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**CTD Observations in the
Coastal Transition Zone
Off Northern California
16-25 February 1987**

by
Richard E. Schramm,
Jane Fleischbein, Adriana Huyer
and P. Michael Kosro

Office of Naval Research
N00014-87-K-0242
NR 083-102

Data Report 137
Reference 87-24
September 1987

OREGON STATE UNIVERSITY

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER 87-24 DR137		2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) CTD OBSERVATIONS IN THE COASTAL TRANSITION ZONE OFF NORTHERN CALIFORNIA 16-25 FEBRUARY 1987		5. TYPE OF REPORT & PERIOD COVERED Data Report	
		6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s) Schramm, Richard E; Fleischbein, Jane; Huyer, Adriana; Kosro, P. Michael		8. CONTRACT OR GRANT NUMBER(s) N00014-87-K-0242	
9. PERFORMING ORGANIZATION NAME AND ADDRESS College of Oceanography Oregon State University Corvallis, Oregon 97331		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR083-102	
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Ocean Science & Technology Division Arlington, Virginia 22217		12. REPORT DATE September 1987	
		13. NUMBER OF PAGES 62	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified	
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited			
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Wecoma cruise W8702B was conducted in February 1987 as part of the pilot study for the Coastal Transition Zone project. CTD observations were made in the coastal transition zone off northern California between 37.5°N and 41.5°N. Stations were planned along three alongshore transects, at distances of 60, 90 and 150 km from the coast. Strong winds (with speeds greater than 35 kts) prevented the completion of the survey, but 38 stations were completed successfully. They were concentrated along lines 60 and 90 km from the coast.			

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Maximum sampling depth at most stations was 500 m. Temperature and salinity were measured at all stations; light transmission was also measured at the first 23 stations. This report presents vertical profile plots and tabulations of data at selected depths for each station, and vertical sections of temperature, salinity and density anomaly for the two long alongshore sections.

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ABSTRACT

Wecoma cruise W8702B was conducted in February 1987 as part of the pilot study for the Coastal Transition Zone project. CTD observations were made in the coastal transition zone off northern California between 37.5°N and 41.5°N. Stations were planned along three alongshore transects, at distances of 60, 90 and 150 km from the coast. Strong winds (with speeds greater than 35 kts) prevented the completion of the survey, but 38 stations were completed successfully. They were concentrated along lines 60 and 90 km from the coast. Maximum sampling depth at most stations was 500 m. Temperature and salinity were measured at all stations; light transmission was also measured at the first 23 stations. This report presents vertical profile plots and tabulations of data at selected depths for each station, and vertical sections of temperature, salinity and density anomaly for the two long alongshore sections.

ACKNOWLEDGMENTS

We are grateful to all those who participated in this cruise, and particularly to the master, crew and the marine technicians of the R/V Wecoma for their expert work during the persistently rough weather on this cruise. Pat Collier assisted in the preparation of this report. This study is funded by the Office of Naval Research, contract number N00014-87-K-0242.

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INTRODUCTION

This was the first of three mapping cruises designed to determine the general character of the mesoscale flow field in the Coastal Transition Zone off northern California during the winter and late spring of 1987. All three cruises were intended to have the same basic sampling pattern (shown in Figure 1) covering an alongshore extent of about 450 km. The cruise track was designed to consist of three modular units (A,B, and C, south of Pt. St. George, Cape Mendocino and Pt. Arena, respectively), each of which would take about three days to complete, and thus provide a synoptic mesoscale survey of each unit. Each module included alongshore transects at about 90 and 150 km from shore, and cross-shore transects extending out 60 km from the coast. The combination of three modules yields two continuous alongshore sections (Lines I and II, 150 and 90 km from shore respectively) each about 450 km long, and a discontinuous alongshore transect about 60 km offshore. On each cruise, we planned to make closely spaced CTD casts to 500 m on the outer transects of the southern modules; it is in this region that seaward jets and narrow filaments of cold surface waters had been observed previously (Flament et al., 1986; Kosro and Huyer, 1986). On each cruise, we operated a 300 kHz acoustic-Doppler current profiler continuously and obtained continuous underway surface temperature and salinity data. Complementary biological observations were made on all three cruises by T. Cowles and L. Small of Oregon State University, R.T. Barber and F.A. Chavez of Duke University, and M. Abbott and R. Hood of Scripps Institution of Oceanography. Mark Abbott, Bob Whritner and Melissa Ciandro of the Scripps Satellite Facility provided transission to the ship of sea surface temperature maps derived from the AVLHRR sensor on the NOAA9 satellite. This data report presents only the CTD data from the February cruise.

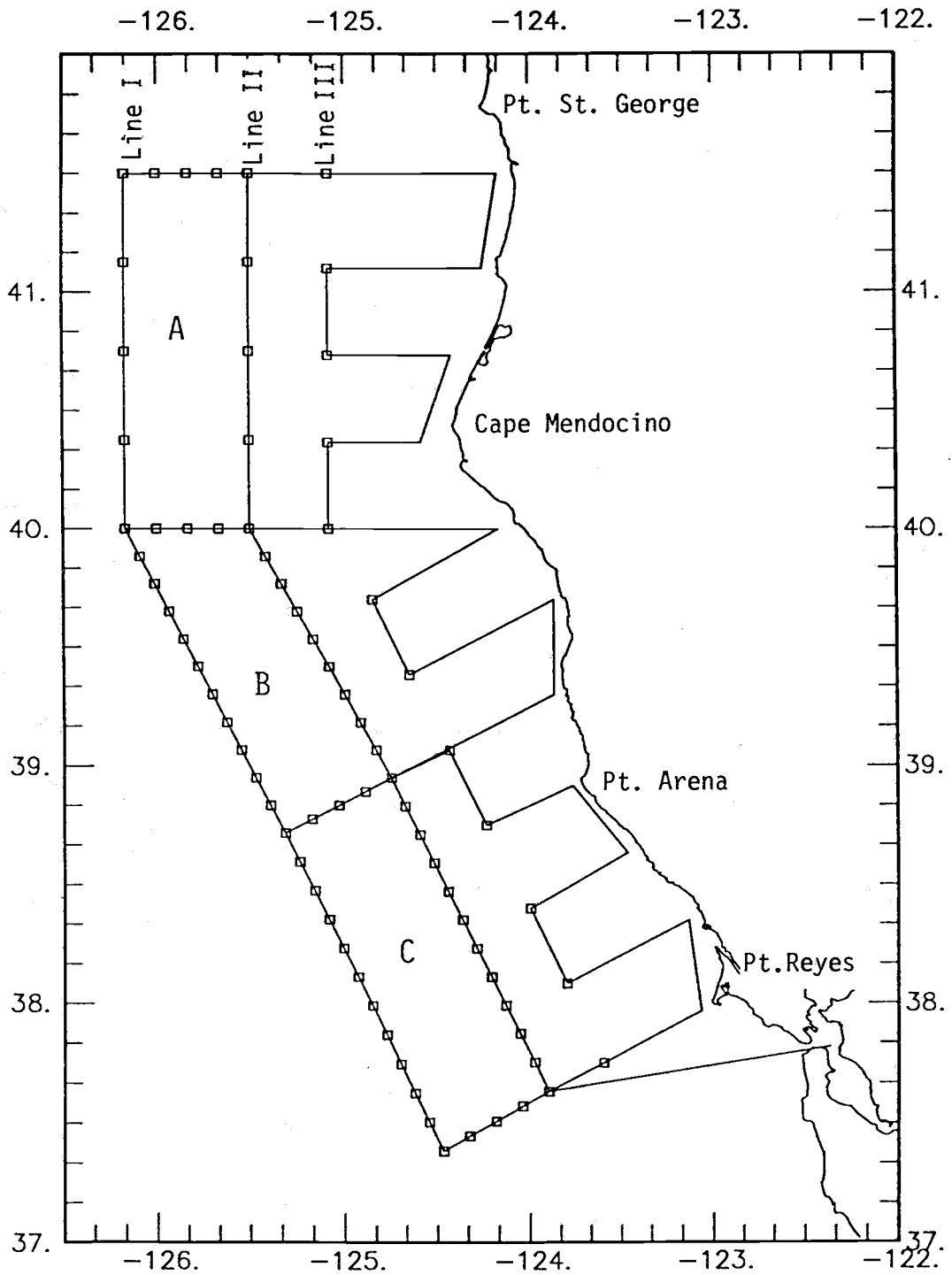


Figure 1. The basic sampling plan for the three CTZ mapping cruises in 1987. Actual sampling during each cruise varied from this pattern because of weather and other constraints.

The ship departed from Newport, Oregon on the morning of 16 February 1987, and headed straight out to $44^{\circ}40'N$, $125^{\circ}30'W$, where a test cast of the CTD equipped with a 12-bottle rosette and a transmissometer was successfully completed (Station 1, Table 1). The ship then steamed directly south to the study area (Figure 2). We began Module A north of Cape Mendocino with Station 2 on 17 February as planned, completing Station 19 early on 20 February. As winds had strengthened to almost 30 knots early on 20 February (Figure 3), we temporarily broke off CTD work and steamed inshore to survey the inshore end of Module B between Cape Mendocino and Pt. Arena. Winds weakened later on 20 February, and we were able to complete Stations 20 and 21 on Line III, and Stations 22 and 23 on Line II. By the middle of 21 February, wind speeds were increasing sharply and the rosette and transmissometer were removed from the CTD to make the package easier to handle in the rough seas. Winds continued to increase to speeds well in excess of 30 knots (Figure 3) and CTD operations were suspended entirely after Station 25. The ship steamed slowly northward along Line II to about $40^{\circ}30'N$, before tacking southwestward to the northwest corner of Module B on Line I. On 23 February, the ship steamed rapidly downwind along Line I while winds and seas remained too high to resume CTD work. On 24 February, we turned to go northward along Line II; by the middle of the day the sea had calmed enough to resume CTD operations (without the rosette and transmissometer); we completed Stations 26-35 along Line II and Stations 36-38 on Line III. There was not sufficient time left in the cruise to complete the cross-shore sections planned for the inshore portion of Module C. The ship arrived in port in San Francisco late on 25 February.

Personnel participating in the cruise were Michael Kosro (chief scientist), Tim Cowles, Rich Schramm, Jane Fleischbein, Dennis Barstow, Henry Pittock, Glenna Pittock, Ted Benson, Marc Willis and Kevin Krefft of Oregon

Table 1. List of CTD stations occupied during W8702A, showing date, time, location, weather and sea state. All casts were down to 500 dbar; Stations 1-23 included measurements of light transmission as well as temperature, conductivity and pressure.

Date	Time (UT)	Stn.	Latitude	Longitude	Depth (m)	Wind		Atmos Press (mb)	Swell			Air Temp	
						Dir	Spd		Dir	Ht	Per	Dry	Wet
						(	T)(kts)		(	T)(ft)	(sec)	(C)	(C)
February 16	2301	1	44 40.2 N	125 30.0 W	504	318	10	1023.0	250	12	13	13.1	10.8
February 17	1700	2	41 29.8 N	125 30.0 W	3093	325	5	1030.0	270	6	10	-	-
	17 1958	3	41 30.0 N	125 5.1 W	1878	325	10	1030.0	280	6	9	13.7	8.9
February 18	546	4	41 6.0 N	125 5.1 W	2961	355	10	1031.0	305	6	11	13.3	9.4
	18 854	5	40 44.0 N	125 5.9 W	2641	350	10	1030.0	305	6	13	13.4	10.5
	18 1643	6	40 21.9 N	125 5.3 W	1550	345	21	1032.0	295	8	10	14.3	9.8
	18 1924	7	39 59.9 N	125 5.2 W	1568	245	22	1032.0	350	8	10	13.8	9.4
	18 2144	8	40 0.0 N	125 30.0 W	2953	350	22	1030.5	300	6	-	13.1	9.8
February 19	110	9	40 22.4 N	125 30.0 W	1466	355	22	1030.0	300	6	10	13.5	10.0
	19 431	10	40 44.9 N	125 30.0 W	2988	355	25	1032.0	300	8	10	13.0	9.1
	19 800	11	41 7.0 N	125 30.0 W	3145	350	22	1031.0	300	8	9	11.6	9.1
	19 1108	12	41 30.0 N	125 30.1 W	3104	012	24	1031.0	300	7	9	12.1	8.9
	19 1246	13	41 30.1 N	125 40.1 W	3069	015	23	1031.0	300	7	10	13.5	10.0
	19 1448	14	41 29.9 N	125 50.0 W	3028	010	21	1032.0	300	7	10	12.5	9.5
	19 1630	15	41 30.0 N	126 0.1 W	2631	006	18	1030.2	300	7	10	13.0	9.5
	19 1758	16	41 30.0 N	126 10.0 W	2904	015	19	1032.8	300	7	10	13.1	9.8
	19 2045	17	41 7.5 N	126 10.0 W	2939	010	20	1031.0	300	7	9	12.5	9.9
	19 2312	18	40 45.1 N	126 9.9 W	2927	000	24	1030.0	300	7	9	10.4	11.3
February 20	152	19	40 22.1 N	126 10.2 W	2901	010	26	1028.6	350	9	10	13.5	12.0
	20 1750	20	39 42.1 N	124 50.9 W	1856	355	15	1025.8	350	7	10	15.4	11.9
	20 2018	21	39 23.0 N	124 39.0 W	2968	008	12	1026.8	305	6	9	15.0	12.2
February 21	426	22	38 57.0 N	124 45.2 W	3398	340	24	1026.8	310	8	10	13.7	10.6
	21 634	23	39 3.6 N	124 50.2 W	3291	350	27	1025.7	310	10	10	13.8	10.5
	21 813	24	39 11.0 N	124 54.5 W	3132	350	27	1026.9	305	10	10	12.3	10.5
	21 948	25	39 17.9 N	124 59.8 W	3026	340	26	1026.1	305	10	10	11.1	9.5
February 24	1551	26	38 6.6 N	124 12.4 W	3719	350	20	1004.7	330	10	10	14.3	9.0
	24 1720	27	38 13.9 N	124 17.2 W	3719	345	21	1005.1	330	8	10	12.9	8.0
	24 1846	28	38 21.1 N	124 21.8 W	3742	355	20	1006.1	330	8	10	13.4	8.0
	24 2015	29	38 28.0 N	124 26.6 W	3591	000	20	1006.4	330	8	9	12.5	7.9
	24 2143	30	38 35.4 N	124 31.1 W	3635	355	20	1006.5	330	8	9	12.2	8.3
	24 2311	31	38 42.5 N	124 35.6 W	3631	350	24	1006.7	330	8	9	12.5	8.0
February 25	40	32	38 49.8 N	124 40.4 W	3578	355	26	1016.9	330	8	7	14.2	9.0
	25 253	33	38 56.9 N	124 45.2 W	3397	355	30	1017.2	330	8	7	13.5	8.9
	25 436	34	39 3.9 N	124 50.4 W	3293	350	32	1007.7	330	8	10	12.0	7.7
	25 617	35	39 11.0 N	124 55.0 W	3126	355	30	1008.8	330	8	10	12.2	8.2
	25 912	36	39 4.0 N	124 25.4 W	3273	345	20	1008.3	320	8	9	11.9	8.2
	25 1122	37	38 44.8 N	124 13.5 W	3009	345	18	1008.1	320	8	9	12.5	8.8
	25 1532	38	38 5.1 N	123 47.8 W	3028	airs	--	1019.2	300	7	11	13.5	9.0

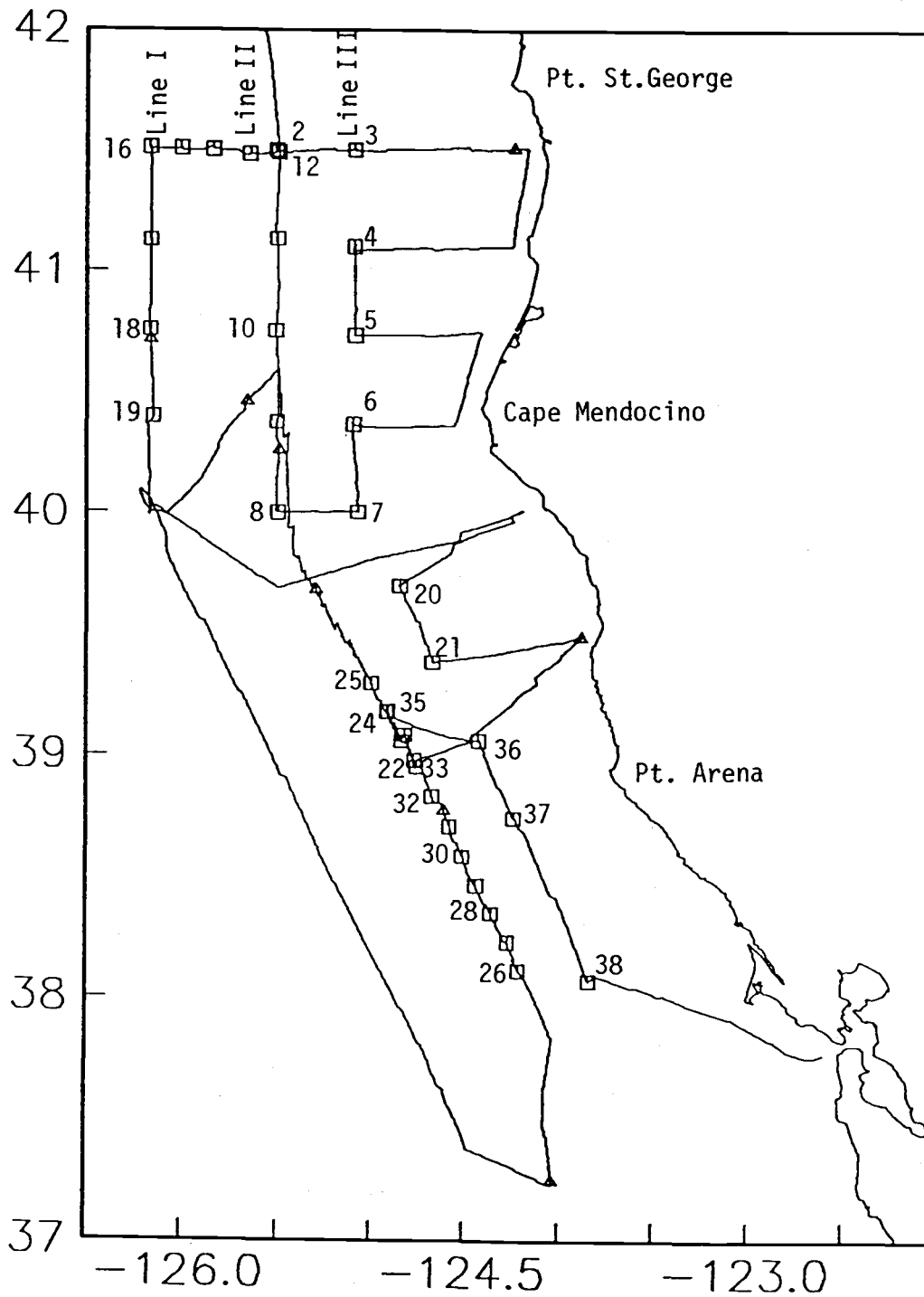


Figure 2. Ship's track during the first CTZ mapping cruise, W8702B, R/V Wecoma, 15-25 February 1987. Triangles indicate the start of each new day; squares indicate the positions of CTD stations.

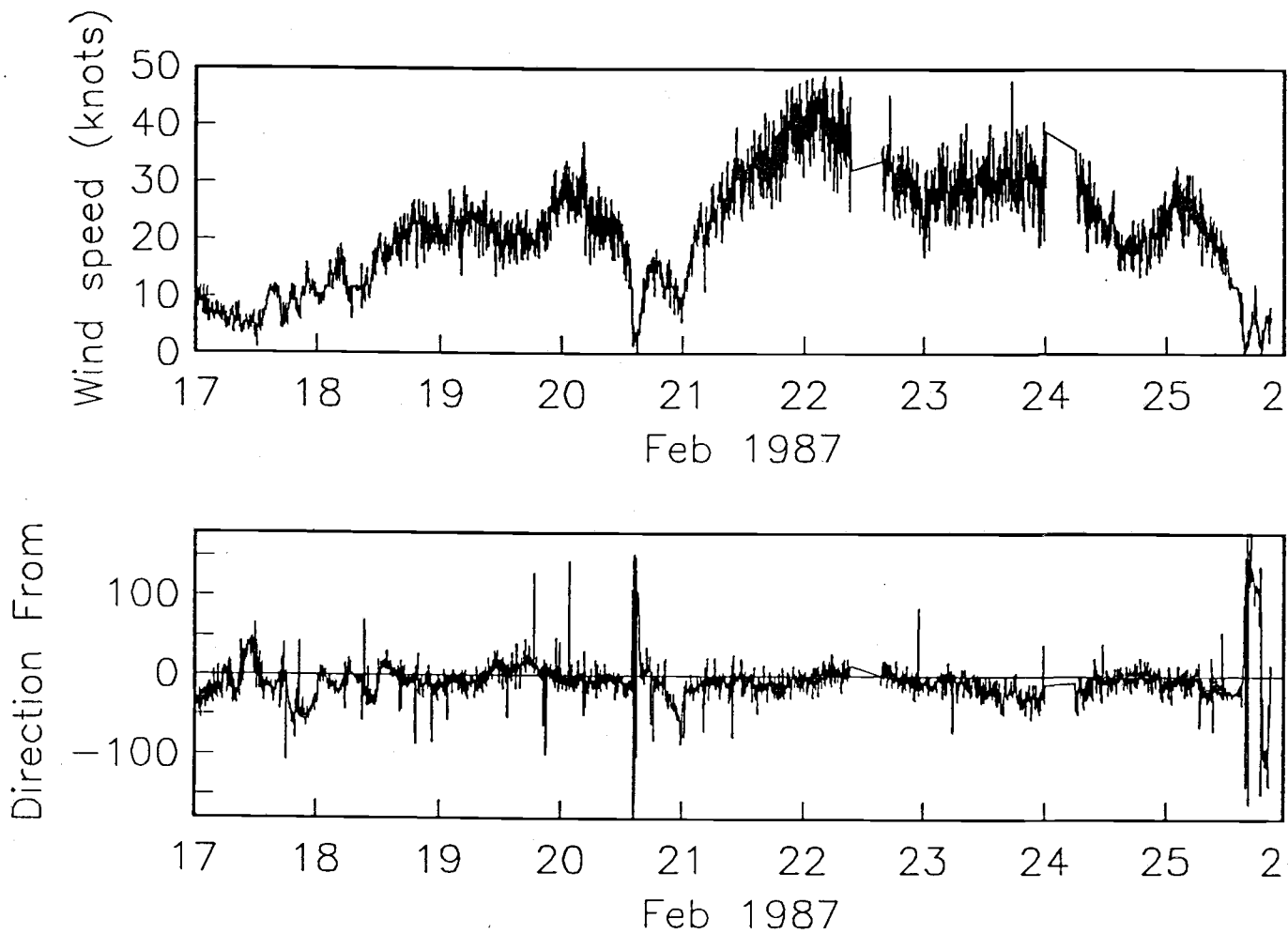


Figure 3. Speed (knots) and direction (degrees clockwise from north) of the wind vectors recorded at two-minute intervals. Note the data gaps on 22 and 24 February.

State University; Patrick Whaling of Duke University; Robert Petty of UC Santa Barbara; and Raleigh Hood of Scripps Institution of Oceanography.

SAMPLING AND CALIBRATION PROCEDURES

A Neil Brown Instruments Mark IIIb conductivity-temperature depth (CTD) probe (#2561) was used to obtain continuous profiles of temperature and salinity and pressure at each station. During the first half of the cruise (i.e., Stations 1-23), a General Oceanics rosette water sampler was mounted with the CTD, and the CTD was equipped with a Sea Tech. Inc. 25-cm transmissometer (#33D). The entire package was lowered at about 45 m/min. The CTD was fitted with a 1600 db pressure sensor and the fast response thermistor was disabled and replaced in the circuitry with a precision 10 ohm resistor. The CTD was set to sample at its maximum rate of 32 Hz. The time constant of the platinum resistance thermometer of the probe had earlier been determined to be 0.235 sec (Fleischbein et al., 1987) using estimates of the slope of the phase spectrum between the measured temperature and conductivity as suggested by Millard, Toole and Swartz (1980).

OSU's CTD probe #2561 was calibrated for pressure, temperature and conductivity by the manufacturer in December 1986. Water samples were taken from the rosette Niskin bottles at selected depths to provide in situ calibration data. Protected reversing thermometers were mounted on one rosette bottle. After use of the rosette was discontinued (i.e. after Station 23), a single Niskin bottle was mounted immediately above the CTD. No water samples were obtained on Stations 23-24 and 34-38. Bottles were tripped during the up-cast, and the CTD data to be compared with the samples were recorded at the actual depth at which each bottle was tripped. Duplicate salinity samples were drawn from selected bottles and stored in round 4-oz. glass bottles with

new poly-seal caps, with an additional outer seal of 'Parafilm'. One complete set of the salinity samples was analyzed on a Guildline 8400A Autosol salinometer (OSU's #3) within three weeks (by 17 March). Duplicates were analyzed mainly to check those sample values which showed relatively large differences from the CTD. The Guildline Autosol determines water sample salinity with a precision of ± 0.002 and an accuracy of ± 0.003 . The reversing thermometers have an accuracy of $\pm 0.02^{\circ}\text{C}$ and were corrected using the results of calibrations done once every 3 years at the Northwest Regional Calibration Center.

Typically, a few CTD-sample differences are much larger than the others, as large as several standard deviations; these usually occur in regions of sharp vertical gradients and are eliminated from the in situ calibration data set. For this cruise, we eliminated 6 of the salinity samples and two sets of thermometer readings. The remaining temperature differences (Table 2) were within or close to the stated accuracy of the reversing thermometers, so no temperature correction was applied to the CTD data. The CTD temperature was also calibrated in the laboratory at OSU in August 1987; results of that calibration (mean difference less than 0.001°C from the standard) confirmed that no correction was needed. The CTD pressure at the surface prior to a cast was recorded at regular intervals during the cruise; it always remained less than 0.5 dbar which is within the stated accuracy of the pressure sensor (± 1.6 dbar) so no pressure correction was applied to the CTD data. Sample conductivities were calculated using the sample salinity value with the CTD temperature and pressure values; a value of $42.914 \text{ mmho cm}^{-1}$ for the conductivity of standard seawater at 15°C (Culkin and Smith, 1980) was used to convert the measured sample conductivity ratios to conductivity. Sample conductivities were compared to CTD conductivities

Table 2. Results of in situ calibration samples: comparison between sample and CTD values of temperature, conductivity and salinity.

STA	Z	Sample Values			CTD Values			Differences		
		T	S	C	T	C	S	DC	DT	DS
2	343	6.00	34.016	33.661	6.016	33.658	34.013	0.002	-0.016	0.003
3	38		32.686	37.409	11.754	37.401	32.678	0.009		0.008
3	49		32.683	37.384	11.724	37.380	32.679	0.004		0.004
3	342		34.012	34.100	6.512	34.098	34.010	0.002		0.002
3	500	5.55			5.571	33.426			-0.021	
4	25		32.664	37.286	11.649	37.283	32.661	0.004		0.003
4	504		34.143	33.173	5.263	33.176	34.146	-0.003		-0.003
5	17		32.759	37.867	12.185	37.862	32.754	0.005		0.005
5	17		32.759	37.867	12.185	37.862	32.754	0.005		0.005
5	37		32.759	37.879	12.189	37.874	32.754	0.005		0.005
5	339		33.975	33.821	6.239	33.820	33.974	0.001		0.001
5	437	5.95	34.079	33.709	5.961	33.714	34.085	-0.005	-0.011	-0.006
6	5		32.788	37.507	11.762	37.505	32.786	0.003		0.002
6	15		32.788	37.512	11.762	37.509	32.785	0.003		0.003
6	35		32.799	37.525	11.755	37.517	32.791	0.008		0.008
6	49		32.897	37.416	11.517	37.413	32.894	0.003		0.003
6	70	10.62			10.629	36.945			-0.009	
7	25		32.640	37.616	12.041	37.613	32.637	0.003		0.003
7	408	5.67	33.997	33.379	5.686	33.385	34.005	-0.007	-0.016	-0.008
8	14		32.772	38.200	12.538	38.199	32.770	0.002		0.002
8	23		32.776	38.202	12.531	38.195	32.769	0.007		0.007
8	25	12.53	32.772	38.208	12.541	38.208	32.772	0.000	-0.011	0.000
8	1003	3.54	34.407	32.100	3.547	32.103	34.411	-0.003	-0.007	-0.004
9	5		32.649	37.525	11.940	37.521	32.644	0.005		0.005
9	15		32.648	37.531	11.943	37.528	32.644	0.004		0.004
9	34		32.647	37.537	11.941	37.537	32.647	0.000		0.000
9	51	11.91	32.659	37.536	11.918	37.531	32.654	0.005	-0.008	0.005
10	25	11.80	32.620	37.384	11.807	37.382	32.618	0.002	-0.007	0.002
10	211		33.902	34.671	7.325	34.670	33.900	0.002		0.002
10	323	5.97	33.975	33.579	5.975	33.578	33.974	0.000	-0.005	0.001
11	5		32.601	37.286	11.730	37.283	32.598	0.003		0.003
11	10		32.599	37.285	11.729	37.283	32.596	0.003		0.003
11	30		32.599	37.298	11.734	37.297	32.597	0.002		0.002
11	50		32.602	37.307	11.731	37.304	32.598	0.004		0.004
12	10	11.24	32.613	36.868	11.250	36.867	32.612	0.001	-0.010	0.001
12	366		34.016	33.668	6.013	33.663	34.011	0.005		0.005
12	900		34.364	32.248	3.807	32.248	34.364	0.000		0.000
13	30		32.565	36.507	10.892	36.501	32.559	0.006		0.006
13	498	5.26			5.271	33.166			-0.01	
14	44	10.95	32.550	36.559	10.960	36.557	32.548	0.002	-0.010	0.002
15	71		32.554	36.553	10.936	36.551	32.552	0.002		0.002
15	208	7.38	33.930	34.763	7.399	34.764	33.931	-0.001	-0.019	-0.001

Table 2. Continued.

STA	Z	Sample Values			CTD Values			Differences		
		T	S	C	T	C	S	DC	DT	DS
16	24		32.517	36.513	10.956	36.507	32.511	0.006		0.006
16	50		32.514	36.520	10.954	36.518	32.512	0.002		0.002
16	997	3.51	34.404	32.073	3.522	32.083	34.416	-0.010	-0.012	-0.012
17	25		32.684	37.187	11.516	37.183	32.680	0.004		0.004
18	4		32.617	37.506	11.956	37.504	32.614	0.003		0.003
18	10		32.618	37.509	11.955	37.506	32.615	0.003		0.003
18	29	11.94	32.613	37.500	11.942	37.499	32.611	0.002	-0.002	0.002
18	49		32.613	37.499	11.931	37.496	32.610	0.003		0.003
18	70		32.610	37.487	11.911	37.485	32.608	0.002		0.002
19	25		32.655	37.774	12.198	37.773	32.654	0.001		0.001
19	50	12.18	32.657	37.789	12.200	37.785	32.653	0.004	-0.020	0.004
20	25		32.710	37.936	12.313	37.934	32.708	0.002		0.002
20	50		32.711	37.941	12.306	37.940	32.710	0.001		0.001
20	410	5.96	34.087	33.714	5.972	33.722	34.096	-0.008	-0.012	-0.009
21	25		32.711	37.757	12.115	37.755	32.709	0.002		0.002
21	50	12.09	32.711	37.767	12.115	37.765	32.708	0.003	-0.025	0.003
22	997		34.412	32.342	3.821	32.343	34.413	0.000		-0.001
22	70		32.991	36.706	10.619	36.708	32.993	-0.002		-0.002
22	50		32.828	37.862	12.086	37.860	32.825	0.003		0.003
22	29		32.825	37.891	12.131	37.889	32.823	0.002		0.002
22	13		32.826	37.886	12.132	37.883	32.823	0.004		0.003
22	4		32.826	37.882	12.132	37.879	32.822	0.004		0.004
23	187		33.985	35.940	8.651	35.943	33.988	-0.003		-0.003
23	5		32.798	37.860	12.139	37.859	32.797	0.001		0.001
27	9		32.948	37.973	12.090	37.975	32.950	-0.002		-0.002
28	348		34.058	34.015	6.368	34.014	34.057	0.001		0.001
30	83		32.930	37.501	11.558	37.502	32.931	-0.001		-0.001
31	52		32.894	37.984	12.143	37.985	32.895	-0.001		-0.001
32	325		34.085	34.604	7.008	34.601	34.082	0.003		0.003
33	72		32.873	37.333	11.442	37.329	32.869	0.004		0.004
Mean.								0.002	-0.012	0.002
Std dev.								0.003	0.006	0.004
No. obs.								69.	19.	69.

which had been corrected for temperature and pressure effects on the cell. The average and standard deviation of the conductivity differences (Table 2) were within the stated accuracy of the CTD so no conductivity correction was applied to the CTD conductivity data.

The transmissometer measures the light transmitted by a collimated beam of nearly monochromatic (660 nm) light through a 25 cm path length, providing an analog output of 0 to 5 VDC, corresponding to 0 to 100 % transmission. This output is digitized by the CTD using the full integer range of 0 to 4095, and merged into the data stream. The transmissometer was calibrated in air and water by the manufacturer prior to the cruise, and the air calibration was repeated on the ship during the cruise. The results are used to correct the measured voltage using the formula:

$$\text{VOLTS} = (\text{AIROLD} / \text{AIRNEW}) * (\text{TVOLT} - \text{ZERO})$$

where VOLTS is the corrected voltage, AIROLD is the voltage output in air obtained during the precalibration (4.741 V in this case), AIRNEW is the voltage output obtained in air during the cruise (4.744 V in this case), TVOLT is the measured voltage output, and ZERO is the voltage output when the light path is completely blocked (0.0007 V in this case). The formula

$$\text{TRANS} = (\text{VOLTS} / 5) * 100.$$

was used to convert the corrected voltage to percent transmission.

CTD DATA PROCESSING PROCEDURES

The CTD data are recorded at sea on a Kennedy 9-track data logger, with many stations on each tape. Data logging normally begins as soon as the CTD probe is in the water, and continues until after the probe has reached the maximum depth. The first step in data processing is to obtain a directory of

the data tape using program NBCTD3. For each station, this directory lists the header data, the block number in which the instrument descent begins, and the maximum pressure. NBCTD3 is then used to create disc files of pressure, temperature, conductivity and transmissometer counts for each cast. This program also corrects the conductivity data for variations in cell geometry due to pressure and temperature changes. Using program CTDRED6 we then apply the temperature, conductivity and pressure calibrations if necessary, and check for extraneous values and extreme gradients. This program applies a recursive filter designed by R. Millard (S. Hayes, pers. comm.) to the conductivity data to remove the phase difference introduced by the finite response time ($T = 235$ msec) of the temperature sensor; this filter has the form

$$C(n) = a_0 C(n-1) + (1-a_0) C_0(n)$$

where $C_0(n)$ is the observed value and $C(n)$ is the filtered value of the n^{th} scan, and $a_0 = T / (T + t_i) = 0.880$ is a constant determined from the time constant T and the time interval t_i between scans. The same recursive filter is applied to the pressure data to reduce the digitizing noise and ensure that the pressure data is in phase with the temperature and conductivity data at low frequencies (<1 Hz). Practical salinity (Lewis, 1978) is computed from the temperature and the filtered conductivity and pressure data using standard algorithms (Fofonoff and Millard, 1983) and a value of 42.914 to convert CTD conductivity to conductivity ratio (Culkin and Smith, 1980).

The filtered pressure data are used to eliminate the ascending scans caused by ship's motion. Data collected during descent are sorted into 2 dbar bins, and the extremes and averages of each variable are computed for each bin. Profiles of the temperature and salinity extremes are plotted to

determine whether further editing is needed, and the 2 dbar mean temperatures and salinities constitute the processed data. When editing appears to be necessary, the original data files are examined in detail; data points that are rejected are replaced by linearly interpolated values, and the files are reprocessed using CTDRED6.

The processed data files containing integral pressure, and average temperature, conductivity, salinity, transmission, etc., are archived. These files are used to calculate other parameters of interest such as potential temperature (θ), potential density anomaly (σ_θ), specific volume anomaly, geopotential anomaly, sound velocity, etc., from the new equation of state of sea-water (UNESCO, 1981) using standard algorithms (Fofonoff and Millard, 1983). In this data report we show only profile plots of temperature, salinity, σ_θ and light transmission vs. pressure, and tables of temperature, salinity, σ_θ , specific volume anomaly, geopotential anomaly and light transmission at selected pressures.

DATA PRESENTATION

The body of this data report presents vertical profiles of temperature, salinity and the density anomaly, σ_θ for all 38 stations. For the first 23 stations, a second plot shows the vertical profile of light transmission, with the temperature and salinity profiles repeated to facilitate comparisons among variables. For all stations, data from the upper 500 dbar are shown to the same vertical scale; for station 22, which penetrated to 1000 dbar, a second set of plots shows data from the entire cast.

For each station, we also present tabulations of selected parameters at standard depths. Header information for each station includes:

STA NO	Consecutive station number
LAT	Latitude in degrees and minutes north of the equator
LONG	Longitude in degrees and minutes west of the Greenwich meridian
DATE	Day, Month, Year
TIME	Universal Time (Greenwich Mean Time)
PROBE	Serial number of the CTD probe
DEPTH	Sonic depth in meters, corrected according to Matthews Tables.

The data table for each station gives values of temperature in °C (TEMP), practical salinity (SAL), potential temperature (POTEN TEMP), density anomaly in kg/m^3 (SIGMA THETA), specific volume anomaly in $10^{-8} \text{ m}^3/\text{kg}$ (SVA), geopotential anomaly (dynamic height, DELD) in dynamic meters, and light transmission (TRN) in percent.

SUMMARY OF RESULTS

Because of strong winds and high seas, we were able to complete less than half of the CTD casts in our sampling plan. Nevertheless, we obtained reasonably good alongshore coverage along Lines II and III, and the vertical distributions of temperature, salinity and sigma-theta along these lines are shown in Figures 4-9.

Along Line II, the surface temperature was rather uniform, ranging only between 11.3 and 12.6; surface salinities were somewhat lower in the north than in the south. Both the thermocline and the halocline were roughly

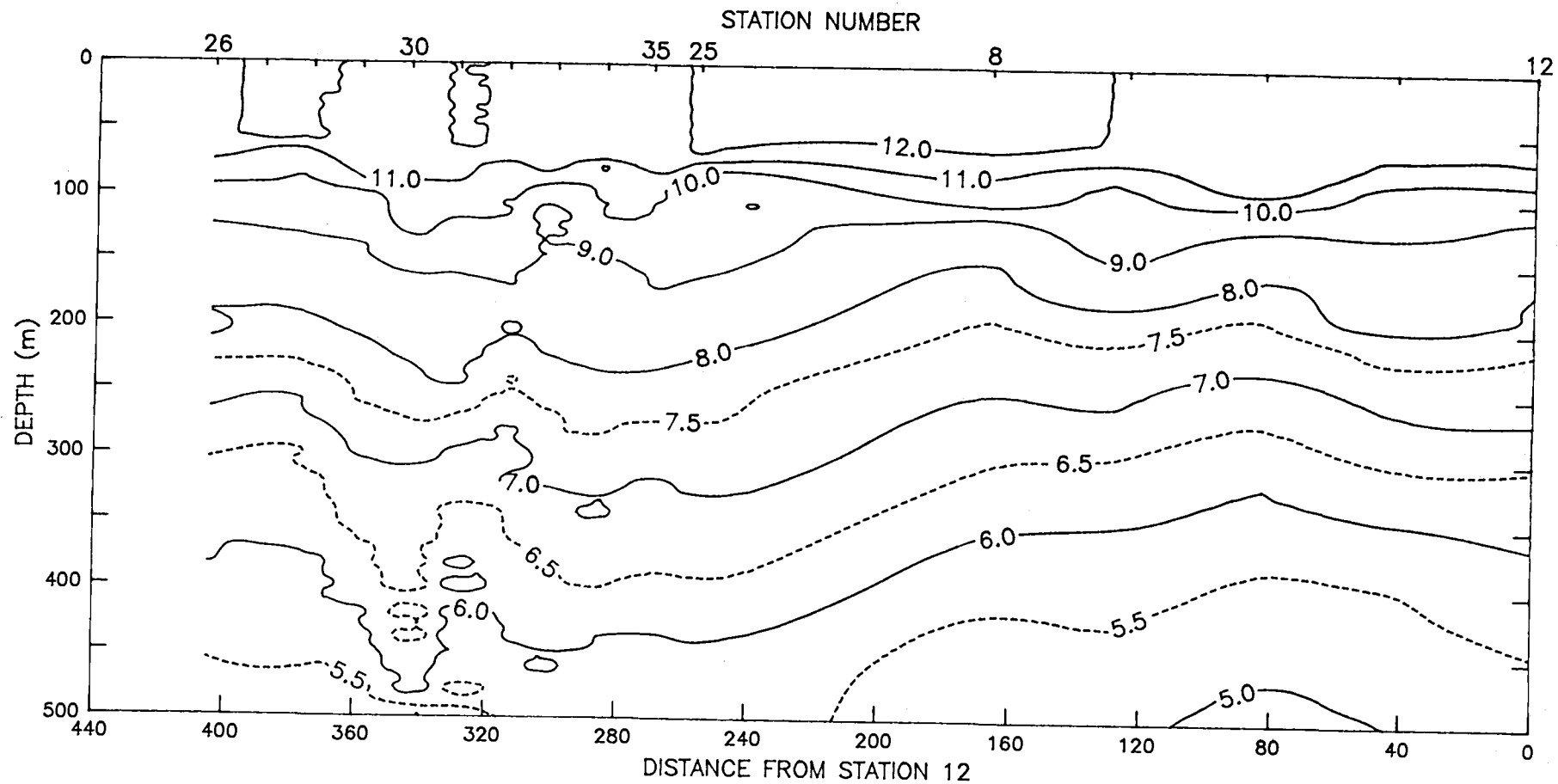


Figure 4. The vertical distribution of temperature along Line II, 18-25 February. The position of Line II is shown in Figure 2.

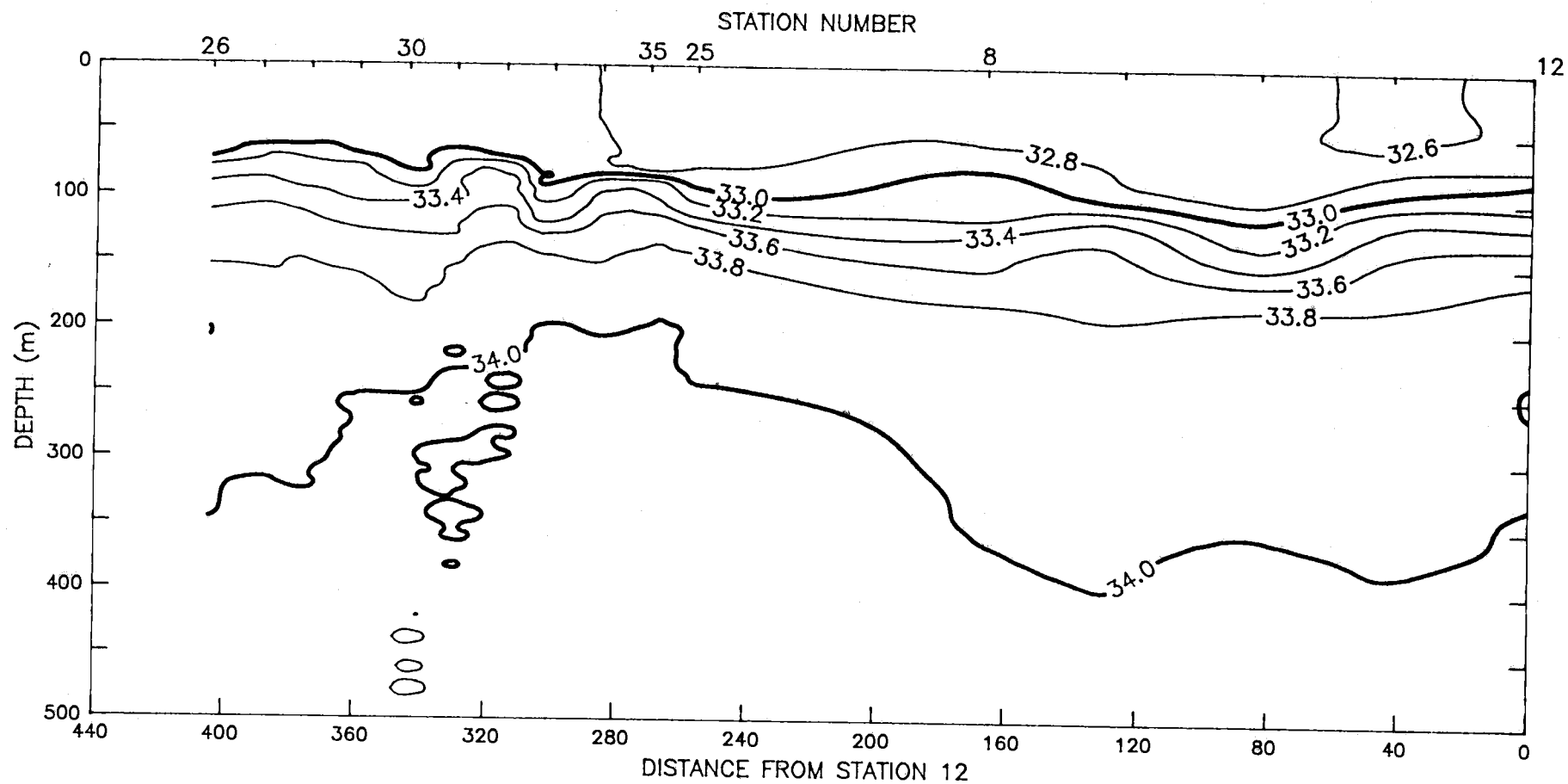


Figure 5. The vertical distribution of salinity along Line II, 18-25 February. The position of Line II is shown in Figure 2.

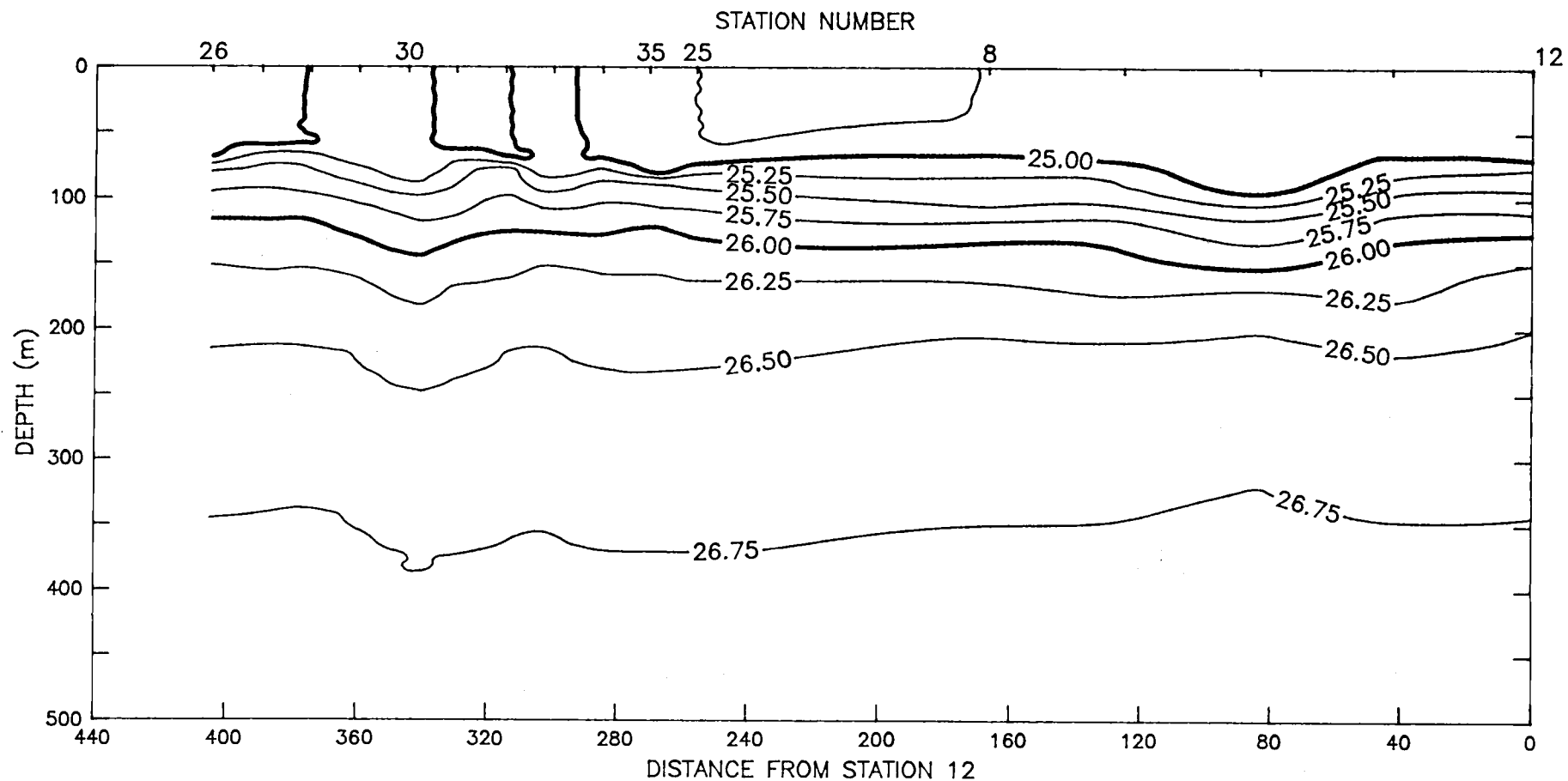


Figure 6. The vertical distribution of the density anomaly (σ - θ) along Line II, 18-25 February.

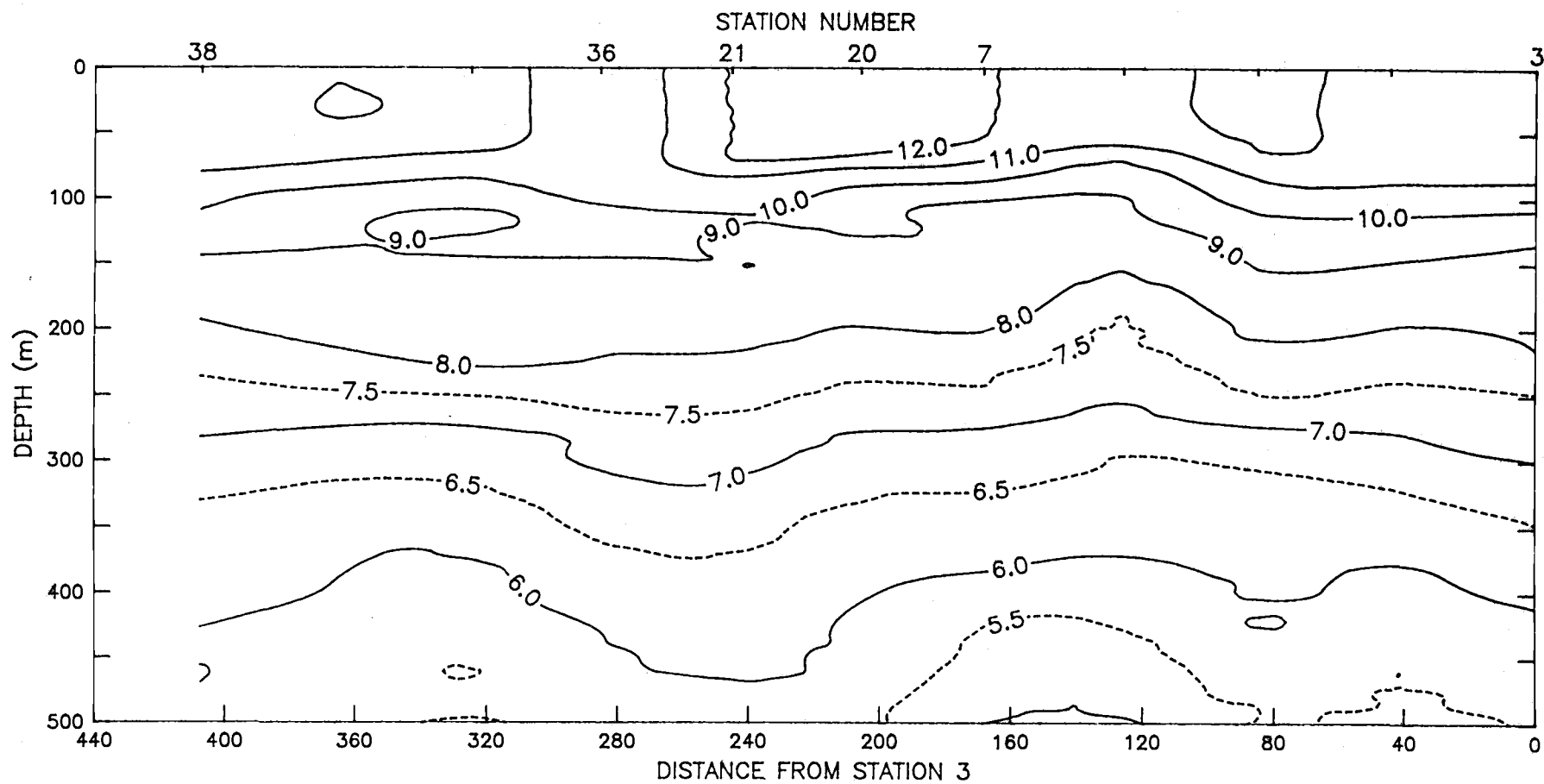


Figure 7. The vertical distribution of temperature along Line III, 17-25 February. The position of Line III is shown in Figure 2.

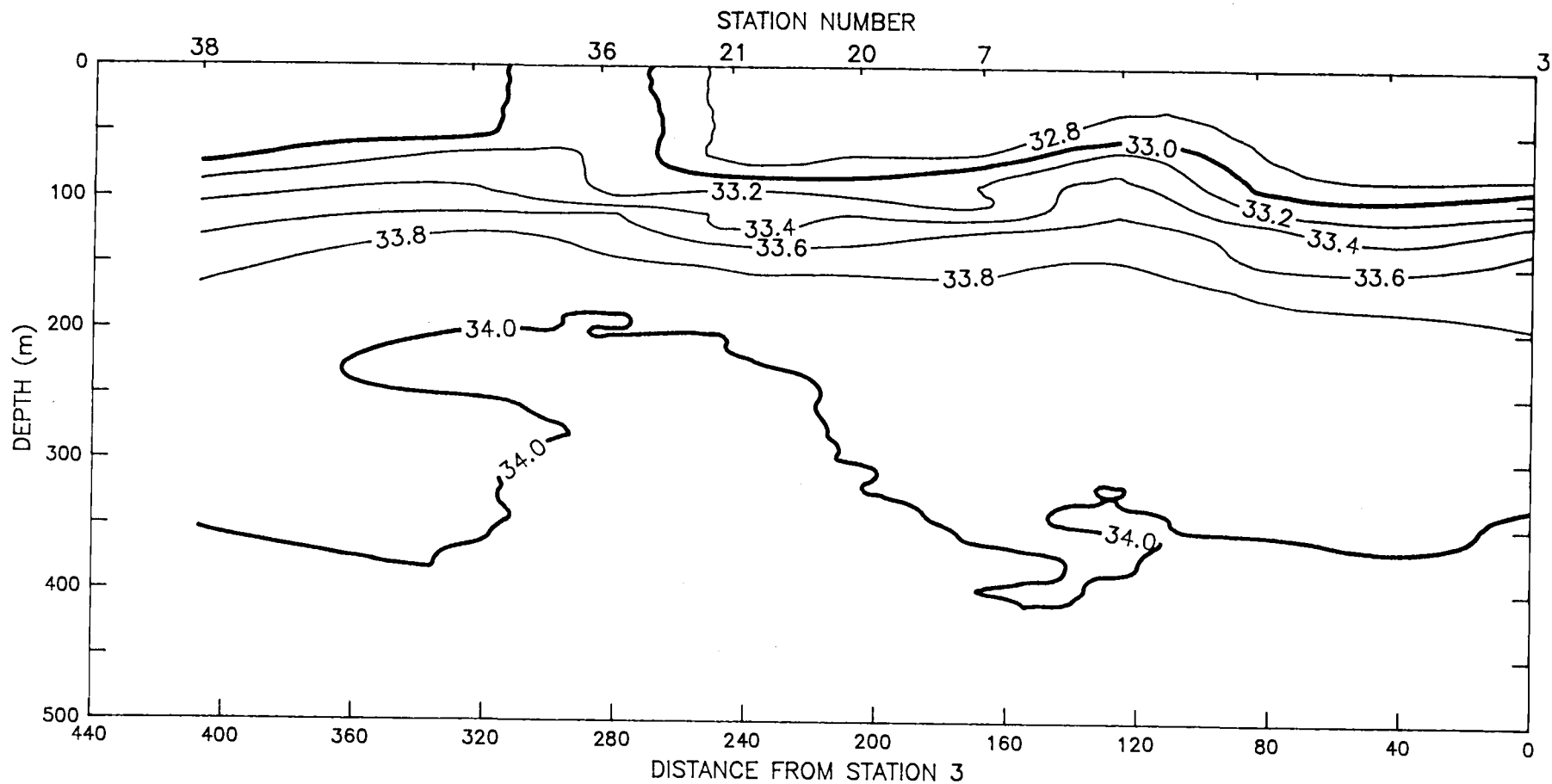


Figure 8. The vertical distribution of salinity along Line III, 17-25 February. The position of Line III is shown in Figure 2.

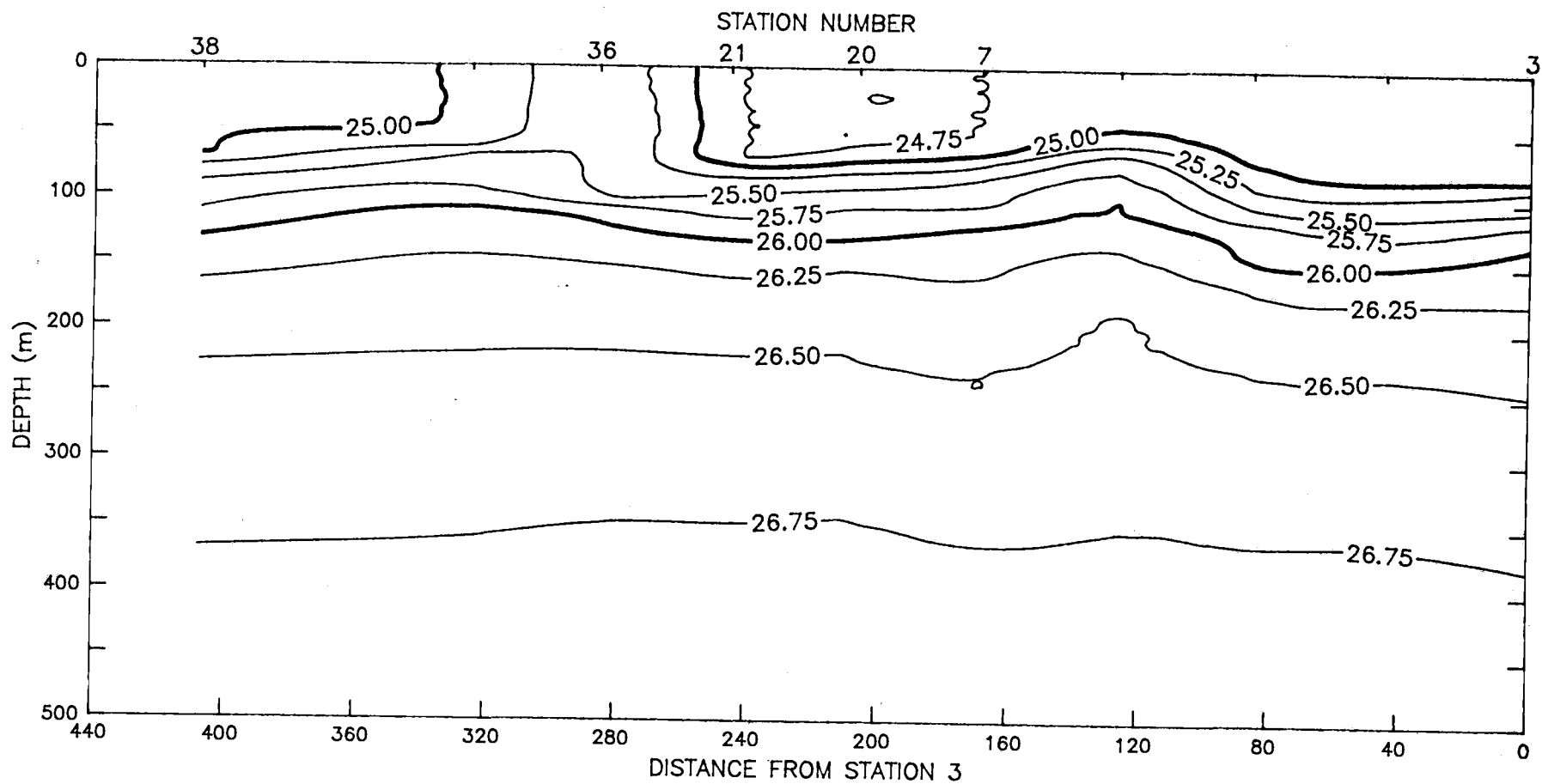


Figure 9. The vertical distribution of the density anomaly ($\sigma\text{-}\theta$) along Line III, 17-25 February. The position of Line III is shown in Figure 2.

level and centered at about 100 m (Figures 4,5). Deeper waters showed some alongshore gradation in both temperature and salinity, but these seemed to have a compensatory density effects, i.e. warmer waters were higher in salinity and cooler waters were lower in salinity, so that the deeper alongshore density gradients were generally small (Figure 6).

The surface temperature along Line III had stronger alongshore gradients (Figure 7), particularly between Stations 36 and 37, where surface temperatures were 10.4 and 11.6 C, respectively. There was an even larger difference between Stations 21 and 36, but this may be partly the result of temporal aliasing. The cold surface water at Station 36 was relatively high in salinity ($S=33.12$) compared to the neighboring stations ($S<32.8$ at Sta. 21 and $S<33.0$ at Sta. 35), so there are associated alongshore density gradients north and south of this station (Figure 9). These density gradients do not seem to penetrate to depths below the pycnocline centered at about 100 m (Figure 9). However, there are subsurface alongshore gradients in temperature and salinity, with the warmest, highest salinity water occurring at Stations 21 and 36, just north of Pt. Arena, and the coldest, lowest salinity water occurring at Stations 6 and 7 near Cape Mendocino (Figures 7,8).

Three pairs of CTD casts before and after a four-day interval of strong winds were made at three locations on Line II just north of Pt. Arena. In all three pairs, the temperature and salinity profiles (Figure 10) show that the surface mixed layer is deeper and the surface temperature is colder after the windy interval as expected. There is also a substantial change in the structure of the temperature inversion embedded in the halocline. The surface salinity, however, is very nearly unchanged.

Average and standard deviations of the 38 temperature, salinity and sigma-theta profiles (Figure 11) show the bottom of the surface mixed layer

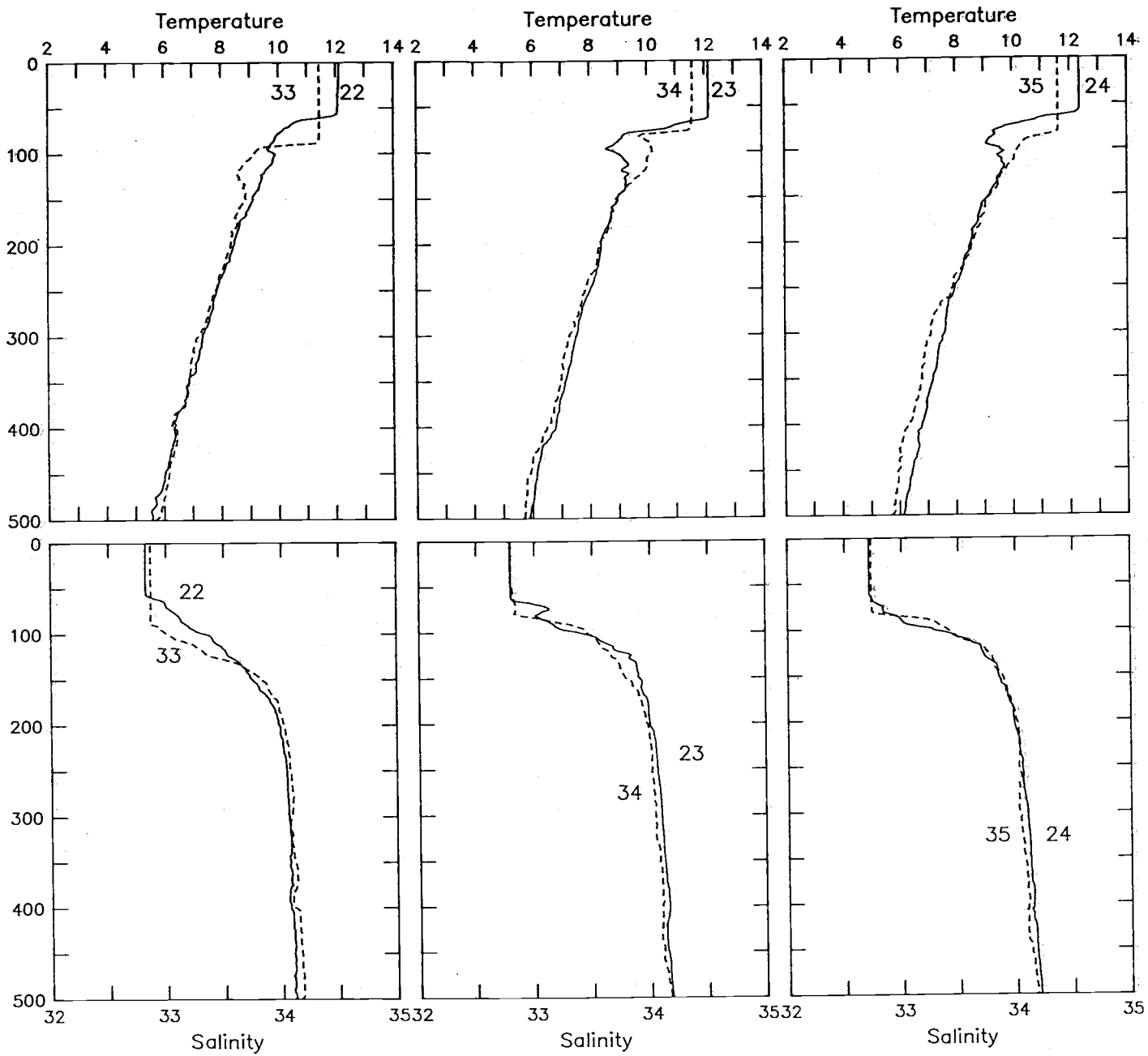


Figure 10. Vertical profiles of temperature and salinity at pairs of stations at the same location but separated by a four-day interval of strong winds. In each panel, the solid line is the earlier station, and the dashed profile is the station four days later. Station locations are shown in Figure 2.

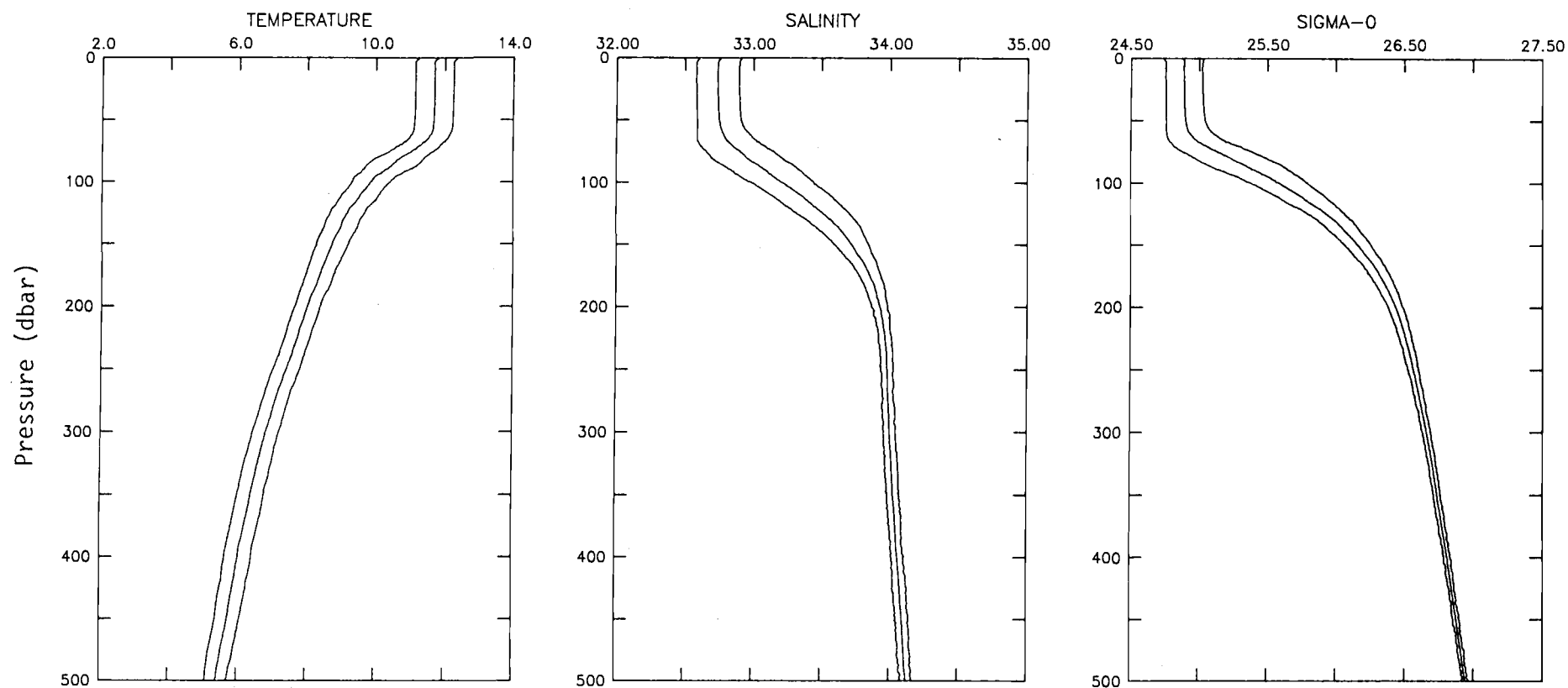


Figure 11. Overall averages, and the average plus and minus the standard deviation of temperature, salinity and density anomaly, calculated and displayed as a function of pressure.

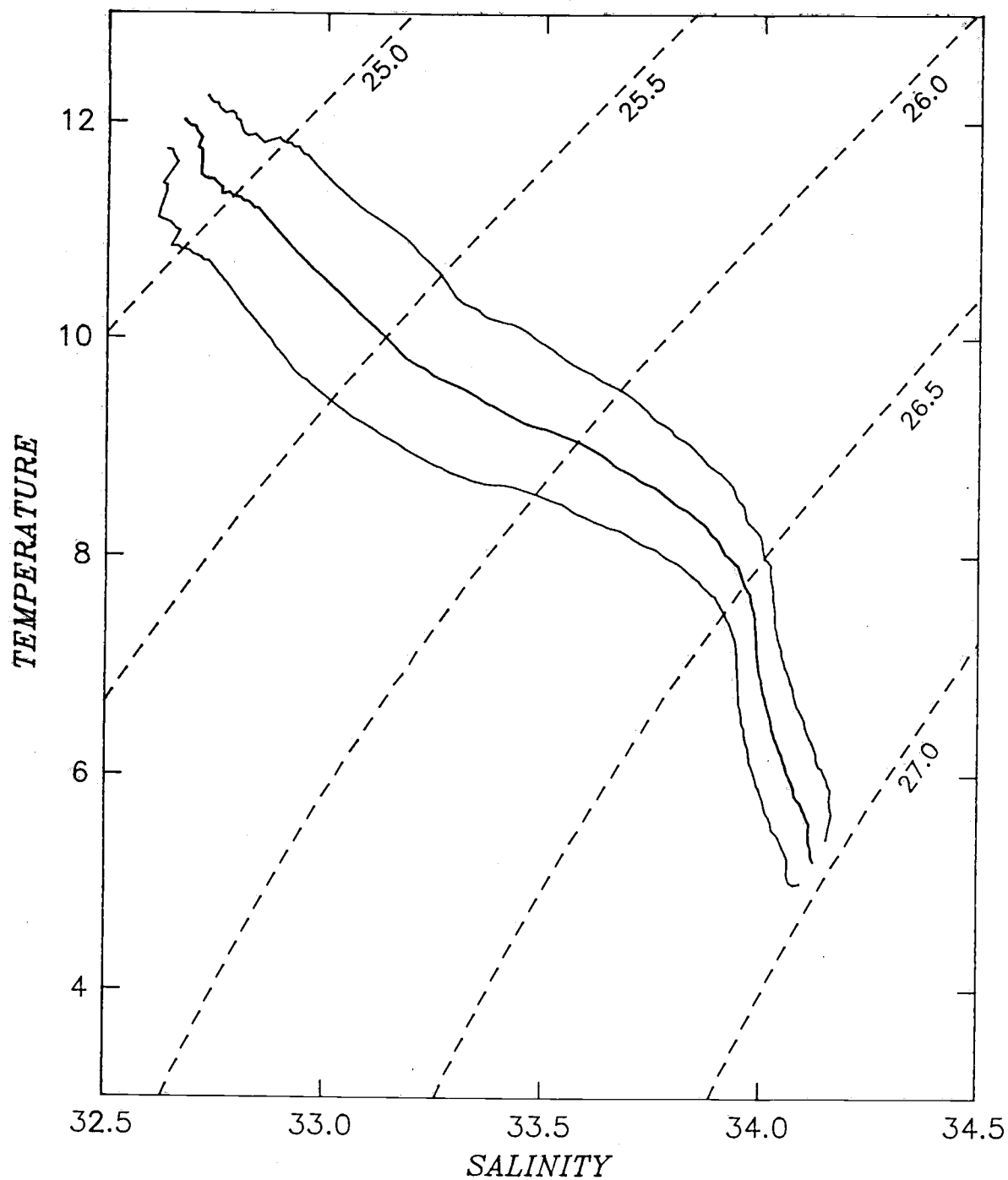


Figure 12. Average T-S curve calculated from the 38 CTD casts, and the average plus and minus the standard deviations of temperature and salinity, calculated as a function of sigma-theta (intervals of 0.01 kg/m^3), and shown only for the density range covered by at least 10 stations. Dashed curves are lines of constant sigma-t.

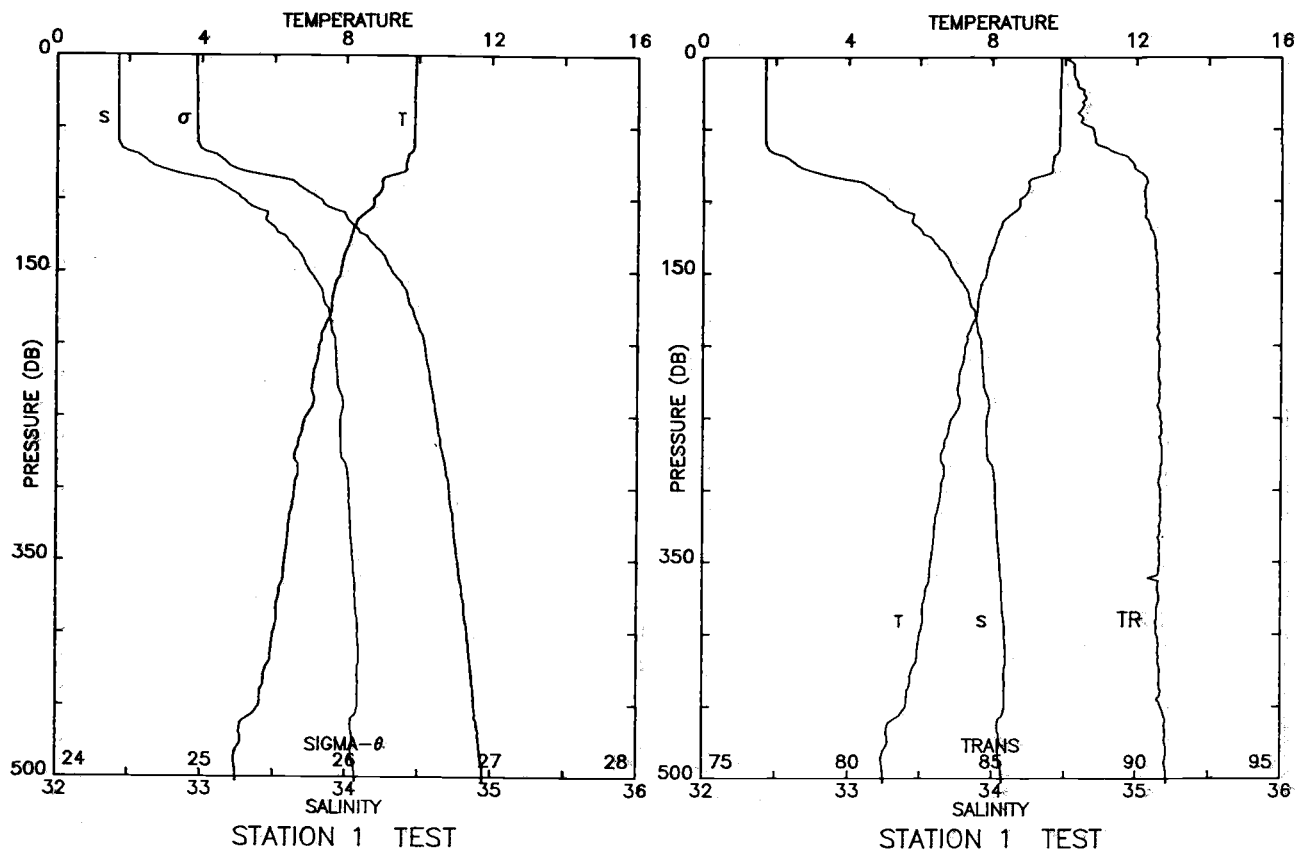
occurs at about 60-80 m, at the top of a sharp halocline which coincides with the upper thermocline. The standard deviations of salinity and density decrease with depth through this halocline, but the temperature variability is nearly constant with depth (Figure 11). Average and standard deviations of the T-S curves were computed after the CTD data were reordered to treat sigma-theta, rather than pressure, as the independent variable; statistics were computed for each 0.01 kg/m^3 interval of sigma-theta. The resulting curves (Figure 12) show that there was considerable variation in T-S characteristics within the survey region.



REFERENCES

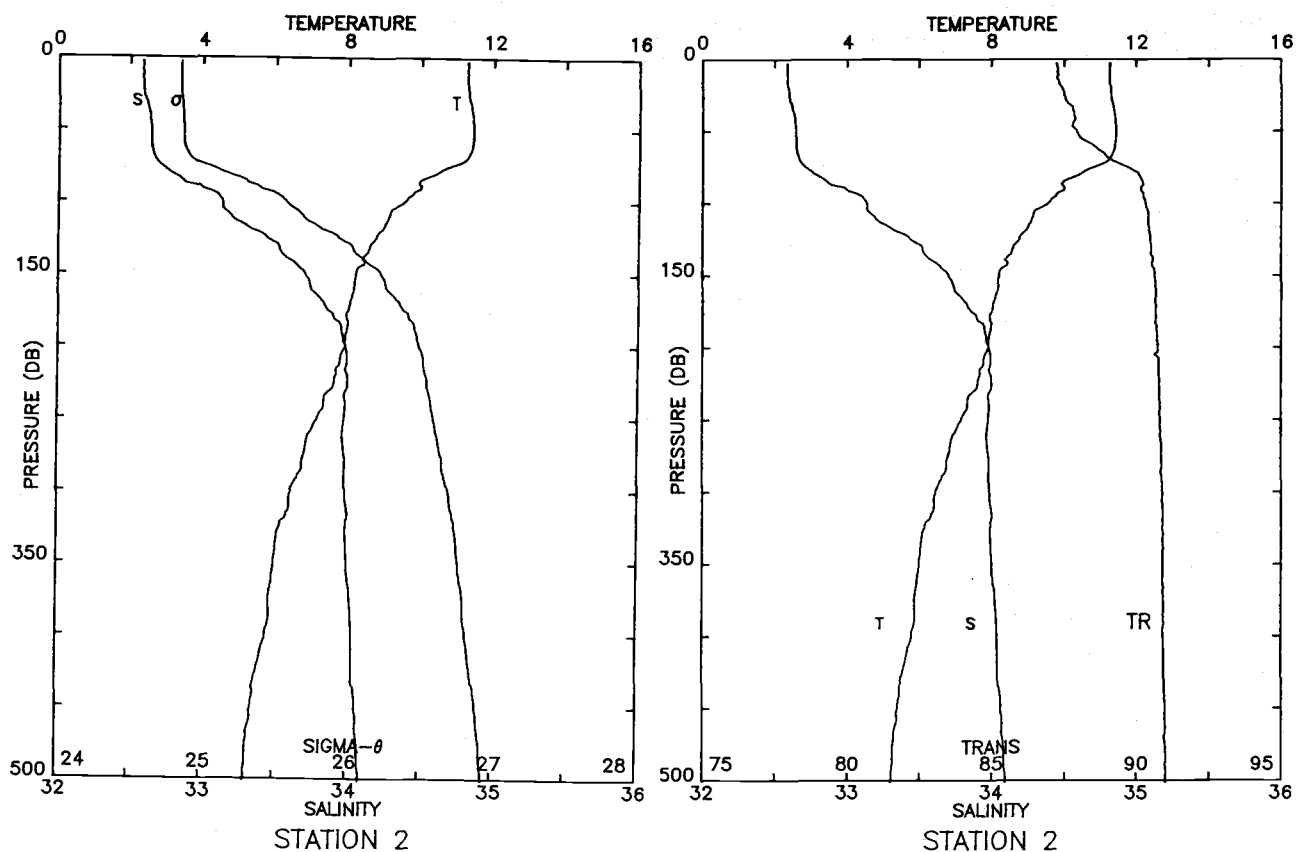
- Culkin, F., and N.D. Smith. 1980. Determination of the concentration of potassium chloride having the same electrical conductivity, at 15°C and infinite frequency, as standard seawater of salinity 35.000 ‰ (chlorinity 19.37394 ‰). IEEE Journal of Ocean Engineering, OE-5, 22-23.
- Flament, P., L. Armi and L. Washburn. 1985. The evolving structure of an upwelling filament. J. Geophys. Res., 90, 11765-11778.
- Fofonoff, N.P., and R.C. Millard, Jr. 1983. Algorithms for computation of fundamental properties of sea water. UNESCO Technical Papers in Marine Science, 44, 53 pp.
- Lewis, L.L. 1980. The Practical Salinity Scale 1978 and its antecedents. IEEE Journal of Ocean Engineering, OE-5, 3-8.
- Kosro, P.M. and A. Huyer. 1986. CTD and velocity surveys of seaward jets off northern California, July 1981 and 1982. J. Geophys. Res., 91, 7680-7690.
- UNESCO, 1981. Tenth report of the joint panel on oceanographic tables and standards, Sidney, B.C., Canada, 1-5 September 1980, sponsored by Unesco, ICES, SCOR, IAPSO. UNESCO Technical Papers in Marine Science, 36, 23 pp.

PROFILE PLOTS AND LISTINGS



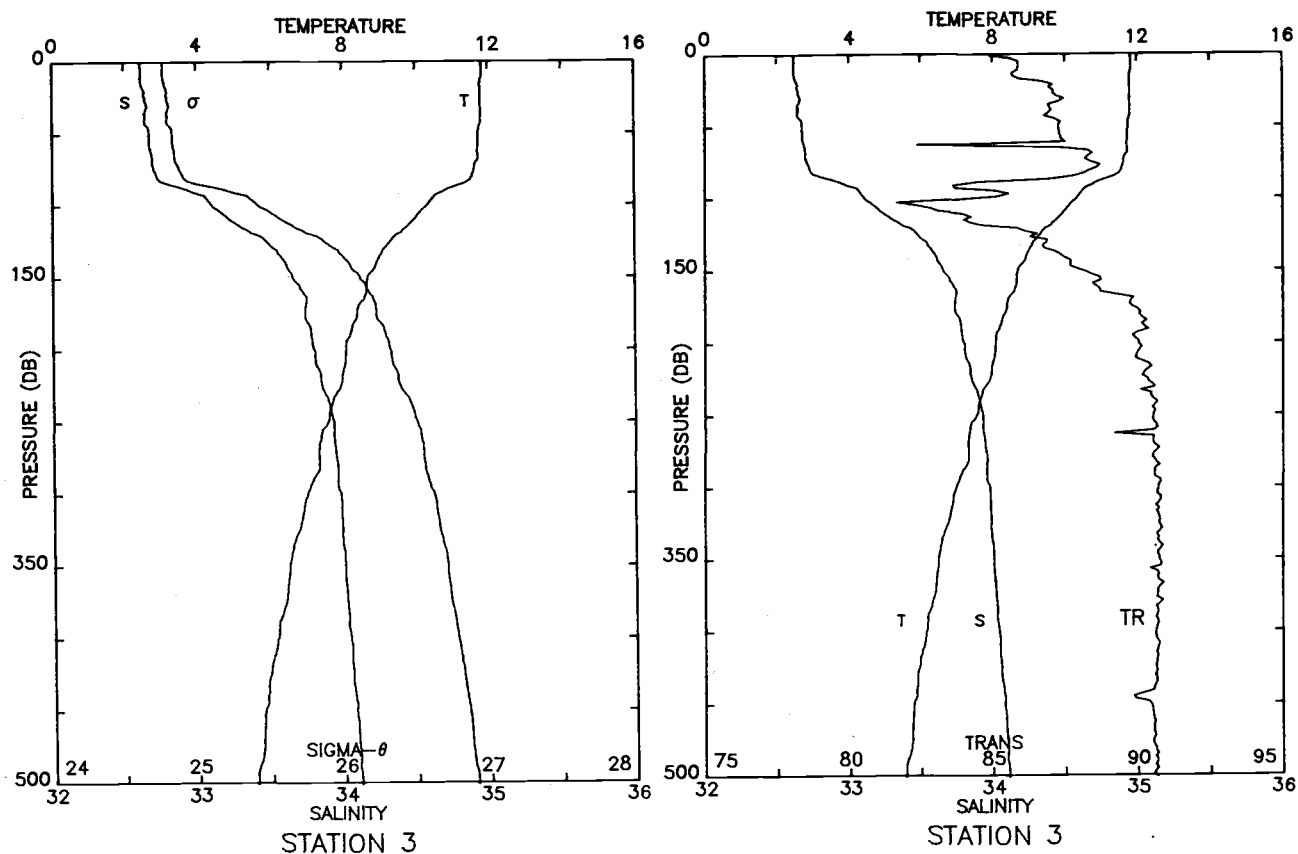
STA NO 1 TEST LAT: 44 40.2 N LONG: 125 30.0 W
 16 FEB 1987 2301 GMT PROBE 2561 DEPTH 504M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	9.898	32.428	9.898	24.961	298.5	0.003	87.6
10	9.895	32.428	9.894	24.962	298.6	0.030	87.8
20	9.881	32.427	9.879	24.964	298.6	0.060	88.0
30	9.864	32.426	9.861	24.966	298.6	0.090	88.2
40	9.878	32.426	9.874	24.964	299.0	0.119	88.0
50	9.854	32.427	9.849	24.968	298.8	0.149	88.5
60	9.854	32.431	9.847	24.972	298.6	0.179	88.6
70	9.685	32.577	9.677	25.114	285.3	0.209	89.7
80	9.618	32.764	9.610	25.271	270.5	0.237	90.1
90	8.994	33.140	8.985	25.665	233.2	0.261	90.3
100	8.730	33.284	8.720	25.819	218.8	0.284	90.3
110	8.468	33.451	8.457	25.990	202.7	0.305	90.3
120	8.183	33.504	8.171	26.074	194.8	0.325	90.5
130	8.054	33.611	8.042	26.178	185.1	0.344	90.7
140	7.899	33.697	7.885	26.267	176.7	0.362	90.7
150	7.822	33.746	7.807	26.318	172.1	0.380	90.7
175	7.583	33.877	7.566	26.455	159.5	0.421	90.7
200	7.253	33.924	7.235	26.539	151.8	0.460	90.8
225	7.072	33.942	7.052	26.579	148.4	0.497	90.8
250	6.881	33.964	6.858	26.622	144.5	0.534	90.8
300	6.569	34.022	6.542	26.710	136.8	0.604	90.8
400	5.986	34.089	5.952	26.839	125.6	0.736	90.7
500	4.969	34.071	4.929	26.947	115.5	0.856	91.1
503	4.971	34.073	4.931	26.948	115.5	0.860	91.1



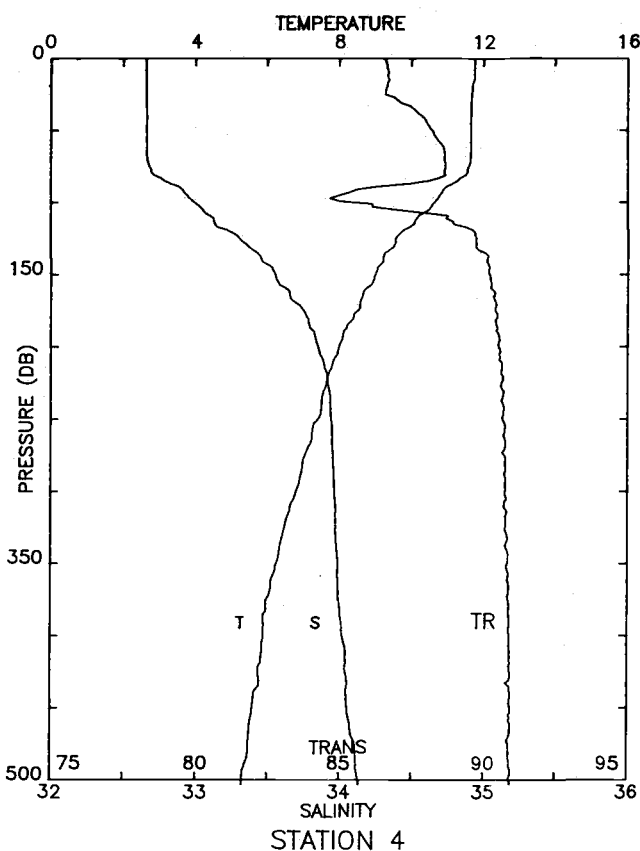
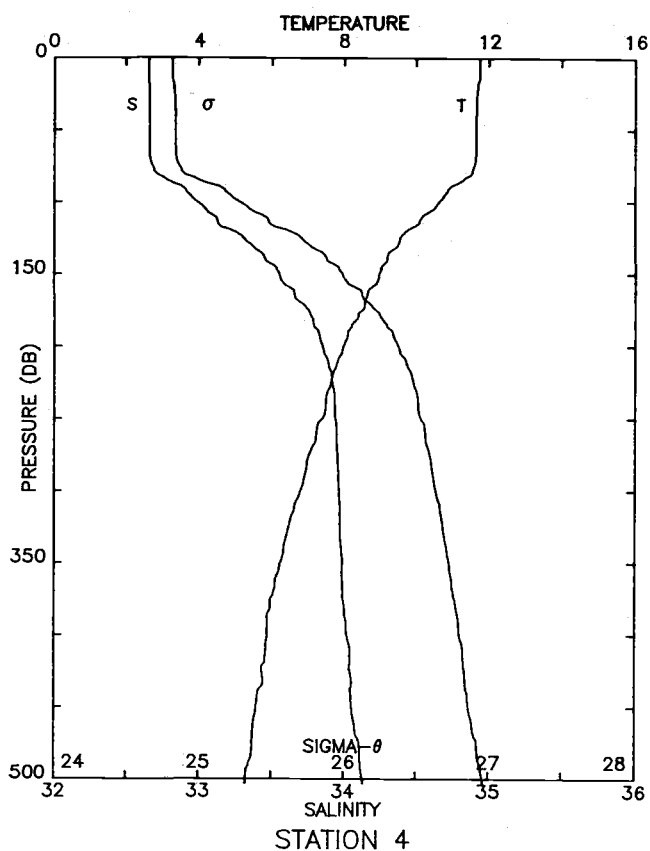
STA NO 2 LAT: 41 29.8 N LONG: 125 30.0 W
 17 FEB 1987 1700 GMT PROBE 2561 DEPTH 3093M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
3	11.265	32.584	11.265	24.848	309.3	0.009	87.2
10	11.266	32.584	11.265	24.848	309.5	0.031	87.3
20	11.281	32.589	11.279	24.849	309.6	0.062	87.4
30	11.325	32.605	11.322	24.854	309.3	0.093	87.6
40	11.401	32.632	11.396	24.862	308.8	0.124	87.8
50	11.426	32.643	11.420	24.866	308.7	0.155	87.9
60	11.402	32.645	11.395	24.872	308.3	0.185	88.5
70	11.222	32.671	11.213	24.925	303.5	0.216	89.1
80	10.419	32.784	10.410	25.153	281.9	0.245	90.1
90	9.988	32.991	9.978	25.388	259.7	0.272	90.2
100	9.537	33.135	9.526	25.574	242.1	0.297	90.3
110	9.111	33.195	9.099	25.689	231.3	0.321	90.4
120	8.895	33.360	8.882	25.853	216.0	0.343	90.5
130	8.595	33.520	8.581	26.024	199.8	0.364	90.5
140	8.413	33.600	8.399	26.115	191.3	0.384	90.6
150	8.206	33.707	8.191	26.230	180.6	0.402	90.7
175	7.996	33.861	7.979	26.383	166.4	0.446	90.7
200	7.906	33.983	7.886	26.492	156.5	0.486	90.7
225	7.612	34.000	7.590	26.548	151.5	0.524	90.8
250	7.151	33.976	7.128	26.595	147.3	0.562	90.8
300	6.441	33.985	6.414	26.697	137.9	0.633	90.9
400	5.781	34.039	5.747	26.825	126.7	0.765	90.9
500	5.205	34.098	5.165	26.941	116.4	0.886	91.0
501	5.201	34.098	5.160	26.941	116.3	0.887	91.0



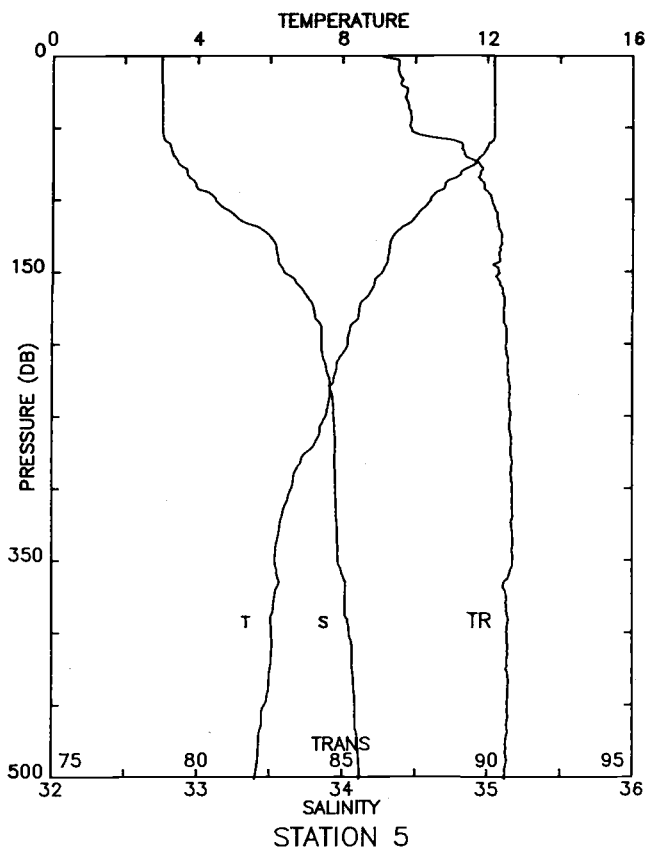
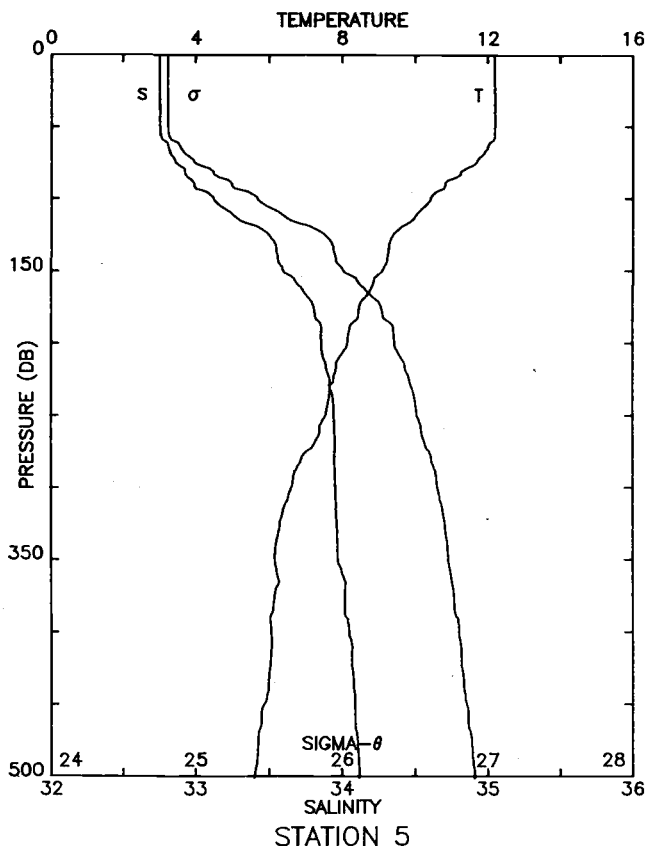
STA NO 3 LAT: 41 30.0 N LONG: 125 5.1 W
 17 FEB 1987 1958 GMT PROBE 2561 DEPTH 1878M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.821	32.617	11.821	24.773	316.5	0.003	84.9
10	11.832	32.616	11.831	24.770	316.9	0.032	85.9
20	11.787	32.641	11.784	24.798	314.5	0.063	86.9
30	11.795	32.659	11.791	24.811	313.5	0.095	87.3
40	11.796	32.645	11.791	24.800	314.8	0.126	87.0
50	11.731	32.675	11.725	24.836	311.6	0.157	87.3
60	11.712	32.682	11.705	24.845	311.0	0.189	87.5
70	11.680	32.698	11.671	24.863	309.4	0.220	88.4
80	11.549	32.731	11.540	24.913	305.0	0.250	88.5
90	10.803	32.962	10.793	25.226	275.3	0.280	84.1
100	10.319	33.109	10.307	25.424	256.6	0.306	84.5
110	9.954	33.234	9.942	25.583	241.6	0.331	83.6
120	9.519	33.402	9.506	25.786	222.4	0.354	85.3
130	9.132	33.532	9.118	25.950	207.0	0.376	86.9
140	8.916	33.608	8.902	26.044	198.2	0.396	87.4
150	8.678	33.658	8.662	26.121	191.1	0.415	88.1
175	8.381	33.740	8.363	26.231	181.0	0.461	89.8
200	8.078	33.804	8.058	26.326	172.3	0.505	90.0
225	7.920	33.857	7.898	26.392	166.5	0.548	90.4
250	7.563	33.934	7.539	26.504	156.1	0.588	90.5
300	7.000	33.981	6.972	26.620	145.6	0.664	90.7
400	6.154	34.042	6.119	26.781	131.2	0.802	90.6
500	5.575	34.111	5.533	26.908	119.9	0.927	90.6
501	5.573	34.111	5.531	26.908	119.9	0.928	90.7



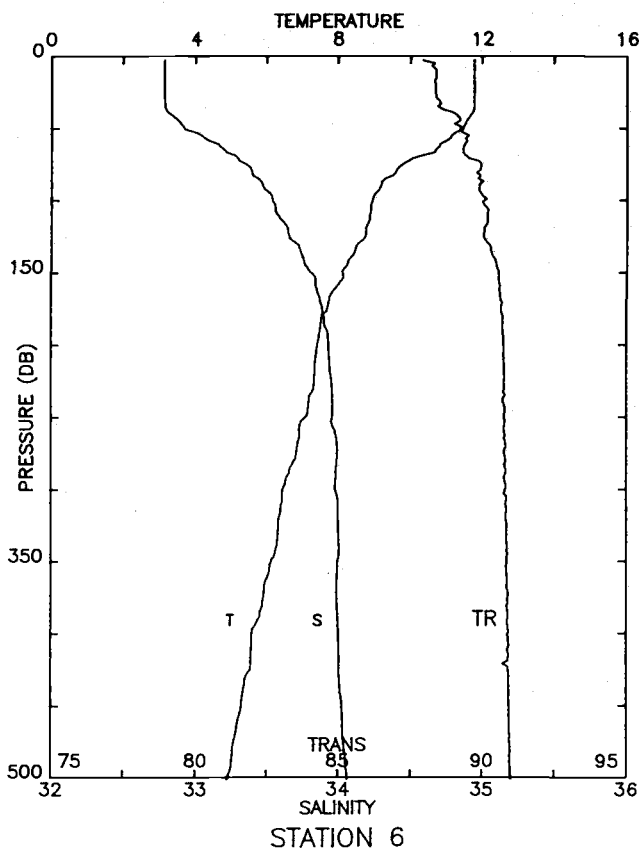
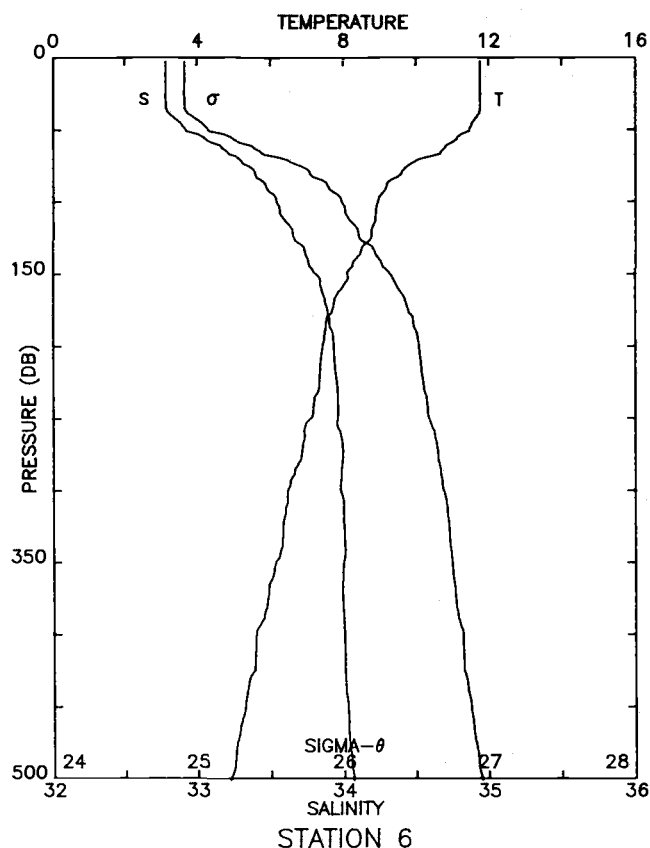
STA NO 4 LAT: 41 6.0 N LONG: 125 5.1 W
 18 FEB 1987 0546 GMT PROBE 2561 DEPTH 2961M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.746	32.653	11.746	24.815	312.4	0.003	86.6
10	11.740	32.654	11.739	24.816	312.5	0.031	86.7
20	11.679	32.655	11.676	24.829	311.5	0.062	86.6
30	11.651	32.659	11.647	24.837	311.0	0.094	87.1
40	11.645	32.659	11.640	24.838	311.1	0.125	87.9
50	11.644	32.659	11.638	24.839	311.3	0.156	88.2
60	11.644	32.659	11.636	24.839	311.5	0.187	88.6
70	11.628	32.665	11.619	24.847	311.0	0.218	88.6
80	11.519	32.703	11.509	24.897	306.5	0.249	88.7
90	10.903	32.895	10.892	25.156	281.9	0.278	85.9
100	10.612	32.993	10.601	25.283	270.0	0.306	85.6
110	10.165	33.109	10.153	25.451	254.2	0.332	88.7
120	9.737	33.236	9.723	25.621	238.1	0.357	89.7
130	9.490	33.365	9.476	25.762	224.9	0.380	89.7
140	9.192	33.459	9.177	25.884	213.5	0.402	90.1
150	8.972	33.554	8.957	25.993	203.3	0.423	90.2
175	8.496	33.753	8.478	26.223	181.7	0.471	90.4
200	7.980	33.852	7.960	26.378	167.3	0.515	90.5
225	7.634	33.921	7.612	26.483	157.6	0.555	90.6
250	7.398	33.943	7.374	26.534	153.1	0.594	90.7
300	6.788	33.968	6.761	26.638	143.7	0.668	90.8
400	5.877	34.024	5.843	26.801	129.0	0.803	90.9
500	5.287	34.135	5.247	26.961	114.6	0.926	90.9
503	5.288	34.138	5.247	26.964	114.4	0.929	90.9



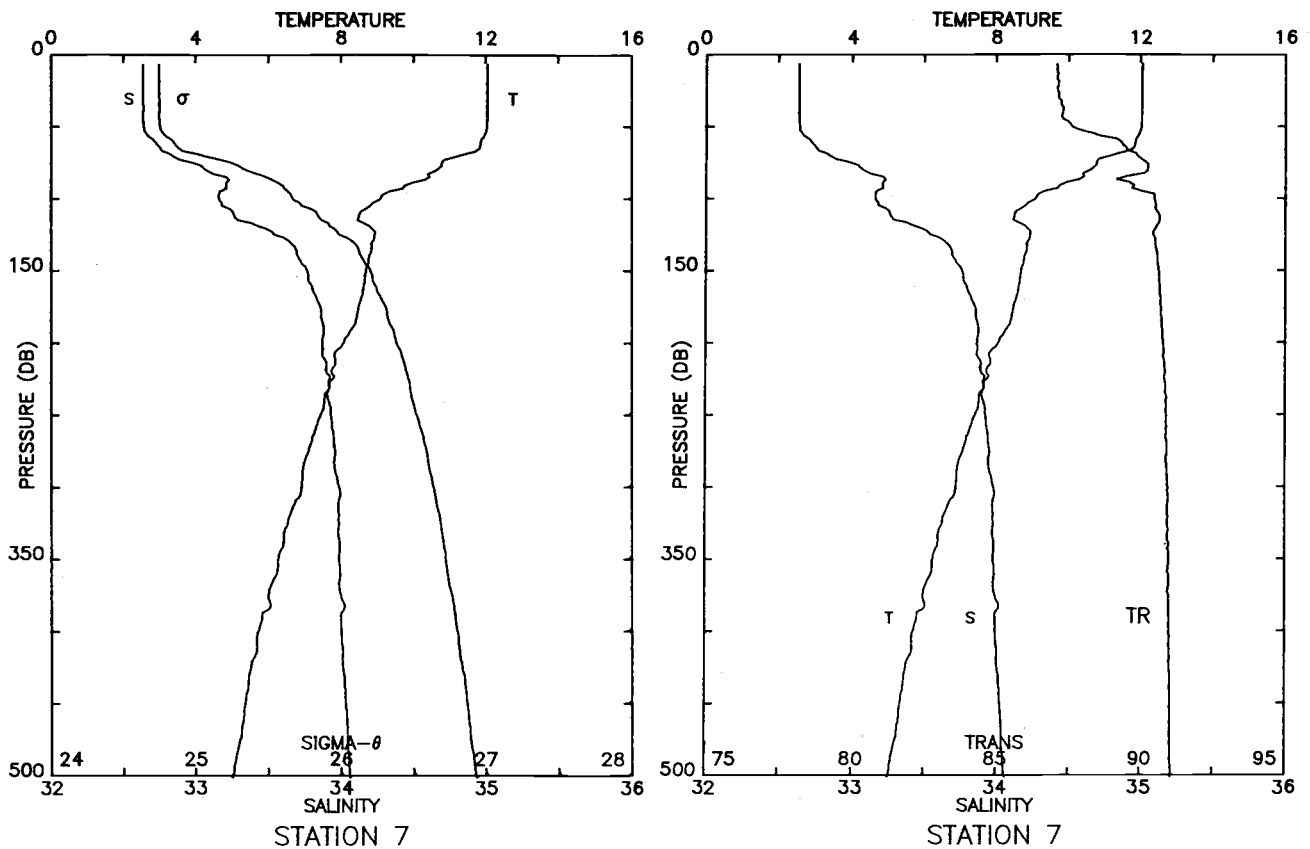
STA NO 5 LAT: 40 44.0 N LONG: 125 5.9 W
 18 FEB 1987 0854 GMT PROBE 2561 DEPTH 2641M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
			TEMP	THETA			
1	12.184	32.750	12.184	24.808	313.1	0.003	86.4
10	12.183	32.750	12.182	24.809	313.2	0.031	86.9
20	12.188	32.750	12.185	24.808	313.5	0.063	87.0
30	12.193	32.751	12.189	24.808	313.8	0.094	87.2
40	12.193	32.752	12.188	24.809	314.0	0.125	87.3
50	12.194	32.754	12.187	24.810	314.1	0.157	87.3
60	12.095	32.788	12.088	24.856	310.0	0.188	88.9
70	11.820	32.837	11.812	24.945	301.7	0.219	89.2
80	11.306	32.925	11.296	25.108	286.4	0.248	89.8
90	10.806	32.988	10.796	25.246	273.4	0.276	89.9
100	10.406	33.123	10.395	25.420	257.0	0.303	90.2
110	10.053	33.243	10.041	25.574	242.5	0.328	90.3
120	9.593	33.431	9.580	25.797	221.4	0.351	90.4
130	9.297	33.533	9.283	25.924	209.5	0.373	90.5
140	9.232	33.555	9.217	25.952	207.0	0.393	90.4
150	9.083	33.599	9.067	26.011	201.6	0.414	90.4
175	8.465	33.806	8.447	26.270	177.4	0.461	90.6
200	8.145	33.859	8.125	26.360	169.2	0.504	90.7
225	7.764	33.915	7.742	26.460	159.9	0.545	90.7
250	7.546	33.943	7.522	26.514	155.2	0.584	90.8
300	6.606	33.956	6.579	26.653	142.2	0.658	90.9
400	6.057	34.051	6.023	26.800	129.3	0.794	90.7
500	5.596	34.120	5.554	26.913	119.5	0.918	90.6
501	5.593	34.121	5.551	26.913	119.4	0.919	90.6



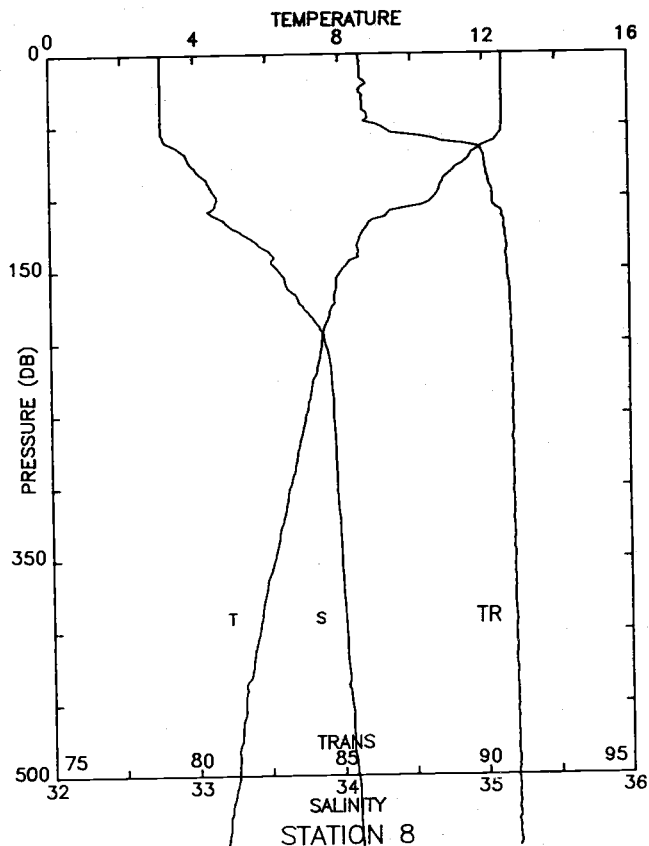
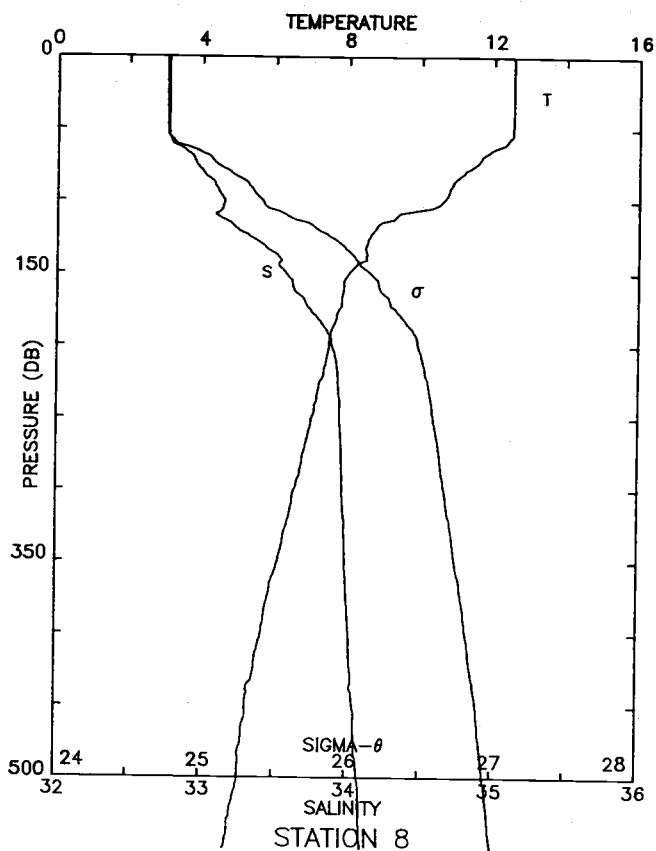
STA NO 6 LAT: 40 21.9 N LONG: 125 5.3 W
 18 FEB 1987 1643 GMT PROBE 2561 DEPTH 1550M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
3	11.765	32.782	11.764	24.911	303.3	0.009	87.9
10	11.767	32.781	11.765	24.911	303.5	0.030	88.4
20	11.767	32.781	11.765	24.910	303.8	0.061	88.4
30	11.766	32.783	11.762	24.912	303.9	0.091	88.4
40	11.695	32.821	11.690	24.955	300.0	0.121	89.0
50	11.456	32.920	11.450	25.076	288.7	0.151	89.2
60	10.894	33.128	10.887	25.338	264.0	0.178	89.4
70	10.189	33.288	10.181	25.585	240.7	0.204	89.5
80	9.590	33.395	9.581	25.769	223.3	0.227	89.9
90	9.171	33.474	9.161	25.898	211.1	0.248	89.9
100	8.938	33.543	8.928	25.989	202.7	0.269	90.1
110	8.873	33.576	8.862	26.025	199.4	0.289	90.2
120	8.763	33.648	8.751	26.099	192.6	0.309	90.1
130	8.554	33.710	8.541	26.180	185.1	0.328	90.2
140	8.326	33.757	8.312	26.252	178.4	0.346	90.4
150	8.109	33.811	8.094	26.327	171.4	0.364	90.6
175	7.690	33.893	7.673	26.453	159.7	0.405	90.7
200	7.424	33.935	7.405	26.523	153.3	0.444	90.8
225	7.338	33.956	7.316	26.553	150.9	0.482	90.8
250	7.096	33.962	7.073	26.592	147.5	0.519	90.8
300	6.460	33.982	6.434	26.692	138.4	0.590	90.8
400	5.589	34.007	5.556	26.823	126.7	0.723	90.9
500	4.893	34.066	4.854	26.952	115.0	0.845	91.0
501	4.888	34.067	4.848	26.953	114.8	0.846	91.0



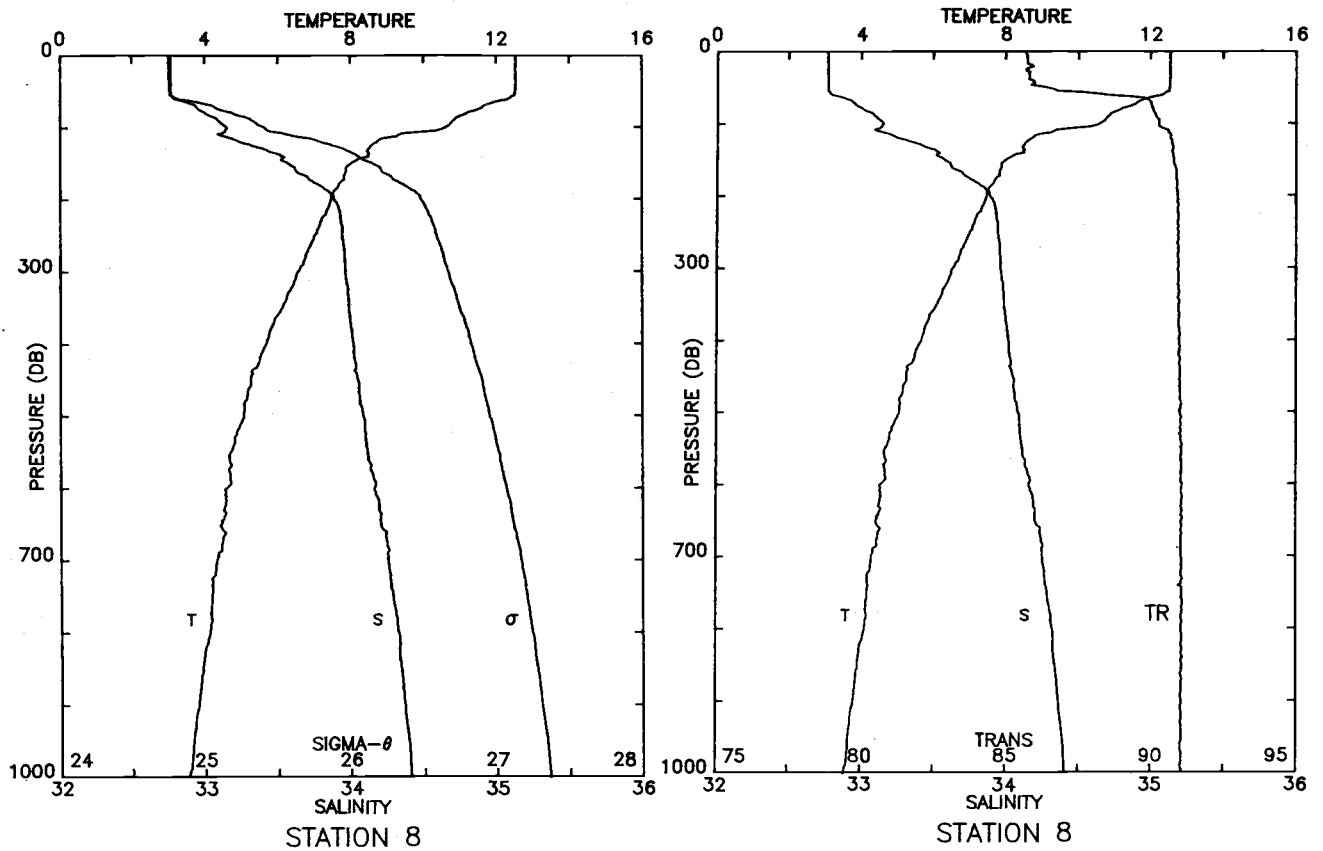
STA NO 7 LAT: 39 59.0 N LONG: 125 5.2 W
 18 FEB 1987 1924 GMT PROBE 2561 DEPTH 1568M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
7	12.047	32.635	12.046	24.745	319.2	0.022	87.1
10	12.045	32.636	12.044	24.746	319.2	0.032	87.1
20	12.042	32.636	12.039	24.747	319.4	0.064	87.2
30	12.043	32.636	12.040	24.747	319.6	0.096	87.2
40	12.041	32.637	12.036	24.748	319.7	0.128	87.3
50	12.027	32.641	12.021	24.754	319.4	0.160	87.6
60	11.860	32.714	11.853	24.842	311.2	0.191	89.2
70	11.252	32.840	11.243	25.051	291.5	0.222	89.9
80	10.626	33.072	10.616	25.342	264.0	0.249	90.3
90	9.846	33.209	9.836	25.581	241.3	0.275	89.7
100	9.077	33.160	9.066	25.668	233.2	0.298	90.5
110	8.517	33.258	8.506	25.831	217.7	0.321	90.6
120	8.826	33.455	8.813	25.938	207.9	0.342	90.6
130	8.859	33.646	8.846	26.083	194.4	0.362	90.5
140	8.774	33.701	8.759	26.139	189.2	0.382	90.6
150	8.678	33.765	8.662	26.204	183.2	0.400	90.7
175	8.470	33.857	8.452	26.309	173.7	0.445	90.7
200	8.058	33.869	8.038	26.380	167.2	0.488	90.8
225	7.762	33.920	7.740	26.464	159.5	0.528	90.8
250	7.421	33.930	7.397	26.521	154.4	0.568	90.9
300	6.895	33.987	6.867	26.639	143.7	0.642	91.0
400	5.705	33.999	5.671	26.803	128.7	0.778	91.0
500	5.015	34.062	4.975	26.934	116.7	0.901	91.1
501	5.001	34.065	4.962	26.939	116.3	0.902	91.1



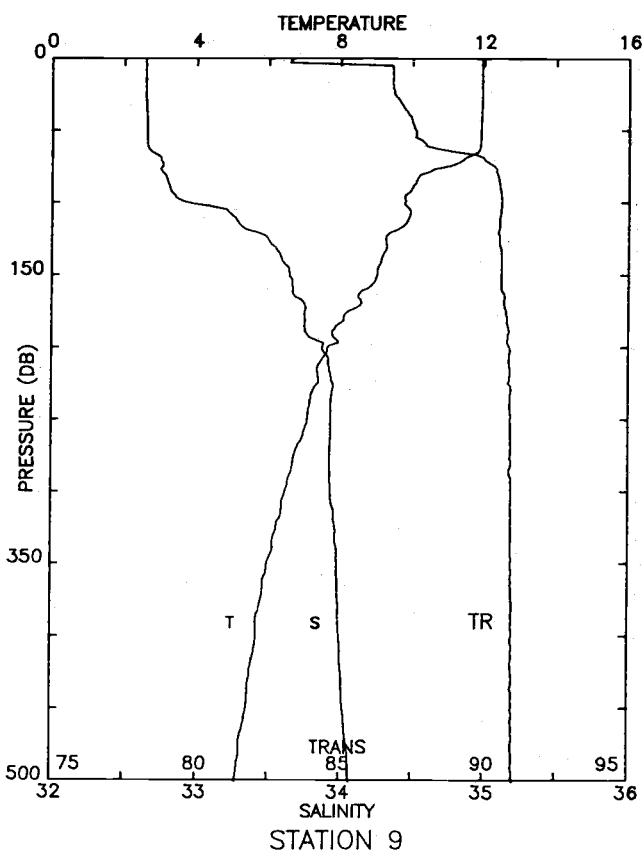
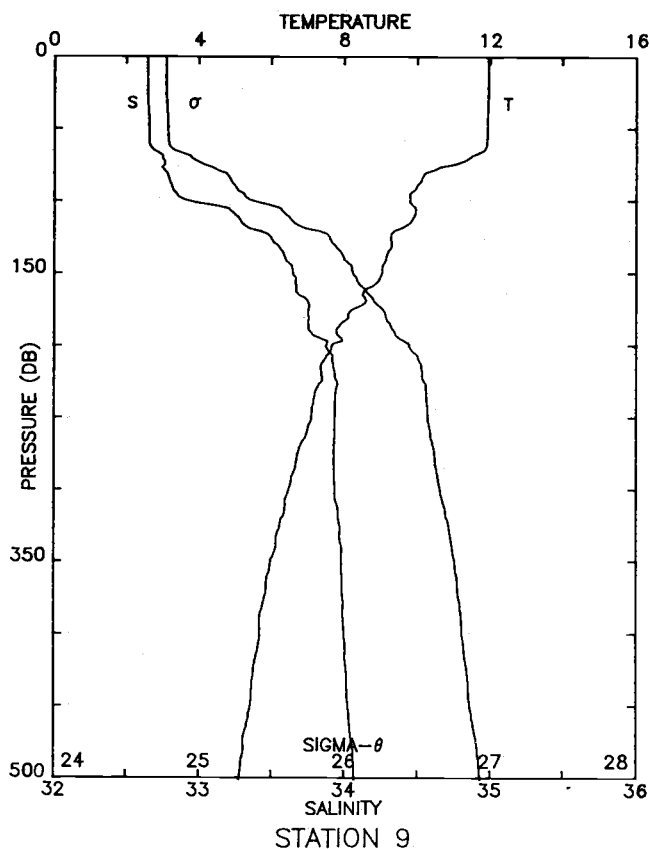
STA NO 8 LAT: 40 0.0 N LONG: 125 30.0 W
18 FEB 1987 2144 GMT PROBE 2561 DEPTH 2953M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	12.529	32.768	12.529	24.756	318.0	0.003	85.7
10	12.532	32.768	12.531	24.756	318.2	0.032	85.7
20	12.517	32.768	12.515	24.759	318.2	0.064	85.9
30	12.524	32.768	12.521	24.758	318.6	0.095	85.8
40	12.522	32.768	12.517	24.759	318.7	0.127	85.9
50	12.509	32.769	12.503	24.762	318.7	0.159	86.4
60	12.322	32.793	12.314	24.817	313.7	0.191	88.4
70	11.638	32.940	11.629	25.059	290.9	0.221	90.0
80	11.180	33.007	11.171	25.194	278.1	0.250	90.1
90	10.815	33.096	10.804	25.328	265.6	0.277	90.2
100	10.591	33.152	10.579	25.411	257.9	0.303	90.3
110	9.349	33.100	9.337	25.578	242.0	0.328	90.6
120	8.732	33.248	8.720	25.790	221.8	0.351	90.7
130	8.502	33.413	8.489	25.955	206.3	0.373	90.7
140	8.487	33.536	8.473	26.054	197.1	0.393	90.7
150	8.023	33.573	8.008	26.152	187.9	0.412	90.8
175	7.749	33.744	7.732	26.327	171.7	0.457	90.9
200	7.471	33.892	7.452	26.483	157.2	0.498	90.9
225	7.225	33.935	7.204	26.552	150.9	0.536	90.9
250	7.016	33.947	6.992	26.591	147.6	0.574	90.9
300	6.553	33.968	6.526	26.670	140.6	0.646	91.0
400	5.666	34.022	5.632	26.825	126.5	0.779	91.0
500	5.056	34.089	5.016	26.951	115.2	0.899	91.0



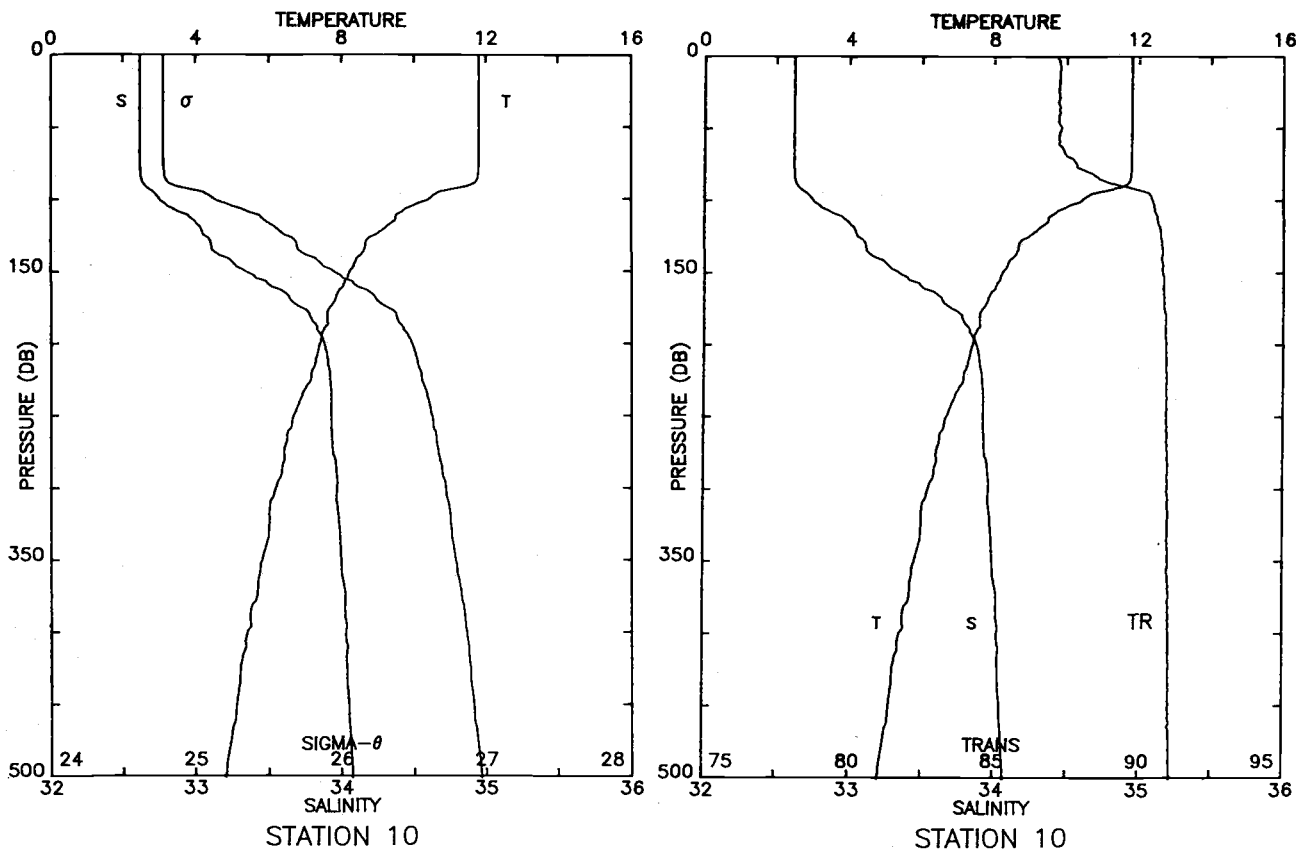
STA NO 8 LAT: 40 0.0 N LONG: 125 30.0 W
 18 FEB 1987 2144 GMT PROBE 2561 DEPTH 2953M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	OELD	TRN
			TEMP	THETA			
1	12.529	32.768	12.529	24.756	318.0	0.003	85.7
10	12.532	32.768	12.531	24.756	318.2	0.032	85.7
20	12.517	32.768	12.515	24.759	318.2	0.064	85.9
30	12.524	32.768	12.521	24.758	318.6	0.095	85.8
40	12.522	32.768	12.517	24.759	318.7	0.127	85.9
50	12.509	32.769	12.503	24.762	318.7	0.159	86.4
60	12.322	32.793	12.314	24.817	313.7	0.191	88.4
70	11.638	32.940	11.629	25.059	290.9	0.221	90.0
80	11.180	33.007	11.171	25.194	278.1	0.250	90.1
90	10.815	33.096	10.804	25.328	265.6	0.277	90.2
100	10.591	33.152	10.579	25.411	257.9	0.303	90.3
110	9.349	33.100	9.337	25.578	242.0	0.328	90.6
120	8.732	33.248	8.720	25.790	221.8	0.351	90.7
130	8.502	33.413	8.489	25.955	206.3	0.373	90.7
140	8.487	33.536	8.473	26.054	197.1	0.393	90.7
150	8.023	33.573	8.008	26.152	187.9	0.412	90.8
175	7.749	33.744	7.732	26.327	171.7	0.457	90.9
200	7.471	33.892	7.452	26.483	157.2	0.498	90.9
225	7.225	33.935	7.204	26.552	150.9	0.536	90.9
250	7.016	33.947	6.992	26.591	147.6	0.574	90.9
300	6.553	33.968	6.526	26.670	140.6	0.646	91.0
400	5.666	34.022	5.632	26.825	126.5	0.779	91.0
500	5.056	34.089	5.016	26.951	115.2	0.899	91.0
600	4.569	34.163	4.523	27.065	105.0	1.009	91.1
800	4.114	34.326	4.054	27.244	89.4	1.202	91.1
1000	3.549	34.411	3.477	27.370	78.1	1.369	91.1
1001	3.546	34.412	3.474	27.371	78.1	1.369	91.1



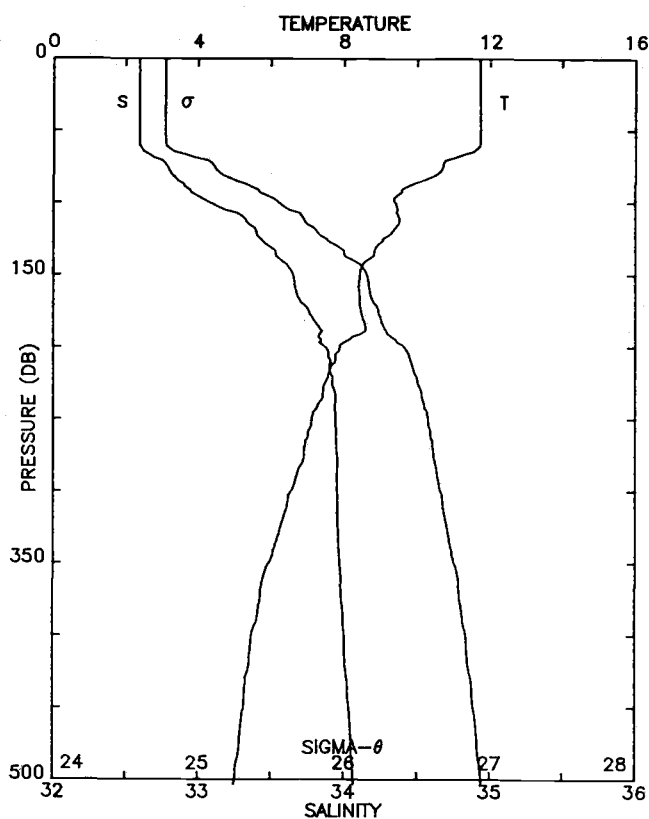
STA NO 9 LAT: 40 22.4 N LONG: 125 30.0 W
19 FEB 1987 0110 GMT PROBE 2561 DEPTH 1466M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
			TEMP	THETA			
1	11.939	32.644	11.939	24.772	316.5	0.003	83.3
10	11.941	32.645	11.940	24.772	316.7	0.032	86.8
20	11.941	32.645	11.939	24.772	316.9	0.063	86.8
30	11.937	32.648	11.933	24.776	316.8	0.095	87.1
40	11.921	32.654	11.915	24.784	316.3	0.127	87.4
50	11.911	32.657	11.905	24.788	316.2	0.158	87.6
60	11.897	32.660	11.889	24.793	315.9	0.190	88.0
70	11.435	32.752	11.427	24.950	301.2	0.221	90.0
80	10.334	32.773	10.325	25.159	281.3	0.250	90.5
90	9.986	32.816	9.976	25.251	272.7	0.278	90.6
100	9.784	32.936	9.773	25.379	260.8	0.305	90.6
110	9.915	33.258	9.903	25.609	239.2	0.329	90.6
120	9.471	33.386	9.458	25.781	222.9	0.353	90.5
130	9.292	33.535	9.278	25.927	209.2	0.374	90.6
140	9.137	33.596	9.122	26.000	202.4	0.395	90.6
150	9.027	33.650	9.011	26.060	197.0	0.414	90.6
175	8.232	33.756	8.214	26.265	177.7	0.461	90.8
200	7.667	33.877	7.648	26.443	161.0	0.504	90.9
225	7.382	33.952	7.361	26.543	151.8	0.543	90.8
250	7.088	33.934	7.065	26.571	149.5	0.581	90.9
300	6.469	33.936	6.443	26.655	141.9	0.653	91.0
400	5.678	34.001	5.645	26.808	128.2	0.787	91.0
500	5.105	34.073	5.065	26.933	117.0	0.910	91.1
501	5.103	34.073	5.063	26.934	117.0	0.911	91.1

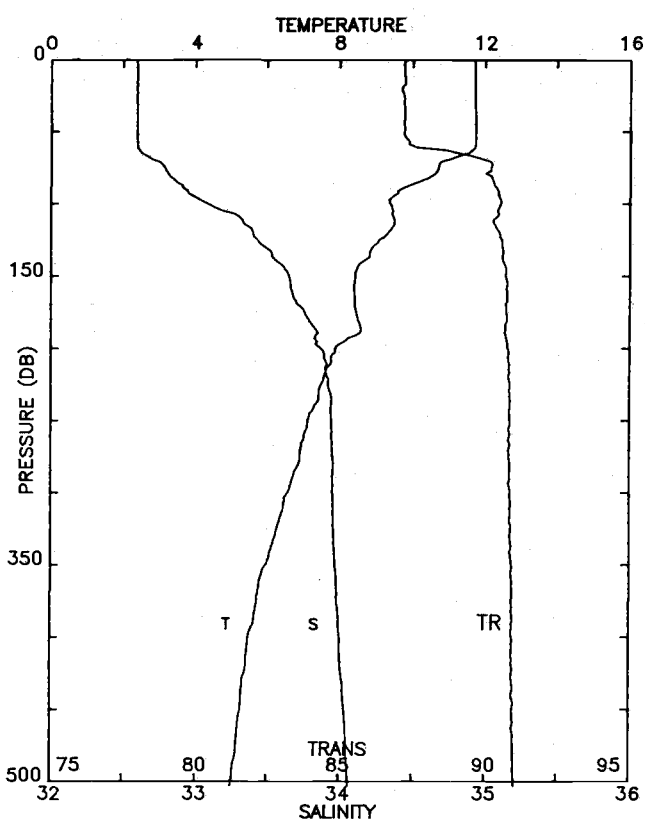


STA NO 10 LAT: 40 44.9 N LONG: 125 30.0 W
 19 FEB 1987 0431 GMT PROBE 2561 DEPTH 2988M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.796	32.617	11.796	24.777	316.0	0.003	87.2
10	11.804	32.617	11.803	24.776	316.3	0.032	87.3
20	11.803	32.617	11.801	24.776	316.5	0.063	87.2
30	11.802	32.617	11.798	24.777	316.7	0.095	87.2
40	11.804	32.617	11.799	24.777	317.0	0.127	87.3
50	11.809	32.617	11.803	24.776	317.3	0.158	87.3
60	11.807	32.617	11.799	24.777	317.4	0.190	87.2
70	11.804	32.619	11.795	24.779	317.5	0.222	87.6
80	11.789	32.622	11.779	24.784	317.2	0.254	88.2
90	11.579	32.648	11.568	24.843	311.8	0.285	89.4
100	10.407	32.754	10.396	25.132	284.3	0.315	90.5
110	9.592	32.922	9.580	25.399	259.0	0.342	90.6
120	9.208	33.038	9.195	25.552	244.6	0.367	90.7
130	8.675	33.108	8.662	25.689	231.6	0.391	90.8
140	8.474	33.197	8.460	25.790	222.1	0.414	90.8
150	8.222	33.341	8.207	25.941	207.9	0.435	90.8
175	7.679	33.714	7.662	26.314	172.9	0.483	90.9
200	7.404	33.880	7.385	26.484	157.1	0.523	91.0
225	7.151	33.921	7.130	26.551	151.0	0.562	91.0
250	6.682	33.929	6.659	26.621	144.5	0.599	91.0
300	6.181	33.967	6.155	26.717	135.8	0.669	91.0
400	5.398	34.029	5.365	26.863	122.7	0.798	91.1
500	4.821	34.076	4.782	26.967	113.4	0.916	91.1
501	4.819	34.076	4.780	26.968	113.4	0.917	91.1



STATION 11



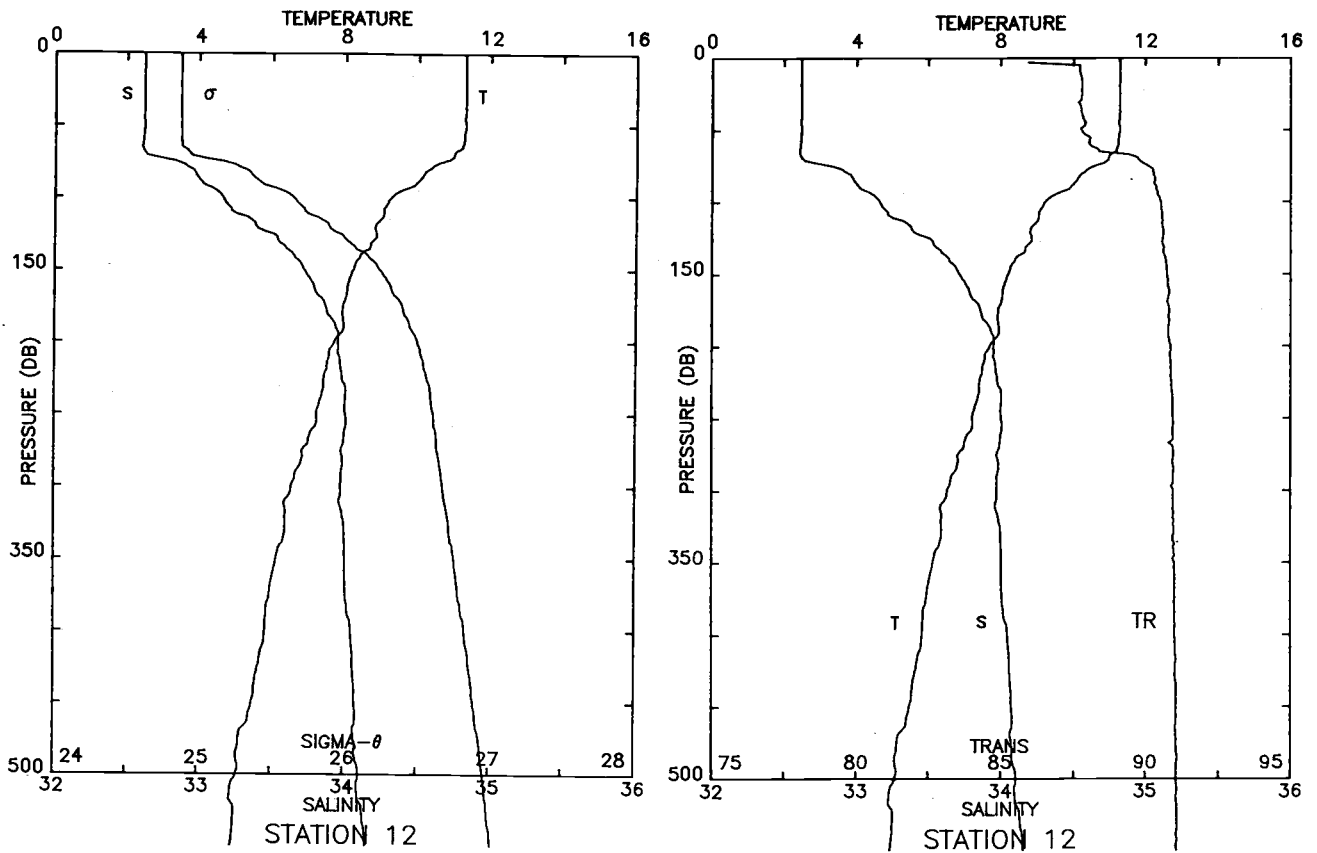
STATION 11

STA NO 11
19 FEB 1987

LAT: 41 7.0 N
0800 GMT PROBE 2561

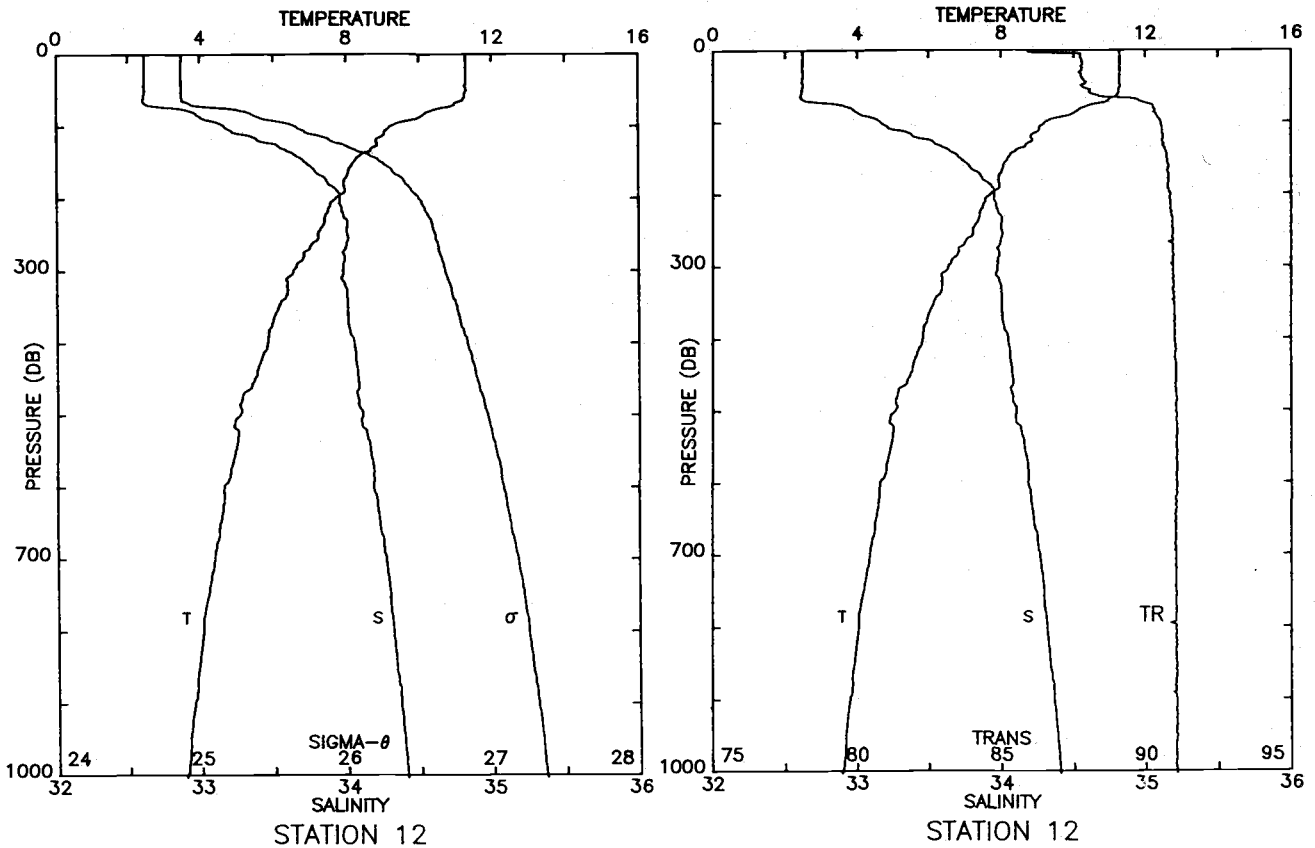
LONG: 125 30.0 W
DEPTH 3145M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
	TEMP			THETA			
1	11.708	32.591	11.708	24.773	316.4	0.003	87.2
10	11.717	32.592	11.716	24.773	316.6	0.032	87.2
20	11.716	32.591	11.713	24.773	316.9	0.063	87.1
30	11.720	32.592	11.716	24.772	317.2	0.095	87.2
40	11.724	32.592	11.719	24.772	317.4	0.127	87.2
50	11.724	32.592	11.718	24.772	317.6	0.159	87.2
60	11.714	32.595	11.706	24.777	317.4	0.190	87.5
70	10.893	32.721	10.885	25.022	294.2	0.221	90.0
80	10.548	32.815	10.539	25.155	281.7	0.250	90.1
90	9.652	32.928	9.642	25.394	259.1	0.277	90.4
100	9.387	33.084	9.377	25.559	243.6	0.302	90.6
110	9.488	33.313	9.476	25.721	228.4	0.326	90.4
120	9.320	33.401	9.307	25.817	219.4	0.348	90.5
130	8.897	33.488	8.883	25.953	206.7	0.369	90.6
140	8.623	33.575	8.609	26.064	196.3	0.390	90.7
150	8.423	33.653	8.407	26.155	187.7	0.409	90.7
175	8.464	33.762	8.446	26.235	180.6	0.455	90.7
200	7.885	33.873	7.866	26.409	164.4	0.499	90.8
225	7.489	33.922	7.467	26.505	155.6	0.539	90.9
250	7.121	33.946	7.098	26.575	149.1	0.577	90.9
300	6.562	33.955	6.535	26.658	141.7	0.649	90.9
400	5.480	34.007	5.447	26.836	125.3	0.783	91.0
500	5.010	34.069	4.971	26.940	116.2	0.903	91.1
503	4.991	34.071	4.951	26.944	115.8	0.907	91.1



STA NO 12 LAT: 41 0.0 N LONG: 125 30.1 W
 19 FEB 1987 1108 GMT PROBE 2561 DEPTH 3104M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.282	32.614	11.282	24.869	307.3	0.003	71.6
10	11.283	32.618	11.282	24.871	307.3	0.031	87.7
20	11.283	32.616	11.280	24.870	307.6	0.061	87.8
30	11.288	32.617	11.284	24.870	307.8	0.092	87.7
40	11.283	32.616	11.278	24.871	308.0	0.123	87.8
50	11.293	32.619	11.287	24.871	308.2	0.154	87.8
60	11.238	32.610	11.231	24.874	308.1	0.185	88.1
70	10.961	32.630	10.952	24.939	302.1	0.215	89.7
80	10.256	32.941	10.247	25.303	267.6	0.244	90.3
90	9.904	33.025	9.894	25.428	255.9	0.270	90.4
100	9.220	33.163	9.209	25.647	235.1	0.294	90.5
110	9.042	33.237	9.030	25.733	227.1	0.317	90.6
120	8.809	33.395	8.796	25.894	212.1	0.339	90.6
130	8.721	33.547	8.708	26.027	199.6	0.360	90.6
140	8.388	33.650	8.374	26.158	187.2	0.379	90.7
150	8.196	33.722	8.181	26.243	179.3	0.397	90.7
175	7.939	33.865	7.921	26.394	165.3	0.440	90.8
200	7.707	33.954	7.688	26.498	155.9	0.480	90.9
225	7.417	33.983	7.396	26.563	150.0	0.519	90.9
250	7.226	34.007	7.202	26.609	146.0	0.556	91.0
300	6.542	33.974	6.515	26.676	140.0	0.627	91.0
400	5.835	34.051	5.801	26.827	126.5	0.760	91.0
500	5.059	34.107	5.019	26.965	113.9	0.881	91.1

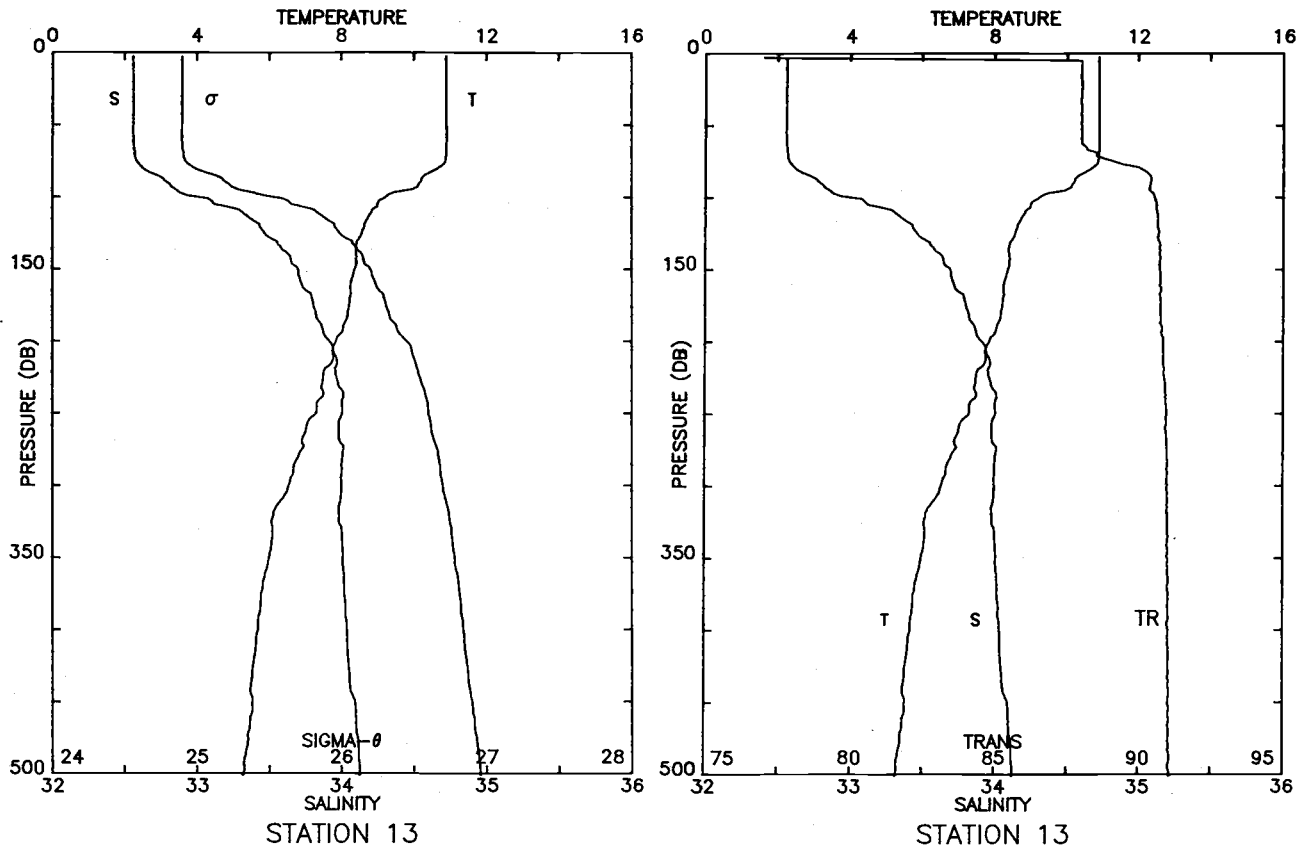


STA NO 12
19 FEB 1987

LAT: 41 30.0 N
1108 GMT PROBE 2561

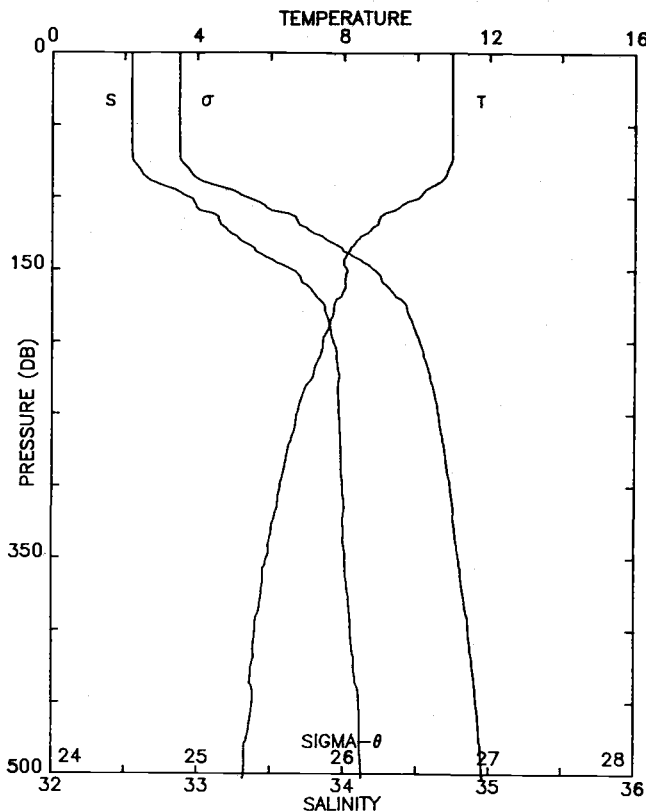
LONG: 125 30.1 W
DEPTH 3104M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.282	32.614	11.282	24.869	307.3	0.003	71.6
10	11.283	32.618	11.282	24.871	307.3	0.031	87.7
20	11.283	32.616	11.280	24.870	307.6	0.061	87.8
30	11.288	32.617	11.284	24.870	307.8	0.092	87.7
40	11.283	32.616	11.278	24.871	308.0	0.123	87.8
50	11.293	32.619	11.287	24.871	308.2	0.154	87.8
60	11.238	32.610	11.231	24.874	308.1	0.185	88.1
70	10.961	32.630	10.952	24.939	302.1	0.215	89.7
80	10.256	32.941	10.247	25.303	267.6	0.244	90.3
90	9.904	33.025	9.894	25.428	255.9	0.270	90.4
100	9.220	33.163	9.209	25.647	235.1	0.294	90.5
110	9.042	33.237	9.030	25.733	227.1	0.317	90.6
120	8.809	33.395	8.796	25.894	212.1	0.339	90.6
130	8.721	33.547	8.708	26.027	199.6	0.360	90.6
140	8.388	33.650	8.374	26.158	187.2	0.379	90.7
150	8.196	33.722	8.181	26.243	179.3	0.397	90.7
175	7.939	33.865	7.921	26.394	165.3	0.440	90.8
200	7.707	33.954	7.688	26.498	155.9	0.480	90.9
225	7.417	33.983	7.396	26.563	150.0	0.519	90.9
250	7.226	34.007	7.202	26.609	146.0	0.556	91.0
300	6.542	33.974	6.515	26.676	140.0	0.627	91.0
400	5.835	34.051	5.801	26.827	126.5	0.760	91.0
500	5.059	34.107	5.019	26.965	113.9	0.881	91.1
600	4.629	34.181	4.583	27.073	104.3	0.990	91.1
800	4.039	34.316	3.980	27.244	89.2	1.182	91.1
1000	3.592	34.406	3.519	27.362	79.0	1.350	91.1
1003	3.569	34.409	3.497	27.366	78.6	1.352	91.1

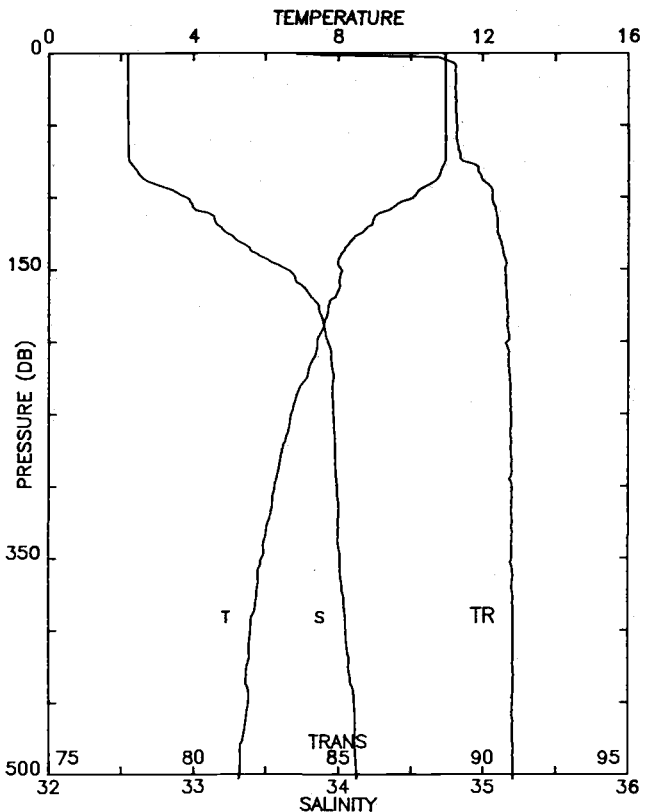


STA NO 13 LAT: 41 30.1 N LONG: 125 40.1 W
 19 FEB 1987 1246 GMT PROBE 2561 DEPTH 3069M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
3	10.887	32.559	10.887	24.895	304.8	0.009	77.0
10	10.886	32.559	10.885	24.896	304.9	0.030	88.0
20	10.887	32.558	10.885	24.896	305.2	0.061	88.0
30	10.891	32.558	10.888	24.895	305.4	0.092	88.0
40	10.893	32.559	10.888	24.895	305.6	0.122	88.0
50	10.897	32.559	10.891	24.894	305.9	0.153	88.0
60	10.901	32.559	10.893	24.894	306.1	0.183	88.0
70	10.884	32.568	10.876	24.904	305.4	0.214	88.5
80	10.662	32.625	10.653	24.988	297.7	0.244	90.1
90	10.159	32.797	10.149	25.208	276.9	0.273	90.4
100	9.220	33.006	9.209	25.524	246.8	0.299	90.6
110	8.836	33.303	8.825	25.817	219.1	0.323	90.7
120	8.625	33.433	8.613	25.951	206.5	0.344	90.7
130	8.453	33.531	8.440	26.055	196.9	0.364	90.7
140	8.400	33.632	8.386	26.142	188.8	0.383	90.8
150	8.362	33.695	8.347	26.198	183.7	0.402	90.8
175	8.209	33.803	8.191	26.306	173.8	0.447	90.8
200	7.844	33.913	7.824	26.446	160.9	0.489	90.9
225	7.484	33.966	7.462	26.540	152.2	0.528	90.9
250	7.291	34.006	7.268	26.599	146.9	0.565	91.0
300	6.536	34.000	6.510	26.697	138.0	0.636	91.0
400	5.669	34.039	5.635	26.839	125.3	0.767	91.1
500	5.267	34.128	5.227	26.958	114.9	0.887	91.1
501	5.255	34.128	5.214	26.959	114.7	0.888	91.1



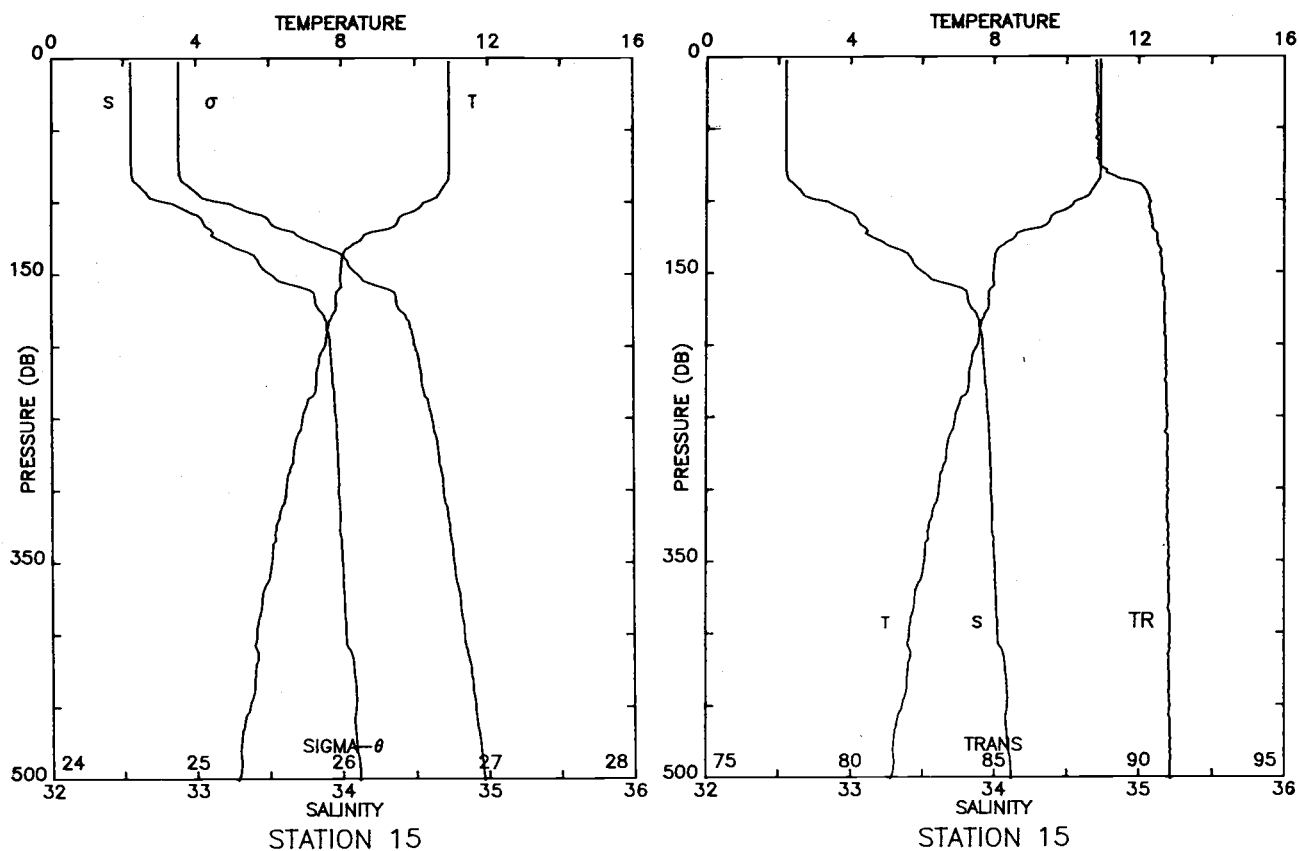
STATION 14



STATION 14

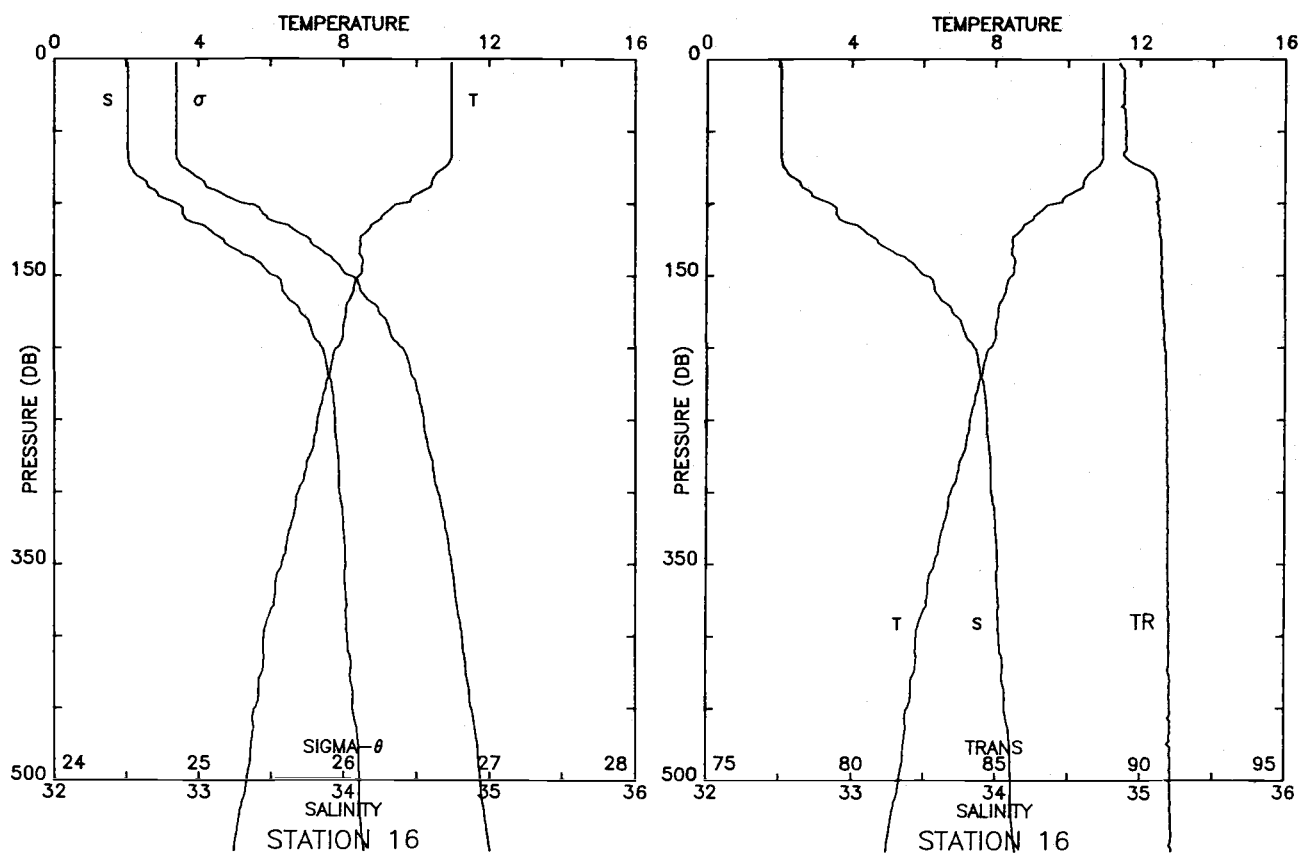
STA NO 14 LAT: 41 29.9 N LONG: 125 50.0 W
 19 FEB 1987 1448 GMT PROBE 2561 DEPTH 3028M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	10.951	32.547	10.951	24.875	306.7	0.003	83.6
10	10.957	32.546	10.956	24.874	307.0	0.031	89.1
20	10.959	32.547	10.957	24.874	307.2	0.061	89.1
30	10.962	32.547	10.958	24.874	307.5	0.092	89.1
40	10.963	32.547	10.959	24.873	307.7	0.123	89.1
50	10.965	32.548	10.959	24.874	307.9	0.154	89.1
60	10.965	32.548	10.958	24.874	308.1	0.184	89.1
70	10.958	32.552	10.950	24.879	307.8	0.215	89.2
80	10.852	32.598	10.843	24.934	302.8	0.246	89.8
90	10.584	32.708	10.573	25.066	290.4	0.276	90.1
100	10.052	32.943	10.041	25.340	264.5	0.303	90.3
110	9.245	33.060	9.233	25.562	243.4	0.329	90.5
120	8.840	33.179	8.827	25.720	228.5	0.352	90.5
130	8.344	33.303	8.331	25.893	212.2	0.374	90.6
140	8.052	33.451	8.039	26.052	197.2	0.395	90.7
150	8.076	33.646	8.061	26.202	183.2	0.414	90.8
175	7.718	33.866	7.701	26.427	162.1	0.457	90.8
200	7.419	33.928	7.400	26.519	153.8	0.496	90.9
225	7.137	33.969	7.116	26.591	147.2	0.534	90.9
250	6.708	33.967	6.685	26.648	142.0	0.570	91.0
300	6.251	33.992	6.225	26.727	134.9	0.639	91.0
400	5.587	34.052	5.554	26.858	123.3	0.769	91.1
500	5.282	34.127	5.241	26.955	115.1	0.887	91.1
503	5.264	34.128	5.223	26.958	114.9	0.891	91.1



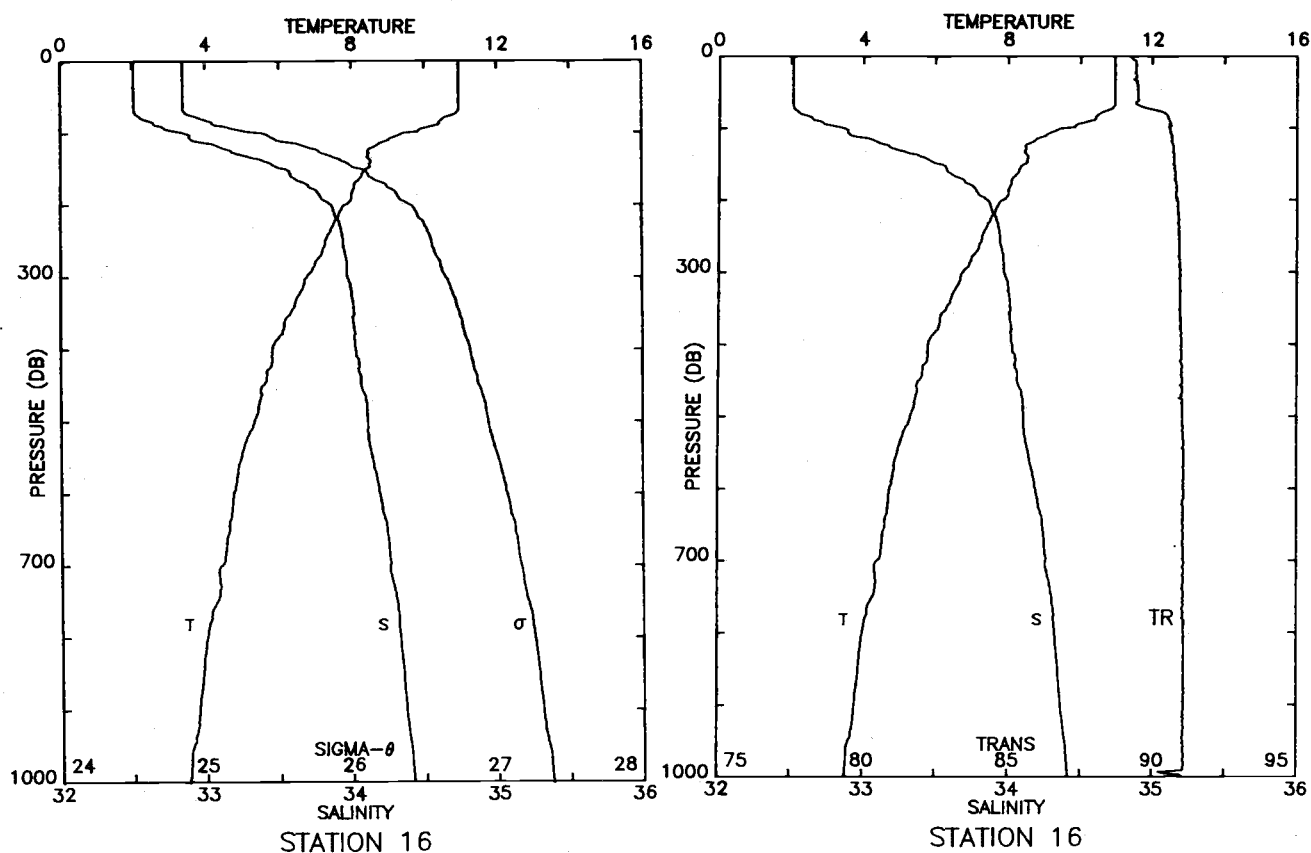
STA NO 15 LAT: 41 30.0 N LONG: 126 0.1 W
 19 FEB 1987 1630 GMT PROBE 2561 DEPTH 2631M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
	TEMP			THETA			
3	10.934	32.550	10.934	24.881	306.2	0.009	88.5
10	10.933	32.550	10.932	24.881	306.3	0.031	88.5
20	10.935	32.550	10.932	24.881	306.6	0.061	88.5
30	10.936	32.550	10.932	24.881	306.8	0.092	88.6
40	10.936	32.550	10.931	24.881	307.0	0.123	88.5
50	10.937	32.550	10.932	24.881	307.2	0.153	88.6
60	10.940	32.551	10.933	24.881	307.4	0.184	88.6
70	10.941	32.551	10.933	24.881	307.6	0.215	88.6
80	10.934	32.557	10.925	24.887	307.3	0.246	88.9
90	10.776	32.624	10.765	24.967	299.9	0.276	90.1
100	10.314	32.795	10.303	25.180	279.7	0.305	90.4
110	9.637	33.024	9.624	25.472	252.1	0.332	90.4
120	9.057	33.112	9.044	25.633	236.8	0.357	90.5
130	8.298	33.241	8.285	25.850	216.2	0.379	90.7
140	8.011	33.421	7.998	26.035	198.8	0.400	90.8
150	7.972	33.510	7.957	26.110	191.8	0.419	90.8
175	7.839	33.847	7.821	26.395	165.3	0.463	90.9
200	7.539	33.924	7.520	26.499	155.7	0.503	90.9
225	7.307	33.939	7.285	26.544	151.7	0.541	90.9
250	6.925	33.961	6.902	26.614	145.3	0.578	91.0
300	6.462	33.981	6.436	26.692	138.4	0.649	91.0
400	5.631	34.028	5.598	26.834	125.7	0.781	91.1
500	5.122	34.120	5.082	26.968	113.7	0.900	91.1
501	5.112	34.121	5.072	26.970	113.5	0.901	91.1



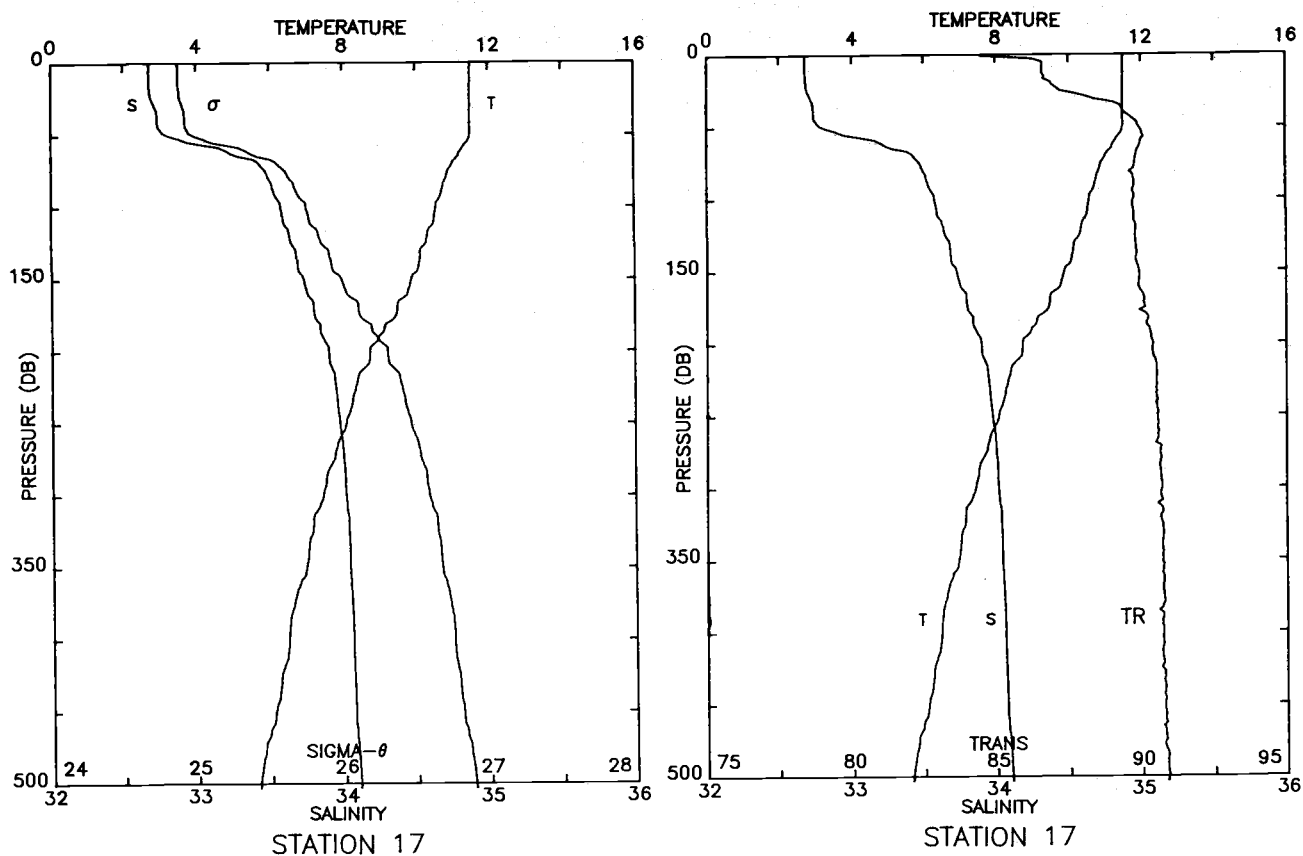
STA NO 16 LAT: 41 30.0 N LONG: 126 10.0 W
 19 FEB 1987 1758 GMT PROBE 2561 DEPTH 2904M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
3	10.957	32.510	10.956	24.845	309.6	0.009	89.3
10	10.957	32.511	10.956	24.846	309.7	0.031	89.4
20	10.955	32.511	10.953	24.846	309.8	0.062	89.4
30	10.956	32.510	10.952	24.846	310.1	0.093	89.4
40	10.955	32.511	10.950	24.847	310.2	0.124	89.5
50	10.956	32.511	10.950	24.847	310.4	0.155	89.5
60	10.957	32.511	10.950	24.847	310.7	0.186	89.5
70	10.928	32.515	10.919	24.856	310.1	0.217	89.6
80	10.524	32.565	10.515	24.965	299.8	0.248	90.4
90	10.296	32.680	10.285	25.093	287.8	0.277	90.6
100	9.623	32.850	9.612	25.338	264.6	0.305	90.6
110	9.037	32.909	9.026	25.477	251.4	0.330	90.7
120	8.629	33.099	8.617	25.690	231.4	0.354	90.7
130	8.467	33.227	8.454	25.814	219.7	0.377	90.7
140	8.543	33.408	8.529	25.945	207.5	0.398	90.7
150	8.447	33.522	8.431	26.049	197.8	0.418	90.7
175	8.081	33.702	8.063	26.246	179.5	0.466	90.8
200	7.852	33.855	7.833	26.400	165.2	0.509	90.8
225	7.519	33.918	7.497	26.497	156.3	0.549	90.9
250	7.278	33.943	7.254	26.551	151.5	0.587	90.9
300	6.753	33.972	6.725	26.646	142.9	0.661	91.0
400	5.800	34.028	5.766	26.814	127.7	0.796	91.0
500	5.313	34.111	5.272	26.939	116.7	0.918	91.1



STA NO 16 LAT: 41 30.0 N LONG: 126 10.0 W
 19 FEB 1987 1758 GMT PROBE 2561 DEPTH 2904M

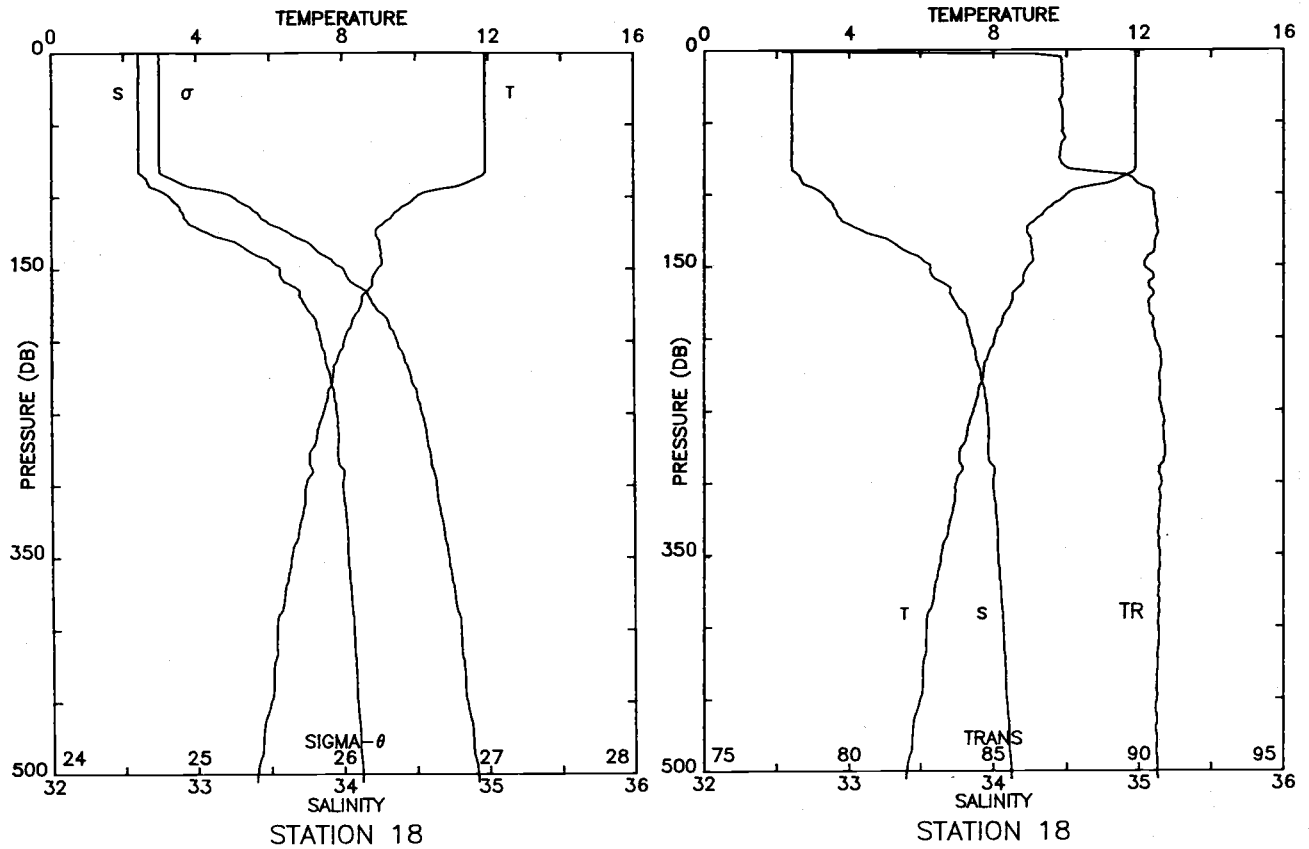
PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
			TEMP	THETA			
3	10.957	32.510	10.956	24.845	309.6	0.009	89.3
10	10.957	32.511	10.956	24.846	309.7	0.031	89.4
20	10.955	32.511	10.953	24.846	309.8	0.062	89.4
30	10.956	32.510	10.952	24.846	310.1	0.093	89.4
40	10.955	32.511	10.950	24.847	310.2	0.124	89.5
50	10.956	32.511	10.950	24.847	310.4	0.155	89.5
60	10.957	32.511	10.950	24.847	310.7	0.186	89.5
70	10.928	32.515	10.919	24.856	310.1	0.217	89.6
80	10.524	32.565	10.515	24.965	299.8	0.248	90.4
90	10.296	32.680	10.285	25.093	287.8	0.277	90.6
100	9.623	32.850	9.612	25.338	264.6	0.305	90.6
110	9.037	32.909	9.026	25.477	251.4	0.330	90.7
120	8.629	33.099	8.617	25.690	231.4	0.354	90.7
130	8.467	33.227	8.454	25.814	219.7	0.377	90.7
140	8.543	33.408	8.529	25.945	207.5	0.398	90.7
150	8.447	33.522	8.431	26.049	197.8	0.418	90.7
175	8.081	33.702	8.063	26.246	179.5	0.466	90.8
200	7.852	33.855	7.833	26.400	165.2	0.509	90.8
225	7.519	33.918	7.497	26.497	156.3	0.549	90.9
250	7.278	33.943	7.254	26.551	151.5	0.587	90.9
300	6.753	33.972	6.725	26.646	142.9	0.661	91.0
400	5.800	34.028	5.766	26.814	127.7	0.796	91.0
500	5.313	34.111	5.272	26.939	116.7	0.918	91.1
600	4.739	34.192	4.692	27.070	104.8	1.029	91.1
800	3.998	34.326	3.939	27.256	88.0	1.221	91.1
1000	3.503	34.419	3.432	27.381	77.0	1.387	91.1
1001	3.501	34.420	3.430	27.382	76.9	1.388	91.1



STA NO 17 LAT: 41 7.5 N LONG: 126 10.0 W
 19 FEB 1987 2045 GMT PROBE 2561 DEPTH 2939M

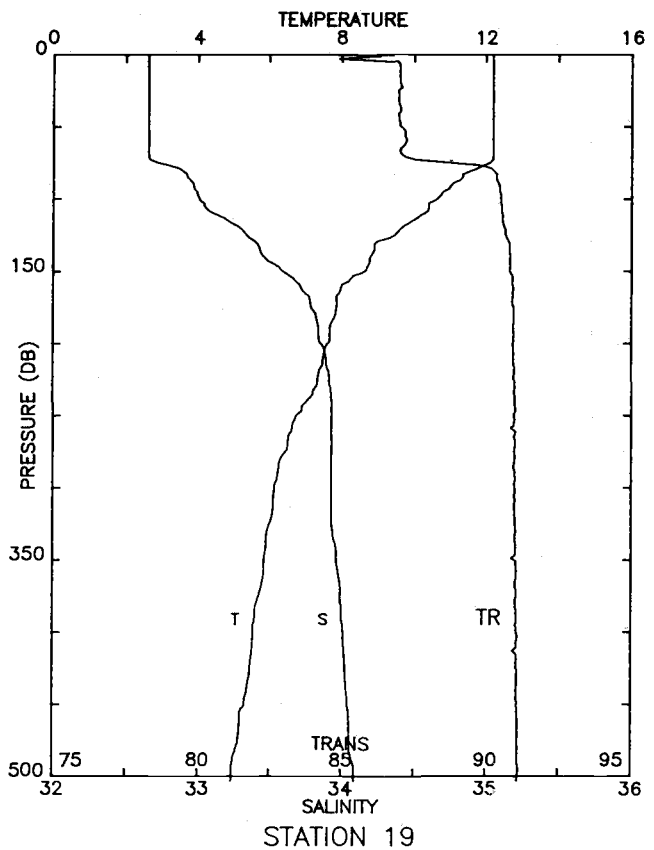
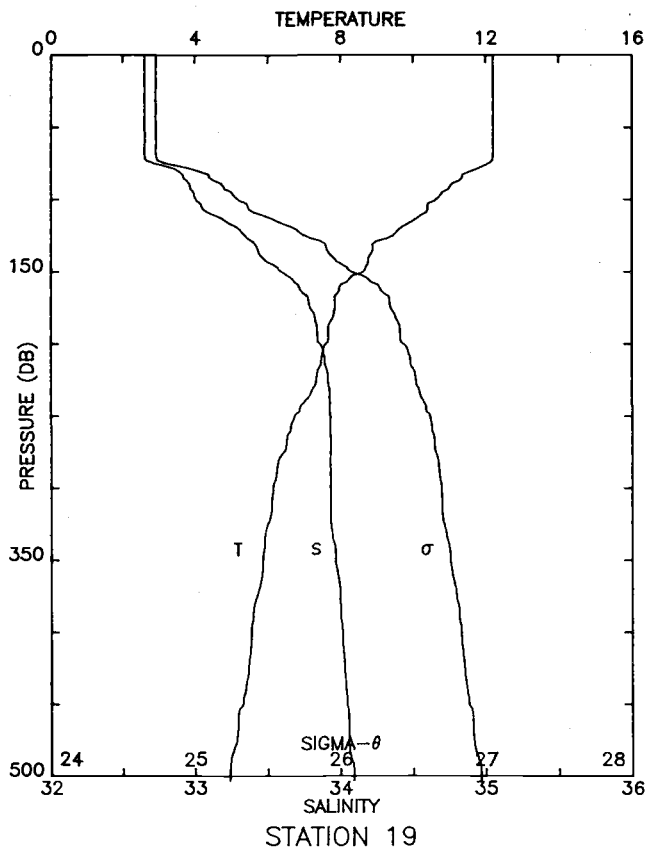
PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.517	32.677	11.517	24.875	306.7	0.003	84.5
10	11.510	32.678	11.509	24.877	306.7	0.031	86.6
20	11.500	32.684	11.498	24.884	306.3	0.061	86.9
30	11.500	32.716	11.497	24.909	304.1	0.092	88.3
40	11.499	32.736	11.494	24.925	302.8	0.122	89.4
50	11.498	32.796	11.492	24.972	298.6	0.152	89.9
60	11.267	33.182	11.260	25.314	266.3	0.181	90.0
70	11.001	33.430	10.993	25.555	243.6	0.206	89.8
80	10.824	33.495	10.814	25.637	236.0	0.230	89.7
90	10.701	33.534	10.690	25.689	231.3	0.254	89.7
100	10.550	33.576	10.539	25.749	225.8	0.276	89.7
110	10.490	33.596	10.478	25.774	223.6	0.299	89.7
120	10.311	33.636	10.297	25.837	217.9	0.321	89.8
130	10.125	33.678	10.110	25.902	211.9	0.342	89.8
140	10.061	33.689	10.045	25.921	210.2	0.364	89.8
150	9.851	33.731	9.834	25.989	203.9	0.384	89.9
175	9.438	33.803	9.418	26.114	192.5	0.434	90.1
200	8.718	33.900	8.697	26.304	174.7	0.479	90.4
225	8.314	33.949	8.291	26.405	165.4	0.522	90.5
250	8.059	33.975	8.034	26.464	160.2	0.563	90.6
300	7.417	34.014	7.388	26.588	148.9	0.640	90.7
400	6.460	34.058	6.424	26.754	134.0	0.780	90.7
500	5.653	34.102	5.611	26.891	121.6	0.908	90.9
503	5.644	34.103	5.602	26.893	121.5	0.912	90.9

2 MIN GAP 427DB & 448DB



STA NO 18 LAT: 40 45.1 N LONG: 126 9.9 W
 19 FEB 1987 2312 GMT PROBE 2561 DEPTH 2927M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	11.903	32.601	11.903	24.745	319.1	0.003	77.7
10	11.909	32.603	11.908	24.746	319.2	0.032	87.3
20	11.907	32.603	11.905	24.746	319.4	0.064	87.4
30	11.904	32.602	11.900	24.746	319.7	0.096	87.4
40	11.901	32.601	11.896	24.746	319.9	0.128	87.3
50	11.904	32.602	11.898	24.746	320.1	0.160	87.4
60	11.912	32.603	11.904	24.746	320.4	0.192	87.4
70	11.906	32.601	11.897	24.746	320.6	0.224	87.3
80	11.903	32.601	11.893	24.747	320.8	0.256	87.4
90	11.425	32.668	11.414	24.886	307.7	0.288	89.8
100	10.013	32.822	10.002	25.252	272.9	0.317	90.5
110	9.484	32.900	9.472	25.399	258.9	0.343	90.6
120	9.040	32.977	9.027	25.530	246.6	0.368	90.6
130	8.994	33.222	8.980	25.730	227.8	0.392	90.6
140	9.046	33.403	9.031	25.863	215.4	0.414	90.5
150	8.953	33.568	8.937	26.007	201.9	0.435	90.2
175	8.494	33.742	8.476	26.215	182.5	0.483	90.3
200	8.028	33.851	8.008	26.371	168.1	0.527	90.6
225	7.716	33.915	7.694	26.467	159.2	0.568	90.7
250	7.449	33.959	7.425	26.540	152.6	0.606	90.8
300	6.971	33.999	6.943	26.638	143.9	0.680	90.8
400	6.154	34.070	6.119	26.803	129.1	0.817	90.7
500	5.604	34.125	5.562	26.916	119.2	0.942	90.6
505	5.593	34.127	5.550	26.918	119.0	0.948	90.7

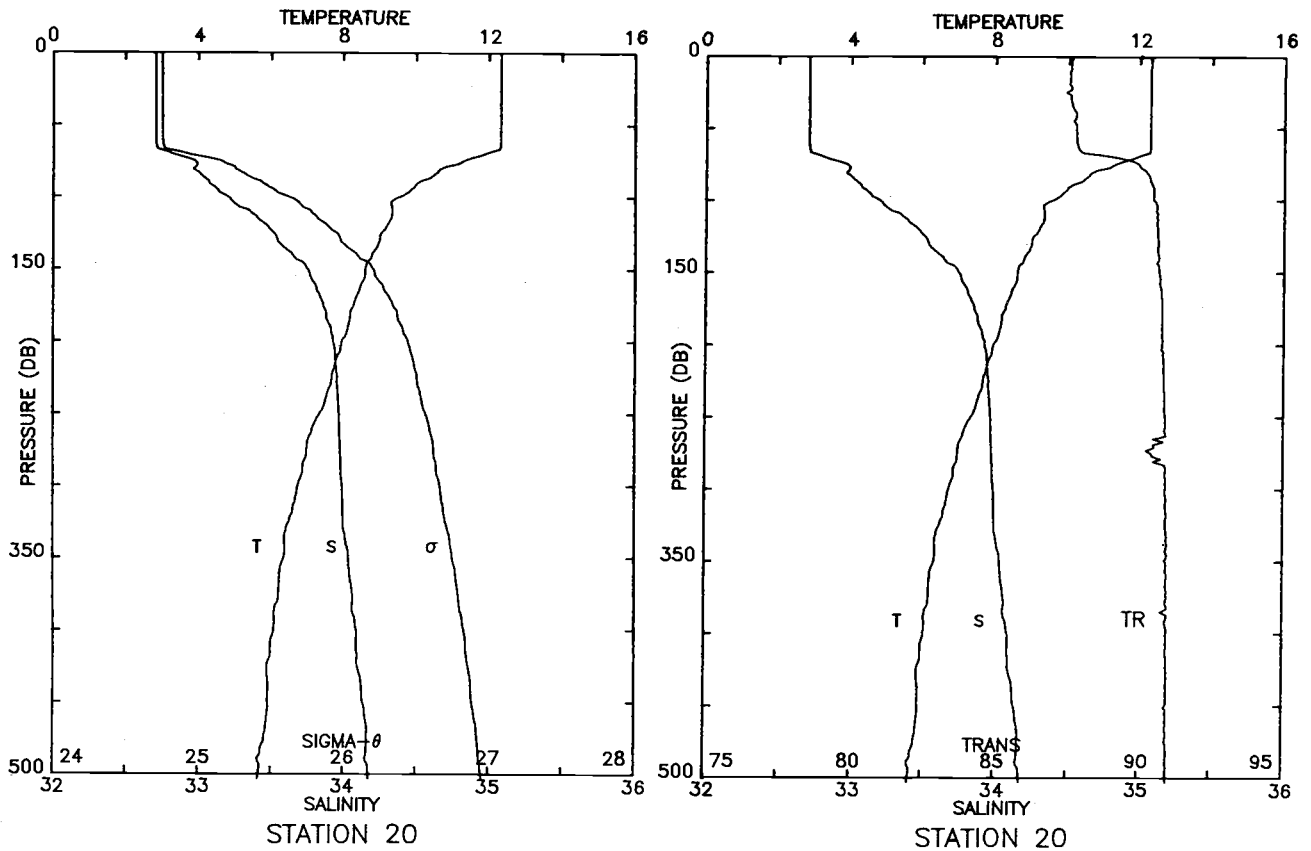


STA NO 19
20 FEB 1987

LAT: 40 22.1 N
0152 GMT PROBE 2561

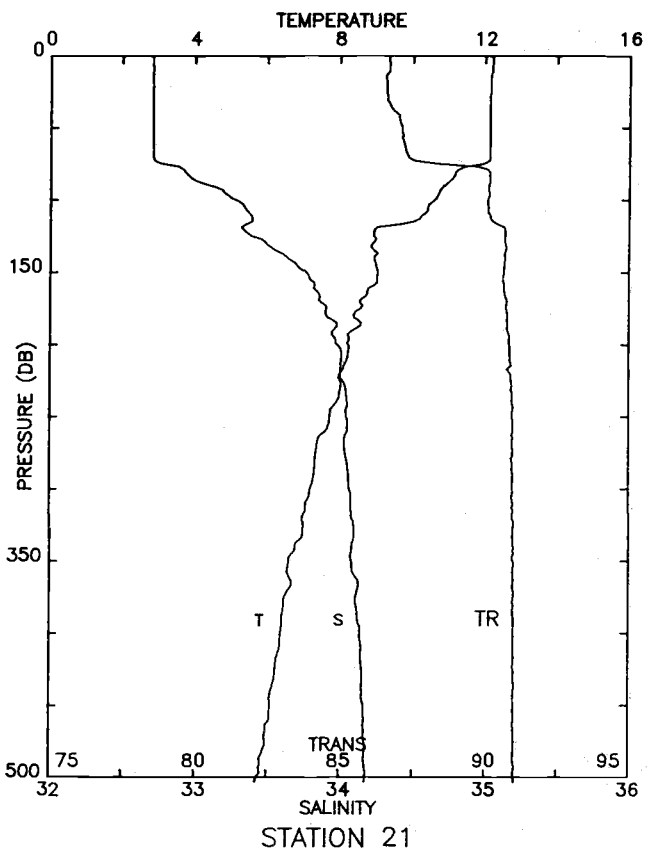
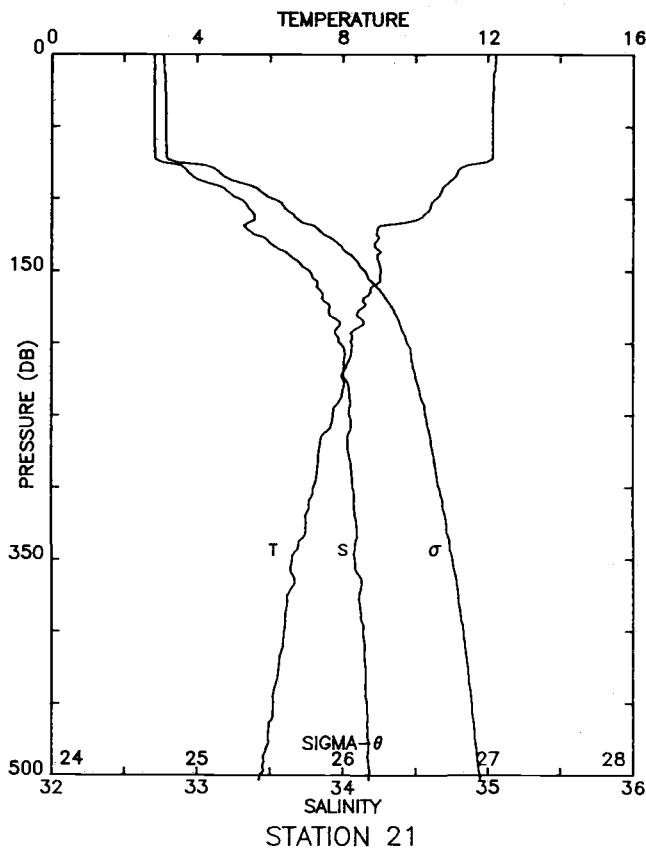
LONG: 126 10.2 W
DEPTH 2901M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	12.191	32.651	12.191	24.730	320.5	0.003	86.3
10	12.195	32.651	12.194	24.729	320.8	0.032	87.0
20	12.196	32.651	12.194	24.730	321.0	0.064	87.0
30	12.199	32.651	12.195	24.729	321.3	0.096	87.0
40	12.200	32.651	12.195	24.729	321.5	0.128	87.0
50	12.201	32.652	12.194	24.730	321.7	0.161	87.1
60	12.198	32.655	12.191	24.733	321.7	0.193	87.2
70	12.200	32.655	12.191	24.733	321.9	0.225	87.1
80	11.651	32.882	11.642	25.011	295.6	0.256	90.2
90	11.041	32.966	11.030	25.187	279.0	0.285	90.5
100	10.626	33.009	10.615	25.293	269.1	0.312	90.5
110	10.284	33.109	10.271	25.430	256.2	0.339	90.6
120	9.659	33.293	9.646	25.678	232.7	0.363	90.7
130	8.947	33.405	8.933	25.880	213.6	0.385	90.8
140	8.789	33.462	8.775	25.950	207.1	0.406	90.8
150	8.623	33.597	8.608	26.081	194.8	0.427	90.8
175	7.856	33.792	7.838	26.349	169.6	0.471	91.0
200	7.622	33.858	7.603	26.435	161.8	0.512	90.9
225	7.339	33.918	7.318	26.523	153.8	0.551	91.0
250	6.746	33.932	6.723	26.615	145.1	0.589	91.0
300	6.140	33.932	6.114	26.694	138.0	0.659	91.0
400	5.545	34.014	5.512	26.834	125.6	0.792	91.1
500	4.946	34.093	4.907	26.967	113.6	0.912	91.1
503	4.941	34.094	4.901	26.968	113.5	0.915	91.1



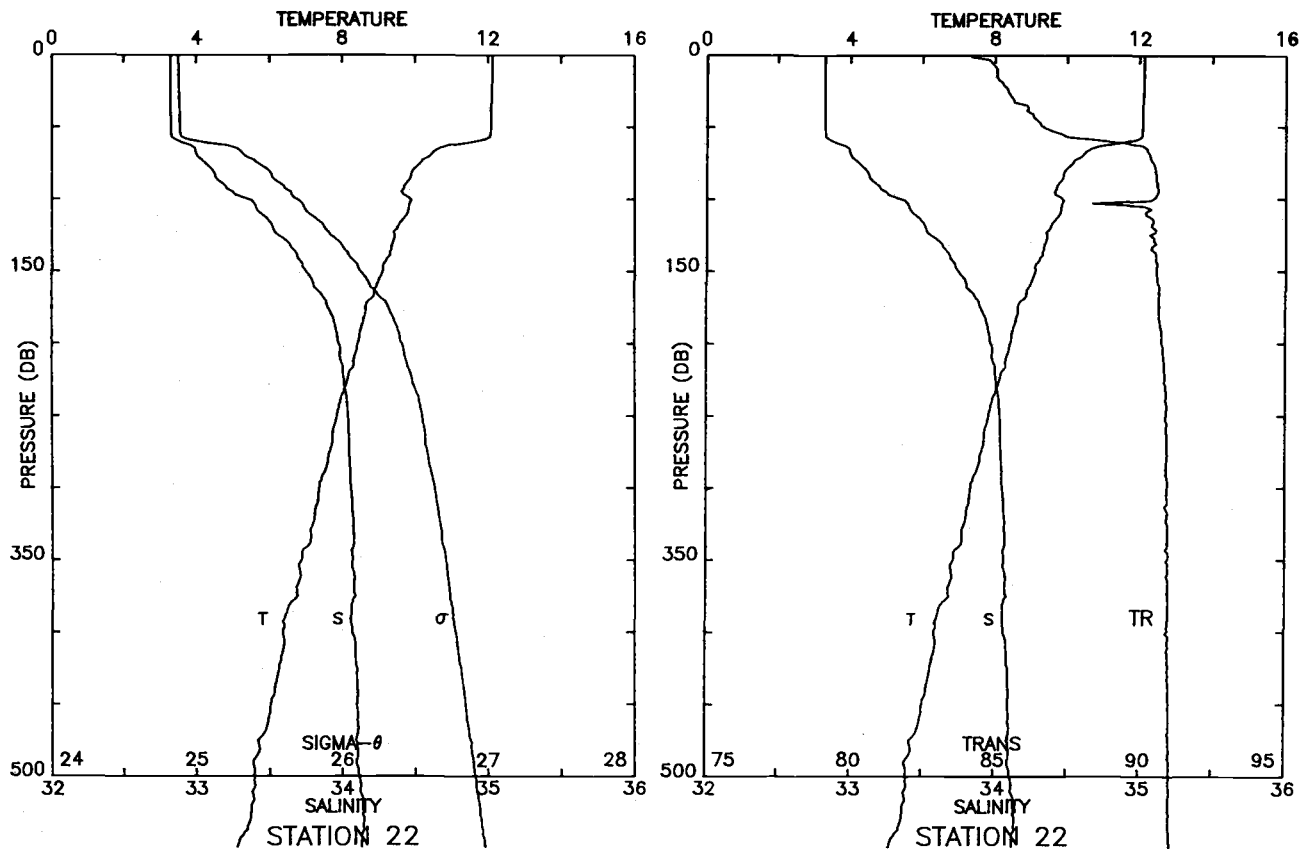
STA NO 20 LAT: 39 42.1 N LONG: 124 50.9 W
 20 FEB 1987 1750 GMT PROBE 2561 DEPTH 1856M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
			TEMP	THETA			
1	12.311	32.706	12.311	24.750	318.6	0.003	87.6
10	12.309	32.706	12.308	24.750	318.8	0.032	87.6
20	12.308	32.706	12.305	24.751	319.0	0.064	87.6
30	12.307	32.706	12.303	24.751	319.2	0.096	87.6
40	12.308	32.706	12.303	24.752	319.4	0.128	87.8
50	12.308	32.707	12.302	24.752	319.6	0.160	87.8
60	12.308	32.708	12.300	24.753	319.7	0.192	87.8
70	11.891	32.812	11.883	24.913	304.8	0.223	89.2
80	10.712	32.974	10.702	25.251	272.7	0.252	90.2
90	10.056	33.071	10.046	25.439	254.9	0.278	90.5
100	9.543	33.200	9.532	25.624	237.4	0.303	90.5
110	9.331	33.352	9.319	25.778	223.0	0.326	90.6
120	9.188	33.472	9.175	25.894	212.1	0.348	90.7
130	8.985	33.543	8.972	25.982	203.9	0.368	90.7
140	8.784	33.647	8.769	26.095	193.3	0.388	90.7
150	8.599	33.753	8.583	26.207	182.9	0.407	90.7
175	8.277	33.859	8.260	26.339	170.7	0.451	90.8
200	7.951	33.929	7.931	26.443	161.1	0.493	90.8
225	7.674	33.957	7.652	26.506	155.5	0.532	90.9
250	7.338	33.972	7.314	26.566	150.1	0.571	90.9
300	6.734	33.994	6.707	26.666	141.0	0.643	91.0
400	6.059	34.095	6.025	26.835	126.0	0.777	91.0
500	5.653	34.181	5.611	26.954	115.7	0.897	91.0
503	5.643	34.182	5.601	26.956	115.5	0.901	91.0



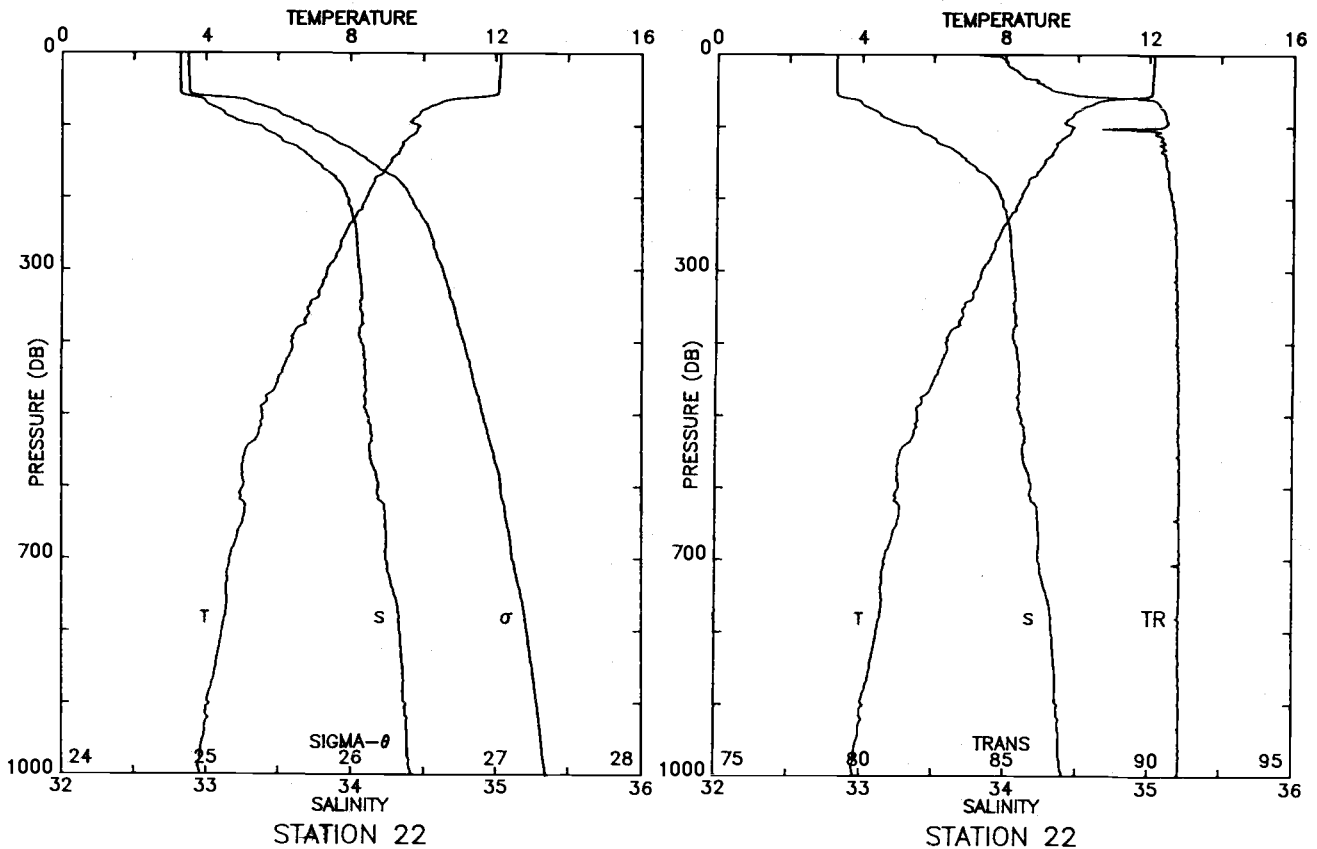
STA NO 21 LAT: 39 23.0 N LONG: 124 39.0 W
20 FEB 1987 2018 GMT PROBE 2561 DEPTH 2968M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	12.210	32.707	12.210	24.770	316.7	0.003	86.7
10	12.190	32.707	12.189	24.774	316.5	0.032	86.7
20	12.140	32.707	12.138	24.783	315.9	0.063	86.6
30	12.123	32.706	12.119	24.786	315.8	0.095	86.6
40	12.118	32.707	12.113	24.788	315.9	0.126	86.9
50	12.118	32.707	12.111	24.788	316.1	0.158	87.1
60	12.119	32.708	12.111	24.789	316.3	0.190	87.2
70	12.117	32.710	12.108	24.791	316.4	0.221	87.3
80	11.190	32.925	11.181	25.129	284.4	0.252	90.1
90	10.859	33.101	10.849	25.324	266.0	0.279	90.1
100	10.580	33.280	10.568	25.512	248.2	0.305	90.1
110	10.281	33.381	10.268	25.643	236.0	0.329	90.2
120	8.972	33.327	8.960	25.815	219.6	0.352	90.7
130	8.901	33.491	8.888	25.954	206.5	0.373	90.7
140	8.943	33.643	8.928	26.067	196.0	0.394	90.7
150	9.039	33.770	9.023	26.152	188.3	0.413	90.7
175	8.574	33.911	8.556	26.335	171.2	0.458	90.7
200	8.234	33.982	8.214	26.442	161.4	0.499	90.9
225	8.008	34.020	7.985	26.506	155.7	0.539	90.9
250	7.729	34.047	7.704	26.569	150.0	0.577	91.0
300	7.201	34.071	7.173	26.663	141.7	0.650	91.0
400	6.381	34.143	6.345	26.831	126.7	0.784	91.0
500	5.715	34.180	5.673	26.945	116.6	0.905	91.0
503	5.689	34.178	5.647	26.947	116.4	0.909	91.1



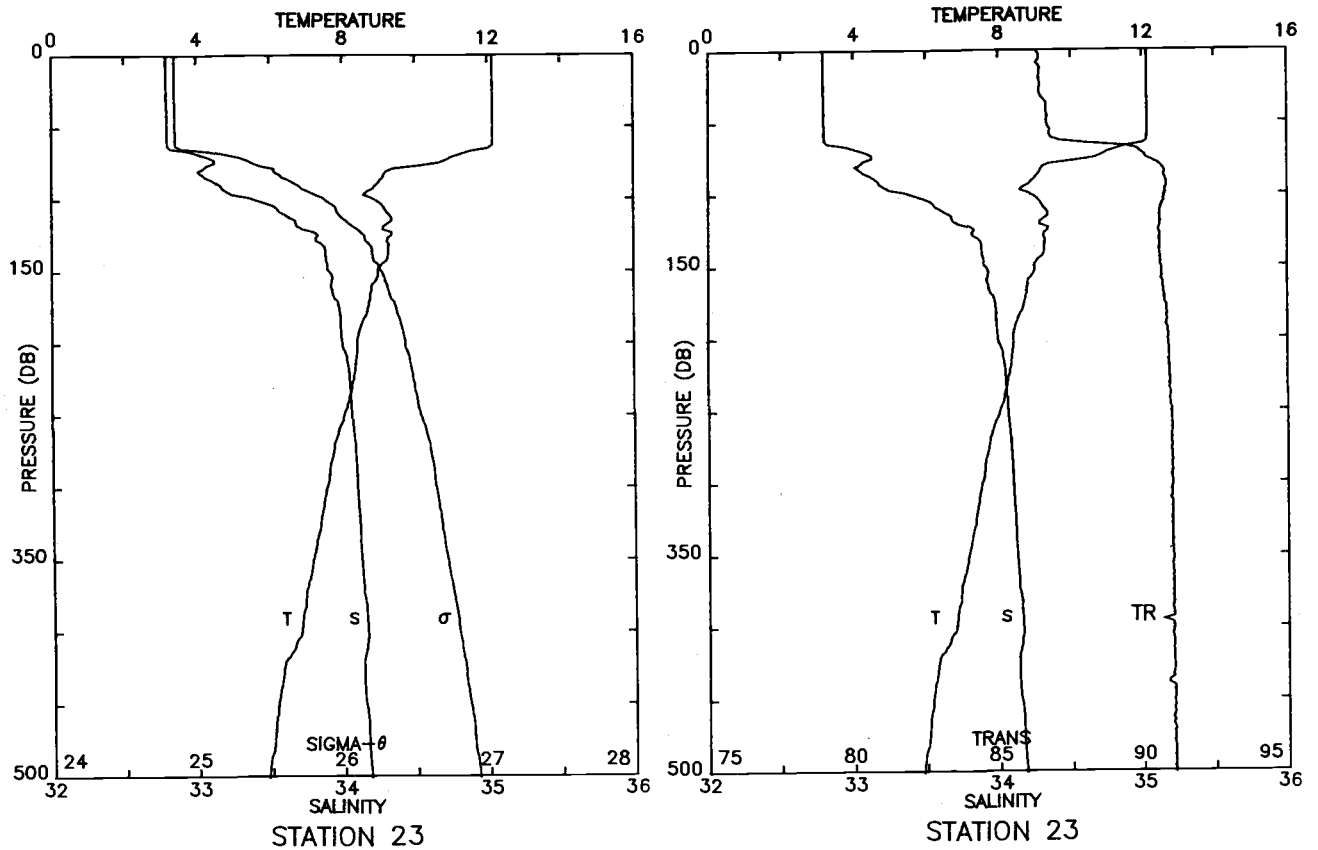
STA NO 22 LAT: 38 57.0 N LONG: 124 45.2 W
 21 FEB 1987 0426 GMT PROBE 2561 DEPTH 3398M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
	TEMP		TEMP	THETA			
1	12.126	32.821	12.125	24.874	306.8	0.003	84.2
10	12.120	32.821	12.119	24.875	306.9	0.031	85.1
20	12.112	32.820	12.109	24.877	307.0	0.061	85.3
30	12.099	32.820	12.095	24.879	307.0	0.092	85.6
40	12.081	32.821	12.076	24.883	306.9	0.123	86.2
50	12.079	32.822	12.073	24.885	307.0	0.153	86.7
60	11.687	32.879	11.679	25.002	296.0	0.184	88.9
70	10.394	33.006	10.386	25.330	264.8	0.211	90.4
80	9.936	33.110	9.927	25.489	249.9	0.237	90.6
90	9.727	33.186	9.717	25.583	241.1	0.262	90.6
100	9.869	33.349	9.857	25.687	231.5	0.285	90.5
110	9.782	33.437	9.769	25.771	223.8	0.308	90.2
120	9.515	33.522	9.502	25.881	213.4	0.330	90.5
130	9.387	33.625	9.372	25.982	204.0	0.351	90.5
140	9.273	33.693	9.258	26.054	197.4	0.371	90.6
150	9.108	33.750	9.092	26.125	190.8	0.390	90.6
175	8.638	33.905	8.620	26.320	172.6	0.436	90.7
200	8.432	33.978	8.411	26.410	164.5	0.478	90.8
225	8.141	34.013	8.119	26.481	158.1	0.518	90.9
250	7.842	34.041	7.817	26.548	152.1	0.557	90.9
300	7.355	34.060	7.326	26.633	144.6	0.631	91.0
400	6.354	34.070	6.318	26.777	131.7	0.769	91.0
500	5.574	34.118	5.532	26.913	119.4	0.895	91.1



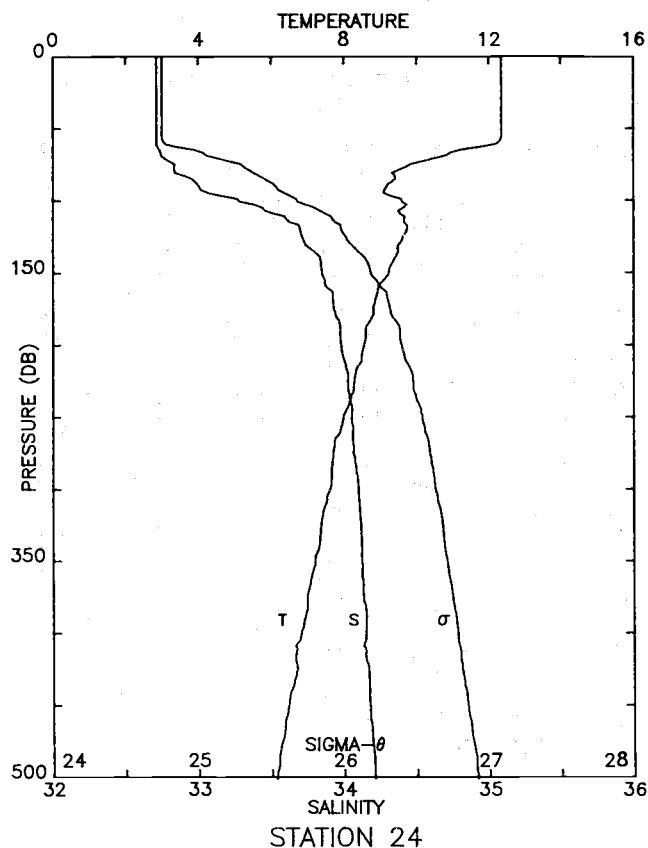
STA NO 22 LAT: 38 57.0 N LONG: 124 45.2 W
 21 FEB 1987 0426 GMT PROBE 2561 DEPTH 3398M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD	TRN
1	12.126	32.821	12.125	24.874	306.8	0.003	84.2
10	12.120	32.821	12.119	24.875	306.9	0.031	85.1
20	12.112	32.820	12.109	24.877	307.0	0.061	85.3
30	12.099	32.820	12.095	24.879	307.0	0.092	85.6
40	12.081	32.821	12.076	24.883	306.9	0.123	86.2
50	12.079	32.822	12.073	24.885	307.0	0.153	86.7
60	11.687	32.879	11.679	25.002	296.0	0.184	88.9
70	10.394	33.006	10.386	25.330	264.8	0.211	90.4
80	9.936	33.110	9.927	25.489	249.9	0.237	90.6
90	9.727	33.186	9.717	25.583	241.1	0.262	90.6
100	9.869	33.349	9.857	25.687	231.5	0.285	90.5
110	9.782	33.437	9.769	25.771	223.8	0.308	90.2
120	9.515	33.522	9.502	25.881	213.4	0.330	90.5
130	9.387	33.625	9.372	25.982	204.0	0.351	90.5
140	9.273	33.693	9.258	26.054	197.4	0.371	90.6
150	9.108	33.750	9.092	26.125	190.8	0.390	90.6
175	8.638	33.905	8.620	26.320	172.6	0.436	90.7
200	8.432	33.978	8.411	26.410	164.5	0.478	90.8
225	8.141	34.013	8.119	26.481	158.1	0.518	90.9
250	7.842	34.041	7.817	26.548	152.1	0.557	90.9
300	7.355	34.060	7.326	26.633	144.6	0.631	91.0
400	6.354	34.070	6.318	26.777	131.7	0.769	91.0
500	5.574	34.118	5.532	26.913	119.4	0.895	91.1
600	5.038	34.192	4.990	27.036	108.4	1.008	91.1
800	4.444	34.338	4.382	27.219	92.4	1.209	91.1
1000	3.819	34.413	3.745	27.345	81.1	1.382	91.1
1001	3.815	34.413	3.741	27.346	81.1	1.383	91.1



STA NO 23 LAT: 39 3.6 N LONG: 124 50.2 W
 21 FEB 1987 0634 GMT PROBE 2561 DEPTH 3291M

PRESS	TEMP	SAL	POTEN	SIGMA	SVA	DELD	TRN
	TEMP			THETA			
1	12.137	32.790	12.137	24.848	309.3	0.003	86.3
10	12.140	32.790	12.139	24.848	309.5	0.031	86.3
20	12.140	32.791	12.137	24.849	309.7	0.062	86.4
30	12.142	32.791	12.138	24.849	309.9	0.093	86.4
40	12.144	32.796	12.139	24.852	309.8	0.124	86.6
50	12.145	32.796	12.138	24.852	310.1	0.155	86.7
60	12.143	32.798	12.135	24.854	310.1	0.186	86.8
70	11.119	33.051	11.111	25.239	273.7	0.216	89.9
80	9.290	33.027	9.281	25.529	246.0	0.242	90.6
90	8.935	33.155	8.925	25.685	231.3	0.266	90.8
100	8.877	33.387	8.867	25.877	213.3	0.288	90.8
110	9.272	33.589	9.260	25.972	204.5	0.309	90.6
120	9.127	33.709	9.114	26.089	193.6	0.329	90.6
130	9.255	33.840	9.241	26.172	186.0	0.347	90.6
140	9.249	33.887	9.233	26.210	182.6	0.366	90.6
150	8.977	33.908	8.961	26.269	177.1	0.384	90.7
175	8.698	33.978	8.680	26.368	168.1	0.427	90.8
200	8.394	33.997	8.373	26.430	162.6	0.468	90.9
225	8.294	34.047	8.271	26.485	157.9	0.508	90.9
250	8.023	34.062	7.998	26.538	153.2	0.547	91.0
300	7.536	34.096	7.507	26.636	144.4	0.621	91.0
400	6.801	34.161	6.764	26.790	130.9	0.759	91.1
500	5.892	34.181	5.849	26.925	118.7	0.883	91.1
501	5.888	34.182	5.845	26.926	118.7	0.884	91.1

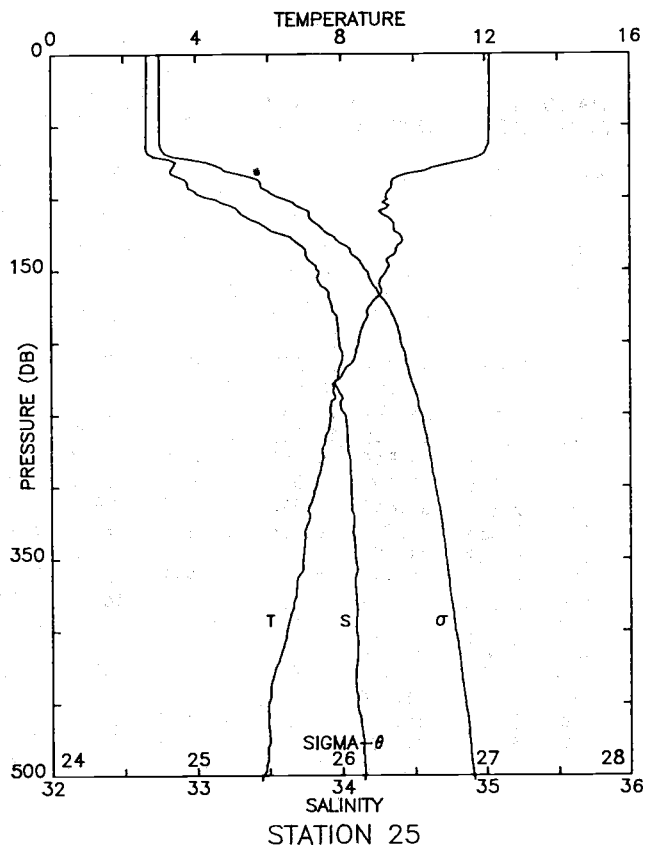


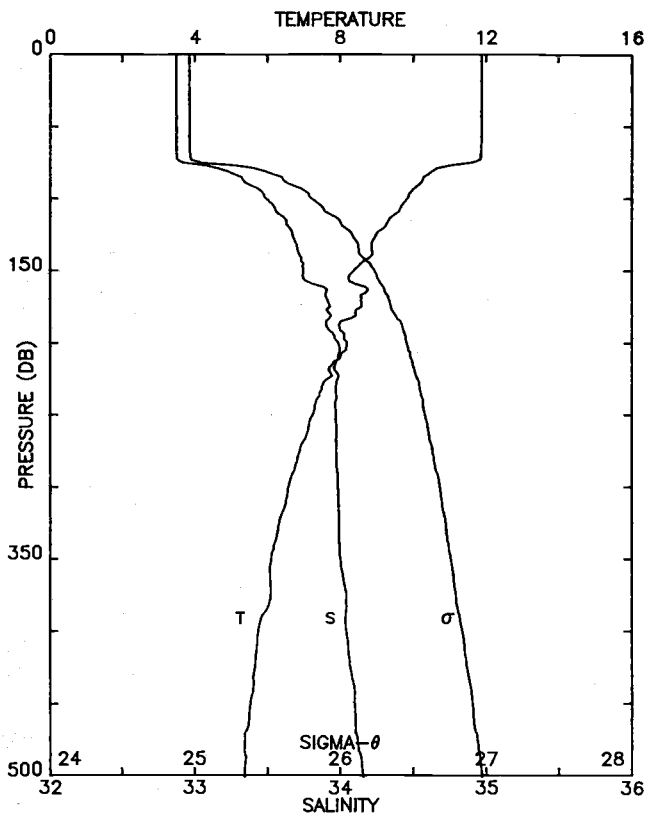
STA NO 24 LAT: 39 11.0 N LONG: 124 54.5 W
21 FEB 1987 0813 GMT PROBE 2561 DEPTH 3132M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	12.338	32.713	12.338	24.750	318.6	0.003
10	12.343	32.713	12.342	24.749	318.9	0.032
20	12.347	32.713	12.344	24.749	319.1	0.064
30	12.348	32.713	12.344	24.749	319.4	0.096
40	12.348	32.713	12.343	24.749	319.6	0.128
50	12.350	32.713	12.343	24.749	319.9	0.160
60	12.249	32.714	12.242	24.769	318.2	0.192
70	10.634	32.761	10.626	25.098	286.9	0.222
80	9.410	32.840	9.401	25.364	261.7	0.249
90	9.182	33.003	9.172	25.527	246.3	0.274
100	9.590	33.278	9.579	25.677	232.4	0.298
110	9.598	33.552	9.586	25.890	212.4	0.320
120	9.734	33.700	9.721	25.984	203.8	0.341
130	9.523	33.735	9.509	26.046	198.0	0.361
140	9.392	33.837	9.376	26.148	188.5	0.381
150	9.224	33.850	9.207	26.185	185.1	0.399
175	8.796	33.932	8.778	26.317	173.0	0.444
200	8.549	33.983	8.529	26.396	165.9	0.486
225	8.274	34.029	8.251	26.474	158.9	0.526
250	7.980	34.054	7.955	26.538	153.1	0.566
300	7.613	34.099	7.584	26.628	145.3	0.640
400	6.802	34.148	6.766	26.780	131.9	0.778
500	6.136	34.209	6.092	26.916	119.9	0.904
501	6.133	34.210	6.089	26.917	119.8	0.905

STA NO 25 LAT: 39 17.9 N LONG: 124 59.8 W
21 FEB 1987 0948 GMT PROBE 2561 DEPTH 3026M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	12.131	32.656	12.131	24.745	319.1	0.003
10	12.129	32.658	12.127	24.747	319.1	0.032
20	12.133	32.657	12.130	24.746	319.4	0.064
30	12.134	32.657	12.130	24.746	319.7	0.096
40	12.123	32.656	12.118	24.748	319.8	0.128
50	12.119	32.655	12.113	24.748	320.0	0.160
60	12.102	32.654	12.095	24.750	320.0	0.192
70	11.920	32.689	11.911	24.812	314.3	0.224
80	10.410	32.829	10.401	25.190	278.4	0.253
90	9.385	32.942	9.375	25.448	253.9	0.279
100	9.248	33.100	9.237	25.593	240.3	0.304
110	9.080	33.304	9.069	25.780	222.7	0.327
120	9.455	33.483	9.442	25.860	215.4	0.349
130	9.682	33.687	9.668	25.983	204.1	0.370
140	9.389	33.761	9.373	26.089	194.1	0.390
150	9.251	33.840	9.235	26.172	186.4	0.409
175	8.769	33.939	8.751	26.327	172.1	0.454
200	8.473	33.988	8.452	26.412	164.4	0.496
225	7.961	33.979	7.939	26.481	158.1	0.536
250	7.713	34.025	7.688	26.554	151.4	0.575
300	7.294	34.065	7.266	26.646	143.4	0.648
400	6.459	34.094	6.424	26.783	131.3	0.785
500	5.809	34.150	5.766	26.910	120.0	0.911
503	5.776	34.150	5.733	26.914	119.6	0.914





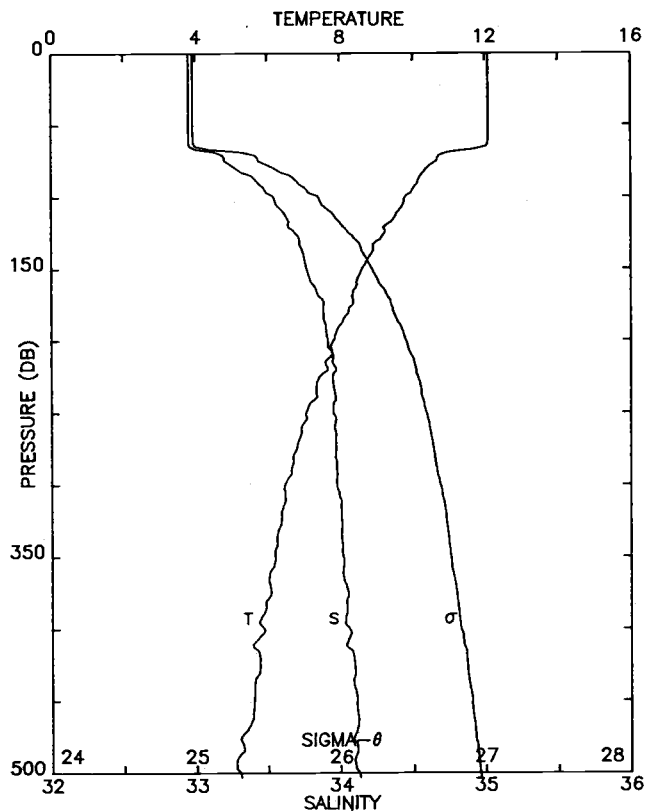
STATION 26

STA NO 26 LAT: 38 6.6 N LONG: 124 12.4 W
24 FEB 1987 1551 GMT PROBE 2561 DEPTH 3719M

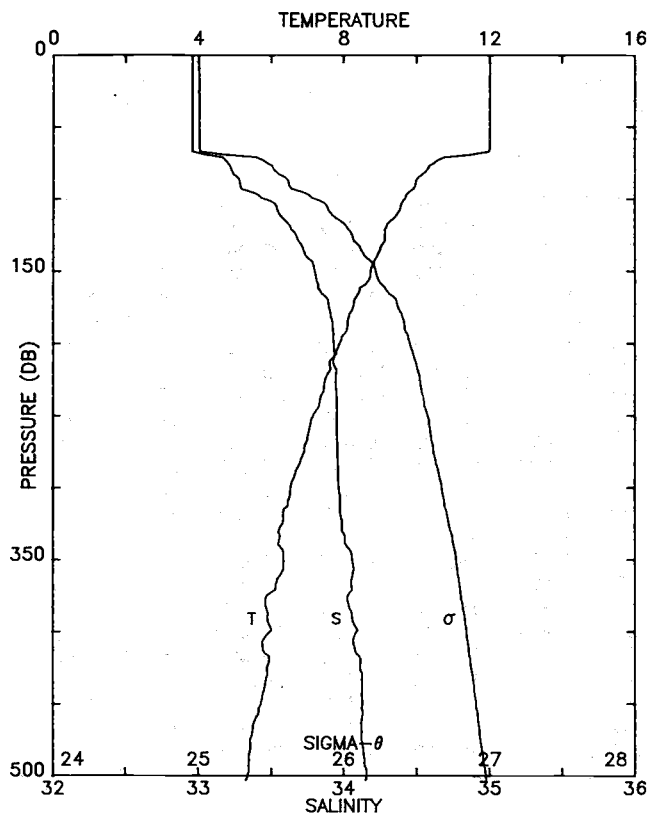
PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.869	32.870	11.868	24.960	298.6	0.003
10	11.871	32.870	11.870	24.960	298.8	0.030
20	11.870	32.870	11.867	24.961	299.0	0.060
30	11.871	32.870	11.867	24.960	299.3	0.090
40	11.871	32.871	11.866	24.961	299.4	0.120
50	11.870	32.871	11.863	24.962	299.6	0.150
60	11.869	32.872	11.861	24.963	299.8	0.180
70	11.855	32.875	11.847	24.968	299.5	0.209
80	10.572	33.194	10.563	25.447	254.0	0.238
90	10.155	33.368	10.144	25.654	234.5	0.262
100	9.830	33.490	9.819	25.804	220.4	0.285
110	9.538	33.570	9.526	25.915	210.1	0.306
120	9.198	33.648	9.185	26.030	199.2	0.326
130	8.869	33.691	8.856	26.116	191.2	0.346
140	8.833	33.726	8.818	26.150	188.2	0.365
150	8.363	33.745	8.347	26.236	180.0	0.383
175	8.587	33.931	8.569	26.348	170.0	0.427
200	8.171	33.985	8.151	26.455	160.2	0.468
225	7.654	33.982	7.632	26.529	153.4	0.507
250	7.237	33.972	7.213	26.580	148.8	0.545
300	6.566	33.985	6.539	26.681	139.5	0.617
400	5.729	34.045	5.695	26.836	125.6	0.750
500	5.365	34.161	5.324	26.973	113.6	0.869
501	5.366	34.162	5.325	26.973	113.6	0.870

STA NO 27 LAT: 38 13.9 N LONG: 124 17.2 W
24 FEB 1987 1720 GMT PROBE 2561 DEPTH 3719M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	12.094	32.947	12.094	24.978	296.9	0.003
10	12.093	32.947	12.091	24.978	297.1	0.030
20	12.094	32.947	12.091	24.978	297.3	0.059
30	12.094	32.948	12.090	24.979	297.5	0.089
40	12.096	32.947	12.090	24.978	297.8	0.119
50	12.097	32.947	12.090	24.979	298.0	0.149
60	12.088	32.949	12.080	24.982	298.0	0.179
70	10.850	33.161	10.842	25.372	261.0	0.207
80	10.376	33.279	10.367	25.546	244.5	0.233
90	10.117	33.436	10.107	25.713	228.9	0.256
100	9.778	33.543	9.767	25.853	215.7	0.279
110	9.583	33.609	9.571	25.937	207.9	0.300
120	9.227	33.644	9.214	26.023	199.9	0.320
130	9.038	33.725	9.024	26.116	191.2	0.340
140	8.829	33.750	8.814	26.169	186.3	0.359
150	8.596	33.774	8.580	26.224	181.3	0.377
175	8.348	33.889	8.330	26.352	169.5	0.421
200	7.825	33.917	7.805	26.452	160.3	0.462
225	7.432	33.950	7.410	26.535	152.7	0.501
250	7.055	33.956	7.032	26.592	147.5	0.538
300	6.470	33.978	6.444	26.689	138.7	0.610
400	5.887	34.062	5.853	26.830	126.3	0.742
500	5.214	34.127	5.174	26.963	114.3	0.862
503	5.244	34.135	5.203	26.966	114.1	0.865



STATION 27

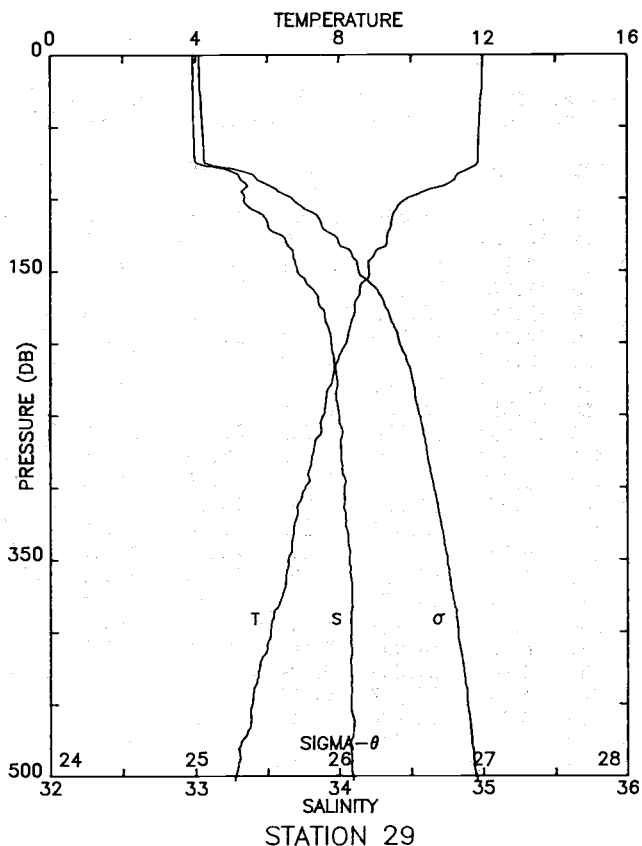


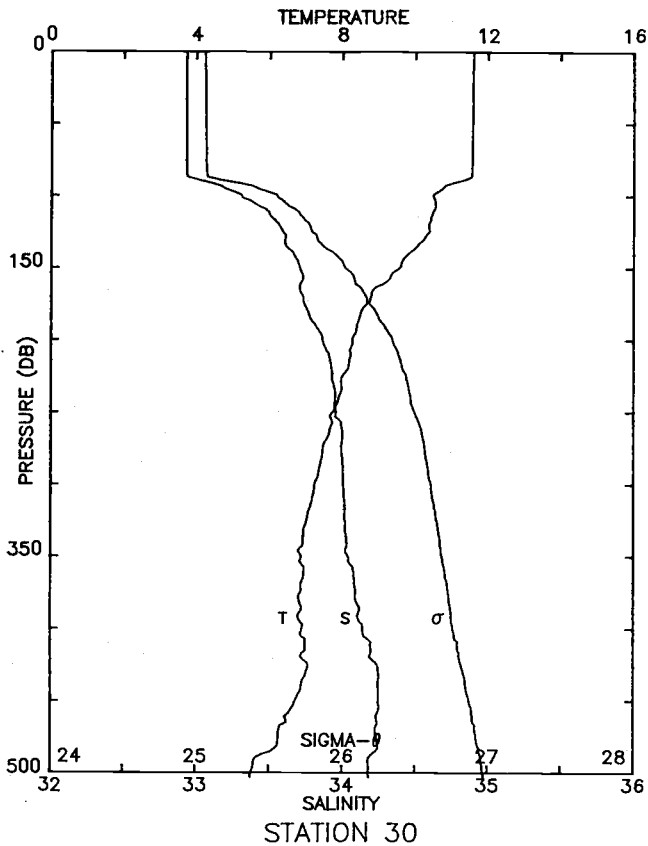
STA NO 28 LAT: 38 21.1 N LONG: 124 21.8 W
24 FEB 1987 1846 GMT PROBE 2561 DEPTH 3742M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	12.008	32.957	12.008	25.002	294.6	0.003
10	12.009	32.958	12.007	25.003	294.8	0.029
20	12.003	32.958	12.001	25.004	294.9	0.059
30	12.003	32.958	11.999	25.004	295.1	0.088
40	12.004	32.959	11.999	25.005	295.3	0.118
50	12.004	32.959	11.998	25.005	295.5	0.148
60	12.002	32.959	11.994	25.006	295.7	0.177
70	11.111	33.103	11.103	25.280	269.7	0.206
80	10.270	33.227	10.261	25.524	246.6	0.232
90	9.953	33.285	9.943	25.623	237.4	0.256
100	9.657	33.457	9.646	25.806	220.2	0.279
110	9.467	33.556	9.455	25.915	210.0	0.300
120	9.146	33.635	9.134	26.028	199.4	0.320
130	9.088	33.697	9.075	26.086	194.1	0.340
140	8.891	33.747	8.876	26.157	187.5	0.359
150	8.733	33.802	8.717	26.225	181.2	0.377
175	8.252	33.902	8.234	26.377	167.1	0.421
200	7.881	33.932	7.861	26.456	159.9	0.462
225	7.484	33.946	7.462	26.524	153.7	0.501
250	7.149	33.953	7.125	26.577	148.9	0.539
300	6.525	33.968	6.498	26.673	140.2	0.611
400	5.966	34.092	5.931	26.844	125.1	0.743
500	5.333	34.160	5.292	26.976	113.3	0.863
503	5.291	34.157	5.251	26.978	113.0	0.866

STA NO 29 LAT: 38 28.0 N LONG: 124 26.6 W
24 FEB 1987 2015 GMT PROBE 2561 DEPTH 3591M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.985	32.979	11.985	25.023	292.6	0.003
10	11.976	32.979	11.975	25.025	292.6	0.029
20	11.971	32.979	11.968	25.027	292.7	0.059
30	11.928	32.981	11.924	25.036	292.1	0.088
40	11.911	32.981	11.906	25.039	292.0	0.117
50	11.888	32.984	11.882	25.046	291.6	0.146
60	11.869	32.988	11.862	25.053	291.2	0.175
70	11.862	32.991	11.854	25.057	291.0	0.204
80	11.549	33.218	11.539	25.292	268.9	0.233
90	11.001	33.355	10.991	25.496	249.6	0.259
100	9.879	33.338	9.868	25.676	232.5	0.283
110	9.515	33.451	9.503	25.825	218.5	0.305
120	9.420	33.511	9.406	25.887	212.8	0.327
130	9.328	33.634	9.314	25.999	202.4	0.348
140	8.942	33.683	8.927	26.098	193.1	0.367
150	8.833	33.712	8.817	26.139	189.4	0.386
175	8.444	33.873	8.426	26.325	172.1	0.431
200	8.201	33.949	8.180	26.422	163.3	0.473
225	7.806	33.988	7.784	26.511	155.1	0.513
250	7.551	34.001	7.527	26.559	150.9	0.551
300	7.044	34.036	7.016	26.657	142.1	0.624
400	6.069	34.084	6.034	26.824	127.0	0.758
500	5.090	34.095	5.050	26.953	115.1	0.879
503	5.078	34.098	5.037	26.956	114.8	0.882



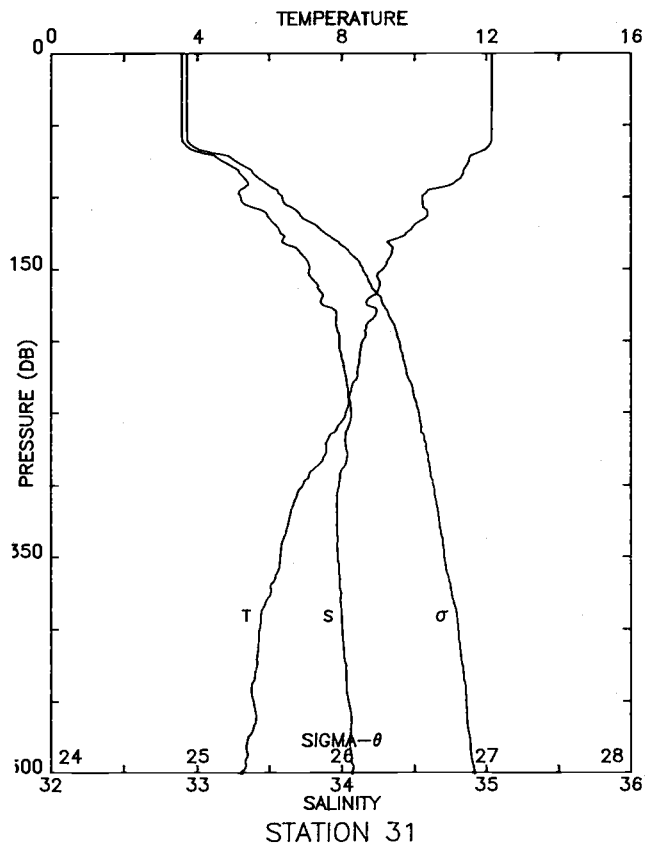


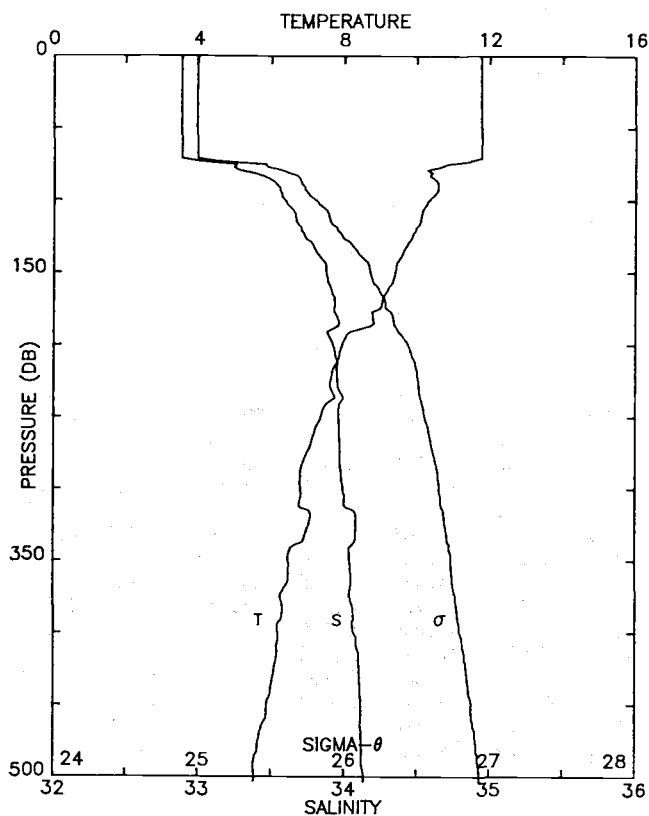
STA NO 30 LAT: 38 35.4 N LONG: 124 31.1 W
24 FEB 1987 2143 GMT PROBE 2561 DEPTH 3635M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.596	32.930	11.596	25.057	289.4	0.003
10	11.591	32.930	11.589	25.058	289.5	0.029
20	11.579	32.929	11.576	25.060	289.6	0.058
30	11.575	32.929	11.571	25.061	289.7	0.087
40	11.575	32.929	11.570	25.061	289.9	0.116
50	11.569	32.928	11.563	25.062	290.1	0.145
60	11.565	32.928	11.558	25.063	290.2	0.174
70	11.559	32.928	11.550	25.064	290.4	0.203
80	11.556	32.928	11.546	25.065	290.5	0.232
90	11.199	33.051	11.188	25.225	275.5	0.261
100	10.485	33.307	10.474	25.550	244.7	0.286
110	10.503	33.483	10.491	25.685	232.1	0.310
120	10.361	33.564	10.347	25.772	224.0	0.333
130	10.225	33.604	10.210	25.827	219.0	0.355
140	9.802	33.664	9.786	25.945	207.9	0.377
150	9.544	33.708	9.528	26.022	200.7	0.397
175	8.653	33.740	8.635	26.189	185.1	0.445
200	8.261	33.864	8.241	26.346	170.5	0.489
225	7.984	33.930	7.962	26.439	162.0	0.531
250	7.727	33.956	7.703	26.498	156.8	0.571
300	7.231	34.008	7.202	26.610	146.7	0.646
400	6.897	34.143	6.859	26.763	133.6	0.786
500	5.504	34.182	5.462	26.972	113.8	0.910
503	5.504	34.189	5.462	26.978	113.3	0.913

STA NO 31 LAT: 38 42.5 N LONG: 124 35.6 W
24 FEB 1987 2311 GMT PROBE 2561 DEPTH 3631M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	12.145	32.892	12.145	24.925	301.9	0.003
10	12.146	32.892	12.145	24.925	302.1	0.030
20	12.144	32.892	12.141	24.926	302.3	0.060
30	12.146	32.891	12.142	24.925	302.6	0.091
40	12.149	32.892	12.144	24.926	302.8	0.121
50	12.144	32.893	12.138	24.928	302.9	0.151
60	12.137	32.897	12.130	24.932	302.7	0.182
70	11.667	33.072	11.658	25.156	281.6	0.211
80	11.385	33.265	11.375	25.358	262.6	0.238
90	11.098	33.352	11.087	25.477	251.5	0.264
100	10.208	33.300	10.196	25.592	240.6	0.289
110	10.348	33.466	10.335	25.698	230.8	0.312
120	9.972	33.552	9.959	25.829	218.5	0.335
130	9.362	33.592	9.348	25.960	206.1	0.356
140	9.352	33.729	9.336	26.069	195.9	0.376
150	9.118	33.779	9.101	26.146	188.8	0.395
175	8.691	33.873	8.672	26.288	175.8	0.441
200	8.565	33.984	8.544	26.394	166.1	0.483
225	8.424	34.030	8.400	26.452	161.0	0.524
250	8.099	34.065	8.074	26.528	154.1	0.564
300	6.918	33.977	6.891	26.628	144.8	0.638
400	5.721	34.004	5.687	26.804	128.6	0.775
500	5.227	34.072	5.187	26.918	118.5	0.899
501	5.225	34.073	5.185	26.919	118.5	0.900



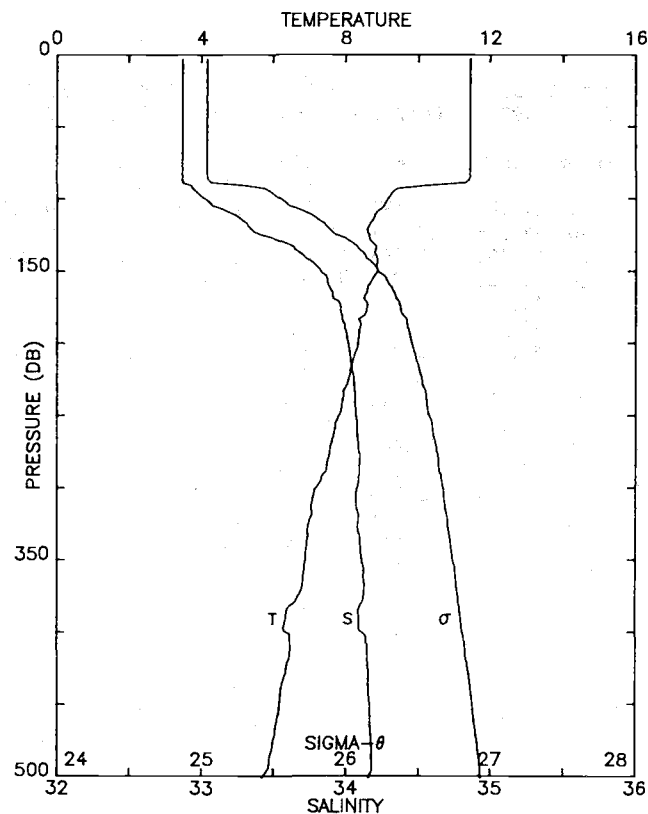


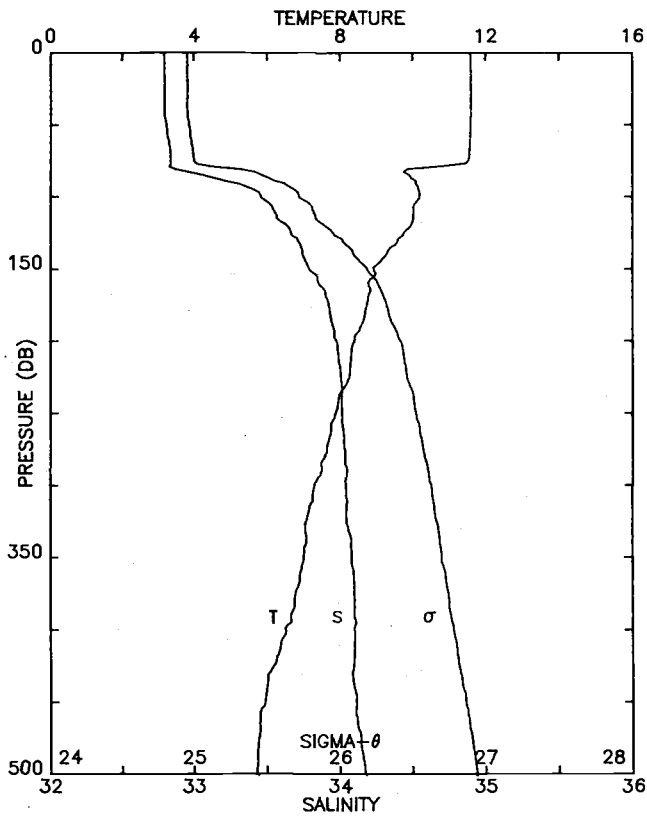
STA NO 32 LAT: 38 49.8 N LONG: 124 40.4 W
25 FEB 1987 0040 GMT PROBE 2561 DEPTH 3578M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.758	32.886	11.758	24.993	295.4	0.003
10	11.760	32.885	11.758	24.992	295.7	0.030
20	11.763	32.885	11.760	24.992	296.0	0.059
30	11.762	32.884	11.758	24.992	296.3	0.089
40	11.766	32.884	11.761	24.991	296.6	0.118
50	11.770	32.885	11.763	24.991	296.8	0.148
60	11.770	32.885	11.763	24.992	297.0	0.178
70	11.761	32.885	11.752	24.993	297.1	0.207
80	10.343	33.322	10.334	25.586	240.8	0.234
90	10.574	33.542	10.563	25.718	228.5	0.257
100	10.313	33.591	10.301	25.801	220.8	0.280
110	10.116	33.662	10.104	25.890	212.5	0.301
120	9.956	33.704	9.943	25.950	207.0	0.322
130	9.737	33.778	9.723	26.045	198.2	0.343
140	9.525	33.839	9.510	26.127	190.5	0.362
150	9.389	33.875	9.373	26.178	185.9	0.381
175	8.967	33.929	8.949	26.288	175.8	0.426
200	7.936	33.922	7.916	26.439	161.5	0.468
225	7.616	33.953	7.594	26.511	155.0	0.508
250	7.345	33.961	7.321	26.556	151.1	0.546
300	6.804	33.994	6.776	26.657	142.0	0.619
400	6.183	34.067	6.148	26.797	129.7	0.754
500	5.541	34.139	5.499	26.934	117.5	0.877
503	5.529	34.139	5.487	26.936	117.3	0.881

STA NO 33 LAT: 38 56.9 N LONG: 124 45.2 W
25 FEB 1987 0253 GMT PROBE 2561 DEPTH 3397M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
3	11.440	32.867	11.439	25.037	291.4	0.009
10	11.435	32.867	11.434	25.037	291.5	0.029
20	11.438	32.867	11.436	25.037	291.7	0.058
30	11.439	32.867	11.435	25.037	291.9	0.087
40	11.437	32.867	11.432	25.038	292.1	0.117
50	11.440	32.868	11.434	25.038	292.3	0.146
60	11.441	32.867	11.433	25.038	292.6	0.175
70	11.444	32.867	11.435	25.038	292.8	0.204
80	11.437	32.867	11.427	25.039	292.9	0.234
90	10.729	32.897	10.719	25.186	279.0	0.263
100	9.151	33.022	9.141	25.548	244.6	0.288
110	8.822	33.206	8.810	25.743	226.1	0.312
120	8.594	33.334	8.582	25.879	213.4	0.334
130	8.721	33.566	8.707	26.041	198.2	0.355
140	8.848	33.717	8.833	26.140	189.1	0.374
150	8.861	33.831	8.845	26.227	181.0	0.392
175	8.573	33.968	8.555	26.380	166.9	0.435
200	8.325	34.019	8.305	26.458	160.0	0.476
225	8.067	34.057	8.044	26.527	153.7	0.515
250	7.803	34.072	7.779	26.578	149.2	0.553
300	7.175	34.078	7.146	26.673	140.7	0.626
400	6.368	34.111	6.333	26.808	128.8	0.760
500	5.703	34.163	5.661	26.933	117.7	0.883
501	5.675	34.160	5.633	26.935	117.5	0.884



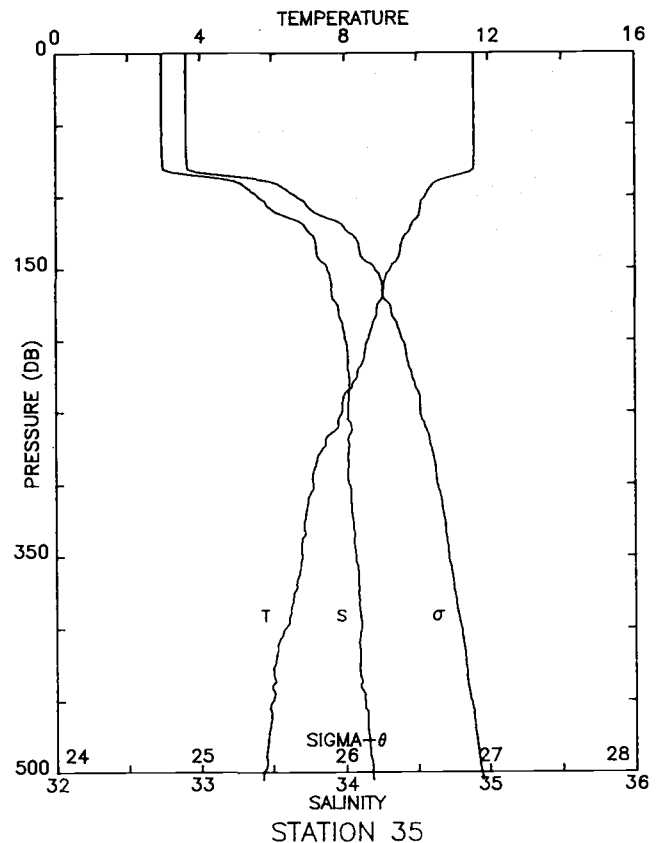


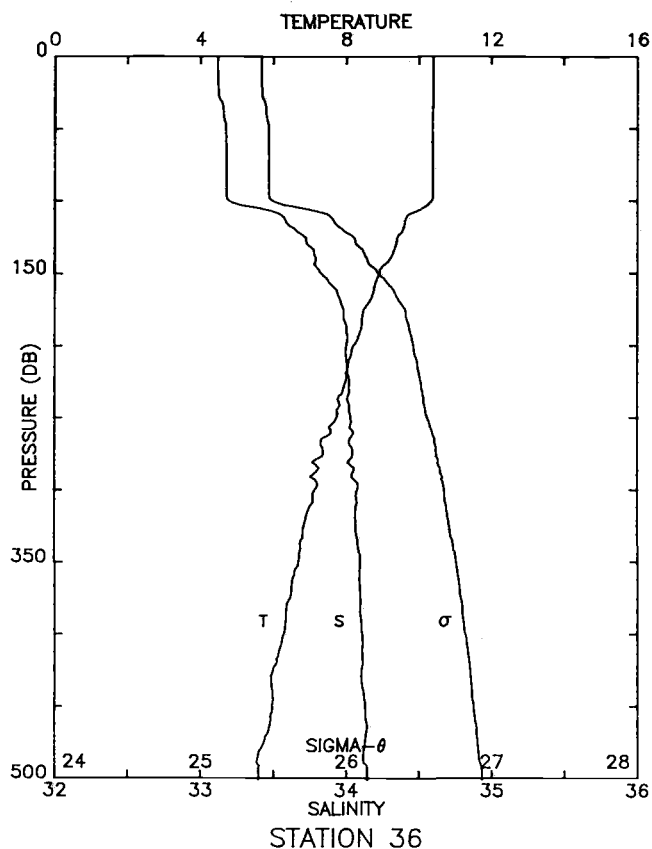
STA NO 34 LAT: 39 3.9 N LONG: 124 50.4 W
25 FEB 1987 0436 GMT PROBE 2561 DEPTH 3293M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.577	32.792	11.576	24.953	299.3	0.003
10	11.589	32.793	11.588	24.952	299.6	0.030
20	11.592	32.795	11.589	24.953	299.7	0.060
30	11.593	32.794	11.589	24.952	300.0	0.090
40	11.594	32.793	11.589	24.951	300.3	0.120
50	11.581	32.807	11.575	24.965	299.3	0.150
60	11.569	32.820	11.561	24.978	298.3	0.180
70	11.553	32.835	11.544	24.993	297.1	0.210
80	10.321	32.850	10.312	25.220	275.5	0.239
90	10.087	33.260	10.077	25.581	241.4	0.264
100	10.193	33.457	10.182	25.717	228.7	0.288
110	10.020	33.548	10.008	25.817	219.4	0.310
120	9.942	33.633	9.929	25.897	212.1	0.332
130	9.580	33.708	9.566	26.016	200.9	0.352
140	9.262	33.743	9.247	26.095	193.5	0.372
150	8.913	33.788	8.898	26.186	185.0	0.391
175	8.723	33.922	8.705	26.320	172.7	0.435
200	8.379	33.974	8.358	26.414	164.1	0.477
225	8.237	34.005	8.214	26.461	160.1	0.518
250	7.861	34.013	7.836	26.523	154.4	0.557
300	7.291	34.043	7.263	26.629	145.0	0.632
400	6.496	34.099	6.460	26.782	131.4	0.770
500	5.733	34.178	5.691	26.942	117.0	0.894
501	5.759	34.184	5.716	26.943	116.8	0.895

STA NO 35 LAT: 39 11.0 N LONG: 124 55.0 W
25 FEB 1987 0617 GMT PROBE 2561 DEPTH 3126M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.598	32.732	11.598	24.903	304.1	0.003
10	11.605	32.731	11.604	24.901	304.4	0.030
20	11.605	32.730	11.602	24.901	304.7	0.061
30	11.602	32.730	11.599	24.901	304.9	0.091
40	11.611	32.730	11.606	24.900	305.3	0.122
50	11.606	32.731	11.600	24.901	305.3	0.152
60	11.611	32.730	11.603	24.900	305.7	0.183
70	11.611	32.731	11.602	24.902	305.8	0.214
80	11.596	32.741	11.586	24.912	305.0	0.244
90	10.521	33.257	10.511	25.504	248.8	0.272
100	10.211	33.404	10.200	25.673	232.9	0.296
110	10.065	33.514	10.052	25.783	222.6	0.319
120	9.827	33.724	9.814	25.987	203.5	0.340
130	9.587	33.795	9.573	26.083	194.6	0.360
140	9.502	33.810	9.486	26.109	192.3	0.379
150	9.244	33.882	9.228	26.207	183.1	0.398
175	8.896	33.954	8.877	26.319	172.9	0.443
200	8.621	34.007	8.600	26.404	165.2	0.485
225	8.332	34.031	8.309	26.467	159.6	0.526
250	7.910	34.022	7.885	26.523	154.5	0.565
300	7.129	34.032	7.101	26.643	143.5	0.639
400	6.337	34.108	6.301	26.809	128.7	0.775
500	5.729	34.180	5.687	26.944	116.7	0.898
505	5.716	34.185	5.673	26.950	116.3	0.904



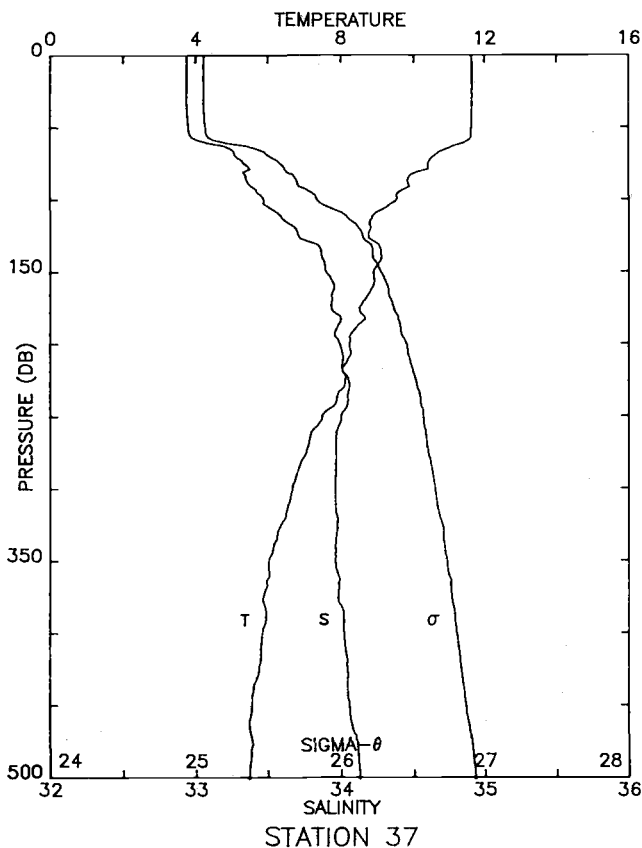


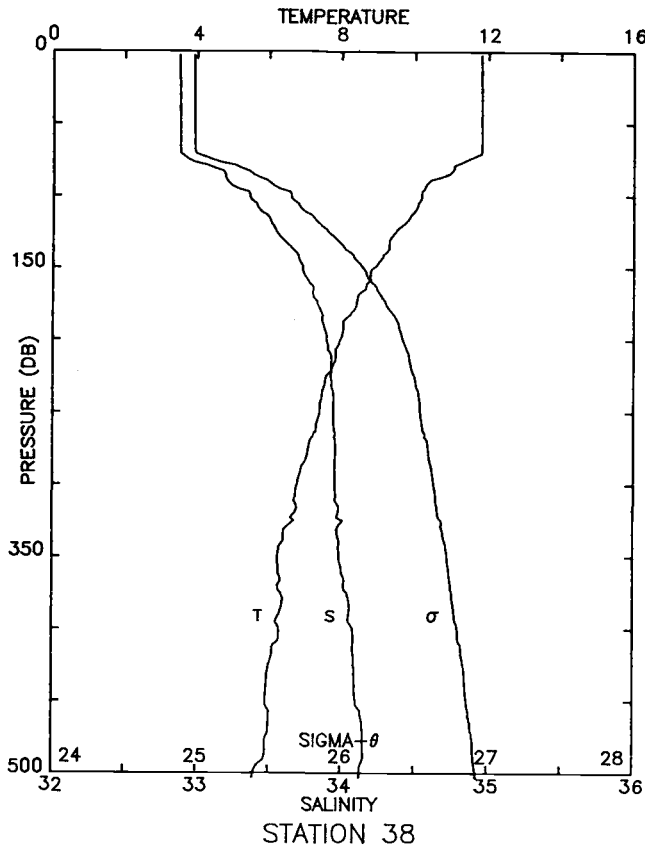
STA NO 36 LAT: 39 4.0 N LONG: 124 25.4 W
25 FEB 1987 0912 GMT PROBE 2561 DEPTH 3273M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	10.381	33.116	10.381	25.417	255.1	0.003
10	10.389	33.114	10.388	25.414	255.6	0.026
20	10.392	33.117	10.389	25.416	255.6	0.051
30	10.391	33.136	10.388	25.431	254.4	0.077
40	10.377	33.156	10.372	25.450	252.8	0.102
50	10.363	33.172	10.357	25.465	251.6	0.127
60	10.369	33.175	10.362	25.466	251.7	0.152
70	10.372	33.176	10.364	25.467	251.9	0.178
80	10.374	33.176	10.365	25.467	252.1	0.203
90	10.374	33.178	10.364	25.468	252.2	0.228
100	10.322	33.202	10.311	25.496	249.7	0.253
110	9.669	33.557	9.656	25.883	213.1	0.276
120	9.532	33.653	9.519	25.980	204.1	0.297
130	9.353	33.735	9.339	26.074	195.3	0.317
140	9.179	33.789	9.164	26.144	188.8	0.336
150	8.886	33.831	8.870	26.223	181.4	0.355
175	8.463	33.983	8.445	26.408	164.2	0.398
200	8.194	34.001	8.173	26.464	159.4	0.438
225	7.971	34.023	7.948	26.515	154.9	0.478
250	7.720	34.032	7.695	26.558	151.0	0.516
300	7.141	34.075	7.113	26.675	140.5	0.588
400	6.273	34.111	6.238	26.820	127.6	0.722
500	5.592	34.146	5.551	26.933	117.6	0.845
501	5.593	34.146	5.551	26.934	117.5	0.846

STA NO 37 LAT: 38 44.8 N LONG: 124 13.5 W
25 FEB 1987 1122 GMT PROBE 2561 DEPTH 3009M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
1	11.628	32.936	11.628	25.056	289.5	0.003
10	11.647	32.936	11.645	25.052	290.0	0.029
20	11.646	32.936	11.644	25.053	290.2	0.058
30	11.648	32.935	11.644	25.052	290.5	0.087
40	11.644	32.939	11.639	25.056	290.4	0.116
50	11.629	32.948	11.623	25.066	289.6	0.145
60	11.478	33.049	11.471	25.172	279.8	0.174
70	10.561	33.278	10.553	25.514	247.4	0.200
80	10.241	33.353	10.232	25.627	236.8	0.224
90	9.863	33.378	9.853	25.711	229.1	0.247
100	9.529	33.474	9.518	25.840	216.9	0.269
110	8.912	33.577	8.901	26.020	199.9	0.290
120	8.800	33.689	8.787	26.126	190.1	0.310
130	8.971	33.806	8.958	26.191	184.2	0.328
140	9.109	33.873	9.094	26.221	181.5	0.347
150	8.890	33.899	8.874	26.276	176.4	0.365
175	8.496	33.934	8.478	26.365	168.3	0.408
200	8.237	33.992	8.217	26.450	160.7	0.449
225	8.116	34.053	8.093	26.516	154.8	0.488
250	7.492	34.002	7.468	26.568	150.0	0.526
300	6.669	33.962	6.642	26.649	142.6	0.599
400	5.848	34.021	5.814	26.803	128.8	0.735
500	5.481	34.128	5.440	26.932	117.5	0.858
501	5.480	34.128	5.438	26.933	117.5	0.859





STA NO 38 LAT: 38 5.1 N LONG: 123 47.8 W
 25 FEB 1987 1532 GMT PROBE 2561 DEPTH 3028M

PRESS	TEMP	SAL	POTEN TEMP	SIGMA THETA	SVA	DELD
3	11.800	32.875	11.800	24.977	297.0	0.009
10	11.805	32.877	11.804	24.978	297.1	0.030
20	11.806	32.878	11.803	24.979	297.3	0.059
30	11.807	32.879	11.804	24.979	297.5	0.089
40	11.808	32.879	11.803	24.979	297.7	0.119
50	11.810	32.880	11.803	24.980	297.9	0.149
60	11.810	32.879	11.802	24.980	298.1	0.179
70	11.793	32.881	11.784	24.985	297.9	0.208
80	11.053	33.094	11.043	25.284	269.6	0.237
90	10.373	33.211	10.362	25.494	249.7	0.263
100	10.163	33.364	10.152	25.650	235.1	0.287
110	9.998	33.438	9.985	25.735	227.2	0.310
120	9.669	33.524	9.656	25.857	215.8	0.332
130	9.319	33.592	9.305	25.967	205.4	0.353
140	9.179	33.693	9.164	26.069	196.0	0.373
150	8.872	33.732	8.856	26.148	188.5	0.393
175	8.399	33.836	8.381	26.303	174.2	0.438
200	7.955	33.898	7.935	26.418	163.5	0.480
225	7.572	33.928	7.551	26.497	156.3	0.520
250	7.393	33.947	7.369	26.538	152.8	0.558
300	6.768	33.956	6.741	26.632	144.3	0.632
400	6.296	34.087	6.260	26.798	129.7	0.769
500	5.584	34.134	5.542	26.925	118.3	0.893
503	5.571	34.135	5.529	26.927	118.2	0.896