

GLOBEC CRUISE PLAN
CRUISE HX283: 3-11 May 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 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 May 2004 cruise marks the seventh consecutive May cruise 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. May characterizes late spring/early summer conditions in the 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. Test IARC Iron sampling equipment and collect surface and vertical profiles of Iron concentrations.

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 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 600 m) near the end of the Seward Line at station GAK13 and at station PWS2.
9. Iron sampling consisted of vertical hydrographic casts with bottles strapped to the hydrowire (tripped with internal electronics) and bottles tripped with a messenger on a synthetic line and with samples taken by a surface collection bottle tied to a pole.

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 this report.

Cruise Chronology:

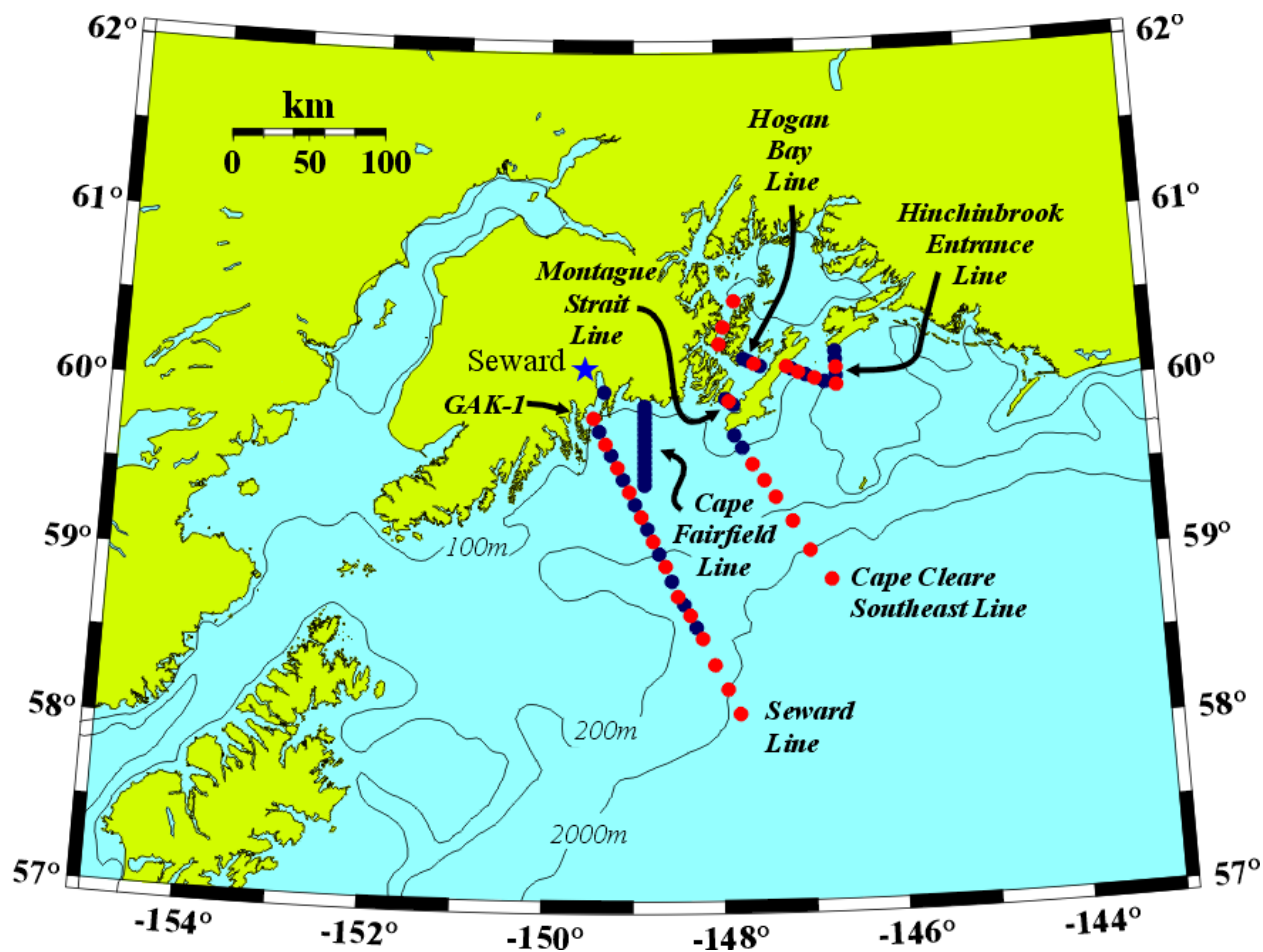
We departed the Seward IMS dock at 09:52 on 3 May, tested the HTI in Resurrection Bay and transited to the outer portion of the Seward Line to begin our work, given a good weather forecast. We started nighttime activities at GAK11 and worked toward the offshore end of the line from there. Excellent weather and calm seas continued for the entirety of the cruise. We proceeded to sample the remainder of the Seward Line then the Cape Fairfield Line, the Hinchinbrook Entrance Line, The Hogan Bay Line and Montague Strait. Deep Sea winch breaker was still giving problems and motor finally became inoperable on 9 May in Knight Island Passage. We terminated sampling until daylight at which time we were able to arrange for parts to be shipped to Whittier. We continued our sampling until 10 May (including MOCNESS sampling, having scavenged the drill press motor to run the deep sea winch hydraulics). On May 10 we were able to pick up a new winch motor in Whittier and we were able to complete our sampling in Prince William Sound. On the last day of the cruise we were able to sample the CCSE line and do one more iron experiment in offshore waters. We returned to Seward on 12 May early in the morning.

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

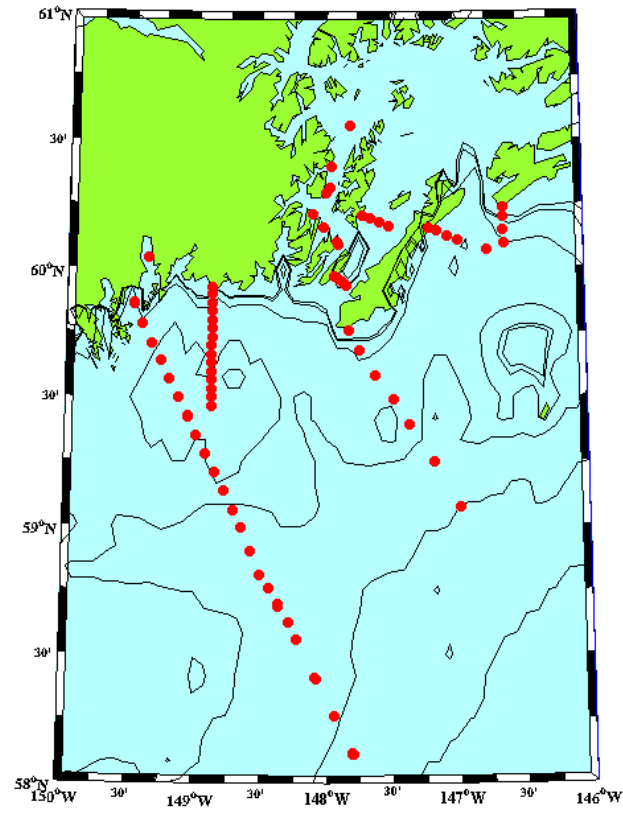
59	31	148	52	CF13
59	29	148	52	CF14
59	27	148	52	CF15
Prince William Sound Stations				
60	22.78	147	56.17	PWS1
60	32.1	147	48.2	PWS2
Knight Island Passage Station				
60	16.7	147	59.2	KIP2
Hogan Bay Line				
60	11.57	147	42	HB1
60	10.754	147	38.5	HB2
60	9.855	147	34.508	HB3
60	8.807	147	30.04	HB4
Montague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

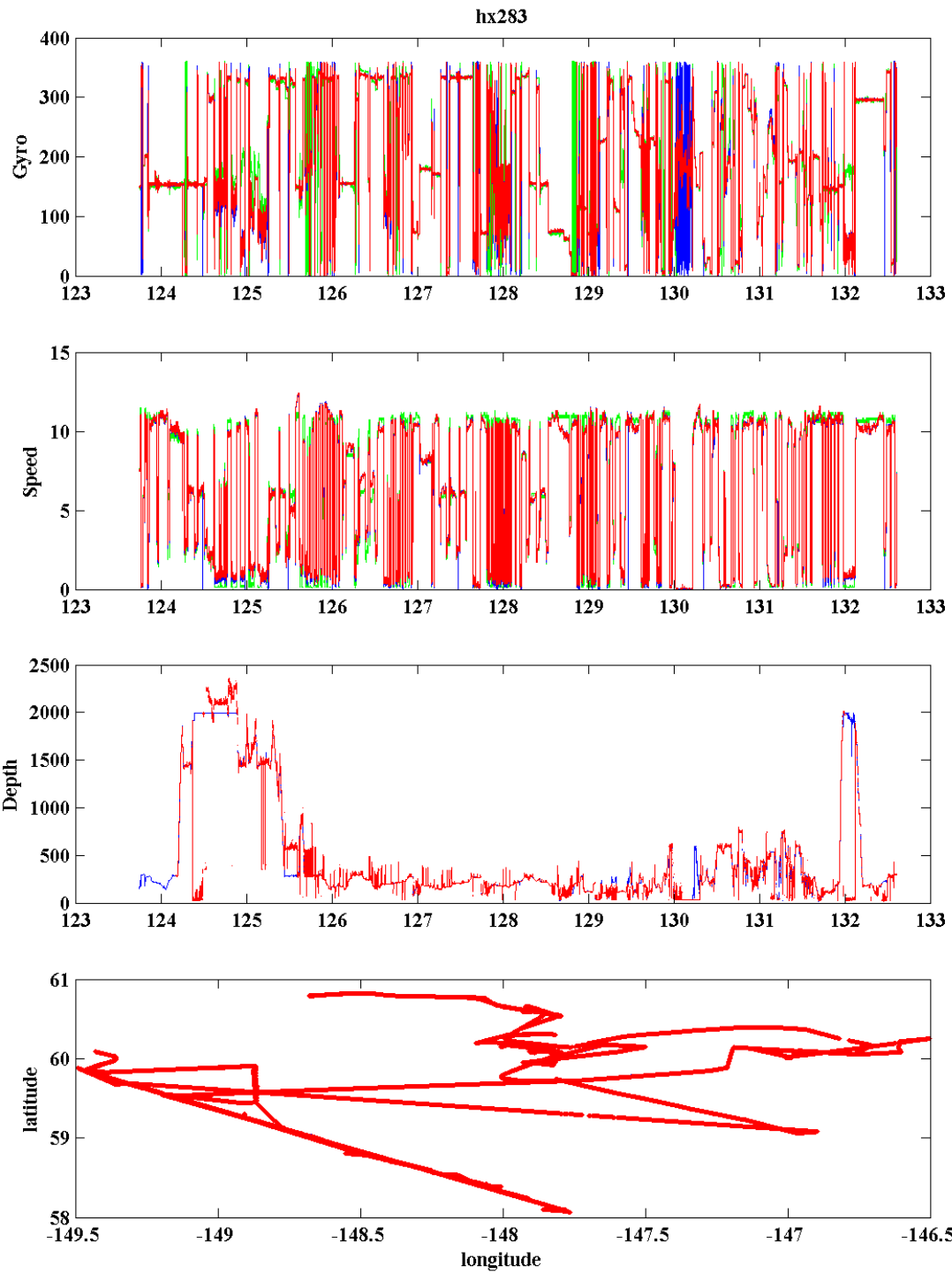
NEP GLOBEC Standard Station Map



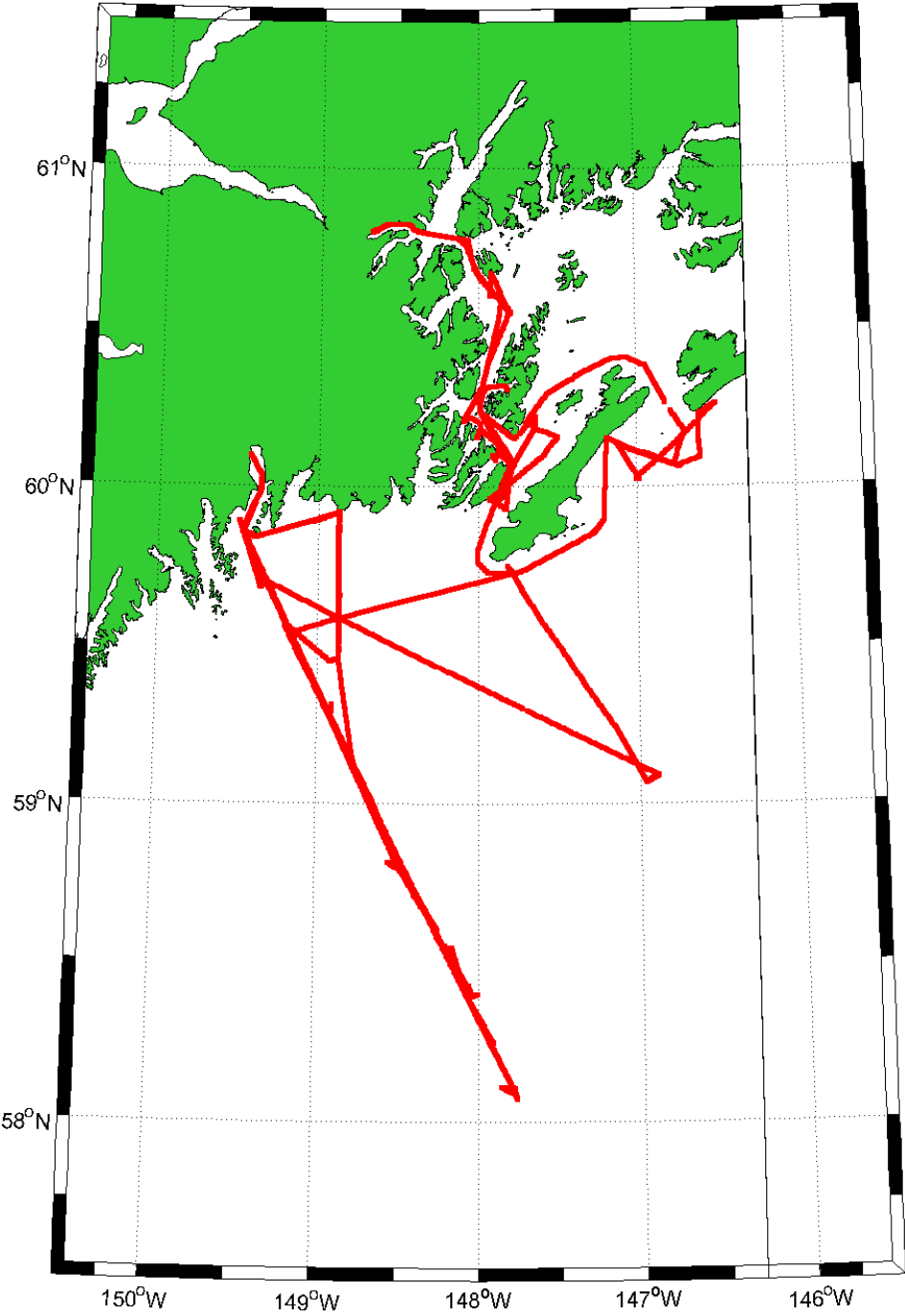
Note: The Cape Cleare Southeast Line is a standard line only in select cruises during the Process Study sampling years.

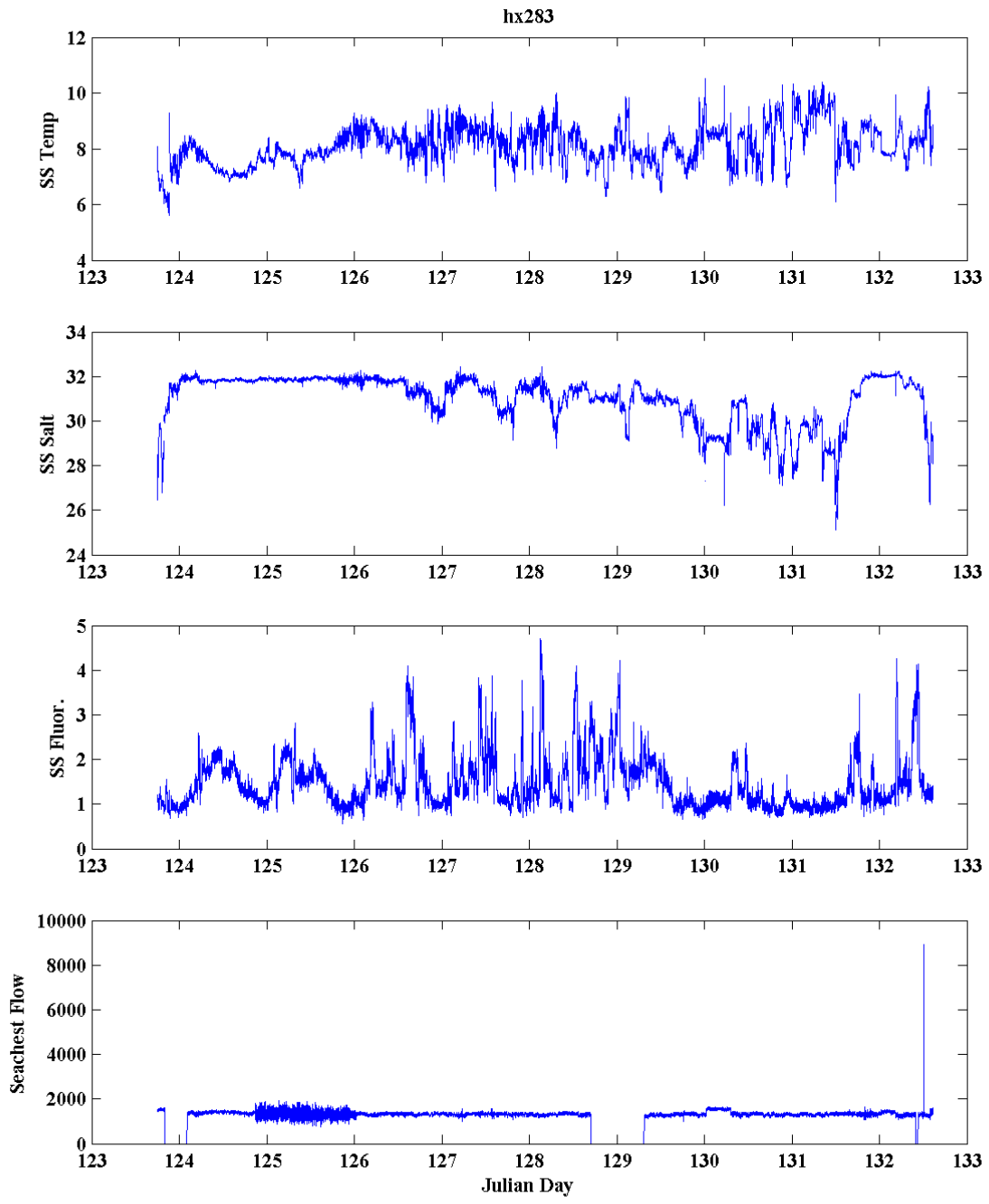
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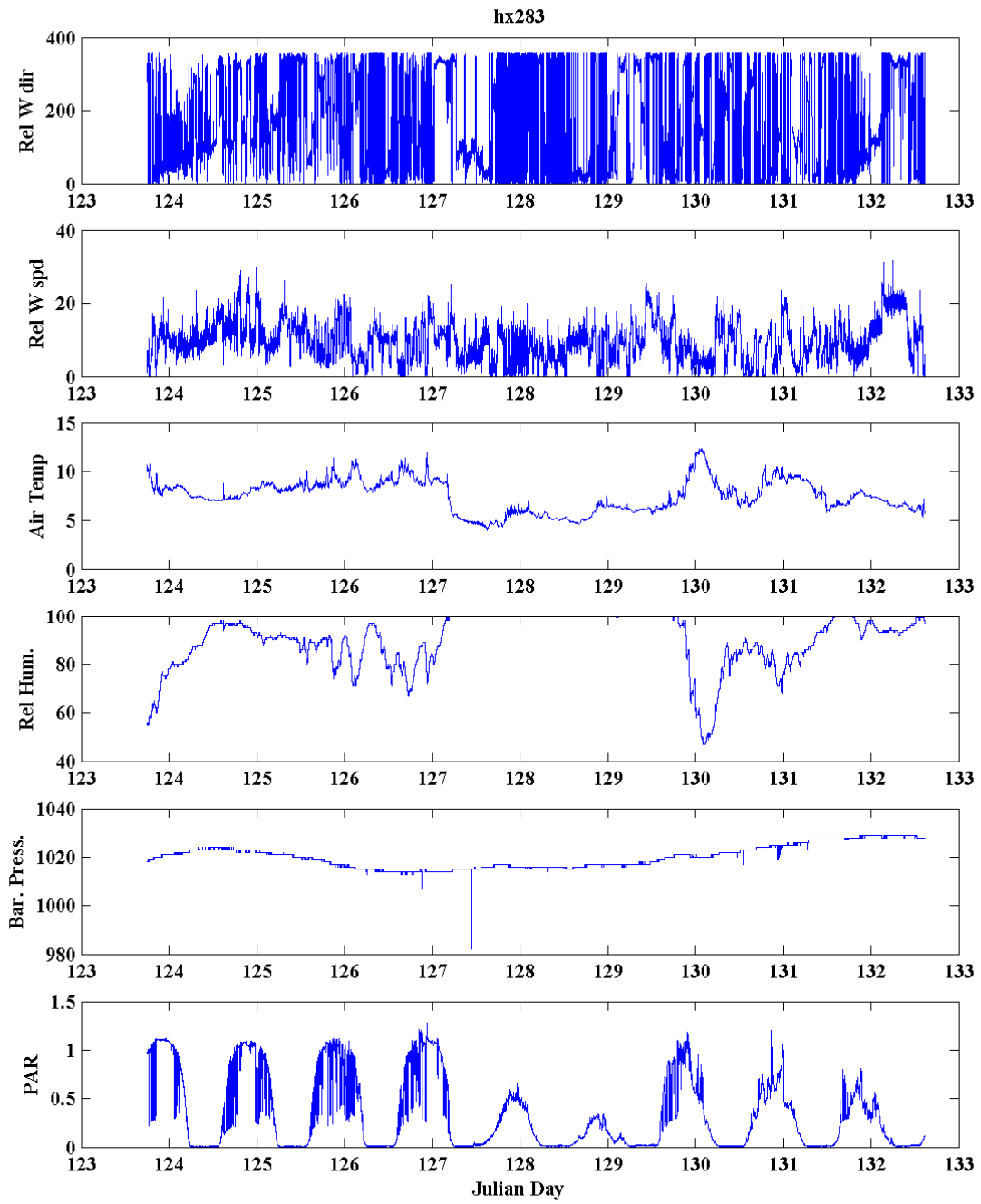




hx283 Cruise Track







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	si	comments
HX28312404.01	CTD1-Start	RES2.5	5/3/04	1836	60.0246	149.3600	300	weingartner	
HX28312404.02	CTD1-End	RES2.5	5/3/04	1853	60.0256	149.3601	300	weingartner	
HX28312404.03	CTD2-Start	GAK1	5/3/04	2020	59.8447	149.4661	271	weingartner	
HX28312404.04	CTD2-End	GAK1	5/3/04	2037	59.8453	149.4670	271	weingartner	
HX28312504.01	MOCNESS-Start	GAK11	5/4/04	0646	58.3912	148.0685	1420	coyle	
HX28312504.02	MOCNESS-End	GAK11	5/4/04	0720	58.4161	148.0585	1420	coyle	
HX28312504.03	HTI Transect-Start	GAK11	5/4/04	0743	58.3877	148.0700	1420	coyle	
HX28312504.04	HTI Transect-End	GAK12	5/4/04	0917	58.2439	147.9339	1919	coyle	
HX28312504.05	MOCNESS-Start	GAK12	5/4/04	0920	58.2414	147.9314	1919	coyle	
HX28312504.06	MOCNESS-End	GAK12	5/4/04	1004	58.2115	147.9024	1919	coyle	
HX28312504.07	HTI Transect-Start	GAK12	5/4/04	1034	58.2425	147.9322	1919	coyle	
HX28312504.08	HTI Transect-End	GAK13	5/4/04	1208	58.0981	147.7893	1997	coyle	
HX28312504.09	MOCNESS-Start	GAK13	5/4/04	1211	58.0957	147.7876	1997	coyle	
HX28312504.10	MOCNESS-End	GAK13	5/4/04	1248	58.0687	147.7687	1997	coyle	
HX28312504.11	MOCNESS-Start	GAK13	5/4/04	1324	58.0784	147.7779	1997	coyle	deep cast
HX28312504.12	MOCNESS-Start	GAK13	5/4/04	NA	NA	NA	1997		
HX28312504.13	CTD2-Start	GAK13	5/4/04	1506	58.0986	147.7944	1997	weingartner	
HX28312504.14	CTD2-End	GAK13	5/4/04	1619	58.0932	147.7797	1997	weingartner	
HX28312504.15	CTD4-Start	GAK13	5/4/04	1634	58.0970	147.7929	1997	whitledge	
HX28312504.16	CTD4-End	GAK13	5/4/04	1642	58.0961	147.7908	1997	whitledge	
HX28312504.17	CalVET Net Tow-Start	GAK13	5/4/04	1649	58.0950	147.7908	1997	hopcroft	
HX28312504.18	CalVET Net Tow-End	GAK13	5/4/04	1653	58.0947	147.7895	1997	hopcroft	
HX28312504.19	CTD5-Start	GAK13	5/4/04	1702	58.0966	147.7934	1997	hopcroft	zoop cast 1
HX28312504.20	CTD5-End	GAK13	5/4/04	1704	58.0963	147.7929	1997	hopcroft	
HX28312504.21	CTD6-Start	GAK13	5/4/04	1715	58.0950	147.7894	1997	hopcroft	zoop cast 2
HX28312504.22	CTD6-End	GAK13	5/4/04	1718	58.0946	147.7882	1997	hopcroft	
HX28312504.23	CTD7-Start	GAK13	5/4/04	1725	58.0933	147.7845	1997	hopcroft	zoop cast 3
HX28312504.24	CTD7-End	GAK13	5/4/04	1730	58.0933	147.7845	1997	hopcroft	
HX28312504.25	Ring Net-Start	GAK13	5/4/04	1752	58.0986	147.7929	1997	hopcroft	
HX28312504.26	Ring Net-End	GAK13	5/4/04	1759	58.0987	147.7907	1997	hopcroft	

HX28312504.27	CTD8-Start	GAK13	5/4/04	1804	58.0984	147.7902	1997	hopcroft	zoop cast4
HX28312504.28	CTD8-End	GAK13	5/4/04	1805	58.0983	147.7899	1997	hopcroft	
HX28312504.29	CTD9-Start	GAK13	5/4/04	1813	58.0974	147.7877	1997	hopcroft	zoop cast 5
HX28312504.30	CTD9-End	GAK13	5/4/04	1815	58.0972	147.7870	1997	hopcroft	
HX28312504.31	Ring Net-Start	GAK13	5/4/04	1822	58.0990	147.7951	1997	hopcroft	
HX28312504.32	Ring Net-End	GAK13	5/4/04	1825	58.0987	147.7943	1997	hopcroft	
HX28312504.33	Ring Net-Start	GAK13	5/4/04	1829	58.0981	147.7930	1997	hopcroft	
HX28312504.34	Ring Net-End	GAK13	5/4/04	1832	58.0976	147.7921	1997	hopcroft	
HX28312504.35	Ring Net-Start	GAK13	5/4/04	1833	58.0973	147.7916	1997	hopcroft	
HX28312504.36	Ring Net-End	GAK13	5/4/04	1839	58.0963	147.7901	1997	hopcroft	
HX28312504.37	CalVET Net Tow-Start	GAK12	5/4/04	1943	58.2439	147.9324	2169	hopcroft	
HX28312504.38	CalVET Net Tow-End	GAK12	5/4/04	1949	58.2434	147.9301	2169	hopcroft	
HX28312504.39	CTD10-Start	GAK12	5/4/04	1953	58.2430	147.9301	2169	weingartner	
HX28312504.40	CTD10-End	GAK12	5/4/04	2109	58.2388	147.9073	2169	weingartner	
HX28312504.41	CalVET Net Tow-Start	GAK11	5/4/04	2215	58.3896	148.0709	1432	hopcroft	
HX28312504.42	CalVET Net Tow-End	GAK11	5/4/04	2220	58.3905	148.0688	1432	hopcroft	
HX28312504.43	CTD11-Start	GAK11	5/4/04	2224	58.3917	148.0691	1432	weingartner	
HX28312504.44	CTD11-End	GAK11	5/4/04	2337	58.3989	148.0436	1432	weingartner	
HX28312604.01	CalVET Net Tow-Start	GAK10	5/5/04	0039	58.5422	148.2099	1468	hopcroft	
HX28312604.02	CalVET Net Tow-End	GAK10	5/5/04	0045	58.5428	148.2057	1468	hopcroft	
HX28312604.03	Ring Net-Start	GAK10	5/5/04	0049	58.5431	148.2030	1468	hopcroft	
HX28312604.04	Ring Net-End	GAK10	5/5/04	0056	58.5436	148.1988	1468	hopcroft	
HX28312604.05	CTD12-Start	GAK10	5/5/04	0103	58.5405	148.2097	1479	weingartner	
HX28312604.06	CTD12-End	GAK10	5/5/04	0217	58.5373	148.1630	1479	weingartner	
HX28312604.07	CTD13-Start	GAK11	5/5/04	0320	58.3881	148.0661	1436	Wu	Standard CTD; 11 MiteSS Samples clamped to CTD wire
HX28312604.08	CTD13-End	GAK11	5/5/04	0549	58.3915	148.0066	1436	Wu	MITESS=> 1L Nalgene bottles on Vanes; electronically closed
HX28312604.09	HTI Transect-Start	GAK11	5/5/04	0633	58.3887	148.0712	1436	coyle	
HX28312604.10	HTI Transect-End	GAK10	5/5/04	0815	58.5417	148.2117	1490	coyle	
HX28312604.11	MOCNESS-Start	GAK10	5/5/04	0817	58.5433	148.2140	1490	coyle	
HX28312604.12	MOCNESS-End	GAK10	5/5/04	0901	58.5690	148.2474	1490	coyle	
HX28312604.13	HTI Transect-Start	GAK10	5/5/04	0929	58.5427	148.2123	1490	coyle	

HX28312604.14	HTI Transect-End	GAK9	5/5/04	1101	58.6794	148.3493	281	coyle	
HX28312604.15	MOCNESS-Start	GAK9	5/5/04	1104	58.6817	148.3521	281	coyle	
HX28312604.16	MOCNESS-End	GAK9	5/5/04	1146	58.7016	148.3885	281	coyle	
HX28312604.17	HTI Transect-Start	GAK9	5/5/04	1212	58.6809	148.3505	281	coyle	
HX28312604.18	HTI Transect-End	GAK8	5/5/04	1347	58.7918	148.4896	291	coyle	
HX28312604.19	14-Start	GAK9I	5/5/04	1459	58.6093	148.2752	691	weingartner	
HX28312604.20	14-End	GAK9I	5/5/04	1547	58.5948	148.2516	691	weingartner	
HX28312604.21	CTD15-Start	GAK9	5/5/04	1631	58.6791	148.3496	291	weingartner	
HX28312604.22	CTD15-End	GAK9	5/5/04	1654	58.6718	148.3445	291	weingartner	
HX28312604.23	CalVET Net Tow-Start	GAK9	5/5/04	1656	58.6713	148.3442	291	hopcroft	
HX28312604.24	CalVET Net Tow-End	GAK9	5/5/04	1701	58.6698	148.3436	291	hopcroft	
HX28312604.25	CTD16-Start	GAK9	5/5/04	1710	58.6795	148.3502	277	whitledge	prim prod cast
HX28312604.26	CTD16-End	GAK9	5/5/04	1718	58.6778	148.3493	277	whitledge	
HX28312604.27	CTD17-Start	GAK9	5/5/04	1729	58.6742	148.3497	277	hopcroft	zoop cast 1
HX28312604.28	CTD17-End	GAK9	5/5/04	1730	58.6739	148.3498	277	hopcroft	
HX28312604.29	CTD18-Start	GAK9	5/5/04	1736	58.6720	148.3502	277	hopcroft	zoop cast 2
HX28312604.30	CTD18-End	GAK9	5/5/04	1737	58.6717	148.3504	277	hopcroft	
HX28312604.31	Ring Net-Start	GAK9	5/5/04	1740	58.6709	148.3508	277	hopcroft	zoop cast 2
HX28312604.32	Ring Net-End	GAK9	5/5/04	1744	58.6696	148.3513	277	hopcroft	
HX28312604.33	CTD19-Start	GAK9	5/5/04	1752	58.6799	148.3500	277	hopcroft	zoop cast 3
HX28312604.34	CTD19-End	GAK9	5/5/04	1753	58.6798	148.3501	277	hopcroft	
HX28312604.35	CTD20-Start	GAK9	5/5/04	1800	58.6786	148.3511	277	hopcroft	Zoop cast 4
HX28312604.36	CTD20-End	GAK9	5/5/04	1802	58.6782	148.3515	277	hopcroft	
HX28312604.37	CTD21-Start	GAK9	5/5/04	1806	58.6774	148.3522	277	hopcroft	zoop cast 5
HX28312604.38	CTD21-End	GAK9	5/5/04	1809	58.6770	148.3525	277	hopcroft	
HX28312604.39	CTD22-Start	GAK9	5/5/04	1814	58.6760	148.3531	277	hopcroft	zoop cast 6
HX28312604.40	CTD22-End	GAK9	5/5/04	1815	58.6758	148.3532	277	hopcroft	
HX28312604.41	Ring Net-Start	GAK9	5/5/04	1819	58.6753	148.3535	277	hopcroft	
HX28312604.42	Ring Net-End	GAK9	5/5/04	1823	58.6746	148.3542	277	hopcroft	
HX28312604.43	Ring Net-Start	GAK9	5/5/04	1826	58.6743	148.3544	277	hopcroft	
HX28312604.44	Ring Net-End	GAK9	5/5/04	1831	58.6736	148.3552	277	hopcroft	
HX28312604.45	CTD23-Start	GAK8I	5/5/04	1901	58.7437	148.4218	289	weingartner	
HX28312604.46	CTD23-End	GAK8I	5/5/04	1924	58.7447	148.4275	289	weingartner	
HX28312604.47	CalVET Net Tow-Start	GAK8	5/5/04	1947	58.7929	148.4915	291	hopcroft	
HX28312604.48	CalVET Net Tow-End	GAK8	5/5/04	1953	58.7933	148.4937	291	hopcroft	
HX28312604.49	CTD24-Start	GAK8	5/5/04	1955	58.7933	148.4946	291	weingartner	
HX28312604.50	CTD24-End	GAK8	5/5/04	2014	58.7941	148.5002	291	weingartner	
HX28312604.51	CTD25-Start	GAK7I	5/5/04	2048	58.8831	148.5627	302	weingartner	
HX28312604.52	CTD25-End	GAK7I	5/5/04	2111	58.8898	148.5701	302	weingartner	
HX28312604.53	CalVET Net Tow-Start	GAK7	5/5/04	2141	58.9727	148.6311	243	hopcroft	

HX28312604.54	CalVET Net Tow-End	GAK7	5/5/04	2147	58.9742	148.6320	243	hopcroft	
HX28312604.55	CTD26-Start	GAK7	5/5/04	2148	58.9747	148.6325	243	weingartner	
HX28312604.56	CTD26-End	GAK7	5/5/04	2206	58.9795	148.6342	243	weingartner	
HX28312604.57	CTD27-Start	GAK6I	5/5/04	2232	59.0455	148.6986	193	weingartner	
HX28312604.58	CTD27-End	GAK6I	5/5/04	2248	59.0490	148.6998	193	weingartner	
HX28312604.59	CalVET Net Tow-Start	GAK6	5/5/04	2317	59.1182	148.7702	152	hopcroft	
HX28312604.60	CalVET Net Tow-End	GAK6	5/5/04	2325	59.1199	148.7683	152	hopcroft	
HX28312604.61	CTD28-Start	GAK6	5/5/04	2326	59.1201	148.7681	152	weingartner	
HX28312604.62	CTD28-End	GAK6	5/5/04	2338	59.1227	148.7664	152	weingartner	
HX28312704.01	CTD29-Start	GAK5I	5/6/04	0007	59.1915	148.8388	167	weingartner	
HX28312704.02	CTD29-End	GAK5I	5/6/04	0020	59.1914	148.8368	167	weingartner	
HX28312704.03	Fe-Start	GAK5X	5/6/04	0039	59.2314	148.8752	167	Wu	Nalgene bottle off bow while steaming; pole sample
HX28312704.04	Fe-End	GAK5X	5/6/04	0042	59.2321	148.8763	167	Wu	
HX28312704.05	CalVET Net Tow-Start	GAK5	5/6/04	0056	59.2622	148.9082	167	hopcroft	
HX28312704.06	CalVET Net Tow-End	GAK5	5/6/04	0102	59.2615	148.9087	167	hopcroft	
HX28312704.07	CTD30-Start	GAK5	5/6/04	0104	59.2614	148.9086	169	weingartner	
HX28312704.08	CTD30-End	GAK5	5/6/04	0117	59.2595	148.9064	169	weingartner	
HX28312704.09	CTD31-Start	GAK4I	5/6/04	0151	59.3351	148.9799	196	weingartner	
HX28312704.10	CTD31-End	GAK4I	5/6/04	0206	59.3332	148.9768	196	weingartner	
HX28312704.11	Fe trawl-Start	GAK5I	5/6/04	0324	59.1648	148.8275	196	Wu	underway fish sampler trawl
HX28312704.12	Fe trawl-End	GAK5I	5/6/04	NA	NA	NA		Wu	water collection device failed and terminated for cruise
HX28312704.13	MOCNESS-Start	GAK8	5/6/04	0647	58.7929	148.4965	290	coyle	
HX28312704.14	MOCNESS-End	GAK8	5/6/04	0719	58.8054	148.5428	290	coyle	
HX28312704.15	HTI Transect-Start	GAK8	5/6/04	0747	58.7931	148.4925	290	coyle	
HX28312704.16	HTI Transect-End	GAK7	5/6/04	0926	58.9724	148.6308	247	coyle	
HX28312704.17	MOCNESS-Start	GAK7	5/6/04	0930	58.9766	148.6345	247	coyle	
HX28312704.18	MOCNESS-End	GAK7	5/6/04	1010	59.0138	148.6662	247	coyle	
HX28312704.19	HTI Transect-Start	GAK7	5/6/04	1042	58.9729	148.6308	247	coyle	
HX28312704.20	HTI Transect-End	GAK6	5/6/04	1206	59.1172	148.7705	154	coyle	

HX28312704.21	MOCNESS-Start	GAK6	5/6/04	1208	59.1199	148.7726	154	coyle	
HX28312704.22	MOCNESS-End	GAK6	5/6/04	1241	59.1386	148.7947	154	coyle	
HX28312704.23	transit		5/6/04	1418	59.3730	149.0146	199	weingartner	just pased through convergent front; huge fluorescence peak in thru-hull sampler.
HX28312704.24	CTD32-Start	GAK4	5/6/04	1434	59.4084	149.0488	200	weingartner	
HX28312704.25	CTD32-End	GAK4	5/6/04	1451	59.4074	149.0457	200	weingartner	
HX28312704.26	CalVET Net Tow-Start	GAK4	5/6/04	1454	59.4073	149.0452	200	hopcroft	
HX28312704.27	CalVET Net Tow-End	GAK4	5/6/04	1458	59.4072	149.0444	200	hopcroft	
HX28312704.28	CTD33-Start	GAK4	5/6/04	1514	59.4070	149.0417	200	whitledge	Prim Prod cast. 0-50ug/l fluorometer cable added. Clipped previous cast on 0-15 scale.
HX28312704.29	CTD33-End	GAK4	5/6/04	1530	59.4066	149.0390	200	whitledge	
HX28312704.30	CTD34-Start	GAK4	5/6/04	1540	59.4094	149.0464	200	hopcroft	zoop cast 1
HX28312704.31	CTD34-End	GAK4	5/6/04	1543	59.4098	149.0459	200	hopcroft	
HX28312704.32	CTD35-Start	GAK4	5/6/04	1548	59.4103	149.0456	200	hopcroft	zoop cast 2
HX28312704.33	CTD35-End	GAK4	5/6/04	1550	59.4105	149.0455	200	hopcroft	
HX28312704.34	CTD36-Start	GAK4	5/6/04	1556	59.4111	149.0453	200	hopcroft	zoop cast 3
HX28312704.35	CTD36-End	GAK4	5/6/04	1557	59.4112	149.0453	200	hopcroft	
HX28312704.36	CTD37-Start	GAK4	5/6/04	1603	59.4114	149.0456	200	hopcroft	zoop cast 4
HX28312704.37	CTD37-End	GAK4	5/6/04	1604	59.4113	149.0457	200	hopcroft	
HX28312704.38	CTD38-Start	GAK4	5/6/04	1611	59.4112	149.0454	200	hopcroft	zoop cast 5
HX28312704.39	CTD38-End	GAK4	5/6/04	1612	59.4112	149.0453	200	hopcroft	
HX28312704.40	Ring Net-Start	GAK4	5/6/04	1621	59.4077	149.0483	200	hopcroft	
HX28312704.41	Ring Net-End	GAK4	5/6/04	1626	59.4077	149.0480	200	hopcroft	
HX28312704.42	Ring Net-Start	GAK4	5/6/04	1628	59.4076	149.0478	200	hopcroft	
HX28312704.43	Ring Net-End	GAK4	5/6/04	1633	59.4076	149.0473	200	hopcroft	
HX28312704.44	Ring Net-Start	GAK4	5/6/04	1636	59.4076	149.0471	200	hopcroft	
HX28312704.45	Ring Net-End	GAK4	5/6/04	1640	59.4076	149.0466	200	hopcroft	
HX28312704.46	CTD39-Start	GAK3I	5/6/04	1713	59.4829	149.1181	200	weingartner	
HX28312704.47	CTD39-End	GAK3I	5/6/04	NA	NA	NA	200	weingartner	
HX28312704.48	CalVET Net Tow-Start	GAK3	5/6/04	1759	59.5536	149.1880	211	hopcroft	
HX28312704.49	CalVET Net Tow-End	GAK3	5/6/04	1804	59.5541	149.1882	211	hopcroft	
HX28312704.50	CTD40-Start	GAK3	5/6/04	1806	59.5542	149.1886	211	weingartner	
HX28312704.51	CTD40-End	GAK3	5/6/04	1821	59.5549	149.1928	211	weingartner	
HX28312704.52	CTD41-Start	GAK3	5/6/04	1843	59.5531	149.1932	211	weingartner	Recast put original Flu cable back on.

HX28312704.53	CTD41-End	GAK3	5/6/04	1844	59.5531	149.1935	211	weingartner	
HX28312704.54	CTD42-Start	GAK3	5/6/04	1856	59.5531	149.1899	211	weingartner	Big CTD for Flu profile and total Chl
HX28312704.55	CTD42-End	GAK3	5/6/04	1912	59.5548	149.1963	211	weingartner	
HX28312704.56	CTD43-Start	GAK2I	5/6/04	1941	59.6268	149.2595	212	weingartner	
HX28312704.57	CTD43-End	GAK2I	5/6/04	1957	59.6268	149.2617	212	weingartner	
HX28312704.58	CalVET Net Tow-Start	GAK2	5/6/04	2025	59.6916	149.3275	227	hopcroft	
HX28312704.59	CalVET Net Tow-End	GAK2	5/6/04	2030	59.6911	149.3287	227	hopcroft	
HX28312704.60	CTD44-Start	GAK2	5/6/04	2034	59.6906	149.3296	227	weingartner	
HX28312704.61	CTD44-End	GAK2	5/6/04	2049	59.6889	149.3327	227	weingartner	
HX28312704.62	CTD45-Start	GAK1I	5/6/04	2124	59.7662	149.3985	260	weingartner	
HX28312704.63	CTD45-End	GAK1I	5/6/04	2214	59.8450	149.4701	260	weingartner	
HX28312704.64	CTD46-Start	GAK1	5/6/04	2216	59.8454	149.4713	272	weingartner	
HX28312704.65	CTD46-End	GAK1	5/6/04	2235	59.8477	149.4723	272	weingartner	
HX28312804.01	ADCP Line-Start	CF1	5/7/04	NA	NA	NA		weingartner	
HX28312804.02	ADCP Line-End	CF15	5/7/04	NA	NA	NA		weingartner	
HX28312804.03	HTI Transect-Start	GAK6	5/7/04	0635	59.1185	148.7717	148	coyle	
HX28312804.04	HTI Transect-End	GAK5	5/7/04	0807	59.2623	148.9087	167	coyle	
HX28312804.05	MOCNESS-Start	GAK5	5/7/04	0810	59.2658	148.9089	167	coyle	
HX28312804.06	MOCNESS-End	GAK5	5/7/04	0849	59.2978	148.9049	167	coyle	
HX28312804.07	HTI Transect-Start	GAK5	5/7/04	0916	59.2635	148.9097	167	coyle	
HX28312804.08	HTI Transect-End	GAK4	5/7/04	1050	59.4083	149.0483	204	coyle	
HX28312804.09	MOCNESS-Start	GAK4	5/7/04	1053	59.4106	149.0506	204	coyle	
HX28312804.10	MOCNESS-End	GAK4	5/7/04	1137	59.4377	149.0768	204	coyle	
HX28312804.11	HTI Transect-Start	GAK4	5/7/04	NA	NA	NA	204	coyle	
HX28312804.12	HTI Transect-End	GAK3	5/7/04	1337	59.5526	149.1876	216	coyle	
HX28312804.13	CTD47-Start	GAK1	5/7/04	1548	59.8467	149.4678	270	weingartner	
HX28312804.14	CTD47-End	GAK1	5/7/04	1555	59.8470	149.4665	270	weingartner	
HX28312804.15	CalVET Net Tow-Start	GAK1	5/7/04	1556	59.8470	149.4663	270	hopcroft	
HX28312804.16	CalVET Net Tow-End	GAK1	5/7/04	1602	59.8473	149.4660	270	hopcroft	
HX28312804.17	CTD48-Start	GAK1	5/7/04	1609	59.8475	149.4657	270	whitledge	prim prod cast
HX28312804.18	CTD48-End	GAK1	5/7/04	1613	59.8477	149.4656	270	whitledge	
HX28312804.19	CTD49-Start	GAK1	5/7/04	1624	59.8444	149.4677	270	hopcroft	zoop cast 1
HX28312804.20	CTD49-End	GAK1	5/7/04	1625	59.8444	149.4677	270	hopcroft	
HX28312804.21	CTD50-Start	GAK1	5/7/04	1630	59.8448	149.4679	270	hopcroft	zoop cast 2
HX28312804.22	CTD50-End	GAK1	5/7/04	1632	59.8449	149.4680	270	hopcroft	
HX28312804.23	CTD51-Start	GAK1	5/7/04	1636	59.8454	149.4679	270	hopcroft	zoop cast 3

HX28312804.24	CTD51-End	GAK1	5/7/04	1640	59.8454	149.4679	270	hopcroft	
HX28312804.25	CTD52-Start	GAK1	5/7/04	1642	59.8457	149.4680	270	hopcroft	zoop cast 4
HX28312804.26	CTD52-End	GAK1	5/7/04	1646	59.8457	149.4680	270	hopcroft	
HX28312804.27	CTD53-Start	GAK1	5/7/04	1651	59.8460	149.4682	270	hopcroft	zoop cast 5
HX28312804.28	CTD53-End	GAK1	5/7/04	1652	59.8460	149.4683	270	hopcroft	
HX28312804.29	CTD54-Start	GAK1	5/7/04	1656	59.8463	149.4684	270	hopcroft	zoop cast 6
HX28312804.30	CTD54-End	GAK1	5/7/04	1658	59.8463	149.4684	270	hopcroft	
HX28312804.31	CTD55-Start	GAK1	5/7/04	1702	59.8466	149.4684	270	hopcroft	zoop cast 7
HX28312804.32	CTD55-End	GAK1	5/7/04	1704	59.8467	149.4684	270	hopcroft	
HX28312804.33	CTD56-Start	GAK1	5/7/04	1709	59.8469	149.4685	270	hopcroft	zoop cast 8
HX28312804.34	CTD56-End	GAK1	5/7/04	1710	59.8469	149.4685	270	hopcroft	
HX28312804.35	Ring Net-Start	GAK1	5/7/04	1713	59.8470	149.4686	270	hopcroft	
HX28312804.36	Ring Net-End	GAK1	5/7/04	1718	59.8471	149.4688	270	hopcroft	
HX28312804.37	Ring Net-Start	GAK1	5/7/04	1722	59.8472	149.4689	270	hopcroft	
HX28312804.38	Ring Net-End	GAK1	5/7/04	1728	59.8472	149.4690	270	hopcroft	
HX28312804.39	Ring Net-Start	GAK1	5/7/04	1731	59.8473	149.4690	270	hopcroft	
HX28312804.40	Ring Net-End	GAK1	5/7/04	1737	59.8474	149.4691	270	hopcroft	
HX28312804.41	Fe-End	GAK1	5/7/04	NA	59.8359	149.4614	270	Wu	Nalgene bottle off bow while steaming; pole sample
HX28312804.42	Fe-End	GAK1	5/7/04	1746	59.8359	149.4614	270	Wu	
HX28312804.43	CTD57-Start	CF1	5/7/04	1936	NA	NA	82	weingartner	
HX28312804.44	CTD57-End	CF1	5/7/04	NA	NA	NA		weingartner	
HX28312804.45	CTD58-Start	CF2	5/7/04	1957	59.8835	148.8664	114	weingartner	
HX28312804.46	CTD58-End	CF2	5/7/04	NA	NA	NA	114	weingartner	
HX28312804.47	CTD59-Start	CF3	5/7/04	2020	59.8504	148.8661	160	weingartner	
HX28312804.48	CTD59-End	CF3	5/7/04	2040	59.8526	148.8738	160	weingartner	
HX28312804.49	CTD60-Start	CF4	5/7/04	2057	59.8168	148.8667	182	weingartner	
HX28312804.50	CTD60-End	CF4	5/7/04	2108	59.8168	148.8712	182	weingartner	
HX28312804.51	CTD61-Start	CF5	5/7/04	2126	59.7827	148.8665	194	weingartner	
HX28312804.52	CTD61-End	CF5	5/7/04	2140	59.7823	148.8710	194	weingartner	
HX28312804.53	CTD62-Start	CF6	5/7/04	2157	59.7497	148.8654	191	weingartner	
HX28312804.54	CTD62-End	CF6	5/7/04	2207	59.7496	148.8655	191	weingartner	
HX28312804.55	CTD63-Start	CF7	5/7/04	2222	59.7166	148.8656	182	weingartner	
HX28312804.56	CTD63-End	CF7	5/7/04	2235	59.7168	148.8657	182	weingartner	
HX28312804.57	CTD64-Start	CF8	5/7/04	2249	59.6834	148.8673	180	weingartner	
HX28312804.58	CTD64-End	CF8	5/7/04	2300	59.6845	148.8668	180	weingartner	
HX28312804.59	CTD65-Start	CF9	5/7/04	2318	59.6500	148.8654	179	weingartner	
HX28312804.60	CTD65-End	CF9	5/7/04	2334	59.6491	148.8621	179	weingartner	
HX28312804.61	CTD66-Start	CF10	5/7/04	2349	59.6155	148.8645	177	weingartner	
HX28312904.01	CTD66-End	CF10	5/8/04	0000	59.6168	148.8628	177	weingartner	
HX28312904.02	CTD67-Start	CF11	5/8/04	0017	59.5832	148.8653	177	weingartner	
HX28312904.03	CTD67-End	CF11	5/8/04	NA	NA	NA	177	weingartner	
HX28312904.04	CTD68-Start	CF12	5/8/04	0046	59.5498	148.8653	184	weingartner	
HX28312904.05	CTD68-End	CF12	5/8/04	0100	59.5458	148.8635	184	weingartner	
HX28312904.06	CTD69-Start	CF13	5/8/04	0110	59.5167	148.8660	173	weingartner	
HX28312904.07	CTD69-End	CF13	5/8/04	0125	59.5167	148.8631	173	weingartner	

HX28312904.08	CTD70-Start	CF14	5/8/04	0139	59.4829	148.8665	173	weingartner	
HX28312904.09	CTD70-End	CF14	5/8/04	0153	59.4816	148.8622	173	weingartner	
HX28312904.10	CTD71-Start	CF15	5/8/04	0208	59.4498	148.8666	183	weingartner	
HX28312904.11	CTD71-End	CF15	5/8/04	0221	59.4505	148.8667	183	weingartner	
HX28312904.12	CTD72-Start	GAK3	5/8/04	0335	59.5545	149.1897	213	weingartner	
HX28312904.13	CTD72-End	GAK3	5/8/04	0348	59.5556	149.1880	213	weingartner	
HX28312904.14	CalVET Net Tow-Start	GAK2	5/8/04	0450	59.6909	149.3242	225	hopcroft	
HX28312904.15	CalVET Net Tow-End	GAK2	5/8/04	0457	59.6908	149.3238	225	hopcroft	
HX28312904.16	CTD73-Start	GAK2	5/8/04	0458	59.6910	149.3242	225	weingartner	
HX28312904.17	CTD73-End	GAK2	5/8/04	0512	59.6903	149.3243	225	weingartner	
HX28312904.18	MOCNESS-Start	GAK1	5/8/04	0635	59.8474	149.4686	269	coyle	
HX28312904.19	MOCNESS-End	GAK1	5/8/04	0718	59.8782	149.4910	269	coyle	
HX28312904.20	HTI Transect-Start	GAK1	5/8/04	0741	59.8432	149.4655	269	coyle	
HX28312904.21	HTI Transect-End	GAK2	5/8/04	0926	59.6913	149.3261	231	coyle	
HX28312904.22	MOCNESS-Start	GAK2	5/8/04	0931	59.6931	149.3274	231	coyle	
HX28312904.23	MOCNESS-End	GAK2	5/8/04	1014	59.7150	149.3687	231	coyle	
HX28312904.24	HTI Transect-Start	GAK2	5/8/04	1034	59.6912	149.3268	231	coyle	
HX28312904.25	HTI Transect-End	GAK3	5/8/04	1206	59.5532	149.1883	217	coyle	
HX28312904.26	MOCNESS-Start	GAK3	5/8/04	1209	59.5507	149.1859	217	coyle	
HX28312904.27	MOCNESS-End	GAK3	5/8/04	1239	59.5331	149.1685	217	coyle	
HX28312904.28	CTD74-Start	HE11	5/8/04	2049	60.1425	147.1898	176	weingartner	
HX28312904.29	CTD74-End	HE11	5/8/04	2101	60.1432	147.1882	176	weingartner	
HX28312904.30	CalVET Net Tow-Start	HE10	5/8/04	2117	60.1304	147.1322	216	hopcroft	
HX28312904.31	CalVET Net Tow-End	HE10	5/8/04	2122	60.1304	147.1321	216	hopcroft	
HX28312904.32	CTD75-Start	HE10	5/8/04	2123	60.1304	147.1321	216	weingartner	
HX28312904.33	CTD75-End	HE10	5/8/04	2139	60.1303	147.1320	216	weingartner	
HX28312904.34	CTD76-Start	HE9	5/8/04	2157	60.1102	147.0498	277	weingartner	
HX28312904.35	CTD76-End	HE9	5/8/04	NA	NA	NA	277	weingartner	
HX28312904.36	CTD77-Start	HE8	5/8/04	2238	60.0939	146.9613	148	weingartner	
HX28312904.37	CTD77-End	HE8	5/8/04	2251	60.0986	146.9638	148	weingartner	
HX28312904.38	CalVET Net Tow-Start	HE6.5	5/8/04	2338	60.0526	146.7361	124	hopcroft	
HX28312904.39	CalVET Net Tow-End	HE6.5	5/8/04	2343	60.0539	146.7369	124	hopcroft	
HX28312904.40	CTD78-Start	HE6.5	5/8/04	2346	60.0545	146.7374	124	weingartner	
HX28312904.41	CTD78-End	HE6.5	5/8/04	2358	60.0573	146.7340	124	weingartner	
HX28313004.01	CalVET Net Tow-Start	HE4	5/9/04	0022	60.0800	146.6071	116	hopcroft	

HX28313004.02	CalVET Net Tow-End	HE4	5/9/04	0028	60.0806	146.6055	116	hopcroft	
HX28313004.03	CTD79-Start	HE4	5/9/04	0029	60.0809	146.6051	116	weingartner	
HX28313004.04	CTD79-End	HE4	5/9/04	0041	60.0858	146.6017	116	weingartner	
HX28313004.05	CTD80-Start	HE3	5/9/04	0057	60.1299	146.6092	116	weingartner	
HX28313004.06	CTD80-End	HE3	5/9/04	0106	60.1301	146.6109	116	weingartner	
HX28313004.07	CalVET Net Tow-Start	HE2	5/9/04	0128	60.1801	146.6098	116	hopcroft	
HX28313004.08	CalVET Net Tow-End	HE2	5/9/04	0134	60.1805	146.6103	116	hopcroft	
HX28313004.09	CTD81-Start	HE2	5/9/04	0136	60.1807	146.6103	200	weingartner	
HX28313004.10	CTD81-End	HE2	5/9/04	0151	60.1826	146.6119	200	weingartner	
HX28313004.11	CTD82-Start	HE1	5/9/04	0206	60.2169	146.6079	84	weingartner	
HX28313004.12	CTD82-End	HE1	5/9/04	0212	60.2179	146.6056	84	weingartner	
HX28313004.13	MOCNESS-Start	HE10	5/9/04	0704	60.1288	147.1288	218	coyle	
HX28313004.14	MOCNESS-End	HE10	5/9/04	NA	NA	NA		coyle	
HX28313004.15	CTD83-Start	HB1	5/9/04	1455	60.1918	147.7016	245	weingartner	
HX28313004.16	CTD83-End	HB1	5/9/04	1513	60.1912	147.7031	245	weingartner	
HX28313004.17	CalVET Net Tow-Start	HB2	5/9/04	1528	60.1782	147.6430	176	hopcroft	
HX28313004.18	CalVET Net Tow-End	HB2	5/9/04	1533	60.1782	147.6419	176	hopcroft	
HX28313004.19	CTD84-Start	HB2	5/9/04	1537	60.1777	147.6422	176	weingartner	
HX28313004.20	CTD84-End	HB2	5/9/04	1552	60.1767	147.6391	176	weingartner	
HX28313004.21	CTD85-Start	HB3	5/9/04	1618	60.1632	147.5734	82	weingartner	
HX28313004.22	CTD85-End	HB3	5/9/04	NA	NA	NA	82	weingartner	
HX28313004.23	CTD86-Start	HB4	5/9/04	1642	60.1463	147.5004	110	weingartner	
HX28313004.24	CTD86-End	HB4	5/9/04	1654	60.1461	147.4993	110	weingartner	
HX28313004.25	Fe-Start	HBX	5/9/04	1702	60.1300	147.5242	110	Wu	Nalgene bottle off bow while steaming; pole sample
HX28313004.26	Fe-End	HBX	5/9/04	1707	60.1300	147.5290	110	Wu	
HX28313004.27	CTD87-Start	MS1	5/9/04	1908	59.9540	147.9263	167	weingartner	
HX28313004.28	CTD87-End	MS1	5/9/04	1922	59.9537	147.9303	167	weingartner	
HX28313004.29	CalVET Net Tow-Start	MS2	5/9/04	1932	59.9435	147.8947	193	hopcroft	
HX28313004.30	CalVET Net Tow-End	MS2	5/9/04	1937	59.9436	147.8935	193	hopcroft	
HX28313004.31	CTD88-Start	MS2	5/9/04	1938	59.9436	147.8933	193	weingartner	
HX28313004.32	CTD88-End	MS2	5/9/04	1953	59.9437	147.8912	193	weingartner	
HX28313004.33	CTD89-Start	MS3	5/9/04	2003	59.9312	147.8568	165	weingartner	
HX28313004.34	CTD89-End	MS3	5/9/04	2023	59.9202	147.8282	165	weingartner	
HX28313004.35	CTD90-Start	MS4	5/9/04	2024	59.9202	147.8271	112	weingartner	
HX28313004.36	CTD90-End	MS4	5/9/04	2035	59.9208	147.8246	112	weingartner	
HX28313004.37	CTD91-Start	KIP2	5/9/04	2248	60.2789	147.9883	554	weingartner	
HX28313004.38	CTD91-End	KIP2	5/9/04	2319	60.2809	147.9896	554	weingartner	
HX28313004.39	Ring Net-Start	KIP2	5/9/04	2321	60.2810	147.9894	554	hopcroft	

HX28313004.40	Ring Net-End	KIP2	5/9/04	2326	60.2813	147.9886	554	hopcroft	
HX28313004.41	CTD92-Start	WATER	5/9/04	2341	60.2985	147.9560	554	hopcroft	collect water for experiments
HX28313004.42	CTD92-End	WATER	5/9/04	2343	60.2985	147.9563	554	hopcroft	
HX28313104.01	MOCNESS-Start	MS2	5/10/04	0807	59.9453	147.8877	194	coyle	
HX28313104.02	MOCNESS-End	MS2	5/10/04	0839	59.9577	147.8500	194	coyle	
HX28313104.03	MOCNESS-Start	HB2	5/10/04	1012	60.1819	147.6419	177	coyle	
HX28313104.04	MOCNESS-End	HB2	5/10/04	1044	60.2081	147.6366	177	coyle	
HX28313104.05	MOCNESS-Start	KIP2	5/10/04	1229	60.2795	147.9854	590	coyle	for live animals only
HX28313104.06	MOCNESS-End	KIP2	5/10/04	NA	NA	NA		coyle	
HX28313104.07	CTD93-Start	KIP2	5/10/04	1417	60.2767	147.9871	590	weingartner	
HX28313104.08	CTD93-End	KIP2	5/10/04	1428	60.2756	147.9853	590	weingartner	
HX28313104.09	CalVET Net Tow-Start	KIP2	5/10/04	1433	60.2781	147.9868	590	hopcroft	
HX28313104.10	CalVET Net Tow-End	KIP2	5/10/04	1455	60.2775	147.9865	590	hopcroft	
HX28313104.11	CTD94-Start	KIP2	5/10/04	1451	60.2777	147.9866	590	hopcroft	zoop cast 1
HX28313104.12	CTD94-End	KIP2	5/10/04	1454	60.2776	147.9866	590	hopcroft	
HX28313104.13	CTD95-Start	KIP2	5/10/04	1457	NA	147.9864	590	hopcroft	zoop cast 2
HX28313104.14	CTD95-End	KIP2	5/10/04	1459	60.2773	147.9864	590	hopcroft	
HX28313104.15	CTD96-Start	KIP2	5/10/04	1504	60.2770	147.9863	590	hopcroft	zoop cast 3
HX28313104.16	CTD96-End	KIP2	5/10/04	1507	60.2768	147.9863	590	hopcroft	
HX28313104.17	CTD97-Start	KIP2	5/10/04	1511	60.2764	147.9865	590	hopcroft	zoop cast 4
HX28313104.18	CTD97-End	KIP2	5/10/04	1514	60.2763	147.9865	590	hopcroft	
HX28313104.19	CTD98-Start	KIP2	5/10/04	1518	60.2760	147.9866	590	hopcroft	zoop cast 5
HX28313104.20	CTD98-End	KIP2	5/10/04	1519	60.2760	147.9866	590	hopcroft	
HX28313104.21	CTD99-Start	KIP2	5/10/04	1523	60.2757	147.9868	590	hopcroft	zoop cast 6
HX28313104.22	CTD99-End	KIP2	5/10/04	1525	60.2756	147.9869	590	hopcroft	
HX28313104.23	Ring Net-Start	KIP2	5/10/04	1527	60.2754	147.9870	590	hopcroft	
HX28313104.24	Ring Net-End	KIP2	5/10/04	1532	60.2752	147.9873	590	hopcroft	
HX28313104.25	Ring Net-Start	KIP2	5/10/04	1535	60.2751	147.9874	590	hopcroft	
HX28313104.26	Ring Net-End	KIP2	5/10/04	1541	60.2748	147.9877	590	hopcroft	
HX28313104.27	Ring Net-Start	KIP2	5/10/04	1544	60.2747	147.9877	590	hopcroft	
HX28313104.28	Ring Net-End	KIP2	5/10/04	1550	60.2745	147.9879	590	hopcroft	
HX28313104.29	Ring Net-Start	KIP2	5/10/04	1553	60.2744	147.9881	590	hopcroft	
HX28313104.30	Ring Net-End	KIP2	5/10/04	1559	60.2742	147.9881	590	hopcroft	
HX28313104.31	CalVET Net Tow-Start	PWS1	5/10/04	1642	60.3796	147.9370	355	hopcroft	
HX28313104.32	CalVET Net Tow-End	PWS1	5/10/04	1648	60.3789	147.9380	355	hopcroft	
HX28313104.33	CTD100-Start	PWS1	5/10/04	1651	60.3784	147.9382	355	weingartner	
HX28313104.34	CTD100-End	PWS1	5/10/04	1713	60.3750	147.9393	355	weingartner	
HX28313104.35	CalVET Net Tow-Start	PWS2	5/10/04	1817	60.5365	147.8027	738	hopcroft	

HX28313104.36	CalVET Net Tow-End	PWS2	5/10/04	1823	60.5369	147.8014	738	hopcroft	
HX28313104.37	CTD101-Start	PWS2	5/10/04	1823	60.5370	147.8013	738	weingartner	
HX28313104.38	CTD101-End	PWS2	5/10/04	1903	60.5401	147.7957	738	weingartner	
HX28313104.39	Fe-Start	PWS2	5/10/04	1911	60.5443	147.8040	738	Wu	Nalgene bottle off bow while steaming; pole sample
HX28313104.40	Fe-End	PWS2	5/10/04	1915	60.5473	147.8052	738	Wu	
HX28313204.01	MOCNESS-Start	PWS2	5/11/04	0708	60.5422	147.8077	735	coyle	
HX28313204.02	MOCNESS-End	PWS2	5/11/04	0750	60.5632	147.8435	735	coyle	
HX28313204.03	MOCNESS-Start	PWS1	5/11/04	0909	60.3785	147.9386	353	coyle	
HX28313204.04	MOCNESS-End	PWS1	5/11/04	0940	60.3572	147.9477	353	coyle	
HX28313204.05	MOCNESS-Start	KIP1	5/11/04	1041	60.2786	147.9852	592	coyle	
HX28313204.06	MOCNESS-End	KIP1	5/11/04	1109	60.2965	147.9741	592	coyle	
HX28313204.07	CTD102-Start	BP1	5/11/04	1209	60.1965	148.0906	592	weingartner	
HX28313204.08	CTD102-End	BP1	5/11/04	1222	60.1953	148.0924	592	weingartner	
HX28313204.09	CTD103-Start	FI1	5/11/04	1306	60.1460	148.0045	592	weingartner	
HX28313204.10	CTD103-End	FI1	5/11/04	1321	60.1441	148.0070	592	weingartner	
HX28313204.11	CTD104-Start	EV2	5/11/04	1413	60.0750	147.8880	130	weingartner	
HX28313204.12	CTD104-End	EV2	5/11/04	1422	60.0733	147.8880	130	weingartner	
HX28313204.13	CTD105-Start	EV1	5/11/04	1435	60.0866	147.9067	210	weingartner	
HX28313204.14	CTD105-End	EV1	5/11/04	1445	60.0883	147.9043	210	weingartner	
HX28313204.15	CTD106-Start	CCSE1	5/11/04	1750	59.7419	147.8153	65	weingartner	
HX28313204.16	CTD106-End	CCSE1	5/11/04	1754	59.7420	147.8146	65	weingartner	
HX28313204.17	CTD107-Start	CCSE2	5/11/04	1828	59.6670	147.7272	117	weingartner	
HX28313204.18	CTD107-End	CCSE2	5/11/04	NA	NA	NA	117	weingartner	
HX28313204.19	CTD108-Start	CCSE3	5/11/04	1918	59.5698	147.6068	110	weingartner	
HX28313204.20	CTD108-End	CCSE3	5/11/04	1925	59.5688	147.6065	110	weingartner	
HX28313204.21	CTD109-Start	CCSE4	5/11/04	2009	59.4735	147.4733	114	weingartner	
HX28313204.22	CTD109-End	CCSE4	5/11/04	2015	59.4732	147.4736	114	weingartner	
HX28313204.23	CTD110-Start	CCSE5	5/11/04	2059	59.3752	147.3494	129	weingartner	
HX28313204.24	CTD110-End	CCSE5	5/11/04	2108	59.3737	147.3502	129	weingartner	
HX28313204.25	CTD111-Start	CCSE6	5/11/04	2209	59.2336	147.1570	196	weingartner	
HX28313204.26	CTD111-End	CCSE6	5/11/04	2221	59.2322	147.1528	196	weingartner	
HX28313204.27	CTD112-Start	CCSE7	5/11/04	2332	59.0582	146.9666	2012	weingartner	
HX28313304.01	CTD112-End	CCSE7	5/12/04	0017	59.0627	146.9516	2012	weingartner	
HX28313304.02	Fe-Start	CCSE7	5/12/04	0019	59.0629	146.9510	2012	Wu	Iron Experiment cast; GOFLOW bottles off non-metallic line; ca. 6 depths
HX28313304.03	Fe-End	CCSE7	5/12/04	0256	59.0813	146.8960	2012	Wu	

HX28313304.04	MOCNESS-Start	GAK2	5/12/04	1111	59.6866	149.3325	228	coyle	
HX28313304.05	MOCNESS-End	GAK2	5/12/04	1152	59.7100	149.3810	228	coyle	
HX28313304.06	CTD113-Start	GAK1	5/12/04	1258	59.8452	149.4687	272	weingartner	
HX28313304.07	CTD113-End	GAK1	5/12/04	1406	60.0211	149.3580	272	weingartner	
HX28313304.08	CTD114-Start	RES2.5	5/12/04	1409	60.0256	149.3577	295	weingartner	
HX28313304.09	CTD114-End	RES2.5	5/12/04	1429	60.0253	149.3589	295	weingartner	
HX28313304.10	Ring Net-Start	RES2.5	5/12/04	1430	60.0253	149.3590	295	hopcroft	
HX28313304.11	Ring Net-End	RES2.5	5/12/04	1432	60.0252	149.3594	295	hopcroft	