GLOBEC Northeast Pacific, Coastal Gulf of Alaska

Cruise Report, R/V *Alpha Helix* (HX 242)

17 April – 1 May 2001

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Port of Departure: Seward, Alaska
Port of Return: Seward, Alaska

Cruise Goals / Scientific Purpose

The GLOBEC Northeast Pacific program seeks to understand the relationship between climate variability and the success of marine fish, bird and mammal populations. In the coastal Gulf of Alaska, the program focuses on the mechanisms by which climate and weather can influence the physical - chemical structure of the coastal zone, how this in turn affects the coastal planktonic food web, and how food web variations influence distribution and recruitment success of pink salmon. The process cruises specifically will be conducted 3 times in 2001 and 3 times in 2003. On each cruise the aim is to visit four sites representing a diversity of physical - chemical conditions in the coastal Gulf of Alaska. At each of these core sites, rates of phytoplankton growth, zooplankton grazing and zooplankton egg production will be measured, as well as aspects of phytoplankton and zooplankton community structure. These measurements will be related to the physical - chemical environment by means of vertical profiling at the process stations themselves, sampling of a "fine-scale" grid around each of the core process stations, and use of data collected on LTOP cruises. Data collected will ultimately be compared to related data from the Oregon coastal upwelling system.

The April cruise focused on early-mid spring phytoplankton bloom processes, and the responses of the zooplankton community to early-mid bloom conditions.

Cruise Objectives

1. Determine phytoplankton growth rates and rates of microzooplankton herbivory.
2. Determine rates of grazing on phyto- and microzooplankton by dominant copepod taxa including *Neocalanus* and *Calanus*. Live net collections are summarized in Table 2.
3. Measure rates of egg production by copepods *Calanus*, *Pseudocalanus*, *Metridia*
4. Assess vertical distribution of temperature, salinity, light, nutrients, chlorophyll and microzooplankton at core process stations and fine-scale grid stations (Table 3).
5. Conduct net tows (CalVET, MOCNESS) for distribution and abundance of zooplankton at core process stations. MOCNESS tows are summarized in Table 4. CalVET and CalVET53 net tows in Tables 5 and 6.

Summaries of each of the GLOBEC projects may be found at the web site: http://globec.coas.oregonstate/edu/groups/nep/projs.html.

Table 1. GLOBEC Cruise Participants

Jeff Napp (Project co-PI)	Copepod grazing/egg prod., AFSC (M), Jeff.Napp@noaa.gov
Christine Baier	Copepod grazing/egg prod., AFSC (F), Christine.Baier@noaa.gov
Hongbin Liu	Neocalanus grazing, LUMCON (M), hliu@lumcon.edu
David Lawrence	Neocalanus grazing, LUMCON (M), Dlawrence@lumcon.edu
Brady Olson	Microzoo grazing, WWU (M), olsonm@cc.wwu.edu
Deborah Kast	Microzoo grazing, WWU (F), debkast@hotmail.com
Erin Macri	Chlorophyll/nutrients, WWU (F), macrie@hotmail.com
Marnie Jo Zirbel	Chlorophyll/nutrients, WWU (F), mjozirbel@hotmail.com
William J. Williams	CTD/ADCP, UAF (M)
Steve Hartz	Marine tech, UAF (M)
Dave Aldrich	Marine tech, UAF (M)

AFSC = Alaska Fisheries Science Center (NOAA); LUMCON = Louisiana Universities Marine Consortium; WWU = Western Washington University.

Summary of Cruise

See Appendix 1 (Event Log).

Daily Cruise Summary (Narrative)

17 April. Departed Seward 0937 ADT. Proceeded directly to our outer shelf core station OS-C (GAK-10). Immediately following initial CTD profiling commenced grazing experiments.

18 April. Continued day/night cycle of work as outlined above, completing daytime grid station survey on 18 April and night MOCNESS/CalVET sampling on nights of 17-18 April, 18-19 April, and 19-20 April. Additional Seward Line stations GAK-11, -12, -13, -9, and –8i were profiled while working in this vicinity. Three sets of grazing experiments (microzooplankton, *Neocalanus*, other calanoids) were run at OS-C.

20 April. Proceeded to the mid-shelf core station MS-C (GAK-6).

21 April. Conducted daytime grid survey on 21 April, and night MOCNESS/CalVET sampling on night of 20-21 April. One to two grazing experiments (depending on taxon) were run at MS-C. Additional Seward Line stations were also profiled while working in this vicinity and transiting to the inner shelf.

22 April. Due to rough weather, departed the mid-shelf in the early morning, a day or two earlier than planned. Arrived inner shelf and conducted CTD casts in a transect across the Alaska Coastal Current region (GAK4 to GAK 1i, with additional stations ACC-1 and ACC-2 added on either side of GAK-2) to determine location of current. Selected station ACC-2 as the inner shelf core station IS-C. Commenced day/night cycle of work as above, completing daytime grid survey on 23 April and night MOCNESS/CalVET sampling on nights of 22-23 April, 23-24 April, and 24-25 April. CTD transect across Alaska Coastal Current was repeated an additional 3 times while working in this vicinity, and GAK-1 was sampled on 22 April, collectively giving complete CTD coverage of the Seward Line between 18 and 22 April. Four sets of grazing experiments were conducted at IS-C.

25 April. Transited to Prince William Sound, surveying stations KIP-2, PWS-1, PWS-2 and PWS-3 with CTD, ring net tows and FlowCAM to determine location of core station. Chose PWS-2 as core station (PWS-C) for this region and commenced day/night cycle of work as above.

27 April. Daytime grid survey was conducted, and nighttime MOCNESS/CalVET sampling on nights of 25-29 April. Four sets of grazing experiments were conducted at PWS-C. Additional CTD sections at Montague Strait and Hogan Bay were also accomplished.

30 April. The Cape Fairfield line was completed en route to Seward on 30 April – 1 May, with a final MOCNESS at GAK-2 at 0800 1 May.

1 May. The Helix returned to the dock at Seward at 1149. This was nearly a full day earlier than planned, so that work could be done on the electrical system before the 4 May LTOP cruise.

The cooperative attitude and hard work of Captain Bill Rook and the crew of the R.V. *Alpha Helix* are much appreciated, and contributed in large part to the success of this cruise.

Summary of Sampling Operations

Daytime Activities:

1. Collected ADCP, sea surface salinity, temperature and fluorescence data using sensors in the seachest, both while underway and while on station.

2. Occupied core process stations OS-C (GAK-10), MS-C (GAK-6), IS-C (ACC-2) and PWS-C (PWS-2) and conducted vertical CTD profiles (to near bottom, as for LTOP cruises) for determination of T, S, light (PAR) and in situ fluorescence distribution.

3. Collected discrete water samples from CTD cast (8 or 9 depths per cast) for measurement of nutrients (frozen for analysis by C. Mordy), size-fractionated chlorophyll (<5 µm, 5 – 20 µm, >20 µm, analyzed on board), algal pigments (frozen for HPLC analysis by S. Strom) and microzooplankton abundance (acid Lugol's-fixed samples for inverted microscopy, gluataraldehyde-fixed samples for epifluorescence microscopy). (Activities 2 and 3 were conducted upon arrival and at approx. local noon each day on station, with a reduced set of sample types taken during all but first cast on station.)

4. Conducted net tows (CalVET, Ring net) for preserved samples (zooplankton abundance, copepod egg abundance) and live animals (grazing and egg production experiment set-up).

5. Used CTD to collect water from upper mixed layer for set-up of dilution experiments (phytoplankton growth and microzooplankton grazing rates) and copepod grazing experiments.

6. Occupied fine-scale grid stations (8) surrounding each core station (see attached charts) and conducted vertical profiling (as in #2) and water bottle sampling (as in #3, but with only 5 depths per cast, water samples collected for nutrient and size-fractionated chlorophyll analysis).

Nighttime Activities:

1. Conducted MOCNESS and CalVET tows once each night while on core process stations.

2. Conduct night CTD/water sample profiling at core process station (see above).

3. Conducted MOCNESS, CalVET tows and CTD/water sampling at 3 of the 8 grid stations surrounding each core station (one per night).

CHRONOLOGY

Departed Seward 0937 ADT 17 April 2001. Proceeded directly to our outer shelf core station OS-C (GAK-10). Immediately following initial CTD profiling commenced grazing experiments. Continued day/night cycle of work as outlined above, completing daytime grid station survey on 18 April and night MOCNESS/CalVET sampling on nights of 17-18 April, 18-19 April, and 19-20 April. Additional Seward Line stations GAK-11, -12, -13, -9, and –8i were profiled while working in this vicinity. Three sets of grazing experiments (microzooplankton, *Neocalanus*, other calanoids) were run at OS-C.

Proceeded to the mid-shelf core station MS-C (GAK-6) on 20 April. Conducted daytime grid survey on 21

April, and night MOCNESS/CalVET sampling on night of 20-21 April. One to two grazing experiments (depending on taxon) were run at MS-C. Additional Seward Line stations were also profiled while working in this vicinity and transiting to the inner shelf. Due to rough weather, departed the mid-shelf in the early morning of 22 April, a day or two earlier than planned.

Arrived inner shelf on 22 April and conducted CTD casts in a transect across the Alaska Coastal Current region (GAK4 to GAK 1i, with additional stations ACC-1 and ACC-2 added on either side of GAK-2) to determine location of current. Selected station ACC-2 as the inner shelf core station IS-C. Commenced day/night cycle of work as above, completing daytime grid survey on 23 April and night MOCNESS/CalVET sampling on nights of 22-23 April, 23-24 April, and 24-25 April. CTD transect across Alaska Coastal Current was repeated an additional 3 times while working in this vicinity, and GAK-1 was sampled on 22 April, collectively giving complete CTD coverage of the Seward Line between 18 and 22 April. Four sets of grazing experiments were conducted at IS-C.

Transited to Prince William Sound 25 April, surveying stations KIP-2, PWS-1, PWS-2 and PWS-3 with CTD, ring net tows and FlowCAM to determine location of core station. Chose PWS-2 as core station (PWS-C) for this region and commenced day/night cycle of work as above. Daytime grid survey was conducted on 27 April, and nighttime MOCNESS/CalVET sampling on nights of 25-29 April. Four sets of grazing experiments were conducted at PWS-C. Additional CTD sections at Montague Strait and Hogan Bay were also accomplished. The Cape Fairfield line was completed en route to Seward on 30 April – 1 May, with a final MOCNESS at GAK-2 at 0800 1 May. The Helix returned to the dock at Seward at 1149 1 May. This was nearly a full day earlier than planned, so that work could be done on the electrical system before the 4 May LTOP cruise.

The cooperative attitude and hard work of Captain Bill Rook and the crew of the R.V. *Alpha Helix* are much appreciated, and contributed in large part to the success of this cruise.

Work Conducted:

Microplankton (Strom, Olson, Kast, with assistance from Macri and Zirbel)

Vertical profiles for phyto- and microzooplankton abundance and species composition were taken at all core stations. A total of 13 seawater dilution experiments was conducted on board, with all experiments sampled for size-fractionated chlorophyll, phytoplankton pigments (HPLC) and microplankton community composition. Analysis of chlorophyll samples on board showed that phytoplankton cell division rates varied widely, reaching highest levels during one experiment at the mid-shelf and during a "fresh" diatom bloom (predominately *Thalassiosira* sp.) during the latter part of our stay at the inner shelf.

Preliminary results indicate that microzooplankton grazing rates were consistently equal to or higher than phytoplankton growth rates for the smallest chlorophyll size fraction (<5 µm), showing that this component of the phytoplankton community was tightly regulated by microzooplankton grazers. Grazing rates on the medium (5-20 µm) phytoplankton cells was generally the highest of all 3 size fractions in an absolute sense. Grazing on the large phytoplankton (>20 µm) ranged widely, from 0 to 0.7 per d.

The FlowCAM was used extensively to characterize the microplankton at each station and to analyze the shifts in particle size spectrum and community composition during copepod grazing experiments. FlowCAM images revealed that the region surrounding PWS-C was experiencing the demise of a diatom bloom during our stay, with large numbers of heterotrophic dinoflagellates seen feeding on diatoms, and increasing concentrations of small detrital particles accumulating over time in the region.

Egg Production and Diet Studies (Napp and Baier, with assistance from Kast and Zirbel)

Shipboard incubation experiments for egg production, egg viability, and diet were conducted at selected stations. Females of the target species (*Calanus* spp., *Pseudocalanus* spp. and *Metridia* spp.) were not available at each and every station and the middle shelf station was only briefly occupied. The bulk of our results for this cruise will come from the Inner Shelf (GAK-2) and Prince William Sound (PWS-2) stations. Preliminary results are as follows:

1. Most or all of the *Calanus marshallae* females collected were reproductively mature and laid eggs during shipboard incubation.
2. Clutch size of *C. marshallae* females ranged from 40 to 80 eggs.
3. *Calanus* eggs hatched during incubation; viability rates will be calculated after the preserved samples

are returned to our laboratory.

4. Three distinct sizes of *Pseudocalanus* spp. females were found probably corresponding to *P. newmani*, *P mimus*, and *P. minutus*. Preserved samples will confirm the identities of the different sized females.
5. Approximately 1 in 10 *Pseudocalanus* spp. females laid eggs during the 24-hr incubation period.
6. Viability of *Pseudocalanus* spp. eggs will be determined from females incubated until their egg hatched.
7. Diet studies for the females of the target species were conducted using 24-hr shipboard grazing experiments on natural particulate matter. This research was done in collaboration with S. Strom and co-workers. Samples for chlorophyll, microplankton community (Lugol's and glutaraldehyde preserved), FlowCam, and HPLC will be analyzed to determine grazing rates and diet preferences.
8. Zooplankton samples were collected in and around each cardinal station using the NEP GOA GLOBEC protocol (MOCNESS 500 µm and CalVET 150 µm mesh) to determine the concentration and depth distribution of GLOBEC target species.

Neocalanus *Grazing Experiments* (Liu and Lawrence)

During cruise HX242 (April 17 – May 2), we conducted 12 *Neocalanus* grazing experiments, 3 at the outer-shelf station, 1 at the middle-shelf station, 4 at the inner-shelf station and 4 in the Prince William Sound. Live animals were obtained by vertical net tows. We were able to get healthy *Neocalanus cristatus* and *Neocalanus flemingeri* at stations except the inner-shelf station, where rough seas and a diatom bloom prevented us from obtaining animals in good shape. Various numbers of *Neocalanus* copepodids were added to each experimental bottle, usually duplicates of 4 different treatments plus a control. Chlorophyll a concentrations in 3 size fractions (< 5, 5 – 20 and > 20 um) were measured at the beginning and end of the experiment. Water samples were taken at the beginning and end of the incubation for FlowCam analysis of phytoplankton and microzoograzer compositions. In addition, samples from each incubation bottle were preserved in Lugol's solution and gluteraldehyde (for making slides on board) for additional identification of microzooplankton. When healthy copepods were available, our results indicate that *Neocalanus* feed mostly on the phytoplankton cells larger than 20 um. We saw very little grazing and sometimes a positive cascading effect on the < 5 um fraction. It is possible that grazing pressure of microzooplankton on the < 5 um cells were released as a result of *Neocalanus* feeding on protozoan grazers. More information on potential cascading interactions will be available when microzooplankton samples are analyzed.

Additionally, *Neocalanus* samples were frozen in liquid nitrogen for future analyses of dry weight, element composition and lipid content at each core station. Water samples were also taken at stations on the Seward line for flow cytometric analysis of picophytoplankton and bacteria abundance.

Table 2: Collection of Live Animals for Shipboard Experiments

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX10701.02	LiveNet	1	1	OS-C	4	17	2035	58.5408	-148.2143	nd	100	ev#002; Neocalanus
HX10701.03	LiveNet	nd	1	OS-C	4	17	2057	58.5348	-148.2240	nd	nd	ev#003; aborted tow-no cast #
HX10701.04	LiveNet	nd	1	OS-C	4	17	2117	58.5412	-148.2128	nd	nd	ev#004; aborted tow-no cast #
HX10701.05	LiveNet	2	1	OS-C	4	17	2130	58.5375	-148.2185	nd	50	ev#005
HX10701.06	LiveNet	3	1	OS-C	4	17	2146	58.5412	-148.2125	nd	50	ev#006
HX10801.08	LiveNet	4	3	OS-C	4	18	0812	58.5403	-148.2108	1482	50	ev#017
HX10801.09	LiveNet	5	3	OS-C	4	18	0822	58.5380	-148.2128	1475	50	ev#018
HX10801.10	LiveNet	6	3	OS-C	4	18	0828	58.5372	-148.2140	1475	75	ev#019
HX10901.08	LiveNet	7	14	OS-C	4	19	1305	58.5397	-148.2180	nd	50	ev#037; GAK 10
HX10901.09	LiveNet	8	14	OS-C	4	19	1315	58.5385	-148.2213	nd	75	ev#038; GAK 10
HX10901.10	LiveNet	9	14	OS-C	4	19	1325	58.5372	-148.2245	nd	75	ev#039; GAK 10
HX11001.09	LiveNet	10	21	MS-C	4	20	1040	59.1150	-148.7707	150	75	ev#056
HX11001.10	LiveNet	11	21	MS-C	4	20	1050	59.1175	-148.7767	150	75	ev#057
HX11001.11	LiveNet	12	21	MS-C	4	20	1102	59.1202	-148.7827	150	100	ev#058
HX11201.12	LiveNet	13	47	IS-C	4	22	0952	59.6573	-149.2928	220	50	ev#095; net loose on ring frame
HX11201.13	LiveNet	14	47	IS-C	4	22	1020	59.6572	-149.2987	220	50	ev#096
HX11201.14	LiveNet	15	47	IS-C	4	22	1040	59.6573	-149.2925	220	50	ev#097
HX11201.15	LiveNet	16	47	IS-C	4	22	1049	59.6538	-149.2993	220	50	ev#098
HX11301.06	LiveNet	nd	51	IS-C	4	23	0701	59.6553	-149.2922	220	50	ev#111; fail-no cast #
HX11301.07	LiveNet	17	51	IS-C	4	23	0719	59.6583	-149.2925	219	50	ev#112
HX11301.08	LiveNet	18	51	IS-C	4	23	0724	59.6585	-149.2923	219	50	ev#113
HX11301.09	LiveNet	19	51	IS-C	4	23	0740	59.6587	-149.2928	218	75	ev#114
HX11301.10	LiveNet	20	51	IS-C	4	23	0800	59.6582	-149.2920	218	75	ev#115
HX11301.14	LiveNet	21	51	IS-C	4	23	1307	59.6573	-149.2927	218	50	ev#119
HX11401.11	LiveNet	22	72	IS-C	4	24	1515	59.6567	-149.3090	221	75	ev#145
HX11401.12	LiveNet	23	72	IS-C	4	24	1530	59.6588	-149.2987	221	62	ev#146
HX11401.13	LiveNet	24	72	IS-C	4	24	1540	59.6577	-149.2995	221	75	ev#147
HX11501.05	LiveNet	25	81	IS-C	4	25	0715	59.6588	-14918.33	218	75	ev#165
HX11501.06	LiveNet	26	81	IS-C	4	25	0735	59.6582	-149.2940	219	75	ev#166
HX11501.07	LiveNet	27	81	IS-C	4	25	0750	59.6583	-149.2928	219	75	ev#167
HX11501.12	LiveNet	28	83	KIP3	4	25	1607	60.2788	-147.9838	590	75	ev#171; zoo community assessment
HX11501.14	LiveNet	29	84	PWS-C	4	25	1715	60.4617	-147.9428	346	75	ev#173; zoo community assessment
HX11501.16	LiveNet	30	85	PWS2	4	25	1845	60.5348	-147.8053	738	75	ev#175; zoo community assessment
HX11501.18	LiveNet	31	86	PWS3	4	25	2004	60.6542	-147.6768	747	nd	ev#177
HX11601.05	LiveNet	32	87	PWS-C	4	26	1308	60.5342	-147.8015	733	nd	ev#185
HX11601.06	LiveNet	33	87	PWS-C	4	26	1315	60.5333	-147.8003	733	50	ev#186
HX11601.07	LiveNet	34	87	PWS-C	4	26	1322	60.5328	-147.8002	733	75	ev#187
HX11701.04	LiveNet	35	89	PWS-C	4	27	0700	60.5357	-147.8008	735	75	ev#196
HX11701.05	LiveNet	36	89	PWS-C	4	27	0715	60.5352	-147.8008	735	75	ev#197
HX11701.06	LiveNet	37	89	PWS-C	4	27	0722	60.5342	-147.8008	735	75	ev#198
HX11701.07	LiveNet	38	89	PWS-C	4	27	0725	60.5330	-147.8012	742	75	ev#199
HX11701.20	LiveNet	39	99	PWS-C	4	27	1903	60.5343	-147.8038	742	75	ev#212
HX11701.21	LiveNet	40	99	PWS-C	4	27	1914	60.5347	-147.8087	742	75	ev#213
HX11801.04	LiveNet	41	101	PWS-C	4	28	0732	60.5375	-147.8000	742	75	ev#220
HX11801.05	LiveNet	42	101	PWS-C	4	28	0720	60.5378	-147.8030	742	100	ev#221
HX11801.07	LiveNet	43	101	PWS-C	4	28	1400	60.5343	-147.8028	733	50	ev#223
HX11801.08	LiveNet	44	101	PWS-C	4	28	1404	60.5332	-147.8053	733	50	ev#224
HX11901.07	LiveNet	45	103	PWS-C	4	29	0730	60.5357	-147.8023	735	75	ev#236

Table 2: Collection of Live Animals for Shipboard Experiments (cont'd)

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11901.08	LiveNet	46	103	PWS-C	4	29	0745	60.5343	-147.7982	735	75	ev#237
HX11901.09	LiveNet	47	103	PWS-C	4	29	0756	60.5332	-147.7958	735	100	ev#238
HX11901.15	LiveNet	48	103	PWS-C	4	29	1616	60.5367	-147.7988	738	100	ev#244; for CHNs
HX12001.04	LiveNet	49	113	PWS-C	4	30	0834	60.5355	-147.8030	737	75	ev#254
HX12001.05	LiveNet	50	113	PWS-C	4	30	0845	60.5358	-147.8020	737	50	ev#255
HX12001.06	LiveNet	51	113	PWS-C	4	30	0852	60.5363	-147.8013	737	50	ev#256; collect for AJ Paul

Table 3: CTD Casts

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX10701.01	CTD1	1	1	OS-C	4	17	1905	58.5402	-148.2098	1555	1505	ev#001; bottom depth increase
HX10701.07	CTD2	2	1	OS-C	4	17	2159	58.5410	-148.2130	1555	10	ev#007; water for grazing expts #1
HX10701.09	CTD1	3	1	OS-C	4	17	2327	58.5407	-148.2125	1500	500	ev#009; no water samples
HX10801.03	CTD1	4	2	OS-Ge	4	18	0223	58.5783	-148.0583	1805	1610	ev#012
HX10801.11	CTD2	5	3	OS-C	4	18	0845	58.5408	-148.2173	1480	110	ev#020; water for grazing expts #2
HX10801.12	CTD1	6	3	OS-C	4	18	1200	58.5408	-148.2123	1470	500	ev#021
HX10801.13	CTD1	7	4	OS-Gc	4	18	1414	58.6640	-148.1208	783	510	ev#022; outer shelf grid survey
HX10801.14	CTD1	8	5	OS-Gb	4	18	1518	58.6285	-148.2807	554	549	ev#023
HX10801.15	CTD1	9	6	OS-Gd	4	18	1639	58.5375	-148.3677	612	500	ev#024; grid survey
HX10801.16	CTD1	10	7	OS-Gg	4	18	1800	58.4630	-148.1433	1810	1500	ev#025; GAK 10i
HX10801.17	CTD1	11	8	OS-Gh	4	18	1945	58.5133	-148.9848	2116	500	ev#026; grid survey
HX10801.19	CTD1	12	9	OS-C	4	18	2216	58.5422	-148.2132	1464	500	ev#028; GAK 10 no water collected
HX10901.02	CTD1	13	10	OS-Gf	4	19	0021	58.4233	-148.3102	1331	1284	ev#031; grid survey
HX10901.04	CTD1	14	11	GAK11	4	19	0322	58.3890	-148.0720	1431	1411	ev#033; outer Seward line HongbIn only water
HX10901.05	CTD1	15	12	GAK12	4	19	0525	58.2495	-147.9327	2200	1500	ev#034; outer Seward line HongbIn only water
HX10901.06	CTD1	16	13	GAK13	4	19	0725	58.0970	-147.7947	2150	1500	ev#035; outer Seward line HongbIn only water
HX10901.07	CTD1	17	14	OS-C	4	19	1200	58.5403	-148.2153	1465	500	ev#036; GAK 10
HX10901.11	CTD2	18	14	OS-C	4	19	1351	58.5417	-148.2123	1465	26	ev#040; water at 10m for expts #3
HX10901.12	CTD2	19	14	OS-C	4	19	1426	58.5420	-148.2128	1465	26	ev#041; water at 10m for expts #3
HX10901.13	CTD1	20	15	GAK9	4	19	1701	58.6803	-148.3610	277	275	ev#042
HX10901.14	CTD1	21	16	GAK8I	4	19	1740	58.7440	-148.4192	287	285	ev#043
HX10901.15	CTD1	22	17	GAK8I	4	19	1834	58.7920	-148.4888	291	286	ev#044; Seward line survey
HX10901.17	CTD1	23	18	OS-C	4	19	2215	58.5370	-148.2202	1470	500	ev#046; no water collected
HX11001.02	CTD1	24	19	OS-Ga	4	20	0027	58.5918	-148.4252	234	225	ev#049; bottles 1-4 only, no surface water
HX11001.04	CTD1	25	19	OS-Ga	4	20	0141	58.5922	-148.4387	234	25	ev#051; cast for surface water
HX11001.08	CTD1	26	21	MS-C	4	20	1020	59.0183	-148.7705	150	150	ev#055
HX11001.12	CTD2	27	21	MS-C	4	20	1120	59.1175	-148.7690	152	50	ev#059; for fsw dilutions
HX11001.13	CTD2	28	21	MS-C	4	20	1218	59.1173	-148.7698	152	50	ev#060; for grazing exps. #4
HX11001.14	CTD1	29	22	GAK7I	4	20	1836	58.8813	-148.5588	300	294	ev#061; Seward Line survey
HX11001.15	CTD1	30	23	GAK7I	4	20	1937	58.9712	-148.6332	245	242	ev#062
HX11001.16	CTD1	31	24	GAK6I	4	20	2229	59.0453	-148.7025	185	180	ev#063
HX11001.18	CTD1	32	25	MS-C	4	20	2215	59.1177	-148.7715	151	140	ev#065
HX11101.02	CTD1	33	26	MS-Ge	4	21	0037	59.1608	-148.6235	145	137	ev#068
HX11101.07	CTD1	34	27	MS-C	4	21	0708	58.1153	-148.7748	149	50	ev#073; water for grazing expts #5
HX11101.08	CTD1	35	27	MS-C	4	21	1205	59.1175	-148.7722	152	148	ev#074
HX11101.09	CTD1	36	28	GAK5	4	21	1333	59.2617	-148.9092	168	166	ev#075; Seward Line survey
HX11101.10	CTD1	37	29	GAK5I	4	21	1447	59.1912	-148.8385	167	164	ev#076
HX11101.11	CTD1	38	30	GAK6I	4	21	1702	59.0452	-148.7010	191	190	ev#077
HX11101.12	CTD1	39	31	MS-Gf	4	21	1823	59.0023	-148.8550	216	215	ev#078; Mid shelf grid survey
HX11101.13	CTD1	40	32	MS-Gd	4	21	1919	59.0768	-148.9287	147	146	ev#079
HX11101.14	CTD1	41	33	MS-Ga	4	21	2007	59.1500	-148.9963	165	162	ev#080
HX11101.15	CTD1	42	34	MS-Gb	4	21	2111	59.1905	-148.8402	167	165	ev#081
HX11101.16	CTD1	43	35	MS-Gc	4	21	2219	59.2300	-148.6832	122	122	ev#082
HX11101.17	CTD1	44	36	MS-Gh	4	21	2345	59.0847	-148.5940	213	210	ev#083
HX11201.01	CTD1	45	37	GAK4I	4	22	0210	59.3353	-148.9802	197	190	ev#084; Seward line survey
HX11201.02	CTD1	46	38	GAK4I	4	22	0258	59.4085	-149.0522	200	195	ev#085
HX11201.03	CTD1	47	39	GAK3I	4	22	0345	59.4808	-149.1215	207	197	ev#086
HX11201.04	CTD1	48	40	GAK3	4	22	0434	59.5542	-149.1898	215	210	ev#087; ACC survey

Table 3: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11201.05	CTD1	49	41	GAK2I	4	22	0522	59.6263	-149.2617	214	205	ev#088
HX11201.06	CTD1	50	42	ACC2	4	22	0553	59.6580	-149.2955	220	214	ev#089
HX11201.07	CTD1	51	43	GAK2	4	22	0640	59.6915	-149.3282	226	222	ev#090
HX11201.08	CTD1	52	44	ACC1	4	22	0715	59.7292	-149.3637	245	237	ev#091
HX11201.09	CTD1	53	45	GAK1I	4	22	0750	59.7672	-149.3973	260	nd	ev#092; no header file, repeat cast
HX11201.10	CTD1	54	45	GAK1I	4	22	0820	59.7682	-149.3987	262	257	ev#093; repeat of previous cast
HX11201.11	CTD2	55	46	ACC2	4	22	0924	59.6570	-149.2970	220	215	ev#094
HX11201.16	CTD2	56	47	IS-C	4	22	1104	59.6597	-149.2985	220	50	ev#099; for fsw
HX11201.17	CTD1	57	47	IS-C	4	22	1224	59.6580	-149.2948	222	47	ev#100; water for grazing expts #6
HX11201.18	CTD1	58	48	GAK1	4	22	2040	59.8442	-149.4663	272	263	ev#101
HX11201.20	CTD1	59	49	IS-C	4	22	2217	59.6552	-149.2962	218	nd	ev#103
HX11301.01	CTD1	60	50	IS-Ge	4	23	0013	59.7378	-149.2063	262	253	ev#106
HX11301.11	CTD2	61	51	IS-C	4	23	0843	59.6582	-149.2937	219	50	ev#116; water for filtration
HX11301.12	CTD1	62	51	IS-C	4	23	0937	59.6570	-149.2910	218	51	ev#117; water for grazing expts #7
HX11301.13	CTD1	63	51	IS-C	4	23	1204	59.6588	-149.2930	218	nd	ev#118; core station profile
HX11301.15	CTD1	64	52	GAK1I	4	23	1517	59.7658	-149.3953	263	255	ev#120; ACC survey
HX11301.16	CTD1	65	53	ACC1	4	23	1550	59.7292	-149.3605	245	238	ev#121;
HX11301.17	CTD1	66	54	GAK2	4	23	1623	59.6920	-149.3257	228	224	ev#122
HX11301.18	CTD1	67	55	ACC2	4	23	1658	59.6592	-149.2898	220	215	ev#123
HX11301.19	CTD1	68	56	GAK2I	4	23	1727	59.6263	-149.2560	214	210	ev#124
HX11301.20	CTD1	69	57	GAK3	4	23	1812	59.5523	-149.1875	215	212	ev#125
HX11301.21	CTD1	70	58	IS-Gf	4	23	1859	59.5482	-149.3482	215	204	ev#126; inner shelf grid survey
HX11301.22	CTD1	71	59	IS-Gd	4	23	1932	59.5808	-149.3815	209	203	ev#127
HX11301.23	CTD1	72	60	IS-Ga	4	23	2009	59.6137	-149.4148	220	219	ev#128
HX11301.24	CTD1	73	61	IS-Gh	4	23	2122	59.7035	-149.1688	250	245	ev#129
HX11301.25	CTD1	74	62	IS-Ge	4	23	2155	59.7353	-149.2057	259	252	ev#130
HX11301.26	CTD1	75	63	IS-Gc	4	23	2225	59.7690	-149.2412	265	260	ev#131
HX11301.28	CTD1	76	64	IS-C	4	23	2335	59.6577	-149.2943	220	210	ev#133
HX11401.02	CTD1	77	65	IS-Gf	4	24	0136	59.5485	-149.3490	212	207	ev#136
HX11401.04	CTD1	78	66	GAK1I	4	24	1043	59.7670	-149.3965	260	257	ev#138; ACC survey
HX11401.05	CTD1	79	67	ACC1	4	24	1120	59.7243	-149.3633	244	243	ev#139
HX11401.06	CTD1	80	68	GAK2	4	24	1156	59.6918	-149.3278	228	227	ev#140
HX11401.07	CTD1	81	69	ACC2	4	24	1229	59.6593	-149.2923	220	218	ev#141
HX11401.08	CTD1	82	70	GAK2I	4	24	1259	59.6270	-149.2567	215	212	ev#142
HX11401.09	CTD1	83	71	GAK3	4	24	1345	59.5537	-149.1855	215	211	ev#143
HX11401.10	CTD2	84	72	IS-C	4	24	1444	59.6592	-149.2943	220	218	ev#144
HX11401.14	CTD2	85	72	IS-C	4	24	1558	59.6595	-149.2943	220	5	ev#148; dilution exp #8 filtrate
HX11401.15	CTD1	86	72	IS-C	4	24	1640	59.6600	-149.2932	220	5	ev#149; water for grazing exp.#8
HX11401.16	CTD1	87	73	GAK3	4	24	1738	59.5537	-149.1858	215	209	ev#150; ACC survey
HX11401.17	CTD1	88	74	GAK2I	4	24	1823	59.6267	-149.2588	215	211	ev#151
HX11401.18	CTD1	89	75	ACC2	4	24	1854	59.6587	-149.2930	220	216	ev#152
HX11401.19	CTD1	90	76	GAK2	4	24	1924	59.6912	-149.3270	226	225	ev#153
HX11401.20	CTD1	91	77	ACC1	4	24	2001	59.7282	-149.3655	243	241	ev#154
HX11401.21	CTD1	92	78	GAK1I	4	24	2036	59.7662	-149.3990	260	259	ev#155
HX11401.23	CTD1	93	79	IS-C	4	24	2213	59.6592	-149.2947	218	nd	ev#157; no water collected
HX11401.26	CTD1	94	80	IS-Ga	4	24	2346	59.6102	-149.4215	235	nd	ev#160; no water collected
HX11501.08	CTD1	95	81	IS-C	4	25	0816	59.5927	-149.2977	220	50	ev#168a; water for exp. #9
HX11501.09	CTD1	96	81	IS-C	4	25	0816	59.5927	-149.2977	220	5	ev#168b; water for exp. #9

Table 3: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11501.10	CTD1	97	81	IS-C	4	25	0916	59.6595	-149.2952	220	214	ev#169; water for exp. #9
HX11501.11	CTD1	98	82	KIP2	4	25	1553	60.2787	-147.9843	593	150	ev#170
HX11501.13	CTD1	99	84	PWS-C	4	25	1702	60.3802	-147.9383	346	150	ev#172
HX11501.15	CTD1	100	85	PWS2	4	25	1834	60.5345	-147.8033	747	150	ev#174
HX11501.17	CTD1	101	86	PWS3	4	25	1951	60.6557	-147.6785	760	150	ev#176
HX11501.19	CTD1	102	87	PWS-C	4	25	2156	60.5353	-147.8035	730	727	ev#178
HX11601.04	CTD2	103	87	PWS-C	4	26	1202	60.5348	-147.7997	747	724	ev#184
HX11601.08	CTD2	104	87	PWS-C	4	26	1353	60.5357	-147.8015	747	99	ev#188; fsw for expt #10
HX11601.09	CTD1	105	87	PWS-C	4	26	1434	60.5352	-147.8032	747	50	ev#189; water for grazing expts #10
HX11601.11	CTD1	106	87	PWS-C	4	26	2242	60.5355	-147.8038	725	747	ev#191; no water collected
HX11701.02	CTD1	107	88	PWS3	4	27	0058	60.6553	-147.6812	752	760	ev#194
HX11701.08	CTD1	108	89	PWS-C	4	27	0753	60.5353	-147.8045	747	100	ev#200; water for fsw
HX11701.09	CTD1	109	89	PWS-C	4	27	0845	60.5357	-147.8053	747	99	ev#201; water for grazing expts #11
HX11701.10	CTD1	110	90	PWS-Gc	4	27	1024	60.5628	-147.6788	714	200	ev#202; PWS grid survey
HX11701.11	CTD1	111	91	PWS-Gb	4	27	1056	60.5813	-147.7608	764	200	ev#203
HX11701.12	CTD1	112	92	PWS-Ga	4	27	1125	60.5953	-147.8312	380	200	ev#204
HX11701.13	CTD1	113	93	PWS-Gd	4	27	1158	60.5500	-147.8727	505	200	ev#205
HX11701.14	CTD1	114	94	PWS-C	4	27	1232	60.5360	-147.8073	747	729	ev#206; problems-not all water collected—recast
HX11701.15	CTD1	115	94	PWS-C	4	27	1314	60.5382	-147.8063	747	50	ev#207
HX11701.16	CTD1	116	95	PWS-Gg	4	27	1346	60.4897	-147.7892	237	229	ev#208
HX11701.17	CTD1	117	96	PWS-Gf	4	27	1422	60.4898	-147.8317	521	200	ev#209
HX11701.18	CTD1	118	97	PWS-Ge	4	27	1454	60.5133	-147.8995	215	214	ev#210
HX11701.19	CTD1	119	98	PWS-Gh	4	27	1538	60.4418	-147.8823	352	200	ev#211
HX11701.23	CTD1	120	99	PWS-C	4	27	2246	60.5358	-147.8053	747	206	ev#215
HX11801.02	CTD1	121	100	PWS1	4	28	0112	60.3795	-147.9627	363	363	ev#218
HX11801.06	CTD1	122	101	PWS-C	4	28	1303	60.5360	-147.8043	735	728	ev#222
HX11801.09	CTD1	123	101	PWS-C	4	28	1426	60.5357	-147.8063	747	50	ev#225; water for fsw
HX11801.10	CTD1	124	101	PWS-C	4	28	1456	60.5358	-147.8043	747	50	ev#226; water for grazing expts #12
HX11801.12	CTD1	125	101	PWS-C	4	28	2249	60.5357	-147.8040	747	742	ev#228
HX11901.02	CTD1	126	102	PP1	4	29	0116	60.6382	-148.0157	400	425	ev#231
HX11901.10	CTD2	127	103	PWS-C	4	29	0850	60.5338	-147.8043	747	50/5	ev#239; for dilution expt filtered sw
HX11901.11	CTD1	128	103	PWS-C	4	29	0920	60.5343	-147.8050	747	50/3	ev#240; sw for grazing experiments #13
HX11901.12	CTD1	129	103	PWS-C	4	29	1202	60.5352	-147.8008	747	654	ev#241; CTD aborted before bottom
HX11901.13	CTD2	130	103	PWS-C	4	29	1234	60.5322	-147.7910	733	50	ev#242; water coll. corresponding to profile 129
HX11901.14	CTD1	131	103	PWS-C	4	29	1533	60.5345	-147.8045	747	53	ev#243; water for carboy comparison expt
HX11901.16	CTD1	132	104	MS4	4	29	2032	59.9205	-147.8297	111	109	ev#245; Montague Strait line survey
HX11901.17	CTD1	133	105	MS3	4	29	2049	59.9190	-147.8582	170	169	ev#246
HX11901.18	CTD1	134	106	MS2	4	29	2110	59.9435	-147.9787	196	191	ev#247
HX11901.19	CTD1	135	107	MS1	4	29	2132	59.9545	-147.9290	166	162	ev#248
HX11901.20	CTD1	136	108	HB5	4	29	2333	60.1338	-147.4488	40	39	ev#249; Hogan Bay line survey
HX11901.21	CTD1	137	109	HB4	4	29	2351	60.1488	-147.5035	105	103	ev#250
HX12001.01	CTD1	138	110	HB3	4	30	0015	60.1640	-147.5758	90	86	ev#251
HX39901.02	CTD1	139	111	HB2	4	30	0037	60.1797	-147.6410	175	168	ev#252
HX12001.03	CTD1	140	112	HB1	4	30	0103	60.1928	-147.6997	248	245	ev#253
HX12001.07	CTD1	141	113	PWS-C	4	30	1203	60.5360	-147.8025	747	730	ev#257
HX12001.08	CTD1	142	114	CF15	4	30	2041	59.4493	-148.8653	183	178	ev#258; Cape Fairfield line survey
HX12001.09	CTD1	143	115	CF14	4	30	2108	59.4838	-148.8673	173	168	ev#259
HX12001.10	CTD1	144	116	CF13	4	30	2133	59.5170	-148.8682	174	171	ev#260

Table 3: CTD Casts (cont'd)

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX12001.11	CTD1	145	117	CF12	4	30	2200	59.5503	-148.8670	186	181	ev#261
HX12001.12	CTD1	146	118	CF11	4	30	2227	59.5840	-148.8677	178	176	ev#262
HX12001.13	CTD1	147	119	CF10	4	30	2254	59.6172	-148.8673	177	175	ev#263
HX12001.14	CTD1	148	120	CF9	4	30	2320	59.6502	-148.8685	180	175	ev#264
HX12001.15	CTD1	149	121	CF8	4	30	2347	59.6835	-148.8708	180	178	ev#265
HX12101.01	CTD1	150	122	CF7	5	1	0013	59.7172	-148.8665	183	180	ev#266
HX12101.02	CTD1	151	123	CF6	5	1	0039	59.7503	-148.8662	190	187	ev#267
HX12101.03	CTD1	152	124	CF5	5	1	0105	59.7840	-148.8655	195	192	ev#268
HX12101.04	CTD1	153	125	CF4	5	1	0132	59.6675	-148.8663	183	181	ev#269
HX12101.05	CTD1	154	126	CF3	5	1	0157	59.8503	-148.8660	163	158	ev#270
HX12101.06	CTD1	155	127	CF2	5	1	0223	59.8837	-148.8657	115	112	ev#271
HX12101.07	CTD1	156	128	CF1	5	1	0243	59.9088	-148.8648	85	82	ev#272

Table 4: MOCNESS Sampling

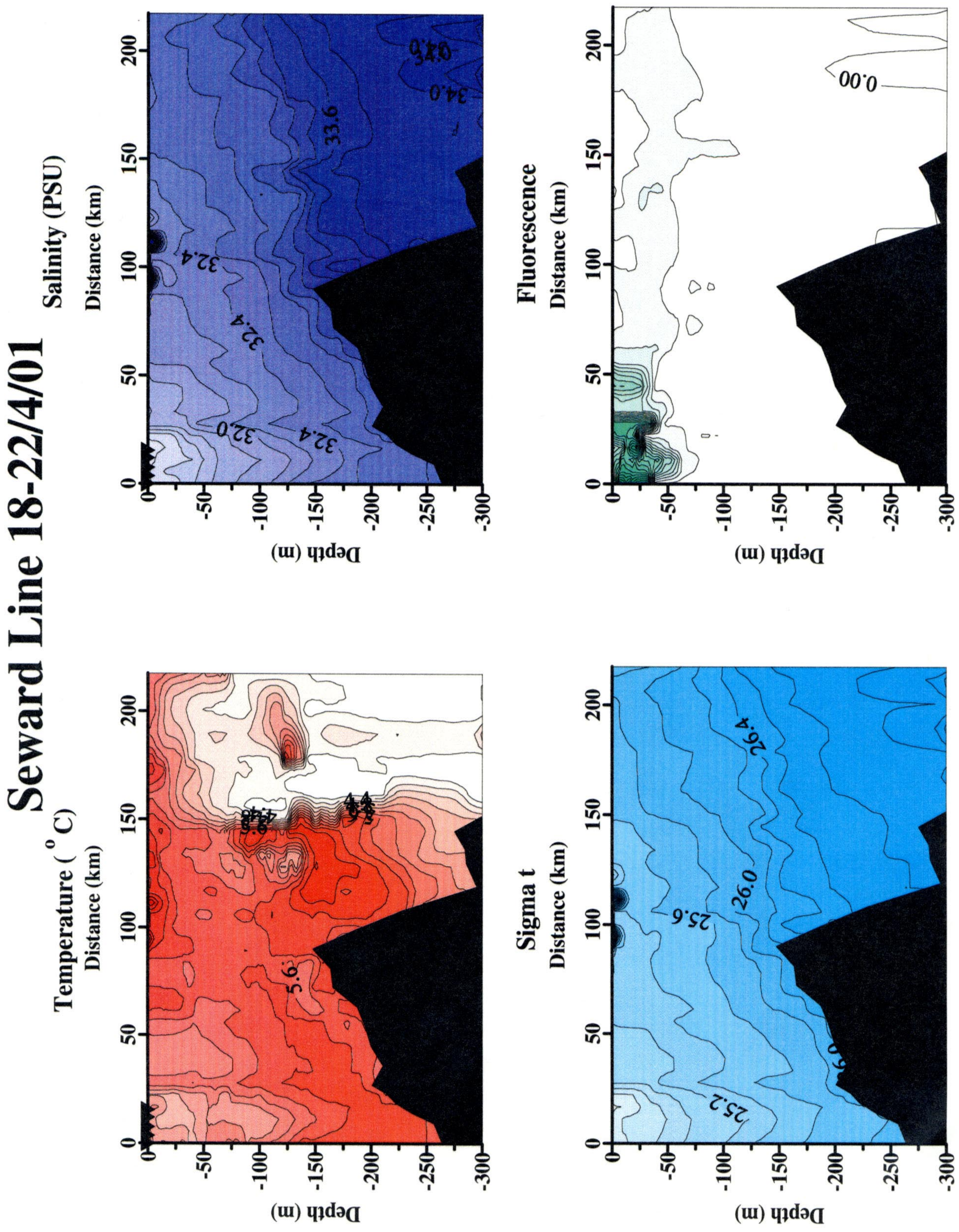
Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX10801.01	MOC	1	1	OS-C	4	18	0031	58.5405	-148.2133	1475	100	ev#010
HX10801.04	MOC	2	2	OS-Ge	4	18	0354	58.5658	-148.0453	nd	100	ev#013; ? bottle 1 depth
HX10801.20	MOC	3	9	OS-C	4	18	2252	58.5333	-148.2232	nd	100	ev#029
HX10901.03	MOC	4	10	OS-Gf	4	19	0146	58.4268	-148.3005	1331	100	ev#032
HX10901.18	MOC	5	18	OS-C	4	19	2248	58.5340	-148.2223	1470	100	ev#047
HX11001.03	MOC	6	19	OS-Ga	4	20	0044	58.5913	-148.4430	234	100	ev#050
HX11001.19	MOC	7	25	MS-C	4	20	2237	59.1172	-148.7722	151	100	ev#066
HX11101.03	MOC	8	26	MS-Ge	4	21	0054	59.1635	-148.6298	138	100	ev#069
HX11201.21	MOC	9	49	IS-C	4	22	2239	59.6590	-149.2970	220	100	ev#104
HX11301.02	MOC	10	50	IS-Ge	4	23	0035	59.7400	-149.2062	262	100	ev#107
HX11301.29	MOC	11	64	IS-C	4	23	2349	59.6573	-149.2943	220	100	ev#134
HX11401.03	MOC	12	65	IS-Gf	4	24	0154	59.5468	-149.3493	214	100	ev#137
HX11401.24	MOC	13	79	IS-C	4	24	2231	59.6585	-149.2992	218	100	ev#158
HX11501.01	MOC	14	80	IS-Ga	4	25	0050	59.6065	-149.4308	272	100	ev#161
HX11501.21	MOC	15	87	PWS-C	4	25	2322	60.5333	-147.8037	730	100	ev#180
HX11601.12	MOC	16	87	PWS-C	4	26	2318	60.5352	-147.8042	742	100	ev#192
HX11701.03	MOC	17	88	PWS3	4	27	0138	60.6528	-147.6832	754	100	ev#195
HX11701.24	MOC	18	99	PWS-C	4	27	2302	60.5365	-147.8088	740	100	ev#216
HX11801.03	MOC	19	100	PWS1	4	28	0146	60.3807	-147.9590	397	100	ev#219
HX11801.13	MOC	20	101	PWS-C	4	28	2326	60.5345	-147.8025	733	100	ev#229
HX11901.03	MOC	21	102	PP1	4	29	0138	60.6385	-147.0248	440	100	ev#232
HX12101.08	MOC	22	129	GAK2	5	1	0757	59.6858	-149.3350	230	212	ev#273; daytime for euphausiids

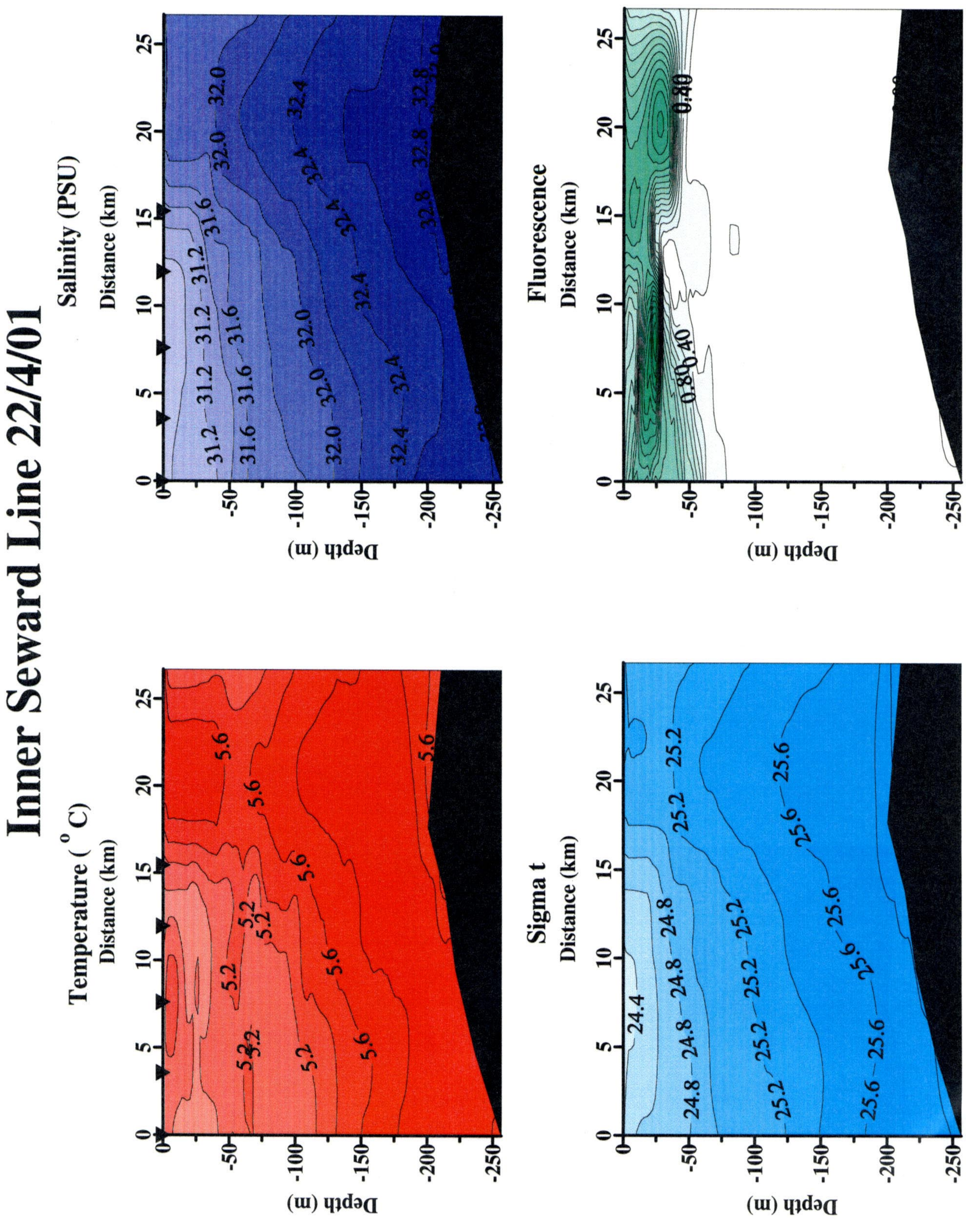
Table 5: Small CalVet Collection Nets

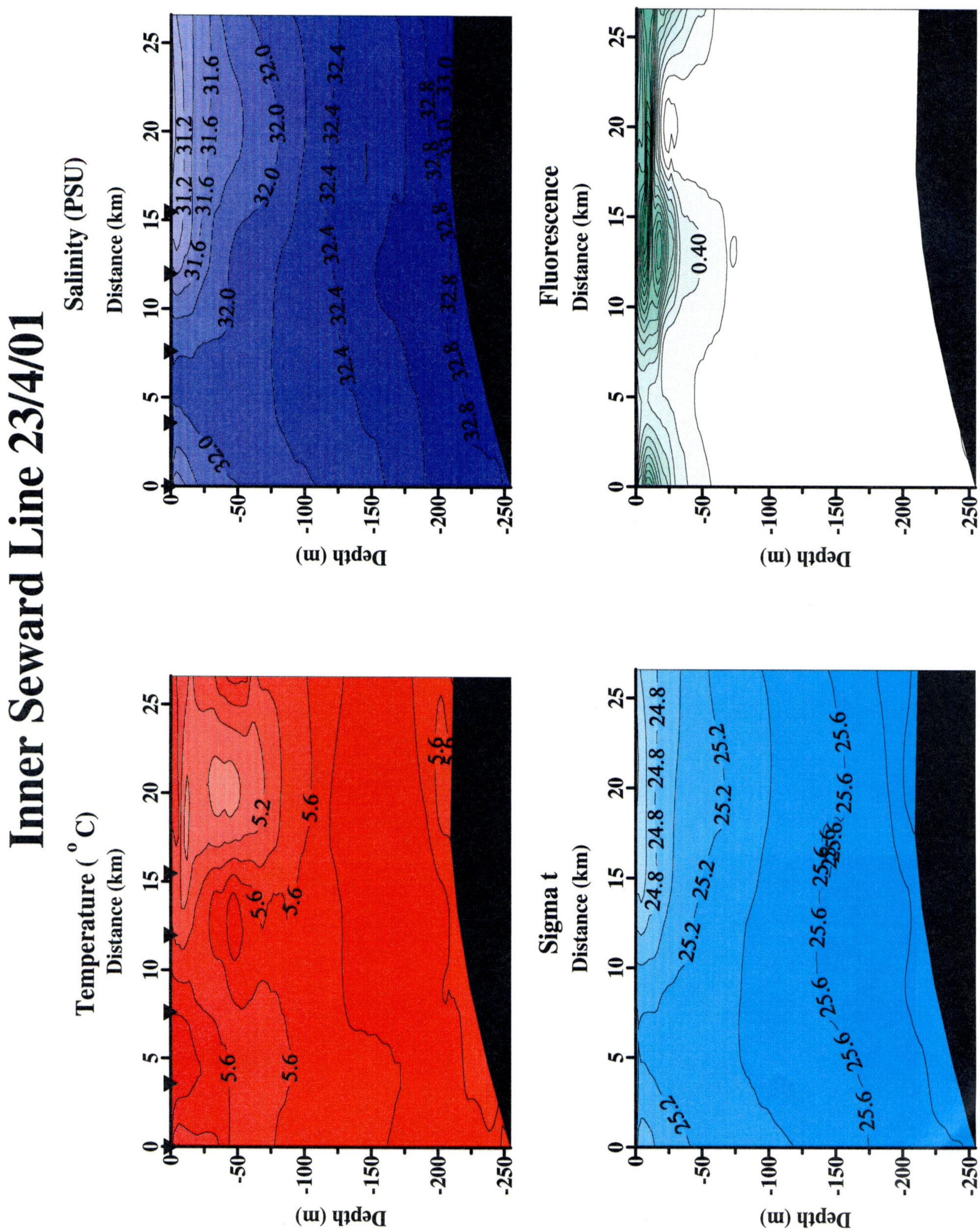
Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX10701.08	CalVET	1	1	OS-C	4	17	2305	58.5405	-148.2133	nd	100	ev#008
HX10801.02	CalVET	2	2	OS-Ge	4	18	0200	58.5405	-148.2133	nd	100	ev#011
HX10801.05	CalVET	3	3	OS-C	4	18	0724	58.5903	-148.2160	1480	100	ev#014
HX10801.06	CalVET	4	3	OS-C	4	18	0739	58.5903	-148.2160	1480	100	ev#015
HX10801.07	CalVET	5	3	OS-C	4	18	0753	58.6120	-148.2893	1482	100	ev#016
HX10801.18	CalVET	6	9	OS-C	4	18	2216	58.5400	-148.2153	1475	100	ev#027
HX10901.01	CalVET	7	10	OS-Gf	4	19	0012	58.4263	-148.3033	1331	100	ev#030
HX10901.16	CalVET	8	18	OS-C	4	19	2200	58.5410	-148.2117	1475	100	ev#045
HX11001.01	CalVET	9	19	OS-Ga	4	20	0015	58.5917	-148.4390	234	100	ev#048
HX11001.17	CalVET	10	25	MS-C	4	20	2202	59.1167	-148.7732	151	100	ev#064
HX11101.01	CalVET	11	26	MS-Ge	4	21	0022	59.1557	-148.6145	145	100	ev#067
HX11201.19	CalVET	12	49	IS-C	4	22	2207	59.6577	-149.2942	220	100	ev#102
HX11201.22	CalVET	13	50	IS-Ge	4	22	2353	59.7365	-149.2013	262	100	ev#105
HX11301.27	CalVET	14	64	IS-C	4	23	2321	59.6577	-149.2943	220	100	ev#132
HX11401.01	CalVET	15	65	IS-Gf	4	24	0128	59.5485	-149.3600	214	100	ev#135
HX11401.22	CalVET	16	79	IS-C	4	24	2200	59.6593	-149.2952	218	100	ev#156
HX11401.25	CalVET	17	80	IS-Ga	4	24	2335	59.6120	-149.4157	220	100	ev#159
HX11501.20	CalVET	18	87	PWS-C	4	25	2310	60.5345	-147.8042	730	100	ev#179
HX11601.10	CalVET	19	87	PWS-C	4	26	2230	60.5352	-147.8040	740	100	ev#190
HX11701.01	CalVET	20	88	PWS3	4	27	0050	60.6562	-147.6797	761	100	ev#193
HX11701.22	CalVET	21	99	PWS-C	4	27	2232	60.5362	-147.8045	740	100	ev#214
HX11801.01	CalVET	22	100	PWS1	4	28	0102	60.3797	-147.9383	354	100	ev#217
HX11801.11	CalVET	23	101	PWS-C	4	28	2235	60.5340	-147.8057	735	100	ev#227
HX11901.01	CalVET	24	102	PP1	4	29	0108	60.6378	-148.0105	402	100	ev#230

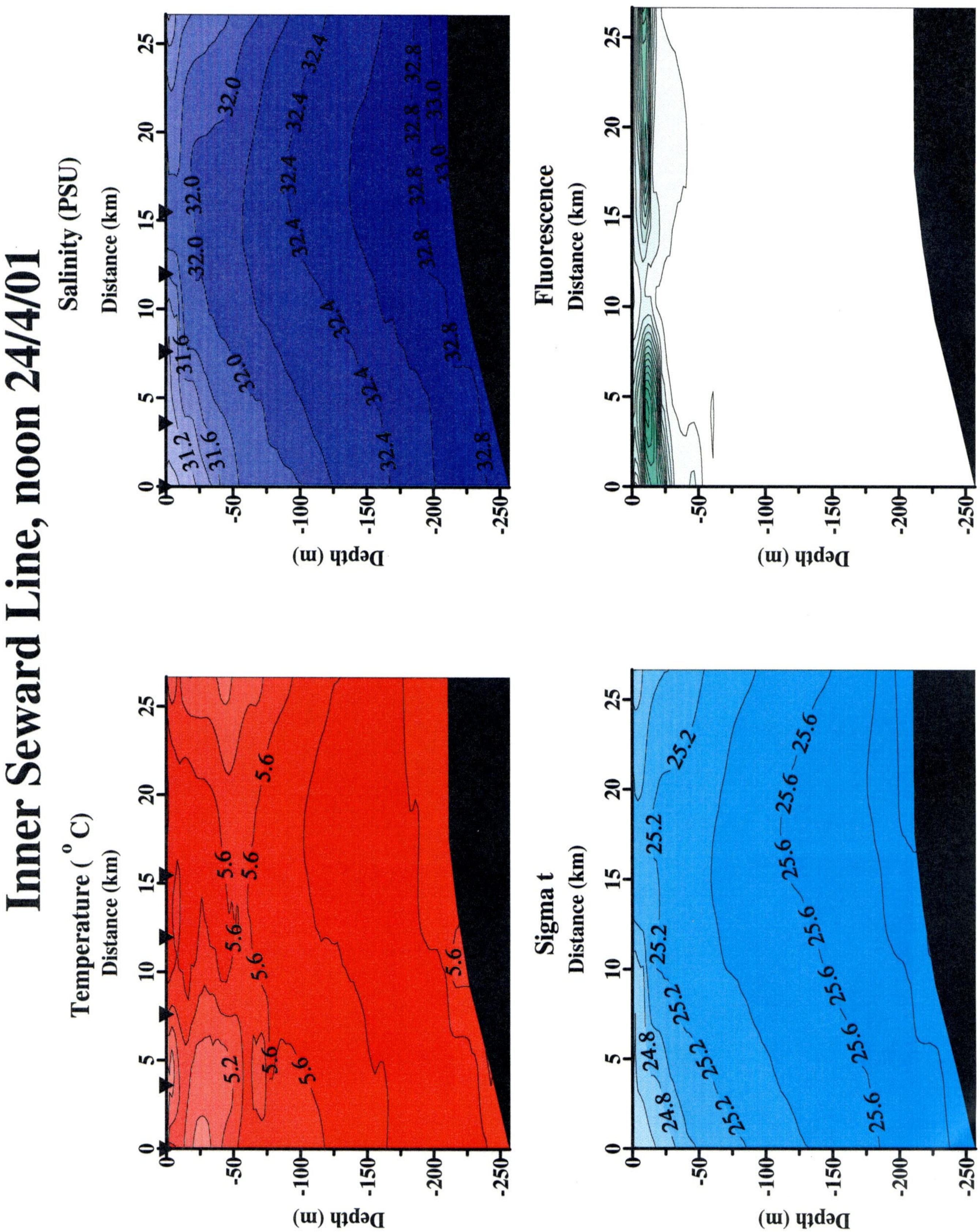
Table 6: CalVet53 Collection Nets

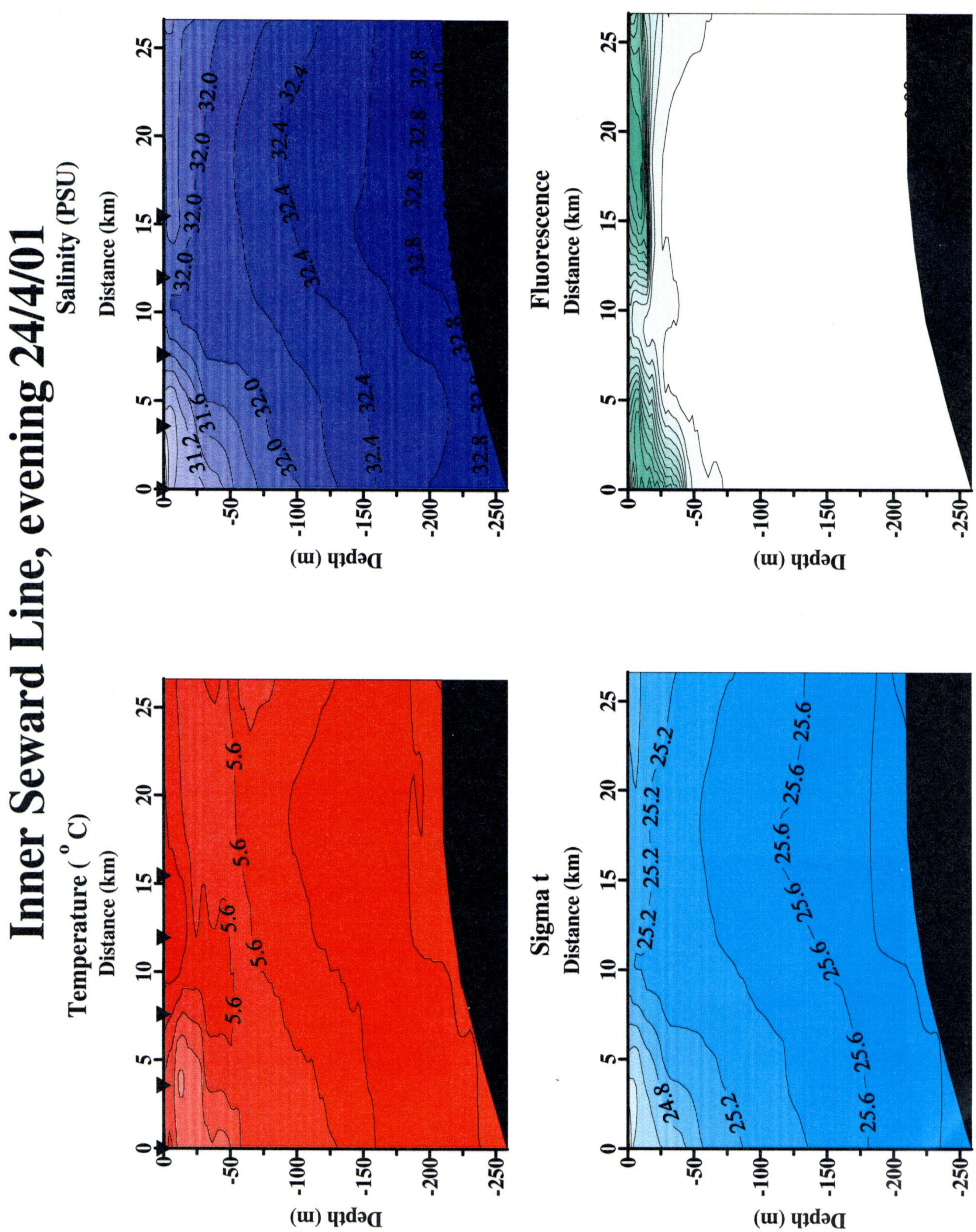
Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11001.05	CalVET53	1	20	OS-C	4	20	0601	58.5400	-148.2068	1400	100	ev#052; egg ratio
HX11001.06	CalVET53	2	20	OS-C	4	20	0616	58.5383	-148.2067	1400	100	ev#053; egg ratio
HX11001.07	CalVET53	3	20	OS-C	4	20	0630	58.5417	-148.2133	1400	100	ev#054; egg ratio
HX11101.04	CalVET53	4	27	MS-C	4	21	0611	59.1177	-148.7700	150	100	ev#070; egg ratio
HX11101.05	CalVET53	5	27	MS-C	4	21	0627	59.1180	-148.7750	150	100	ev#071; egg ratio
HX11101.06	CalVET53	6	27	MS-C	4	21	0642	59.1193	-148.7817	150	100	ev#072; egg ratio
HX11301.03	CalVET53	7	51	IS-C	4	23	0603	59.6568	-149.2915	220	100	ev#108; egg ratio
HX11301.04	CalVET53	8	51	IS-C	4	23	0619	59.6580	-149.2890	218	100	ev#109; egg ratio
HX11301.05	CalVET53	9	51	IS-C	4	23	0635	59.6575	-149.2913	219	100	ev#110; egg ratio
HX11501.02	CalVET53	10	81	IS-C	4	25	0622	59.6587	-149.2972	219	nd	ev#162; egg ratio
HX11501.03	CalVET53	11	81	IS-C	4	25	0637	59.6578	-149.3090	219	nd	ev#163; egg ratio
HX11501.04	CalVET53	12	81	IS-C	4	25	0655	59.6582	-149.2932	219	nd	ev#164; egg ratio
HX11601.01	CalVET53	13	87	PWS-C	4	26	0617	60.5350	-147.8020	742	100	ev#181; egg ratio
HX11601.02	CalVET53	14	87	PWS-C	4	26	0631	60.5337	-147.8058	735	100	ev#182; egg ratio
HX11601.03	CalVET53	15	87	PWS-C	4	26	0646	60.5327	-147.8100	735	100	ev#183; egg ratio
HX11901.04	CalVET53	16	103	PWS-C	4	29	0608	60.5350	-147.8008	740	100	ev#233; egg ratio
HX11901.05	CalVET53	17	103	PWS-C	4	29	0620	60.5335	-147.7950	733	100	ev#234; egg ratio
HX11901.06	CalVET53	18	103	PWS-C	4	29	0631	60.5315	-147.7922	720	100	ev#235; egg ratio

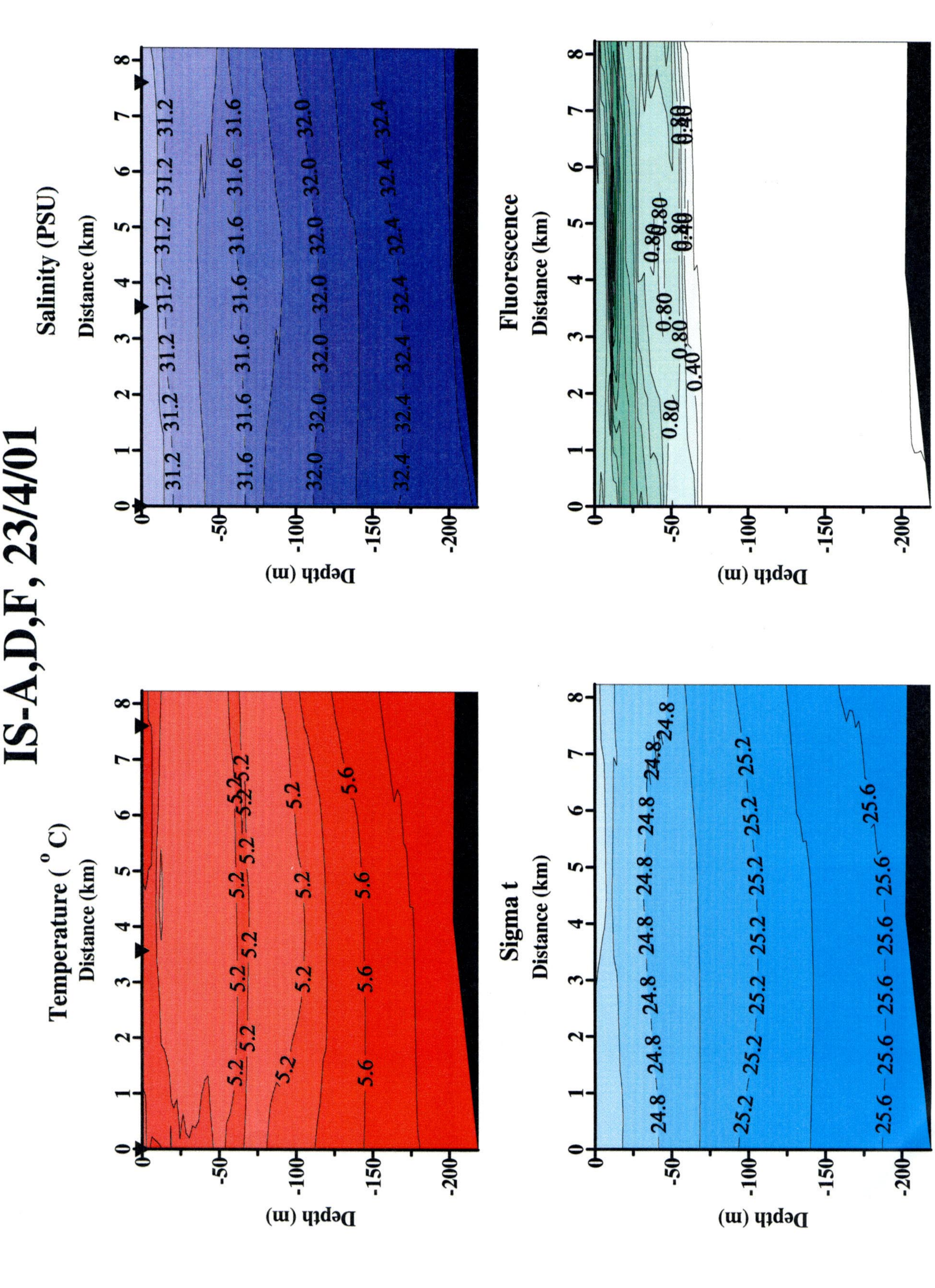

Seward Line 18-22/4/01
Temperature (°C)
Salinity (PSU)
Sigma t
Fluorescence
Distance (km)
Depth (m)
5.6
32.0
32.4
33.6
34.0
25.2
25.6
26.0
26.4
0.00

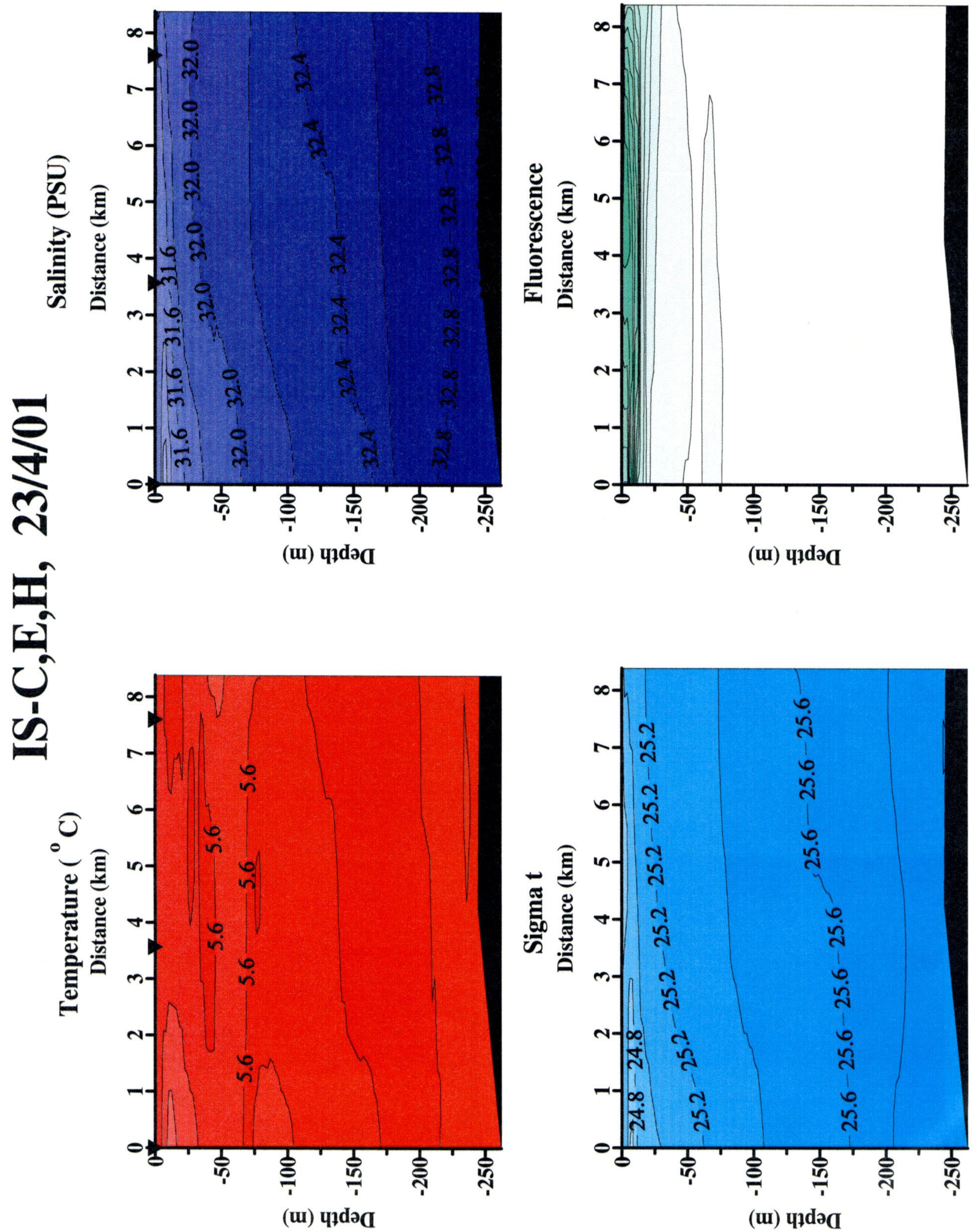

Inner Seward Line 22/4/01
Salinity (PSU)
Temperature (°C)
Fluorescence
Sigma t
Distance (km)
Depth (m)

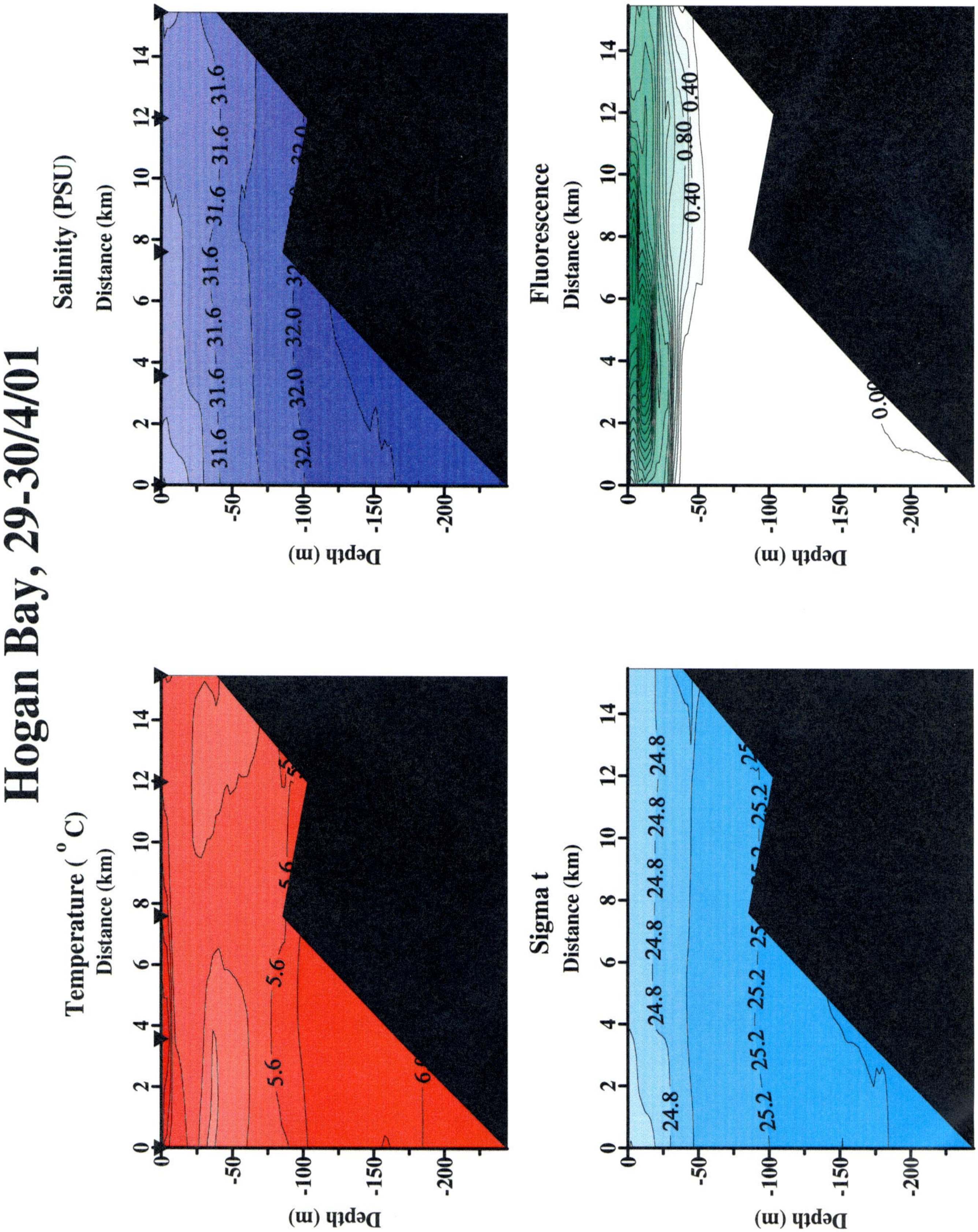

Inner Seward Line 23/4/01
Temperature (°C)
Salinity (PSU)
Sigma t
Fluorescence
Distance (km)
Depth (m)

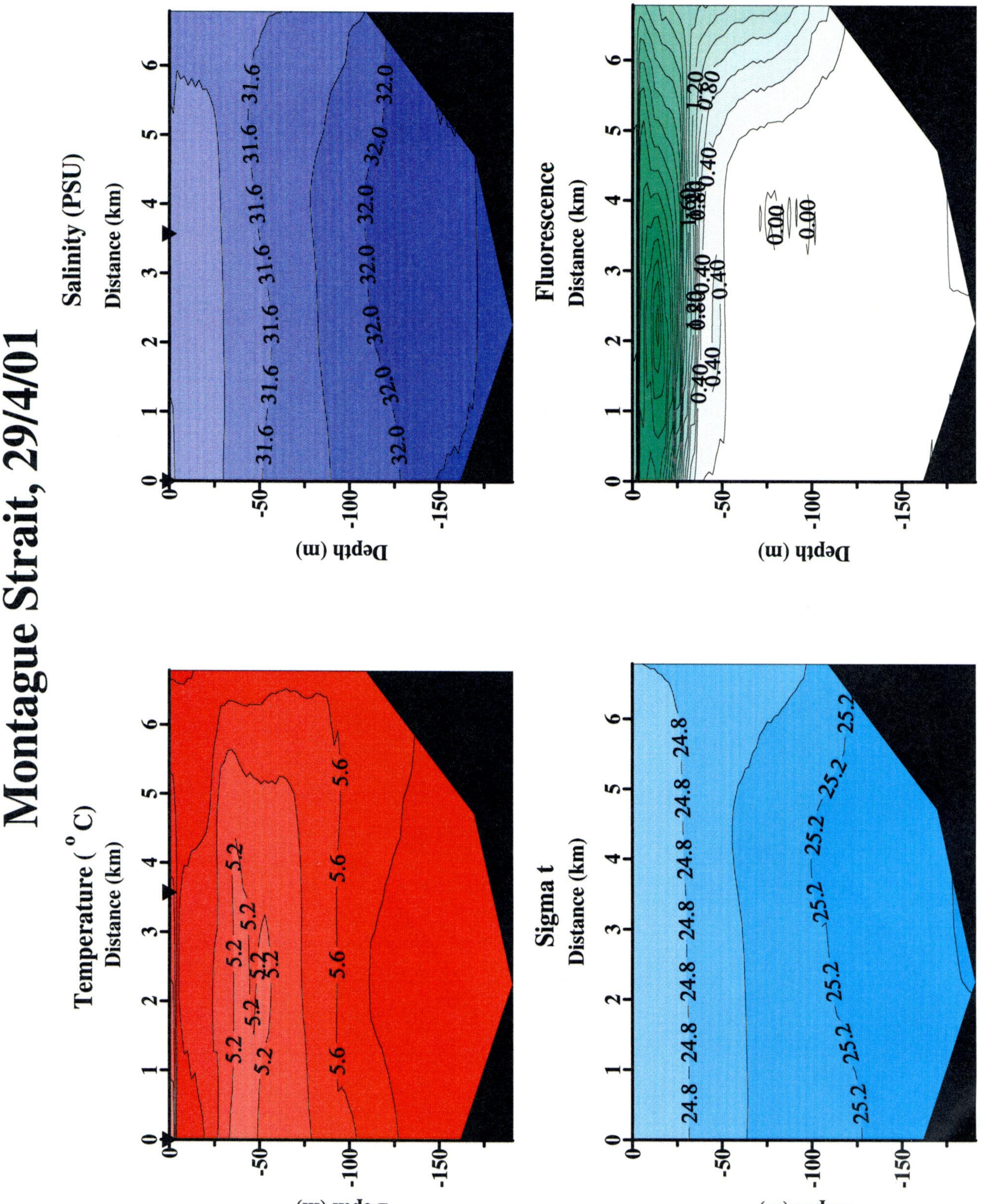

Inner Seward Line, noon 24/4/01
Salinity (PSU)
Distance (km)
Depth (m)
Fluorescence
Distance (km)
Depth (m)
Temperature (°C)
Distance (km)
Depth (m)
Sigma t
Distance (km)
Depth (m)

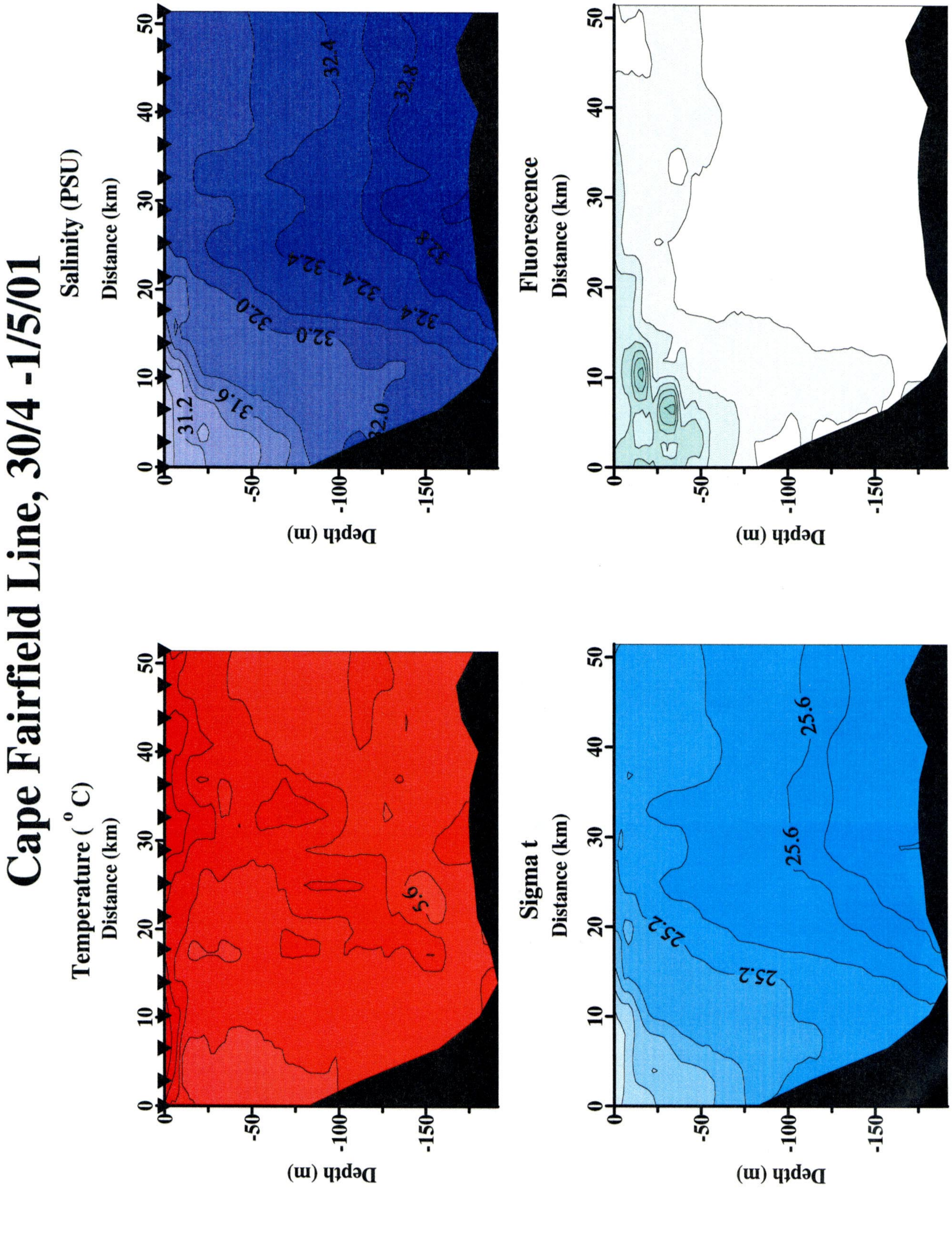

Inner Seward Line, evening 24/4/01
Salinity (PSU)
Temperature (°C)
Fluorescence
Sigma t
Distance (km)
Depth (m)


IS-A,D,F, 23/4/01
Temperature (°C)
Distance (km)
Depth (m)
Salinity (PSU)
Distance (km)
Depth (m)
Sigma t
Distance (km)
Depth (m)
Fluorescence
Distance (km)
Depth (m)


IS-C,E,H, 23/4/01
Salinity (PSU)
Temperature (°C)
Fluorescence
Sigma t
Distance (km)
Depth (m)


Hogan Bay, 29-30/4/01
Salinity (PSU)
Temperature (°C)
Fluorescence
Sigma t
Distance (km)
Depth (m)


Montague Strait, 29/4/01
Temperature (°C)
Salinity (PSU)
Sigma t
Fluorescence
Distance (km)
Depth (m)


Cape Fairfield Line, 30/4 -1/5/01
Salinity (PSU)
Distance (km)
Depth (m)
Fluorescence
Distance (km)
Depth (m)
Temperature (°C)
Distance (km)
Depth (m)
Sigma t
Distance (km)
Depth (m)

APPENDIX I

HX242 EVENT LOG

EVENT LOG CONTENTS

Column Label	Description
Event#	Unique identifier for each line of event log
Instrument (Instr)	CTD1: Conductivity Temperature Depth profile collected with Seabird SBE with 5 liter rosette, fluorescence; CTD2: Conductivity Temperature Depth profile collected with Seabird SBE with 10 liter rosette, no fluorescence; MOC: 1m^2 MOCNESs with 0.505 mm mesh; LiveNet: 0.75 m diameter ring net with 0.200 mm mesh for collecting animals for experiments; CalVET: quantitative zooplankton sampling with 25 cm diameter CalVET net, equipped with 0.150 mm mesh; towed vertically; CalVET53: zooplankton sampling with a 25 cm diameter;
Cast	Sequence # for a particular instrument
Station (Sta)	
Station Standard (Sta std)	
Day	Local time basis
Month (Mos)	Local time basis
Time	Local time
Latitude (Lat)	Decimal degrees; north is positive
Longitude (Long)	Decimal degrees; east is positive
Water Depth	Depth of bottom
Cast Depth	Maximum depth of deployment
Scientific Investigator (SI)	
Comments	

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX10701.01	CTD	1	1	OS-C	4	17	1905	58.5402	-148.2098	1555	1505	ev#001; bottom depth increase
HX10701.02	LiveNet	1	1	OS-C	4	17	2035	58.5408	-148.2143	nd	100	ev#002; Neocalanus
HX10701.03	LiveNet	nd	1	OS-C	4	17	2057	58.5348	-148.2240	nd	nd	ev#003; aborted tow-no cast #
HX10701.04	LiveNet	nd	1	OS-C	4	17	2117	58.5412	-148.2128	nd	nd	ev#004; aborted tow-no cast #
HX10701.05	LiveNet	2	1	OS-C	4	17	2130	58.5375	-148.2185	nd	50	ev#005
HX10701.06	LiveNet	3	1	OS-C	4	17	2146	58.5412	-148.2125	nd	50	ev#006
HX10701.07	CTD	2	1	OS-C	4	17	2159	58.5410	-148.2130	1555	10	ev#007; water for grazing expts #1
HX10701.08	CalVET	1	1	OS-C	4	17	2305	58.5405	-148.2133	nd	100	ev#008
HX10701.09	CTD	3	1	OS-C	4	17	2327	58.5407	-148.2125	1500	500	ev#009; no water samples
HX10801.01	MOC	1	1	OS-C	4	18	0031	58.5405	-148.2133	1475	100	ev#010
HX10801.02	CalVET	2	2	OS-Ge	4	18	0200	58.5405	-148.2133	nd	100	ev#011
HX10801.03	CTD	4	2	OS-Ge	4	18	0223	58.5783	-148.0583	1805	1610	ev#012
HX10801.04	MOC	2	2	OS-Ge	4	18	0354	58.5658	-148.0453	nd	100	ev#013; ? bottle 1 depth
HX10801.05	CalVET	3	3	OS-C	4	18	0724	58.5903	-148.2160	1480	100	ev#014
HX10801.06	CalVET	4	3	OS-C	4	18	0739	58.5903	-148.2160	1480	100	ev#015
HX10801.07	CalVET	5	3	OS-C	4	18	0753	58.6120	-148.2893	1482	100	ev#016
HX10801.08	LiveNet	4	3	OS-C	4	18	0812	58.5403	-148.2108	1482	50	ev#017
HX10801.09	LiveNet	5	3	OS-C	4	18	0822	58.5380	-148.2128	1475	50	ev#018
HX10801.10	LiveNet	6	3	OS-C	4	18	0828	58.5372	-148.2140	1475	75	ev#019
HX10801.11	CTD	5	3	OS-C	4	18	0845	58.5408	-148.2173	1480	110	ev#020; water for grazing expts #2
HX10801.12	CTD	6	3	OS-C	4	18	1200	58.5408	-148.2123	1470	500	ev#021
HX10801.13	CTD	7	4	OS-Gc	4	18	1414	58.6640	-148.1208	783	510	ev#022; outer shelf grid survey
HX10801.14	CTD	8	5	OS-Gb	4	18	1518	58.6285	-148.2807	554	549	ev#023
HX10801.15	CTD	9	6	OS-Gd	4	18	1639	58.5375	-148.3677	612	500	ev#024; grid survey
HX10801.16	CTD	10	7	OS-Gg	4	18	1800	58.4630	-148.1433	1810	1500	ev#025; GAK 10i
HX10801.17	CTD	11	8	OS-Gh	4	18	1945	58.5133	-148.9848	2116	500	ev#026; grid survey
HX10801.18	CalVET	6	9	OS-C	4	18	2216	58.5400	-148.2153	1475	100	ev#027
HX10801.19	CTD	12	9	OS-C	4	18	2216	58.5422	-148.2132	1464	500	ev#028; GAK 10 no water collected
HX10801.20	MOC	3	9	OS-C	4	18	2252	58.5333	-148.2232	nd	100	ev#029
HX10901.01	CalVET	7	10	OS-Gf	4	19	0012	58.4263	-148.3033	1331	100	ev#030
HX10901.02	CTD	13	10	OS-Gf	4	19	0021	58.4233	-148.3102	1331	1284	ev#031; grid survey
HX10901.03	MOC	4	10	OS-Gf	4	19	0146	58.4268	-148.3005	1331	100	ev#032
HX10901.04	CTD	14	11	GAK11	4	19	0322	58.3890	-148.0720	1431	1411	ev#033; outer Seward line HongbIn only water
HX10901.05	CTD	15	12	GAK12	4	19	0525	58.2495	-147.9327	2200	1500	ev#034; outer Seward line HongbIn only water
HX10901.06	CTD	16	13	GAK13	4	19	0725	58.0970	-147.7947	2150	1500	ev#035; outer Seward line HongbIn only water
HX10901.07	CTD	17	14	OS-C	4	19	1200	58.5403	-148.2153	1465	500	ev#036; GAK 10
HX10901.08	LiveNet	7	14	OS-C	4	19	1305	58.5397	-148.2180	nd	50	ev#037; GAK 10
HX10901.09	LiveNet	8	14	OS-C	4	19	1315	58.5385	-148.2213	nd	75	ev#038; GAK 10
HX10901.10	LiveNet	9	14	OS-C	4	19	1325	58.5372	-148.2245	nd	75	ev#039; GAK 10
HX10901.11	CTD	18	14	OS-C	4	19	1351	58.5417	-148.2123	1465	26	ev#040; water at 10m for expts #3
HX10901.12	CTD	19	14	OS-C	4	19	1426	58.5420	-148.2128	1465	26	ev#041; water at 10m for expts #3
HX10901.13	CTD	20	15	GAK9	4	19	1701	58.6803	-148.3610	277	275	ev#042
HX10901.14	CTD	21	16	GAK8I	4	19	1740	58.7440	-148.4192	287	285	ev#043
HX10901.15	CTD	22	17	GAK8I	4	19	1834	58.7920	-148.4888	291	286	ev#044; Seward line survey
HX10901.16	CalVET	8	18	OS-C	4	19	2200	58.5410	-148.2117	1475	100	ev#045
HX10901.17	CTD	23	18	OS-C	4	19	2215	58.5370	-148.2202	1470	500	ev#046; no water collected
HX10901.18	MOC	5	18	OS-C	4	19	2248	58.5340	-148.2223	1470	100	ev#047
HX11001.01	CalVET	9	19	OS-Ga	4	20	0015	58.5917	-148.4390	234	100	ev#048

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11001.02	CTD	24	19	OS-Ga	4	20	0027	58.5918	-148.4252	234	225	ev#049; bottles 1-4 only, no surface water
HX11001.03	MOC	6	19	OS-Ga	4	20	0044	58.5913	-148.4430	234	100	ev#050
HX11001.04	CTD	25	19	OS-Ga	4	20	0141	58.5922	-148.4387	234	25	ev#051; cast for surface water
HX11001.05	CalVET53	1	20	OS-C	4	20	0601	58.5400	-148.2068	1400	100	ev#052; egg ratio
HX11001.06	CalVET53	2	20	OS-C	4	20	0616	58.5383	-148.2067	1400	100	ev#053; egg ratio
HX11001.07	CalVET53	3	20	OS-C	4	20	0630	58.5417	-148.2133	1400	100	ev#054; egg ratio
HX11001.08	CTD	26	21	MS-C	4	20	1020	59.0183	-148.7705	150	150	ev#055
HX11001.09	LiveNet	10	21	MS-C	4	20	1040	59.1150	-148.7707	150	75	ev#056
HX11001.10	LiveNet	11	21	MS-C	4	20	1050	59.1175	-148.7767	150	75	ev#057
HX11001.11	LiveNet	12	21	MS-C	4	20	1102	59.1202	-148.7827	150	100	ev#058
HX11001.12	CTD	27	21	MS-C	4	20	1120	59.1175	-148.7690	152	50	ev#059; for fsw dilutions
HX11001.13	CTD	28	21	MS-C	4	20	1218	59.1173	-148.7698	152	50	ev#060; for grazing exps. #4
HX11001.14	CTD	29	22	GAK7I	4	20	1836	58.8813	-148.5588	300	294	ev#061; Seward Line survey
HX11001.15	CTD	30	23	GAK7I	4	20	1937	58.9712	-148.6332	245	242	ev#062
HX11001.16	CTD	31	24	GAK6I	4	20	2229	59.0453	-148.7025	185	180	ev#063
HX11001.17	CalVET	10	25	MS-C	4	20	2202	59.1167	-148.7732	151	100	ev#064
HX11001.18	CTD	32	25	MS-C	4	20	2215	59.1177	-148.7715	151	140	ev#065
HX11001.19	MOC	7	25	MS-C	4	20	2237	59.1172	-148.7722	151	100	ev#066
HX11101.01	CalVET	11	26	MS-Ge	4	21	0022	59.1557	-148.6145	145	100	ev#067
HX11101.02	CTD	33	26	MS-Ge	4	21	0037	59.1608	-148.6235	145	137	ev#068
HX11101.03	MOC	8	26	MS-Ge	4	21	0054	59.1635	-148.6298	138	100	ev#069
HX11101.04	CalVET53	4	27	MS-C	4	21	0611	59.1177	-148.7700	150	100	ev#070; egg ratio
HX11101.05	CalVET53	5	27	MS-C	4	21	0627	59.1180	-148.7750	150	100	ev#071; egg ratio
HX11101.06	CalVET53	6	27	MS-C	4	21	0642	59.1193	-148.7817	150	100	ev#072; egg ratio
HX11101.07	CTD	34	27	MS-C	4	21	0708	58.1153	-148.7748	149	50	ev#073; water for grazing expts #5
HX11101.08	CTD	35	27	MS-C	4	21	1205	59.1175	-148.7722	152	148	ev#074
HX11101.09	CTD	36	28	GAK5	4	21	1333	59.2617	-148.9092	168	166	ev#075; Seward Line survey
HX11101.10	CTD	37	29	GAK5I	4	21	1447	59.1912	-148.8385	167	164	ev#076
HX11101.11	CTD	38	30	GAK6I	4	21	1702	59.0452	-148.7010	191	190	ev#077
HX11101.12	CTD	39	31	MS-Gf	4	21	1823	59.0023	-148.8550	216	215	ev#078; Mid shelf grid survey
HX11101.13	CTD	40	32	MS-Gd	4	21	1919	59.0768	-148.9287	147	146	ev#079
HX11101.14	CTD	41	33	MS-Ga	4	21	2007	59.1500	-148.9963	165	162	ev#080
HX11101.15	CTD	42	34	MS-Gb	4	21	2111	59.1905	-148.8402	167	165	ev#081
HX11101.16	CTD	43	35	MS-Gc	4	21	2219	59.2300	-148.6832	122	122	ev#082
HX11101.17	CTD	44	36	MS-Gh	4	21	2345	59.0847	-148.5940	213	210	ev#083
HX11201.01	CTD	45	37	GAK4I	4	22	0210	59.3353	-148.9802	197	190	ev#084; Seward line survey
HX11201.02	CTD	46	38	GAK4I	4	22	0258	59.4085	-149.0522	200	195	ev#085
HX11201.03	CTD	47	39	GAK3I	4	22	0345	59.4808	-149.1215	207	197	ev#086
HX11201.04	CTD	48	40	GAK3	4	22	0434	59.5542	-149.1898	215	210	ev#087; ACC survey
HX11201.05	CTD	49	41	GAK2I	4	22	0522	59.6263	-149.2617	214	205	ev#088
HX11201.06	CTD	50	42	ACC2	4	22	0553	59.6580	-149.2955	220	214	ev#089
HX11201.07	CTD	51	43	GAK2	4	22	0640	59.6915	-149.3282	226	222	ev#090
HX11201.08	CTD	52	44	ACC1	4	22	0715	59.7292	-149.3637	245	237	ev#091
HX11201.09	CTD	53	45	GAK1I	4	22	0750	59.7672	-149.3973	260	nd	ev#092; no header file, repeat cast
HX11201.10	CTD	54	45	GAK1I	4	22	0820	59.7682	-149.3987	262	257	ev#093; repeat of previous cast
HX11201.11	CTD	55	46	ACC2	4	22	0924	59.6570	-149.2970	220	215	ev#094
HX11201.12	LiveNet	13	47	IS-C	4	22	0952	59.6573	-149.2928	220	50	ev#095; net loose on ring frame
HX11201.13	LiveNet	14	47	IS-C	4	22	1020	59.6572	-149.2987	220	50	ev#096

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11201.14	LiveNet	15	47	IS-C	4	22	1040	59.6573	-149.2925	220	50	ev#097
HX11201.15	LiveNet	16	47	IS-C	4	22	1049	59.6538	-149.2993	220	50	ev#098
HX11201.16	CTD	56	47	IS-C	4	22	1104	59.6597	-149.2985	220	50	ev#099; for fsw
HX11201.17	CTD	57	47	IS-C	4	22	1224	59.6580	-149.2948	222	47	ev#100; water for grazing expts #6
HX11201.18	CTD	58	48	GAK1	4	22	2040	59.8442	-149.4663	272	263	ev#101
HX11201.19	CalVET	12	49	IS-C	4	22	2207	59.6577	-149.2942	220	100	ev#102
HX11201.20	CTD	59	49	IS-C	4	22	2217	59.6552	-149.2962	218	nd	ev#103
HX11201.21	MOC	9	49	IS-C	4	22	2239	59.6590	-149.2970	220	100	ev#104
HX11201.22	CalVET	13	50	IS-Ge	4	22	2353	59.7365	-149.2013	262	100	ev#105
HX11301.01	CTD	60	50	IS-Ge	4	23	0013	59.7378	-149.2063	262	253	ev#106
HX11301.02	MOC	10	50	IS-Ge	4	23	0035	59.7400	-149.2062	262	100	ev#107
HX11301.03	CalVET53	7	51	IS-C	4	23	0603	59.6568	-149.2915	220	100	ev#108; egg ratio
HX11301.04	CalVET53	8	51	IS-C	4	23	0619	59.6580	-149.2890	218	100	ev#109; egg ratio
HX11301.05	CalVET53	9	51	IS-C	4	23	0635	59.6575	-149.2913	219	100	ev#110; egg ratio
HX11301.06	LiveNet	nd	51	IS-C	4	23	0701	59.6553	-149.2922	220	50	ev#111; fail-no cast #
HX11301.07	LiveNet	17	51	IS-C	4	23	0719	59.6583	-149.2925	219	50	ev#112
HX11301.08	LiveNet	18	51	IS-C	4	23	0724	59.6585	-149.2923	219	50	ev#113
HX11301.09	LiveNet	19	51	IS-C	4	23	0740	59.6587	-149.2928	218	75	ev#114
HX11301.10	LiveNet	20	51	IS-C	4	23	0800	59.6582	-149.2920	218	75	ev#115
HX11301.11	CTD	61	51	IS-C	4	23	0843	59.6582	-149.2937	219	50	ev#116; water for filtration
HX11301.12	CTD	62	51	IS-C	4	23	0937	59.6570	-149.2910	218	51	ev#117; water for grazing expts #7
HX11301.13	CTD	63	51	IS-C	4	23	1204	59.6588	-149.2930	218	nd	ev#118; core station profile
HX11301.14	LiveNet	21	51	IS-C	4	23	1307	59.6573	-149.2927	218	50	ev#119
HX11301.15	CTD	64	52	GAK1I	4	23	1517	59.7658	-149.3953	263	255	ev#120; ACC survey
HX11301.16	CTD	65	53	ACC1	4	23	1550	59.7292	-149.3605	245	238	ev#121
HX11301.17	CTD	66	54	GAK2	4	23	1623	59.6920	-149.3257	228	224	ev#122
HX11301.18	CTD	67	55	ACC2	4	23	1658	59.6592	-149.2898	220	215	ev#123
HX11301.19	CTD	68	56	GAK2I	4	23	1727	59.6263	-149.2560	214	210	ev#124
HX11301.20	CTD	69	57	GAK3	4	23	1812	59.5523	-149.1875	215	212	ev#125
HX11301.21	CTD	70	58	IS-Gf	4	23	1859	59.5482	-149.3482	215	204	ev#126; inner shelf grid survey
HX11301.22	CTD	71	59	IS-Gd	4	23	1932	59.5808	-149.3815	209	203	ev#127
HX11301.23	CTD	72	60	IS-Ga	4	23	2009	59.6137	-149.4148	220	219	ev#128
HX11301.24	CTD	73	61	IS-Gh	4	23	2122	59.7035	-149.1688	250	245	ev#129
HX11301.25	CTD	74	62	IS-Ge	4	23	2155	59.7353	-149.2057	259	252	ev#130
HX11301.26	CTD	75	63	IS-Gc	4	23	2225	59.7690	-149.2412	265	260	ev#131
HX11301.27	CalVET	14	64	IS-C	4	23	2321	59.6577	-149.2943	220	100	ev#132
HX11301.28	CTD	76	64	IS-C	4	23	2335	59.6577	-149.2943	220	210	ev#133
HX11301.29	MOC	11	64	IS-C	4	23	2349	59.6573	-149.2943	220	100	ev#134
HX11401.01	CalVET	15	65	IS-Gf	4	24	0128	59.5485	-149.3600	214	100	ev#135
HX11401.02	CTD	77	65	IS-Gf	4	24	0136	59.5485	-149.3490	212	207	ev#136
HX11401.03	MOC	12	65	IS-Gf	4	24	0154	59.5468	-149.3493	214	100	ev#137
HX11401.04	CTD	78	66	GAK1I	4	24	1043	59.7670	-149.3965	260	257	ev#138; ACC survey
HX11401.05	CTD	79	67	ACC1	4	24	1120	59.7243	-149.3633	244	243	ev#139
HX11401.06	CTD	80	68	GAK2	4	24	1156	59.6918	-149.3278	228	227	ev#140
HX11401.07	CTD	81	69	ACC2	4	24	1229	59.6593	-149.2923	220	218	ev#141
HX11401.08	CTD	82	70	GAK2I	4	24	1259	59.6270	-149.2567	215	212	ev#142
HX11401.09	CTD	83	71	GAK3	4	24	1345	59.5537	-149.1855	215	211	ev#143
HX11401.10	CTD	84	72	IS-C	4	24	1444	59.6592	-149.2943	220	218	ev#144

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11401.11	LiveNet	22	72	IS-C	4	24	1515	59.6567	-149.3090	221	75	ev#145
HX11401.12	LiveNet	23	72	IS-C	4	24	1530	59.6588	-149.2987	221	62	ev#146
HX11401.13	LiveNet	24	72	IS-C	4	24	1540	59.6577	-149.2995	221	75	ev#147
HX11401.14	CTD	85	72	IS-C	4	24	1558	59.6595	-149.2943	220	5	ev#148; dilution exp #8 filtrate
HX11401.15	CTD	86	72	IS-C	4	24	1640	59.6600	-149.2932	220	5	ev#149; water for grazing exp.#8
HX11401.16	CTD	87	73	GAK3	4	24	1738	59.5537	-149.1858	215	209	ev#150; ACC survey
HX11401.17	CTD	88	74	GAK2I	4	24	1823	59.6267	-149.2588	215	211	ev#151
HX11401.18	CTD	89	75	ACC2	4	24	1854	59.6587	-149.2930	220	216	ev#152
HX11401.19	CTD	90	76	GAK2	4	24	1924	59.6912	-149.3270	226	225	ev#153
HX11401.20	CTD	91	77	ACC1	4	24	2001	59.7282	-149.3655	243	241	ev#154
HX11401.21	CTD	92	78	GAK1I	4	24	2036	59.7662	-149.3990	260	259	ev#155
HX11401.22	CalVET	16	79	IS-C	4	24	2200	59.6593	-149.2952	218	100	ev#156
HX11401.23	CTD	93	79	IS-C	4	24	2213	59.6592	-149.2947	218	nd	ev#157; no water collected
HX11401.24	MOC	13	79	IS-C	4	24	2231	59.6585	-149.2992	218	100	ev#158
HX11401.25	CalVET	17	80	IS-Ga	4	24	2335	59.6120	-149.4157	220	100	ev#159
HX11401.26	CTD	94	80	IS-Ga	4	24	2346	59.6102	-149.4215	235	nd	ev#160; no water collected
HX11501.01	MOC	14	80	IS-Ga	4	25	0050	59.6065	-149.4308	272	100	ev#161
HX11501.02	CalVET53	10	81	IS-C	4	25	0622	59.6587	-149.2972	219	nd	ev#162; egg ratio
HX11501.03	CalVET53	11	81	IS-C	4	25	0637	59.6578	-149.3090	219	nd	ev#163; egg ratio
HX11501.04	CalVET53	12	81	IS-C	4	25	0655	59.6582	-149.2932	219	nd	ev#164; egg ratio
HX11501.05	LiveNet	25	81	IS-C	4	25	0715	59.6588	-14918.33	218	75	ev#165
HX11501.06	LiveNet	26	81	IS-C	4	25	0735	59.6582	-149.2940	219	75	ev#166
HX11501.07	LiveNet	27	81	IS-C	4	25	0750	59.6583	-149.2928	219	75	ev#167
HX11501.08	CTD	95	81	IS-C	4	25	0816	59.5927	-149.2977	220	50	ev#168a; water for exp. #9
HX11501.09	CTD	96	81	IS-C	4	25	0816	59.5927	-149.2977	220	5	ev#168b; water for exp. #9
HX11501.10	CTD	97	81	IS-C	4	25	0916	59.6595	-149.2952	220	214	ev#169; water for exp. #9
HX11501.11	CTD	98	82	KIP2	4	25	1553	60.2787	-147.9843	593	150	ev#170
HX11501.12	LiveNet	28	83	KIP3	4	25	1607	60.2788	-147.9838	590	75	ev#171; zoo community assessment
HX11501.13	CTD	99	84	PWS-C	4	25	1702	60.3802	-147.9383	346	150	ev#172
HX11501.14	LiveNet	29	84	PWS-C	4	25	1715	60.4617	-147.9428	346	75	ev#173; zoo community assessment
HX11501.15	CTD	100	85	PWS2	4	25	1834	60.5345	-147.8033	747	150	ev#174
HX11501.16	LiveNet	30	85	PWS2	4	25	1845	60.5348	-147.8053	738	75	ev#175; zoo community assessment
HX11501.17	CTD	101	86	PWS3	4	25	1951	60.6557	-147.6785	760	150	ev#176
HX11501.18	LiveNet	31	86	PWS3	4	25	2004	60.6542	-147.6768	747	nd	ev#177
HX11501.19	CTD	102	87	PWS-C	4	25	2156	60.5353	-147.8035	730	727	ev#178
HX11501.20	CalVET	18	87	PWS-C	4	25	2310	60.5345	-147.8042	730	100	ev#179
HX11501.21	MOC	15	87	PWS-C	4	25	2322	60.5333	-147.8037	730	100	ev#180
HX11601.01	CalVET53	13	87	PWS-C	4	26	0617	60.5350	-147.8020	742	100	ev#181; egg ratio
HX11601.02	CalVET53	14	87	PWS-C	4	26	0631	60.5337	-147.8058	735	100	ev#182; egg ratio
HX11601.03	CalVET53	15	87	PWS-C	4	26	0646	60.5327	-147.8100	735	100	ev#183; egg ratio
HX11601.04	CTD	103	87	PWS-C	4	26	1202	60.5348	-147.7997	747	724	ev#184
HX11601.05	LiveNet	32	87	PWS-C	4	26	1308	60.5342	-147.8015	733	nd	ev#185
HX11601.06	LiveNet	33	87	PWS-C	4	26	1315	60.5333	-147.8003	733	50	ev#186
HX11601.07	LiveNet	34	87	PWS-C	4	26	1322	60.5328	-147.8002	733	75	ev#187
HX11601.08	CTD	104	87	PWS-C	4	26	1353	60.5357	-147.8015	747	99	ev#188; fsw for expt #10
HX11601.09	CTD	105	87	PWS-C	4	26	1434	60.5352	-147.8032	747	50	ev#189; water for grazing expts #10
HX11601.10	CalVET	19	87	PWS-C	4	26	2230	60.5352	-147.8040	740	100	ev#190
HX11601.11	CTD	106	87	PWS-C	4	26	2242	60.5355	-147.8038	725	747	ev#191; no water collected

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11601.12	MOC	16	87	PWS-C	4	26	2318	60.5352	-147.8042	742	100	ev#192
HX11701.01	CalVET	20	88	PWS3	4	27	0050	60.6562	-147.6797	761	100	ev#193
HX11701.02	CTD	107	88	PWS3	4	27	0058	60.6553	-147.6812	752	760	ev#194
HX11701.03	MOC	17	88	PWS3	4	27	0138	60.6528	-147.6832	754	100	ev#195
HX11701.04	LiveNet	35	89	PWS-C	4	27	0700	60.5357	-147.8008	735	75	ev#196
HX11701.05	LiveNet	36	89	PWS-C	4	27	0715	60.5352	-147.8008	735	75	ev#197
HX11701.06	LiveNet	37	89	PWS-C	4	27	0722	60.5342	-147.8008	735	75	ev#198
HX11701.07	LiveNet	38	89	PWS-C	4	27	0725	60.5330	-147.8012	742	75	ev#199
HX11701.08	CTD	108	89	PWS-C	4	27	0753	60.5353	-147.8045	747	100	ev#200; water for fsw
HX11701.09	CTD	109	89	PWS-C	4	27	0845	60.5357	-147.8053	747	99	ev#201; water for grazing expts #11
HX11701.10	CTD	110	90	PWS-Gc	4	27	1024	60.5628	-147.6788	714	200	ev#202; PWS grid survey
HX11701.11	CTD	111	91	PWS-Gb	4	27	1056	60.5813	-147.7608	764	200	ev#203
HX11701.12	CTD	112	92	PWS-Ga	4	27	1125	60.5953	-147.8312	380	200	ev#204
HX11701.13	CTD	113	93	PWS-Gd	4	27	1158	60.5500	-147.8727	505	200	ev#205
HX11701.14	CTD	114	94	PWS-C	4	27	1232	60.5360	-147.8073	747	729	ev#206; problems—not all water collected—recast
HX11701.15	CTD	115	94	PWS-C	4	27	1314	60.5382	-147.8063	747	50	ev#207
HX11701.16	CTD	116	95	PWS-Gg	4	27	1346	60.4897	-147.7892	237	229	ev#208
HX11701.17	CTD	117	96	PWS-Gf	4	27	1422	60.4898	-147.8317	521	200	ev#209
HX11701.18	CTD	118	97	PWS-Ge	4	27	1454	60.5133	-147.8995	215	214	ev#210
HX11701.19	CTD	119	98	PWS-Gh	4	27	1538	60.4418	-147.8823	352	200	ev#211
HX11701.20	LiveNet	39	99	PWS-C	4	27	1903	60.5343	-147.8038	742	75	ev#212
HX11701.21	LiveNet	40	99	PWS-C	4	27	1914	60.5347	-147.8087	742	75	ev#213
HX11701.22	CalVET	21	99	PWS-C	4	27	2232	60.5362	-147.8045	740	100	ev#214
HX11701.23	CTD	120	99	PWS-C	4	27	2246	60.5358	-147.8053	747	206	ev#215
HX11701.24	MOC	18	99	PWS-C	4	27	2302	60.5365	-147.8088	740	100	ev#216
HX11801.01	CalVET	22	100	PWS1	4	28	0102	60.3797	-147.9383	354	100	ev#217
HX11801.02	CTD	121	100	PWS1	4	28	0112	60.3795	-147.9627	363	363	ev#218
HX11801.03	MOC	19	100	PWS1	4	28	0146	60.3807	-147.9590	397	100	ev#219
HX11801.04	LiveNet	41	101	PWS-C	4	28	0732	60.5375	-147.8000	742	75	ev#220
HX11801.05	LiveNet	42	101	PWS-C	4	28	0720	60.5378	-147.8030	742	100	ev#221
HX11801.06	CTD	122	101	PWS-C	4	28	1303	60.5360	-147.8043	735	728	ev#222
HX11801.07	LiveNet	43	101	PWS-C	4	28	1400	60.5343	-147.8028	733	50	ev#223
HX11801.08	LiveNet	44	101	PWS-C	4	28	1404	60.5332	-147.8053	733	50	ev#224
HX11801.09	CTD	123	101	PWS-C	4	28	1426	60.5357	-147.8063	747	50	ev#225; water for fsw
HX11801.10	CTD	124	101	PWS-C	4	28	1456	60.5358	-147.8043	747	50	ev#226; water for grazing expts #12
HX11801.11	CalVET	23	101	PWS-C	4	28	2235	60.5340	-147.8057	735	100	ev#227
HX11801.12	CTD	125	101	PWS-C	4	28	2249	60.5357	-147.8040	747	742	ev#228
HX11801.13	MOC	20	101	PWS-C	4	28	2326	60.5345	-147.8025	733	100	ev#229
HX11901.01	CalVET	24	102	PP1	4	29	0108	60.6378	-148.0105	402	100	ev#230
HX11901.02	CTD	126	102	PP1	4	29	0116	60.6382	-148.0157	400	425	ev#231
HX11901.03	MOC	21	102	PP1	4	29	0138	60.6385	-147.0248	440	100	ev#232
HX11901.04	CalVET53	16	103	PWS-C	4	29	0608	60.5350	-147.8008	740	100	ev#233; egg ratio
HX11901.05	CalVET53	17	103	PWS-C	4	29	0620	60.5335	-147.7950	733	100	ev#234; egg ratio
HX11901.06	CalVET53	18	103	PWS-C	4	29	0631	60.5315	-147.7922	720	100	ev#235; egg ratio
HX11901.07	LiveNet	45	103	PWS-C	4	29	0730	60.5357	-147.8023	735	75	ev#236
HX11901.08	LiveNet	46	103	PWS-C	4	29	0745	60.5343	-147.7982	735	75	ev#237
HX11901.09	LiveNet	47	103	PWS-C	4	29	0756	60.5332	-147.7958	735	100	ev#238
HX11901.10	CTD	127	103	PWS-C	4	29	0850	60.5338	-147.8043	747	50/5	ev#239; for dilution expt filtered sw

Event#	Instr	Cast	Sta	Sta std	Mos	Day	Time	Lat	Long	Water Depth	Cast Depth	Comments
HX11901.11	CTD	128	103	PWS-C	4	29	0920	60.5343	-147.8050	747	50/3	ev#240; sw for grazing experiments #13
HX11901.12	CTD	129	103	PWS-C	4	29	1202	60.5352	-147.8008	747	654	ev#241; CTD aborted before bottom
HX11901.13	CTD	130	103	PWS-C	4	29	1234	60.5322	-147.7910	733	50	ev#242; water coll. corresponding to profile 129
HX11901.14	CTD	131	103	PWS-C	4	29	1533	60.5345	-147.8045	747	53	ev#243; water for carbon comparison expt
HX11901.15	LiveNet	48	103	PWS-C	4	29	1616	60.5367	-147.7988	738	100	ev#244; for CHNs
HX11901.16	CTD	132	104	MS4	4	29	2032	59.9205	-147.8297	111	109	ev#245; Montague Strait line survey
HX11901.17	CTD	133	105	MS3	4	29	2049	59.9190	-147.8582	170	169	ev#246
HX11901.18	CTD	134	106	MS2	4	29	2110	59.9435	-147.9787	196	191	ev#247
HX11901.19	CTD	135	107	MS1	4	29	2132	59.9545	-147.9290	166	162	ev#248
HX11901.20	CTD	136	108	HB5	4	29	2333	60.1338	-147.4488	40	39	ev#249; Hogan Bay line survey
HX11901.21	CTD	137	109	HB4	4	29	2351	60.1488	-147.5035	105	103	ev#250
HX12001.01	CTD	138	110	HB3	4	30	0015	60.1640	-147.5758	90	86	ev#251
HX39901.02	CTD	139	111	HB2	4	30	0037	60.1797	-147.6410	175	168	ev#252
HX12001.03	CTD	140	112	HB1	4	30	0103	60.1928	-147.6997	248	245	ev#253
HX12001.04	LiveNet	49	113	PWS-C	4	30	0834	60.5355	-147.8030	737	75	ev#254
HX12001.05	LiveNet	50	113	PWS-C	4	30	0845	60.5358	-147.8020	737	50	ev#255
HX12001.06	LiveNet	51	113	PWS-C	4	30	0852	60.5363	-147.8013	737	50	ev#256; collect for AJ Paul
HX12001.07	CTD	141	113	PWS-C	4	30	1203	60.5360	-147.8025	747	730	ev#257
HX12001.08	CTD	142	114	CF15	4	30	2041	59.4493	-148.8653	183	178	ev#258; Cape Fairfield line survey
HX12001.09	CTD	143	115	CF14	4	30	2108	59.4838	-148.8673	173	168	ev#259
HX12001.10	CTD	144	116	CF13	4	30	2133	59.5170	-148.8682	174	171	ev#260
HX12001.11	CTD	145	117	CF12	4	30	2200	59.5503	-148.8670	186	181	ev#261
HX12001.12	CTD	146	118	CF11	4	30	2227	59.5840	-148.8677	178	176	ev#262
HX12001.13	CTD	147	119	CF10	4	30	2254	59.6172	-148.8673	177	175	ev#263
HX12001.14	CTD	148	120	CF9	4	30	2320	59.6502	-148.8685	180	175	ev#264
HX12001.15	CTD	149	121	CF8	4	30	2347	59.6835	-148.8708	180	178	ev#265
HX12101.01	CTD	150	122	CF7	5	1	0013	59.7172	-148.8665	183	180	ev#266
HX12101.02	CTD	151	123	CF6	5	1	0039	59.7503	-148.8662	190	187	ev#267
HX12101.03	CTD	152	124	CF5	5	1	0105	59.7840	-148.8655	195	192	ev#268
HX12101.04	CTD	153	125	CF4	5	1	0132	59.6675	-148.8663	183	181	ev#269
HX12101.05	CTD	154	126	CF3	5	1	0157	59.8503	-148.8660	163	158	ev#270
HX12101.06	CTD	155	127	CF2	5	1	0223	59.8837	-148.8657	115	112	ev#271
HX12101.07	CTD	156	128	CF1	5	1	0243	59.9088	-148.8648	85	82	ev#272
HX12101.08	MOC	22	129	GAK2	5	1	0757	59.6858	-149.3350	230	212	ev#273; daytime for euphausiids