GLOBEC CRUISE REPORT

Cruise HX292 September 29 – October 8, 2004

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Scientific Purpose:
The purpose of the NE Pacific GLOBEC program is to develop a mechanistic understanding of the response of this marine ecosystem to climate variability. Toward this end the GLOBEC cruises on the Gulf of Alaska shelf will determine the physical-chemical structure, primary production and the distribution and abundance of zooplankton, yoy salmon and other planktivorous fish. These interdisciplinary cruises will occur over a seven-year period and throughout the year so that seasonal and interannual depictions of the oceanography of this shelf will be available. Some of the data will be compared with historical data sets whereas other data sets will be a product of the first systematic sampling effort from this shelf. This October sampling marks the eighth consecutive October for GLOBEC LTOP sampling in the GOA.

Cruise Objectives:

1. Determine thermohaline, velocity, and nutrient structure of the Gulf of Alaska shelf, emphasizing Seward Line, C. Fairfield Line, Prince William Sound stations, and offshore PWS stations (Table 1). Other lines as time permits.
2. Determine primary production and phytoplankton biomass distribution.
3. Determine the distribution and abundance of zooplankton.
4. 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 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. 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.
6. We did deep MOCNESS tows (to 600 m) near the end of the Seward Line at station GAK13 and at station PWS2.

NIGHTTIME ACTIVITIES

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

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

Cruise Activity Timeline:

9/29	Science party arrived in Seward and sets up equipment.
9/30	Precruise meeting. Departed from dock for RES 2.5 and inner Seward Line stations. Completed CTD at GAK1-5.
10/1-2	Completed CTD and Mocness offshore GAK9-13. Abort of the Seward Line sampling due to rough weather.
10/3-4	Completion of sampling in PWS.
10/5	Calmer weather, completed Fairfield Line CTD.
10/6	Finished Seward Line and Cape Fairfield ADCP transect.
10/7	Completed Hinchinbrook Entrance CTD and Mocness.
10/8	Return to Seward.

Cruise Summary:

The weather forecast predicted bad weather for basically the entire length of the cruise. After leaving the dock at Seward in the morning of September 30th, we collected CTD stations 1-4 of the Seward Line. Seas were rough but workable with up to 15 knot winds. After completing the offshore work from GAK9 to GAK13 conditions were too rough to continue MOCNESS and HTI operation. Sampling was stopped due to weather and in the night of October 2nd, we started the passage to Prince William Sound to occupy stations under sheltered conditions. We completed the deep stations of PWS1 and 2 as well as KIP2 before sampling the hydrography of the Hogan Bay and Montague Strait Lines. HTI and MOCNESS were conducted the following night and work in PWS was completed in the night of the 5th of October.

Conditions outside the Sound were good with 5 foot seas and 10 knot winds, so the Fairfield Line could be completed during the day, before steaming to position of GAK5 in order to resume work along the Seward Line. HTI and MOCNESS stations went offshore to GAK9 and CTD stations were carried out inward the following morning, so that the Seward Line was completed in the afternoon of October 6th. Weather conditions became rougher again. From GAK5i we took the short passage to CF15 in order to conduct the Doppler transect for the current profile of the Fairfield Line. The equipment was in excellent shape and gave no problems at all.

The remaining stations in the very dynamic region of Hinchinbrook Entrance were sampled during the day of October 7th. Winds reached up to over 20 knots but seas remained workable, so that the physical portion of the cruise could be completed that evening. The remaining acoustic stations were sampled and after the 12 hour passage the ship tied up at the dock of the Seward Marine Center at noon of October 8th. Crew and equipment were working great under the conditions and granted the successful sampling of all stations, despite the overall rough weather which was very hard on crew and science party.

Zooplankton Stable C & N Isotopes (T. Kline)

Samples for **stable isotope analysis (SIA) were** collected from MOCNESS tows made during HX292. SIA sampling stations consisted of the 13 Seward Line stations GAK1 to GAK 13; four of the Hinchinbrook Entrance stations, HE10, HE 6.5, HE 4, and HE 2; and the five core LTOP stations within Prince William Sound, MS 2, HB 2, KIP 2, PWS1, 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' MOCNESS stations, GAK13 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.

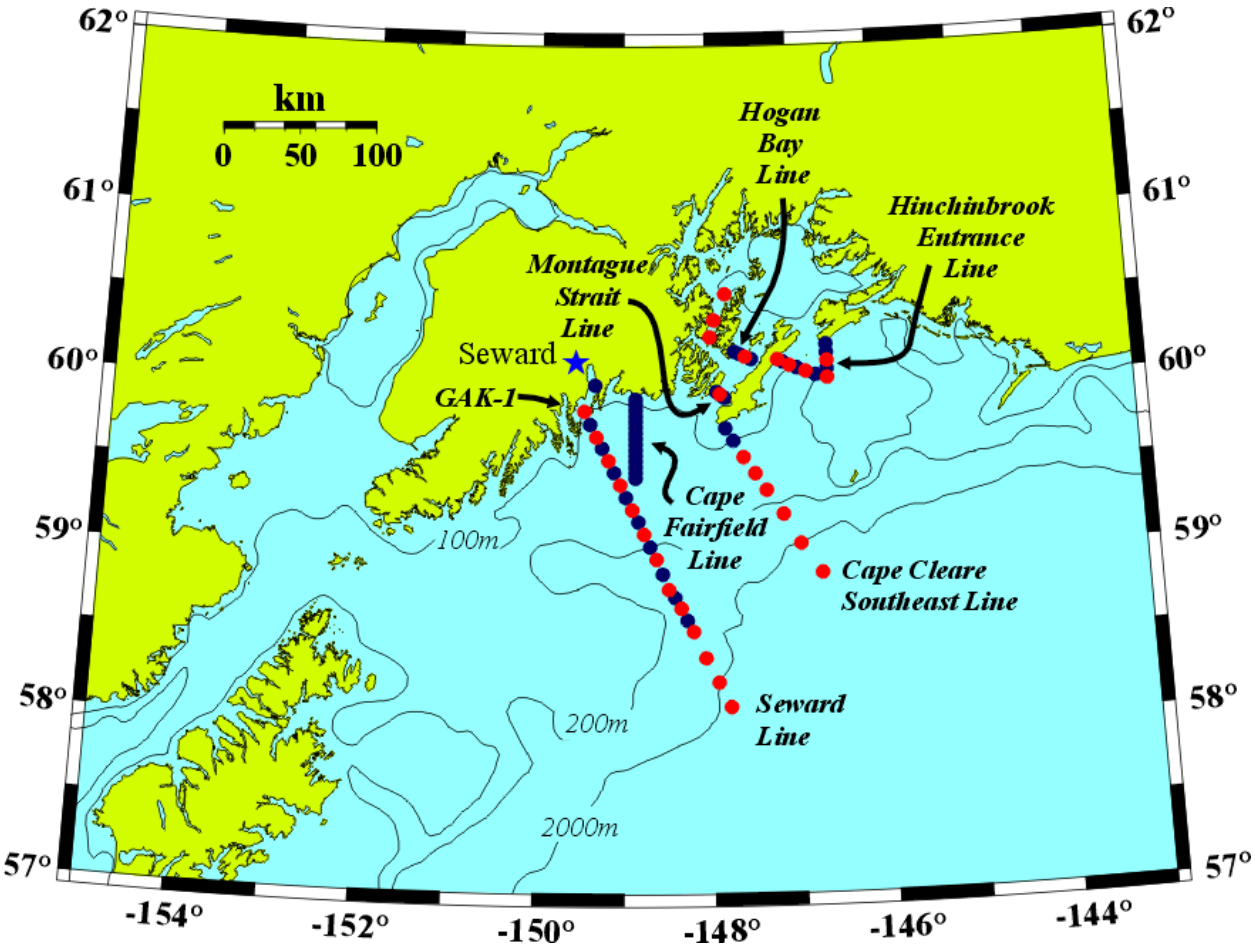
Table 1.

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

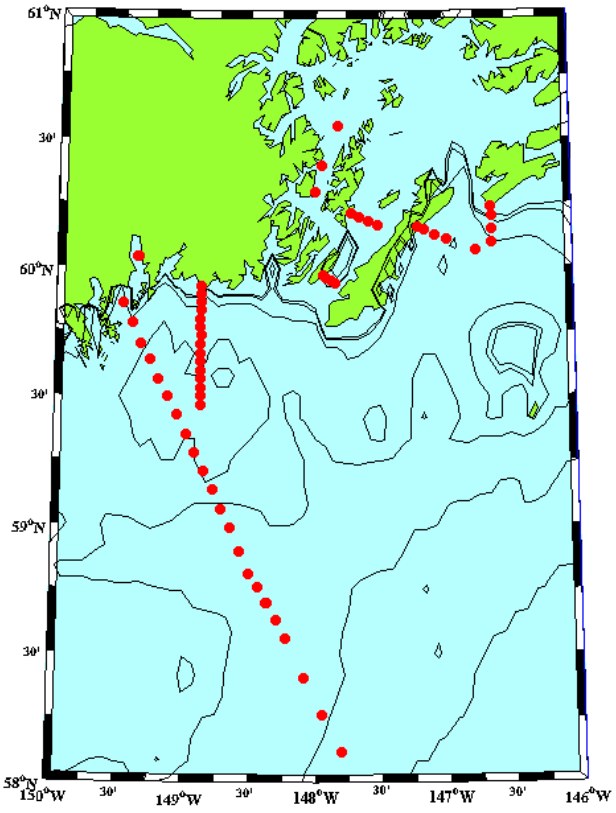
60	3.126	146	44.19	HE6.5
60	5.6	146	57.7	HE8
60	6.6	147	3	HE9
60	7.8	147	8	HE10
60	8.6	147	11.5	HE11
Cape Cleare Southeast				
59	44.5	147	49	CCSE1
59	40	147	43.6	CCSE2
59	34.25	147	36.5	CCSE3
59	28.5	147	28.5	CCSE4
59	22.5	147	21	CCSE5
59	14	147	9.5	CCSE6
59	3.5	146	58	CCSE7
58	53	146	44	CCSE8

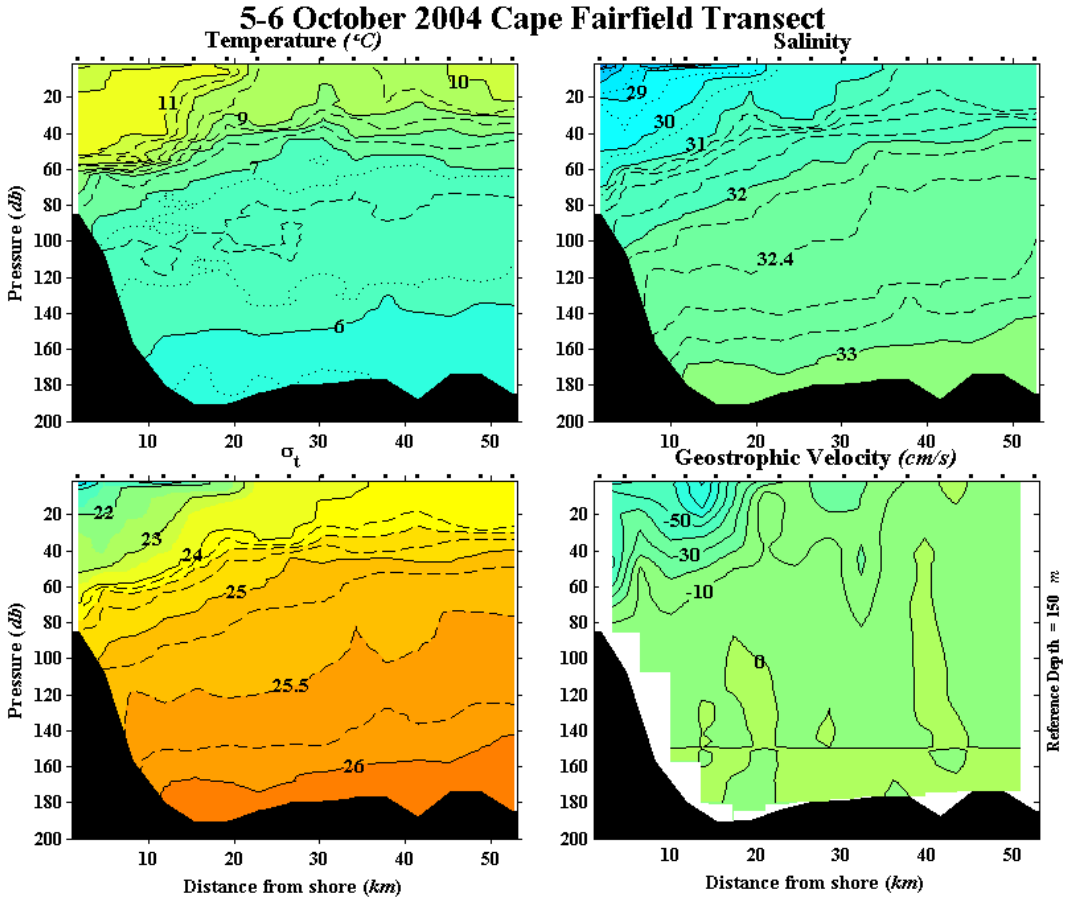
NEP GLOBEC Standard Station Map

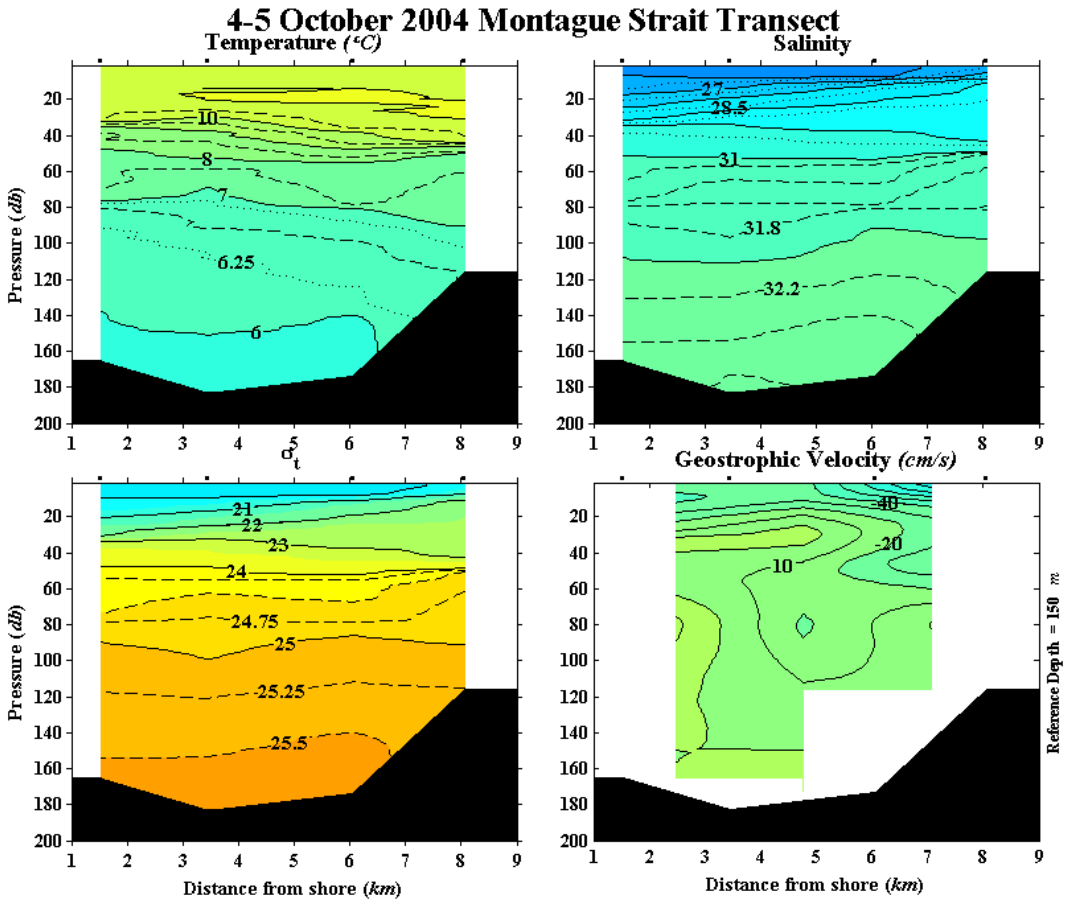


Note: The Cape Cleare Southeast Line is a standard line only in selected cruises during the Process Study sampling years.

hx292




5-6 October 2004 Cape Fairfield Transect
Temperature (°C)
Salinity
σt
Geostrophic Velocity (cm/s)
Pressure (db)
Distance from shore (km)
Reference Depth = 150 m


4-5 October 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)

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.

event	Description	Station	Date	GMT	Latitude	Longitude	Depth	si	Comments
HX29227404.01	CTD001-Start	RES2.5	9/30/04	1817	60.0245	149.3554	293	Weingartner	
HX29227404.02	CTD001-End	RES2.5	9/30/04	1837	60.0239	149.3544	293	Weingartner	
HX29227404.03	CTD002-Start	RES2.5	9/30/04	1849	60.0250	149.3596	293	Weingartner	recast for water
HX29227404.04	CTD002-End	RES2.5	9/30/04	1901	60.0219	149.363	293	Weingartner	
HX29227404.05	HTI Transect-Start	RES2.5	9/30/04	1902	60.0212	149.3631	293	Coyle	noise test
HX29227404.06	HTI Transect-End	RES2.5	9/30/04	2023	59.8468	149.4654	293	Coyle	
HX29227404.07	CTD003-Start	GAK1	9/30/04	2026	59.8443	149.4641	260	Weingartner	
HX29227404.08	CTD003-End	GAK1	9/30/04	2047	59.8455	149.4677	260	Weingartner	
HX29227404.09	CalVET Net Tow-Start	GAK1	9/30/04	2112	59.8469	149.469	271	Hopcroft	
HX29227404.10	CalVET Net Tow-End	GAK1	9/30/04	2145	59.7862	149.4143	271	Hopcroft	
HX29227404.11	CTD004-Start	GAK1I	9/30/04	2156	59.7657	149.3951	271	Weingartner	
HX29227404.12	CTD004-End	GAK1I	9/30/04	2216	59.7618	149.408	271	Weingartner	
HX29227404.13	CalVET Net Tow-Start	GAK2	9/30/04	2250	59.6900	149.3239	227	Hopcroft	
HX29227404.14	CalVET Net Tow-End	GAK2	9/30/04	2304	59.6862	149.3245	227	Hopcroft	
HX29227404.15	CTD005-Start	GAK2	9/30/04	2305	59.6859	149.325	227	Weingartner	
HX29227404.16	CTD005-End	GAK2	9/30/04	2323	59.6810	149.3306	227	Weingartner	
HX29227404.17	CTD006-Start	GAK2I	9/30/04	2352	59.6252	149.2577	211	Weingartner	
HX29227504.01	CTD006-End	GAK2I	10/1/04	0008	59.6234	149.2592	211	Weingartner	
HX29227504.02	CalVET Net Tow-Start	GAK3	10/1/04	0043	59.5520	149.1895	211	Hopcroft	
HX29227504.03	CalVET Net Tow-End	GAK3	10/1/04	Na	Na	Na	211	Hopcroft	
HX29227504.04	CTD7-Start	GAK3	10/1/04	0057	59.5505	149.1909	216	Weingartner	
HX29227504.05	CTD7-End	GAK3	10/1/04	0113	59.5502	149.1921	216	Weingartner	
HX29227504.06	CTD008-Start	GAK3I	10/1/04	0145	59.4817	149.1164	203	Weingartner	
HX29227504.07	CTD008-End	GAK3I	10/1/04	0204	59.4815	149.1135	203	Weingartner	
HX29227504.08	CalVET Net Tow-Start	GAK4	10/1/04	0243	59.4084	149.0472	203	Hopcroft	
HX29227504.09	CalVET Net Tow-End	GAK4	10/1/04	0248	59.4082	149.0437	203	Hopcroft	
HX29227504.10	CTD8-Start	GAK4	10/1/04	0252	59.4085	149.0415	198	Weingartner	
HX29227504.11	CTD8-End	GAK4	10/1/04	0312	59.4070	149.0267	198	Weingartner	
HX29227504.12	CTD010-Start	GAK4I	10/1/04	0347	59.3348	148.9753	198	Weingartner	
HX29227504.13	CTD010-End	GAK4I	10/1/04	0408	59.3323	148.9613	198	Weingartner	
HX29227504.14	MOCNESS-Start	GAK5	10/1/04	0451	59.2558	148.905	163	Coyle	
HX29227504.15	MOCNESS-End	GAK5	10/1/04	0525	59.2313	148.9184	163	Coyle	
HX29227504.16	HTI Transect-Start	GAK5	10/1/04	0551	59.2627	148.9088	163	Coyle	
HX29227504.17	HTI Transect-End	GAK4	10/1/04	0736	59.4090	149.0494	198	Coyle	
HX29227504.18	MOCNESS-Start	GAK4	10/1/04	0740	59.4069	149.0536	198	Coyle	
HX29227504.19	MOCNESS-End	GAK4	10/1/04	0817	59.3860	149.0863	198	Coyle	
HX29227504.20	HTI Transect-Start	GAK4	10/1/04	0840	59.4083	149.048	198	Coyle	
HX29227504.21	HTI Transect-End	GAK3	10/1/04	1019	59.5539	149.1899	215	Coyle	

HX29227504.22	MOCNESS-Start	GAK3	10/1/04	1022	59.5530	149.1918	215	Coyle	
HX29227504.23	MOCNESS-End	GAK3	10/1/04	1054	59.5314	149.2244	215	Coyle	
HX29227504.24	HTI Transect-Start	GAK3	10/1/04	1124	59.5643	149.2001	215	Coyle	
HX29227504.25	HTI Transect-End	GAK2	10/1/04	1258	59.6923	149.3275	228	Coyle	
HX29227504.26	MOCNESS-Start	GAK2	10/1/04	1301	59.6929	149.3295	228	Coyle	
HX29227504.27	MOCNESS-End	GAK2	10/1/04	1331	59.7098	149.3433	228	Coyle	
HX29227504.28	HTI Transect-Start	GAK2	10/1/04	1354	59.6911	149.3263	228	Coyle	
HX29227504.29	HTI Transect-End	GAK1	10/1/04	1539	59.8454	149.467	269	Coyle	
HX29227504.30	CTD011-Start	GAK1	10/1/04	1545	59.8454	149.4686	269	Weingartner	
HX29227504.31	CTD011-End	GAK1	10/1/04	1600	59.8424	149.4695	269	Weingartner	
HX29227504.32	CTD012-Start	GAK4	10/1/04	1858	59.4090	149.05	298	Whitledge	Prim Prod
HX29227504.33	CTD012-End	GAK4	10/1/04	1906	59.4087	149.0552	198	Whitledge	
HX29227504.34	CalVET Net Tow-Start	GAK5	10/1/04	1906	59.4087	149.0552	168	Hopcroft	
HX29227504.35	CalVET Net Tow-End	GAK5	10/1/04	2035	59.2626	148.9124	168	Hopcroft	
HX29227504.36	CTD013-Start	GAK5	10/1/04	2035	59.2626	148.9125	168	Weingartner	
HX29227504.37	CTD013-End	GAK5	10/1/04	2052	59.2661	148.9235	168	Weingartner	
HX29227504.38	CalVET Net Tow-Start	GAK5	10/1/04	2054	59.2666	148.9242	168	Hopcroft	recast
HX29227504.39	CalVET Net Tow-End	GAK5	10/1/04	2106	59.2551	148.9159	168	Hopcroft	
HX29227604.01	CTD14-Start	GAK9I	10/2/04	0200	58.6136	148.2761	678	Weingartner	
HX29227604.02	CTD14-End	GAK9I	10/2/04	0239	58.6220	148.2672	678	Weingartner	
HX29227604.03	CalVET Net Tow-Start	GAK10	10/2/04	0319	58.5417	148.2113	1461	Coyle	
HX29227604.04	CalVET Net Tow-End	GAK10	10/2/04	0324	58.5424	148.2119	1461	Coyle	
HX29227604.05	CTD015-Start	GAK10	10/2/04	0326	58.5427	148.2121	1461	Weingartner	
HX29227604.06	CTD015-End	GAK10	10/2/04	0443	58.5632	148.2135	1461	Weingartner	
HX29227604.07	MOCNESS-Start	GAK10	10/2/04	0452	58.5624	148.2117	1461	Coyle	
HX29227604.08	MOCNESS-End	GAK10	10/2/04	0524	58.5441	148.2106	1461	Coyle	
HX29227604.09	HTI Transect-Start	GAK10	10/2/04	0528	58.5414	148.2099	1461	Coyle	
HX29227604.10	HTI Transect-End	GAK11	10/2/04	0714	58.3876	148.0703	1431	Coyle	
HX29227604.11	MOCNESS-Start	GAK11	10/2/04	0718	58.3890	148.0633	1431	Coyle	
HX29227604.12	MOCNESS-End	GAK11	10/2/04	0758	58.3997	148.01	1431	Coyle	
HX29227604.13	HTI Transect-Start	GAK11	10/2/04	0825	58.3870	148.071	1431	Coyle	
HX29227604.14	HTI Transect-End	GAK12	10/2/04	1007	58.2424	147.9275	2166	Coyle	
HX29227604.15	MOCNESS-Start	GAK12	10/2/04	1008	58.2424	147.9269	2166	Coyle	
HX29227604.16	MOCNESS-End	GAK12	10/2/04	1037	58.2426	147.8878	2166	Coyle	
HX29227604.17	HTI Transect-Start	GAK12	10/2/04	1101	58.2425	147.9338	2166	Coyle	
HX29227604.18	HTI Transect-End	GAK13	10/2/04	1251	58.0977	147.7924	1431	Coyle	
HX29227604.19	MOCNESS-Start	GAK13	10/2/04	1253	58.0971	147.7907	1431	Coyle	
HX29227604.20	MOCNESS-End	GAK13	10/2/04	1324	58.0854	147.7559	1431	Coyle	
HX29227604.21	MOCNESS-Start	GAK13	10/2/04	1347	58.0964	147.7937	1431	Coyle	
HX29227604.22	MOCNESS-End	GAK13	10/2/04	1508	58.0619	147.7346	1431	Coyle	
HX29227604.23	CTD016-Start	GAK13	10/2/04	1539	58.0989	147.7946	1996	Weingartner	
HX29227604.24	CTD016-End	GAK13	10/2/04	1707	58.1166	147.8562	1996	Weingartner	
HX29227604.25	CTD17-Start	GAK13	10/2/04	1736	58.1001	147.7952	1996	Whitledge	Prim Prod
HX29227604.26	CTD17-End	GAK13	10/2/04	1745	58.1034	147.8009	1996	Whitledge	
HX29227604.27	CalVET Net Tow-Start	GAK13	10/2/04	1750	58.1047	147.8013	1996	Hopcroft	
HX29227604.28	CalVET Net Tow-End	GAK13	10/2/04	1805	58.1305	147.8261	1996	Hopcroft	
HX29227604.29	CalVET Net Tow-Start	GAK12	10/2/04	1854	58.2434	147.935	1996	Hopcroft	
HX29227604.30	CalVET Net Tow-End	GAK12	10/2/04	1901	58.2441	147.9362	1996	Hopcroft	

HX29227604.31	CTD18-Start	GAK12	10/2/04	1902	58.2440	147.9362	1996	Weingartner	
HX29227604.32	CTD18-End	GAK12	10/2/04	2010	58.2520	147.9486	1996	Weingartner	
HX29227604.33	CalVET Net Tow-Start	GAK11	10/2/04	2117	58.3879	148.0722	1441	Hopcroft	
HX29227604.34	CalVET Net Tow-End	GAK11	10/2/04	2124	58.3875	148.0721	1441	Hopcroft	
HX29227604.35	CTD19-Start	GAK11	10/2/04	2125	58.3875	148.0722	1441	Weingartner	
HX29227604.36	CTD19-End	GAK11	10/2/04	2231	58.3854	148.0849	1441	Weingartner	
HX29227704.01	CalVET Net Tow-Start	GAK09	10/3/04	0045	58.6797	148.3539	278	Coyle	aborted
HX29227704.02	CalVET Net Tow-End	GAK09	10/3/04	0047	58.6800	148.3544	278	Coyle	aborted
HX29227704.03	CTD0200-Start	GAK09	10/3/04	0053	58.6789	148.3565	279	Weingartner	
HX29227704.04	CTD0200-End	GAK09	10/3/04	0113	58.6774	148.3659	279	Weingartner	
HX29227704.05	CalVET Net Tow-Start	GAK09	10/3/04	0116	58.6774	148.3678	279	Coyle	
HX29227704.06	CalVET Net Tow-End	GAK09	10/3/04	0122	58.6783	148.3706	279	Coyle	
HX29227704.07	CTD21-Start	GAK8I	10/3/04	0151	58.7432	148.4211	293	Weingartner	
HX29227704.08	CTD21-End	GAK8I	10/3/04	0214	58.7453	148.4361	293	Weingartner	
HX29227704.09	HTI Transect-Start	GAK10	10/3/04	0411	58.5468	148.2152	1439	Coyle	
HX29227704.10	HTI Transect-End	GAK9	10/3/04	0536	58.6807	148.3511	277	Coyle	
HX29227704.11	MOCNESS-Start	GAK9	10/3/04	0539	58.6798	148.3506	277	Coyle	
HX29227704.12	MOCNESS-End	GAK9	10/3/04	0613	58.6623	148.3136	277	Coyle	
HX29227704.13	MOCNESS-Start	GAK1	10/3/04	1428	59.8412	149.4601	272	Coyle	
HX29227704.14	MOCNESS-End	GAK1	10/3/04	1500	59.8265	149.4268	272	Coyle	
HX29227704.15	CTD22-Start	GAK1	10/3/04	1700	59.8444	149.4659	272	Weingartner	
HX29227704.16	CTD22-End	GAK1	10/3/04	1719	59.8468	149.4693	272	Weingartner	
HX29227704.17	CTD23-Start	GAK1	10/3/04	1733	59.8455	149.4659	269	Weingartner	Prim prod
HX29227704.18	CTD23-End	GAK1	10/3/04	1741	59.8460	149.4668	269	Weingartner	
HX29227704.19	CalVET Net Tow-Start	PWS1	10/3/04	1741	59.8460	149.4668	330	Coyle	
HX29227804.01	CalVET Net Tow-End	PWS1	10/4/04	0050	60.3790	147.9339	330	Coyle	
HX29227804.02	CTD24-Start	PWS1	10/4/04	0053	60.3781	147.9346	330	Weingartner	
HX29227804.03	CTD24-End	PWS1	10/4/04	0114	60.3766	147.934	330	Weingartner	
HX29227804.04	CalVET Net Tow-Start	PWS2	10/4/04	0227	60.5362	147.8068	742	Coyle	
HX29227804.05	CalVET Net Tow-End	PWS2	10/4/04	0232	60.5360	147.808	742	Coyle	
HX29227804.06	CTD25-Start	PWS2	10/4/04	0232	60.5360	147.8083	742	Weingartner	
HX29227804.07	CTD25-End	PWS2	10/4/04	0314	60.5379	147.8249	742	Weingartner	
HX29227804.08	MOCNESS-Start	PWS2	10/4/04	0326	60.5368	147.8007	742	Coyle	
HX29227804.09	MOCNESS-End	PWS2	10/4/04	0442	60.5824	147.7529	742	Coyle	
HX29227804.10	CTD26-Start	PWS2	10/4/04	0527	60.5346	147.8068	742	Coyle	Water for critters
HX29227804.11	CTD26-End	PWS2	10/4/04	0536	60.5353	147.8103	734	Coyle	
HX29227804.12	MOCNESS-Start	PWS2	10/4/04	0540	60.5379	147.8092	734	Coyle	
HX29227804.13	MOCNESS-End	PWS2	10/4/04	0612	60.5586	147.7928	734	Coyle	
HX29227804.14	MOCNESS-Start	PWS1	10/4/04	0733	60.3815	147.9342	346	Coyle	
HX29227804.15	MOCNESS-End	PWS1	10/4/04	0804	60.3994	147.9241	346	Coyle	
HX29227804.16	MOCNESS-Start	KIP2	10/4/04	0906	60.2792	147.9845	587	Coyle	
HX29227804.17	MOCNESS-End	KIP2	10/4/04	0945	60.3042	147.9725	587	Coyle	
HX29227804.18	CTD27-Start	KIP2	10/4/04	1615	60.2780	147.9877	587	Weingartner	
HX29227804.19	CTD27-End	KIP2	10/4/04	1650	60.2662	147.9973	587	Weingartner	
HX29227804.20	CalVET Net Tow-Start	KIP2	10/4/04	1702	60.2773	147.9853	587	Coyle	
HX29227804.21	CalVET Net Tow-End	KIP2	10/4/04	1709	60.2759	147.9856	587	Coyle	
HX29227804.22	CTD28-Start	KIP2	10/4/04	1713	60.2780	147.988	587	Whitledge	Primprod
HX29227804.23	CTD28-End	KIP2	10/4/04	1720	60.2752	147.9905	587	Whitledge	

HX29227804.24	CTD29-Start	HB1	10/4/04	1857	60.1932	147.7025	243	Weingartner	
HX29227804.25	CTD29-End	HB1	10/4/04	1914	60.1919	147.7068	243	Weingartner	
HX29227804.26	CalVET Net Tow-Start	HB2	10/4/04	1933	60.1777	147.6404	172	Coyle	
HX29227804.27	CalVET Net Tow-End	HB2	10/4/04	1935	60.1777	147.6414	172	Coyle	
HX29227804.28	CTD30-Start	HB2	10/4/04	1944	60.1778	147.643	172	Weingartner	
HX29227804.29	CTD30-End	HB2	10/4/04	1957	60.1771	147.6487	172	Weingartner	
HX29227804.30	CTD31-Start	HB3	10/4/04	2015	60.1652	147.5741	87	Weingartner	
HX29227804.31	CTD31-End	HB3	10/4/04	2023	60.1663	147.5763	87	Weingartner	
HX29227804.32	CTD32-Start	HB4	10/4/04	2042	60.1479	147.5002	108	Weingartner	
HX29227804.33	CTD32-End	HB4	10/4/04	2050	60.1497	147.5027	108	Weingartner	
HX29227804.34	CTD33-Start	MS1	10/4/04	2242	59.9537	147.9259	171	Weingartner	
HX29227804.35	CTD33-End	MS1	10/4/04	2255	59.9550	147.9314	171	Weingartner	
HX29227804.36	CalVET Net Tow-Start	MS2	10/4/04	2307	59.9425	147.8972	195	Coyle	
HX29227804.37	CalVET Net Tow-End	MS2	10/4/04	2314	59.9427	147.8994	195	Coyle	
HX29227804.38	CTD34-Start	MS2	10/4/04	2318	59.9420	147.9002	195	Weingartner	
HX29227804.39	CTD34-End	MS2	10/4/04	2347	59.9316	147.8573	195	Weingartner	
HX29227804.40	CTD35-Start	MS3	10/4/04	2347	59.9317	147.8575	168	Weingartner	
HX29227904.01	CTD35-End	MS3	10/5/04	0004	59.9320	147.8697	168	Weingartner	
HX29227904.02	CTD36-Start	MS4	10/5/04	0018	59.9207	147.8286	114	Weingartner	
HX29227904.03	CTD36-End	MS4	10/5/04	0029	59.9214	147.8355	114	Weingartner	
HX29227904.04	MOCNESS-Start	MS2	10/5/04	0448	59.9349	147.9021	183	Coyle	
HX29227904.05	MOCNESS-End	MS2	10/5/04	0524	59.9455	147.8699	183	Coyle	
HX29227904.06	MOCNESS-Start	HB2	10/5/04	0733	60.1876	147.6692	252	Coyle	
HX29227904.07	MOCNESS-End	HB2	10/5/04	0803	60.2072	147.6658	252	Coyle	
HX29227904.08	CTD37-Start	CF1	10/5/04	1842	59.9080	148.8676	85	Weingartner	
HX29227904.09	CTD37-End	CF1	10/5/04	1851	59.9077	148.8714	85	Weingartner	
HX29227904.10	CTD38-Start	CF1	10/5/04	1857	59.9085	148.8674	85	Weingartner	recast for water
HX29227904.11	CTD38-End	CF1	10/5/04	1904	59.9084	148.871	85	Weingartner	
HX29227904.12	CTD39-Start	CF2	10/5/04	1919	59.8819	148.8678	108	Weingartner	
HX29227904.13	CTD39-End	CF2	10/5/04	1927	59.8818	148.8718	108	Weingartner	
HX29227904.14	CTD40-Start	CF3	10/5/04	1943	59.8507	148.8669	160	Weingartner	
HX29227904.15	CTD40-End	CF3	10/5/04	1956	59.8522	148.8733	160	Weingartner	
HX29227904.16	CTD41-Start	CF4	10/5/04	2014	59.8172	148.8674	184	Weingartner	
HX29227904.17	CTD41-End	CF4	10/5/04	2028	59.8204	148.8802	184	Weingartner	
HX29227904.18	CTD42-Start	CF5	10/5/04	2049	59.7841	148.8684	195	Weingartner	
HX29227904.19	CTD42-End	CF5	10/5/04	2109	59.7886	148.8921	195	Weingartner	
HX29227904.20	CTD43-Start	CF6	10/5/04	2133	59.7504	148.8693	195	Weingartner	
HX29227904.21	CTD43-End	CF6	10/5/04	2146	59.7547	148.8851	195	Weingartner	
HX29227904.22	CTD44-Start	CF7	10/5/04	2208	59.7176	148.8654	182	Weingartner	
HX29227904.23	CTD44-End	CF7	10/5/04	2221	59.7187	148.871	182	Weingartner	
HX29227904.24	CTD45-Start	CF8	10/5/04	2240	59.6839	148.8658	182	Weingartner	
HX29227904.25	CTD45-End	CF8	10/5/04	2252	59.6845	148.872	182	Weingartner	
HX29227904.26	CTD46-Start	CF9	10/5/04	2310	59.6502	148.8659	182	Weingartner	
HX29227904.27	CTD46-End	CF9	10/5/04	2325	59.6502	148.876	182	Weingartner	
HX29227904.28	CTD47-Start	CF10	10/5/04	2342	59.6163	148.8674	178	Weingartner	
HX29228004.01	CTD47-End	CF10	10/6/04	0013	59.5830	148.8668	178	Weingartner	
HX29228004.02	CTD48-Start	CF11	10/6/04	0013	59.5829	148.8669	178	Weingartner	
HX29228004.03	CTD48-End	CF11	10/6/04	0028	59.5830	148.8752	178	Weingartner	

HX29228004.04	CTD49-Start	CF12	10/6/04	0046	59.5498	148.8677	186	Weingartner	
HX29228004.05	CTD49-End	CF12	10/6/04	0058	59.5504	148.8741	186	Weingartner	
HX29228004.06	CTD50-Start	CF13	10/6/04	0115	59.5166	148.8664	175	Weingartner	
HX29228004.07	CTD50-End	CF13	10/6/04	0129	59.5175	148.8741	175	Weingartner	
HX29228004.08	CTD51-Start	CF14	10/6/04	0147	59.4827	148.8687	174	Weingartner	
HX29228004.09	CTD51-End	CF14	10/6/04	0157	59.4821	148.873	174	Weingartner	
HX29228004.10	CTD52-Start	CF15	10/6/04	0213	59.4499	148.8684	183	Weingartner	
HX29228004.11	CTD52-End	CF15	10/6/04	0228	59.4472	148.8713	183	Weingartner	
HX29228004.12	HTI Transect-Start	GAK5	10/6/04	0404	59.2610	148.9095	169	Coyle	
HX29228004.13	HTI Transect-End	GAK6	10/6/04	0541	59.1158	148.7691	151	Coyle	
HX29228004.14	MOCNESS-Start	GAK6	10/6/04	0543	59.1144	148.7657	151	Coyle	
HX29228004.15	MOCNESS-End	GAK6	10/6/04	0615	59.1054	148.7278	151	Coyle	
HX29228004.16	HTI Transect-Start	GAK6	10/6/04	0641	59.1147	148.7687	150	Coyle	
HX29228004.17	HTI Transect-End	GAK7	10/6/04	0815	58.9711	148.6293	242	Coyle	
HX29228004.18	MOCNESS-Start	GAK7	10/6/04	0818	58.9699	148.625	242	Coyle	
HX29228004.19	MOCNESS-End	GAK7	10/6/04	0856	58.9623	148.5765	242	Coyle	
HX29228004.20	HTI Transect-Start	GAK7	10/6/04	0923	58.9705	148.6311	242	Coyle	
HX29228004.21	HTI Transect-End	GAK8	10/6/04	1112	58.7902	148.4868	287	Coyle	
HX29228004.22	MOCNESS-Start	GAK8	10/6/04	1114	58.7894	148.4846	287	Coyle	
HX29228004.23	MOCNESS-End	GAK8	10/6/04	1145	58.7789	148.455	287	Coyle	
HX29228004.24	HTI Transect-Start	GAK8	10/6/04	1206	58.7911	148.4908	287	Coyle	
HX29228004.25	HTI Transect-End	GAK9	10/6/04	1328	58.6790	148.3479	277	Coyle	
HX29228004.26	MOCNESS-Start	GAK9	10/6/04	1330	58.6783	148.3448	277	Coyle	
HX29228004.27	MOCNESS-End	GAK9	10/6/04	1400	58.6686	148.3202	277	Coyle	
HX29228004.28	CTD53-Start	GAK9	10/6/04	1626	58.6817	148.3492	277	Weingartner	
HX29228004.29	CTD53-End	GAK9	10/6/04	1646	58.6825	148.3569	277	Weingartner	
HX29228004.30	CTD54-Start	GAK9	10/6/04	1701	58.6808	148.3503	280	Whitledge	Prim prod
HX29228004.31	CTD54-End	GAK9	10/6/04	1711	58.6822	148.3547	280	Whitledge	
HX29228004.32	CalVET Net Tow-Start	GAK8	10/6/04	1806	58.7909	148.4926	288	Coyle	
HX29228004.33	CalVET Net Tow-End	GAK8	10/6/04	1811	58.7913	148.4935	288	Coyle	
HX29228004.34	CTD55-Start	GAK8	10/6/04	1815	58.7909	148.4925	288	Weingartner	
HX29228004.35	CTD55-End	GAK8	10/6/04	1838	58.7923	148.4957	288	Weingartner	
HX29228004.36	CTD56-Start	GAK7I	10/6/04	1915	58.8820	148.5604	302	Weingartner	
HX29228004.37	CTD56-End	GAK7I	10/6/04	1935	58.8834	148.5623	302	Weingartner	
HX29228004.38	CalVET Net Tow-Start	GAK7	10/6/04	2021	58.9710	148.6294	302	Coyle	
HX29228004.39	CalVET Net Tow-End	GAK7	10/6/04	2022	58.9709	148.6295	302	Coyle	
HX29228004.40	CTD57-Start	GAK7	10/6/04	2026	58.9706	148.6312	244	Weingartner	
HX29228004.41	CTD57-End	GAK7	10/6/04	2044	58.9700	148.6332	244	Weingartner	
HX29228004.42	CalVET Net Tow-Start	GAK7	10/6/04	2049	58.9692	148.6315	244	Coyle	recast
HX29228004.43	CalVET Net Tow-End	GAK7	10/6/04	2056	58.9722	148.6331	244	Coyle	
HX29228004.44	CTD58-Start	GAK6I	10/6/04	2128	59.0452	148.7012	193	Weingartner	
HX29228004.45	CTD58-End	GAK6I	10/6/04	2143	59.0450	148.709	193	Weingartner	
HX29228004.46	CalVET Net Tow-Start	GAK6	10/6/04	2217	59.1189	148.7744	151	Coyle	
HX29228004.47	CalVET Net Tow-End	GAK6	10/6/04	2222	59.1193	148.7764	151	Coyle	
HX29228004.48	CTD59-Start	GAK6	10/6/04	2222	59.1193	148.7764	151	Weingartner	
HX29228004.49	CTD59-End	GAK6	10/6/04	2239	59.1179	148.774	151	Weingartner	
HX29228004.50	CTD60-Start	GAK5I	10/6/04	2310	59.1905	148.8394	167	Weingartner	
HX29228004.51	CTD60-End	GAK5I	10/6/04	2324	59.1913	148.8444	167	Weingartner	

HX29228104.01	ADCP Line-Start	CF15	10/7/04	0056	59.4540	148.8663		Weingartner	
HX29228104.02	ADCP Line-End	CF1	10/7/04	0540	59.9078	148.8436		Weingartner	
HX29228104.03	CTD61-Start	HE1	10/7/04	1614	60.2174	146.6125	80	Weingartner	
HX29228104.04	CTD61-End	HE1	10/7/04	1627	60.2132	146.6308	80	Weingartner	
HX29228104.05	CalVET Net Tow-Start	HE2	10/7/04	1651	60.1795	146.6151	196	Coyle	
HX29228104.06	CalVET Net Tow-End	HE2	10/7/04	1654	60.1797	146.6185	196	Coyle	
HX29228104.07	CTD62-Start	HE2	10/7/04	1700	60.1809	146.6103	196	Weingartner	
HX29228104.08	CTD62-End	HE2	10/7/04	1721	60.1780	146.6361	196	Weingartner	
HX29228104.09	CTD63-Start	HE3	10/7/04	1746	60.1309	146.6078	116	Weingartner	
HX29228104.10	CTD63-End	HE3	10/7/04	1757	60.1306	146.614	116	Weingartner	
HX29228104.11	CalVET Net Tow-Start	HE4	10/7/04	1822	60.0795	146.6084	118	Coyle	
HX29228104.12	CalVET Net Tow-End	HE4	10/7/04	1833	60.0799	146.6126	118	Coyle	
HX29228104.13	CTD64-Start	HE4	10/7/04	1833	60.0799	146.6128	118	Weingartner	
HX29228104.14	CTD64-End	HE4	10/7/04	1844	60.0795	146.6188	118	Weingartner	
HX29228104.15	CalVET Net Tow-Start	HE6.5	10/7/04	1917	60.0519	146.741	123	Coyle	
HX29228104.16	CalVET Net Tow-End	HE6.5	10/7/04	1919	60.0522	146.7426	123	Coyle	
HX29228104.17	CTD65-Start	HE6.5	10/7/04	1922	60.0522	146.7427	123	Weingartner	
HX29228104.18	CTD65-End	HE6.5	10/7/04	1945	60.0521	146.7566	125	Weingartner	
HX29228104.19	CTD66-Start	HE6.5	10/7/04	1945	60.0521	146.7567	125	Weingartner	
HX29228104.20	CTD66-End	HE6.5	10/7/04	1945	60.0521	146.7567	125	Weingartner	
HX29228104.21	CTD67-Start	HE8	10/7/04	2027	60.0941	146.9636	150	Weingartner	
HX29228104.22	CTD67-End	HE8	10/7/04	2041	60.0914	146.973	150	Weingartner	
HX29228104.23	CTD68-Start	HE9	10/7/04	2101	60.1108	147.0551	275	Weingartner	
HX29228104.24	CTD68-End	HE9	10/7/04	2126	60.1040	147.0813	275	Weingartner	
HX29228104.25	CalVET Net Tow-Start	HE10	10/7/04	2146	60.1315	147.1365	216	Coyle	
HX29228104.26	CalVET Net Tow-End	HE10	10/7/04	Na	Na	Na	216	Coyle	
HX29228104.27	CTD69-Start	HE10	10/7/04	2157	60.1305	147.1341	216	Weingartner	
HX29228104.28	CTD69-End	HE10	10/7/04	2216	60.1258	147.1497	216	Weingartner	
HX29228104.29	CTD70-Start	HE11	10/7/04	2230	60.1432	147.1918	177	Weingartner	
HX29228104.30	CTD70-End	HE11	10/7/04	2259	60.1161	147.164	177	Weingartner	
HX29228204.01	MOCNESS-Start	HE2	10/8/04	0411	60.1729	146.6099	171	Coyle	
HX29228204.02	MOCNESS-End	HE2	10/8/04	0440	60.1548	146.6123	171	Coyle	
HX29228204.03	MOCNESS-Start	HE4	10/8/04	0515	60.0793	146.6052	116	Coyle	
HX29228204.04	MOCNESS-End	HE4	10/8/04	0546	60.0681	146.5691	116	Coyle	
HX29228204.05	MOCNESS-Start	HE6.5	10/8/04	0629	60.0504	146.7373	124	Coyle	
HX29228204.06	MOCNESS-End	HE6.5	10/8/04	0658	60.0357	146.705	124	Coyle	
HX29228204.07	MOCNESS-Start	HE10	10/8/04	0834	60.1315	147.1391	215	Coyle	
HX29228204.08	MOCNESS-End	HE10	10/8/04	0906	60.1483	147.1463	215	Coyle	
HX29228204.09	CTD71-Start	GAK1	10/8/04	1718	59.8434	149.4688	273	Weingartner	
HX29228204.10	CTD71-End	GAK1	10/8/04	1733	59.8402	149.4731	273	Weingartner	
HX29228204.11	CTD72-Start	RES2.5	10/8/04	1852	60.0244	149.36	295	Weingartner	
HX29228204.12	CTD72-End	RES2.5	10/8/04	1908	60.0198	149.3605	295	Weingartner	