

**GLOBEC CRUISE REPORT**  
**CRUISE HX258 30 April – 8 May 2002**

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

**Chief Scientist:** Seth Danielson, [seth@ims.uaf.edu](mailto: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:**

Dave Aldrich	Marine Technician, IMS-SMC (M, Marine Tech. Stateroom)
Amanda Byrd	Zooplankton, IMS-UAF (F, forward 3)
Amy Childers	Nutrients/Chlorophyll, IMS-UAF (F forward 3)
Maria delFino	Zooplankton, IMS-UAF (M, upper 4)
Leandra DeSousa	Birds/Zooplankton, IMS-UAF (F, upper 4)
Russ Hopcroft	Zooplankton, IMS-UAF (M, Galley Stateroom)
Thomas Kline	Zooplankton, PWSSC (M, upper 2)
Hui Liu	Zooplankton, IMS-UAF (M, Mar. Tech Stateroom)
Julie Matweyous	Nutrients/Chlorophyll, IMS-UAF (F upper 4)
Stephanie Moreland	Nutrients/Chlorophyll, IMS-UAF (F forward 3)
Alexei Pinchuk	Zooplankton, IMS-UAF (M, forward 2)
Ilia Pinchuk	Zooplankton, IMS-UAF (M, forward 2)

**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.

This cruise will be the first May GOA LTOP sampling effort during a year that will likely build up to El-Nino conditions. Our first month of GLOBEC sampling was October 1997 and the major El-Nino event of 1997-1998 was already well underway. Also, there has been a large anti-cyclonic eddy off of the shelf break since before our first sampling in March this year. During March we likely sampled the leading half of this eddy, during April the eddy was directly off of the Seward line, and we will be somewhere along the tailing half of the eddy during this cruise. As of this writing, it appears that the motion of the eddy has somewhat "stalled" in its progress along the shelfbreak and may be sitting in pretty much the same spot it was in April.

## 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.
6. Characterize the carbon and nitrogen stable isotope concentrations in zooplankton.
7. Determine seawater Dimethyl Sulfide concentrations.

## SAMPLING

### DAYTIME ACTIVITIES

1. Occupy the various hydrographic transects and collect vertical CTD-chlorophyll-PAR profiles. Station Transect (**Table 1**) priorities are (in order): Seward, C. Fairfield, W. PWS, Hinchinbrook Entrance. (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. One CalVet Net cast (the current CalVet net frame accommodates a total of four nets, of two different mesh sizes) along the major Seward Line stations, at selected PWS stations and along the Cape Cleare Line.
7. At 2-4 Seward Line stations (GAK1, 4, 9, 13) and one PWS station Hopcroft performs 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 600 m) near the end of the Seward Line and in PWS. This should be done in conjunction with Coyle's MOCNESS/HTI work at that station.

### NIGHTTIME ACTIVITIES

1. Hydroacoustic samples and MOCNESS discrete samples along the Seward Line, and at the PWS and Hinchinbrook Entrance Stations indicated.
2. In addition to the normal .5mm mesh nets, fine mesh nets (.100 mm) were swapped into the MOCNESS at stations GAK1, GAK7 and GAK9 for euphausiid collection.

## CRUISE ACTIVITY SCHEDULE

- 4/29 Science party arrived at Seward and set up equipment.  
4/30 08:00 Muster galley for pre-cruise meeting  
09:00 Depart from the dock, underway on cr  
See Event Log for sampling details.  
5/9 Return to Seward at 0800 on 5/9.

See the attached Event Log for sampling details.

## CRUISE SUMMARY:

After the first couple of days in which we experienced somewhat stormy conditions, the weather cooperated quite nicely on this cruise. We were never shut down from CTD casts during the daytime, but we did lose one nights worth of sampling due to high winds and choppy seas. The limited amount of darkness at this time of year placed further constraints on the sampling of diel-migrating zooplankton, and it took us a full six days to complete sampling on the Seward Line. We lost half a days worth of sampling due to electrical problems with the CTD wire termination, and another half day to run from the shelf break in to station GAK1 to drop off an AB who needed to go to Seattle for training.

The weather at the beginning of the cruise constrained us to begin sampling inshore; after we had completed the inner few stations and the Cape Fairfield Line, we used the period of poor weather to transit to the outer end of the Seward Line to begin the deep stations when the weather improved. The Seward Line, Cape Fairfield Line, the Hinchinbrook Entrance Line and the Prince William Sound stations were all sampled successfully, although we did not have enough nighttime hours to sample with acoustics and the MOCNESS on the Hinchinbrook Entrance Line. On the last day of the cruise we were also able to sample along the Hoof Point line.

## Hydrography (*Danielson*):

The range of near shore and surface salinities are more similar to those seen in May 1999 (La Nina) than those seen in May 1998 (El Nino). The foot of the shelfbreak front appears to have migrated fairly far onshore; this may be consistent with the presence of a large eddy offshore. Near the shelf break, we saw shear in the ADCP profiles that indicated flow to the southeast in the upper layer and flow to the north in the lower layer. In Hinchinbrook Canyon there was also bi-directional flow, with currents to the south in the surface layer and currents to the north in the lower layer. The major storm event of the cruise is seen in the barometric pressure and wind speed plots on Julian Days 120 and 121. High fluorescence values were seen spread over the inner and mid-shelf regions. Concentrations as high as 15 ug/l were observed in the fluorometer traces. See accompanying plots for details of surface parameters and hydrographic cross-sections. CTD casts for physical sampling were completed to a maximum depth of 1500m, or to within 5m of the bottom (determined by the altimeter mounted on the CTD), whichever was shallower.

### **Zooplankton (Coyle):**

Zooplankton abundance and biomass was assessed with two gear types. The large zooplankton and micronekton were sampled with a 1-m<sup>2</sup> MOCNESS equipped with .500 mm mesh nets. Samples were collected at night in five 20-m depth intervals between 100 m and the surface. The small zooplankton taxa were sampled with a 25 cm diameter CalVet net array consisting of four nets, two having .150 mm mesh and two having .053 mm mesh. Volume filtered in each was measured with General Oceanics flowmeters. The CalVet nets were fished vertically from 100 m to the surface. The samples were preserved in 10% seawater formalin and returned to the lab for processing. Both MOCNESS and CalVet samples were collected at the thirteen Seward Line stations and at five stations in Prince William Sound to 100m depth. In addition, CalVet samples were taken at four Hinchinbrook Entrance stations. Supplemental MOCNESS samples were taken at stations GAK13 and PWS2 to 600 m depth. A total of 140 zooplankton samples were collected.

Acoustic data were collected along the Seward transect at night and during each MOCNESS tow. Acoustic data were collected with an HTI (Hydroacoustic Technology Inc.) model 244 narrow band acoustic system at frequencies of 420, 200, 120 and 38 kHz. All narrow band transducers were split beam and therefore collected target strength data in addition to volume scattering data. The HTI system was multiplexed with a SciFish broadband acoustic system to provide target signature information. The SciFish system returned a frequency spectrum between 110 and 190 kHz for all discriminated targets.

### **Zooplankton (Hopcroft):**

There was a considerable biomass of chain forming phytoplankton that made creation of cohorts difficult. This was hampered by considerable population of *Oikopleura labradorensis*, (especially at GAK9 & GAK13) whose houses further contributed to the clogging of nets and meshes. *Neocalanus cristatus* was relative uncommon at all sites, and a large natural cohort of *Calanus marshallae* early copepodites was observed at many sites. On the Seward line, surface *Neocalanus* population were already dominated by stage 5 individual rich in lipid. In the sound, most *Neocalanus* populations appear to have already descended for diapause. *Pseudocalanus* spp. and *Oithona similis* dominated numerically at all sites, with *Acartia longiremis* and *Centropages abdominalis* still rare. Significant population of the larvacean *Fritillaria borealis* was developing along with *Oikopleura labradorensis* inside the sound.

Full cohort experiments were run at GAK1, GAK4 & KIP2, with partial experiments at GAK9 and GAK13. *Neocalanus flemingeri* C4s were incubated the four Seward Line stations. Egg production by *Pseudocalanus* spp. was measured at all five sites, and for the unusually large population of ripe *Eucalanus bungii* at GAK9 and GAK13. Euphausiid growth rate experiments and egg production experiments were executed at GAK1, GAK7, and again at GAK1.

### **Sampling for stable isotope analysis (*Kline*):**

Stable isotope analysis samples were taken from each MOCNESS tow made in the upper 100m and deep tows made at two stations, GAK13 and PWS2 during HX258.

Macro-zooplankters, principally copepods and euphausiids, and micro-nekton, principally lanternfish and glass shrimp, were saved for stable isotope analysis from the contents of net #1 of each upper 100m MOCNESS tow. Tows were made at the 13 Seward Line and 5 Prince William Sound stations. Deep MOCNESS tows were made at stations GAK13 and PWS2 to collect diapausing *Neocalanus* spp. from MOCNESS net #2 (sampled between 400 and 600m) while micro-nekton were saved from net #1 (Table 1).

MOCNESS macro-zooplankton and micro-nekton samples were sorted to species and frozen individually in vials for further laboratory processing.

HX258 GAK13 and PWS2 Deep MOCNESS tows:

<b>Net#</b>	<b>Depth range</b>	<b>Type</b>	<b>Investigators</b>
1.	0-400	Open drogue	Kline
2.	400-600	Closed drogue	Kline
3.	600-400	Closed	Hopcroft
4.	400-300	Closed	Hopcroft
5.	300-200	Closed	Hopcroft
6.	200-150	Closed	Hopcroft
7.	150-100	Closed	Hopcroft
8.	100-50	Closed	Hopcroft
9.	50-0	Closed	Hopcroft

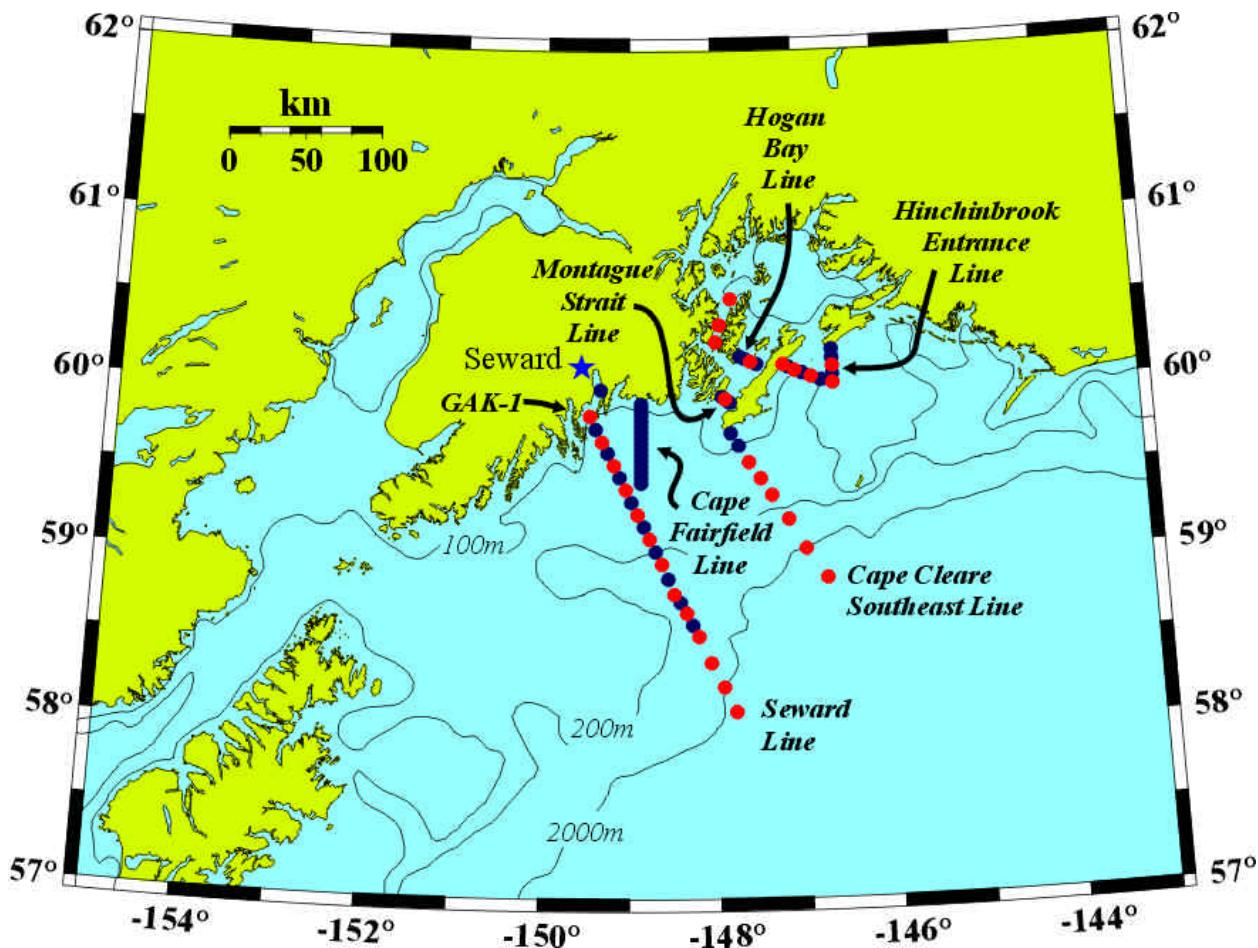
### **Seabirds and Marine Mammals (*Sousa*):**

Seabird and marine mammal sightings were recorded along the Seward Line, Cape Fairfield Line and Hinchinbrook Entrance Line. Seabird observations were made within a 90° angle and 300m wide at the starboard side of the vessel. Data was collected using 10X42 binocular and with a naked eyed while the vessel was moving at ~10 knots. Each sighting included species identification, location, number and behavior. Seabird and marine mammals were more abundant between stations GAK 6 and GAK 7i along the Seward line, stations CF1 and CF4 at the Cape Fairfield line and stations HE1 to HE2 and HE10 to HE 11.

NEP GLOBEC LTOP STANDARD STATIONS				
Latitude (degrees   minutes)		Longitude (degrees   minutes)		Station Name
<i>Seward Line</i>				
59	50.7	149	28	GAK1
59	46	149	23.8	GAK1I
59	41.5	149	19.6	GAK2
59	37.6	149	15.5	GAK2I
59	33.2	149	11.3	GAK3
59	28.9	149	7.1	GAK3I
59	24.5	149	2.9	GAK4
59	20.1	148	58.7	GAK4I
59	15.7	148	54.5	GAK5
59	11.4	148	50.3	GAK5I
59	7	148	46.2	GAK6
59	2.7	148	42	GAK6I
58	58.3	148	37.8	GAK7
58	52.9	148	33.6	GAK7I
58	47.5	148	29.4	GAK8
58	44.6	148	25.2	GAK8I
58	40.8	148	21	GAK9
58	36.7	148	16.7	GAK9I
58	32.5	148	12.7	GAK10
58	23.3	148	4.3	GAK11
58	14.6	147	56	GAK12
58	5.9	147	47.6	GAK13
<i>Cape Fairfield Line</i>				
59	54.5	148	52	CF1
59	53	148	52	CF2
59	51	148	52	CF3
59	49	148	52	CF4
59	47	148	52	CF5
59	45	148	52	CF6
59	43	148	52	CF7
59	41	148	52	CF8
59	39	148	52	CF9
59	37	148	52	CF10
59	35	148	52	CF11
59	33	148	52	CF12
59	31	148	52	CF13
59	29	148	52	CF14
59	27	148	52	CF15

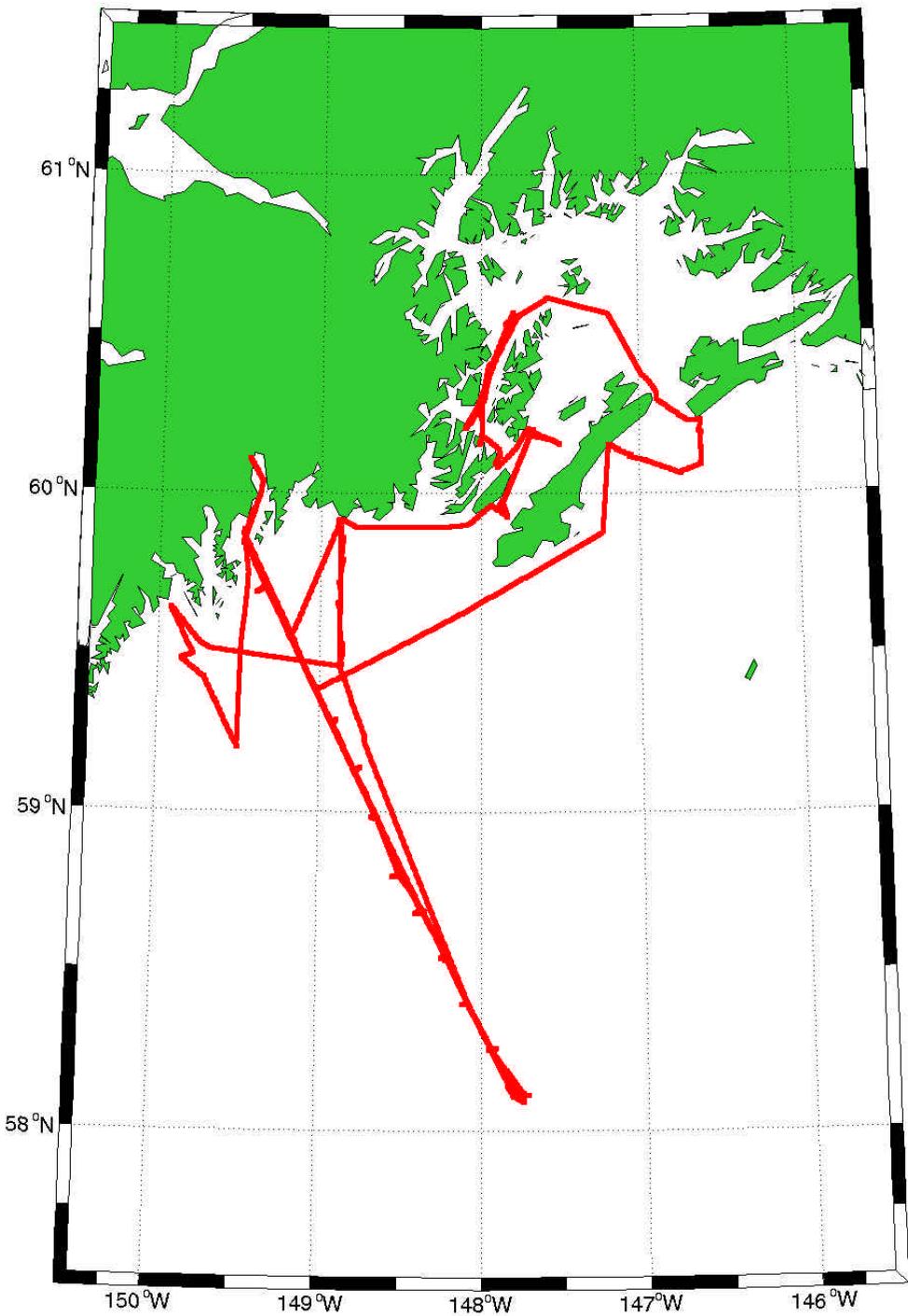
<b>Hogan Bay Line</b>				
60	11.57	147	42	HB1
60	10.754	147	38.5	HB2
60	9.855	147	34.508	HB3
60	8.807	147	30.04	HB4
<b>Montague Strait Line</b>				
59	57.465	147	56.225	MS0i
59	57.257	147	55.602	MS1
59	56.982	147	54.761	MS1i
59	56.6	147	53.7	MS2
59	56.282	147	52.633	MS2i
59	55.9	147	51.4	MS3
59	55.56	147	50.611	MS3i
59	55.2	147	49.7	MS4
<b>Prince William Sound Stations</b>				
60	22.78	147	56.17	PWS1
60	32.1	147	48.2	PWS2
<b>Knight Island Passage Station</b>				
60	16.7	147	59.2	KIP2
<b>Resurrection Bay Station</b>				
60	1.5	149	21.5	RES2.5
<b>Hinchinbrook Entrance Line</b>				
60	13	146	36.5	HE1
60	10.8	146	36.5	HE2
60	7.8	146	36.5	HE3
60	4.8	146	36.5	HE4
60	3.126	146	44.19	HE6.5
60	5.6	146	57.7	HE8
60	6.6	147	3	HE9
60	7.8	147	8	HE10
60	8.6	147	11.5	HE11
<b>Cape Cleare Southeast</b>				
59	44.5	147	49	CCSE1
59	40	147	43.6	CCSE2
59	34.25	147	36.5	CCSE3
59	28.5	147	28.5	CCSE4
59	22.5	147	21	CCSE5
59	14	147	9.5	CCSE6
59	3.5	146	58	CCSE7
58	53	146	44	CCSE8

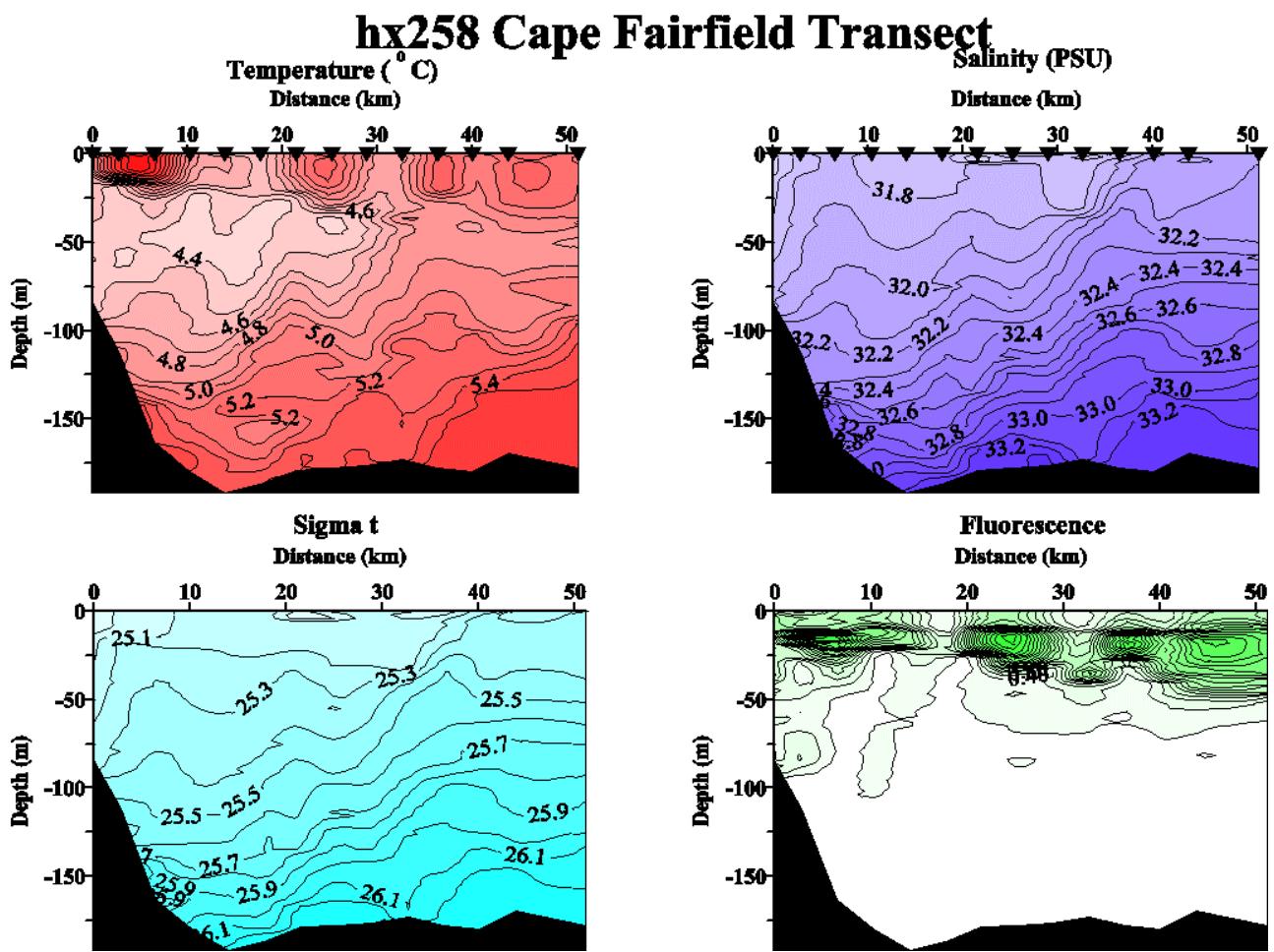
## GLOBEC LTOP Standard Stations



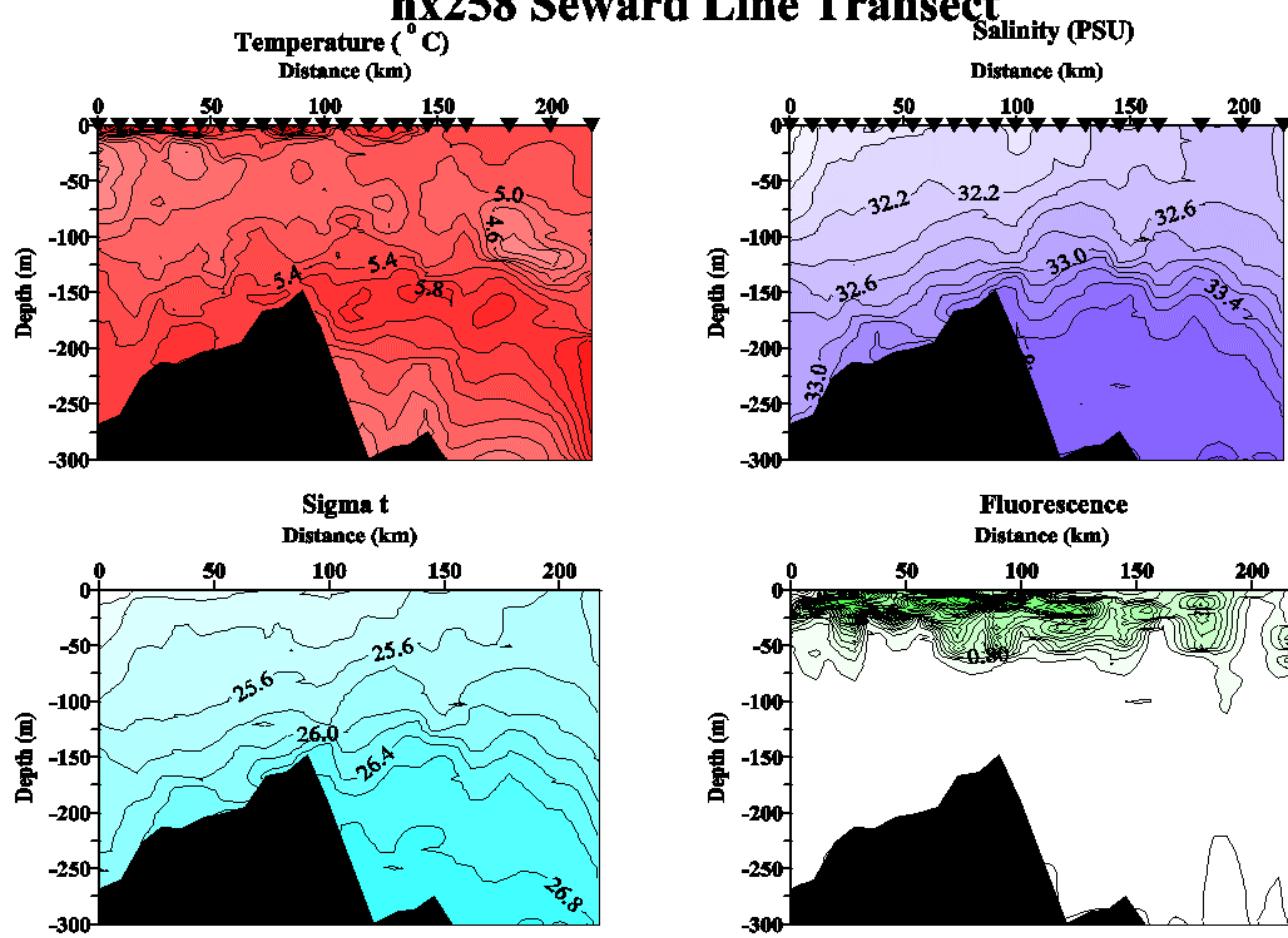
The *Cape Cleare Southeast Line* is included in the standard stations for the May, July, and August cruises during the 2001 and 2003 (Process Study) sampling years.

hx258 Cruise Track

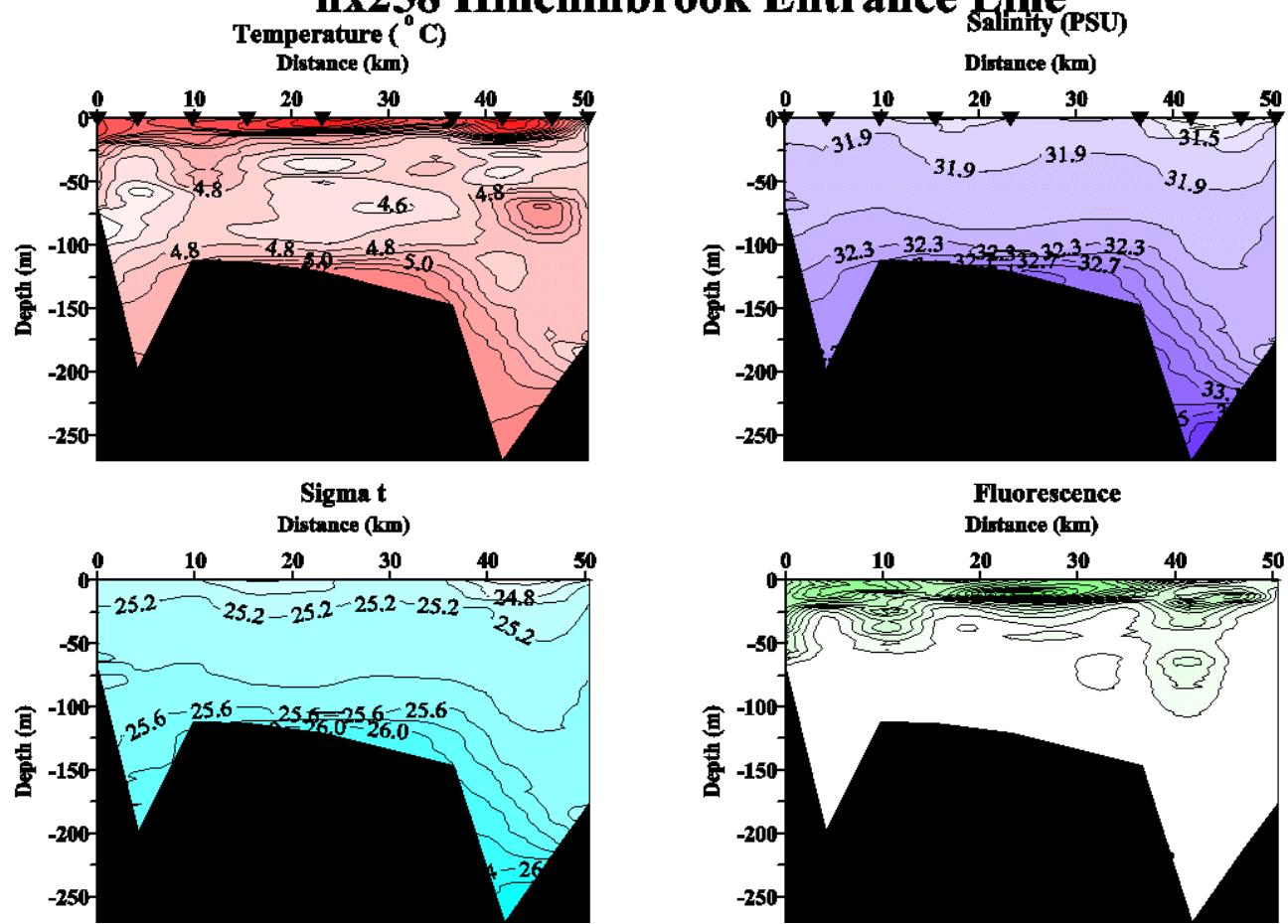


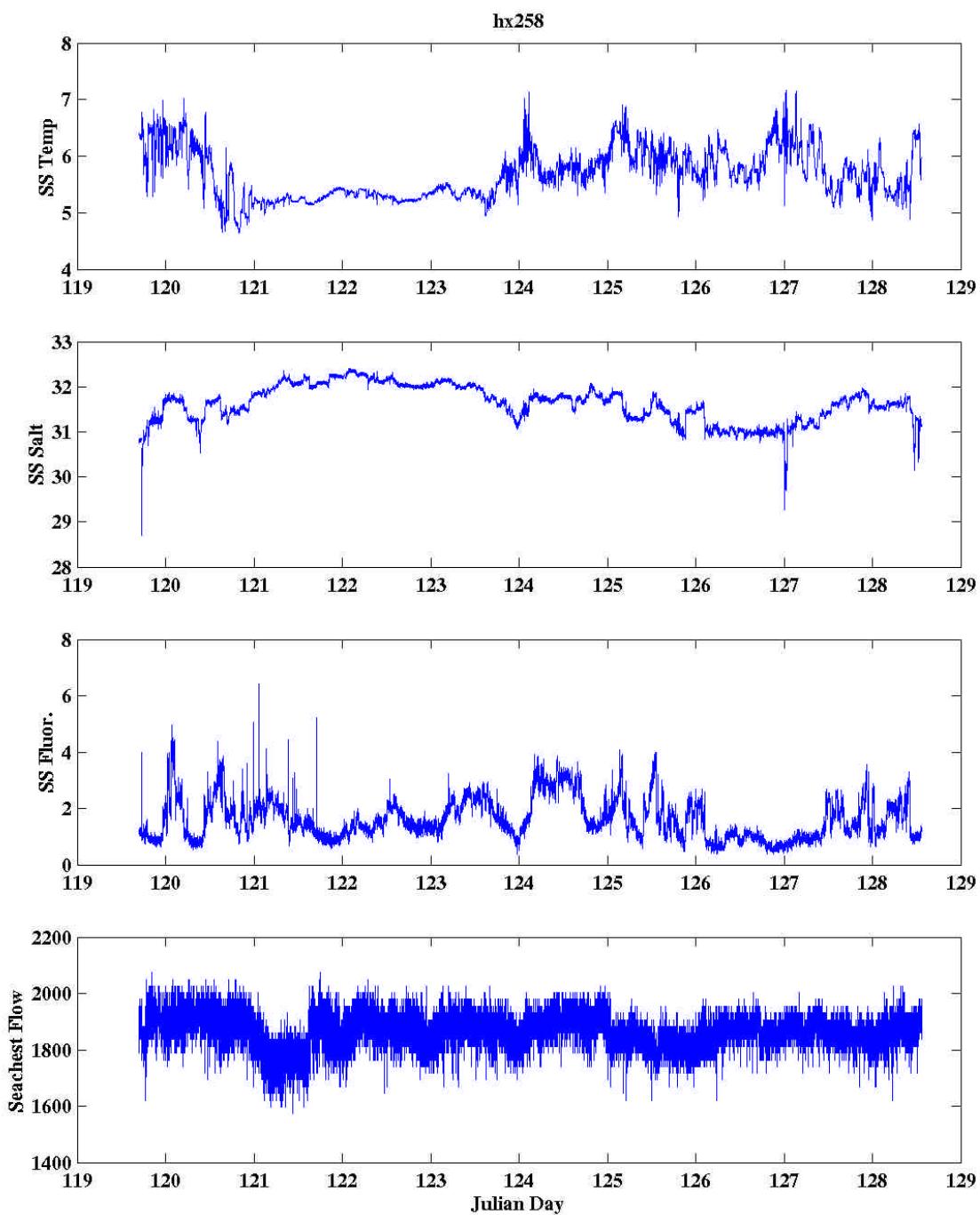


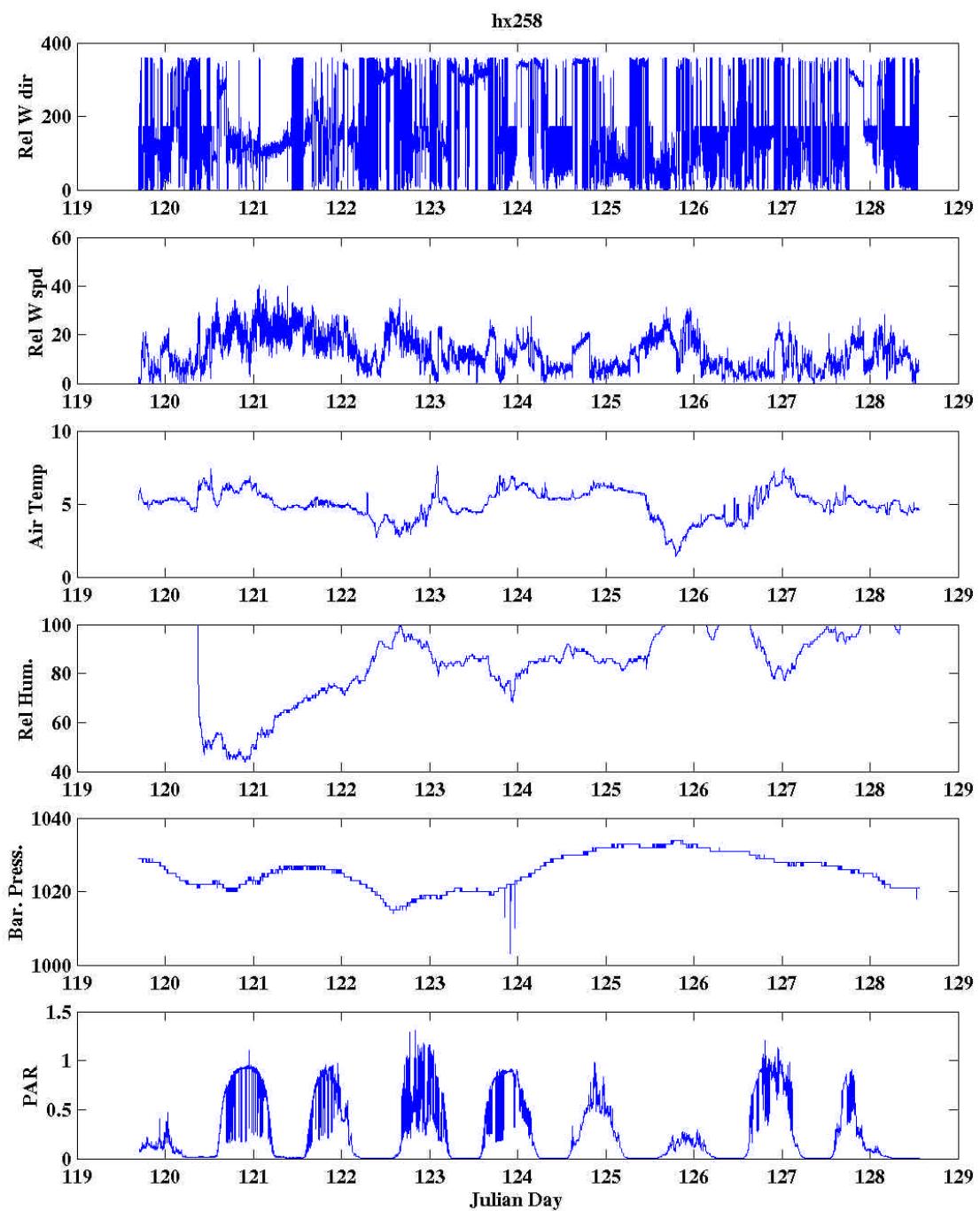
## hx258 Seward Line Transect

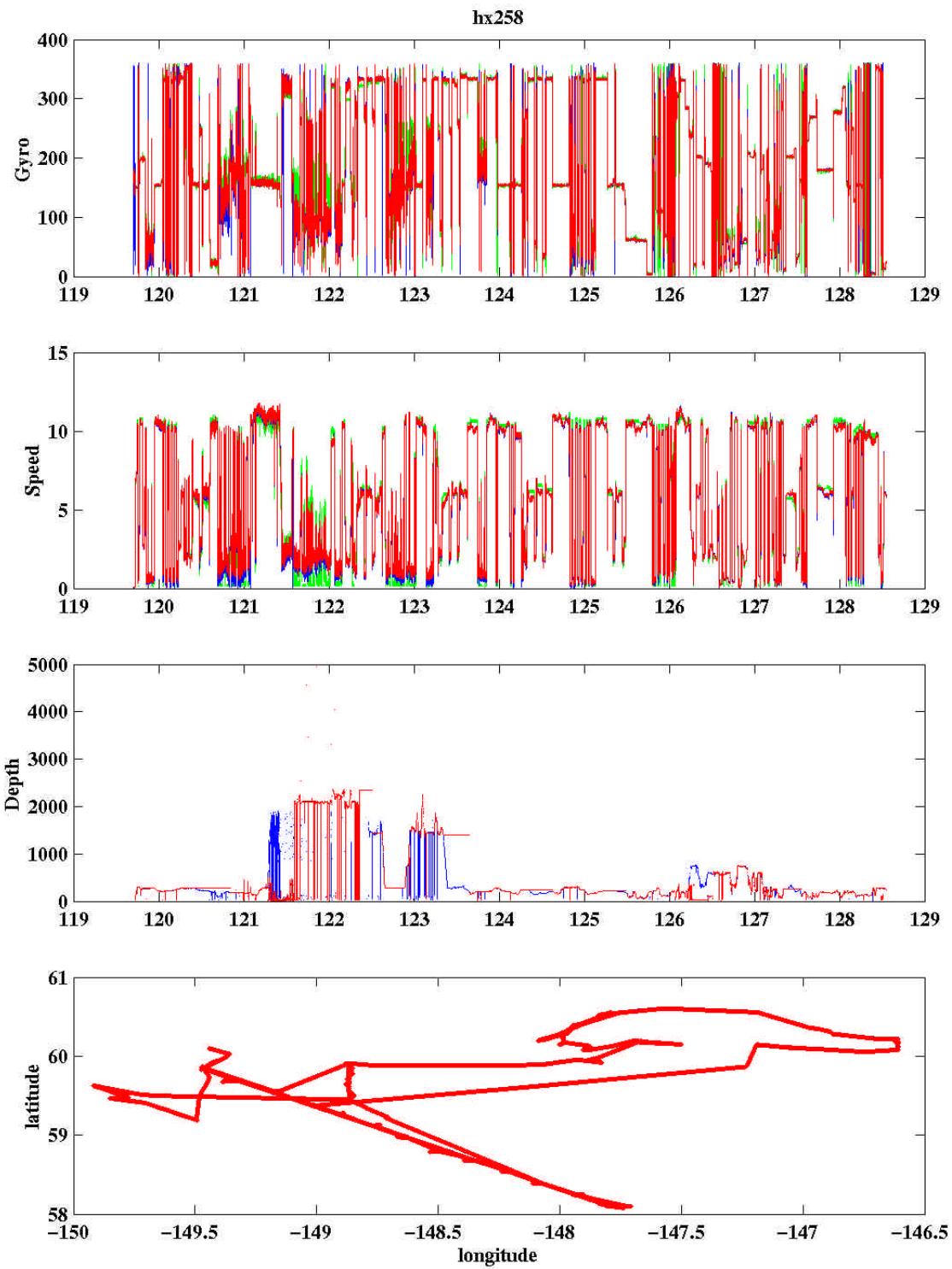


## hx258 Hinchinbrook Entrance Line









## Event Log:

Unless otherwise noted, CTDs were taken for T. Weingartner and T. Royer.

Water samples taken for T. Whittlege 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
HX25812002.001	CTD1 Start	RES2.5	4/30/02	18:16	60.02583	149.3599	289		Danielson
HX25812002.002	CTD1 End	RES2.5	4/30/02	18:34	60.02878	149.3591	289		Danielson
HX25812002.003	HTI Transect Start	GAK1	4/30/02	19:38	59.87382	149.4476	289	hti test	Coyle
HX25812002.004	CTD2 Start	GAK1	4/30/02	20:28	59.84515	149.4657	269		Danielson
HX25812002.005	CTD2 End	GAK1	4/30/02	nd	nd	nd	269		Danielson
HX25812002.006	CalVET Net Tow Start	GAK1	4/30/02	20:50	59.84415	149.4666	267		Hopcroft
HX25812002.007	CalVET Net Tow End	GAK1	4/30/02	21:03	59.84415	149.4666	267		Hopcroft
HX25812002.008	CTD3 Start	GAK1	4/30/02	21:04	59.84417	149.4666	267	prod cast	Childers
HX25812002.009	CTD3 End	GAK1	4/30/02	21:13	59.84477	149.4661	267		Childers
HX25812002.010	Ring Net Start	GAK1	4/30/02	21:18	59.84755	149.4615	268		Hopcroft
HX25812002.011	Ring Net End	GAK1	4/30/02	21:23	nd	nd	268		Hopcroft
HX25812002.012	CTD4 Start	GAK1	4/30/02	21:30	59.84617	149.4641	267	zoop cast	Hopcroft
HX25812002.013	CTD4 End	GAK1	4/30/02	21:41	59.8471	149.463	267		Hopcroft
HX25812002.014	CTD5 Start	GAK1	4/30/02	21:49	59.84783	149.462	268	zoop cast	Hopcroft
HX25812002.015	CTD5 End	GAK1	4/30/02	21:55	59.8484	149.4613	268		Hopcroft
HX25812002.016	CTD6 Start	GAK1	4/30/02	22:02	59.84407	149.4656	268	zoop cast	Hopcroft
HX25812002.017	CTD6 End	GAK1	4/30/02	22:06	59.84455	149.4651	268		Hopcroft
HX25812002.018	CTD7 Start	GAK1	4/30/02	22:13	59.84537	149.4642	268	zoop cast	Hopcroft
HX25812002.019	CTD7 End	GAK1	4/30/02	22:19	59.84593	149.4632	268		Hopcroft
HX25812002.020	Ring Net Start	GAK1	4/30/02	22:21	59.846	149.4628	268		Hopcroft
HX25812002.021	Ring Net End	GAK1	4/30/02	22:26	nd	nd	268		Hopcroft
HX25812002.022	CTD8 Start	GAK1	4/30/02	22:28	59.84673	149.4623	268	zoop cast	Hopcroft
HX25812002.023	CTD8 End	GAK1	4/30/02	22:32	59.84715	149.462	268		Hopcroft
HX25812002.024	Ring Net Start	GAK1	4/30/02	22:37	59.8473	149.4617	268		Hopcroft
HX25812002.025	Ring Net End	GAK1	4/30/02	22:56	nd	nd	268		Hopcroft
HX25812102.001	CTD9 Start	GAK1	5/1/02	1:06	59.48168	149.1174	268		Danielson
HX25812102.002	CTD9 End	GAK1	5/1/02	1:24	59.48365	149.1133	268		Danielson
HX25812102.003	CTD10 Start	GAK3	5/1/02	1:58	59.5539	149.1877	214		Danielson
HX25812102.004	CTD10 End	GAK3	5/1/02	2:17	59.5546	149.1888	214		Danielson
HX25812102.005	CalVET Net Tow Start	GAK3	5/1/02	2:18	59.5692	149.199	214		Hopcroft
HX25812102.006	CalVET Net Tow End	GAK3	5/1/02	2:35	59.56982	149.1997	214		Hopcroft

HX25812102.007	CTD11 Start	GAK2I	5/1/02	3:01	59.62763	149.2583	214		Danielson
HX25812102.008	CTD11 End	GAK2I	5/1/02	3:23	59.62873	149.2582	214		Danielson
HX25812102.009	CTD12 Start	GAK2	5/1/02	3:57	59.6925	149.3262	214		Danielson
HX25812102.010	CTD12 End	GAK2	5/1/02	4:18	59.69282	149.3291	214		Danielson
HX25812102.011	CalVET Net Tow Start	GAK2	5/1/02	4:20	59.69288	149.3293	227		Coyle
HX25812102.012	CalVET Net Tow End	GAK2	5/1/02	4:31	59.69327	149.3295	227		Coyle
HX25812102.013	CTD13 Start	GAK1I	5/1/02	5:05	59.76677	149.3976	227		Danielson
HX25812102.014	CTD13 End	GAK1I	5/1/02	5:33	59.76535	149.4047	227		Danielson
HX25812102.015	MOCNESS Start	GAK1	5/1/02	7:53	59.846	149.4655	270	TOW ABORTED, NO GPS	Coyle
HX25812102.016	MOCNESS Start	GAK1	5/1/02	8:39	59.84713	149.4647	270	also used .1mm mesh nets	Coyle
HX25812102.017	MOCNESS End	GAK1	5/1/02	9:20	59.8693	149.4667	270		Coyle
HX25812102.018	HTI Transect Start	GAK1	5/1/02	9:41	59.84455	149.466	270		Coyle
HX25812102.019	HTI Transect End	GAK2	5/1/02	11:26	59.69083	149.3252	228		Coyle
HX25812102.020	MOCNESS Start	GAK2	5/1/02	11:33	59.6909	149.3313	228		Coyle
HX25812102.021	MOCNESS End	GAK2	5/1/02	12:12	59.68044	149.381	208		Coyle
HX25812102.022	HTI Transect Start	GAK2	5/1/02	12:37	59.69065	149.3272	229		Coyle
HX25812102.023	HTI Transect End	GAK3	5/1/02	14:11	59.55202	149.1874	215		Coyle
HX25812102.024	CTD14 Start	CF1	5/1/02	16:48	59.90798	148.8687	215		Danielson
HX25812102.025	CTD14 End	CF1	5/1/02	16:55	59.90862	148.8676	215		Danielson
HX25812102.026	CTD15 Start	CF2	5/1/02	17:16	59.88337	148.8671	112		Danielson
HX25812102.027	CTD15 End	CF2	5/1/02	17:30	59.88435	148.8647	112		Danielson
HX25812102.028	CTD16 Start	CF3	5/1/02	17:47	59.8501	148.8655	156		Danielson
HX25812102.029	CTD16 End	CF3	5/1/02	18:00	59.85048	148.8602	156	10m bottle misfire	Danielson
HX25812102.030	CTD17 Start	CF3	5/1/02	18:15	59.851	148.853	156	REDO 10M BOTTLE TRIP for CTD16	Danielson
HX25812102.031	CTD17 End	CF3	5/1/02	18:18	59.85107	148.8514	156	RECAST TO 10 M	Danielson
HX25812102.032	CTD18 Start	CF4	5/1/02	18:38	59.81608	148.8652	182		Danielson
HX25812102.033	CTD18 End	CF4	5/1/02	18:50	59.81522	148.8577	182		Danielson
HX25812102.034	CTD19 Start	CF5	5/1/02	19:07	59.78312	148.8658	194		Danielson
HX25812102.035	CTD19 End	CF5	5/1/02	19:25	59.78208	148.8568	194		Danielson
HX25812102.036	CTD20 Start	CF6	5/1/02	19:53	59.7495	148.866	190		Danielson
HX25812102.037	CTD20 End	CF6	5/1/02	20:03	59.74897	148.8638	190		Danielson
HX25812102.038	CTD21 Start	CF7	5/1/02	20:26	59.71613	148.8664	181		Danielson
HX25812102.039	CTD21 End	CF7	5/1/02	20:40	59.7144	148.8646	190		Danielson
HX25812102.040	CTD22 Start	CF8	5/1/02	21:07	59.68272	148.867	178		Danielson
HX25812102.041	CTD22 End	CF8	5/1/02	21:18	59.6815	148.8663	178		Danielson
HX25812102.042	CTD23 Start	CF9	5/1/02	21:35	59.64957	148.8667	177		Danielson
HX25812102.043	CTD23 End	CF9	5/1/02	21:48	59.64858	148.8656	177		Danielson
HX25812102.044	CTD24 Start	CF10	5/1/02	22:16	59.61648	148.8672	176		Danielson
HX25812102.045	CTD24 End	CF10	5/1/02	22:25	59.61668	148.8674	176		Danielson
HX25812102.046	CTD25 Start	CF11	5/1/02	22:46	59.58237	148.8698	179		Danielson
HX25812102.047	CTD25 End	CF11	5/1/02	22:59	59.58312	148.8699	179		Danielson
HX25812102.048	CTD26 Start	CF12	5/1/02	23:29	59.55003	148.8658	182		Danielson

HX25812102.049	CTD26 End	CF12	5/1/02	23:40	59.5514	148.8614	182		Danielson
HX25812202.001	CTD27 Start	CF13	5/2/02	0:08	59.51662	148.8658	172		Danielson
HX25812202.002	CTD27 End	CF13	5/2/02	0:22	59.51723	148.8584	182		Danielson
HX25812202.003	CTD28 Start	CF15	5/2/02	1:15	59.45047	148.8638	180		Danielson
HX25812202.004	CTD28 End	CF15	5/2/02	1:29	59.45248	148.857	180		Danielson
HX25812202.005	CTD29 Start	GAK13	5/2/02	14:06	58.09855	147.788	2600		Danielson
HX25812202.006	CTD29 End	GAK13	5/2/02	14:42	58.1006	147.7619	2600		Danielson
HX25812202.007	CTD30 Start	GAK13	5/2/02	14:43	58.10062	147.7617	2600		Danielson
HX25812202.008	CTD30 End	GAK13	5/2/02	16:35	58.09848	147.789	2600		Danielson
	CalVET Net Tow Start	GAK13	5/2/02	16:37	58.0984	147.7907	2600		Hopcroft
HX25812202.010	CalVET Net Tow End	GAK13	5/2/02	16:45	58.09852	147.7917	2600		Hopcroft
	CalVET Net Tow Start	GAK13	5/2/02	16:49	58.0986	147.7923	2600		Hopcroft
HX25812202.012	CalVET Net Tow End	GAK13	5/2/02	17:06	58.0988	147.7927	2600		Hopcroft
HX25812202.013	Ring Net Start	GAK13	5/2/02	17:38	58.09932	147.778	2600		Hopcroft
HX25812202.014	Ring Net End	GAK13	5/2/02	17:44	58.09912	147.7761	2600		Hopcroft
HX25812202.015	CTD31 Start	GAK13	5/2/02	17:54	58.10003	147.7883	2600	PROD CAST USING BIG CTD	Danielson
HX25812202.016	CTD31 End	GAK13	5/2/02	18:00	58.101	147.7846	2600	CTD NOT WORKING PROPERLY	Danielson
HX25812202.017	Ring Net Start	GAK13	5/2/02	18:31	58.1001	147.7771	2600		Hopcroft
HX25812202.018	Ring Net End	GAK13	5/2/02	19:12	nd	nd	2600		Hopcroft
HX25812202.019	CTD32 Start	GAK13	5/2/02	19:13	58.09883	147.7909	2600	PROD CAST	Danielson
HX25812202.020	CTD32 End	GAK13	5/2/02	19:43	58.09883	147.7909	2600		Danielson
HX25812202.021	CTD33 Start	GAK13	5/2/02	19:57	58.10018	147.7716	2600	cast aborted, fuse blown	Danielson
HX25812202.022	CTD33 End	GAK13	5/2/02	20:10	58.1262	147.7655	2600		Danielson
HX25812202.023	CTD34 Start	GAK13	5/2/02	21:40	58.09766	147.7883	2600	cast aborted, fuse blown	Danielson
HX25812202.024	CTD34 End	GAK13	5/2/02	21:50	nd	nd	2600	removed 20m of wire from hydrocable winch	Danielson
HX25812202.025	Ring Net Start	GAK13	5/2/02	22:09	58.099	147.7797	2600		Hopcroft
HX25812202.026	Ring Net End	GAK13	5/2/02	22:25	nd	nd	2600		Hopcroft
HX25812202.027	CTD35 Start	GAK13	5/2/02	23:13	58.09783	147.7913	2600		Danielson
HX25812302.001	CTD35 End	GAK13	5/3/02	2:30	nd	nd	2600		Danielson
HX25812302.002	CTD36 Start	GAK12	5/3/02	3:43	58.23765	147.9165	2200		Danielson
HX25812302.003	CTD36 End	GAK12	5/3/02	3:44	58.237	147.916	2200	bottle #11 did not trip	Danielson
HX25812302.004	CalVET Net Tow Start	GAK12	5/3/02	3:22	58.24422	147.9323	2200		Hopcroft
HX25812302.005	CalVET Net Tow End	GAK12	5/3/02	3:43	58.23925	147.9178	2200		Hopcroft
HX25812302.006	CTD37 Start	GAK12	5/3/02	3:44	58.23638	147.9155	2200	redo for 10m bottle mistrip of CTD36	Danielson
HX25812302.007	CTD37 End	GAK12	5/3/02	3:49	58.23563	147.915	2200		Danielson
HX25812302.008	MOCNESS Start	GAK13	5/3/02	4:48	58.10168	147.797	2089		Hopcroft
HX25812302.009	MOCNESS End	GAK13	5/3/02	6:05	58.13165	147.8352	2089		Hopcroft
HX25812302.010	CTD38 Start	GAK13	5/3/02	6:36	58.09952	147.7869	2089	cohorts ctd cast	Hopcroft

HX25812302.011	CTD38 End	GAK13	5/3/02	6:43	58.10053	147.7823	2089		Hopcroft
HX25812302.012	CTD39 End	GAK13	5/3/02	6:43	58.10058	147.782	2089	cohorts ctd #2	Hopcroft
HX25812302.013	CTD39 End	GAK13	5/3/02	6:56	58.09825	147.7898	2089		Hopcroft
HX25812302.014	CTD40 Start	GAK13	5/3/02	6:57	58.09828	147.7896	2089	cohorts #3	Hopcroft
HX25812302.015	CTD40 End	GAK13	5/3/02	7:01	58.0988	147.7867	2089		Hopcroft
HX25812302.016	MOCNESS Start	GAK13	5/3/02	7:21	58.10042	147.7857	2089		Coyle
HX25812302.017	MOCNESS End	GAK13	5/3/02	7:55	58.1041	147.8039	2089		Coyle
HX25812302.018	HTI Transect Start	GAK13	5/3/02	8:12	58.10057	147.7944	2089		Coyle
HX25812302.019	HTI Transect End	GAK12	5/3/02	9:52	58.24408	147.9348	2200		Coyle
HX25812302.020	MOCNESS Start	GAK12	5/3/02	9:54	58.24413	147.937	2200		Coyle
HX25812302.021	MOCNESS End	GAK12	5/3/02	10:27	58.24538	147.9497	2200		Coyle
HX25812302.022	HTI Transect Start	GAK12	5/3/02	10:38	58.2455	147.9321	2200		Coyle
HX25812302.023	HTI Transect End	GAK11	5/3/02	12:14	58.38857	148.0719	1436		Coyle
HX25812302.024	MOCNESS Start	GAK11	5/3/02	12:16	58.38928	148.0754	1436		Coyle
HX25812302.025	MOCNESS End	GAK11	5/3/02	12:50	58.38935	148.1065	1436		Coyle
HX25812302.026	HTI Transect Start	GAK11	5/3/02	13:09	58.39012	148.0724	1436		Coyle
HX25812302.027	HTI Transect End	GAK10	5/3/02	14:59	58.54317	148.213	1457		Coyle
HX25812302.028	CTD41 Start	GAK9	5/3/02	16:01	58.68003	148.3517	278		Danielson
HX25812302.029	CTD41 End	GAK9	5/3/02	16:37	58.67773	148.3432	278		Danielson
HX25812302.030	CTD42 Start	GAK9	5/3/02	16:37	58.67775	148.3432	278		Danielson
HX25812302.031	CTD42 End	GAK9	5/3/02	16:41	58.67722	148.3428	278		Danielson
HX25812302.032	Ring Net Start	GAK9	5/3/02	16:42	58.67733	148.3439	278		Hopcroft
HX25812302.033	Ring Net End	GAK9	5/3/02	16:59	58.6775	148.3443	278		Hopcroft
HX25812302.034	CTD43 Start	GAK9	5/3/02	19:09	58.67877	148.3488	278	prod	Danielson
HX25812302.035	CTD43 End	GAK9	5/3/02	19:17	58.67775	148.3465	278		Danielson
HX25812302.036	CTD44 Start	GAK9	5/3/02	19:40	58.67723	148.347	278		Danielson
HX25812302.037	CTD44 End	GAK9	5/3/02	20:01	58.67427	148.3425	278		Danielson
HX25812302.038	Ring Net Start	GAK9	5/3/02	20:20	58.67542	148.345	278		Pinchuk
HX25812302.039	Ring Net End	GAK9	5/3/02	20:25	58.67933	148.3499	278		Pinchuk
HX25812302.040	CTD45 Start	GAK9	5/3/02	20:26	58.67922	148.3498	278		Danielson
HX25812302.041	CTD45 End	GAK9	5/3/02	20:30	58.67878	148.3493	278		Danielson
HX25812302.042	CTD46 Start	GAK9	5/3/02	20:37	58.6779	148.3481	278	cohorts	Danielson
HX25812302.043	CTD46 End	GAK9	5/3/02	20:42	58.67722	148.348	278		Danielson
HX25812302.044	CTD47 Start	GAK9	5/3/02	20:49	58.6762	148.347	278	cohorts	Danielson
HX25812302.045	CTD47 End	GAK9	5/3/02	20:53	58.67563	148.3466	278		Danielson
HX25812302.046	CTD48 Start	GAK9	5/3/02	21:01	58.67963	148.3499	278	cohorts	Danielson
HX25812302.047	CTD48 End	GAK9	5/3/02	21:05	58.67898	148.3495	278		Danielson
HX25812302.048	CTD49 Start	GAK9	5/3/02	21:13	58.6777	148.3492	278	cohorts	Danielson
HX25812302.049	CTD49 End	GAK9	5/3/02	21:17	58.67707	148.349	278		Danielson
HX25812302.050	CTD50 Start	GAK9I	5/3/02	21:49	58.61208	148.2758	677		Danielson
HX25812302.051	CTD50 End	GAK9I	5/3/02	22:27	58.60353	148.2663	677		Danielson
HX25812302.052	CTD51 Start	GAK10	5/3/02	22:56	58.5419	148.21	1484		Danielson
HX25812402.001	CTD51 End	GAK10	5/4/02	0:06	58.52677	148.2107	1484	10m bottle misfire	Danielson
HX25812402.002	CalVET Net Tow Start	GAK10	5/4/02	0:40	58.51807	148.1902	1484		Hopcroft

HX25812402.003	CalVET Net Tow End	GAK10	5/4/02	0:41	58.51575	148.188	1484		Hopcroft
HX25812402.004	CTD52 Start	GAK10	5/4/02	0:28	58.54077	148.2097	1484	redo for 10m bottle trip of CTD51	Danielson
HX25812402.005	CTD52 End	GAK10	5/4/02	0:28	58.54077	148.2097	1484		Danielson
HX25812402.006	CTD53 Start	GAK11	5/4/02	3:29	58.38822	148.0732	1431		Danielson
HX25812402.007	CTD53 End	GAK11	5/4/02	4:55	58.38023	148.0665	1431		Danielson
	CalVET Net Tow Start	GAK11	5/4/02	4:56	58.3802	148.0665	1431		Hopcroft
HX25812402.009	CalVET Net Tow End	GAK11	5/4/02	5:15	58.38015	148.0663	1430		Hopcroft
HX25812402.010	Ring Net Start	GAK11	5/4/02	5:16	58.38012	148.0663	1430		Hopcroft
HX25812402.011	Ring Net End	GAK11	5/4/02	5:30	58.37963	148.0671	1430		Hopcroft
HX25812402.012	MOCNESS Start	GAK10	5/4/02	6:53	58.53928	148.2207	1468	MOCNESS signal lost	Coyle
HX25812402.013	MOCNESS Start	GAK10	5/4/02	7:19	58.53345	148.2328	1468		Coyle
HX25812402.014	MOCNESS End	GAK10	5/4/02	7:50	58.53465	148.1992	1468		Coyle
HX25812402.015	HTI Transect Start	GAK10	5/4/02	8:10	58.54318	148.2126	1468		Coyle
HX25812402.016	HTI Transect End	GAK9	5/4/02	9:50	58.68062	148.3513	273		Coyle
HX25812402.017	MOCNESS Start	GAK9	5/4/02	9:53	58.68065	148.3573	278	also used .1mm mesh nets	Coyle
HX25812402.018	MOCNESS End	GAK9	5/4/02	10:30	58.6735	148.3927	278		Coyle
HX25812402.019	HTI Transect Start	GAK9	5/4/02	10:51	58.6807	148.351	278		Coyle
HX25812402.020	HTI Transect End	GAK8	5/4/02	12:11	58.79258	148.4928	290		Coyle
HX25812402.021	MOCNESS Start	GAK8	5/4/02	12:13	58.79242	148.4955	290		Coyle
HX25812402.022	MOCNESS End	GAK8	5/4/02	12:43	58.78922	148.5296	290		Coyle
HX25812402.023	HTI Transect Start	GAK8	5/4/02	13:05	58.79528	148.4928	290		Coyle
HX25812402.024	HTI Transect End	GAK7	5/4/02	15:00	58.97363	148.6317	242		Coyle
HX25812402.025	CTD54 Start	GAK4	5/4/02	18:01	59.40905	149.0514	202		Danielson
HX25812402.026	CTD54 End	GAK4	5/4/02	18:17	59.4061	149.0506	202		Danielson
HX25812402.027	CalVET Net Tow Start	GAK4	5/4/02	18:17	59.40608	149.0506	202		Hopcroft
HX25812402.028	CalVET Net Tow End	GAK4	5/4/02	18:33	59.40838	149.0496	202		Hopcroft
HX25812402.029	CTD55 Start	GAK4	5/4/02	18:34	59.40818	149.0497	202		Danielson
HX25812402.030	CTD55 End	GAK4	5/4/02	18:43	59.40662	149.0491	202		Danielson
HX25812402.031	CTD56 Start	GAK4	5/4/02	18:48	59.40582	149.0488	202	prim prod	Danielson
HX25812402.032	CTD56 End	GAK4	5/4/02	18:55	59.40457	149.0482	202		Danielson
HX25812402.033	Ring Net Start	GAK4	5/4/02	19:03	59.4085	149.0469	202		Hopcroft
HX25812402.034	Ring Net End	GAK4	5/4/02	19:10	59.4075	149.0464	202		Hopcroft
HX25812402.035	Ring Net Start	GAK4	5/4/02	19:10	59.40747	149.0464	202		Hopcroft
HX25812402.036	Ring Net End	GAK4	5/4/02	19:27	59.40472	149.0454	202		Hopcroft
HX25812402.037	CTD57 Start	GAK4	5/4/02	19:28	59.40467	149.0454	202	cohorts #1	Hopcroft
HX25812402.038	CTD57 End	GAK4	5/4/02	19:33	59.40385	149.0452	202		Hopcroft
HX25812402.039	CTD58 Start	GAK4	5/4/02	19:43	59.4025	149.0444	202	cohorts #2	Hopcroft
HX25812402.040	CTD58 End	GAK4	5/4/02	19:50	59.40147	149.044	202		Hopcroft
HX25812402.041	CTD59 Start	GAK4	5/4/02	19:58	59.40795	149.0503	202	cohorts #3	Hopcroft
HX25812402.042	CTD59 End	GAK4	5/4/02	20:02	59.4073	149.0501	202		Hopcroft
HX25812402.043	CTD60 Start	GAK4	5/4/02	20:10	59.40619	149.0494	202	cohorts #4	Hopcroft
HX25812402.044	CTD60 End	GAK4	5/4/02	20:14	59.40568	149.0491	202		Hopcroft

HX25812402.045	CTD61 Start	GAK4	5/4/02	20:21	59.4047	149.0482	202	cohorts #5	Hopcroft
HX25812402.046	CTD61 End	GAK4	5/4/02	20:25	59.40413	149.0478	202		Hopcroft
HX25812402.047	CTD62 Start	GAK1	5/4/02	23:26	59.84573	149.4678	272		Danielson
HX25812402.048	CTD62 End	GAK1	5/4/02	23:40	59.84595	149.4715	272		Danielson
HX25812502.001	CTD63 Start	GAK4I	5/5/02	3:08	59.33533	148.9767	200		Danielson
HX25812502.002	CTD63 End	GAK4I	5/5/02	3:23	59.33723	148.9771	200		Danielson
HX25812502.003	CTD64 Start	GAK5	5/5/02	4:00	59.26143	148.9066	168		Danielson
HX25812502.004	CTD64 End	GAK5	5/5/02	4:14	59.2629	148.9079	168		Danielson
	CalVET Net Tow Start	GAK5	5/5/02	4:15	59.26295	148.908	168		Hopcroft
HX25812502.006	CalVET Net Tow End	GAK5	5/5/02	4:25	59.25655	148.904	168		Hopcroft
								also used .1mm mesh nets	
HX25812502.007	MOCNESS Start	GAK7	5/5/02	7:18	58.97275	148.636	243		Coyle
HX25812502.008	MOCNESS End	GAK7	5/5/02	7:52	58.97478	148.6658	243		Coyle
HX25812502.009	HTI Transect Start	GAK7	5/5/02	8:10	58.97258	148.6305	243		Coyle
HX25812502.010	HTI Transect End	GAK6	5/5/02	9:52	59.11987	148.7681	150		Coyle
HX25812502.011	MOCNESS Start	GAK6	5/5/02	10:00	59.11	148.7686	150		Coyle
HX25812502.012	MOCNESS End	GAK6	5/5/02	10:24	59.13012	148.7383	150		Coyle
HX25812502.013	HTI Transect Start	GAK6	5/5/02	10:44	59.11	148.767	150		Coyle
HX25812502.014	HTI Transect End	GAK5	5/5/02	12:19	59.2628	148.9087	165		Coyle
HX25812502.015	MOCNESS Start	GAK5	5/5/02	12:26	59.26693	148.9045	165		Coyle
HX25812502.016	MOCNESS End	GAK5	5/5/02	12:57	59.27912	148.8882	165		Coyle
HX25812502.017	HTI Transect Start	GAK5	5/5/02	13:16	59.26133	148.9081	165		Coyle
HX25812502.018	HTI Transect End	GAK4	5/5/02	14:55	59.40943	149.0494	200		Coyle
HX25812502.019	CTD65 Start	GAK8I	5/5/02	20:05	58.74392	148.4179	291		Danielson
HX25812502.020	CTD65 End	GAK8I	5/5/02	20:27	58.74455	148.4176	291		Danielson
HX25812502.021	CTD66 Start	GAK8	5/5/02	20:53	58.7923	148.4878	291		Danielson
HX25812502.022	CTD66 End	GAK8	5/5/02	21:13	58.7929	148.4863	291	bottle misfired @ 30m	Danielson
	CalVET Net Tow Start	GAK8	5/5/02	21:14	58.79155	148.4841	291		Hopcroft
HX25812502.023	CalVET Net Tow End	GAK8	5/5/02	21:26	58.79155	148.484	291		Hopcroft
								recast to 30m for CTD66	Danielson
HX25812502.025	CTD67 Start	GAK8	5/5/02	21:27	58.79153	148.484	291		
HX25812502.026	CTD67 End	GAK8	5/5/02	21:29	58.79156	148.4838	291		Danielson
HX25812502.027	CTD68 Start	GAK7I	5/5/02	22:07	58.88125	148.5565	302		Danielson
HX25812502.028	CTD68 End	GAK7I	5/5/02	22:27	58.88107	148.5526	302		Danielson
HX25812502.029	CTD69 Start	GAK7	5/5/02	23:10	58.97125	148.6286	243		Danielson
HX25812502.030	CTD69 End	GAK7	5/5/02	23:25	58.97092	148.6272	243	bottle misfired @ 75m	Danielson
HX25812502.031	CalVET Net Tow End	GAK7	5/5/02	23:32	58.97075	148.6236	243		Hopcroft
HX25812502.032	CalVET Net Tow End	GAK7	5/5/02	23:37	58.97085	148.6223	243		Hopcroft
HX25812502.033	CTD70 Start	GAK7	5/5/02	23:38	58.9707	148.6223	243		Danielson
								recast to 75m for CTD69	
HX25812502.034	CTD70 End	GAK7	5/5/02	23:43	58.9694	148.6215	243		Danielson
HX25812602.001	CTD71 Start	GAK6I	5/6/02	0:18	59.04515	148.6967	190		Danielson
HX25812602.002	CTD71 End	GAK6I	5/6/02	0:32	59.04562	148.6935	190		Danielson
HX25812602.003	CTD72 Start	GAK6	5/6/02	1:06	59.11798	148.769	149		Danielson

HX25812602.004	CTD72 End	GAK6	5/6/02	1:17	59.11913	148.7702	149		Danielson
HX25812602.005	CalVET Net Tow Start	GAK6	5/6/02	1:18	59.11943	148.7682	149		Hopcroft
HX25812602.006	CalVET Net Tow End	GAK6	5/6/02	1:27	59.11946	148.7681	149		Hopcroft
HX25812602.007	CTD73 Start	GAK5I	5/6/02	1:58	59.1905	148.8387	165	bottle misfires @100m & 50m	Danielson
HX25812602.008	CTD73 End	GAK5I	5/6/02	2:11	59.19155	148.8389	165		Danielson
HX25812602.009	CTD74 Start	GAK5I	5/6/02	2:23	59.19221	148.8384	165	chlorophyll test cast, redo 50 and 100m bottles	Danielson
HX25812602.010	CTD74 End	GAK5I	5/6/02	2:32	59.19295	148.8382	165	recast for 100 and 50m for CTD73	Danielson
HX25812602.011	CTD75 Start	GAK5I	5/6/02	2:51	59.19442	148.8384	165	chl reps	Danielson
HX25812602.012	CTD75 End	GAK5I	5/6/02	2:57	59.19492	148.8387	165		Danielson
HX25812602.013	CTD76 Start	GAK5I	5/6/02	3:05	59.19567	148.8393	165	chl rep try #3, flu not working	Danielson
HX25812602.014	CTD76 End	GAK5I	5/6/02	3:12	59.19623	148.8396	165		Danielson
HX25812602.015	HTI Transect Start	GAK2	5/6/02	6:38	59.69288	149.3291	215		Coyle
HX25812602.016	HTI Transect End	GAK3	5/6/02	8:07	59.5524	149.1876	215		Coyle
HX25812602.017	MOCNESS Start	GAK3	5/6/02	8:13	59.551	149.1874	215		Coyle
HX25812602.018	MOCNESS End	GAK3	5/6/02	8:41	59.53572	149.1768	215		Coyle
HX25812602.019	HTI Transect Start	GAK3	5/6/02	8:59	59.55392	149.1893	215		Coyle
HX25812602.020	HTI Transect End	GAK4	5/6/02	10:39	59.40792	149.0479	200		Coyle
HX25812602.021	MOCNESS Start	GAK4	5/6/02	10:41	59.40643	149.0464	200		Coyle
HX25812602.022	MOCNESS End	GAK4	5/6/02	11:13	59.39027	149.0283	200		Coyle
HX25812602.023	CTD77 Start	HE11	5/6/02	19:12	60.14347	147.1916	176		Danielson
HX25812602.024	CTD77 End	HE11	5/6/02	19:28	60.14435	147.1888	176		Danielson
HX25812602.025	CTD78 Start	HE10	5/6/02	20:01	60.13055	147.1343	217		Danielson
HX25812602.026	CTD78 End	HE10	5/6/02	20:01	60.1305	147.1343	217		Danielson
HX25812602.027	CalVET Net Tow Start	HE10	5/6/02	20:02	60.13047	147.1344	217		Hopcroft
HX25812602.028	CalVET Net Tow End	HE10	5/6/02	20:11	60.12938	147.1369	217		Hopcroft
HX25812602.029	CTD79 Start	HE10	5/6/02	20:13	60.12922	147.1373	217		Danielson
HX25812602.030	CTD79 End	HE10	5/6/02	20:18	60.12837	147.1385	217		Danielson
HX25812602.031	CTD80 Start	HE9	5/6/02	20:40	60.10966	147.0489	267		Danielson
HX25812602.032	CTD80 End	HE9	5/6/02	21:03	60.10543	147.0581	267		Danielson
HX25812602.033	CTD81 Start	HE8	5/6/02	21:25	60.09385	146.9612	148		Danielson
HX25812602.034	CTD81 End	HE8	5/6/02	21:37	60.09408	146.9679	148		Danielson
HX25812602.035	CTD82 Start	HE6.5	5/6/02	22:28	60.05275	146.7353	123		Danielson
HX25812602.036	CTD82 End	HE6.5	5/6/02	22:38	60.0535	146.7406	123		Danielson
HX25812602.037	CalVET Net Tow Start	HE6.5	5/6/02	22:42	60.05388	146.7412	123		Hopcroft
HX25812602.038	CalVET Net Tow End	HE6.5	5/6/02	22:50	60.0798	146.6078	123		Hopcroft
HX25812602.039	CTD83 Start	HE4	5/6/02	23:19	60.07998	146.6073	115		Danielson
HX25812602.040	CTD83 End	HE4	5/6/02	23:29	60.07962	146.6098	115		Danielson
HX25812602.041	CalVET Net Tow Start	HE4	5/6/02	23:29	60.07962	146.61	115		Hopcroft

HX25812602.042	CalVET Net Tow End	HE4	5/6/02	23:35	60.08058	146.6101	115			Hopcroft
HX25812702.001	CTD84 Start	HE3	5/7/02	0:00	60.13058	146.6078	114			Danielson
HX25812702.002	CTD84 End	HE3	5/7/02	0:11	60.13245	146.6105	114			Danielson
HX25812702.003	CTD85 Start	HE2	5/7/02	0:34	60.18137	146.6083	197			Danielson
HX25812702.004	CTD85 End	HE2	5/7/02	0:50	60.18343	146.6179	197	bottle misfire, unclear which went wrong redo whole cast		Danielson
HX25812702.005	CalVET Net Tow Start	HE2	5/7/02	0:50	60.18348	146.6181	197			Hopcroft
HX25812702.006	CalVET Net Tow End	HE2	5/7/02	1:07	60.18087	146.6076	197			Hopcroft
HX25812702.007	CTD86 Start	HE2	5/7/02	1:08	60.18097	146.608	197	recast CTD85		Danielson
HX25812702.008	CTD86 End	HE2	5/7/02	1:40	60.21792	146.6082	197			Danielson
HX25812702.009	CTD87 Start	HE1	5/7/02	1:41	60.21805	146.6087	70			Danielson
HX25812702.010	CTD87 End	HE1	5/7/02	1:46	60.2187	146.6119	70			Danielson
HX25812702.011	MOCNESS Start	PWS2	5/7/02	6:57	60.53875	147.8023	740			Coyle
HX25812702.012	MOCNESS End	PWS2	5/7/02	7:31	60.55628	147.7892	740			Coyle
HX25812702.013	MOCNESS Start	PWS1	5/7/02	9:27	60.38377	147.9295	347			Coyle
HX25812702.014	MOCNESS End	PWS1	5/7/02	9:57	60.40008	147.916	347			Coyle
HX25812702.015	MOCNESS Start	KIP2	5/7/02	10:59	60.2749	147.9879	577			Coyle
HX25812702.016	MOCNESS End	KIP2	5/7/02	11:32	60.25632	147.9933	577			Coyle
HX25812702.017	CTD88 Start	KIP2	5/7/02	14:02	60.27825	147.9879	585			Danielson
HX25812702.018	CTD88 End	KIP2	5/7/02	14:40	60.28103	147.9876	585			Danielson
HX25812702.019	CalVET Net Tow Start	KIP2	5/7/02	14:40	60.28108	147.9875	585			Hopcroft
HX25812702.020	CalVET Net Tow End	KIP2	5/7/02	14:57	60.2783	147.9865	585			Hopcroft
HX25812702.021	CTD88 Start	KIP2	5/7/02	14:58	60.27833	147.9863	585	cohorts #1		Hopcroft
HX25812702.022	CTD88 End	KIP2	5/7/02	15:06	60.27928	147.9834	585			Hopcroft
HX25812702.023	CTD90 Start	KIP2	5/7/02	15:17	60.27923	147.9882	585	cohorts #2		Hopcroft
HX25812702.024	CTD90 End	KIP2	5/7/02	15:22	60.28018	147.988	585			Hopcroft
HX25812702.025	Ring Net Start	KIP2	5/7/02	15:26	60.28083	147.9877	585			Hopcroft
HX25812702.026	Ring Net End	KIP2	5/7/02	15:35	60.28215	147.9866	585			Hopcroft
HX25812702.027	CTD91 Start	KIP2	5/7/02	15:35	60.28222	147.9866	585	cohorts #3		Hopcroft
HX25812702.028	CTD91 End	KIP2	5/7/02	15:40	60.28282	147.9858	585			Hopcroft
HX25812702.029	CTD92 Start	KIP2	5/7/02	15:49	60.28403	147.9846	585	cohorts #4		Hopcroft
HX25812702.030	CTD92 End	KIP2	5/7/02	15:53	60.2847	147.9839	585			Hopcroft
HX25812702.031	CTD93 Start	KIP2	5/7/02	16:05	60.2787	147.9882	585	cohorts #5		Hopcroft
HX25812702.032	CTD93 End	KIP2	5/7/02	16:09	60.27923	147.9869	585			Hopcroft
HX25812702.033	Ring Net Start	KIP2	5/7/02	16:18	60.2801	147.9838	585			Hopcroft
HX25812702.034	Ring Net End	KIP2	5/7/02	16:33	60.28135	147.9791	585			Hopcroft
HX25812702.035	CTD94 Start	KIP2	5/7/02	16:34	60.2828	147.9753	585	prim Prod cast		Childers
HX25812702.036	CTD94 End	KIP2	5/7/02	16:44	60.28283	147.9752	585			Childers
HX25812702.037	Ring Net Start	KIP2	5/7/02	16:45	60.28287	147.9752	585			Hopcroft
HX25812702.038	Ring Net End	KIP2	5/7/02	16:48	60.28288	147.9751	585			Hopcroft
HX25812702.039	Ring Net Start	KIP2	5/7/02	16:48	60.28303	147.9749	585			Hopcroft
HX25812702.040	Ring Net End	KIP2	5/7/02	16:52	60.28307	147.9749	585			Hopcroft
HX25812702.041	CTD95 Start	PWS1	5/7/02	17:45	60.38092	147.9342	350			Danielson

HX25812702.042	CTD95 End	PWS1	5/7/02	18:10	60.3834	147.9304	350	10m bottle misfire	Danielson
HX25812702.043	Ring Net Start	PWS1	5/7/02	18:11	60.38428	147.929	350		Hopcroft
HX25812702.044	Ring Net End	PWS1	5/7/02	18:20	60.3843	147.9289	350		Hopcroft
HX25812702.045	CTD96 Start	PWS1	5/7/02	18:21	60.38433	147.9289	350	recast to 10m for CTD95	Danielson
HX25812702.046	CTD96 End	PWS1	5/7/02	18:22	60.38447	147.9286	350		Danielson
HX25812702.047	CTD97 Start	PWS2	5/7/02	19:22	60.53452	147.8009	350		Danielson
HX25812702.048	CTD97 End	PWS2	5/7/02	20:00	60.5361	147.7966	350		Danielson
HX25812702.049	CalVET Net Tow Start	PWS2	5/7/02	20:01	60.53632	147.7959	730		Hopcroft
HX25812702.050	CalVET Net Tow End	PWS2	5/7/02	20:09	60.53632	147.7959	730		Hopcroft
HX25812702.051	MOCNESS Start	PWS2	5/7/02	21:40	60.54222	147.7722	740	deep tow	Hopcroft
HX25812702.052	MOCNESS End	PWS2	5/7/02	21:54	60.54573	147.7594	740		Hopcroft
HX25812802.001	CTD98 Start	BP1	5/8/02	0:19	60.19513	148.0905	214		Danielson
HX25812802.002	CTD98 End	BP1	5/8/02	0:32	60.19593	148.0882	214		Danielson
HX25812802.003	CTD99 Start	KIP2	5/8/02	1:10	60.27851	147.9839	585		Hopcroft
HX25812802.004	CTD99 End	KIP2	5/8/02	1:22	60.28057	147.9799	585		Hopcroft
HX25812802.005	CTD100 Start	FI1	5/8/02	2:39	60.14533	148.0037	290		Danielson
HX25812802.006	CTD100 End	FI1	5/8/02	2:57	60.14708	148.0007	290		Danielson
HX25812802.007	CTD101 Start	EV1	5/8/02	3:49	60.08418	147.9039	232		Danielson
HX25812802.008	CTD101 End	EV1	5/8/02	4:02	60.0856	147.9007	232		Danielson
HX25812802.009	CTD102 Start	EV2	5/8/02	4:12	60.07515	147.8878	132		Danielson
HX25812802.010	CTD102 End	EV2	5/8/02	4:19	60.07585	147.8855	132		Danielson
HX25812802.011	CTD103 Start	HB1	5/8/02	5:42	60.19175	147.7005	245		Danielson
HX25812802.012	CTD103 End	HB1	5/8/02	6:00	60.19383	147.6978	245		Danielson
HX25812802.013	CTD104 Start	HB1	5/8/02	6:06	60.19428	147.6963	245		Danielson
HX25812802.014	CTD104 End	HB1	5/8/02	6:10	60.19448	147.6951	245		Danielson
HX25812802.015	CalVET Net Tow Start	HB2	5/8/02	6:24	60.17823	147.6418	175		Hopcroft
HX25812802.016	CalVET Net Tow End	HB2	5/8/02	6:32	60.17731	147.6416	175		Hopcroft
HX25812802.017	CTD105 Start	HB2	5/8/02	6:32	60.1773	147.6416	175		Danielson
HX25812802.018	CTD105 End	HB2	5/8/02	6:56	60.16793	147.5925	175		Danielson
HX25812802.019	CTD106 Start	HB3	5/8/02	7:02	60.16448	147.5745	84		Danielson
HX25812802.020	CTD106 End	HB3	5/8/02	7:10	60.16505	147.5733	84		Danielson
HX25812802.021	CTD107 Start	HB4	5/8/02	7:28	60.14632	147.5002	112		Danielson
HX25812802.022	CTD107 End	HB4	5/8/02	7:36	60.14642	147.4984	112		Danielson
HX25812802.023	MOCNESS Start	HB2	5/8/02	8:14	60.17582	147.672	225		Coyle
HX25812802.024	MOCNESS End	HB2	5/8/02	8:46	60.19175	147.6655	225		Coyle
HX25812802.025	MOCNESS Start	MS2	5/8/02	11:44	59.9399	147.8906	191		Coyle
HX25812802.026	MOCNESS End	MS2	5/8/02	12:13	59.9501	147.8804	191		Coyle
HX25812802.027	CTD108 Start	MS4	5/8/02	13:19	59.91935	147.8268	122		Danielson
HX25812802.028	CTD108 End	MS4	5/8/02	13:34	59.9242	147.8409	122		Danielson
HX25812802.029	CTD109 Start	MS3	5/8/02	13:42	59.93142	147.8569	165		Danielson
HX25812802.030	CTD109 End	MS3	5/8/02	13:54	59.93047	147.8578	165		Danielson
HX25812802.031	CTD110 Start	MS2	5/8/02	14:06	59.94402	147.8953	195		Danielson

HX25812802.032	CTD110 End	MS2	5/8/02	14:19	59.94288	147.8948	195		Danielson
HX25812802.033	CalVET Net Tow Start	MS2	5/8/02	14:19	59.94287	147.8947	195		Hopcroft
HX25812802.034	CalVET Net Tow End	MS2	5/8/02	14:31	59.94633	147.9046	195		Hopcroft
HX25812802.035	CTD111 Start	MS1	5/8/02	14:38	59.95532	147.9282	172		Danielson
HX25812802.036	CTD111 End	MS1	5/8/02	14:51	59.95533	147.9285	172		Danielson
HX25812902.001	CTD112 Start	HP1	5/9/02	1:50	59.62645	149.9167	183		Danielson
HX25812902.002	CTD112 End	HP1	5/9/02	2:08	59.61157	149.9045	183		Danielson
HX25812902.003	CTD113 Start	HP2	5/9/02	2:34	59.55385	149.8438	180		Danielson
HX25812902.004	CTD113 End	HP2	5/9/02	2:46	59.5522	149.8463	180		Danielson
HX25812902.005	CTD114 Start	HP3	5/9/02	3:19	59.48245	149.775	190		Danielson
HX25812902.006	CTD114 End	HP3	5/9/02	3:27	59.48148	149.7777	190		Danielson
HX25812902.007	CTD115 Start	HP4	5/9/02	4:35	59.40995	149.706	102		Danielson
HX25812902.008	CTD115 End	HP4	5/9/02	4:40	59.41087	149.7081	102		Danielson
HX25812902.009	CTD116 Start	HP5	5/9/02	5:18	59.33577	149.6338	122		Danielson
HX25812902.010	CTD116 End	HP5	5/9/02	5:25	59.33703	149.6351	122		Danielson
HX25812902.011	CTD117 Start	HP6	5/9/02	6:01	59.26182	149.5639	128		Danielson
HX25812902.012	CTD117 End	HP6	5/9/02	6:07	59.26252	149.5655	128		Danielson
HX25812902.013	CTD118 Start	HP7	5/9/02	6:43	59.19048	149.4916	131		Danielson
HX25812902.014	CTD118 End	HP7	5/9/02	6:49	59.19137	149.4933	131		Danielson
HX25812902.015	MOCNESS Start	GAK1	5/9/02	11:09	59.85237	149.4686	131	used only .1mm mesh net	Pinchuk
HX25812902.016	MOCNESS End	GAK1	5/9/02	11:21	59.85932	149.4709	131		Pinchuk
HX25812902.017	CTD119 Start	GAK1	5/9/02	12:07	59.84583	149.4679	270		Danielson
HX25812902.018	CTD119 End	GAK1	5/9/02	12:16	59.84685	149.4671	270		Danielson
HX25812902.019	CTD120 Start	RES2.5	5/9/02	14:22	60.02557	149.3604	295		Danielson
HX25812902.020	CTD120 End	RES2.5	5/9/02	14:33	60.02612	149.3601	295		Danielson