

# GLOBEC CRUISE REPORT

Cruise HX243 May 4 – 14, 2001

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

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## Scientific Personnel:

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Michael Foy	Microplankton, Technician, UW
Russell Hopcroft	Zooplankton, IMS-UAF
Thomas Kline	Zooplankton C-N stable isotopes, Pr. Wm. Sd. Sci Cen.
Brian Rowe	Marine Technician, IMS-UAF,

## 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 that end, the GLOBEC cruises on the Gulf of Alaska shelf will determine the physical-chemical structure, primary production, the distribution and abundance of zooplankton, YOY salmon, other planktivorous fishes, and marine birds and mammals. These interdisciplinary cruises will occur over a three-year period and throughout the year so that seasonal and interannual comparisons of the oceanography of this shelf can be made. 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 May 2001 cruise was the fourth May cruise in as many years as part of the Gulf of Alaska GLOBEC program Long Term Observation Program (LTOP). Cruise activities concentrated on physical oceanography (circulation and thermohaline structure), nutrient and chlorophyll concentrations, zooplankton, seabird and marine mammal distributions. Zooplankton were also sampled for C-N stable isotope composition and experiments were established to estimate growth rates. Samples were also taken for microplankton community composition.

May is the spring transition month during which coastal discharge and solar radiation increases, and cyclonic wind stress intensity decreases. These changes result in a restructuring of the shelf from the well-mixed conditions of winter to the more stratified conditions of spring. due to strong vertical mixing. May is also the time of the year when the spring phytoplankton bloom can occur over the shelf and when the copepod bloom occurs.

**Cruise Objectives:** To determine:

1. thermohaline, velocity, and nutrient structure of the Gulf of Alaska shelf.
2. primary productivity and chlorophyll abundance
3. abundance, distribution, and community composition of seabirds and marine mammals
4. abundance, distribution, and community composition of macrozooplankton
5. abundance, distribution, and community composition of microzooplankton
6. zooplankton growth rate
7. zooplankton stable isotope composition

**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**). AH Line (**Table 5**); no need to do any of the cross-Hinchinbrook Canyon Lines), Cape Clear Line (**Table 6**) and the PWSSW Line (**Table 1**). (These can be performed at night after zooplankton work is completed.)
2. collect ADCP, sea surface salinity (SSS), temperature (SST) and fluorescence (SSF) using seacrest 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 casts was collected along the Seward Line and at selected other stations.
7. At Seward Line stations GAK1, GAK4, GAK13 and one PWS station Hopcroft collected 6 -7 casts with the 10-liter Niskins/Rosette to collect water (from ~ 20m) for zooplankton incubations and at least one ring net tow over upper 50m.
8. HOPCROFT collected one deep MOCNESS tow (to ~500 m) at GAK 13 and at PWS 3.

**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.

### ***Cruise Log:***

5/3		Science party arrives in Seward and sets up equipment.
5/4	0830	Precruise meeting
	0900	Depart from dock for RES 2.5
		See the cruise event log that shows all sampling activities
5/15	0900	Return to SMC; science party departs.

### **Cruise Summary:**

#### **PHYSICAL OCEANOGRAPHY (*T. Weingartner*)**

We collected CTD and ADCP data along the stations listed in Tables 1-8. We also collected continuous sea surface temperature, salinity, fluorescence, and meteorological data while underway and between all waypoints. The shelf was weakly stratified everywhere with the greatest stratification occurring in the Alaska Coastal Current where the stratification was associated with freshwater runoff. Further seaward the upper water column showed early evolution of thermal and haline stratification. Fluorescence values were consequently low everywhere except in the ACC. It appears that the stratification was weaker during this cruise than during the GLOBEC Process cruise of late April (Strom, Chief Sci.). Weather conditions then were quite calm. We experienced heavy weather (35 knots) early in the cruise, which probably weakened the incipient stratification that began in late April.

We found evidence that the ACC recirculates (flows eastward) along the outer end of the Cape Fairfield section. We suspect that this recirculation occurs in the vicinity of GAK3 – GAK4 and is associated with the ACC rounding the shoals south of the Chiswell Islands. A portion of this flow continues westward around the shoal while another branch swings eastward. More than likely the eastward branch forms an eddy (probably intermittent) associated with the inertial overshoot of the ACC in the vicinity of the Chiswells.

Offshore of Hinchinbrook Entrance the waters are substantially saltier than within Prince William Sound. There was little stratification and generally low fluorescence levels. Waters in western Prince William Sound were substantially fresher down to at least 200 m depth than those offshore of Hinchinbrook Entrance. Fluorescence levels were relatively high along both the Hogan Bay Line and Knight Island Passage. These results suggest that the sound is a major freshwater and carbon (exported as phytoplankton) source for the shelf.

#### **ZOOPLANKTON (HYDROACOUSTICS AND MOCNESS; *K. Coyle*)**

A MOCNESS tow was collected at each of the Seward Line stations, at the outer three stations on the Cape Cleare southeast line, at five stations in Prince William Sound and at four stations in Hinchinbrook Entrance. CalVET net samples were collected at all stations on the Seward Line, at the station on the Cape Cleare southeast line, at five stations in Prince William Sound and at four stations in Hinchinbrook Entrance. Acoustic transects were run along the Seward Line and the outer end of the Cape Cleare southeast line. In addition, acoustic data were collected during each MOCNESS tow to

aid in interpreting the acoustic results. 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.

Casual observation of the net samples suggest an abundance of *Neocalanus* species during the cruise. Scattering layers, probably due to euphausiids, were observed in the upper 100 m over much of the Seward Line. Intense scattering from fish targets was observed on the inner end of the Seward Line and near the shelf break on the Cape Cleare line.

#### **ZOOPLANKTON (GROWTH EXPERIMENTS; *R. Hopcroft*)**

Experiments for copepod somatic growth rates using the artificial cohort method were executed at Gak1, Gak4 and PWS2. Picked stages of *Neocalanus* were incubated for molt rate determination at Gak1, Gak4, Gak9, and Gak13, and additionally for *Eucalanus bungii* at Gak9. Egg production for *Pseudocalanus* spp., *Acartia longiremis*, *Eucalanus bungii*, *Metridia pacifica* were conducted variably at these stations. Failure of the ship's refrigerated incubators the resulted in destruction of all *Metridia* egg production experiments at PWS2, and may have compromised egg production for *Pseudocalanus* and *Acartia*. Euphausiid molting rates were determined for Gak9, Gak13, PWS and CCSE7 employing ~60 animals per experiment.

#### **ZOOPLANKTON (STABLE ISOTOPES; *T. Kline*)**

At each MOCNESS station, samples were saved for C and N stable isotope analysis from the contents of net #1. Additionally, samples of diapausing *Neocalanus*, were saved for C and N stable isotope analysis from Dr. Hopcroft's MOCNESS sample taken at 400-600m at station PWS2. Zooplankton were saved as individuals in separate vials after identification to species level and frozen. They will be freeze-dried in the laboratory prior to isotopic analysis.

#### **MICROZOOPLANKTON (*M. Foy*)**

Samples were taken to determine microzooplankton abundance and biomass, either as discrete vertical samples or as integrated samples. Vertical samples consisted of sampling from depths 0m, 10 or 20m, 30m, 50m, & 100m and were taken at GAK 2,4,6,8,10,13 and PWS2. Integrated samples were taken by combining water for an upper layer sample (0m, 10m, 20m, 30m, 40m & 50m) and a lower layer sample (75m & 100m) and taken at GAK 1,3,5,7,9,11,12, CF 3,9, HE 2,7,10, CCSE 2,5,8 and KIP 2. Above samples were filtered and prepared for epifluorescent microscopy as well as preserved in acid Lugols. In addition, samples were fixed for flow cytometry.

#### **BIRDS AND MAMMALS (*L. DeSousa*)**

Seabird identification and abundance were recorded on the Seward, Cape Fairfield, Hinchinbrook Entrance, Hinchinbrook Canyon and Cape Clear 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).

HX243

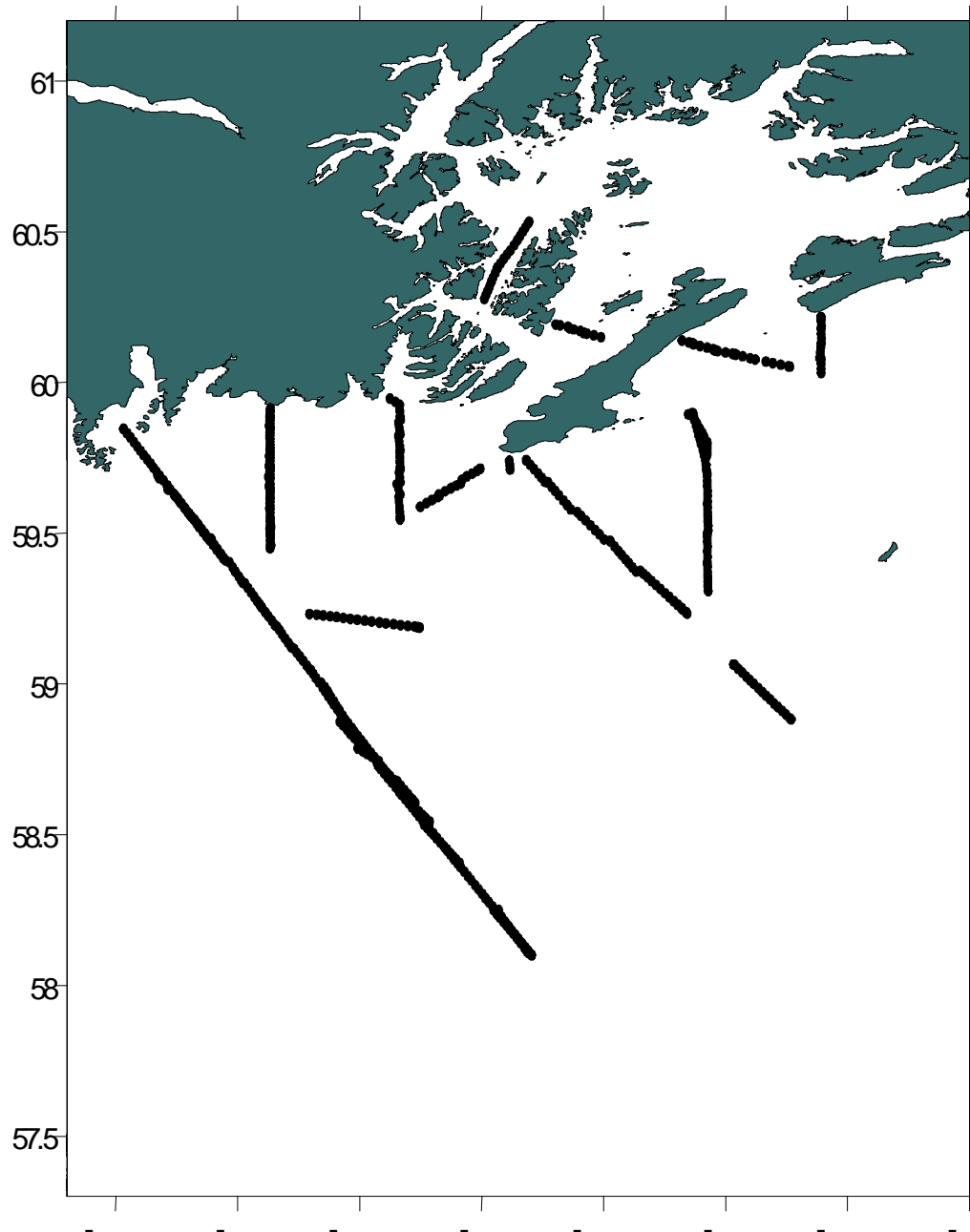


Figure 1: Transects surveyed to estimate seabird and marine mammal abundances

**Table 1. CTD Station Locations along Seward Line.**

<b>Station Name</b>	<b>Latitude (° N)</b>	<b>Longitude (° )</b>	<b>Approximate Bottom Depth (m)</b>
<b>RES 2.5</b>	60 0.0	149 20.3	290
<b>GAK 1</b>	59 50.7	149 28.0	265
<b>GAK 1i*</b>	59 46.0	149 23.8	250
<b>GAK 2</b>	59 41.5	149 19.6	220
<b>GAK 2i*</b>	59 37.6	149 15.5	220
<b>GAK 3</b>	59 33.2	149 11.3	220
<b>GAK3i*</b>	59 28.9	149 7.1	210
<b>GAK 4</b>	59 24.5	149 2.9	200
<b>GAK 4i*</b>	59 20.1	148 58.7	200
<b>GAK 5</b>	59 15.7	148 54.5	175
<b>GAK 5i*</b>	59 11.4	148 50.3	150
<b>GAK 6</b>	59 7.0	148 46.2	145
<b>GAK 6i**</b>	59 2.7	148 42.0	192
<b>GAK 7**</b>	58 58.3	148 37.8	245
<b>GAK 7i**</b>	58 52.9	148 33.6	298
<b>GAK 8**</b>	58 47.5	148 29.4	290
<b>Gak 8i**</b>	58 44.6	148 25.2	294
<b>GAK 9</b>	58 40.8	148 21.0	275
<b>GAK9i**</b>	58 36.7	148 16.7	650
<b>GAK 10</b>	58 32.5	148 12.7	1400
<b>GAK 11</b>	58 23.3	148 4.3	1410
<b>GAK 12</b>	58 14.6	147 56.0	2190
<b>GAK 13</b>	58 5.9	147 47.6	2090

\*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)
CF1	59 55.0	148 52.0	50
CF2	59 53.0	148 52.0	120
CF3	59 51.0	148 52.0	170
CF4	59 49.0	148 52.0	180
CF5	59 47.0	148 52.0	180
CF6	59 45.0	148 52.0	185
CF7	59 43.0	148 52.0	180
CF8	59 41.0	148 52.0	180
CF9	59 39.0	148 52.0	175
CF9	59 39.0	148 52.0	175
CF10	59 37.0	148 52.0	175
CF11	59 35.0	148 52.0	160
CF12	59 33.0	148 52.0	145
CF13	59 31.0	148 52.0	145
CF14	59 29.0	148 52.0	145
CF15	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.
PWS10	60.385	146.925	293	Anc.
PWS9	60.477	147.070	222	Anc.
PWS8	60.557	147.126	228	Anc.
PWS7	60.629	147.149	292	Anc.
PWS6	60.722	147.145	390	Anc.
PWS5	60.822	147.398	476	Anc.
PWS4	60.737	147.658	657	Anc.
PWS3	60.655	147.809	753	zooplankton
PWS2	60.534	147.802	742	Anc.
PWS1	60.379	147.936	333	zooplankton

**Table 4. CTD Stations Bracketing Hinchinbrook Entrance.**

Station Name	Latitude (° N)	Longitude (° )	Approximate Bottom Depth (m)
HE1	60 13.8	146 36.5	Zooplankton
HE2	60 10.8	146 36.5	
HE3	60 7.8	146 36.5	
HE4	60 4.8	146 36.5	
HE5	60 1.8	146 36.5	Zooplankton
HE6	60 3.0	146 44.8	
HE7	60 4.3	146 51.3	
HE8	60 5.6	146 57.7	
HE9	60 6.6	147 3.0	Zooplankton
HE10	60 7.8	147 8.0	zooplankton
HE11	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	230
AHC 4	59 36.0	147 4.5	206
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**

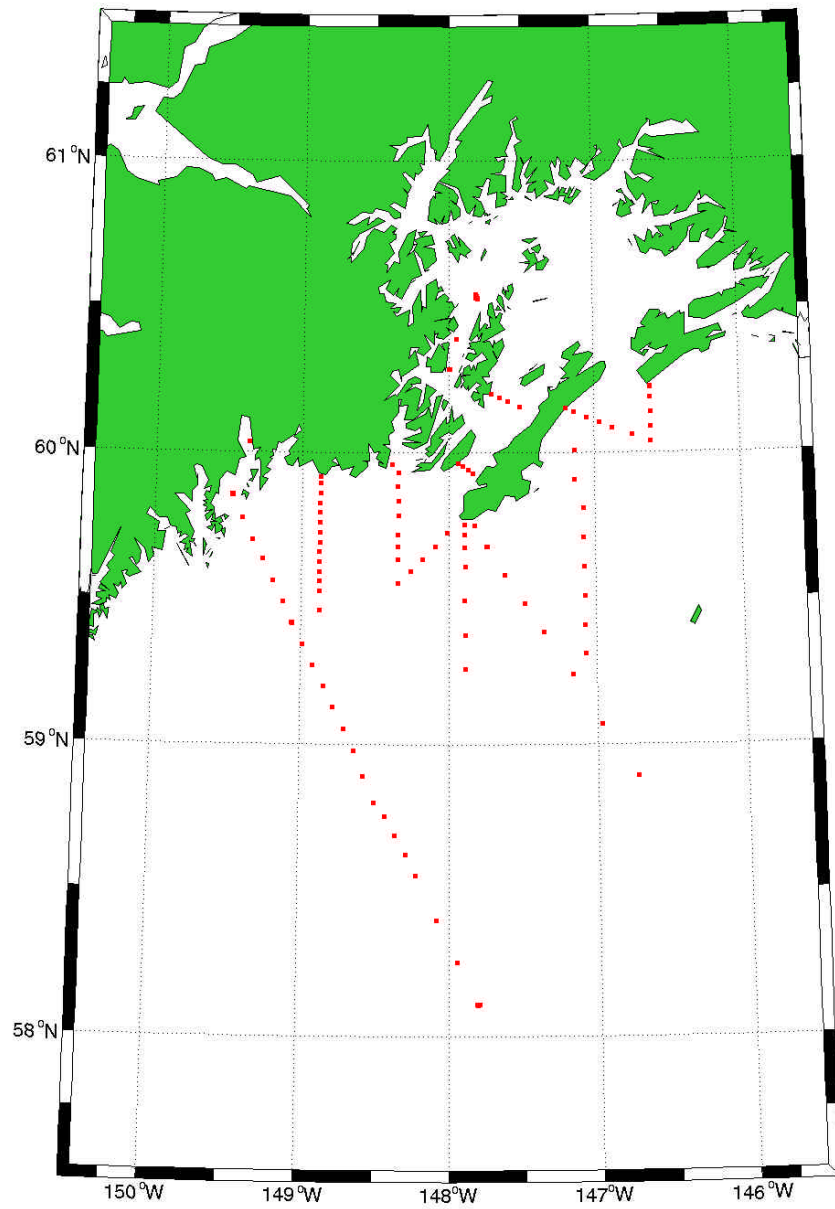
<b>Station Name</b>	<b>Latitude (° N)</b>	<b>Longitude (°)</b>	<b>Approximate Bottom Depth (m)</b>
<b>*CC 1</b>	59 44.67	147 53.0	23
<b>*CC 2</b>	59 42.6	147 53.0	68
<b>*CC 3</b>	59 40.0	147 53.0	67
<b>*CC 4</b>	59 36.0	147 53.0	114
<b>*CC-5</b>	59 29.0	147 53.0	113
<b>*CC-6</b>	59 22.0	147 53.0	177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

\*most important

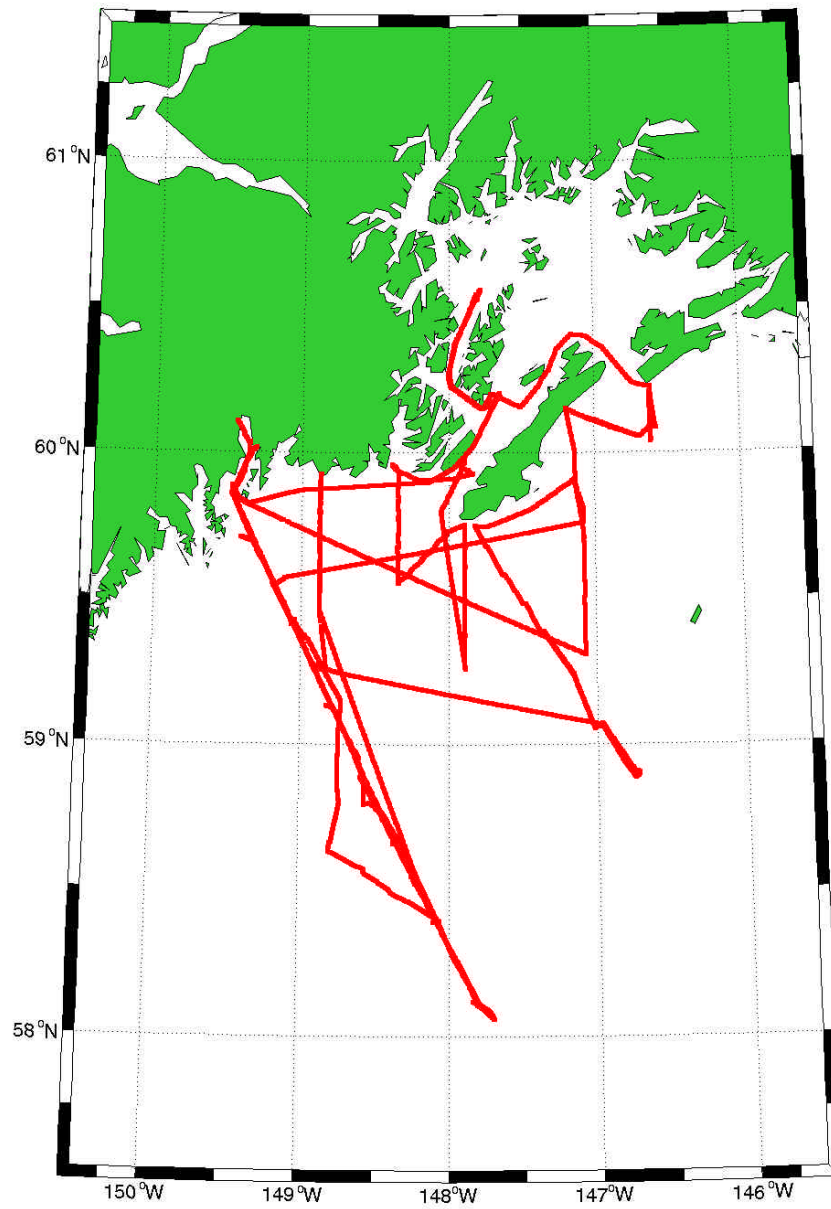
**Table 8. CTD Station Locations Along Cape Cleare SE Line - Offshore Montague Island**

<b>Station Name</b>	<b>Latitude (°N)</b>	<b>Longitude (°)</b>	<b>Approximate Bottom Depth (m)</b>
<b>CCSE1</b>	59.74	147.82	64
<b>CCSE2</b>	59.67	147.72	116
<b>CCSE3</b>	59.57	147.61	111
<b>CCSE4</b>	59.47	147.48	116
<b>CCSE5</b>	59.37	147.35	126
<b>CCSE6</b>	59.23	147.16	201
<b>CCSE7</b>	59.06	146.97	2012
<b>CCSE8</b>	58.88	146.74	2790

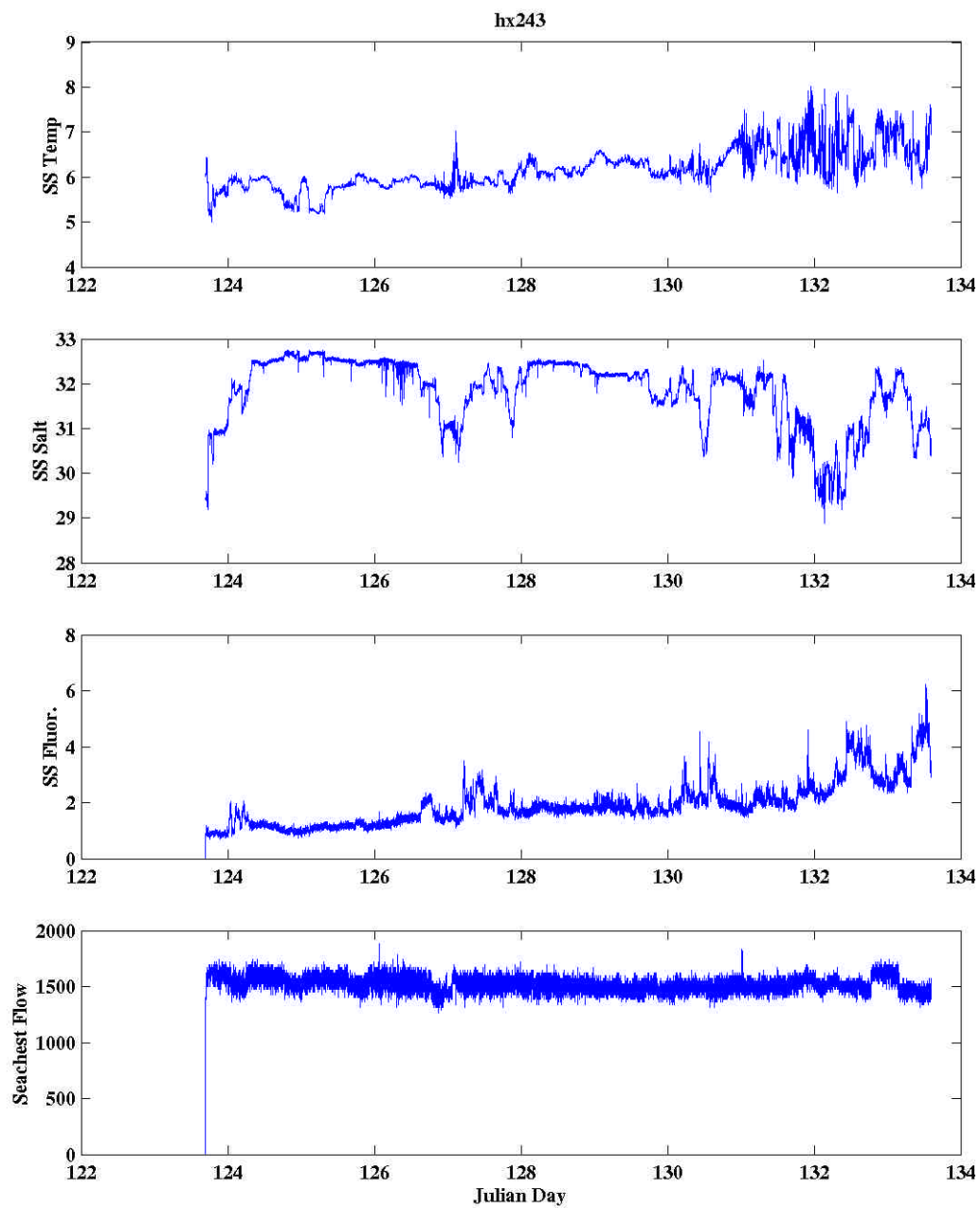
hx243 Station Locations

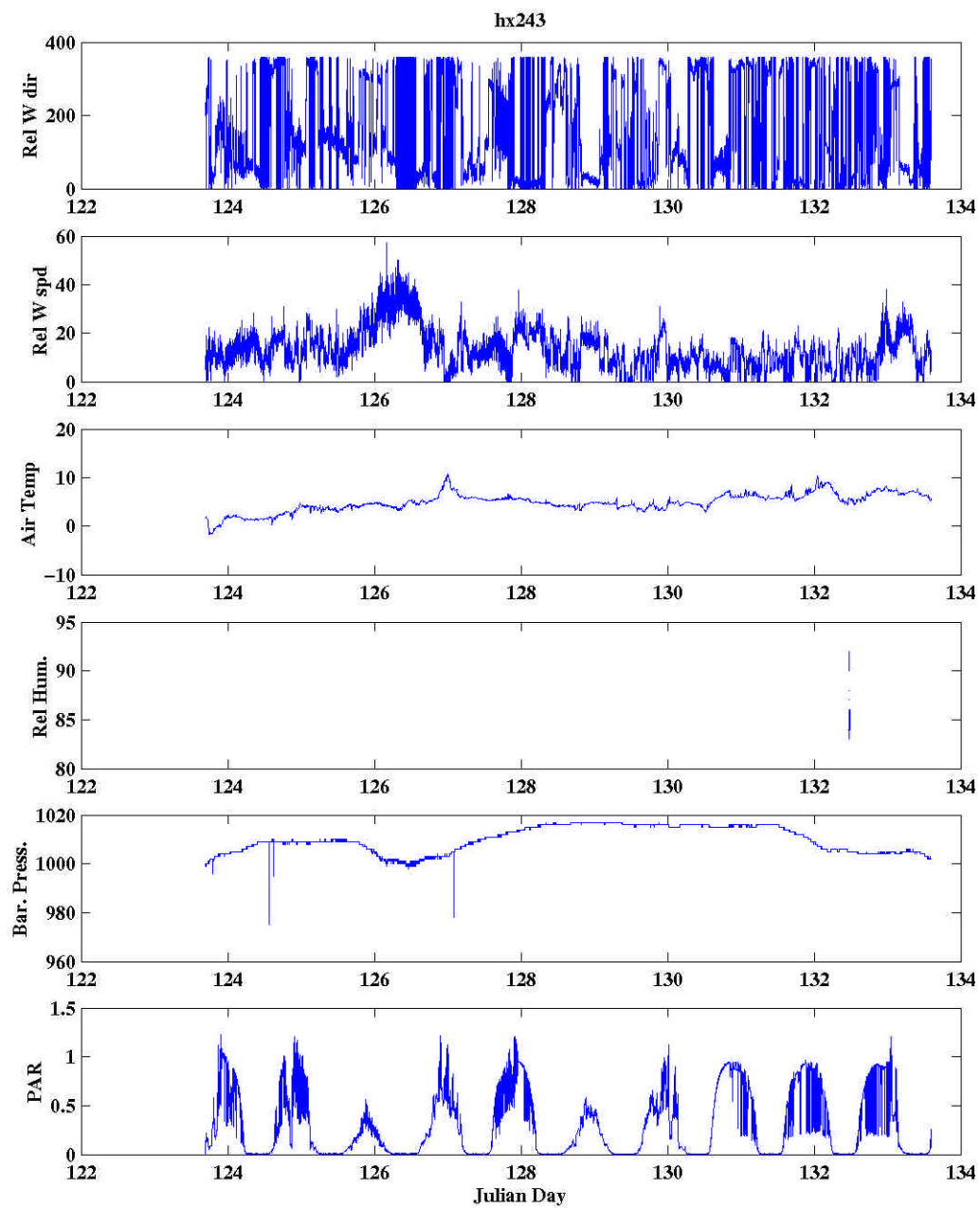


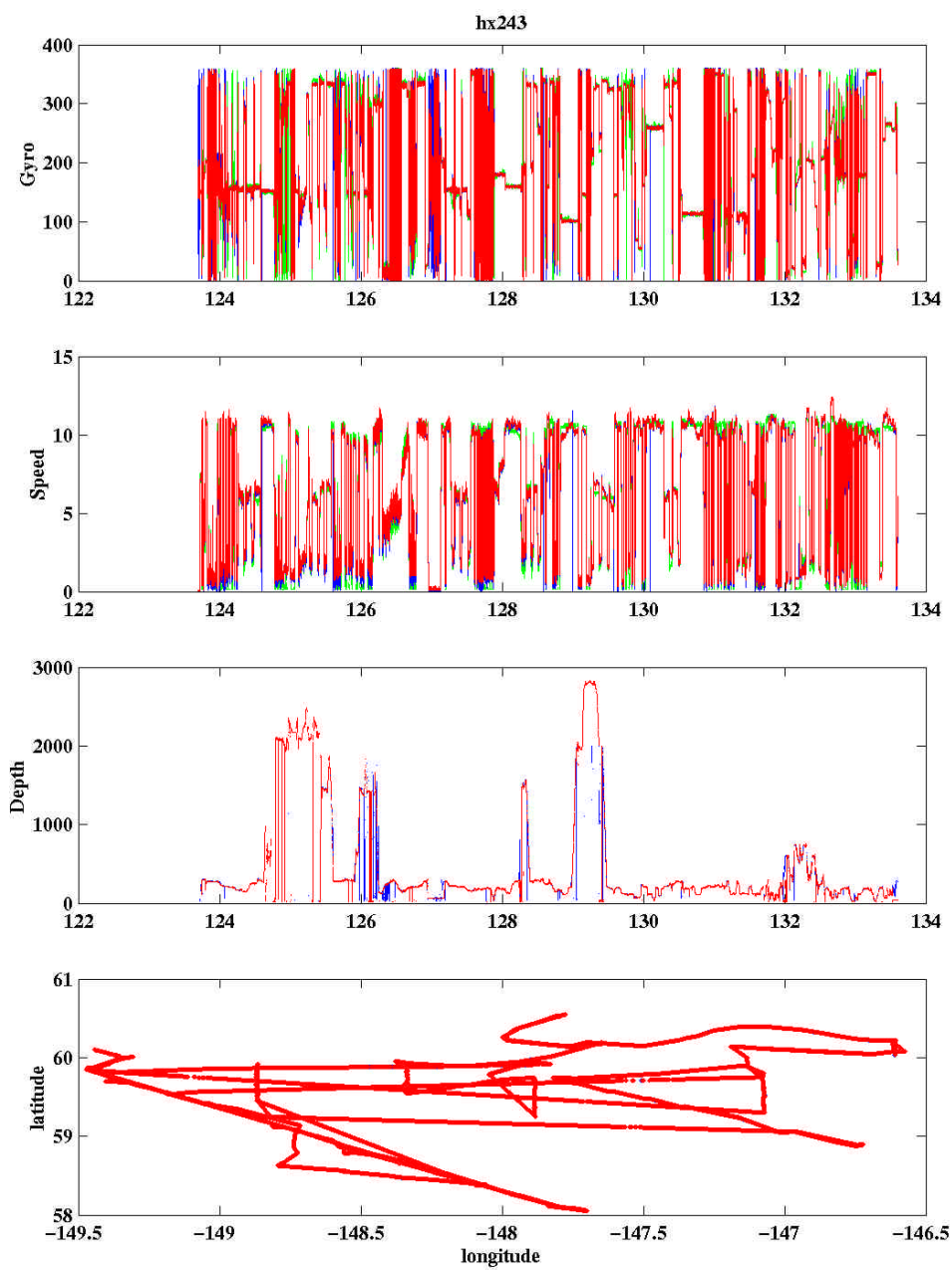
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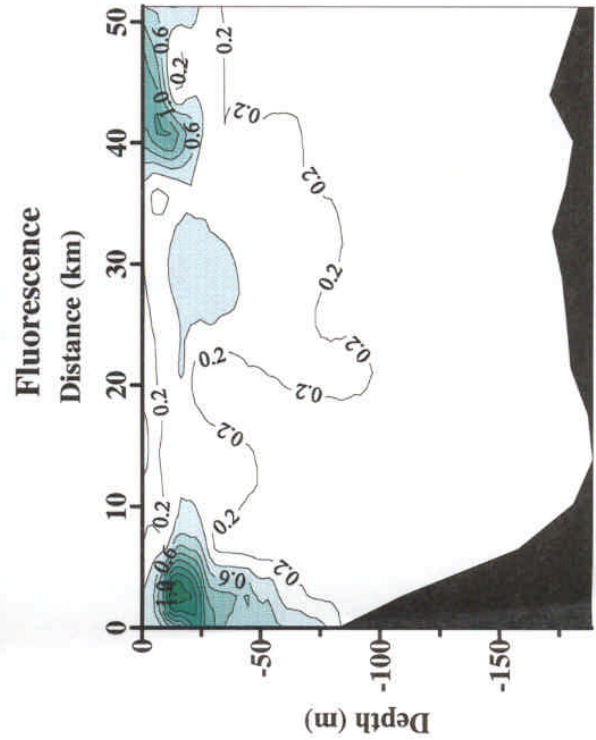
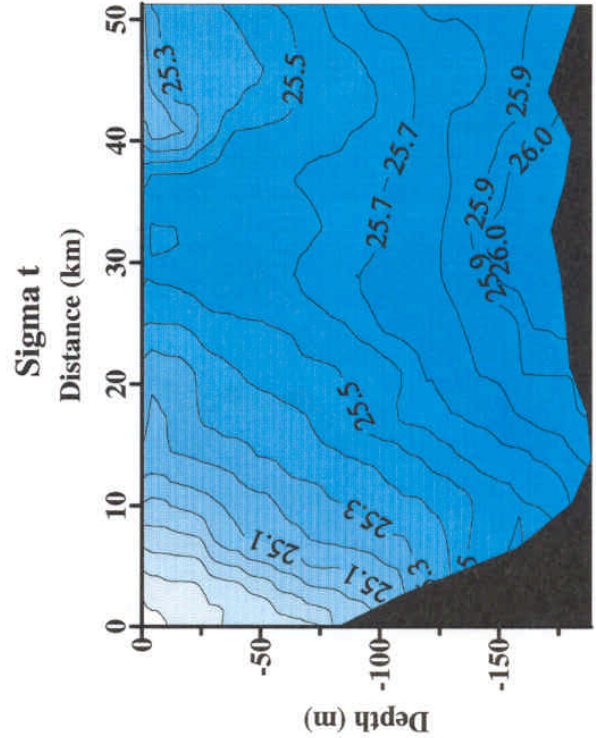
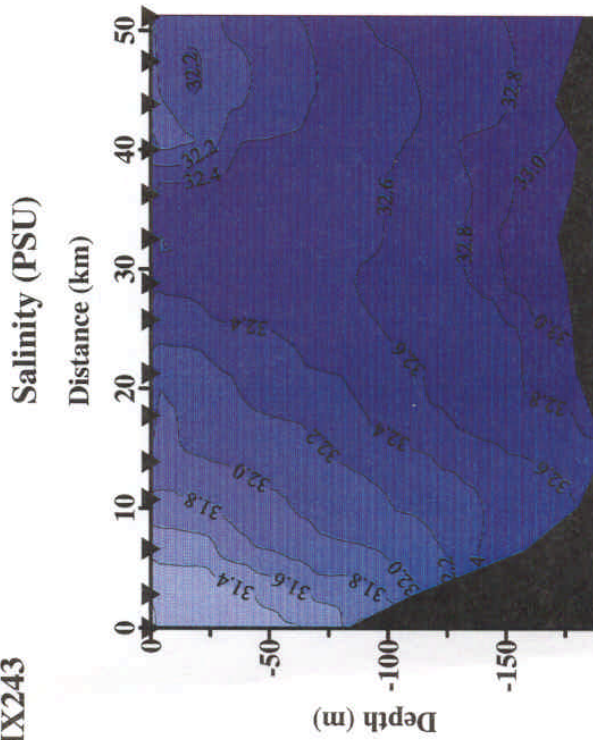
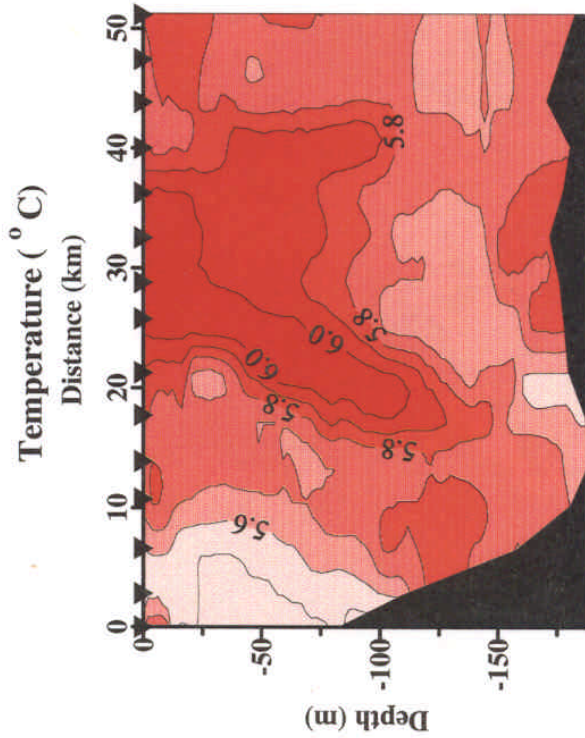
HX243 Cruise Track





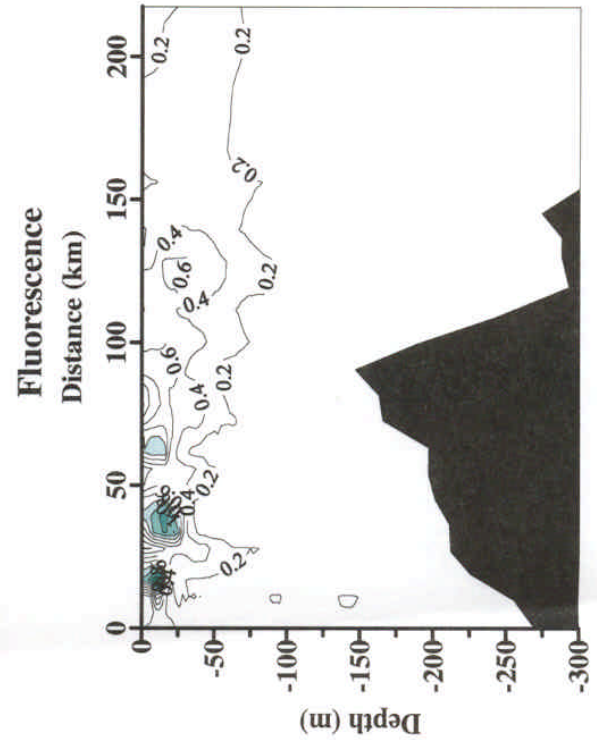
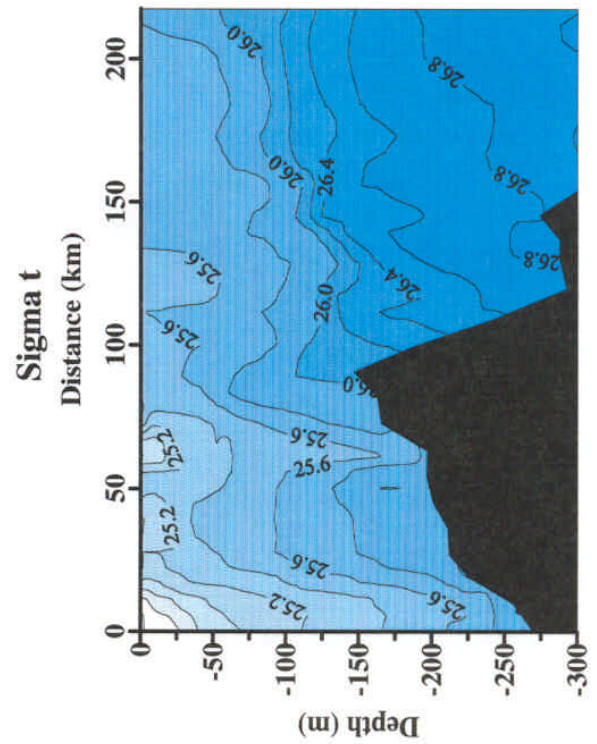
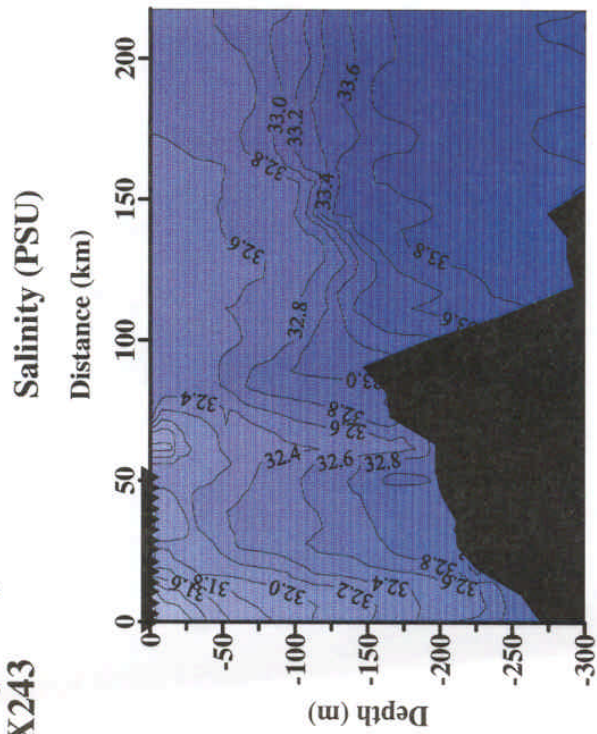
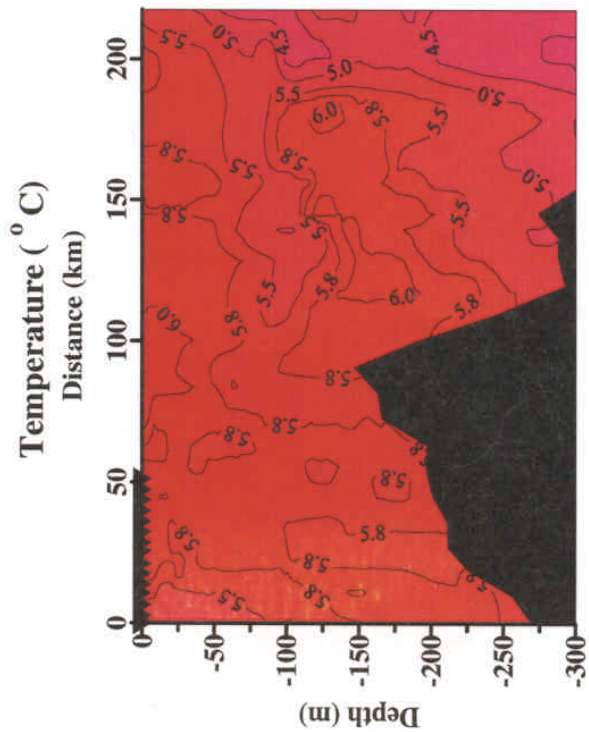


Cape Fairfield; May 8, 2001  
HX243





Seward Line; May 4 - 9, 2001  
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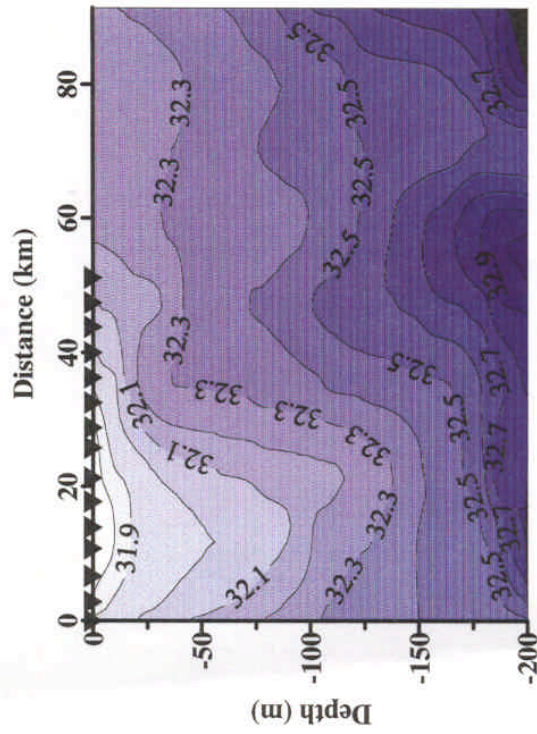




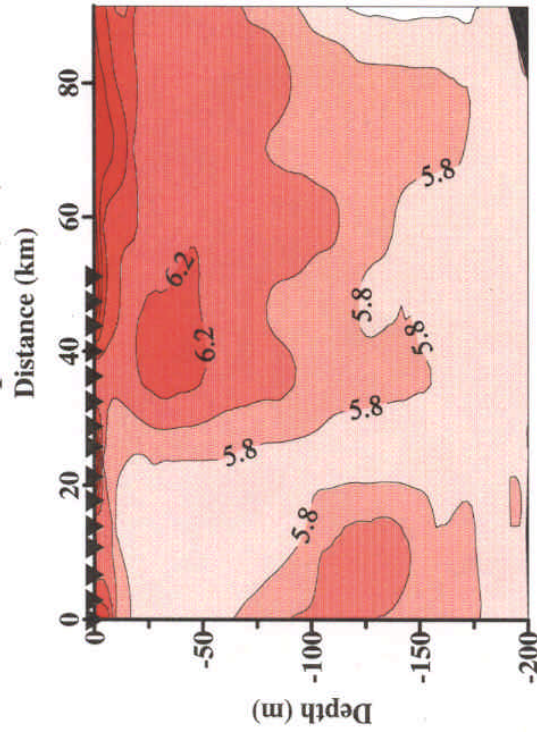
# Hinchinbrook Canyon; May 10 - 11, 2001

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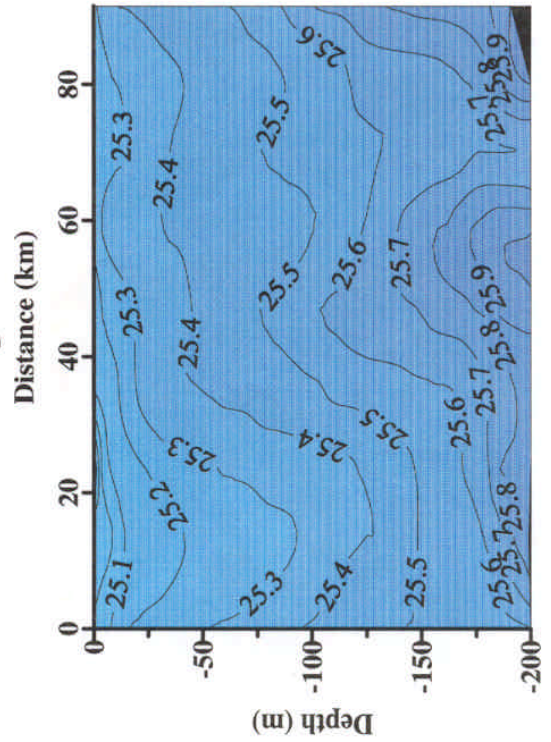
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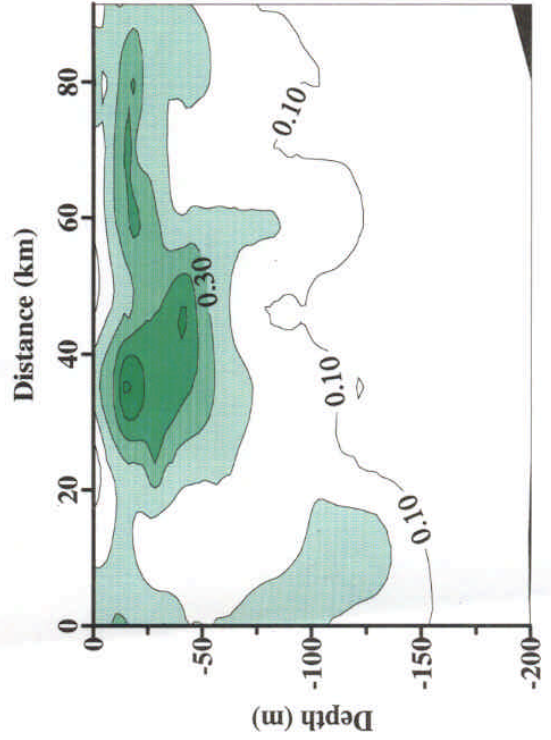
Temperature ( $^{\circ}\text{C}$ )



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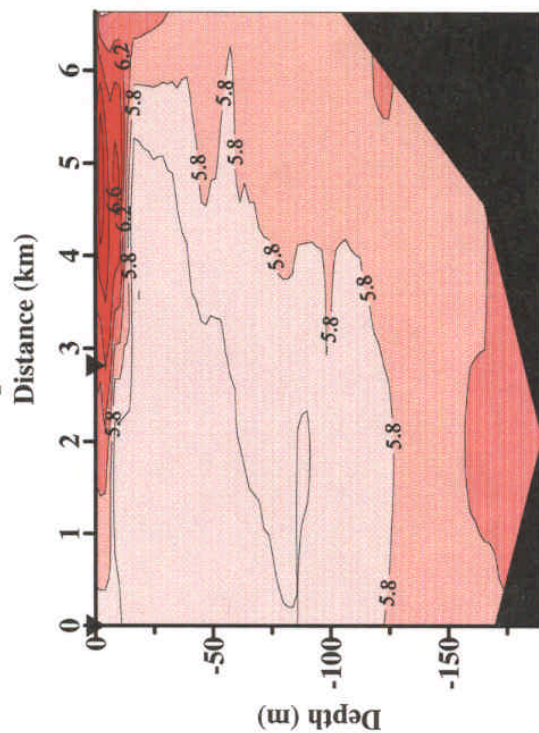


Fluorescence

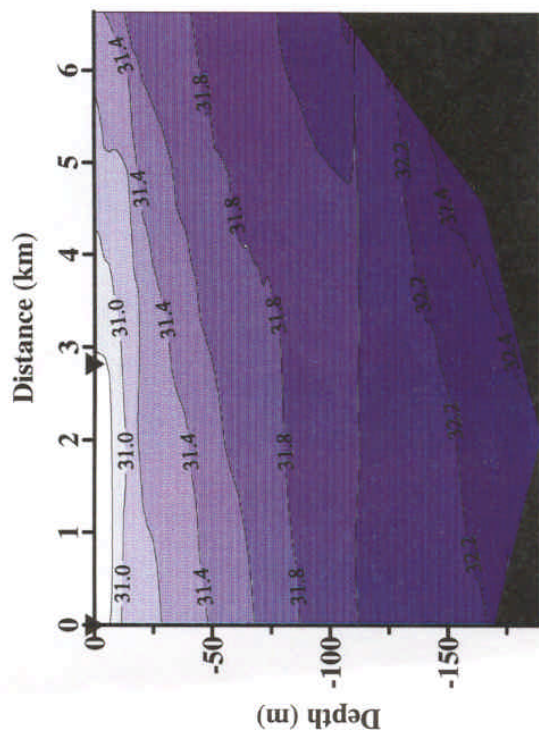


# Montague Strait; May 13, 2001 HX243

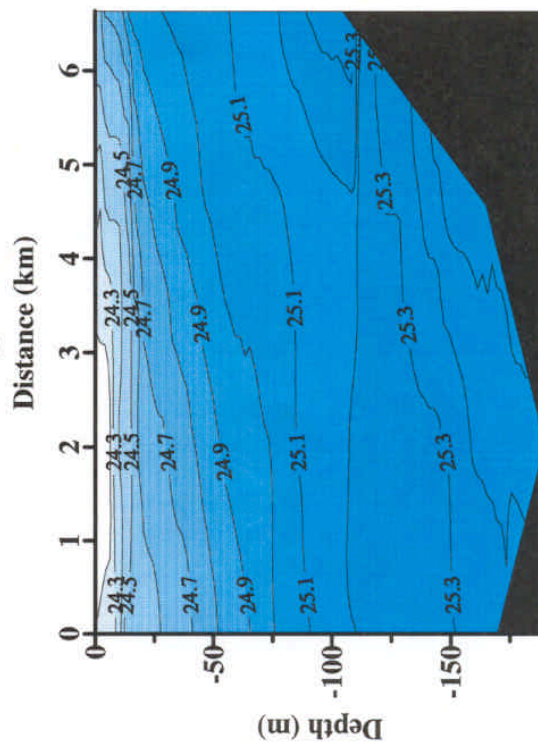
Temperature ( $^{\circ}\text{C}$ )



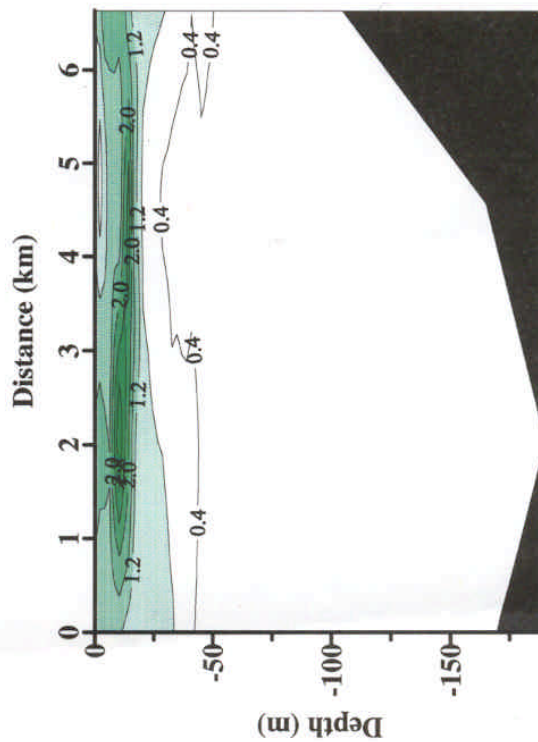
Salinity (PSU)



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Fluorescence



## Event Log:

Event Number	Description	Station	Date	GMT	latitude	longitude	depth	Comments	Investigator
HX24312401.001	CTD1	RES2.5	5/4/2001	18:15:00	60 1.53	149 21.48	299		Weingartner/ Childers
HX24312401.002	CTD End	RES2.5	5/4/2001	18:24:00	60 1.48	149 21.26	299		Weingartner
HX24312401.003	HTI Test Begin		5/4/2001	18:35:00	60. 1.48	149 21.26			Coyle
HX24312401.004	HTI TEST END		5/4/2001	19:04:00	59 58.9	149 21.27			
HX24312401.005	CTD2	GAK1	5/4/2001	19:58:00	59 50.69	149 28.00	273		Weingartner/ Childers
HX24312401.006	CTD End	GAK1	5/4/2001	20:06:00	59 50.76	149 27.99	273		
HX24312401.007	CTD3	GAK1	5/4/2001	20:36:00	59 50.76	149 27.98	273	PROD CAST	Childers
HX24312401.008	Calvet Net Tow	GAK1	5/4/2001	20:39:00	59 50.98	149 28.10	273	CALVET - 100m	Hopcroft
HX24312401.009	End Calvet	GAK1	5/4/2001	20:44:00	59 50.98	149 28.10	272		
HX24312401.010	CTD4	GAK1	5/4/2001	21:10:00	59 50.67	149 27.95	272	Zoop. Inc. Cast 1 (15m)	Hopcroft
HX24312401.011	CTD5	GAK1	5/4/2001	21:23:00	59 50.75	149 27.91	272	Zoop. Inc. Cast 2	Hopcroft
HX24312401.012	CTD6	GAK1	5/4/2001	21:38:00	59 50.76	149 27.78	272	Zoop. Inc. Cast 3	Hopcroft
HX24312401.013	CTD7	GAK1	5/4/2001	21:53:00	59 50.63	149 28.03	272	Zoop. Inc. Cast 4	Hopcroft
HX24312401.014	CTD8	GAK1	5/4/2001	22:05:00	59 50.72	149 28.00	272	Zoop. Inc. Cast 5	Hopcroft
HX24312401.015	CTD9	GAK1	5/4/2001	22:19:00	59 50.79	149 28.04	272	Zoop. Inc. Cast 6	Hopcroft
HX24312401.016	CTD10	GAK1	5/4/2001	22:31:00	59 50.77	149 28.03	272	Zoop. Inc. Cast 7	Hopcroft
HX24312401.017	Ring net	GAK1	5/4/2001	22:38:00	59 50.81	149 28.12	272		Hopcroft
HX24312401.018	Ring net	GAK1	5/4/2001	22:48:00	59 50.86	149 28.32	272		Hopcroft
HX24312401.019	Ring net	GAK1	5/4/2001	23:00:00	59 50.70	149 28.01	272		Hopcroft
HX24312401.020	CTD11	GAK1I	5/4/2001	23:49:00	59 45.87	149 23.75	258		Weingartner/ Childers
HX24312401.021	CTD End	GAK 1I	5/4/2001	23:55:00	59 45.88	149 23.79	258		
HX24312501.001	CTD12	GAK2	5/5/2001	0:38:00	59 41.45	149 19.52	225		Weingartner/ Childers
HX24312501.002	CTD End	GAK2	5/5/2001	0:43:00	59 41.39	149 19.6	225		
HX24312501.003	Calvet	GAK2	5/5/2001	0:56:00	59 41.19	149 19.61	225	CALVET - 100m	Hopcroft
HX24312501.004	End Calvet	GAK2	5/5/2001	1:02:00	59 41.18	149 19.60	225		
HX24312501.005	CTD13	GAK2I	5/5/2001	1:37:00	59 37.61	149 15.46	212		Weingartner/ Childers
HX24312501.006	CTD End	GAK2I	5/5/2001	1:43:00	59 37.63	149 15.45	212		

HX24312501.007	CTD14	GAK3	5/5/2001	2:25:00	59 33.15	149 11.25	213		Weingartner/ Childers
HX24312501.008	CTD End	GAK3	5/5/2001	2:32:00	59 33.13	149 11.12	213		
HX24312501.009	CALVET	GAK3	5/5/2001	2:44:00	59 33.05	149 10.99	213		Hopcroft
HX24312501.010	End CalVET	GAK3	5/5/2001	2:52:00	59 32.97	149 10.87	213		
HX24312501.011	CTD15	GAK3I	5/5/2001	3:22:00	59 28.83	149 6.49	201		Weingartner/ Childers
HX24312501.012	CTD End	GAK3I	5/5/2001	3:34:00	59 28.83	149 6.49	201		
HX24312501.013	CTD16	GAK4	5/5/2001	4:05:00	59 24.45	149 2.84	200		Weingartner/ Childers
HX24312501.014	CTD End	GAK4	5/5/2001	4:17:00	59 24.44	149 2.44	200		
HX24312501.015	CALVET	GAK4	5/5/2001	4:21:00	59 24.40	149 2.42	200		Hopcroft
HX24312501.016	End CalVET	GAK4	5/5/2001	4:30:00	59 24.29	149 2.12	200		
HX24312501.017	CTD17	GAK4I	5/5/2001	4:58:00	59 20.06	148 58.66	196		Weingartner/ Childers
HX24312501.018	CTD End	GAK4I	5/5/2001	5:11:00	59 20.10	148 58.37	196		
HX24312501.019	CTD18	GAK5	5/5/2001	5:42:00	59 15.66	148 54.47	170		Weingartner/ Childers
HX24312501.020	CTD End	GAK5	5/5/2001	6:01:00	59 15.64	148 54.33	170		
HX24312501.021	CALVET	GAK5	5/5/2001	6:04:00	59 15.58	148 54.32	168		Hopcroft
HX24312501.022	End Calvet	GAK5	5/5/2001	6:12:00	59 15.56	148 54.12	168		
HX24312501.023	Deploy HTI	GAK5	5/5/2001	6:32:00	59 15.67	148 54.45	168		Coyle
HX24312501.024	Deploy MOCNESS	GAK6	5/5/2001	8:16:00	59 7.10	148 46.52	150		Coyle
HX24312501.025	Recover MOCNESS	GAK6	5/5/2001	8:47:00	59 7.43	148 48.50	145		Coyle
HX24312501.026	Deploy MOCNESS	GAK7	5/5/2001	10:55:00	58 57.6	148 36.9	250		Coyle
HX24312501.027	Recover MOCNESS	GAK7	5/5/2001	11:29:00	58 57.0	148 36.2	253		Coyle
HX24312501.028	Recover HTI	GAK8	5/5/2001	13:53:00	58 47.7	148 29.5	290		Coyle
HX24312501.029	CTD19	GAK13	5/5/2001	18:39:00	58 5.95	147 47.55	2090	Prod. Cast	Childers
HX24312501.030	CALVET	GAK13	5/5/2001	18:58:00	58 5.87	147 47.70	2090		Hopcroft
HX24312501.031	CALVET END	GAK13	5/5/2001	19:06:00	58 5.90	147 47.75	2090		
HX24312501.032	CTD20	GAK13	5/5/2001	19:18:00	58 5.97	147 47.94	2100	Zoop. Inc. Cast 1 (20m)	Hopcroft
HX24312501.033	Ring net	GAK13	5/5/2001	19:30:00	58 5.89	147 47.67	2090	100 m (failed)	Hopcroft
HX24312501.034	CTD21	GAK13	5/5/2001	19:40:00	58 5.94	147 47.84	2100	Zoop. Inc. Cast 2	Hopcroft
HX24312501.035	Ring net	GAK13	5/5/2001	19:43:00	58 5.94	147 47.84	2100	100 m	Hopcroft
HX24312501.036	CTD22	GAK13	5/5/2001	19:58:00	58 5.94	147 48.28	2090	Zoop. Inc. Cast 3	Hopcroft
HX24312501.037	CTD23	GAK13	5/5/2001	20:13:00	58 5.95	147 47.77	2090	Zoop. Inc. Cast 4	Hopcroft
HX24312501.038	CTD24	GAK13	5/5/2001	20:26:00	58 5.98	147 48.20	2072	Zoop. Inc. Cast 5	Hopcroft
HX24312501.039	CTD25	GAK13	5/5/2001	20:39:00	58 5.88	147 48.10	2081	Zoop. Inc. Cast 6	Hopcroft
HX24312501.040	Ring net	GAK13	5/5/2001	20:48:00	58 5.85	147 48.10	2090	100 m	Hopcroft
HX24312501.041	Ring net	GAK13	5/5/2001	20:55:00	58 5.85	147 48.10	2090	100 m	Hopcroft
HX24312501.042	CTD26	GAK13	5/5/2001	21:10:00	58 5.98	147 47.67	2090	Aborted	Weingartner/ Childers



HX24312501.043	CTD27	GAK13	5/5/2001	21:12:00	58 5.98	147 47.73	2090		Weingartner/ Childers
HX24312501.044	CTD End	GAK13	5/5/2001	21:49:00	58 6.19	147 48.55	2090	.	.
HX24312501.045	CTD28	GAK13	5/5/2001	22:52:00	58 6.01	147 47.70	2090	upper 400m repeat	Weingartner
HX24312501.046	CTD End	GAK13	5/5/2001	23:20:00	58 6.17	147 48.04	2090		
HX24312601.001	CTD29	GAK12	5/6/2001	0:10:00	58 14.68	147 56.19	2190		Weingartner/ Childers
HX24312601.002	CTD End	GAK12	5/6/2001	1:30:00	58 15.45	147 57.60	2190		
HX24312601.003	CALVET	GAK12	5/6/2001	1:35:00	58 15.5	147 57.67	2190		Hopcroft
HX24312601.004	Deploy MOCNESS	GAK13	5/6/2001	3:04:00	58 5.65	147 47.5	2096	to 500 m	Hopcroft
HX24312601.005	Recover MOCNESS	GAK13	5/6/2001	4:37:00	58 4.66	147 48.9	2096		
HX24312601.006	Deploy HTI	GAK13	5/6/2001	6:23:00	58 5.88	147 48	2090		Coyle
HX24312601.007	Deploy MOCNESS	GAK13	5/6/2001	6:25:00	58 5.81	147 47.83	2092		Coyle
HX24312601.008	Recover MOCNESS	GAK13	5/6/2001	7:15:00	58 5.05	147 45.78	2094		Coyle
HX24312601.009	Deploy MOCNESS	GAK12	5/6/2001	10:14:00	58 14.53	147 56.09	2199		Coyle
HX24312601.010	Recover MOCNESS	GAK12	5/6/2001	10:39:00	58 13.94	147 55.51	2196		Coyle
HX24312601.011	Deploy MOCNESS	GAK11	5/6/2001	12:34:00	58 23.24	148 4.31	1415		
HX24312601.012	Recover MOCNESS	GAK11	5/6/2001	13:08:00	58 22.76	148 3.44	1410		
HX24312601.013	Recover HTI	GAK10	5/6/2001	14:53:00	58 32.50	148 12.71	1412		
HX24312601.014	RingNet	GAK9	5/6/2001	15:05:00	58 40.7	148 21.22	274	TO 100M	Hopcroft
HX24312601.015	CTD30	GAK9	5/6/2001	15:16:00	58 40.8	148 20.98	277	Prod Cast - 60 m	Childers
HX24312601.016	CTD31 start	GAK9	5/6/2001	15:39:00	58 40.72	148 21.01	277		Weingartner/ Childers
HX24312601.017	CTD31 end	GAK9	5/6/2001	16:00:00	58 40.45	148 21.33	277		
HX24312601.018	CALVET	GAK9	5/6/2001	16:05:00	58 40.46	148 21.34	273		Hopcroft
HX24312601.019	CTD32	GAK9	5/6/2001	16:23:00	58 40.7	148 21.16	279	zoop. Inc.cast 1 (17m)	Hopcroft
HX24312601.020	CTD33	GAK9	5/6/2001	16:34:00	58 40.7	148 21.15	279	zoop. Inc.cast 2	Hopcroft
HX24312601.021	CTD34	GAK9	5/6/2001	16:42:00	58 40.75	148 21.12	279	zoop. Inc.cast 3	Hopcroft
HX24312601.022	CTD35	GAK9	5/6/2001	17:00:00	58 40.77	148 21.09	279	zoop. Inc.cast 4	Hopcroft
HX24312601.023	RingNet	GAK9	5/6/2001	17:04:00	58 40.72	148 21.39	279	to 100m	Hopcroft
HX24312601.024	CTD36	GAK7I	5/6/2001	18:48:00	58 52.57	148 33.92	298		Weingartner/ Childers
HX24312601.025	CTD End	GAK7I	5/6/2001	19:15:00	58 52.50	148 33.8	297		
HX24312601.026	CTD37	GAK8	5/6/2001	19:30:00	58 47.53	148 29.44	292		Weingartner/ Childers
HX24312601.027	CTD End	GAK8	5/6/2001	19:50:00	58 47.6	148 29.4	290		
HX24312601.028	CalVET Net Tow Start	GAK8	5/6/2001	20:14:00	58.7893	148.5063	290		Pinchuk
HX24312601.029	CalVET Net Tow End	GAK8	5/6/2001	20:19:00	58.7891	148.5101	290		Pinchuk
HX24312601.030	CTD38	GAK8I	5/6/2001	20:52:00	58 44.66	148 25.3	294		Weingartner/ Childers
HX24312601.031	CTD End	GAK8I	5/6/2001	21:11:00	58 44.75	148 26.11	294		

HX24312601.032	CTD39	GAK9I	5/6/2001	22:24:00	58 36.72	148 16.94	650		Weingartner/ Childers
HX24312601.033	CTD End	GAK9I	5/6/2001	23:00:00	58 36.2	148 16.8	625		
HX24312601.034	CTD40	GAK10	5/6/2001	23:40:00	58 32.57	148 12.77	1465		Weingartner/ Childers
HX24312701.001	CTD End	GAK10	5/7/2001	0:50:00	58 32.26	148 14.42	1400		
HX24312701.002	CALVET	GAK10	5/7/2001	0:54:00	58 32.25	148 14.50	1373	to 100 m	Hopcroft
HX24312701.003	CalVET Net Tow Start	GAK11	5/7/2001	2:25:00	58.3886	148.0777	1410		Hopcroft
HX24312701.004	CalVET Net Tow End	GAK11	5/7/2001	2:32:00	58.3894	148.0826	1410		Hopcroft
HX24312701.005	CTD41	GAK11	5/7/2001	2:41:00	58 23.33	148 4.41	1429		Weingartner/ Childers
HX24312701.006	CTD42	GAK4	5/7/2001	16:35:00	59 24.53	149 2.92	204	PROD CAST	Childers
HX24312701.007	RINGNET	GAK4	5/7/2001	16:51:00	59 24.46	149 3.07	200	to 100 m	Hopcroft
HX24312701.008	CTD43	GAK4	5/7/2001	17:09:00	59 24.46	149 2.98	200	zoop inc cast 1 (14m)	Hopcroft
HX24312701.009	CTD44	GAK4	5/7/2001	17:21:00	59 24.37	149 3.11	202	zoop inc cast 2	Hopcroft
HX24312701.010	CTD45	GAK4	5/7/2001	17:45:00	59 24.53	149 2.97	200	zoop inc cast 3	Hopcroft
HX24312701.011	CTD46	GAK4	5/7/2001	17:53:00	59 24.46	149 3.18	202	zoop inc cast 4	Hopcroft
HX24312701.012	CTD47	GAK4	5/7/2001	18:10:00	59 24.52	149 2.99	202	zoop inc cast 5	Hopcroft
HX24312701.013	CTD48	GAK4	5/7/2001	18:18:00	59 24.93	149 3.06	199	zoop inc cast 6	Hopcroft
HX24312701.014	RING NET	GAK4	5/7/2001	18:30:00	59 24.27	149 3.31	201	to 100 m	Hopcroft
HX24312701.015	RING NET	GAK4	5/7/2001	18:41:00	59 24.23	149 3.32	203	to 100 m	Hopcroft
HX24312801.001	CTD49 Start	GAK1	5/8/2001	4:49:00	59.8452	149.4641	274		Weingartner
HX24312801.002	CTD49 End	GAK1	5/8/2001	4:56:00	59.8459	149.4647	274		Weingartner
HX24312801.003	MOCNESS Start	GAK3	5/8/2001	6:58:00	59.5555	149.1907	214		Coyle
HX24312801.004	MOCNESS End	GAK3	5/8/2001	7:34:00	59.5378	149.1789	220		Coyle
HX24312801.005	HTI Transect Start	GAK3	5/8/2001	8:04:00	59.5505	149.189	214		Coyle
HX24312801.006	HTI Transect End	GAK4	5/8/2001	9:41:00	59.4076	149.0472	214		Coyle
HX24312801.007	MOCNESS Start	GAK4	5/8/2001	9:43:00	59.4068	149.0449	201		Coyle
HX24312801.008	MOCNESS End	GAK4	5/8/2001	10:15:00	59.3996	149.0228	200		Coyle
HX24312801.009	HTI Transect Start	GAK4	5/8/2001	10:35:00	59.4078	149.0478	200		Coyle
HX24312801.010	HTI Transect End	GAK5	5/8/2001	12:12:00	59.2615	148.9075	170		Coyle
HX24312801.011	MOCNESS Start	GAK5	5/8/2001	12:16:00	59.2595	148.8983	169		Coyle
HX24312801.012	MOCNESS End	GAK5	5/8/2001	12:52:00	59.2509	148.8616	169		Coyle
HX24312801.013	CTD50 Start	CF15	5/8/2001	14:40:00	59.45	148.8683	185		Weingartner/ Childers
HX24312801.014	CTD50 End	CF15	5/8/2001	14:57:00	59.4523	148.865	185		Weingartner/ Childers
HX24312801.015	CTD51 Start	CF13	5/8/2001	15:23:00	59.5154	148.8681	175		Weingartner/ Childers
HX24312801.016	CTD51 End	CF13	5/8/2001	15:39:00	59.5176	148.8641	170		Weingartner/ Childers

HX24312801.017	CTD52 Start	CF12	5/8/2001	15:54:00	59.5495	148.8676	184		Weingartner/ Childers
HX24312801.018	CTD52 End	CF12	5/8/2001	16:09:00	59.5515	148.862	184		Weingartner/ Childers
HX24312801.019	CTD53 Start	CF11	5/8/2001	16:24:00	59.5819	148.8683	177		Weingartner/ Childers
HX24312801.020	CTD53 End	CF11	5/8/2001	16:39:00	59.5819	148.8692	177		Weingartner/ Childers
HX24312801.021	CTD54 Start	CF10	5/8/2001	16:57:00	59.6163	148.8687	175		Weingartner/ Childers
HX24312801.022	CTD54 End	CF10	5/8/2001	17:06:00	59.6165	148.8678	175		Weingartner/ Childers
HX24312801.023	CTD55 Start	CF9	5/8/2001	17:23:00	59.6498	148.8695	178		Weingartner/ Childers
HX24312801.024	CTD55 End	CF9	5/8/2001	17:37:00	59.6505	148.8723	178		Weingartner/ Childers
HX24312801.025	CTD56 Start	CF8	5/8/2001	17:53:00	59.6835	148.8662	178		Weingartner/ Childers
HX24312801.026	CTD56 End	CF8	5/8/2001	18:03:00	59.6843	148.8734	178		Weingartner/ Childers
HX24312801.027	CTD57 Start	CF7	5/8/2001	18:19:00	59.7166	148.8655	180		Weingartner/ Childers
HX24312801.028	CTD57 End	CF7	5/8/2001	18:33:00	59.7186	148.8718	180		Weingartner/ Childers
HX24312801.029	CTD58 Start	CF6	5/8/2001	18:48:00	59.751	148.8653	188		Weingartner/ Childers
HX24312801.030	CTD58 Start	CF6	5/8/2001	18:58:00	59.7519	148.8709	189		Weingartner/ Childers
HX24312801.031	CTD59 Start	CF5	5/8/2001	19:13:00	59.7842	148.8653	191		Weingartner/ Childers
HX24312801.032	CTD59 End	CF5	5/8/2001	19:28:00	59.7847	148.8729	191		Weingartner/ Childers
HX24312801.033	CTD60 Start	CF4	5/8/2001	19:43:00	59.8171	148.8663	186		Weingartner/ Childers
HX24312801.034	CTD60 End	CF4	5/8/2001	19:52:00	59.818	148.87	186		Weingartner/ Childers
HX24312801.035	CTD61 Start	CF3	5/8/2001	20:07:00	59.8502	148.8661	163		Weingartner/ Childers
HX24312801.036	CTD61 End	CF3	5/8/2001	20:19:00	59.8515	148.8708	163		Weingartner/ Childers
HX24312801.037	CTD62 Start	CF2	5/8/2001	20:35:00	59.8842	148.8658	116		Weingartner/ Childers
HX24312801.038	CTD62 End	CF2	5/8/2001	20:43:00	59.8854	148.8683	116		Weingartner/ Childers
HX24312801.039	CTD63 Start	CF1	5/8/2001	20:54:00	59.9085	148.8654	86		Weingartner/ Childers
HX24312801.040	CTD63 End	CF1	5/8/2001	21:01:00	59.9094	148.8668	86		Weingartner/ Childers

								Tow aborted, flowmeter failure	
HX24312901.001	MOCNESS Start	GAK10	5/9/2001	6:43:00	58.5427	148.213	1450		Coyle
HX24312901.002	MOCNESS Start	GAK10	5/9/2001	7:20:00	58.5407	148.2142	1450		Coyle
HX24312901.003	MOCNESS End	GAK10	5/9/2001	7:57:00	58.5174	148.22	1450		Coyle
HX24312901.004	HTI Transect Start	GAK10	5/9/2001	8:17:00	58.5427	148.2129	1450		Coyle
HX24312901.005	HTI Transect End	GAK9	5/9/2001	9:48:00	58.6806	148.3515	279		Coyle
HX24312901.006	MOCNESS Start	GAK9	5/9/2001	9:51:00	58.6784	148.3535	279		Coyle
HX24312901.007	MOCNESS End	GAK9	5/9/2001	10:29:00	58.6549	148.3635	279		Coyle
HX24312901.008	HTI Transect Start	GAK9	5/9/2001	10:50:00	58.6819	148.3533	279		Coyle
HX24312901.009	HTI Transect End	GAK8	5/9/2001	12:04:00	58.7927	148.4916	292		Coyle
HX24312901.010	MOCNESS Start	GAK8	5/9/2001	12:08:00	58.789	148.5303	292		Coyle
HX24312901.011	MOCNESS End	GAK8	5/9/2001	12:42:00	58.7918	148.5599	292		Coyle
HX24312901.012	CTD64 Start	GAK7	5/9/2001	14:40:00	58.9704	148.6301	244		Weingartner/ Childers
HX24312901.013	CTD64 End	GAK7	5/9/2001	14:56:00	58.9699	148.6259	244		Weingartner/ Childers
HX24312901.014	CalVET Net Tow Start	GAK7	5/9/2001	15:00:00	58.9696	148.6243	244		Hopcroft
HX24312901.015	CalVET Net Tow End	GAK7	5/9/2001	15:07:00	58.9696	148.6244	244		Hopcroft
HX24312901.016	ctd65 Start	GAK6I	5/9/2001	17:14:00	59.0452	148.6982	192		Weingartner/ Childers
HX24312901.017	ctd65 End	GAK6I	5/9/2001	17:26:00	59.044	148.7004	192		Weingartner/ Childers
HX24312901.018	ctd66 Start	GAK6	5/9/2001	17:58:00	59.1173	148.769	150		Weingartner/ Childers
HX24312901.019	ctd66 End	GAK6	5/9/2001	18:10:00	59.1181	148.7734	150		Weingartner/ Childers
HX24312901.020	CalVET Net Tow Start	GAK6	5/9/2001	18:14:00	59.1175	148.7746	150		Hopcroft
HX24312901.021	CTD67 Start	GAK5I	5/9/2001	18:51:00	59.1902	148.8373	163		Weingartner/ Childers
HX24312901.022	CTD67 End	GAK5I	5/9/2001	19:03:00	59.1918	148.8442	163		Weingartner/ Childers
HX24312901.023	CTD68 Start	GAK5	5/9/2001	19:33:00	59.2628	148.907	168		Weingartner/ Childers
HX24312901.024	CTD68 End	GAK5	5/9/2001	19:45:00	59.2655	148.9129	168		Weingartner/ Childers
HX24313001.001	CTD69 Start	CCSE7	5/10/2001	1:52:00	59.0596	146.9662	2010		Weingartner/ Childers
HX24313001.002	CTD69 End	CCSE7	5/10/2001	3:03:00	59.0635	146.9668	2010		Weingartner/ Childers
HX24313001.003	CalVET Net Tow Start	CCSE7	5/10/2001	3:04:00	59.0635	146.9668	2010		Hopcroft
HX24313001.004	CTD70 Start	CCSE8	5/10/2001	4:31:00	58.8834	146.7294	2775		Weingartner/ Childers
HX24313001.005	CTD70 End	CCSE8	5/10/2001	5:40:00	58.8962	146.7335	2775		Weingartner/ Childers
HX24313001.006	CalVET Net Tow Start	CCSE8	5/10/2001	5:48:00	58.8964	146.7343	2775		Hopcroft
HX24313001.007	CalVET Net Tow End	CCSE8	5/10/2001	5:56:00	58.8974	146.7355	2775		Hopcroft
HX24313001.008	MOCNESS Start	CCSE8	5/10/2001	6:30:00	58.8881	146.729	2790		Coyle



HX24313001.009	MOCNESS End	CCSE8	5/10/2001	7:01:00	58.8782	146.7449	2790		Coyle
HX24313001.010	HTI Transect Start	CCSE8	5/10/2001	7:07:00	58.8794	146.7518	2790		Coyle
HX24313001.011	HTI Transect End	CCSE7	5/10/2001	8:58:00	59.0591	146.9689	2012		Coyle
HX24313001.012	MOCNESS Start	CCSE7	5/10/2001	9:06:00	59.0564	146.9778	2012		Coyle
HX24313001.013	MOCNESS End	CCSE7	5/10/2001	9:43:00	59.0484	147.0128	2012		Coyle
HX24313001.014	HTI Transect Start	CCSE7	5/10/2001	9:50:00	59.0485	147.018	2012		Coyle
HX24313001.015	HTI Transect End	CCSE6	5/10/2001	11:44:00	59.2342	147.1597	201		Coyle
HX24313001.016	MOCNESS Start	CCSE6	5/10/2001	11:45:00	59.2354	147.1614	201		Coyle
HX24313001.017	MOCNESS End	CCSE6	5/10/2001	12:18:00	59.2475	147.1773	197		Coyle
HX24313001.018	HTI Transect Start	CCSE6	5/10/2001	12:23:00	59.2504	147.1814	197		Coyle
HX24313001.019	HTI Transect End	CCSE5	5/10/2001	13:59:00	59.3755	147.3506	130		Coyle
HX24313001.020	CTD71 Start	CCSE6	5/10/2001	15:06:00	59.2326	147.1564	201		Weingartner/ Childers
HX24313001.021	CTD71 End	CCSE6	5/10/2001	15:22:00	59.2328	147.1546	201		Weingartner/ Childers
HX24313001.022	CalVET Net Tow Start	CCSE6	5/10/2001	15:24:00	59.2328	147.1545	201		Hopcroft
HX24313001.023	CalVET Net Tow End	CCSE6	5/10/2001	15:31:00	59.2329	147.1545	201		Hopcroft
HX24313001.024	CTD72 Start	CCSE5	5/10/2001	16:36:00	59.3753	147.3536	126		Weingartner/ Childers
HX24313001.025	CTD72 End	CCSE5	5/10/2001	16:46:00	59.3751	147.3583	126		Weingartner/ Childers
HX24313001.026	Ring Net	CCSE5	5/10/2001	16:47:00	59.3751	147.3585	126	Hand held Ring net at the same time as the CTD	Hopcroft
HX24313001.027	CalVET Net Tow Start	CCSE5	5/10/2001	16:55:00	59.3741	147.3611	126		Hopcroft
HX24313001.028	CalVET Net Tow End	CCSE5	5/10/2001	16:59:00	59.3736	147.362	126		Hopcroft
HX24313001.029	CalVET Net Tow start	CCSE5	5/10/2001	17:11:00	59.3724	147.3635	126		Hopcroft
HX24313001.030	CalVET Net Tow End	CCSE5	5/10/2001	17:17:00	59.3719	147.3638	126		Hopcroft
HX24313001.031	ctd73 Start	CCSE4	5/10/2001	18:01:00	59.4747	147.4781	116		Weingartner/ Childers
HX24313001.032	ctd73 End	CCSE4	5/10/2001	18:12:00	59.475	147.4861	116		Weingartner/ Childers
HX24313001.033	CalVET Net Tow Start	CCSE4	5/10/2001	18:13:00	59.4751	147.487	116		Hopcroft
HX24313001.034	CalVET Net Tow End	CCSE4	5/10/2001	18:22:00	59.4757	147.4927	116		Hopcroft
HX24313001.035	CTD74 Start	CCSE3	5/10/2001	19:01:00	59.5713	147.6116	111		Weingartner/ Childers
HX24313001.036	CTD74 End	CCSE3	5/10/2001	19:12:00	59.5729	147.6193	111		Weingartner/ Childers
HX24313001.037	CTD75 Start	CCSE2	5/10/2001	20:00:00	59 40.15	147 43.73	116		Weingartner/ Childers
HX24313001.038	CTD75 End	CCSE2	5/10/2001	20:10:00	59 40.15	147.43.73	116		Weingartner/ Childers
HX24313001.039	CalVET Net Tow Start	CCSE2	5/10/2001	20:11:00	59 40.15	147 43.73	116		Hopcroft
HX24313001.040	CalVET Net Tow End	CCSE2	5/10/2001	20:19:00	59 40.2	147 44.12	116		Hopcroft
HX24313001.041	CTD76 Start	CCSE2	5/10/2001	20:21:00	59 40.2	147 44.13	114		Childers
HX24313001.042	CTD76 End	CCSE2	5/10/2001	20:25:00	59 40.2	147 44.25	114		Childers

HX24313001.043	CTD77 Start	CCSE1	5/10/2001	20:59:00	59.7417	147.8179	64		Weingartner/ Childers
HX24313001.044	CTD77 End	CCSE1	5/10/2001	21:05:00	59.7411	147.8185	64		Weingartner/ Childers
HX24313001.045	CalVET Net Tow Start	CCSE1	5/10/2001	21:07:00	59.7411	147.8185	64		Hopcroft
HX24313001.046	CalVET Net Tow End	CCSE1	5/10/2001	21:11:00	59.7413	147.8189	64		Hopcroft
HX24313001.047	CTD78 Start	AHC3	5/10/2001	23:31:00	59.9	147.1368	230		Weingartner/ Childers
HX24313001.048	CTD78 End	AHC3	5/10/2001	23:43:00	59.8977	147.1378	230		Weingartner/ Childers
HX24313101.001	CTD79 Start	AHC4	5/11/2001	0:24:00	59.8004	147.0733	206		Weingartner/ Childers
HX24313101.002	CTD79 End	AHC4	5/11/2001	0:38:00	59.7974	147.0737	206		Weingartner/ Childers
HX24313101.003	HTI Transect Start	GAK3	5/11/2001	7:15:00	59.5542	149.1891	213		Coyle
HX24313101.004	HTI Transect End	GAK2	5/11/2001	8:49:00	59.6931	149.3296	229		Coyle
HX24313101.005	MOCNESS Start	GAK2	5/11/2001	8:54:00	59.6943	149.3389	229		Coyle
HX24313101.006	MOCNESS End	GAK2	5/11/2001	9:37:00	59.6982	149.3953	229		Coyle
HX24313101.007	HTI Transect Start	GAK2	5/11/2001	10:08:00	59.6931	149.3292	229		Coyle
HX24313101.008	HTI Transect End	GAK1	5/11/2001	11:44:00	59.8456	149.4677	274		Coyle
HX24313101.009	MOCNESS Start	GAK1	5/11/2001	11:47:00	59.8488	149.4683	274		Coyle
HX24313101.010	MOCNESS End	GAK1	5/11/2001	12:34:00	59.8725	149.4698	274		Coyle
HX24313101.011	CTD80 Start	AHC9	5/11/2001	20:29:00	59.3012	147.0734	195		Weingartner/ Childers
HX24313101.012	CTD80 End	AHC9	5/11/2001	20:42:00	59.3012	147.0697	195		Weingartner/ Childers
HX24313101.013	CTD81 Start	AHC8	5/11/2001	21:21:00	59.4007	147.0732	203		Weingartner/ Childers
HX24313101.014	CTD81 End	AHC8	5/11/2001	21:33:00	59.4018	147.0728	203		Weingartner/ Childers
HX24313101.015	CTD82 Start	AHC7	5/11/2001	22:11:00	59.5005	147.0728	223		Weingartner/ Childers
HX24313101.016	CTD82 End	AHC7	5/11/2001	22:25:00	59.5019	147.0704	223		Weingartner/ Childers
HX24313101.017	CTD83 Start	AHC6	5/11/2001	23:03:00	59.6007	147.0731	208		Weingartner/ Childers
HX24313101.018	CTD83 End	AHC6	5/11/2001	23:15:00	59.6026	147.0726	208		Weingartner/ Childers
HX24313101.019	CTD84 Start	AHC5	5/11/2001	23:51:00	59.7009	147.0745	210		Weingartner/ Childers
HX24313201.001	CTD84 End	AHC5	5/12/2001	0:03:00	59.7033	147.0779	210		Weingartner/ Childers
HX24313201.002	CTD85 Start	AHC3	5/12/2001	1:13:00	59.8999	147.1348	230		Weingartner/ Childers
HX24313201.003	CTD85 End	AHC3	5/12/2001	1:26:00	59.8992	147.1306	230		Weingartner/ Childers
HX24313201.004	Ring Net start	AHC3	5/12/2001	1:26:00	59.8992	147.1306	230		Hopcroft
HX24313201.005	CTD86 Start	AHC2	5/12/2001	2:19:00	59.9999	147.1333	203		Hopcroft

HX24313201.006	CTD86 End	AHC2	5/12/2001	2:33:00	59.9967	147.1321	203		Weingartner/ Childers
HX24313201.007	CTD87 Start	HE12	5/12/2001	3:31:00	60.1426	147.1909	178		Weingartner/ Childers
HX24313201.008	CTD87 End	HE12	5/12/2001	3:42:00	60.142	147.1922	178		Weingartner/ Childers
HX24313201.009	CTD88 Start	HE11	5/12/2001	3:57:00	60.1292	147.1346	222		Weingartner/ Childers
HX24313201.010	CTD88 End	HE11	5/12/2001	4:09:00	60.1283	147.142	222		Weingartner/ Childers
HX24313201.011	CTD89 Start	HE10	5/12/2001	4:30:00	60.1095	147.049	278		Weingartner/ Childers
HX24313201.012	CTD89 End	HE10	5/12/2001	4:45:00	60.1076	147.0486	278		Weingartner/ Childers
HX24313201.013	calvet net start	HE10	5/12/2001	4:52:00	60.1069	147.0395	278		Hopcroft
HX24313201.014	calvet net end	HE10	5/12/2001	4:56:00	60.1066	147.0398	278		Hopcroft
HX24313201.015	CTD90 Start	HE9	5/12/2001	5:15:00	60.0929	146.959	148		Weingartner/ Childers
HX24313201.016	CTD90 End	HE9	5/12/2001	5:28:00	60.0936	146.9606	148		Weingartner/ Childers
HX24313201.017	CTD91 Start	HE8	5/12/2001	5:46:00	60.0754	146.8745	105		Weingartner/ Childers
HX24313201.018	CTD91 End	HE8	5/12/2001	6:03:00	60.0757	146.8728	105		Weingartner/ Childers
HX24313201.019	CTD92 Start	HE6.5	5/12/2001	6:22:00	60.0517	146.7353	123		Weingartner/ Childers
HX24313201.020	CTD92 End	HE6.5	5/12/2001	6:34:00	60.0519	146.7329	123		Weingartner/ Childers
HX24313201.021	CalVET Net Tow Start	HE6.5	5/12/2001	6:35:00	60.0519	146.7328	123		Hopcroft
HX24313201.022	CalVET Net Tow End	HE6.5	5/12/2001	6:43:00	60.0515	146.7309	123		Hopcroft
HX24313201.023	MOCNESS Start	HE10	5/12/2001	7:49:00	60.1083	147.0447	277		Coyle
HX24313201.024	MOCNESS End	HE10	5/12/2001	8:30:00	60.1036	147.0067	277		Coyle
HX24313201.025	MOCNESS Start	HE6.5	5/12/2001	9:35:00	60.0512	146.7296	123		Coyle
HX24313201.026	MOCNESS End	HE6.5	5/12/2001	10:09:00	60.0453	146.696	119		Coyle
HX24313201.027	MOCNESS Start	HE4	5/12/2001	10:41:00	60.0792	146.6053	116		Coyle
HX24313201.028	MOCNESS End	HE4	5/12/2001	11:11:00	60.0761	146.582	116		Coyle
HX24313201.029	MOCNESS Start	HE2	5/12/2001	11:59:00	60.1811	146.6083	197		Coyle
HX24313201.030	MOCNESS End	HE2	5/12/2001	12:28:00	60.1948	146.6131	215		Coyle
HX24313201.031	CTD93 Start	HE5	5/12/2001	14:07:00	60.03	146.6097	97		Weingartner/ Childers
HX24313201.032	CTD93 End	HE5	5/12/2001	14:15:00	60.0291	146.6075	97		Weingartner/ Childers
HX24313201.033	CTD94 Start	HE4	5/12/2001	14:35:00	60.0792	146.6098	117		Weingartner/ Childers
HX24313201.034	CTD94 End	HE4	5/12/2001	14:46:00	60.0795	146.613	117		Weingartner/ Childers
HX24313201.035	CalVET Net Tow start	HE4	5/12/2001	14:51:00	60.0789	146.6139	117		Hopcroft
HX24313201.036	CalVET Net Tow End	HE4	5/12/2001	14:55:00	60.0787	146.6139	117		Hopcroft

HX24313201.037	CTD95 Start	HE3	5/12/2001	15:15:00	60.1306	146.6074	117		Weingartner/ Childers
HX24313201.038	CTD95 End	HE3	5/12/2001	15:25:00	60.1306	146.6069	117		Weingartner/ Childers
HX24313201.039	CTD96 start	HE2	5/12/2001	16:10:00	60 10.7	146 36.57	193		Weingartner/ Childers
HX24313201.040	CTD96 end	HE2	5/12/2001	16:22:00	60 10.55	146 36.47	184		Weingartner/ Childers
HX24313201.041	CalVET Net Tow start	HE2	5/12/2001	16:22:00	60 10.55	146 36.47	184		Hopcroft
HX24313201.042	CalVET Net Tow end	HE2	5/12/2001	16:30:00	60 10.51	146 36.47	175		Hopcroft
HX24313201.043	CalVET Net Tow start	HE2	5/12/2001	16:36:00	60 10.70	146 36.44	189	redo	Hopcroft
HX24313201.044	CalVET Net Tow end	HE2	5/12/2001	16:42:00	60 10.72	146 36.45	186		Hopcroft
HX24313201.045	CTD97 start	HE1	5/12/2001	16:58:00	60 12.94	146 36.56	85		Weingartner/ Childers
HX24313201.046	CTD97 end	HE1	5/12/2001	17:06:00	60 12.09	146 36.47	85		Weingartner/ Childers
HX24313201.048	CTD98 end	HE1	5/12/2001	17:06:00	60 12.09	146 36.37	85	at 20 m	Weingartner/ Childers
HX24313201.047	CTD98 start	HE1	5/12/2001	17:12:00	60 12.88	146 36.42	85	redo for more water	Weingartner/ Childers
HX24313201.049	CTD99 Start	HB4	5/12/2001	21:24:00	60.1482	147.5046	104		Weingartner/ Childers
HX24313201.050	CTD99 End	HB4	5/12/2001	21:31:00	60.1478	147.503	104		Weingartner/ Childers
HX24313201.051	CTD100 Start	HB3	5/12/2001	21:50:00	60.1666	147.5851	90		Weingartner/ Childers
HX24313201.052	CTD100 End	HB3	5/12/2001	21:56:00	60.1671	147.5848	90		Weingartner/ Childers
HX24313201.053	CTD101 Start	HB2	5/12/2001	22:11:00	60.1805	147.6409	177		Weingartner/ Childers
HX24313201.054	CTD101 End	HB2	5/12/2001	22:20:00	60.1816	147.6407	177		Weingartner/ Childers
HX24313201.055	CalVET Net Tow Start	HB2	5/12/2001	22:22:00	60.1819	147.64	177		Hopcroft
HX24313201.056	CalVET Net Tow End	HB2	5/12/2001	22:28:00	60.1827	147.64	177		Hopcroft
HX24313201.057	CTD102 Start	HB1	5/12/2001	22:43:00	60.1929	147.7006	247		Weingartner/ Childers
HX24313201.058	CTD102 End	HB1	5/12/2001	22:56:00	60.1937	147.7024	247		Weingartner/ Childers
HX24313301.001	CTD103 Start	KIP2	5/13/2001	0:29:00	60.2778	147.9861	303	prod cast	Childers
HX24313301.002	CTD103 End	KIP2	5/13/2001	0:33:00	60.2771	147.9861	303		Childers
HX24313301.003	CalVET Net Tow Start	KIP2	5/13/2001	0:38:00	60.2767	147.9847	303		Hopcroft
HX24313301.004	CalVET Net Tow End	KIP2	5/13/2001	0:43:00	60.2775	147.9844	600		Hopcroft
HX24313301.005	CTD104 Start	KIP2	5/13/2001	0:50:00	60.2774	147.9879	600		Weingartner
HX24313301.006	CTD104 End	KIP2	5/13/2001	1:08:00	60.2766	147.9887	600		Weingartner
HX24313301.007	CTD105 Start	PWS1	5/13/2001	1:52:00	60.3804	147.9366	371		Weingartner
HX24313301.008	CTD105 End	PWS1	5/13/2001	2:12:00	60.3767	147.9398	371		Weingartner
HX24313301.009	CalVET Net Tow Start	PWS1	5/13/2001	2:16:00	60.3767	147.94	371		Hopcroft
HX24313301.010	CalVET Net Tow End	PWS1	5/13/2001	2:23:00	60.3749	147.9405	371		Hopcroft

HX24313301.011	CTD106 Start	PWS2	5/13/2001	3:28:00	60.5349	147.8045	740		Weingartner/ Childers
HX24313301.012	CTD106 End	PWS2	5/13/2001	3:47:00	60.5326	147.8031	740		Weingartner/ Childers
HX24313301.013	CalVET Net Tow Start	PWS2	5/13/2001	3:54:00	60.5311	147.8021	740		Hopcroft
HX24313301.014	CalVET Net Tow End	PWS2	5/13/2001	3:56:00	60.5307	147.8018	740		Hopcroft
HX24313301.015	CTD107 Start	PWS2	5/13/2001	4:05:00	60.5287	147.8004	656	zoop inc. cast 1	Hopcroft
HX24313301.016	CTD107 End	PWS2	5/13/2001	4:08:00	60.5281	147.8	656		Hopcroft
HX24313301.017	CTD110 Start	PWS2	5/13/2001	4:24:00	60.5245	147.7979	656	zoop inc cast 2	Hopcroft
HX24313301.018	CTD110 End	PWS2	5/13/2001	4:31:00	60.5231	147.7972	656		Hopcroft
HX24313301.019	CTD111 Start	PWS2	5/13/2001	4:41:00	60.5208	147.7962	545	zoop inc cast 3	Hopcroft
HX24313301.020	CTD111 End	PWS2	5/13/2001	4:45:00	60.5201	147.796	545		Hopcroft
HX24313301.021	CTD112 Start	PWS2	5/13/2001	4:56:00	60.5175	147.7954	523	zoop inc cast 4	Hopcroft
HX24313301.022	CTD112 End	PWS2	5/13/2001	4:59:00	60.5169	147.7953	523		Hopcroft
HX24313301.023	CTD113 Start	PWS2	5/13/2001	5:13:00	60.5301	147.8038	742	zoop inc cast 5	Hopcroft
HX24313301.024	CTD113 End	PWS2	5/13/2001	5:16:00	60.5288	147.8044	742		Hopcroft
HX24313301.025	Ring Net Start	PWS2	5/13/2001	5:19:00	60.5277	147.8048	650		Hopcroft
HX24313301.026	CTD114 Start	PWS2	5/13/2001	5:29:00	60.5251	147.8047	631	zoop inc cast 6	Hopcroft
HX24313301.027	CTD114 End	PWS2	5/13/2001	5:33:00	60.5241	147.8046	631		Hopcroft
HX24313301.028	Ring Net Start	PWS2	5/13/2001	5:37:00	60.523	147.8043	596		Hopcroft
HX24313301.029	CTD115 Start	PWS2	5/13/2001	5:46:00	60.521	147.804	556	zoop inc cast 7	Hopcroft
HX24313301.030	CTD115 End	PWS2	5/13/2001	5:49:00	60.5203	147.804	556		Hopcroft
HX24313301.031	HTI Transect Start	PWS2	5/13/2001	5:56:00	60.5223	147.8029	740		Coyle
HX24313301.032	MOCNESS Start	PWS2	5/13/2001	6:01:00	60.5243	147.8026	740		Coyle
HX24313301.033	MOCNESS End	PWS2	5/13/2001	7:14:00	60.5492	147.7755	740		Coyle
HX24313301.034	MOCNESS Start	PWS1	5/13/2001	8:25:00	60.3756	147.9402	351		Coyle
HX24313301.035	MOCNESS End	PWS1	5/13/2001	8:59:00	60.3592	147.9542	351		Coyle
HX24313301.036	MOCNESS Start	KIP1	5/13/2001	9:33:00	60.2758	147.9879	598		Coyle
HX24313301.037	MOCNESS End	KIP1	5/13/2001	10:06:00	60.2593	147.998	583		Coyle
HX24313301.038	MOCNESS Start	HB2	5/13/2001	11:37:00	60.1819	147.6436	179		Coyle
HX24313301.039	MOCNESS End	HB2	5/13/2001	12:07:00	60.1931	147.6467	240		Coyle
HX24313301.040	CTD116 Start	MS1	5/13/2001	13:52:00	59.9535	147.9266	170		Weingartner/ Childers
HX24313301.041	CTD116 End	MS1	5/13/2001	14:07:00	59.9497	147.9276	170		Weingartner/ Childers
HX24313301.042	CTD117 Start	MS2	5/13/2001	14:16:00	59.9439	147.8952	195		Weingartner/ Childers
HX24313301.043	CTD117 End	MS2	5/13/2001	14:30:00	59.9409	147.9007	195		Weingartner/ Childers
HX24313301.044	CalVET Net Tow Start	MS2	5/13/2001	14:33:00	50.9409	147.9007	195		Hopcroft
HX24313301.045	CalVET Net Tow End	MS2	5/13/2001	14:39:00	59.94	147.901	195		Hopcroft

HX24313301.046	CTD118 Start	MS3	5/13/2001	14:53:00	59.9321	147.8571	195		Weingartner/ Childers
HX24313301.047	CTD118 End	MS3	5/13/2001	15:07:00	59.9297	147.8624	195		Weingartner/ Childers
HX24313301.048	CTD119 Start	MS4	5/13/2001	15:17:00	59.9205	147.8282	119		Weingartner/ Childers
HX24313301.049	CTD119 End	MS4	5/13/2001	15:27:00	59.9187	147.8302	119		Weingartner/ Childers
HX24313301.050	CTD120 Start	PWSW0	5/13/2001	17:01:00	59.9505	148.378	162		Weingartner
HX24313301.051	CTD120 End	PWSW0	5/13/2001	17:10:00	59.9491	148.3795	162		Weingartner
HX24313301.052	CTD121 Start	PWSW1	5/13/2001	17:25:00	59.9243	148.3358	98		Weingartner
HX24313301.053	CTD121 End	PWSW1	5/13/2001	17:31:00	59.924	148.3363	98		Weingartner
HX24313301.054	CTD122 Start	PWSW2	5/13/2001	17:51:00	59.8752	148.3368	76		Weingartner
HX24313301.055	CTD122 End	PWSW2	5/13/2001	17:56:00	59.8747	148.3401	78		Weingartner
HX24313301.056	CTD123 Start	PWSW3	5/13/2001	18:18:00	59.8251	148.3345	123		Weingartner
HX24313301.057	CTD123 End	PWSW3	5/13/2001	18:25:00	59.8244	148.3391	123		Weingartner
HX24313301.058	CTD124 Start	PWSW4	5/13/2001	18:45:00	59.7746	148.3351	124		Weingartner
HX24313301.059	CTD124 End	PWSW4	5/13/2001	18:53:00	59.7735	148.336	124		Weingartner
HX24313301.060	CTD125 Start	PWSW5	5/13/2001	19:17:00	59.7091	148.3365	172		Weingartner
HX24313301.061	CTD125 End	PWSW5	5/13/2001	19:27:00	59.7086	148.3376	172		Weingartner
HX24313301.062	CTD126 Start	PWSW5	5/13/2001	19:44:00	59.6675	148.3371	188		Weingartner
HX24313301.063	CTD126 End	PWSW5	5/13/2001	19:55:00	59.6671	148.3451	188		Weingartner
HX24313301.064	CTD127 Start	PWSW6	5/13/2001	20:14:00	59.6246	148.3365	194		Weingartner
HX24313301.065	CTD127 End	PWSW6	5/13/2001	20:23:00	59.6243	148.3384	194		Weingartner
HX24313301.066	CTD128 Start	CCSW5	5/13/2001	20:55:00	59.5434	148.3357	187		Weingartner
HX24313301.067	CTD128 End	CCSW5	5/13/2001	21:04:00	59.5436	148.3389	187		Weingartner
HX24313301.068	CTD129 Start	CCSW4	5/13/2001	21:30:00	59.5856	148.2482	177		Weingartner
HX24313301.069	CTD129 End	CCSW4	5/13/2001	21:39:00	59.5872	148.2523	177		Weingartner
HX24313301.070	CTD130 Start	CCSW3	5/13/2001	22:02:00	59.626	148.1715	164		Weingartner
HX24313301.071	CTD130 End	CCSW3	5/13/2001	22:10:00	59.6269	148.1756	164		Weingartner
HX24313301.072	CTD131 Start	CCSW2	5/13/2001	22:34:00	59.6674	148.084	54		Weingartner
HX24313301.073	CTD131 End	CCSW2	5/13/2001	22:39:00	59.6694	148.0879	54		Weingartner
HX24313301.074	CTD132 Start	CCSW1	5/13/2001	23:05:00	59.7164	148.0027	24		Weingartner
HX24313301.075	CTD132 End	CCSW1	5/13/2001	23:08:00	59.7176	148.0049	24		Weingartner
HX24313301.076	CTD133 Start	CC1	5/13/2001	23:39:00	59.7449	147.8844	20		Weingartner
HX24313301.077	CTD133 End	CC1	5/13/2001	23:42:00	59.7452	147.8864	20		Weingartner
HX24313301.078	CTD134 Start	CC2	5/13/2001	23:59:00	59.7104	147.8829	68		Weingartner
HX24313401.001	CTD135 Start	CC3	5/14/2001	0:23:00	59.6672	147.8819	72		Weingartner
HX24313401.002	CTD135 End	CC3	5/14/2001	0:27:00	59.6672	147.8837	71		Weingartner
HX24313401.003	CTD136 Start	CC4	5/14/2001	0:56:00	59.6005	147.8814	116		Weingartner
HX24313401.004	CTD136 End	CC4	5/14/2001	1:02:00	59.6002	147.8831	116		Weingartner
HX24313401.005	CTD137 Start	CC5	5/14/2001	1:59:00	59.4846	147.8826	118		Weingartner
HX24313401.006	CTD137 End	CC5	5/14/2001	2:05:00	59.4848	147.8848	118		Weingartner
HX24313401.007	CTD139 Start	CC7	5/14/2001	3:50:00	59.2503	147.8807	183		Weingartner
HX24313401.008	MOCNESS Start	MS2	5/14/2001	8:25:00	59.9452	147.8941	183		Coyle
HX24313401.009	MOCNESS End	MS2	5/14/2001	9:07:00	59.9571	147.8881	183		Coyle
HX24313401.010	CTD140 Start	GAK1	5/14/2001	13:58:00	59.8441	149.4683	275		Weingartner

HX24313401.011	CTD140 End	GAK1	5/14/2001	14:14:00	59.8433	149.4703	275		Weingartner
HX24313401.012	Ring Net Start	GAK1	5/14/2001	14:16:00	59.8432	149.4704	272		Pinchuk
HX24313401.013	CTD141 Start	RES2.5	5/14/2001	16:01:00	60.0257	149.36	272		Weingartner
HX24313401.014	CTD141 End	RES2.5	5/14/2001	16:15:00	60.0259	149.3627	272		Weingartner