GLOBEC CRUISE REPORT

Cruise HX281 – 19 -27 March 2004

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

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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 March sampling marks the seventh consecutive March for GLOBEC LTOP sampling in the GOA.

Cruise Objectives

1. Determine thermohaline, velocity, and nutrient structure of the Gulf of Alaska shelf, emphasizing Seward Line, C. Fairfield Line, Prince William Sound stations, and offshore PWS stations (Table 1). Other lines as time permits.
2. Determine primary production and phytoplankton biomass distribution.
3. Determine the distribution and abundance of zooplankton.
4. Determine copepod and euphausiid rates of growth and egg production.
5. Characterize the carbon and nitrogen stable isotope concentrations in zooplankton.
6. Assess new ADCP installation.

SAMPLING

DAYTIME ACTIVITIES

1. Occupy the various hydrographic transects and collect vertical CTD-chlorophyll-PAR profiles. Station Transect priorities are (in order): Seward, C. Fairfield, W. PWS, Hinchinbrook Entrance. (These can also be performed at night after zooplankton work is completed.) (see **Table 1**)
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. 1 CalVet Net cast will be done (CalVet frame has 4 nets) after the CTD cast along the Seward Line and at selected PWS stations. THERE WILL BE NO CALVET sampling at the “i” stations on the Seward Line.
6. At 2-4 Seward Line stations (GAK1, 4, 9, 13) and one PWS station Hopcroft will perform 4-7 casts with the 10-liter Niskins/Rosette (weather permitting) to collect water (from 10-20m) for zooplankton incubations and two ring net tows over the upper 50m.
7. 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 Coyles MOCNESS/HTI work at that station.
8. If the ISUS instrument is functional we would like to run it at all (5-l) CTD stations at depths of less than 1000m. It should be mounted in the horizontal position so all 12 Niskin bottles are available.

NIGHTTIME ACTIVITIES

1. Hydroacoustic samples and MOCNESS discrete samples along the Seward Line, and at select PWS and Hinchinbrook Entrance Stations.
2. Fine mesh nets will be swapped into the MOCNESS at intermittent stations for euphausiid collection.

Cruise Chronology and Summary of Samples Taken:

We departed Seward at 10:43 on 19 March, tested CTD, HTI and MOCNESS equipment inside Ressurection Bay, took a CTD at GAK1 then drove to Prince William Sound to begin our work in sheltered waters. Wind speed at GAK1 was ~30 kts. We worked in northern Prince William Sound, Knight Island Passage, Hogan Bay and Montague Strait over the course of the next two days, sampled Hinchinbrook Entrance on 21 March and finally were able to begin our work on the Seward Line at station GAK9 on 22 March. We worked from the shelf break toward deeper waters and then continued up over the shelf over the next few days. On 24 March, the HTI instrument developed problems which were not servicable at sea. Night crew continued with MOCNESS sampling, however the circuit breaker to the Deep Sea winch kept tripping, which make that process cumbersome. On 25 March we took a trip to the IMS dock to pick up repair items for the winch and to ship out the HTI unit to manufacturer in Washington. On 26 March we occupied the Cape Fairfield Line and then made some ADCP tests to examine the performance of the newly installed RDI 150KHz ADCP. Initial results indicate a very good installation. Returned to Seward and terminated the cruise on 27 March at 15:46.

Zooplankton (K.Coyle):

Zooplankton abundance and biomass was assessed with two gear types. The large zooplankton and micronekton were sampled with a 1-m^2 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 0.150 mm mesh and two having 0.053 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 and MOCNESS 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 43 kHz. All transducers were split beam and therefore collected target strength data in addition to volume scattering data.

Initial observations indicate the presence of an unusually high number of salps during this cruise.

Zooplankton (R. Hopcroft):

Egg production and cohort experiments were executed at all of the 5 primary stations: GAK1, GAK4, GAK9, GAK13 and KIP2. Egg production work encompassed *Pseudocalanus spp., Metridia pacifica, Acartia longiremis, Calanus pacifica, Centropages abdominalis* and *Paracalanus parvus*. Euphausiid growth rate experiments on *Euphausia pacifica* were restricted to Gak 12, due to low numbers of animals on the inner shelf and inside of PWS.

There were notable differences in the zooplankton community compared to previous months and years. *Pseudocalanus* spp., and low numbers of *Acartia,* were distributed broadly across the shelf, but *Pseudocalanus* were not very abundant at Gak1 or PWS due to the extremely depressed salinity. Large populations of a small lobate ctenophore (*Bolinopsis*?) were observed inshore, coincident with the low salinity waters; these will likely dissolve following preservation. A significant salp bloom occurred at the most offshore stations and finally dropped off on the midshelf. *Paracalanus parvus,* which had been observed in low numbers all year, continued its increase from notable numbers at Gak1 during the August cruise. It is now distributed completely throughout the sampling area, ranging from perhaps 25% of *Pseudocalanus* abundance at Gak13 to being several times more abundant than *Pseudocalanus* at Gak1 and PWS. A *Corycaeus* species (tentatively *C. anglicus*) was observed in very low numbers at all stations, but was more common inshore.

Phytoplankton/Nutrients (M. Rohr / S. Thornton):

Nutrient and chlorophyll samples were collected at all stations along the Seward line and at alternate stations along the Cape Fairfield line. Within the sound, samples were collected at the Knight Island Passage, Montague Strait, and Hogan Bay lines. Samples were also taken at all stations along the Hinchinbrook Entrance line. A total of 591 nutrient samples from 57 stations were analyzed on board for nitrate, nitrite, silicate, phosphate and ammonia. Samples for total chlorophyll were filtered onto GF/F filters, frozen, and will be analyzed in Seward. At 29 of the stations, additional samples were filtered by size-fraction (20um, 5um, GF/F filters) for later analysis. In addition, continuous Nitrate profiles were collected with ISUS (In-Situ Ultraviolet Spectroscopy) during each CTD cast during the early part of the cruise (Prince William Sound and Hinchinbrook Entrance only). The ISUS internal clock failed after CTD 30 and was therefore removed from the CTD package before the Seward Line stations were occupied. We also conducted five productivity experiments at the following sites: GAK1, GAK4, GAK9, GAK13, KIP2. These N-15 and C –13 experiments were for nitrogen uptake rates and primary productivity estimates. Isotope filter samples were taken for B. Finney (UAF) during this cruise at GAK1, GAK4, GAK8, GAK10 and GAK13.

Stable C and N Isotopes (Kline):

Samples for stable isotope analysis (SIA) were collected from MOCNESS tows made during HX281. SIA sampling stations consisted of the 13 Seward Line stations GAK1 to GAK13; four of the Hinchinbrook Entrance stations, HE10, HE6.5, HE4, and HE2; and the five core LTOP stations within Prince William Sound, MS2, HB2, KIP2, and PWS2.

At each station, samples were saved for SIA from the contents of MOCNESS net #1, which sampled the upper 100 m. At two designated ‘deep’ stations, GAK 13 and PWS 2, diapausing *Neocalanus* spp. were saved for SIA from the contents of a MOCNESS net that sampled between 400 and 600 m. MOCNESS SIA samples consisted primarily of zooplankton, which were sorted to species and frozen individually in vials for further laboratory processing.

NEP GLOBEC Standard Station Map

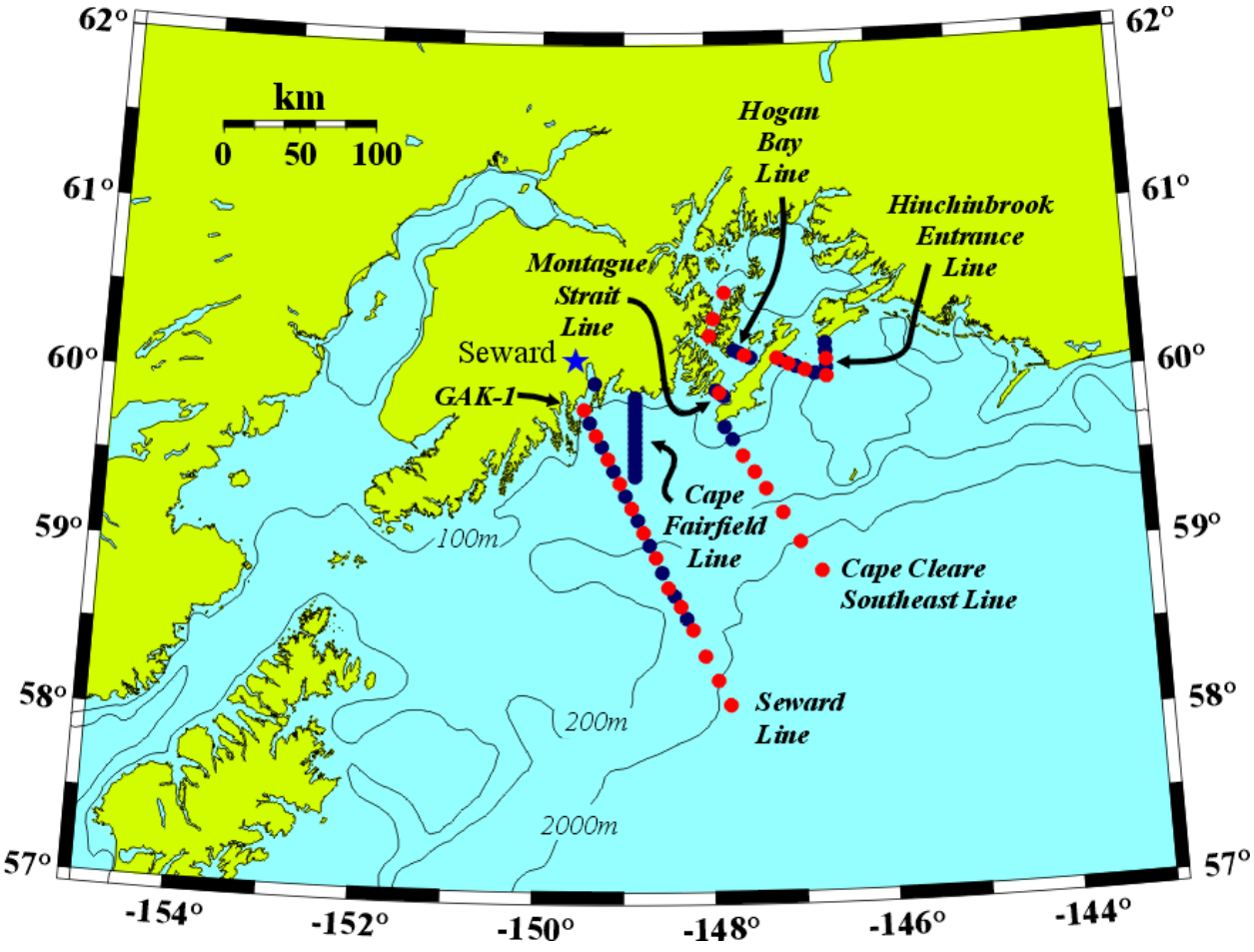
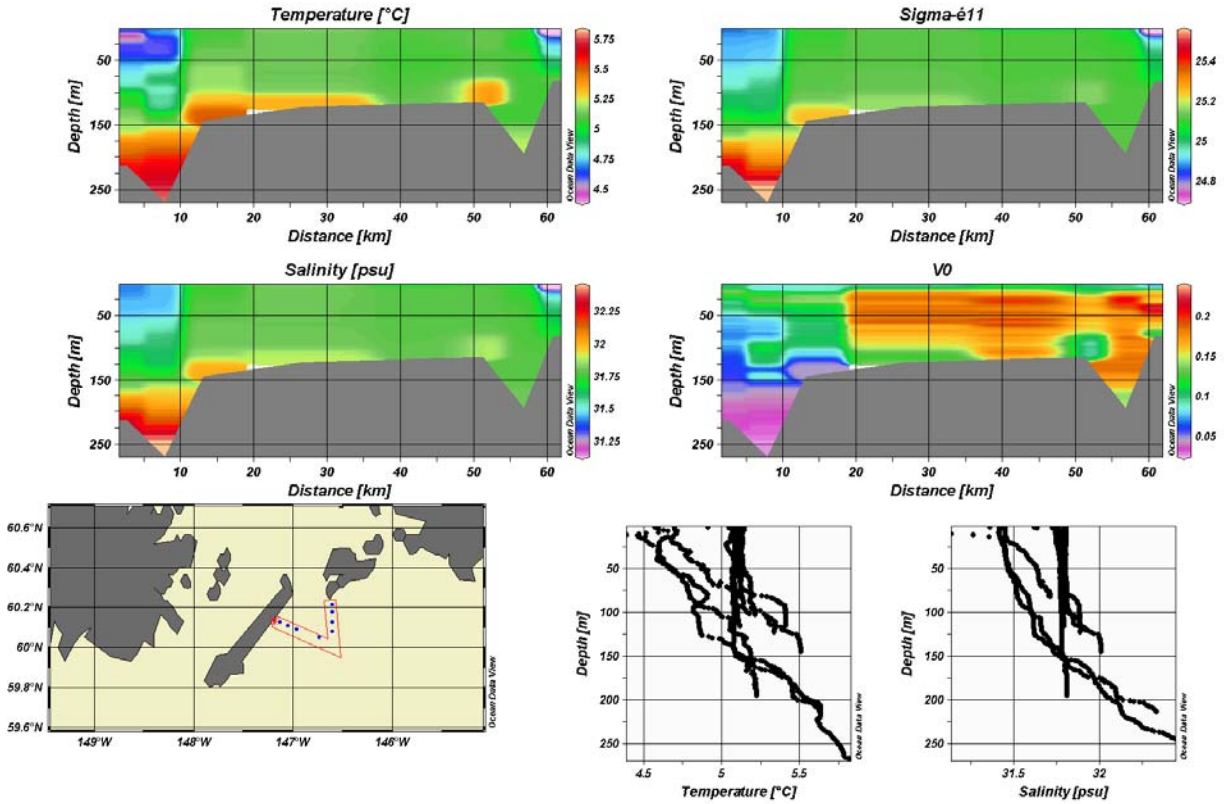


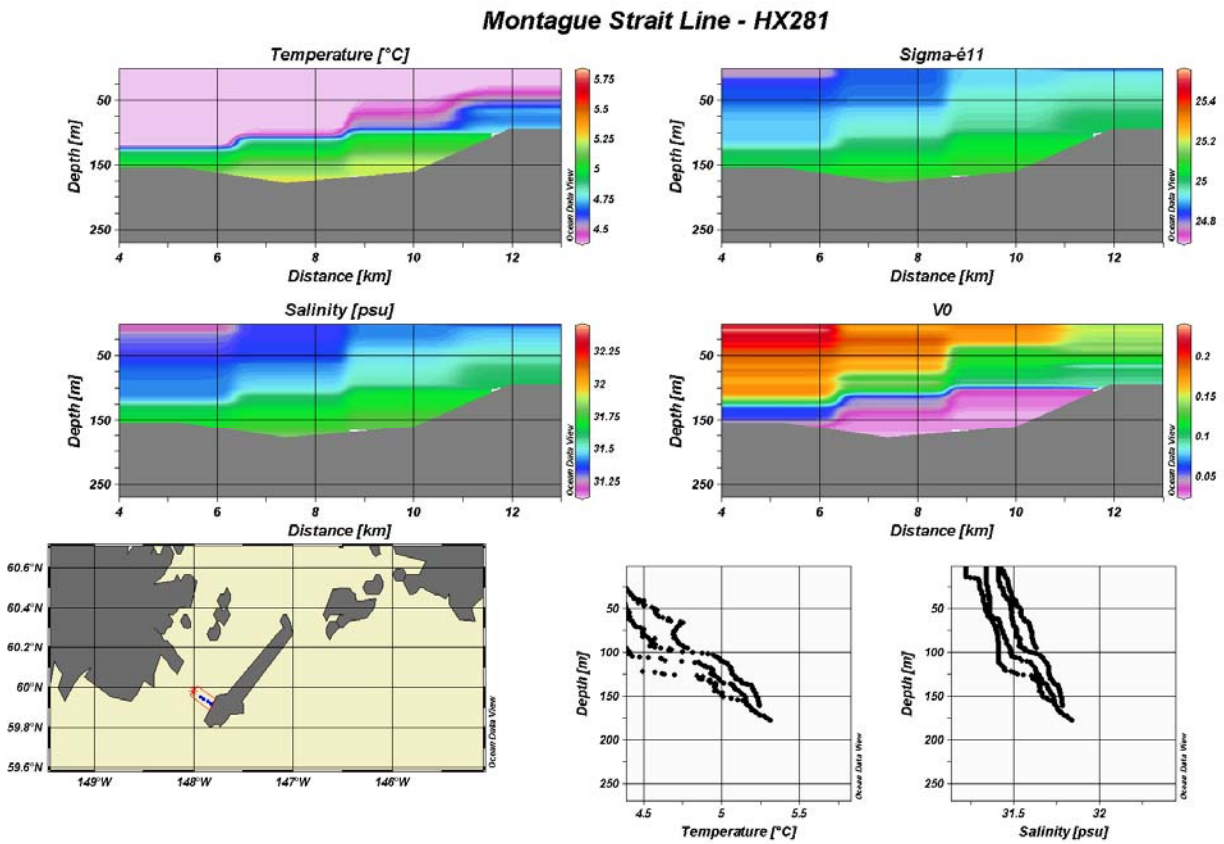
Table 1.

NEP GLOBEC LTOP STANDARD STATIONS				
Latitude N (degrees, minutes)		**Longitude W (degrees, minutes)**		**Station Name**
Resurrection Bay Station				
60	1.5	149	21.5	RES2.5
Seward Line				
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
Cape Fairfield Line				
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

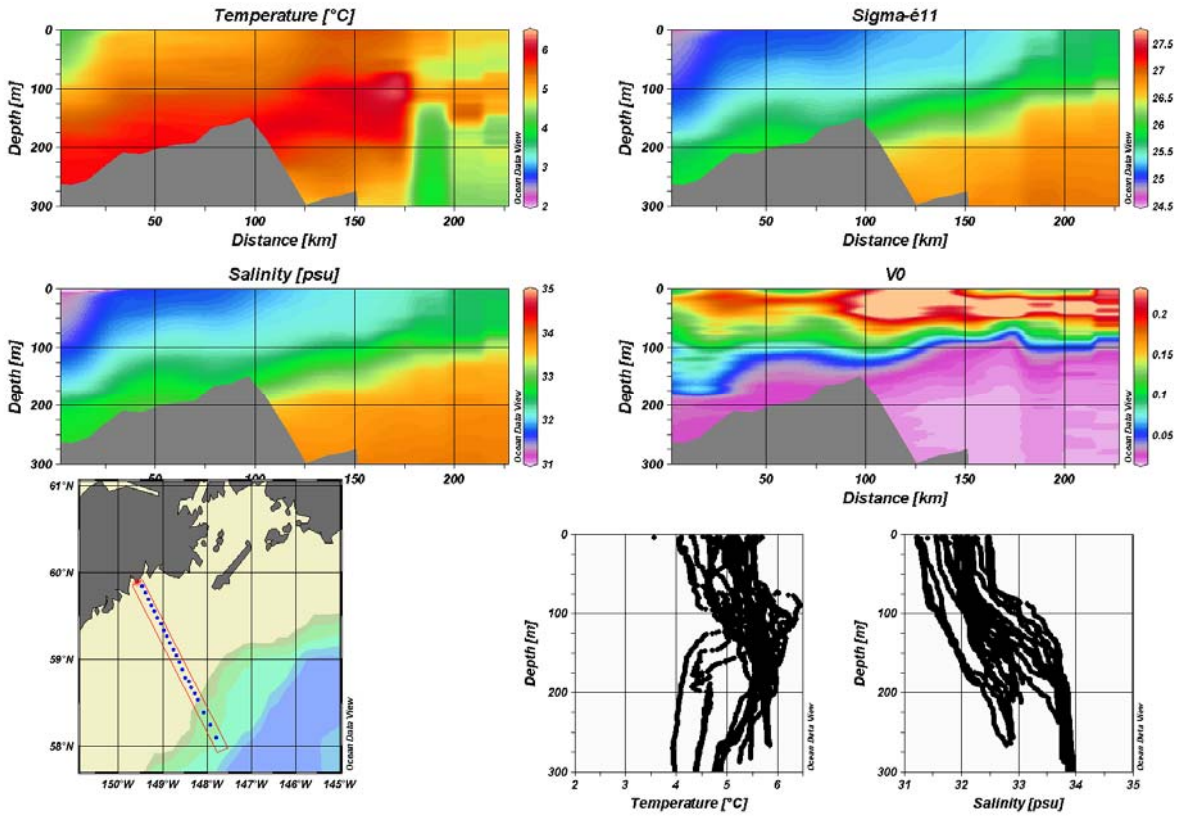
59	29	148	52	CF14
59	27	148	52	CF15
Prince William Sound Stations				
60	22.78	147	56.17	PWS1
60	32.1	147	48.2	PWS2
Knight Island Passage Station				
60	16.7	147	59.2	KIP2
Hogan Bay Line				
60	11.57	147	42	HB1
60	10.754	147	38.5	HB2
60	9.855	147	34.508	HB3
60	8.807	147	30.04	HB4
Montague Strait Line				
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
Hinchinbrook Entrance Line				
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
Cape Cleare Southeast				
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

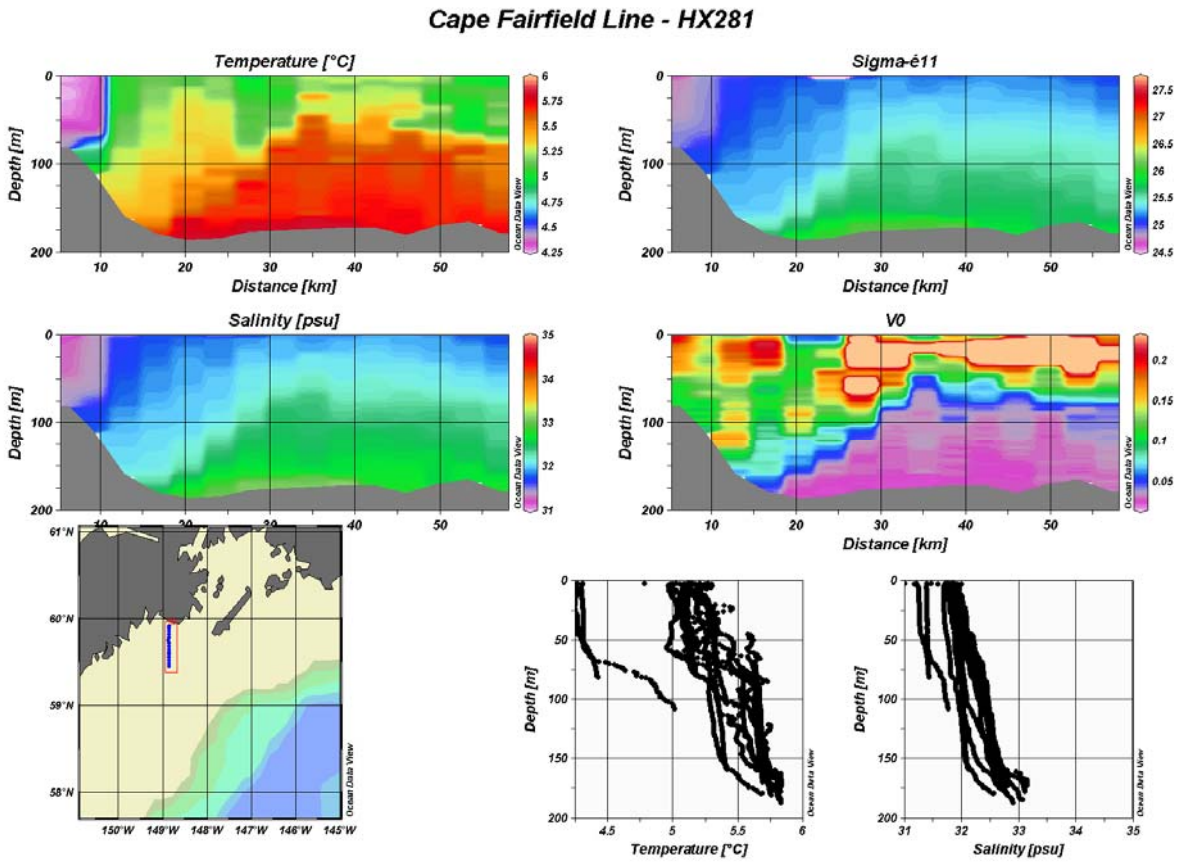
Hinchinbrook Entrance Line - HX281

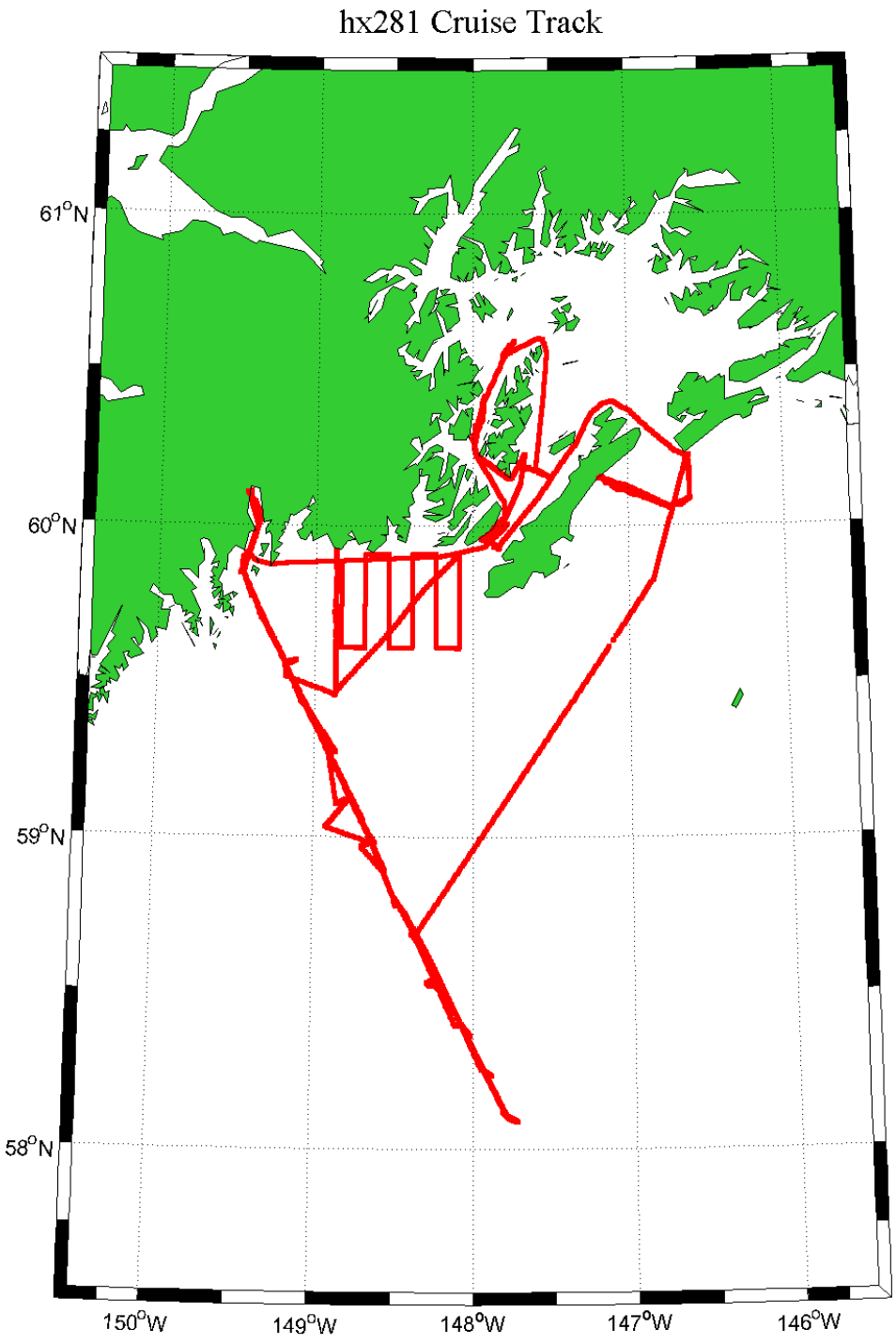


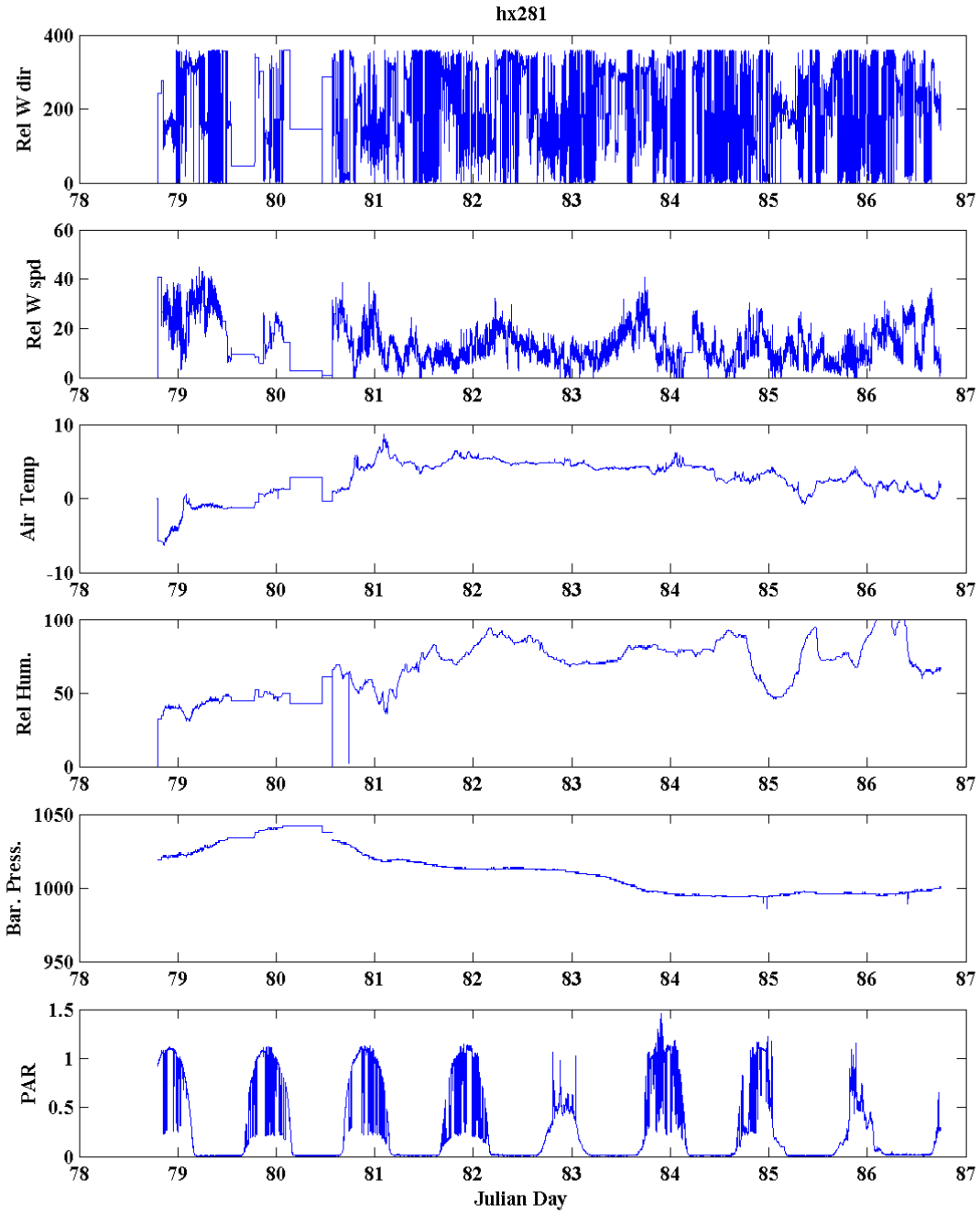

Montague Strait Line - HX281
Temperature [°C]
Sigma-é11
Salinity [psu]
V0
Depth [m]
Distance [km]
Ocean Data View
60.6°N
60.4°N
60.2°N
60°N
59.8°N
59.6°N
149°W
148°W
147°W
146°W
Temperature [°C]
Salinity [psu]

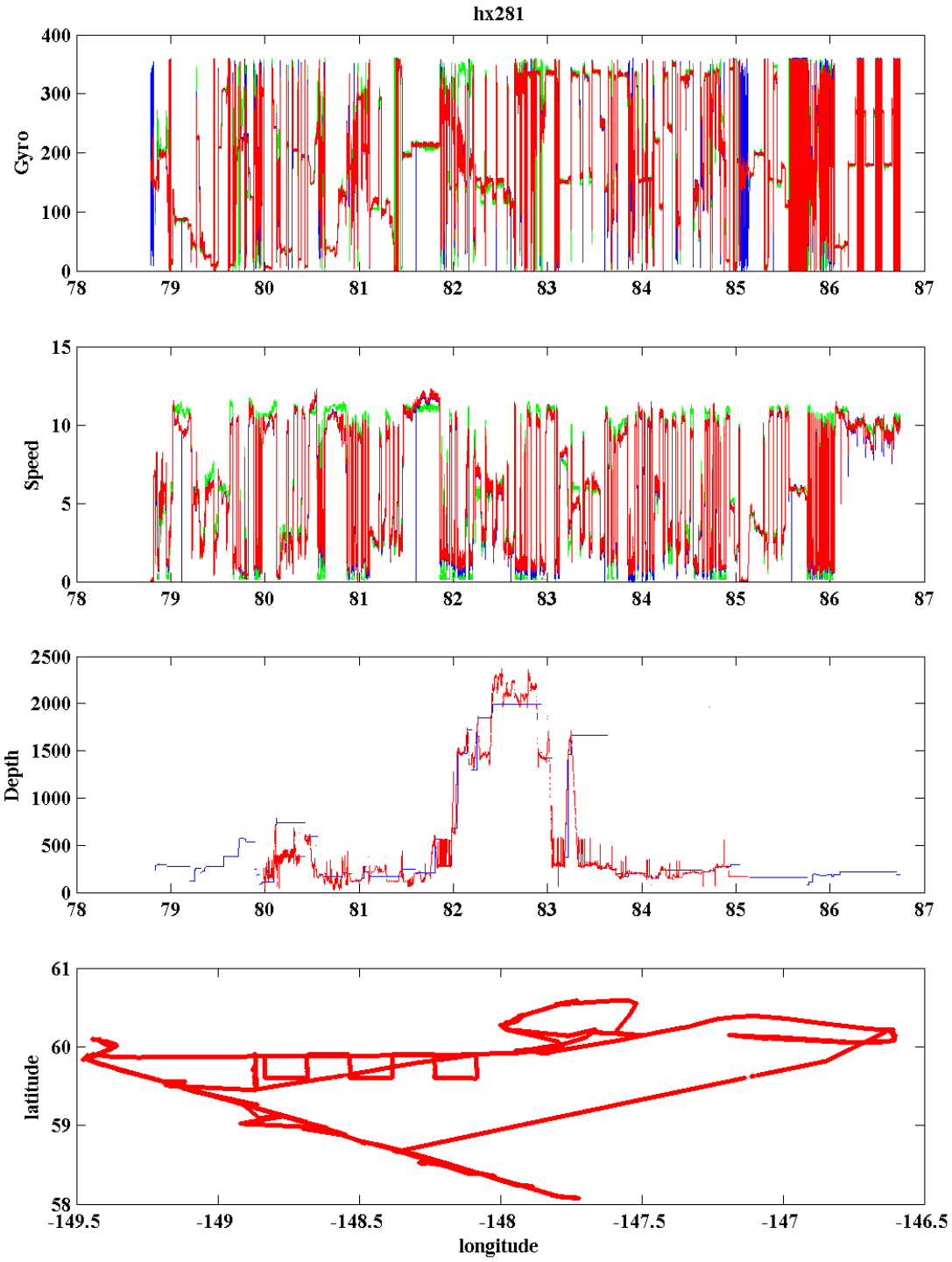
Seward Line - HX281

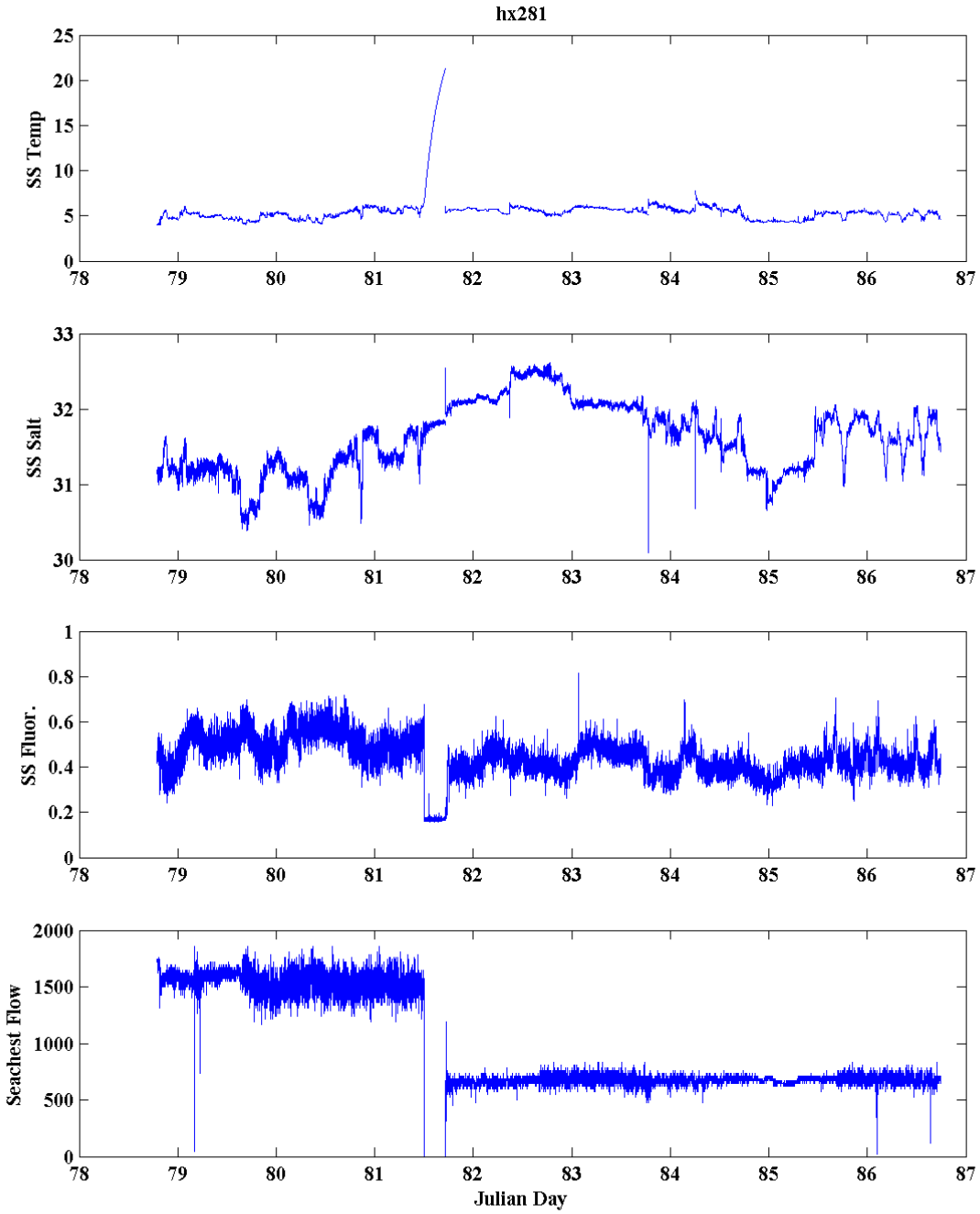



Cape Fairfield Line - HX281
Temperature [°C]
Depth [m]
Distance [km]
Sigma-é11
Salinity [psu]
V0
61°N
60°N
59°N
58°N
150°W
149°W
148°W
147°W
146°W
145°W
Temperature [°C]
Salinity [psu]
Ocean Data View


hx281 Cruise Track
61°N
60°N
59°N
58°N
150°W
149°W
148°W
147°W
146°W


hx281
Rel W dir
400
200
0
Rel W spd
60
40
20
0
Air Temp
10
0
-10
Rel Hum.
100
50
0
Bar. Press.
1050
1000
950
PAR
1.5
1
0.5
0
78
79
80
81
82
83
84
85
86
87
Julian Day


hx281
Gyro
Speed
Depth
latitude
longitude


hx281
SS Temp
SS Salt
SS Fluor.
Seachest Flow
Julian Day

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

Event	Description	Station	Date	GMT	lat	lon	Depth	Scientist	Comments
HX28107904.01	CTD001-Start	RES2.5	3/19/04	NA	NA	NA	295	Weingartner	
HX28107904.02	CTD001-End	RES2.5	3/19/04	NA	NA	NA	295	Weingartner	
HX28107904.03	CTD002-Start	GAK1	3/19/04	2307	59.8438	149.4648	272	Weingartner	
HX28107904.04	CTD002-End	GAK1	3/19/04	2332	59.8403	149.4570	272	Weingartner	
HX28108004.01	MOCNESS-Start	MS2	3/20/04	0723	59.9419	147.8919	195	Coyle	
HX28108004.02	MOCNESS-End	MS2	3/20/04	0801	59.9582	147.8582	195	Coyle	
HX28108004.03	MOCNESS-Start	HB2	3/20/04	1103	60.1833	147.6753	255	Coyle	
HX28108004.04	MOCNESS-End	HB2	3/20/04	1140	60.2034	147.6704	255	Coyle	
HX28108004.05	CTD003-Start	PWS2	3/20/04	1552	60.3781	147.9376	354	Weingartner	
HX28108004.06	CTD003-End	PWS2	3/20/04	1627	60.3746	147.9279	246	Weingartner	
HX28108004.07	CalVET Net Tow-Start	PWS2	3/20/04	1635	60.3727	147.9282	246	Hopcroft	
HX28108004.08	CalVET Net Tow-End	PWS2	3/20/04	1640	60.3721	147.9256	246	Hopcroft	
HX28108004.09	CTD004-Start	KIP2	3/20/04	1723	60.2775	147.9906	558	Whitledge	prim prod cast
HX28108004.10	CTD004-End	KIP2	3/20/04	1728	60.2766	147.9918	558	Whitledge	
HX28108004.11	CalVET Net Tow-Start	KIP2	3/20/04	1732	60.2759	147.9928	558	Hopcroft	
HX28108004.12	CalVET Net Tow-End	KIP2	3/20/04	1737	60.2752	147.9942	558	Hopcroft	
HX28108004.13	CTD005-Start	KIP2	3/20/04	1751	60.2777	147.9895	558	Weingartner	
HX28108004.14	CTD005-End	KIP2	3/20/04	1828	60.2737	147.9976	558	Weingartner	
HX28108004.15	CTD006-Start	KIP2	3/20/04	1842	60.2723	148.0010	558	Hopcroft	zoop cast
HX28108004.16	CTD006-End	KIP2	3/20/04	1843	60.2722	148.0013	558	Hopcroft	
HX28108004.17	CTD007-Start	KIP2	3/20/04	1854	60.2795	147.9883	558	Hopcroft	zoop cast
HX28108004.18	CTD007-End	KIP2	3/20/04	1858	60.2802	147.9897	530	Hopcroft	
HX28108004.19	CTD008-Start	KIP2	3/20/04	1904	60.2801	147.9903	530	Hopcroft	zoop cast
HX28108004.20	CTD008-End	KIP2	3/20/04	1907	60.2798	147.9906	530	Hopcroft	
HX28108004.21	CTD009-Start	KIP2	3/20/04	1913	60.2798	147.9913	530	Hopcroft	zoop cast
HX28108004.22	CTD009-End	KIP2	3/20/04	1915	60.2797	147.9922	530	Hopcroft	
HX28108004.23	Ring Net-Start	KIP2	3/20/04	1919	60.2801	147.9931	530	Hopcroft	
HX28108004.24	Ring Net-End	KIP2	3/20/04	1926	60.2797	147.9944	530	Hopcroft	
HX28108004.25	Ring Net-Start	KIP2	3/20/04	1930	60.2791	147.9959	530	Hopcroft	
HX28108004.26	Ring Net-End	KIP2	3/20/04	1934	60.2791	147.9959	530	Hopcroft	
HX28108004.27	Ring Net-Start	KIP2	3/20/04	1935	60.2789	147.9962	530	Hopcroft	
HX28108004.28	Ring Net-End	KIP2	3/20/04	1941	60.2784	147.9973	530	Hopcroft	
HX28108004.29	Ring Net-Start	KIP2	3/20/04	1943	60.2783	147.9977	530	Hopcroft	
HX28108004.30	Ring Net-End	KIP2	3/20/04	1948	60.2779	147.9987	530	Hopcroft	
HX28108004.31	CTD010-Start	HB1	3/20/04	2117	60.1939	147.6993	250	Weingartner	
HX28108004.32	CTD010-End	HB1	3/20/04	2135	60.1899	147.7010	250	Weingartner	
HX28108004.33	CTD011-Start	HB2	3/20/04	2156	60.1791	147.6435	180	Weingartner	
HX28108004.34	CTD011-End	HB2	3/20/04	2210	60.1757	147.6486	180	Weingartner	

HX28108004.35	CalVET Net Tow-Start	HB2	3/20/04	2214	60.1755	147.6491	180	Hopcroft	
HX28108004.36	CalVET Net Tow-End	HB2	3/20/04	2218	60.1744	147.6502	180	Hopcroft	
HX28108004.37	CTD012-Start	HB3	3/20/04	2238	60.1649	147.5749	86	Weingartner	
HX28108004.38	CTD012-End	HB3	3/20/04	NA	NA	NA	86	Weingartner	
HX28108004.39	CTD013-Start	HB4	3/20/04	2309	60.1478	147.4999	93	Weingartner	
HX28108004.40	CTD013-End	HB4	3/20/04	2317	60.1465	147.4998	93	Weingartner	
HX28108104.01	CTD014-Start	PWS2	3/21/04	0301	60.5352	147.8048	735	Weingartner	
HX28108104.02	CTD014-End	PWS2	3/21/04	0337	60.5331	147.8016	735	Weingartner	
HX28108104.03	CalVET Net Tow-Start	PWS2	3/21/04	0343	60.5337	147.7993	735	Hopcroft	
HX28108104.04	CalVET Net Tow-End	PWS2	3/21/04	0348	60.5336	147.7990	735	Hopcroft	
HX28108104.05	MOCNESS-Start	PWS2	3/21/04	0356	60.5355	147.7996	735	Coyle	
HX28108104.06	MOCNESS-End	PWS2	3/21/04	0551	60.5500	147.7814	735	Coyle	
HX28108104.07	MOCNESS-Start	PWS2	3/21/04	0606	60.5394	147.8001	735	Coyle	
HX28108104.08	MOCNESS-End	PWS2	3/21/04	0654	60.5665	147.7623	735	Coyle	
HX28108104.09	MOCNESS-Start	PWS1	3/21/04	0830	60.3803	147.9395	349	Coyle	
HX28108104.10	MOCNESS-End	PWS1	3/21/04	0907	60.4062	147.9211	349	Coyle	
HX28108104.11	MOCNESS-Start	KIP2	3/21/04	1013	60.2811	147.9881	557	Coyle	
HX28108104.12	MOCNESS-End	KIP2	3/21/04	1045	60.3044	147.9817	557	Coyle	
HX28108104.13	CTD15-Start	MS1	3/21/04	1323	59.9530	147.9313	169	Weingartner	
HX28108104.14	CTD15-End	MS1	3/21/04	NA	NA	NA	169	Weingartner	
HX28108104.15	CTD16-Start	MS2	3/21/04	1354	59.9423	147.8987	190	Weingartner	
HX28108104.16	CTD16-End	MS2	3/21/04	1411	59.9348	147.9144	190	Weingartner	
HX28108104.17	CalVET Net Tow-Start	MS2	3/21/04	1421	59.9435	147.8959	190	Hopcroft	
HX28108104.18	CalVET Net Tow-End	MS2	3/21/04	1428	59.9400	147.9012	190	Hopcroft	
HX28108104.19	CTD17-Start	MS3	3/21/04	1441	59.9311	147.8577	165	Weingartner	
HX28108104.20	CTD17-End	MS3	3/21/04	1455	59.9246	147.8647	165	Weingartner	
HX28108104.21	CTD18-Start	MS4	3/21/04	1508	59.9198	147.8306	111	Weingartner	
HX28108104.22	CTD18-End	MS4	3/21/04	1515	59.9171	147.8334	111	Weingartner	
HX28108104.23	CTD19-Start	HE1	3/21/04	2048	60.2150	146.6117	86	Weingartner	
HX28108104.24	CTD19-End	HE1	3/21/04	2054	60.2136	146.6163	86	Weingartner	
HX28108104.25	CTD20-Start	HE2	3/21/04	2112	60.1797	146.6112	197	Weingartner	
HX28108104.26	CTD20-End	HE2	3/21/04	2127	60.1788	146.6111	197	Weingartner	
HX28108104.27	CalVET Net Tow-Start	HE2	3/21/04	2131	60.1786	146.6141	197	Hopcroft	
HX28108104.28	CalVET Net Tow-End	HE2	3/21/04	2137	60.1775	146.6156	197	Hopcroft	
HX28108104.29	CTD21-Start	HE3	3/21/04	2159	60.1293	146.6092	116	Weingartner	
HX28108104.30	CTD21-End	HE3	3/21/04	2208	60.1290	146.6051	116	Weingartner	
HX28108104.31	CTD22-Start	HE4	3/21/04	2228	60.0799	146.6099	118	Weingartner	
HX28108104.32	CTD22-End	HE4	3/21/04	2239	60.0791	146.6050	118	Weingartner	
HX28108104.33	CalVET Net Tow-Start	HE4	3/21/04	2243	60.0787	146.6062	118	Hopcroft	
HX28108104.34	CalVET Net Tow-End	HE4	3/21/04	2249	60.0778	146.6051	118	Hopcroft	
HX28108104.35	CTD23-Start	HE6.5	3/21/04	2319	60.0517	146.7376	125	Weingartner	
HX28108104.36	CTD23-End	HE6.5	3/21/04	2330	60.0488	146.7344	125	Weingartner	

HX28108104.37	CalVET Net Tow-Start	HE6.5	3/21/04	2335	60.0484	146.7346	125	Hopcroft	
HX28108104.38	CalVET Net Tow-End	HE6.5	3/21/04	2340	60.0469	146.7341	125	Hopcroft	
HX28108204.01	CTD24-Start	HE8	3/22/04	0034	60.0932	146.9639	150	Weingartner	
HX28108204.02	CTD24-End	HE8	3/22/04	0046	60.0901	146.9631	150	Weingartner	
HX28108204.03	CTD25-Start	HE9	3/22/04	0108	60.1096	147.0526	277	Weingartner	
HX28108204.04	CTD25-End	HE9	3/22/04	0126	60.1039	147.0586	277	Weingartner	
HX28108204.05	CTD26-Start	HE10	3/22/04	0146	60.1298	147.1357	217	Weingartner	
HX28108204.06	CTD26-End	HE10	3/22/04	0204	60.1274	147.1351	217	Weingartner	
HX28108204.07	CalVET Net Tow-Start	HE10	3/22/04	0206	60.1272	147.1349	217	Hopcroft	
HX28108204.08	CalVET Net Tow-End	HE10	3/22/04	0211	60.1267	147.1344	217	Hopcroft	
HX28108204.09	CTD27-Start	HE11	3/22/04	0233	60.1435	147.1928	162	Weingartner	
HX28108204.10	CTD27-End	HE11	3/22/04	0240	60.1442	147.1926	162	Weingartner	
HX28108204.11	MOCNESS-Start	HE10	3/22/04	0548	60.1305	147.1328	215	Coyle	
HX28108204.12	MOCNESS-End	HE10	3/22/04	0623	60.1270	147.0777	215	Coyle	
HX28108204.13	MOCNESS-Start	HE6.5	3/22/04	0756	60.0528	146.7279	124	Coyle	
HX28108204.14	MOCNESS-End	HE6.5	3/22/04	0827	60.0550	146.6826	124	Coyle	
HX28108204.15	MOCNESS-Start	HE4	3/22/04	0900	60.0838	146.6081	117	Coyle	
HX28108204.16	MOCNESS-End	HE4	3/22/04	0935	60.1114	146.6057	117	Coyle	
HX28108204.17	MOCNESS-Start	HE2	3/22/04	1012	60.1777	146.6088	183	Coyle	
HX28108204.18	MOCNESS-End	HE2	3/22/04	1050	60.2024	146.6263	183	Coyle	
HX28108204.19	CTD28-Start	GAK9	3/22/04	2035	58.6799	148.3554	279	Weingartner	
HX28108204.20	CTD28-End	GAK9	3/22/04	2046	58.6795	148.3638	279	Weingartner	
HX28108204.21	CalVET Net Tow-Start	GAK9	3/22/04	2049	58.6792	148.3640	279	Hopcroft	
HX28108204.22	CalVET Net Tow-End	GAK9	3/22/04	2106	58.6801	148.3548	279	Hopcroft	
HX28108204.23	CTD29-Start	GAK9	3/22/04	2107	58.6800	148.3555	279	Weingartner	
HX28108204.24	CTD29-End	GAK9	3/22/04	2130	58.6798	148.3747	279	Weingartner	
HX28108204.25	CTD30-Start	GAK9	3/22/04	2146	58.6795	148.3517	279	Hopcroft	zoop cast 1
HX28108204.26	CTD30-End	GAK9	3/22/04	2149	58.6794	148.3538	279	Hopcroft	
HX28108204.27	CTD31-Start	GAK9	3/22/04	2156	58.6794	148.3594	279	Hopcroft	zoop cast 2
HX28108204.28	CTD31-End	GAK9	3/22/04	2157	58.6794	148.3605	279	Hopcroft	
HX28108204.29	CTD32-Start	GAK9	3/22/04	2203	58.6795	148.3653	279	Hopcroft	zoop cast 2
HX28108204.30	CTD32-End	GAK9	3/22/04	2206	58.6795	148.3677	279	Hopcroft	
HX28108204.31	CTD33-Start	GAK9	3/22/04	2213	58.6798	148.3726	279	Hopcroft	zoop cast 2
HX28108204.32	CTD33-End	GAK9	3/22/04	2214	58.6798	148.3738	279	Hopcroft	
HX28108204.33	Ring Net-Start	GAK9	3/22/04	2229	58.6791	148.3541	279	Hopcroft	
HX28108204.34	Ring Net-End	GAK9	3/22/04	2235	58.6791	148.3586	279	Hopcroft	
HX28108204.35	Ring Net-Start	GAK9	3/22/04	2237	58.6791	148.3608	279	Hopcroft	
HX28108204.36	Ring Net-End	GAK9	3/22/04	2244	58.6790	148.3657	279	Hopcroft	
HX28108204.37	Ring Net-Start	GAK9	3/22/04	2246	58.6790	148.3675	279	Hopcroft	
HX28108204.38	Ring Net-End	GAK9	3/22/04	2253	58.6791	148.3723	279	Hopcroft	
HX28108204.39	Ring Net-Start	GAK9	3/22/04	2258	58.6791	148.3756	279	Hopcroft	
HX28108204.40	Ring Net-End	GAK9	3/22/04	2307	58.6783	148.3797	279	Hopcroft	
HX28108204.41	CTD34-Start	GAK9I	3/22/04	2343	58.6127	148.2796	665	Weingartner	
HX28108304.01	CTD34-End	GAK9I	3/23/04	0020	58.6086	148.2980	665	Weingartner	
HX28108304.02	CTD34a-Start	GAK9I	3/23/04	0029	58.6087	148.3019	665	Weingartner	recast for 20m

									water
HX28108304.03	CTD34a-End	GAK9I	3/23/04	0030	58.6087	148.3025	665	Weingartner	
HX28108304.04	CalVET Net Tow-Start	GAK10	3/23/04	0104	58.5408	148.2117	1456	Hopcroft	
HX28108304.05	CalVET Net Tow-End	GAK10	3/23/04	0113	58.5398	148.2138	1456	Hopcroft	
HX28108304.06	CTD35-Start	GAK10	3/23/04	0119	58.5391	148.2130	1478	Weingartner	
HX28108304.07	CTD35-End	GAK10	3/23/04	0234	58.5283	148.2239	1478	Weingartner	
HX28108304.08	HTI Transect-Start	GAK10	3/23/04	0539	58.5371	148.2103	1484	Coyle	
HX28108304.09	HTI Transect-End	GAK11	3/23/04	0707	58.3873	148.0699	1434	Coyle	
HX28108304.10	MOCNESS-Start	GAK11	3/23/04	0709	58.3863	148.0685	1434	Coyle	
HX28108304.11	MOCNESS-End	GAK11	3/23/04	0756	58.3582	148.0238	1434	Coyle	
HX28108304.12	HTI Transect-Start	GAK11	3/23/04	0829	58.3879	148.0733	1434	Coyle	
HX28108304.13	HTI Transect-End	GAK12	3/23/04	1007	58.2427	147.9323	2192	Coyle	
HX28108304.14	MOCNESS-Start	GAK12	3/23/04	1009	58.2419	147.9302	2192	Coyle	
HX28108304.15	MOCNESS-End	GAK12	3/23/04	1045	58.2272	147.8927	2192	Coyle	
HX28108304.16	HTI Transect-Start	GAK12	3/23/04	1112	58.2424	147.9330	2192	Coyle	
HX28108304.17	HTI Transect-End	GAK13	3/23/04	1252	58.0981	147.7925	2085	Coyle	
HX28108304.18	MOCNESS-Start	GAK13	3/23/04	1257	58.0959	147.7869	2085	Coyle	
HX28108304.19	MOCNESS-End	GAK13	3/23/04	1333	58.0845	147.7590	2085	Coyle	
HX28108304.20	MOCNESS-Start	GAK13	3/23/04	1403	58.0974	147.7979	2085	Coyle	deep cast
HX28108304.21	MOCNESS-End	GAK13	3/23/04	1519	58.0783	147.7341	2085	Coyle	
HX28108304.22	CTD36-Start	GAK13	3/23/04	1551	58.1001	147.7948	2085	Weingartner	
HX28108304.23	CTD36-End	GAK13	3/23/04	1703	58.1092	147.8197	2085	Weingartner	
HX28108304.24	CalVET Net Tow-Start	GAK13	3/23/04	1717	58.0975	147.7925	2085	Hopcroft	
HX28108304.25	CalVET Net Tow-End	GAK13	3/23/04	1720	58.0981	147.7935	2085	Hopcroft	
HX28108304.26	CTD37-Start	GAK13	3/23/04	1725	58.0987	147.7929	2085	Whitledge	prim prod cast
HX28108304.27	CTD37-End	GAK13	3/23/04	1732	58.0999	147.7953	2085	Whitledge	
HX28108304.28	CTD38-Start	GAK13	3/23/04	1742	58.1014	147.7986	2085	Hopcroft	zoop cast
HX28108304.29	CTD38-End	GAK13	3/23/04	1746	58.1021	147.7999	2085	Hopcroft	
HX28108304.30	CTD39-Start	GAK13	3/23/04	1753	58.1031	147.8020	2085	Hopcroft	zoop cast
HX28108304.31	CTD39-End	GAK13	3/23/04	1755	58.1035	147.8028	2085	Hopcroft	
HX28108304.32	CTD40-Start	GAK13	3/23/04	1802	58.1044	147.8051	2085	Hopcroft	zoop cast
HX28108304.33	CTD40-End	GAK13	3/23/04	1804	58.1047	147.8058	2085	Hopcroft	
HX28108304.34	CTD41-Start	GAK13	3/23/04	1810	58.1056	147.8075	2085	Hopcroft	zoop cast
HX28108304.35	CTD41-End	GAK13	3/23/04	1812	58.1058	147.8082	2085	Hopcroft	
HX28108304.36	Ring Net-Start	GAK13	3/23/04	1822	58.0980	147.7963	2085	Hopcroft	
HX28108304.37	Ring Net-End	GAK13	3/23/04	1826	58.0986	147.7975	2085	Hopcroft	
HX28108304.38	Ring Net-Start	GAK13	3/23/04	1827	58.0989	147.7978	2085	Hopcroft	
HX28108304.39	Ring Net-End	GAK13	3/23/04	1832	58.0998	147.7986	2085	Hopcroft	
HX28108304.40	Ring Net-Start	GAK13	3/23/04	1834	58.1000	147.7989	2085	Hopcroft	
HX28108304.41	Ring Net-End	GAK13	3/23/04	1838	58.1006	147.7997	2085	Hopcroft	
HX28108304.42	Ring Net-Start	GAK13	3/23/04	1842	58.1012	147.8004	2085	Hopcroft	
HX28108304.43	Ring Net-End	GAK13	3/23/04	1847	58.1021	147.8010	2085	Hopcroft	

HX28108304.44	CalVET Net Tow-Start	GAK12	3/23/04	1945	58.2435	147.9308	2164	Hopcroft	
HX28108304.45	CalVET Net Tow-End	GAK12	3/23/04	1955	58.2434	147.9300	2164	Hopcroft	
HX28108304.46	CTD42-Start	GAK12	3/23/04	1956	58.2435	147.9301	2226	Weingartner	
HX28108304.47	CTD42-End	GAK12	3/23/04	2121	58.2695	147.9707	2226	Weingartner	
HX28108304.48	CalVET Net Tow-Start	GAK11	3/23/04	2209	58.3886	148.0704	1433	Hopcroft	
HX28108304.49	CalVET Net Tow-End	GAK11	3/23/04	2216	58.3889	148.0733	1433	Hopcroft	
HX28108304.50	CTD43-Start	GAK11	3/23/04	2218	58.3887	148.0752	1433	Weingartner	
HX28108304.51	CTD43-End	GAK11	3/23/04	2334	58.3844	148.1089	1433	Weingartner	
HX28108404.01	CTD44-Start	GAK8I	3/24/04	0151	58.7438	148.4204	289	Weingartner	
HX28108404.02	CTD44-End	GAK8I	3/24/04	0208	58.7454	148.4208	289	Weingartner	
HX28108404.03	CalVET Net Tow-Start	GAK8	3/24/04	0233	58.7916	148.4907	290	Hopcroft	
HX28108404.04	CalVET Net Tow-End	GAK8	3/24/04	0239	58.7925	148.4887	290	Hopcroft	
HX28108404.05	CTD45-Start	GAK8	3/24/04	0243	58.7934	148.4885	290	Weingartner	
HX28108404.06	CTD45-End	GAK8	3/24/04	0302	58.7942	148.4867	290	Weingartner	
HX28108404.07	MOCNESS-Start	GAK10	3/24/04	0518	58.5414	148.2117	1442	Coyle	
HX28108404.08	MOCNESS-End	GAK10	3/24/04	0553	58.5117	148.1860	1442	Coyle	
HX28108404.09	HTI Transect-Start	GAK10	3/24/04	0619	58.5420	148.2120	1442	Coyle	
HX28108404.10	HTI Transect-End	GAK9	3/24/04	0811	58.6800	148.3501	278	Coyle	
HX28108404.11	MOCNESS-Start	GAK9	3/24/04	0816	58.6771	148.3505	278	Coyle	
HX28108404.12	MOCNESS-End	GAK9	3/24/04	0858	58.6467	148.3301	278	Coyle	
HX28108404.13	HTI Transect-Start	GAK9	3/24/04	0923	58.6804	148.3506	278	Coyle	
HX28108404.14	HTI Transect-End	GAK8	3/24/04	1041	58.7921	148.4905	291	Coyle	
HX28108404.15	MOCNESS-Start	GAK8	3/24/04	1045	58.7903	148.4916	291	Coyle	
HX28108404.16	MOCNESS-End	GAK8	3/24/04	1117	58.7723	148.4813	291	Coyle	
HX28108404.17	HTI Transect-Start	GAK8	3/24/04	1135	58.7928	148.4910	291	Coyle	
HX28108404.18	HTI Transect-End	GAK7	3/24/04	1330	58.9723	148.6310	243	Coyle	
HX28108404.19	MOCNESS-Start	GAK7	3/24/04	1333	58.9719	148.6344	243	Coyle	
HX28108404.20	MOCNESS-End	GAK7	3/24/04	1409	58.9657	148.6714	243	Coyle	
HX28108404.21	CTD46-Start	GAK7I	3/24/04	1513	58.8813	148.5596	300	Weingartner	
HX28108404.22	CTD46-End	GAK7I	3/24/04	1534	58.8830	148.5473	300	Weingartner	
HX28108404.23	CalVET Net Tow-Start	GAK7	3/24/04	1617	58.9714	148.6284	244	Hopcroft	
HX28108404.24	CalVET Net Tow-End	GAK7	3/24/04	1625	58.9715	148.6229	244	Hopcroft	
HX28108404.25	CTD47-Start	GAK7	3/24/04	1631	58.9710	148.6287	244	Weingartner	
HX28108404.26	CTD47-End	GAK7	3/24/04	1650	58.9712	148.6138	244	Weingartner	
HX28108404.27	CTD48-Start	GAK6I	3/24/04	1731	59.0443	148.6997	191	Weingartner	
HX28108404.28	CTD48-End	GAK6I	3/24/04	1748	59.0433	148.6879	191	Weingartner	
HX28108404.29	CTD49-Start	GAK4	3/24/04	2033	59.4086	149.0491	200	Weingartner	
HX28108404.30	CTD49-End	GAK4	3/24/04	2048	59.4088	149.0480	200	Weingartner	
HX28108404.31	CalVET Net Tow-Start	GAK4	3/24/04				200	Hopcroft	

HX28108404.32	CalVET Net Tow-End	GAK4	3/24/04	2101	59.4085	149.0471	200	Hopcroft	
HX28108404.33	CTD050-Start	GAK4	3/24/04	2104	59.4085	149.0464	200	Whitledge	prim prod cast
HX28108404.34	CTD050-End	GAK4	3/24/04	2116	59.4083	149.0446	200	Whitledge	
HX28108404.35	CTD051-Start	GAK4	3/24/04	2117	59.4083	149.0446	200	Hopcroft	zoop cast
HX28108404.36	CTD051-End	GAK4	3/24/04	2120	59.4080	149.0450	200	Hopcroft	
HX28108404.37	CTD052-Start	GAK4	3/24/04	2126	59.4079	149.0458	200	Hopcroft	zoop cast
HX28108404.38	CTD052-End	GAK4	3/24/04	2127	59.4079	149.0457	200	Hopcroft	
HX28108404.39	CTD053-Start	GAK4	3/24/04	2134	59.4078	149.0448	200	Hopcroft	zoop cast
HX28108404.40	CTD053-End	GAK4	3/24/04	2136	59.4078	149.0444	200	Hopcroft	
HX28108404.41	CTD054-Start	GAK4	3/24/04	2142	59.4078	149.0438	200	Hopcroft	zoop cast
HX28108404.42	CTD054-End	GAK4	3/24/04	2144	59.4077	149.0435	200	Hopcroft	
HX28108404.43	Ring Net-Start	GAK4	3/24/04	2154	59.4081	149.0434	200	Hopcroft	
HX28108404.44	Ring Net-End	GAK4	3/24/04	2158	59.4080	149.0431	200	Hopcroft	
HX28108404.45	Ring Net-Start	GAK4	3/24/04	2202	59.4079	149.0429	200	Hopcroft	
HX28108404.46	Ring Net-End	GAK4	3/24/04	2208	59.4077	149.0425	200	Hopcroft	
HX28108404.47	Ring Net-Start	GAK4	3/24/04	2211	59.4075	149.0422	200	Hopcroft	
HX28108404.48	Ring Net-End	GAK4	3/24/04	2219	59.4070	149.0417	200	Hopcroft	
HX28108404.49	CTD55-Start	GAK3I	3/24/04	2251	59.4805	149.1189	206	Weingartner	
HX28108504.01	CTD55-End	GAK3I	3/25/04	0005	59.3353	148.9786	200	Weingartner	
HX28108504.02	CTD56-Start	GAK4I	3/25/04	0009	59.3354	148.9768	197	Weingartner	
HX28108504.03	CTD56-End	GAK4I	3/25/04	0024	59.3341	148.9744	197	Weingartner	
HX28108504.04	CalVET Net Tow-Start	GAK5	3/25/04	0056	59.2616	148.9090	170	Hopcroft	
HX28108504.05	CalVET Net Tow-End	GAK5	3/25/04	0103	59.2617	148.9082	170	Hopcroft	
HX28108504.06	CTD57-Start	GAK5	3/25/04	0106	59.2619	148.9077	170	Weingartner	
HX28108504.07	CTD57-End	GAK5	3/25/04	0117	59.2626	148.9062	170	Weingartner	
HX28108504.08	CTD58-Start	GAK5	3/25/04	0128	59.2630	148.9047	170	Weingartner	recast to 40m bottle six missfire
HX28108504.09	CTD58-End	GAK5	3/25/04	0131	59.2632	148.9041	170	Weingartner	
HX28108504.10	CTD59-Start	GAK5I	3/25/04	0204	59.1900	148.8379	167	Weingartner	
HX28108504.11	CTD59-End	GAK5I	3/25/04	0216	59.1882	148.8340	167	Weingartner	
HX28108504.12	CalVET Net Tow-Start	GAK6	3/25/04	0246	59.1155	148.7695	151	Hopcroft	
HX28108504.13	CalVET Net Tow-End	GAK6	3/25/04	0252	59.1153	148.7688	151	Hopcroft	
HX28108504.14	CTD60-Start	GAK6	3/25/04	0254	59.1155	148.7685	151	Weingartner	
HX28108504.15	CTD60-End	GAK6	3/25/04	0307	59.1162	148.7658	151	Weingartner	
HX28108504.16	HTI Transect-Start	GAK7	3/25/04	0528	58.9721	148.6289	243	Coyle	
HX28108504.17	HTI Transect-End	GAK7	3/25/04	0600	59.0141	148.6696	243	Coyle	HTI failure
HX28108504.18	MOCNESS-Start	GAK6	3/25/04	0645	59.1159	148.7755	151	Coyle	
HX28108504.19	MOCNESS-End	GAK6	3/25/04	0724	59.1023	148.8275	151	Coyle	
HX28108504.20	MOCNESS-Start	GAK5	3/25/04	0919	59.2607	148.9070	166	Coyle	
HX28108504.21	MOCNESS-End	GAK5	3/25/04	0953	59.2619	148.8665	166	Coyle	
HX28108504.22	CalVET Net Tow-Start	GAK3	3/25/04	1535	59.5527	149.1873	214	Hopcroft	
HX28108504.23	CalVET Net Tow-End	GAK3	3/25/04	1541	59.5525	149.1863	214	Hopcroft	
HX28108504.24	CTD61-Start	GAK3	3/25/04	1541	59.5525	149.1862	214	Weingartner	

HX28108504.25	CTD61-End	GAK3	3/25/04	1559	59.5515	149.1824	214	Weingartner	
HX28108504.26	CTD62-Start	GAK2I	3/25/04	1634	59.6264	149.2591	212	Weingartner	
HX28108504.27	CTD62-End	GAK2I	3/25/04	1650	59.6247	149.2582	212	Weingartner	
HX28108504.28	CalVET Net Tow-Start	GAK2	3/25/04	1726	59.6931	149.3316	215	Hopcroft	
HX28108504.29	CalVET Net Tow-End	GAK2	3/25/04	1728	59.6934	149.3331	215	Hopcroft	
HX28108504.30	CTD63-Start	GAK2	3/25/04	1730	59.6933	149.3342	231	Weingartner	
HX28108504.31	CTD63-End	GAK2	3/25/04	1746	59.6942	149.3422	231	Weingartner	
HX28108504.32	CTD64-Start	GAK2	3/25/04	1801	59.6921	149.3286	231	Weingartner	recast to bottom
HX28108504.33	CTD64-End	GAK2	3/25/04	1807	59.6925	149.3315	231	Weingartner	
HX28108504.34	CTD65-Start	GAK1I	3/25/04	1841	59.7663	149.3991	264	Weingartner	
HX28108504.35	CTD65-End	GAK1I	3/25/04	1935	59.8451	149.4680	264	Weingartner	
HX28108504.36	CTD66-Start	GAK1	3/25/04	1935	59.8451	149.4681	270	Weingartner	
HX28108504.37	CTD66-End	GAK1	3/25/04	1956	59.8411	149.4728	270	Weingartner	
HX28108504.38	CalVET Net Tow-Start	GAK1	3/25/04	1959	59.8413	149.4738	270	Hopcroft	
HX28108504.39	CalVET Net Tow-End	GAK1	3/25/04	2010	59.8456	149.4678	270	Hopcroft	
HX28108504.40	CTD67-Start	GAK1	3/25/04	2010	59.8455	149.4679	270	Whitledge	prim prod cast
HX28108504.41	CTD67-End	GAK1	3/25/04	2018	59.8438	149.4712	270	Whitledge	
HX28108504.42	CTD68-Start	GAK1	3/25/04	2029	59.8418	149.4731	270	Hopcroft	zoop cast
HX28108504.43	CTD68-End	GAK1	3/25/04	2030	59.8415	149.4734	270	Hopcroft	
HX28108504.44	CTD69-Start	GAK1	3/25/04	2037	59.8401	149.4745	270	Hopcroft	zoop cast
HX28108504.45	CTD69-End	GAK1	3/25/04	2039	59.8396	149.4749	270	Hopcroft	
HX28108504.46	CTD70-Start	GAK1	3/25/04	2046	59.8381	149.4758	270	Hopcroft	zoop cast
HX28108504.47	CTD70-End	GAK1	3/25/04	2047	59.8377	149.4760	270	Hopcroft	
HX28108504.48	CTD71-Start	GAK1	3/25/04	2053	59.8364	149.4767	270	Hopcroft	zoop cast
HX28108504.49	CTD71-End	GAK1	3/25/04	2055	59.8359	149.4769	270	Hopcroft	
HX28108504.50	Ring Net-Start	GAK1	3/25/04	2104	59.8444	149.4659	270	Hopcroft	
HX28108504.51	Ring Net-End	GAK1	3/25/04	2110	59.8428	149.4645	270	Hopcroft	
HX28108504.52	Ring Net-Start	GAK1	3/25/04	2113	59.8424	149.4643	270	Hopcroft	
HX28108504.53	Ring Net-End	GAK1	3/25/04	2118	59.8410	149.4642	270	Hopcroft	
HX28108504.54	Ring Net-Start	GAK1	3/25/04	2121	59.8404	149.4643	270	Hopcroft	
HX28108504.55	Ring Net-Start	GAK1	3/25/04				270	Hopcroft	
HX28108604.01	MOCNESS-Start	GAK1	3/26/04	0715	59.8472	149.4678	270	Coyle	
HX28108604.02	MOCNESS-End	GAK1	3/26/04	0802	59.8803	149.4656	270	Coyle	
HX28108604.03	MOCNESS-Start	GAK2	3/26/04	0940	59.6920	149.3249	227	Coyle	
HX28108604.04	MOCNESS-End	GAK2	3/26/04	1014	59.7114	149.3501	227	Coyle	
HX28108604.05	MOCNESS-Start	GAK3	3/26/04	1137	59.5490	149.1873	215	Coyle	
HX28108604.06	MOCNESS-End	GAK3	3/26/04	1211	59.5245	149.1857	215	Coyle	
HX28108604.07	ADCP Line-Start	CF15	3/26/04	1330	59.4500	148.8668	188	Weingartner	
HX28108604.08	ADCP Line-End	CF1	3/26/04	1815	59.9087	148.8680	84	Weingartner	
HX28108604.09	CTD72-Start	CF1	3/26/04	1815	59.9088	148.8681	84	Weingartner	
HX28108604.10	CTD72-End	CF1	3/26/04	1823	59.9096	148.8712	84	Weingartner	
HX28108604.11	CTD73-Start	CF2	3/26/04	1836	59.8841	148.8660	116	Weingartner	
HX28108604.12	CTD73-End	CF2	3/26/04	1843	59.8839	148.8705	116	Weingartner	
HX28108604.13	CTD74-Start	CF3	3/26/04	1902	59.8506	148.8650	163	Weingartner	
HX28108604.14	CTD74-End	CF3	3/26/04	1927	59.8157	148.8646	163	Weingartner	
HX28108604.15	CTD75-Start	CF4	3/26/04	1928	59.8158	148.8643	183	Weingartner	

HX28108604.16	CTD75-End	CF4	3/26/04	1938	59.8155	148.8646	183	Weingartner	
HX28108604.17	CTD76-Start	CF5	3/26/04	1952	59.7839	148.8667	191	Weingartner	
HX28108604.18	CTD76-End	CF5	3/26/04	2007	59.7840	148.8668	191	Weingartner	
HX28108604.19	CTD77-Start	CF6	3/26/04	2023	59.7480	148.8700	188	Weingartner	
HX28108604.20	CTD77-End	CF6	3/26/04	2034	59.7485	148.8732	188	Weingartner	
HX28108604.21	CTD78-Start	CF7	3/26/04	2048	59.7167	148.8673	181	Weingartner	
HX28108604.22	CTD78-End	CF7	3/26/04	2102	59.7179	148.8737	181	Weingartner	
HX28108604.23	CTD79-Start	CF8	3/26/04	2119	59.6832	148.8661	179	Weingartner	
HX28108604.24	CTD79-End	CF8	3/26/04	2131	59.6844	148.8682	179	Weingartner	
HX28108604.25	CTD80-Start	CF9	3/26/04	2147	59.6499	148.8661	179	Weingartner	
HX28108604.26	CTD80-End	CF9	3/26/04	2201	59.6511	148.8694	179	Weingartner	
HX28108604.27	CTD81-Start	CF10	3/26/04	2219	59.6171	148.8657	180	Weingartner	
HX28108604.28	CTD81-End	CF10	3/26/04	2230	59.6187	148.8715	180	Weingartner	
HX28108604.29	CTD82-Start	CF11	3/26/04	2247	59.5839	148.8649	177	Weingartner	
HX28108604.30	CTD82-End	CF11	3/26/04	2302	59.5871	148.8699	177	Weingartner	
HX28108604.31	CTD83-Start	CF12	3/26/04	2320	59.5509	148.8648	182	Weingartner	
HX28108604.32	CTD83-End	CF12	3/26/04	2332	59.5527	148.8688	182	Weingartner	
HX28108604.33	CTD84-Start	CF13	3/26/04	2351	59.5166	148.8651	173	Weingartner	
HX28108704.01	CTD84-End	CF13	3/27/04	0004	59.5188	148.8694	173	Weingartner	
HX28108704.02	CTD85-Start	CF14	3/27/04	0020	59.4844	148.8647	170	Weingartner	
HX28108704.03	CTD85-End	CF14	3/27/04	0032	59.4860	148.8652	170	Weingartner	
HX28108704.04	CTD86-Start	CF15	3/27/04	0051	59.4514	148.8648	170	Weingartner	
HX28108704.05	CTD86-End	CF15	3/27/04	0105	59.4535	148.8669	170	Weingartner	
HX28108704.06	ADCP Line-Start	XXX	3/27/04	0439	59.8775	148.0841	55	Weingartner	ADCP transducer alignment test/survey
HX28108704.07	ADCP Line-End	XXX	3/27/04	2021	59.6006	149.0003	173	Weingartner	
HX28108704.08	CTD87-Start	GAK1	3/27/04	2221	59.8450	149.4689	270	Weingartner	
HX28108704.09	CTD87-End	GAK1	3/27/04				270	Weingartner	
HX28108704.10	CTD88-Start	RES2.5	3/27/04	2346	60.0253	149.3591	296	Weingartner	
HX28108704.11	CTD88-Start	RES2.5	3/27/04				296	Weingartner	