PRELIMINARY CRUISE REPORT, W0103B
R/V WECOMA, 20-24 March 2001
GLOBEC NEP Long-Term Observations off Oregon

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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 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 W0103B is presented here. An event log is provided in Table 3, and participating personnel are listed in Table 4. During the immediately preceding cruise (W0103A), whose primary purpose was to service the GLOBEC LTOP moorings off Newport, Coos Bay and Rogue River, CTD sections were completed along our standard FM and RR Lines. This recent sampling reduced the urgency of CTD sampling along these lines during W0103B, but rosette sampling of the inshore stations for biochemical analyses was still deemed to be of high priority, especially for the FM-line.

Wecoma departed Newport at 1000 PDT on 20 March 2001. CTD sampling started at NH-1. At NH-3, the HTI (bio-acoustic system) was deployed. MOCNESS tows were started at NH-5. We

released five drifters and completed all CTD stations and net tows along the Newport Line during moderately strong upwelling-favorable wind, and completed this section at 1540 PDT, 21 March. Since winds off central Oregon continued to be strong, and CTD stations along the FM-line had been made a few days earlier, we transited directly to the inshore end of the CR-line, and began sampling at CR-1 in daylight at 0730 PDT, 22 March. The most offshore stations (CR-10 and CR-11) were omitted because stations at CR-8 and CR-9a are sufficiently representative of offshore waters at this time of year. Sampling along the CR-line was completed at 0045, 23 March, and we transited to the inshore end of the RR-line, to arrive there during daylight in order to avoid moored crab pots.

Since weather reports predicted a strong storm with gale winds and high seas would arrive in our work area late on March 23 or early on March 24, and since sampling along the FM-line had higher priority than sampling along the RR-line, we broke off sampling after completing the station at RR-3.

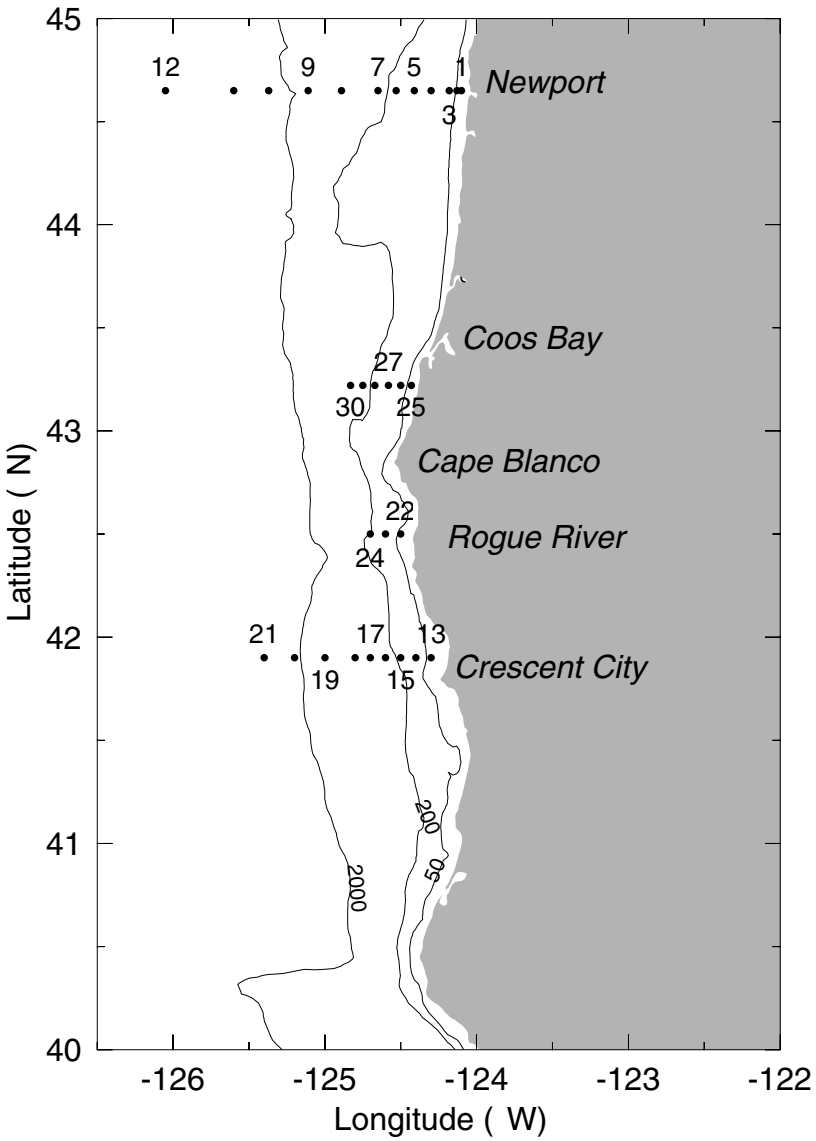


Figure 1. CTD stations during W0103B, along the Newport, Five Mile, Rogue River and Crescent City Hydrographic Lines.

We began the transit to FM-1 at 1010 PDT, to arrive there during daylight to avoid crab pots. Local winds and seas remained fair while we continued sampling as far as FM-7, but the forecast remained grim. We therefore broke off sampling after FM-7 in order to be sure to arrive at Newport at high tide (1230 PDT) on March 24.

PRELIMINARY RESULTS

Winds during the few weeks before this cruise had been generally unfavorable for coastal upwelling, and this is reflected in the hydrographic fields along the Newport Line: the 8.5 to 9.5 C isotherms and the 32.8 to 33.6 psu isopycnals are nearly level across the shelf. During the first two days of our cruise, winds were strongly favorable for upwelling, and this upwelling is reflected in the hydrographic fields along the Crescent City Line: the 8.5 to 10 C isotherms, the 33.0 to 33.4 psu isohalines, the 25.0 isopycnal, and the 4-6 isopleths of dissolved oxygen all slope up toward shore over the continental shelf. The inshore waters along the FM and RR lines had cooled significantly in the week since the sampling on 17-18 March (both the partial sections from this cruise and the complete sections from W0103A are appended below).

We saw no evidence of the Columbia River Plume on this cruise, presumably because the seasonally southward coastal jet had not been established prior to our cruise. Note however, that the drifters we deployed over the outer shelf showed equatorward flow during our cruise.

We also saw relatively little salinity stratification over inner shelf off Newport; this is probably due to low local runoff because of the exceptionally dry weather this winter.

The high seas forecast to occur at the end of our cruise were delayed until after our return to Newport: significant wave height at Buoy 46050 off Newport reached 18 feet at about 0200 UTC, 26 March.

The attached zooplankton report was provided by Dr. Wm. Peterson.

Table 4. Names, affiliations, and responsibilities of scientific personnel participating on W0103B.

Robert L. Smith	Chief Scientist	OSU	CTD
Adriana Huyer	Co-Chief Scientist	OSU	CTD
Jane Fleischbein	Technician	OSU	CTD
Dale Hubbard	Technician	OSU	CTD, oxygen
Margaret Sparrow	Technician	OSU	CTD
Lee Karp-Boss	Post-doc	OSU	nuts, chl
Woody Moses	Graduate Student	OSU	nuts, chl
Doris Greilinger	Graduate Student	OSU	nuts, chl
Michael Wetz	Graduate Student	OSU	nuts, chl
Linda Hunn	Technician	OSU	nuts, chl
Carlos Lopez	Technician	OSU	microzooplankton
Mitch Vance	Technician	HMSC	zooplankton
Julie Keister	Technician	HMSC	zooplankton
Leah Feinberg	Technician	HMSC	zooplankton
Anders Roestad	Technician	ODFW	zooplankton
Linda Fayler	Technician	OSU	martec
Daryl Swensen	Technician	OSU	martec

Table 1. CTD station positions during W0103B, and sampling at each station (C: Bio/Chem bottle sampling, N:half-meter vertical net tows, M:Mocness, P:Pigment, 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	44.65	-124.10	29	25	N
NH-3	2	5.6	44.65	-124.13	47	42	P,N
NH-5	3	9.6	44.65	-124.18	60	55	C,N,M
NH-10	4	18.9	44.65	-124.30	80	75	P,N,D
NH-15	5	27.6	44.65	-124.41	91	86	C,Z,N,M,D
NH-20	6	36.9	44.65	-124.53	142	137	P,N
NH-25	7	46.5	44.65	-124.65	296	283	C,Z,N,M,D
NH-35	8	65	44.65	-124.89	450	441	C,Z,N,M
NH-45	9	83.2	44.65	-125.11	694	671	C,Z,N,M,D
NH-55	10	103.2	44.65	-125.37	2866	1006	P,O2
NH-65	11	121.5	44.65	-125.60	2861	1005	C,Z,N,D
NH-85	12	157.2	44.65	-126.05	2883	1006	C,Z
CR-1	13	7.8	41.90	-124.30	42	39	C,Z,N
CR-2	14	16.1	41.90	-124.40	69	66	N,M
CR-3	15	24.4	41.90	-124.50	138	133	C,Z,N,M
CR-4	16	32.6	41.90	-124.60	504	501	C,Z,N,M
CR-5	17	40.9	41.90	-124.70	658	648	C
CR-6	18	49.3	41.90	-124.80	696	671	N,M
CR-7	19	65.7	41.90	-125.00	835	800	C,Z,N
CR-8	20	82.2	41.90	-125.20	2716	1006	N,O2
CR-9a	21	98.9	41.90	-125.40	3097	1006	C,Z
RR-1	22	7.2	42.50	-124.50	36	32	C,N
RR-2	23	15.6	42.50	-124.60	88	80	C,Z,N,M
RR-3	24	23.7	42.50	-124.70	135	129	C,Z,N
FM-1	25	3.3	43.22	-124.43	34	30	N
FM-3	26	8.7	43.22	-124.50	67	61	C,Z,N,M
FM-4	27	15.4	43.22	-124.58	87	80	C,Z,N,M
FM-5	28	22.2	43.22	-124.67	156	150	C,N,M
FM-6	29	28.9	43.22	-124.75	311	301	O2
FM-7	30	35.7	43.22	-124.83	344	330	C,Z,N,M

Table 2: Actual sample depths and types of subsamples for biochemical sampling during the Mar.-'01 LTOP GLOBEC cruise.

Station, Depth, Dist. From Shore	**Sample Collection Depths (m)**	**Type of Sample Collected**
NH-03, 47m, 6km	26, 19, 7, 2	Slide Samples at 19 and 2 m
NH-05, 60m, 10km	55, 50, 42, 40, 30, 25, 20, 15, 13, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
NH-10, 80m, 19km	38, 21, 8, 2	Slide Samples at 21 and 2 m
NH-15, 91m, 28km	87, 70, 60, 49, 31, 23, 20, 10, 5, 1	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
NH-20, 142m, 37km	115, 27, 15, 2	Slide Samples at 27 and 2 m
NH-25, 296m, 46km	281, 200, 150, 101, 71, 51, 44, 41, 30, 20, 10, 1	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
NH-35, 450m, 65km	440, 410, 150, 100, 70, 50, 40, 30, 25, 20, 10, 3	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 440, 410 and 150 m)
NH-45, 694m, 83km	615, 500, 150, 100, 70, 50, 40, 30, 25, 20, 10, 1	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 615, 500 and 150m)
NH-55, 2866m, 103km	1005, 900, 836, 700, 600, 501, 400, 300, 200, 60, 10, 1	Slide Samples at 60 and 1 m
NH-65, 2861m, 121km	1005, 916, 150, 100, 65, 50, 40, 35, 30, 20, 10, 1	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 1005, 916 and 150m)
NH-85, 2883m, 157km	1005, 920, 150, 100, 70, 53, 50, 40, 30, 20, 10, 2	TOC (all depths), Nutrients, TN (all depths), both Chl and POC/PON (except 1005, 920 and 150 m)

Table 2 cont.

CR-1, 42m, 8km	35, 30, 25, 19, 15, 10, 7, 6, 1	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
CR-3, 138m, 24km	131, 100, 69, 50, 40, 30, 20, 16, 10, 5, 1	TOC (surface), Nutrients, TN (all depths), Chl, POC/PON
CR-4, 504m, 33km	450, 395, 150, 100, 70, 50, 40, 30, 22, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 450, 395 and 150m)
CR-5, 658m, 41km	633, 500, 150, 100, 70, 50, 40, 30, 20 11, 10, 2	TOC (all depths), Nutrients, TN (all depths), both Chl, POC/PON (except 633, 500 and 150m)
CR-7, 835m, 66km	798, 500, 151, 100, 70, 50, 40, 30, 25, 20, 10, 2	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 798, 500 and 151m)
CR-9, 3097m,99km	1005, 150, 100, 70, 50, 41, 29, 25, 20, 10, 3	TOC (all depths), Nutrients, TN (all depths), both Chl, POC/PON (except 1005 and150m)

RR-1, 36m, 7km	32, 30, 25, 20, 15, 10, 5, 2	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
RR-2, 88m, 16km	80, 73, 70, 60, 50, 40, 30, 20, 17, 10, 5, 1	TOC (surface), Nutrients, TN (surface), Chl (all depths), POC/PON (except 30, 20, 17, 10, 5 and 1m)
RR-3, 135m, 24km	120, 96, 70, 60, 50, 39, 30, 21, 11, 10, 5, 1	TOC (surface), Nutrients, TN (surface), Chl, POC/PON

FM-3, 67m, 9km	59, 56, 50, 40, 30, 25, 20, 17, 15, 10, 6, 2	TOC (all depths), Nutrients, TN (all depths), Chl, POC/PON
FM-4, 87m, 15km	80, 70, 65, 60, 50, 40, 30, 20, 15, 10, 1	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON
FM-5, 156m, 22km	150, 120, 100, 70, 60, 50, 40, 30, 20, 15, 10, 5, 1	TOC (surface), Nutrients, TN (surface), both Chl, POC/PON (except 150m)
FM-7, 344m, 36km	330, 230, 151, 100, 71, 50, 40, 30, 24, 20, 10, 1	TOC (all depths), Nutrients, TN (all depths) both Chl, POC/PON (except 330, 230, and 151m)

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

Table 3. R/V WECOMA Cruise W0103B

	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)		
20-Mar	1745												air calibration of transmissometer	
	1800												Depart Newport	
	1809												Start echosounder	
	1810												Start ADCP	
	1810												Start DAS	
	1830												Start flo-thru	
	1930		1	NH-1	44	39.1	-124	06.0	29	1023.8	350	18	CTD	WE07901.01
	1940	1944			44	39.0	-124	06.1					vertical net tow	WE07901.02
	1953	1955											DAS down to check wetstar input	
	2007		2	NH-3	44	39.0	-124	07.9	47	1023.3	350	20	CTD with pigments at 2m, 19m	WE07901.03
	2023				44	38.8	-124	08.2					HTI deployed	WE07901.04
	2049			NH-5	44	38.9	-124	10.7					vertical net tow, 55 m	WE07901.05
	2102		3	NH-5	44	38.8	-124	11.0	60	1023.3	350	20	CTD with biochem, mzp	WE07901.06
	2126				44	38.5	-124	11.4					Mocness deployed	WE07901.07
		2148			44	39.0	-124	11.8					Mocness aboard	WE07901.08
	2237	2241		NH-10	44	39.1	-124	17.8					vertical net tow, 75 m	WE07901.09
	2248		4	NH-10	44	39.1	-124	18.0	80	1023.0	350	23	CTD with pigments at 2m, 21m	WE07901.10
	2310				44	38.96	-124	18.35					drifter 22915	WE07901.11
	2359		5	NH-15	44	39.1	-124	24.7	91	1022.0	355	22	CTD with biochem, mzp	WE07901.12
21-Mar	0013	0015			44	39.0	-124	24.9					secchi disk	WE08001.01
	0015	0022			44	39.0	-124	24.9					vertical net tow	WE08001.02
	0028				44	39.1	-124	25.1					Mocness deployed	WE08001.03
		0101			44	39.8	-124	25.8					Mocness aboard	WE08001.04
	0111				44	39.93	-124	26.12					drifter 22933	WE08001.05
	0207		6	NH-20	44	39.1	-124	31.7	142	1022.0	355	23	CTD with pigments at 1m, 8 m	WE08001.06
	0223	0230			44	39.1	-124	31.8					vertical net tow	WE08001.07
	0324		7	NH-25	44	39.1	-124	39.0	298	1021.5	355	23	CTD with biochem, mzp	WE08001.08
	0353	0400			44	39.0	-124	39.2					vertical net tow, 100 m	WE08001.09
	0411				44	39.1	-124	39.3					Mocness deployed	WE08001.10
		0527			44	41.5	-124	40.0					Mocness aboard	WE08001.11
	0539				44	41.46	-124	40.68					drifter 22935	WE08001.12
	0718		8	NH-35	44	39.1	-124	53.1	454	1022.3	010	27	CTD with biochem, mzp	WE08001.13
	0802	0808			44	39.0	-124	53.4					vertical net tow, 100 m	WE08001.14
	0823				44	39.2	-124	53.4					Mocness deployed	WE08001.15
		0948			44	41.7	-124	52.8					Mocness aboard	WE08001.01

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)		
	1157			NH-45	44	39.6	-125	06.7					Mocness deployed	WE08001.16
		1334			44	43.0	-125	06.4					Mocness aboard	WE08001.17
	1430		9	NH-45	44	39.1	-125	06.9	694	1022.2	010	23	CTD with biochem, mzp	WE08001.18
	1440												Cleaned flo-thru filters	
	1512	1519			44	39.1	-125	07.2					vertical net tow	WE08001.19
	1521				44	39.16	-125	07.32					drifter 22936	WE08001.20
	1701			NH-55	44	39.1	-125	22.0					HTI recovered	WE08001.21
	1723		10	NH-55	44	39.1	-125	22.0	2866	1023.6	010	26	CTD with pigments, oxygen	WE08001.22
	1943		11	NH-65	44	39.1	-125	36.0	2861	1024.0	010	21	CTD with biochem, mzp	WE08001.23
	2042	2048			44	39.2	-125	36.1					vertical net tow, 100 m	WE08001.24
	2051				44	39.2	-125	36.1					drifter 22937	WE08001.25
	2253		12	NH-85	44	39.1	-126	03.3	2883	1023.0	015	23	CTD with biochem, mzp	WE08001.26
	2330												cleaned underway fluorometer	
	2340												begin transit to CR-Line	
22-Mar	1451												Cleaned flo-thru filters	
	1501												cleaned underway fluorometer	
	1528		13	CR-1	41	54.0	-124	18.0	42	1018.5	150	10	CTD with biochem, mzp	WE08101.1
	1542	1545			41	54.1	-124	18.0					vertical net tow, 35 m	WE08101.2
	1552				41	54.2	-124	18.1					HTI deployed	WE08101.3
	1639	1642		CR-2	41		-124						vertical net tow, 65 m	WE08101.4
	1651		14	CR-2	41	54.0	-124	24.0	69	1019.3	170	6	CTD	WE08101.5
	1706				41	54.1	-124	24.1					Mocness deployed	WE08101.6
		1727			41	54.7	-124	24.2					Mocness aboard	WE08101.7
	1707												air calibration of transmissometer	
	1819		15	CR-3	41	54.0	-124	30.0	138	1019.9	205	5	CTD with biochem, mzp	WE08101.8
	1840	1845			41	54.0	-124	30.0					vertical net tow, 100 m	WE08101.9
	1854				41	54.2	-124	30.1					Mocness deployed	WE08101.10
		1121			41	55.0	-124	30.0					Mocness aboard	WE08101.11
	2009		16	CR-4	41	54.0	-124	36.0	504	1019.5	170	10	CTD with biochem, mzp	WE08101.12
	2044	2050			41	53.9	-124	35.8					vertical net tow, 100m	WE08101.13
	2057				41	54.0	-124	35.9					Mocness deployed	WE08101.14
		2215			41	56.7	-124	35.8					Mocness aboard	WE08101.15
	2311		17	CR-5	41	54.0	-124	42.0	658	1018.9	170	5	CTD with biochem	WE08101.16
23-Mar	0035		18	CR-6	41	54.0	-124	48.0	696	1018.1	095	4	CTD	WE08201.1
	0111	0117			41	54.0	-124	48.0					vertical net tow, 100m	WE08201.2
	0125				41	54.1	-124	48.0					Mocness deployed	WE08201.3
		0233			41	56.6	-124	48.0					Mocness aboard	WE08201.4
	0240				41	56.7	-124	48.0					HTI recovered	WE08201.5
	0353		19	CR-7	41	54.0	-125	00.0	835	1018.3	155	6	CTD with biochem, mzp	WE08201.6

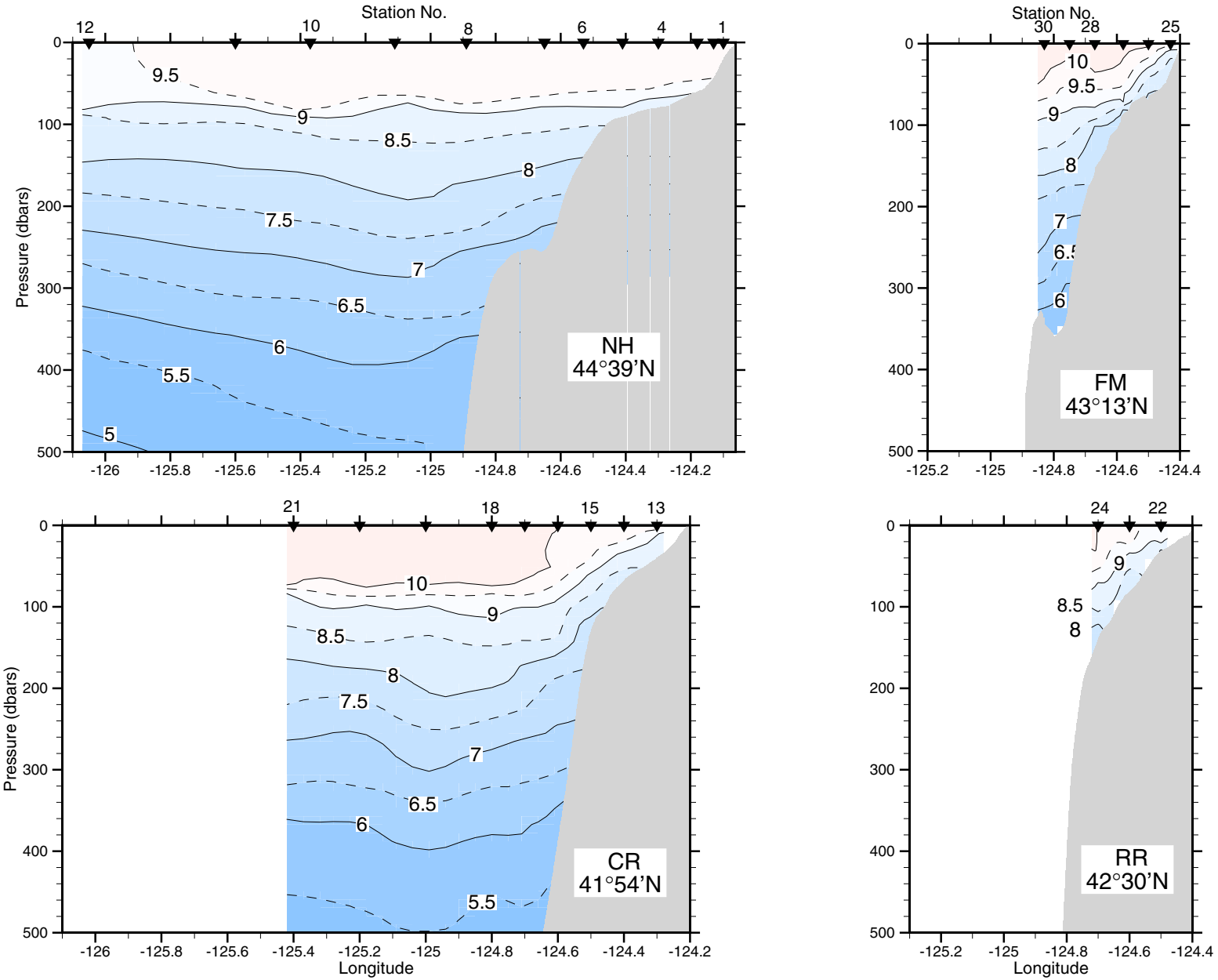
Table 3. cont.

	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)		
	0439	0444			41	54.1	-125	59.8					vertical net tow, 100 m	WE08201.7
	0545		20	CR-8	41	54.0	-125	12.0	2716	1018.4	145	10	CTD with ooxygen	WE08201.8
	0737			CR-9a	41	54.0	-125	24.0					vertical net tow, 100m	WE08201.9
	0756		21	CR-9a	41	54.0	-125	24.0	3097	1018.1	150	12	CTD with biochem, mzp	WE08201.10
	0843												begin transit to RR line	
	1400	1430											observed 4-5 whale spouts, RR-1	
	1435		22	RR-1	42	30.0	-124	29.9	36	1017.9	165	12	CTD with biochem	WE08201.11
	1451	1458			42	30.0	-124	30.0					vertical net tow, 32 m	WE08201.12
	1509				42	30.0	-124	30.0					HTI deployed	WE08201.13
	1549		23	RR-2	42	30.0	-124	36.0	88	1018.6	170	12	CTD with biochem, mzp	WE08201.14
	1609	1613			42	30.0	-124	36.1					vertical net tow, 80 m	WE08201.15
	1623				42	30.3	-124	36.2					Mocness deployed	WE08201.16
		1650			42	31.2	-124	36.3					Mocness aboard	WE08201.17
	1639												cleaned underway fluorometer	
	1708												air calibration of transmissometer	
	1735		24	RR-3	42	30.0	-124	42.0	135	1018.9	170	12	CTD with biochem, mzp	WE08201.18
	1755	1801			42	30.0	-124	41.9					vertical net tow, 100 m	WE08201.19
	1806				42	30.0	-124	41.9					HTI recovered	WE08201.20
	1810												begin transit to FM-1	
													(broke off line because inshore	
													sampling of FM line has high priority	
													and storm is forecast to arrive soon)	
	2154												air calibration of transmissometer	
	2229		25	FM-1	43	13.0	-124	26.0	34	1017.1	205	13	CTD	WE08201.21
	2238	2241			43	13.0	-124	26.0					vertical net tow, 28 m	WE08201.22
	2249				43	13.0	-124	26.0					HTI deployed	WE08201.23
	2322		26	FM-3	43	13.0	-124	30.0	67	1016.8	210	14	CTD with biochem, mzp	WE08201.24
	2340	2344			43	12.8	-124	29.8					vertical net tow, 60m	WE08201.25
	2352				43	12.6	-124	29.9					Mocness deployed	WE08201.26
24-Mar		0018			43	11.8	-124	30.2					Mocness aboard	WE08301.1
	0058		27	FM-4	43	13.0	-124	35.0	85	1016.0	195	15	CTD with biochem, mzp	WE08301.2
	0118	0123			43	13.0	-124	35.0					vertical net tow, 80m	WE08301.3
	0130				43	12.9	-124	34.9					Mocness deployed	WE08301.4
		0157			43	11.9	-124	34.7					Mocness aboard	WE08301.5
	0239		28	FM-5	43	13.0	-124	40.0	156	1015.0	200	15	CTD with biochem	WE08301.6
	0201	0206			43	13.0	-124	40.0					vertical net tow, 100	WE08301.7
	1913				43	12.9	-124	40.1					Mocness deployed	WE08301.8
		1957			43	11.9	-124	41.8					Mocness aboard	WE08301.9
	0433		29	FM-6	43	13.1	-124	45.0	311	1014.9	170	21	CTD with oxygen	WE08301.10

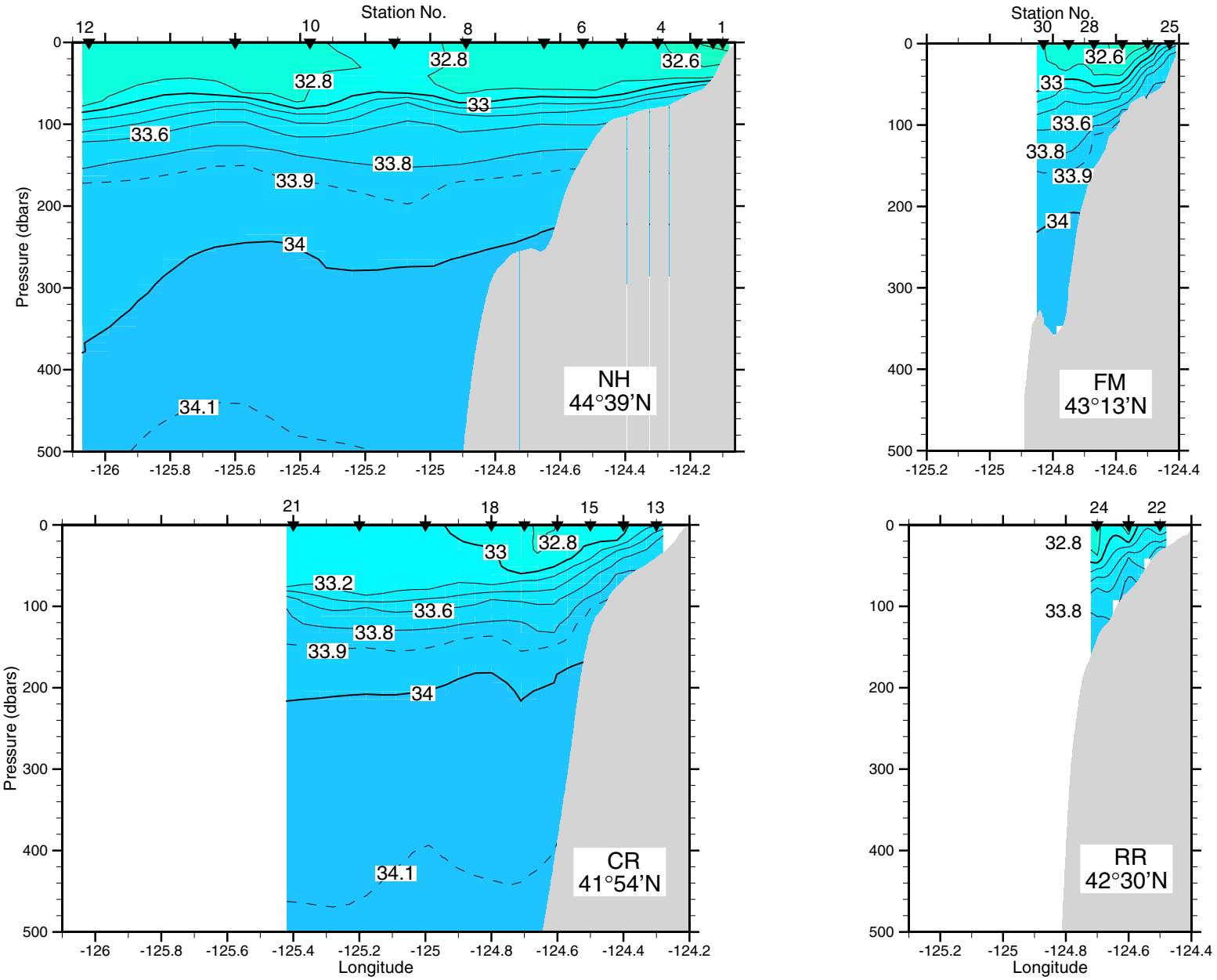
Table 3. cont.

	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)		
	0559	0605		FM-7	43	13.0	-124	50.0					vertical net tow	WE08301.11
	0615		30	FM-7	43	13.0	-124	50.0	344	1014.0	155	19	CTD with biochem, mzp	WE08301.12
	0651				43	12.9	-124	50.0					Mocness deployed	WE08301.13
		0751			43	10.8	-124	50.1					Mocness aboard	WE08301.14
	0757				43	10.7	-124	50.1					HTI recovered	WE08301.15
	0755												begin transit to Newport	
													(broke off line in time to arrive at	
													Newport for high tide on Saturday,	
													because of forecast storm)	
	1956												shut down flow through system	
	1957												shut down echosounder	
	1958												shut down DAS	
	1958												shut down ADCP	
	2034												arrive at pier in Newport	

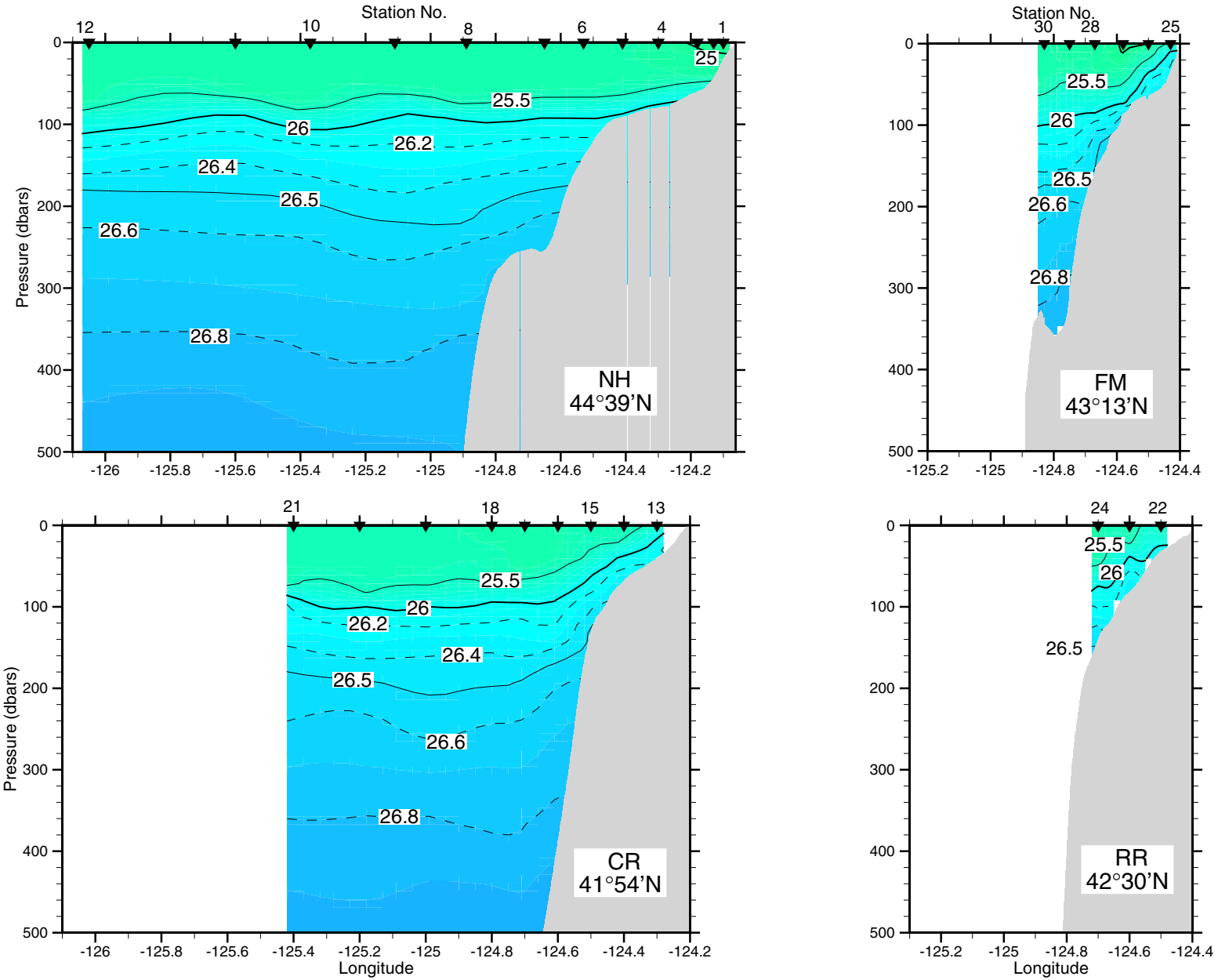
Temperature, 20-24 March 2001



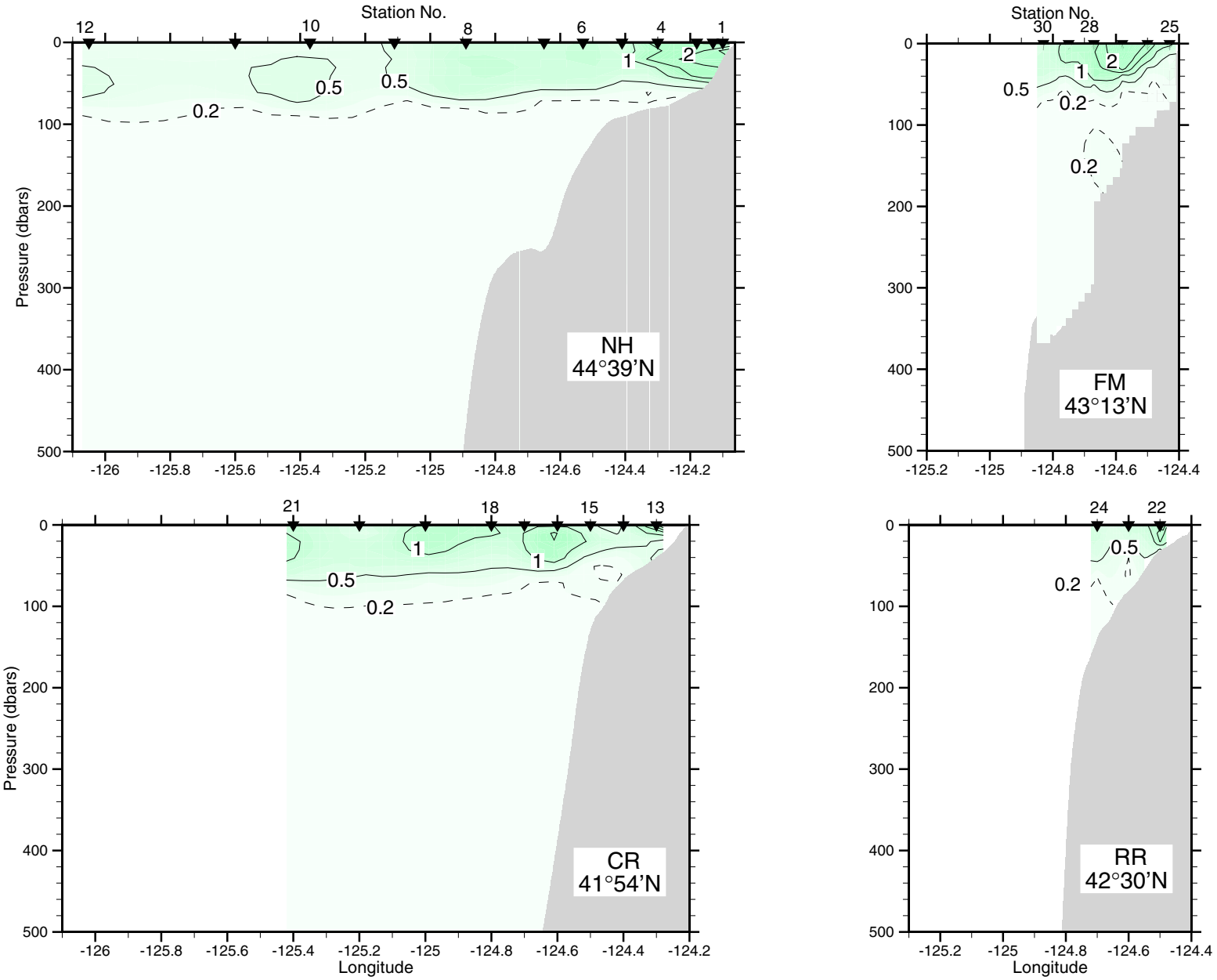
Salinity, 20-24 March 2001



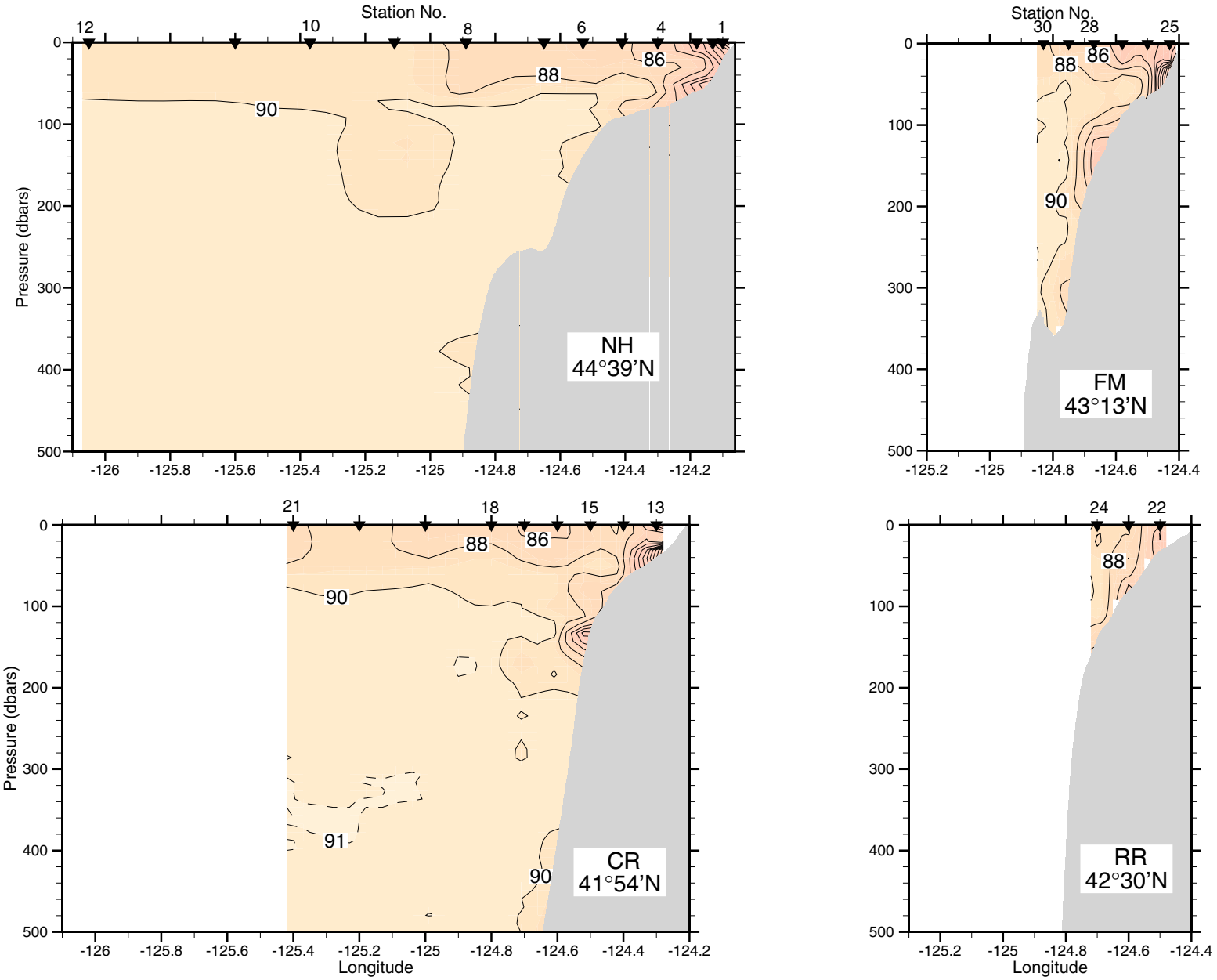
Sigma-theta, 20-24 March 2001



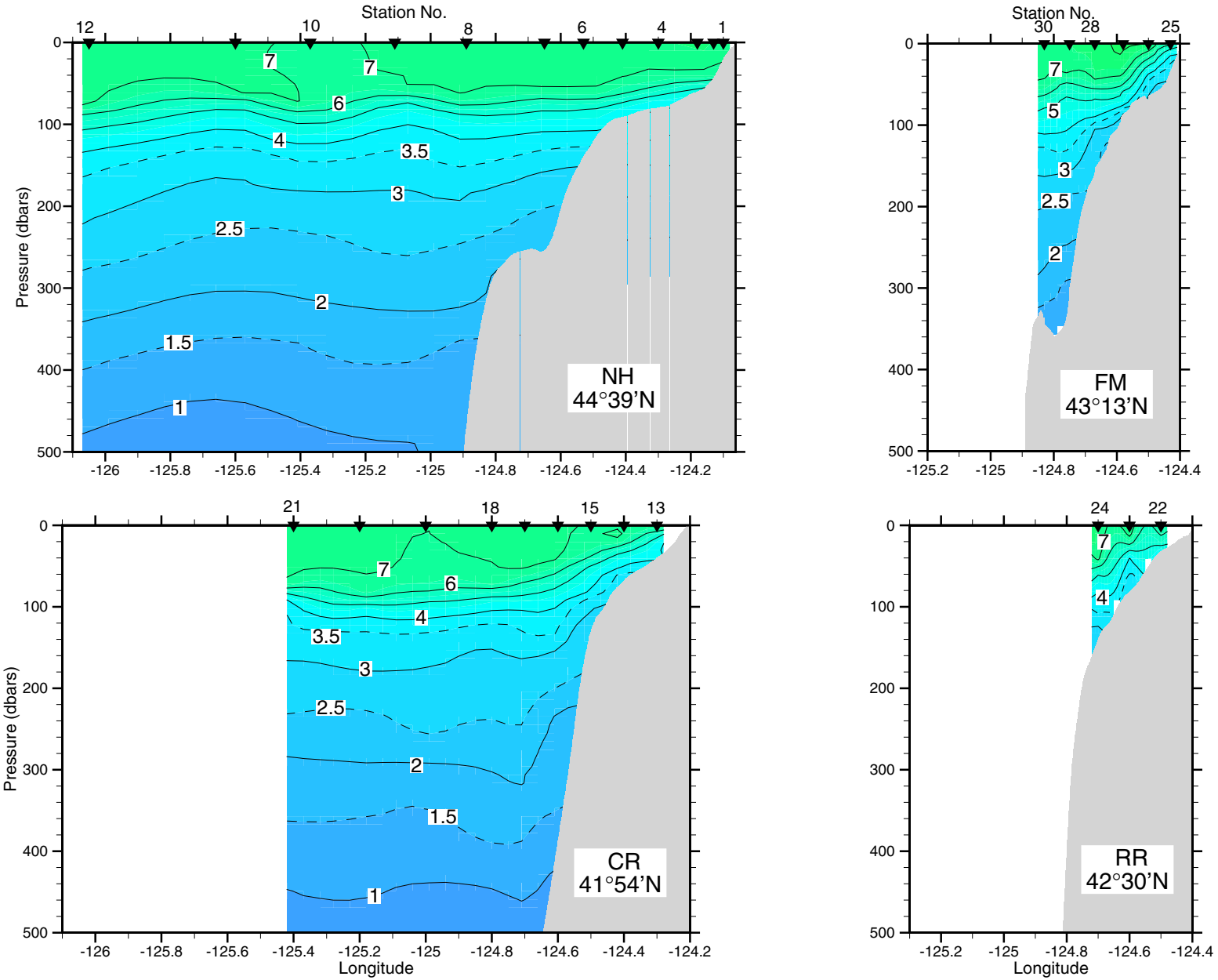
Fluorescence, 20-24 March 2001



% Light Transmission, 20-24 March 2001



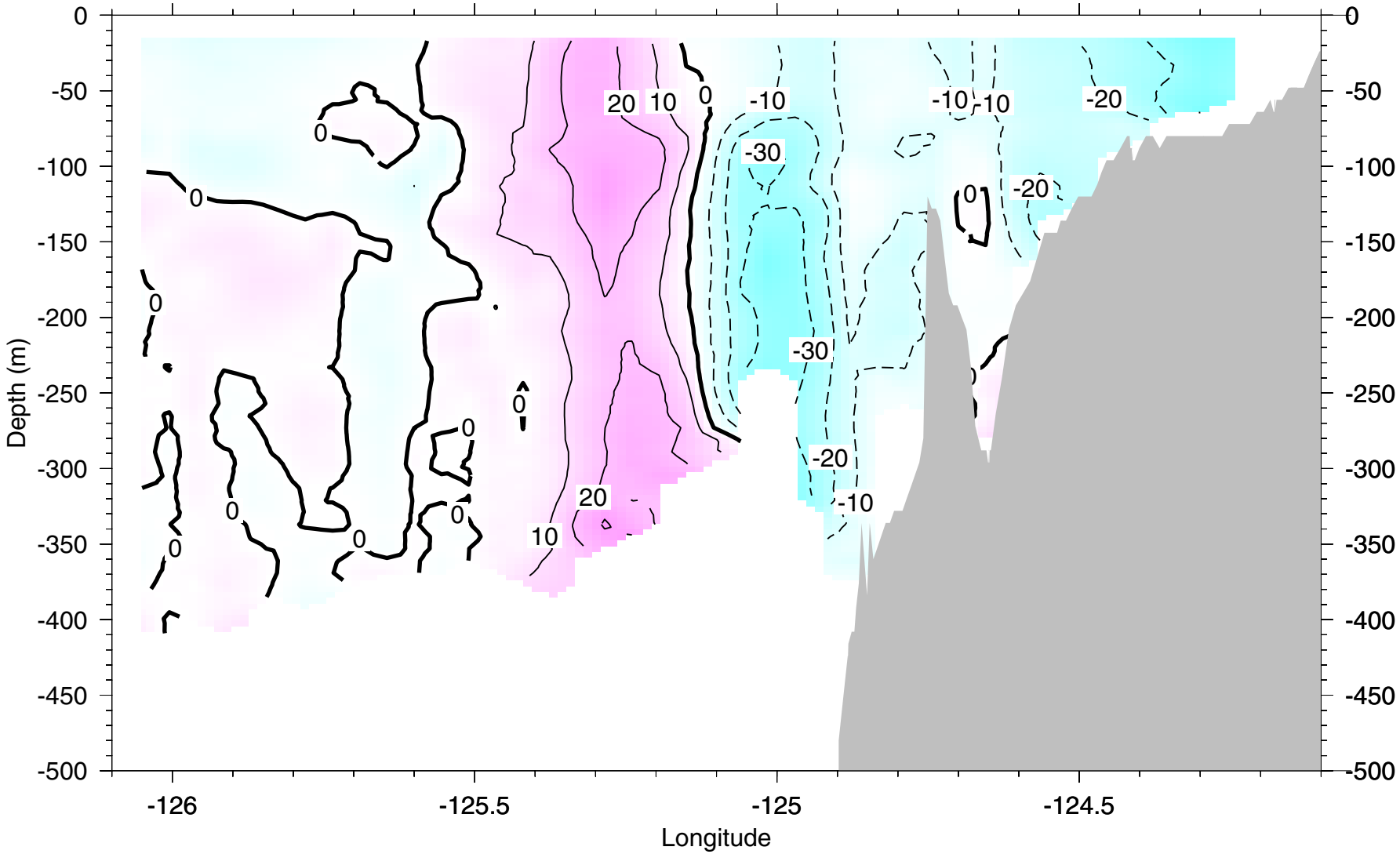
Oxygen, 20-24 March 2001



Newport Hydrographic Line 44.6°N

20-21 March 2001

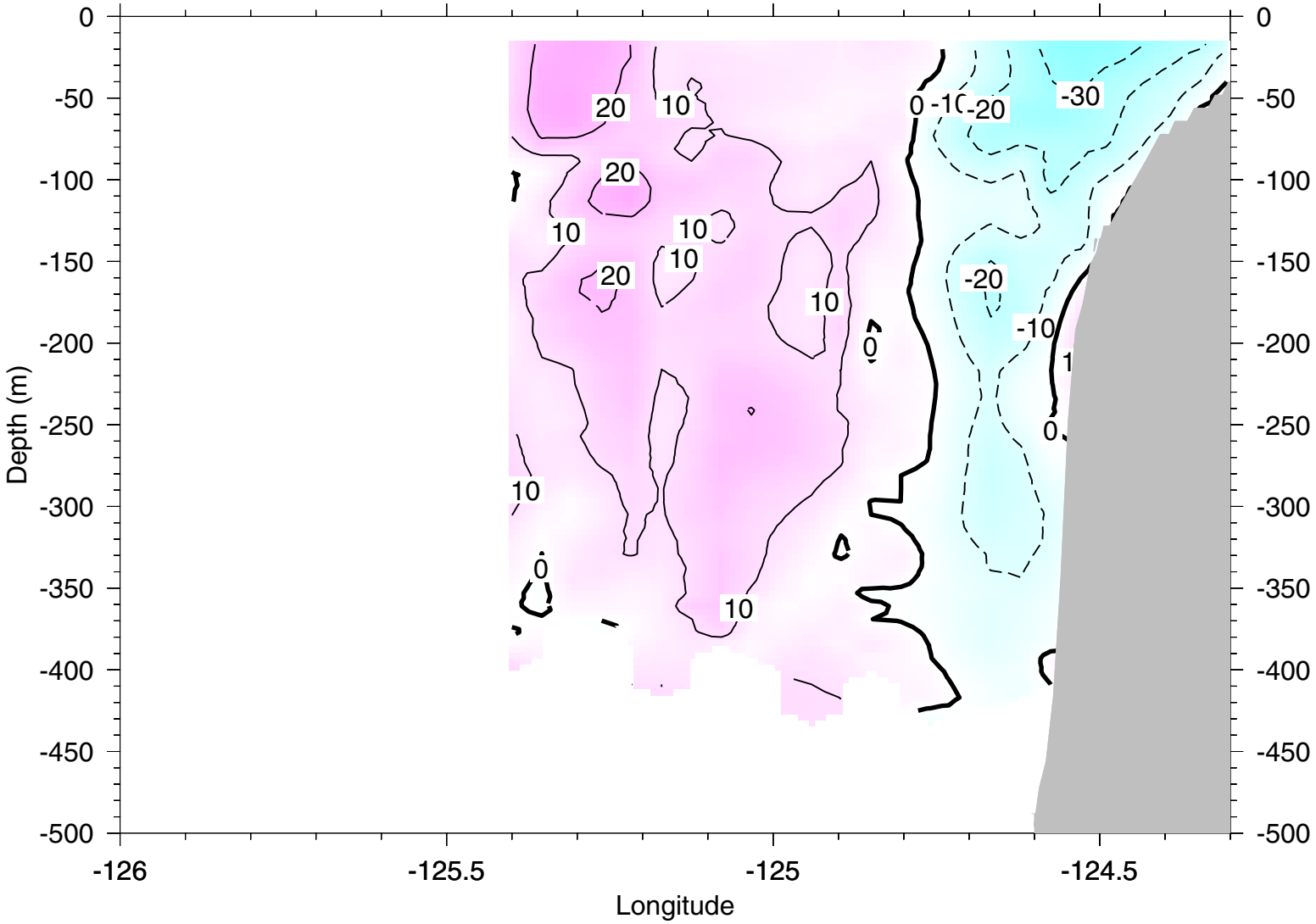
ADCP: Northward current (cm/s)



Crescent City Hydrographic Line 41.9°N

22-23 March 2001

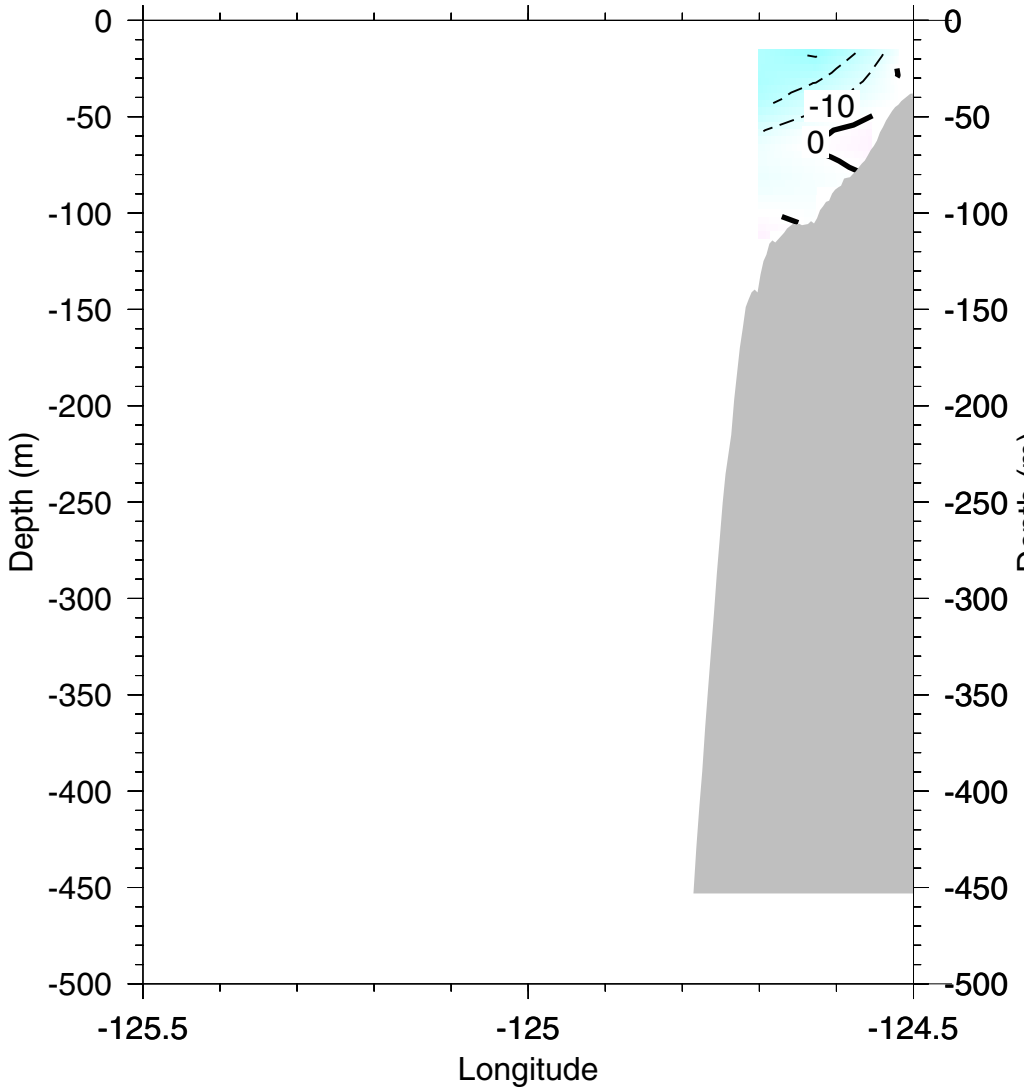
ADCP: Northward current (cm/s)



Rogue River Line 42.5°N

23 March 2001

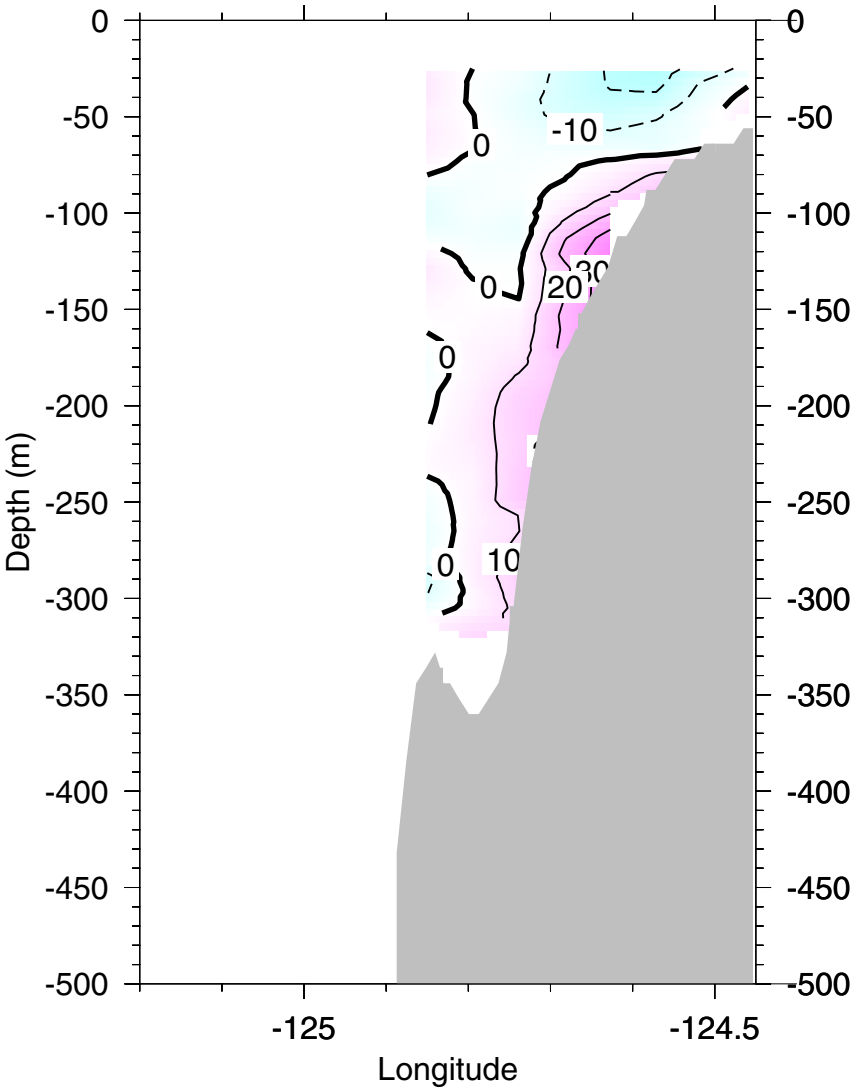
ADCP: Northward current (cm/s)



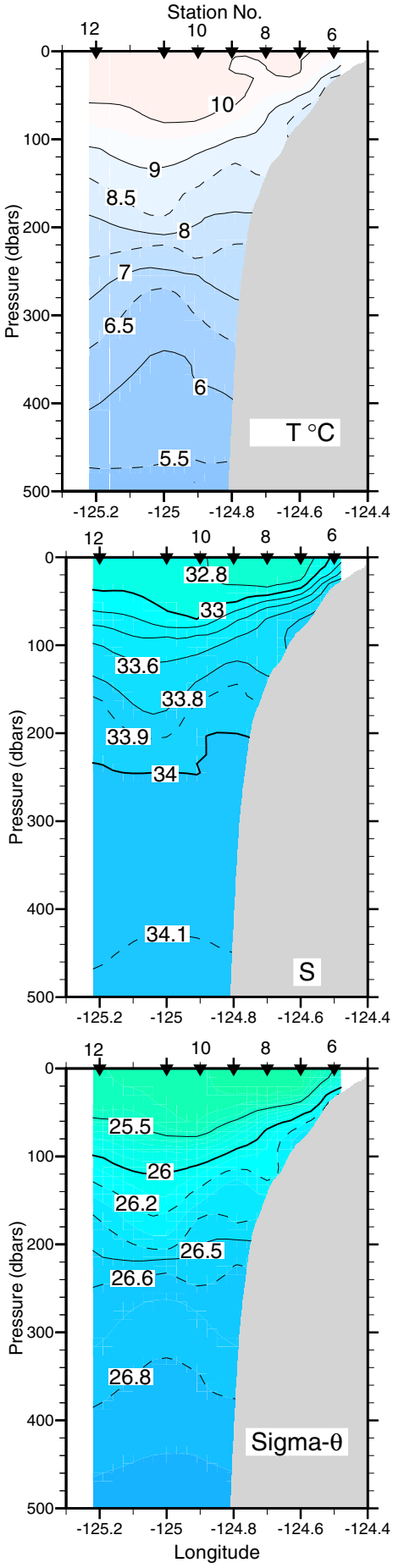
Five Mile Hydrographic Line 43.2°N

23-24 March 2001

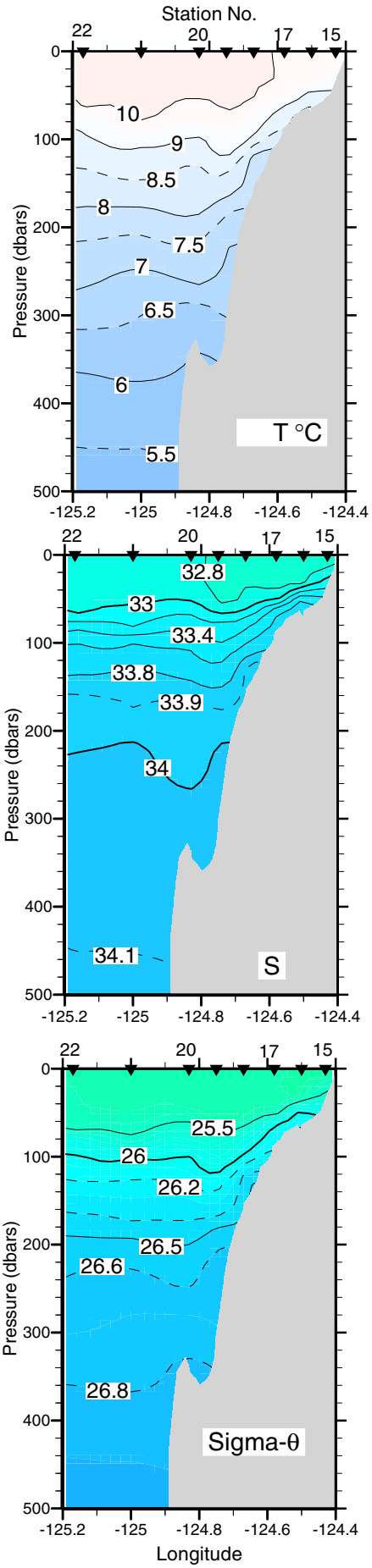
ADCP: Northward current (cm/s)



Rogue River Line 42° 30'N
17 March 2001

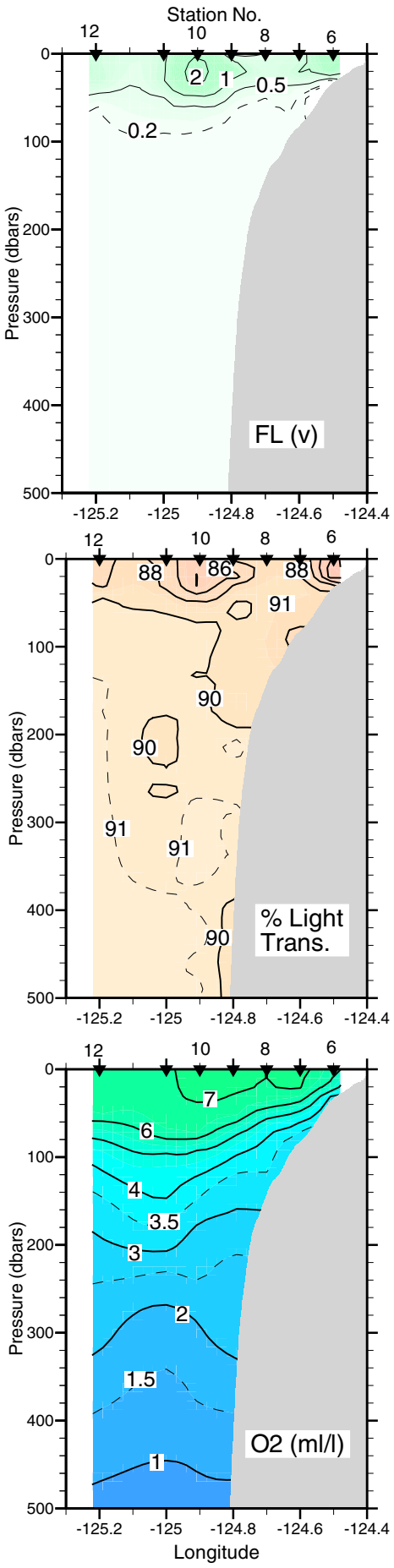


Five Mile Line 43° 13'N
18 March 2001



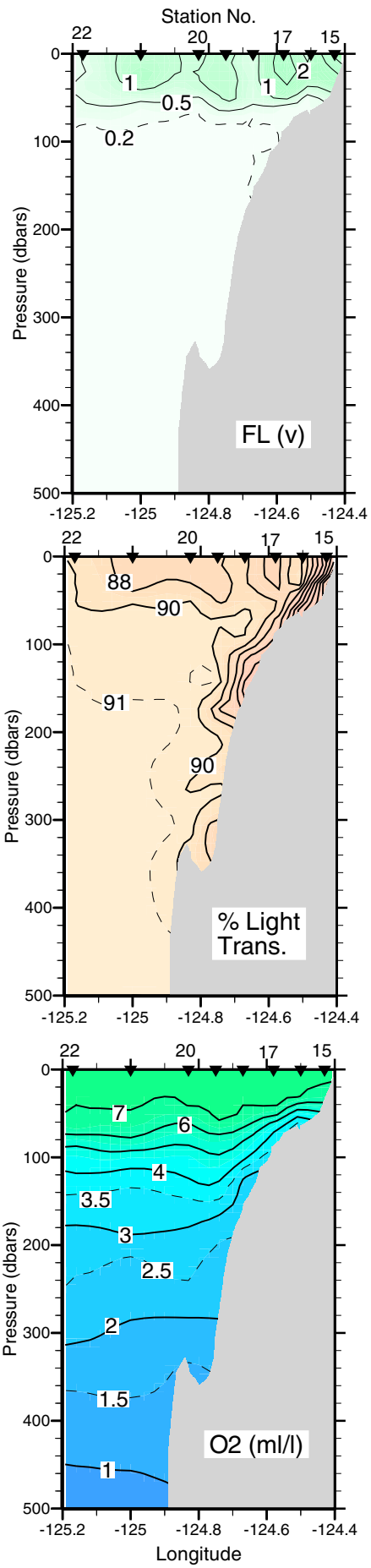
Rogue River Line 42° 30'N

17 March 2001



Five Mile Line 43° 13'N

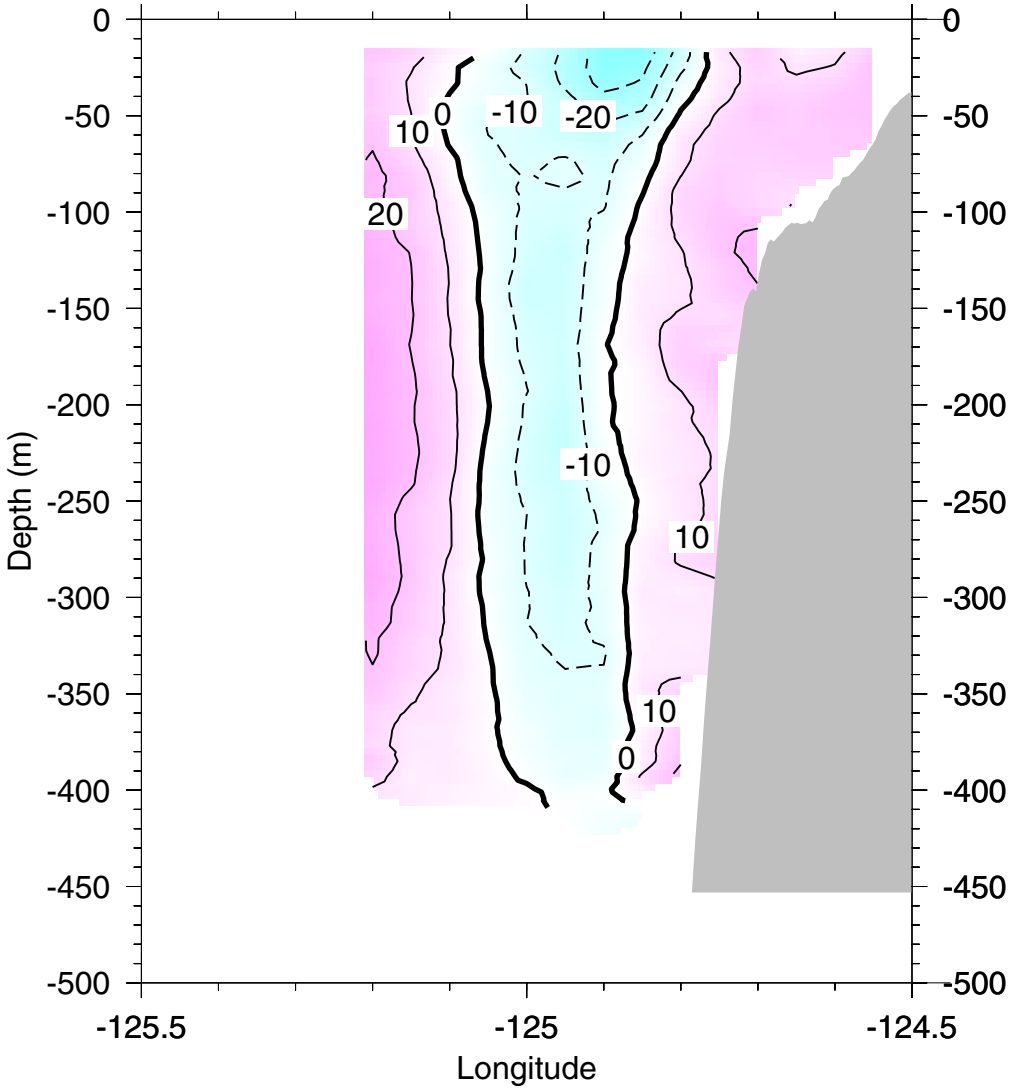
18 March 2001



Rogue River Line 42.5°N

17 March 2001

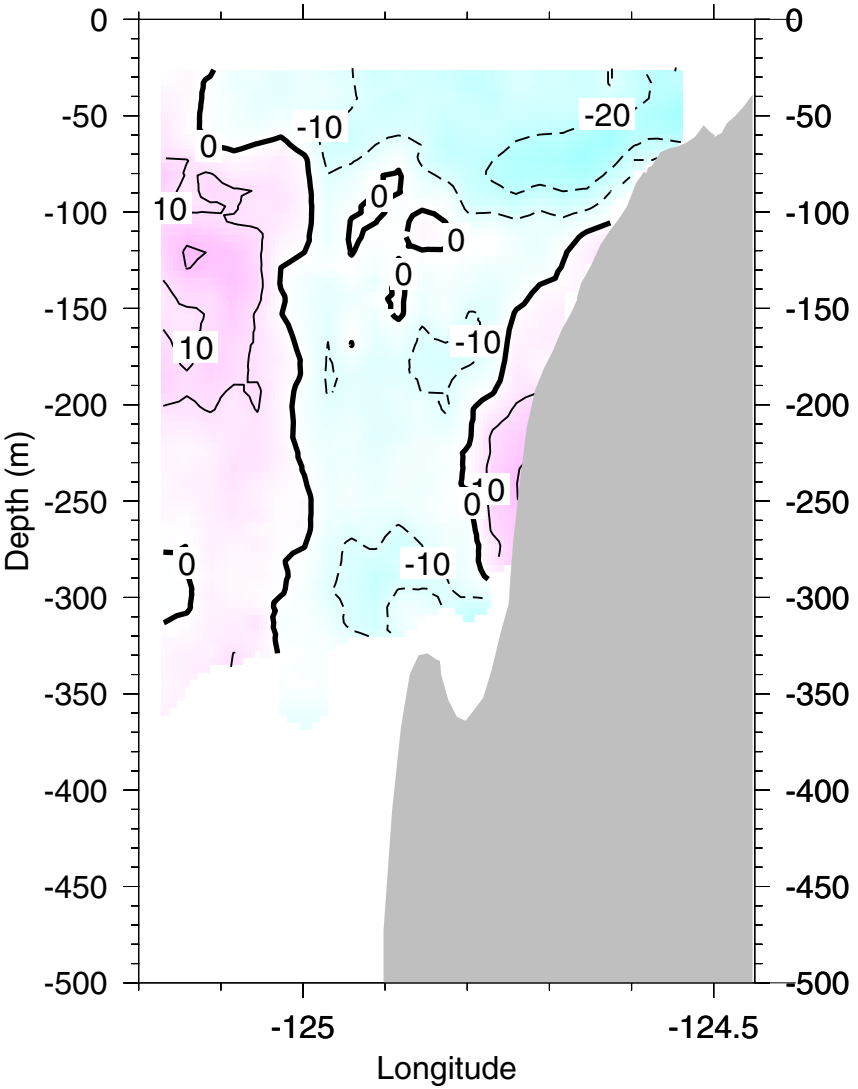
ADCP: Northward current (cm/s)



Five Mile Hydrographic Line 43.2°N

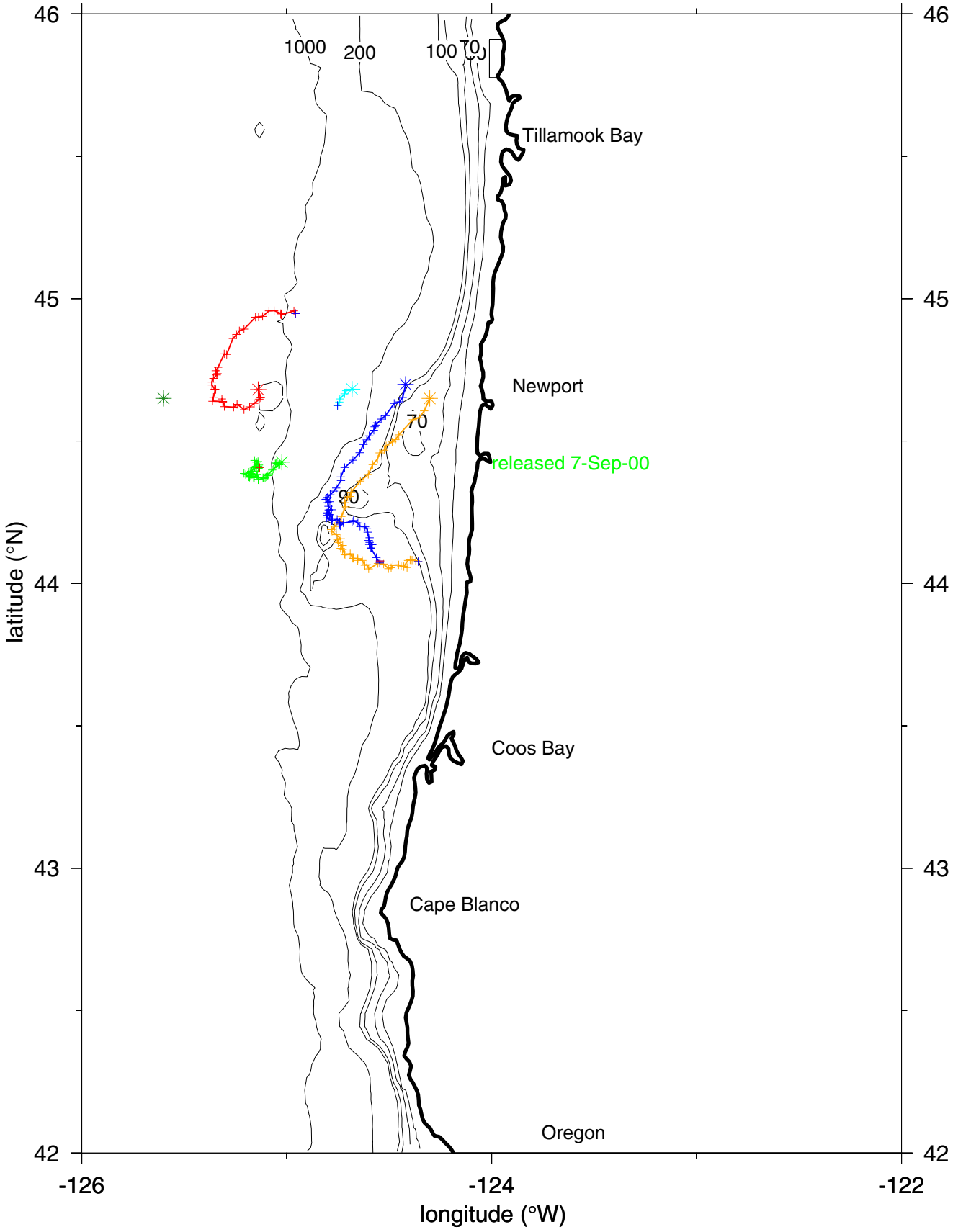
18 March 2001

ADCP: Northward current (cm/s)



Drifter data from Mar 20 2001 to Mar 26 2001

(dates on land indicate last transmission from failed drifters)



Zooplankton Report

MOCNESS DESCRIPTIONS

NH5 1325 h water depth=60m

50-20 m	copepods, amphipods, Pleurobrachia, Phialidium, crabs, chaetognaths
20-10 m	amphipods, crab zoea, Pleurobrachia, Phialidium
10-0 m	jellies, copepods, amphipods, polychaets, chaetognaths

NH15 1635 h water depth=90m

80-50	copepods, salp pieces, small copepods, Limacina, amphipods
50-20	Calanus, Limacina, small salps
20-10	copepods, Limacina, chaetognaths
10-0	copepods, small Pleurobrachia, Limacina

NH25 2011 h water depth=300m

280-200	Muggiaea, 9 myctophids, ~40 adult euphausiids
200-150	salps, ~20 adults euphausiids, 2 shrimp, copepods, small chaetognaths
150-100	salps, ~20 adults euphausiids, 1 squid, 1 shrimp, 1 amphipods
100-50	salps, ~30 young adult euphausiids, amphipods, copepods
50-20	salps, ~500 adult euphausiids, small copepods
20-10	big salps, small adult euphausiids, small copepods
10-0	salps, small adult euphausiids, copepods

NH35 0020 h water depth=480m

350-300	Muggiaea, chaetognaths, copepods, 2 myctophids
300-200	radiolarians, Muggiaea, ~10 euphausiids, 2 silver dollar jellies, copepods
200-150	~7 euphausiids, radiolarians, chaetognaths, copepods
150-100	Praya chain, 2 shrimp, 10 euphausiids, 1 red jelly
100-50	~200 euphausiids, 3 silver dollar jellies, copepods
50-20	Limacina, big salp, Calanus, adult euphausiids, amphipods
20-10	Limacina, ~30 euphausiids, Calanus
10-0	1 large salp, young euphausiids, Limacina

NH45 0400 h water depth=660m

350-300	Muggiaea, radoilarians, 3 jellies, copepods
300-200	radiolarians, Muggiaea, copepods, jellies, 1 myctophiid, amphipods
200-150	Muggiaea, radiolarians, chaetognaths, big copepods, fish
150-100	radiolarians, 1 shrimp, small chaetognaths, small euphausiids
100-50	6 myctophids, Limacina, amphipods, chaetognaths, copepods
50-20	2 fish, small euphausiids, Limacina, copepods

20-10 Calanus, ~500 euphausiids, Limacina
10-0 ~200 euphausiids, copepods, Limacina

CR2 0900 h water depth=70m

60-50 copepods, furcilia, chaetognaths, 2 Pleurobrachia, 2 jellies
50-20 30 Pleurobrachia, copepods, furcilia, Limacina
20-10 Pleurobrachia, copepods, amphipods, Limacina
10-0 Pleurobrachia, Limacina, amphipods, copepods, chaetognaths

CR3 1100 h water depth=135m

120-50 1 Praya, ~200 euphausiids, furcilia, copepods
50-20 furcilia, 10 adult euphausiids, euphausiid eggs, 34 Pleurobrachia, copepods
20-10 ~100 Pleurobrachia, copepods, furcilia
10-0 ~40 Pleurobrachia, copepods, amphipods, 1 adult euphausiid

CR4 1300 h water depth=500m

350-300 1 myctophid, blue Euchaeta eggs, 10 Muggiaea, chaetognaths, copepods
300-200 ~100 euphausiids, Muggiaea, Euchaeta, copepods, euphausiid eggs
200-150 purple female euphausiids, copepods, chaetognaths, euphausiid eggs
150-100 ~40 euphausiids, chaetognaths, amphipods, euphausiid eggs, copepods
100-50 euphausiids, copepods, radiolarians, chaetognaths
50-20 ~60 Pleurobrachia, copepods, furcilia, Praya chain, copepods
20-10 copepods, 3 Beroe,~100 Pleurobrachia, amphipods, chaetognaths, eggs
10-0 euphausiid eggs, 1 adult euphausiid, 20 Pleurobrachia, 1 Beroe, chaetognaths, copepods, crab zoea

CR6 1725 h water depth=700m

350-300 radiolaria, copepods, eggs, 1 myctophid, chaetognaths, Muggiaea
300-200 eggs, Muggiaea, amphipods
200-150 radiolarians, eggs, 1 myctophid, Muggiaea, copepods
150-100 radiolarians, jellies, euphausiid eggs, copepods, 3-4 euphausiids
100-50 Praya chains, radiolarians, euphausiids, eggs, chaetognaths, copepods
50-20 copepods, chaetognaths, amphipods, young euphausiids
20-10 1 flatfish, amphipods, chaetognaths, Limacina
10-0 copepods, eggs, Pleurobrachia, amphipods, Limacina

RR2 0825 h water depth=90m

80-50 1 Praya, Pleurobrachia, amphipods, small copepods, furcilia
50-20 furcilia, copepods, Pleurobrachia, 3 euphausiids, eggs, Limacina
20-10 furcilia, euphausiid eggs, Limacina, Pleurobrachia, copepods

10-0 Pleurobrachia, copepods, euphausiid eggs, Limacina, amphipods

FM3 1554 h water depth=66m

55-20 Pleurobrachia, small copepods, silver dollar jellies, amphipods, 1 squid
20-10 ~30 Pleurobrachia, small copepods,
10-0 ~40 Pleurobrachia, phytoplankton ooze, copepods

FM4 1730 h water depth=87m

70-50 ~20 Pleurobrachia, furcilia, chaetognaths, amphipods, copepods
50-20 ~40 Pleurobrachia, furcilia, Limacina, copepods
20-10 ~20 Pleurobrachia, Limacina, copepods, furcilia
10-0 ~40 Pleurobrachia, phytoplankton

FM5 1913 h water depth=160m

150-100 5 shrimp, Praya chain, chaetognaths, amphipods, copepods
100-50 Limacina, small copepods, ~40 euphausiids, 1 shrimp
50 m (acoustic target) copepods, 15 Pleurobrachia, larval fish, Limacina, amphipods
50-20 ~1000 euphausiids, ~30 Pleurobrachia, eggs, furcilia, copepods
20-10 ~700 adult euphausiids, Calanus
10-0 ~1500 euphausiids, copepods, furcilia

FM7 2250 h water depth=345m

310-250 2 siphonophores, 5 silver dollar jellies, 3 myctophids, radiolarians, chaetognaths, copepods
250-200 radiolarians, chaetognaths, amphipods
200-150 radiolarians, chaetognaths, copepods, 1 sergestiid, amphipods
150-100 radiolarians, chaetognaths, ~5 euphausiids, Muggiaea
100-50 radiolarians, chaetognaths, 7 euphausiids, copepods, 1 sergestiid
50-20 1 large jelly, radiolarians, euphausiids, Limacina
20-10 small copepods, 1 salp, 1 shrimp, amphipods, euphausiids
10-1 small copepods, salps, adult euphausiids, amphipods

Other zooplankton sampling:

Vertical tows (200µm mesh) from 100m to the surface completed at stations NH1, NH5, NH10, NH15, NH20, NH25, NH35, NH45, NH65, CR1, CR2, CR3, CR4, CR6, CR7, CR9a, RR1, RR2, RR3, FM1, FM3, FM4, FM5, and FM7.

Euphausiids from station CR4 were incubated for moulting rates and egg production rates.

Microzooplankton Sampling

(submitted by Drs. E. and B. Sherr, Oregon State University)

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

MICROPROTIST (10 – 200 μm sized) 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.

Secondary goal: ABUNDANCE OF PICOEUKARYOTES 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.

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 depth
- 4 other depths in upper 50 m, don't sample the 1 m depth, more or less evenly spaced; may want to sample the depth nearest the chlorophyll maximum depth

Transect lines: top priority is the NH line, second priorities are the FM and CR lines, tertiary priority for the HH and RR lines

PROTOCOL FOR EPIFLUORESCENCE SAMPLES

1) Preserve the sample: **to each 230 ml seawater sample :**

- **add 3 drops of alkaline Lugol solution, gently mix by capping & inverting bottle**

- **add 6 drops of 3% sodium thiosulfate, gently mix** (sample color should go from pale golden to clear)

- **add 6 ml of formalin (2 squirts from the 3-ml Oxford dispensor**
- **refrigerate for 6-12 hours before filtration to harden and shrink cells (probably can let the samples sit 24+ hours, but its best to stain, settle on filters, mount & freeze as soon after ~ 6 hours as possible**

2) **Filter and stain with DAPI:** Prepare filtration bases with 0.45 μm backing filters, wetted, lay on top a 3.0 μm black membrane filter, and clamp tower over the filters on the base. (Note: *If the filtration clamp isn't on securely, the sample will leak out of the tower down the side of the base - check for leaks after pouring the sample into the tower).* Filter appropriate volume of preserved sample (usually 100 ml). *Filter down to about 5 ml* of sample, relieve the vacuum by turning the manifold valve to the off position, quickly taking off and then replacing the filtration unit (including the stopper) on, the manifold, (if you don't do this, there will be enough residual vacuum for the sample to keep dripping into the manifold during the staining procedure). Turn off pump and relieve all vacuum when last sample is down to 5 ml.

Note: A problem with filtration of multiple samples at a time is that usually some samples filter more quickly than others. You'll have to keep a sharp watch on the samples, and when each sample in turn reaches the 5 ml mark on the tower, turn the valve for the filtration unit to the off position and then remove & replace the stopper to ensure all the vacuum in that filtration unit is relieved. When all of the samples have gone down to 5 ml, then turn off the pump and relieve all the vacuum in the system by taking off & replacing one of the tower stoppers, or the stopper on the first vacuum trap.

2) Add 30 μl of 500 μg/ml DAPI to each of the samples in the towers, let sit ~ 7 minutes (longer is OK).

3) Prepare labeled slides: While waiting for the samples to incubate with the DAPI stain, prepare the glass slides for mounting the samples. Use consecutive slide numbers with number codes listed in log sheets with sample information. Mount two replicate filters onto each slide. Put a drop of immersion oil onto the slide and smear flat with the edge of a cover slip.

4) Filter samples down, mount onto glass slides and freeze: Turn on the pump, open all the manifold valves, and filter down the stained samples to dryness. *Remove the filters while vacuum is still on.* Lay duplicate filters side by side on the glass slide, put a drop of immersion oil on each, put a glass cover slip on top of each filter, put in a labeled slide box and store in -20oC freezer until returned to COAS (on ice to keep cold).

PROTOCOL for Utermohl inverted microscopy method

Settle 50 mls of acid Lugol's preserved sample in a graduate cylinder for 24 hrs. Pipette off the top 30 mls and then pour the rest into an Utermohl settling chamber followed by 5 mls of acid lugal's containing filtered seawater used to rinse the graduate cylinder. Let the sample settle for another 12 hrs. Then prepare the bottom portion of the chamber for enumerating ciliates using DIC or brightfield inverted microscopy.

Table 5: Actual sample depths for microzooplankton samples (epifluorescence slide preparations and acid Lugol-fixed samples) during the Mar.-'01 LTOP GLOBEC cruise.

Station, Depth, Dist. From Shore	Sample Collection Depths (m)
NH-05, 60m, 10km	55, 40, 25, 20, 13, 10
NH-15, 83m, 28km	70, 49, 31, 20, 10, 5
NH-25, 296m, 46km	71, 51, 44, 30, 20, 10
NH-35, 450m, 65km	70, 50, 30, 25, 20, 10
NH-45, 694m, 83km	70, 45, 40, 30, 20, 10
NH-65, 2861m, 121km	65, 50, 35, 30, 20, 10
NH-85, 2883m, 157km	70, 53, 40, 30, 20, 10
CR-1, 42m, 8km	35, 25, 19, 15, 10, 6
CR-3, 138m, 24km	69, 50, 30, 16, 10, 5
CR-4, 504m, 33km	70, 50, 40, 30, 22, 10
CR-7, 835m, 66km	70, 50, 40, 29, 20, 10
CR-9a, 3097m, 99km	70, 50, 41, 29, 25, 10
RR-2, 88m, 16km	70, 50, 30, 17, 10, 5
RR-3, 135m, 24km	70, 50, 30, 21, 11, 5
FM-3, 67m, 9km	50, 30, 20, 15, 10, 6
FM-4, 87m, 15km	60, 40, 30, 15, 10, 5
FM-7, 344m, 36km	71, 50, 30, 24, 20, 10