

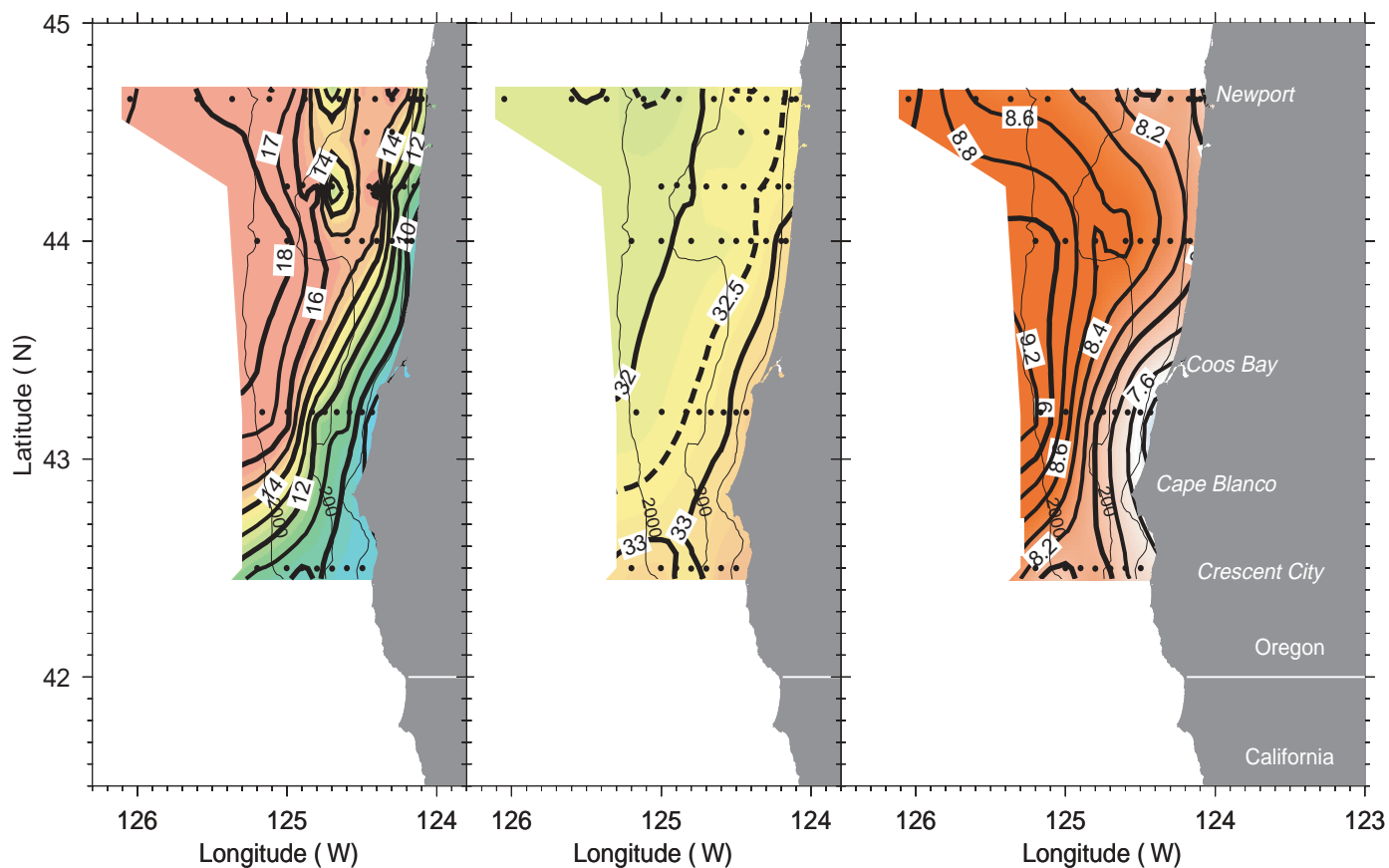
College of Oceanic and Atmospheric Sciences

30 August - 9 September 2004

T (C) at 10 m

S (psu) at 10 m

Geopot. Anom. (0/500 dbar)



Hydrographic Data from the GLOBEC Long-Term Observation Program off Oregon, 2004

Jane Fleischbein, A. Huyer, R. L. Smith,
P. M. Kosro

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Data Report 200
Reference 2005-3
January 2005

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Hydrographic Data from the GLOBEC Long-Term Observation Program off Oregon, 2004

Introduction

As part of the GLOBEC Northeast Pacific Program, a Long Term Observation Program (LTOP) of repeated hydrographic observations along lines off Oregon began in September 1997 (Fleischbein et al, 1999; Fleischbein et al, 2001; Fleischbein et al, 2002; Fleischbein et al, 2003). Of these lines, NH, off Newport, had been sampled frequently during the decade from 1961 to 1970, and another, FM, off Coos Bay, had been sampled repeatedly in 1981-1983. During 2004, the LTOP program continued sampling along these two lines and three additional lines off Oregon and California. The program includes measurements of upper ocean currents by the ship-borne Acoustic Doppler profiling system, and nutrient, chlorophyll and zooplankton sampling at selected stations; those results will be presented elsewhere. This report presents the CTD data from two cruises made during August and September 2004.

During the 2004 cruises, sampling occurred on five separate lines (Table 1, Figure 1): the Newport Hydro (NH) line which extends 150 km west along $44^{\circ}39.1'N$ off Newport, Oregon; the Strawberry Hill line which extends 72 km along $44^{\circ}15'N$; the Heceta Head (HH) line which extends 100 km west along $44^{\circ}00'N$ off Heceta Head, Oregon; the Five Mile Point (FM) line which extends 65 km west along $43^{\circ}13'N$ from Coos Bay, Oregon; and the Rogue River (RR) line which extends 65 km west long $42^{\circ}30'N$ from the Rogue River, Oregon. Station names on each line reflect historical usage: for the NH line, the numerical suffix indicates the distance from shore in nautical miles; for all other lines, the station location names are numbered sequentially. Each section except the Strawberry Hill line includes at least two stations beyond the 1000 m isobath, and the maximum CTD sampling depth is 1000 m.

The cruises were on the R/V Wecoma, operated by Oregon State University from her homeport of Newport, Oregon. The cruise name convention is as follows: the first letter designates the ship (W for Wecoma), the next four digits indicate the beginning year and month, and the final letter distinguishes between cruises starting in the same month (A for first, B for second, etc). Participants on the 2004 cruises (Table 2) also participated on previous LTOP cruises to ensure similar sampling protocols were used throughout the project. Cruise W0409A was primarily a mooring cruise (Dr. P. Michael Kosro, Principle Investigator); only the CTD data are presented here.

Cruise W0408D started CTD sampling on 30 August at NH-1 (Table 3, Figure 2). In order to maximize darkness for the Bongo net tows, the CTD stations were done in their usual order out to NH-25, then the ship returned to NH-20, NH-15 and NH-10. CTD stations and net tows were then done in order from NH-35 out to NH-85, finishing sampling on the line on 31 August. The ship transited to HH-5 on the Heceta Head line, arriving on 1 September, to begin working inshore to do Bongo net tows in darkness. CTD sampling resumed at HH-1a and the line was completed on 1 September, working out to HH-7.

Due to reports of a possible near-bottom hypoxic event occurring south of Newport, the Strawberry Hill line was added to the sampling regime. Strawberry Hill stations had been sampled repeatedly by the PICSO project. CTD sampling on the Strawberry Hill line began at SH-9 on 2 September, followed by SH-8. Only Bongo net tows were done on the way in towards shore from SH-7 to SH-1 to allow sampling in darkness. CTD sampling resumed at SH-1 on 2 September, and the line was worked out to SH-7. Two stations were done over Stonewall Bank, followed by a repeat of the CTD stations from NH-5 to NH-25. The same NH stations were then

worked toward shore with net tows only, finishing NH-5 on 3 September.

W0409a sampled the NH line out to NH-25 (Table 4, Figure 3), the FM line and the RR-line from 7 to 9 September, 2004. Additional casts were done at the two mooring sites.

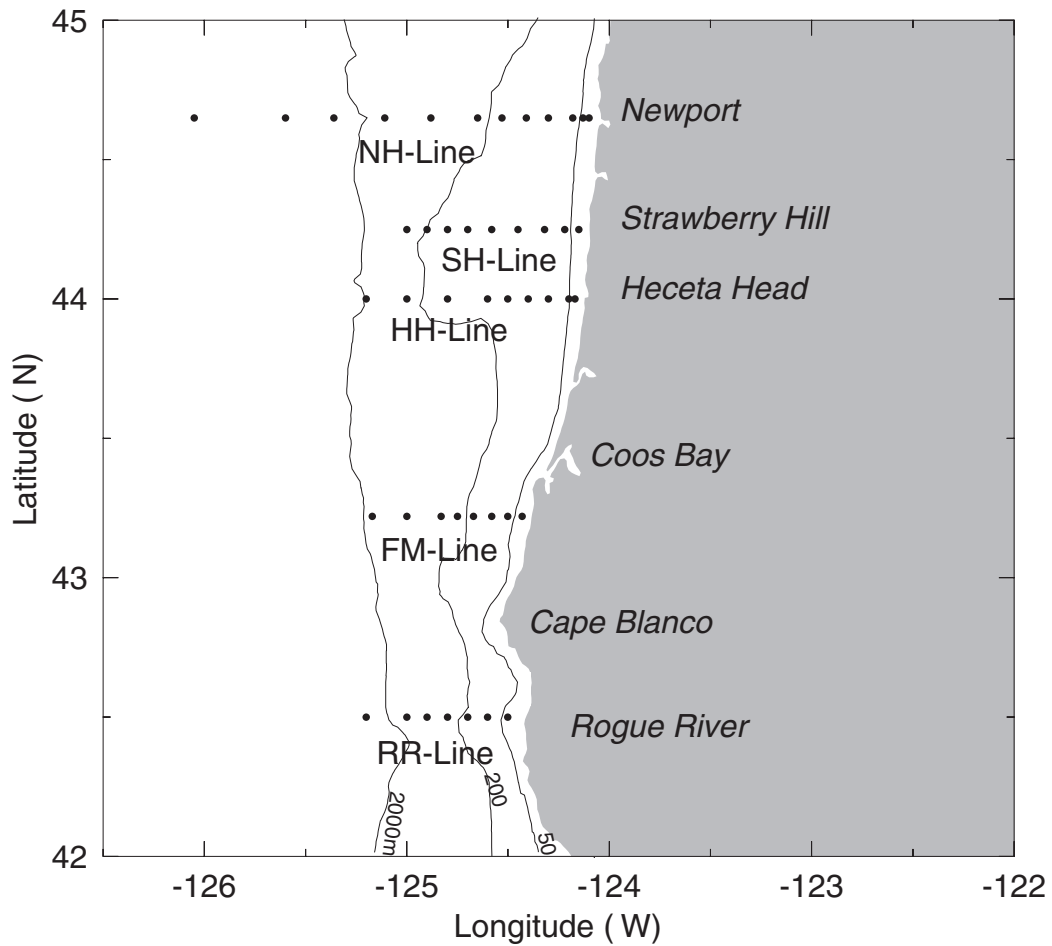


Figure 1. Location of standard sampling lines.

Table 1. Stations occupied along the 5 hydrographic lines: Newport, Strawberry Hill, Heceta Head, Five Mile, Rogue River, and at Stonewall Bank and mooring sites during the 2004 GLOBEC cruises.

Station	W0408D 30 Aug - 3 Sept	W0409A 7-9 Sept
NH-1	1	
-3	2	2
-5	3,35	3
-10	4,36	1,4
-15	5,37	5
-20	6,38	6
-25	7,39	7
-35	8,9,10	
-45	11	
-55	12	
-65	13	
-85	14	
HH-1a	15	
-1	16	
-2a	17	
-2	18	
-3a	19	
-3	20	
-4	21	
-5	22	
-7	23	
SH-1	26	
-2	27	
-3	28	
-4	29	
-5	30	
-6	31	
-7	32	
-8	25	
-9	24	
SB-1	34	
-2	33	
FM-1		10
-3		11
-4		12
-5		13
-6		14
-7		15
-8		16
-9		17
RR-1		18
-2		19
-3		20
-4		21
-5		22
-6		23
-7		24
RR-mooring		8
CB-mooring		9

Table 2. Names, affiliations, and responsibilities of scientific personnel participating on W0408d.

Adriana Huyer	Chief Scientist	OSU	CTD
Robert L. Smith	Co-Chief Scientist	OSU	CTD
Jane Fleischbein	Technician	OSU	CTD, Oxygen
Julie Arrington	Technician	OSU	nuts, chl
Jennifer Jarrell-Wetz	Technician	OSU	nuts, chl
Mike Wetz	Graduate Student	OSU	nuts, chl
William T. Peterson	Co-Chief Scientist	NOAA	zooplankton
Leah Feinberg	Technician	HMSC	zooplankton
Carolyn Tracy Shaw	Technician	HMSC	zooplankton
Mitch Vance	Technician	HMSC	zooplankton
Rian Hooff	Technician	HMSC	zooplankton
Jesse Lamb	Technician	HMSC	zooplankton
Julie Keister	Graduate Student	OSU	zooplankton
Linda Faylor	Technician	OSU	martec
Daryl Swensen	Technician	OSU	martec

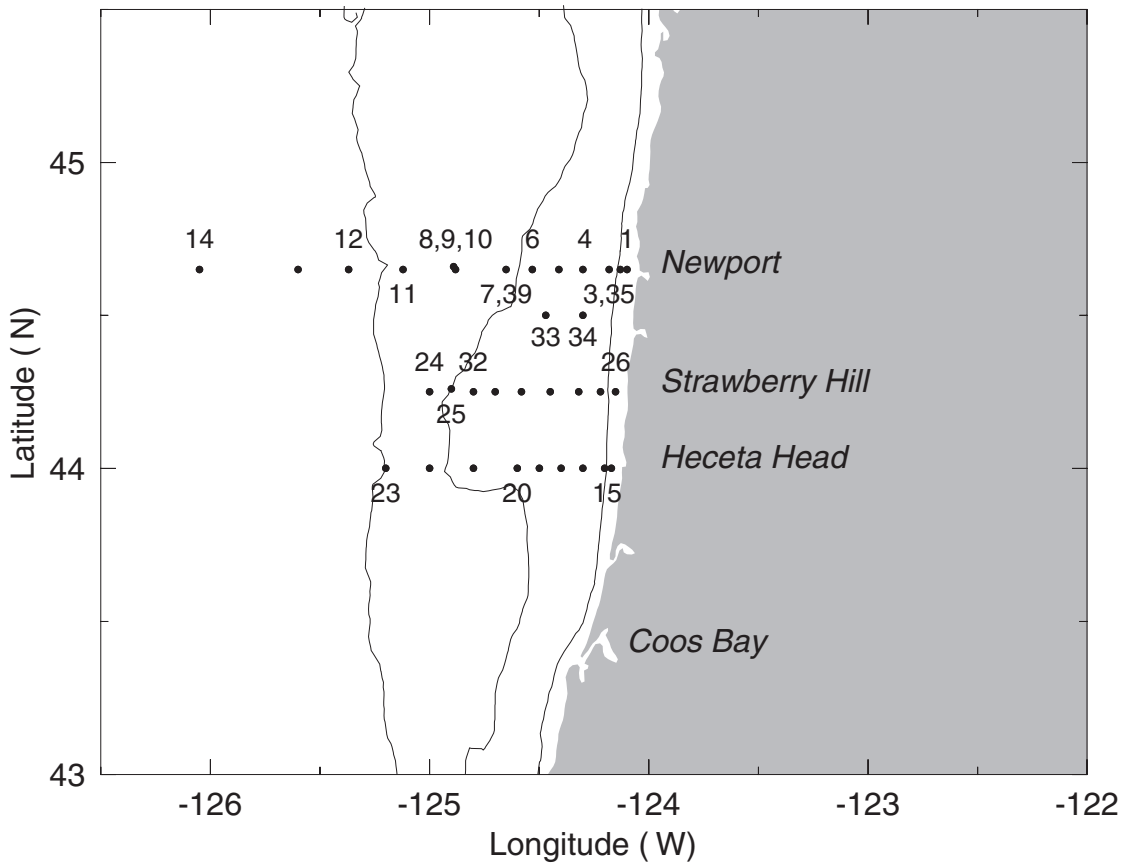


Figure 2. Location of CTD stations during W0408D.

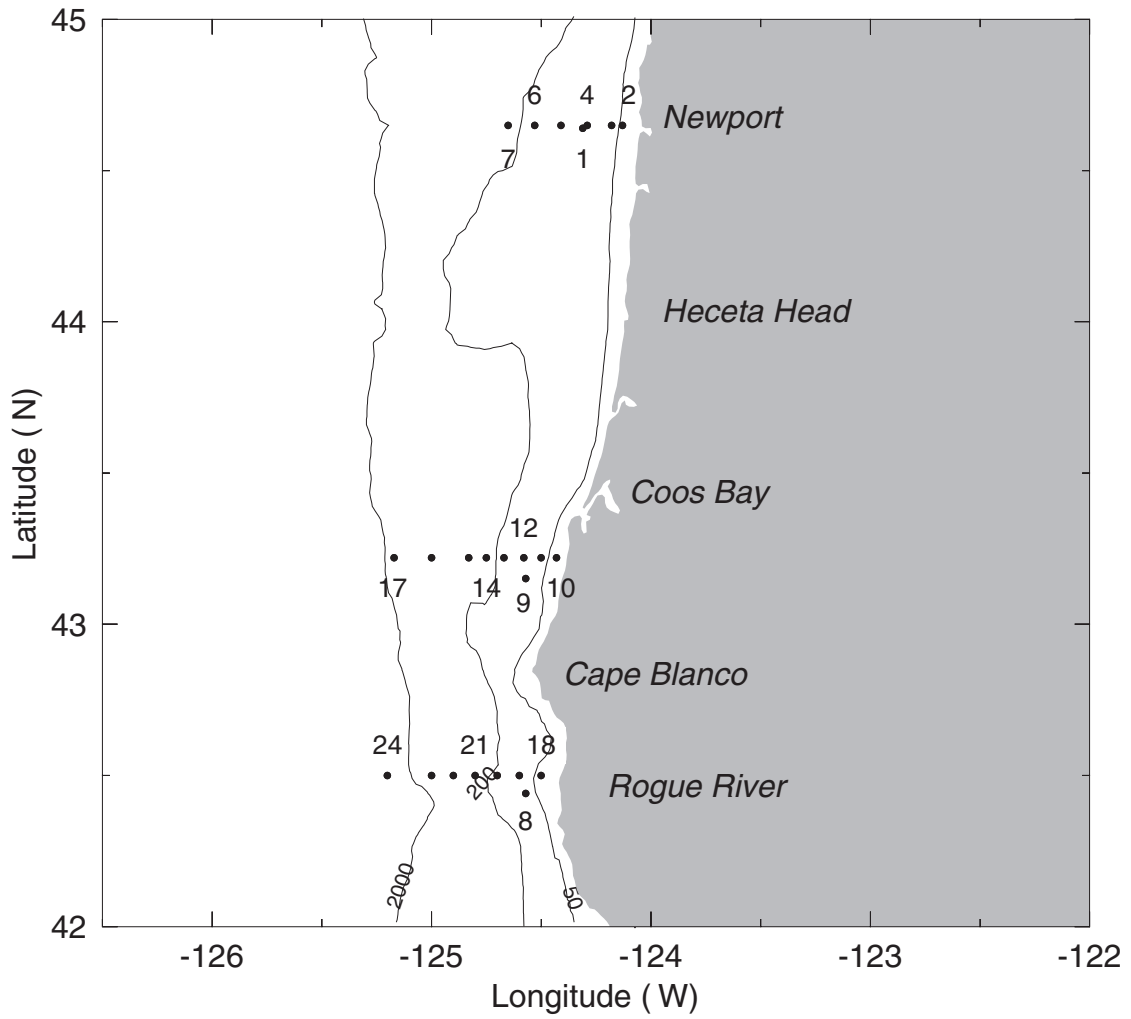


Figure 3. Location of CTD stations during W0409A.

Table 3. CTD stations occupied during W0408D.

Sta. No.	Station Name	Date UT	Time UT	Latitude	Longitude	Dist. From Shore	Depth (m)	Atm. Pr. (mbar)	Wind Dir. (°T)	Wind Spd. (kt)	Chlor., Nuts.
1	NH-1	30 Aug	2217	44°39.1'N	124°06.0'W	3.0	28	1015.3	335	21	
2	NH-3		2251	44°39.0'	124°07.9'	5.6	48	1015.0	345	18	
3	NH-5		2321	44°39.1'	124°10.6'	9.1	58	1014.9	345	18	Y
4	NH-10	31 Aug	0038	44°39.1'	124°17.8'	18.5	81	1014.7	335	20	
5	NH-15		0149	44°39.1'	124°24.7'	27.6	93	1014.9	355	17	Y
6	NH-20		0307	44°39.1'	124°31.7'	36.9	142	1015.3	005	14	
7	NH-25		0412	44°39.1'	124°39.0'	46.5	293	1016.0	000	14	Y
8	NH-35		1306	44°39.1'	124°53.0'	65.0	442	1016.6	355	15	Y
9	NH-35		1430	44°39.4'	124°53.4'	65.4	458				
10	NH-35		1505	44°39.4'	124°53.5'	65.6	458				
11	NH-45		1633	44°39.1'	125°07.0'	83.3	704	1017.9	005	8	Y
12	NH-55		1851	44°39.1'	125°22.0'	103.2	2866	1018.0	340	12	
13	NH-65		2144	44°39.1'	125°36.0'	121.5	2861	1018.0	355	10	Y
14	NH-85	1 Sept	0112	44°39.1'	126°03.0'	157.2	2882	1017.2	000	12	Y
15	HH-1a		1326	44°00.0'	124°10.0'	2.2	30	1019.0	260	5	
16	HH-1		1403	44°00.0'	124°12.0'	5.0	53	1019.6	325	12	Y
17	HH-2a		1503	44°00.0'	124°18.0'	13.0	93	1020.2	350	7	
18	HH-2		1604	44°00.0'	124°24.0'	20.9	120	1021.0	335	8	Y
19	HH-3a		1721	44°00.0'	124°30.0'	28.9	137	1021.8	330	10	
20	HH-3		1832	44°00.0'	124°35.9'	36.9	155	1022.4	325	8	Y
21	HH-4		2018	44°00.0'	124°48.0'	53.0	112	1022.5	300	11	Y
22	HH-5		2206	44°00.0'	125°00.0'	68.9	932	1023.0	305	14	Y
23	HH-7	2 Sept	0016	44°00.0'	125°12.0'	84.8	1697	1022.9	330	15	Y
24	SH-9		0316	44°15.0'	125°00.0'	71.9	562	1023.0	330	12	
25	SH-8		0553	44°15.4'	124°53.8'	63.7	152	1023.2	335	10	
26	SH-1		1301	44°15.0'	124°09.0'	4.3	40	1022.7	165	7	
27	SH-2		1340	44°15.0'	124°13.0'	9.6	60	1022.7	145	5	
28	SH-3		1424	44°15.0'	124°18.9'	17.4	79	1022.7	185	9	
29	SH-4		1521	44°15.0'	124°27.0'	28.2	97	1023.2	330	7	
30	SH-5		1623	44°15.0'	124°34.6'	38.2	102	1023.3	340	10	
31	SH-6		1720	44°15.0'	124°42.0'	48.0	98	1023.6	340	11	
32	SH-7		1815	44°15.0'	124°48.0'	55.9	118	1023.9	345	12	
33	SB-2		2106	44°30.0'	124°28.0'	31.3	82	1023.0	345	12	
34	SB-1		2245	44°30.0'	124°17.9'	18.0	83	1022.3	315	8	
35	NH-5	3 Sept	0025	44°39.1'	124°10.6'	9.1	58	1022.1	335	10	
36	NH-10		0140	44°39.1'	124°17.7'	18.3	81	1021.9	335	7	
37	NH-15		0234	44°39.1'	124°24.7'	27.6	96	1022.2	350	14	
38	NH-20		0334	44°39.1'	124°31.7'	36.9	142	1022.4	005	12	
39	NH-25		0438	44°39.1'	124°39.0'	46.5	296	1022.9	350	12	

Table 4. CTD stations occupied during W0409A.

Sta. No.	Station Name	Date UT	Time UT	Latitude	Longitude	Dist. From Shore	Depth (m)	Atm. Pr. (mbar)	Wind Dir. (°T)	Wind Spd. (kt)
1	NH-10	7 Sept	1800	44°38.6'N	124°18.4'W	19.4km	83	1020.8	015	11
2	NH-3		2231	44°39.1'	124°07.6'	5.2	48	1019.1	345	15
3	NH-5		2259	44°39.1'	124°10.6'	9.1	59	1018.9	350	15
4	NH-10		2342	44°39.1'	124°17.7'	18.3	82	1018.8	350	15
5	NH-15	8 Sept	0026	44°39.1'	124°24.7'	27.6	94	1018.0	000	13
6	NH-20		0110	44°39.1'	124°31.7'	36.9	144	1018.1	000	13
7	NH-25		0158	44°39.1'	124°38.9'	46.3	298	1017.8	345	11
8	RR_mooring		1456	42°26.4'	124°34.3'	14.8	76	1015.9	340	21
9	CB_mooring		2026	43°09.3'	124°34.0'	15.7	100	1018.4	000	6
10	FM-1		2128	43°12.9'	124°26.0'	3.3	35	1018.5	330	7
11	FM-3		2158	43°12.9'	124°30.0'	8.7	64	1018.5	355	5
12	FM-4		2236	43°12.9'	124°35.0'	15.4	88	1018.4	335	3
13	FM-5		2312	43°12.9'	124°40.0'	22.2	157	1018.1	330	4
14	FM-6		2352	43°13.0'	124°44.9'	28.7	310	1018.1	330	7
15	FM-7	9 Sept	0050	43°13.0'	124°50.0'	35.7	342	1017.9	325	6
16	FM-8		0152	43°13.0'	124°59.9'	49.1	1078	1017.1	330	5
17	FM-9		0315	43°12.9'	125°10.0'	62.6	1651	1017.6	345	9
18	RR-1		1446	42°30.0'	124°29.9'	7.2	37	1016.4	000	16
19	RR-2		1527	42°30.0'	124°36.0'	15.6	87	1016.2	350	16
20	RR-3		1608	42°29.9'	124°42.0'	23.7	133	1016.3	350	17
21	RR-4		1652	42°29.9'	124°48.0'	31.9	605	1016.5	345	18
22	RR-5		1748	42°30.0'	124°54.0'	40	1159	1016.9	345	13
23	RR-6		1859	42°30.0'	125°00.1'	48.3	1775	1016.7	335	14
24	RR-7		2036	42°30.0'	125°12.0'	64.6	2977	1016.5	335	13

CTD Data Acquisition and Calibration

All CTD/rosette casts were made with a Sea-Bird 9/11-plus CTD system equipped with dual ducted temperature and conductivity sensors (Table 5). A transmissometer and fluorometer were mounted adjacent to the CTD and a Sea-Bird Beckman-type dissolved oxygen sensor was mounted on the rosette adjacent to the CTD sensors (Table 5).

The fluorometer had the time constant set to 1 second, and the range set to medium ($X3 = 10 \text{ mg m}^{-3}$ chlorophyll). The transmissometer was configured with a wavelength of 660 nm and pathlength of 25 cm. The fluorometer and transmissometer data were recorded as voltages by the CTD system. All fluorometer results are presented as fluorescence voltage.

Air calibrations of the transmissometer were recorded during W0408D for correcting transmission voltage and were used in computing the light transmission values for W0408D and W0409A. The methodology utilized to compute light transmission followed the method given by SeaBird (2001) to calculate a slope and offset correction. The equation used to compute percent light transmission is:

$$\%LT = (19.402 * V_x) - 1.0423$$

where %LT = calibrated % light transmission and V_x = raw output voltage.

Calibrated transmission voltage is plotted for both cruises in Appendix A and presented as percent light transmission in the data listings.

The pressure sensors were Digiquartz pressure transducers and calibrated by Sea-Bird (Table 5). The Sea-Bird CTD temperature and conductivity sensors were also calibrated by Sea-Bird at least once a year (Table 5). The deck unit provided a correction for the time lag between T0 and C0, and no correction for the lag between T1 and C1. Plots of T0-T1 differences were used to check the stability of the temperature calibrations. At each CTD station, samples were collected at one or more depths for *in situ* calibration of the conductivity sensors. Twelve 5-liter Niskin bottles were attached to the rosette and at most stations all of the bottles were fired. Nearly all of bottles were used for biological analyses, with one bottle reserved specifically for the CTD calibration. Usually one or two of the biologist's sample depths also coincided with a mixed region for an additional salinity sample, and duplicate salt samples were drawn from 1 to 3 Niskin bottles at each station. The pressure, temperature and conductivity data for each bottle firing depth were extracted from the recorded up cast data using the Sea-Bird Seasoft DATCNV and ROSSUM utilities.

Table 5. Instruments and sensors used for CTD sampling, and dates of laboratory calibration. Cruise station numbers are listed for each CTD used, and a dot represents a sensor used for all stations of a cruise. CTD primary (P) and secondary (S) temperature and conductivity sensors are shown, with the sensor pair used in final processing marked (*) or as footnoted.

Instrument/ Sensor No.	Factory Calibrations	W0408D 30 Aug – 3 Sept	W0409A 7-9 Sept
CTD/Rosette			
Ctd-256		1-39	1-24
Pressure 50130	28 Oct 03	•	•
Temperature			
1367	17 Oct 03	S	S*
1371	18 Oct 03	P*	P
Conductivity			
1054	17 Oct 03	P*	P
1538	11 Nov 03	S	S*
Transmissometer			
Wetlabs CST-590DR	1 May 02	•	•
Flurometer			
SeaTech 101S	Mar 04	•	•
Oxygen			
SBE43 0387	4 Dec 03	•	•

Salinity samples were run on a Guildline Autosol in a lab on shore. IAPSO Standard Water was used to standardize and check the salinometer at the beginning and end of each batch of 24 samples. The Guildline Portasal determines water sample salinity with a precision of ± 0.002 and an accuracy of ± 0.003 . Sample conductivity was calculated using the sample salinity value with the CTD temperature and pressure values; a value of 4.2914 S m^{-1} for the conductivity of standard seawater at 15°C (Culkin and Smith, 1980) was used to convert the measured sample conductivity ratios to conductivity. Occasionally the CTD-sample differences were larger than three standard deviations from the mean; these occurred in regions of sharp vertical gradients and were eliminated from the final calibration data sets.

The results of the CTD - bottle comparisons are shown in Table 6. Analysis showed no corrections were needed in conductivity for the two cruises.

The preferred sensor pair used in final CTD data processing for each cruise is shown in Table 5. The preferred pair was chosen by examining temperature and conductivity data for each cast for the least number of spikes (caused by biological detritus or electrical interference), and the calibration data. Station 26 of W0408D had clogging in the secondary sensor pair, and station 13 of W0409A had clogging in the primary sensor pair.

Table 6. Results of *in situ* conductivity calibration for both sensor pairs. Columns show the range of station numbers, number of samples (N), correction applied to CTD conductivity, and the average and standard deviations of the bottle - ctd salinity differences.

Cruise	Stations	N(S0/S1)	Correction		Average		Standard Deviation	
			C0	C1	S0	S1	S0	S1
W0408D	1-39	55/56	no corr.	no corr.	0.001	0.000	0.003	0.003
W0409A	1-24	40/43	no corr.	no corr.	0.003	0.003	0.005	0.005

CTD Data Processing

The CTD data were processed using the Sea-Bird SEASOFT software, and included all of the normal steps, i.e., using SEASOFT modules DATCNV, ALIGNCTD, WILDEDIT, CELLTM, FILTER, LOOPEDIT, DERIVE and BINAVG to obtain 1-dbar average values of pressure, primary and secondary temperature, primary and secondary conductivity, dissolved oxygen concentration and the two voltages from the fluorometer and transmissometer. The ALIGNCTD module was run with the T-C offset for the primary sensor pair as 0.000 sec, and the T-C offset for the secondary sensor pair as 0.073 sec; oxygen was advanced 3.0 sec relative to pressure. The dissolved oxygen concentration was calculated by the DERIVE module using the manufacturer's calibration. CTD oxygen and results of oxygen titration of samples collected at a few stations are compared in Appendix B.

CTD Data Presentation

Derived parameters, including salinity, potential temperature (theta), density anomaly (sigma-theta) and specific volume anomaly were computed from the processed and calibrated 1-dbar values of temperature and conductivity using standard algorithms (Fofonoff and Millard, 1983).

For each station, we present a plot of the vertical temperature, salinity, and sigma-t profiles, and a listing of the observed and derived variables at standard pressures. Header data includes the CTD Station Number and Name, Latitude (degrees and minutes North), Longitude (degrees and minutes West), Date and Time (UTC), and Bottom Depth (in meters).

Following the station plots and standard depth listings, vertical sections of temperature, salinity, sigma-theta and dissolved oxygen are shown for each hydrographic line.

Acknowledgements:

We are deeply grateful to COAS colleagues Linda Faylor, Daryl Swensen who participated in the CTD/rosette sampling. The CTD and rosette on Wecoma are maintained by the OSU Marine Technicians, under the supervision of Marc Willis. These cruises would not be possible without the steady work and dedication of Wecoma's crew.

These observations were supported NSF Grant OCE-0000733. This report is a contribution of the U.S. GLOBEC program, jointly funded by the National Science Foundation and the National Oceanic and Atmospheric Administration.

References

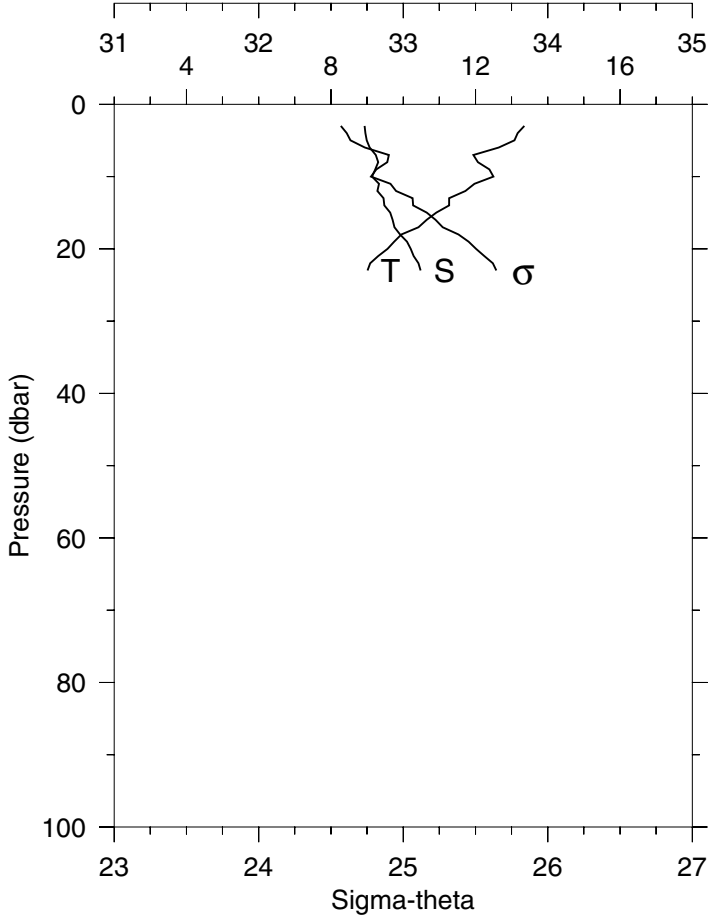
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CTD Data

Profiles of Temperature, Salinity and Density Anomaly
Tabulated Values at Standard Depths

W0408D

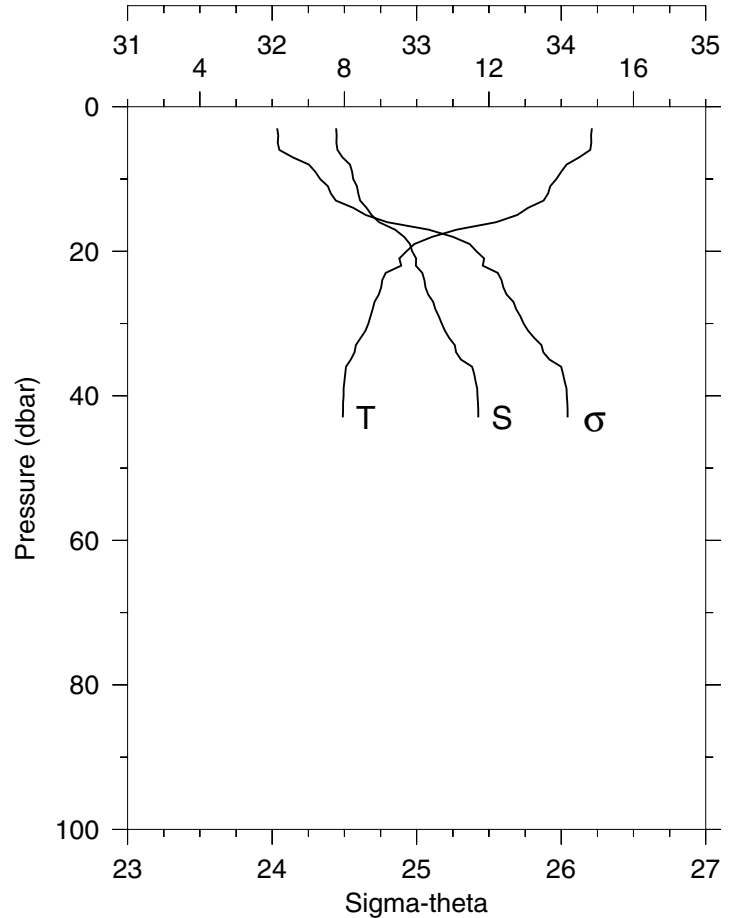
Station 1 NH-1
Temperature, Salinity



STA: 1 NH-1 LAT: 44 39.1 N LONG: 124 6.1 W
30 AUG 2004 2217 GMT DEPTH 28

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	13.35	32.733	13.35	24.568	0.101	0.24	80.6
10	12.49	32.785	12.49	24.777	0.324	0.23	82.7
20	9.57	33.052	9.56	25.503	0.603	0.19	84.8
23	9.01	33.120	9.01	25.645	0.675	0.19	84.4

Station 2 NH-3
Temperature, Salinity

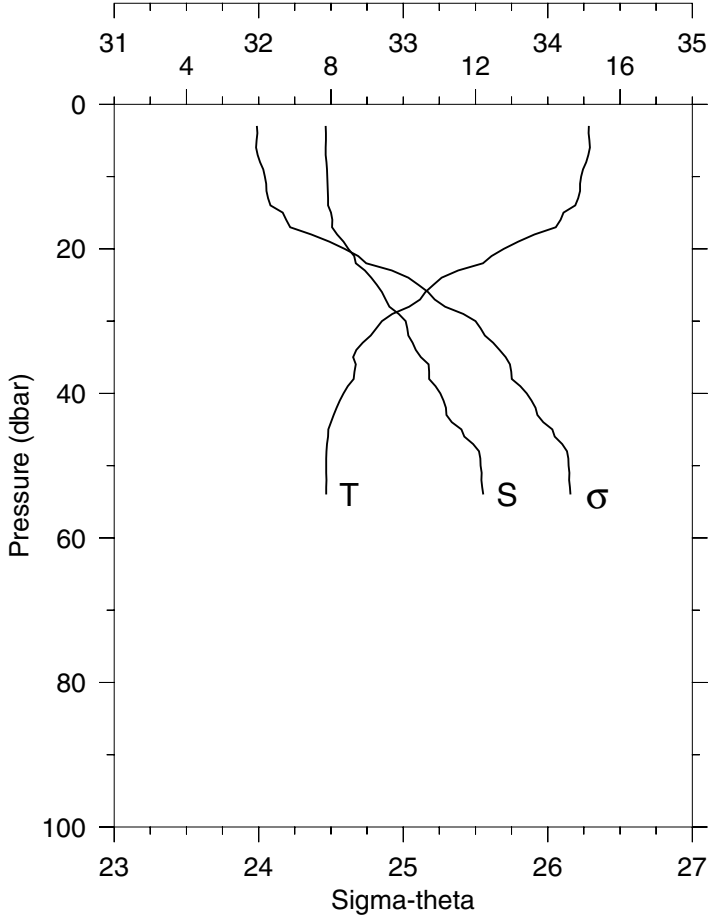


STA: 2 NH-3 LAT: 44 39.0 N LONG: 124 8.0 W
30 AUG 2004 2251 GMT DEPTH 48

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	14.85	32.442	14.85	24.034	0.116	0.93	73.5
10	13.86	32.561	13.86	24.332	0.380	0.64	79.0
20	9.72	32.968	9.72	25.413	0.696	0.19	86.6
30	8.67	33.173	8.66	25.740	0.934	0.22	85.1
40	7.97	33.420	7.97	26.038	1.142	0.23	83.9
43	7.96	33.426	7.95	26.045	1.201	0.25	81.1

W0408D

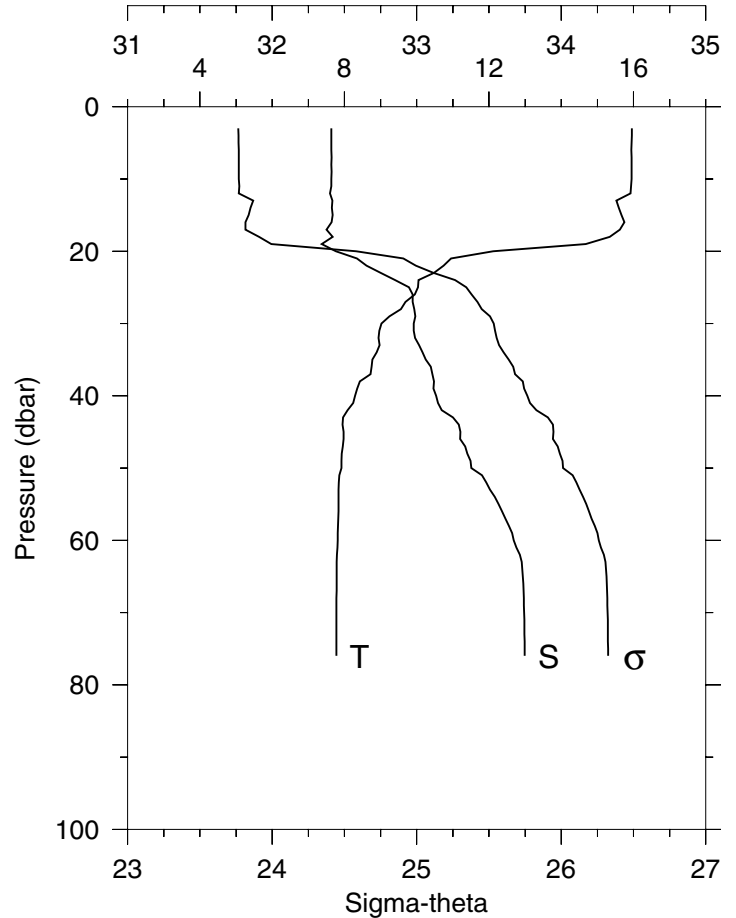
Station 3 NH-5
Temperature, Salinity



STA: 3 NH-5 LAT: 44 39.1 N LONG: 124 10.7 W
30 AUG 2004 2321 GMT DEPTH 58

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.14	32.464	15.14	23.988	0.117	1.20	74.9
10	14.93	32.474	14.92	24.042	0.390	1.13	76.5
20	12.78	32.621	12.78	24.594	0.762	0.24	85.3
30	9.41	33.016	9.41	25.501	1.051	0.19	86.8
40	8.34	33.256	8.34	25.855	1.282	0.18	86.8
50	7.87	33.536	7.87	26.144	1.481	0.24	85.2
54	7.86	33.553	7.86	26.158	1.555	0.26	84.4

Station 4 NH-10
Temperature, Salinity

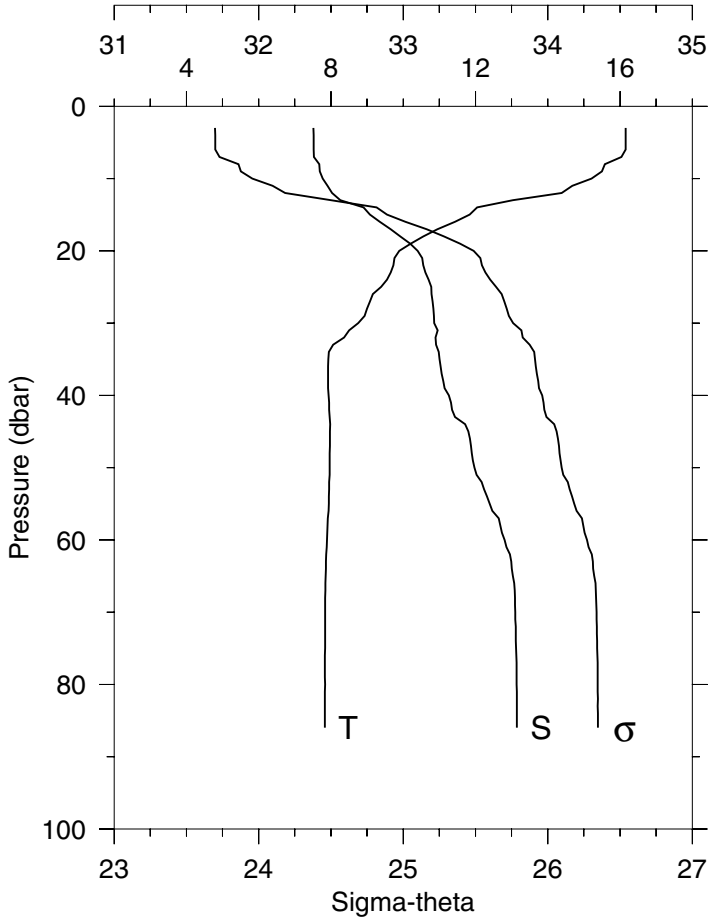


STA: 4 NH-10 LAT: 44 39.1 N LONG: 124 17.8 W
31 AUG 2004 0038 GMT DEPTH 81

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.96	32.410	15.96	23.766	0.124	1.12	76.3
10	15.94	32.410	15.94	23.770	0.412	1.25	75.4
20	12.11	32.440	12.11	24.581	0.814	0.79	83.6
30	9.02	32.979	9.02	25.533	1.086	0.36	86.9
40	8.30	33.134	8.29	25.766	1.321	0.25	87.9
50	7.92	33.378	7.91	26.013	1.529	0.17	87.6
60	7.81	33.672	7.81	26.260	1.714	0.18	87.2
70	7.78	33.744	7.77	26.321	1.885	0.20	84.8
76	7.78	33.748	7.77	26.324	1.988	0.22	84.6

W0408D

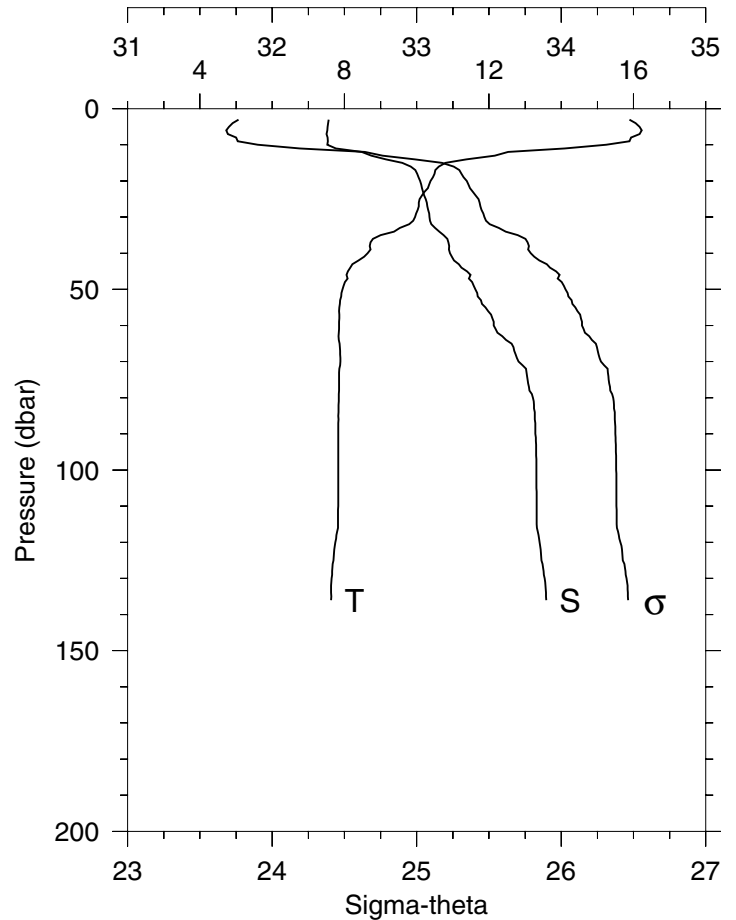
Station 5 NH-15
Temperature, Salinity



STA: 5 NH-15 LAT: 44 39.1 N LONG: 124 24.8 W
31 AUG 2004 0149 GMT DEPTH 93

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.16	32.379	16.16	23.698	0.126	0.48	83.1
10	15.22	32.443	15.21	23.956	0.414	0.62	81.4
20	9.89	33.100	9.89	25.487	0.728	0.96	84.1
30	8.75	33.215	8.75	25.760	0.963	0.32	87.1
40	7.93	33.315	7.93	25.961	1.173	0.16	87.9
50	7.96	33.493	7.96	26.096	1.370	0.16	87.7
60	7.89	33.701	7.88	26.271	1.553	0.17	87.3
70	7.84	33.775	7.83	26.337	1.724	0.18	86.1
80	7.84	33.785	7.83	26.346	1.892	0.22	85.9
86	7.83	33.787	7.83	26.347	1.993	0.23	85.8

Station 6 NH-20
Temperature, Salinity

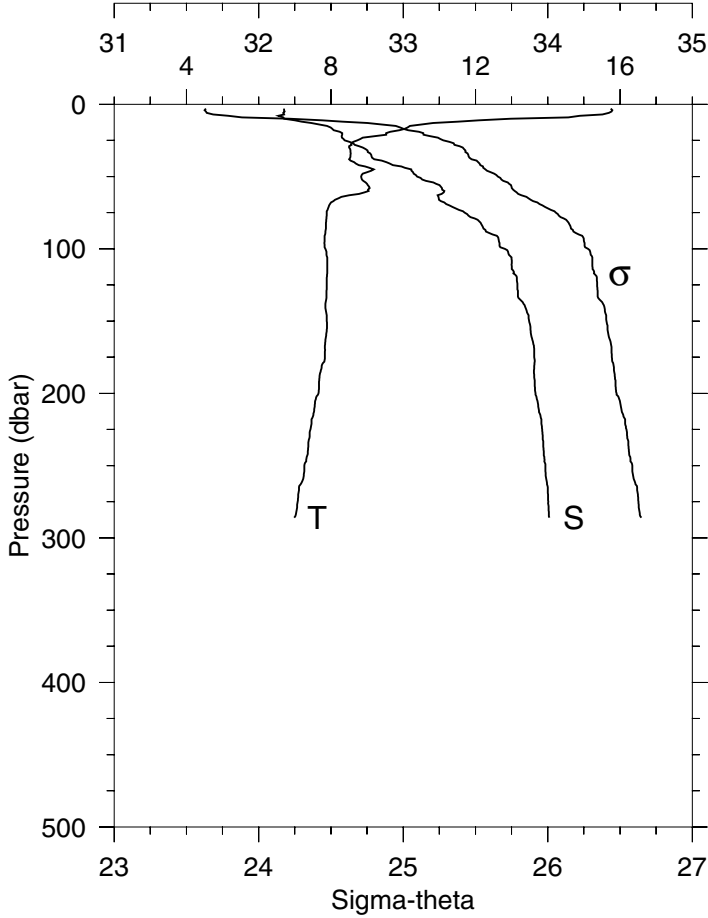


STA: 6 NH-20 LAT: 44 39.1 N LONG: 124 31.8 W
31 AUG 2004 0307 GMT DEPTH 142

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.89	32.391	15.89	23.768	0.124	0.52	81.8
10	15.25	32.381	15.24	23.901	0.414	0.56	81.3
20	10.38	33.024	10.38	25.346	0.714	0.29	86.4
30	9.96	33.088	9.95	25.468	0.970	0.35	86.0
40	8.64	33.231	8.64	25.789	1.203	0.27	87.1
50	7.95	33.405	7.95	26.029	1.409	0.17	87.7
60	7.86	33.533	7.85	26.144	1.601	0.15	87.9
70	7.89	33.704	7.88	26.275	1.781	0.14	87.4
80	7.84	33.805	7.84	26.360	1.951	0.15	86.2
90	7.83	33.821	7.82	26.374	2.117	0.16	85.2
100	7.83	33.828	7.82	26.380	2.282	0.16	84.5
110	7.83	33.830	7.82	26.382	2.447	0.15	83.9
120	7.75	33.851	7.74	26.410	2.612	0.16	82.6
130	7.65	33.885	7.64	26.452	2.773	0.14	82.7
136	7.63	33.897	7.62	26.463	2.868	0.14	82.5

W0408D

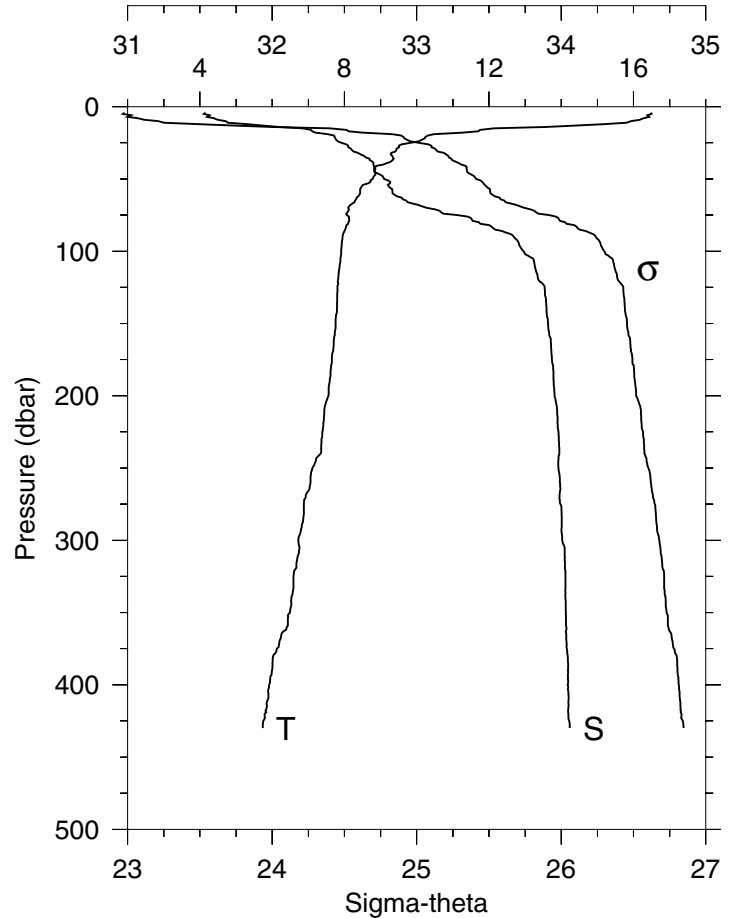
Station 7 NH-25
Temperature, Salinity



STA: 7 NH-25 LAT: 44 39.1 N LONG: 124 39.0 W
31 AUG 2004 0412 GMT DEPTH 293

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.74	32.175	15.74	23.635	0.128	0.44	83.3
10	12.97	32.176	12.97	24.212	0.418	1.49	78.0
20	9.53	32.578	9.53	25.139	0.972	0.30	86.4
30	8.50	32.720	8.50	25.411	0.997	0.26	87.4
40	8.64	32.884	8.64	25.518	1.250	0.24	87.2
50	8.84	33.097	8.83	25.655	1.490	0.23	87.3
60	9.04	33.285	9.03	25.771	1.717	0.23	86.9
70	7.95	33.320	7.94	25.963	1.931	0.15	87.9
80	7.87	33.515	7.86	26.128	2.127	0.15	87.8
90	7.84	33.618	7.83	26.214	2.313	0.14	87.7
100	7.85	33.703	7.84	26.279	2.491	0.14	87.7
110	7.90	33.751	7.89	26.309	2.664	0.14	87.8
120	7.89	33.786	7.87	26.339	2.835	0.13	88.1
130	7.88	33.793	7.86	26.346	3.004	0.13	88.1
140	7.85	33.844	7.83	26.391	3.172	0.14	88.0
150	7.89	33.871	7.87	26.406	3.336	0.14	87.7
175	7.83	33.907	7.82	26.443	3.741	0.13	87.5
200	7.65	33.915	7.63	26.476	4.139	0.13	87.2
225	7.43	33.962	7.41	26.544	4.525	0.13	87.2
250	7.27	33.984	7.24	26.585	4.901	0.13	87.1
275	7.08	34.004	7.05	26.627	5.267	0.13	87.1
286	6.98	34.012	6.95	26.647	5.425	0.13	87.0

Station 8 NH-35
Temperature, Salinity

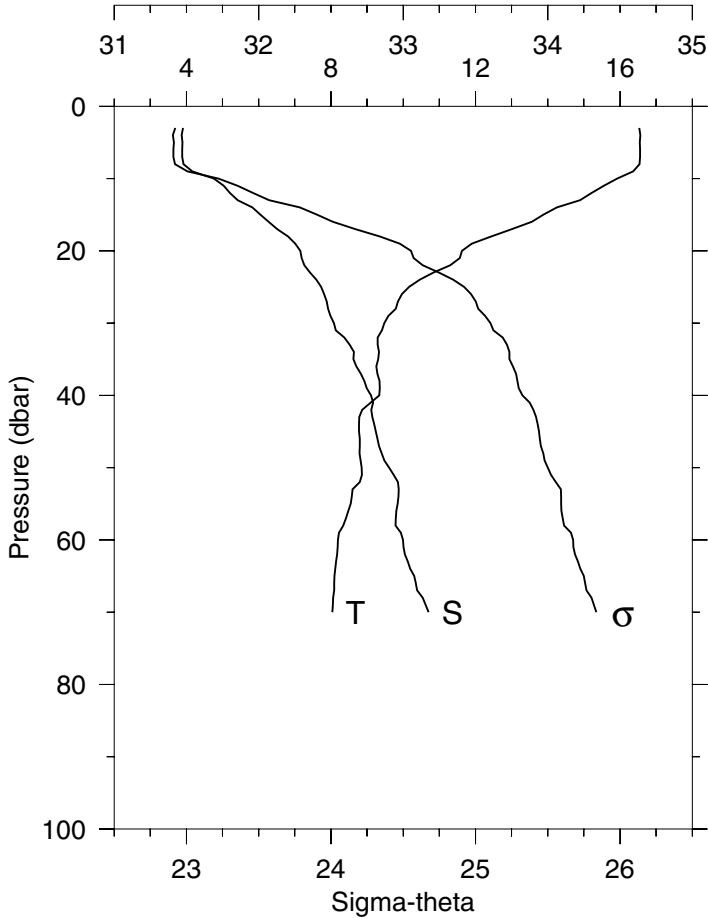


STA: 8 NH-35 LAT: 44 39.1 N LONG: 124 53.0 W
31 AUG 2004 1306 GMT DEPTH 442

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
4	16.49	31.538	16.48	22.978	0.195	0.24	85.4
10	15.93	31.679	15.93	23.211	0.484	0.28	85.1
20	10.31	32.427	10.31	24.892	0.861	0.46	84.7
30	9.44	32.552	9.43	25.134	1.155	0.50	84.8
40	9.07	32.701	9.06	25.309	1.429	0.30	86.6
50	8.78	32.775	8.77	25.412	1.690	0.23	87.3
60	8.44	32.834	8.43	25.510	1.940	0.18	88.0
70	8.10	33.069	8.10	25.744	2.178	0.14	88.3
80	8.11	33.429	8.10	26.026	2.389	0.13	88.3
90	7.95	33.671	7.94	26.239	2.576	0.13	88.2
100	7.91	33.739	7.90	26.298	2.752	0.13	88.2
110	7.87	33.817	7.86	26.366	2.921	0.13	87.8
120	7.82	33.843	7.81	26.393	3.087	0.13	87.9
130	7.80	33.888	7.79	26.432	3.249	0.13	86.9
140	7.80	33.898	7.78	26.441	3.409	0.13	86.5
150	7.75	33.909	7.74	26.456	3.569	0.13	86.7
175	7.65	33.936	7.64	26.492	3.963	0.13	87.1
200	7.56	33.953	7.54	26.519	4.349	0.13	87.2
225	7.39	33.982	7.37	26.566	4.727	0.13	87.1
250	7.12	33.982	7.09	26.604	5.099	0.13	87.6
275	6.88	33.995	6.85	26.648	5.460	0.13	87.2
300	6.72	34.008	6.70	26.678	5.814	0.13	87.3
350	6.49	34.033	6.46	26.729	6.501	0.13	87.9
400	5.92	34.045	5.89	26.813	7.157	0.13	88.5
430	5.74	34.059	5.71	26.846	7.537	0.13	88.3

W0408D

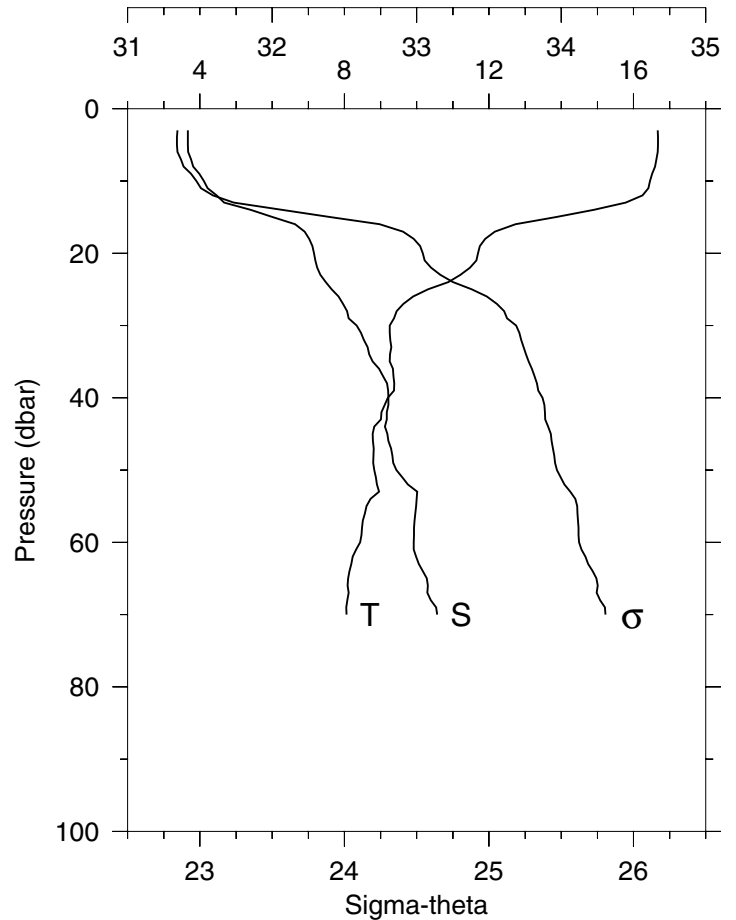
Station 9 NH-35
Temperature, Salinity



STA: 9 NH-35 LAT: 44 39.5 N LONG: 124 53.5 W
31 AUG 2004 1430 GMT DEPTH 458

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.53	31.477	16.53	22.922	0.148	0.25	85.3
10	15.92	31.690	15.92	23.221	0.491	0.27	85.0
20	11.62	32.288	11.62	24.554	0.892	0.39	84.6
30	9.48	32.521	9.47	25.103	1.200	0.44	85.0
40	9.34	32.777	9.34	25.325	1.473	0.31	86.4
50	8.85	32.903	8.85	25.501	1.728	0.19	87.6
60	8.19	32.998	8.19	25.675	1.967	0.17	88.2
70	8.04	33.176	8.03	25.836	2.192	0.13	88.3

Station 10 NH-35
Temperature, Salinity



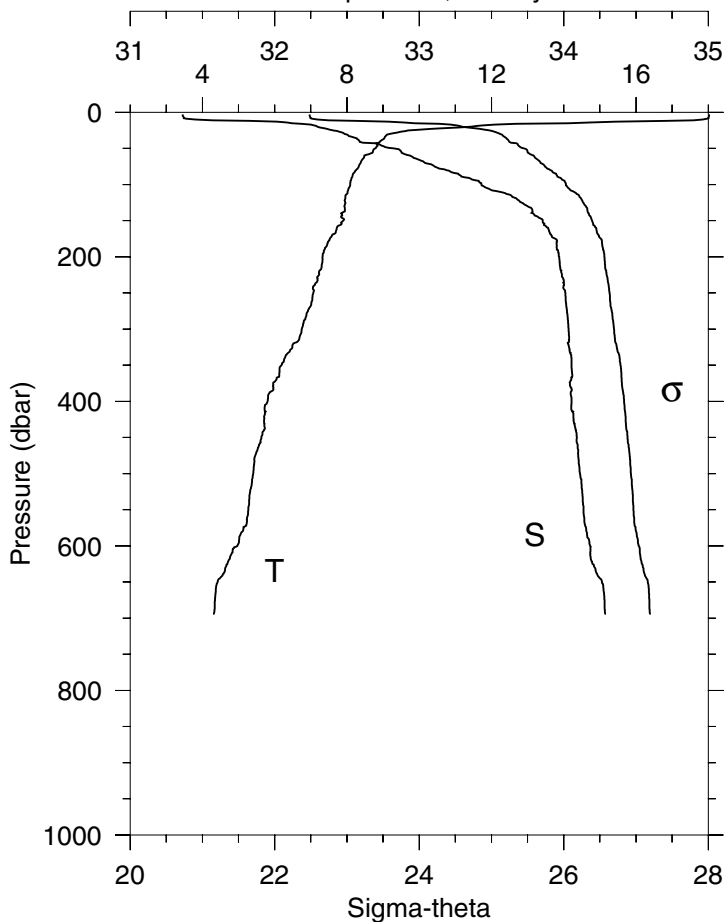
STA: 10 NH-35 LAT: 44 39.5 N LONG: 124 53.5 W
31 AUG 2004 1505 GMT DEPTH 458

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.67	31.417	16.67	22.844	0.150	0.24	85.3
10	16.46	31.528	16.46	22.976	0.498	0.26	85.2
20	11.69	32.289	11.69	24.542	0.906	0.41	84.6
30	9.26	32.584	9.25	25.188	1.215	0.43	85.3
40	9.20	32.805	9.20	25.370	1.484	0.27	86.8
50	8.83	32.860	8.82	25.471	1.739	0.20	87.5
60	8.44	32.980	8.43	25.624	1.980	0.16	88.0
70	8.06	33.141	8.06	25.807	2.207	0.14	88.3

W0408D

Station 11 NH-45
Temperature, Salinity

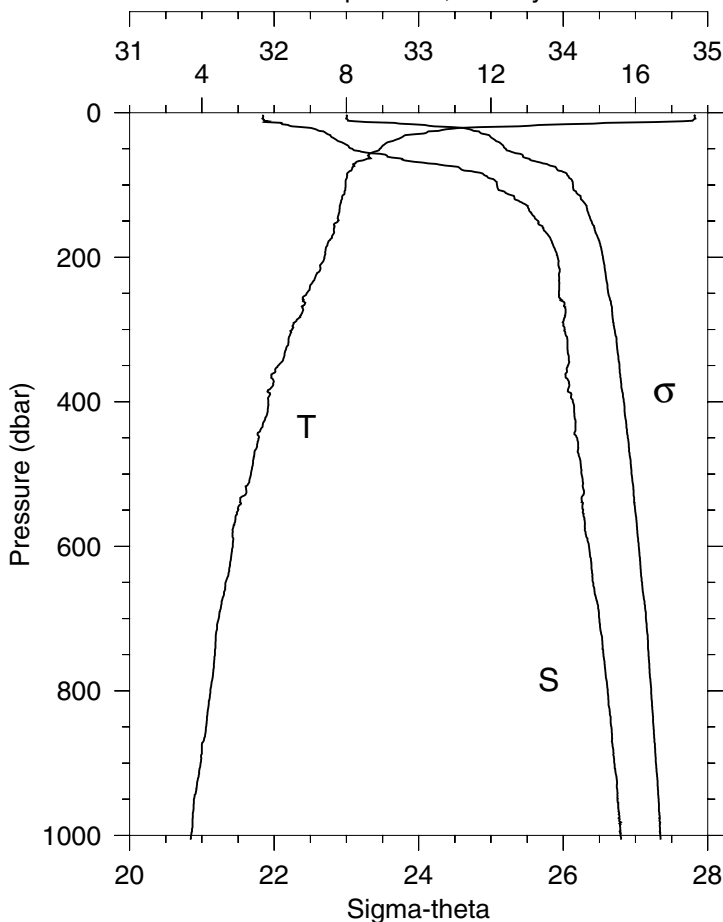
STA: 11 NH-45 LAT: 44 39.1 N LONG: 125 7.1 W
31 AUG 2004 1633 GMT DEPTH 704



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	18.01	31.361	18.01	22.485	0.160	0.20	85.3
10	17.84	31.452	17.84	22.596	0.534	0.21	85.5
20	11.43	32.296	11.43	24.595	0.938	0.38	85.1
30	9.19	32.483	9.18	25.120	1.241	0.28	87.0
40	8.92	32.586	8.92	25.242	1.518	0.21	87.8
50	8.78	32.821	8.77	25.447	1.780	0.20	88.1
60	8.48	32.936	8.47	25.583	2.027	0.16	88.3
70	8.38	33.040	8.37	25.680	2.263	0.15	88.5
80	8.25	33.189	8.24	25.816	2.488	0.13	88.5
90	8.14	33.317	8.13	25.933	2.701	0.13	88.4
100	8.09	33.431	8.08	26.030	2.902	0.12	88.5
110	8.02	33.557	8.01	26.139	3.097	0.12	88.5
120	7.95	33.676	7.94	26.243	3.280	0.13	88.3
130	7.93	33.750	7.92	26.305	3.456	0.12	88.3
140	7.84	33.788	7.83	26.347	3.627	0.13	88.4
150	7.90	33.855	7.89	26.391	3.794	0.13	88.3
175	7.53	33.942	7.51	26.513	4.194	0.13	88.2
200	7.32	33.968	7.31	26.563	4.572	0.13	88.3
225	7.23	33.988	7.21	26.593	4.944	0.13	88.2
250	7.07	34.011	7.05	26.634	5.306	0.13	88.0
275	6.92	34.022	6.89	26.663	5.663	0.13	88.0
300	6.75	34.034	6.72	26.696	6.012	0.13	87.7
350	6.18	34.053	6.16	26.785	6.685	0.13	88.2
400	5.80	34.054	5.77	26.834	7.325	0.12	88.6
450	5.63	34.090	5.60	26.884	7.944	0.12	88.6
500	5.41	34.113	5.36	26.929	8.541	0.13	88.6
600	4.97	34.182	4.92	27.036	9.682	0.12	88.4
695	4.33	34.285	4.28	27.189	10.623	0.13	88.5

Station 12 NH-55
Temperature, Salinity

STA: 12 NH-55 LAT: 44 39.1 N LONG: 125 22.0 W
31 AUG 2004 1851 GMT DEPTH 2866

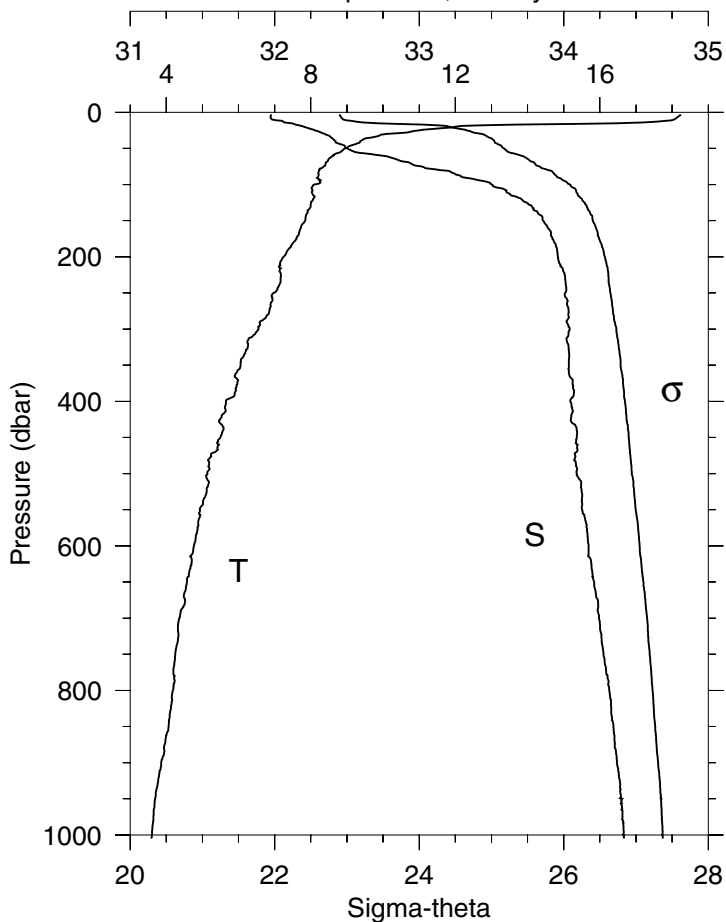


P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	17.62	31.926	17.62	23.013	0.145	0.22	84.9
10	17.60	31.930	17.60	23.019	0.485	0.22	85.1
20	11.69	32.194	11.68	24.469	0.905	0.32	85.7
30	9.86	32.373	9.86	24.925	1.223	0.44	85.1
40	9.22	32.451	9.21	25.090	1.517	0.28	86.9
50	8.92	32.540	8.91	25.206	1.798	0.22	87.5
60	8.61	32.783	8.60	25.444	2.063	0.18	88.2
70	8.25	33.065	8.24	25.719	2.306	0.13	88.5
80	8.14	33.316	8.13	25.933	2.520	0.12	88.6
90	8.01	33.482	8.00	26.081	2.718	0.12	88.6
100	7.97	33.542	7.97	26.135	2.908	0.12	88.6
110	7.95	33.597	7.94	26.181	3.095	0.12	88.6
120	7.88	33.666	7.86	26.247	3.276	0.12	88.6
130	7.82	33.755	7.80	26.325	3.450	0.13	88.6
140	7.79	33.782	7.77	26.351	3.620	0.12	88.6
150	7.76	33.827	7.75	26.390	3.787	0.12	88.6
175	7.55	33.914	7.54	26.489	4.189	0.13	88.5
200	7.39	33.962	7.37	26.550	4.572	0.13	88.5
225	7.16	33.971	7.14	26.590	4.945	0.13	88.5
250	6.90	33.970	6.88	26.625	5.309	0.13	88.6
275	6.79	34.016	6.77	26.676	5.663	0.13	88.6
300	6.50	34.011	6.48	26.711	6.009	0.13	88.6
350	6.11	34.032	6.08	26.778	6.677	0.13	88.6
400	5.84	34.066	5.80	26.839	7.319	0.13	88.6
450	5.58	34.095	5.54	26.894	7.935	0.13	88.6
500	5.36	34.127	5.32	26.946	8.525	0.12	88.5
600	4.85	34.178	4.81	27.045	9.640	0.13	88.6
800	4.24	34.308	4.18	27.217	11.621	0.13	88.7
1000	3.70	34.395	3.63	27.342	13.347	0.12	88.8
1006	3.69	34.403	3.62	27.350	13.395	0.12	88.7

W0408D

Station 13 NH-65
Temperature, Salinity

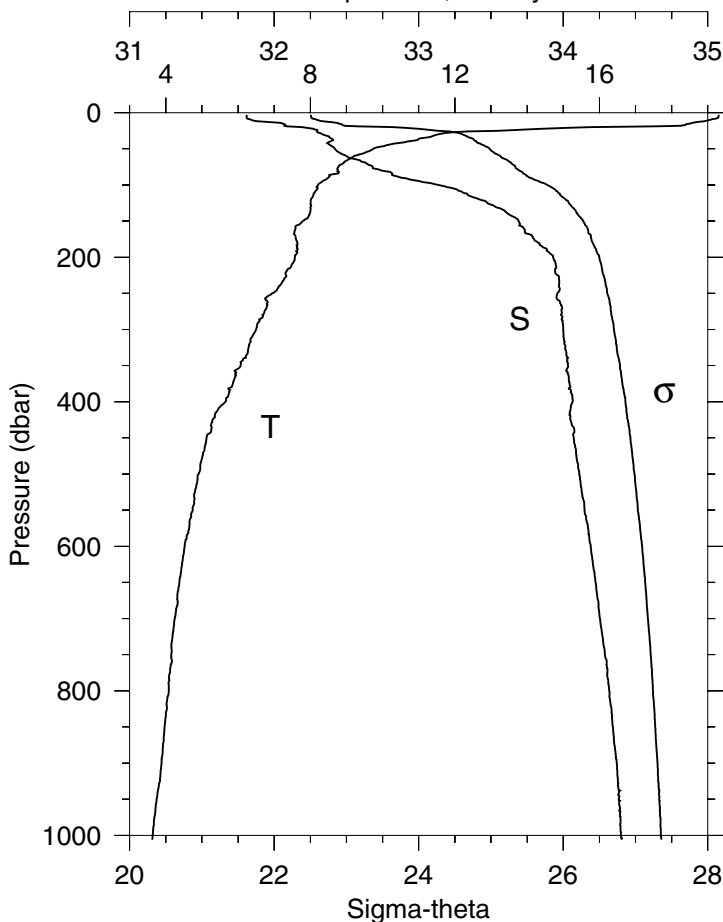
STA: 13 NH-65 LAT: 44 39.1 N LONG: 125 36.0 W
31 AUG 2004 2144 GMT DEPTH 2861



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	18.22	31.973	18.22	22.903	0.148	0.14	85.4
10	18.06	31.982	18.06	22.949	0.494	0.15	85.4
20	12.00	32.203	11.99	24.419	0.924	0.18	86.6
30	10.09	32.347	10.09	24.867	1.253	0.67	82.5
40	9.37	32.420	9.37	25.041	1.552	0.32	86.9
50	8.95	32.501	8.94	25.171	1.837	0.24	87.9
60	8.63	32.739	8.62	25.406	2.108	0.17	88.3
70	8.41	32.937	8.41	25.594	2.356	0.14	88.5
80	8.24	33.148	8.23	25.785	2.589	0.13	88.5
90	8.19	33.305	8.18	25.916	2.802	0.14	88.3
100	8.08	33.503	8.07	26.088	3.003	0.13	88.3
110	8.03	33.602	8.02	26.174	3.192	0.13	88.4
120	8.06	33.706	8.05	26.251	3.374	0.13	88.3
130	7.99	33.779	7.98	26.318	3.549	0.13	88.3
140	7.90	33.822	7.88	26.366	3.719	0.13	88.3
150	7.84	33.857	7.83	26.402	3.884	0.13	88.3
175	7.60	33.921	7.59	26.487	4.283	0.13	88.3
200	7.24	33.959	7.22	26.568	4.663	0.13	88.3
225	7.17	34.006	7.15	26.615	5.029	0.13	87.7
250	6.97	34.010	6.95	26.646	5.389	0.13	87.8
275	6.85	34.033	6.83	26.680	5.741	0.13	88.0
300	6.55	34.040	6.52	26.728	6.085	0.13	87.6
350	6.05	34.035	6.03	26.787	6.745	0.13	88.4
400	5.65	34.046	5.62	26.847	7.380	0.13	88.6
450	5.50	34.090	5.46	26.900	7.991	0.13	88.6
500	5.14	34.090	5.10	26.942	8.581	0.12	88.7
600	4.76	34.171	4.72	27.050	9.692	0.12	88.8
800	4.18	34.315	4.12	27.229	11.657	0.13	88.8
1000	3.60	34.417	3.53	27.370	13.341	0.12	88.6
1005	3.60	34.413	3.53	27.367	13.381	0.12	88.6

Station 14 NH-85
Temperature, Salinity

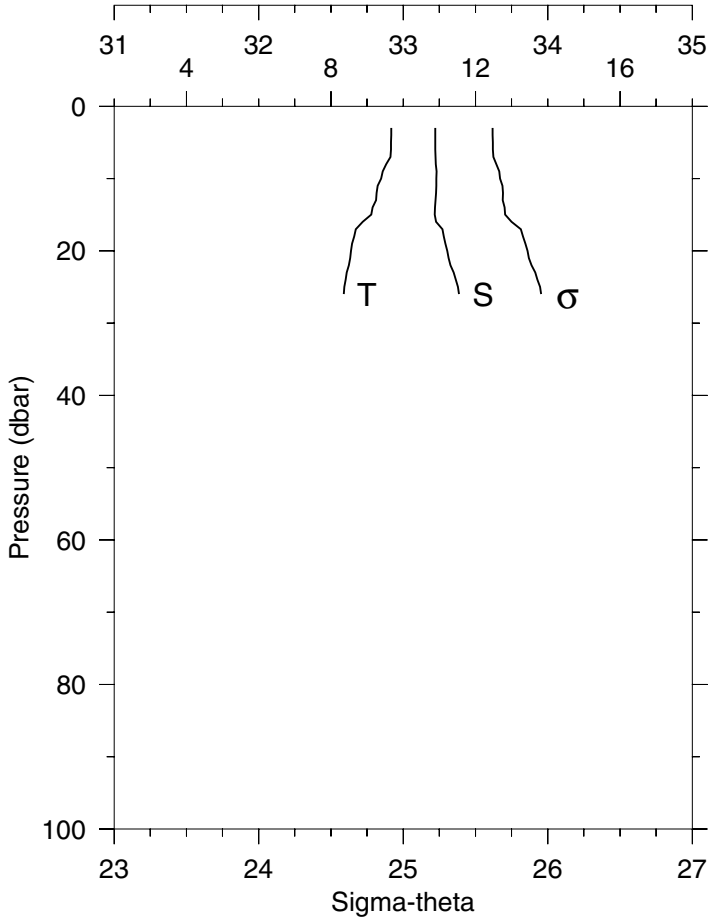
STA: 14 NH-85 LAT: 44 39.1 N LONG: 126 3.0 W
01 SEP 2004 0112 GMT DEPTH 2882



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	19.30	31.810	19.30	22.510	0.160	0.18	85.2
10	19.05	31.843	19.05	22.599	0.531	0.17	85.5
20	15.74	32.194	15.74	23.650	1.027	0.18	86.4
30	11.54	32.334	11.53	24.606	1.394	0.23	85.9
40	10.68	32.388	10.68	24.799	1.717	0.57	83.7
50	9.74	32.421	9.73	24.983	2.022	0.37	86.6
60	9.22	32.498	9.21	25.127	2.314	0.24	88.1
70	8.90	32.638	8.90	25.285	2.590	0.18	88.4
80	8.76	32.743	8.75	25.390	2.854	0.16	88.4
90	8.50	32.881	8.49	25.537	3.106	0.15	88.5
100	8.21	33.138	8.20	25.782	3.340	0.13	88.6
110	8.12	33.303	8.11	25.925	3.554	0.12	88.6
120	8.01	33.420	8.00	26.033	3.758	0.12	88.6
130	8.01	33.529	8.00	26.119	3.953	0.12	88.6
140	7.98	33.618	7.97	26.194	4.139	0.13	88.6
150	7.80	33.691	7.78	26.278	4.319	0.12	88.5
175	7.61	33.798	7.59	26.390	4.744	0.12	88.5
200	7.57	33.930	7.55	26.499	5.146	0.13	88.6
225	7.33	33.964	7.31	26.560	5.529	0.13	88.6
250	6.95	33.959	6.92	26.609	5.898	0.13	88.6
275	6.73	33.989	6.71	26.662	6.255	0.13	88.6
300	6.50	34.000	6.47	26.702	6.603	0.13	88.7
350	6.07	34.034	6.04	26.785	7.273	0.12	88.7
400	5.65	34.064	5.62	26.861	7.906	0.13	88.7
450	5.13	34.072	5.09	26.929	8.507	0.13	88.8
500	4.91	34.112	4.87	26.986	9.078	0.13	88.8
600	4.52	34.190	4.48	27.091	10.151	0.12	88.9
800	4.08	34.319	4.03	27.242	12.060	0.13	88.8
1000	3.63	34.401	3.56	27.353	13.748	0.13	88.9
1006	3.62	34.405	3.55	27.358	13.796	0.12	88.9

W0408D

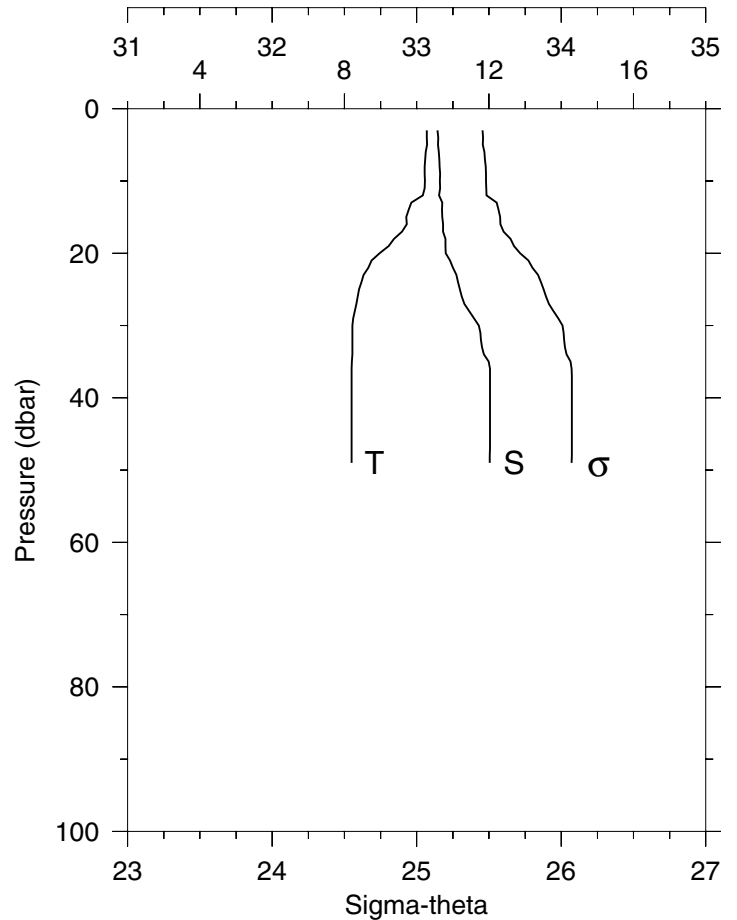
Station 15 HH-1a
Temperature, Salinity



STA: 15 HH-1a LAT: 44 0.1 N LONG: 124 10.1 W
01 SEP 2004 1326 GMT DEPTH 30

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	9.67	33.221	9.67	25.619	0.071	0.32	78.4
10	9.39	33.229	9.39	25.670	0.235	0.32	79.1
20	8.56	33.305	8.55	25.860	0.459	0.23	82.1
26	8.36	33.386	8.35	25.954	0.584	0.24	78.1

Station 16 HH-1
Temperature, Salinity

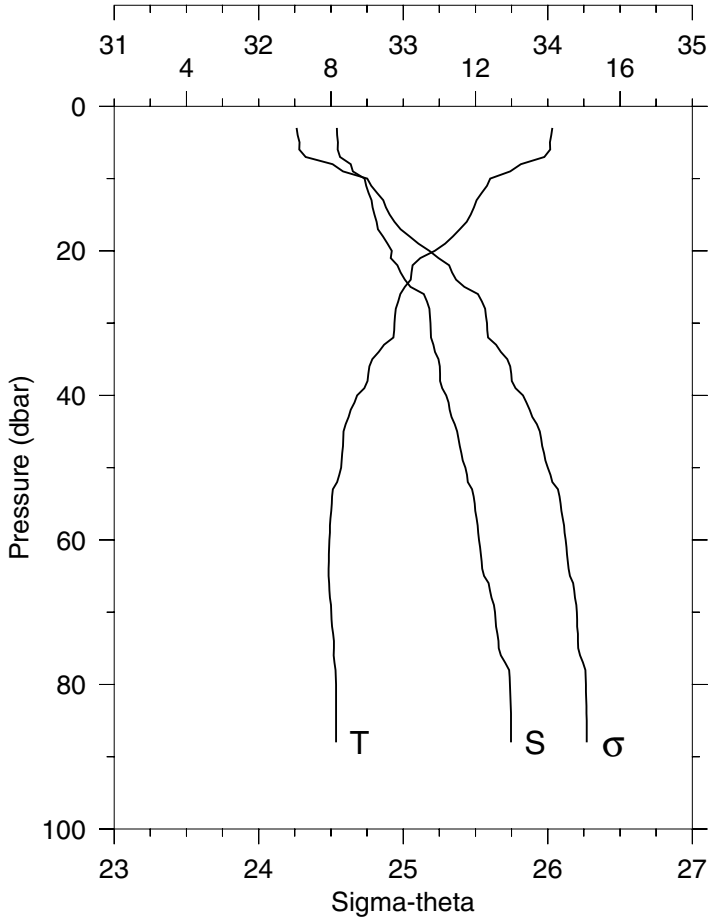


STA: 16 HH-1 LAT: 44 0.1 N LONG: 124 12.1 W
01 SEP 2004 1403 GMT DEPTH 53

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	10.28	33.144	10.28	25.456	0.075	0.31	82.0
10	10.23	33.161	10.22	25.479	0.251	0.30	82.0
20	8.97	33.201	8.97	25.715	0.491	0.27	85.4
30	8.22	33.430	8.22	26.009	0.703	0.14	87.4
40	8.20	33.507	8.19	26.073	0.899	0.18	81.8
49	8.20	33.506	8.19	26.072	1.073	0.20	81.5

W0408D

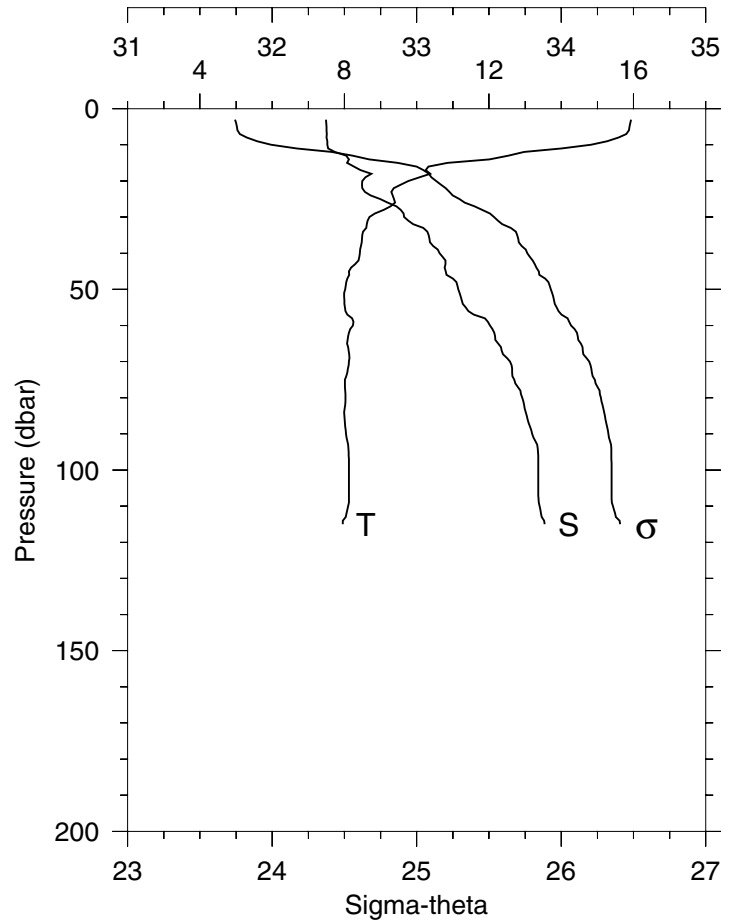
Station 17 HH-2a
Temperature, Salinity



STA: 17 HH-2a LAT: 44 0.1 N LONG: 124 18.0 W
01 SEP 2004 1503 GMT DEPTH 93

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	14.13	32.540	14.12	24.262	0.110	0.82	79.6
10	12.40	32.732	12.40	24.752	0.356	0.48	82.9
20	10.87	32.921	10.86	25.181	0.658	0.26	85.6
30	9.76	33.188	9.75	25.579	0.913	0.32	86.5
40	8.72	33.297	8.72	25.828	1.143	0.18	87.6
50	8.28	33.430	8.27	26.001	1.350	0.21	88.0
60	7.96	33.525	7.95	26.123	1.543	0.13	88.3
70	8.01	33.634	8.00	26.201	1.729	0.14	85.6
80	8.14	33.739	8.13	26.264	1.908	0.16	78.9
88	8.14	33.746	8.14	26.269	2.049	0.16	77.3

Station 18 HH-2
Temperature, Salinity



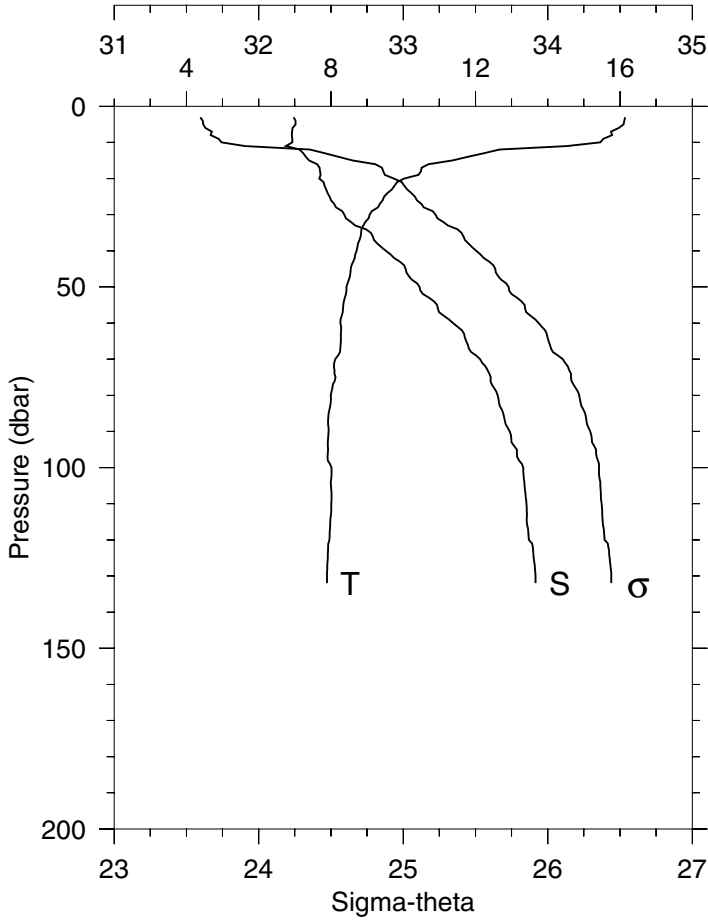
STA: 18 HH-2 LAT: 44 0.1 N LONG: 124 24.0 W
01 SEP 2004 1604 GMT DEPTH 120

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.93	32.372	15.93	23.744	0.124	0.67	77.0
10	14.82	32.382	14.82	23.993	0.411	0.81	78.6
20	9.77	32.623	9.77	25.135	0.730	0.33	85.6
30	8.69	32.914	8.69	25.534	0.995	0.20	87.8
40	8.43	33.158	8.42	25.765	1.226	0.16	88.2
50	8.02	33.288	8.01	25.927	1.441	0.14	88.2
60	8.24	33.507	8.23	26.068	1.643	0.14	88.1
70	8.12	33.646	8.12	26.194	1.832	0.14	87.6
80	8.03	33.730	8.02	26.274	2.010	0.13	87.9
90	8.05	33.799	8.04	26.326	2.183	0.14	84.4
100	8.12	33.842	8.11	26.348	2.352	0.14	78.0
110	8.10	33.851	8.09	26.358	2.520	0.15	76.9
115	7.95	33.885	7.94	26.407	2.603	0.15	72.9

W0408D

Station 19 HH-3a
Temperature, Salinity

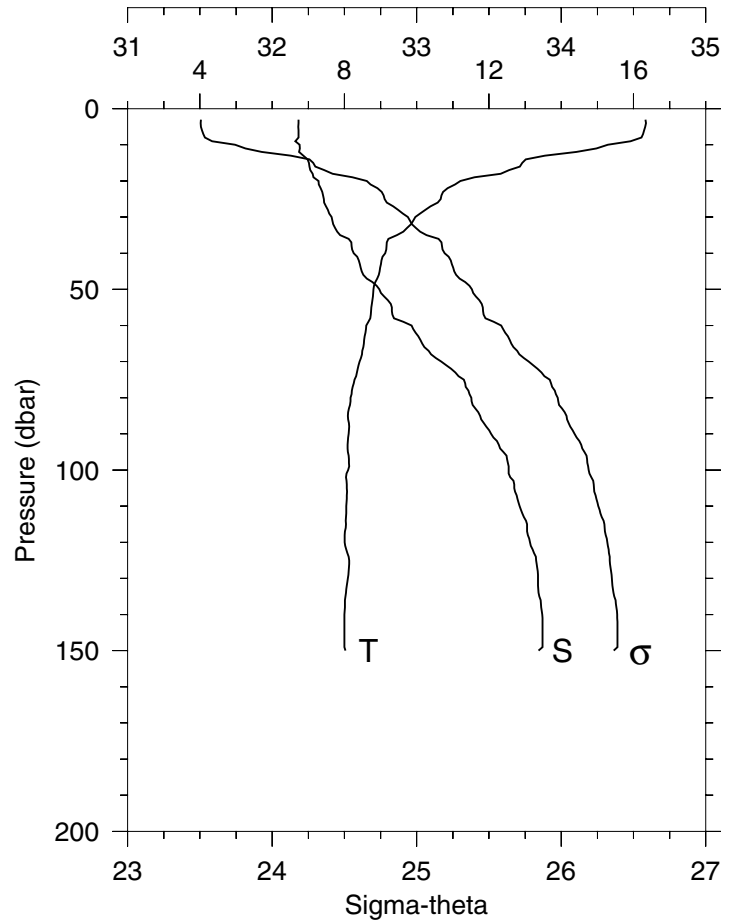
STA: 19 HH-3a LAT: 44 0.1 N LONG: 124 30.0 W
01 SEP 2004 1721 GMT DEPTH 137



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.14	32.241	16.14	23.596	0.129	0.32	83.4
10	15.46	32.232	15.45	23.741	0.425	0.35	83.6
20	10.02	32.419	10.02	24.935	0.761	0.43	84.8
30	9.07	32.593	9.07	25.223	1.049	0.28	87.0
40	8.71	32.880	8.70	25.505	1.309	0.22	87.9
50	8.43	33.113	8.43	25.729	1.545	0.16	88.3
60	8.26	33.346	8.26	25.937	1.762	0.14	88.2
70	8.12	33.531	8.11	26.104	1.962	0.14	88.0
80	8.00	33.653	7.99	26.218	2.147	0.13	87.9
90	7.94	33.737	7.93	26.293	2.325	0.13	88.0
100	8.02	33.830	8.01	26.354	2.495	0.13	85.4
110	8.01	33.852	8.00	26.373	2.662	0.14	82.9
120	7.96	33.870	7.95	26.394	2.828	0.14	82.9
130	7.89	33.915	7.88	26.440	2.989	0.13	79.1
132	7.89	33.916	7.88	26.440	3.021	0.14	78.7

Station 20 HH-3
Temperature, Salinity

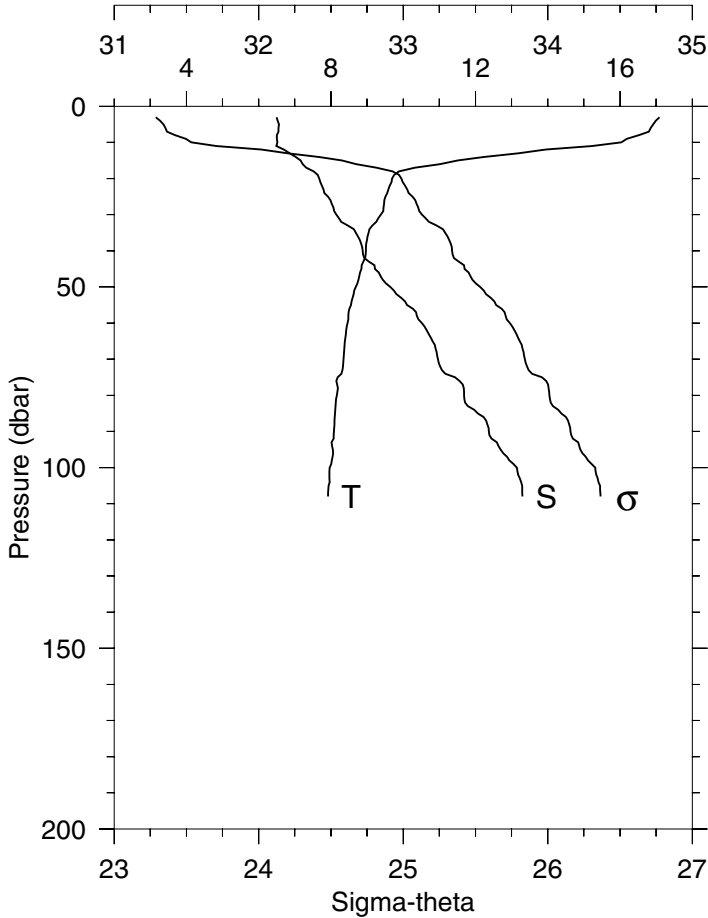
STA: 20 HH-3 LAT: 44 0.1 N LONG: 124 36.0 W
01 SEP 2004 1832 GMT DEPTH 155



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.33	32.183	16.33	23.508	0.131	0.22	84.1
10	15.29	32.189	15.29	23.744	0.435	0.27	84.0
20	11.21	32.320	11.20	24.654	0.804	0.48	83.3
30	9.96	32.411	9.96	24.939	1.119	0.49	84.5
40	9.12	32.565	9.12	25.193	1.407	0.29	87.1
50	8.80	32.742	8.80	25.382	1.676	0.23	87.8
60	8.61	32.964	8.60	25.585	1.929	0.19	88.2
70	8.42	33.169	8.41	25.775	2.162	0.15	88.4
80	8.17	33.378	8.16	25.976	2.373	0.13	88.4
90	8.12	33.515	8.11	26.092	2.571	0.13	88.2
100	8.10	33.637	8.09	26.190	2.758	0.13	87.8
110	8.05	33.712	8.04	26.257	2.938	0.13	87.2
120	8.01	33.784	8.00	26.319	3.112	0.13	86.6
130	8.09	33.840	8.08	26.351	3.282	0.16	84.5
140	8.00	33.869	7.99	26.387	3.449	0.14	79.8
150	8.03	33.843	8.02	26.363	3.614	0.14	77.6

W0408D

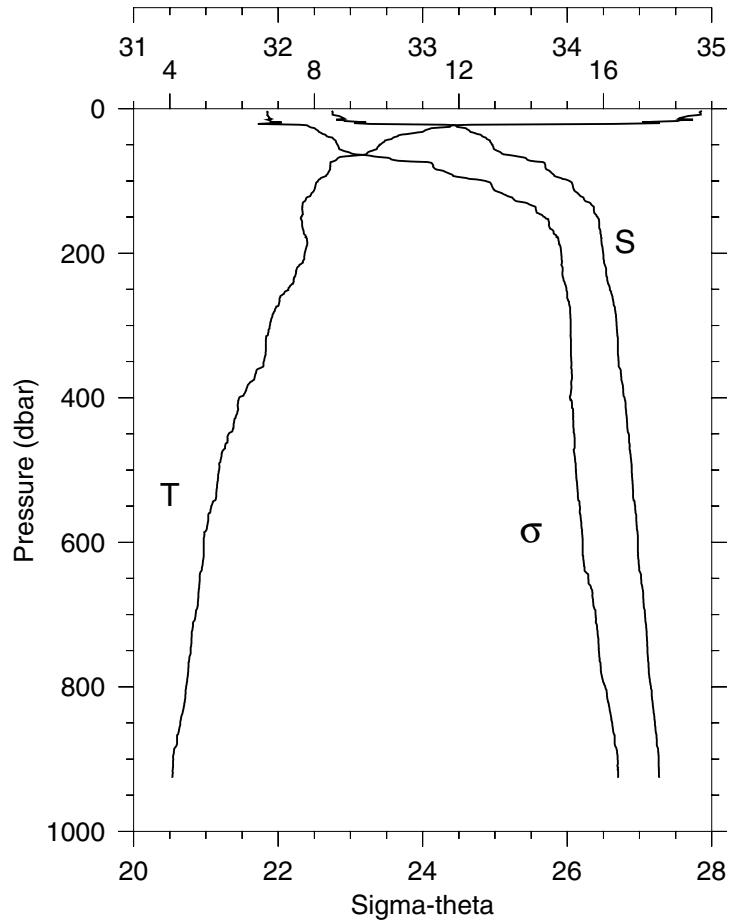
Station 21 HH-4
Temperature, Salinity



STA: 21 HH-4 LAT: 44 0.1 N LONG: 124 48.0 W
01 SEP 2004 2018 GMT DEPTH 112

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	17.09	32.123	17.09	23.288	0.137	0.17	84.7
10	16.04	32.130	16.04	23.533	0.452	0.22	84.5
20	9.69	32.419	9.69	24.988	0.798	0.38	85.8
30	9.38	32.537	9.38	25.130	1.088	0.37	86.1
40	8.97	32.719	8.96	25.338	1.358	0.26	87.5
50	8.68	32.909	8.68	25.531	1.613	0.20	88.2
60	8.45	33.130	8.45	25.739	1.848	0.15	88.5
70	8.35	33.240	8.34	25.841	2.068	0.13	87.9
80	8.16	33.420	8.15	26.011	2.275	0.13	88.3
90	8.08	33.593	8.07	26.158	2.467	0.13	88.0
100	7.96	33.786	7.95	26.328	2.647	0.13	86.7
108	7.92	33.825	7.91	26.365	2.781	0.13	86.2

Station 22 HH-5
Temperature, Salinity



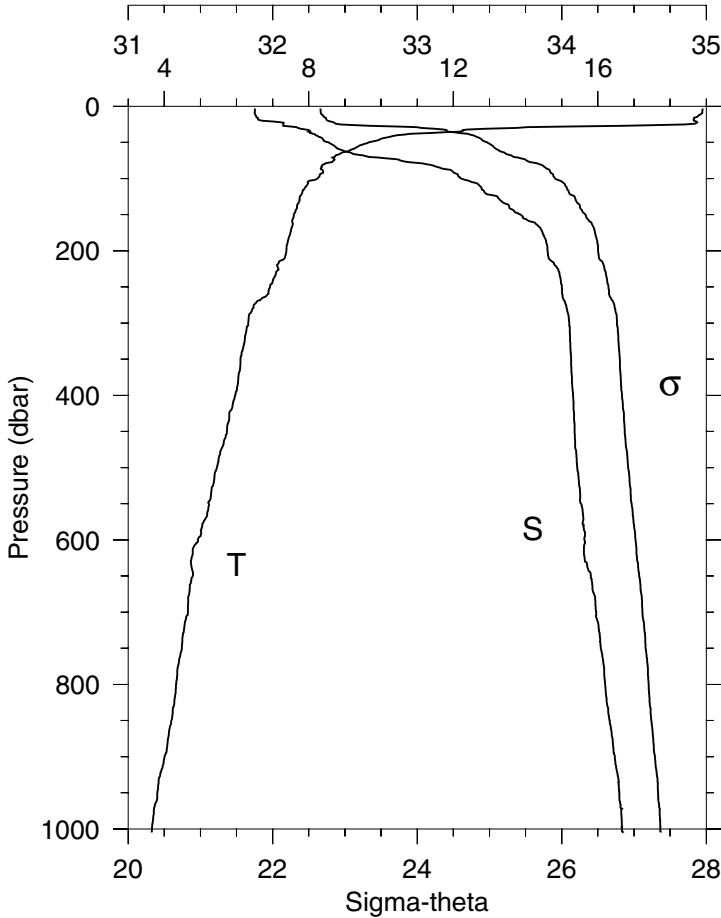
STA: 22 HH-5 LAT: 44 0.1 N LONG: 125 0.1 W
01 SEP 2004 2206 GMT DEPTH 932

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	18.73	31.925	18.73	22.742	0.153	0.16	85.8
10	18.35	31.930	18.35	22.838	0.509	0.17	85.7
20	17.57	31.961	17.56	23.052	1.000	0.21	85.5
30	11.07	32.273	11.06	24.642	1.361	0.33	85.8
40	10.19	32.374	10.18	24.872	1.680	0.37	86.3
50	9.81	32.412	9.80	24.965	1.983	0.26	87.5
60	9.50	32.482	9.49	25.069	2.279	0.22	87.9
70	8.62	32.783	8.61	25.442	2.551	0.15	88.5
80	8.44	33.072	8.43	25.696	2.788	0.13	88.6
90	8.37	33.188	8.36	25.798	3.014	0.13	88.6
100	8.10	33.435	8.09	26.032	3.226	0.12	88.6
110	8.01	33.487	8.00	26.086	3.421	0.12	88.5
120	7.90	33.580	7.89	26.175	3.610	0.12	88.5
130	7.69	33.710	7.67	26.308	3.790	0.12	88.5
140	7.67	33.784	7.66	26.369	3.959	0.12	88.5
150	7.64	33.843	7.62	26.421	4.124	0.12	88.4
175	7.75	33.923	7.74	26.467	4.525	0.13	87.2
200	7.74	33.959	7.72	26.498	4.918	0.13	85.7
225	7.50	33.968	7.48	26.539	5.304	0.13	86.6
250	7.28	33.995	7.26	26.591	5.680	0.13	86.5
275	6.94	34.020	6.91	26.659	6.041	0.13	86.7
300	6.77	34.023	6.74	26.684	6.392	0.13	86.0
350	6.60	34.029	6.57	26.711	7.083	0.13	86.1
400	5.92	34.019	5.89	26.792	7.751	0.12	88.4
450	5.63	34.048	5.60	26.851	8.389	0.13	87.3
500	5.36	34.060	5.32	26.892	9.003	0.13	87.3
600	4.94	34.106	4.89	26.979	10.177	0.12	87.8
800	4.45	34.263	4.39	27.159	12.298	0.13	88.4
926	4.07	34.354	4.00	27.272	13.459	0.13	87.7

W0408D

Station 23 HH-7
Temperature, Salinity

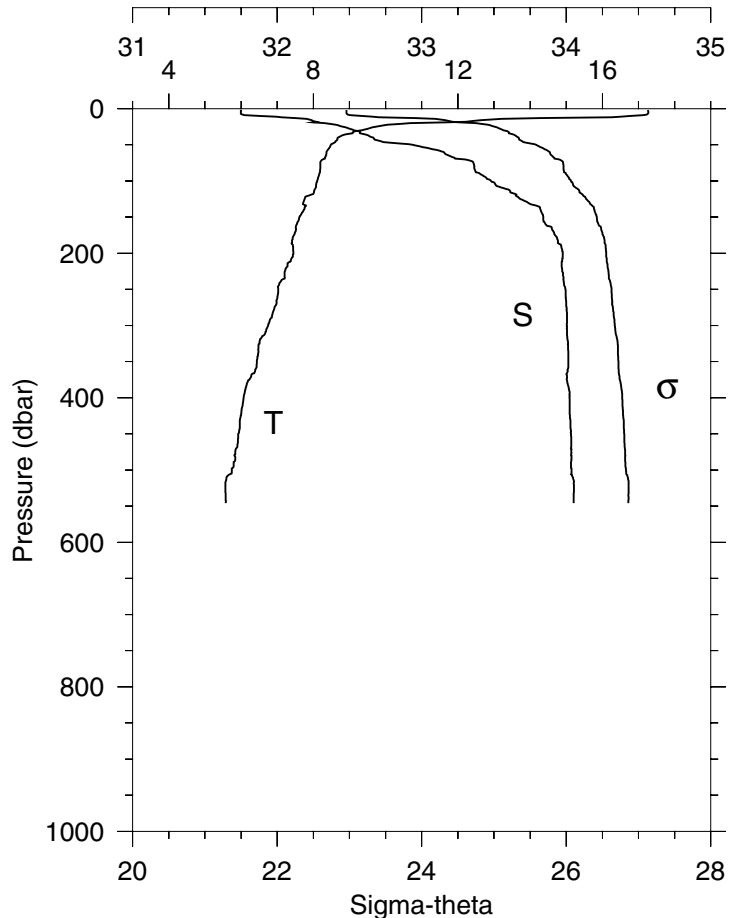
STA: 23 HH-7 LAT: 44 0.1 N LONG: 125 12.1 W
02 SEP 2004 0016 GMT DEPTH 1697



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	18.90	31.876	18.90	22.662	0.155	0.17	85.4
10	18.87	31.876	18.87	22.669	0.518	0.18	85.4
20	18.66	31.926	18.66	22.759	1.031	0.18	86.4
30	13.75	32.175	13.75	24.057	1.499	0.18	87.1
40	10.47	32.298	10.46	24.766	1.845	0.39	84.6
50	9.66	32.387	9.65	24.969	2.153	0.81	85.9
60	9.18	32.467	9.17	25.109	2.445	0.24	87.6
70	8.71	32.666	8.70	25.337	2.720	0.16	88.4
80	8.44	33.061	8.43	25.688	2.966	0.13	88.6
90	8.39	33.244	8.39	25.838	3.189	0.13	88.6
100	8.24	33.305	8.23	25.909	3.402	0.12	88.6
110	7.94	33.432	7.93	26.053	3.603	0.12	88.6
120	7.81	33.471	7.80	26.102	3.798	0.12	88.5
130	7.74	33.574	7.73	26.193	3.984	0.12	88.4
140	7.67	33.637	7.66	26.253	4.164	0.12	88.4
150	7.58	33.717	7.57	26.329	4.339	0.12	88.4
175	7.49	33.868	7.47	26.461	4.750	0.12	88.4
200	7.38	33.902	7.36	26.504	5.141	0.12	88.5
225	7.16	33.975	7.14	26.593	5.520	0.12	88.5
250	6.92	34.001	6.90	26.645	5.881	0.13	88.4
275	6.48	34.030	6.45	26.728	6.230	0.13	88.4
300	6.32	34.051	6.30	26.765	6.562	0.13	88.1
350	6.11	34.065	6.08	26.804	7.211	0.13	88.0
400	5.96	34.078	5.93	26.833	7.848	0.13	88.1
450	5.73	34.089	5.70	26.871	8.470	0.13	88.4
500	5.45	34.108	5.41	26.920	9.074	0.13	88.5
600	4.93	34.157	4.88	27.021	10.217	0.13	88.7
800	4.33	34.301	4.26	27.202	12.239	0.13	88.6
1000	3.66	34.416	3.59	27.363	13.960	0.13	88.3
1005	3.65	34.416	3.58	27.365	14.000	0.13	88.3

Station 24 SH-9
Temperature, Salinity

STA: 24 SH-9 LAT: 44 15.1 N LONG: 125 0.1 W
02 SEP 2004 0316 GMT DEPTH 562

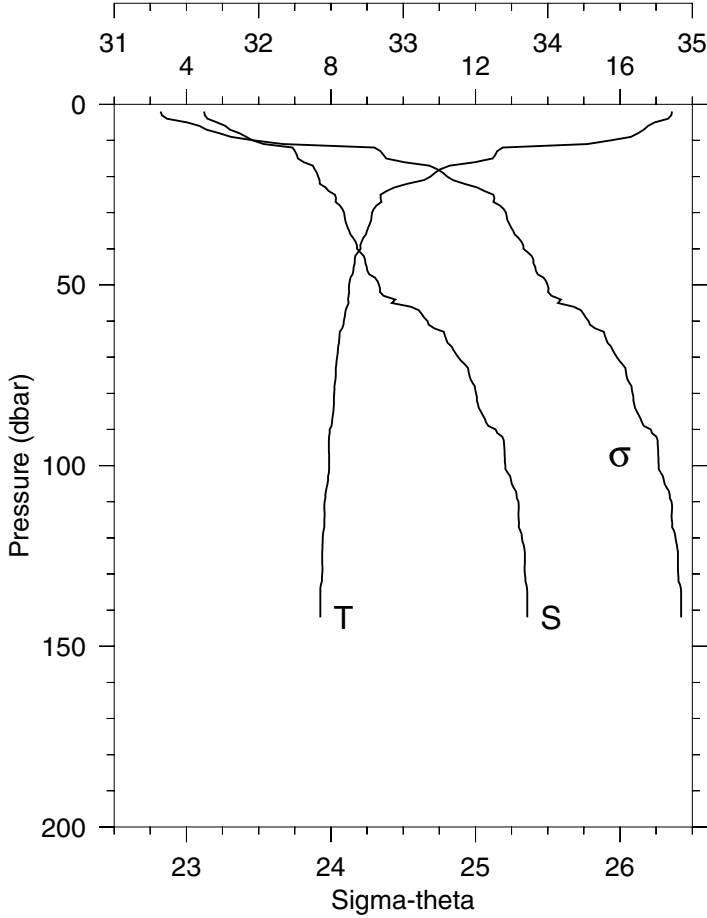


P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	17.26	31.746	17.26	22.960	0.098	0.27	84.9
10	16.79	31.877	16.79	23.169	0.488	0.25	84.6
20	10.67	32.329	10.67	24.754	0.872	0.42	85.0
30	9.34	32.531	9.34	25.133	1.167	0.25	87.6
40	8.68	32.664	8.68	25.340	1.439	0.19	88.1
50	8.49	32.936	8.48	25.582	1.695	0.17	88.3
60	8.36	33.152	8.36	25.770	1.926	0.14	88.4
70	8.26	33.297	8.25	25.900	2.145	0.13	88.5
80	8.19	33.365	8.18	25.963	2.351	0.13	88.5
90	8.17	33.404	8.16	25.997	2.555	0.13	88.5
100	8.11	33.480	8.10	26.066	2.753	0.13	88.5
110	8.06	33.568	8.05	26.142	2.946	0.13	88.4
120	7.89	33.652	7.88	26.233	3.129	0.13	88.2
130	7.72	33.735	7.71	26.323	3.305	0.12	88.5
140	7.74	33.822	7.72	26.390	3.472	0.12	88.4
150	7.62	33.842	7.60	26.423	3.636	0.12	88.5
175	7.47	33.923	7.45	26.508	4.032	0.13	88.3
200	7.45	33.976	7.43	26.552	4.412	0.13	86.7
225	7.22	33.972	7.19	26.583	4.785	0.13	87.8
250	7.03	33.995	7.00	26.627	5.151	0.13	87.1
275	6.93	34.002	6.90	26.646	5.510	0.13	86.8
300	6.75	34.005	6.72	26.673	5.864	0.13	87.2
350	6.44	34.014	6.41	26.722	6.552	0.13	87.5
400	6.07	34.022	6.04	26.776	7.224	0.12	87.6
450	5.92	34.034	5.89	26.803	7.877	0.13	87.4
500	5.74	34.036	5.70	26.828	8.521	0.13	87.6
546	5.58	34.051	5.53	26.861	9.097	0.13	87.4

W0408D

Station 25 SH-8
Temperature, Salinity

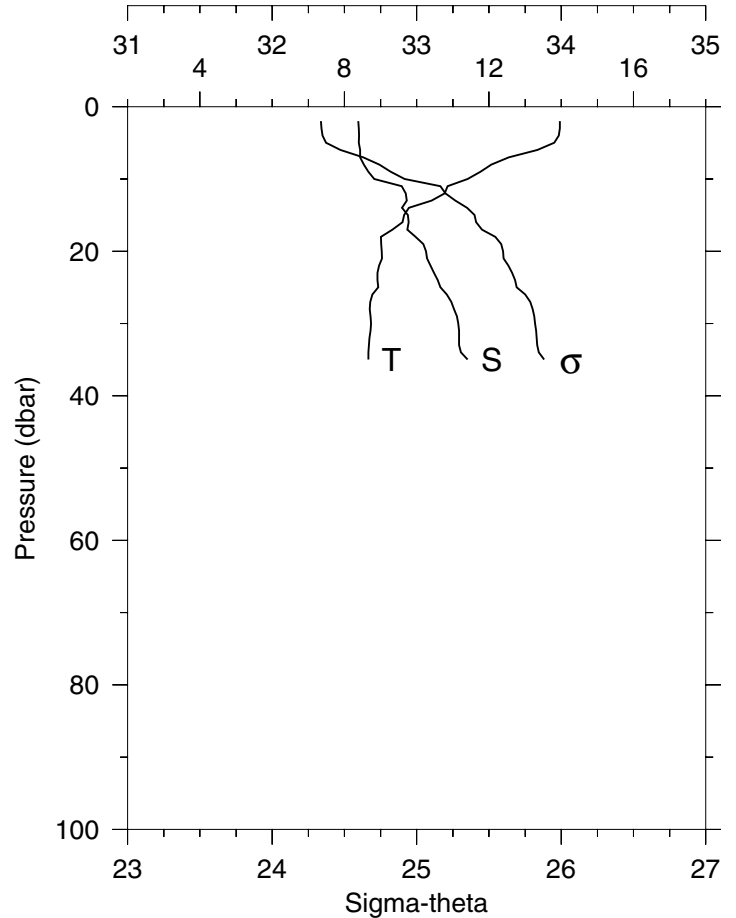
STA: 25 SH-8 LAT: 44 15.4 N LONG: 124 53.8 W
02 SEP 2004 0553 GMT DEPTH 152



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	17.44	31.622	17.44	22.822	0.101	0.20	85.6
10	15.75	31.957	15.75	23.464	0.483	0.30	85.2
20	10.76	32.412	10.75	24.804	0.837	0.43	85.2
30	9.14	32.591	9.14	25.211	1.126	0.25	87.8
40	8.82	32.681	8.81	25.332	1.396	0.21	87.1
50	8.51	32.832	8.50	25.498	1.652	0.17	88.3
60	8.36	33.168	8.35	25.783	1.888	0.15	88.5
70	8.17	33.380	8.16	25.978	2.099	0.13	88.6
80	8.09	33.503	8.08	26.087	2.296	0.12	80.8
90	7.97	33.639	7.96	26.212	2.485	0.12	87.9
100	7.95	33.706	7.94	26.267	2.662	0.13	87.8
110	7.82	33.797	7.81	26.357	2.834	0.13	86.8
120	7.77	33.821	7.76	26.384	3.001	0.13	86.4
130	7.76	33.842	7.74	26.402	3.165	0.13	86.7
140	7.70	33.858	7.69	26.422	3.328	0.13	86.4
142	7.70	33.858	7.69	26.422	3.360	0.13	86.4

Station 26 SH-1
Temperature, Salinity

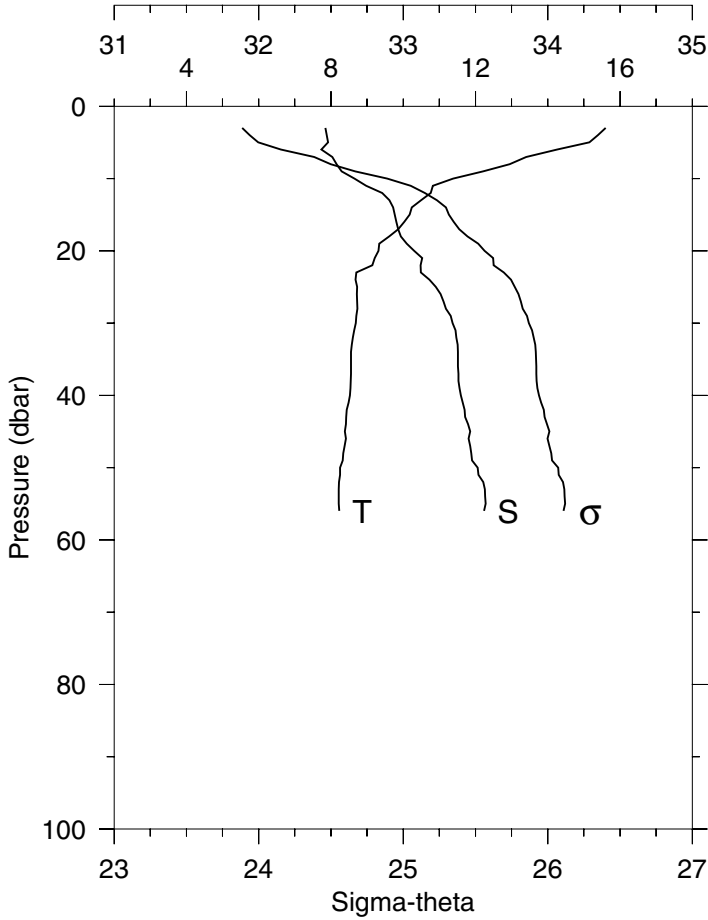
STA: 26 SH-1 LAT: 44 15.1 N LONG: 124 9.1 W
02 SEP 2004 1301 GMT DEPTH 40



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	13.96	32.596	13.96	24.338	0.072	0.88	76.0
10	11.41	32.706	11.41	24.916	0.342	0.35	83.5
20	9.03	33.064	9.03	25.598	0.603	0.18	87.2
30	8.74	33.288	8.73	25.819	0.830	0.20	85.8
35	8.66	33.353	8.66	25.882	0.938	0.19	86.0

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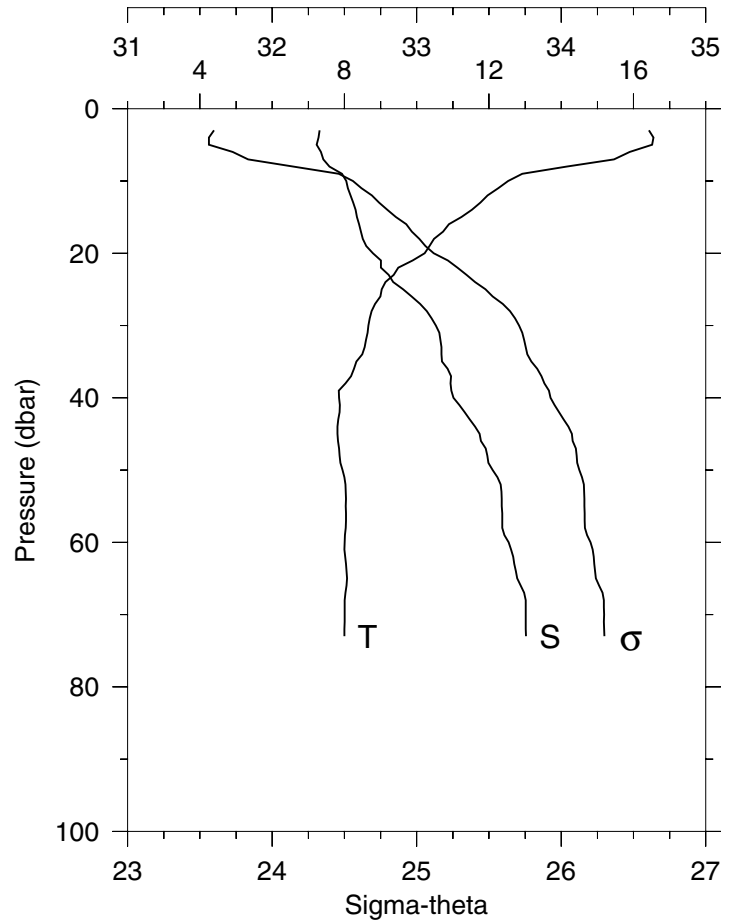
Station 27 SH-2
Temperature, Salinity



STA: 27 SH-2 LAT: 44 15.1 N LONG: 124 13.1 W
02 SEP 2004 1340 GMT DEPTH 60

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.60	32.462	15.60	23.885	0.120	0.45	80.2
10	11.38	32.663	11.38	24.889	0.374	0.31	85.4
20	9.31	33.076	9.31	25.563	0.641	0.20	86.9
30	8.68	33.341	8.68	25.869	0.865	0.15	88.0
40	8.52	33.398	8.52	25.939	1.074	0.14	84.1
50	8.25	33.515	8.24	26.072	1.274	0.16	87.3
56	8.23	33.559	8.22	26.110	1.389	0.17	85.7

Station 28 SH-3
Temperature, Salinity



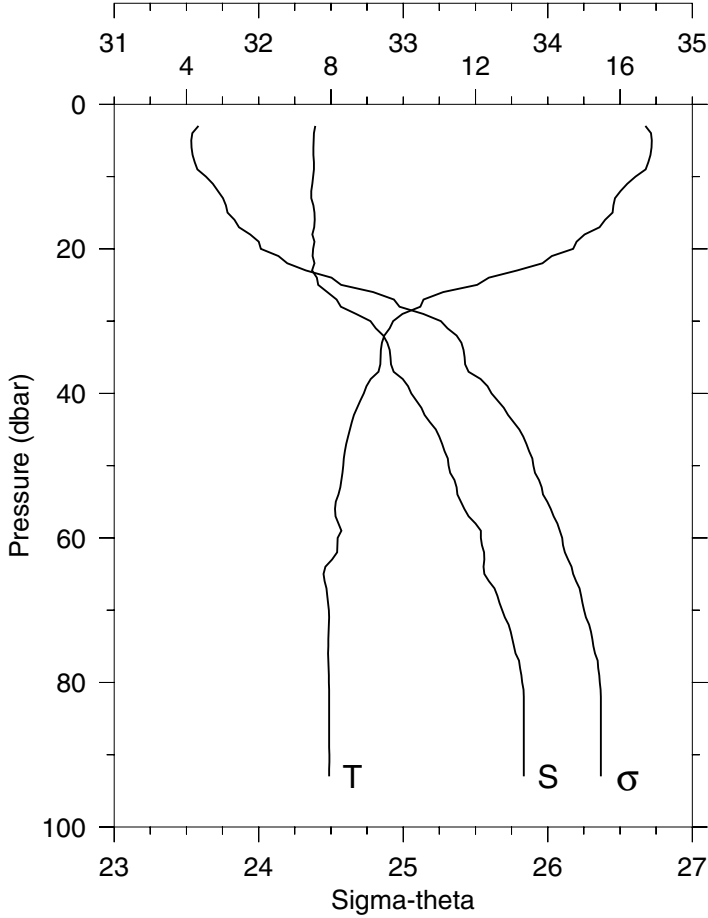
STA: 28 SH-3 LAT: 44 15.1 N LONG: 124 18.9 W
02 SEP 2004 1424 GMT DEPTH 79

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.43	32.328	16.43	23.597	0.129	0.44	80.1
10	12.53	32.513	12.53	24.558	0.408	0.37	85.2
20	10.22	32.697	10.22	25.117	0.717	0.34	85.9
30	8.66	33.133	8.66	25.709	0.969	0.21	87.6
40	7.85	33.255	7.85	25.926	1.187	0.14	88.3
50	7.95	33.526	7.95	26.125	1.383	0.14	88.2
60	8.00	33.636	8.00	26.203	1.568	0.14	88.3
70	8.00	33.755	8.00	26.297	1.745	0.16	84.4
73	8.00	33.756	7.99	26.298	1.797	0.16	83.8

W0408D

Station 29 SH-4
Temperature, Salinity

STA: 29 SH-4 LAT: 44 15.1 N LONG: 124 27.0 W
02 SEP 2004 1521 GMT DEPTH 97

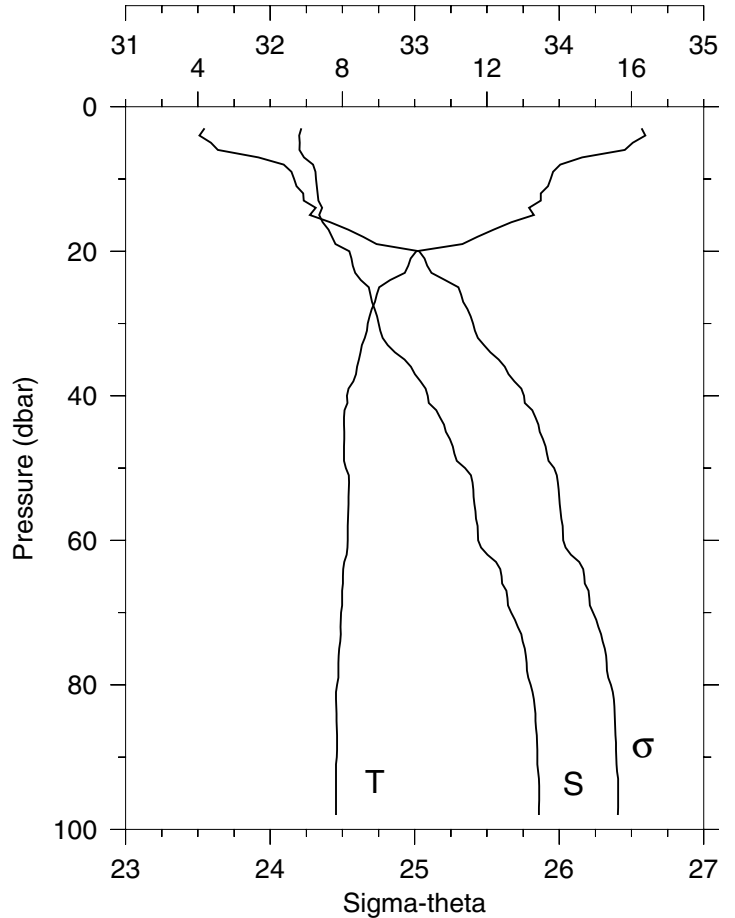


P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.70	32.392	16.70	23.584	0.129	0.40	82.1
10	16.43	32.377	16.43	23.635	0.432	0.39	82.0
20	14.70	32.376	14.70	24.015	0.840	0.51	82.1
30	9.72	32.774	9.72	25.261	1.171	0.29	86.1
40	8.91	33.056	8.90	25.611	1.425	0.18	86.1
50	8.34	33.313	8.34	25.900	1.646	0.14	88.1
60	8.19	33.538	8.18	26.100	1.847	0.14	87.9
70	7.95	33.685	7.94	26.251	2.031	0.13	88.1
80	7.95	33.824	7.94	26.360	2.202	0.14	82.9
90	7.95	33.835	7.94	26.367	2.368	0.15	79.0
93	7.95	33.835	7.94	26.367	2.418	0.15	78.7

STA: 30 SH-5 LAT: 44 15.1 N LONG: 124 34.6 W
02 SEP 2004 1623 GMT DEPTH 102

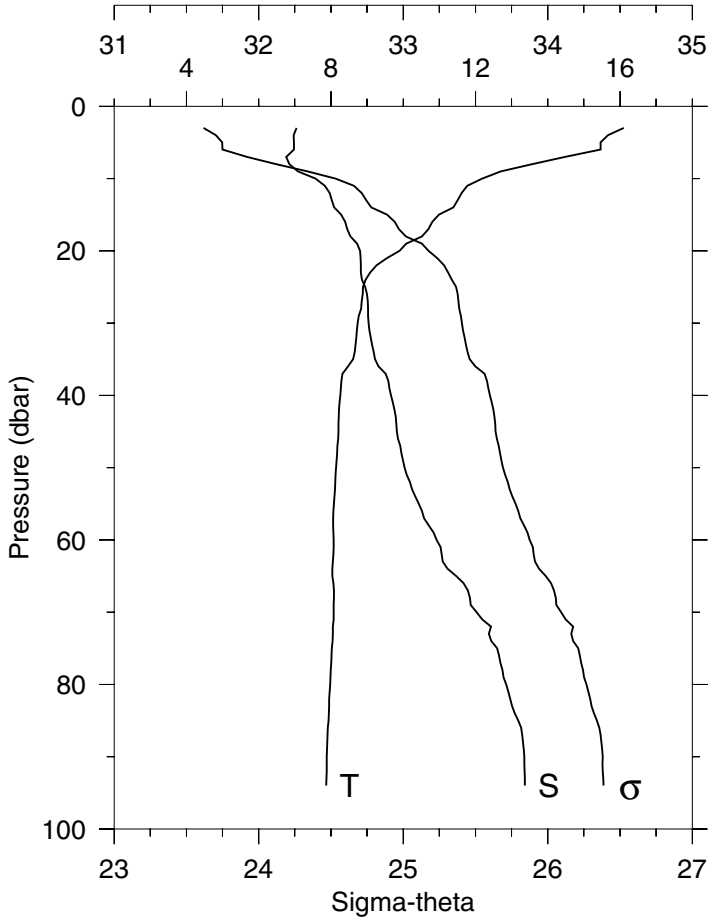
Station 30 SH-5
Temperature, Salinity

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.28	32.216	16.28	23.545	0.130	0.31	82.7
10	13.76	32.318	13.76	24.165	0.415	0.56	79.9
20	10.05	32.548	10.05	25.031	0.766	0.48	84.1
30	8.70	32.751	8.70	25.404	1.038	0.22	87.1
40	8.13	33.090	8.12	25.756	1.279	0.16	88.0
50	8.10	33.348	8.09	25.964	1.493	0.14	88.0
60	8.15	33.439	8.14	26.027	1.693	0.13	88.1
70	7.96	33.667	7.96	26.234	1.879	0.13	87.9
80	7.85	33.803	7.84	26.358	2.051	0.13	87.1
90	7.84	33.849	7.83	26.395	2.216	0.14	84.8
98	7.82	33.859	7.82	26.405	2.346	0.15	82.4



W0408D

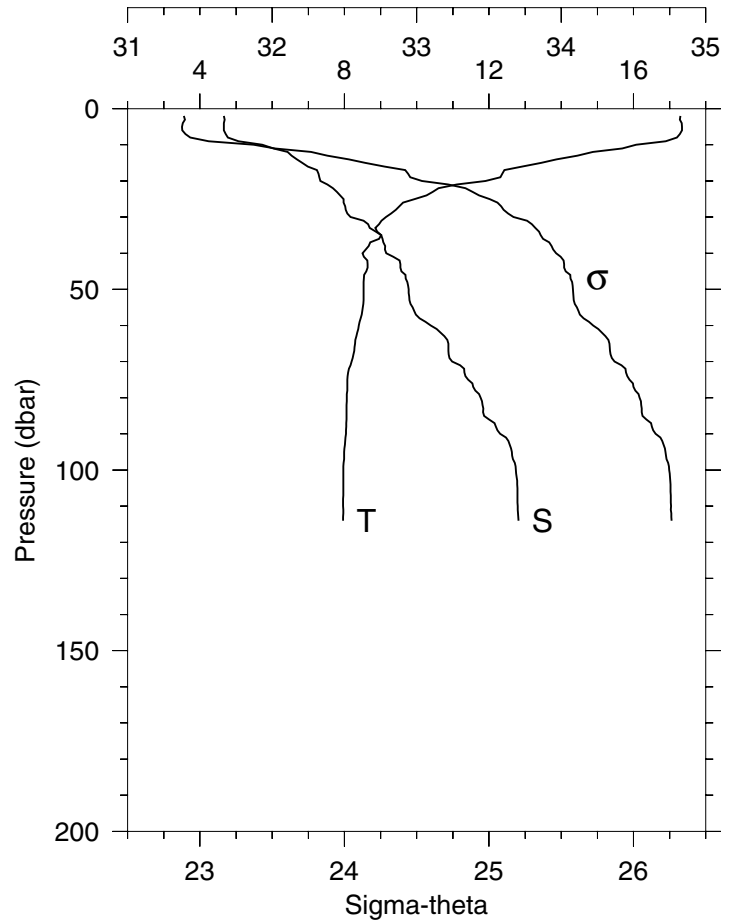
Station 31 SH-6
Temperature, Salinity



STA: 31 SH-6 LAT: 44 15.1 N LONG: 124 42.0 W
02 SEP 2004 1720 GMT DEPTH 98

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.11	32.262	16.11	23.619	0.128	0.30	82.6
10	12.19	32.394	12.19	24.532	0.404	0.51	81.4
20	9.90	32.702	9.89	25.176	0.712	0.60	82.6
30	8.74	32.761	8.74	25.406	0.975	0.34	86.4
40	8.26	32.916	8.25	25.600	1.224	0.19	87.9
50	8.14	33.009	8.14	25.691	1.458	0.16	88.0
60	8.08	33.230	8.07	25.874	1.680	0.14	88.2
70	8.07	33.508	8.06	26.093	1.882	0.13	88.0
80	7.97	33.712	7.97	26.267	2.065	0.13	87.4
90	7.88	33.838	7.87	26.380	2.234	0.14	83.5
94	7.87	33.842	7.86	26.385	2.300	0.14	83.3

Station 32 SH-7
Temperature, Salinity



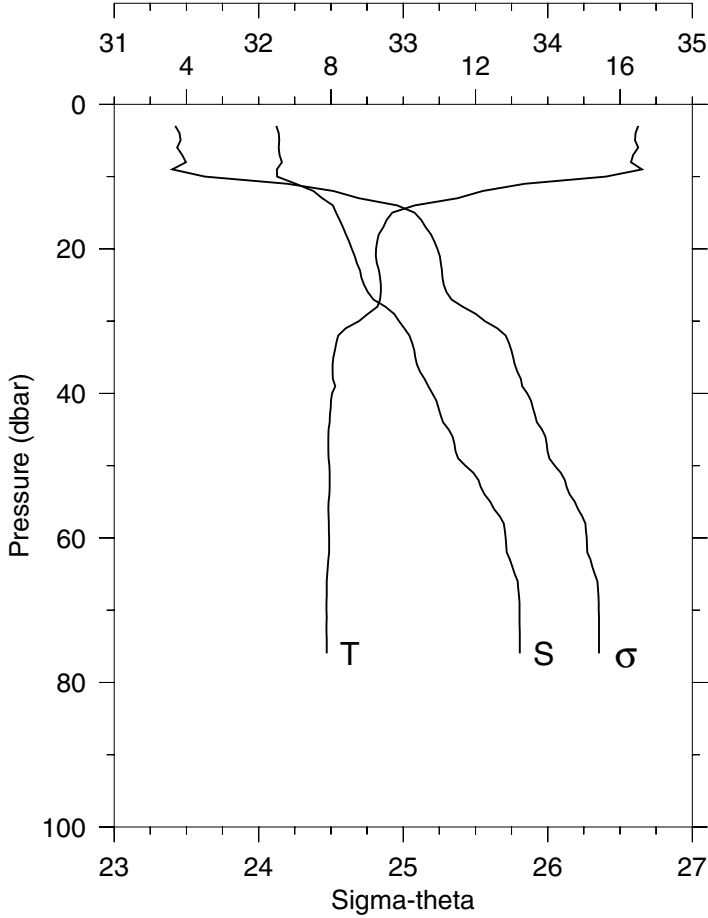
STA: 32 SH-7 LAT: 44 15.1 N LONG: 124 48.0 W
02 SEP 2004 1815 GMT DEPTH 118

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	17.30	31.666	17.30	22.889	0.099	0.19	85.6
10	16.08	31.932	16.07	23.373	0.492	0.22	85.3
20	11.91	32.334	11.90	24.537	0.874	0.60	82.2
30	9.15	32.542	9.15	25.170	1.173	0.41	85.6
40	8.50	32.789	8.50	25.464	1.434	0.21	87.9
50	8.53	32.944	8.53	25.581	1.679	0.17	88.2
60	8.40	33.098	8.40	25.722	1.915	0.15	88.4
70	8.20	33.246	8.19	25.868	2.134	0.14	88.4
80	8.06	33.442	8.06	26.042	2.337	0.13	88.3
90	8.04	33.578	8.03	26.153	2.530	0.13	88.0
100	7.97	33.687	7.96	26.248	2.711	0.13	87.4
110	7.97	33.700	7.95	26.260	2.888	0.13	87.1
114	7.97	33.704	7.95	26.263	2.959	0.13	86.9

W0408D

Station 33 SB-2
Temperature, Salinity

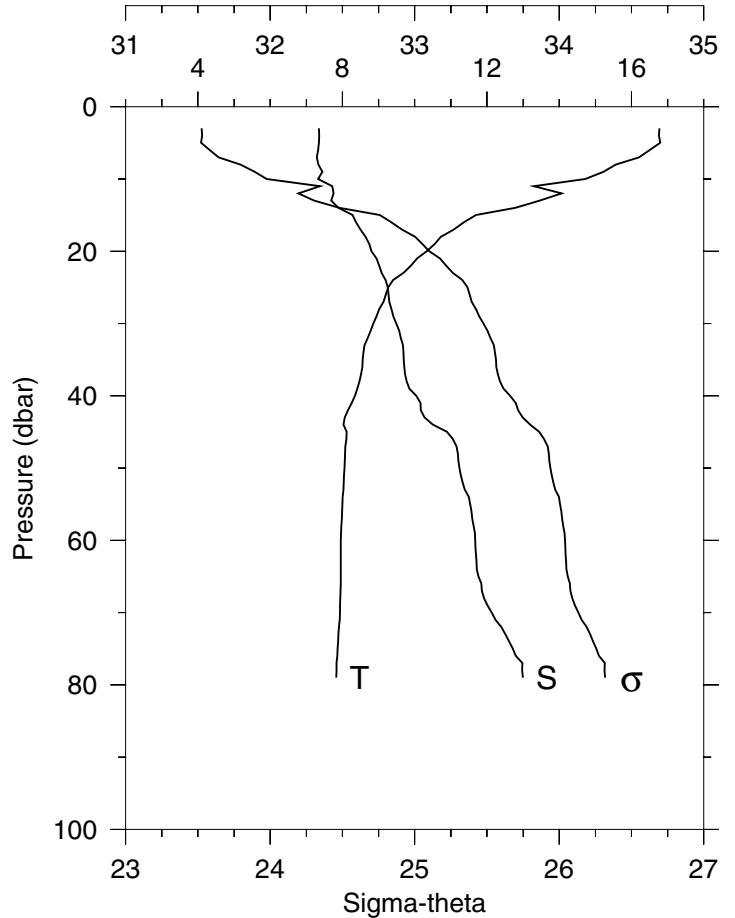
STA: 33 SB-2 LAT: 44 30.0 N LONG: 124 28.0 W
02 SEP 2004 2106 GMT DEPTH 82



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.50	32.121	16.50	23.422	0.134	0.27	82.5
10	15.61	32.128	15.61	23.627	0.443	0.29	81.9
20	9.24	32.645	9.24	25.237	0.751	0.48	83.7
30	8.78	32.970	8.77	25.564	1.015	0.28	86.9
40	8.03	33.202	8.03	25.858	1.239	0.15	88.1
50	7.96	33.431	7.95	26.049	1.445	0.14	88.1
60	7.95	33.709	7.94	26.269	1.628	0.13	87.5
70	7.88	33.804	7.87	26.353	1.799	0.15	86.3
76	7.88	33.806	7.87	26.355	1.899	0.15	86.3

Station 34 SB-1
Temperature, Salinity

STA: 34 SB-1 LAT: 44 30.0 N LONG: 124 17.9 W
02 SEP 2004 2245 GMT DEPTH 83

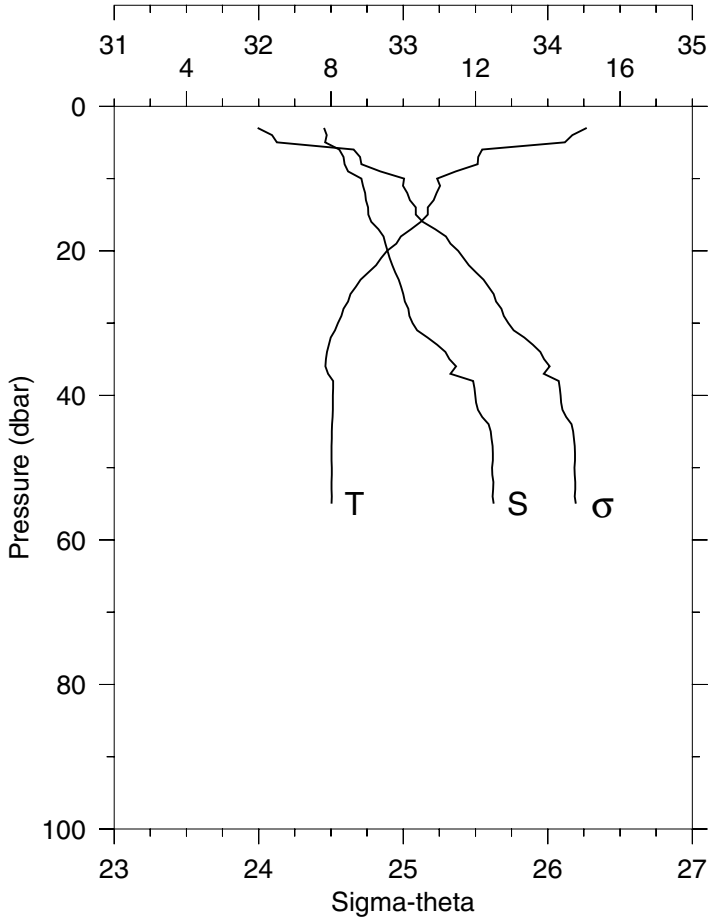


P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.78	32.338	16.78	23.525	0.131	0.49	81.5
10	14.72	32.332	14.72	23.976	0.426	0.49	82.1
20	10.33	32.701	10.33	25.102	0.755	0.26	86.0
30	8.86	32.873	8.85	25.475	1.019	0.25	87.0
40	8.34	33.010	8.34	25.661	1.261	0.19	87.7
50	8.06	33.310	8.06	25.939	1.477	0.16	80.8
60	7.96	33.419	7.95	26.040	1.678	0.15	88.1
70	7.93	33.533	7.93	26.133	1.873	0.16	88.0
79	7.83	33.749	7.82	26.317	2.033	0.20	85.9

W0408D

Station 35 NH-5
Temperature, Salinity

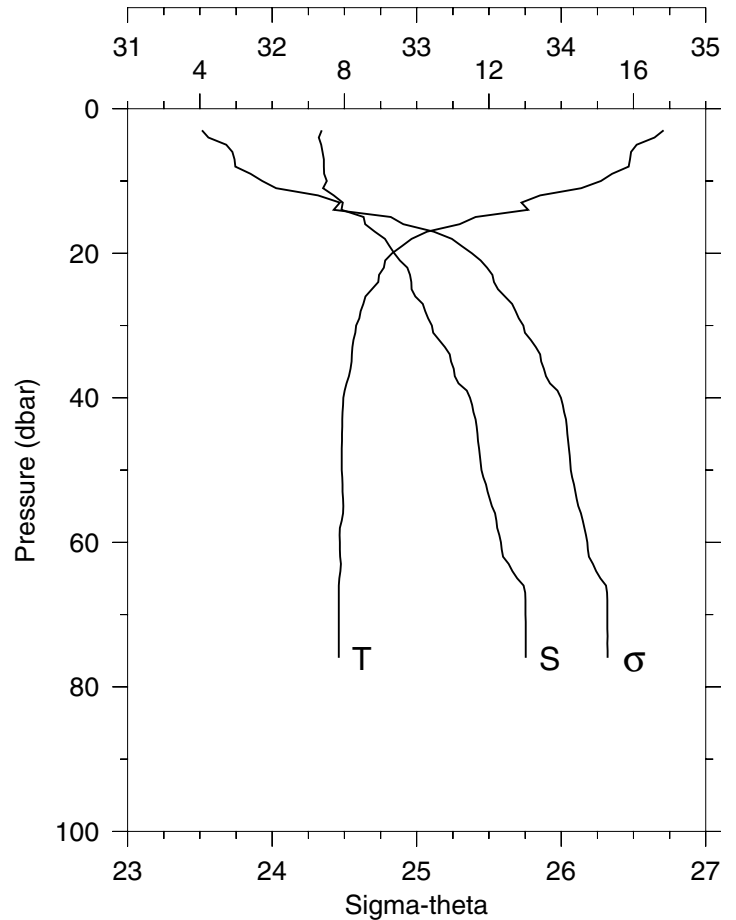
STA: 35 NH-5 LAT: 44 39.1 N LONG: 124 10.7 W
03 SEP 2004 0025 GMT DEPTH 58



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	15.08	32.453	15.08	23.993	0.117	0.46	79.5
10	10.94	32.710	10.94	25.005	0.356	0.36	85.6
20	9.55	32.892	9.55	25.381	0.637	0.23	87.0
30	8.19	33.064	8.19	25.727	0.878	0.28	87.7
40	8.05	33.498	8.05	26.088	1.084	0.16	87.6
50	8.02	33.615	8.02	26.184	1.269	0.18	86.3
55	8.02	33.626	8.01	26.194	1.361	0.19	85.9

Station 36 NH-10
Temperature, Salinity

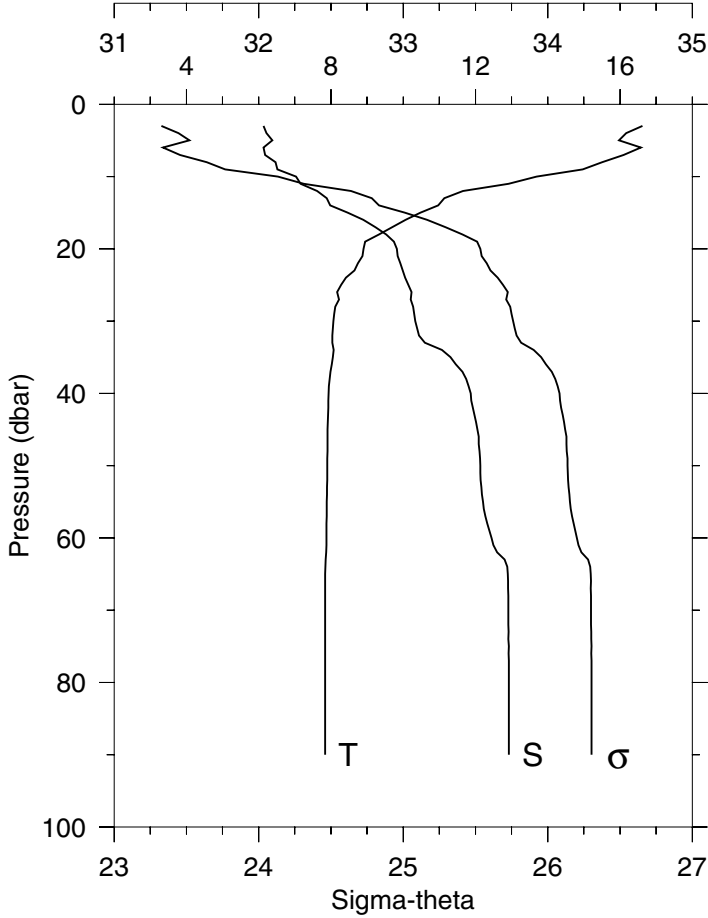
STA: 36 NH-10 LAT: 44 39.1 N LONG: 124 17.8 W
03 SEP 2004 0140 GMT DEPTH 81



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.84	32.343	16.84	23.515	0.131	0.44	82.1
10	15.10	32.378	15.10	23.931	0.423	0.59	81.4
20	9.32	32.845	9.32	25.382	0.744	0.46	85.7
30	8.33	33.105	8.32	25.738	0.984	0.24	87.6
40	7.97	33.369	7.96	25.998	1.198	0.16	88.1
50	7.93	33.449	7.92	26.067	1.394	0.15	88.1
60	7.87	33.583	7.87	26.181	1.583	0.14	88.2
70	7.84	33.753	7.84	26.319	1.759	0.19	86.2
76	7.84	33.754	7.84	26.320	1.861	0.21	86.0

W0408D

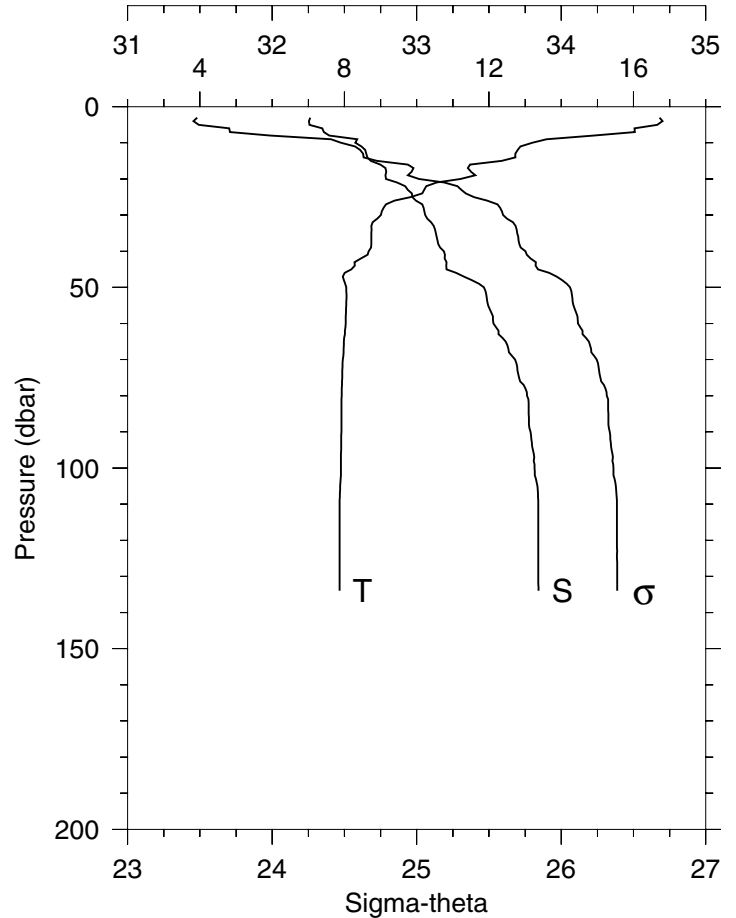
Station 37 NH-15
Temperature, Salinity



STA: 37 NH-15 LAT: 44 39.1 N LONG: 124 24.8 W
03 SEP 2004 0234 GMT DEPTH 96

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.62	32.033	16.62	23.327	0.136	0.27	84.1
10	13.69	32.259	13.69	24.133	0.439	0.36	82.3
20	8.90	32.956	8.90	25.534	0.736	0.31	86.2
30	8.07	33.084	8.07	25.760	0.968	0.16	88.0
40	7.93	33.467	7.93	26.081	1.175	0.14	88.1
50	7.90	33.533	7.89	26.137	1.365	0.14	88.0
60	7.88	33.611	7.87	26.202	1.550	0.13	87.9
70	7.84	33.728	7.83	26.300	1.725	0.17	87.1
80	7.84	33.731	7.83	26.302	1.897	0.17	87.1
90	7.84	33.731	7.83	26.303	2.070	0.17	87.2

Station 38 NH-20
Temperature, Salinity



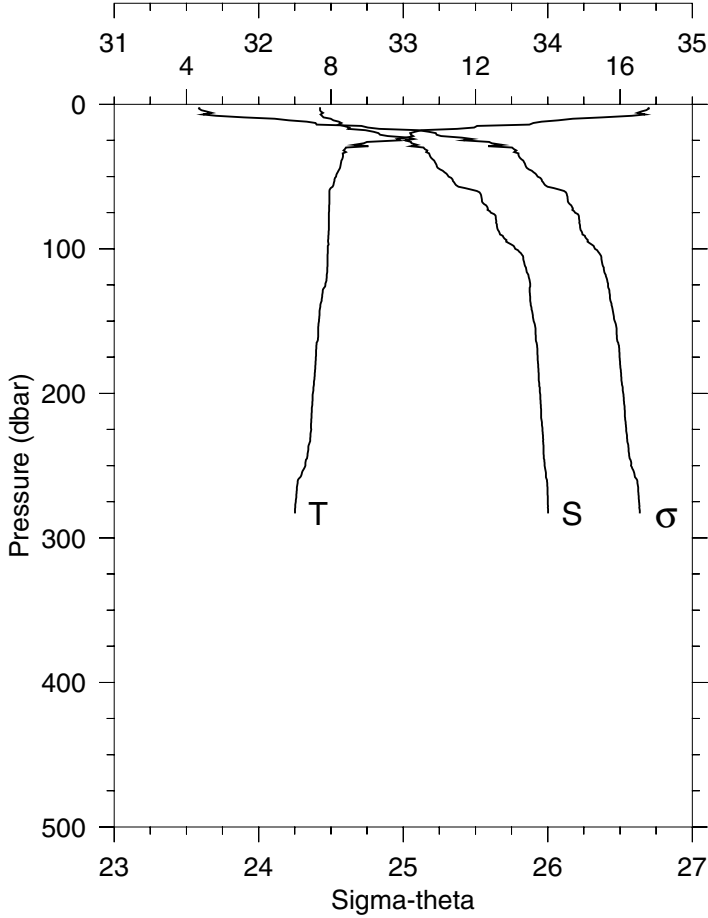
STA: 38 NH-20 LAT: 44 39.1 N LONG: 124 31.8 W
03 SEP 2004 0334 GMT DEPTH 142

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.72	32.264	16.72	23.481	0.132	0.31	82.7
10	13.21	32.575	13.20	24.475	0.417	0.30	84.4
20	11.21	32.788	11.21	25.017	0.734	0.19	86.5
30	9.01	33.059	9.01	25.598	0.991	0.17	87.9
40	8.67	33.188	8.66	25.752	1.221	0.16	87.8
50	8.05	33.464	8.05	26.061	1.432	0.13	88.2
60	8.03	33.532	8.03	26.117	1.624	0.13	88.2
70	7.95	33.681	7.95	26.246	1.808	0.13	88.0
80	7.92	33.764	7.91	26.316	1.982	0.13	87.3
90	7.91	33.788	7.91	26.336	2.152	0.13	87.0
100	7.90	33.816	7.89	26.361	2.321	0.14	86.6
110	7.86	33.841	7.86	26.386	2.487	0.14	85.0
120	7.86	33.842	7.85	26.386	2.652	0.14	84.5
130	7.86	33.842	7.85	26.387	2.817	0.14	84.6
134	7.86	33.843	7.85	26.387	2.883	0.14	84.8

W0408D

Station 39 NH-25
Temperature, Salinity

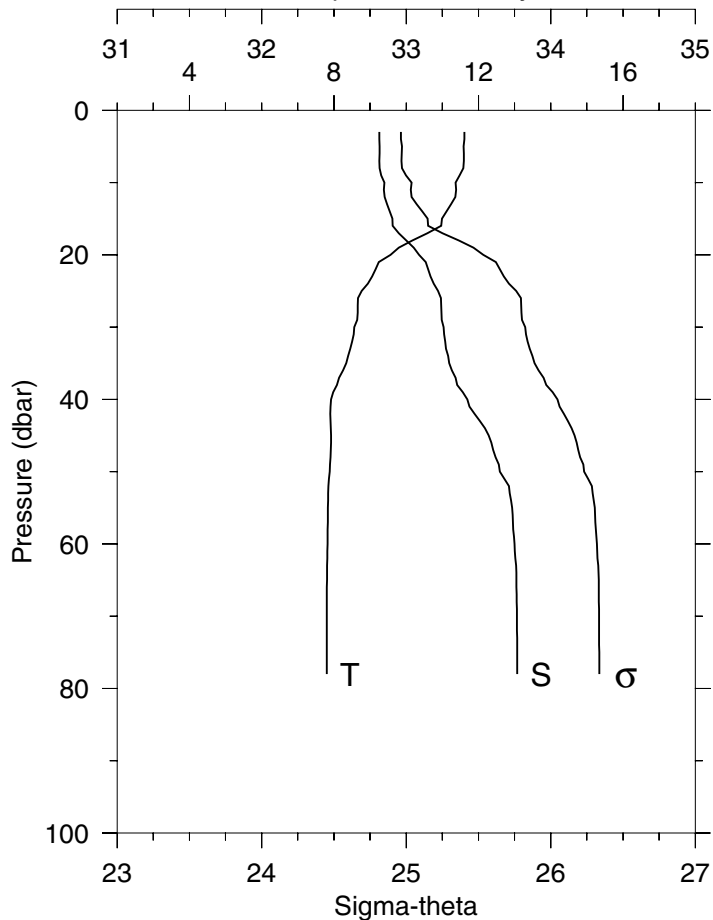
STA: 39 NH-25 LAT: 44 39.1 N LONG: 124 39.0 W
03 SEP 2004 0438 GMT DEPTH 296



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	16.78	32.425	16.78	23.590	0.086	0.31	83.9
10	14.69	32.499	14.69	24.111	0.421	0.59	81.3
20	10.19	32.829	10.19	25.226	0.749	0.22	87.2
30	8.41	33.140	8.41	25.753	0.999	0.19	87.9
40	8.28	33.220	8.27	25.836	1.218	0.15	88.0
50	8.14	33.314	8.14	25.930	1.431	0.17	87.9
60	7.95	33.510	7.95	26.112	1.632	0.14	88.0
70	7.95	33.574	7.94	26.162	1.820	0.14	88.1
80	7.94	33.643	7.93	26.218	2.002	0.13	88.1
90	7.93	33.670	7.93	26.241	2.182	0.13	88.0
100	7.91	33.776	7.90	26.327	2.356	0.13	87.9
110	7.91	33.837	7.89	26.376	2.524	0.13	87.3
120	7.88	33.870	7.87	26.406	2.688	0.14	87.2
130	7.77	33.875	7.76	26.426	2.850	0.13	87.5
140	7.70	33.885	7.69	26.444	3.011	0.13	87.4
150	7.67	33.903	7.65	26.464	3.170	0.13	87.4
175	7.58	33.930	7.57	26.497	3.562	0.13	87.4
200	7.50	33.947	7.48	26.522	3.948	0.13	87.4
225	7.45	33.963	7.43	26.542	4.330	0.13	87.2
250	7.30	33.978	7.27	26.576	4.707	0.13	86.9
275	7.03	34.001	7.00	26.632	5.071	0.13	85.9
283	7.00	34.002	6.98	26.636	5.186	0.13	85.5

W0409A

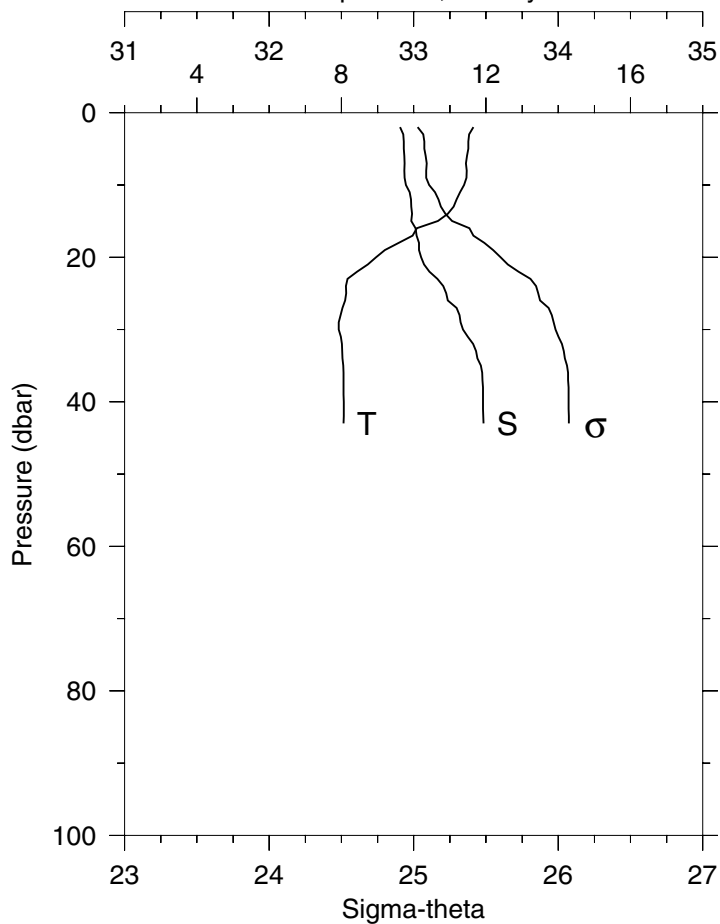
Station 1 NH-10
Temperature, Salinity



STA: 1 NH-10 LAT: 44 38.6 N LONG: 124 18.4 W
07 SEP 2004 1800 GMT DEPTH 83

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	11.61	32.813	11.61	24.963	0.089	0.45	79.0
10	11.36	32.849	11.36	25.037	0.297	0.70	78.8
20	9.56	33.089	9.56	25.533	0.574	0.31	85.9
30	8.56	33.259	8.56	25.823	0.800	0.17	88.0
40	7.92	33.422	7.92	26.047	1.009	0.15	88.3
50	7.88	33.647	7.88	26.230	1.196	0.14	88.0
60	7.82	33.749	7.82	26.319	1.368	0.16	87.0
70	7.80	33.766	7.80	26.335	1.538	0.17	83.8
78	7.80	33.767	7.80	26.336	1.673	0.18	85.5

Station 2 NH-3
Temperature, Salinity

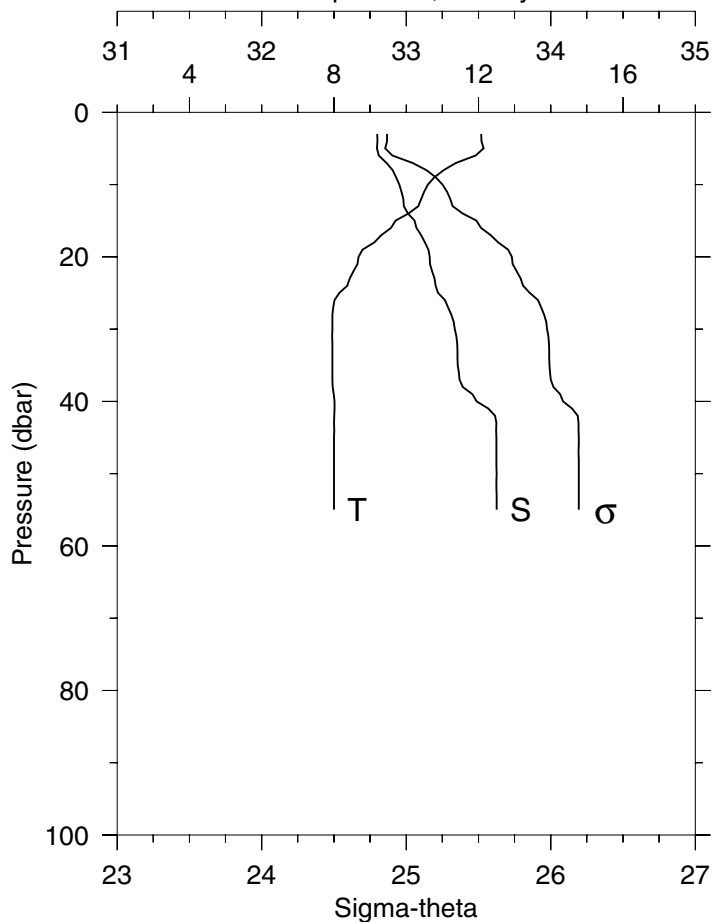


STA: 2 NH-3 LAT: 44 39.1 N LONG: 124 7.7 W
07 SEP 2004 2231 GMT DEPTH 48

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	11.65	32.906	11.65	25.028	0.058	0.60	73.2
10	11.39	32.947	11.39	25.107	0.288	0.80	72.9
20	8.95	33.052	8.95	25.601	0.553	0.34	86.2
30	7.93	33.341	7.92	25.982	0.768	0.16	88.0
40	8.06	33.479	8.06	26.071	0.964	0.19	83.5
43	8.06	33.483	8.06	26.074	1.022	0.19	83.0

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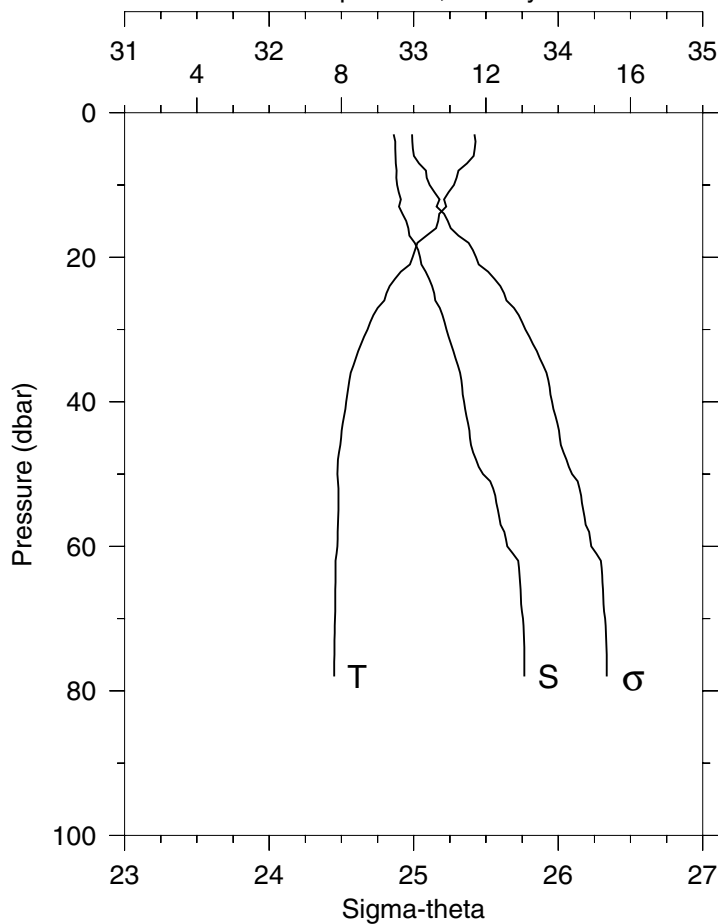
Station 3 NH-5
Temperature, Salinity



STA: 3 NH-5 LAT: 44 39.1 N LONG: 124 10.7 W
07 SEP 2004 2259 GMT DEPTH 59

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	12.07	32.799	12.07	24.867	0.092	0.73	75.5
10	10.60	32.952	10.60	25.252	0.298	0.75	80.0
20	8.68	33.163	8.67	25.731	0.548	0.19	87.5
30	7.95	33.336	7.95	25.974	0.762	0.15	88.2
40	8.01	33.487	8.01	26.085	0.962	0.15	87.7
50	8.00	33.625	8.00	26.194	1.145	0.19	85.9
55	8.00	33.625	8.00	26.194	1.236	0.20	86.0

Station 4 NH-10
Temperature, Salinity

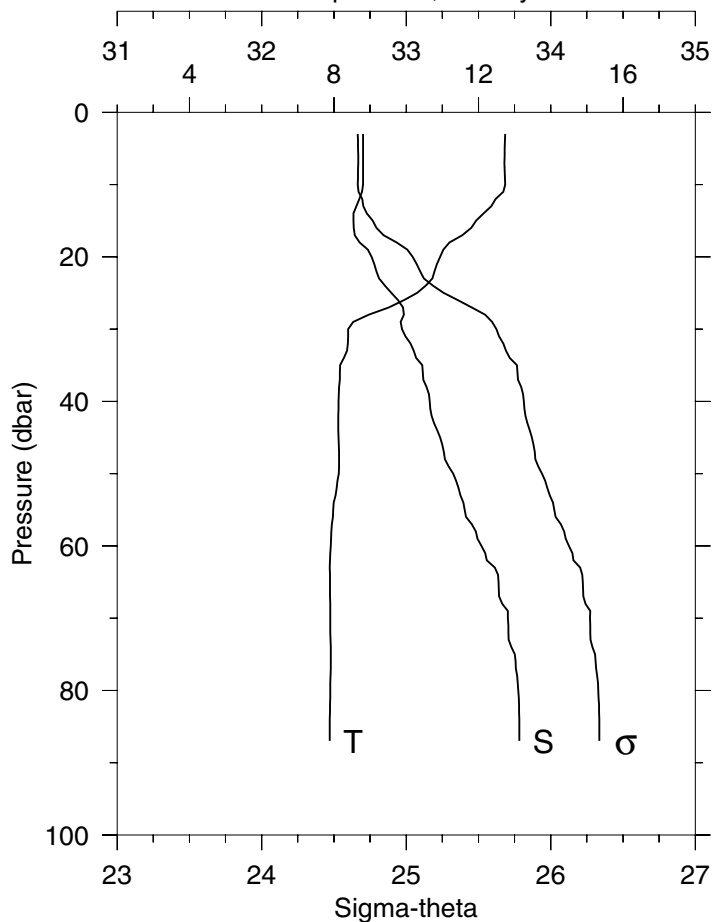


STA: 4 NH-10 LAT: 44 39.1 N LONG: 124 17.8 W
07 SEP 2004 2342 GMT DEPTH 82

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	11.68	32.862	11.68	24.988	0.089	0.58	78.7
10	11.11	32.886	11.11	25.110	0.293	0.66	78.7
20	9.97	33.045	9.97	25.431	0.564	0.44	83.9
30	8.72	33.226	8.72	25.773	0.800	0.18	87.6
40	8.13	33.349	8.13	25.958	1.012	0.16	88.2
50	7.89	33.479	7.89	26.096	1.210	0.13	88.4
60	7.89	33.647	7.89	26.228	1.394	0.15	88.2
70	7.82	33.757	7.81	26.325	1.567	0.16	86.8
78	7.80	33.766	7.79	26.335	1.702	0.19	85.9

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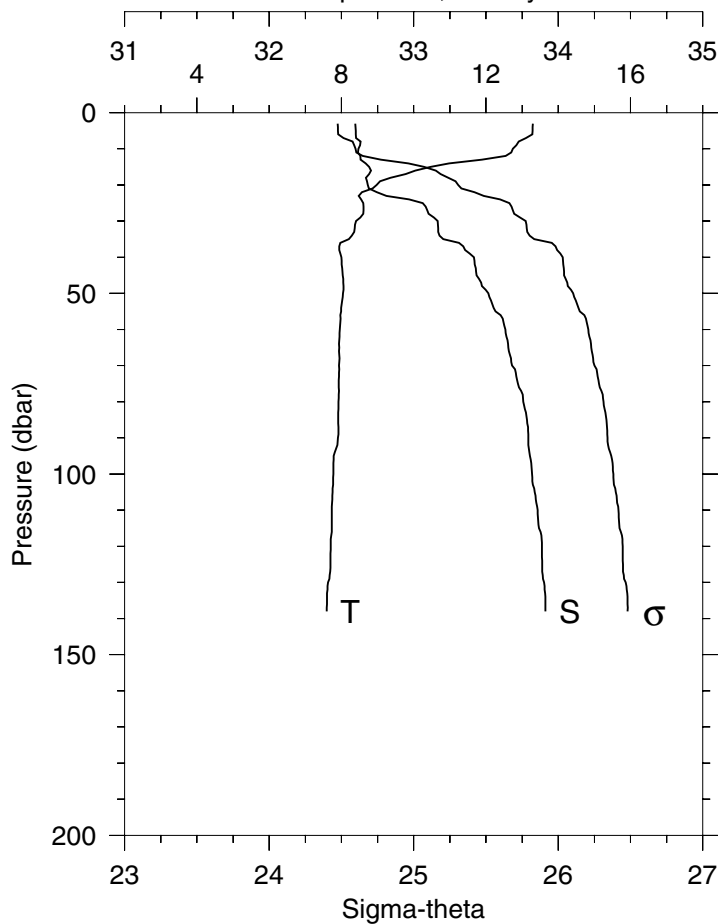
Station 5 NH-15
Temperature, Salinity



STA: 5 NH-15 LAT: 44 39.1 N LONG: 124 24.8 W
08 SEP 2004 0026 GMT DEPTH 94

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	12.74	32.702	12.74	24.664	0.098	0.88	75.8
10	12.74	32.702	12.74	24.665	0.327	0.85	75.9
20	10.94	32.761	10.93	25.045	0.641	0.62	82.0
30	8.39	32.971	8.39	25.624	0.907	0.16	88.0
40	8.13	33.162	8.12	25.813	1.133	0.15	88.3
50	8.14	33.325	8.13	25.939	1.346	0.14	88.3
60	7.91	33.520	7.91	26.125	1.544	0.13	88.5
70	7.90	33.704	7.89	26.272	1.725	0.13	87.8
80	7.90	33.776	7.89	26.329	1.897	0.14	86.9
87	7.89	33.783	7.88	26.336	2.016	0.14	86.4

Station 6 NH-20
Temperature, Salinity

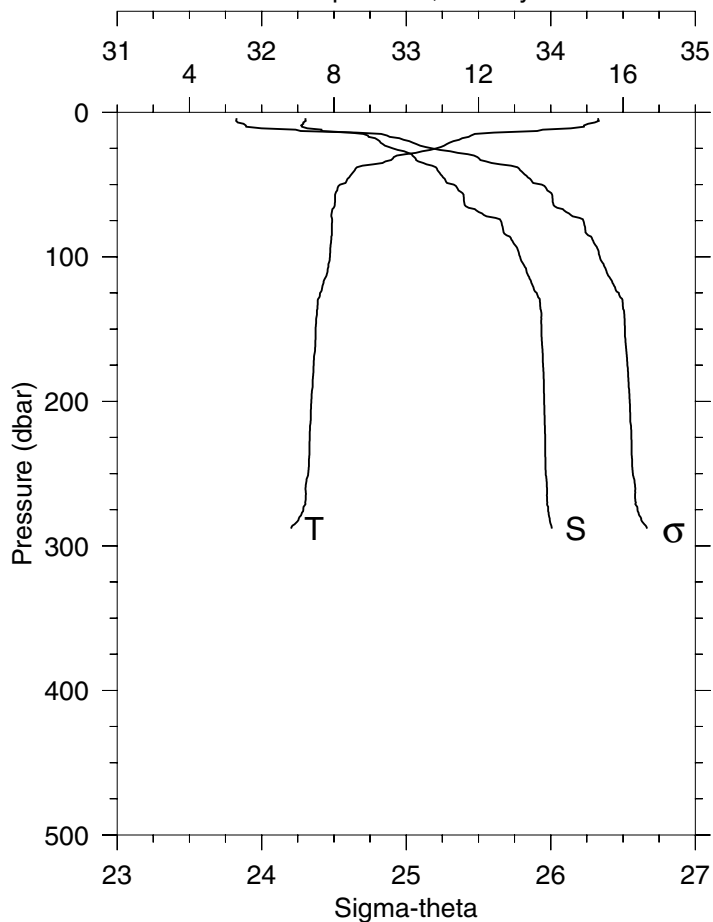


STA: 6 NH-20 LAT: 44 39.1 N LONG: 124 31.8 W
08 SEP 2004 0110 GMT DEPTH 144

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	13.30	32.596	13.29	24.474	0.103	1.06	73.7
10	12.75	32.617	12.74	24.597	0.342	0.98	74.9
20	8.98	32.683	8.98	25.308	0.638	0.26	86.7
30	8.41	33.166	8.40	25.774	0.878	0.16	88.0
40	8.00	33.417	8.00	26.031	1.089	0.13	88.1
50	8.04	33.517	8.04	26.104	1.285	0.13	88.2
60	7.95	33.634	7.95	26.209	1.470	0.13	88.0
70	7.93	33.681	7.92	26.250	1.649	0.13	88.0
80	7.92	33.759	7.91	26.313	1.823	0.13	87.6
90	7.90	33.793	7.89	26.342	1.993	0.13	86.6
100	7.78	33.819	7.77	26.381	2.160	0.12	88.3
110	7.73	33.857	7.72	26.417	2.324	0.13	88.0
120	7.70	33.887	7.69	26.446	2.485	0.13	85.9
130	7.63	33.902	7.62	26.467	2.644	0.13	86.2
138	7.60	33.912	7.58	26.480	2.769	0.13	85.3

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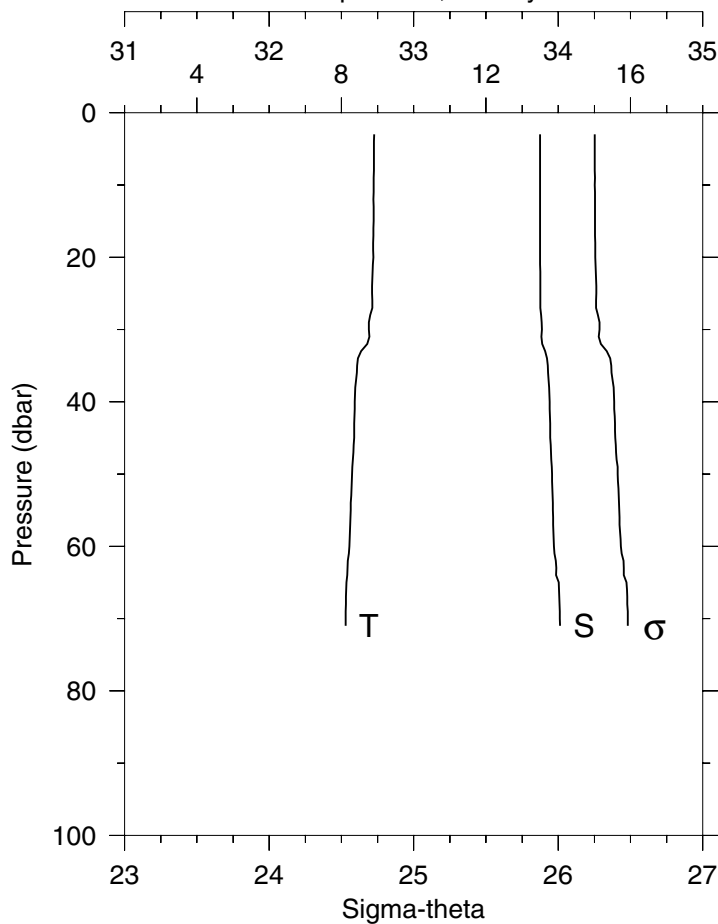
Station 7 NH-25
Temperature, Salinity



STA: 7 NH-25 LAT: 44 39.1 N LONG: 124 39.0 W
08 SEP 2004 0158 GMT DEPTH 298

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
4	15.31	32.303	15.31	23.827	0.163	0.55	78.4
10	14.92	32.279	14.92	23.894	0.405	0.51	78.0
20	11.30	32.815	11.30	25.021	0.737	0.34	85.4
30	9.74	33.043	9.74	25.468	1.013	0.19	87.2
40	8.58	33.216	8.57	25.788	1.249	0.15	87.9
50	8.17	33.328	8.16	25.937	1.465	0.14	87.9
60	8.03	33.399	8.02	26.013	1.666	0.14	88.1
70	7.93	33.524	7.93	26.126	1.863	0.13	88.0
80	7.94	33.668	7.93	26.238	2.044	0.13	88.2
90	7.92	33.740	7.91	26.298	2.220	0.13	88.2
100	7.89	33.788	7.88	26.340	2.391	0.13	88.3
110	7.82	33.833	7.81	26.386	2.558	0.13	88.1
120	7.69	33.875	7.68	26.438	2.721	0.13	88.2
130	7.55	33.925	7.54	26.496	2.878	0.13	87.1
140	7.53	33.936	7.51	26.509	3.033	0.12	86.9
150	7.49	33.936	7.48	26.514	3.186	0.13	87.0
175	7.44	33.946	7.42	26.530	3.569	0.13	87.1
200	7.38	33.955	7.36	26.546	3.948	0.13	87.3
225	7.33	33.961	7.31	26.558	4.325	0.13	87.3
250	7.29	33.966	7.26	26.568	4.700	0.13	87.2
275	7.15	33.982	7.12	26.600	5.072	0.13	86.6
288	6.81	34.007	6.79	26.666	5.260	0.13	85.2

Station 8 RR-mooring
Temperature, Salinity



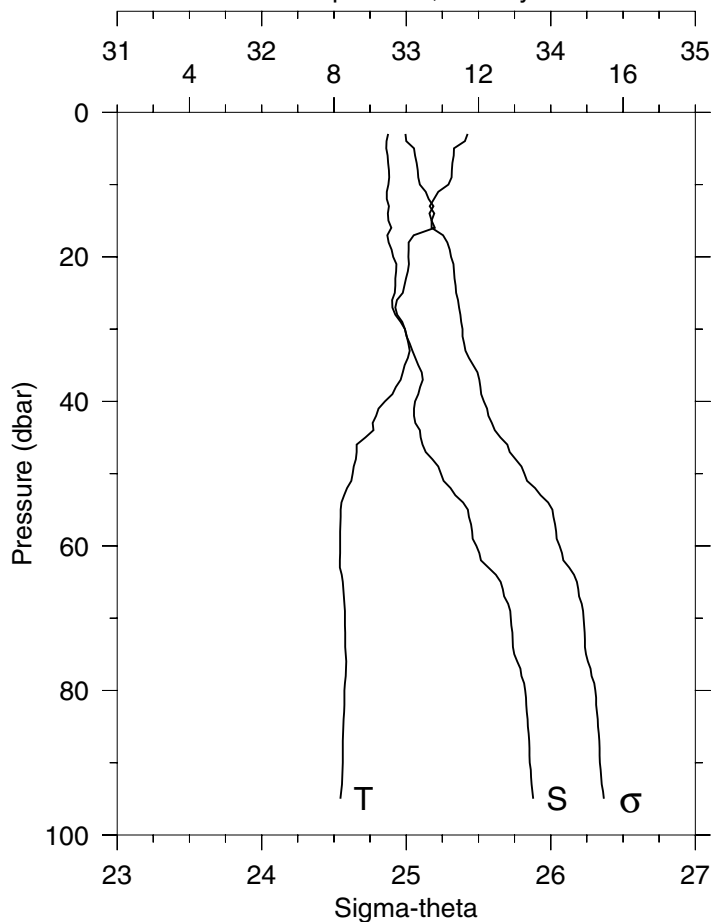
STA: 8 RR_mo LAT: 42 26.4 N LONG: 124 34.3 W
08 SEP 2004 1456 GMT DEPTH 76

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	8.90	33.874	8.90	26.252	0.053	0.38	80.8
10	8.90	33.874	8.89	26.253	0.176	0.34	80.9
20	8.88	33.874	8.88	26.256	0.352	0.33	81.1
30	8.76	33.887	8.76	26.285	0.526	0.32	82.0
40	8.37	33.940	8.36	26.387	0.694	0.14	82.6
50	8.30	33.957	8.29	26.411	0.857	0.15	82.4
60	8.22	33.970	8.22	26.433	1.017	0.13	81.4
70	8.11	34.011	8.11	26.482	1.174	0.13	80.4
71	8.11	34.012	8.11	26.482	1.189	0.13	80.4

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Station 9 CB-mooring
Temperature, Salinity

STA: 9 CB_mo LAT: 43 9.4 N LONG: 124 34.0 W
08 SEP 2004 2026 GMT DEPTH 100

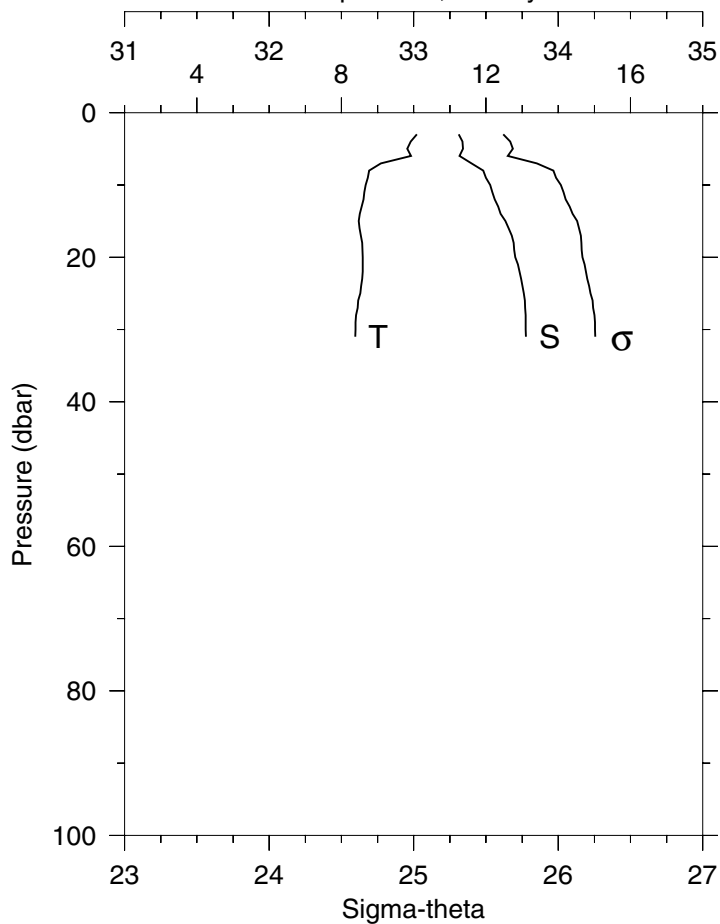


P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	11.70	32.874	11.70	24.995	0.089	1.56	71.9
10	11.17	32.877	11.17	25.094	0.291	1.47	74.5
20	10.06	32.910	10.06	25.311	0.567	1.17	75.7
30	9.97	32.991	9.96	25.390	0.829	1.88	75.0
40	9.41	33.062	9.41	25.537	1.081	1.66	76.6
50	8.51	33.240	8.51	25.817	1.313	0.16	87.8
60	8.17	33.486	8.16	26.061	1.517	0.14	87.8
70	8.30	33.723	8.30	26.227	1.702	0.14	85.1
80	8.29	33.823	8.28	26.308	1.879	0.14	82.2
90	8.24	33.855	8.23	26.340	2.049	0.14	80.0
95	8.18	33.878	8.17	26.368	2.133	0.14	78.2

STA: 10 FM-1 LAT: 43 12.9 N LONG: 124 26.0 W
08 SEP 2004 2128 GMT DEPTH 35

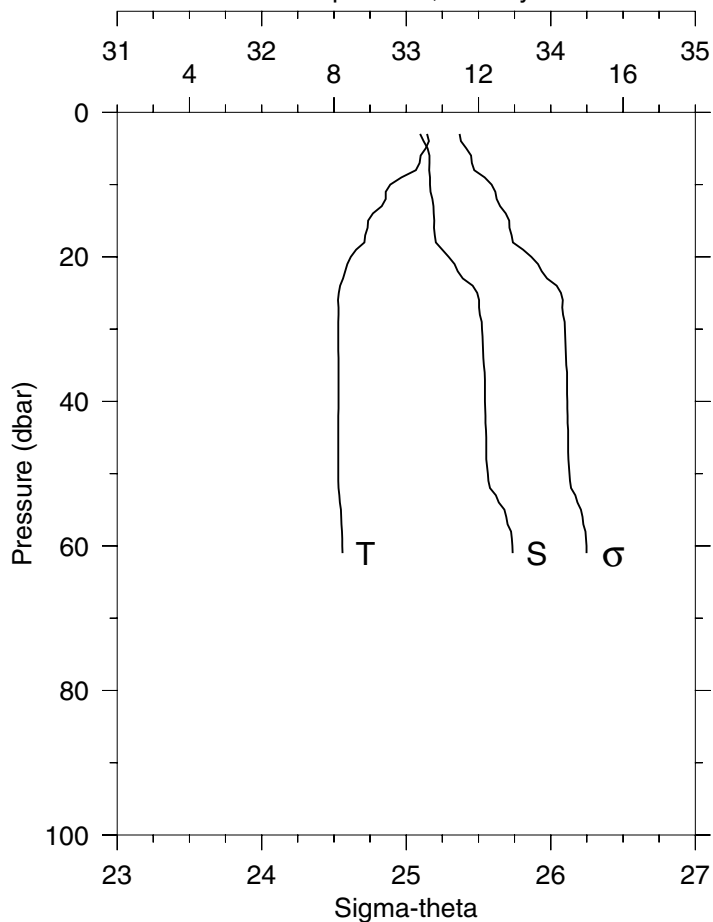
P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	10.09	33.312	10.09	25.619	0.071	0.58	76.2
10	8.67	33.529	8.67	26.018	0.224	0.72	78.6
20	8.59	33.703	8.59	26.167	0.413	0.31	77.9
30	8.39	33.775	8.39	26.254	0.592	0.21	78.0
31	8.38	33.776	8.38	26.256	0.610	0.18	77.9

Station 10 FM-1
Temperature, Salinity



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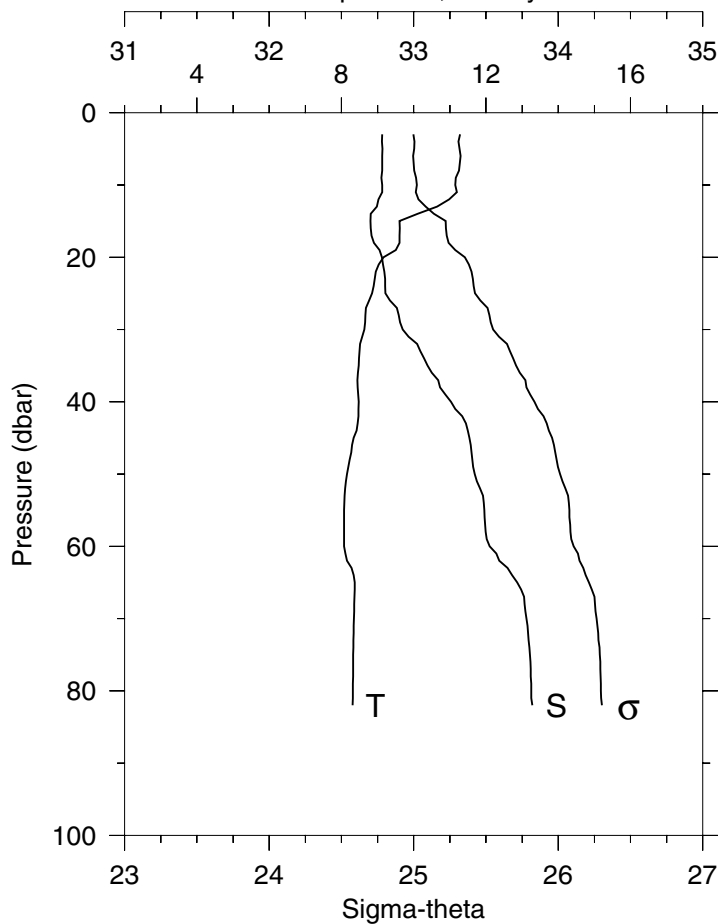
Station 11 FM-3
Temperature, Salinity



STA: 11 FM-3 LAT: 43 12.9 N LONG: 124 30.0 W
08 SEP 2004 2158 GMT DEPTH 64

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	10.58	33.097	10.58	25.369	0.078	0.89	77.5
10	9.56	33.164	9.56	25.591	0.254	1.68	77.8
20	8.47	33.294	8.47	25.866	0.482	0.28	87.2
30	8.12	33.524	8.12	26.098	0.680	0.13	87.7
40	8.12	33.545	8.12	26.114	0.870	0.13	87.5
50	8.12	33.564	8.12	26.129	1.059	0.14	87.4
60	8.23	33.735	8.23	26.247	1.241	0.14	84.7
61	8.23	33.737	8.23	26.248	1.259	0.14	84.6

Station 12 FM-4
Temperature, Salinity



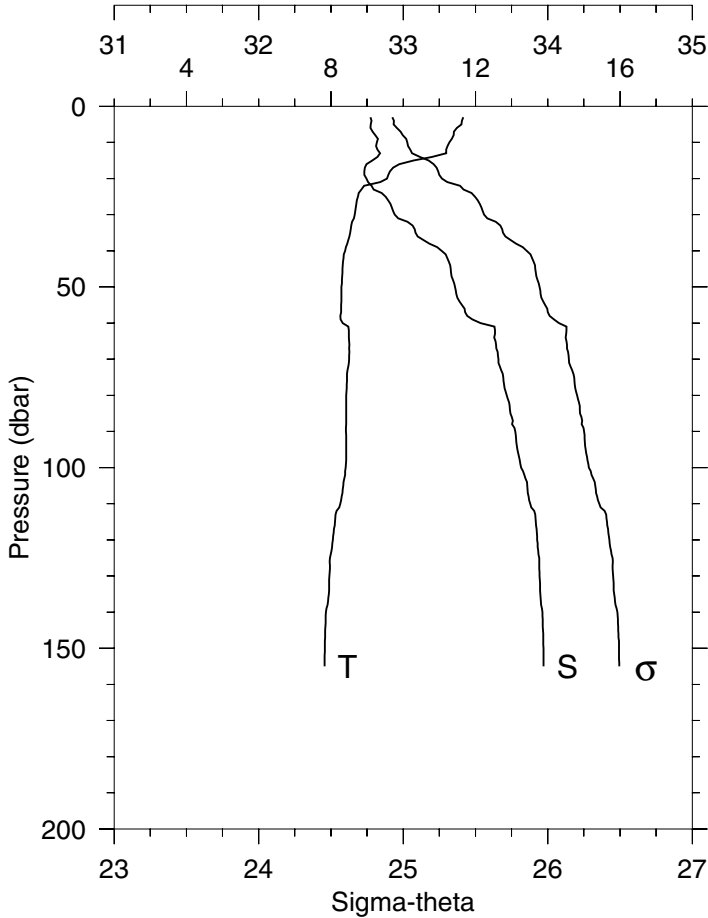
STA: 12 FM-4 LAT: 43 12.9 N LONG: 124 35.0 W
08 SEP 2004 2236 GMT DEPTH 88

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	11.29	32.782	11.29	24.998	0.089	0.81	76.9
10	11.15	32.782	11.15	25.022	0.295	0.99	77.4
20	9.17	32.780	9.16	25.354	0.574	0.84	84.4
30	8.63	32.924	8.63	25.550	0.826	0.25	87.2
40	8.48	33.259	8.47	25.836	1.054	0.16	88.0
50	8.15	33.422	8.15	26.013	1.260	0.13	88.3
60	8.08	33.526	8.07	26.106	1.454	0.13	88.0
70	8.35	33.781	8.34	26.266	1.636	0.13	83.7
80	8.32	33.813	8.31	26.296	1.810	0.13	81.6
82	8.31	33.820	8.30	26.302	1.844	0.13	81.4

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Station 13 FM-5
Temperature, Salinity

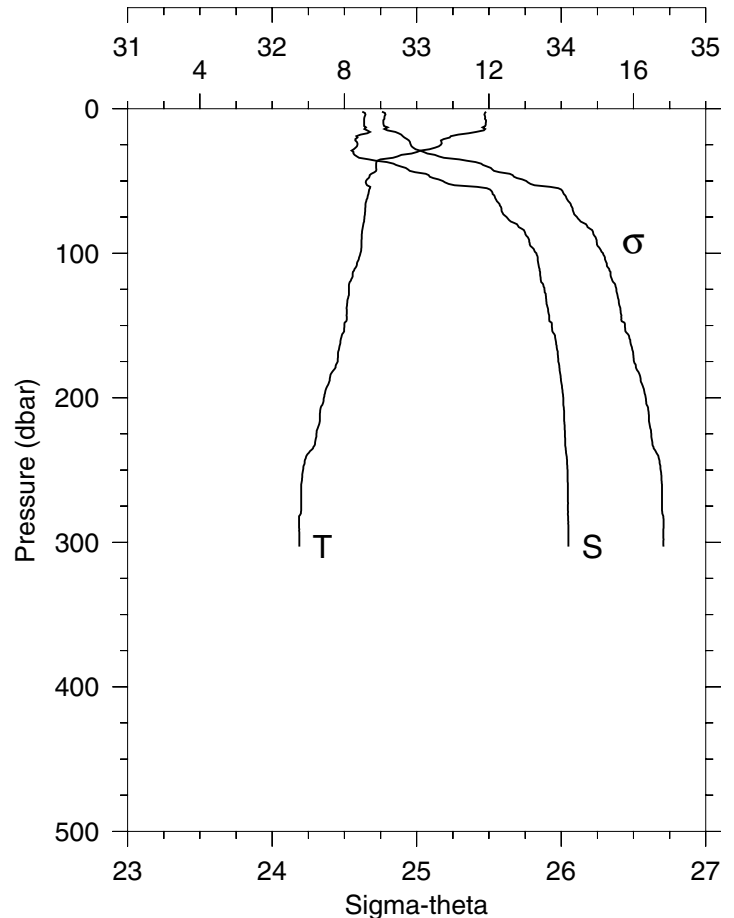
STA: 13 FM-5 LAT: 43 12.9 N LONG: 124 40.0 W
08 SEP 2004 2312 GMT DEPTH 157



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	11.66	32.774	11.66	24.924	0.091	0.98	77.4
10	11.28	32.817	11.28	25.027	0.299	2.15	73.5
20	9.55	32.746	9.55	25.267	0.580	1.25	83.4
30	8.66	32.941	8.66	25.560	0.831	0.23	87.5
40	8.39	33.266	8.39	25.855	1.059	0.15	88.2
50	8.29	33.359	8.29	25.943	1.268	0.14	88.2
60	8.32	33.536	8.32	26.077	1.470	0.13	88.1
70	8.50	33.658	8.49	26.146	1.659	0.13	87.9
80	8.42	33.717	8.41	26.204	1.843	0.13	87.8
90	8.42	33.776	8.41	26.252	2.023	0.13	87.4
100	8.41	33.816	8.40	26.285	2.199	0.13	86.8
110	8.26	33.878	8.25	26.356	2.370	0.13	82.8
120	8.05	33.927	8.04	26.426	2.533	0.13	79.8
130	7.96	33.943	7.95	26.452	2.693	0.14	79.9
140	7.86	33.963	7.85	26.482	2.851	0.13	75.6
150	7.83	33.970	7.81	26.492	3.007	0.14	67.7
155	7.82	33.971	7.81	26.494	3.085	0.14	66.3

Station 14 FM-6
Temperature, Salinity

STA: 14 FM-6 LAT: 43 13.1 N LONG: 124 45.0 W
08 SEP 2004 2352 GMT DEPTH 310

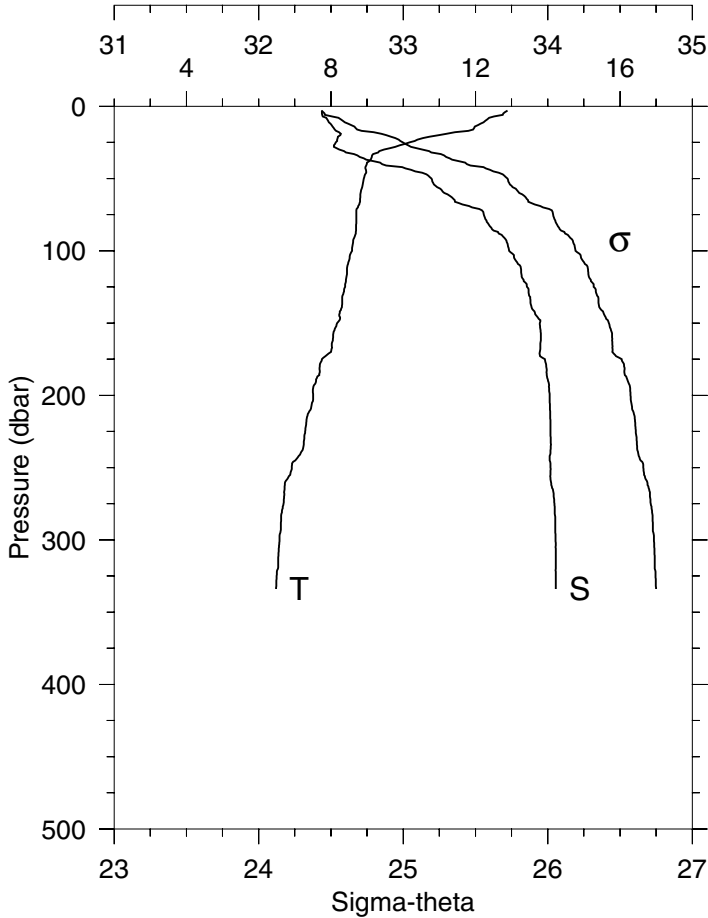


P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	11.92	32.624	11.92	24.760	0.064	0.82	76.7
10	11.91	32.636	11.91	24.770	0.317	0.81	77.1
20	10.91	32.590	10.91	24.915	0.628	0.68	81.4
30	10.01	32.562	10.01	25.048	0.926	0.46	84.2
40	8.88	32.892	8.87	25.488	1.196	0.21	87.6
50	8.60	33.181	8.59	25.758	1.432	0.16	88.2
60	8.65	33.536	8.64	26.028	1.641	0.14	88.1
70	8.57	33.587	8.57	26.079	1.836	0.13	88.0
80	8.52	33.693	8.51	26.171	2.027	0.13	87.7
90	8.48	33.775	8.47	26.241	2.208	0.13	86.9
100	8.44	33.829	8.43	26.289	2.385	0.13	87.0
110	8.31	33.846	8.30	26.324	2.557	0.13	87.2
120	8.15	33.862	8.14	26.360	2.726	0.13	87.7
130	8.11	33.894	8.10	26.391	2.892	0.14	87.5
140	8.06	33.910	8.05	26.411	3.056	0.13	87.0
150	8.00	33.936	7.98	26.441	3.219	0.13	86.7
175	7.81	33.980	7.80	26.503	3.612	0.13	83.2
200	7.43	34.014	7.41	26.585	3.989	0.13	83.5
225	7.23	34.025	7.20	26.623	4.353	0.13	85.2
250	6.86	34.044	6.83	26.689	4.707	0.13	86.5
275	6.81	34.046	6.78	26.698	5.051	0.13	85.9
300	6.75	34.049	6.72	26.707	5.394	0.13	83.5
303	6.75	34.049	6.72	26.708	5.435	0.13	83.5

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Station 15 FM-7
Temperature, Salinity

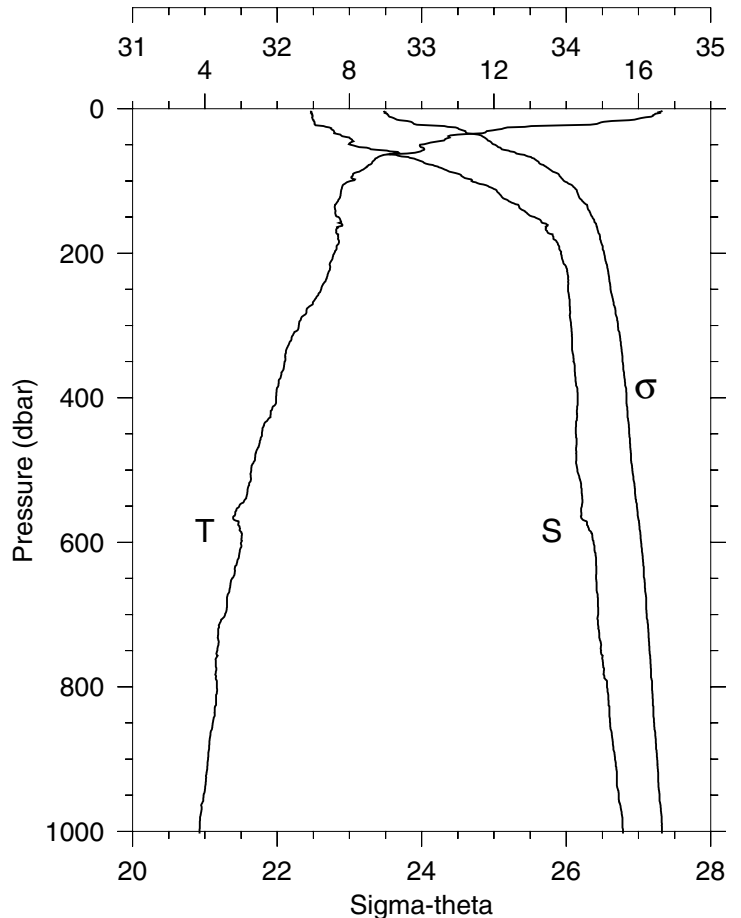
STA: 15 FM-7 LAT: 43 13.1 N LONG: 124 50.0 W
09 SEP 2004 0050 GMT DEPTH 342



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	12.88	32.439	12.88	24.433	0.105	0.60	77.6
10	12.28	32.479	12.27	24.581	0.344	0.76	77.7
20	10.99	32.564	10.99	24.882	0.669	0.58	82.6
30	9.47	32.557	9.47	25.132	0.964	0.35	85.9
40	8.99	32.855	8.98	25.442	1.231	0.23	87.5
50	8.91	33.195	8.90	25.721	1.468	0.14	88.2
60	8.82	33.284	8.82	25.803	1.692	0.14	88.2
70	8.74	33.477	8.74	25.967	1.905	0.14	87.8
80	8.70	33.578	8.69	26.053	2.103	0.14	87.2
90	8.66	33.690	8.65	26.147	2.296	0.14	86.6
100	8.58	33.732	8.57	26.192	2.480	0.13	86.5
110	8.46	33.806	8.45	26.269	2.660	0.13	86.7
120	8.41	33.832	8.40	26.297	2.835	0.13	86.5
130	8.34	33.869	8.33	26.337	3.006	0.13	87.0
140	8.28	33.891	8.27	26.363	3.175	0.13	87.1
150	8.17	33.945	8.16	26.422	3.340	0.13	85.0
175	7.75	33.980	7.73	26.512	3.740	0.13	87.3
200	7.51	34.013	7.49	26.573	4.118	0.13	87.0
225	7.29	34.019	7.26	26.610	4.485	0.13	86.6
250	6.92	34.019	6.89	26.661	4.845	0.13	88.2
275	6.69	34.046	6.66	26.713	5.191	0.13	86.3
300	6.57	34.054	6.55	26.735	5.529	0.13	84.9
334	6.48	34.056	6.45	26.749	5.984	0.13	84.9

Station 16 FM-8
Temperature, Salinity

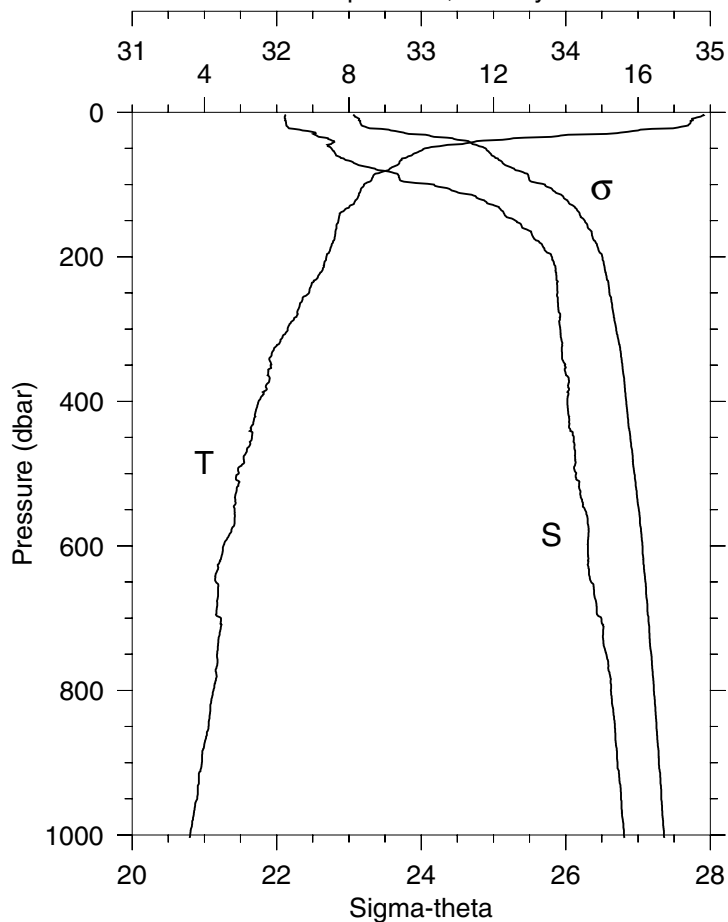
STA: 16 FM-8 LAT: 43 13.1 N LONG: 124 60.0 W
09 SEP 2004 0152 GMT DEPTH 1078



P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	16.66	32.237	16.66	23.474	0.132	0.18	84.9
10	16.40	32.246	16.40	23.541	0.438	0.18	85.0
20	14.91	32.260	14.91	23.881	0.857	0.31	84.3
30	11.97	32.389	11.97	24.568	1.221	0.55	83.5
40	10.77	32.499	10.77	24.870	1.543	0.25	87.3
50	9.95	32.507	9.95	25.014	1.845	0.19	87.9
60	9.91	32.834	9.90	25.277	2.130	0.16	88.2
70	8.71	32.961	8.70	25.568	2.385	0.14	88.5
80	8.48	33.112	8.47	25.721	2.621	0.13	88.6
90	8.10	33.252	8.10	25.888	2.842	0.13	88.6
100	8.03	33.345	8.02	25.971	3.050	0.12	88.5
110	7.79	33.490	7.78	26.120	3.246	0.12	88.5
120	7.75	33.547	7.74	26.171	3.433	0.12	88.5
130	7.65	33.621	7.64	26.244	3.616	0.12	88.4
140	7.61	33.694	7.59	26.307	3.791	0.12	88.4
150	7.69	33.780	7.68	26.362	3.961	0.12	88.4
175	7.69	33.906	7.67	26.463	4.368	0.13	88.3
200	7.58	33.963	7.56	26.524	4.759	0.13	88.2
225	7.43	34.006	7.41	26.580	5.136	0.13	88.3
250	7.22	34.013	7.20	26.614	5.503	0.13	88.3
275	6.87	34.025	6.84	26.672	5.861	0.13	88.3
300	6.60	34.034	6.57	26.716	6.206	0.13	88.4
350	6.20	34.050	6.17	26.780	6.870	0.13	88.5
400	5.97	34.079	5.94	26.833	7.510	0.13	88.5
450	5.58	34.067	5.54	26.872	8.133	0.12	88.7
500	5.28	34.077	5.24	26.915	8.737	0.12	88.7
600	5.00	34.189	4.95	27.037	9.870	0.13	88.5
800	4.33	34.282	4.27	27.187	11.893	0.13	88.7
1000	3.85	34.392	3.78	27.325	13.676	0.12	88.1
1003	3.85	34.392	3.78	27.326	13.701	0.13	88.1

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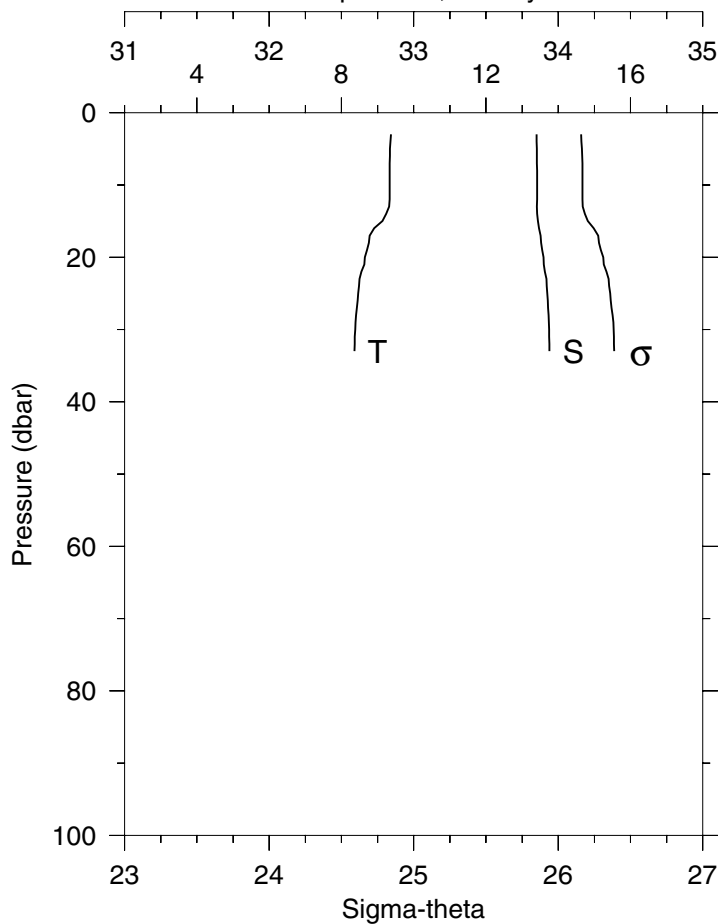
Station 17 FM-9
Temperature, Salinity



STA: 17 FM-9 LAT: 43 12.9 N LONG: 125 10.1 W
09 SEP 2004 0315 GMT DEPTH 1651

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	17.79	32.058	17.79	23.071	0.144	0.17	85.7
10	17.51	32.059	17.50	23.141	0.477	0.17	85.7
20	17.20	32.075	17.19	23.226	0.947	0.20	85.6
30	15.13	32.253	15.13	23.828	1.381	0.28	84.9
40	11.53	32.396	11.53	24.655	1.742	0.42	85.9
50	10.11	32.378	10.10	24.889	2.061	0.34	86.6
60	9.73	32.411	9.72	24.978	2.363	0.30	87.1
70	9.40	32.533	9.39	25.125	2.653	0.21	87.9
80	9.09	32.703	9.08	25.307	2.929	0.16	88.3
90	8.66	32.846	8.65	25.487	3.184	0.14	88.5
100	8.41	33.089	8.40	25.714	3.428	0.13	88.5
110	8.31	33.244	8.30	25.852	3.650	0.13	88.5
120	8.22	33.402	8.21	25.988	3.859	0.12	88.5
130	8.01	33.520	8.00	26.112	4.056	0.12	88.5
140	7.74	33.572	7.73	26.192	4.243	0.12	88.5
150	7.71	33.652	7.69	26.261	4.425	0.12	88.4
175	7.60	33.781	7.58	26.377	4.853	0.12	88.4
200	7.37	33.904	7.35	26.507	5.254	0.12	88.5
225	7.17	33.934	7.15	26.559	5.636	0.12	88.5
250	6.89	33.943	6.87	26.604	6.005	0.12	88.5
275	6.58	33.950	6.55	26.652	6.364	0.13	88.5
300	6.30	33.962	6.28	26.697	6.714	0.12	88.6
350	5.83	33.993	5.80	26.782	7.381	0.12	88.6
400	5.50	34.012	5.47	26.837	8.019	0.12	88.6
450	5.31	34.056	5.28	26.895	8.634	0.12	88.7
500	4.95	34.072	4.91	26.950	9.223	0.12	88.7
600	4.53	34.154	4.48	27.062	10.323	0.12	88.8
800	4.25	34.312	4.19	27.219	12.294	0.12	88.3
1000	3.60	34.403	3.53	27.358	14.005	0.13	88.8
1004	3.59	34.406	3.52	27.362	14.036	0.12	88.8

Station 18 RR-1
Temperature, Salinity

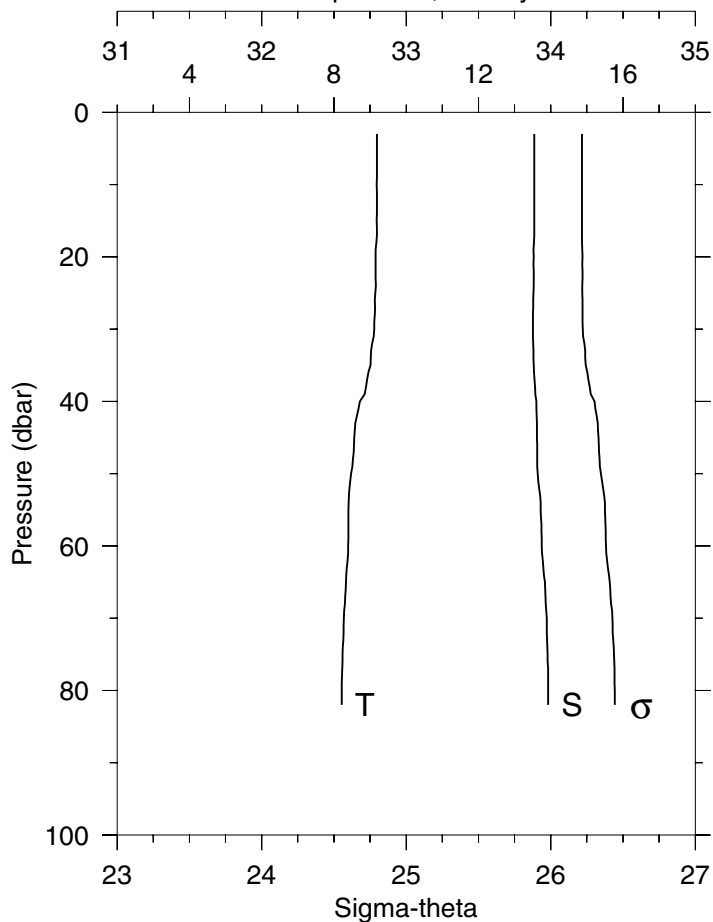


STA: 18 RR-1 LAT: 42 30.0 N LONG: 124 29.9 W
09 SEP 2004 1446 GMT DEPTH 37

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	9.37	33.851	9.37	26.159	0.055	0.77	78.0
10	9.34	33.854	9.34	26.167	0.184	0.85	78.2
20	8.65	33.898	8.65	26.311	0.363	0.33	81.8
30	8.38	33.937	8.38	26.383	0.530	0.18	81.9
33	8.36	33.939	8.36	26.387	0.579	0.18	81.7

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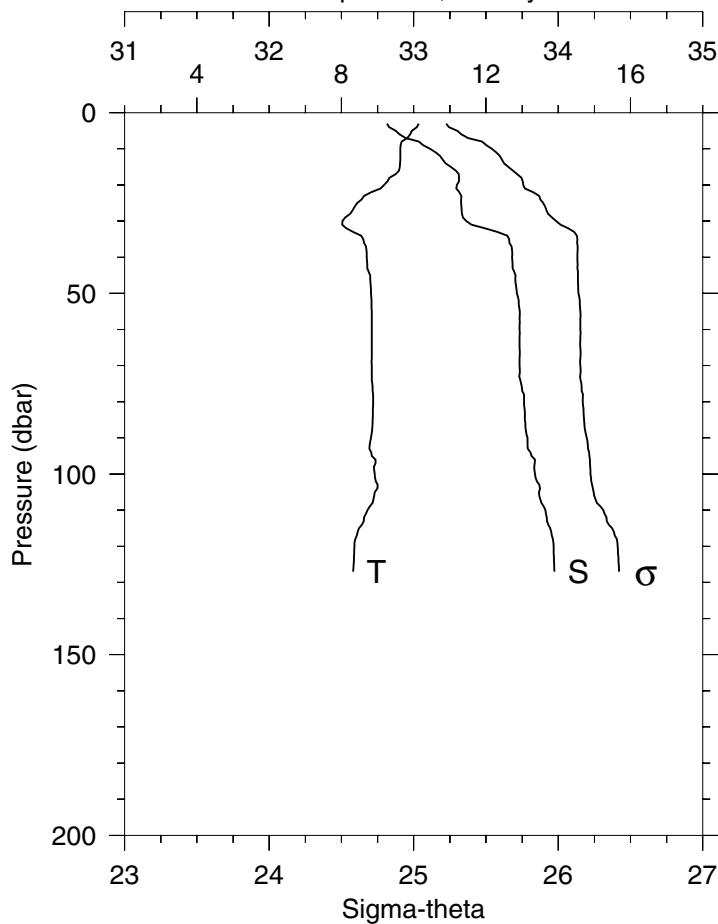
Station 19 RR-2
Temperature, Salinity



STA: 19 RR-2 LAT: 42 30.0 N LONG: 124 36.0 W
09 SEP 2004 1527 GMT DEPTH 87

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	9.19	33.885	9.19	26.216	0.054	0.63	78.8
10	9.19	33.886	9.18	26.217	0.179	0.76	78.7
20	9.15	33.882	9.15	26.219	0.359	0.75	78.9
30	9.12	33.876	9.11	26.221	0.538	0.66	79.4
40	8.72	33.900	8.71	26.302	0.715	0.32	81.5
50	8.48	33.909	8.47	26.347	0.884	0.18	83.9
60	8.39	33.938	8.39	26.382	1.050	0.15	83.0
70	8.27	33.972	8.27	26.427	1.212	0.16	81.9
80	8.22	33.981	8.21	26.443	1.372	0.14	79.9
82	8.22	33.981	8.21	26.443	1.404	0.15	79.9

Station 20 RR-3
Temperature, Salinity

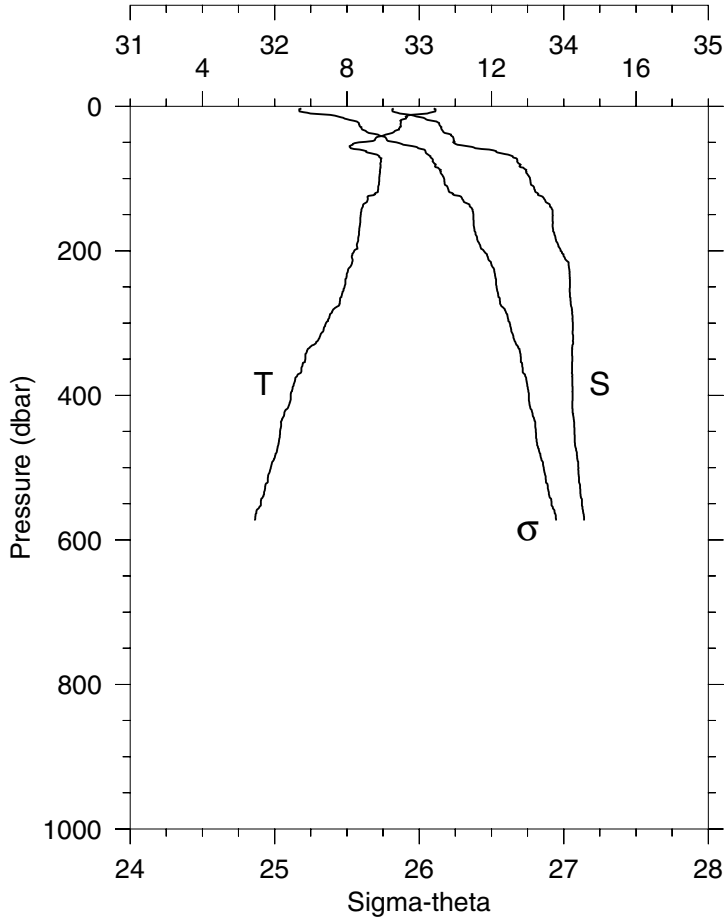


STA: 20 RR-3 LAT: 42 29.9 N LONG: 124 42.0 W
09 SEP 2004 1608 GMT DEPTH 133

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	10.14	32.816	10.14	25.224	0.082	0.23	85.4
10	9.63	33.113	9.63	25.540	0.264	0.30	85.4
20	9.18	33.299	9.18	25.758	0.496	0.29	85.6
30	8.02	33.364	8.02	25.986	0.707	0.14	88.3
40	8.70	33.680	8.69	26.133	0.897	0.20	86.0
50	8.82	33.714	8.81	26.141	1.085	0.20	85.5
60	8.84	33.733	8.83	26.153	1.272	0.22	85.1
70	8.84	33.732	8.83	26.153	1.458	0.23	85.1
80	8.88	33.763	8.87	26.170	1.644	0.24	84.0
90	8.82	33.787	8.81	26.198	1.828	0.24	84.1
100	8.92	33.840	8.91	26.224	2.009	0.33	82.1
110	8.72	33.912	8.71	26.312	2.187	0.25	81.7
120	8.36	33.968	8.35	26.411	2.354	0.14	83.3
127	8.33	33.974	8.31	26.421	2.468	0.14	82.2

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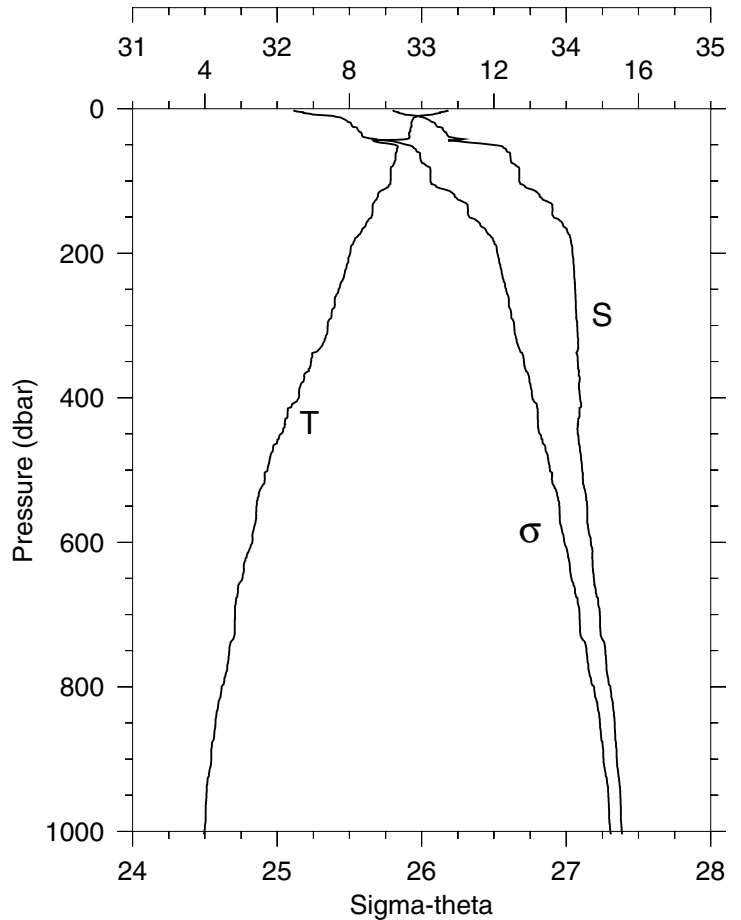
Station 21 RR-4
Temperature, Salinity



STA: 21 RR-4 LAT: 42 29.9 N LONG: 124 48.0 W
09 SEP 2004 1652 GMT DEPTH 605

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	10.40	32.823	10.40	25.185	0.083	0.35	82.6
10	10.22	32.865	10.22	25.248	0.277	0.41	82.9
20	9.48	33.089	9.48	25.546	0.530	0.36	85.3
30	9.45	33.152	9.45	25.600	0.770	0.37	85.3
40	9.03	33.220	9.03	25.720	1.004	0.25	87.0
50	8.33	33.236	8.32	25.841	1.226	0.15	88.2
60	8.35	33.484	8.34	26.033	1.433	0.16	87.7
70	8.89	33.647	8.89	26.077	1.628	0.19	86.8
80	8.93	33.698	8.92	26.112	1.821	0.25	84.7
90	8.91	33.742	8.90	26.149	2.010	0.24	84.5
100	8.89	33.766	8.88	26.171	2.196	0.23	84.5
110	8.87	33.787	8.86	26.191	2.381	0.23	83.8
120	8.79	33.818	8.78	26.228	2.564	0.21	84.3
130	8.57	33.871	8.55	26.304	2.740	0.16	84.8
140	8.43	33.913	8.41	26.358	2.911	0.14	85.0
150	8.38	33.923	8.37	26.374	3.078	0.14	84.2
175	8.33	33.933	8.31	26.389	3.495	0.14	83.3
200	8.20	33.979	8.18	26.446	3.906	0.13	84.1
225	8.04	34.038	8.02	26.516	4.300	0.13	86.4
250	7.93	34.042	7.91	26.536	4.685	0.13	86.7
275	7.78	34.050	7.76	26.564	5.065	0.13	87.0
300	7.42	34.063	7.39	26.626	5.434	0.13	87.2
350	6.85	34.059	6.81	26.703	6.143	0.13	87.3
400	6.45	34.061	6.41	26.758	6.822	0.12	87.3
450	6.15	34.074	6.11	26.807	7.479	0.12	87.3
500	5.89	34.101	5.85	26.861	8.117	0.13	86.1
573	5.46	34.141	5.41	26.946	9.001	0.13	85.7

Station 22 RR-5
Temperature, Salinity

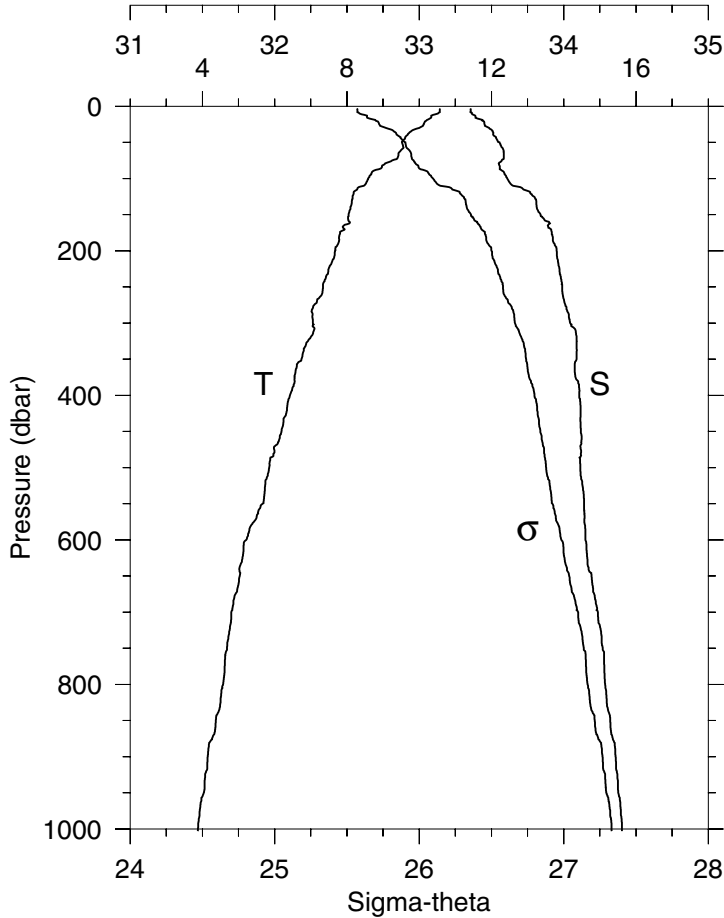


STA: 22 RR-5 LAT: 42 30.0 N LONG: 124 54.0 W
09 SEP 2004 1748 GMT DEPTH 1159

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
2	10.70	32.800	10.70	25.115	0.057	0.30	82.5
10	9.90	32.975	9.90	25.388	0.277	0.36	83.5
20	9.71	33.092	9.71	25.511	0.528	0.38	84.4
30	9.69	33.151	9.68	25.562	0.773	0.33	85.1
40	9.65	33.213	9.65	25.615	1.013	0.33	84.9
50	9.25	33.485	9.25	25.894	1.235	0.33	86.0
60	9.30	33.596	9.30	25.972	1.441	0.27	85.2
70	9.28	33.616	9.27	25.992	1.643	0.29	85.1
80	9.18	33.663	9.17	26.045	1.843	0.25	84.9
90	9.14	33.675	9.13	26.060	2.039	0.23	85.3
100	9.14	33.676	9.13	26.061	2.234	0.24	85.4
110	9.01	33.731	9.00	26.125	2.428	0.20	85.8
120	8.79	33.815	8.78	26.226	2.612	0.17	86.6
130	8.68	33.885	8.66	26.298	2.790	0.15	87.0
140	8.64	33.905	8.62	26.320	2.962	0.14	87.0
150	8.61	33.914	8.59	26.331	3.134	0.14	87.1
175	8.25	34.023	8.23	26.472	3.543	0.13	86.7
200	8.02	34.044	8.00	26.523	3.931	0.13	87.1
225	7.88	34.055	7.86	26.553	4.312	0.13	87.2
250	7.70	34.062	7.68	26.585	4.687	0.13	87.2
275	7.58	34.066	7.56	26.605	5.056	0.13	87.4
300	7.40	34.076	7.37	26.640	5.419	0.13	87.9
350	6.93	34.081	6.90	26.708	6.127	0.13	88.1
400	6.59	34.096	6.56	26.766	6.803	0.13	88.1
450	6.11	34.080	6.07	26.817	7.452	0.13	86.4
500	5.73	34.110	5.69	26.887	8.075	0.13	87.3
600	5.31	34.171	5.26	26.987	9.245	0.13	87.6
800	4.46	34.306	4.40	27.192	11.332	0.13	88.3
1000	3.99	34.384	3.91	27.306	13.115	0.13	87.2
1004	3.98	34.386	3.90	27.308	13.149	0.13	87.3

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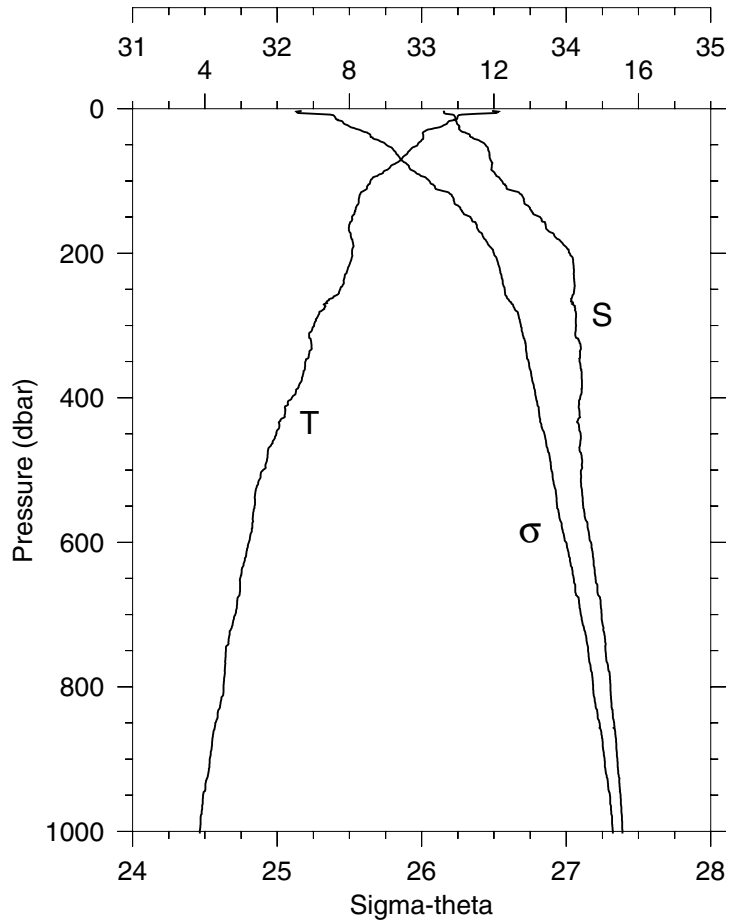
Station 23 RR-6
Temperature, Salinity



STA: 23 RR-6 LAT: 42 30.0 N LONG: 125 0.2 W
09 SEP 2004 1859 GMT DEPTH 1775

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	10.58	33.353	10.58	25.568	0.072	0.22	84.3
10	10.52	33.364	10.52	25.587	0.240	0.27	84.3
20	10.20	33.438	10.19	25.700	0.474	0.36	84.9
30	10.00	33.484	10.00	25.770	0.700	0.38	85.2
40	9.66	33.513	9.66	25.848	0.918	0.37	85.4
50	9.52	33.555	9.51	25.905	1.130	0.35	85.5
60	9.52	33.581	9.51	25.926	1.339	0.30	85.6
70	9.41	33.585	9.40	25.946	1.546	0.30	86.0
80	9.04	33.551	9.03	25.978	1.751	0.19	87.2
90	8.71	33.582	8.70	26.055	1.952	0.15	87.8
100	8.59	33.610	8.58	26.096	2.146	0.13	88.1
110	8.46	33.650	8.45	26.146	2.337	0.13	88.1
120	8.19	33.768	8.17	26.281	2.516	0.13	88.2
130	8.14	33.809	8.13	26.320	2.689	0.13	88.3
140	8.10	33.813	8.08	26.329	2.861	0.13	88.2
150	8.05	33.840	8.03	26.358	3.030	0.13	88.3
175	7.81	33.918	7.79	26.455	3.441	0.13	88.3
200	7.67	33.951	7.65	26.501	3.835	0.13	88.3
225	7.49	33.970	7.47	26.543	4.221	0.13	88.3
250	7.33	33.989	7.31	26.580	4.597	0.13	88.1
275	7.09	34.011	7.07	26.631	4.965	0.13	88.4
300	7.06	34.045	7.03	26.663	5.321	0.13	88.3
350	6.74	34.088	6.71	26.740	6.008	0.13	88.2
400	6.42	34.107	6.39	26.798	6.671	0.13	88.5
450	6.19	34.118	6.15	26.837	7.311	0.13	88.5
500	5.85	34.115	5.81	26.878	7.934	0.13	88.5
600	5.21	34.150	5.16	26.983	9.121	0.12	88.7
800	4.57	34.286	4.51	27.164	11.210	0.12	88.3
1000	3.88	34.402	3.80	27.331	12.996	0.13	88.1
1003	3.87	34.403	3.80	27.332	13.021	0.12	88.0

Station 24 RR-7
Temperature, Salinity



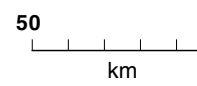
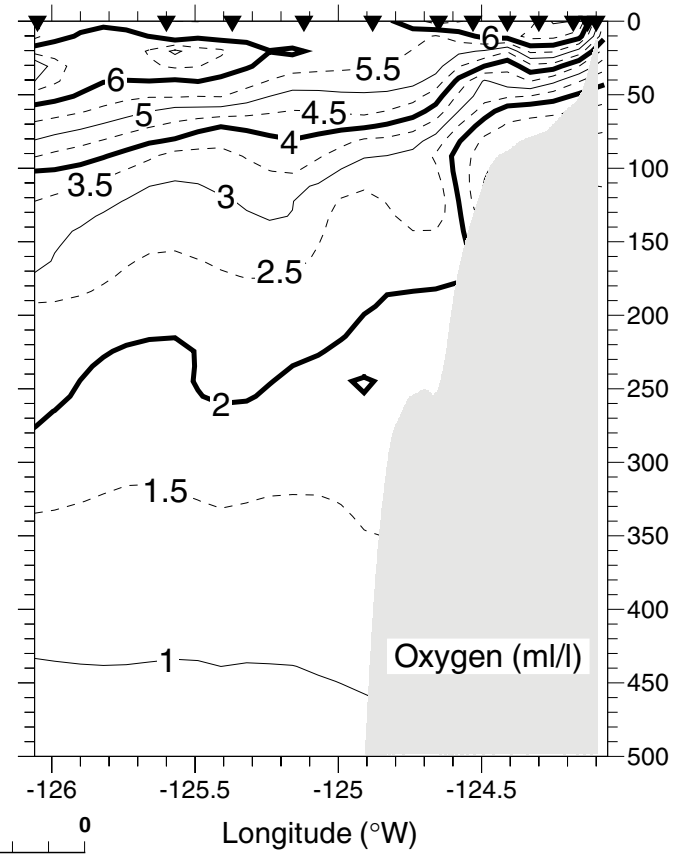
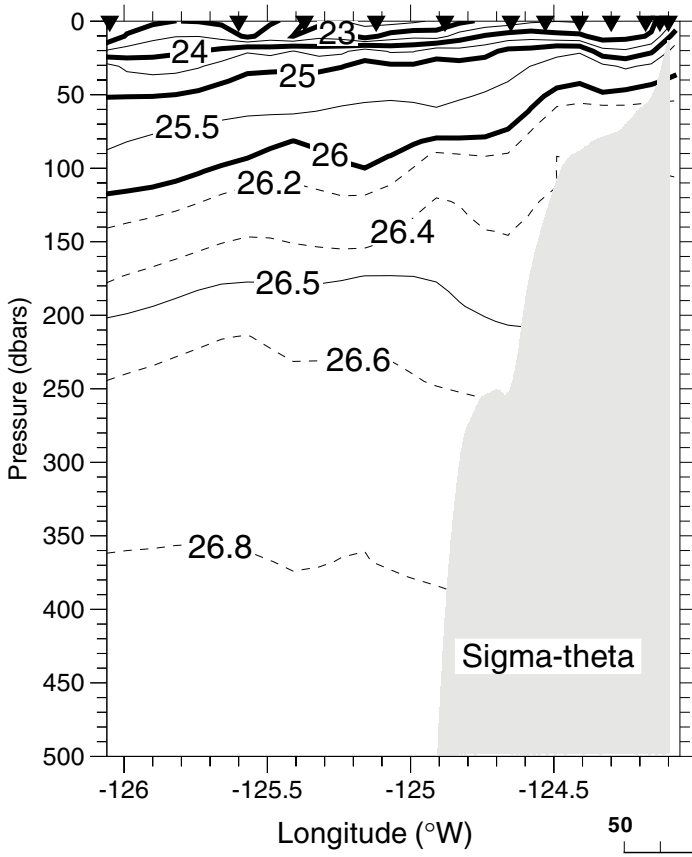
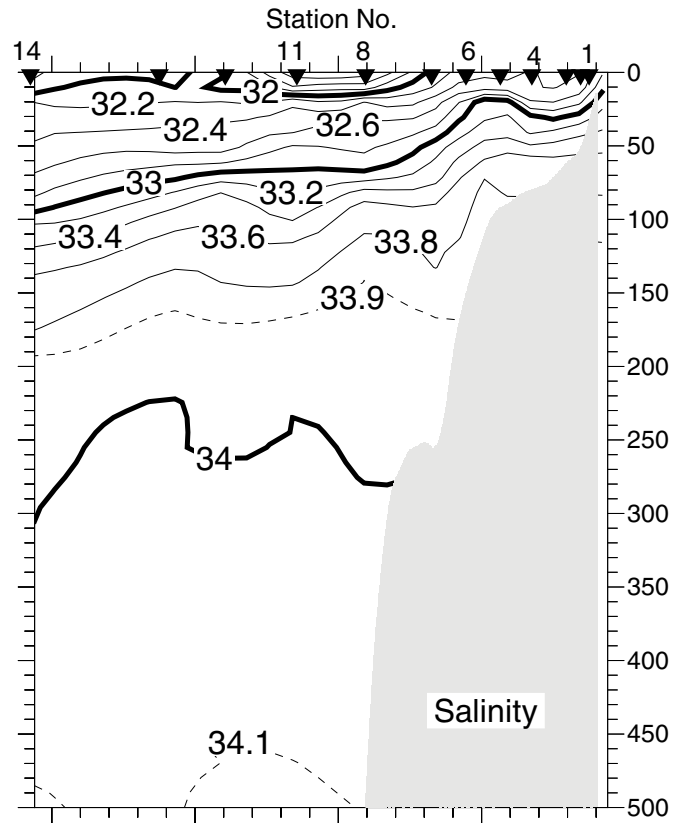
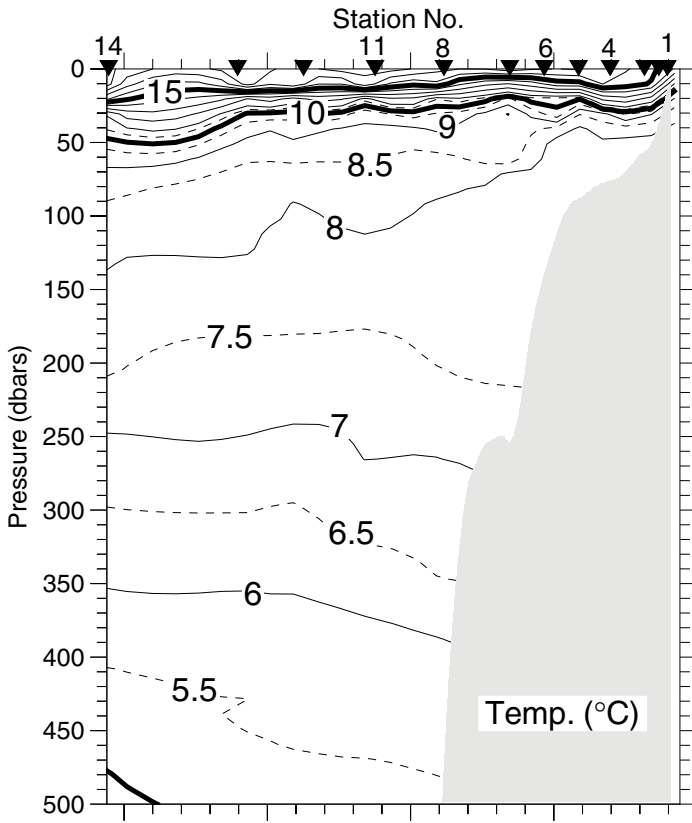
STA: 24 RR-7 LAT: 42 30.0 N LONG: 125 12.1 W
09 SEP 2004 2036 GMT DEPTH 2977

P (DB)	T (C)	S	POT T (C)	SIGMA THETA	DYN HT (J/KG)	FL (V)	TRN (%)
3	11.95	33.158	11.95	25.169	0.084	0.22	84.3
10	11.00	33.226	11.00	25.395	0.274	0.28	85.1
20	10.71	33.244	10.70	25.460	0.529	0.33	85.3
30	10.12	33.268	10.12	25.580	0.775	0.32	86.4
40	10.05	33.353	10.04	25.660	1.011	0.25	86.7
50	9.89	33.441	9.88	25.755	1.239	0.20	87.1
60	9.62	33.467	9.62	25.819	1.460	0.19	87.2
70	9.44	33.475	9.44	25.854	1.676	0.19	87.3
80	9.14	33.485	9.13	25.912	1.888	0.17	87.6
90	8.89	33.508	8.88	25.968	2.096	0.16	87.9
100	8.58	33.555	8.57	26.053	2.296	0.14	88.1
110	8.49	33.587	8.48	26.093	2.490	0.13	88.2
120	8.28	33.694	8.27	26.209	2.677	0.13	88.3
130	8.25	33.711	8.24	26.226	2.858	0.13	88.3
140	8.17	33.755	8.15	26.273	3.036	0.13	88.3
150	8.07	33.819	8.06	26.338	3.210	0.13	88.3
175	8.03	33.916	8.02	26.420	3.627	0.13	88.2
200	8.07	34.023	8.05	26.499	4.025	0.13	87.8
225	7.93	34.053	7.91	26.544	4.409	0.13	87.8
250	7.74	34.056	7.72	26.574	4.787	0.13	87.9
275	7.31	34.058	7.29	26.638	5.155	0.13	87.4
300	7.02	34.069	6.99	26.686	5.507	0.13	88.0
350	6.78	34.092	6.75	26.739	6.192	0.13	88.2
400	6.41	34.096	6.37	26.791	6.856	0.13	88.5
450	5.98	34.099	5.94	26.849	7.497	0.13	88.5
500	5.61	34.104	5.57	26.898	8.111	0.13	88.5
600	5.22	34.171	5.17	26.999	9.281	0.13	88.2
800	4.52	34.306	4.45	27.186	11.343	0.13	87.7
1000	3.86	34.389	3.79	27.322	13.119	0.12	88.6
1003	3.86	34.389	3.78	27.323	13.144	0.13	88.6

Vertical Sections

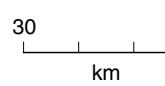
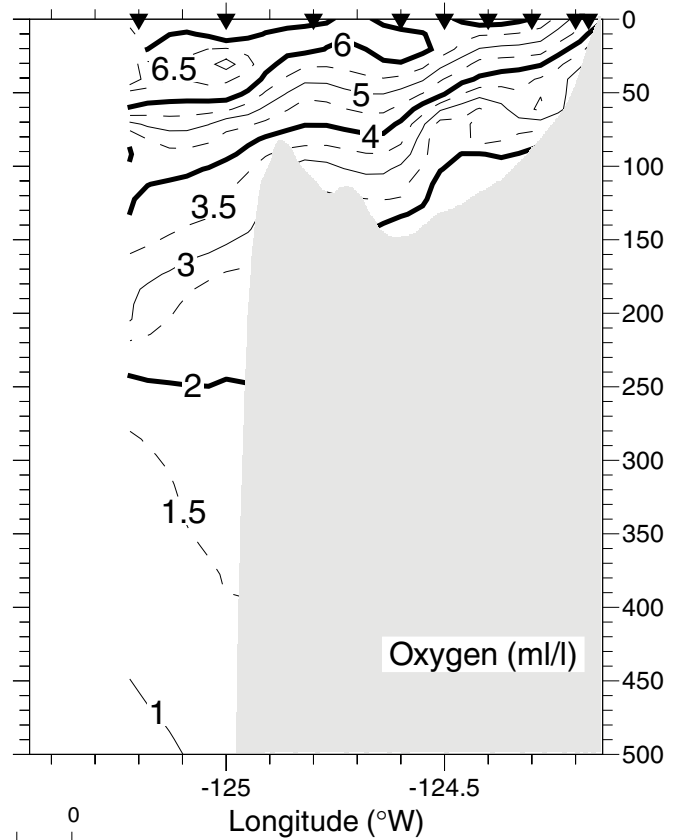
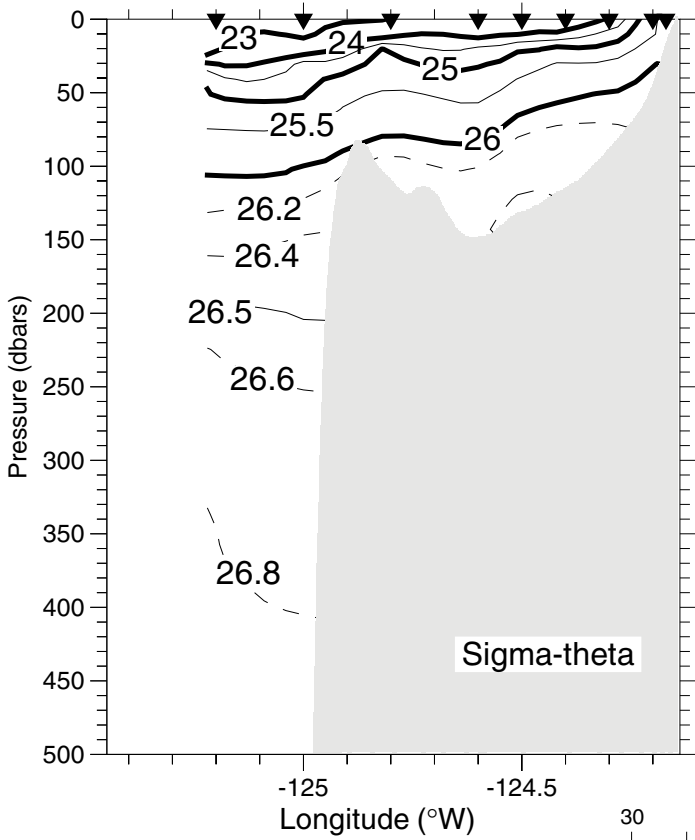
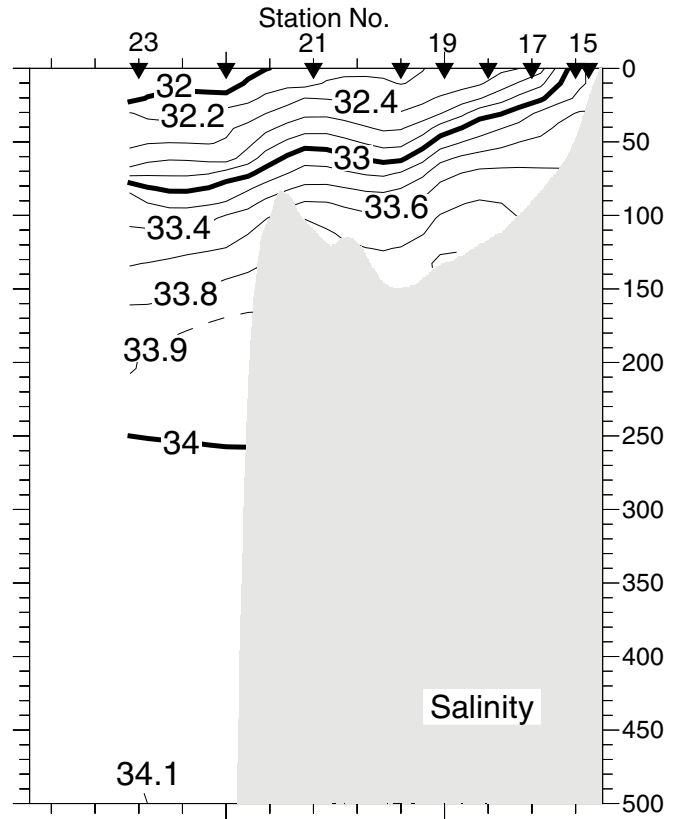
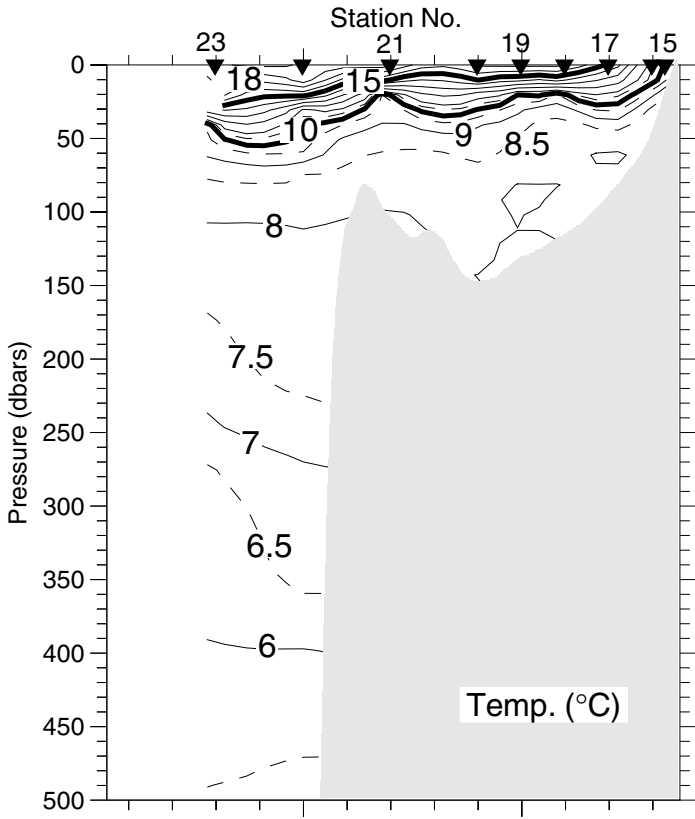
Vertical Distributions of Temperature, Salinity, Sigma-t, and Dissolved Oxygen

Newport Hydrographic Line 44°39'N
30 August - 1 September 2004



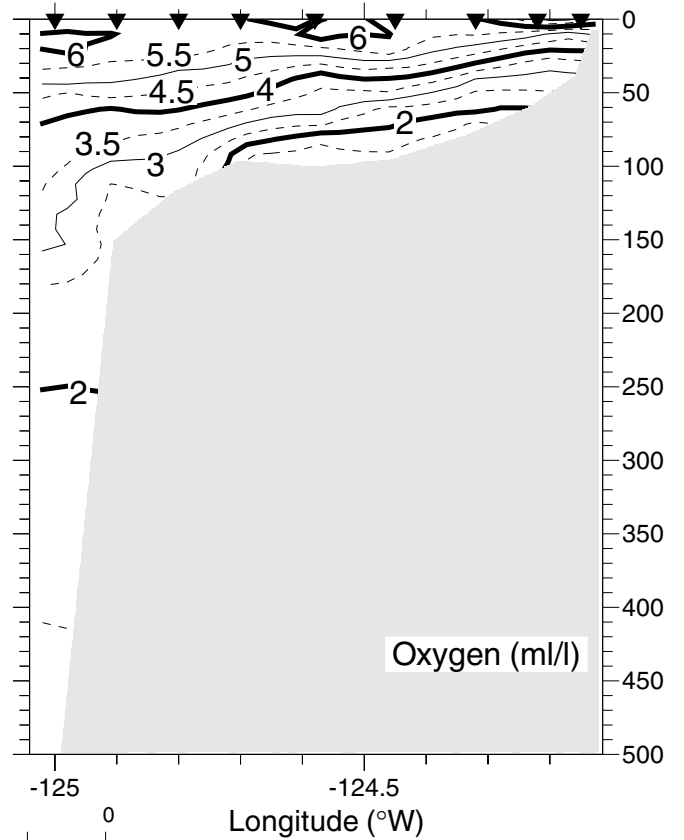
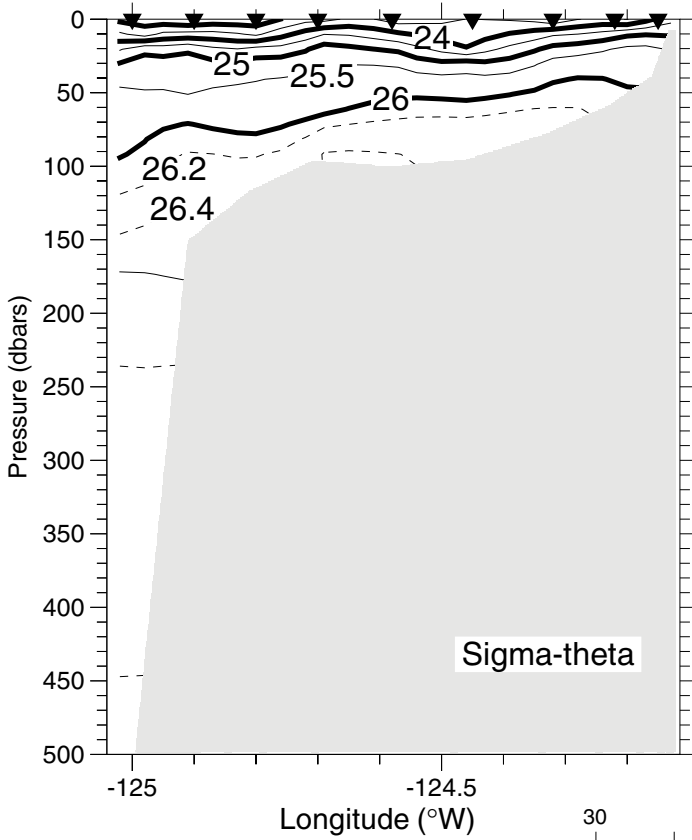
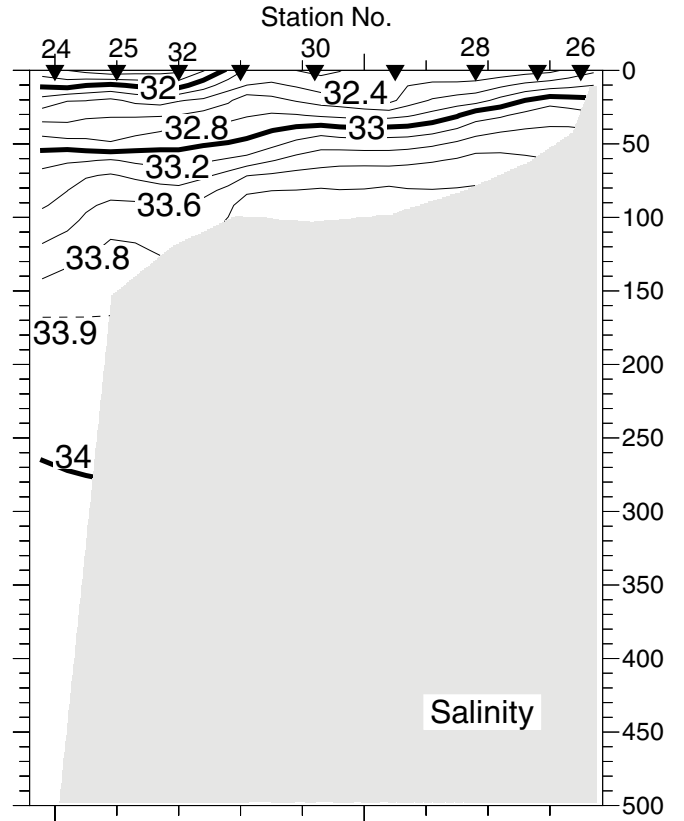
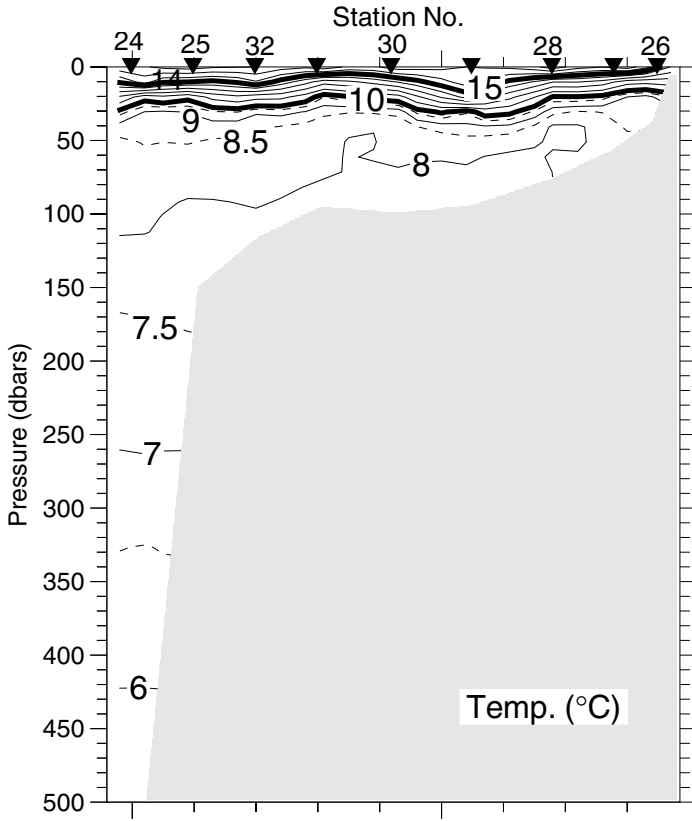
Heceta Head Hydrographic Line 44°00'N

1-2 September 2004



Strawberry Hill Hydrographic Line 43°13'N

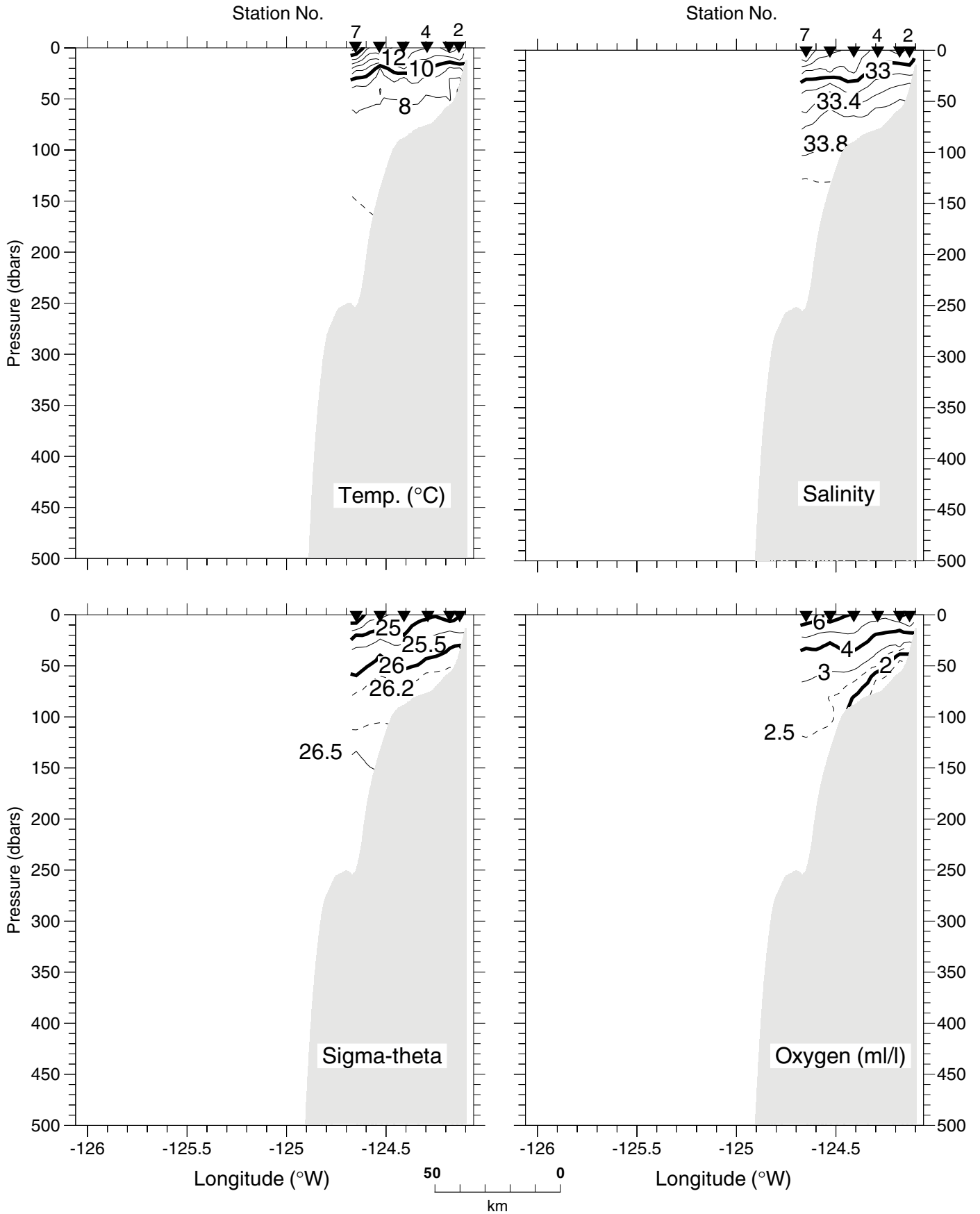
2 September 2004



30 0 km

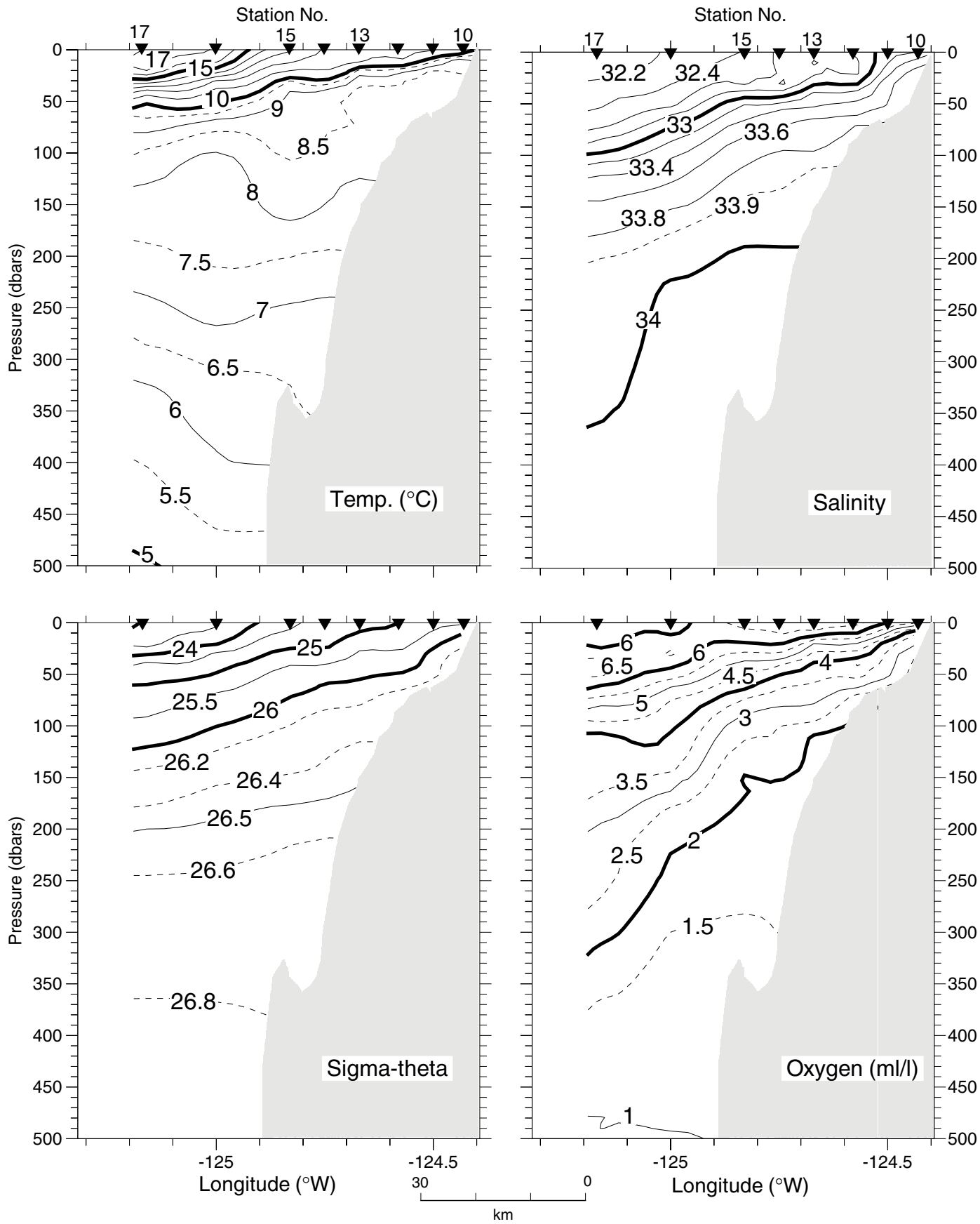
Newport Hydrographic Line 44°39'N

7-8 September 2004



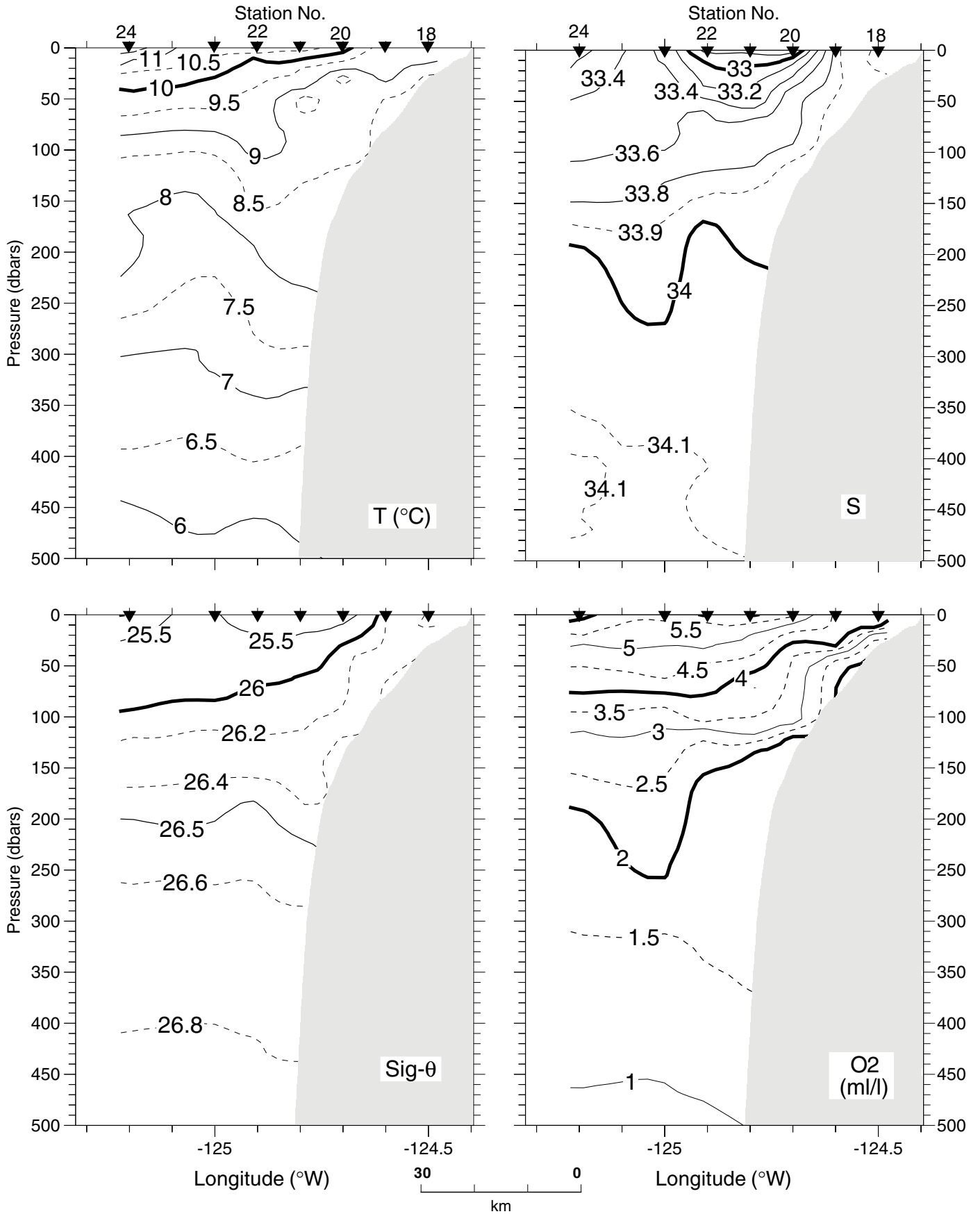
Five Mile Hydrographic Line 43°13'N

8-9 September 2004



Rogue River Hydrographic Line 42°30'N

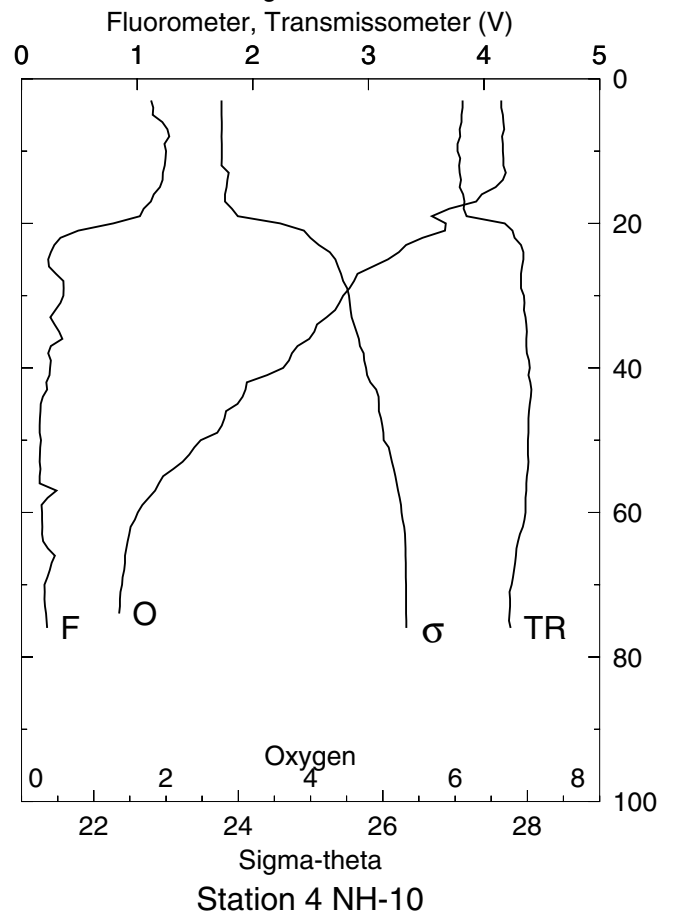
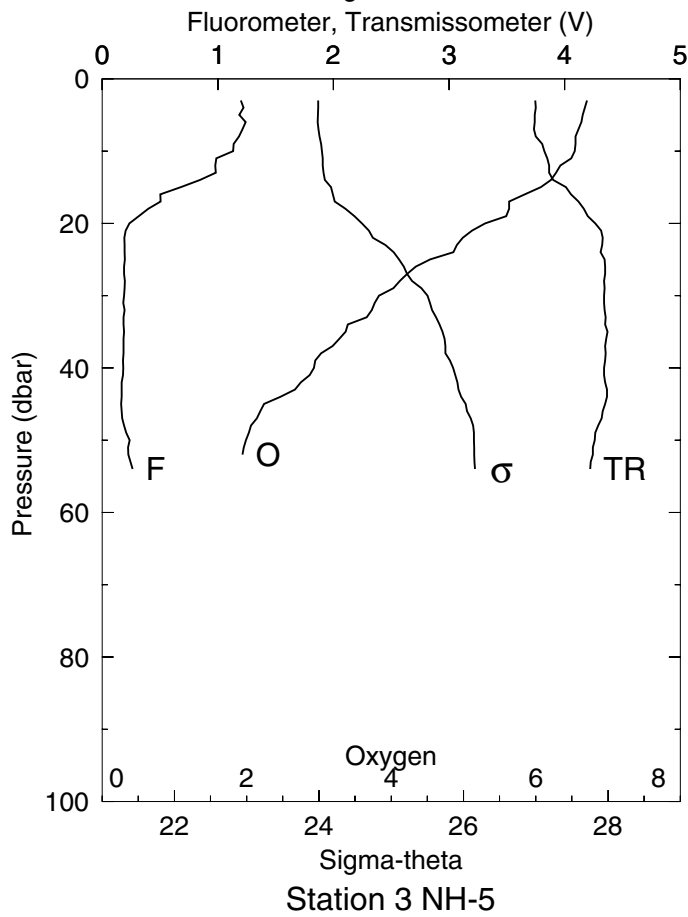
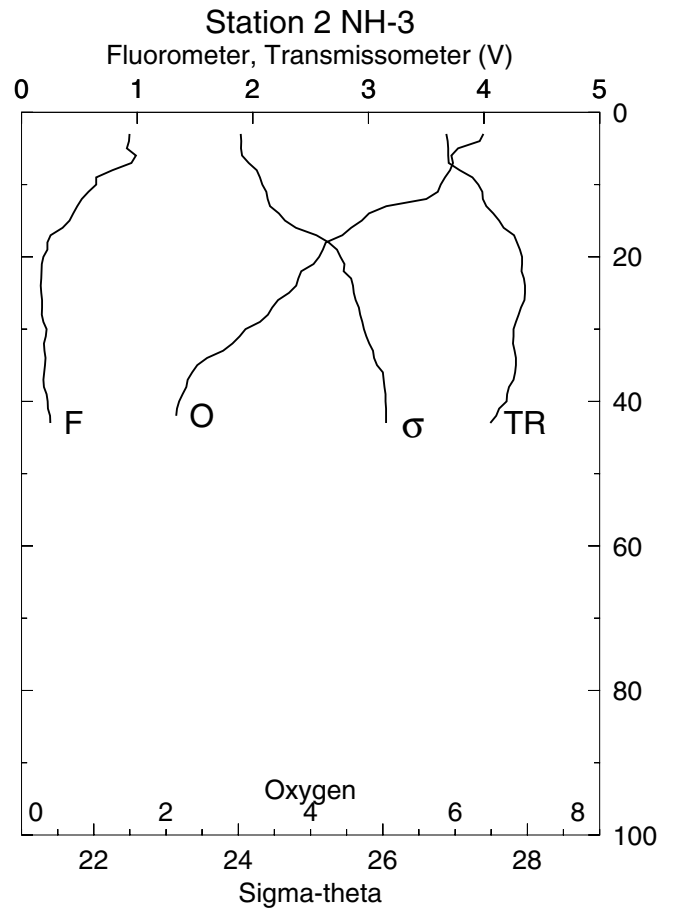
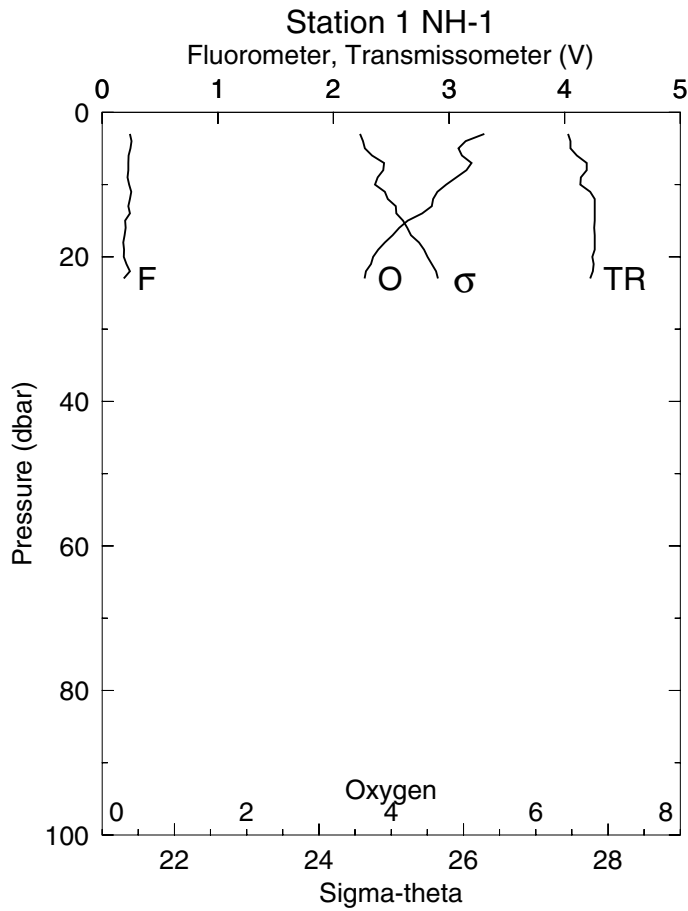
9 September 2004

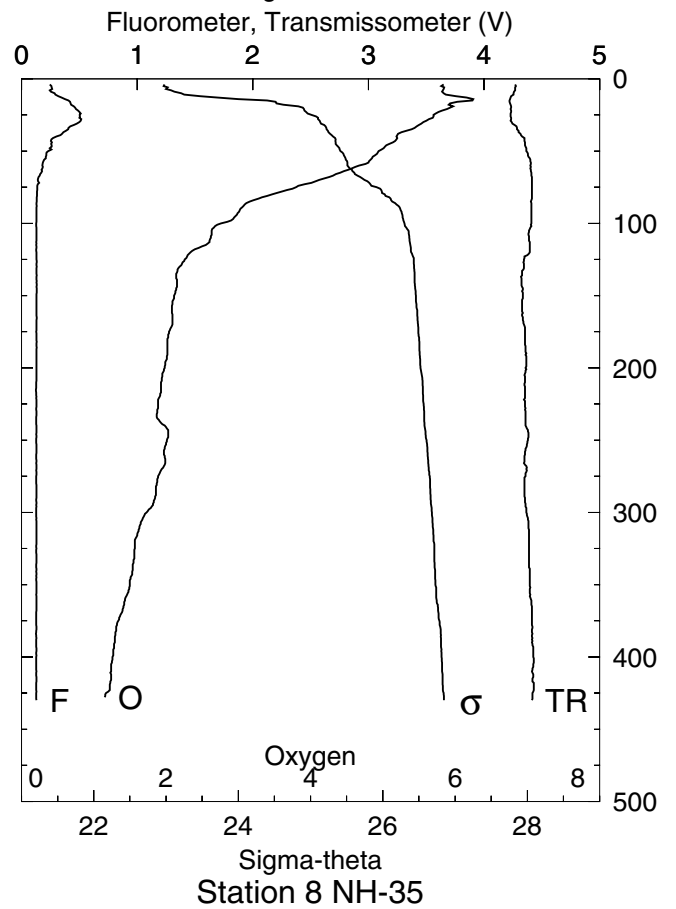
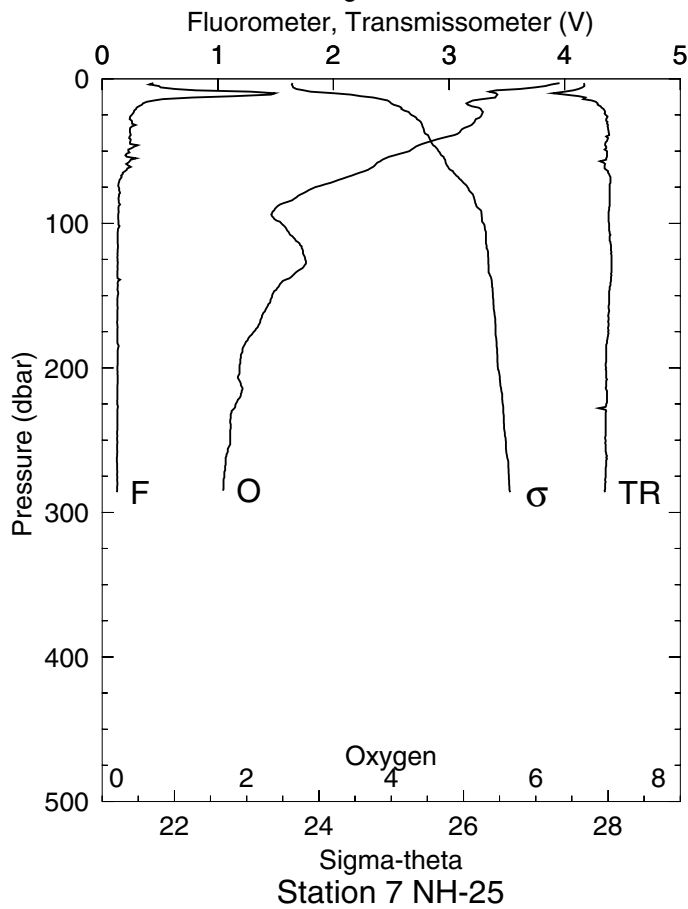
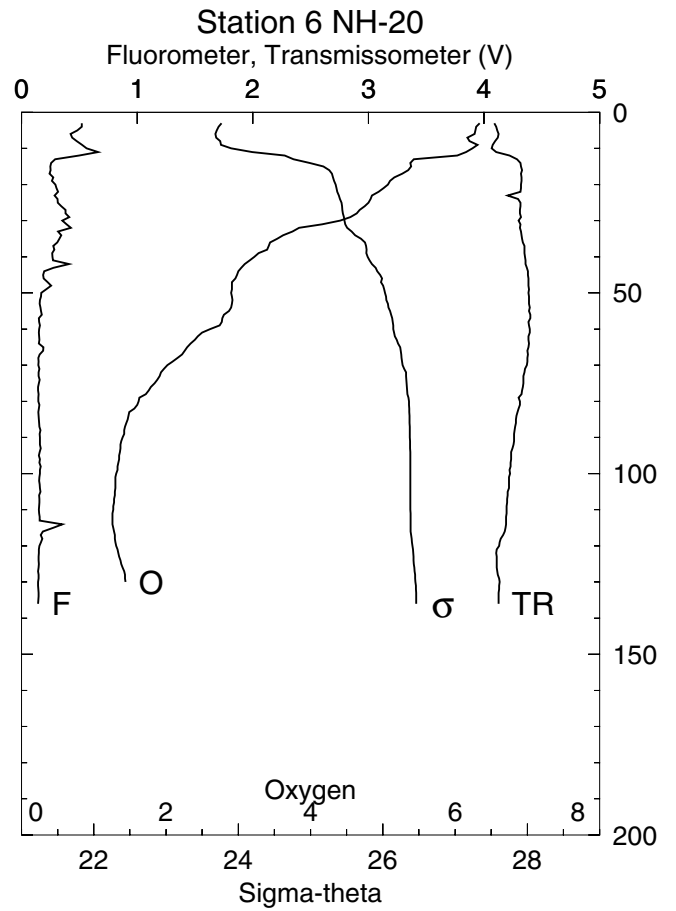
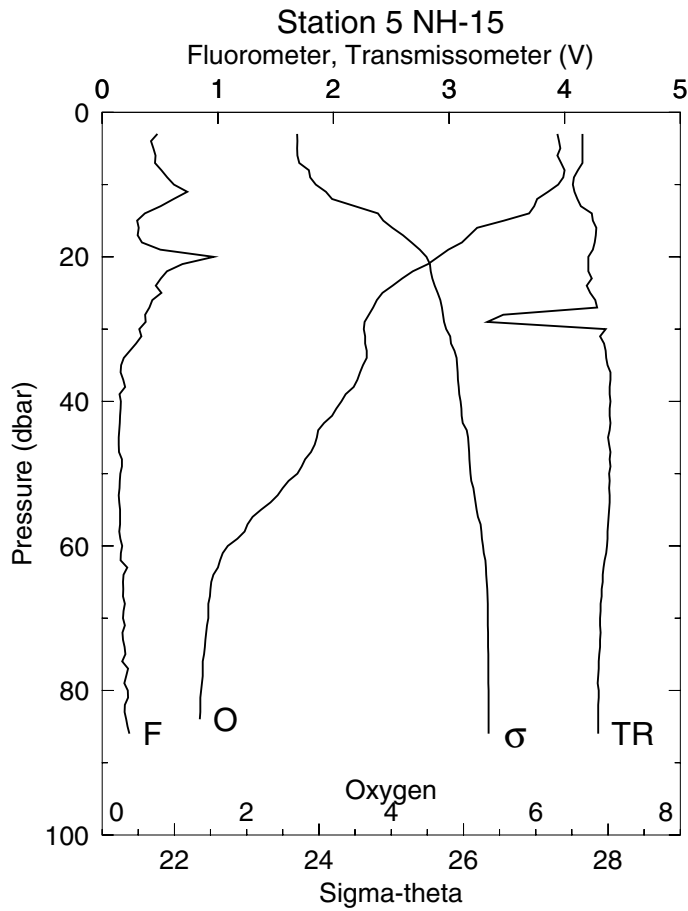


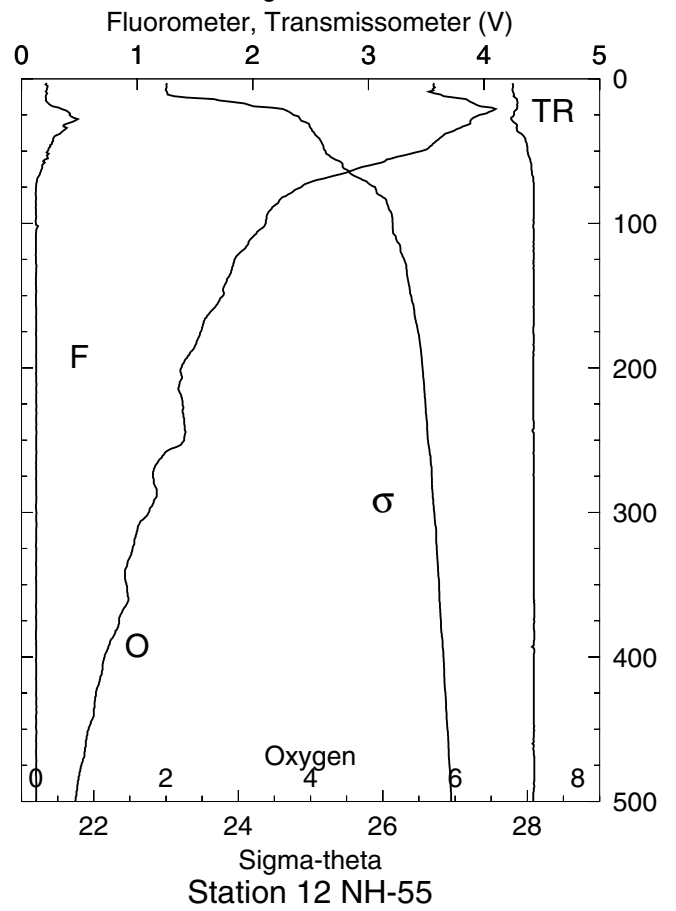
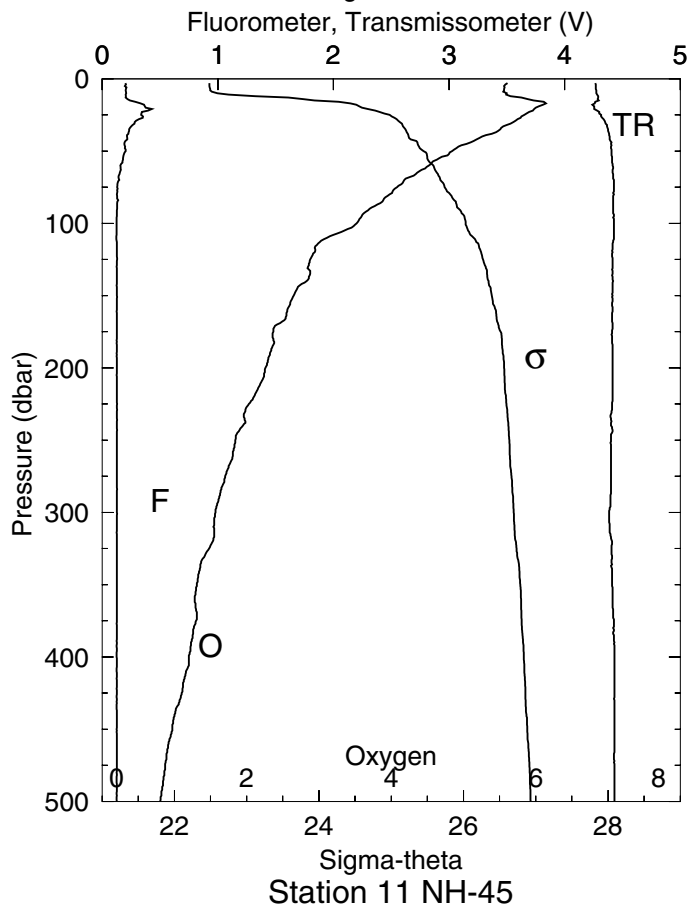
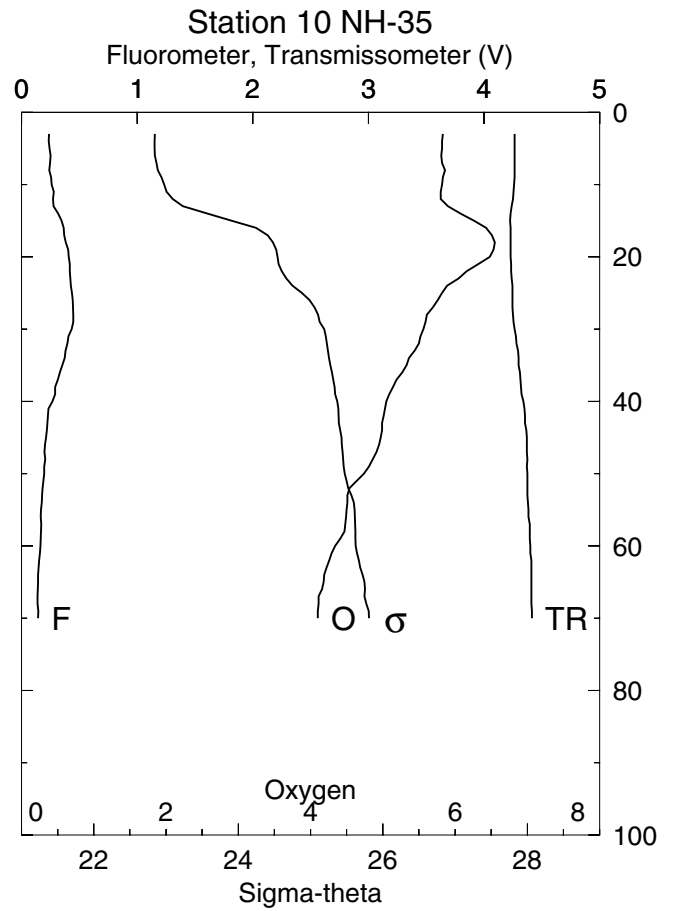
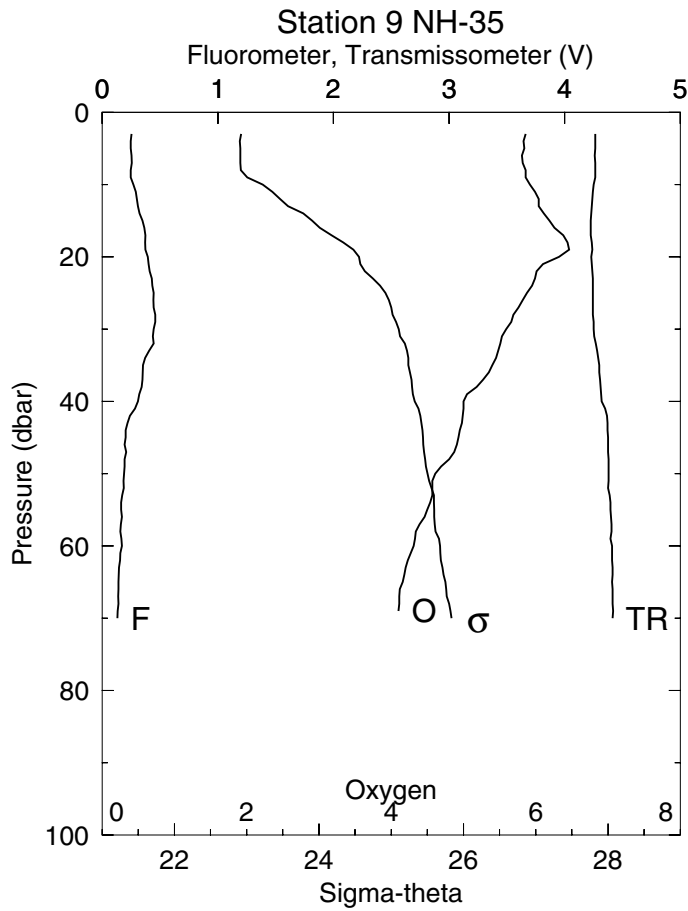
Appendix A

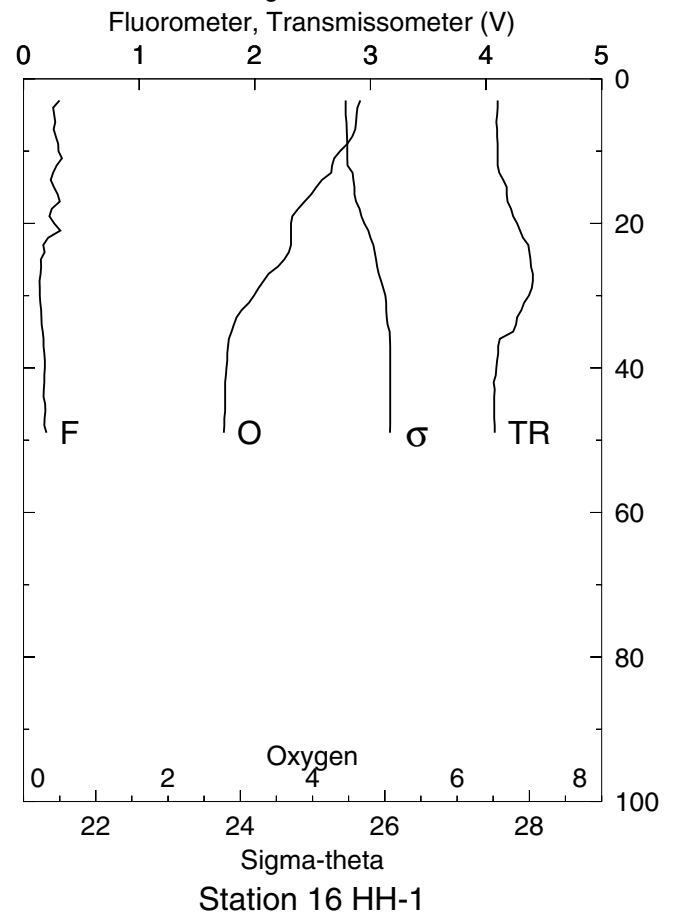
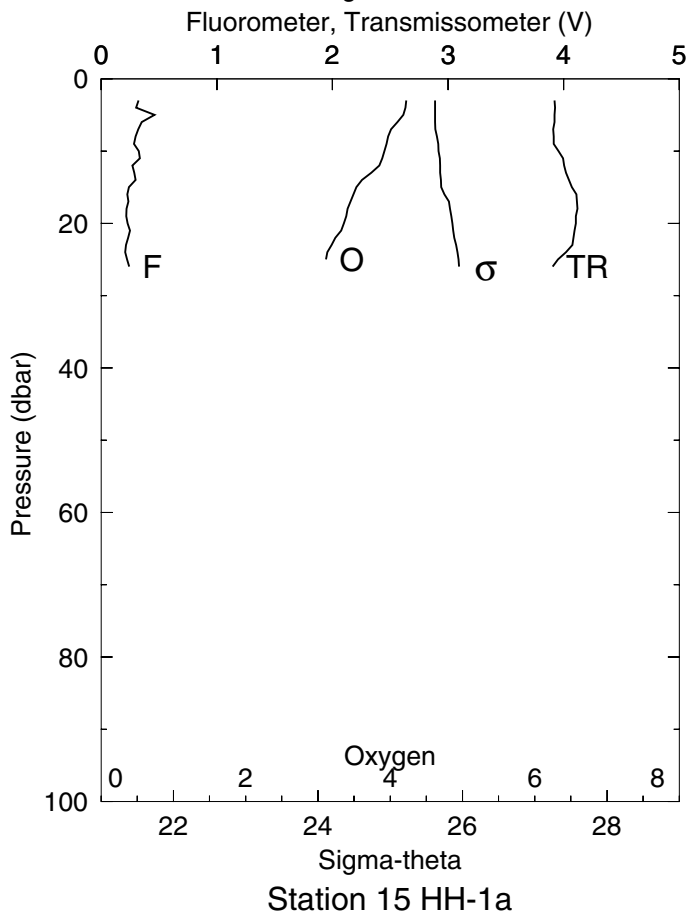
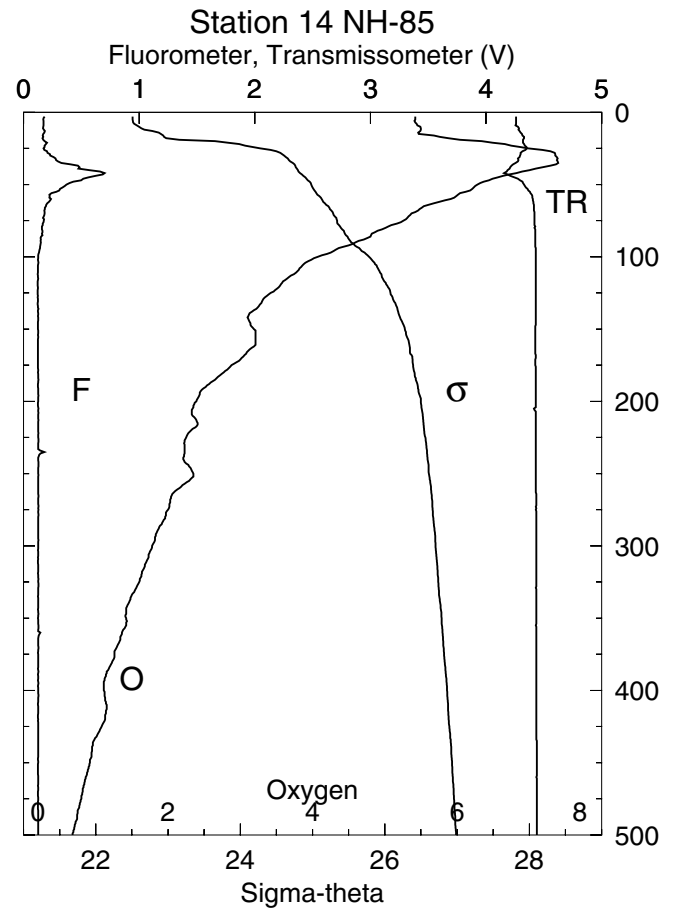
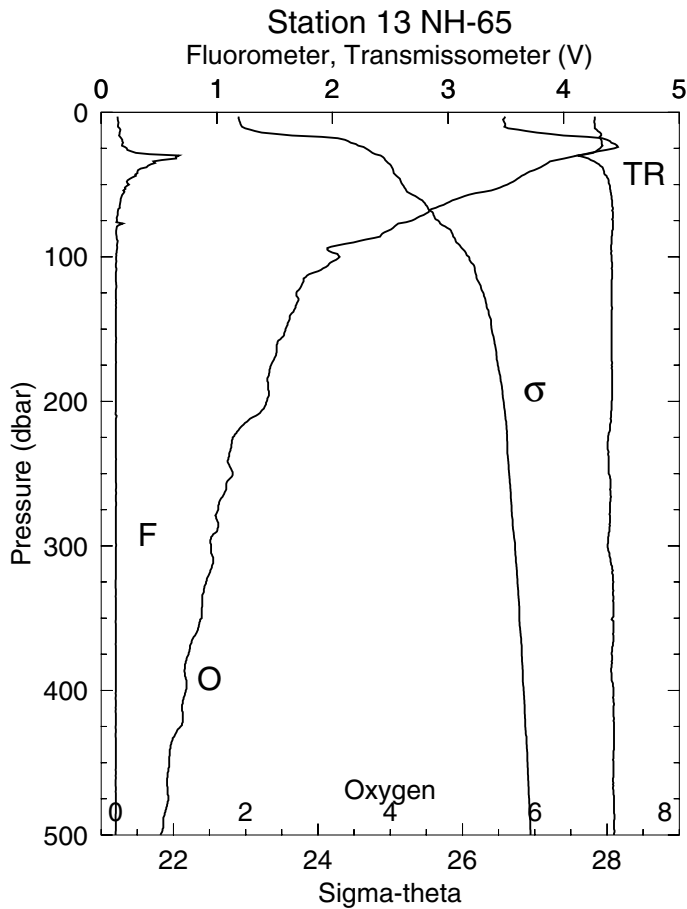
Vertical Profiles of Fluorometer Voltage (F),
Transmissometer Voltage (TR),
and Dissolved Oxygen (O)
with the Density Anomaly (σ) for reference

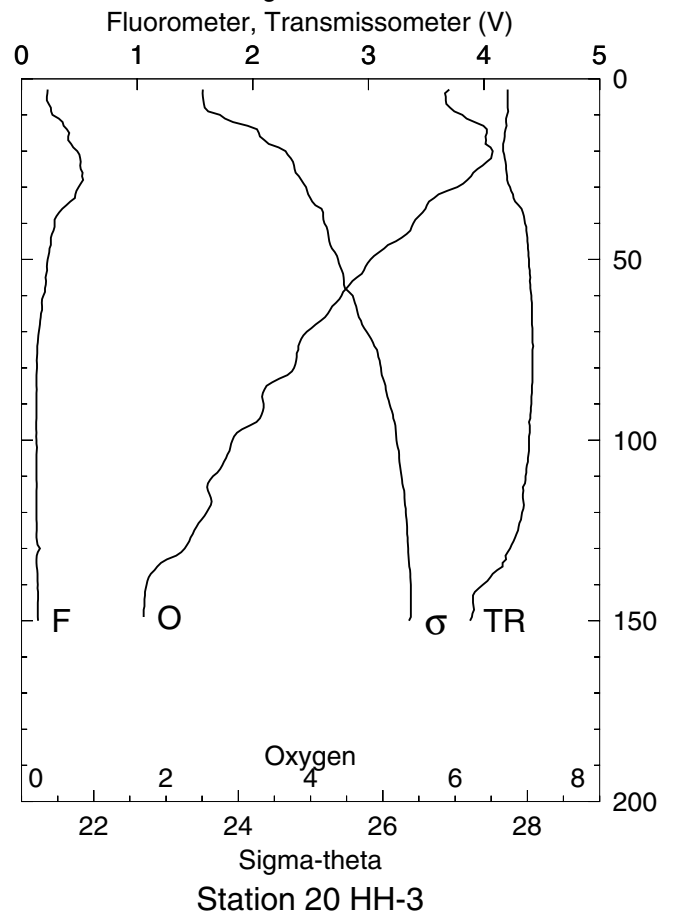
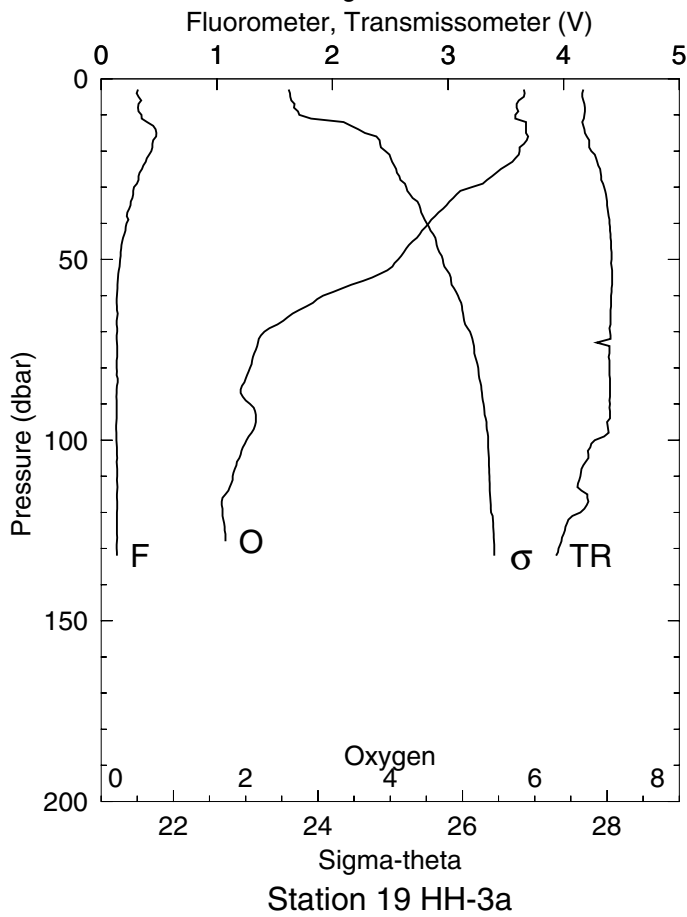
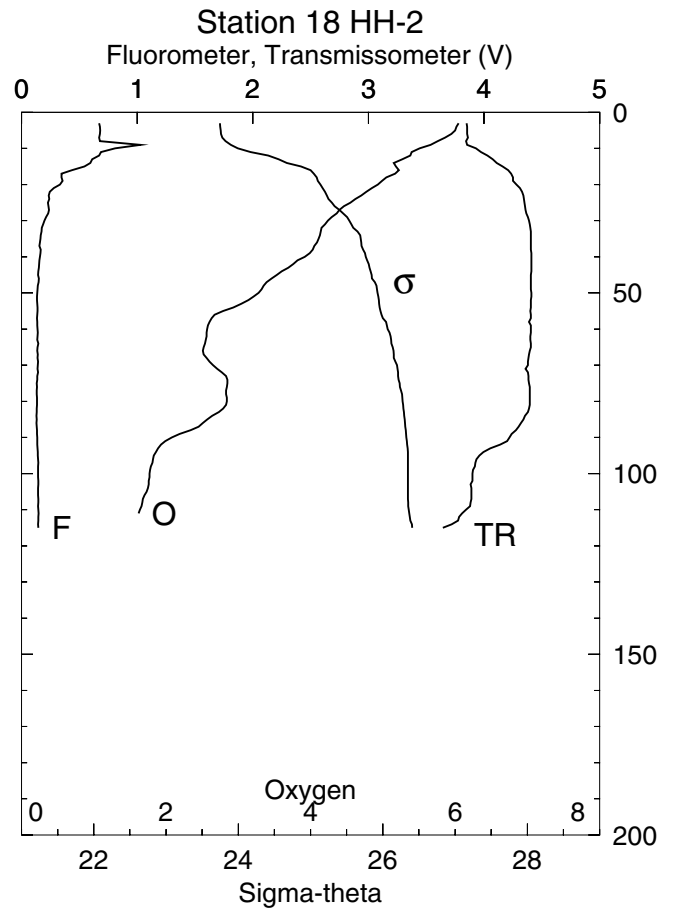
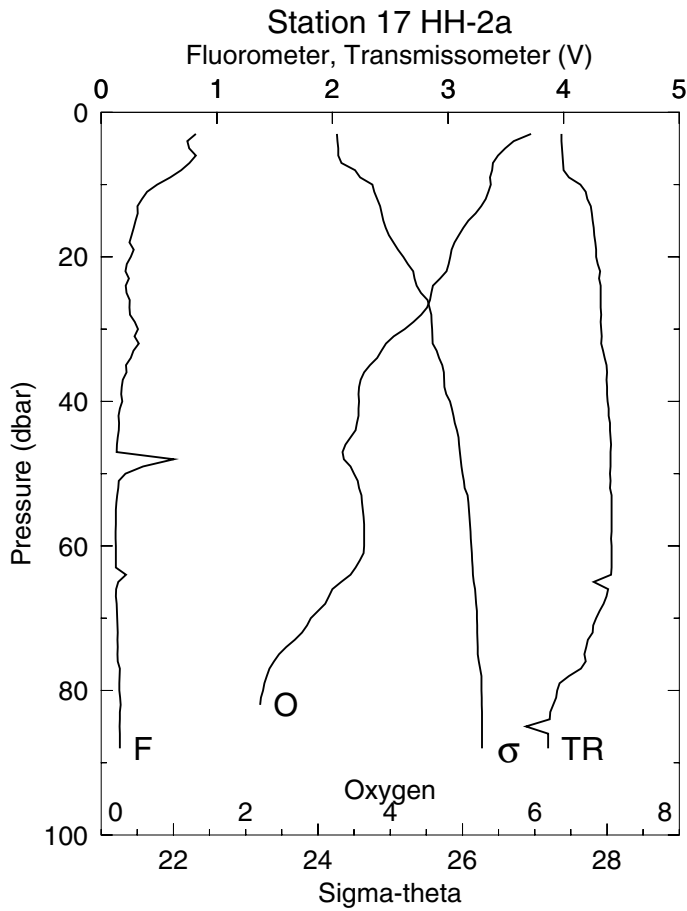
W0408D

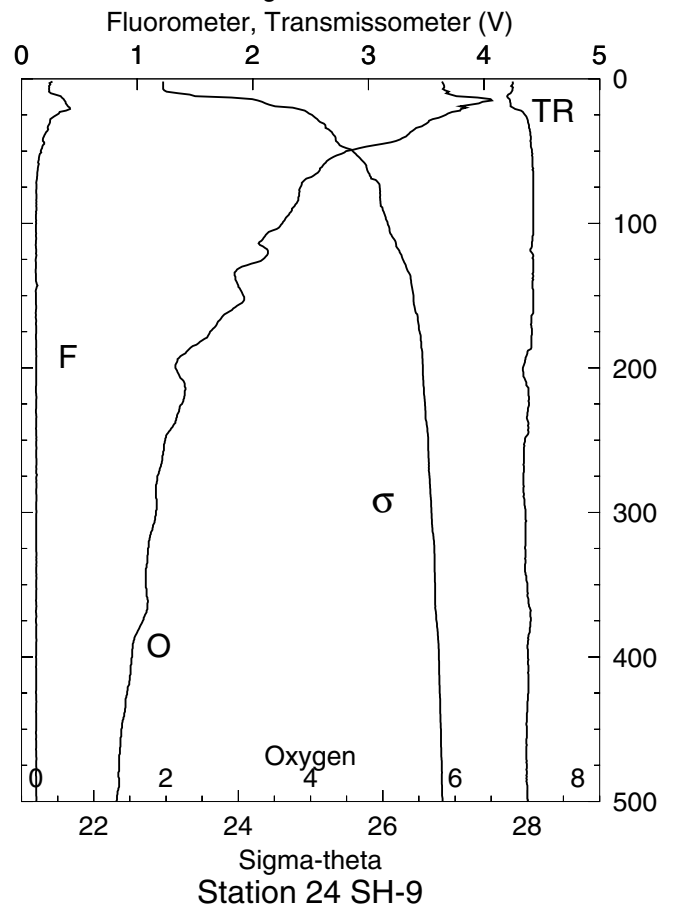
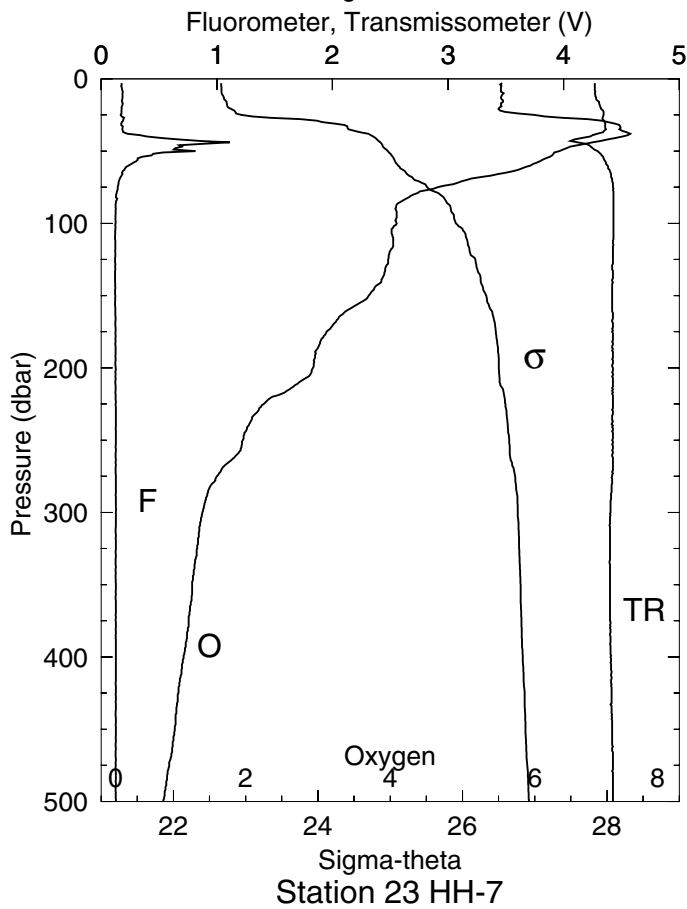
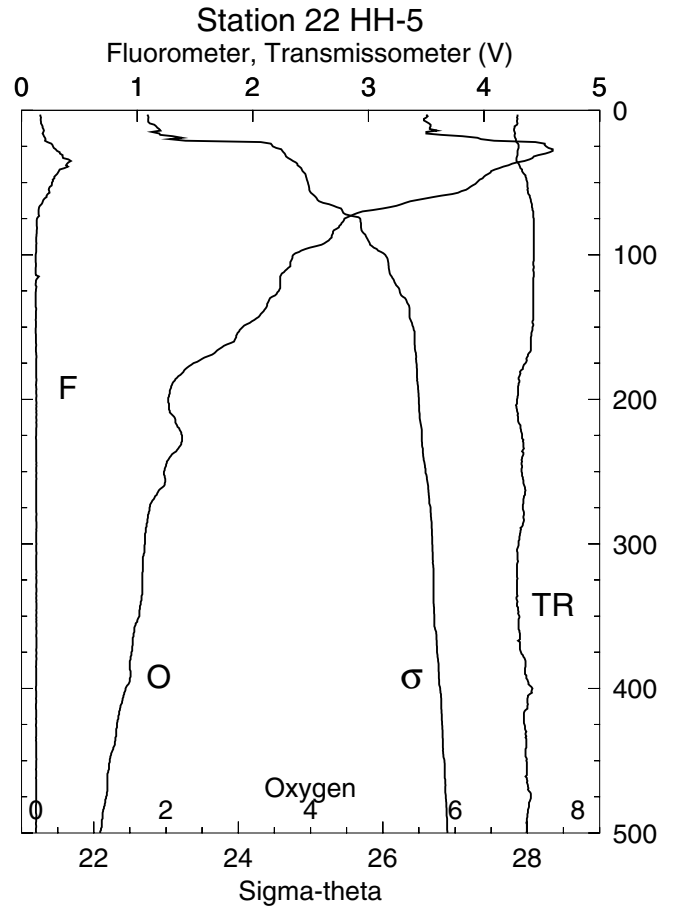
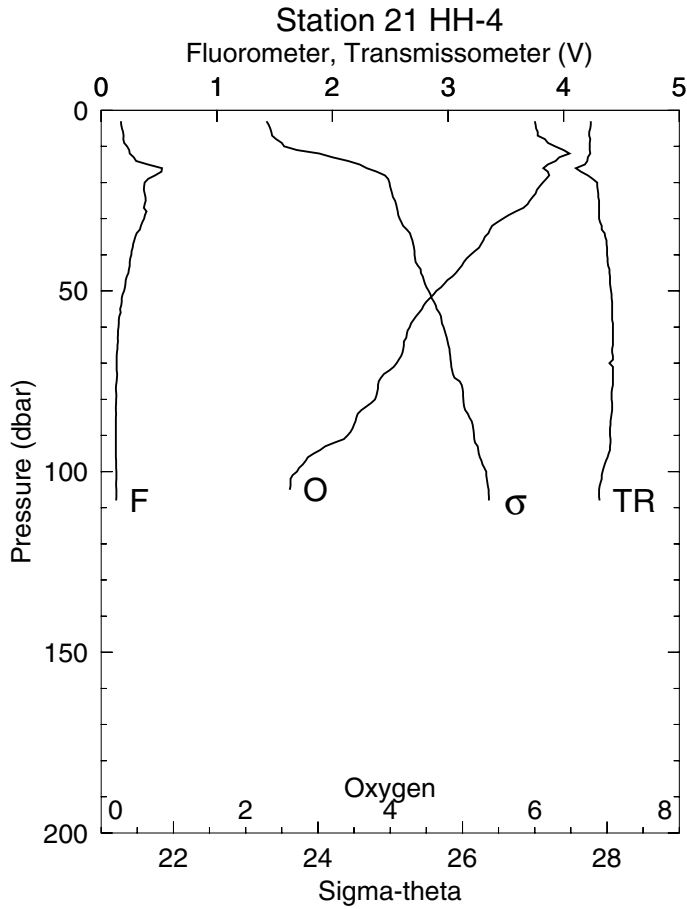




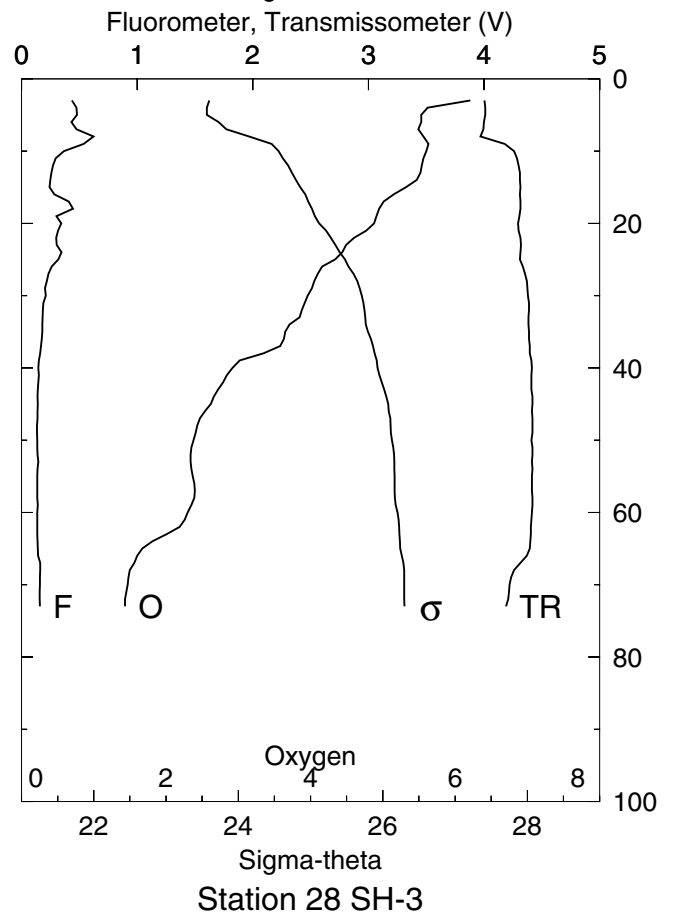
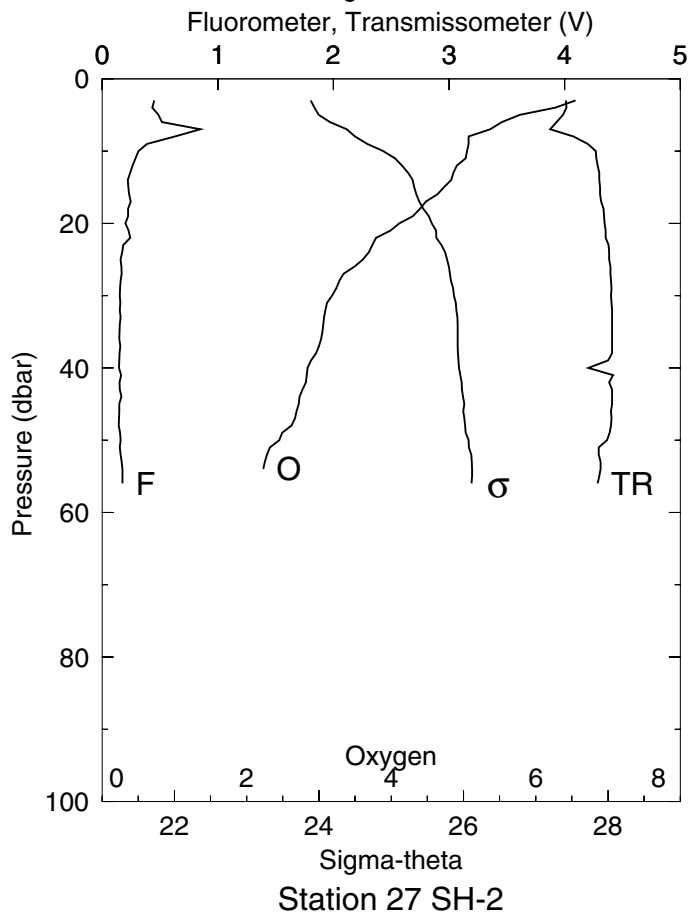
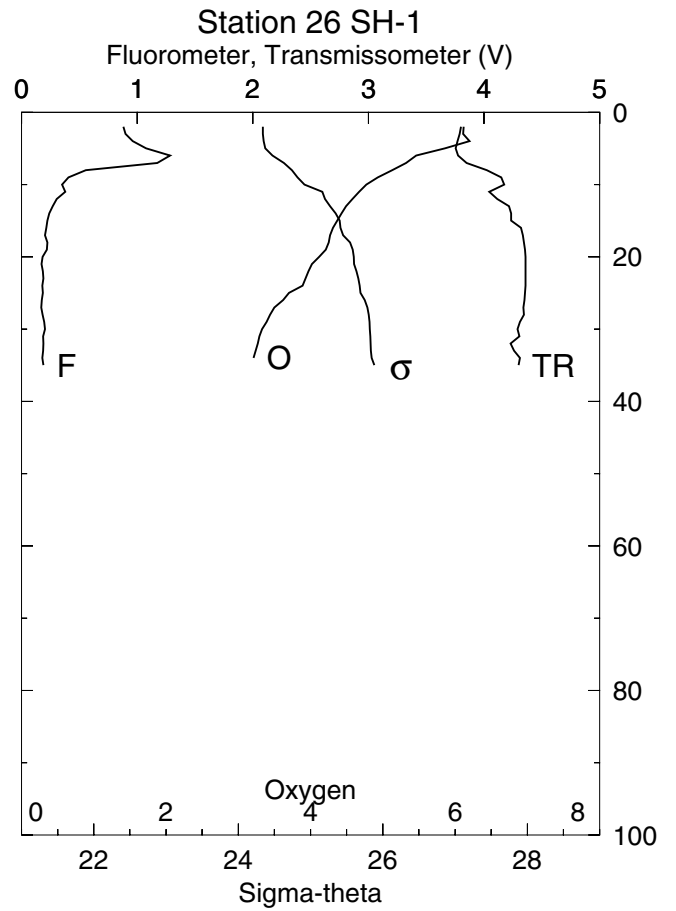
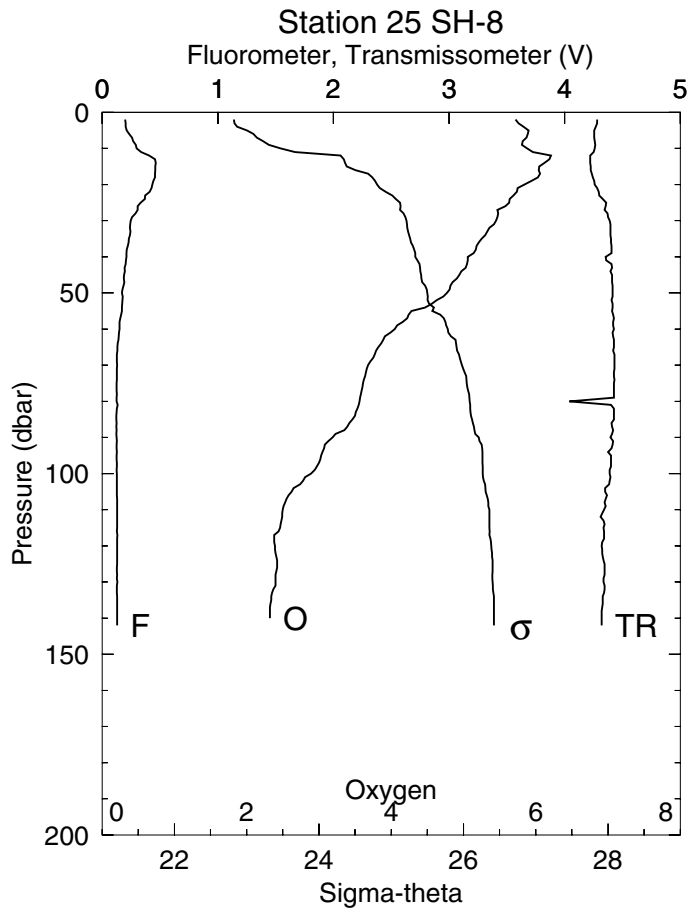


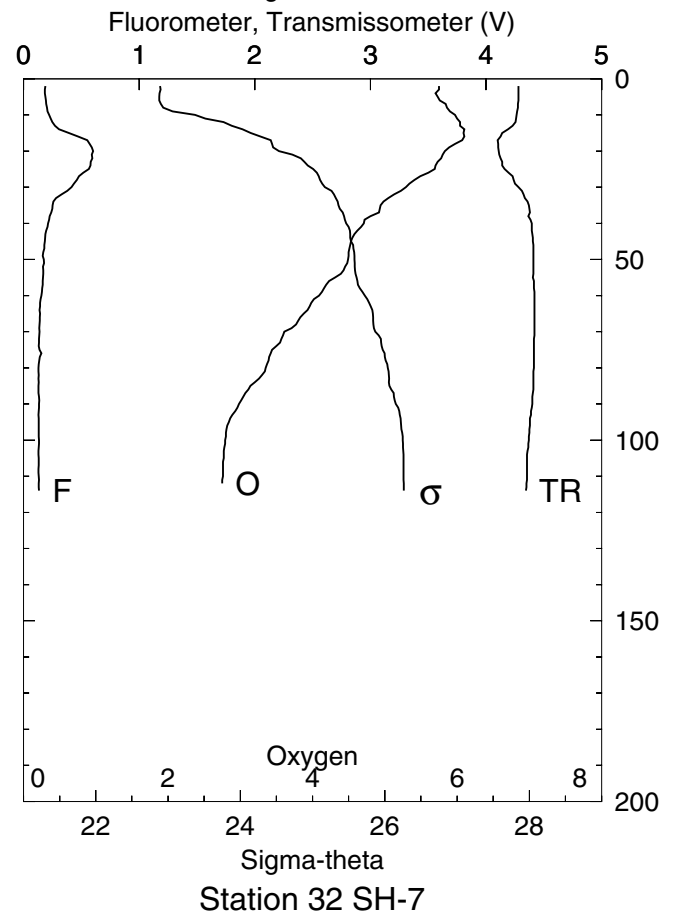
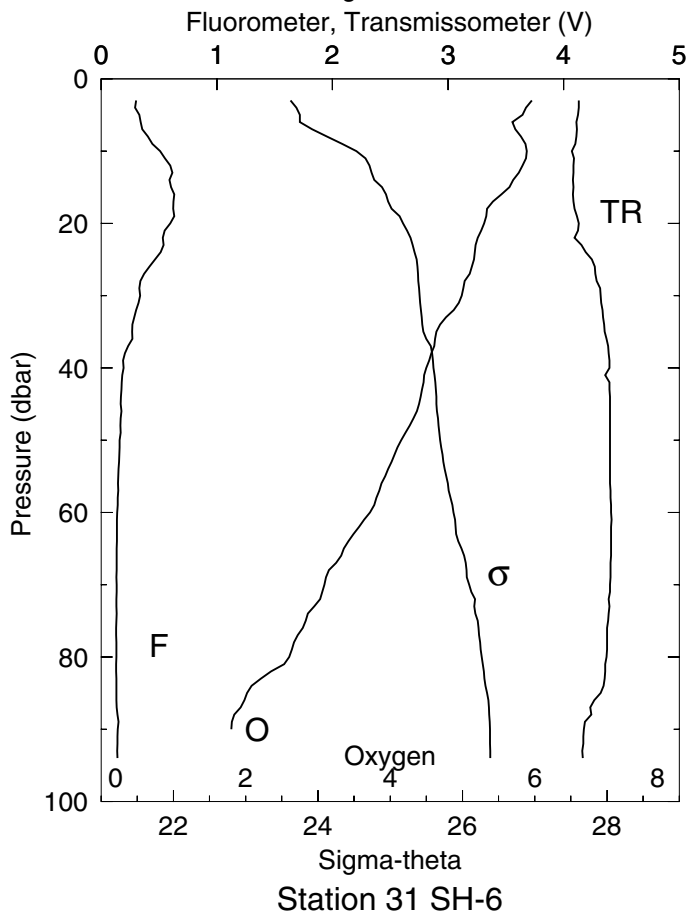
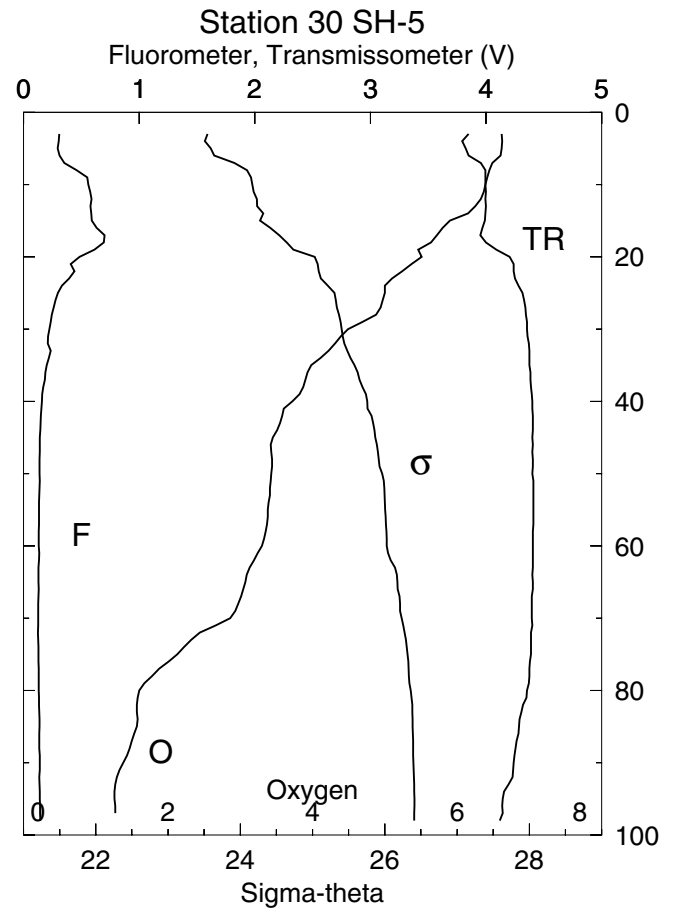
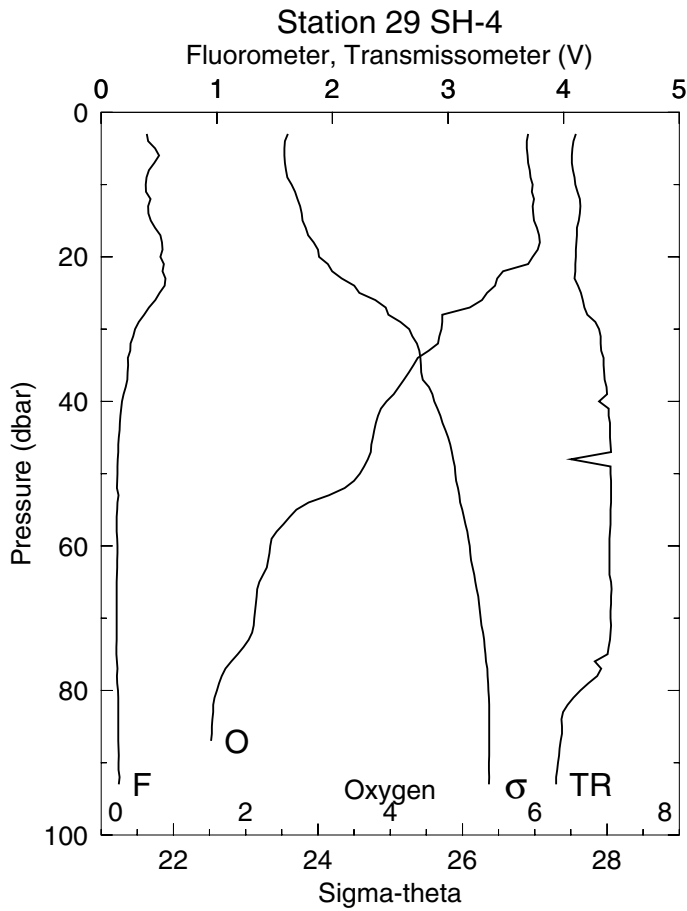




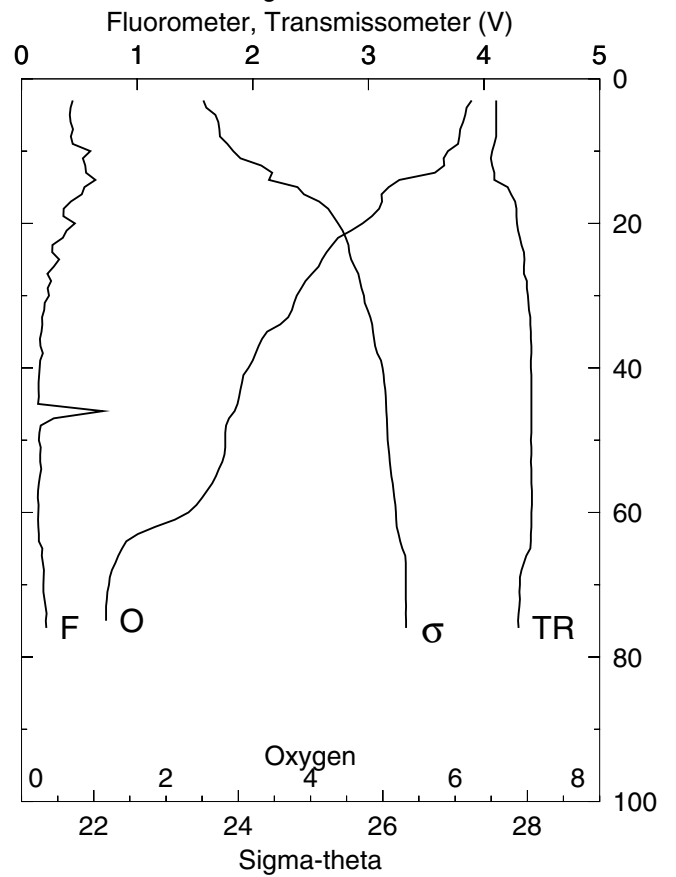
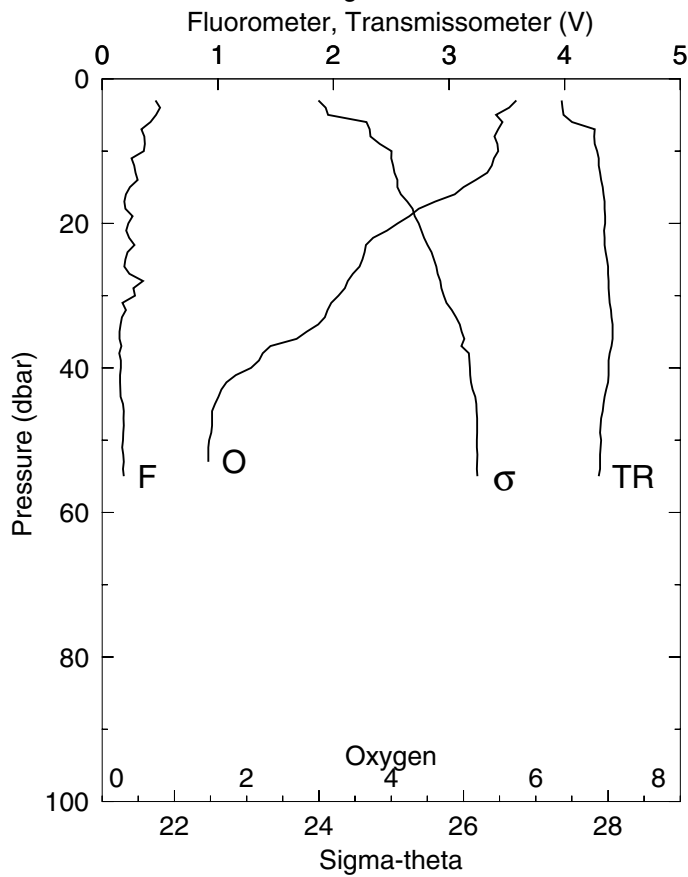
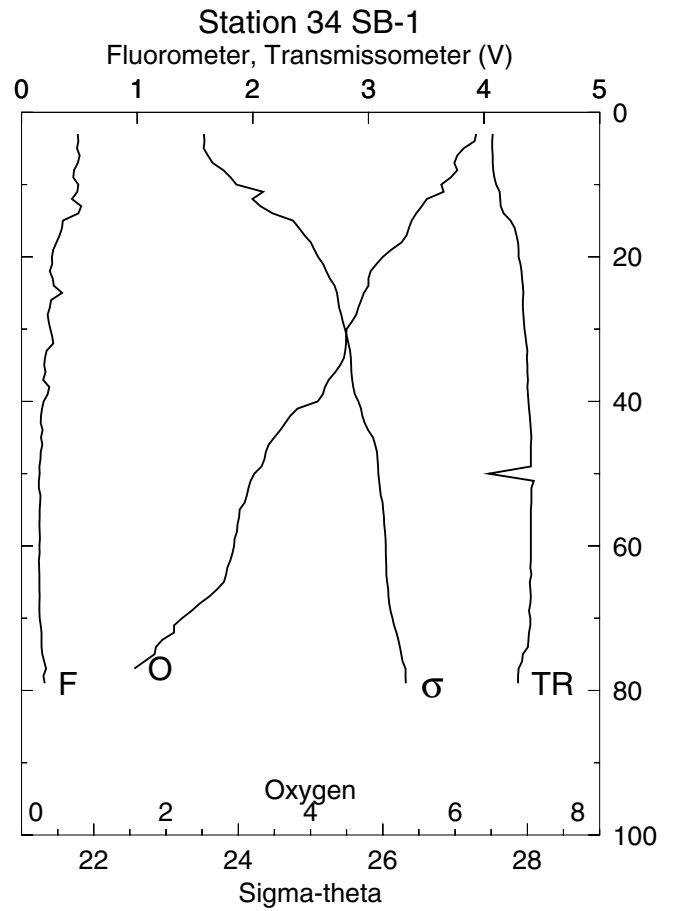
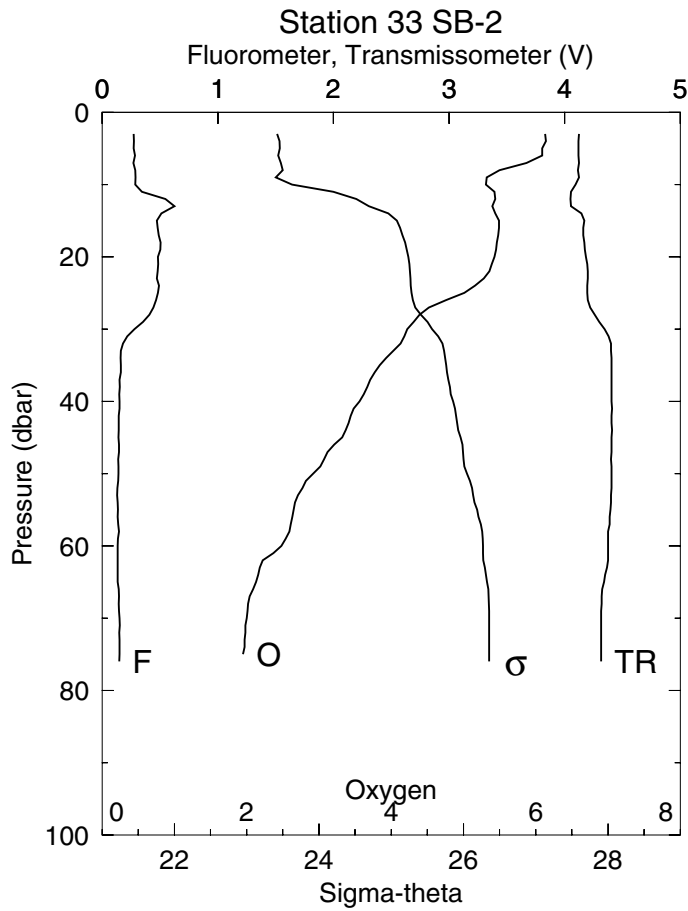


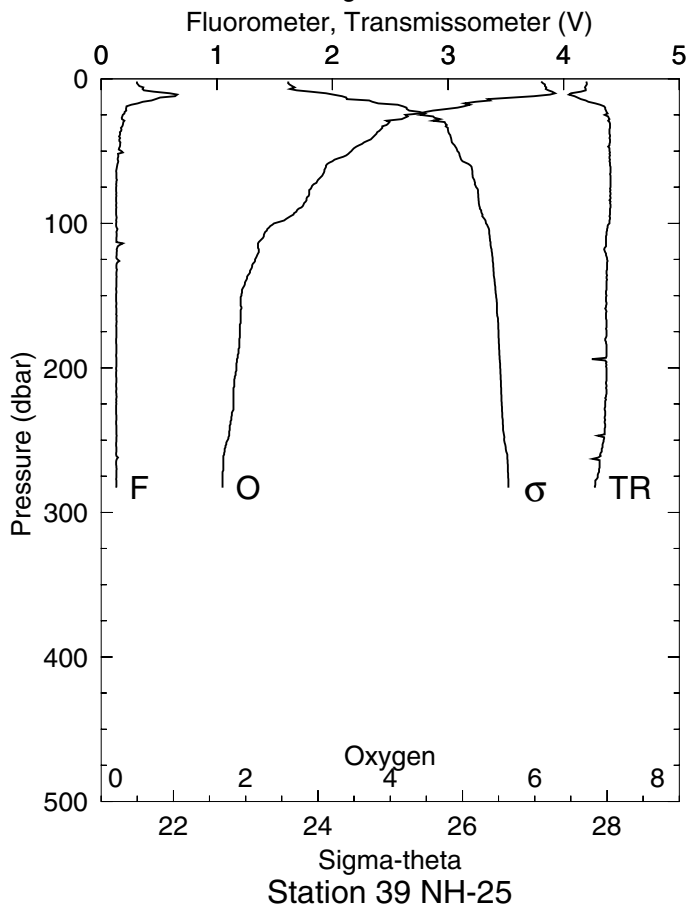
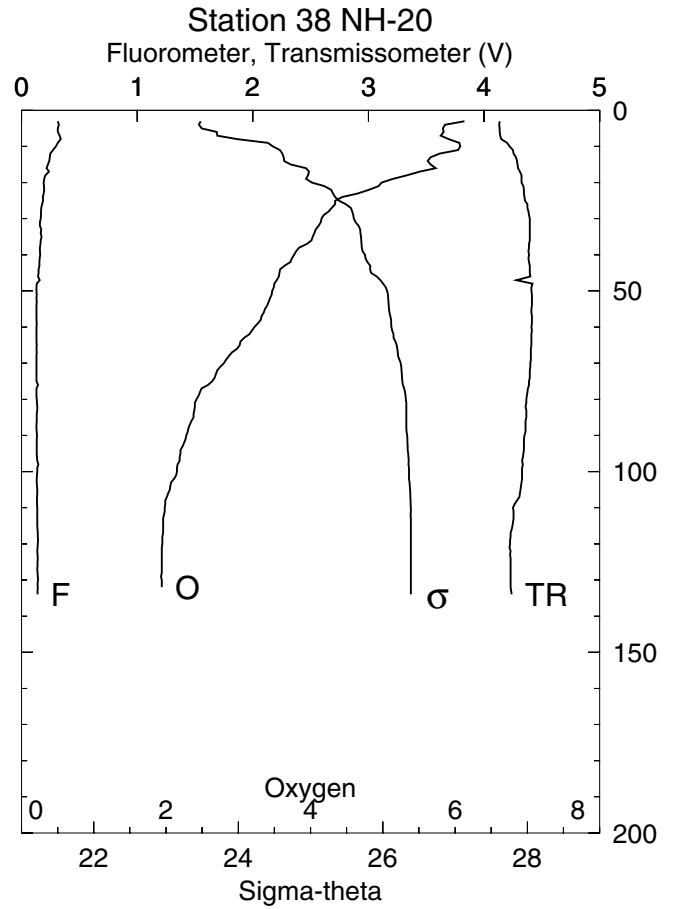
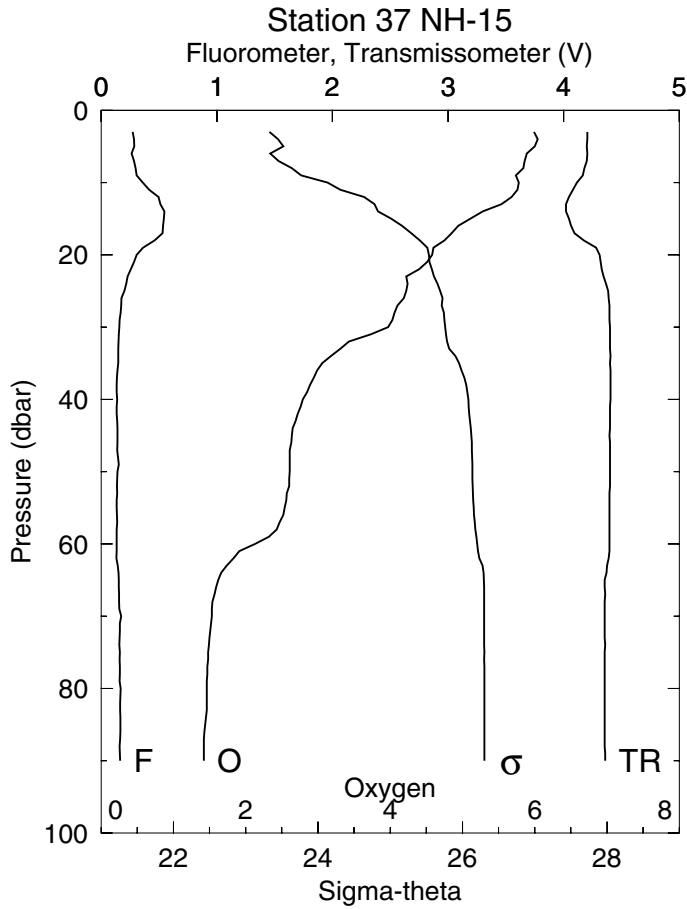
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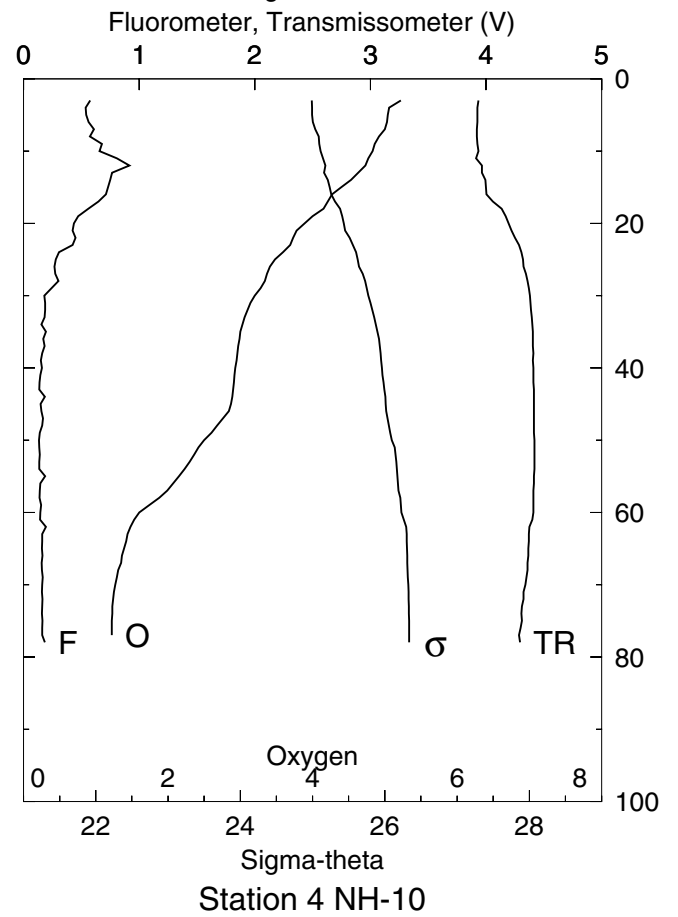
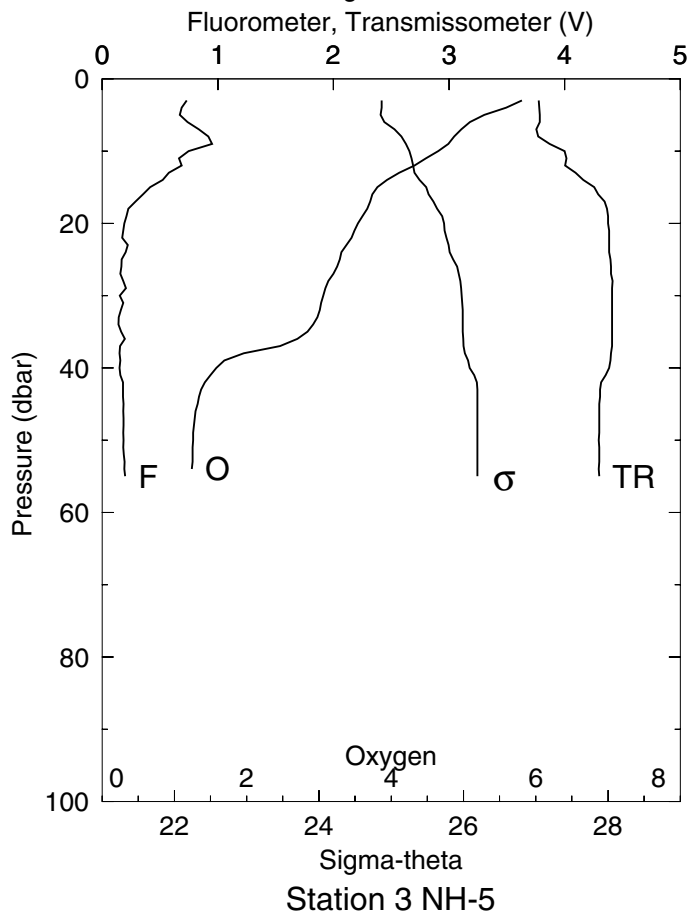
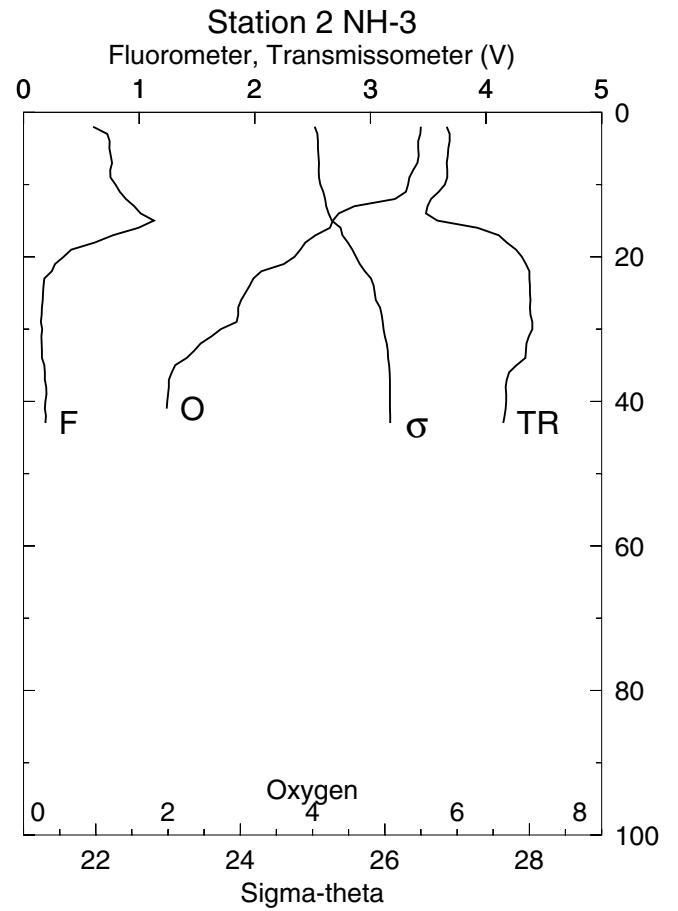
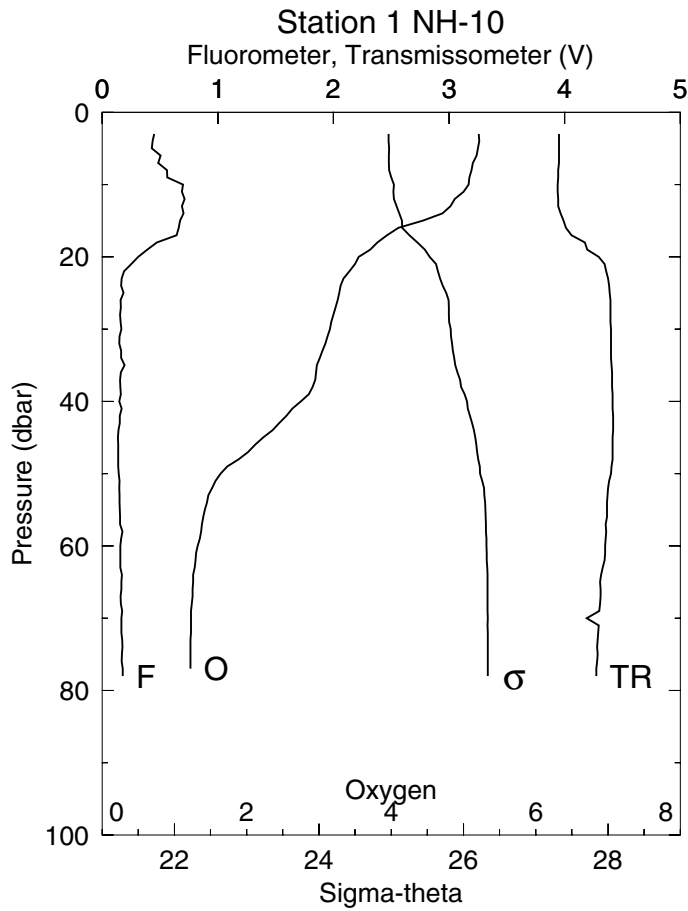


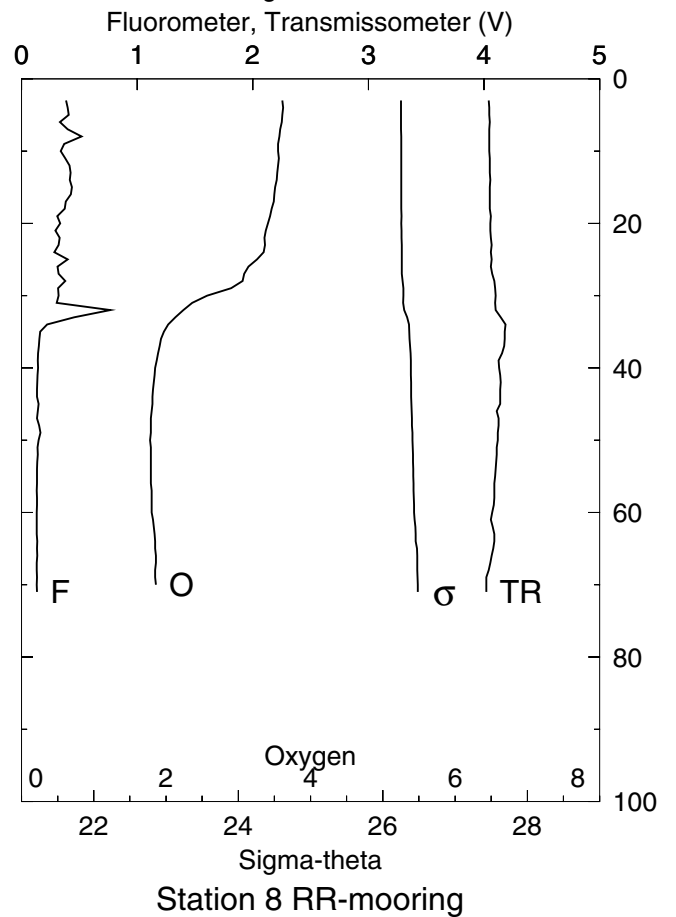
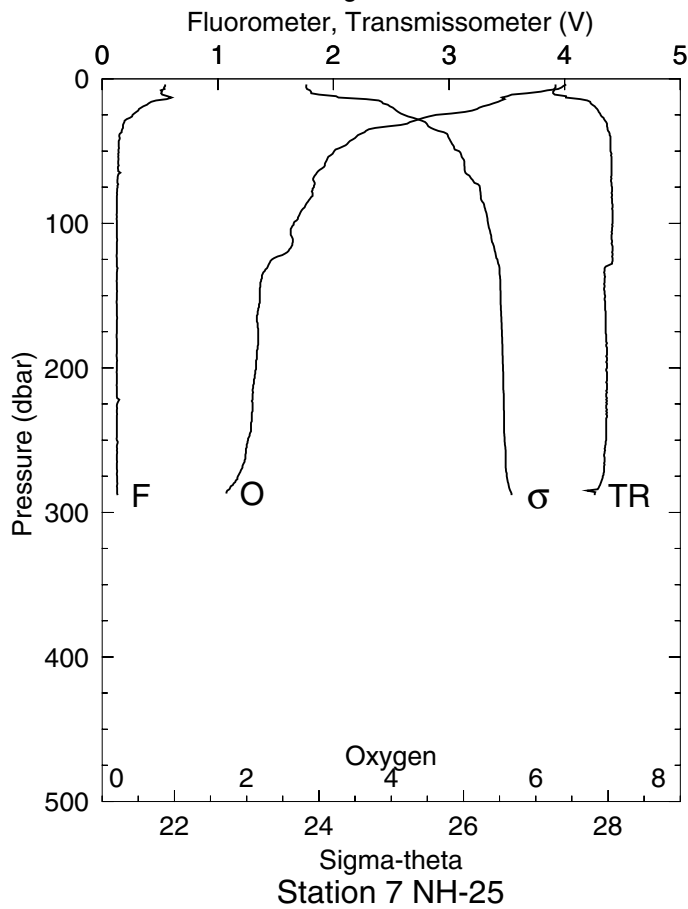
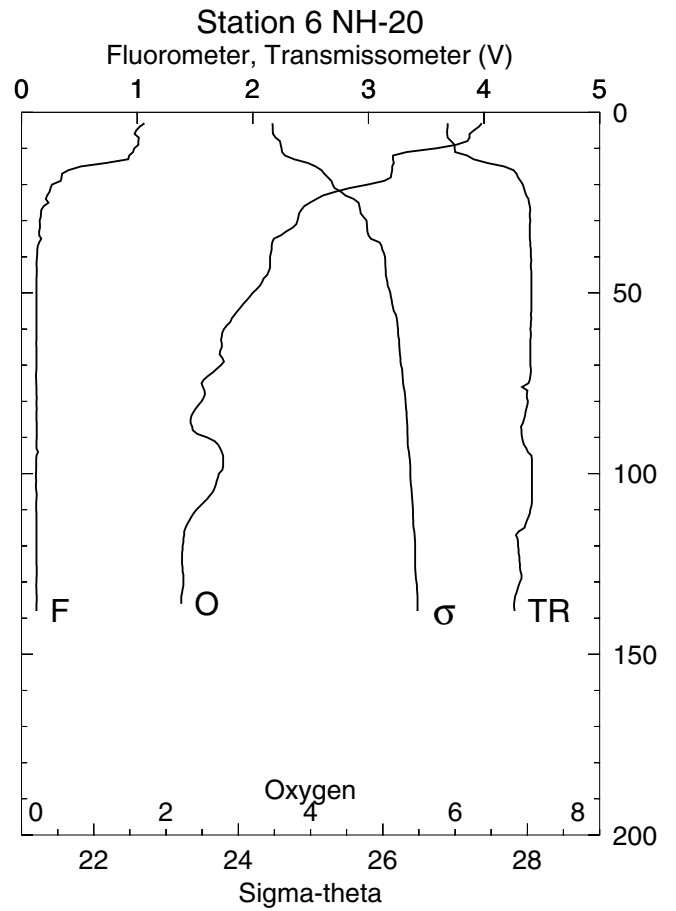
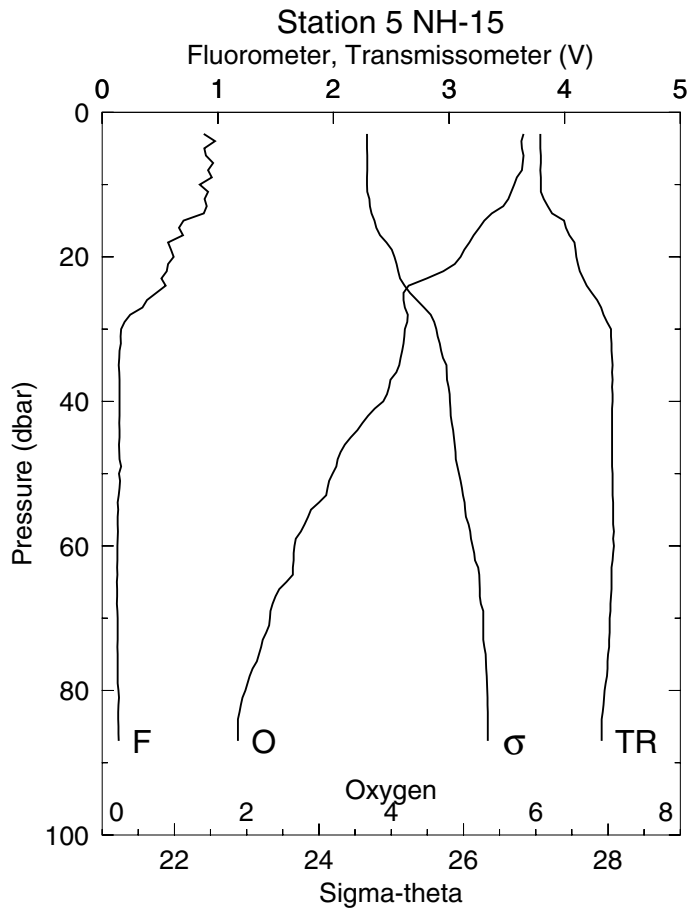


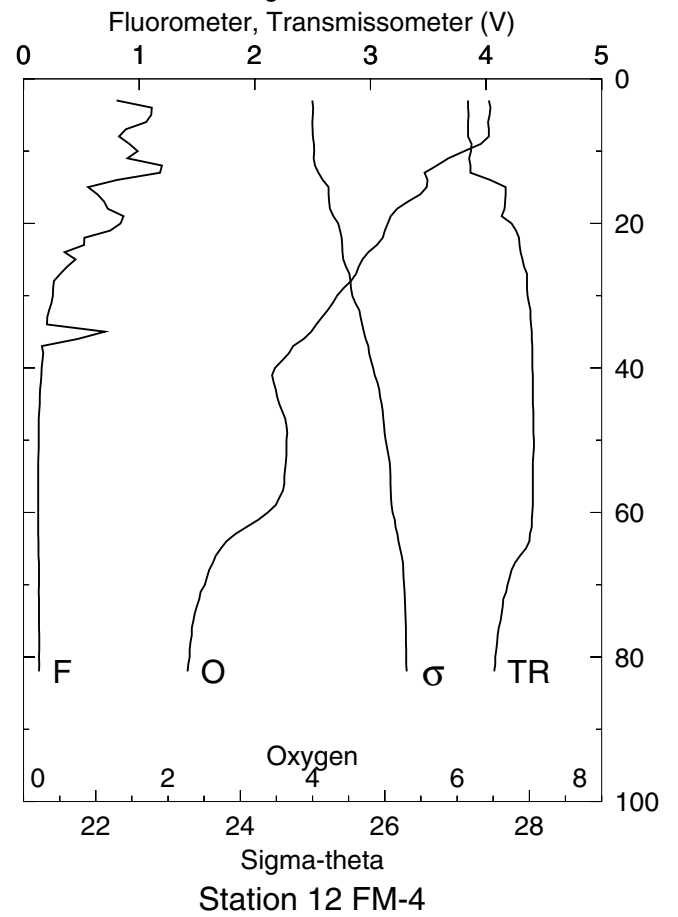
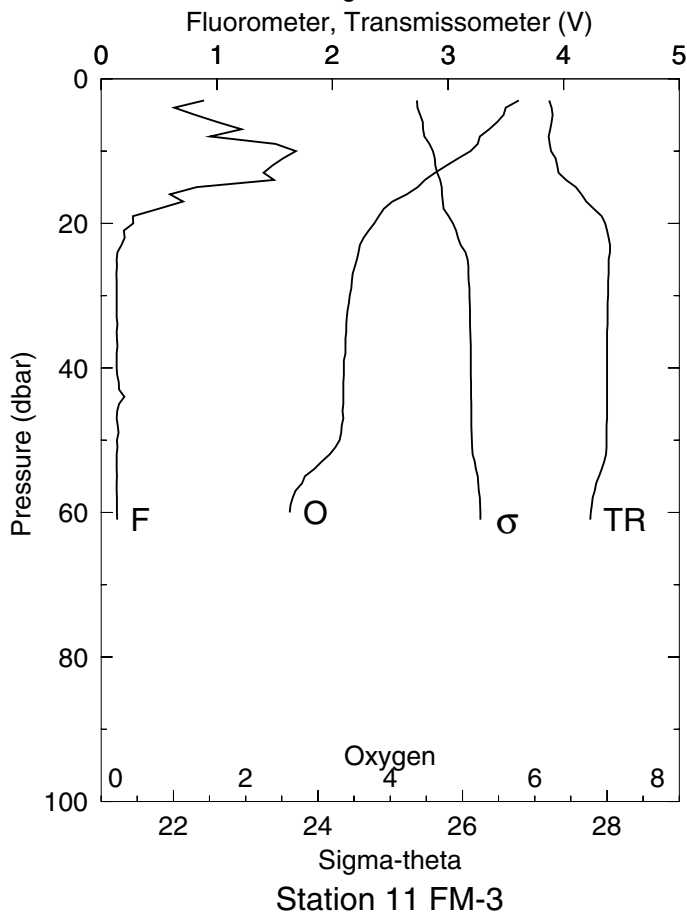
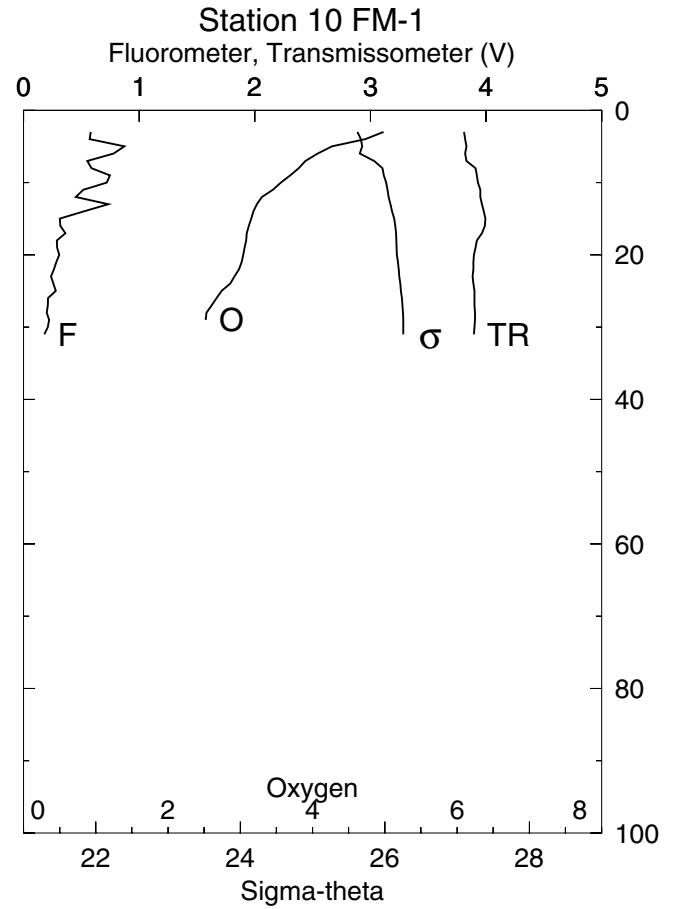
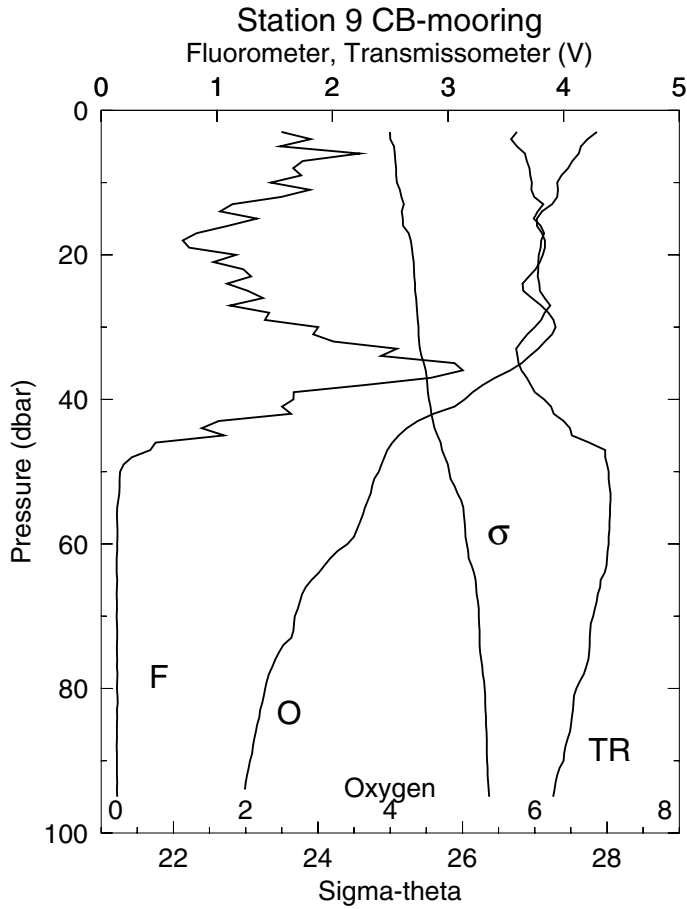
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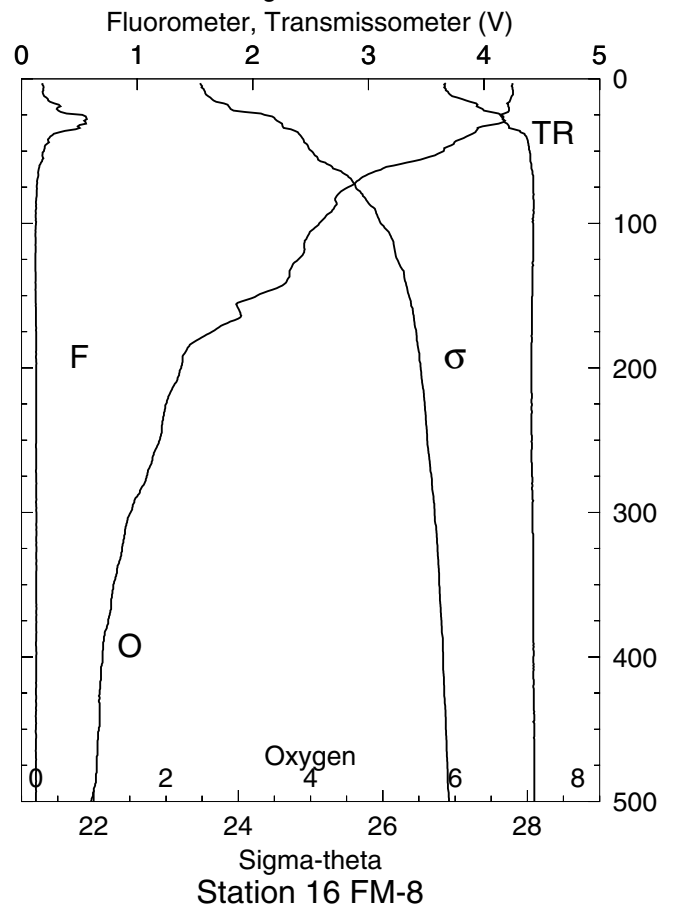
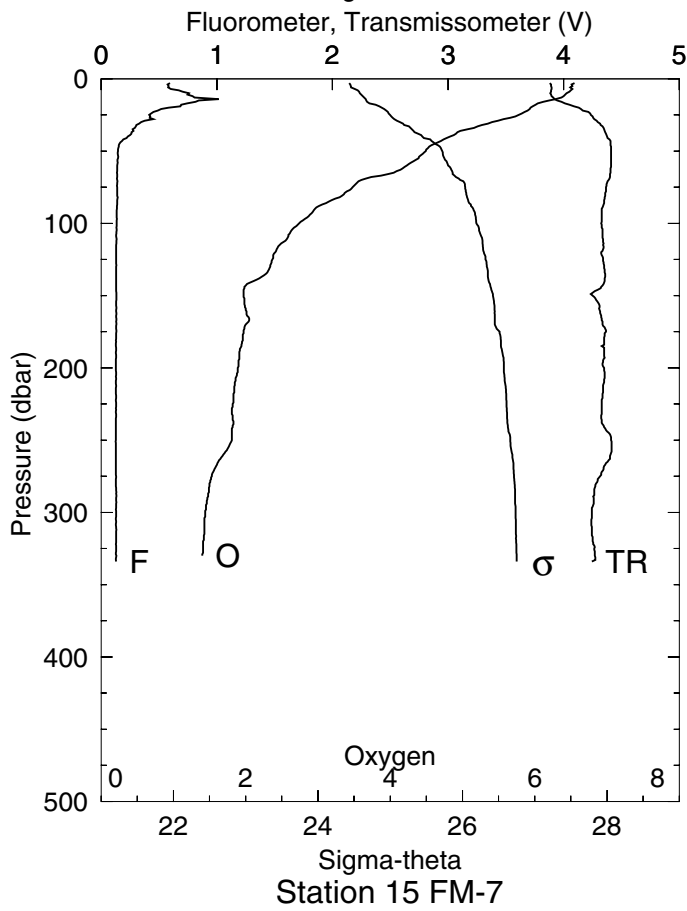
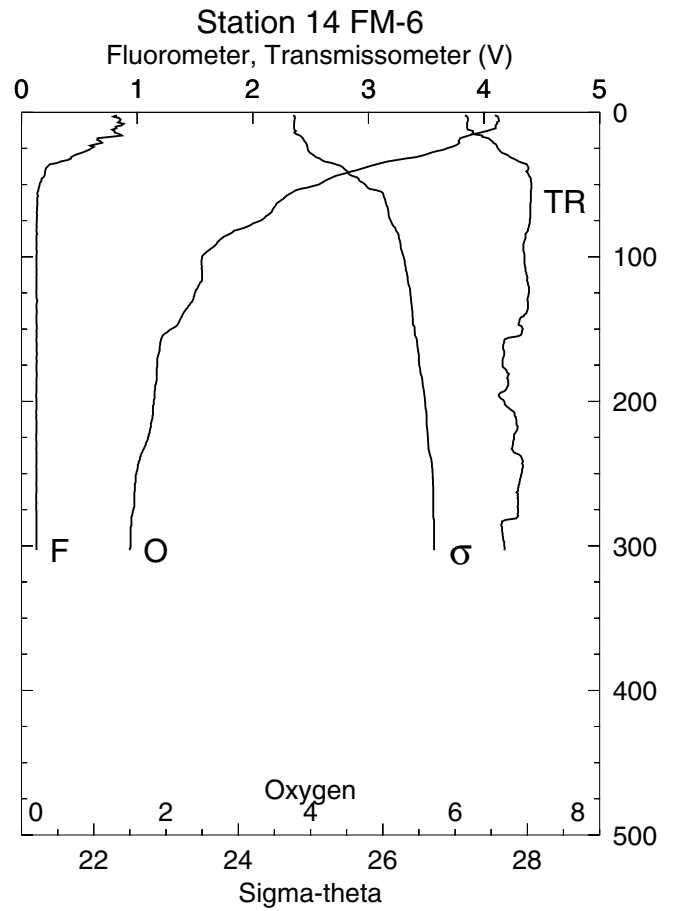
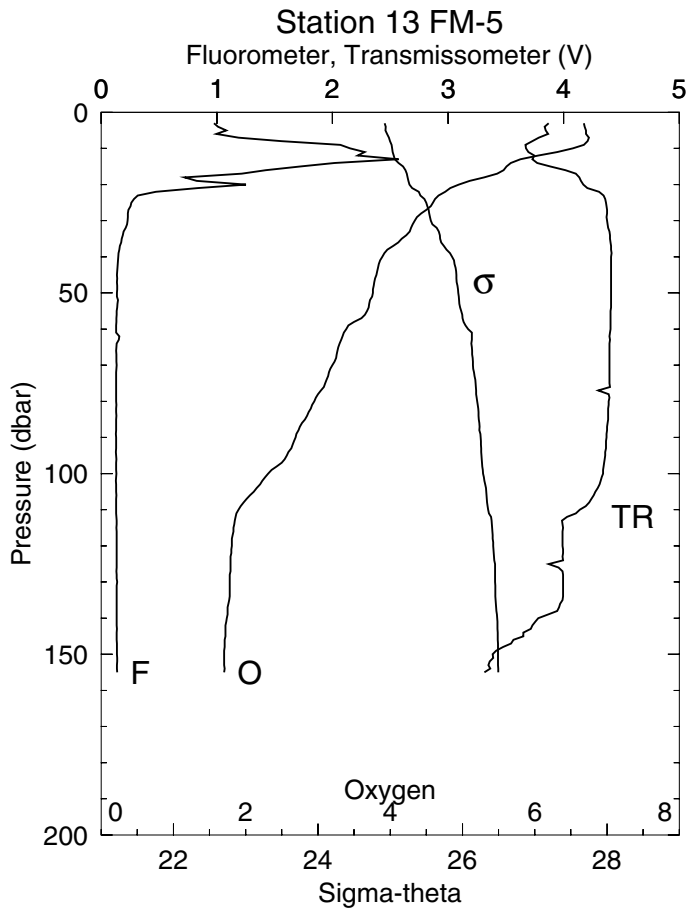


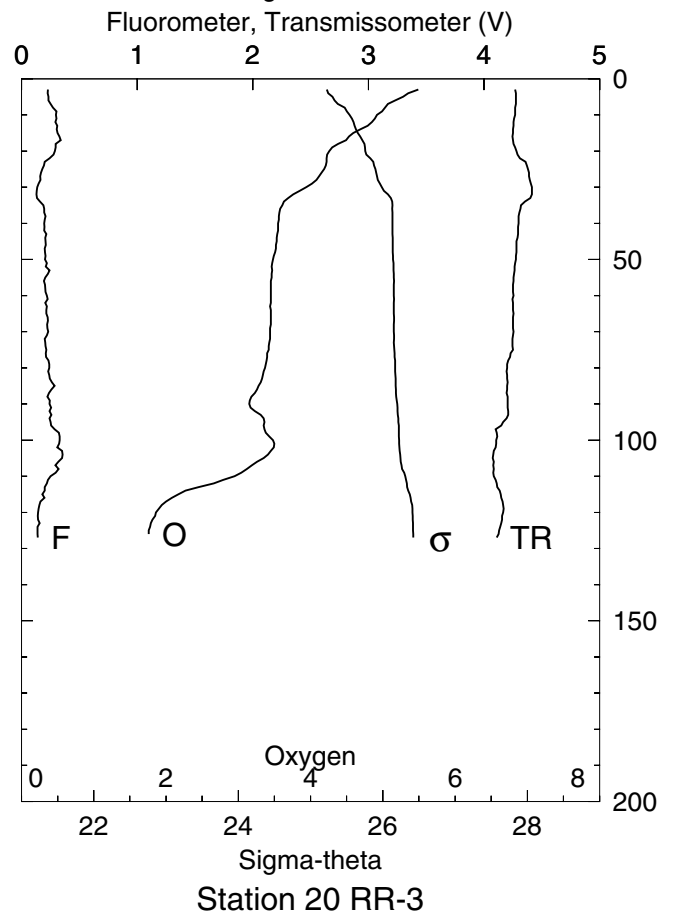
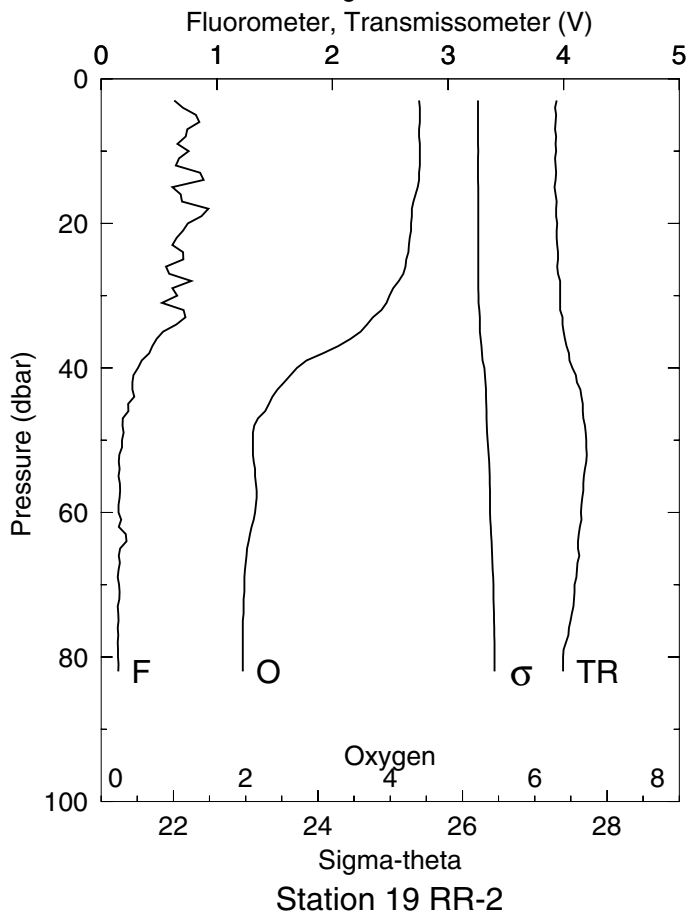
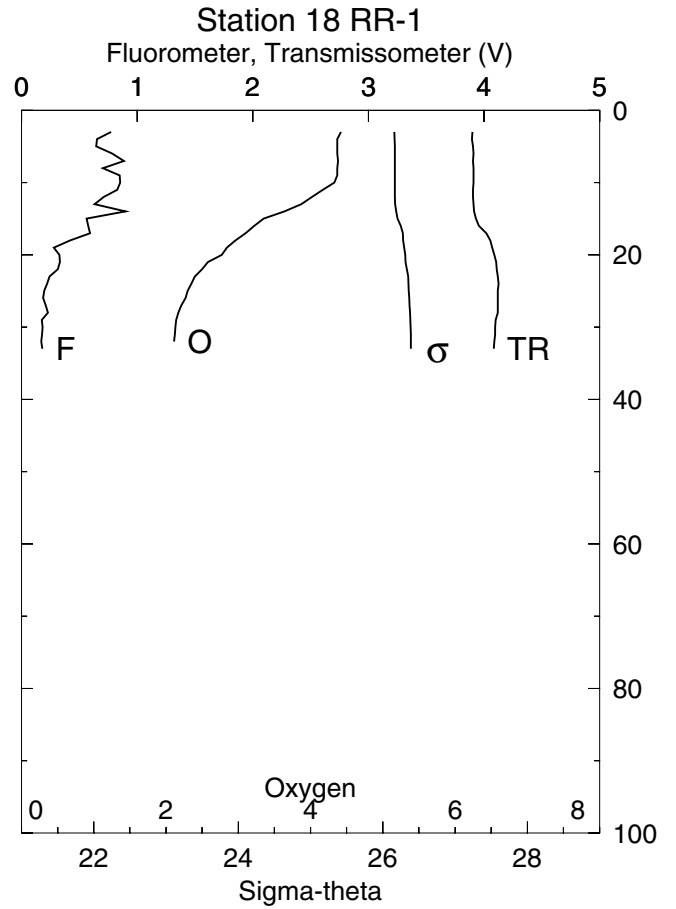
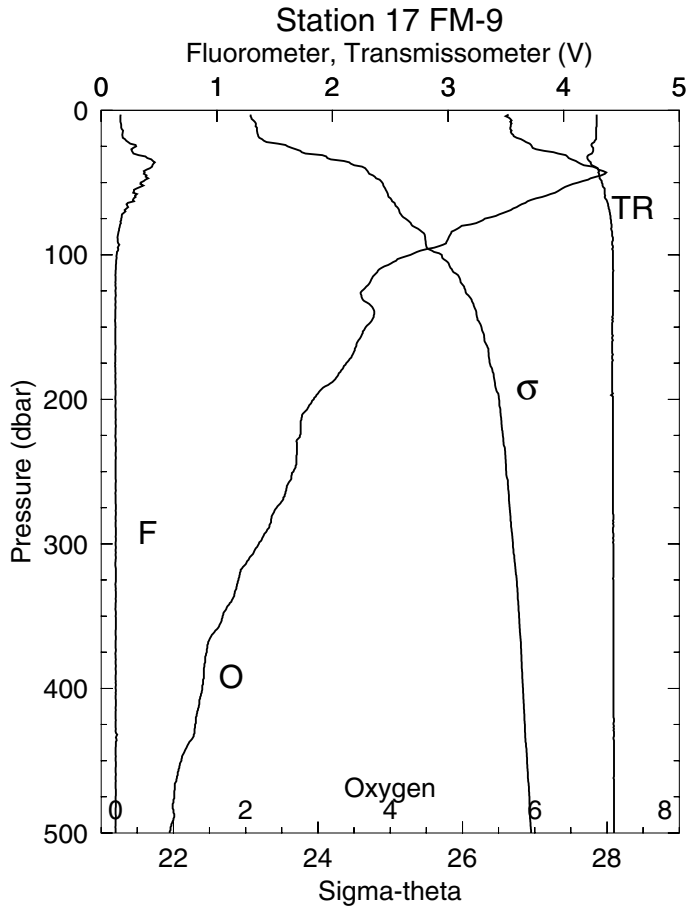


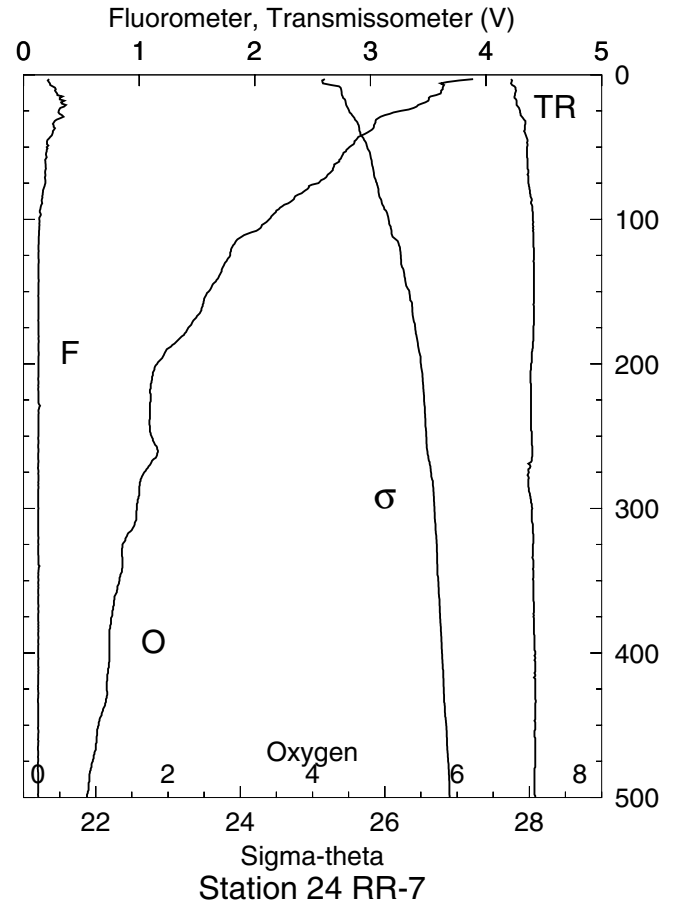
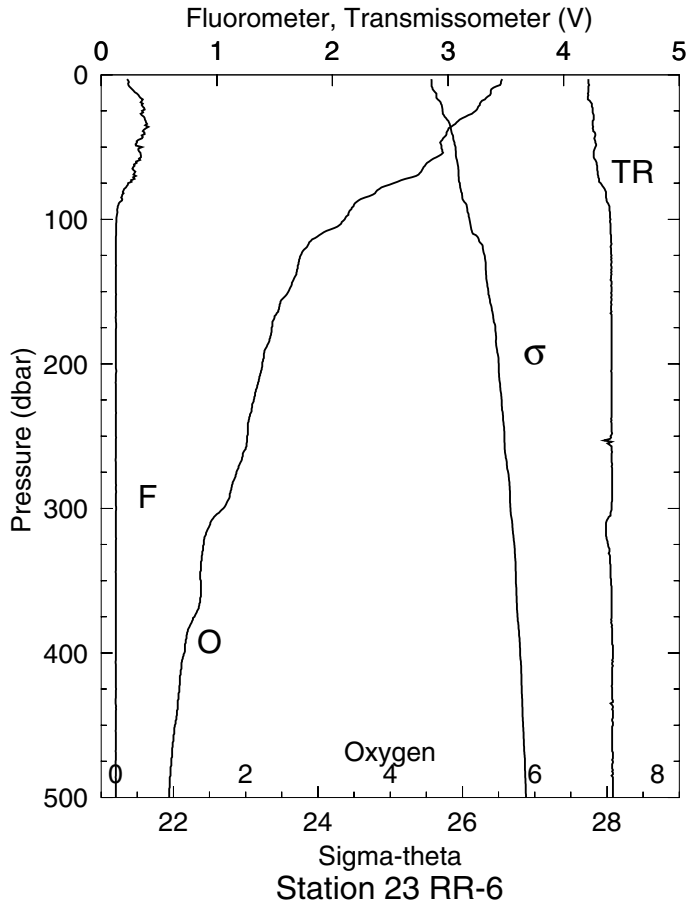
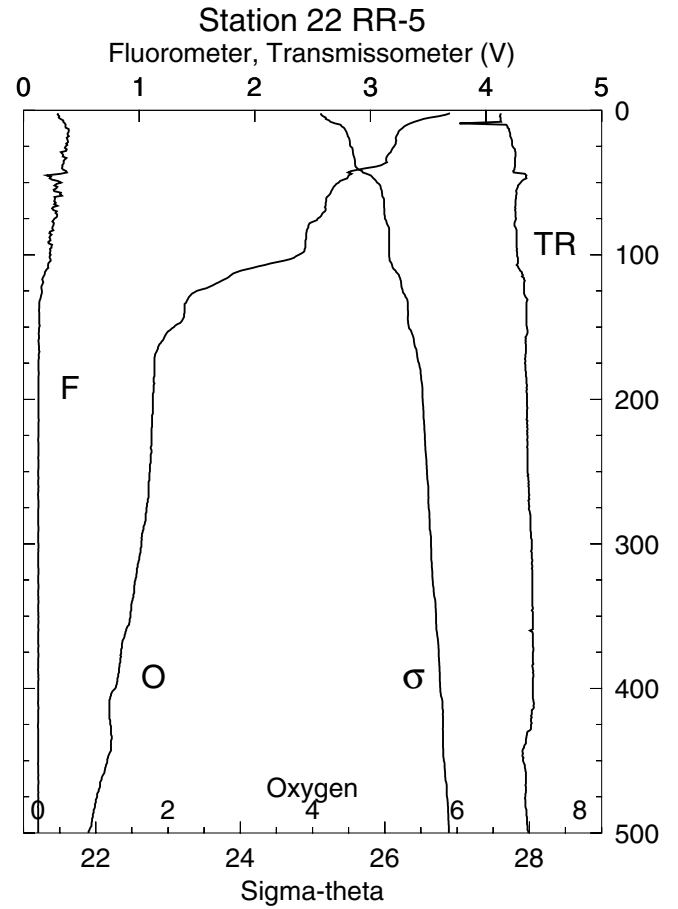
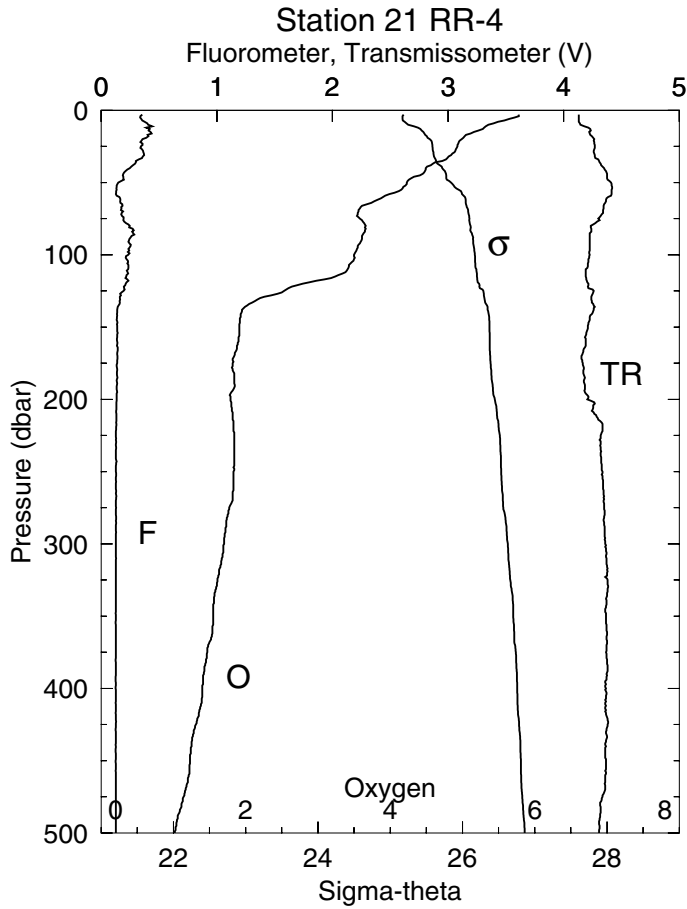












Appendix B: Oxygen calibration data.

APPENDIX B. CALIBRATION OF DISSOLVED OXYGEN DATA

Dissolved oxygen concentrations reported in this data report were those measured by a Sea-Bird SBE 43 oxygen sensor, mounted on the SBE 9/11*plus* CTD. The sensors were calibrated using recent SBE calibration data (see Table 5 for calibration dates) and the results of comparisons to standard Winkler titrations of water samples collected at a few stations on each of the cruises. The sample titration values (collected during ascent) were compared with CTD values at the same depths (measured during ascent).

There are some systematic differences between Winkler and CTD values, which tend to increase with time since calibration, as might be expected from aging of the sensor. New oxygen calibration constants were derived from the Winkler and oxygen probe data using the method recommended by Sea-Bird (Application Note No. 64-2) for the SBE 43 sensors. These results are presented in linear regression plots and scatter diagrams (one for each 2004 cruise), and the new *Soc* and *Voffset* values are presented in Table B1. Profile plots of corrected dissolved oxygen (during descent) and sample oxygen (collected during ascent) are also presented for each station.

The full set of sample values of the dissolved oxygen concentration measured by Winkler titration is given in Table B2.

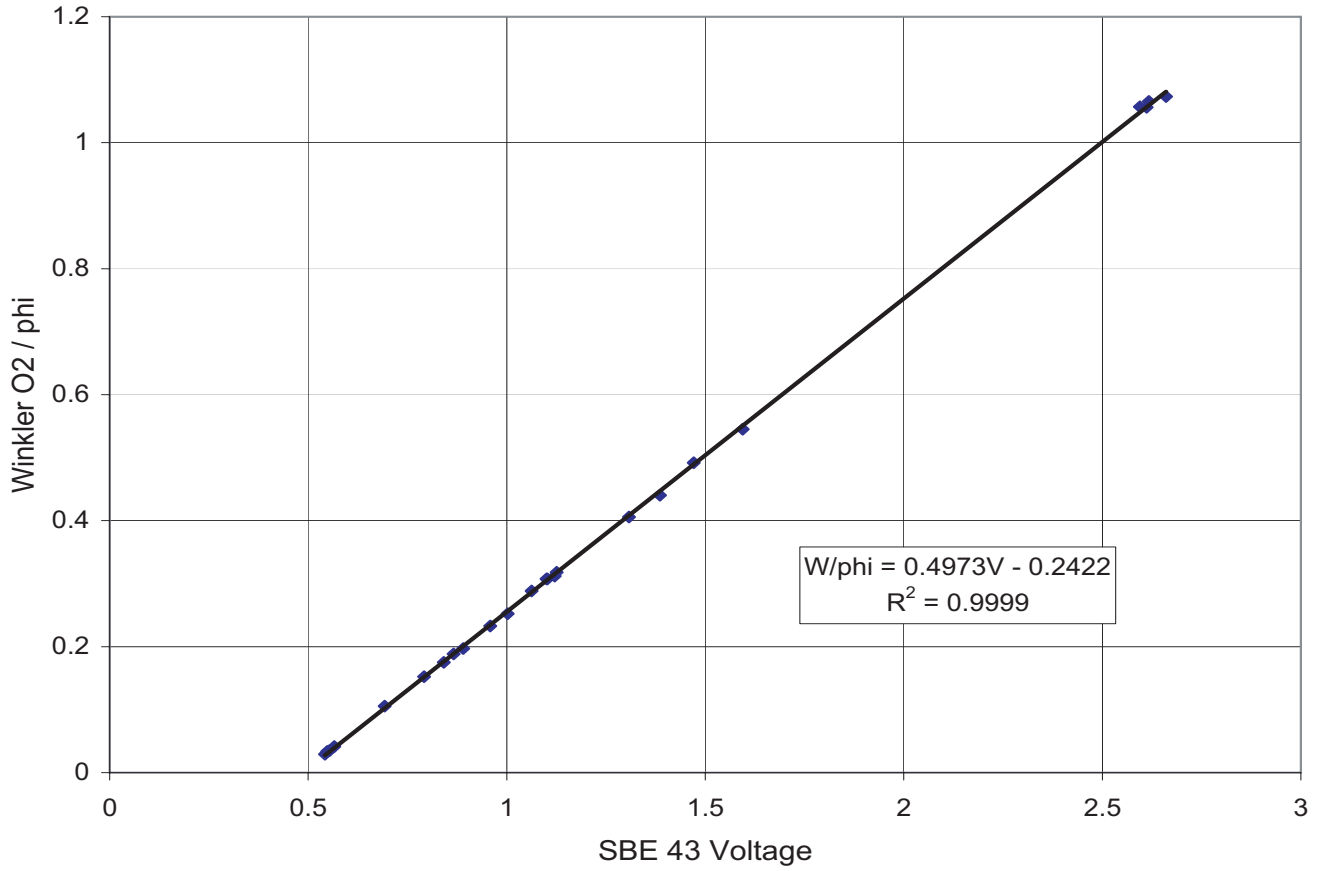
Table B1. Results of comparisons of Winkler titration and CTD values of dissolved oxygen concentration for 2004 cruises using Sea-Bird methodology.

	Number of Samples	Slope	Offset	SOC	Voffset
W0408D	24	0.4973	-0.2422	0.4973	-0.4870
W0409A	14	0.5060	-0.2482	0.5060	-0.4905

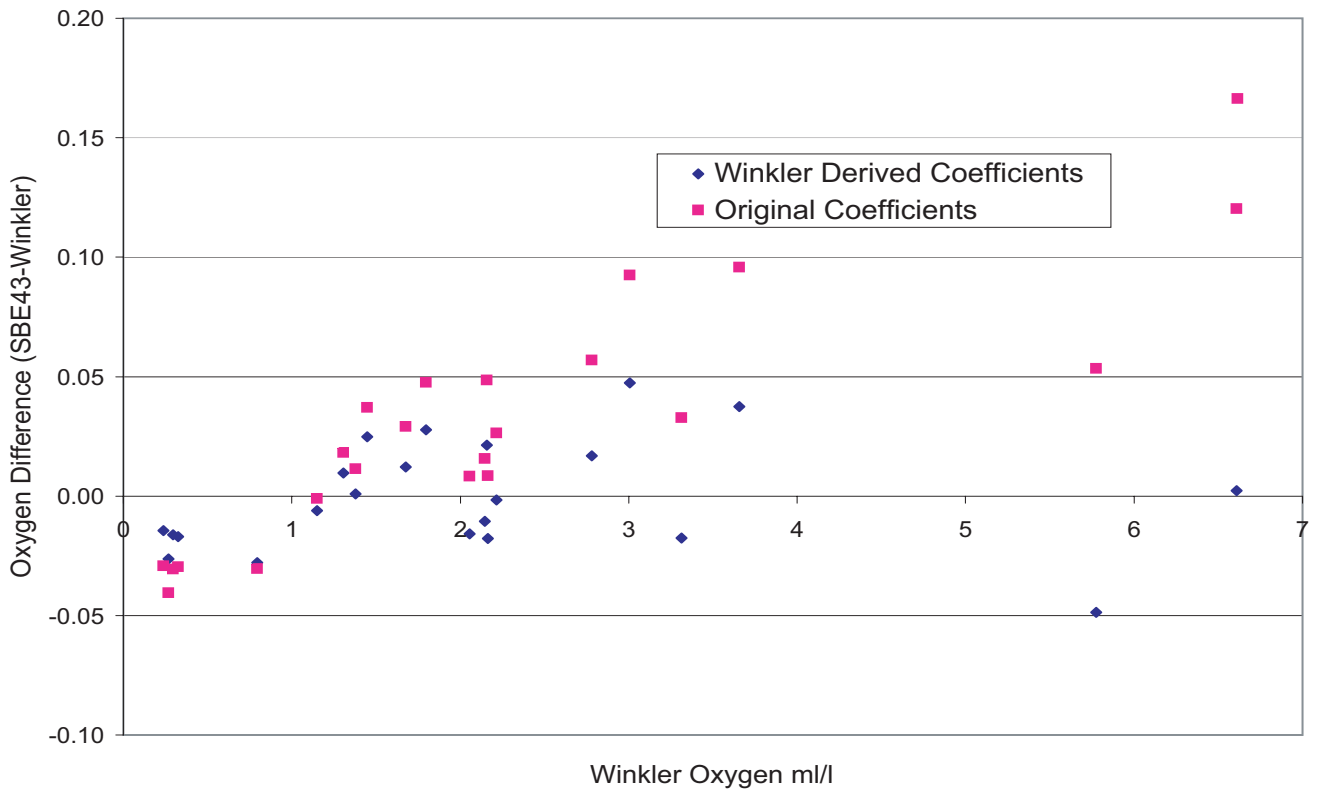
Table B2. Oxygen calibration data for W0408D and W0409A.

Cruise	Sta. No.	Station Name	Date UT	Latitude	Longitude	Pressure (dbar)	O2-titration (ml/l)	O2-probe (ml/l)
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	1006.0	0.295	0.2783
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	822.4	0.238	0.22381
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	749.7	0.269	0.24267
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	679.6	0.326	0.30845
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	480.5	0.795	0.76686
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	372.2	1.378	1.37929
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	281.7	2.054	2.03834
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	249.9	2.164	2.14626
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	220.3	2.214	2.21202
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	100.3	3.313	3.29522
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	19.9	6.609	6.61095
W0408D	12	NH-55	31 Aug	44°39.1'N	125°22.0'W	3.2	5.775	5.72598
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	545.9	1.151	1.14506
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	490.9	1.306	1.3151
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	415.6	1.448	1.47238
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	350.2	1.677	1.68944
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	299.7	1.796	1.82342
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	230.3	2.147	2.13623
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	200.2	2.156	2.17771
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	165.2	2.781	2.7976
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	150.1	3.007	3.05469
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	90.2	3.655	3.69266
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	20.1	6.616	6.66291
W0408D	24	SH-9	2-Sept	44°15.0'N	125°00.0'W	3.9	5.860	5.82735
W0409A	4	NH10	7-Sept	44°39.1'N	124°17.7'W	77.7	1.223	1.2038
W0409A	4	NH10	7-Sept	44°39.1'N	124°17.7'W	3.5	5.153	5.13736
W0409A	6	NH20	8-Sept	44°39.1'N	124°31.7'W	137.5	2.188	2.20259
W0409A	6	NH20	8-Sept	44°39.1'N	124°31.7'W	2.6	6.287	6.29165
W0409A	14	FM6	8-Sept	43°13.0'N	124°44.9'W	303.3	1.492	1.50349
W0409A	14	FM6	8-Sept	43°13.0'N	124°44.9'W	303.4	1.495	1.50257
W0409A	14	FM6	8-Sept	43°13.0'N	124°44.9'W	2.6	6.643	6.62117
W0409A	14	FM6	8-Sept	43°13.0'N	124°44.9'W	2.6	6.627	6.65308
W0409A	20	RR3	9-Sept	42°29.9'N	124°42.0'W	126.6	1.732	1.74356
W0409A	20	RR3	9-Sept	42°29.9'N	124°42.0'W	126.5	1.729	1.74313
W0409A	22	RR5	9-Sept	42°30.0'N	124°54.0'W	1004.3	0.274	0.26427
W0409A	22	RR5	9-Sept	42°30.0'N	124°54.0'W	1004.4	0.265	0.26428
W0409A	22	RR5	9-Sept	42°30.0'N	124°54.0'W	200.5	1.769	1.76517
W0409A	22	RR5	9-Sept	42°30.0'N	124°54.0'W	200.5	1.782	1.76556

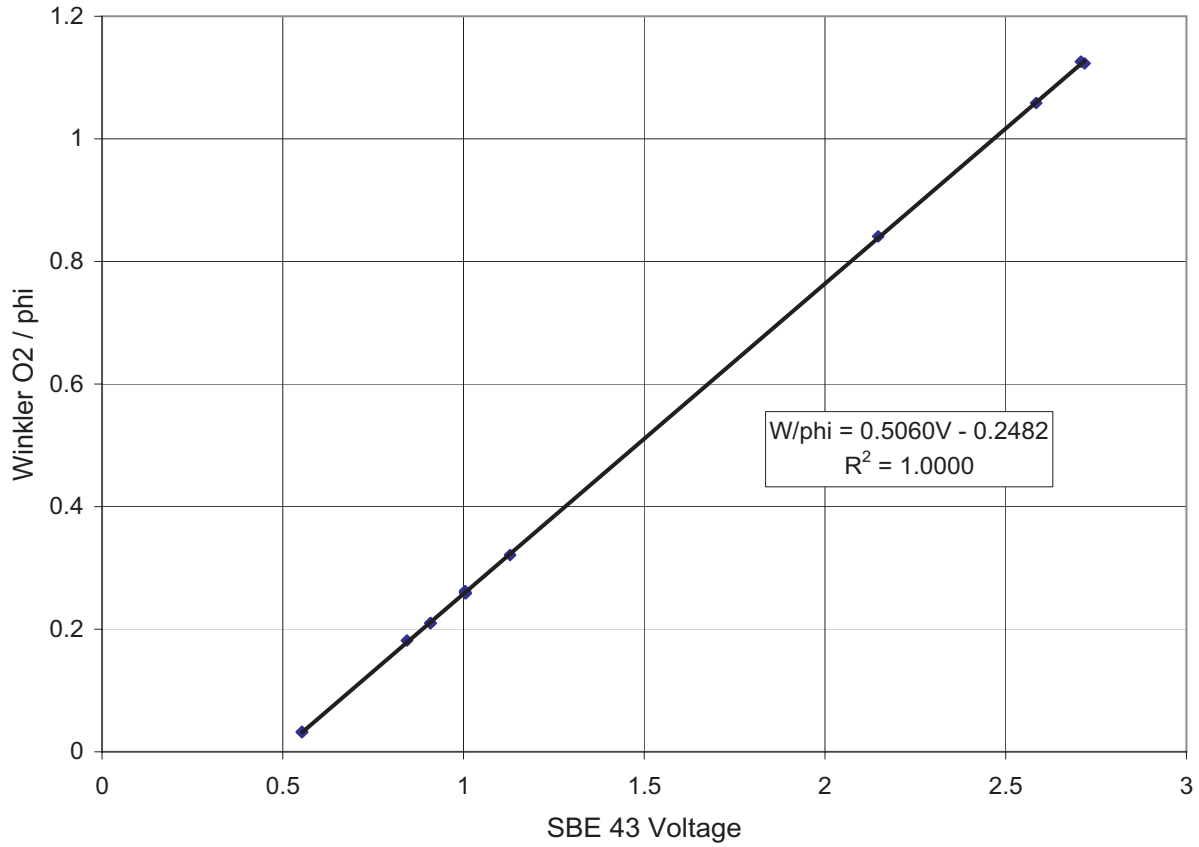
W0408D Linear Regression of Winkler O₂/phi versus SBE 43 Voltage



W0408D Comparison of SBE and Winkler Corrections



W0409A Linear Regression of Winkler O₂/phi versus SBE 43 Voltage



W0409A Comparison of SBE and Winkler Corrections

