

PRELIMINARY CRUISE REPORT, W9909C
R/V WECOMA, 22-27 September 1999
GLOBEC/ENSO Long-Term Observations off Oregon

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P. Michael Kosro, P. A. Wheeler, W. T. Peterson and Jack A. Barth

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, Coos Bay, Crescent City and Eureka), to make additional stations along a fifth line (off Rogue River or Heceta Head if time permits), 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. Table 1 shows the intended CTD station positions.

SAMPLING PLAN:

1. Use ship's intake continuously for Temperature, Salinity, 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.
4. Rosette sampling: 5 liter bottles for nutrients, and chlorophyll.
5. Deploy surface drifters after selected NH-line stations.
6. Vertical net tows: WP-2 nets 200 m to surface; Oblique tows: Bongo nets (70 cm dia) 200 m to surface at 2-3 kts.

CRUISE NARRATIVE

Only a brief overview of the cruise is presented here. A detailed event log is provided in Table 2, and the participating personnel are listed in Table 3. Wecoma departed Newport at 1000 PDT, 22 September 1999, and we began sampling offshore along the Newport Line. At about 1630 PDT, while at NH-15, Amy Chiuchiolo suffered an injury to her finger, and Wecoma proceeded back to Newport to disembark her for medical treatment. Wecoma sailed again from Newport at 1920 p.m., and returned to NH-15 to continue sampling. After completing Newport Line at 1235 PDT, 23 September, we transited to the offshore end of the FM-line, and began sampling there about 2030 PDT. Winds remained moderate for the FM line, and it was completed about 0930 PDT, 24 September. From the inshore end of the FM line, we transited along the shelf to the inshore end of the CR-

line, and began sampling there at 1630 PDT, 24 September. Winds increased abruptly, but decreased rapidly after our station at CR-2, and we were able to continue sampling through the night, completing CR-9 at about 0700 PDT, 25 September. Northerly winds increased gradually during our transit to EUR-1, with the sea state building. We were able to complete sampling at EUR-1 and EUR-2, but winds increased again, and we had to break off sampling after the CTD cast at EUR-3, at about 1800 PDT, 25 September. We attempted to continue steaming west for ADCP sampling along the line, but seas were too rough, and by 1900 PDT we were hove-to, making slow progress into the wind through the night. After lunch the next day, we reached the inshore end, RR-1 (42.5°N, 124.5°W), of a potential sampling line off the Rogue River; we ran westward to RR-7 (42.5°N, 125.2°W) for ADCP sampling of the currents along this transect. After reaching this point at 1530 PDT, we headed north and reached NH-20 at 0345 PDT, 27 September. From there we made a small-scale ADCP survey for comparison with surface currents measured by a local CODAR installation. We arrived alongside the pier at Newport at about 1330 PDT.

PRELIMINARY RESULTS

Vertical sections of selected parameters measured by the SBE CTD system (temperature, salinity, density, and fluorescence voltage) are presented at the end of this report for the three lines that were fully sampled (NH, FM, and CR), and for the partial section off Eureka. Vertical sections of alongshore velocity measured by ADCP are presented for each of these lines and also for a line off the Rogue River. All sections show evidence of strong upwelling at the coast, consistent with the late-season upwelling-favorable winds that prevailed during much of September. Also included at the end of this report is a plot of the trajectories of the 15-m drogued drifters deployed during this cruise. Four of the six drifters show evidence of the large anticyclonic eddy which can be clearly seen in the ADCP and temperature sections for the NH-line. Its center appears to lie near 44.5 N, 125.2 W; the 7 and 8C isotherms and the 26.6 isopycnal were significantly depressed at this longitude.

Table 1. Intended CTD station positions, and intended sampling at each station (showing Station name, distance (km) to shore, longitude, depth (m), and additional sampling (C: Bio/Chem bottle sampling, D: Drifter deployment, N: net tows)

Newport Hydro Line along 44-39.1°N

NH-1	2 km	124 - 06'W	30 m	N
NH-3	5	124 - 07.8'	48	
NH-5	9	124 - 10.6'	60	C,N
NH-10	18	124 - 17.7'	80	N,D
NH-15	28	124 - 24.7'	90	C,N,D
NH-20	37	124 - 31.7'	140	
NH-25	46	124 - 39'	296	C,N,D
NH-35	65	124 - 53'	435	C,
NH-45	84	125 - 07'	700	C,N,D
NH-55	102	125 - 22'	2885	
NH-65	120	125 - 36'	2880	C,N,D
NH-85	157	126 - 03'	2900	C

FM Line along 43-13°N

FM-1	3 km	124 - 26'W	36 m	N
FM-3	9	124 - 30'	60	C,N
FM-4	15	124 - 35'	84	C,N
FM-5	22	124 - 40'	158	C,N
FM-6	29	124 - 45'	310	
FM-7	35	124 - 50'	336	C,N
FM-8	49	125 - 00'	1078	C,N
FM-9	63	125 - 10'	1722	C,N

Crescent City Line along 41-54°N

CR-1	8 km	124 - 18'W	39 m	C,N
CR-2	16	124 - 24'	65	N
CR-3	23	124 - 30'	117	C,N
CR-4	31	124 - 36'	495	C,N
CR-5	41	124 - 42'	645	C,N
CR-6	49	124 - 48'	687	
CR-7	66	125 - 00'	852	C,N
CR-8	82	125 - 12'	2745	
CR-9	93	125 - 20'	3089	C,N

Eureka Line along 40-52°N

EU-1	9 km	124 - 16'W	59 m	C,N
EU-2	17	124 - 22'	111	C,N
EU-3	26	124 - 28'	372	C,N
EU-4	34	124 - 34'	550	
EU-5	43	124 - 40'	729	C,N
EU-6	54	124 - 48'	1653	
EU-7	65	124 - 56'	2930	C,N

Heceta Hydro Line along 44-00°N

HH-1		124 - 12'W	52 m	C,N
HH-2		124 - 24'	115	C,N
HH-3		124 - 36'	150	C,N
HH-4		124 - 48'	100	C,N
HH-5		125 - 00'	950	C,N
HH-6		125 - 06'	1450	
HH-7		125 - 12'	1600	C
HH-8		125 - 18'	2900	
HH-9		125 - 24'	3000	C

Table 2. Cruise log of W9909C

Date	Time	Station		Latitude	Longitude	Z _B	At. Pr.	Wind		
UT	UT	No.	Name	deg, min N	deg, min W	(m)	(mbar)	Dir. (°T)	Spd. (kt.)	Event
22 Sep	1700									Depart Newport
	1704									Start DAS, flo-thru pumps
	1732									Start ADCP
	1829	1	NH-1	44 39.1	124 06.0	28	1018.2	340	12	CTD
										Vertical Net: 1849-1853 UT
										Meter Tow: 1855-1859 UT
	1900									Changed Draft on PDR from 0 m to 5 m
	1929	2	NH-3	44 39.1	124 07.8	48	1018.0	000	8-10	CTD
	2004	3	NH-5	44 39.1	124 10.5	58	1018.2	005	10	CTD, biochem
										Vert. net , 55 m: 2025-2030 UT
										Bongo net, 65 m: 2048-2057 UT
	2133	4	NH-10	44 39.0	124 17.7	80	1018.0	000	12	CTD
	2223			44 38.9	124 17.9					Drifter #15887
	2302	5	NH-15	44 39.1	124 24.6	94	1017.8	350	15	CTD, biochem
										Vert. Net, 2322-2330 UT
	2335									Departing NH-15 for Newport, because of injury to Amy's finger
	2335			44 39.22	124 24.92					Drifter #15888 deployed
	2338			44 39.21	124 24.82					Drifter #23682 deployed
	0030									Flo-thru pumps turned off
23 Sep	0150									At pier, Newport
	0220									Depart Newport
	0306									Flo-thru pumps turned on
	0413		NH-15	44 39.1	124 24.7		1016.8	335	8	Vertical net,
										Meter tow, 0425-0429
										Bongo, 0435-0442
	0520	6	NH-20	44°39.1	124 31.7	143	1016.9	340	9	CTD
	0546									Vertical net, 100 m,
	0631	7	NH-25	44 39.1	124 39.0	295	1016.8	335	8	CTD, biochem
										Vertical net, 0705-0726
										Meter tow, 0744-0749
										Bongo, 0756-0815
	0819			44 38.6	124 39.0					Drifter #15889
	0922	8	NH-35	44 39.0	124 52.9	436	1016.9	330	12	CTD, biochem
	1058	9	NH-45	44 39.1	125 07.0	716	1016.4	320	5	CTD, biochem
										Vertical net, 1146-1155
										Meter tow, 1158-1203
										Bongo, 1208-1228
	1253			44 39.87	125 08.1					Drifter #15896 deployed
	1335	10	NH-55	44 39.3	125 21.6	2857	1017.0	300	10	CTD

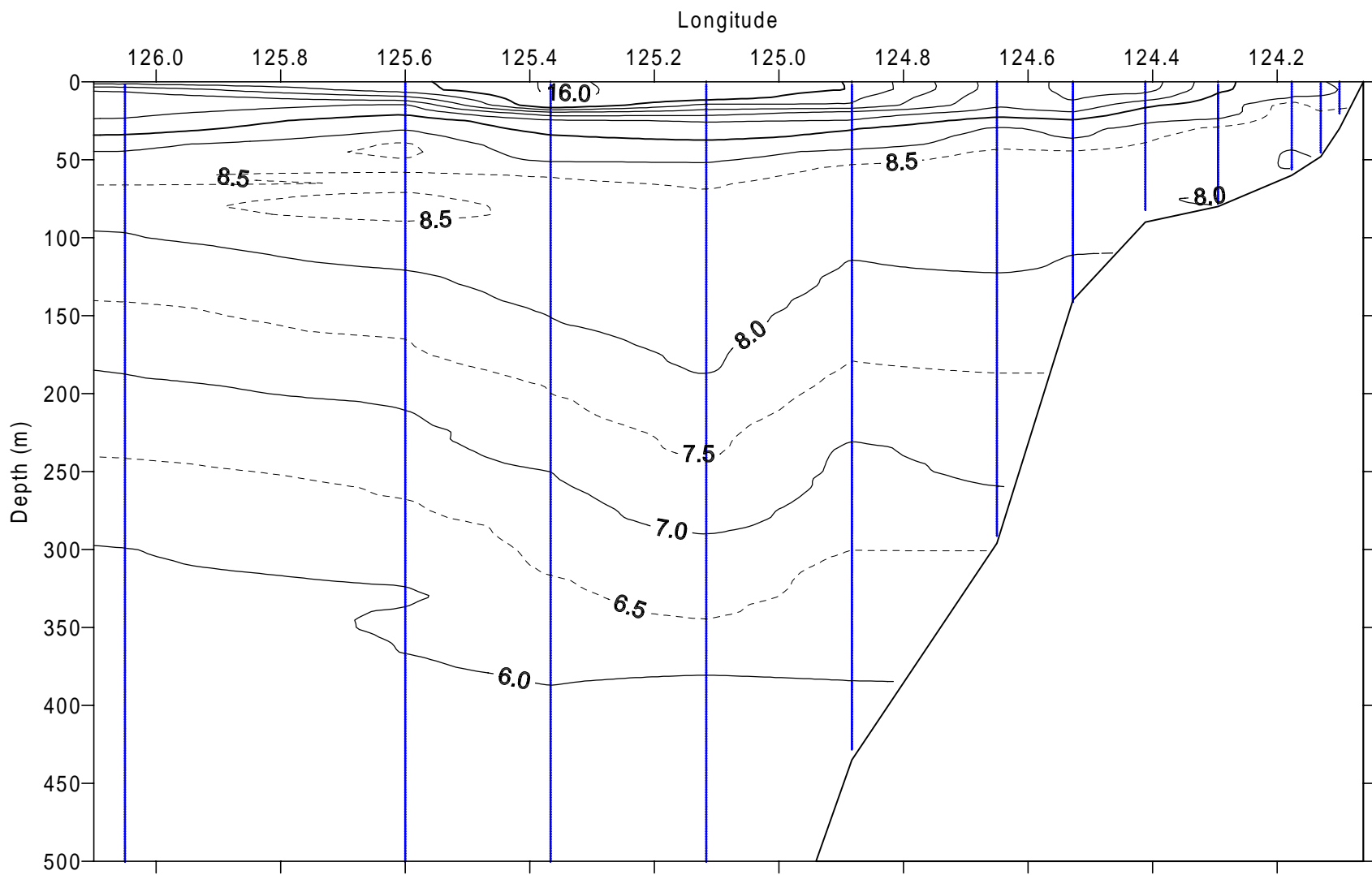
	1410									Cleaned flo-thru filters
	1530	11	NH-65	44 39.1	125 36.0	2864	1017.0	230	5	CTD, biochem
										Vertical net, 1622-1630
										Meter tow, 1633-1639
										Bongo, 1641
	1700			44 39.07	125 36.34					Drifter 15897 deployed
	1845	12	NH-85	44 39.1	126 03.0	2883	1018.9	340	17	CTD, biochem
	1935									Begin transit to FM-9
24 Sept	0333	13	FM-9	43 13.0	125 10.0	1664	1018.9	020	15	CTD, biochem
										Vertical net, 0428-0440
										Meter tow, 0446
										Bongo, 0450-0503
	0601	14	FM-8	43 13.0	125 00.1	1084	1019.6	020	17	CTD, biochem
										Vertical net, 0655-0703
										Meter tow, 0718-0725
										Bongo, 0729-0748
	0912	15	FM-7	43 12.9	124 50.2	340	1019.0	005	25-30	CTD, biochem
										Vertical net, 0954-1002
										Meter tow, 1006-1011
										Bongo, 1016-1034
	1125	16	FM-6	43 13.0	124 45.0	314	1019.5	010	25	CTD
	1223	17	FM-5	43 13.0	124 39.9	152	1019.8	020	17	CTD, biochem
										Vertical net, 1251-1302
										Meter tow, 1305-1312
										Bongo, 1316-1324
	1407	18	FM-4	43 13.0	124 34.9	83	1020.5	020	15	CTD, biochem
										Vertical net, 1425-1433
										Meter tow, 1436-1443
	1425									Cleaned Flo-thru filters
	1513	19	FM-3	43 13.0	124 30.0	65	1021.3	015	12	CTD, biochem
										Vertical net, 1528-1534
										Meter tow, 1538
	1612	20	FM-1	43 13.0	124 26.0	35	1021.4	020	10	CTD, biochem
										Vertical net, 1623-1627
										Meter tow, 1630-1634
	1635									Begin transit from FM-1 to CR-1
	2330	21	CR-1	41 54.1	124 18.0	39	1018.5	330	23	CTD, biochem
										Vertical net, 2344-2348
										Meter tow, 2350-2356
25 Sept	0037	22	CR-2	41 54.1	124 23.1	67	1018.2	000	35	CTD
										Vertical net, 0050-0056
										Meter tow, 0058-0105
	0145	23	CR-3	41 54.0	124 30.0	134	1020.0	340	14	CTD, biochem

										Vertical net, 0208-0216
										Meter tow, 0219-0225
	0300	24	CR-4	41 54.0	124 36.2	505	1021.0	340	14	CTD, biochem
										Vertical net, 100m, 0334-0342
										Light trap, 0344
										Meter tow, 60m, 0403-0408
										Bongo, 250 m, 0414-0432
	0504	25	CR-5	41 54.0	124 42.0	657	1022.8	0000	6	CTD, biochem
										Vertical net, 100m, 0544-0552
										Meter tow, 60m, 0555-0600
										Bongo, 250 m, 0604-0621
	0726	26	CR-6	41 54.0	124 47.9	696	1023.5	000	7	CTD
	0906	27	CR-7	41 54.0	125 00.0	836	1023.8	000	5	CTD, biochem
										Vertical net, 0954-1003
										Meter tow, 1016-1012
										Bongo, 1014-1030
	1141	28	CR-8	41 54.0	125 12.0	2713	1024.1	000	14	CTD
	1313	29	CR-9	41 54.0	125 19.9	3098	1024.8	025	12	CTD, biochem, oxygen
										Vertical net, 1413-1422
										Meter tow, 1424-1431
	1516									Clean flo-thru filters
	2107	30	EUR-1	40 52.0	124 16.0	61	1022.2	000	30+	CTD, biochem
										Vertical net, 55m, 2132-2135
										Meter tow, 2137-2142
	2222	31	EUR-2	40 52.0	124 21.9	111	1022.5	000	20-30	CTD, biochem, (2nd duct clogged)
										Vertical net, 2244-2255
										Meter tow, 2257-1603
										Bongo, 2307-2320
26 Sept	0006	32	EUR-3	40 52.0	124 28.0	381	1021.4	000	35	CTD, biochem
	0044									Secured sampling due to high seas
	0050									Continuing westward for ADCP
	0200									Hove-to into wind, beginning transit northward to RR-1 as sea state allows
	1415									Cleaned flo-thru filters
	1942									Passing RR-1, turning west for ADCP section along 42.5 N
	2237									At RR-7, turn north toward NH-20, Winds still >30 kts
27 Sept	1045									Passing thru NH-20 and starting local ADCP survey for Mike Kosro
	1405									Cleaned flo-thru filters
	2002									Shut down flo-thru systems
	2010									Shut down ADCP
	2011									Shut down DAS
	2030									Alongside pier in Newport

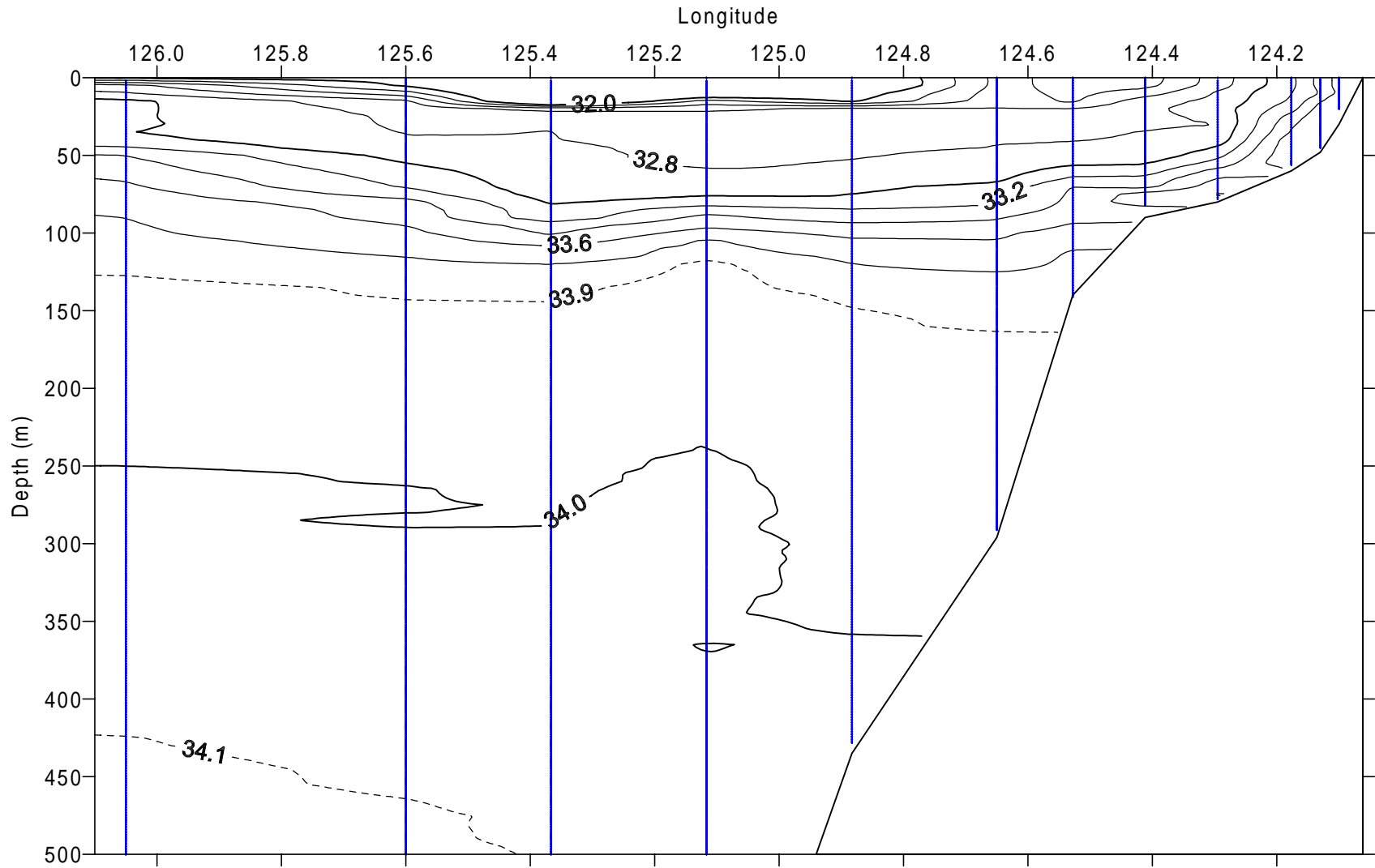
Table 3. Names, affiliations, and responsibilities of scientific personnel participating on W9909C.

Robert L. Smith	Chief Scientist	OSU	CTD	
Adriana Huyer	Co-Chief Scientist	OSU	CTD	
P. Michael Kosro	Co-Chief Scientist	OSU	ADCP, CTD	
Jane Fleischbein	Technician	OSU	CTD	
Joe Jennings	Technician	OSU	CTD, oxygen	
Sheila O Keefe	Graduate Student	OSU	CTD	
Holly Corwith	Graduate Student	OSU	nuts, chl	
Sheryl Horstman	Student Worker	OSU	nuts, chl	
Julie Arrington	Technician	OSU	nuts, chl	
Pat Collier	Technician	OSU	nuts, chl	
William T Peterson	Co-Chief Scientist	HMSC	zooplankton	
Julie Keister	Technician	HMSC	zooplankton	
Leah Feinberg	Technician	HMSC	zooplankton	
Amy Chiuchiolo	Technician	OSU	zooplankton	
Linda Fayler	Technician	OSU	martec	

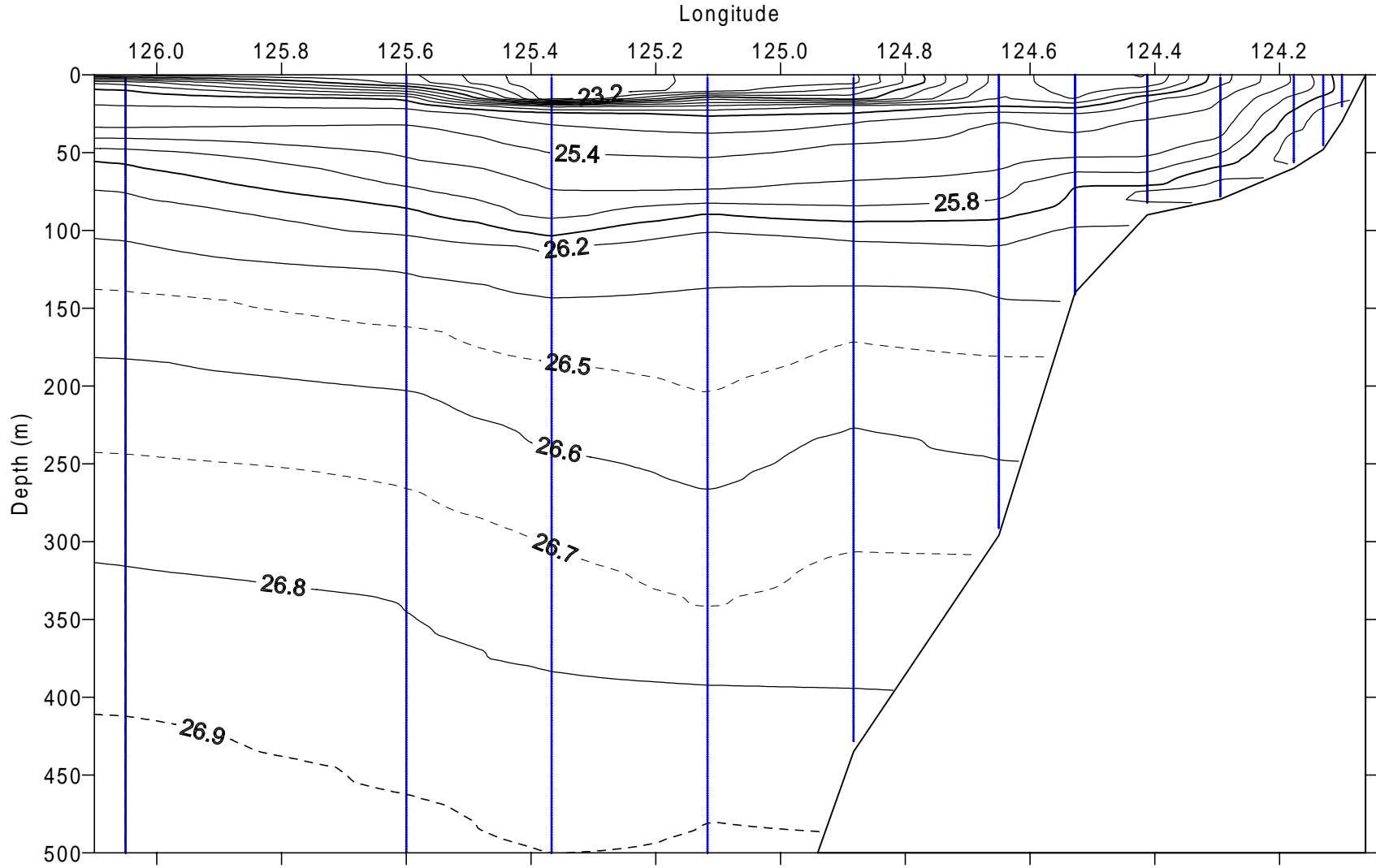
Temperature, NH-line, September 1999



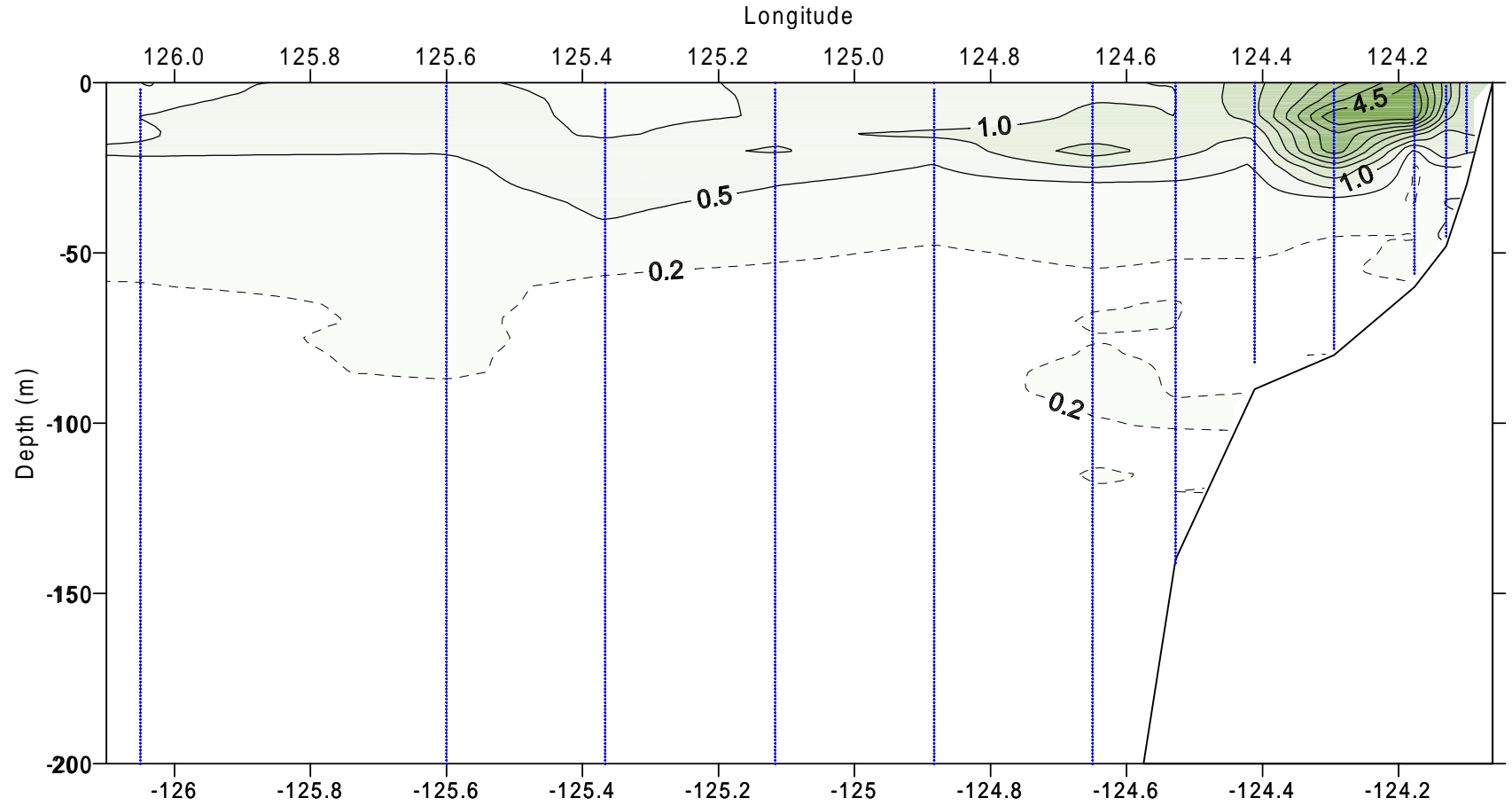
Salinity, NH-line, September 1999



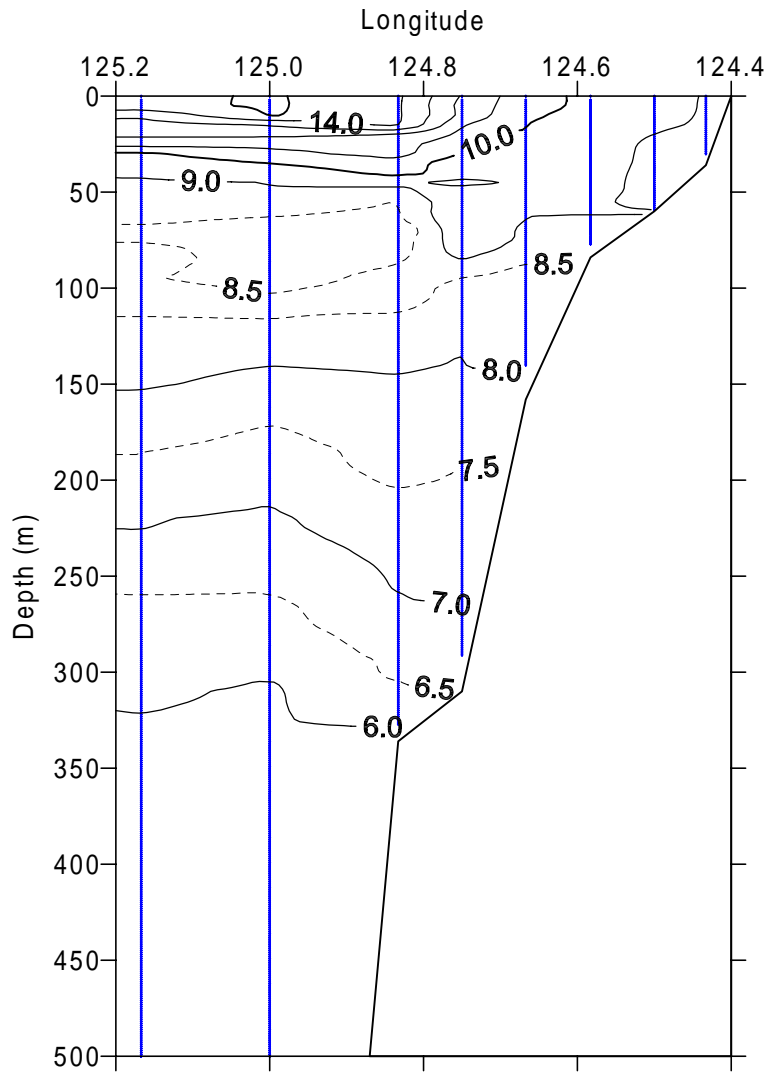
Density (sigma-theta), NH-line, September 1999



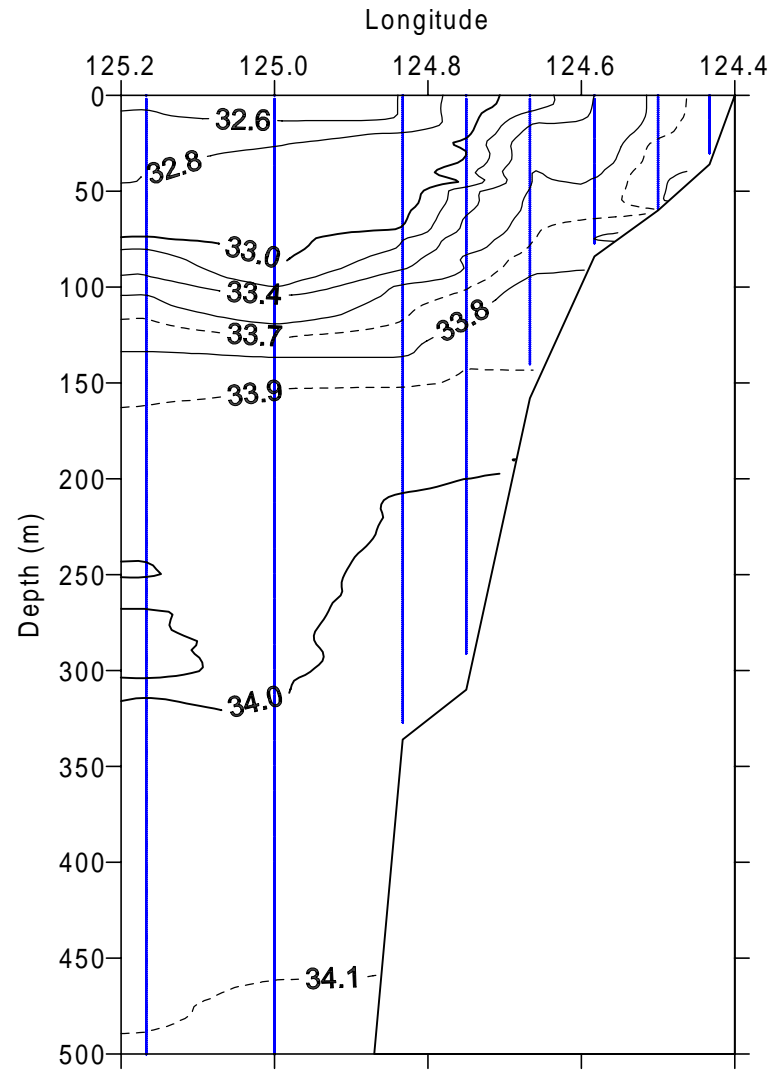
Fluorescence Voltage, NH-line, September 1999



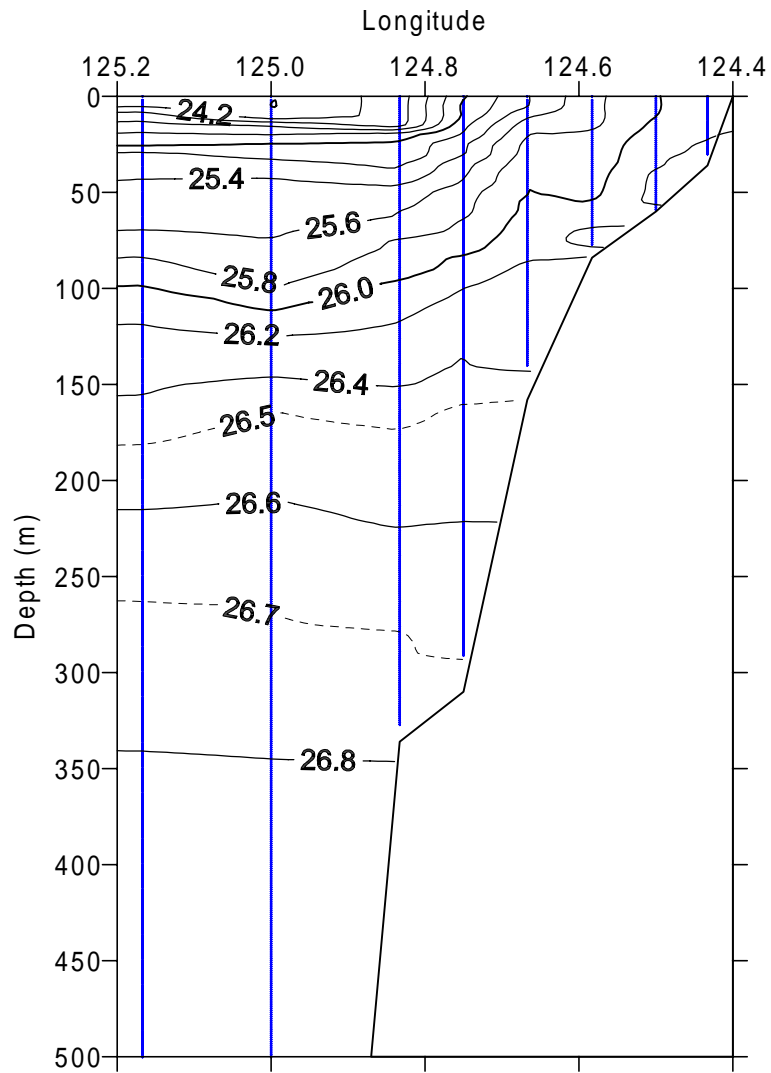
Temperature, FM-line, September 1999



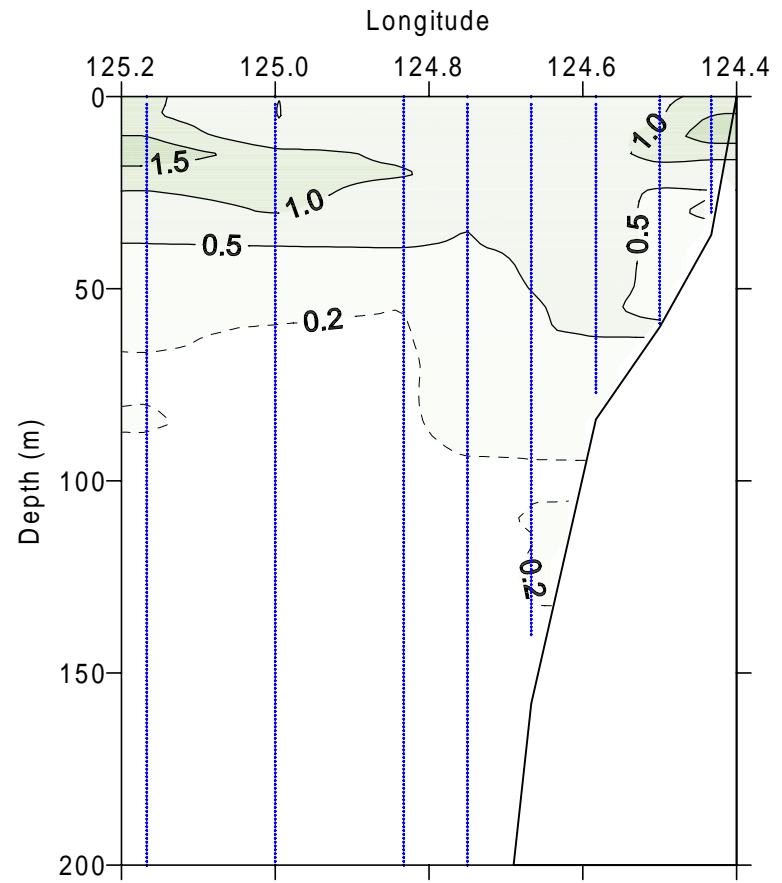
Salinity, FM-line, September 1999



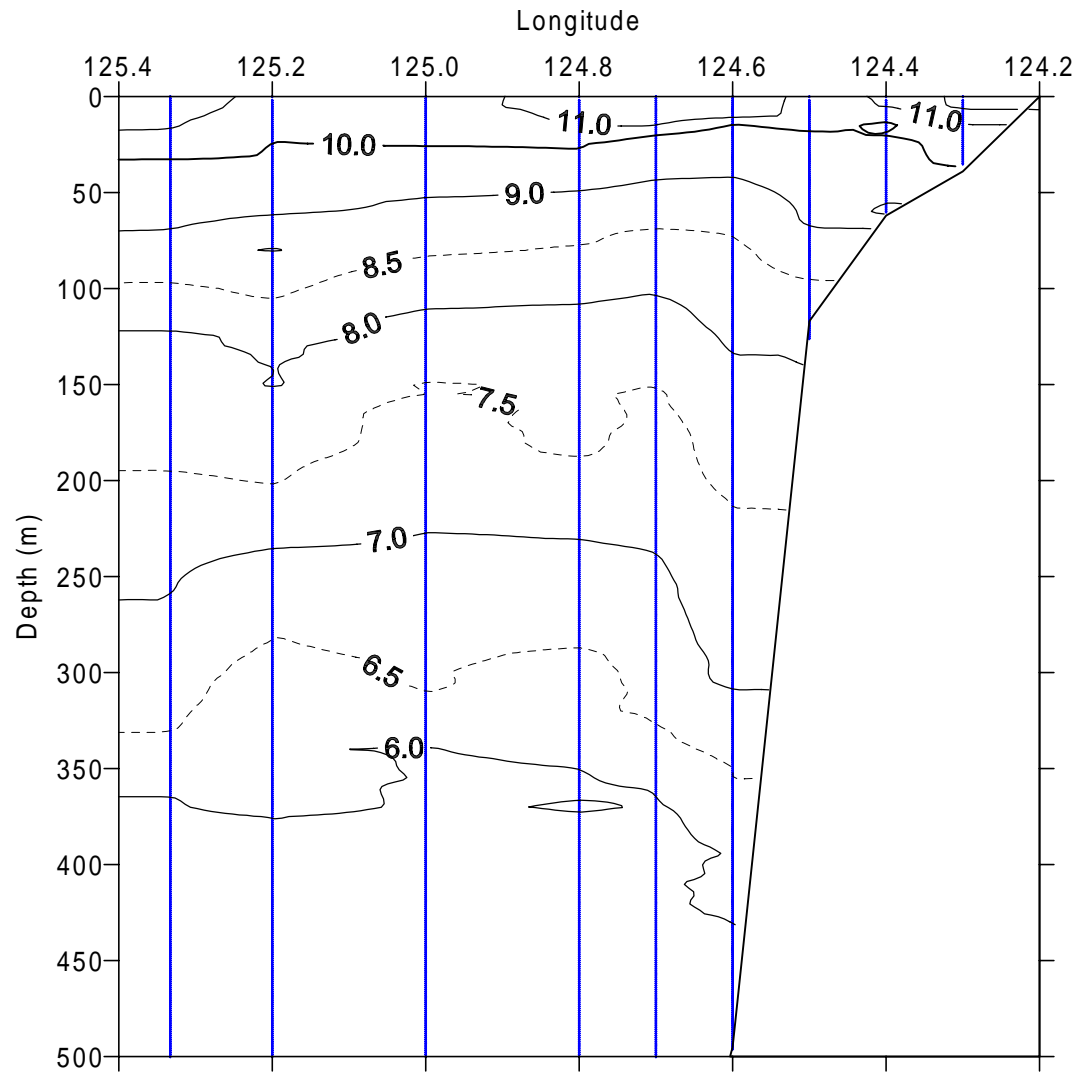
Sigma-theta, FM-line, September 1999



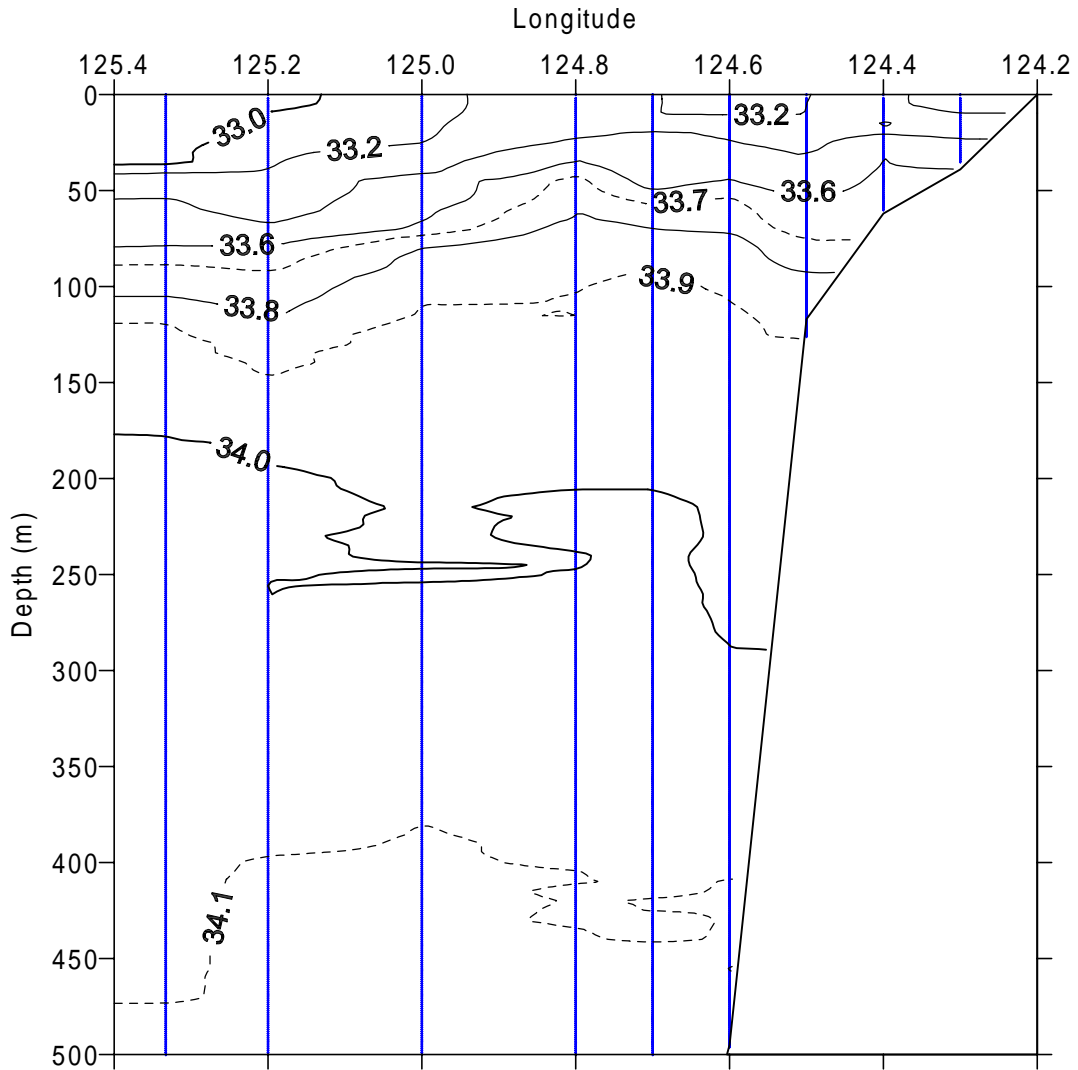
Fluorescence Voltage, FM-line
September 1999



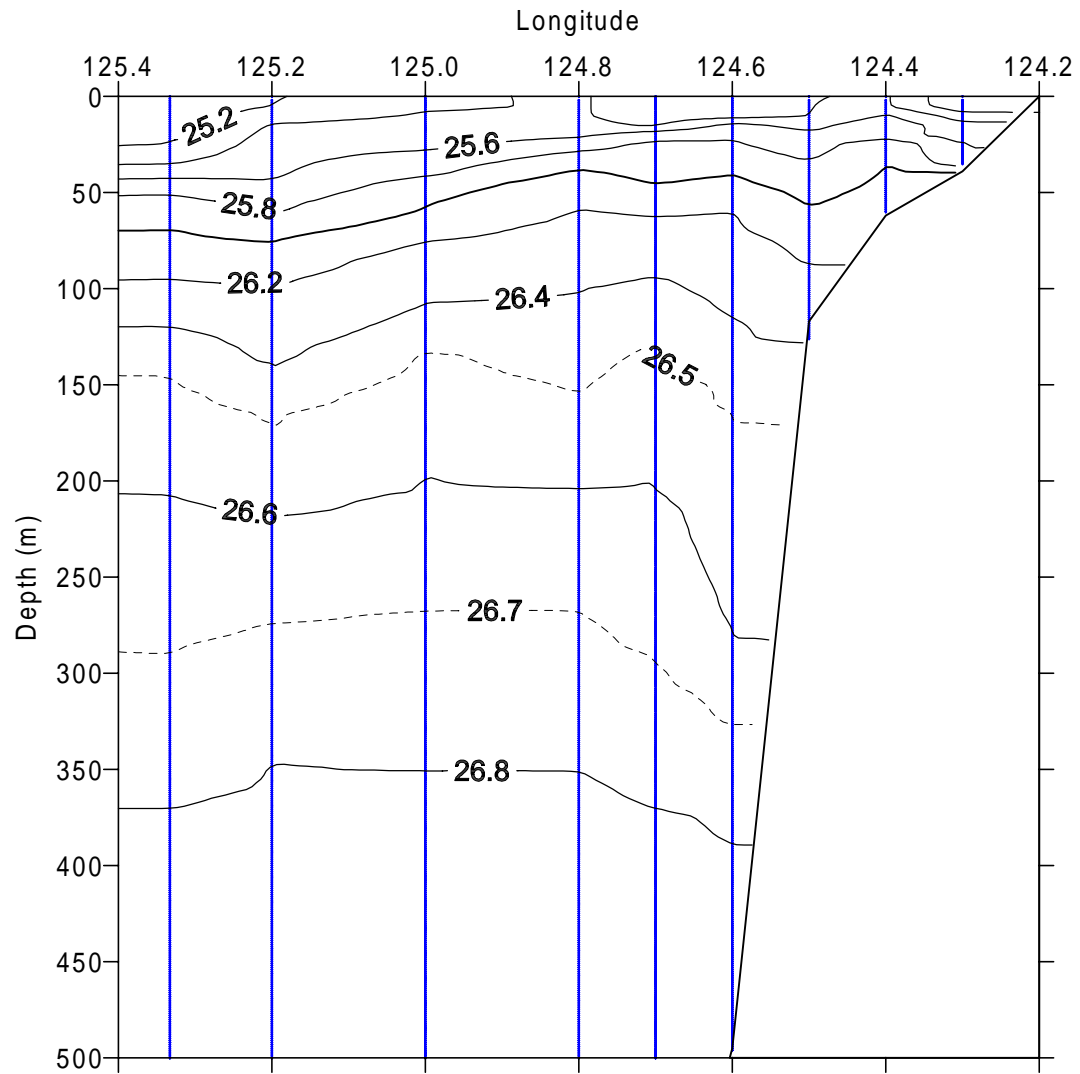
Temperature, CR-line, September 1999



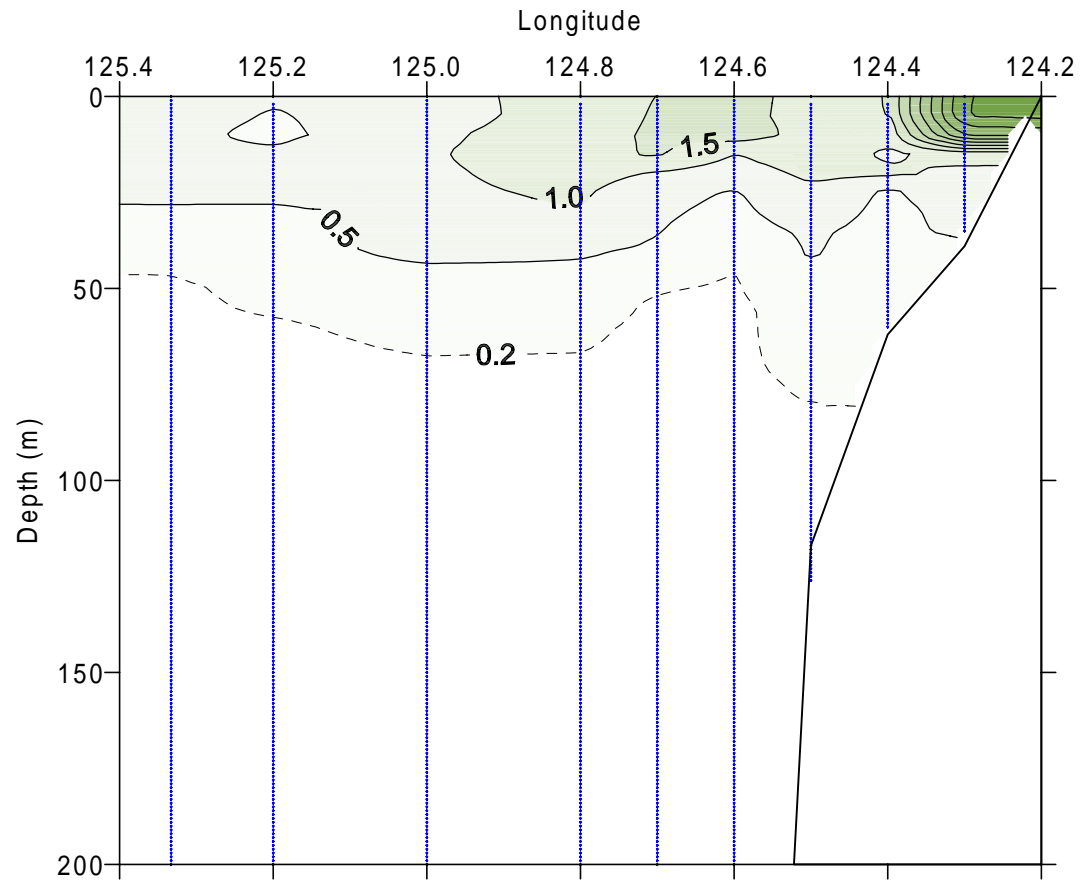
Salinity, CR-line, September 1999



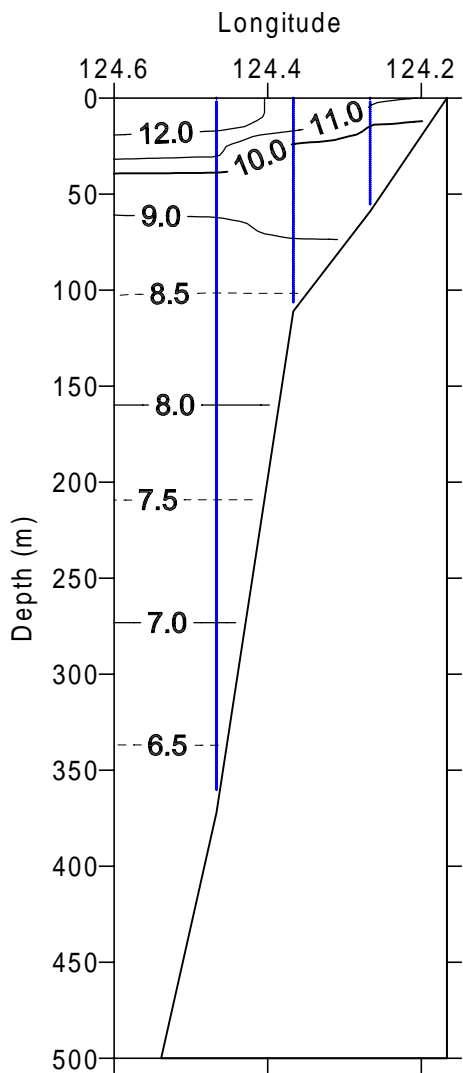
Density (sigma-theta), CR-line, September 1999



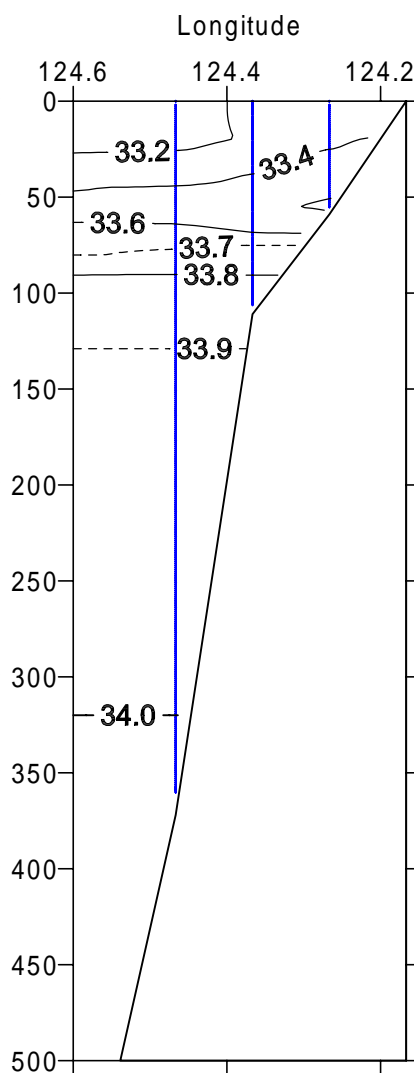
Fluorescence Voltage, CR-line, September 1999



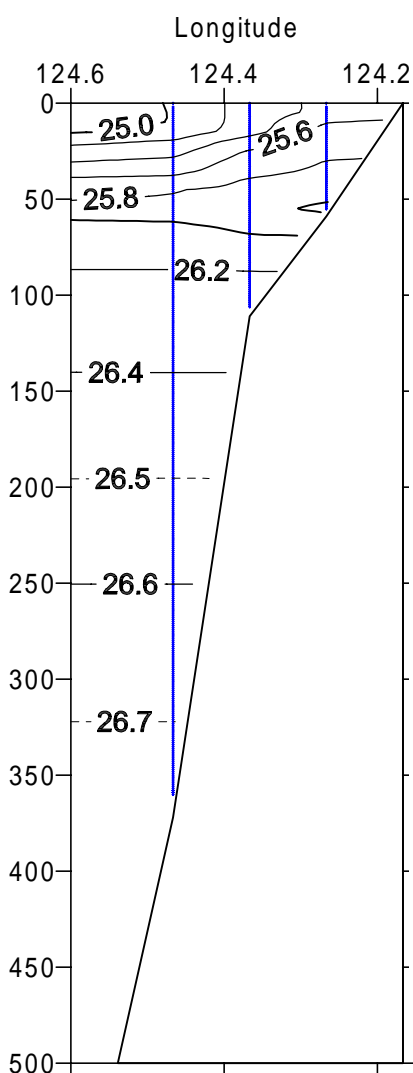
Temperature, EUR-line
September 1999



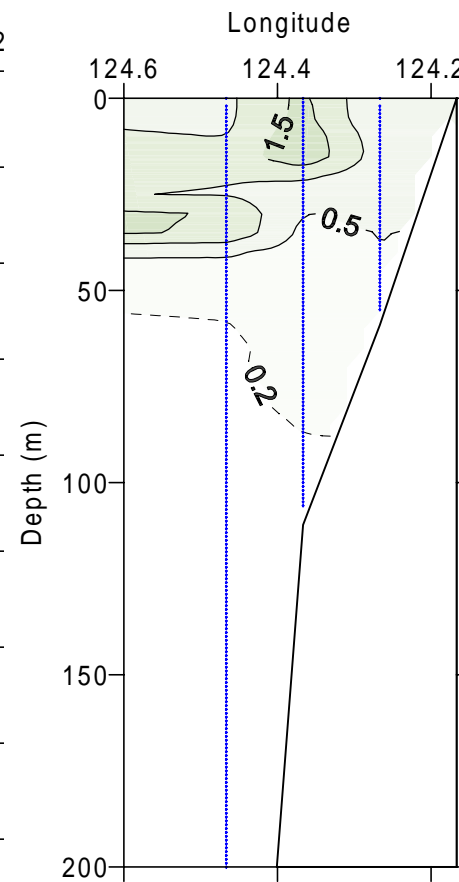
Salinity, EUR-line
September 1999



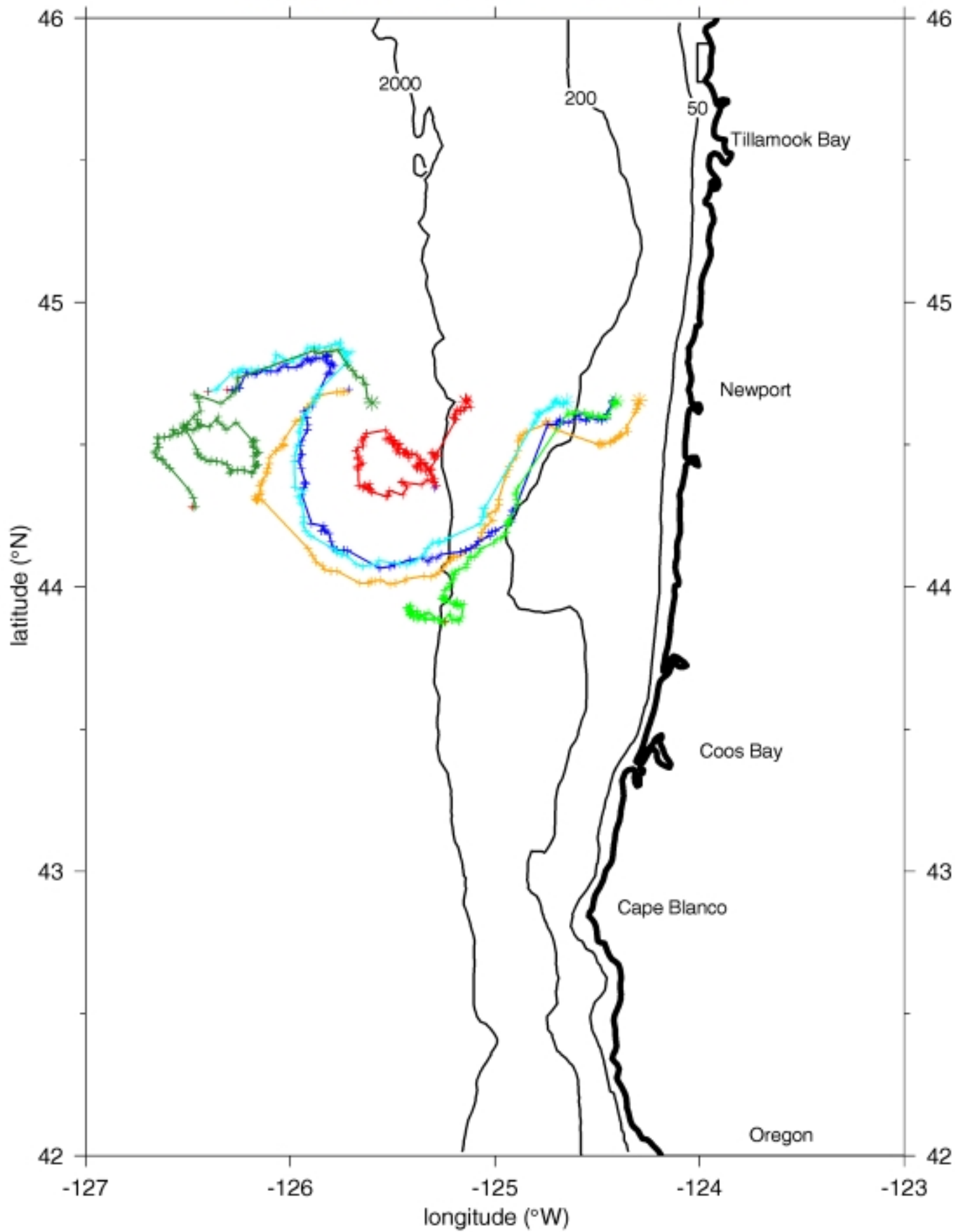
Sigma-theta, EUR-line,
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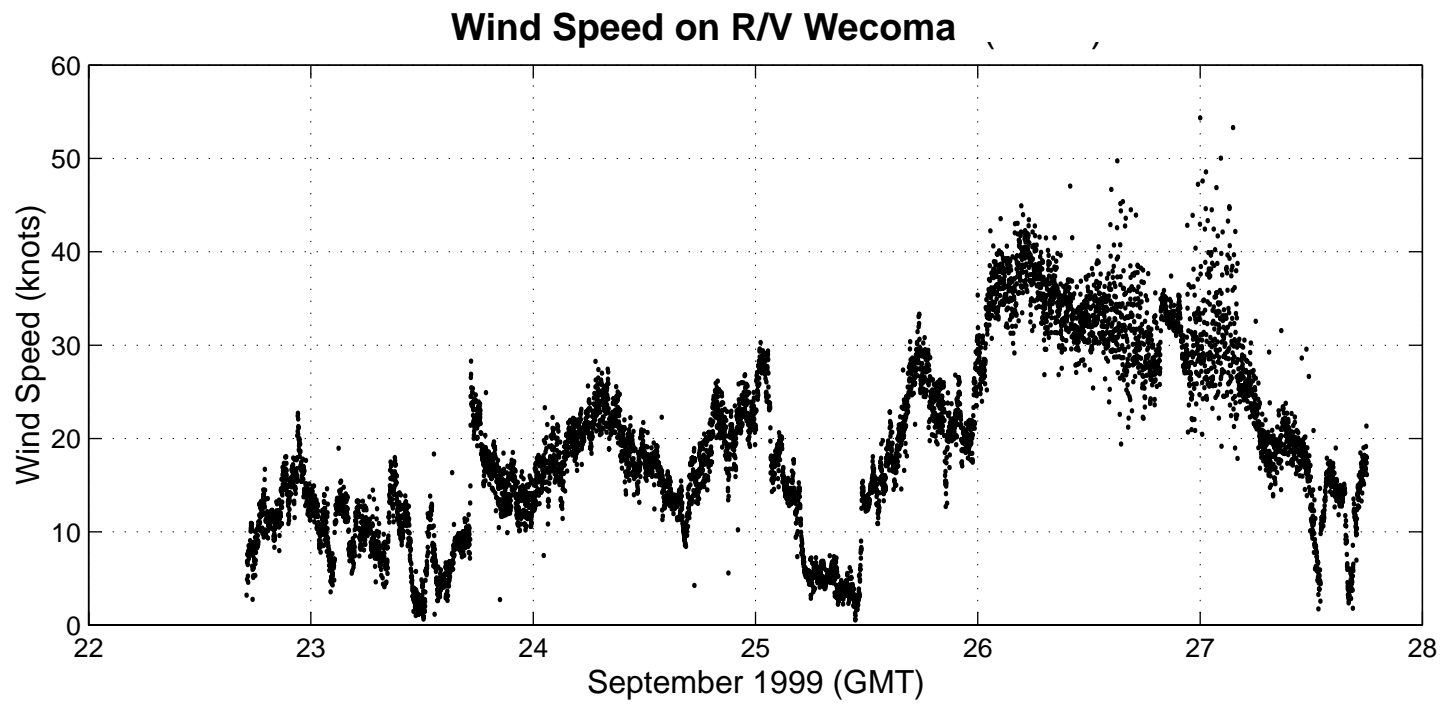
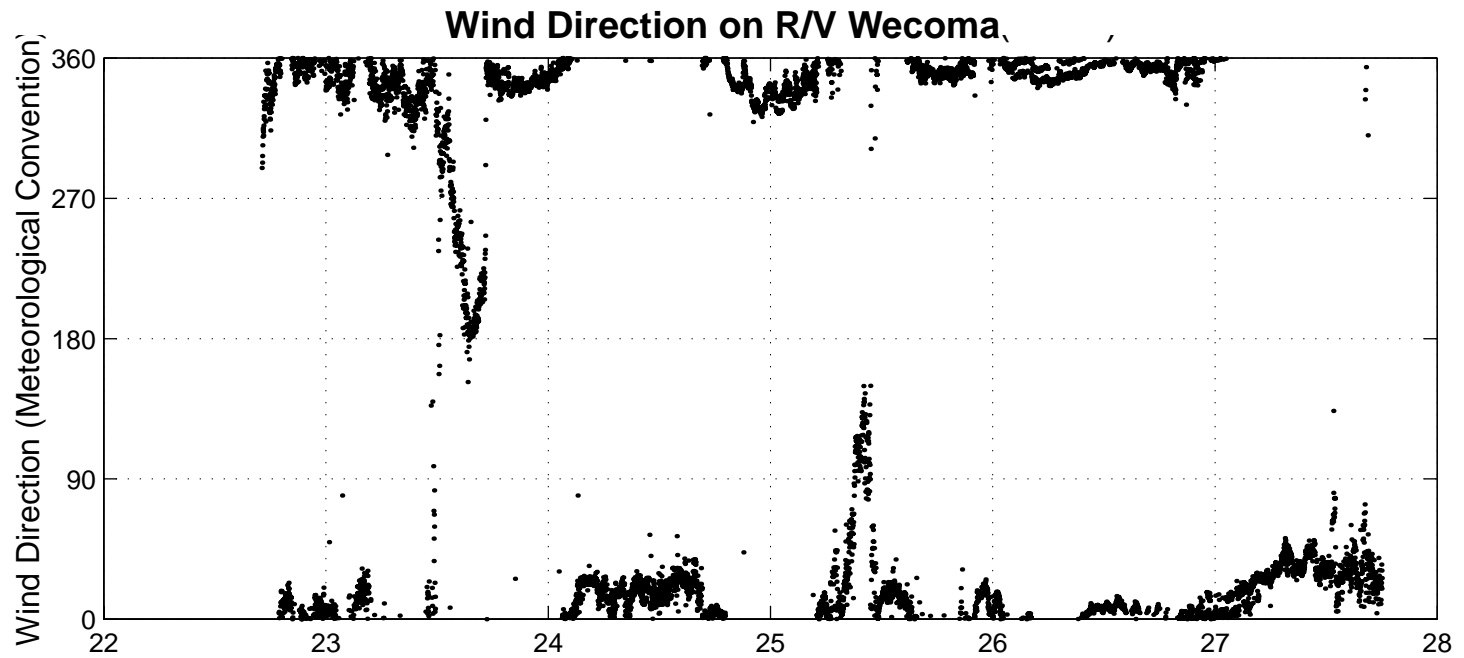


Fluorescence Voltage, EUR-line,
September 1999



Drifter data from Sep 22 1999 to Oct 5 1999
(dates on land indicate last transmission from failed drifters)



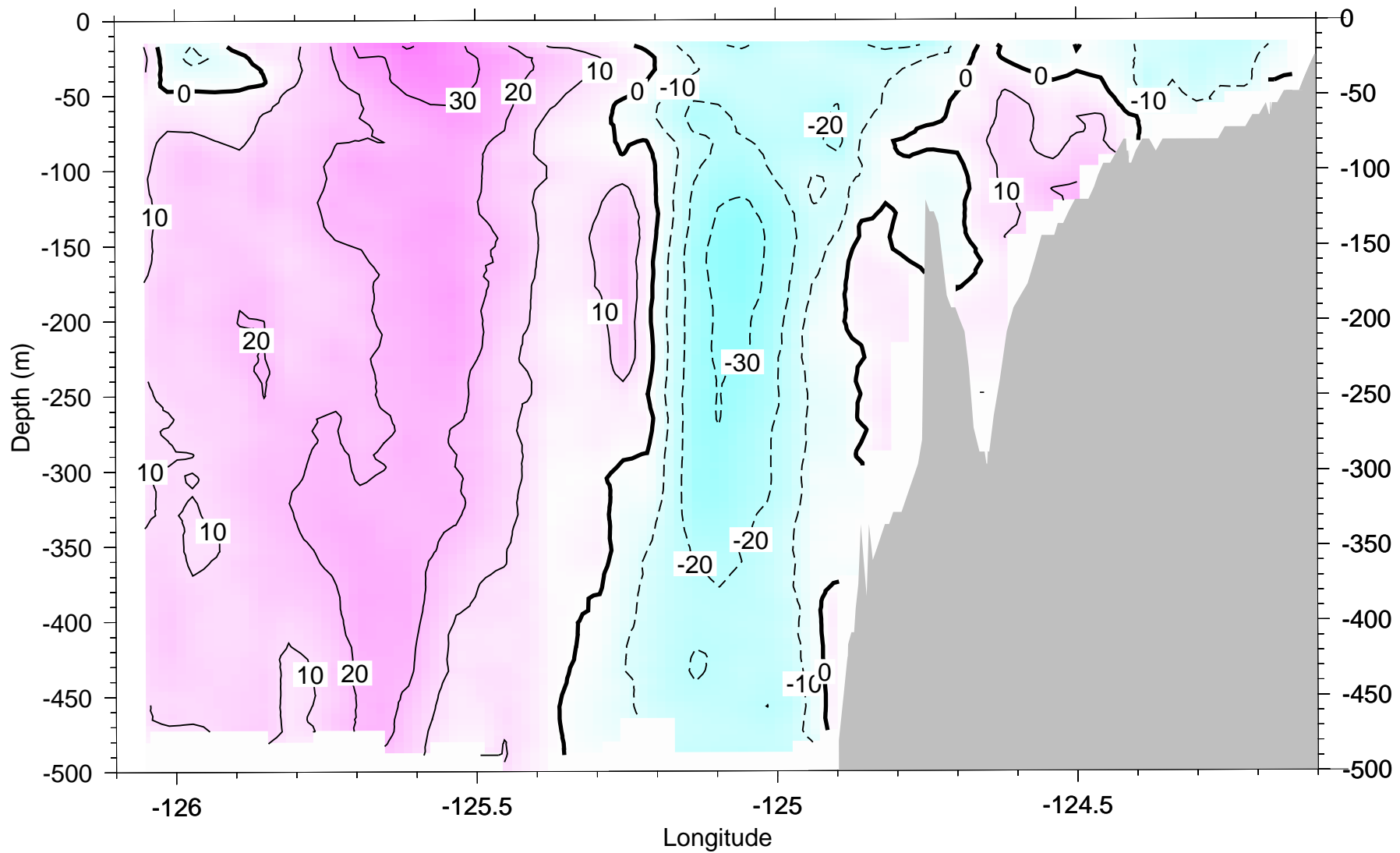


September 1999 (GMT)

Newport Hydrographic Line 44.6°N

22-23 September 1999

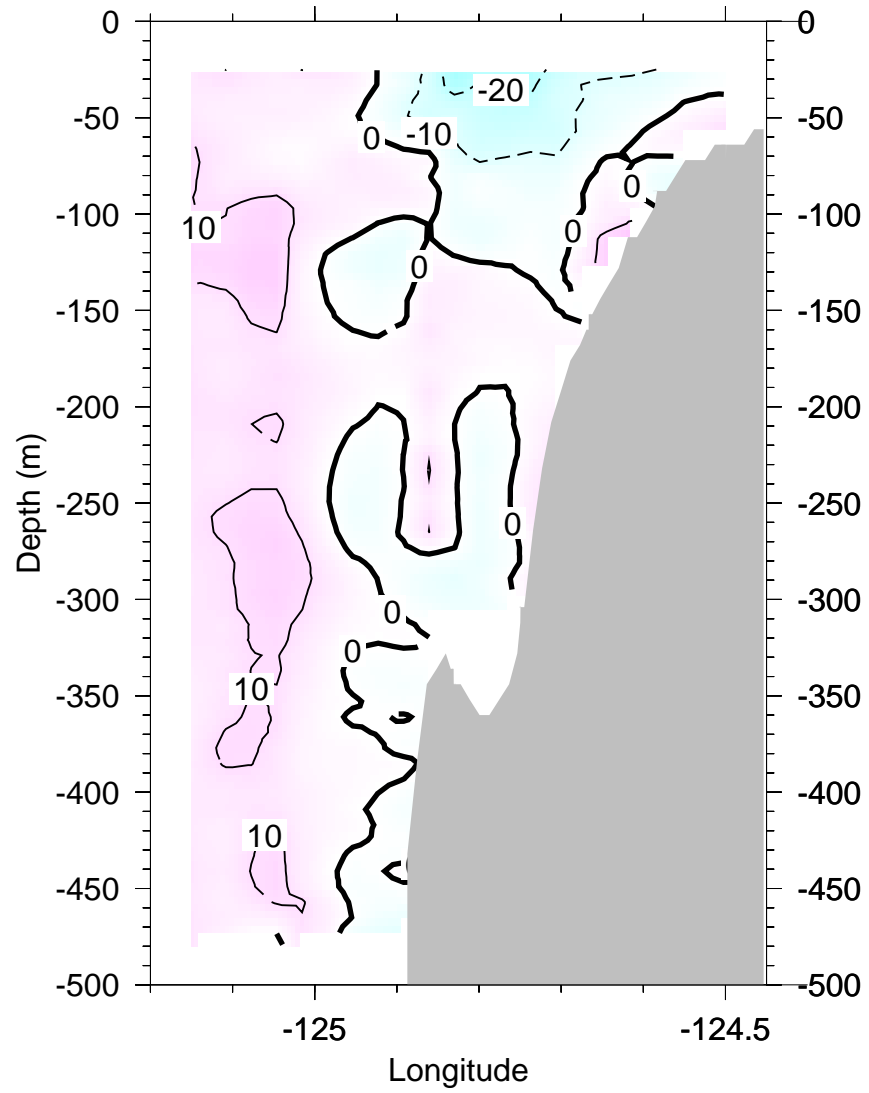
ADCP: Northward current (cm/s)



Five Mile Hydrographic Line 43.2°N

24 September 1999

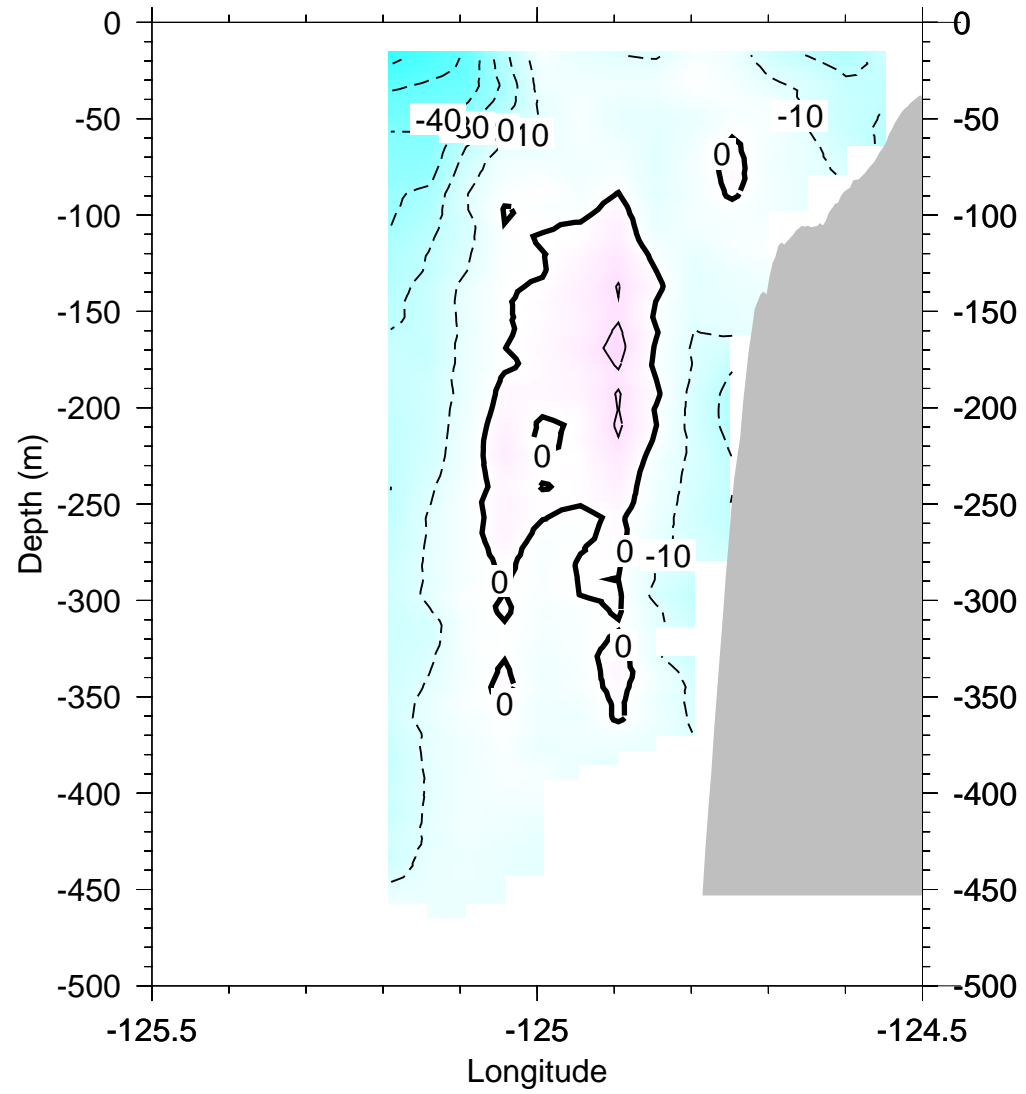
ADCP: Northward current (cm/s)



Rogue River Line 42.5°N

26 September 1999

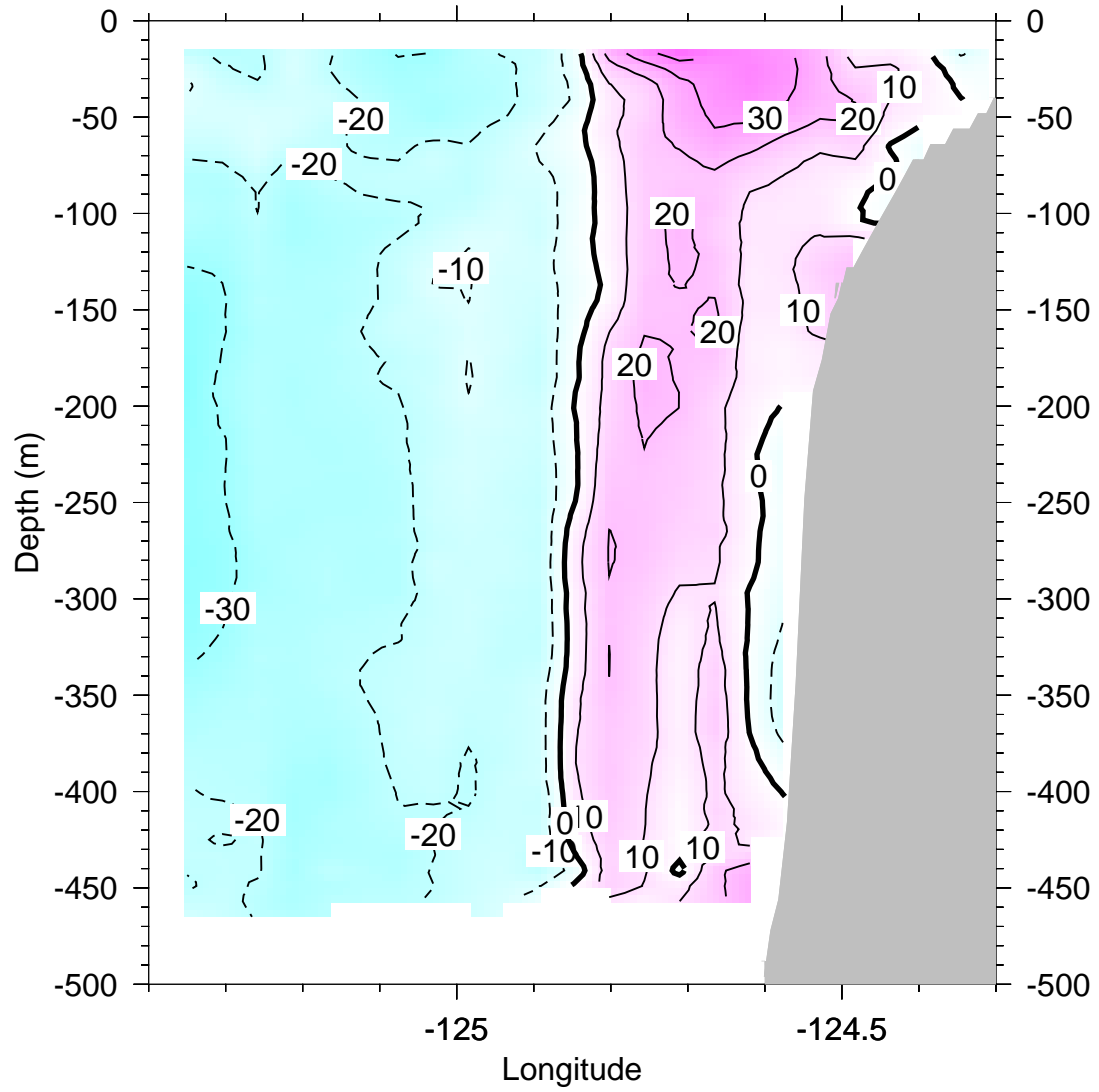
ADCP: Northward current (cm/s)



Crescent City Hydrographic Line 43.2°N

24-25 September 1999

ADCP: Northward current (cm/s)



Eureka Line (partial) 43.2°N

25-26 September 1999

ADCP: Northward current (cm/s)

