GLOBEC CRUISE REPORT
CRUISE HX248: 30 July to 8 August 2001

Funding Source: NSF-NOAA (NA-67-RJ-0147)

Chief Scientist: Seth Danielson, seth@ims.uaf.edu
Institute of Marine Science
University of Alaska
Fairbanks, AK 99775-1080
Phone: 907-474-7830

Co-Chief Scientist: Ken Coyle, Zooplankton, IMS-UAF (upper 2)

Scientific Personnel:

Amy Childers	Nutrients/Chlorophyll, IMS-UAF (F, forward 2)
Leandra Sousa	Birds/Zooplankon, IMS-UAF (F, upper 4)
Russ Hopcroft	Zooplankton, IMS-UAF (M, forward 3)
Tom Kline	Zooplankton, PWSSC, (M, forward 3)
Alexei Pinchuk	Zooplankton, IMS-UAF (M, upper 2)
Melanie Rohr	Nutrients/Chlorophyll, IMS-UAF, (F, upper 4)
Steve Hartz	Marine Technician, IMS-SMC (M, Mar. Tech. SR)
Sarah Thornton	Nutrients/Chlorophyll, IMS-UAF (F, forward 2)
Kathy Turco	Zooplankton/Audio, IMS-UAF, (F, upper 4)

Scientific Purpose:
The purpose of the NE Pacific GLOBEC program is to develop a mechanistic understanding of the response of this marine ecosystem to climate variability. Toward this end the GLOBEC cruises on the Gulf of Alaska shelf will determine the physical-chemical structure, primary production and the distribution and abundance of zooplankton, yoy salmon and other planktivorous fish. These interdisciplinary cruises will occur over a seven-year period and throughout the year so that seasonal and interannual depictions of the oceanography of this shelf will be available. Some of the data will be compared with historical data sets whereas other data sets will be a product of the first systematic sampling effort from this shelf.

The August 2001 cruise focused on the distribution of physical properties, nutrients, and chlorophyll, zooplankton, and seabird populations over the shelf along the Seward Line, within western Prince William Sound, and on the shelf south of Hinchinbrook Entrance. The purpose is to characterize the along shore variability in the physical and chemical properties and the biological components of the northern Gulf of Alaska shelf.

Cruise Objectives

1. Determine thermohaline, velocity, and nutrient structure of the Gulf of Alaska shelf, emphasizing Seward Line (Table 1), C. Fairfield Line (Table 2), Prince William Sound stations (Table 3), and offshore PWS stations (Table 4). Other lines as time permits
2. Determine primary production and phytoplankton biomass distribution.
3. Determine the distribution and abundance of zooplankton.
4. Determine the distribution and abundance of seabirds and marine mammals.
5. Determine copepod and euphausiid rates of growth and egg production.

SAMPLING

DAYTIME ACTIVITIES

1. Occupy the various hydrographic transects and collect vertical CTD-chlorophyll-PAR profiles. Station Transect priorities are (in order): Seward (**Table 1**), C. Fairfield (**Table 2**), W. PWS (**Table 3**), Hinchinbrook Entrance (**Table 4**). (These can also be performed at night after zooplankton work is completed.)

2. Collect ADCP, sea surface salinity (SSS), temperature (SST) and fluorescence (SSF) using seachest sensors,

3. Collect discrete bottle samples at these stations for nutrients and chlorophyll pigments. Chlorophyll Size Fractionation will be done at the whole numbered Seward Line stations and at every other C. Fairfield Line station.

4. Measure Primary Productivity at Stations GAK 1, 4, 9, and 13. These are to begin as close to daylight as possible.

5. Observe and document marine mammal and seabird distributions from the bridge.

6. 1 CalVet Net cast will be done (CalVet cage now has 4 nets) after the CTD cast along the Seward Line, CCSE and at selected PWS stations. The two will be a large mesh net and the second will be with a fine mesh net. THERE WILL BE NO CALVET sampling at the "i" stations on the Seward Line.

7. At 2-4 Seward Line stations (GAK1, 4, 9, 13) and one PWS station Hopcroft will perform 4-7 casts with the 10-liter Niskins/Rosette to collect water (from 10-20m) for zooplankton incubations and two ring net tows over the upper 50m.

8. Time permitting, we will do one deep MOCNESS tow (to 350 or 500 m) near the end of the Seward Line and in PWS. This should be done in conjunction with Coyles MOCNESS/HTI work at that station.

NIGHTTIME ACTIVITIES
1. Hydroacoustic samples and MOCNESS discrete samples along the Seward Line, and at the PWS (Table 3) and Hinchinbrook Entrance Stations(Table 4) indicated.

2. Fine mesh nets will be swapped into the MOCNESS at intermittent stations for euphausiid collection.

CRUISE ACTIVITY SCHEDULE

7/29   Science party arrived at Seward and set up equipment.
7/30   08:00 Muster galley for pre-cruise meeting
          09:00 Depart the dock, underway on cruise.
          See Event Log for sampling details.
8/8   Return to Seward by 0900 on 8/8.

See the attached Event Log for sampling details.

CRUISE SUMMARY:

Excellent weather worked in our favor on this trip, and we were able to complete all sampling tasks, even though there were only about six hours of darkness in which we were able tow for diel-migrating zooplankton. In addition to the Seward, Cape Fairfield, Hinchinbrook Entrance and Prince William Sound stations, we occupied stations along the Hinchinbrook Canyon, Cape Cleare Southeast, and Prince William Sound West transect lines, collecting CTD, ADCP, nutrient, and chlorophyll data at all of these additional stations.

S. Danielson (Physics)
Surface temperatures ranged from about 11.5 to just under 18° C and surface salinities ranged between approximately 20 and 32 *psu.* At some spots, warmer surface temperatures seemed to correlate with lower salinity surface water, but at other locations the opposite or no relationship was apparent.   Some strong currents (>50 cm/s) were measured by the ADCP. There did not appear to be a well-formed jet of the Alaska Coastal Current. I suspect that baroclinic tides were fairly strong at times. Saw evidence of strong vertical shear of horizontal currents at times. We made 113 CTD casts over the course of the cruise. We made a total of three transects along the Cape Fairfield line to look at short-term variability in the structure of the Alaska Coastal Current during the summer. Two of these transects were made at "acoustic tow speed" of approximately 6 knots to help ensure high quality acoustic data.

K. Coyle (Zooplankton distribution/abundance):

Large zooplankton were collected with our standard 1-m MOCNESS net system equipped with 500 ? m mesh nets. The MOCNESS was fished at night in the upper 100 m. Samples were taken in 20 m increments from 100 m to the surface. The small zooplankton were sampled with a 25 cm diameter CalVET system equipped with 150 ? m mesh nets towed vertically from 100 m to the surface. Copepod eggs and nauplii were sampled with a 25 cm diameter CalVET system equipped with 53 ? m mesh nets, also towed vertically from 100 m depth to the surface.

A MOCNESS tow was collected at each of the Seward Line stations, at five stations in Prince William Sound and at three stations in Hinchinbrook Entrance. CalVET net samples were collected at all stations on the Seward Line, at five stations in Prince William Sound and at four stations in Hinchinbrook Entrance. Acoustic transects were run along the Seward. In addition, acoustic data were collected during each MOCNESS tow to aid in interpreting the acoustic results. A short acoustic transect was also run between Station HE10 and HE6 in Hinchinbrook Entrance to document the bathymetric influence of Hinchinbrook Canyon on the water column sound scattering intensity. Supplemental deep MOCNESS tows were collected at the outer end of the Seward Line and at the north end of Knight Island Passage in Prince William Sound.

A total of 167 zooplankton samples were collected. Reporting of the results will have to await laboratory processing of the zooplankton samples.

R. Hopcroft (Zooplankton growth):

Experiments for copepod somatic growth rates using the artificial cohort method were executed at Gak1, Gak9, Gak13, and PWS2. Picked stages of Eucalanus bungii were incubated for molt rate determination at Gak9. Despite high abundance of Eucalanus in cohort and egg production experiments, unusually warm surface temperatures (~15°C) resulted in high mortality during incubations. Egg production for Pseudocalanus spp. and Acartia longiremis were run at Gak9, Gak4, Gak1 and PWS2. Egg production for Centropages abdominalis was run at Gak1 and PWS2. Egg production for Metridia pacifica and M. ohkotensis were run only at PWS2. Euphausiid molting rates and egg production were determined for Gak1, Gak4, Gak9, and Gak12 employing ~60 animals per experiment. Preliminary estimates of euphausiid egg and naupliar development times were determined at 2 temperatures

A. Childers (Nutrients/Chlorophyll):

During HX248 we conducted six productivity experiments at the following sites: GAK 1, GAK 4, GAK 9, GAK 13, KIP 2, and CCSE2. These experiments were N-15 and C-13 studies for nitrogen uptake rates and primary productivity estimates. In addition four nutrient addition studies were run in conjunction with the nitrogen uptake and primary production stations at GAK 1, GAK 4, GAK 9, and GAK 13. Chlorophyll and nutrient samples were collected at all stations along the Seward line, Hinchinbrook Entrance line, Along Hinchinbrook Canyon line, Cape Clear Southeast line, Prince William Sound West line, and at alternate stations along the Cape Fairfield line. Within

the Sound, samples were collected at Knight Island Passage 2, Prince William Sound 1 and 2, and along the Montague Strait and Hogan Bay lines. Nutrient samples were run on board and chlorophyll samples were filtered onboard and will be analyzed back in Seward. Nitrate concentrations were low in the upper 10-20 m while chlorophyll levels were generally low with the highest fluoresence values in the subsurface waters between 15 and 25 m.

T. Kline (Stable Isotopes)
There were two categories of samples taken MOCNESS tows made during HX248, (1) those from the upper 100m and (2) those from 400 to 600m.
(1) Upper 100m MOCNESS tows: Macro-zooplankters were saved for stable isotope analysis from the contents of net #1 of each upper 100m MOCNESS tow. These were the 13 Seward line, 3 Hinchinbrook Entrance, and 5 within Prince William Sound stations.
(2) Deep MOCNESS tows: At stations GAK13 and PWS2, diapausing *Neocalanus* spp. were saved for stable isotope analysis from the contents of a MOCNESS net that sampled between 400 and 600m.
MOCNESS samples consisted primarily of macro-zooplankton, which were sorted to species and frozen individually in vials for further laboratory processing.

L. Sousa (Marine Mammals/seabirds)
Seabird identification and abundance were recorded on the Seward, Cape Fairfield, Hichinbrook Entrance, Hinchinbrook Canyon and Cape Clear South East Lines, Hogan Bay, Prince William Sound West, and in Knight Island Passage. Seabirds and marine mammals were identified to species and age when possible, and flock occurrences for the seabird data was recorded as single or multiple species flock. Counts were recorded in 5 min. bins and the locations and time was recorded for each sighting (Fig. 1).
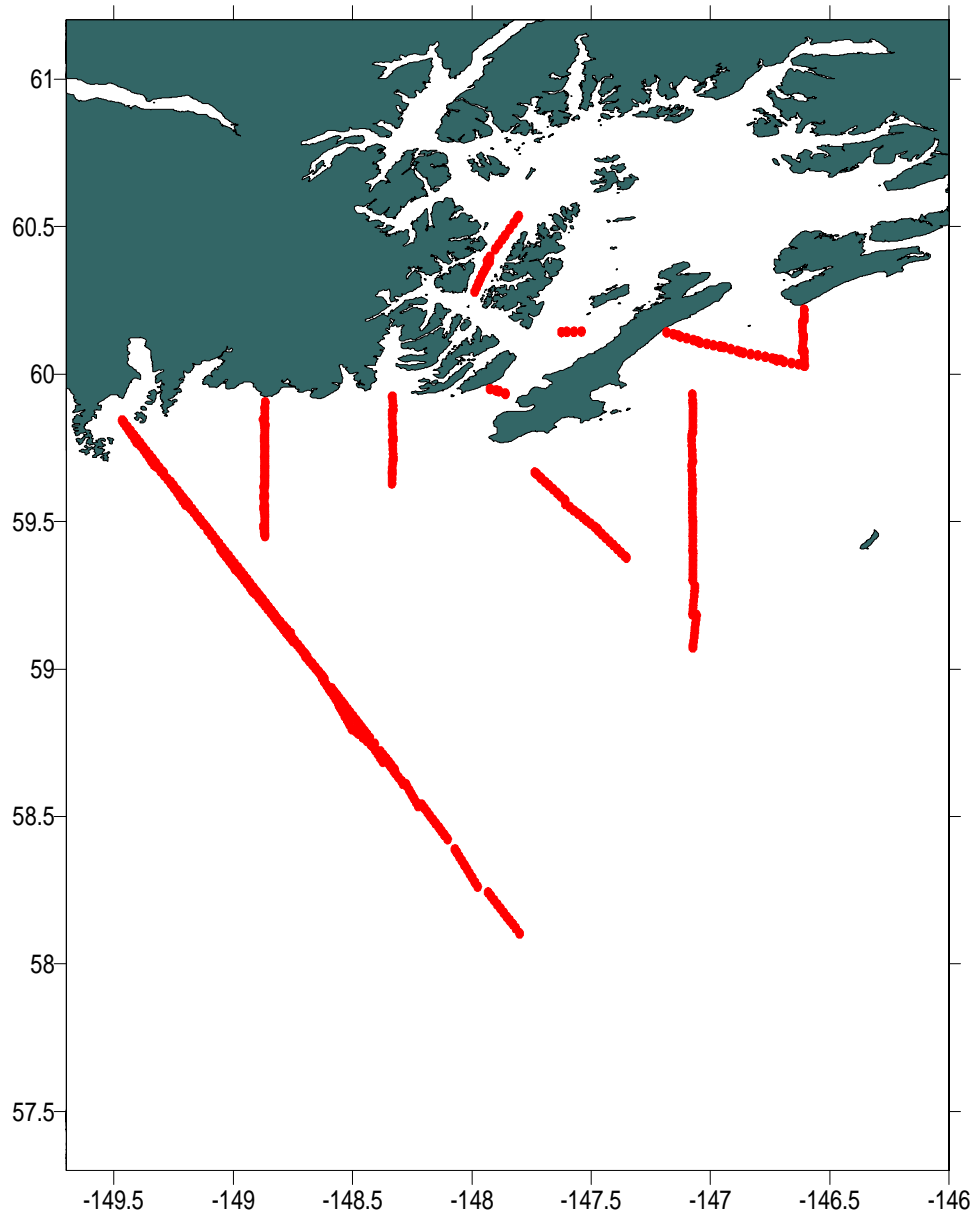
Fig 1: HX 248 Bird Transect surveys

Table 1. CTD Station Locations along Seward Line.

Station Name	Latitude (° ′ N)	Longitude (° ′)	Approximate Bottom Depth (m)
RES 2.5	60 0.0	149 20.3	290
GAK 1	59 50.7	149 28.0	265
GAK 1i*	59 46.0	149 23.8	250
GAK 2	59 41.5	149 19.6	220
GAK 2i*	59 37.6	149 15.5	220
GAK 3	59 33.2	149 11.3	220
GAK3i*	59 28.9	149 7.1	210
GAK 4	59 24.5	149 2.9	200
GAK 4i*	59 20.1	148 58.7	200
GAK 5	59 15.7	148 54.5	175
GAK 5i*	59 11.4	148 50.3	150
GAK 6	59 7.0	148 46.2	145
GAK 6i**	59 2.7	148 42.0	190
GAK 7**	58 58.3	148 37.8	230
GAK 7i**	58 52.9	148 33.6	260
GAK 8**	58 47.5	148 29.4	290
Gak 8i**	58 44.6	148 25.2	280
GAK 9	58 40.8	148 21.0	275
GAK9i**	58 36.7	148 16.7	~700
GAK 10	58 32.5	148 12.7	1300
GAK 11	58 23.3	148 4.3	1400
GAK 12	58 14.6	147 56.0	1500
GAK 13	58 5.9	147 47.6	1525

*useful in defining Alaska Coastal Current front
**useful in defining the shelfbreak front

Table 2. CTD Station Locations Along Cape Fairfield Line

Station Name	Latitude (° ' N)	Longitude (° ')	Approximate Bottom Depth (m)
CF 1	59 55.0	148 52.0	50
CF 2	59 53.0	148 52.0	120
CF 3	59 51.0	148 52.0	170
CF 4	59 49.0	148 52.0	180
CF-5	59 47.0	148 52.0	180
CF-6	59 45.0	148 52.0	185
CF-7	59 43.0	148 52.0	180
CF-8	59 41.0	148 52.0	180
CF-9	59 39.0	148 52.0	175
CF-9	59 39.0	148 52.0	175
CF-10	59 37.0	148 52.0	175
CF 11	59 35.0	148 52.0	160
CF-12	59 33.0	148 52.0	145
CF-13	59 31.0	148 52.0	145
CF-14	59 29.0	148 52.0	145
CF-15	59 27.0	148 52.0	145

Table 3. CTD Station Locations In Western PWS (Northern PWS; Knight Island Passage; KIP; Hogan Bay; HB; and Montague Strait; MS). [ANC = weather station]

Station Name	Latitude (°N)	Longitude (°W)	Approximate Bottom Depth (m)	
HB1	60.1929	147.7001	246	
HB2	60.1792	147.6410	173	zooplankton
HB3	60.1634	147.5756	84	
HB4	60.1482	147.5024	95	
MS1	59.9587	147.9138	179	
MS2	59.9442	147.8783	201	zooplankton
MS3	59.9332	147.8550	168	
MS4	59.9219	147.8268	118	
KIP2	60.2783	147.9866	588	zooplankton
KIP1	60.2811	148.0132	540	Anc.
PWS 10	60.385	146.925	293	Anc.
PWS 9	60.477	147.070	222	Anc.
PWS 8	60.557	147.126	228	Anc.
PWS 7	60.629	147.149	292	Anc.
PWS 6	60.722	147.145	390	Anc.
PWS 5	60.822	147.398	476	Anc.
PWS 4	60.737	147.658	657	Anc.
PWS 3	60.655	147.809	753	zooplankton
PWS 2	60.534	147.802	742	Anc.
PWS 1	60.379	147.936	333	zooplankton

Table 4. CTD Stations Bracketing Hinchinbrook Entrance.

Station Name	Latitude (°' N)	Longitude (°')	Approximate Bottom Depth (m)
HE 1	60 13.8	146 36.5	
HE 2	60 10.8	146 36.5	zooplankton
HE 3	60 7.8	146 36.5	
HE 4	60 4.8	146 36.5	
HE-5	60 1.8	146 36.5	zooplankton
HE-6	60 3.0	146 44.8	
HE-7	60 4.3	146 51.3	
HE-8	60 5.6	146 57.7	
HE-9	60 6.6	147 3.0	zooplankton
HE-10	60 7.8	147 8.0	zooplankton
HE-11	60 8.6	147 11.5	

Table 5. CTD Station Locations Along Ragged Island and Pye Island Lines

Station Name	Latitude (°´N)	Longitude (°´)	Approximate Bottom Depth (m)
RI10	59.4091	148.8670	165
RI8	59.4081	149.2115	188
RI7	59.4076	149.3767	142
RI6	59.4077	149.5417	98
RI5	59.4093	149.7095	112
RI4	59.4077	149.8711	164
RI3	59.4091	150.0361	172
RI2	59.4093	150.1996	124
RI1	59.4063	150.2638	100
PI2	59.3262	150.1958	152
PI3	59.2429	150.1279	154

Table 6. CTD Station Locations Along Hinchinbrook Canyon: Deep Inflow into PWS

Station Name	Latitude (°´N)	Longitude (°´)	Approximate Bottom Depth (m)
AHC 1	59 18.0	147 4.5	200
AHC 2	59 24.0	147 4.5	200
AHC 3	59 30.0	147 4.5	200
AHC 4	59 36.0	147 4.5	200
AHC-5	59 42.0	147 4.5	200
AHC-6	59 48.0	147 4.5	200
AHC-7	59 54.0	147 4.5	200
AHC-8	60 00.0	147 4.5	200
AHC-9	60 06.0	147 4.5	200

Table 7. CTD Station Locations Along Cape Cleare Line - Offshore Montague Island

Station Name	Latitude (° ' N)	Longitude (° ')	Approximate Bottom Depth (m)
*CC 1	59 44.67	147 53.0	23
*CC 2	59 42.6	147 53.0	68
*CC 3	59 40.0	147 53.0	67
*CC 4	59 36.0	147 53.0	114
*CC-5	59 29.0	147 53.0	113
*CC-6	59 22.0	147 53.0	177
CC-7	59 15.0	147 53.0	185
CC-8	59 7.75	147 53.0	201

*most important

Table 8. CTD Station Locations Along Cape Cleare SW Line - Offshore Montague Island

Station Name	Latitude (° ' N)	Longitude (° ')	Approximate Bottom Depth (m)
CCSW 1	59 42.9	148.00	23
CCSW 2	59 40.0	148 5.0	50
CCSW 3	59 37.5	148 10.2	158
CCSW 4	59 35.1	148 14.8	177
CCSW-5	59 32.6	148 20.0	189
CCSW-6	59 22.0	147 53.0	177
CCSW-7	59 15.0	147 53.0	185
CCSW-8	59 7.75	147 53.0	201

Table 9. CTD Station Locations Along Cape Suckling Line

Station Name	Latitude (°´N)	Longitude (°´)	Approximate Bottom Depth (m)
CS-0	60 0.73	143 40.0	52
CS 1	59 57.0	143 40.0	219
CS 2	59 54.0	143 40.0	264
CS 3	59 51.0	143 40.0	274
CS 4	59 48.0	143 40.0	260
CS-5	59 44.0	143 40.0	171
CS-6	59 38.0	143 40.0	136
CS-7	59 32.0	143 40.0	540
CS-8	59 25.0	143 40.0	1818

Table 10. CTD Station Locations Across Middle of Hinchinbrook Canyon To Assess Deep Inflow into Prince William Sound.

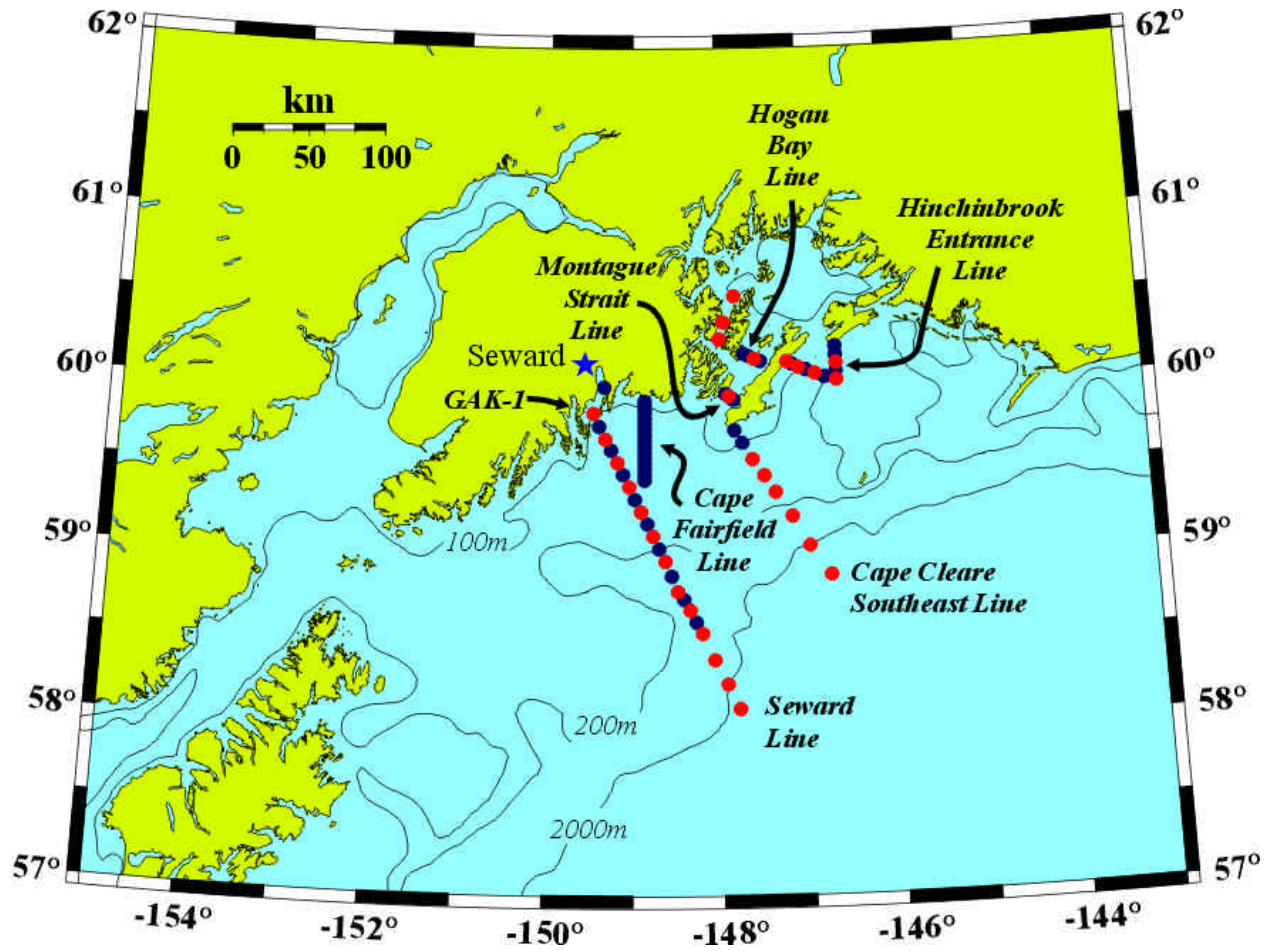| Station Name	Latitude (°´N)	Longitude (°´)	Approximate Bottom Depth (m)
XHCU 1	58 48.0	146 40.0	85
XHCU 2	59 48.0	146 47.0	85
XHCU 3	59 48.0	146 54.0	100
XHCU 4	59 48.0	146 57.5	150
XHCU-5	59 48.0	147 01.0	200
XHCU-6	59 48.0	147 4.5	220
XHCU-7	59 48.0	147 8.0	220
XHCU-8	59 48.0	147 11.5	200
XHCU-9	59 48.0	147 15.0	150
XHCU-10	59 48.0	147 20.0	80
XHCU-11	59 48.0	147 25.0	100

Table 11. CTD Station Locations Across Shelfbreak Entrance to Hinchinbrook Canyon To Assess Deep Inflow into Prince William Sound

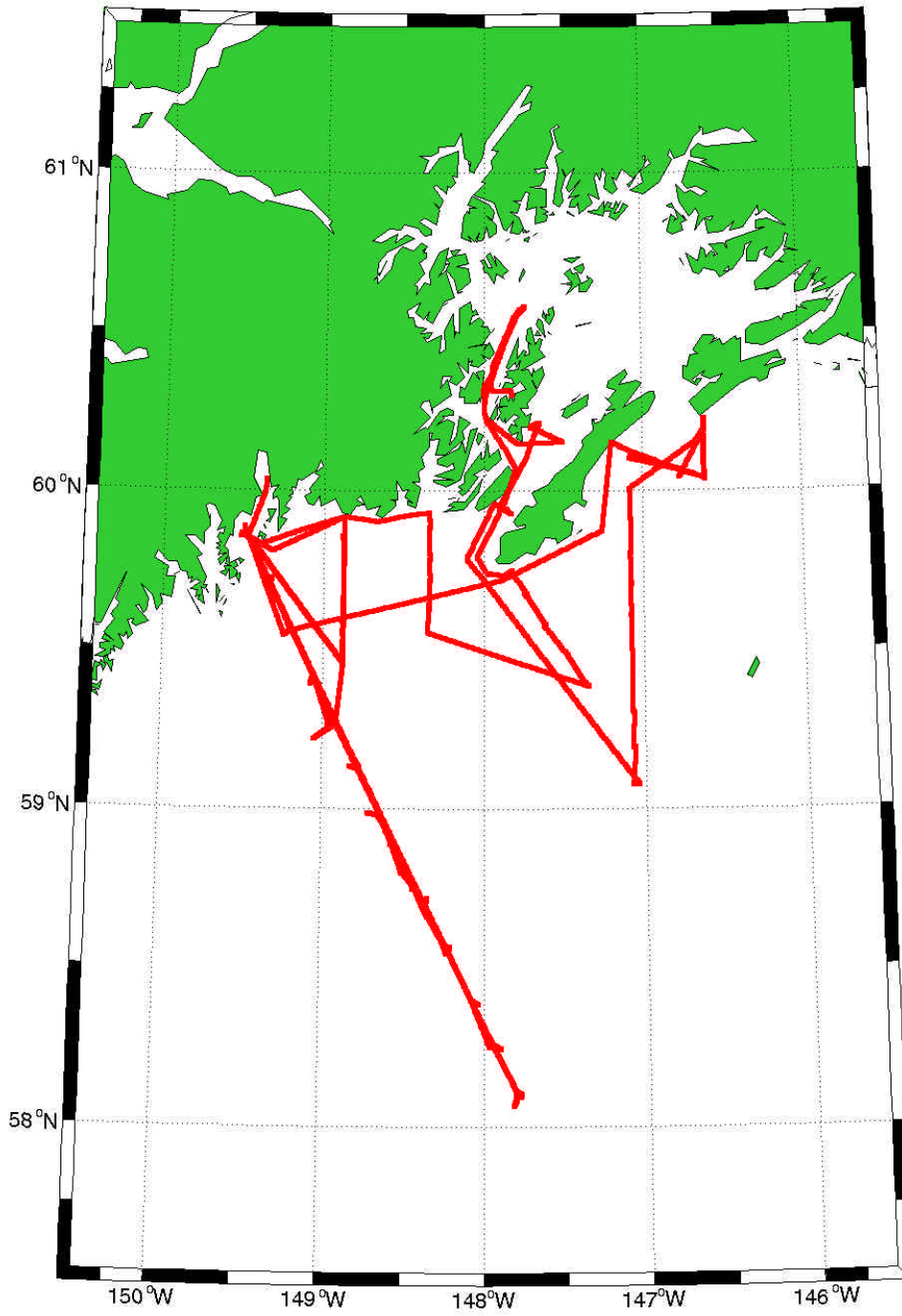| Station Name	Latitude (° ' N)	Longitude (° ' W)	Approximate Bottom Depth (m)
XHCL 1	59 14.0	146 40.0	200-300
XHCL 2	59 14.0	146 47.0	200-300
XHCL 3	59 14.0	146 54.0	200-300
XHCL 4	59 14.0	146 57.5	200-300
XHCL-5	59 14.0	147 01.0	200-300
XHCL-6	59 14.0	147 4.5	200-300
XHCL-7	59 14.0	147 8.0	200-300
XHCL-8	59 14.0	147 11.5	200-300
XHCL-9	59 14.0	147 15.0	200-300
XHCL-10	59 14.0	147 20.0	200-300
XHCL-11	59 14.0	147 25.0	200-300

Table 12. CTD Station Along the CCSE Line to provide alongshore sampling complimentary to the Seward Line Stations.

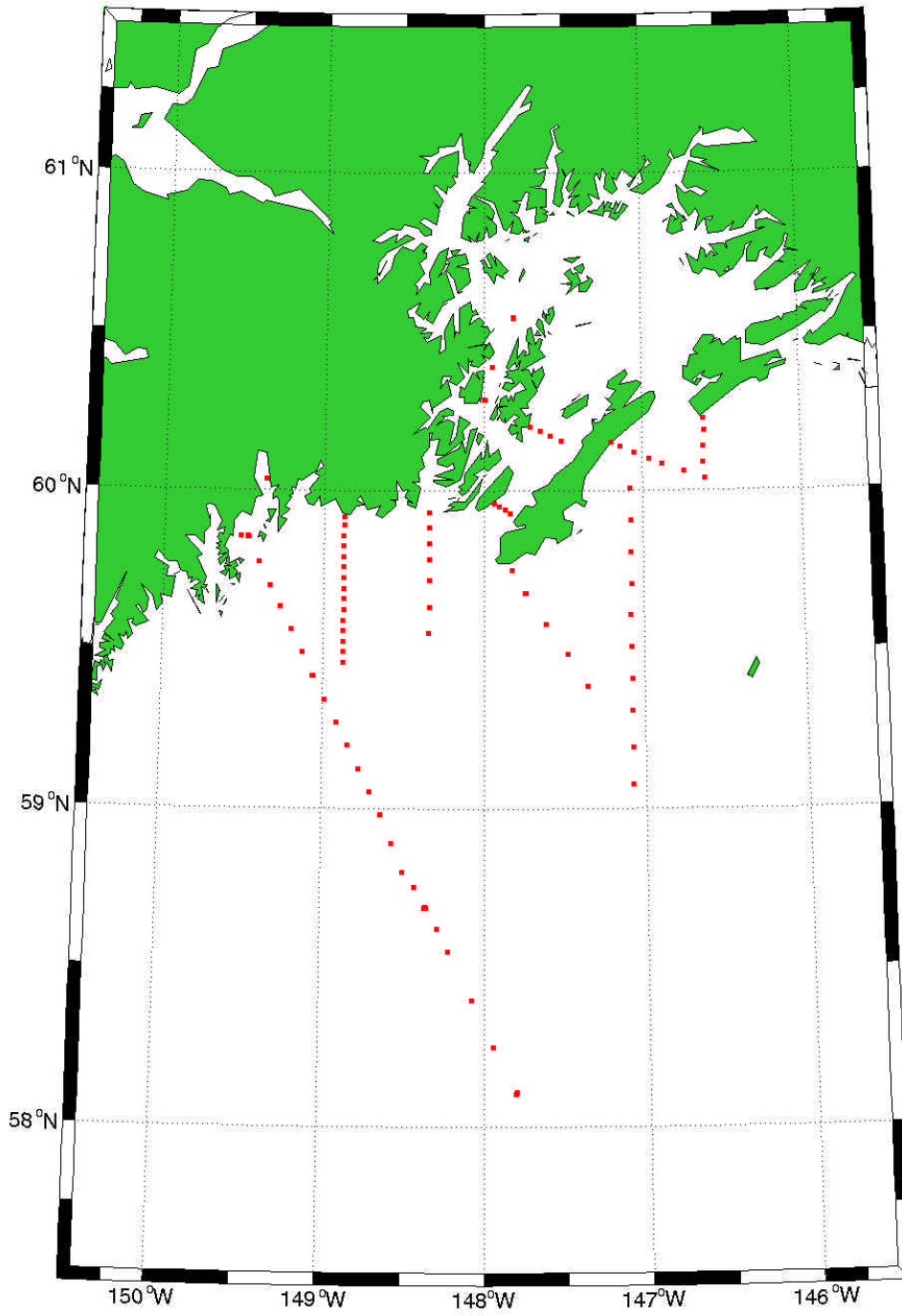| Station Name	Latitude (° ' N)	Longitude (° ' W)	Approximate Bottom Depth (m)
CCSE1	59.74167	-147.817	
CCSE2	59.66667	-147.727	
CCSE3	59.57083	-147.608	
CCSE4	59.475	-147.475	
CCSE5	59.375	-147.35	
CCSE6	59.23333	-147.158	
CCSE7	59.05833	-146.967	
CCSE8	58.88333	-146.733	

GLOBEC LTOP Standard Stations

hx248 Cruise Track

hx248 Station Locations
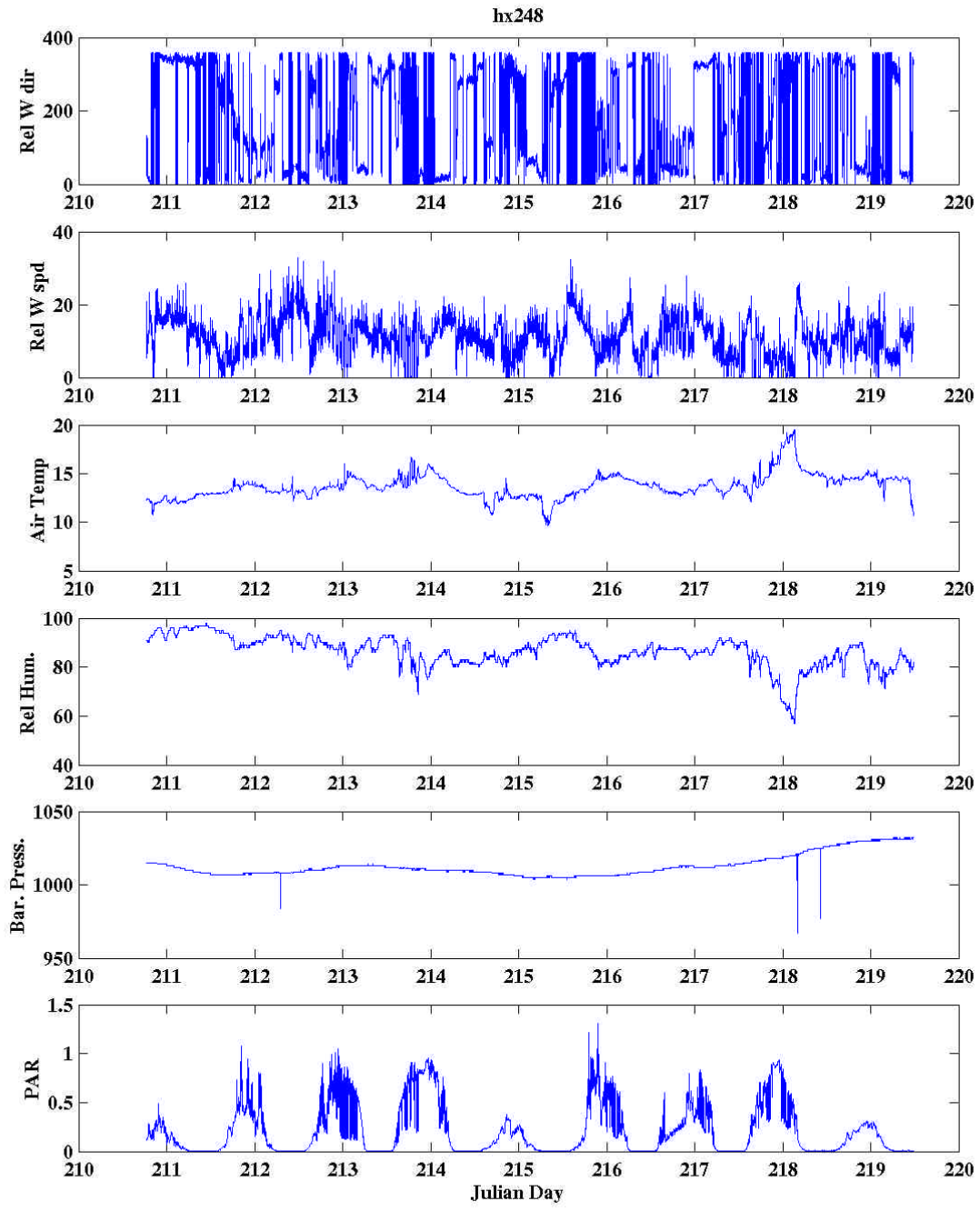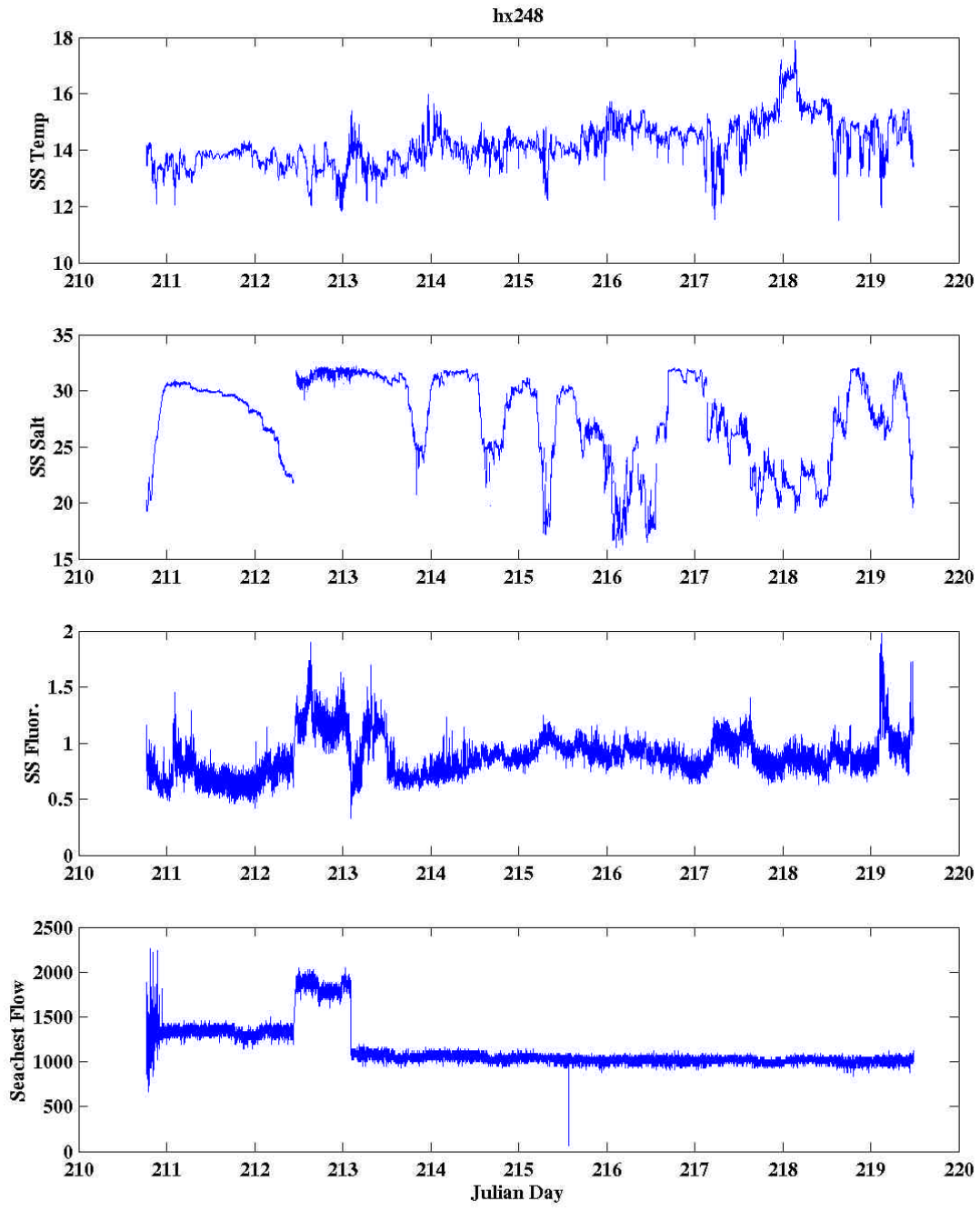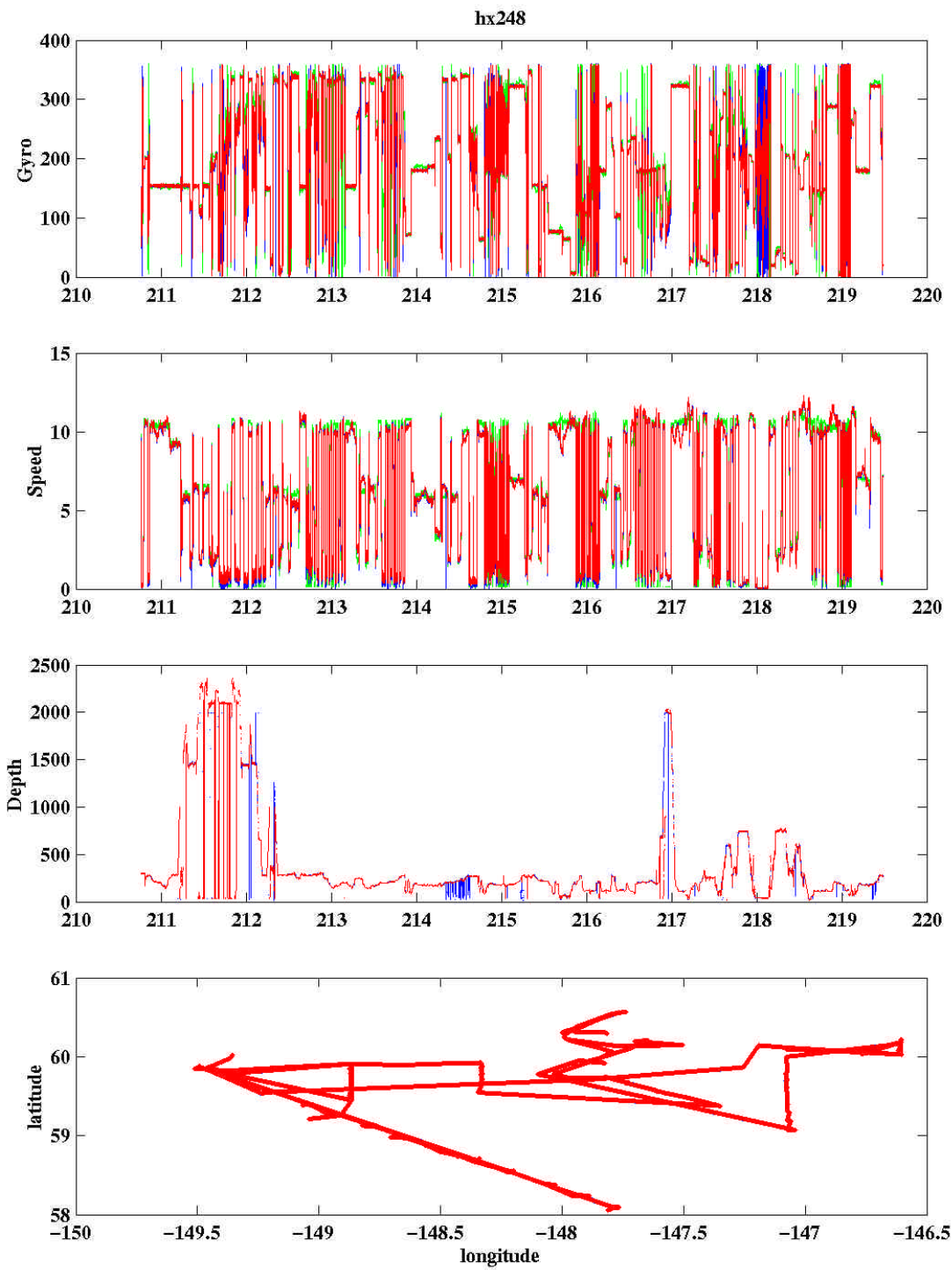
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7/31 to 8/2 2001 Seward Line Transect

Temperature (°C)

Distance (km)

Salinity (PSU)

Distance (km)

Sigma t

Distance (km)
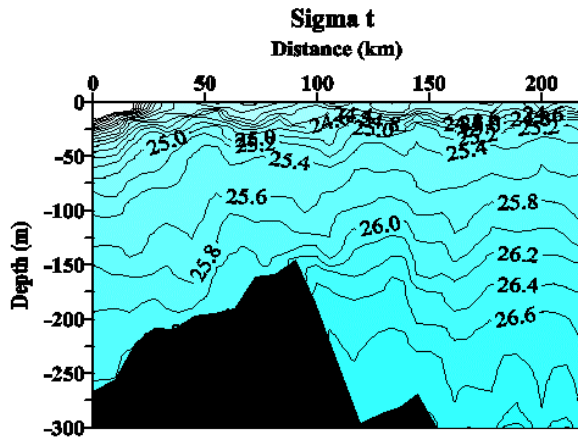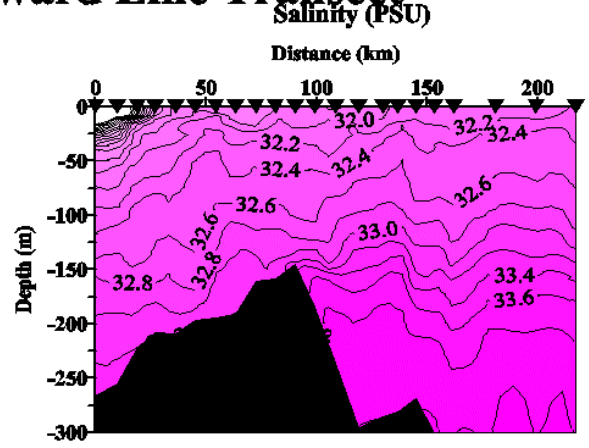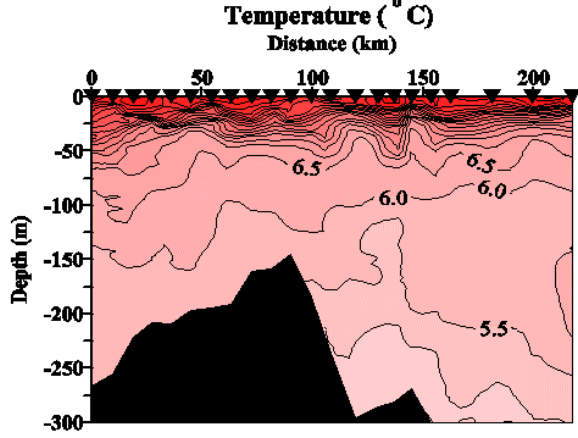
HX248 8/3/2001 Cape Fairfield Transect

Temperature (°C)

Salinity (PSU)

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Fluorescence
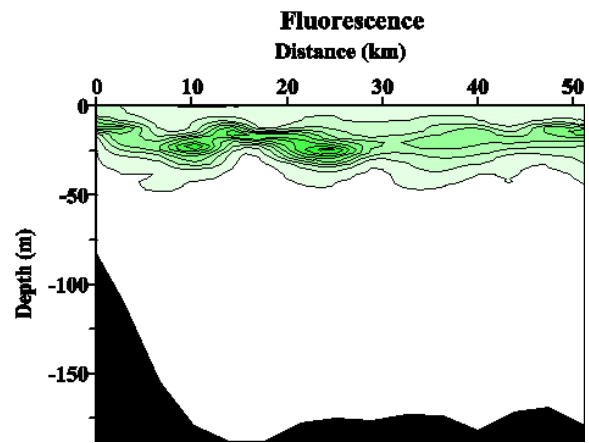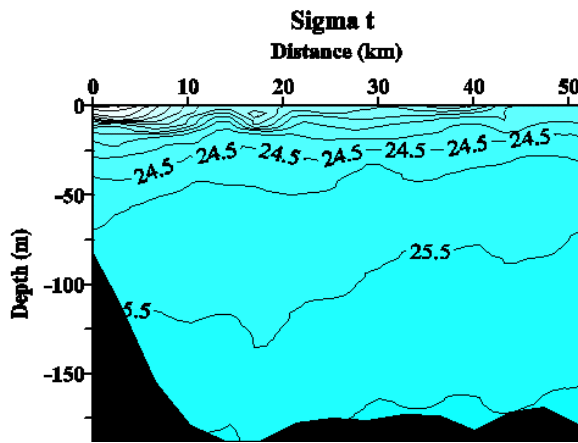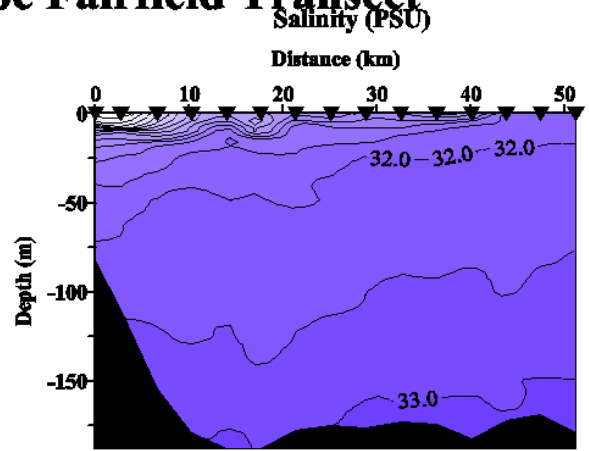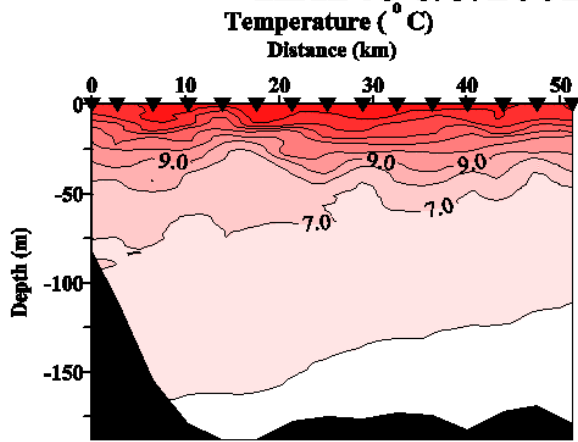
HX248 8/5/2001 Along Hincinbrook Canyon Transect

Temperature (°C)

Salinity (PSU)

Sigma t

Fluorescence

22
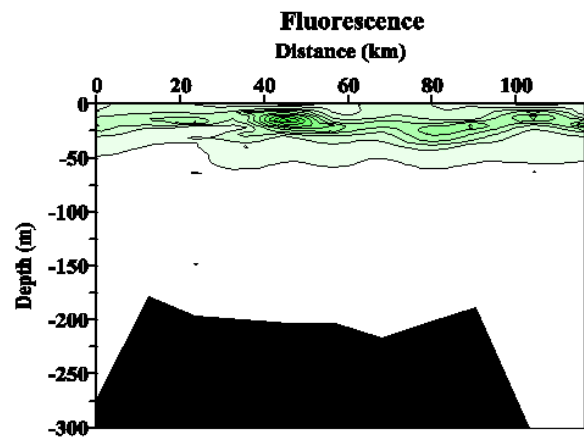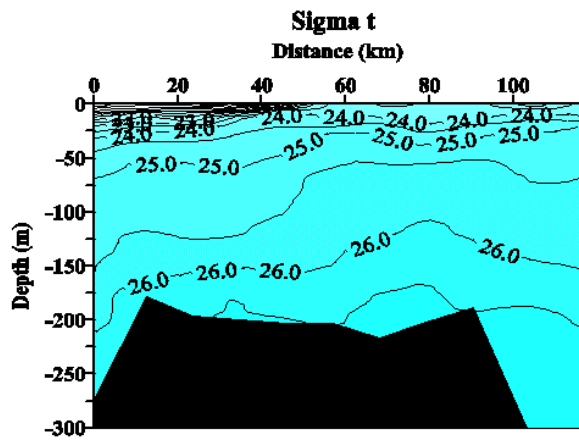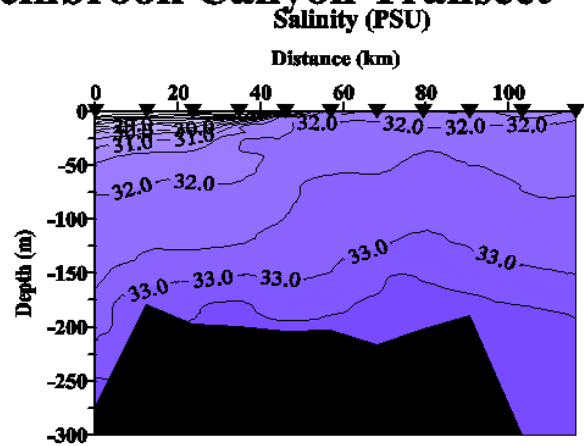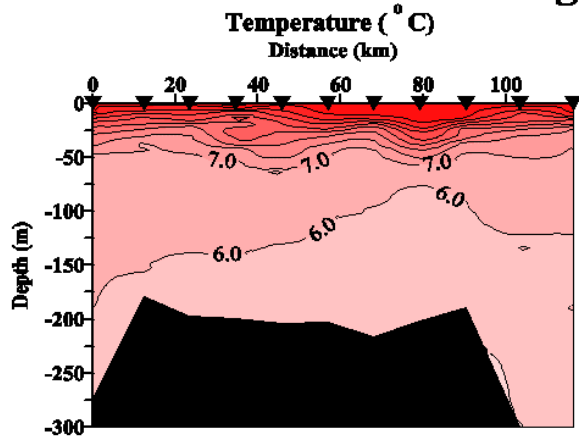
HX248 Cape Cleare Southeast Transect

23
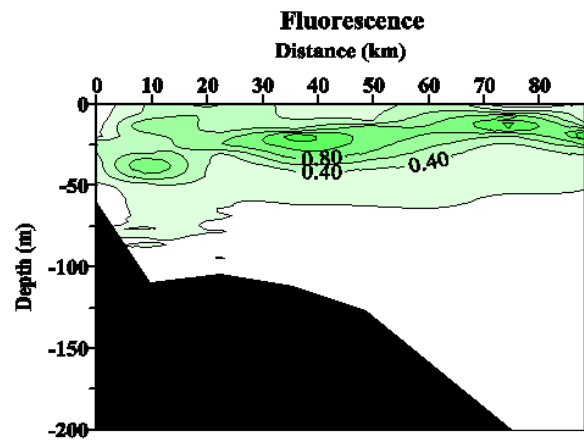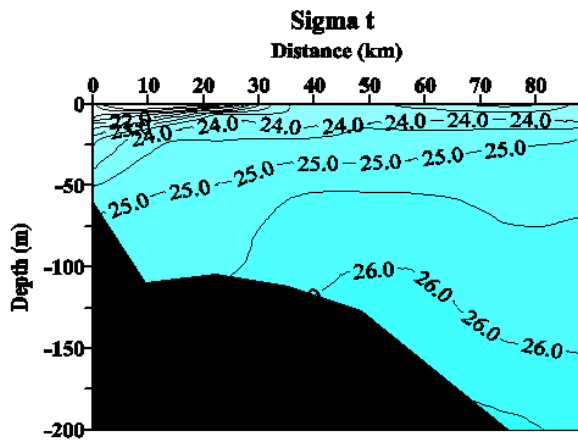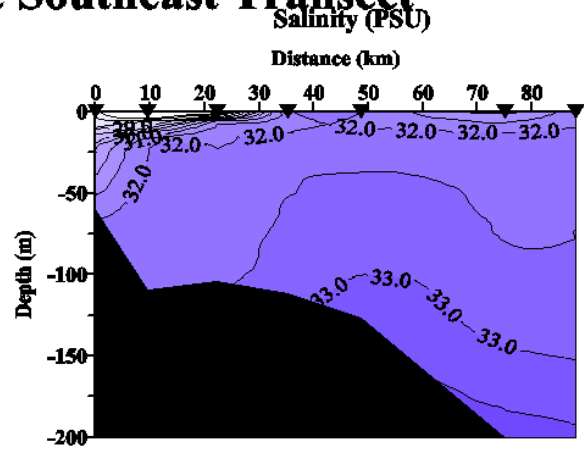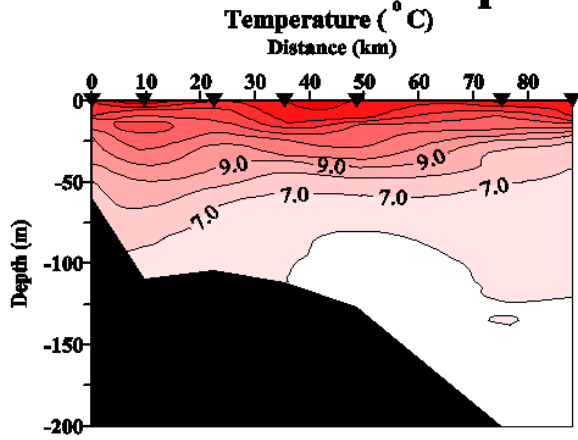
HX248 Hogan Bay Transect

Temperature (°C)

Salinity (PSU)

Sigma t

Fluorescence
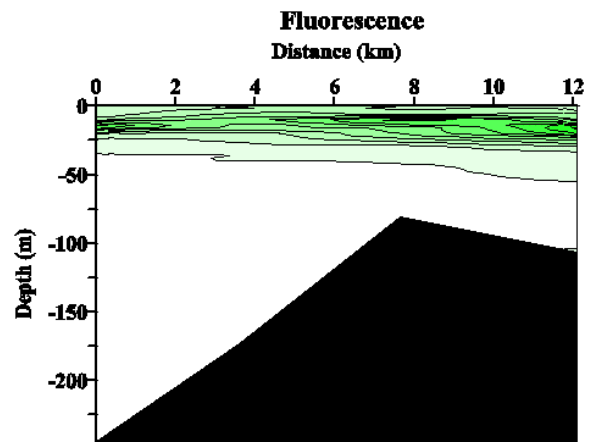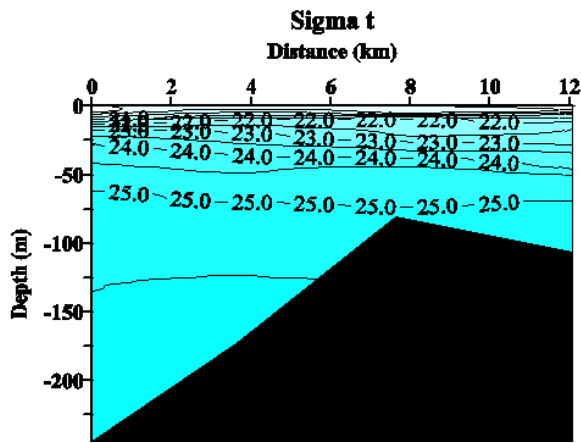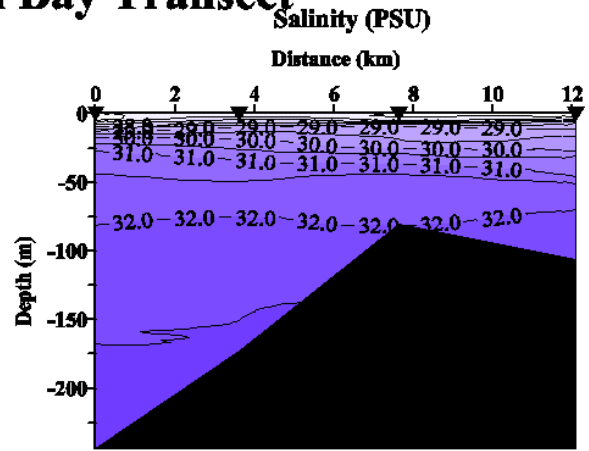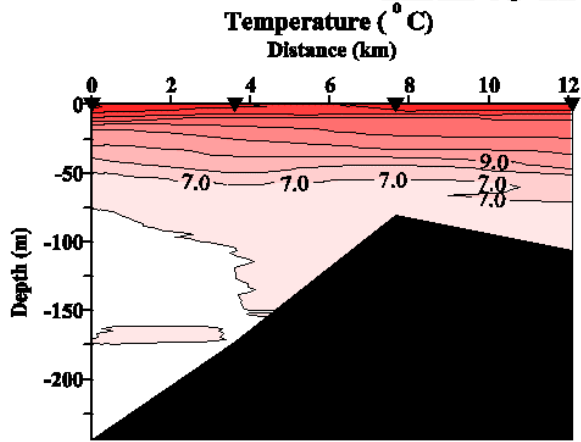
HX248 Montague Strait Transect

Temperature (°C)
Distance (km)

Salinity (PSU)
Distance (km)

Sigma t
Distance (km)

Fluorescence
Distance (km)

25
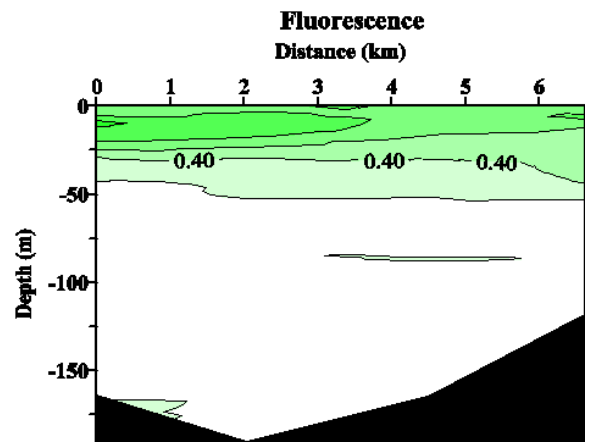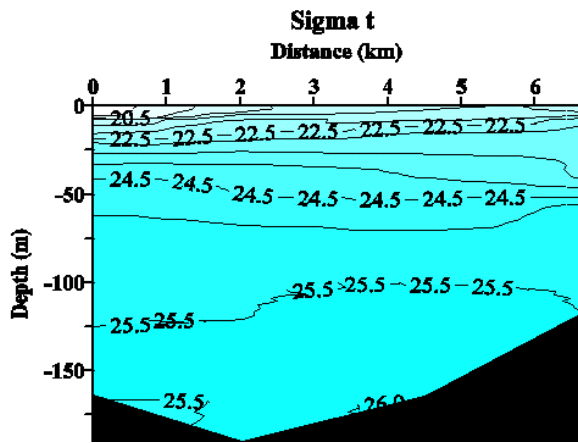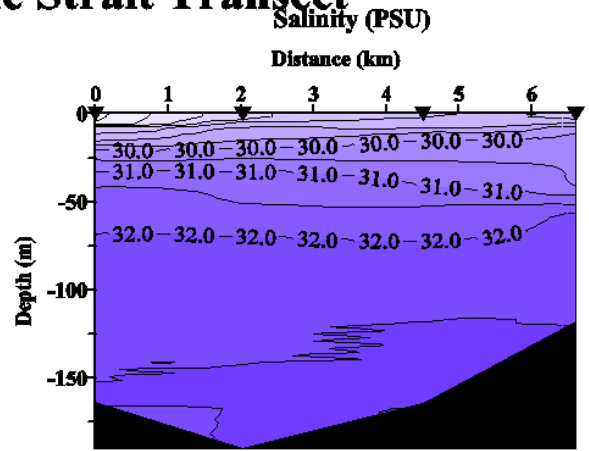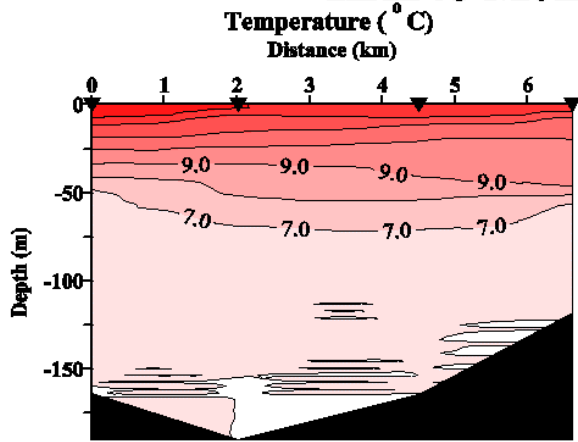
Unless otherwise noted, CTDs were taken for T. Weingartner and T. Royer.
Water samples taken for T. Whitledge and D. Stockwell Nutrient and Chlorophyll analysis.
CalVet samples were taken for K. Coyle and R. Hopcroft.
HTI and MOCNESS samples were taken for K. Coyle.
Ring Net samples were taken for R. Hopcroft and K. Coyle.

Event #	Description	Station	Date	GMT	Latitude	Longitude	Depth	Comments	Scientist
HX24821101.001	CTD1 Start	RES2.5	7/ 30/01	18:33	60.02568	149.3562	297		Danielson
HX24821101.002	CTD1 End	RES2.5	7/ 30/01	18:50	60.02625	149.3562	297		Danielson
HX24821101.003	HTI Transect Start	RES2.5	7/ 30/01	19:04	60.01642	149.3575	295	test HTI	Coyle
HX24821101.004	HTI Transect End	RES2.5	7/ 30/01	19:05	60.01525	149.3577	295		Coyle
HX24821101.005	CTD2 Start	GAK1	7/ 30/01	20:19	59.84432	149.4645	295		Danielson
HX24821101.006	CTD2 End	GAK1	7/ 30/01	20:35	59.84297	149.4638	268		Danielson
HX24821101.007	HTI Transect Start	GAK10	7/ 30/01	6:15	58.54223	148.2122	1460		Coyle
HX24821201.001	HTI Transect End	GAK11	7/ 31/01	8:03	58.38843	148.0715	1430		Coyle
HX24821201.002	MOCNESS1 Start	GAK11	7/ 31/01	8:08	58.38667	148.0658	1430		Coyle
HX24821201.003	MOCNESS1 End	GAK11	7/ 31/01	8:47	58.37782	148.0362	1430		Coyle
HX24821201.004	HTI Transect Start	GAK11	7/ 31/01	9:12	58.3877	148.0713	1430		Coyle
HX24821201.005	HTI Transect End	GAK12	7/ 31/01	10:46	58.2424	147.9308	1400		Coyle
HX24821201.006	MOCNESS Start	GAK12	7/ 31/01	10:51	58.24127	147.9252	2150		Coyle
HX24821201.007	HTI Transect Start	GAK12	7/ 31/01	11:56	58.24195	147.9313	2150		Coyle
HX24821201.008	HTI Transect End	GAK13	7/ 31/01	13:31	58.09913	147.7898	2094		Coyle
HX24821201.009	MOCNESS Start	GAK13	7/ 31/01	13:39	58.09777	147.7795	2094		Coyle
HX24821201.010	MOCNESS End	GAK13	7/ 31/01	14:10	58.08653	147.769	2094		Coyle

ID	Event	Station	Date	Time	Lat	Lon	Depth	Notes	PI
HX24821201.011	MOCNESS start	GAK13	7/ 31/01	14:38	58.09587	147.7898	2094		Hopcroft
HX24821201.012	MOCNESS End	GAK13	7/ 31/01	16:05	58.06335	147.8077	2094		Hopcroft
HX24821201.013	CTD3 Start	GAK13	7/ 31/01	16:21	58.09842	147.7922	2094		Danielson
HX24821201.014	CTD3 Start	GAK13	7/ 31/01	17:43	58.09846	147.7863	2094		Danielson
HX24821201.015	Ring Net Start	GAK13	7/ 31/01	17:50	58.09702	147.7932	2094		Hopcroft
HX24821201.016	Ring Net End	GAK13	7/ 31/01	17:59	58.09612	147.7933	2094		Hopcroft
HX24821201.017	CTD3 End	GAK13	7/ 31/01	18:02	58.09602	147.7933	2094	prod cast	Childers
HX24821201.018	CTD4 Start	GAK13	7/ 31/01	18:09	58.09565	147.7928	2094		Childers
HX24821201.019	CalVET Net Tow Start	GAK13	7/ 31/01	18:33	58.09381	147.7943	2094		Hopcroft
HX24821201.020	CalVET Net Tow End	GAK13	7/ 31/01	18:39	58.09337	147.795	2094		Hopcroft
HX24821201.021	CTD4 End	GAK13	7/ 31/01	18:47	58.09775	147.7936	2094		Hopcroft
HX24821201.022	CTD5 Start	GAK13	7/ 31/01	18:53	58.09737	147.7944	2094		Hopcroft
HX24821201.023	CTD5 Start	GAK13	7/ 31/01	19:06	58.09593	147.7968	2094	cohorts cast #2	Hopcroft
HX24821201.024	CTD6 Start	GAK13	7/ 31/01	19:08	58.09572	147.7971	2094		Hopcroft
HX24821201.025	CTD6 End	GAK13	7/ 31/01	19:21	58.0943	147.7999	2094	cohorts cast #3	Hopcroft
HX24821201.026	CTD7 Start	GAK13	7/ 31/01	19:39	58.09278	147.8035	2094		Hopcroft
HX24821201.027	Ring Net Start	GAK13	7/ 31/01	19:40	58.09277	147.8036	2094		Pinchuk
HX24821201.028	CTD7 End	GAK13	7/ 31/01	19:41	58.09275	147.8037	2094	start should be about 10 min before end	Pinchuk
HX24821201.029	CTD8 Start	GAK13	7/ 31/01	19:47	58.09823	147.7935	2094	cohorts cast #4	Hopcroft
HX24821201.030	CTD8 End	GAK13	7/ 31/01	19:50	58.09793	147.7936	2094		Hopcroft
HX24821201.031	CalVET Net Tow Start	GAK12	7/ 31/01	21:03	58.2419	147.937	2094		Hopcroft
HX24821201.032	CalVET Net Tow End	GAK12	7/ 31/01	21:05	58.24178	147.9374	2094		Hopcroft
HX24821201.033	CTD9 Start	GAK12	7/ 31/01	21:06	58.24175	147.9375	2094		Danielson
HX24821201.034	CTD9 End	GAK12	7/ 31/01	22:16	58.23967	147.9575	2094		Danielson
HX24821201.035	CalVET Net Tow Start	GAK11	7/ 31/01	23:23	58.38923	148.0699	1436		Hopcroft
HX24821201.036	CalVET Net Tow End	GAK11	7/ 31/01	23:23	58.38918	148.0697	1436		Hopcroft
HX24821201.037	CTD10 Start	GAK11	7/ 31/01	23:25	58.38915	148.0697	1436		Danielson
HX24821301.001	CTD10 End	GAK11	8/ 1/01	0:31	58.38635	148.0683	1436		Danielson
HX24821301.002	CTD11 Start	GAK10	8/ 1/01	1:39	58.54156	148.213	1400		Danielson
HX24821301.003	CTD11 End	GAK10	8/ 1/01	2:46	58.53435	148.2228	1400		Danielson
HX24821301.004	CalVET Net Tow Start	GAK10	8/ 1/01	2:52	58.53452	148.224	1400		Hopcroft
HX24821301.005	CalVET Net Tow End	GAK10	8/ 1/01	3:02	58.54217	148.2294	1400		Hopcroft

HX24821301.006	CTD12 Start	GAK9I	8/ 1/01	3:28	58.61122	148.2781	695		Danielson
HX24821301.007	CTD12 End	GAK9I	8/ 1/01	4:07	58.60966	148.2878	695		Danielson
HX24821301.008	CTD13 Start	GAK9	8/ 1/01	5:00	58.6763	148.362	276		Danielson
HX24821301.009	CTD13 End	GAK9	8/ 1/01	5:15	58.6763	148.362	276		Danielson
HX24821301.010	CalVET Net Tow Start	GAK9	8/ 1/01	5:17	58.67655	148.3627	276		Hopcroft
HX24821301.011	MOCNESS Start	GAK10	8/ 1/01	7:00	58.54395	148.2096	384		Coyle
HX24821301.012	MOCNESS End	GAK10	8/ 1/01	7:29	58.55582	148.1989	384		Coyle
HX24821301.013	HTI Transect Start	GAK10	8/ 1/01	7:44	58.54352	148.2133	384		Coyle
HX24821301.014	HTI Transect End	GAK9	8/ 1/01	9:14	58.68112	148.3505	281		Coyle
HX24821301.015	MOCNESS Start	GAK9	8/ 1/01	9:19	58.6834	148.3501	281		Coyle
HX24821301.016	MOCNESS End	GAK9	8/ 1/01	9:59	58.70657	148.3416	281		Coyle
HX24821301.017	HTI Transect Start	GAK9	8/ 1/01	10:24	58.6801	148.3504	281		Coyle
HX24821301.018	HTI Transect End	GAK8	8/ 1/01	11:49	58.79111	148.4893	288		Coyle
HX24821301.019	MOCNESS Start	GAK8	8/ 1/01	11:56	58.79519	148.4906	288		Coyle
HX24821301.020	MOCNESS End	GAK8	8/ 1/01	12:24	58.80522	148.4884	288		Coyle
HX24821301.021	HTI Transect Start	GAK8	8/ 1/01	12:41	58.7922	148.4911	288		Coyle
HX24821301.022	HTI Transect End	GAK7	8/ 1/01	14:55	58.97075	148.6322	241		Coyle
HX24821301.023	CTD14 Start	GAK9	8/ 1/01	16:58	58.67745	148.3512	277	prim prod cast	Childers
HX24821301.024	CTD14 End	GAK9	8/ 1/01	17:15	58.67233	148.3584	277		Childers
HX24821301.025	Ring Net Start	GAK9	8/ 1/01	17:22	58.6789	148.3498	277		Hopcroft
HX24821301.026	Ring Net End	GAK9	8/ 1/01	17:30	58.67748	148.3545	277		Hopcroft
HX24821301.027	Ring Net Start	GAK9	8/ 1/01	17:31	58.67747	148.355	277		Hopcroft
HX24821301.028	Ring Net End	GAK9	8/ 1/01	17:44	58.68067	148.3506	277		Hopcroft
HX24821301.029	CTD15 Start	GAK9	8/ 1/01	17:45	58.68065	148.3508	277	cohorts #1	Hopcroft

HX24821301.030	CTD15 End	GAK9	8/ 1/01	17:48	58.68045	148.3522	277		Hopcroft
HX24821301.031	CTD16 Start	GAK9	8/ 1/01	17:58	58.67862	148.3564	277	cohorts #2	Hopcroft
HX24821301.032	CTD16 End	GAK9	8/ 1/01	18:05	58.67862	148.3564	277		Hopcroft
HX24821301.033	Ring Net Start	GAK9	8/ 1/01	18:10	58.67885	148.3531	277		Hopcroft
HX24821301.034	Ring Net End	GAK9	8/ 1/01	18:14	58.67885	148.3531	277		Hopcroft
HX24821301.035	CTD17 Start	GAK9	8/ 1/01	18:19	58.67922	148.3534	277	cohorts #3	Hopcroft
HX24821301.036	CTD17 End	GAK9	8/ 1/01	18:21	58.67915	148.3546	277		Hopcroft
HX24821301.037	CTD18 Start	GAK8I	8/ 1/01	19:10	58.74258	148.4218	277		Danielson
HX24821301.038	CTD18 End	GAK8I	8/ 1/01	19:31	58.73703	148.4296	277		Danielson
HX24821301.039	CTD19 Start	GAK8	8/ 1/01	20:03	58.79183	148.4911	288		Danielson
HX24821301.040	CTD19 End	GAK8	8/ 1/01	20:23	58.78992	148.4939	288		Danielson
HX24821301.041	CalVET Net Tow Start	GAK8	8/ 1/01	20:30	58.78977	148.4953	288		Hopcroft
HX24821301.042	CalVET Net Tow End	GAK8	8/ 1/01	20:37	58.7909	148.4991	288		Hopcroft
HX24821301.043	CTD20 Start	GAK7I	8/ 1/01	21:12	58.88178	148.5608	302		Danielson
HX24821301.044	CTD20 End	GAK7I	8/ 1/01	21:33	58.87977	148.5649	302		Danielson
HX24821301.045	CTD21 Start	GAK7	8/ 1/01	22:18	58.9721	148.6296	302		Danielson
HX24821301.046	CTD21 End	GAK7	8/ 1/01	22:36	58.97178	148.6258	302		Danielson
HX24821301.047	CalVET Net Tow Start	GAK7	8/ 1/01	22:42	58.97217	148.6229	302		Hopcroft
HX24821301.048	CalVET Net Tow End	GAK7	8/ 1/01	22:47	58.9719	148.6227	302		Hopcroft
HX24821301.049	CTD22 Start	GAK6I	8/ 1/01	23:19	59.0453	148.6994	193		Danielson
HX24821301.050	CTD22 End	GAK6I	8/ 1/01	23:37	59.04737	148.6937	193		Danielson
HX24821301.051	CTD23 Start	GAK6	8/ 1/01	0:11	59.11703	148.7693	150		Danielson
HX24821301.052	CTD23 End	GAK6	8/ 1/01	0:25	59.1183	148.7632	150		Danielson
HX24821301.053	CalVET Net Tow Start	GAK6	8/ 1/01	0:49	59.15113	148.7942	150		Pinchuk
HX24821301.054	CalVET Net Tow End	GAK6	8/ 1/01	0:50	59.1517	148.7948	150		Pinchuk
HX24821301.055	CTD24 Start	GAK5I	8/ 1/01	1:08	59.19024	148.8377	164		Danielson
HX24821301.056	CTD24 End	GAK5I	8/ 1/01	1:20	59.1905	148.8356	164		Danielson
HX24821301.057	CTD25 Start	GAK5	8/ 1/01	1:54	59.26143	148.9064	165		Danielson
HX24821301.058	CTD25 End	GAK5	8/ 1/01	2:08	59.25928	148.9105	165		Danielson
HX24821301.059	CalVET Net Tow Start	GAK5	8/ 1/01	2:10	59.40787	149.0567	165		Pinchuk
HX24821301.060	CalVET Net Tow End	GAK5	8/ 1/01	2:16	59.40795	149.0566	165		Pinchuk
HX24821301.061	CTD26 Start	GAK4I	8/ 1/01	2:52	59.33432	148.9809	199		Danielson
HX24821301.062	CTD26 End	GAK4I	8/ 1/01	3:08	59.33312	148.9878	199		Danielson
HX24821301.063	CTD27 Start	GAK4	8/ 1/01	3:39	59.40747	149.0504	200		Danielson
HX24821301.064	CTD27 End	GAK4	8/ 1/01	3:52	59.40782	149.0542	200		Danielson
HX24821301.065	CalVET Net Tow Start	GAK4	8/ 1/01	3:54	59.40782	149.0547	200		Pinchuk

	CalVET Net								
HX24821301.066	Tow End	GAK4	8/ 1/01	4:00	59.40783	149.0566	200		Pinchuk
	MOCNESS								
HX24821301.067	Start	GAK7	8/ 1/01	7:07	58.97285	148.6429	243		Coyle
	MOCNESS								
HX24821301.068	End	GAK7	8/ 1/01	7:53	58.97688	148.7042	243		Coyle
	HTI Transect								
HX24821401.001	Start	GAK7	8/ 2/01	8:19	58.9732	148.6302	243		Coyle
	HTI Transect								
HX24821401.002	End	GAK6	8/ 2/01	9:45	59.11758	148.7737	150		Coyle
	MOCNESS								
HX24821401.003	Start	GAK6	8/ 2/01	9:48	59.11797	148.7766	150		Coyle
	MOCNESS								
HX24821401.004	End	GAK6	8/ 2/01	10:28	59.12495	148.8171	150		Coyle
	HTI Transect								
HX24821401.005	Start	GAK6	8/ 2/01	10:52	59.11775	148.7701	150		Coyle
	HTI Transect								
HX24821401.006	End	GAK5	8/ 2/01	12:25	59.26218	148.9105	167		Coyle
	MOCNESS								
HX24821401.007	Start	GAK5	8/ 2/01	12:30	59.25342	148.9455	167		Coyle
	MOCNESS								
HX24821401.008	End	GAK5	8/ 2/01	13:00	59.25342	148.9455	167		Coyle
HX24821401.009	CTD28 Start	GAK4	8/ 2/01	14:12	59.40775	149.0489	200	prim prod cast	Childers
HX24821401.010	CTD28 End	GAK4	8/ 2/01	14:27	59.40692	149.0517	200		Childers
	Ring Net								
HX24821401.011	Start	GAK4	8/ 2/01	14:31	59.40673	149.052	200		Hopcroft
	Ring Net								
HX24821401.012	End	GAK4	8/ 2/01	14:34	59.40672	149.0525	200		Hopcroft
	Ring Net								
HX24821401.013	Start	GAK4	8/ 2/01	14:50	59.40658	149.0533	200		Hopcroft
	Ring Net								
HX24821401.014	End	GAK4	8/ 2/01	15:00	59.4069	149.0569	200		Hopcroft
HX24821401.015	CTD29 Start	GAK4	8/ 2/01	15:00	59.4069	149.057	200	cohorts #1	Hopcroft
HX24821401.016	CTD29 End	GAK4	8/ 2/01	15:03	59.40698	149.0574	200		Hopcroft
HX24821401.017	CTD30 Start	GAK4	8/ 2/01	15:15	59.40838	149.0495	200	cohorts #2	Hopcroft
HX24821401.018	CTD30 End	GAK4	8/ 2/01	15:18	59.40868	149.0498	200		Hopcroft
HX24821401.019	CTD31 Start	GAK3I	8/ 2/01	15:51	59.4819	149.1178	202		Danielson
HX24821401.020	CTD31 End	GAK3I	8/ 2/01	16:06	59.48143	149.1182	202		Danielson
HX24821401.021	CTD32 Start	GAK3	8/ 2/01	16:39	59.55332	149.188	212		Danielson
HX24821401.022	CTD32 End	GAK3	8/ 2/01	16:55	59.55223	149.1927	212		Danielson
	CalVET Net								
HX24821401.023	Tow Start	GAK3	8/ 2/01	16:58	59.55173	149.1936	212		Hopcroft

	CalVET Net								
HX24821401.024	Tow End	GAK3	8/ 2/01	17:03	59.55095	149.194	212		Hopcroft
HX24821401.025	CTD33 Start	GAK2I	8/ 2/01	17:34	59.6269	149.2585	212		Danielson
HX24821401.026	CTD33 End	GAK2I	8/ 2/01	17:50	59.62738	149.2603	212		Danielson
	CalVET Net								
HX24821401.027	Tow Start	GAK2	8/ 2/01	18:23	59.69165	149.3269	226		Hopcroft
	CalVET Net								
HX24821401.028	Tow End	GAK2	8/ 2/01	18:28	59.69127	149.3272	226		Hopcroft
HX24821401.029	CTD34 Start	GAK2	8/ 2/01	18:28	59.69125	149.3272	226		Danielson
HX24821401.030	CTD34 End	GAK2	8/ 2/01	18:47	59.68988	149.3295	226		Danielson
HX24821401.031	CTD35 Start	GAK1I	8/ 2/01	19:20	59.76638	149.3958	259		Danielson
HX24821401.032	CTD35 End	GAK1I	8/ 2/01	19:39	59.76377	149.3997	259		Danielson
HX24821401.033	CTD36 Start	GAK1	8/ 2/01	20:13	59.84532	149.4672	268		Danielson
HX24821401.034	CTD36 End	GAK1	8/ 2/01	20:32	59.84453	149.4645	268		Danielson
	CalVET Net								
HX24821401.035	Tow Start	GAK1	8/ 2/01	20:36	59.84432	149.4638	268		Hopcroft
	CalVET Net								
HX24821401.036	Tow End	GAK1	8/ 2/01	20:46	59.8335	149.4278	268		Hopcroft
	ADCP transect								
HX24821401.037	Start	CF1	8/ 2/01	22:35	59.90723	148.8657	85		Danielson
	ADCP								
HX24821401.038	transect End	CF15	8/ 2/01	3:22	59.43727	148.8691	181		Danielson
	HTI Transect								
HX24821401.039	Start	GAK5	8/ 2/01	7:21	59.26587	148.9125	170		Coyle
	HTI Transect								
HX24821501.001	End	GAK4	8/ 3/01	8:51	59.4084	149.0507	202		Coyle
	MOCNESS								
HX24821501.002	Start	GAK4	8/ 3/01	8:49	59.4078	149.04017	202		Coyle
	MOCNESS								
HX24821501.003	End	GAK4	8/ 3/01	9:36	59.38678	149.0667	202		Coyle
	HTI Transect								
HX24821501.004	Start	GAK4	8/ 3/01	9:58	59.40997	149.0511	202		Coyle
	HTI Transect								
HX24821501.005	End	GAK3	8/ 3/01	11:38	59.5536	149.1906	214		Coyle
	MOCNESS								
HX24821501.006	Start	GAK3	8/ 3/01	12:19	59.55366	149.18933	232		Coyle
	MOCNESS								
HX24821501.007	End	GAK3	8/ 3/01	12:19	59.54078	149.226	232		Coyle
HX24821501.008	CTD37 Start	GAK1	8/ 3/01	14:47	59.84465	149.468	271	prim prod cast	Childers
HX24821501.009	CTD37 End	GAK1	8/ 3/01	15:04	59.84532	149.4675	271		Childers
	Ring Net								
HX24821501.010	Start	GAK1	8/ 3/01	15:09	59.8453	149.4676	271		Hopcroft

HX24821501.011	Ring Net End	GAK1	8/ 3/01	15:17	59.84525	149.4678	271		Hopcroft
HX24821501.012	38 Start	GAK1	8/ 3/01	15:29	59.84482	149.4681	271	cohorts #1	Hopcroft
HX24821501.013	CTD38 Start	GAK1	8/ 3/01	15:34	59.84462	149.4682	271		Hopcroft
HX24821501.014	CTD39 Start	GAK1	8/ 3/01	15:50	59.84393	149.468	268	cohorts #2	Hopcroft
HX24821501.015	CTD39 End	GAK1	8/ 3/01	15:52	59.84381	149.468	268		Hopcroft
HX24821501.016	CTD40 Start	GAK1	8/ 3/01	16:00	59.84332	149.4679	268	cohorts #3	Hopcroft
HX24821501.017	CTD40 End	GAK1	8/ 3/01	16:02	59.84315	149.4678	268		Hopcroft
HX24821501.018	CTD41 Start	GAK1	8/ 3/01	16:11	59.84578	149.4678	268	cohorts #4	Hopcroft
HX24821501.019	CTD41 End	GAK1	8/ 3/01	16:14	59.84552	149.4679	268		Hopcroft
HX24821501.020	CTD42 Start	GAK1	8/ 3/01	16:26	59.84472	149.468	268	cohorts #5	Hopcroft
HX24821501.021	CTD42 End	GAK1	8/ 3/01	16:29	59.84455	149.4678	268		Hopcroft
HX24821501.022	CTD43 Start	GAK1	8/ 3/01	16:40	59.844	149.4673	268	cohorts #6	Hopcroft
HX24821501.023	CTD43 End	GAK1	8/ 3/01	16:43	59.84388	149.4673	268		Hopcroft
HX24821501.024	Ring Net Start	GAK1	8/ 3/01	16:49	59.84357	149.4672	268		Hopcroft
HX24821501.025	Ring Net End	GAK1	8/ 3/01	16:53	59.84328	149.4673	268		Hopcroft
HX24821501.026	Ring Net Start	GAK1	8/ 3/01	17:02	59.84223	149.468	268		Hopcroft
HX24821501.027	Ring Net End	GAK1	8/ 3/01	17:08	59.8421	149.4685	268		Hopcroft
HX24821501.028	CTD44 Start	CF1	8/ 3/01	19:13	59.9077	148.8668	85		Danielson
HX24821501.029	CTD44 End	CF1	8/ 3/01	19:21	59.9077	148.8662	85		Danielson
HX24821501.030	CTD45 Start	CF2	8/ 3/01	19:32	59.88365	148.8654	112		Danielson
HX24821501.031	CTD45 End	CF2	8/ 3/01	19:39	59.88352	148.8664	112		Danielson
HX24821501.032	CTD46 Start	CF3	8/ 3/01	19:55	59.84903	148.8681	163		Danielson
HX24821501.033	CTD46 End	CF3	8/ 3/01	20:08	59.84913	148.8755	163		Danielson
HX24821501.034	CTD47 Start	CF4	8/ 3/01	20:24	59.8161	148.8671	183		Danielson
HX24821501.035	CTD47 End	CF4	8/ 3/01	20:34	59.8164	148.8676	183		Danielson
HX24821501.036	CTD48 Start	CF5	8/ 3/01	20:52	59.7853	148.871	192		Danielson
HX24821501.037	CTD48 End	CF5	8/ 3/01	21:09	59.78335	148.871	192		Danielson
HX24821501.038	CTD49 Start	CF6	8/ 3/01	21:23	59.75035	148.8665	191		Danielson
HX24821501.039	CTD49 End	CF6	8/ 3/01	21:32	59.75253	148.8686	191		Danielson
HX24821501.040	CTD50 Start	CF7	8/ 3/01	21:54	59.71693	148.8665	182		Danielson
HX24821501.041	CTD50 End	CF7	8/ 3/01	22:09	59.72087	148.87	182		Danielson
HX24821501.042	CTD51 Start	CF8	8/ 3/01	22:28	59.6833	148.8673	181		Danielson
HX24821501.043	CTD51 End	CF8	8/ 3/01	22:37	59.68583	148.869	181		Danielson
HX24821501.044	CTD52 Start	CF9	8/ 3/01	22:59	59.64982	148.8666	179		Danielson
HX24821501.045	CTD52 End	CF9	8/ 3/01	23:15	59.65351	148.8706	179		Danielson
HX24821501.046	CTD53 Start	CF10	8/ 3/01	23:33	59.61692	148.8658	177		Danielson
HX24821501.047	CTD53 End	CF10	8/ 3/01	23:42	59.6176	148.8695	177		Danielson
HX24821501.048	CTD54 Start	CF11	8/ 3/01	0:01	59.5826	148.8681	177		Danielson
HX24821501.049	CTD54 End	CF11	8/ 3/01	0:14	59.54852	148.8739	177		Danielson
HX24821501.050	CTD55 Start	CF12	8/ 3/01	0:35	59.54975	148.8684	185		Danielson
HX24821501.051	CTD55 End	CF12	8/ 3/01	0:49	59.54935	148.874	185		Danielson

HX24821501.052	CTD56 Start	CF13	8/ 3/01	1:04	59.51642	148.8693	175		Danielson
HX24821501.053	CTD56 End	CF13	8/ 3/01	1:18	59.51657	148.875	175		Danielson
HX24821501.054	CTD57 Start	CF14	8/ 3/01	1:33	59.48368	148.8692	168		Danielson
HX24821501.055	CTD57 End	CF14	8/ 3/01	1:43	59.48395	148.8724	172		Danielson
HX24821501.056	CTD58 Start	CF15	8/ 3/01	2:00	59.45027	148.8653	181		Danielson
HX24821501.057	CTD58 End	CF15	8/ 3/01	2:14	59.45135	148.8705	181		Danielson
HX24821501.058	CTD59 End	WATER	8/ 3/01	7:21	59.84497	149.5122	252	water for Alexi in res bay	Danielson
HX24821501.059	CTD59 End	WATER	8/ 3/01	7:25	59.84442	149.5125	252		Danielson
HX24821501.060	MOCNESS Start	GAK1	8/ 3/01	7:41	59.84888	149.4778	271		Coyle
HX24821601.001	MOCNESS End	GAK1	8/ 4/01	8:26	59.87357	149.4895	271		Coyle
HX24821601.002	HTI Transect Start	GAK1	8/ 4/01	8:48	59.84272	149.4646	271		Coyle
HX24821601.003	HTI Transect End	GAK2	8/ 4/01	10:28	59.69148	149.3241	227		Coyle
HX24821601.004	MOCNESS Start	GAK2	8/ 4/01	10:33	59.69485	149.3223	227		Coyle
HX24821601.005	MOCNESS End	GAK2	8/ 4/01	11:06	59.71275	149.3161	227		Coyle
HX24821601.006	HTI Transect Start	GAK2	8/ 4/01	11:26	59.69022	149.3252	227		Coyle
HX24821601.007	HTI Transect End	GAK3	8/ 4/01	13:06	59.55295	149.1878	213		Coyle
HX24821601.008	CTD60 Start	HE12	8/ 4/01	21:00	60.14318	147.1902	177		Danielson
HX24821601.009	CTD60 End	HE12	8/ 4/01	21:15	60.14283	147.1902	177		Danielson
HX24821601.010	CTD61 Start	HE11	8/ 4/01	21:29	60.12975	147.1327	217		Danielson
HX24821601.011	CTD61 End	HE11	8/ 4/01	21:45	60.12792	147.1337	217		Danielson
HX24821601.012	CTD62 Start	HE10	8/ 4/01	22:04	60.10966	147.0496	277		Danielson
HX24821601.013	CTD62 End	HE10	8/ 4/01	22:24	60.10795	147.052	277		Danielson
HX24821601.014	CalVET Net Tow Start	HE10	8/ 4/01	22:29	60.10777	147.0523	277		Hopcroft
HX24821601.015	CalVET Net Tow End	HE10	8/ 4/01	22:31	60.10747	147.0526	277		Hopcroft
HX24821601.016	CTD63 Start	HE9	8/ 4/01	22:54	60.09262	146.956	147		Danielson
HX24821601.017	CTD63 End	HE9	8/ 4/01	23:07	60.09262	146.9498	147		Danielson
HX24821601.018	CTD64 Start	HE8	8/ 4/01	23:24	60.07457	146.8741	107		Danielson
HX24821601.019	CTD64 End	HE8	8/ 4/01	23:34	60.07378	146.8701	107		Danielson
HX24821601.020	CTD65 Start	HE6.5	8/ 4/01	0:12	60.0513	146.7376	124		Danielson
HX24821601.021	CTD65 End	HE6.5	8/ 4/01	0:23	60.04918	146.7339	124		Danielson
HX24821601.022	CalVET Net Tow Start	HE6.5	8/ 4/01	0:31	60.04825	146.7316	124		Hopcroft

	CalVET Net								
HX24821601.023	Tow End	HE6.5	8/ 4/01	0:35	60.04738	146.731	124		Hopcroft
HX24821601.024	CTD66 Start	HE5	8/ 4/01	1:01	60.02896	146.6078	90		Danielson
HX24821601.025	CTD66 End	HE5	8/ 4/01	1:09	60.02711	146.6047	90		Danielson
HX24821601.026	CTD67 Start	HE4	8/ 4/01	1:35	60.07822	146.612	115		Danielson
HX24821601.027	CTD67 End	HE4	8/ 4/01	1:45	60.0751	146.614	115		Danielson
	CalVET Net								
HX24821601.028	Tow Start	HE4	8/ 4/01	1:42	60.0745	146.6164	115		Hopcroft
	CalVET Net								
HX24821601.029	Tow End	HE4	8/ 4/01	1:54	60.0761	146.6169	115		Hopcroft
HX24821601.030	CTD68 Start	HE3	8/ 4/01	2:17	60.12831	146.6126	113		Danielson
HX24821601.031	CTD68 End	HE3	8/ 4/01	2:27	60.12833	146.6123	113		Danielson
HX24821601.032	CTD69 Start	HE2	8/ 4/01	2:48	60.17905	146.6075	185		Danielson
HX24821601.033	CTD69 End	HE2	8/ 4/01	3:04	60.17832	146.6054	185		Danielson
	CalVET Net								
HX24821601.034	Tow Start	HE2	8/ 4/01	3:06	60.17882	146.605	185		Hopcroft
	CalVET Net								
HX24821601.035	Tow End	HE2	8/ 4/01	3:13	60.17918	146.6051	185		Hopcroft
HX24821601.036	CTD70 Start	HE1	8/ 4/01	3:29	60.21668	146.6061	75		Danielson
HX24821601.037	CTD70 End	HE1	8/ 4/01	3:37	60.21632	146.6048	75		Danielson
	ADCP Transect								
HX24821601.038	Start	HE1	8/ 4/01	3:38	60.21593	146.6046	75	Transect from HE1 to HE10	Danielson
	ADCP								
HX24821601.039	transect End	HE10	8/ 4/01	7:13	60.10918	147.0508	75		Coyle
	MOCNESS								
HX24821601.040	Start	HE10	8/ 4/01	7:20	60.10645	147.0576	275		Coyle
	MOCNESS								
HX24821601.041	End	HE10	8/ 4/01	7:50	60.09402	147.0746	275		Coyle
	HTI Transect								
HX24821601.042	Start	HE10	8/ 4/01	7:56	60.09113	147.0733	275		Coyle
	HTI Transect								
HX24821701.001	End	HE6.5	8/ 5/01	9:36	60.05213	146.7351	125		Coyle
	MOCNESS								
HX24821701.002	Start	HE6.5	8/ 5/01	9:41	60.05032	146.7405	125		Coyle
	MOCNESS								
HX24821701.003	End	HE6.5	8/ 5/01	10:12	60.03758	146.761	125		Coyle
	MOCNESS								
HX24821701.004	Start	HE2	8/ 5/01	11:28	60.1783	146.6131	198		Coyle
	MOCNESS								
HX24821701.005	End	HE2	8/ 5/01	11:59	60.16118	146.6355	198		Coyle
HX24821701.006	CTD71 Start	AHC2	8/ 5/01	13:52	59.99877	147.0761	185		Danielson
HX24821701.007	CTD71 End	AHC2	8/ 5/01	14:06	59.99643	147.0778	185		Danielson
HX24821701.008	CTD72 Start	AHC3	8/ 5/01	14:41	59.89927	147.0735	199		Danielson
HX24821701.009	CTD72 End	AHC3	8/ 5/01	14:55	59.89513	147.0735	199		Danielson

HX24821701.010	CTD73 Start	AHC4	8/ 5/01	15:29	59.79898	147.0745	202	Danielson
HX24821701.011	CTD73 End	AHC4	8/ 5/01	15:45	59.79462	147.0803	202	Danielson
HX24821701.012	CTD74 Start	AHC5	8/ 5/01	16:20	59.69915	147.0741	205	Danielson
HX24821701.013	CTD74 End	AHC5	8/ 5/01	16:36	59.69437	147.0796	205	Danielson
HX24821701.014	CTD75 Start	AHC6	8/ 5/01	17:12	59.59968	147.0774	204	Danielson
HX24821701.015	CTD75 End	AHC6	8/ 5/01	17:27	59.59868	147.0763	204	Danielson
HX24821701.016	CTD76 Start	AHC7	8/ 5/01	18:04	59.49952	147.0751	219	Danielson
HX24821701.017	CTD76 End	AHC7	8/ 5/01	18:19	59.50058	147.0743	219	Danielson
HX24821701.018	CTD77 Start	AHC8	8/ 5/01	18:58	59.39972	147.0755	203	Danielson
HX24821701.019	CTD77 End	AHC8	8/ 5/01	19:12	59.4005	147.0724	203	Danielson
HX24821701.020	CTD78 Start	AHC9	8/ 5/01	19:50	59.29905	147.0738	196	Danielson
HX24821701.021	CTD78 End	AHC9	8/ 5/01	20:09	59.29255	147.0654	196	Danielson
HX24821701.022	CTD79 Start	AHC10	8/ 5/01	20:50	59.1832	147.074	640	Danielson
HX24821701.023	CTD79 End	AHC10	8/ 5/01	21:24	59.18568	147.0611	640	Danielson
HX24821701.024	CTD80 Start	AHC11	8/ 5/01	22:13	59.06692	147.0745	1700	Danielson
HX24821701.025	CTD80 End	AHC11	8/ 5/01	23:46	59.06918	147.0389	1700	Danielson
HX24821701.026	CTD81 Start	MS1	8/ 5/01	6:13	59.95253	147.9257	169	Danielson
HX24821701.027	CTD81 End	MS1	8/ 5/01	6:26	59.95088	147.927	169	Danielson
HX24821701.028	CTD82 Start	MS2	8/ 5/01	6:35	59.94315	147.8956	192	Danielson
HX24821701.029	CTD82 End	MS2	8/ 5/01	6:51	59.94205	147.893	192	Danielson
HX24821701.030	CalVET Net Tow Start	MS2	8/ 5/01	6:53	59.94262	147.8916	192	Pinchuk
HX24821701.031	CalVET Net Tow End	MS2	8/ 5/01	6:59	59.9427	147.891	192	Pinchuk
HX24821701.032	CTD83 Start	MS3	8/ 5/01	7:10	59.93165	147.8576	171	Danielson
HX24821701.033	CTD83 End	MS3	8/ 5/01	7:23	59.93495	147.8521	171	Danielson
HX24821701.034	CTD84 Start	MS4	8/ 5/01	7:32	59.92022	147.8286	109	Danielson
HX24821701.035	CTD84 End	MS4	8/ 5/01	7:43	59.92157	147.8245	109	Danielson
HX24821801.001	MOCNESS Start	MS2	8/ 6/01	8:06	59.9432	147.893	194	Coyle
HX24821801.002	MOCNESS End	MS2	8/ 6/01	8:37	59.96193	147.8698	194	Coyle
HX24821801.003	MOCNESS Start	HB2	8/ 6/01	10:07	60.18243	147.6645	252	Coyle
HX24821801.004	MOCNESS End	HB2	8/ 6/01	10:37	60.20067	147.6485	252	Coyle
HX24821801.005	CTD85 Start	HB1	8/ 6/01	11:46	60.19332	147.6984	250	Danielson
HX24821801.006	CTD85 End	HB1	8/ 6/01	12:02	60.19108	147.7024	250	Danielson
HX24821801.007	CTD86 Start	HB2	8/ 6/01	12:19	60.17855	147.6409	175	Danielson
HX24821801.008	CTD86 End	HB2	8/ 6/01	12:33	60.17872	147.6415	175	Danielson
HX24821801.009	CalVET Net Tow Start	HB2	8/ 6/01	12:30	60.17855	147.6409	175	Hopcroft
HX24821801.010	CalVET Net Tow End	HB2	8/ 6/01	12:38	60.17872	147.6415	175	Hopcroft
HX24821801.011	CTD87 Start	HB3	8/ 6/01	13:02	60.163	147.5756	90	Danielson
HX24821801.012	CTD87 End	HB3	8/ 6/01	13:12	60.1626	147.5754	90	Danielson

HX24821801.013	CTD88 Start	HB4	8/ 6/01	13:34	60.14625	147.5027	109		Danielson
HX24821801.014	CTD88 End	HB4	8/ 6/01	13:40	60.14603	147.5027	109		Danielson
HX24821801.015	CTD89 Start	KIP2	8/ 6/01	15:40	60.2789	147.9852	588		Danielson
HX24821801.016	CTD89 End	KIP2	8/ 6/01	16:10	60.27325	147.9867	588		Danielson
HX24821801.017	CalVET Net Tow Start	KIP2	8/ 6/01	16:16	60.27818	147.9849	588		Hopcroft
HX24821801.018	CalVET Net Tow End	KIP2	8/ 6/01	16:20	60.27718	147.9848	588		Hopcroft
HX24821801.019	CTD90 Start	KIP2	8/ 6/01	16:25	60.278	147.9881	588	prod cast	Childers
HX24821801.020	CTD90 End	KIP2	8/ 6/01	16:32	60.27687	147.9892	588		Childers
HX24821801.021	CTD91 Start	PWS1	8/ 6/01	17:22	60.37971	147.9377	326		Danielson
HX24821801.022	CTD91 End	PWS1	8/ 6/01	17:42	60.37745	147.9405	326		Danielson
HX24821801.023	CalVET Net Tow Start	PWS1	8/ 6/01	17:46	60.37687	147.9412	326		Hopcroft
HX24821801.024	CalVET Net Tow End	PWS1	8/ 6/01	17:51	60.37673	147.9413	326		Hopcroft
HX24821801.025	CTD92 Start	PWS2	8/ 6/01	18:54	60.53547	147.8045	730		Danielson
HX24821801.026	CTD92 End	PWS2	8/ 6/01	19:30	60.53487	147.8071	730		Danielson
HX24821801.027	CalVET Net Tow Start	PWS2	8/ 6/01	19:30	60.53487	147.8071	730		Hopcroft
HX24821801.028	CalVET Net Tow End	PWS2	8/ 6/01	20:07	60.53575	147.8041	730		Hopcroft
HX24821801.029	CTD93 Start	PWS2	8/ 6/01	20:07	60.53572	147.8042	730	cohorts #1	Hopcroft
HX24821801.030	CTD93 End	PWS2	8/ 6/01	20:18	60.53517	147.8055	730		Hopcroft
HX24821801.031	Ring Net Start	PWS2	8/ 6/01	20:18	60.53515	147.8056	730		Hopcroft
HX24821801.032	Ring Net End	PWS2	8/ 6/01	20:25	60.53456	147.8058	730		Hopcroft
HX24821801.033	CTD94 Start	PWS2	8/ 6/01	20:26	60.53453	147.8057	730	cohorts #2	Hopcroft
HX24821801.034	CTD94 End	PWS2	8/ 6/01	20:28	60.53411	147.8053	730		Hopcroft
HX24821801.035	CTD96 Start	PWS2	8/ 6/01	20:40	60.53318	147.8069	730	cohorts #3	Hopcroft
HX24821801.036	CTD96 End	PWS2	8/ 6/01	20:43	60.53327	147.8073	730		Hopcroft
HX24821801.037	CTD97 Start	PWS2	8/ 6/01	20:53	60.53411	147.8071	730	cohorts #4	Hopcroft
HX24821801.038	CTD97 End	PWS2	8/ 6/01	20:56	60.5341	147.8064	730		Hopcroft
HX24821801.039	CTD98 Start	PWS2	8/ 6/01	21:05	60.5331	147.8052	730	cohorts #5	Hopcroft
HX24821801.040	CTD98 End	PWS2	8/ 6/01	21:09	60.5328	147.8056	730		Hopcroft
HX24821801.041	Ring Net Start	PWS2	8/ 6/01	21:10	60.53275	147.8057	730		Hopcroft
HX24821801.042	Ring Net End	PWS2	8/ 6/01	21:16	60.53053	147.8028	730		Hopcroft
HX24821801.043	Ring Net Start	PWS2	8/ 6/01	21:32	60.53036	147.8025	737		Hopcroft
HX24821801.044	Ring Net End	PWS2	8/ 6/01	21:36	60.53027	147.8023	737		Hopcroft
HX24821801.045	Ring Net Start	PWS2	8/ 6/01	21:42	60.52962	147.8011	737		Hopcroft

HX24821801.046	Ring Net End	PWS2	8/ 6/01	21:50	60.49475	147.83	737		Hopcroft
HX24821801.047	HTI Calibration Start	MB1	8/ 6/01	23:30	60.29337	147.8165	42		Coyle
HX24821801.048	HTI Calibration End	MB1	8/ 6/01	1:13	60.29337	147.8165	42		Coyle
HX24821801.049	MOCNESS Start	PWS2	8/ 6/01	5:24	60.53387	147.804	737		Hopcroft
HX24821801.050	MOCNESS End	PWS2	8/ 6/01	6:45	60.56777	147.7412	737		Hopcroft
HX24821801.051	MOCNESS Start	PWS2	8/ 6/01	7:26	60.5391	147.7938	737		Hopcroft
HX24821801.052	MOCNESS End	PWS2	8/ 6/01	7:58	60.55511	147.7738	737		Coyle
HX24821901.001	MOCNESS Start	PWS1	8/ 7/01	9:24	60.38163	147.9328	344		Coyle
HX24821901.002	MOCNESS End	PWS1	8/ 7/01	10:04	60.40676	147.9088	344		Coyle
HX24821901.003	MOCNESS Start	KIP2	8/ 7/01	11:06	60.2817	147.984	553		Coyle
HX24821901.004	MOCNESS End	KIP2	8/ 7/01	11:35	60.30222	147.9798	553		Coyle
HX24821901.005	CTD99 Start	CCSE1	8/ 7/01	15:43	59.74152	147.8169	64		Danielson
HX24821901.006	CTD99 End	CCSE1	8/ 7/01	15:49	59.74014	147.8193	64		Danielson
HX24821901.007	CTD100 Start	CCSE2	8/ 7/01	16:25	59.66822	147.728	113		Danielson
HX24821901.008	CTD100 End	CCSE2	8/ 7/01	16:35	59.66818	147.7342	113		Danielson
HX24821901.009	CTD101 Start	CCSE2	8/ 7/01	16:42	59.66848	147.7363	113	prod cast	Childers
HX24821901.010	CTD101 End	CCSE2	8/ 7/01	16:49	59.66924	147.74	113		Childers
HX24821901.011	CTD102 Start	CCSE3	8/ 7/01	17:37	59.57055	147.6095	108		Danielson
HX24821901.012	CTD102 End	CCSE3	8/ 7/01	17:46	59.56845	147.6166	108		Danielson
HX24821901.013	CTD103 Start	CCSE4	8/ 7/01	18:35	59.47577	147.4745	114		Danielson
HX24821901.014	CTD103 End	CCSE4	8/ 7/01	18:44	59.47702	147.4801	114		Danielson
HX24821901.015	CTD104 Start	CCSE5	8/ 7/01	19:34	59.37602	147.3482	131		Danielson
HX24821901.016	CTD104 End	CCSE5	8/ 7/01	19:45	59.3781	147.3475	131		Danielson

HX24821901.017	CTD105 Start	CCSE5	8/ 7/01	22:47	59.54358	148.3357	187	Danielson
HX24821901.018	CTD105 End	CCSE5	8/ 7/01	23:01	59.54642	148.344	187	Danielson
HX24821901.019	CTD106 Start	PWSW5	8/ 7/01	23:33	59.62528	148.3334	191	Danielson
HX24821901.020	CTD106 End	PWSW5	8/ 7/01	23:46	59.6268	148.335	191	Danielson
HX24821901.021	CTD107 Start	PWSW5	8/ 7/01	0:19	59.70885	148.3313	174	Danielson
HX24821901.022	CTD107 End	PWSW5	8/ 7/01	0:30	59.71037	148.3293	174	Danielson
HX24821901.023	CTD108 Start	PWSW4	8/ 7/01	0:57	59.77602	148.3324	125	Danielson
HX24821901.024	CTD108 End	PWSW4	8/ 7/01	1:06	59.77597	148.3299	125	Danielson
HX24821901.025	CTD109 Start	PWSW3	8/ 7/01	1:29	59.82507	148.3324	122	Danielson
HX24821901.026	CTD109 End	PWSW3	8/ 7/01	1:38	59.82375	148.3312	122	Danielson
HX24821901.027	CTD110 Start	PWSW2	8/ 7/01	2:00	59.87508	148.3323	96	Danielson
HX24821901.028	CTD110 End	PWSW2	8/ 7/01	2:06	59.8747	148.3303	96	Danielson
HX24821901.029	CTD111 Start	PWSW1	8/ 7/01	2:27	59.92356	148.336	95	Danielson
HX24821901.030	CTD111 End	PWSW1	8/ 7/01	2:36	59.92198	148.3409	95	Danielson
HX24821901.031	ADCP Transect Start	CF1	8/ 7/01	4:04	59.908	148.8616	80	Danielson
HX24822001.001	ADCP Transect End	CF15	8/ 8/01	8:04	59.908	148.8616	80	Danielson
HX24822001.002	CTD112 Start	GAK1	8/ 8/01	11:07	59.8447	149.4681	268	Danielson
HX24822001.003	CTD112 End	GAK1	8/ 8/01	11:22	59.84253	149.4708	268	Danielson
HX24822001.004	CTD113 Start	RES2.5	8/ 8/01	13:11	60.02538	149.3591	296	Danielson
HX24822001.005	CTD113 End	RES2.5	8/ 8/01	13:26	60.02667	149.3584	296	Danielson