21700.10	Niskin3m	39	40	NH-15	4	8	1057	S	44.65997	-124.41435	95	3	
SE21700.11	Neuston	36	40	NH-15	4	8	1104	S	44.65833	-124.41163	97	0	
SE21700.12	Trawl	37	40	NH-15	4	8	1127	S	44.64070	-124.41597	71	18	
SE21700.12	Trawl	37	40	NH-15	4	8	1157	E	44.61327	-124.41183	55	18	
SE21700.13	CTD_SBE19	41	41	NH-20	4	8	1300	S	44.67430	-124.52922	143	100	
SE21700.14	Niskin3m	40	41	NH-20	4	8	1300	S	44.67430	-124.52922	143	3	
SE21700.15	Neuston	37	41	NH-20	4	8	1308	S	44.67567	-124.52895	143	0	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21700.16	Trawl	38	41	NH-20	4	8	1325	S	44.67023	-124.52220	135	18	
SE21700.16	Trawl	38	41	NH-20	4	8	1355	E	44.64233	-124.52427	139	18	
SE21700.17	CTD_SBE19	42	42	NH-25	4	8	1453	S	44.67440	-124.65213	311	100	
SE21700.18	Niskin3m	41	42	NH-25	4	8	1453	S	44.67440	-124.65213	311	3	
SE21700.19	Neuston	38	42	NH-25	4	8	1501	S	44.67332	-124.65305	311	0	
SE21700.20	Trawl	39	42	NH-25	4	8	1519	S	44.66457	-124.65298	309	18	
SE21700.20	Trawl	39	42	NH-25	4	8	1549	E	44.63608	-124.65127	278	18	
SE21700.21	CTD_SBE19	43	43	NH-35	4	8	1716	S	44.66868	-124.88557	457	100	
SE21700.22	Niskin3m	42	43	NH-35	4	8	1716	S	44.66868	-124.88557	457	3	
SE21700.23	Neuston	39	43	NH-35	4	8	1725	S	44.66913	-124.88837	494	0	
SE21700.24	Trawl	40	43	NH-35	4	8	1743	S	44.66405	-124.88543	494	18	
SE21700.24	Trawl	40	43	NH-35	4	8	1813	E	44.63555	-124.88405	530	18	
SE21800.01	CTD_SBE19	44	44	BOB-5	5	8	0618	S	44.27260	-124.89842	196	100	
SE21800.02	Niskin3m	43	44	BOB-5	5	8	0618	S	44.27260	-124.89842	196	3	
SE21800.03	Neuston	40	44	BOB-5	5	8	0627	S	44.27203	-124.90018	199	0	
SE21800.04	Trawl	41	44	BOB-5	5	8	0645	S	44.26353	-124.89752	179	18	
SE21800.04	Trawl	41	44	BOB-5	5	8	0715	E	44.23570	-124.90078	141	18	
SE21800.05	CTD_SBE19	45	45	BOB-4	5	8	0847	S	44.27535	-124.69778	84	70	
SE21800.06	Niskin3m	44	45	BOB-4	5	8	0847	S	44.27535	-124.69778	84	3	
SE21800.07	Neuston	41	45	BOB-4	5	8	0852	S	44.27480	-124.69830	86	0	
SE21800.08	Trawl	42	45	BOB-4	5	8	0912	S	44.26302	-124.70408	93	18	
SE21800.08	Trawl	42	45	BOB-4	5	8	0942	E	44.23813	-124.70788	108	18	
SE21800.09	CTD_SBE19	46	46	BOB-3	5	8	1107	S	44.27865	-124.49872	101	84	
SE21800.10	Niskin3m	45	46	BOB-3	5	8	1107	S	44.27865	-124.49872	101	3	
SE21800.11	Neuston	42	46	BOB-3	5	8	1115	S	44.27662	-124.49745	102	0	
SE21800.12	Trawl	43	46	BOB-3	5	8	1134	S	44.26327	-124.49420	102	18	
SE21800.12	Trawl	43	46	BOB-3	5	8	1204	E	44.23825	-124.48832	101	18	
SE21800.13	CTD_SBE19	47	47	BOB-2	5	8	1258	S	44.26507	-124.36925	86	70	
SE21800.14	Niskin3m	46	47	BOB-2	5	8	1258	S	44.26507	-124.36925	86	3	
SE21800.15	Neuston	43	47	BOB-2	5	8	1304	S	44.26595	-124.37048	86	0	
SE21800.16	Trawl	44	47	BOB-2	5	8	1323	S	44.25698	-124.36880	88	18	
SE21800.16	Trawl	44	47	BOB-2	5	8	1353	E	44.23295	-124.36827	88	18	
SE21800.17	CTD_SBE19	48	48	BOB-1	5	8	1532	S	44.26582	-124.14163	33	20	
SE21800.18	Niskin3m	47	48	BOB-1	5	8	1532	S	44.26582	-124.14163	33	3	
SE21800.09	Neuston	44	48	BOB-1	5	8	1536	S	44.26730	-124.14120	33	0	
SE21800.20	Trawl	45	48	BOB-1	5	8	1620	S	44.25467	-124.13680	27	18	
SE21800.20	Trawl	45	48	BOB-1	5	8	1650	E	44.23173	-124.13388	24	18	
SE21800.21	CTD_SBE19	49	49	BOB-1A	5	8	1847	S	44.25337	-124.28797	77	70	
SE21800.22	Niskin3m	48	49	BOB-1A	5	8	1847	S	44.25337	-124.28797	77	3	
SE21800.23	Neuston	45	49	BOB-1A	5	8	1852	S	44.25337	-124.28600	77	0	
SE21800.24	Trawl	46	49	BOB-1A	5	8	1910	S	44.25118	-124.27373	75	18	
SE21800.24	Trawl	46	49	BOB-1A	5	8	1940	E	44.24968	-124.23397	68	18	
SE21800.25	CTD_SBE19	50	49	BOB-1A	5	8	1958	S	44.24388	-124.22637	64	59	
SE21900.01	CTD_SBE19	51	50	UR-1	6	8	0611	S	43.75353	-124.23823	62	54	
SE21900.02	Niskin3m	49	50	UR-1	6	8	0611	S	43.75353	-124.23823	62	3	
SE21900.03	Neuston	46	50	UR-1	6	8	0616	S	43.75258	-124.23880	62	0	
SE21900.04	Trawl	47	50	UR-1	6	8	0637	S	43.74732	-124.23370	55	18	
SE21900.04	Trawl	47	50	UR-1	6	8	0652	E	43.73593	-124.23145	48	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE21900.05	CTD_SBE19	52	51	UR-3	6	8	0812	S	43.76412	-124.40000	115	98	
SE21900.06	Niskin3m	50	51	UR-3	6	8	0812	S	43.76412	-124.40000	115	3	
SE21900.07	Neuston	47	51	UR-3	6	8	0821	S	43.76387	-124.40198	117	0	
SE21900.08	Trawl	48	51	UR-3	6	8	0839	S	43.74878	-124.40043	115	18	
SE21900.08	Trawl	48	51	UR-3	6	8	0909	E	43.72132	-124.40315	117	18	
SE21900.09	CTD_SBE19	53	52	UR-5	6	8	1016	S	43.76578	-124.56788	208	100	
SE21900.10	Niskin3m	51	52	UR-5	6	8	1016	S	43.76578	-124.56788	208	3	
SE21900.11	Neuston	48	52	UR-5	6	8	1025	S	43.76648	-124.56862	208	0	
SE21900.12	Trawl	49	52	UR-5	6	8	1043	S	43.75810	-124.56475	208	18	
SE21900.12	Trawl	49	52	UR-5	6	8	1113	E	43.73043	-124.55688	198	18	
SE21900.13	CTD_SBE19	54	53	UR-7	6	8	1229	S	43.76292	-124.40205	494	100	
SE21900.14	Niskin3m	52	53	UR-7	6	8	1229	S	43.76292	-124.40205	494	3	
SE21900.15	Neuston	49	53	UR-7	6	8	1237	S	43.76172	-124.73627	494	0	
SE21900.16	Trawl	50	53	UR-7	6	8	1254	S	43.74880	-124.73057	494	18	
SE21900.16	Trawl	50	53	UR-7	6	8	1324	E	43.71763	-124.72623	512	18	
SE21900.17	CTD_SBE19	55	54	UR-8	6	8	1523	S	43.77875	-125.03367	1372	92	
SE21900.18	Niskin3m	53	54	UR-8	6	8	1523	S	43.77875	-125.03367	1372	3	
SE21900.19	Neuston	50	54	UR-8	6	8	1530	S	43.77762	-125.03382	1372	0	
SE21900.20	Trawl	51	54	UR-8	6	8	1547	S	43.77273	-125.02835	1372	18	
SE21900.20	Trawl	51	54	UR-8	6	8	1617	E	43.74777	-125.02898	1372	18	
SE21900.21	CTD_SBE19	56	55	UR-10	6	8	1743	S	43.77595	-125.25157	1737	100	
SE21900.22	Niskin3m	54	55	UR-10	6	8	1743	S	43.77595	-125.25157	1737	3	
SE21900.23	Neuston	51	55	UR-10	6	8	1750	S	43.77550	-125.25083	1737	0	
SE21900.24	Trawl	52	55	UR-10	6	8	1808	S	43.76815	-125.24363	1737	18	
SE21900.24	Trawl	52	55	UR-10	6	8	1838	E	43.74305	-125.24742	1737	18	
SE21900.25	CTD_SBE19	57	56	NFS-1	6	8	2243	S	43.76850	-125.69617	2926	99	
SE21900.26	Niskin3m	55	56	NFS-1	6	8	2243	S	43.76850	-125.69617	2926	3	
SE21900.27	Neuston	52	56	NFS-1	6	8	2248	S	43.76802	-125.69707	2926	0	
SE21900.28	Trawl	53	56	NFS-1	6	8	2307	S	43.75763	-125.69378	2926	18	
SE21900.28	Trawl	53	56	NFS-1	6	8	2337	E	43.73463	-125.69333	2926	18	
SE22000.01	CTD_SBE19	58	57	NFS-2	7	8	1331	S	43.77418	-125.99400	3018	90	
SE22000.02	Niskin3m	56	57	NFS-2	7	8	1331	S	43.77418	-125.99400	3018	3	
SE22000.03	Neuston	53	57	NFS-2	7	8	1343	S	43.77358	-125.99457	3018	0	
SE22000.04	Trawl	54	57	NFS-2	7	8	1422	S	43.78388	-126.00260	3018	18	
SE22000.04	Trawl	54	57	NFS-2	7	8	1452	E	43.75930	-126.00308	3018	18	
SE22000.05	CTD_SBE19	59	57	NFS-2	7	8	1521	S	43.75752	-126.00508	3018	95	
SE22000.06	CTD_SBE19	60	58	NFS-1A	7	8	1600	S	43.78042	-125.91938	3018	95	
SE22000.07	Niskin3m	57	58	NFS-1A	7	8	1600	S	43.78042	-125.91938	3018	3	
SE22000.08	Neuston	54	58	NFS-1A	7	8	1614	S	43.78082	-125.91485	3018	0	
SE22000.09	CTD_SBE19	61	59	NFS-3	7	8	1823	S	43.49667	-125.80243	3018	88	
SE22000.10	Niskin3m	58	59	NFS-3	7	8	1823	S	43.49667	-125.80243	3018	3	
SE22000.11	Neuston	55	59	NFS-3	7	8	1835	S	43.49518	-125.80567	3018	0	
SE22000.12	Trawl	55	59	NFS-3	7	8	1900	S	43.50345	-125.80645	3018	18	
SE22000.12	Trawl	55	59	NFS-3	7	8	1930	E	43.47782	-125.81273	3018	18	
SE22000.13	CTD_SBE19	62	59	NFS-3	7	8	1950	S	43.46553	-125.81618	3018	95	
SE22000.14	CTD_SBE19	63	60	NFS-3	7	8	2207	S	43.52212	-125.80533	3018	96	
SE22000.15	Niskin3m	59	60	NFS-3	7	8	2207	S	43.52212	-125.80533	3018	3	
SE22000.16	Neuston	56	60	NFS-3	7	8	2217	S	43.52212	-125.80667	3018	0	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE22000.17	Trawl	56	60	NFS-3	7	8	2234	S	43.51067	-125.80102	3018	18	
SE22000.17	Trawl	56	60	NFS-3	7	8	2304	E	43.48678	-125.80128	3018	18	
SE22000.18	CTD_SBE19	64	60	NFS-3	7	8	2304	S	43.48678	-125.80128	3018	100	
SE22000.19	CTD_SBE19	65	61	NFS-4	7	8	2325	S	43.47553	-125.79318	3018	94	
SE22000.20	Niskin3m	60	61	NFS-4	7	8	2325	S	43.47553	-125.79318	3018	3	
SE22100.01	Neuston	57	61	NFS-4	8	8	0140	S	43.35143	-125.50640	3018	0	
SE22100.02	Trawl	57	61	NFS-4	8	8	0209	S	43.35192	-125.50540	3018	18	
SE22100.02	Trawl	57	61	NFS-4	8	8	0239	E	43.33542	-125.50773	3018	18	
SE22100.03	CTD_SBE19	66	61	NFS-4	8	8	0313	S	43.31268	-125.50165	3018	94	
SE22100.04	CTD_SBE19	67	62	NFS-5	8	8	0500	S	43.23727	-125.80317	3018	97	
SE22100.05	Niskin3m	61	62	NFS-5	8	8	0500	S	43.23727	-125.80317	3018	3	
SE22100.06	Neuston	58	62	NFS-5	8	8	0500	S	43.23727	-125.80317	3018	0	
SE22100.07	CTD_SBE19	68	63	NFS-8	8	8	1005	S	42.82990	-125.15253	2012	98	
SE22100.08	Niskin3m	62	63	NFS-8	8	8	1005	S	42.82990	-125.15253	2012	3	
SE22100.09	Neuston	59	63	NFS-8	8	8	1013	S	42.82932	-125.15363	2012	0	
SE22100.10	Trawl	58	63	NFS-8	8	8	1038	S	42.81917	-125.14570	2012	18	
SE22100.10	Trawl	58	63	NFS-8	8	8	1110	E	42.79015	-125.14665	2012	18	
SE22100.11	CTD_SBE19	69	63	NFS-8	8	8	1127	S	42.77973	-125.14683	2012	100	
SE22100.12	CTD_SBE19	70	64	NFS-9	8	8	1341	S	42.97217	-124.85077	123	98	
SE22100.13	Niskin3m	63	64	NFS-9	8	8	1341	S	42.97217	-124.85077	123	3	
SE22100.14	Neuston	60	64	NFS-9	8	8	1350	S	42.97258	-124.84972	123	0	
SE22100.15	Trawl	59	64	NFS-9	8	8	1408	S	42.95993	-124.84932	117	18	
SE22100.15	Trawl	59	64	NFS-9	8	8	1438	E	42.93325	-124.85140	155	18	
SE22100.16	CTD_SBE19	71	64	NFS-9	8	8	1454	S	42.92232	-124.85475	192	100	
SE22100.17	CTD_SBE19	72	65	NFS-10	8	8	1723	S	43.23140	-124.67102	159	100	
SE22100.18	Niskin3m	64	65	NFS-10	8	8	1723	S	43.23140	-124.67102	159	3	
SE22100.19	Neuston	61	65	NFS-10	8	8	1735	S	43.22813	-124.66483	148	0	
SE22100.20	Trawl	60	65	NFS-10	8	8	1749	S	43.22017	-124.66270	152	18	
SE22100.20	Trawl	60	65	NFS-10	8	8	1819	E	43.20800	-124.65962	144	18	
SE22100.21	CTD_SBE19	73	65	NFS-10	8	8	1835	S	43.18880	-124.64823	139	94	
SE22200.01	CTD_SBE19	74	66	7A-1	9	8	0705	S	43.10013	-124.46925	37	28	
SE22200.02	Niskin3m	65	66	7A-1	9	8	0705	S	43.10013	-124.46925	37	3	
SE22200.03	Neuston	62	66	7A-1	9	8	0710	S	43.10047	-124.46945	37	0	
SE22200.04	Trawl	61	66	7A-1	9	8	0728	S	43.09023	-124.47200	42	18	
SE22200.04	Trawl	61	66	7A-1	9	8	0758	E	43.05763	-124.47108	37	18	
SE22200.05	CTD_SBE19	75	67	7A-2	9	8	0859	S	43.09452	-124.60157	117	100	
SE22200.06	Niskin3m	66	67	7A-2	9	8	0859	S	43.09452	-124.60157	117	3	
SE22200.07	Neuston	63	67	7A-2	9	8	0908	S	43.09387	-124.60227	117	0	
SE22200.08	Trawl	62	67	7A-2	9	8	0924	S	43.08027	-124.59983	117	18	
SE22200.08	Trawl	62	67	7A-2	9	8	0954	E	43.04983	-124.60115	117	18	
SE22200.09	CTD_SBE19	76	68	7A-3	9	8	1115	S	43.09783	-124.79968	249	100	
SE22200.10	Niskin3m	67	68	7A-3	9	8	1115	S	43.09783	-124.79968	249	3	
SE22200.11	Neuston	64	68	7A-3	9	8	1121	S	43.09840	-124.80043	249	0	
SE22200.12	Trawl	63	68	7A-3	9	8	1140	S	43.08902	-124.79848	232	18	
SE22200.12	Trawl	63	68	7A-3	9	8	1210	E	43.06630	-124.79770	188	18	
SE22200.13	CTD_SBE19	77	69	8-3	9	8	1255	S	42.98952	-124.81578	119	100	
SE22200.14	Niskin3m	68	69	8-3	9	8	1255	S	42.98952	-124.81578	119	3	
SE22200.15	Neuston	65	69	8-3	9	8	1303	S	42.99000	-124.81712	123	0	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE22200.16	Trawl	64	69	8-3	9	8	1319	S	42.98182	-124.81715	123	18	
SE22200.16	Trawl	64	69	8-3	9	8	1349	E	42.95887	-124.81775	134	18	
SE22200.17	CTD_SBE19	78	70	8-2	9	8	1506	S	42.96448	-124.62727	101	90	
SE22200.18	Niskin3m	69	70	8-2	9	8	1506	S	42.96448	-124.62727	101	3	
SE22200.19	Neuston	66	70	8-2	9	8	1514	S	42.96198	-124.62742	99	0	
SE22200.20	Trawl	65	70	8-2	9	8	1529	S	42.95403	-124.62722	95	18	
SE22200.20	Trawl	65	70	8-2	9	8	1559	E	42.92685	-124.62777	84	18	
SE22200.21	CTD_SBE19	79	71	8-1	9	8	1700	S	42.96443	-124.50995	38	30	
SE22200.22	Niskin3m	70	71	8-1	9	8	1700	S	42.96443	-124.50995	38	3	
SE22200.23	Neuston	67	71	8-1	9	8	1705	S	42.96848	-124.50957	42	0	
SE22200.24	Trawl	66	71	8-1	9	8	1720	S	42.95835	-124.50560	31	18	
SE22200.24	Trawl	66	71	8-1	9	8	1750	E	42.93525	-124.51518	26	18	
SE22200.25	CTD_SBE19	80	71	8-1	9	8	1809	S	42.92665	-124.52043	26	22	
SE22300.01	CTD_SBE19	81	72	8A-1	10	8	0632	S	42.83210	-124.63067	51	40	
SE22300.02	Niskin3m	71	72	8A-1	10	8	0632	S	42.83210	-124.63067	51	3	
SE22300.03	Neuston	68	72	8A-1	10	8	0635	S	42.83218	-124.63150	51	0	
SE22300.04	Trawl	67	72	8A-1	10	8	0655	S	42.82355	-124.62648	46	18	
SE22300.04	Trawl	67	72	8A-1	10	8	0725	E	42.79580	-124.63027	49	18	
SE22300.05	CTD_SBE19	82	73	8A-2	10	8	0816	S	42.84475	-124.70190	124	100	
SE22300.06	Niskin3m	72	73	8A-2	10	8	0816	S	42.84475	-124.70190	124	3	
SE22300.07	Neuston	69	73	8A-2	10	8	0824	S	42.84467	-124.70232	126	0	
SE22300.08	Trawl	68	73	8A-2	10	8	0842	S	42.83608	-124.70052	121	18	
SE22300.08	Trawl	68	73	8A-2	10	8	0912	E	42.81162	-124.69950	130	18	
SE22300.09	CTD_SBE19	83	74	8B-2	10	8	0945	S	42.76807	-124.70347	163	100	
SE22300.10	Niskin3m	73	74	8B-2	10	8	0945	S	42.76807	-124.70347	163	3	
SE22300.11	Neuston	70	74	8B-2	10	8	0952	S	42.76798	-124.70385	165	0	
SE22300.12	Trawl	69	74	8B-2	10	8	1010	S	42.75960	-124.70595	190	18	
SE22300.12	Trawl	69	74	8B-2	10	8	1040	E	42.73698	-124.69980	179	18	
SE22300.13	CTD_SBE19	84	75	8B-1	10	8	1140	S	42.76152	-124.56897	38	30	
SE22300.14	Niskin3m	74	75	8B-1	10	8	1140	S	42.76152	-124.56897	38	3	
SE22300.15	Neuston	71	75	8B-1	10	8	1143	S	42.76110	-124.56858	38	0	
SE22300.16	Trawl	70	75	8B-1	10	8	1201	S	42.75222	-124.56828	46	18	
SE22300.16	Trawl	70	75	8B-1	10	8	1231	E	42.73037	-124.57113	73	18	
SE22300.17	CTD_SBE19	85	76	9-1	10	8	1320	S	42.70287	-124.49737	40	36	
SE22300.18	Niskin3m	75	76	9-1	10	8	1320	S	42.70287	-124.49737	40	3	
SE22300.19	Neuston	72	76	9-1	10	8	1325	S	42.70300	-124.49550	42	0	
SE22300.20	Trawl	71	76	9-1	10	8	1340	S	42.69570	-124.49580	48	18	
SE22300.20	Trawl	71	76	9-1	10	8	1410	E	42.71870	-124.49333	59	18	
SE22300.21	CTD_SBE19	86	77	9-3	10	8	1536	S	42.70835	-124.71878	230	98	
SE22300.22	Niskin3m	76	77	9-3	10	8	1536	S	42.70835	-124.71878	230	3	
SE22300.23	Neuston	73	77	9-3	10	8	1541	S	42.70835	-124.71878	230	0	
SE22300.24	Trawl	72	77	9-3	10	8	1602	S	42.70210	-124.71530	221	18	
SE22300.24	Trawl	72	77	9-3	10	8	1632	E	42.67998	-124.70917	205	18	
SE22300.25	CTD_SBE19	87	78	Birds-1	10	8	1842	S	42.91045	-124.63583	84	80	
SE22300.26	Niskin3m	77	78	Birds-1	10	8	1842	S	42.91045	-124.63583	84	3	
SE22300.27	Neuston	74	78	Birds-1	10	8	1847	S	42.91340	-124.63613	84	0	
SE22300.28	Trawl	73	78	Birds-1	10	8	1905	S	42.90325	-124.63278	80	18	
SE22300.28	Trawl	73	78	Birds-1	10	8	1935	E	42.88053	-124.62830	68	18	

Event#	Instr	Cast	Sta	Sta std	Day	Mos	Time	S/E flag	Lat	Long	Water Depth	Cast Depth	Comments
SE22500.01	CTD_SBE19	88	79	2-6	12	8	0622	S	44.49917	-124.70130	168	100	
SE22500.02	Niskin3m	78	79	2-6	12	8	0622	S	44.49917	-124.70130	168	3	
SE22500.03	Neuston	75	79	2-6	12	8	0629	S	44.49788	-124.70153	168	0	
SE22500.04	Trawl	74	79	2-6	12	8	0647	S	44.47498	-124.70605	168	18	
SE22500.04	Trawl	74	79	2-6	12	8	0717	E	44.46337	-124.70657	154	18	
SE22500.05	CTD_SBE19	89	79	2-6	12	8	0732	S	44.45272	-124.70483	146	90	
SE22500.06	CTD_SBE19	90	80	2-5	12	8	0820	S	44.47610	-124.58675	128	100	
SE22500.07	Niskin3m	79	80	2-5	12	8	0820	S	44.47610	-124.58675	128	3	
SE22500.08	Neuston	76	80	2-5	12	8	0827	S	44.47535	-124.58708	130	0	
SE22500.09	Trawl	75	80	2-5	12	8	0847	S	44.46455	-124.58732	124	18	
SE22500.09	Trawl	75	80	2-5	12	8	0917	E	44.43975	-124.58348	115	18	
SE22500.10	CTD_SBE19	91	80	2-5	12	8	0930	S	44.43182	-124.58243	113	95	
SE22500.11	CTD_SBE19	92	81	2-4	12	8	1040	S	44.48270	-124.39913	57	48	
SE22500.12	Niskin3m	80	81	2-4	12	8	1040	S	44.48270	-124.39913	57	3	
SE22500.13	Neuston	77	81	2-4	12	8	1045	S	44.48258	-124.40042	55	0	
SE22500.14	Trawl	76	81	2-4	12	8	1101	S	44.47327	-124.39637	60	18	
SE22500.14	Trawl	76	81	2-4	12	8	1131	E	44.44658	-124.39738	73	18	
SE22500.15	CTD_SBE19	93	81	2-4	12	8	1147	S	44.43663	-124.39853	79	30	
SE22500.16	CTD_SBE19	94	82	2-3	12	8	1226	S	44.47765	-124.35913	62	50	
SE22500.17	Niskin3m	81	82	2-3	12	8	1226	S	44.47765	-124.35913	62	3	
SE22500.18	Neuston	78	82	2-3	12	8	1230	S	44.47770	-124.36057	60	0	
SE22500.19	Trawl	77	82	2-3	12	8	1247	S	44.46762	-124.35855	64	18	
SE22500.19	Trawl	77	82	2-3	12	8	1317	E	44.43965	-124.36170	73	18	
SE22500.20	CTD_SBE19	95	82	2-3	12	8	1336	S	44.42897	-124.36167	73	50	
SE22500.21	CTD_SBE19	96	83	2-2	12	8	1424	S	44.47712	-124.24585	69	58	
SE22500.22	Niskin3m	82	83	2-2	12	8	1424	S	44.47712	-124.24585	69	3	
SE22500.23	Neuston	79	83	2-2	12	8	1429	S	44.47653	-124.24728	69	0	
SE22500.24	Trawl	78	83	2-2	12	8	1447	S	44.46640	-124.24707	69	18	
SE22500.24	Trawl	78	83	2-2	12	8	1517	E	44.44107	-124.24255	69	18	
SE22500.25	CTD_SBE19	97	83	2-2	12	8	1535	S	44.43218	-124.24023	69	50	
SE22500.26	CTD_SBE19	98	84	2-1	12	8	1622	S	44.47592	-124.12973	40	30	
SE22500.27	Niskin3m	83	84	2-1	12	8	1622	S	44.47592	-124.12973	40	3	
SE22500.28	Neuston	80	84	2-1	12	8	1625	S	44.47593	-124.13082	40	0	
SE22500.29	Trawl	79	84	2-1	12	8	1643	S	44.46557	-124.13075	42	18	
SE22500.29	Trawl	79	84	2-1	12	8	1653	E	44.44788	-124.13158	42	18	
SE22500.30	CTD_SBE19	99	84	2-1	12	8	1720	S	44.44035	-124.13250	42	30	