PRELIMINARY CRUISE REPORT, NH0307A
R/V WECOMA, 2-8 July 2003
GLOBEC NEP Long-Term Observations off Oregon

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FILING DATE: 15 August 2003

CONTRACT/GRANT NUMBER: NSF Grant OCE-0000733.

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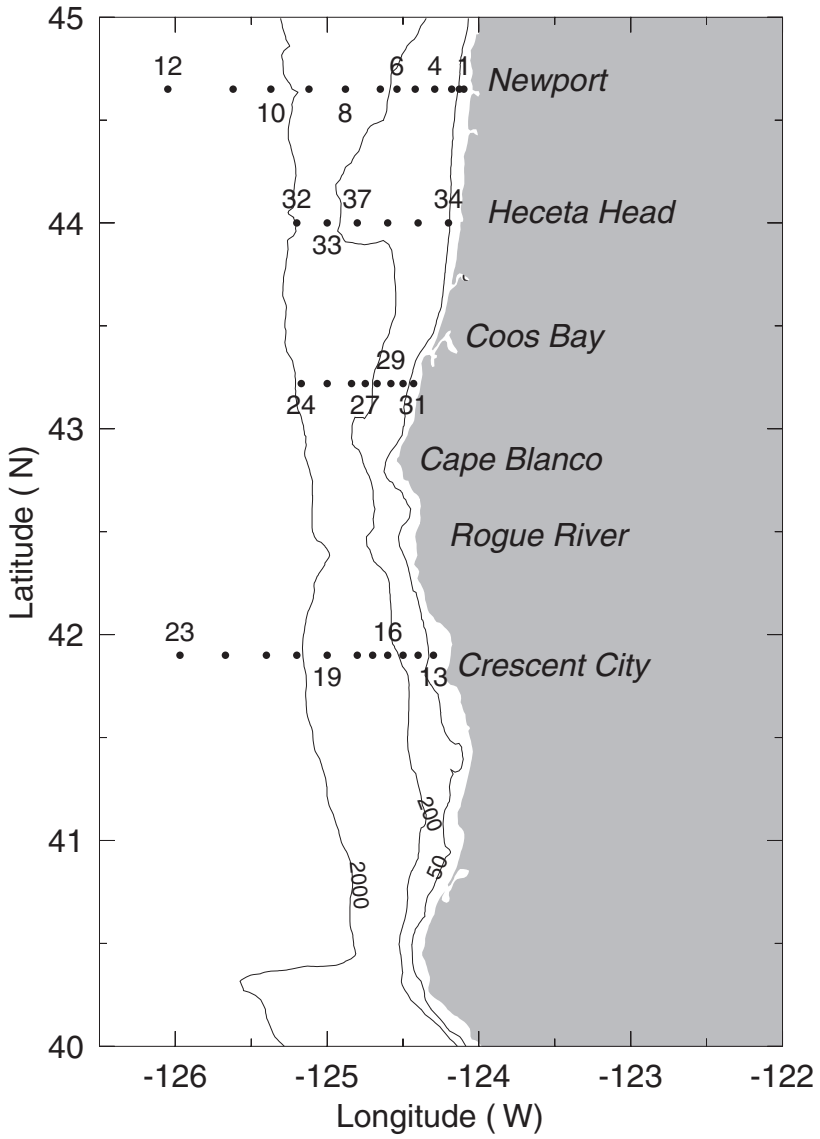
PURPOSE: To determine physical, plankton and nutrient/chemical conditions over the continental margin for climate change studies in NE Pacific. In particular, to make CTD and CTD/rosette and net tow stations along 4 lines (off Newport, Heceta Head, Coos Bay, OR. and Crescent City, CA.), to deploy drifters at selected locations on the Newport line, and to make continuous observations of currents using ADCP and of surface-layer temperature, salinity and fluorescence by means of ship's thru-flo system. Figure 1 shows the location of the CTD stations. Table 1 shows the CTD station positions, and Table 2 shows the biochemical sampling depths.
SAMPLING PLAN:
1. Use ship's intake continuously for Temperature, Salinity, and Fluorescence
2. Continuous ADCP Profiling (150 kHz transducer) for water velocity and backscattering for bio-acoustics.
3. Standard CTD Stations using SBE 9/11 plus CTD system for Temperature, Salinity, Fluorescence, Light Transmission, Oxygen, PAR.
4. Rosette sampling: 10 liter bottles for nutrients, chlorophyll, microzooplankton
5. Deploy surface drifters at selected NH-line stations.
6. Vertical net tows: 1/2 meter nets 100 m to surface; Horizontal net tows with 1 m^2 MOCNESS.

CRUISE NARRATIVE

A brief overview of NH0307A is presented here. An event log is provided in Table 3, and participating personnel are listed in Table 4. New Horizon departed Newport at 1600 PDT on 2 July 2003. CTD sampling started at NH-1 and continued out to NH-12. In A single vertical net tow was done at NH-1, and both MOCNESS and vertical net tows were started at NH-5. At station 7, NH-25, the MOCNESS tow was done before the CTD cast in order to complete the tow in darkness. The NH line was completed at 1640 PDT on 3 July. Drifters were released at NH-10, 15, 25, 45 and 65. The ship transited to the inshore end of the Crescent City line to be at the inshore end in daylight, and began sampling at CR-1 at 1350 PDT, 4 July, with MOCNESS tows beginning at CR-2. The CR line was finished at 1530 PDT, 5 July, and the ship transited to the offshore end of the Five Mile line.

The ship arrived at FM-9 at 2336 PDT on 5 July, with MOCNESS tows beginning at FM-7. Working inshore, the Five Mile line was finished at 1510 PDT on 6 July.

Figure 1. CTD stations during NH0307A, along the Newport, Five Mile, Heceta Head, and Crescent City Hydrographic Lines.



The ship arrived at the offshore end of the Heceta Head line at 1644 PDT on 6 July, and after completing CTD casts only at HH-7 and HH-5, the ship transited to Newport, arriving at the pier at 0730 PDT on 7 July. In Newport, five members of the scientific party disembarked, and one scientist and four camera crew came aboard for the second leg of the cruise. The ship departed Newport at 1400 on 7 July, and arrived at HH-1 at 1755 PDT to resume CTD casts and vertical net tows, with the camera crew filming the night operations. MOCNESS tows resumed at HH-2, and the MOCNESS at HH-4 was omitted to permit time for a deep day/night pair at HH-5. The CTD at HH-5 had been done on the previous leg so it was omitted, but two vertical nets and two MOCNESS tows were done at HH-5. The tows were completed at 0814 PDT, 8 July, and the ship transited to Newport, arriving at the pier at 1330 PDT, 8 July.

Preliminary Results from NH0307A, 2-8 July 2003, R/V New Horizon

Adriana Huyer, COAS-OSU, 9 July 2003

Newport Line

There was a sharp surface salinity front between NH-5 and NH-10. Surface temperatures ranged from <10º C inshore to >16º C at NH-85.

T-S diagram shows a 1º C spread among temperatures of the halocline. The coldest halocline temperatures were observed at the mid-shelf and outer shelf stations (NH-10 to NH-20), probably near the core of the southward-flowing coastal jet. Contour diagrams of temperature plotted as a function of salinity and longitude show that the halocline was not as cold as in July 2002, but still colder than in July 2001. The difference between 2002 and 2003 temperatures is greatest at the offshore stations, and at the top of the permanent halocline ($32.5 < S < 33.0$), where the 2003 values were about 1º C warmer than the 2002 values.

Crescent City Line

The surface density front lay about 100 km offshore, and cool, salty water covered the entire shelf and upper slope. Temperatures in the lower halocline were about 0.5º C warmer than in July 2002.

FM Line off Coos Bay

The surface density front lay over the outer shelf. Inshore surface waters were very cool and salty, indicative of very recent upwelling. Over the outer shelf, a layer of warm, salty, high fluorescence water was overlain by cooler, fresher water. Temperatures in the middle of the halocline were about 0.5º C warmer than in July 2002.

Heceta Head Line

Surface waters over the shelf were cool (<12º C) and salty (S >32.5). The Columbia River Plume was present only over the most offshore station (HH-7). Several stations showed very high concentrations of dissolved oxygen (>8.5 ml/l) in the surface layer and relatively low values (<2 ml/l) near the bottom.

High Fluorescence

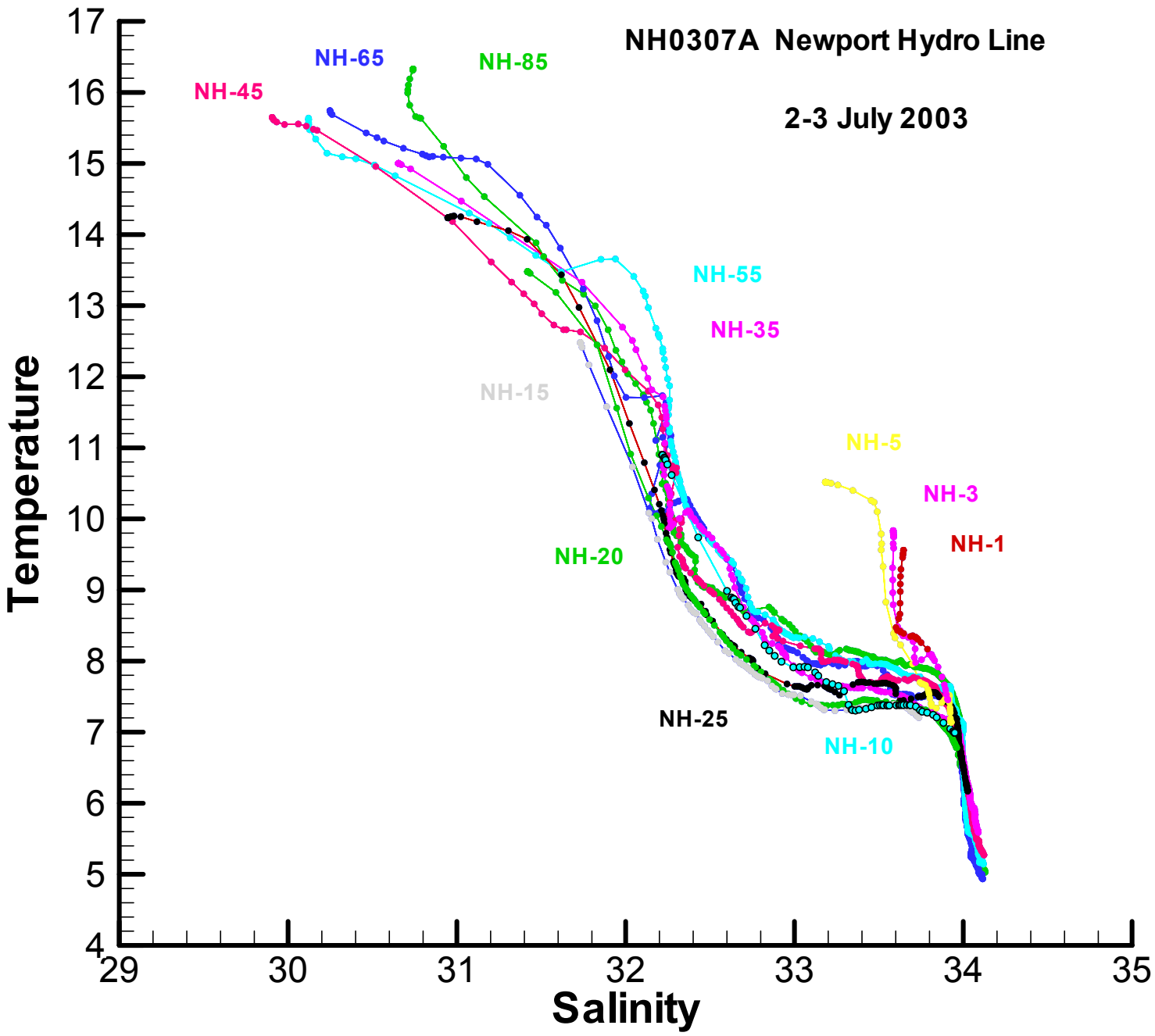
We still need to confirm the settings on the SeaTech fluorometer on the CTD frame, but preliminary indications are that it is set on maximum range. Inshore waters were visibly murky on the three sections off Newport, Crescent City and Coos Bay, and fluorescence values in the near-surface layer exceeded full scale at several stations on each section:

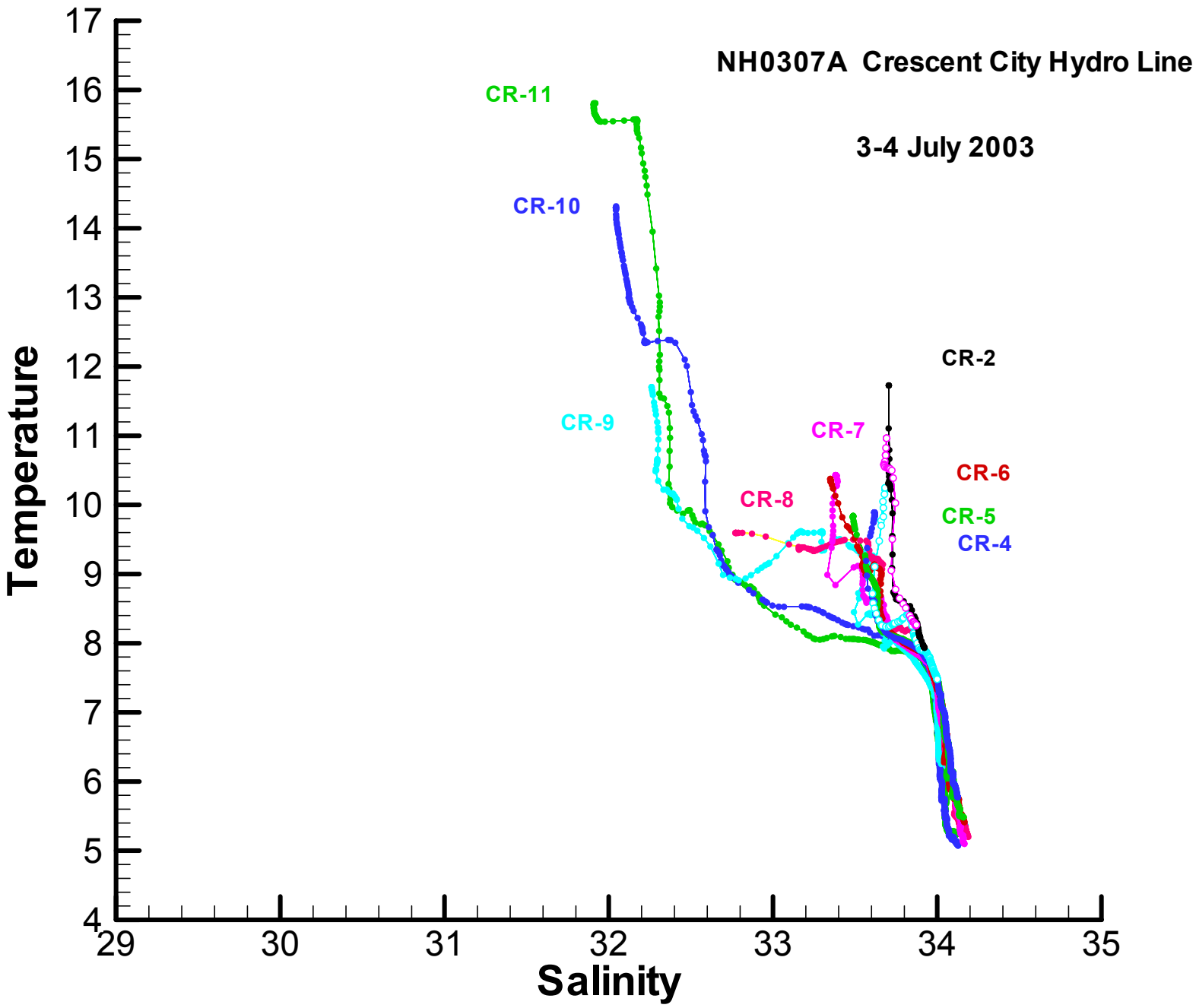
- NH-3, -5, and –10 off Newport,
- CR-1, -2, -3, -4 off Crescent City,
- FM-4, -5, -6 off Coos Bay.
-HH-1 thru HH-5 off Heceta Head.

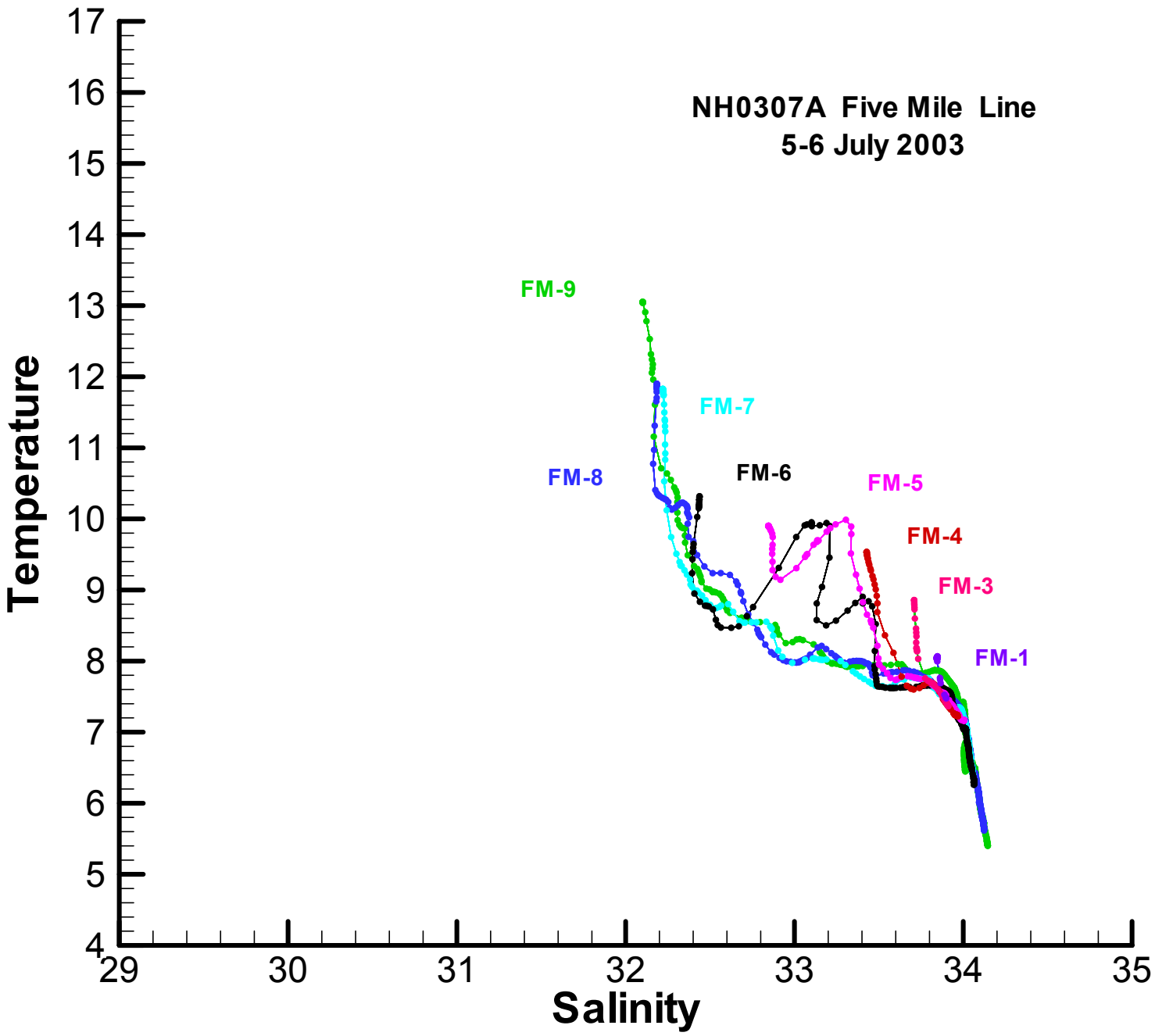
On the FM line, the waters at the most inshore stations were very cold and saline (freshly upwelled?), and these waters had lower fluorescence than mid-shelf stations on this section.

The extracted chlorophylls have not yet been analyzed. Meanwhile, these high fluorescence values suggest that the ecological effects of the 2002 Subarctic intrusion have persisted to produce high primary productivity off Oregon this summer.

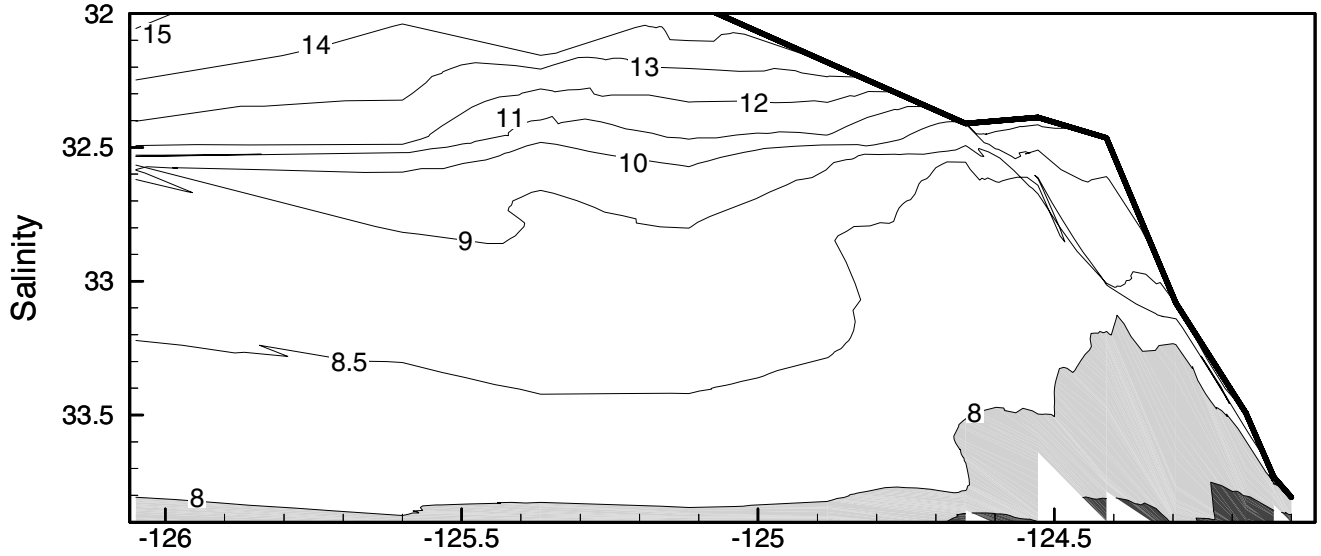
The attached zooplankton report was provided by Dr. Wm. Peterson, and the attached microzooplankton report was provided by Drs. Evelyn and Barry Sherr.


NH0307A Newport Hydro Line
2-3 July 2003
NH-65
NH-85
NH-45
NH-55
NH-35
NH-15
NH-5
NH-3
NH-1
NH-20
NH-25
NH-10
Temperature
Salinity
17
16
15
14
13
12
11
10
9
8
7
6
5
4
29
30
31
32
33
34
35

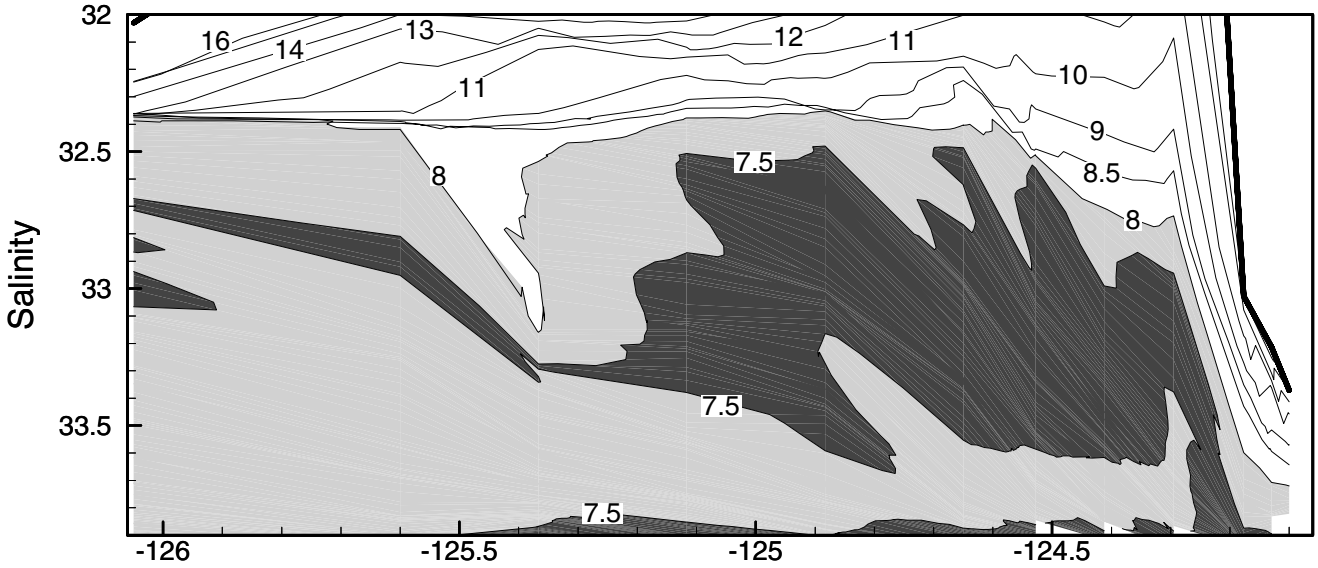

NH0307A Crescent City Hydro Line
3-4 July 2003
CR-11
CR-10
CR-9
CR-8
CR-7
CR-6
CR-5
CR-4
CR-2
Temperature
Salinity
17
16
15
14
13
12
11
10
9
8
7
6
5
4
29
30
31
32
33
34
35


NH0307A Five Mile Line
5-6 July 2003
FM-9
FM-7
FM-8
FM-6
FM-5
FM-4
FM-3
FM-1
Temperature
Salinity
17
16
15
14
13
12
11
10
9
8
7
6
5
4
29
30
31
32
33
34
35

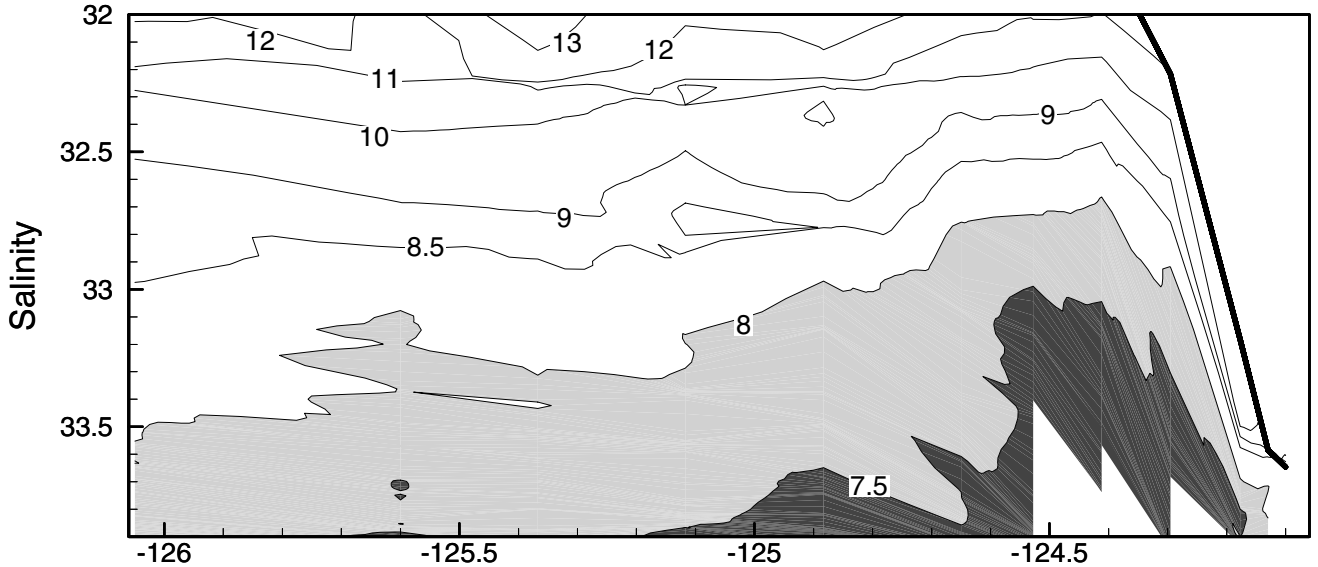
Halocline Temperatures off Newport



July 2001

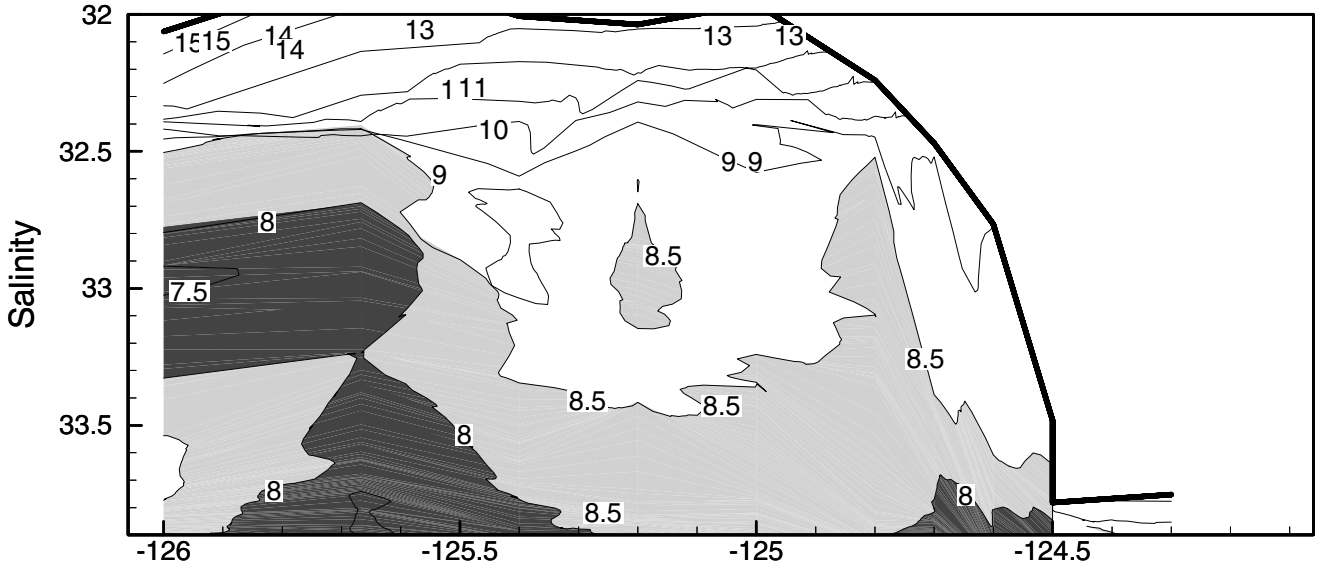


July 2002

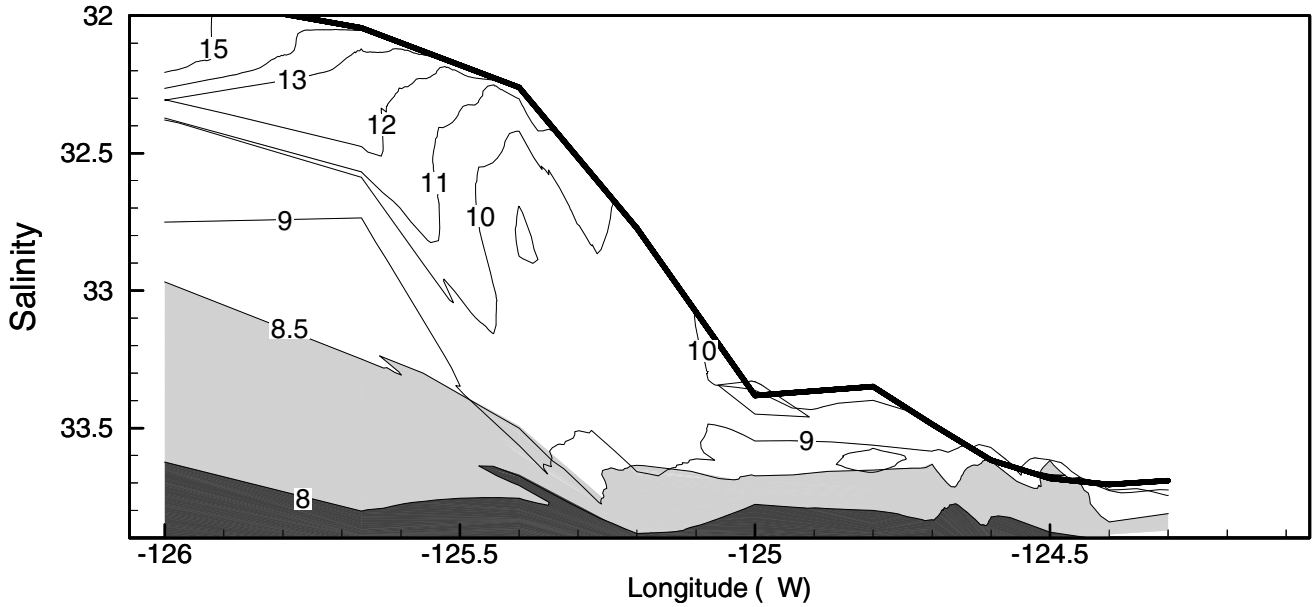


July 2003

Halocline Temperatures off Crescent City

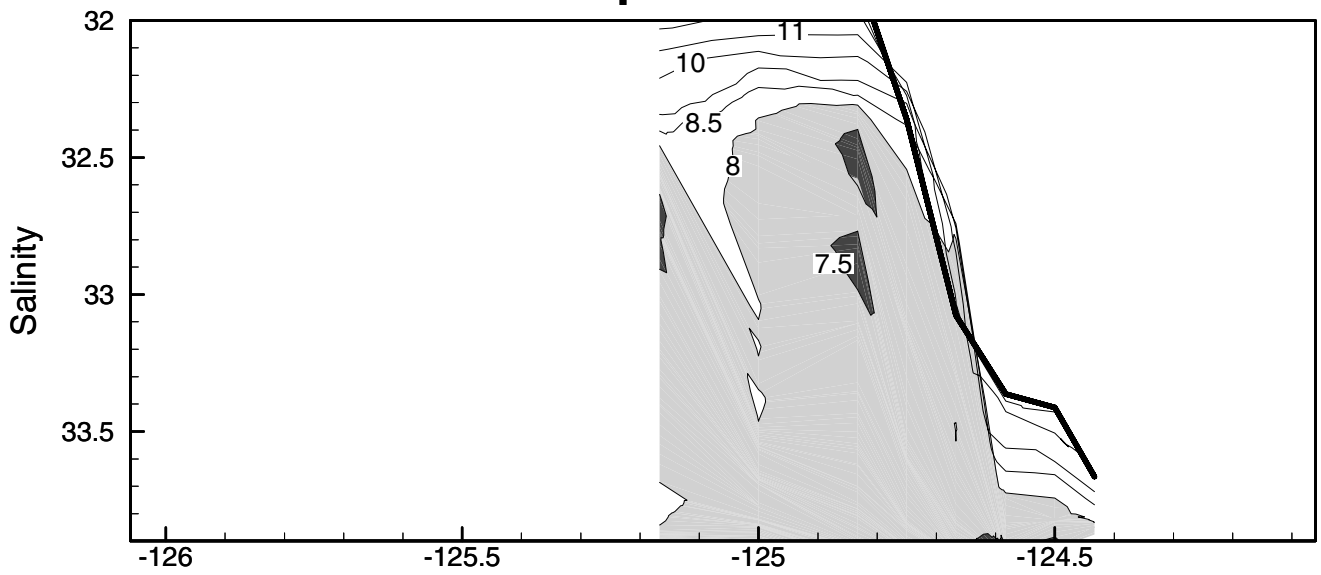


July 2002

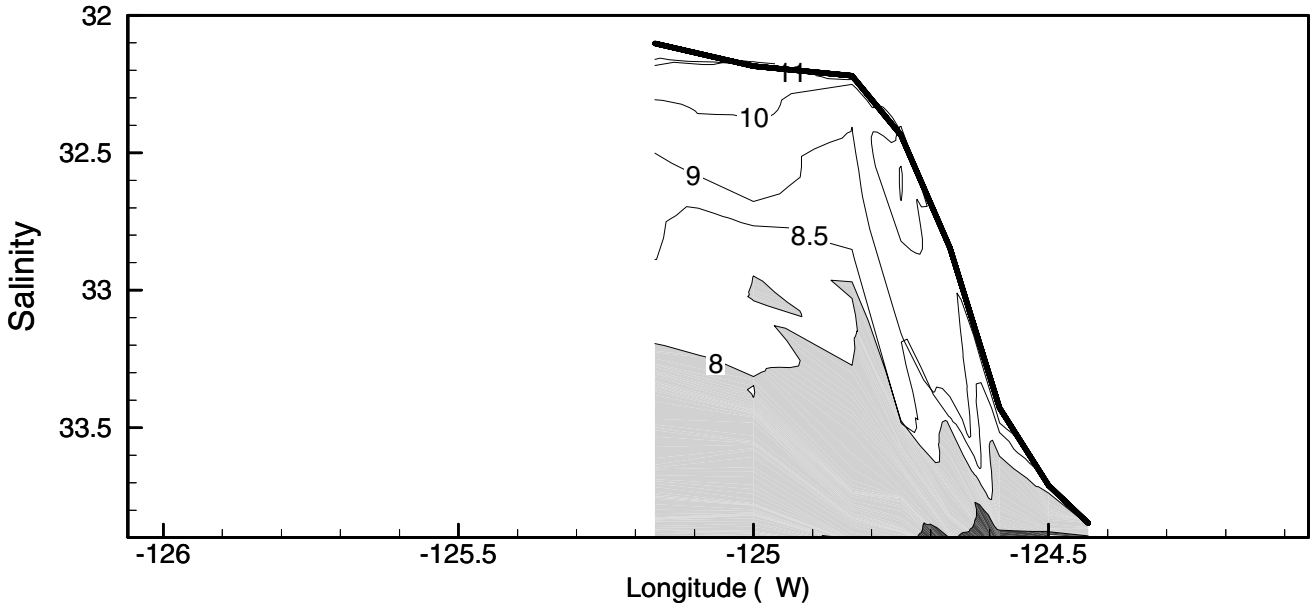


July 2003

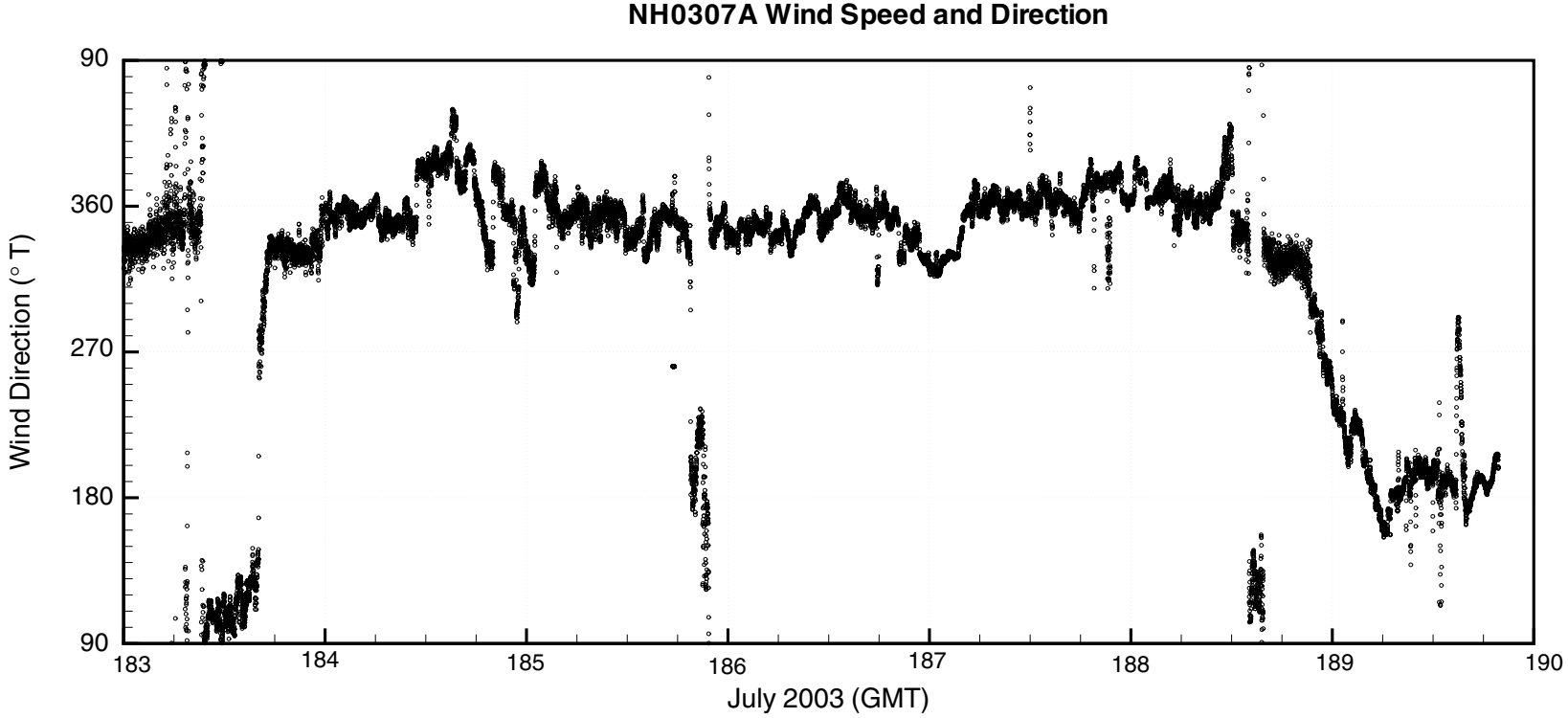
Halocline Temperatures off Five Mile Pt.



July 2002



July 2003


NH0307A Wind Speed and Direction
Wind Direction (° T)
90
360
270
180
90
183
184
185
186
187
188
189
190
July 2003 (GMT)

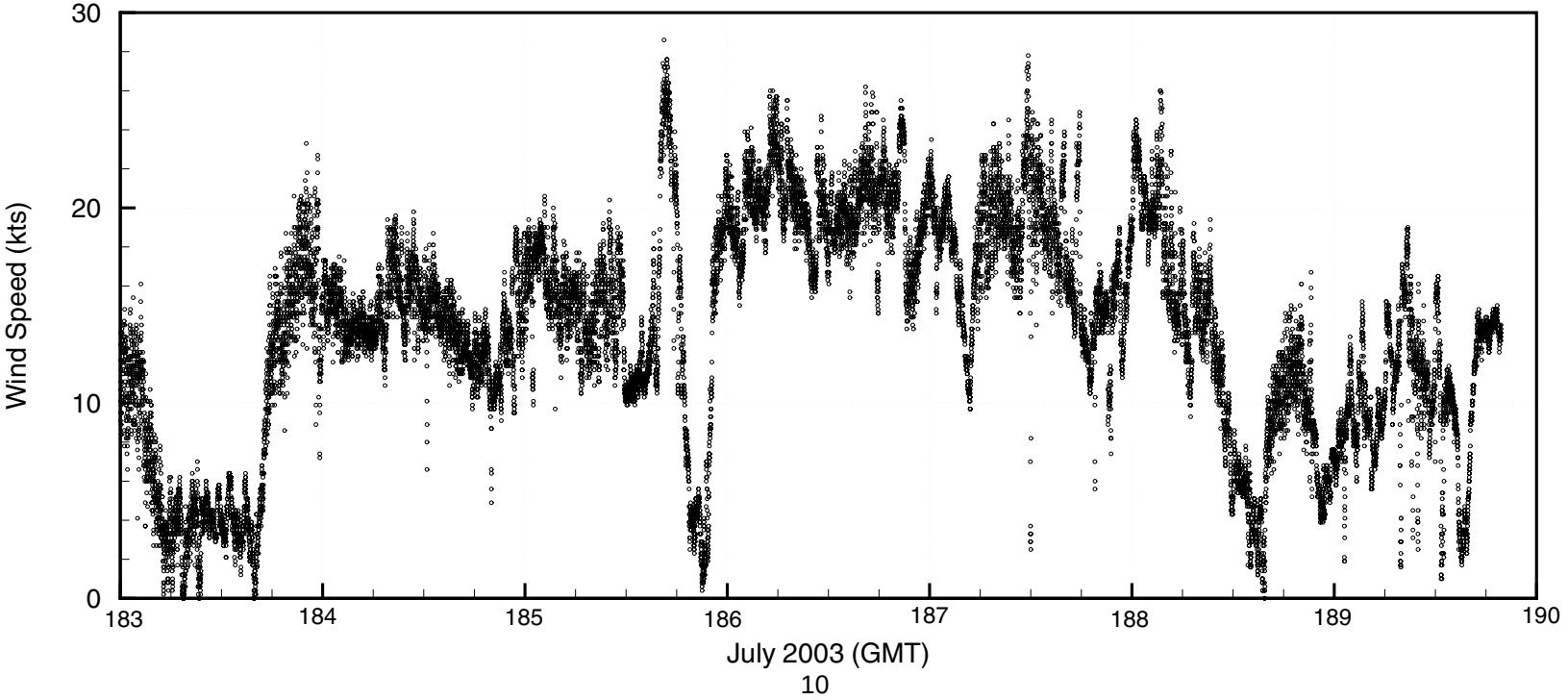

Wind Speed (kts)
30
20
10
0
183
184
185
186
187
188
189
190
July 2003 (GMT)

Table 1. CTD station positions during W0304A, and sampling at each station (C: Bio/Chem bottle sampling, N:half-meter vertical net tows, M:Mocness, O:Oxygen samples, D:Drifter, Z:Microzooplankton bottle sampling).

Station		Distance	Lat.	Long.	Bottom	Cast	Sampling
Name	No.	from shore	°N	°W	Depth	Depth	Type
		(km)			(m)	(db)	
NH-1	1	3.3	44.65	-124.1	33	29	N
NH-3	2	5.6	44.65	-124.13	49	44	
NH-5	3	9.3	44.65	-124.18	61	56	C,Z,N,M
NH-10	4	18.3	44.65	-124.29	82	77	N,D
NH-15	5	28	44.65	-124.42	91	87	C,Z,N,M,D
NH-20	6	37.4	44.65	-124.54	148	142	Z,N
NH-25	7	46.5	44.65	-124.65	297	286	C,Z,N,M,D
NH-35	8	64.8	44.65	-124.88	432	428	C,Z,N,M
NH-45	9	83.3	44.65	-125.12	699	699	C,Z,N,M,D,O2
NH-55	10	103.3	44.65	-125.37	2867	1004	
NH-65	11	123.5	44.64	-125.62	2866	1007	C,Z,N,D
NH-85	12	157.2	44.65	-126.05	2884	1005	C,Z
CR-1	13	8	41.9	-124.3	42	36	C,Z,N
CR-2	14	16.3	41.9	-124.4	70	64	C,Z,N,M
CR-3	15	24.4	41.9	-124.5	140	134	C,Z,N,M
CR-4	16	32.6	41.9	-124.6	505	499	C,Z,N,M
CR-5	17	40.7	41.9	-124.7	659	644	C
CR-6	18	49.4	41.9	-124.8	700	689	N,M
CR-7	19	65.6	41.9	-125	835	820	C,Z,N
CR-8	20	82.6	41.9	-125.2	2764	1007	O2
CR-9	21	98.9	41.9	-125.4	3097	1005	C,Z,N
CR-10	22	120.9	41.9	-125.67	2927	1015	
CR-11	23	145.9	41.9	-125.97	3333	1001	C,Z,N
FM-9	24	63	43.22	-125.17	1708	1005	C,Z,N
FM-8	25	49.3	43.22	-125	1083	1002	C,Z,N
FM-7	26	36.1	43.22	-124.84	338	318	C,Z,N,M,O2
FM-6	27	29.3	43.22	-124.75	325	310	
FM-5	28	22.4	43.22	-124.67	164	154	C,N,M
FM-4	29	15.6	43.22	-124.58	90	82	C,Z,N,M
FM-3	30	8.9	43.22	-124.5	57	48	C,Z,N,M
FM-1	31	3.3	43.22	-124.43	36	34	N
HH-7	32	84.8	44	-125.2	1698	1001	C,Z
HH-5	33	69.1	44	-125	939	941	C,Z
HH-1	34	5.2	44	-124.2	56	51	C,Z,N,O2
HH-2	35	20.7	44	-124.4	123	115	C,Z,N,M,O2
HH-3	36	36.9	44	-124.6	155	149	C,Z,N,M,O2
HH-4	37	53	44	-124.8	109	99	C,Z,N

Table 2: Actual sample depths and types of subsamples for biochemical sampling during the July ’03 LTOP GLOBEC cruise.

Station, Depth, Dist. From Shore	**Sample Collection Depths (m)**	**Type of Sample Collected**
NH-05, 60m, 9km	54, 50, 40, 29, 25, 21, 16, 11, 6, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
NH-15, 90m, 28km	82, 70, 60, 50, 40, 30, 18, 17,12, 6, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
NH-25, 295m, 46km	244, 199, 150, 102, 71, 50, 40, 30, 20, 10, 3	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths except 244 and 199 m)
NH-35, 673m, 65km	429, 255, 237,150, 101, 70, 50, 40, 29, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 429, 255 and 237 m)
NH-45, 700m, 83km	690, 573, 500, 272,149, 70, 50, 40, 30, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 690, 573,500 and 272m)
NH-65, 288m, 121km	1009, 768, 155 102 , 70, 50, 40, 35, 30, 20, 11, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 1009, 768 and 155m)
NH-85, 2900m, 157km	1006, 755, 155, 100, 65, 52, 44, 40, 30, 21, 11, 3	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths except 1006, 755 and 155 m)
HH-1, 52m, 7km	49, 40, 30, 25, 22, 15, 10, 6, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
HH-2, 115m, 16km	115, 100, 70, 59, 48, 39, 31, 19, 10, 6, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths)
HH-3, 150m, 24km	148, 100, 70, 61, 53, 41, 30, 21, 10	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths)
HH-4, 100m, 32km	99, 70, 60, 52, 40, 31, 20, 15, 10, 6, 3	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
HH-5, 950m, 40km	815, 501, 397, 152, 101, 70, 50, 41, 30, 20, 10, 3	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 815, 501, and 397 m)
HH-7, 1600m, 48km	1004, 781, 343, 151, 102, 71, 50, 40, 30, 22, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 1004, 781, and 343)

Table 2 cont.

FM-3, 60m, 9km	48, 39, 30, 26, 20, 14, 9, 5, 2	TOC (all depths), Nutrients, TN (all depths), both Chl, POC/PON (all depths)
FM-4, 84m, 15km	81, 71, 60, 50, 41, 30, 21, 11, 6, 3	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (all depths)
FM-5, 158m, 22km	155, 99, 68, 49, 42, 31, 23, 10, 6, 2	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (all depths)
FM-7, 336m, 35km	301, 219, 150, 100, 70, 52, 40, 30, 25, 20, 10, 3	TOC (all depths), Nutrients, TN (all depths) both Chl, POC/PON (all depths except 300 and 219m)
FM-8, 1078m, 49km	1006, 154, 101, 70, 50, 40, 30, 20, 15, 10, 2	TOC (surface), Nutrients, TN (surface) both Chl, POC/PON (all depths except 1006 and 154m)
FM-9, 1722m, 49km	1005, 155, 97, 70, 52, 40, 30, 20, 15, 10, 2	TOC (all depths), Nutrients, TN (all depths) both Chl, POC/PON (all depths except 1005 and 155m)

CR-1, 39m, 8km	35, 30, 25, 20, 15, 10, 5, 3	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
CR-3, 117m, 23km	133, 101, 90, 70, 59, 50, 41, 30, 20, 11, 6, 3	TOC (surface), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
CR-4, 495m, 31km	497, 437, 434, 151, 100, 70, 50, 40, 29, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 497, 437, and 434m)
CR-5, 645m, 41km	500, 280, 150, 100, 70, 50, 39, 30, 20, 3	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths except 500, 280 and 150m)
CR-7, 852m, 66km	817, 507, 151, 101, 69, 51, 40, 30, 26, 20, 10, 3	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 817 and 507)
CR-9a, 3089m, 93km	1003, 150, 121, 102, 71, 51, 40, 35, 29, 19, 9, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths except 1003m)
CR-11, 3400m, 147km	998, 488, 157, 103, 70, 66, 51, 40, 29, 20, 11, 3	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths except 1000, 488 and 157m)

Table 2 cont.

Subsample	**Replicates**
TOC	3
Nutrients	2
TN	3
Chl	2
POC/PON	1

Table 3. R/V New Horizon Cruise NH0307A

	Start	End	Sta.	Sta.	Latitude		Longitude		Bottom	Atmos	Wind	Wind	Event	Event ID
(UT)	Time	Time	No.	Name	(deg)	(min)	(deg)	(min)	Depth	Press	Dir.	Speed		
	(UT)	(UT)							(m)	(mbar)	(deg T)	(kts)		
2-Jul	2300												Depart Newport	
	2359												Start echosounder	
	2359												Start ADCP	
	2359												Start flo-thru	
3-Jul	0043	0056	1	NH-1	44	39.1	-124	06.2	33	1018.9	000	17	CTD	NH18403.1
	0116				44	39.0	-124	06.6					vertical net tow, aborted	NH18403.2
	0122	0126			44	39.1	-124	06.6					vertical net tow, 33m	NH18403.3
	0126												air calibration of transmissometer	
	0157		2	NH-3	44	39.1	-124	07.9	49	1018.9	000	17	CTD	NH18403.4
	0250	0300	3	NH-5	44	39.1	-124	10.7	61	1018.0	0005	14	CTD with biochem, mzp	NH18403.5
													delay due to pumping tanks - 2 nm south	
	0404	0414			44	39.0	-124	10.8					vertical net tow, 50 m	NH18403.6
	0420	0424			44	38.9	-124	10.8					2nd vertical net tow, 52 m	NH18403.7
	0509				44	39.2	-124	11.0					Mocness deployed	NH18403.9
		0535			44	40.1	-124	11.2					Mocness aboard	NH18403.10
	0627	0639	4	NH-10	44	39.1	-124	17.6	82	1019.0	000	15	CTD	NH18403.11
	0650	0657			44	39.0	-124	17.8					vertical net tow, 72 m	NH18403.12
	0705				44	39.04	-124	17.94					drifter 40177 deployed	NH18403.13
	0749	0811	5	NH-15	44	39.1	-124	24.9	91	1019.0	355	15	CTD with biochem, mzp	NH18403.14
	0820	0828			44	39.1	-124	25.4					vertical net tow, 80 m	NH18403.15
	0843				44	39.4	-124	25.8					Mocness deployed	NH18403.16
		0915			44	40.4	-124	26.3					Mocness aboard	NH18403.17
	0918				44	40.46	-124	26.46					drifter 40178 deployed	NH18403.18
	1000	1018	6	NH-20	44	39.0	-124	32.1	148	1018.9	360	14	CTD	NH18403.19
	1028	1039			44	39.2	-124	32.6					vertical net tow, 100 m	NH18403.20
	1127			NH-25	44	38.5	-125	39.0					Mocness deployed	NH18403.21
		1211			44	39.8	-124	39.1					Mocness aboard	NH18403.22
	1231	1304	7	NH-25	44	39.1	-124	39.0	295	1019.0	020	17	CTD with biochem, mzp	NH18403.23
	1313	1322			44	39.2	-124	39.5					vertical net tow, 100 m	NH18403.24
	1325				44	39.17	-125	39.53					drifter 40174 deployed	NH18403.25
	1430	1509	8	NH-35	44	39.1	-124	52.9	432	1019.8	020	17	CTD with biochem, mzp	NH18403.26
	1516	1525			44	39.3	-124	53.0					vertical net tow, 100 m	NH18403.27
	0836				44	39.4	-124	53.2					Mocness deployed	NH18403.28
		0936			44	41.3	-124	52.6					Mocness aboard	NH18403.29

Table 3 cont.

	Start	End	Sta.	Sta.	Latitude		Longitude		Bottom	Atmos	Wind	Wind	Event	Event ID
(UT)	Time	Time	No.	Name	(deg)	(min)	(deg)	(min)	Depth	Press	Dir.	Speed		
	(UT)	(UT)							(m)	(mbar)	(deg T)	(kts)		
3-Jul	1755	1833	9	NH-45	44	39.1	-125	07.0					CTD with oxygen, biochem, mzp	NH18403.30
	1842	1848			44	39.2	-125	06.9					vertical net tow, 100 m	NH18403.31
	1856				44	39.3	-125	06.9					Mocness deployed	NH18403.32
		1951			44	41.3	-125	06.5					Mocness aboard	NH18403.33
	1955				44	41.40	-124	06.48					Drifter 40180 deployed	NH18403.34
	2114	2156	10	NH-55	44	39.1	-125	22.1	2867	1021.4	005	10	CTD	NH18403.35
	2323	0016	11	NH-65	44	38.5	-125	37.5					CTD with biochem, mzp	NH18403.36
4-Jul	0023	0031			44	38.7	-125	38.3					vertical net tow, 100 m	NH18503.1
	0037	0044			44	38.6	-125	38.3					2nd vertical net tow, 100 m	NH18503.2
	0047				44	38.72	-125	38.31					drifter 40181 deployed	NH18503.3
	0239	0328	12	NH-85	44	39.2	-126	03.0	2884	1021.9	000	22	CTD with biochem	NH18503.4
	0340												begin transit to CR-Line	
	2050	2103	13	CR-1	41	54.1	-124	18.1	42	1019.6	250	4	CTD with biochem, mzp	NH18503.5
	2113	2118			41	54.3	-124	18.3					vertical net tow, 35 m	NH18503.6
	2204	2216	14	CR-2	41	54.0	-124	24.1	70	1019.6	340	10	CTD, mzp	NH18503.9
	2223	2229			41	54.1	-124	24.2					vertical net tow, 65 m	NH18503.7
	2235	2241			41	54.1	-124	24.2					2nd vertical net tow, 65 m	NH18503.8
	2250				41	54.3	-124	24.3					Mocness deployed	NH18503.10
		2314			41	55.0	-124	24.4					Mocness aboard	NH18503.11
	2354	0012	15	CR-3	41	54.0	-124	30.1	140	1019.6	340	20	CTD with biochem, mzp	NH18503.12
5-Jul	0020	0028			41	54.2	-124	30.4					vertical net tow, 100m	NH18603.1
	0039				41	54.3	-124	30.6					Mocness deployed	NH18603.2
		0111			41	55.3	-124	31.1					Mocness recovered	NH18603.3
	0210	0248	16	CR-4	41	54.0	-124	36.0	505	1018.9	350	20-25	CTD with biochem, mzp	NH18603.4
	0256	0306			41	54.2	-124	36.3					vertical net tow, 100 m	NH18603.5
	0316				41	54.4	-124	36.3					Mocness deployed	NH18603.6
		0416			41	56.2	-124	37.0					Mocness aboard	NH18603.7
	0512	0549	17	CR-5	41	54.0	-124	41.9	659	1019.1	350	20-25	CTD with biochem	NH18603.8
	0718	0800	18	CR-6	41	54.1	-124	48.2	700	1019.1	340	23	CTD	NH18603.9
	0806	0816			41	54.7	-124	48.7					vertical net tow, 100 m	NH18603.10
	0838				41	55.0	-124	48.9					Mocness deployed	NH18603.11
		0926			41	56.9	-124	50.2					Mocness aboard	NH18603.12
	1055	1147	19	CR-7	41	54.0	-124	59.9	835	1019.7	350	20	CTD with biochem, mzp	NH18603.13
	1152	1202			41	54.4	-124	59.9					vertical net tow, 100 m	NH18603.14
	1322	1425	20	CR-8	41	54.0	-125	12.2	2764	1019.8	350	20-25	CTD with oxygen	NH18603.15

Table 3 cont.

	Start	End	Sta.	Sta.	Latitude		Longitude		Bottom	Atmos	Wind	Wind	Event	Event ID
(UT)	Time	Time	No.	Name	(deg)	(min)	(deg)	(min)	Depth	Press	Dir.	Speed		
	(UT)	(UT)							(m)	(mbar)	(deg T)	(kts)		
5-Jul	1555	1644	21	CR-9a	41	53.9	-125	24.0	3097		350	22	CTD with biochem, mzp	NH18603.16
	1650	1657			41	53.8	-125	24.8					vertical net tow, 100m	NH18603.17
	1701	1709			41	53.8	-125	26.0					2nd vertical net tow, 100m	NH18603.18
	1845	1933	22	CR-10	41	54.0	-125	40.0	2927	1020.5	000	19	CTD	NH18603.19
	2110	2202	23	CR-11	41	54.3	125	58.2	3333	1020.4	000	24	CTD with biochem, mzp	NH18603.20
	2210	2219			41	54.9	-125	58.8					vertical net tow,100m	NH18603.21
	2230	2235											begin transit to FM line	
6-Jul	0636	0729	24	FM-9	43	13.0	-125	10.2	1708	1018.8	005	17	CTD with biochem, mzp	NH18703.1
	0735	0744			43	13.4	-125	10.9					vertical net tow, 100 m	NH18703.2
	0928	1020	25	FM-8	43	13.2	-125	00.1	1083	1018.2	005	20	CTD with biochem, mzp	NH18703.3
	1028	1038			43	13.7	124	00.6					vertical net tow, 100 m	NH18703.4
	1159	1237	26	FM-7	43	12.9	-124	50.3	338	1017.9	010	20	CTD with oxygen, biochem, mzp	NH18703.5
	1307	1316			43	12.9	-124	50.6					vertical net tow, 100 m	NH18703.6
	1325				43	13.0	-124	50.8					Mocness deployed	NH18703.7
		1425			43	14.6	-124	50.9					Mocness aboard	NH18703.8
	1504	1529	27	FM-6	43	13.0	-124	45.3	325	1019.2	005	17	CTD	NH18703.9
	1607	1624	28	FM-5	43	13.1	-124	40.2	164	1019.1	015	17	CTD with biochem	NH18703.10
	0630	1639			43	13.2	-124	40.7					vertical net tow, 100 m	NH18703.11
	0930				43	13.4	-124	41.0					Mocness deployed	NH18703.12
		1714			43	14.0	-124	41.2					Mocness aboard	NH18703.13
	1755	1808	29	FM-4	43	13.1	-124	35.1	90	1017.5	010	16	CTD with biochem, mzp	NH18703.14
	1815	1822			43	13.3	-124	35.4					vertical net tow, 88m	NH18703.15
	1832				43	13.5	-124	35.4					Mocness deployed	NH18703.16
		1900			43	14.4	-124	35.8					Mocness aboard	NH18703.17
	1945	2000	30	FM-3	43	13.1	-124	30.1	57	1017.4	020	15	CTD with biochem, mzp	NH18703.18
	2025	2011			43	13.3	-124	30.2					vertical net tow, 60m	NH18703.19
	2033				43	13.8	-124	30.4					Mocness deployed	NH18703.20
		2101			43	15.0	-124	30.2					Mocness aboard	NH18703.21
	2140	2148	31	FM-1	43	13.1	-124	26.0	36	1017.9	015	16	CTD	NH18703.22
	2156	2201			43	13.4	-124	26.0					vertical net tow, 30 m	NH18703.23
	2210												begin transit to HH-7	
7-Jul	0344	0434	32	HH-7	44	00.0	-125	12.0	1698	1016.7	020	22	CTD with biochem, mzp	NH18803.1
	0602	0652	33	HH-5	44	00.0	-125	00.1	939	1016.4	005	19	CTD with biochem, mzp	NH18803.2
	1430												arrive pier Newport	
													exchange personnel	
	2100												depart pier Newport	
	2210												Start flow-thru system	

Table 3 cont.

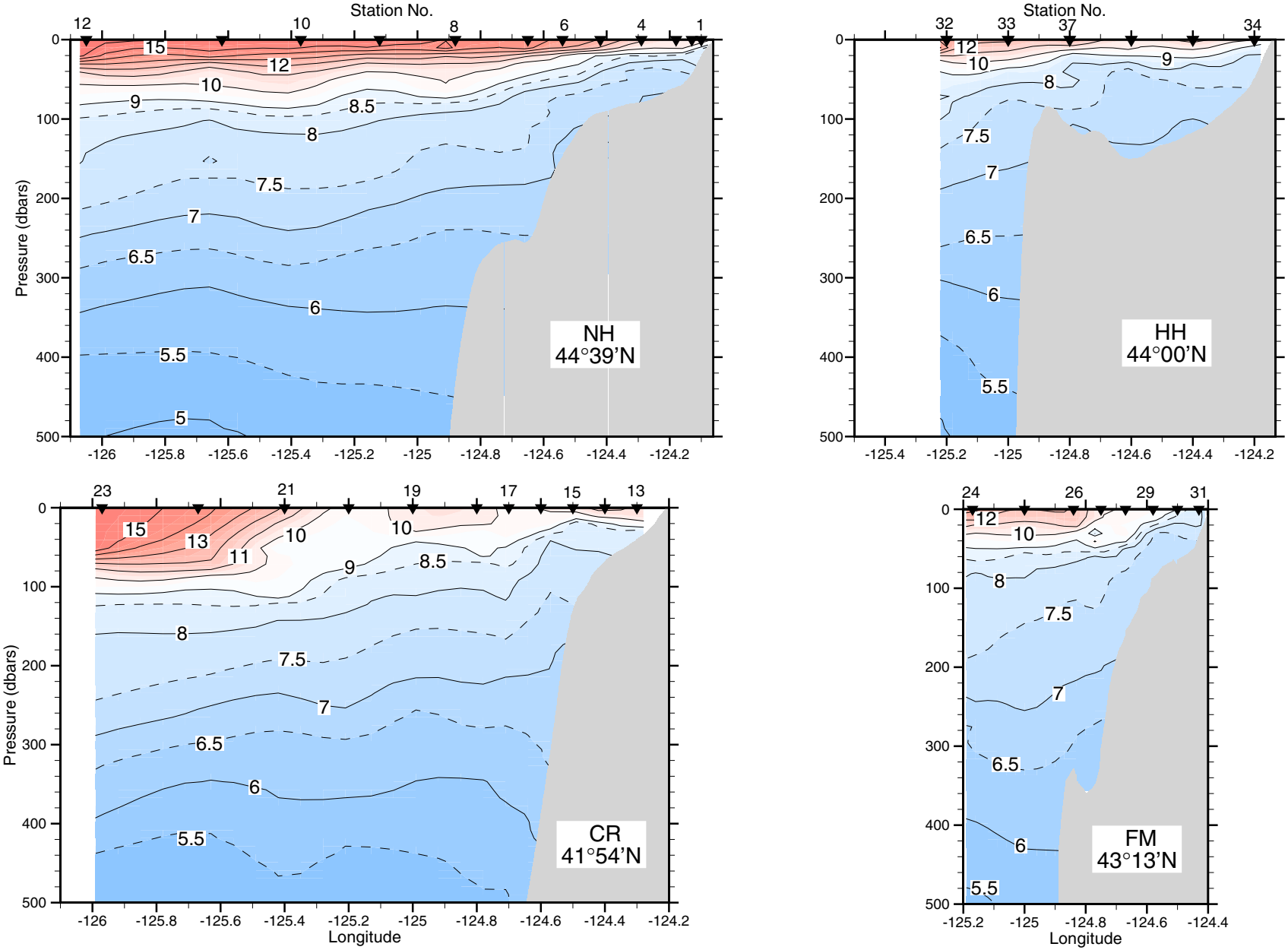
	Start	End	Sta.	Sta.	Latitude		Longitude		Bottom	Atmos	Wind	Wind	Event	Event ID
(UT)	Time	Time	No.	Name	(deg)	(min)	(deg)	(min)	Depth	Press	Dir.	Speed		
	(UT)	(UT)							(m)	(mbar)	(deg T)	(kts)		
8-Jul	0055	0106	34	HH-1	44	00.1	-124	12.2	56	1015.6	250	8	CTD with biochem, mzp, 2 oxygen	NH18803.3
	0113	0118			43	59.9	-124	12.1					vertical net tow, 50m	NH18803.4
	0218	0235	35	HH-2	44	00.0	-124	23.9	123	1016.8	270	10	CTD with biochem, mzp, 2 oxygen	NH18803.5
	0242	0250			43	59.9	-124	23.8					vertical net tow, 100 m	NH18803.6
	0257				44	00.0	-124	23.8					Mocness deployed	NH18803.7
		0330			44	00.5	-124	25.5					Mocness aboard	NH18803.8
	0428	0445	36	HH-3	44	00.0	-124	36.0	155	-	190	5	CTD with biochem, mzp, 3 oxygen	NH18803.9
	0452	0501			44	00.0	-124	35.7					vertical net tow, 100 m	NH18803.10
	0511				43	59.7	-124	35.7					Mocness deployed	NH18803.11
		0558			43	57.8	-124	36.5					Mocness aboard	NH18803.12
	0704	0722	37	HH-4	44	00.1	-124	48.1	109	1018.1	180	8	CTD with biochem, mzp	NH18803.13
	0730	0738			44	00.3	-124	47.7					vertical net tow, 100 m	NH18803.14
	0904	0909		HH-5	44	00.0	-124	59.9	100	1013.1	200	15	vertical net tow, 100 m	NH18803.15
	0924				44	00.0	-125	00.0					Mocness deployed - deep, dark	NH18803.16
		1141			44	04.9	-124	03.0					Mocness aboard	NH18803.17
	1305				44	00.5	-125	00.6					Mocness deployed	NH18803.18
		1455			44	04.1	-125	03.1					Mocness aboard	NH18803.19
	1507	1514			44	04.2	-125	03.3					vertical net tow, 100 m	NH18803.20
	2030												arrive at pier in Newport	

Table 4. Names, affiliations, and responsibilities of scientific personnel participating on NH0307A.

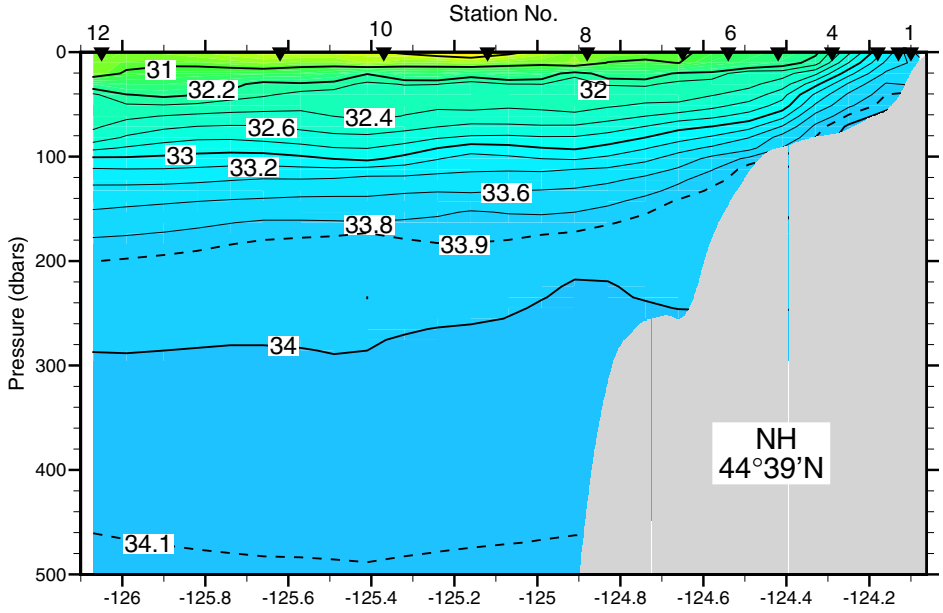
Adriana Huyer	Chief Scientist	OSU	CTD
Robert L. Smith[1]	Co-Chief Scientist	OSU	CTD
Jane Fleischbein[1]	Technician	OSU	CTD
Joe Jennings	Technician	OSU	CTD, Oxygen
Daryl Swensen	Technician	OSU	CTD
Kathryn Brooksforce	Technician	OSU	CTD
Julie Arrington	Technician	OSU	nuts, chl
Jennifer Jarrell-Wetz	Technician	OSU	nuts, chl
Jennifer Harman	Technician	OSU	nuts, chl
Mike Wetz[1]	Graduate Student	OSU	nuts, chl
Somrudee Meprasert[1]	Graduate Student	OSU	Nuts, chl
Carlos López	Technician	OSU	microzooplankton
Greer Martin	Undergraduate Student	OSU	microzooplankton
Julie Keister	Technician	HMSC	zooplankton
Wm. T. Peterson[2]	Scientist	NOAA	zooplankton
Caroline Tracy Shaw	Technician	HMSC	zooplankton
Kristina Johnson[1]	Undergraduate Student	HMSC	zooplankton
Rian Hooff	Technician	HMSC	zooplankton
Cambria Colt	Technician	SIO	martec
Jim Schmitt	Technician	SIO	martec
Rob Whittelsey[2]	Documentary Crew		
Spencer Palermo[2]	Documentary Crew		
Erich Roland[2]	Documentary Crew		
Matt Barbie[2]	Documentary Crew		

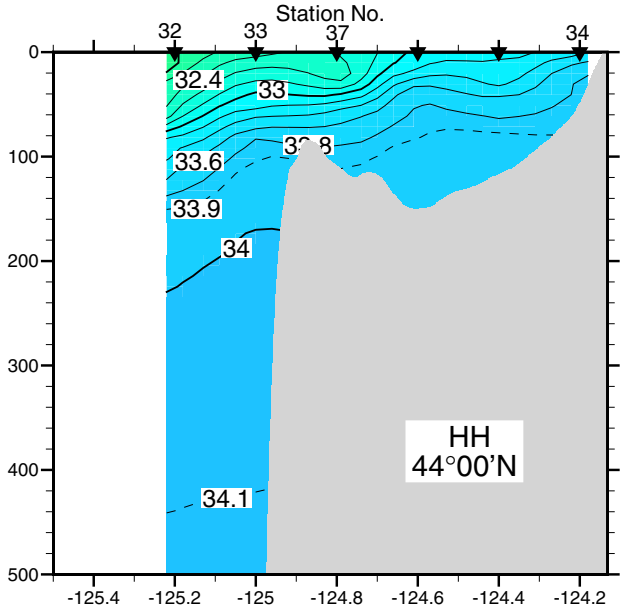
[1]First leg only
[2]Second leg only

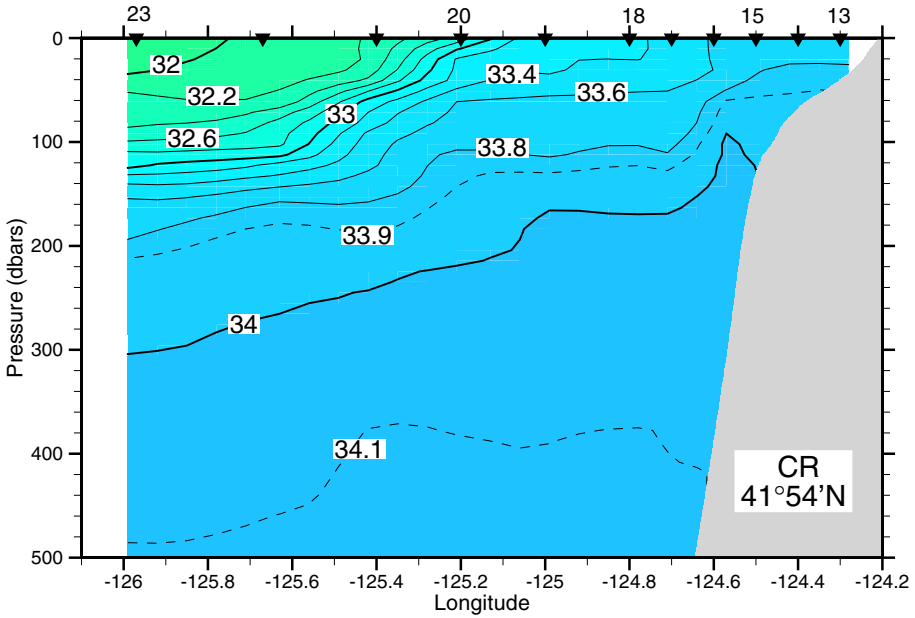
Temperature, 3-8 July 2003

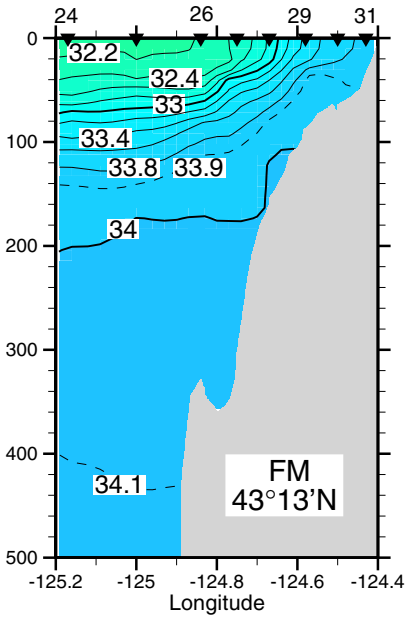


Salinity, 3-8 July 2003

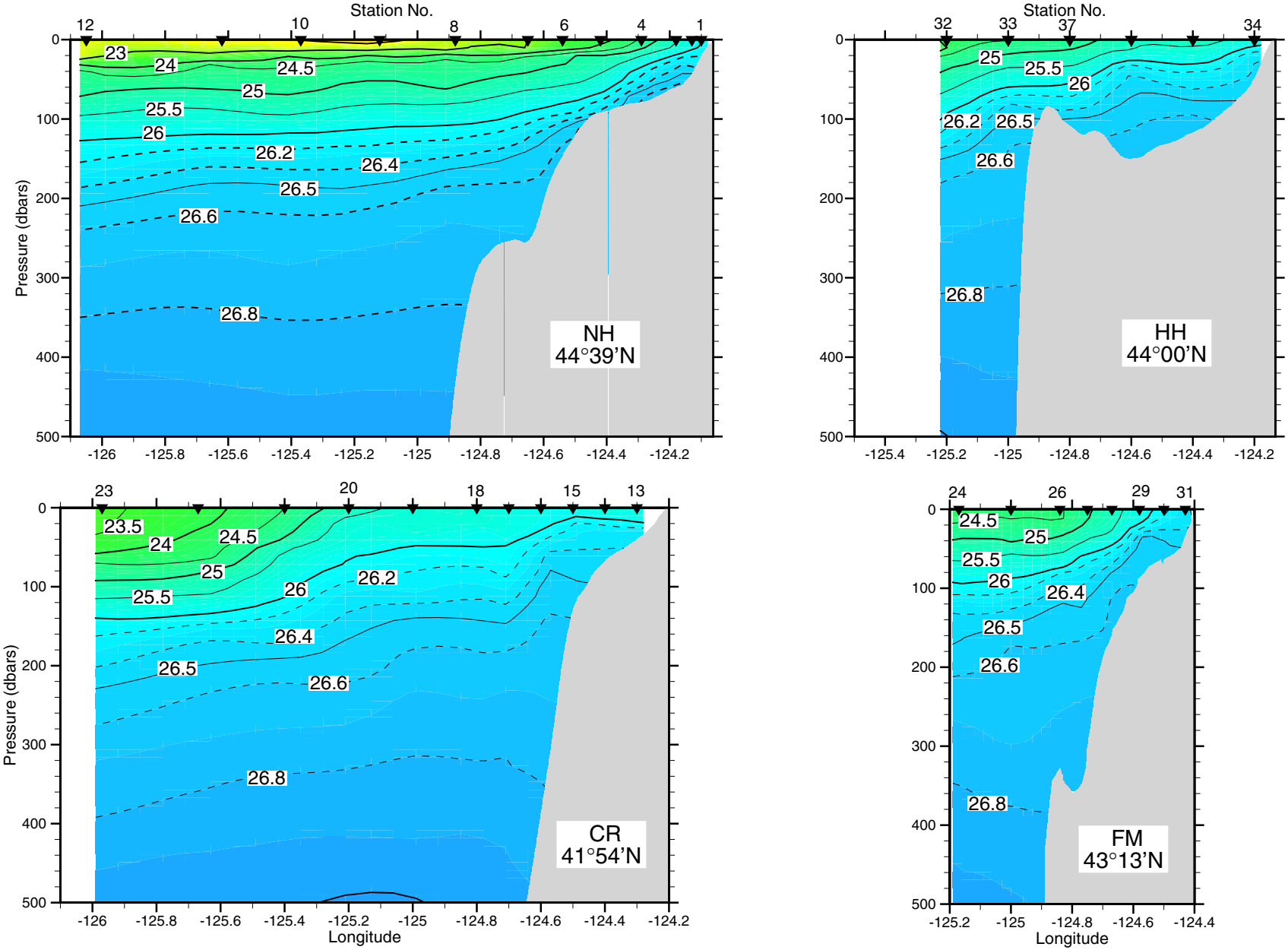




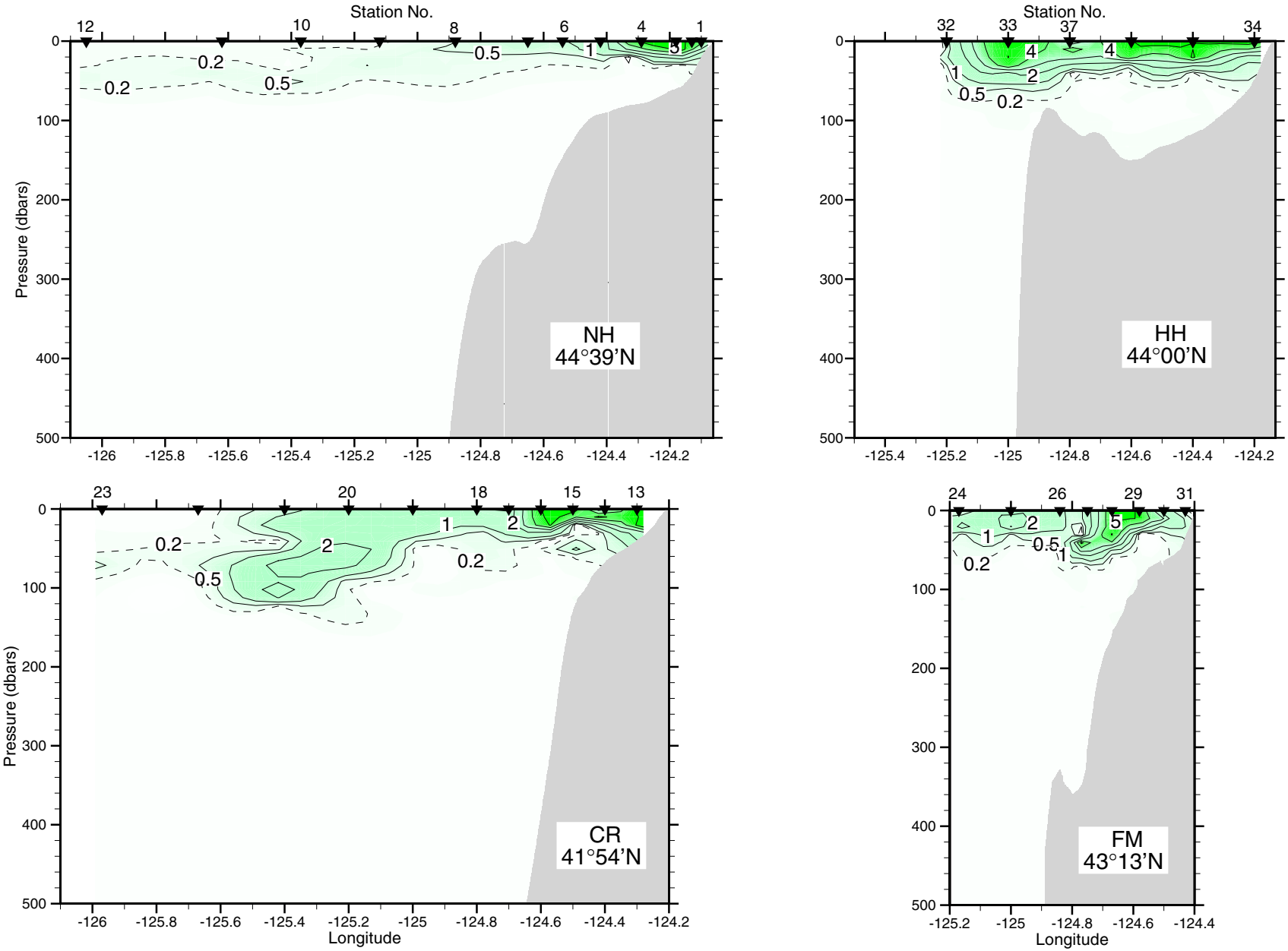




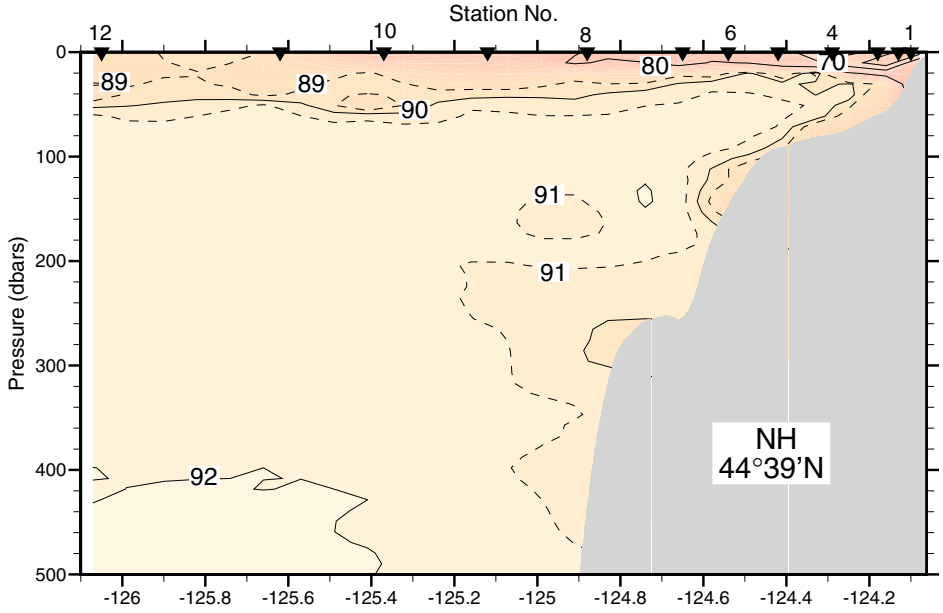
Sigma-theta, 3-8 July 2003

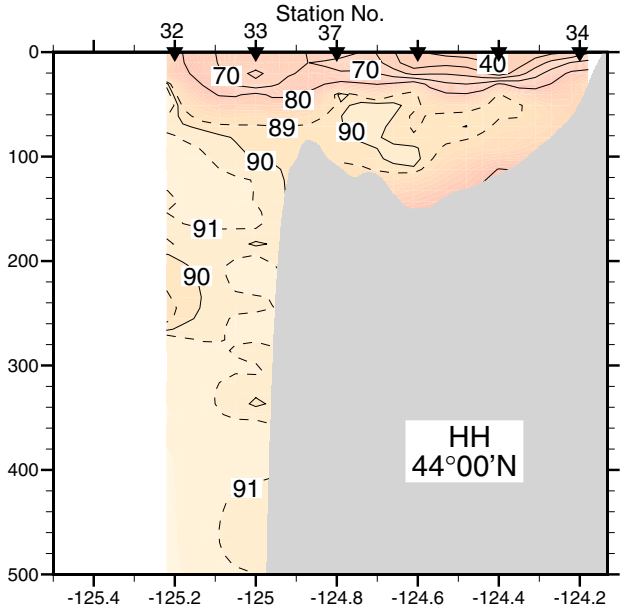


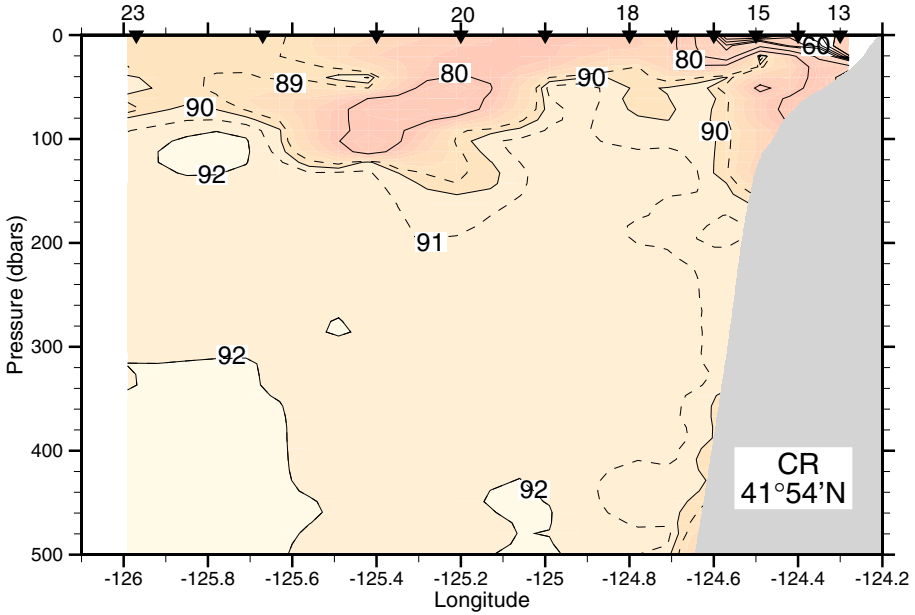
Fluorescence Voltage, 3-8 July 2003

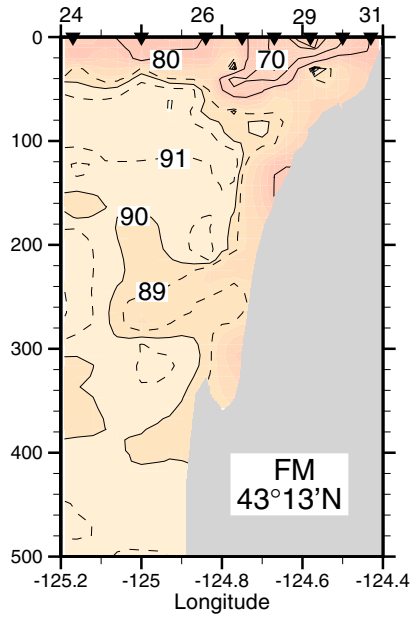


% Light Transmission, 3-8 July 2003

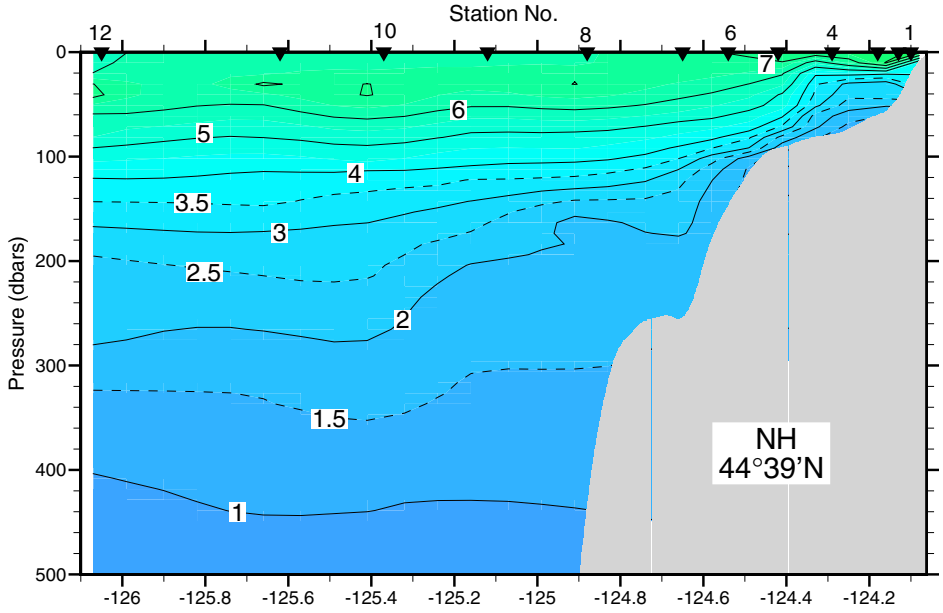


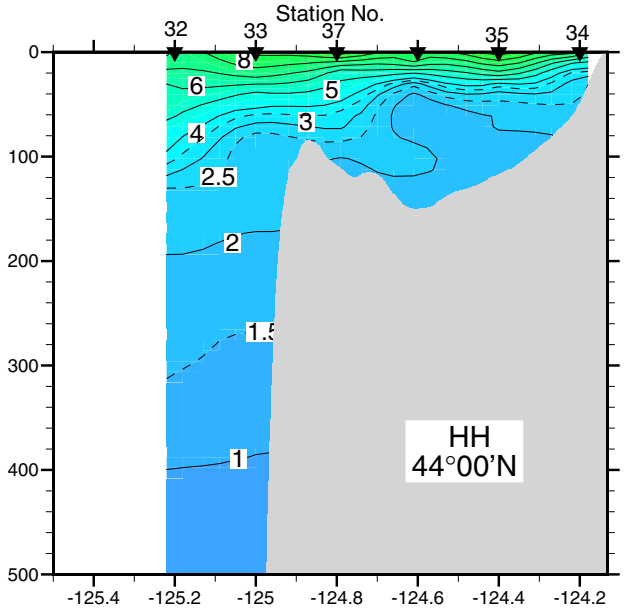


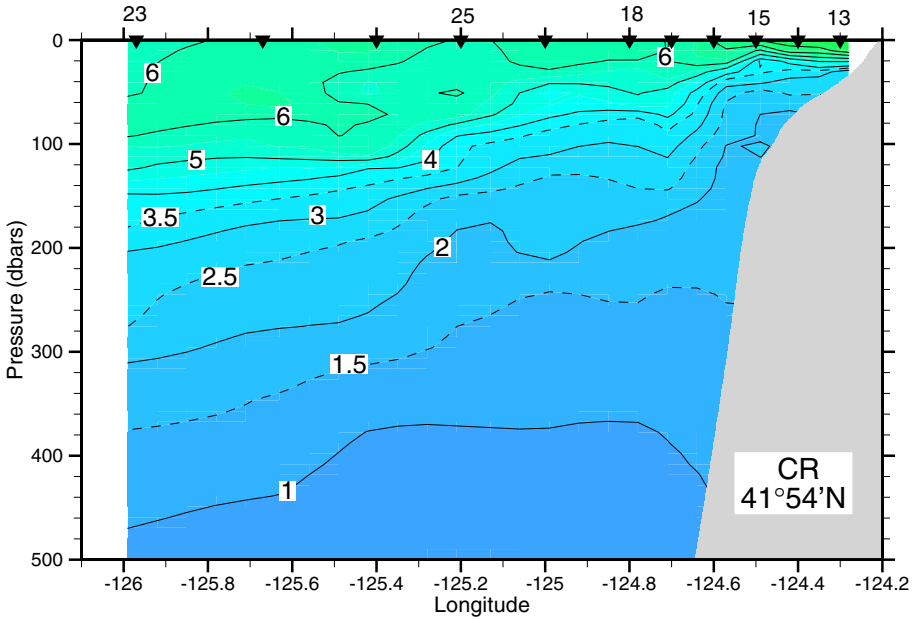


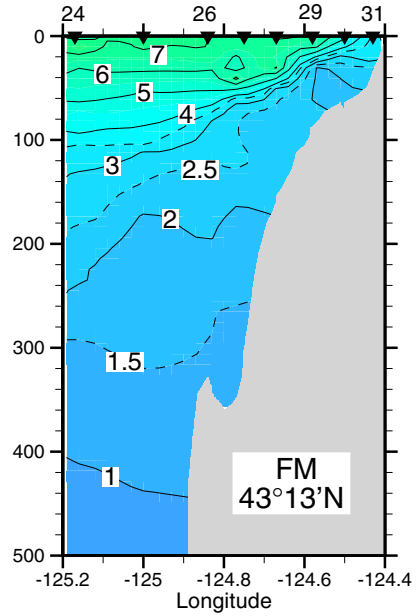


Oxygen, 3-8 July 2003





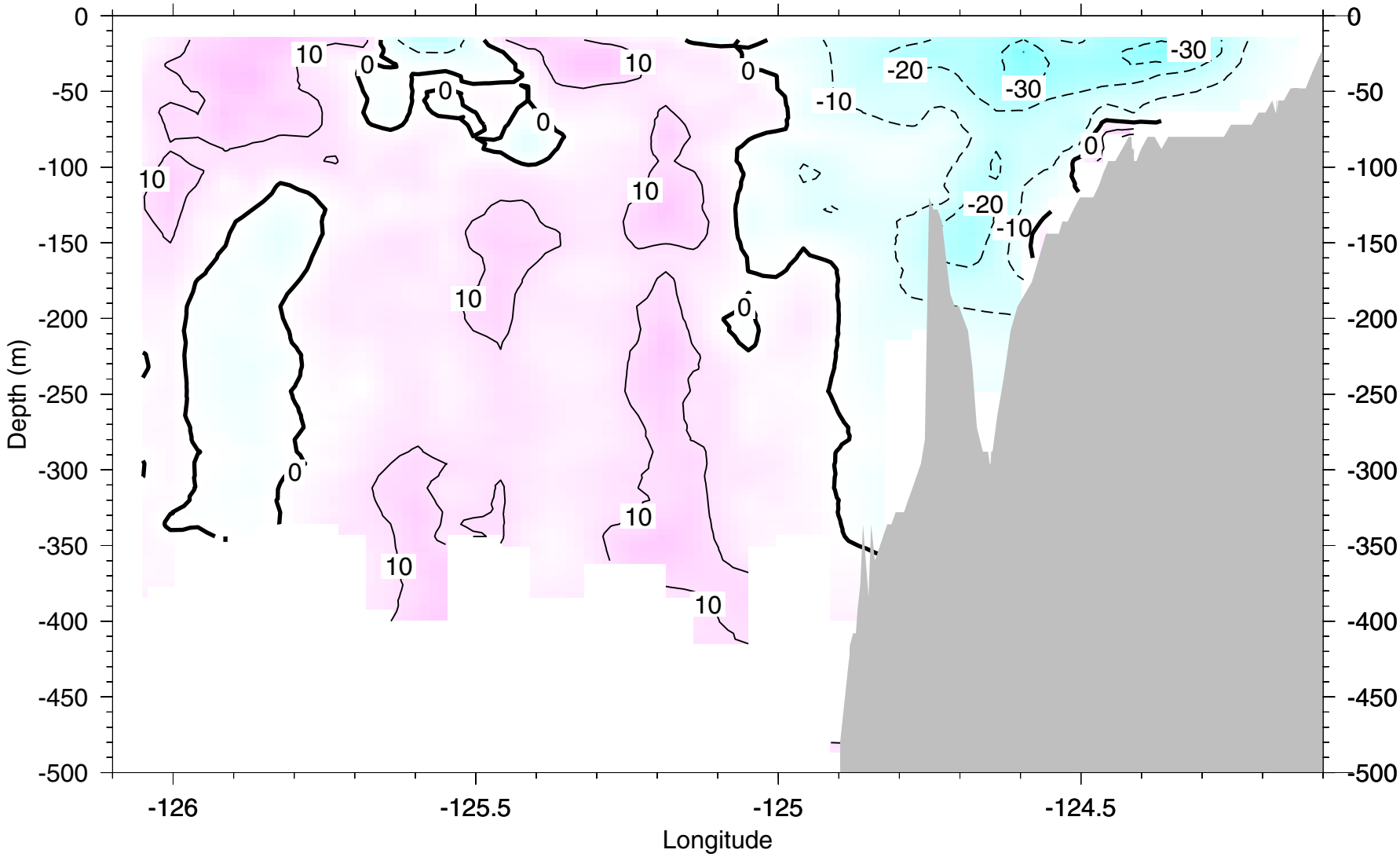




Newport Hydrographic Line 44.6°N

03-04 July 2003

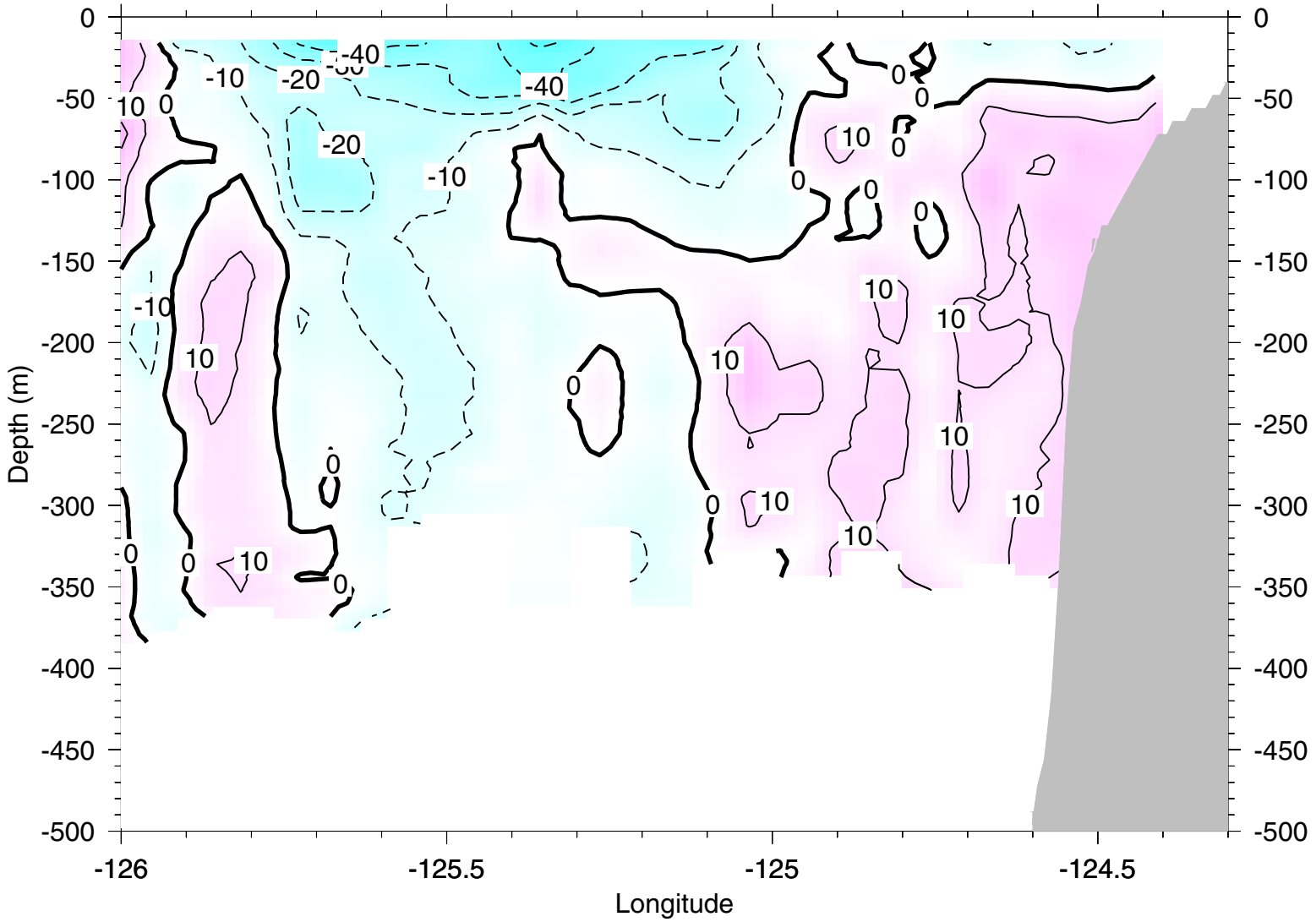
ADCP: Northward current (cm/s)



Crescent City Hydrographic Line 41.9°N

04-05 July 2003

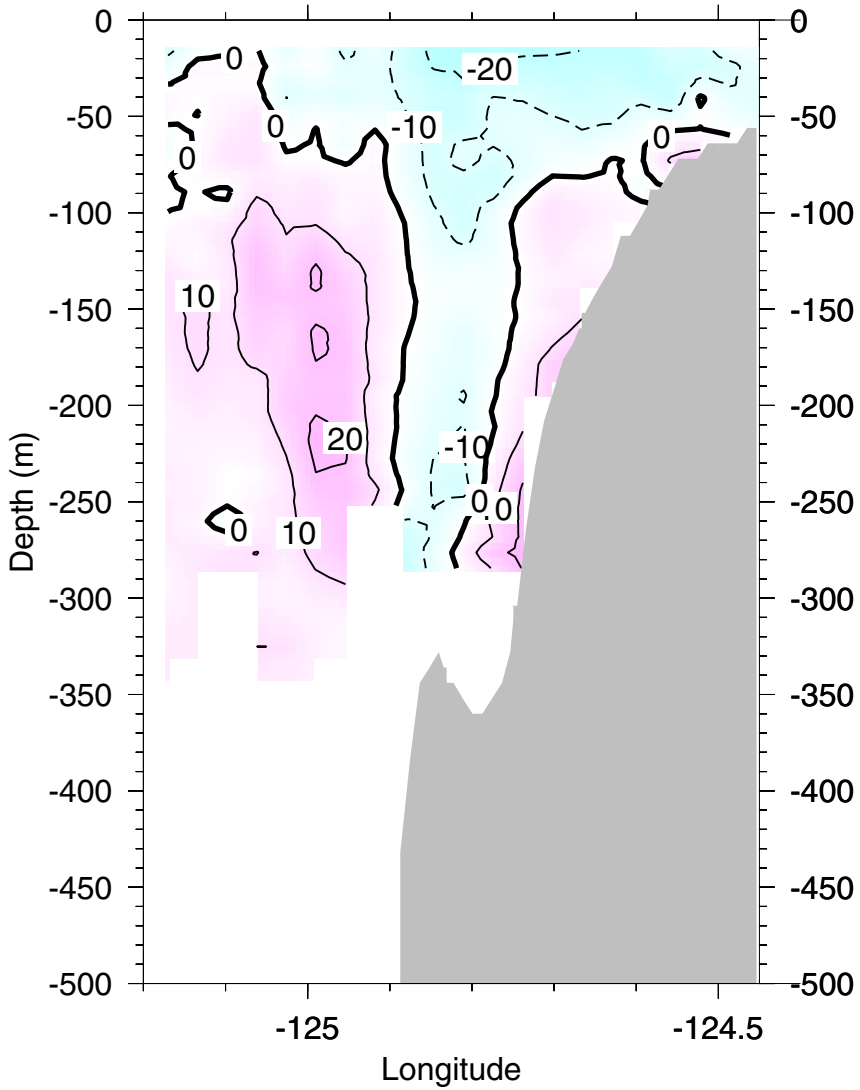
ADCP: Northward current (cm/s)



Five Mile Hydrographic Line 43.2°N

06 July 2003

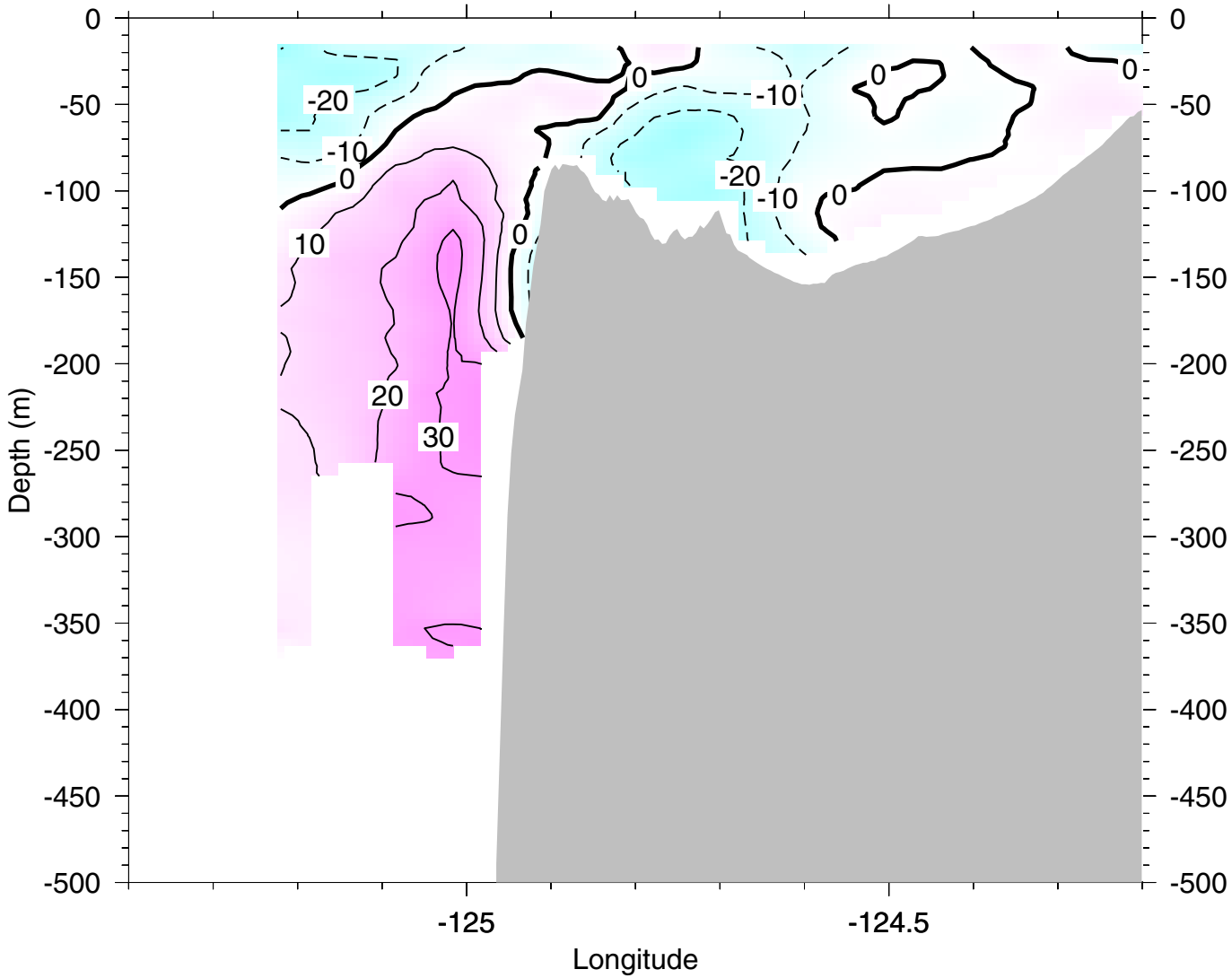
ADCP: Northward current (cm/s)

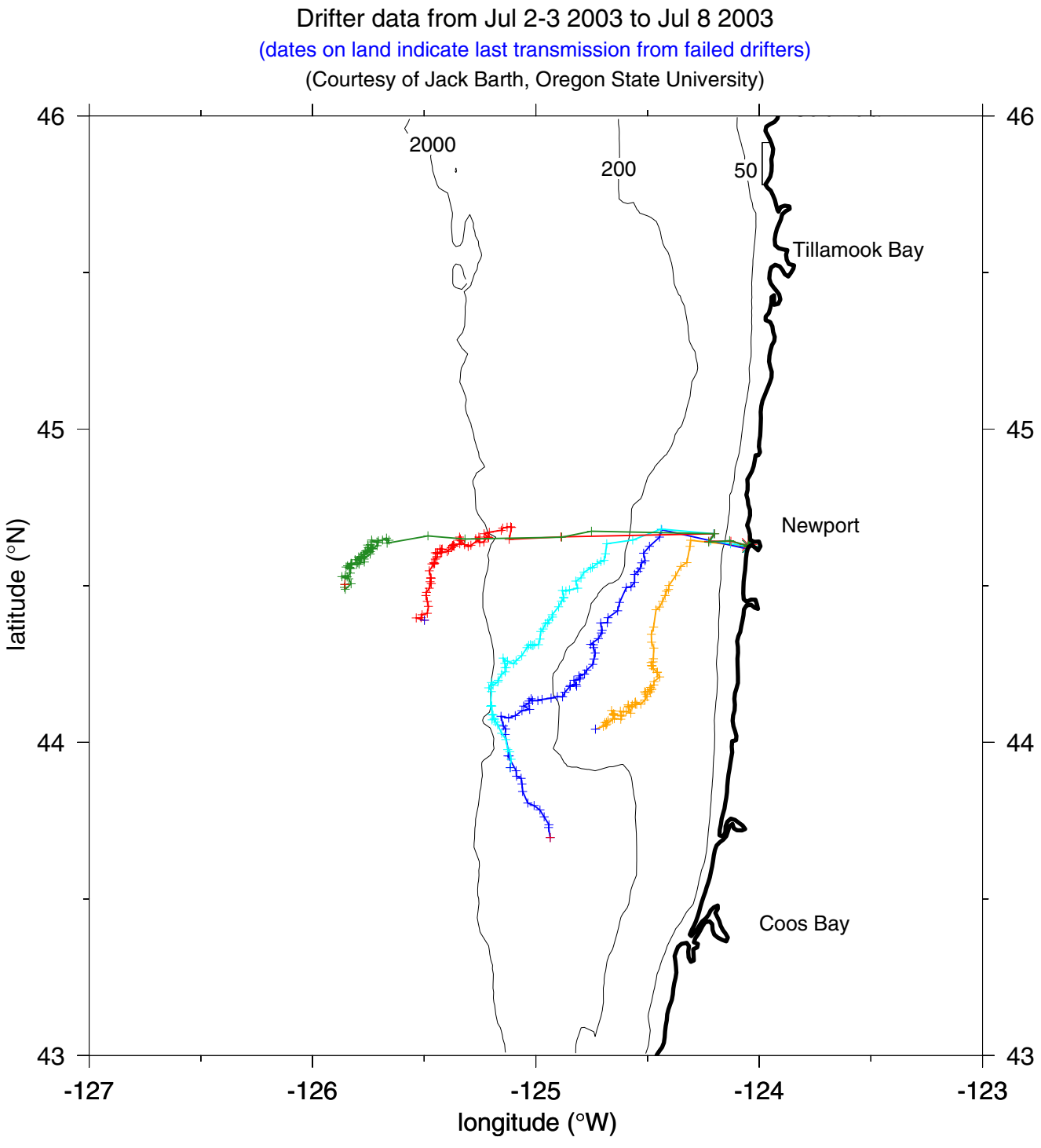


Heceta Head ADCP Line 44.0°N

07-08 July 2003

ADCP: Northward current (cm/s)

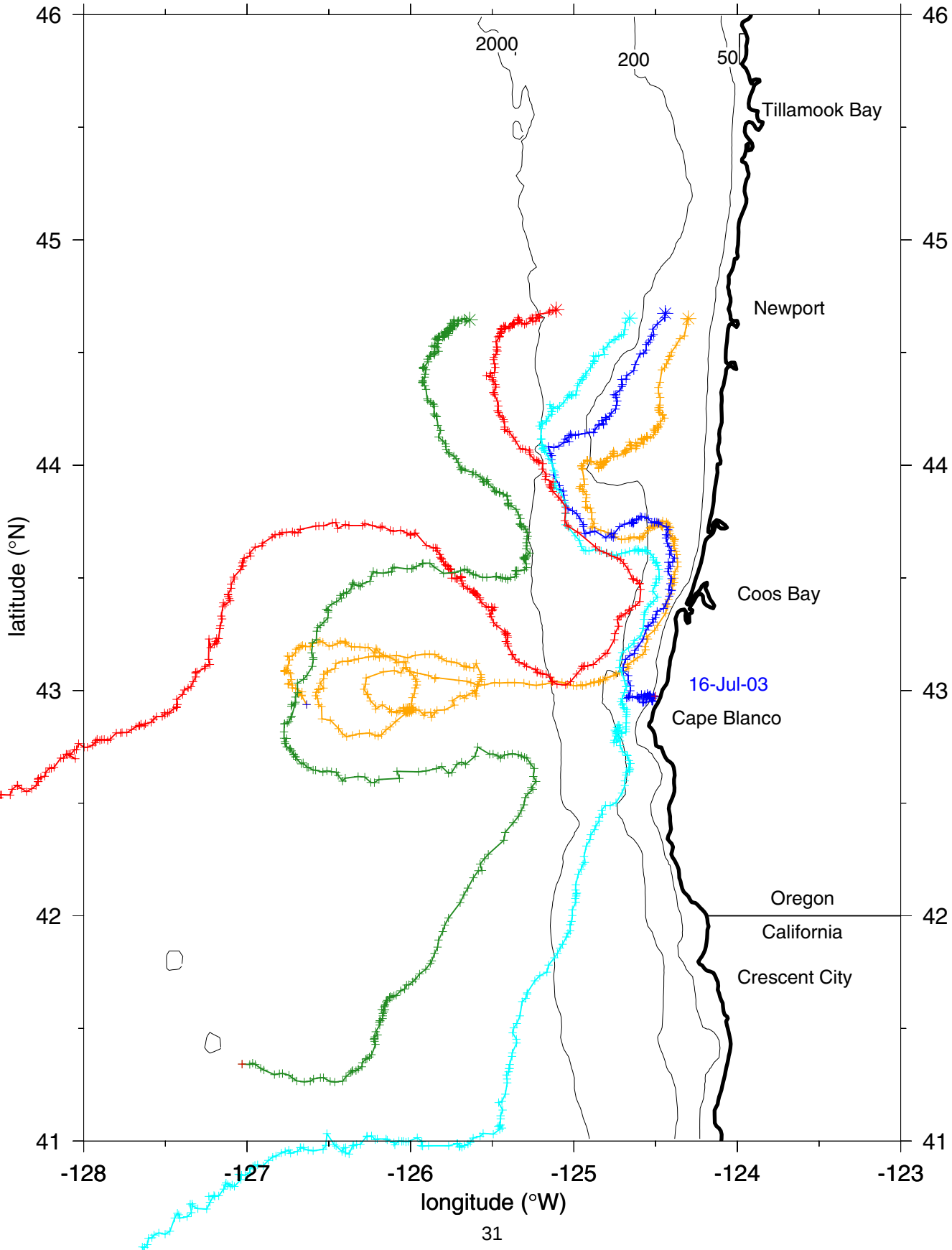



Drifter data from Jul 2-3 2003 to Jul 8 2003
(dates on land indicate last transmission from failed drifters)
(Courtesy of Jack Barth, Oregon State University)
2000
200
50
Tillamook Bay
Newport
Coos Bay
46
45
44
43
-127
-126
-125
-124
-123
latitude (°N)
longitude (°W)

Drifter data from Jul 3-4 2003 to Aug 5 2003

(dates on land indicate last transmission from failed drifters)

(Courtesy of Jack Barth, Oregon State University)



July 2003 GLOBEC LTOP Zooplankton Report

(Submitted by Julie Keister and Dr. Wm. Peterson, Oregon State University and NOAA)

MOCNESS DESCRIPTIONS

NH5 22:10 h (local time) water depth= 64m

54-35 m	lost
35-20	Misc. jellies, copepods
20-10 m	Misc. jellies, phytoplankton, copepods, Pleurobrachia
10-0 m	lost

NH15 01:40 h water depth=100m

75-50 m	copepods, 1 fish larva
50-20 m	copepods, 15 Pleurobrachia, Limacina
20-10 m	copepods, juvenile euphausiids, 50 Pleurobrachia, Limacina
10-0 m	copepods, adult and juvenile euphausiids

NH25 04:25 h water depth=283m

232-200	6 cephalopods, jellies, copepods, shrimp
200-150	Neocalanus, 6 shrimp, chaetognaths
150-100	copepods, juvenile euphausiids, chaetognaths, 1 fish larva, 2 megalope
100-50	copepods, 4 jellies, amphipods, juvenile euphausiids, megalope
50-20	copepods, adult euphausiids, 4 jellies
20-10	copepods, 5 jellies, 10 adult euphausiids, juvenile euphausiids
10-0	few copepods, ~30 tiny Pleurobrachia

NH35 08:40 h water depth=450m

350-250	copepods, chaetognaths, shrimp, Siphonophores, Limacina
250-200	copepods, Limacina, Siphonophores, chaetognaths, 2 adult euphausiids
200-150	copepods, Limacina, chaetognaths, Siphonophores, chaetognaths, 1 fish larva, 1 adult euphausiid
150-100	copepods, Limacina, chaetognaths, 2 adult euphausiids, 1 squid
100-50	copepods, 4 jellies, chaetognaths
35-20	Neocalanus, 12 jellies, 1 Beroe
20-10	copepods, 3 Pleurobrachia
10-0	copepods, Pleurobrachia, chaetognaths, euphausiid eggs, 1 Beroe

NH45 11:56 h water depth=690m

350-250	adult euphausiids copepods, 2 fish larvae
250-200	Muggiaea, Neocalanus, Limacina, 1 jelly, 1 squid
200-150	Neocalanus, chaetognaths, Muggiaea, 1 jelly
150-100	Neocalanus, chaetognaths, Limacina, 1 amphipod, 1 jelly

100-50	Misc. jellies, juvenile euphausiids, 5 purple female euphausiids
50-20	Neocalanus, ~50 Pleurobrachia, jellies, Limacina, chaetognaths, megalope
20-10	Neocalanus, ~50 Pleurobrachia, 4 jellies, ~20 fish larvae, ~10 Doliolids
10-0	copepods, ~50 Pleurobrachia

CR2 15:50 h (local time) water depth= 72m

60-20	Pleurobrachia, copepods, jellies, phytoplankton
20-10 m	Pleurobrachia, copepods, jellies, phytoplankton
10-0 m	Pleurobrachia, copepods, jellies, phytoplankton

CR3 17:40 h water depth=149m

130-100	jellies, adult euphausiids, phytoplankton
75-50 m	adult euphausiids, jellies, 10 Pleurobrachia, copepods
50-20 m	jellies, adult euphausiids, copepods, ~35 Pleurobrachia, 2 fish larvae
20-10 m	Pleurobrachia, phytoplankton, jellies, copepods, juvenile euphausiids
10-0 m	phytoplankton, jellies, copepods

CR4 20:17 h water depth=516m

350-250	copepods, ctenophores, 3 adult euphausiids, 1 shrimp, 1 Atolla
232-200	copepods, jellies, 4 shrimp
200-150	chaetognaths, jellies, shrimp, adult euphausiids
150-100	chaetognaths, copepods, adult euphausiids, 10 shrimp, 1 myctophid, 2 megalope, 1 squid
100-50	shrimp, adult euphausiids, copepods, 1 myctophid
50-20	Pleurobrachia, jellies, adult euphausiids, Limacina, phytoplankton, juvenile euphausiids
20-10	copepods, Beroe, adult and juvenile euphausiids
350-250	copepods, Pleurobrachia, furcilia

CR6 01:30 h water depth=722m

350-250	copepods, adult euphausiids, 1 fish larva
250-150	copepods, 1 fish larva, several juvenile euphausiids, ~10 adult euphausiids
150-100	chaetognaths, Muggiaea, copepods, 1 myctophid, 2 squid, few juvenile euphausiids
100-50	copepods, adult euphausiids, 1 megalopa
50-35	lost cod end
35-20	copepods, adult euphausiids, phytoplankton, ~20 Pleurobrachia
20-10	copepods, adult euphausiids, amphipods, ctenophores, phytoplankton
10-0	phytoplankton, adult euphausiids, copepods, Pleurobrachia

FM7 06:25 h water depth=340m

350-250	shrimp, megalope, copepods, Limacina, adult euphausiids, 3 myctophids, 1 squid
250-150	shrimp, Doliolids, copepods, 1 fish larva, 2 megalope
150-100	Limacina, chaetognaths, Muggiaea, copepods, 1 megalope
100-50	juvenile euphausiids, copepods, phytoplankton
50-20	copepods, Limacina, 5 Pleurobrachia
20-10	copepods, phytoplankton, Limacina
10-0	copepods, 1 shrimp, 2 adult euphausiids

FM5 09:50 h water depth=175m

155-100	juvenile euphausiids, misc. jellies, a few adult euphausiids
100-50	1000's of juvenile euphausiids, ~10 adult euphausiids, misc. jellies
50-20	juvenile euphausiids, adult euphausiids, 1 amphipod, 1 fish larva
20-10	copepods, phytoplankton, misc. jellies, ~10 Pleurobrachia
10-0	copepods

FM4 11:33 h water depth=102m

100-50	adult euphausiids, copepods, misc. jellies, phytoplankton, 4 Pleurobrachia
50-20	Pleurobrachia, juvenile euphausiids, adult euphausiids, misc. jellies, phytoplankton
20-10	Pleurobrachia, misc. jellies, adult euphausiids, phytoplankton, juvenile euphausiids
10-0	Misc. jellies, phytoplankton, copepods

FM3 13:33 h water depth=63m

55-20	Pleurobrachia, copepods, 1 fish larva, 4 megalope
20-10	Pleurobrachia, Mitrocoma, phytoplankton
10-0	Pleurobrachia, Mitrocoma, phytoplankton, copepods

HH2 20:02 h water depth=123m

110-50	Muggiaea, copepods, 2 shrimp
50-20	adult euphausiids, jellies, Limacina, phytoplankton, copepods
20-10	jellies, phytoplankton, copepods, adult and juvenile euphausiids
10-0	phytoplankton, Pleurobrachia, jellies

HH3 22:13 h water depth=158m

150-100	copepods, 10 adult chaetognaths
100-50	lost cod end
50-35	Mitrocoma, phytoplankton, ~40 adult euphausiids

35-20	Mitrocoma and other jellies, phytoplankton, adult euphausiids
20-10	10000 adult euphausiids, furcilia, 10 Pleurobrachia, 1 fish larva
10-0	1000 adult and juvenile euphausiids, phytoplankton, 50 Pleurobrachia, copepods 1 fish larva

HH5 (night replicate) 02:24 h water depth=1000m

1000-700	few copepods, 1 shrimp
700-500	few copepods, few adult euphausiids, 3 fish, few shrimp, 10 medusae
500-300	myctophids, few copepods, chaetognaths, 10 Sergestid shrimp
300-200	100 adult euphausiids, few copepods, chaetognaths, 2 myctophids
200-100	15 shrimp, adult and juvenile euphausiids, 4 fish larvae
100-50	1000 adult euphausiids, Pleurobrachia, copepods
50-20	adult euphausiids including purple females, ~30 Pleurobrachia, copepods, furcilia, 2 fish larvae
20-10	furcilia, adult euphausiids, ~75 Pleurobrachia, copepods, Sergestids, amphipods
10-0	millions of furcilia, shrimp, copepods, 100 adult and juvenile euphausiids, 50 amphipods, chaetognaths, ~25 Pleurobrachia

HH5 (day replicate) 06:04 h water depth=1000m

1000-700	copepods
700-500	copepods, 2 shrimp, Muggiaea, 2 fish larvae, amphipods
500-300	copepods, jellies, amphipods, 2 fish larvae
300-201	Muggiaea, jellies, 2 shrimp, 10 adult and juvenile euphausiids, copepods
200-100	salps, shrimp, copepods, phytoplankton, 2 squid, 1 megalope, 1 fish larva
100-50	adult euphausiids, phytoplankton, adult euphausiids
50-20	~2000 adult euphausiids, furcilia, copepods, phytoplankton
20-10	jellies, copepods, phytoplankton
10-0	~10 adult euphausiids, copepods, furcilia, 1 jelly

Other zooplankton sampling:

Vertical tows (0.5m diameter, 200µm mesh) from 100 meters (or from just above bottom) to surface were completed at stations NH1, 5, 10, 15, 20, 25, 35, 45, and 65; CR1,2,3,4,6,7,9,and 11; FM2,3,4,5,7,8,and 9; and HH1,2,3,4,and 5. Replicates for EtOH preservation were taken at NH5, NH65, CR2, and CR9.

Euphausiids from station NH25 were incubated for molting rate experiments; ovigerous female euphausiids were collected from HH5 for egg production experiments.

Microzooplankton Sampling

(Submitted by Carlos López and Drs. E. and B. Sherr, Oregon State University)

July, 2003 GLOBEC CRUISE NH0307A:

Primary goal: MICROZOOPLANKTON ABUNDANCE, BIOMASS, AND GENERAL TAXONOMIC COMPOSITION

Table 5: Actual sample depths for collection of microzooplankton samples for bacterial counts (Flow Cytometry), dinoflagellate counts (Epifluorescence Microscopy), and ciliate counts (Inverted Scope Microscopy) during **NH0307A**.

Station	Sample Collection Depths (m)
NH-01	6,17,25
NH-03	5,23,43
NH-05	2,6,11,16,21,29,40,54
NH-10	5,22,38,78
NH-15	2,6,12,18,30,50,82
NH-20	2,71,140
NH-25	3,10,20,30,40,50,71
NH-35	2,10,20,29,40,50,70,101
NH-45	2, 10, 20, 30, 40, 50, 70
NH-65	3,11,20,30,40,50,71
NH-85	3, 11,21,30,44,52,65,100

CR-1	2,6,10,15,20,25,30,35
CR-2	10,46,63
CR-3	3,11,20,30,41,50,59,70
CR-4	2,10,20,29,40,50,70
CR-5	3,20,30,39,50,70,100
CR-6	10,22
CR-7	3,10,20,26,40,51,69,101
CR-8	3,21,65,120
CR-9a	2,9,19,29,35,51,71,102
CR-10	2,26,51,74
CR-11	3,11,20,29,40,51,70,103

Table 5 cont.

FM-1	2,19,32
FM-3	2,9,20,39
FM-4	3,11,21,50
FM-5	2,10,23,31,49,68
FM-6	2,54
FM-7	3,10,20,30,40,52,70
FM-8	2,10,15,20,30,40,50,70
FM-9	2,10,15,20,30,40,52,70

HH-1	2,6,10,15,22,25,40,49
HH-2	3,6,10,19,31,39,59,70
HH-3	10,21,30,41,53,61,70,100
HH-4	3,10,15,20,31,40,61,99
HH-5	2,10,30,41,50,70
HH-7	2,10,22,30,40,50,71