

NOAA Data Report ERL AOML-12

CURRENT VELOCITY AND HYDROGRAPHIC OBSERVATIONS IN THE SOUTHWESTERN NORTH
ATLANTIC OCEAN: SUBTROPICAL ATLANTIC CLIMATE STUDIES (STACS), 1987

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I. INTRODUCTION

The primary objectives of the STACS program are to increase our understanding of the dynamics of the North Atlantic circulation and the role of ocean circulation in global climate, to develop the capability to monitor the climatically important processes, and to provide data needed in the development of the coupled ocean-atmosphere general circulation models to be used for global climate prediction. In particular, the mechanisms by which the ocean transports heat to balance the net radiation deficit at northerly latitudes are being studied.

The initial objectives of STACS (Molinari et al., 1985) were directed at the Florida Current, a flow which makes significant contribution to heat flux. After an intensive two-year observing program, we have the capability to monitor Florida Current transport without extensive ship-board observations. Data collected during this period are listed in Williams et al. (1983), Leaman and Vertes (1983), Vertes and Leaman (1984), and Ratnaswamy et al. (1985). STACS efforts during 1984-86 were directed toward studying the relationship of western boundary currents along the Antillean Archipelago and in the Caribbean Sea to the dynamics of the North Atlantic subtropical gyre and on meridional heat flux, while continuing the monitoring effort in the Florida Current at 27°N. Data collected during these cruises are given in Wilburn et al. (1987a,b).

STACS efforts during the period of this report (1987) continued the observational studies of western boundary currents, extending the study area southward to Brazil (4°N) in order to examine the contribution of cross-equatorial boundary currents to the North Atlantic mass and heat fluxes. Pegasus and CTD data were collected along the sections shown in Figure 1. Actual sampling stations are shown in Figure 2 for the March cruise and Figure 3 for the September cruise. Each section is not necessarily occupied during a particular cruise. CTD station positions also vary. In addition, continuous profiles of upper layer current structure were obtained along the trackline using an Ametek-Straza system. These data will appear in another report.

II. DATA COLLECTION AND ANALYSIS

Data from STACS cruises conducted on the NOAA Ship RESEARCHER during two cruises--March and September 1987--are contained in this report. Table 1 shows the type of data collected on each cruise. Techniques used to reduce the Pegasus, CTD, and XBT data to final form are described below.

A. Pegasus Current Profiler

The Pegasus instrument is an acoustically-tracked, free-falling profiler of horizontal current components (Spain et al., 1981). A schematic of the Pegasus system is shown in Figure 4. The Pegasus instrument used by AOML consists of a hollow cylindrical metal tube with the electronics package sealed within. A flotation collar attached to the exterior of the cylinder provides the instrument buoyancy. Pegasus houses a transducer/receiver, a thermistor and a pressure sensor. When the Pegasus is in the water, its transducer interrogates two fixed transponders on the ocean bottom at a frequency of 10 KHz at an interval of eight or sixteen seconds. Each

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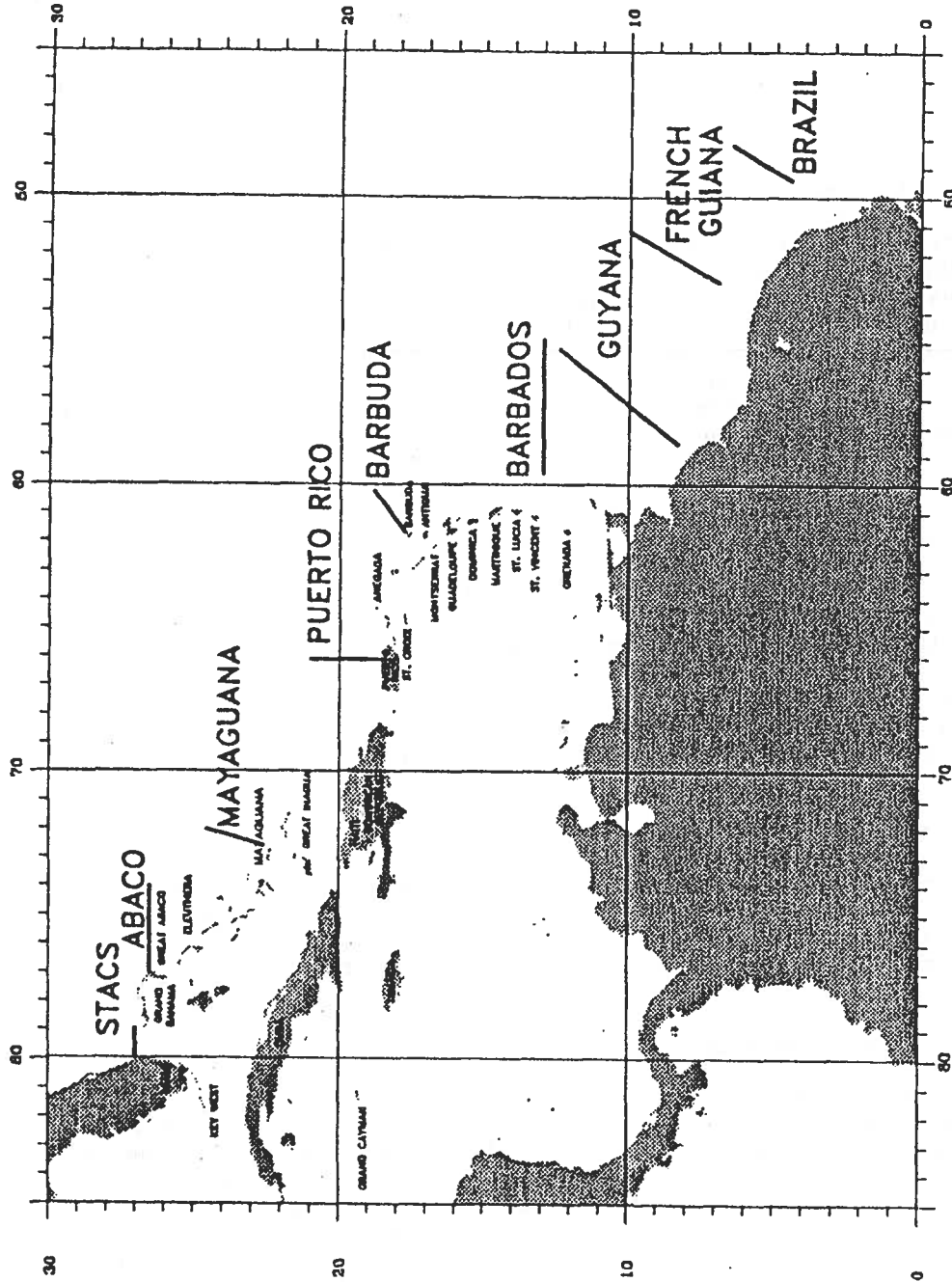


Figure 1. Map of the STACS study area. CTD observations are collected on all sections; Pegasus profiles are collected along the Abaco and French Guiana sections. Ametek-Straza data are also collected along the sections.

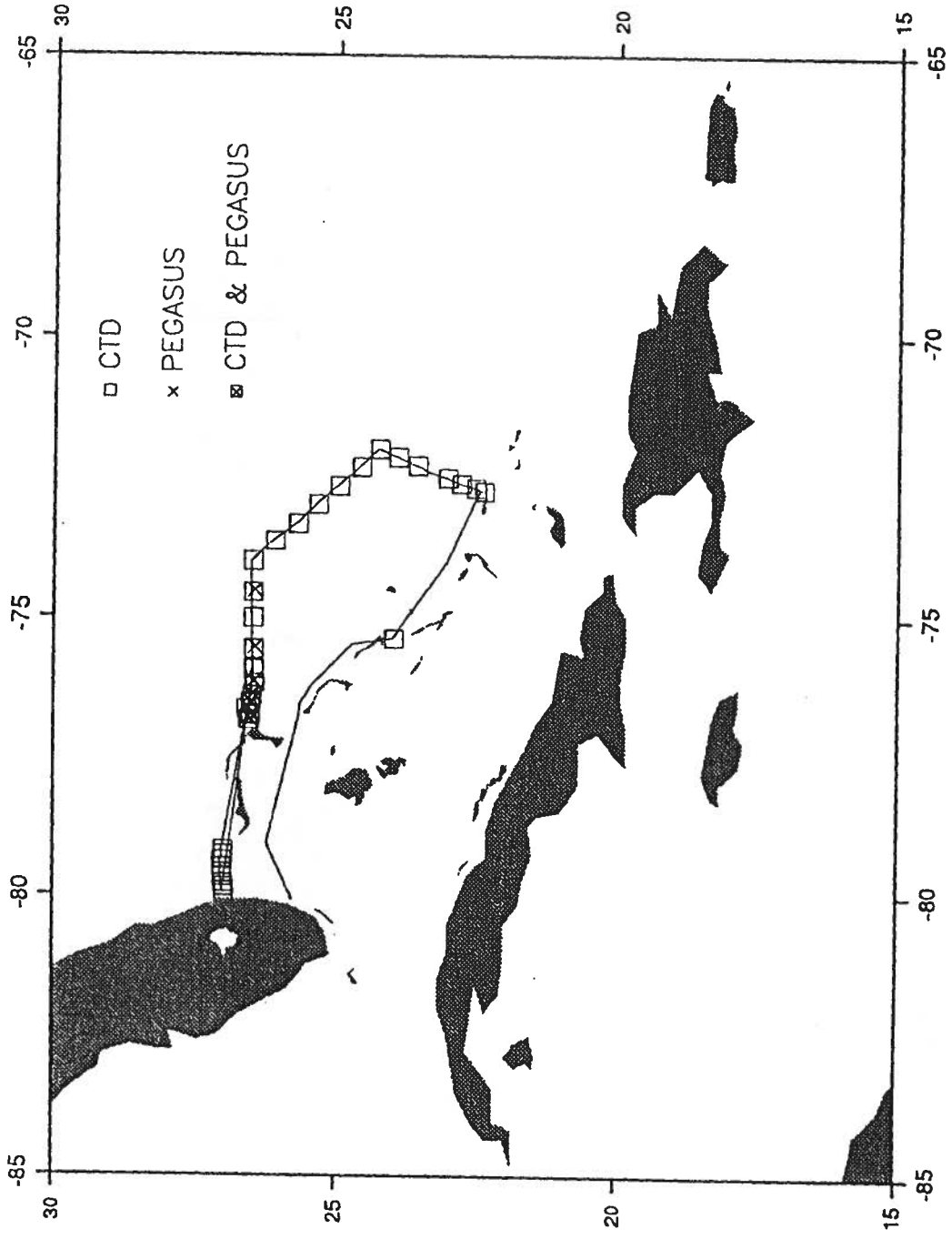


Figure 2: STACS Cruise Track for MARCH 1987 showing CTD & PEGASUS sampling stations

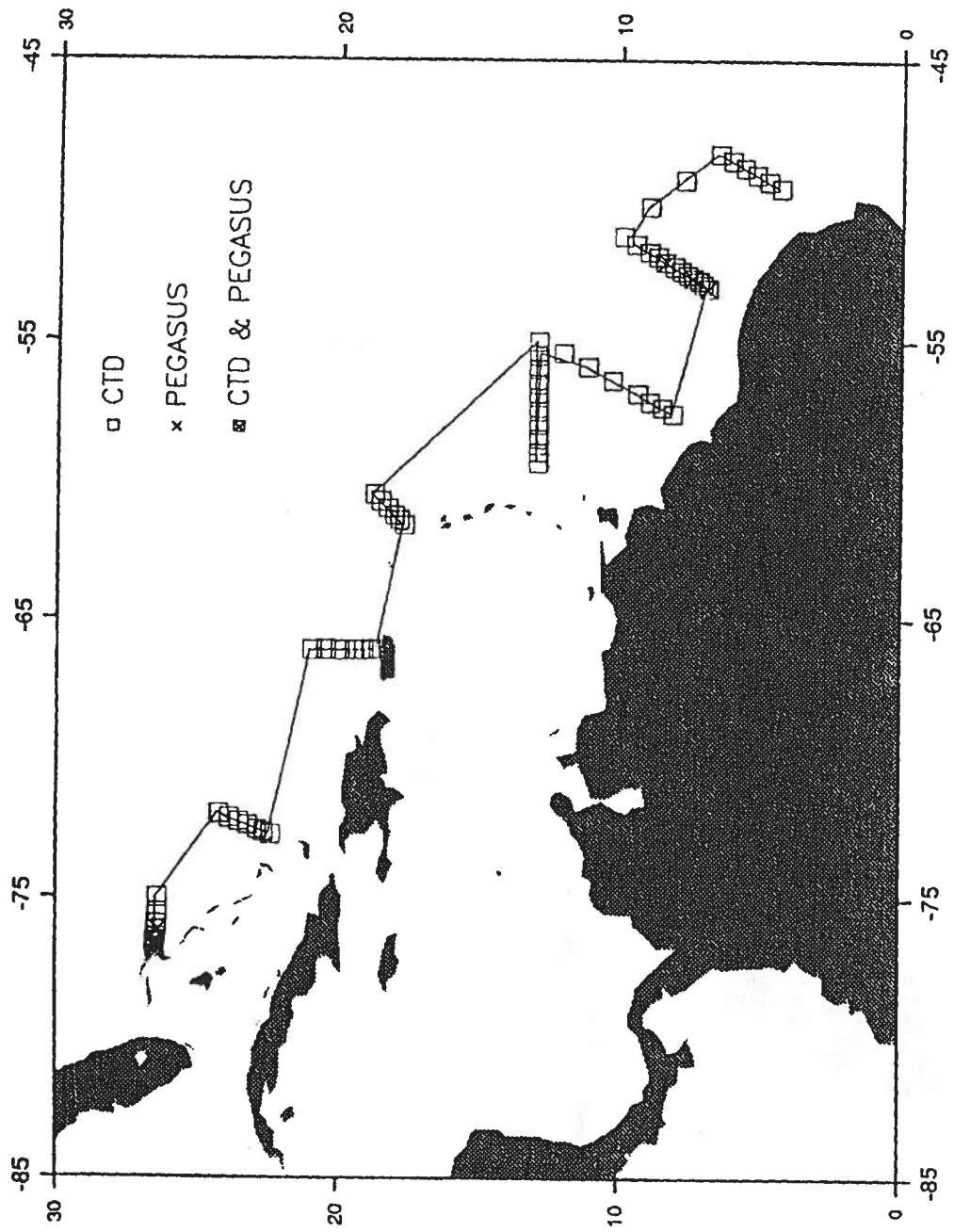


Figure 3: STACS Cruise Track for SEPTEMBER 1987 showing CTD & PEGASUS sampling stations

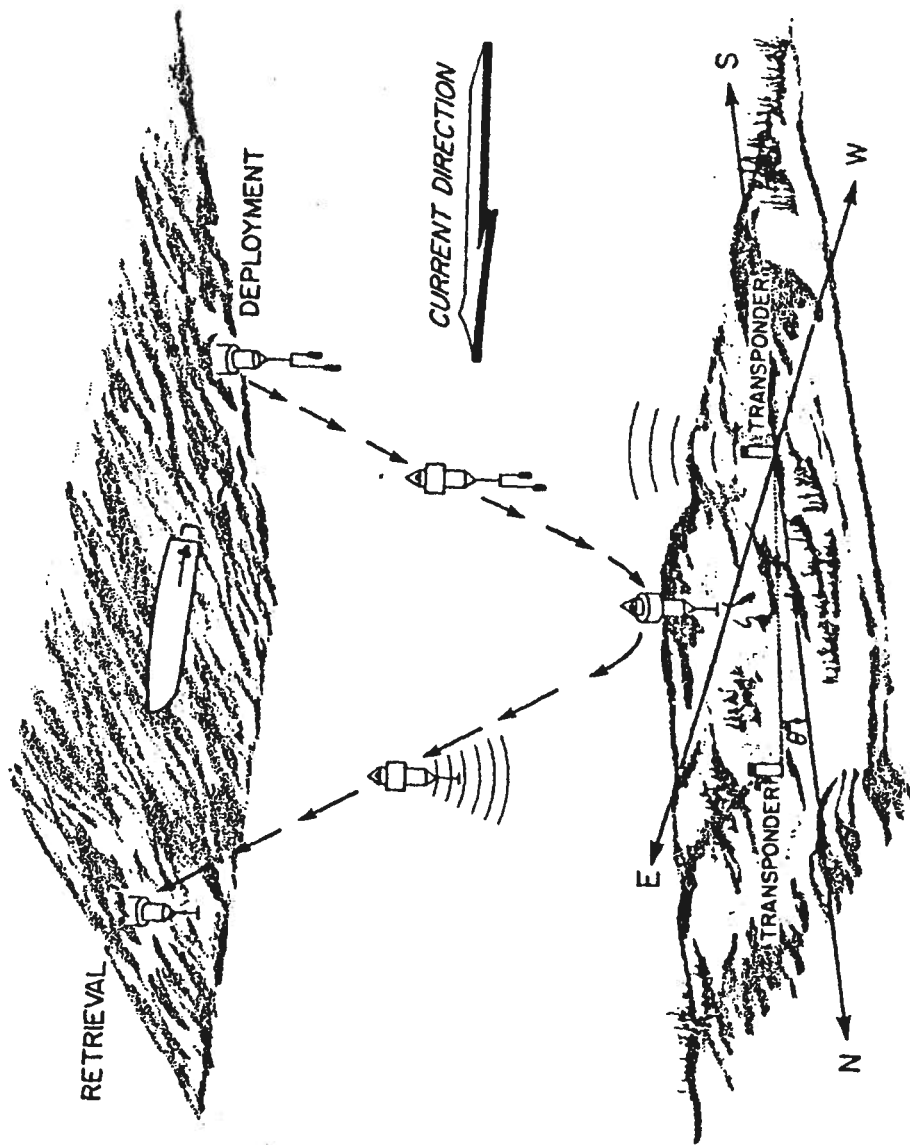


Figure 4. Schematic of the Pegasus current profiler.

Table 1. Types of Data Collected by Cruise.

Cruise	Vessel	Dates	Pegasus	CTD	XBT	Ametek-Straza
March 1987 (RES-STACS 27-87)	RESEARCHER	3/11-3/23/87	10	42	35	Continuous
September 1987 (RES-STACS 28-87)	RESEARCHER	9/1-10/1/87	7	66	128	Continuous

transponder responds at a different frequency. The Pegasus internally records the acoustic travel times from the transponders, along with temperature and pressure. Transponder frequency pairs are alternated between stations in order to avoid interference from adjacent stations.

The instrument is weighted at the beginning of the drop and falls at a rate between 20-50 cm/sec. This rate may be adjusted by adding or removing weights. External weights are released by a bottom trip mechanism when the weights touch the ocean floor or by a pressure release when the Pegasus reaches a predetermined depth. The instrument ascends at approximately the same rate as it descends.

Each Pegasus station is defined by a unique geometry (see Table 2). A mean sound velocity profile for each station is used to convert the acoustic travel times from the transponders to the instrument into ranges in meters. The baseline becomes the base of a triangle which is projected onto the bottom. The X and Y coordinates of the instrument at each pressure can then be determined.

Following a Pegasus cast the contents of the instrument's solid state memory are transferred to a Hewlett Packard 85 computer for conversion to decimal values and storage on flexible diskettes. The conversion of raw data to a velocity profile is done on an HP-86 in three steps: editing, calibration and velocity computations. Following is a brief description of each step.

1. Editing

Two files are created for each Pegasus cast: an ASCII character header file on magnetic tape containing cast information and a multi-record data file on magnetic disk. Each record contains decimal values of the original Pegasus memory address, corresponding pressure and temperature sensor output counts and two travel times significant to 10^{-4} second. HP-86 BASIC programs allow graphic display and printed listings of the data for preliminary evaluation of data quality.

Errors can be introduced into the raw data due to instrument hardware errors and into the travel times by acoustic propagation irregularities such as the detection of reflected instead of direct path signals. Erroneous points are hand edited from the record and replaced by points estimated by a low order polynomial fit.

2. Calibration

Prior to each research cruise the Pegasus pressure sensor is calibrated to produce second order polynomial fits of pressure counts versus pressure in decibars (db). Standard deviations from the fits over the working range of the sensors are generally on the order of 1 db. After the raw data has been edited the pressure counts are converted to decibars. Pressure is further smoothed with a five point running mean. Cast limits (surface/bottom/surface) are recorded in the header file and the data are split into downcast and upcast files containing two travel times and pressure (db).

Table 2. Summary of Pegasus Station Geometry off Abaco Island.

Station	Transponder Parameters			Depth (m)	Baseline Length (m)
	Latitude (N)	Longitude (W)	Frequency (KHz)		
15	26°31.74'	76°21.55'	13.0	4810	4296
	26°31.62'	76°24.09'	12.0		
16	26°32.86'	76°29.98'	13.0	4825	4410
	26°32.86'	76°32.65'	11.5		
17	26°35.48'	76°39.30'	12.5	4050	3937
	26°33.72'	76°39.31'	12.0		
18	26°32.56'	76°45.29'	13.0	3600	3570
	26°30.53'	76°44.88'	11.5		
19	26°33.07'	76°51.16'	12.0	800	1311
	26°32.22'	76°50.92'	11.5		
34	26°29.90'	76°07.22'	12.5	4810	4197
	26°29.71'	76°09.61'	12.0		
35	26°29.31'	75°32.34'	12.0	4610	4038
	26°29.44'	75°29.94'			
36	26°30.20'	74°32.97'	12.0	4460	1665
	26°30.12'	74°30.31'			

3. Velocity Calculation

Given the transponder depths, baseline length, pressure and the travel times, the Pegasus position can be determined. Each station has an associated sound velocity profile used to calculate harmonic mean velocity and thus convert acoustic travel times to distance for input into the position equations. The resulting profiles of X and Y position (in unrotated baseline coordinates) versus depth are smoothed with a seven point convolution. The resulting U and V velocity components are then rotated into a true geographic coordinate system. Each cast produces two profiles: one represents the downcast portion and the other the upcast. Only one profile from each cast is chosen based on a subjective comparison of the up and down profiles and these data for each cruise are presented by increasing cast numbers in Appendix A. The positions represent deployment locations rather than the transponder positions listed in Table 1.

B. CTD Data

1. System Description

The Neil Brown Instrument Mark III CTD system used in STACS includes pressure, temperature, salinity and oxygen sensors. The oxygen data will be described in a future report.

The instrument scans at a rate of 30 scans per second. The descent rate is approximately 30 meters per minute to a depth of 200 meters then increases to 60 meters per minute for the remainder of the cast. CTD values are averaged in one decibar increments. Appendix B contains graphic representations of CTD profiles arranged by cruise and cast number. CTD values are listed at selected depths.

2. Calibration

Laboratory calibrations are used for the CTD pressure and temperature sensors. Rosette thermometer temperature data are in agreement with the CTD temperatures to within $\pm .01^{\circ}\text{C}$. Bottle salinities are collected using a rosette sampler lowered with the CTD, with the final values determined using a Guildline Autosal unit. The bottle salinities are used for calibration of the raw CTD data using the methodology described in Wilburn *et al.* (1986a, 1986b), and summarized below.

- a. The bottle salinity data are first corrected for the particular batch of standard water used relative to batch P80 (Mantyla, 1986) to ensure cruise-to-cruise consistency within the STACS program and to facilitate intercomparisons with data collected during the Transient Tracers in the Ocean (TTO) program (Williams, 1986a, 1986b). The bottle salinities are edited for bad values based on graphical comparisons with the TTO regional potential temperature vs. salinity (TS) relationship.
- b. The raw CTD salinity profiles are examined for sensor drift by examination of the TS relationship in the deep water, and divided into calibration subgroups if necessary. A least squares regression is run on the "delta" (bottle minus CTD salinity) vs. depth data sets for each

subgroup, and polynomial or linear fits are obtained over appropriate portions of the water column.

- c. The raw CTD salinity profiles are calibrated using the results of the regressions, and the TS correlation checked again. If there still appear to be calibration problems, typically due to insufficient high quality bottle salinity data, then the historical deep water TS relationship is used directly for the calibration. The calibrated CTD salinity and temperature data are despiked, and a final data set subsampled to 2 db spacing is produced.

Discussions of the bottle salinity quality and CTD performance for the individual cruises, and tabulations of the calibration corrections, follow.

March 1987:

Standard seawater batch number P103 was used, requiring a correction of -.003 ppt relative to batch P80. Due to problems in maintaining a consistent temperature in the laboratory where the Autosol was used, the bottle salinity values were widely scattered, and extensive editing was required. In addition, the CTD showed pronounced drift, especially during the first five casts, requiring individual calibrations based upon the historical TS relationship. There did not appear to be significant depth-dependence to the offset. The CTD sensor drift problem corrected itself over time, and the various subgroups (casts 6-10, 11-14, 15-24, and 25-42) were internally very consistent.

The calibration corrections used for the March data during the time of CTD sensor drift are as tabulated below:

<u>Cast</u>	<u>Correction</u>
1,2,4	.003 ppt
3	-.002 ppt
5	-.004 ppt
6-10	-.005 ppt
11-14	-.006 ppt

The linear calibration curves derived from the delta vs. depth analysis for casts 15-24 and 25-42, respectively, are of the form:

$$S_{cal} = S_{CTD} - .004 - 10^{-6} * \text{pressure}$$

$$S_{cal} = S_{CTD} - .002 - 10^{-6} * \text{pressure}$$

September 1987:

Standard seawater batch number P103 was used, requiring a correction of -.003 ppt relative to batch P80. Bottle salinities were in close agreement with historical data, to within $\pm .002$ ppt in the deep water indicating improved STACS data quality. Toward the end of the cruise the quality of the

bottle salinity data began to deteriorate because of temperature problems in the laboratory. These values are not used in the analysis. The CTD sensor operated well during this cruise, with some drift during the first eight casts but very steady performance for the remainder.

The calibration corrections used for the first three casts when the CTD drifted most extremely are as listed below:

<u>Cast</u>	<u>Correction</u>
1,2	.011
3	.005

The calibration curves used for casts 4 through 8 are of the form:

0 to 900 m

$$S_{cal} = S_{CTD} - .0038 + 9.76 \cdot 10^{-5} * P - 3.88 \cdot 10^{-9} * P^2 + 4.40 \cdot 10^{-13} * P^3$$

900 m to bottom

$$S_{cal} = S_{CTD} + .002$$

The calibration curves used for the remainder of the September cruise (casts 9-66) are as follows:

0 to 1200 m

$$S_{cal} = S_{CTD} - .0057 + 4.91 \cdot 10^{-6} * P - 1.76 \cdot 10^{-9} * P^2 + 1.98 \cdot 10^{-13} * P^3$$

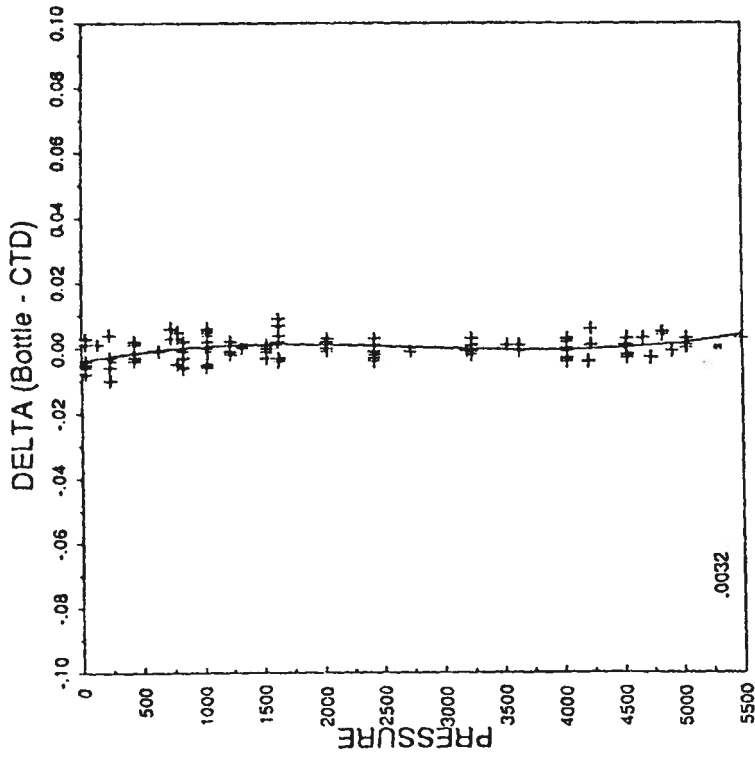
1200 m to bottom

$$S_{cal} = S_{CTD} - .0023 + 2.60 \cdot 10^{-7} * P$$

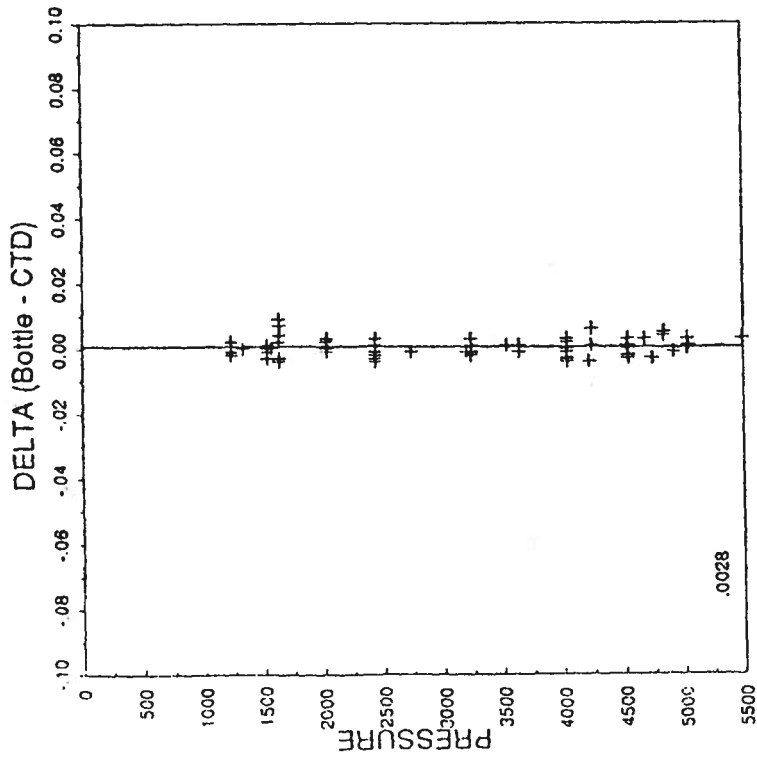
These values were obtained from the delta vs. pressure analysis of casts 9-25, as shown in Figure 5. The error associated with scatter of the bottle values around the regression curve is $\pm .003$ ppt.

C. XBT Data

T-6 expendable bathythermograph (XBT) probes which record a temperature profile down to 450 meters and T-7 XBT probes which record a temperature profile down to 750 meters were used during all of the cruises covered in this data report. Appendix C presents XBT data by cruises and cast number.



SEPTEMBER 1987



SEPTEMBER 1987

Figure 5. Delta vs. pressure correlations for September 1987, CTD casts 9-25. The left panel is the linear fit between 1200 m and the bottom, and the right panel is the third order polynomial fit over the entire water column.

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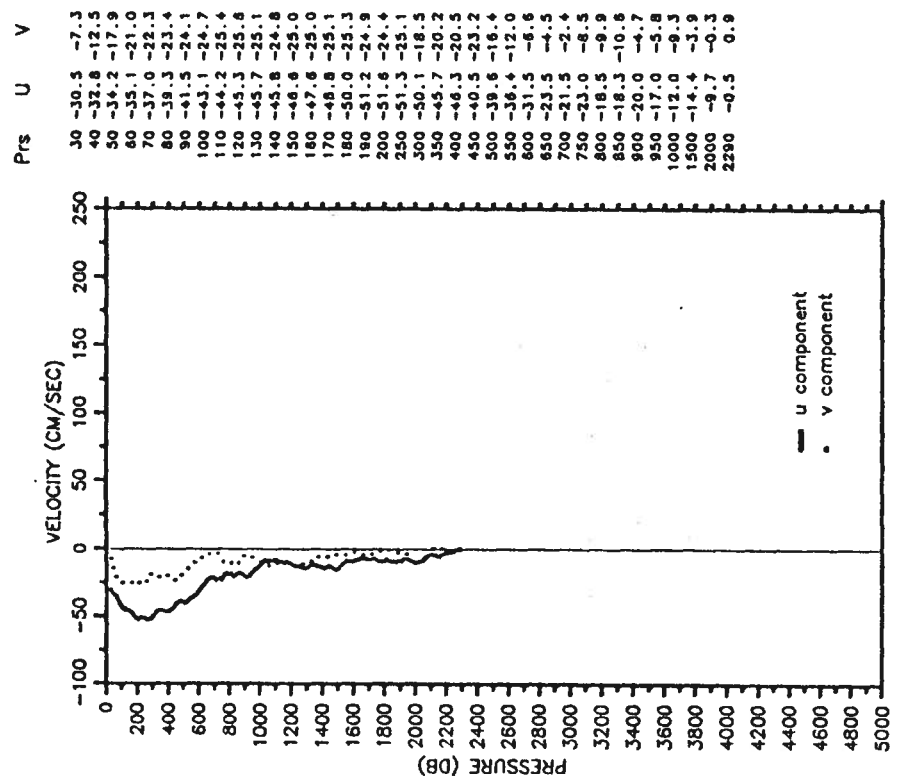
IV. ACKNOWLEDGMENTS

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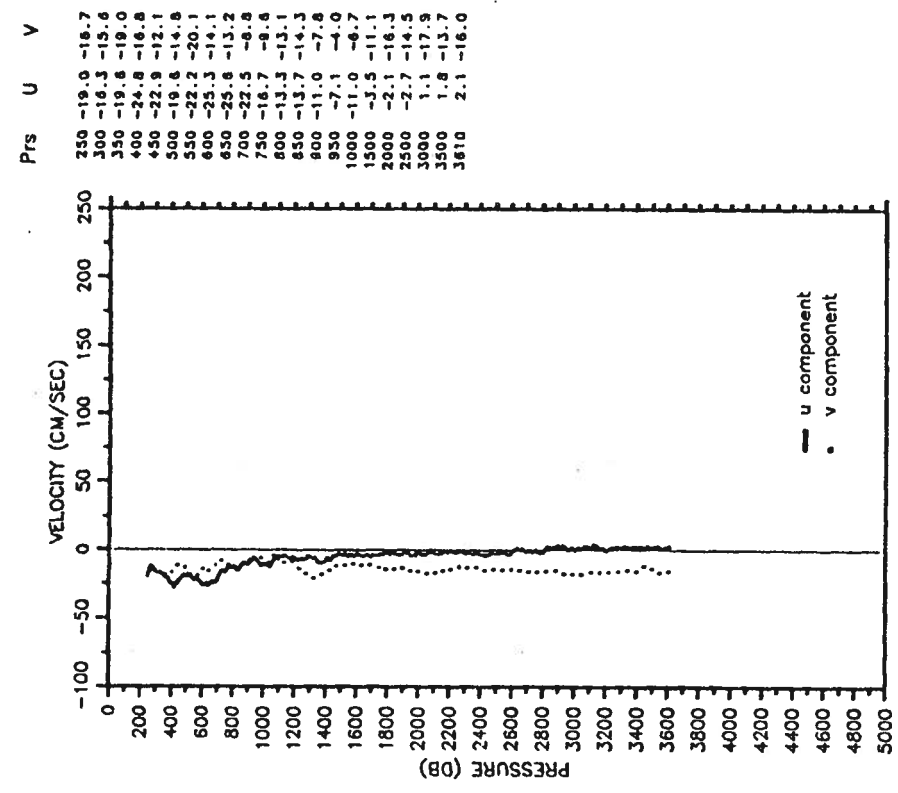
APPENDIX A: PEGASUS DATA

Casts are presented by cruise and increasing cast number. The cruise number and vessel, Pegasus cast and station number, Julian day and time, and position are shown at the top of each plot. "U" represents the east component of velocity. "V" represents the north component. Casts where there are no data values given for the U and V components indicate that the transponders signals were not being received by the Pegasus instrument at the given depth.

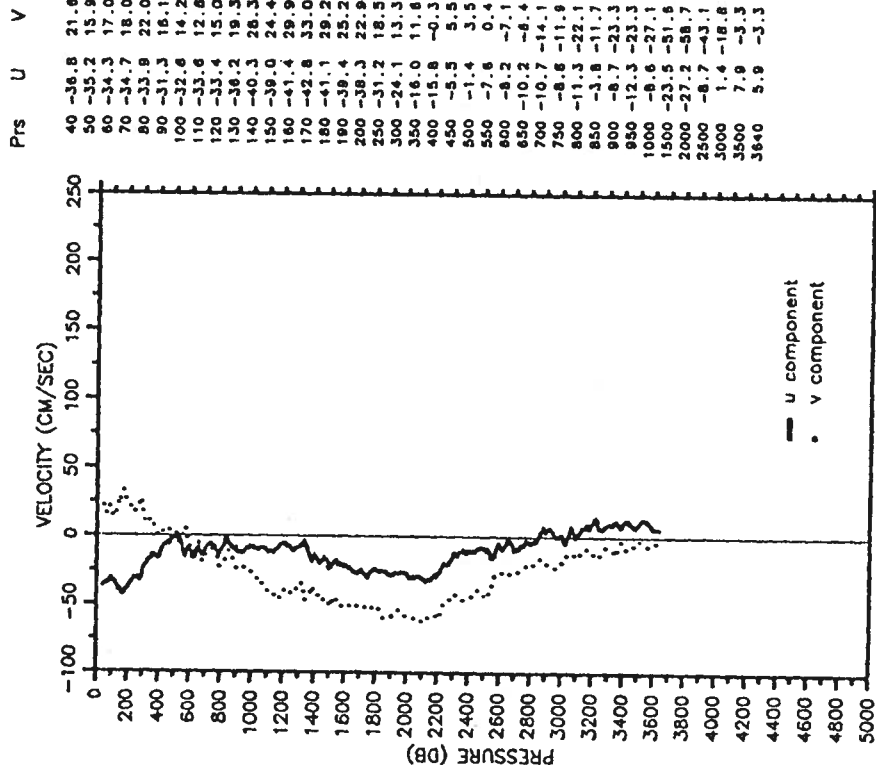
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 R/V RESEARCHER JDAY 76 TIME 1821Z
 Latitude 26.469 N Longitude 075.527 W



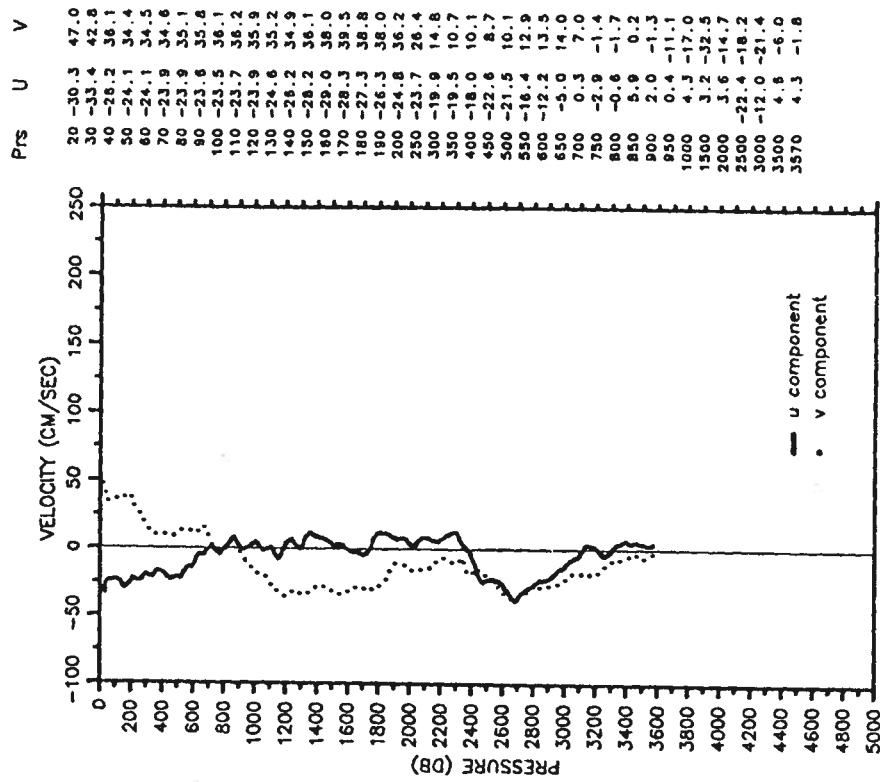
RES-STACS27-87 PEGASUS 9 STN 34
 R/V RESEARCHER JDAY 77 TIME 0355Z
 Latitude 26.491 N Longitude 076.139 W



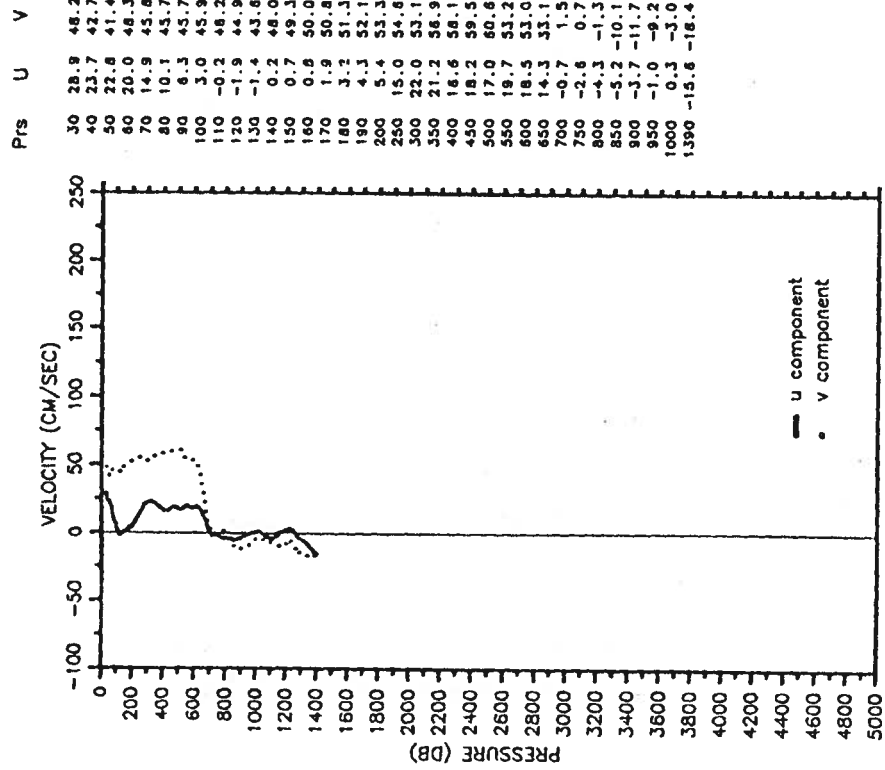
RES-STACS27-87 PEGASUS 11 STN 16
 R/V RESEARCHER JDAY 78 TIME 0059Z
 Latitude 26.539 N Longitude 076.531 W



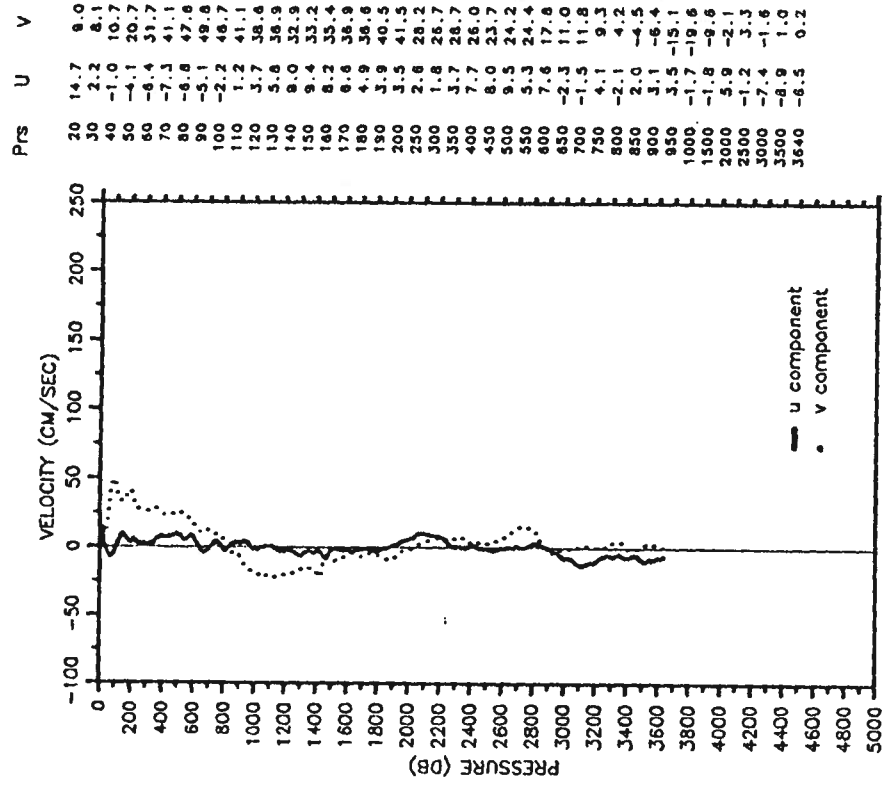
RES-STACS27-87 PEGASUS 13 STN 17
 R/V RESEARCHER JDAY 78 TIME 1241Z
 Latitude 26.596 N Longitude 076.638 W



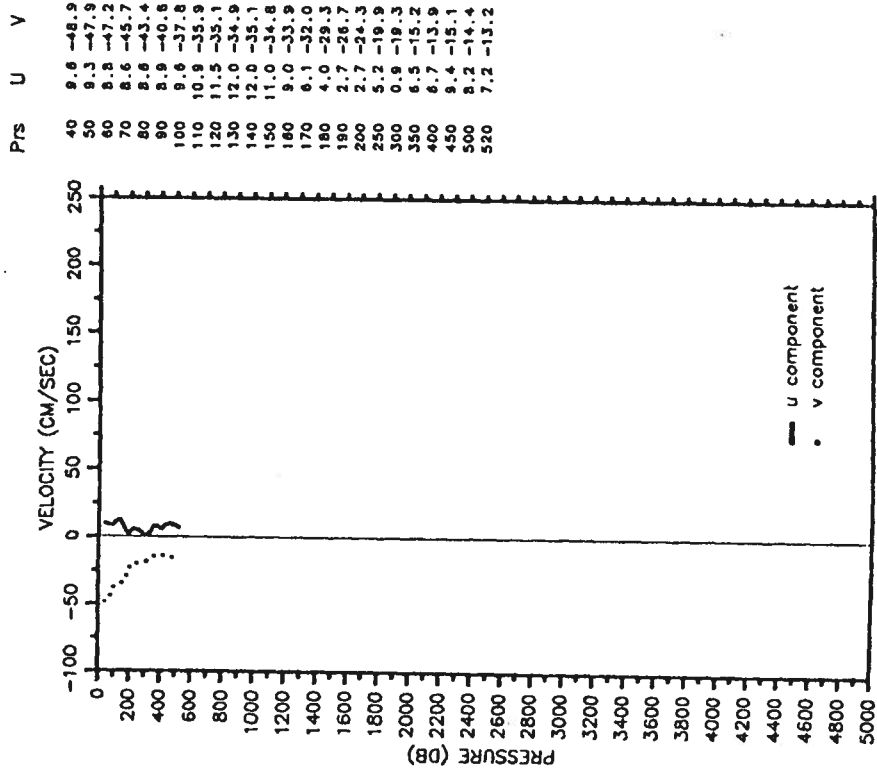
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 R/V RESEARCHER JDAY 78 TIME 2326Z
 Latitude 26.559 N Longitude 076.840 W



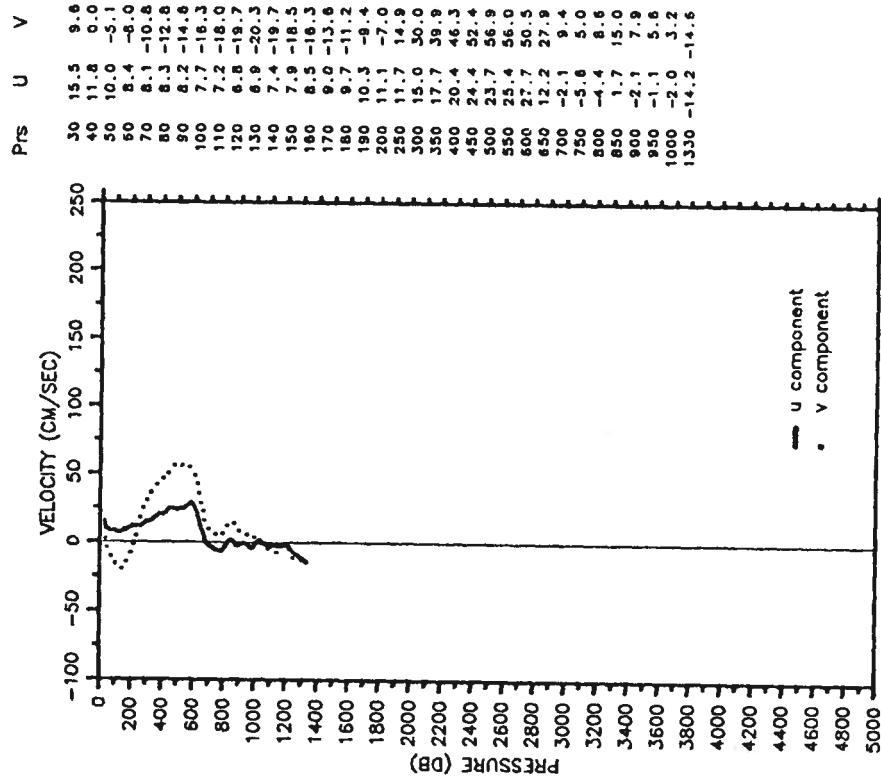
RES-STACS27-87 PEGASUS 16 STN 18
 R/V RESEARCHER JDAY 79 TIME 0501Z
 Latitude 26.537 N Longitude 076.734 W



RES-STACS27-87 PEGASUS 67 STN 34
 R/V RESEARCHER JDAY 85 TIME 1822Z
 Latitude 26.503 N Longitude 076.153 W

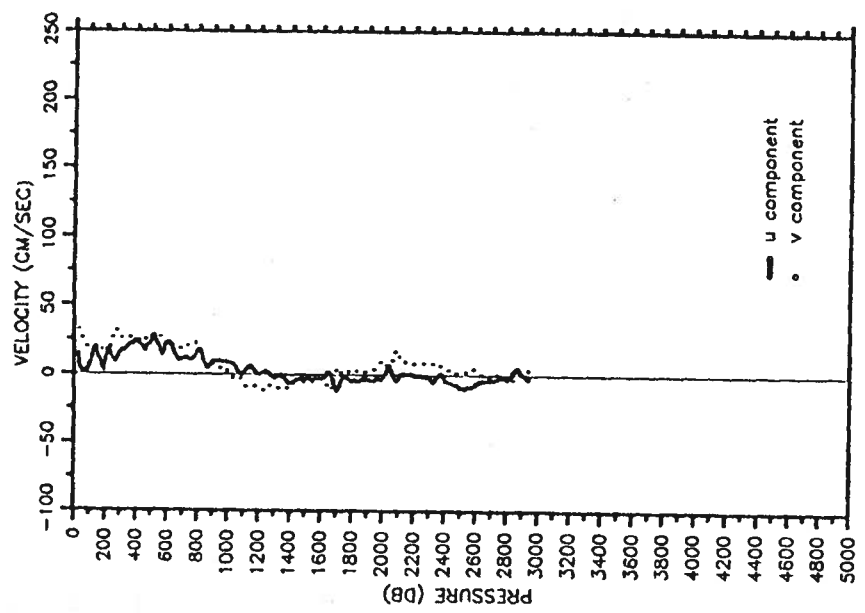


RES-STACS27-87 PEGASUS 69 STN 19
 R/V RESEARCHER JDAY 87 TIME 0511Z
 Latitude 26.556 N Longitude 076.842 W



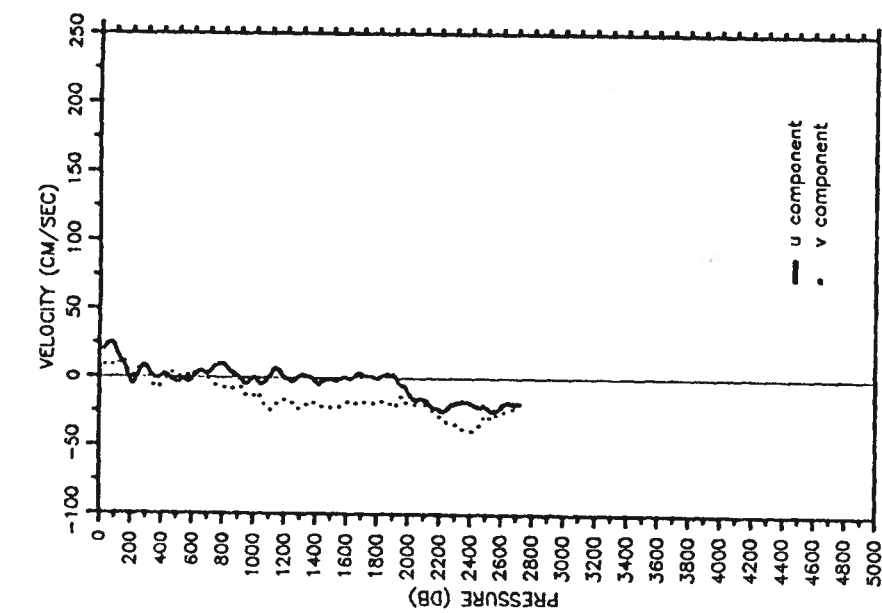
RES-STACS27-87 PEGASUS 70 STN 18
 R/V RESEARCHER JDAY 87 TIME 0722Z
 Latitude 26.531 N Longitude 076.742 W

Prs	U	V
30	14.4	31.8
40	4.5	28.0
50	2.3	26.2
60	1.8	24.9
70	1.5	23.3
80	2.3	21.0
90	4.0	18.2
100	6.5	15.0
110	8.8	13.3
120	12.4	12.8
130	18.1	12.9
140	19.2	11.1
150	16.7	12.3
160	12.7	14.7
170	9.1	18.5
180	5.1	17.6
190	3.2	19.3
200	7.8	20.8
250	11.9	28.4
300	16.2	26.5
350	20.2	28.4
400	23.8	23.9
450	17.6	24.7
500	23.5	24.6
550	19.7	25.6
600	22.3	20.4
650	15.1	21.4
700	11.1	18.3
750	10.9	22.4
800	16.5	20.7
850	7.8	4.5
900	9.3	7.1
950	9.5	4.9
1000	8.5	1.2
1500	-3.3	-5.7
2000	-2.2	10.1
2500	-8.7	1.5
2940	-2.8	3.7

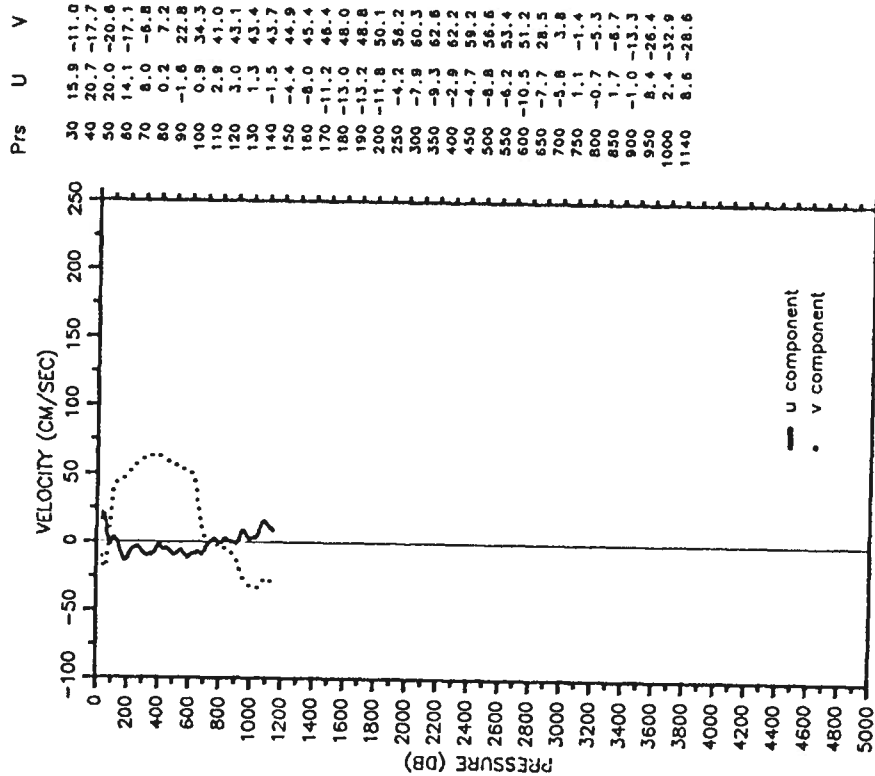


RES-STACS27-87 PEGASUS 72 STN 17
 R/V RESEARCHER JDAY 88 TIME 1918Z
 Latitude 26.592 N Longitude 076.626 W

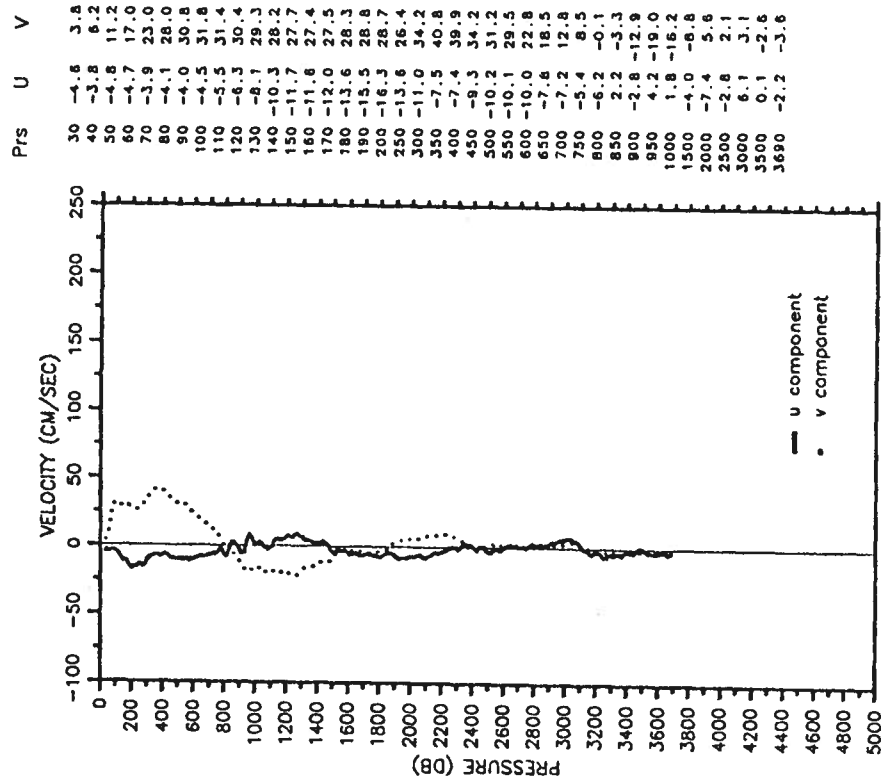
Prs	U	V
30	20.9	8.1
40	22.3	6.1
50	24.4	7.2
60	25.1	7.7
70	25.2	8.6
80	23.9	9.1
90	22.1	8.1
100	19.4	7.7
110	17.1	8.2
120	14.9	10.9
130	12.8	11.3
140	11.5	13.1
150	9.4	13.1
160	8.6	10.3
170	3.1	6.1
180	-0.1	3.1
200	-2.4	2.4
250	2.0	6.4
300	7.8	5.7
350	0.3	-6.6
400	0.7	-5.4
450	0.1	1.0
500	-2.6	2.0
550	-2.0	3.0
600	-1.1	0.4
650	4.5	3.6
700	3.3	-0.1
750	8.0	-5.0
800	10.1	-7.2
850	4.7	-8.3
900	0.5	-6.4
950	-4.2	-13.0
1000	0.3	-12.8
1500	-1.3	-21.9
2000	-11.0	-18.7
2500	-21.5	-26.3
2720	-18.4	-22.5



RES-STACS28-87 PEGASUS 2 STN 19
 R/V RESEARCHER JDAY 246 TIME 0614Z
 Latitude 26.546 N Longitude 076.843 W

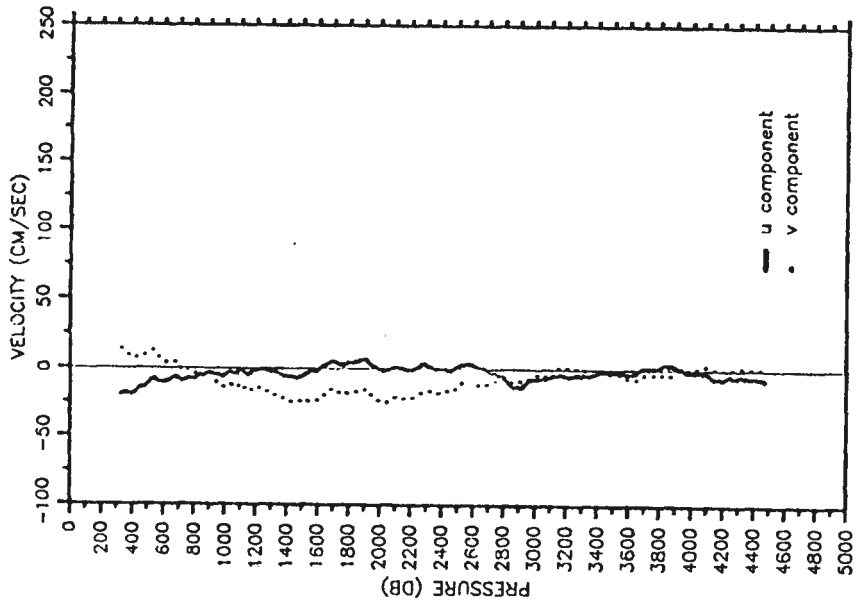


RES-STACS28-87 PEGASUS 3 STN 18
 R/V RESEARCHER JDAY 246 TIME 0954Z
 Latitude 26.533 N Longitude 076.740 W



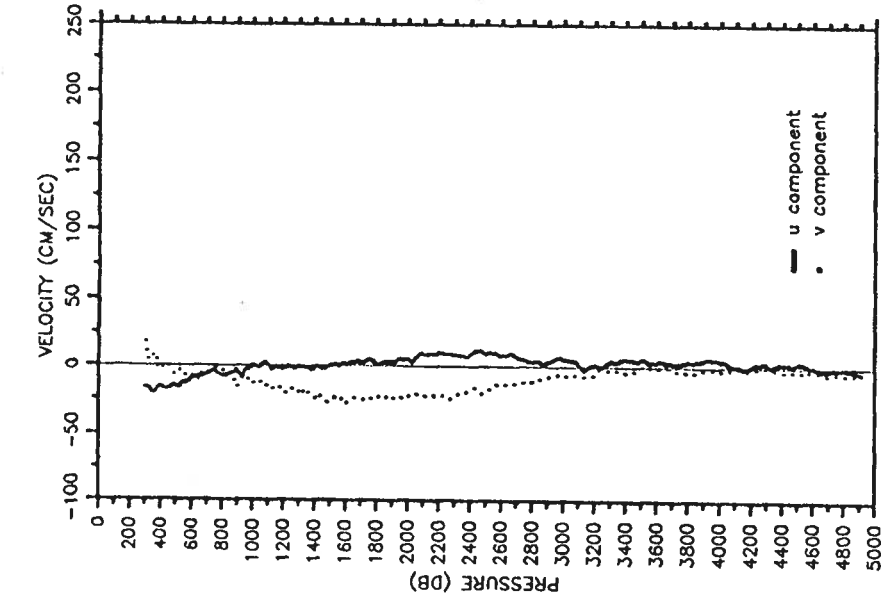
RES-STACS28-87 PEGASUS 4 STN 17
 R/V RESEARCHER JDAY 246 TIME 1531Z
 Latitude 26.576 N Longitude 076.627 W

Prs	U	V
350	-18.4	12.3
400	-19.0	9.8
450	-14.5	9.0
500	-11.6	10.7
550	-9.0	11.0
600	-10.1	4.5
650	-8.1	4.5
700	-8.7	-0.8
750	-8.0	-1.6
800	-7.7	-4.3
850	-5.4	-4.1
900	-3.5	-4.2
950	-4.9	-10.1
1000	-5.5	-13.1
1500	-6.0	-24.9
2000	-0.7	-24.4
2500	1.7	-12.3
3000	-7.4	-3.9
3500	-2.3	-5.1
4000	-1.5	0.7
4470	-7.6	0.4

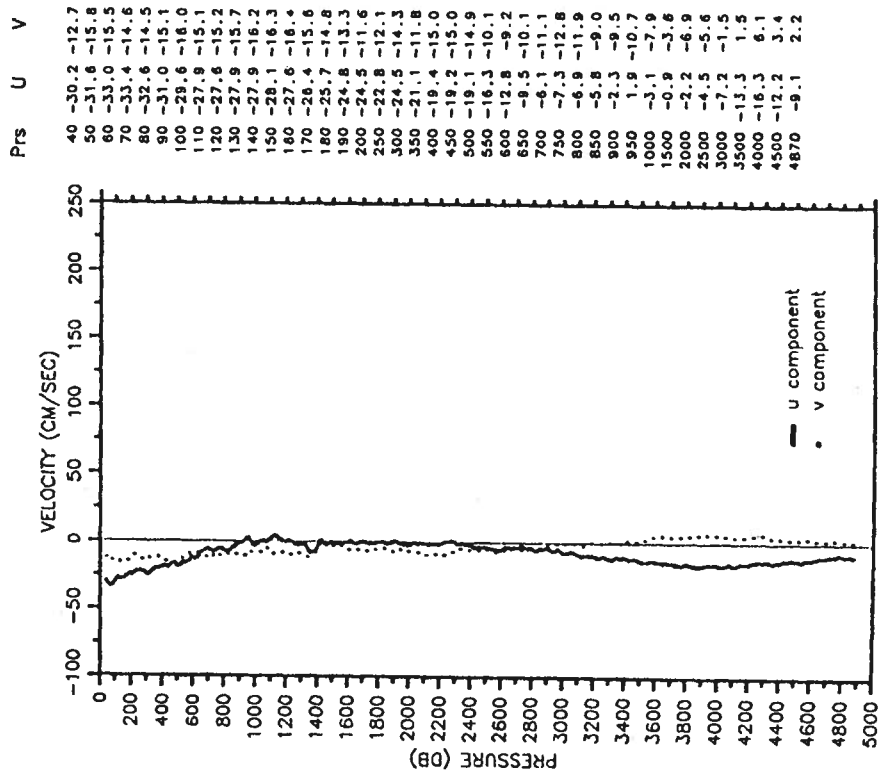


RES-STACS28-87 PEGASUS 5 STN 16
 R/V RESEARCHER JDAY 246 TIME 2209Z
 Latitude 26.541 N Longitude 076.523 W

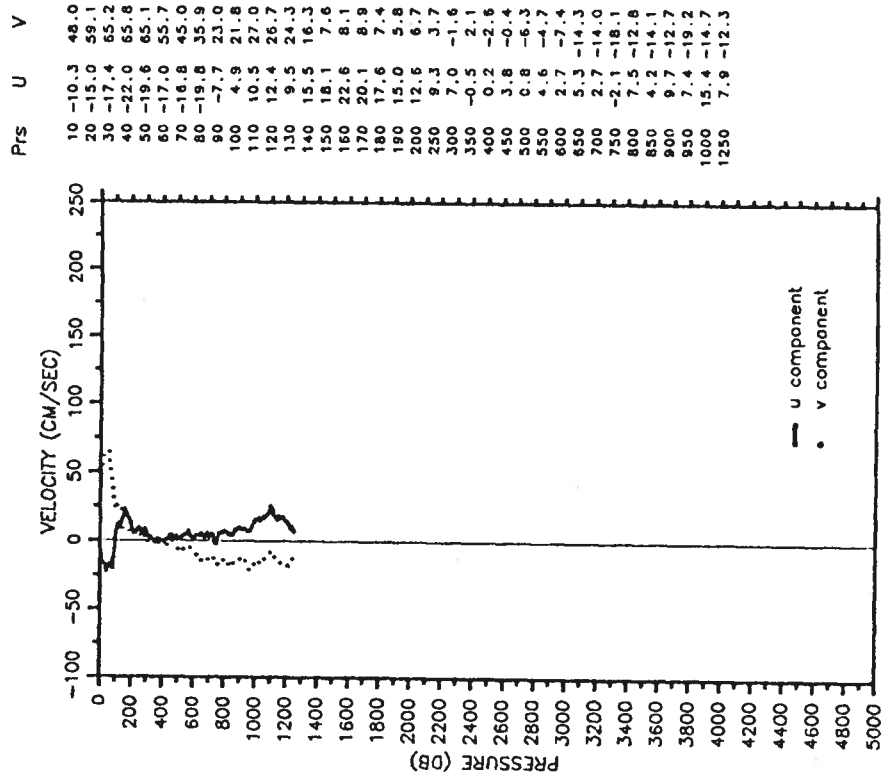
Prs	U	V
300	-18.2	18.0
350	-20.4	9.2
400	-16.3	-4.2
450	-17.4	-0.2
500	-16.0	-7.2
550	-12.5	-7.7
600	-8.8	-7.6
650	-8.2	-7.3
700	-6.7	-4.1
750	-3.8	-0.7
800	-7.4	-3.2
850	-6.5	-6.3
900	-4.7	-14.8
950	-3.5	-10.1
1000	0.1	-12.5
1500	0.3	-24.0
2000	5.1	-23.0
2500	9.6	-18.5
3000	5.4	-7.4
3500	5.3	0.2
4000	4.7	-1.9
4500	3.3	-3.7
4910	-4.0	-2.8



RES-STACS28-87 PEGASUS 7 STN 34
 R/V RESEARCHER JDAY 247 TIME 0950Z
 Latitude 26.480 N Longitude 076.137 W

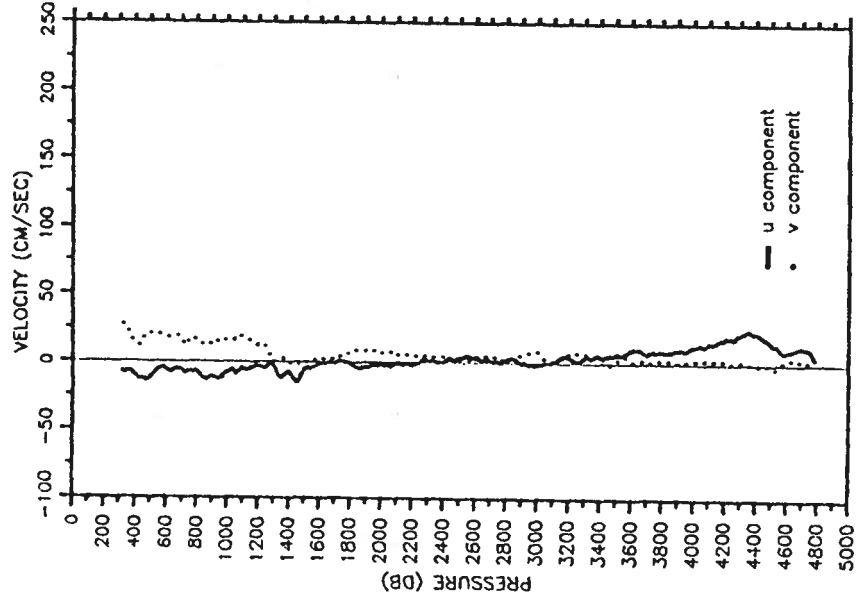


RES-STACS28-87 PEGASUS 8 STN 99
 R/V RESEARCHER JDAY 264 TIME 0252Z
 Latitude 07.596 N Longitude 052.740 W



RES--STACS28--87 PEGASUS 9 STN 37
 R/V RESEARCHER JDAY 265 TIME 0440Z
 Latitude 08.502 N Longitude 052.155 W

Prs	U	V
350	-7.7	23.4
400	-10.5	12.6
450	-13.2	15.8
500	-11.8	20.8
550	-6.5	20.1
600	-7.0	18.5
650	-6.9	18.2
700	-7.3	14.5
750	-7.6	16.3
800	-8.0	14.2
850	-13.2	13.1
900	-11.5	13.5
950	-12.2	16.6
1000	-8.3	15.4
1500	-5.4	-0.8
2000	-2.3	7.0
2500	3.2	1.7
3000	-1.8	7.7
3500	8.4	1.1
4000	12.0	1.8
4500	14.6	-2.3
4780	4.6	0.0

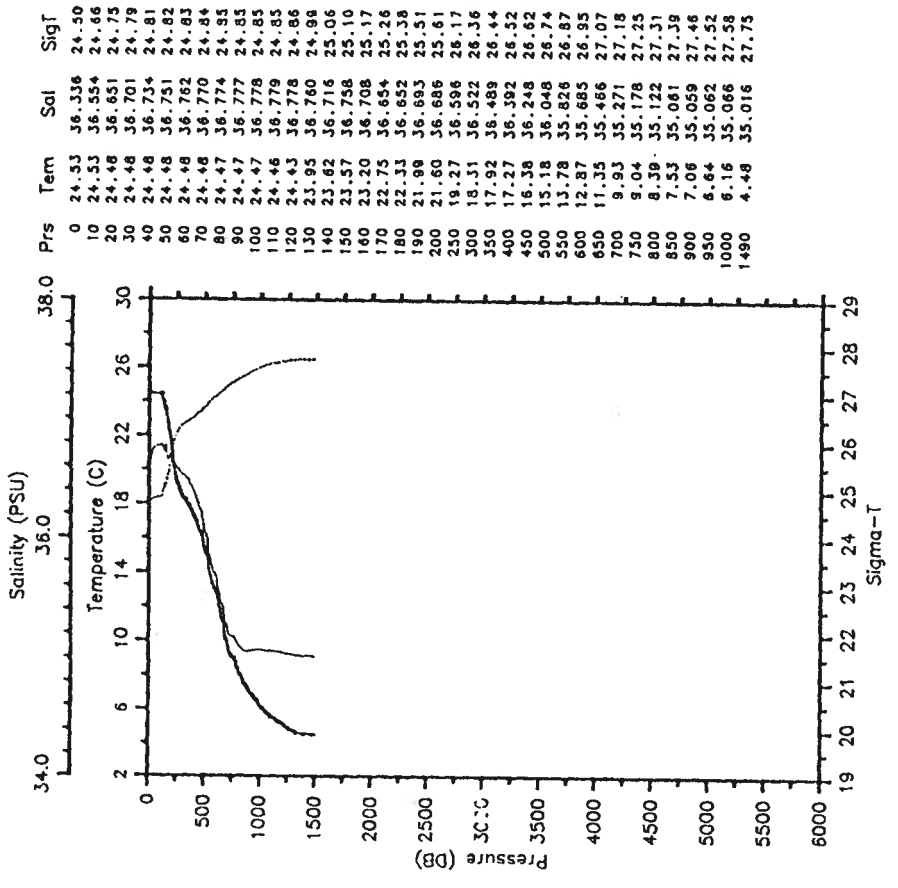


APPENDIX B: CTD DATA

Casts are presented by cruise and increasing cast number. Julian day and time, cruise number and vessel, and position are given at the top of each plot. Temperature, salinity and sigma-t profiles are shown for each cast.

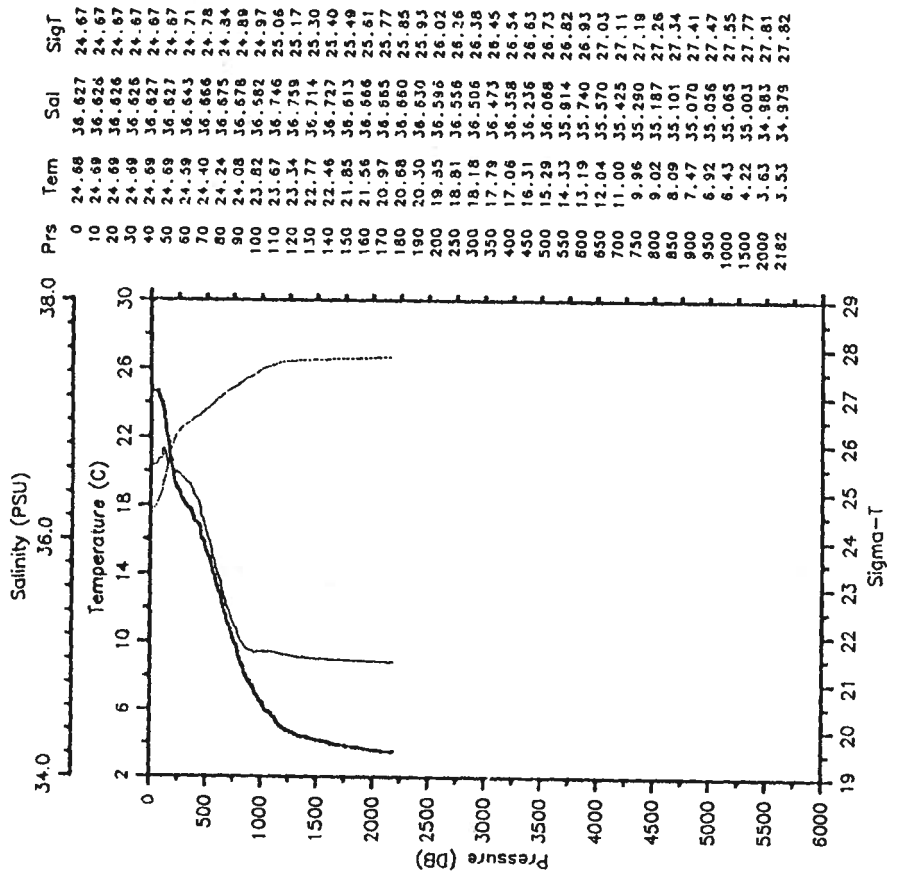
RES-STACS27-87 CTD 1 RESEARCHER
 Date 03 12 87 Latitude 24.015 N
 Time 1724 Z Longitude 75.370 W

— Tem — Sal
 — SigT



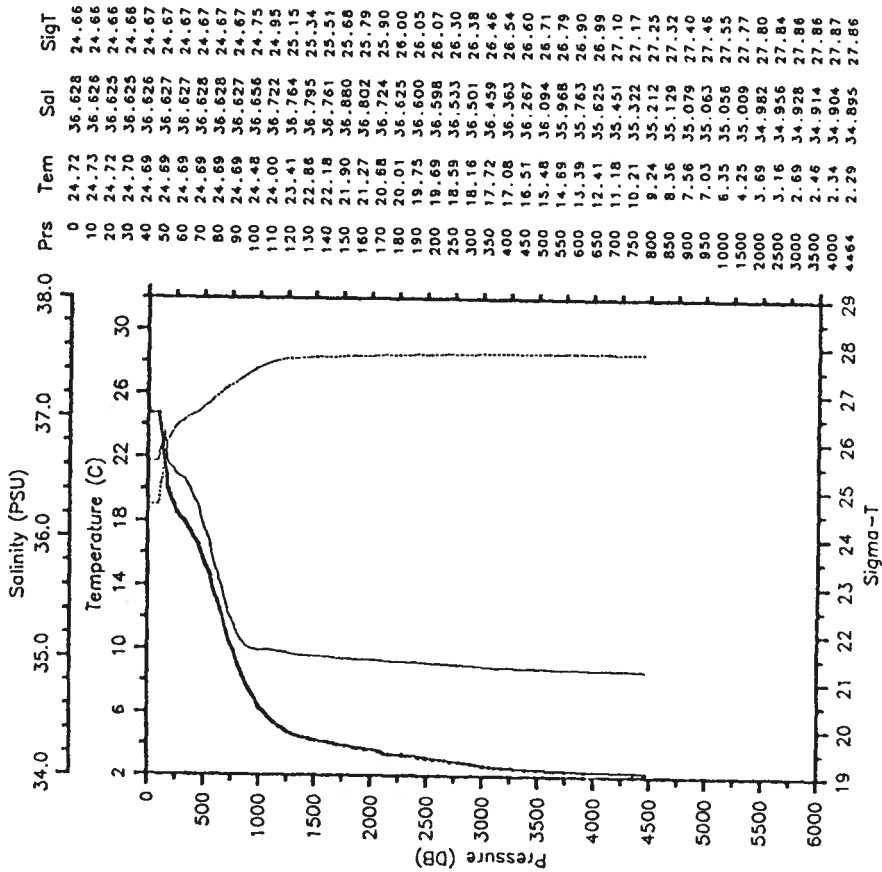
RES-STACS27-87 CTD 2 RESEARCHER
 Date 03 13 87 Latitude 22.420 N
 Time 1159 Z Longitude 72.754 W

— Tem — Sal
 — SigT



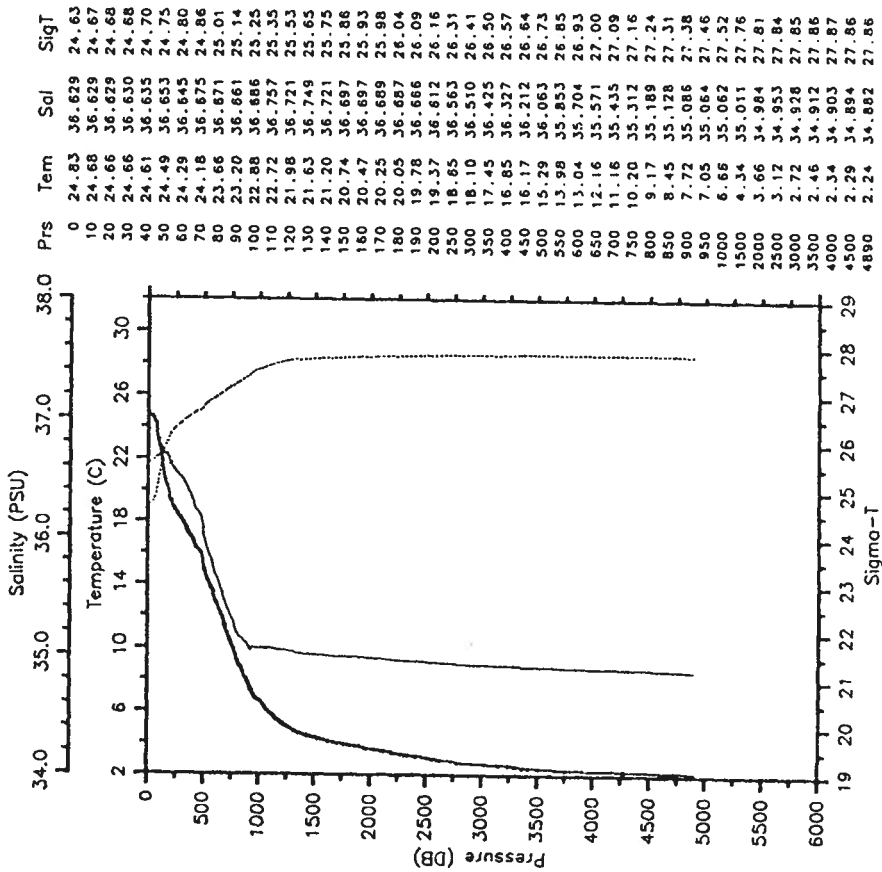
RES-STACS27-87 CTD 3 RESEARCHER
 Date 03 13 87 Latitude 22.569 N
 Time 1459 Z Longitude 72.691 W

— Tem — Sal
 - - - - - SigT



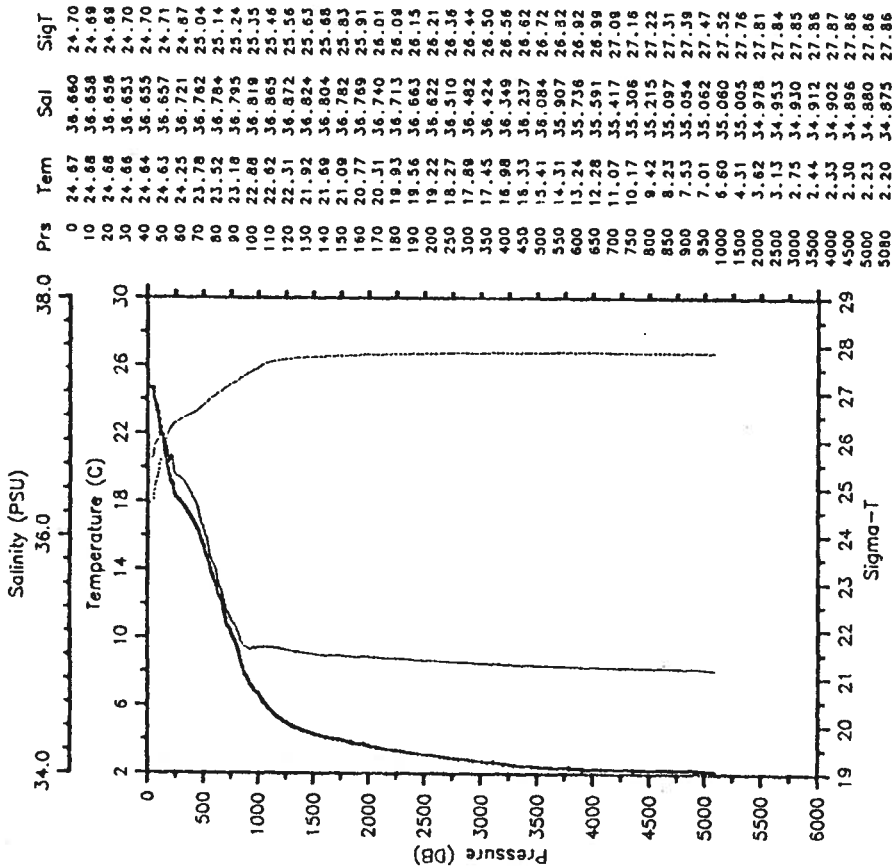
RES-STACS27-87 CTD 4 RESEARCHER
 Date 03 13 87 Latitude 22.832 N
 Time 1910 Z Longitude 72.615 W

— Tem — Sal
 - - - - - SigT



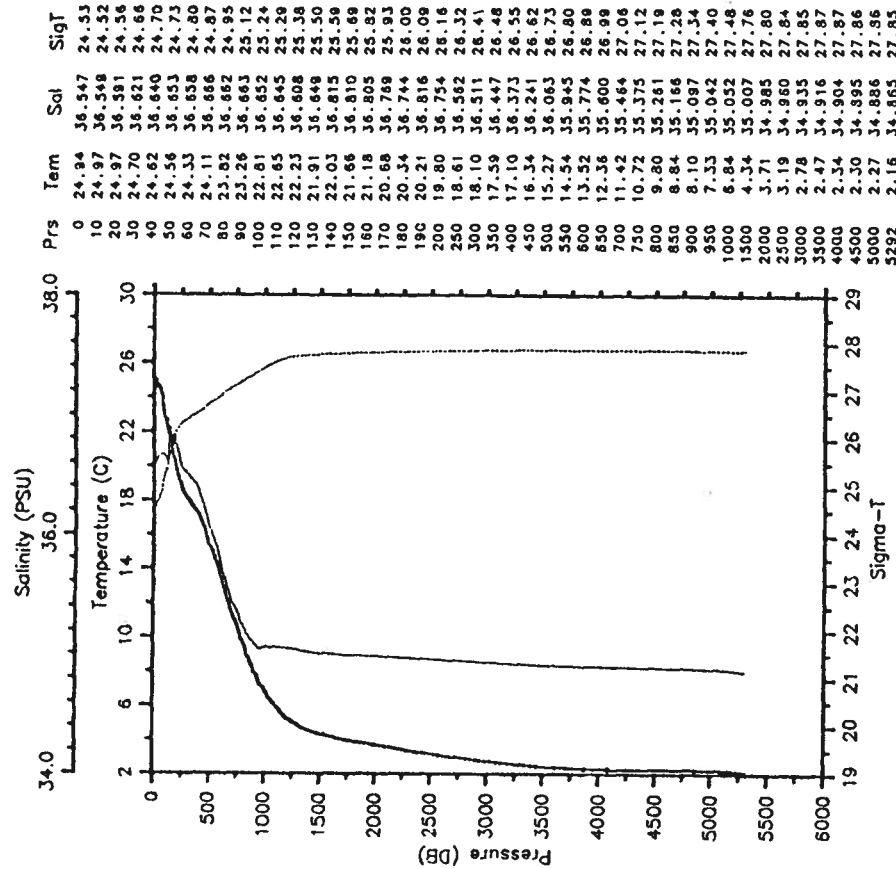
RES-STACS27-87 CTD 5 RESEARCHER
 Date 03 13 87 Latitude 23.066 N
 Time 2322 Z Longitude 72.512 W

— Term — Sal
 — SigT

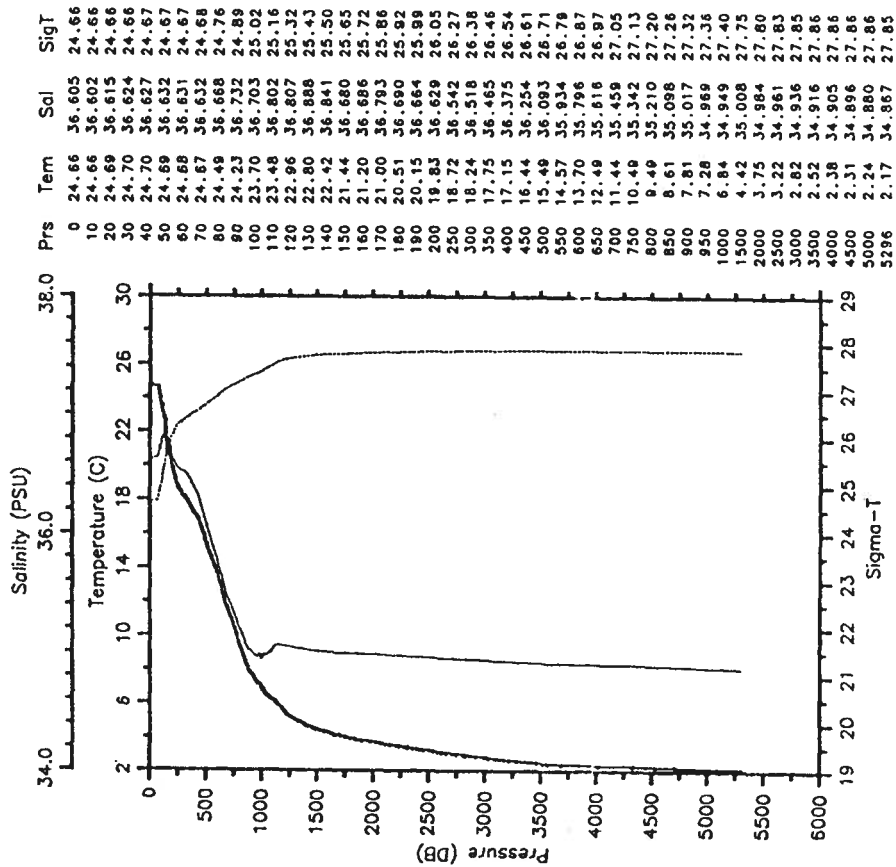


RES-STACS27-87 CTD 6 RESEARCHER
 Date 03 13 87 Latitude 23.340 N
 Time 0335 Z Longitude 72.420 W

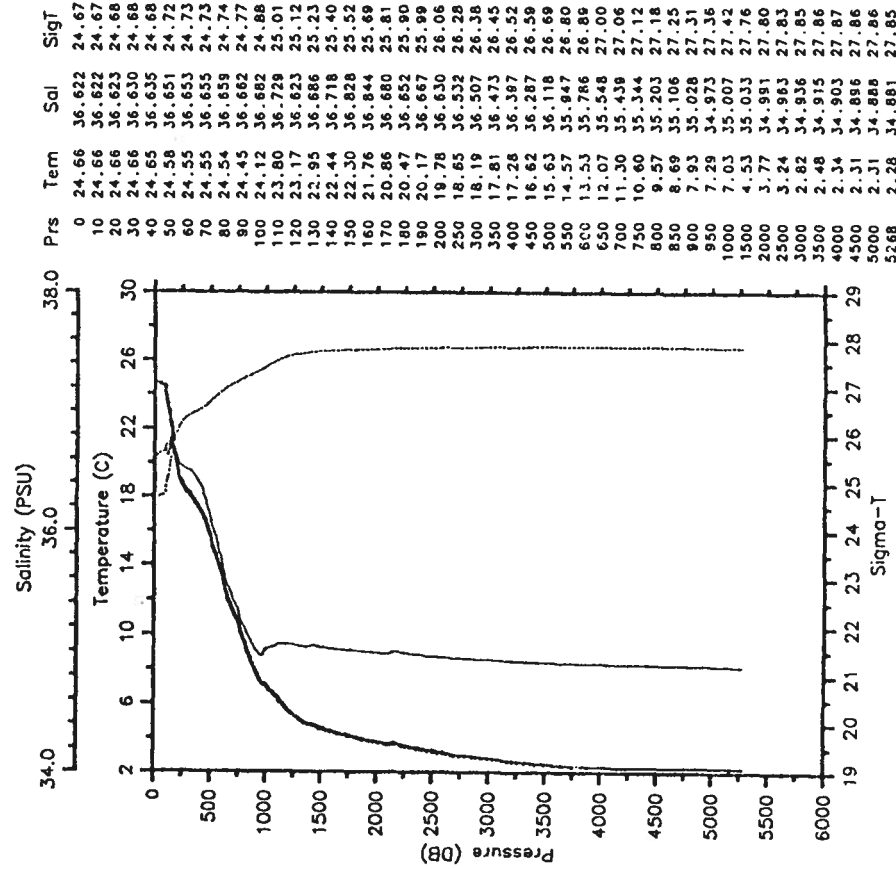
— Term — Sal
 — SigT



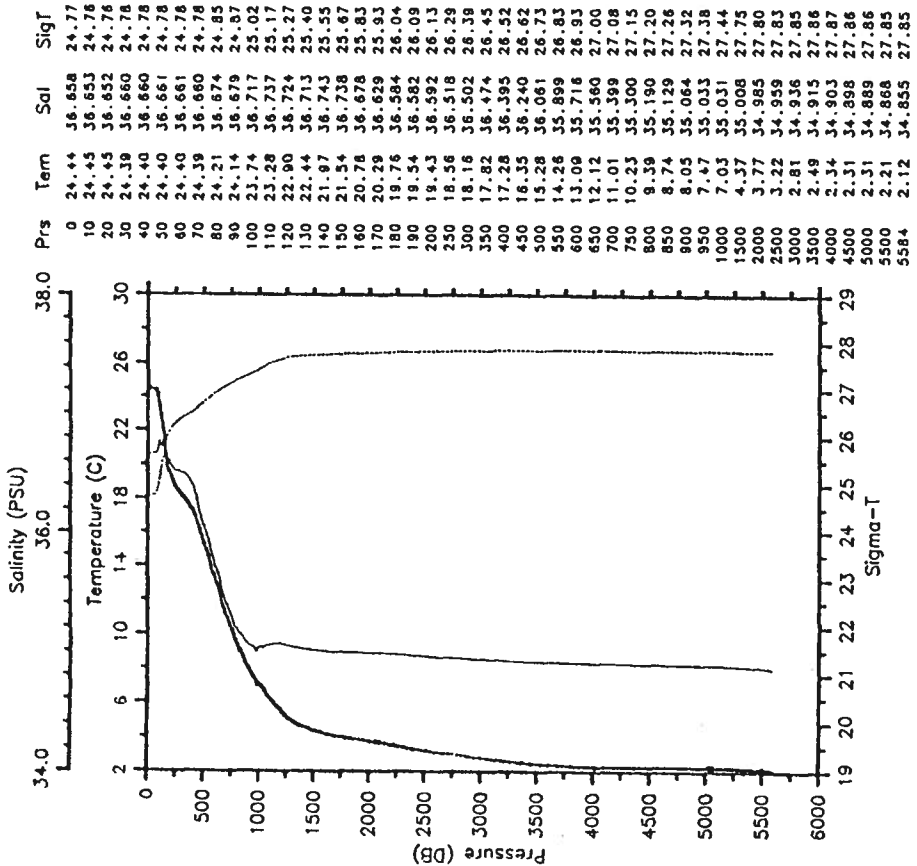
RES--STACS27-87 CTD 7 RESEARCHER
 Date 03 14 87 Latitude 23.600 N
 Time 0803 Z Longitude 72.300 W



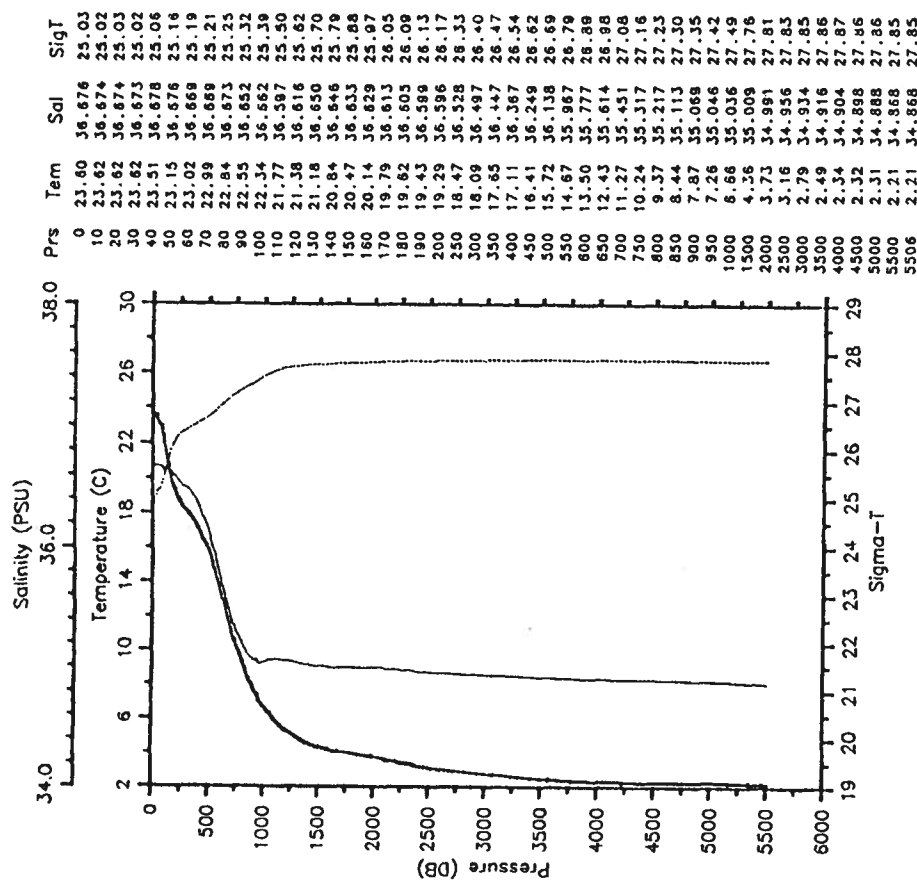
RES--STACS27-87 CTD 8 RESEARCHER
 Date 03 14 87 Latitude 23.949 N
 Time 1537 Z Longitude 72.150 W



RES-STACS27-87 CTD 9 RESEARCHER
 Date 03 14 87 Latitude 24.277 N
 Time 2045 Z Longitude 72.010 W

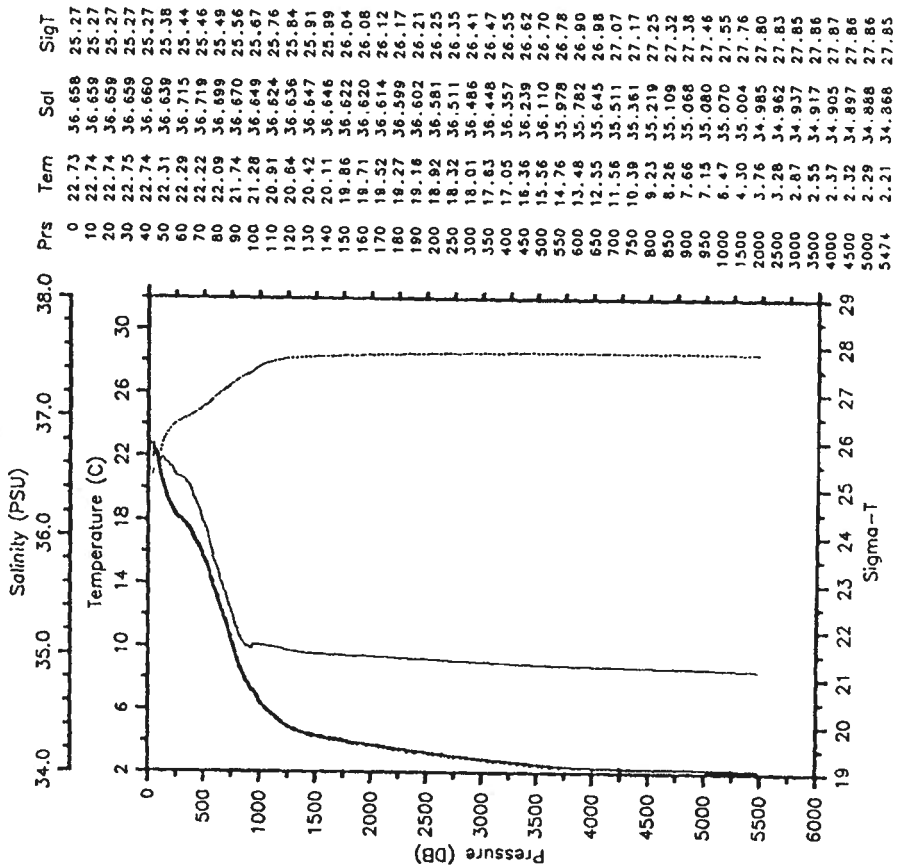


RES-STACS27-87 CTD 10 RESEARCHER
 Date 03 15 87 Latitude 24.603 N
 Time 0241 Z Longitude 72.328 W



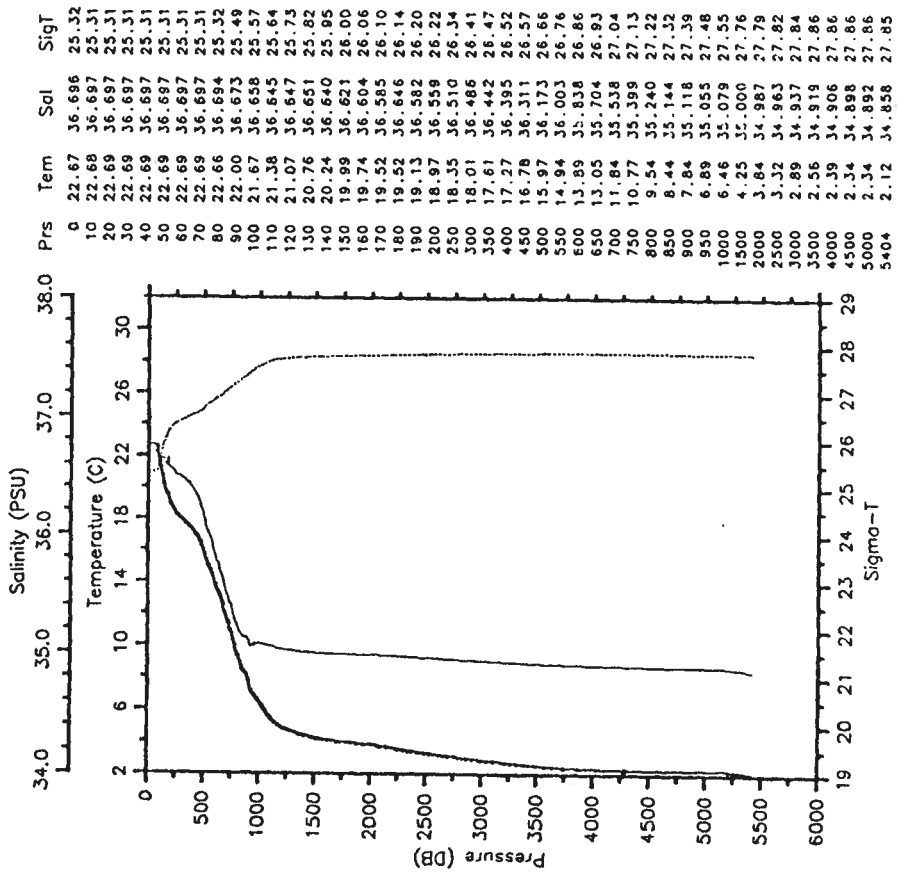
RES-STACS27-87 CTD 11 RESEARCHER
 Date 03 15 87 Latitude 24.996 N
 Time 0952 Z Longitude 72.670 W

— Tem — Sal
 - - - - - SigT



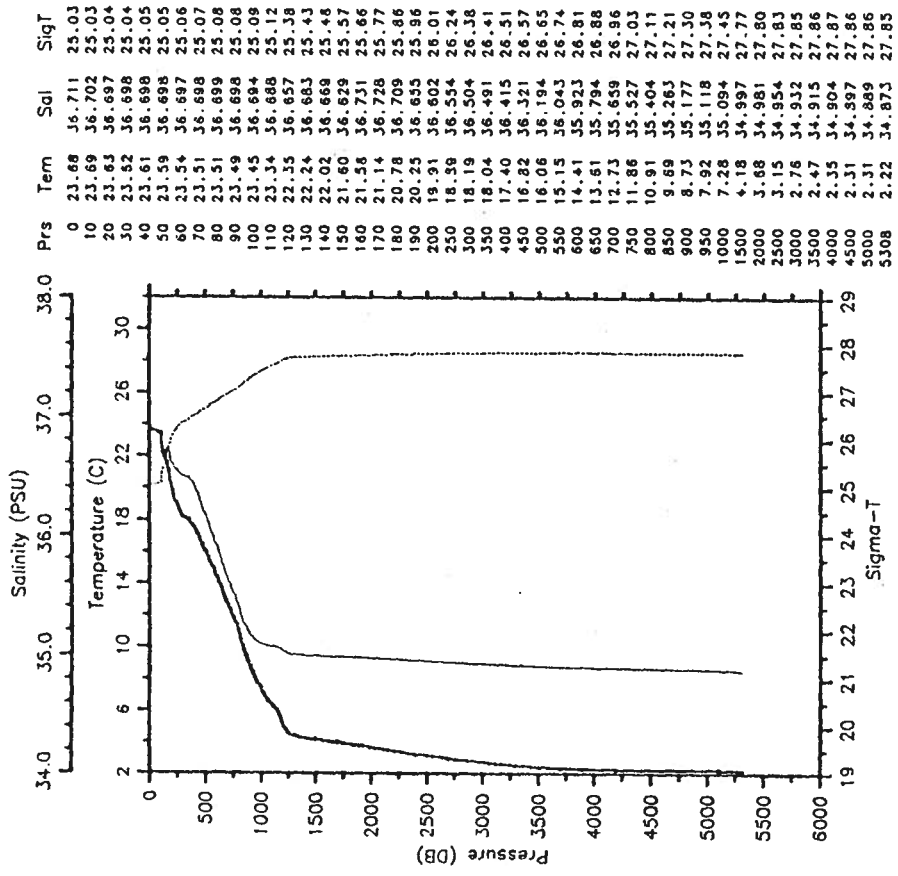
RES-STACS27-87 CTD 12 RESEARCHER
 Date 03 15 87 Latitude 25.365 N
 Time 1533 Z Longitude 72.994 W

— Tem — Sal
 - - - - - SigT



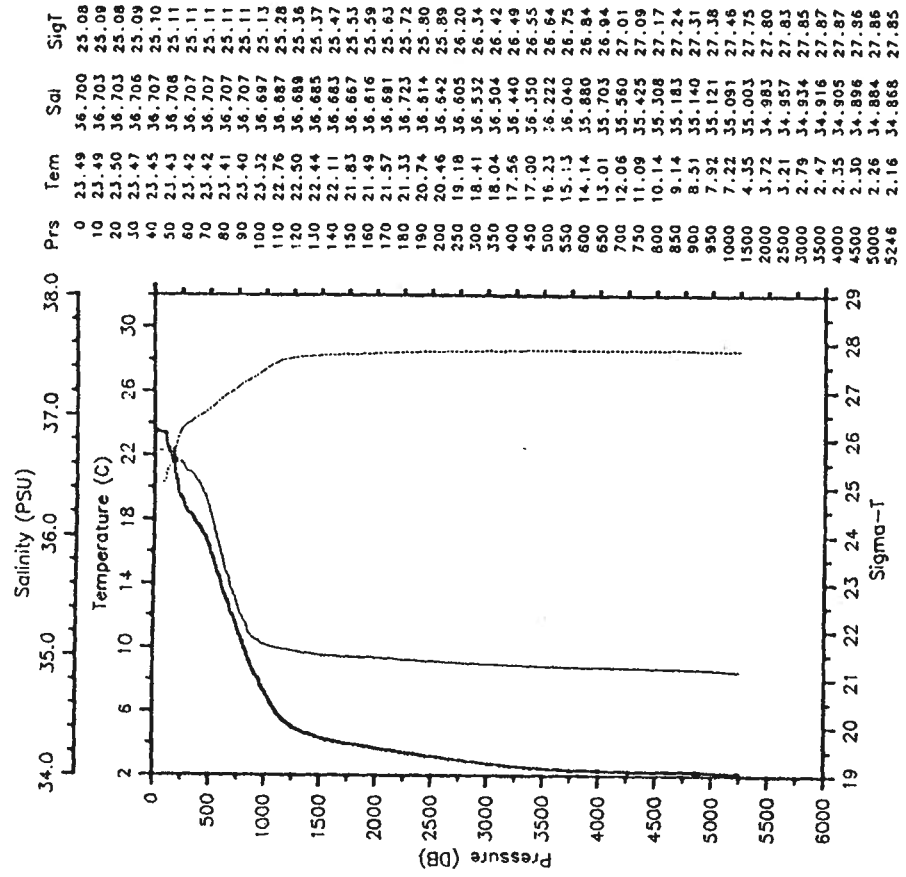
RES-STACS27-87 CTD 13 RESEARCHER
 Date 03 15 87 Latitude 25.717 N
 Time 2250 Z Longitude 73.347 W

— Temp — Sal
 - - - - - SigT



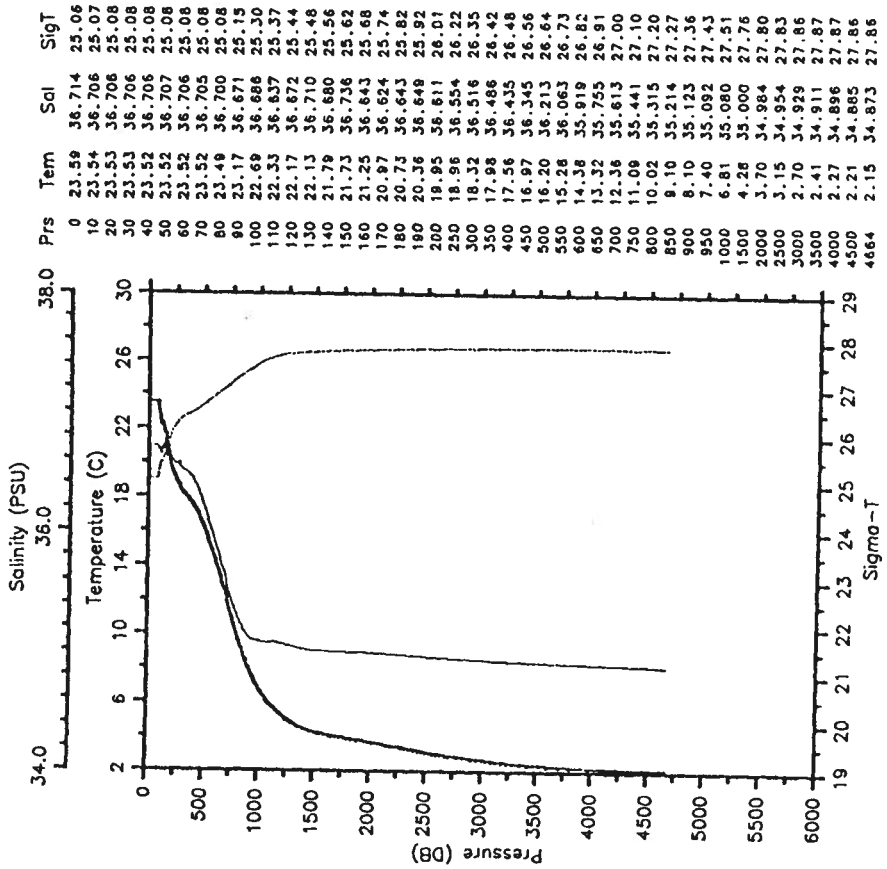
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 Date 03 16 87 Latitude 26.128 N
 Time 1007 Z Longitude 73.648 W

— Temp — Sal
 - - - - - SigT



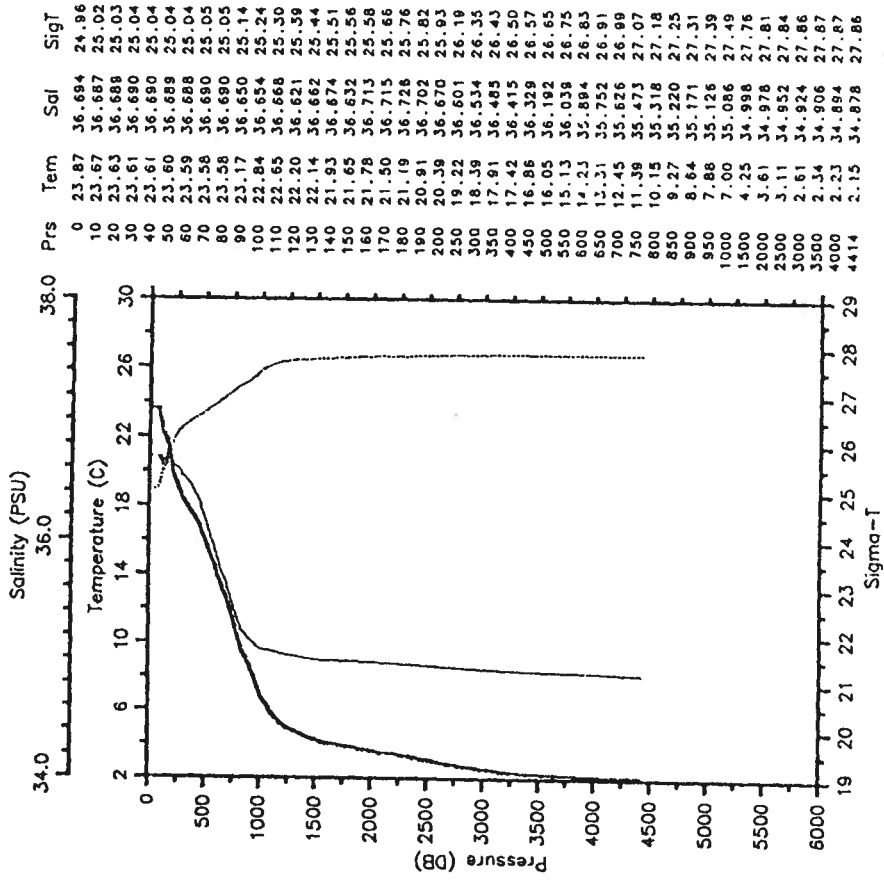
RES-STACS27-87 CTD 15 RESEARCHER
 Date 03 16 87 Latitude 26.508 N
 Time 1749 Z Longitude 74.001 W

— Tem — Sal
 — Sigt



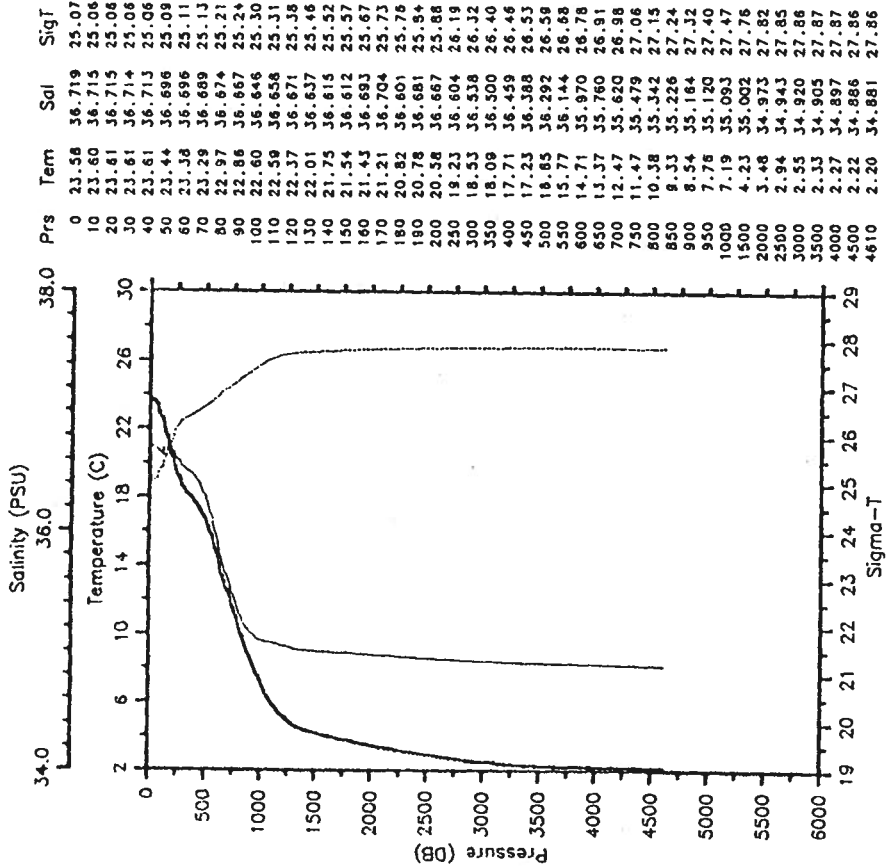
RES-STACS27-87 CTD 16 RESEARCHER
 Date 03 16 87 Latitude 26.504 N
 Time 2304 Z Longitude 74.551 W

— Tem — Sal
 — Sigt



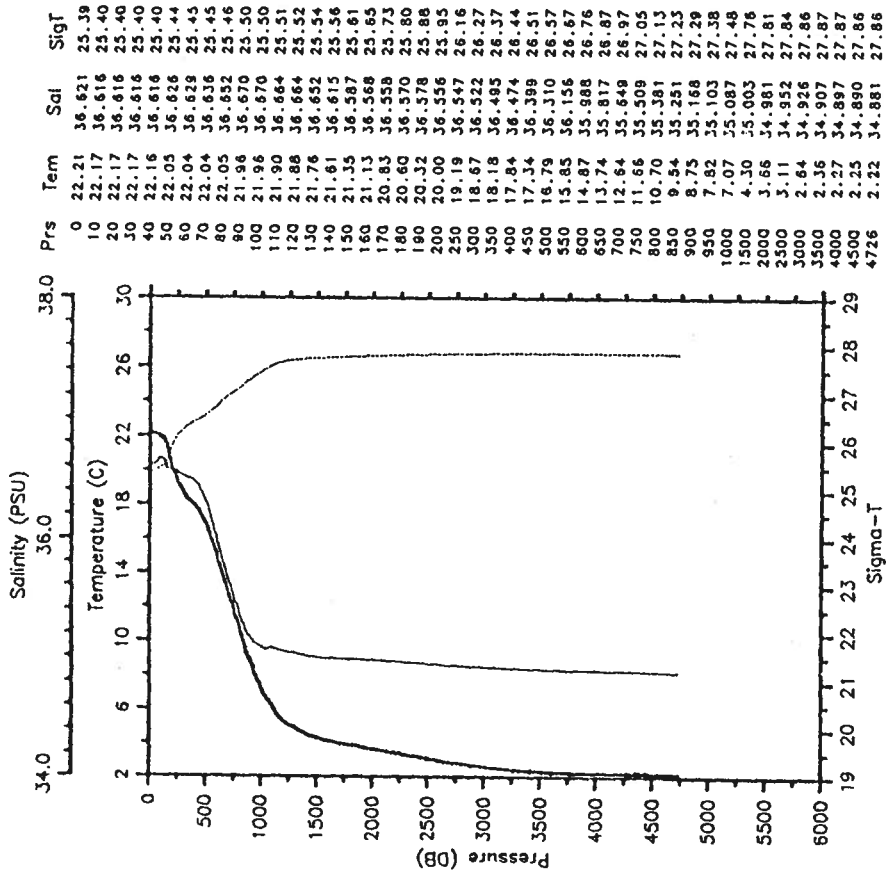
RES-STACS27-87 CTD 17 RESEARCHER
 Date 03 17 87 Latitude 26.500 N
 Time 1056 Z Longitude 75.012 W

--- Tem --- Sal
 --- SigT



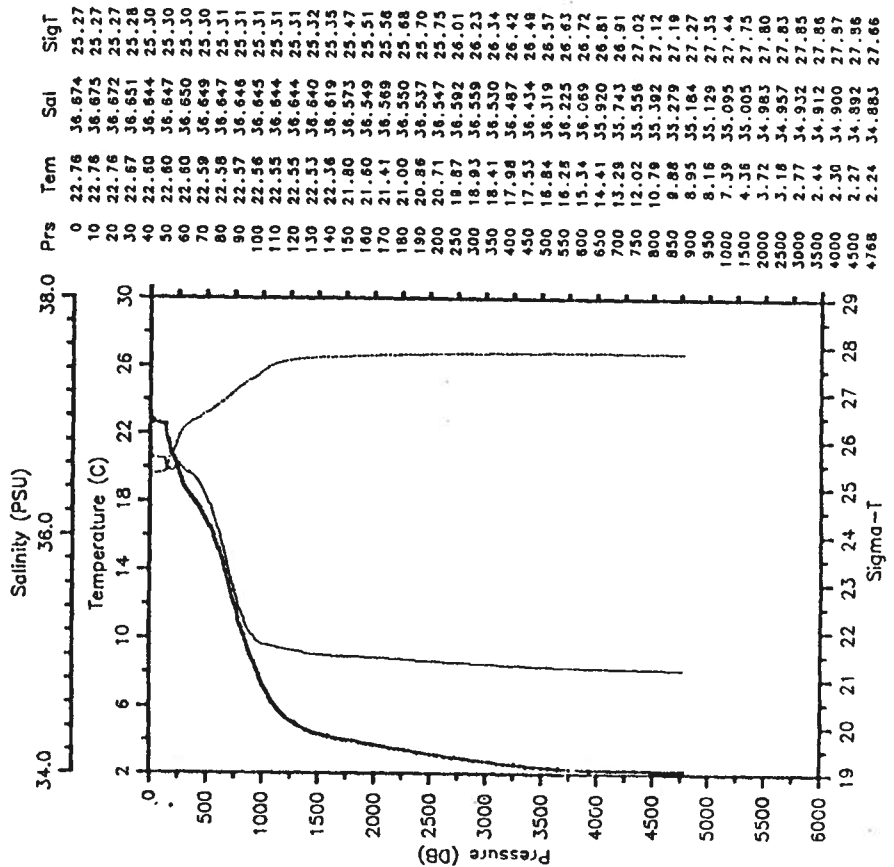
RES-STACS27-87 CTD 18 RESEARCHER
 Date 03 17 87 Latitude 26.486 N
 Time 1550 Z Longitude 75.566 W

--- Tem --- Sal
 --- SigT



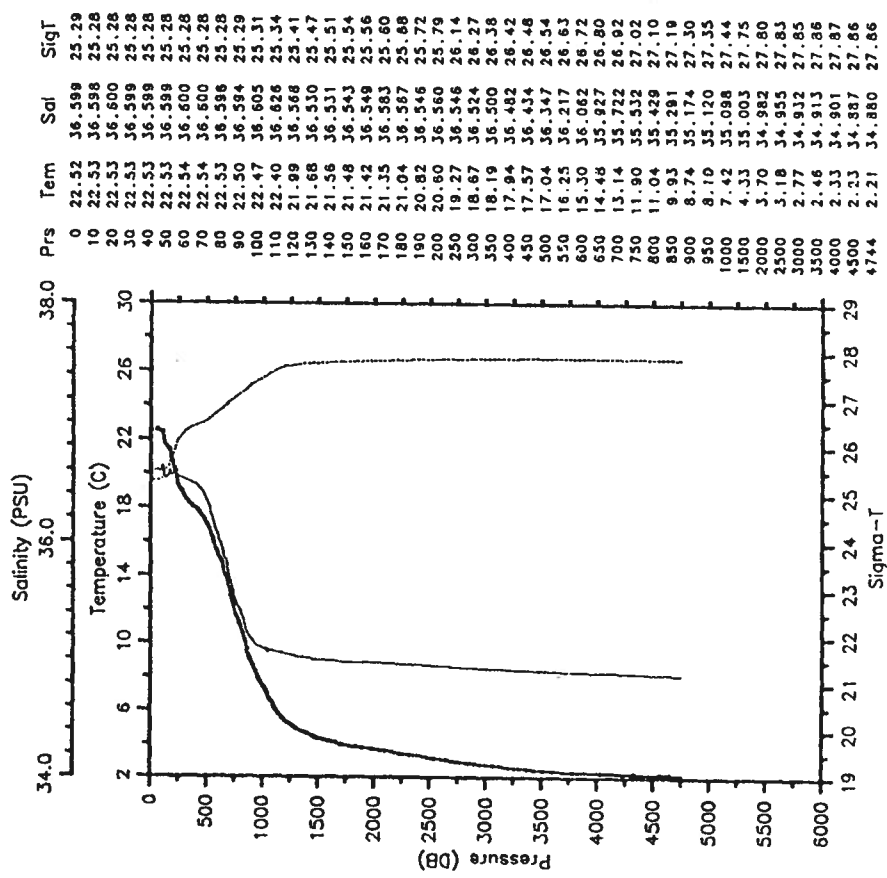
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 Time 0523 Z Longitude 76.175 W

— Tem — Sal
 ———— SigT



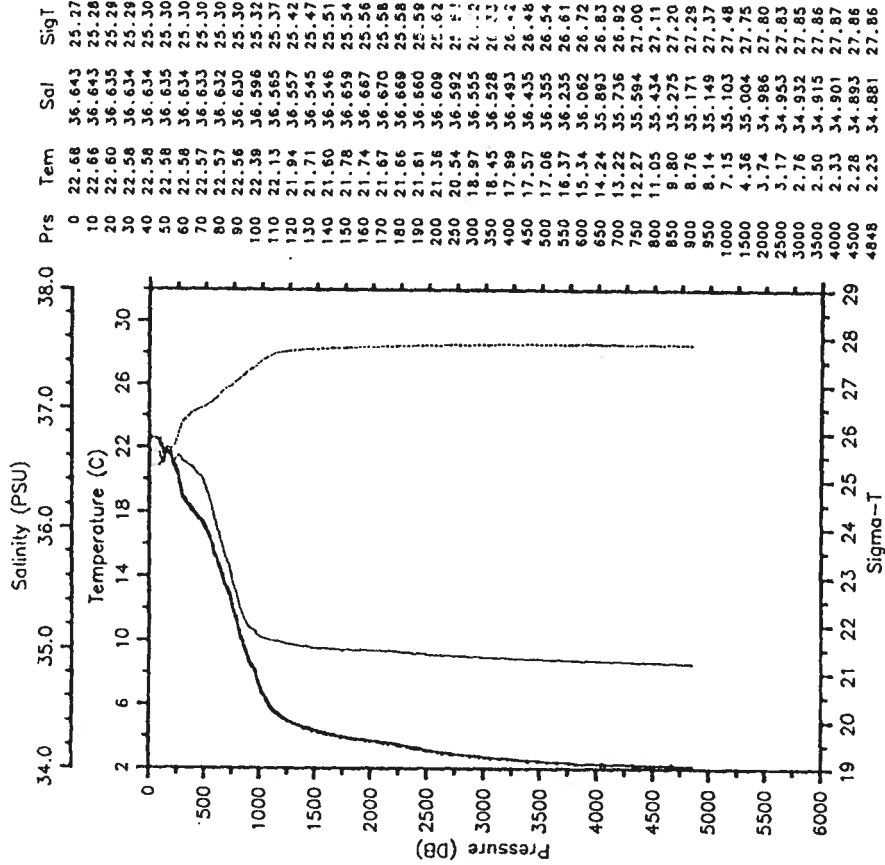
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 Time 1141 Z Longitude 75.924 W

— Tem — Sal
 ———— SigT



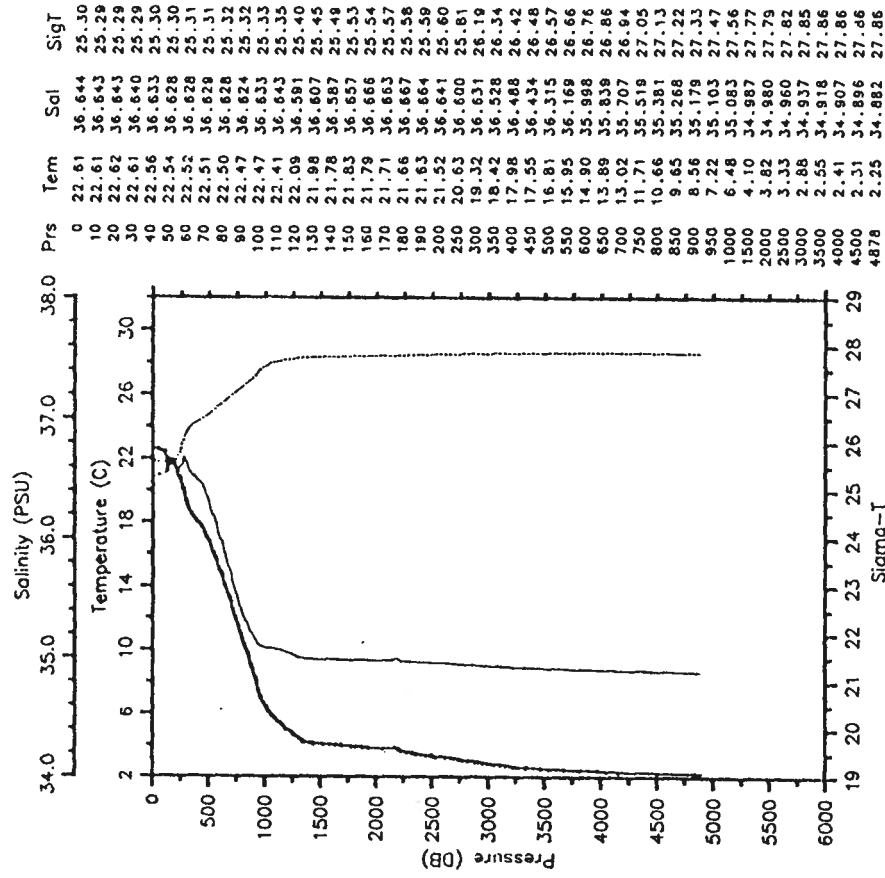
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 Date 03 18 87 Latitude 26.507 N
 Time 2117 Z Longitude 76.409 W

— Tem — Sal
 --- SigT



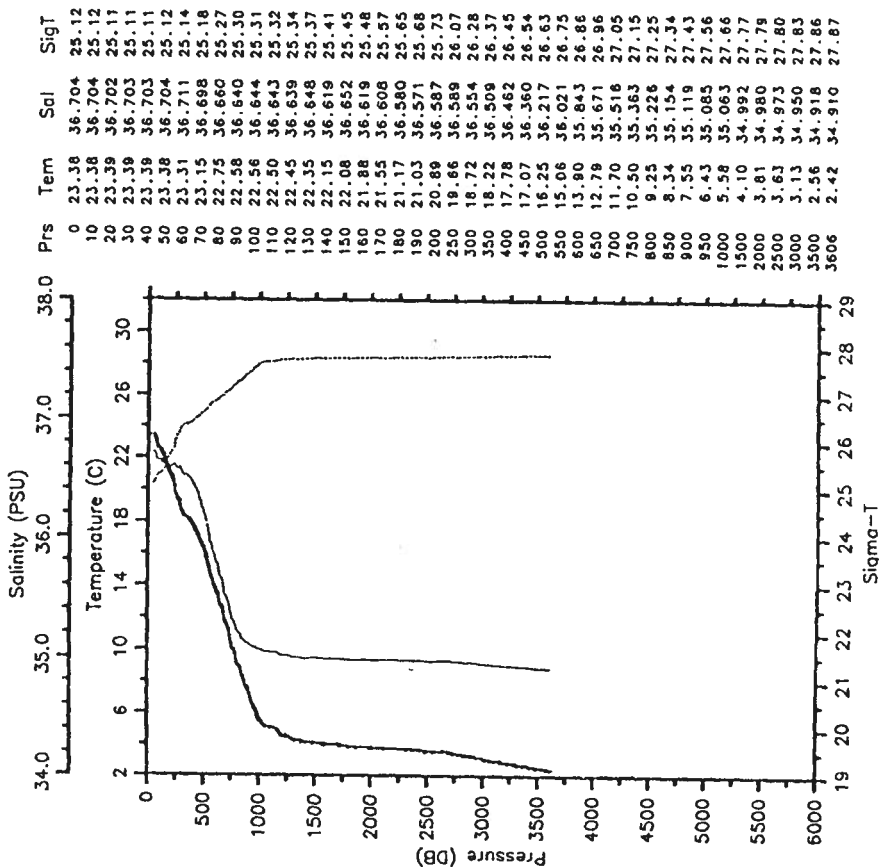
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 Date 03 19 87 Latitude 26.529 N
 Time 0223 Z Longitude 76.539 W

— Tem — Sal
 --- SigT



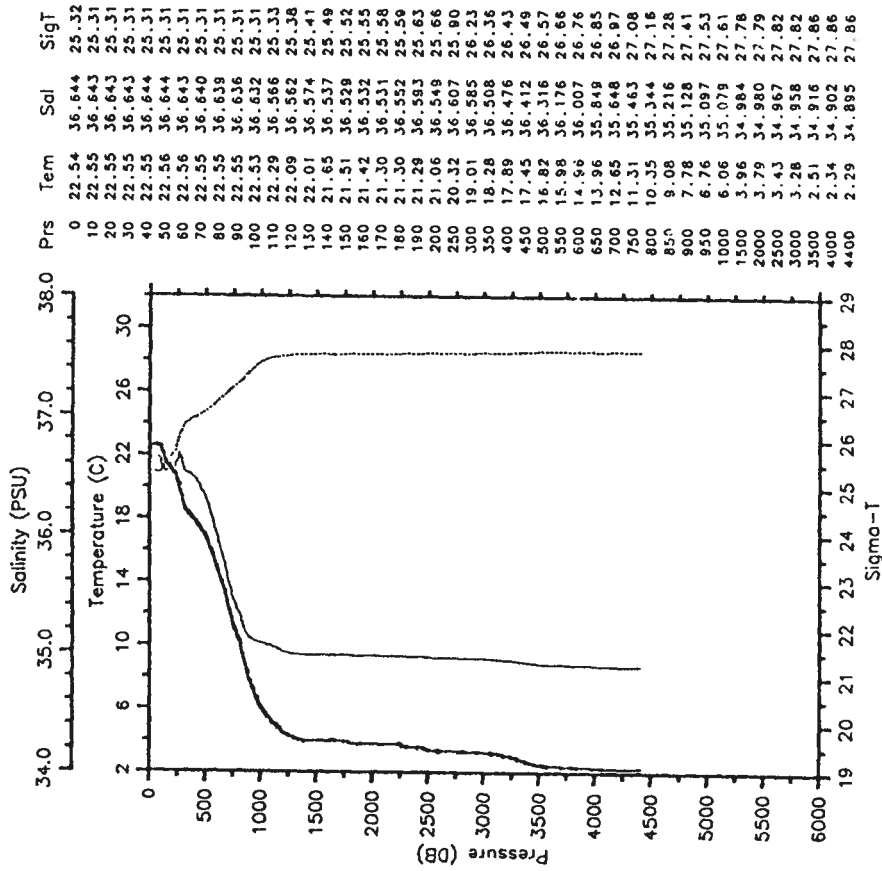
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 Date 03 19 87 Latitude 26.539 N
 Time 0848 Z Longitude 76.761 W

— Tem — Sal
 SigT



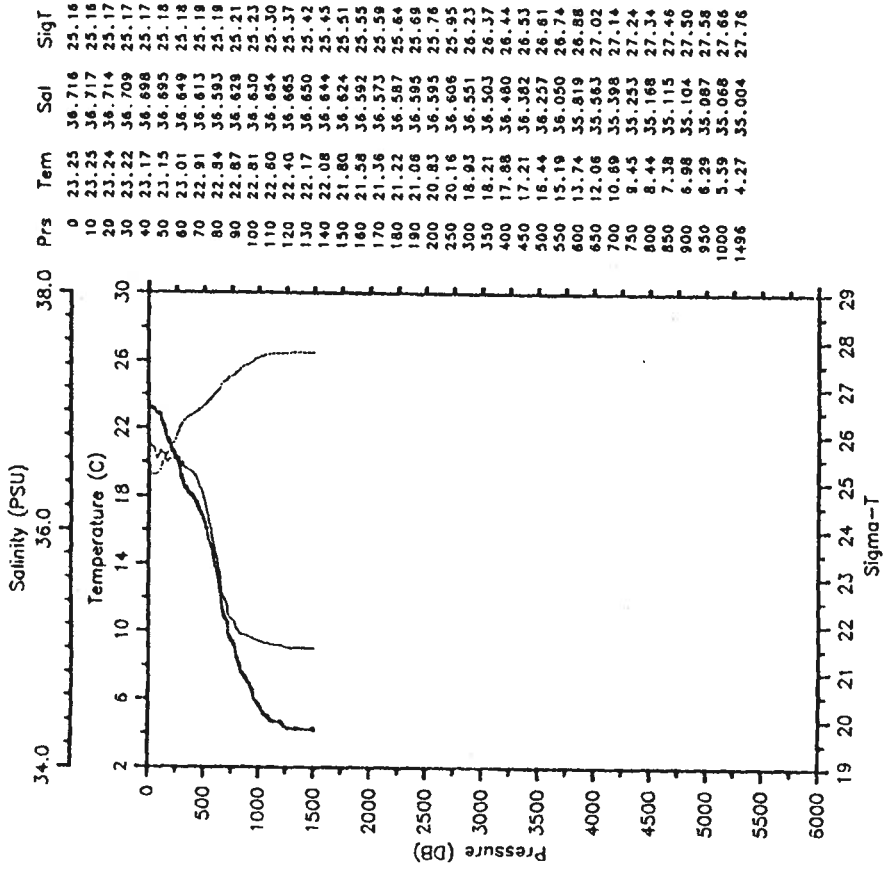
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 Time 1359 Z Longitude 76.656 W

— Tem — Sal
 SigT



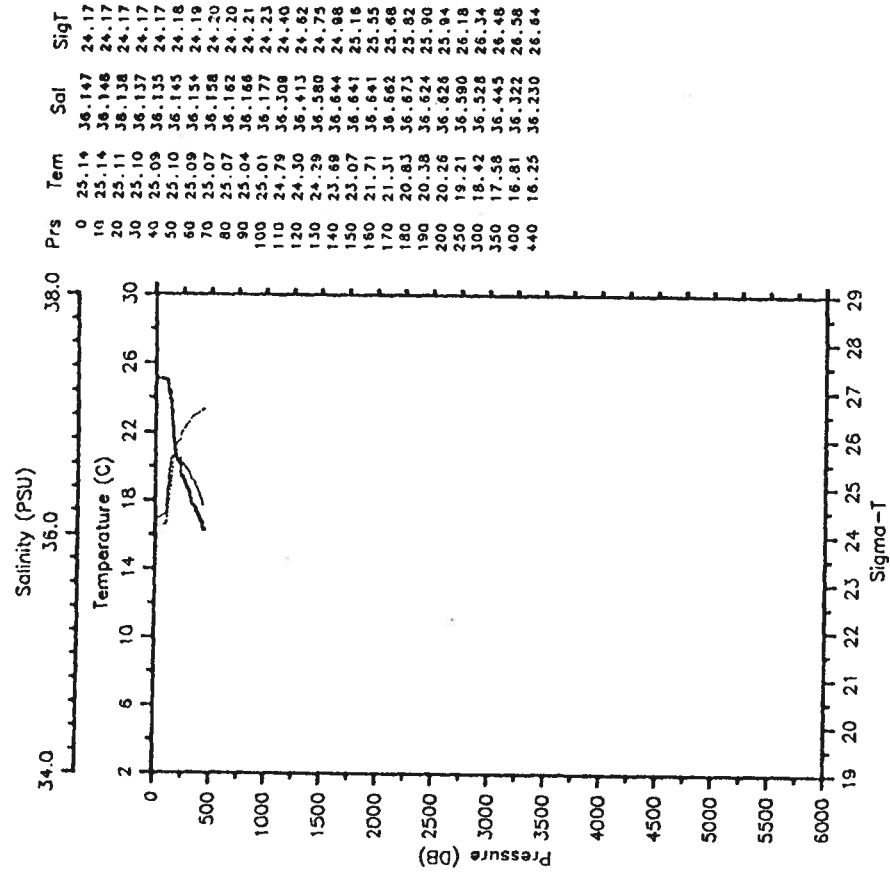
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 Date 03 19 87 Latitude 26.587 N
 Time 2125 Z Longitude 76.841 W

— Tem — Sal
 — SigT



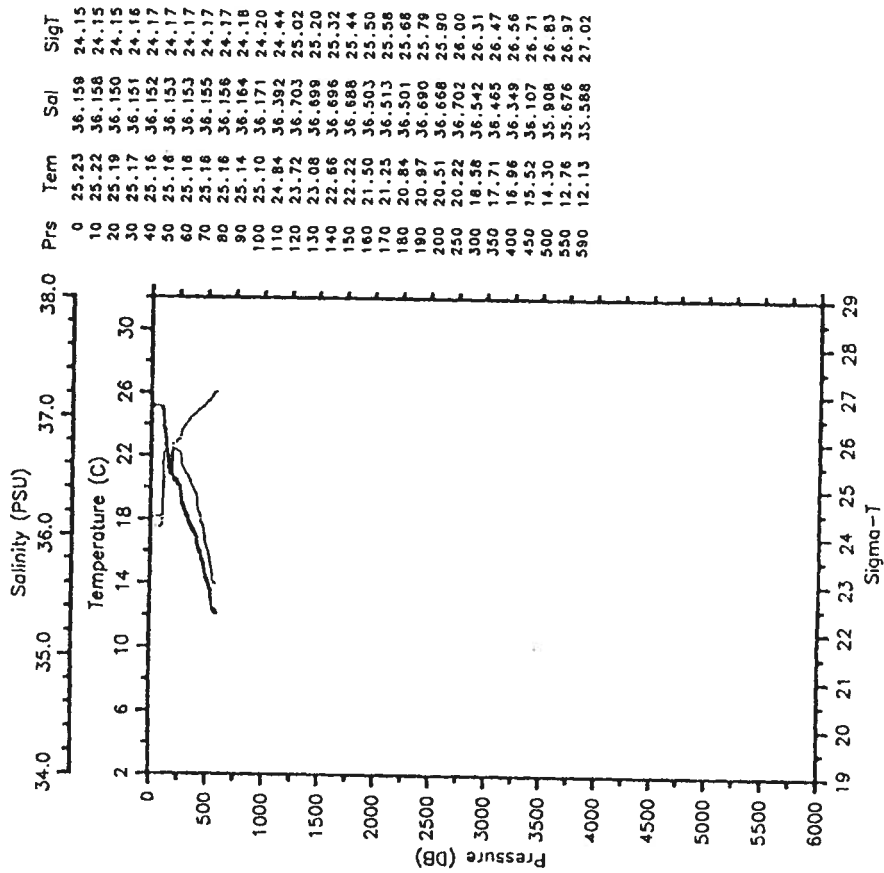
RES-STACS27-87 CTD 27 RESEARCHER
 Date 03 21 87 Latitude 27.016 N
 Time 0249 Z Longitude 79.201 W

— Tem — Sal
 — SigT



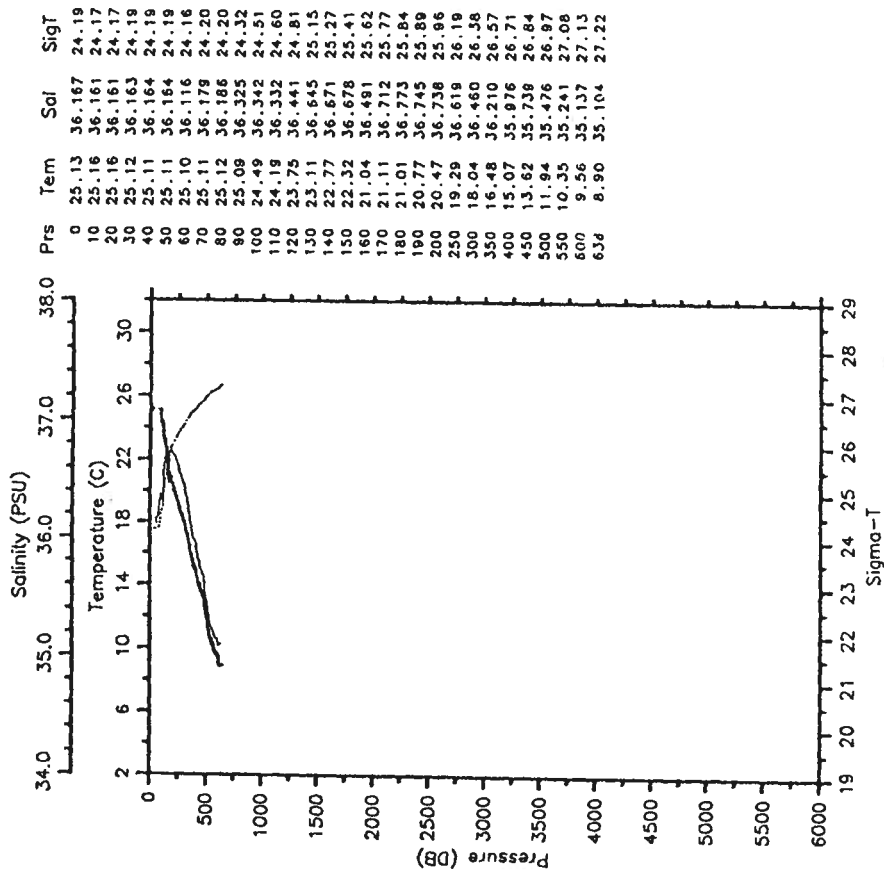
RES-STACS27-87 CTD 28 RESEARCHER
 Date 03 21 87 Latitude 27.009 N
 Time 0357 Z Longitude 79.286 W

— Tem — Sal
 — SigT



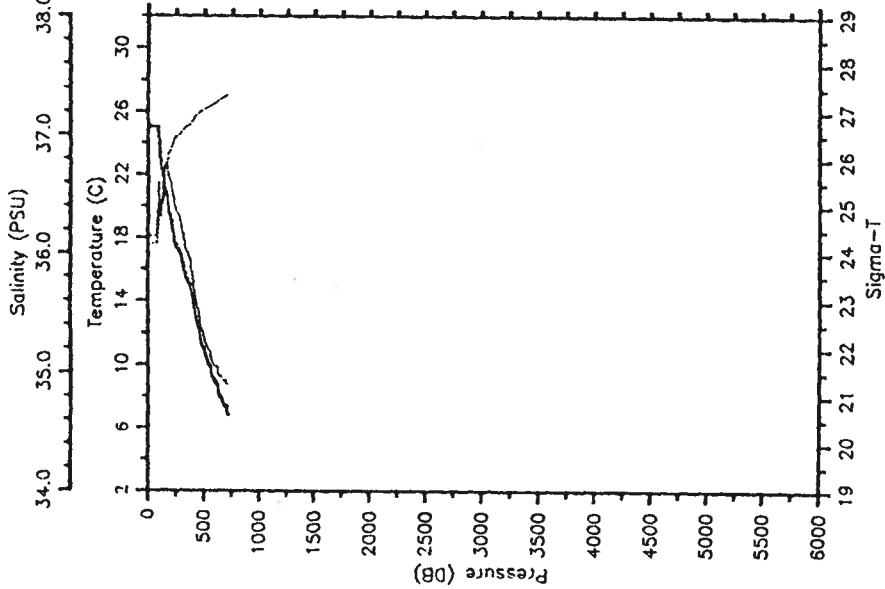
RES-STACS27-87 CTD 30 RESEARCHER
 Date 03 21 87 Latitude 27.045 N
 Time 0556 Z Longitude 79.394 W

— Tem — Sal
 — SigT



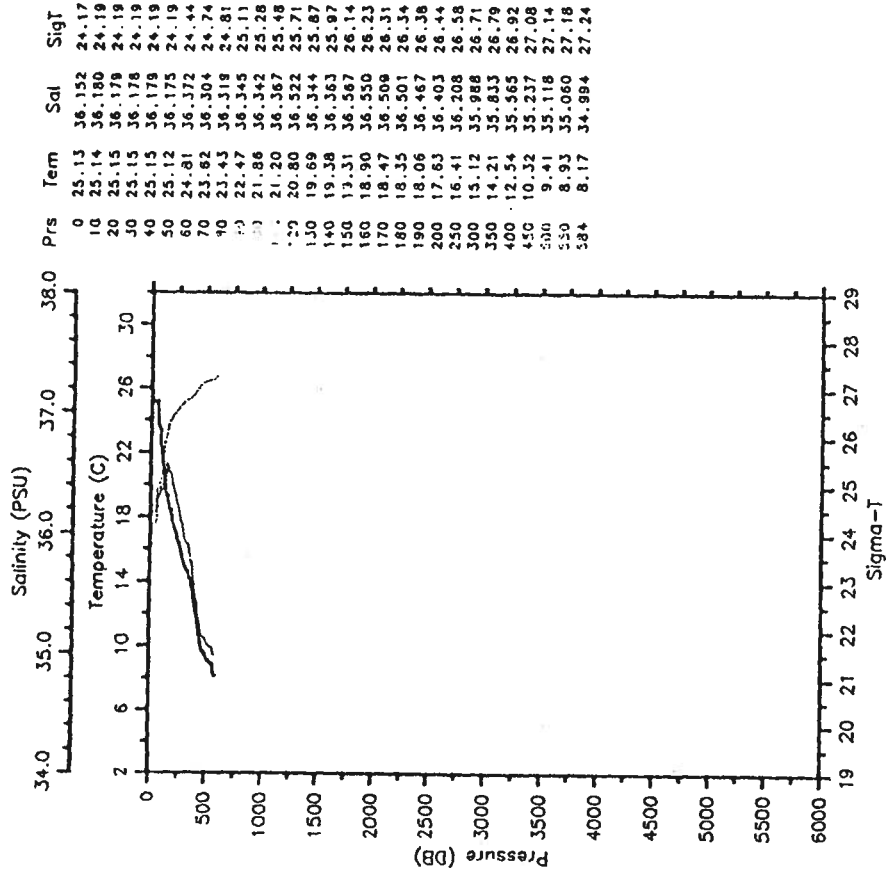
RES-STACS27-87 CTD 31 RESEARCHER
 Date 03 21 87 Latitude 27.023 N
 Time 0716 Z Longitude 79.508 W

— Tem — Sal
 — Sigma-T



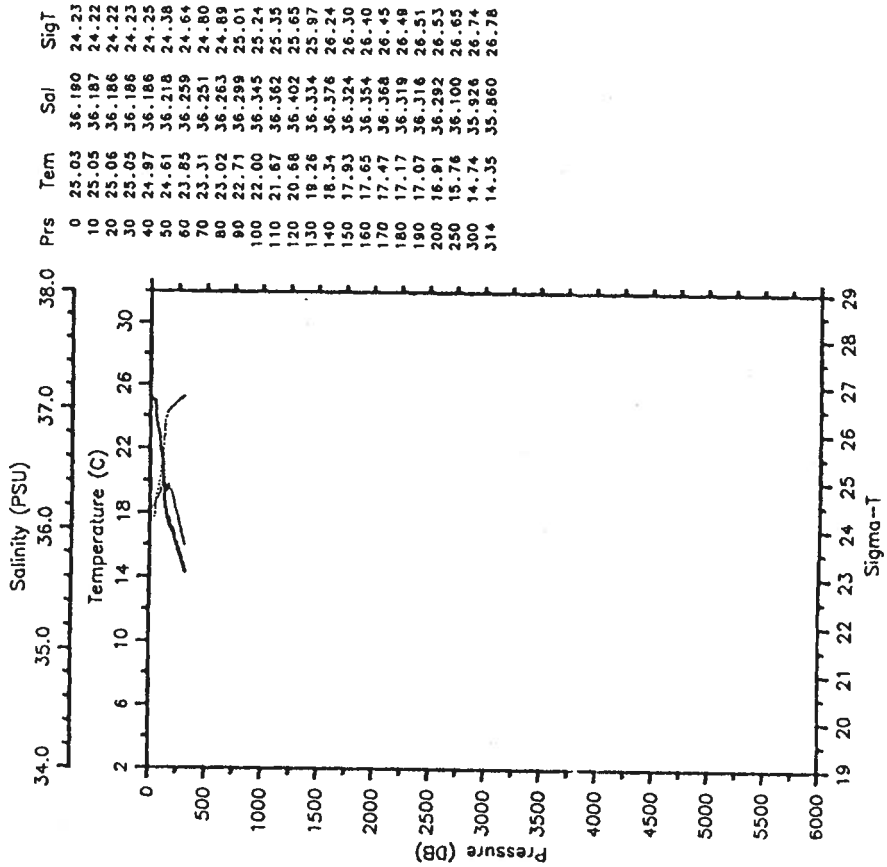
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 Date 03 21 87 Latitude 27.037 N
 Time 0900 Z Longitude 79.625 W

— Tem — Sal
 — Sigma-T



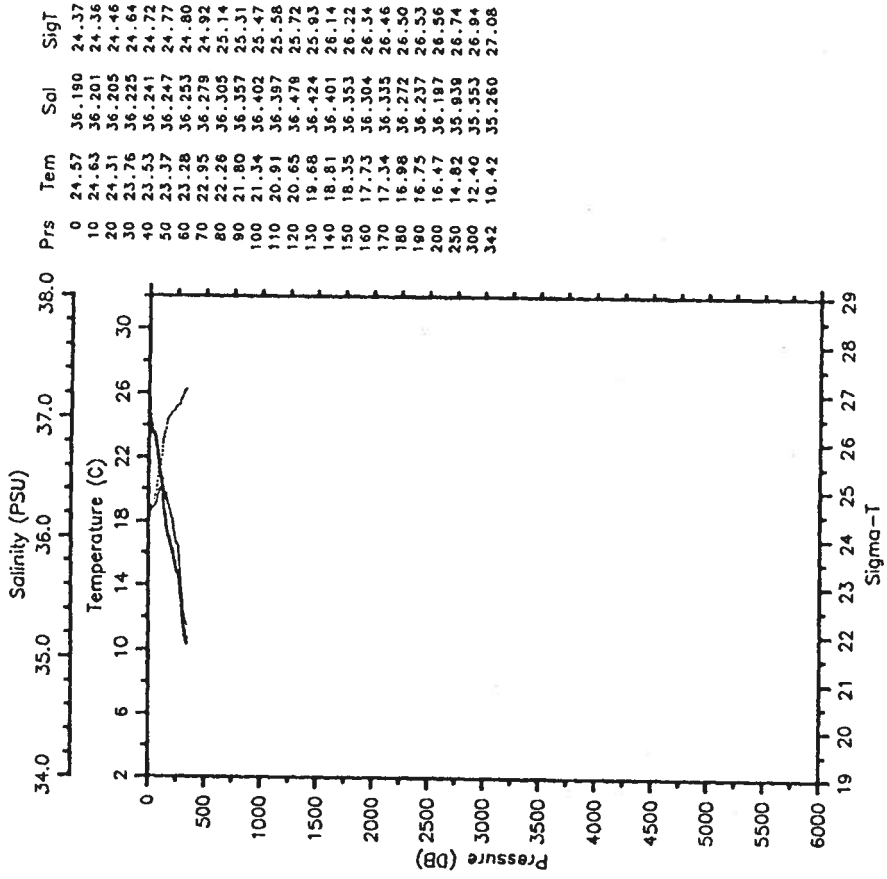
RES-STACS27-87 CTD 33 RESEARCHER
 Date 03 21 87 Latitude 27.022 N
 Time 1021 Z Longitude 79.685 W

— Tem — Sal
 — SigT



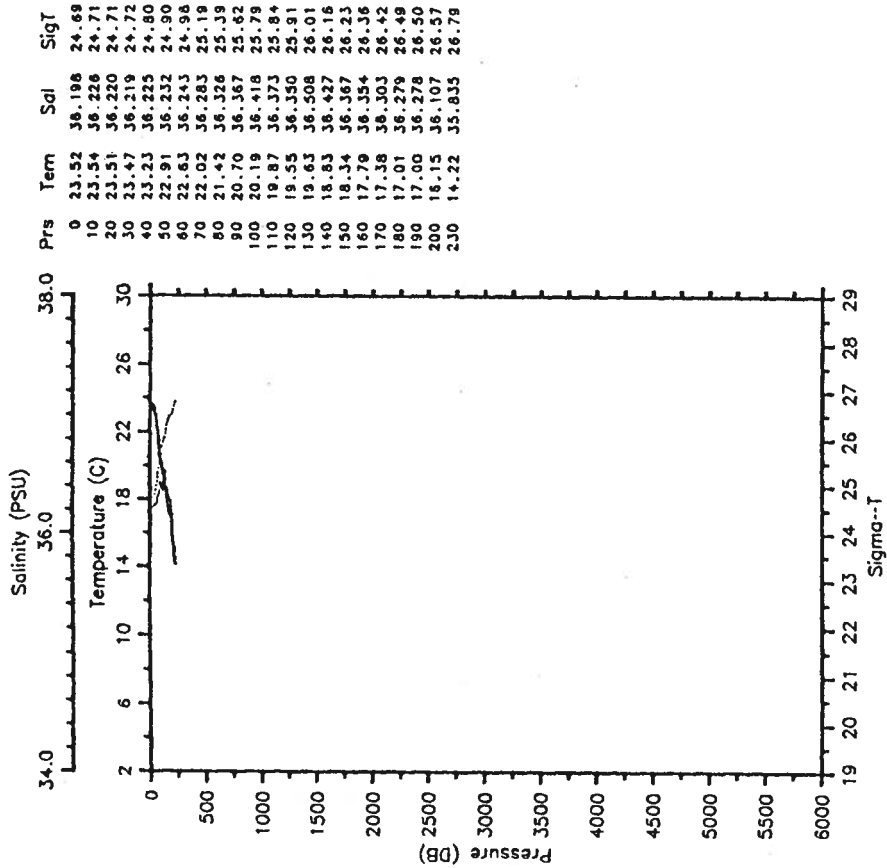
RES-STACS27-87 CTD 34 RESEARCHER
 Date 03 21 87 Latitude 27.017 N
 Time 1126 Z Longitude 79.802 W

— Tem — Sal
 — SigT



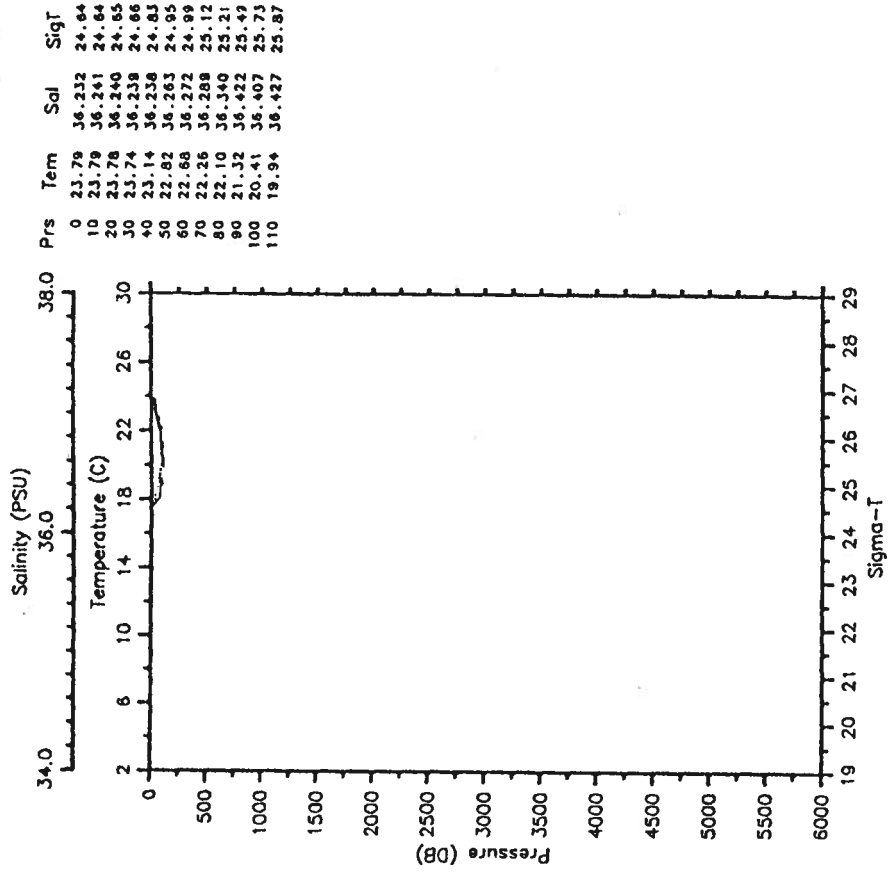
RES-STACS27-87 CTD 35 RESEARCHER
 Date 03 21 87 Latitude 27.005 N
 Time 1250 Z Longitude 79.867 W

— Tem — Sal
 — SigT



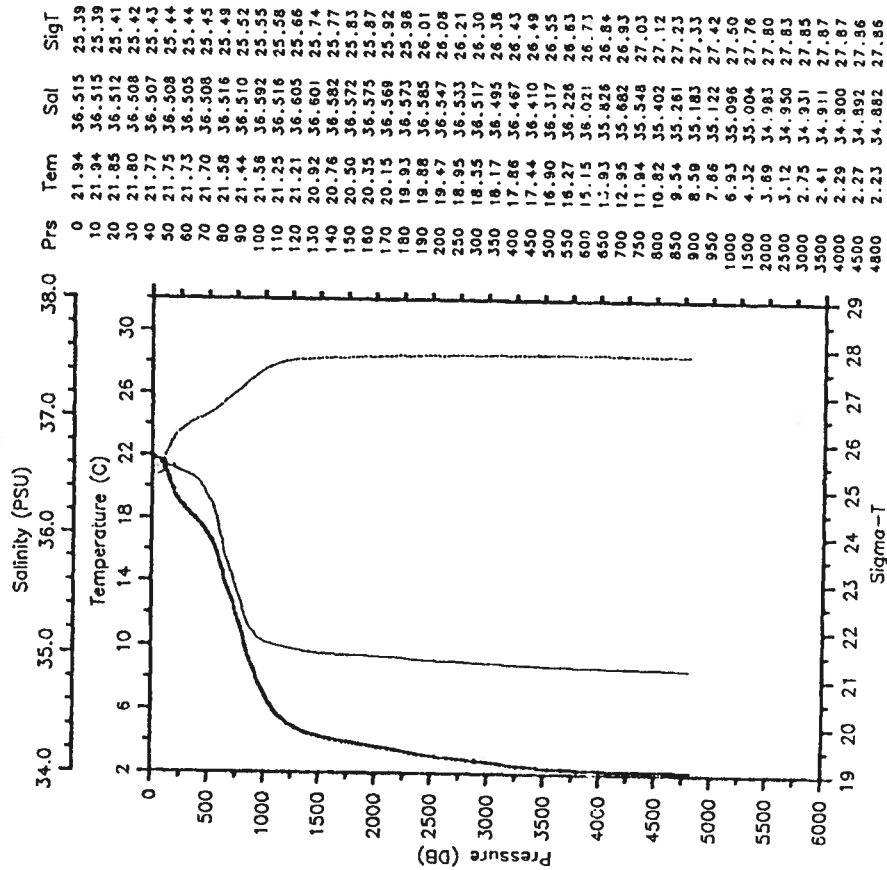
RES-STACS27-87 CTD 36 RESEARCHER
 Date 03 21 87 Latitude 26.999 N
 Time 1335 Z Longitude 79.931 W

— Tem — Sal
 — SigT



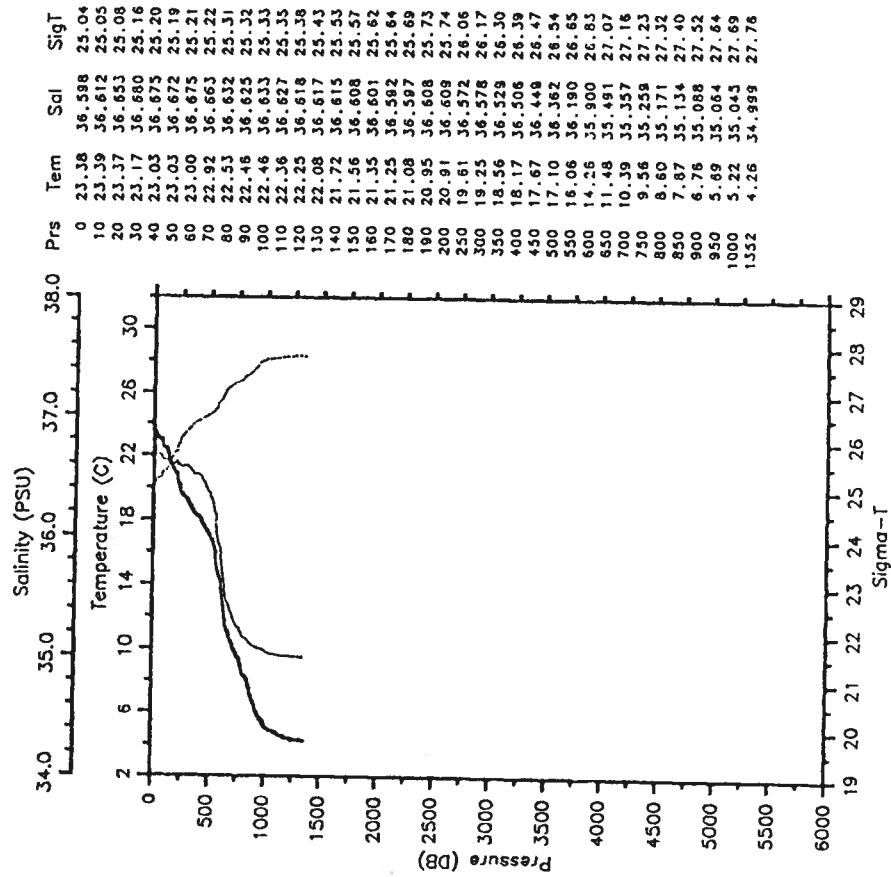
RES-STACS27-87 CTD 37 RESEARCHER
 Date 03 26 87 Latitude 26.477 N
 Time 0045 Z Longitude 76.137 W

— Tem — Sal
 ———— SigT



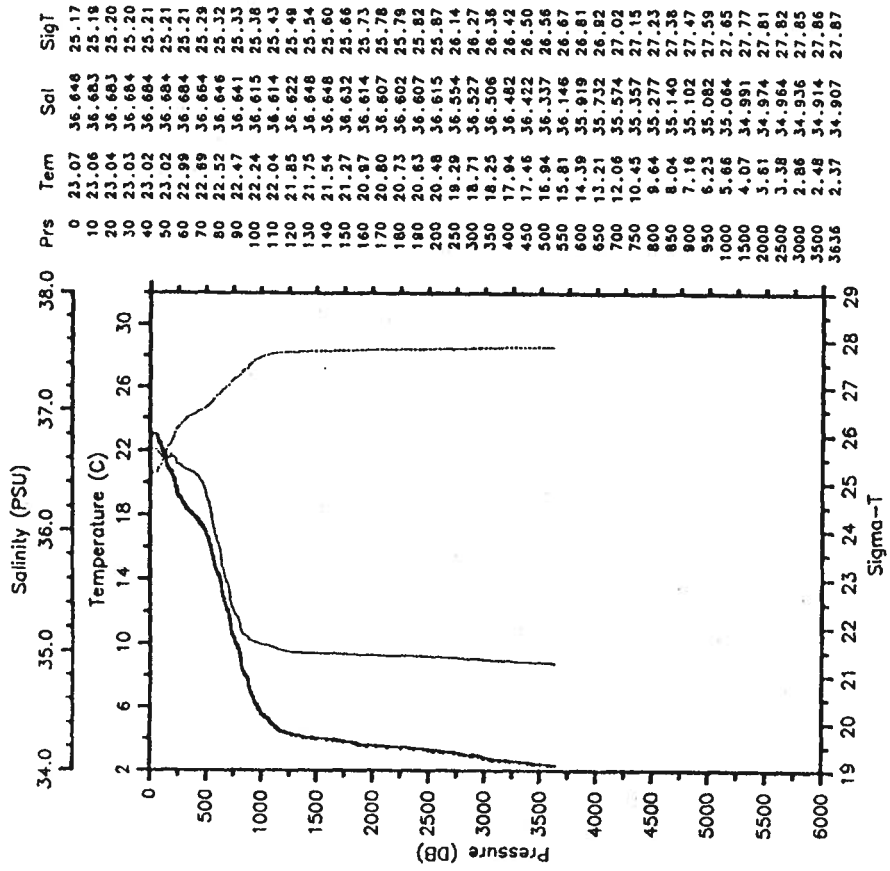
RES-STACS27-87 CTD 38 RESEARCHER
 Date 03 27 87 Latitude 26.555 N
 Time 0548 Z Longitude 76.845 W

— Tem — Sal
 ———— SigT



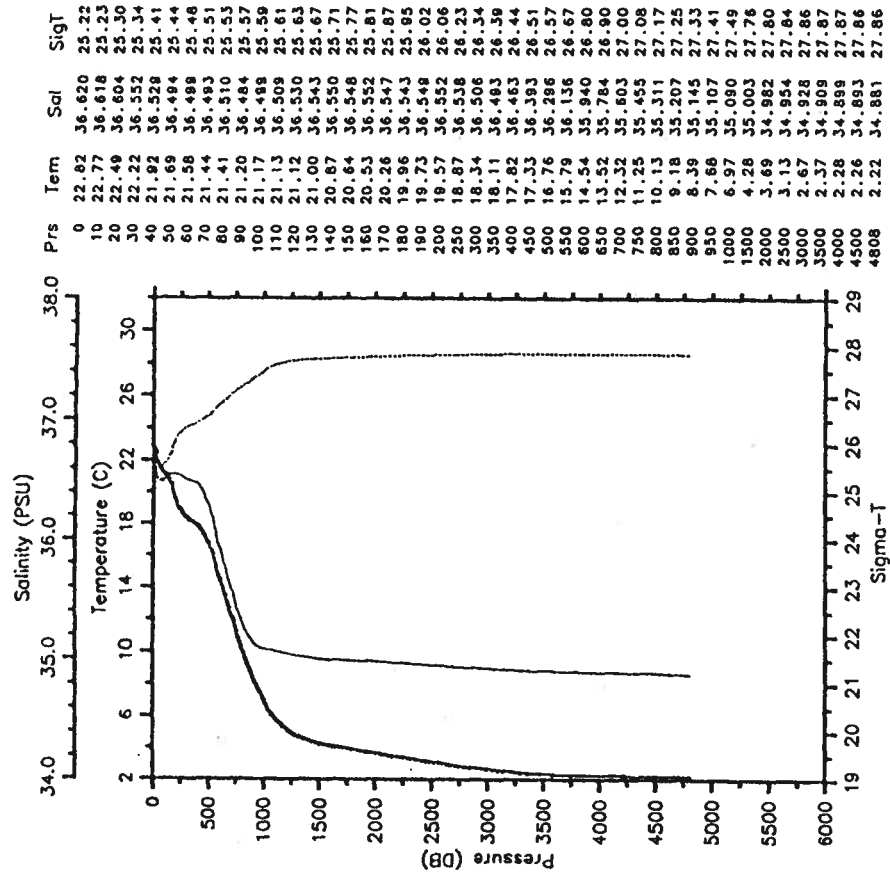
RES-STACS27-87 CTD 39 RESEARCHER
 Date 03 27 87 Latitude 26.545 N
 Time 0828 Z Longitude 76.755 W

— Tem — Sal
 — SigT



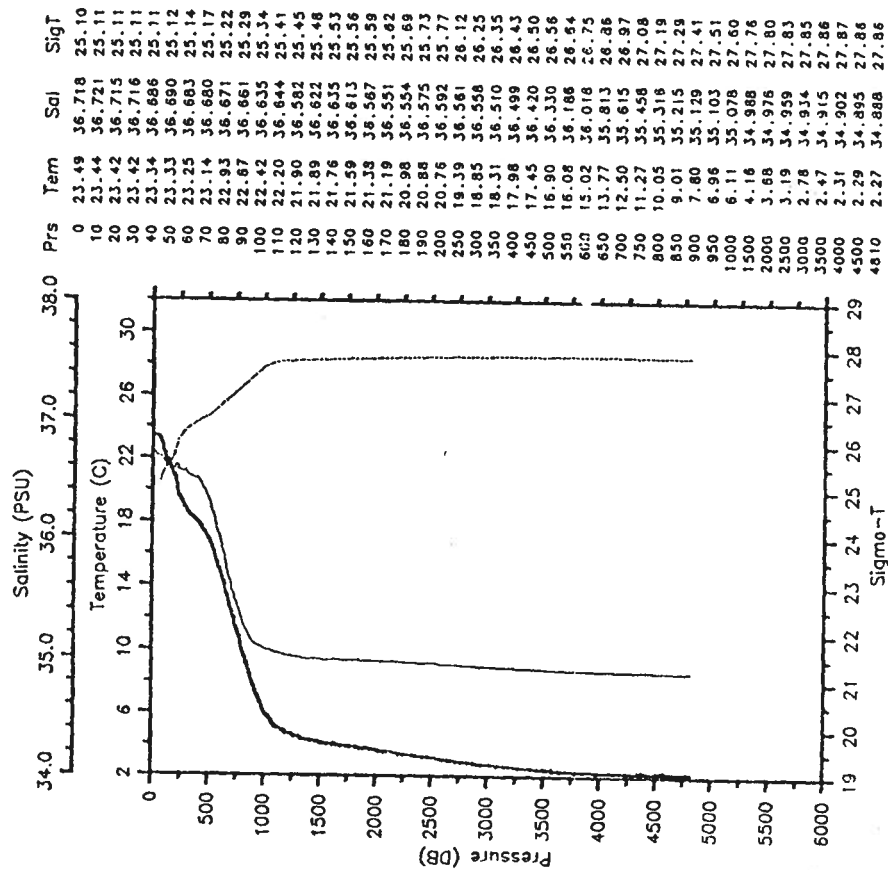
RES-STACS27-87 CTD 40 RESEARCHER
 Date 03 28 87 Latitude 26.474 N
 Time 0215 Z Longitude 75.916 W

— Tem — Sal
 — SigT



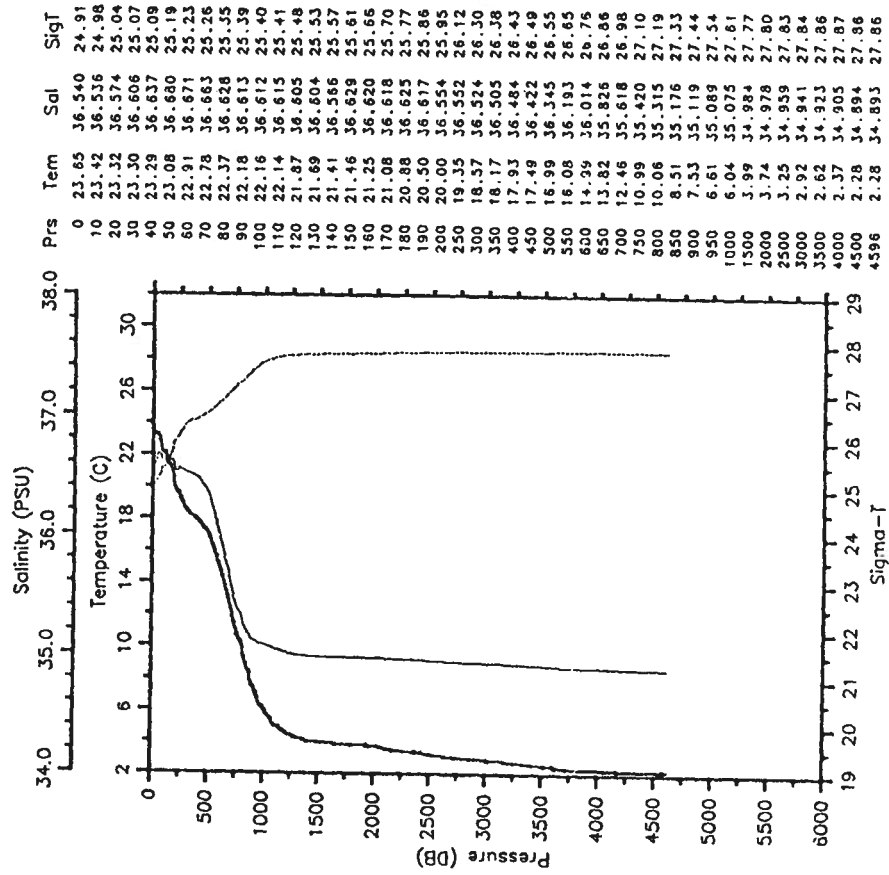
RES-STACS27-87 CTD 41 RESEARCHER
 Date 03 28 87 Latitude 26.536 N
 Time 0746 Z Longitude 76.526 W

— Tem — Sal
 --- SigT



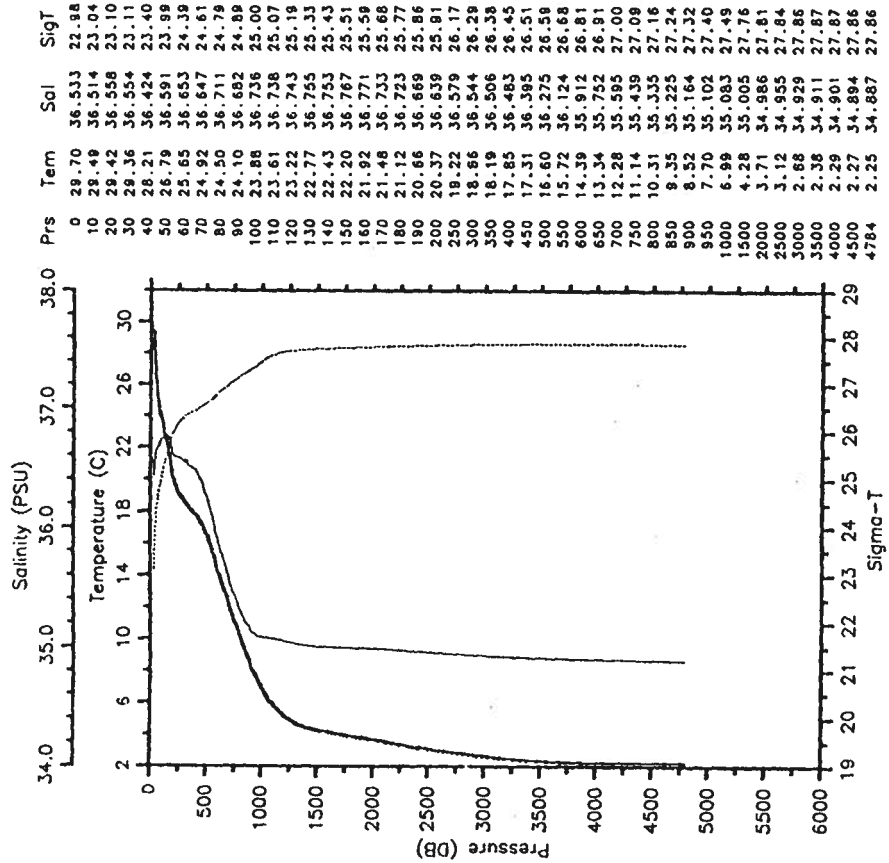
RES-STACS27-87 CTD 42 RESEARCHER
 Date 03 28 87 Latitude 26.588 N
 Time 2034 Z Longitude 76.62 0

— Tem — Sal
 --- SigT



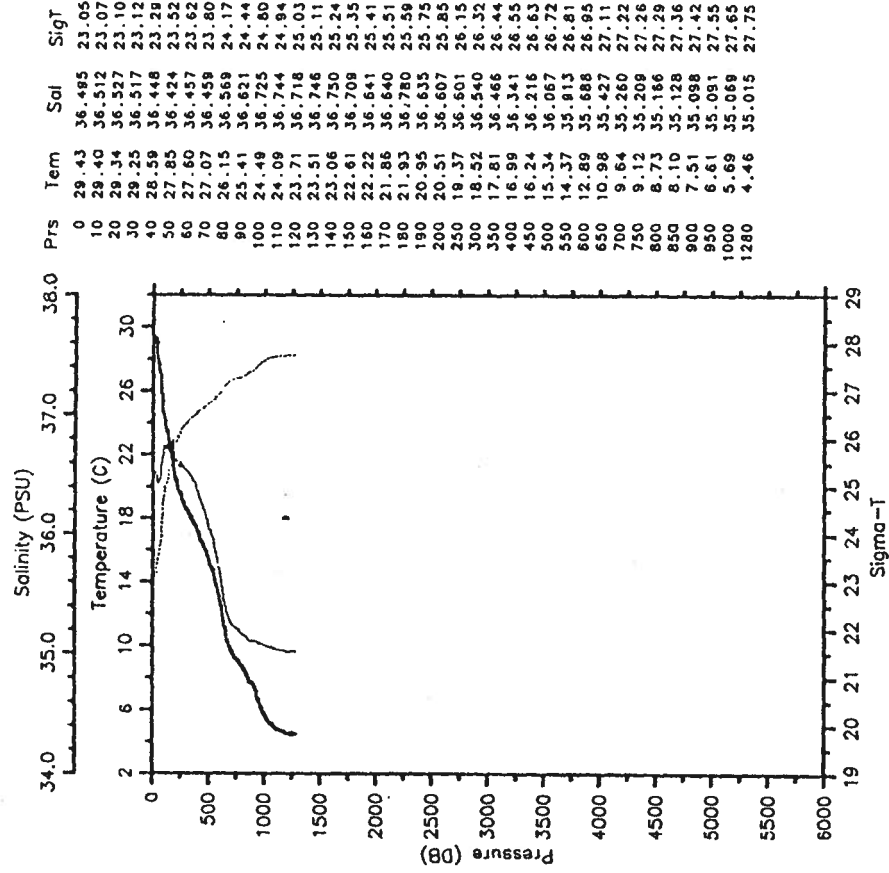
RES-STACS28-87 CTD 1 RESEARCHER
 Date 09 02 87 Latitude 26.500 N
 Time 1800 Z Longitude 75.947 W

— Tem — Sal
 - - - SigT



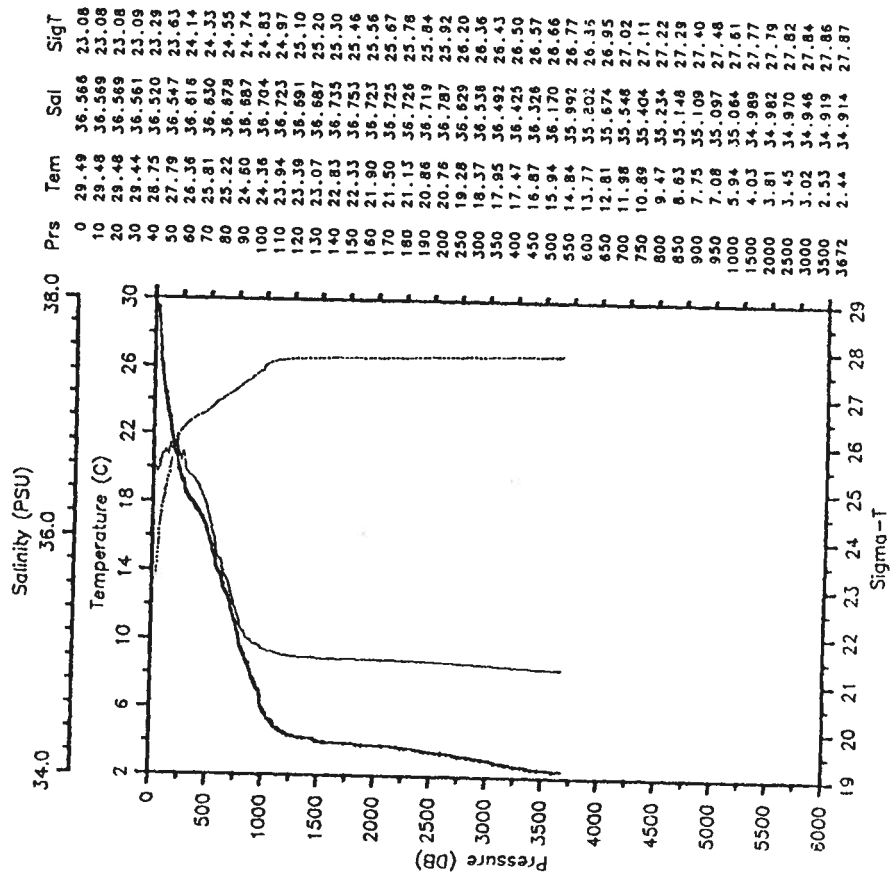
RES-STACS28-87 CTD 2 RESEARCHER
 Date 09 03 87 Latitude 26.562 N
 Time 0540 Z Longitude 76.848 W

— Tem — Sal
 - - - SigT



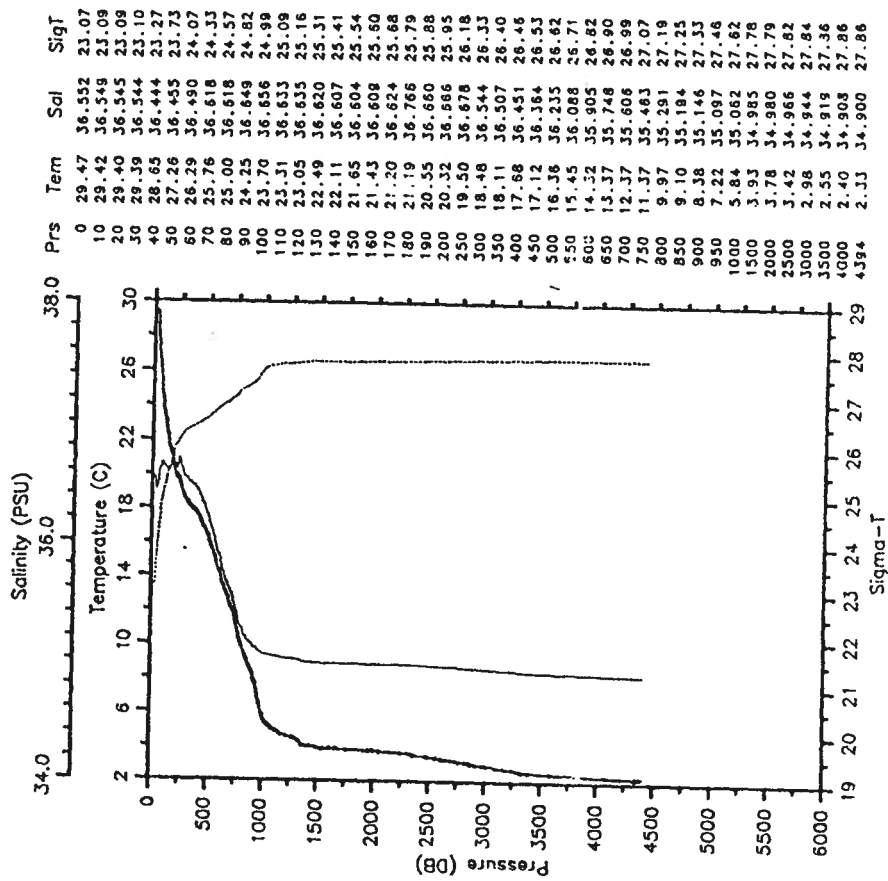
RES-STACS28-87 CTD 3 RESEARCHER
 Date 09 03 87 Latitude 26.550 N
 Time 1008 Z Longitude 76.767 W

— Tem — Sal
 — SigT



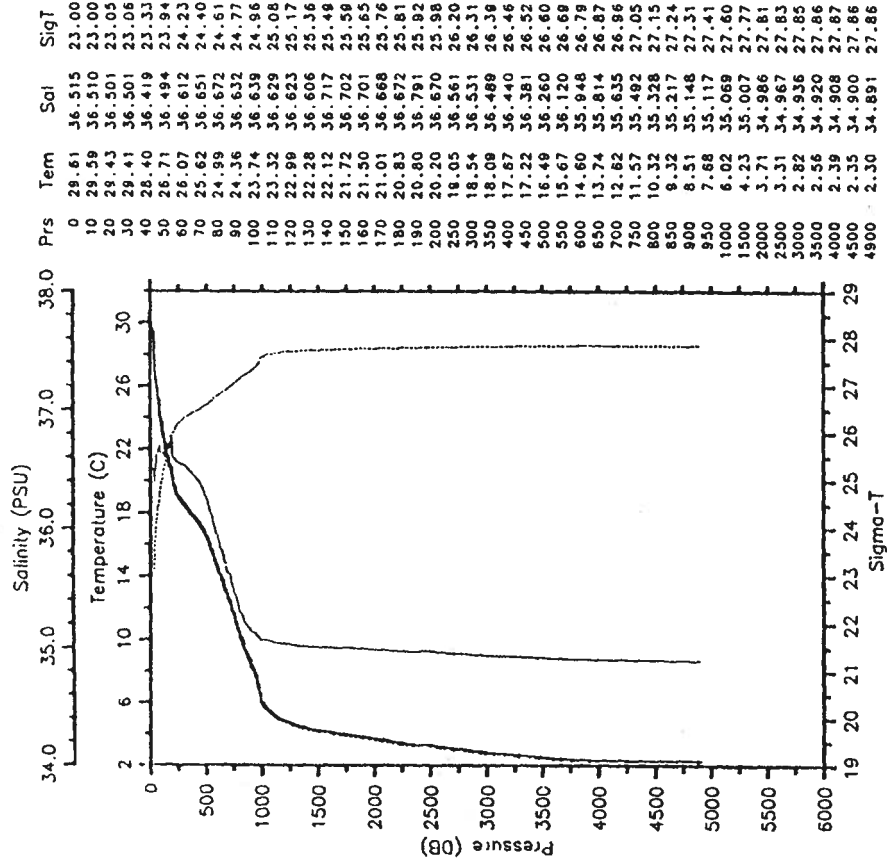
RES-STACS28-87 CTD 4 RESEARCHER
 Date 09 03 87 Latitude 26.577 N
 Time 1537 Z Longitude 76.627 W

— Tem — Sal
 — SigT



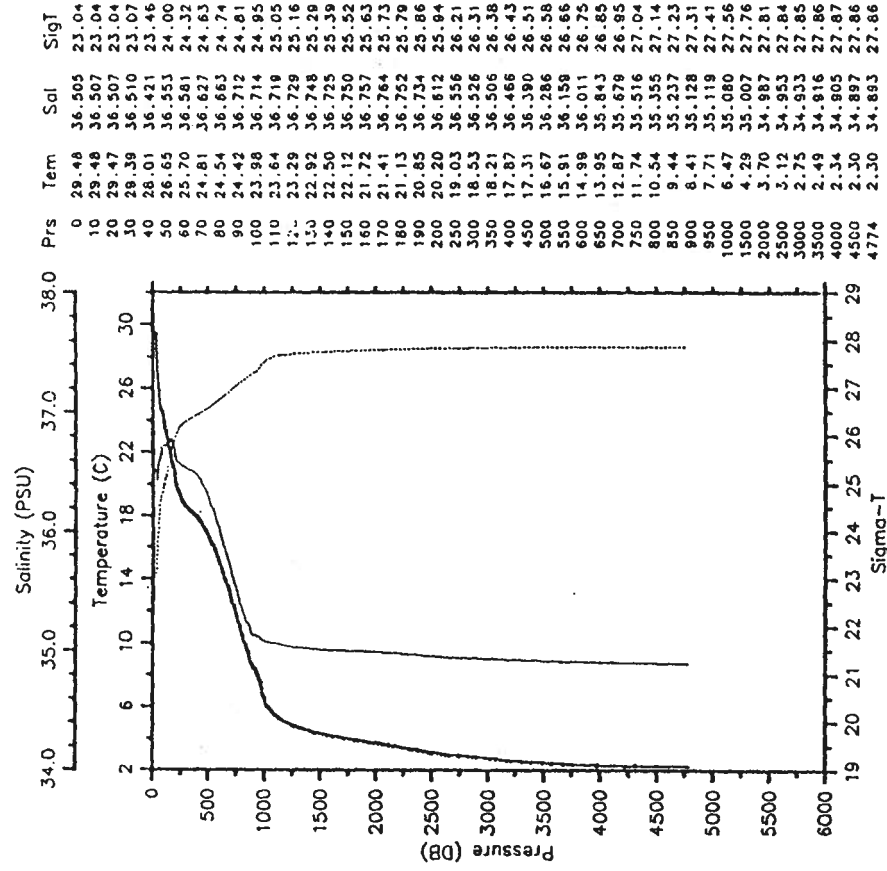
RES-STACS28-87 CTD 5 RESEARCHER
 Date 09 03 87 Latitude 26.552 N
 Time 2216 Z Longitude 76.535 W

— Tem — Sal
 - - - - - SigT



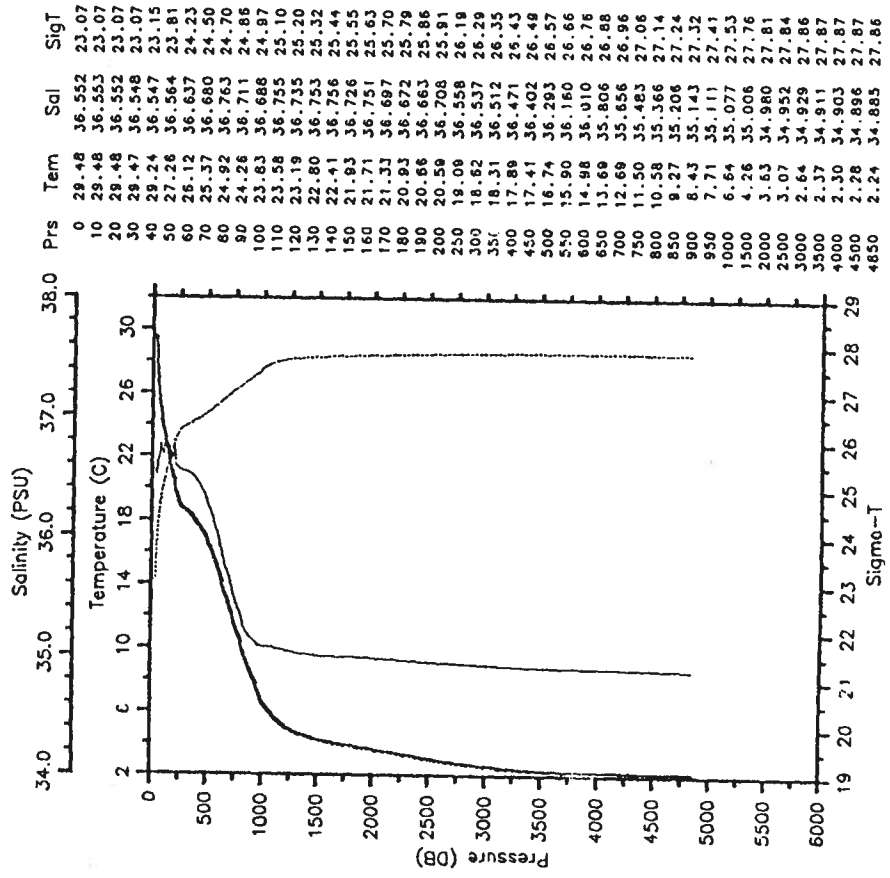
RES-STACS28-87 CTD 6 RESEARCHER
 Date 09 04 87 Latitude 26.522 N
 Time 0642 Z Longitude 76.408 W

— Tem — Sal
 - - - - - SigT



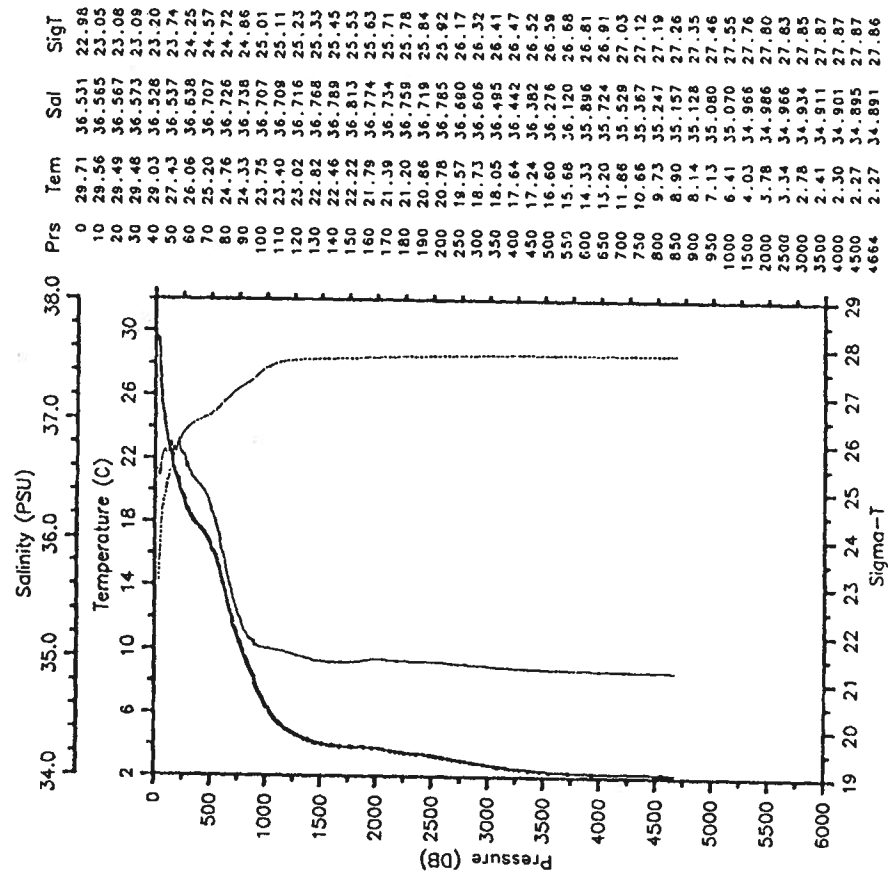
RES-STACS28-87 CTD 7 RESEARCHER
 Date 09 04 87 Latitude 26.483 N
 Time 1118 Z Longitude 76.157 W

--- Tem --- Sal
 --- SigT



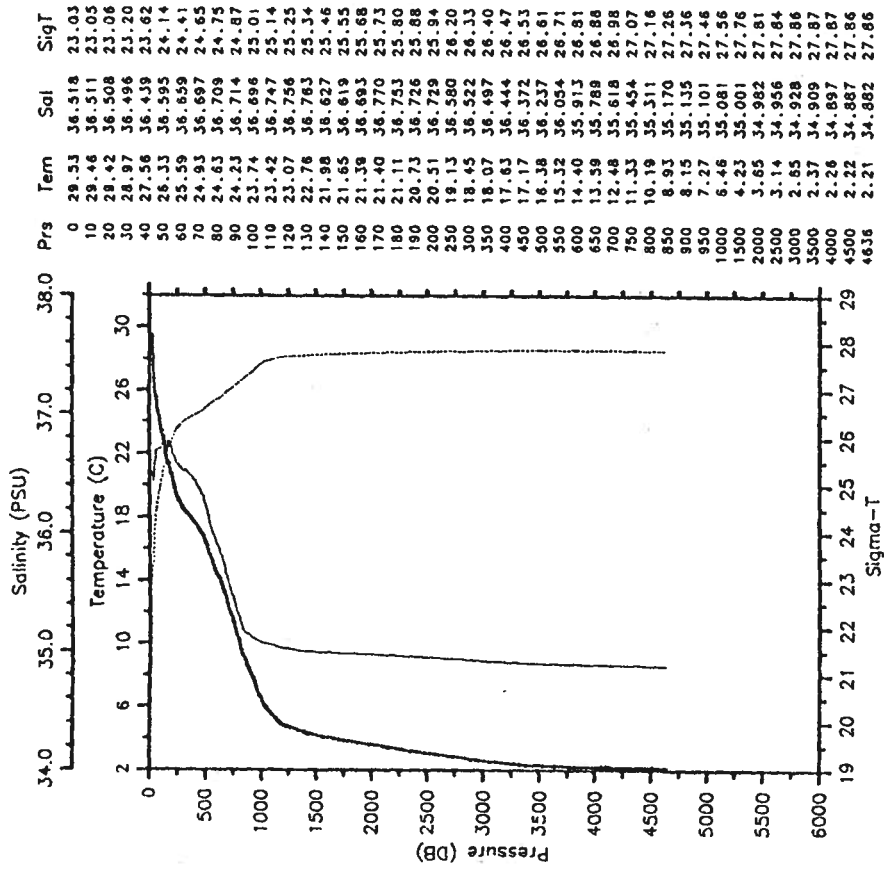
RES-STACS28-87 CTD 8 RESEARCHER
 Date 09 04 87 Latitude 26.468 N
 Time 1953 Z Longitude 75.532 W

--- Tem --- Sal
 --- SigT



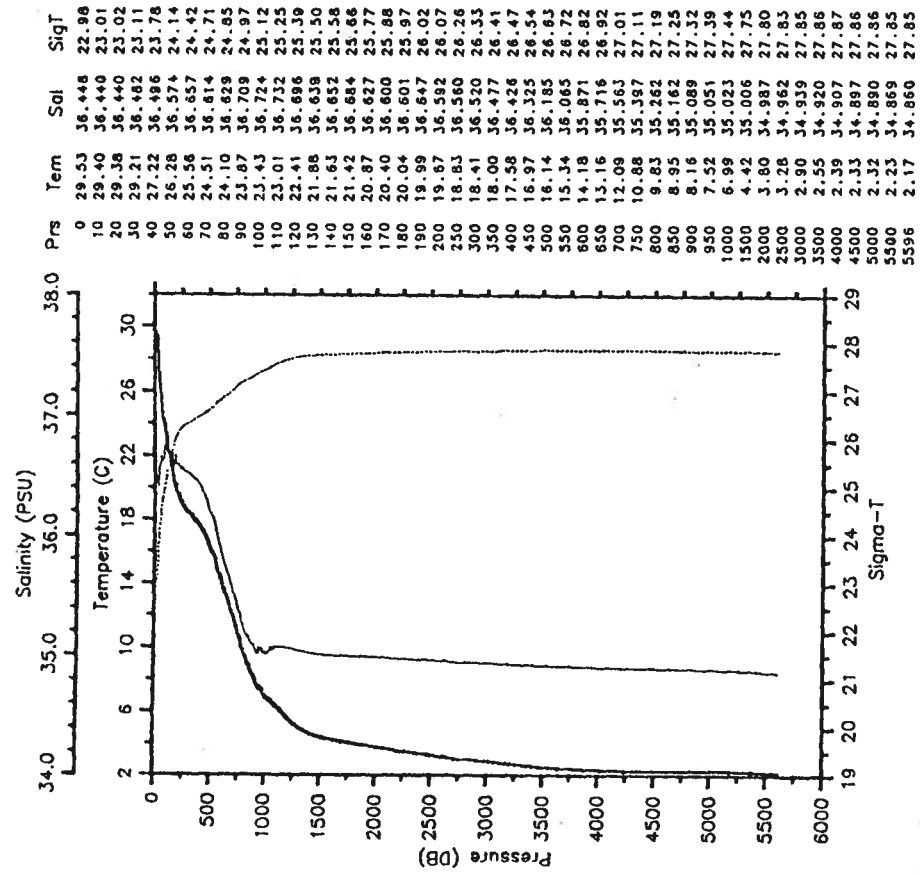
RES-STACS28-87 CTD 9 RESEARCHER
 Date 09 05 87 Latitude 26.467 N
 Time 0332 Z Longitude 75.025 W

— Tem — Sal
 — Sigma-T



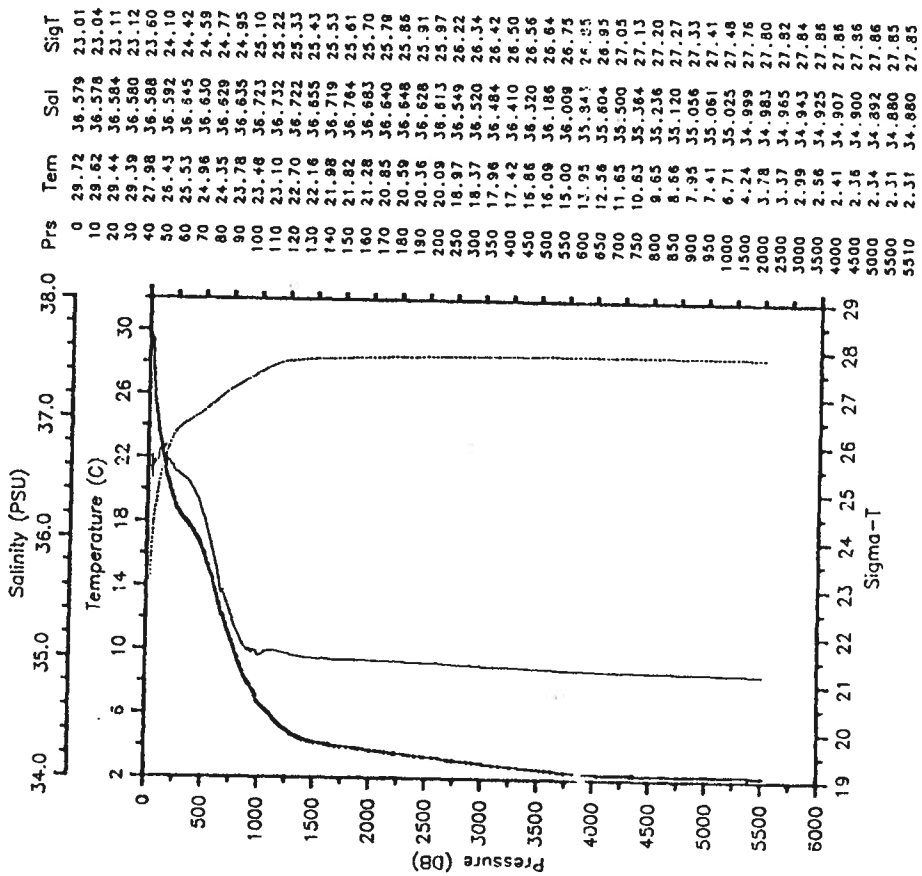
RES-STACS28-87 CTD 10 RESEARCHER
 Date 09 05 87 Latitude 24.270 N
 Time 2220 Z Longitude 72.023 W

— Tem — Sal
 — Sigma-T



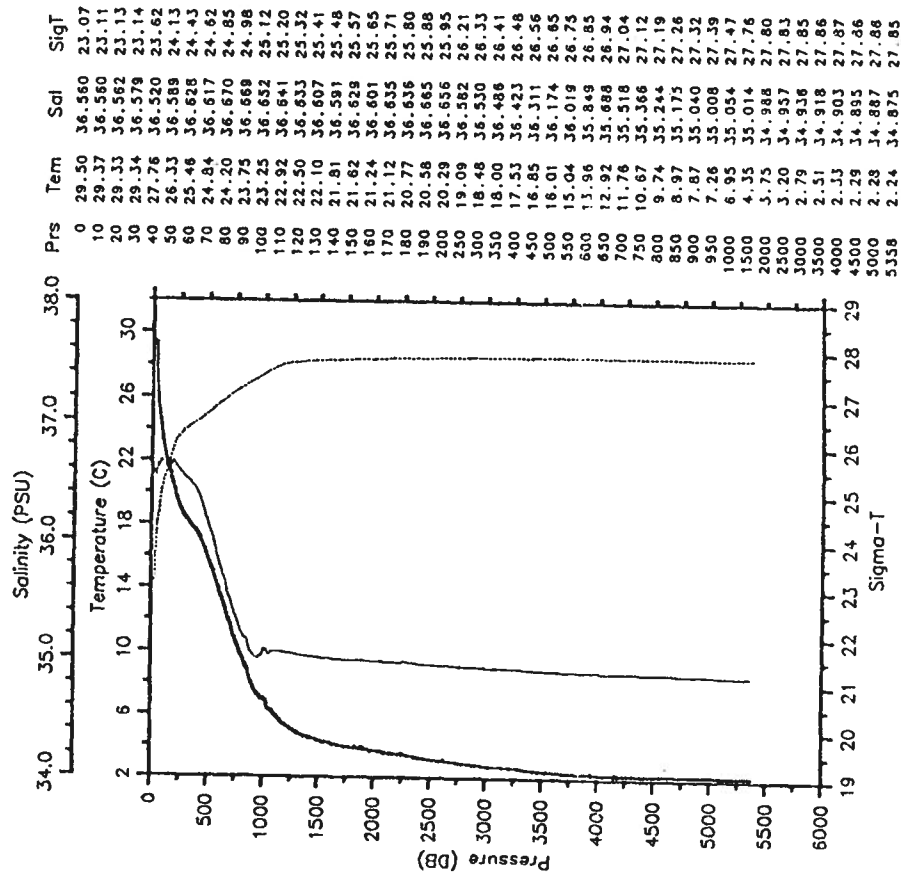
RES-STACS28-87 CTD 11 RESEARCHER
 Date 09 06 87 Latitude 23.917 N
 Time 0313 Z Longitude 72.183 W

— Tem — Sal
 — SigT



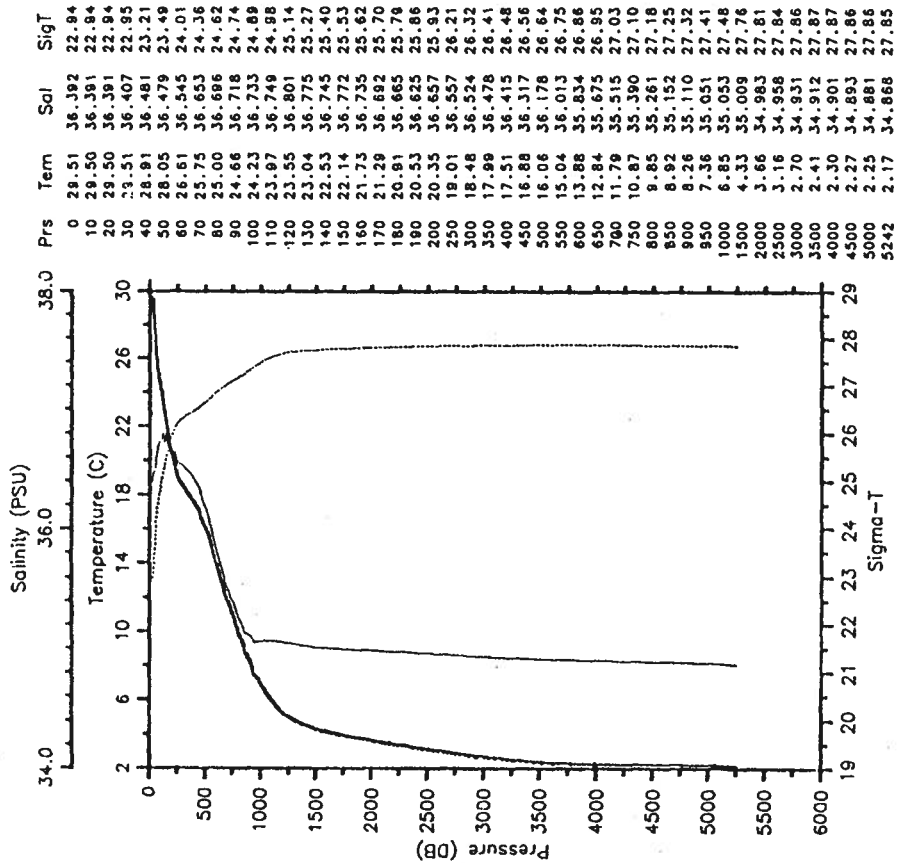
RES-STACS28-87 CTD 12 RESEARCHER
 Date 09 06 87 Latitude 23.570 N
 Time 0827 Z Longitude 72.332 W

— Tem — Sal
 — SigT



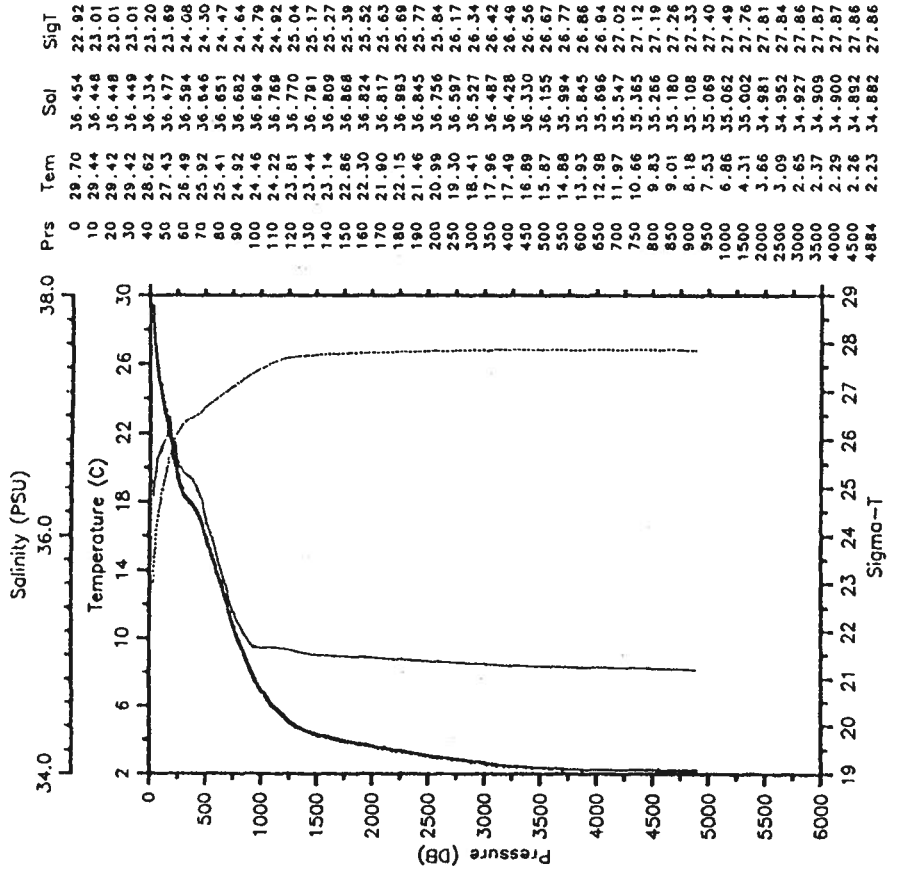
RES-STACS28-87 CTD 13 RESEARCHER
 Date 09 06 87 Latitude 23.263 N
 Time 1252 Z Longitude 72.450 W

— Tem — Sal
 - - - SigT



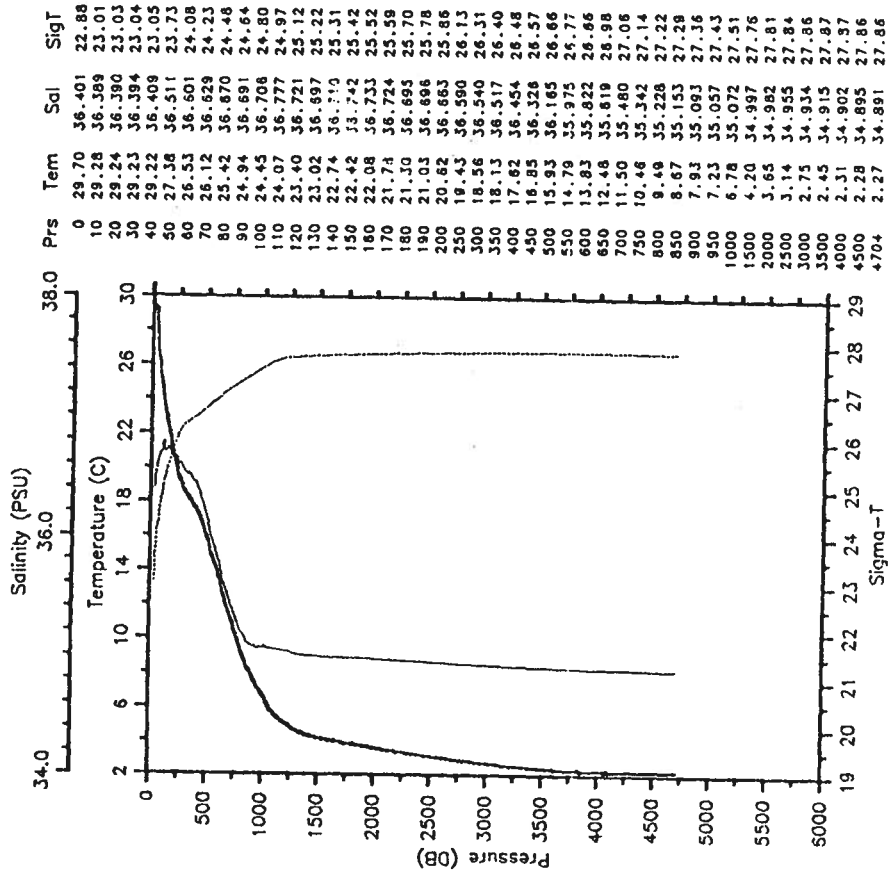
RES-STACS28-87 CTD 14 RESEARCHER
 Date 09 06 87 Latitude 22.945 N
 Time 1718 Z Longitude 72.587 W

— Tem — Sal
 - - - SigT



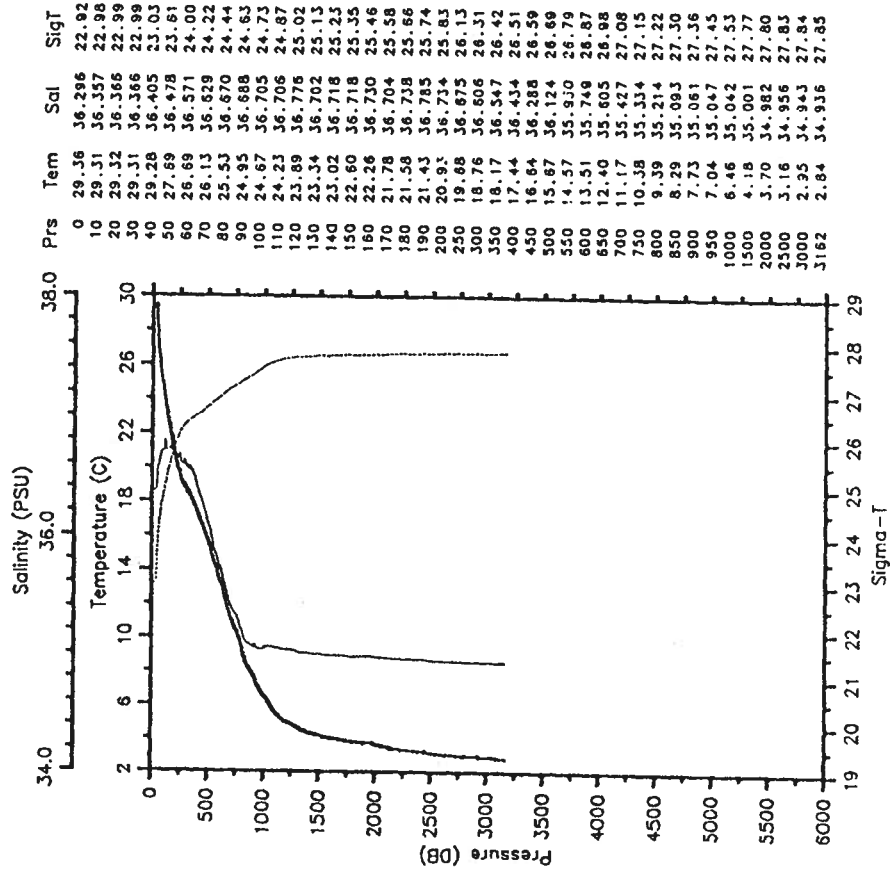
RES-STACS28-87 CTD 15 RESEARCHER
 Date 09 06 87 Latitude 22.700 N
 Time 2108 Z Longitude 72.682 W

— Tem — Sal
 — SigT



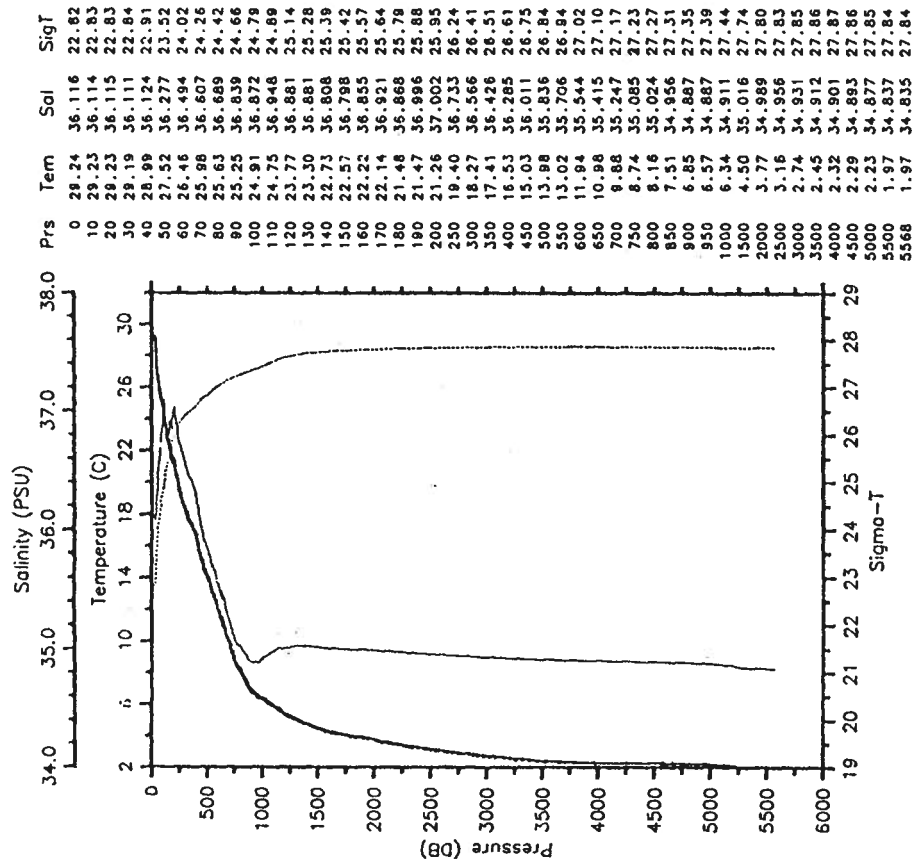
RES-STACS28-87 CTD 16 RESEARCHER
 Date 09 06 87 Latitude 22.467 N
 Time 2338 Z Longitude 72.767 W

— Tem — Sal
 — SigT



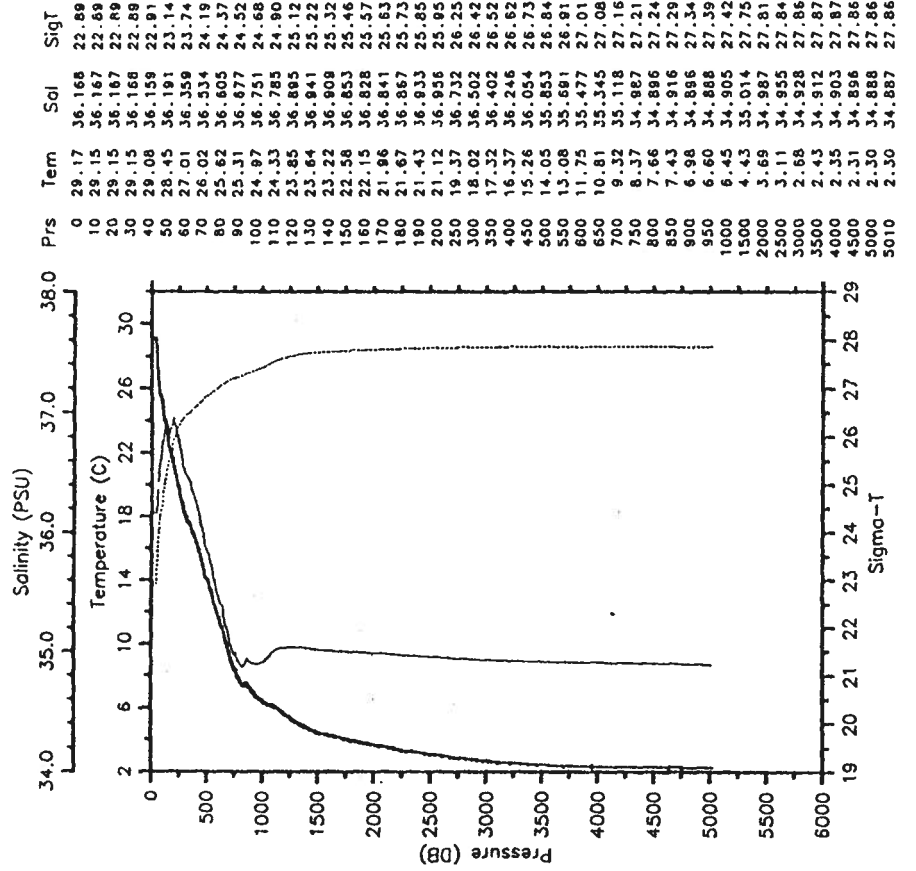
RES-STACS28-87 CTD 17 RESEARCHER
 Date 09 08 87 Latitude 21.000 N
 Time 0937 Z Longitude 66.133 W

— Tem — Sal
 SigT



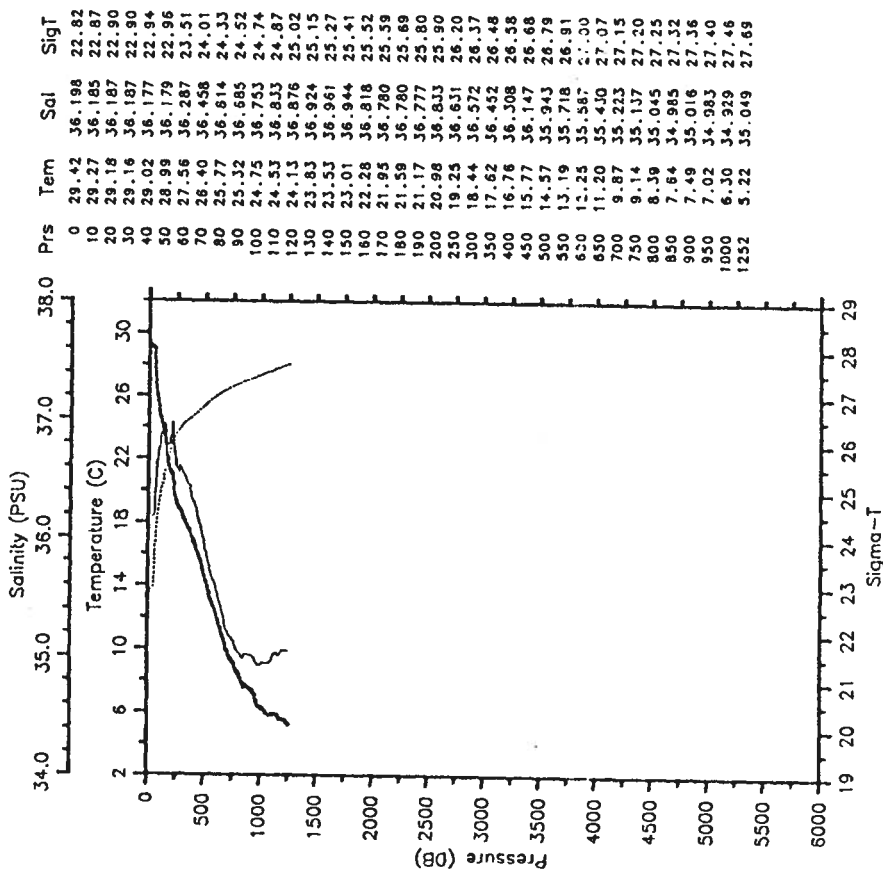
RES-STACS28-87 CTD 18 RESEARCHER
 Date 09 08 87 Latitude 20.495 N
 Time 1522 Z Longitude 66.117 W

— Tem — Sal
 SigT



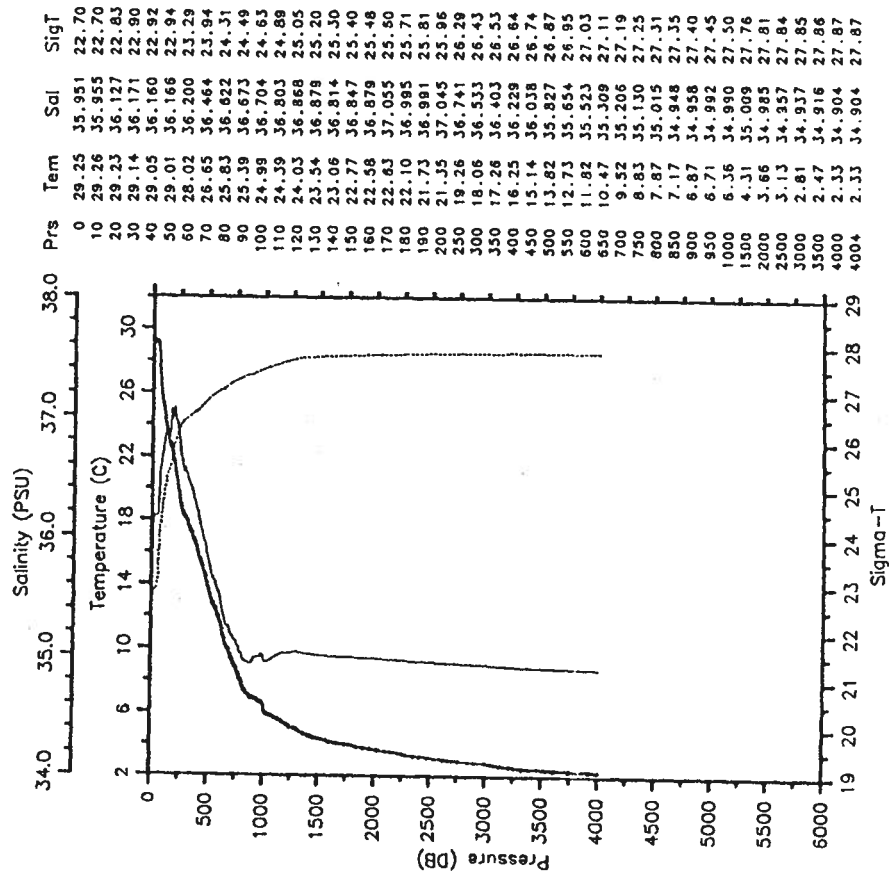
RES-STACS28-87 CTD 19 RESEARCHER
 Date 09 08 87 Latitude 20.005 N
 Time 1933 Z Longitude 66.130 W

— Tem — Sal
 - - - - - SigT



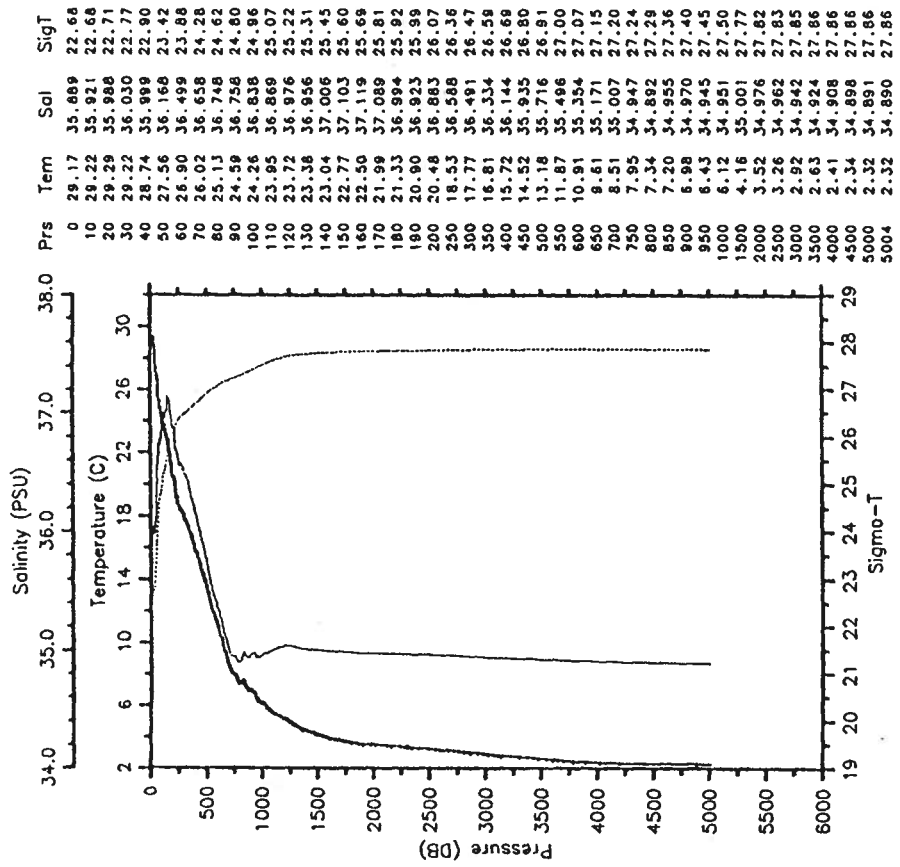
RES-STACS28-87 CTD 20 RESEARCHER
 Date 09 09 87 Latitude 19.503 N
 Time 0347 Z Longitude 66.128 W

— Tem — Sal
 - - - - - SigT



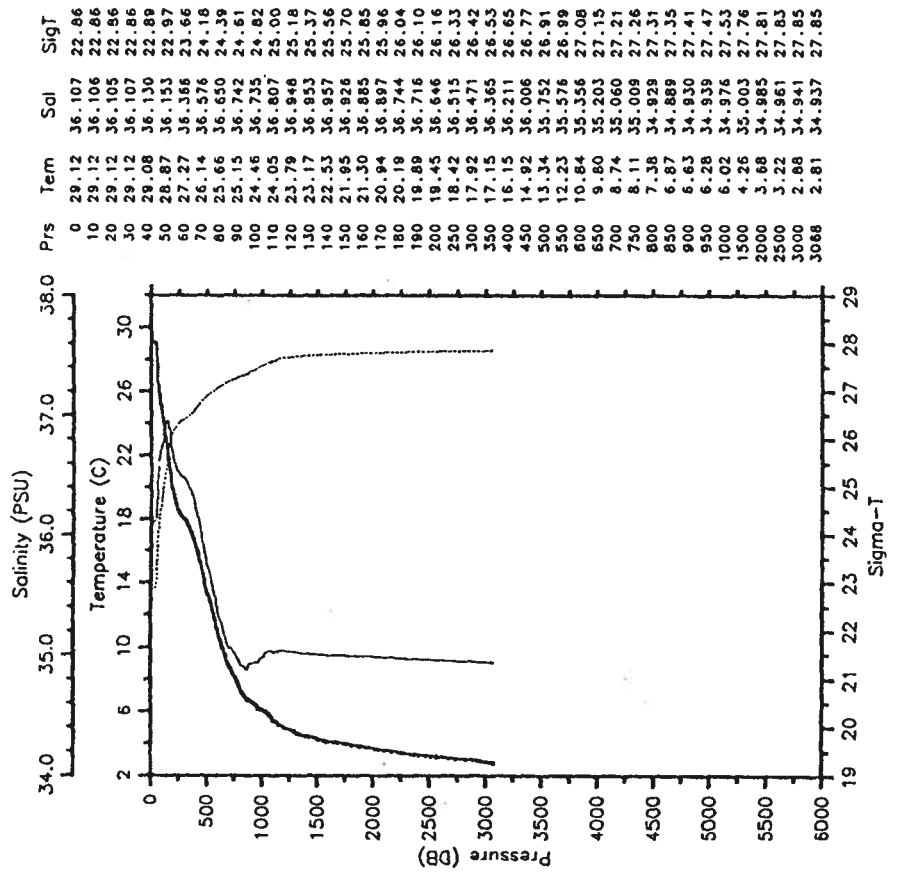
RES-STACS28-87 CTD 21 RESEARCHER
 Date 09 09 87 Latitude 19.172 N
 Time 0757 Z Longitude 66.137 W

— Tem — Sal
 - - - - - SigT



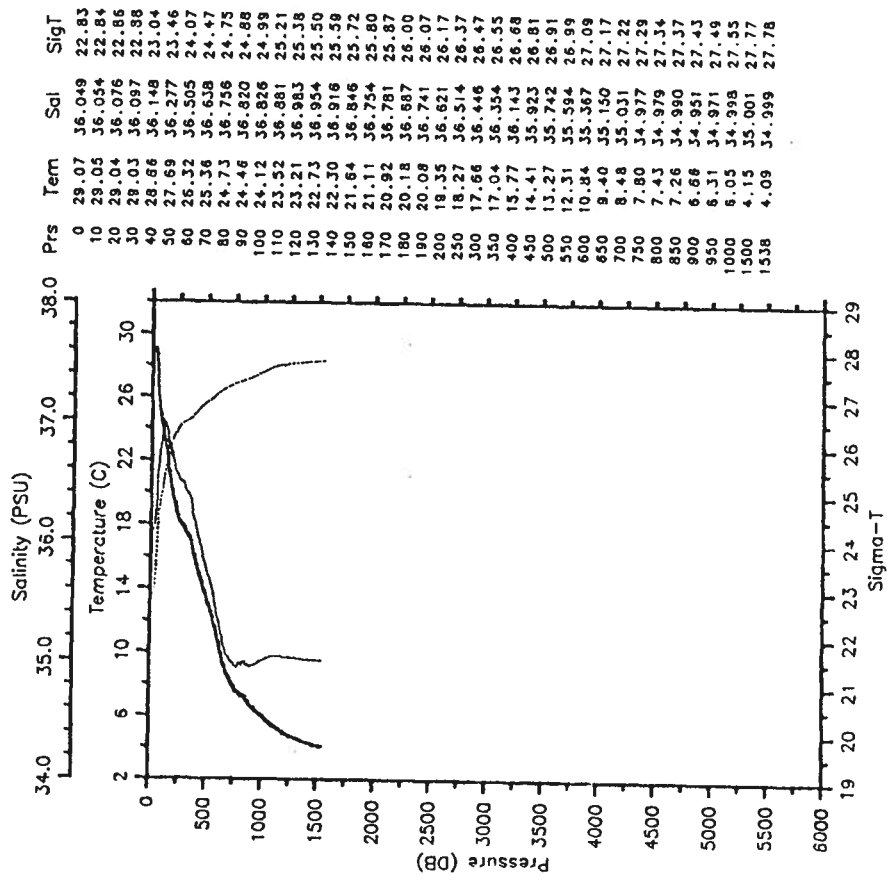
RES-STACS28-87 CTD 22 RESEARCHER
 Date 09 09 87 Latitude 18.918 N
 Time 1127 Z Longitude 66.103 W

— Tem — Sal
 - - - - - SigT



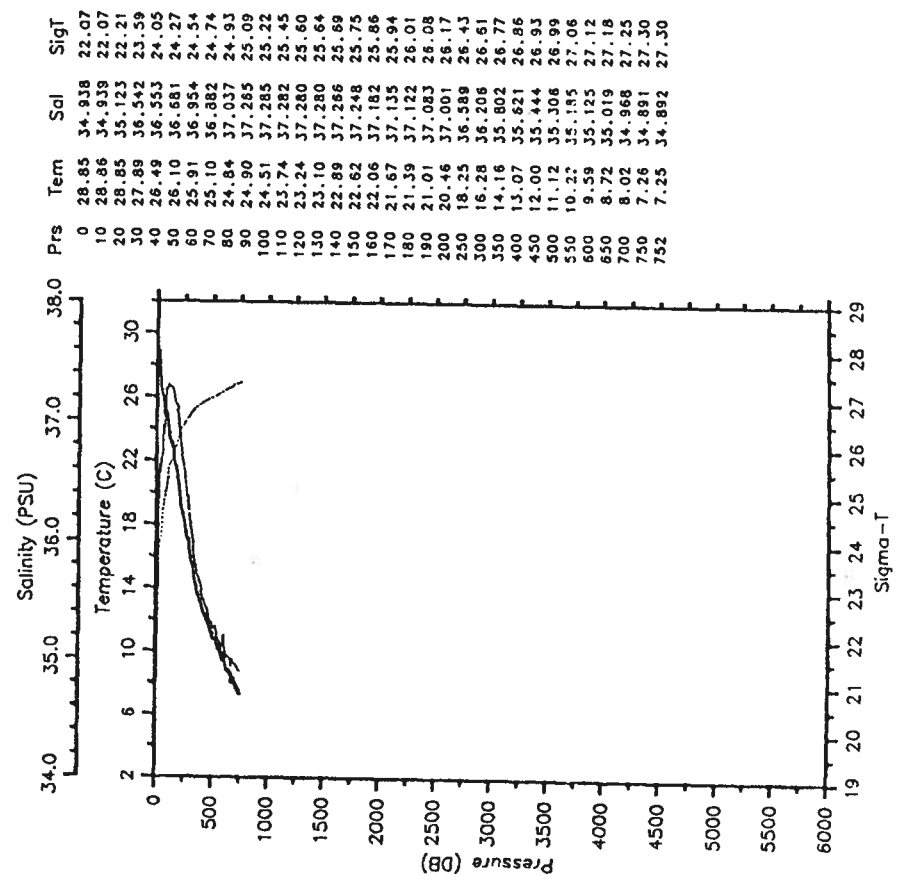
RES-STACS28-87 CTD 23 RESEARCHER
 Date 09 09 87 Latitude 18.662 N
 Time 1403 Z Longitude 66.108 W

— Tem — Sal
 - - - - - SigT



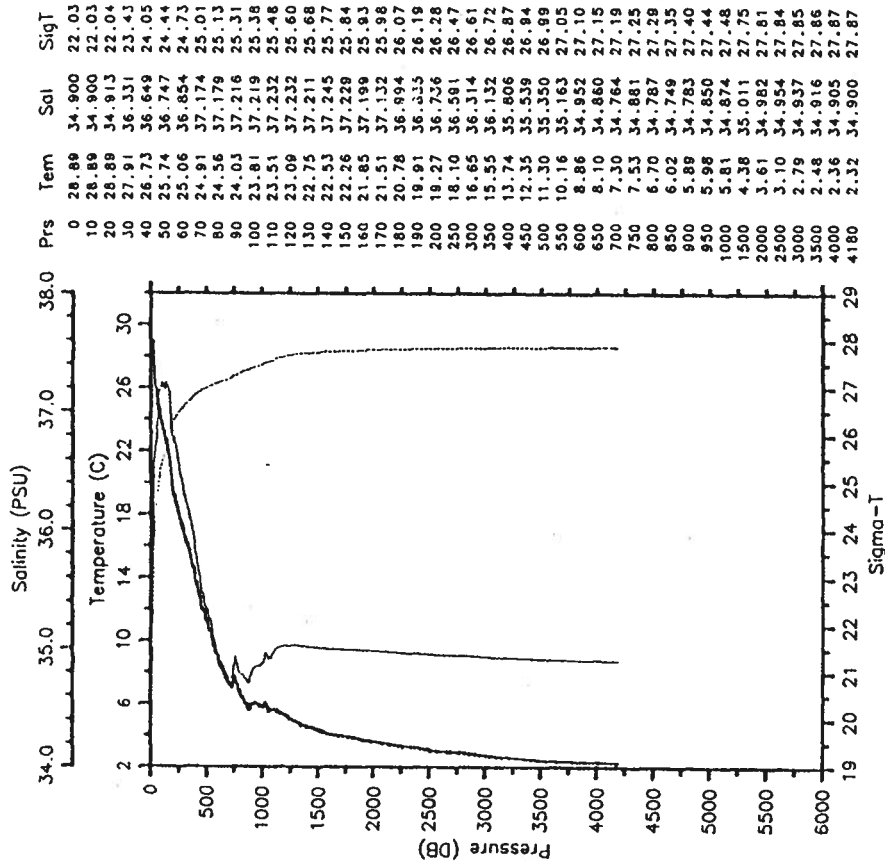
RES-STACS28-87 CTD 24 RESEARCHER
 Date 09 10 87 Latitude 17.750 N
 Time 1205 Z Longitude 61.618 W

— Tem — Sal
 - - - - - SigT



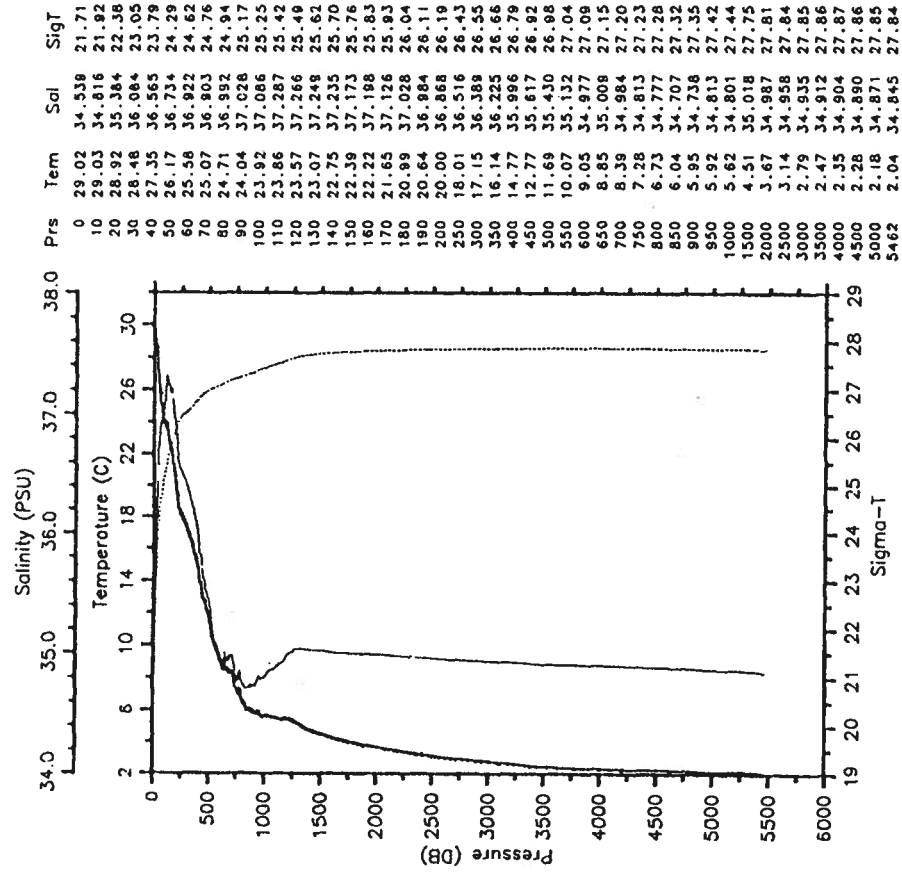
RES-STACS28-87 CTD 25 RESEARCHER
 Date 09 10 87 Latitude 17.935 N
 Time 1432 Z Longitude 61.442 W

— Tem — Sal
 - - - - - SigT



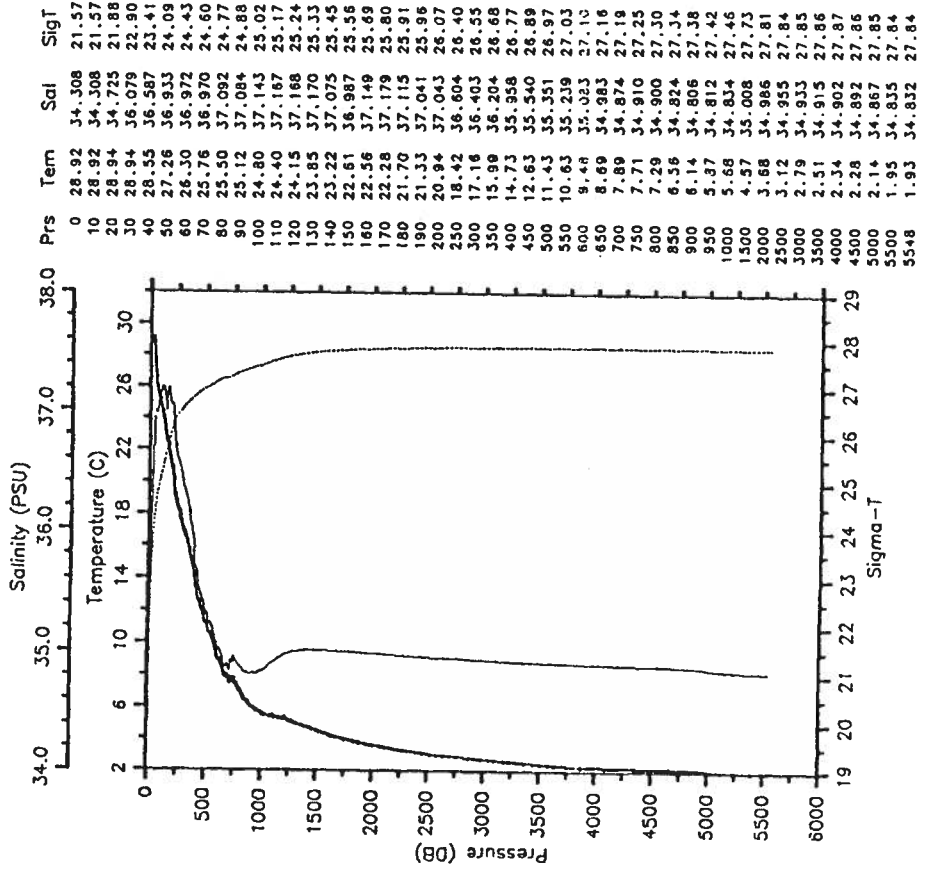
RES-STACS28-87 CTD 26 RESEARCHER
 Date 09 10 87 Latitude 18.108 N
 Time 1815 Z Longitude 61.265 W

— Tem — Sal
 - - - - - SigT



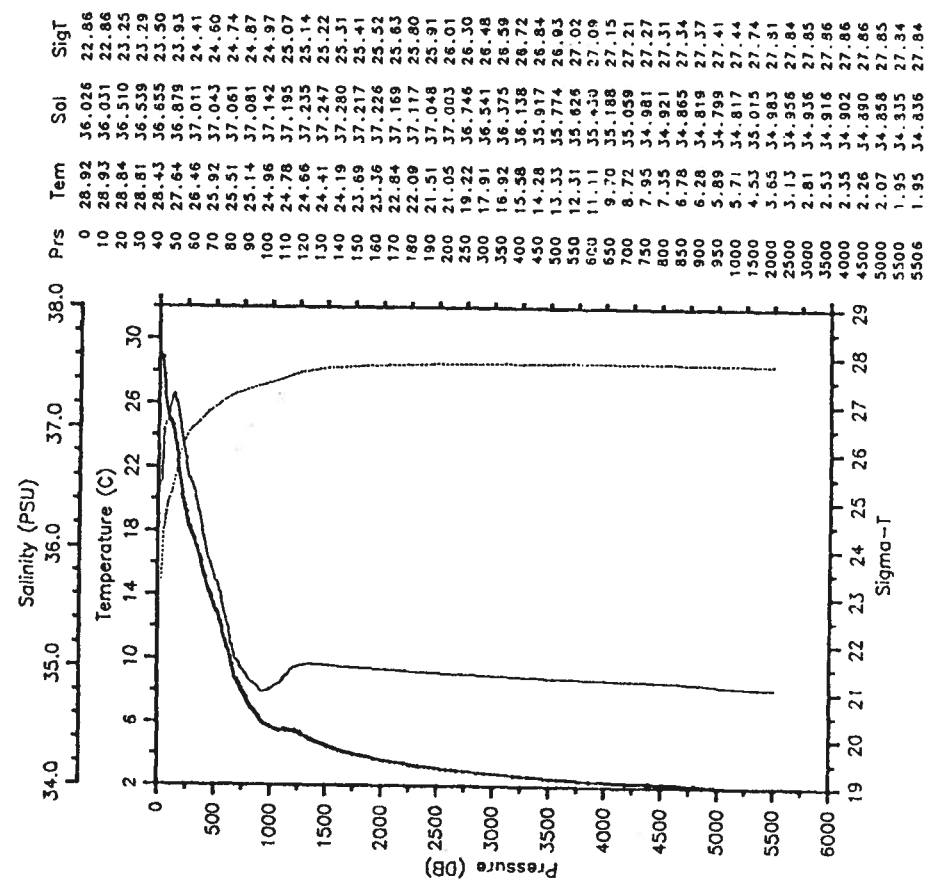
RES-STACS28-87 CTD 27 RESEARCHER
 Date 09 10 87 Latitude 18.338 N
 Time 2240 Z Longitude 61.013 W

— Tem — Sal
 - - - SigT



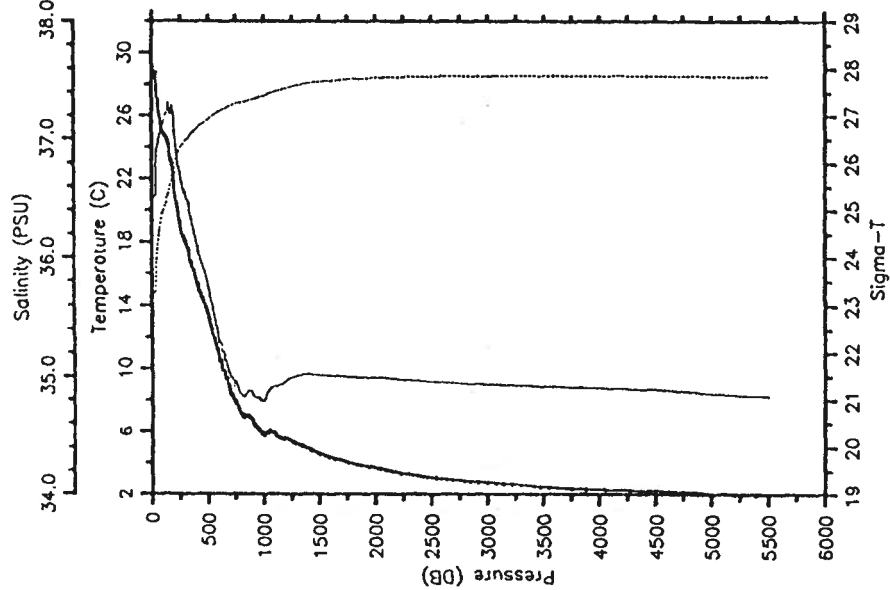
RES-STACS28-87 CTD 28 RESEARCHER
 Date 09 11 87 Latitude 18.587 N
 Time 0301 Z Longitude 60.772 W

— Tem — Sal
 - - - SigT



RES-STACS28-87 CTD 29 RESEARCHER
 Date 09 11 87 Latitude 18.813 N
 Time 0734 Z Longitude 60.520 W

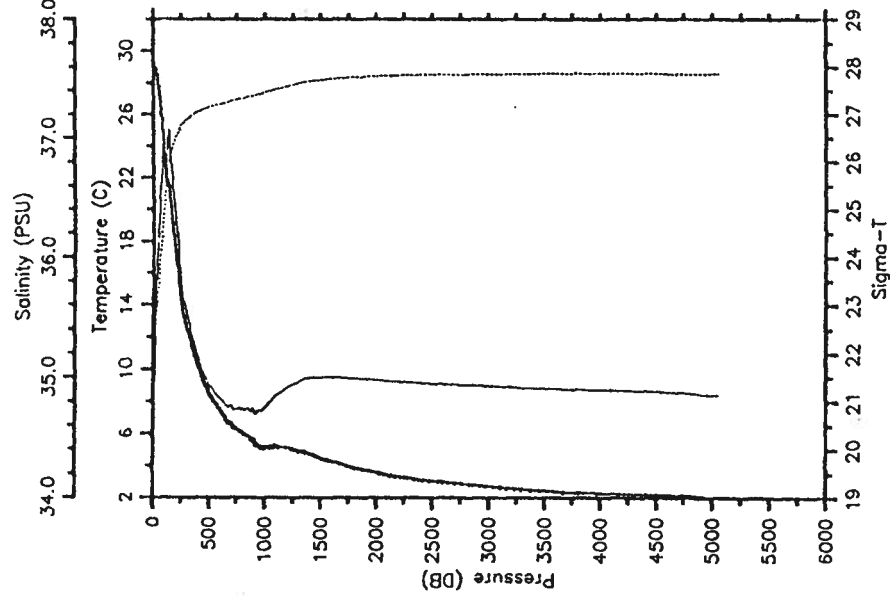
— Tem — Sal
 - - - - - SigT



Prs	Tem	Sal	SigT
0	28.83	36.508	23.26
10	28.83	36.508	23.26
20	28.84	36.511	23.26
30	28.83	36.517	23.26
40	28.45	36.761	23.57
50	27.22	36.936	24.11
60	26.48	36.981	24.38
70	26.00	37.034	24.57
80	25.60	37.075	24.73
90	25.14	37.115	24.90
100	24.90	37.136	24.99
110	24.75	37.158	25.05
120	24.65	37.196	25.11
130	24.47	37.223	25.18
140	24.32	37.306	25.29
150	24.01	37.285	25.37
160	23.44	37.218	25.48
170	23.18	37.228	25.57
180	22.83	37.238	25.72
190	22.37	37.238	25.82
200	21.43	37.055	25.84
250	19.27	36.727	26.27
300	17.95	36.549	26.47
350	16.73	36.342	26.61
400	15.48	36.120	26.73
450	14.50	35.957	26.82
500	13.39	35.777	26.92
550	12.01	35.548	27.01
600	10.47	35.289	27.10
650	8.60	35.158	27.14
700	8.57	35.027	27.21
750	7.92	34.960	27.25
800	7.12	34.848	27.28
850	6.97	34.859	27.31
900	6.73	34.859	27.35
950	6.18	34.821	27.39
1000	5.83	34.792	27.41
1500	4.59	35.015	27.73
2000	3.88	34.990	27.81
2500	3.08	34.954	27.84
3000	2.76	34.931	27.85
3500	2.49	34.912	27.86
4000	2.33	34.901	27.87
4500	2.26	34.891	27.86
5000	2.07	34.859	27.85
5500	1.95	34.836	27.84
5504	1.95	34.836	27.84

RES-STACS28-87 CTD 30 RESEARCHER
 Date 09 13 87 Latitude 13.000 N
 Time 0013 Z Longitude 55.007 W

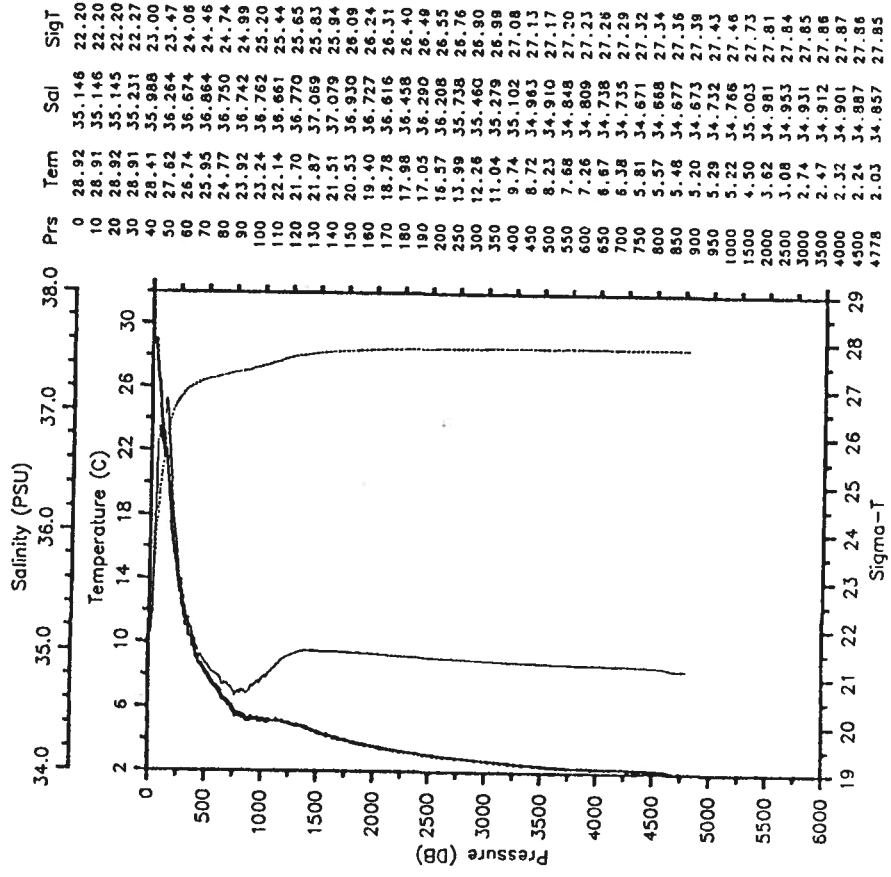
— Tem — Sal
 - - - - - SigT



Prs	Tem	Sal	SigT
0	28.83	34.880	22.03
10	28.88	34.918	22.05
20	28.94	34.987	22.08
30	28.57	35.798	22.81
40	28.50	36.038	23.01
50	27.81	36.236	23.39
60	27.18	36.430	23.74
70	26.26	36.608	24.17
80	25.57	36.766	24.47
90	24.73	36.917	24.88
100	23.43	36.748	25.14
110	22.49	36.767	25.42
120	21.87	36.836	25.65
130	21.80	37.026	25.82
140	21.50	37.065	25.83
150	20.83	36.834	26.07
160	19.78	36.802	26.19
170	19.10	36.688	26.28
180	18.36	36.549	26.37
190	17.74	36.434	26.44
200	17.22	36.338	26.49
250	14.09	35.768	26.76
300	12.53	35.532	26.80
350	11.25	35.337	26.99
400	10.22	35.185	27.06
450	9.20	35.031	27.11
500	8.43	34.933	27.16
550	7.95	34.883	27.19
600	7.48	34.832	27.22
650	6.90	34.772	27.25
700	6.64	34.762	27.28
750	6.29	34.735	27.31
800	6.06	34.733	27.33
850	5.87	34.743	27.37
900	5.54	34.728	27.40
950	5.24	34.727	27.43
1000	5.14	34.751	27.46
1500	4.47	34.985	27.73
2000	3.59	34.979	27.81
2500	3.05	34.950	27.84
3000	2.73	34.929	27.85
3500	2.46	34.912	27.86
4000	2.31	34.912	27.86
4500	2.22	34.899	27.86
5000	2.03	34.852	27.85
5046	2.03	34.852	27.85

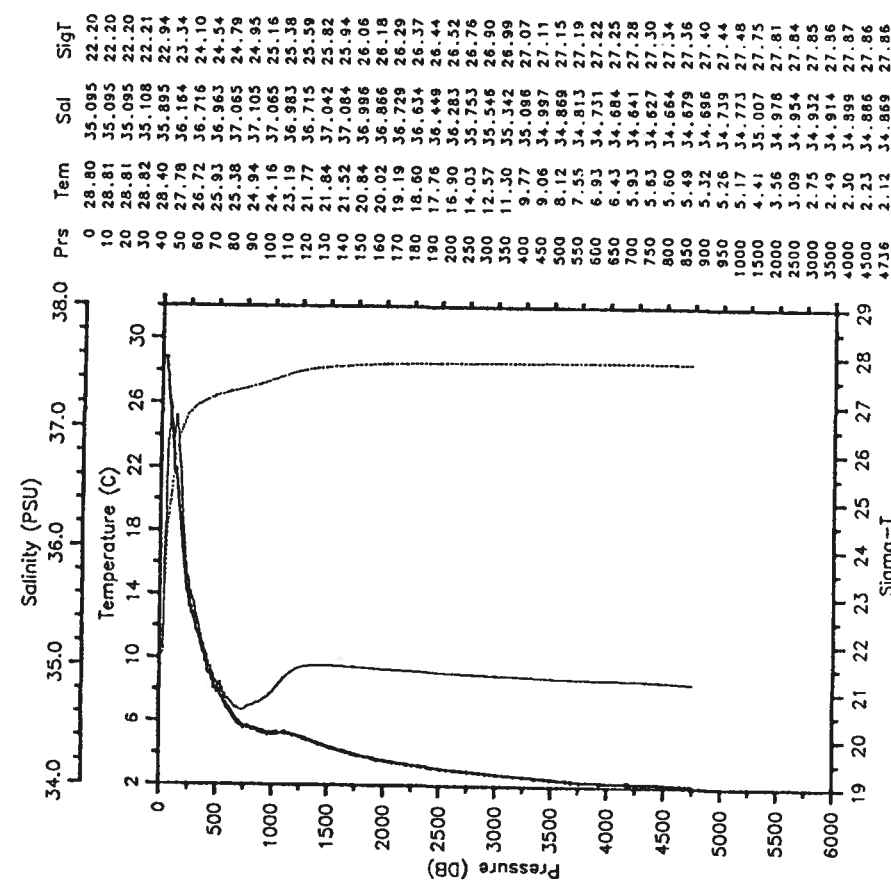
RES-STACS28-87 CTD 31 RESEARCHER
 Date 09 13 87 Latitude 13.000 N
 Time 0448 Z Longitude 55.500 W

— Tem — Sal
 --- SigT



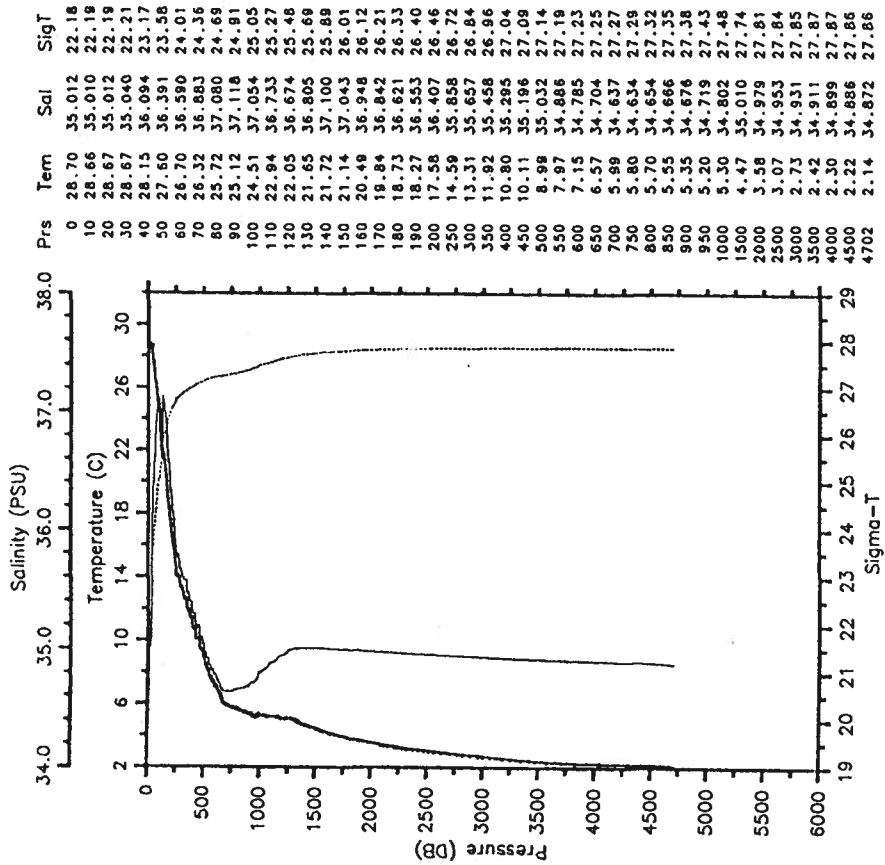
RES-STACS28-87 CTD 32 RESEARCHER
 Date 09 13 87 Latitude 12.987 N
 Time 0936 Z Longitude 55.977 W

— Tem — Sal
 --- SigT



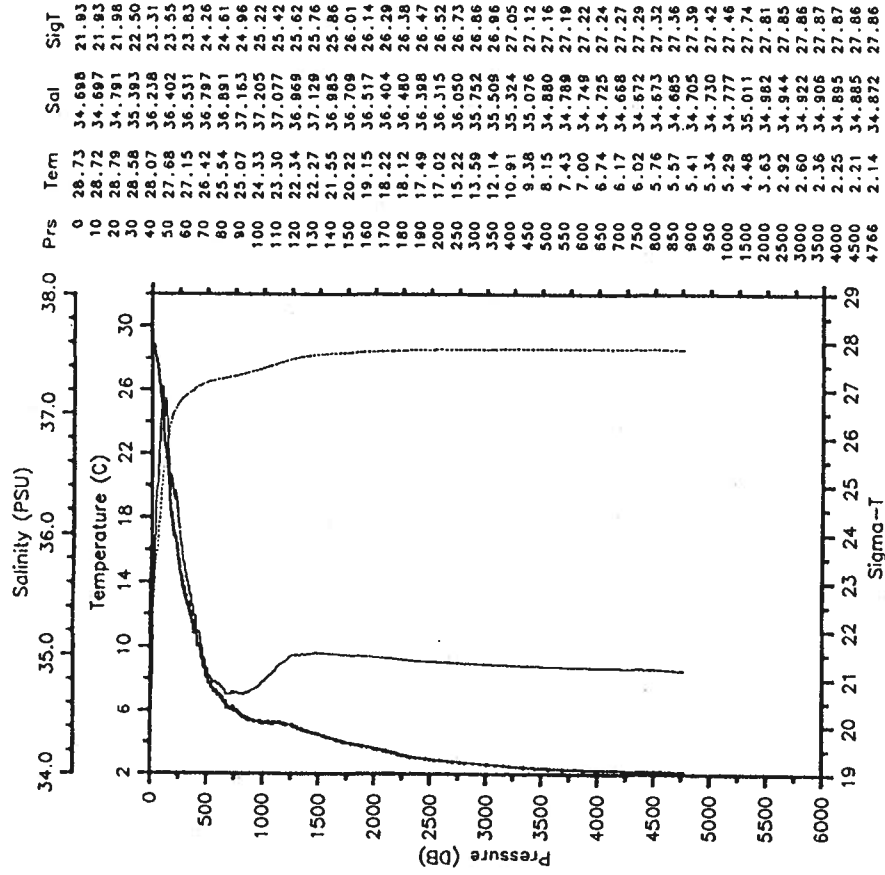
RES-STACS28-87 CTD 33 RESEARCHER
 Date 09 13 87 Latitude 13.013 N
 Time 1415 Z Longitude 56.517 W

— Tem — Sal
 --- SigT



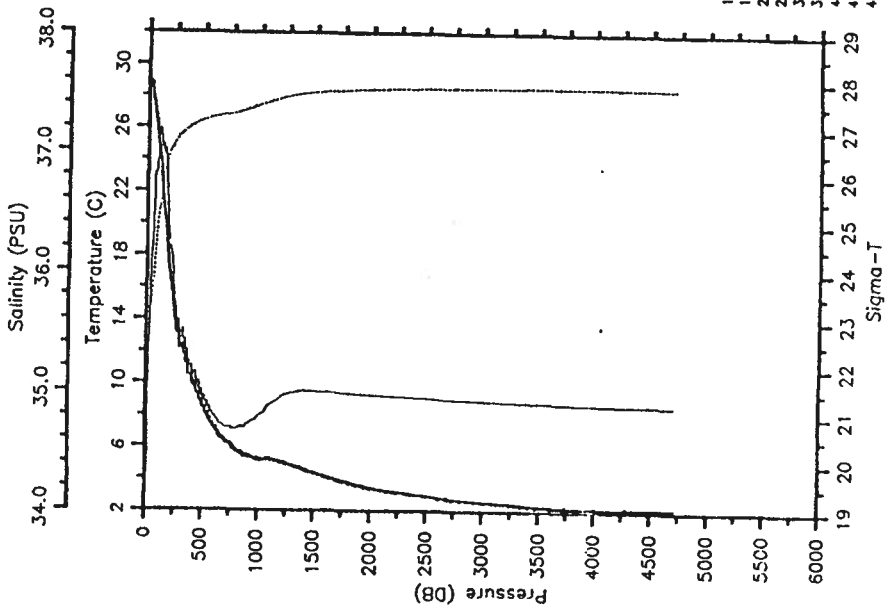
RES-STACS28-87 CTD 34 RESEARCHER
 Date 09 13 87 Latitude 13.000 N
 Time 1851 Z Longitude 56.995 W

— Tem — Sal
 --- SigT



RES-STACS28-87 CTD 35 RESEARCHER
 Date 09 13 87 Latitude 13.000 N
 Time 2327 Z Longitude 57.500 W

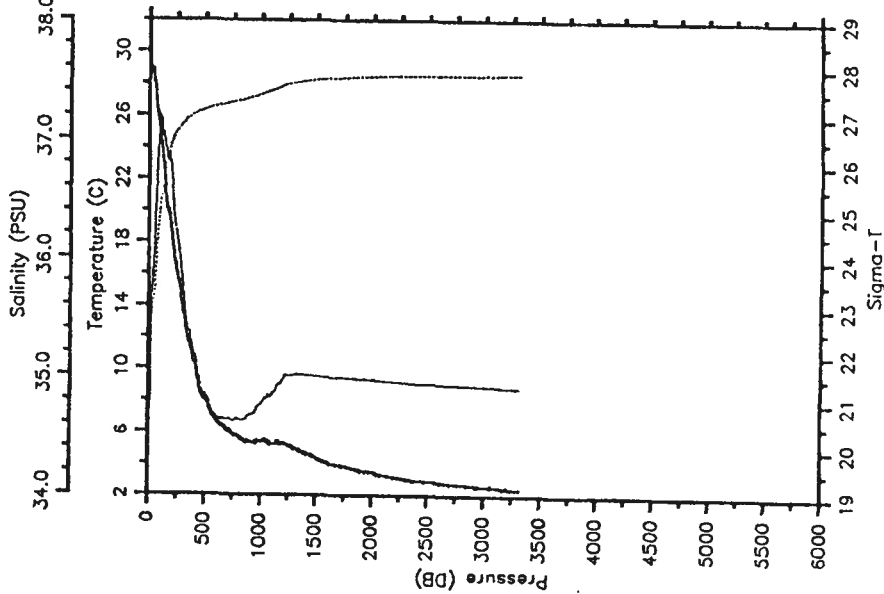
--- Tem --- Sal
 --- Sigt



Prs	Tem	Sal	Sigt
0	28.72	34.295	21.63
10	28.73	34.296	21.63
20	28.76	34.331	21.64
30	28.72	35.390	22.45
40	28.13	36.075	23.16
50	27.71	36.179	23.38
60	27.10	36.404	23.75
70	26.64	36.737	24.14
80	25.92	36.796	24.42
90	25.19	36.927	24.74
100	24.64	37.117	25.05
110	24.08	37.185	25.27
120	23.50	37.113	25.39
130	22.75	37.030	25.55
140	22.01	37.024	25.76
150	20.90	36.988	26.04
160	20.44	36.969	26.15
170	19.76	36.836	26.23
180	18.73	36.643	26.35
190	17.81	36.454	26.44
200	16.89	36.273	26.52
250	14.50	35.810	26.71
300	12.20	35.442	26.88
350	11.85	35.429	26.93
400	10.51	35.217	27.03
450	9.37	35.076	27.12
500	8.92	35.015	27.14
550	8.11	34.910	27.19
600	7.33	34.815	27.22
650	6.74	34.740	27.25
700	6.36	34.706	27.27
750	6.16	34.703	27.30
800	5.82	34.685	27.33
850	5.61	34.702	27.37
900	5.44	34.722	27.40
950	5.32	34.753	27.44
1000	5.23	34.790	27.48
1500	4.37	35.003	27.75
2000	3.45	34.973	27.82
2500	2.97	34.948	27.85
3000	2.61	34.925	27.86
3500	2.35	34.908	27.87
4000	2.25	34.896	27.87
4500	2.22	34.886	27.86
4702	2.23	34.884	27.86

RES-STACS28-87 CTD 36 RESEARCHER
 Date 09 14 87 Latitude 13.000 N
 Time 0340 Z Longitude 58.000 W

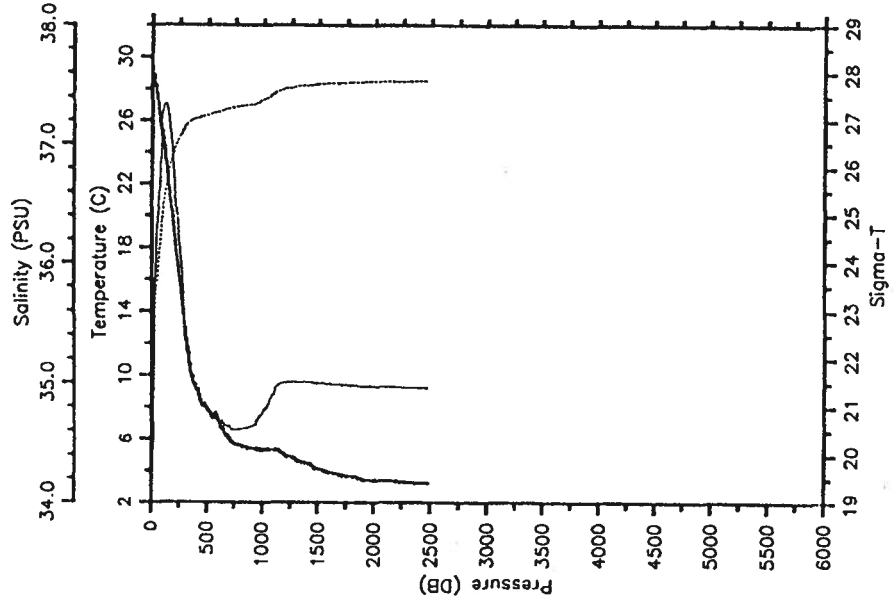
--- Tem --- Sal
 --- Sigt



Prs	Tem	Sal	Sigt
0	28.72	34.487	21.77
10	28.73	34.485	21.77
20	28.76	34.512	21.78
30	28.81	35.684	22.64
40	28.37	35.888	22.94
50	28.00	36.058	23.19
60	27.48	36.324	23.56
70	26.60	36.564	24.03
80	25.99	36.889	24.47
90	25.51	36.970	24.66
100	24.78	37.002	24.92
110	24.28	37.137	25.18
120	23.79	37.129	25.32
130	22.93	37.030	25.49
140	22.24	37.049	25.71
150	21.05	36.926	25.95
160	20.52	36.887	26.06
170	20.05	36.827	26.14
180	19.80	36.807	26.20
190	19.56	36.864	26.30
200	18.95	36.757	26.38
250	16.08	36.214	26.66
300	13.94	35.794	26.82
350	11.68	35.385	26.95
400	10.35	35.170	27.02
450	8.91	34.926	27.08
500	8.06	34.816	27.12
550	7.40	34.739	27.16
600	6.74	34.666	27.19
650	6.41	34.655	27.23
700	6.14	34.641	27.25
750	5.86	34.630	27.28
800	5.69	34.642	27.31
850	5.48	34.639	27.33
900	5.39	34.673	27.37
950	5.34	34.693	27.39
1000	5.38	34.762	27.44
1500	4.34	35.006	27.75
2000	3.48	34.977	27.82
2500	2.92	34.943	27.85
3000	2.61	34.924	27.86
3304	2.43	34.911	27.86

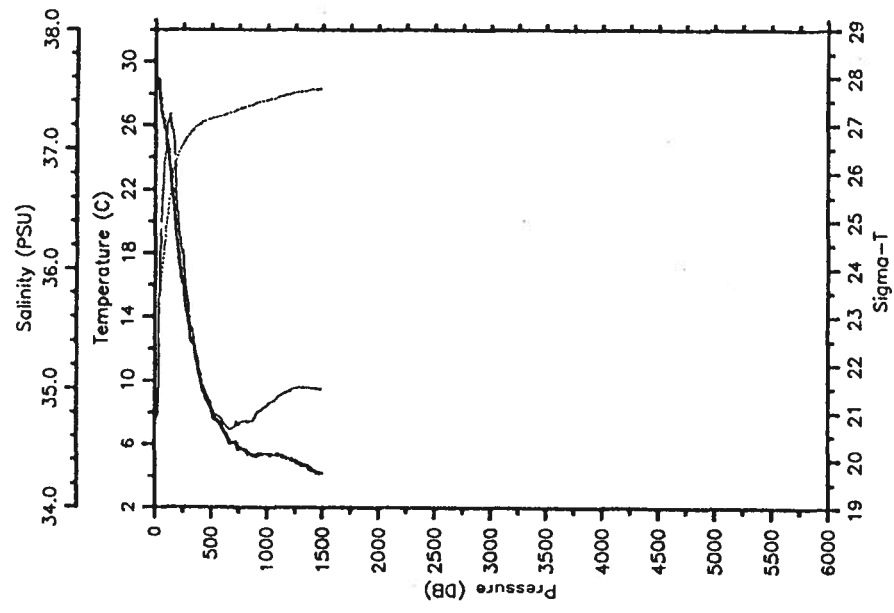
RES-STACS28-87 CTD 37 RESEARCHER
 Date 09 14 87 Latitude 13.003 N
 Time 0733 Z Longitude 58.507 W

— Tem — Sal
 - - - SigT



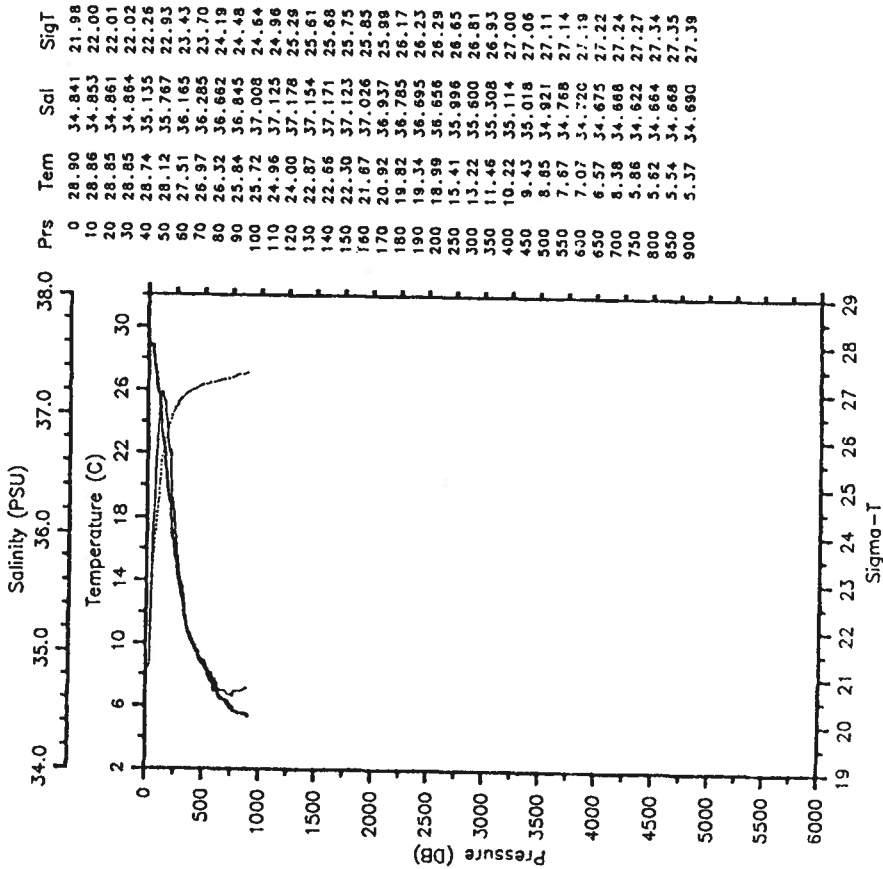
RES-STACS28-87 CTD 38 RESEARCHER
 Date 09 14 87 Latitude 13.000 N
 Time 1023 Z Longitude 59.000 W

— Tem — Sal
 - - - SigT



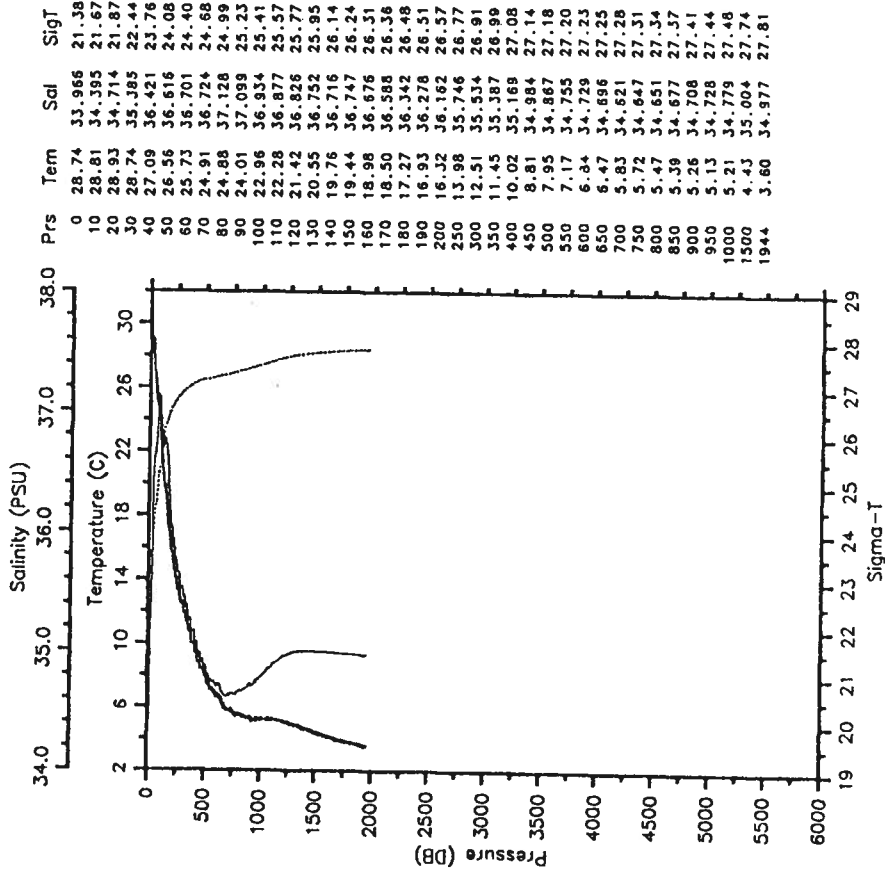
RES-STACS28-87 CTD 39 RESEARCHER
 Date 09 16 87 Latitude 13.000 N
 Time 1543 Z Longitude 59.362 W

— Tem — Sal
 --- SigT



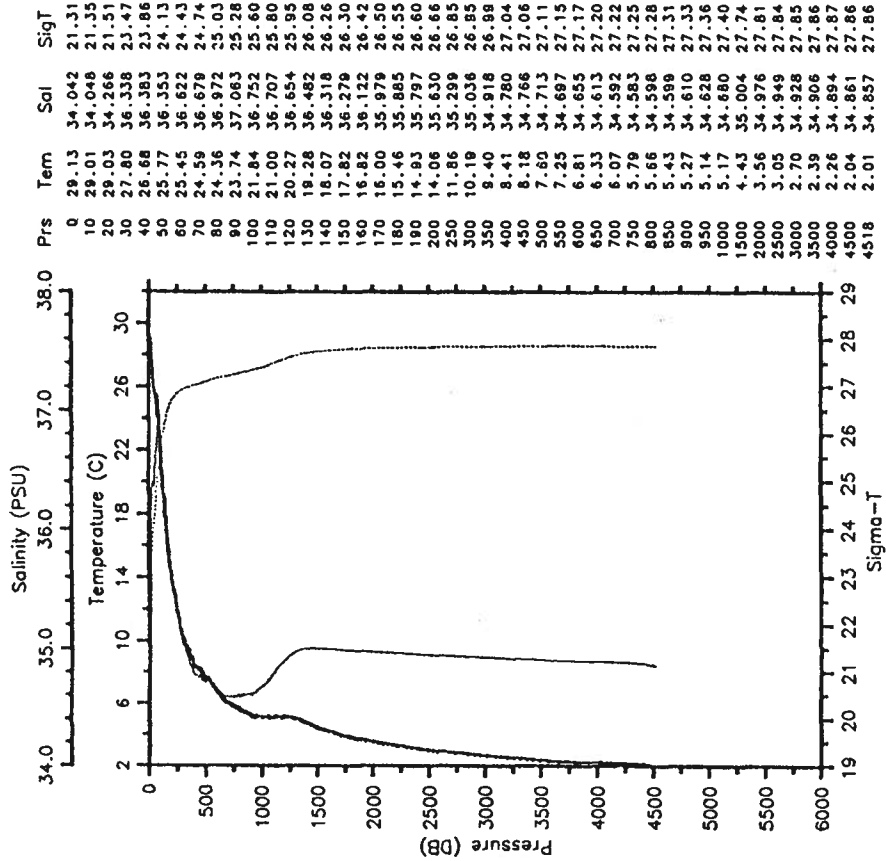
RES-STACS28-87 CTD 40 RESEARCHER
 Date 09 17 87 Latitude 12.117 N
 Time 1117 Z Longitude 55.415 W

— Tem — Sal
 --- SigT



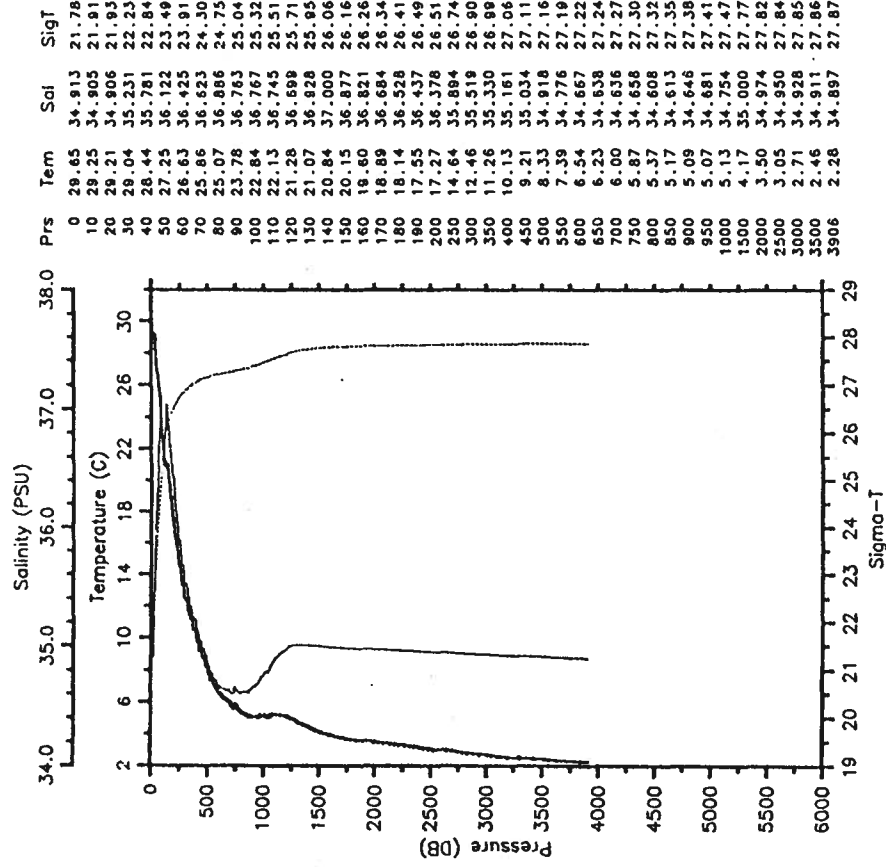
RES-STACS28-87 CTD 41 RESEARCHER
 Date 09 17 87 Latitude 11.250 N
 Time 1838 Z Longitude 55.903 W

— Tem — Sal
 — SigT



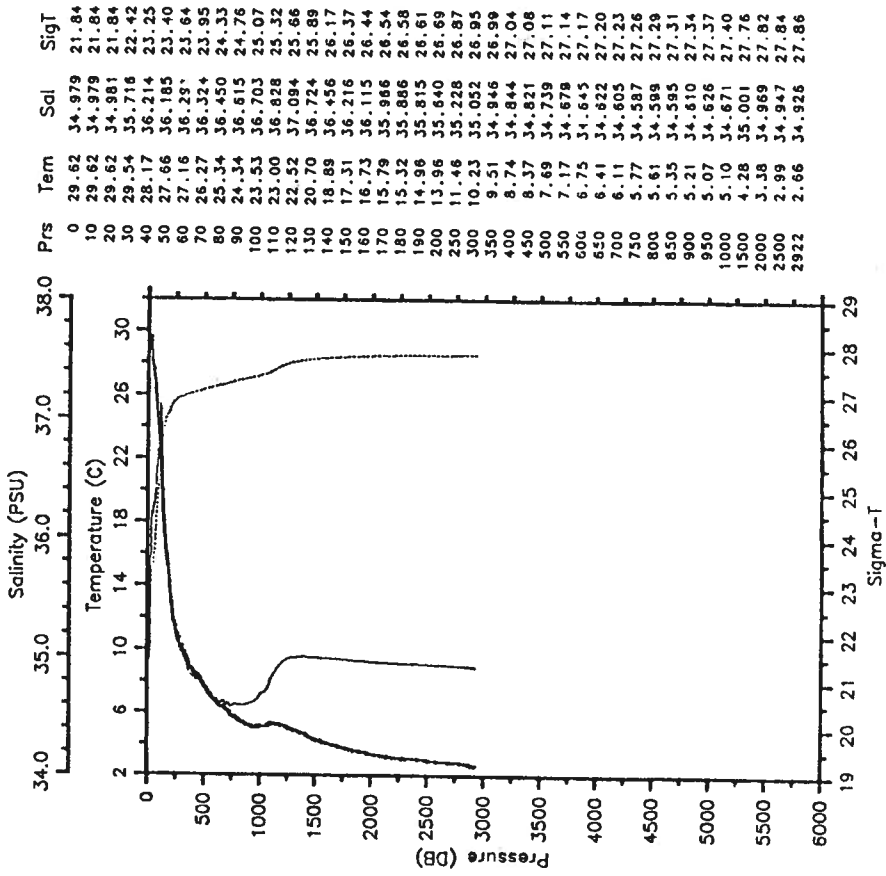
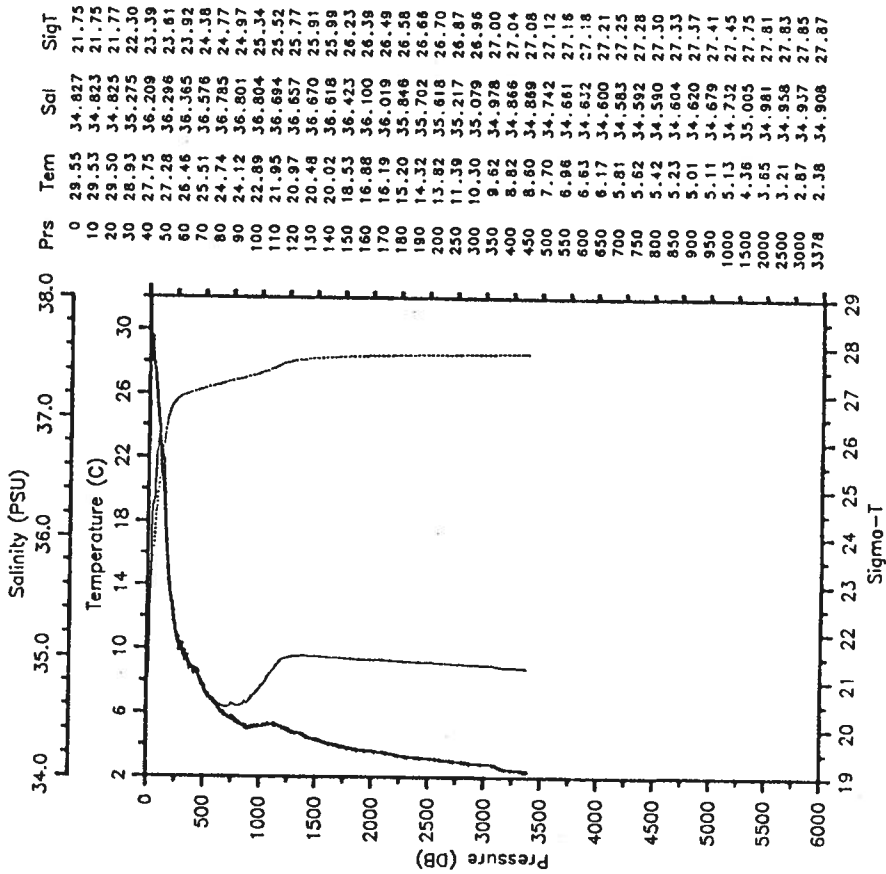
RES-STACS28-87 CTD 42 RESEARCHER
 Date 09 18 87 Latitude 10.378 N
 Time 0130 Z Longitude 56.388 W

— Tem — Sal
 — SigT



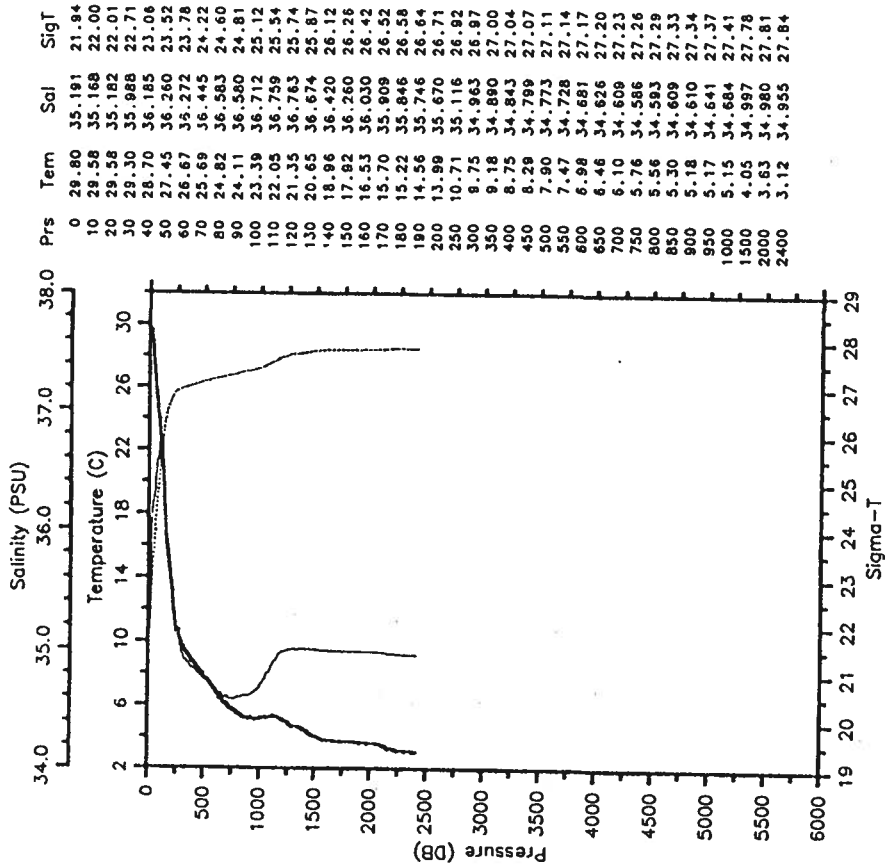
RES-STACS28-87 CTD 43 RESEARCHER
 Date 09 18 87 Latitude 9.483 N
 Time 0807 Z Longitude 56.863 W

RES-STACS28-87 CTD 44 RESEARCHER
 Date 09 18 87 Latitude 9.048 N
 Time 1216 Z Longitude 57.165 W



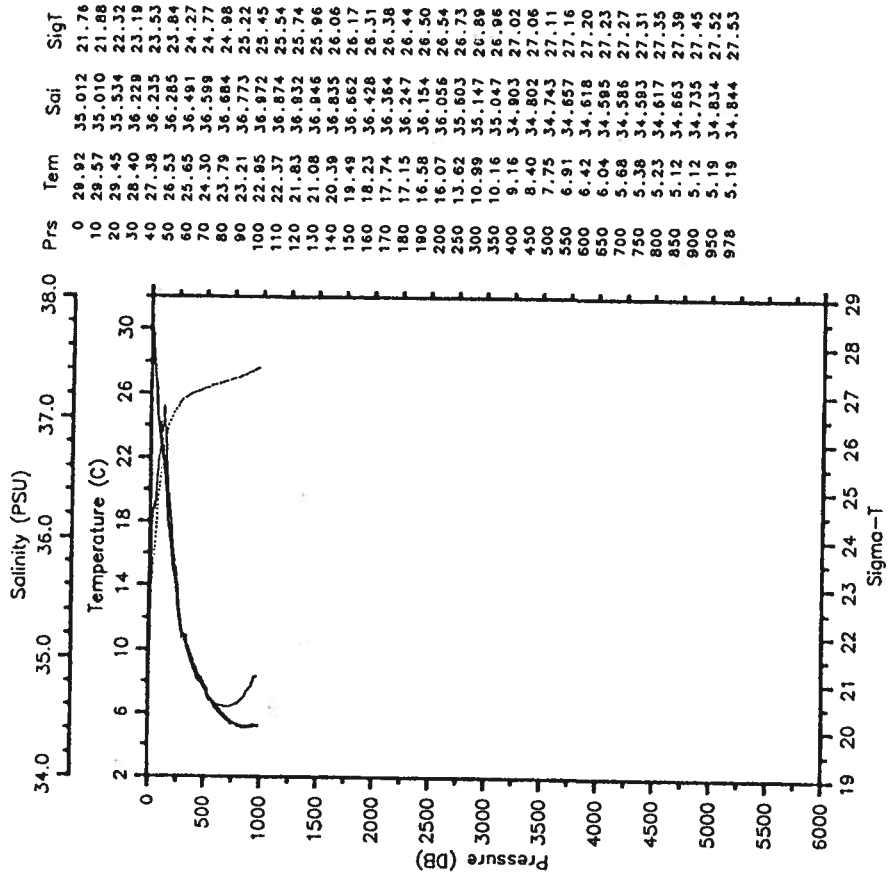
RES-STACS28-87 CTD 45 RESEARCHER
 Date 09 18 87 Latitude 8.620 N
 Time 1602 Z Longitude 57.370 W

— Tem — Sal
 --- SigT



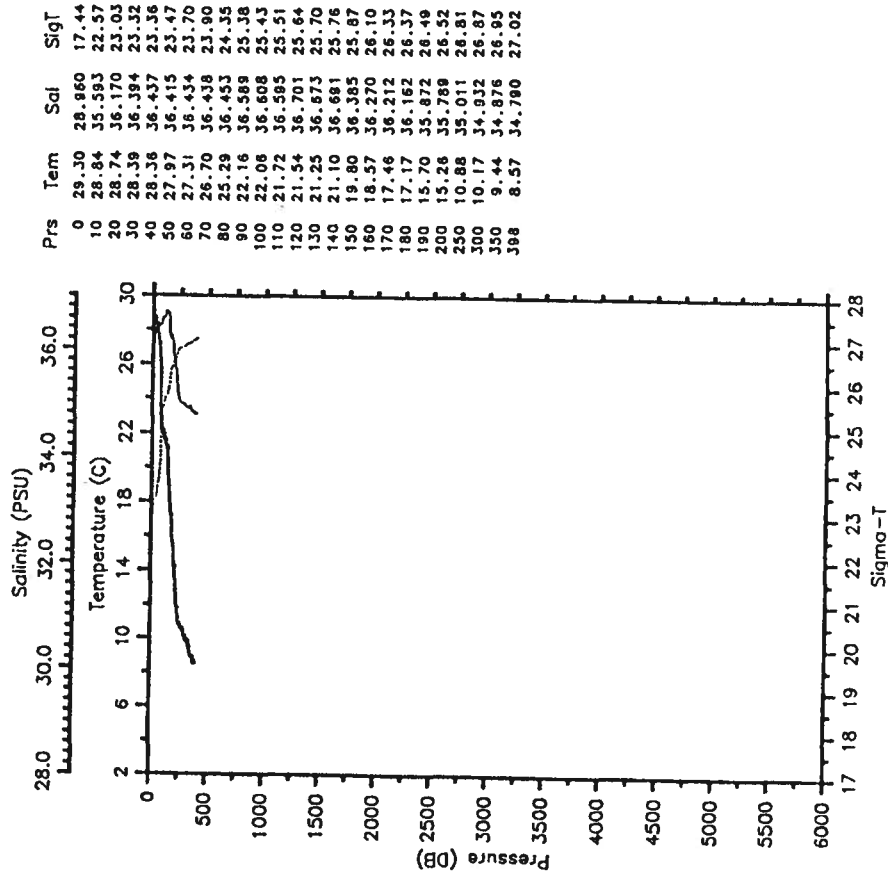
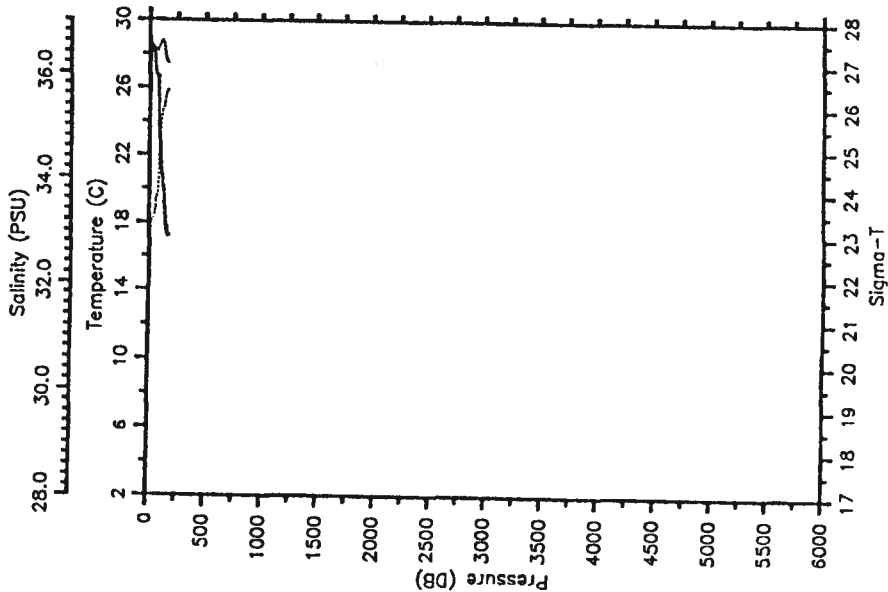
RES-STACS28-87 CTD 46 RESEARCHER
 Date 09 18 87 Latitude 8.220 N
 Time 1924 Z Longitude 57.595 W

— Tem — Sal
 --- SigT



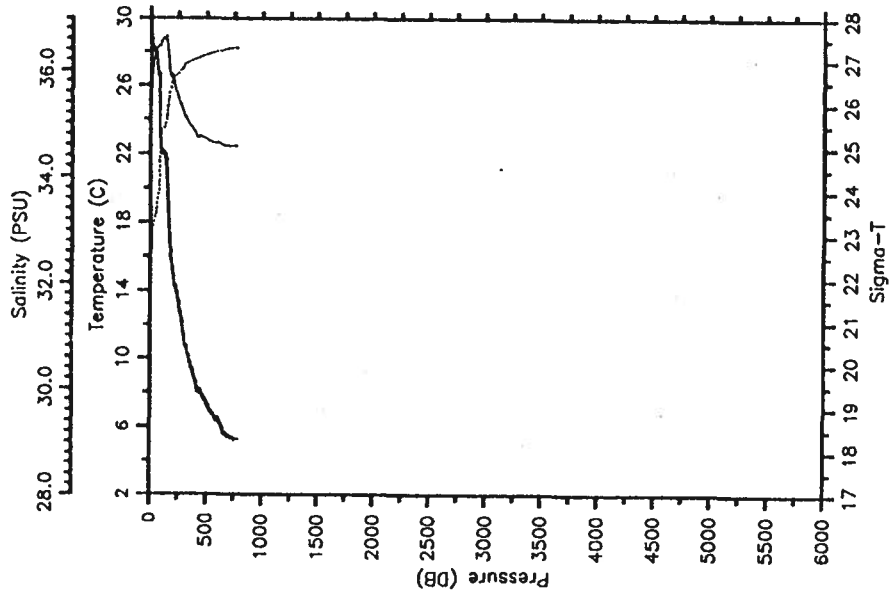
RES-STACS28-87 CTD 47 RESEARCHER
 Date 09 19 87 Latitude 7.015 N
 Time 1916 Z Longitude 53.093 W

RES-STACS28-87 CTD 48 RESEARCHER
 Date 09 20 87 Latitude 7.182 N
 Time 1030 Z Longitude 52.952 W



RES-STACS28-87 CTD 49 RESEARCHER
 Date 09 20 87 Latitude 7.337 N
 Time 1203 Z Longitude 52.827 W

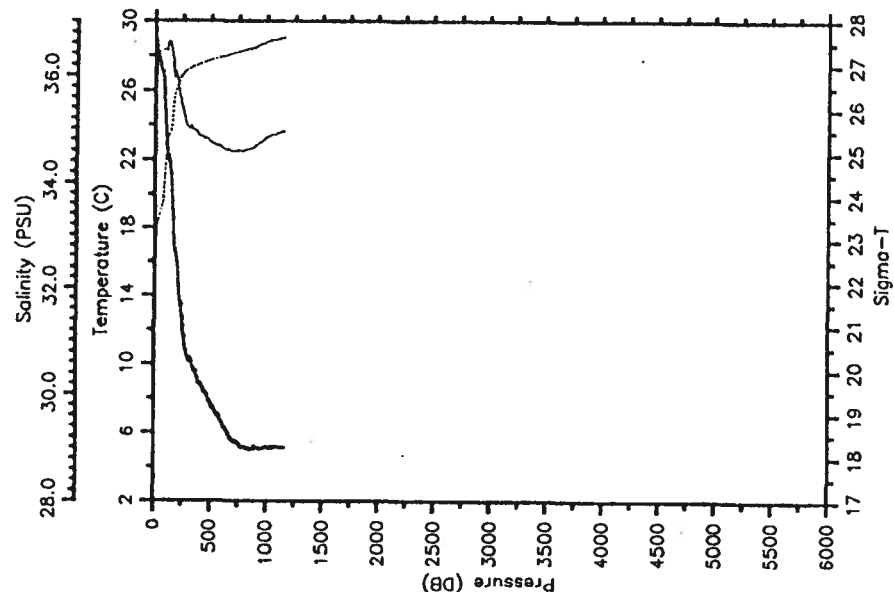
— Tem — Sal
 — SigT



Prs	Tem	Sal	SigT
0	28.99	34.933	22.01
10	28.73	35.603	22.61
20	28.32	36.033	23.07
30	28.13	36.182	23.24
40	28.01	36.335	23.40
50	27.88	36.359	23.46
60	27.36	36.429	23.66
70	26.67	36.487	23.83
80	26.50	36.488	23.88
90	23.01	36.437	25.04
100	22.34	36.558	25.31
110	22.08	36.589	25.41
120	22.06	36.611	25.43
130	21.97	36.608	25.45
140	21.72	36.572	25.48
150	21.43	36.587	25.58
160	18.53	36.352	25.92
170	17.61	35.974	26.11
180	16.43	35.871	26.32
190	15.92	35.921	26.48
200	15.35	35.864	26.56
250	13.45	35.515	26.70
300	11.43	35.216	26.87
350	8.77	34.870	26.87
400	8.73	34.830	27.03
450	7.89	34.750	27.08
500	7.39	34.705	27.13
550	6.78	34.650	27.17
600	6.39	34.634	27.21
650	5.83	34.603	27.25
700	5.46	34.576	27.28
750	5.28	34.576	27.31
778	5.26	34.576	27.31

RES-STACS28-87 CTD 50 RESEARCHER
 Date 09 20 87 Latitude 7.550 N
 Time 1344 Z Longitude 52.728 W

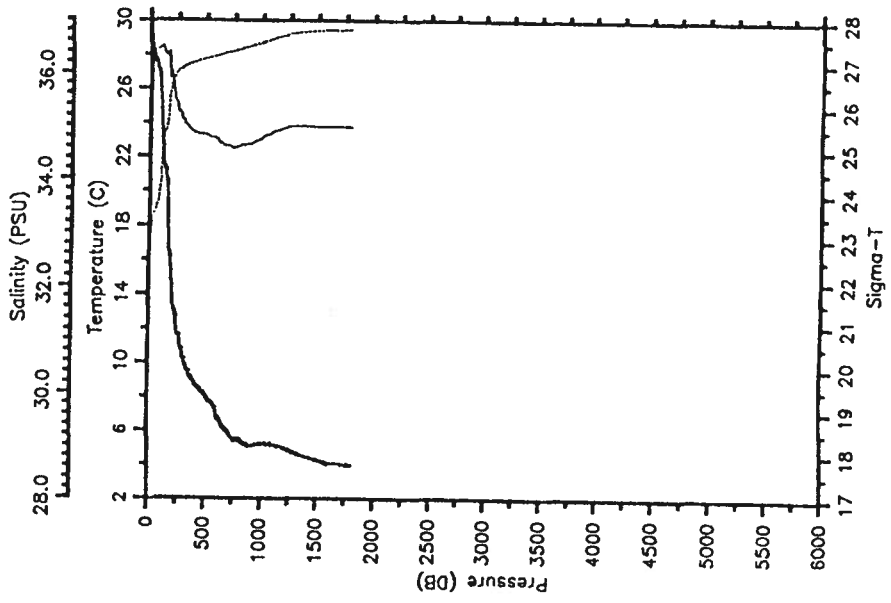
— Tem — Sal
 — SigT



Prs	Tem	Sal	SigT
0	28.55	32.026	19.65
10	28.85	35.181	22.25
20	28.55	35.931	22.82
30	28.07	36.378	23.41
40	27.89	36.422	23.50
50	27.62	36.451	23.61
60	27.24	36.449	23.73
70	27.08	36.454	23.78
80	26.68	36.462	23.83
90	25.20	36.474	24.40
100	23.83	36.474	24.78
110	22.69	36.466	25.14
120	22.16	36.612	25.40
130	22.13	36.626	25.42
140	21.88	36.605	25.47
150	21.25	36.506	25.57
160	19.90	36.385	25.85
170	18.01	36.178	26.17
180	16.35	35.991	26.37
190	16.35	36.039	26.47
200	15.85	35.963	26.52
250	12.57	35.397	26.79
300	10.35	35.016	26.90
350	9.65	34.971	26.99
400	8.86	34.869	27.04
450	8.37	34.827	27.08
500	7.60	34.735	27.13
550	7.08	34.687	27.16
600	6.59	34.644	27.18
650	6.11	34.618	27.24
700	5.51	34.574	27.28
750	5.37	34.590	27.31
800	5.08	34.584	27.34
850	5.03	34.625	27.37
900	5.11	34.684	27.42
950	5.06	34.769	27.49
1000	5.14	34.852	27.54
1152	5.11	34.957	27.63

RES-STACS28-87 CTD 51 RESEARCHER
 Date 09 21 87 Latitude 7.738 N
 Time 0620 Z Longitude 52.618 W

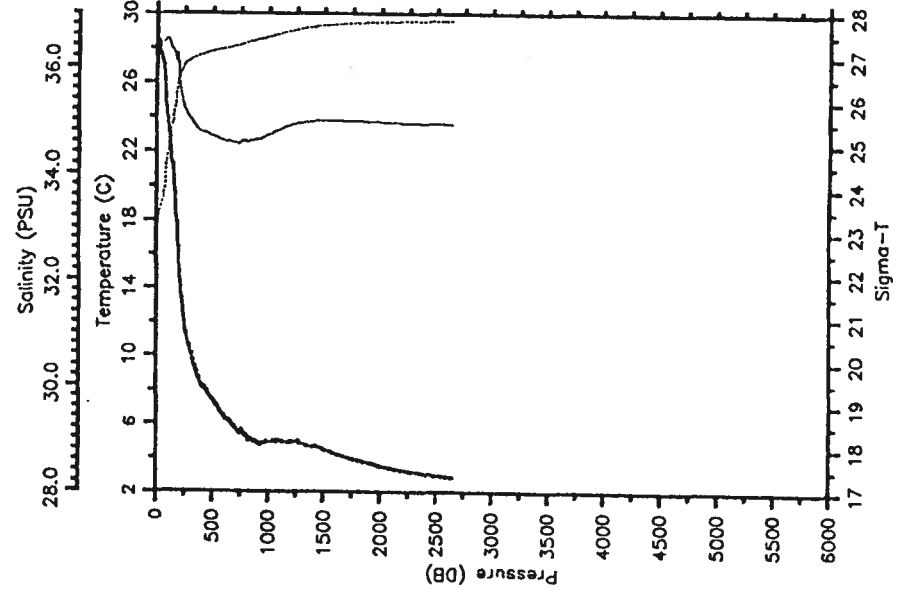
— Tem — Sal
 --- SigT



Prs	Tem	Sal	SigT
0	28.18	34.766	21.83
10	28.00	35.065	22.12
20	28.28	35.173	23.18
30	27.98	35.409	23.48
40	27.74	35.445	23.57
50	27.62	35.451	23.61
60	27.32	35.457	23.72
70	27.10	35.458	23.78
80	26.83	35.463	23.88
90	26.00	35.487	24.16
100	25.22	35.494	24.40
110	23.60	35.500	24.90
120	22.63	35.434	25.13
130	21.49	35.368	25.40
140	21.31	35.357	25.44
150	20.82	35.333	25.56
160	20.34	35.323	25.68
170	18.14	35.172	26.14
180	16.50	35.943	26.36
190	16.17	35.997	26.48
200	15.19	35.845	26.58
250	11.72	35.282	26.86
300	10.81	35.139	26.92
350	9.53	34.952	26.99
400	8.97	34.885	27.03
450	8.55	34.860	27.08
500	8.17	34.837	27.12
550	7.71	34.789	27.15
600	7.36	34.767	27.18
650	6.49	34.665	27.22
700	6.06	34.642	27.26
750	5.53	34.596	27.28
800	5.36	34.617	27.33
850	5.21	34.652	27.36
900	5.05	34.669	27.41
950	5.12	34.730	27.45
1000	5.19	34.796	27.49
1500	4.27	34.998	27.76
1794	3.95	34.988	27.78

RES-STACS28-87 CTD 52 RESEARCHER
 Date 09 21 87 Latitude 7.972 N
 Time 0848 Z Longitude 52.477 W

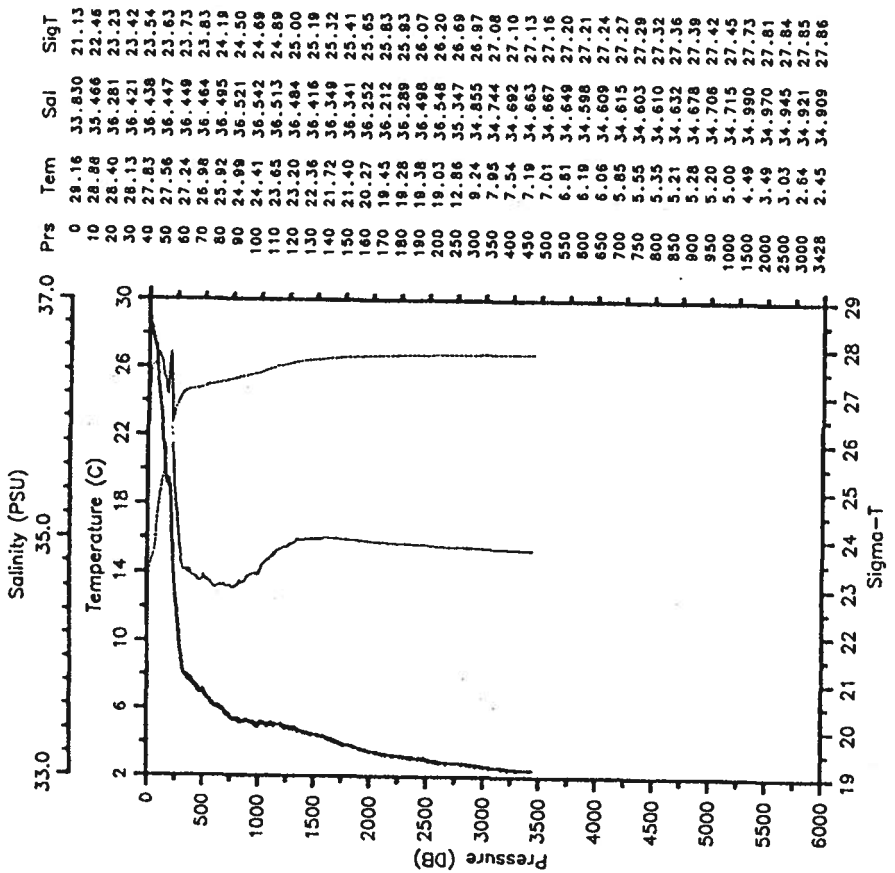
— Tem — Sal
 --- SigT



Prs	Tem	Sal	SigT
0	28.07	34.871	22.02
10	28.01	35.142	22.17
20	28.35	35.225	23.20
30	28.00	35.415	23.46
40	27.70	35.450	23.59
50	27.48	35.454	23.66
60	27.16	35.452	23.76
70	26.81	35.458	23.88
80	25.36	35.505	24.31
90	24.86	35.528	24.60
100	24.11	35.523	24.76
110	23.55	35.506	24.92
120	22.88	35.459	25.08
130	21.94	35.371	25.28
140	21.26	35.348	25.45
150	21.11	35.326	25.48
160	20.07	35.266	25.71
170	19.29	35.206	25.87
180	18.00	35.106	26.12
190	17.46	35.212	26.33
200	16.33	35.081	26.50
250	11.89	35.272	26.82
300	10.27	35.050	26.83
350	9.10	34.881	27.01
400	8.30	34.781	27.06
450	7.96	34.766	27.10
500	7.39	34.707	27.13
550	6.84	34.667	27.16
600	6.43	34.616	27.19
650	6.15	34.606	27.22
700	5.75	34.578	27.25
750	5.51	34.589	27.29
800	5.33	34.616	27.33
850	5.02	34.612	27.37
900	4.89	34.635	27.40
950	4.84	34.671	27.43
1000	4.91	34.727	27.47
1500	4.44	35.003	27.74
2000	3.53	34.973	27.81
2500	2.99	34.943	27.84
2646	2.89	34.937	27.84

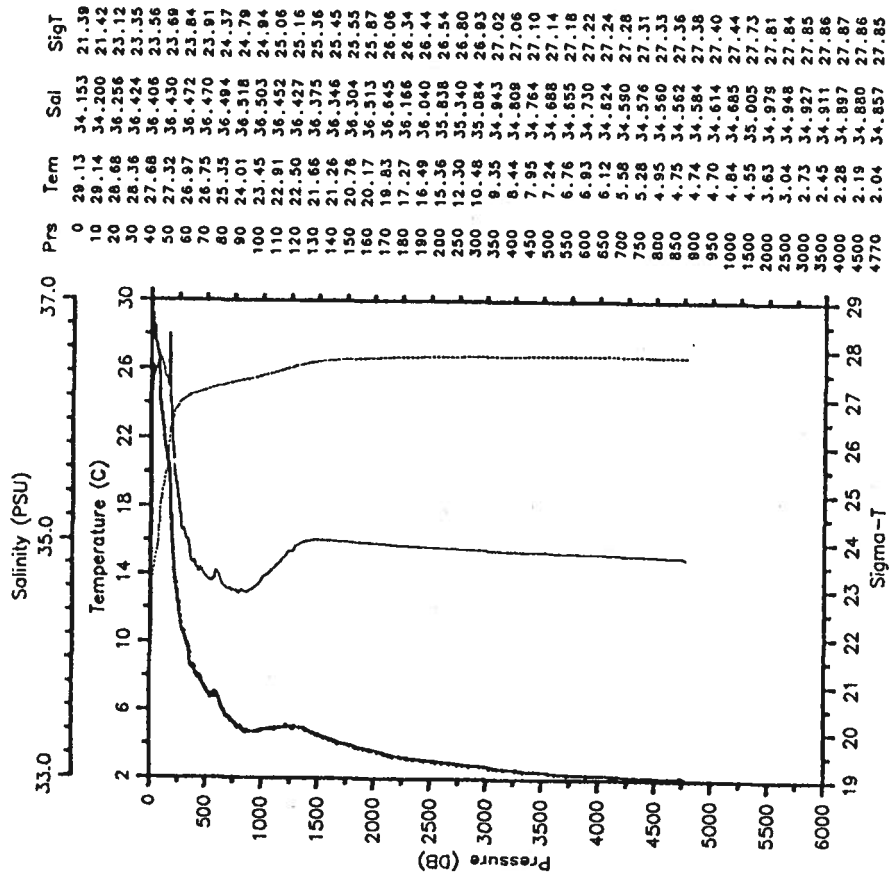
RES-STACS28-87 CTD 53 RESEARCHER
 Date 09 21 87 Latitude 8.213 N
 Time 1153 Z Longitude 52.315 W

---Tem ---Sal
 ---SigT



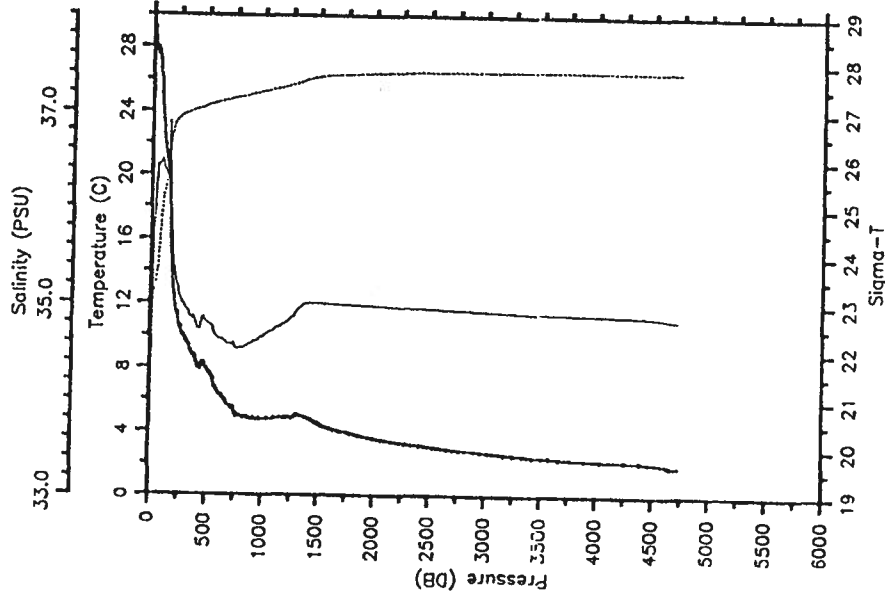
RES-STACS28-87 CTD 54 RESEARCHER
 Date 09 22 87 Latitude 8.545 N
 Time 0552 Z Longitude 52.168 W

---Tem ---Sal
 ---SigT



RES-STACS28-87 CTD 55 RESEARCHER
 Date 09 22 87 Latitude 8.782 N
 Time 1353 Z Longitude 51.960 W

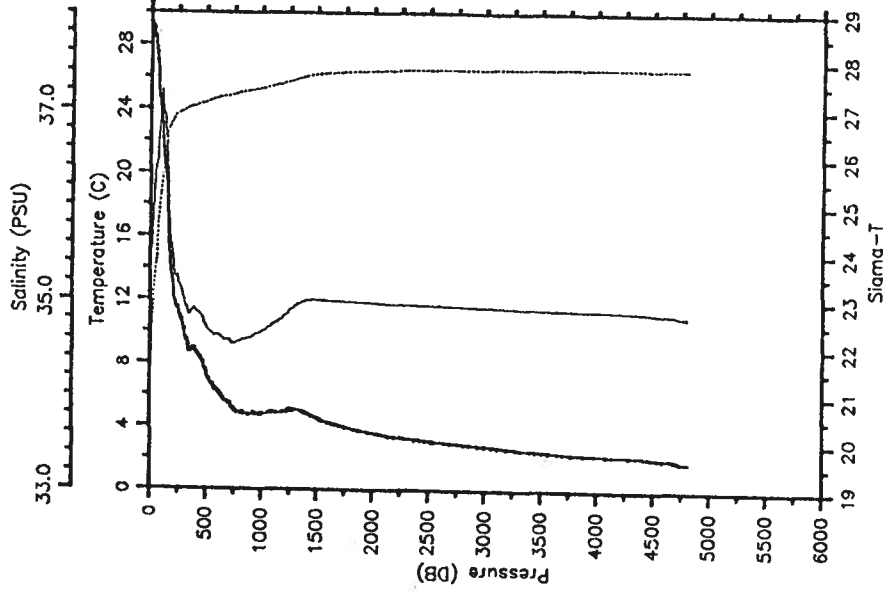
— Tem — Sal
 — SigT



Prs	Tem	Sal	SigT
0	29.35	35.26	20.93
10	29.19	35.716	21.04
20	28.95	36.521	21.72
30	27.83	35.833	23.08
40	27.65	36.046	23.30
50	27.64	36.261	23.46
60	27.48	36.431	23.64
70	26.95	36.450	23.83
80	25.66	36.450	24.24
90	24.18	36.473	24.71
100	23.32	36.474	24.96
110	22.41	36.408	25.17
120	21.91	36.391	25.30
130	21.31	36.365	25.45
140	20.88	36.332	25.54
150	20.45	36.299	25.63
160	20.76	36.809	25.94
170	17.96	36.317	26.29
180	15.42	35.628	26.52
190	14.42	35.670	26.62
200	13.10	35.452	26.72
250	10.97	35.136	26.89
300	9.84	34.990	26.95
350	9.10	34.866	27.00
400	8.60	34.827	27.05
450	7.91	34.733	27.08
500	7.95	34.817	27.14
550	7.49	34.776	27.17
600	6.55	34.653	27.21
650	6.15	34.627	27.24
700	5.67	34.583	27.26
750	5.36	34.571	27.29
800	4.99	34.542	27.31
850	4.88	34.556	27.34
900	4.80	34.588	27.37
950	4.78	34.616	27.40
1000	4.78	34.663	27.43
1500	4.53	35.005	27.73
2000	3.61	34.977	27.81
2500	3.11	34.952	27.84
3000	2.77	34.929	27.85
3500	2.47	34.906	27.86
4000	2.30	34.896	27.86
4500	2.16	34.874	27.85
4720	1.92	34.843	27.85

RES-STACS28-87 CTD 56 RESEARCHER
 Date 09 22 87 Latitude 9.098 N
 Time 1808 Z Longitude 51.797 W

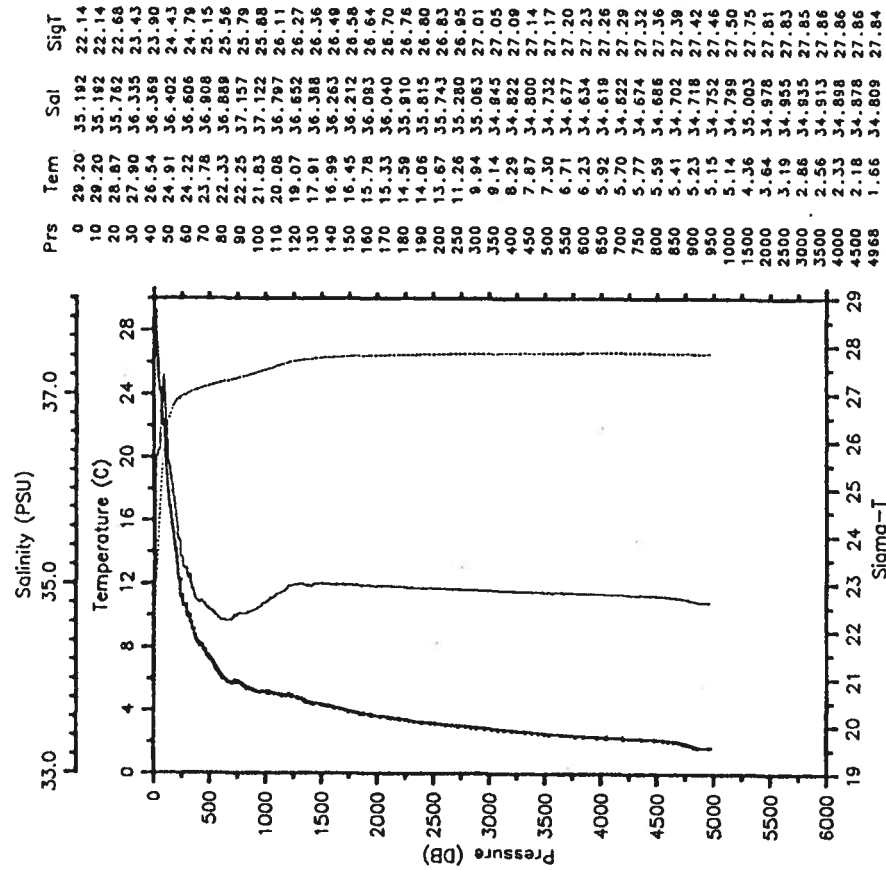
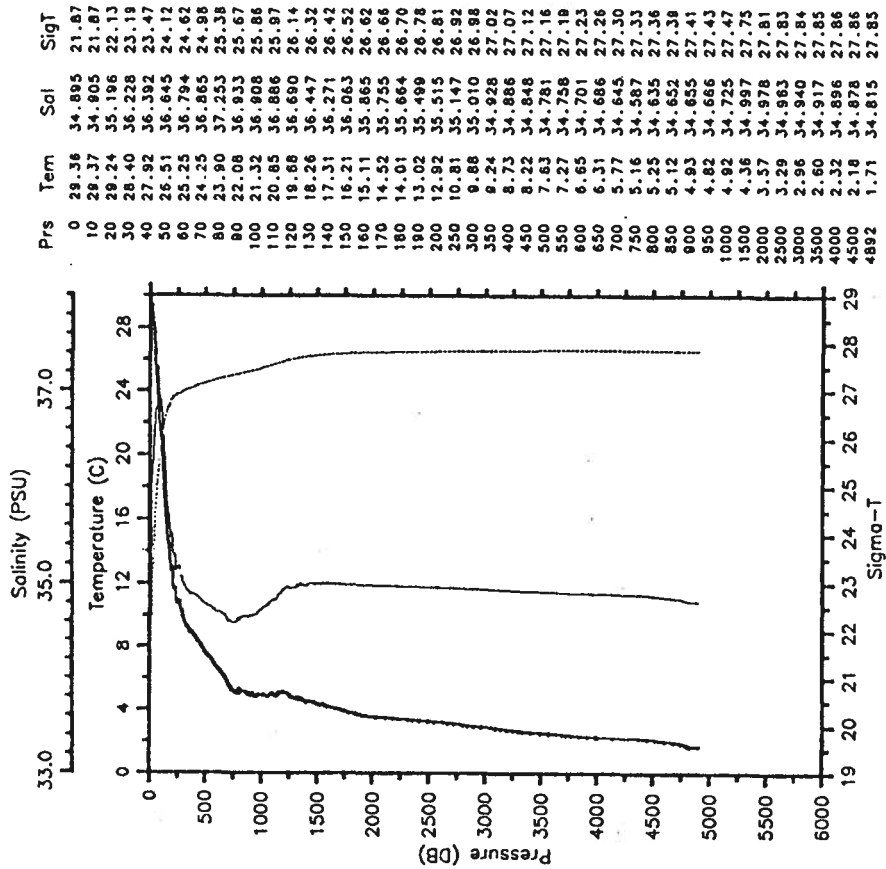
— Tem — Sal
 — SigT



Prs	Tem	Sal	SigT
0	29.35	35.640	20.93
10	29.19	35.742	21.06
20	29.00	35.263	22.26
30	28.97	35.751	22.67
40	28.41	36.198	23.16
50	27.62	36.356	23.54
60	27.12	36.409	23.74
70	26.27	36.443	24.04
80	24.74	36.671	24.69
90	24.10	36.874	25.03
100	23.62	36.982	25.26
110	23.03	37.107	25.52
120	21.62	36.948	25.81
130	20.98	36.938	25.98
140	20.20	36.804	26.09
150	19.55	36.686	26.17
160	17.67	36.336	26.38
170	15.31	35.895	26.59
180	14.88	35.785	26.81
190	13.82	35.897	26.89
200	13.45	35.551	26.73
250	11.54	35.260	26.88
300	10.15	35.045	26.96
350	8.85	34.846	27.02
400	8.93	34.905	27.06
450	8.35	34.848	27.10
500	7.42	34.723	27.14
550	6.69	34.656	27.19
600	6.28	34.633	27.23
650	5.80	34.598	27.26
700	5.51	34.577	27.28
750	5.05	34.539	27.30
800	4.87	34.564	27.34
850	4.80	34.584	27.37
900	4.77	34.600	27.38
950	4.81	34.644	27.41
1000	4.78	34.671	27.44
1500	4.54	35.005	27.73
2000	3.62	34.979	27.81
2500	3.15	34.951	27.83
3000	2.84	34.935	27.85
3500	2.53	34.911	27.86
4000	2.32	34.899	27.86
4500	2.14	34.874	27.86
4798	1.87	34.835	27.85

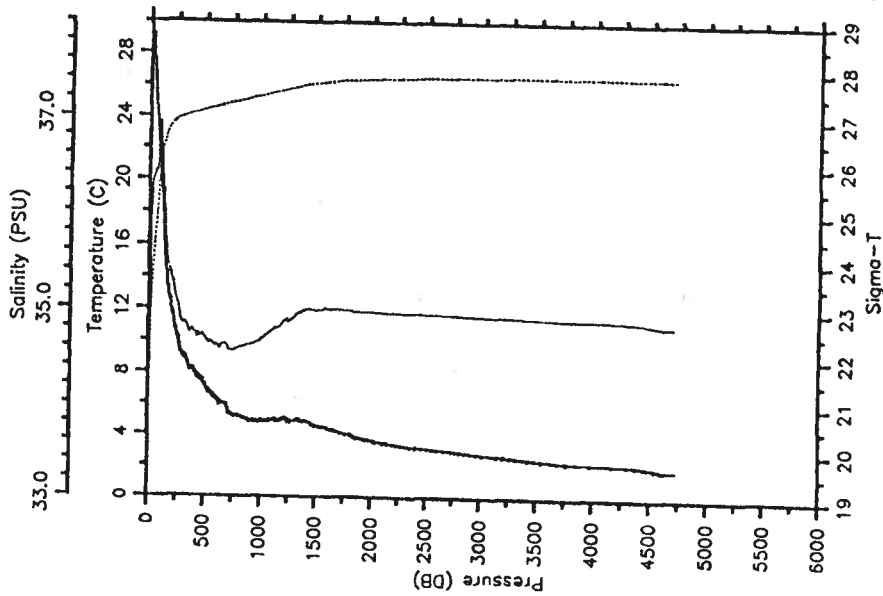
RES-STACS28-87 CTD 57 RESEARCHER
 Date 09 22 87 Latitude 9.562 N
 Time 2302 Z Longitude 51.517 W

RES-STACS28-87 CTD 58 RESEARCHER
 Date 09 23 87 Latitude 10.000 N
 Time 0341 Z Longitude 51.248 W



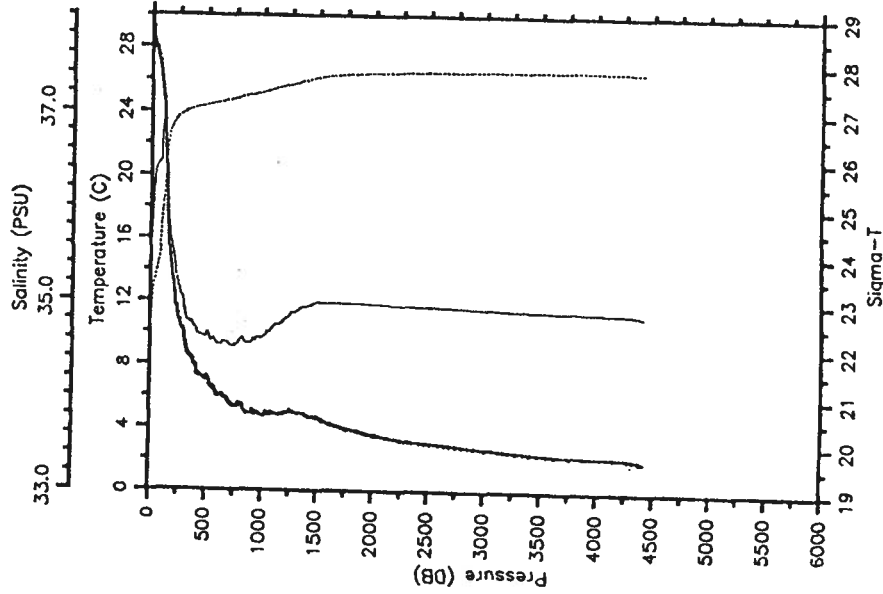
RES-STACS28-87 CTD 59 RESEARCHER
 Date 09 23 87 Latitude 9.065 N
 Time 1248 Z Longitude 50.192 W

— Tem — Sal
 --- SigT



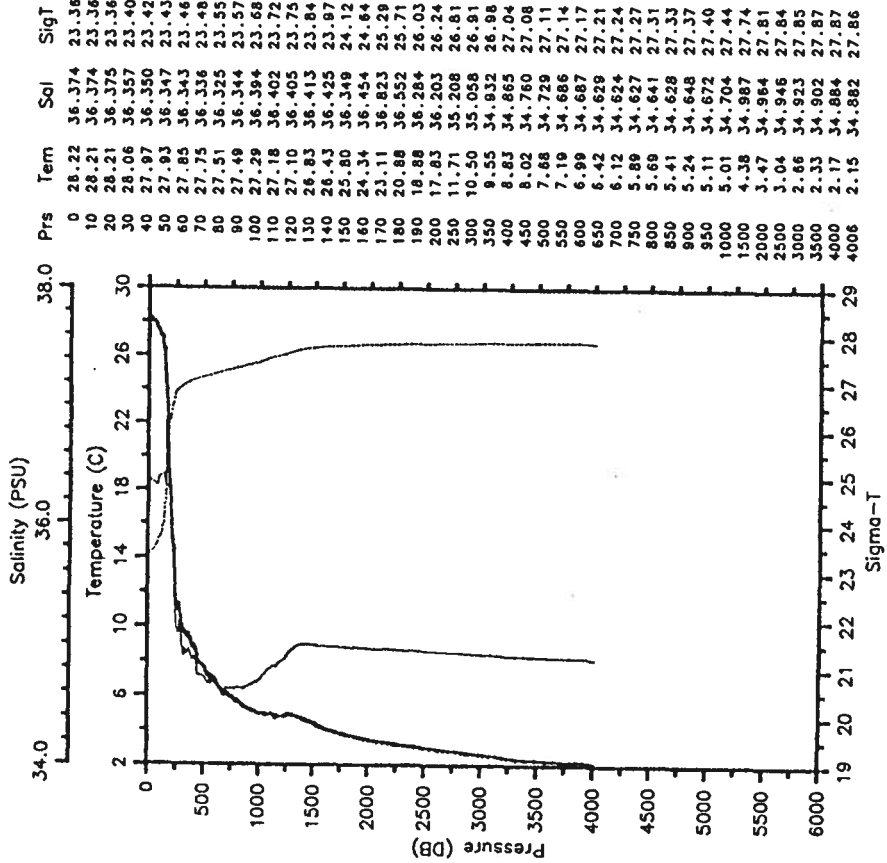
RES-STACS28-87 CTD 60 RESEARCHER
 Date 09 23 87 Latitude 7.835 N
 Time 2142 Z Longitude 49.222 W

— Tem — Sal
 --- SigT



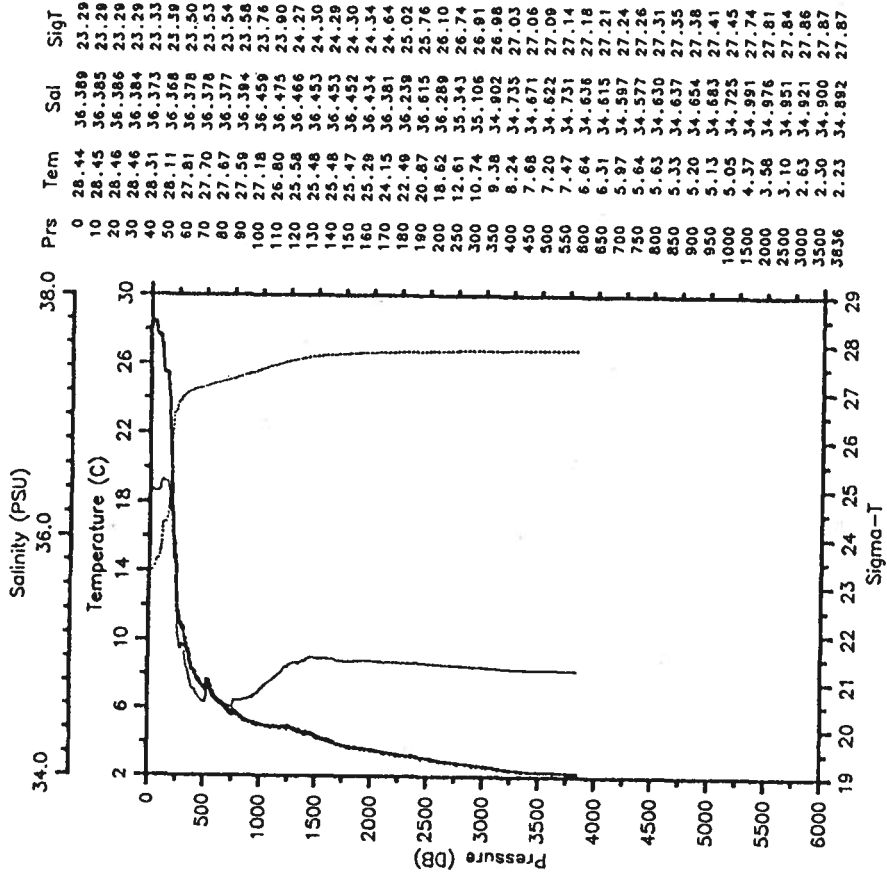
RES-STACS28-87 CTD 61 RESEARCHER
 Date 09 24 87 Latitude 6.618 N
 Time 0659 Z Longitude 48.287 W

— Tem — Sal
 — SigT



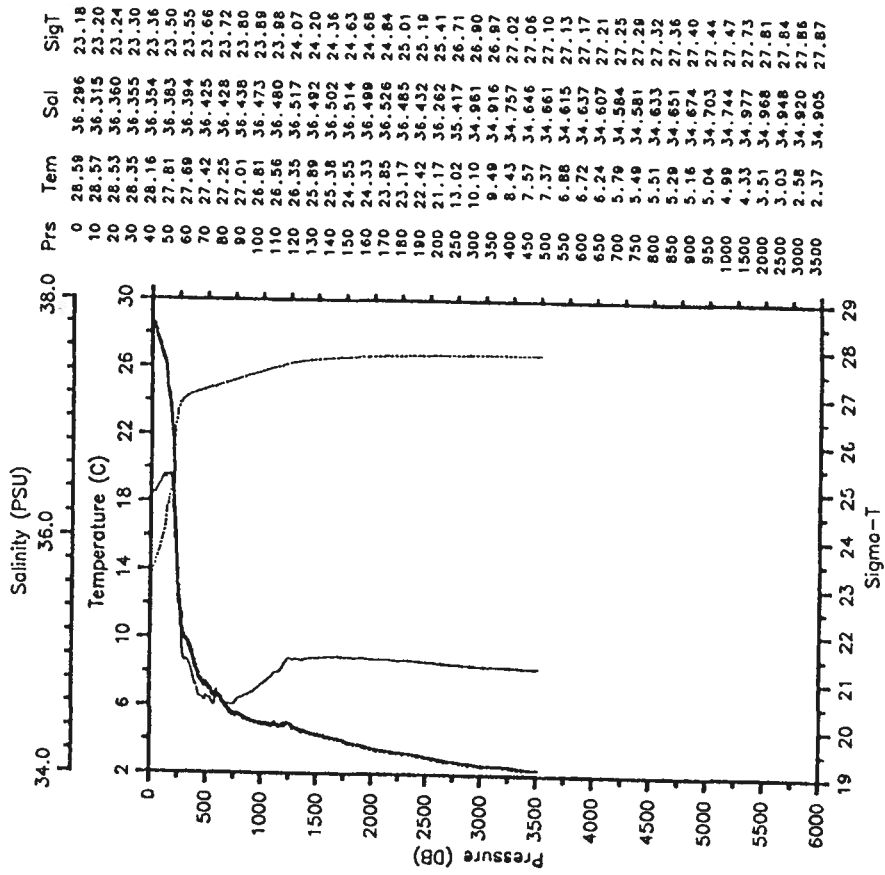
RES-STACS28-87 CTD 62 RESEARCHER
 Date 09 24 87 Latitude 6.185 N
 Time 1130 Z Longitude 48.527 W

— Tem — Sal
 — SigT



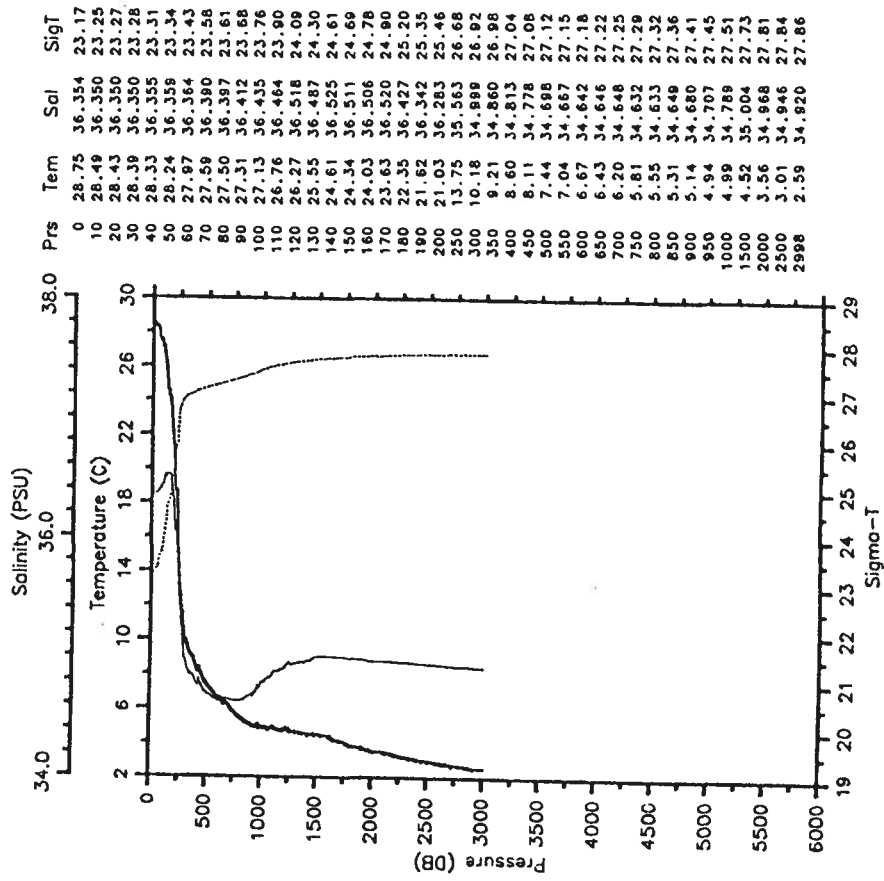
RES-STACS28-87 CTD 63 RESEARCHER
 Date 09 24 87 Latitude 5.738 N
 Time 1554 Z Longitude 48.775 W

--- Tem --- Sal
 SigT



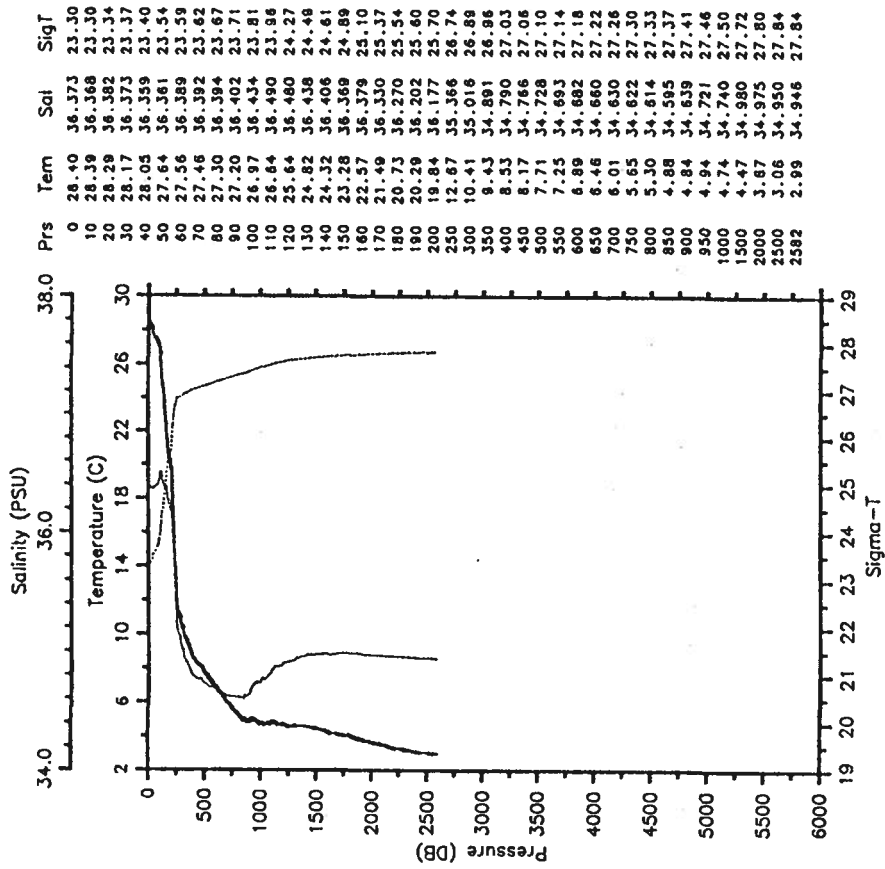
RES-STACS28-87 CTD 64 RESEARCHER
 Date 09 24 87 Latitude 5.305 N
 Time 2026 Z Longitude 49.018 W

--- Tem --- Sal
 SigT



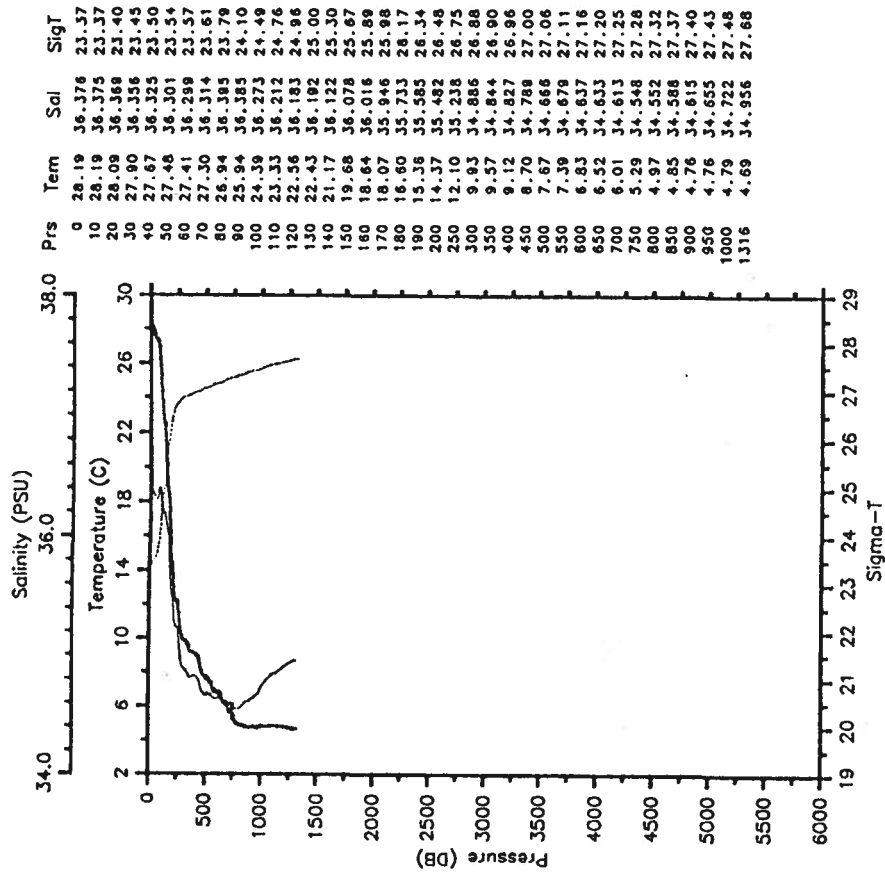
RES-STACS28-87 CTD 65 RESEARCHER
 Date 09 25 87 Latitude 4.870 N
 Time 0055 Z Longitude 49.272 W

— Tem — Sal
 — SigT



RES-STACS28-87 CTD 66 RESEARCHER
 Date 09 25 87 Latitude 4.425 N
 Time 0449 Z Longitude 49.498 W

— Tem — Sal
 — SigT



APPENDIX C: XBT DATA

Casts are presented by cruise and increasing cast number. Isotherm depths in meters are listed at temperatures ranging from 30 to 6 degrees Centigrade.

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ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS27-87						
XBT NO.	1	2	3	4	5	6	7	
YEAR	1987	1987	1987	1987	1987	1987	1987	
MONTH	3	3	3	3	3	3	3	
DAY (GRT)	11	12	12	13	13	14	15	
TIME (GRT)	1918	0706	1919	0736	2025	3214	0018	
LAT (N)	26.11	25.54	24.08	22.51	22.83	23.58	24.52	
LOX (W)	79.26	76.42	75.38	72.93	72.61	72.29	72.24	
SURF T (C)	25.0	23.9	24.7	24.8	24.8	24.8	23.8	

25	5							
24	105		131	100	63	88		
23	123	122	165	118	93	116	98	
22	143	151	180	158	117	147	122	
21	162	171	203	175	136	176	143	

20	181	214	223	202	168	194	166	
19	217	249	270	260	209	228	209	
18	316	329	339	335	295	307	305	
17	368	411	415	395	371	387	400	
16				441	451	439		

15								
14								
13								
11								
11								

10								
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS27-87						
XBT NO.	8	9	10	11	12	13	14	
YEAR	1987	1987	1987	1987	1987	1987	1987	
MONTH	3	3	3	3	3	3	3	
DAY (GRT)	15	15	16	17	17	18	18	
TIME (GRT)	1205	2359	1217	0040	1217	0032	1244	
LAT (N)	25.07	25.75	26.13	26.51	26.50	26.45	26.50	
LOX (W)	72.73	73.33	73.67	74.54	75.21	75.58	75.92	
SURF T (C)	22.0	23.6	23.6	23.7	23.5	21.4	22.5	

25								
24								
23		126	115	109	74	31		
22		151	148	149	128	88	126	
21	81	172	184	180	168	361	171	

20	188	197	208	214	209	192	223	
19	176	238	252	258	255	252	271	
18	292	321	344	342	360	368	393	
17	401	414	442	429		448		
16								

15								
14								
13								
12								
11								

10								
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS27-87						
XBT NO.	15	16	17	18	19	20	21	
YEAR	1987	1987	1987	1987	1987	1987	1987	
MONTH	3	3	3	3	3	3	3	
DAY (GRT)	18	19	19	20	21	21	22	
TIME (GRT)	0355	1601	0905	2113	0912	2213	1044	
LAT (N)	26.52	26.60	26.56	27.26	27.00	27.03	27.00	
LOX (W)	76.55	76.64	76.75	79.25	79.85	79.50	79.88	
SURF T (C)	22.4	22.6	21.3	25.0	24.4	25.2	25.0	

25				54		83	48	
24				113	39	98	62	
23			70	128	61	121	94	
22	134	134	148	158	78	136	107	
21	215	211	196	151	91	173	123	

20	261	253	252	204	131	203	129	
19	308	295	286	274	149	222	136	
18	349	376	380	321	172	242	153	
17			445	394	440	278	191	
16				433	397	323	238	

15				215	151	284		
14				232	377	114		
13				245	404	345		
12				264	433	359		
11				273		376		

10						418		
9						450		
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS27-87						
XBT NO.	22	23	24	25	26	27	28	
YEAR	1987	1987	1987	1987	1987	1987	1987	
MONTH	3	3	3	3	3	3	3	
DAY (GRT)	23	24	24	24	25	26	26	
TIME (GRT)	1023	0000	1204	2358	3222	0025	1230	
LAT (N)	25.91	26.48	27.04	27.00	27.03	26.15	25.91	
LOX (W)	79.73	79.51	79.70	79.38	79.63	79.82	76.75	
SURF T (C)	25.3	25.2	25.1	25.1	25.4	25.3	23.1	

25	94	112	76	131	98	90		
24	112	123	91	146	108	96		
23	130	134	113	167	135	103	64	
22	135	145	130	186	161	139	169	
21	150	158	141	217	173	158	205	

20	179	175	152	245	183	165	225	
19	201	216	181	257	198	189	255	
18	221	237	193	291	209	218	338	
17	243	264	212	314	233	245	426	
16	270	280	224	358	262	254		

15	280	305	233	393	285	265		
14	298	331	243	433	307	304		
13	327	361	269		324	333		
12	356	408	303			361		
11	382	437	341			401		

10	429		381			428		
9			438					
8								
7								
6								

ISOTHERM DEPTHS (M)

	R/V RESEARCHER			RES-STACS27-87			
ST NO.	29	30	31	31	33	34	35
YEAR	1987	1987	1987	1987	1987	1987	1987
MONTH	3	3	3	3	3	3	3
DAY (GMT)	27	27	28	28	29	29	30
TIME (GMT)	0644	1835	0649	2201	1003	2248	1105
LAT (N)	26.52	26.51	26.56	26.50	26.54	26.15	26.19
LONG (W)	76.74	76.53	76.84	76.62	76.67	79.82	79.28
SURF T (C)	23.4	23.7	23.2	23.6	23.4	23.6	25.0
28							
27							
26							
25							61
24							135
23	40	41	39	77	53	65	154
22	137	127	129	129	123	318	169
21	179	182	165	174	180	181	197
20	212	222	226	212	205	205	231
19	277	272	278	259	272	263	259
18		377		386	383	378	295
17							355
16							
15							
14							
13							
12							
11							
10							
9							
8							
7							
6							

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87						
XBT NO.	1	2	3	4	5	6	7	
YEAR	87	87	87	87	87	87	87	
MONTH	9	9	9	9	9	9	9	
DAY (GMT)	1	2	2	2	2	2	2	
TIME (GMT)	1742	0539	1007	1115	1211	1329	1427	
LAT (N)	25.92	25.92	26.00	26.00	26.00	26.00	26.00	
LOX (W)	79.42	77.76	77.00	76.73	76.46	76.19	75.92	
SURF T (C)	30.0	29.9	29.5	29.5	29.5	29.4	29.4	
30	0							
29	35	40	47	47	48	42	38	
28	53	60	51	53	55	48	44	
27	77	81	56	58	62	54	49	
26	92	102	66	69	71	59	62	
25	132	135	80	82	81	75	85	
24	143	143	98	100	97	93	105	
23	150	152	125	123	120	124	121	
22	169	166	164	151	153	147	147	
21	187	185	183	175	182	174	182	
20	205	199	213	213	214	212	216	
19	225	218	246	258	263	244	247	
18	256	269	332	341	340	335	333	
17	284	143	404	410	433	436	420	
16	319	395	463	485	497	470	473	
15	344	445	504	538	538	521	518	
14	375		548	582	600	567	575	
13	404		594	624	648	619	623	
12	439		634	655	694	666	671	
11			664	701	736	706	720	
10			703					
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87						
XBT NO.	8	9	10	11	12	13	14	
YEAR	87	87	87	87	87	87	87	
MONTH	9	9	9	9	9	9	9	
DAY (GMT)	2	2	2	2	3	3	3	
TIME (GMT)	1518	2119	2233	2319	0008	0113	0204	
LAT (N)	26.25	26.75	27.00	27.00	27.00	27.01	27.00	
LOX (W)	75.92	75.95	75.93	76.15	76.38	76.61	76.83	
SURF T (C)	29.5	29.8	29.8	29.8	29.6	29.6	29.6	
30								
29	39	37	39	40	39	37	36	
28	45	40	46	45	46	44	42	
27	54	48	59	61	55	52	48	
26	63	58	68	70	68	65	65	
25	78	80	86	83	84	79	76	
24	101	97	97	109	107	95	93	
23	122	117	122	140	133	115	121	
22	145	147	159	170	153	141	146	
21	178	188	201	207	196	200	188	
20	202	222	226	240	229	228	213	
19	265	267	284	300	289	268	260	
18	351	374	390	416	398	371	382	
17	449	478	489	506	487	452	467	
16	494	533	552	566	544	536	524	
15	550	579	603	616	596	629	568	
14	603	631	637	659	647	671	622	
13	648	674	691	704	695	702	664	
12	693	719			736	730	700	
11	728							
10								
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87						
XBT NO.	15	16	17	18	19	20	21	
YEAR	87	87	87	87	87	87	87	
MONTH	9	9	9	9	9	9	9	
DAY (GMT)	3	3	4	5	5	5	5	
TIME (GMT)	0305	1753	1754	0655	0853	1054	1254	
LAT (N)	26.75	26.58	28.49	26.18	25.90	25.63	25.39	
LOX (W)	76.85	76.66	75.92	74.92	74.15	73.87	73.49	
SURF T (C)	29.4	29.7	29.6	29.5	29.5	29.3	29.4	
30								
29	40	36	46	47	41	46	46	
28	47	39	51	53	45	55	50	
27	54	48	58	61	50	65	60	
26	67	57	66	72	65	75	74	
25	83	72	78	85	84	87	89	
24	104	99	98	99	107	108	110	
23	123	125	125	125	127	136	136	
22	143	143	155	148	149	159	165	
21	179	186	196	182	177	193	201	
20	229	195	226	208	211	225	230	
19	259	253	271	251	249	270	273	
18	345	341	363	341	322	359	384	
17	426	445		407	423	414	466	
16	472			471	487	497	523	
15	520			517	535	549	567	
14	559			566	578	597	616	
13	609			625	617	637	659	
12	652			663	660	671	708	
11	695			701	693	721		
10					731			
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87						
XBT NO.	22	23	24	25	26	27	28	
YEAR	87	87	87	87	87	87	87	
MONTH	9	9	9	9	9	9	9	
DAY (GMT)	5	5	5	6	7	7	7	
TIME (GMT)	1454	1653	1853	1153	0201	0345	0541	
LAT (N)	25.10	24.82	24.52	23.25	22.44	22.31	22.25	
LOX (W)	73.10	72.75	72.35	72.46	72.64	72.12	71.87	
SURF T (C)	29.7	29.8	29.7	29.5	29.2	29.4	29.5	
30								
29	41	40	45	42	41	45	52	
28	43	44	51	52	54	50	58	
27	49	50	56	58	64	59	67	
26	60	61	69	67	78	73	81	
25	76	76	84	80	94	96	94	
24	100	102	97	108	115	127	112	
23	131	131	119	127	145	150	138	
22	164	161	146	151	166	168	159	
21	203	205	175	174	186	198	187	
20	246	245	203	201	221	221	203	
19	306	290	252	245	262	263	244	
18	409	399	373	341	332	325	325	
17	499	490	463	425	433	416	422	
16	553	548	518		463	469	473	
15	598	589	560		500	507	518	
14	634	628	608		550	554	566	
13	679	681	656		599	594	610	
12	723	726	695		625	627	655	
11					678	677	709	
10					723			
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER RES-STACS28-87

Table with columns: XBT NO., YEAR, MONTH, DAY (GMT), TIME (GMT), LAT (N), LON (W), SURF T (C), and depth values (30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6).

ISOTHERM DEPTHS (M)

R/V RESEARCHER RES-STACS28-87

Table with columns: XBT NO., YEAR, MONTH, DAY (GMT), TIME (GMT), LAT (N), LON (W), SURF T (C), and depth values (30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6).

ISOTHERM DEPTHS (M)

R/V RESEARCHER RES-STACS28-87

Table with columns: XBT NO., YEAR, MONTH, DAY (GMT), TIME (GMT), LAT (N), LON (W), SURF T (C), and depth values (30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6).

ISOTHERM DEPTHS (M)

R/V RESEARCHER RES-STACS28-87

Table with columns: XBT NO., YEAR, MONTH, DAY (GMT), TIME (GMT), LAT (N), LON (W), SURF T (C), and depth values (30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6).

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87						
KBT NO.	111	124	115	116	117	118	119	
YEAR	87	87	87	87	87	87	87	
MONTH	9	9	9	9	9	9	9	
DAY (GMT)	26	26	26	27	27	27	27	
TIME (GMT)	1909	2114	2255	0116	0312	0531	0733	
LAT (N)	10.92	11.10	11.45	11.72	11.99	12.26	12.52	
LOX (W)	56.20	56.72	57.07	57.49	57.92	58.35	56.79	
SURF T (C)	29.1	29.1	29.1	28.9	28.8	28.8	28.9	
30								
29	33	29	35					
28	45	45	49	46	53	48	61	
27	55	56	59	56	70	59	75	
26	67	68	71	76	83	74	96	
25	74	82	86	93	94	92	115	
24	85	97	99	105	104	102	128	
23	112	115	115	114	115	114	146	
22	127	120	129	131	132	135	160	
21	137	128	141	143	131	150	171	
20	143	139	152	156	141	157	179	
19	148	146	160	169	148	167	208	
18	170	154	167	189	174	175	217	
17	195	167	173	200	199	199	228	
16	205	183	179	209	226	235	239	
15	223	195	186	220	241	234	253	
14	245	206	200	226	255	266	269	
13	272	225	213	240	274	283	286	
12	301	240	226	257	304	303	304	
11	347	258	262	322	332	329	324	
10	377	280	308	359		374	371	
9	409	372	320	402		413	421	
8		434	407					
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87						
KBT NO.	120	121	122	123	124	125	126	
YEAR	87	87	87	87	87	87	87	
MONTH	9	9	9	9	9	9	9	
DAY (GMT)	27	27	28	28	29	29	30	
TIME (GMT)	0928	2349	1152	2348	1154	2339	1153	
LAT (N)	12.79	15.67	16.65	18.78	20.51	22.27	23.93	
LOX (W)	59.21	61.47	61.77	65.75	68.39	71.06	73.73	
SURF T (C)	28.9	29.1	29.4	29.4	29.4	29.4	29.3	
30								
29		31	53	49	50	48	41	
28	48	54	64	55	55	55	45	
27	62	65	73	64	65	62	55	
26	81	80	85	76	75	74	67	
25	98	98	109	105	94	100	81	
24	119	112	134	131	116	131	95	
23	140	132	150	140	138	152	115	
22	159	143	176	167	161	187	145	
21	170	156	189	189	190	220	171	
20	186	176	208	210	234	255	193	
19	202	186	221	249	261	287	252	
18	224	202	243	281	344	341	364	
17	243	222	272	314	381	396		
16	257	249	285	351	424			
15	278	268	305	387				
14	295	292	335	423				
13	311	319	366					
12	331	345	404					
11	353	391	448					
10	391	432						
9								
8								
7								
6								

ISOTHERM DEPTHS (M)

R/V RESEARCHER		RES-STACS28-87	
KBT NO.	127	128	
YEAR	87	87	
MONTH	9	10	
DAY (GMT)	30	1	
TIME (GMT)	2351	1200	
LAT (N)	25.59	26.27	
LOX (W)	76.35	79.29	
SURF T (C)	29.7	29.4	
30			
29	47	40	
28	52	65	
27	40	92	
26	71	119	
25	86	127	
24	105	136	
23	128	159	
22	160	173	
21	186	198	
20	215	220	
19	260	270	
18	330	322	
17	400	363	
16		377	
15			
14			
13			
12			
11			
10			
9			
8			
7			
6			