PRELIMINARY CRUISE REPORT, W0002A
R/V WECOMA, 1-3 February 2000
GLOBEC/ENSO 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 one line off Newport, OR, 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 bioacoustics.
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. Vertical net tows: WP-2 nets 200 m to surface; Horizontal net tows: 1-m diameter plankton net over upper 20m.

CRUISE NARRATIVE

A brief overview of the cruise is presented here. An event log is provided in Table 3, and the participating personnel are listed in Table 4. Wecoma departed Newport at 1809 PDT, 1 February 2000. Due to rough weather we omitted sampling at NH-1, and began sampling at NH-3 instead. CTD's and net tows were completed at NH-5 and NH-10. Following the CTD and vertical net tow at NH-15, deteriorating sea conditions prevented the completion of the meter net tow. Because the seas were too sloppy for work to continue in the dark, we broke off sampling and steamed toward NH-65. However, the weather improved rapidly with a shift in wind direction and speed, so the net tows were resumed at NH-25. After heading back inshore to complete NH-20, the net tows were continued though out the night, working offshore to NH-65. The next morning we resumed CTD sampling at NH-85 and worked inshore to NH-20. After completing CTD Station 15 (NH-20), we returned to NH-15 for the meter net tow we had missed the previous day. We arrived alongside the pier at Newport at about 0625 UT, 3 February 2000.

PRELIMINARY RESULTS

Vertical sections of several parameters measured by the SBE CTD system (temperature, salinity, density, fluorescence voltage and transmissometer voltage) are presented at the end of this report. Also included are vertical sections of the alongshore currents measured by the shipborne Acoustic Doppler Profiler during both the outbound and inbound legs of the cruise. Short time series plots of wave height, wind speed and wind direction from NDBC Buoy 46050 at Stonewall Bank are shown in Figures 2-4.

The most remarkable feature in the temperature and salinity sections is the depth (70 m) and the lateral homogeneity of the surface mixed layer offshore of the shelf-break. These are likely the result of the strong winds and high seas that persisted into the first day of our cruise. Over the outer shelf, the entire water column is virtually homogeneous: T, S are constant to within 0.015 C and 0.01 psu between the surface and the deepest observation at 87 m. Farther inshore, shelf waters were stratified by salinity, presumably because of local runoff from coastal streams. Transmissometer voltage shows turbid water inshore and in the bottom layers over the shelf and shelf-break, as expected from the high-amplitude long-period (14-second) swell. Over the shelf and shelf-break, alongshore currents are poleward during both inbound and outbound legs, with the strongest poleward flow located over the outer shelf. Currents in the offshore waters changed direction between the two legs; this would be consistent with the possible presence of inertial currents there.

The attached zooplankton report was provided by Julie Keister.

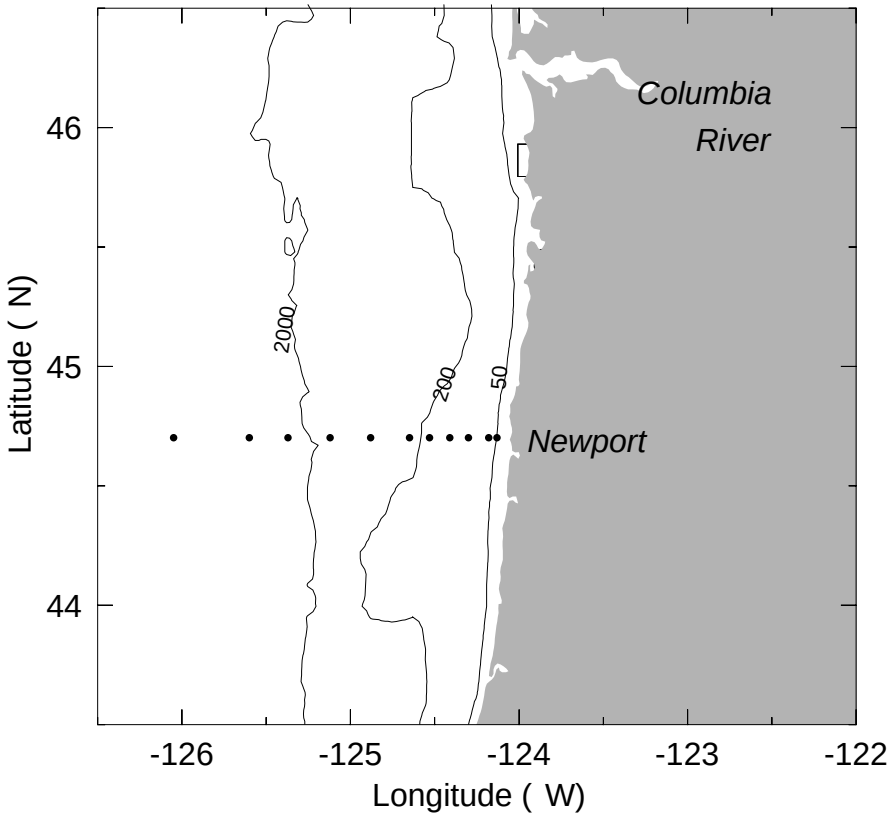


Figure 1. W0002A CTD station positions on the Newport Hydrographic Line.

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

Newport Hydro Line					
NH-3	5	44° 39.2'N	124° 07.8'W	47	
NH-5	9	44° 39.1'	124° 10.7'	58	C,N
NH-10	18	44° 39.1'	124° 17.7'	79	N
NH-15	27	44° 39.0'	124° 24.4'	94	N
NH-20	37	44° 39.1'	124° 31.7'	142	C,N
NH-25	46	44° 39.1'	124° 39.0'	294	C,N
NH-35	65	44° 39.1'	124° 53.1'	448	C
NH-45	83	44° 39.1'	125° 06.9'	698	C,N
NH-55	103	44° 39.1'	125° 22.0'	2867	
NH-65	122	44° 39.1'	125° 36.1'	2863	C,N
NH-85	157	44° 39.1'	126° 02.9'	2886	C

Table 2. Sample depths and types of subsamples for biochemical sampling

Station, Depth, Dist. From shore	**Sample Collection Depths (m)**
NH-05, 58m, 9km	1, 5, 10, 15, 20, 25, 30, 40, 50, 52
NH-15, 79m, 27km	1, 10, 20, 30, 40, 50, 60, 70, 85
NH-20, 142m, 37km	2, 10, 34, 100, 124
NH-25, 294m, 46km	1, 10, 20, 25, 30, 40, 50, 70, 100, 150, 200, 275
NH-35, 448m, 65km	2, 10, 20, 29, 41, 50, 61, 70, 101, 150, 314, 425
NH-45, 698m, 83km	1, 10, 20, 30, 40, 50, 60, 70, 100, 150, 500, 689
NH-55, 2867m, 103km	2, 11, 23, 39, 1001
NH-65, 2863m, 122km	2, 6, 11, 20, 31, 39, 49, 70, 101, 150, 802, 999
NH-85, 2886m, 157km	3, 10, 22, 30, 42, 45, 50, 69, 100, 152, 900, 1000

Station, Depth, Dist. From shore	**Type of Sample Collected**
NH-05, 58m, 9km	TOC (all depths), Nutrients, TN (all depths), Chl, Chl<10µm, POC/PON
NH-15, 79m, 27km	TOC (all depths), Nutrients, TN (all depths), Chl, Chl<10µm, POC/PON
NH-20, 142m, 37km	Pigments for HPLC analysis only at 2m and 34m
NH-25, 294m, 46km	TOC (all depths), Nutrients, TN (all depths), Chl, Chl<10µm, POC/PON
NH-35, 448m, 65km	TOC (surface only), Nutrients, TN (surface only), Chl, Chl<10µm, POC/PON
NH-45, 698m, 83km	TOC (surface only), Nutrients, TN (surface only), Chl, Chl<10µm, POC/PON
NH-55, 2867m, 103km	Pigments for HPLC analysis only at 2m and 39m
NH-65, 2863m, 122km	TOC (surface only), Nutrients, TN (surface only), Chl, Chl<10µm, POC/PON
NH-85, 2886m, 157km	TOC (all depths), Nutrients, TN (all depths, except 1000m), Chl, Chl<10µm, POC/PON (except 1000m)

Subsample	**Replicates**
TOC (surface sample only at NH-35,45 and NH-65)	3
Nutrients	1
TN (surface sample only at NH-35,45 and NH-65)	3
Chl	2
Chl<10 µm, only 3 samples per station	2
POC/PON	

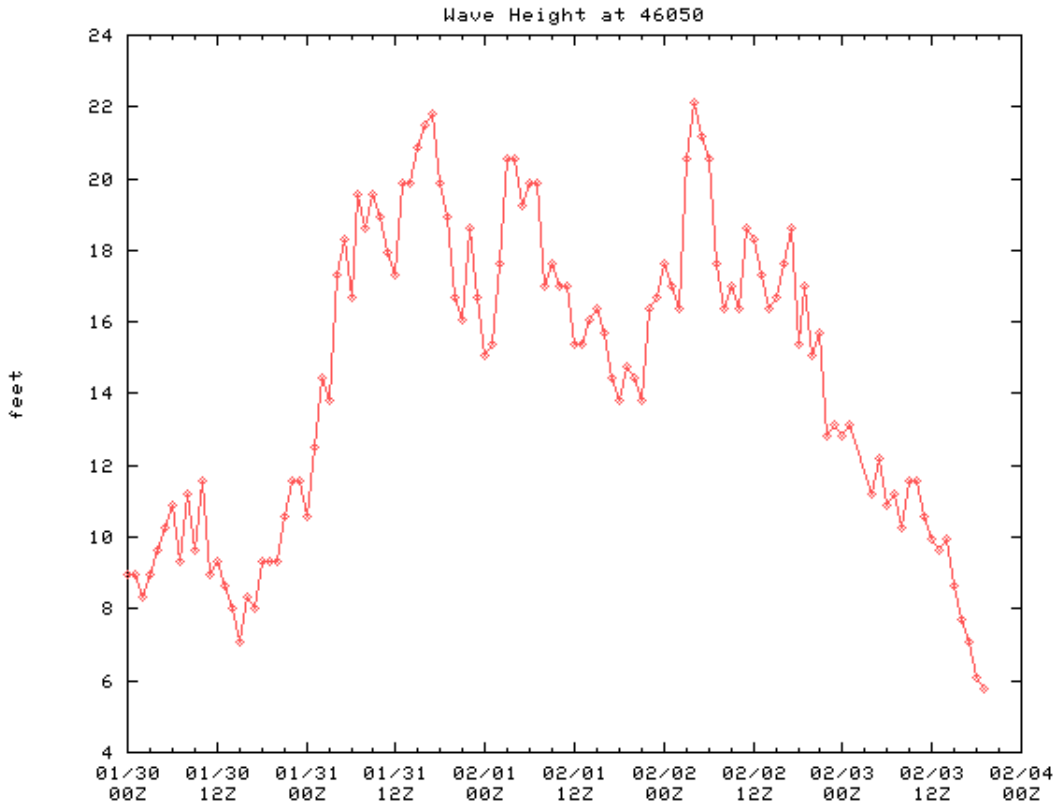
Table 3. Event log for W0002A

Date (UT)	Start Time (UT)	End Time (UT)	Sta. No.	Sta. Name	Latitude (deg)	(min)	Longitude (deg)	(min)	Bottom Depth (m)	Atmos Press (mbar)	Wind Dir. (deg T)	Wind Speed (kts)	Event	Event ID
1-Feb	1809												Start DAS	
	1809												Depart Newport	
	1810												Start ADCP	
	2019												Start flo-thru fluorometer	
	2024												Start flo-thru T, C (late, fixed plumbing)	
	2041		1	NH-3	44	39.2	-124	7.8	47	1020.0	213	22	CTD	WE03200.0 -124.13
	2139		2	NH-5	44	39.1	-124	10.7	58	1019.9	222	26	CTD with biochem	WE03200.0 -124.178
	2216				44	39.4	-124	10.7					vertical net tow, 52 m, aborted	WE03200.0 -124.178
	2229				44	39.4	-124	10.8					meter net tow, 60 m	WE03200.0 -124.18
	2241				44	39.3	-124	10.9					vertical net tow, 50 m	WE03200.0 -124.182
2-Feb	0005		3	NH-10	44	39.1	-124	17.7	79	1021.1	233	30	CTD	WE03300.0 -124.295
	0030	0036			44	39.4	-124	17.7					vertical net tow	WE03300.0 -124.295
	0043	0052			44	39.5	-124	17.9					meter net tow	WE03300.0 -124.298
	0150		4	NH-15	44	39.0	-124	24.4	94	1021.5	230	30	CTD	WE03300.0 -124.407
	0220	0230			44	39.3	-124	24.5					vertical net tow,	WE03300.0 -124.408
	0441		5	NH-25	44	39.2	-124	38.9		1024.8	305	12	vertical net tow, 100 m	WE03300.06
	0454				44	39.2	-124	39.0					meter net tow, 60 m	WE03300.07
	0545		6	NH-20	44	39.1	-124	31.7		1025.8	325	8	vertical net tow, 100 m	WE03300.08
	0833		7	NH-45	44	39.1	-125	07.1		1027.5	359	5	vertical net tow, 100 m	WE03300.09
					44	39.0	-125	07.4					meter net tow, 60 m	WE03300.10
	1113		8	NH-65	44	39.7	-125	35.0		1027.0	001	5	vertical net tow, 100 m	WE03300.11
	1135				44	39.8	-125	35.2					meter net tow, 60 m	WE03300.12
	1432		9	NH-85	44	39.1	-126	02.9	2886	1027.0	045	10	CTD	WE03300.13
	1731		10	NH-65	44	39.1	-125	36.1	2863	1027.5	055	13	CTD	WE03300.14
	1947		11	NH-55	44	39.1	-125	22.0	2867	1027.2	055	13	CTD	WE03300.15
	2225		12	NH-45	44	39.1	-125	06.9	698	1024.5	061	19	CTD	WE03300.16
3-Feb	0032		13	NH-35	44	39.1	-124	53.1	448	1023.0	050	20	CTD	WE03400.01
	0209		14	NH-25	44	39.1	-124	39.0	294	1023.0	050	20	CTD	WE03400.02
	0321		15	NH-20	44	39.1	-124	31.7	142	1021.5	050	18	CTD	WE03400.03
	0411		16	NH-15	44	39.1	-124	24.6		1020.6	085	11	meter net tow, 60m	WE03400.04
	0541												Stop flo-thru, ADCP, DAS	
	0625												Arrive Newport	

Table 4. Names, affiliations, and responsibilities of scientific personnel participating on W0002A.

Adriana Huyer	Chief Scientist	OSU	CTD
Jane Fleischbein	Technician	OSU	CTD
Margaret Sparrow	Technician	OSU	CTD, oxygen
Lee Karp-Boss	Post-doc	OSU	nuts, chl
Nobuyuki Kawasaki	Technician	OSU	nuts, chl
Julie Arrington	Technician	OSU	nuts, chl
Woody Moses	Graduate Student	OSU	nuts, chl
William T. Peterson	Co-Chief Scientist	NOAA	
Julie Keister	Technician	HMSC	zooplankton
Leah Feinberg	Technician	HMSC	zooplankton
Mark Amend	Technician	ODFW	zooplankton
Linda Fayler	Technician	OSU	martec

Figure 2. Wave height at NOAA buoy 46050 for January 30 - February 3, 2000.



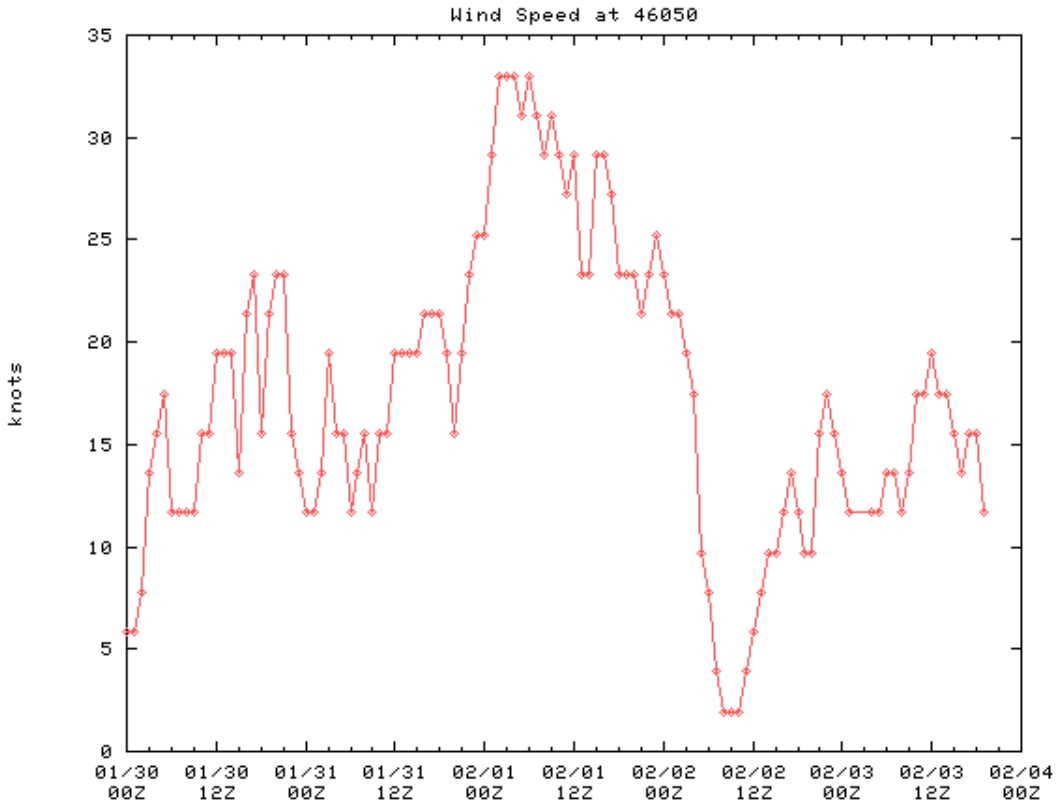


Figure 3. Wind speed at NOAA buoy 46050 for January 30 - February 3, 2000.

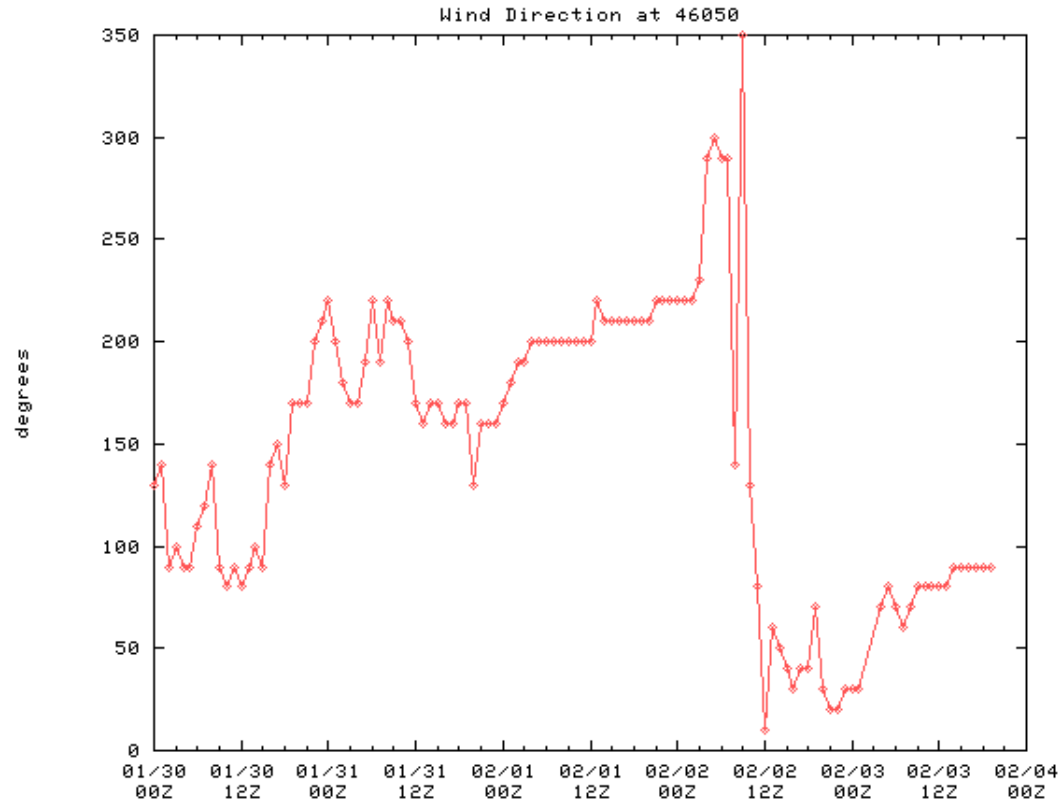
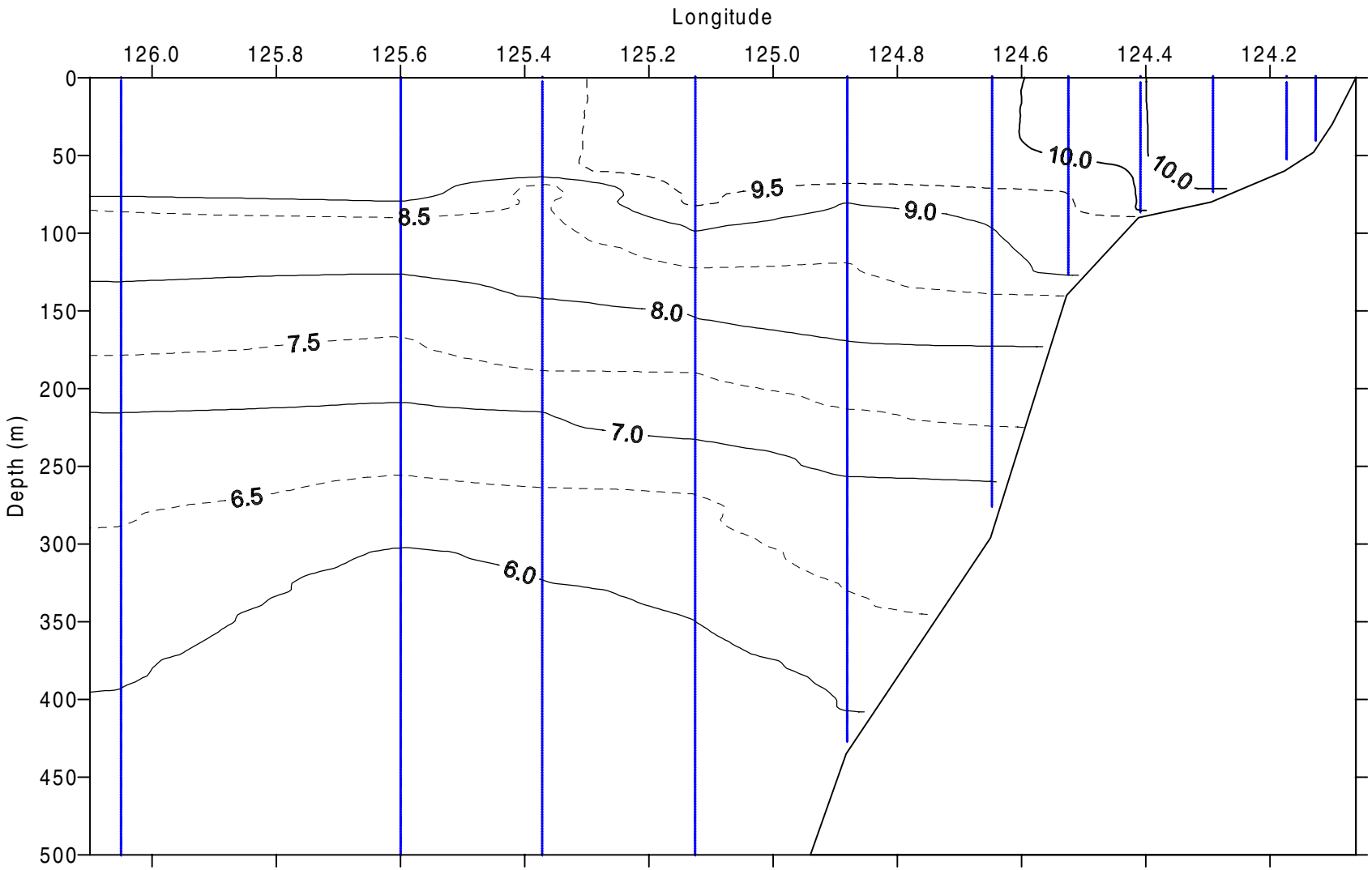
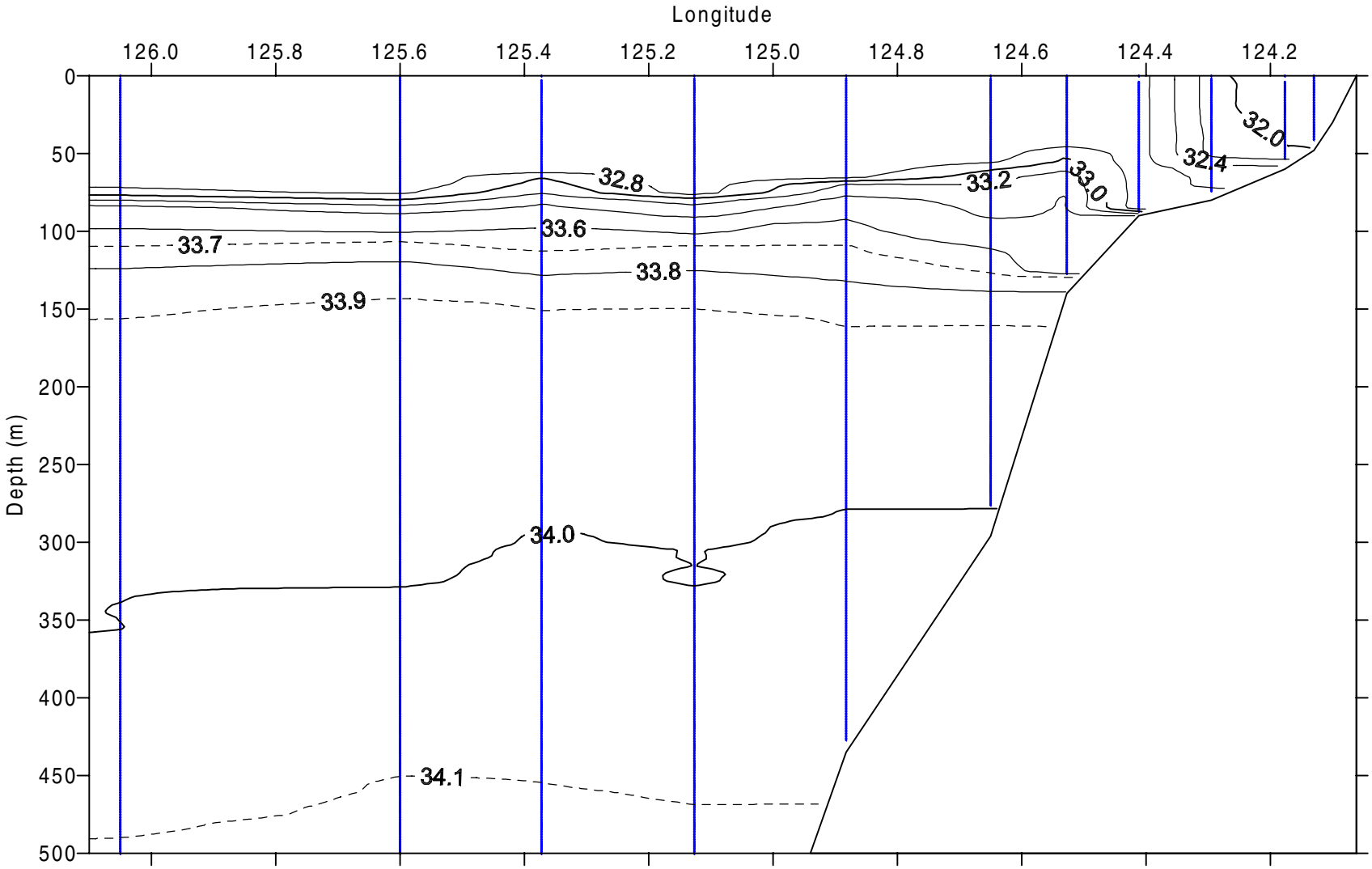
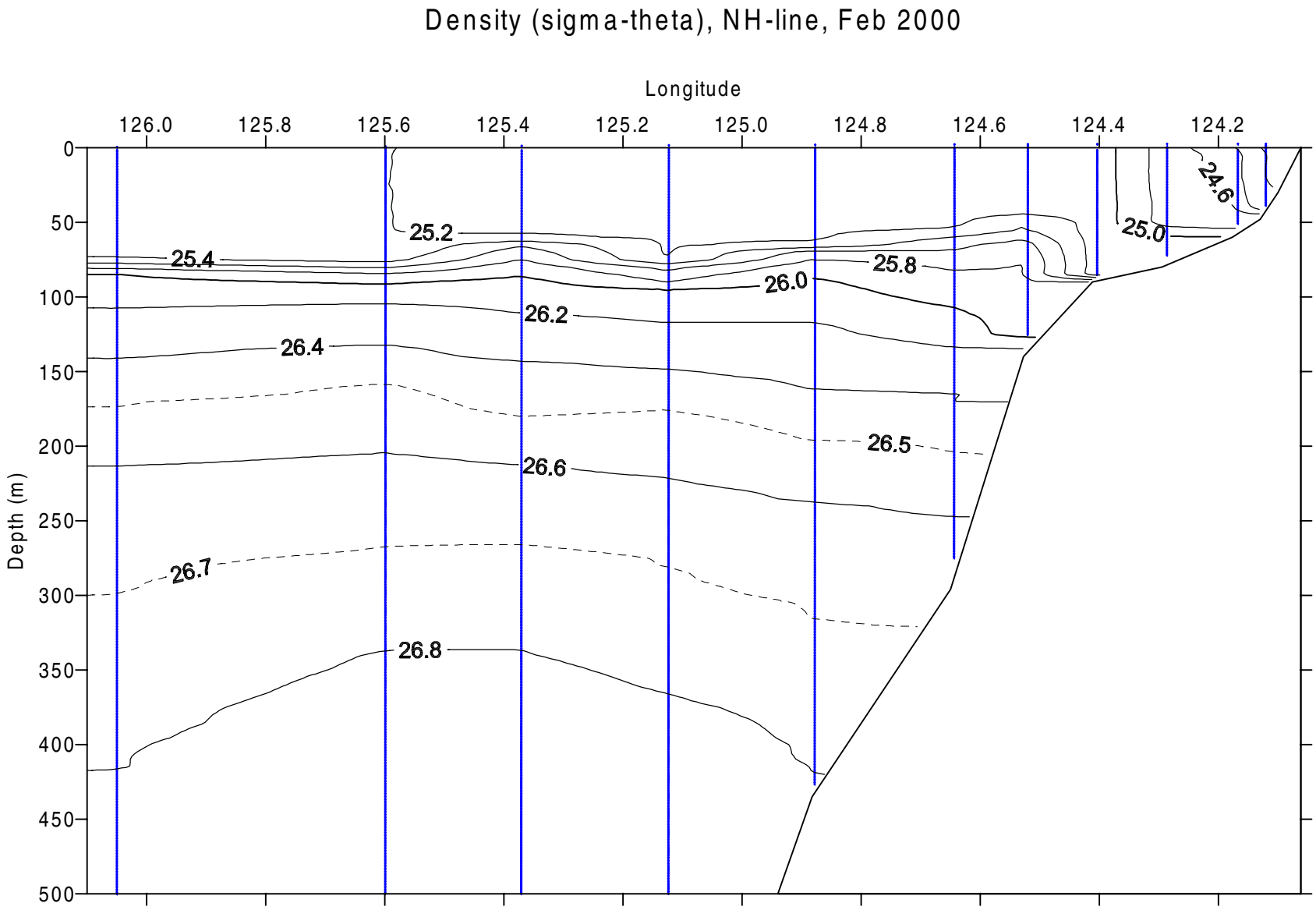


Figure 4. Wind direction at NOAA buoy 46050 for January 30 - February 3, 2000.

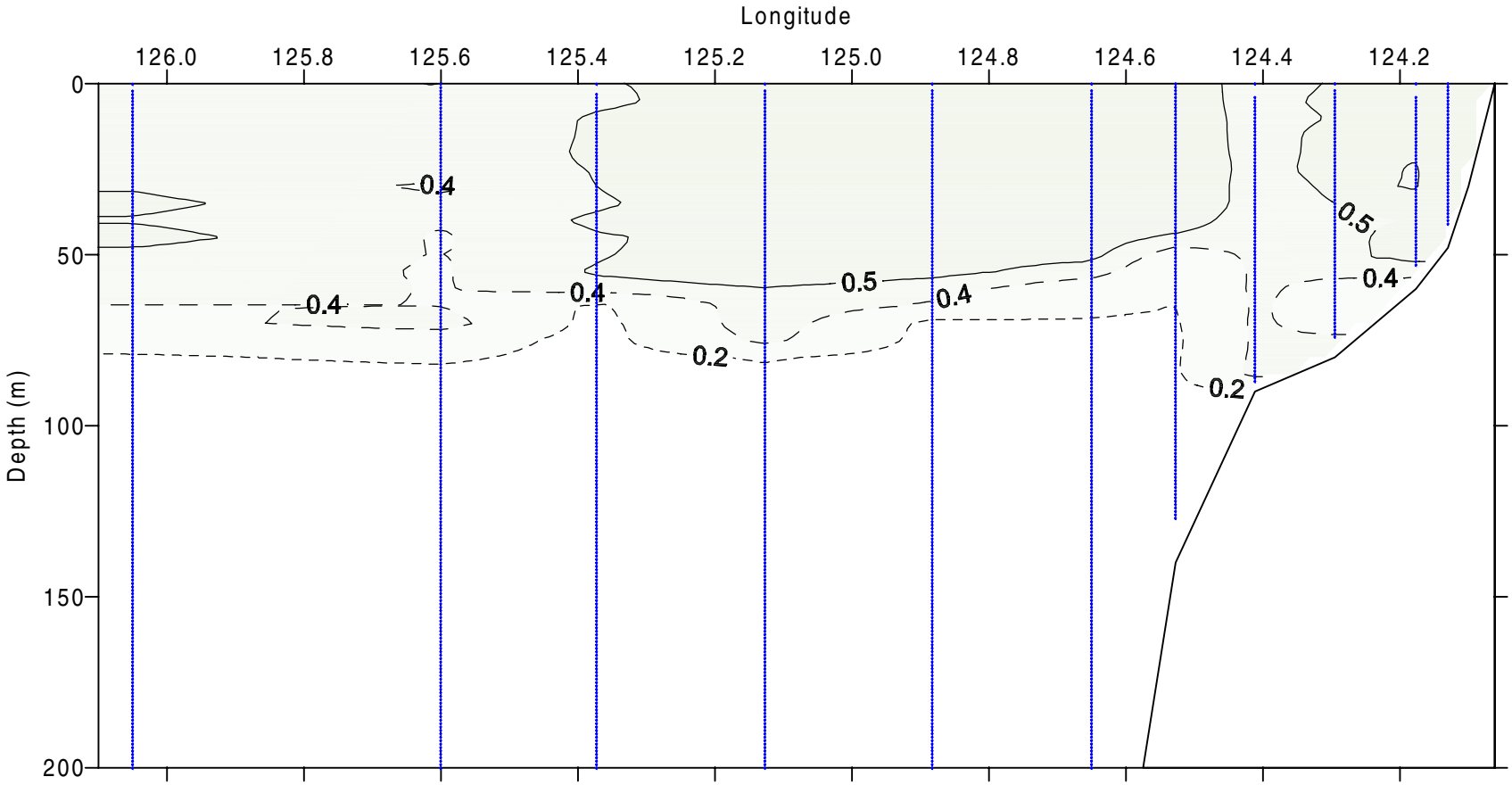

Temperature, NH-line, Feb 2000
Longitude
126.0
125.8
125.6
125.4
125.2
125.0
124.8
124.6
124.4
124.2
Depth (m)
0
50
100
150
200
250
300
350
400
450
500
10.0
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0

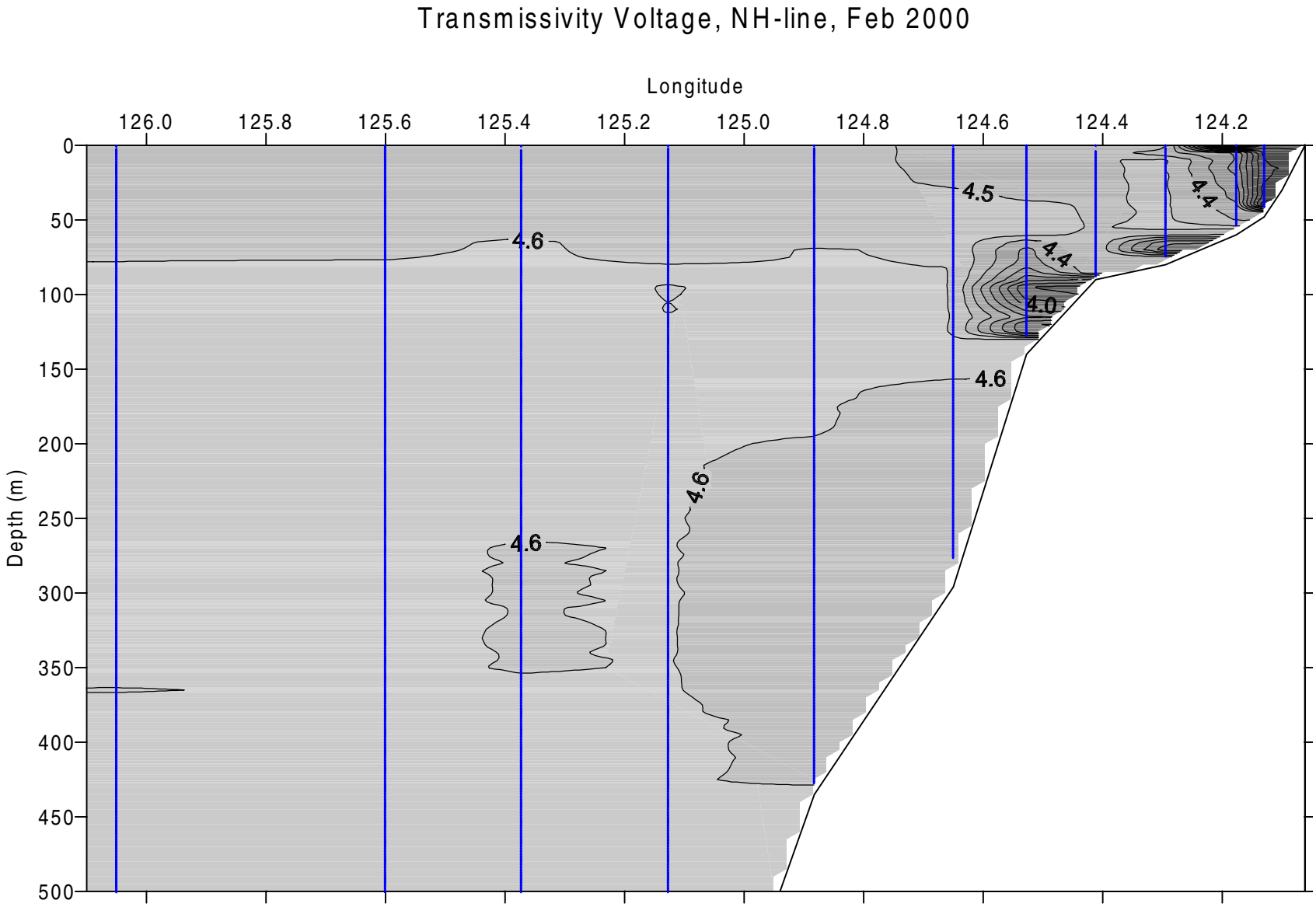
Salinity, NH-line, Feb 2000




Density (sigma-theta), NH-line, Feb 2000
Longitude
126.0
125.8
125.6
125.4
125.2
125.0
124.8
124.6
124.4
124.2
Depth (m)
0
50
100
150
200
250
300
350
400
450
500
24.6
25.0
25.2
25.4
25.8
26.0
26.2
26.4
26.5
26.6
26.7
26.8

Fluorescence Voltage, NH-line, Feb 2000

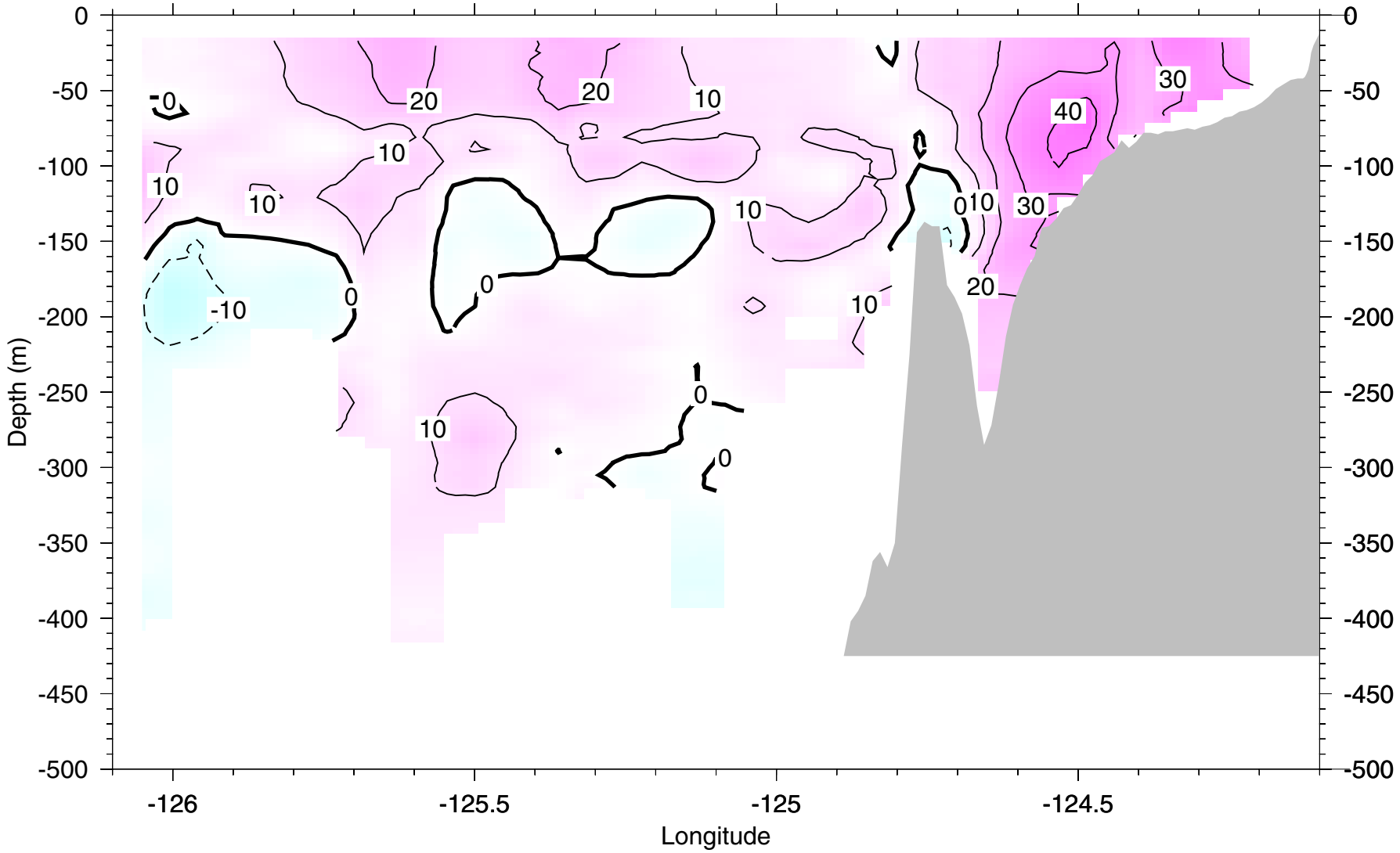



Transmissivity Voltage, NH-line, Feb 2000
Longitude
126.0
125.8
125.6
125.4
125.2
125.0
124.8
124.6
124.4
124.2
Depth (m)
0
50
100
150
200
250
300
350
400
450
500
4.5
4.4
4.6
4.4
4.0
4.6
4.6
4.6

Newport Hydrographic Line 44.6°N

01-02 February 2000

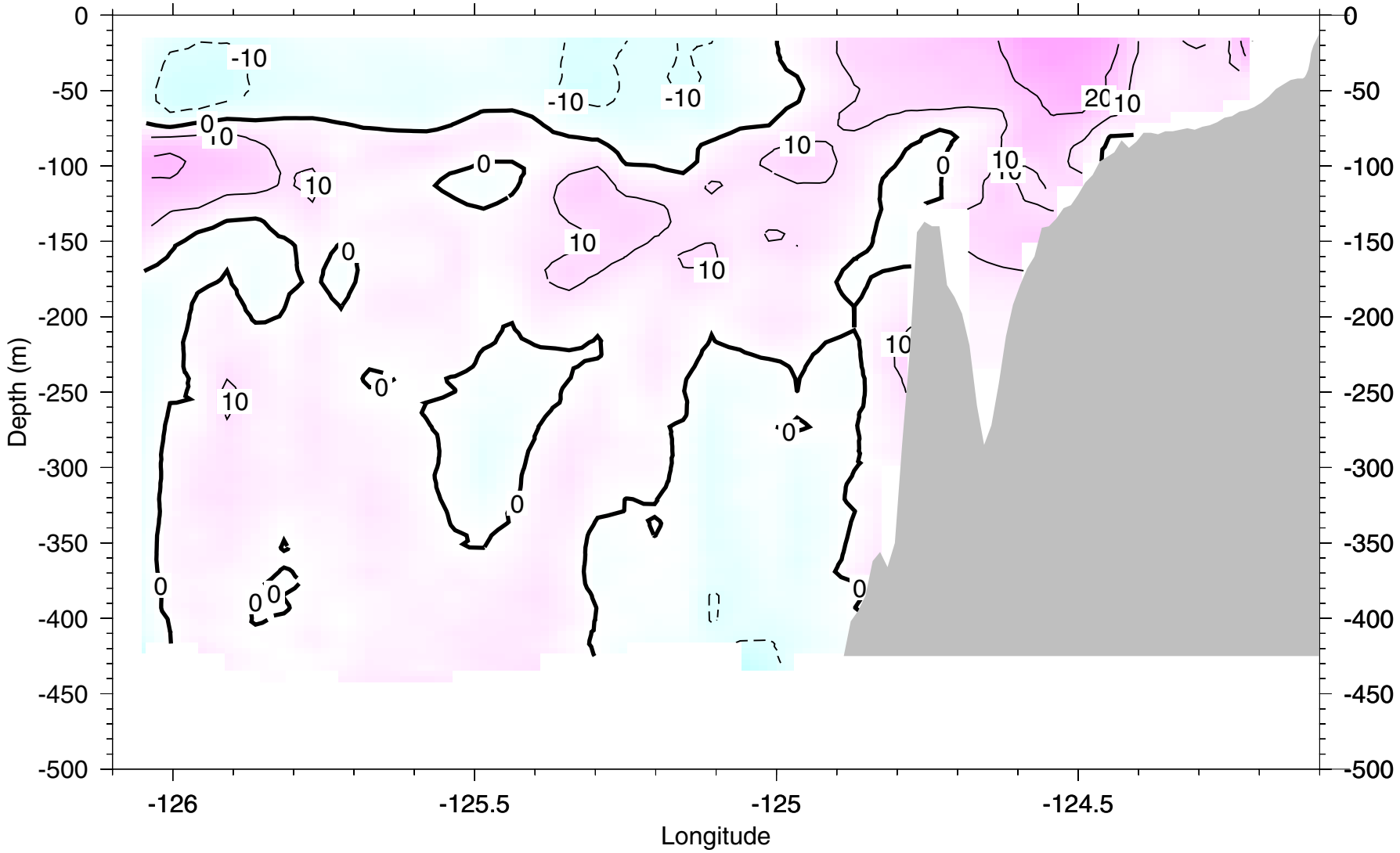
ADCP: Northward current (cm/s)



Newport Hydrographic Line 44.6°N

2-3 February 2000

ADCP: Northward current (cm/s)



Zooplankton report for the February 2000 GLOBEC LTOP Wecoma cruise.

- Relative Biomass is scaled low to high (1-5).
- Color is Orange, Green, White, or Tan. Orange generally indicates the presence of high densities of lipid-filled large copepods or euphausiids. Green indicates high phytoplankton biomass; white may indicate low densities of small copepods, chaetognaths, gelatinous zooplankton, or other; tan coloring generally indicates high densities of copepods, etc.
- Gelatinous biomass scaled 0 (none) to 5.
- Euphausiid biomass scaled 0 (none) to 5.
- Comments: most abundant gelatinous forms and other obvious species.

1/2-m vertical plankton tow:

Station	Relative Biomass	Color	Gelats	Euphausiids	Comments
NH5	3	T	0	0	Small copepods
NH10	3	T	0	1	Small copepods, pteropods, furcilia
NH15	1	W	0	1	Small copepods, pteropods, few furcilia
NH20	1	W	0	1	Small copepods, few furcilia, 1 adult euphausiid, pteropods
NH25	1	W	0	1	Small copepods, 4 juvenile/adult euphausiids, pteropods
NH45	1	W	0	1	Small copepods, pteropods, furcilia, 1 large mysid
NH65	1	W	0	2	10-15 adult/juvy euphausiids, pteropods, small copepods

1-m horizontal plankton tow:

Station	Relative Biomass	Color	Gelats	Euphausiids	Comments
NH5	1	T	1	1	Calanus, pteropods, small copepods, few furcilia
NH10	3	T	1	1	10-20 Pleurobrachia, Calanus, pteropods, few adult/juvenile euphausiids
NH15	2	T	1	3	Many pteropods, ~50 adult euphausiids, small copepods
NH20					
NH25	3	T	0	3	50-100 euphausiids, small copepods, pteropods, chaetognaths
NH45	3	T	1	3	100-150 euphausiids, pteropods, small copepods, 1 Beroe, 1 Pleurobrachia, 1 Siphonophore
NH65	3	T	0	3	Several hundred euphausiids, amphipods, pteropods, few small copepods