

GLOBEC CRUISE REPORT
Cruise HX279, 7-17 October 2003

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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.

October 2003 is the seventh consecutive October sampled by the GOA GLOBEC LTOP group. October is a transitional month characterized by typically warm water temperatures and a large standing stock of fresh water due to the runoff of late summer and early fall. Surface wind mixing and cooling breaks down the near-surface thermohaline stratification as the ocean waters progress into winter conditions.

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 and microzooplankton.
4. Determine the distribution and abundance of seabirds and marine mammals.
5. Determine copepod and euphausiid rates of growth and egg production.
6. Characterize the carbon and nitrogen stable isotope concentrations in zooplankton.

SAMPLING

DAYTIME ACTIVITIES

1. Occupied the hydrographic transects (Table 1) and collected vertical CTD-chlorophyll-PAR profiles.
2. Collected ADCP, sea surface salinity (SSS), temperature (SST) and fluorescence (SSF) using seacrest sensors,
3. Collected discrete bottle samples at these stations for nutrients and chlorophyll pigments. Chlorophyll size fractionation was done at the whole numbered Seward Line stations and at every other C. Fairfield Line station.
4. Measured primary productivity at stations GAK1, GAK4, GAK9, GAK13, and KIP2.
5. Observed and documented marine mammal and seabird distributions from the bridge.
6. One CalVet Net cast was done (the CalVet frame has 4 nets) on the Seward Line stations and at selected HE and Prince William Sound stations. There were two fine mesh nets (.053mm) and two large mesh nets (.150mm) on each tow.
7. At Seward Line stations GAK1, GAK4, GAK9, GAK13) and KIP2 station Liu performed 3-6 casts with the 10-liter Niskins/Rosette to collect water for zooplankton incubations. This was accompanied by two to three ring net tows over the upper 50m.
8. We did deep MOCNESS tows (to 600 m) near the end of the Seward Line at station GAK13 and at station PWS2 in Prince William Sound.

NIGHTTIME ACTIVITIES

1. Hydroacoustic samples and MOCNESS discrete samples were taken along the Seward Line, and at select PWS and Hinchinbrook Entrance Stations (see Event Log for details).
2. In addition to the normal .5mm mesh nets, fine mesh nets (.100 mm) were swapped into the MOCNESS at intermittent stations for euphausiid collection.

Cruise chronology:

We were extremely lucky with the weather this October after having seen week after week of storms come through the Gulf before our trip. The first five days of our cruise passed with generally calm seas and winds below 20 knots, much of the time below 15 knots. Seas were excited from a previous storm when we left Seward and the forecast was for 2-3 days of good weather so we elected to transit on the first day to the outer portion of the Seward Line to begin work. Over twelve hours of darkness on this cruise gave us ample time to sample with the MOCNESS, so we were able to finish sampling on the Seward Line in about four days. We completed the four deep CTD casts on the first day of CTD sampling and the equipment all worked well. After that day, though, we were plagued by some undetermined CTD problem. Over the course of the next week we needed to re-terminate the CTD cable numerous times, achieving only about 4-5 casts per termination. We continued in this fashion sampling the Cape Fairfield and Hinchinbrook Entrance Lines. By the time we had finished the zooplankton work in Hinchinbrook Entrance winds were up to 30 knots and we slipped into Prince William Sound to do our work in protected waters. The CTD problems appeared to finally go away when we removed the PAR sensor, the Altimeter and the ISUS (nitrate profiler) from the system. Also at this time we covered the slipping assembly and through-vessel connection of the hydrocable wire with a plastic bag. The PAR, Altimeter, and ISUS sensors were not on the CTD for the Montague Strait and Hogan Bay lines. We replaced the ISUS the PAR sensor from the 10-liter rosette frame for the final primary productivity study at KIP2 on 10/15. A developing low pressure system over the Gulf and forecast higher winds prompted us to return to Seward after completing our work in Prince William Sound on the morning of 10/17. Martech Aldrich tested the hydrocable between the CTD deck unit and the winch upon return to Seward and indicated that there were problems in that section of wire and it would be replaced before the next cruise. [NOTE: In retrospect, we determined that the likely root of the problem was the ISUS instrument attempting to scavenge too much power from the Seabird 911 underwater unit. S.D, 2005.]

Summary of Samples Taken:

Physics (S. Danielson):

We completed 95 CTD casts during this cruise. For the Seward, Cape Fairfield and Hinchinbrook Entrance Lines we had as auxiliary sensors: fluorometer, PAR, Altimeter and ISUS (In-Situ Ultraviolet Spectroscopy, a continuous NO₃ profiler). All instruments worked well except for the CTD troubles noted in the chronology above and two casts on the Cape Fairfield Line that had sporadic fluorometer spikes to zero voltage on the downcasts. This was fixed by replacing the cable between the CTD and the fluorometer when we found corrosion on this cable.

The nearshore appeared to be extremely fresh this October (minimum salinity at GAK1 ~ 26 PSU) and everywhere the 0-100m temperatures appeared to be fairly high, with most stations, especially the nearshore stations, having subsurface temperature maxima of ~10-12 °C. These may be the warmest October waters sampled during the GLOBEC years.

Underway ADCP measurements depicted strong NE flow near the shelf break. Vessel set in the coastal region was strongly to the west for most of the Cape Fairfield Line stations. ADCP transects were occupied in conjunction with the HTI transects along the Seward Line. After completion of the Cape Fairfield CTD transect we turned around and occupied the line with the ADCP, steaming at 6 knots.

Zooplankton (K.Coyle):

Zooplankton abundance and biomass was assessed with two gear types. The large zooplankton and micronekton were sampled with a 1-m² 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):

Chlorophyll and nutrient 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. Nutrient samples were run on board and chlorophyll samples will be analyzed back in Seward. In addition, continuous Nitrate profiles were collected with ISUS (In-Situ Ultraviolet Spectroscopy) during each CTD cast, except for the Montague and Hogan Bay Lines. 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.

Seabirds and Marine Mammals (L. DeSousa):

Seabird and marine mammal surveys were conducted on the Seward Line Transect and partially along the Cape Fairfield and Hinchinbrook Entrance transects. Data on species, behavior, number of individuals, time, date, position (latitude and longitude) and observation conditions were recorded to an ACCESS database. Seabird sightings were scarce along all transects with occasional sightings of Dall's Porpoise (*Phocoenoides dalli*) along the Seward Line.

Stable C and N Isotopes (Kline):

Samples for stable isotope analysis (SIA) were collected from MOCNESS tows made during HX279. 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.

Neuston Trawls (Gibson):

Using a neuston (NIO) net samples were taken to determine the abundance and biomass of zooplankton in the upper one meter of the water column. A total of nineteen samples were taken at stations GAK1-GAK7, GAK9, GAK11, GAK13, MS2, HE2, HE4 HE6.5,

HE10, HB2, KIP2, PWS1 and PWS2. The net used for sample collection had a mesh size of 500 μ m and a 1m² mouth opening. At each sample station the NIO net was deployed for duration of 10 minutes while the ship maintained a speed of two knots. A calibrated flow meter was attached across the mouth of the net to ascertain volume of water filtered. Every effort was made to keep the bridle at or just below the surface. After collection each sample was preserved in a glass jar with a 10% formalin solution. Throughout this cruise a large amount of gelatinous plankton was found in each sample, notable on the mid and outer GAK line where there was an abundance of salps.

Microplankton (Foy):

Samples were taken to determine microplankton abundance and biomass, either as discrete vertical samples or as integrated samples. Vertical samples consisted of sampling from depths 0m, 20, 30, 50m, & 100m and were taken at GAK 2,4,6,8,10,11,13 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 GAK1, GAK3, GAK5, GAK7, GAK9, GAK12, CF3, CF9, MS2 and KIP2. Above samples were filtered and prepared for epifluorescent microscopy as well as preserved in acid Lugols. Samples were also taken for flow cytometry.

Fluorescence at all stations was relatively low (~0.5V) in the upper mixed layer. The phytoplankton community at stations along the Seward Line and in Prince William Sound was primarily composed of small autotrophic flagellates. Diatoms were present at all stations (assorted small centrics, chaetoceros, pseudonitzchia) but were never abundant or dominant. Cyanobacteria abundance was high at all stations. Heterotrophic dinoflagellates were common at all stations, and a number of ceratium species were seen at some stations.

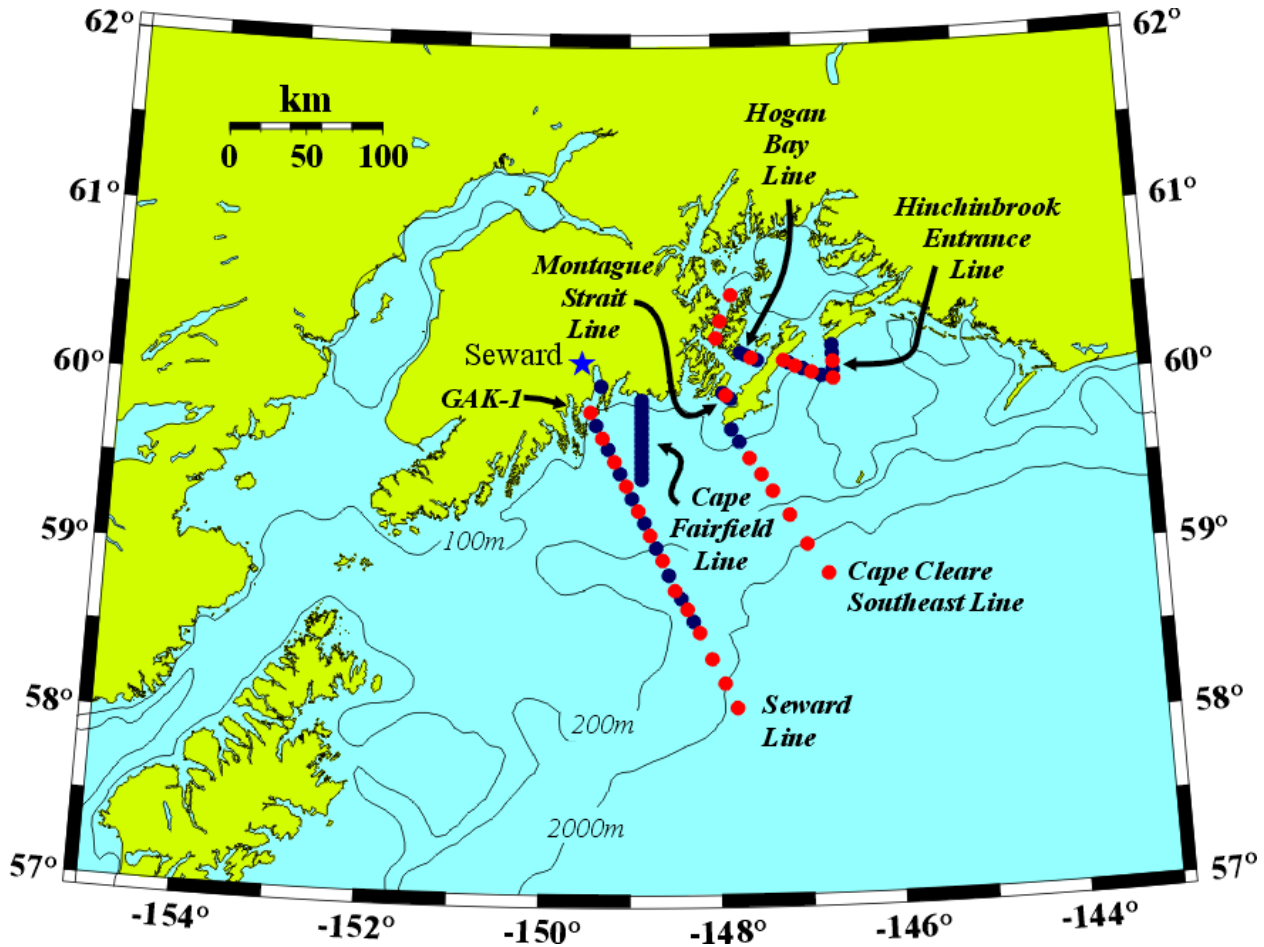
Table 1.

NEP GLOBEC LTOP STANDARD STATIONS				
Latitude N (degrees, minutes)		Longitude W (degrees, minutes)		Station Name
<i>Resurrection Bay Station</i>				
60	1.5	149	21.5	RES2.5
<i>Seward Line</i>				
59	50.7	149	28	GAK1
59	46	149	23.8	GAK1I
59	41.5	149	19.6	GAK2
59	37.6	149	15.5	GAK2I
59	33.2	149	11.3	GAK3
59	28.9	149	7.1	GAK3I
59	24.5	149	2.9	GAK4
59	20.1	148	58.7	GAK4I
59	15.7	148	54.5	GAK5
59	11.4	148	50.3	GAK5I
59	7	148	46.2	GAK6
59	2.7	148	42	GAK6I
58	58.3	148	37.8	GAK7
58	52.9	148	33.6	GAK7I
58	47.5	148	29.4	GAK8
58	44.6	148	25.2	GAK8I
58	40.8	148	21	GAK9
58	36.7	148	16.7	GAK9I
58	32.5	148	12.7	GAK10
58	23.3	148	4.3	GAK11
58	14.6	147	56	GAK12
58	5.9	147	47.6	GAK13
<i>Cape Fairfield Line</i>				
59	54.5	148	52	CF1
59	53	148	52	CF2
59	51	148	52	CF3
59	49	148	52	CF4
59	47	148	52	CF5
59	45	148	52	CF6
59	43	148	52	CF7
59	41	148	52	CF8

59	39	148	52	CF9
59	37	148	52	CF10
59	35	148	52	CF11
59	33	148	52	CF12
59	31	148	52	CF13
59	29	148	52	CF14
59	27	148	52	CF15
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

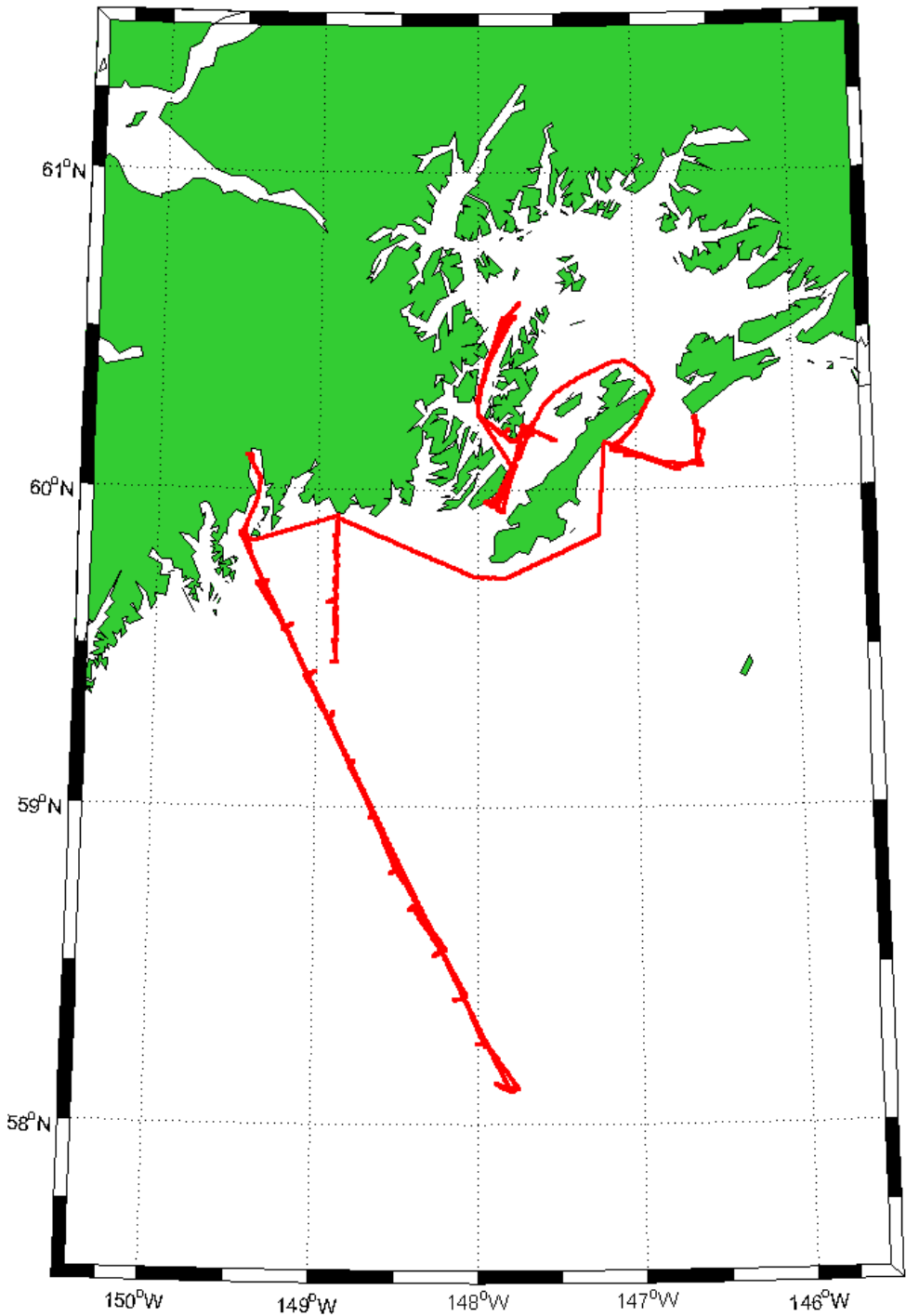
59	3.5	146	58	CCSE7
58	53	146	44	CCSE8

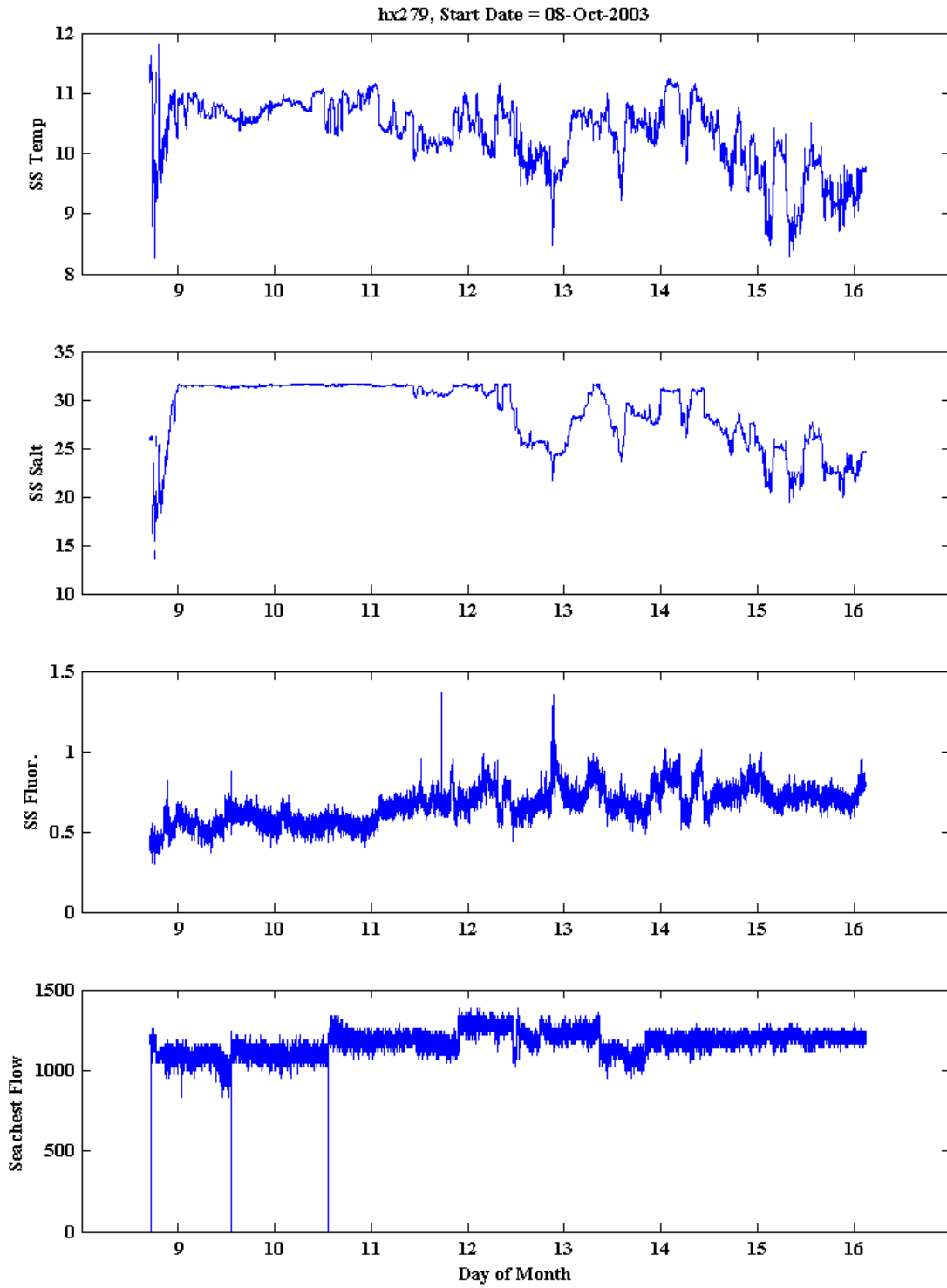
NEP GLOBEC Standard Station Map

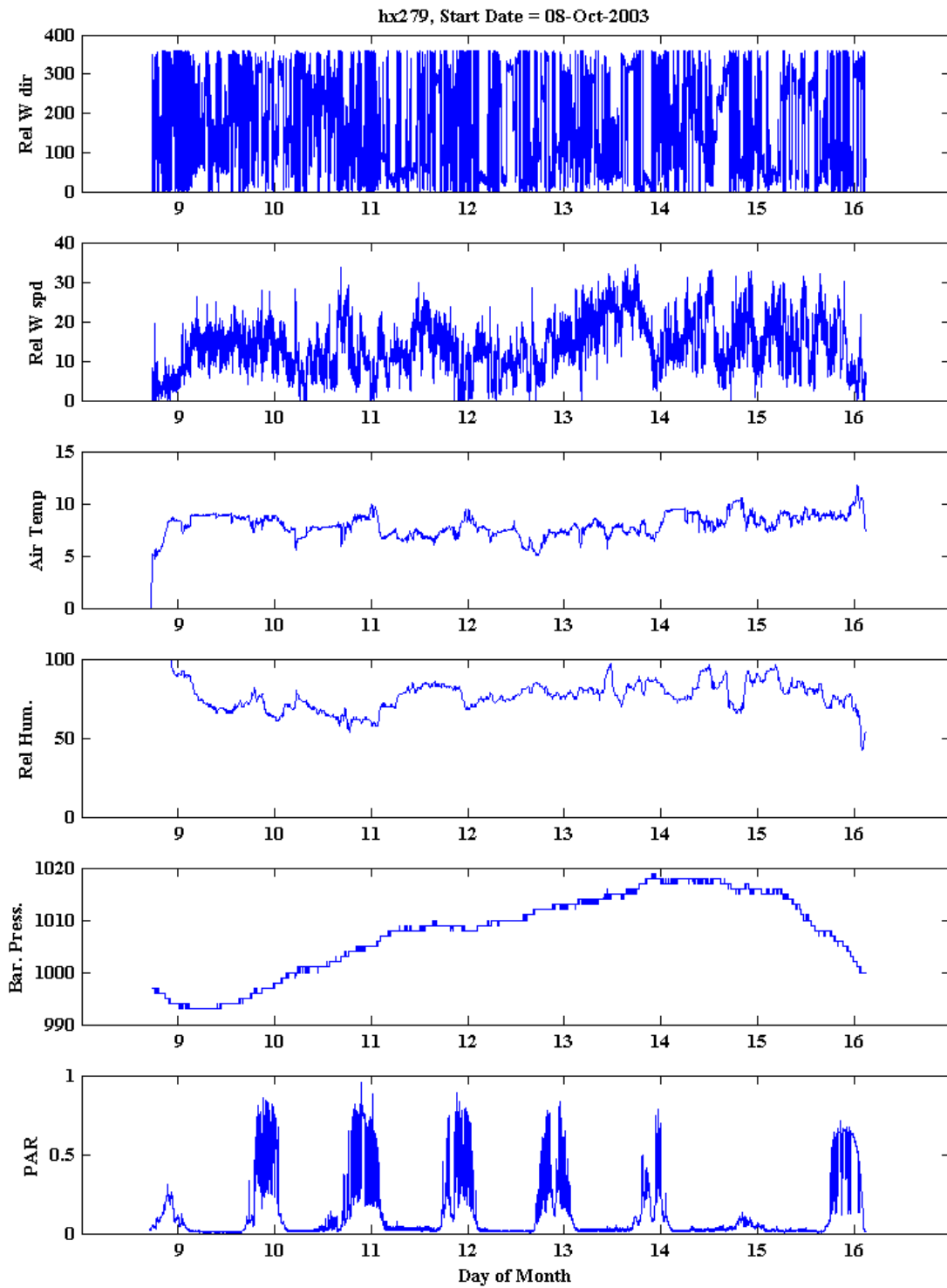


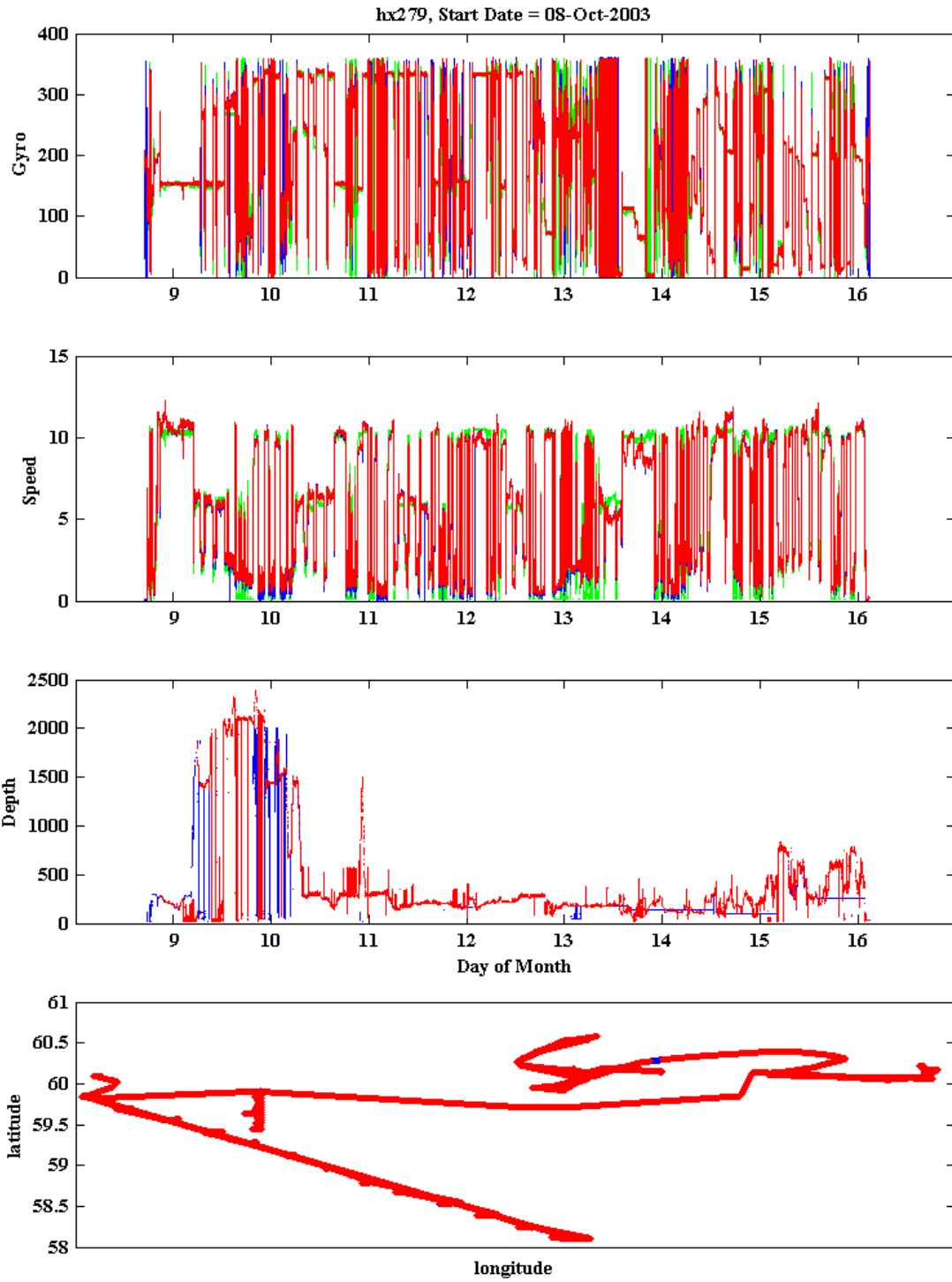
Note: The Cape Cleare Southeast Line is a standard line only in select cruises during the Process Study sampling years.

hx279 Cruise Track









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

Event #	Description	Station	Date	GMT	Latitude	Longitude	Depth	Comments	Scientist
HX27928103.001	CTD1-Start	RES2.5	10/8/2003	20:14	59.944	149.3857	300		Danielson
HX27928103.002	CTD1-End	RES2.5	10/8/2003	20:15	59.9418	149.3875	300		Danielson
HX27928203.001	HTI Transect-Start	GAK10	10/9/2003	5:28	58.5397	148.2108	na		Coyle
HX27928203.002	HTI Transect-End	GAK11	10/9/2003	6:42	58.3878	148.0706	1438		Coyle
HX27928203.003	MOCNESS-Start	GAK11	10/9/2003	6:44	58.3884	148.0723	1438		Coyle
HX27928203.004	MOCNESS-End	GAK11	10/9/2003	7:33	58.3852	148.1308	1438		Coyle
HX27928203.005	HTI Transect-Start	GAK11	10/9/2003	7:59	58.388	148.0712	1438		Coyle
HX27928203.006	HTI Transect-End	GAK12	10/9/2003	9:38	58.2429	147.9325	2000		Coyle
HX27928203.007	MOCNESS-Start	GAK12	10/9/2003	9:40	58.2437	147.9351	2000		Coyle
HX27928203.008	MOCNESS-End	GAK12	10/9/2003	10:16	58.246	147.9875	2000		Coyle
HX27928203.009	HTI Transect-Start	GAK12	10/9/2003	10:48	58.2423	147.9333	2000		Coyle
HX27928203.010	HTI Transect-End	GAK13	10/9/2003	12:30	58.0994	147.7917	2101		Coyle
HX27928203.011	MOCNESS-Start	GAK13	10/9/2003	12:32	58.1004	147.7947	2101		Coyle
HX27928203.012	MOCNESS-End	GAK13	10/9/2003	13:07	58.1063	147.8367	2101		Coyle
HX27928203.013	MOCNESS-Start	GAK13	10/9/2003	13:37	58.1016	147.7903	2101		Coyle
HX27928203.014	MOCNESS-End	GAK13	10/9/2003	14:59	58.1199	147.8763	2101		Coyle
HX27928203.015	CalVET Net Tow-Start	GAK13	10/9/2003	15:26	58.0988	147.7928	2101		Hopcroft
HX27928203.016	CalVET Net Tow-End	GAK13	10/9/2003	15:30	58.0998	147.7902	2101		Hopcroft
HX27928203.017	CTD002-Start	GAK13	10/9/2003	15:35	58.1011	147.7897	2101	zoop cast 1	Hopcroft
HX27928203.018	CTD002-End	GAK13	10/9/2003	15:44	58.1039	147.7853	2101		Hopcroft
HX27928203.019	CTD003-Start	GAK13	10/9/2003	15:51	58.1058	147.7814	2101	zoop cast 2	Hopcroft
HX27928203.020	CTD003-End	GAK13	10/9/2003	15:55	58.1068	147.7795	2101		Hopcroft
HX27928203.021	CTD004-Start	GAK13	10/9/2003	16:06	58.0995	147.7905	2101	zoop cast 3	Hopcroft
HX27928203.022	CTD004-End	GAK13	10/9/2003	16:10	58.1001	147.7883	2101		Hopcroft
HX27928203.023	CTD005-Start	GAK13	10/9/2003	16:20	58.0979	147.792	2101	zoop cast 4	Hopcroft
HX27928203.024	CTD005-End	GAK13	10/9/2003	16:23	58.0983	147.7893	2101		Hopcroft
HX27928203.025	CTD006-Start	GAK13	10/9/2003	16:30	58.0994	147.7849	2101	zoop cast 5	Hopcroft
HX27928203.026	CTD006-End	GAK13	10/9/2003	16:33	58.1	147.7824	2101		Hopcroft
HX27928203.027	Ring Net-Start	GAK13	10/9/2003	16:43	58.0997	147.7908	2101		Hopcroft
HX27928203.028	Ring Net-End	GAK13	10/9/2003	16:47	58.0998	147.7881	2101		Hopcroft
HX27928203.029	CTD007-Start	GAK13	10/9/2003	16:55	58.1005	147.7841	2092	prim prod cast	Whitledge
HX27928203.030	CTD007-End	GAK13	10/9/2003	17:09	58.1023	147.7745	2092		Whitledge
HX27928203.031	Neuston Net-Start	GAK13	10/9/2003	17:57	58.0997	147.779	2092		Gibson

HX27928203.032	Neuston Net-End	GAK13	10/9/2003	18:08	58.0954	147.7791	2092		Gibson
HX27928203.033	CTD008-Start	GAK13	10/9/2003	18:16	58.0985	147.7937	2092		Danielson
HX27928203.034	CTD008-End	GAK13	10/9/2003	19:38	58.1041	147.7466	2092		Danielson
HX27928203.035	CalVET Net Tow-Start	GAK12	10/9/2003	20:48	58.244	147.9335	2174		Hopcroft
HX27928203.036	CalVET Net Tow-End	GAK12	10/9/2003	20:54	58.2435	147.934	2174		Hopcroft
HX27928203.037	CTD009-Start	GAK12	10/9/2003	20:59	58.2433	147.9362	2174		Danielson
HX27928203.038	CTD009-End	GAK12	10/9/2003	22:16	58.2368	147.9446	2174		Danielson
HX27928203.039	CalVET Net Tow-Start	GAK11	10/9/2003	23:21	58.3899	148.0723	2174		Hopcroft
HX27928203.040	CalVET Net Tow-End	GAK11	10/9/2003	23:27	58.3903	148.0719	2174		Hopcroft
HX27928203.041	neuston-Start	GAK11	10/9/2003	23:33	58.3902	148.078	2174		Gibson
HX27928203.042	neuston-End	GAK11	10/9/2003	23:40	58.3896	148.086	2174		Gibson
HX27928203.043	CTD010-Start	GAK11	10/9/2003	23:48	58.388	148.0722	1432		Danielson
HX27928303.001	CTD010-End	GAK11	10/10/2003	1:00	58.3971	148.0598	1432		Danielson
HX27928303.002	CalVET Net Tow-Start	GAK10	10/10/2003	2:13	58.5418	148.209	1461		Hopcroft
HX27928303.003	CalVET Net Tow-End	GAK10	10/10/2003	2:18	58.5415	148.2069	1461		Hopcroft
HX27928303.004	CTD011-Start	GAK10	10/10/2003	2:21	58.5416	148.2052	1461		Danielson
HX27928303.005	CTD011-End	GAK10	10/10/2003	3:37	58.5413	148.1824	1461		Danielson
HX27928303.006	CTD012-Start	GAK9i	10/10/2003	4:17	58.6106	148.2798	675		Danielson
HX27928303.007	CTD012-End	GAK9i	10/10/2003	4:52	58.6067	148.2735	675		Danielson
HX27928303.008	MOCNESS-Start	GAK10	10/10/2003	5:30	58.5376	148.221	1443		Coyle
HX27928303.009	MOCNESS-End	GAK10	10/10/2003	6:10	58.5377	148.2138	1443		Coyle
HX27928303.010	HTI Transect-Start	GAK10	10/10/2003	6:28	58.5419	148.2124	1443		Coyle
HX27928303.011	HTI Transect-End	GAK9	10/10/2003	8:02	58.6807	148.3511	280		Coyle
HX27928303.012	MOCNESS-Start	GAK9	10/10/2003	8:04	58.6799	148.3559	280		Coyle
HX27928303.013	MOCNESS-End	GAK9	10/10/2003	8:40	58.6693	148.405	264		Coyle
HX27928303.014	HTI Transect-Start	GAK9	10/10/2003	9:07	58.6807	148.3516	264		Coyle
HX27928303.015	HTI Transect-End	GAK8	10/10/2003	10:21	58.7925	148.4908	292		Coyle
HX27928303.016	MOCNESS-Start	GAK8	10/10/2003	10:23	58.7921	148.4935	292		Coyle
HX27928303.017	MOCNESS-End	GAK8	10/10/2003	10:52	58.7834	148.523	292		Coyle
HX27928303.018	HTI Transect-Start	GAK8	10/10/2003	11:11	58.7947	148.4926	292		Coyle
HX27928303.019	HTI Transect-End	GAK7	10/10/2003	12:59	58.9722	148.6316	242		Coyle
HX27928303.020	MOCNESS-Start	GAK7	10/10/2003	13:01	58.9714	148.6329	242		Coyle
HX27928303.021	MOCNESS-End	GAK7	10/10/2003	13:34	58.9587	148.6476	242		Coyle
HX27928303.022	HTI Transect-Start	GAK7	10/10/2003	13:50	58.973	148.6309	242		Coyle
HX27928303.023	HTI Transect-End	GAK6	10/10/2003	15:21	59.1172	148.7704	149		Coyle
HX27928303.024	CTD013-Start	GAK9	10/10/2003	18:23	58.6801	148.349	280		Danielson
HX27928303.025	CTD013-End	GAK9	10/10/2003	18:44	58.6815	148.3563	280		Danielson

HX27928303.026	CalVET Net Tow-Start	GAK9	10/10/2003	18:50	58.681	148.3585	280		Hopcroft
HX27928303.027	CalVET Net Tow-End	GAK9	10/10/2003	18:57	58.6816	148.3614	280		Hopcroft
HX27928303.028	Ring Net-Start	GAK9	10/10/2003	18:59	58.6818	148.3629	280		Hopcroft
HX27928303.029	Ring Net-End	GAK9	10/10/2003	19:06	58.6824	148.3664	280		Hopcroft
HX27928303.030	CTD014-Start	GAK9	10/10/2003	19:13	58.6806	148.3502	280	Prim Prod cast	Whitledge
HX27928303.031	CTD014-End	GAK9	10/10/2003	19:23	58.6821	148.3551	280		Whitledge
HX27928303.032	Ring Net-Start	GAK9	10/10/2003	19:33	58.6793	148.3522	280		Hopcroft
HX27928303.033	CTD015-Start	GAK9	10/10/2003	19:49	58.6809	148.3515	280	zoop cast 1	Hopcroft
HX27928303.034	CTD015-End	GAK9	10/10/2003	19:52	58.6815	148.3526	280		Hopcroft
HX27928303.035	CTD016-Start	GAK9	10/10/2003	19:59	58.6825	148.3554	280	zoop cast 2	Hopcroft
HX27928303.036	CTD016-End	GAK9	10/10/2003	20:01	58.6827	148.3562	280		Hopcroft
HX27928303.037	CTD017-Start	GAK9	10/10/2003	20:08	58.6834	148.3584	280	zoop cast 3	Hopcroft
HX27928303.038	CTD017-End	GAK9	10/10/2003	20:11	58.6837	148.3596	280		Hopcroft
HX27928303.039	CTD018-Start	GAK9	10/10/2003	20:15	58.6842	148.3614	280	zoop cast 4	Hopcroft
HX27928303.040	CTD018-End	GAK9	10/10/2003	20:19	58.6848	148.363	280		Hopcroft
HX27928303.041	CTD019-Start	GAK9	10/10/2003	20:23	58.6851	148.3643	280	zoop cast 5	Hopcroft
HX27928303.042	CTD019-End	GAK9	10/10/2003	20:25	58.6855	148.3652	280		Hopcroft
HX27928303.043	Ring Net-Start	GAK9	10/10/2003	20:44	58.6809	148.3595	280		Hopcroft
HX27928303.044	Ring Net-End	GAK9	10/10/2003	20:50	58.6818	148.3625	280		Hopcroft
HX27928303.045	Ring Net-Start	GAK9	10/10/2003	20:55	58.6811	148.3681	280		Hopcroft
HX27928303.046	Ring Net-End	GAK9	10/10/2003	21:01	58.6815	148.3705	280		Hopcroft
HX27928303.047	Neuston trawl-Start	GAK9	10/10/2003	21:07	58.6811	148.3763	280		Gibson
HX27928303.048	Neuston trawl-End	GAK9	10/10/2003	21:17	58.6774	148.3879	280		Gibson
HX27928303.049	CTD020-Start	GAK8i	10/10/2003	23:43	58.7449	148.4188	287		Danielson
HX27928403.001	CTD020-End	GAK8i	10/11/2003	0:02	58.7488	148.4173	287		Danielson
HX27928403.002	CTD021-Start	GAK8i	10/11/2003	0:08	58.7499	148.4161	287	redo for upper 75 m	Danielson
HX27928403.003	CTD021-End	GAK8i	10/11/2003	0:18	58.7522	148.4151	287		Danielson
HX27928403.004	CalVET Net Tow-Start	GAK8	10/11/2003	0:42	58.7934	148.4881	290		Hopcroft
HX27928403.005	CalVET Net Tow-End	GAK8	10/11/2003	0:48	58.7951	148.4855	290		Hopcroft
HX27928403.006	CTD022-Start	GAK8	10/11/2003	0:50	58.7957	148.485	290		Danielson
HX27928403.007	CTD022-End	GAK8	10/11/2003	1:13	58.8002	148.477	290		Danielson
HX27928403.008	neuston trawl-Start	GAK8	10/11/2003	1:15	58.8019	148.477	290		Gibson
HX27928403.009	neuston trawl-End	GAK8	10/11/2003	1:26	58.809	148.4772	290		Gibson
HX27928403.010	CTD023-Start	GAK8	10/11/2003	2:00	58.8818	148.5597	299	ctd 23 failed	Danielson
HX27928403.011	CTD023-End	GAK7i	10/11/2003	2:28	58.8834	148.5605	299		Danielson
HX27928403.012	CTD024-Start	GAK7i	10/11/2003	2:31	58.8835	148.5607	299	ctd 24 failed, will reterminate	Danielson
HX27928403.013	CTD024-End	GAK7i	10/11/2003	2:42	58.8837	148.562	299		Danielson
HX27928403.014	CTD025-Start	GAK7i	10/11/2003	3:56	58.8814	148.5581	299		Danielson
HX27928403.015	CTD025-End	GAK7i	10/11/2003	4:08	58.8814	148.5564	299	ISUS not working	Danielson

HX27928403.016	CTD025-Start	GAK7i	10/11/2003	4:12	58.8811	148.5556	299	ISUS appears to be working	Danielson
HX27928403.017	CTD025-End	GAK7i	10/11/2003	4:31	58.8808	148.5577	299	pump quit @60m ISUS not working, pump back on @80m	Danielson
HX27928403.018	CTD026-Start	GAK6	10/11/2003	6:10	59.1173	148.772	148	test	martech
HX27928403.019	CTD026-End	GAK6	10/11/2003	6:20	59.1173	148.772	148	test	martech
HX27928403.020	MOCNESS-Start	GAK6	10/11/2003	6:25	59.1209	148.7753	148		Coyle
HX27928403.021	MOCNESS-End	GAK6	10/11/2003	6:55	59.1341	148.7531	148		Coyle
HX27928403.022	HTI Transect-Start	GAK6	10/11/2003	7:16	59.1174	148.7703	148		Coyle
HX27928403.023	HTI Transect-End	GAK5	10/11/2003	8:44	59.2622	148.9087	168		Coyle
HX27928403.024	MOCNESS-Start	GAK5	10/11/2003	8:46	59.2647	148.9076	168		Coyle
HX27928403.025	MOCNESS-End	GAK5	10/11/2003	9:17	59.2852	148.8853	168		Coyle
HX27928403.026	CTD27-Start	GAK5	10/11/2003	9:24	59.2893	148.8819	168		Danielson
HX27928403.027	CTD27-end	GAK5	10/11/2003	9:24	59.2893	148.8819	168		Danielson
HX27928403.028	HTI Transect-Start	GAK5	10/11/2003	9:56	59.2624	148.9089	168		Coyle
HX27928403.029	HTI Transect-End	GAK4	10/11/2003	11:28	59.4044	149.0437	200		Coyle
HX27928403.030	MOCNESS-Start	GAK4	10/11/2003	11:31	59.4061	149.0403	200		Coyle
HX27928403.031	MOCNESS-End	GAK4	10/11/2003	12:07	59.4164	149.0025	200		Coyle
HX27928403.032	CTD028-Start	GAK6	10/11/2003	12:15	59.4164	149.0025	200	test	martech
HX27928403.033	CTD028-End	GAK6	10/11/2003	12:30	59.4164	149.0025	200	test	martech
HX27928403.034	HTI Transect-Start	GAK4	10/11/2003	12:43	59.4055	149.0458	200		Coyle
HX27928403.035	HTI Transect-End	GAK3	10/11/2003	14:27	59.5535	149.1881	212		Coyle
HX27928403.036	MOCNESS-Start	GAK3	10/11/2003	14:31	59.5536	149.1872	212		Coyle
HX27928403.037	MOCNESS-End	GAK3	10/11/2003	15:13	59.5655	149.1472	212		Coyle
HX27928403.038	CalVET Net Tow-Start	GAK3	10/11/2003	15:29	59.5509	149.1859	212		Hopcroft
HX27928403.039	CalVET Net Tow-End	GAK3	10/11/2003	15:34	59.5499	149.1873	212		Hopcroft
HX27928403.040	Neuston trawl-Start	GAK3	10/11/2003	15:51	59.5537	149.1903	212		Gibson
HX27928403.041	Neuston trawl-End	GAK3	10/11/2003	16:01	59.5568	149.1857	212		Gibson
HX27928403.042	CalVET Net Tow-Start	GAK4	10/11/2003	17:03	59.4074	149.0474	212		Hopcroft
HX27928403.043	CalVET Net Tow-End	GAK4	10/11/2003	17:09	59.4057	149.0488	212		Hopcroft
HX27928403.044	Neuston trawl-Start	GAK4	10/11/2003	17:10	59.4049	149.0474	212		Gibson
HX27928403.045	Neuston trawl-End	GAK4	10/11/2003	17:21	59.4057	149.0354	212		Gibson
HX27928403.046	Water-buckets-Start	GAK4	10/11/2003	17:22	59.4061	149.0356	212		Hopcroft
HX27928403.047	Water-Buckets-End	GAK4	10/11/2003	18:03	59.4083	149.0505	212		Hopcroft

HX27928403.048	CTD029-Start	GAK4	10/11/2003	18:03	59.4083	149.0508	200		Danielson
HX27928403.049	CTD029-End	GAK4	10/11/2003	18:22	59.4047	149.0584	200		Danielson
HX27928403.050	Ring Net-Start	GAK4	10/11/2003	18:32	59.4071	149.0492	200		Hopcroft
HX27928403.051	Ring Net-End	GAK4	10/11/2003	18:38	59.4064	149.0521	200		Hopcroft
HX27928403.052	Ring Net-Start	GAK4	10/11/2003	18:39	59.4063	149.0524	200		Hopcroft
HX27928403.053	Ring Net-End	GAK4	10/11/2003	18:45	59.4055	149.0554	200		Hopcroft
HX27928403.054	CTD030-Start	GAK4	10/11/2003	18:51	59.4081	149.0504	200	Prim Prod cast	Whitledge
HX27928403.055	CTD030-End	GAK4	10/11/2003	18:59	59.4065	149.0543	200		Whitledge
HX27928403.056	Ring Net-Start	GAK4	10/11/2003	19:03	59.4066	149.0554	200		Hopcroft
HX27928403.057	Ring Net-End	GAK4	10/11/2003	19:10	59.4061	149.0586	200		Hopcroft
HX27928403.058	Ring Net-Start	GAK4	10/11/2003	19:12	59.4059	149.0596	200		Hopcroft
HX27928403.059	Ring Net-End	GAK4	10/11/2003	19:18	59.4052	149.0628	200		Hopcroft
HX27928403.060	CTD031-Start	GAK4i	10/11/2003	19:51	59.3358	148.9778	196		Danielson
HX27928403.061	CTD031-End	GAK4i	10/11/2003	20:07	59.3337	148.9837	196		Danielson
HX27928403.062	CalVET Net Tow-Start	GAK5	10/11/2003	20:42	59.262	148.9079	169		Hopcroft
HX27928403.063	CalVET Net Tow-End	GAK5	10/11/2003	20:47	59.2625	148.9088	169		Hopcroft
HX27928403.064	CTD032-Start	GAK5	10/11/2003	20:52	59.2633	148.9084	169		Danielson
HX27928403.065	CTD032-End	GAK5	10/11/2003	21:05	59.2639	148.9113	169		Danielson
HX27928403.066	neuston trawl- Start	GAK5	10/11/2003	21:10	59.2667	148.9101	169		Gibson
HX27928403.067	neuston trawl- End	GAK5	10/11/2003	21:23	59.2758	148.9064	169		Gibson
HX27928403.068	CalVET Net Tow-Start	GAK5	10/11/2003	21:26	59.2767	148.906	169	redo of 1st gak 5 calvet due to sample spillage	Hopcroft
HX27928403.069	CalVET Net Tow-End	GAK5	10/11/2003	21:31	59.2778	148.9071	169		Hopcroft
HX27928403.070	CTD033-Start	GAK5i	10/11/2003	22:14	59.1902	148.8388	167		Danielson
HX27928403.071	CTD033-End	GAK5i	10/11/2003	22:24	59.1909	148.8363	167		Danielson
HX27928403.072	CalVET Net Tow-Start	GAK6	10/11/2003	22:58	59.1166	148.7675	152		Hopcroft
HX27928403.073	CalVET Net Tow-End	GAK6	10/11/2003	23:03	59.1169	148.7675	152		Hopcroft
HX27928403.074	CTD034-Start	GAK6	10/11/2003	23:06	59.1171	148.7676	152		Danielson
HX27928403.075	CTD034-End	GAK6	10/11/2003	23:18	59.1174	148.7663	152		Danielson
HX27928403.076	Neuston Trawl- Start	GAK6	10/11/2003	23:22	59.1162	148.7645	152		Gibson
HX27928403.077	Neuston Trawl- End	GAK6	10/11/2003	23:32	59.1105	148.7569	152		Gibson
HX27928503.001	CTD035-Start	GAK6i	10/12/2003	0:01	59.0445	148.6983	192		Danielson
HX27928503.002	CTD035-End	GAK6i	10/12/2003	0:17	59.046	148.6955	192		Danielson
HX27928503.003	CalVET Net Tow-Start	GAK7	10/12/2003	0:51	58.9712	148.6302	244		Hopcroft
HX27928503.004	CalVET Net Tow-End	GAK7	10/12/2003	0:57	58.9717	148.6299	244		Hopcroft
HX27928503.005	CTD036-Start	GAK7	10/12/2003	0:58	58.9718	148.6297	244		Danielson
HX27928503.006	CTD036-End	GAK7	10/12/2003	1:14	58.9728	148.6279	244		Danielson
HX27928503.007	Neuston Trawl- Start	GAK7	10/12/2003	1:17	58.9745	148.6291	244		Gibson
HX27928503.008	Neuston Trawl-	GAK7	10/12/2003	1:27	58.981	148.6335	244		Gibson

	End								
HX27928503.009	CTD037-Start	GAK3i	10/12/2003	4:55	59.482	149.1182	202		Danielson
HX27928503.010	CTD037-End	GAK3i	10/12/2003	5:10	59.4798	149.1184	202		Danielson
HX27928503.011	CalVET Net Tow-Start	GAK3	10/12/2003	5:45	59.5528	149.1909	212		Hopcroft
HX27928503.012	CalVET Net Tow-End	GAK3	10/12/2003	5:51	59.5522	149.1938	212		Hopcroft
HX27928503.013	CTD038-Start	GAK3	10/12/2003	5:53	59.552	149.1946	212		Danielson
HX27928503.014	CTD038-End	GAK3	10/12/2003	6:10	59.5496	149.2003	212		Danielson
HX27928503.015	Neuston Trawl-Start	GAK3	10/12/2003	6:14	59.551	149.201	212		Gibson
HX27928503.016	Neuston Trawl-End	GAK3	10/12/2003	6:24	59.5553	149.2006	212		Gibson
HX27928503.017	CTD039-Start	GAK2i	10/12/2003	6:54	59.6272	149.2598	212		Danielson
HX27928503.018	CTD039-End	GAK2i	10/12/2003	7:10	59.627	149.2617	212		Danielson
HX27928503.019	CalVET Net Tow-Start	GAK2	10/12/2003	7:39	59.692	149.3311	225		Hopcroft
HX27928503.020	CalVET Net Tow-End	GAK2	10/12/2003	7:44	59.6926	149.3368	225		Hopcroft
HX27928503.021	CTD040-Start	GAK2	10/12/2003	7:47	59.6922	149.3414	225		Danielson
HX27928503.022	CTD040-End	GAK2	10/12/2003	8:07	59.691	149.363	225		Danielson
HX27928503.023	Neuston Trawl-Start	GAK2	10/12/2003	8:10	59.6925	149.3642	225		Gibson
HX27928503.024	Neuston Trawl-End	GAK2	10/12/2003	8:19	59.6965	149.3668	243		Gibson
HX27928503.025	HTI Transect-Start	GAK3	10/12/2003	9:46	59.5541	149.1893	214		Coyle
HX27928503.026	HTI Transect-End	GAK2	10/12/2003	11:09	59.6913	149.3262	226		Coyle
HX27928503.027	MOCNESS-Start	GAK2	10/12/2003	11:13	59.694	149.3238	226		Coyle
HX27928503.028	MOCNESS-End	GAK2	10/12/2003	11:52	59.7009	149.3068	226		Coyle
HX27928503.029	HTI Transect-Start	GAK2	10/12/2003	12:11	59.692	149.3275	226		Coyle
HX27928503.030	HTI Transect-End	GAK1	10/12/2003	13:50	59.8452	149.467	270		Coyle
HX27928503.031	MOCNESS-Start	GAK1	10/12/2003	13:52	59.8451	149.4669	270		Coyle
HX27928503.032	MOCNESS-End	GAK1	10/12/2003	14:33	59.8712	149.442	270		Coyle
HX27928503.033	CTD041-Start	GAK1i	10/12/2003	15:20	59.7661	149.3961	258		Danielson
HX27928503.034	CTD041-End	GAK1i	10/12/2003	15:38	59.7648	149.3972	258		Danielson
HX27928503.035	CTD042-Start	GAK1	10/12/2003	16:13	59.8451	149.4685	283		Danielson
HX27928503.036	CTD042-End	GAK1	10/12/2003	16:32	59.8437	149.4739	283		Danielson
HX27928503.037	CalVET Net Tow-Start	GAK1	10/12/2003	16:35	59.8443	149.4753	283		Hopcroft
HX27928503.038	CalVET Net Tow-End	GAK1	10/12/2003	16:40	59.8449	149.4777	283		Hopcroft
HX27928503.039	Neuston Trawl-Start	GAK1	10/12/2003	16:45	59.8459	149.4761	283		Gibson
HX27928503.040	Neuston Trawl-End	GAK1	10/12/2003	16:55	59.8524	149.4724	283		Gibson
HX27928503.041	CTD043-Start	GAK1	10/12/2003	17:02	59.8452	149.4693	268	prim prod cast	Whitledge
HX27928503.042	CTD043-End	GAK1	10/12/2003	17:11	59.8446	149.4691	268		Whitledge
HX27928503.043	CTD044-Start	GAK1	10/12/2003	17:27	59.8465	149.4711	268	zoop cast 1	Hopcroft
HX27928503.044	CTD044-End	GAK1	10/12/2003	17:30	59.8464	149.4721	268		Hopcroft

HX27928503.045	CTD045-Start	GAK1	10/12/2003	17:40	59.8462	149.4743	268	zoop cast 2	Hopcroft
HX27928503.046	CTD045-End	GAK1	10/12/2003	17:43	59.8462	149.4748	268		Hopcroft
HX27928503.047	CTD046-Start	GAK1	10/12/2003	17:52	59.8462	149.4762	268	zoop cast 3	Hopcroft
HX27928503.048	CTD046-End	GAK1	10/12/2003	17:54	59.8462	149.4765	268		Hopcroft
HX27928503.049	CTD047-Start	GAK1	10/12/2003	18:04	59.8464	149.4783	268	zoop cast 4	Hopcroft
HX27928503.050	CTD047-End	GAK1	10/12/2003	18:06	59.8464	149.4788	268		Hopcroft
HX27928503.051	Ring Net-Start	GAK1	10/12/2003	18:20	59.8452	149.4689	268		Hopcroft
HX27928503.052	Ring Net-End	GAK1	10/12/2003	18:25	59.8449	149.4692	268		Hopcroft
HX27928503.053	Ring Net-Start	GAK1	10/12/2003	18:29	59.8447	149.4698	268		Hopcroft
HX27928503.054	Ring Net-End	GAK1	10/12/2003	18:35	59.8443	149.4713	268		Hopcroft
HX27928503.055	Ring Net-Start	GAK1	10/12/2003	18:38	59.8442	149.4719	268		Hopcroft
HX27928503.056	Ring Net-End	GAK1	10/12/2003	18:45	59.8438	149.4736	268		Hopcroft
HX27928503.057	Ring Net-Start	GAK1	10/12/2003	18:46	59.8437	149.474	268		Hopcroft
HX27928503.058	Ring Net-End	GAK1	10/12/2003	18:54	59.8433	149.4754	268		Hopcroft
HX27928503.059	CTD048-Start	CF1	10/12/2003	20:54	59.9081	148.8685	85		Danielson
HX27928503.060	CTD048-End	CF1	10/12/2003	21:05	59.9111	148.8683	85		Danielson
HX27928503.061	CTD049-Start	CF2	10/12/2003	21:16	59.884	148.8657	112		Danielson
HX27928503.062	CTD049-End	CF2	10/12/2003	21:26	59.884	148.8657	112		Danielson
HX27928503.063	CTD050-Start	CF3	10/12/2003	22:55	59.8503	148.8675	162	new termination	Danielson
HX27928503.064	CTD050-End	CF3	10/12/2003	23:07	59.8483	148.8719	162		Danielson
HX27928503.065	CTD051-Start	CF4	10/12/2003	23:22	59.8171	148.8655	183		Danielson
HX27928503.066	CTD052-Start	CF5	10/12/2003	23:50	59.7834	148.8663	193		Danielson
HX27928603.001	CTD052-End	CF5	10/13/2003	0:05	59.7805	148.8766	193		Danielson
HX27928603.002	CTD053-Start	CF6	10/13/2003	0:27	59.7477	148.8739	190		Danielson
HX27928603.003	CTD053-End	CF6	10/13/2003	0:33	59.7457	148.8795	190		Danielson
HX27928603.004	CTD054-Start	CF7	10/13/2003	0:48	59.7164	148.8665	183	downcast	Danielson
HX27928603.005	CTD054-End	CF7	10/13/2003	0:57	59.7124	148.8761	183		Danielson
HX27928603.006	CTD055-Start	CF7	10/13/2003	0:57	59.7124	148.8763	183	upcast	Danielson
HX27928603.007	CTD55-End	CF7	10/13/2003	1:08	59.7081	148.8861	183		Danielson
HX27928603.008	CTD056-Start	CF8	10/13/2003	1:21	59.6834	148.8675	178		Danielson
HX27928603.009	CTD056-End	CF8	10/13/2003	1:37	59.6732	148.8807	178		Danielson
HX27928603.010	CTD057-Start	CF9	10/13/2003	1:47	59.6487	148.8701	179		Danielson
HX27928603.011	CTD057-End	CF9	10/13/2003	1:57	59.6453	148.8777	179	flu crapped out, no module errors, blew fuse	Danielson
HX27928603.012	CTD058-Start	CF9	10/13/2003	3:03	59.6503	148.8671	179	Changed Flu cable	Danielson
HX27928603.013	CTD058-End	CF9	10/13/2003	3:12	59.647	148.8752	179	More errors!!! What's wrong???	Danielson
HX27928603.014	CTD059-Start	CF9	10/13/2003	4:37	59.6501	148.869	179	new termination	Danielson
HX27928603.015	CTD059-End	CF9	10/13/2003	4:53	59.6457	148.8838	179		Danielson
HX27928603.016	CTD060-Start	CF10	10/13/2003	5:10	59.6169	148.8672	174		Danielson
HX27928603.017	CTD060-End	CF10	10/13/2003	5:20	59.6142	148.8751	174		Danielson
HX27928603.018	CTD061-Start	CF11	10/13/2003	5:36	59.5832	148.8674	174		Danielson
HX27928603.019	CTD061-End	CF11	10/13/2003	5:49	59.5802	148.8783	174		Danielson
HX27928603.020	CTD062-Start	CF12	10/13/2003	6:05	59.5502	148.8671	183		Danielson

HX27928603.021	CTD062-End	CF12	10/13/2003	6:16	59.5491	148.8752	183		Danielson
HX27928603.022	CTD063-Start	CF13	10/13/2003	6:33	59.5171	148.8672	170		Danielson
HX27928603.023	CTD063-End	CF13	10/13/2003	6:42	59.5171	148.8766	170	modulo error	Danielson
HX27928603.024	CTD064-Start	CF15	10/13/2003	7:34	59.4507	148.8721	181		Danielson
HX27928603.025	CTD065-Start	CF15	10/13/2003	8:04	59.4493	148.8869	181		Danielson
HX27928603.026	CTD066-Start	CF11	10/13/2003	9:38	59.5694	148.8706	180	test	Danielson
HX27928603.027	CTD066-End	CF11	10/13/2003	9:46	59.5679	148.8781	180		Danielson
HX27928603.028	CTD067-Start	CF5-6	10/13/2003	12:37	59.7982	148.8739	191	test	Danielson
HX27928603.029	CTD067-End	CF5-6	10/13/2003	na	na	na	na		Danielson
HX27928603.030	CTD068-Start	HE11	10/13/2003	22:01	60.1431	147.1903	177		Danielson
HX27928603.031	CTD068-End	HE11	10/13/2003	22:15	60.1417	147.1926	177		Danielson
HX27928603.032	CalVET Net Tow-Start	HE10	10/13/2003	22:29	60.1297	147.133	217		Hopcroft
HX27928603.033	CalVET Net Tow-End	HE10	10/13/2003	22:35	60.1278	147.1357	217		Hopcroft
HX27928603.034	CTD069-Start	HE10	10/13/2003	22:37	60.1276	147.1369	217		Danielson
HX27928603.035	CTD069-End	HE10	10/13/2003	22:55	60.1217	147.1458	217		Danielson
HX27928603.036	Neuston Trawl-Start	HE10	10/13/2003	22:57	60.1197	147.1456	217		Gibson
HX27928603.037	Neuston Trawl-End	HE10	10/13/2003	23:07	60.1146	147.1385	217		Gibson
HX27928603.038	CTD070-Start	HE9	10/13/2003	23:29	60.1102	147.0502	277		Danielson
HX27928603.039	CTD070-End	HE9	10/13/2003	23:50	60.1007	147.0616	277		Danielson
HX27928703.001	CTD071-Start	HE8	10/14/2003	0:13	60.0943	146.9613	147		Danielson
HX27928703.002	CTD071-End	HE8	10/14/2003	0:25	60.0945	146.9651	147		Danielson
HX27928703.003	CalVET Net Tow-Start	HE6.5	10/14/2003	1:13	60.0511	146.7366	123		Hopcroft
HX27928703.004	CalVET Net Tow-End	HE6.5	10/14/2003	1:20	60.0511	146.7382	123		Hopcroft
HX27928703.005	CTD072-Start	HE6.5	10/14/2003	1:24	60.0507	146.7375	123		Danielson
HX27928703.006	CTD072-End	HE6.5	10/14/2003	1:31	60.0505	146.7388	123	CTD probs again, lost comm	Danielson
HX27928703.007	Neuston Trawl-Start	HE6.5	10/14/2003	1:35	60.0505	146.7355	123		Gibson
HX27928703.008	Neuston Trawl-End	HE6.5	10/14/2003	1:45	60.0503	146.7254	123		Gibson
HX27928703.009	CTD73-Start	HE6.5	10/14/2003	3:07	60.0524	146.7348	121		Danielson
HX27928703.010	CTD073-End	HE6.5	10/14/2003	3:18	60.0534	146.736	121		Danielson
HX27928703.011	CalVET Net Tow-Start	HE4	10/14/2003	3:52	60.0813	146.606	115		Hopcroft
HX27928703.012	CalVET Net Tow-End	HE4	10/14/2003	3:54	60.0813	146.605	115		Hopcroft
HX27928703.013	CTD074-Start	HE4	10/14/2003	3:58	60.0812	146.6049	113		Danielson
HX27928703.014	CTD074-End	HE4	10/14/2003	4:05	60.0811	146.6043	113		Danielson
HX27928703.015	Nueston Trawl	HE4	10/14/2003	4:09	60.0807	146.6	113		Gibson
HX27928703.016	Nueston Trawl	HE4	10/14/2003	4:20	60.0784	146.5862	113		Gibson
HX27928703.017	CTD75-Start	HE3	10/14/2003	4:43	60.1298	146.6079	112		Danielson
HX27928703.018	CTD75-End	HE3	10/14/2003	4:52	60.1271	146.6094	112		Danielson
HX27928703.019	CalVET Net Tow-Start	HE2	10/14/2003	5:17	60.1798	146.6079	190		Hopcroft
HX27928703.020	CalVET Net Tow-End	HE2	10/14/2003	5:23	60.1778	146.6091	190		Hopcroft
HX27928703.021	CTD076-Start	HE2	10/14/2003	5:26	60.1765	146.6099	190		Danielson

HX27928703.022	CTD076-End	HE2	10/14/2003	5:39	60.173	146.6115	190		Danielson
HX27928703.023	neuston trawl-Start	HE2	10/14/2003	5:42	60.1726	146.6085	190		Gibson
HX27928703.024	neuston trawl-End	HE2	10/14/2003	5:50	60.1696	146.5991	190		Gibson
HX27928703.025	CTD077-Start	HE1	10/14/2003	6:12	60.2164	146.6091	78		Danielson
HX27928703.026	CTD077-End	HE1	10/14/2003	6:22	60.2156	146.6203	78		Danielson
HX27928703.027	MOCNESS-Start	HE2	10/14/2003	6:42	60.1786	146.6037	188		Coyle
HX27928703.028	MOCNESS-End	HE2	10/14/2003	7:12	60.1726	146.5684	188		Coyle
HX27928703.029	MOCNESS-Start	HE4	10/14/2003	7:55	60.0781	146.6049	112		Coyle
HX27928703.030	MOCNESS-End	HE4	10/14/2003	8:22	60.0684	146.5817	112		Coyle
HX27928703.031	MOCNESS-Start	HE7	10/14/2003	9:19	60.0751	146.8614	105		Coyle
HX27928703.032	MOCNESS-End	HE7	10/14/2003	9:50	60.0756	146.8268	105		Coyle
HX27928703.033	MOCNESS-Start	HE10	10/14/2003	10:56	60.1311	147.133	216		Coyle
HX27928703.034	MOCNESS-End	HE10	10/14/2003	11:34	60.141	147.0932	216		Coyle
HX27928703.035	CTD078-Start	MS1	10/14/2003	17:28	59.9547	147.9301	163	bottom shoaled to 155 by end of cast	Danielson
HX27928703.036	CTD078-End	MS1	10/14/2003	17:43	59.9512	147.9427	163		Danielson
HX27928703.037	CalVET Net Tow-Start	MS2	10/14/2003	17:56	59.9424	147.8962	192		Hopcroft
HX27928703.038	CalVET Net Tow-End	MS2	10/14/2003	18:02	59.9412	147.9009	192		Hopcroft
HX27928703.039	CTD079-Start	MS2	10/14/2003	18:08	59.9444	147.8967	192		Danielson
HX27928703.040	Neuston Trawl-Start	MS2	10/14/2003	18:26	59.9428	147.9082	175		Gibson
HX27928703.041	Neuston Trawl-End	MS2	10/14/2003	18:36	59.9419	147.9008	175		Gibson
HX27928703.042	CTD080-Start	MS3	10/14/2003	18:49	59.9324	147.857	167		Danielson
HX27928703.043	CTD080-End	MS3	10/14/2003	19:04	59.9304	147.8675	167		Danielson
HX27928703.044	Ring Net-Start	MS3	10/14/2003	19:08	59.9305	147.8681	167		Hopcroft
HX27928703.045	Ring Net-End	MS3	10/14/2003	19:12	59.9302	147.8717	167		Hopcroft
HX27928703.046	CTD081-Start	MS4	10/14/2003	19:25	59.9215	147.8295	111		Danielson
HX27928703.047	CTD081-End	MS4	10/14/2003	19:33	59.9218	147.8324	111		Danielson
HX27928703.048	CTD082-Start	HB1	10/14/2003	21:22	60.1926	147.7026	244		Danielson
HX27928703.049	CTD082-End	HB1	10/14/2003	21:34	60.1906	147.7092	244	sensors whacked out!	Danielson
HX27928703.050	CTD083-Start	HB4	10/14/2003	22:34	60.1477	147.5016	108		Danielson
HX27928703.051	CTD083-End	HB4	10/14/2003	22:44	60.147	147.5069	108		Danielson
HX27928703.052	CTD084-Start	HB3	10/14/2003	23:01	60.1651	147.5744	103		Danielson
HX27928703.053	CTD084-End	HB3	10/14/2003	23:10	60.1639	147.5779	103		Danielson
HX27928703.054	CalVET Net Tow-Start	HB2	10/14/2003	23:25	60.1781	147.6434	179		Hopcroft
HX27928703.055	CalVET Net Tow-End	HB2	10/14/2003	23:31	60.1766	147.6459	179		Hopcroft
HX27928703.056	CTD085-Start	HB2	10/14/2003	23:36	60.176	147.6486	179		Danielson
HX27928703.057	CTD085-End	HB2	10/14/2003	23:52	60.1716	147.6558	179		Danielson
HX27928703.058	Neuston Trawl-Start	HB2	10/14/2003	23:54	60.171	147.6543	179		Gibson

HX27928803.001	Neuston Trawl-End	HB2	10/15/2003	0:04	60.167	147.6433	179		Gibson
HX27928803.002	CTD086-Start	HB1	10/15/2003	0:24	60.1929	147.6997	247		Danielson
HX27928803.003	CTD086-End	HB1	10/15/2003	0:40	60.1892	147.7055	247		Danielson
HX27928803.004	CTD087-Start	PWS0.5	10/15/2003	2:56	60.3498	147.9504	279		Hopcroft
HX27928803.005	CTD087-End	PWS0.5	10/15/2003	3:02	60.3484	147.9526	279		Hopcroft
HX27928803.006	MOCNESS-Start	PWS2	10/15/2003	4:20	60.536	147.8021	700		Coyle
HX27928803.007	MOCNESS-End	PWS2	10/15/2003	5:43	60.5765	147.7276	732	deep tow	Coyle
HX27928803.008	MOCNESS-Start	PWS2	10/15/2003	6:17	60.5343	147.7988	732		Coyle
HX27928803.009	MOCNESS-End	PWS2	10/15/2003	6:46	60.5358	147.7594	732		Coyle
HX27928803.010	MOCNESS-Start	PWS1	10/15/2003	7:59	60.3813	147.9315	330		Coyle
HX27928803.011	MOCNESS-End	PWS1	10/15/2003	8:29	60.4016	147.91	330		Coyle
HX27928803.012	MOCNESS-Start	KIP2	10/15/2003	9:24	60.2795	147.984	580		Coyle
HX27928803.013	MOCNESS-End	KIP2	10/15/2003	10:08	60.311	147.9768	580		Coyle
HX27928803.014	MOCNESS-Start	HB2	10/15/2003	11:58	60.1753	147.6743	258		Coyle
HX27928803.015	MOCNESS-End	HB2	10/15/2003	12:39	60.2002	147.6432	258		Coyle
HX27928803.016	MOCNESS-Start	MS2	10/15/2003	14:24	59.9408	147.8987	192		Coyle
HX27928803.017	MOCNESS-End	MS2	10/15/2003	14:56	59.9449	147.8616	192		Coyle
HX27928803.018	Ring Net-Start	KIP2	10/15/2003	17:22	60.2773	147.9848	585		Hopcroft
HX27928803.019	Ring Net-End	KIP2	10/15/2003	17:26	60.2767	147.9856	585		Hopcroft
HX27928803.020	CTD088-Start	KIP2	10/15/2003	na	na	na	585	zoop cast 1	Hopcroft
HX27928803.021	CTD088-End	KIP2	10/15/2003	17:33	60.2781	147.9896	585		Hopcroft
HX27928803.022	CTD089-Start	KIP2	10/15/2003	17:38	60.2775	147.991	585	zoop cast 2	Hopcroft
HX27928803.023	CTD089-End	KIP2	10/15/2003	17:42	60.2768	147.9919	585		Hopcroft
HX27928803.024	CTD090-Start	KIP2	10/15/2003	17:46	60.2761	147.9926	585	zoop cast 3	Hopcroft
HX27928803.025	CTD090-End	KIP2	10/15/2003	17:50	60.2753	147.9932	585		Hopcroft
HX27928803.026	CTD091-Start	KIP2	10/15/2003	17:54	60.2742	147.9938	585	zoop cast 4	Hopcroft
HX27928803.027	CTD091-End	KIP2	10/15/2003	17:57	60.2737	147.9941	585		Hopcroft
HX27928803.028	CTD092-Start	KIP2	10/15/2003	18:01	60.2728	147.9948	585	zoop cast 5	Hopcroft
HX27928803.029	CalVET Net Tow-Start	KIP2	10/15/2003	18:06	60.27	147.985	585		Hopcroft
HX27928803.030	CalVET Net Tow-End	KIP2	10/15/2003	18:16	60.2772	147.985	585		Hopcroft
HX27928803.031	CTD092-End	KIP2	10/15/2003	18:03	60.2723	147.9949	585		Hopcroft
HX27928803.032	CTD093-Start	KIP2	10/15/2003	18:20	60.2776	147.987	585	Prim prod cast	Whitledge
HX27928803.033	Neuston Trawl-Start	KIP2	10/15/2003	18:32	60.2769	147.989	585		Gibson
HX27928803.034	Neuston Trawl-End	KIP2	10/15/2003	18:42	60.2804	147.9869	585		Gibson
HX27928803.035	Ring Net-Start	KIP2	10/15/2003	18:44	60.2806	147.9866	585		Hopcroft
HX27928803.036	Ring Net-End	KIP2	10/15/2003	18:51	60.2789	147.9871	585		Hopcroft
HX27928803.037	Ring Net-Start	KIP2	10/15/2003	18:54	60.278	147.9874	585		Hopcroft
HX27928803.038	Ring Net-End	KIP2	10/15/2003	18:59	60.2763	147.9881	585		Hopcroft
HX27928803.039	Ring Net-Start	KIP2	10/15/2003	19:02	60.2755	147.9885	585		Hopcroft
HX27928803.040	Ring Net-End	KIP2	10/15/2003	19:07	60.2739	147.989	585		Hopcroft
HX27928803.041	CTD094-Start	KIP2	10/15/2003	19:13	60.2782	147.9883	585		Danielson

HX27928803.042	CTD094-End	KIP2	10/15/2003	19:45	60.2696	147.9916	585		Danielson
HX27928803.043	CalVET Net Tow-Start	PWS1	10/15/2003	20:32	60.3798	147.9348	354		Hopcroft
HX27928803.044	CalVET Net Tow-End	PWS1	10/15/2003	20:39	60.3794	147.937	354		Hopcroft
HX27928803.045	CTD095-Start	PWS1	10/15/2003	20:42	60.3797	147.9362	354		Danielson
HX27928803.046	CTD095-End	PWS1	10/15/2003	21:03	60.3772	147.9381	354		Danielson
HX27928803.047	Neuston Trawl-Start	PWS1	10/15/2003	21:06	60.3782	147.9384	354		Gibson
HX27928803.048	Neuston Trawl-End	PWS1	10/15/2003	21:16	60.3846	147.9373	354		Gibson
HX27928803.049	CalVET Net Tow-Start	PWS2	10/15/2003	22:18	60.535	147.8021	735		Hopcroft
HX27928803.050	CalVET Net Tow-End	PWS2	10/15/2003	22:24	60.5346	147.8045	735		Hopcroft
HX27928803.051	CTD096-Start	PWS2	10/15/2003	22:25	60.5345	147.8051	735		Danielson
HX27928803.052	CTD096-End	PWS2	10/15/2003	23:06	60.5327	147.8239	735		Danielson
HX27928803.053	Neuston Trawl-Start	PWS2	10/15/2003	23:09	60.5319	147.8267	735		Gibson
HX27928803.054	Neuston Trawl-End	PWS2	10/15/2003	23:19	60.5262	147.8351	735		Gibson
HX27928903.001	HTI Calibration-start	LittleBay	10/16/2003	2:19	na	na	28.5		Coyle
HX27928903.002	HTI Calibration-end	LittleBay	10/16/2003	3:30	na	na	28.5		Coyle
HX27928903.003	CTD097-Start	test	10/16/2003	6:52	60.1319	147.8132	295	test cast with altimeter added	Danielson
HX27928903.004	CTD097-End	test	10/16/2003	7:03	60.1304	147.8137	295		Danielson
HX27928903.005	MOCNESS-Start	MS2	10/16/2003	8:15	59.9379	147.8815	188		Hopcroft
HX27928903.006	CTD098-Start	GAK1	10/16/2003	13:12	59.845	149.4685	272		Danielson
HX27928903.007	CTD098-End	GAK1	10/16/2003	13:29	59.8395	149.4724	272		Danielson
HX27928903.008	Ring Net-Start	GAK1	10/16/2003	13:32	59.8392	149.4736	273		Hopcroft
HX27928903.009	Ring Net-End	GAK1	10/16/2003	13:40	59.8386	149.4765	273		Hopcroft
HX27928903.010	Ring Net-Start	GAK1	10/16/2003	13:42	59.8381	149.477	273		Hopcroft
HX27928903.011	Ring Net-End	GAK1	10/16/2003	13:48	59.8372	149.4797	273		Hopcroft
HX27928903.012	Ring Net-Start	GAK1	10/16/2003	13:50	59.8371	149.4802	273		Hopcroft
HX27928903.013	Ring Net-End	GAK1	10/16/2003	13:56	59.8366	149.4826	273		Hopcroft
HX27928903.014	CTD99-Start	RES2.5	10/16/2003	15:58	60.025	149.3597	295		Danielson
HX27928903.015	CTD99-End	RES2.5	10/16/2003	16:15	60.0193	149.3561	295		Danielson