PRELIMINARY CRUISE REPORT, W0204A
R/V WECOMA, 4-10 April 2002
GLOBEC NEP Long-Term Observations off Oregon

Submitted by Jane Fleischbein
College of Oceanic & Atmospheric Sciences
Oregon State University
Corvallis, Oregon 97331-5503
flei@oce.orst.edu, 541.737.5698

FILING DATE: 4 May 2002

CONTRACT/GRANT NUMBER: NSF Grant OCE-0000733.

PRINCIPAL INVESTIGATORS: Adriana Huyer, Robert L. Smith,
P. Michael Kosro, P. A. Wheeler, Jack A. Barth, W. T. Peterson, E. Sherr and B. Sherr

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 5 lines (off Newport, Heceta Head, Coos Bay, the Rogue River, OR. and Crescent City, CA.), to make continuous bio-acoustic observations between the 50-500m. isobaths along the 5 lines, 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: 5 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.
7. Continuous bio-acoustic observations between the 50-500m isobath along 5 sections using a Hydroacoustics Technology, Inc., system towed alongside the ship.

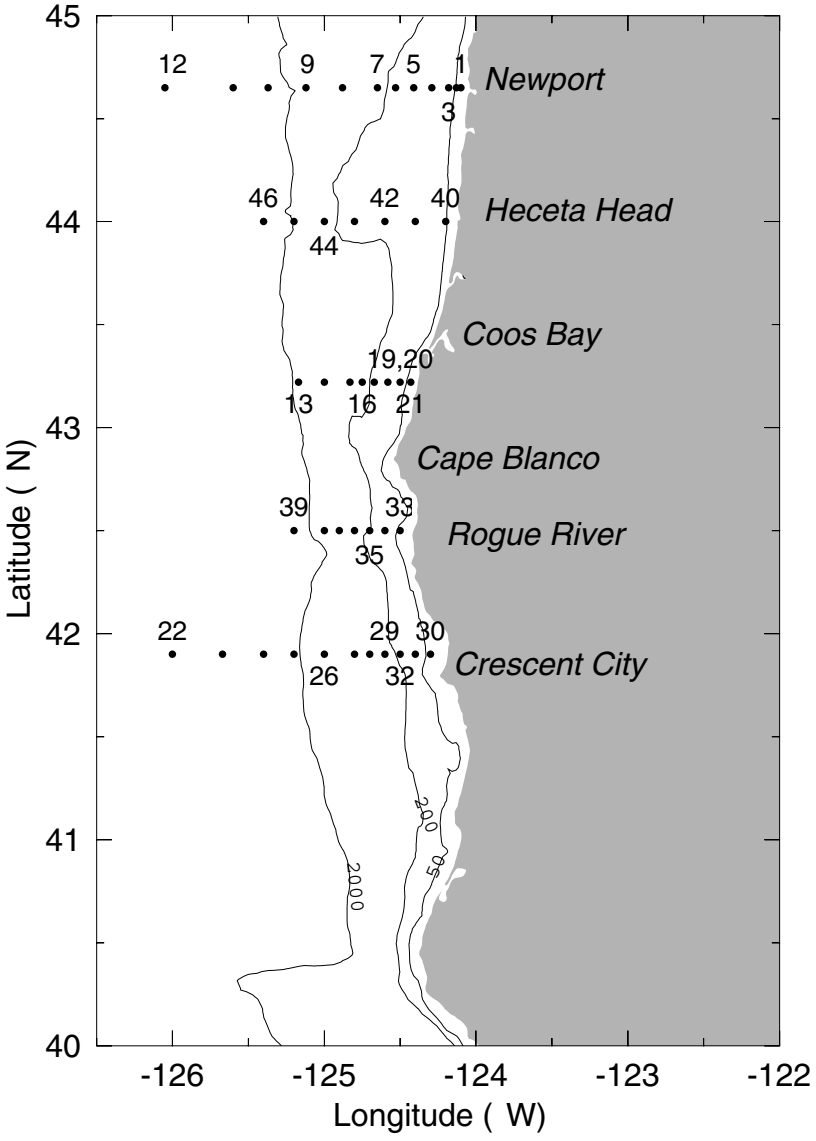
CRUISE NARRATIVE

A brief overview of W0204A is presented here. An event log is provided in Table 3, and participating personnel are listed in Table 4. Wecoma departed Newport at 1356 PDT on 4 April 2002. CTD sampling started at NH-1 and continued out to NH-85. A single vertical net tow was done at NH-1. The Benthos altimeter on the CTD gave intermittent results on the first 2 stations so it was replaced with a Simrad altimeter prior to station 3. The HTI (bio-acoustic system) was deployed at NH-3, and both MOCNESS and vertical net tows were started at NH-5. Drifters were released at NH-10, 15, 25, 45 and 65. The ship transit to the offshore end of the FM-line in order to be at the inshore end at daylight, and began sampling at FM-9 at 0031 PDT, 6 April. the HTI was deployed at FM-8. At station 19, at FM-3, several of the Niskin bottles came up partially empty, and the winch

operator reported seeing a large group of bubbles at the beginning of the cast. Unsure of what happened, the cast was repeated as station 20, and all of the Niskin bottles appeared to have fired correctly. The FM line was finished at 1638 PST, and the ship transited to the offshore end of the Crescent City line.

Sampling began at CR-11 at 0244 PDT on 7 April, doing CTD's and vertical net tows while working towards shore. Following CR-4, the ship ran inshore to CR-1 so the inshore stations could be completed in daylight. Following CR-1, the HTI was deployed, and Mocness tows were started along with CTD's at CR-2. The CTD sampling was completed at CR-3, then only Mocness and vertical net tows were done at CR-4 and CR-6, finishing the CR line at 0325 PDT on 8 April.

Figure 1. CTD stations during W0204A, along the Newport, Five Mile, Heceta Head, Rogue River and Crescent City Hydrographic Lines.



The ship arrived at the inshore end of the Rogue River line at 0804 PDT on 8 April, and the RR-line was completed at 1935 PDT on 9 April doing both CTD's and the usual net tows in order. The ship transited to HH-1, arriving at 0445 PDT, 9 April. Vertical net tows were completed along with the CTD's at HH-1 and HH-2, and then only CTD's were done working out to HH-9 to allow the Mocness sampling to occur during the night. At CTD station 46, HH-9, the secondary pump possibly had an air block at the beginning of the cast, since the secondary conductivity values are too low near the surface. The CTD's were completed at 1654 PDT on 9 April, and the ship ran back to HH-5, arriving at 1855 to begin the HTI sampling and Mocness tows working toward shore. Net sampling at HH-2 was completed at 0756 PDT, 10 April and the ship transited to Newport, arriving at the pier at 1300 PDT.

PRELIMINARY RESULTS

Winds had been favorable for coastal upwelling for a week or so before the cruise, and Mike Kosro's surface current maps (http://bragg.coas.oregonstate.edu/seasonde/) for 30 March and 4 April 2002 show a strong coastal jet was already flowing southward along the mid-shelf off Newport). Time series of wind speed and direction (Figure 2) show that winds were highly variable during our cruise: from the south on 5 April, from the northwest on 6-8 April, and from the south on 8-10 April.

All temperature, salinity and density sections show isopleths upwarping toward the coast from depth of 150-150 m offshore. This upwarping is particularly obvious in salinity, which also shows most clearly how much farther offshore the upwelling front lies off Crescent City than off Newport.

Fluorescence was high on all sections, especially on the FM-line (off-scale at all stations from FM-7 to FM-1) and the HH-line. A few shelf stations (30 and 31 on the CR-line and 33 on the RR-line) had high fluorescence near the bottom, as well as near the surface. A sample profile is shown for Station 31 off Crescent City (Figure 3): note that the bottom layer has very low light transmission as well as high fluorescence. Of these, Station 31 off Crescent City the high fluorescence in the bottom layer was off-scale, even exceeding the high values of the surface layer.

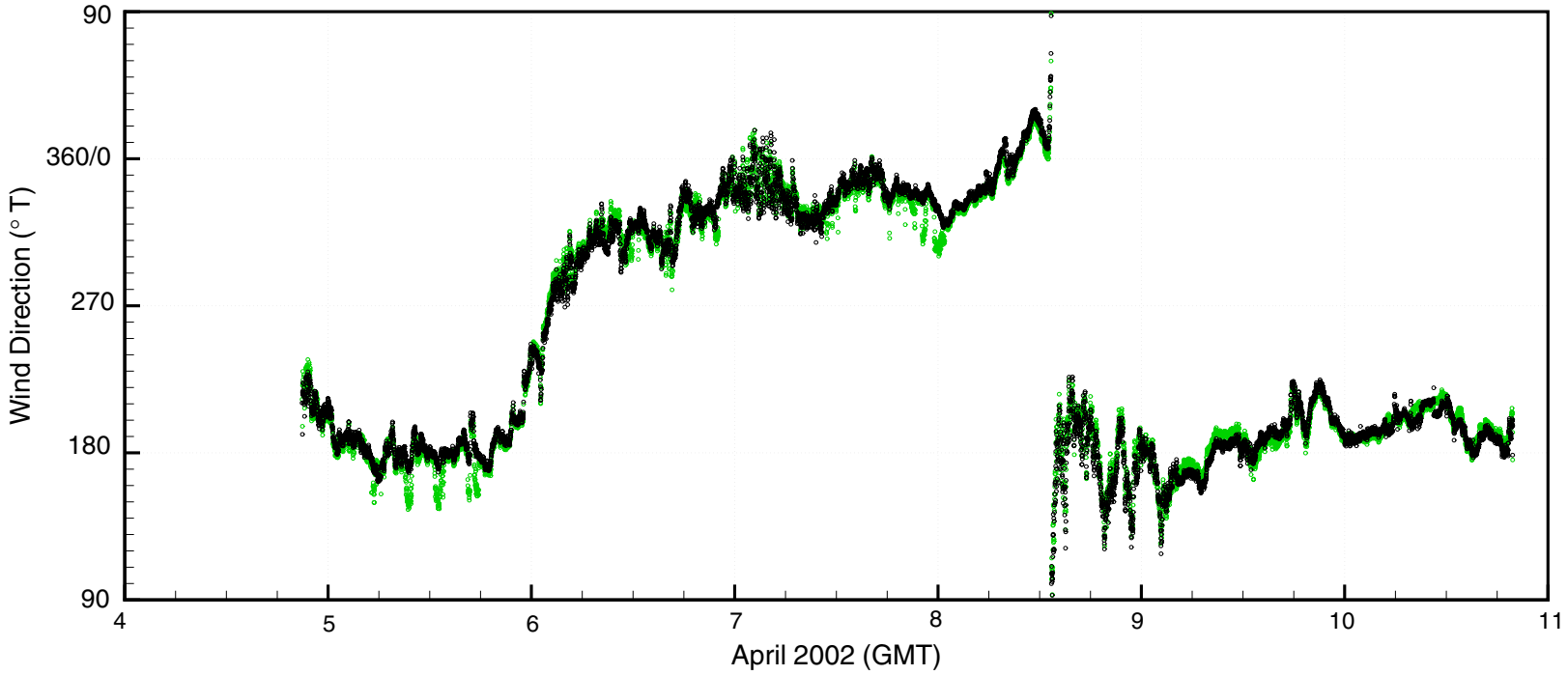
There's a lot of interleaving in the pycnocline, which is manifested most clearly in the temperature inversions between the 8 and 9 C isotherms off Newport, and in oxygen inversions between the 3 and 4 ml/l contours off Rogue River. There seems to be a lot more fine-scale structure than usual, but this will need to be confirmed by quantitative studies, beyond the scope of this preliminary report.

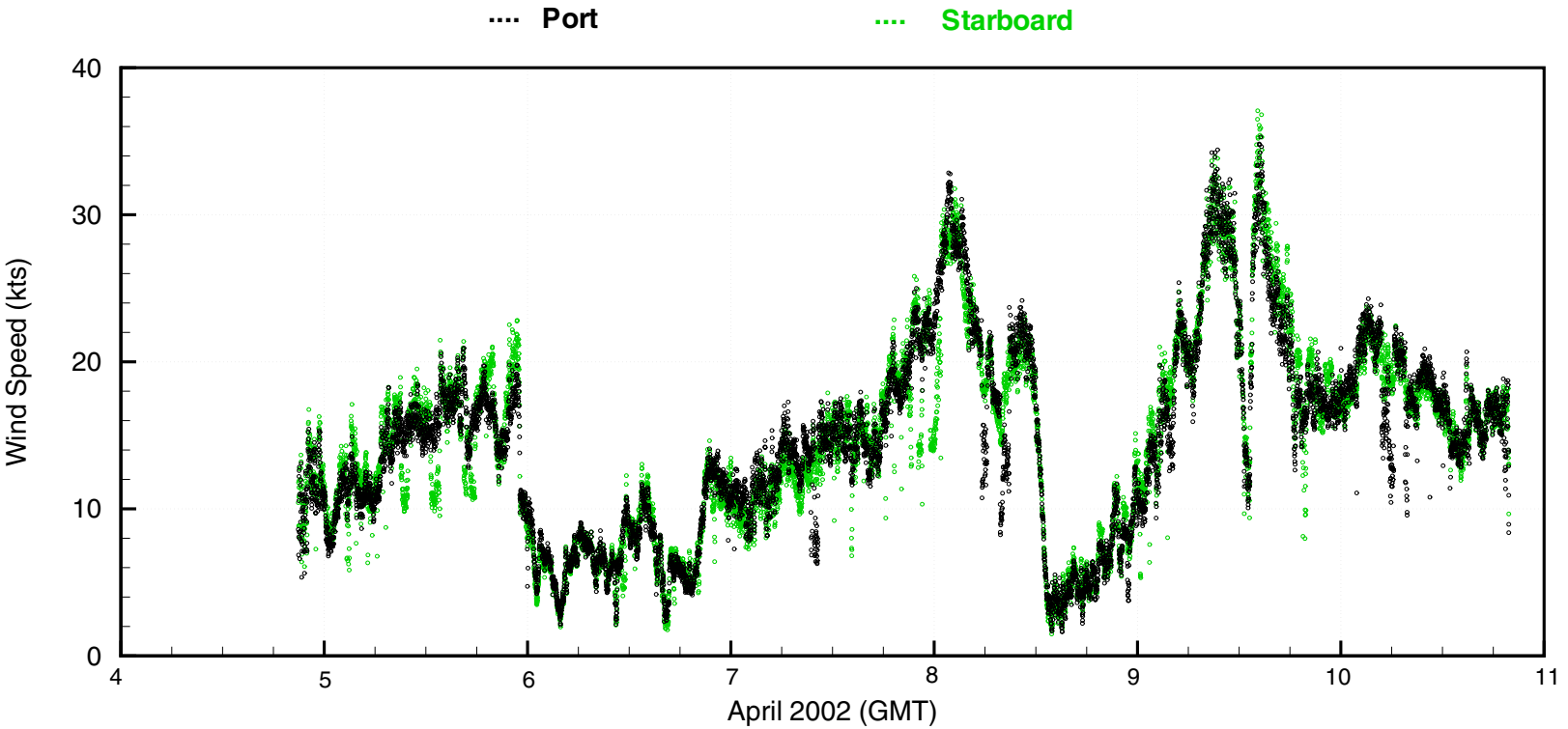
Because of an instrument malfunction, we made a second CTD cast at FM-3 about 35 minutes after the first, and found a remarkably large change in the shape of the temperature, salinity and density profiles (see plots and tabulated data for Stations 19 and 20, Figure 4), though surface and bottom values remained nearly the same. Especially striking is the change in surface layer depth, from less than 4 m to nearly 20 m.

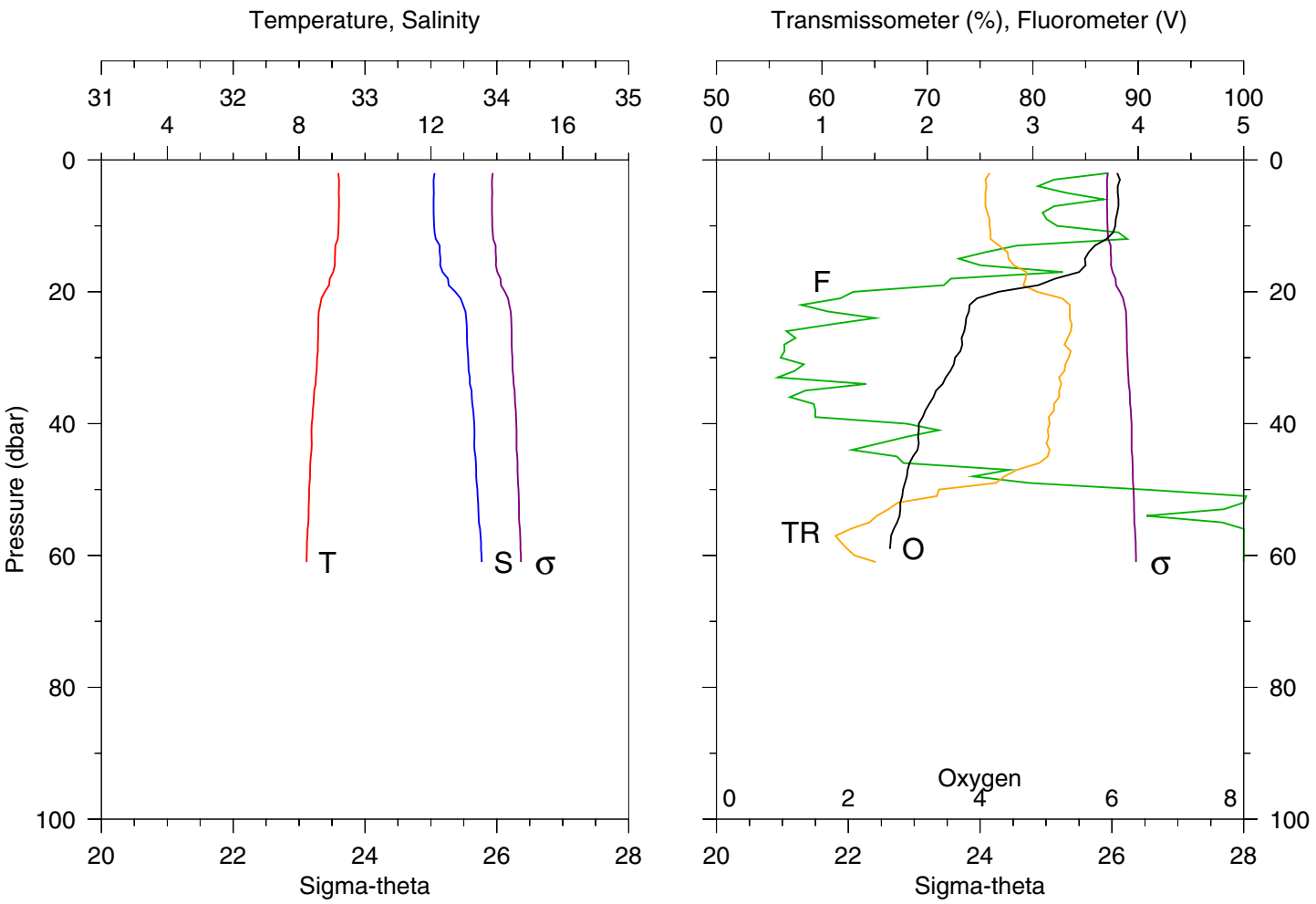
Drifters deployed off Newport show clearly that the southward-flowing jet was constrained to the shelf. The drifters at NH-10 and NH-15 were advected rapidly southward during our cruise, those deployed at NH-25 and NH-45 moved slowing Southwestward, while the one deployed at NH-85 moved slowly northward.

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

Figure 2. W0204A Wind Speed and Direction on R/V Wecoma





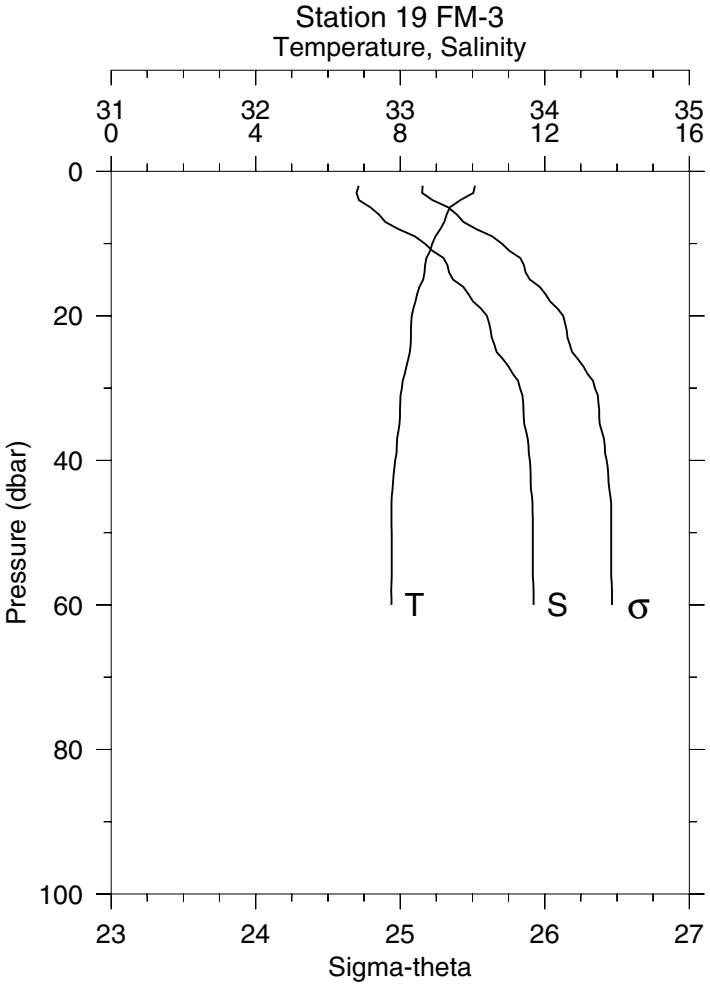


STA NO 31 CR-2 LAT: 41 54.0 N LONG: 124 24.0 W
08 APR 2002 210 GMT DEPTH 68

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	GEO AN (J/KG)	FL (V)	TRN (V)
2	9.186	33.528	9.186	25.937	0.041	3.72	75.90
10	9.198	33.524	9.197	25.932	0.206	3.23	75.90
20	8.783	33.685	8.781	26.123	0.407	1.30	80.40
30	8.546	33.782	8.543	26.236	0.587	0.61	83.40
40	8.385	33.829	8.381	26.297	0.762	1.80	81.60
50	8.305	33.853	8.300	26.329	0.933	4.06	71.10
60	8.229	33.884	8.223	26.364	1.101	5.00	63.10
61	8.230	33.885	8.224	26.365	1.118	5.00	65.10

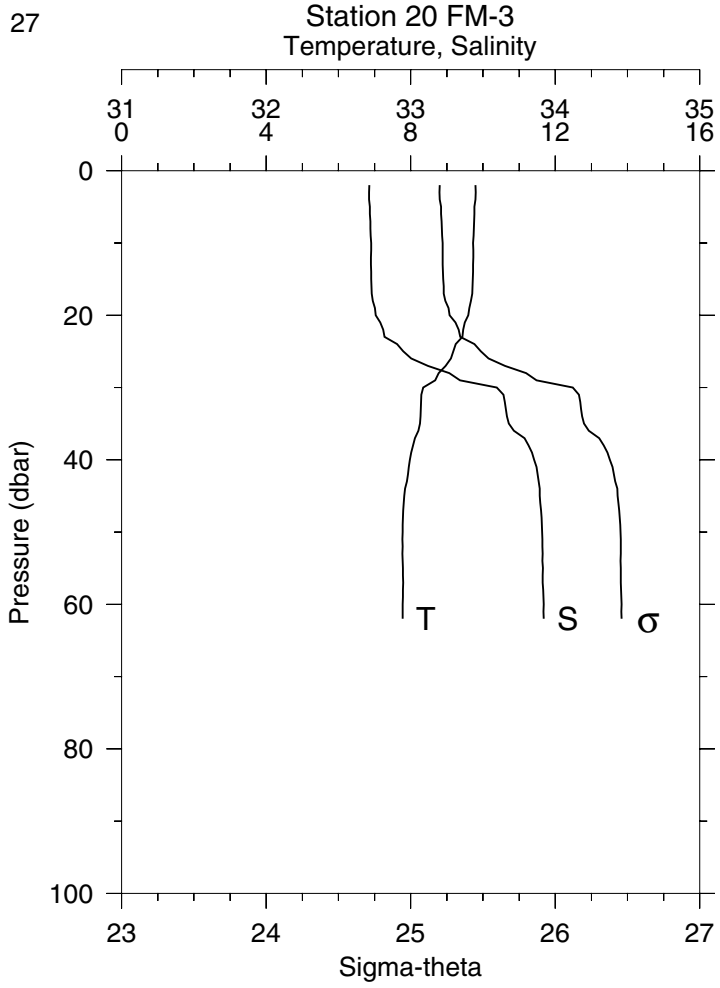
Figure 3. Plots and Data Listing for Station 31.

Figure 4. Plots and Listings for Stations 19 and 20.



STA: 19 FM-3 LAT: 43 13.1 N LONG: 124 30.0 W
06 APR 2002 2213 GMT DEPTH 65

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	10.07	32.713	10.07	25.156	0.056	5.00	61.0
10	8.89	33.170	8.89	25.703	0.262	2.97	76.7
20	8.32	33.599	8.32	26.127	0.470	0.99	82.6
30	8.04	33.829	8.04	26.348	0.649	0.26	85.2
40	7.86	33.897	7.86	26.428	0.812	0.18	85.6
50	7.76	33.917	7.76	26.459	0.970	0.21	83.9
60	7.76	33.923	7.75	26.465	1.127	0.19	84.4



STA: 20 FM-3 LAT: 43 13.1 N LONG: 124 30.0 W
06 APR 2002 2247 GMT DEPTH 66

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	9.80	32.713	9.80	25.201	0.055	5.00	58.8
10	9.73	32.726	9.73	25.222	0.275	5.00	59.5
20	9.60	32.759	9.59	25.269	0.548	5.00	61.9
30	8.35	33.596	8.34	26.121	0.791	2.16	77.9
40	7.98	33.855	7.97	26.379	0.969	0.26	85.1
50	7.78	33.910	7.77	26.452	1.129	0.23	83.7
60	7.78	33.920	7.78	26.459	1.287	0.23	83.8
62	7.78	33.920	7.77	26.459	1.318	0.21	83.9

Table 1. CTD station positions during W0204A, 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	3.1	44.65	-124.10	29	25	N	
NH-3	2	5.4	44.65	-124.13	48	44		
NH-5	3	9.1	44.65	-124.18	59	56	C,Z,N,M	
NH-10	4	18.3	44.65	-124.29	83	80	N,D	
NH-15	5	27.6	44.65	-124.41	92	88	C,Z,N,M,D	
NH-20	6	36.9	44.65	-124.53	143	137	N	
NH-25	7	46.5	44.65	-124.65	295	288	C,Z,N,M,D	
NH-35	8	64.8	44.65	-124.88	437	427	C,Z,N,M	
NH-45	9	83.3	44.65	-125.12	702	680	C,Z,N,M,D	
NH-55	10	103.2	44.65	-125.37	2866	1006	O2	
NH-65	11	121.5	44.65	-125.60	2857	1005	C,Z,N,D	
NH-85	12	157.0	44.65	-126.05	2884	1006	C	
FM-9	13	62.8	43.22	-125.17	1649	1006	C,Z,N	
FM-8	14	49.1	43.22	-125.00	1083	1005	C,Z,N	
FM-7	15	35.7	43.22	-124.83	343	330	C,Z,N,M	
FM-6	16	29.1	43.22	-124.75	317	312	O2	
FM-5	17	22.2	43.22	-124.67	157	151	C,N,M	
FM-4	18	15.2	43.22	-124.58	85	80	C,Z,N,M	
FM-3	19	8.7	43.22	-124.50	65	60	N	
FM-3	20	8.7	43.22	-124.50	66	62	C,Z,M	
FM-1	21	3.3	43.22	-124.43	34	30	N	
CR-11	22	148.5	41.90	-126.00	3329	1005	C,Z,N	
CR-10	23	120.8	41.90	-125.67	2930	1005		
CR-9a	24	98.9	41.90	-125.40	3096	1006	C,Z,N	
CR-8	25	82.2	41.90	-125.20	2723	1005	O2	
CR-7	26	65.7	41.90	-125.00	838	835	C,Z,N	
CR-6	27	49.3	41.90	-124.80	699	690	N,M	
CR-5	28	40.9	41.90	-124.70	658	646	C	
CR-4	29	32.6	41.90	-124.60	504	495	C,Z,N,M	
CR-1	30	7.8	41.90	-124.30	40	35	C,Z,N	
CR-2	31	16.1	41.90	-124.40	68	61	N,M	
CR-3	32	24.4	41.90	-124.50	138	134	C,Z,N,M	
RR-1	33	7.2	42.50	-124.50	37	32	C,Z,N	
RR-2	34	15.6	42.50	-124.60	88	83	C,Z,N,M	
RR-3	35	23.7	42.50	-124.70	135	130	C,Z,N,M	
RR-4	36	32.0	42.50	-124.80	584	570	C,Z,N,M	
RR-5	37	40.0	42.50	-124.90	1158	1005	O2	
RR-6	38	48.3	42.50	-125.00	1768	1006	C,Z,N	
RR-7	39	64.6	42.50	-125.20	2970	1006	C,Z,N	
HH-1	40	5.0	44.00	-124.20	54	48	C,Z,N	
HH-2	41	20.9	44.00	-124.40	120	110	C,Z,N,M	
HH-3	42	36.9	44.00	-124.60	155	151	C,Z,N,M	
HH-4	43	52.8	44.00	-124.80	113	109	C,Z,N,M	
HH-5	44	68.9	44.00	-125.00	927	925	C,Z,N,M	
HH-7	45	84.8	44.00	-125.20	1687	1006	C,Z	
HH-9□	46□	108.9□	44.00□	-125.40□	3016□	1005□	C,Z	

Table 2: Actual sample depths and types of subsamples for biochemical sampling during the April '02 LTOP GLOBEC cruise.

Station	**Sample Collection Depths (m)**	**Type of Sample Collected**
NH-05	56, 50, 40, 30, 25, 20, 15, 10, 5, 1	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
NH-15	88, 74, 70, 60, 50, 40, 30, 20, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
NH-25	200, 150, 100, 70, 50, 40, 30, 20, 17, 10, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 200 and 150 m)
NH-35	427, 250, 150, 100, 70, 50, 40, 30, 20, 10, 5, 1	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 427, 250 and 150 m)
NH-45	680, 499, 150, 100, 69, 50, 40, 30, 25, 19, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 680, 499 and 150m)
NH-65	1005, 600, 150, 100, 70, 50, 40, 30, 20, 15, 10, 1	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 1005, 600 and 150m)
NH-85	1005, 285, 150, 100, 70, 50, 40, 30, 20, 10, 4, 1	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 1005, 285 and 150 m)
FM-3	60, 55, 50, 40, 30, 25, 20, 15, 10, 5, 1	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
FM-4	80, 70, 60, 50, 41, 30, 20, 10, 5, 1	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON
FM-5	151, 100, 70, 60, 50, 40, 30, 20, 10, 5, 2	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 151m)
FM-7	300, 150, 100, 70, 50, 38, 31, 19, 14, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths) both Chl, POC/PON (except 300 and 150m)
FM-8	1000, 850, 150, 100, 70, 50, 40, 30, 20, 10, 5, 1	TOC (surface), Nutrients, TN (surface) both Chl, POC/PON (except 1000, 850, and 150m)
FM-9	1000, 965, 150, 100, 70, 50, 40, 30, 20, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths) both Chl, POC/PON (except 1000, 965, and 150m)

Table 2 cont.

CR-1	35, 30, 25, 20, 15, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
CR-3	133, 100, 70, 60, 50, 40, 30, 20, 10, 5, 2	TOC (surface), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
CR-4	495, 450, 150, 100, 70, 50, 40, 30, 25, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 495, 450, and 150m)
CR-5	645, 500, 400, 150, 100, 70, 50, 40, 30, 20, 10, 1	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 645, 500, 400 and 150m)
CR-7	835, 500, 150, 100, 70, 50, 40, 30, 20, 10, 5, 1	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 835, 500 and 150m)
CR-9a	1005, 770, 150, 100, 70, 50, 40, 30, 20, 10, 4, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 1005, 770 and 150m)
CR-11	1000, 390, 150, 100, 70, 50, 40, 30, 20, 15, 10, 1	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 1000, 390 and 150m)

RR-1	32, 30, 25, 20, 15, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
RR-2	83, 70, 60, 50, 40, 30, 20, 10, 5, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths)
RR-3	120, 70, 60, 50, 40, 30, 20, 15, 10, 5, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths)
RR-4	500, 450, 150, 100, 70, 50, 40, 30, 20, 10, 5, 1	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 500, 450, and 150 m)
RR-6	1005, 200, 150, 100, 70, 50, 40, 30, 25, 20, 10, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 1005, 200, and 150 m)
RR-7	1006, 830, 150, 99, 70, 50, 30, 25, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 1006, 830 and 150)

Table 2 cont.

HH-1	48, 40, 29, 25, 20, 15, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
HH-2	100, 70, 60, 50, 40, 30, 24, 20, 10, 4, 3	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths)
HH-3	144, 125, 100, 69, 59, 50, 40, 30, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths)
HH-4	110, 95, 70, 60, 50, 40, 30, 20, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths)
HH-5	820, 500, 150, 100, 70, 50, 40, 30, 25, 20, 10, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (all depths) (except 820, 500, and 150 m)
HH-7	1005, 900, 150, 70, 50, 40, 30, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 1005, 900, and 150)
HH-9	1004, 910, 150, 99, 70, 50, 45, 40, 30, 20, 10, 1	TOC (surface), Nutrients, TN (surface), both Chl and POC/PON (all depths) (except 1004, 910, and 150)

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

Table 3. R/V WECOMA Cruise W0204A

	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)		
4-Apr	2057												Start DAS	
	2145												Start echosounder	
	2156												Depart Newport	
	2159												Start ADCP	
	2200												air calibration of transmissometer	
	2228												Start flo-thru	
	2228												Start flo-thru fluorometer	
4-Apr	2320		1	NH-1	44	39.1	-124	06.1	29	1017.0	205	12	CTD	WE09402.1
	2332	2336			44	39.1	-124	06.1					vertical net tow, 25m	WE09402.2
	2359		2	NH-3	44	39.1	-124	07.8	48	1016.5	200	10	CTD	WE09402.3
5-Apr	0021				44	39.3	-124	08.0					HTI deployed	WE09502.1
													changed to Simrad altimeter	
	0053		3	NH-5	44	39.1	-124	10.6	59	1016.5	200	11	CTD with biochem, mzp	WE09502.2
	0109	0113			44	39.1	-124	10.6					vertical net tow, 55 m	WE09502.3
	0114	0113			44	39.0	-124	10.6					Secchi disk	WE09502.4
	0125				44	38.9	-124	10.7					Mocness deployed	WE09502.5
		0151			44	38.2	-124	11.1					Mocness aboard	WE09502.6
	0240		4	NH-10	44	39.0	-124	17.7	83	1016.2	185	10	CTD	WE09502.7
	0256	0300			44	38.8	-124	17.8					vertical net tow, 76 m	WE09502.8
	0303				44	38.68	-124	18.07					drifter 35894 deployed	WE09502.9
	0351		5	NH-15	44	39.0	-124	24.7	92	1015.8	180	11	CTD with biochem, mzp	WE09502.10
	0414	0419			44	39.0	-124	24.7					vertical net tow, 88 m	WE09502.11
	0432				44	38.8	-124	25.1					Mocness deployed	WE09502.12
		0501			44	38.0	-124	26.1					Mocness aboard	WE09502.13
	0507				44	37.96	-124	26.28					drifter 35895 deployed	WE09502.14
	0547		6	NH-20	44	39.1	-124	31.7	143	1016.0	160	10	CTD	WE09502.15
	0607	0612			44	39.1	-124	31.7					vertical net tow, 100 m	WE09502.16
	0702		7	NH-25	44	39.1	-124	39.0	295	1016.1	180	14	CTD with biochem, mzp	WE09502.17
	0730	0736			44	39.2	-124	39.0					vertical net tow, 100 m	WE09502.18
	0745				44	39.0	-125	39.1					Mocness deployed	WE09502.19
		0851			44	36.6	-124	41.1					Mocness aboard	WE09502.20
	0858				44	36.52	-124	41.33					Drifter 35986 deployed	WE09502.21
	1017		8	NH-35	44	39.1	-124	52.9	437	1015.9	170	18	CTD with biochem, mzp	WE09502.22
	1052	1058			44	39.1	-124	52.8					vertical net tow, 100 m	WE09502.23
	1105				44	39.1	-124	52.8					Mocness deployed	WE09502.24
		1216			44	36.3	-124	55.4					Mocness aboard	WE09502.25
	1347		9	NH-45	44	39.1	-125	07.0	702	1014.2	175	18	CTD with biochem	WE09502.26

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-Apr	1427	1435			44	39.1	-125	07.0					vertical net tow, 100 m	WE09502.27
	1444				44	38.9	-125	07.0					Mocness deployed	WE09502.28
	1445												cleaned flo-thru fluorometer	
		1622			44	34.8	-125	08.3					Mocness aboard	WE09502.29
	1626				44	34.75	-125	08.44					drifter 35897 deployed	WE09502.30
	1756			NH-55	44	39.1	-125	22.0					HTI recovered	WE09502.31
	1808		10	NH-55	44	39.1	-125	22.0	2866	1015.2	175	16	CTD with oxygen	WE09502.32
	1930												cleaned flo-thru filters	
	2009		11	NH-65	44	39.1	-125	36.0	2857	1015.1	190	17	CTD with biochem, mzp	WE09502.33
	2102	2109			44	39.1	-125	36.0					vertical net tow, 100 m	WE09502.34
	2116				44	39.07	-125	36.02					drifter 35898 deployed	WE09502.35
	2313		12	NH-85	44	39.1	-126	02.9	2884	1014.8	200	18	CTD with biochem	WE09502.36
6-Apr	0008												transit to FM-Line	
	0252												air calibration of transmissometer	
	0831		13	FM-9	43	13.0	-125	10.1	1649	1018.2	310	7	CTD with biochem, mzp	WE09602.1
	0921	0926			43	13.0	-125	10.0					vertical net tow, 100 m	WE09602.2
	0929	0935			43	13.1	-125	10.1					vertical net tow for M. Ohman, 100 m	WE09602.3
	1032		14	FM-8	43	12.9	-125	00.0	1083	1018.3	320	6	CTD with biochem, mzp	WE09602.4
	1120	1125			43	13.0	-125	00.0					vertical net tow, 100 m	WE09602.5
	1135				43	13.0	-125	00.0					HTI deployed	WE09602.6
	1249		15	FM-7	43	13.0	-124	50.0	343	1018.5	320	8	CTD with biochem, mzp	WE09602.7
	1323	1328		FM-7	43	13.0	-124	50.0					vertical net tow, 100 m	WE09602.8
	1337				43	13.1	-124	50.3					Mocness deployed	WE09602.9
		1457			43	16.0	-124	51.9					Mocness aboard	WE09602.10
	1500												cleaned flo-thru fluorometer	
	1508				43	16.1	-124	52.1					HTI recovered for inspection (noisy)	WE09602.11
	1514				43	16.0	-124	52.1					HTI redeployed looks fine)	WE09602.12
	1614		16	FM-6	43	13.0	-124	45.1	317	1020.5	310	3	CTD with oxygen	WE09602.13
	1723		17	FM-5	43	13.0	-124	40.0	157	1021.2	340	6	CTD with biochem	WE09602.14
	1746	1753			43	13.0	-124	40.0					vertical net tow, 100 m	WE09602.15
	1801				43	13.1	-124	40.1					Mocness deployed	WE09602.16
		1856			43	15.3	-124	41.4					Mocness aboard	WE09602.17
	2000		18	FM-4	43	13.0	-124	34.9	85	1021.2	340	5	CTD with biochem, mzp	WE09602.18
	2030	2035			43	13.0	-124	34.7					vertical net tow, 77m	WE09602.19
	2034												cleaned flo-thru filters	
	2054				43	13.0	-124	34.7					Mocness deployed	WE09602.20
		2128			43	14.2	-124	34.9					Mocness aboard	WE09602.21
	2213		19	FM-3	43	13.0	-124	30.0	65	1021.2	340	11	CTD; rosette malfunctioned	WE09602.20
	2230	2234			43	13.0	-124	30.0					vertical net tow, 60m	WE09602.21

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)		
6-Apr	2237	2241			43	12.9	-124	30.0					vertical net tow for M. Ohman, 50m	WE09602.24
	2247		20	FM-3	43	13.0	-124	30.0	66				CTD with biochem, mzp	WE09602.25
	2304				43	12.9	-124	30.0					Mocness deployed	WE09602.26
		2328			43	13.3	-124	31.2					Mocness aboard	WE09602.27
	2338				43	13.3	-124	31.4					HTI recovered	WE09602.28
7-Apr	0022		21	FM-1	43	13.0	-124	26.0	34	1021.1	330	11	CTD	WE09702.1
	0035	0037			43	13.0	-124	26.0					vertical net tow, 30 m	WE09702.2
	0038												begin transit to CR-11	
	0313												cleaned flo-thru filters	
	0321												air calibration of transmissometer	
	0944	1028	22	CR-11	41	54.0	-126	00.0	3329	1021.7	325	14	CTD with biochem, mzp	WE09702.3
	1037	1044			41	54.0	-126	00.0					vertical net tow,100m	WE09702.4
	1222		23	CR-10	41	54.0	-125	39.9	2930	1020.5	335	15	CTD	WE09702.5
	1426		24	CR-9a	41	54.0	-125	24.0	3096	1020.5	340	15	CTD with biochem, mzp	WE09702.3
	1522	1528			41	54.0	-125	24.0					vertical net tow, 100m	WE09702.6
	1531	1537			41	54.0	-125	24.0					vertical net tow, 100m for Mark Ohman	WE09702.7
	1636	1724	25	CR-8	41	54.0	-125	12.0	2723	1020.9	345	13	CTD with oxygen	WE09702.8
	1824	1904	26	CR-7	41	54.0	-125	00.0	838	1021.0	335	17	CTD with biochem, mzp	WE09702.9
	1908	1913			41	53.9	-125	00.0					vertical net tow, 100 m	WE09702.10
	2016	2047	27	CR-6	41	54.0	-124	48.0	706	1021.0	335	18	CTD	WE09702.11
	2126	2200	28	CR-5	41	54.0	-124	42.0	658	1019.5	345	18	CTD with biochem	WE09702.12
	2255	2328	29	CR-4	41	54.0	-124	36.0	504	1018.6	325	23	CTD with biochem, mzp	WE09702.13
	2348												cleaned flo-thru filters	
	2356												cleaned flo-thru fluorometer	
8-Apr	0056	0106	30	CR-1	41	54.0	-124	17.9	40	1015.9	320	27	CTD with biochem, mzp	WE09802.1
	0111	0113			41	54.0	-124	18.0					vertical net tow, 35 m	WE09802.2
	0125				41	54.0	-124	18.1					HTI deployed	WE09802.3
	0210	0219	31	CR-2	41	54.0	-124	24.0	68	1016.2	335	23	CTD	WE09802.4
	0226	0229			41	54.0	-124	24.0					vertical net tow, 60m	WE09802.5
	0232	0235			41	54.1	-124	24.0					vertical net tow for M. Ohman, 62m	WE09802.6
	0244				41	54.3	-124	24.0					Mocness deployed	WE09802.7
		0308			41	55.1	-124	24.2					Mocness aboard	WE09802.8
	0416	0432	32	CR-3	41	54.0	-124	30.0	135	1016.2	335	23	CTD with biochem, mzp	WE09802.9
	0437	0443			41	54.0	-124	30.0					vertical net tow, 100m	WE09802.10
	0452				41	54.0	-124	30.0					Mocness deployed	WE09802.11
		0530			41	55.3	-124	31.4					Mocness recovered	WE09802.12
	0620	0626		CR-4	41	54.0	-124	36.0		1016.3	340	22	vertical net tow, 100 m	WE09802.13
	0633				41	54.1	-124	36.1					Mocness deployed	WE09802.14
		0739			41	56.8	-124	37.6					Mocness aboard	WE09802.15

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)		
8-Apr	0856	0900		CR-6	41	53.9	-124	47.9		1016.2	335	23	vertical net tow, 100 m	WE09802.16
	0910				41	53.9	-124	48.0					Mocness deployed	WE09802.17
		1010			41	55.7	-124	50.0					Mocness aboard	WE09802.18
	1019				41	55.7	-124	50.2					HTI recovered	WE09802.19
	1025												begin transit to RR line	
	1350												air calibration of transmissometer	
	1504		33	RR-1	42	30.0	-124	30.0	37	1014.4	160	3	CTD with biochem, mzp	WE09802.20
	1517	1520			42	30.0	-124	30.0					vertical net tow, 30 m	WE09802.21
	1528				42	30.0	-124	30.0					HTI deployed	WE09802.22
	1610	1623	34	RR-2	42	30.0	-124	36.0	88	1014.9	200	5	CTD with biochem, mzp	WE09802.23
	1628	1633			42	30.0	-124	36.0					vertical net tow, 83 m	WE09802.24
	1640				42	30.0	-124	36.0					Mocness deployed	WE09802.25
		1714			42	31.5	-124	36.2					Mocness aboard	WE09802.26
	1801	1819	35	RR-3	42	30.0	-124	42.0	135	1015.4	200	4	CTD with biochem, mzp	WE09802.27
	1822	1828			42	30.0	-124	42.1					vertical net tow, 100 m	WE09802.28
	1834				42	30.1	-124	42.1					Mocness deployed	WE09802.29
		1912			42	31.3	-124	41.2					Mocness aboard	WE09802.30
	2005	2037	36	RR-4	42	30.0	-124	48.1	584	1015.2	157	7	CTD with biochem, mzp	WE09802.31
	2041	2047			42	29.9	-124	48.2					vertical net tow, 100 m	WE09802.32
	2056				42	30.0	-124	48.2					Mocness deployed	WE09802.33
		2205			42	32.7	-124	48.6					Mocness aboard	WE09802.34
	2211				42	32.7	-125	48.6					HTI recovered	WE09802.35
	2251	2342	37	RR-5	42	30.0	-124	54.0	1158	1015.2	150	8	CTD with oxygen	WE09802.36
9-Apr	0020	0112	38	RR-6	42	30.0	-125	00.0	1768	1014.0	180	12	CTD with biochem, mzp	WE09902.1
	0118	0123			42	30.0	-124	00.1					vertical net tow, 100 m	WE09902.2
	0224	0318	39	RR-7	42	30.0	-125	12.0	2970	1013.2	140	10	CTD with biochem, mzp	WE09902.3
	0322	0329			42	29.9	-125	12.0					vertical net tow,100 m	WE09902.4
	0335												begin transit to HH-7	
	1245	1258	40	HH-1	44	00.1	-124	12.0	54	1012.5	180	19	CTD with biochem, mzp	WE09902.5
	1301	1304			44	00.0	-124	12.0					vertical net tow, 48m	WE09902.6
	1420	1438	41	HH-2	44	00.0	-124	24.0	120	1012.0	190	30	CTD with biochem, mzp	WE09902.7
	1443	1448			44	00.0	-124	23.9					vertical net tow, 100 m	WE09902.8
	1619	1636	42	HH-3	44	00.0	-124	35.9	155	1012.6	190	24	CTD with biochem, mzp	WE09902.9
	1752	1806	43	HH-4	44	00.0	-124	47.9	113	1013.2	210	24	CTD with biochem, mzp	WE09902.10
	1919	2004	44	HH-5	44	00.0	-125	00.0	927	1012.8	205	18	CTD with biochem, mzp	WE09902.11
	2110	2158	45	HH-7	44	00.0	-125	12.0	1687	1014.0	205	15	CTD with biochem, mzp	WE09902.12
	2305	2354	46	HH-9	44	00.0	-125	24.0	3016	1015.1	200	17	CTD with biochem, mzp	WE09902.13
10-Apr	0000												transit to HH-5 for Mocness section	
	0044												air calibration of transmissometer	

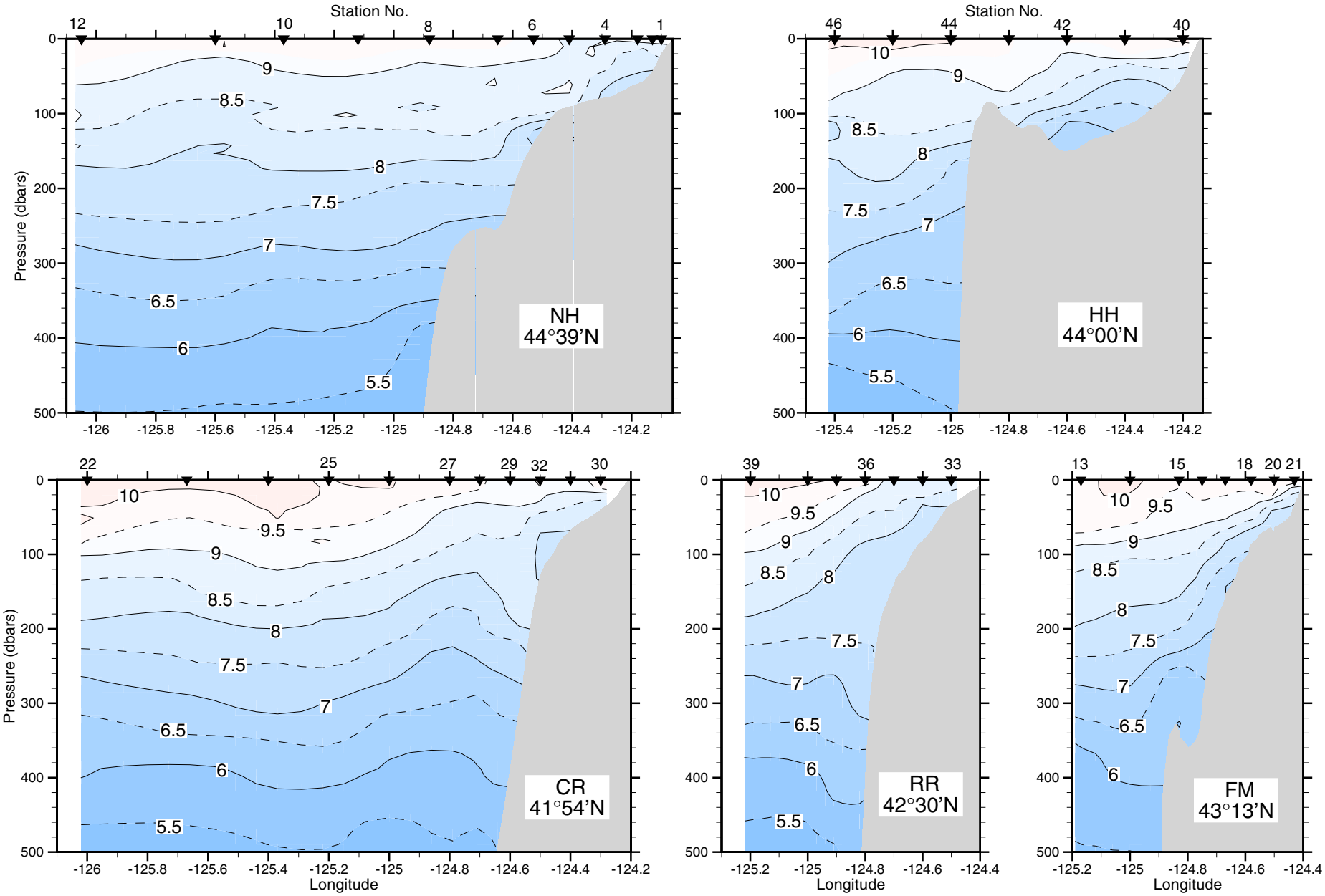
Table 3 cont.

	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)		
10-Apr	0155												arrive HH-5	
	0203			HH-5	44	00.0	-125	00.0		1016.0	185	18	HTI deployed	WE10002.1
	0320	0326			44	00.0	-124	59.9		1016.6	190	21	vertical net tow, 100 m	WE10002.2
	0335				43	59.9	-125	00.0					Mocness deployed	WE10002.3
		0439			43	57.7	-125	00.0					Mocness aboard	WE10002.4
	0621	0628		HH-4	44	00.0	-124	48.0		1018.4	200	21	vertical net tow, 100 m	WE10002.5
	0637				43	59.8	-124	48.1					Mocness deployed	WE10002.6
		0712			43	58.6	-124	48.7					Mocness aboard	WE10002.7
	0911			HH-3	43	59.4	-124	35.7		1018.8	205	20	vertical net tow, 100 m	WE10002.8
	0925				43	59.1	-124	35.6					Mocness deployed	WE10002.9
		1021			43	56.9	-124	35.6					Mocness aboard	WE10002.10
	1211			HH-2	44	01.2	-124	23.9		1020.5	210	18	Mocness deployed	WE10002.11
		1249			43	59.7	-124	24.1					Mocness aboard	WE10002.12
	1306	1313			44	00.0	-124	24.0					vertical net tow, 100 m	WE10002.13
	1419				44	01.3	-124	24.1		1021.2	190	16	Mocness deployed	WE10002.14
		1456			43	59.8	-124	24.0					Mocness aboard	WE10002.15
	1506				44	00.0	-124	24.3					HTI recovered	WE10002.16
	1510												begin transit to Newport	
	1914												shut down flow through system	
	1920												shut down echosounder	
	1949												shut down DAS	
	1949												shut down ADCP	
	2000												arrive at pier in Newport	

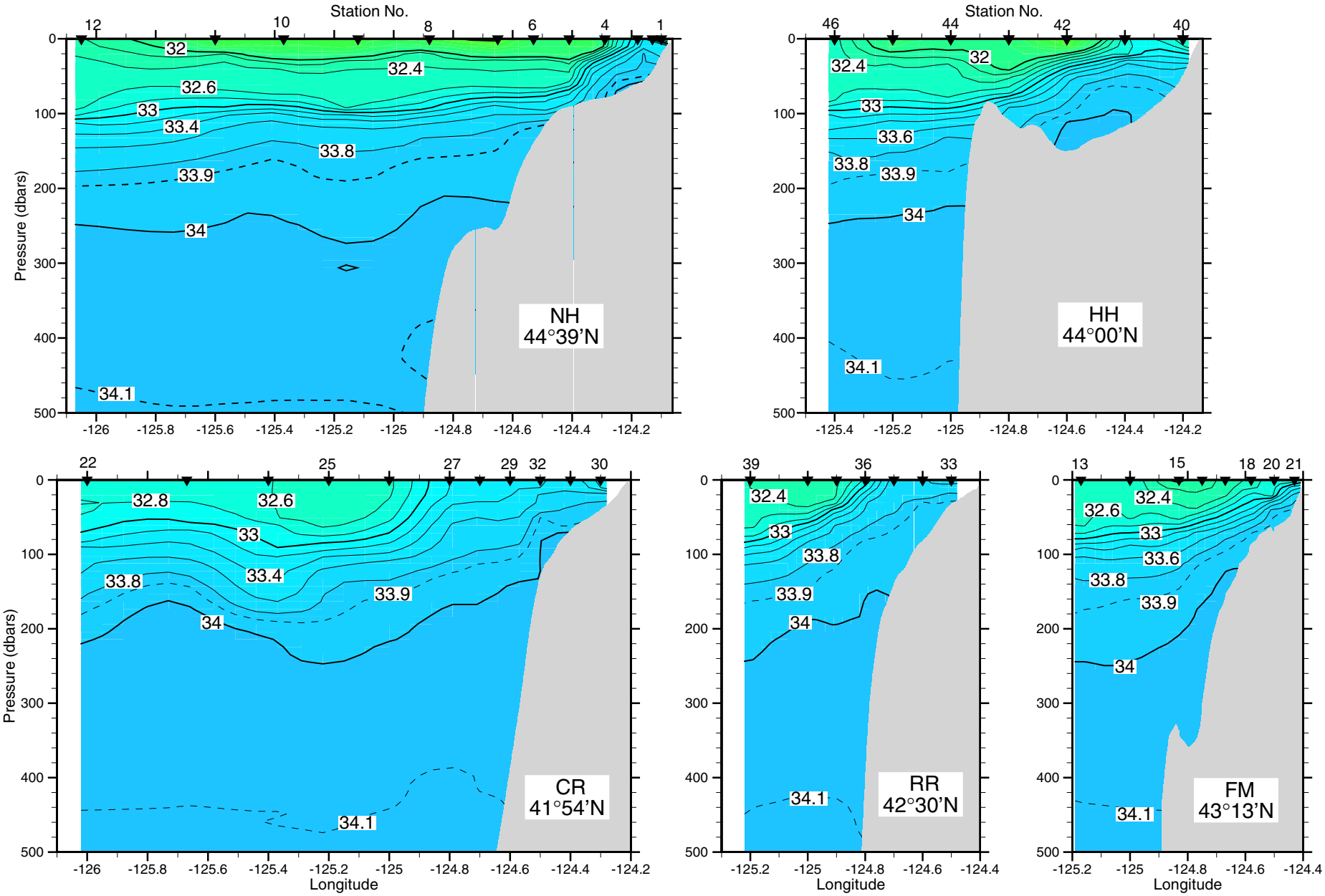
Table 4. Names, affiliations, and responsibilities of scientific personnel participating on W0204A.

Robert L. Smith	Chief Scientist	OSU	CTD
Adriana Huyer	Co-Chief Scientist	OSU	CTD
Jane Fleischbein	Technician	OSU	CTD, oxygen
Margaret Sparrow	Technician	OSU	CTD
Kathryn Brooksforce	Technician	OSU	CTD
Mike Wetz	Graduate Student	OSU	nuts, chl
Julie Arrington	Technician	OSU	nuts, chl
Jennifer Harman	Technician	OSU	nuts, chl
Carrie Newell	Graduate Student	OSU	nuts, chl
Carlos López	Technician	OSU	microzooplankton
Anders Roestad	Technician	ODFW	zooplankton
Julie Keister	Technician	HMSC	zooplankton
Carolyn Tracy Shaw	Technician	HMSC	zooplankton
Mitch Vance	Technician	OSU	zooplankton
Linda Fayler	Technician	OSU	martec
Daryl Swensen	Technician	OSU	martec

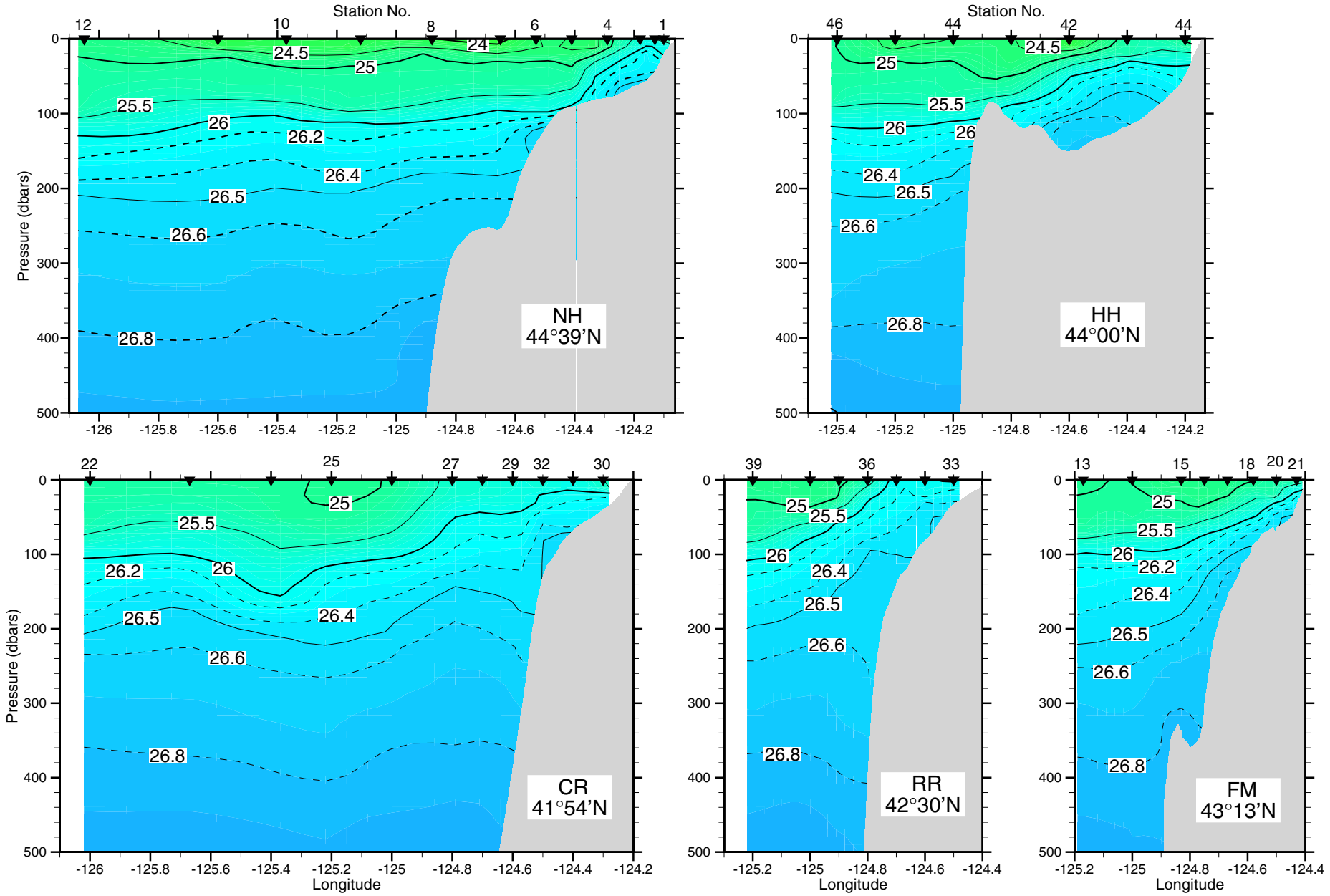
Temperature, 4-9 April 2002



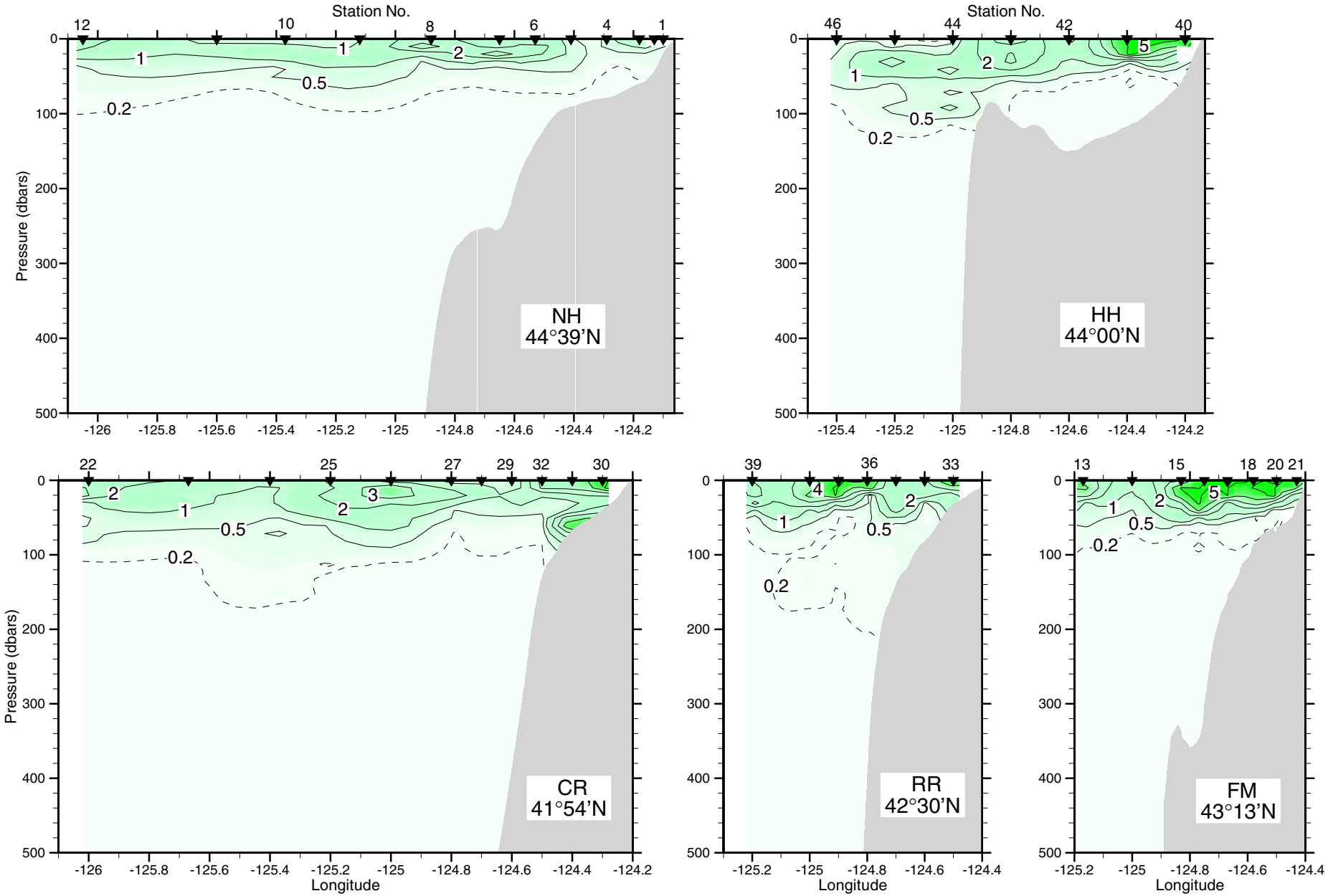
Salinity, 4-9 April 2002



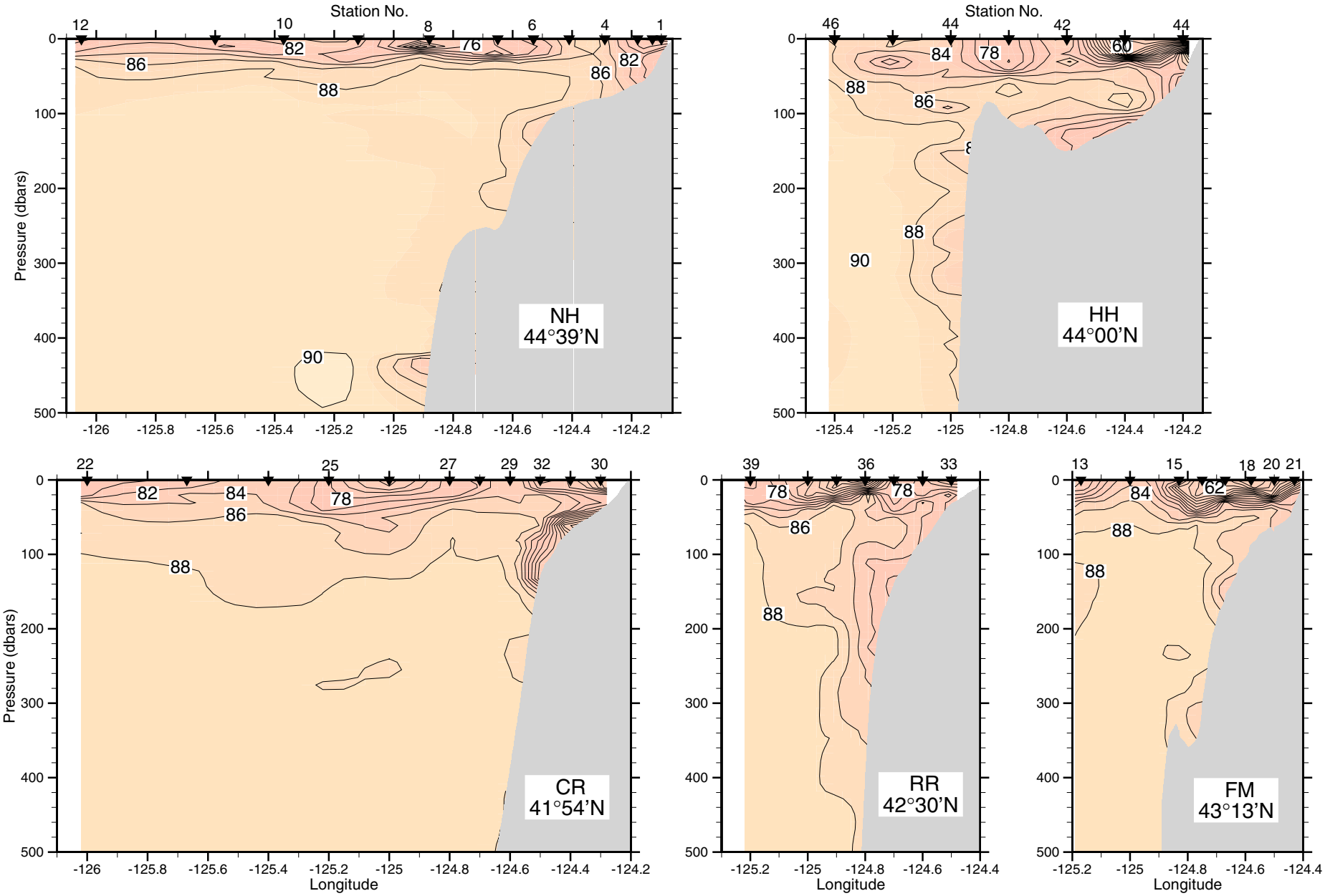
Sigma-theta, 4-9 April 2002



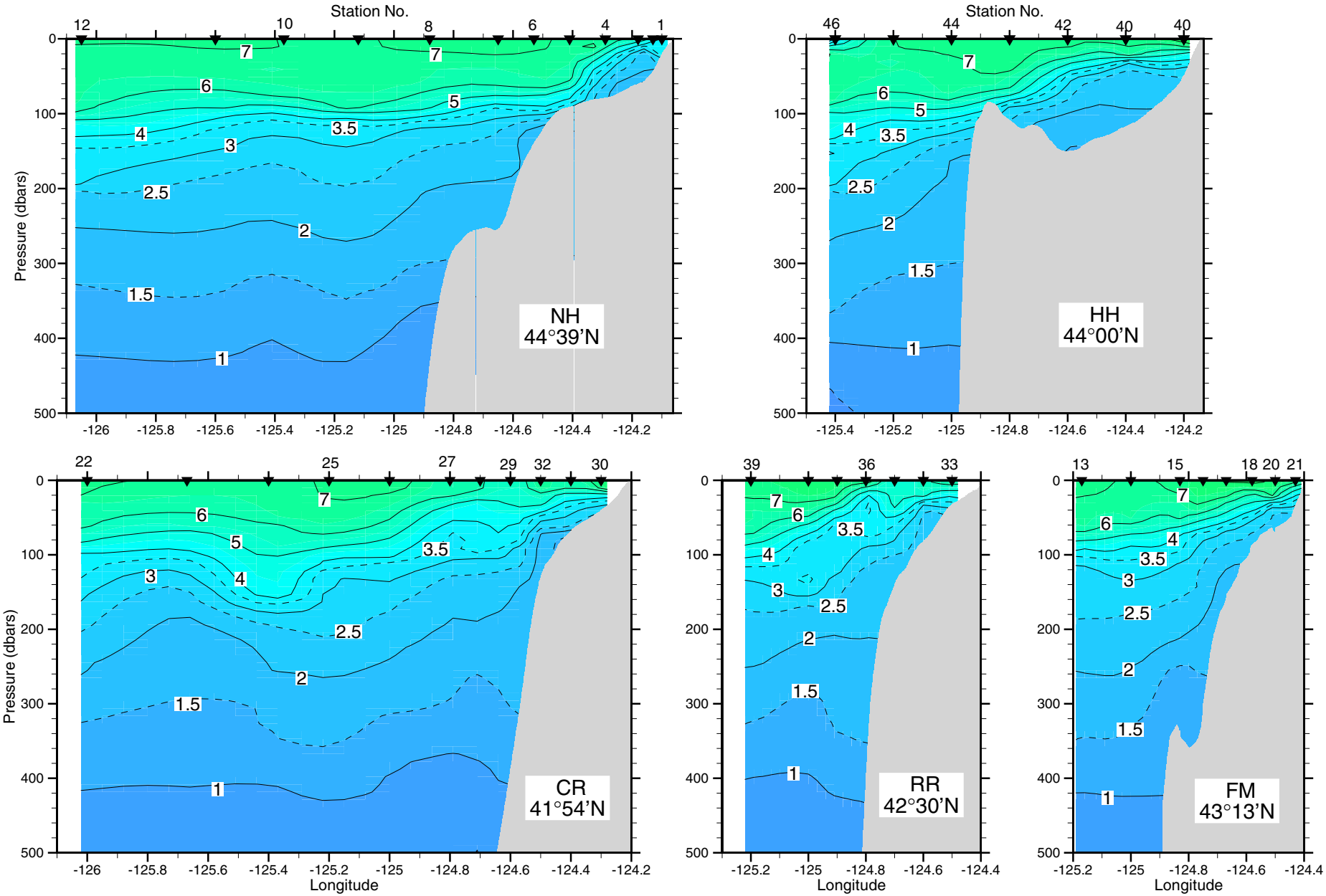
Fluorescence Voltage, 4-9 April 2002



% Light Transmission, 4-9 April 2002



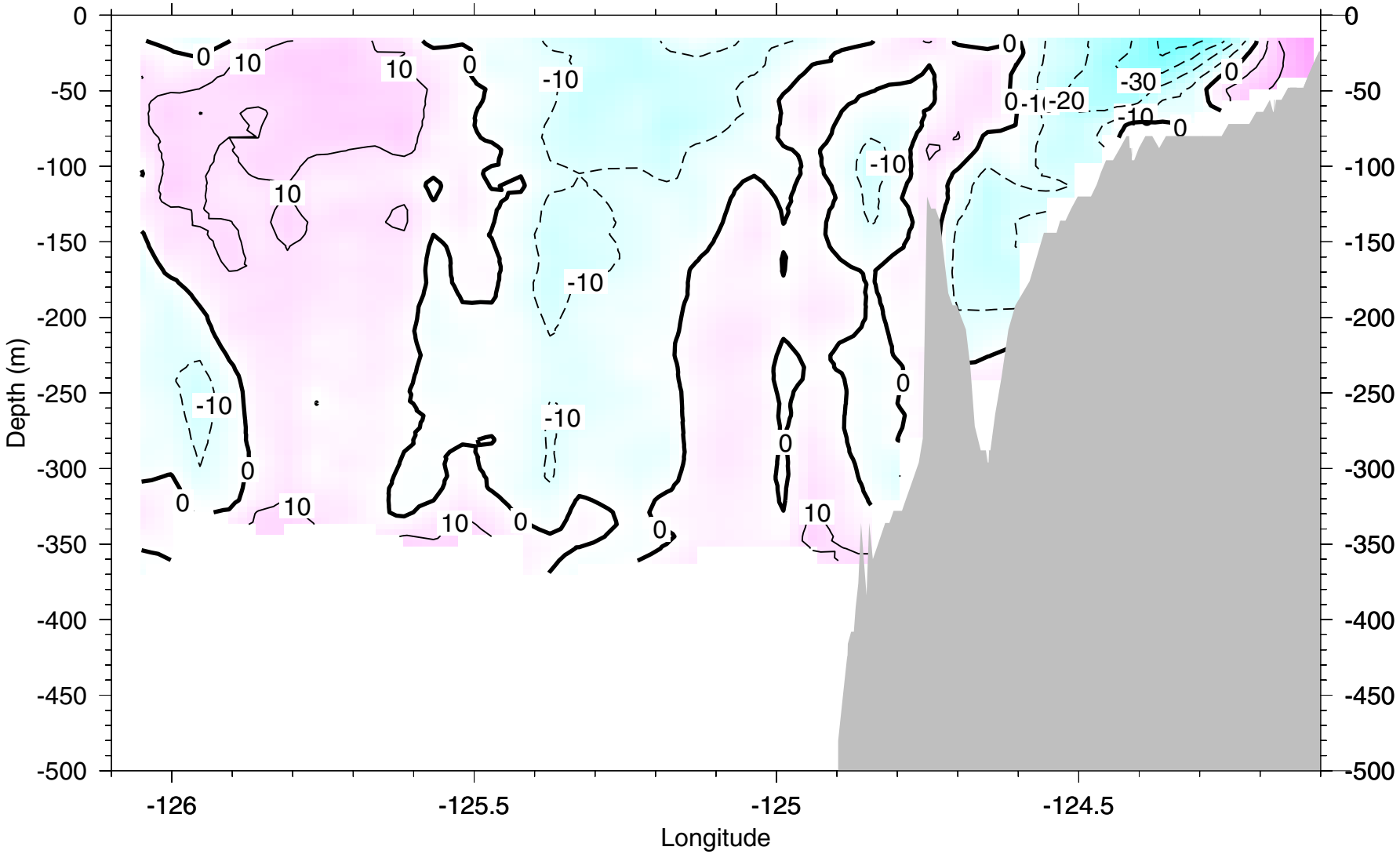
Oxygen, 4-9 April 2002



Newport Hydrographic Line 44.6°N

4-5 April 2002

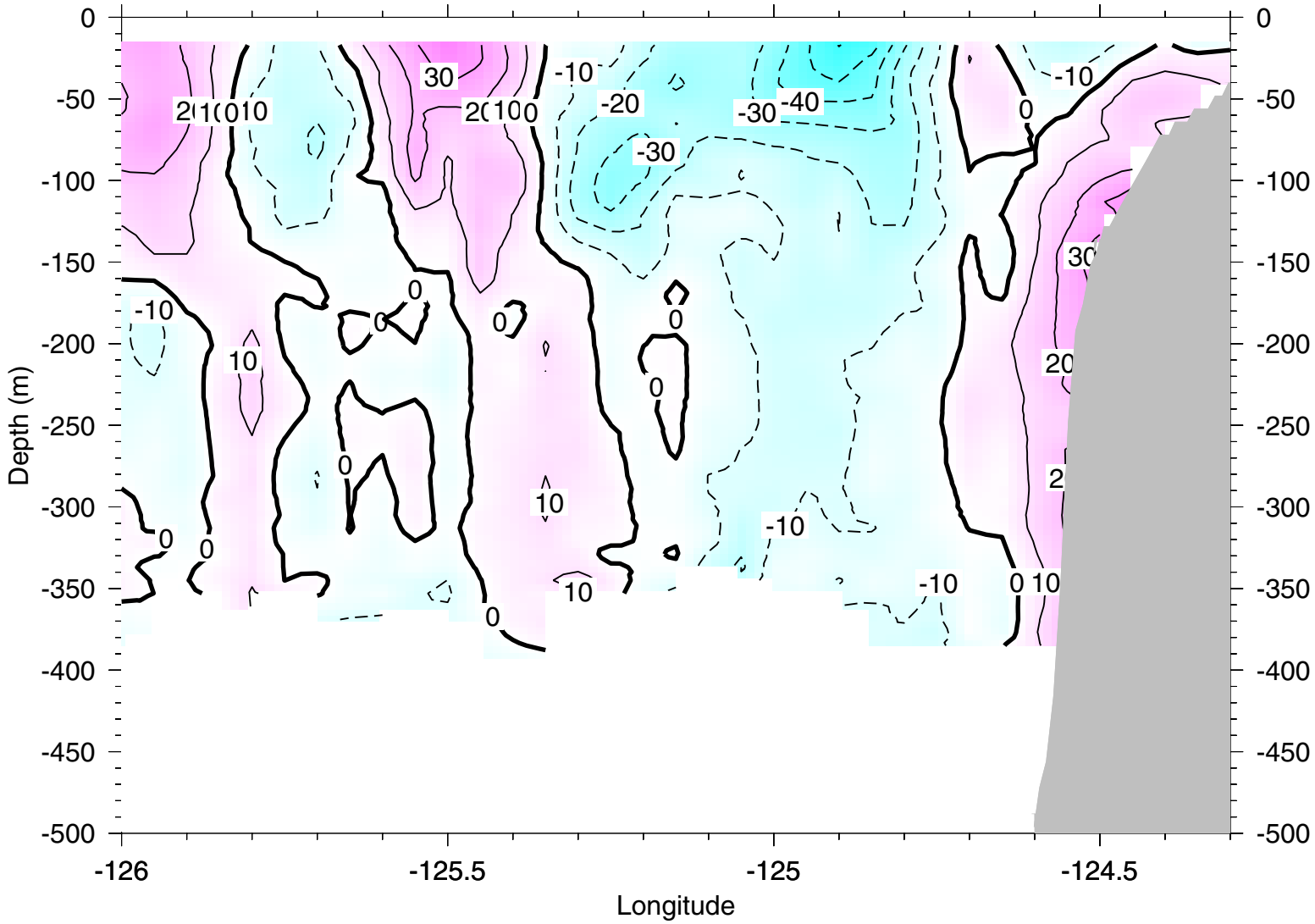
ADCP: Northward current (cm/s)



Crescent City Hydrographic Line 41.9°N

07-08 Apr 2002

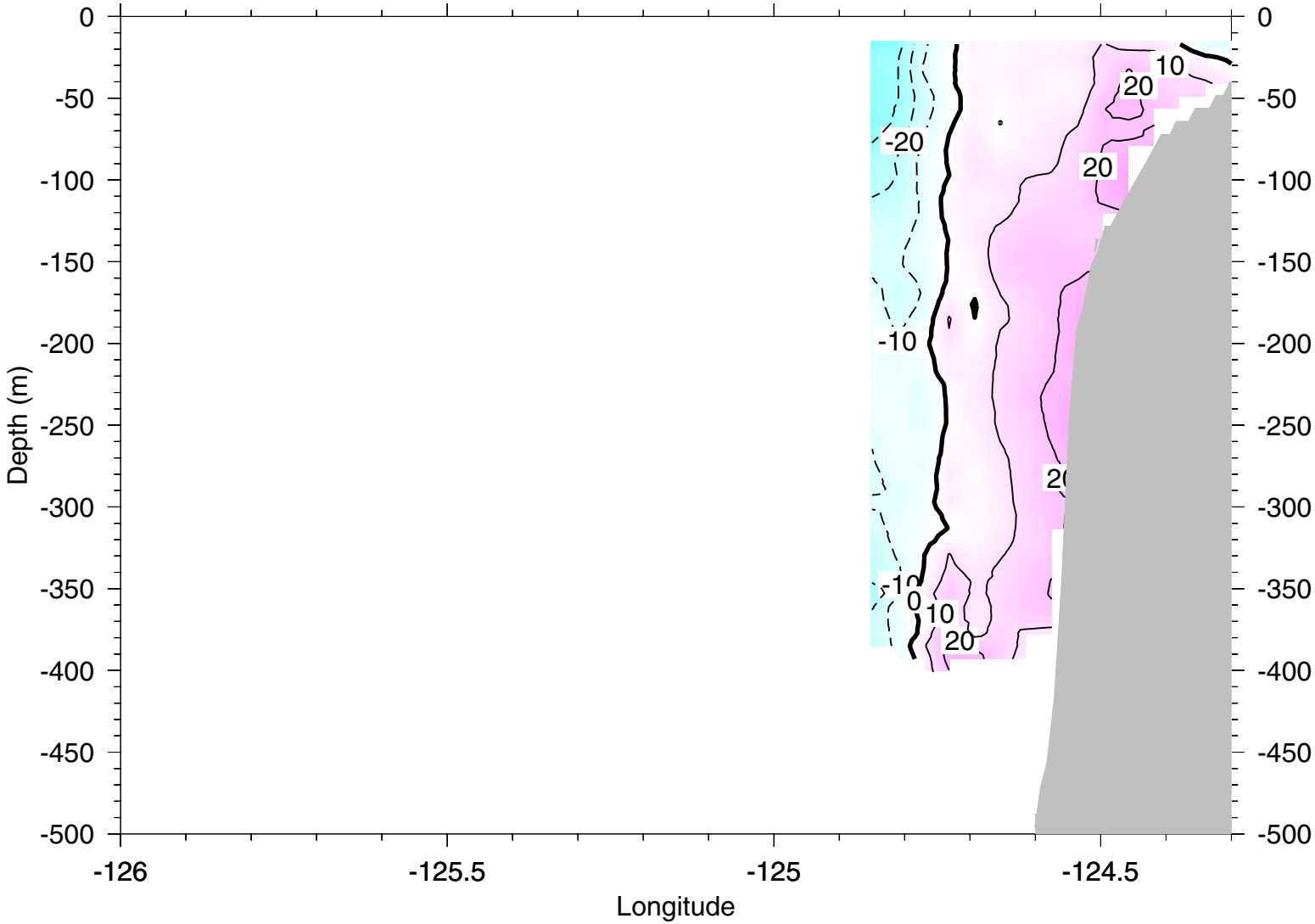
ADCP: Northward current (cm/s)



Crescent City Hydrographic Line 41.9°N

08 Apr 2002

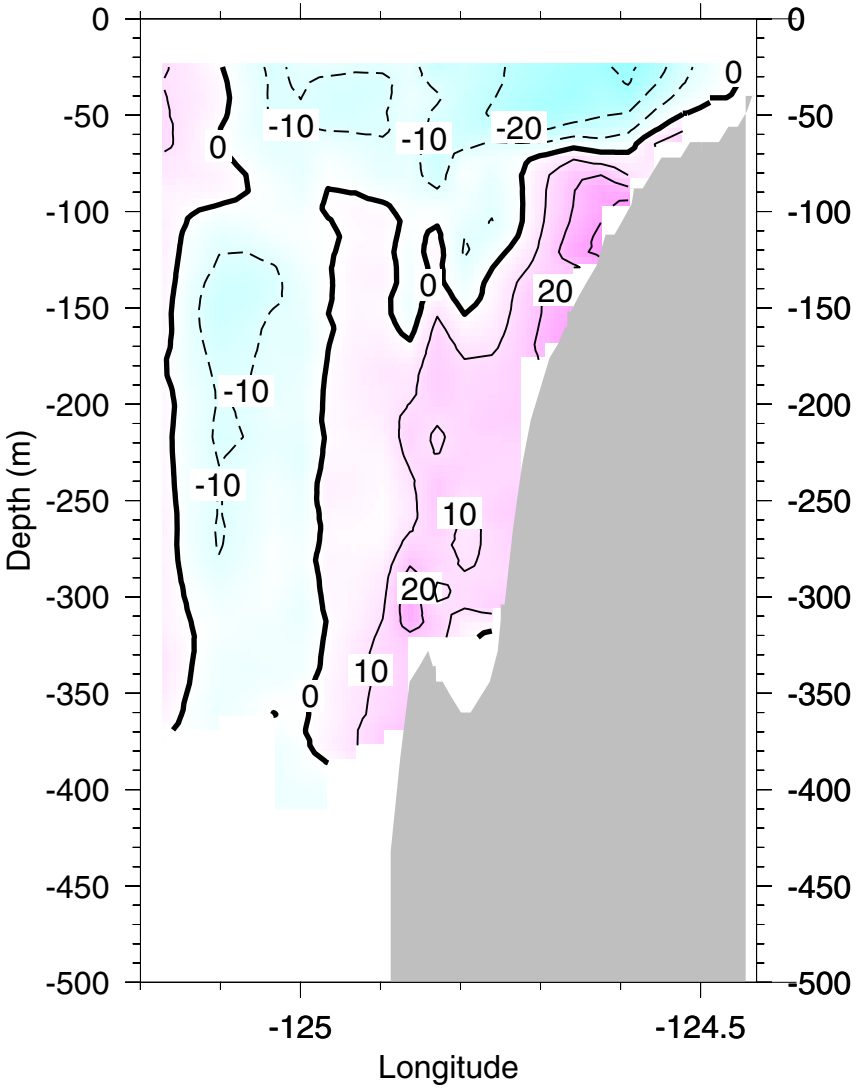
ADCP: Northward current (cm/s)



Five Mile Hydrographic Line 43.2°N

06-07 Apr 2002

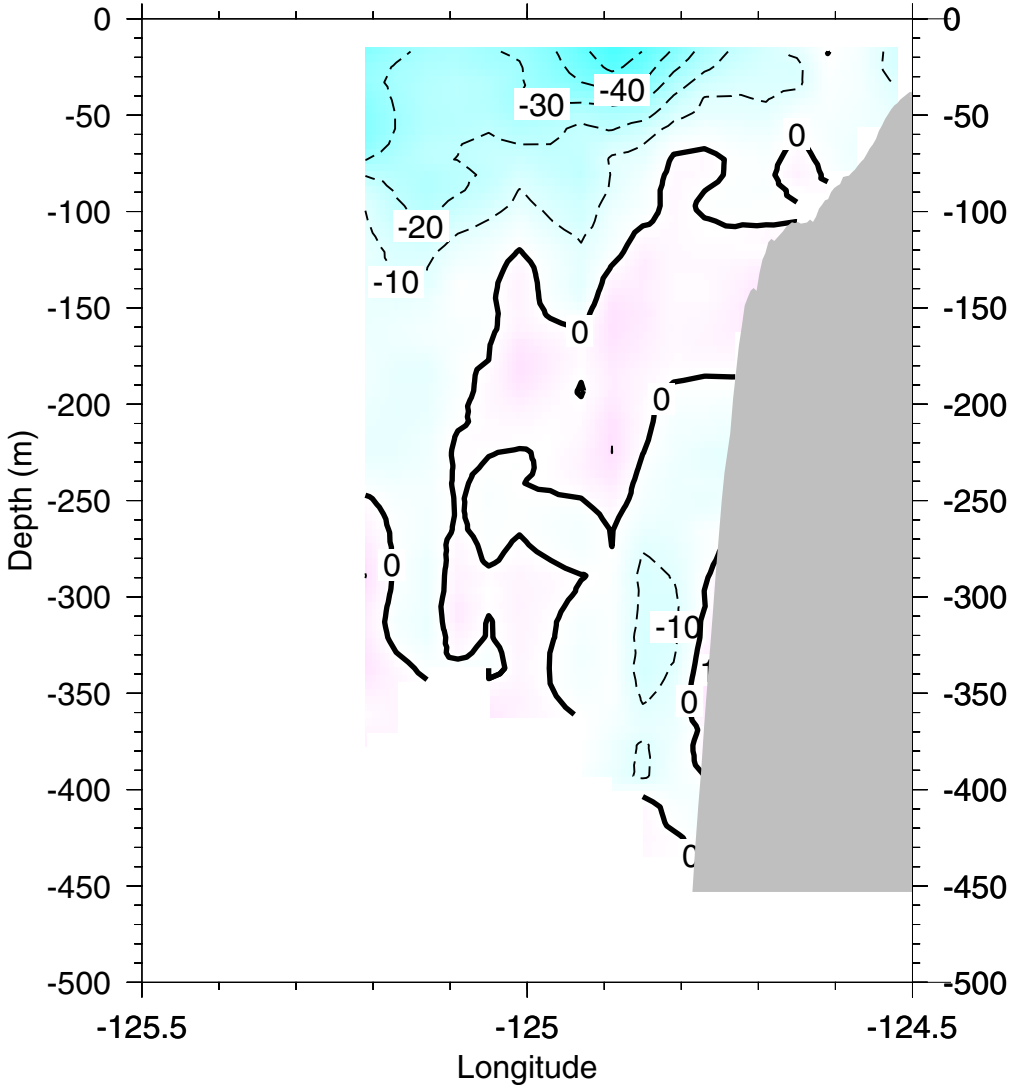
ADCP: Northward current (cm/s)



Rogue River Line 42.5°N

08-09 Apr 2002

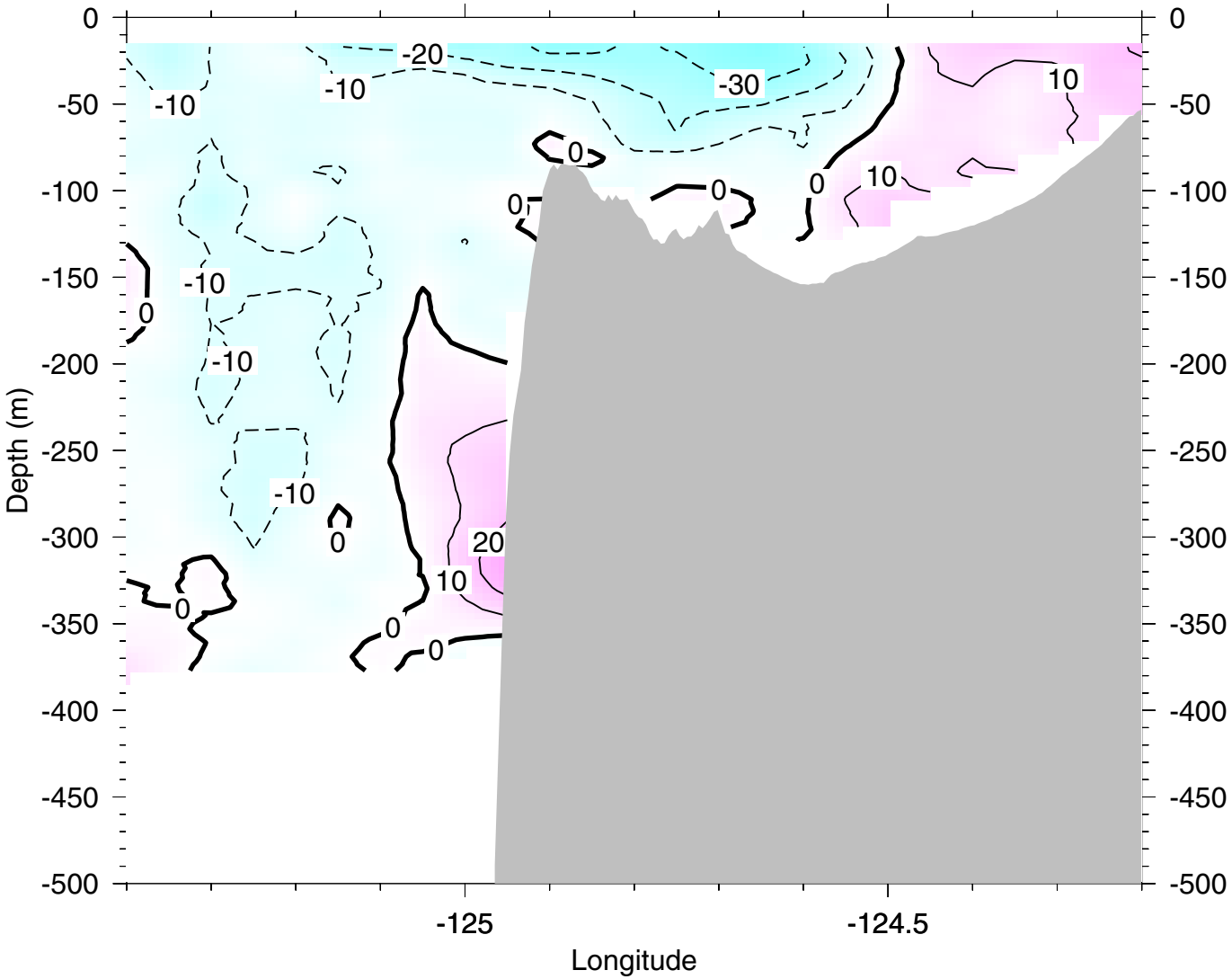
ADCP: Northward current (cm/s)



Heceta Head ADCP Line 44.0°N

09 Apr 2002

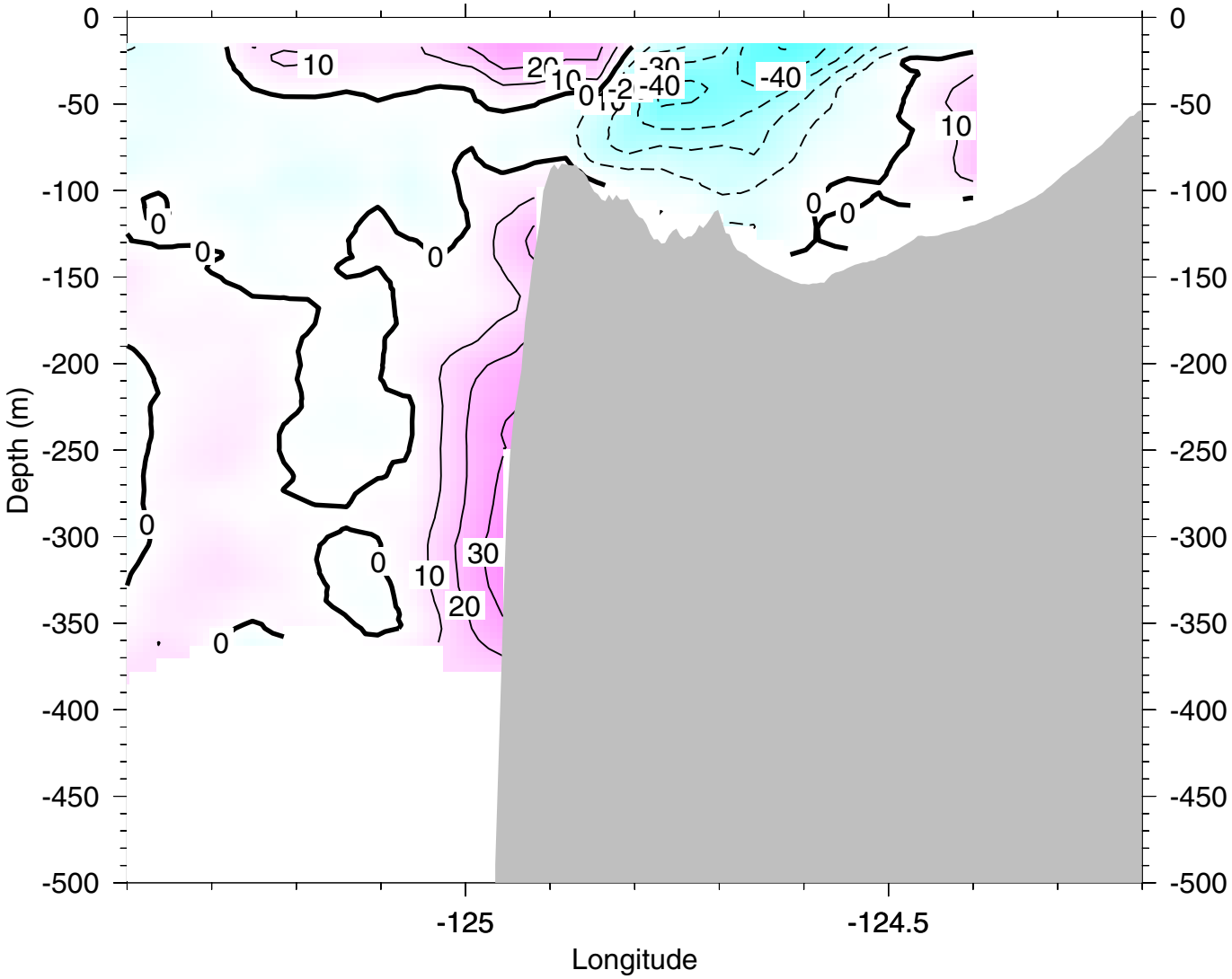
ADCP: Northward current (cm/s)

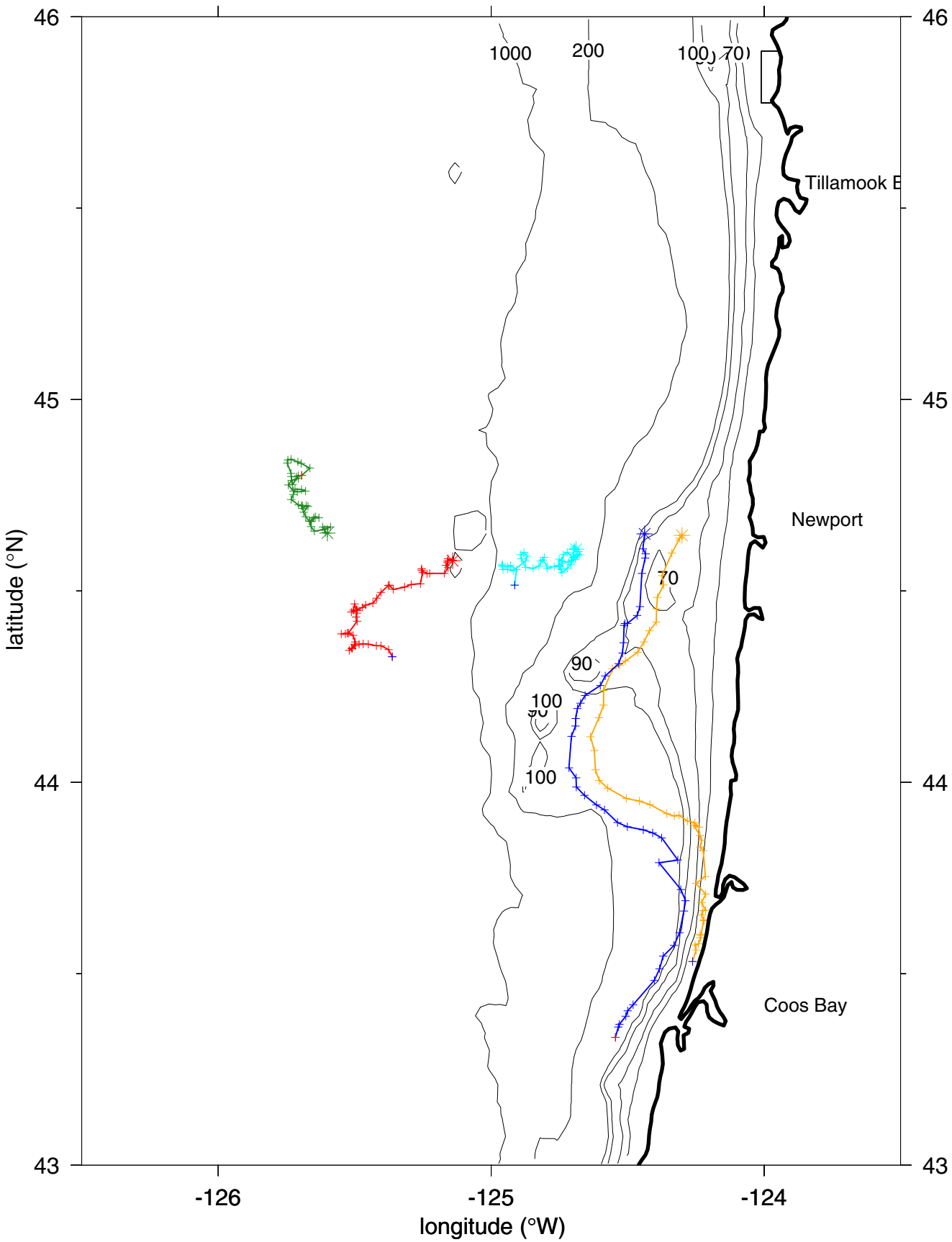


Heceta Head ADCP Line 44.0°N

09-10 Apr 2002

ADCP: Northward current (cm/s)




Drifter data from Apr 5 2002 to Apr 10 2002
(dates on land indicate last transmission from failed drifters)
(Courtesy of Jack Barth, Oregon State University)
1000
200
100
70
Tillamook B
Newport
70
90
100
100
Coos Bay
46
45
44
43
-126
-125
-124
latitude (°N)
longitude (°W)

Zooplankton Report

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

MOCNESS DESCRIPTIONS

NH5 15:30 h (local time) water depth= 60m

50-20 m	¼ gallon Pleurobrachia, copepods
20-10 m	½ gallon Pleurobrachia, copepods, chaetognaths, amphipods
10-0 m	½ gallon Pleurobrachia, copepods, amphipods

NH15 20:30 h water depth=100m

75-50 m	copepods, furcilia, Limacina, amphipods
50-20 m	copepods, Limacina, furcilia, 10 Pleurobrachia, fish larvae, 10 Clione
20-10 m	copepods, Limacina, chaetognaths, furcilia, Pleurobrachia
10-0 m	copepods, Limacina, chaetognaths, 40 Pleurobrachia

NH25 23:45 h water depth=247m

232-200	copepods, Muggiaea, 10 chaetognaths, 1 myctophid, 1 sergestid shrimp
200-150	copepods, chaetognaths, amphipods, adult euphausiids, sergestid, squid
150-100	20 chaetognaths, copepods, 1 sergestid
100-50	copepods, Limacina, furcilia, adult euphausiids, Sergestids, squid
50-35	copepods, 1 myctophid, 3 fish larvae, 4 adult euphausiids, 2 Sergestids
35-20	copepods, adult euphausiids, Limacina, chaetognaths, Sergestids, squid
20-10	copepods, ~150 adult euphausiids, furcilia, Limacina, 50 Pleurobrachia
10-0	copepods, adult euphausiids, juvenile euphausiids, chaetognaths, 75 Pleurobrachia

NH35 03:00 h water depth=450m

350-300	copepods, Muggiaea, chaetognaths, amphipods, Limacina, myctophids
300-200	copepods, furcilia, Muggiaea, amphipods, squid, myctophids
200-150	copepods, amphipods, chaetognaths, Muggiaea, clione, 3 myctophids
150-100	2 myctophids, Limacina, Neocalanus, chaetognaths, 1 Muggiaea, 1 Sergestid
100-50	copepods, euphausiid eggs, Limacina, chaetognaths, amphipods, juvy euphausiids, 7 fish larvae, Sergestids
50-35	copepods, Clione, Limacina, chaetognaths, Pleurobrachia, “silver dollar” jellies, amphipods, adult euphausiids, fish larvae
35-20	~75 Pleurobrachia, ~200 juvy euphausiids, copepods, phytoplankton, 1 “silver dollar” jelly, 1 Beroe, 2 myctophids
20-10	copepods, Limacina, euphausiid eggs, adults euphausiids, chaetognaths,
10-0	Pleurobrachia, amphipods, fish larvae copepods, juvenile euphausiids

NH45 06:40 h water depth=670m

350-300	copepods, chaetognaths, 1 myctophid, 2 Muggiaea
300-250	copepods, radiolarians, 7 myctophids, 3 Sergestid
250-200	copepods, amphipods, radiolarians, chaetognaths, Muggiaea, adult euphausiids, 7 myctophids, 3 Sergestid, 1 octopus
200-150	copepods, Muggiaea, chaetognaths, adult euphausiids, 1 squid
150-100	copepods, amphipods, Muggiaea, chaetognaths, adult euphausiids 1 "silver dollar" jelly
100-50	copepods, Limacina, chaetognaths, 1 dungeness megalopa
50-20	Limacina, copepods, furcilia, 10 Pleurobrachia, 1 myctophid, 3 "silver dollar" jellies
20-10	Neocalanus, Limacina, ~50 Pleurobrachia, chaetognaths, furcilia, ~20 megalope, 5 Beroe
10-0	Neocalanus, ~200 Pleurobrachia, amphipods, zoea

FM7 05:35 h water depth=345m

340-300	copepods, amphipods, chaetognaths, Muggiaea, 5 Atolla, 2 fish larvae, 1 myctophid
300-200	Muggiaea, chaetognaths, copepods, 2 adult euphausiids
200-150	chaetognaths, Muggiaea, copepods, Limacina, 8 adult euphausiids, 1 "silver dollar" jelly, few furcilia
150-100	100 large chaetognaths, amphipods, copepods, adult euphausiids
100-50	copepods, amphipods, Limacina, juvy euphausiids, adult euphausiids, furcilia, Pleurobrachia, chaetognaths
50-20	~300 Pleurobrachia, ~100 adult euphausiids, small salps, Limacina, furcilia, 1 Beroe
20-10	~250 Pleurobrachia, ~1000 adult euphausiids, furcilia, amphipods
10-0	Pleurobrachia, adult euphausiids, Ptychogena (jelly)

FM5 10:00 h water depth=165m

150-135	~1000 adult euphausiids, few Pleurobrachia
135-125	~700 adult euphausiids, Pleurobrachia
125-100	adult euphausiids, 4 Pleurobrachia
100-100	~5000 adult euphausiids, furcilia, copepods
100-85	~500 adult euphausiids, furcilia, copepods
85-50	~Pleurobrachia, adult euphausiids, juvy euphausiids, 1 Beroe
50-30	furcilia, Pleurobrachia
30-10	Pleurobrachia, Limacina, furcilia, amphipods
10-0	Pleurobrachia, adult euphausiids, tons of euphausiid eggs, furcilia

FM4 12:55 h water depth=84m

70-50	~100 Pleurobrachia, copepods, furcilia, amphipods, chaetognaths
50-20	~300 Pleurobrachia, furcilia, copepods, phytoplankton
20-10	Pleurobrachia. Phytoplankton
10-0	~300 Pleurobrachia, phytoplankton

FM3 15:00 h water depth=64m

50-20	½ gallon Pleurobrachia, copepods, Limacina, phytoplankton, amphipods, furcilia
20-10	1 gallon Pleurobrachia, jellies, phytoplankton, amphipods, furcilia
10-0	¾ gallon Pleurobrachia, jellies, phytoplankton, fish larvae

CR2 20:45 h water depth=69m

50-20	~400 adult euphausiids, Pleurobrachia, copepods, 20 dungeness megalope
20-10	Pleurobrachia, phytoplankton, euphausiid eggs, furcilia, amphipods
10-0	~30 Pleurobrachia, phytoplankton, copepods

CR3 20:51 h water depth=145m

130-100	~100 adult euphausiids, copepods
100-50	50 adult euphausiids, 1 8cm flatfish, copepods, Dungeness megalope, 10 Pleurobrachia
50-35	~200 adult euphausiids, 40 Pleurobrachia, furcilia, copepods, 3 fish larvae
35-20	~800 adult euphausiids, Pleurobrachia, copepods,1 Sole, 15 megalope
20-10	copepods, 100 adult euphausiids, 10 Pleurobrachia, 10 megalope
10-0	copepods, phytoplankton, ~30 adult T. spinifera, Limacina, furcilia

CR4 23:30 h water depth=495m

350-300	copepods, chaetognaths, Pleurobrachia, Muggiaea, shrimp, 1 myctophid
300-200	copepods, 8 shrimp, Muggiaea, amphipods
200-150	chaetognaths, Muggiaea, 5 shrimp, 15 adult euphausiids
150-100	copepods, chaetognaths, ~20 adult euphausiids, 6 Pleurobrachia, Muggiaea
100-50	40 Pleurobrachia, 20 shrimp, copepods, chaetognaths, 1 myctophids, 10 adult euphausiids
50-35	200 Pleurobrachia, Neocalanus, 3 fish larvae, 3 shrimp, 1 Beroe
35-20	50 shrimp, Pleurobrachia, chaetognaths, furcilia, 3 fish larvae
20-10	13 shrimp, copepods, Pleurobrachia, furcilia, 1 flatfish
10-0	~800 adult euphausiids, 25 Pleurobrachia, copepods, amphipods, 4 shrimp, 2 fish larvae

CR6 02:10 h water depth=840m

350-300	5 Atolla, Muggiaea, copepods, radiolarians
300-200	radiolarians, Muggiaea, copepods, chaetognaths
200-150	radiolarians, Muggiaea, 20 adult euphausiids, copepods, 1 Pleurobrachia, chaetognaths
150-100	9 myctophids, 1 fish larva, copepods, 1 dungeness megalopa
100-50	~ 500 adult euphausiids, 100 Pleurobrachia, 4 megalopae
50-20	~1000 adult euphausiids, 300 Pleurobrachia, furcilia, copepods
20-10	400 adult euphausiids, furcilia, 20 Pleurobrachia, amphipods, 1 flatfish
10-0	~800 adult euphausiids, furcilia, copepods, Pleurobrachia, Limacina

RR2 09:40 h water depth=88m

75-50	copepods, 80 Pleurobrachia, furcilia, chaetognaths
50-20	150 Pleurobrachia, copepods, furcilia
20-10	100 Pleurobrachia, copepods, furcilia, 2 megalope, jellies
10-0	125 Pleurobrachia, phytoplankton, copepods, 1 “nipple” jelly, 1 Beroe

RR3 11:30 h water depth=153m

140-100	18 Pleurobrachia, 10 Muggiaea, 30 adult euphausiids, furcilia, copepods
100-50	furcilia, 60 Pleurobrachia, copepods, chaetognaths
50-20	60 Pleurobrachia, furcilia, copepods, amphipods
20-10	40 Pleurobrachia, phytoplankton, 9 “nipple” jellies, copepods, amphipods
10-0	12 Pleurobrachia, copepods, chaetognaths, furcilia

RR4 13:55 h water depth=110m

350-300	78 Sergestid shrimp, copepods, Muggiaea
300-200	60 Sergestid shrimp, 10 glass shrimp, 10 Pleurobrachia, 10 squid, chaetognaths, copepods, 1 myctophid, 5 adult euphausiids
200-150	40 shrimp, Beroe, copepods, chaetognaths, 1 fish larva, 2 squid
150-100	16 Sergestids, 10 adult euphausiids, radiolarians, copepods, chaetognaths
100-50	30 adult euphausiids, radiolarians, 20 Pleurobrachia, furcilia, copepods, chaetognaths
50-35	50 Pleurobrachia, jellies, copepods, amphipods, 10 adult euphausiids, furcilia
35-20	100 Pleurobrachia, 2 shrimp, amphipods, furcilia, 2 Sergestids
20-10	Pleurobrachia, furcilia, amphipods, 1 Beroe, 3 megalope, phytoplankton
10-0	Beroe, phytoplankton, chaetognaths, 3 adult euphausiids, Muggiaea, furcilia, 1 fish larva, 1 Sergestid

HH5 20:35 h water depth=924m

350-300	copepods, radiolarians, “nipple jellies”, chaetognaths
300-200	not described
200-150	copepods, radiolarians, 1 myctophid, chaetognaths, 1 fish larva
150-100	copepods. Radiolarians, chaetognaths, 1 fish larva
100-50	copepods, chaetognaths, ~40 adult euphausiids, 1 dungeness megalope, 1 squid
50-35	~150 adult euphausiids, copepods, 15 Pleurobrachia, 1 fish larva, 1 megalopa
35-20	~200 adult euphausiids, 15 Pleurobrachia, Limacina
20-10	~400 adult euphausiids, furcilia, 15 Pleurobrachia, copepods
10-0	not described

HH4 23:37 h water depth=153m

00-50	100 Limacina, copepods, 3 fish larvae, furcilia, 2 adult euphausiids
50-35	furcilia, Limacina, copepods, 6 adult euphausiids
35-20	100 adult euphausiids—many purple T. spinifera, furcilia, copepods, 20 Pleurobrachia
20-10	100 Pleurobrachia, copepods, phytoplankton, furcilia, Limacina, many purple T. spinifera
10-0	copepods, 5 T. spinifera adult, 4 Pleurobrachia, Limacina

HH3 02:25 h water depth=110m

150-100	200 adult euphausiids, copepods, furcilia, 2 shrimp
100-50	200 adult euphausiids, 5 shrimp, 4 Pleurobrachia, furcilia, copepods
50-35	200 adult euphausiids, furcilia, copepods
35-20	300 adult euphausiids, 30 Pleurobrachia, phytoplankton, copepods
20-10	30 Pleurobrachia, 500 juvy euphausiids, phytoplankton, 3 adult euphausiids, copepods
10-0	100 Pleurobrachia, copepods, furcilia

HH2 05:05 h water depth=120m

110-50	copepods, 15 adult euphausiids, furcilia, 1 large flatworm
50-35	50 adult euphausiids, copepods, 12 Pleurobrachia, amphipods, 1 fish larva
35-20	40 Pleurobrachia, copepods, furcilia, 40 adult euphausiids, phytoplankton, 1 fish larva, 1 6.75” sanddab
20-10	200 Pleurobrachia, phytoplankton, copepods, 40 adult euphausiids, 10 fish larvae, furcilia
10-0	400 Pleurobrachia, phytoplankton, copepods, furcilia

Other zooplankton sampling:
Vertical tows(200µm mesh) from 100 meters (or from just above bottom) to surface were completed at stations NH1, NH5, NH10, NH15, NH20, NH25, NH35, NH45, NH65, FM1, FM3, FM4, FM5, FM7, FM8, FM9, CR1, CR2, CR3, CR4, CR6, CR7, CR9, CR11, RR1, RR2, RR3, RR4, RR6, RR7, HH1, HH2, HH3, HH4 and HH5.

Euphausiids from stations NH25, FM2, CR2, and HH5 were incubated for molting rates. At , NH25, NH35, FM5, and HH5 adult euphausiids were preserved for gut fluorescence measurements. Egg production experiments were conducted on female euphausiids collected from NH25, FM7, FM2, CR2, and HH4. *Thysanoessa spinifera* females from HH4 were taken home to spawn in the laboratory.

Microzooplankton Sampling

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

April 4-9, 2002 GLOBEC CRUISE W0204A:

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

MICROPROTIST (10 – 200 µm sized heterotrophic protists) BIOMASS -

A) Epifluorescence samples: preserve with Lugol's +Na thiosulfate+ formalin, filter 100 ml subsamples onto 3 µm black filters, stain with DAPI, mount on labeled slide, freeze in slide box.

B) Settling samples: Add 23 ml acid Lugol solution to 240 ml (8 oz) labeled amber bottle, add 207 ml seawater sample, gently mix, cap tightly, store in boxes for later inspection via inverted light microscopy.

Secondary goal: ABUNDANCE OF PHYTOPLANKTON AND BACTERIA

Flow cytometry samples: pipette 3 ml of sample into 4 ml labeled cryovial, add 120 µl of unfrozen, 25% glutaraldehyde (0.5% final conc), cap & mix using vortex mixer, store in liquid nitrogen shipper for later analysis via flow cytometry.

SAMPLING STRATEGY:

Focus on upper 100 m, with emphasis on 0-50 m depth zone, including chlorophyll-a maximum.

Depths to sample: 6 depths per cast

- Depth of chlorophyll-a maximum (will vary from cast to cast)
- 70 m – 100 m depth
- 4 other depths in upper 50 m, more or less evenly spaced; may want to sample the depth nearest the chlorophyll maximum depth

Table 6: Actual sample depths for collection of microzooplankton samples for bacterial counts (Flow Cytometry), dinoflagellate counts (Epifluorescence Microscopy), and ciliate counts (Inverted Scope Microscopy) during the W0204A.

Station	Sample Collection Depths (m)
NH-03	40, 18, 12, 1
NH-05	56, 40, 20, 15, 8, 5
NH-15	74, 60, 40, 30, 20, 10, 5
NH-25	70, 50, 40, 30, 17, 10
NH-35	70, 50, 40, 30, 20, 5
NH-45	100, 50, 35, 10
NH-65	50, 40, 30, 15, 10, 1
NH-85	70, 50, 40, 30, 20, 10, 4

No. of Samples = 53

FM-3	50, 30, 25, 20, 15, 5
FM-4	60, 41, 30, 20, 10, 5
FM-5	70, 40, 30, 20, 10, 5
FM-7	70, 50, 38, 31, 19, 10, 5
FM-8	70, 40, 20, 5
FM-9	70, 40, 30, 20, 10, 5

No. of Samples = 35

CR-1	30, 15, 5
CR-3	50, 30, 20, 5
CR-4	70, 50, 40, 30, 25, 10
CR-5	70, 50, 40, 30, 20, 10
CR-7	70, 50, 30, 10, 5
CR-9a	70, 50, 40, 30, 20, 4
CR-11	100, 70, 50, 40, 30, 15, 10

No. of Samples = 37

RR-1	30, 20, 15, 10, 2
RR-2	60, 40, 30, 20, 10, 5
RR-3	70, 60, 40, 20, 10, 2
RR-4	70, 50, 40, 30, 20, 10, 5
RR-6	150, 100, 70, 40, 25, 20, 10
RR-7	70, 50, 30, 25, 20, 10

No. of Samples = 37

Table 6 cont.

HH-1	40, 25,15, 10, 5
HH-2	50, 30, 24, 20, 10, 4
HH-3	60, 40, 30, 20, 10
HH-4	60, 40, 30, 20, 10, 4.8
HH-5	100, 70, 50, 40, 25, 20, 10
HH-7	70, 50, 30, 20, 10
HH-9	99, 70, 45, 30, 20, 10

No. of Samples = 40