GLOBEC CRUISE REPORT

Cruise HX286, 27 June – 5 July 2004

Funding Source: NSF-NOAA (NA-67-RJ-0147)
Chief Scientist: Russell Hopcroft
Institute of Marine Science
University of Alaska
Fairbanks, AK 99775-1080
Phone:
E-mail: hopcroft@ims.uaf.edu

Co-Chief Scientist: Ken Coyle, IMS-UAF

Scientific Personnel:

Thomas Kline	Zooplankton stable isotope composition, PWSSC
Amanda Byrd	Zooplankton, Grad Student, IMS-UAF
Stephanie Moreland	Nutrients/Chlorophyll, Technician, IMS-SMC
Hui Liu	Zooplankton, Grad Student, IMS-UAF
Melanie Rohr	Nutrients/Chlorophyll, Technician, IMS-UAF
Alexei Pinchuk	Zooplankton, Technician, IMS-SMC
Yihua Cai	Chemistry, IARC-UAF
Jingfeng Wu	Chemistry, Faculty, IARC-UAF
Markus Janout	Physics, Grad Student, IMS-UAF
David Leech	Marine Technician, IMS-SMC

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 seven-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 June/July 2004 cruise was conducted 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 sampled for C-N stable isotope composition and experiments were established to estimate zooplankton growth rates and egg production and primary production. Late June and early July characterize mid-summer in the northern Gulf of Alaska.

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 the distribution and abundance of seabirds and marine mammals.
5. Determine copepod and euphausiid rates of growth and egg production.
6. Characterize the carbon and nitrogen stable isotope concentrations in zooplankton.
7. Characterize the distribution of the micronutrient Iron and associated molecules.

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 seachest 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 PWS 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 (from 10-20m) for zooplankton incubations. This was accompanied by two to three ring net tows over the upper 50m.
8. We did deep MOCNESS tows (to 600m) near the end of the Seward Line at station GAK13 and at PWS2.
9. Perform vertical casts and collect surface water for Iron analyses.

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.

A detailed sampling schedule is contained in the Cruise Event Log appended to the end of this report.

Cruise Chronology, Sampling Summary and Results:

Occupied the various hydrographic transects and collected vertical CTD-chlorophyll-PAR profiles. Station Transect priorities are (in order): Seward, C. Fairfield, Montague Strait, Hogan Bay, Prince William Sound and Knight Island Passage,and Hinchinbrook Entrance. Collected ADCP, sea surface salinity (SSS), temperature (SST) and fluorescence (SSF) using seachest sensors; 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.

We measured Primary Productivity at Stations GAK1, GAK4, GAK9, and GAK13, and within Prince William Sound at KIP2. A total of 18 CalVet Net casts were done along the Seward Line, at 5 selected PWS stations and 4 station along the Hinchinbrook Entrance Line. A 10-liter Niskins/Rosette was used to collect water (from ~ 20m) for Hopcroft's zooplankton incubations at GAK1, GAK4, GAK9, GAK13 and KIP2. Ring net collections accompanied these 5 stations.

Samples were collected for determination of the dissolved iron concentration at the surface and through the ware column at selected stations using "clean" techniques.

At night, hydroacoustic (HTI) samples and MOCNESS discrete samples were done along the Seward Line and within PWS.

The cruise departed Seward, Alaska at 1003 LST and proceeded to Resurrection Bay 2.5 and GAK1 for CTD only. We then headed for the end of the Seward line to begin night-time sampling. The line was completed over a 4-day period, followed by occupation of the Cape Fairfield Line. GAK1 and GAK2 were then re-occupied to examine temporal variability in physics at these stations (requested by T. Royer).

Overall, weather was good and had no impact on sampling activities.

Hydrography (Janout)
CTD casts were made on all standard sampling lines. Along the Seward Line, near-surface salinity and temperature appears to be about normal across the shelf, but temperatures may be slightly elevated offshore. Down deeper, however, the temperatures from mid-shelf and on out to GAK13 appear to be colder than normal. Likewise, 150-250m depth salinities may have been fresher than normal.

Stable isotope samples (Kline)
Samples for stable isotope analysis (SIA) were collected from MOCNESS tows made during HX286. SIA sampling stations consisted of the 13 Seward Line stations GAK1 to

GAK13; and the five core LTOP stations within Prince William Sound: MS2, HB2, KIP2, PWS1, and PWS2.

At each station, samples were saved for SIA from the contents of MOCNESS net #1, which sampled the upper 100m. At two designated 'deep' MOCNESS stations, GAK13 and PWS2, diapausing *Neocalanus* spp. were saved for SIA from the contents of a MOCNESS net that sampled between 400m and 600m. MOCNESS SIA samples consisted primarily of zooplankton, which were sorted to species and frozen individually in vials for further laboratory processing.

Zooplankton assessment (Coyle)

Calvet sampling was completed at all regular stations. MOCNESS sampling was completed at all stations except for Hinchinbrook Entrance due to lack of time caused by the shortness of the dark period at this time of year. HTI sampling was conducted along the Seward line and in conjunction with the MOCNESS samples in PWS.

Zooplankton Growth (Hopcroft)

Small copepods (*Pseudocalanus* and *Oithona*) dominated the collections. Copepod cohort experiments and egg production were setup at GAK1, GAK4, GAK9, GAK13 and KIP2 as per normal. Copepod egg production: *Pseudocalanus* was set at all sites. *Metridia pacifica* and *Calanus marshallae* were set at all sites but GAK13 (none present). A *Eucalanus* experiment was executed at GAK9. Two experiments for euphausiid growth were executed. Reproductive rates accompanied some of these.

Iron (Wu)

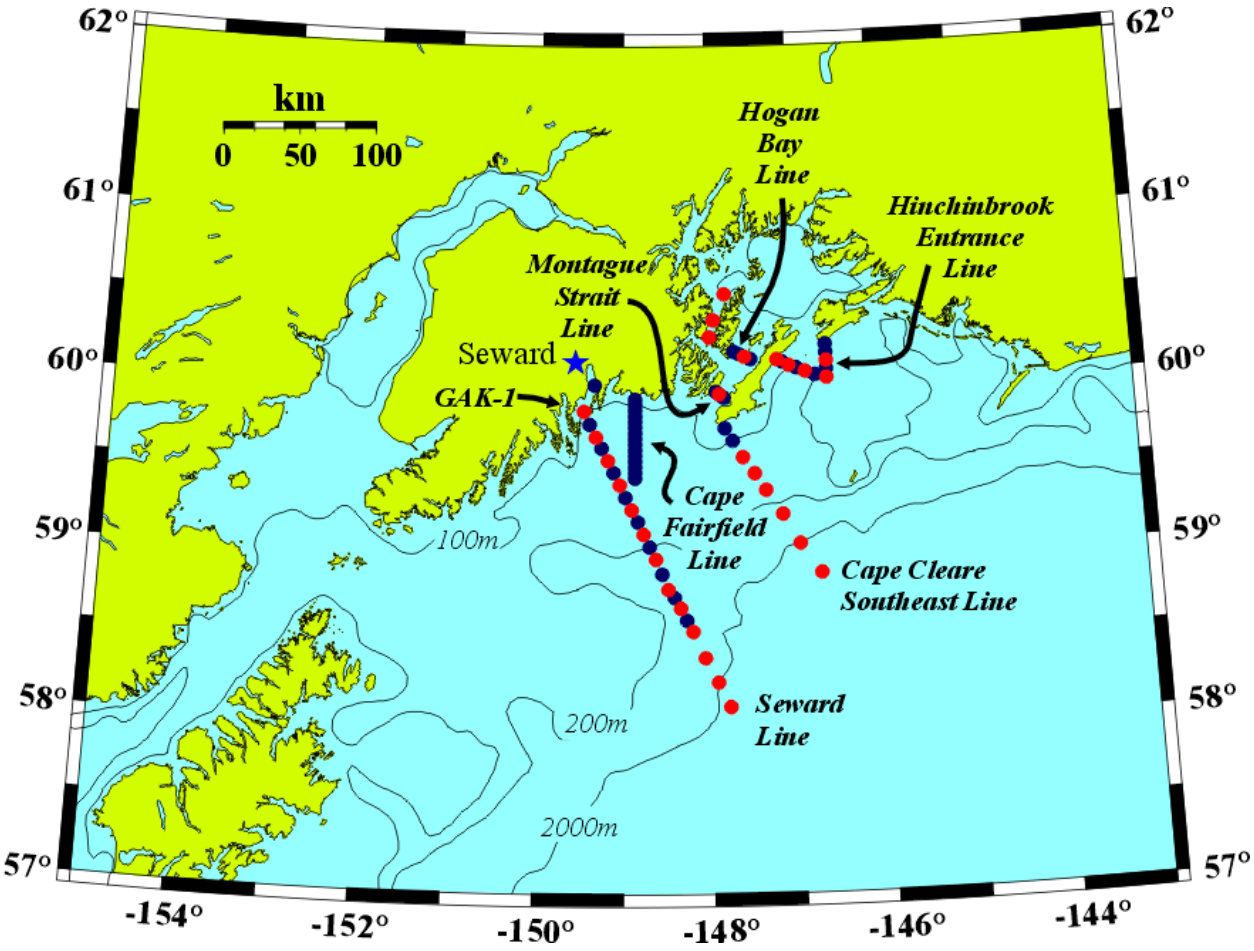
Surface iron concentrations were examined at 5 stations along the Seward Line, at 7 odd-numbered stations along the Cape Fairfield Line, and at 4 stations along the Hinchinbrook Line. Full depth profiles were completed ay GAK13, GAK11, and GAK1. Most deployments were successful.

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

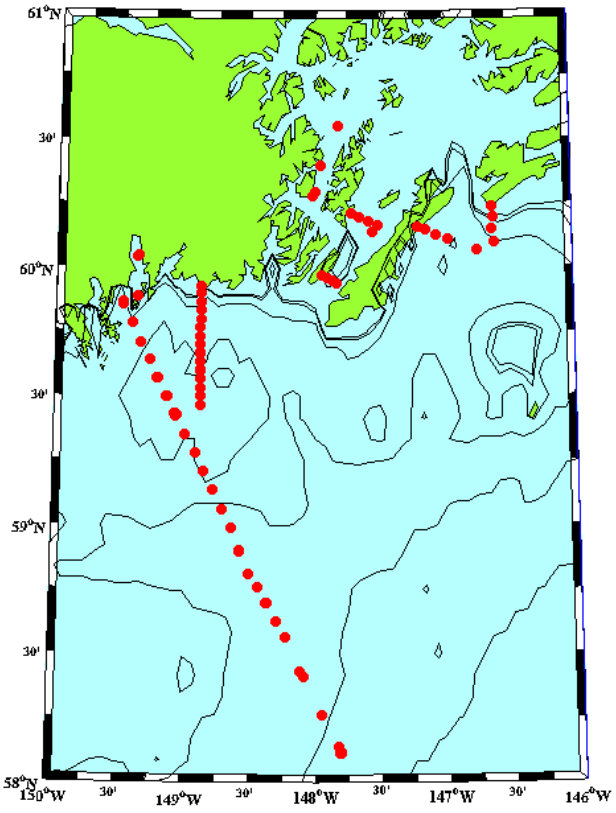
59	31	148	52	CF13
59	29	148	52	CF14
59	27	148	52	CF15
Prince William Sound Stations				
60	22.78	147	56.17	PWS1
60	32.1	147	48.2	PWS2
Knight Island Passage Station				
60	16.7	147	59.2	KIP2
Hogan Bay Line				
60	11.57	147	42	HB1
60	10.754	147	38.5	HB2
60	9.855	147	34.508	HB3
60	8.807	147	30.04	HB4
Montague 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

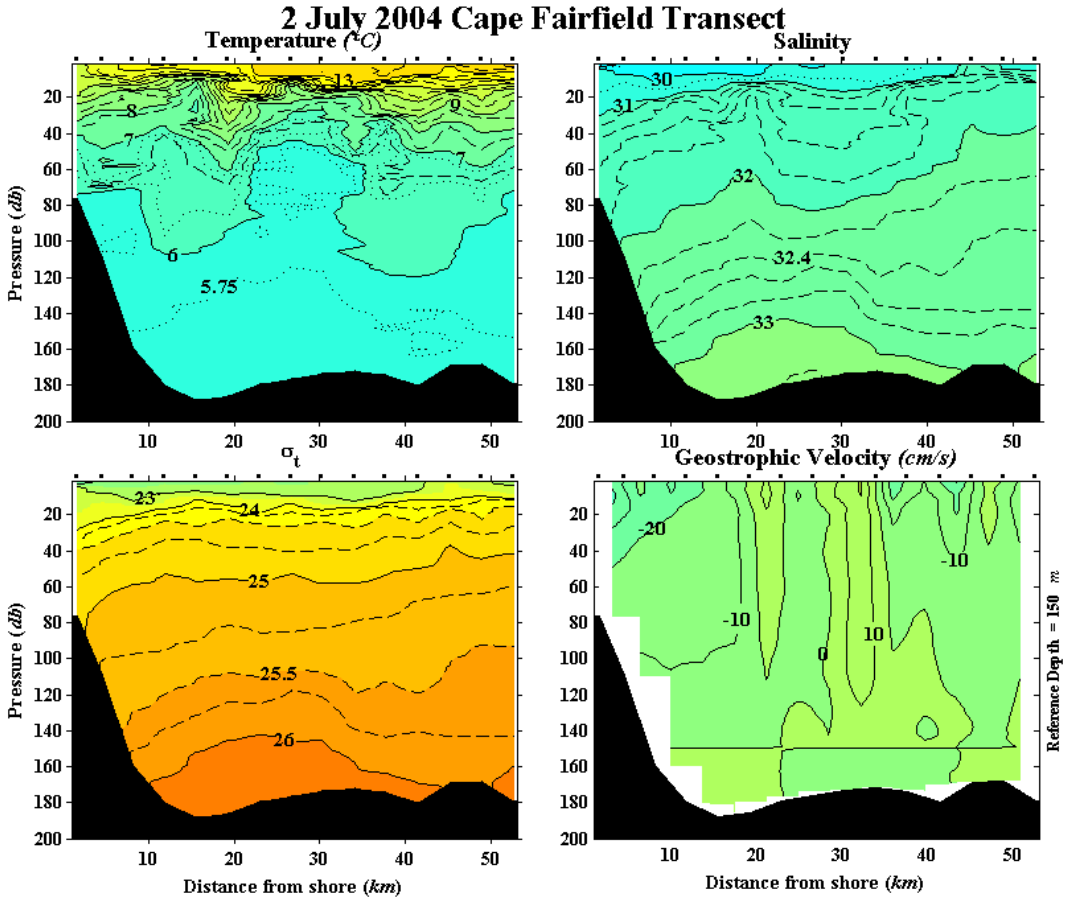
NEP GLOBEC Standard Station Map

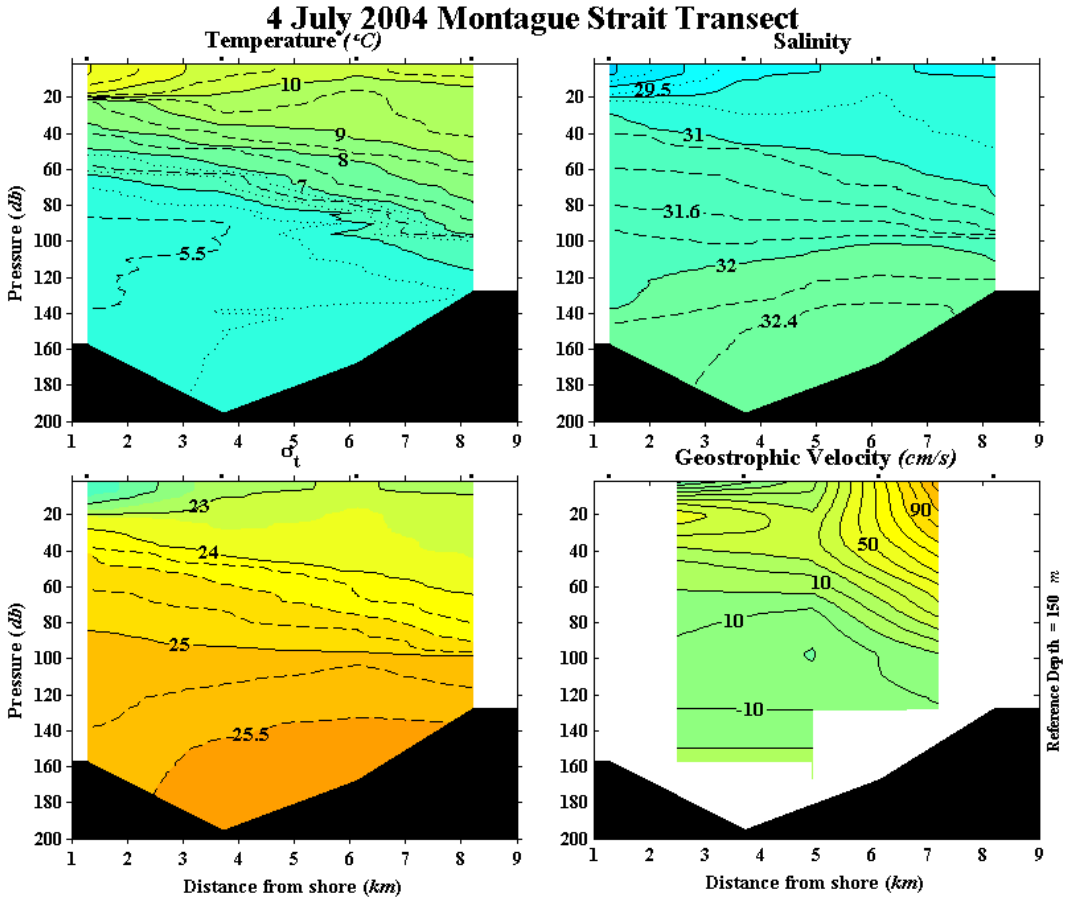


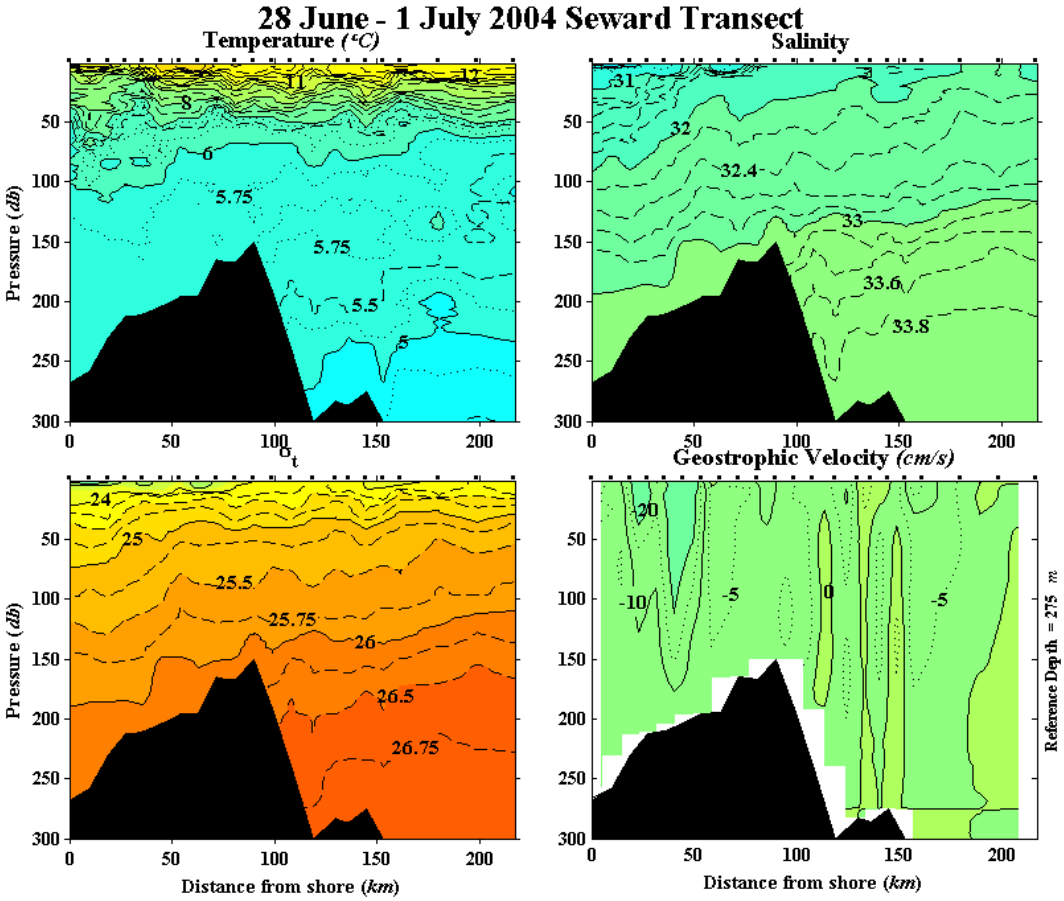
Note: The Cape Cleare Southeast Line is a standard line only in select cruises during the Process Study sampling years.

hx286




2 July 2004 Cape Fairfield Transect
Temperature (°C)
Salinity
σt
Geostrophic Velocity (cm/s)
Pressure (db)
Distance from shore (km)
Reference Depth = 150 m


4 July 2004 Montague Strait Transect
Temperature (°C)
Salinity
Pressure (db)
σt
Geostrophic Velocity (cm/s)
Reference Depth = 150 m
Distance from shore (km)
Distance from shore (km)


28 June - 1 July 2004 Seward Transect
Temperature (°C)
Salinity
Pressure (db)
Geostrophic Velocity (cm/s)
Reference Depth = 275 m
Distance from shore (km)
Distance from shore (km)

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.

Event	Description	Station	Date	GMT	lat	lon	Depth	si	comments
HX28617904.01	CTD1-Start	RES2.5	6/27/04	1920	60.0257	-149.3577	295	Weingartner	
HX28617904.02	CTD1-End	RES2.5	6/27/04	1927	60.0268	-149.3573	295	Weingartner	aborted
HX28617904.03	CTD2-Start	RES2.5	6/27/04				295	Weingartner	
HX28617904.04	CTD2-End	RES2.5	6/27/04				295	Weingartner	aborted
HX28617904.05	CTD3-Start	RES2.5	6/27/04	1953	60.0302	-149.3565	295	Weingartner	
HX28617904.06	CTD3-End	RES2.5	6/27/04	2015	60.0223	-149.3577	295	Weingartner	
HX28617904.07	CTD4-Start	GAK1	6/27/04	2124	59.8447	-149.4684	270	Weingartner	
HX28617904.08	CTD4-End	GAK1	6/27/04	2147	59.8436	-149.4686	270	Weingartner	
HX28618004.01	HTI Transect-Start	GAK11	6/28/04	0750	58.3871	-148.0704	270	Coyle	
HX28618004.02	HTI Transect-End	GAK12	6/28/04	0936	58.2428	-147.9328	1997	Coyle	
HX28618004.03	MOCNESS-Start	GAK12	6/28/04	0940	58.2404	-147.9305	1997	Coyle	
HX28618004.04	MOCNESS-End	GAK12	6/28/04	1023	58.2131	-147.9171	1997	Coyle	
HX28618004.05	HTI Transect-Start	GAK12	6/28/04	1050	58.2428	-147.9328	1997	Coyle	
HX28618004.06	HTI Transect-End	GAK13	6/28/04	1227	58.0990	-147.7898	2095	Coyle	
HX28618004.07	MOCNESS-Start	GAK13	6/28/04	1237	58.0941	-147.7854	2095	Coyle	
HX28618004.08	MOCNESS-End	GAK13	6/28/04	1311	58.0702	-147.7701	2095	Coyle	
HX28618004.09	MOCNESS-Start	GAK13	6/28/04	1339	58.0494	-147.7542	2095	Coyle	Deep
HX28618004.10	MOCNESS-End	GAK13	6/28/04	1507	58.0069	-147.6384	2095	Coyle	
HX28618004.11	CTD5-Start	GAK13	6/28/04	1606	58.0984	-147.7873	2095	Weingartner	
HX28618004.12	CTD5-End	GAK13	6/28/04	1738	58.0971	-147.7932	2095	Weingartner	
HX28618004.13	CTD6-Start	GAK13	6/28/04	1738	58.0971	-147.7932	2095	Weingartner	test for water samplers
HX28618004.14	CTD6-End	GAK13	6/28/04	1738	58.0971	-147.7932	2095	Weingartner	
HX28618004.15	CTD7-Start	GAK13	6/28/04	1741	58.0968	-147.7928	2095		
HX28618004.16	CTD7-End	GAK13	6/28/04	1751	58.0960	-147.7920	2095	Hopcroft	prods
HX28618004.17	CalVET Net Tow-Start	GAK13	6/28/04	1801	58.0950	-147.7915	2095	Hopcroft	
HX28618004.18	CalVET Net Tow-End	GAK13	6/28/04				2095	Hopcroft	
HX28618004.19	CTD8-Start	GAK13	6/28/04	1823	58.0965	-147.7949	2095	Hopcroft	zoopcast1
HX28618004.20	CTD8-End	GAK13	6/28/04	1828	58.0959	-147.7950	2095	Hopcroft	
HX28618004.21	CTD9-Start	GAK13	6/28/04	1834	58.0952	-147.7954	2095	Hopcroft	zoopcast2
HX28618004.22	CTD9-End	GAK13	6/28/04	1836	58.0949	-147.7956	2095	Hopcroft	
HX28618004.23	CTD10-Start	GAK13	6/28/04	1843	58.0942	-147.7960	2095	Hopcroft	zoopcast3
HX28618004.24	CTD10-End	GAK13	6/28/04	1845	58.0940	-147.7962	2095	Hopcroft	
HX28618004.25	CTD11-Start	GAK13	6/28/04	1851	58.0934	-147.7970	2095	Hopcroft	zoopcast4

HX28618004.26	CTD11-End	GAK13	6/28/04	1853	58.0932	-147.7973	2095	Hopcroft	
HX28618004.27	CTD12-Start	GAK13	6/28/04	1900	58.0925	-147.7983	2095	Hopcroft	zoopcast5
HX28618004.28	CTD12-End	GAK13	6/28/04				2095	Hopcroft	zoopcast5
HX28618004.29	Ring Net-Start	GAK13	6/28/04	1906	58.0920	-147.7993	2095	Hopcroft	
HX28618004.30	Ring Net-End	GAK13	6/28/04	1919	58.0916	-147.8022	2095	Hopcroft	
HX28618004.31	CTD13-Start	GAK13	6/28/04	1942	58.0978	-147.7920	2095	Weingartner	
HX28618004.32	CTD13-End	GAK13	6/28/04	2058	58.1039	-147.8077	2095	Weingartner	
HX28618004.33	CTD14-Start	GAK13	6/28/04	2136	58.1131	-147.8090	2095	Wu	mitess
HX28618104.01	CTD14-End	GAK13	6/29/04	0308	58.2437	-147.9335	2095	Wu	
HX28618104.02	CalVET Net Tow-Start	GAK12	6/29/04	0309	58.2438	-147.9333	2095	Hopcroft	
HX28618104.03	CalVET Net Tow-End	GAK12	6/29/04				2095	Hopcroft	
HX28618104.04	CTD15-Start	GAK12	6/29/04	0320	58.2440	-147.9328	2000	Weingartner	
HX28618104.05	CTD15-End	GAK12	6/29/04	0434	58.2477	-147.9285	2000	Weingartner	
HX28618104.06	MOCNESS-Start	GAK11	6/29/04	0647	58.3845	-148.0740	1445	Coyle	
HX28618104.07	MOCNESS-End	GAK11	6/29/04	0719	58.3574	-148.0922	1445	Coyle	
HX28618104.08	HTI Transect-Start	GAK11	6/29/04	0741	58.3887	-148.0739	1445	Coyle	
HX28618104.09	HTI Transect-End	GAK10	6/29/04	0923	58.5420	-148.2119	1480	Coyle	
HX28618104.10	MOCNESS-Start	GAK10	6/29/04	0926	58.5411	-148.2145	1480	Coyle	
HX28618104.11	MOCNESS-End	GAK10	6/29/04	1010	58.5093	-148.2277	1480	Coyle	
HX28618104.12	HTI Transect-Start	GAK10	6/29/04	1031	58.5417	-148.2146	1480	Coyle	
HX28618104.13	HTI Transect-End	GAK9	6/29/04	1208	58.6803	-148.3505	272	Coyle	
HX28618104.14	MOCNESS-Start	GAK9	6/29/04	1211	58.6786	-148.3519	272	Coyle	
HX28618104.15	MOCNESS-End	GAK9	6/29/04	1242	58.6502	-148.3583	272	Coyle	
HX28618104.16	CTD16-Start	GAK8	6/29/04	1354	58.7913	-148.4882	272	Weingartner	
HX28618104.17	CTD16-End	GAK8	6/29/04	1420	58.7872	-148.4811	272	Weingartner	
HX28618104.18	CalVET Net Tow-Start	GAK8	6/29/04	1421	58.7872	-148.4810	272	Hopcroft	
HX28618104.19	CalVET Net Tow-End	GAK8	6/29/04	1424	58.7846	-148.4771	272	Hopcroft	
HX28618104.20	CTD17-Start	GAK8I	6/29/04	1442	58.7430	-148.4201	272	Weingartner	
HX28618104.21	CTD17-End	GAK8I	6/29/04	1502	58.7412	-148.4203	272	Weingartner	
HX28618104.22	CTD18-Start	GAK9	6/29/04	1533	58.6790	-148.3497	277	Weingartner	
HX28618104.23	CTD18-End	GAK9	6/29/04	1551	58.6782	-148.3542	277	Weingartner	
HX28618104.24	CalVET Net Tow-Start	GAK9	6/29/04	1553	58.6781	-148.3547	277	Hopcroft	
HX28618104.25	CalVET Net Tow-End	GAK9	6/29/04	1602	58.6776	-148.3573	277	Hopcroft	
HX28618104.26	CTD19-Start	GAK9	6/29/04	1603	58.6775	-148.3575	275	Whitledge	Prim prod
HX28618104.27	CTD19-End	GAK9	6/29/04	1610	58.6772	-148.3593	275	Whitledge	
HX28618104.28	CTD20-Start	GAK9	6/29/04	1626	58.6807	-148.3495	275	Hopcroft	zoopcast1
HX28618104.29	CTD20-End	GAK9	6/29/04	1627	58.6806	-148.3499	275	Hopcroft	
HX28618104.30	CTD21-Start	GAK9	6/29/04	1633	58.6805	-148.3517	275	Hopcroft	zoopcast2
HX28618104.31	CTD21-End	GAK9	6/29/04	1635	58.6805	-148.3522	275	Hopcroft	
HX28618104.32	CTD22-Start	GAK9	6/29/04	1642	58.6806	-148.3547	275	Hopcroft	zoopcast3
HX28618104.33	CTD22-End	GAK9	6/29/04	1644	58.6806	-148.3554	275	Hopcroft	

HX28618104.34	CTD23-Start	GAK9	6/29/04	1655	58.6810	-148.3589	275	Hopcroft	zoopcast4
HX28618104.35	CTD23-End	GAK9	6/29/04	1656	58.6811	-148.3595	275	Hopcroft	
HX28618104.36	CTD24-Start	GAK9	6/29/04	1704	58.6815	-148.3622	275	Hopcroft	zoopcast5
HX28618104.37	CTD24-End	GAK9	6/29/04	1705	58.6816	-148.3629	275	Hopcroft	
HX28618104.38	Ring Net-Start	GAK9	6/29/04	1713	58.6822	-148.3663	275	Hopcroft	
HX28618104.39	Ring Net-End	GAK9	6/29/04	1817	58.6096	-148.2761	275	Hopcroft	
HX28618104.40	CTD25-Start	GAK9I	6/29/04	1820	58.6104	-148.2764	701	Weingartner	
HX28618104.41	CTD25-End	GAK9I	6/29/04	1902	58.6197	-148.2940	701	Weingartner	
HX28618104.42	CalVET Net Tow-Start	GAK10	6/29/04	1941	58.5425	-148.2112	1464	Hopcroft	
HX28618104.43	CalVET Net Tow-End	GAK10	6/29/04	1951	58.5456	-148.2150	1464	Hopcroft	
HX28618104.44	CTD26-Start	GAK10	6/29/04	1951	58.5456	-148.2151	1464	Weingartner	
HX28618104.45	CTD26-End	GAK10	6/29/04	2108	58.5617	-148.2363	1464	Weingartner	
HX28618104.46	CalVET Net Tow-Start	GAK11	6/29/04	2227	58.3891	-148.0708	1430	Hopcroft	
HX28618104.47	CalVET Net Tow-End	GAK11	6/29/04	2238	58.3921	-148.0755	1430	Hopcroft	
HX28618104.48	CTD27-Start	GAK11	6/29/04	2238	58.3922	-148.0756	1430	Weingartner	
HX28618104.49	CTD27-End	GAK11	6/29/04	2358	58.4064	-148.1030	1430	Weingartner	
HX28618204.01	CTD28-Start	GAK11	6/30/04	0014	58.4110	-148.1054	1430	Wu	Mitess
HX28618204.02	CTD28-End	GAK11	6/30/04	0335	58.4305	-148.1198	1430	Wu	mitess
HX28618204.03	HTI Transect-Start	GAK9	6/30/04	0631	58.6811	-148.3510	282	Coyle	
HX28618204.04	HTI Transect-End	GAK8	6/30/04	0746	58.7922	-148.4908	286	Coyle	
HX28618204.05	MOCNESS-Start	GAK8	6/30/04	0749	58.7908	-148.4947	286	Coyle	
HX28618204.06	MOCNESS-End	GAK8	6/30/04	0835	58.7718	-148.5282	286	Coyle	
HX28618204.07	HTI Transect-Start	GAK8	6/30/04	0854	58.7925	-148.4904	286	Coyle	
HX28618204.08	HTI Transect-End	GAK7	6/30/04	1038	58.9723	-148.6312	242	Coyle	
HX28618204.09	MOCNESS-Start	GAK7	6/30/04	1040	58.9709	-148.6317	242	Coyle	
HX28618204.10	MOCNESS-End	GAK7	6/30/04	1123	58.9470	-148.6304	242	Coyle	
HX28618204.11	HTI Transect-Start	GAK7	6/30/04	1141	58.9716	-148.6300	242	Coyle	
HX28618204.12	HTI Transect-End	GAK6	6/30/04	1330	59.1172	-148.7705	150	Coyle	
HX28618204.13	HTI Transect-End	GAK6	6/30/04	1411	59.2165	-148.8643	150	Coyle	
HX28618204.14	CTD29-Start	GAK4	6/30/04	1531	59.4080	-149.0505	197	Weingartner	
HX28618204.15	CTD29-End	GAK4	6/30/04	1548	59.4071	-149.0515	197	Weingartner	
HX28618204.16	CalVET Net Tow-Start	GAK4	6/30/04	1556	59.4068	-149.0525	197	Hopcroft	
HX28618204.17	CalVET Net Tow-End	GAK4	6/30/04	1556	59.4069	-149.0525	197	Hopcroft	
HX28618204.18	CTD30-Start	GAK4	6/30/04	1600	59.4069	-149.0533	197	Whitledge	
HX28618204.19	CTD30-End	GAK4	6/30/04	1608	59.4067	-149.0547	197	Whitledge	
HX28618204.20	CTD31-Start	GAK4	6/30/04	1620	59.4088	-149.0474	197	Hopcroft	zoopcast1
HX28618204.21	CTD31-End	GAK4	6/30/04	1624	59.4090	-149.0478	197	Hopcroft	
HX28618204.22	CTD32-Start	GAK4	6/30/04	1630	59.4093	-149.0488	197	Hopcroft	zoopcast2

HX28618204.23	CTD32-End	GAK4	6/30/04	1632	59.4095	-149.0492	197	Hopcroft	
HX28618204.24	CTD33-Start	GAK4	6/30/04	1638	59.4097	-149.0504	197	Hopcroft	zoopcast3
HX28618204.25	CTD33-End	GAK4	6/30/04	1640	59.4099	-149.0507	197	Hopcroft	
HX28618204.26	CTD34-Start	GAK4	6/30/04	1646	59.4104	-149.0516	197	Hopcroft	zoopcast4
HX28618204.27	CTD34-End	GAK4	6/30/04	1648	59.4105	-149.0518	197	Hopcroft	
HX28618204.28	CTD35-Start	GAK4	6/30/04	1653	59.4111	-149.0524	197	Hopcroft	zoopcast5
HX28618204.29	CTD35-End	GAK4	6/30/04	1655	59.4114	-149.0526	197	Hopcroft	
HX28618204.30	CTD36-Start	GAK4	6/30/04	1755	59.4081	-149.0481	197	Weingartner	royer1
HX28618204.31	CTD36-End	GAK4	6/30/04	1825	59.4125	-149.0571	197	Weingartner	
HX28618204.32	CTD37-Start	GAK4	6/30/04	1826	59.4125	-149.0571	197	Weingartner	royer2
HX28618204.33	CTD37-End	GAK4	6/30/04	1826	59.4125	-149.0572	197	Weingartner	
HX28618204.34	CTD38-Start	GAK4	6/30/04	1826	59.4125	-149.0573	197	Weingartner	royer3
HX28618204.35	CTD38-End	GAK4	6/30/04	1826	59.4126	-149.0573	197	Weingartner	
HX28618204.36	CTD39-Start	GAK4	6/30/04	1827	59.4127	-149.0574	197	Weingartner	royer4
HX28618204.37	CTD39-End	GAK4	6/30/04	1835	59.4142	-149.0592	197	Weingartner	
HX28618204.38	CTD40-Start	GAK4	6/30/04	1835	59.4142	-149.0592	197	Weingartner	royer5
HX28618204.39	CTD40-End	GAK4	6/30/04	1843	59.4157	-149.0605	197	Weingartner	
HX28618204.40	CTD41-Start	GAK4	6/30/04	1844	59.4157	-149.0606	197	Weingartner	royer6
HX28618204.41	CTD41-End	GAK4	6/30/04	1852	59.4173	-149.0623	197	Weingartner	
HX28618204.42	CTD42-Start	GAK4I	6/30/04	1934	59.3354	-148.9781	197	Weingartner	
HX28618204.43	CTD42-End	GAK4I	6/30/04	1950	59.3400	-148.9778	197	Weingartner	
HX28618204.44	CalVET Net Tow-Start	GAK5	6/30/04	2028	59.2629	-148.9057	168	Hopcroft	
HX28618204.45	CalVET Net Tow-End	GAK5	6/30/04	2033	59.2636	-148.9042	168	Hopcroft	
HX28618204.46	CTD43-Start	GAK5	6/30/04	2037	59.2641	-148.9040	168	Weingartner	
HX28618204.47	CTD43-End	GAK5	6/30/04	2051	59.2669	-148.9025	168	Weingartner	
HX28618204.48	Pole sample for Fe-Start	GAK5	6/30/04	2051	59.2669	-148.9025	168	Wu	
HX28618204.49	Pole sample for Fe-End	GAK5	6/30/04					Wu	
HX28618204.50	CTD44-Start	GAK5I	6/30/04	2126	59.1906	-148.8362	166	Weingartner	
HX28618204.51	CTD44-End	GAK5I	6/30/04	2138	59.1921	-148.8355	166	Weingartner	
HX28618204.52	CalVET Net Tow-Start	GAK6	6/30/04	2240	59.1174	-148.7697	152	Hopcroft	
HX28618204.53	CalVET Net Tow-End	GAK6	6/30/04	2249	59.1173	-148.7687	152	Hopcroft	
HX28618204.54	CTD45-Start	GAK6	6/30/04	2250	59.1173	-148.7687	151	Weingartner	
HX28618204.55	CTD45-End	GAK6	6/30/04	2301	59.1176	-148.7683	151	Weingartner	
HX28618204.56	CTD46-Start	GAK6I	6/30/04	2335	59.0450	-148.6979	192	Weingartner	
HX28618204.57	CTD46-End	GAK6I	6/30/04	2350	59.0455	-148.6911	192	Weingartner	
HX28618304.01	CalVET Net Tow-Start	GAK7	7/1/04	0023	58.9715	-148.6293	243	Hopcroft	
HX28618304.02	CalVET Net Tow-End	GAK7	7/1/04	0032	58.9723	-148.6242	243	Hopcroft	
HX28618304.03	CTD47-Start	GAK7	7/1/04	0034	58.9724	-148.6234	243	Weingartner	
HX28618304.04	CTD47-End	GAK7	7/1/04	0051	58.9730	-148.6185	243	Weingartner	
HX28618304.05	Pole sample for Fe-Start	GAK7	7/1/04	0051	58.9730	-148.6185	243	Wu	
HX28618304.06	Pole sample for Fe-End	GAK7	7/1/04					Wu	

HX28618304.07	CTD48-Start	GAK7I	7/1/04	0132	58.8817	-148.5577	302	Weingartner	
HX28618304.08	CTD48-End	GAK7I	7/1/04	0155	58.8851	-148.5469	302	Weingartner	
HX28618304.09	CTD49-Start	GAK7I	7/1/04	0206	58.8827	-148.5600	302	Weingartner	test
HX28618304.10	CTD49-End	GAK7I	7/1/04	0207	58.8828	-148.5594	302	Weingartner	
HX28618304.11	CTD50-Start	GAK7I	7/1/04	0209	58.8828	-148.5585	302	Weingartner	
HX28618304.12	CTD50-End	GAK7I	7/1/04	0232	58.8844	-148.5445	302	Weingartner	
HX28618304.13	MOCNESS-Start	GAK6	7/1/04	0636	59.1163	-148.7695	152	Coyle	
HX28618304.14	MOCNESS-End	GAK6	7/1/04	0709	59.0988	-148.7525	152	Coyle	
HX28618304.15	HTI Transect-Start	GAK6	7/1/04	0726	59.1172	-148.7705	152	Coyle	
HX28618304.16	HTI Transect-End	GAK5	7/1/04	0902	59.2622	-148.9102	170	Coyle	
HX28618304.17	MOCNESS-Start	GAK5	7/1/04	0904	59.2607	-148.9092	170	Coyle	
HX28618304.18	MOCNESS-End	GAK5	7/1/04	0945	59.2369	-148.8749	170	Coyle	
HX28618304.19	HTI Transect-Start	GAK5	7/1/04	1005	59.2620	-148.9088	170	Coyle	
HX28618304.20	HTI Transect-End	GAK4	7/1/04	1146	59.4088	-149.0496	201	Coyle	
HX28618304.21	MOCNESS-Start	GAK4	7/1/04	1153	59.4053	-149.0436	201	Coyle	
HX28618304.22	MOCNESS-End	GAK4	7/1/04	1225	59.3869	-148.9996	201	Coyle	
HX28618304.23	CTD51-Start	GAK1	7/1/04	1539	59.8449	-149.4692	270	Weingartner	
HX28618304.24	CTD51-End	GAK1	7/1/04	1601	59.8428	-149.4692	270	Weingartner	
HX28618304.25	CalVET Net Tow-Start	GAK1	7/1/04	1602	59.8427	-149.4692	270	Hopcroft	
HX28618304.26	CalVET Net Tow-End	GAK1	7/1/04	1607	59.8424	-149.4690	270	Hopcroft	
HX28618304.27	CTD52-Start	GAK1	7/1/04	1607	59.8424	-149.4690	270	Whitledge	prods
HX28618304.28	CTD52-End	GAK1	7/1/04	1615	59.8419	-149.4685	270	Whitledge	
HX28618304.29	CTD53-Start	GAK1	7/1/04	1626	59.8459	-149.4684	270	Hopcroft	zoopcast1
HX28618304.30	CTD53-End	GAK1	7/1/04	1630	59.8453	-149.4686	270	Hopcroft	
HX28618304.31	CTD54-Start	GAK1	7/1/04	1636	59.8446	-149.4682	270	Hopcroft	zoopcast2
HX28618304.32	CTD54-End	GAK1	7/1/04	1638	59.8445	-149.4681	270	Hopcroft	
HX28618304.33	CTD55-Start	GAK1	7/1/04	1649	59.8437	-149.4672	270	Hopcroft	zoopcast3
HX28618304.34	CTD55-End	GAK1	7/1/04	1651	59.8436	-149.4671	270	Hopcroft	
HX28618304.35	CTD56-Start	GAK1	7/1/04	1658	59.8431	-149.4668	270	Hopcroft	zoopcast4
HX28618304.36	CTD56-End	GAK1	7/1/04	1700	59.8430	-149.4668	270	Hopcroft	
HX28618304.37	CTD57-Start	GAK1	7/1/04	1707	59.8426	-149.4668	270	Hopcroft	zoopcast5
HX28618304.38	CTD57-End	GAK1	7/1/04				270	Hopcroft	zoopcast5
HX28618304.39	Ring Net-Start	GAK1	7/1/04	1715	59.8421	-149.4666	270	Hopcroft	
HX28618304.40	Ring Net-End	GAK1	7/1/04	1751	59.8397	-149.4666	270	Hopcroft	
HX28618304.41	Pole sample for Fe-Start	GAK1	7/1/04	1751	59.8397	-149.4666	270	Wu	
HX28618304.42	Pole sample for Fe-End	GAK1	7/1/04				270	Wu	
HX28618304.43	CTD58-Start	GAK1I	7/1/04	1827	59.7667	-149.3963	270	Weingartner	
HX28618304.44	CTD58-End	GAK1I	7/1/04	1845	59.7664	-149.3987	270	Weingartner	
HX28618304.45	CalVET Net Tow-Start	GAK2	7/1/04	1920	59.6917	-149.3266	270	Hopcroft	
HX28618304.46	CalVET Net Tow-End	GAK2	7/1/04	1928	59.6921	-149.3296	227	Hopcroft	
HX28618304.47	CTD59-Start	GAK2	7/1/04	1929	59.6921	-149.3297	227	Weingartner	

HX28618304.48	CTD59-End	GAK2	7/1/04	1947	59.6929	-149.3368	227	Weingartner	
HX28618304.49	CTD60-Start	GAK2I	7/1/04	2020	59.6261	-149.2576	215	Weingartner	
HX28618304.50	CTD60-End	GAK2I	7/1/04	2040	59.6243	-149.2664	215	Weingartner	
HX28618304.51	CalVET Net Tow-Start	GAK3	7/1/04	2118	59.5526	-149.1868	215	Hopcroft	
HX28618304.52	CalVET Net Tow-End	GAK3	7/1/04	2123	59.5526	-149.1873	215	Hopcroft	
HX28618304.53	CTD61-Start	GAK3	7/1/04	2127	59.5529	-149.1881	215	Weingartner	
HX28618304.54	CTD61-End	GAK3	7/1/04	2147	59.5541	-149.1945	215	Weingartner	
HX28618304.55	CTD62-Start	GAK3	7/1/04	2159	59.5548	-149.1980	215	Weingartner	recast with ctd2
HX28618304.56	CTD62-End	GAK3	7/1/04	2214	59.5551	-149.2012	215	Weingartner	
HX28618304.57	Pole sample for Fe-Start	GAK3	7/1/04	2214	59.5551	-149.2012	215	Wu	
HX28618304.58	Pole sample for Fe-End	GAK3	7/1/04				215	Wu	
HX28618304.59	CTD63-Start	GAK3I	7/1/04	2311	59.4824	-149.1174	205	Weingartner	
HX28618304.60	CTD63-End	GAK3I	7/1/04	2327	59.4829	-149.1228	205	Weingartner	
HX28618304.61	CTD64-Start	GAK3I	7/1/04	2335	59.4831	-149.1256	205	Weingartner	recast with ctd1
HX28618304.62	CTD64-End	GAK3I	7/1/04	2350	59.4833	-149.1299	205	Weingartner	
HX28618404.01	HTI Transect-Start	GAK4	7/2/04	0645	59.4098	-149.0508	201	Coyle	
HX28618404.02	HTI Transect-End	GAK3	7/2/04	0822	59.5539	-149.1897	215	Coyle	
HX28618404.03	MOCNESS-Start	GAK3	7/2/04	0828	59.5485	-149.1889	215	Coyle	
HX28618404.04	MOCNESS-End	GAK3	7/2/04	0915	59.5156	-149.1604	215	Coyle	
HX28618404.05	HTI Transect-Start	GAK3	7/2/04	0940	59.5535	-149.1895	215	Coyle	
HX28618404.06	HTI Transect-End	GAK2	7/2/04	1120	59.6922	-149.3283	228	Coyle	
HX28618404.07	MOCNESS-Start	GAK2	7/2/04	1123	59.6906	-149.3292	228	Coyle	
HX28618404.08	MOCNESS-End	GAK2	7/2/04	1207	59.6576	-149.3281	228	Coyle	
HX28618404.09	CTD65-Start	CF1	7/2/04	1445	59.9103	-148.8665	77	Weingartner	
HX28618404.10	CTD65-End	CF1	7/2/04	1452	59.9113	-148.8667	77	Weingartner	
HX28618404.11	CTD66-Start	CF2	7/2/04	1507	59.8827	-148.8681	112	Weingartner	
HX28618404.12	CTD66-End	CF2	7/2/04	1512	59.8827	-148.8683	112	Weingartner	
HX28618404.13	CTD67-Start	CF3	7/2/04	1527	59.8498	-148.8663	160	Weingartner	
HX28618404.14	CTD67-End	CF3	7/2/04	1540	59.8479	-148.8680	160	Weingartner	
HX28618404.15	CTD68-Start	CF4	7/2/04	1552	59.8170	-148.8667	180	Weingartner	
HX28618404.16	CTD68-End	CF4	7/2/04	1605	59.8151	-148.8683	180	Weingartner	
HX28618404.17	CTD69-Start	CF5	7/2/04	1618	59.7835	-148.8672	190	Weingartner	
HX28618404.18	CTD69-End	CF5	7/2/04	1634	59.7816	-148.8708	190	Weingartner	
HX28618404.19	CTD70-Start	CF6	7/2/04	1649	59.7494	-148.8670	186	Weingartner	
HX28618404.20	CTD70-End	CF6	7/2/04	1700	59.7470	-148.8702	186	Weingartner	
HX28618404.21	CTD71-Start	CF7	7/2/04	1714	59.7161	-148.8658	180	Weingartner	
HX28618404.22	CTD71-End	CF7	7/2/04	1728	59.7146	-148.8678	180	Weingartner	
HX28618404.23	CTD72-Start	CF8	7/2/04	1743	59.6830	-148.8666	177	Weingartner	
HX28618404.24	CTD72-End	CF8	7/2/04	1753	59.6826	-148.8686	177	Weingartner	
HX28618404.25	CTD73-Start	CF9	7/2/04	1808	59.6501	-148.8659	177	Weingartner	

HX28618404.26	CTD73-End	CF9	7/2/04	1814	59.6502	-148.8656	177	Weingartner	CTD problem aborted cast
HX28618404.27	CTD74-Start	CF9	7/2/04	1829	59.6503	-148.8688	177	Weingartner	
HX28618404.28	CTD74-End	CF9	7/2/04				177	Weingartner	
HX28618404.29	CTD75-Start	CF9	7/2/04	1850	59.6508	-148.8725	177	Weingartner	switch to ctd2
HX28618404.30	CTD75-End	CF9	7/2/04	1903	59.6510	-148.8750	177	Weingartner	
HX28618404.31	Pole sample for Fe-Start	CF9	7/2/04	1903	59.6510	-148.8750	177	Wu	
HX28618404.32	Pole sample for Fe-end	CF9	7/2/04	1903	59.6510	-148.8750	177	Wu	
HX28618404.33	CTD76-Start	CF10	7/2/04	1920	59.6166	-148.8660	175	Weingartner	ctd2
HX28618404.34	CTD76-End	CF10	7/2/04	1933	59.6170	-148.8702	175	Weingartner	
HX28618404.35	CTD77-Start	CF11	7/2/04	1950	59.5836	-148.8663	177	Weingartner	
HX28618404.36	CTD77-End	CF11	7/2/04	2014	59.5840	-148.8692	177	Weingartner	Flu and transmissometer not working this cast
HX28618404.37	CTD78-Start	CF11	7/2/04	2016	59.5840	-148.8687	177	Weingartner	fluor. test
HX28618404.38	CTD78-End	CF11	7/2/04	2029	59.5870	-148.8655	177	Weingartner	
HX28618404.39	Pole sample for Fe-Start	CF9	7/2/04	1903	59.6510	-148.8750	177	Wu	
HX28618404.40	Pole sample for Fe-end	CF9	7/2/04	1903	59.6510	-148.8750	177	Wu	
HX28618404.41	CTD79-Start	CF12	7/2/04	2047	59.5498	-148.8658	183	Weingartner	
HX28618404.42	CTD79-End	CF12	7/2/04	2059	59.5509	-148.8643	183	Weingartner	
HX28618404.43	CTD80-Start	CF13	7/2/04	2116	59.5160	-148.8648	171	Weingartner	
HX28618404.44	CTD80-End	CF13	7/2/04	2128	59.5175	-148.8627	171	Weingartner	
HX28618404.45	Pole sample for Fe-Start	CF13	7/2/04	2128	59.5175	-148.8627	171	Wu	
HX28618404.46	Pole sample for Fe-end	CF13	7/2/04	2128	59.5175	-148.8627	171	Wu	
HX28618404.47	CTD81-Start	CF14	7/2/04	2146	59.4835	-148.8651	171	Weingartner	
HX28618404.48	CTD81-End	CF14	7/2/04	2158	59.4859	-148.8656	171	Weingartner	
HX28618404.49	CTD82-Start	CF15	7/2/04	2217	59.4501	-148.8655	182	Weingartner	
HX28618404.50	CTD82-End	CF15	7/2/04	2252	59.4424	-148.8638	182	Weingartner	
HX28618404.51	Pole sample for Fe-Start	CF15	7/2/04	2252	59.4424	-148.8638	182	Wu	
HX28618404.52	Pole sample for Fe-end	CF15	7/2/04	2252	59.4424	-148.8638	182	Wu	
HX28618404.53	ADCP line-Start	CF15	7/2/04	2252	59.4424	-148.8638	182	Weingartner	
HX28618404.54	Pole sample for Fe-Start	CF7	7/2/04		59.7161	-148.8658	180	Wu	
HX28618404.55	Pole sample for Fe-End	CF7	7/2/04				180	Wu	
HX28618404.56	Pole sample for Fe-Start	CF5	7/2/04		59.7835	-148.8672	190	Wu	
HX28618404.57	Pole sample for Fe-end	CF5	7/2/04				190	Wu	

HX28618404.58	Pole sample for Fe-Start	CF3	7/2/04		59.8498	-148.8663	160	Wu	
HX28618404.59	Pole sample for Fe-end	CF3	7/2/04				160	Wu	
HX28618404.60	Pole sample for Fe-Start	CF1	7/2/04		59.9103	-148.8665	77	Wu	
HX28618404.61	Pole sample for Fe-end	CF1	7/2/04				77	Wu	
HX28618404.62	ADCP line-End	CF1	7/2/04		59.9103	-148.8665	77	Weingartner	
HX28618504.01	CTD83-Start	GAK1	7/3/04	0526	59.8446	-149.4663	274	Weingartner	
HX28618504.02	CTD83-End	GAK1	7/3/04	0549	59.8436	-149.4659	274	Weingartner	
HX28618504.03	Ring Net-Start	GAK1	7/3/04	0550	59.8436	-149.4660	274	Hopcroft	
HX28618504.04	Ring Net-End	GAK1	7/3/04	0553	59.8429	-149.4649	274	Hopcroft	
HX28618504.05	CTD84-Start	GAK2	7/3/04	0653	59.6904	-149.3259	227	Weingartner	
HX28618504.06	CTD84-End	GAK2	7/3/04	0707	59.6892	-149.3244	227	Weingartner	
HX28618504.07	HTI Transect-Start	GAK2	7/3/04	0714	59.6919	-149.3269	227	Coyle	
HX28618504.08	HTI Transect-End	GAK1	7/3/04	0859	59.8457	-149.4672	273	Coyle	
HX28618504.09	MOCNESS-Start	GAK1	7/3/04	0902	59.8488	-149.4663	273	Coyle	
HX28618504.10	MOCNESS-End	GAK1	7/3/04	0945	59.8816	-149.4495	273	Coyle	
HX28618504.11	CTD85-Start	RUGGED IS.	7/3/04	1016	59.8688	-149.3543	85	Hopcroft	Water for experiments
HX28618504.12	CTD85-End	RUGGED IS.	7/3/04				85	Hopcroft	Water for experiments
HX28618504.13	CTD86-Start	HE11	7/3/04	1846	60.1433	-147.1915	175	Weingartner	
HX28618504.14	CTD86-End	HE11	7/3/04	1858	60.1432	-147.1937	175	Weingartner	
HX28618504.15	Pole sample for Fe-Start	HE11	7/3/04	1858	60.1432	-147.1937	175	Wu	
HX28618504.16	Pole sample for Fe-end	HE11	7/3/04	1858	60.1432	-147.1937	175	Wu	
HX28618504.17	CalVET Net Tow-Start	HE10	7/3/04	1920	60.1316	-147.1314	175	Hopcroft	
HX28618504.18	CalVET Net Tow-End	HE10	7/3/04	1920			175	Hopcroft	
HX28618504.19	CTD87-Start	HE10	7/3/04	1921	60.1317	-147.1313	215	Weingartner	
HX28618504.20	CTD87-End	HE10	7/3/04	1939	60.1359	-147.1257	215	Weingartner	
HX28618504.21	CTD88-Start	HE9	7/3/04	2000	60.1115	-147.0488	275	Weingartner	
HX28618504.22	CTD88-End	HE9	7/3/04	2020	60.1156	-147.0414	275	Weingartner	
HX28618504.23	Pole sample for Fe-Start	HE9	7/3/04	2024	60.1136	-147.0336	275	Wu	
HX28618504.24	Pole sample for Fe-end	HE9	7/3/04	2027	60.1092	-147.0193	275	Wu	
HX28618504.25	CTD89-Start	HE8	7/3/04	2041	60.0929	-146.9587	147	Weingartner	
HX28618504.26	CTD89-End	HE8	7/3/04	2053	60.0933	-146.9568	147	Weingartner	
HX28618504.27	CalVET Net Tow-Start	HE6.5	7/3/04	2138	60.0523	-146.7353	124	Hopcroft	
HX28618504.28	CalVET Net Tow-End	HE6.5	7/3/04	2143	60.0528	-146.7343	124	Hopcroft	
HX28618504.29	CTD90-Start	HE6.5	7/3/04	2145	60.0529	-146.7341	124	Weingartner	

HX28618504.30	CTD90-End	HE6.5	7/3/04	2156	60.0542	-146.7297	124	Weingartner	
HX28618504.31	Pole sample for Fe-Start	HE6.5	7/3/04	2159	60.0545	-146.7260	124	Wu	
HX28618504.32	Pole sample for Fe-end	HE6.5	7/3/04	2200	60.0549	-146.7243	124	Wu	
HX28618504.33	CalVET Net Tow-Start	HE4	7/3/04	2227	60.0799	-146.6025	117	Hopcroft	
HX28618504.34	CalVET Net Tow-End	HE4	7/3/04	2227	60.0799	-146.6024	117	Hopcroft	
HX28618504.35	CTD91-Start	HE4	7/3/04	2230	60.0804	-146.5998	117	Weingartner	
HX28618504.36	CTD91-End	HE4	7/3/04	2241	60.0812	-146.5920	117	Weingartner	
HX28618504.37	POle Fe sample-End	HE4	7/3/04	2246	60.0921	-146.5957	117	Wu	
HX28618504.38	POle Fe sample-Start	HE4	7/3/04	2247	60.0930	-146.5962	117	Wu	
HX28618504.39	CTD92-Start	HE3	7/3/04	2302	60.1299	-146.6084	117	Weingartner	
HX28618504.40	CTD92-End	HE3	7/3/04	2311	60.1313	-146.6066	117	Weingartner	
HX28618504.41	CTD93-Start	HE1	7/3/04	2344	60.2193	-146.6062	50	Weingartner	
HX28618504.42	CTD93-End	HE1	7/3/04	2355	60.2193	-146.6062	50	Weingartner	*
HX28618604.01	CalVET Net Tow-Start	HE2	7/4/04	0009	60.1794	-146.6063	193	Hopcroft	
HX28618604.02	CalVET Net Tow-End	HE2	7/4/04	0014	60.1794	-146.6063	193	Hopcroft	*
HX28618604.03	CTD94-Start	HE2	7/4/04	0023	60.1771	-146.5997	177	Weingartner	
HX28618604.04	CTD94-End	HE2	7/4/04	0036	60.1752	-146.5976	177	Weingartner	
HX28618604.05	Pole sample for Fe-Start	HE2	7/4/04	0037	60.1754	-146.5984	177	Wu	
HX28618604.06	Pole Fe sample-End	HE2	7/4/04	0037	60.1755	-146.5990	177	Wu	
HX28618604.07	MOCNESS-Start	PWS2	7/4/04	0455	60.6267	-147.6404	694	Coyle	Deep
HX28618604.08	MOCNESS-End	PWS2	7/4/04	0625	60.5766	-147.7377	694	Coyle	
HX28618604.09	CTD95-Start	PWS2	7/4/04	0652	60.5352	-147.8046	740	Coyle	
HX28618604.10	CTD95-End	PWS2	7/4/04	0655	60.5352	-147.8057	740	Coyle	
HX28618604.11	MOCNESS-Start	PWS2	7/4/04	0726	60.5398	-147.7946	740	Coyle	
HX28618604.12	MOCNESS-End	PWS2	7/4/04	0800	60.5570	-147.7682	740	Coyle	
HX28618604.13	MOCNESS-Start	PWS1	7/4/04	0920	60.3775	-147.9401	350	Coyle	
HX28618604.14	MOCNESS-End	PWS1	7/4/04	0956	60.3514	-147.9582	350	Coyle	
HX28618604.15	MOCNESS-Start	KIP2	7/4/04	1030	60.2793	-147.9859	580	Coyle	
HX28618604.16	MOCNESS-End	KIP2	7/4/04	1114	60.3082	-147.9650	580	Coyle	
HX28618604.17	CTD96-Start	PWS2	7/4/04	1304	60.5352	-147.8057	740	Weingartner	
HX28618604.18	CTD96-End	PWS2	7/4/04	1400	60.5352	-147.8057	740	Weingartner	
HX28618604.19	CalVET Net Tow-Start	PWS2	7/4/04	1405	60.5352	-147.8057	740	Hopcroft	
HX28618604.20	CalVET Net Tow-End	PWS2	7/4/04	1410	60.5352	-147.8057	740	Hopcroft	
HX28618604.21	CalVET Net Tow-Start	PWS1	7/4/04	1455	60.3787	-147.9355	347	Hopcroft	
HX28618604.22	CalVET Net Tow-End	PWS1	7/4/04	1501	60.3775	-147.9355	347	Hopcroft	
HX28618604.23	CTD97-Start	PWS1	7/4/04	1506	60.3794	-147.9400	346	Weingartner	
HX28618604.24	CTD97-End	PWS1	7/4/04	1530	60.3711	-147.9501	365	Weingartner	
HX28618604.25	CTD98-Start	KIP2	7/4/04	1603	60.2780	-147.9864	586	Hopcroft	zoop cast

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HX28618604.26	CTD98-End	KIP2	7/4/04	1610	60.2758	-147.9891	586	Hopcroft	
HX28618604.27	CTD99-Start	KIP2	7/4/04	1616	60.2737	-147.9916	586	Hopcroft	zoopcast2
HX28618604.28	CTD99-End	KIP2	7/4/04	1620	60.2726	-147.9928	586	Hopcroft	
HX28618604.29	CTD100-Start	KIP2	7/4/04	1624	60.2711	-147.9943	586	Hopcroft	zoopcast3
HX28618604.30	CTD100-End	KIP2	7/4/04	1625	60.2707	-147.9947	586	Hopcroft	
HX28618604.31	CTD101-Start	KIP2	7/4/04	1630	60.2690	-147.9963	586	Hopcroft	
HX28618604.32	CTD101-End	KIP2	7/4/04	1632	60.2685	-147.9966	586	Hopcroft	
HX28618604.33	CTD102-Start	KIP2	7/4/04	1638	60.2662	-147.9982	586	Hopcroft	zoopcast5
HX28618604.34	CTD102-End	KIP2	7/4/04	1639	60.2660	-147.9984	586	Hopcroft	
HX28618604.35	CTD103-Start	KIP2	7/4/04	1647	60.2631	-148.0001	586	Hopcroft	zoopcast6
HX28618604.36	CTD103-End	KIP2	7/4/04	1651	60.2615	-148.0008	586	Hopcroft	
HX28618604.37	CalVET Net Tow-Start	KIP2	7/4/04	1745	60.2700	-147.9840	586	Hopcroft	
HX28618604.38	CalVET Net Tow-End	KIP2	7/4/04	1745	60.2700	-147.9840	586	Hopcroft	
HX28618604.39	Ring Net-Start	KIP2	7/4/04	1746	60.2700	-147.9840	586	Hopcroft	
HX28618604.40	Ring Net-End	KIP2	7/4/04	1750	60.2684	-147.9836	586	Hopcroft	
HX28618604.41	CTD104-Start	KIP2	7/4/04	1758	60.2777	-147.9899	586	Weingartner	
HX28618604.42	CTD104-End	KIP2	7/4/04	1836	60.2648	-147.9940	586	Weingartner	
HX28618604.43	CTD105-Start	KIP2	7/4/04	1846	60.2774	-147.9891	586	Whitledge	prods
HX28618604.44	CTD105-End	KIP2	7/4/04	1854	60.2751	-147.9900	586	Whitledge	
HX28618604.45	CTD106-Start	MS1	7/4/04	2104	59.9549	-147.9292	164	Weingartner	
HX28618604.46	CTD106-End	MS1	7/4/04	2121	59.9536	-147.9364	164	Weingartner	
HX28618604.47	CalVET Net Tow-Start	MS2	7/4/04	2134	59.9429	-147.8944	194	Hopcroft	
HX28618604.48	CalVET Net Tow-End	MS2	7/4/04	2139	59.9427	-147.8934	194	Hopcroft	
HX28618604.49	CTD107-Start	MS2	7/4/04	2143	59.9434	-147.8926	194	Weingartner	
HX28618604.50	CTD107-End	MS2	7/4/04	2158	59.9439	-147.8936	194	Weingartner	
HX28618604.51	CTD108-Start	MS3	7/4/04	2215	59.9327	-147.8550	166	Weingartner	
HX28618604.52	CTD108-End	MS3	7/4/04	2227	59.9335	-147.8536	166	Weingartner	
HX28618604.53	CTD109-Start	MS4	7/4/04	2239	59.9217	-147.8245	124	Weingartner	
HX28618604.54	CTD109-End	MS4	7/4/04	2256	59.9281	-147.8160	124	Weingartner	
HX28618704.01	CTD110-Start	HB1	7/5/04	0032	60.1929	-147.7022	245	Weingartner	
HX28618704.02	CTD110-End	HB1	7/5/04	0051	60.1881	-147.7059	245	Weingartner	
HX28618704.03	CTD111-Start	HB2	7/5/04	0109	60.1800	-147.6422	179	Weingartner	
HX28618704.04	CTD111-End	HB2	7/5/04	0124	60.1798	-147.6489	179	Weingartner	
HX28618704.05	CalVET Net Tow-Start	HB2	7/5/04	0127	60.1802	-147.6490	179	Hopcroft	
HX28618704.06	CalVET Net Tow-End	HB2	7/5/04	0135	60.1789	-147.6483	179	Hopcroft	
HX28618704.07	CTD112-Start	HB3	7/5/04	0157	60.1649	-147.5739	82	Weingartner	
HX28618704.08	CTD112-End	HB3	7/5/04	0206	60.1644	-147.5756	82	Weingartner	
HX28618704.09	CTD113-Start	HB4	7/5/04	0225	60.1474	-147.5007	109	Weingartner	
HX28618704.10	CTD113-End	HB4	7/5/04	0235	60.1467	-147.5039	109	Weingartner	
HX28618704.11	CTD114-Start	RANDOM	7/5/04	0248	60.1255	-147.5430	120	Hopcroft	
HX28618704.12	CTD114-End	RANDOM	7/5/04	0252	60.1253	-147.5437	120	Hopcroft	

HX28618704.13	MOCNESS-Start	HB2	7/5/04	0725	60.1841	-147.6716	255	Coyle	
HX28618704.14	MOCNESS-End	HB2	7/5/04	0813	60.2175	-147.6378	255	Coyle	
HX28618704.15	MOCNESS-Start	MS2	7/5/04	1015	59.9451	-147.8877	197	Coyle	
HX28618704.16	MOCNESS-End	MS2	7/5/04	1103	59.9734	-147.8246	197	Coyle	
HX28618704.17	CTD115-Start	GAK1	7/5/04	1646	59.8445	-149.4669	197	Wu	mitess
HX28618704.18	CTD115-End	GAK1	7/5/04	1820	59.8382	-149.4686	270	Wu	
HX28618704.19	CTD116-Start	GAK1	7/5/04	1820	59.8381	-149.4686	270	Wu	mitess
HX28618704.20	CTD116-End	GAK1	7/5/04	1911	59.8363	-149.4709	270	Wu	
HX28618704.21	CTD117-Start	GAK1	7/5/04	1911	59.8363	-149.4709	270	Wu	mitess
HX28618704.22	CTD117-End	GAK1	7/5/04	2007	59.8357	-149.4772	270	Wu	
HX28618704.23	Ring Net-Start	GAK1	7/5/04	2013	59.8457	-149.4681	270	Hopcroft	
HX28618704.24	Ring Net-End	GAK1	7/5/04	2020	59.8460	-149.4682	270	Hopcroft	
HX28618704.25	CTD118-Start	GAK1	7/5/04	2020	59.8460	-149.4682	270	Weingartner	
HX28618704.26	CTD118-End	GAK1	7/5/04	2037	59.8460	-149.4707	270	Weingartner	
HX28618704.27	CTD119-Start	RES2.5	7/5/04	2200	60.0266	-149.3591	270	Weingartner	
HX28618704.28	CTD119-End	RES2.5	7/5/04	2204	60.0276	-149.3585	270	Weingartner	