

GLOBEC CRUISE Report

CRUISE HX293: 1 - 10 December 2004

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

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Scientific Purpose:

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

This December sampling is the seventh consecutive year of GLOBEC LTOP December sampling in the GOA. This originally unscheduled cruise was appended to the original schedule because the April 2004 cruise was cancelled due to a mechanical failure of the vessel's clutch.

Cruise Objectives:

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

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. 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.

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

CRUISE ACTIVITY SCHEDULE

DATE TIME:

11/30	1700	Fairbanks-based Science party members arrived in Seward.
12/01	0930	Pre-cruise meeting
	1015	Depart from dock; occupy RES 2.5 and GAK 1. Start working out the Seward Line, reaching GAK1i and GAK2. Weather deteriorating and daylight fading. Twenty foot swells and fading daylight at GAK2 prompt the decision to turn for Prince William Sound at 1500. Sample PWS2 (CTD)

- and MOCNESS), and PWS1 during the night.
- 12/02 0600 Finish deep cast at KIP2 with some misfiring bottles on the CTD. Will try to reoccupy KIP2 and PWS2 during daylight later in the cruise for Calvet samples.
- 1030 Occupy Hogan Bay and Montague Strait lines, then anchor for night.
- 12/03 0930 Occupy Hinchinbrook Entrance line, working from HE11 to HE1. Winds from NW. CTD's all completed but Calvet was only taken at HE10 due to the high winds. Headed back into the Sound and up to PWS4 & PWS3 (CTD's to 500db) and PWS2 and KIP2 (CTD's to 100db and Calvet nets).
- 12/04 0630 Depart Bainbridge Passage and head for CF line. Calm seas. Begin sampling at CF1 at 0930; finish line at 1630 and head for GAK13
- 12/05 Arrive at GAK13 ~midnight. Complete Deep MOCNESS, deep CTD and Calvet net tows. Beginning working inshore along the Seward line. Calm seas and winds.
- 12/06 0530 Finish Seward Line (GAK1) at 0530 and head to CF line to ADCP from CF1 to CF15. Weather deteriorates offshore. Break off line and turn for Sound at CF10 due to rough seas and possible icing conditions. Rough ride into Sound. Anchor for night.
- 12/07 0730 PWS2 deep MOCNESS to 600m using a fine mesh. Then head to Port Nellie Juan and Kings Bay CTD's. Anchor for night.
- 12/08 0900 Depart anchorage. CTD at KIP2 to collect deep water for zooplankton experiments. Exit Sound through Bainbridge Passage and head for Chiswell Islands. Occupy CRS line and add RI3, RI2, and RI1. Significant East swells, but workable.
- 12/09 Transit from the Ragged Island Line to Seward, occupying GAK1 (CTD) and Res 2.5 (CTD and MOCNESS) upon return. Ship docked at 0930 and all scientific equipment was offloaded by 1200.
- 12/10 Fairbanks-based science party departs via Seward Bus Lines.

PHYSICAL OCEANOGRAPHY (S.Thornton)

We collected CTDs along the Seward Line, Hinchinbrook Line, and Cape Fairfiled Line on the continental shelf and in Montague Strait, Knight Island Passage, and at other locations throughout western Prince William Sound. We also collected CTDs along the Chiswell Rocks Line (CRS) with Ragged Island Extension. Continuous sea surface temperature, salinity, fluorescence data, ADCP data, and underway meteorological data were collected throughout the cruise. Two new CTD stations were added in Kings Bay (Western PWS): KB1 (60 31.9N, 148 32.0W) and KB2 (60 29.0N, 148 38.0W). Due to

poor weather forecasts, we were unable to complete the occupation of the eastern Gulf of Alaska stations that had been proposed.

NUTRIENT AND CHLOROPHYLL (S.Thornton/M. Rohr)

Water samples from the CTD Rosette were obtained at all stations on the GAK, HE, HB, MS and KIP lines and alternate stations on the CF line. 577 water samples were analyzed on board ship for 5 dissolved nutrients (nitrate, phosphate, silicate, ammonium and nitrite) using an RFA 300 AutoAnalyzer.

Total chlorophyll samples were taken at 6 depths at the fore mentioned stations. In addition, at 23 of those stations size-fractionated filtrations (20, 5, 0.7um) were completed at 0, 20, and 40m. Filters were frozen on the ship and taken to Fairbanks for analysis.

ZOOPLANKTON (GROWTH EXPERIMENTS; A. Pinchuk)

1. 36 CalVET net samples with 53 um and 150 um mesh sizes were collected on 13 main stations along the Seward line, 4 stations in PWS and 1 station in HE line.
2. 600 m deep MOCNESS tows were collected at PWS2 and GAK13
3. An additional 600 m MOCNESS was executed at PWS2 for collection of live zooplankton.
4. About 150 live *Neocalanus flemingeri* females were sorted and set for egg production experiments.
5. About 50 live *Pareuchaeta elongata* were sorted and sent to Georgia Tech for behavioral and feeding experiments.

ZOOPLANKTON (STABLE ISOTOPES; T. Kline)

During HX293, diapausing *Neocalanus* spp. were sampled for stable isotope analysis (SIA) from the contents of MOCNESS tows that sampled between 400 and 600m at stations GAK13 and PWS2. *Neocalanus* were 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
<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

Table 2.

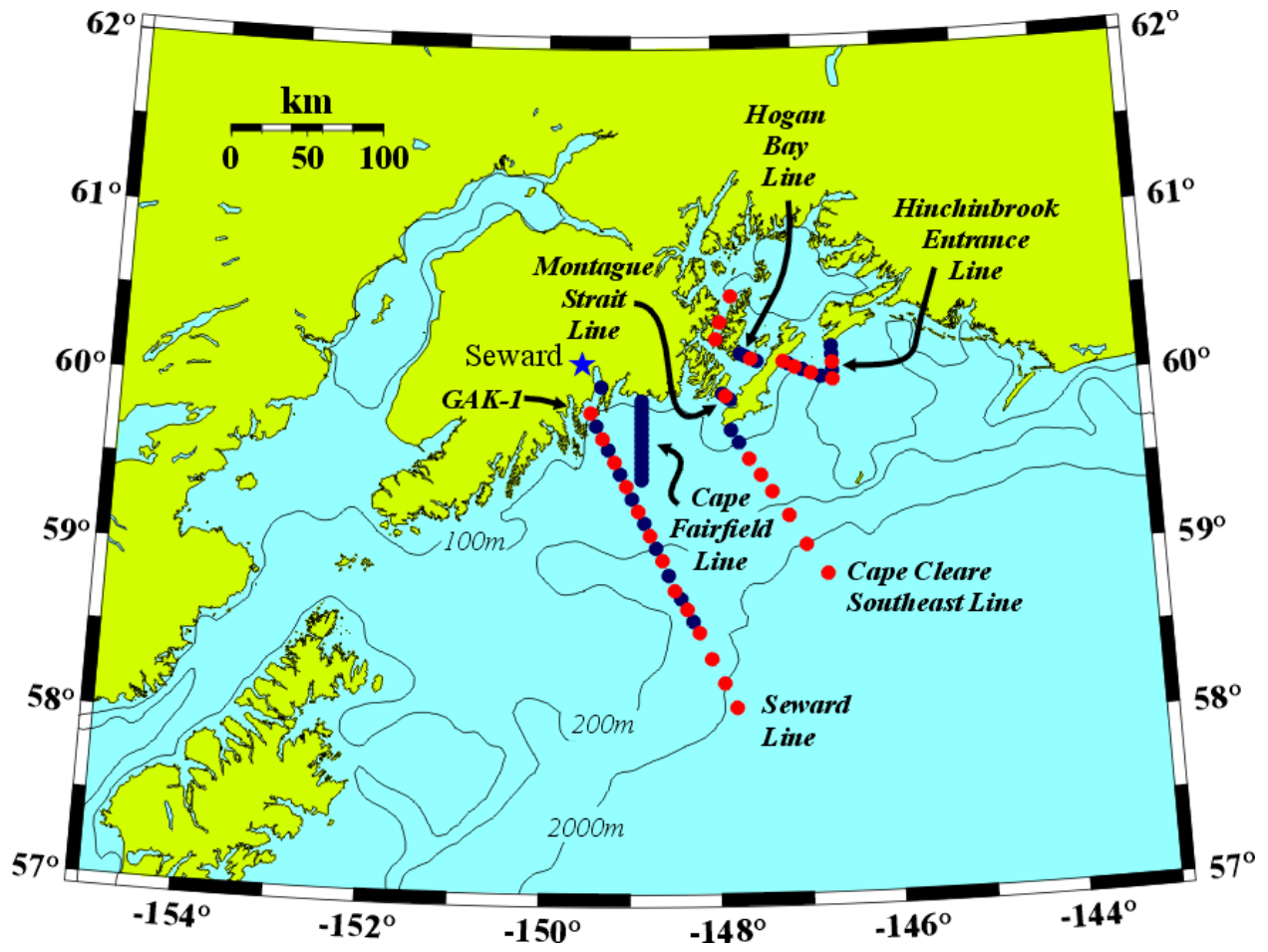
NEP GLOBEC LTOP OPPORTUNISTIC STATIONS				
Latitude N (degrees, minutes)		Longitude W (degrees, minutes)		Station Name
<i>Along Hinchinbrook Canyon Line</i>				
60	0	147	4.5	AHC2
59	54	147	4.5	AHC3
59	48	147	4.5	AHC4
59	42	147	4.5	AHC5
59	36	147	4.5	AHC6
59	30	147	4.5	AHC7
59	24	147	4.5	AHC8
59	18	147	4.5	AHC9
59	11	147	4.5	AHC10
59	4	147	4.5	AHC11
<i>Cross Upper Hinchinbrook Canyon Line</i>				
59	48	146	54	XHCU3
59	48	146	57.5	XHCU4
59	48	147	1	XHCU5
59	48	147	8	XHCU7
59	48	147	11.5	XHCU8
59	48	147	15	XHCU9
59	48	147	20	XHCU10
59	48	147	25	XHCU11
<i>Cape Cleare Line</i>				
59	44.67	147	53	CC1
59	42.6	147	53	CC2
59	40	147	53	CC3
59	36	147	53	CC4
59	29	147	53	CC5
59	22	147	53	CC6
59	15	147	53	CC7
59	7.75	147	53	CC8
<i>Cape Cleare South-West Line</i>				
59	42.9	148	0	CCSW1
59	40	148	5	CCSW2
59	37.5	148	10.2	CCSW3
59	35.1	148	14.8	CCSW4
59	32.6	148	20	CCSW5
<i>Copper River Line</i>				
60	6.2	144	35.2	CR1
60	1.2	144	42.6	CR2
59	56.2	144	49.2	CR3

59	51.2	144	55.9	CR4
59	46.2	145	2.3	CR5
59	41.2	145	8.3	CR6
59	35.2	145	8.3	CR7
59	29.2	145	8.3	CR8
59	23.8	145	8.3	CR9
Cape Suckling Line				
59	57	143	40	CS1
59	54	143	40	CS2
59	51	143	40	CS3
59	48	143	40	CS4
59	44	143	40	CS5
59	38	143	40	CS6
59	32	143	40	CS7
59	25	143	40	CS8
Gore Point Line				
59	10.3	150	56.1	GP1
59	6.2	150	51.6	GP2
59	2.1	150	47.1	GP3
58	58	150	43.6	GP4
58	53.9	150	39.1	GP5
58	47.8	150	33.3	GP6
58	41.6	150	26.6	GP7
58	35.5	150	20	GP8
58	29.3	150	13.4	GP9
58	23.1	150	6.8	GP10
Hoof Point Line				
59	37.6	149	54.9	HP1
59	33.2	149	50.7	HP2
59	28.9	149	46.5	HP3
59	20.1	149	38.1	HP5
59	15.7	149	33.9	HP6
59	11.4	149	29.5	HP7
59	7	149	25.1	HP8
59	1.8	149	19.7	HP9
58	57.4	149	17.4	HP10
58	52.9	149	13.5	HP11
58	47.5	149	7.1	HP12
58	40.9	148	59.5	HP13
Pye Island Line				
59	19.5	150	11.7	PI2
59	14.5	150	7.7	PI3
59	9.5	150	3.7	PI4
59	4.5	149	59.7	PI5

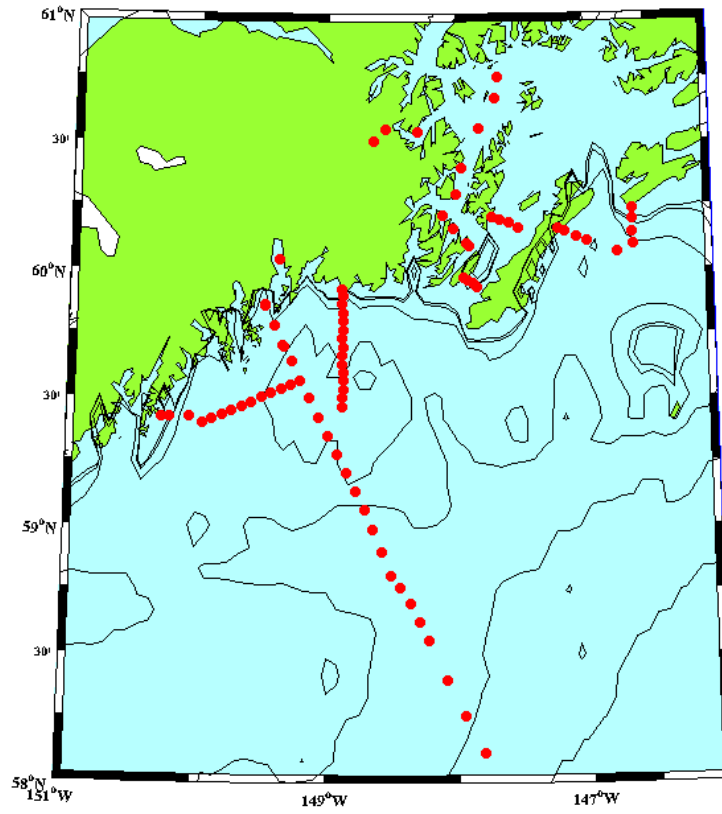
59	0.5	149	55.7	PI6
<i>Ragged Island Line</i>				
59	24.5	150	15.5	RI1
59	24.5	150	11.85	RI2
59	24.5	150	2.018	RI3
59	24.5	149	52.15	RI4
59	24.5	149	42.3	RI5
59	24.5	149	32.45	RI6
59	24.5	149	22.6	RI7
59	24.5	149	12.75	RI8
59	24.5	148	52	RI10
<i>Amatuli Trough Stations</i>				
59	12.6	150	12.82	TXC1
59	18.6	150	12.64	TXC2
59	5.6	150	13.7	XC1
59	3.9	150	2.4	XC2
59	2.9	149	55.92	XC2.5
59	2.2	149	51.1	XC3
59	0.5	149	40.4	XC4
58	58.5	149	28.7	XC5
58	55.1	149	5.3	XC6
58	53.4	148	53.9	XC7
58	51.7	148	42.5	XC8
<i>Montague-Marmot Line</i>				
59	20.987	149	9.643	MM2
59	17.523	149	16.825	MM3
59	14.188	149	23.873	MM4
59	7.297	149	37.845	MM6
59	3.885	149	45.415	MM7
59	0.189	149	51.946	MM8
<i>Chiswell Rocks Line</i>				
59	32.12	149	16	CRS1
59	31.12	149	20.3	CRS2
59	30.12	149	25	CRS3
59	29.12	149	29.3	CRS4
59	28.12	149	34	CRS5
59	27.12	149	38.3	CRS6
59	26.12	149	43	CRS7
59	25.12	149	47.3	CRS8
59	24.12	149	52	CRS9
59	23.12	149	56.3	CRS10
<i>West of Prince William Sound Stations</i>				
59	55.5	148	20	PWSW1
59	52.5	148	20	PWSW2

59	49.5	148	20	PWSW3
59	46.5	148	20	PWSW4
59	42.5	148	20	PWSW5
59	40	148	20	PWSW5i
59	37.5	148	20	PWSW6
Prince William Sound Stations				
60	39.3	147	40.6	PWS3
60	44.2	147	39.4	PWS4
60	49.3	147	23.7	PWS5
60	43.174	147	8.368	PWS6
60	37.7	147	8.9	PWS7
60	33.4	147	7.6	PWS8
60	28.6	147	4.2	PWS9
60	17	146	48.4	PWS11
Naked Island Line				
60	50.452	147	35.722	NI1
60	48.534	147	33.886	NI2
60	46.413	147	31.674	NI3
60	44.436	147	29.762	NI4
Nellie Juan Station / Kings Bay				
60	31.156	148	17.333	NJ1
60	31.9	148	32.0	KB1
60	29	148	38.0	KB2
Port Wells Station				
60	48.33	148	13.086	PW1
Knight Island Passage Station				
60	16.8	148	0.8	KIP1
Central Prince William Sound Stations				
60	36.36	146	51.15	KJ1
60	32.26	146	51.15	KJ2
60	29.55	146	40.45	KJ4
60	24.1	147	5.5	MH1
60	24.1	146	58.36	MH2
60	24.1	146	51.15	MH3
60	24.1	146	44.26	MH4
60	39.9	147	0	MK3
60	28.04	147	7.6	MN1
60	31.92	147	9.8	MN2
60	35.83	147	11.72	MN3
60	39.9	147	14.15	NK1
60	39.9	147	7.15	NK2
60	39.9	146	52.8	NK4
60	39.9	146	45.75	NK5

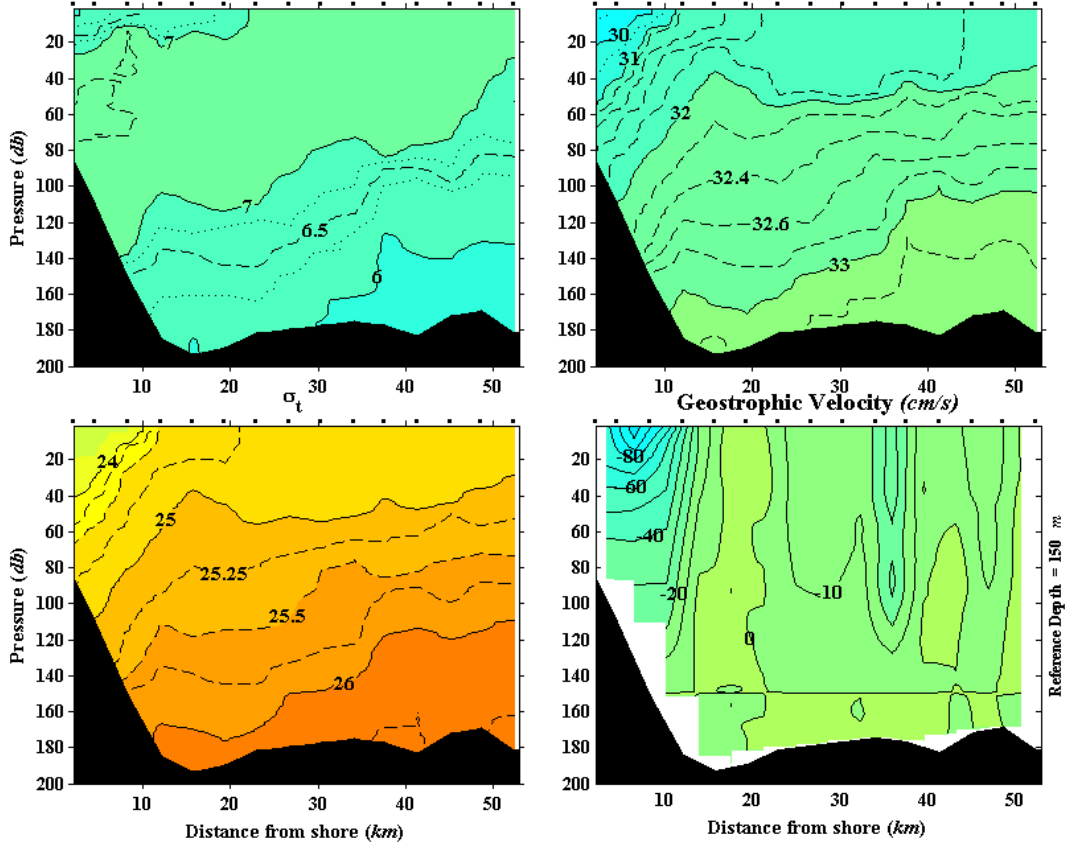
NEP GLOBEC Standard Station Map



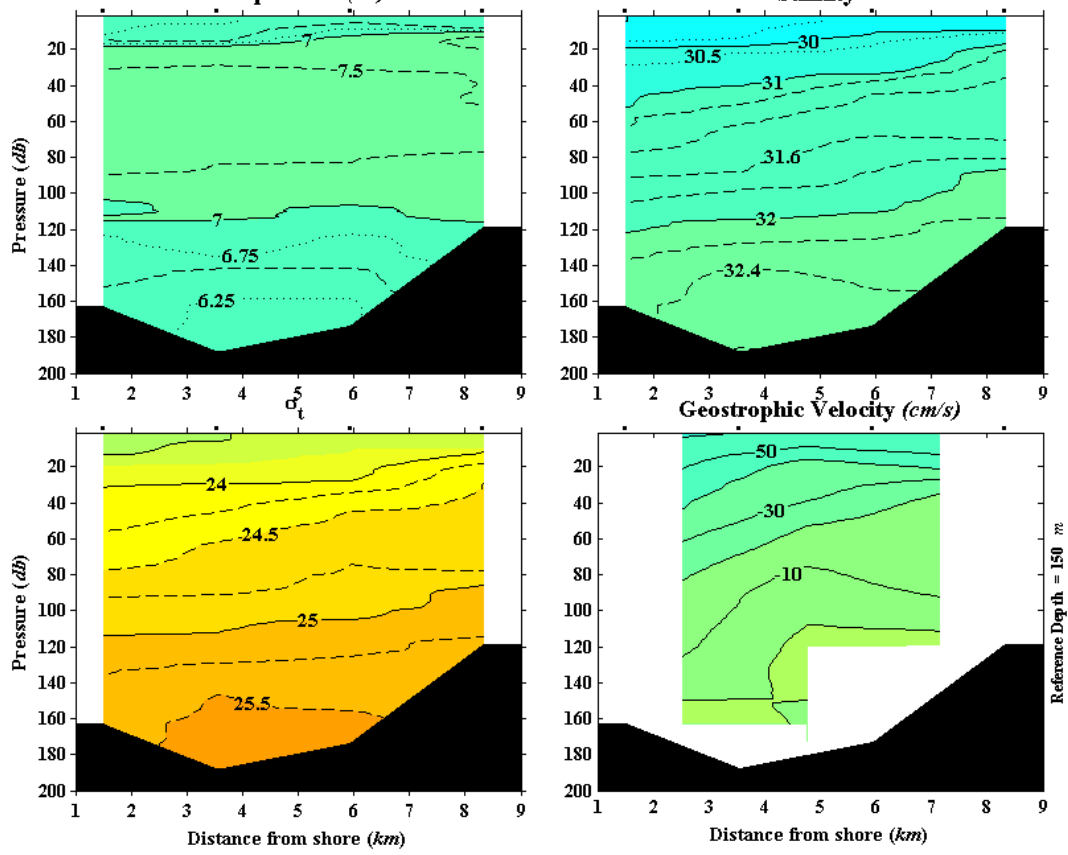
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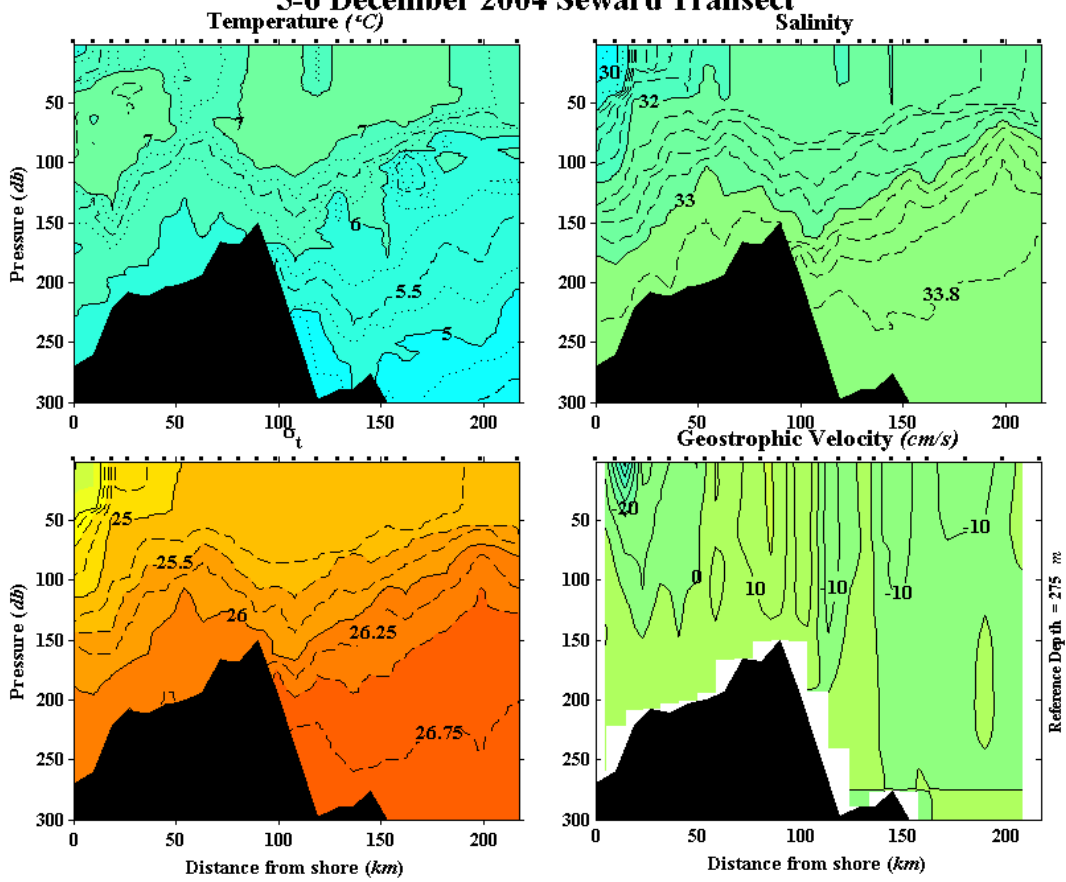
4-5 December 2004 Cape Fairfield Transect



2-3 December 2004 Montague Strait Transect



5-6 December 2004 Seward Transect



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 R. Hopcroft and T. Kline.

Event	Description	Station	Date	GMT	Latitude	Longitude	Depth	Scientist	Comments
HX293106601.001	CTD1	Res2.5	12/1/04	20:02	60.0246	149.3607	295	weingartner	
HX293106601.002	CTD1	Res2.5	12/1/04	20:22	60.0228	149.3608	295	weingartner	
HX293106601.003	CalVET Net Tow	gak1	12/1/04	21:32	59.8454	149.4648	271	hopcroft	
HX293106601.004	CalVET Net Tow	gak1	12/1/04	21:37	59.8456	149.4666	271	hopcroft	
HX293106601.005	CTD2	gak1	12/1/04	21:40	59.8463	149.4678	271	weingartner	
HX293106601.006	CTD2	gak1	12/1/04	22:01	59.8481	149.4714	271	weingartner	
HX293106601.007	CTD3	gak1i	12/1/04	22:42	59.7658	149.3941	261	weingartner	
HX293106601.008	CTD3	gak1i	12/1/04	23:14	59.746	149.3923	261	weingartner	
HX293106701.001	CTD4	gak2	12/2/04	0:01	59.6868	149.3228	227	weingartner	
HX293106701.002	CTD4	gak2	12/2/04	0:18	59.6848	149.3233	227	weingartner	
HX293106701.003	CTD5	pws2	12/2/04	8:15	60.5353	147.8029	734	weingartner	
HX293106701.004	CTD5	pws2	12/2/04	8:41	60.5365	147.8065	734	weingartner	
HX293106701.005	MOCNESS	pws2	12/2/04	8:47	60.5398	147.804	734	hopcroft	
HX293106701.006	MOCNESS	pws2	12/2/04	10:40	60.5985	147.7388	780	hopcroft	
HX293106701.007	CTD6	pws2	12/2/04	11:15	60.5352	147.8007	735	weingartner	
HX293106701.008	CTD7	pws1	12/2/04	13:06	60.3785	147.9381	355	weingartner	
HX293106701.009	CTD8	kip2	12/2/04	14:11	60.2799	147.9879	560	weingartner	
HX293106701.010	CTD9	kip2	12/2/04	15:07	60.2782	147.9887	560	weingartner	
HX293106701.011	CTD10	HB1	12/2/04	19:25	60.1908	147.7034	242	weingartner	
HX293106701.012	CTD10	HB1	12/2/04	19:53	60.1742	147.7136	200	weingartner	
HX293106701.013	CalVET Net Tow	HB2	12/2/04	20:19	60.1778	147.641	200	hopcroft	
HX293106701.014	CalVET Net Tow	HB2	12/2/04	20:24	4:14	147.6413	200	hopcroft	
HX293106701.015	CTD11	HB2	12/2/04	20:30	60.1779	147.6445	180	weingartner	
HX293106701.016	CTD11	HB2	12/2/04	20:45	60.1717	147.6454	180	weingartner	
HX293106701.017	CTD12	HB3	12/2/04	21:05	60.1651	147.5735	180	weingartner	
HX293106701.018	CTD12	HB3	12/2/04	21:15	60.1643	147.5741	80	weingartner	
HX293106701.019	CTD13	HB4	12/2/04	21:38	60.1482	147.5001	107	weingartner	
HX293106701.020	CTD13	hb4	12/2/04	22:08	60.1162	147.5548	122	weingartner	
HX293106701.021	CTD14	MS1	12/2/04	23:38	59.9513	147.9303	166	weingartner	
HX293106701.022	CTD14	MS1	12/2/04	23:54	59.9455	147.9386	166	weingartner	
HX293106801.001	CalVET Net Tow	MS2	12/3/04	0:07	59.9431	147.8947	196	hopcroft	
HX293106801.002	CalVET Net Tow	MS2	12/3/04	0:12	59.9417	147.8959	196	hopcroft	
HX293106801.003	CTD15	MS2	12/3/04	0:15	59.9415	147.8987	192	weingartner	
HX293106801.004	CTD15	MS2	12/3/04	0:31	59.9352	147.9089	192	weingartner	
HX293106801.005	CTD16	MS3	12/3/04	0:49	59.9314	147.86	172	weingartner	
HX293106801.006	CTD16	ms3	12/3/04	1:09	59.9254	147.8747	173	weingartner	
HX293106801.007	CTD17	ms4	12/3/04	1:23	59.9187	147.8262	121	weingartner	
HX293106801.008	CTD17	ms4	12/3/04	1:38	59.914	147.839	121	weingartner	
HX293106801.009	CTD18-Start	he11	12/3/04	18:17	60.1422	147.1928	173	weingartner	

HX293106801.010	CTD18-End	he11	12/3/04	18:39	60.1345	147.165	173	weingartner	late
HX293106801.011	CTD19-Start	he10	12/3/04	18:49	60.1305	147.1351	216	weingartner	
HX293106801.012	CalVET Net Tow-Start	he10	12/3/04	19:18	60.1229	147.1351	216	weingartner	
HX293106801.013	CTD19-End	he10	12/3/04	19:19	60.123	147.135	216	weingartner	late
HX293106801.014	CalVET Net Tow-End	he10	12/3/04	19:19	60.1231	147.1349	216	weingartner	
HX293106801.015	CTD20-Start	he9	12/3/04	19:38	60.1105	147.0499	278	weingartner	
HX293106801.016	CTD20-End	he9	12/3/04	20:03	60.1035	147.0389	278	weingartner	
HX293106801.017	CTD21-Start	he8	12/3/04	20:23	60.0938	146.962	150	weingartner	
HX293106801.018	CTD21-End	he8	12/3/04	20:36	60.0909	146.9577	150	weingartner	
HX293106801.019	CTD22-Start	he6i	12/3/04	21:25	60.0527	146.736	124	weingartner	
HX293106801.020	CTD22-End	he6i	12/3/04	21:37	60.0507	146.7318	124	weingartner	
HX293106801.021	CTD23-Start	he4	12/3/04	22:11	60.0804	146.608	115	weingartner	
HX293106801.022	CTD23-End	he4	12/3/04	22:23	60.0774	146.6048	115	weingartner	
HX293106801.023	CTD24-Start	he3	12/3/04	22:58	60.1277	146.6096	115	weingartner	
HX293106801.024	CTD24-End	he3	12/3/04	23:04	60.1262	146.6082	115	weingartner	
HX293106801.025	CTD25-Start	he2	12/3/04	23:43	60.1794	146.6109	194	weingartner	
HX293106801.026	CTD25-End	he2	12/3/04	23:58	60.1756	146.6135	194	weingartner	
HX293106901.001	CTD26-Start	he1	12/4/04	0:27	60.2168	146.6116	80	weingartner	
HX293106901.002	CTD26-End	he1	12/4/04	0:35	60.2146	146.6146	80	weingartner	
HX293106901.003	CTD27-Start	pws4	12/4/04	6:52	60.7358	147.6565	651	weingartner	
HX293106901.004	CTD27-End	pws4	12/4/04	7:22	60.7319	147.6411	651	weingartner	
HX293106901.005	CTD28-Start	pws3	12/4/04	7:59	60.6536	147.6775	758	weingartner	
HX293106901.006	CTD28-End	pws3	12/4/04	8:28	60.6509	147.6595	758	weingartner	
HX293106901.007	CTD29-Start	pws2	12/4/04	9:28	60.5336	147.8036	740	weingartner	
HX293106901.008	CTD29-End	pws2	12/4/04	9:47	60.5307	147.7964	740	weingartner	late
HX293106901.009	CalVET Net Tow-Start	pws2	12/4/04	9:47	60.5308	147.7964	740	hopcroft	late
HX293106901.010	CalVET Net Tow-End	pws2	12/4/04	9:47	60.5308	147.7964	740	hopcroft	
HX293106901.011	CTD30-Start	kip2	12/4/04	12:35	60.2774	147.987	588	weingartner	
HX293106901.012	CTD30-End	kip2	12/4/04	13:04	60.2652	147.991	588	weingartner	late
HX293106901.013	CalVET Net Tow-Start	kip2	12/4/04	13:04	60.2651	147.991	588	hopcroft	late
HX293106901.014	CalVET Net Tow-End	kip2	12/4/04	13:04	60.265	147.991	588	hopcroft	
HX293106901.015	CTD31-Start	cf1	12/4/04	18:46	59.9082	148.8701	86	weingartner	
HX293106901.016	CTD31-End	cf1	12/4/04	18:54	59.9078	148.8734	86	weingartner	
HX293106901.017	CTD32-Start	cf2	12/4/04	19:05	59.8834	148.8664	113	weingartner	
HX293106901.018	CTD32-End	cf2	12/4/04	19:15	59.882	148.8755	113	weingartner	
HX293106901.019	CTD33-Start	cf3	12/4/04	19:30	59.85	148.8688	160	weingartner	
HX293106901.020	CTD33-End	cf3	12/4/04	19:45	59.852	148.8846	160	weingartner	
HX293106901.021	CTD34-Start	cf4	12/4/04	20:02	59.8159	148.8669	183	weingartner	
HX293106901.022	CTD34-End	cf4	12/4/04	20:15	59.8165	148.8688	183	weingartner	
HX293106901.023	CTD35-Start	cf5	12/4/04	20:29	59.783	148.8657	192	weingartner	
HX293106901.024	CTD35-End	cf5	12/4/04	20:43	59.7813	148.8649	192	weingartner	
HX293106901.025	CTD36-Start	cf6	12/4/04	20:58	59.7497	148.8668	189	weingartner	
HX293106901.026	CTD36-End	cf6	12/4/04	21:10	59.7483	148.8664	189	weingartner	
HX293106901.027	CTD37-Start	cf7	12/4/04	21:24	59.7165	148.8675	180	weingartner	
HX293106901.028	CTD37-End	cf7	12/4/04	21:39	59.7147	148.8662	180	weingartner	

HX293106901.029	CTD38-Start	cf8	12/4/04	21:53	59.683	148.8659	180	weingartner	
HX293106901.030	CTD38-End	cf8	12/4/04	22:04	59.6812	148.8666	180	weingartner	
HX293106901.031	CTD39-Start	cf9	12/4/04	22:19	59.6497	148.8678	178	weingartner	
HX293106901.032	CTD39-End	cf9	12/4/04	22:33	59.6472	148.8698	178	weingartner	
HX293106901.033	CTD40-Start	cf10	12/4/04	22:47	59.6159	148.8692	175	weingartner	
HX293106901.034	CTD40-End	cf10	12/4/04	22:58	59.6153	148.8729	175	weingartner	
HX293106901.035	CTD41-Start	cf11	12/4/04	23:13	59.5842	148.8654	176	weingartner	
HX293106901.036	CTD41-End	cf11	12/4/04	23:28	59.5822	148.872	176	weingartner	
HX293106901.037	CTD42-Start	cf12	12/4/04	23:43	59.5511	148.8652	187	weingartner	
HX293106901.038	CTD42-End	cf12	12/4/04	23:54	59.5495	148.8681	187	weingartner	
HX293107001.001	CTD43-Start	cf13	12/5/04	0:10	59.5171	148.865	171	weingartner	
HX293107001.002	CTD43-End	cf13	12/5/04	0:23	59.5158	148.8697	171	weingartner	
HX293107001.003	CTD44-Start	cf14	12/5/04	0:38	59.4847	148.8651	168	weingartner	
HX293107001.004	CTD44-End	cf14	12/5/04	0:48	59.4847	148.8691	168	weingartner	
HX293107001.005	CTD45-Start	cf15	12/5/04	1:05	59.4509	148.8651	181	weingartner	
HX293107001.006	CTD45-End	cf15	12/5/04	1:19	59.4503	148.8678	181	weingartner	
HX293107001.007	MOCNESS-Start	gak13	12/5/04	10:03	58.0957	147.7872	600	hopcroft	
HX293107001.008	MOCNESS-End	gak13	12/5/04	11:47	58.0923	147.7647	600	hopcroft	late
HX293107001.009	CalVET Net Tow-Start	gak13	12/5/04	11:56	58.0982	147.7932	100	hopcroft	
HX293107001.010	CalVET Net Tow-End	gak13	12/5/04	12:07	58.098	147.7909	100	hopcroft	
HX293107001.011	CTD46-Start	gak13	12/5/04	12:07	58.098	147.7908	1500	weingartner	
HX293107001.012	CTD46-End	gak13	12/5/04	13:27	58.0891	147.7777	1500	weingartner	
HX293107001.013	CalVET Net Tow-Start	gak12	12/5/04	14:36	58.2432	147.9335	100	hopcroft	
HX293107001.014	CalVET Net Tow-End	gak12	12/5/04	14:42	58.2423	147.933	100	hopcroft	
HX293107001.015	CTD47-Start	gak12	12/5/04	14:45	58.2417	147.9327	1500	weingartner	
HX293107001.016	CTD47-End	GAK12	12/5/04	16:13	58.2577	147.9621	1500	weingartner	late
HX293107001.017	CalVET Net Tow-Start	GAK11	12/5/04	17:09	58.3869	148.0735	1500	hopcroft	
HX293107001.018	CalVET Net Tow-End	GAK11	12/5/04	17:15	58.3856	148.0732	1500	hopcroft	
HX293107001.019	CTD48-Start	GAK11	12/5/04	17:16	58.3853	148.0731	1500	weingartner	
HX293107001.020	CTD48-End	GAK11	12/5/04	18:25	58.3775	148.0677	1500	weingartner	
HX293107001.021	CalVET Net Tow-Start	GAK10	12/5/04	19:42	58.5404	148.2088	1500	hopcroft	
HX293107001.022	CalVET Net Tow-End	GAK10	12/5/04	19:42	58.5404	148.2088	1500	hopcroft	
HX293107001.023	CTD49-Start	GAK10	12/5/04	19:44	58.5394	148.2079	1482	weingartner	
HX293107001.024	CTD49-End	GAK10	12/5/04	20:55	58.5273	148.2012	1482	weingartner	
HX293107001.025	CTD50-Start	GAK9i	12/5/04	21:37	58.6105	148.2798	677	weingartner	
HX293107001.026	CTD50-End	GAK9i	12/5/04	22:15	58.6025	148.277	677	weingartner	
HX293107001.027	CalVET Net Tow-Start	GAK9	12/5/04	22:52	58.6803	148.3483	277	weingartner	
HX293107001.028	CalVET Net Tow-End	GAK9	12/5/04	22:58	58.6801	148.3461	277	weingartner	
HX293107001.029	CTD51-Start	GAK9	12/5/04	23:02	58.6799	148.3475	277	weingartner	
HX293107001.030	CTD51-End	GAK9	12/5/04	23:21	58.6761	148.3465	277	weingartner	
HX293107001.031	CTD52-Start	GAK8i	12/5/04	23:56	58.742	148.4218	290	weingartner	
HX293107101.001	CTD52-End	GAK8i	12/6/04	0:14	58.7389	148.4237	290	weingartner	

HX293107101.002	CalVET Net Tow-Start	GAK8	12/6/04	0:42	58.7919	148.4917	290	weingartner	
HX293107101.003	CalVET Net Tow-End	GAK8	12/6/04	0:48	58.792	148.4931	290	weingartner	
HX293107101.004	CTD53-Start	GAK8	12/6/04	0:51	58.7918	148.4951	290	weingartner	
HX293107101.005	CTD53-End	GAK8	12/6/04	1:09	58.7919	148.4962	290	weingartner	
HX293107101.006	CTD54-Start	GAK8	12/6/04	1:15	58.792	148.4963	288	weingartner	
HX293107101.007	CTD54-End	GAK8	12/6/04	1:31	58.7919	148.4977	288	weingartner	
HX293107101.008	CTD55-Start	GAK7i	12/6/04	2:09	58.8808	148.5623	301	weingartner	
HX293107101.009	CTD55-End	GAK7i	12/6/04	2:27	58.8807	148.5656	301	weingartner	
HX293107101.010	CalVET Net Tow-Start	GAK7	12/6/04	3:06	58.9721	148.6312	244	weingartner	
HX293107101.011	CalVET Net Tow-End	GAK7	12/6/04	3:12	58.9723	148.6315	244	weingartner	
HX293107101.012	CTD56-Start	GAK7	12/6/04	3:16	58.9729	148.6321	243	weingartner	
HX293107101.013	CTD56-End	GAK7	12/6/04	3:56	59.0369	148.6918	243	weingartner	very late...
HX293107101.014	CTD57-Start	GAK6i	12/6/04	4:02	59.0457	148.6994	192	weingartner	
HX293107101.015	CTD57-End	GAK6i	12/6/04	4:15	59.0454	148.6949	192	weingartner	
HX293107101.016	CalVET Net Tow-Start	GAK6	12/6/04	4:51	59.1168	148.7694	151	weingartner	
HX293107101.017	CalVET Net Tow-End	GAK6	12/6/04	4:56	59.117	148.7682	151	weingartner	
HX293107101.018	CTD58-Start	GAK6	12/6/04	5:01	59.1176	148.7675	151	weingartner	
HX293107101.019	CTD58-End	GAK6	12/6/04	5:10	59.1177	148.7638	151	weingartner	
HX293107101.020	CTD59-Start	GAK5i	12/6/04	5:45	59.1908	148.8366	166	weingartner	
HX293107101.021	CTD59-End	GAK5i	12/6/04	5:57	59.1906	148.8293	166	weingartner	
HX293107101.022	CalVET Net Tow-Start	GAK5	12/6/04	6:31	59.2622	148.9084	169	weingartner	
HX293107101.023	CalVET Net Tow-End	GAK5	12/6/04	6:36	59.2629	148.9077	169	weingartner	
HX293107101.024	CTD60-Start	GAK5	12/6/04	6:40	59.264	148.9073	167	weingartner	
HX293107101.025	CTD60-End	GAK5	12/6/04	6:52	59.2648	148.9056	167	weingartner	
HX293107101.026	CTD61-Start	gak4i	12/6/04	7:25	59.3358	148.9771	198	weingartner	
HX293107101.027	CTD61-End	gak4i	12/6/04	7:37	59.3358	148.9745	198	weingartner	
HX293107101.028	CalVET Net Tow-Start	gak4	12/6/04	8:11	59.4086	149.0486	199	weingartner	
HX293107101.029	CalVET Net Tow-End	gak4	12/6/04	8:16	59.4087	149.0483	199	weingartner	
HX293107101.030	CTD62-Start	gak4	12/6/04	8:19	59.4086	149.0481	199	weingartner	
HX293107101.031	CTD62-End	gak4	12/6/04	8:32	59.409	149.0483	199	weingartner	
HX293107101.032	CTD63-Start	gak3i	12/6/04	9:06	59.4822	149.1192	203	weingartner	
HX293107101.033	CTD63-End	gak3i	12/6/04	9:22	59.4819	149.1234	203	weingartner	
HX293107101.034	CalVET Net Tow-Start	gak3	12/6/04	9:54	59.5533	149.1872	212	hopcroft	
HX293107101.035	CalVET Net Tow-End	gak3	12/6/04	10:00	59.5527	149.1906	212	hopcroft	
HX293107101.036	CTD64-Start	gak3	12/6/04	10:03	59.5521	149.1932	212	weingartner	
HX293107101.037	CTD64-End	gak3	12/6/04	10:30	59.5533	149.1896	212	weingartner	
HX293107101.038	CTD65-Start	gak2i	12/6/04	11:04	59.6269	149.2591	212	weingartner	
HX293107101.039	CTD65-End	gak2i	12/6/04	11:30	59.6298	149.2637	212	weingartner	late
HX293107101.040	CalVET Net Tow-Start	gak2	12/6/04	11:59	59.6918	149.3256	225	hopcroft	
HX293107101.041	CalVET Net Tow-End	gak2	12/6/04	12:06	59.6909	149.3299	225	hopcroft	

HX293107101.042	CTD66-Start	gak2	12/6/04	12:08	59.6905	149.3311	225	weingartner	
HX293107101.043	CTD66-End	gak2	12/6/04	12:30	59.6885	149.3324	225	weingartner	late
HX293107101.044	CTD67-Start	gak1i	12/6/04	13:08	59.7656	149.399	260	weingartner	
HX293107101.045	CTD67-End	gak1i	12/6/04	13:23	59.7609	149.4063	260	weingartner	
HX293107101.046	CTD68-Start	gak1	12/6/04	14:03	59.8449	149.4682	271	weingartner	
HX293107101.047	CTD68-End	gak1	12/6/04	14:33	59.8376	149.4501	271	weingartner	
HX293107101.048	ADCP Line-Start	CF1	12/6/04	16:39	59.9083	148.867	86	weingartner	
HX293107101.049	ADCP Line-End	CF10	12/6/04	19:37	59.6144	148.8645	177	weingartner	
HX293107201.001	CTD69-Start	bp1	12/7/04	2:27	60.1972	148.0934	241	weingartner	
HX293107201.002	69-End	bp1	12/7/04	2:42	60.1949	148.0966	241	weingartner	
HX293107201.003	CTD70-Start	fi1	12/7/04	3:25	60.1455	148.0045	272	weingartner	
HX293107201.004	CTD70-End	fi1	12/7/04	3:41	60.142	148.0075	272	weingartner	
HX293107201.005	CTD71-Start	ev1	12/7/04	4:38	60.0844	147.9072	272	weingartner	
HX293107201.006	CTD71-End	ev1	12/7/04	4:59	60.0756	147.891	272	weingartner	
HX293107201.007	CTD72-Start	ev2	12/7/04	5:02	60.0753	147.8908	123	weingartner	
HX293107201.008	CTD72-End	ev2	12/7/04	5:11	60.0728	147.898	123	weingartner	
HX293107201.009	MOCNESS-Start	pws2	12/7/04	16:42	60.5339	147.8259	729	coyle	
HX293107201.010	MOCNESS-End	pws2	12/7/04	18:02	60.5266	147.7376	600	coyle	
HX293107201.011	CTD73-Start	NJ1	12/7/04	20:19	60.5193	148.2901	530	weingartner	
HX293107201.012	CTD73-End	NJ1	12/7/04	20:48	60.5112	148.3006	530	weingartner	
HX293107201.013	CTD74-Start	kb1	12/7/04	21:34	60.5316	148.5365	465	weingartner	
HX293107201.014	CTD74-End	kb1	12/7/04	21:58	60.5271	148.5438	465	weingartner	
HX293107201.015	CTD75-Start	kb2	12/7/04	22:23	60.4843	148.6351	367	weingartner	
HX293107201.016	CTD75-End	kb2	12/7/04	22:41	60.4811	148.6409	367	weingartner	
HX293107301.001	CTD76-Start	kip2	na	na	na	na	588	hopcroft	water for alexei
HX293107301.002	CTD76-End	kip2	12/8/04	19:07	60.275	147.9844	588	hopcroft	
HX293107401.001	CTD77-Start	crs1	12/9/04	1:06	59.5334	149.2673	229	weingartner	
HX293107401.002	CTD77-End	crs1	12/9/04	1:20	59.5286	149.2711	229	weingartner	
HX293107401.003	CTD78-Start	crs2	12/9/04	1:37	59.5181	149.3394	229	weingartner	
HX293107401.004	CTD78-End	crs2	12/9/04	1:49	59.5142	149.342	229	weingartner	
HX293107401.005	CTD79-Start	crs3	12/9/04	2:06	59.5024	149.4173	120	weingartner	
HX293107401.006	CTD79-End	crs3	12/9/04	2:14	59.5008	149.4174	120	weingartner	
HX293107401.007	CTD80-Start	crs4	12/9/04	2:33	59.4849	149.4899	109	weingartner	
HX293107401.008	CTD80-End	crs4	12/9/04	2:59	59.4675	149.57	109	weingartner	
HX293107401.009	CTD81-Start	crs5	12/9/04	2:59	59.4674	149.5702	95	weingartner	
HX293107401.010	CTD81-End	crs5	12/9/04	3:06	59.4657	149.5746	95	weingartner	
HX293107401.011	CTD82-Start	crs6	12/9/04	3:22	59.4507	149.6436	85	weingartner	
HX293107401.012	CTD82-End	crs6	12/9/04	3:28	59.4484	149.6496	85	weingartner	
HX293107401.013	CTD83-Start	crs7	12/9/04	3:43	59.4354	149.7194	140	weingartner	
HX293107401.014	CTD83-End	crs7	12/9/04	3:55	59.4326	149.7321	140	weingartner	
HX293107401.015	CTD84-Start	crs8	12/9/04	4:08	59.4194	149.7899	189	weingartner	
HX293107401.016	CTD84-End	crs8	12/9/04	4:23	59.417	149.8087	189	weingartner	
HX293107401.017	CTD85-Start	crs9	12/9/04	4:37	59.4025	149.8697	166	weingartner	
HX293107401.018	CTD85-End	crs9	12/9/04	4:51	59.4018	149.8892	166	weingartner	
HX293107401.019	CTD86-Start	crs10	12/9/04	5:04	59.3861	149.9375	160	weingartner	
HX293107401.020	CTD86-End	crs10	12/9/04	5:14	59.3863	149.9477	160	weingartner	
HX293107401.021	CTD87-Start	ri3	12/9/04	5:34	59.4078	150.0373	160	weingartner	
HX293107401.022	CTD87-End	ri3	12/9/04	5:48	59.405	150.053	160	weingartner	

HX293107401.023	CTD88-Start	ri2	12/9/04	6:16	59.4085	150.1988	124	weingartner	
HX293107401.024	CTD89-Start	ri1	12/9/04	6:37	59.4084	150.2583	97	weingartner	
HX293107401.025	CTD89-End	ri1	12/9/04	6:44	59.4079	150.2612	97	weingartner	
HX293107401.026	CTD90-Start	GAK1	12/9/04	11:34	59.8451	149.4682	270	weingartner	
HX293107401.027	CTD90-End	GAK1	12/9/04	11:56	59.8449	149.4649	270	weingartner	
HX293107401.028	CTD91-Start	Res 2.5	12/9/04	14:32	60.0255	149.3599	294	weingartner	
HX293107401.029	CTD91-End	Res 2.5	12/9/04	14:32	60.0255	149.3599	294	weingartner	not exactly
HX293107401.030	MOCNESS-End	Res 2.5	12/9/04	15:46	60.0421	149.3636	294	pinchuk	