

NOAA Data Report OAR AOML-39



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**CTD/O<sub>2</sub>, LADCP AND XBT MEASUREMENTS COLLECTED ABOARD  
THE *R/V SEWARD JOHNSON*, DECEMBER 1998: NORTH BRAZIL  
CURRENT RINGS EXPERIMENT CRUISE 1 (NBC-1)**

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Atlantic Oceanographic and Meteorological Laboratory  
Miami, Florida  
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# CTD/O<sub>2</sub>, LADCP, and XBT measurements collected aboard the *R/V Seward Johnson*, November-December 1998: North Brazil Current Rings Experiment Cruise 1 (NBC-1)

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**Abstract.** Summaries of conductivity-temperature-depth (CTD/O<sub>2</sub>), lowered acoustic doppler current profiler (LADCP), expendable bathythermograph (XBT) measurements, and hydrographic data acquired on an oceanographic research cruise during the fall of 1998 aboard the Harbor Branch Oceanographic Institution ship *R/V Seward Johnson* are presented. Data acquisition and processing systems are described, and calibration procedures are documented. Station location, CTD/O<sub>2</sub>, LADCP, XBT summary data listings, and profiles are included for each station.

## 1. Introduction

North Brazil Current rings are large (400 km diameter) anticyclones that pinch off from the North Brazil Current (NBC) retroflection in the western tropical Atlantic near 8°N, translate northwestward along the coast of South America, and decay through topographic interaction near the passages of the southeastern Caribbean. Advection within translating NBC rings has been proposed as one of several important pathways for the transport of South Atlantic upper-ocean water across the equatorial-tropical gyre boundary and into the North Atlantic subtropical gyre. Such transport is required to complete the Meridional Overturning Cell (MOC) in the Atlantic forced by the high-latitude production and southward export of North Atlantic Deep Water.

The mechanisms which contribute to NBC ring formation, and the structure and dynamics of the rings themselves, are not well understood. The specific objectives of the cruise were to:

1. Obtain a thorough description of the spatial and temporal evolution of the North Brazil Current retroflection and the separation of rings from the retroflection;
2. Determine the physical structure of the rings after separation from the NBC, including their sizes, vertical structure, horizontal swirl velocities, and the volume of South Atlantic water they trap and transport; and
3. Determine the rates of translation, decay, and mixing with resident North Atlantic waters as the rings move northwestward from their generation point toward the Caribbean Sea.

To accomplish these objectives, several complementary measurement techniques were employed. Primary elements of the observing strategy included: (1) an Inverted Echo Sounder (IES) array placed within TOPEX/GEOSAT-2 track lines to optimally monitor the evolution of the NBC retroflection and ring generation events; (2) moored current and temperature-salinity measurements along the ring translation corridor to determine the transport and water mass characteristics of the rings; (3) detailed shipboard CTD/ADCP surveys; (4) deployments of surface drifters and subsurface RAFOS floats in selected rings to track their propagation and decay at various stages of their life cycle; and (5) XBT deployments. This report describes the CTD/O<sub>2</sub>-LADCP survey data and XBT profile data collected during the first cruise of this project (NBC-1), which took place from November 7 to December 11, 1998 aboard the *R/V Seward Johnson*.

A total of 68 hydrographic stations were occupied during two legs of this cruise. Figure 1 shows

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station locations for legs 1 and 2. Table 1 provides a summary of CTD/O<sub>2</sub>-LADCP cast information. At each station, profiles of temperature, salinity (conductivity), and dissolved oxygen concentration were collected to a depth of 2000 m or to within approximately 10 m of the bottom at shallower depths. LADCP measurements were taken concurrently with CTD/O<sub>2</sub> stations. Water samples for calibration of the salinity and dissolved oxygen profiles were collected at each station.

## 2. Standards and Pre-Cruise Calibrations

The CTD/O<sub>2</sub> system is a real-time data acquisition system with the data from a Sea Bird Electronics, Inc. (SBE) 9plus underwater unit transmitted via a conducting cable to a SBE 11plus deck unit. The serial data from the underwater unit is sent to the deck unit in RS-232 NRZ format. The deck unit decodes the serial data and sends it to a personal computer for display and storage in a disk file using Sea-Bird SEASOFT software.

The SBE 911plus system transmits data from primary and auxiliary sensors in the form of binary numbers equivalent to the frequency or voltage outputs from those sensors. These are referred to as the raw data. The SBE software performs the calculations required to convert raw data to engineering units.

The SBE 911plus system is electrically and mechanically compatible with the standard, unmodified rosette water sampler, also made by Sea-Bird Electronics, Inc. A modem and rosette interface allows the 911plus system to control the operations of the rosette directly without interrupting the flow of data from the CTD.

The SBE 9plus underwater unit is configured with dual standard modular temperature (SBE 3) and conductivity (SBE 4) sensors, which are mounted near the lower end cap. The conductivity cell entrance is co-planar with the tip of the temperature sensor probe. The pressure sensor is mounted inside the underwater unit main housing. A centrifugal pump module flushes water through sensor tubing at a constant rate independent of the CTD's motion to improve dynamic performance. Dual dissolved oxygen sensors are added to the pumped sensor configuration following the temperature-conductivity (TC) pair.

### 2.1 Conductivity

The flow-through conductivity-sensing element is a glass tube (cell) with three platinum electrodes. The resistance measured between the center electrode and the end electrode pair is determined by the cell geometry and the specific conductance of the fluid within the cell, and controls the output frequency of a Wein Bridge circuit. The sensor has a frequency output of approximately 3 to 12kHz corresponding to conductivity from 0 to 7 Siemens/meter (0 to 70 mmho/cm). The SBE 4 has a typical accuracy/stability of  $\pm 0.0003$  S/m and resolution of 0.00004 S/m at 24 scans per second.

Two conductivity sensors were used during NBC-1 (serial numbers s/n1374 and 1387). Pre-cruise sensor calibrations were performed at Sea-Bird Electronics, Inc. in Bellevue, Washington. The following coefficients were entered into SEASOFT using the software module SEACON:

<u>s/n 1374</u>	<u>s/n 1387</u>
<u>June 9, 1998</u>	<u>April 17, 1998</u>
<i>g</i> = -4.27462699e+00	<i>g</i> = -4.05634514e+00
<i>h</i> = 5.21681775e-01	<i>h</i> = 4.62039307e-01
<i>i</i> = -4.66319760e-05	<i>i</i> = -1.50583604e-04
<i>j</i> = 3.07572222e-05	<i>j</i> = 3.32621635e-05
<i>ctcor</i> = 3.2500e-06	<i>ctcor</i> = 3.2500e-06
<i>cpcor</i> = -9.5700e-08	<i>cpcor</i> = -9.5700e-08

Conductivity calibration certificates show an equation containing the appropriate pressure-dependent correction term to account for the effect of hydrostatic loading (pressure) on the conductivity cell:

$$C (S/m) = (g + hf^2 + if^3 + jf^4) / 10 (1 + ctcor * t + cpcor * p)$$

where  $g$ ,  $h$ ,  $i$ ,  $j$ ,  $ctcor$ , and  $cpcor$  are the calibration coefficients shown above,  $f$  is the instrument frequency (kHz),  $t$  is the water temperature (degrees Celsius), and  $p$  is the pressure (dbar). SEASOFT automatically implements this equation.

## 2.2 Temperature

The temperature-sensing element is a glass-coated thermistor bead, pressure protected by a stainless steel tube. The sensor output frequency ranges from 5-13 kHz corresponding to temperature ranging from -5 to 35°C. The output frequency is inversely proportional to the square root of the thermistor resistance, which controls the output of a patented Wein Bridge circuit. The thermistor resistance is exponentially related to temperature. The SBE 3 thermometer has a typical accuracy/stability of  $\pm 0.004^\circ\text{C}$  per year and a resolution of  $0.0003^\circ\text{C}$  at 24 samples per second. The SBE3 thermometer has a fast response time of 0.070 seconds.

The two temperature sensors used during NBC-1 were s/n 1701 and 1075. Pre-cruise sensor calibrations were performed at Sea-Bird Electronics, Inc. in Bellevue, Washington. The following coefficients were entered into SEASOFT using SEACON:

s/n 1701	s/n 1075
May 01, 1998	April 17, 1998
$g = 4.79045670e-03$	$g = 4.81181676e-03$
$h = 6.53699147e-04$	$h = 6.70191644e-04$
$i = 1.84549957e-05$	$i = 2.57253314e-05$
$j = 1.00984586e-06$	$j = 2.07717961e-06$
$f_0 = 1000.0$	$f_0 = 1000.0$

Temperature (ITS-90) is computed according to

$$T [^\circ\text{C}] = [1 / (g + h \ln(f_0/f) + i \ln^2(f_0/f) + j \ln^3(f_0/f))] - 273.15$$

where  $g$ ,  $h$ ,  $i$ ,  $j$  and  $f_0$  are the calibration coefficients above and  $f$  is the instrument frequency (Hz). SEASOFT automatically implements this equation and converts between ITS-90 and IPTS-68 temperature scales as desired.

## 2.3 Pressure

The Paroscientific series 4000 Digiquartz high pressure transducer uses a quartz crystal resonator whose frequency of oscillation varies with pressure induced stress, measuring changes in pressure as small as 0.01 parts per million with an absolute range of 0 to 10,000 psia (0 to 6885 dbar). Repeatability, hysteresis, and pressure conformance are 0.002% FS. The nominal pressure frequency (0 to full scale) is 34 to 38 kHz. The nominal temperature frequency is 172 kHz + 50 ppm/°C.

The two pressure sensors utilized during NBC-1 were s/n 58808 and 50619. Pre-cruise sensor calibrations were performed at Sea-Bird Electronics, Inc. in Bellevue, Washington. The following coefficients were entered into SEASOFT using the module SEACON:

s/n 58808 May 31, 1996	s/n 50619 June 24, 1994
c1 = -4.53844e+04	c1 = -4.010525e+04
c2 = -1.963440e-01	c2 = .6815307e+0
c3 = 1.278040e-02	c3 = 1.28865e-02
d1 = 3.779600e-02	d1 = 0.039747
d2 = 0	d2 = 0
t1 = 3.010293e+01	t1 = 3.029263e+01
t2 = -2.932600e-04	t2 = -5.273358e-05
t3 = 3.610820e-06	t3 = 4.37835e-06
t4 = 3.748630e-09	t4 = 2.06507e-09

Pressure coefficients are first formulated into

$$c = c_1 + c_2U + c_3U^2$$

$$d = d_1 + d_2U$$

$$t0 = t1 + t2 * U + t3 * U^2 + t4 * U^3$$

where  $U$  is temperature in degrees Celsius. Pressure is computed according to

$$P \text{ (psia)} = c (1 - (t0^2 / t^2)) (1 - d (1 - (t0^2 / t^2)))$$

where  $t$  is pressure period ( $\mu$ s). SEASOFT automatically implements this equation.

## 2.4 Oxygen

The SBE 13Y dissolved oxygen sensor (Yellow Springs Instrument (YSI)) uses a polarographic type element. Oxygen sensors determine the dissolved oxygen concentration by counting the number of oxygen molecules per second (flux) that diffuse through a membrane. By knowing the flux of oxygen and the geometry of the diffusion path, the concentration of oxygen can be computed. The permeability of the membrane to oxygen is a function of temperature and ambient pressure. The interface electronics output voltages are proportional to membrane current (oxygen current) and membrane temperature (oxygen temperature). Oxygen temperature is used for internal temperature compensation. Initial computation of dissolved oxygen in engineering units is done in the software. The range for dissolved oxygen is 0 to 670  $\mu$ mol/kg; nominal accuracy is 4.45  $\mu$ mol/kg; resolution is 0.4  $\mu$ mol/kg. Response times are roughly 2 seconds at 25°C and 5 seconds at 0°C.

Oxygen sensors 130433 and 230531 were used during NBC-1. The following oxygen calibrations were entered into SEASOFT using SEACON:

s/n 130433 September 9, 1998	s/n 230531 August 31, 1998
$m = 1.0048e-5$	$m = 1.0059e-5$
$b = -4.8229e-9$	$b = -1.6094e-8$
$soc = .0785$	$soc = 0.0887$
$boc = -.0083$	$boc = -0.0209$
$tcor = -0.033$	$tcor = -0.033$
$pcor = 1.50e-4$	$pcor = 1.50e-4$
$\tau = 2.0$	$\tau = 2.0$
$wt = 0.85$	$wt = .85$
$k = 6.5742$	$k = 6.5121$
$c = -1.4886$	$c = -1.7991$

The use of these constants in linear equations of the form  $I = mV + b$  and  $T = kV + c$  yield sensor membrane current and temperature (with maximum error of about 0.5°C) as a function of sensor output voltage.

### **3. Data Acquisition**

CTD/O<sub>2</sub> measurements were made using a SBE 9plus CTD with dual sensor configuration. Each set of sensors included a temperature, conductivity, and dissolved oxygen sensor. The sets were placed as mirror images to each other mounted low in the CTD main housing with the intakes approximately 6-8 inches apart. The TC pairs were monitored for calibration drift and shifts by examining the differences between the two pairs on each CTD and comparing CTD salinity values with bottle salinity measurements.

AOML's SBE 9plus CTD/O<sub>2</sub> s/n 09P10779-0363 (sampling rate 24Hz) was mounted in a 24-position frame and employed as the primary package. Auxiliary sensors included a lowered acoustic doppler current profiler (LADCP) and a Simrad altimeter. Water samples were collected using a SBE bottle carousel and 10-liter Niskin bottles. Data from the primary sensor package was used for all final data in this report.

The package entered the water from the starboard side of the ship and was held within 5 meters of the surface for 1 minute in order to activate the pump. The package was lowered at a rate of 30 m/min to 100 m and 60 m/min generally to within 10 meters of the bottom, slowing on the approach. The altimeter monitored the position of the package relative to the bottom.

Upon completion of the cast, sensors were flushed repeatedly and stored with a dilute Triton-X solution in the plumbing. Niskin bottles were then sampled for oxygen, salinity and nutrients.

A SBE 11plus deck unit received the data signal from the CTD. Digitized data were forwarded to a personal computer equipped with SEASOFT acquisition and processing software version 4.234. Preliminary temperature, salinity, and oxygen profiles were displayed in real time. Raw data files were archived to SyQuest 230 mb removable drives.

#### **3.1 Data Acquisition/System Problems**

Most of the data acquisition problems incurred during the cruise was due to data flow interruption to the carousel. During NBC-1, five CTD stations (15, and 42 through 45) experienced signal interruptions. Therefore, bottle sample data for these stations was unable to be obtained due to rosette bottle firing problems, and are not included in this data report. Another problem that was discovered during leg 2 of the cruise was the fluctuation of pressure sensor 50619. This sensor gave inaccurate pressure readings after station 42, and was subsequently replaced with sensor 58808. The performance of the temperature, conductivity, and oxygen sensors was outstanding.

#### **3.2 Salinity Analyses**

Bottle salinity analyses were performed in the ship's temperature-controlled salinity laboratory using a Guildline Model 8400B inductive autosalinometer and a dedicated PC. Software allowed the user to standardize the autosal and perform a second standardization using a fresher standard (30 PSS) for a linearity check. IAPSO Standard Seawater was used as the standard. The autosal was standardized before each case of 24 samples was analyzed. The software limits set required that each successive reading be within  $\pm 0.002$  PSS or the program would reject that reading and seek another. Stable room temperature and high performance of the autosalinometer allowed these limits to be strictly set.

Duplicate samples were taken from the deepest bottle on each cast. Bottle salinities were compared with preliminary CTD salinity values to monitor CTD conductivity cell performance and drift. The expected precision of the autosal was 0.001 PSS, with an accuracy of  $\pm 0.0003$  PSS.

#### **3.3 Oxygen Analyses**

Bottle oxygen analyses were also performed in the ship's temperature-controlled salinity laboratory using a photometric automatic Winkler method tritator with a Carpenter modification, and a dedicated PC. The

water samples were drawn (without air bubbles) from Niskin bottles immediately upon arrival on deck. Manganese sulfate (or chloride) was added to the sample, followed by the addition of an alkaline sodium hydroxide-sodium iodide solution. These solutions "pickled" the sample, causing it to precipitate and react with the dissolved oxygen in the water sample. The sample was then dissolved and photometrically titrated to an end point with a standardized sodium thiosulphate solution. The content of oxygen value was calculated utilizing the volume of the water sample bottle and the amount of added thiosulphate. Automated titrating systems can attain a precision of about  $\pm 4.46 \mu\text{mol/kg}$  (Friederich *et al.*, 1991).

#### 4. At Sea Processing of CTD Data

SEASOFT consists of modular menu-driven routines for acquisition, display, processing, and archiving of oceanographic data acquired with SBE equipment. The software is designed to work with a PC. Raw data are acquired from the instruments and are stored in an unmodified format. The conversion module DATCNV uses the instrument configuration and pre-cruise factory calibration coefficients to create a converted engineering unit data file that is utilized by all SEASOFT post-processing modules. Unless otherwise noted, all calibration parameters given are factory default values recommended by Sea Bird Electronics, Inc. The following is the SEASOFT processing module sequence and specifications used in the reduction of CTD/O<sub>2</sub> data from this cruise:

- DATCNV converted the raw data to pressure, temperature, conductivity, oxygen current, and oxygen temperature, and computed salinity, the time rate of change of oxygen current, and preliminary oxygen. DATCNV also extracted bottle information where scans were marked with a bottle confirmation bit during acquisition.
- ROSSUM created a summary of the bottle data. Bottle position, date, and time were output automatically. Pressure, temperature, conductivity, salinity, oxygen current, oxygen temperature, time rate of change of oxygen current, and preliminary oxygen values were averaged over a 2 second interval from 5 to 3 seconds prior to the confirm bit. ROSSUM computed potential temperature and sigma-theta.
- WILDEDIT marked extreme outliers in the data files. The first pass of WILDEDIT obtained an accurate estimate of the true standard deviation of the data. The data were read in blocks of 200 scans. Data greater than two standard deviations were flagged. The second pass computed a standard deviation over the same 200 scans excluding the flagged values. Values greater than 16 standard deviations were marked as bad values.
- SPLIT grouped data into up cast (pressure decreasing) and down cast (pressure increasing) files.
- FILTER performed a low-pass filter on pressure data with a time constant of 0.15 seconds. In order to produce no time shift, the filter first ran forward through and then backwards through the data.
- ALIGNCTD aligned conductivity, temperature, and oxygen in time relative to pressure to ensure that all calculations were made using measurements from the same parcel of water, which minimized salinity spiking and density errors. The SBE 11plus deck unit has factory settings to advance the primary conductivity cell; therefore, ALIGNCTD was not performed on this cell. The secondary conductivity cell, however, is not advanced in the deck unit and so was advanced 0.073 seconds in the ALIGNCTD module. Since the SBE3 temperature sensor response is fast, (0.06 seconds), it was unnecessary to advance temperature relative to pressure. Oxygen sensors s/n 130433 and s/n 230531 were advanced 3 seconds in ALIGNCTD.
- CELLTM used a recursive filter to remove conductivity cell thermal mass effects from measured conductivity. Both conductivity cells were epoxy coated and therefore the thermal anomaly amplitude ( $\alpha$ ) and time constant ( $1/\beta$ ) were 0.03 and 9.0, respectively, for each sensor.

- DERIVE was used to re-compute the time rate of change of oxygen current (dox/dt) and oxygen ( $\mu\text{mol/kg}$ ) with a time window size of 2 seconds.
- LOOPEDIT marked data scans where the CTD package was moving less than a minimum velocity of 0.25 m/s or traveling backwards due to ship roll.
- BINAVG averaged the data into 1 decibar (dbar) pressure bins starting at 1 dbar with no surface bin. The center value of the first bin was set to equal the bin size. The bin minimum and maximum values were the center values plus or minus half the bin size. Scans with pressure values greater than the minimum and less than or equal to the maximum were averaged. Scans were interpolated so that a data record existed for every decibar. The number of points averaged in each bin was added to the variables listed in the data file.
- DERIVE recomputed salinity and calculated other oceanographic parameters (e.g. density, etc.).

## 5. Post-Cruise Calibrations

Post cruise sensor calibrations were done at Sea-Bird Electronics, Inc. during January 1999. The secondary TC pair T1075/C1387 was selected for final data reduction for all stations. In addition to the SEASOFT processing modules, several programs obtained from the Pacific Marine Environmental Laboratory (PMEL) were used to further reduce the CTD/O<sub>2</sub> data:

- FILLSFC was used to copy the first good value of salinity, potential temperature, oxygen, and oxygen current back to the surface. FILLSFC then back-calculated temperature and conductivity and zeroed doc/dt of oxygen current for those records.
- DESPIKE1 removed spikes from primary oxygen current and oxygen temperature data, as well as removing spikes from the primary conductivity sensor. Data were linearly interpolated over de-spiked records. Conductivity was back calculated, and sigma-theta and potential temperature were recomputed for the interpolated records.
- DESPIKE2 removed spikes from secondary sensors in the same method as DESPIKE1.
- Package slowdown and reversals due to ship roll can move mixed water in tow in front of the CTD sensors. This mixture can create artificial density inversions and other artifacts. In addition to SEASOFT module LOOPEDIT, the PMEL program DELOOP computed values of density locally referenced between every 1 dbar of pressure to compute  $N^2 = (-g/\rho) (d\rho/dz)$  and linearly interpolated measured parameters over those records where  $N^2 \leq -1.0e-05s^{-2}$ .
- FILTDOC applied a median filter of width 5 dbar to the time rate of change in oxygen current (doc/dt).

### 5.1 Conductivity

Conductivity slope and bias, along with a linear pressure term (modified beta), were computed by a least-squares minimization of CTD and bottle conductivity differences. The function minimized was

$$BC - m * CC - b - \beta * CP$$

where BC is bottle conductivity (S/m), CC is pre-cruise calibrated CTD conductivity (S/m), CP is the CTD pressure (dbar),  $m$  is the conductivity slope,  $b$  is the bias (S/m), and  $\beta$  is a linear pressure term (S/m/dbar). The final conductivity (S/m) is

$$m * CC + b + \beta * CP$$

The slope term  $m$  is a constant fit for the entire cruise. For s/n 1387 a series of fits were made, with each fit eliminating bottle values for locations having a residual between CTD and bottle conductivity greater than three standard deviations. The procedure was repeated with the remaining bottle values until no more bottle values were eliminated.

For s/n 1387, the slope correction was 0.9991 and the bias applied was 0.00047. Of the 809 bottles, 75% were retained in the fit with a standard deviation of 0.00024 S/m. The PMEL program CALCTD applied these calibrations.

CTD-bottle conductivity differences were plotted against station number, for up cast data, to show the stability of the calibrated CTD conductivities relative to the bottle conductivities (Figure 2, upper panel). CTD-bottle conductivity differences were also plotted against pressure, for up cast data (Figure 2, lower panel).

After the final CTD conductivity was determined by CALCTD, final salinity values were computed. Salinity values were determined according to the UNESCO 1983 polynomial (Fofonoff and Millard, 1983). The standard deviation of the bottle salinity differences was  $\pm 0.002$ . CTD-bottle salinity differences plotted against station number (Figure 3, upper panel) and pressure (Figure 3, lower panel) are shown.

## 5.2 / Temperature

The pre-cruise calibration of T1075 was the mean of two post-cruise calibrations, and was within  $0.05e^{-3}^{\circ}\text{C}$  of the overall drift trajectory over the duration of the cruise, as determined by the calibration history of the sensor. The pressure correction for this sensor was determined by Sea Bird to be zero. However, a bias of  $-0.6e^{-3}^{\circ}\text{C}$  was applied to the temperature data in program CALCTD to account for the effect of viscous heating on SBE 3 sensors. An adjustment of  $-0.6e^{-3}^{\circ}\text{C}$  resulted in errors of no more than  $\pm 0.15e^{-3}^{\circ}\text{C}$  from this effect for the full range of oceanographic temperature and salinity.

## 5.3 Oxygen

Oxygen samples collected during CTD/O<sub>2</sub> profiles were used for post measurement calibration. Due to a potential hysteresis problem with oxygen sensors, the PMEL program OXDWNP replaced up-profile Niskin sample data with corresponding processed down-profile CTD/O<sub>2</sub> data at common pressure levels. Oxygen saturation values were computed according to Benson and Krausse (1984) in units of  $\mu\text{mol/kg}$ .

The algorithm used for converting oxygen sensor current and probe temperature measurements as described by Owens and Millard (1985) required a non-linear least squares regression technique in order to determine the best fit coefficients of the model for oxygen sensor behavior to water sample observations. The Woods Hole Oceanographic Institution (WHOI) program OXFITMR employed Numerical Recipe (Press *et al.*, 1986) Fortran routines of MRQMIN, MRQCOF, GAUSSJ, and COVSRT to perform non-linear least squares regressions using the Levenberg-Marquardt method. A Fortran subroutine, FOXY, described the oxygen model with the derivatives of the model with respect to six coefficients in the following order: oxygen current slope, temperature correction, pressure correction, weight, oxygen current bias, and oxygen current lag.

Program OXFITMR read the data for a group of stations. The data were edited to remove imprecise points where values were less than zero or greater than 1.2 times the saturation value. The routine varied the six (or fewer) parameters of the model in such a way as to produce the best least squares fit between the calibration oxygen values and the computed values. Individual differences between the calibration oxygen values and the computed values (residuals) were then compared with the standard deviation of the residuals. Any residuals exceeding a factor of 2.8 standard deviations were rejected. A factor of 2.8 had a 0.5% chance of rejecting a valid oxygen value for a normally distributed



set of residuals. The iterative fitting process was continued until none of the data failed the edit criteria. Coefficients were applied using the AOML program CALIBOXY for plotting in Matlab.

By plotting the oxygen residuals versus station, appropriate station groupings for further refinements of fitting were obtained by looking for abrupt station-to-station changes in the residuals. For each grouping, one set of coefficients was determined by fitting bottles from the entire water column. Pressure correction, weight, and lag coefficients were fixed within a reasonable range from output of full water column group fits. Final coefficients were applied to downcast data using the AOML program CALCTDOX2. An overall correction (3<sup>rd</sup> order polynomial fit) was applied to final oxygen data to bring the standard deviation near the nominal WOCE standard accuracy of 0.5% for discrete oxygen titrations.

CTD-bottle oxygen differences were plotted against station number to show the stability of the calibrated CTD oxygen values relative to bottle oxygen values (Figure 4, upper panel). CTD-bottle oxygen differences were also plotted against pressure to show the fit (Figure 4, lower panel) through the water column. The standard deviation of the oxygen differences was  $\pm 3.25 \mu\text{mol/kg}$ . Oxygen sensor 230531 was selected for final data reduction for all stations.

## 6. Lowered Acoustic Doppler Current Profiler

An RD Instruments 300 kHz Broadband ADCP (SN 207) was mounted in downward-looking mode near the center of the CTD/rosette frame. Velocity profiles were internally recorded during CTD casts, and post-processed using AOML-developed software to create velocity shear profiles. Absolute velocities were calculated by referencing shear profiles using ship drift obtained from P-code global positioning system (GPS) positions obtained at the beginning and end of each cast. The shear profile processing methods were similar to those described in Fischer and Visbeck (1993); see also Wilson (1994) for an analysis of the performance of the 300 kHz broadband ADCP in lowered applications. Significant setup parameters were:

Mode 1  
25, 8 m bins  
1 ping / sec  
1 ping / ensemble  
2 m s<sup>-1</sup> fixed ambiguity velocity  
Narrow Bandwidth

Velocity data were averaged into 10 m bins for presentation. The first valid bin was at 20 m; values plotted at 10 m and the surface are repeated from 20 m. The deepest bin was approximately 100 m below the maximum cast depth, or within 15 m of the bottom. Depth-averaged errors are estimated to be less than 1 cm s<sup>-1</sup>. Profiles shown were based on all shear profiles derived from up- and downcasts. Positions and times listed are midpoints of start-down and at-surface values used in processing.

## 7. Expendable Bathythermograph Data

Temperature profiles were measured at 176 stations (Table 2) using type T-7 XBT probes. Locations of XBT drops are also given in Table 2. The launches are listed in sequential order; probes that failed are not listed. The probes were launched from the stern of the vessel while underway. Deployment procedures included noting the time (Z), location, depth (m), thermosalinograph temperature (°C) and salinity, and engine intake water temperature (°C). The data were acquired on an AOML supplied SEASIV PC running SEAS4 software. The underway XBT autolauncher was engineered and manufactured at NOAA/AOML in Miami, FL.

The output of the acquired data is in ASCII format. Each file is run through a series of AOML created post-processing programs to produce data containing a header of date, time, latitude, and

longitude, as well as column data of depth (m) and temperature (°C). Each XBT file was quality controlled according to standard AOML quality control procedures (Daneshzadeh *et al.*, 1994).

## 8. Final Data Presentation

AOML Matlab program DATAREPORT processed the finalized CTD/O<sub>2</sub> data and computed ITS-90 temperature, ITS-90 potential temperature and dynamic height. The final calibrated data files were used to produce the tables and station profile plots presented in Appendix A for each CTD station. The table on the left is in "standard depths" and its corresponding profile plot is shown on the facing page. Niskin bottle depths are presented on the right side of the profile plot. Bottle salinity values are plotted as points in the three smaller plots. LADCP profile plots showing U and V components are presented in Appendix B. The final quality controlled XBT data were used to produce profile plots displayed in Appendix C.

## 9. Acknowledgments

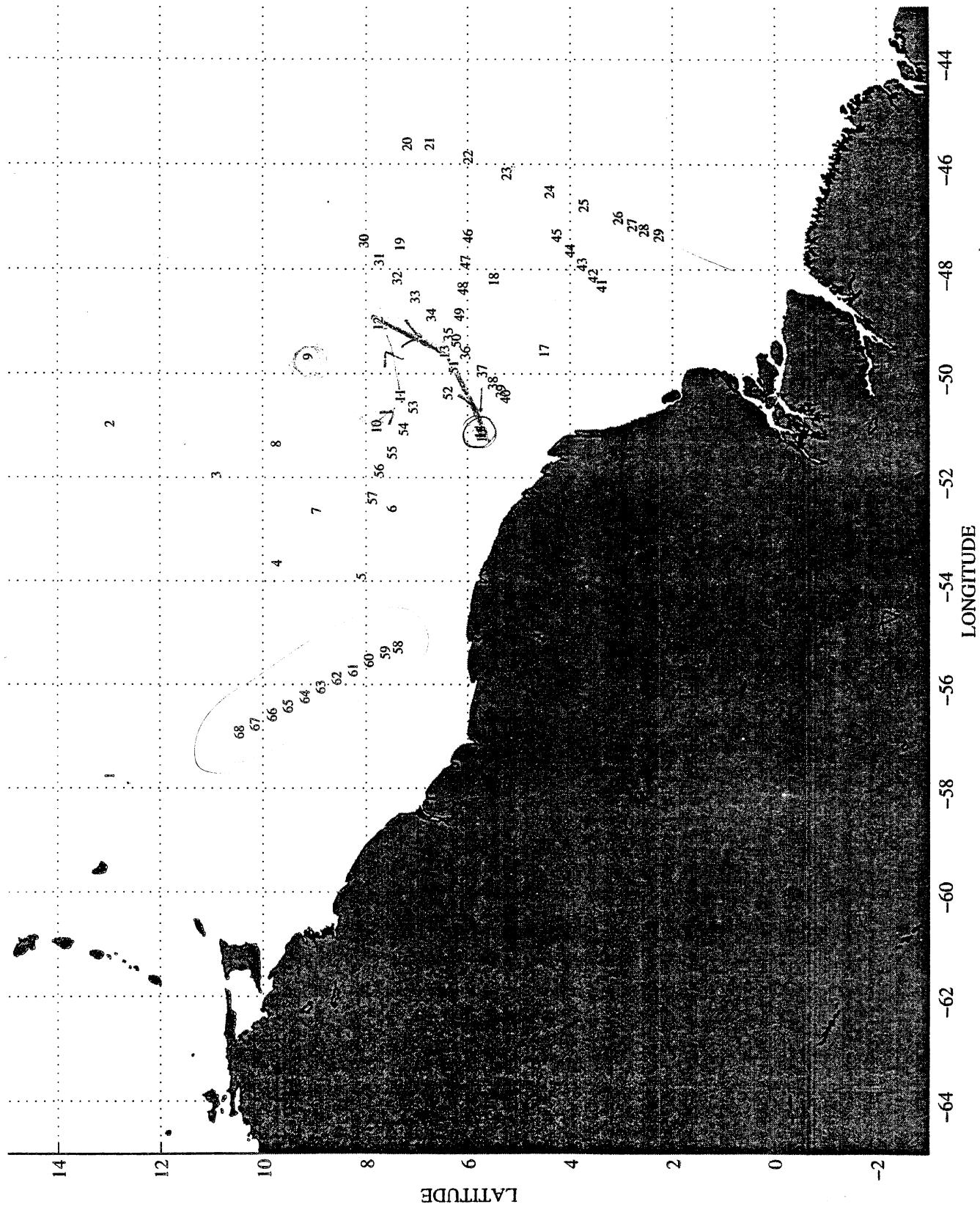
The assistance of Captain Vince Seiler and the crew of the *R/V Seward Johnson* are gratefully acknowledged. Marine Technician Donald Cucciarra provided high quality oxygen and salinity samples and analysis documentation. The scientific participation from Brazil and Trinidad and Tobago was extremely helpful in all aspects of the cruise. Technical support from Kristy McTaggart and Greg Johnson of the PMEL was also extremely helpful.

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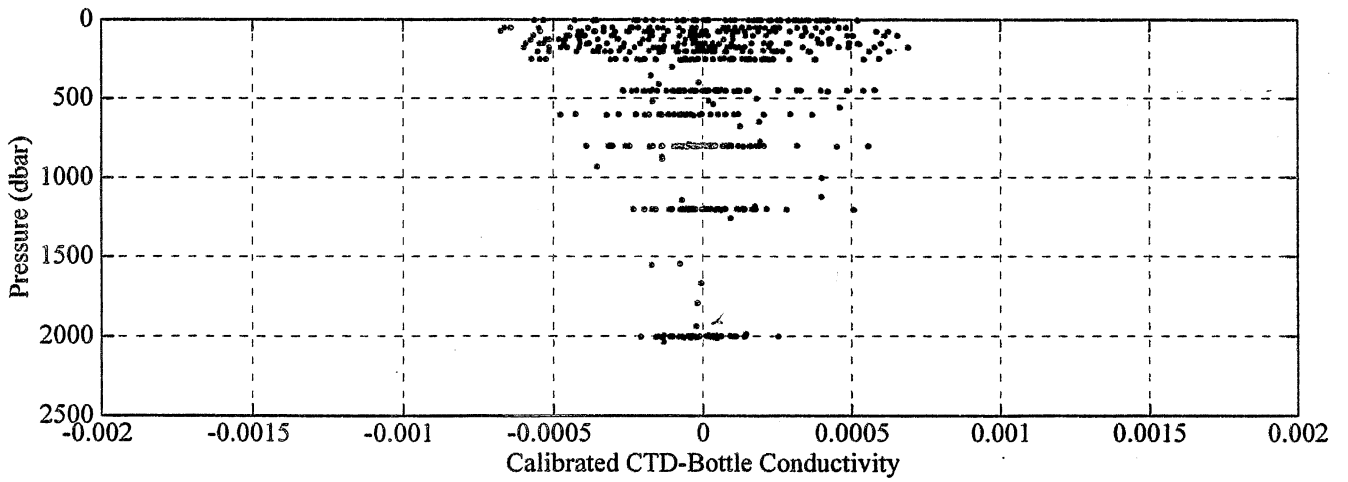
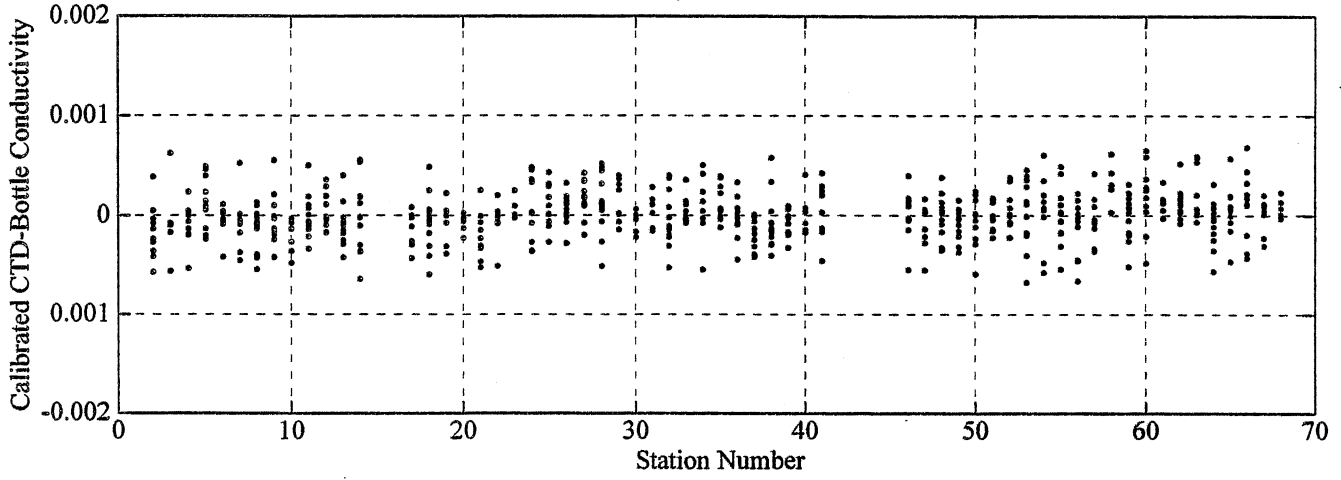
## 10. References

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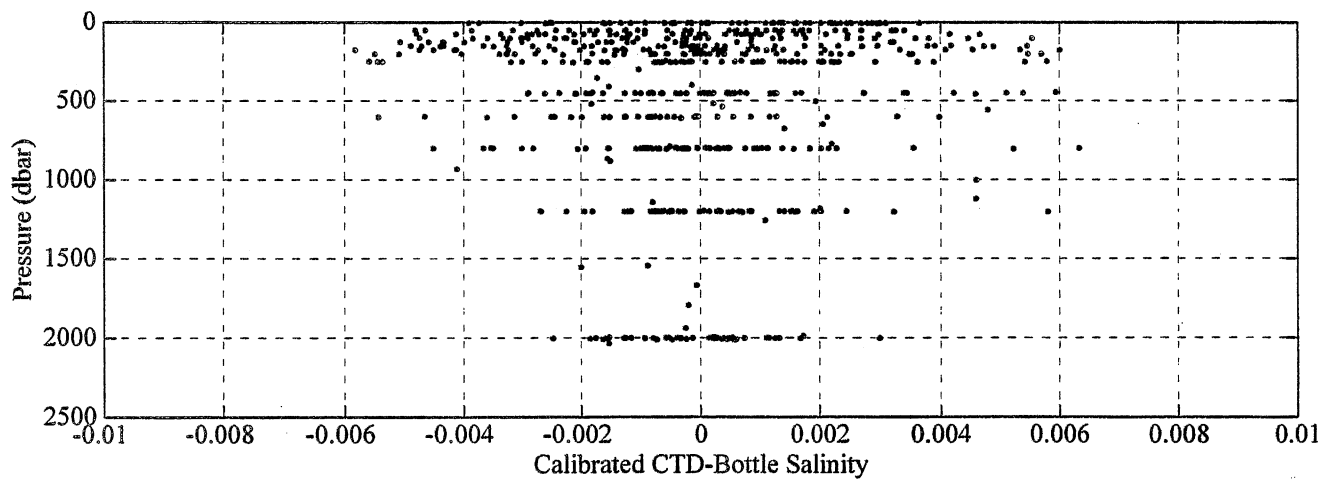
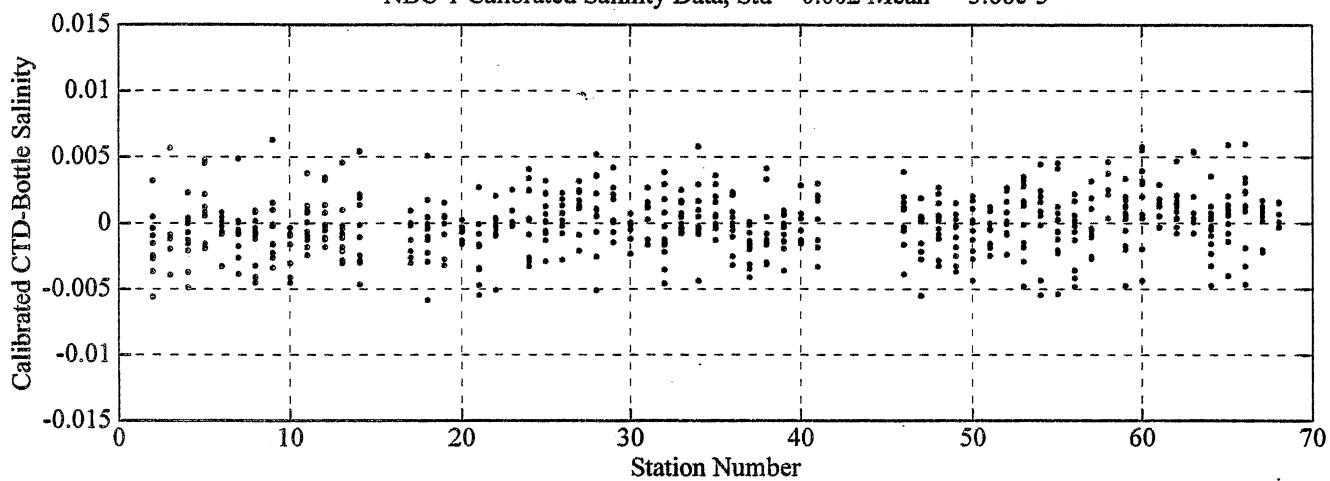
Figure 1, NBC-1 November-December 1998 CTD/LADCP Station Locations



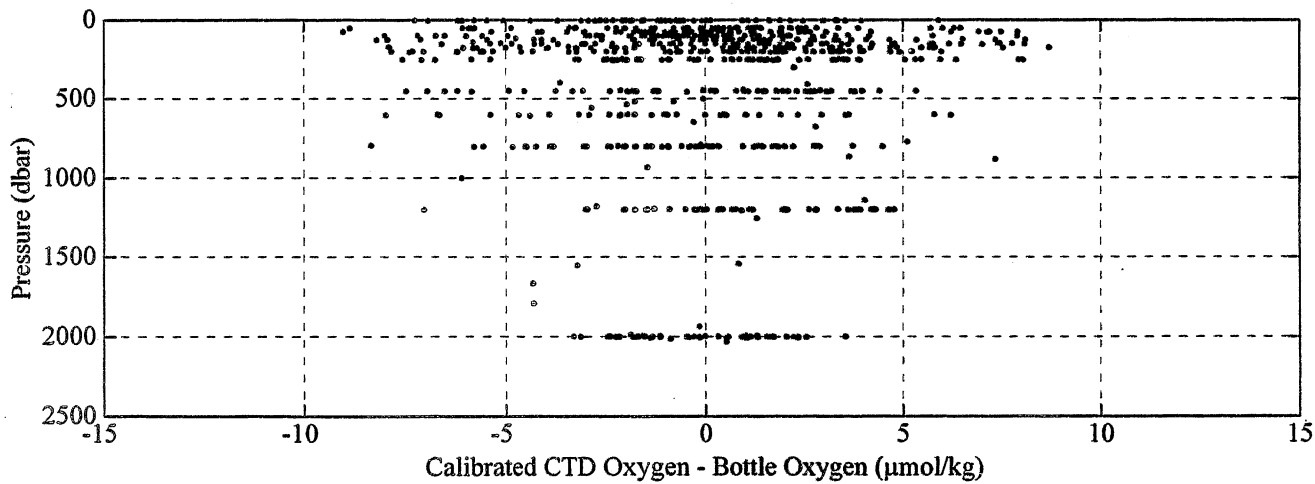
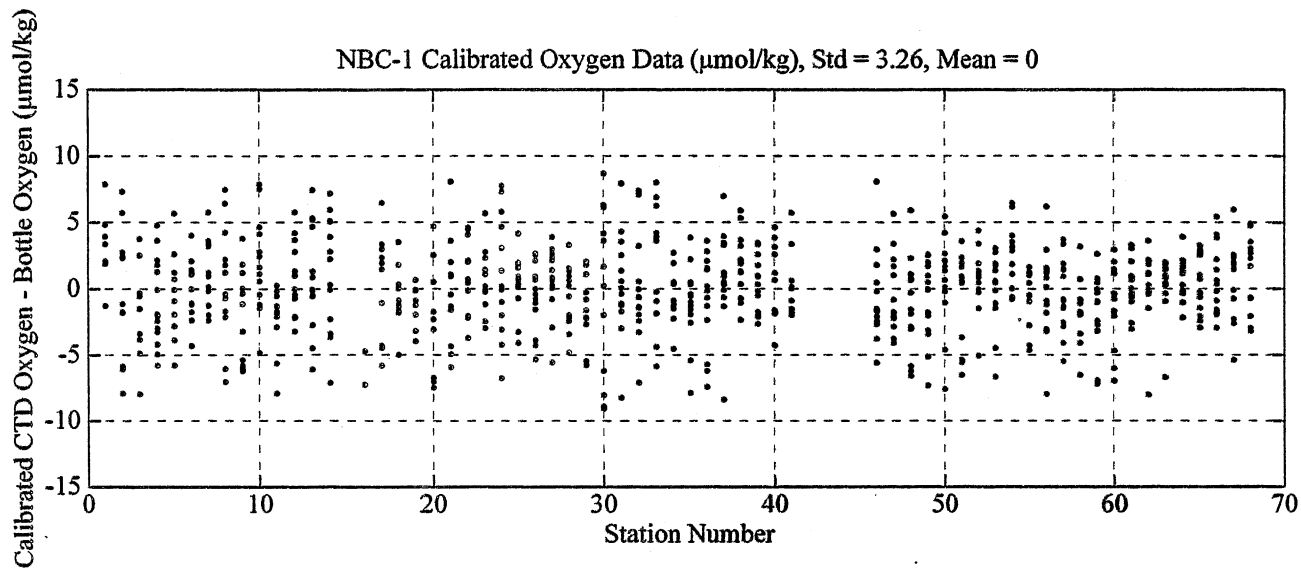
NBC-1 Calibrated Conductivity Data, Std = 2.46e-4 Mean = -2.82e-6



NBC-1 Calibrated Salinity Data, Std = 0.002 Mean = -3.68e-5



NBC-1 Calibrated Oxygen Data ( $\mu\text{mol/kg}$ ), Std = 3.26, Mean = 0



**Table 1:  
CTD cast  
summary**

Station	Date	Time (Z)	Latitude N	Longitude W	Depth (m)	Cast (db)
1	11 09 98	2244	13.000	-57.900	3000	2000.9
2	11 11 98	2003	12.996	-51.116	5000	2003.3
3	11 12 98	1230	10.911	-52.078	4914	2000.7
4	11 13 98	0400	9.744	-53.783	3000	1999.7
5	11 14 98	1620	8.103	-54.041	1111	1121.1
6	11 15 98	0257	7.503	-52.733	1150	1140.9
7	11 15 98	2210	8.986	-52.769	4600	2000.0
8	11 16 98	1323	9.755	-51.483	4650	2001.1
9	11 17 98	0319	9.148	-49.808	4600	2003.0
10	11 17 98	1735	7.801	-51.151	4600	2003.5
11	11 17 98	2316	7.337	-50.549	4223	2001.9
12	11 18 98	1027	7.769	-49.175	4000	1998.8
13	11 18 98	2129	6.463	-49.709	4000	2003.0
14	11 19 98	2017	5.772	-51.246	1000	771.5
15	11 19 98	2243	5.747	-51.269	409	457.0
16	11 19 98	2344	5.728	-51.325	120	118.6
17	11 20 98	1433	4.520	-49.688	1682	1666.4
18	11 21 98	0331	5.500	-48.319	3441	2000.7
19	11 21 98	1611	7.350	-47.660	4236	2013.3
20	11 22 98	0443	7.205	-45.754	4312	2011.9
21	11 22 98	1030	6.766	-45.743	4400	2001.8
22	11 22 98	1617	6.001	-46.000	3969	2000.6
23	11 22 98	2139	5.261	-46.310	3686	2002.5
24	11 23 98	0508	4.413	-46.652	3273	2002.3
25	11 23 98	1111	3.751	-46.915	2606	2000.5
26	11 23 98	1954	3.078	-47.150	1805	1793.0
27	11 24 98	0033	2.801	-47.283	1513	1544.7
28	11 24 98	0330	2.567	-47.383	1293	1256.7
29	11 24 98	0365	2.275	-47.479	540	515.5
30	12 01 98	0319	8.050	-47.600	4406	2002.0
31	12 01 98	1308	7.751	-47.949	4328	2001.0
32	12 01 98	1707	7.399	-48.307	4300	2008.0
33	12 01 98	2140	7.046	-48.665	4200	1999.0
34	12 02 98	0153	6.726	-49.013	4100	1997.0
35	12 02 98	0601	6.387	-49.379	3800	1997.0
36	12 02 98	1011	6.049	-49.734	3750	2010.0
37	12 02 98	1418	5.731	-50.083	3400	2023.0
38	12 02 98	1734	5.520	-50.309	2950	1997.0
39	12 02 98	2038	5.366	-50.468	2008	1947.0
40	12 02 98	2330	5.279	-50.571	406	409.0
41	12 04 98	0059	3.395	-48.437	515	519.0
42	12 04 98	0317	3.566	-48.252	956	742.0
43	12 04 98	0750	3.783	-48.033	1400	1289.0
44	12 04 98	1049	4.015	-47.772	1241	2082.0
45	12 04 98	1423	4.277	-47.486	2400	2006.0
46	12 05 98	0221	6.000	-47.500	3812	2002.0

**Table 1:  
CTD cast  
summary**

Station	Date	Time (Z)	Latitude N	Longitude W	Depth (m)	Cast (db)
47	12 05 98	0638	6.049	-47.995	3795	2002.0
48	12 05 98	1116	6.100	-48.500	3786	1996.0
49	12 05 98	1536	6.168	-49.003	3750	2003.0
50	12 05 98	2025	6.233	-49.500	3683	1999.0
51	12 06 98	0021	6.283	-50.000	3813	2002.0
52	12 06 98	0439	6.397	-50.506	3694	2009.0
53	12 06 98	1101	7.084	-50.777	4088	2001.0
54	12 06 98	1500	7.272	-51.202	4083	2000.0
55	12 06 98	1905	7.500	-51.649	4144	2000.0
56	12 06 98	2302	7.751	-52.000	3317	1999.0
57	12 07 98	0250	7.884	-52.527	2319	1999.0
58	12 09 98	0029	7.387	-55.408	540	535.0
59	12 09 98	0228	7.634	-55.514	1556	1550.0
60	12 09 98	0532	7.950	-55.664	2169	2001.0
61	12 09 98	0908	8.267	-55.851	2631	2002.0
62	12 09 98	1232	8.586	-56.015	2932	2002.0
63	12 09 98	1552	8.901	-56.182	3252	2006.0
64	12 09 98	1924	9.213	-56.369	3360	2001.0
65	12 09 98	2258	9.535	-56.549	3518	2008.0
66	12 10 98	0233	9.833	-56.716	3600	2000.0
67	12 10 98	0619	10.166	-56.899	3685	2000.0
68	12 10 98	0955	10.467	-57.050	3813	2006.0

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**Table 2:  
XBT Data  
Summary**

Drop #	Date	Time (Z)	Latitude N	Longitude W
3	11/14/98	0429	8.535	-53.395
4	11/14/98	1647	7.823	-53.512
5	11/15/98	0845	8.250	-52.745
6	11/15/98	0848	8.250	-52.745
7	11/16/98	0429	9.395	-52.127
8	11/16/98	2020	9.438	-50.615
10	11/18/98	1608	6.987	-49.468
11	11/19/98	0247	6.235	-50.323
12	11/19/98	1806	5.895	-51.065
13	11/19/98	1840	5.830	-51.152
14	11/19/98	1859	5.792	-51.200
16	11/20/98	1902	4.877	-49.260
20	11/20/98	1921	4.910	-49.208
21	11/20/98	2139	5.152	-48.850
24	11/21/98	1244	6.813	-47.850
25	11/21/98	2205	7.203	-46.927
26	11/22/98	0123	7.205	-46.318
27	11/22/98	1427	6.335	-45.887
28	11/23/98	1428	3.445	-47.022
29	11/24/98	0604	2.332	-47.468
30	11/28/98	1414	2.302	-47.488
32	11/28/98	1512	2.472	-47.420
33	11/28/98	1659	2.797	-47.293
34	11/28/98	1900	3.177	-47.143
35	11/28/98	1954	3.342	-47.077
36	11/28/98	2056	3.528	-47.005
37	11/28/98	2149	3.683	-46.955
38	11/28/98	2259	3.867	-47.092
39	11/29/98	0000	4.018	-47.207
40	11/29/98	0100	4.153	-47.333
42	11/29/98	0204	4.288	-47.485
43	11/29/98	0300	4.418	-47.592
44	11/29/98	0401	4.557	-47.718
45	11/29/98	0501	4.682	-47.858
46	11/29/98	0559	4.818	-47.982
47	11/29/98	0700	4.965	-48.113
48	11/29/98	0758	5.103	-48.240
49	11/29/98	0858	5.247	-48.367
50	11/29/98	1000	5.393	-48.500
52	11/29/98	1200	5.677	-48.755
54	11/29/98	1302	5.823	-48.890
55	11/29/98	1400	5.963	-49.013
56	11/29/98	1502	6.115	-49.152
57	11/29/98	1558	6.253	-49.275
58	11/29/98	1701	6.387	-49.400
60	11/29/98	1803	6.537	-49.537

**Table 2:  
XBT Data  
Summary**

Drop #	Date	Time (Z)	Latitude N	Longitude W
61	11/29/98	1859	6.675	-49.665
63	11/29/98	2003	6.832	-49.805
64	11/29/98	2059	6.970	-49.925
66	11/29/98	2259	7.253	-50.197
67	11/30/98	0000	7.392	-50.335
70	11/30/98	0104	7.543	-50.478
71	11/30/98	0200	7.677	-50.603
72	11/30/98	0258	7.813	-50.732
73	11/30/98	0356	7.948	-50.858
74	11/30/98	0456	8.088	-50.992
75	11/30/98	0556	8.233	-51.128
76	11/30/98	0656	8.380	-51.263
77	11/30/98	0755	8.527	-51.397
78	11/30/98	0855	8.670	-51.528
79	11/30/98	0956	8.812	-51.657
80	11/30/98	1200	8.797	-51.368
81	11/30/98	1358	8.722	-51.015
82	11/30/98	1603	8.640	-50.630
83	11/30/98	1803	8.565	-50.258
84	11/30/98	1958	8.487	-49.897
85	11/30/98	2200	8.400	-49.522
86	12/1/98	0000	8.340	-49.153
87	12/1/98	0200	8.263	-48.787
88	12/1/98	0400	8.193	-48.438
89	12/1/98	0601	8.120	-48.092
90	12/1/98	0758	8.055	-47.770
91	12/1/98	1158	7.895	-47.787
92	12/1/98	1601	7.528	-48.170
93	12/1/98	1858	7.353	-48.308
94	12/1/98	2002	7.220	-48.438
95	12/1/98	2005	7.213	-48.447
96	12/2/98	0039	6.867	-48.843
97	12/2/98	0448	6.520	-49.217
98	12/2/98	0843	6.227	-49.548
99	12/2/98	1310	5.862	-49.945
100	12/2/98	1639	5.628	-50.207
101	12/2/98	1956	5.445	-50.418
102	12/2/98	2000	5.437	-50.425
103	12/2/98	2305	5.320	-50.545
104	12/4/98	0232	3.490	-48.342
105	12/4/98	0552	3.680	-48.152
106	12/4/98	0941	3.890	-47.915
107	12/4/98	1313	4.148	-47.633
108	12/4/98	1728	4.602	-47.432
109	12/4/98	1928	4.967	-47.382
110	12/4/98	2130	5.332	-47.333

**Table 2:  
XBT Data  
Summary**

Drop #	Date	Time (Z)	Latitude N	Longitude W
111	12/4/98	2329	5.693	-47.285
112	12/5/98	0053	5.950	-47.255
113	12/5/98	0510	6.020	-47.755
114	12/5/98	0942	6.075	-48.247
115	12/5/98	1413	6.135	-48.770
116	12/5/98	1902	6.173	-49.258
117	12/5/98	2305	6.260	-49.762
118	12/6/98	0304	6.307	-50.247
119	12/6/98	0741	6.585	-50.702
120	12/6/98	1348	7.188	-50.982
121	12/6/98	1740	7.398	-51.422
122	12/6/98	2141	7.660	-51.823
123	12/7/98	0138	7.858	-52.308
124	12/7/98	0616	8.232	-52.747
125	12/7/98	0807	8.553	-52.957
126	12/7/98	1005	8.895	-53.177
127	12/7/98	1058	9.045	-53.282
128	12/7/98	1158	9.222	-53.395
129	12/7/98	1236	9.332	-53.468
130	12/7/98	1329	9.333	-53.647
131	12/7/98	1440	9.332	-53.888
132	12/7/98	1530	9.335	-54.053
133	12/7/98	1630	9.333	-54.250
134	12/7/98	1730	9.332	-54.450
135	12/7/98	1830	9.333	-54.648
136	12/7/98	1929	9.332	-54.838
137	12/7/98	2029	9.315	-55.035
138	12/7/98	2130	9.278	-55.227
139	12/7/98	2228	9.212	-55.407
140	12/7/98	2234	9.203	-55.428
141	12/7/98	2330	9.143	-55.598
142	12/8/98	0030	9.075	-55.787
143	12/8/98	0131	9.008	-55.995
144	12/8/98	0227	8.903	-56.150
145	12/8/98	0242	8.880	-56.183
146	12/8/98	0402	8.755	-56.365
147	12/8/98	0459	8.650	-56.518
148	12/8/98	0600	8.537	-56.680
149	12/8/98	0700	8.428	-56.838
150	12/8/98	0703	8.422	-56.847
151	12/8/98	0759	8.318	-56.998
152	12/8/98	0900	8.203	-57.163
153	12/8/98	1000	8.097	-57.332
154	12/8/98	1100	7.977	-57.500
155	12/8/98	1103	7.970	-57.510
156	12/8/98	1113	7.953	-57.535

**Table 2:  
XBT Data  
Summary**

Drop #	Date	Time (Z)	Latitude N	Longitude W
157	12/8/98	1530	7.725	-56.855
158	12/8/98	1628	7.677	-56.687
159	12/8/98	1728	7.627	-56.515
160	12/8/98	1829	7.578	-56.342
161	12/8/98	1937	7.522	-56.143
162	12/8/98	2034	7.472	-55.975
163	12/8/98	2129	7.422	-55.810
164	12/8/98	2132	7.418	-55.800
165	12/8/98	2228	7.368	-55.627
166	12/9/98	0149	7.530	-55.477
167	12/9/98	0432	7.790	-55.597
168	12/9/98	0807	8.120	-55.767
169	12/9/98	1136	8.433	-55.940
170	12/9/98	1459	8.760	-56.110
171	12/9/98	1816	9.052	-56.272
172	12/9/98	2207	9.413	-56.482
173	12/10/98	0131	9.703	-56.635
175	12/10/98	0515	10.008	-56.813
176	12/10/98	0854	10.317	-56.977



**HYDROGRAPHIC DATA**

**APPENDIX A**

**CTD DATA**

**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 1 (98001)**  
**Latitude 13.000N Longitude 57.900W**  
**09-Nov-198 22:44Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigTh kg/m <sup>3</sup>
1	28.569	28.568	35.866	194.0	0.005	22.861
10	28.587	28.584	35.865	193.0	0.050	22.855
20	28.589	28.584	35.865	193.8	0.100	22.856
30	28.556	28.549	35.914	193.2	0.150	22.905
40	28.599	28.590	35.979	195.0	0.199	22.942
50	28.806	28.794	36.261	192.0	0.248	23.087
60	28.500	28.485	36.555	189.8	0.295	23.411
70	27.079	27.063	36.807	212.2	0.336	24.067
80	25.945	25.927	36.958	202.6	0.372	24.542
90	25.378	25.358	37.131	197.3	0.405	24.851
100	24.754	24.732	37.174	185.4	0.435	25.075
110	24.577	24.553	37.236	189.8	0.464	25.178
120	23.709	23.683	37.169	191.8	0.491	25.388
130	22.450	22.423	37.047	170.7	0.516	25.663
140	21.694	21.666	36.956	161.5	0.539	25.808
150	19.927	19.899	36.749	151.2	0.560	26.132
160	19.347	19.318	36.682	148.0	0.579	26.233
170	19.031	19.000	36.639	154.9	0.597	26.283
180	18.552	18.520	36.559	148.7	0.615	26.345
190	17.898	17.866	36.440	150.1	0.632	26.418
200	17.069	17.036	36.282	134.2	0.648	26.499
250	13.135	13.100	35.544	142.4	0.720	26.802
300	11.744	11.705	35.316	150.9	0.783	26.899
350	10.568	10.526	35.130	156.2	0.843	26.970
400	9.846	9.799	35.010	160.5	0.901	27.003
450	9.200	9.149	34.924	160.1	0.957	27.043
500	8.399	8.346	34.820	160.8	1.012	27.089
550	8.012	7.955	34.772	159.7	1.065	27.110
600	7.384	7.325	34.699	160.0	1.117	27.145
650	7.022	6.960	34.672	159.4	1.167	27.175
700	6.705	6.639	34.639	160.5	1.217	27.192
750	6.539	6.469	34.646	160.9	1.266	27.221
800	6.232	6.159	34.617	157.5	1.313	27.240
900	5.853	5.773	34.627	158.2	1.406	27.297
1000	5.443	5.356	34.716	164.7	1.491	27.419
1500	4.536	4.409	34.983	221.6	1.806	27.743
2000	3.519	3.358	34.944	234.2	2.051	27.821

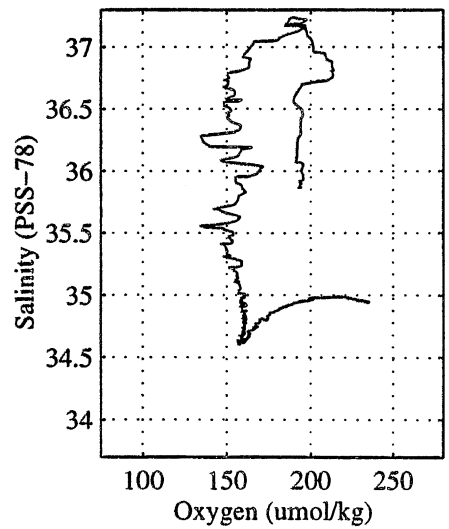
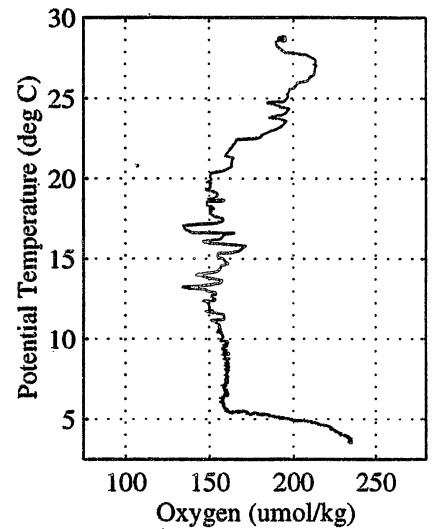
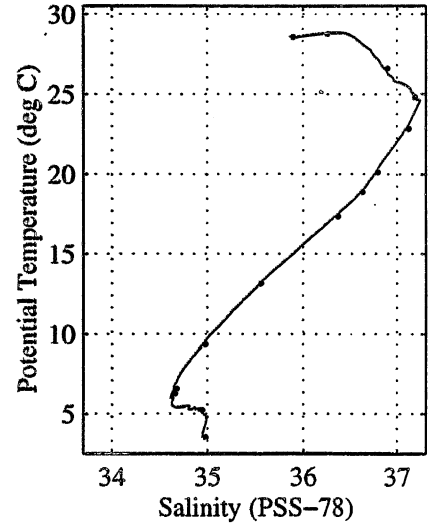
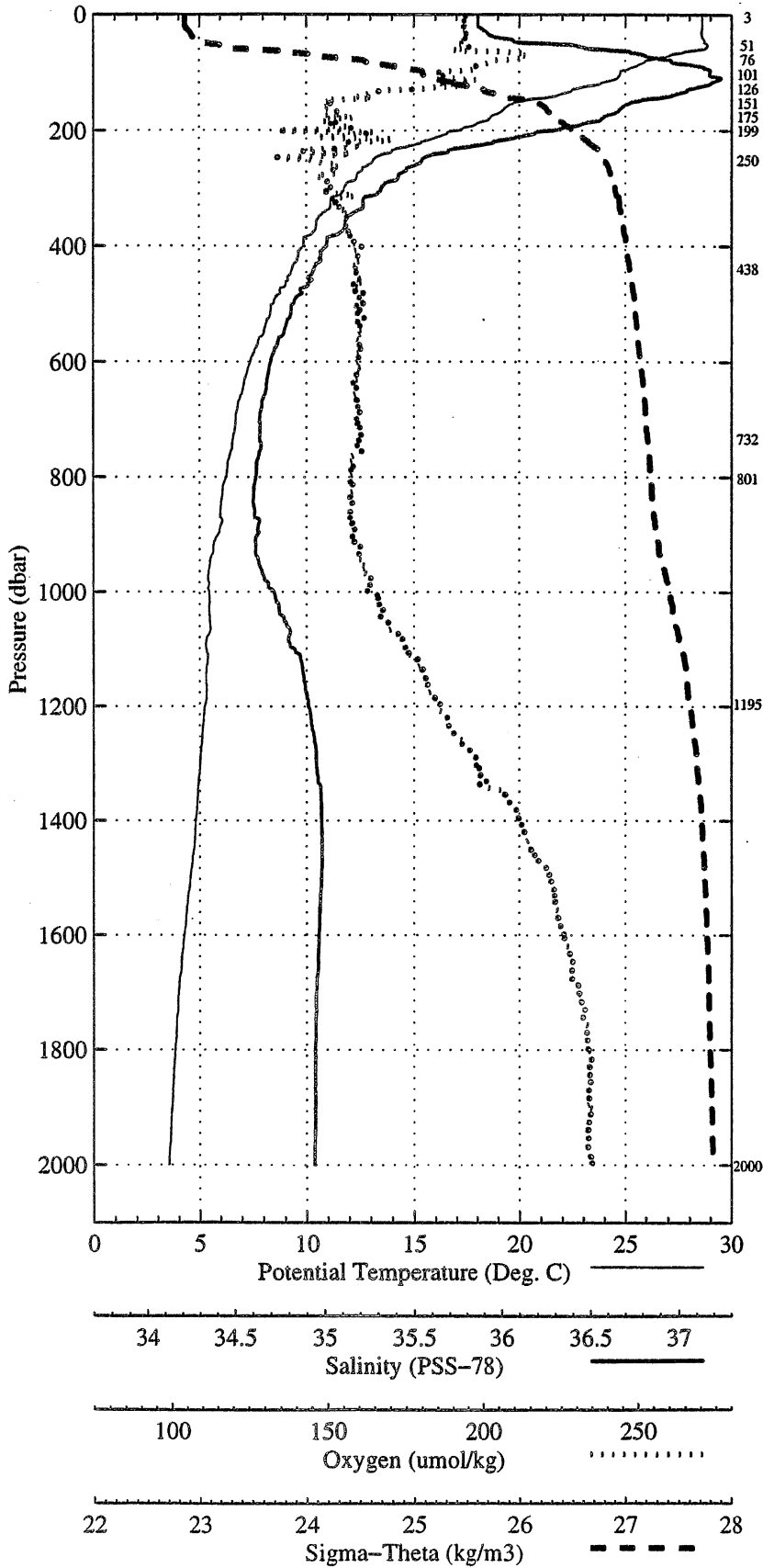
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78
2001	1	3.519	3.359	34.977
1195	2	5.218	5.114	34.943
801	3	6.278	6.205	34.652
733	4	6.576	6.508	34.671
439	5	9.361	9.312	34.976
251	6	13.170	13.135	35.565
199	12	17.352	17.319	36.371
175	13	18.883	18.851	36.632
152	14	20.129	20.100	36.794
127	15	22.847	22.821	37.119
102	16	24.814	24.792	37.186
76	17	26.598	26.580	36.897
51	18	28.762	28.750	36.262
4	24	28.562	28.561	35.898

NBC-1 R/V SEWARD JOHNSON

CTD Station 1 (98001)

Latitude 13.000 N Longitude 57.900 W

09-Nov-1998 22:44 Z





**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 2 (98002)**  
**Latitude 12.996N Longitude 51.116W**  
**11-Nov-1998 20:03Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.174	28.174	34.703	193.5	0.006	22.116
10	28.135	28.132	34.740	199.3	0.057	22.159
20	28.434	28.429	35.474	204.3	0.112	22.614
30	28.357	28.350	35.848	202.3	0.163	22.922
40	28.366	28.357	36.060	203.4	0.211	23.080
50	28.349	28.337	36.128	204.1	0.259	23.138
60	27.490	27.475	36.535	199.5	0.304	23.728
70	24.998	24.982	36.755	173.0	0.340	24.680
80	22.917	22.900	36.779	170.5	0.369	25.319
90	22.699	22.681	36.957	174.7	0.395	25.518
100	21.673	21.653	36.936	158.5	0.419	25.795
110	20.629	20.608	36.826	153.2	0.440	25.999
120	19.654	19.632	36.709	154.1	0.460	26.171
130	18.901	18.878	36.609	146.6	0.478	26.290
140	18.314	18.290	36.484	127.5	0.495	26.344
150	17.124	17.099	36.245	118.0	0.512	26.453
160	16.592	16.566	36.161	124.7	0.528	26.516
170	15.810	15.783	36.011	117.2	0.543	26.583
180	15.292	15.264	35.922	113.5	0.558	26.632
190	15.018	14.989	35.882	112.9	0.573	26.662
200	14.415	14.385	35.770	107.5	0.587	26.707
250	11.908	11.875	35.352	98.6	0.652	26.894
300	11.062	11.024	35.220	95.0	0.712	26.950
350	10.321	10.279	35.105	89.5	0.770	26.993
400	9.652	9.606	35.023	90.9	0.826	27.045
450	9.233	9.183	34.997	87.5	0.880	27.095
500	8.899	8.844	34.958	89.4	0.933	27.119
550	8.435	8.377	34.906	91.5	0.985	27.152
600	7.758	7.697	34.836	97.5	1.035	27.200
650	7.319	7.254	34.799	101.2	1.083	27.234
700	7.132	7.064	34.800	101.4	1.130	27.262
750	6.746	6.675	34.770	104.8	1.176	27.292
800	6.346	6.272	34.743	109.7	1.220	27.325
900	5.747	5.667	34.723	120.9	1.304	27.386
1000	5.490	5.403	34.770	131.1	1.383	27.456
1500	4.553	4.426	34.991	219.5	1.694	27.747
2000	3.487	3.327	34.973	255.3	1.933	27.848

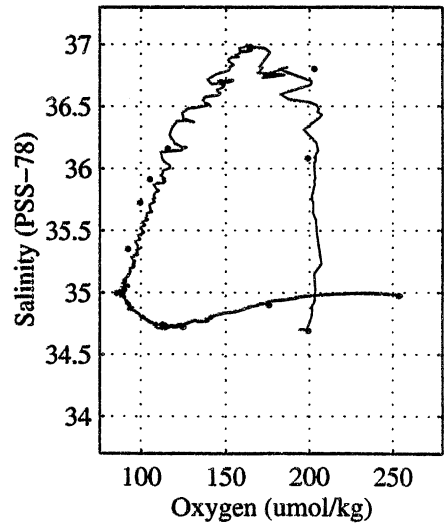
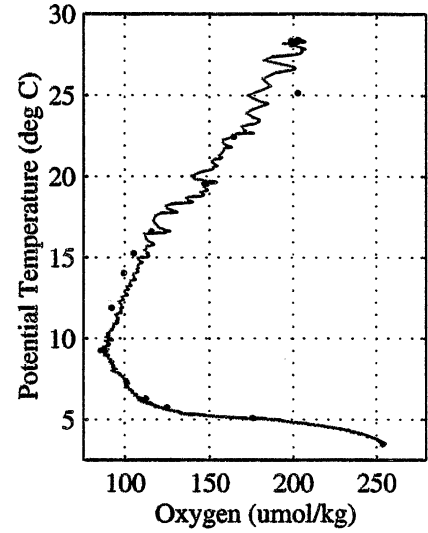
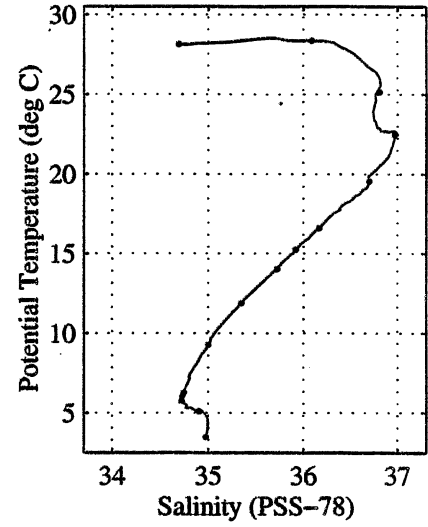
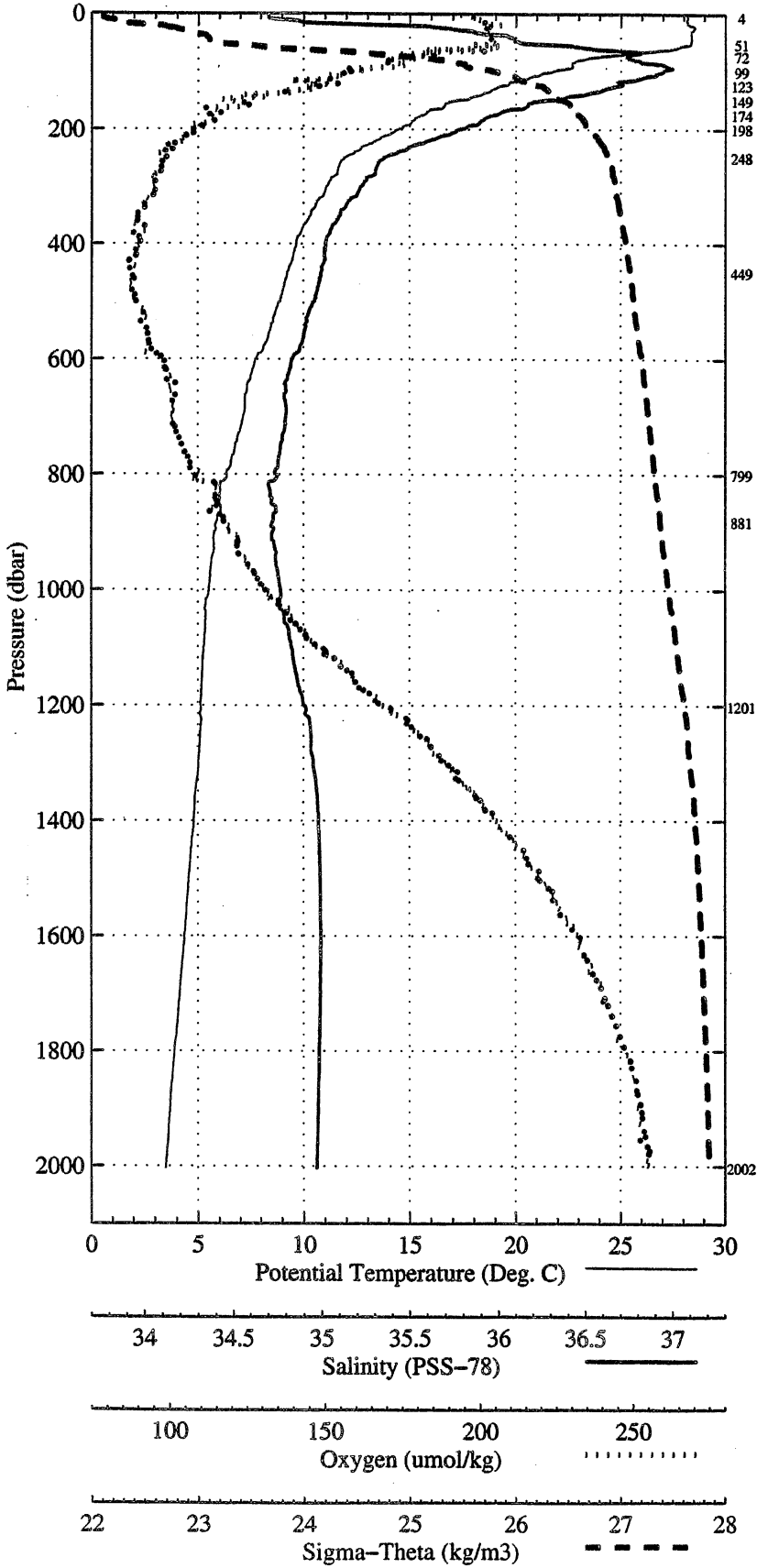
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
5	14	28.145	28.144	34.693	199.1
150	9	16.611	16.587	36.161	115.7
174	8	15.258	15.231	35.913	105.1
99	11	22.454	22.434	36.965	164.6
52	13	28.367	28.355	36.083	198.8
123	10	19.540	19.517	36.688	148.0
199	7	14.042	14.013	35.724	99.3
73	12	25.151	25.135	36.803	202.7
248	6	11.891	11.859	35.350	91.9
449	5	9.277	9.226	34.996	85.4
800	4	6.296	6.222	34.741	112.5
881	3	5.755	5.677	34.720	124.7
1201	2	5.105	5.002	34.901	175.9
2003	1	3.485	3.325	34.973	253.7

NBC-1 R/V SEWARD JOHNSON

CTD Station 2 (98002)

Latitude 12.996 N Longitude 51.116 W

11-Nov-1998 20:03 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 3 (98003)**  
**Latitude 10.911N Longitude 52.078W**  
**12-Nov-1998 12:30Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>2</sup> /kg	SigT kg/m <sup>3</sup>
1	28.107	28.107	33.818	199.5	0.006	21.473
10	28.128	28.126	33.847	204.0	0.063	21.490
20	28.171	28.166	33.961	206.2	0.126	21.563
30	28.742	28.734	35.337	207.6	0.184	22.410
40	29.017	29.007	35.858	207.9	0.237	22.712
50	29.098	29.085	36.539	203.9	0.286	23.198
60	27.929	27.915	36.659	210.8	0.330	23.678
70	27.079	27.063	36.818	208.2	0.371	24.075
80	25.735	25.718	37.050	204.3	0.406	24.677
90	25.157	25.137	37.169	198.6	0.438	24.947
100	23.914	23.893	37.165	177.7	0.467	25.322
110	22.517	22.494	36.989	166.9	0.492	25.597
120	21.477	21.453	36.957	165.2	0.515	25.867
130	20.831	20.807	36.900	151.9	0.536	26.002
140	19.346	19.321	36.689	152.1	0.555	26.238
150	18.544	18.518	36.568	147.7	0.573	26.352
160	17.298	17.271	36.283	129.9	0.590	26.441
170	16.462	16.434	36.152	130.0	0.606	26.540
180	16.317	16.288	36.176	136.9	0.621	26.594
190	15.838	15.808	36.086	137.1	0.636	26.635
200	15.279	15.248	35.986	135.4	0.650	26.685
250	12.668	12.634	35.528	127.6	0.716	26.883
300	11.350	11.312	35.316	124.0	0.776	26.972
350	9.918	9.878	35.090	120.9	0.831	27.051
400	9.143	9.099	34.979	119.0	0.884	27.093
450	8.174	8.127	34.843	119.0	0.936	27.139
500	7.627	7.577	34.777	121.9	0.986	27.169
550	7.273	7.219	34.747	121.6	1.034	27.196
600	6.857	6.800	34.711	124.7	1.082	27.227
650	6.617	6.556	34.713	124.0	1.128	27.261
700	6.247	6.183	34.694	126.5	1.173	27.295
750	5.937	5.870	34.685	129.0	1.216	27.329
800	5.559	5.489	34.667	134.4	1.258	27.362
900	5.379	5.301	34.727	141.3	1.338	27.433
1000	5.195	5.109	34.792	156.1	1.411	27.508
1500	4.236	4.113	34.983	238.8	1.698	27.773
2000	3.564	3.403	34.977	258.7	1.929	27.844

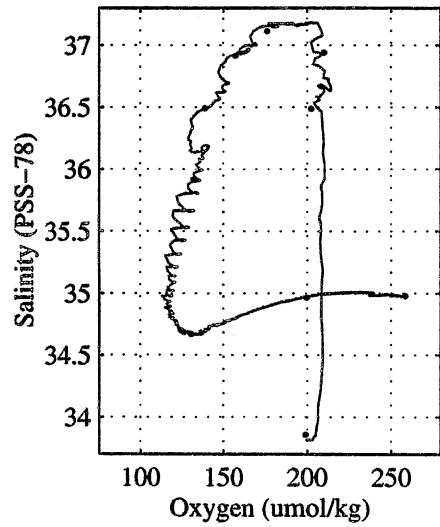
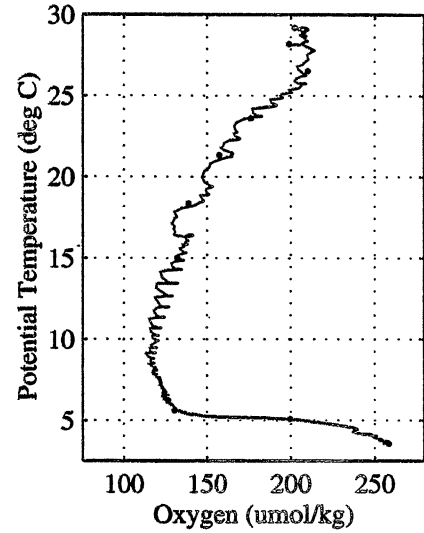
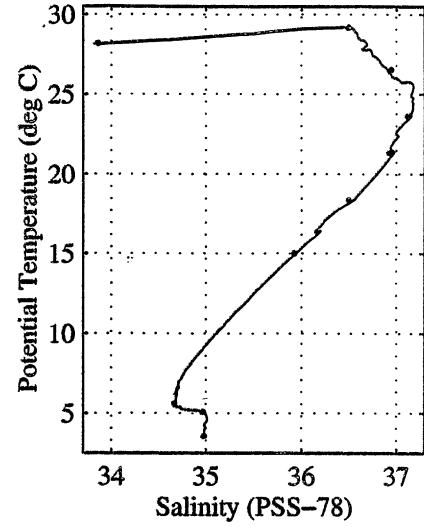
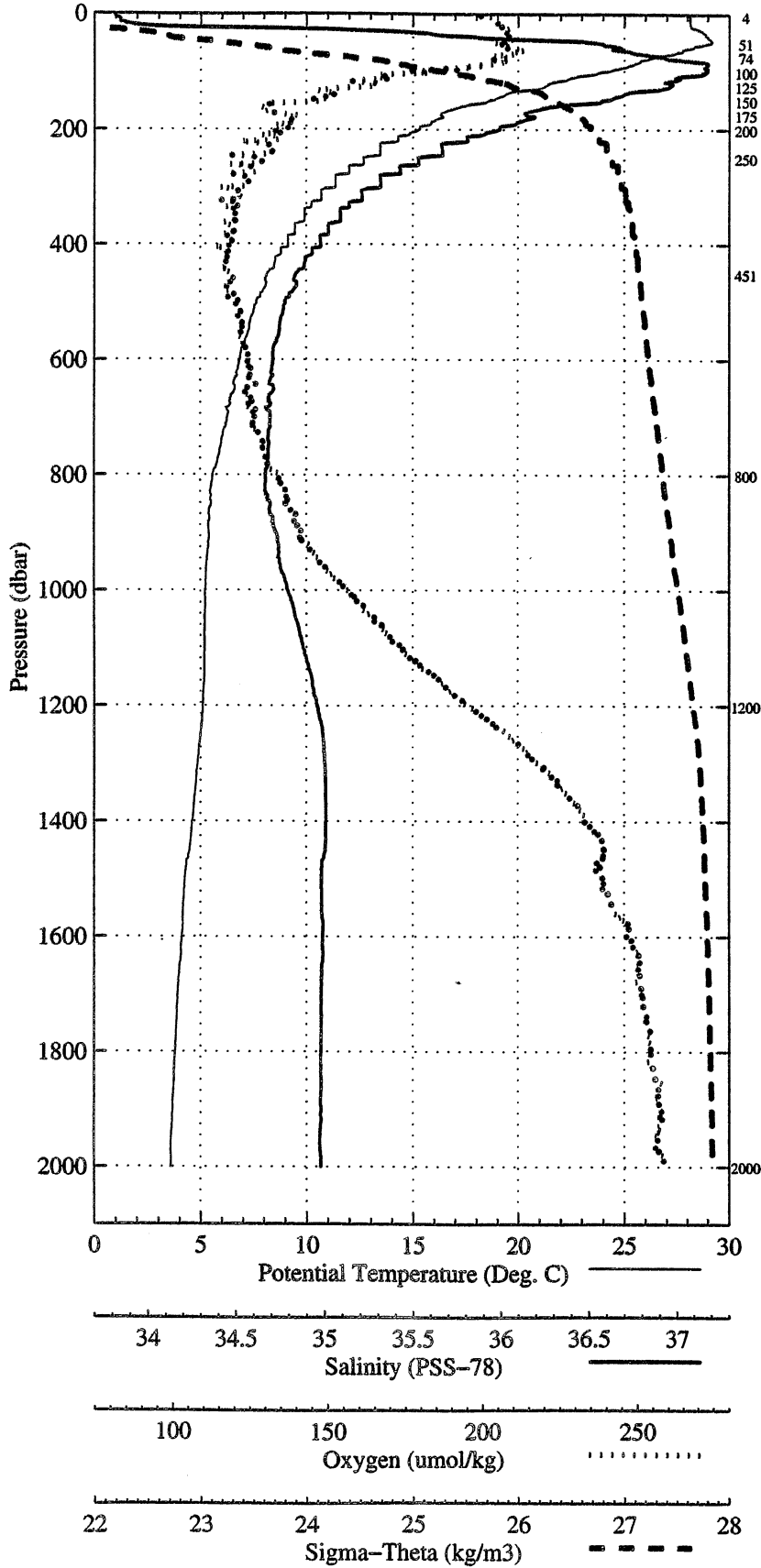
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2000	1	3.563	3.402	34.977	258.4
1201	2	5.075	4.972	34.966	199.3
800	3	5.626	5.557	34.668	130.6
452	4	8.279	NaN	NaN	NaN
250	5	12.656	NaN	NaN	NaN
201	6	15.017	14.987	35.921	132.1
175	7	16.432	NaN	NaN	NaN
151	8	18.364	18.338	36.492	138.8
125	9	21.339	21.314	36.918	157.0
101	10	23.611	23.590	37.114	176.3
75	11	26.529	26.511	36.940	209.7
51	12	29.181	29.168	36.490	202.2
4	13	28.177	28.176	33.858	198.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 3 (98003)

Latitude 10.911 N Longitude 52.078 W

12-Nov-1998 12:30 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 4 (98004)**  
**Latitude 9.744N Longitude 53.783W**  
**13-Nov-1998 04:00Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg.	SigT kg/m <sup>3</sup>
1	28.003	28.003	35.179	196μ8	0.0 <sup>0</sup> 5	22.5 <sup>3</sup> 1
10	27.987	27.985	35.173	204.3	0.053	22.533
20	28.048	28.043	35.295	205.4	0.106	22.606
30	28.126	28.119	35.426	205.8	0.158	22.680
40	27.813	27.804	35.777	204.0	0.209	23.049
50	27.211	27.199	36.253	198.9	0.254	23.604
60	24.014	24.001	36.214	148.1	0.293	24.566
70	21.503	21.490	36.152	164.6	0.322	25.242
80	21.058	21.042	36.160	160.8	0.349	25.371
90	19.447	19.431	36.096	158.2	0.373	25.753
100	17.988	17.971	35.934	160.2	0.394	26.000
110	17.171	17.152	35.845	157.3	0.414	26.132
120	15.862	15.843	35.710	150.8	0.432	26.335
130	15.302	15.282	35.612	158.3	0.449	26.387
140	14.820	14.799	35.527	159.9	0.466	26.428
150	14.256	14.234	35.445	158.0	0.482	26.487
160	13.876	13.853	35.387	160.3	0.498	26.523
170	13.309	13.285	35.307	160.6	0.513	26.579
180	13.062	13.037	35.277	160.3	0.528	26.605
190	12.828	12.802	35.244	159.1	0.542	26.627
200	12.637	12.610	35.212	158.0	0.557	26.641
250	11.716	11.684	35.092	158.6	0.627	26.727
300	10.797	10.760	34.981	155.7	0.695	26.811
350	9.915	9.875	34.893	152.0	0.758	26.897
400	9.004	8.960	34.813	143.3	0.817	26.986
450	8.098	8.052	34.712	144.9	0.873	27.047
500	7.907	7.856	34.709	145.0	0.927	27.074
550	6.877	6.825	34.596	144.5	0.979	27.132
600	6.615	6.559	34.570	148.3	1.030	27.148
650	6.507	6.447	34.565	149.4	1.080	27.159
700	6.277	6.213	34.603	136.8	1.129	27.220
750	5.804	5.738	34.583	138.1	1.176	27.265
800	5.727	5.657	34.620	136.0	1.221	27.304
900	5.038	4.963	34.570	145.8	1.306	27.347
1000	4.917	4.834	34.615	150.5	1.388	27.398
1500	4.687	4.559	35.009	233.9	1.711	27.747
2000	3.676	3.513	34.982	262.2	1.955	27.838

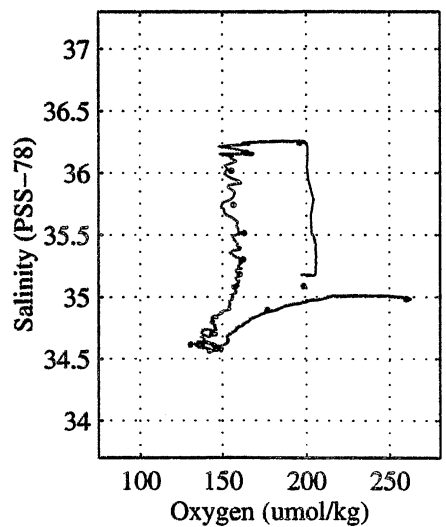
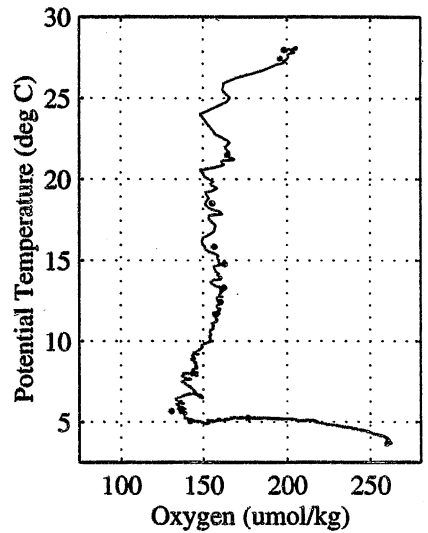
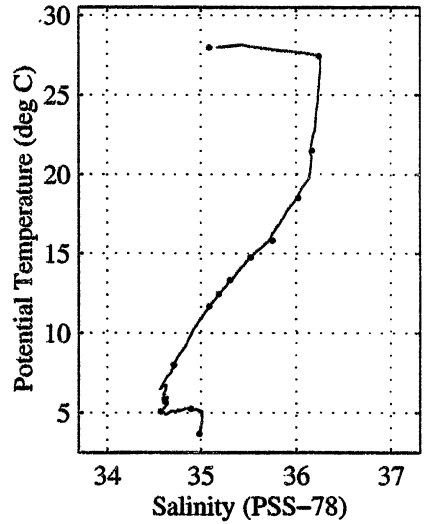
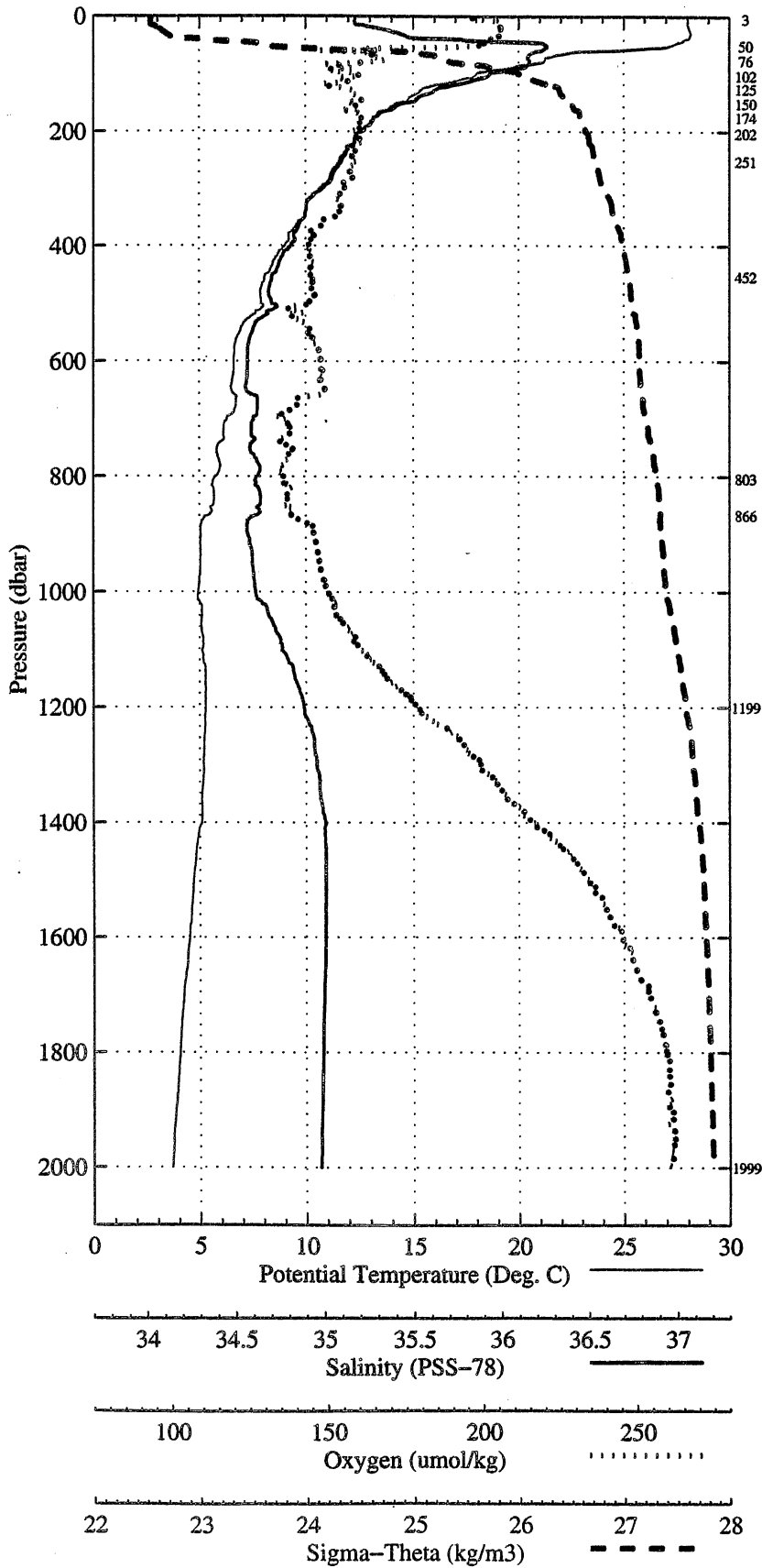
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1999	1	3.676	3.514	34.982	260.0
1200	2	5.250	5.145	34.893	176.5
867	3	5.072	5.000	34.564	142.1
803	4	5.667	5.597	34.615	130.6
453	5	8.014	7.967	34.706	143.6
251	6	11.686	11.653	35.083	157.0
203	7	12.444	12.417	35.184	160.1
174	8	13.315	13.291	35.304	162.2
150	9	14.764	14.742	35.516	162.8
125	10	15.840	15.820	35.744	156.4
102	11	18.509	18.491	36.018	155.3
76	12	21.491	21.476	36.162	164.4
50	13	27.423	27.411	36.245	195.7
4	14	27.971	27.970	35.087	198.2

NBC-1 R/V SEWARD JOHNSON

CTD Station 4 (98004)

Latitude 9.744 N Longitude 53.783 W

13-Nov-1998 04:00 Z



NBC-1 RV SEWARD JOHNSON  
 CTD Station 5 (98005)  
 Latitude 8.103N Longitude 54.041W  
 14-Nov-1998 16:20Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.104	28.104	36.137	184.2	0.005	23.218
10	28.107	28.105	36.152	201.1	0.046	23.230
20	27.995	27.990	36.336	201.4	0.092	23.407
30	27.299	27.292	36.328	188.4	0.136	23.629
40	24.849	24.840	36.351	183.6	0.175	24.416
50	23.750	23.739	36.365	183.4	0.208	24.758
60	23.228	23.216	36.345	177.6	0.239	24.897
70	22.563	22.548	36.302	178.7	0.269	25.057
80	21.417	21.402	36.236	174.6	0.297	25.331
90	19.372	19.356	36.060	169.0	0.321	25.745
100	18.857	18.839	36.018	173.0	0.343	25.847
110	18.834	18.814	36.019	174.1	0.365	25.854
120	18.816	18.794	36.019	173.7	0.387	25.859
130	17.674	17.652	35.886	167.0	0.408	26.044
140	16.916	16.893	35.794	166.6	0.427	26.156
150	16.436	16.412	35.730	165.4	0.446	26.221
160	15.368	15.343	35.587	158.9	0.464	26.355
170	14.951	14.925	35.531	165.0	0.481	26.405
180	14.333	14.306	35.450	163.0	0.497	26.476
190	14.099	14.072	35.413	164.1	0.513	26.497
200	13.746	13.717	35.369	162.6	0.529	26.539
250	12.378	12.345	35.174	159.3	0.603	26.665
300	11.782	11.743	35.099	158.7	0.674	26.723
350	11.159	11.115	35.022	158.4	0.742	26.780
400	10.674	10.625	34.964	158.5	0.809	26.824
450	10.167	10.114	34.910	157.0	0.874	26.872
500	9.833	9.775	34.881	153.4	0.938	26.908
550	9.007	8.946	34.812	137.1	0.999	26.990
600	7.942	7.880	34.711	138.9	1.055	27.074
650	6.784	6.723	34.622	134.1	1.107	27.168
700	6.242	6.178	34.603	132.8	1.156	27.225
750	5.759	5.693	34.583	136.5	1.202	27.270
800	5.437	5.369	34.601	138.6	1.246	27.324
900	5.162	5.086	34.645	145.2	1.328	27.392
1000	4.934	4.851	34.739	157.3	1.404	27.495

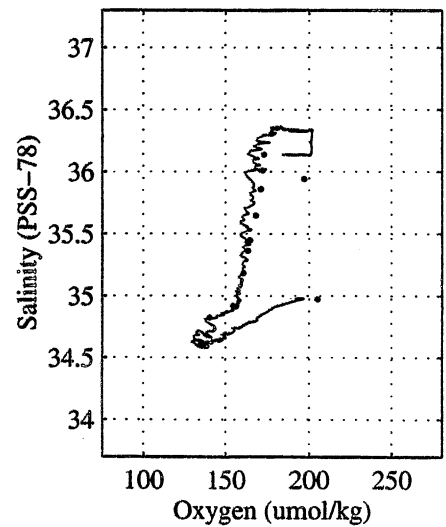
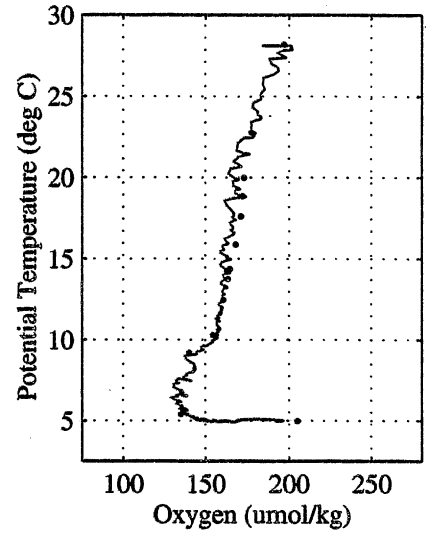
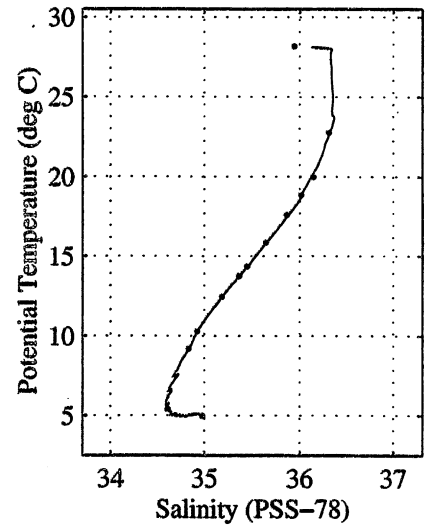
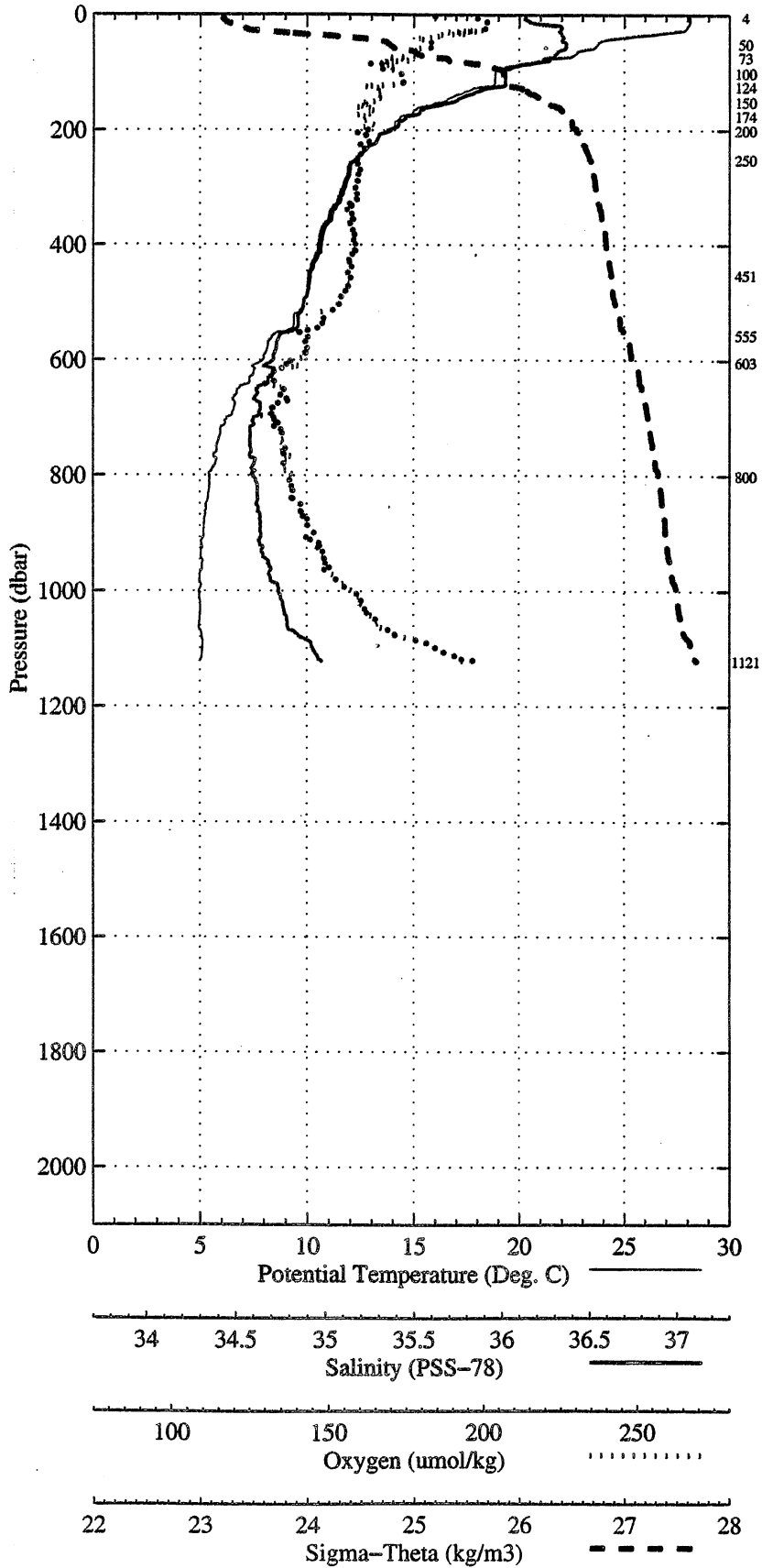
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
1121	1	4.986	4.891	34.975	204.8
801	2	5.401	5.333	34.598	134.7
603	3	7.917	NaN	NaN	NaN
556	4	9.196	9.134	34.825	139.9
452	5	10.287	10.233	34.920	154.5
251	6	12.470	12.436	35.184	160.6
200	7	13.754	13.725	35.362	163.4
175	8	14.364	14.339	35.448	164.5
151	9	15.858	15.834	35.647	168.1
124	10	17.605	17.583	35.860	171.2
101	11	18.856	18.838	36.010	172.1
74	12	19.994	19.980	36.139	173.1
50	13	22.764	22.754	36.308	177.7
4	14	28.191	28.190	35.941	196.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 5 (98005)

Latitude 8.103 N Longitude 54.041 W

14-Nov-1998 16:20 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 6 (98006)  
 Latitude 7.503N Longitude 52.733W  
 15-Nov-1998 02:57Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.830	27.830	36.305	199.7	0.004	23.434
10	27.825	27.823	36.341	195.6	0.044	23.465
20	27.798	27.794	36.341	196.7	0.088	23.475
30	26.985	26.978	36.338	196.1	0.132	23.737
40	26.437	26.428	36.354	193.5	0.172	23.926
50	26.271	26.259	36.360	192.8	0.212	23.983
60	25.796	25.782	36.379	187.4	0.250	24.148
70	25.650	25.634	36.383	186.1	0.288	24.198
80	25.500	25.483	36.392	183.3	0.325	24.253
90	24.460	24.441	36.368	180.5	0.361	24.553
100	24.179	24.158	36.365	180.6	0.395	24.636
110	23.847	23.824	36.357	180.3	0.428	24.730
120	23.134	23.110	36.329	177.5	0.460	24.919
130	22.428	22.402	36.283	175.3	0.489	25.088
140	20.564	20.538	36.108	166.8	0.517	25.472
150	19.816	19.788	36.152	162.5	0.541	25.705
160	19.281	19.252	36.333	155.2	0.563	25.984
170	19.369	19.338	36.536	146.9	0.583	26.118
180	18.212	18.181	36.343	141.2	0.602	26.265
190	17.159	17.127	36.192	135.8	0.620	26.408
200	16.811	16.778	36.158	134.7	0.636	26.465
250	13.299	13.263	35.526	126.8	0.710	26.755
300	10.398	10.362	35.037	132.5	0.774	26.925
350	9.373	9.333	34.911	127.0	0.832	27.001
400	8.486	8.444	34.824	122.1	0.887	27.075
450	8.277	8.230	34.822	116.7	0.940	27.107
500	7.985	7.934	34.815	117.5	0.991	27.147
550	6.783	6.732	34.643	123.2	1.040	27.182
600	6.468	6.412	34.644	123.7	1.088	27.225
650	6.115	6.057	34.629	125.2	1.134	27.259
700	5.427	5.368	34.576	132.0	1.178	27.303
750	5.203	5.141	34.594	135.8	1.219	27.344
800	5.141	5.075	34.634	138.8	1.260	27.384
900	5.007	4.932	34.748	150.3	1.335	27.492
1000	5.162	5.077	34.895	171.5	1.401	27.593

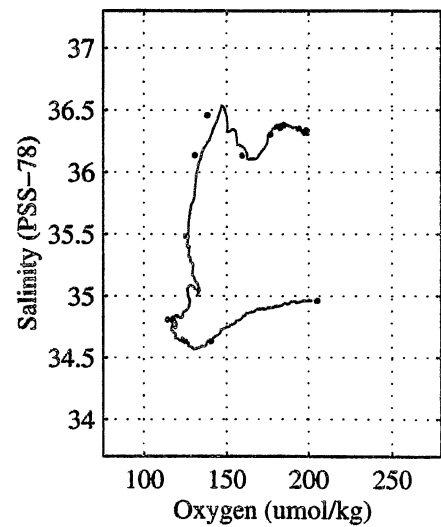
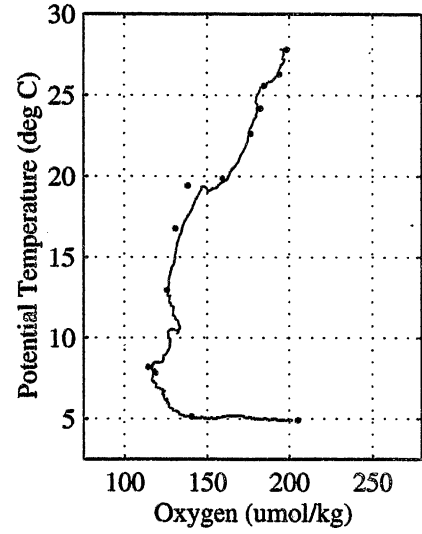
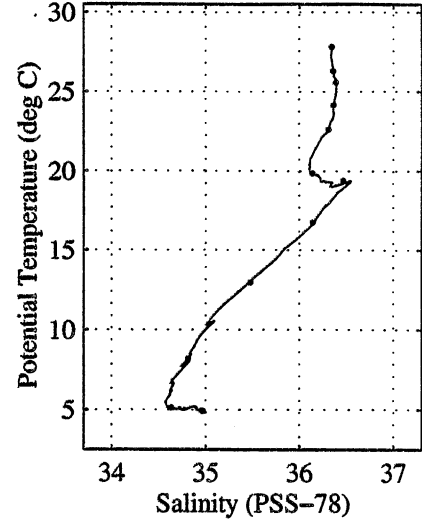
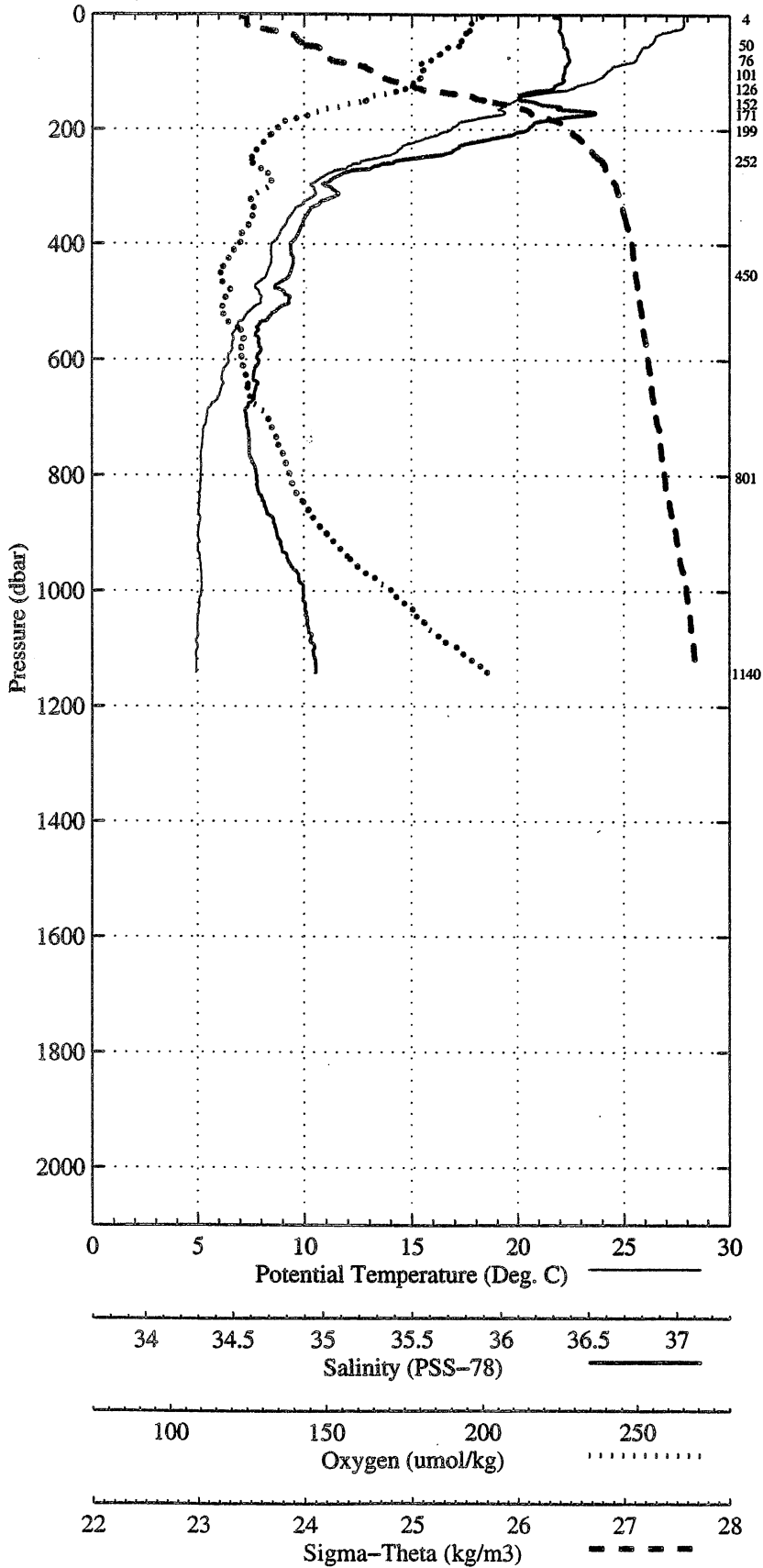
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1141	1	4.917	4.821	34.962	205.0
801	2	5.141	5.075	34.634	140.2
451	3	8.192	8.145	34.808	114.4
252	4	12.970	12.935	35.485	125.6
200	5	16.775	16.742	36.137	130.5
172	6	19.417	19.385	36.460	138.1
153	7	19.875	19.847	36.134	159.4
126	8	22.635	22.609	36.304	177.0
101	9	24.175	24.154	36.358	182.7
76	10	25.581	25.564	36.381	185.0
50	11	26.304	26.293	36.353	194.0
5	12	27.817	27.816	36.338	198.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 6 (98006)

Latitude 7.503 N Longitude 52.733 W

15-Nov-1998 02:57 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 7 (98007)**  
**Latitude 8.986N Longitude 52.769W**  
**15-Nov-1998 22:10Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.962	27.962	35.166	216.8	0.005	22.534
10	27.970	27.967	35.307	198.7	0.053	22.639
20	27.968	27.963	35.382	198.2	0.104	22.698
30	27.774	27.767	35.815	197.3	0.154	23.088
40	27.151	27.142	36.260	195.6	0.199	23.627
50	26.432	26.421	36.262	191.6	0.241	23.859
60	24.567	24.554	36.239	171.0	0.278	24.419
70	21.982	21.968	36.203	159.8	0.310	25.147
80	20.416	20.401	36.188	154.5	0.336	25.567
90	19.643	19.626	36.155	153.0	0.359	25.747
100	18.479	18.462	36.063	151.9	0.381	25.976
110	17.822	17.803	36.019	149.1	0.401	26.107
120	17.178	17.158	36.005	146.9	0.419	26.254
130	15.920	15.899	35.846	143.7	0.436	26.428
140	15.013	14.992	35.689	143.5	0.452	26.511
150	14.331	14.309	35.555	144.8	0.468	26.556
160	13.659	13.636	35.439	145.5	0.483	26.608
170	13.410	13.386	35.385	147.2	0.497	26.618
180	12.950	12.925	35.291	148.6	0.512	26.640
190	12.681	12.655	35.248	149.9	0.526	26.660
200	12.246	12.219	35.190	149.3	0.540	26.700
250	11.189	11.158	35.054	148.1	0.607	26.795
300	10.884	10.847	35.082	140.3	0.671	26.874
350	11.014	10.971	35.218	127.3	0.731	26.959
400	9.495	9.449	34.950	122.0	0.790	27.014
450	9.011	8.962	34.912	122.1	0.845	27.064
500	7.930	7.879	34.743	122.6	0.898	27.098
550	7.295	7.241	34.678	124.6	0.950	27.139
600	7.154	7.096	34.718	120.9	1.000	27.192
650	6.462	6.402	34.639	122.2	1.048	27.224
700	5.994	5.931	34.606	127.8	1.094	27.258
750	5.676	5.611	34.602	130.0	1.139	27.294
800	5.517	5.449	34.616	133.3	1.182	27.326
900	5.051	4.977	34.617	140.7	1.265	27.383
1000	4.960	4.876	34.700	150.4	1.342	27.461
1500	4.627	4.500	35.008	234.0	1.649	27.753
2000	3.531	3.370	34.975	265.1	1.888	27.846

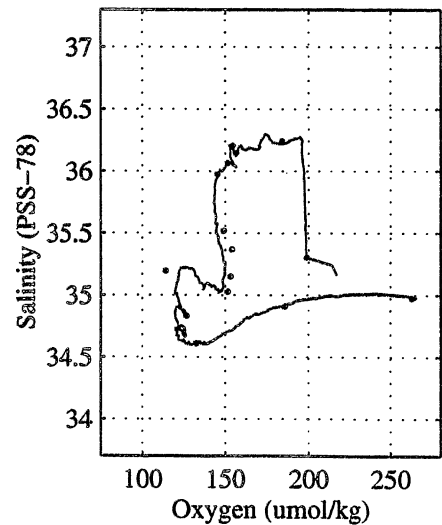
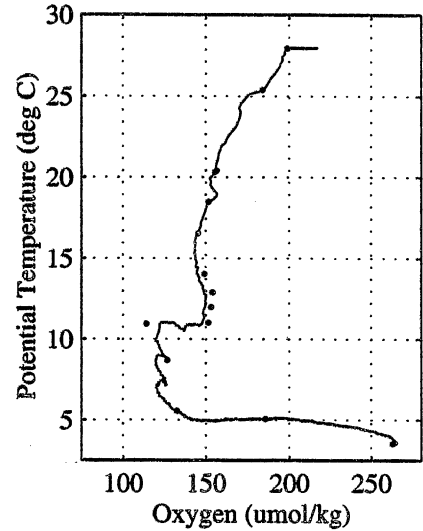
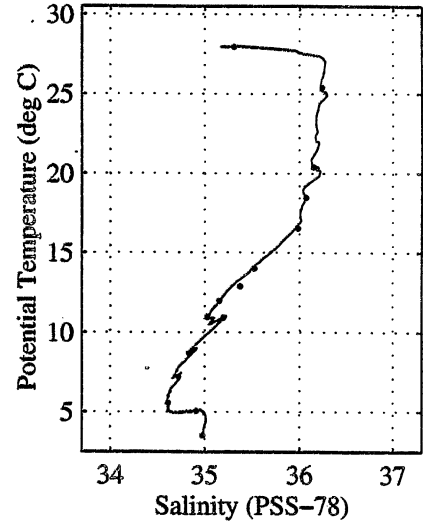
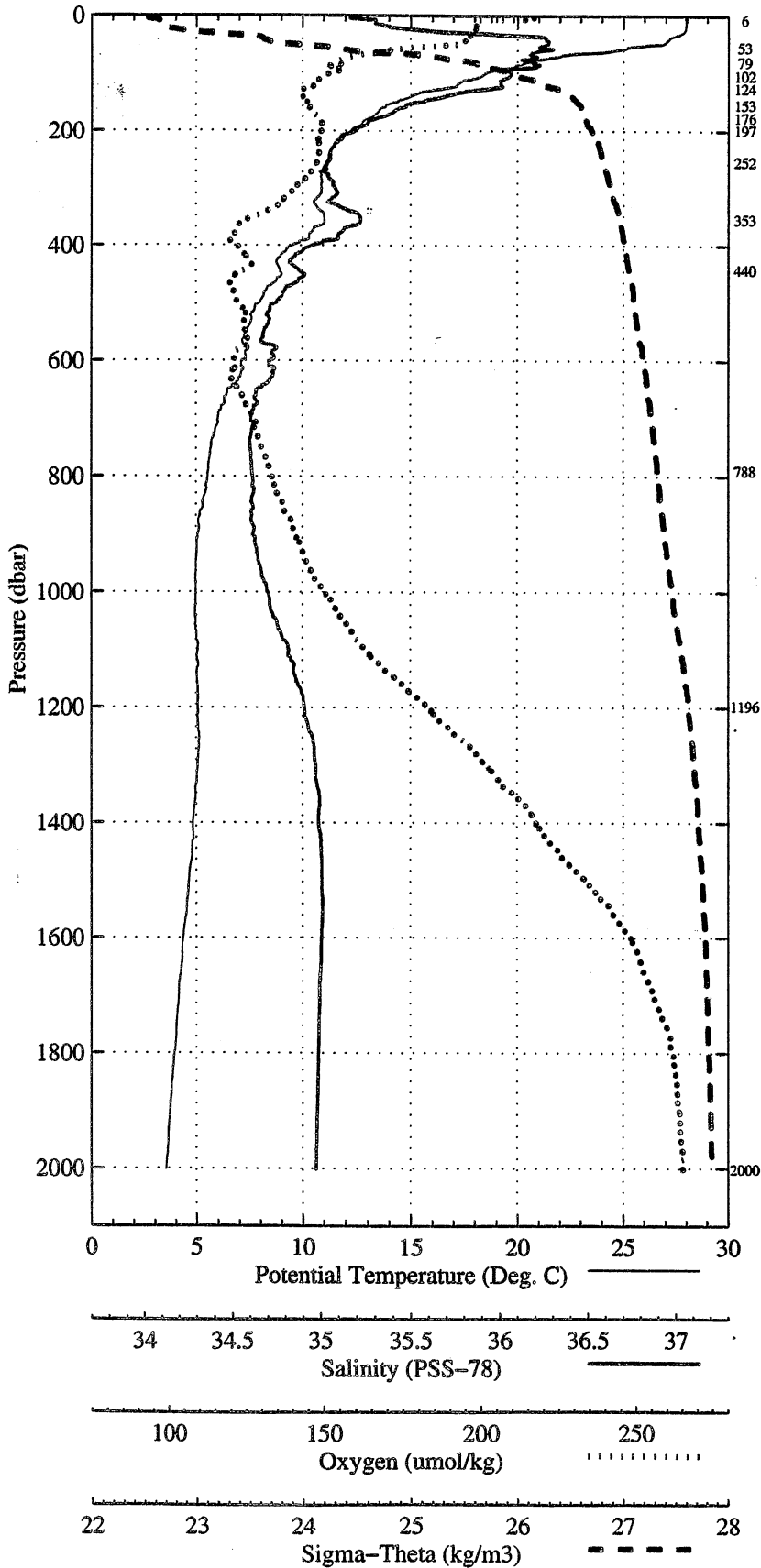
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2001	1	3.531	3.370	34.974	262.7
1196	2	5.063	4.960	34.909	185.6
789	3	5.557	5.489	34.611	132.5
441	4	8.686	8.638	34.833	126.7
353	5	10.935	10.891	35.196	114.1
253	6	11.005	10.974	35.029	151.2
198	7	11.978	11.952	35.149	153.0
176	8	12.881	12.857	35.368	153.8
154	9	14.027	14.004	35.520	148.9
125	10	16.544	16.524	35.977	145.1
103	11	18.482	18.463	36.066	151.4
79	12	20.411	20.396	36.148	156.2
54	13	25.389	25.377	36.241	184.0
6	14	27.949	27.948	35.305	198.5

NBC-1 R/V SEWARD JOHNSON

CTD Station 7 (98007)

Latitude 8.986 N Longitude 52.769 W

15-Nov-1998 22:10 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 8 (98008)**  
**Latitude 9.755N Longitude 51.483W**  
**16-Nov-1998 13:23Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.233	28.233	34.493	185.1	0.006	21.939
10	28.241	28.239	34.481	194.1	0.059	21.930
20	28.248	28.243	34.490	195.7	0.118	21.936
30	28.774	28.767	35.256	197.7	0.176	22.339
40	28.352	28.342	36.455	205.6	0.224	23.382
50	26.832	26.821	36.603	207.0	0.266	23.989
60	25.068	25.055	36.736	193.4	0.302	24.643
70	23.962	23.947	36.695	182.9	0.334	24.947
80	21.984	21.968	36.702	155.6	0.361	25.527
90	21.482	21.465	36.876	154.0	0.385	25.801
100	20.638	20.619	36.854	152.0	0.406	26.017
110	19.932	19.911	36.807	154.7	0.425	26.171
120	18.566	18.545	36.568	144.7	0.443	26.343
130	18.081	18.058	36.493	142.2	0.460	26.408
140	17.294	17.271	36.369	140.4	0.476	26.507
150	16.530	16.505	36.222	139.1	0.491	26.577
160	15.502	15.477	36.011	130.3	0.506	26.652
170	14.925	14.899	35.909	126.5	0.520	26.702
180	14.337	14.311	35.804	124.2	0.534	26.749
190	13.672	13.645	35.684	120.0	0.547	26.797
200	13.393	13.365	35.644	122.7	0.560	26.824
250	11.512	11.480	35.360	115.9	0.620	26.974
300	9.925	9.891	35.095	115.1	0.675	27.051
350	9.036	8.997	34.954	115.1	0.728	27.089
400	8.381	8.339	34.860	115.7	0.780	27.119
450	7.668	7.622	34.770	116.3	0.830	27.156
500	7.255	7.206	34.733	117.8	0.879	27.186
550	6.552	6.502	34.651	119.5	0.926	27.219
600	6.125	6.071	34.625	122.5	0.972	27.254
650	6.013	5.955	34.644	123.8	1.017	27.285
700	5.550	5.490	34.605	128.6	1.060	27.311
750	5.372	5.308	34.608	132.2	1.102	27.336
800	5.345	5.277	34.651	135.5	1.143	27.374
900	5.116	5.040	34.687	142.6	1.221	27.431
1000	5.060	4.976	34.760	152.1	1.295	27.497
1500	4.317	4.193	34.983	233.2	1.588	27.766
2000	3.536	3.376	34.976	260.8	1.820	27.846

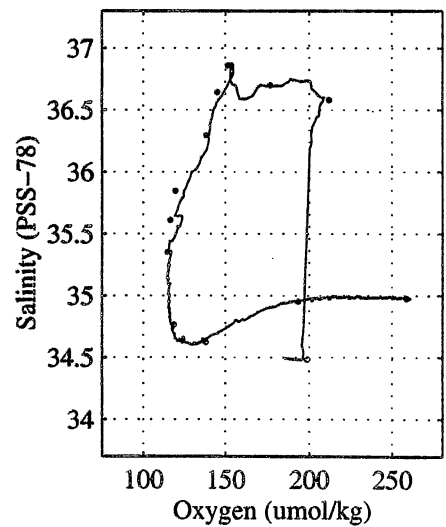
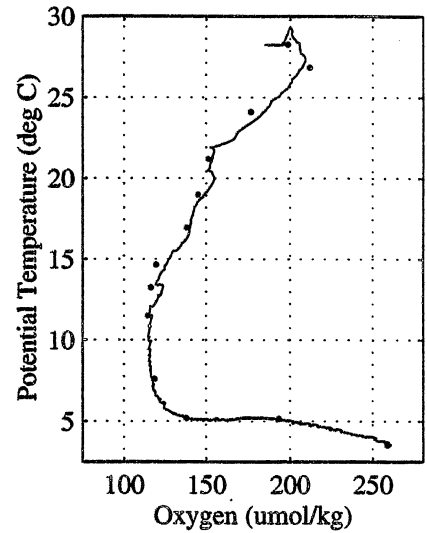
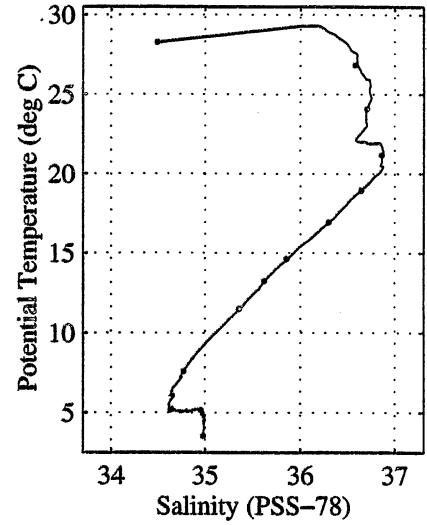
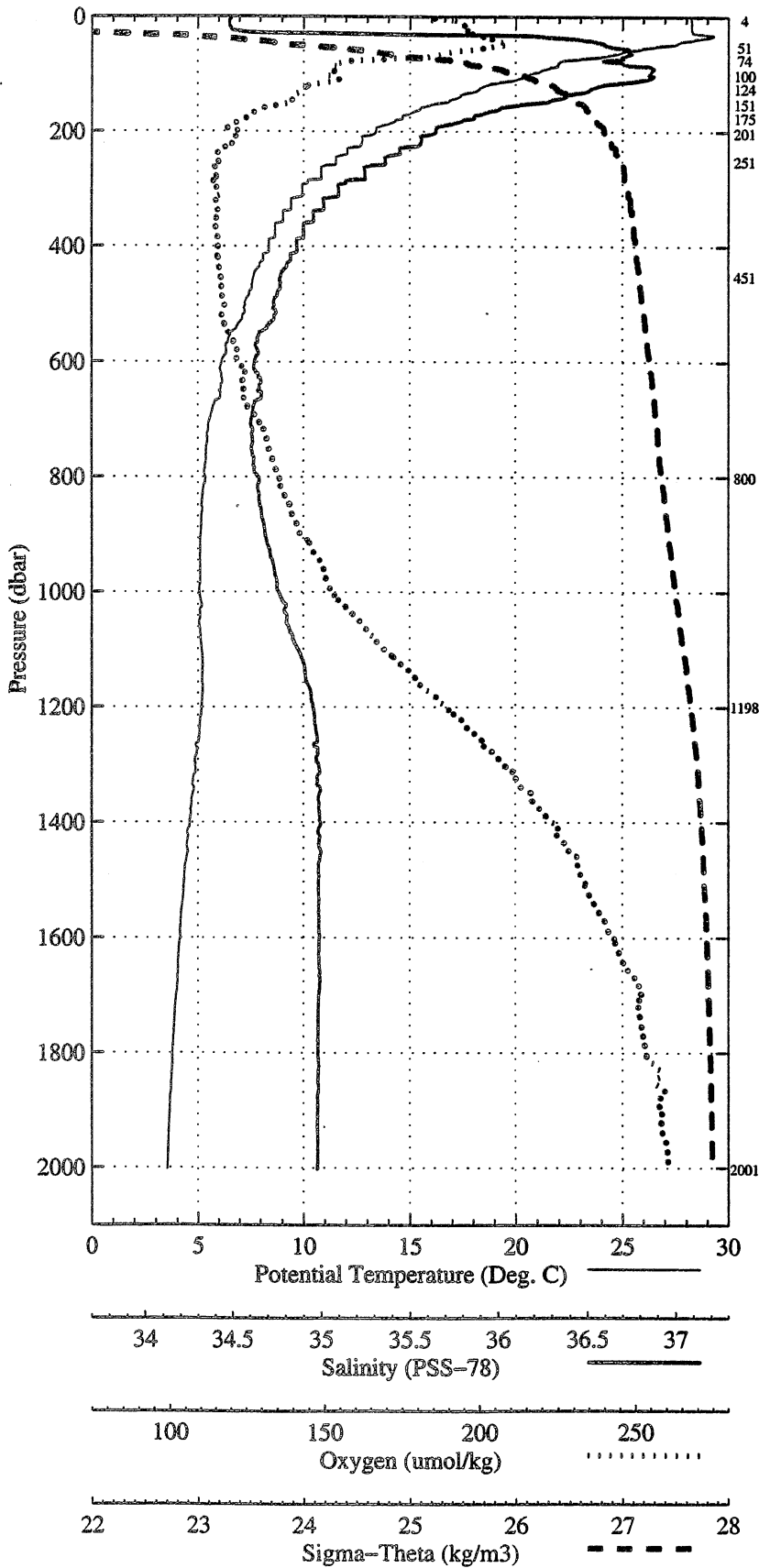
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2002	1	3.535	3.374	34.976	258.7
1199	2	5.159	5.055	34.952	193.2
800	3	5.193	5.126	34.623	137.7
451	4	7.605	7.560	34.765	118.2
251	5	11.512	11.480	35.353	114.3
202	6	13.247	13.219	35.613	116.0
176	7	14.644	14.617	35.847	119.1
152	8	16.937	16.912	36.297	138.0
124	9	18.983	18.960	36.644	144.9
101	10	21.195	21.175	36.859	151.4
74	11	24.104	24.088	36.702	176.6
51	12	26.843	26.831	36.581	211.8
5	13	28.262	28.261	34.483	198.6

NBC-1 R/V SEWARD JOHNSON

CTD Station 8 (98008)

Latitude 9.755 N Longitude 51.483 W

16-Nov-1998 13:23 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 9 (98009)**  
**Latitude 9.148N Longitude 49.808W**  
**17-Nov-1998 03:19Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.405	28.404	35.737	204.7	0.005	22.819
10	28.390	28.388	35.736	200.5	0.050	22.824
20	28.395	28.390	35.737	200.1	0.101	22.825
30	28.398	28.391	35.741	198.7	0.151	22.828
40	27.768	27.759	36.417	194.6	0.196	23.545
50	26.165	26.154	36.525	187.6	0.237	24.141
60	25.101	25.087	36.611	166.7	0.273	24.538
70	23.476	23.461	36.624	165.1	0.304	25.037
80	22.352	22.336	36.712	140.1	0.331	25.430
90	20.112	20.095	36.715	140.8	0.353	26.051
100	19.206	19.188	36.687	147.8	0.372	26.269
110	18.043	18.024	36.480	141.1	0.389	26.407
120	17.247	17.227	36.332	133.0	0.405	26.488
130	16.005	15.984	36.093	129.1	0.420	26.598
140	14.575	14.554	35.835	116.5	0.434	26.719
150	13.328	13.307	35.600	113.2	0.447	26.800
160	12.404	12.383	35.445	113.1	0.460	26.865
170	12.374	12.351	35.446	111.8	0.472	26.872
180	11.763	11.739	35.346	106.0	0.484	26.913
190	11.611	11.586	35.323	106.5	0.496	26.924
200	11.000	10.975	35.218	103.7	0.507	26.955
250	10.331	10.301	35.113	101.5	0.564	26.994
300	9.173	9.139	34.946	106.8	0.618	27.059
350	8.548	8.510	34.866	108.5	0.671	27.097
400	7.890	7.850	34.779	113.1	0.722	27.129
450	7.297	7.254	34.714	116.3	0.771	27.164
500	6.843	6.796	34.678	117.7	0.820	27.200
550	6.299	6.249	34.624	122.1	0.866	27.230
600	6.179	6.125	34.638	122.5	0.912	27.258
650	5.812	5.755	34.638	124.5	0.956	27.305
700	5.528	5.469	34.630	127.6	0.998	27.333
750	5.232	5.169	34.623	134.2	1.039	27.364
800	5.224	5.157	34.667	136.7	1.078	27.401
900	4.945	4.871	34.721	149.6	1.153	27.477
1000	4.936	4.853	34.782	160.7	1.223	27.529
1500	4.765	4.636	34.978	221.8	1.525	27.714
2000	3.683	3.520	34.982	259.4	1.775	27.837

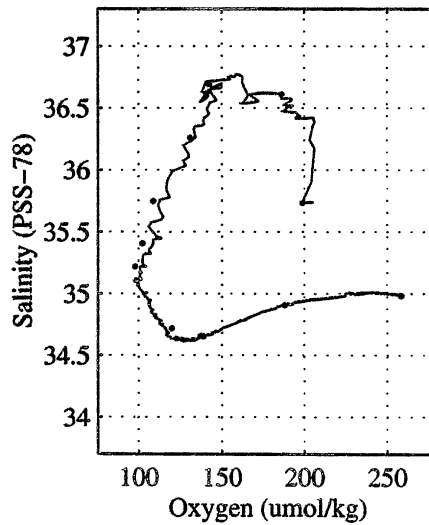
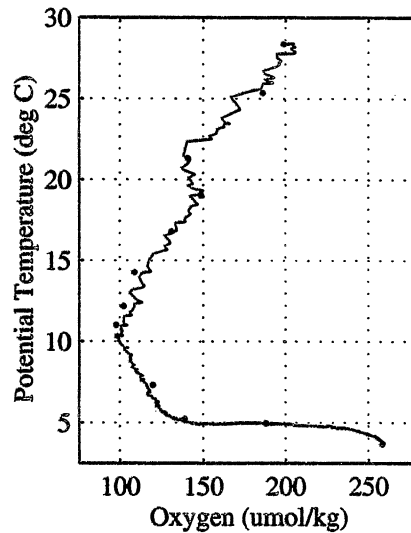
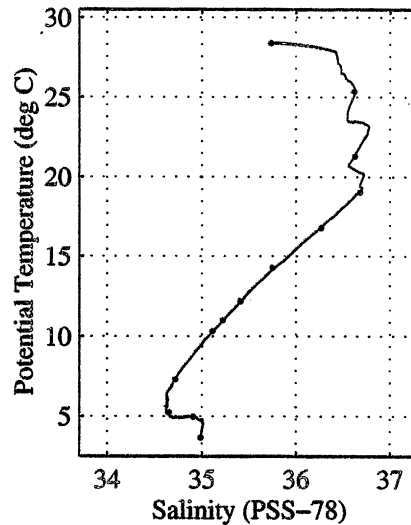
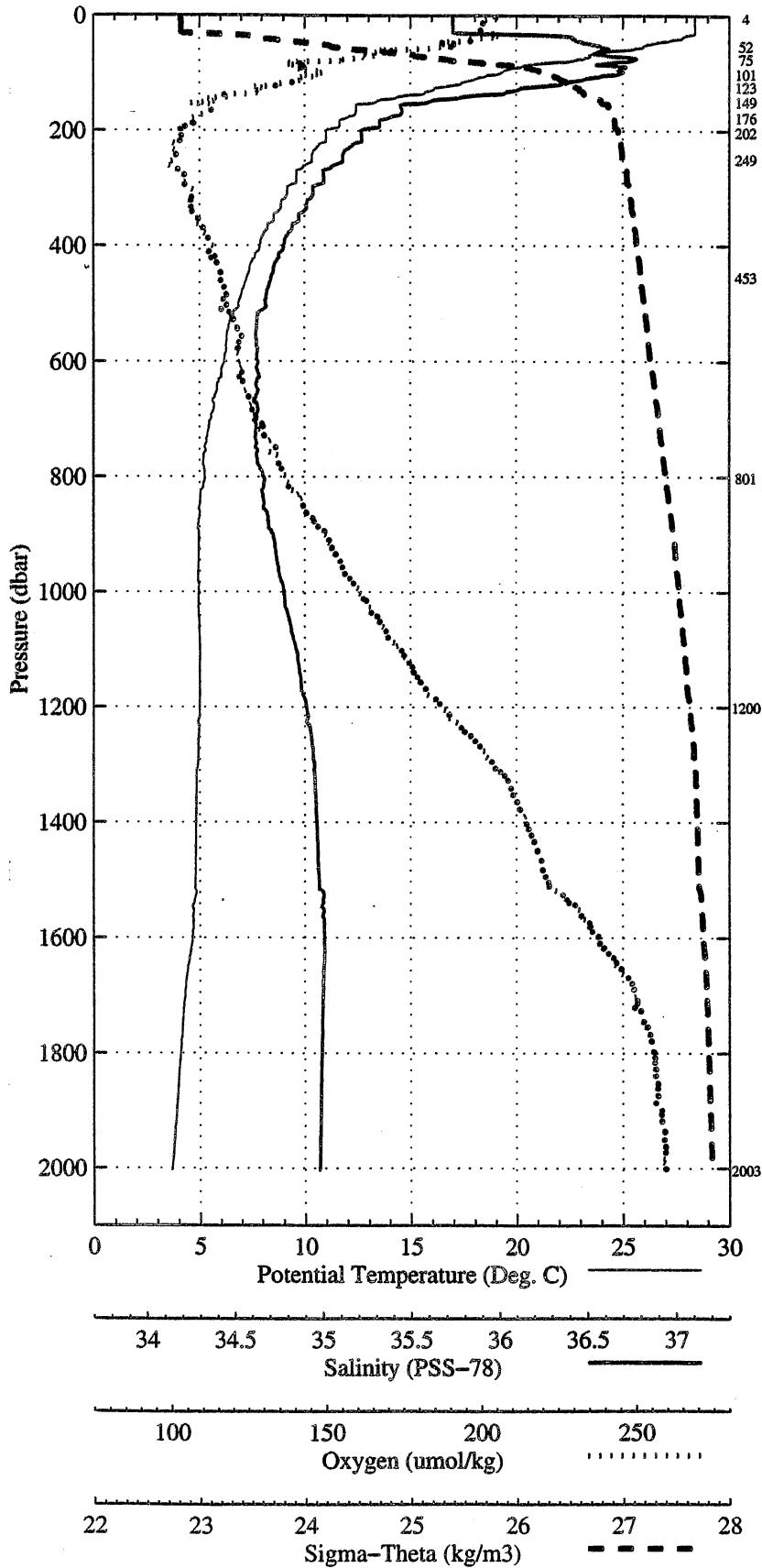
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2003	1	3.673	3.510	34.983	258.4
1200	2	4.969	4.867	34.908	188.1
801	3	5.236	5.169	34.653	138.6
454	4	7.309	7.265	34.718	119.6
249	5	10.323	10.294	35.106	98.3
203	6	11.012	10.987	35.219	97.6
177	7	12.177	12.154	35.407	102.0
149	8	14.276	14.254	35.748	108.6
124	9	16.796	16.775	36.262	130.9
101	10	19.043	19.024	36.677	148.4
75	11	21.308	21.294	36.620	140.7
52	12	25.352	25.341	36.613	186.3
4	13	28.379	28.378	35.735	198.8

NBC-1 R/V SEWARD JOHNSON

CTD Station 9 (98009)

Latitude 9.148 N Longitude 49.808 W

17-Nov-1998 03:19 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 10 (98010)  
 Latitude 7.801N Longitude 51.151W  
 17-Nov-1998 17:35Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.074	28.074	36.286	192.3	0.005	23.340
10	28.076	28.073	36.293	194.7	0.045	23.346
20	28.077	28.072	36.294	196.1	0.091	23.348
30	28.082	28.075	36.294	194.7	0.136	23.348
40	27.945	27.936	36.333	195.4	0.181	23.424
50	27.914	27.902	36.346	195.5	0.226	23.446
60	27.885	27.870	36.352	195.3	0.270	23.461
70	26.635	26.619	36.298	191.8	0.314	23.825
80	25.535	25.518	36.329	171.2	0.353	24.194
90	24.611	24.591	36.559	167.3	0.389	24.652
100	23.332	23.311	36.703	152.9	0.420	25.143
110	22.615	22.593	36.969	157.7	0.446	25.554
120	21.390	21.366	36.960	153.8	0.469	25.894
130	20.400	20.375	36.856	152.9	0.490	26.086
140	19.509	19.483	36.714	149.8	0.509	26.215
150	18.575	18.548	36.553	144.6	0.527	26.332
160	17.212	17.185	36.278	136.8	0.543	26.459
170	15.315	15.289	35.856	126.0	0.559	26.575
180	13.526	13.500	35.513	136.2	0.574	26.694
190	12.656	12.630	35.377	132.2	0.587	26.765
200	11.187	11.162	35.136	133.8	0.600	26.857
250	9.215	9.187	34.845	138.4	0.659	26.971
300	9.460	9.426	34.970	117.6	0.714	27.031
350	8.584	8.547	34.833	121.1	0.768	27.065
400	8.377	8.335	34.849	110.1	0.820	27.111
450	7.607	7.562	34.764	113.4	0.871	27.160
500	7.100	7.052	34.708	115.0	0.919	27.188
550	6.229	6.180	34.609	121.2	0.966	27.227
600	5.830	5.778	34.582	125.1	1.012	27.257
650	5.585	5.529	34.574	130.2	1.056	27.282
700	5.415	5.355	34.578	132.2	1.099	27.306
750	5.318	5.255	34.595	133.8	1.141	27.331
800	5.038	4.972	34.590	139.3	1.183	27.361
900	5.012	4.937	34.660	143.5	1.261	27.422
1000	5.045	4.960	34.746	152.8	1.335	27.488
1500	4.626	4.498	35.001	231.4	1.638	27.747
2000	3.617	3.455	34.979	259.9	1.881	27.841

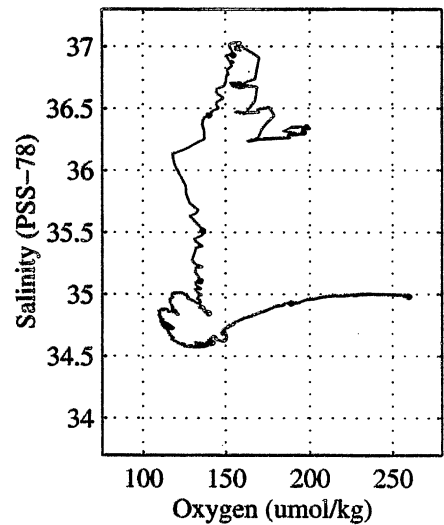
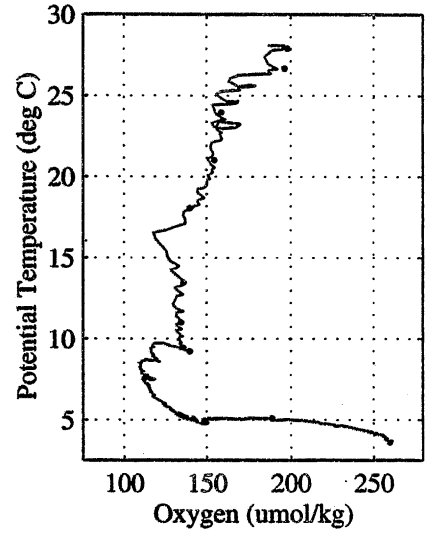
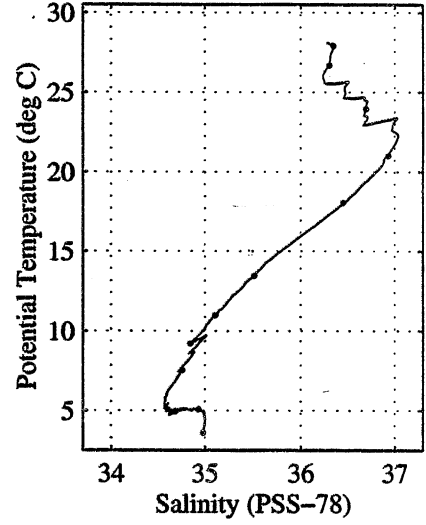
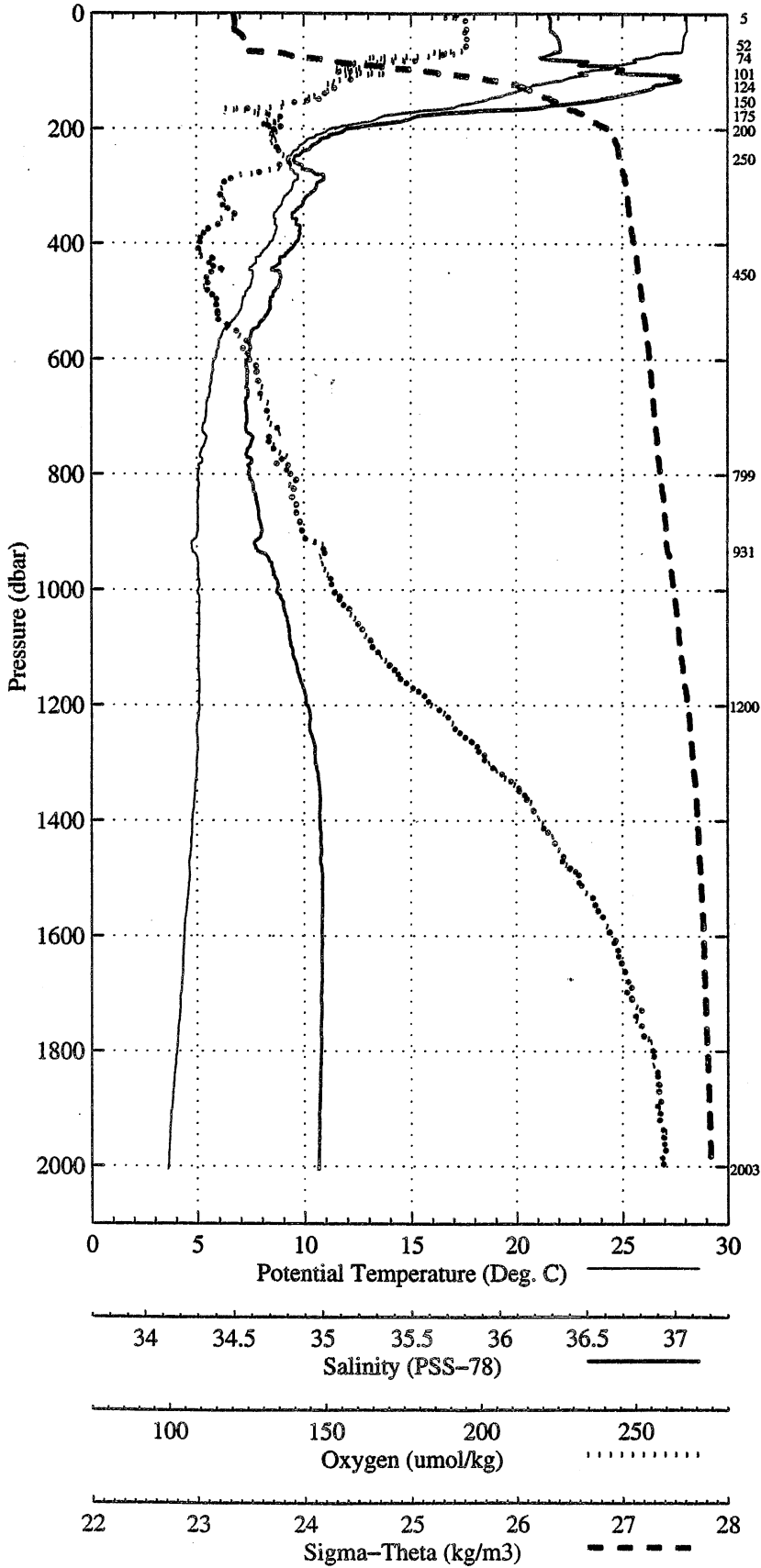
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2004	1	3.609	3.447	34.980	259.6
1200	2	5.090	4.986	34.926	188.5
932	3	4.956	4.878	34.688	148.4
800	4	5.067	5.001	34.607	141.6
451	5	7.540	7.495	34.760	112.3
251	6	9.211	9.183	34.842	139.6
201	7	10.992	10.968	35.104	134.4
175	8	13.459	13.435	35.513	136.0
151	9	18.072	18.046	36.447	139.8
124	10	21.026	21.002	36.929	154.4
102	11	23.958	23.936	36.689	158.6
75	12	26.678	26.661	36.306	196.1
52	13	27.905	27.893	36.346	197.8
5	14	28.058	NaN	NaN	NaN

NBC-1 R/V SEWARD JOHNSON

CTD Station 10 (98010)

Latitude 7.801 N Longitude 51.151 W

17-Nov-1998 17:35 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 11 (98011)**  
**Latitude 7.337N Longitude 50.549W**  
**17-Nov-1998 23:16Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.887	27.886	36.370	202.5	0.004	23.465
10	27.900	27.897	36.347	198.6	0.044	23.444
20	27.839	27.834	36.349	198.6	0.089	23.467
30	26.948	26.941	36.357	196.0	0.131	23.764
40	26.625	26.616	36.361	194.2	0.172	23.871
50	26.632	26.621	36.373	193.4	0.212	23.879
60	26.390	26.376	36.383	190.0	0.252	23.965
70	26.260	26.244	36.371	190.4	0.292	23.998
80	25.958	25.940	36.371	189.9	0.331	24.095
90	25.444	25.424	36.410	182.5	0.369	24.285
100	24.604	24.582	36.368	180.8	0.404	24.511
110	23.992	23.968	36.303	177.7	0.438	24.646
120	22.153	22.129	36.118	168.9	0.469	25.040
130	20.422	20.397	36.138	162.8	0.496	25.532
140	19.641	19.615	36.392	156.4	0.519	25.934
150	18.177	18.151	36.341	143.9	0.538	26.269
160	17.191	17.164	36.219	139.1	0.555	26.419
170	16.143	16.116	36.095	134.7	0.571	26.571
180	15.591	15.563	35.994	132.4	0.586	26.619
190	14.914	14.885	35.873	130.0	0.600	26.677
200	14.369	14.339	35.784	126.9	0.614	26.728
250	10.203	10.173	35.038	121.9	0.677	26.958
300	8.739	8.707	34.844	122.1	0.732	27.048
350	7.837	7.802	34.724	124.3	0.784	27.092
400	7.165	7.127	34.652	125.8	0.834	27.133
450	7.076	7.033	34.683	122.8	0.884	27.171
500	6.396	6.351	34.609	125.0	0.931	27.204
550	6.048	5.999	34.583	127.7	0.978	27.230
600	5.838	5.786	34.584	129.8	1.023	27.257
650	5.421	5.366	34.557	135.9	1.067	27.288
700	5.314	5.255	34.572	136.2	1.110	27.314
750	5.047	4.985	34.566	140.3	1.151	27.340
800	5.141	5.075	34.603	140.4	1.192	27.360
900	4.992	4.918	34.649	146.6	1.272	27.415
1000	4.811	4.728	34.696	155.4	1.346	27.474
1500	4.621	4.494	34.998	227.1	1.652	27.745
2000	3.552	3.391	34.976	258.2	1.891	27.844

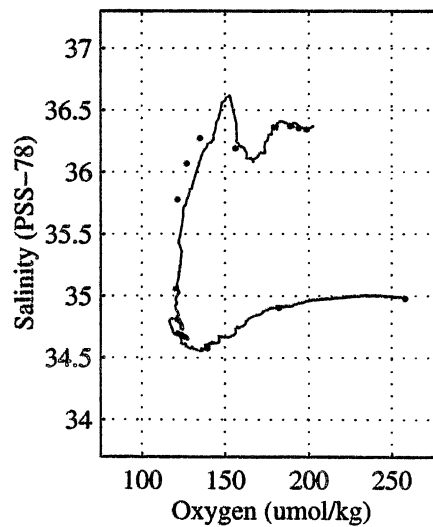
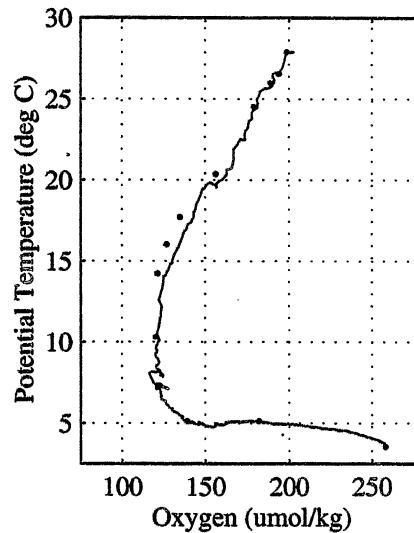
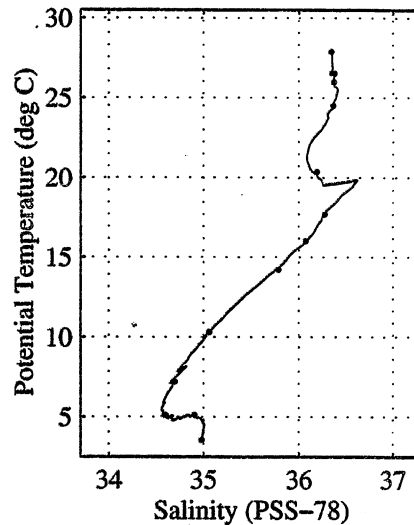
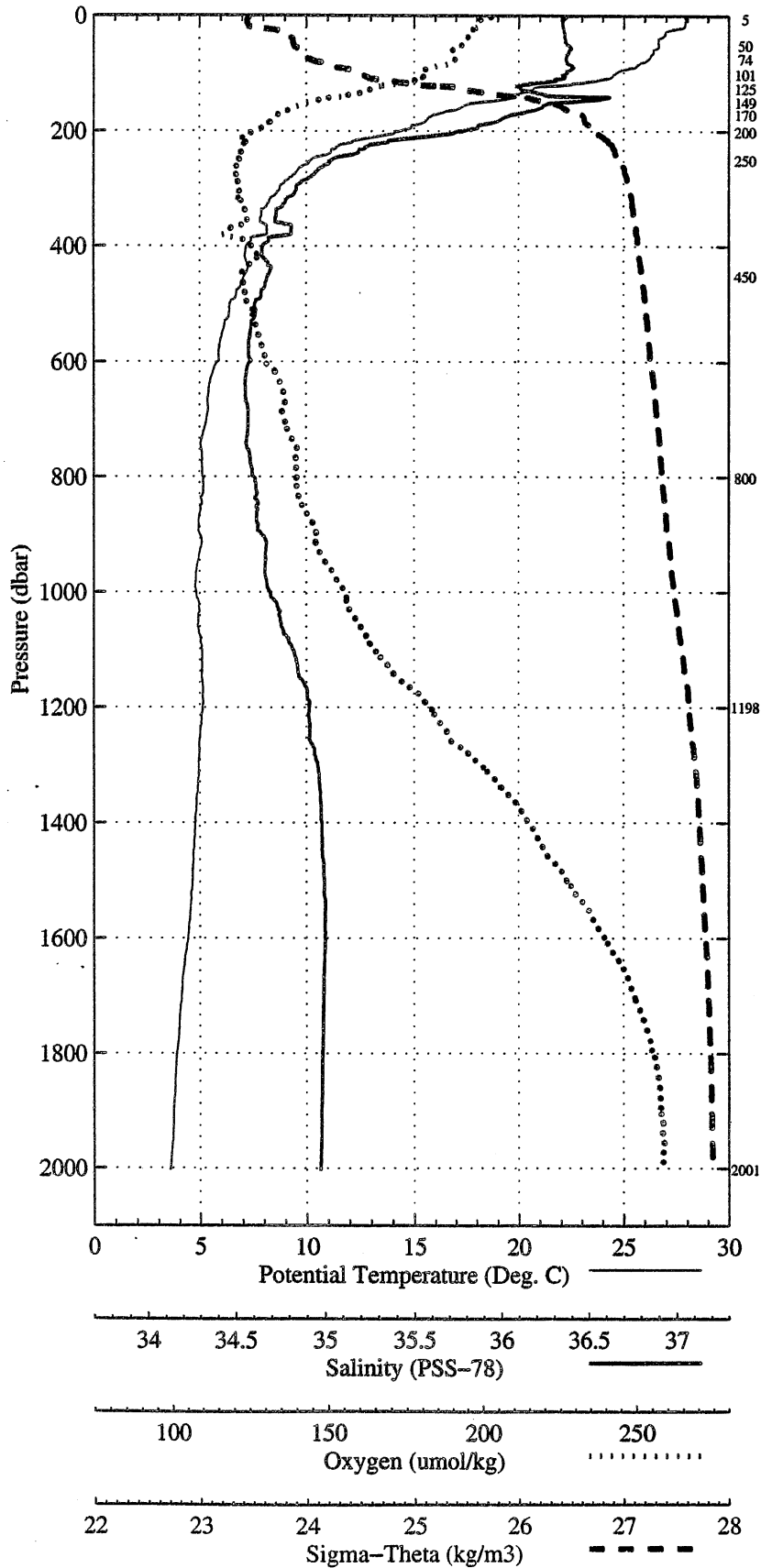
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2002	1	3.553	3.392	34.976	258.1
1199	2	5.130	5.026	34.904	181.9
801	3	5.117	5.050	34.596	139.1
451	4	7.199	7.155	34.694	121.5
250	5	10.321	10.291	35.057	120.3
201	6	14.220	14.191	35.778	121.3
171	7	16.018	15.991	36.069	126.8
149	8	17.710	17.685	36.274	134.8
125	9	20.368	20.344	36.191	156.1
101	10	24.517	24.495	36.363	178.9
74	11	25.989	25.972	36.371	188.7
51	12	26.555	26.544	36.353	193.7
5	13	27.886	27.885	36.343	198.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 11 (98011)

Latitude 7.337 N Longitude 50.549 W

17-Nov-1998 23:16 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 12 (98012)  
 Latitude 7.769N Longitude 49.175W  
 18-Nov-1998 10:27Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.063	28.063	36.321	185.3	0.005	23.370
10	28.061	28.059	36.324	192.4	0.045	23.374
20	28.063	28.058	36.325	194.7	0.090	23.376
30	28.065	28.057	36.325	195.9	0.135	23.377
40	28.063	28.054	36.328	196.3	0.180	23.381
50	28.007	27.995	36.340	196.6	0.225	23.410
60	27.326	27.312	36.337	196.4	0.269	23.632
70	27.124	27.108	36.349	196.1	0.312	23.707
80	26.517	26.498	36.377	191.0	0.353	23.923
90	26.439	26.418	36.420	192.0	0.393	23.982
100	26.374	26.352	36.418	192.6	0.433	24.002
110	26.202	26.177	36.394	192.1	0.472	24.039
120	24.820	24.794	36.422	188.4	0.510	24.489
130	23.004	22.978	36.217	176.0	0.542	24.873
140	21.241	21.213	36.538	157.1	0.570	25.615
150	19.821	19.794	36.508	151.3	0.592	25.976
160	18.177	18.149	36.381	143.1	0.611	26.301
170	16.508	16.480	36.080	134.3	0.628	26.474
180	14.291	14.265	35.655	134.7	0.643	26.644
190	13.141	13.114	35.458	134.9	0.657	26.731
200	12.525	12.498	35.385	126.3	0.670	26.797
250	9.820	9.791	34.947	131.7	0.730	26.951
300	9.111	9.078	34.879	128.6	0.787	27.016
350	8.319	8.283	34.762	128.8	0.841	27.050
400	8.058	8.017	34.758	125.2	0.894	27.087
450	7.531	7.487	34.703	121.5	0.946	27.123
500	7.226	7.177	34.685	121.3	0.996	27.153
550	6.861	6.809	34.657	122.5	1.045	27.182
600	6.277	6.223	34.593	130.4	1.093	27.210
650	6.229	6.170	34.625	125.6	1.140	27.242
700	5.773	5.712	34.602	130.0	1.185	27.282
750	5.555	5.490	34.616	131.2	1.228	27.320
800	5.367	5.299	34.620	134.2	1.270	27.347
900	5.247	5.170	34.683	141.1	1.351	27.413
1000	5.043	4.959	34.739	151.9	1.426	27.483
1500	4.573	4.446	34.998	228.0	1.733	27.750
2000	3.564	3.403	34.976	257.2	1.971	27.843

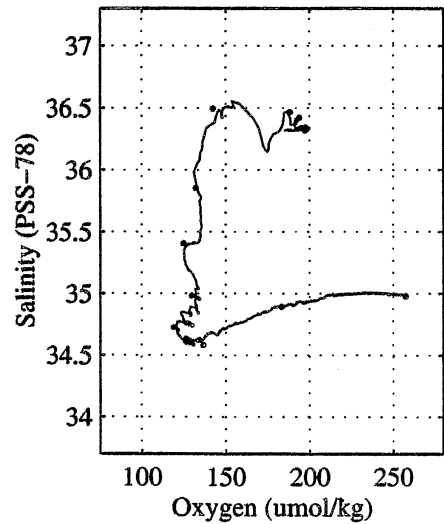
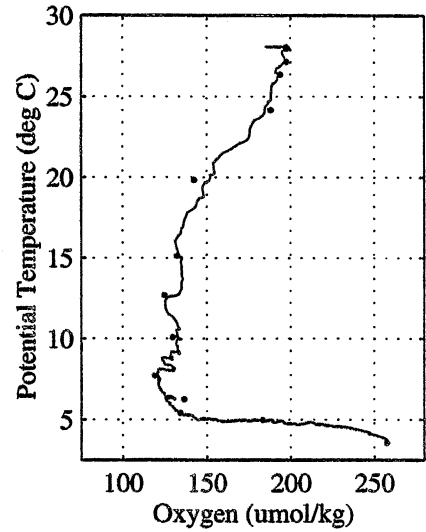
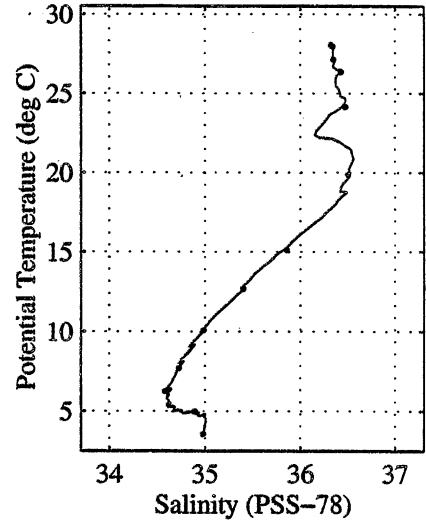
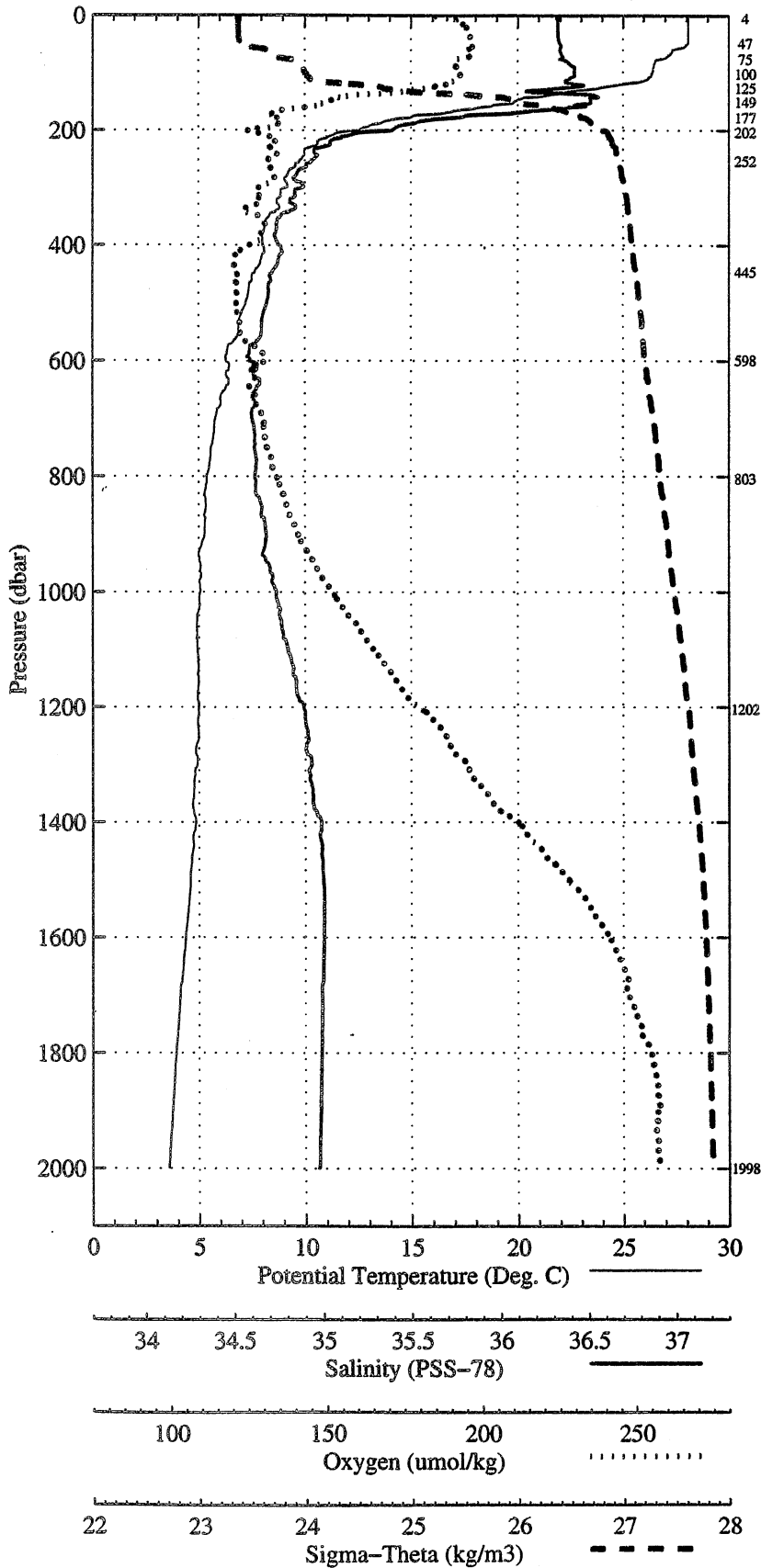
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
1999	1	3.565	3.404	34.976	257.5
1203	2	4.980	4.877	34.892	183.4
803	3	5.411	5.343	34.623	134.1
598	4	6.251	6.197	34.582	136.4
445	5	7.708	7.663	34.726	119.1
253	6	10.088	10.058	34.982	129.7
203	7	12.684	12.657	35.405	124.7
177	8	15.134	15.106	35.854	132.0
150	9	19.855	19.827	36.497	142.1
125	10	24.160	24.133	36.468	188.2
101	11	26.355	26.333	36.424	193.7
75	12	27.149	27.132	36.343	197.4
48	13	27.972	27.961	36.333	197.9
4	14	28.062	28.061	36.319	197.2

NBC-1 R/V SEWARD JOHNSON

CTD Station 12 (98012)

Latitude 7.769 N Longitude 49.175 W

18-Nov-1998 10:27 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 13 (98013)  
 Latitude 6.463N Longitude 49.709W  
 18-Nov-1998 21:29Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.476	28.475	36.332	199.9	0.005	23.242
10	28.490	28.488	36.338	198.4	0.046	23.243
20	28.317	28.312	36.331	198.4	0.092	23.297
30	28.307	28.299	36.332	198.4	0.138	23.302
40	28.294	28.285	36.331	198.4	0.184	23.308
50	28.230	28.219	36.330	198.4	0.230	23.330
60	27.941	27.927	36.331	198.6	0.275	23.427
70	27.716	27.700	36.337	199.2	0.319	23.506
80	27.581	27.562	36.331	198.6	0.363	23.548
90	27.486	27.465	36.348	198.5	0.407	23.592
100	27.268	27.245	36.362	197.5	0.450	23.675
110	26.527	26.502	36.463	194.0	0.491	23.989
120	25.174	25.147	36.550	189.9	0.528	24.478
130	24.653	24.625	36.517	188.6	0.562	24.613
140	21.520	21.492	36.179	181.3	0.592	25.265
150	16.606	16.582	35.593	163.3	0.616	26.075
160	11.570	11.550	35.030	157.8	0.631	26.702
170	11.220	11.198	35.021	156.0	0.644	26.760
180	10.907	10.885	34.990	154.9	0.657	26.793
190	10.622	10.599	34.956	153.7	0.670	26.818
200	10.575	10.551	34.951	154.2	0.683	26.822
250	9.626	9.597	34.860	150.8	0.743	26.916
300	8.784	8.752	34.761	149.0	0.802	26.976
350	8.331	8.295	34.721	147.8	0.858	27.016
400	7.795	7.755	34.663	148.6	0.913	27.052
450	7.581	7.537	34.645	148.9	0.966	27.070
500	7.118	7.070	34.606	149.1	1.019	27.105
550	7.086	7.033	34.630	140.5	1.070	27.130
600	6.661	6.605	34.608	136.1	1.121	27.172
650	6.197	6.139	34.589	132.8	1.169	27.218
700	5.886	5.824	34.570	133.4	1.216	27.243
750	5.712	5.647	34.566	135.7	1.261	27.262
800	5.592	5.523	34.593	134.8	1.306	27.299
900	5.041	4.966	34.573	142.1	1.392	27.349
1000	5.100	5.016	34.654	147.7	1.474	27.409
1500	4.754	4.625	34.996	218.3	1.805	27.729
2000	3.563	3.402	34.977	257.6	2.050	27.844

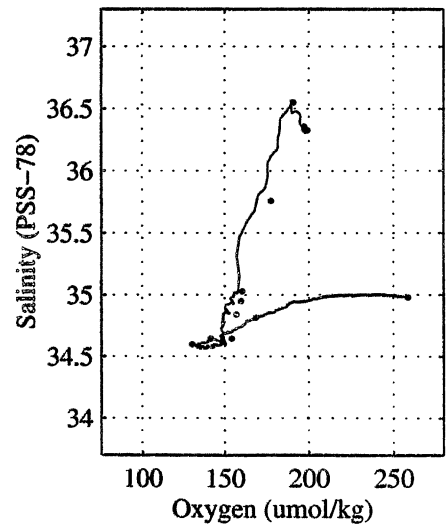
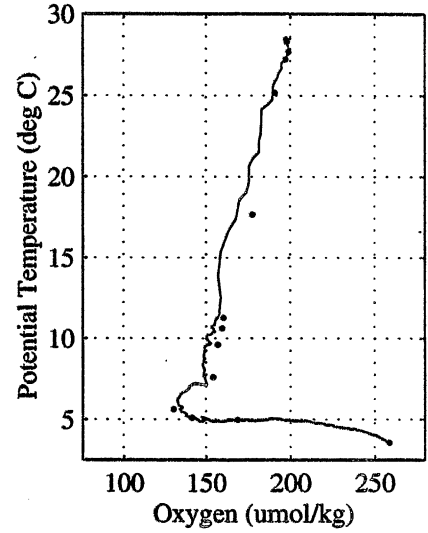
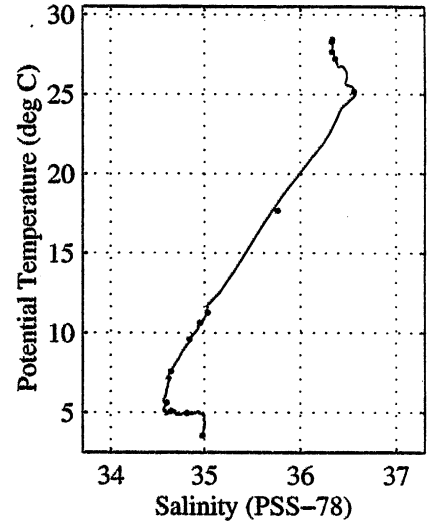
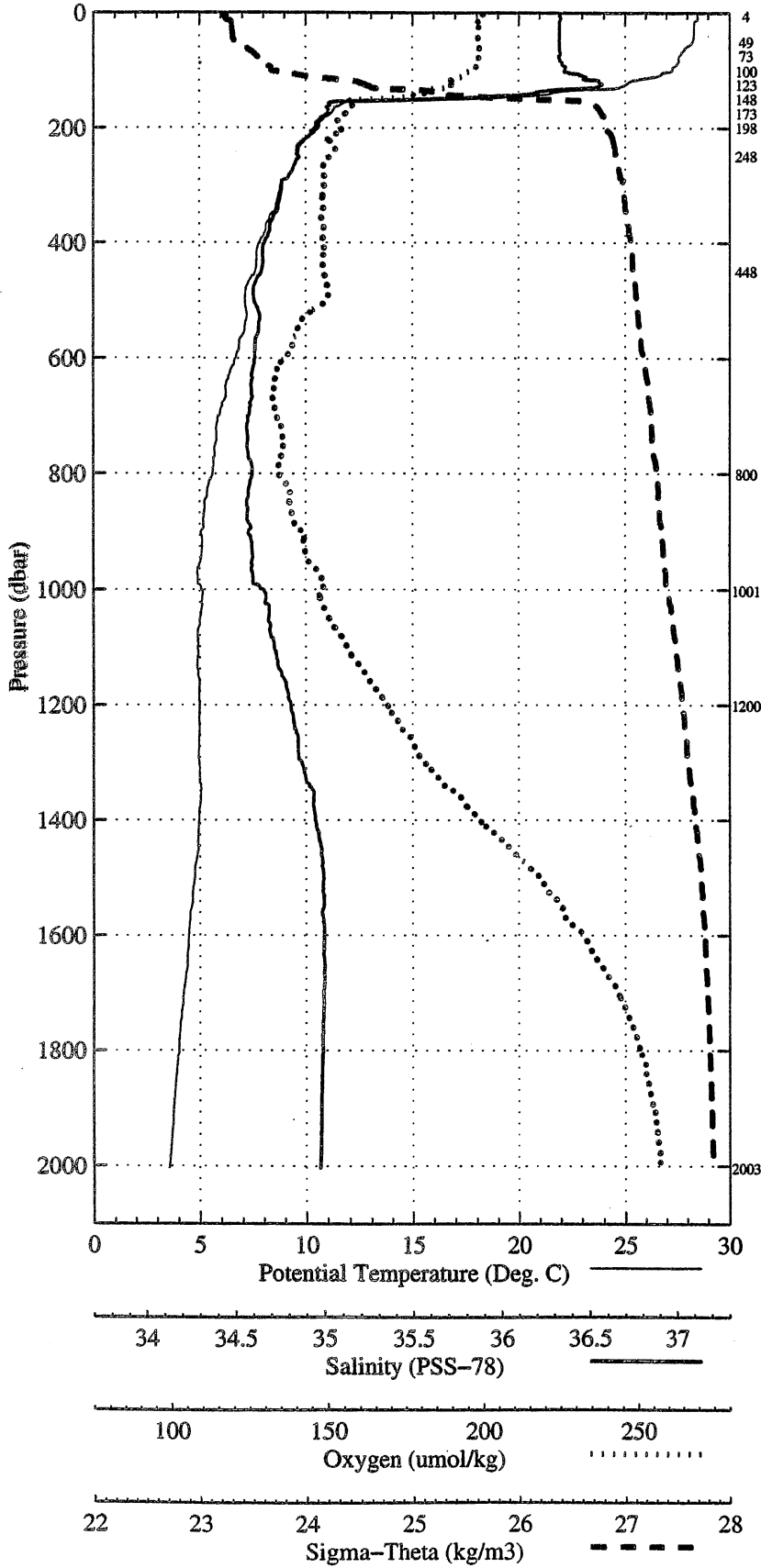
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2003	1	3.560	3.399	34.977	258.6
1200	2	4.965	4.863	34.815	168.8
1002	3	5.097	5.012	34.645	141.5
801	4	5.620	5.551	34.597	130.3
449	5	7.594	7.549	34.645	154.1
248	6	9.600	9.572	34.839	156.9
199	7	10.621	10.597	34.950	159.5
174	8	11.277	11.255	35.028	160.4
149	9	17.668	17.643	35.760	177.5
124	10	25.177	25.150	36.551	190.8
101	11	27.229	27.205	36.356	197.0
74	12	27.671	27.654	36.325	198.8
50	13	28.291	28.279	36.324	197.9
5	14	28.437	28.436	36.332	197.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 13 (98013)

Latitude 6.463 N Longitude 49.709 W

18-Nov-1998 21:29 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 14 (98014)  
 Latitude 5.772N Longitude 51.246W  
 19-Nov-1998 20:17Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	29.328	29.328	36.070	199.3	0.005	22.759
10	29.182	29.180	36.077	199.4	0.051	22.816
20	28.369	28.364	36.456	197.0	0.097	23.373
30	27.741	27.734	36.403	195.1	0.142	23.541
40	26.922	26.912	36.357	185.1	0.184	23.773
50	26.570	26.559	36.341	178.6	0.225	23.875
60	26.421	26.407	36.339	177.1	0.265	23.922
70	24.406	24.391	36.241	170.5	0.303	24.470
80	22.898	22.882	36.289	177.0	0.335	24.952
90	21.273	21.255	36.175	167.8	0.363	25.325
100	20.469	20.451	36.156	163.4	0.389	25.530
110	19.675	19.654	36.232	154.7	0.413	25.800
120	18.603	18.582	36.305	148.8	0.433	26.132
130	18.422	18.399	36.359	143.3	0.452	26.221
140	16.539	16.516	35.998	141.9	0.469	26.402
150	16.630	16.605	36.119	140.3	0.485	26.474
160	15.499	15.474	35.882	137.6	0.501	26.552
170	14.507	14.482	35.684	137.6	0.516	26.619
180	13.599	13.573	35.499	138.1	0.531	26.668
190	12.715	12.689	35.339	138.8	0.545	26.724
200	12.120	12.093	35.234	139.6	0.558	26.759
250	11.092	11.061	35.083	140.3	0.623	26.835
300	9.892	9.857	34.922	139.5	0.684	26.922
350	9.872	9.831	34.960	133.2	0.743	26.957
400	9.644	9.598	34.969	124.7	0.801	27.004
450	9.045	8.995	34.885	124.2	0.857	27.037
500	8.119	8.067	34.768	126.1	0.912	27.090
550	7.638	7.582	34.720	125.4	0.964	27.124
600	7.083	7.025	34.672	125.9	1.015	27.165
650	6.821	6.760	34.653	126.6	1.065	27.187
700	5.749	5.688	34.605	129.5	1.111	27.288
750	5.182	5.120	34.631	135.5	1.153	27.376

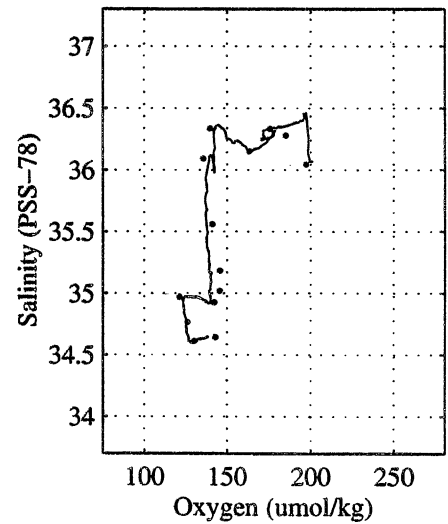
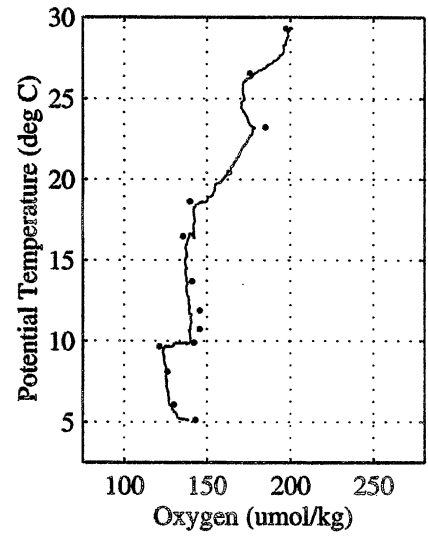
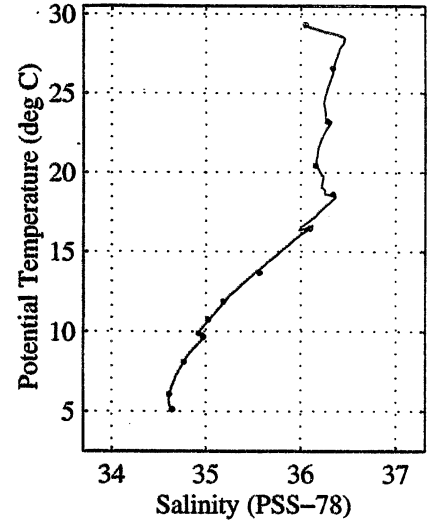
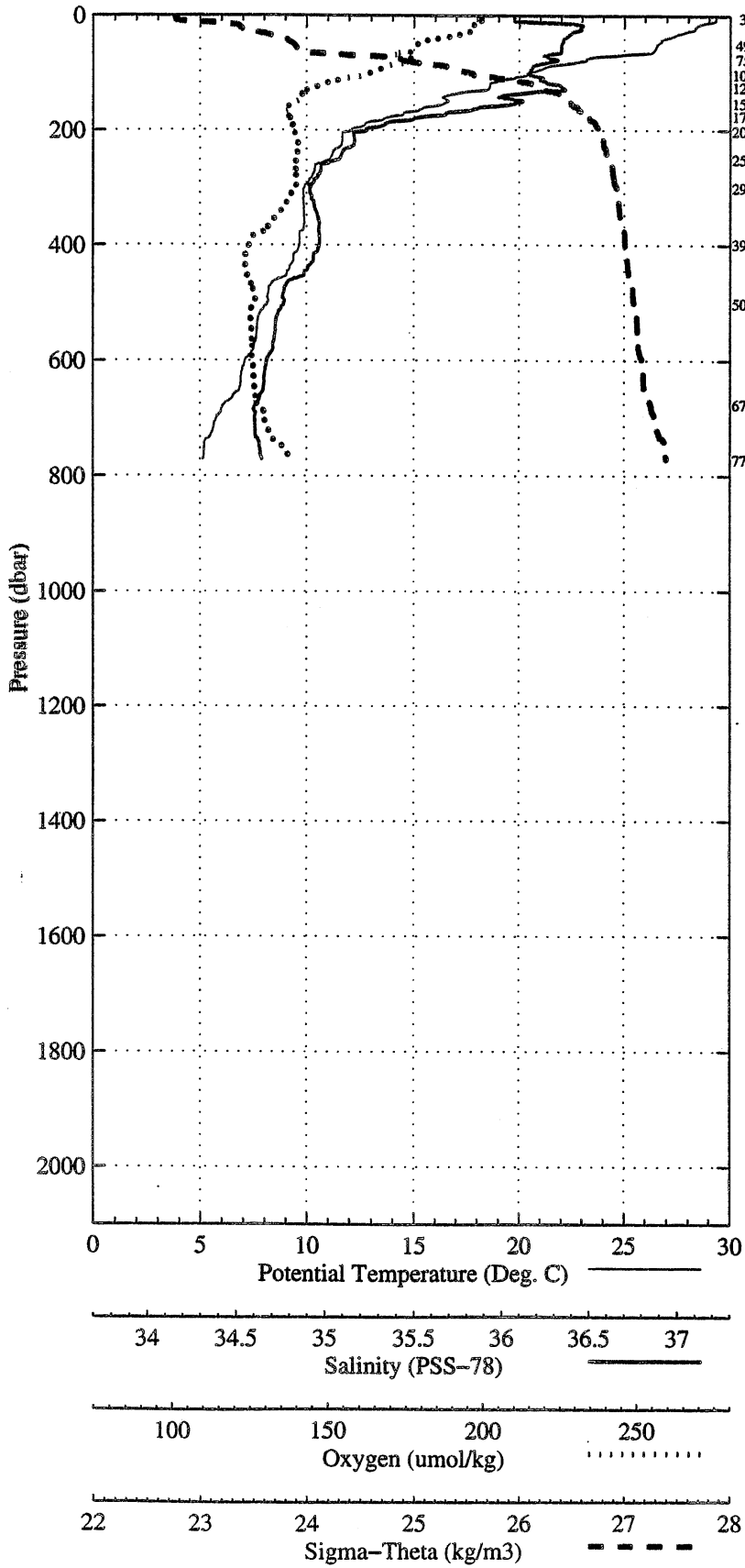
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
772	1	5.129	5.065	34.642	142.8
676	2	6.073	6.013	34.609	130.0
501	3	8.105	8.053	34.763	126.1
397	4	9.663	9.617	34.969	121.4
300	5	9.893	9.858	34.925	142.1
250	6	10.735	10.704	35.020	145.4
201	7	11.873	11.847	35.183	145.6
175	8	13.682	13.657	35.560	141.0
153	9	16.464	16.439	36.093	135.6
124	10	18.630	18.608	36.335	139.6
102	11	20.444	20.425	36.151	163.4
75	12	23.232	23.216	36.281	184.9
50	13	26.564	26.553	36.334	175.5
4	14	29.316	29.315	36.047	197.2

NBC-1 R/V SEWARD JOHNSON

CTD Station 14 (98014)

Latitude 5.772 N Longitude 51.246 W

19-Nov-1998 20:17 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 15 (98015)**  
**Latitude 5.747N Longitude 51.269W**  
**19-Nov-1998 22:43Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg-1	SigT kg/m3
1	29.181	29.181	35.872	222.3	0.005	22.661
10	29.180	29.178	35.923	215.9	0.052	22.701
20	28.547	28.542	36.467	191.9	0.099	23.323
30	28.013	28.006	36.430	191.9	0.144	23.473
40	27.447	27.438	36.383	189.6	0.188	23.624
50	26.800	26.789	36.347	182.6	0.230	23.806
60	26.442	26.428	36.337	178.0	0.270	23.914
70	25.605	25.589	36.294	172.6	0.310	24.145
80	23.209	23.192	36.277	176.7	0.344	24.853
90	22.322	22.304	36.233	173.5	0.374	25.076
100	20.454	20.435	36.139	164.5	0.401	25.521
110	20.080	20.060	36.178	161.2	0.425	25.652
120	19.150	19.129	36.227	151.7	0.447	25.933
130	17.888	17.866	36.187	145.7	0.467	26.221
140	17.538	17.514	36.170	143.8	0.485	26.295
150	16.369	16.345	35.965	142.4	0.502	26.417
160	16.243	16.217	36.007	140.3	0.518	26.479
170	14.683	14.657	35.708	136.5	0.534	26.599
180	13.868	13.842	35.559	138.8	0.548	26.659
190	13.562	13.535	35.501	139.2	0.562	26.678
200	13.248	13.220	35.446	139.6	0.576	26.700
250	12.716	12.682	35.352	140.2	0.646	26.736
300	11.396	11.358	35.128	140.6	0.714	26.817
350	10.056	10.015	34.954	137.5	0.775	26.921
400	9.547	9.501	34.946	128.0	0.835	27.002
450	8.950	8.900	34.875	122.8	0.891	27.044

Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
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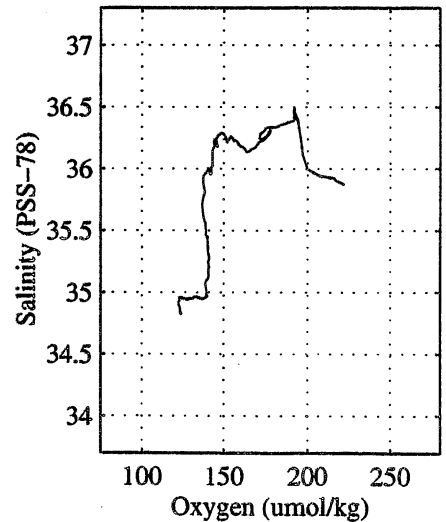
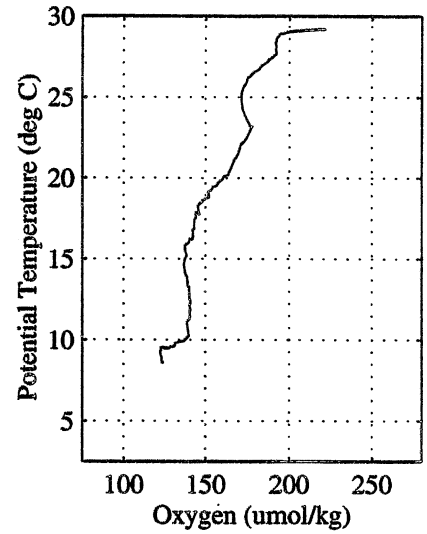
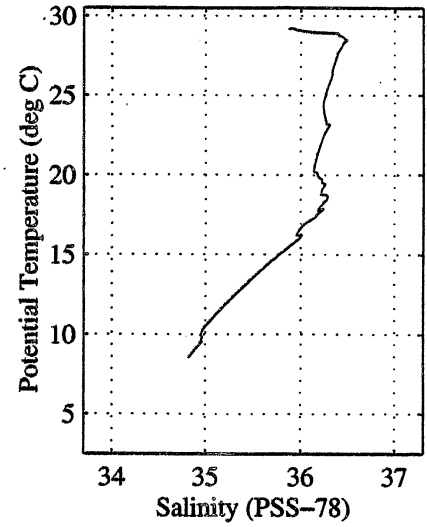
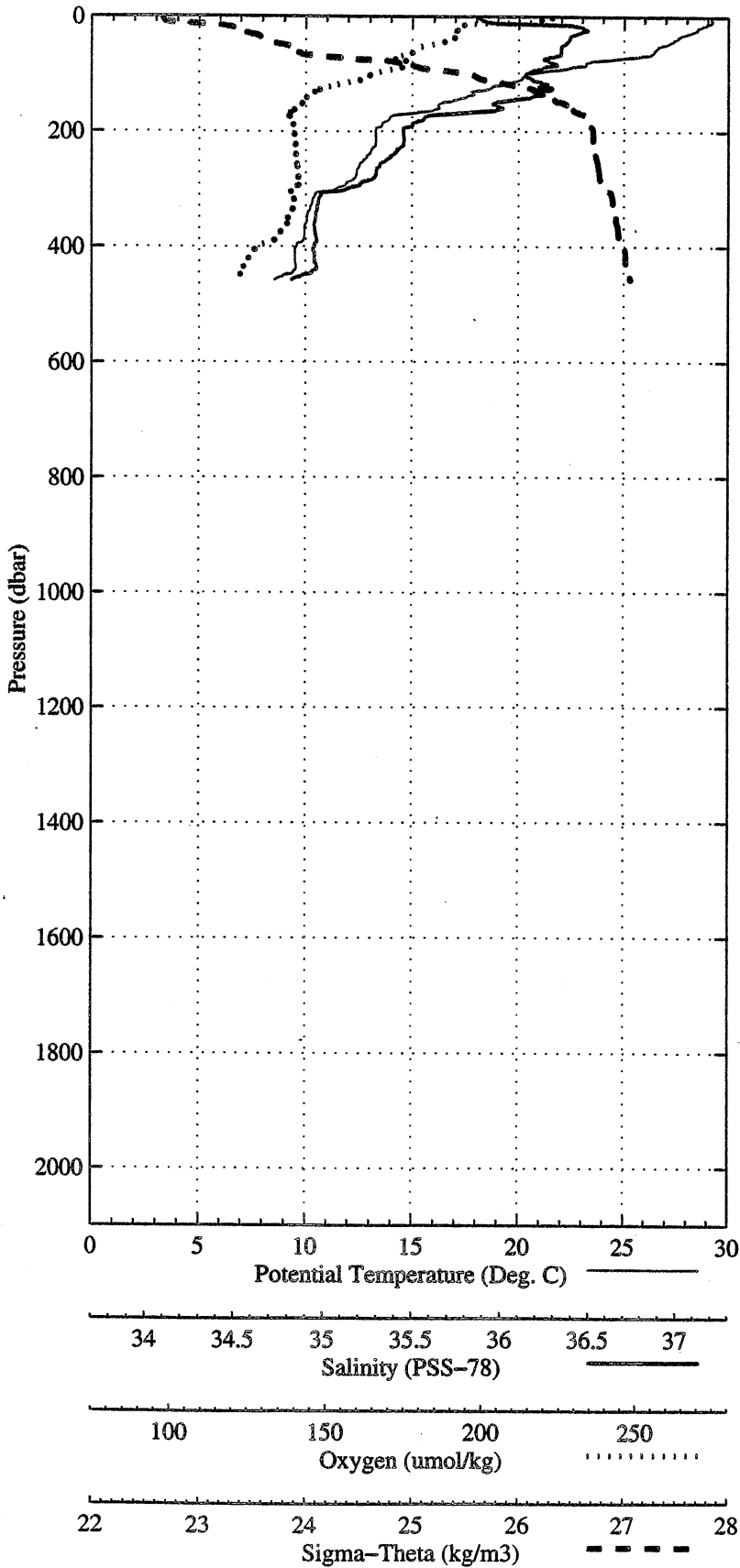
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NBC-1 R/V SEWARD JOHNSON

CTD Station 15 (98015)

Latitude 5.747 N Longitude 51.269 W

19-Nov-1998 22:43 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 16 (98016)**  
**Latitude 5.728N Longitude 51.325W**  
**19-Nov-1998 23:44Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	29.187	29.187	35.141	207.9	0.006	22.110
10	29.028	29.025	35.961	200.9	0.055	22.781
20	28.097	28.093	36.425	196.0	0.101	23.440
30	27.417	27.410	36.396	190.6	0.144	23.642
40	26.699	26.690	36.344	183.1	0.186	23.835
50	26.428	26.417	36.336	179.4	0.226	23.916
60	26.106	26.093	36.321	177.8	0.266	24.008
70	23.799	23.784	36.267	177.3	0.302	24.671
80	23.158	23.141	36.313	180.0	0.333	24.895
90	21.811	21.794	36.202	174.3	0.363	25.196
100	20.783	20.764	36.164	168.3	0.390	25.451
110	19.511	19.491	36.140	161.6	0.413	25.772

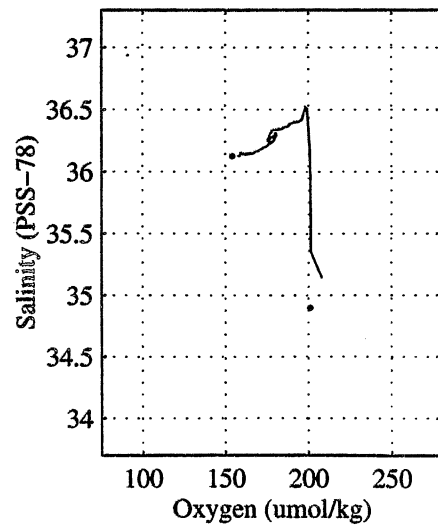
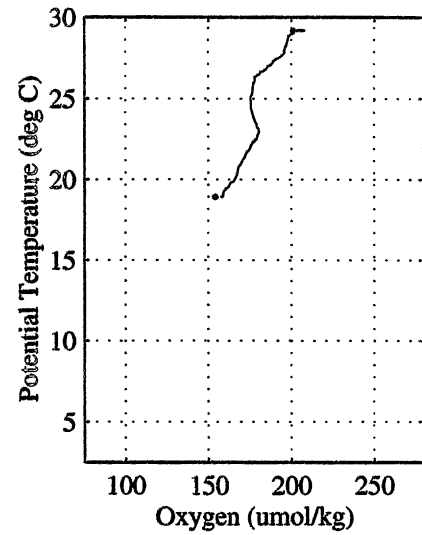
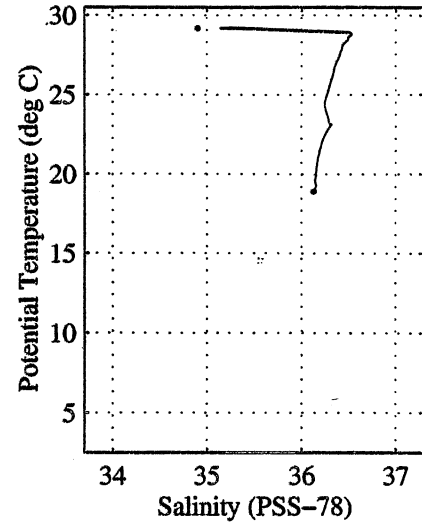
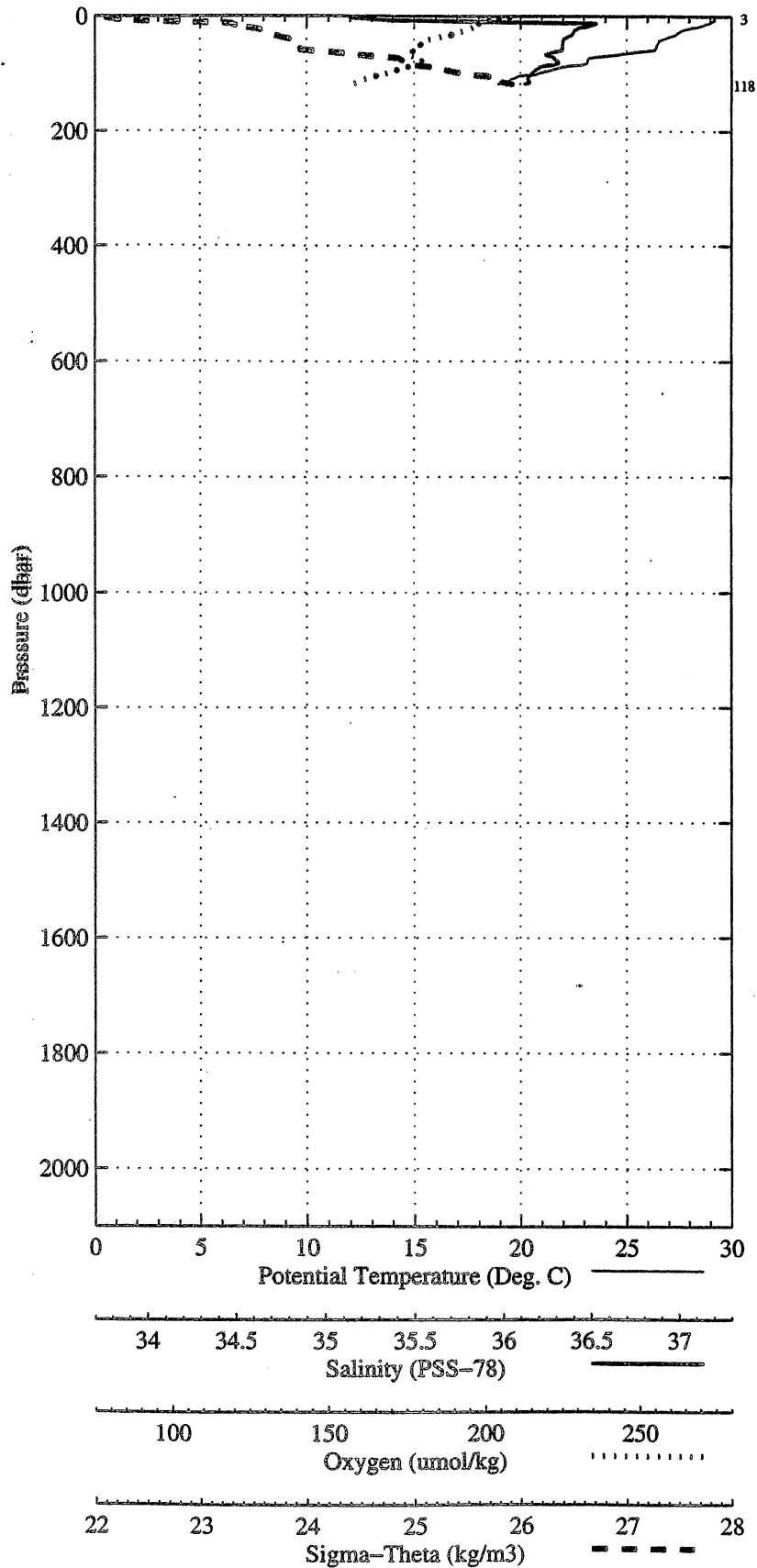
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
119	1	18.922	18.901	36.124	154.1
3	2	29.188	29.187	34.898	200.8

NBC-1 R/V SEWARD JOHNSON

CTD Station 16 (98016)

Latitude 5.728 N Longitude 51.325 W

19-Nov-1998 23:44 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 17 (98017)  
 Latitude 4.520N Longitude 49.688W  
 20-Nov-1998 14:33Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.212	28.212	36.338	195.4	0.005	23.334
10	28.181	28.178	36.338	197.2	0.045	23.345
20	28.131	28.126	36.335	197.6	0.091	23.361
30	27.851	27.844	36.334	197.7	0.135	23.454
40	27.751	27.741	36.336	198.2	0.180	23.490
50	27.562	27.550	36.341	198.1	0.224	23.557
60	27.364	27.350	36.350	197.7	0.267	23.629
70	27.273	27.257	36.349	197.1	0.309	23.659
80	26.656	26.638	36.344	193.6	0.352	23.854
90	25.864	25.844	36.451	190.9	0.390	24.186
100	24.375	24.354	36.331	188.8	0.427	24.552
110	20.325	20.304	36.043	177.5	0.455	25.483
120	16.777	16.757	35.647	173.2	0.478	26.074
130	16.413	16.392	35.907	160.4	0.496	26.360
140	12.810	12.791	35.240	157.1	0.512	26.625
150	11.515	11.496	35.068	157.2	0.525	26.741
160	11.361	11.341	35.053	156.3	0.539	26.759
170	11.290	11.268	35.043	155.1	0.552	26.765
180	11.260	11.237	35.041	153.8	0.565	26.769
190	11.249	11.226	35.041	152.5	0.578	26.771
200	11.230	11.205	35.038	151.9	0.591	26.773
250	10.992	10.961	35.007	150.8	0.657	26.794
300	10.513	10.477	34.953	150.4	0.722	26.839
350	10.062	10.021	34.900	150.3	0.786	26.878
400	9.700	9.654	34.858	151.0	0.847	26.908
450	9.348	9.298	34.826	151.0	0.909	26.942
500	8.369	8.316	34.731	148.5	0.967	27.023
550	8.051	7.994	34.703	148.7	1.023	27.050
600	7.306	7.247	34.675	137.4	1.077	27.137
650	6.631	6.570	34.621	136.4	1.127	27.187
700	6.545	6.480	34.640	132.8	1.175	27.215
750	5.368	5.305	34.543	139.5	1.221	27.285
800	5.177	5.110	34.571	143.4	1.264	27.330
900	4.888	4.814	34.634	151.6	1.345	27.415
1000	4.737	4.655	34.713	162.5	1.418	27.496
1500	4.474	4.348	35.002	242.6	1.696	27.764

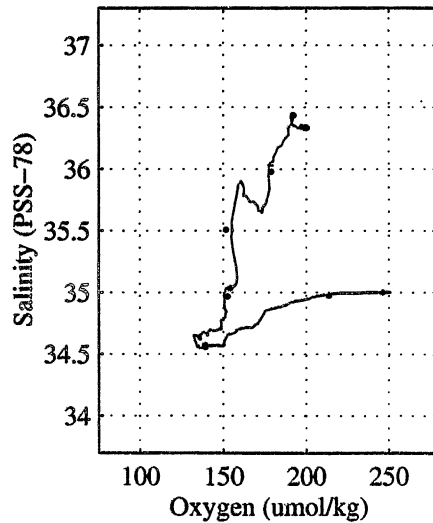
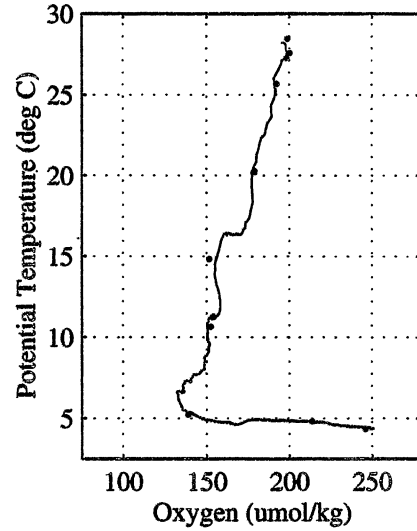
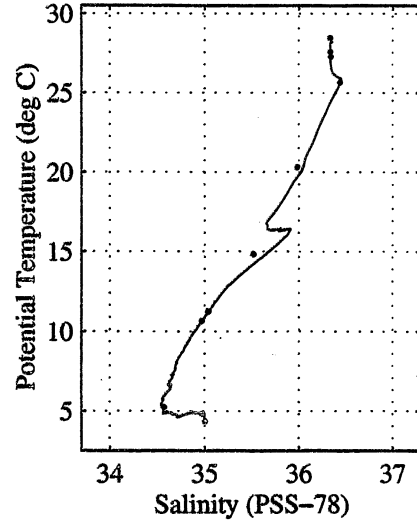
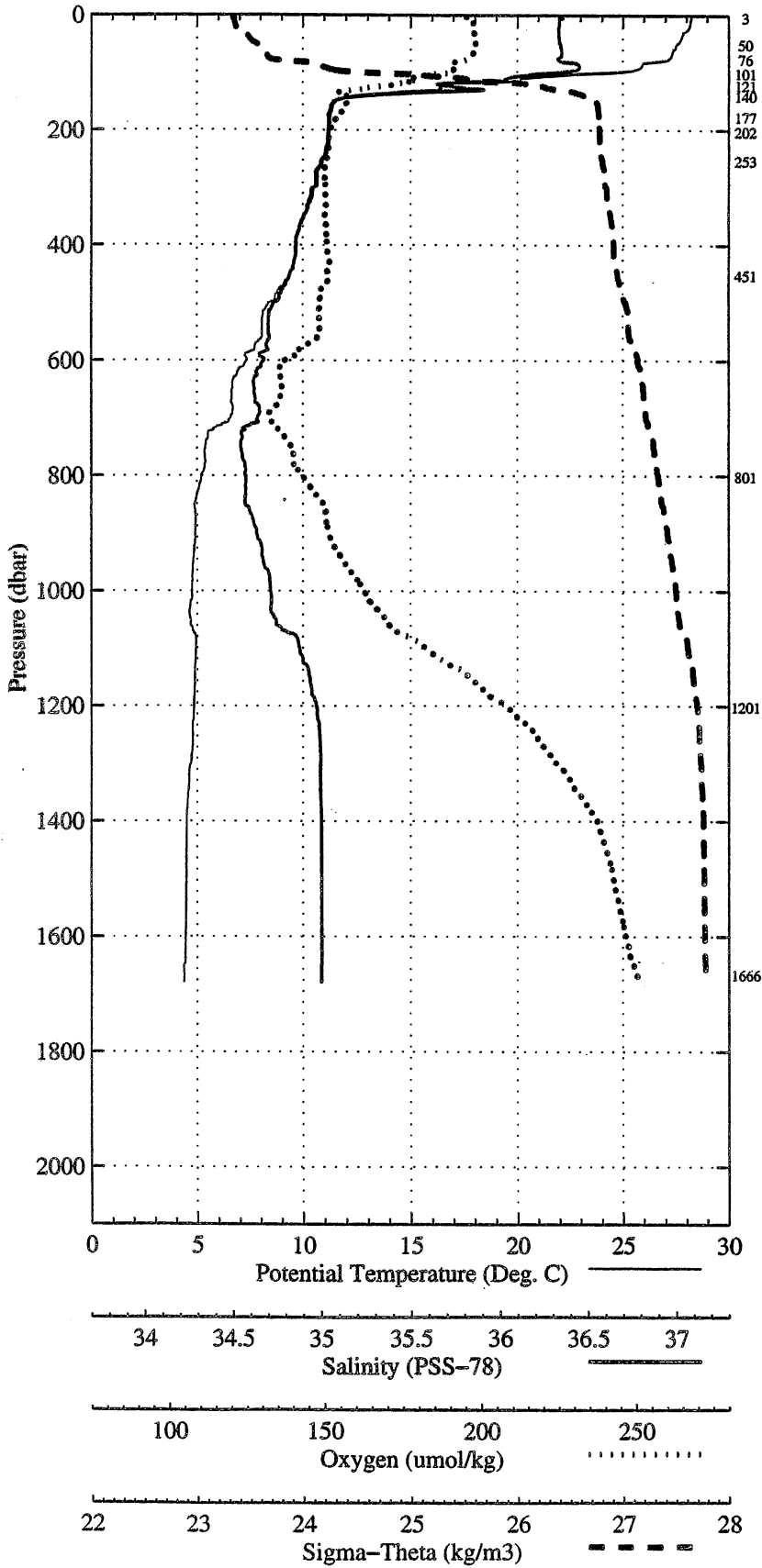
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1667	1	4.351	4.210	35.001	245.9
1201	2	4.826	4.724	34.975	213.6
801	3	5.231	5.163	34.575	139.0
452	4	8.982	NaN	NaN	NaN
253	5	10.663	10.633	34.968	152.3
203	6	11.239	11.213	35.032	153.8
177	7	11.280	11.257	35.036	153.9
140	8	14.834	14.813	35.510	151.3
122	9	20.307	20.284	35.980	178.4
101	10	25.676	25.653	36.435	192.1
76	11	27.285	27.267	36.339	198.1
51	12	27.590	27.579	36.334	200.1
4	13	28.459	28.458	36.334	198.7

NBC-1 R/V SEWARD JOHNSON

CTD Station 17 (98017)

Latitude 4.520 N Longitude 49.688 W

20-Nov-1998 14:33 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 18 (98018)  
 Latitude 5.500N Longitude 48.319W  
 21-Nov-1998 03:31Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.499	28.499	36.335	199.2	0.005	23.237
10	28.494	28.492	36.332	197.2	0.046	23.237
20	28.410	28.406	36.331	197.6	0.093	23.266
30	28.345	28.337	36.325	197.9	0.139	23.285
40	28.057	28.047	36.322	197.9	0.184	23.379
50	27.948	27.936	36.332	198.4	0.229	23.424
60	27.603	27.589	36.332	198.5	0.273	23.538
70	27.588	27.571	36.328	198.4	0.317	23.542
80	27.414	27.395	36.323	197.2	0.360	23.595
90	27.371	27.350	36.334	197.3	0.403	23.619
100	26.655	26.632	36.410	196.1	0.446	23.907
110	26.073	26.048	36.451	194.6	0.485	24.123
120	25.921	25.894	36.451	193.7	0.523	24.172
130	25.709	25.680	36.456	193.2	0.561	24.243
140	25.626	25.595	36.470	192.4	0.598	24.281
150	25.588	25.555	36.490	191.8	0.635	24.309
160	24.181	24.147	36.466	190.1	0.670	24.720
170	17.474	17.445	35.735	181.4	0.697	25.980
180	12.006	11.982	35.076	167.4	0.713	26.657
190	11.539	11.515	35.054	163.5	0.727	26.728
200	11.251	11.226	35.028	160.5	0.740	26.761
250	10.560	10.530	34.943	159.0	0.805	26.821
300	9.761	9.727	34.855	155.3	0.868	26.891
350	9.234	9.195	34.803	154.1	0.928	26.939
400	8.847	8.803	34.762	154.2	0.987	26.970
450	8.789	8.740	34.816	144.1	1.044	27.023
500	7.730	7.680	34.691	139.0	1.099	27.086
550	7.398	7.343	34.681	134.6	1.151	27.127
600	6.593	6.538	34.597	135.5	1.202	27.172
650	6.116	6.058	34.552	141.4	1.250	27.199
700	6.124	6.061	34.617	135.9	1.297	27.251
750	5.663	5.598	34.599	137.2	1.342	27.294
800	5.080	5.014	34.541	146.5	1.385	27.318
900	4.823	4.750	34.595	152.3	1.468	27.391
1000	4.670	4.589	34.635	160.4	1.544	27.441
1500	4.688	4.560	35.009	228.0	1.864	27.747
2000	3.412	3.253	34.971	262.2	2.097	27.853

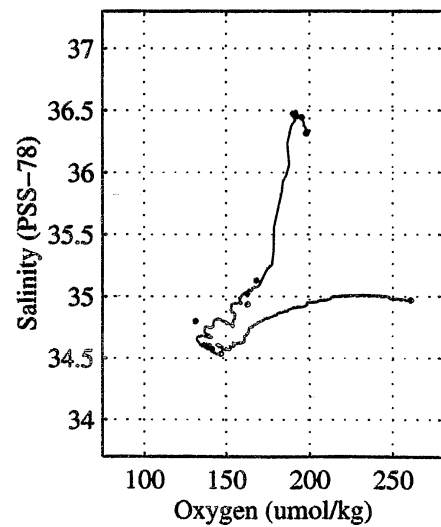
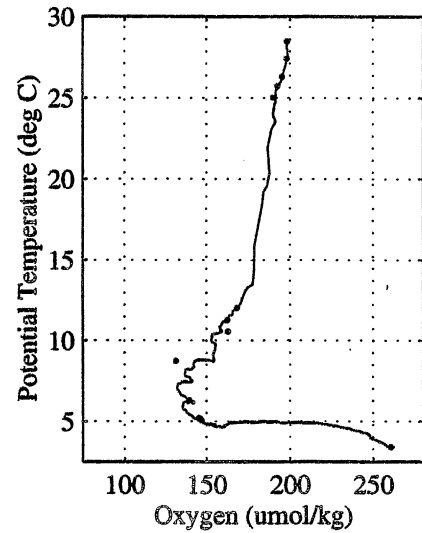
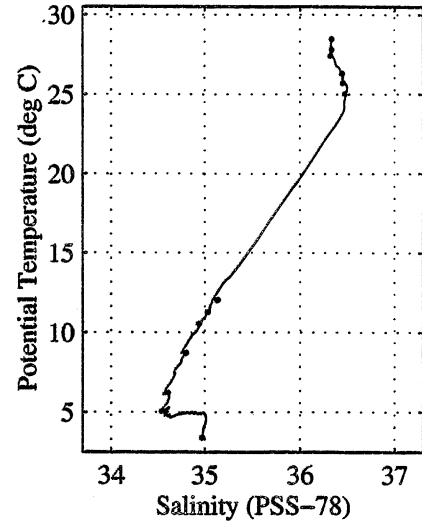
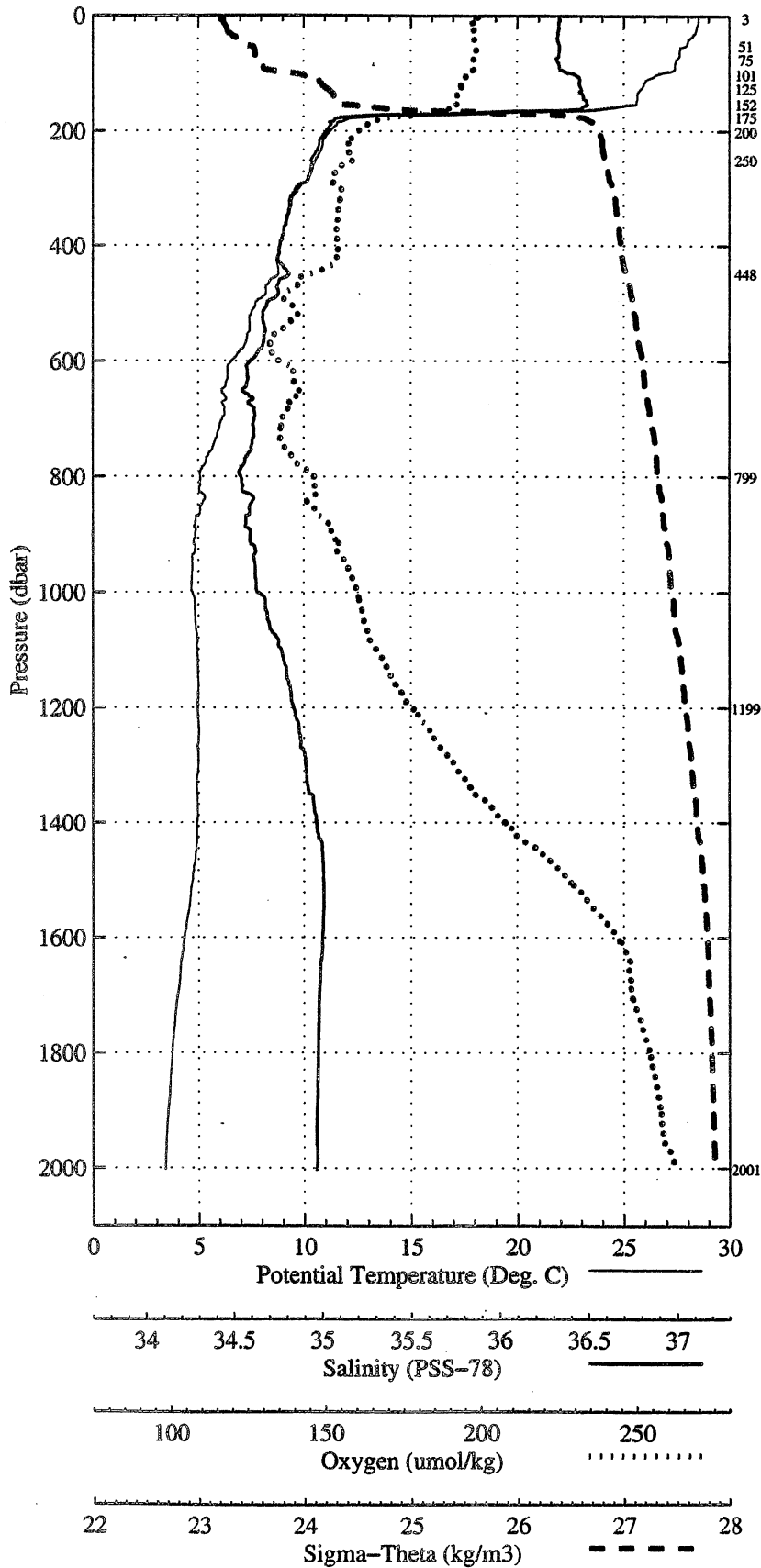
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2001	1	3.411	3.252	34.970	260.4
1200	2	4.936	NaN	NaN	NaN
800	3	5.062	4.996	34.535	146.8
448	4	8.728	8.680	34.800	131.2
250	5	10.554	10.524	34.937	162.6
201	6	11.288	11.262	35.026	162.3
175	7	12.037	12.014	35.128	168.0
153	8	25.025	24.992	36.474	190.1
126	9	25.718	25.690	36.453	192.3
102	10	26.285	26.263	36.444	195.0
75	11	27.423	27.405	36.316	197.8
51	12	27.797	27.785	36.330	NaN
4	13	28.469	28.468	36.328	198.1

NBC-1 R/V SEWARD JOHNSON

CTD Station 18 (98018)

Latitude 5.500 N Longitude 48.319 W

21-Nov-1998 03:31 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 19 (98019)**  
**Latitude 7.350N Longitude 47.660W**  
**21-Nov-1998 16:11Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.276	28.276	36.333	181.6	0.005	23.309
10	28.186	28.184	36.329	187.7	0.046	23.337
20	28.104	28.099	36.328	188.7	0.091	23.365
30	28.116	28.109	36.346	188.6	0.136	23.376
40	28.125	28.115	36.365	188.7	0.181	23.389
50	27.841	27.829	36.351	189.3	0.226	23.473
60	27.426	27.412	36.345	189.7	0.269	23.605
70	26.520	26.504	36.366	186.7	0.310	23.913
80	25.784	25.766	36.376	182.9	0.349	24.153
90	25.303	25.283	36.678	175.1	0.386	24.531
100	24.764	24.742	36.804	196.6	0.419	24.793
110	21.525	21.504	36.646	160.8	0.446	25.616
120	19.446	19.424	36.420	143.0	0.469	26.004
130	18.171	18.149	36.260	133.7	0.488	26.207
140	16.901	16.877	36.069	130.1	0.506	26.371
150	16.227	16.203	35.967	126.9	0.522	26.451
160	14.737	14.713	35.745	129.4	0.538	26.616
170	13.697	13.672	35.579	123.9	0.552	26.709
180	12.677	12.653	35.415	124.6	0.565	26.789
190	12.076	12.051	35.313	124.3	0.578	26.828
200	11.516	11.491	35.218	126.2	0.590	26.860
250	9.556	9.528	34.874	143.0	0.650	26.938
300	9.101	9.068	34.874	139.0	0.707	27.014
350	8.603	8.566	34.811	125.5	0.762	27.045
400	8.093	8.052	34.761	127.0	0.815	27.085
450	7.592	7.548	34.708	122.1	0.867	27.118
500	7.205	7.157	34.679	119.6	0.917	27.151
550	6.824	6.772	34.668	119.4	0.966	27.196
600	6.391	6.336	34.632	123.8	1.014	27.226
650	6.062	6.004	34.619	126.0	1.060	27.259
700	5.735	5.674	34.606	128.5	1.104	27.290
750	5.356	5.293	34.588	135.0	1.147	27.322
800	5.043	4.977	34.577	138.6	1.189	27.350
900	4.922	4.848	34.623	144.7	1.269	27.402
1000	5.044	4.960	34.736	150.3	1.344	27.480
1500	4.704	4.576	35.005	230.9	1.657	27.742
2000	3.554	3.393	34.976	258.9	1.896	27.844

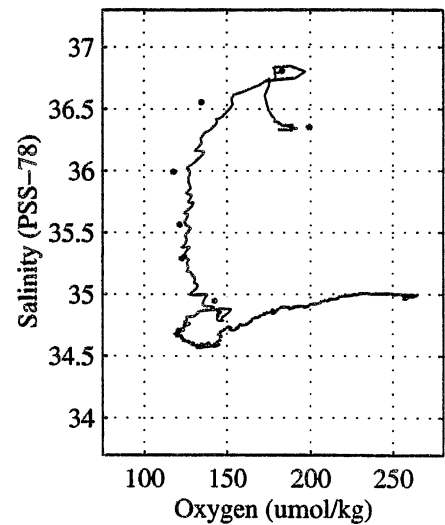
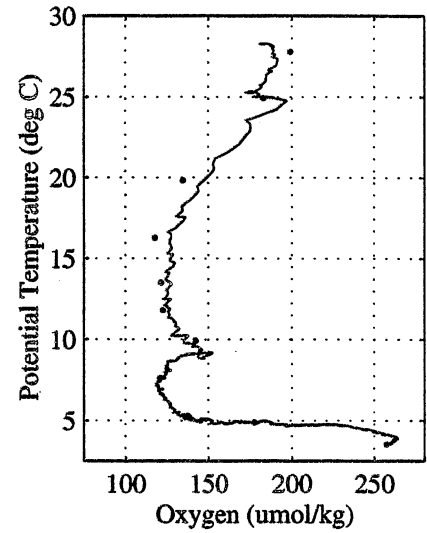
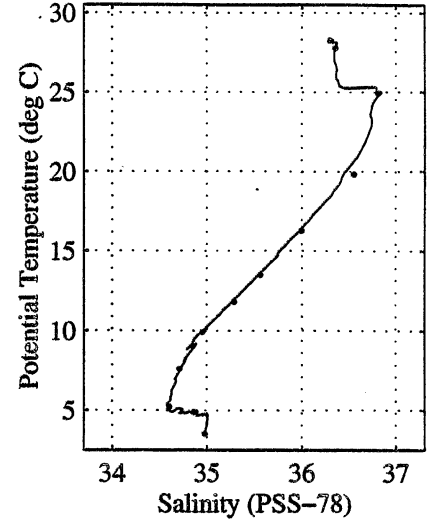
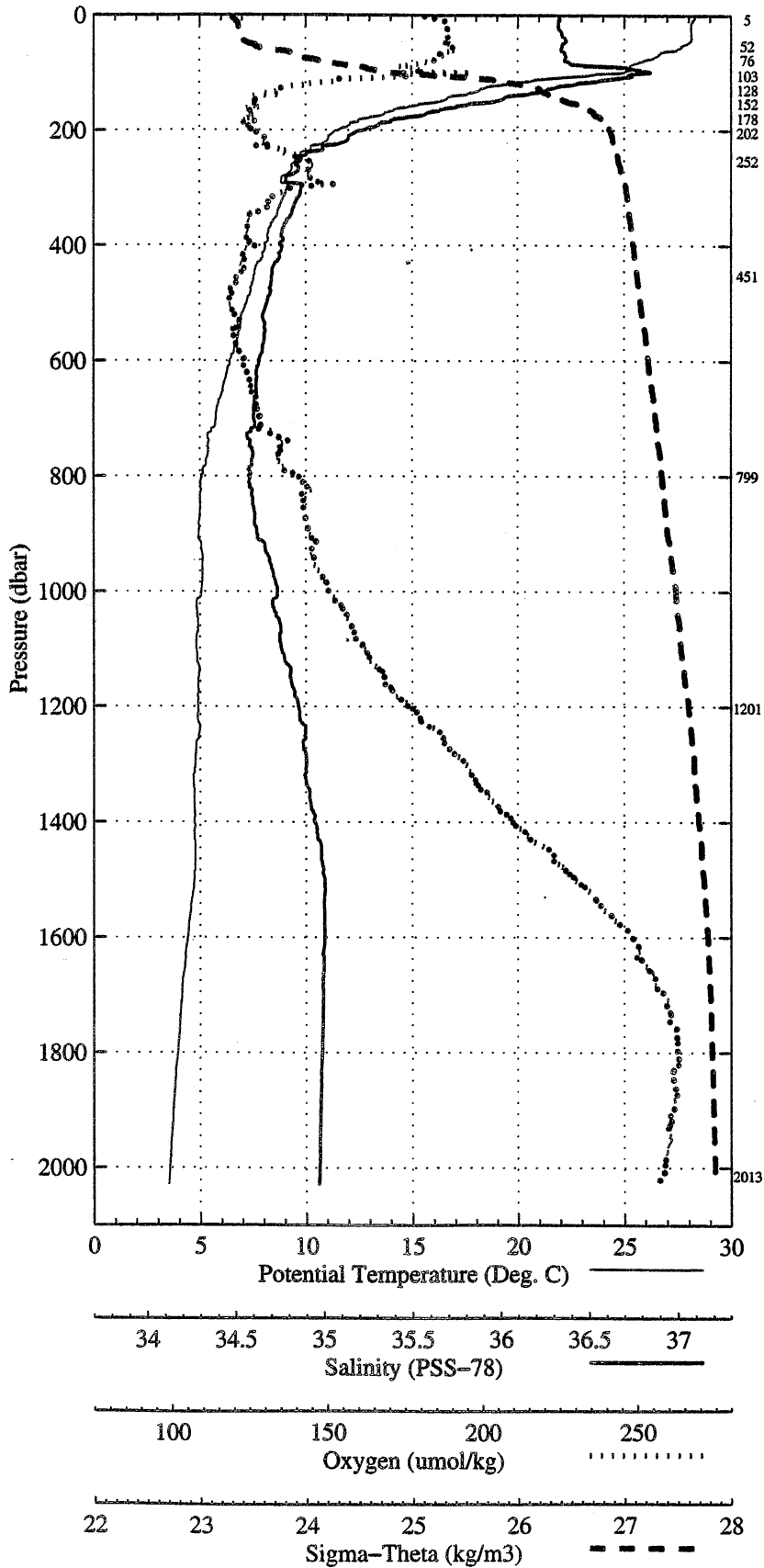
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2013	1	3.529	3.367	34.973	257.4
1201	2	4.891	4.789	34.859	177.9
800	3	5.216	5.150	34.596	138.0
451	4	7.610	7.565	34.704	120.5
252	5	9.928	9.899	34.947	142.0
203	6	11.816	11.789	35.291	122.2
179	7	13.503	13.478	35.566	121.1
152	8	16.278	16.253	35.993	117.3
129	9	19.838	19.814	36.557	134.2
104	10	24.914	24.891	36.810	183.3
76	11	26.526	NaN	NaN	NaN
52	12	27.783	27.771	36.355	199.0
6	13	28.260	28.259	36.297	NaN

NBC-1 R/V SEWARD JOHNSON

CTD Station 19 (98019)

Latitude 7.350 N Longitude 47.660 W

21-Nov-1998 16:11 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 20 (98020)  
 Latitude 7.205N Longitude 45.754W  
 22-Nov-1998 04:43Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.235	28.235	35.575	208.9	0.005	22.752
10	28.241	28.238	35.580	189.2	0.051	22.755
20	28.249	28.244	35.580	189.8	0.102	22.755
30	28.254	28.247	35.622	189.6	0.153	22.786
40	27.522	27.512	36.211	190.1	0.200	23.470
50	26.056	26.045	36.380	183.9	0.241	24.067
60	23.566	23.554	36.352	169.5	0.276	24.803
70	22.540	22.526	36.429	154.0	0.306	25.160
80	21.541	21.525	36.438	145.2	0.332	25.450
90	18.106	18.090	36.076	133.1	0.354	26.079
100	16.902	16.885	35.929	136.3	0.373	26.260
110	14.406	14.390	35.611	132.1	0.388	26.581
120	13.094	13.077	35.398	132.1	0.402	26.690
130	11.630	11.613	35.159	133.3	0.416	26.790
140	10.870	10.853	35.016	138.9	0.428	26.818
150	10.626	10.608	34.982	141.9	0.441	26.836
160	10.526	10.507	34.975	143.0	0.453	26.848
170	10.398	10.378	34.959	144.9	0.466	26.858
180	10.296	10.275	34.946	142.8	0.478	26.867
190	10.159	10.137	34.928	145.2	0.490	26.877
200	10.094	10.070	34.923	145.5	0.502	26.884
250	9.576	9.547	34.865	145.4	0.562	26.928
300	9.116	9.083	34.819	147.1	0.620	26.969
350	8.494	8.457	34.769	141.2	0.676	27.029
400	8.085	8.043	34.740	132.3	0.730	27.069
450	7.603	7.558	34.701	126.6	0.782	27.111
500	6.904	6.857	34.625	132.9	0.833	27.150
550	6.629	6.578	34.638	128.7	0.882	27.198
600	6.471	6.416	34.656	133.4	0.929	27.234
650	6.079	6.021	34.635	126.3	0.974	27.269
700	5.727	5.666	34.621	128.9	1.018	27.303
750	5.499	5.435	34.628	130.6	1.061	27.337
800	5.257	5.190	34.644	134.8	1.102	27.379
900	5.037	4.962	34.716	146.2	1.178	27.464
1000	5.009	4.925	34.802	161.3	1.248	27.537
1500	4.188	4.066	34.996	252.0	1.523	27.789
2000	3.454	3.294	34.973	260.7	1.747	27.851

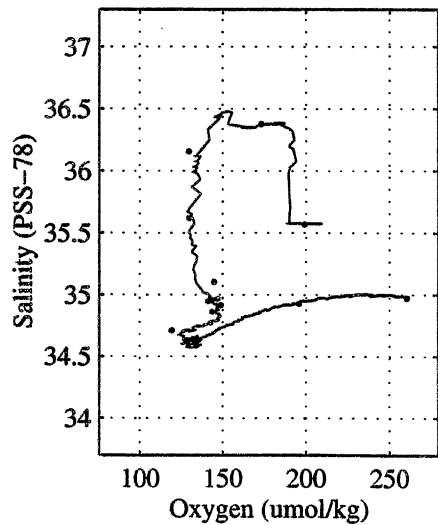
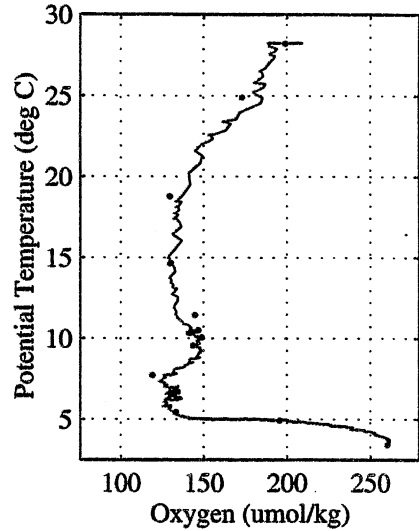
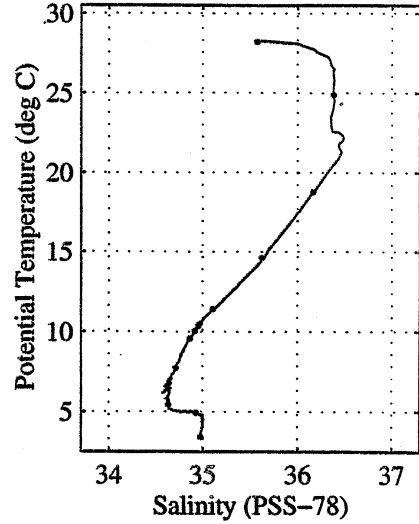
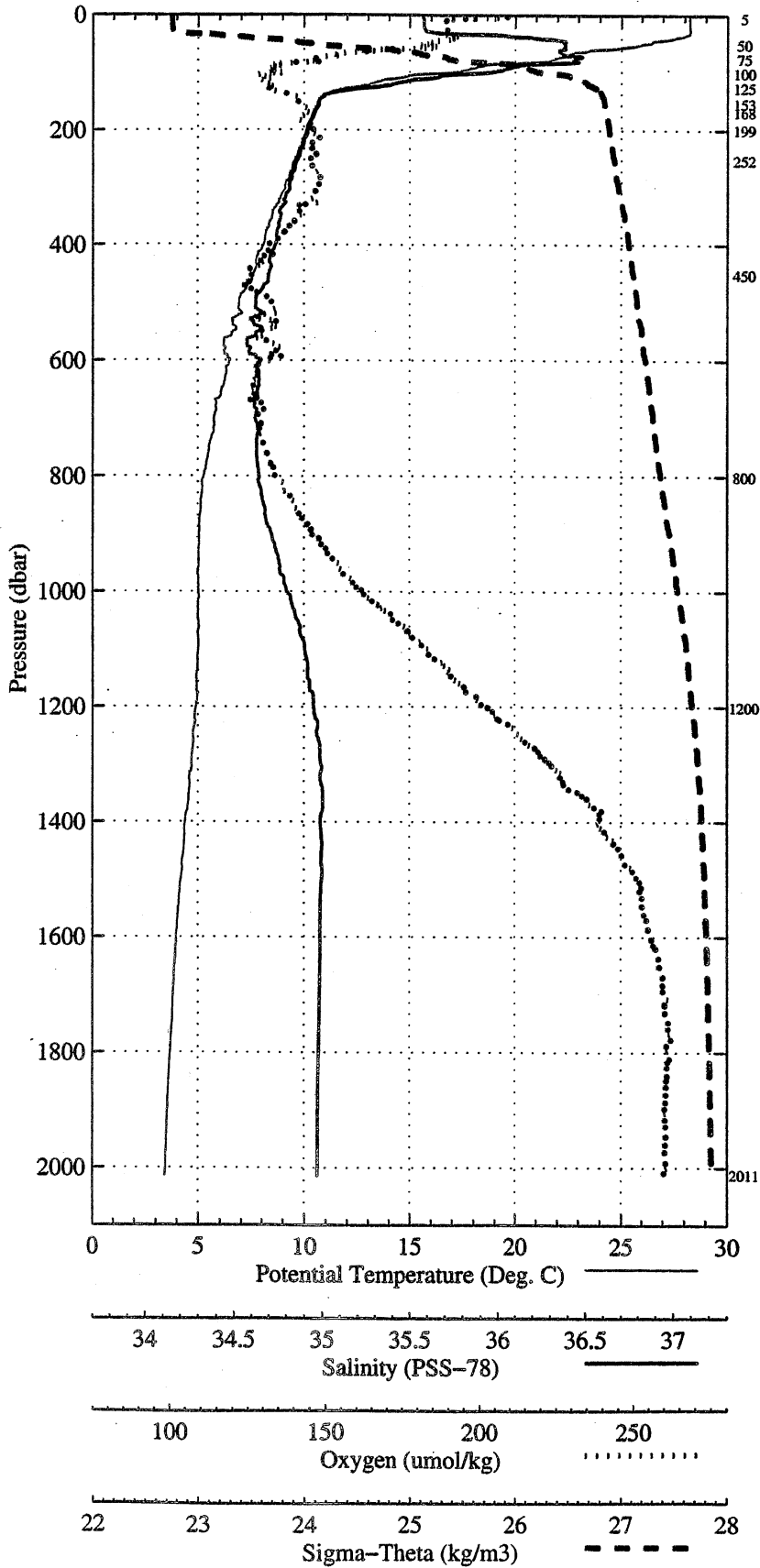
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2012	1	3.428	3.267	34.972	260.5
1200	2	4.926	4.825	34.928	195.4
800	3	5.441	5.373	34.630	133.1
451	4	7.733	7.687	34.711	119.1
252	5	9.567	9.539	34.862	143.5
199	6	10.065	10.041	34.914	148.7
168	7	10.342	10.322	34.950	141.1
154	8	10.496	10.478	34.967	146.8
126	9	11.433	11.417	35.105	144.6
101	10	14.628	14.613	35.620	129.6
76	11	18.781	18.767	36.156	129.3
51	12	24.893	24.882	36.379	173.1
5	13	28.209	28.208	35.571	199.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 20 (98020)

Latitude 7.205 N Longitude 45.754 W

22-Nov-1998 04:43 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 21 (98021)**  
**Latitude 6.766N Longitude 45.743W**  
**22-Nov-1998 10:30Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.067	28.067	35.805	212.7	0.005	22.980
10	28.095	28.093	35.802	190.8	0.049	22.970
20	28.099	28.094	35.805	190.7	0.098	22.973
30	27.979	27.971	35.935	190.5	0.146	23.112
40	26.593	26.584	36.327	183.1	0.190	23.855
50	25.721	25.710	36.363	179.7	0.229	24.158
60	22.846	22.834	36.353	159.9	0.263	25.014
70	21.897	21.883	36.397	149.3	0.291	25.318
80	20.433	20.418	36.331	145.3	0.317	25.671
90	18.353	18.337	36.182	131.0	0.338	26.099
100	16.971	16.955	35.976	131.0	0.356	26.280
110	14.611	14.595	35.612	129.6	0.372	26.537
120	13.137	13.120	35.394	128.6	0.387	26.678
130	11.953	11.936	35.208	134.9	0.400	26.767
140	11.050	11.033	35.039	137.3	0.413	26.804
150	10.832	10.814	35.012	141.2	0.426	26.822
160	10.568	10.549	34.981	145.1	0.438	26.846
170	10.404	10.383	34.958	144.1	0.451	26.857
180	10.303	10.282	34.946	145.1	0.463	26.866
190	10.213	10.191	34.938	143.0	0.475	26.875
200	10.126	10.103	34.928	144.0	0.487	26.882
250	9.558	9.530	34.884	142.8	0.547	26.946
300	8.992	8.959	34.830	143.3	0.603	26.997
350	8.686	8.648	34.829	139.1	0.658	27.046
400	8.014	7.973	34.752	128.9	0.712	27.089
450	7.765	7.720	34.749	124.0	0.763	27.125
500	7.493	7.444	34.757	120.1	0.813	27.172
550	6.423	6.373	34.598	130.0	0.862	27.194
600	5.966	5.914	34.566	131.7	0.909	27.227
650	5.480	5.425	34.535	141.1	0.954	27.264
700	5.533	5.473	34.603	133.6	0.997	27.312
750	5.389	5.326	34.624	135.2	1.039	27.346
800	5.198	5.131	34.642	138.2	1.080	27.384
900	5.064	4.989	34.706	146.6	1.156	27.452
1000	5.003	4.919	34.801	161.5	1.227	27.536
1500	4.348	4.224	34.999	246.7	1.509	27.775
2000	3.439	3.280	34.972	261.9	1.737	27.851

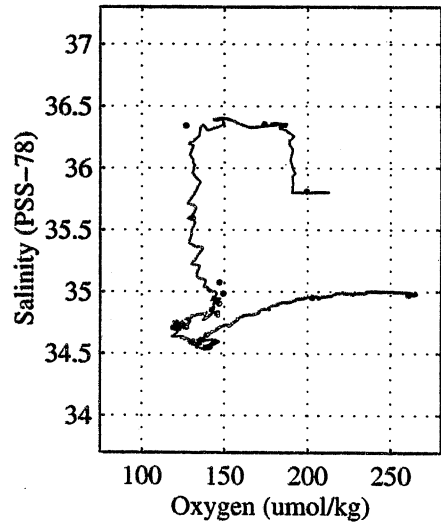
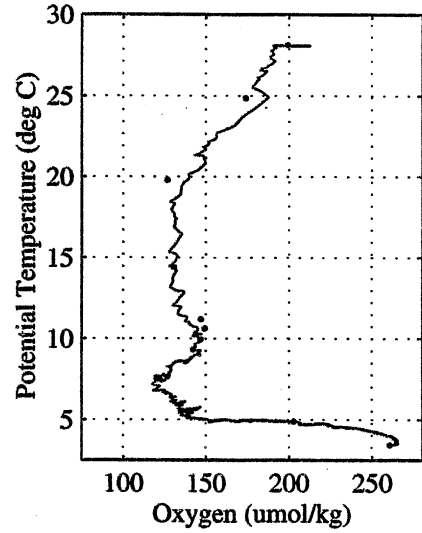
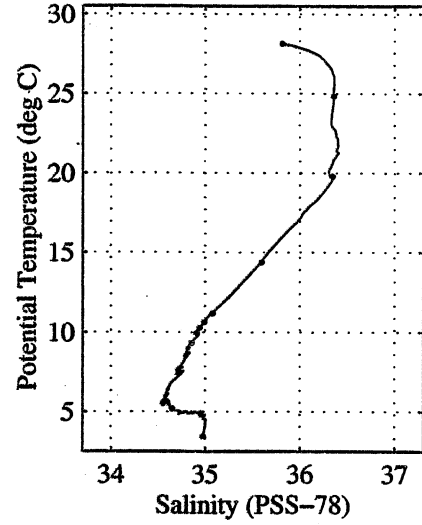
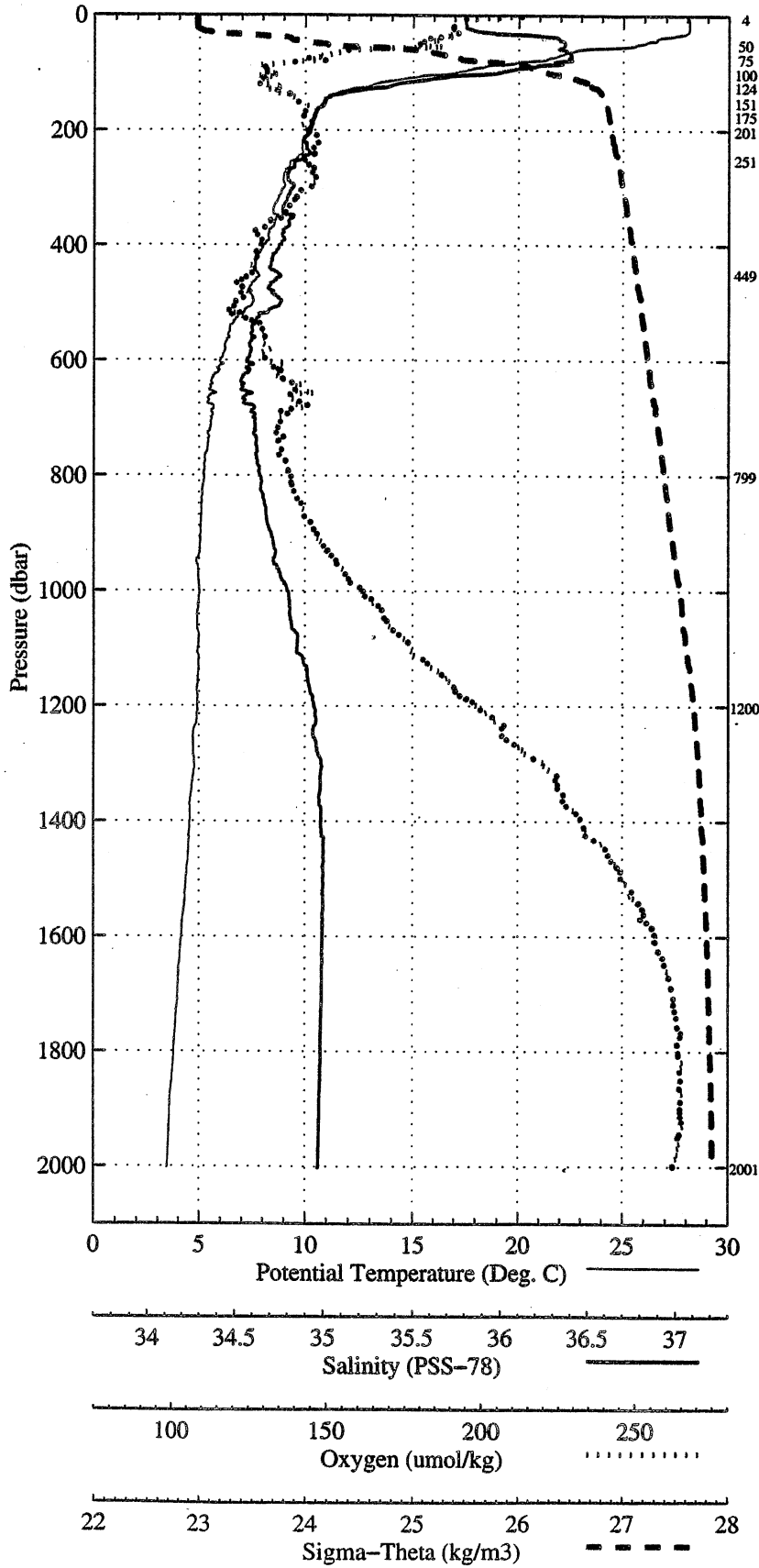
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2001	1	3.438	3.279	34.973	260.6
1201	2	4.904	4.802	34.953	202.6
800	3	5.189	5.122	34.647	139.2
450	4	7.598	7.554	34.715	120.3
251	5	9.328	9.300	34.855	142.1
201	6	9.953	9.930	34.905	146.6
175	7	10.278	10.258	34.940	143.9
151	8	10.624	10.606	34.986	149.2
124	9	11.192	11.176	35.075	146.9
101	10	14.399	14.384	35.595	130.6
75	11	19.796	19.782	36.344	126.6
51	12	24.843	24.833	36.357	173.8
5	13	28.127	28.126	35.812	199.2

NBC-1 R/V SEWARD JOHNSON

CTD Station 21 (98021)

Latitude 6.766 N Longitude 45.743 W

22-Nov-1998 10:30 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 22 (98022)  
 Latitude 6.001N Longitude 46.000W  
 22-Nov-1998 16:17Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.299	28.299	35.963	162.2	0.005	23.023
10	28.293	28.290	35.962	183.9	0.048	23.026
20	28.266	28.261	35.967	185.1	0.097	23.040
30	28.093	28.086	36.047	186.8	0.145	23.159
40	25.603	25.595	36.366	176.2	0.186	24.195
50	24.538	24.527	36.714	176.5	0.220	24.786
60	21.500	21.489	36.438	160.5	0.249	25.459
70	17.364	17.352	35.998	134.6	0.270	26.199
80	15.102	15.090	35.666	134.5	0.287	26.469
90	13.291	13.278	35.392	136.0	0.302	26.644
100	12.508	12.495	35.270	141.6	0.316	26.706
110	11.911	11.896	35.170	145.6	0.329	26.745
120	11.462	11.446	35.095	147.1	0.342	26.771
130	11.236	11.220	35.062	148.1	0.355	26.787
140	11.194	11.177	35.061	148.9	0.368	26.794
150	11.019	11.000	35.035	149.4	0.381	26.806
160	10.820	10.800	35.007	149.6	0.393	26.821
170	10.580	10.559	34.971	149.9	0.406	26.836
180	10.530	10.508	34.965	151.1	0.418	26.840
190	10.309	10.286	34.941	151.3	0.431	26.860
200	10.217	10.194	34.931	151.0	0.443	26.869
250	9.681	9.652	34.875	149.4	0.503	26.918
300	9.163	9.130	34.840	139.4	0.562	26.978
350	8.528	8.491	34.765	139.1	0.618	27.021
400	7.888	7.848	34.717	131.8	0.671	27.080
450	7.532	7.487	34.699	124.8	0.723	27.120
500	7.088	7.040	34.663	123.5	0.774	27.154
550	6.653	6.602	34.651	119.7	0.822	27.205
600	5.999	5.946	34.575	125.3	0.869	27.231
650	5.643	5.587	34.563	132.6	0.914	27.265
700	5.306	5.247	34.559	133.3	0.958	27.304
750	5.297	5.234	34.585	135.2	1.000	27.326
800	4.969	4.904	34.584	138.4	1.041	27.364
900	4.809	4.736	34.635	146.7	1.119	27.425
1000	4.982	4.899	34.769	156.5	1.192	27.514
1500	4.412	4.287	34.998	242.2	1.475	27.767
2000	3.473	3.313	34.974	260.2	1.708	27.850

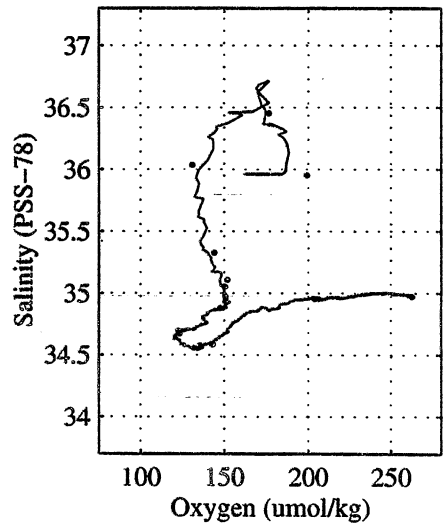
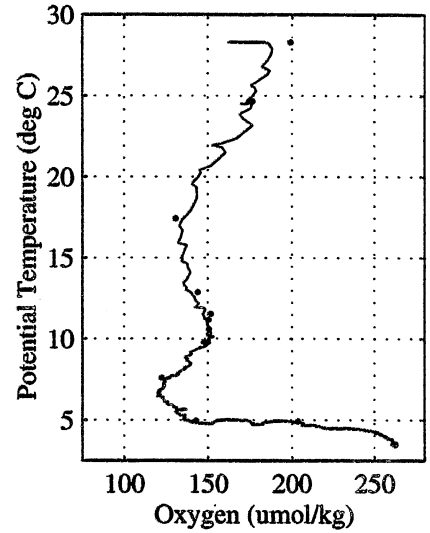
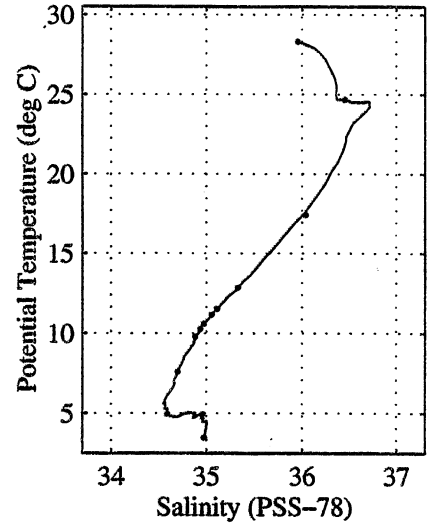
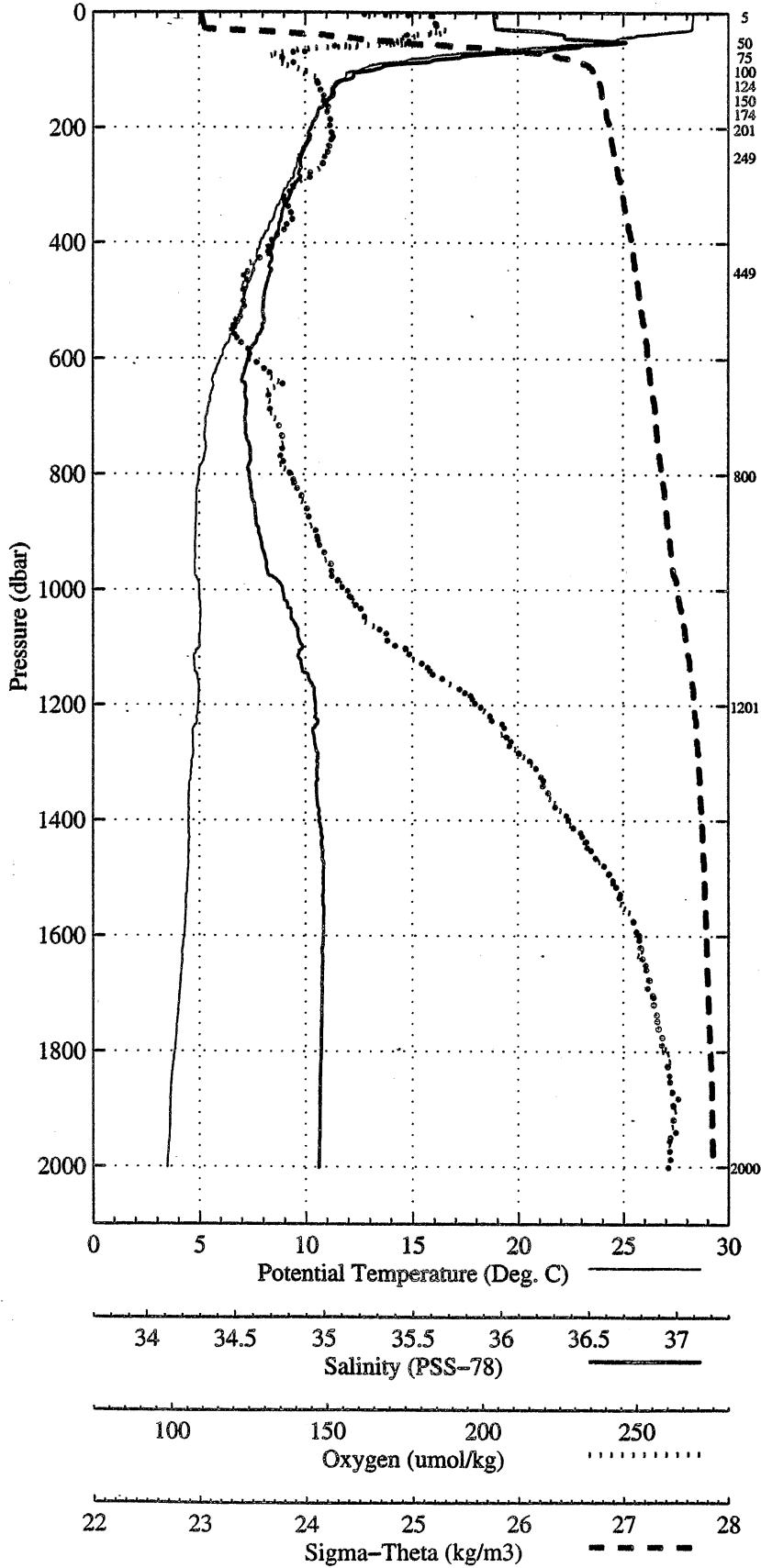
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2001	1	3.473	3.313	34.973	262.3
1201	2	4.926	4.824	34.955	203.7
801	3	4.952	4.887	34.585	142.9
449	4	7.593	7.548	34.695	122.3
250	5	9.799	9.770	34.880	147.5
201	6	10.272	10.248	34.933	150.5
174	7	10.600	10.579	34.969	150.5
150	8	11.173	11.155	35.052	150.2
125	9	11.536	11.520	35.107	151.6
100	10	12.873	12.860	35.326	143.8
75	11	17.433	17.420	36.035	130.7
50	12	24.681	24.670	36.455	176.4
5	13	28.307	28.306	35.952	199.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 22 (98022)

Latitude 6.001 N Longitude 46.000 W

22-Nov-1998 16:17 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 23 (98023)  
 Latitude 5.261N Longitude 46.310W  
 22-Nov-1998 21:39Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.499	28.499	35.218	199.8	0.005	22.397
10	28.503	28.501	35.218	188.8	0.054	22.397
20	28.509	28.504	35.230	189.0	0.109	22.406
30	28.145	28.138	36.189	191.9	0.160	23.249
40	26.617	26.608	36.455	187.2	0.202	23.944
50	25.129	25.118	36.544	176.0	0.239	24.478
60	24.211	24.198	36.571	169.5	0.272	24.778
70	22.253	22.239	36.611	158.3	0.301	25.380
80	18.436	18.422	36.008	147.8	0.324	25.944
90	16.174	16.159	35.766	145.4	0.342	26.305
100	15.060	15.045	35.638	143.3	0.359	26.459
110	12.720	12.705	35.267	141.8	0.374	26.663
120	11.810	11.795	35.130	146.6	0.387	26.733
130	11.487	11.471	35.087	148.7	0.400	26.760
140	11.288	11.270	35.060	148.3	0.413	26.776
150	11.104	11.085	35.034	149.4	0.426	26.790
160	10.944	10.925	35.013	150.6	0.439	26.803
170	10.873	10.853	35.002	151.6	0.452	26.808
180	10.758	10.736	34.989	152.7	0.465	26.819
190	10.596	10.573	34.970	151.9	0.477	26.833
200	10.479	10.455	34.958	152.1	0.490	26.845
250	10.185	10.155	34.925	154.1	0.552	26.872
300	9.835	9.801	34.893	151.5	0.613	26.909
350	9.100	9.062	34.839	136.7	0.672	26.989
400	8.402	8.360	34.759	133.9	0.727	27.036
450	7.692	7.647	34.699	118.2	0.781	27.096
500	7.088	7.040	34.654	120.5	0.832	27.148
550	6.588	6.537	34.600	131.6	0.882	27.173
600	6.265	6.211	34.593	128.1	0.930	27.211
650	5.986	5.928	34.578	129.6	0.977	27.236
700	5.623	5.563	34.556	133.2	1.022	27.264
750	5.608	5.544	34.606	129.4	1.066	27.306
800	5.477	5.409	34.634	129.8	1.109	27.345
900	4.824	4.751	34.622	142.2	1.189	27.412
1000	4.763	4.681	34.682	151.3	1.264	27.469
1500	4.539	4.412	34.978	224.0	1.570	27.738
2000	3.508	3.348	34.975	260.3	1.810	27.847

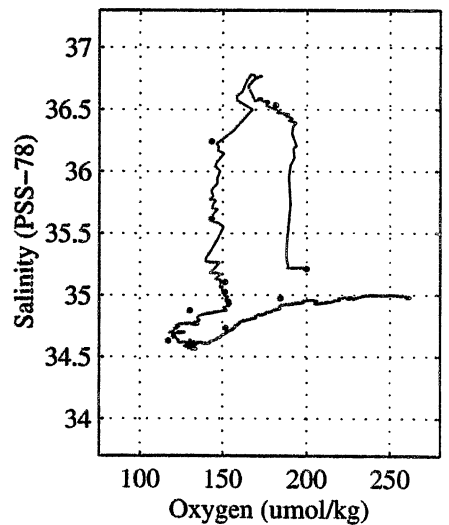
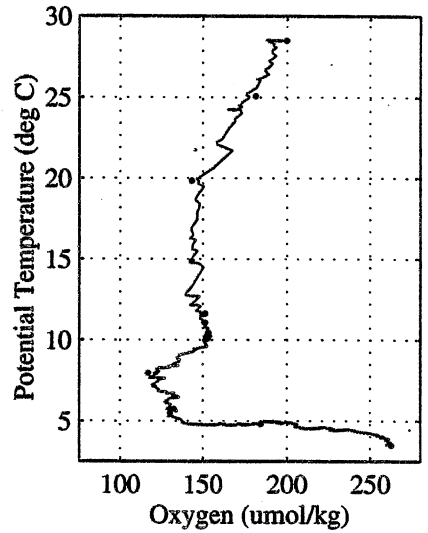
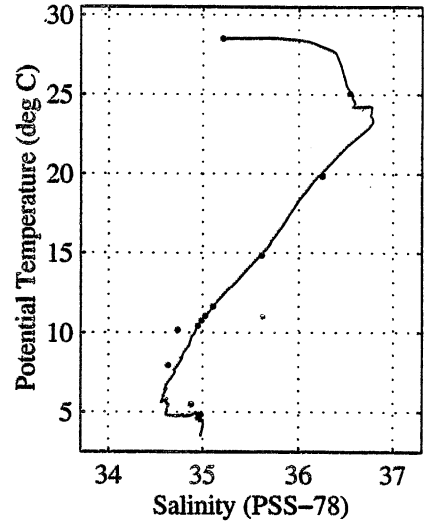
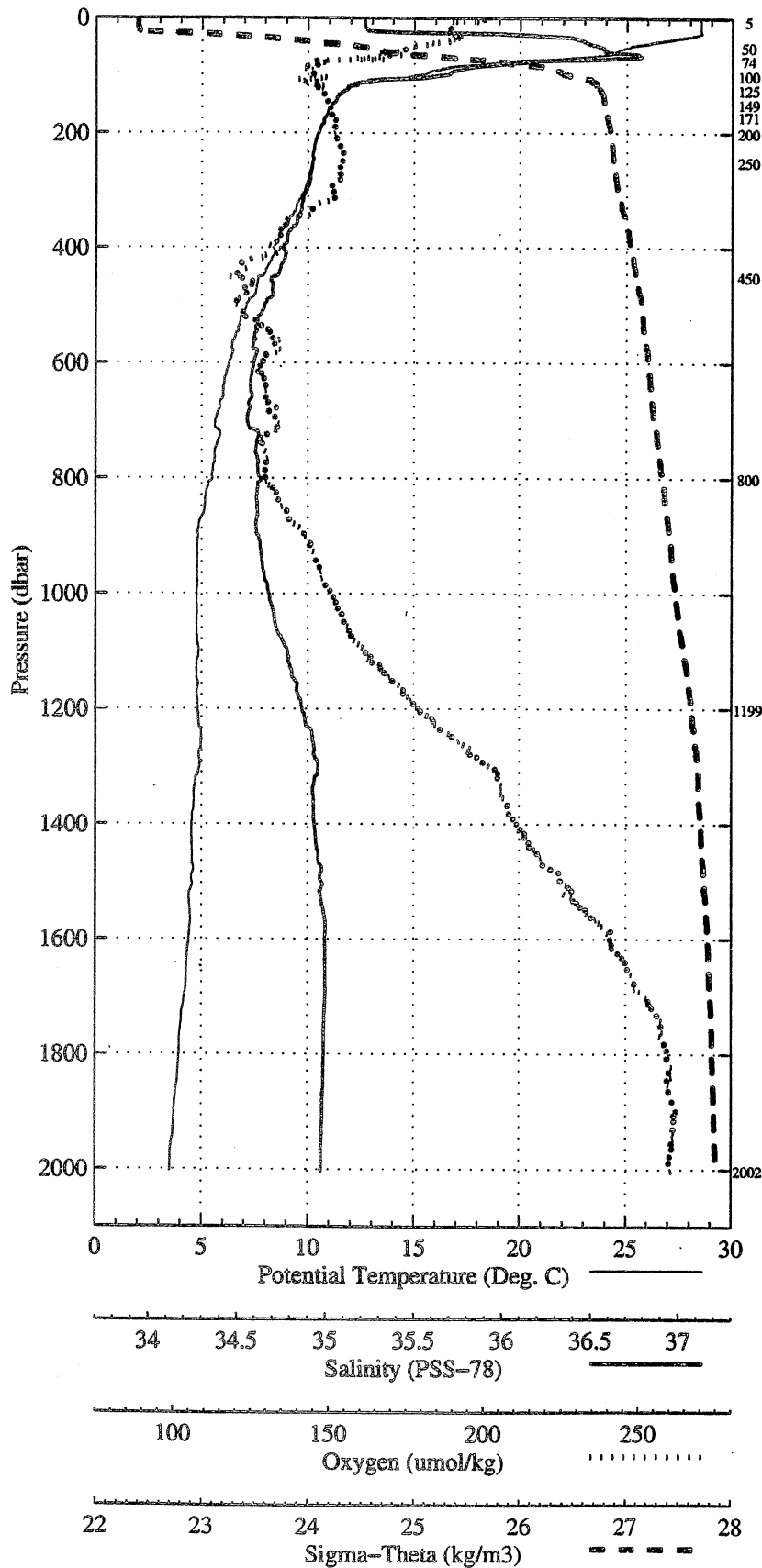
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2002	1	3.499	NaN	NaN	262.6
1200	2	4.826	4.725	34.975	184.7
800	3	5.490	5.421	34.875	130.0
450	4	7.947	7.901	34.630	117.0
251	5	10.180	10.151	34.731	151.6
200	6	10.442	10.418	34.946	153.2
171	7	10.772	10.751	34.985	NaN
150	8	11.068	11.049	35.023	151.2
125	9	11.631	11.615	35.104	151.2
100	10	14.870	14.855	35.619	143.1
74	11	19.848	19.835	36.244	143.1
51	12	25.072	25.061	36.537	181.7
6	13	28.501	28.500	35.212	199.6

NBC-1 R/V SEWARD JOHNSON

CTD Station 23 (98023)

Latitude 5.261 N Longitude 46.310 W

22-Nov-1998 21:39 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 24 (98024)  
 Latitude 4.413N Longitude 46.652W  
 23-Nov-1998 05:08Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.029	28.029	36.287	200.3	0.005	23.356
10	28.029	28.026	36.289	198.8	0.045	23.359
20	28.028	28.023	36.289	199.5	0.090	23.361
30	28.033	28.026	36.290	199.3	0.136	23.361
40	28.032	28.023	36.301	198.9	0.181	23.371
50	27.969	27.957	36.331	198.7	0.226	23.416
60	27.676	27.661	36.335	198.7	0.270	23.517
70	27.151	27.135	36.338	198.1	0.313	23.690
80	26.871	26.853	36.363	195.5	0.355	23.800
90	26.571	26.551	36.386	191.9	0.396	23.914
100	25.156	25.135	36.436	184.8	0.434	24.394
110	24.834	24.810	36.404	184.1	0.470	24.470
120	20.357	20.335	36.191	176.2	0.500	25.589
130	18.845	18.822	36.029	178.3	0.523	25.860
140	17.598	17.574	35.881	176.7	0.543	26.059
150	16.587	16.562	35.753	175.5	0.563	26.203
160	16.390	16.364	35.723	175.3	0.581	26.227
170	16.130	16.102	35.692	174.7	0.599	26.264
180	15.212	15.184	35.560	173.5	0.617	26.369
190	14.699	14.670	35.495	171.2	0.634	26.433
200	14.428	14.398	35.525	163.0	0.650	26.515
250	11.215	11.184	35.119	143.9	0.720	26.841
300	10.249	10.213	35.086	125.7	0.780	26.989
350	9.060	9.021	34.892	125.0	0.836	27.037
400	7.759	7.719	34.698	135.0	0.890	27.084
450	7.294	7.251	34.658	134.3	0.941	27.121
500	7.190	7.141	34.674	131.0	0.991	27.150
550	6.481	6.431	34.615	131.7	1.040	27.199
600	5.885	5.832	34.567	134.9	1.087	27.239
650	5.647	5.591	34.564	136.1	1.132	27.266
700	5.405	5.346	34.570	137.5	1.176	27.301
750	5.271	5.208	34.588	140.5	1.218	27.332
800	5.025	4.960	34.590	143.6	1.259	27.362
900	4.848	4.775	34.647	152.0	1.337	27.430
1000	4.730	4.648	34.719	163.8	1.410	27.502
1500	4.531	4.405	35.000	232.9	1.710	27.756
2000	3.488	3.328	34.975	264.3	1.945	27.849

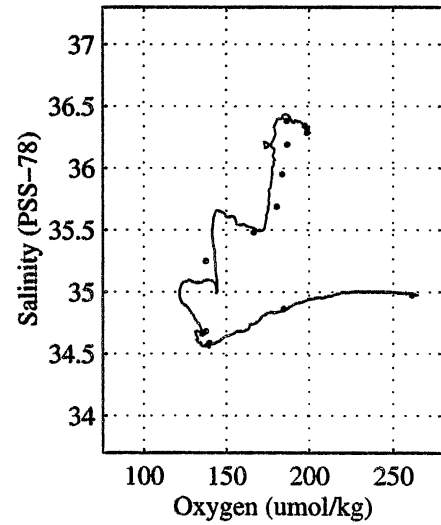
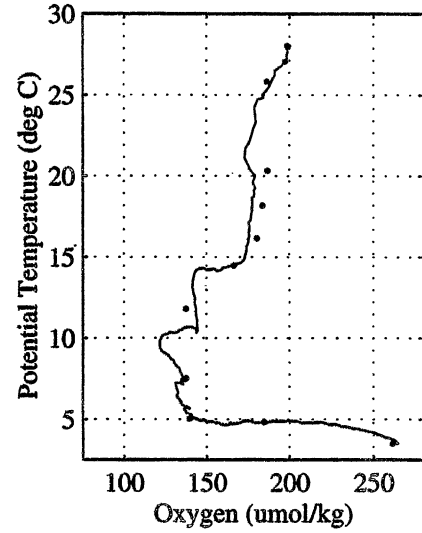
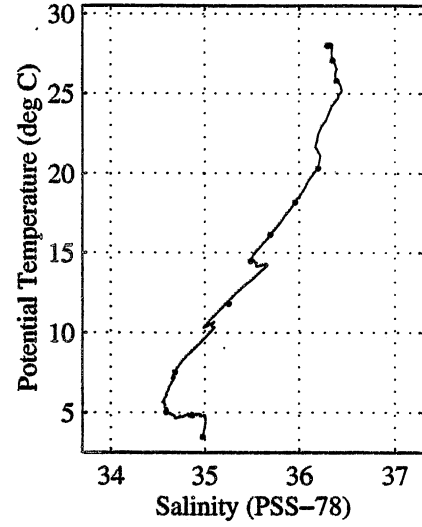
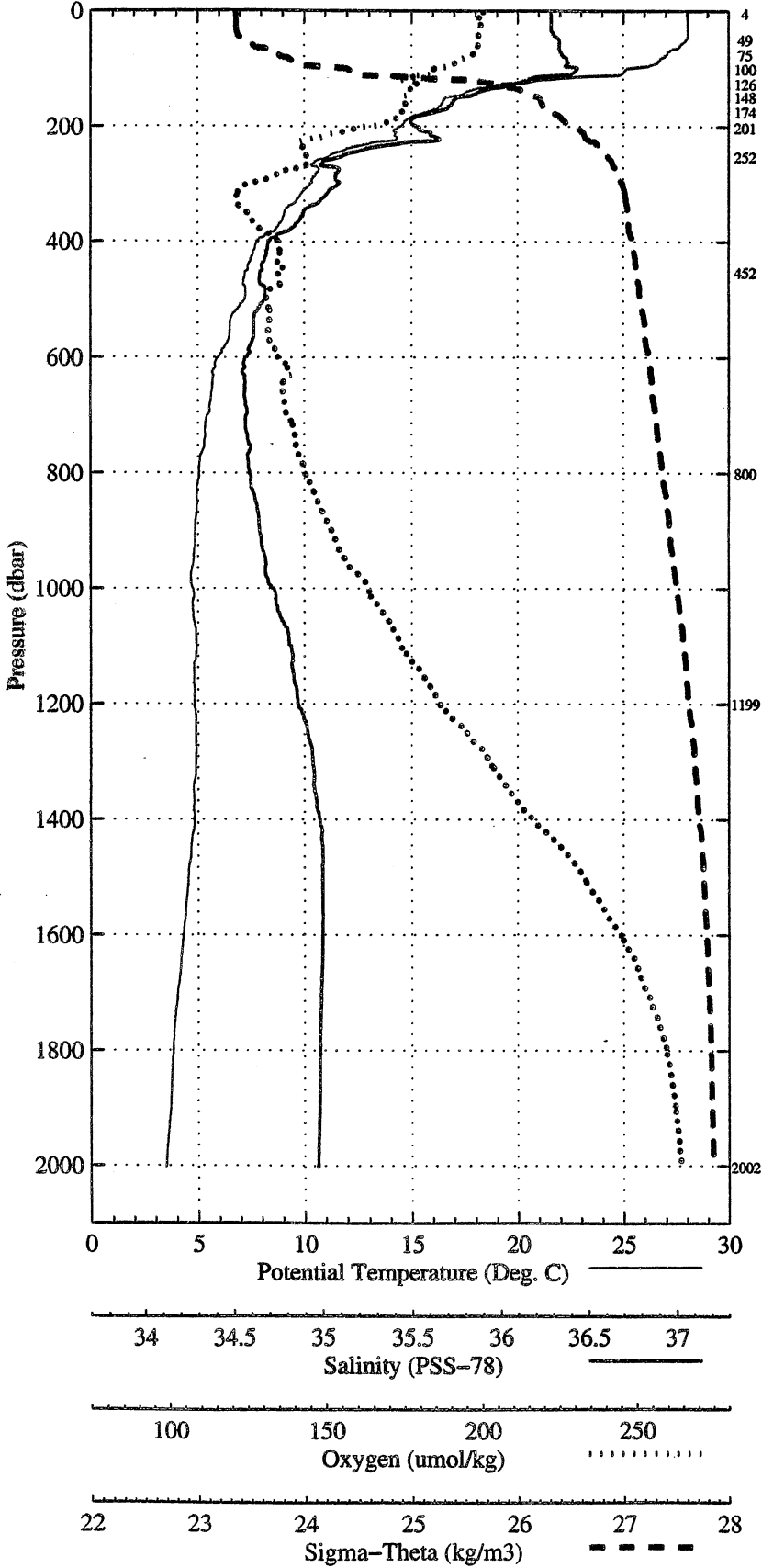
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2002	1	3.487	3.326	34.974	261.3
1200	2	4.825	4.724	34.863	184.5
801	3	5.044	4.978	34.585	139.4
453	4	7.523	7.479	34.681	137.4
252	5	11.815	11.782	35.249	137.3
202	6	14.482	14.452	35.482	166.3
175	7	16.160	16.132	35.690	180.2
148	8	18.178	18.152	35.952	183.6
126	9	20.327	20.303	36.192	186.5
101	10	25.816	25.793	36.383	186.2
76	11	27.082	27.064	36.343	197.3
50	12	27.999	27.988	36.316	198.7
5	13	28.009	28.007	36.286	198.6

NBC-1 R/V SEWARD JOHNSON

CTD Station 24 (98024)

Latitude 4.413 N Longitude 46.652 W

23-Nov-1998 05:08 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 25 (98025)**  
**Latitude 3.751N Longitude 46.915W**  
**23-Nov-1998 11:11Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.140	28.140	36.320	199.6	0.005	23.344
10	28.138	28.136	36.320	197.1	0.045	23.346
20	28.140	28.135	36.320	197.6	0.091	23.347
30	28.141	28.134	36.321	197.8	0.136	23.349
40	28.141	28.131	36.321	198.0	0.181	23.351
50	28.142	28.130	36.322	198.2	0.227	23.353
60	28.145	28.131	36.324	198.3	0.272	23.355
70	28.144	28.127	36.325	198.4	0.318	23.358
80	28.140	28.121	36.328	198.6	0.363	23.362
90	27.925	27.904	36.334	198.3	0.409	23.439
100	27.125	27.102	36.348	197.1	0.452	23.710
110	26.568	26.543	36.370	196.4	0.493	23.906
120	25.175	25.148	36.366	188.3	0.532	24.338
130	22.640	22.614	36.368	183.5	0.566	25.092
140	22.137	22.109	36.380	184.3	0.594	25.246
150	21.769	21.739	36.372	183.6	0.621	25.344
160	16.763	16.737	35.760	176.7	0.644	26.168
170	15.528	15.501	35.583	175.3	0.662	26.317
180	14.040	14.014	35.379	171.9	0.679	26.484
190	13.100	13.074	35.260	167.5	0.695	26.586
200	12.579	12.552	35.193	163.8	0.709	26.638
250	11.433	11.402	35.047	160.6	0.778	26.745
300	11.238	11.200	35.024	160.2	0.846	26.765
350	10.215	10.174	34.921	154.5	0.911	26.868
400	8.602	8.559	34.734	155.7	0.972	26.986
450	7.985	7.939	34.678	155.4	1.028	27.037
500	7.235	7.187	34.651	144.9	1.081	27.125
550	6.172	6.123	34.556	144.4	1.130	27.192
600	5.764	5.712	34.535	145.0	1.177	27.227
650	5.632	5.576	34.562	141.3	1.222	27.266
700	4.846	4.790	34.520	154.3	1.265	27.325
750	4.602	4.543	34.510	158.1	1.306	27.345
800	4.535	4.473	34.508	162.0	1.347	27.351
900	4.687	4.615	34.614	159.4	1.425	27.421
1000	4.548	4.468	34.650	165.3	1.499	27.466
1500	4.183	4.061	34.998	244.0	1.796	27.791
2000	3.566	3.405	34.977	266.0	2.026	27.844

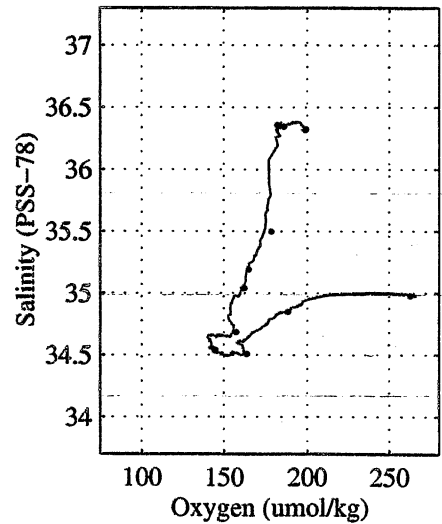
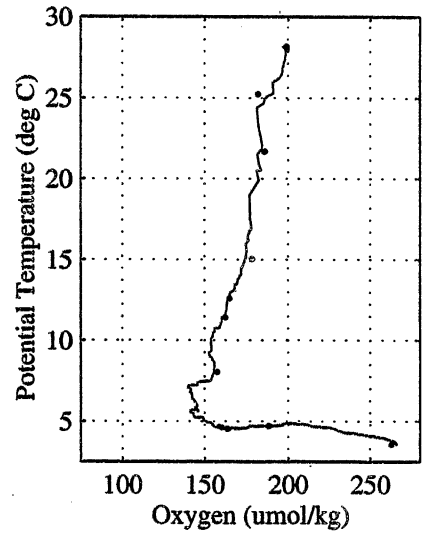
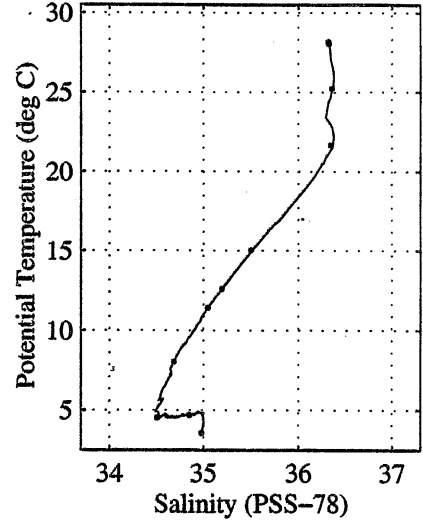
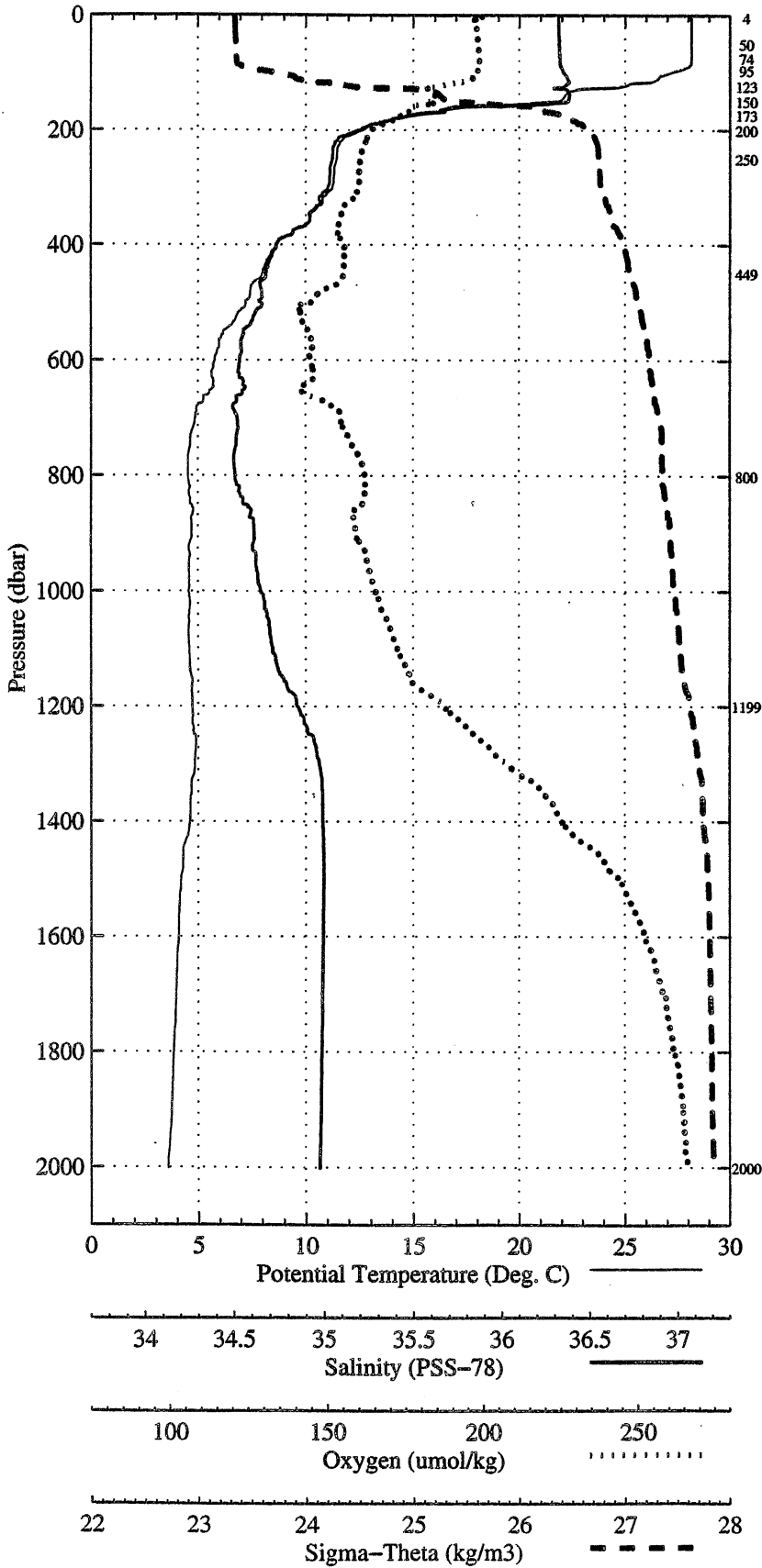
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2001	1	3.564	3.403	34.977	262.7
1199	2	4.709	4.609	34.849	188.1
801	3	4.529	4.466	34.507	163.8
450	4	8.041	7.995	34.685	157.3
250	5	11.429	11.397	35.040	162.4
200	6	12.600	12.573	35.191	164.8
174	7	15.034	15.008	35.498	178.4
150	8	21.688	21.658	36.347	185.9
123	9	25.231	25.204	36.359	182.0
96	10	28.039	28.017	36.326	198.9
75	11	28.157	28.140	36.321	198.7
50	12	28.156	28.145	36.320	198.6
4	13	28.179	28.178	36.321	198.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 25 (98025)

Latitude 3.751 N Longitude 46.915 W

23-Nov-1998 11:11 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 26 (98026)  
 Latitude 3.078N Longitude 47.150W  
 23-Nov-1998 19:54Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.272	28.272	36.343	193.9	0.005	23.317
10	28.169	28.167	36.343	197.5	0.045	23.353
20	28.059	28.054	36.342	198.5	0.091	23.390
30	27.966	27.959	36.341	199.3	0.135	23.422
40	27.901	27.891	36.340	199.6	0.180	23.444
50	27.825	27.814	36.340	199.9	0.224	23.470
60	27.806	27.791	36.339	200.1	0.269	23.477
70	27.783	27.766	36.338	200.3	0.313	23.485
80	27.764	27.745	36.337	200.3	0.357	23.492
90	27.734	27.713	36.335	200.5	0.402	23.502
100	27.198	27.175	36.353	199.1	0.445	23.691
110	25.229	25.205	36.373	190.4	0.485	24.326
120	24.032	24.007	36.510	189.7	0.518	24.792
130	23.398	23.371	36.656	189.5	0.549	25.092
140	18.421	18.397	36.009	182.3	0.572	25.954
150	15.774	15.750	35.617	176.2	0.590	26.286
160	13.867	13.844	35.349	172.7	0.607	26.495
170	12.937	12.913	35.241	167.9	0.622	26.602
180	12.404	12.380	35.178	164.0	0.637	26.659
190	12.101	12.076	35.139	162.8	0.651	26.688
200	12.008	11.982	35.133	160.6	0.665	26.701
250	11.076	11.045	35.008	158.8	0.732	26.780
300	10.717	10.680	34.971	156.1	0.798	26.817
350	9.289	9.249	34.804	157.5	0.861	26.931
400	8.886	8.842	34.769	156.1	0.920	26.969
450	7.849	7.803	34.654	158.5	0.976	27.038
500	7.573	7.524	34.637	158.2	1.031	27.066
550	6.925	6.873	34.587	153.5	1.084	27.118
600	6.510	6.455	34.564	152.4	1.134	27.157
650	6.195	6.137	34.546	152.9	1.183	27.184
700	4.951	4.894	34.505	156.8	1.229	27.302
750	4.636	4.577	34.486	162.7	1.271	27.322
800	4.638	4.574	34.486	165.0	1.313	27.323
900	4.554	4.482	34.581	163.4	1.393	27.409
1000	4.571	4.491	34.654	167.1	1.467	27.467
1500	4.197	4.075	34.996	246.7	1.756	27.788

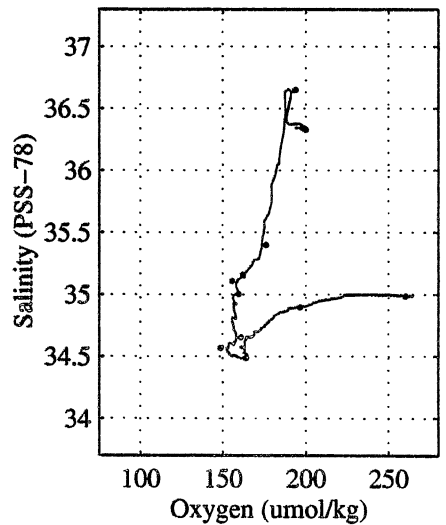
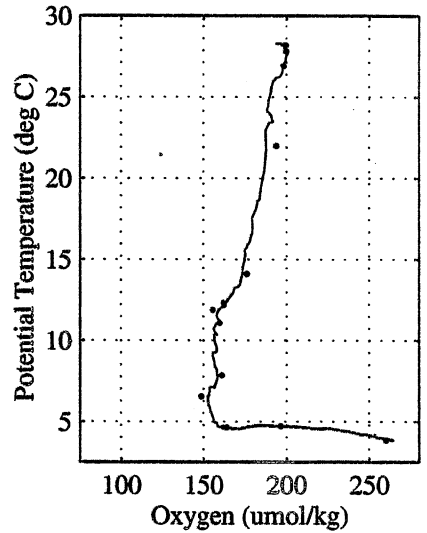
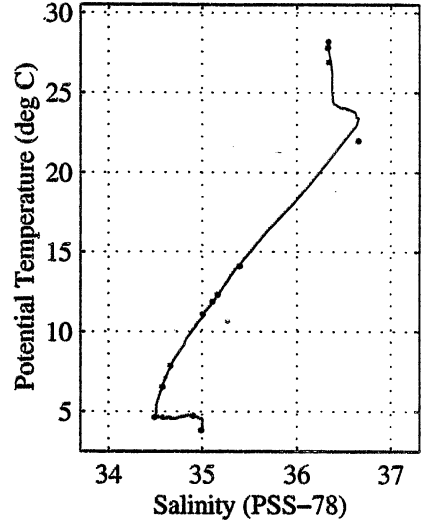
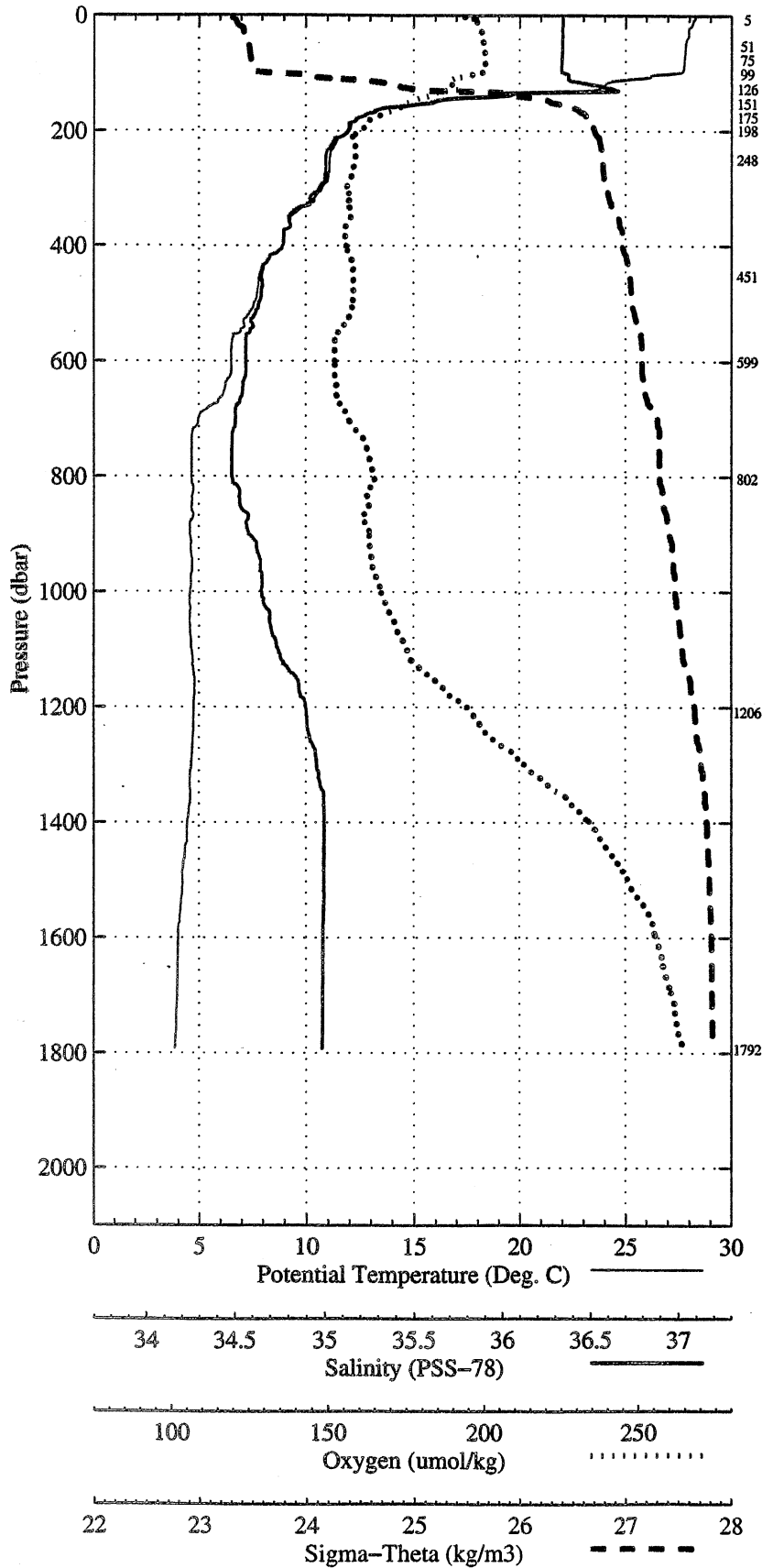
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1793	1	3.839	3.694	34.986	260.2
1207	2	4.725	4.624	34.898	196.4
803	3	4.643	4.579	34.487	164.0
599	4	6.536	6.481	34.566	148.5
451	5	7.856	7.811	34.654	161.1
249	6	11.091	11.060	35.004	159.7
198	7	11.873	11.847	35.108	155.7
175	8	12.314	12.291	35.160	162.2
151	9	14.117	14.095	35.399	176.1
126	10	21.996	21.971	36.653	193.7
100	11	26.901	26.878	36.341	198.0
76	12	27.790	27.772	36.328	199.6
51	13	27.827	27.815	36.331	199.6
6	14	28.181	28.179	36.334	199.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 26 (98026)

Latitude 3.078 N Longitude 47.150 W

23-Nov-1998 19:54 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 27 (98027)  
 Latitude 2.801N Longitude 47.283W  
 24-Nov-1998 00:33Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.634	28.633	36.351	195.8	0.005	23.204
10	28.261	28.259	36.340	196.3	0.046	23.321
20	28.133	28.128	36.340	197.5	0.091	23.364
30	28.078	28.071	36.339	198.2	0.136	23.383
40	27.921	27.911	36.339	198.5	0.181	23.436
50	27.719	27.708	36.342	198.6	0.226	23.506
60	27.651	27.637	36.343	198.6	0.270	23.530
70	27.570	27.554	36.343	198.5	0.313	23.559
80	27.538	27.520	36.344	198.7	0.357	23.571
90	27.473	27.452	36.344	198.8	0.400	23.593
100	27.443	27.419	36.342	198.8	0.444	23.603
110	26.582	26.557	36.368	195.5	0.486	23.900
120	25.088	25.061	36.479	190.7	0.523	24.451
130	24.873	24.845	36.586	192.0	0.558	24.598
140	22.326	22.298	36.488	187.6	0.590	25.274
150	17.659	17.633	35.890	181.4	0.612	26.052
160	15.820	15.794	35.626	177.7	0.631	26.283
170	15.120	15.094	35.533	174.9	0.649	26.369
180	13.493	13.468	35.301	171.3	0.665	26.537
190	12.976	12.950	35.236	170.0	0.680	26.592
200	11.983	11.957	35.115	165.8	0.694	26.692
250	10.983	10.952	34.997	160.0	0.762	26.788
300	10.823	10.786	34.979	160.3	0.828	26.805
350	9.534	9.495	34.830	158.0	0.891	26.911
400	8.829	8.785	34.750	159.1	0.951	26.964
450	8.490	8.442	34.715	159.6	1.009	26.990
500	7.757	7.706	34.654	158.4	1.065	27.053
550	7.181	7.128	34.599	156.5	1.119	27.093
600	6.789	6.733	34.580	152.4	1.171	27.132
650	6.211	6.152	34.546	153.1	1.221	27.182
700	5.390	5.331	34.511	155.1	1.268	27.256
750	4.690	4.631	34.495	159.6	1.312	27.324
800	4.621	4.558	34.491	163.5	1.353	27.329
900	4.660	4.588	34.603	161.0	1.434	27.415
1000	4.624	4.543	34.652	165.1	1.508	27.460
1500	4.231	4.108	34.996	245.8	1.797	27.785

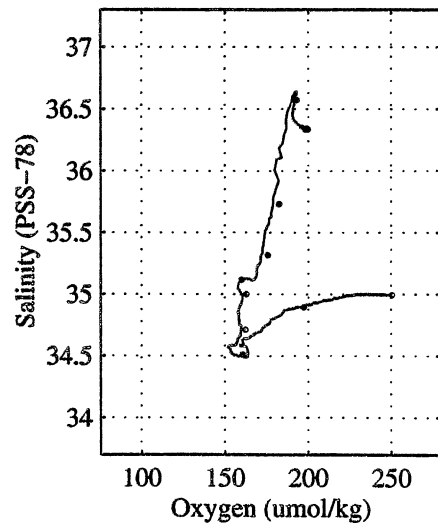
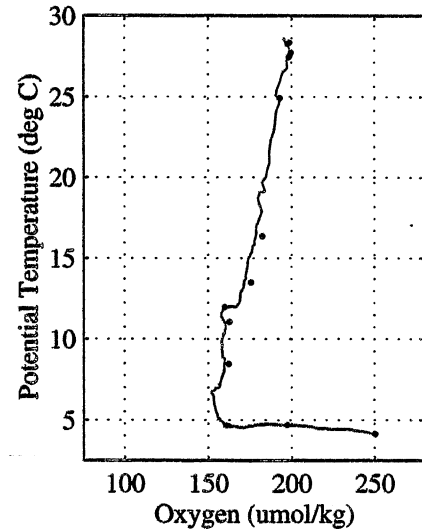
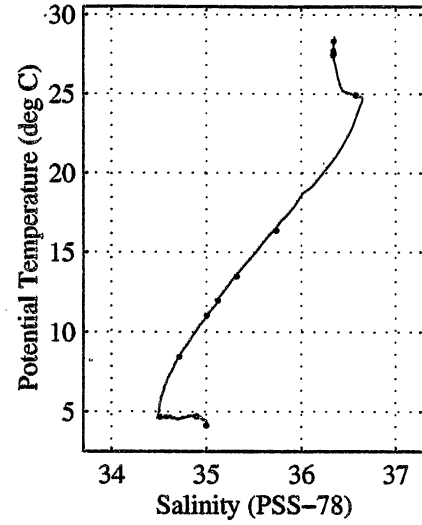
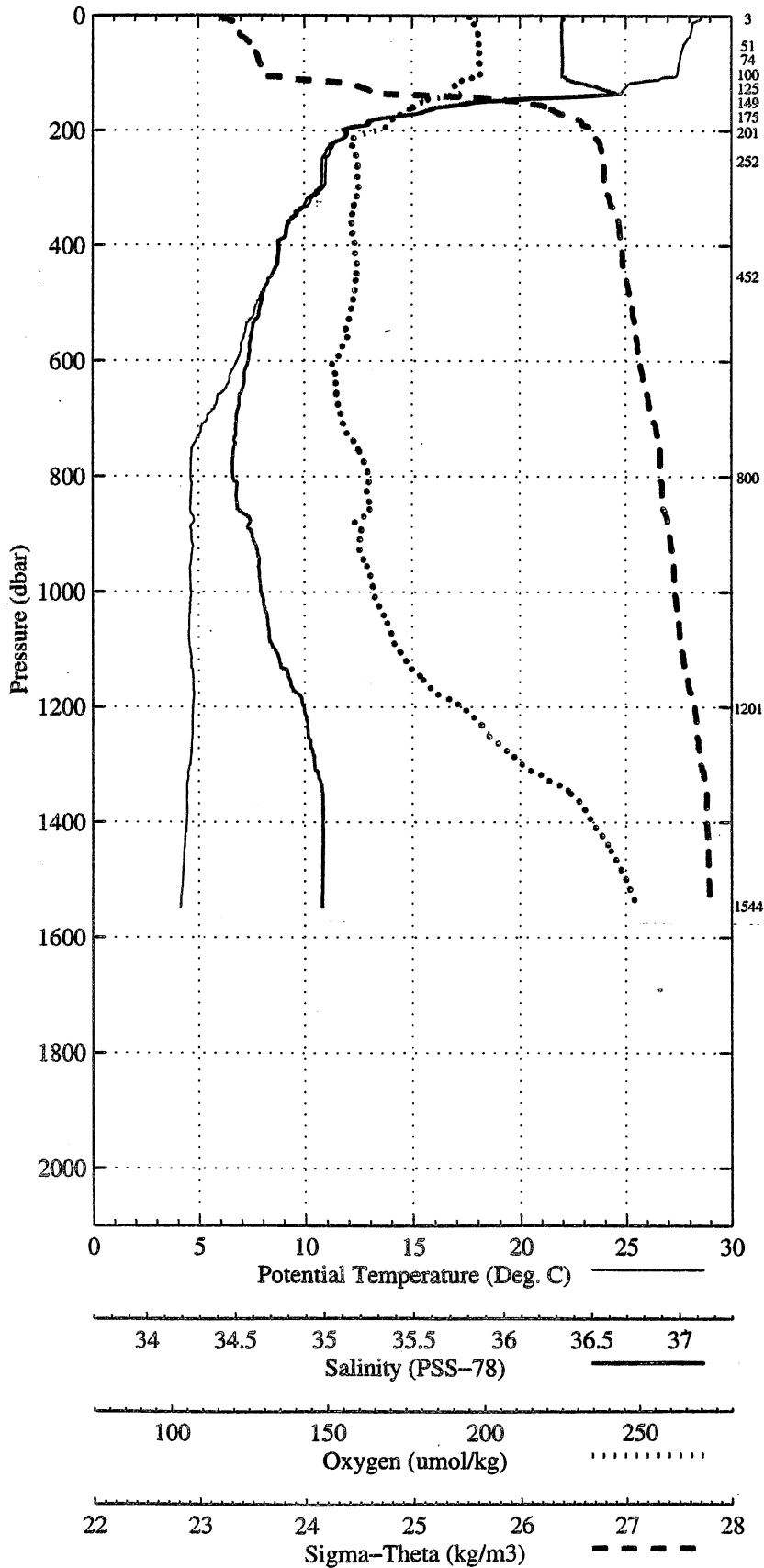
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1545	1	4.144	4.018	34.995	250.2
1201	2	4.700	4.600	34.895	197.2
801	3	4.670	4.607	34.513	160.6
452	4	8.458	8.410	34.713	162.2
252	5	11.052	11.021	35.000	162.6
202	6	11.977	11.951	35.116	159.8
175	7	13.491	13.466	35.318	175.6
150	8	16.366	16.342	35.732	182.5
125	9	24.913	24.885	36.575	192.9
101	10	27.450	27.427	36.333	198.1
75	11	27.555	27.538	36.341	198.8
51	12	27.734	27.722	36.336	199.3
4	13	28.343	28.342	36.340	198.5

NBC-1 R/V SEWARD JOHNSON

CTD Station 27 (98027)

Latitude 2.801 N Longitude 47.283 W

24-Nov-1998 00:33 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 28 (98028)  
 Latitude 2.567N Longitude 47.383W  
 24-Nov-1998 03:30Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.250	28.250	36.347	198.0	0.005	23.328
10	28.130	28.128	36.344	199.4	0.045	23.366
20	28.060	28.056	36.343	199.8	0.090	23.390
30	27.908	27.901	36.340	200.2	0.135	23.440
40	27.564	27.555	36.352	200.3	0.179	23.562
50	27.294	27.282	36.358	199.8	0.222	23.656
60	27.218	27.204	36.352	198.8	0.264	23.678
70	27.187	27.171	36.347	198.4	0.307	23.685
80	26.752	26.734	36.338	195.0	0.349	23.819
90	26.040	26.020	36.386	192.3	0.389	24.082
100	25.764	25.741	36.479	192.8	0.427	24.239
110	25.476	25.451	36.572	194.8	0.463	24.401
120	20.979	20.956	36.366	185.9	0.495	25.554
130	16.831	16.810	35.754	179.6	0.516	26.145
140	15.218	15.197	35.541	176.9	0.534	26.351
150	13.507	13.486	35.306	173.1	0.550	26.536
160	12.736	12.715	35.207	170.6	0.565	26.615
170	12.002	11.980	35.111	168.4	0.579	26.684
180	11.798	11.774	35.099	163.8	0.593	26.714
190	11.785	11.760	35.100	161.9	0.607	26.718
200	11.515	11.489	35.066	158.8	0.620	26.742
250	11.149	11.117	35.021	158.5	0.687	26.777
300	10.036	10.001	34.886	159.8	0.752	26.869
350	9.551	9.511	34.831	159.5	0.813	26.910
400	9.172	9.128	34.791	159.8	0.873	26.941
450	8.747	8.699	34.745	160.3	0.933	26.974
500	7.648	7.598	34.639	159.3	0.989	27.057
550	7.027	6.975	34.593	156.3	1.043	27.109
600	6.222	6.168	34.551	153.1	1.093	27.183
650	5.754	5.698	34.523	153.0	1.141	27.221
700	5.348	5.289	34.522	152.5	1.186	27.270
750	4.858	4.798	34.525	158.0	1.229	27.328
800	4.711	4.647	34.564	158.3	1.270	27.377
900	4.568	4.497	34.594	162.0	1.347	27.418
1000	4.576	4.495	34.683	168.5	1.421	27.490

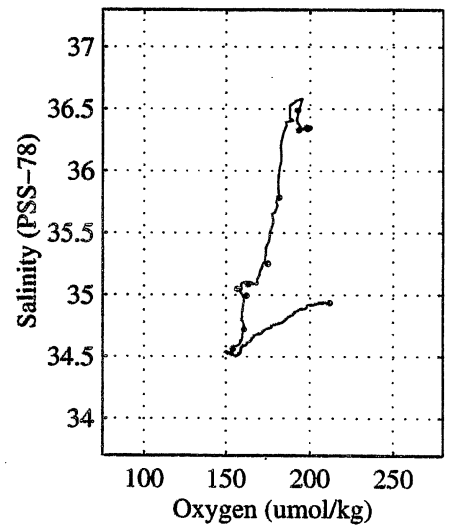
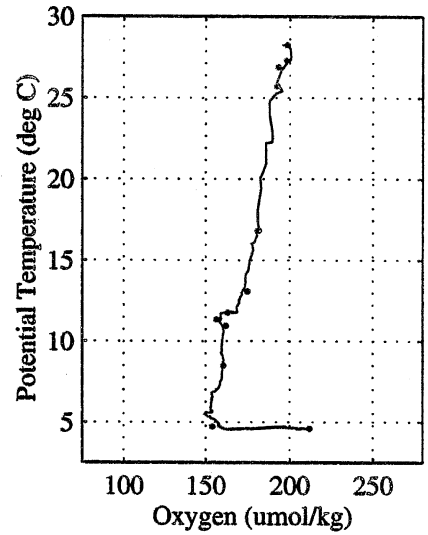
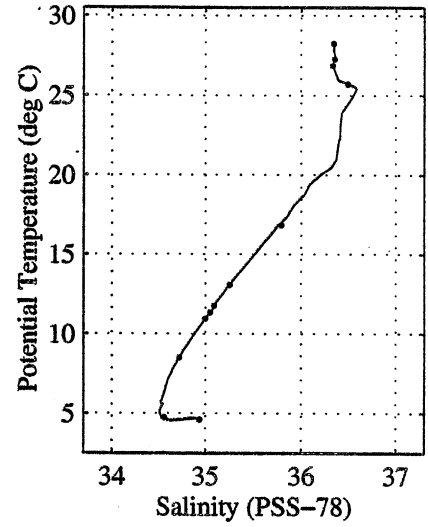
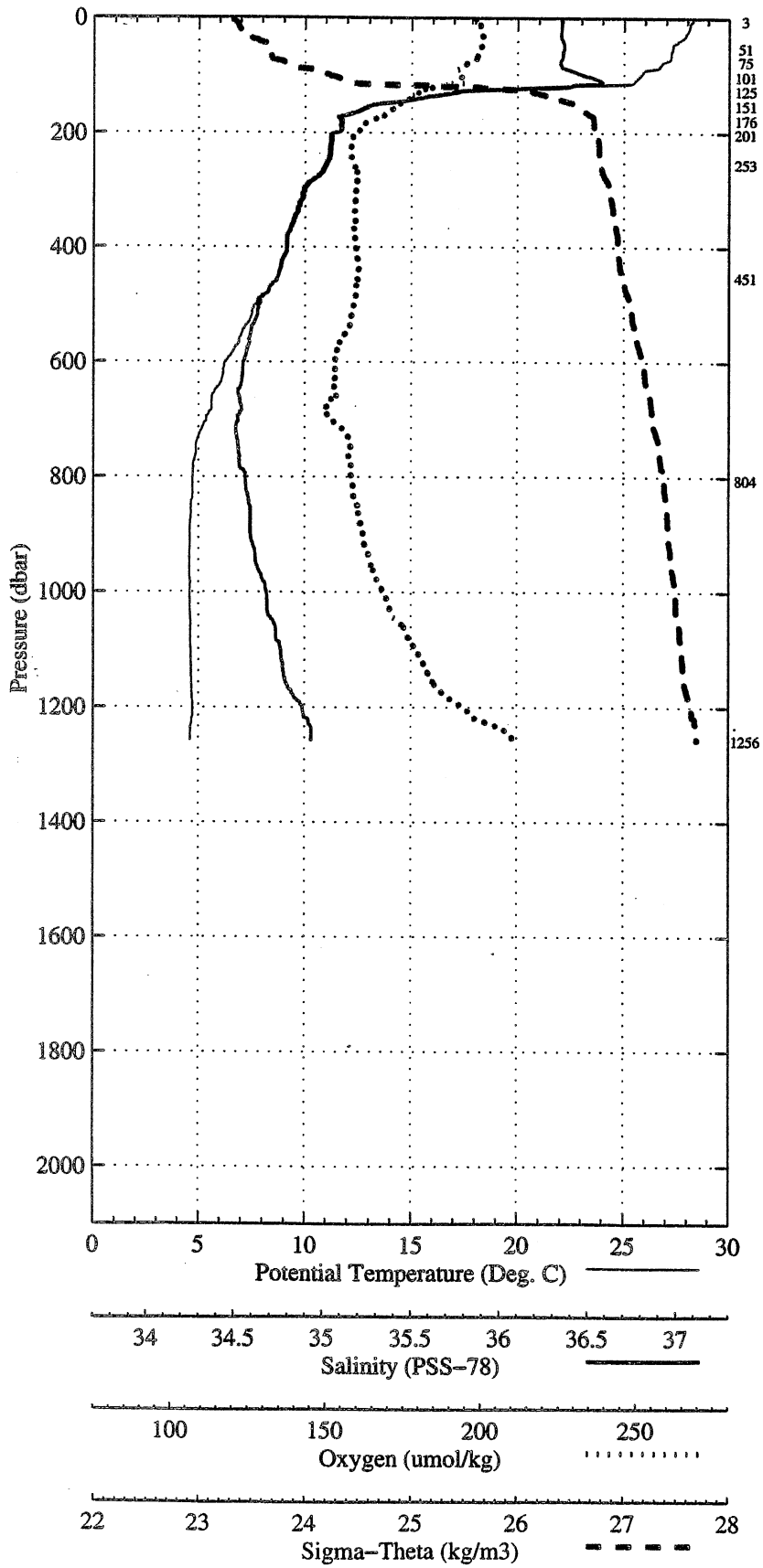
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1257	1	4.603	4.498	34.936	211.6
804	2	4.730	4.666	34.561	153.7
452	3	8.501	8.453	34.721	160.5
254	4	10.959	10.928	34.995	162.1
201	5	11.342	11.316	35.046	156.5
177	6	11.762	11.740	35.085	163.2
151	7	13.072	13.051	35.254	174.8
126	8	16.837	16.816	35.786	181.6
101	9	25.710	25.687	36.489	192.4
75	10	26.885	26.868	36.330	193.0
51	11	27.278	27.266	36.350	197.9
4	12	28.235	28.234	36.342	198.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 28 (98028)

Latitude 2.567 N Longitude 47.383 W

24-Nov-1998 03:30 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 29 (98029)**  
**Latitude 2.275N Longitude 47.479W**  
**24-Nov-1998 04:05Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.160	28.160	36.347	204.0	0.005	23.358
10	28.152	28.150	36.350	198.3	0.045	23.364
20	28.074	28.069	36.345	199.5	0.090	23.387
30	28.026	28.019	36.345	200.1	0.135	23.405
40	27.945	27.935	36.345	200.5	0.180	23.433
50	27.753	27.741	36.350	200.2	0.224	23.502
60	27.423	27.409	36.363	199.6	0.268	23.619
70	26.760	26.744	36.408	199.1	0.309	23.868
80	26.549	26.531	36.426	199.4	0.350	23.950
90	26.496	26.475	36.416	198.4	0.389	23.961
100	25.968	25.945	36.425	193.5	0.429	24.135
110	25.778	25.753	36.482	194.0	0.466	24.239
120	25.293	25.266	36.476	194.1	0.503	24.385
130	24.086	24.059	36.359	191.2	0.538	24.663
140	19.551	19.526	35.930	182.9	0.565	25.604
150	17.580	17.554	35.782	180.6	0.587	25.988
160	16.171	16.145	35.646	178.5	0.607	26.218
170	14.409	14.383	35.439	175.3	0.624	26.451
180	13.745	13.719	35.357	173.5	0.640	26.528
190	12.434	12.408	35.179	171.1	0.655	26.654
200	11.716	11.690	35.088	168.3	0.669	26.722
250	10.822	10.791	34.983	162.3	0.735	26.806
300	9.679	9.644	34.855	159.6	0.799	26.905
350	9.268	9.229	34.806	158.9	0.858	26.936
400	9.116	9.071	34.791	158.8	0.918	26.951
450	8.149	8.102	34.688	159.4	0.976	27.020
500	7.583	7.533	34.639	158.5	1.031	27.066

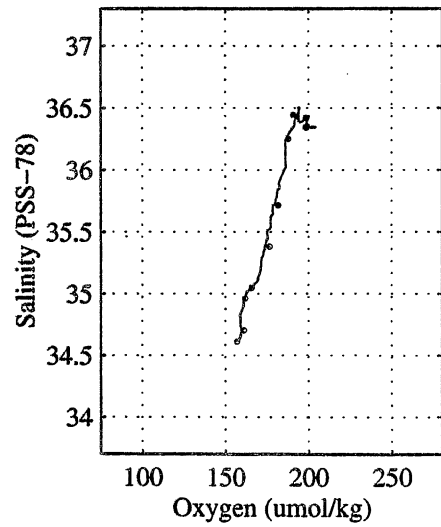
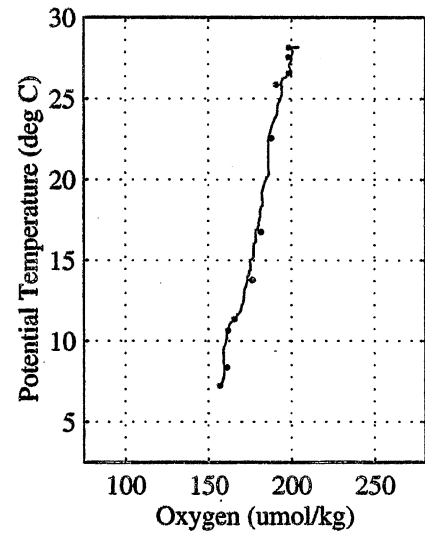
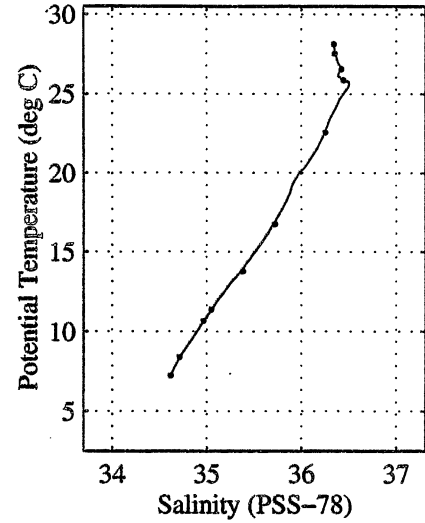
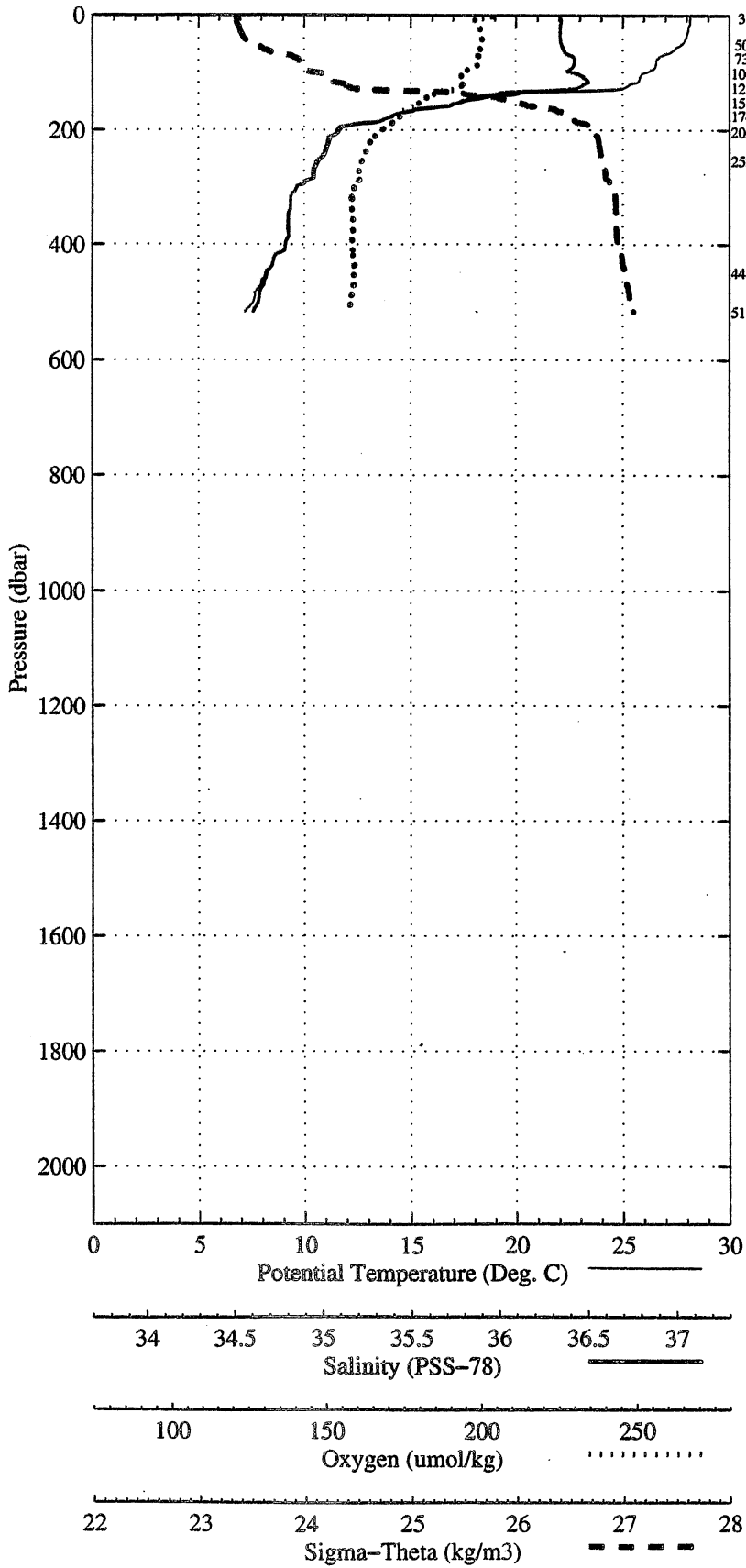
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
516	1	7.248	7.198	34.612	156.9
448	2	8.376	8.329	34.705	161.2
254	3	10.668	10.637	34.962	161.8
203	4	11.364	11.338	35.046	165.8
175	5	13.778	13.753	35.381	176.4
151	6	16.761	16.736	35.717	181.6
126	7	22.576	22.550	36.252	187.8
100	8	25.869	25.846	36.444	190.9
74	9	26.563	26.547	36.422	198.1
50	10	27.538	27.527	36.350	198.1
4	11	28.133	28.132	36.342	198.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 29 (98029)

Latitude 2.275 N Longitude 47.479 W

24-Nov-1998 04:05 Z





**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 30 (98030)**  
**Latitude 8.050N Longitude 47.600W**  
**01-Dec-1998 03:19Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.908	27.908	36.156	210.7	0.005	23.297
10	27.909	27.906	36.149	201.7	0.046	23.292
20	27.913	27.909	36.149	201.9	0.092	23.293
30	27.917	27.910	36.149	202.3	0.138	23.293
40	27.928	27.918	36.157	202.2	0.183	23.297
50	26.651	26.640	36.404	193.4	0.227	23.897
60	24.656	24.643	36.511	172.7	0.264	24.598
70	22.893	22.879	36.631	154.5	0.293	25.212
80	20.401	20.386	36.377	133.9	0.318	25.715
90	18.680	18.664	36.315	130.7	0.339	26.118
100	17.827	17.810	36.179	125.8	0.358	26.228
110	15.891	15.873	35.900	120.0	0.375	26.474
120	14.769	14.751	35.741	114.9	0.390	26.603
130	13.391	13.373	35.500	121.8	0.404	26.709
140	13.146	13.126	35.455	121.8	0.417	26.725
150	12.055	12.035	35.264	126.0	0.430	26.791
160	11.745	11.724	35.216	128.3	0.443	26.814
170	11.256	11.235	35.148	122.2	0.456	26.853
180	10.557	10.535	35.034	128.6	0.468	26.890
190	10.259	10.236	34.995	128.4	0.480	26.911
200	10.419	10.395	35.064	122.6	0.491	26.938
250	9.045	9.018	34.859	125.5	0.548	27.010
300	7.865	7.834	34.696	131.1	0.601	27.064
350	7.383	7.349	34.647	133.2	0.653	27.096
400	7.349	7.310	34.674	126.8	0.704	27.124
450	7.038	6.995	34.662	124.5	0.753	27.159
500	6.638	6.592	34.640	125.2	0.801	27.197
550	6.245	6.196	34.617	127.6	0.848	27.232
600	5.817	5.765	34.572	130.1	0.893	27.251
650	5.419	5.364	34.540	135.1	0.938	27.274
700	5.257	5.199	34.565	141.2	0.981	27.314
750	5.389	5.326	34.616	136.9	1.023	27.340
800	5.239	5.172	34.630	139.1	1.064	27.370
900	5.088	5.013	34.703	146.4	1.141	27.447
1000	4.848	4.765	34.727	155.6	1.213	27.495
1500	4.609	4.482	35.007	226.2	1.514	27.754
2000	3.625	3.463	34.980	257.4	1.753	27.840

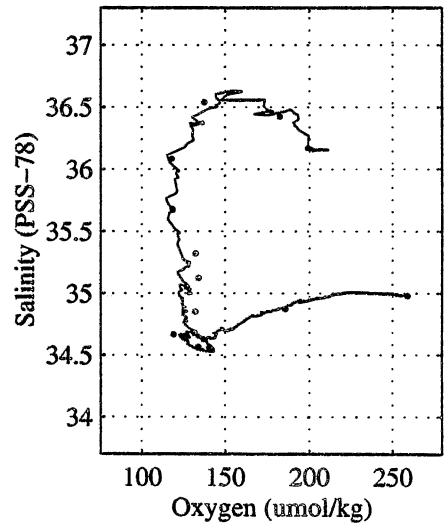
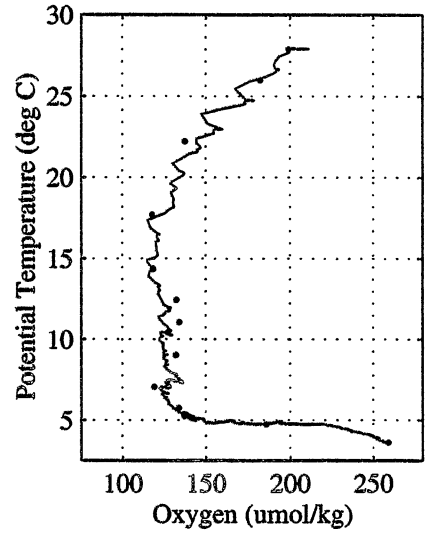
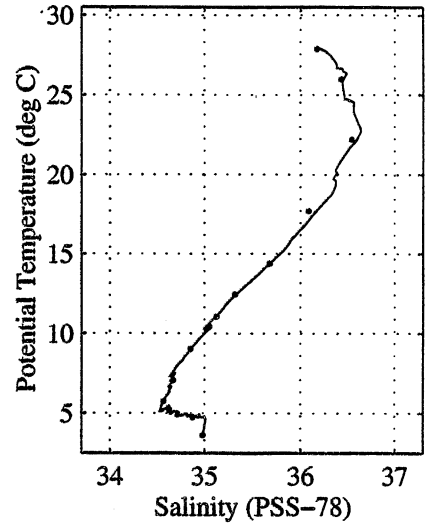
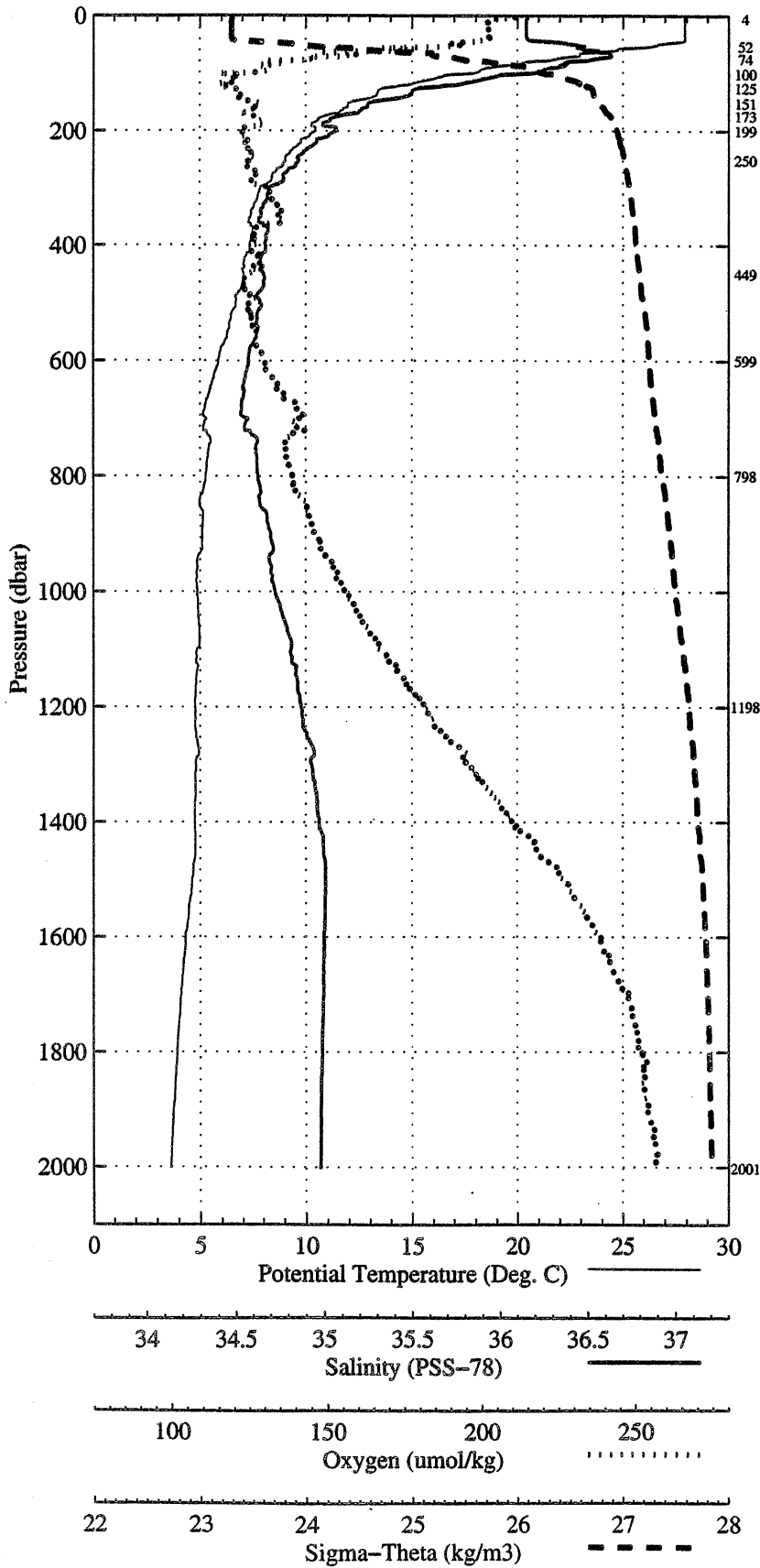
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2001	1	3.623	3.460	34.978	259.1
1199	2	4.749	4.649	34.873	185.8
799	3	5.241	5.174	34.625	137.0
599	4	5.749	5.698	34.566	133.7
449	5	7.065	7.022	34.667	118.9
251	6	9.022	8.995	34.851	131.9
200	7	10.427	10.404	35.048	127.1
174	8	11.066	11.045	35.123	133.9
151	9	12.446	12.426	35.321	132.2
125	10	14.392	14.374	35.680	118.1
101	11	17.699	17.682	36.083	117.8
74	12	22.224	22.209	36.540	137.3
52	13	25.980	25.968	36.427	182.4
5	14	27.876	27.875	36.170	199.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 30 (98030)

Latitude 8.050 N Longitude 47.600 W

01-Dec-1998 03:19 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 31 (98031)**  
**Latitude 7.751N Longitude 47.949W**  
**01-Dec-1998 13:08Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.052	28.052	35.976	193.8	0.005	23.114
10	28.065	28.063	35.976	198.7	0.048	23.111
20	28.064	28.059	35.977	199.7	0.095	23.114
30	28.010	28.003	36.018	198.4	0.143	23.164
40	26.525	26.516	36.468	192.9	0.185	23.983
50	25.767	25.755	36.512	183.9	0.223	24.256
60	24.902	24.889	36.571	176.0	0.258	24.569
70	23.477	23.463	36.574	162.7	0.290	24.999
80	21.322	21.306	36.449	144.9	0.317	25.519
90	19.328	19.312	36.202	131.1	0.339	25.865
100	16.787	16.771	35.898	121.8	0.359	26.263
110	15.467	15.450	35.748	118.5	0.376	26.453
120	14.018	14.000	35.548	111.2	0.392	26.615
130	13.644	13.626	35.501	113.1	0.406	26.657
140	13.094	13.074	35.445	116.8	0.420	26.727
150	12.454	12.434	35.354	114.1	0.433	26.785
160	11.804	11.784	35.252	114.8	0.446	26.831
170	11.662	11.640	35.236	116.3	0.458	26.845
180	10.992	10.969	35.134	114.5	0.470	26.890
190	10.760	10.737	35.091	115.5	0.482	26.898
200	10.305	10.281	35.020	121.2	0.494	26.924
250	8.764	8.737	34.799	127.1	0.551	27.007
300	8.372	8.340	34.769	122.7	0.605	27.046
350	7.813	7.778	34.712	123.5	0.658	27.086
400	7.463	7.424	34.701	119.9	0.708	27.129
450	7.111	7.068	34.678	119.6	0.758	27.162
500	6.655	6.609	34.645	121.8	0.806	27.199
550	6.189	6.140	34.611	125.5	0.852	27.234
600	5.881	5.828	34.597	128.1	0.897	27.263
650	5.701	5.645	34.598	129.5	0.941	27.287
700	5.069	5.012	34.535	136.7	0.984	27.312
750	4.988	4.926	34.536	142.1	1.026	27.323
800	5.062	4.996	34.576	141.4	1.068	27.348
900	5.059	4.984	34.642	145.4	1.148	27.402
1000	4.862	4.779	34.711	153.9	1.223	27.481
1500	4.561	4.434	35.001	228.4	1.527	27.754
2000	3.563	3.402	34.975	257.3	1.765	27.843

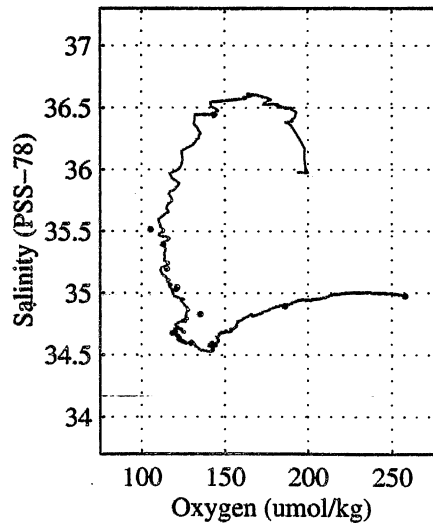
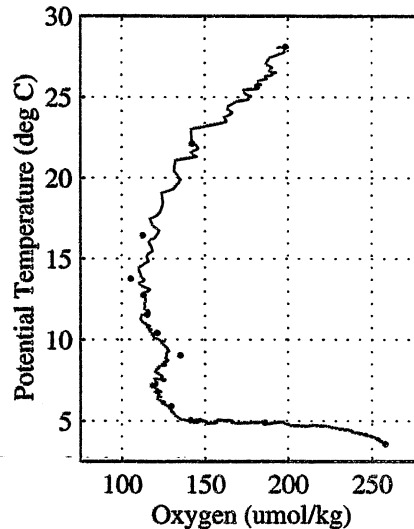
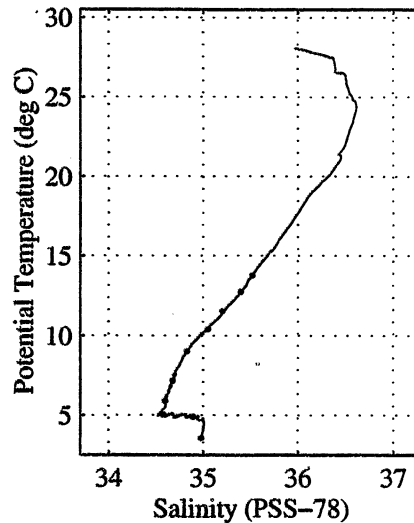
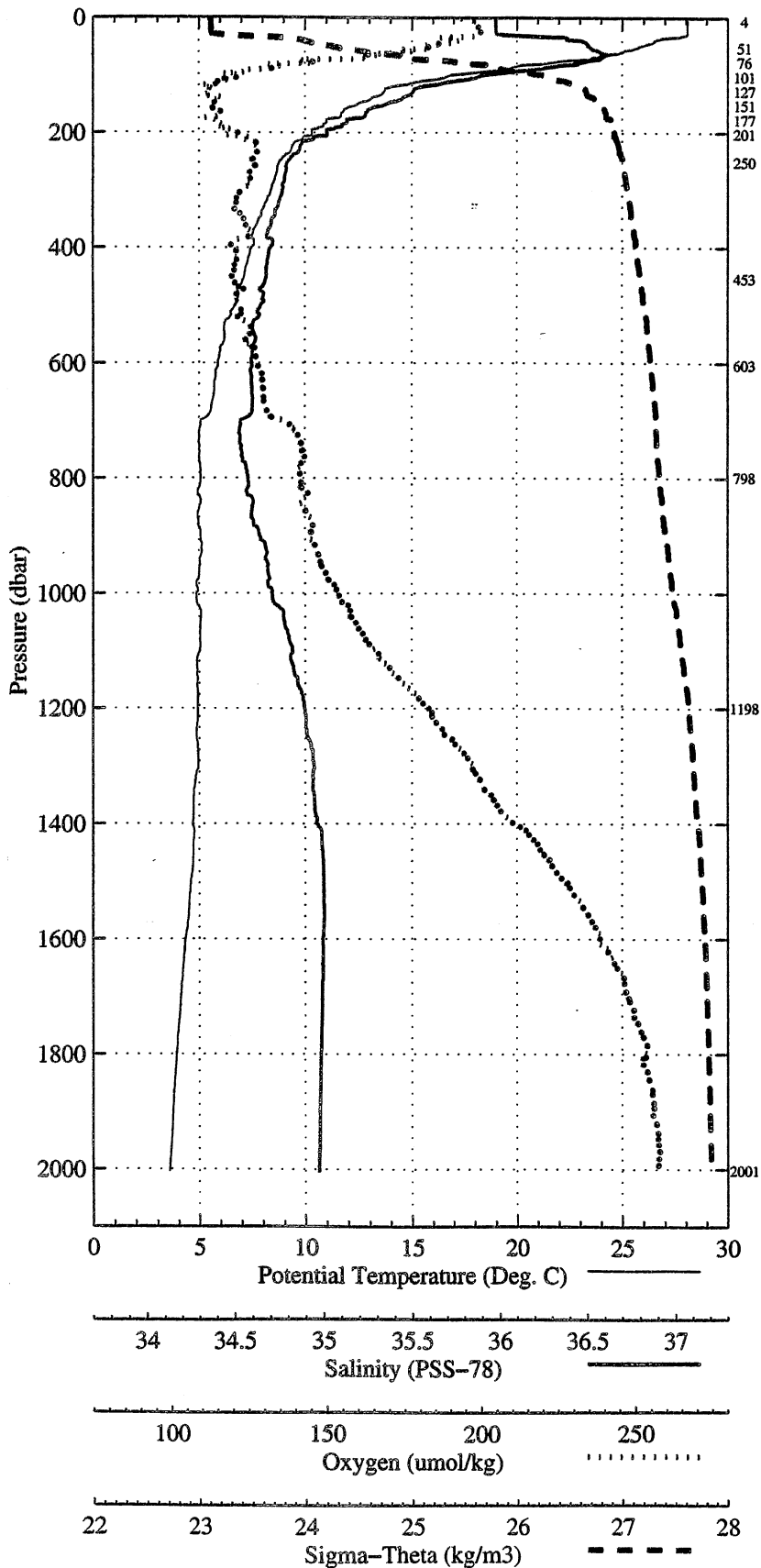
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2002	1	3.562	3.401	34.974	257.9
1199	2	4.904	4.802	34.893	186.1
798	3	5.058	4.992	34.578	141.2
603	4	5.907	5.854	34.597	129.6
453	5	7.172	7.129	34.679	118.6
251	6	9.033	9.006	34.828	135.1
202	7	10.419	10.395	35.047	121.2
177	8	11.542	11.519	35.197	115.2
152	9	12.753	12.732	35.393	112.9
127	10	13.765	13.747	35.516	105.1
102	11	16.436	NaN	NaN	112.5
76	12	22.131	NaN	NaN	142.2
52	13	25.663	NaN	NaN	181.6
5	14	28.112	NaN	NaN	198.6

NBC-1 R/V SEWARD JOHNSON

CTD Station 31 (98031)

Latitude 7.751 N Longitude 47.949 W

01-Dec-1998 13:08 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 32 (98032)  
 Latitude 7.399N Longitude 48.307W  
 01-Dec-1998 17:07Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.176	28.175	36.385	197.0	0.004	23.381
10	28.164	28.162	36.374	197.0	0.045	23.378
20	28.105	28.100	36.374	198.1	0.090	23.399
30	28.087	28.080	36.374	198.4	0.135	23.406
40	28.085	28.076	36.374	198.7	0.180	23.409
50	28.086	28.074	36.376	199.1	0.224	23.412
60	28.058	28.043	36.372	198.9	0.269	23.420
70	26.717	26.701	36.415	195.0	0.312	23.887
80	25.839	25.821	36.834	192.8	0.350	24.481
90	24.453	24.434	36.881	180.8	0.382	24.943
100	23.003	22.982	36.790	164.2	0.411	25.305
110	21.754	21.733	36.717	151.3	0.436	25.606
120	20.430	20.407	36.561	137.2	0.460	25.852
130	18.041	18.019	36.265	127.6	0.479	26.243
140	15.981	15.959	35.876	122.6	0.496	26.438
150	14.831	14.808	35.725	113.4	0.512	26.579
160	12.941	12.919	35.421	126.2	0.526	26.740
170	12.024	12.001	35.260	127.3	0.539	26.796
180	11.683	11.660	35.207	127.6	0.552	26.819
190	11.257	11.234	35.142	129.2	0.564	26.848
200	10.875	10.851	35.080	131.5	0.577	26.870
250	9.455	9.427	34.885	130.1	0.636	26.964
300	9.000	8.967	34.860	126.8	0.692	27.019
350	8.108	8.072	34.742	127.6	0.745	27.066
400	7.735	7.695	34.727	124.2	0.797	27.111
450	7.312	7.268	34.693	122.8	0.848	27.145
500	6.873	6.826	34.657	123.5	0.897	27.179
550	6.468	6.418	34.631	125.7	0.944	27.214
600	6.290	6.235	34.623	125.9	0.991	27.232
650	5.987	5.930	34.609	128.2	1.037	27.260
700	5.624	5.564	34.602	131.7	1.081	27.300
750	5.394	5.331	34.603	133.9	1.124	27.330
800	5.063	4.997	34.590	141.1	1.165	27.358
900	4.852	4.778	34.608	147.3	1.245	27.398
1000	4.971	4.887	34.695	153.6	1.321	27.456
1500	4.520	4.394	35.003	234.7	1.625	27.760
2000	3.498	3.338	34.973	260.3	1.858	27.847

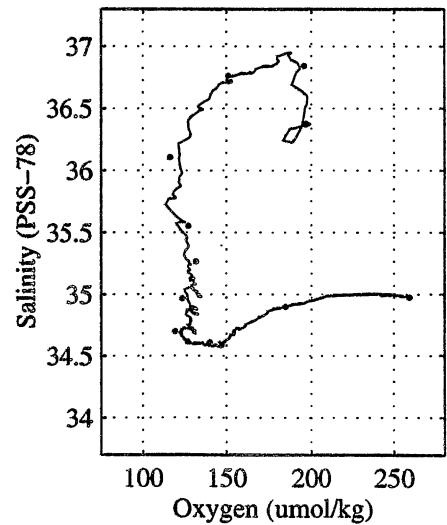
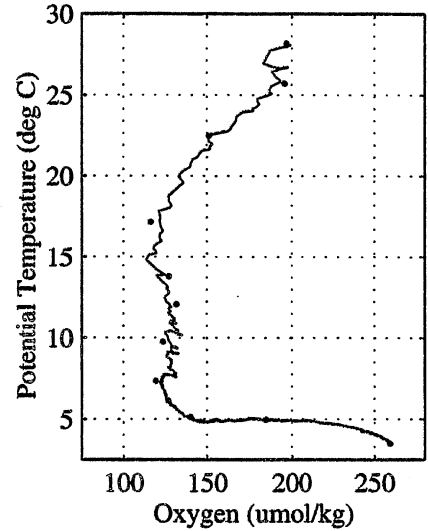
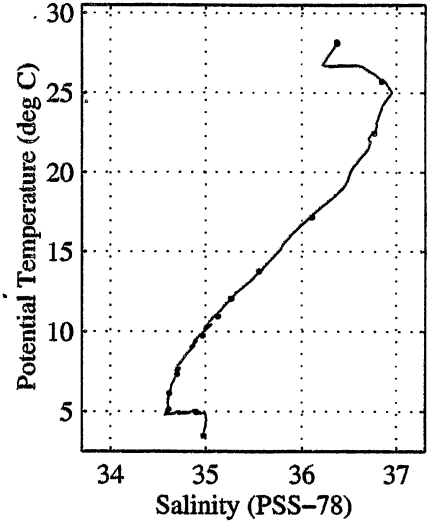
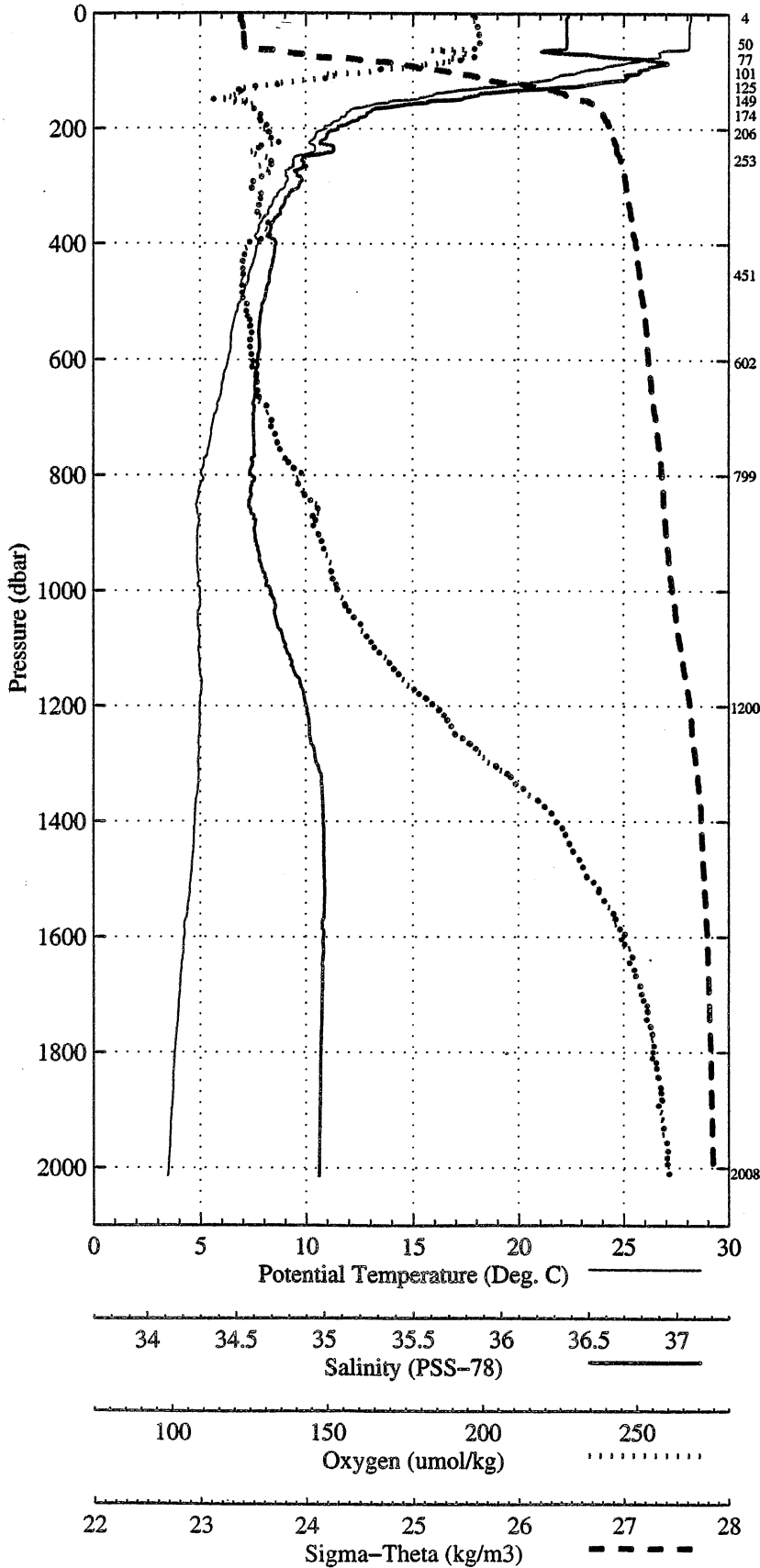
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2009	1	3.486	3.326	34.974	258.9
1201	2	4.970	4.867	34.899	184.6
799	3	5.137	5.071	34.610	139.7
603	4	6.137	6.083	34.615	126.7
451	5	7.345	7.301	34.698	119.2
253	6	9.757	9.728	34.967	123.6
206	7	10.961	10.935	35.125	128.9
175	8	12.057	12.034	35.265	131.7
149	9	13.776	13.755	35.553	127.0
126	10	17.167	17.146	36.107	116.2
101	11	22.468	22.447	36.764	150.9
77	12	25.711	25.693	36.843	195.5
51	13	28.094	28.082	36.378	196.7
5	14	28.181	28.180	36.374	196.7

NBC-1 R/V SEWARD JOHNSON

CTD Station 32 (98032)

Latitude 7.399 N Longitude 48.307 W

01-Dec-1998 17:07 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 33 (98033)  
 Latitude 7.046N Longitude 48.665W  
 01-Dec-1998 21:40Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	27.969	27.969	36.282	205.3	0.005	23.372
10	27.970	27.968	36.283	200.4	0.045	23.373
20	27.972	27.967	36.283	200.6	0.090	23.374
30	27.971	27.964	36.283	200.4	0.135	23.376
40	27.966	27.957	36.283	200.7	0.180	23.380
50	27.935	27.923	36.283	200.0	0.225	23.391
60	27.881	27.867	36.281	200.8	0.270	23.409
70	27.378	27.361	36.339	196.9	0.315	23.618
80	26.462	26.444	36.364	193.1	0.356	23.931
90	25.957	25.937	36.399	192.5	0.395	24.118
100	25.604	25.582	36.398	191.4	0.432	24.228
110	25.086	25.062	36.377	185.3	0.469	24.372
120	23.383	23.358	36.318	165.2	0.503	24.838
130	22.388	22.361	36.653	158.0	0.532	25.381
140	21.924	21.897	36.964	157.0	0.557	25.750
150	19.335	19.307	36.539	138.6	0.578	26.127
160	18.217	18.189	36.364	135.9	0.597	26.278
170	17.174	17.146	36.210	127.0	0.614	26.416
180	15.628	15.600	35.919	121.6	0.630	26.554
190	13.900	13.873	35.590	122.2	0.644	26.677
200	12.676	12.648	35.371	122.1	0.658	26.757
250	10.620	10.590	35.107	123.5	0.720	26.938
300	8.999	8.966	34.852	130.3	<u>0.777</u>	27.013
350	8.630	8.592	34.822	124.8	0.831	27.050
400	7.924	7.883	34.730	127.8	0.884	27.086
450	7.571	7.526	34.708	123.3	0.936	27.121
500	7.246	7.198	34.684	123.3	0.986	27.149
550	6.870	6.818	34.653	126.6	1.036	27.178
600	6.564	6.509	34.647	124.6	1.084	27.215
650	6.208	6.150	34.632	126.4	1.130	27.251
700	5.835	5.774	34.614	130.3	1.175	27.284
750	5.583	5.519	34.617	132.9	1.218	27.318
800	5.479	5.410	34.640	135.1	1.261	27.349
900	5.049	4.974	34.649	144.8	1.341	27.409
1000	5.024	4.940	34.731	154.7	1.416	27.479
1500	4.432	4.307	34.999	234.5	1.719	27.767
2000	3.453	3.294	34.972	260.6	1.951	27.850

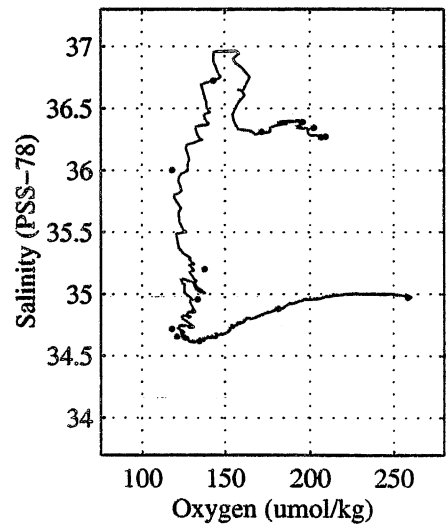
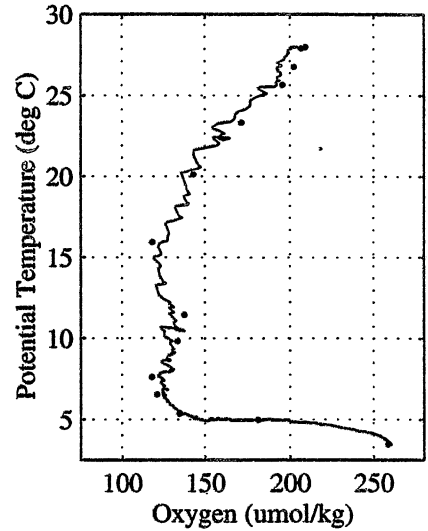
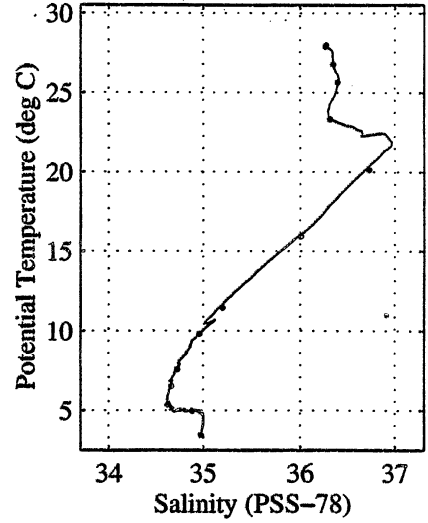
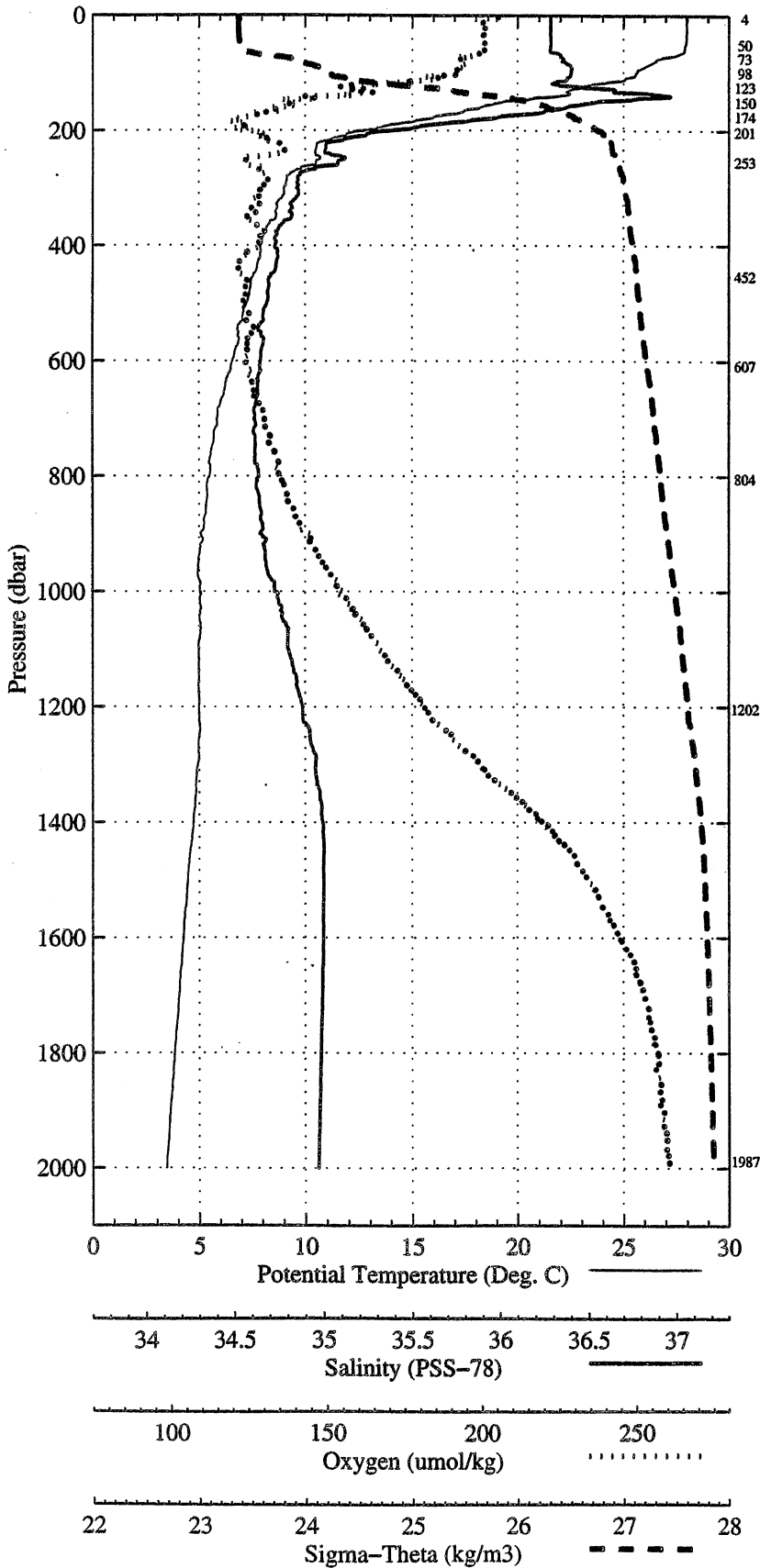
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
1987	1	3.461	3.303	34.971	258.5
1203	2	4.972	4.870	34.880	181.3
804	3	5.359	5.291	34.620	134.4
607	4	6.539	6.483	34.657	120.8
453	5	7.610	7.565	34.719	117.7
254	6	9.828	9.798	34.956	133.3
202	7	11.448	11.423	35.202	137.4
175	8	15.950	15.922	36.005	118.0
150	9	20.136	20.108	36.724	142.9
124	10	23.327	23.302	36.312	171.5
99	11	25.652	25.630	36.391	195.4
74	12	26.778	26.761	36.345	202.0
50	13	27.908	27.897	36.268	206.3
4	14	27.986	27.985	36.273	208.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 33 (98033)

Latitude 7.046 N Longitude 48.665 W

01-Dec-1998 21:40 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 34 (98034)  
 Latitude 6.726N Longitude 49.013W  
 02-Dec-1998 01:53Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.260	28.259	36.261	202.3	0.005	23.260
10	28.259	28.256	36.273	199.0	0.046	23.271
20	28.266	28.261	36.274	199.2	0.092	23.271
30	28.275	28.268	36.288	199.3	0.138	23.280
40	28.192	28.183	36.304	199.2	0.184	23.321
50	28.041	28.029	36.318	199.3	0.230	23.383
60	27.940	27.926	36.320	199.7	0.275	23.419
70	27.838	27.822	36.318	199.7	0.319	23.452
80	27.591	27.572	36.326	199.0	0.364	23.540
90	27.478	27.457	36.339	198.8	0.407	23.588
100	26.926	26.903	36.326	194.4	0.450	23.757
110	26.296	26.271	36.364	195.0	0.490	23.988
120	26.167	26.140	36.404	192.0	0.530	24.060
130	25.085	25.056	36.401	187.9	0.567	24.394
140	23.329	23.300	36.264	180.4	0.601	24.815
150	21.067	21.038	36.146	168.5	0.630	25.366
160	19.956	19.926	36.104	170.3	0.655	25.633
170	20.401	20.369	36.582	155.2	0.678	25.880
180	18.663	18.632	36.368	145.1	0.699	26.171
190	17.410	17.378	36.240	141.8	0.717	26.384
200	16.529	16.496	36.102	140.1	0.733	26.489
250	11.395	11.363	35.206	127.6	0.803	26.876
300	10.177	10.142	35.023	132.9	0.862	26.952
350	9.143	9.104	34.889	126.0	0.919	27.022
400	8.524	8.481	34.823	123.4	0.973	27.068
450	7.968	7.922	34.762	123.0	1.026	27.106
500	7.518	7.469	34.716	122.6	1.077	27.136
550	7.044	6.992	34.681	123.4	1.127	27.176
600	6.687	6.631	34.655	124.7	1.176	27.205
650	6.231	6.172	34.625	127.6	1.223	27.242
700	5.851	5.789	34.612	129.7	1.268	27.281
750	5.574	5.510	34.609	132.6	1.312	27.313
800	5.365	5.297	34.620	135.1	1.354	27.347
900	5.096	5.021	34.672	144.5	1.434	27.421
1000	5.037	4.953	34.749	154.8	1.508	27.491
1500	4.461	4.336	34.999	234.7	1.810	27.763
2000	3.439	3.280	34.972	262.3	2.044	27.851

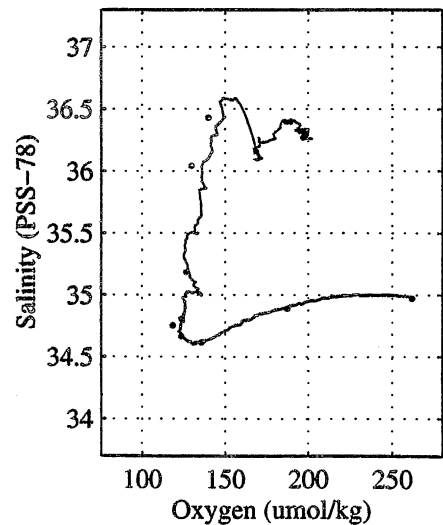
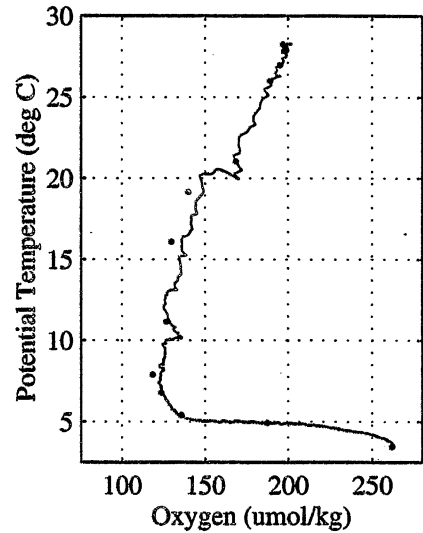
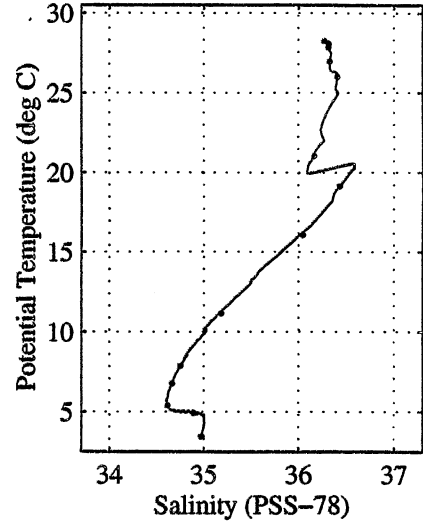
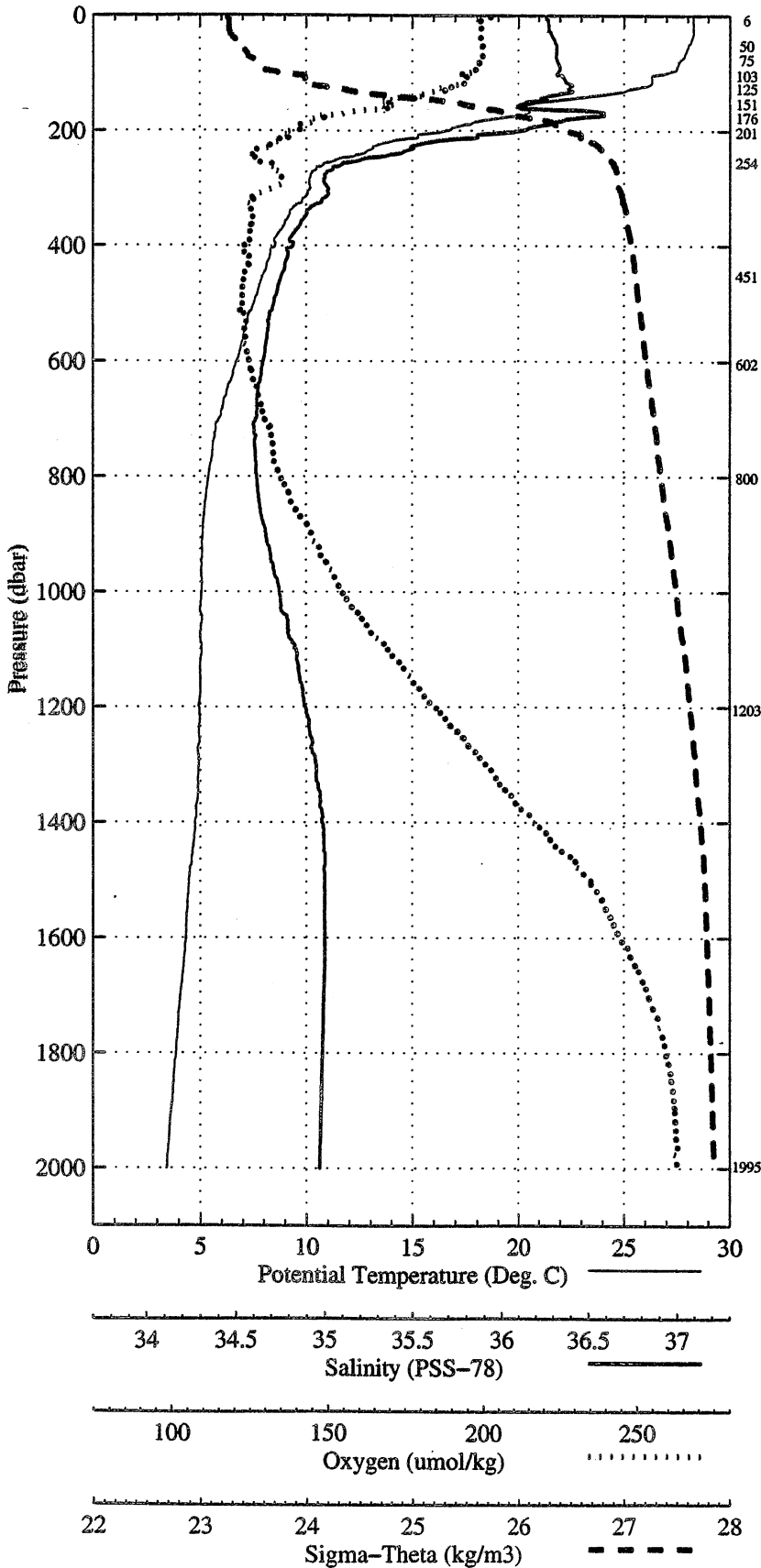
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1995	1	3.457	3.297	34.972	261.6
1203	2	4.932	4.830	34.889	187.4
801	3	5.407	5.338	34.616	135.5
603	4	6.783	6.726	34.663	123.6
451	5	7.893	7.847	34.753	118.4
254	6	11.155	11.123	35.184	126.6
202	7	16.089	16.057	36.041	129.6
176	8	19.166	19.134	36.430	139.7
152	9	21.055	21.025	36.158	168.5
126	10	25.992	25.963	36.401	189.2
103	11	26.965	26.941	36.323	195.0
76	12	27.831	27.813	36.310	197.5
51	13	28.062	28.050	36.312	198.0
6	14	28.245	28.244	36.271	196.8

NBC-1 R/V SEWARD JOHNSON

CTD Station 34 (98034)

Latitude 6.726 N Longitude 49.013 W

02-Dec-1998 01:53 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 35 (98035)  
 Latitude 6.387N Longitude 49.379W  
 02-Dec-1998 06:01Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.199	28.199	36.276	206.1	0.005	23.291
10	28.215	28.212	36.281	198.9	0.046	23.291
20	28.218	28.213	36.281	198.8	0.092	23.292
30	28.219	28.212	36.282	198.9	0.138	23.294
40	28.159	28.149	36.286	198.5	0.183	23.318
50	27.599	27.587	36.318	199.1	0.228	23.527
60	27.539	27.525	36.325	199.6	0.272	23.553
70	27.483	27.467	36.324	198.8	0.315	23.572
80	27.426	27.407	36.337	198.7	0.359	23.602
90	27.027	27.006	36.350	195.8	0.402	23.742
100	26.639	26.616	36.382	196.4	0.443	23.892
110	26.598	26.573	36.406	196.3	0.483	23.923
120	26.560	26.532	36.411	196.1	0.523	23.941
130	26.410	26.380	36.398	195.2	0.563	23.980
140	26.256	26.225	36.400	188.1	0.603	24.031
150	24.043	24.011	36.349	182.4	0.639	24.671
160	23.553	23.519	36.415	184.5	0.671	24.867
170	21.182	21.149	36.125	172.3	0.701	25.320
180	19.726	19.693	36.168	162.2	0.726	25.744
190	18.846	18.812	36.339	152.3	0.747	26.103
200	17.516	17.482	36.242	144.7	0.765	26.360
250	13.124	13.089	35.507	131.9	0.839	26.776
300	11.208	11.170	35.208	126.7	0.903	26.914
350	9.997	9.956	35.028	124.4	0.961	26.989
400	8.934	8.890	34.851	127.1	1.018	27.026
450	8.443	8.395	34.802	126.7	1.073	27.066
500	7.778	7.728	34.730	127.3	1.126	27.110
550	7.272	7.218	34.688	126.4	1.177	27.150
600	6.794	6.738	34.656	125.7	1.227	27.191
650	6.187	6.128	34.594	130.3	1.274	27.223
700	5.772	5.711	34.547	139.3	1.321	27.238
750	5.683	5.618	34.577	135.6	1.366	27.274
800	5.291	5.224	34.552	142.5	1.411	27.302
900	5.243	5.167	34.635	141.6	1.495	27.376
1000	5.124	5.040	34.724	150.7	1.573	27.462
1500	4.545	4.419	34.993	226.9	1.884	27.749
2000	3.458	3.299	34.973	261.0	2.119	27.851

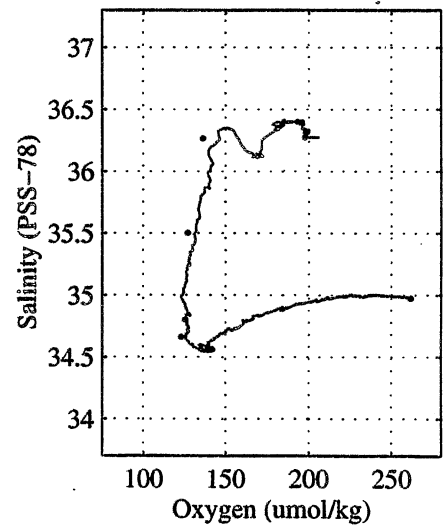
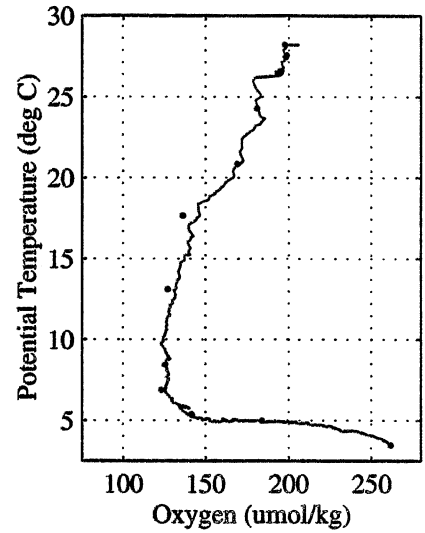
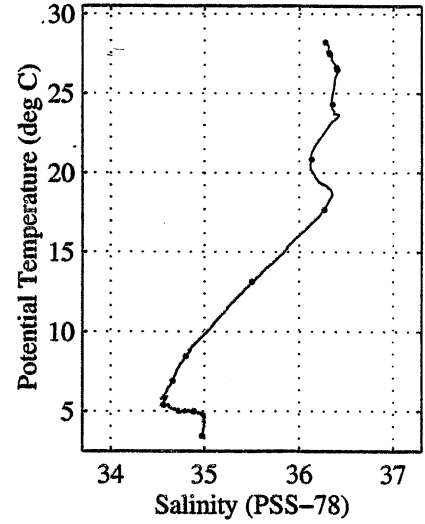
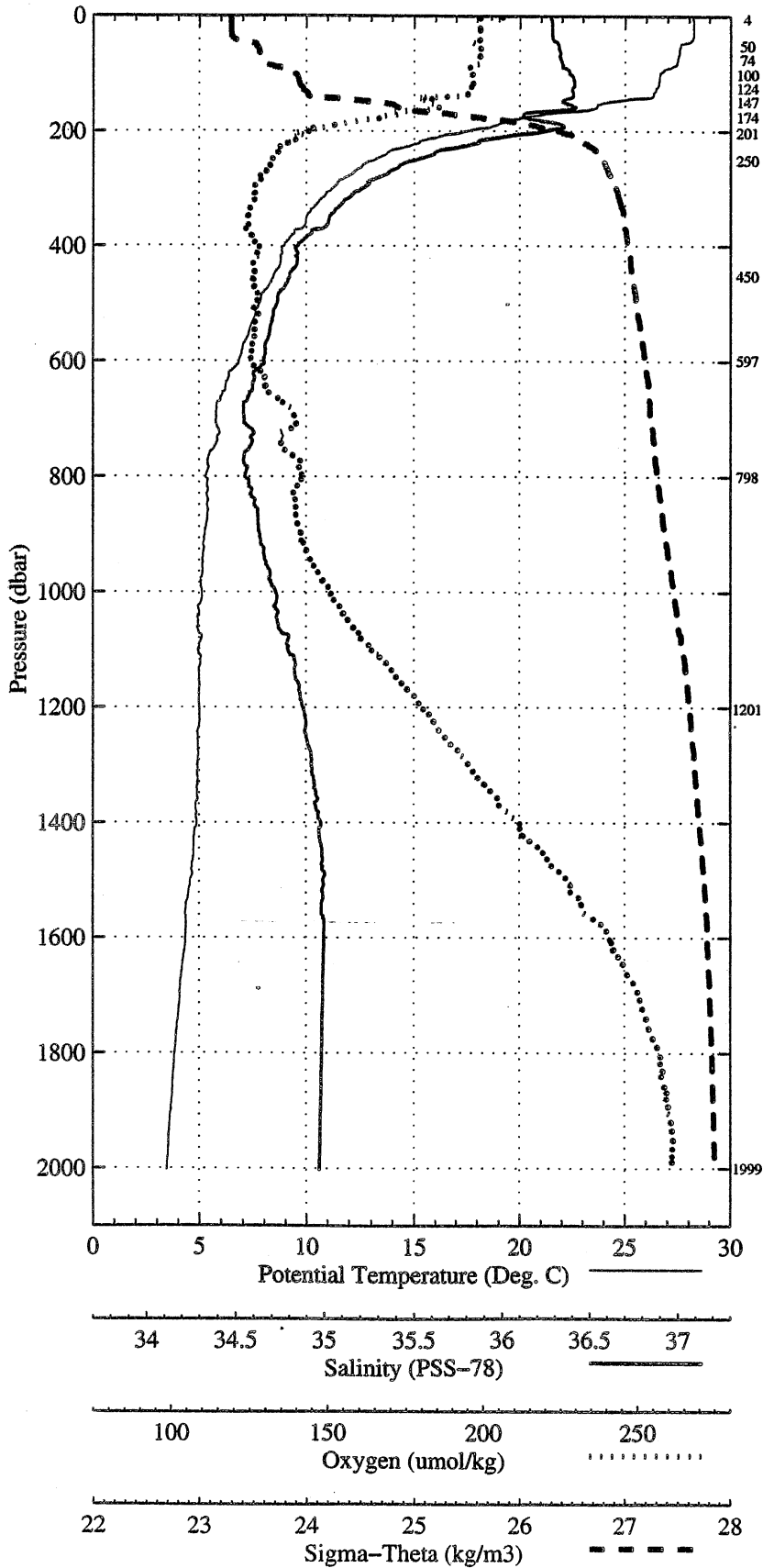
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
1999	1	3.459	3.299	34.973	261.7
1201	2	4.996	4.894	34.890	184.0
799	3	5.401	5.333	34.564	141.5
598	4	6.887	6.831	34.662	123.3
451	5	8.449	8.401	34.801	125.5
250	6	13.126	13.091	35.501	127.0
202	7	17.666	17.631	36.268	136.2
174	8	20.860	20.826	36.127	169.3
148	9	24.294	24.262	36.351	181.2
124	10	26.468	26.440	36.402	193.1
101	11	26.615	26.592	36.393	194.9
75	12	27.451	27.434	36.326	198.0
51	13	27.569	27.557	36.315	198.6
4	14	28.203	28.203	36.276	197.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 35 (98035)

Latitude 6.387 N Longitude 49.379 W

02-Dec-1998 06:01 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 36 (98036)  
 Latitude 6.049N Longitude 49.734W  
 02-Dec-1998 10:11Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.126	28.126	36.310	203.1	0.005	23.341
10	28.128	28.125	36.312	198.5	0.045	23.343
20	28.129	28.124	36.311	198.6	0.091	23.344
30	28.132	28.125	36.312	198.5	0.136	23.345
40	28.108	28.098	36.315	198.3	0.181	23.357
50	27.823	27.811	36.315	199.4	0.226	23.452
60	27.581	27.567	36.327	199.8	0.270	23.541
70	27.458	27.441	36.332	199.1	0.314	23.587
80	27.388	27.370	36.343	199.5	0.357	23.619
90	27.235	27.214	36.357	198.3	0.400	23.680
100	27.045	27.022	36.365	197.0	0.442	23.749
110	26.870	26.845	36.381	197.8	0.484	23.818
120	26.641	26.614	36.382	196.7	0.525	23.893
130	24.433	24.405	36.413	185.5	0.563	24.600
140	23.399	23.370	36.490	185.1	0.595	24.966
150	21.249	21.220	36.166	178.8	0.624	25.331
160	18.969	18.941	35.922	160.8	0.649	25.750
170	14.808	14.783	35.655	150.2	0.667	26.531
180	13.023	12.998	35.386	147.5	0.682	26.698
190	11.795	11.771	35.154	147.9	0.695	26.758
200	11.029	11.005	35.011	152.0	0.708	26.788
250	10.508	10.478	34.952	151.5	0.772	26.837
300	9.771	9.737	34.864	151.0	0.834	26.897
350	9.169	9.131	34.796	152.5	0.894	26.944
400	8.574	8.532	34.739	151.3	0.952	26.994
450	7.801	7.755	34.663	152.7	1.008	27.052
500	7.375	7.326	34.628	151.5	1.062	27.087
550	6.850	6.798	34.605	145.2	1.114	27.143
600	6.658	6.602	34.593	143.0	1.164	27.160
650	6.319	6.260	34.584	138.0	1.213	27.198
700	5.927	5.865	34.550	140.2	1.261	27.222
750	5.928	5.861	34.580	138.0	1.307	27.247
800	5.396	5.328	34.523	144.8	1.353	27.267
900	5.261	5.184	34.576	143.4	1.442	27.326
1000	4.951	4.868	34.642	149.7	1.524	27.416
1500	4.587	4.460	34.996	226.7	1.844	27.747
2000	3.495	3.335	34.974	259.5	2.080	27.848

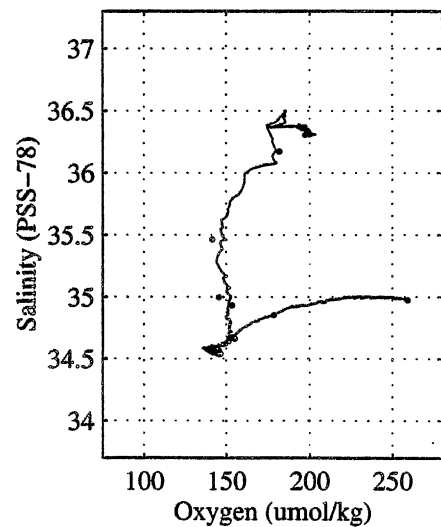
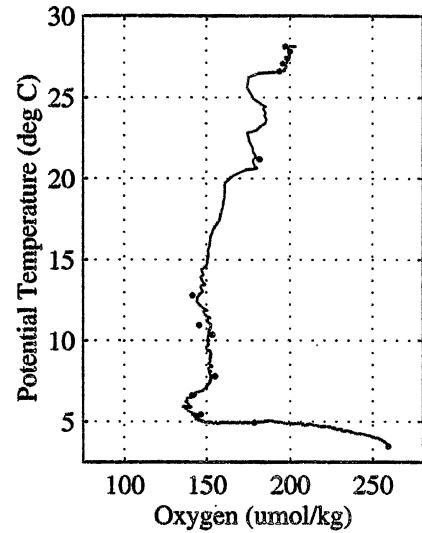
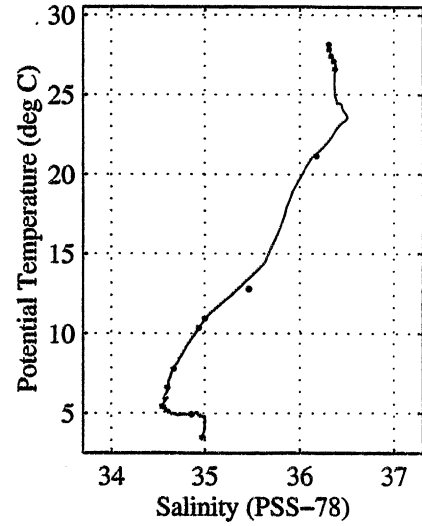
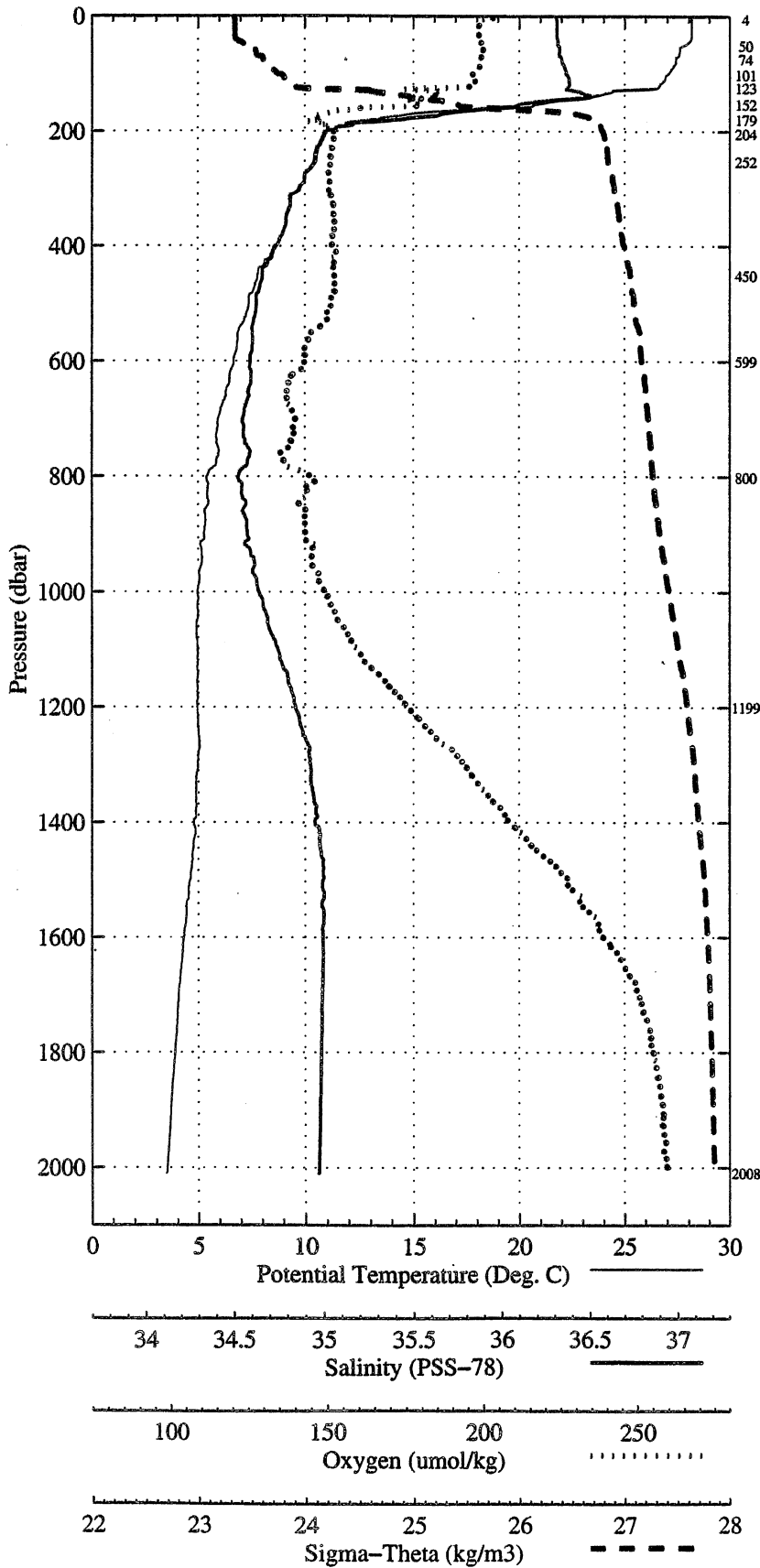
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2009	1	3.479	3.319	34.972	259.1
1199	2	4.947	4.845	34.854	178.4
801	3	5.435	5.367	34.539	146.3
600	4	6.614	6.558	34.592	140.9
451	5	7.791	7.746	34.662	154.8
253	6	10.359	10.329	34.931	153.2
204	7	10.951	10.925	34.998	145.4
179	8	12.784	12.760	35.463	141.4
152	9	21.183	21.153	36.173	181.7
124	10	26.605	26.577	36.375	193.4
101	11	27.069	27.046	36.360	195.4
74	12	27.413	27.396	36.331	198.2
51	13	27.828	27.816	36.312	199.7
5	14	28.128	28.126	36.307	197.1

NBC-1 R/V SEWARD JOHNSON

CTD Station 36 (98036)

Latitude 6.049 N Longitude 49.734 W

02-Dec-1998 10:11 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 37 (98037)**  
**Latitude 5.731N Longitude 50.083W**  
**02-Dec-1998 14:18Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.337	28.336	36.307	193.5	0.005	23.270
10	28.246	28.243	36.306	195.0	0.046	23.300
20	28.195	28.190	36.306	196.4	0.092	23.318
30	28.186	28.179	36.306	197.1	0.137	23.323
40	28.142	28.132	36.313	196.2	0.183	23.344
50	27.859	27.847	36.329	198.9	0.228	23.450
60	27.780	27.766	36.329	199.0	0.272	23.478
70	27.631	27.615	36.330	198.9	0.316	23.529
80	27.532	27.513	36.327	198.2	0.360	23.560
90	27.390	27.369	36.331	196.2	0.403	23.611
100	26.985	26.962	36.354	194.5	0.445	23.760
110	25.764	25.739	36.383	185.0	0.486	24.168
120	24.495	24.470	36.449	181.0	0.522	24.608
130	23.994	23.966	36.479	185.4	0.554	24.781
140	23.488	23.459	36.425	184.6	0.586	24.891
150	20.174	20.146	36.065	139.0	0.615	25.544
160	13.076	13.054	35.294	152.1	0.633	26.615
170	12.584	12.561	35.273	150.2	0.647	26.697
180	11.414	11.391	35.068	150.9	0.661	26.762
190	10.941	10.917	35.006	150.0	0.674	26.800
200	10.793	10.769	34.988	150.6	0.687	26.813
250	10.213	10.183	34.918	149.2	0.749	26.862
300	9.428	9.395	34.825	150.2	0.810	26.922
350	8.797	8.759	34.756	152.1	0.869	26.972
400	8.515	8.473	34.725	153.2	0.926	26.993
450	7.691	7.646	34.644	154.2	0.982	27.053
500	7.534	7.484	34.634	154.0	1.036	27.070
550	7.439	7.385	34.624	154.6	1.090	27.076
600	6.730	6.674	34.583	149.0	1.142	27.142
650	5.947	5.890	34.516	150.6	1.191	27.191
700	5.835	5.774	34.514	152.4	1.239	27.205
750	5.785	5.719	34.549	150.0	1.286	27.239
800	5.661	5.591	34.568	142.7	1.332	27.271
900	5.215	5.140	34.622	144.1	1.418	27.369
1000	4.985	4.901	34.673	150.4	1.497	27.437
1500	4.628	4.501	35.000	227.0	1.818	27.746
2000	3.554	3.393	34.977	258.7	2.055	27.845

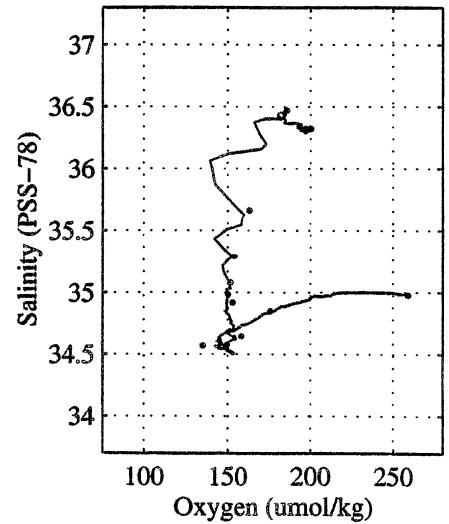
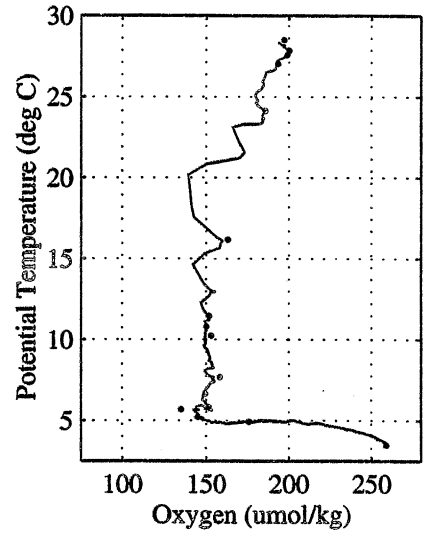
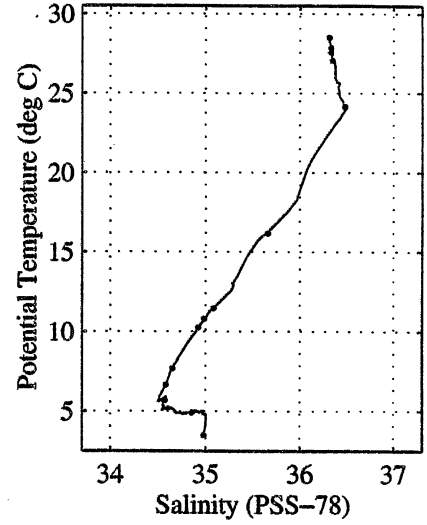
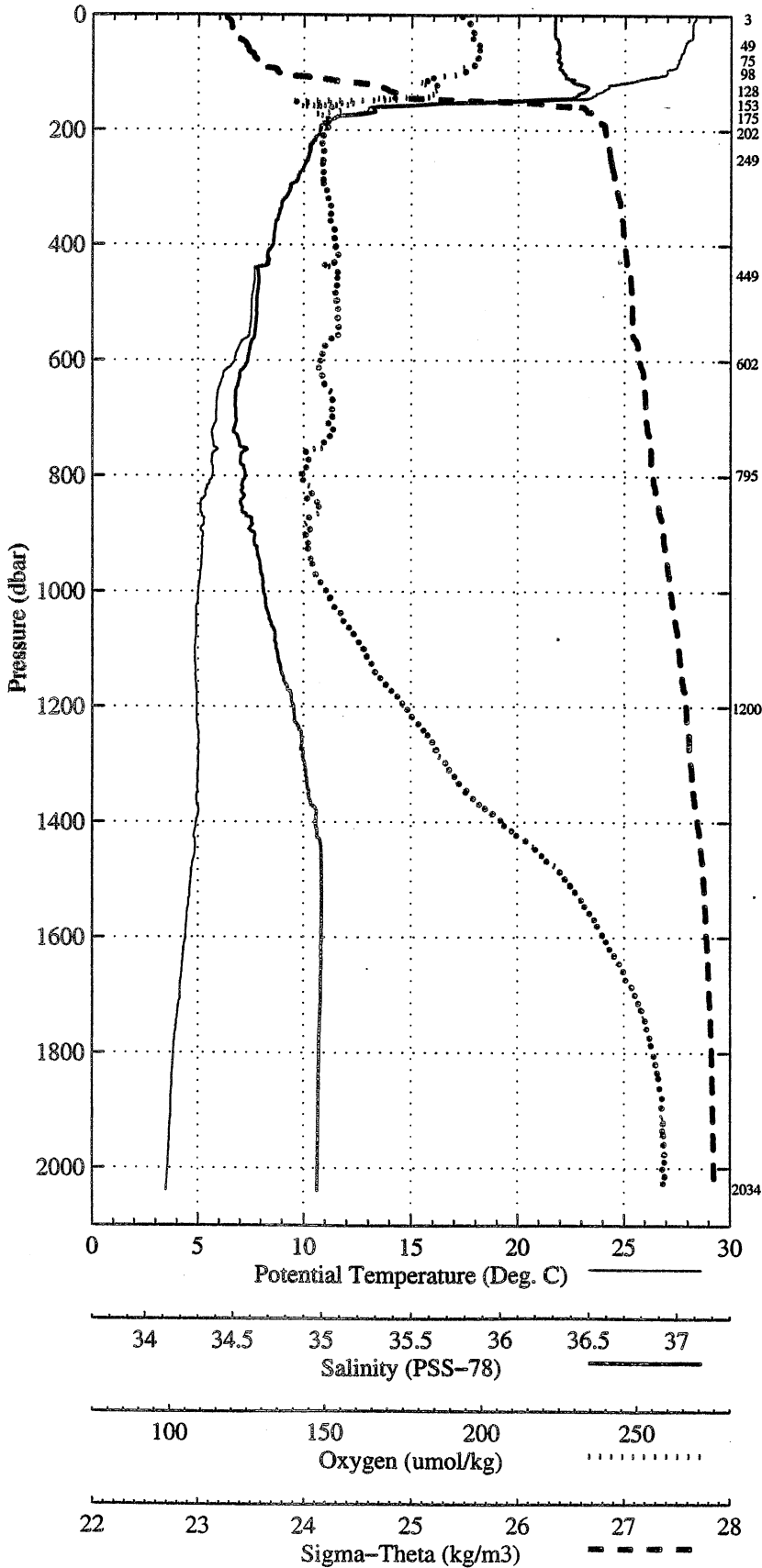
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2035	1	3.483	3.320	34.976	259.1
1200	2	4.921	4.819	34.848	175.9
796	3	5.683	5.614	34.569	134.8
602	4	6.655	6.599	34.578	149.3
450	5	7.680	7.635	34.646	158.1
249	6	10.243	10.214	34.916	152.8
202	7	10.796	10.771	34.982	149.9
176	8	11.462	11.440	35.080	151.5
153	9	16.179	16.154	35.662	163.2
128	10	24.141	24.114	36.471	185.9
99	11	27.053	27.030	36.338	193.3
76	12	27.572	27.554	36.320	198.8
50	13	27.854	27.843	36.323	200.0
4	14	28.494	28.493	36.306	196.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 37 (98037)

Latitude 5.731 N Longitude 50.083 W

02-Dec-1998 14:18 Z





**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 38 (98038)**  
**Latitude 5.520N Longitude 50.309W**  
**02-Dec-1998 17:34Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.314	28.313	36.258	193.5	0.005	23.240
10	28.134	28.132	36.252	195.6	0.046	23.296
20	28.096	28.091	36.269	196.8	0.092	23.323
30	28.077	28.070	36.298	197.4	0.137	23.353
40	28.017	28.008	36.323	197.5	0.183	23.392
50	27.963	27.951	36.330	198.0	0.227	23.417
60	27.961	27.947	36.333	198.3	0.272	23.422
70	27.334	27.318	36.355	194.5	0.316	23.644
80	27.087	27.069	36.352	194.2	0.358	23.723
90	26.271	26.251	36.400	187.9	0.399	24.020
100	25.712	25.689	36.452	187.6	0.437	24.235
110	25.032	25.008	36.500	185.7	0.473	24.482
120	24.626	24.600	36.530	184.2	0.508	24.629
130	21.703	21.678	36.150	161.1	0.539	25.191
140	15.371	15.349	35.739	137.2	0.560	26.470
150	12.956	12.935	35.343	149.6	0.575	26.677
160	12.197	12.176	35.225	148.6	0.588	26.735
170	11.845	11.823	35.159	148.3	0.602	26.751
180	11.297	11.275	35.052	148.4	0.615	26.770
190	11.002	10.978	35.011	148.4	0.628	26.793
200	10.776	10.752	34.985	148.7	0.641	26.813
250	10.114	10.085	34.906	148.3	0.704	26.870
300	9.420	9.387	34.825	148.8	0.764	26.924
350	8.910	8.872	34.766	151.5	0.823	26.962
400	8.514	8.472	34.727	152.7	0.881	26.995
450	7.916	7.870	34.669	153.2	0.936	27.040
500	7.613	7.563	34.640	154.0	0.991	27.063
550	7.468	7.413	34.634	152.1	1.045	27.081
600	6.803	6.747	34.607	145.1	1.097	27.152
650	6.394	6.334	34.596	135.7	1.146	27.198
700	6.062	6.000	34.589	135.4	1.194	27.236
750	5.238	5.175	34.528	145.4	1.239	27.288
800	5.040	4.974	34.535	146.5	1.282	27.317
900	4.746	4.674	34.567	153.0	1.366	27.377
1000	4.742	4.661	34.683	157.6	1.443	27.472
1500	4.616	4.489	35.008	232.3	1.753	27.753
2000	3.574	3.413	34.978	259.2	1.991	27.844

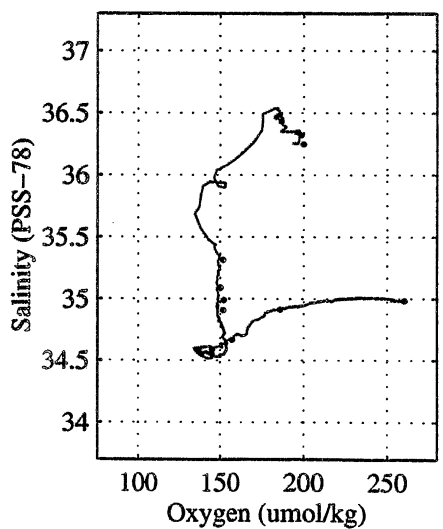
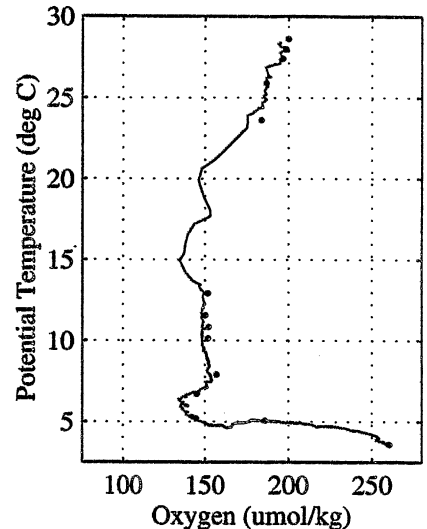
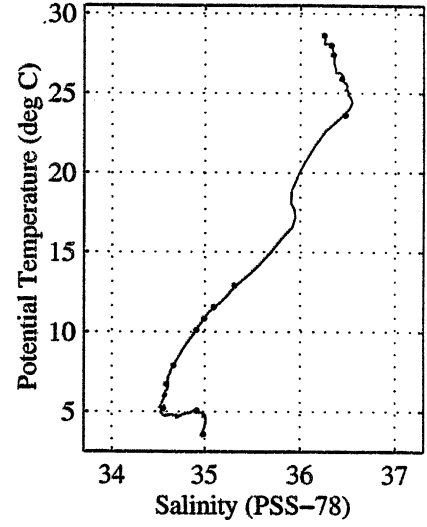
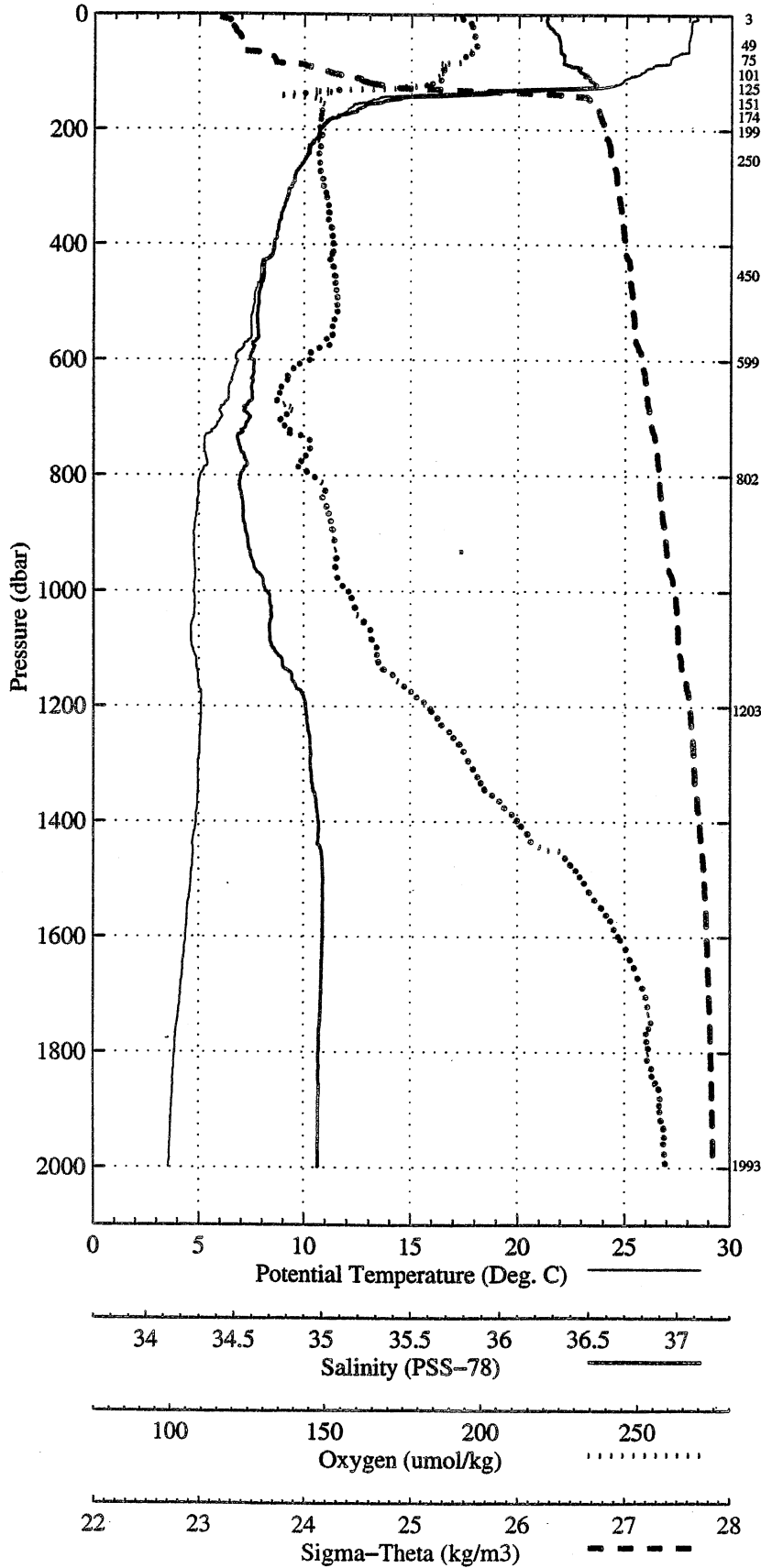
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1994	1	3.586	3.425	34.981	260.3
1204	2	5.082	4.979	34.914	186.0
802	3	5.190	5.123	34.554	144.6
600	4	6.719	6.663	34.590	145.0
450	5	7.906	7.861	34.667	156.9
250	6	10.139	10.110	34.909	151.6
200	7	10.844	10.819	34.988	152.0
174	8	11.554	11.532	35.091	150.0
151	9	12.907	12.886	35.314	151.5
126	10	23.623	23.597	36.469	184.0
101	11	25.907	25.884	36.433	186.8
75	12	27.409	27.391	36.345	196.5
50	13	27.987	27.975	36.322	198.4
4	14	28.622	28.621	36.248	199.8

NBC-1 R/V SEWARD JOHNSON

CTD Station 38 (98038)

Latitude 5.520 N Longitude 50.309 W

02-Dec-1998 17:34 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 39 (98039)**  
**Latitude 5.366N Longitude 50.468W**  
**02-Dec-1998 20:38Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.358	28.358	36.243	196.8	0.005	23.214
10	28.063	28.061	36.260	196.6	0.046	23.326
20	27.990	27.986	36.312	197.8	0.091	23.390
30	27.920	27.913	36.337	198.5	0.136	23.434
40	27.910	27.900	36.345	198.8	0.181	23.445
50	27.895	27.883	36.346	198.9	0.225	23.452
60	27.877	27.862	36.345	198.7	0.270	23.459
70	26.972	26.956	36.365	193.9	0.313	23.768
80	26.741	26.723	36.377	192.9	0.354	23.852
90	25.870	25.850	36.429	189.6	0.394	24.168
100	25.613	25.591	36.442	189.0	0.431	24.258
110	25.547	25.523	36.471	187.4	0.468	24.302
120	23.527	23.502	36.442	171.8	0.503	24.890
130	22.037	22.011	36.276	177.0	0.532	25.193
140	18.115	18.091	35.876	150.3	0.557	25.927
150	12.229	12.209	35.206	146.2	0.572	26.714
160	11.970	11.949	35.192	150.1	0.586	26.752
170	11.736	11.714	35.172	146.2	0.599	26.782
180	11.030	11.008	35.042	147.8	0.612	26.811
190	10.544	10.522	34.962	147.6	0.624	26.836
200	10.434	10.410	34.945	148.4	0.637	26.843
250	10.065	10.036	34.916	148.8	0.698	26.885
300	9.414	9.380	34.830	148.5	0.758	26.929
350	8.879	8.841	34.770	150.4	0.817	26.970
400	8.582	8.539	34.740	150.0	0.874	26.994
450	8.162	8.116	34.700	150.4	0.930	27.028
500	7.803	7.752	34.657	153.4	0.986	27.048
550	7.312	7.258	34.633	148.5	1.040	27.102
600	6.950	6.893	34.640	131.7	1.091	27.158
650	5.868	5.811	34.584	133.7	1.138	27.255
700	5.463	5.404	34.587	135.6	1.183	27.307
750	5.163	5.101	34.570	139.7	1.225	27.330
800	5.004	4.938	34.584	142.9	1.266	27.360
900	4.826	4.752	34.597	149.7	1.346	27.392
1000	4.793	4.710	34.714	158.4	1.421	27.491
1500	4.530	4.404	34.999	233.4	1.718	27.755

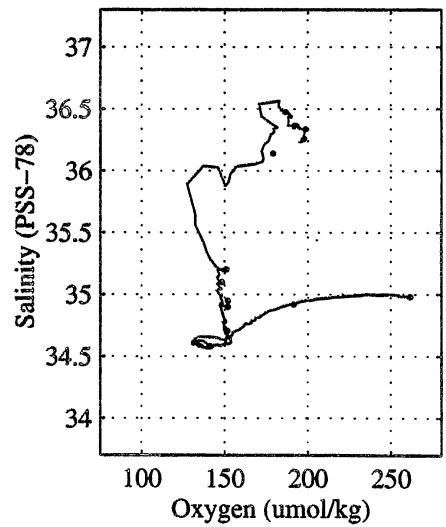
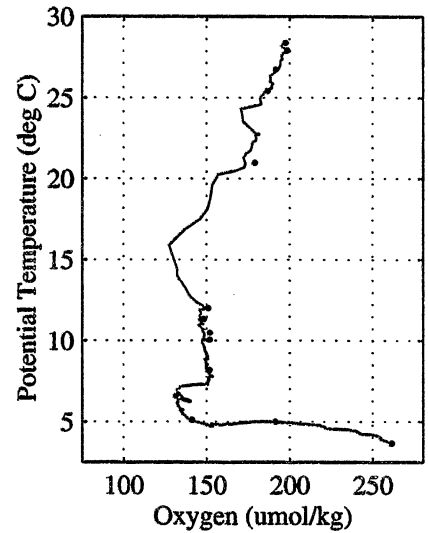
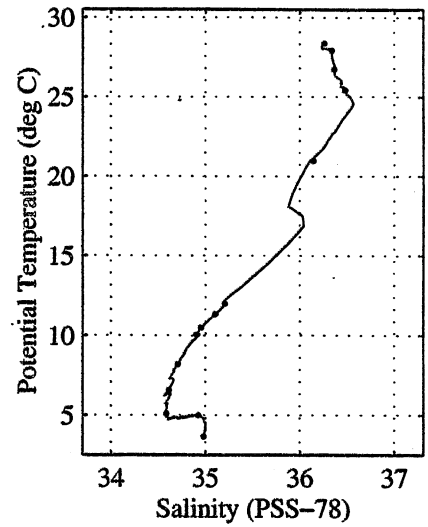
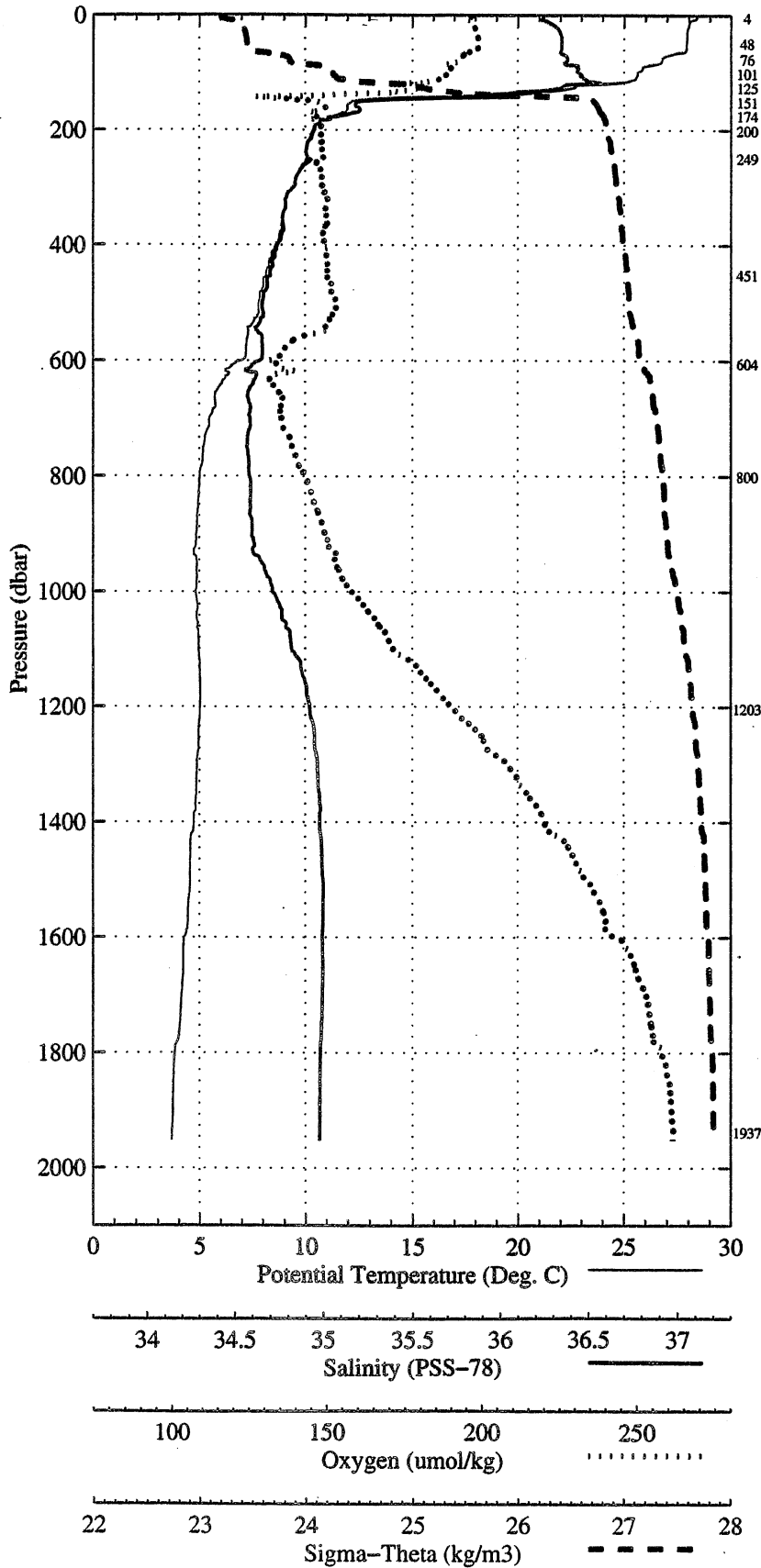
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
1938	1	3.668	3.511	34.979	261.4
1203	2	5.005	4.903	34.919	191.2
800	3	5.117	5.051	34.582	140.9
604	4	6.586	6.530	34.611	131.3
451	5	8.195	8.148	34.704	151.6
249	6	10.065	10.036	34.899	151.7
201	7	10.480	10.456	34.947	151.8
175	8	11.336	11.314	35.099	148.1
151	9	12.001	11.981	35.201	150.8
126	10	20.987	20.963	36.142	178.9
101	11	25.417	25.395	36.475	186.6
76	12	26.738	26.720	36.363	191.5
49	13	27.915	27.903	36.336	198.3
4	14	28.368	28.367	36.261	197.5

NBC-1 R/V SEWARD JOHNSON

CTD Station 39 (98039)

Latitude 5.366 N Longitude 50.468 W

02-Dec-1998 20:38 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 40 (98040)**  
**Latitude 5.279N Longitude 50.571W**  
**02-Dec-1998 23:30Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.143	28.143	36.347	201.0	0.005	23.364
10	28.117	28.114	36.349	197.9	0.045	23.375
20	27.971	27.966	36.347	198.6	0.090	23.423
30	27.920	27.913	36.348	199.2	0.134	23.442
40	27.912	27.903	36.349	199.5	0.179	23.447
50	27.912	27.900	36.349	199.6	0.223	23.449
60	27.883	27.869	36.350	199.5	0.268	23.460
70	26.769	26.753	36.384	192.8	0.311	23.847
80	26.207	26.189	36.438	191.6	0.351	24.067
90	26.113	26.093	36.465	191.6	0.389	24.118
100	25.601	25.579	36.481	185.6	0.427	24.291
110	23.514	23.491	36.374	180.0	0.461	24.841
120	22.165	22.141	36.304	176.2	0.491	25.178
130	20.269	20.244	36.076	165.6	0.517	25.525
140	16.026	16.004	35.920	135.7	0.538	26.461
150	12.373	12.353	35.282	141.6	0.552	26.744
160	11.581	11.561	35.157	143.5	0.565	26.799
170	11.044	11.023	35.071	146.3	0.577	26.831
180	10.854	10.832	35.051	144.7	0.590	26.850
190	10.832	10.809	35.048	144.8	0.602	26.852
200	10.809	10.784	35.043	143.7	0.615	26.853
250	9.892	9.863	34.888	148.2	0.675	26.893
300	9.631	9.597	34.857	149.3	0.736	26.914
350	9.303	9.264	34.819	149.6	0.796	26.940
400	9.070	9.026	34.795	149.7	0.855	26.961

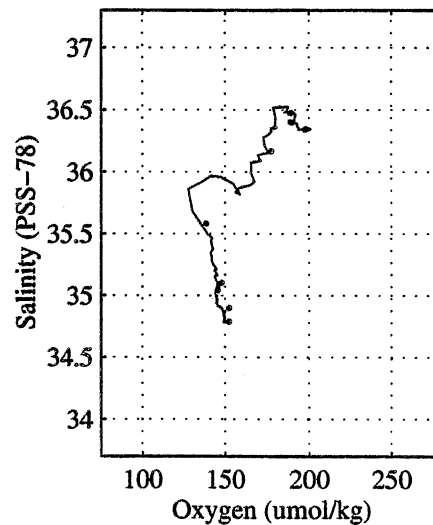
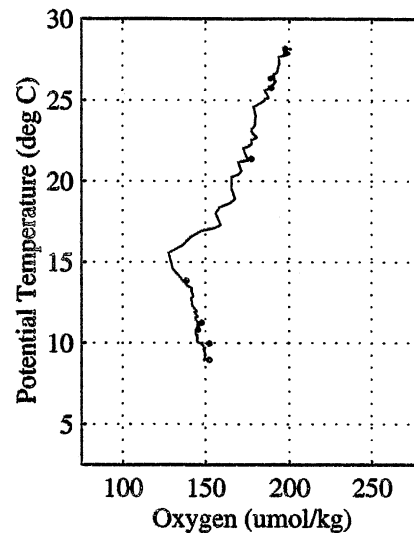
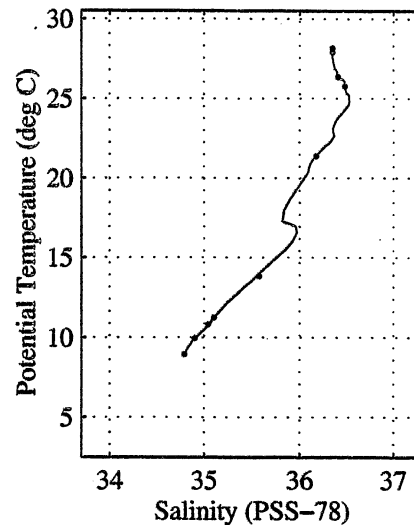
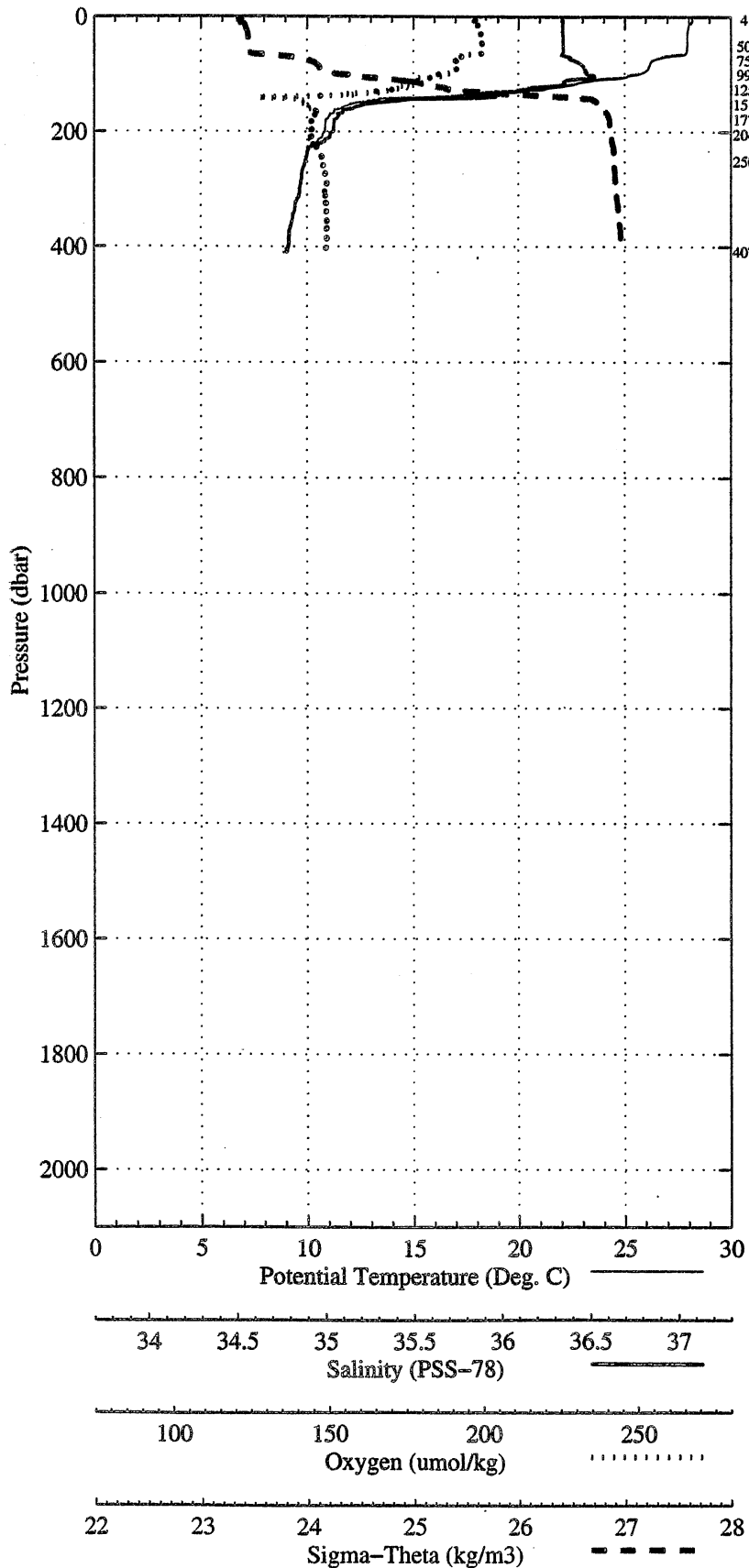
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
407	1	8.956	8.912	34.787	152.2
251	2	9.973	9.944	34.898	152.1
204	3	10.836	10.811	35.041	145.2
178	4	11.260	11.237	35.103	147.5
151	5	13.842	13.821	35.582	138.3
126	6	21.398	21.373	36.167	177.7
100	7	25.767	25.745	36.475	189.2
75	8	26.363	26.346	36.402	189.3
50	9	27.910	27.898	36.344	197.9
4	10	28.172	28.171	36.344	197.5

NBC-1 R/V SEWARD JOHNSON

CTD Station 40 (98040)

Latitude 5.279 N Longitude 50.571 W

02-Dec-1998 23:30 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 41 (98041)  
 Latitude 3.395N Longitude 48.437W  
 04-Dec-1998 00:59Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.863	27.862	36.358	200.2	0.004	23.463
10	27.847	27.845	36.359	198.5	0.044	23.471
20	27.851	27.846	36.359	198.7	0.088	23.471
30	27.854	27.847	36.359	198.7	0.132	23.472
40	27.852	27.843	36.359	198.7	0.177	23.474
50	27.841	27.829	36.358	198.8	0.221	23.478
60	27.790	27.776	36.358	198.6	0.265	23.496
70	27.206	27.190	36.374	198.1	0.309	23.699
80	26.950	26.932	36.412	198.3	0.350	23.812
90	26.862	26.841	36.434	198.4	0.391	23.858
100	26.574	26.551	36.473	197.2	0.431	23.980
110	26.109	26.084	36.498	195.2	0.470	24.147
120	24.945	24.919	36.578	191.2	0.506	24.569
130	22.044	22.019	36.237	185.0	0.537	25.162
140	18.956	18.931	35.879	178.5	0.563	25.718
150	14.330	14.308	35.383	169.6	0.583	26.423
160	12.827	12.805	35.227	164.4	0.598	26.613
170	12.225	12.203	35.163	162.6	0.612	26.681
180	11.747	11.724	35.103	161.7	0.626	26.726
190	11.512	11.488	35.073	161.3	0.639	26.748
200	11.467	11.442	35.069	161.2	0.652	26.754
250	10.167	10.137	34.916	157.7	0.718	26.868
300	9.500	9.466	34.845	155.5	0.778	26.927
350	9.041	9.003	34.804	151.9	0.836	26.971
400	8.818	8.775	34.789	149.9	0.894	26.996
450	7.840	7.794	34.712	144.4	0.948	27.085
500	7.481	7.432	34.692	142.4	1.001	27.122

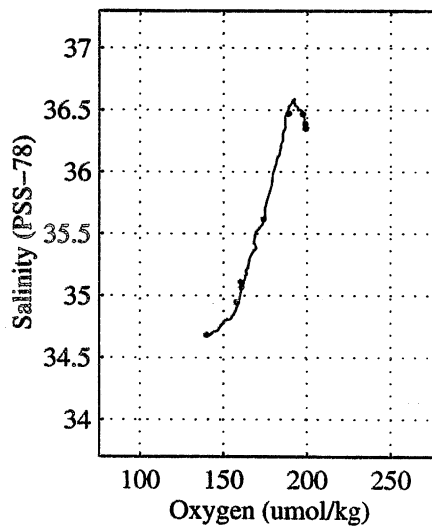
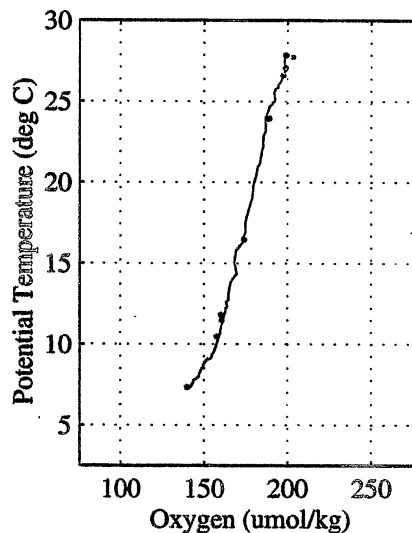
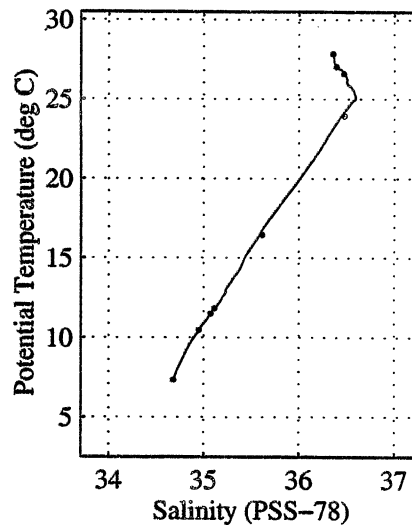
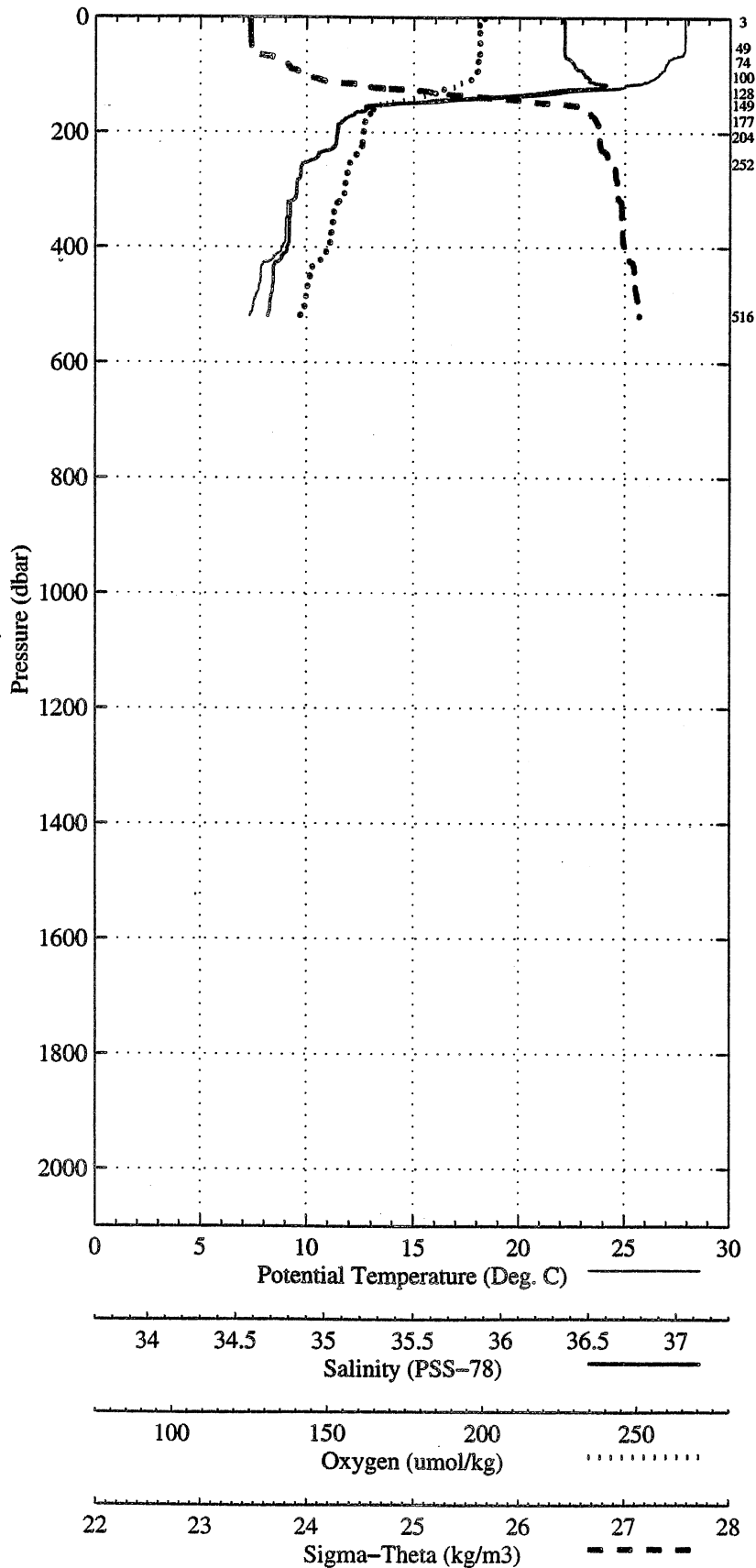
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
517	1	7.346	7.295	34.683	139.9
252	2	10.477	10.447	34.945	157.6
205	3	11.493	11.467	35.068	160.4
177	4	11.828	11.805	35.110	160.0
149	5	16.468	16.444	35.618	173.8
128	6	23.943	23.916	36.473	189.0
100	7	26.602	26.579	36.467	197.3
74	8	27.054	27.037	36.388	198.8
50	9	27.831	27.819	36.351	199.0
4	10	27.843	27.842	36.353	199.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 41 (98041)

Latitude 3.395 N Longitude 48.437 W

04-Dec-1998 00:59 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 42 (98042)  
 Latitude 3.566N Longitude 48.252W  
 04-Dec-1998 03:17Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg-1	SigT kg/m <sup>3</sup>
1	27.881	27.881	36.358	196.5	0.004	23.458
10	27.924	27.922	36.355	196.1	0.044	23.443
20	27.927	27.923	36.355	197.1	0.089	23.444
30	27.929	27.922	36.356	197.4	0.133	23.445
40	27.872	27.862	36.355	197.5	0.178	23.465
50	27.689	27.677	36.359	197.7	0.222	23.529
60	27.385	27.371	36.376	198.3	0.265	23.642
70	27.269	27.252	36.389	198.4	0.307	23.691
80	27.214	27.195	36.396	198.1	0.350	23.715
90	27.194	27.173	36.398	198.1	0.392	23.724
100	27.077	27.054	36.407	197.7	0.434	23.770
110	26.989	26.964	36.418	197.6	0.475	23.808
120	26.625	26.598	36.499	196.6	0.516	23.987
130	24.889	24.861	36.576	192.3	0.552	24.586
140	23.927	23.898	36.546	188.4	0.585	24.853
150	19.172	19.144	35.954	178.7	0.612	25.722
160	14.263	14.240	35.385	171.1	0.631	26.439
170	12.535	12.513	35.181	168.0	0.646	26.635
180	11.745	11.721	35.091	166.0	0.660	26.718
190	11.665	11.641	35.089	165.2	0.674	26.732
200	11.609	11.584	35.084	164.8	0.687	26.738
250	10.032	10.003	34.895	159.8	0.750	26.875
300	9.667	9.633	34.856	158.5	0.811	26.907
350	9.344	9.305	34.822	156.0	0.871	26.936
400	8.614	8.571	34.773	150.3	0.929	27.015
450	8.327	8.280	34.754	143.1	0.985	27.046
500	8.114	8.062	34.738	139.7	1.039	27.066
550	7.448	7.394	34.696	134.2	1.092	27.131
600	6.826	6.769	34.648	132.6	1.142	27.181
650	6.338	6.278	34.619	137.4	1.190	27.223
700	5.631	5.571	34.576	141.9	1.235	27.279
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	

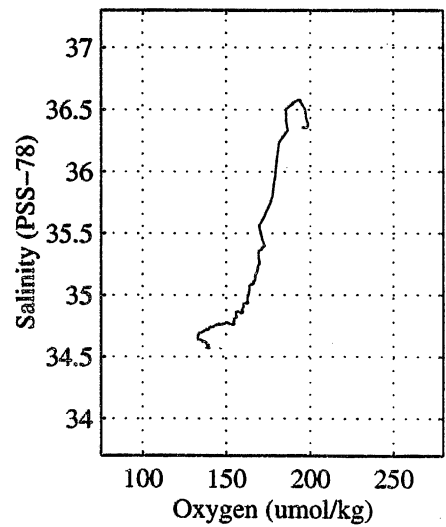
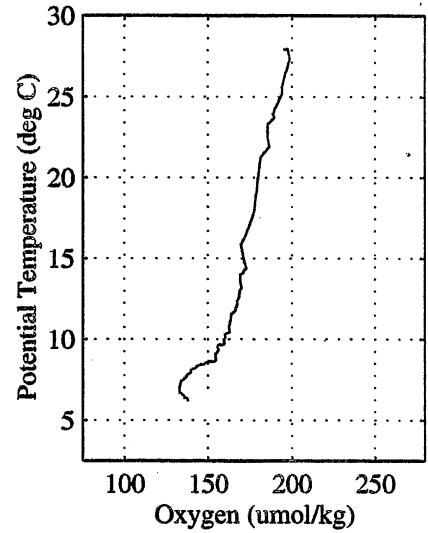
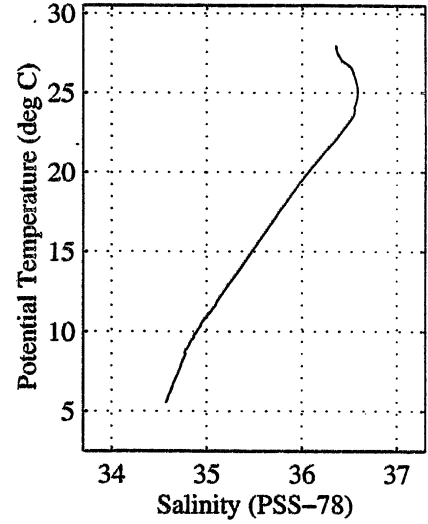
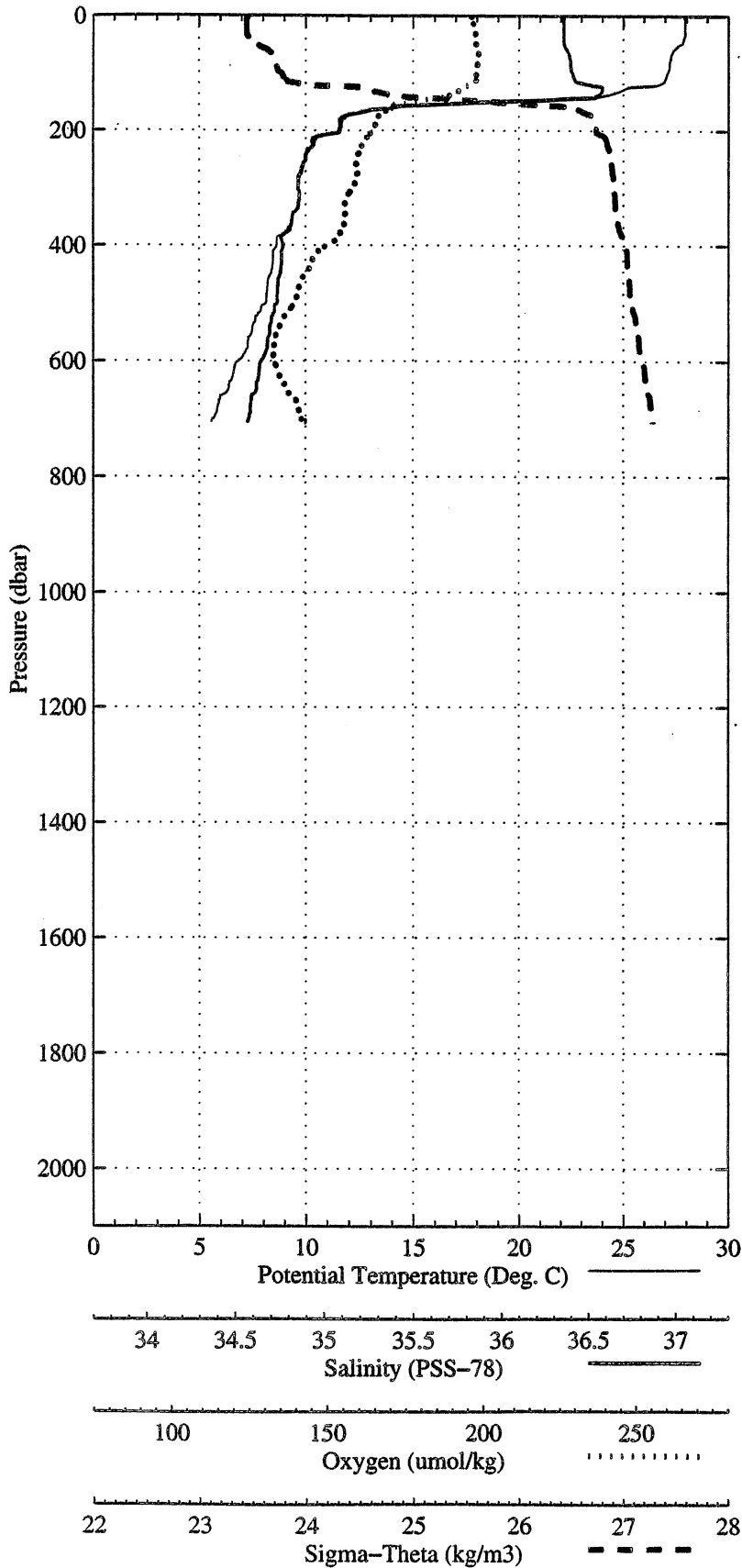
No bottle data available for this station.

NBC-1 R/V SEWARD JOHNSON

CTD Station 42 (98042)

Latitude 3.566 N Longitude 48.252 W

04-Dec-1998 03:17 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 43 (98043)  
 Latitude 3.783N Longitude 48.033W  
 04-Dec-1998 07:50Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg-1	SigT kg/m <sup>3</sup>
1	27.965	27.964	36.308	201.3	0.004	23.392
10	27.985	27.982	36.308	199.3	0.045	23.387
20	27.987	27.982	36.309	199.5	0.090	23.389
30	27.988	27.981	36.309	199.5	0.135	23.390
40	27.993	27.984	36.311	199.4	0.180	23.392
50	27.994	27.982	36.312	199.5	0.225	23.394
60	27.797	27.783	36.354	199.7	0.269	23.491
70	27.702	27.685	36.360	199.8	0.313	23.528
80	27.634	27.615	36.362	199.9	0.357	23.553
90	27.608	27.587	36.363	199.9	0.401	23.564
100	27.555	27.532	36.365	199.8	0.444	23.584
110	27.525	27.499	36.368	200.0	0.488	23.598
120	27.508	27.480	36.368	199.8	0.531	23.605
130	25.150	25.121	36.514	192.1	0.571	24.460
140	23.893	23.863	36.544	189.9	0.604	24.862
150	22.887	22.856	36.495	188.0	0.634	25.120
160	14.950	14.925	35.468	168.4	0.655	26.356
170	12.382	12.360	35.149	165.1	0.671	26.641
180	11.271	11.248	35.023	163.1	0.684	26.752
190	11.174	11.151	35.023	162.9	0.698	26.770
200	10.992	10.967	35.002	161.6	0.711	26.788
250	10.241	10.212	34.916	160.1	0.774	26.855
300	9.403	9.369	34.831	155.2	0.835	26.932
350	8.824	8.786	34.775	154.1	0.894	26.983
400	8.769	8.726	34.782	149.9	0.951	26.998
450	8.466	8.418	34.770	144.2	1.007	27.037
500	7.817	7.766	34.710	136.3	1.062	27.089
550	7.203	7.150	34.675	131.5	1.113	27.149
600	6.552	6.497	34.638	128.7	1.162	27.209
650	5.988	5.930	34.595	132.1	1.208	27.249
700	5.725	5.664	34.582	135.6	1.254	27.272
750	5.381	5.318	34.557	144.1	1.298	27.295
800	5.274	5.206	34.570	141.8	1.341	27.318
900	4.889	4.815	34.615	151.0	1.423	27.400
1000	4.846	4.763	34.733	161.9	1.498	27.500

Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
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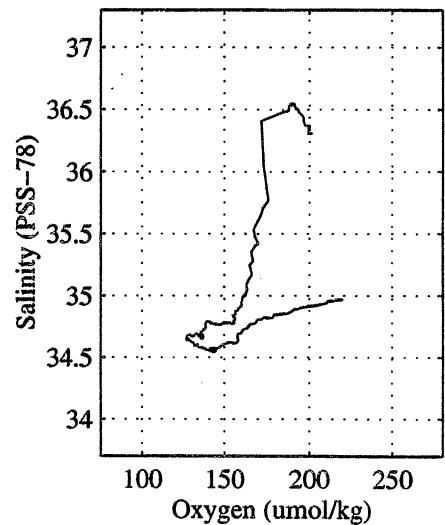
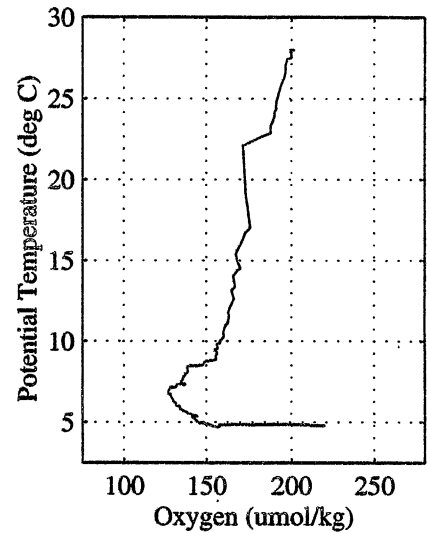
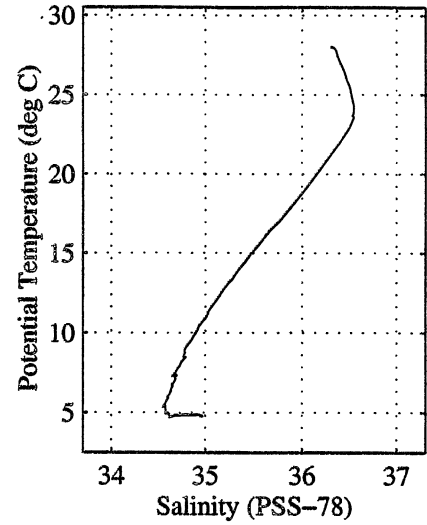
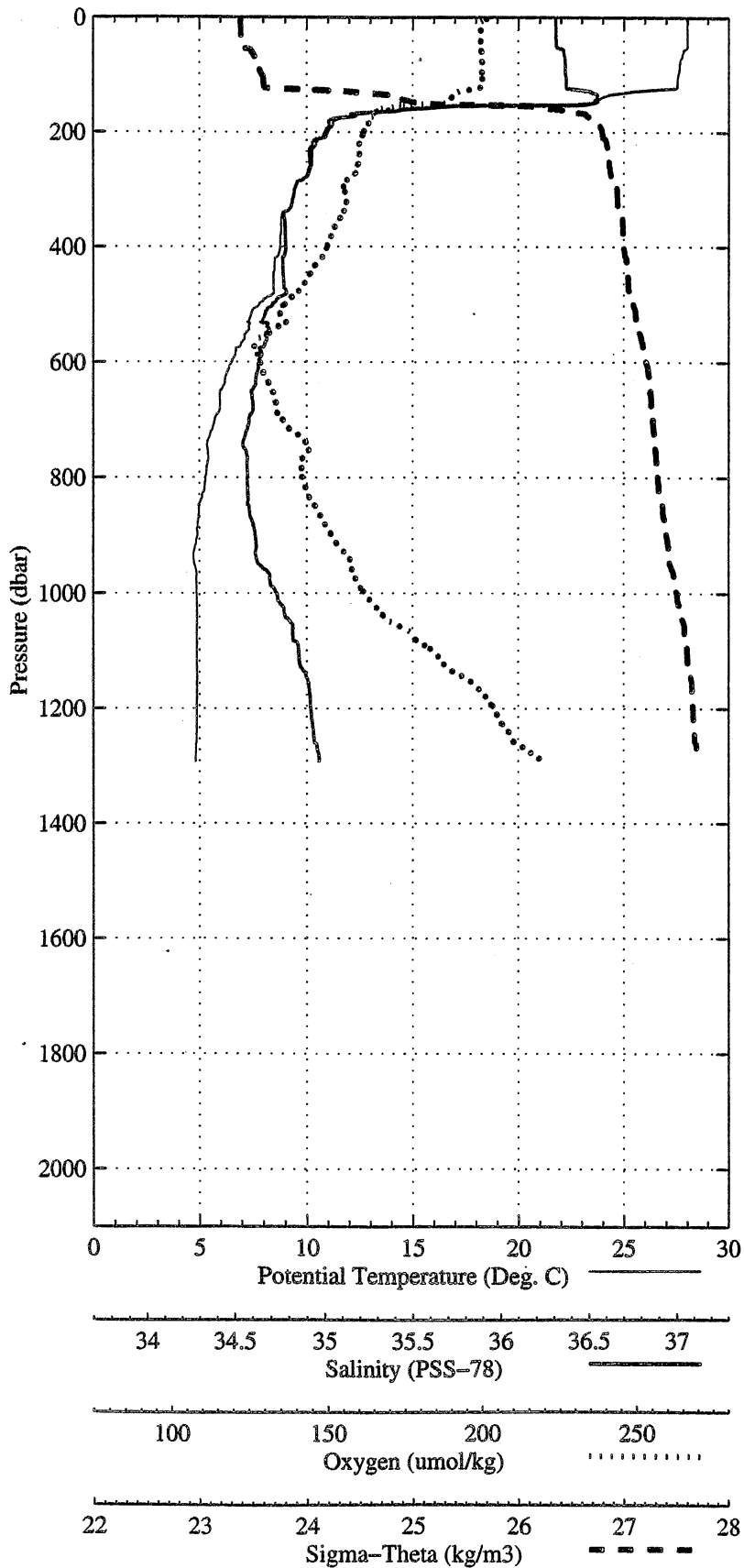
No bottle data for this station.

NBC-1 R/V SEWARD JOHNSON

CTD Station 43 (98043)

Latitude 3.783 N Longitude 48.033 W

04-Dec-1998 07:50 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 44 (98044)  
 Latitude 4.015N Longitude 47.772W  
 04-Dec-1998 10:49Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg-1}$	SigT $\text{kg/m}^3$
1	28.000	28.000	36.305	190.6	0.004	23.379
10	28.013	28.011	36.308	197.6	0.045	23.378
20	28.013	28.008	36.309	197.9	0.090	23.381
30	28.016	28.009	36.309	198.0	0.135	23.381
40	28.009	28.000	36.313	198.1	0.180	23.388
50	28.003	27.992	36.316	198.1	0.225	23.394
60	27.989	27.975	36.324	198.1	0.270	23.406
70	27.988	27.972	36.325	198.2	0.315	23.408
80	27.983	27.965	36.327	198.2	0.360	23.413
90	27.986	27.965	36.328	198.2	0.405	23.414
100	27.982	27.958	36.328	198.0	0.451	23.418
110	27.152	27.126	36.350	195.2	0.495	23.704
120	26.566	26.539	36.429	194.5	0.536	23.952
130	25.816	25.787	36.496	194.3	0.574	24.240
140	24.022	23.992	36.526	190.2	0.609	24.810
150	23.261	23.229	36.544	189.0	0.640	25.049
160	17.765	17.737	35.865	174.7	0.666	26.007
170	12.737	12.714	35.202	165.2	0.682	26.612
180	12.321	12.297	35.170	164.9	0.697	26.669
190	12.202	12.177	35.157	164.6	0.711	26.682
200	11.983	11.957	35.126	164.3	0.725	26.701
250	10.061	10.032	34.891	158.8	0.791	26.867
300	9.671	9.637	34.854	157.8	0.852	26.906
350	9.462	9.422	34.865	154.8	0.912	26.951
400	9.242	9.197	34.913	130.3	0.969	27.026
450	8.133	8.087	34.748	137.0	1.024	27.070
500	7.683	7.633	34.700	135.2	1.077	27.100
550	7.310	7.256	34.688	128.5	1.129	27.145
600	6.894	6.837	34.648	125.1	1.179	27.172
650	6.532	6.471	34.627	128.3	1.228	27.204
700	5.728	5.667	34.571	134.1	1.274	27.263
750	5.173	5.111	34.579	136.8	1.318	27.336
800	4.967	4.901	34.587	144.8	1.358	27.367
900	4.820	4.747	34.624	152.3	1.436	27.414
1000	4.884	4.801	34.714	160.0	1.511	27.480
1500	4.425	4.299	34.996	241.5	1.798	27.765
2000	3.593	3.431	34.976	264.3	2.039	27.841
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	

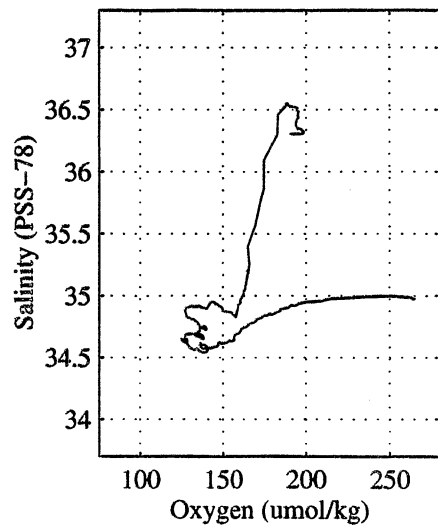
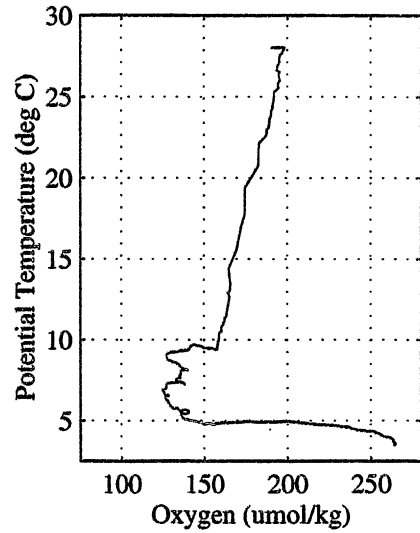
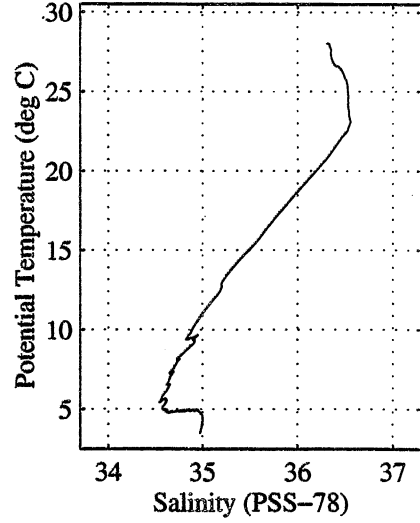
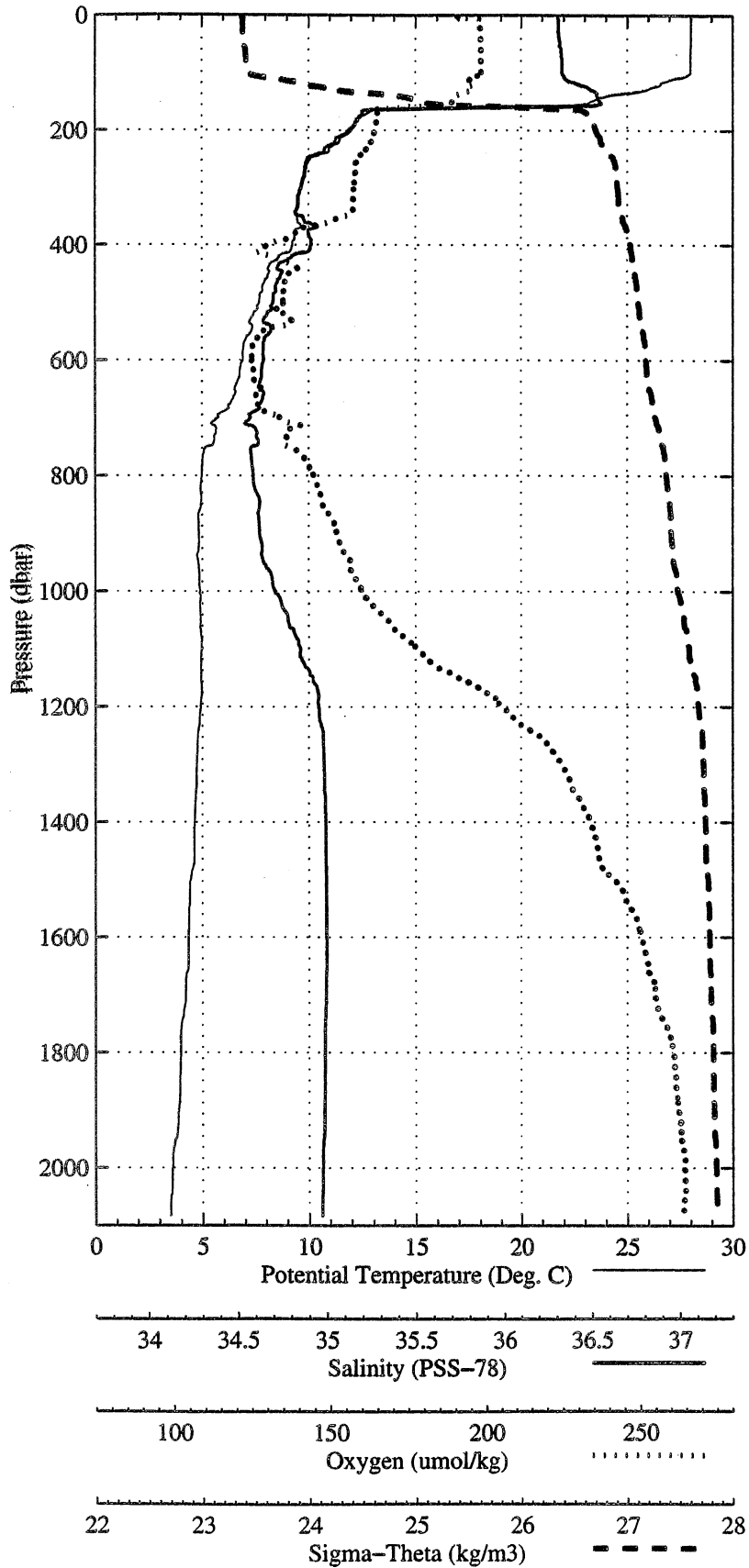
No bottle data for this station.

NBC-1 R/V SEWARD JOHNSON

CTD Station 44 (98044)

Latitude 4.015 N Longitude 47.772 W

04-Dec-1998 10:49 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 45 (98045)  
 Latitude 4.277N Longitude 47.486W  
 04-Dec-1998 14:23Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg-1	SigT kg/m <sup>3</sup>
1	28.151	28.151	36.306	186.8	0.005	23.330
10	28.139	28.136	36.307	192.2	0.045	23.336
20	28.121	28.117	36.306	193.3	0.091	23.343
30	28.118	28.111	36.306	193.8	0.136	23.345
40	28.113	28.103	36.307	194.3	0.182	23.349
50	28.112	28.100	36.307	194.4	0.227	23.351
60	28.108	28.094	36.308	194.6	0.273	23.355
70	27.988	27.971	36.330	194.5	0.318	23.412
80	27.934	27.915	36.333	194.5	0.363	23.434
90	27.601	27.580	36.333	194.1	0.407	23.544
100	26.630	26.607	36.337	190.0	0.450	23.860
110	25.141	25.117	36.525	188.4	0.488	24.468
120	24.995	24.969	36.545	190.6	0.522	24.529
130	24.675	24.647	36.540	190.0	0.557	24.624
140	24.032	24.003	36.522	188.3	0.589	24.804
150	22.909	22.878	36.503	185.7	0.620	25.120
160	15.897	15.872	35.600	166.7	0.644	26.246
170	12.421	12.398	35.168	161.5	0.659	26.648
180	12.243	12.219	35.162	161.6	0.673	26.678
190	12.121	12.096	35.146	161.8	0.687	26.689
200	11.981	11.955	35.126	161.8	0.701	26.701
250	10.664	10.634	34.962	157.9	0.768	26.817
300	10.167	10.132	34.907	156.9	0.831	26.864
350	9.682	9.642	34.927	139.9	0.892	26.963
400	8.539	8.496	34.787	137.0	0.948	27.038
450	7.909	7.863	34.724	131.0	1.002	27.084
500	7.421	7.372	34.682	126.1	1.055	27.123
550	7.229	7.176	34.678	122.3	1.105	27.148
600	6.779	6.722	34.660	121.1	1.155	27.197
650	6.074	6.016	34.600	129.8	1.202	27.243
700	6.005	5.942	34.614	131.3	1.248	27.263
750	5.490	5.426	34.570	134.7	1.292	27.292
800	5.239	5.172	34.578	139.4	1.336	27.329
900	4.818	4.745	34.630	148.8	1.417	27.419
1000	4.828	4.746	34.694	156.1	1.492	27.471
1500	4.492	4.367	35.003	235.6	1.793	27.763
2000	3.578	3.416	34.975	260.3	2.024	27.841
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	

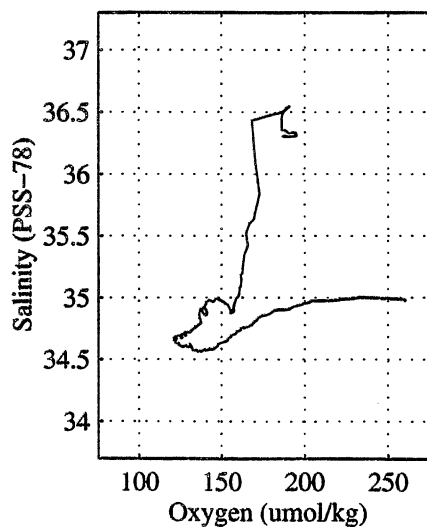
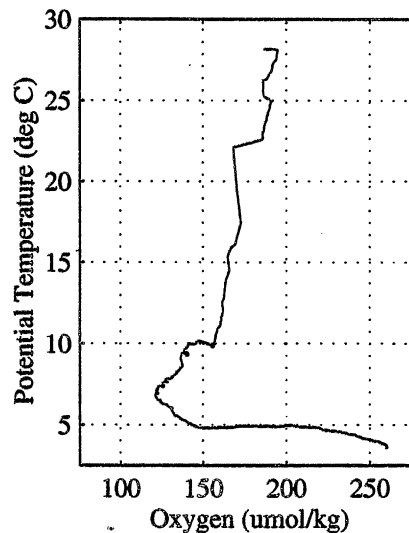
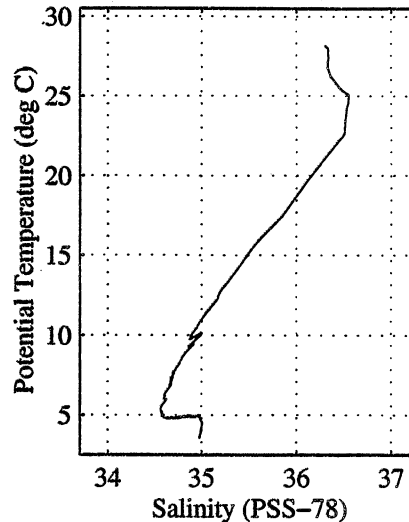
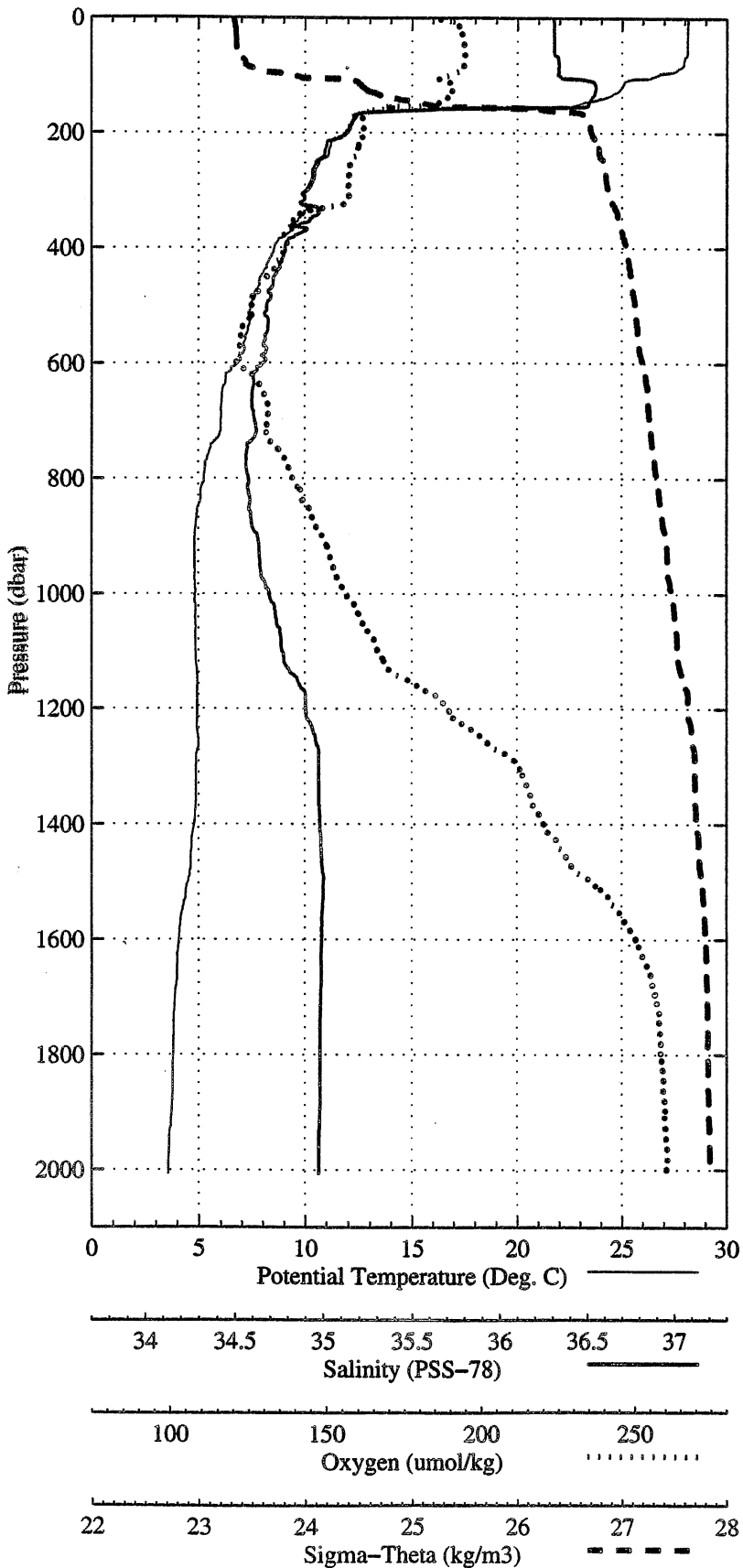
No bottle data for this station.

NBC-1 R/V SEWARD JOHNSON

CTD Station 45 (98045)

Latitude 4.277 N Longitude 47.486 W

04-Dec-1998 14:23 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 46 (98046)  
 Latitude 6.000N Longitude 47.500W  
 05-Dec-1998 02:21Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.019	28.019	36.378	200.1	0.004	23.427
10	28.107	28.105	36.380	197.9	0.045	23.401
20	28.103	28.098	36.380	197.8	0.089	23.404
30	28.070	28.062	36.379	197.8	0.134	23.416
40	28.036	28.027	36.380	197.9	0.179	23.429
50	28.029	28.017	36.380	197.9	0.224	23.433
60	28.018	28.004	36.379	197.6	0.268	23.437
70	26.643	26.627	36.240	190.2	0.312	23.778
80	24.406	24.389	36.295	180.0	0.349	24.513
90	23.606	23.587	36.697	166.0	0.381	25.057
100	22.117	22.097	36.743	155.3	0.408	25.522
110	17.610	17.591	35.865	146.0	0.431	26.041
120	13.902	13.885	35.416	143.8	0.447	26.538
130	12.762	12.744	35.255	149.6	0.461	26.645
140	12.370	12.351	35.196	151.2	0.476	26.677
150	12.019	12.000	35.147	151.6	0.489	26.708
160	11.703	11.683	35.108	152.1	0.503	26.738
170	11.544	11.522	35.086	151.8	0.516	26.751
180	11.443	11.420	35.071	152.2	0.530	26.758
190	11.306	11.282	35.053	152.4	0.543	26.770
200	11.156	11.131	35.032	152.9	0.556	26.782
250	10.434	10.404	34.949	152.1	0.620	26.848
300	9.897	9.862	34.899	149.6	0.682	26.903
350	9.236	9.197	34.853	135.9	0.741	26.978
400	8.622	8.579	34.782	133.3	0.797	27.021
450	8.046	8.000	34.737	123.4	0.852	27.075
500	7.321	7.272	34.670	124.5	0.904	27.128
550	6.874	6.822	34.648	125.8	0.954	27.173
600	6.525	6.470	34.624	126.3	1.002	27.202
650	6.077	6.019	34.596	129.9	1.049	27.238
700	5.690	5.630	34.560	136.0	1.095	27.259
750	5.638	5.573	34.602	136.2	1.139	27.300
800	5.415	5.347	34.607	137.9	1.182	27.331
900	4.955	4.880	34.632	146.9	1.263	27.406
1000	4.792	4.710	34.682	156.1	1.339	27.466
1500	4.548	4.422	34.985	229.5	1.655	27.743
2000	3.395	3.236	34.970	263.6	1.888	27.854

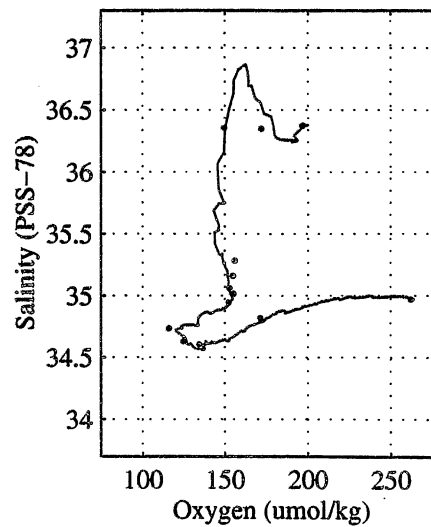
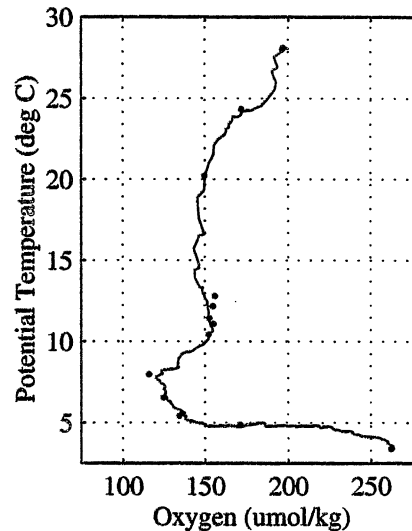
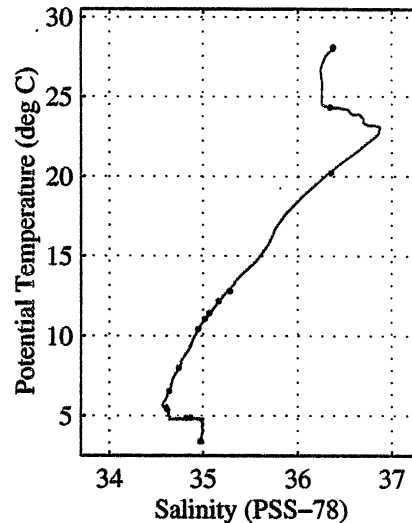
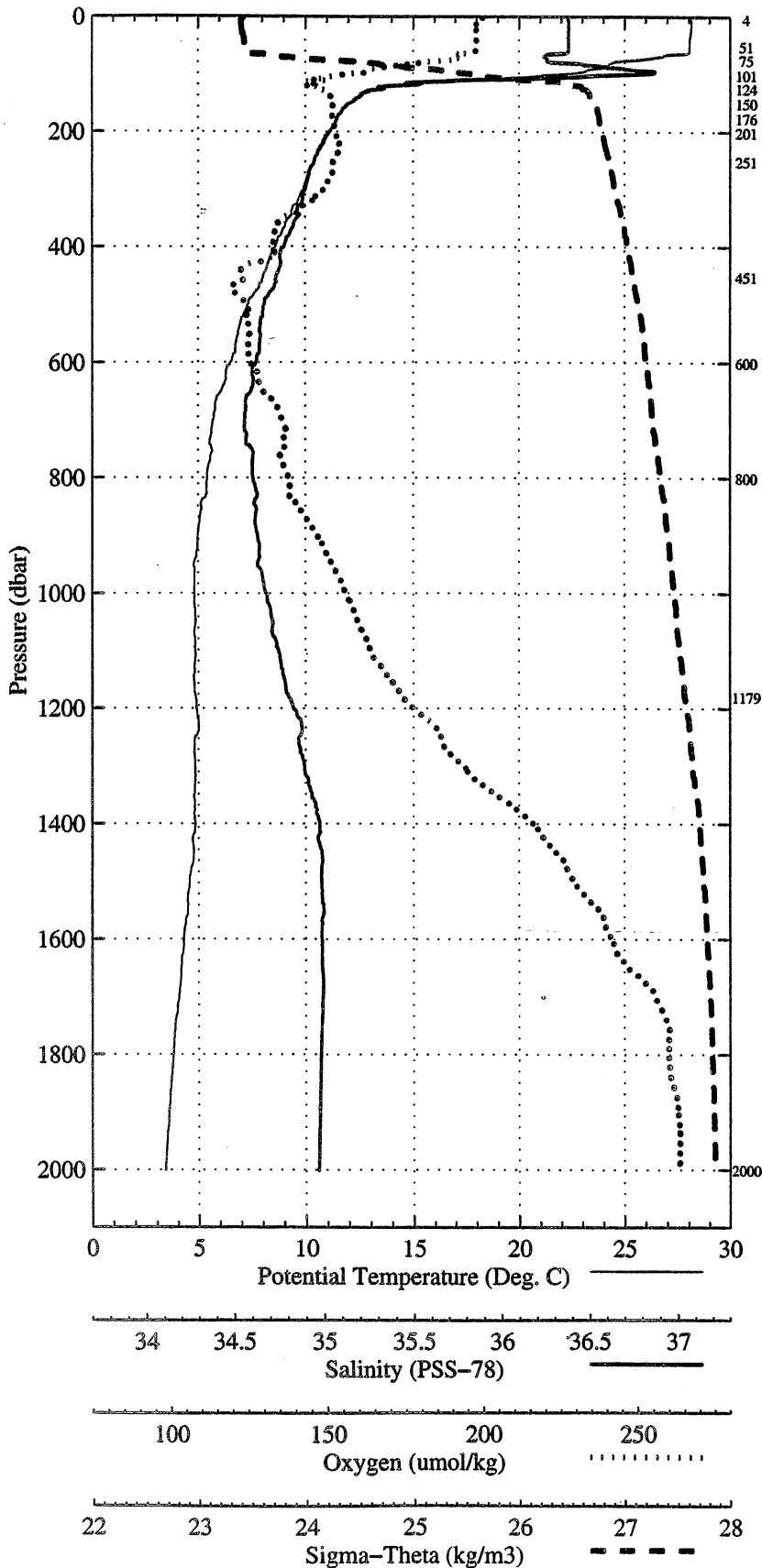
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2000	1	3.393	3.235	34.969	262.1
1180	2	4.876	4.777	34.818	171.2
800	3	5.412	5.344	34.605	134.1
601	4	6.558	6.503	34.630	124.2
452	5	7.995	7.949	34.735	115.4
251	6	10.431	10.401	34.944	152.0
201	7	11.076	11.051	35.017	154.8
176	8	11.424	11.402	35.061	152.5
150	9	12.172	12.152	35.160	154.6
125	10	12.805	12.788	35.283	155.8
102	11	20.219	20.200	36.358	149.5
76	12	24.329	24.313	36.348	171.8
52	13	28.027	28.015	36.373	196.2
4	14	28.115	28.114	36.376	196.8

NBC-1 R/V SEWARD JOHNSON

CTD Station 46 (98046)

Latitude 6.000 N Longitude 47.500 W

05-Dec-1998 02:21 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 47 (98047)  
 Latitude 6.049N Longitude 47.995W  
 05-Dec-1998 06:38Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^2/\text{kg}$	SigT $\text{kg/m}^3$
1	28.146	28.146	36.376	198.5	0.004	23.384
10	28.127	28.124	36.372	198.3	0.045	23.389
20	28.119	28.114	36.372	198.4	0.090	23.393
30	28.088	28.081	36.372	197.8	0.135	23.405
40	28.080	28.070	36.373	197.6	0.180	23.410
50	28.072	28.061	36.373	197.3	0.224	23.414
60	28.065	28.050	36.374	197.2	0.269	23.418
70	27.049	27.032	36.251	194.2	0.314	23.657
80	26.338	26.320	36.299	188.2	0.355	23.921
90	25.269	25.250	36.419	179.4	0.393	24.346
100	23.726	23.705	36.399	164.4	0.427	24.796
110	23.130	23.108	36.506	162.4	0.458	25.053
120	22.161	22.137	36.795	155.0	0.484	25.552
130	20.253	20.229	36.531	149.3	0.507	25.877
140	15.372	15.350	35.694	141.3	0.526	26.435
150	13.056	13.035	35.306	147.4	0.541	26.627
160	12.198	12.176	35.173	150.0	0.555	26.695
170	11.939	11.917	35.138	150.7	0.569	26.717
180	11.678	11.655	35.105	151.7	0.582	26.741
190	11.547	11.523	35.087	152.7	0.596	26.752
200	11.368	11.343	35.061	152.7	0.609	26.766
250	10.630	10.600	34.970	152.5	0.674	26.830
300	9.965	9.930	34.901	151.3	0.736	26.893
350	9.140	9.101	34.834	140.0	0.796	26.979
400	8.170	8.129	34.738	130.3	0.851	27.055
450	7.767	7.721	34.719	125.8	0.904	27.101
500	7.143	7.094	34.656	125.7	0.955	27.142
550	6.491	6.440	34.584	133.2	1.005	27.174
600	6.226	6.172	34.557	139.6	1.053	27.188
650	6.031	5.974	34.543	142.9	1.101	27.202
700	5.944	5.882	34.563	137.9	1.149	27.230
750	5.602	5.538	34.563	135.2	1.195	27.273
800	5.209	5.142	34.549	141.4	1.239	27.309
900	4.957	4.883	34.581	146.6	1.323	27.365
1000	4.826	4.744	34.620	152.6	1.403	27.412
1500	4.736	4.607	34.995	227.4	1.732	27.730
2000	3.543	3.383	34.975	264.6	1.971	27.845

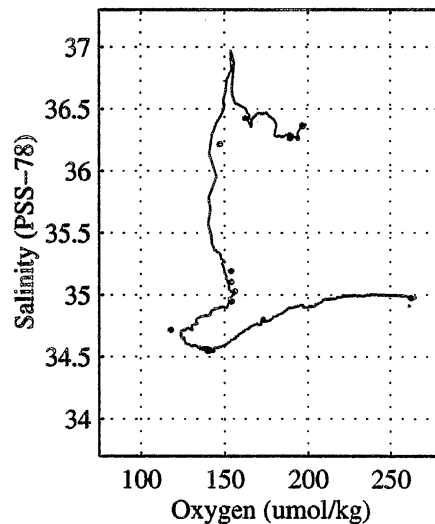
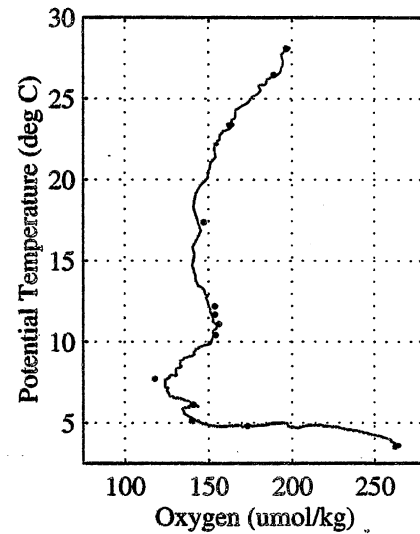
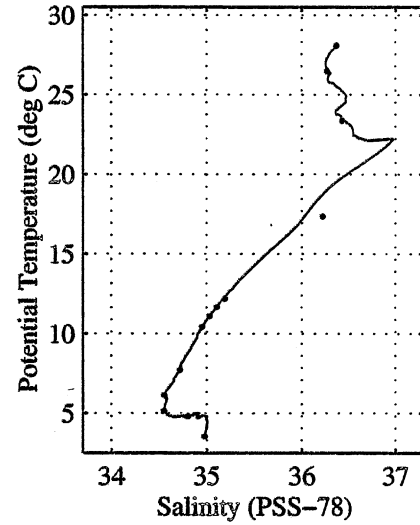
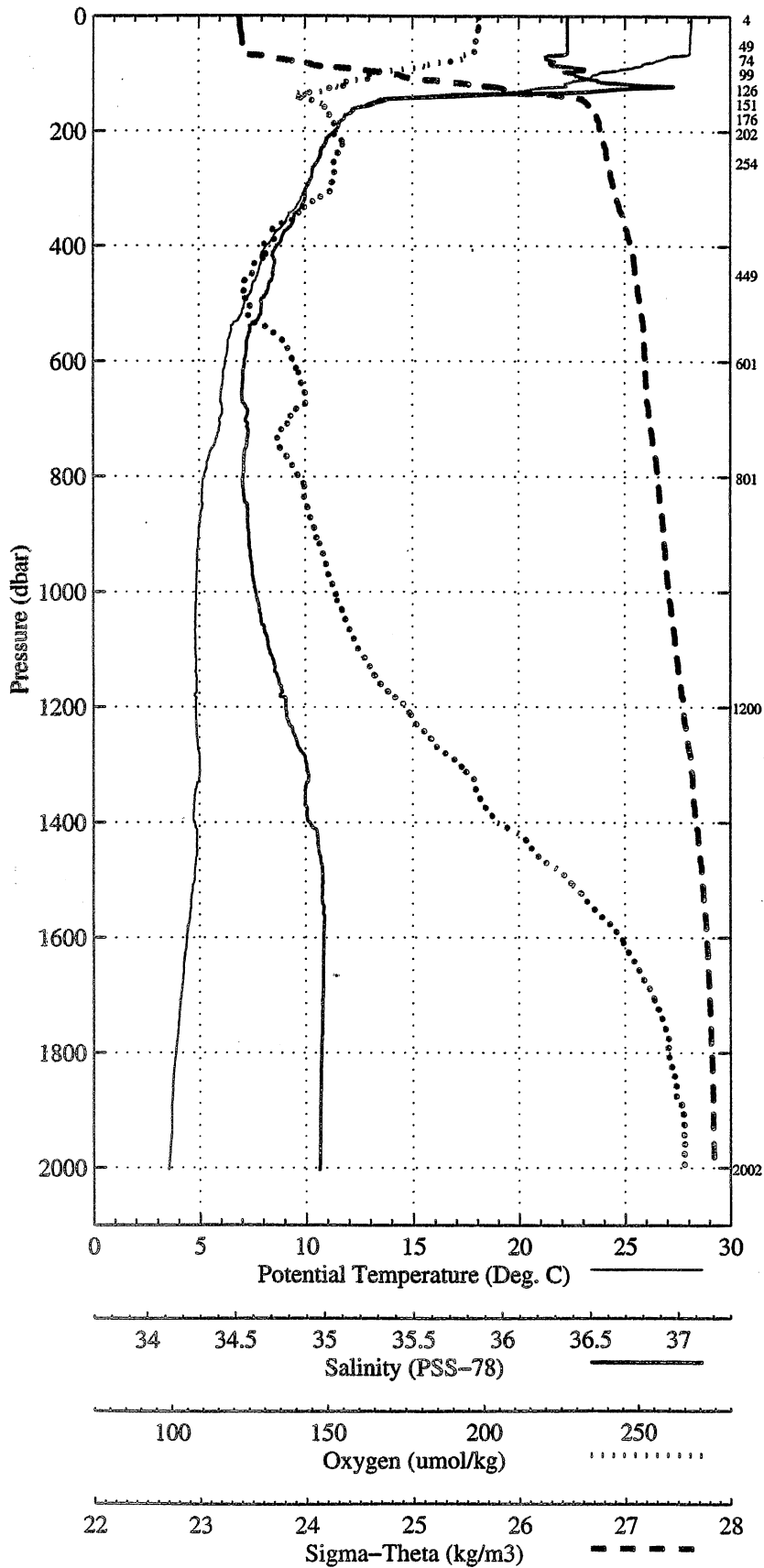
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2002	1	3.532	3.371	34.974	262.3
1201	2	4.822	4.721	34.800	173.3
802	3	5.140	5.073	34.548	139.7
602	4	6.134	6.080	34.551	140.7
449	5	7.723	7.678	34.716	117.8
254	6	10.425	10.395	34.947	154.2
203	7	11.107	11.082	35.029	156.1
177	8	11.684	11.661	35.105	153.8
152	9	12.199	12.179	35.194	153.8
127	10	17.367	17.346	36.217	147.0
99	11	23.378	23.357	36.426	162.6
75	12	26.476	26.459	36.265	189.3
50	13	28.082	28.070	36.360	196.6
4	14	28.101	28.100	36.365	196.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 47 (98047)

Latitude 6.049 N Longitude 47.995 W

05-Dec-1998 06:38 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 48 (98048)**  
**Latitude 6.100N Longitude 48.500W**  
**05-Dec-1998 11:16Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.064	28.063	36.330	196.7	0.004	23.377
10	28.069	28.067	36.330	197.5	0.045	23.376
20	28.067	28.062	36.330	197.6	0.090	23.378
30	28.067	28.060	36.329	197.5	0.135	23.380
40	28.068	28.058	36.330	197.4	0.180	23.381
50	28.062	28.050	36.328	197.3	0.225	23.384
60	28.033	28.019	36.324	197.3	0.271	23.391
70	28.000	27.984	36.325	197.2	0.316	23.404
80	27.870	27.851	36.334	197.1	0.361	23.455
90	27.651	27.630	36.340	196.5	0.405	23.533
100	26.230	26.207	36.387	188.7	0.446	24.024
110	25.499	25.475	36.386	183.2	0.484	24.253
120	23.757	23.732	36.329	175.1	0.519	24.737
130	22.197	22.171	36.611	159.7	0.548	25.403
140	21.121	21.093	36.760	148.2	0.573	25.817
150	18.543	18.516	36.313	142.1	0.593	26.156
160	17.184	17.157	36.168	137.3	0.610	26.381
170	15.520	15.493	35.874	135.3	0.626	26.543
180	14.446	14.419	35.730	132.1	0.641	26.669
190	13.977	13.949	35.658	130.1	0.655	26.713
200	13.312	13.284	35.543	128.7	0.668	26.762
250	10.870	10.839	35.112	129.8	0.732	26.898
300	9.973	9.938	35.013	125.5	0.791	26.979
350	8.815	8.777	34.827	130.6	0.847	27.025
400	8.402	8.360	34.786	129.3	0.901	27.058
450	7.255	7.211	34.636	139.2	0.954	27.109
500	6.970	6.923	34.647	130.9	1.004	27.158
550	6.613	6.562	34.623	131.5	1.053	27.189
600	6.287	6.233	34.619	131.0	1.100	27.229
650	5.579	5.524	34.536	139.0	1.146	27.252
700	5.575	5.516	34.587	135.9	1.190	27.294
750	5.411	5.348	34.600	136.9	1.233	27.325
800	5.205	5.138	34.603	140.9	1.275	27.353
900	4.913	4.839	34.612	148.9	1.355	27.395
1000	4.936	4.853	34.689	153.5	1.432	27.455
1500	4.610	4.483	35.008	236.0	1.747	27.754
2000	3.415	3.256	34.966	256.9	1.980	27.849

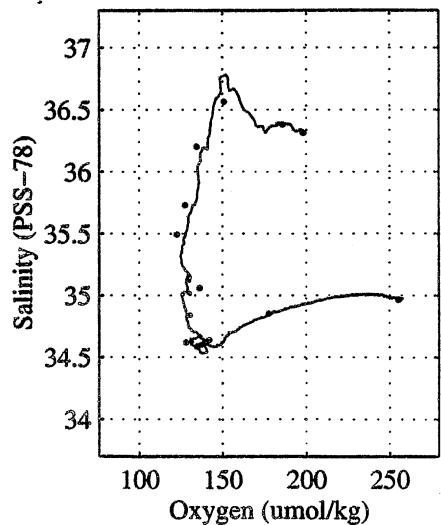
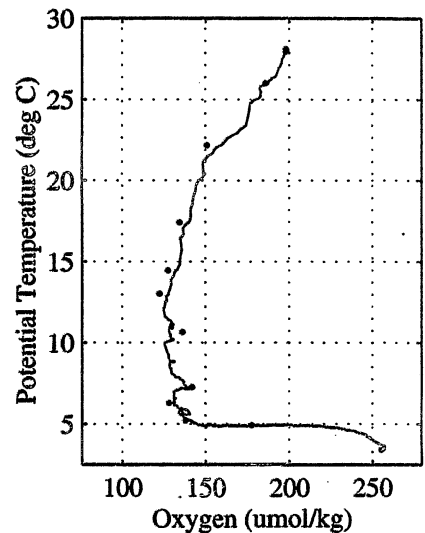
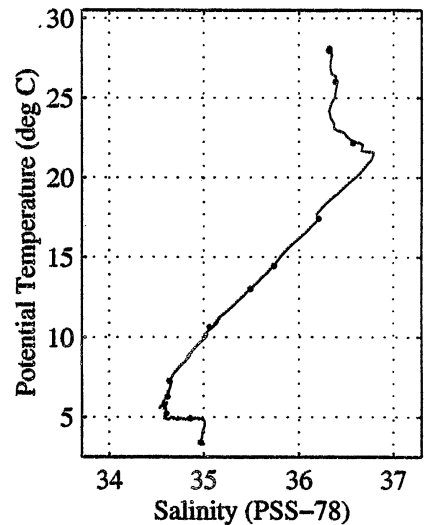
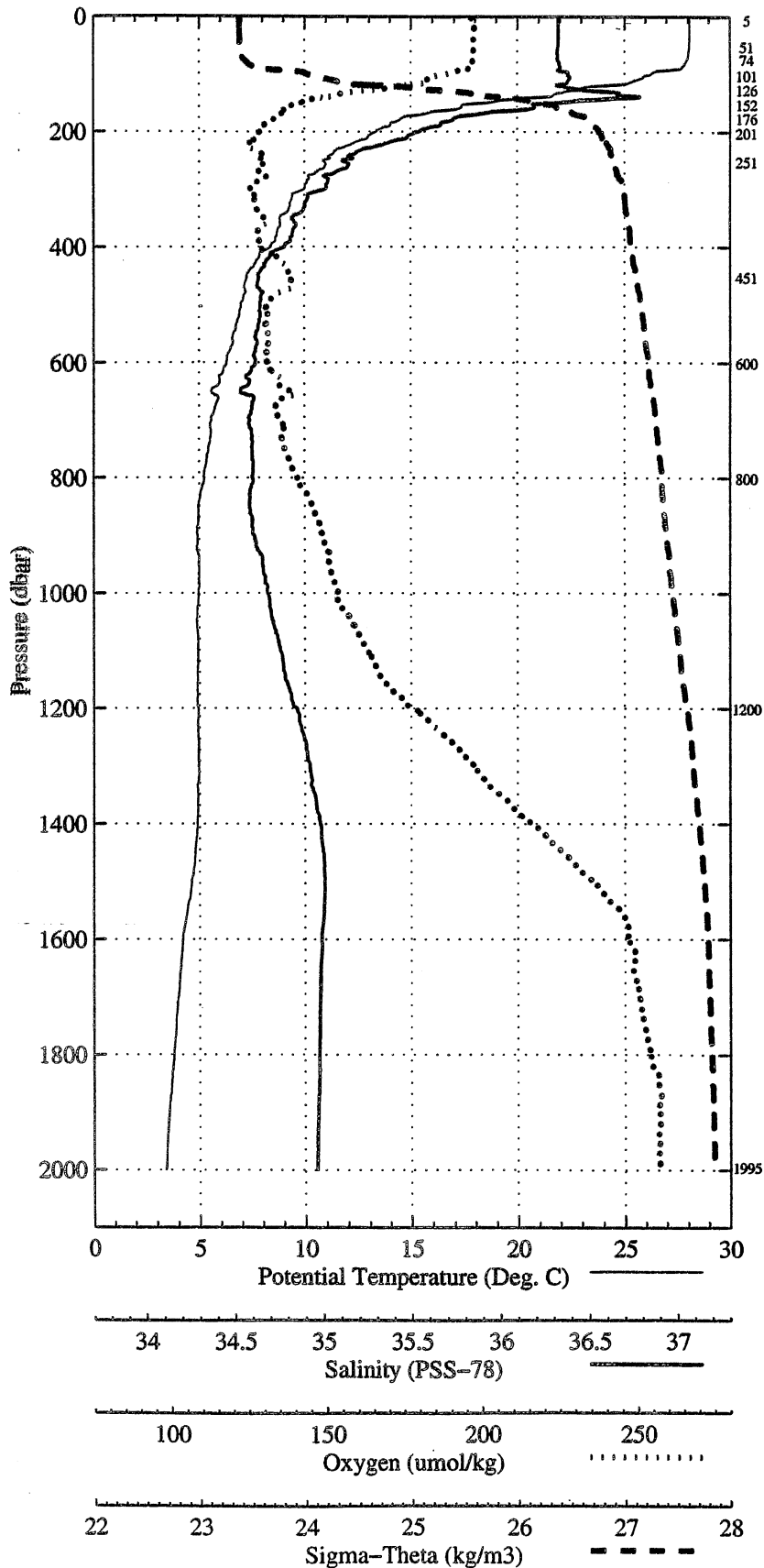
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1995	1	3.420	3.261	34.966	255.3
1200	2	4.923	4.822	34.855	177.6
801	3	5.223	5.156	34.604	137.9
601	4	6.294	6.240	34.620	128.1
452	5	7.278	7.234	34.638	141.8
252	6	10.644	10.614	35.060	136.1
202	7	13.029	13.001	35.493	122.4
176	8	14.462	14.435	35.731	127.5
152	9	17.421	17.395	36.203	134.3
127	10	22.180	22.154	36.568	150.6
102	11	26.017	25.994	36.381	186.0
74	12	27.963	27.945	36.314	197.9
52	13	28.041	28.029	36.315	198.1
6	14	28.105	28.104	36.318	197.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 48 (98048)

Latitude 6.100 N Longitude 48.500 W

05-Dec-1998 11:16 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 49 (98049)  
 Latitude 6.168N Longitude 49.003W  
 05-Dec-1998 15:36Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.430	28.430	36.275	193.4	0.005	23.214
10	28.235	28.232	36.276	194.8	0.046	23.281
20	28.222	28.217	36.276	195.1	0.092	23.287
30	28.219	28.212	36.277	195.3	0.138	23.290
40	28.221	28.211	36.278	195.2	0.184	23.291
50	28.186	28.174	36.288	195.3	0.230	23.312
60	28.188	28.174	36.298	195.4	0.276	23.321
70	28.152	28.135	36.315	195.4	0.322	23.347
80	28.042	28.023	36.325	195.5	0.367	23.392
90	27.841	27.819	36.344	195.6	0.412	23.474
100	27.663	27.639	36.346	195.6	0.456	23.535
110	26.569	26.544	36.376	192.8	0.499	23.910
120	26.235	26.208	36.379	191.0	0.538	24.019
130	25.361	25.333	36.326	186.8	0.577	24.253
140	24.961	24.931	36.296	185.7	0.614	24.353
150	23.755	23.723	36.294	179.3	0.649	24.715
160	22.607	22.575	36.332	170.8	0.681	25.077
170	21.387	21.354	36.648	150.5	0.706	25.662
180	20.073	20.040	36.673	147.1	0.728	26.038
190	18.432	18.399	36.354	139.4	0.748	26.219
200	16.803	16.770	36.114	138.4	0.765	26.433
250	11.765	11.733	35.276	124.3	0.837	26.862
300	10.006	9.971	35.023	117.0	0.897	26.981
350	9.197	9.158	34.903	122.1	0.953	27.023
400	8.370	8.328	34.798	121.0	1.007	27.072
450	7.742	7.697	34.714	125.3	1.060	27.101
500	7.357	7.308	34.701	121.8	1.111	27.148
550	6.838	6.786	34.653	123.5	1.160	27.182
600	6.343	6.289	34.614	128.7	1.208	27.218
650	5.826	5.769	34.575	134.5	1.254	27.253
700	5.715	5.654	34.596	133.9	1.298	27.285
750	5.424	5.361	34.590	136.3	1.342	27.316
800	5.301	5.234	34.599	137.6	1.384	27.338
900	5.002	4.928	34.625	146.1	1.465	27.395
1000	4.943	4.860	34.697	153.2	1.542	27.461
1500	4.668	4.540	35.006	230.0	1.859	27.747
2000	3.461	3.301	34.972	259.5	2.091	27.850

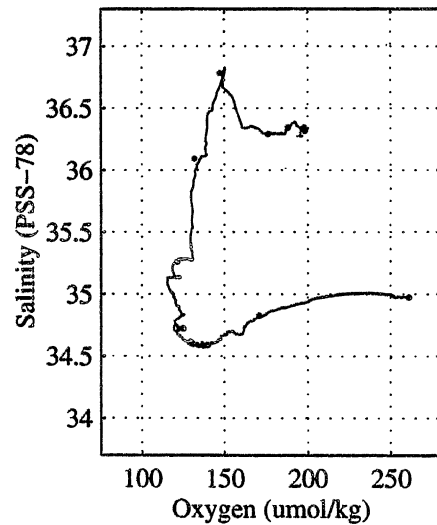
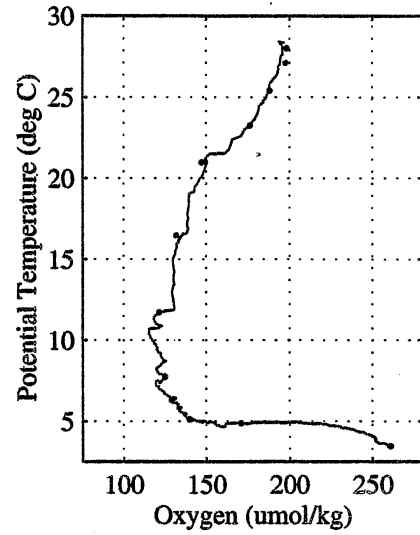
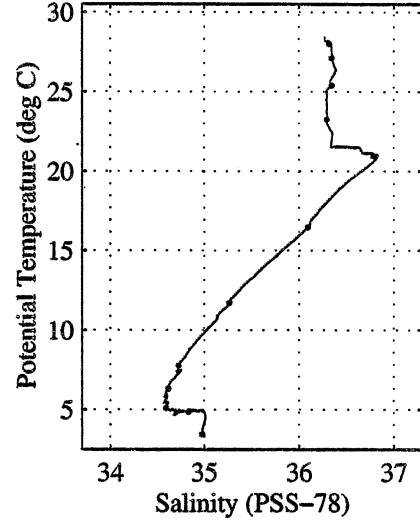
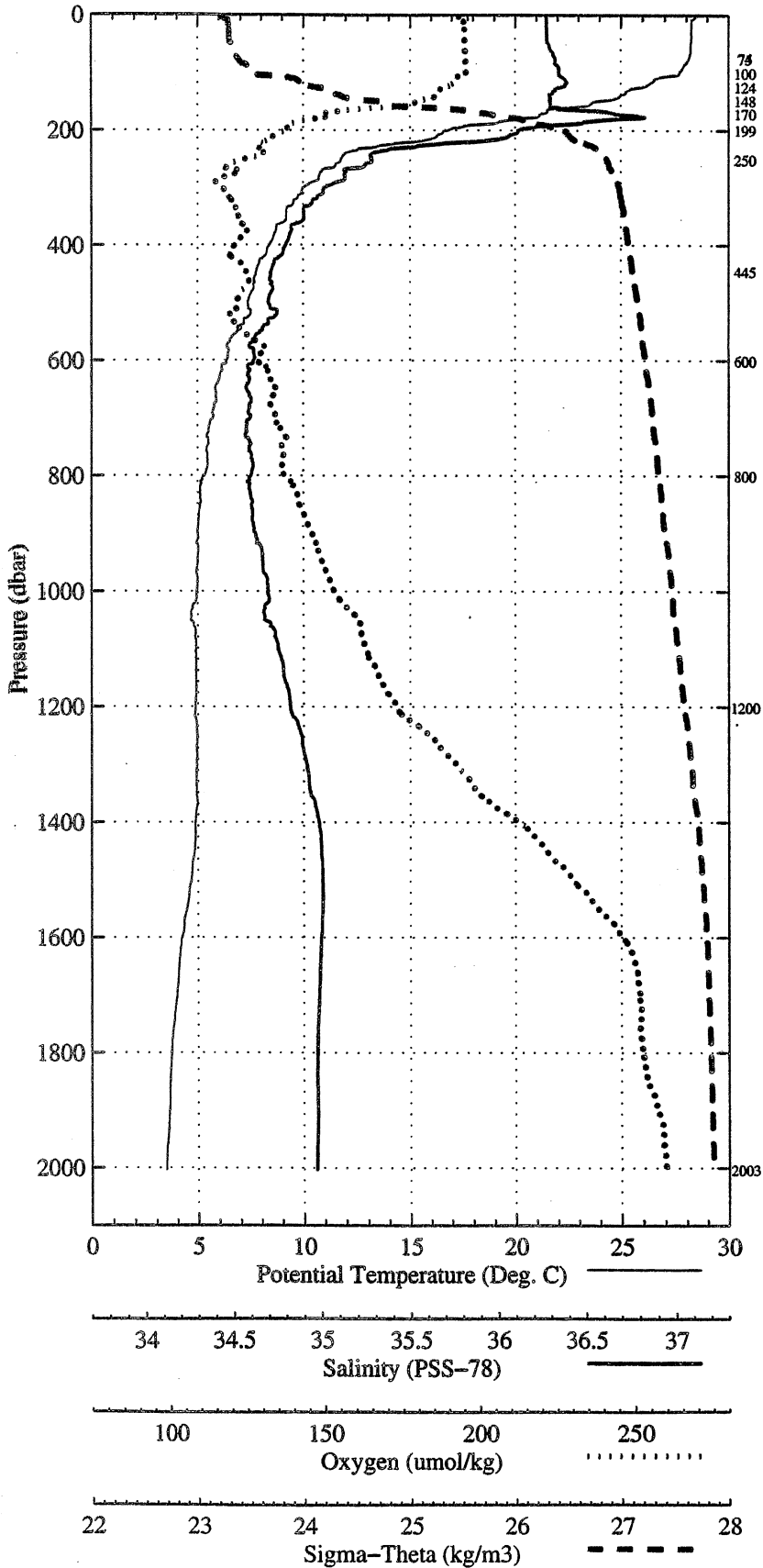
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2003	1	3.455	3.295	34.975	260.6
1201	2	4.871	4.770	34.827	170.9
800	3	5.116	5.049	34.587	139.6
601	4	6.314	6.260	34.614	129.2
600	5	6.314	6.259	34.613	128.7
445	6	7.763	7.718	34.723	124.6
251	7	11.720	11.688	35.261	121.2
200	8	16.477	16.445	36.092	131.6
171	9	20.976	20.943	36.784	147.2
148	10	23.260	23.229	36.293	176.1
124	11	25.406	25.379	36.345	188.0
101	12	27.112	27.089	36.345	197.4
75	13	28.023	28.005	36.318	198.1
76	14	28.019	28.001	36.319	198.2

NBC-1 R/V SEWARD JOHNSON

CTD Station 49 (98049)

Latitude 6.168 N Longitude 49.003 W

05-Dec-1998 15:36 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 50 (98050)  
 Latitude 6.233N Longitude 49.500W  
 05-Dec-1998 20:25Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.412	28.412	36.297	198.8	0.005	23.237
10	28.273	28.271	36.310	196.3	0.046	23.294
20	28.237	28.232	36.311	196.4	0.092	23.308
30	28.220	28.213	36.312	196.2	0.138	23.316
40	28.218	28.209	36.315	196.0	0.183	23.320
50	28.202	28.190	36.316	196.0	0.229	23.329
60	28.060	28.046	36.311	196.1	0.275	23.373
70	27.928	27.912	36.302	196.7	0.320	23.411
80	27.796	27.777	36.327	197.2	0.364	23.474
90	27.513	27.492	36.342	196.7	0.408	23.579
100	27.282	27.259	36.351	195.4	0.451	23.662
110	26.280	26.255	36.395	189.5	0.492	24.016
120	26.261	26.234	36.407	189.7	0.532	24.033
130	26.013	25.984	36.441	189.5	0.571	24.137
140	25.896	25.864	36.438	189.4	0.609	24.172
150	25.247	25.214	36.394	185.5	0.647	24.342
160	23.920	23.886	36.290	180.7	0.682	24.664
170	21.451	21.418	36.179	170.9	0.713	25.287
180	20.918	20.883	36.463	161.7	0.738	25.651
190	20.040	20.004	36.630	147.4	0.760	26.016
200	18.914	18.878	36.462	142.8	0.780	26.180
250	12.479	12.446	35.402	121.1	0.855	26.822
300	11.117	11.079	35.245	106.9	0.916	26.959
350	10.209	10.168	35.091	104.2	0.974	27.002
400	9.233	9.188	34.950	106.0	1.029	27.056
450	8.553	8.505	34.862	112.0	1.083	27.096
500	7.862	7.811	34.774	116.4	1.135	27.132
550	7.318	7.264	34.716	119.6	1.185	27.166
600	6.966	6.908	34.695	121.2	1.234	27.200
650	6.438	6.378	34.644	124.2	1.282	27.231
700	5.995	5.933	34.620	127.5	1.328	27.269
750	5.797	5.731	34.633	129.0	1.372	27.305
800	5.372	5.304	34.612	133.8	1.415	27.340
900	5.066	4.991	34.653	143.4	1.495	27.410
1000	5.031	4.947	34.732	153.4	1.570	27.479
1500	4.516	4.390	35.002	232.6	1.874	27.760
2000	3.418	3.259	34.971	258.9	2.106	27.852

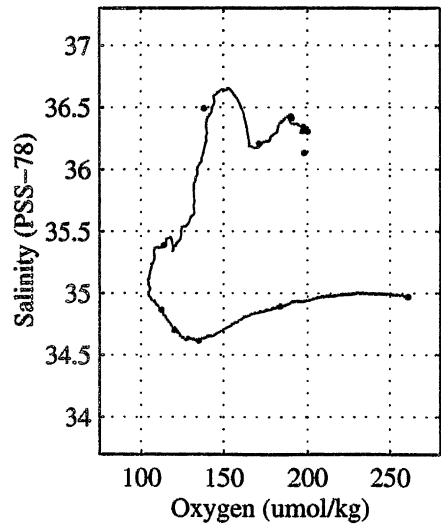
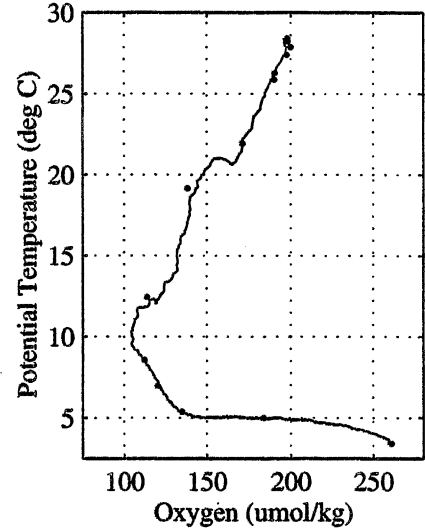
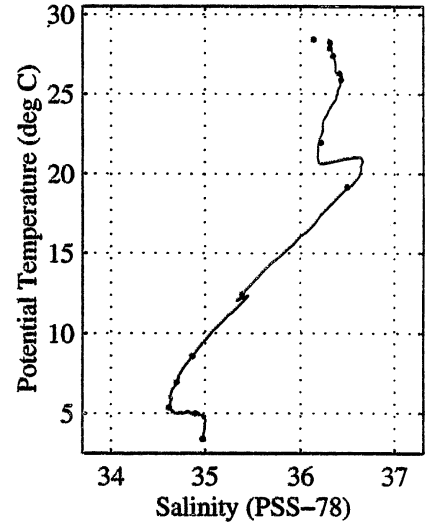
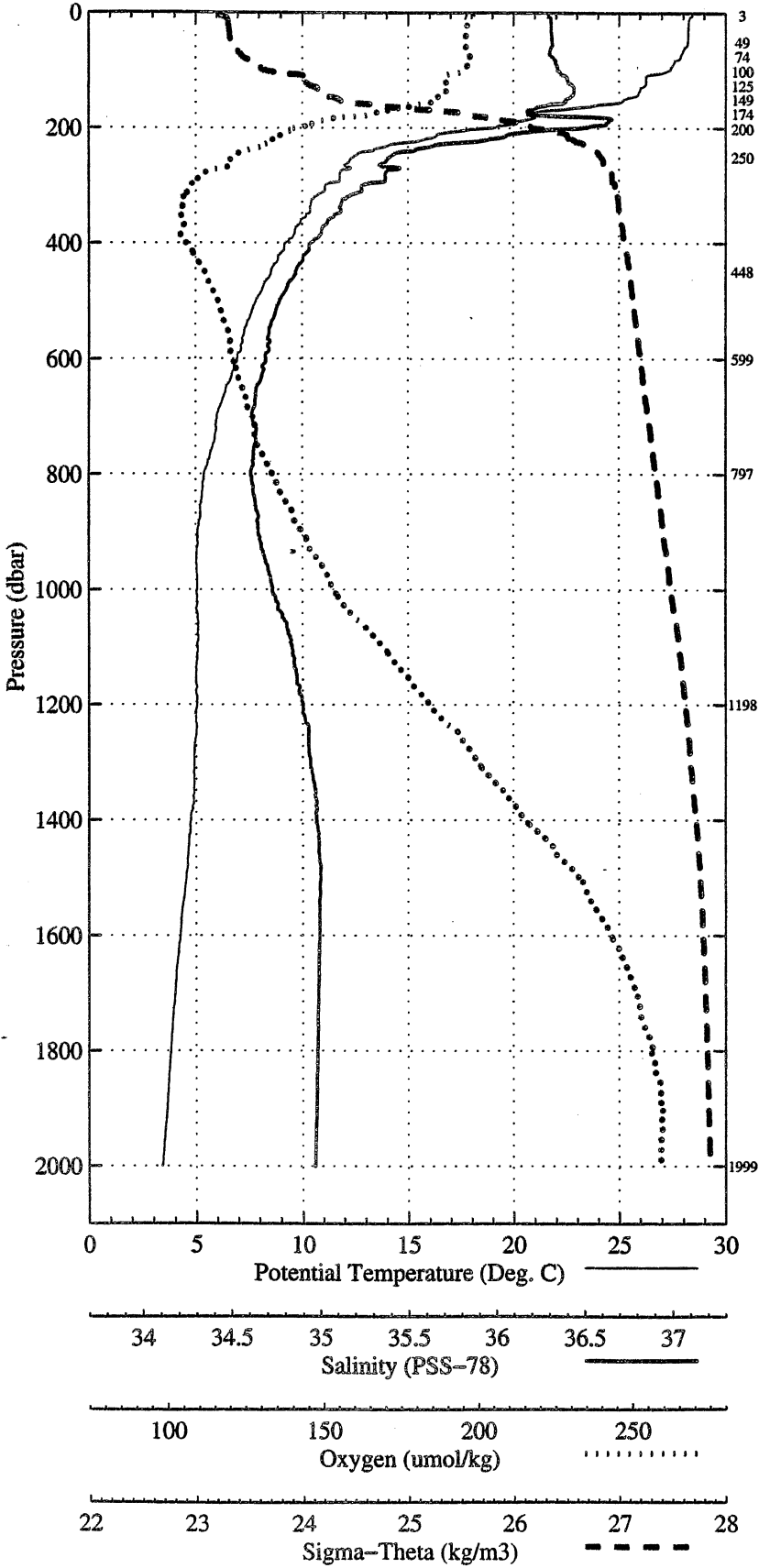
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2000	1	3.418	3.259	34.972	260.9
1198	2	5.003	4.901	34.894	183.8
798	3	5.382	5.314	34.614	134.9
599	4	6.962	6.905	34.698	120.1
448	5	8.573	8.525	34.865	112.0
250	6	12.438	12.405	35.392	113.6
200	7	19.165	19.129	36.494	138.2
174	8	21.952	21.917	36.209	171.4
149	9	25.876	25.843	36.427	190.1
125	10	26.274	26.246	36.411	190.3
100	11	27.393	27.370	36.343	197.5
75	12	27.872	27.855	36.305	199.9
50	13	28.212	28.200	36.310	198.2
3	14	28.430	28.429	36.134	197.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 50 (98050)

Latitude 6.233 N Longitude 49.500 W

05-Dec-1998 20:25 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 51 (98051)  
 Latitude 6.283N Longitude 50.000W  
 06-Dec-1998 00:21Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.464	28.464	36.204	203.2	0.005	23.150
10	28.294	28.291	36.231	198.0	0.047	23.228
20	28.235	28.230	36.242	198.0	0.093	23.257
30	28.173	28.166	36.271	197.6	0.139	23.301
40	28.025	28.015	36.298	197.6	0.185	23.372
50	27.664	27.652	36.316	197.7	0.229	23.505
60	27.521	27.507	36.328	197.7	0.273	23.561
70	27.452	27.436	36.335	197.5	0.316	23.590
80	27.303	27.285	36.331	195.9	0.359	23.637
90	27.204	27.183	36.335	194.4	0.402	23.674
100	26.581	26.558	36.377	190.7	0.443	23.906
110	26.401	26.376	36.419	191.2	0.483	23.996
120	26.247	26.219	36.411	190.3	0.523	24.040
130	25.016	24.987	36.403	185.6	0.561	24.416
140	24.437	24.407	36.390	183.5	0.595	24.583
150	23.962	23.931	36.406	182.6	0.629	24.738
160	23.674	23.640	36.446	183.3	0.661	24.855
170	21.426	21.392	36.223	177.4	0.691	25.328
180	19.149	19.117	36.369	154.2	0.715	26.047
190	15.022	14.993	35.781	139.1	0.732	26.583
200	12.867	12.840	35.317	144.3	0.746	26.677
250	10.932	10.901	34.997	151.0	0.812	26.797
300	10.278	10.242	34.925	150.6	0.877	26.859
350	9.421	9.382	34.832	149.5	0.938	26.931
400	8.813	8.769	34.767	151.4	0.996	26.980
450	8.330	8.282	34.741	144.5	1.053	27.035
500	7.886	7.835	34.716	140.1	1.108	27.083
550	7.235	7.181	34.662	135.0	1.160	27.135
600	6.912	6.855	34.655	130.1	1.210	27.175
650	6.098	6.040	34.576	135.6	1.258	27.220
700	6.022	5.960	34.583	134.3	1.305	27.236
750	5.822	5.756	34.596	138.1	1.351	27.273
800	5.638	5.568	34.618	135.0	1.395	27.313
900	5.219	5.143	34.633	141.4	1.479	27.377
1000	5.016	4.933	34.715	151.6	1.557	27.466
1500	4.578	4.451	35.002	231.5	1.865	27.753
2000	3.525	3.364	34.973	257.4	2.100	27.845

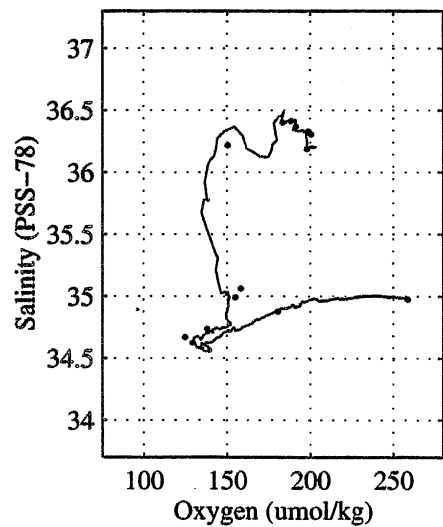
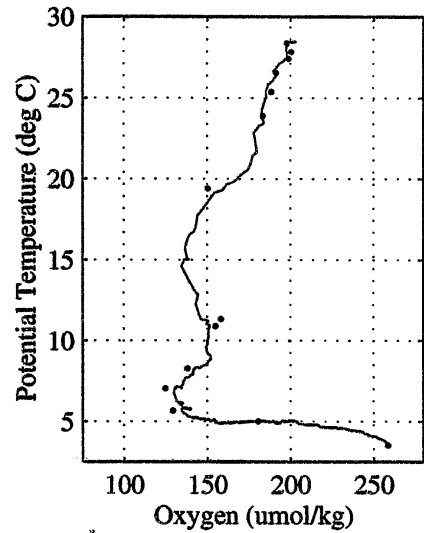
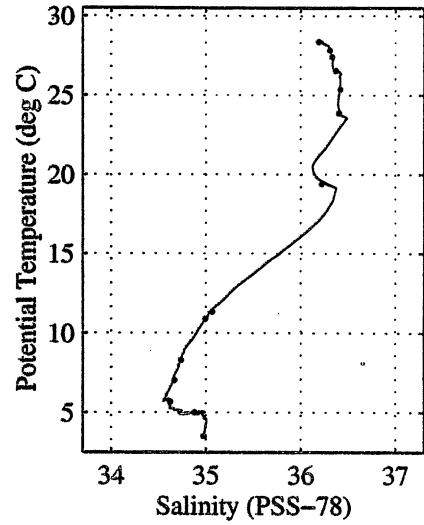
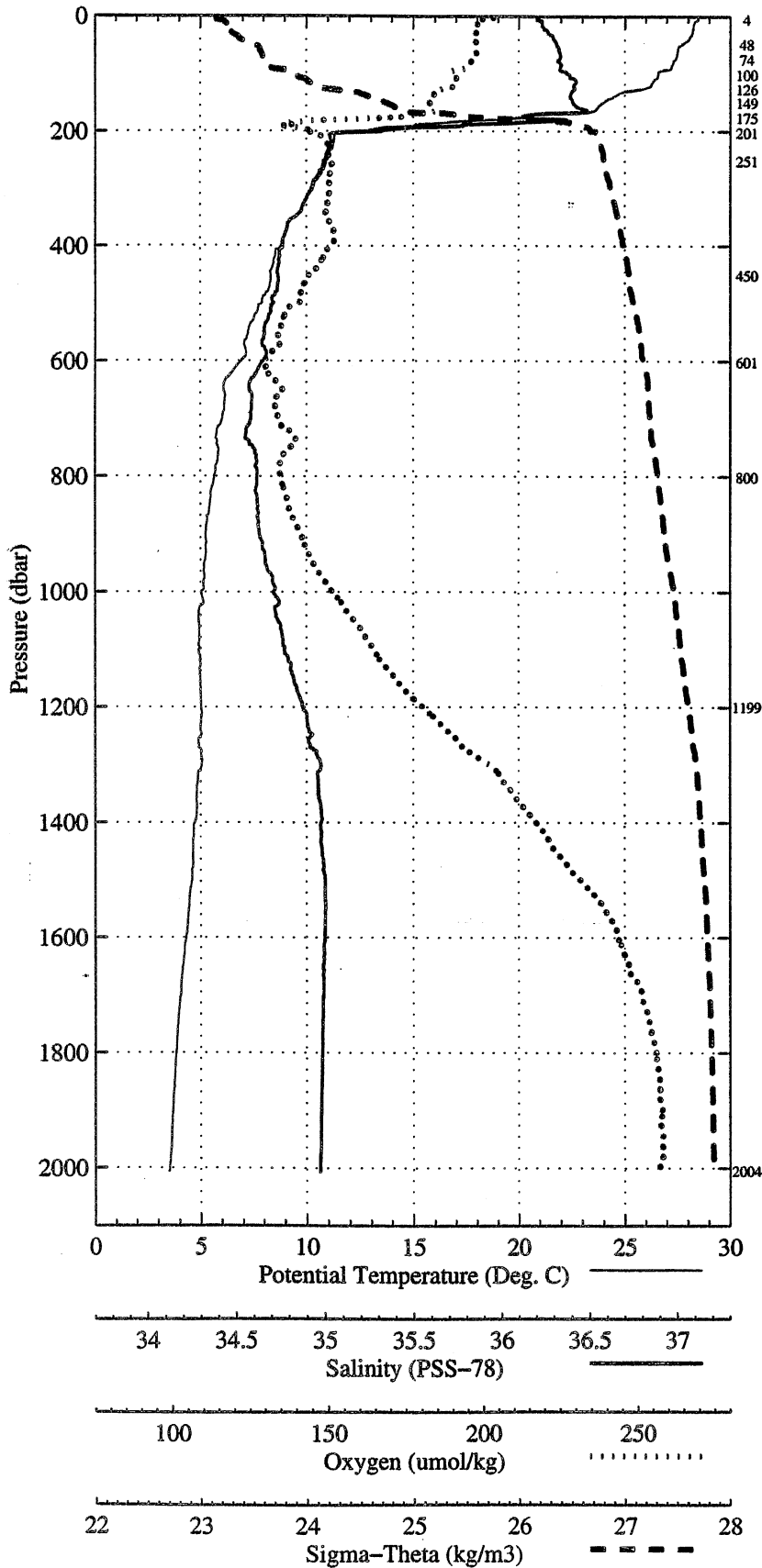
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2005	1	3.516	3.355	34.975	258.5
1199	2	5.006	4.904	34.877	180.6
801	3	5.653	5.583	34.625	129.4
601	4	7.034	6.976	34.669	124.7
451	5	8.290	8.243	34.738	138.0
252	6	10.896	10.865	34.991	154.9
202	7	11.338	11.313	35.063	158.1
176	8	19.414	19.382	36.218	150.3
150	9	23.887	23.855	36.402	183.6
126	10	25.381	25.353	36.414	188.7
101	11	26.550	26.527	36.369	191.3
74	12	27.426	27.409	36.328	198.7
48	13	27.832	27.820	36.305	200.3
5	14	28.372	28.371	36.190	197.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 51 (98051)

Latitude 6.283 N Longitude 50.000 W

06-Dec-1998 00:21 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 52 (98052)**  
**Latitude 6.397N Longitude 50.506W**  
**06-Dec-1998 04:39Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.200	28.200	36.224	204.7	0.005	23.252
10	28.273	28.271	36.236	196.8	0.046	23.238
20	28.176	28.171	36.263	196.9	0.092	23.292
30	27.975	27.968	36.327	197.8	0.138	23.408
40	27.811	27.801	36.321	198.5	0.182	23.459
50	27.727	27.716	36.322	198.9	0.227	23.489
60	27.619	27.605	36.325	199.0	0.271	23.527
70	27.499	27.482	36.331	198.1	0.314	23.572
80	27.412	27.393	36.337	197.4	0.358	23.607
90	27.236	27.216	36.330	195.8	0.401	23.660
100	27.083	27.060	36.341	194.4	0.443	23.719
110	26.646	26.621	36.385	193.3	0.485	23.892
120	24.805	24.779	36.388	183.9	0.522	24.468
130	24.594	24.566	36.424	183.7	0.557	24.560
140	24.067	24.038	36.507	184.0	0.590	24.782
150	16.961	16.936	35.796	161.6	0.616	26.148
160	13.510	13.488	35.372	147.4	0.633	26.587
170	12.108	12.085	35.142	155.9	0.647	26.688
180	11.408	11.386	35.055	155.5	0.661	26.752
190	11.146	11.122	35.025	151.4	0.674	26.778
200	11.016	10.991	35.010	150.1	0.687	26.790
250	10.418	10.388	34.938	149.9	0.751	26.842
300	9.750	9.716	34.859	150.7	0.813	26.896
350	9.335	9.295	34.810	153.2	0.874	26.929
400	8.832	8.789	34.756	154.8	0.933	26.968
450	8.203	8.156	34.690	155.7	0.991	27.014
500	7.910	7.858	34.665	156.7	1.047	27.039
550	7.375	7.321	34.620	155.2	1.101	27.082
600	6.305	6.250	34.547	147.8	1.153	27.170
650	5.862	5.805	34.517	151.6	1.201	27.203
700	5.685	5.625	34.513	152.6	1.248	27.222
750	5.349	5.286	34.497	155.8	1.294	27.250
800	5.281	5.214	34.499	157.1	1.340	27.261
900	5.144	5.069	34.554	150.9	1.429	27.323
1000	4.857	4.774	34.623	153.6	1.512	27.412
1500	4.636	4.508	34.991	227.3	1.838	27.738
2000	3.539	3.378	34.976	258.4	2.078	27.845

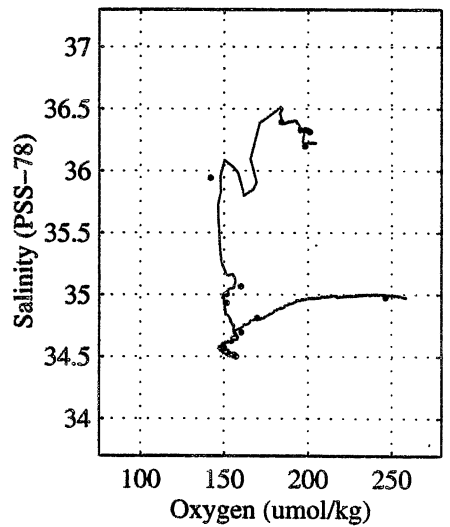
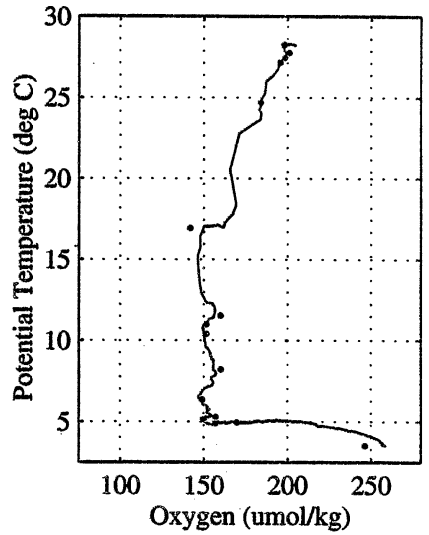
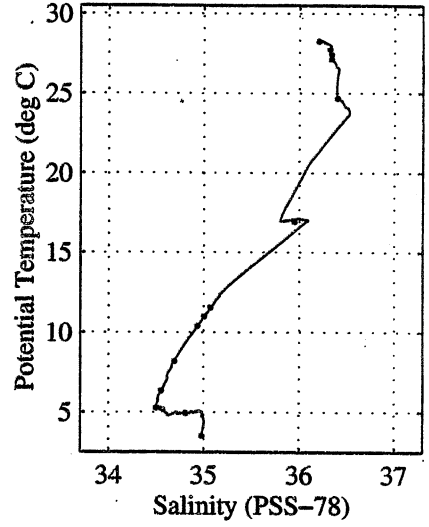
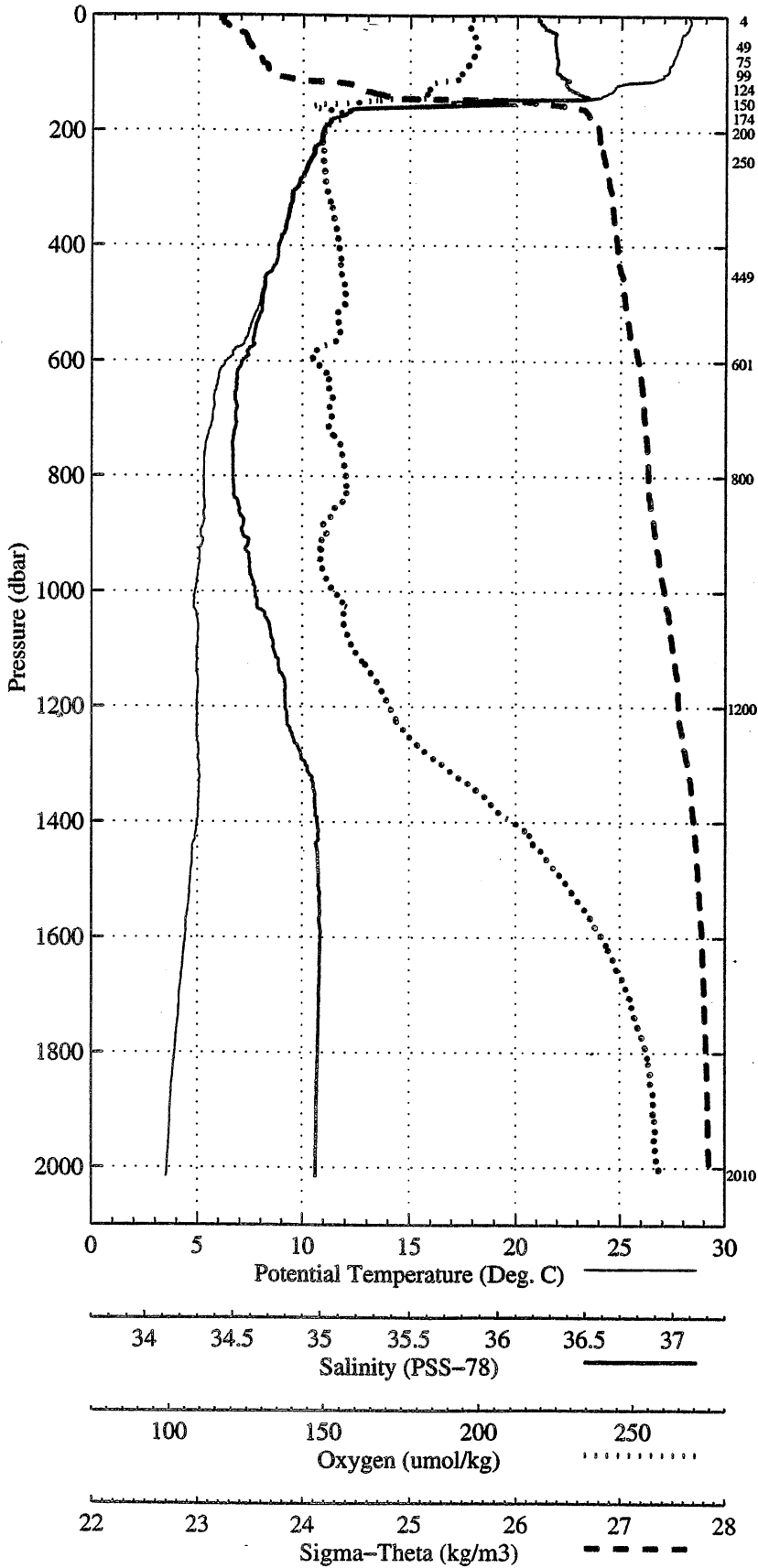
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2010	1	3.519	3.358	34.976	246.2
1200	2	4.949	4.847	34.811	169.5
800	3	5.284	5.217	34.501	156.9
601	4	6.356	6.302	34.553	148.9
450	5	8.204	8.157	34.695	160.1
250	6	10.403	10.373	34.931	151.3
200	7	11.001	10.977	35.003	151.4
175	8	11.532	11.510	35.066	159.8
150	9	16.936	16.911	35.944	141.7
124	10	24.686	24.659	36.394	183.9
99	11	27.145	27.122	36.328	195.3
76	12	27.445	27.427	36.329	198.3
50	13	27.750	27.738	36.314	200.7
5	14	28.248	28.247	36.199	198.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 52 (98052)

Latitude 6.397 N Longitude 50.506 W

06-Dec-1998 04:39 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 53 (98053)**  
**Latitude 7.084N Longitude 50.777W**  
**06-Dec-1998 11:01Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^2/\text{kg}$	SigT $\text{kg/m}^3$
1	28.073	28.073	36.163	204.5	0.005	23.248
10	28.151	28.149	36.195	197.4	0.046	23.248
20	28.207	28.202	36.266	197.6	0.092	23.285
30	28.160	28.153	36.269	197.6	0.138	23.304
40	27.859	27.850	36.326	198.6	0.184	23.446
50	27.700	27.688	36.315	199.1	0.228	23.492
60	27.653	27.639	36.322	199.3	0.272	23.514
70	27.614	27.598	36.324	199.1	0.316	23.530
80	27.422	27.404	36.334	197.8	0.359	23.601
90	27.404	27.383	36.335	197.4	0.403	23.609
100	27.118	27.095	36.358	195.2	0.446	23.720
110	25.836	25.811	36.391	188.4	0.486	24.152
120	25.344	25.318	36.407	185.9	0.523	24.318
130	24.705	24.677	36.412	182.9	0.559	24.518
140	24.368	24.338	36.488	185.0	0.592	24.678
150	21.297	21.268	36.206	178.4	0.623	25.348
160	13.160	13.137	35.226	160.7	0.643	26.546
170	11.973	11.951	35.123	156.8	0.657	26.699
180	11.493	11.470	35.070	154.3	0.671	26.748
190	11.421	11.397	35.061	153.7	0.684	26.755
200	11.327	11.302	35.047	152.4	0.697	26.762
250	10.667	10.637	34.967	149.5	0.762	26.821
300	10.103	10.068	34.898	149.3	0.826	26.867
350	9.569	9.529	34.836	151.1	0.887	26.910
400	8.856	8.812	34.759	154.3	0.947	26.967
450	8.260	8.213	34.700	154.7	1.005	27.014
500	7.800	7.750	34.662	155.0	1.060	27.053
550	7.390	7.336	34.642	150.0	1.114	27.097
600	7.112	7.054	34.648	138.0	1.166	27.142
650	5.855	5.798	34.550	136.6	1.215	27.230
700	5.580	5.520	34.522	145.1	1.261	27.242
750	5.636	5.571	34.544	144.2	1.307	27.254
800	5.496	5.427	34.560	139.8	1.352	27.284
900	5.176	5.100	34.591	144.8	1.438	27.349
1000	4.988	4.905	34.661	150.5	1.519	27.427
1500	4.712	4.584	34.987	223.0	1.842	27.727
2000	3.621	3.459	34.980	257.8	2.088	27.841

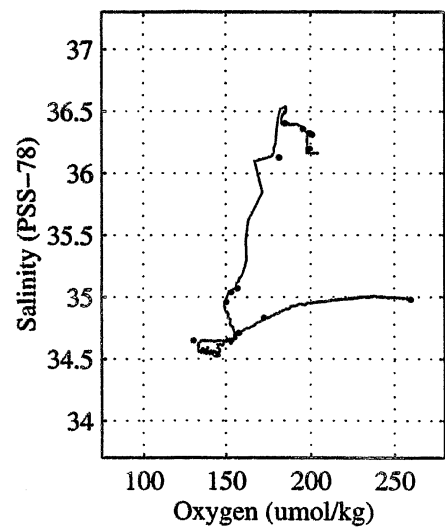
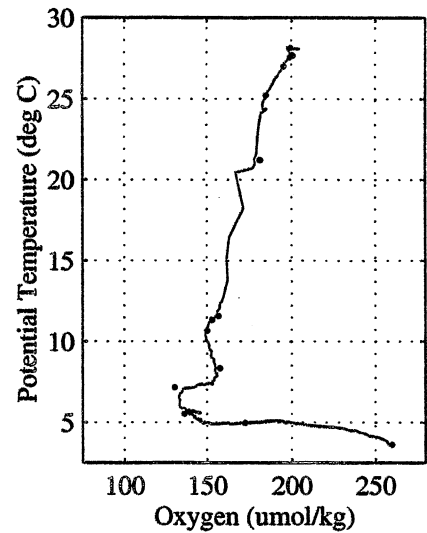
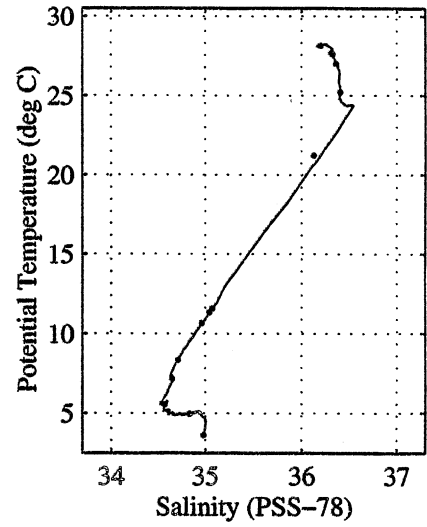
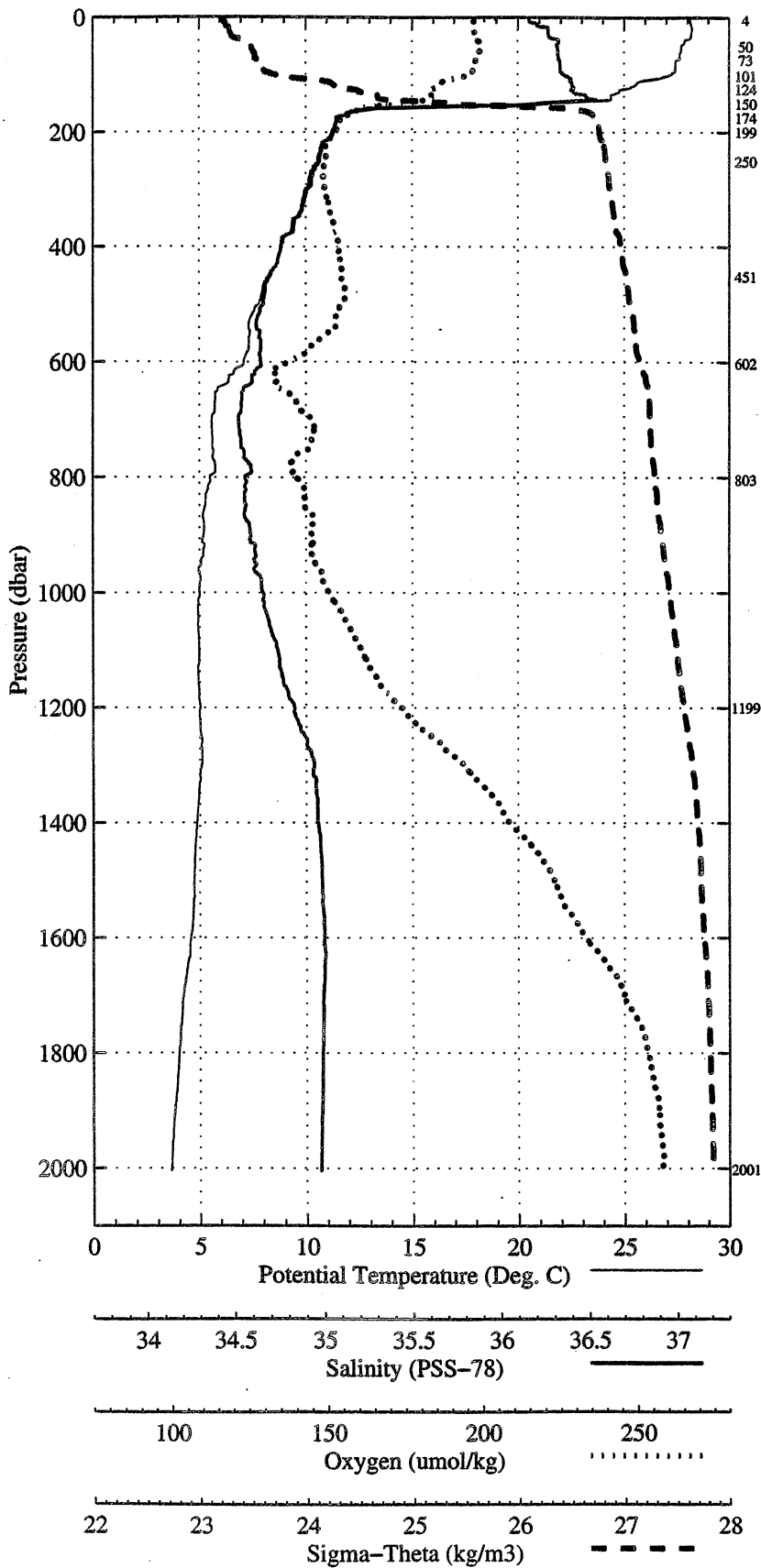
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2002	1	3.621	3.458	34.978	259.6
1199	2	4.967	4.865	34.833	172.5
804	3	5.528	5.458	34.568	136.3
602	4	7.157	7.099	34.648	130.4
451	5	8.347	8.300	34.711	157.5
251	6	10.663	10.632	34.961	150.0
199	7	11.340	11.315	35.041	153.0
174	8	11.593	11.571	35.072	156.7
150	9	21.230	21.201	36.129	181.5
124	10	25.226	25.199	36.404	185.1
101	11	27.003	26.979	36.359	195.2
73	12	27.589	27.572	36.325	199.0
50	13	27.690	27.678	36.312	200.6
4	14	28.136	28.135	36.198	199.2

NBC-1 R/V SEWARD JOHNSON

CTD Station 53 (98053)

Latitude 7.084 N Longitude 50.777 W

06-Dec-1998 11:01 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 54 (98054)  
 Latitude 7.272N Longitude 51.202W  
 06-Dec-1998 15:00Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.035	28.035	36.145	199.7	0.005	23.247
10	28.049	28.047	36.155	196.5	0.046	23.251
20	28.050	28.045	36.214	196.6	0.092	23.297
30	28.016	28.009	36.332	196.8	0.138	23.398
40	28.001	27.991	36.340	197.0	0.182	23.411
50	27.999	27.987	36.340	197.0	0.227	23.413
60	27.984	27.969	36.338	197.1	0.272	23.418
70	27.654	27.637	36.329	197.0	0.317	23.521
80	27.310	27.291	36.337	195.2	0.360	23.639
90	26.768	26.747	36.381	193.0	0.402	23.848
100	26.140	26.117	36.382	188.9	0.442	24.048
110	25.727	25.702	36.416	186.3	0.480	24.205
120	24.790	24.764	36.353	183.8	0.517	24.446
130	24.449	24.421	36.480	185.3	0.550	24.646
140	22.521	22.493	36.270	180.0	0.582	25.053
150	17.940	17.914	35.770	156.1	0.610	25.891
160	14.001	13.978	35.451	155.5	0.626	26.546
170	12.599	12.576	35.276	148.1	0.640	26.696
180	11.830	11.807	35.153	147.7	0.654	26.750
190	11.212	11.189	35.034	148.1	0.667	26.772
200	10.988	10.964	35.009	148.3	0.680	26.794
250	10.438	10.409	34.941	148.7	0.744	26.841
300	9.967	9.932	34.890	149.9	0.807	26.884
350	9.319	9.280	34.810	151.3	0.867	26.931
400	8.654	8.611	34.743	152.1	0.926	26.986
450	8.099	8.053	34.700	150.0	0.983	27.038
500	7.763	7.712	34.706	142.1	1.037	27.094
550	6.493	6.442	34.622	130.5	1.087	27.203
600	5.753	5.701	34.556	133.1	1.133	27.246
650	5.164	5.110	34.509	145.5	1.177	27.280
700	4.899	4.843	34.485	153.4	1.221	27.291
750	4.866	4.805	34.484	158.1	1.264	27.296
800	4.881	4.816	34.486	160.1	1.307	27.297
900	4.950	4.876	34.558	154.1	1.393	27.348
1000	4.918	4.835	34.682	155.5	1.471	27.452
1500	4.738	4.610	34.991	220.7	1.794	27.727
2000	3.647	3.484	34.980	256.4	2.042	27.838

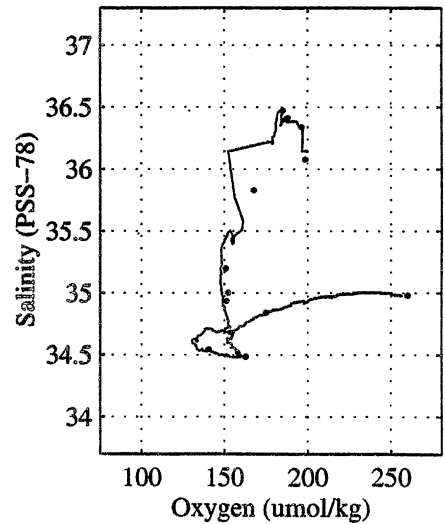
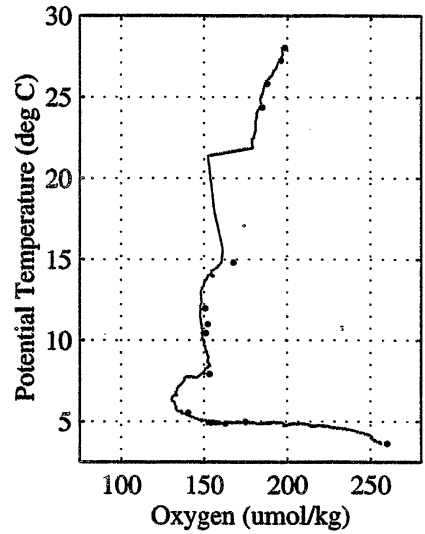
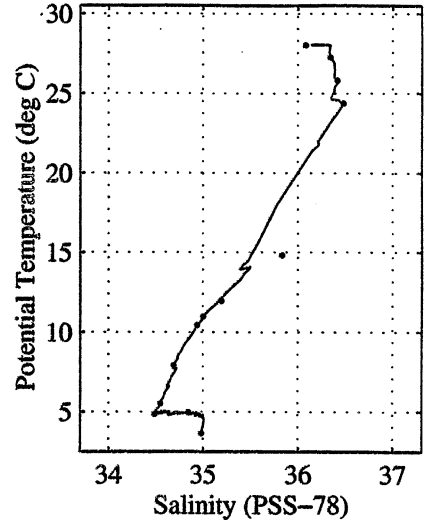
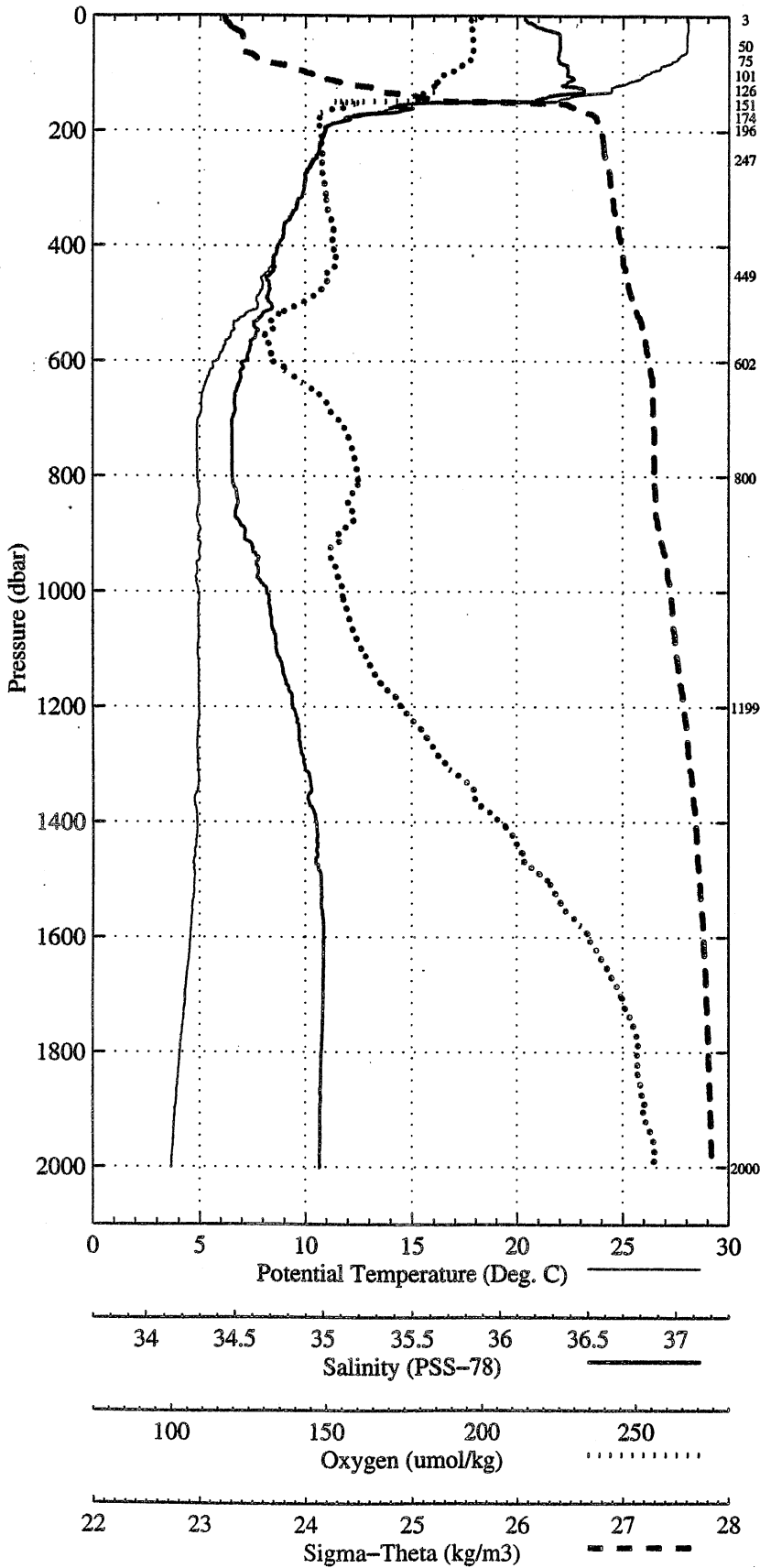
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2001	1	3.646	3.483	34.980	259.9
1200	2	4.976	4.874	34.842	175.1
801	3	4.872	4.807	34.485	163.0
602	4	5.529	5.478	34.544	140.1
449	5	7.926	7.880	34.682	153.4
248	6	10.441	10.412	34.935	151.0
196	7	10.993	10.969	35.002	152.1
174	8	11.955	11.932	35.199	150.6
152	9	14.822	14.799	35.830	167.9
127	10	24.379	24.351	36.475	185.1
101	11	25.816	25.793	36.411	187.9
75	12	27.262	27.245	36.340	196.1
50	13	27.992	NaN	NaN	NaN
4	14	28.032	28.031	36.078	198.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 54 (98054)

Latitude 7.272 N Longitude 51.202 W

06-Dec-1998 15:00 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 55 (98055)**  
**Latitude 7.500N Longitude 51.649W**  
**06-Dec-1998 19:05Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.974	27.974	35.958	199.5	0.005	23.126
10	27.971	27.969	35.961	198.1	0.047	23.131
20	27.970	27.965	36.284	197.6	0.093	23.375
30	27.954	27.947	36.305	197.6	0.138	23.398
40	27.912	27.902	36.333	197.4	0.183	23.435
50	27.855	27.843	36.347	197.5	0.228	23.466
60	27.817	27.803	36.352	197.5	0.272	23.483
70	27.599	27.583	36.350	196.5	0.316	23.554
80	27.153	27.135	36.335	194.6	0.359	23.689
90	26.395	26.374	36.411	190.8	0.400	23.989
100	25.676	25.653	36.381	187.9	0.438	24.193
110	25.092	25.068	36.381	185.2	0.475	24.374
120	23.961	23.935	36.350	180.5	0.510	24.692
130	23.010	22.984	36.330	178.2	0.541	24.956
140	21.289	21.262	36.223	170.7	0.570	25.362
150	19.286	19.259	36.408	152.0	0.592	26.039
160	18.434	18.406	36.353	142.5	0.612	26.215
170	17.081	17.053	36.167	140.0	0.629	26.405
180	16.303	16.274	36.082	137.8	0.646	26.524
190	15.642	15.612	35.957	135.6	0.661	26.581
200	15.002	14.972	35.830	133.3	0.676	26.626
250	11.933	11.901	35.309	129.6	0.743	26.855
300	10.222	10.186	35.021	130.4	0.805	26.943
350	9.345	9.306	34.913	127.6	0.862	27.007
400	8.111	8.070	34.746	129.2	0.917	27.070
450	7.494	7.450	34.725	124.1	0.968	27.146
500	6.679	6.632	34.646	124.7	1.017	27.196
550	6.180	6.131	34.620	127.6	1.063	27.242
600	5.620	5.569	34.585	132.6	1.108	27.285
650	5.178	5.124	34.562	138.2	1.150	27.320
700	4.858	4.802	34.537	146.5	1.191	27.338
750	4.735	4.675	34.545	151.6	1.231	27.358
800	4.732	4.668	34.563	153.3	1.271	27.374
900	4.772	4.699	34.619	154.9	1.349	27.416
1000	4.909	4.826	34.755	161.5	1.422	27.511
1500	4.641	4.514	34.996	229.7	1.721	27.742
2000	3.569	3.408	34.974	255.4	1.965	27.841

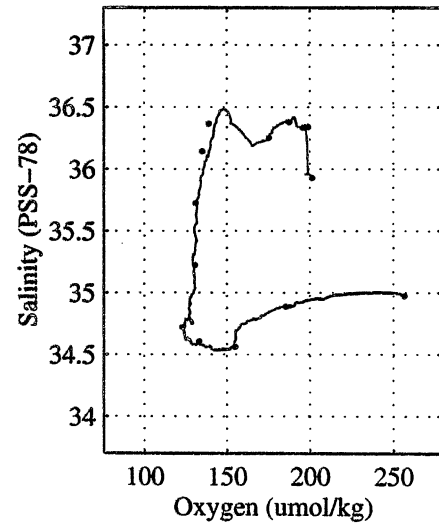
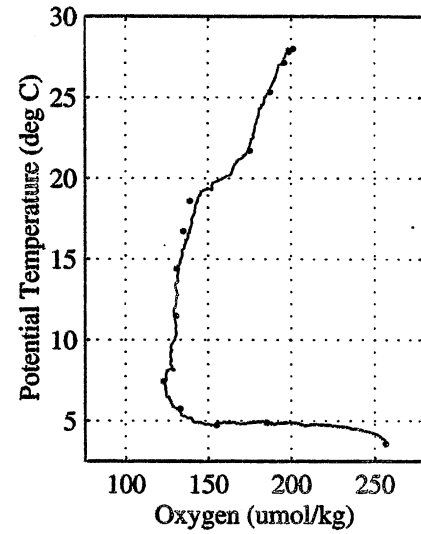
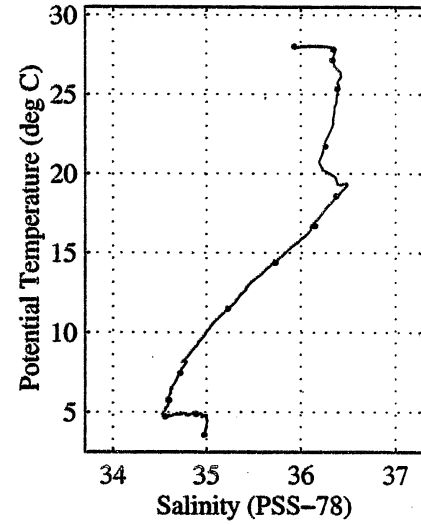
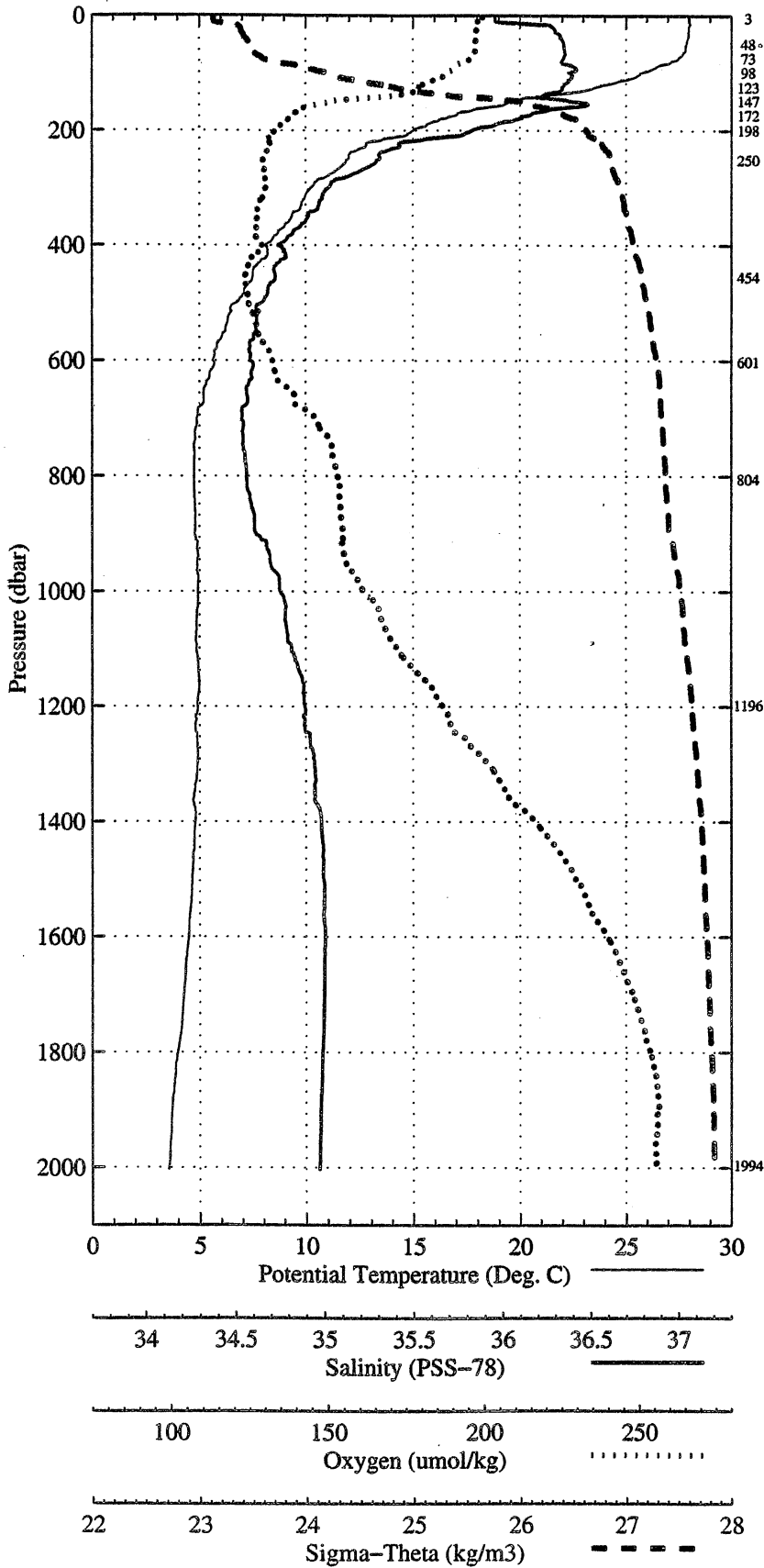
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1995	1	3.583	3.422	34.974	256.6
1197	2	4.885	4.784	34.888	185.5
805	3	4.730	4.666	34.563	154.7
601	4	5.741	5.689	34.606	133.3
455	5	7.448	7.403	34.721	123.1
251	6	11.491	11.459	35.224	130.7
199	7	14.404	14.375	35.725	131.1
173	8	16.723	16.695	36.145	135.1
148	9	18.590	18.564	36.367	139.0
124	10	21.728	21.704	36.255	175.4
98	11	25.356	25.335	36.380	187.5
73	12	27.160	27.143	36.332	195.7
48	13	27.819	27.808	36.342	198.7
4	14	28.012	28.011	35.930	201.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 55 (98055)

Latitude 7.500 N Longitude 51.649 W

06-Dec-1998 19:05 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 56 (98056)  
 Latitude 7.751N Longitude 52.000W  
 06-Dec-1998 23:02Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.682	27.682	34.131	213.6	0.006	21.847
10	27.565	27.563	34.216	212.4	0.059	21.950
20	27.362	27.358	35.718	204.8	0.112	23.147
30	27.248	27.241	36.270	194.2	0.157	23.601
40	27.046	27.037	36.284	190.6	0.199	23.679
50	26.611	26.600	36.294	187.1	0.241	23.826
60	25.296	25.282	36.249	176.9	0.280	24.205
70	24.892	24.876	36.239	170.8	0.316	24.322
80	23.985	23.968	36.294	173.2	0.351	24.637
90	22.526	22.508	36.244	171.2	0.382	25.026
100	21.584	21.564	36.189	168.4	0.410	25.250
110	20.700	20.679	36.164	162.5	0.437	25.474
120	19.905	19.882	36.188	156.7	0.461	25.706
130	19.624	19.600	36.374	148.7	0.483	25.923
140	19.341	19.315	36.410	145.8	0.504	26.025
150	18.296	18.270	36.261	143.3	0.524	26.178
160	16.828	16.802	35.998	142.7	0.542	26.335
170	15.868	15.841	35.913	139.7	0.559	26.494
180	15.028	15.000	35.769	138.7	0.574	26.572
190	14.408	14.380	35.681	137.7	0.589	26.639
200	14.055	14.026	35.656	133.0	0.603	26.696
250	11.588	11.556	35.266	126.2	0.668	26.886
300	10.016	9.981	34.997	126.9	0.727	26.960
350	9.368	9.329	34.946	124.1	0.783	27.029
400	7.899	7.858	34.745	124.9	0.837	27.101
450	7.195	7.152	34.688	124.0	0.887	27.158
500	6.315	6.270	34.621	126.1	0.934	27.225
550	5.769	5.722	34.571	130.6	0.980	27.254
600	5.601	5.550	34.594	132.5	1.023	27.295
650	5.196	5.142	34.574	136.2	1.065	27.327
700	5.096	5.039	34.593	140.6	1.106	27.355
750	5.092	5.030	34.621	141.1	1.146	27.378
800	5.019	4.954	34.644	144.9	1.185	27.406
900	4.866	4.793	34.700	153.5	1.259	27.469
1000	4.932	4.849	34.789	164.0	1.329	27.535
1500	4.645	4.518	34.993	227.2	1.626	27.739
2000	3.741	3.577	34.983	257.5	1.871	27.832

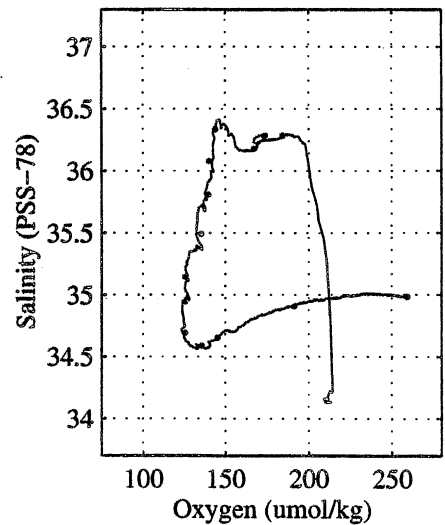
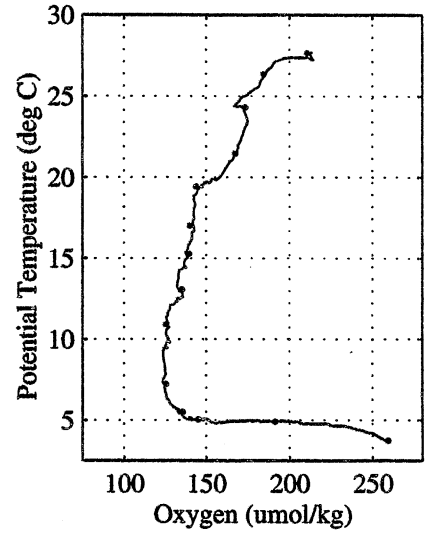
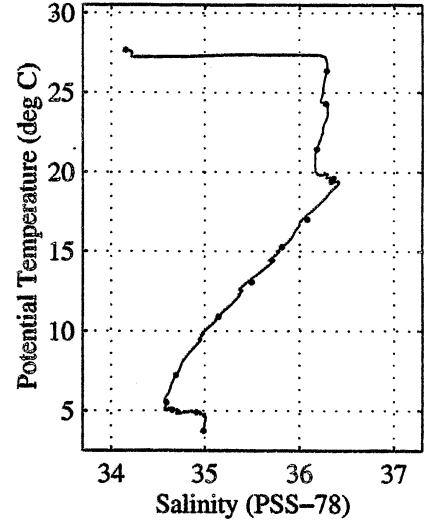
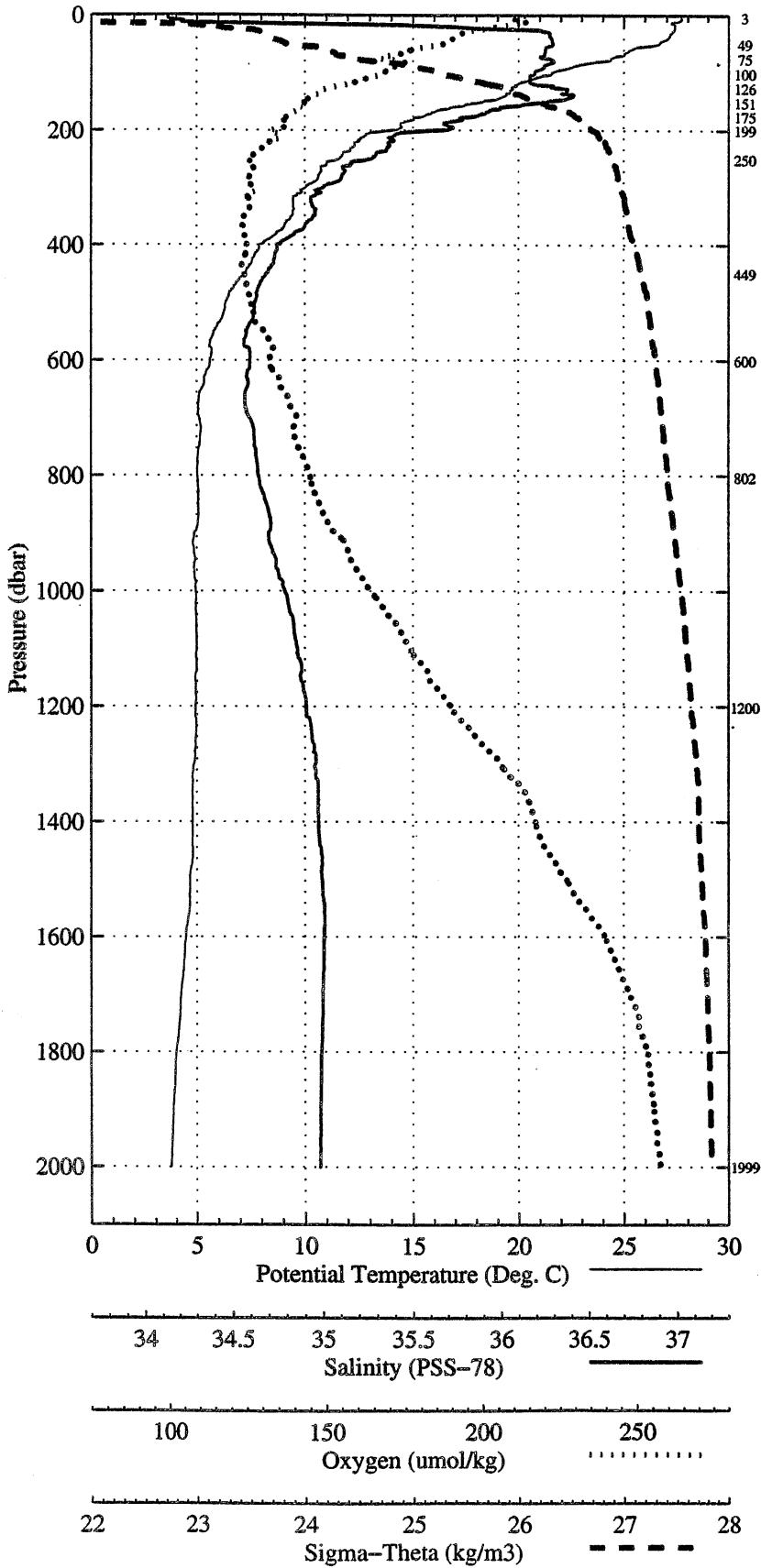
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2000	1	3.740	3.576	34.983	259.1
1201	2	4.912	4.811	34.908	191.1
803	3	5.048	4.982	34.653	145.1
600	4	5.510	5.459	34.588	135.5
449	5	7.229	7.185	34.691	125.3
251	6	10.908	10.877	35.145	125.3
200	7	13.069	13.041	35.492	135.2
176	8	15.268	15.241	35.808	139.4
151	9	17.028	17.003	36.079	140.1
126	10	19.435	19.412	36.333	143.8
101	11	21.457	21.437	36.179	167.3
75	12	24.298	24.282	36.280	173.5
50	13	26.361	26.350	36.286	184.4
4	14	27.660	27.659	34.153	210.5

NBC-1 R/V SEWARD JOHNSON

CTD Station 56 (98056)

Latitude 7.751 N Longitude 52.000 W

06-Dec-1998 23:02 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 57 (98057)**  
**Latitude 7.884N Longitude 52.527W**  
**07-Dec-1998 02:50Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.807	27.806	34.384	212.3	0.006	21.997
10	27.851	27.849	34.418	208.0	0.058	22.009
20	27.718	27.714	34.887	198.7	0.114	22.407
30	26.132	26.125	36.112	170.8	0.162	23.838
40	24.597	24.589	36.229	168.7	0.199	24.400
50	24.268	24.257	36.227	172.8	0.234	24.499
60	22.506	22.494	36.181	170.1	0.267	24.980
70	21.244	21.231	36.163	167.9	0.294	25.321
80	20.680	20.665	36.211	159.8	0.320	25.513
90	20.571	20.554	36.350	152.8	0.345	25.649
100	19.897	19.878	36.242	152.1	0.368	25.748
110	19.780	19.760	36.349	150.9	0.390	25.862
120	18.892	18.870	36.299	147.3	0.411	26.054
130	18.785	18.762	36.378	143.5	0.430	26.143
140	17.985	17.961	36.309	140.1	0.449	26.292
150	17.477	17.452	36.264	138.3	0.466	26.383
160	16.442	16.416	36.077	132.7	0.483	26.486
170	15.745	15.718	35.963	130.3	0.498	26.561
180	14.872	14.845	35.815	127.7	0.513	26.641
190	14.103	14.076	35.690	126.5	0.527	26.711
200	13.718	13.689	35.628	126.9	0.541	26.745
250	11.067	11.036	35.153	128.5	0.605	26.894
300	9.789	9.755	34.947	131.5	0.664	26.958
350	9.439	9.399	34.971	123.1	0.720	27.037
400	8.416	8.374	34.813	125.3	0.774	27.077
450	7.427	7.382	34.685	129.2	0.827	27.123
500	6.450	6.405	34.638	126.8	0.875	27.220
550	6.030	5.982	34.606	129.2	0.920	27.250
600	5.707	5.656	34.608	130.6	0.964	27.292
650	5.285	5.231	34.611	134.9	1.006	27.346
700	5.162	5.105	34.623	138.7	1.046	27.371
750	5.032	4.971	34.635	142.1	1.085	27.397
800	4.795	4.731	34.653	150.2	1.123	27.439
900	4.897	4.823	34.718	155.7	1.195	27.480
1000	4.923	4.840	34.780	164.4	1.264	27.529
1500	4.551	4.424	35.008	234.1	1.565	27.761
2000	3.619	3.457	34.976	261.6	1.798	27.838

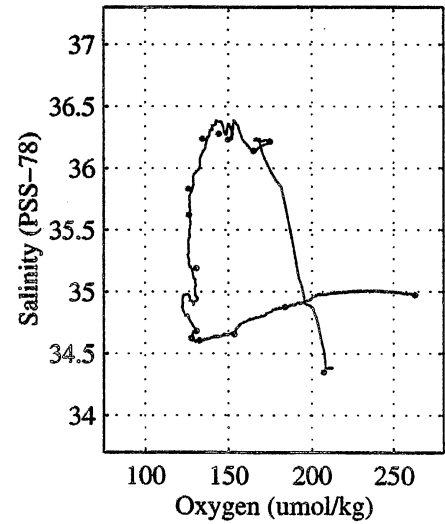
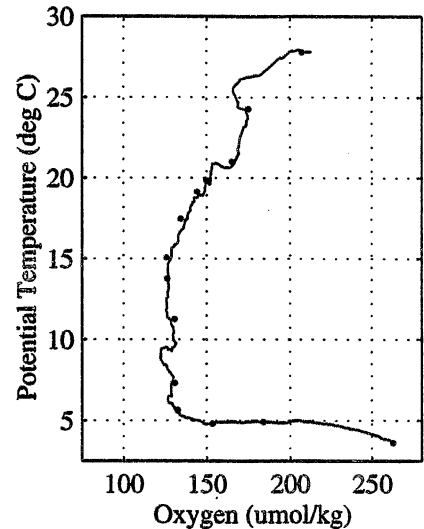
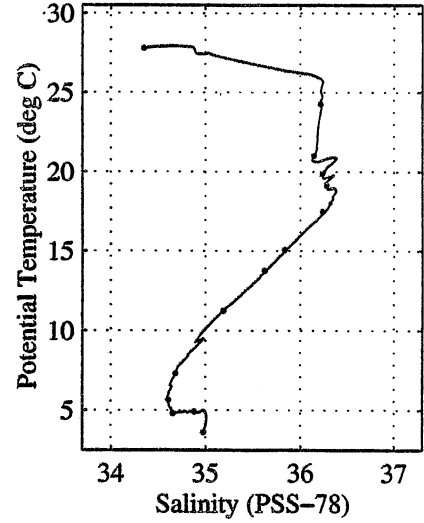
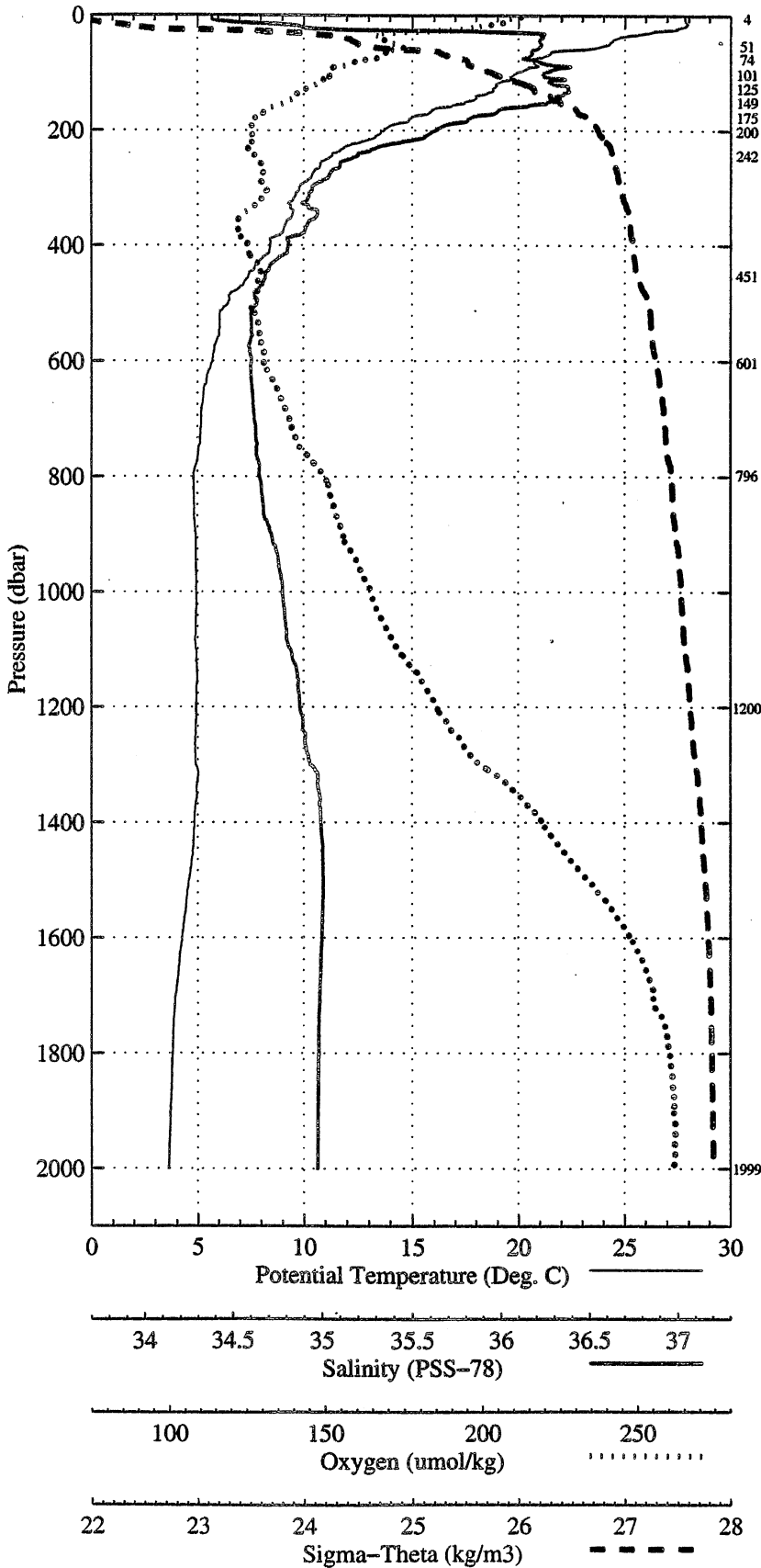
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1999	1	3.619	3.458	34.975	262.5
1200	2	4.910	4.809	34.877	183.8
796	3	4.802	4.738	34.652	153.4
601	4	5.640	5.589	34.605	132.5
451	5	7.310	7.266	34.681	130.7
242	6	11.252	11.221	35.190	130.6
200	7	13.768	13.739	35.624	126.1
176	8	15.070	15.043	35.831	125.8
150	9	17.470	17.444	36.239	134.2
126	10	19.151	19.128	36.281	144.0
101	11	19.871	19.853	36.233	149.6
75	12	21.009	20.994	36.141	165.1
52	13	24.272	24.261	36.218	174.9
4	14	27.798	27.797	34.349	207.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 57 (98057)

Latitude 7.884 N Longitude 52.527 W

07-Dec-1998 02:50 Z





**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 58 (98058)**  
**Latitude 7.387N Longitude 55.408W**  
**09-Dec-1998 00:29Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	27.811	27.811	36.107	199.8	0.005	23.291
10	27.816	27.813	36.100	201.8	0.046	23.286
20	27.817	27.813	36.100	202.2	0.092	23.287
30	27.633	27.626	36.088	201.4	0.137	23.340
40	27.223	27.214	36.327	199.4	0.182	23.654
50	26.660	26.648	36.637	200.7	0.222	24.070
60	25.880	25.866	36.830	187.2	0.259	24.463
70	25.257	25.241	37.061	184.4	0.292	24.832
80	23.716	23.699	37.039	169.0	0.321	25.282
90	22.554	22.536	36.846	159.8	0.347	25.475
100	21.209	21.190	36.585	146.8	0.372	25.656
110	19.776	19.755	36.455	139.6	0.394	25.943
120	18.702	18.681	36.343	140.8	0.414	26.136
130	17.838	17.816	36.225	138.4	0.432	26.263
140	17.228	17.205	36.142	136.1	0.450	26.348
150	16.397	16.372	36.015	134.4	0.467	26.448
160	15.586	15.561	35.879	133.4	0.482	26.531
170	15.092	15.066	35.809	134.0	0.498	26.588
180	14.694	14.667	35.764	132.8	0.512	26.641
190	13.902	13.875	35.609	135.2	0.527	26.691
200	13.500	13.472	35.525	134.9	0.541	26.710
250	12.031	11.998	35.289	134.2	0.608	26.821
300	9.842	9.808	34.906	143.5	0.669	26.917
350	9.645	9.605	34.885	143.9	0.729	26.936
400	9.663	9.617	34.925	139.5	0.788	26.966
450	8.486	8.439	34.772	135.6	0.845	27.036
500	8.061	8.009	34.771	125.3	0.900	27.101

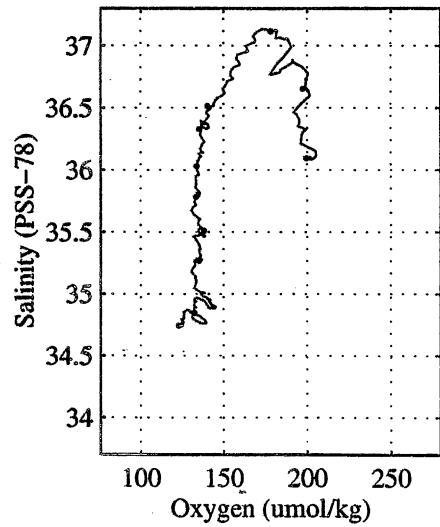
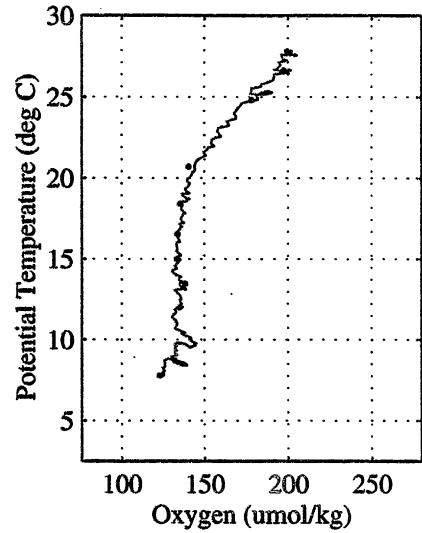
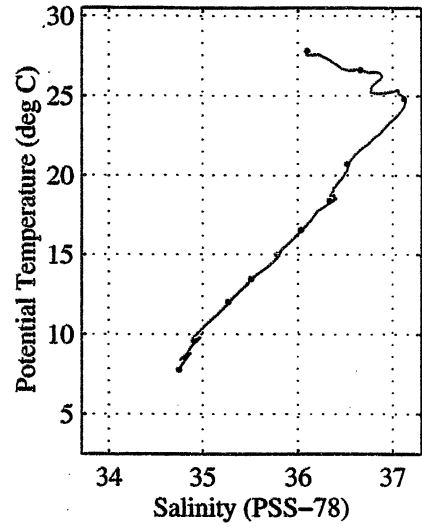
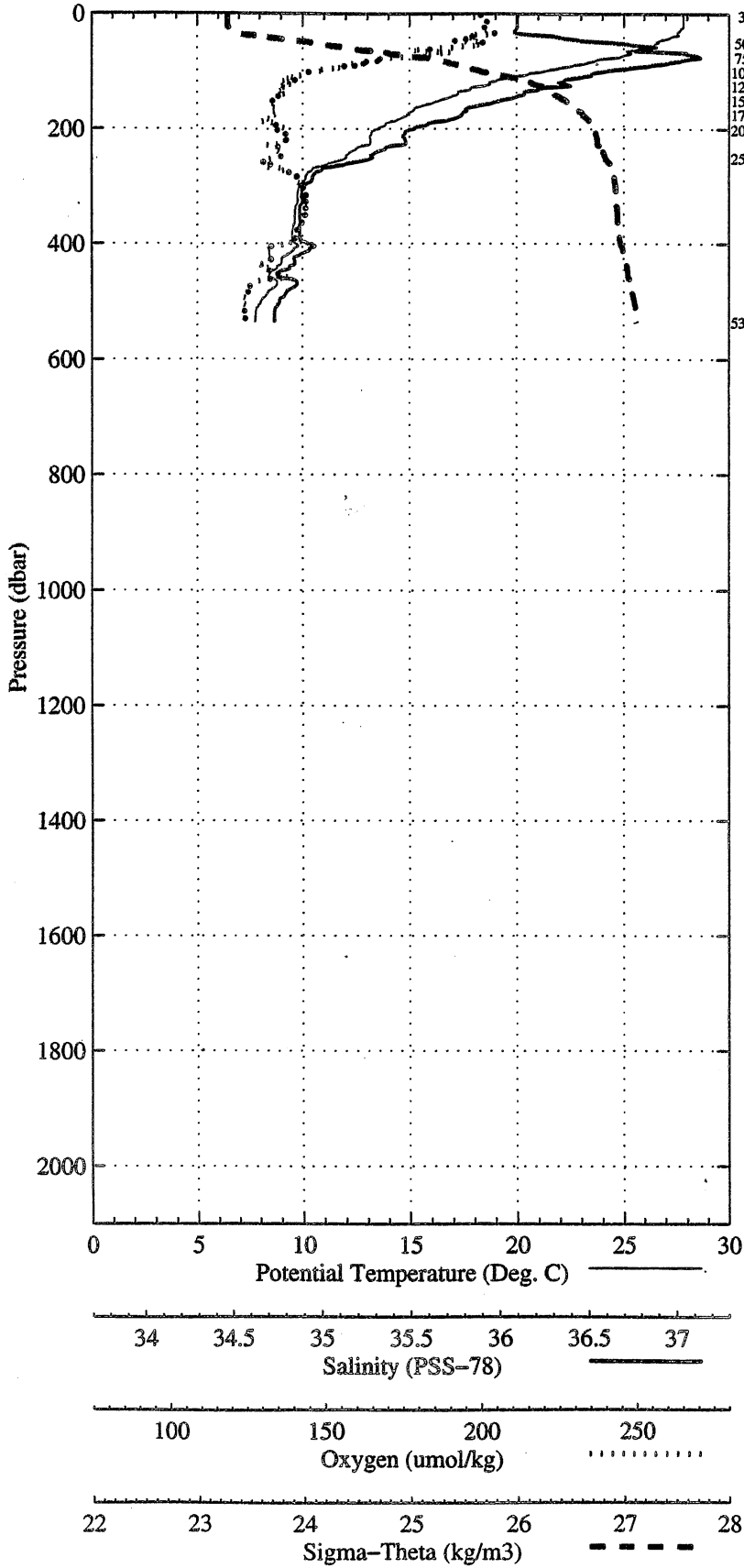
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
535	1	7.779	7.725	34.743	122.9
251	2	12.007	11.974	35.269	134.9
201	3	13.452	13.423	35.510	138.1
175	4	14.986	14.960	35.782	133.1
150	5	16.559	16.535	36.032	133.6
125	6	18.416	18.395	36.330	135.1
101	7	20.711	20.691	36.513	140.3
75	8	24.812	24.795	37.115	178.5
50	9	26.627	26.616	36.653	197.4
3	10	27.811	27.810	36.094	199.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 58 (98058)

Latitude 7.387 N Longitude 55.408 W

09-Dec-1998 00:29 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 59 (98059)  
 Latitude 7.634N Longitude 55.514W  
 09-Dec-1998 02:28Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.255	28.255	35.571	212.1	0.005	22.743
10	28.064	28.062	35.640	199.3	0.051	22.859
20	27.955	27.950	35.769	200.4	0.100	22.993
30	27.978	27.971	35.803	201.8	0.148	23.012
40	28.011	28.002	35.965	206.4	0.197	23.125
50	27.383	27.372	36.663	205.6	0.240	23.857
60	26.022	26.009	37.003	193.1	0.278	24.549
70	24.857	24.841	37.166	186.9	0.309	25.035
80	23.944	23.927	37.167	172.0	0.337	25.312
90	22.097	22.079	36.845	152.0	0.362	25.605
100	20.406	20.387	36.515	145.2	0.385	25.821
110	18.963	18.943	36.400	139.9	0.405	26.112
120	18.373	18.352	36.353	138.2	0.424	26.227
130	17.460	17.438	36.239	133.6	0.442	26.366
140	16.906	16.883	36.153	134.3	0.458	26.434
150	16.252	16.228	36.047	134.1	0.474	26.507
160	15.682	15.657	35.950	131.4	0.490	26.564
170	15.159	15.132	35.858	132.2	0.505	26.611
180	14.475	14.448	35.735	130.4	0.519	26.666
190	13.869	13.841	35.624	131.4	0.533	26.709
200	13.532	13.504	35.568	131.7	0.547	26.737
250	11.989	11.957	35.300	131.5	0.613	26.837
300	10.998	10.961	35.154	127.8	0.675	26.910
350	10.127	10.086	35.035	125.1	0.734	26.972
400	8.624	8.581	34.799	129.9	0.791	27.034
450	7.934	7.888	34.711	134.7	0.845	27.071
500	7.480	7.430	34.662	136.4	0.898	27.099
550	7.217	7.164	34.634	140.9	0.950	27.116
600	7.218	7.160	34.668	132.7	1.002	27.143
650	6.814	6.753	34.669	126.8	1.052	27.200
700	5.806	5.744	34.582	132.9	1.098	27.262
750	5.402	5.338	34.565	137.2	1.143	27.299
800	5.319	5.251	34.618	139.3	1.185	27.351
900	5.278	5.201	34.709	145.8	1.265	27.430
1000	5.275	5.189	34.836	165.7	1.336	27.533
1500	4.332	4.208	35.002	249.1	1.613	27.779

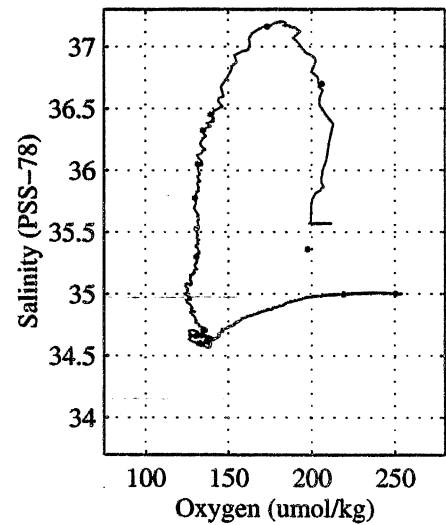
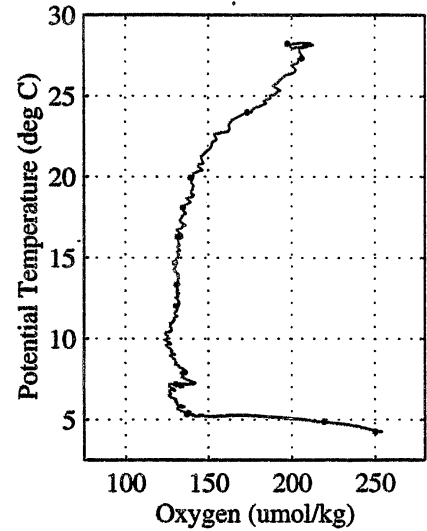
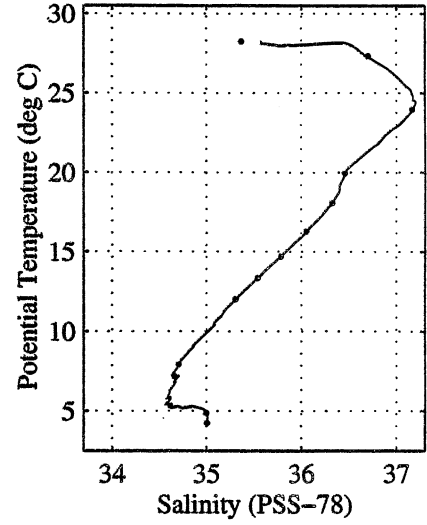
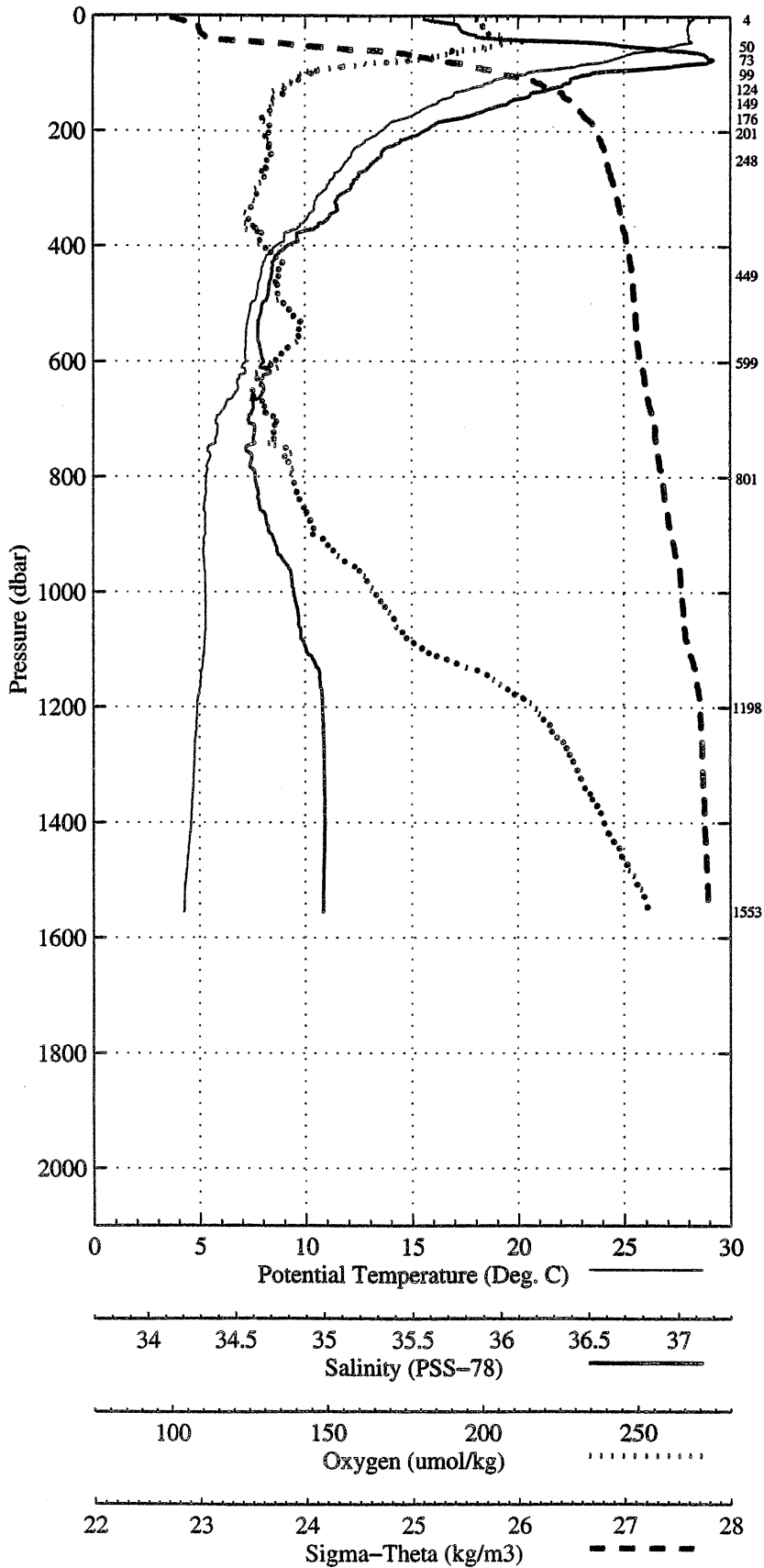
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
1553	1	4.258	4.130	35.002	250.2
1199	2	4.876	4.775	34.996	219.4
801	3	5.314	5.247	34.618	136.9
600	4	7.184	7.126	34.660	130.4
449	5	7.926	7.880	34.705	135.7
249	6	12.013	11.981	35.299	130.5
201	7	13.336	13.308	35.530	130.7
176	8	14.692	14.666	35.777	129.7
149	9	16.309	16.285	36.051	131.5
125	10	18.098	18.076	36.323	134.8
99	11	19.939	19.921	36.451	139.3
74	12	23.980	23.965	37.161	173.1
50	13	27.332	27.320	36.699	206.1
4	14	28.240	28.239	35.360	197.3

NBC-1 R/V SEWARD JOHNSON

CTD Station 59 (98059)

Latitude 7.634 N Longitude 55.514 W

09-Dec-1998 02:28 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 60 (98060)  
 Latitude 7.950N Longitude 55.664W  
 09-Dec-1998 05:32Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.505	28.505	35.184	199.7	0.005	22.369
10	28.518	28.516	35.173	200.5	0.055	22.358
20	28.475	28.470	35.286	200.9	0.109	22.459
30	28.425	28.418	35.514	201.4	0.162	22.648
40	28.431	28.421	36.384	212.9	0.212	23.302
50	26.680	26.668	36.677	196.2	0.254	24.093
60	24.953	24.940	37.035	185.9	0.288	24.904
70	22.217	22.203	36.638	152.0	0.315	25.411
80	21.001	20.986	36.638	150.4	0.339	25.751
90	19.672	19.655	36.489	142.5	0.361	25.995
100	17.654	17.636	36.038	153.0	0.380	26.162
110	16.418	16.400	35.833	154.2	0.398	26.301
120	15.458	15.439	35.662	157.8	0.415	26.390
130	14.815	14.795	35.525	160.6	0.432	26.427
140	14.716	14.695	35.545	160.1	0.448	26.464
150	13.916	13.894	35.414	159.8	0.464	26.535
160	13.370	13.348	35.318	162.1	0.479	26.573
170	13.124	13.101	35.281	160.8	0.494	26.596
180	12.951	12.926	35.274	159.7	0.509	26.625
190	12.625	12.599	35.220	158.7	0.523	26.649
200	12.337	12.311	35.177	156.2	0.537	26.672
250	11.715	11.683	35.101	156.2	0.607	26.735
300	11.291	11.253	35.072	152.9	0.674	26.792
350	10.909	10.866	35.050	147.8	0.739	26.847
400	10.127	10.080	34.966	140.4	0.802	26.921
450	9.762	9.710	34.959	133.0	0.862	26.978
500	8.206	8.154	34.751	132.2	0.918	27.064
550	7.602	7.547	34.681	137.4	0.972	27.099
600	7.598	7.538	34.716	131.5	1.025	27.128
650	7.429	7.364	34.731	125.9	1.076	27.165
700	6.460	6.395	34.617	129.6	1.126	27.207
750	5.930	5.864	34.594	132.8	1.173	27.257
800	5.832	5.761	34.628	133.1	1.218	27.297
900	5.188	5.113	34.651	143.4	1.302	27.395
1000	5.196	5.111	34.763	155.5	1.377	27.485
1500	4.181	4.058	34.997	256.6	1.661	27.791
2000	3.549	3.388	34.972	265.0	1.885	27.842

Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2000	1	3.549	3.388	34.970	263.7
1202	2	5.150	5.046	34.975	203.1
801	3	5.707	5.637	34.620	131.1
602	4	7.583	7.522	34.709	126.1
450	5	9.670	9.619	34.951	126.1
247	6	11.742	11.711	35.095	156.3
200	7	12.437	12.410	35.175	159.0
177	8	13.041	13.017	35.268	162.2
151	9	14.178	14.156	35.454	161.3
125	10	15.483	15.463	35.665	159.0
101	11	18.413	18.395	36.219	147.7
75	12	22.022	22.007	36.639	152.0
51	13	27.038	27.026	36.661	206.9
4	14	28.504	28.503	35.152	199.1



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 61 (98061)  
 Latitude 8.267N Longitude 55.851W  
 09-Dec-1998 09:08Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.333	28.333	34.476	200.4	0.006	21.894
10	28.392	28.389	34.581	201.7	0.059	21.955
20	28.552	28.548	35.219	199.0	0.114	22.383
30	28.749	28.742	35.841	203.3	0.168	22.787
40	27.162	27.153	36.638	204.9	0.212	23.908
50	26.103	26.092	36.966	192.0	0.249	24.494
60	24.146	24.133	36.834	157.8	0.280	24.996
70	21.667	21.653	36.443	155.7	0.308	25.417
80	20.264	20.249	36.166	168.3	0.332	25.591
90	18.217	18.201	35.945	170.0	0.354	25.951
100	17.413	17.396	35.852	165.1	0.375	26.078
110	16.886	16.868	35.786	168.9	0.394	26.154
120	16.292	16.273	35.706	166.9	0.412	26.233
130	15.763	15.742	35.640	166.3	0.430	26.305
140	15.474	15.453	35.605	167.3	0.447	26.344
150	14.991	14.968	35.539	165.2	0.464	26.401
160	14.591	14.567	35.488	164.2	0.481	26.449
170	14.127	14.102	35.419	164.1	0.497	26.495
180	13.802	13.776	35.377	161.7	0.513	26.532
190	13.286	13.259	35.299	163.1	0.528	26.578
200	13.219	13.191	35.289	162.6	0.543	26.585
250	12.016	11.983	35.128	158.9	0.616	26.699
300	11.643	11.604	35.081	157.3	0.685	26.735
350	11.002	10.959	35.001	156.6	0.754	26.792
400	10.428	10.380	34.938	155.8	0.819	26.846
450	9.948	9.895	34.899	150.9	0.883	26.900
500	9.711	9.654	34.882	146.6	0.946	26.928
550	8.805	8.745	34.792	139.4	1.006	27.006
600	8.017	7.955	34.715	139.1	1.062	27.066
650	7.857	7.791	34.744	130.8	1.116	27.114
700	7.212	7.143	34.699	126.6	1.168	27.172
750	6.568	6.498	34.645	129.4	1.217	27.217
800	5.771	5.701	34.612	133.5	1.264	27.292
900	5.324	5.247	34.628	139.0	1.350	27.361
1000	5.134	5.049	34.709	150.9	1.429	27.448
1500	4.347	4.223	35.004	247.5	1.727	27.779
2000	3.357	3.199	34.969	262.8	1.952	27.856

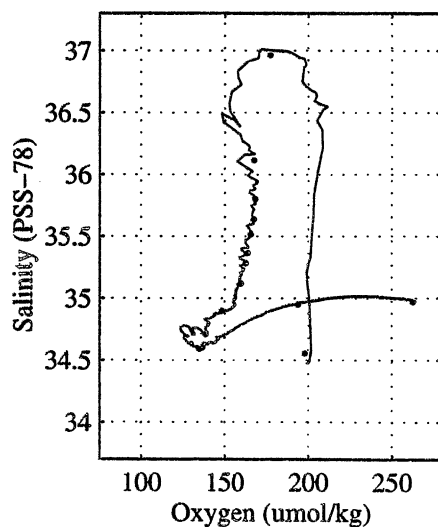
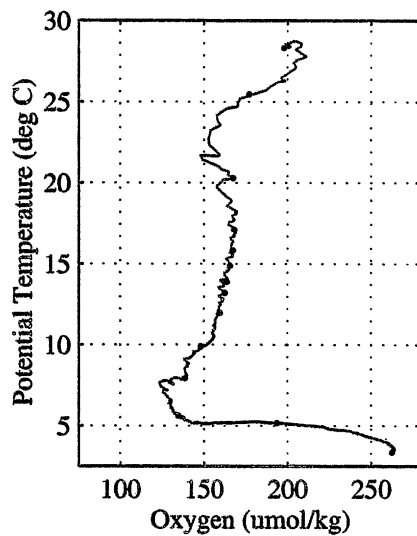
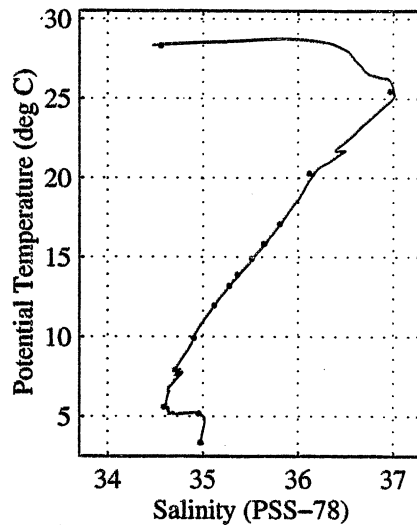
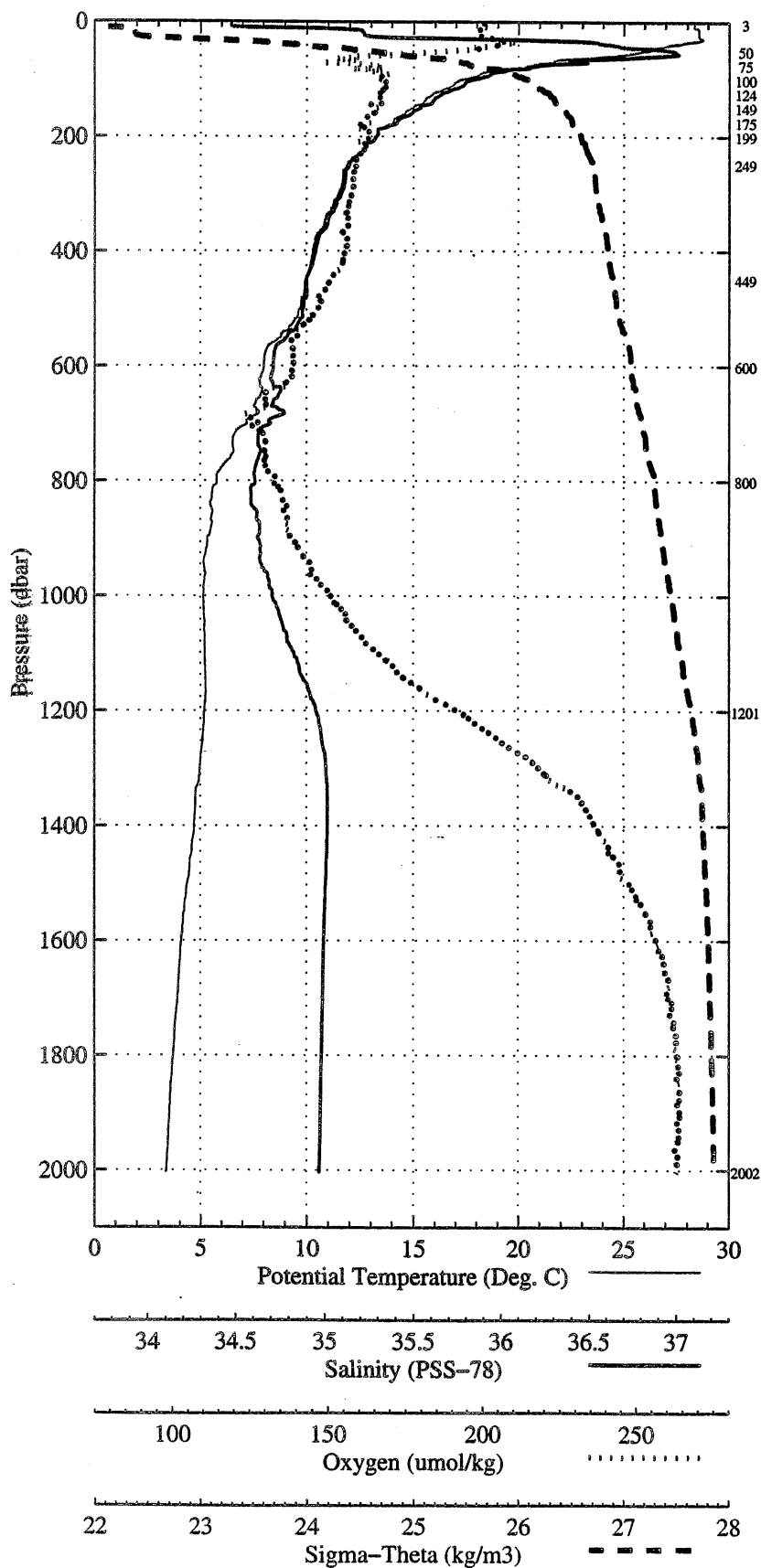
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2003	1	3.349	3.191	34.970	262.5
1201	2	5.177	5.073	34.950	193.6
800	3	5.608	5.538	34.590	134.5
601	4	7.932	7.870	34.708	138.2
450	5	9.912	9.860	34.898	148.0
249	6	11.977	11.944	35.119	159.8
200	7	13.196	13.168	35.281	162.8
175	8	13.895	13.869	35.367	164.0
150	9	14.891	14.869	35.517	165.9
125	10	15.838	15.819	35.639	167.6
101	11	17.100	17.083	35.804	168.5
76	12	20.287	20.272	36.116	167.8
51	13	25.467	25.456	36.964	177.5
4	14	28.315	28.315	34.556	197.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 61 (98061)

Latitude 8.267 N Longitude 55.851 W

09-Dec-1998 09:08 Z





NBC-1 R/V SEWARD JOHNSON  
 CTD Station 62 (98062)  
 Latitude 8.586N Longitude 56.015W  
 09-Dec-1998 12:32Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.587	28.587	35.241	197.7	0.005	22.385
10	28.561	28.559	35.241	198.0	0.054	22.395
20	28.608	28.603	35.547	199.7	0.108	22.611
30	28.491	28.484	35.858	198.8	0.159	22.885
40	27.863	27.854	36.378	196.8	0.206	23.484
50	24.166	24.156	36.424	179.8	0.243	24.678
60	22.245	22.233	36.324	162.6	0.273	25.163
70	19.641	19.629	36.082	166.8	0.298	25.690
80	19.115	19.101	36.048	169.7	0.321	25.802
90	18.410	18.394	35.976	171.1	0.342	25.926
100	18.029	18.012	35.929	168.8	0.363	25.986
110	17.276	17.258	35.836	169.5	0.383	26.100
120	16.902	16.882	35.794	168.5	0.402	26.157
130	16.559	16.538	35.745	166.0	0.421	26.201
140	16.053	16.031	35.677	164.8	0.439	26.267
150	15.364	15.341	35.591	164.2	0.457	26.358
160	14.796	14.771	35.513	161.6	0.473	26.424
170	14.277	14.252	35.435	160.5	0.489	26.476
180	13.892	13.866	35.387	163.5	0.505	26.520
190	13.529	13.502	35.337	160.7	0.521	26.558
200	13.038	13.010	35.261	160.3	0.536	26.599
250	12.203	12.170	35.153	158.7	0.608	26.682
300	11.748	11.709	35.094	157.3	0.679	26.726
350	11.403	11.359	35.050	157.0	0.748	26.757
400	10.991	10.941	34.999	157.0	0.816	26.795
450	10.362	10.308	34.930	154.9	0.882	26.854
500	10.071	10.012	34.904	153.1	0.947	26.886
550	9.592	9.529	34.872	146.2	1.010	26.942
600	8.883	8.817	34.836	136.2	1.069	27.030
650	7.973	7.906	34.761	126.6	1.125	27.110
700	7.154	7.086	34.672	128.2	1.178	27.158
750	6.534	6.464	34.633	129.6	1.228	27.212
800	5.927	5.855	34.611	131.7	1.275	27.272
900	5.209	5.133	34.594	139.9	1.362	27.347
1000	5.050	4.966	34.664	148.2	1.443	27.422
1500	4.345	4.221	35.004	245.9	1.753	27.779
2000	3.342	3.184	34.968	262.1	1.980	27.857

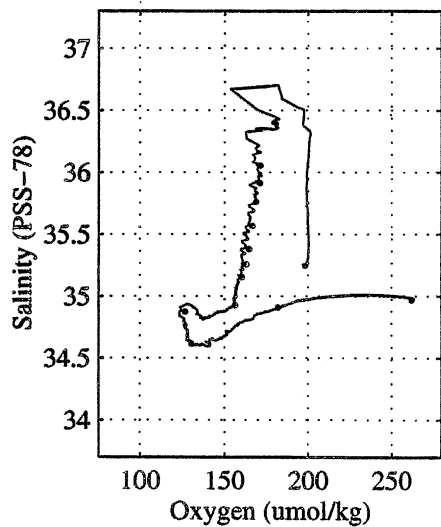
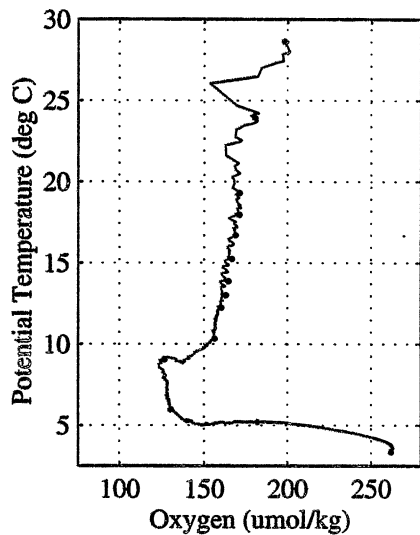
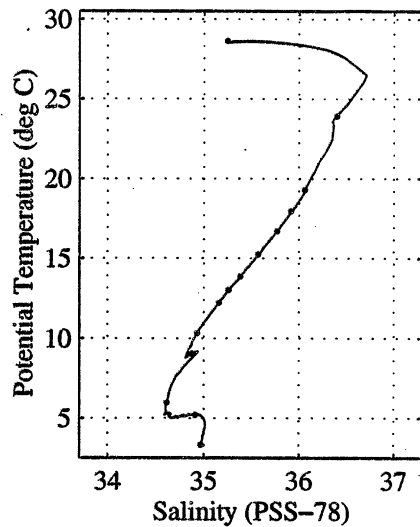
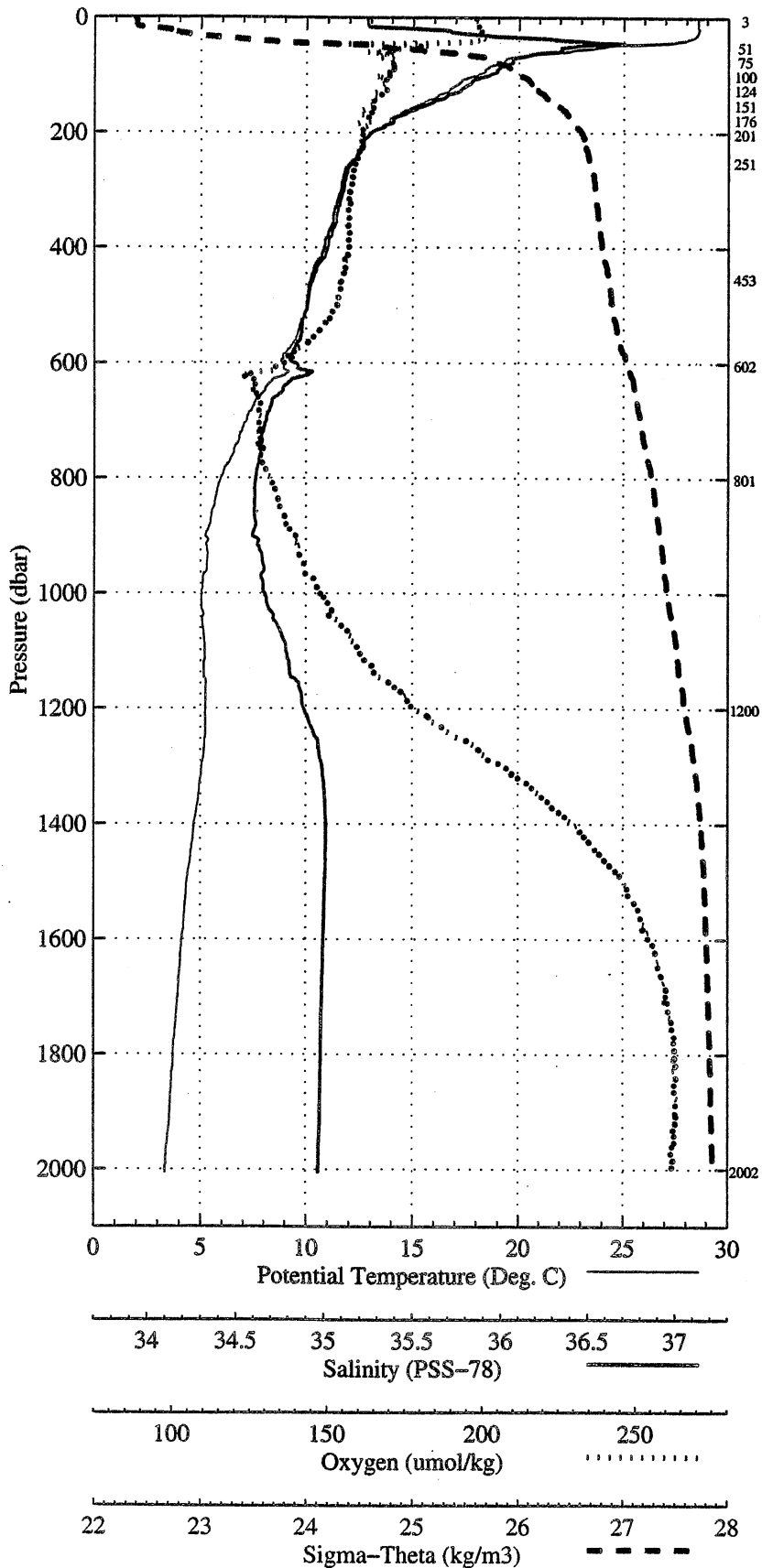
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2002	1	3.342	3.184	34.967	262.0
1200	2	5.205	5.101	34.907	181.9
801	3	5.980	5.908	34.614	130.3
603	4	9.059	8.992	34.874	126.6
453	5	10.338	10.283	34.926	156.1
252	6	12.230	12.197	35.154	160.3
202	7	13.006	12.978	35.256	163.0
177	8	13.868	13.843	35.379	164.5
151	9	15.238	15.214	35.567	166.6
125	10	16.711	16.690	35.764	168.7
100	11	17.971	17.954	35.913	171.0
75	12	19.318	19.304	36.055	171.1
51	13	23.928	23.917	36.393	180.4
4	14	28.631	28.630	35.248	198.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 62 (98062)

Latitude 8.586 N Longitude 56.015 W

09-Dec-1998 12:32 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 63 (98063)**  
**Latitude 8.901N Longitude 56.182W**  
**09-Dec-1998 15:52Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.744	28.744	35.345	224.6	0.005	22.411
10	28.687	28.684	35.344	198.0	0.054	22.431
20	28.622	28.617	35.678	201.0	0.108	22.705
30	28.521	28.514	35.808	199.1	0.158	22.838
40	28.314	28.304	36.096	199.0	0.207	23.125
50	26.666	26.654	36.741	190.2	0.250	24.146
60	23.328	23.316	36.369	177.0	0.284	24.885
70	20.921	20.908	36.202	164.1	0.311	25.440
80	19.717	19.702	36.107	172.1	0.335	25.690
90	19.344	19.328	36.076	169.3	0.358	25.765
100	18.178	18.161	35.953	168.5	0.379	25.968
110	17.463	17.444	35.862	169.0	0.399	26.074
120	16.824	16.804	35.785	168.8	0.418	26.169
130	16.175	16.154	35.694	166.8	0.437	26.252
140	15.717	15.696	35.637	165.4	0.455	26.313
150	14.836	14.813	35.520	164.4	0.472	26.419
160	14.651	14.627	35.497	163.0	0.488	26.443
170	14.296	14.271	35.449	163.5	0.504	26.483
180	14.022	13.996	35.404	162.0	0.520	26.507
190	13.776	13.749	35.366	161.9	0.536	26.529
200	13.429	13.400	35.324	161.5	0.551	26.569
250	12.508	12.474	35.193	158.3	0.626	26.654
300	11.957	11.917	35.121	157.4	0.697	26.707
350	11.561	11.516	35.069	156.7	0.767	26.743
400	11.155	11.105	35.018	156.0	0.836	26.780
450	10.846	10.790	34.982	156.0	0.904	26.810
500	10.345	10.285	34.929	154.8	0.970	26.858
550	10.011	9.946	34.912	150.2	1.035	26.904
600	10.326	10.253	35.089	126.6	1.098	26.990
650	8.697	8.626	34.822	129.2	1.156	27.049
700	7.386	7.316	34.693	127.3	1.211	27.143
750	6.570	6.500	34.628	129.7	1.262	27.203
800	5.824	5.754	34.599	132.7	1.309	27.275
900	5.410	5.333	34.608	137.6	1.397	27.334
1000	5.107	5.023	34.648	145.2	1.480	27.403
1500	4.422	4.297	35.006	241.4	1.795	27.773
2000	3.384	3.225	34.970	260.7	2.023	27.855

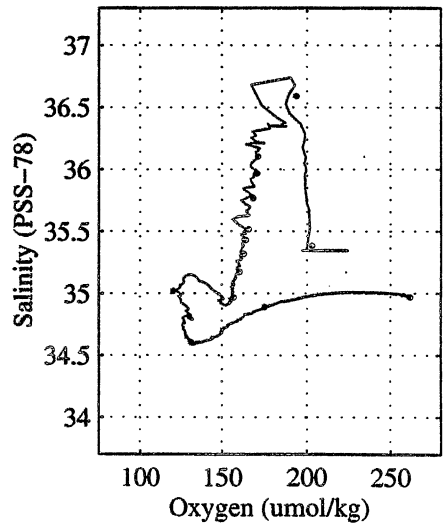
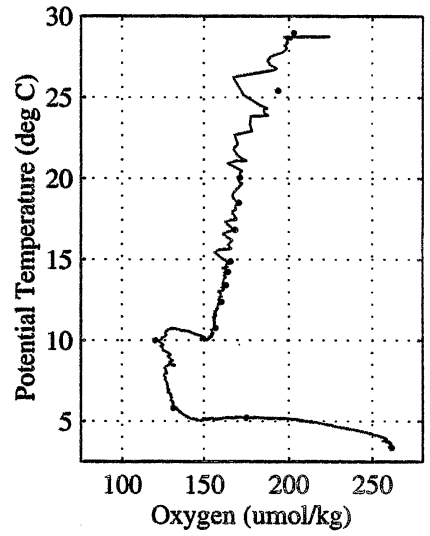
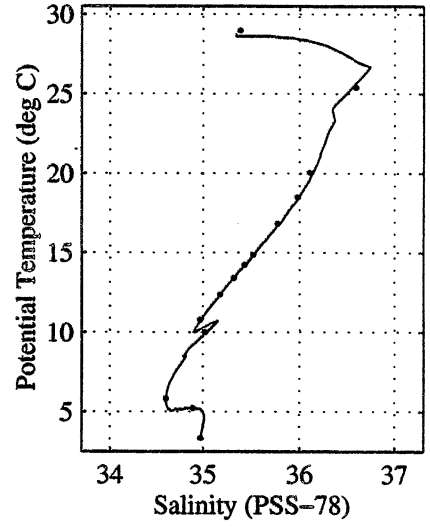
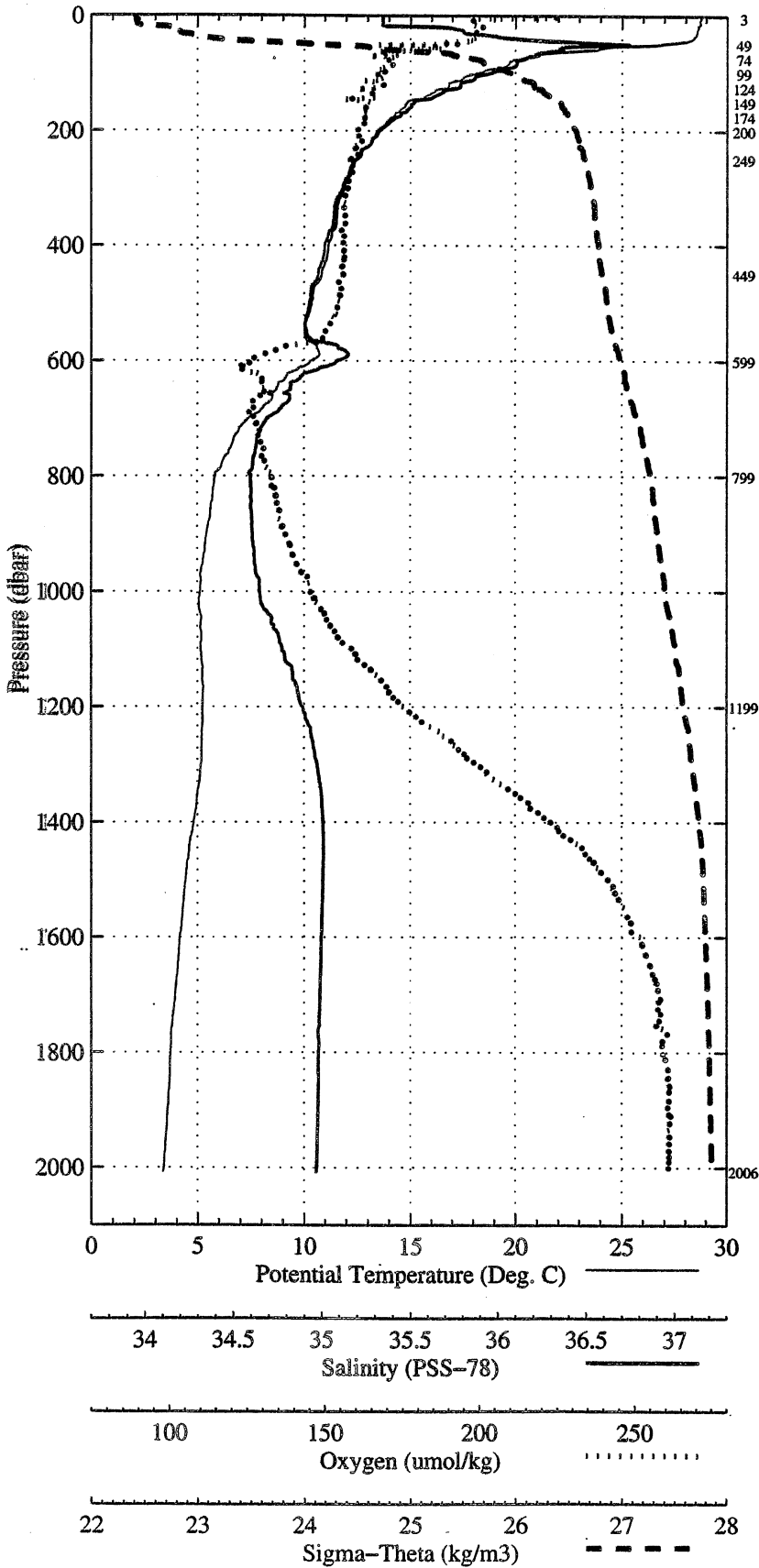
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2007	1	3.362	3.203	34.969	261.5
1200	2	5.219	5.114	34.891	175.1
800	3	5.830	5.759	34.603	131.4
600	4	10.008	9.937	35.019	120.4
450	5	10.775	10.719	34.967	156.6
249	6	12.384	12.350	35.173	160.2
200	7	13.412	13.383	35.318	163.0
175	8	14.230	14.204	35.429	164.2
150	9	14.867	14.844	35.516	165.7
125	10	16.825	16.804	35.766	168.4
100	11	18.498	18.480	35.968	170.6
74	12	20.060	20.046	36.105	171.2
49	13	25.401	25.390	36.592	193.6
4	14	28.972	28.971	35.383	202.9

NBC-1 R/V SEWARD JOHNSON

CTD Station 63 (98063)

Latitude 8.901 N Longitude 56.182 W

09-Dec-1998 15:52 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 64 (98064)**  
**Latitude 9.213N Longitude 56.369W**  
**09-Dec-1998 19:24Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.742	28.742	35.312	201.3	0.005	22.387
10	28.683	28.681	35.316	199.4	0.054	22.411
20	28.612	28.607	35.392	200.6	0.108	22.493
30	28.525	28.518	35.695	200.7	0.161	22.752
40	28.370	28.361	36.252	204.6	0.210	23.223
50	25.133	25.122	36.476	180.3	0.251	24.425
60	22.043	22.031	36.271	174.9	0.281	25.180
70	21.199	21.186	36.234	172.7	0.308	25.388
80	20.938	20.922	36.219	174.2	0.333	25.449
90	20.677	20.659	36.195	170.6	0.359	25.503
100	18.986	18.968	36.031	169.4	0.382	25.823
110	18.376	18.357	35.969	170.8	0.404	25.931
120	17.423	17.403	35.857	167.7	0.424	26.081
130	16.873	16.852	35.783	165.7	0.444	26.157
140	16.421	16.398	35.727	168.0	0.462	26.221
150	16.311	16.287	35.714	165.2	0.481	26.237
160	15.683	15.658	35.625	164.8	0.498	26.313
170	15.427	15.400	35.590	165.0	0.516	26.345
180	14.762	14.735	35.505	162.4	0.533	26.426
190	14.200	14.172	35.429	162.9	0.549	26.489
200	14.127	14.097	35.417	161.6	0.565	26.496
250	12.935	12.901	35.248	156.8	0.642	26.612
300	12.156	12.117	35.148	158.3	0.714	26.689
350	11.615	11.570	35.075	156.3	0.785	26.738
400	11.283	11.232	35.035	155.8	0.854	26.770
450	10.754	10.698	34.974	154.5	0.922	26.820
500	10.709	10.647	35.126	128.8	0.987	26.949
550	8.950	8.889	34.859	128.3	1.046	27.035
600	7.737	7.676	34.737	126.8	1.101	27.124
650	7.597	7.531	34.755	123.2	1.152	27.160
700	7.204	7.136	34.722	122.6	1.203	27.190
750	6.502	6.432	34.634	126.1	1.252	27.217
800	5.844	5.774	34.591	131.4	1.299	27.267
900	5.467	5.389	34.611	136.9	1.387	27.331
1000	5.257	5.172	34.669	143.1	1.471	27.403
1500	4.495	4.369	35.008	238.0	1.792	27.766
2000	3.465	3.305	34.972	261.7	2.023	27.849

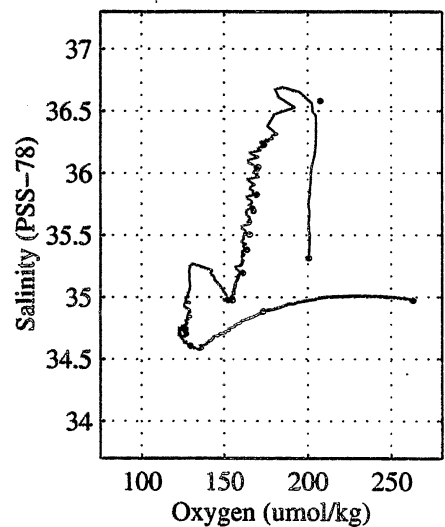
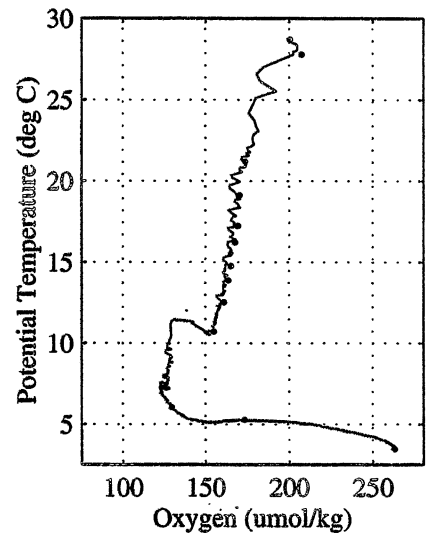
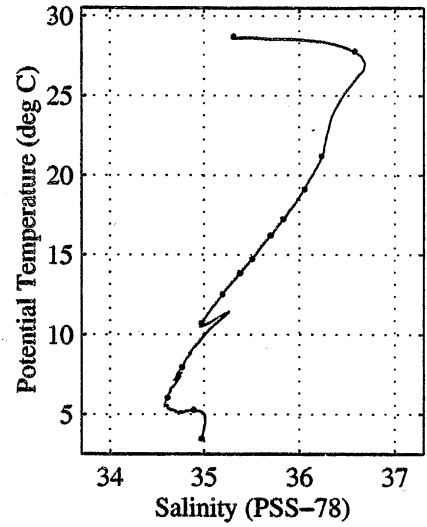
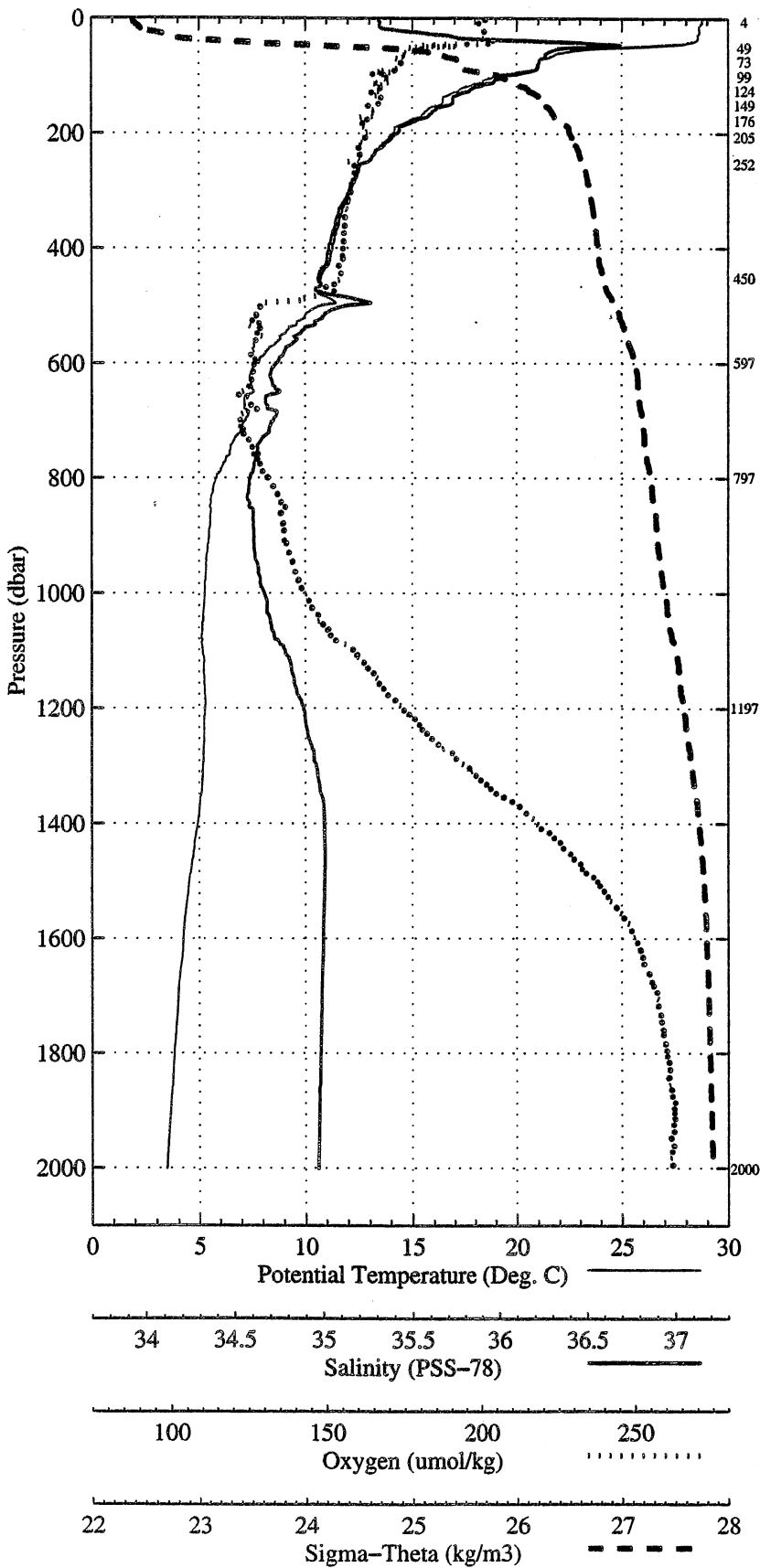
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2001	1	3.464	3.304	34.973	262.7
1198	2	5.282	5.177	34.886	173.5
798	3	6.049	5.977	34.606	129.4
598	4	7.957	7.896	34.761	125.3
450	5	10.718	10.663	34.972	154.8
252	6	12.533	12.499	35.194	161.2
205	7	13.875	13.845	35.383	163.8
177	8	14.754	14.728	35.506	165.3
150	9	16.220	16.195	35.696	167.8
125	10	17.244	17.223	35.829	169.6
100	11	19.131	19.113	36.049	170.5
74	12	21.214	21.200	36.229	173.7
50	13	27.791	27.780	36.582	207.3
5	14	28.706	28.704	35.314	200.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 64 (98064)

Latitude 9.213 N Longitude 56.369 W

09-Dec-1998 19:24 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 65 (98065)  
 Latitude 9.535N Longitude 56.549W  
 09-Dec-1998 22:58Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$	DynHt $\text{m}^3/\text{kg}$	SigT $\text{kg/m}^3$
1	28.486	28.486	35.149	205.3	0.005	22.349
10	28.557	28.555	35.157	202.7	0.055	22.333
20	28.624	28.619	35.311	202.8	0.110	22.428
30	28.614	28.607	35.457	202.5	0.163	22.543
40	27.617	27.608	36.263	200.3	0.212	23.478
50	25.950	25.939	36.380	187.7	0.252	24.100
60	23.905	23.892	36.492	164.9	0.287	24.809
70	22.574	22.560	36.365	164.1	0.317	25.102
80	21.641	21.625	36.291	164.4	0.345	25.310
90	20.724	20.707	36.183	168.6	0.371	25.481
100	19.815	19.797	36.106	168.3	0.395	25.666
110	19.290	19.270	36.061	168.6	0.418	25.769
120	18.261	18.240	35.947	164.9	0.440	25.944
130	17.481	17.459	35.855	166.0	0.460	26.066
140	16.934	16.910	35.788	164.1	0.479	26.148
150	16.080	16.056	35.678	162.4	0.498	26.263
160	15.762	15.736	35.635	163.5	0.516	26.303
170	15.337	15.311	35.588	162.4	0.533	26.363
180	15.023	14.995	35.549	162.1	0.550	26.404
190	14.743	14.715	35.523	161.5	0.567	26.445
200	14.112	14.083	35.415	161.0	0.583	26.498
250	13.387	13.352	35.351	159.1	0.660	26.601
300	13.404	13.361	35.482	145.9	0.734	26.702
350	12.465	12.418	35.407	128.4	0.802	26.834
400	10.892	10.842	35.119	133.5	0.866	26.906
450	9.541	9.490	34.908	131.9	0.927	26.975
500	8.966	8.911	34.880	125.7	0.984	27.047
550	8.337	8.279	34.802	123.8	1.039	27.085
600	8.019	7.957	34.793	122.2	1.092	27.127
650	7.507	7.442	34.733	122.0	1.144	27.156
700	6.997	6.929	34.696	125.0	1.194	27.199
750	6.441	6.372	34.647	126.2	1.243	27.235
800	6.122	6.049	34.634	128.7	1.290	27.267
900	5.490	5.412	34.621	136.4	1.379	27.335
1000	5.274	5.188	34.651	142.5	1.462	27.387
1500	4.622	4.495	35.012	234.4	1.796	27.756
2000	3.477	3.317	34.973	260.3	2.030	27.849

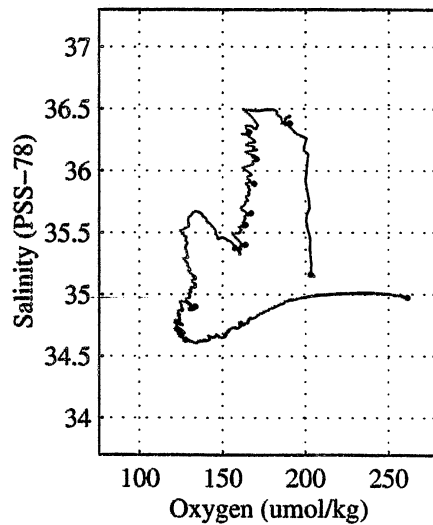
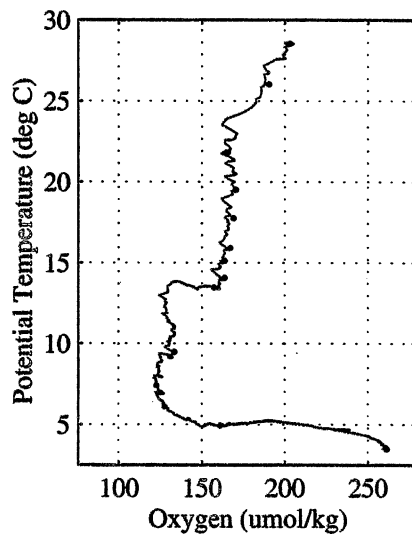
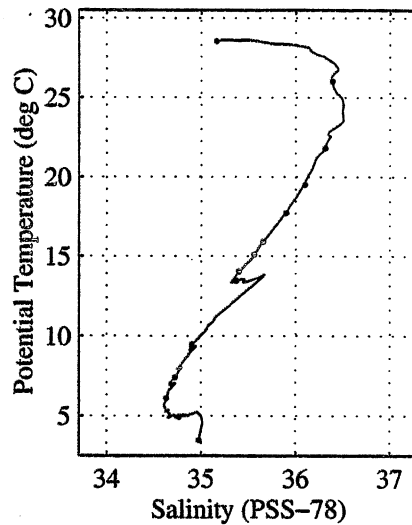
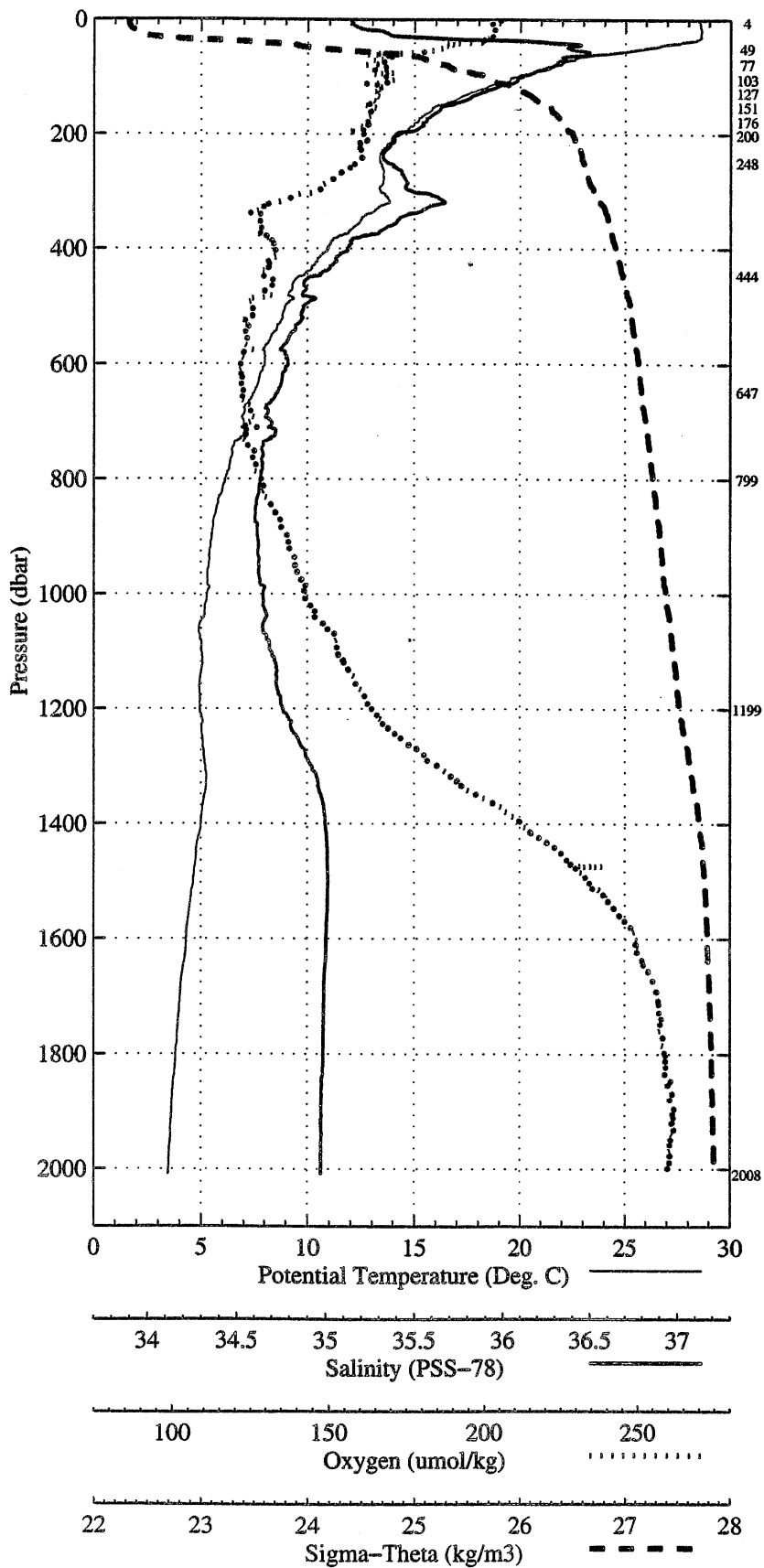
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen $\mu\text{mol/kg}$
2008	1	3.474	3.314	34.973	261.5
1199	2	4.933	4.831	34.762	160.9
799	3	6.103	6.031	34.631	127.4
647	4	7.416	7.352	34.722	122.3
445	5	9.493	9.443	34.900	133.2
249	6	13.458	13.422	35.375	157.3
200	7	14.051	14.022	35.403	163.8
177	8	15.113	15.086	35.561	163.8
152	9	15.918	15.894	35.656	167.2
127	10	17.749	17.727	35.896	169.3
104	11	19.512	19.493	36.095	170.6
77	12	21.824	21.809	36.308	165.7
50	13	26.024	26.012	36.382	190.5
4	14	28.532	28.531	35.161	203.0

NBC-1 R/V SEWARD JOHNSON

CTD Station 65 (98065)

Latitude 9.535 N Longitude 56.549 W

09-Dec-1998 22:58 Z





**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 66 (98066)**  
**Latitude 9.833N Longitude 56.716W**  
**10-Dec-1998 02:33Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.366	28.366	34.926	208.6	0.006	22.221
10	28.363	28.360	34.927	199.0	0.056	22.224
20	28.331	28.326	35.221	198.4	0.111	22.458
30	28.276	28.269	35.410	198.2	0.164	22.619
40	28.190	28.181	35.637	196.5	0.216	22.819
50	27.605	27.594	36.364	201.2	0.263	23.560
60	26.102	26.089	36.352	174.8	0.303	24.032
70	23.664	23.650	36.357	176.5	0.338	24.779
80	23.160	23.143	36.330	174.7	0.369	24.907
90	22.292	22.274	36.477	150.3	0.398	25.270
100	21.439	21.419	36.596	146.7	0.423	25.601
110	20.973	20.952	36.610	143.2	0.447	25.741
120	20.362	20.339	36.574	140.1	0.469	25.879
130	19.536	19.512	36.460	141.6	0.490	26.012
140	18.730	18.705	36.344	136.2	0.510	26.132
150	18.023	17.997	36.201	144.1	0.529	26.201
160	17.389	17.362	36.158	134.1	0.547	26.324
170	17.121	17.093	36.206	137.3	0.564	26.426
180	16.685	16.655	36.159	136.0	0.580	26.494
190	16.612	16.581	36.167	133.4	0.596	26.518
200	16.172	16.140	36.062	131.1	0.612	26.541
250	12.205	12.172	35.261	139.6	0.683	26.766
300	10.777	10.740	35.014	144.1	0.748	26.840
350	10.438	10.396	35.053	130.9	0.810	26.932
400	9.763	9.717	34.964	126.6	0.870	26.980
450	8.931	8.881	34.847	128.1	0.927	27.025
500	8.353	8.300	34.776	128.5	0.982	27.061
550	7.690	7.634	34.691	132.0	1.036	27.094
600	7.475	7.416	34.694	128.9	1.089	27.128
650	7.165	7.102	34.674	127.6	1.140	27.157
700	7.038	6.970	34.701	123.0	1.190	27.197
750	6.508	6.439	34.651	127.3	1.239	27.229
800	6.186	6.114	34.627	129.1	1.286	27.253
900	5.549	5.471	34.607	135.9	1.377	27.317
1000	5.391	5.305	34.646	141.7	1.462	27.369
1500	4.529	4.402	35.011	238.5	1.789	27.765
2000	3.380	3.222	34.969	260.2	2.021	27.854

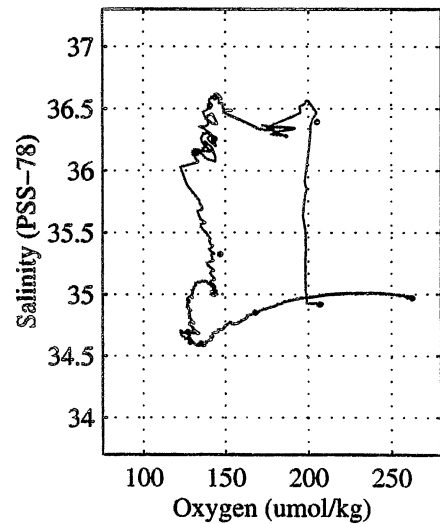
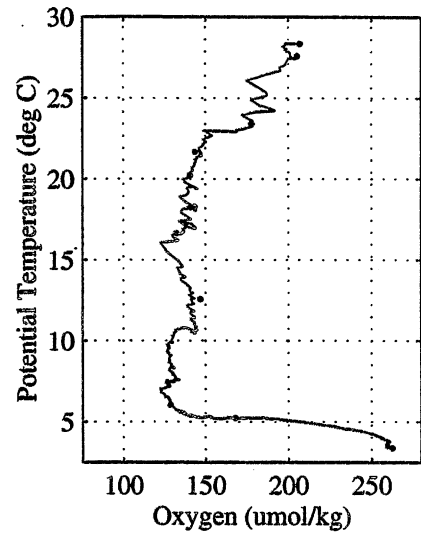
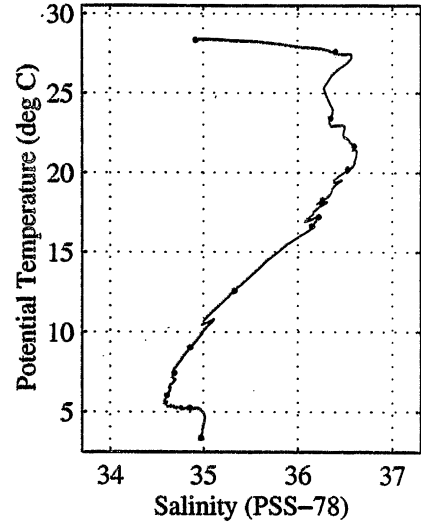
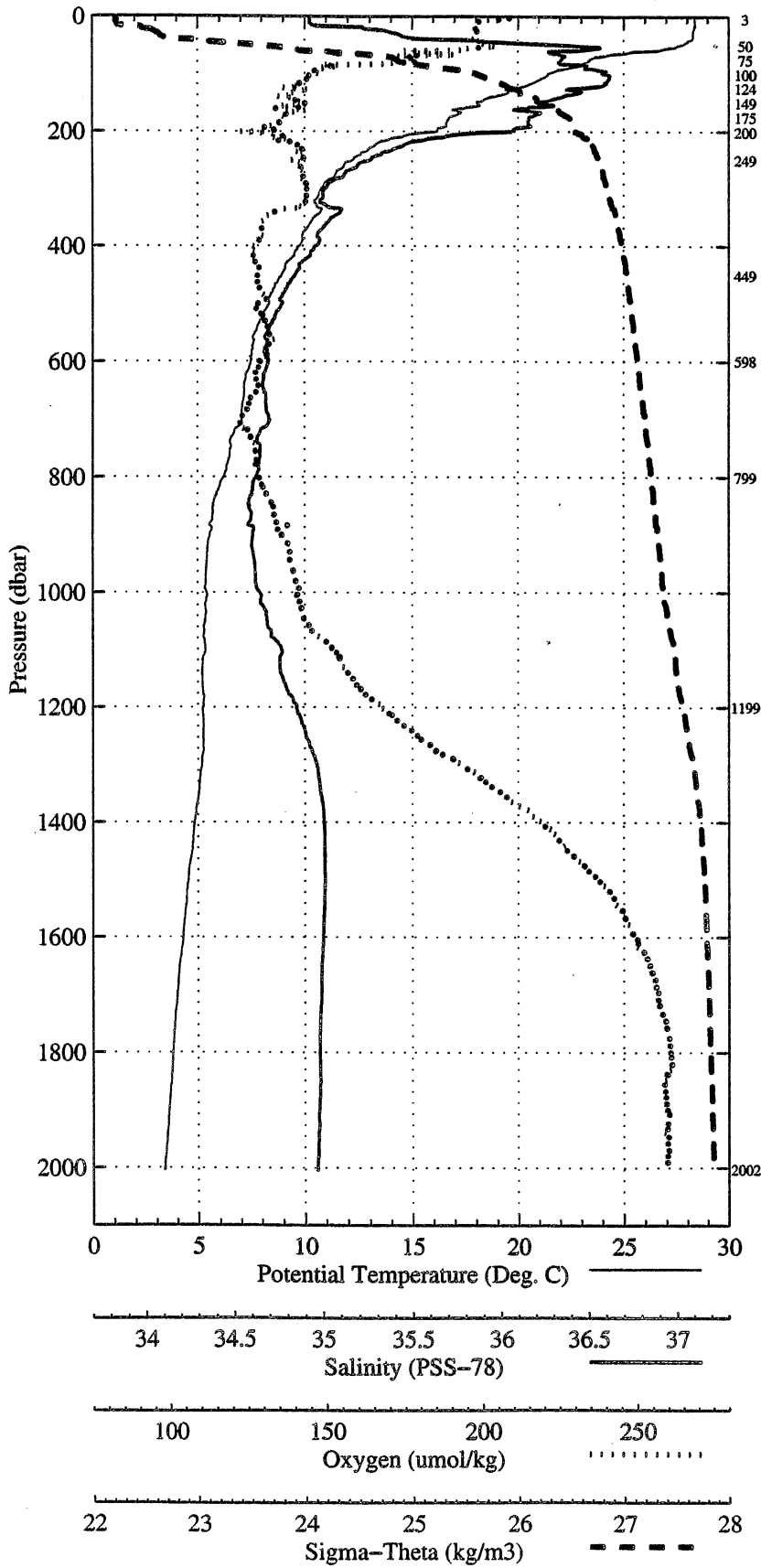
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2002	1	3.378	3.220	34.969	262.5
1199	2	5.249	5.145	34.853	167.8
800	3	6.049	5.977	34.611	128.8
599	4	7.434	7.375	34.692	127.1
450	5	9.035	8.985	34.858	NaN
250	6	12.573	12.540	35.325	146.8
201	7	16.648	16.615	36.139	132.6
175	8	17.227	17.197	36.216	137.8
150	9	18.284	18.257	36.257	143.3
124	10	20.237	20.214	36.526	140.6
100	11	21.672	21.652	36.593	143.8
75	12	23.428	23.413	36.341	177.5
50	13	27.603	27.592	36.393	205.1
4	14	28.342	28.341	34.918	206.8

NBC-1 R/V SEWARD JOHNSON

CTD Station 66 (98066)

Latitude 9.833 N Longitude 56.716 W

10-Dec-1998 02:33 Z



**NBC-1 R/V SEWARD JOHNSON**  
**CTD Station 67 (98067)**  
**Latitude 10.166N Longitude 56.899W**  
**10-Dec-1998 06:19Z**

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.203	28.203	35.555	200.1	0.005	22.748
10	28.210	28.207	35.574	197.1	0.051	22.761
20	28.261	28.257	35.653	197.0	0.102	22.805
30	28.309	28.302	35.725	196.9	0.152	22.845
40	28.038	28.029	35.986	197.7	0.201	23.132
50	26.874	26.863	36.265	189.2	0.245	23.721
60	25.822	25.809	36.295	184.8	0.285	24.077
70	25.075	25.059	36.506	172.3	0.322	24.468
80	24.680	24.663	36.685	166.9	0.356	24.725
90	23.351	23.332	36.809	155.9	0.385	25.216
100	23.001	22.980	36.884	157.5	0.413	25.377
110	21.844	21.822	36.715	149.0	0.438	25.579
120	20.177	20.154	36.378	146.7	0.461	25.779
130	19.510	19.486	36.465	141.1	0.483	26.022
140	19.566	19.541	36.631	141.9	0.502	26.136
150	19.078	19.051	36.575	135.1	0.521	26.221
160	18.419	18.391	36.464	132.7	0.539	26.304
170	17.136	17.108	36.232	130.2	0.556	26.443
180	16.906	16.876	36.199	129.9	0.573	26.473
190	16.194	16.163	36.086	129.1	0.588	26.554
200	15.597	15.565	35.972	127.3	0.604	26.603
250	12.291	12.258	35.383	121.1	0.672	26.844
300	10.732	10.695	35.135	119.9	0.734	26.942
350	9.914	9.873	35.008	119.7	0.792	26.987
400	8.989	8.945	34.875	122.5	0.848	27.037
450	8.664	8.616	34.860	120.1	0.903	27.078
500	8.245	8.193	34.814	119.7	0.956	27.107
550	7.814	7.758	34.776	119.9	1.007	27.142
600	7.180	7.121	34.699	121.1	1.058	27.173
650	7.040	6.977	34.700	120.9	1.107	27.194
700	6.408	6.343	34.631	125.7	1.155	27.225
750	6.230	6.162	34.635	127.9	1.202	27.253
800	5.928	5.856	34.620	129.7	1.248	27.280
900	5.431	5.354	34.617	136.6	1.336	27.339
1000	5.198	5.113	34.648	143.4	1.419	27.393
1500	4.487	4.362	35.007	237.9	1.740	27.767
2000	3.409	3.250	34.967	261.6	1.967	27.851

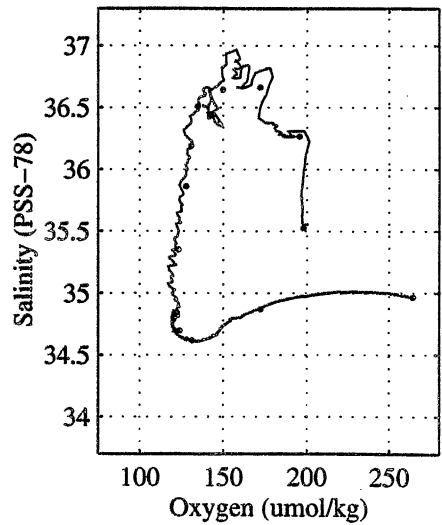
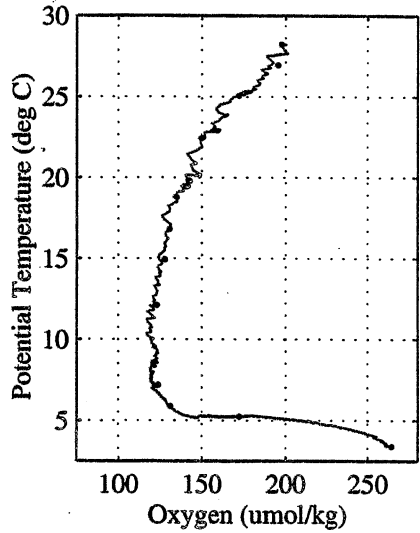
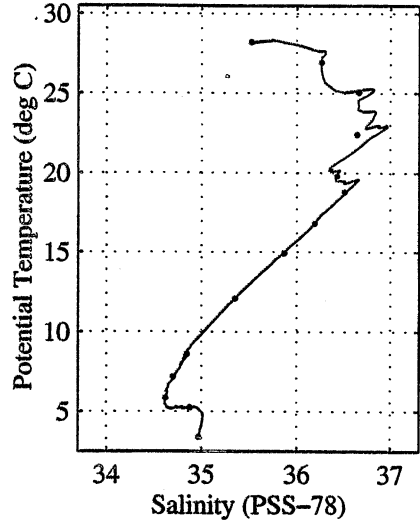
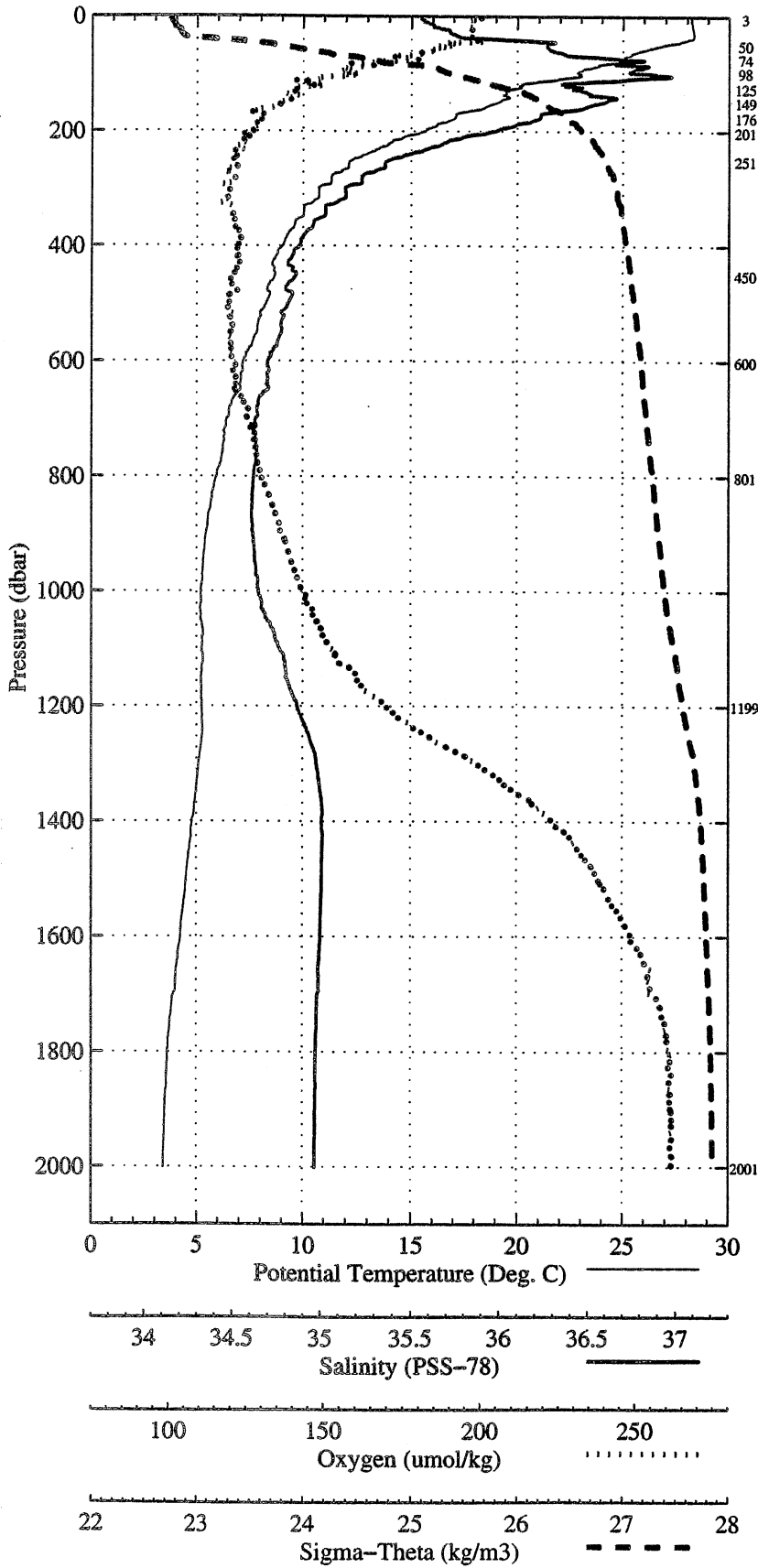
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2001	1	3.408	3.249	34.967	264.2
1200	2	5.245	5.141	34.872	172.4
801	3	5.863	5.792	34.617	131.0
601	4	7.173	7.115	34.697	123.5
451	5	8.603	8.554	34.844	121.6
252	6	12.110	12.077	35.353	122.7
202	7	14.940	14.909	35.863	127.5
176	8	16.816	16.787	36.191	130.4
150	9	18.814	18.787	36.510	134.3
125	10	19.803	19.780	36.434	142.4
98	11	22.423	22.403	36.645	149.6
75	12	25.067	25.051	36.665	172.3
51	13	26.947	26.936	36.268	195.3
4	14	28.208	28.208	35.526	197.6

NBC-1 R/V SEWARD JOHNSON

CTD Station 67 (98067)

Latitude 10.166 N Longitude 56.899 W

10-Dec-1998 06:19 Z



NBC-1 R/V SEWARD JOHNSON  
 CTD Station 68 (98068)  
 Latitude 10.467N Longitude 57.050W  
 10-Dec-1998 09:55Z

Pressure dbar	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg	DynHt m <sup>3</sup> /kg	SigT kg/m <sup>3</sup>
1	28.227	28.226	35.261	201.3	0.005	22.519
10	28.288	28.286	35.260	199.3	0.053	22.499
20	28.324	28.319	35.282	199.4	0.107	22.506
30	28.407	28.399	35.587	199.8	0.159	22.709
40	28.254	28.244	35.846	200.7	0.210	22.956
50	28.083	28.071	35.960	199.6	0.258	23.100
60	27.367	27.353	36.525	199.4	0.303	23.759
70	26.806	26.790	36.685	192.6	0.343	24.062
80	26.347	26.329	36.867	190.0	0.380	24.346
90	25.163	25.144	36.880	174.4	0.415	24.727
100	23.859	23.838	36.935	163.1	0.446	25.164
110	22.040	22.018	36.676	153.3	0.472	25.494
120	21.941	21.917	36.889	151.0	0.496	25.686
130	21.064	21.038	36.750	140.7	0.519	25.825
140	19.663	19.637	36.582	140.3	0.540	26.073
150	19.048	19.021	36.541	137.2	0.560	26.203
160	18.270	18.242	36.418	131.7	0.578	26.306
170	17.214	17.185	36.243	128.7	0.595	26.432
180	16.675	16.645	36.153	126.3	0.611	26.492
190	15.879	15.849	36.024	123.7	0.627	26.578
200	15.102	15.071	35.888	122.4	0.641	26.649
250	13.454	13.418	35.669	117.9	0.709	26.834
300	11.380	11.342	35.318	116.5	0.771	26.968
350	10.752	10.709	35.227	112.8	0.828	27.013
400	9.928	9.882	35.101	110.4	0.883	27.059
450	9.252	9.202	35.005	113.7	0.937	27.098
500	8.612	8.558	34.917	114.4	0.989	27.132
550	8.174	8.116	34.861	116.0	1.040	27.156
600	7.378	7.318	34.751	117.5	1.090	27.186
650	6.926	6.864	34.707	120.5	1.139	27.216
700	6.438	6.373	34.660	123.0	1.186	27.244
750	6.091	6.024	34.642	126.2	1.232	27.275
800	5.819	5.748	34.639	129.8	1.277	27.308
900	5.360	5.283	34.640	136.9	1.362	27.366
1000	5.189	5.104	34.700	146.5	1.441	27.435
1500	4.412	4.288	35.006	239.6	1.747	27.773
2000	3.497	3.336	34.974	259.9	1.976	27.848

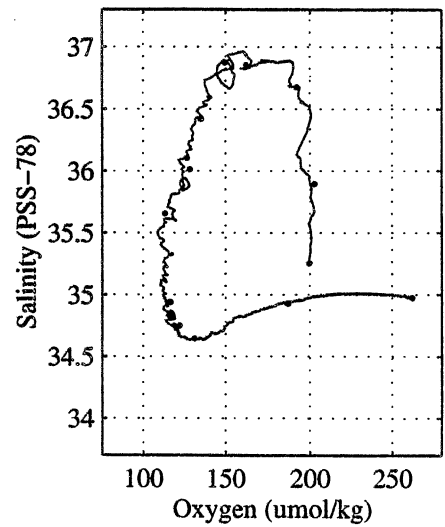
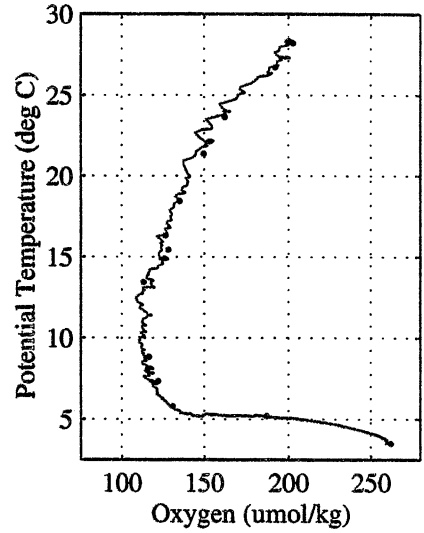
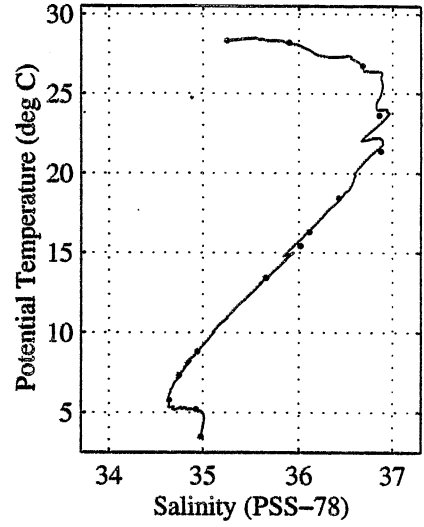
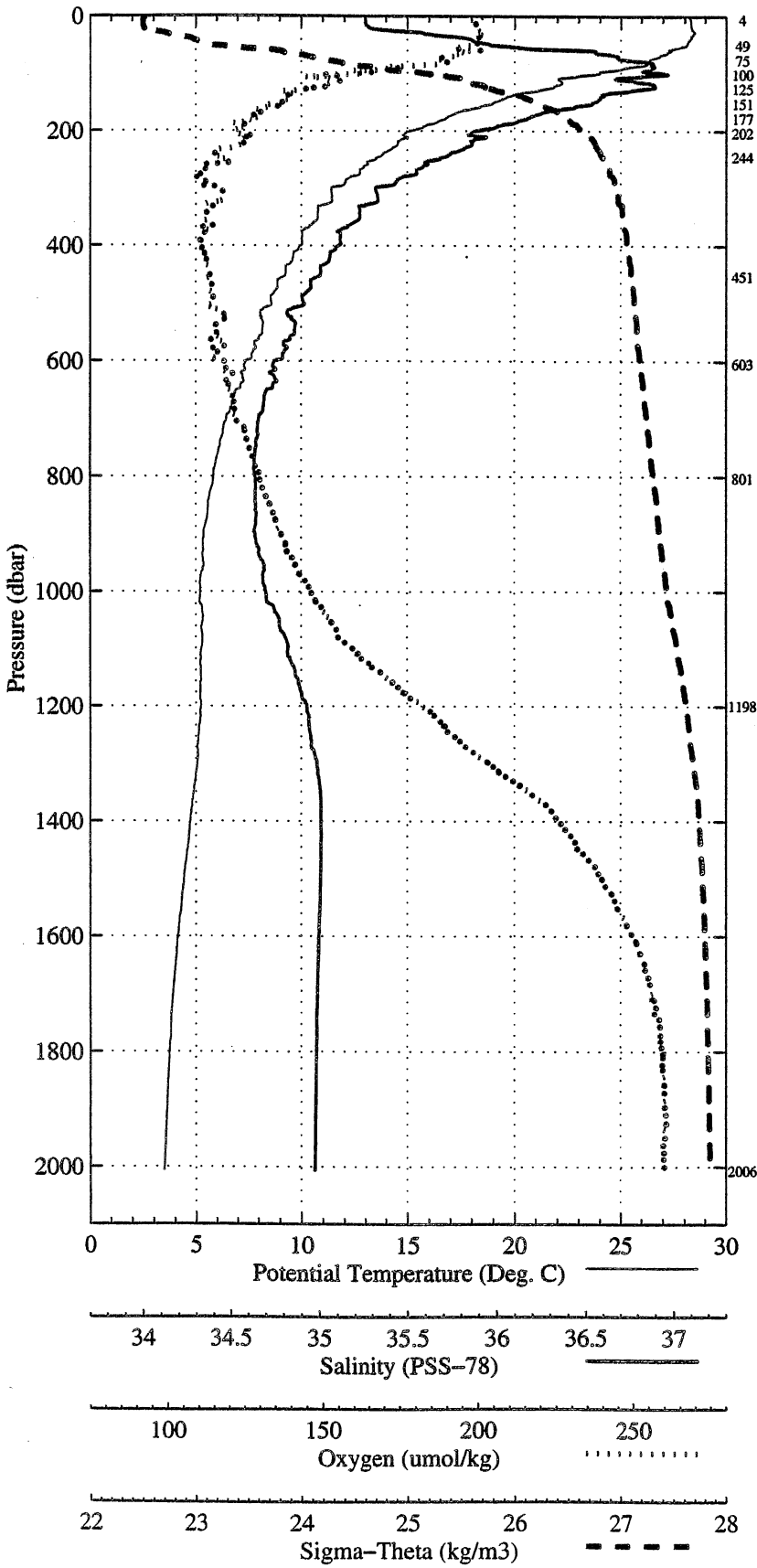
Pressure dbar	Niskin	Temp90 Deg C	PoTemp90 Deg C	Salinity PSS-78	Oxygen μmol/kg
2006	1	3.490	3.330	34.975	262.0
1198	2	5.208	5.103	34.925	187.0
802	3	5.779	5.709	34.643	131.1
603	4	7.341	7.282	34.749	122.0
452	5	8.837	8.788	34.939	116.4
245	6	13.434	13.400	35.655	113.0
202	7	15.435	15.403	36.012	128.4
177	8	16.320	16.292	36.105	126.5
152	9	18.440	18.414	36.420	135.2
125	10	21.383	21.359	36.874	149.6
101	11	23.636	23.615	36.855	162.5
76	12	26.738	26.721	36.678	192.0
50	13	28.208	28.196	35.897	202.6
5	14	28.325	28.324	35.255	199.4

NBC-1 R/V SEWARD JOHNSON

CTD Station 68 (98068)

Latitude 10.467 N Longitude 57.050 W

10-Dec-1998 09:55 Z



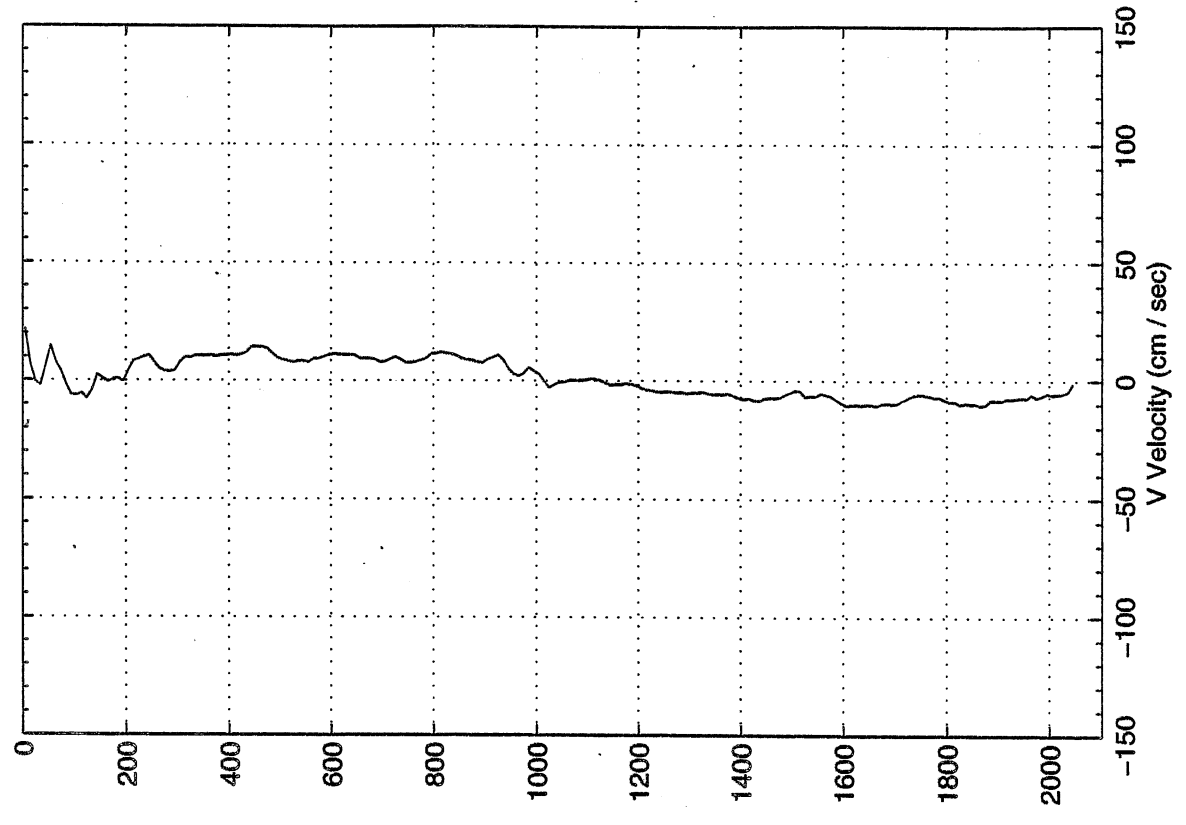
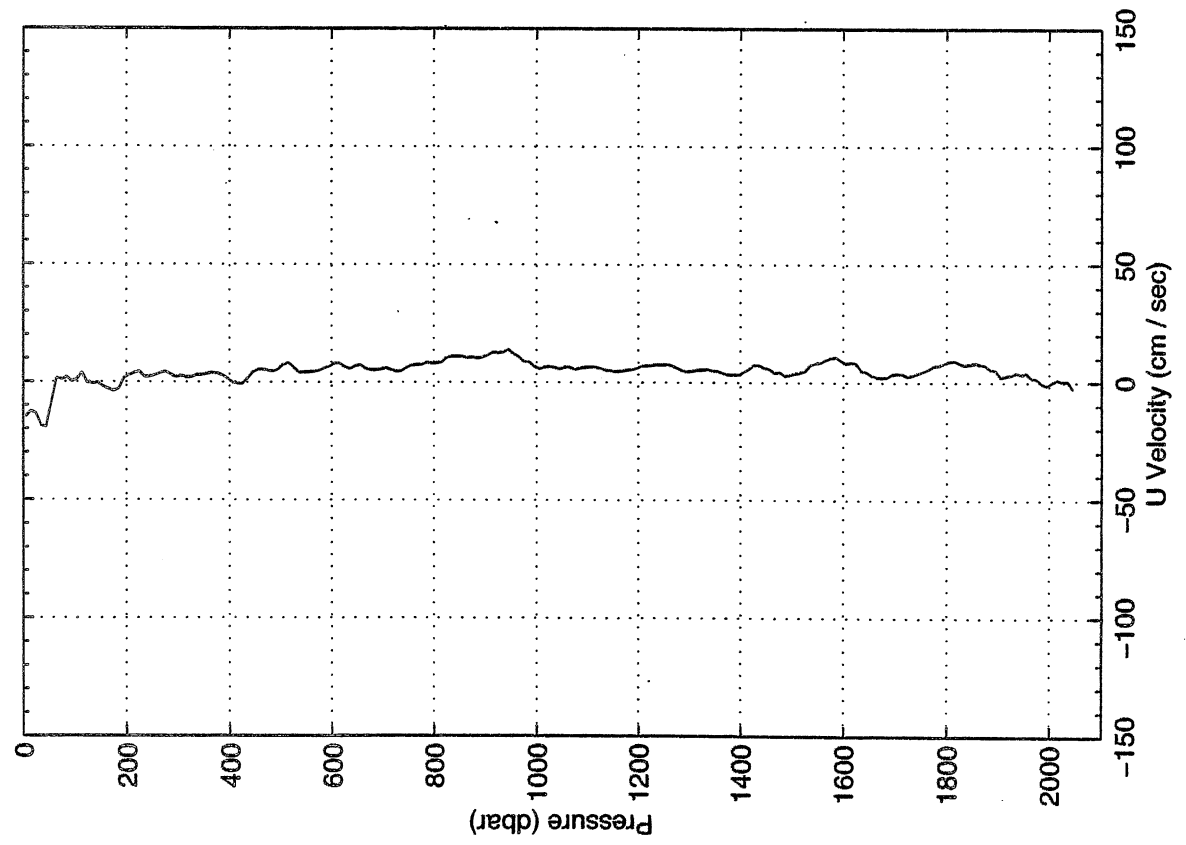
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**APPENDIX B**  
**LADCP DATA**



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LADCP Station 1 (98001)  
Latitude 13.008 N Longitude 57.067 W  
09-Nov-1998 23:24 Z

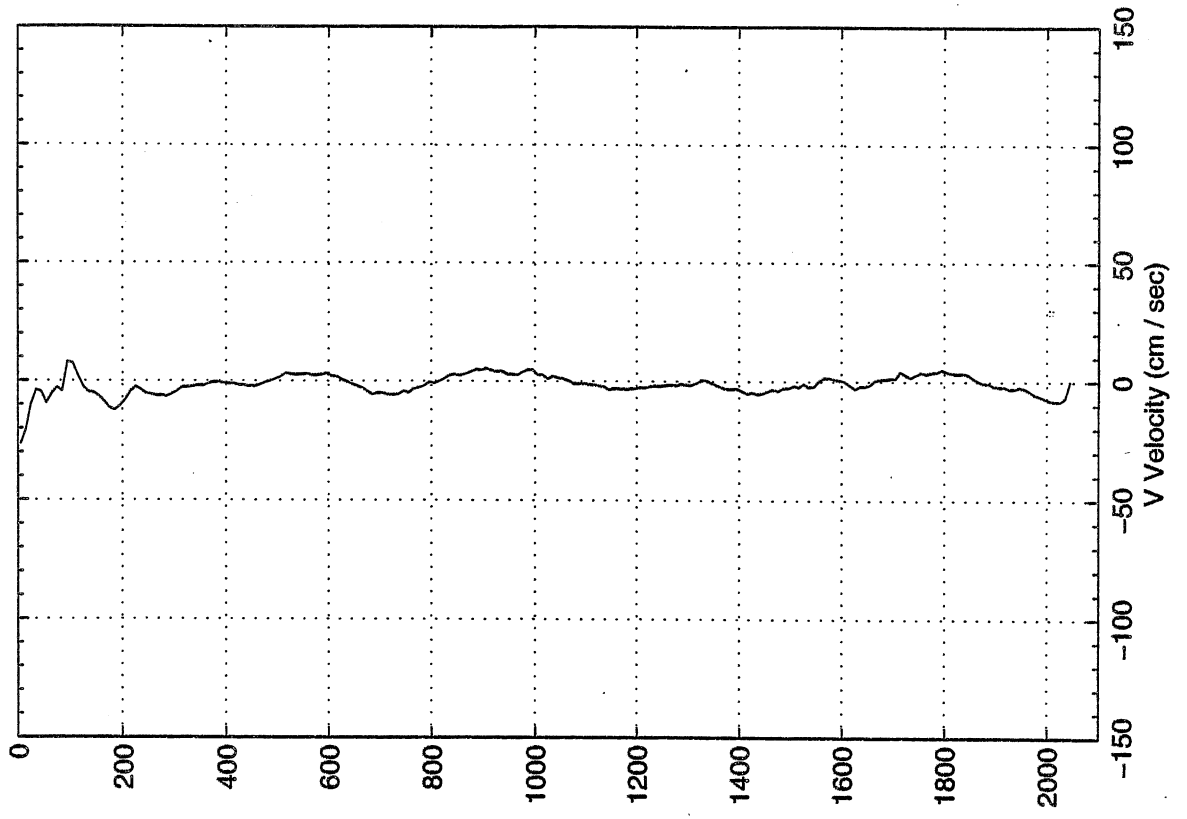
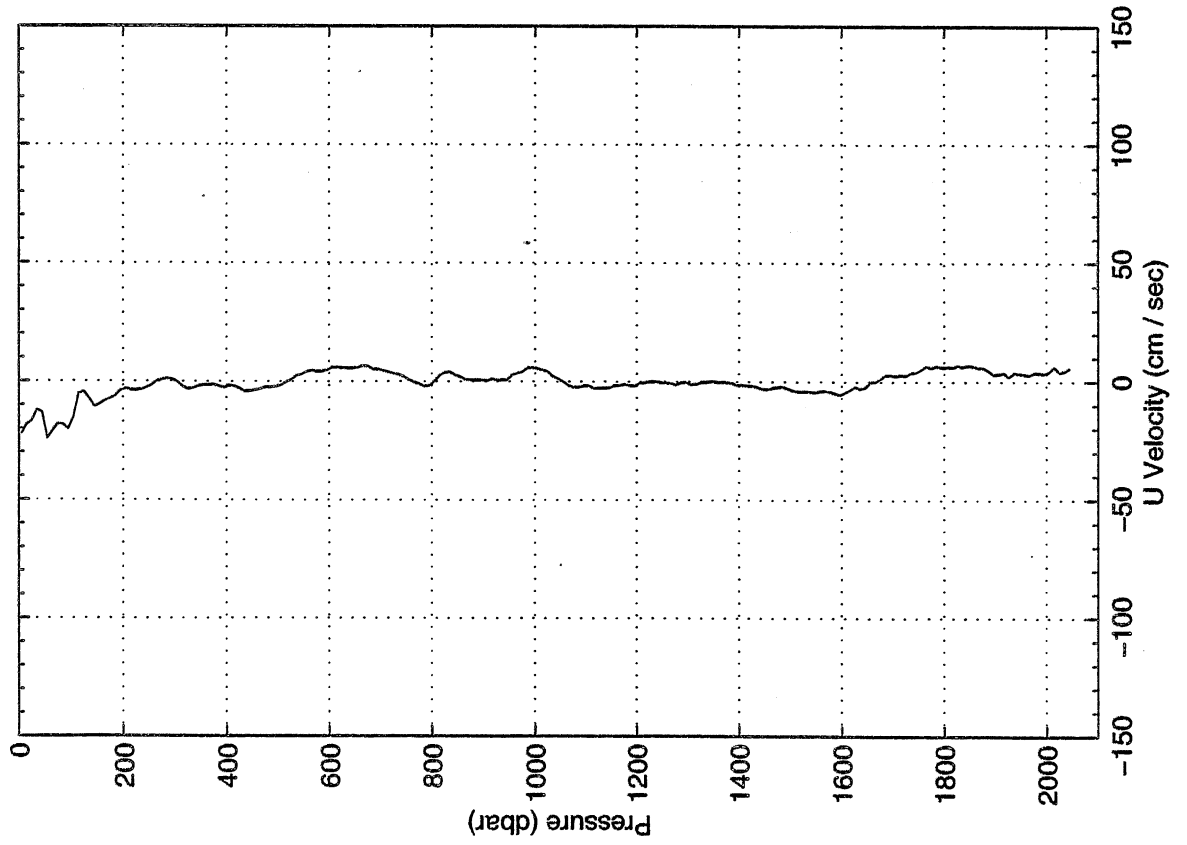


**NBC-1 R/V SEWARD JOHNSON**

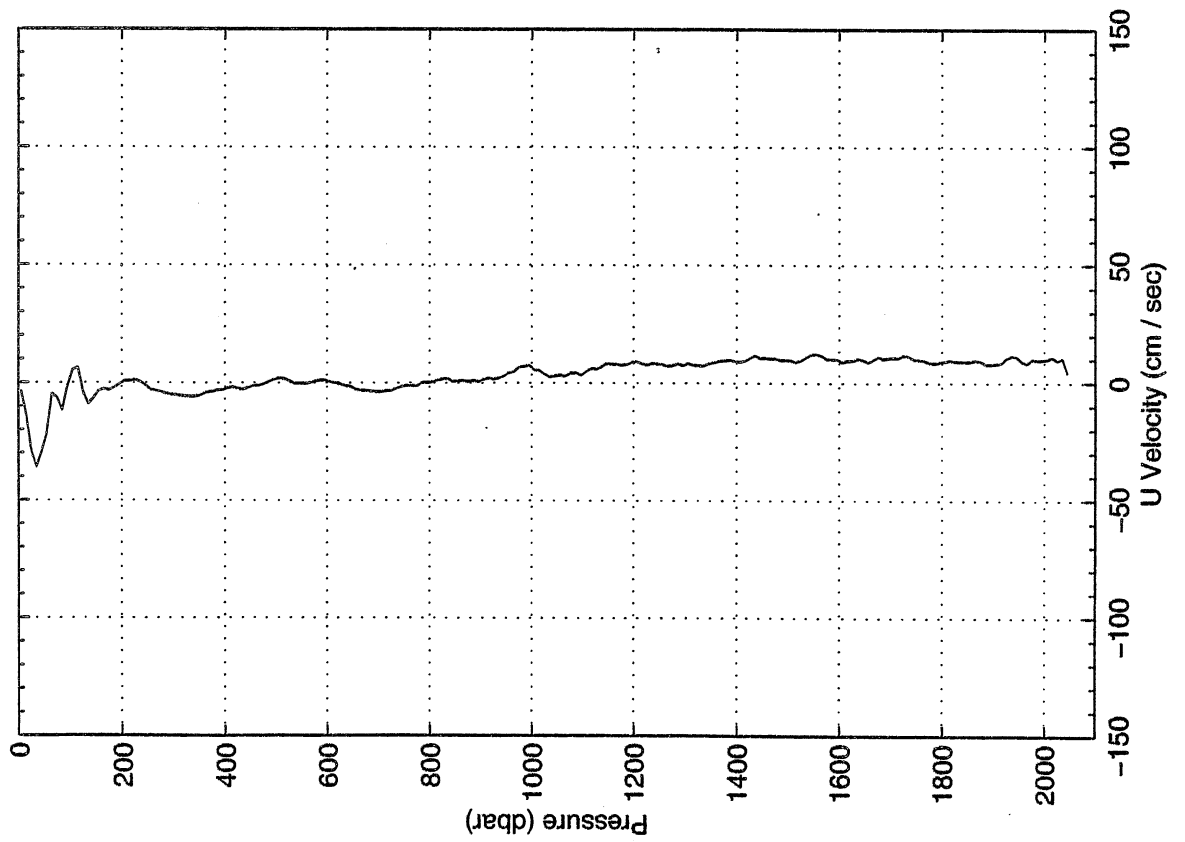
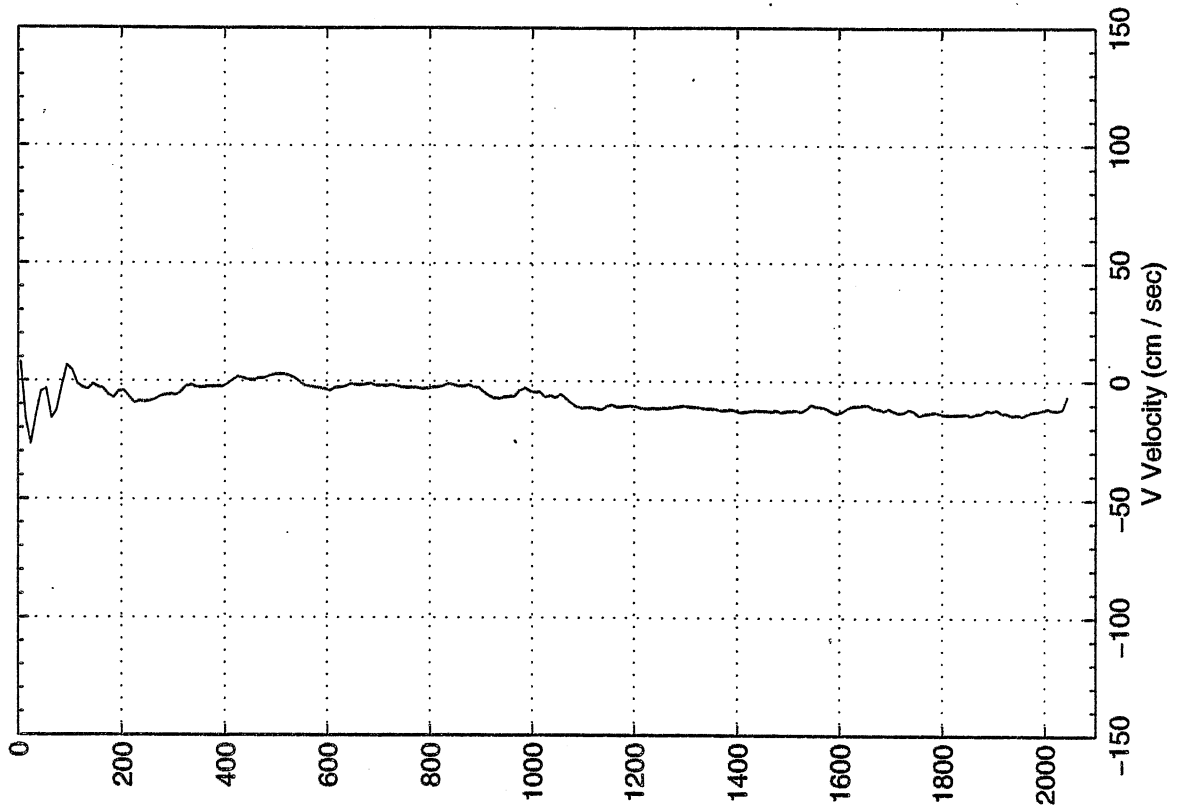
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**Latitude 12.993 N Longitude 51.120 W**

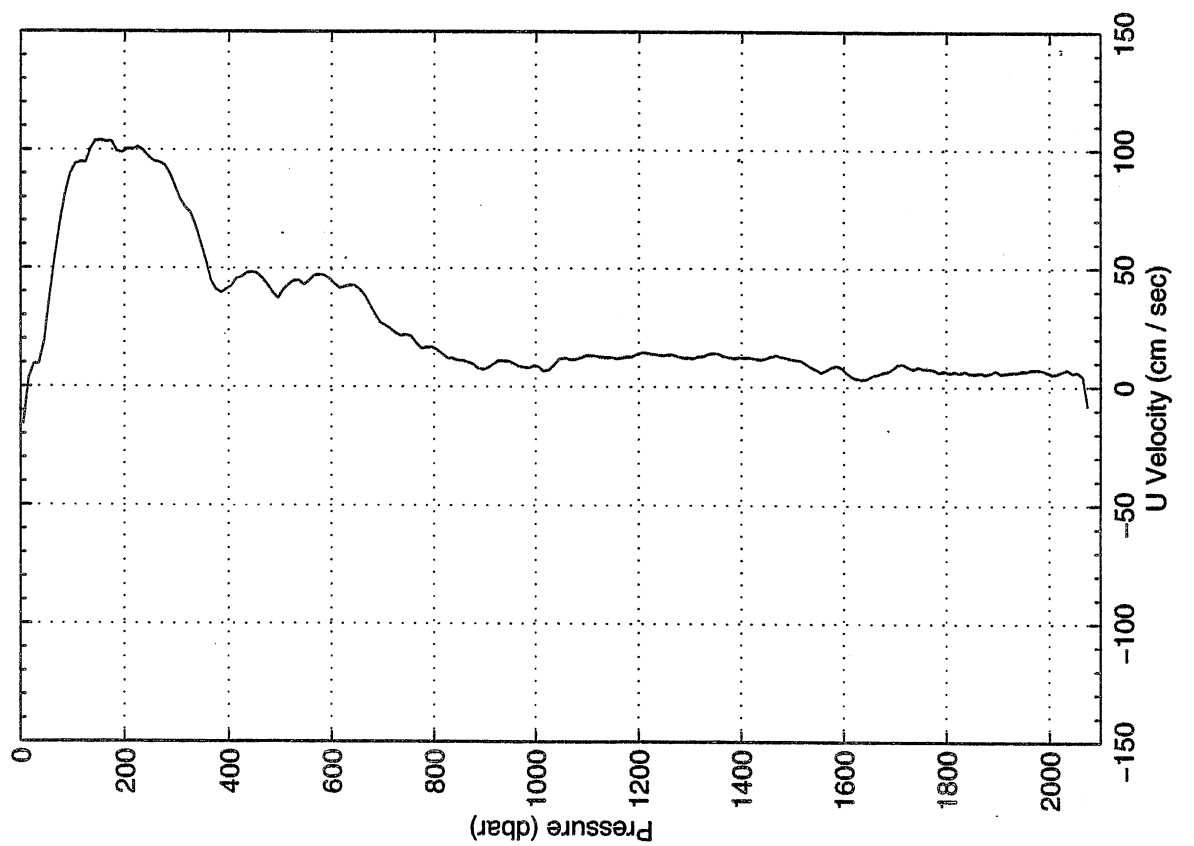
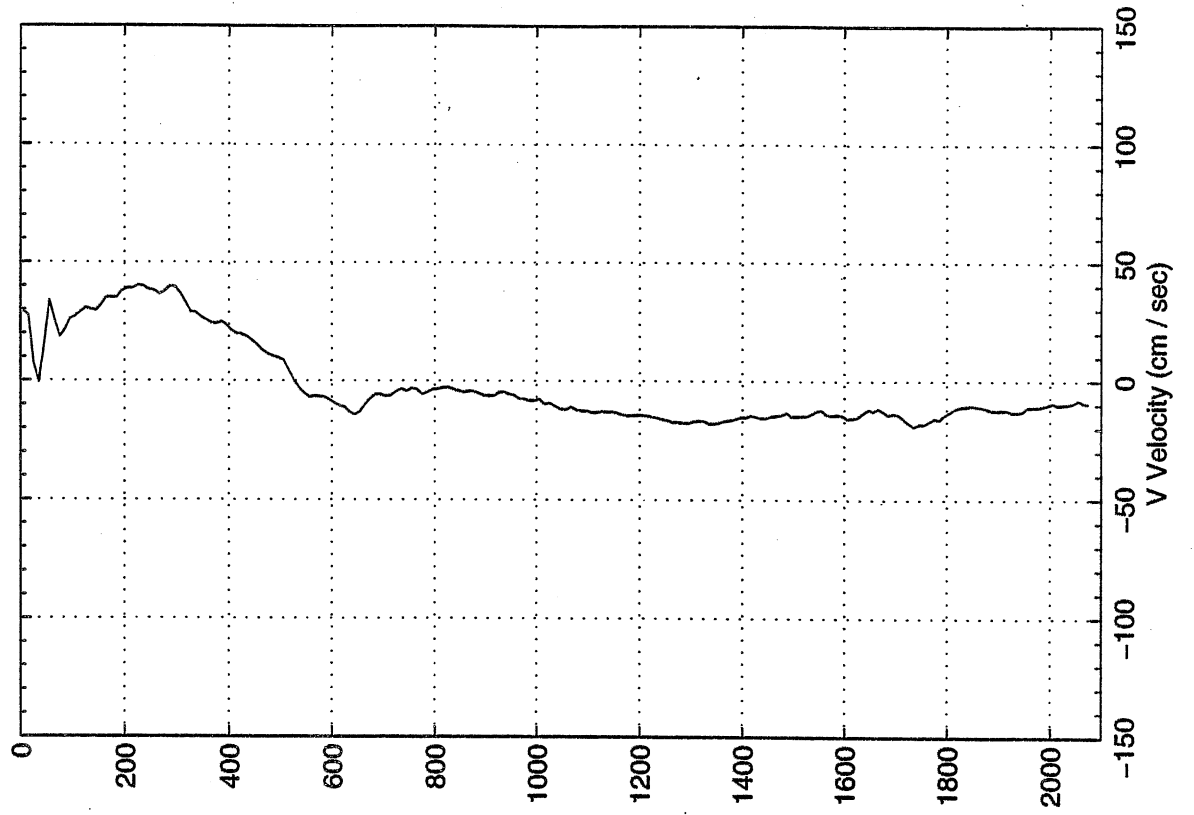
**11-Nov-1998 20:39 Z**



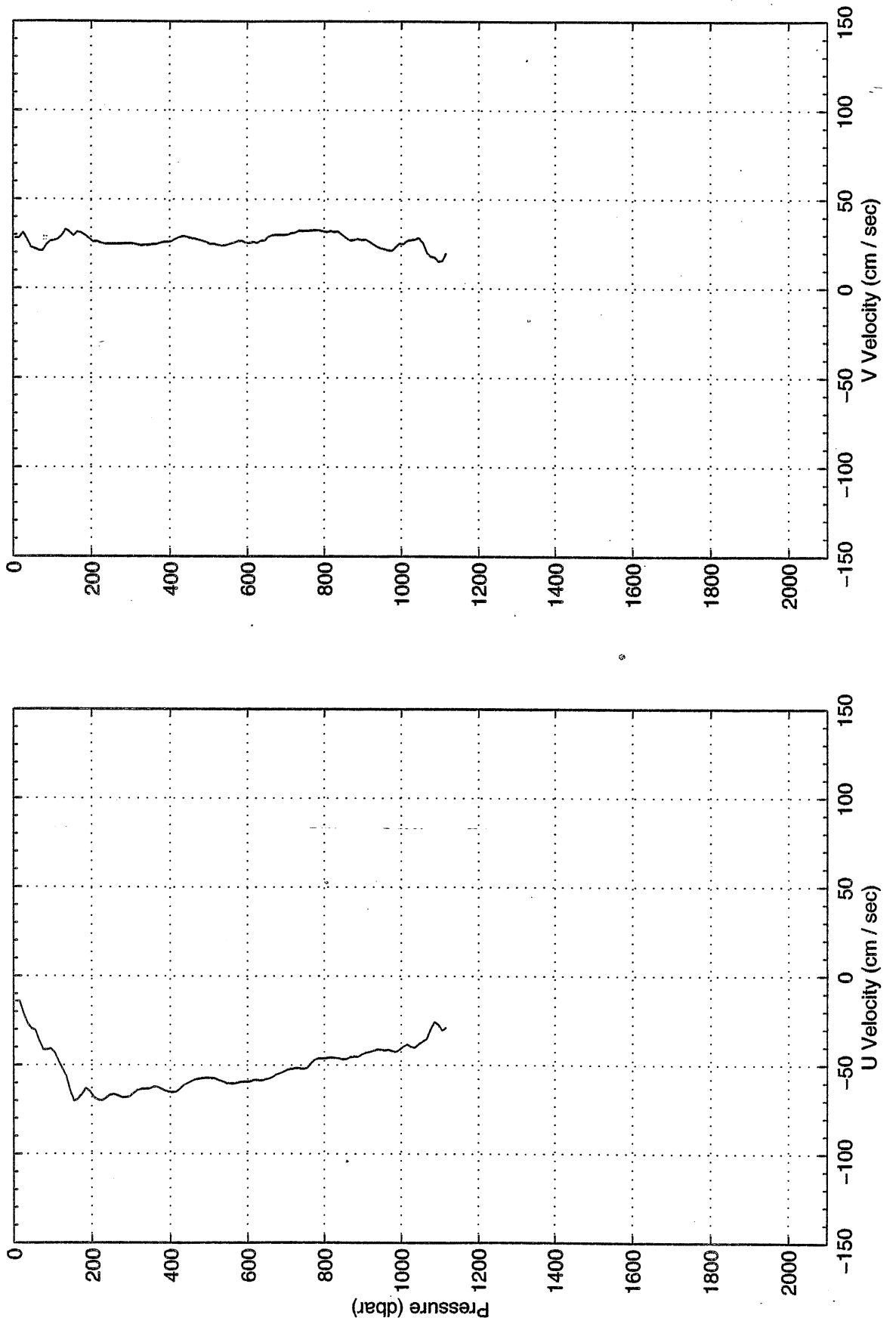
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LADCP Station 3 (98003)  
Latitude 10.913 N Longitude 52.084 W  
12-Nov-1998 13:09 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 4 (98004)  
Latitude 9.753 N Longitude 53.111 W  
13-Nov-1998 04:38 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 5 (98005)  
Latitude 8.111 N Longitude 54.047 W  
14-Nov-1998 12:44 Z

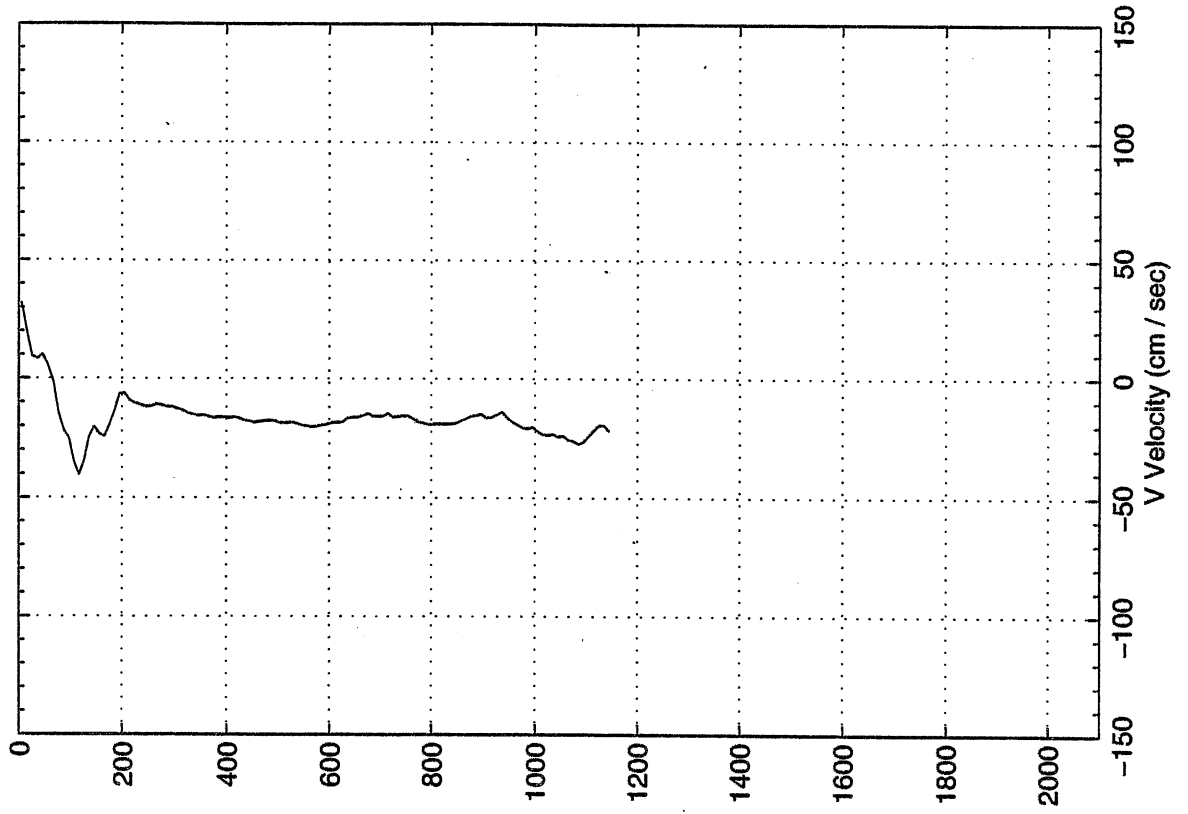
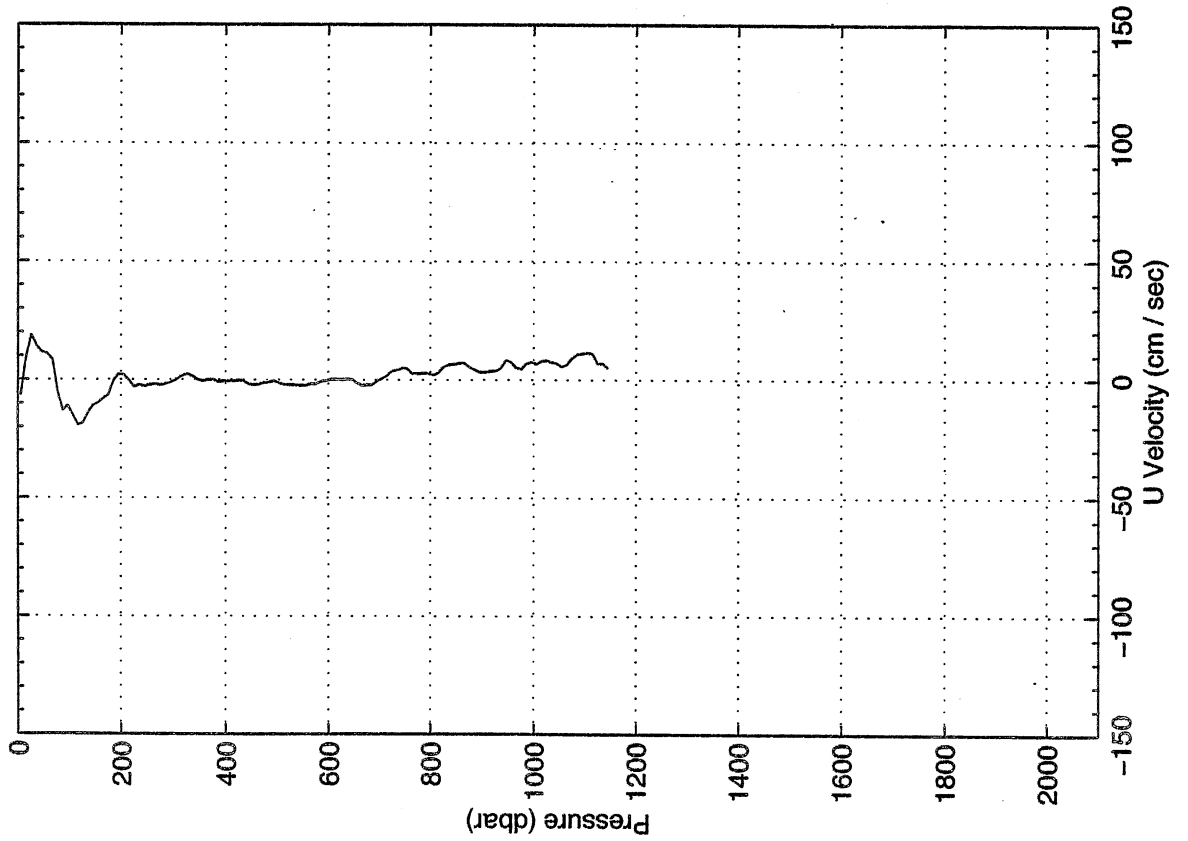


NBC-1 R/V SEWARD JOHNSON

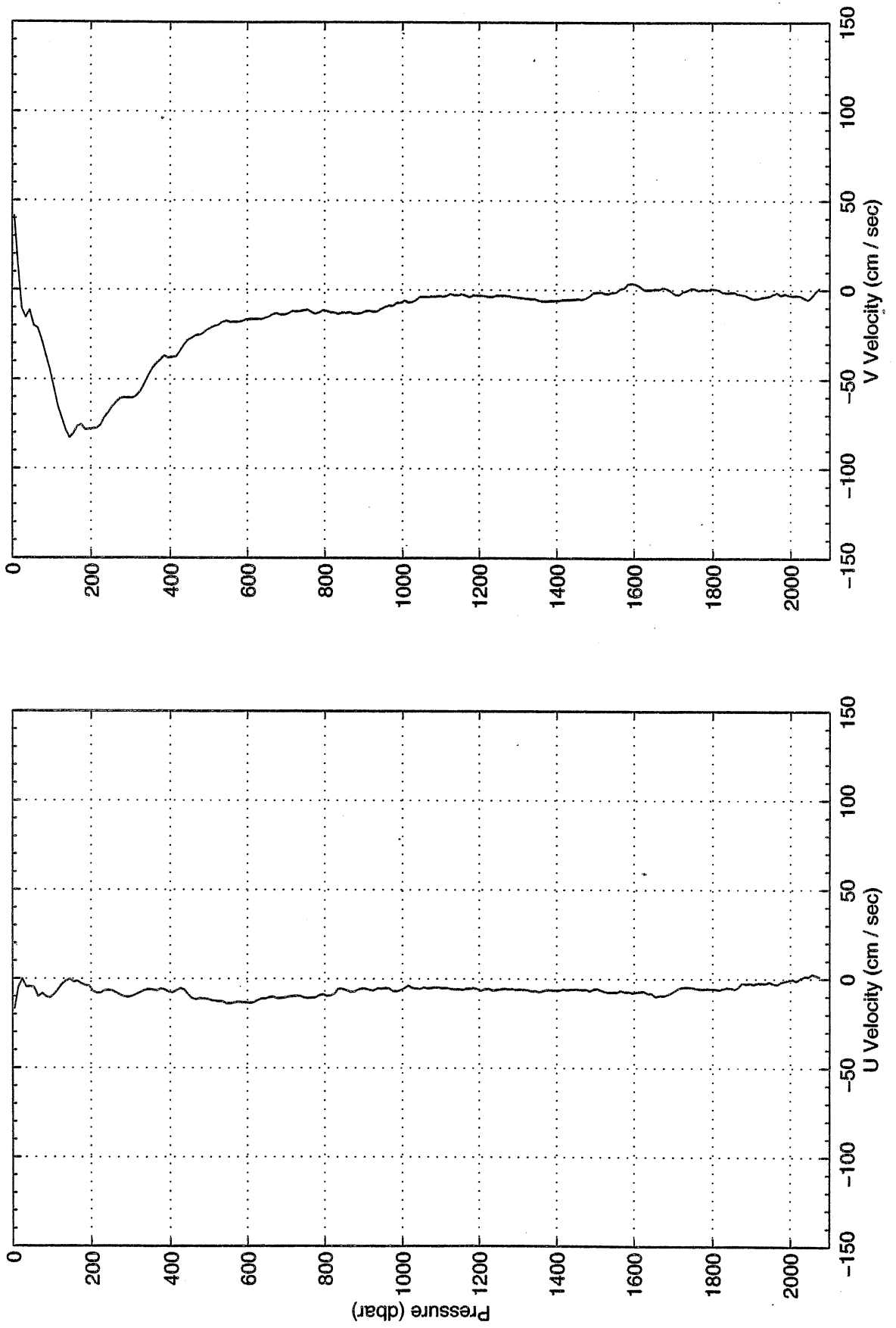
LADCP Station 6 (98006)

Latitude 7.508 N Longitude 52.070 W

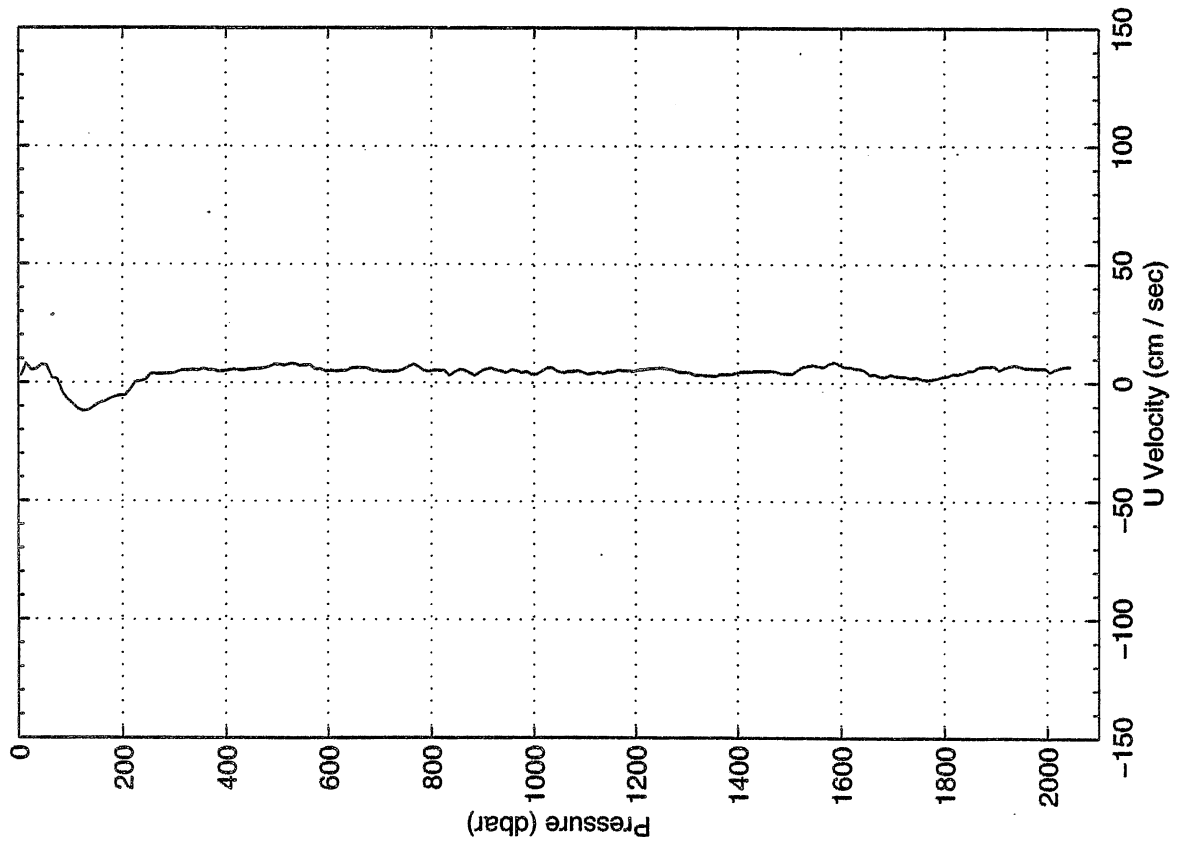
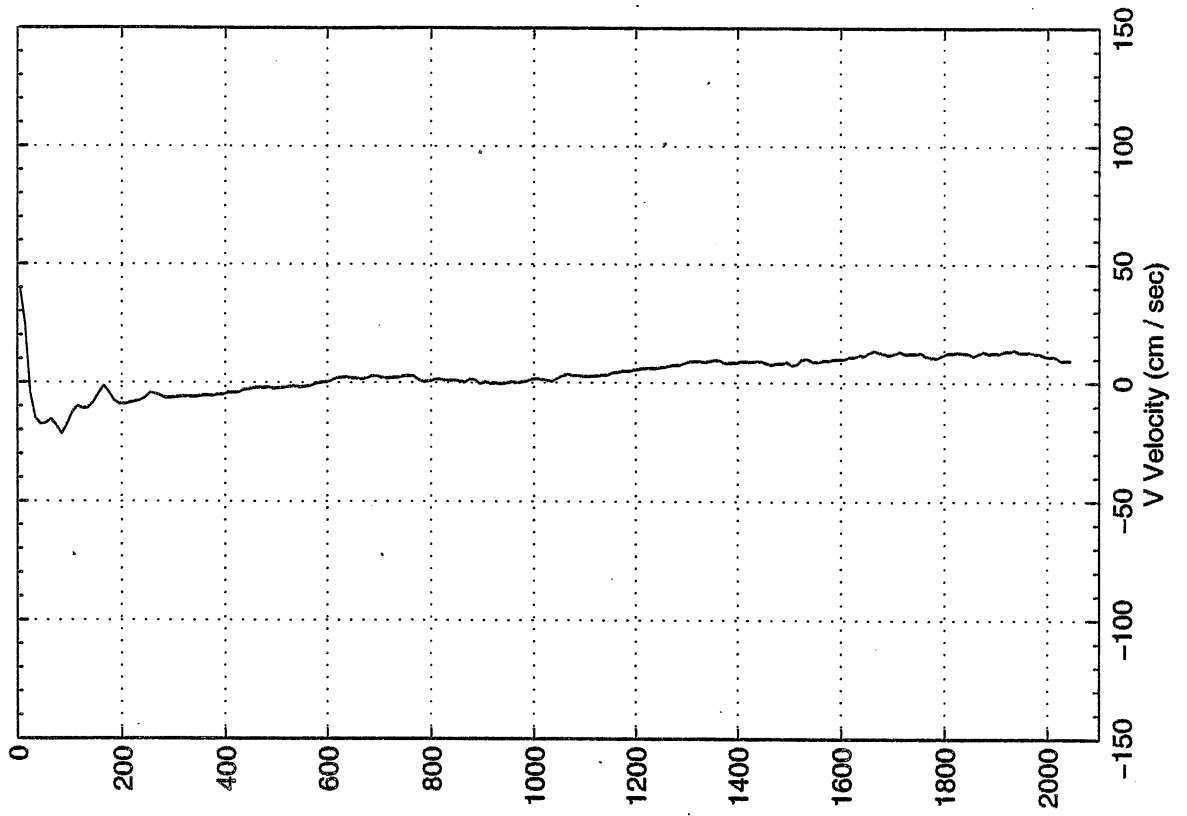
15-Nov-1998 03:21 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 7 (98007)  
Latitude 9.001 N Longitude 52.105 W  
15-Nov-1998 22:49 Z

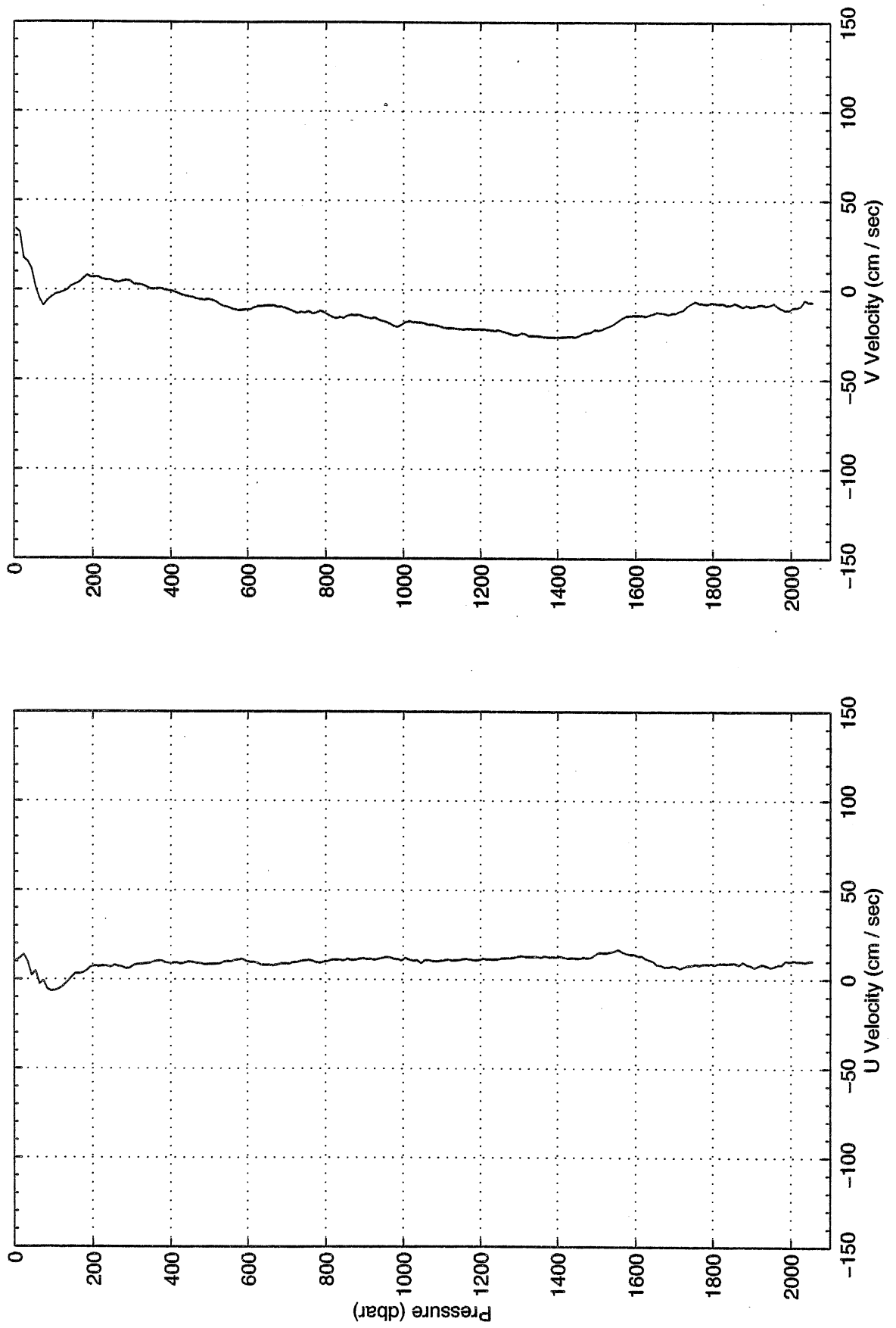


NBC-1 R/V SEWARD JOHNSON  
LADCP Station 8 (98008)  
Latitude 9.765 N Longitude 51.153 W  
16-Nov-1998 14:01 Z

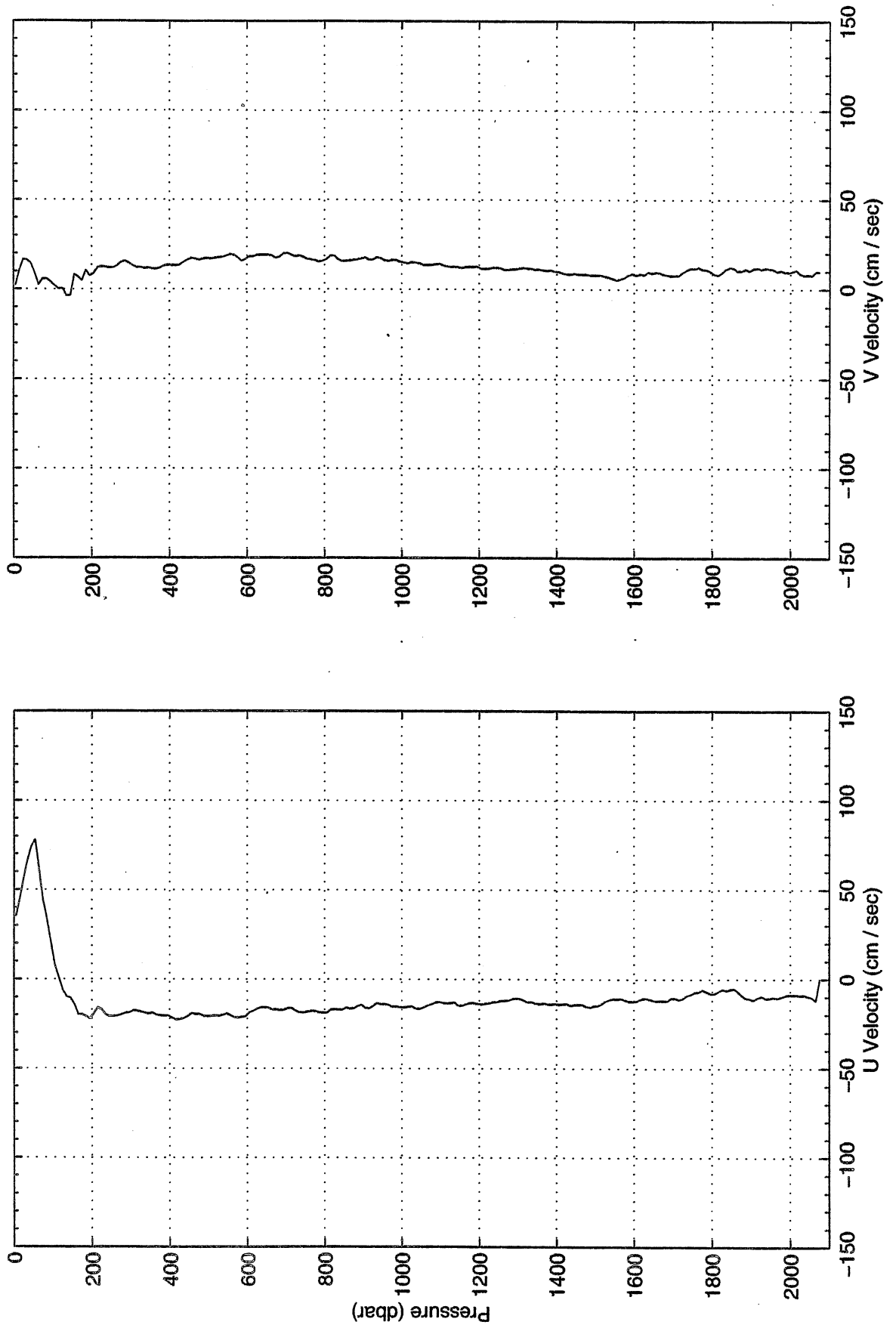




NBC-1 RV SEWARD JOHNSON  
LADCP Station 9 (98009)  
Latitude 9.142 N Longitude 49.141 W  
17-Nov-1998 03:58 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 10 (98010)  
Latitude 7.806 N Longitude 51.142 W  
17-Nov-1998 18:11 Z

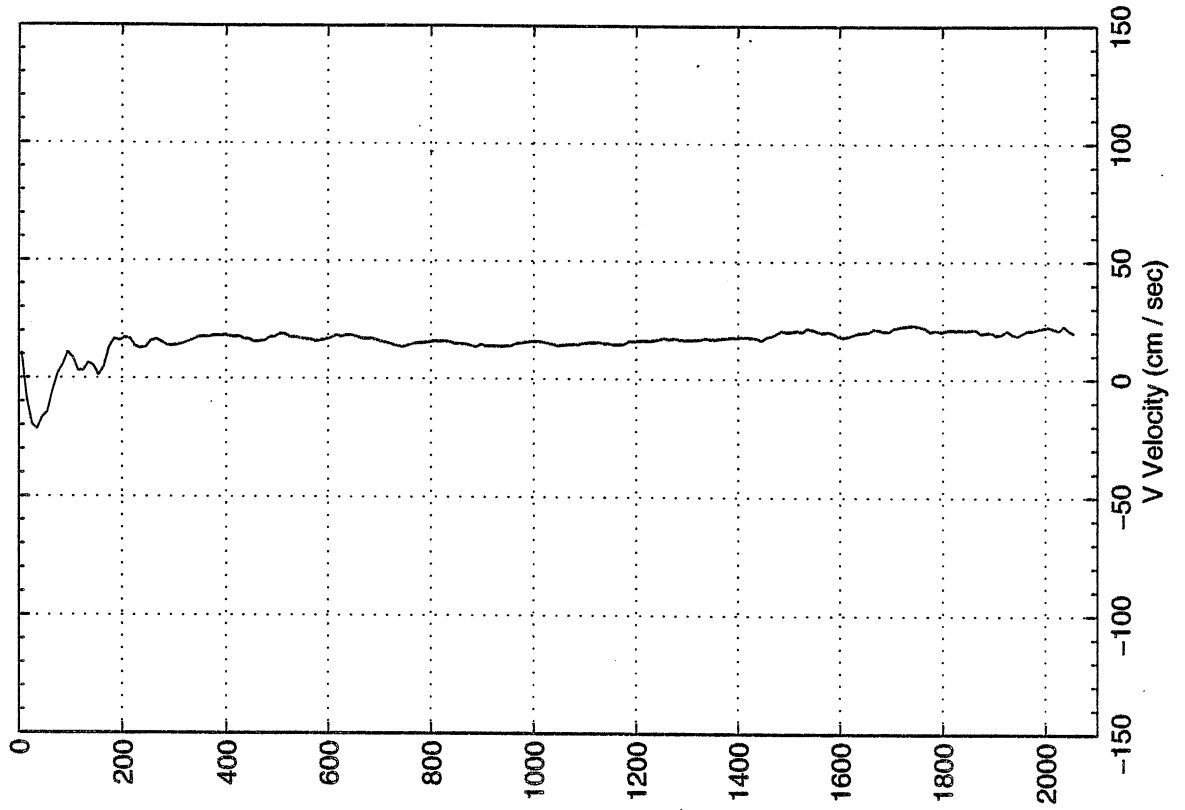
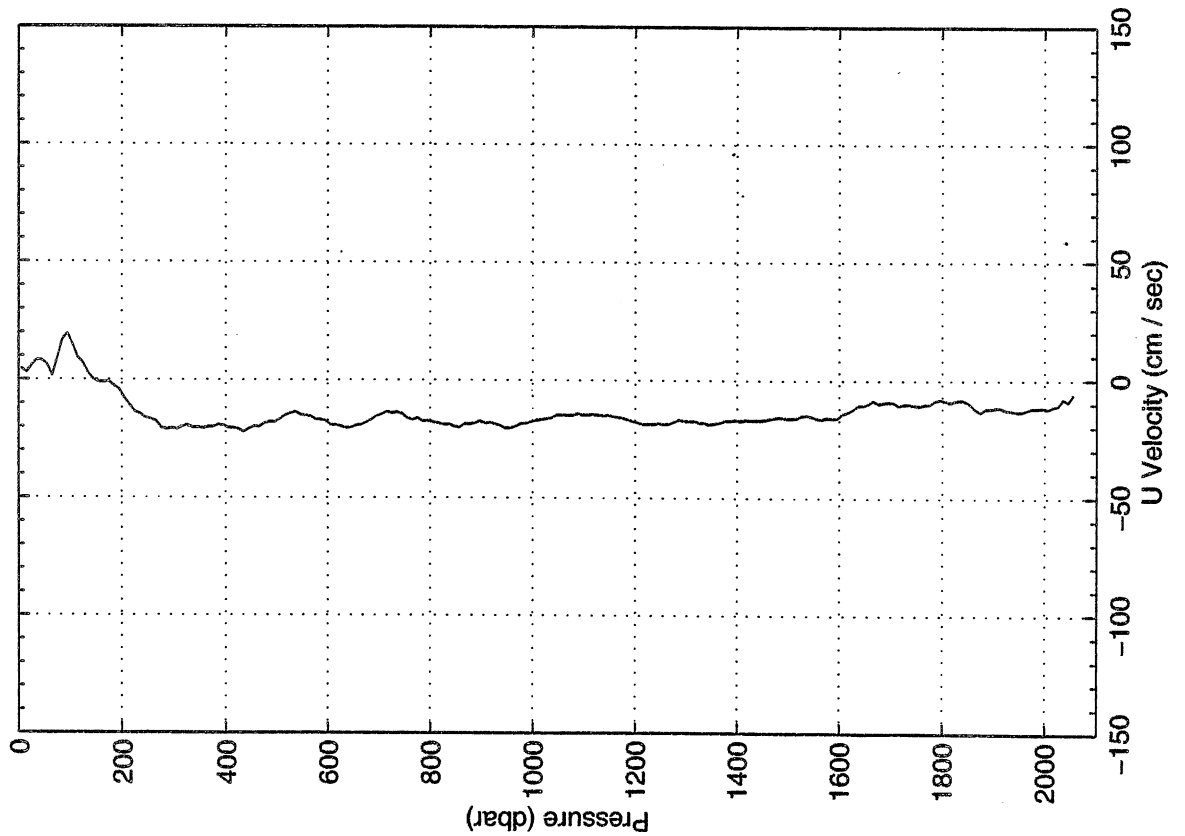


NBC-1 RV SEWARD JOHNSON

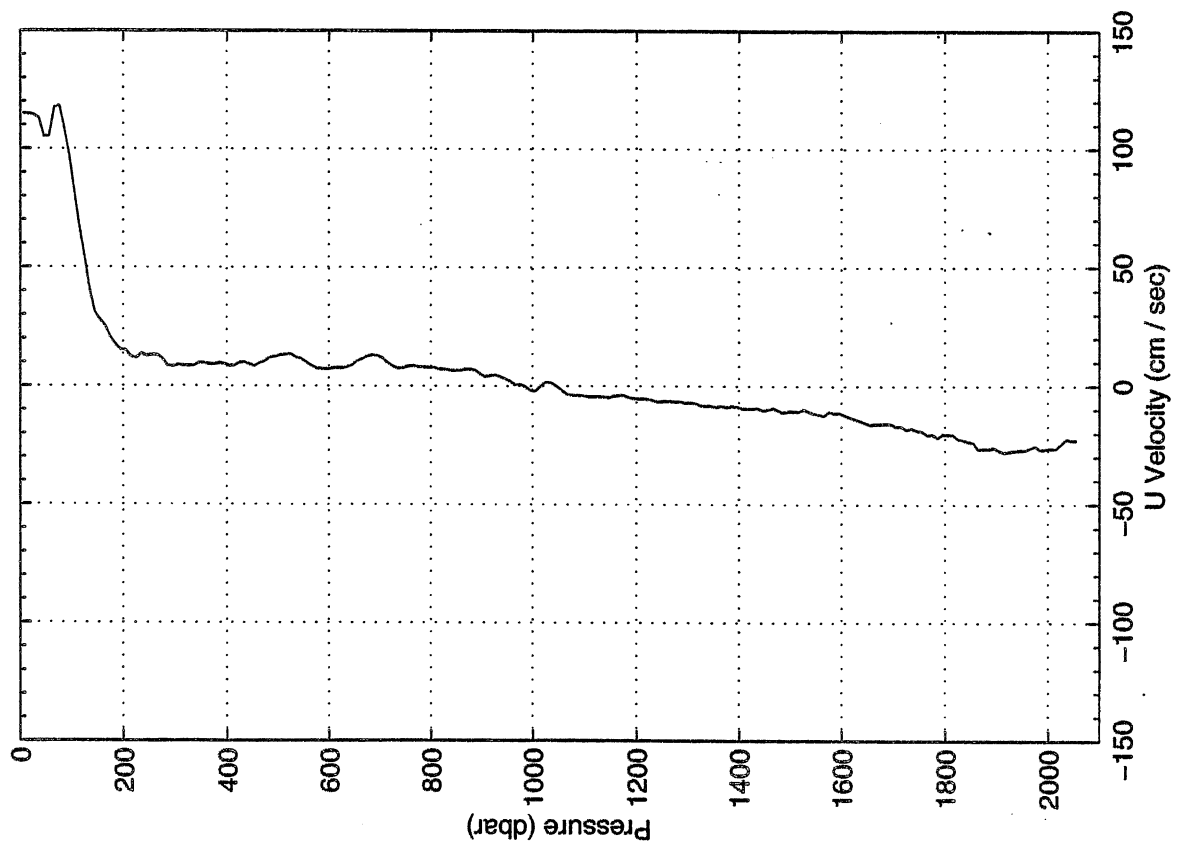
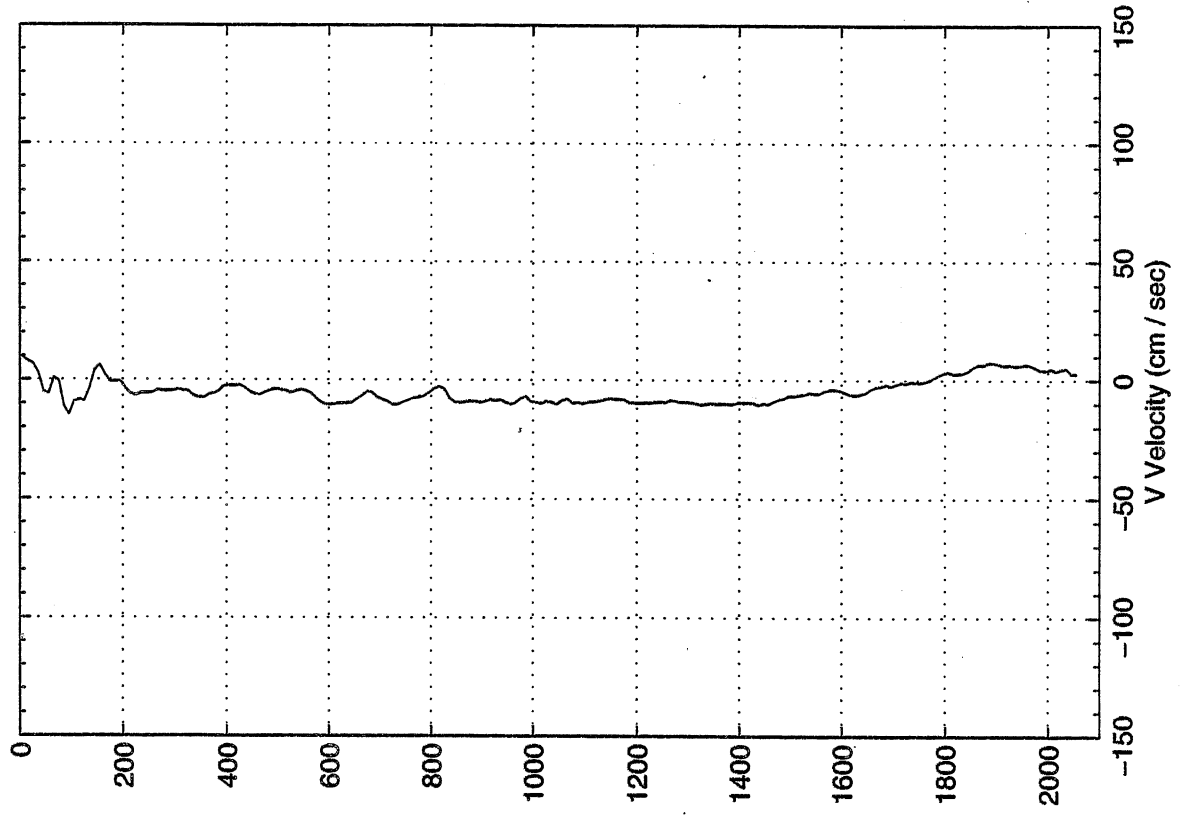
LADCP Station 11 (98011)

Latitude 7.343 N Longitude 50.052 W

17-Nov-1998 23:56 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 12 (98012)  
Latitude 7.587 N Longitude 49.078 W  
18-Nov-1998 11:11 Z

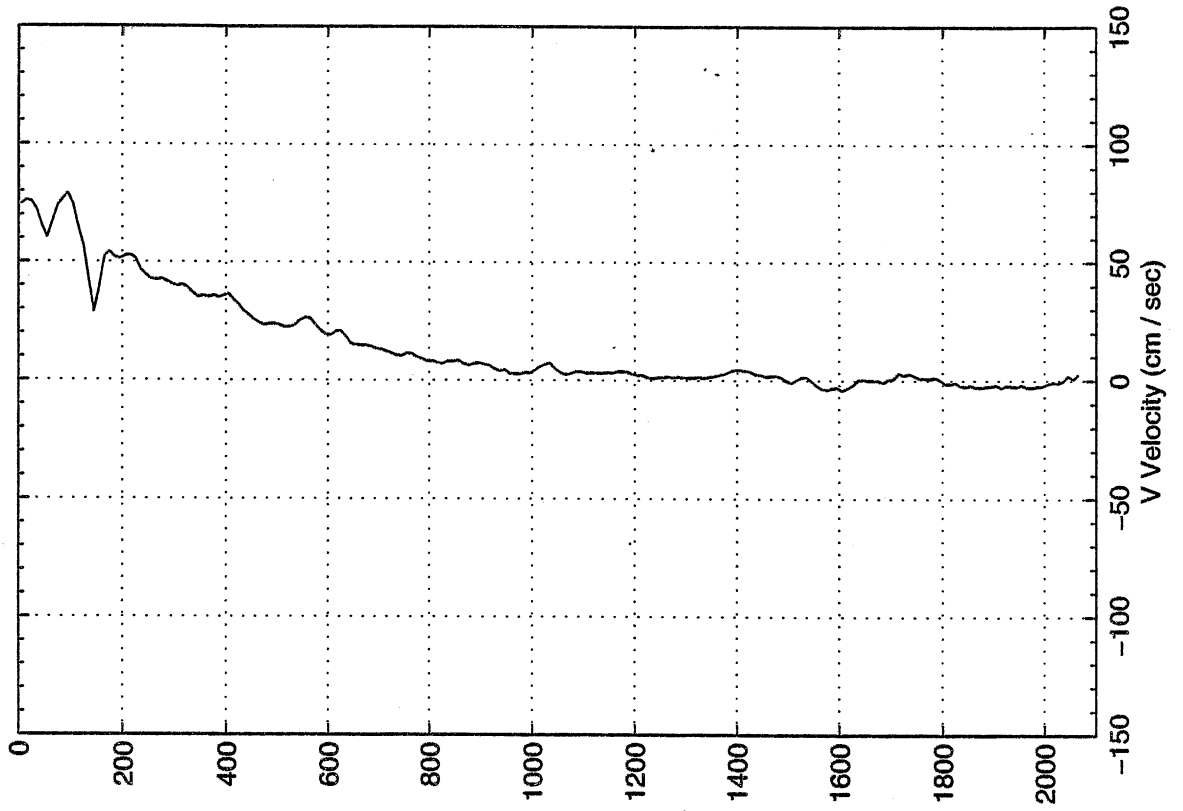
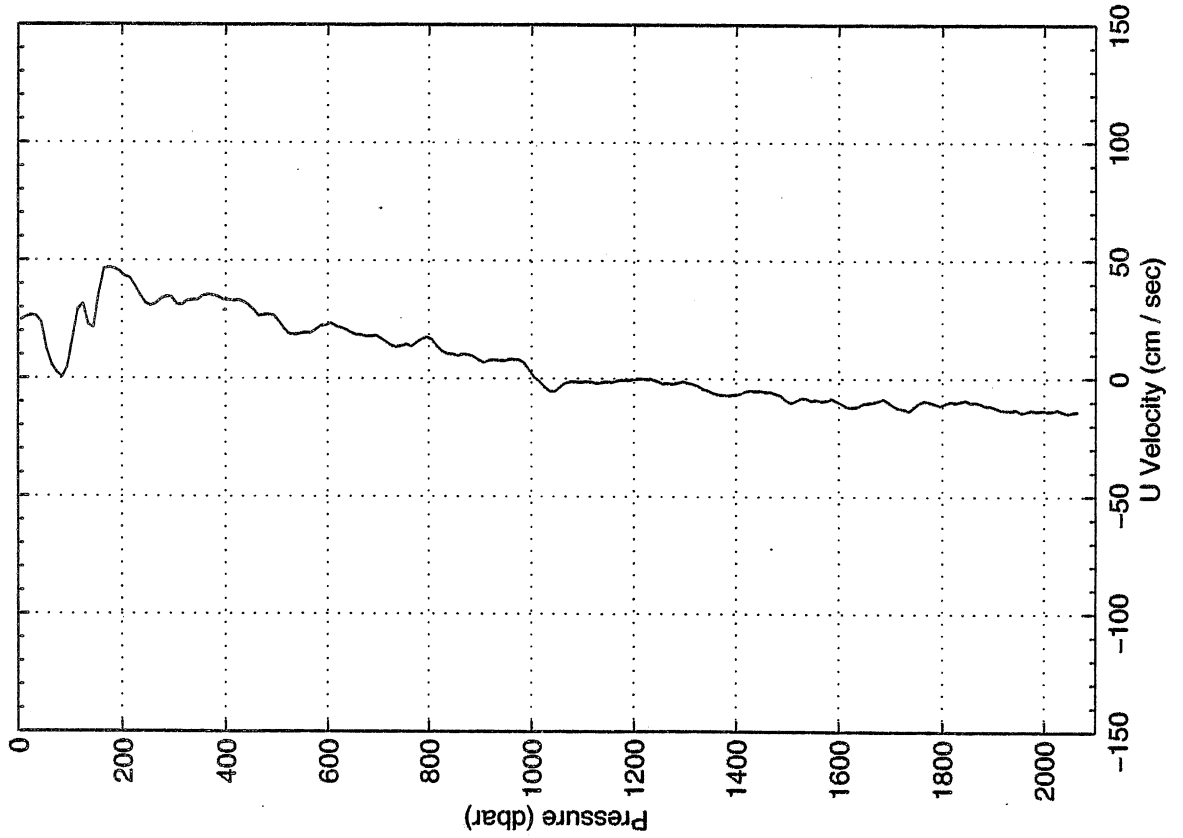


NBC-1 R/V SEWARD JOHNSON

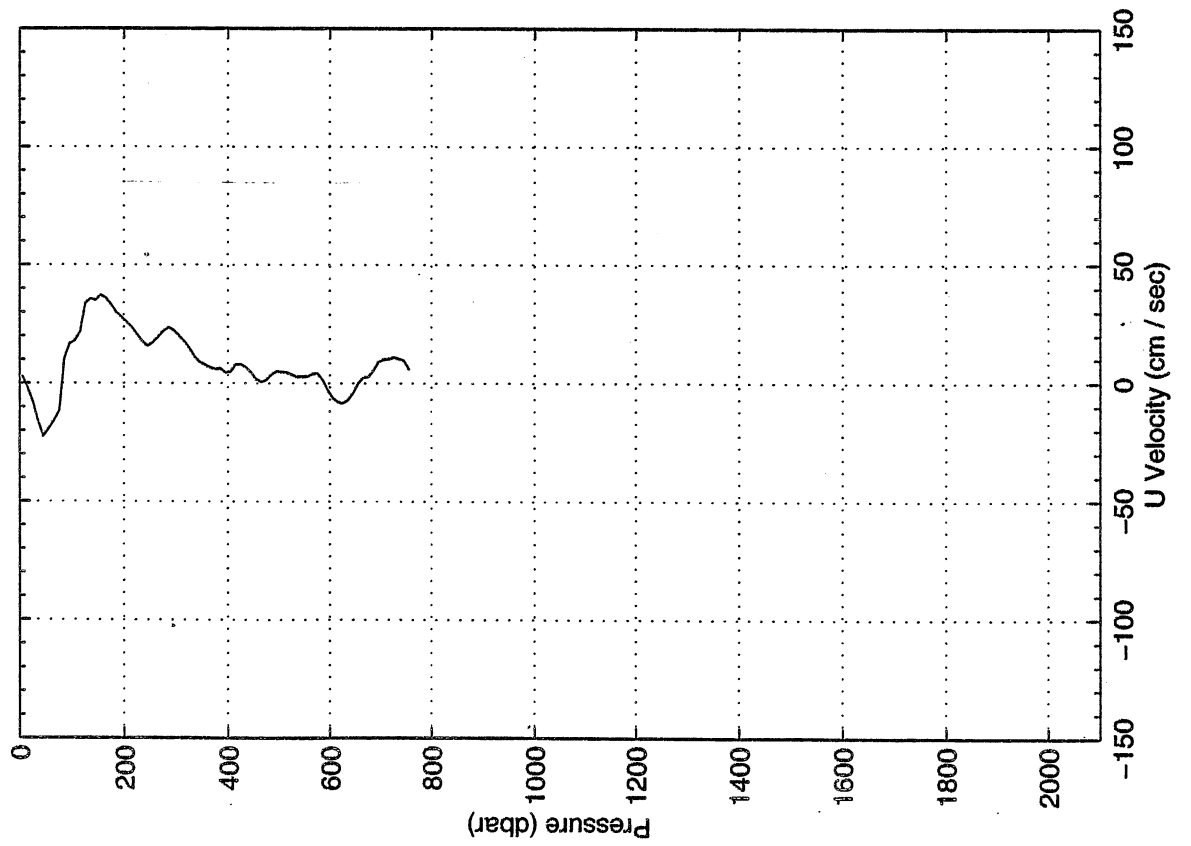
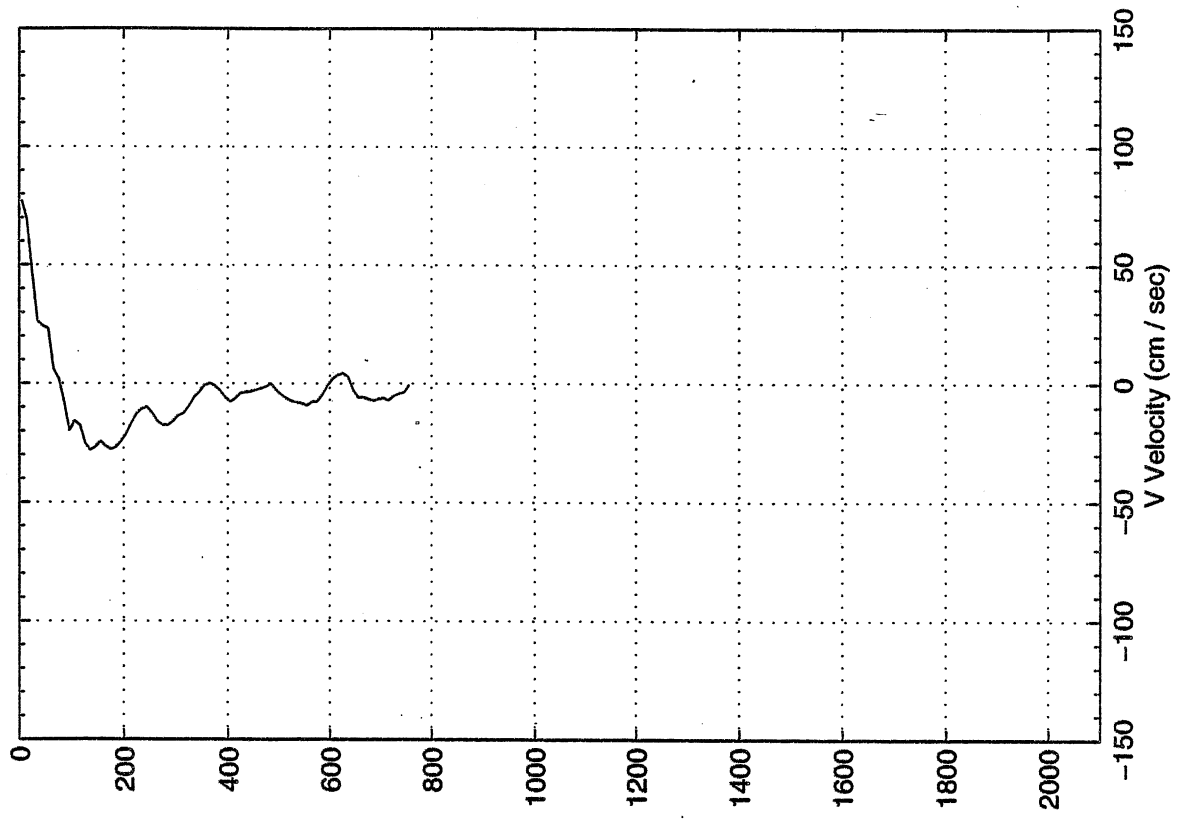
LADCP Station 13 (98013)

Latitude 6.472 N Longitude 49.041 W

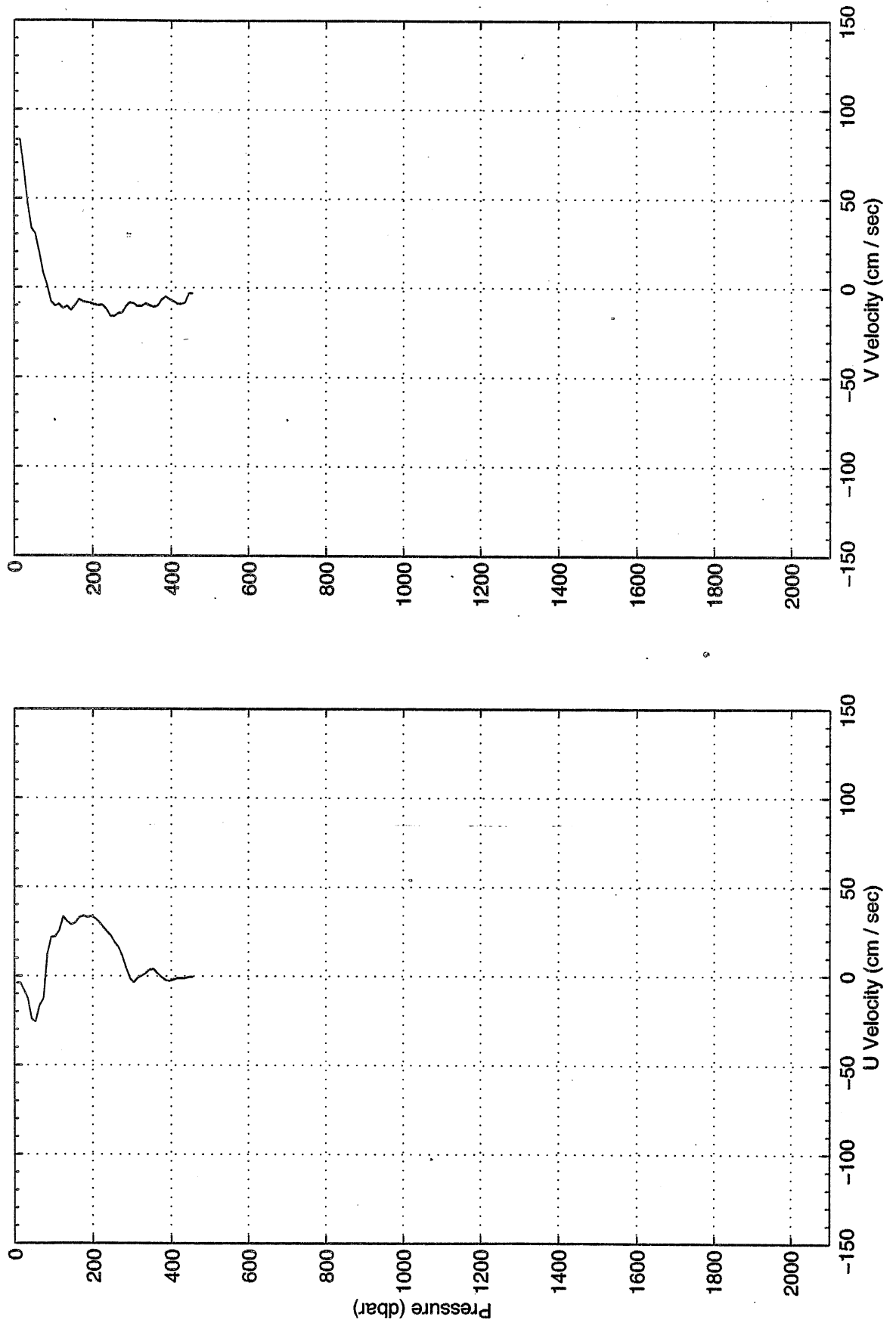
18-Nov-1998 22:09 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 14 (98014)  
Latitude 5.778 N Longitude 51.084 W  
19-Nov-1998 20:35 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 15 (98015)  
Latitude 5.753 N Longitude 51.104 W  
19-Nov-1998 22:53 Z

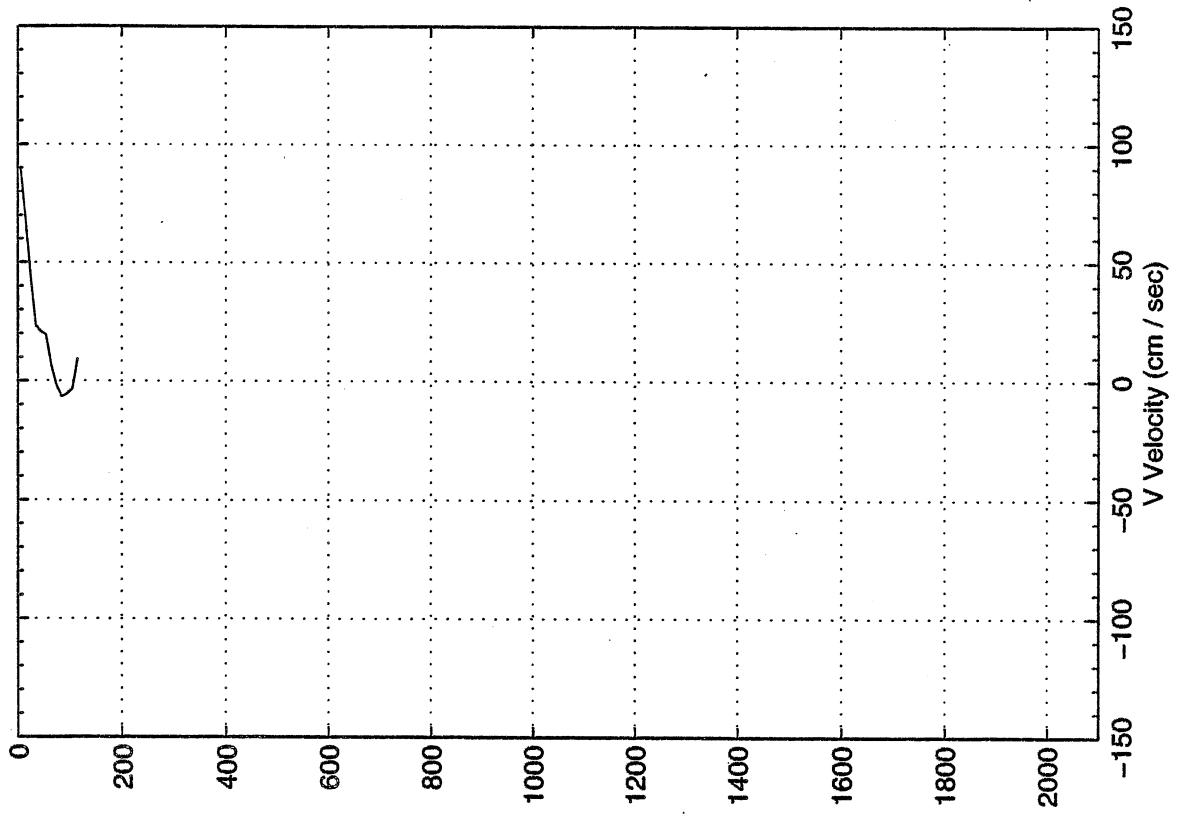
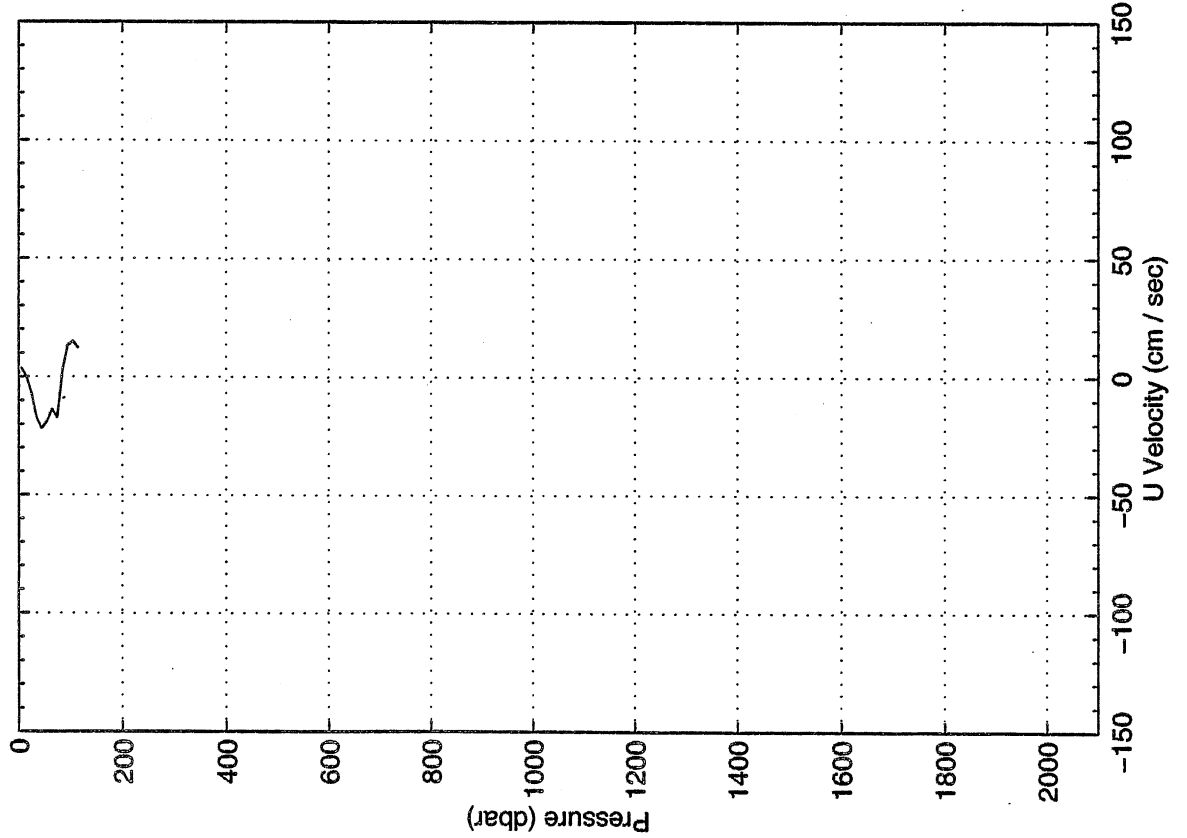


**NBC-1 R/V SEWARD JOHNSON**

**LADCP Station 16 (98016)**

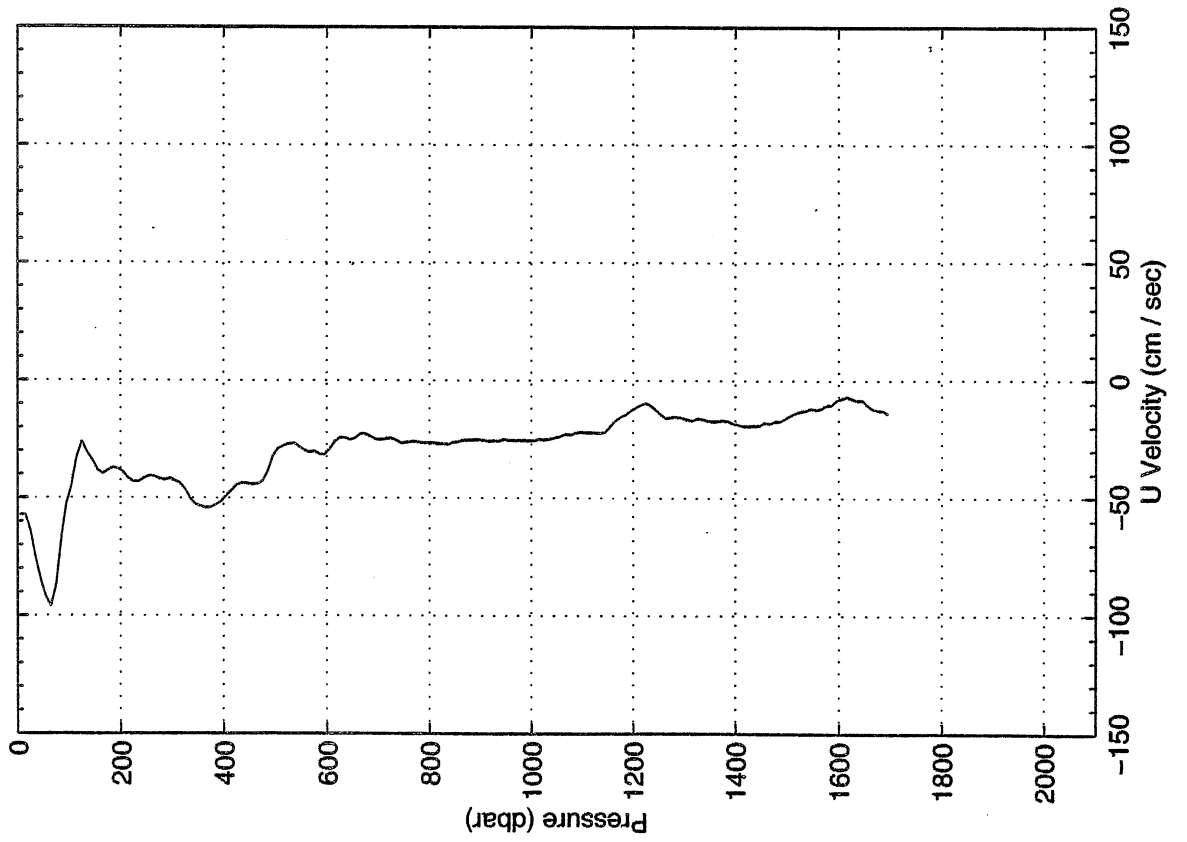
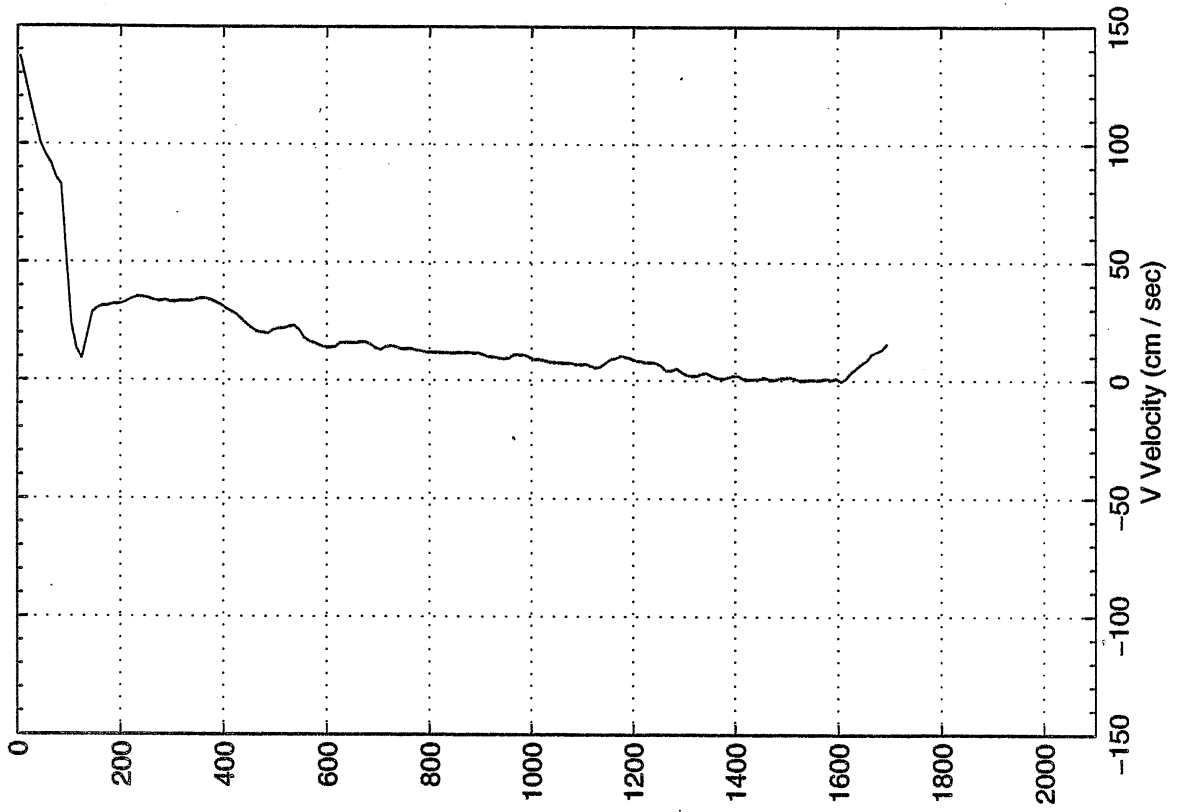
**Latitude 5.732 N Longitude 51.159 W**

**19-Nov-1998 23:44 Z**

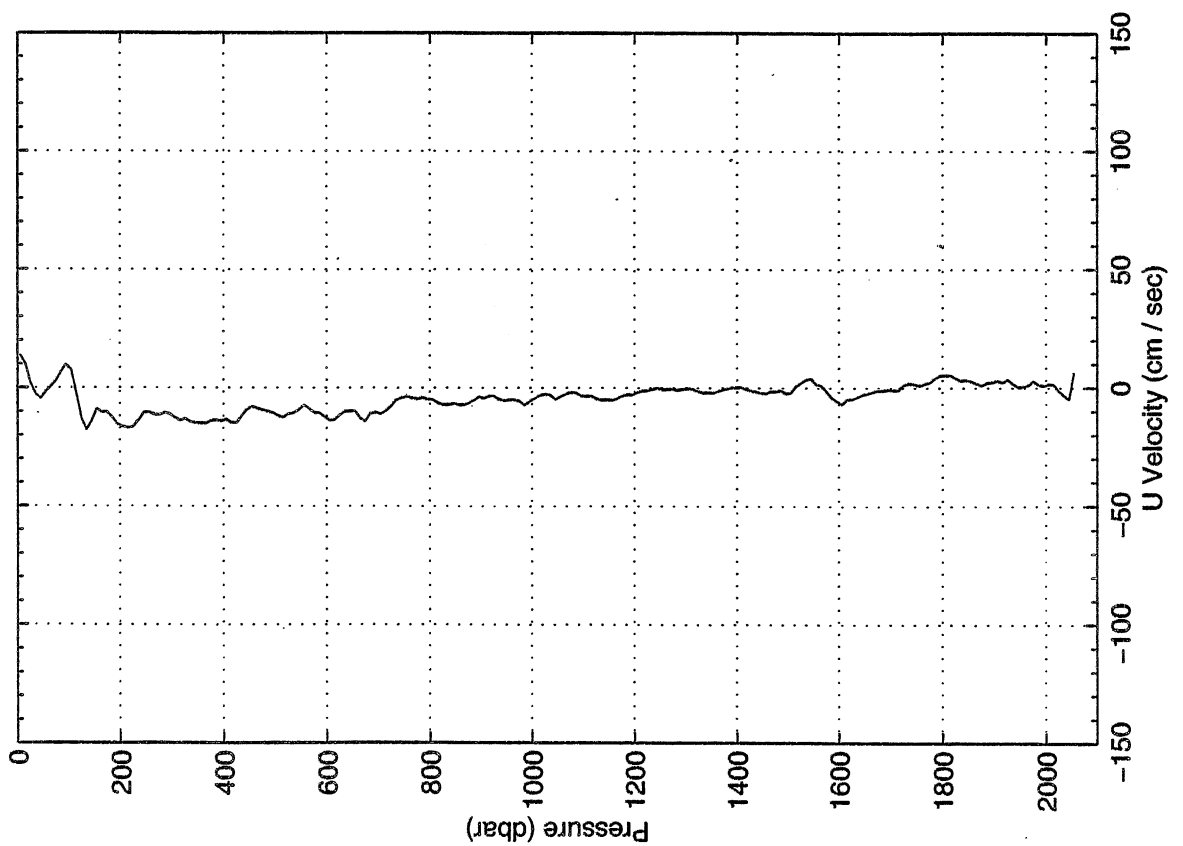
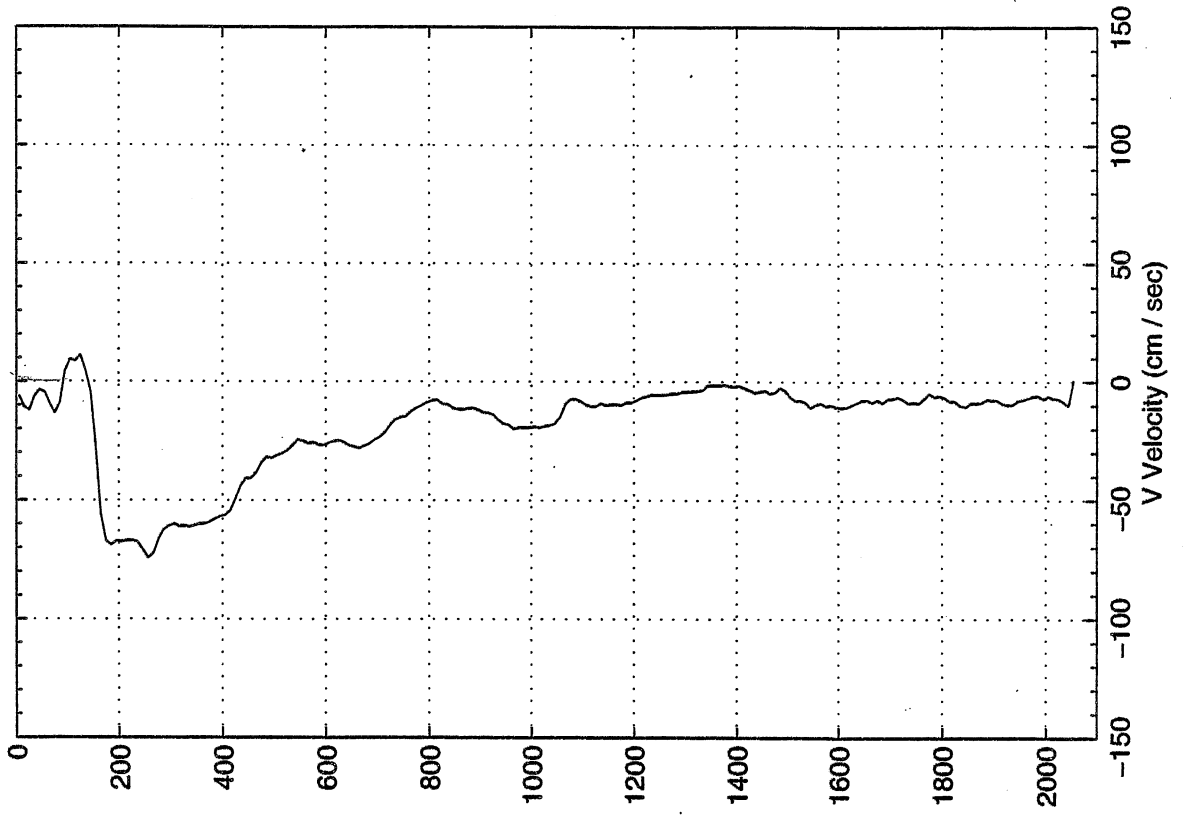




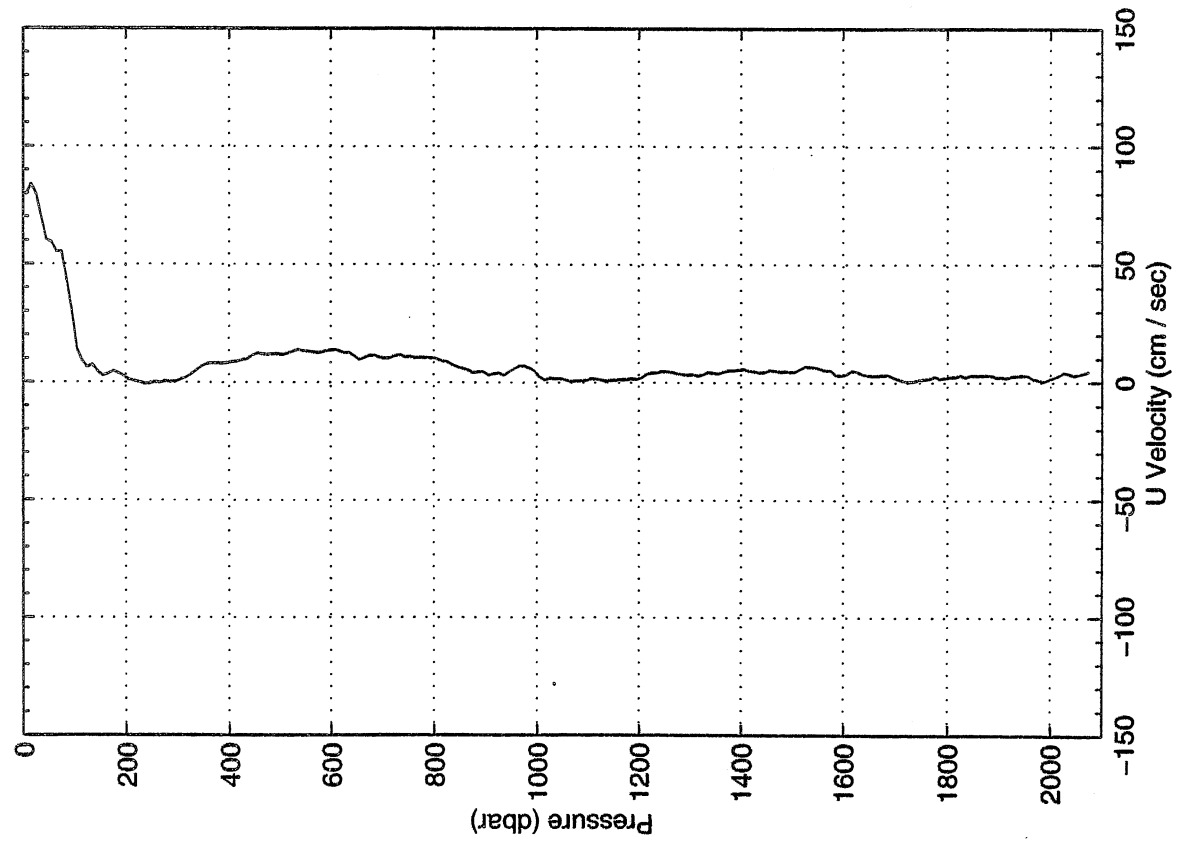
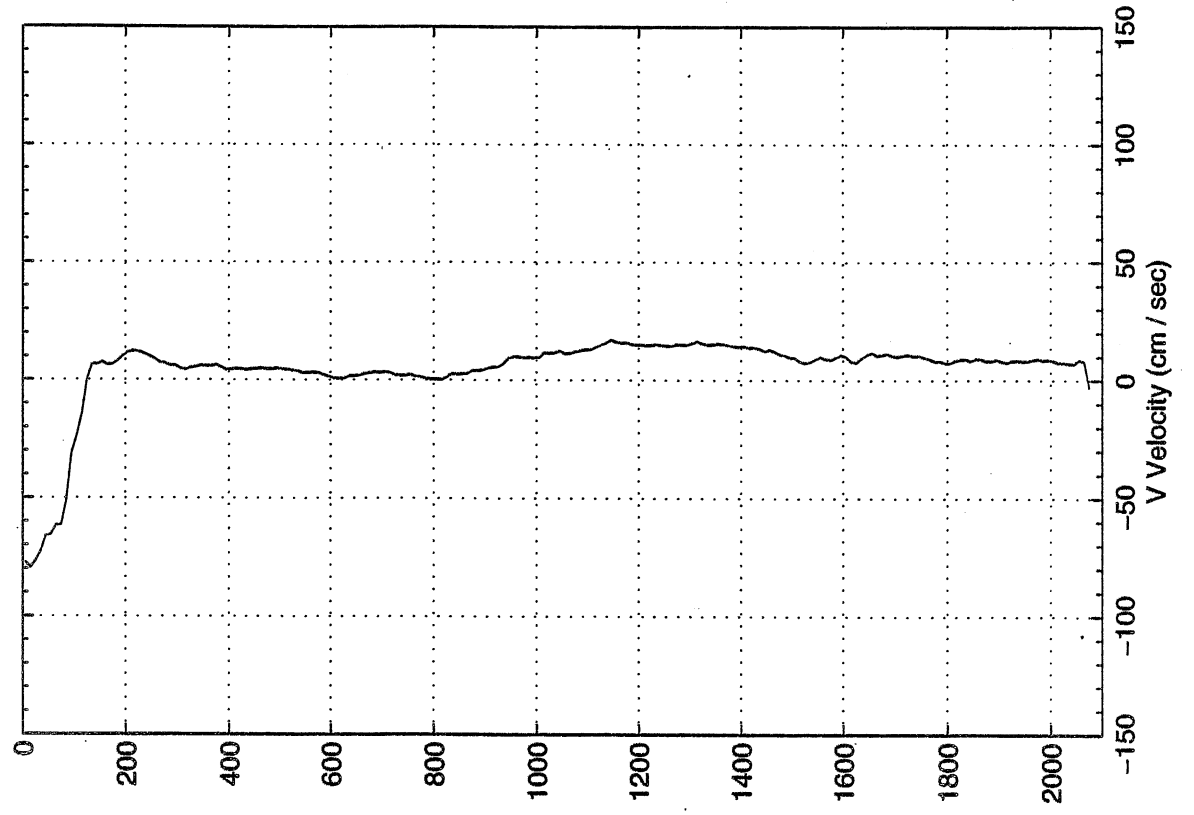
NBC-1 RV SEWARD JOHNSON  
LADCP Station 17 (98017)  
Latitude 4.545 N Longitude 49.032 W  
20-Nov-1998 15:16 Z



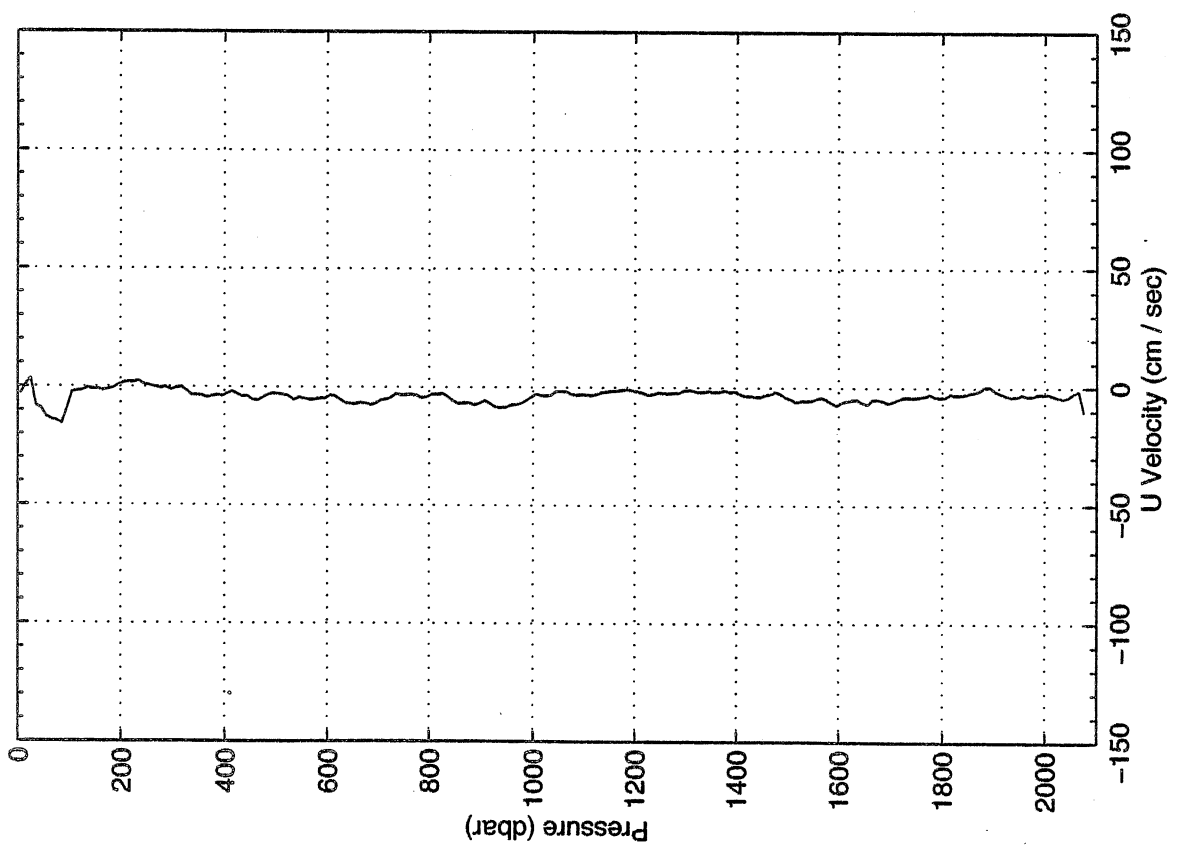
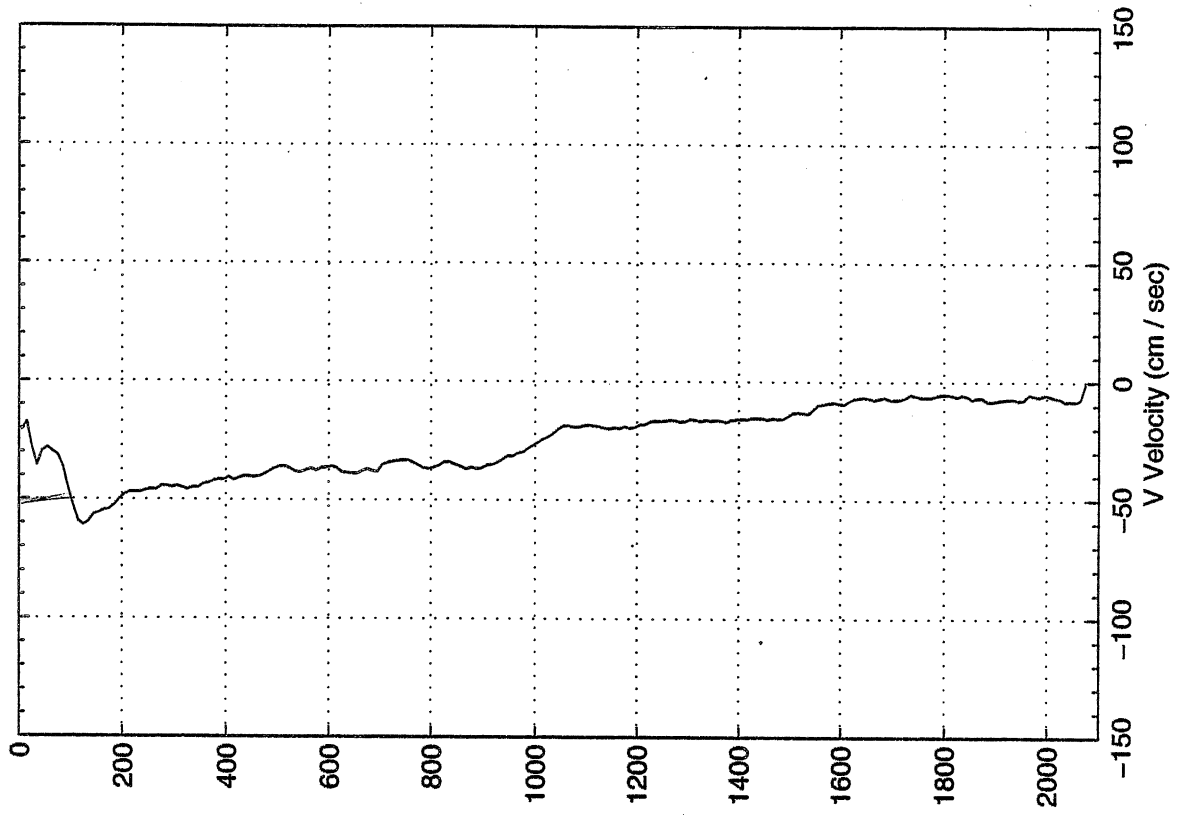
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LADCP Station 18 (98018)  
Latitude 5.499 N Longitude 48.155 W  
21-Nov-1998 04:10 Z



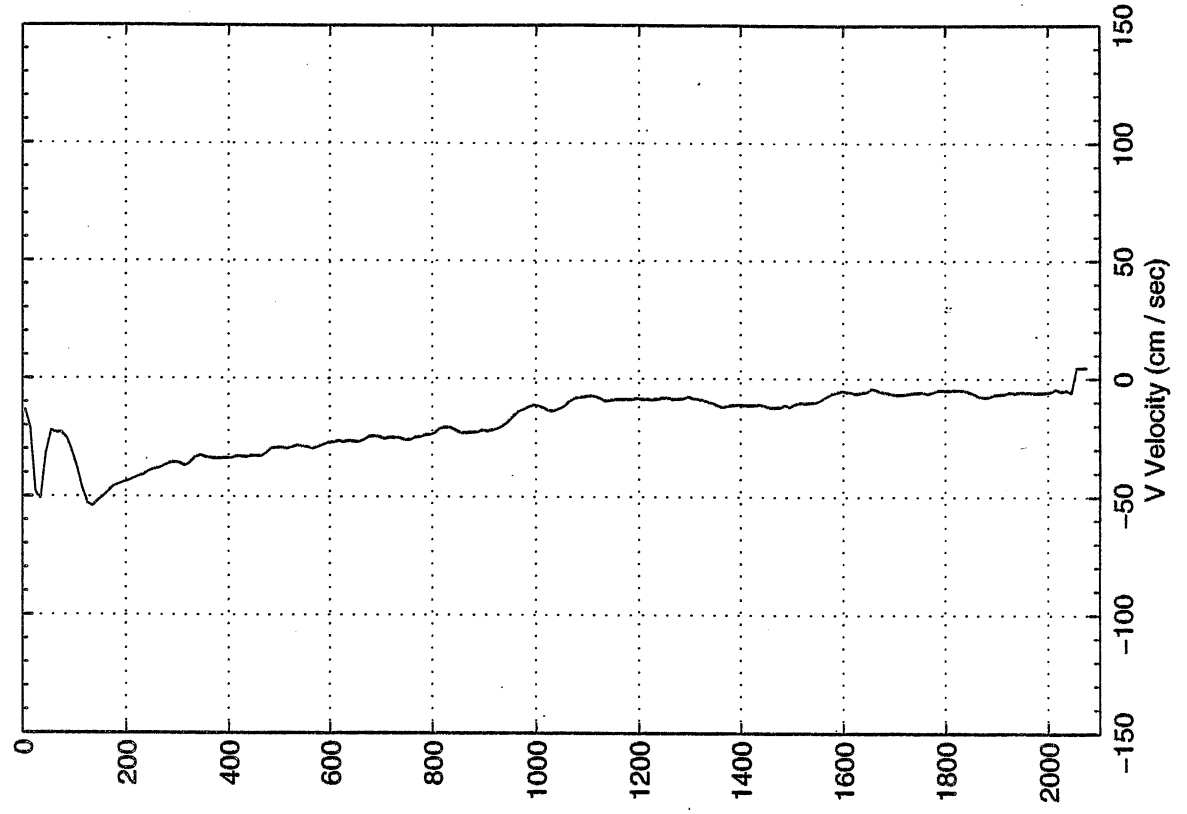
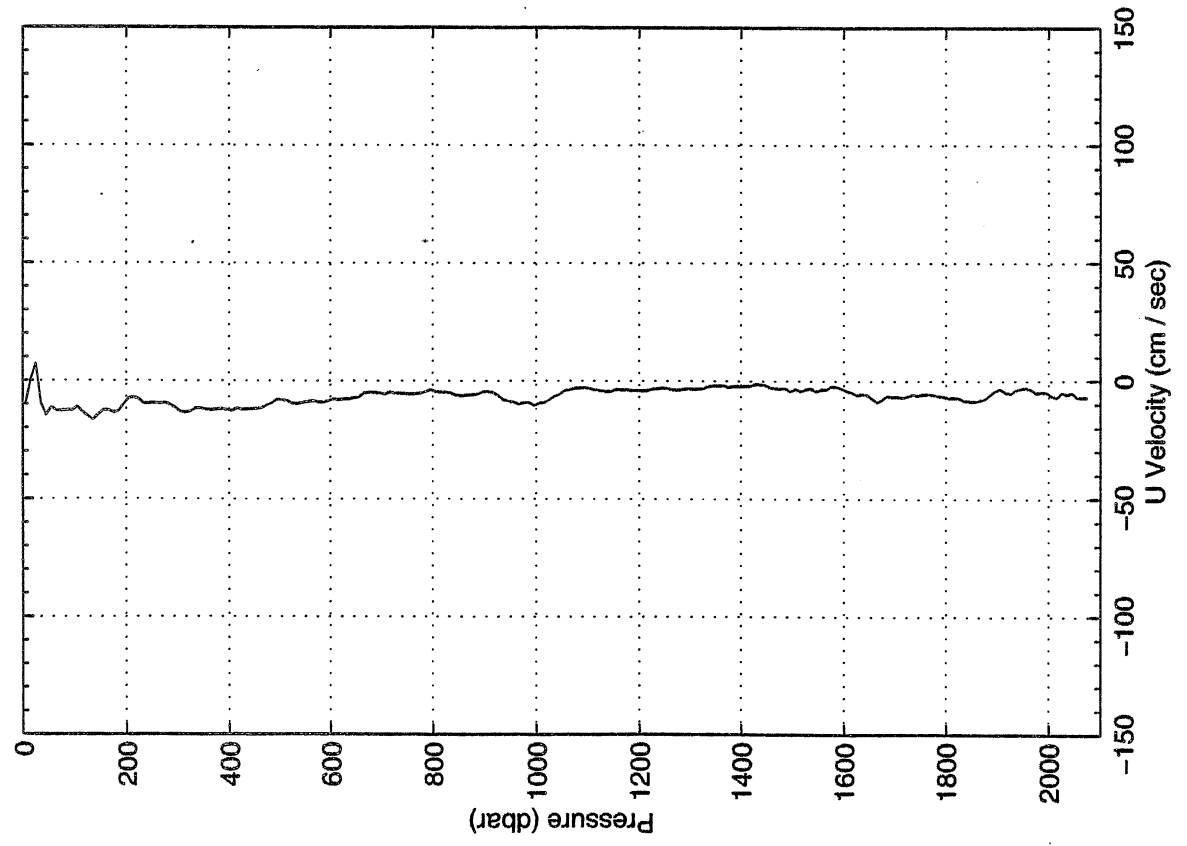
NBC-1 RV SEWARD JOHNSON  
LADCP Station 19 (98019)  
Latitude 7.328 N Longitude 47.159 W  
21-Nov-1998 17:02 Z



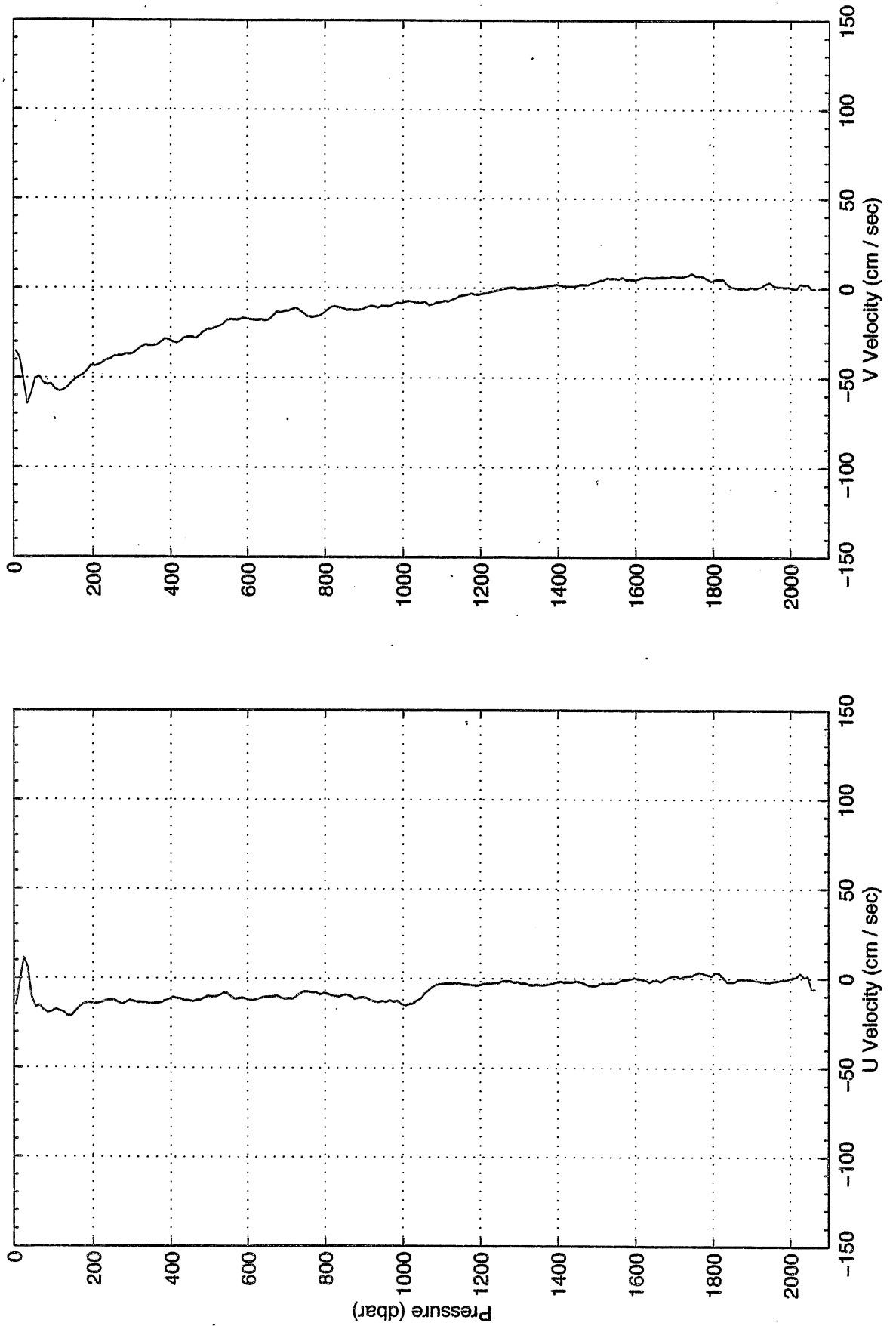
NBC-1 RV SEWARD JOHNSON  
LADCP Station 20 (98020)  
Latitude 7.203 N Longitude 45.084 W  
22-Nov-1996 05:21 Z



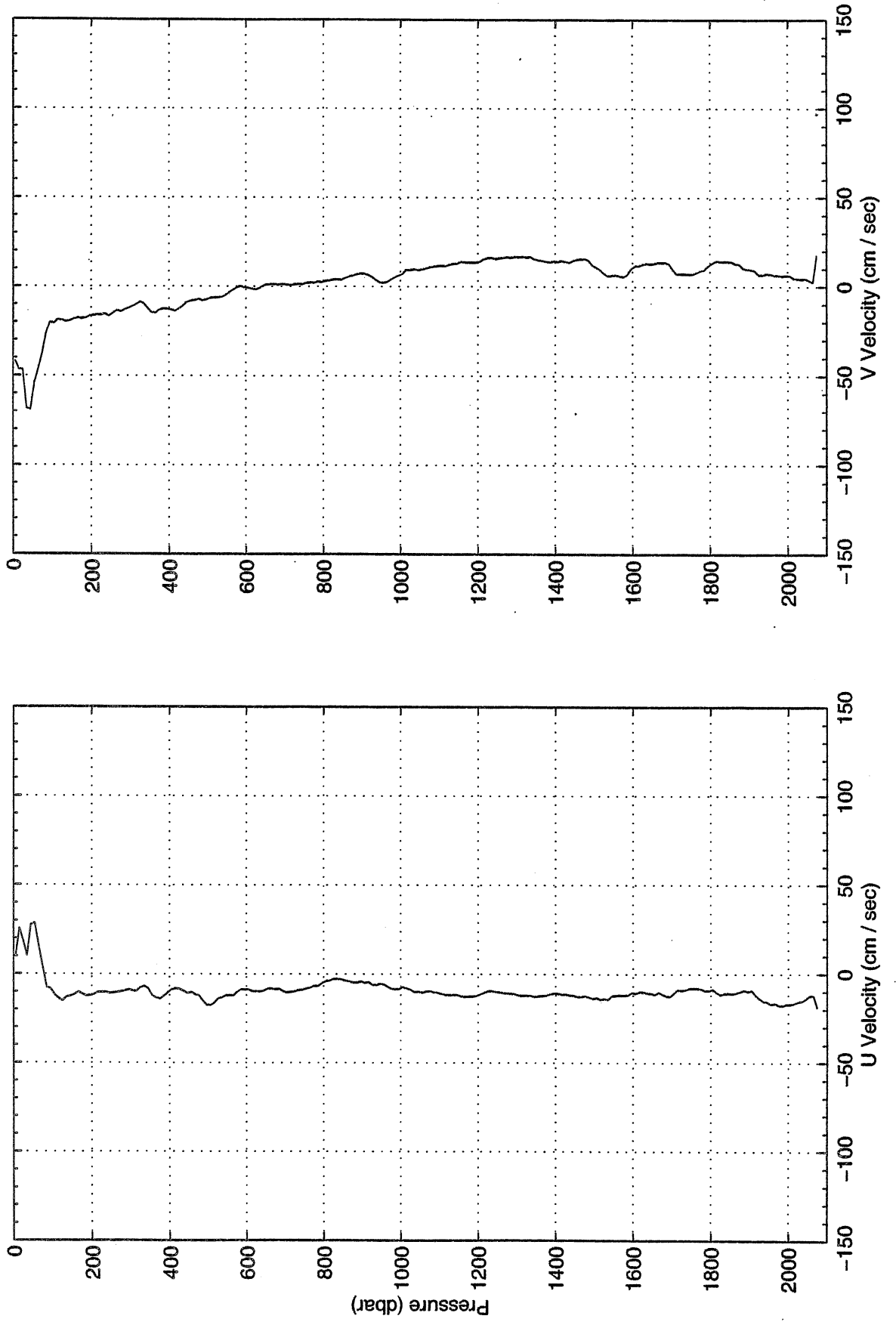
NBC-1 R/V SEWARD JOHNSON  
LADCP Station 21 (98021)  
Latitude 6.764 N Longitude 45.083 W  
22-Nov-1998 11:10 Z



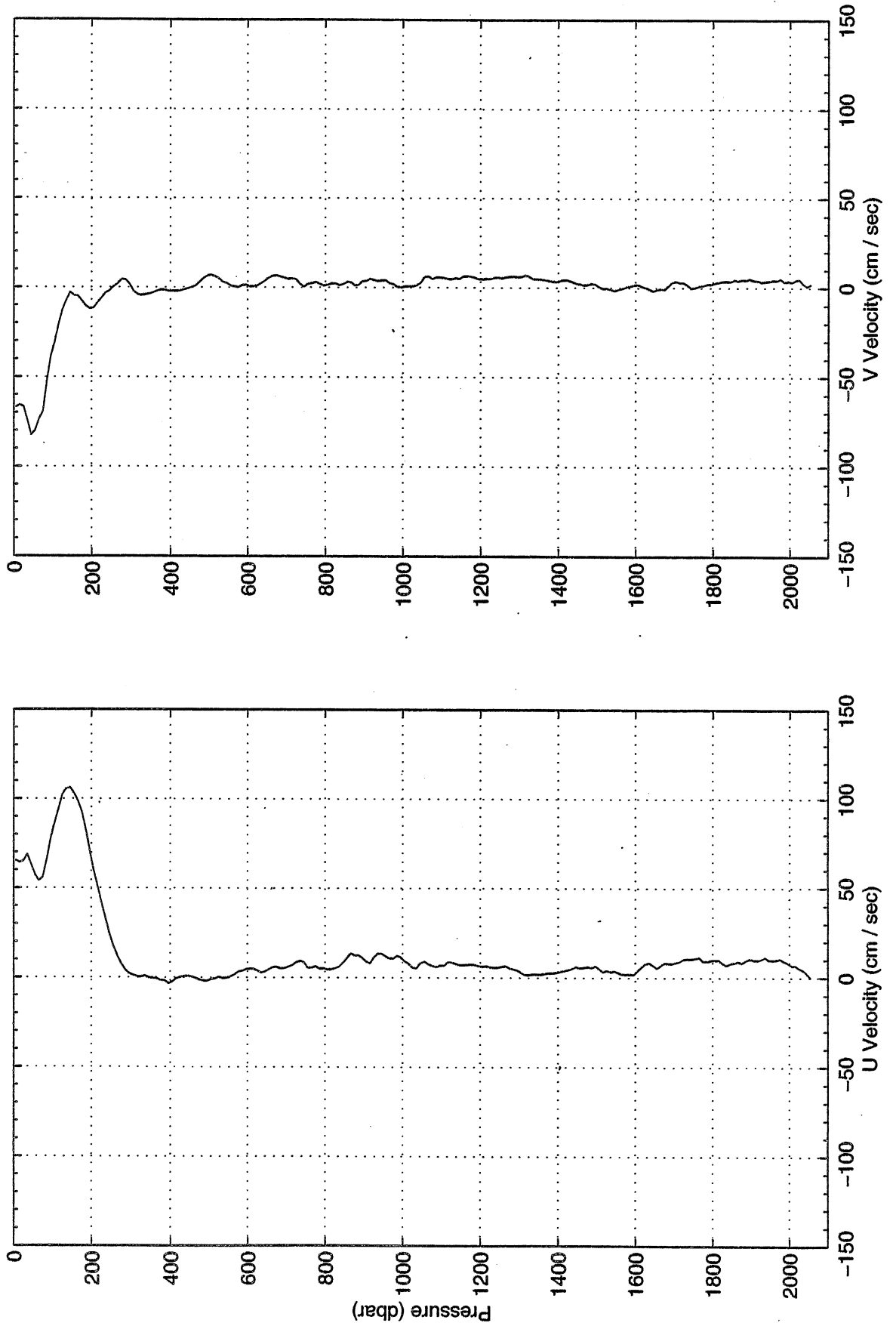
NBC-1 R/V SEWARD JOHNSON  
LADCP Station 22 (98022)  
Latitude 5.991 N Longitude 45.586 W  
22-Nov-1998 16:55 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 23 (98023)  
Latitude 5.250 N Longitude 46.144 W  
22-Nov-1998 22:18 Z

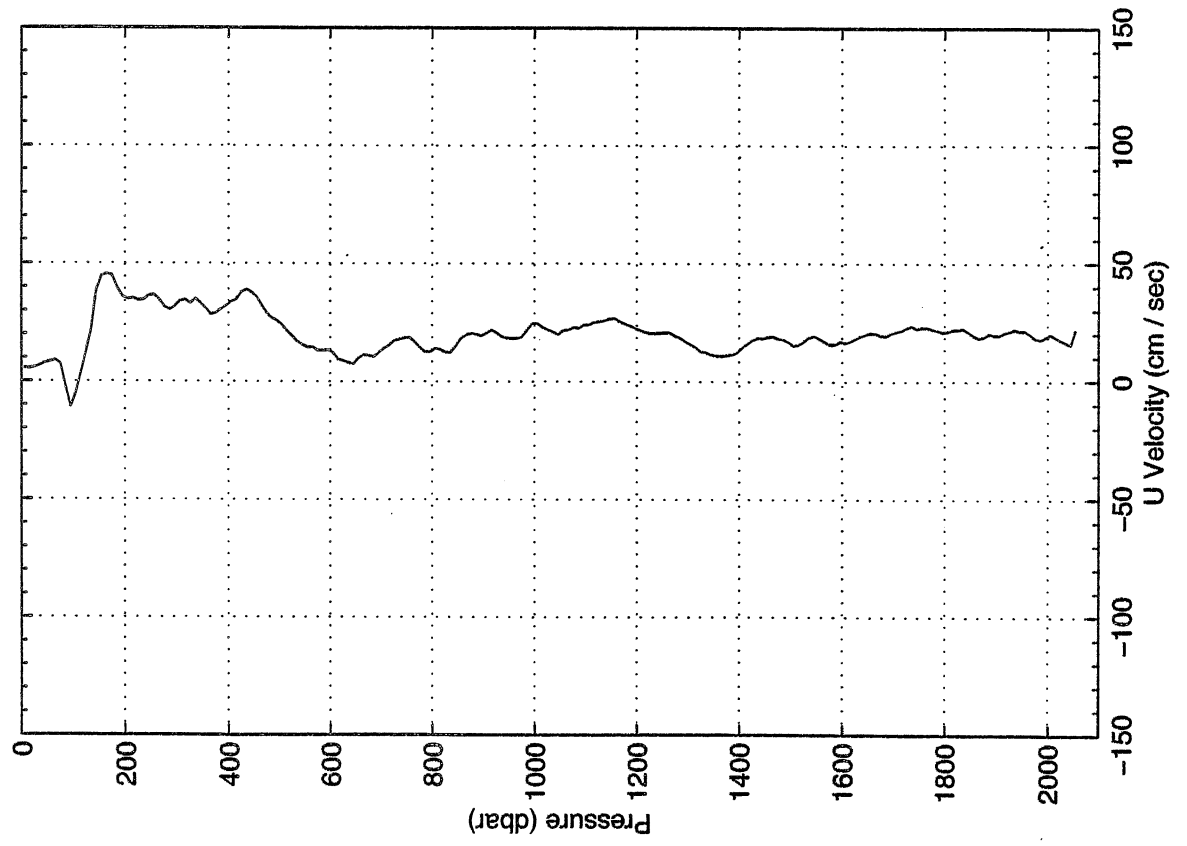
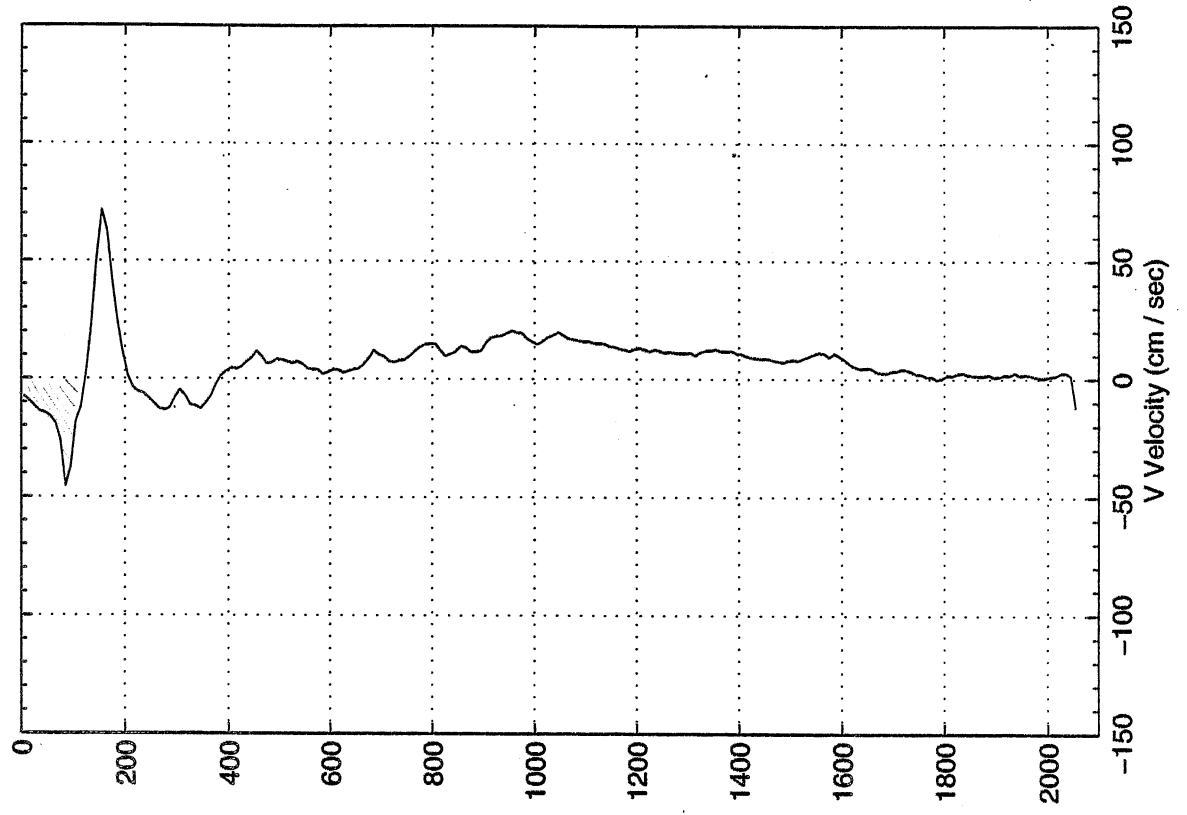


NBC-1 RV SEWARD JOHNSON  
LADCP Station 24 (98024)  
Latitude 4.402 N Longitude 46.143 W  
23-Nov-1998 05:48 Z

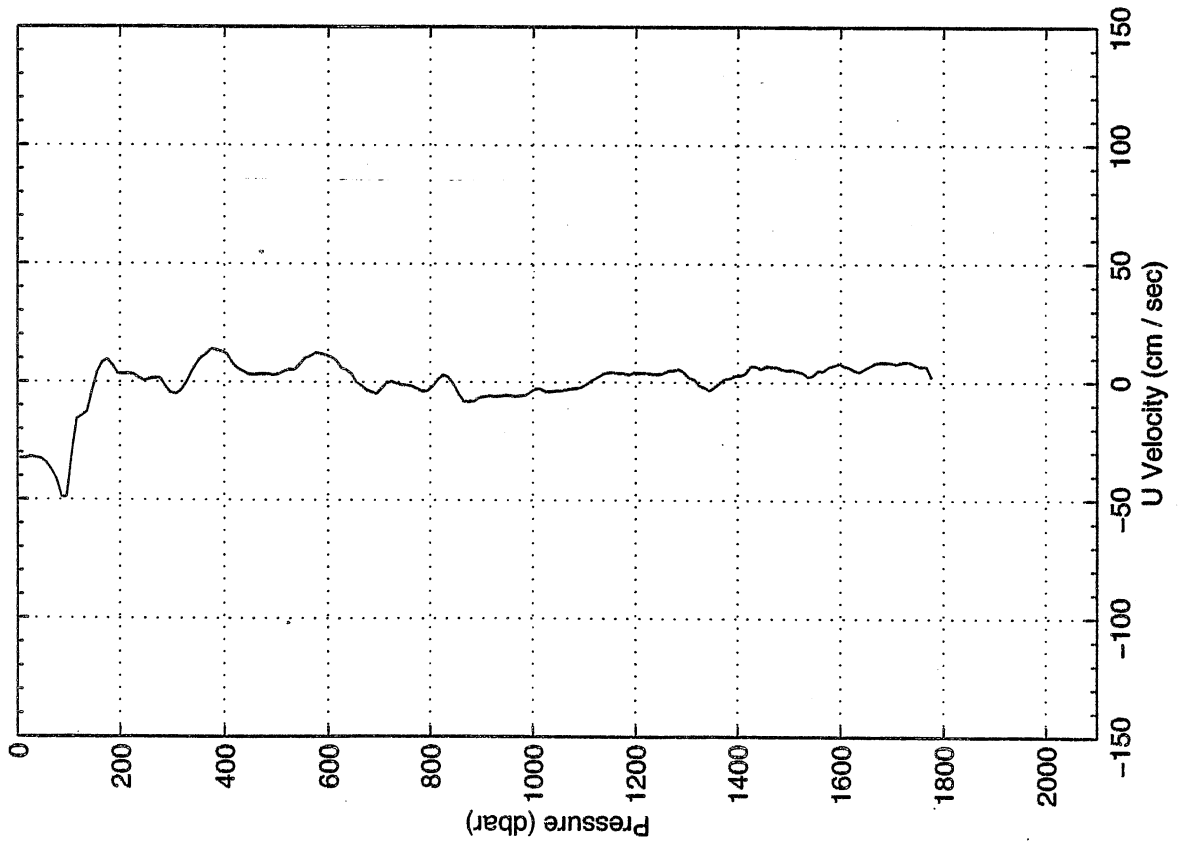
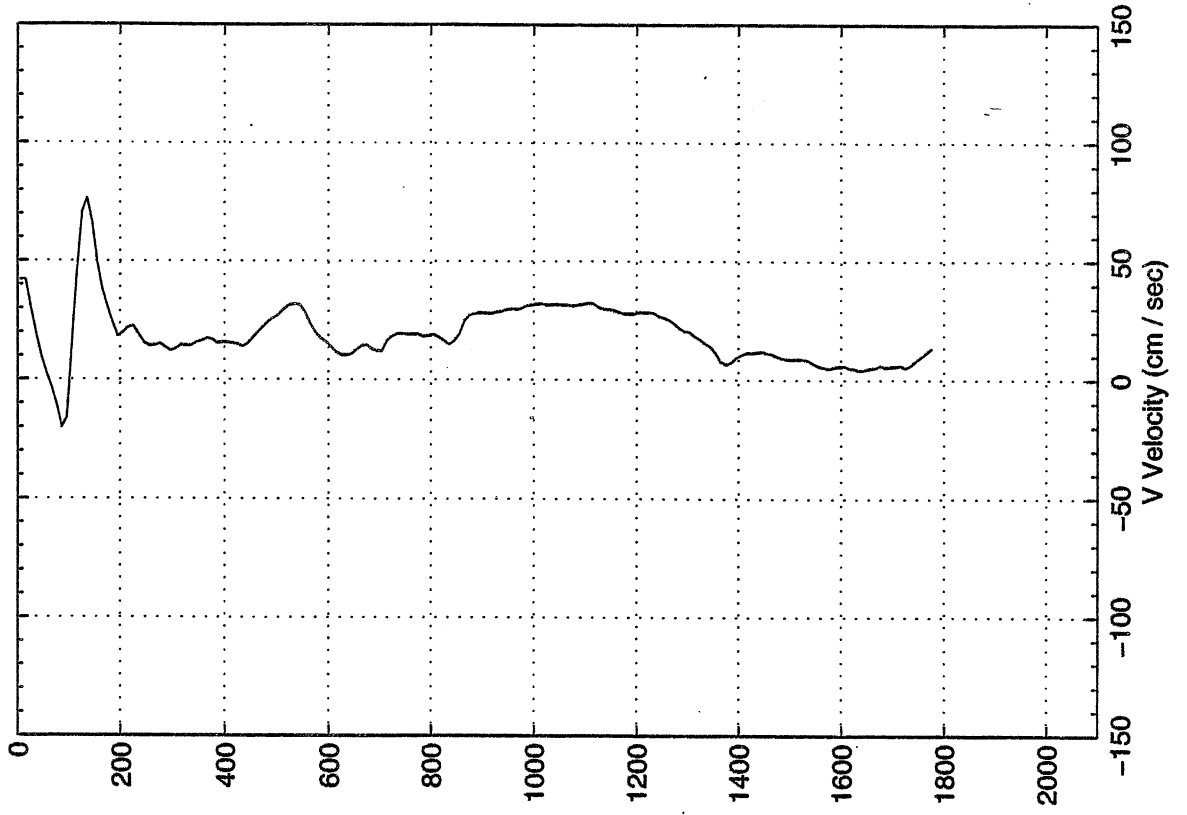




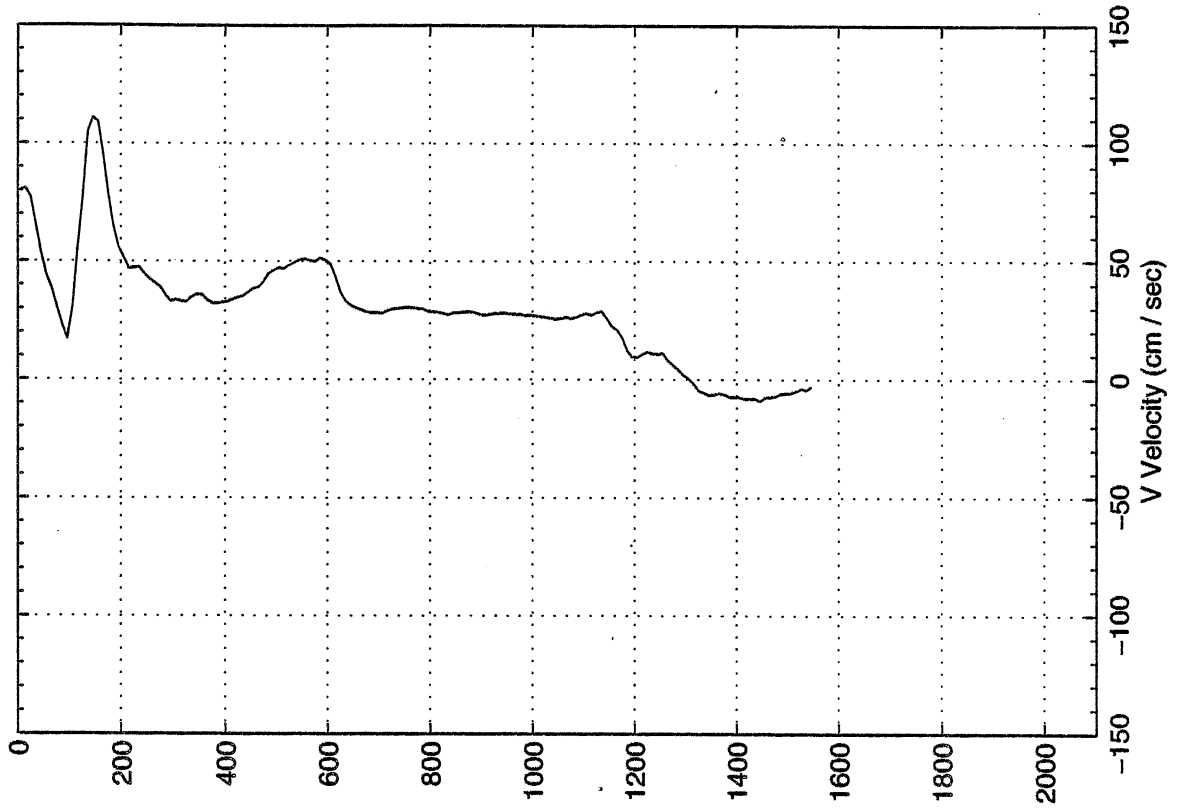
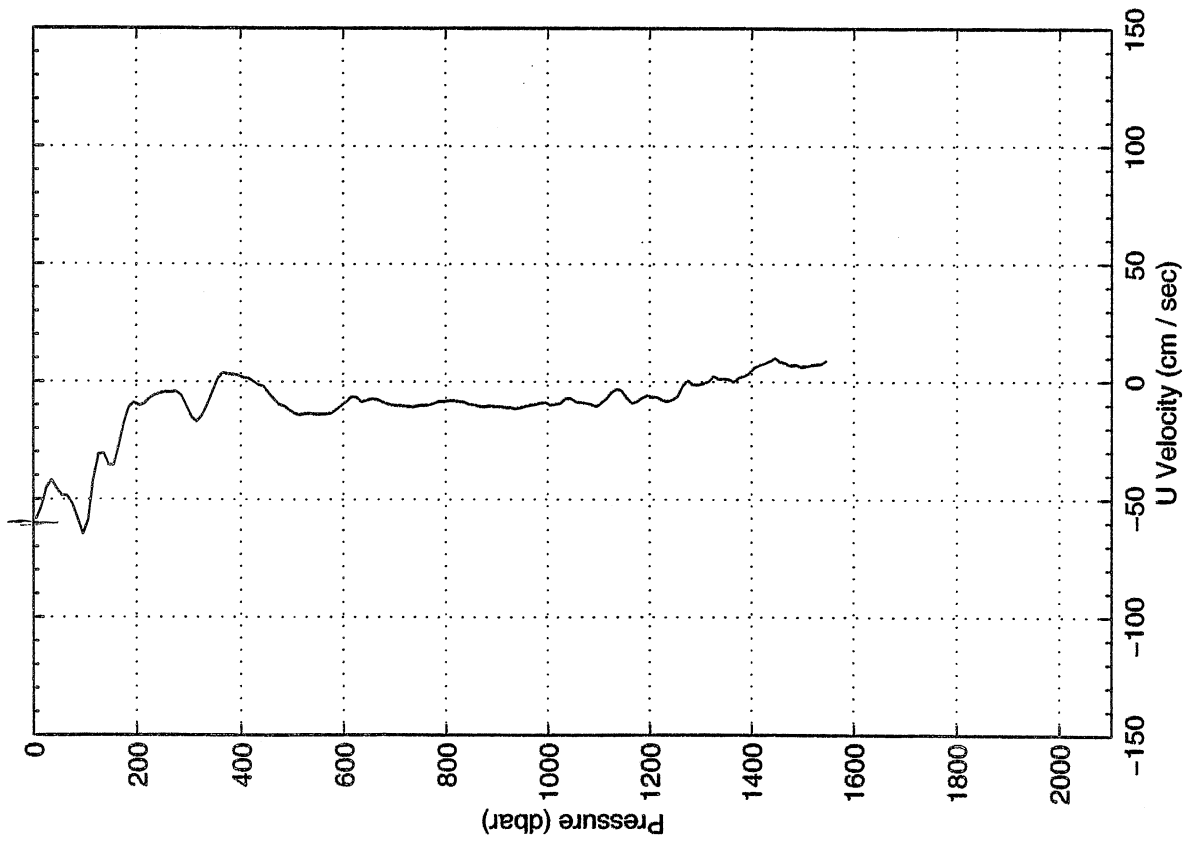
NBC-1 RV SEWARD JOHNSON  
LADCP Station 25 (98025)  
Latitude 3.754 N Longitude 46.078 W  
23-Nov-1998 11:49 Z



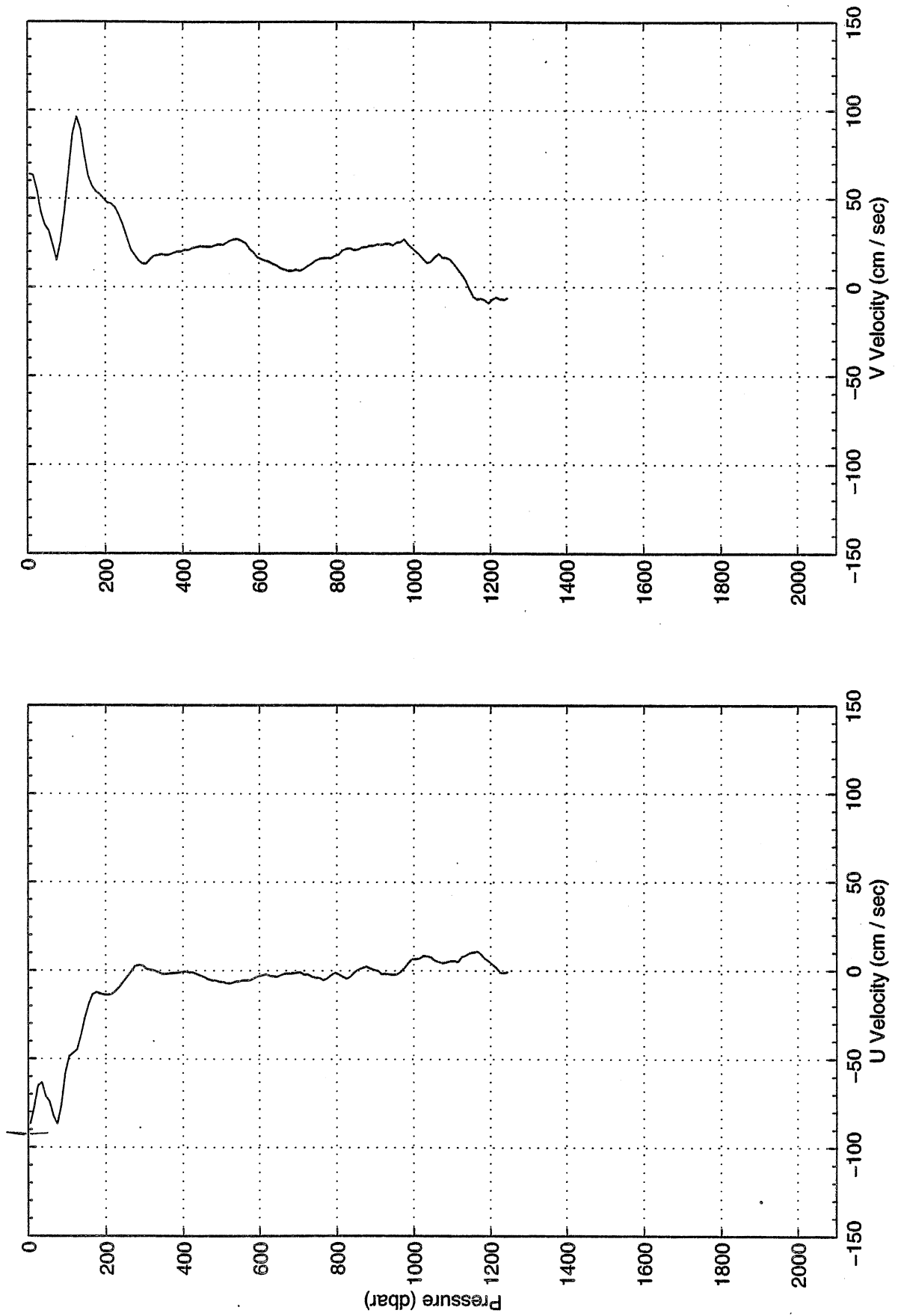
NBC-1 RV SEWARD JOHNSON  
LADCP Station 26 (98026)  
Latitude 3.088 N Longitude 47.080 W  
23-Nov-1998 20:31 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 27 (98027)  
Latitude 2.815 N Longitude 47.129 W  
24-Nov-1998 01:08 Z

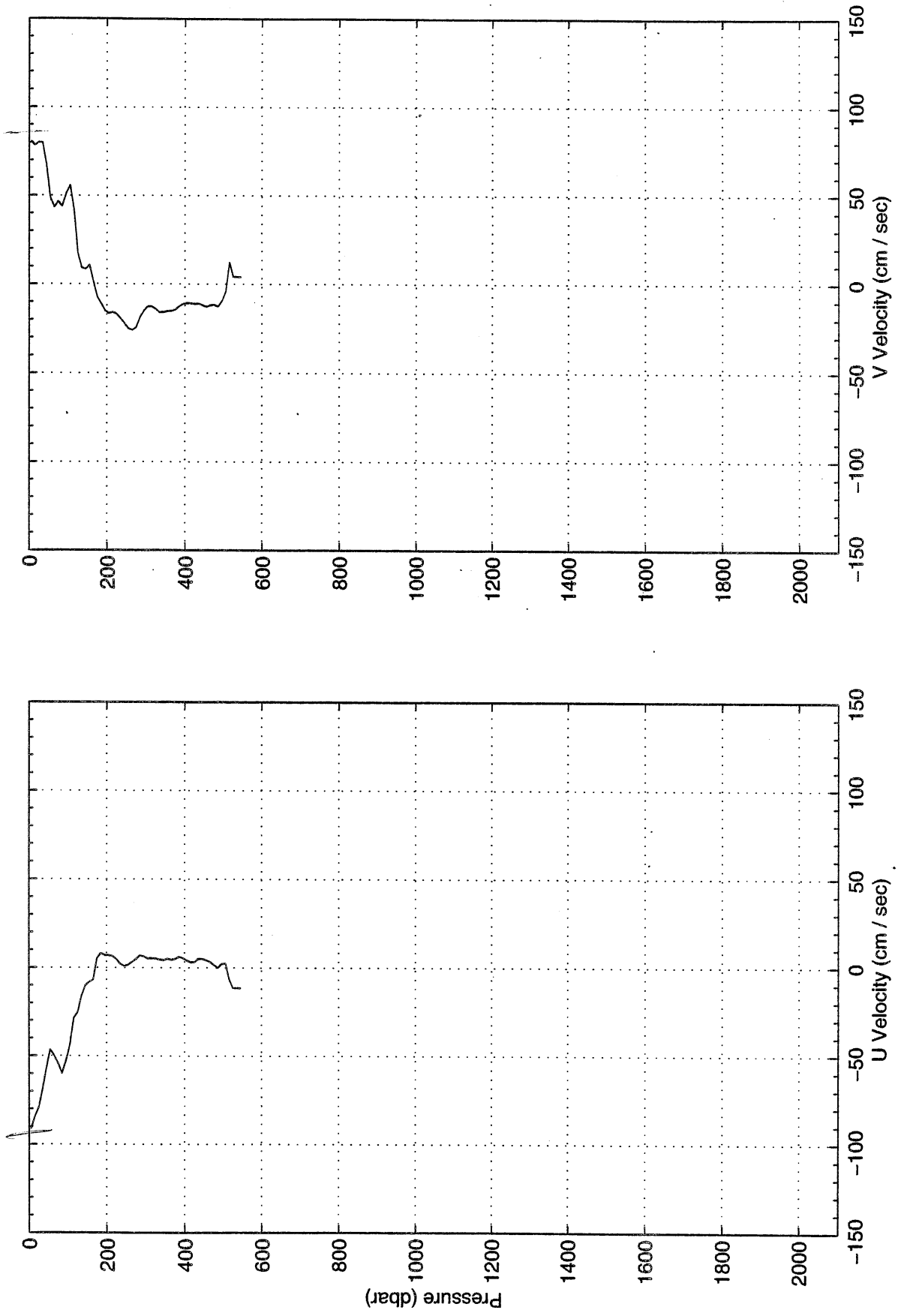


NBC-1 R/V SEWARD JOHNSON  
LADCP Station 28 (98028)  
Latitude 2.573 N Longitude 47.066 W  
24-Nov-1998 03:59 Z

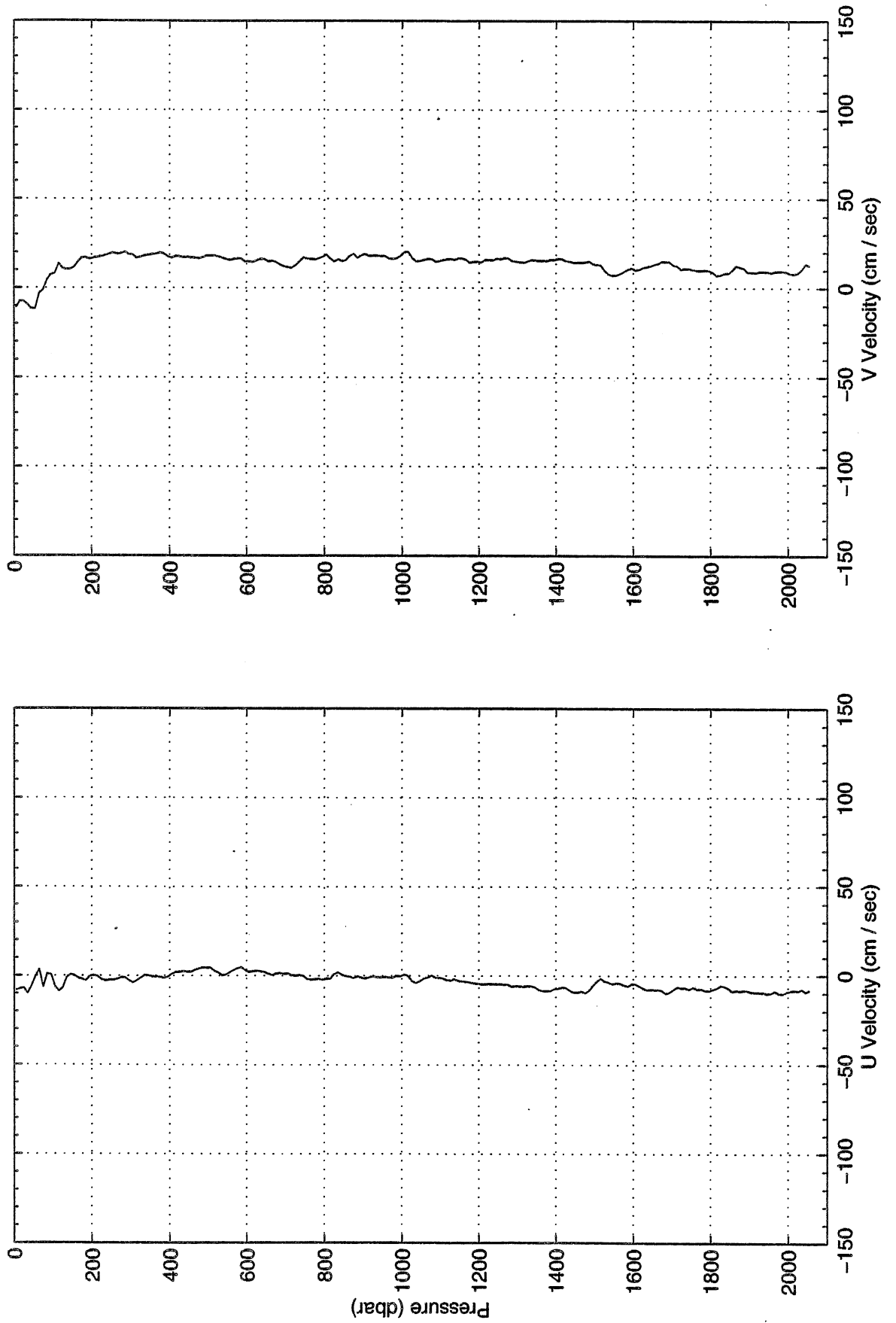


NBC-1 RV SEWARD JOHNSON  
LADCP Station 29 (98029)  
Latitude 2.287 N Longitude 47.152 W  
24-Nov-1998 06:50 Z

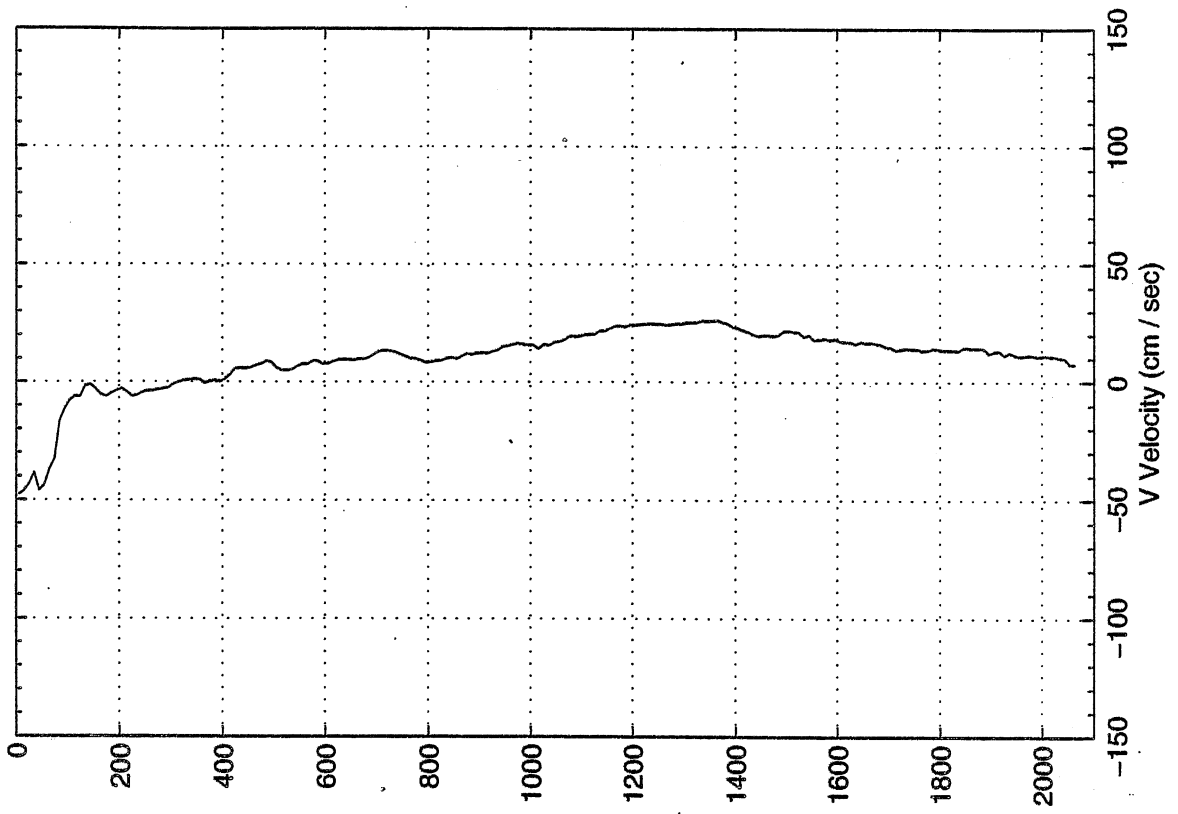
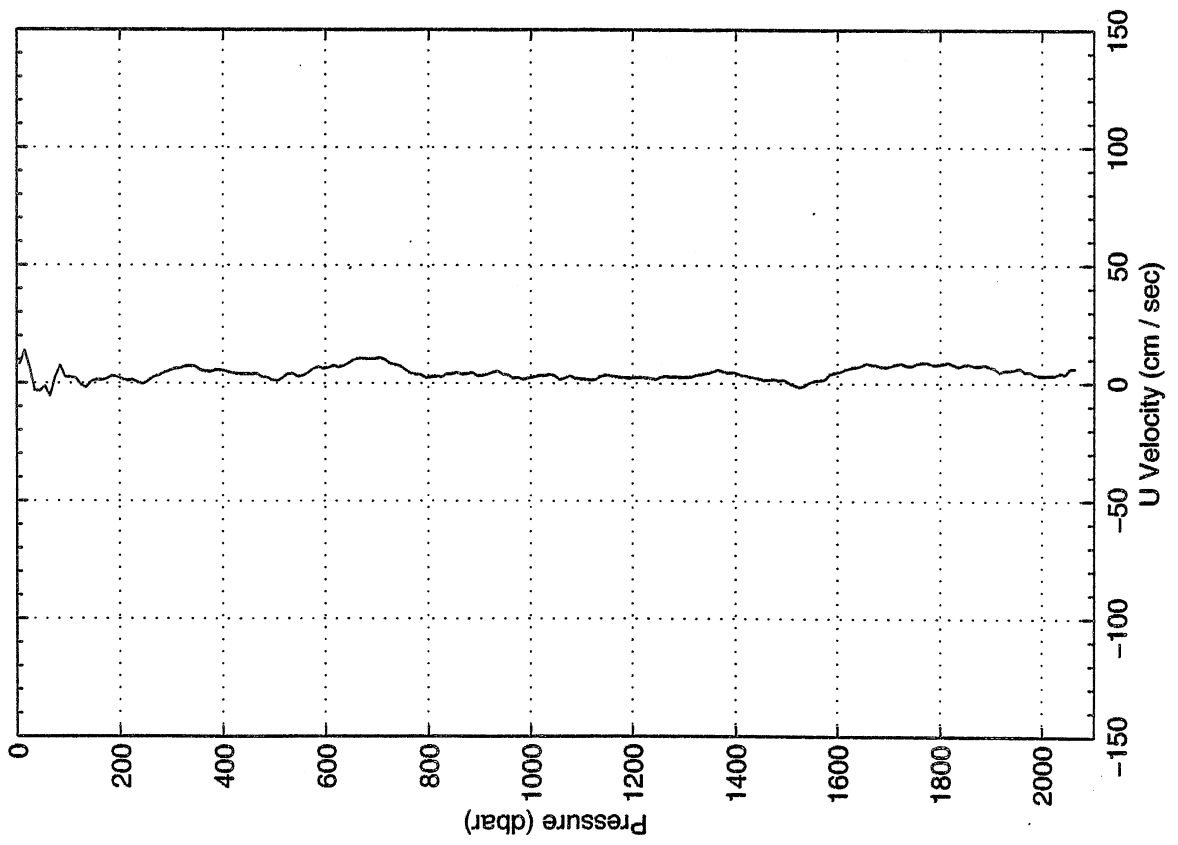
41



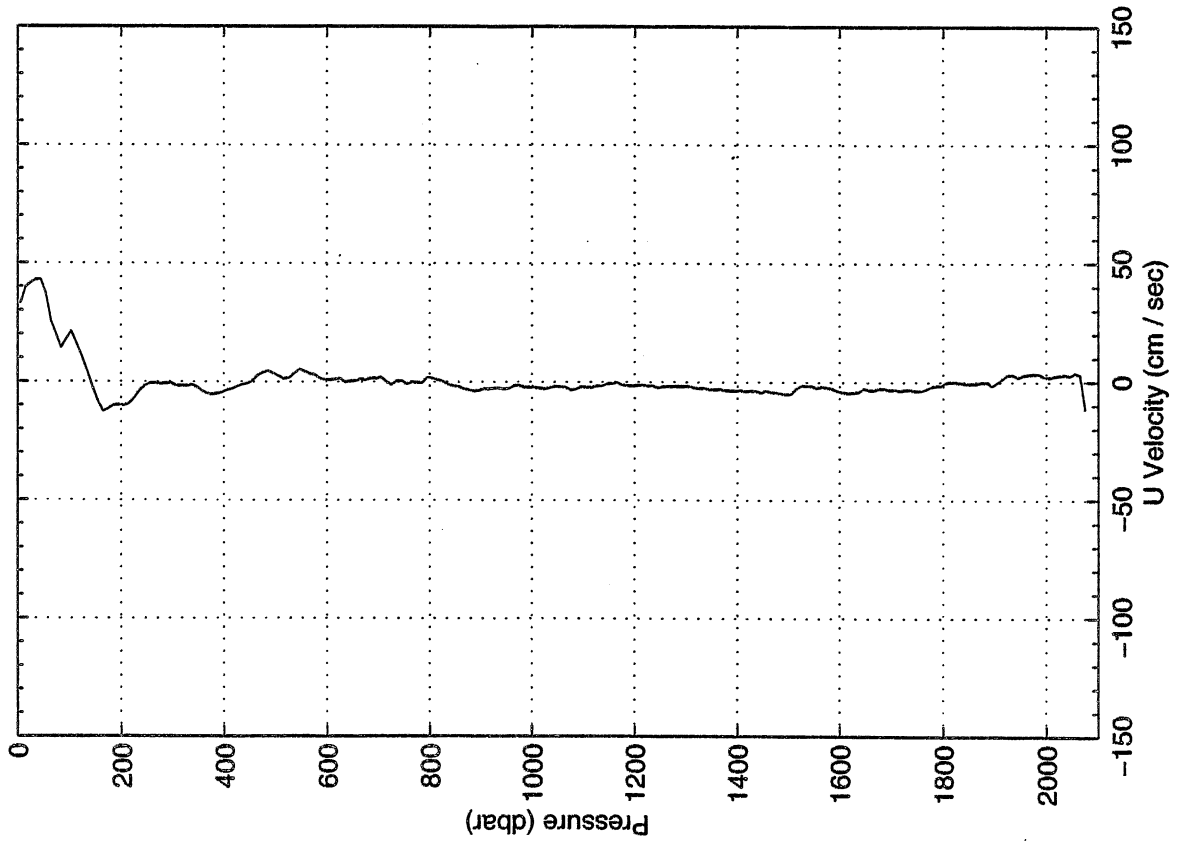
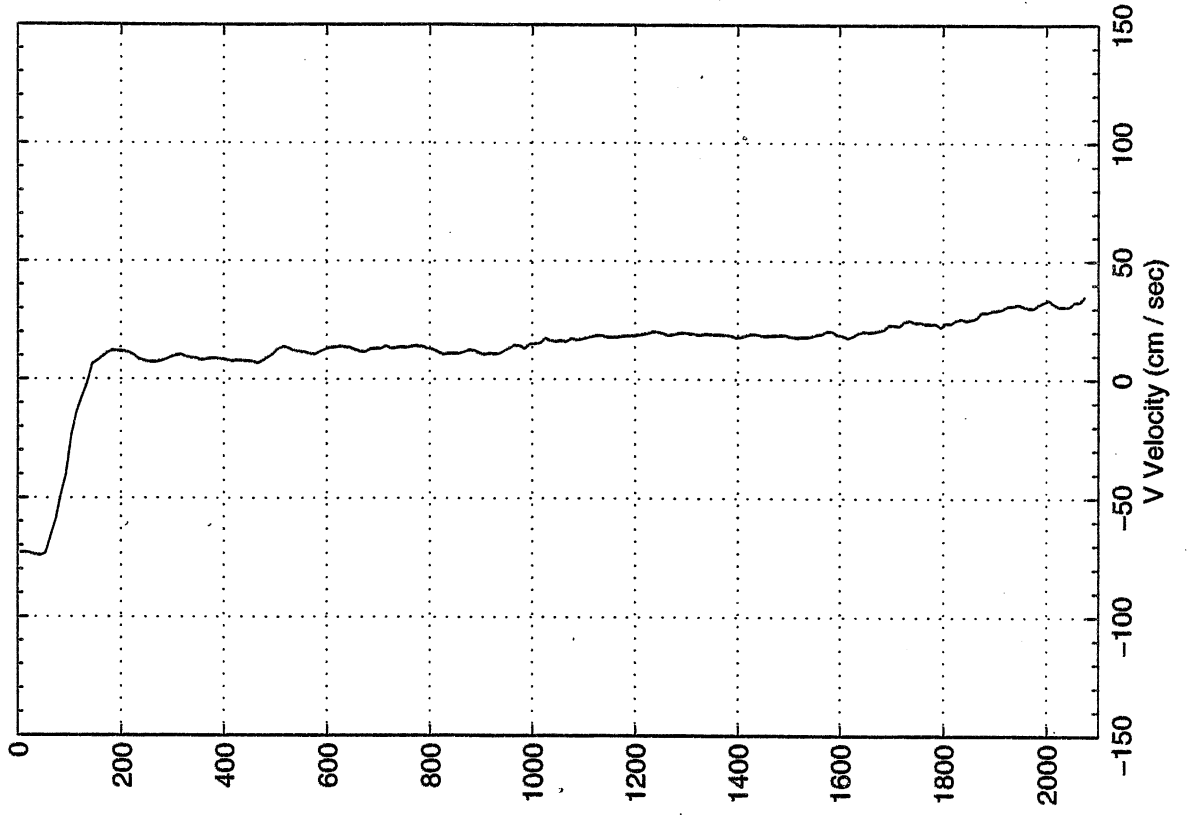
NBC-1 R/V SEWARD JOHNSON  
LADCP Station 30 (98030)  
Latitude 8.056 N Longitude 47.102 W  
01-Dec-1998 09:52 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 31 (98031)  
Latitude 7.739 N Longitude 47.119 W  
01-Dec-1998 13:48 Z

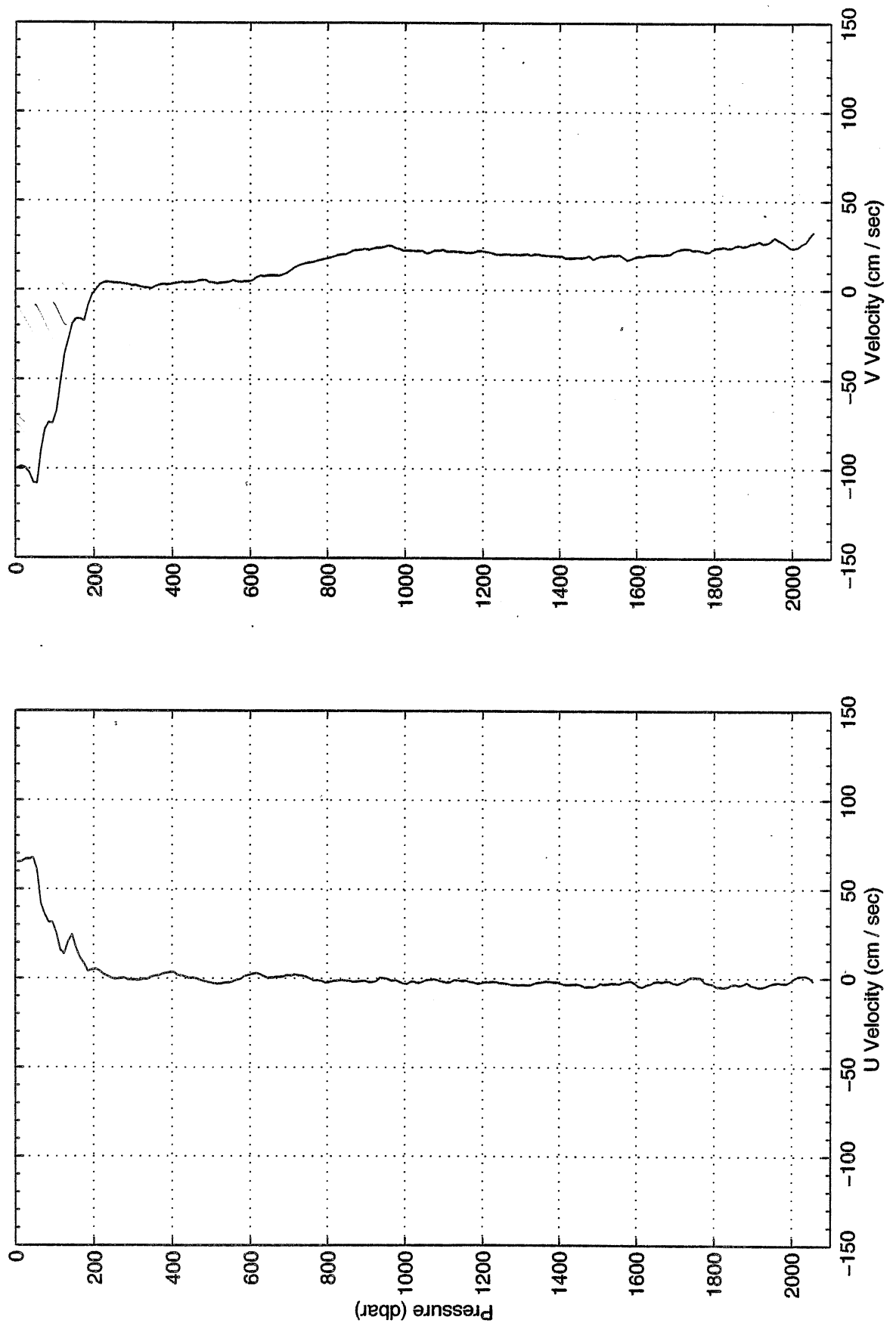


NBC-1 RV SEWARD JOHNSON  
LADCP Station 32 (98032)  
Latitude 7.374 N Longitude 48.143 W  
01-Dec-1998 17:59 Z





NBC-1 RV SEWARD JOHNSON  
LADCP Station 33 (98033)  
Latitude 7.026 N Longitude 48.154 W  
01-Dec-1998 22:28 Z

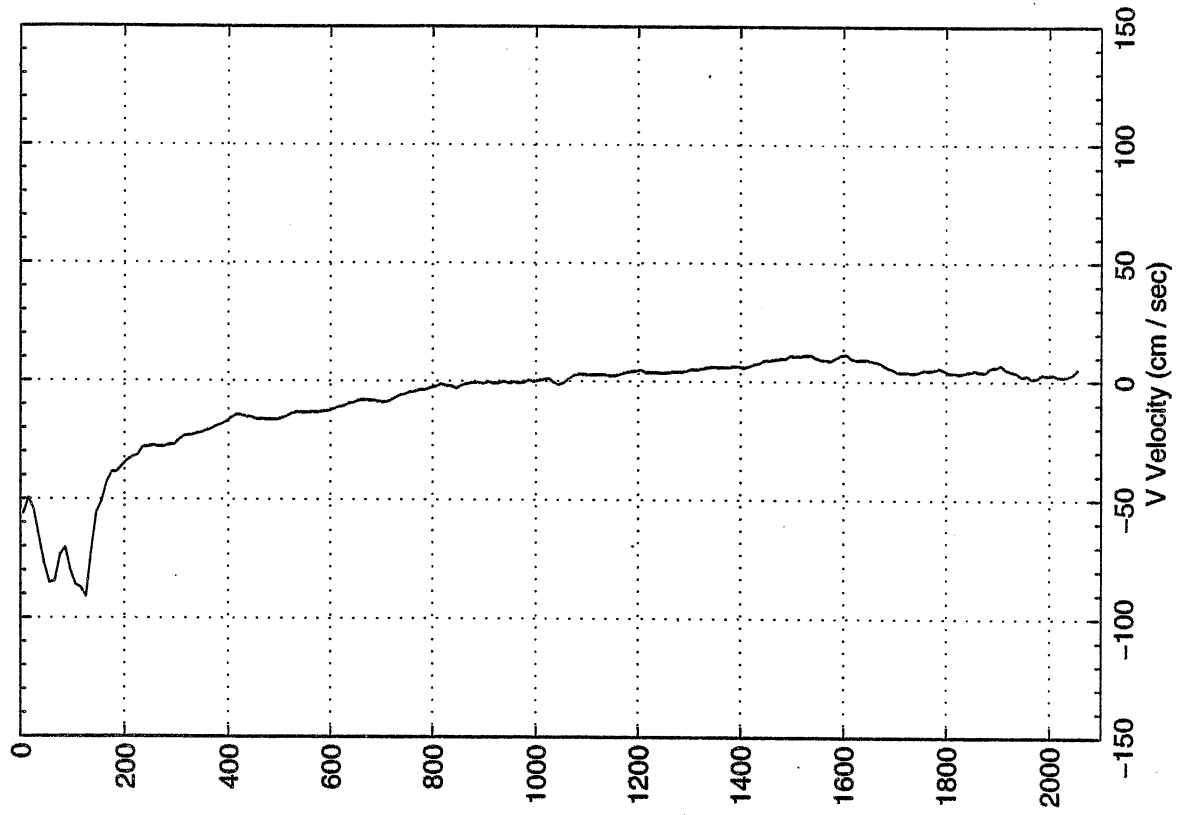
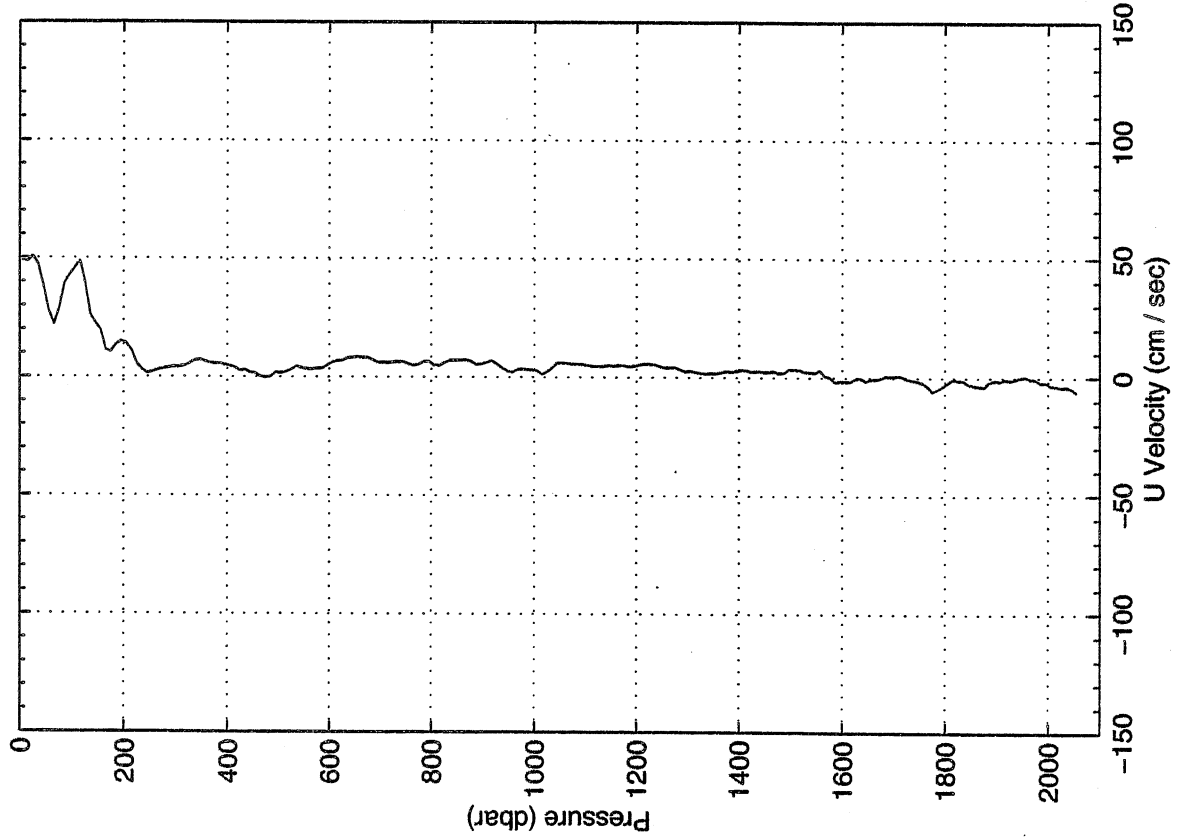


NBC-1 R/V SEWARD JOHNSON

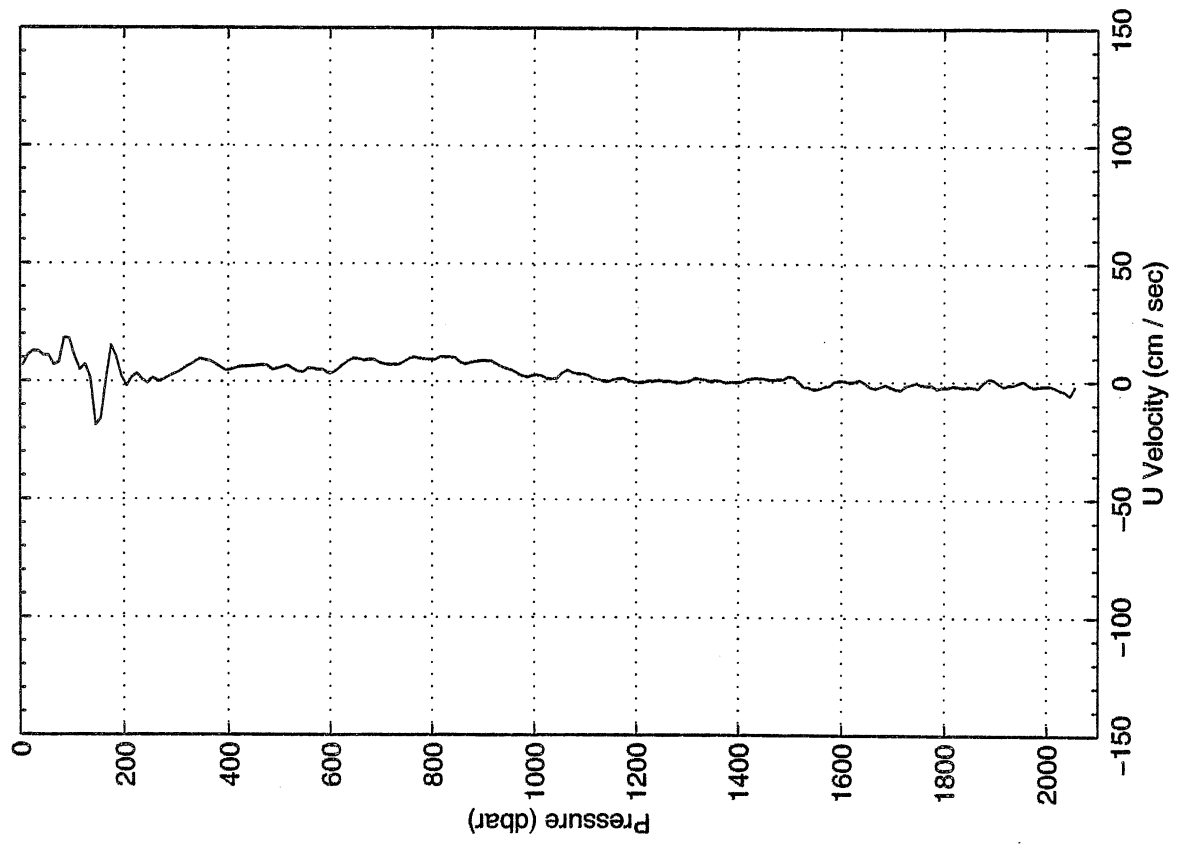
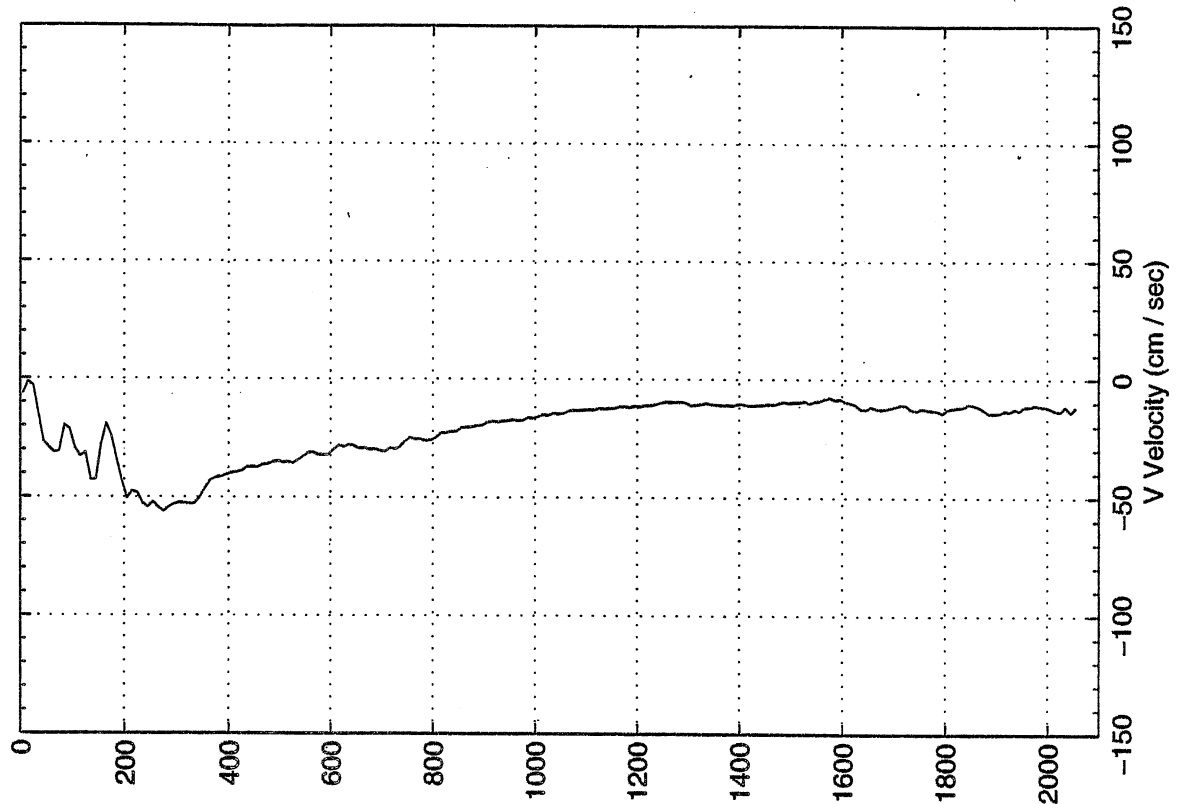
LADCP Station 34 (98034)

Latitude 6.709 N Longitude 49.014 W

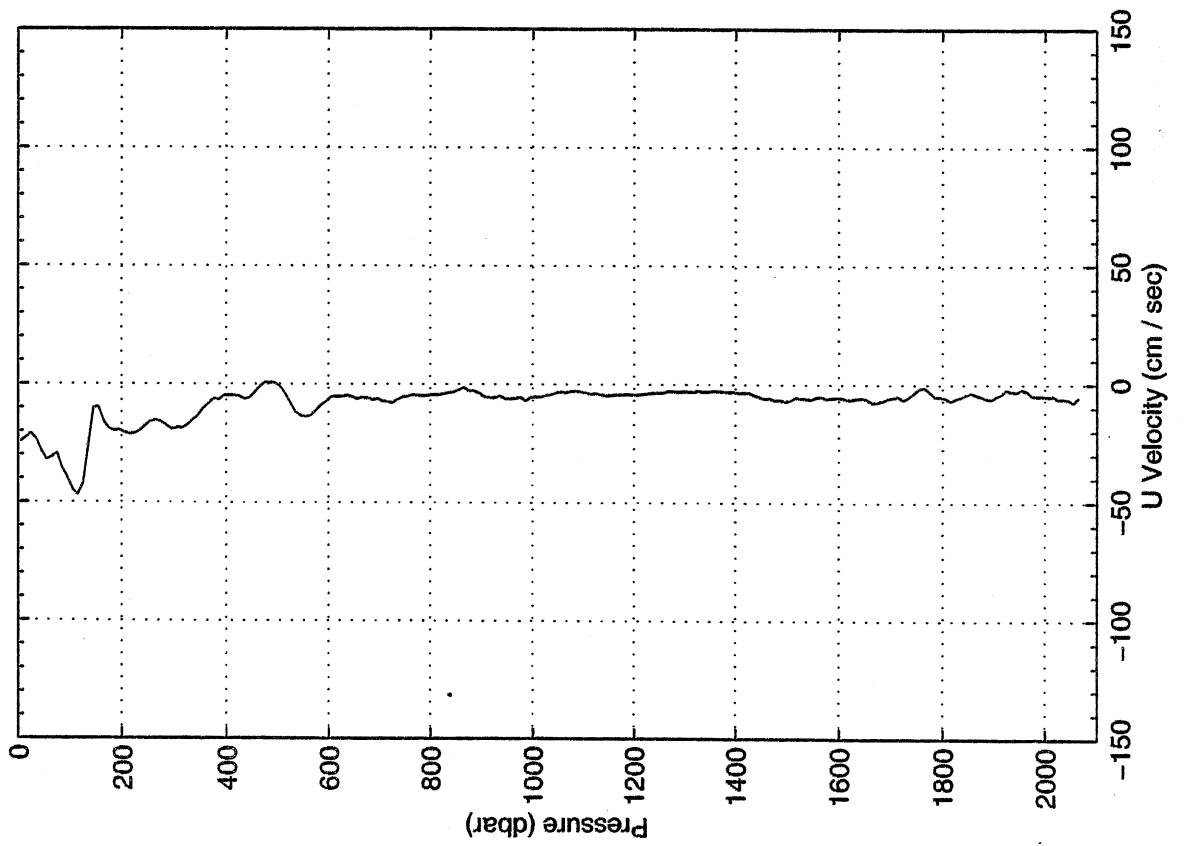
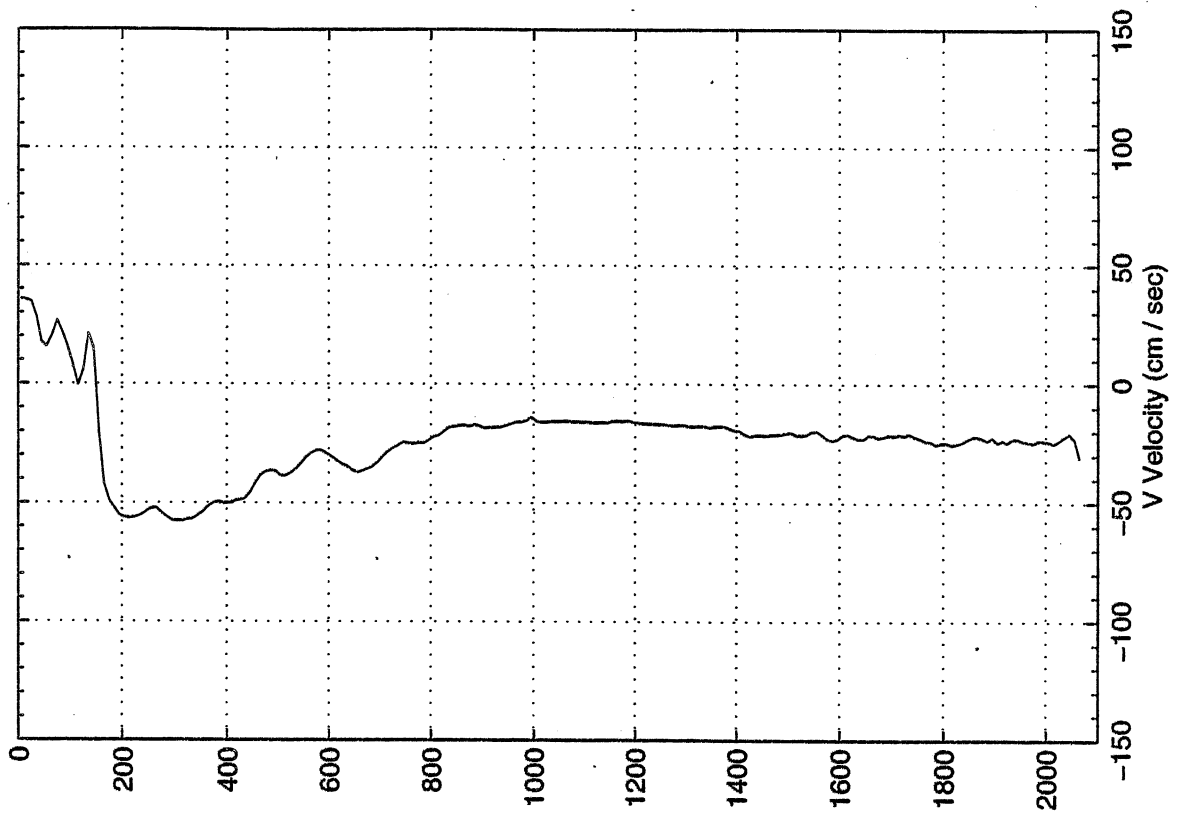
02-Dec-1998 02:35 Z



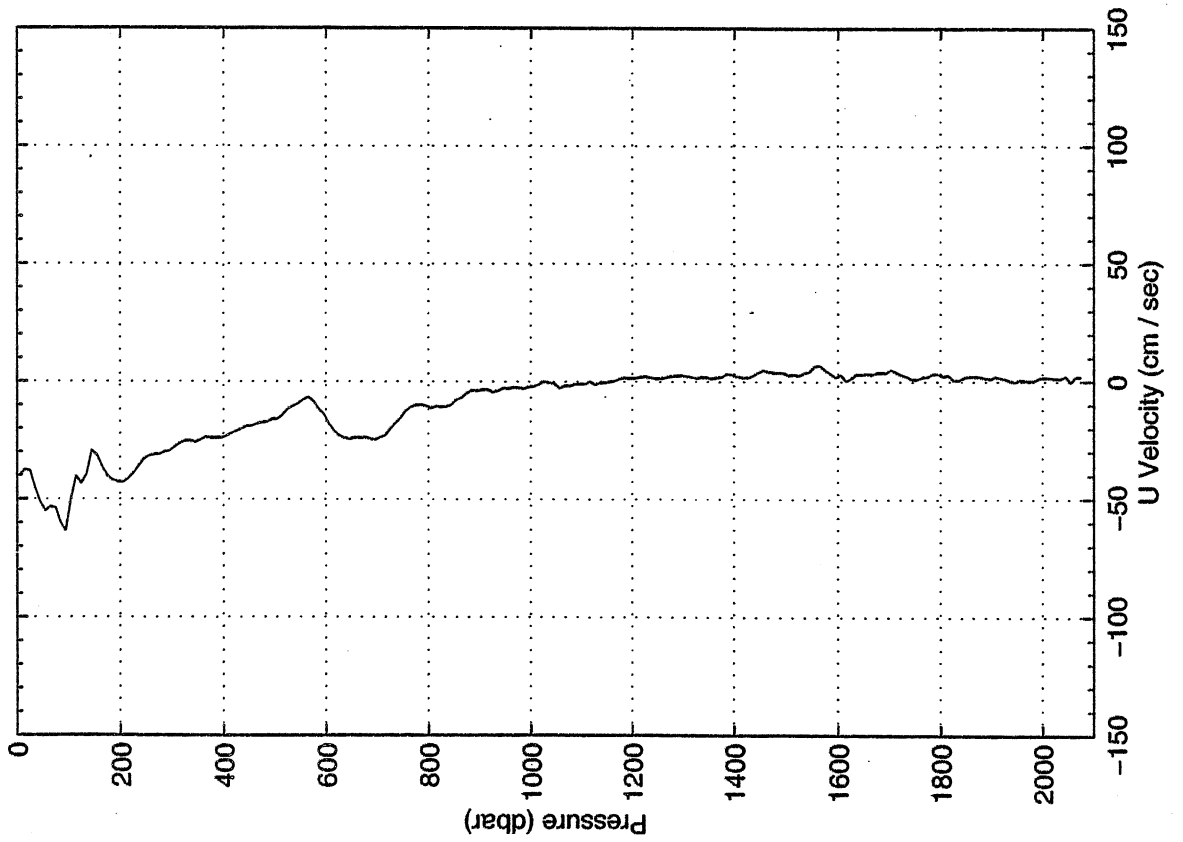
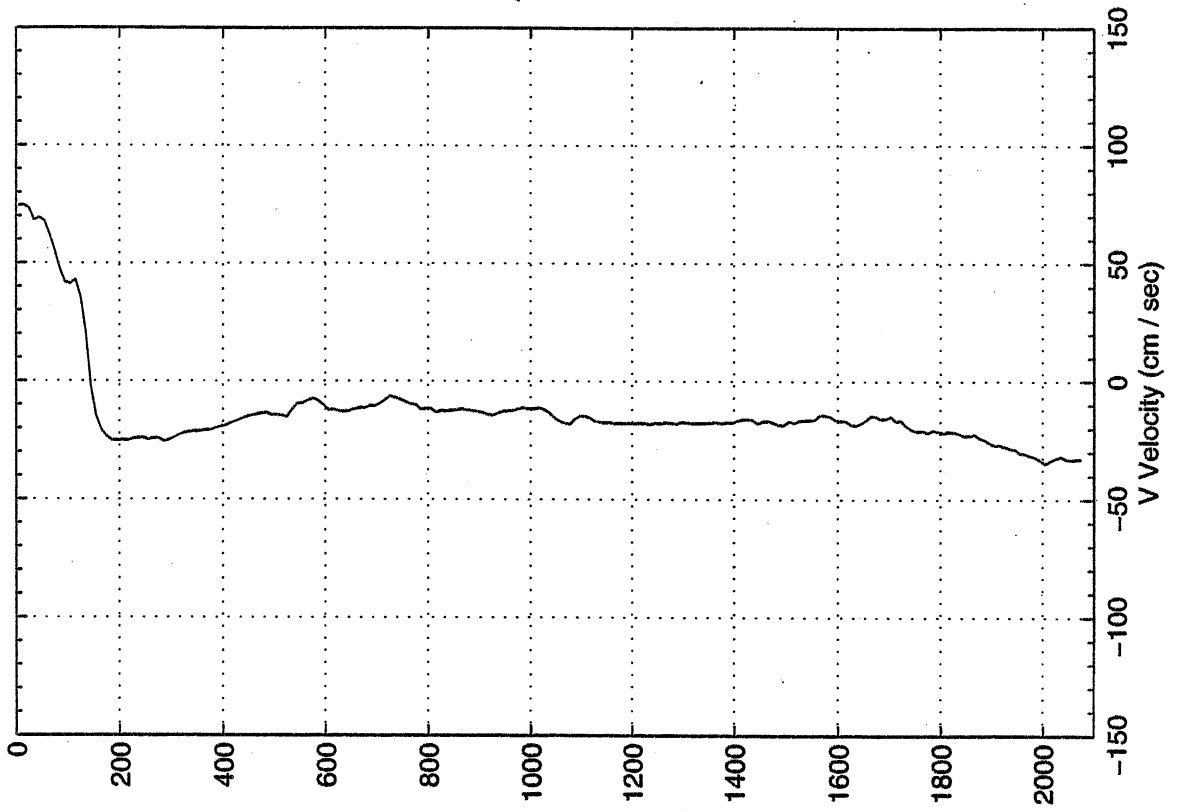
NBC-1 R/V SEWARD JOHNSON  
LADCP Station 35 (98035)  
Latitude 6.383 N Longitude 49.050 W  
02-Dec-1998 06:38 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 36 (98036)  
Latitude 6.056 N Longitude 49.071 W  
02-Dec-1998 10:52 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 37 (98037)  
Latitude 5.739 N Longitude 50.089 W  
02-Dec-1998 14:59 Z

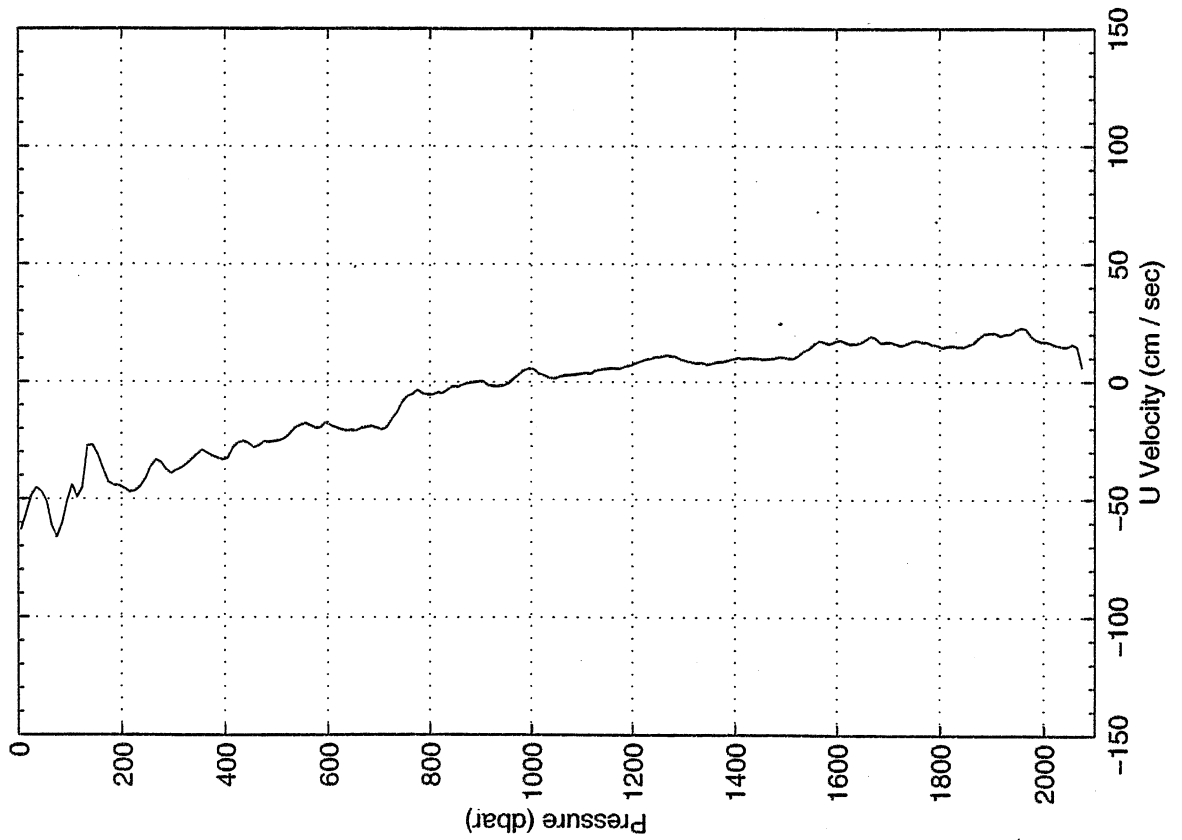
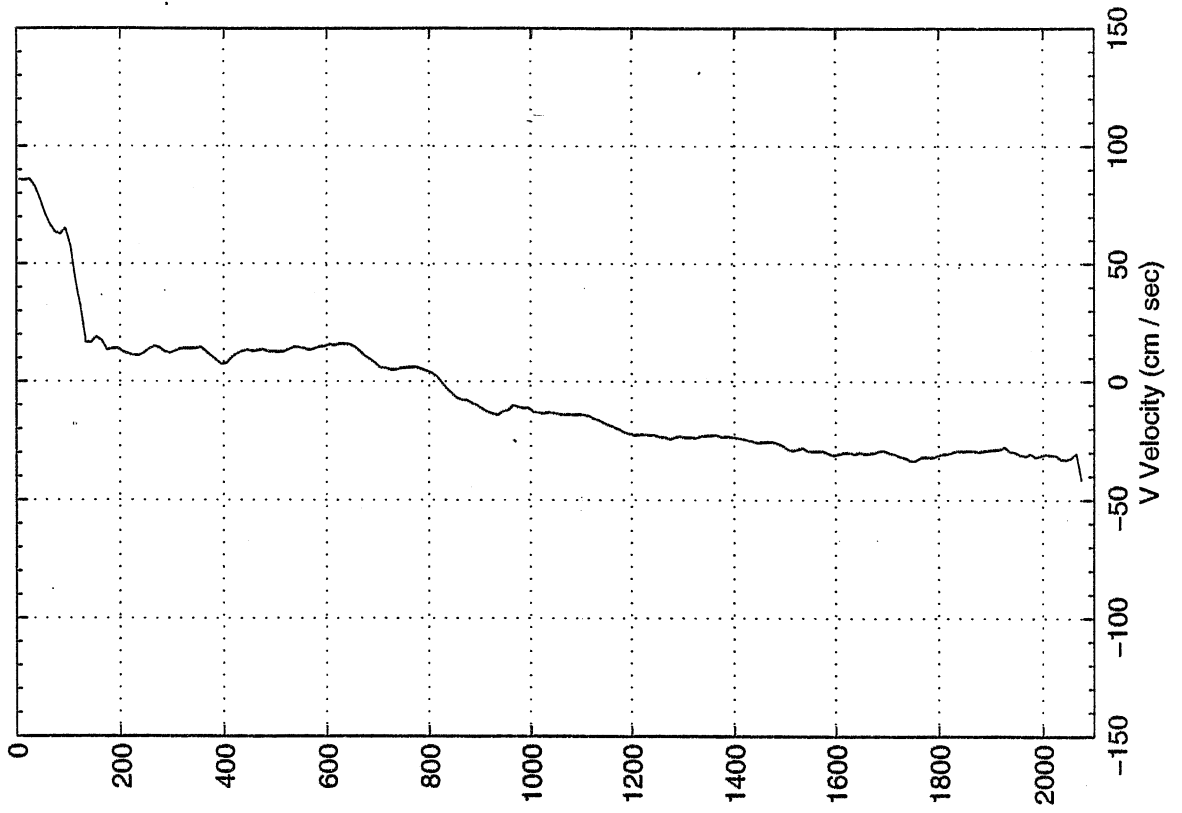


NBC-1 R/V SEWARD JOHNSON

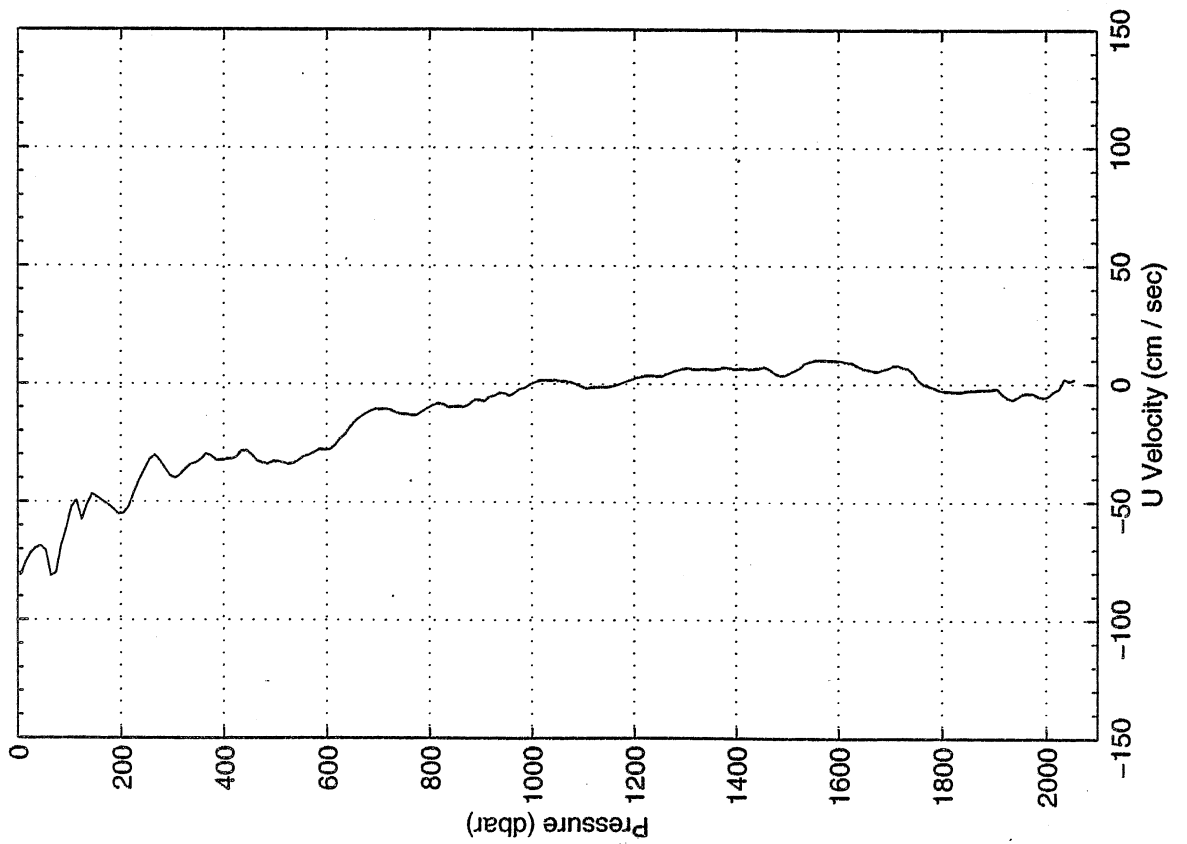
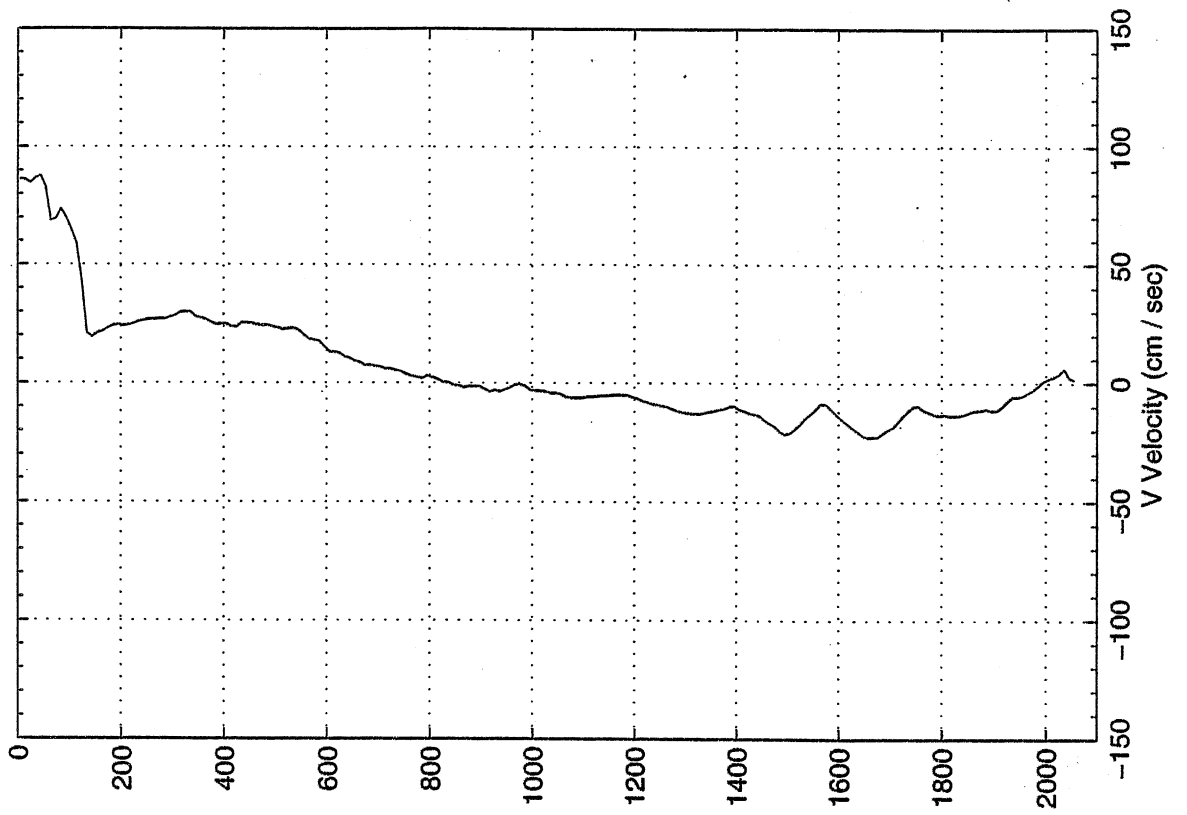
LADCP Station 38 (98038)

Latitude 5.535 N Longitude 50.150 W

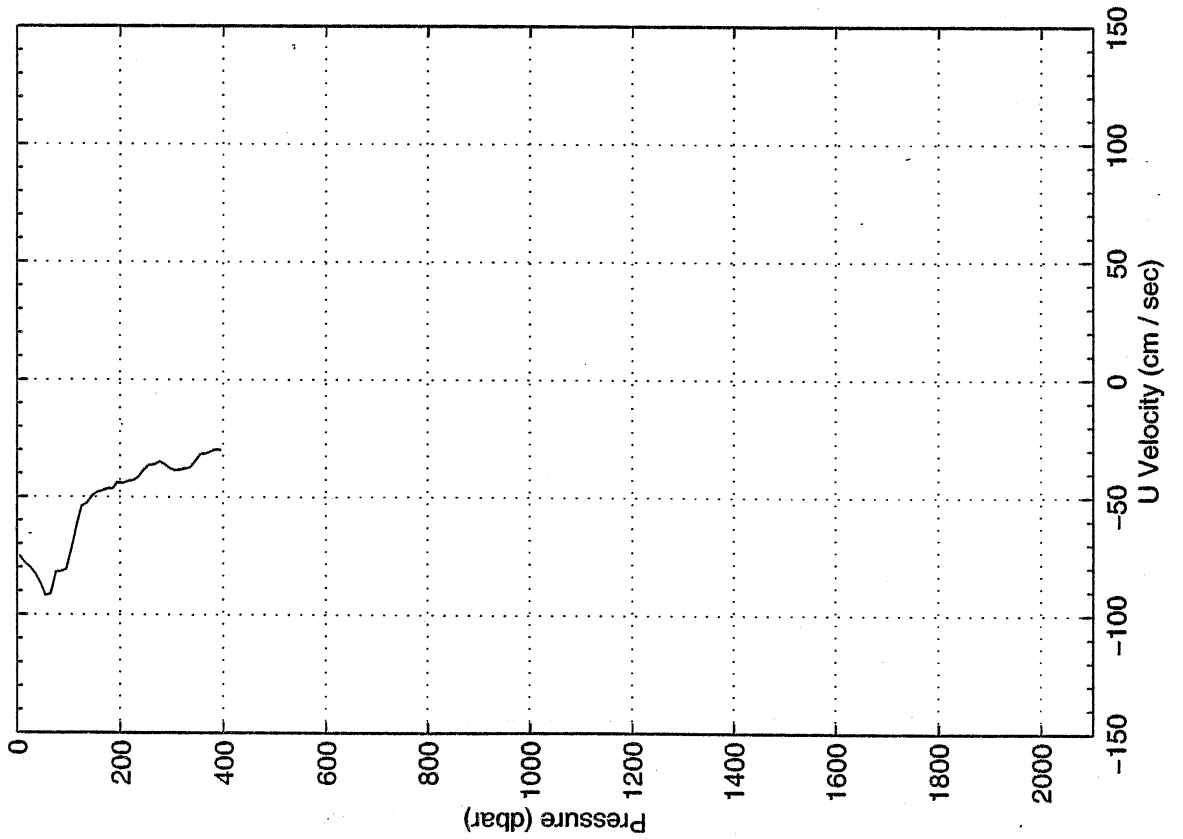
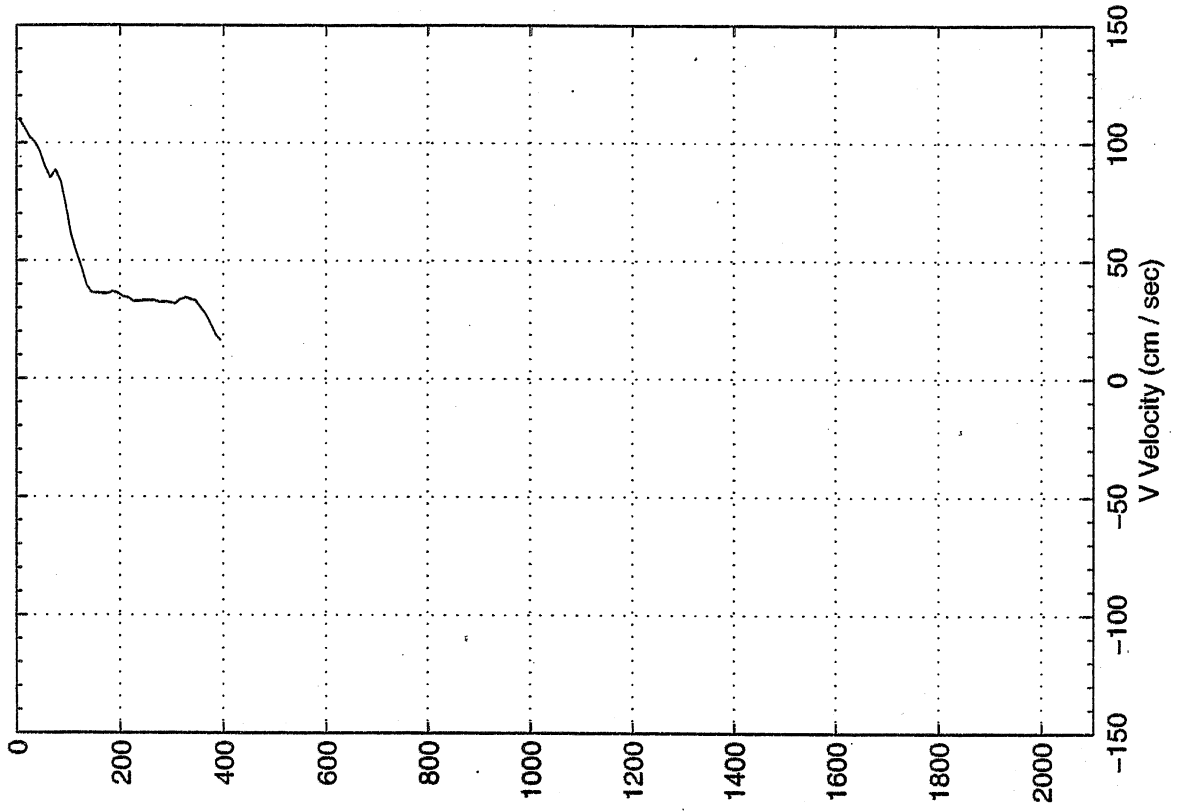
02-Dec-1998 18:17 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 39 (98039)  
Latitude 5.388 N Longitude 50.075 W  
02-Dec-1998 21:30 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 40 (98040)  
Latitude 5.282 N Longitude 50.080 W  
02-Dec-1998 23:47 Z



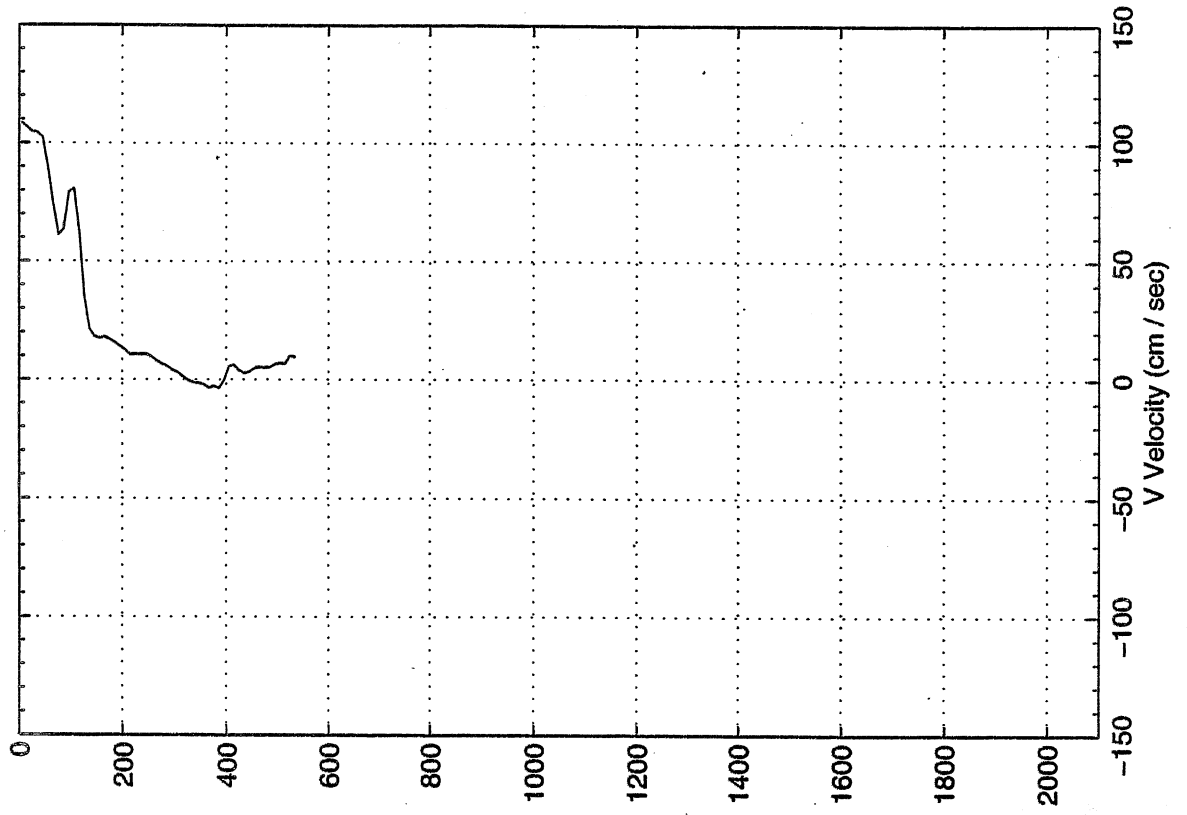
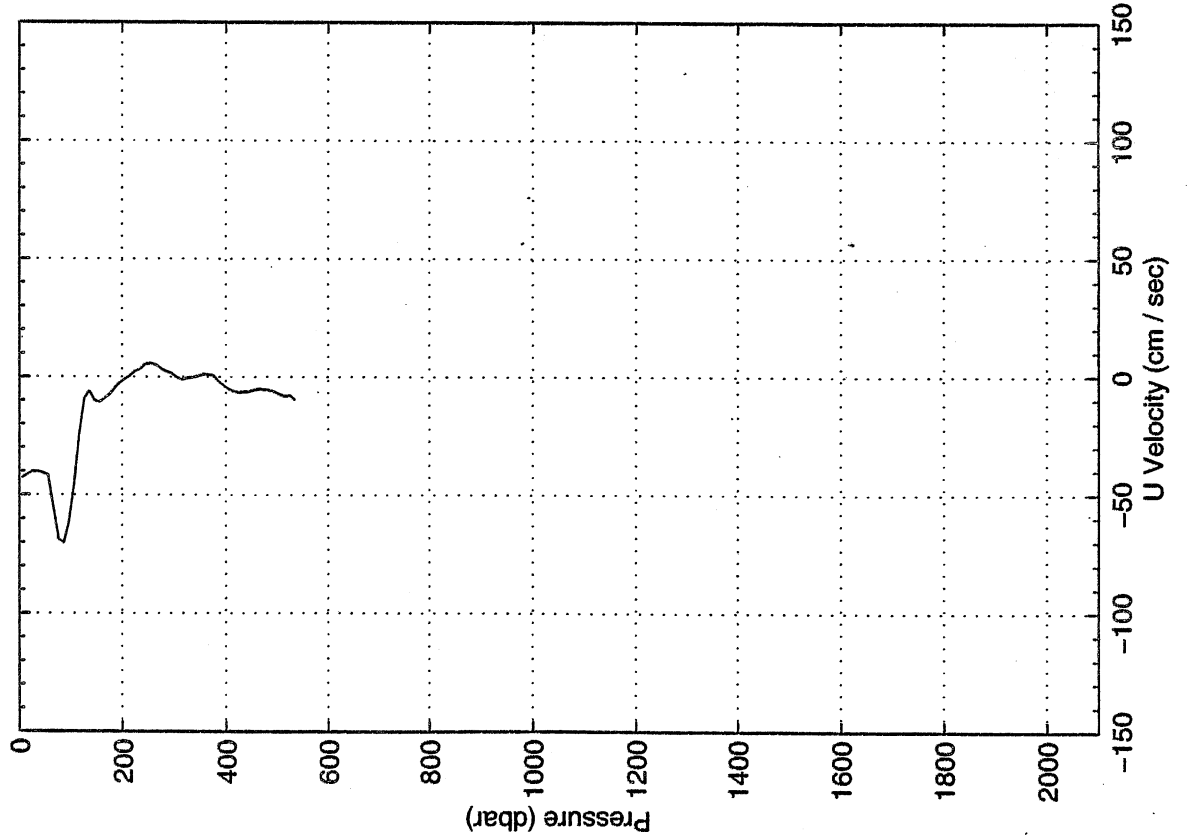


NBC-1 R/V SEWARD JOHNSON

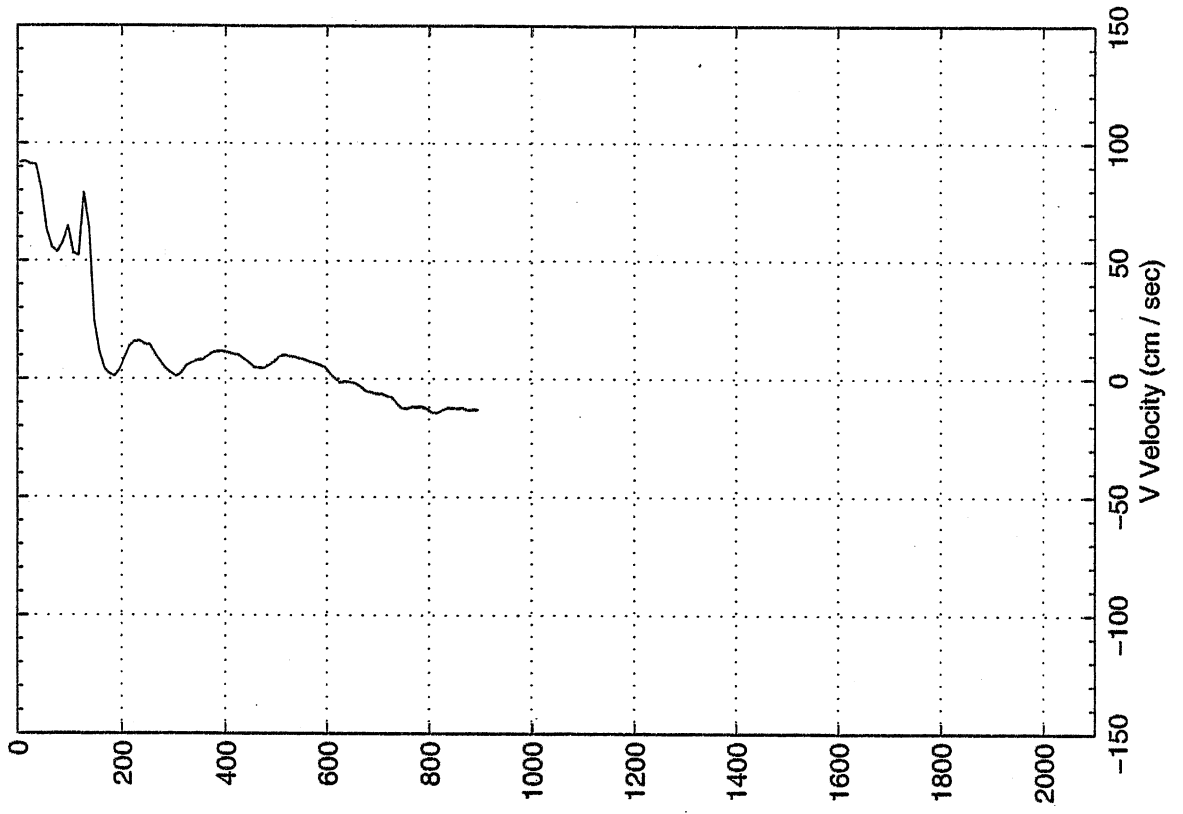
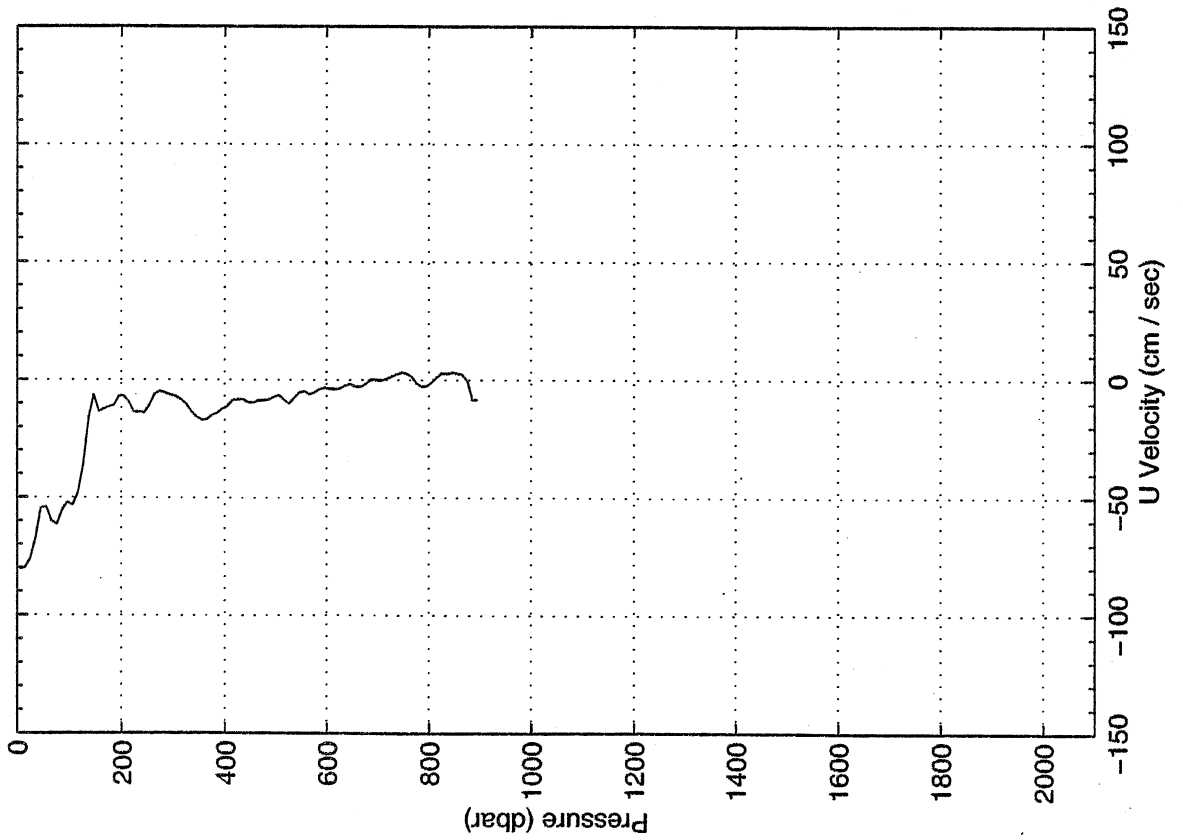
LADCP Station 41 (98041)

Latitude 3.412 N Longitude 48.112 W

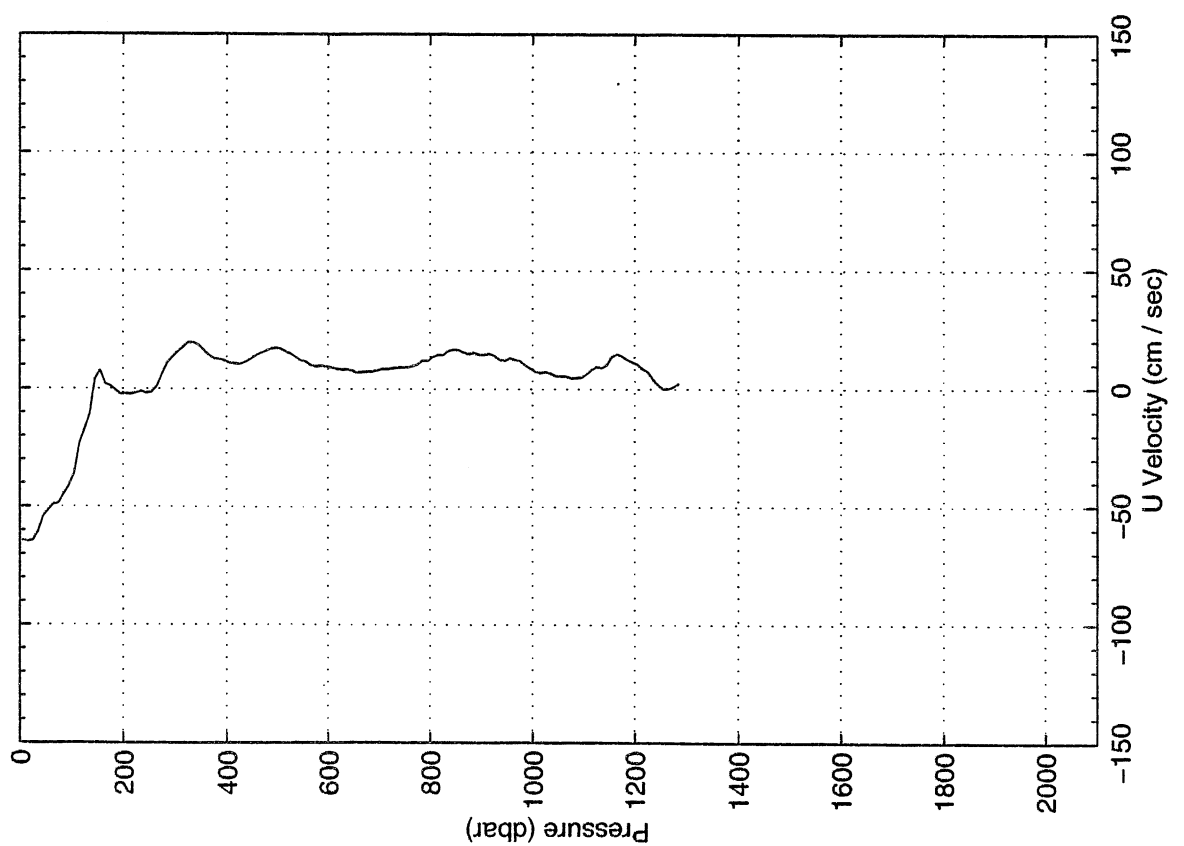
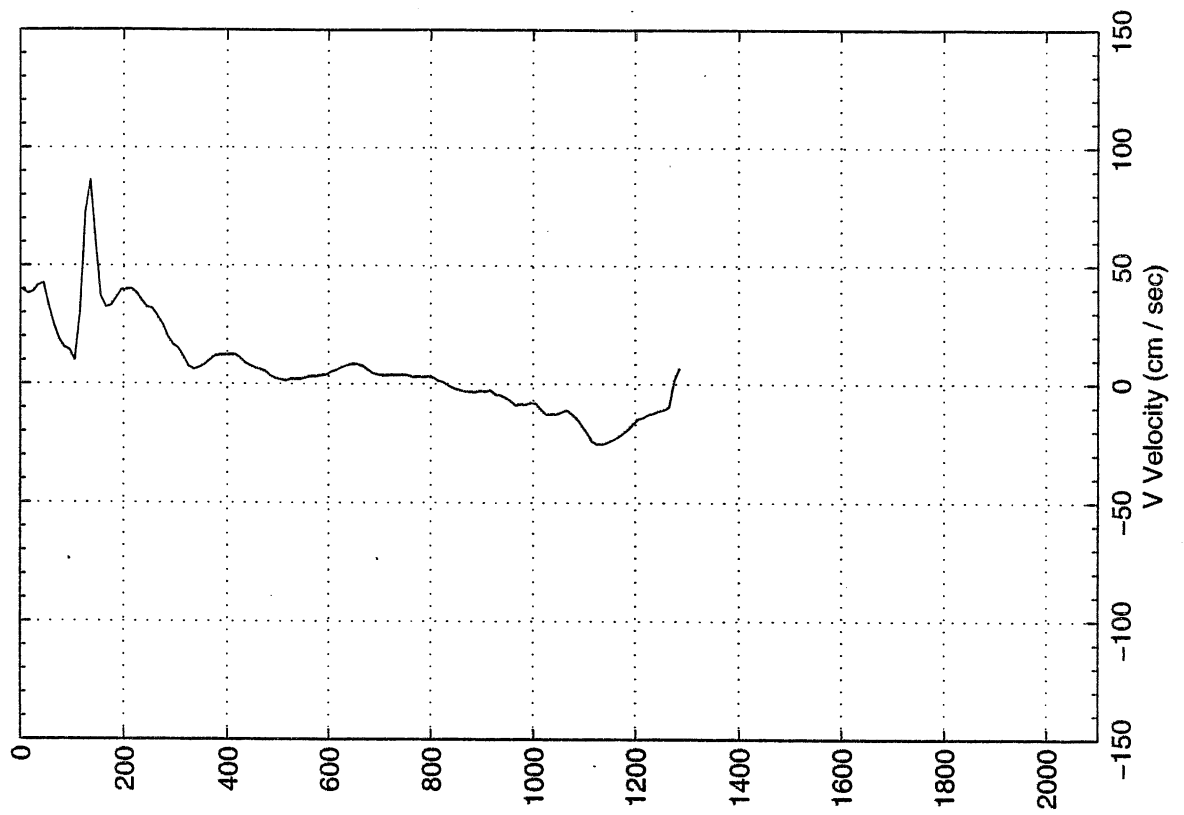
04-Dec-1998 01:18 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 42 (98042)  
Latitude 3.572 N Longitude 48.089 W  
04-Dec-1998 03:34 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 43 (98043)  
Latitude 3.792 N Longitude 48.034 W  
04-Dec-1998 08:14 Z

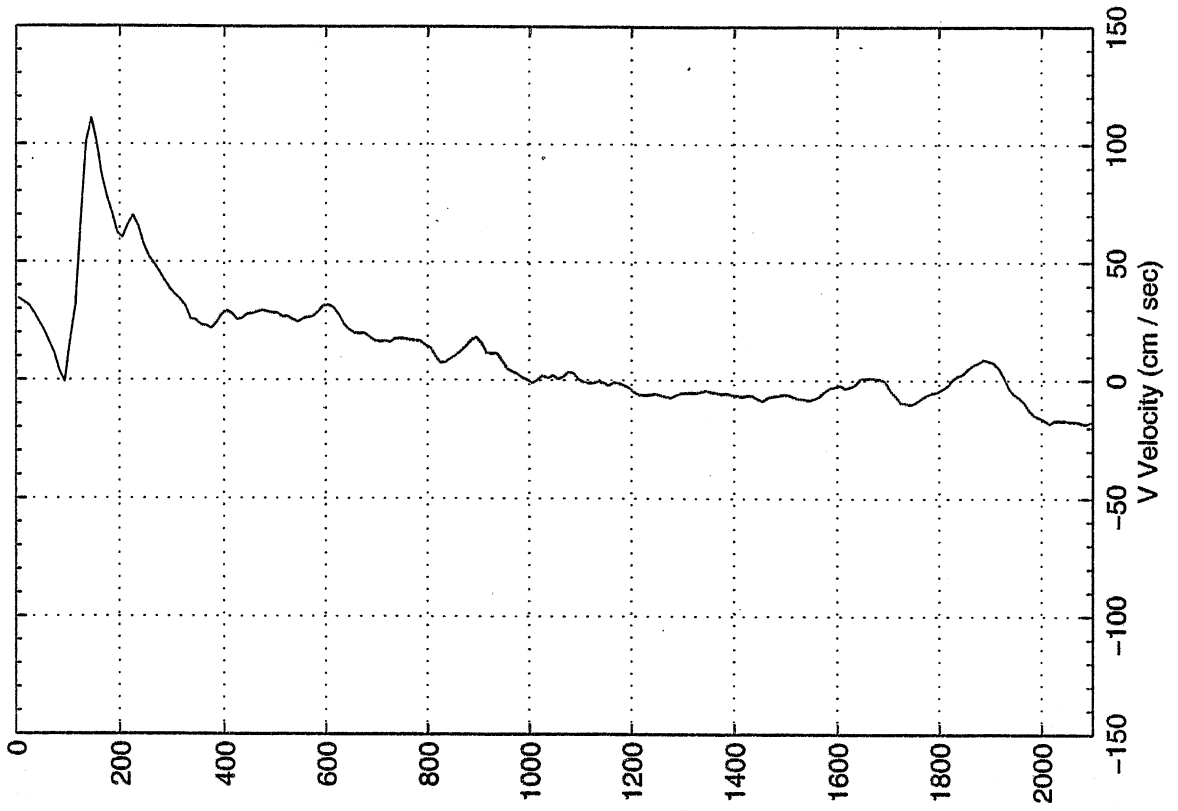
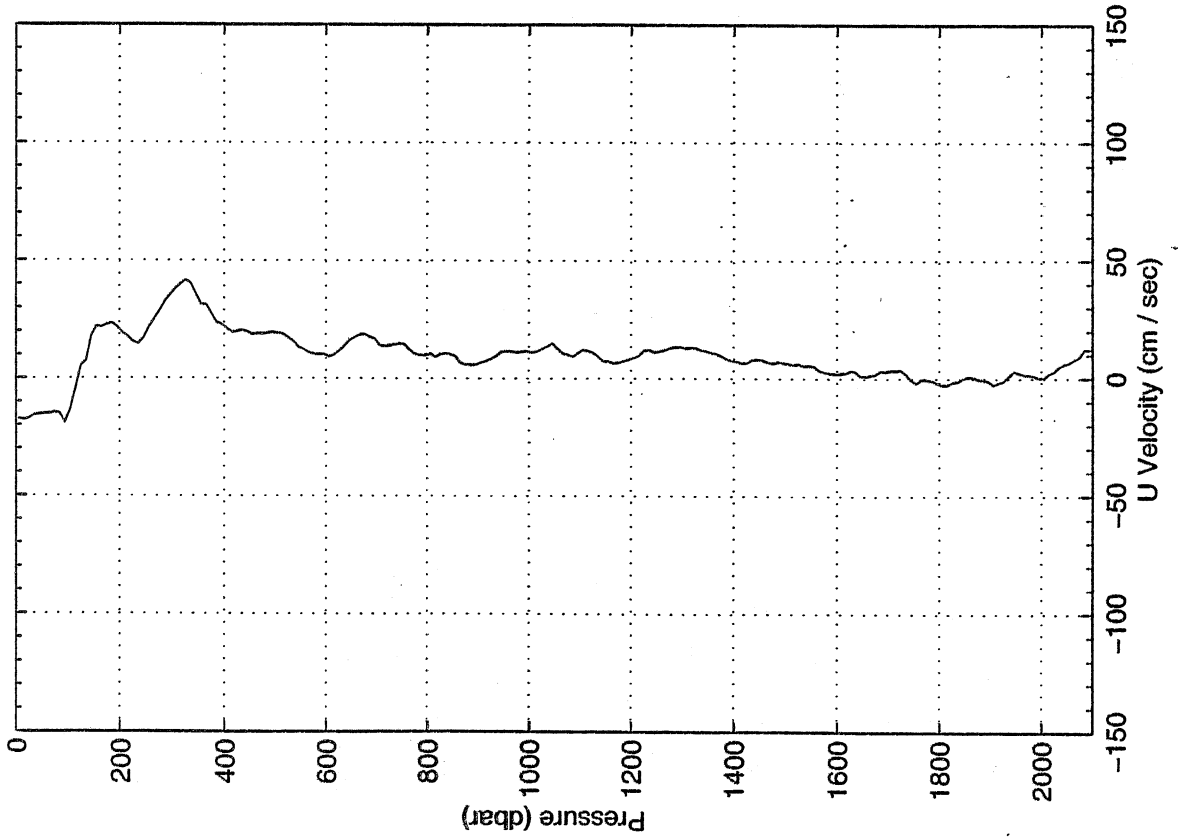


NBC-1 R/V SEWARD JOHNSON

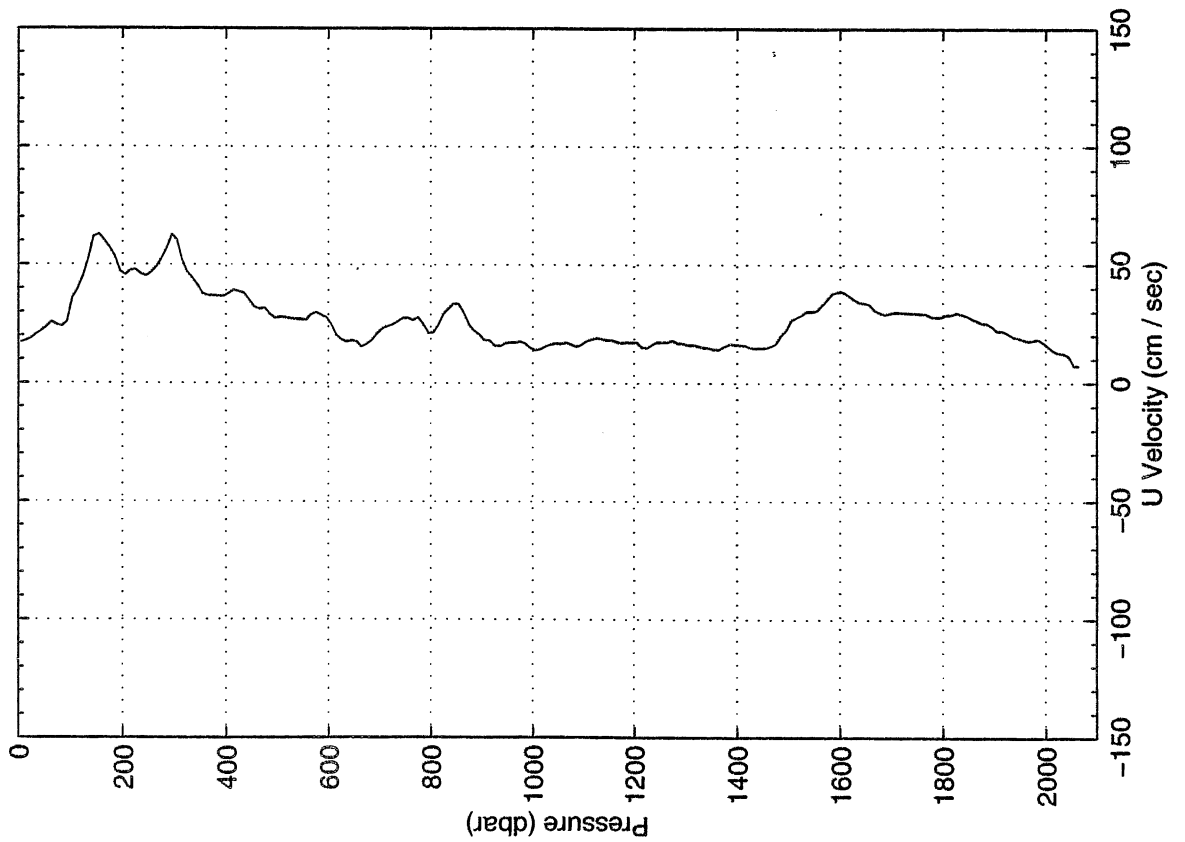
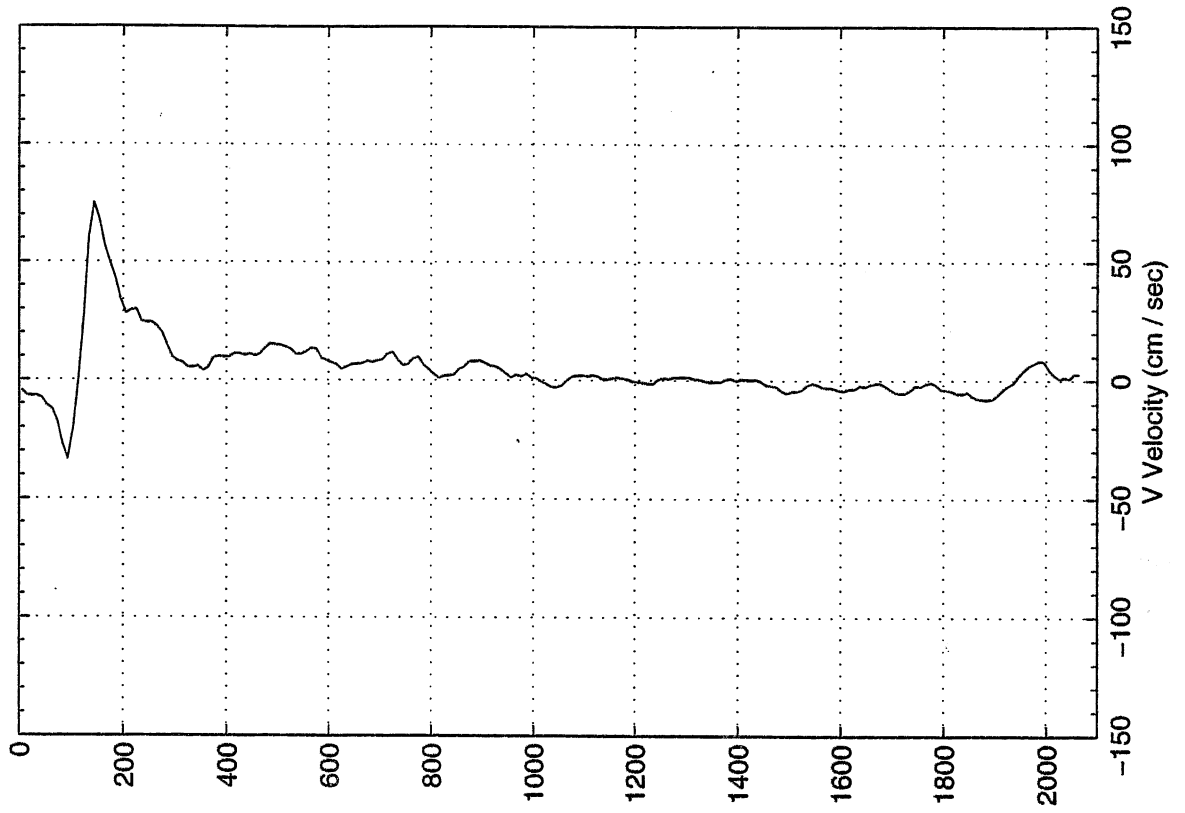
LADCP Station 44 (98044)

Latitude 4.026 N Longitude 47.108 W

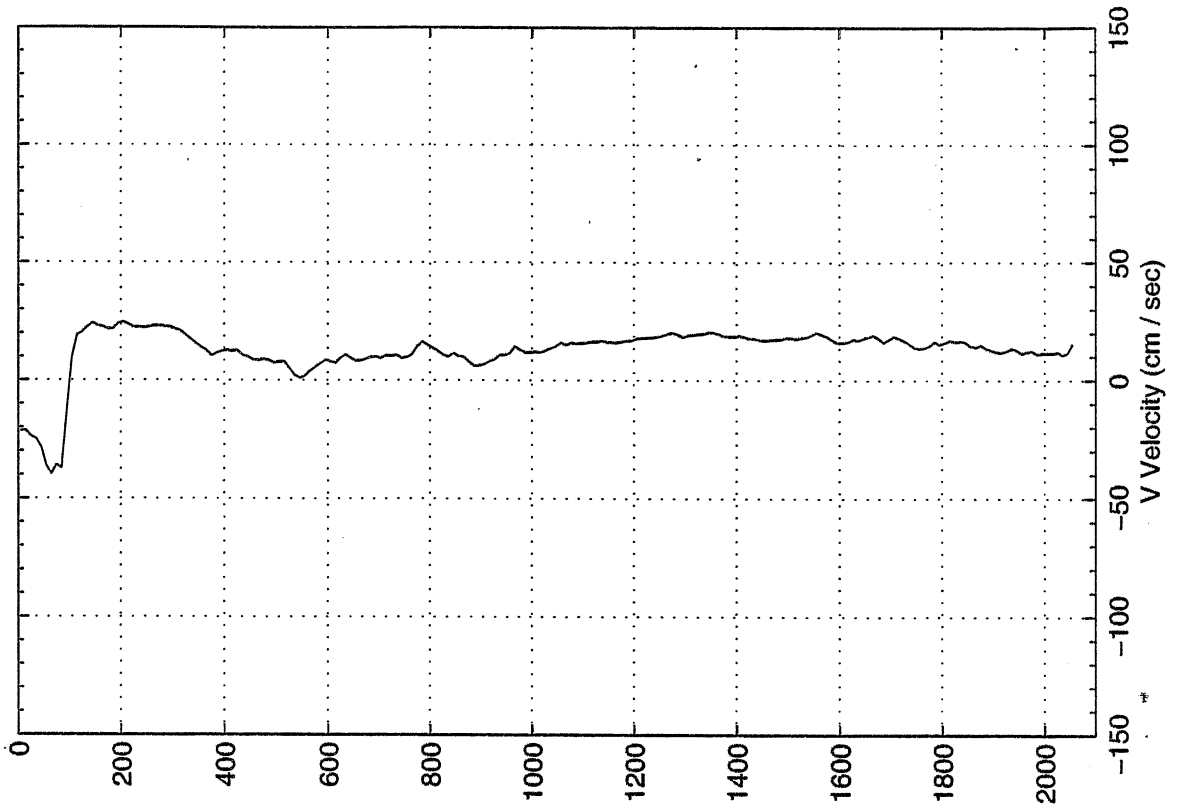
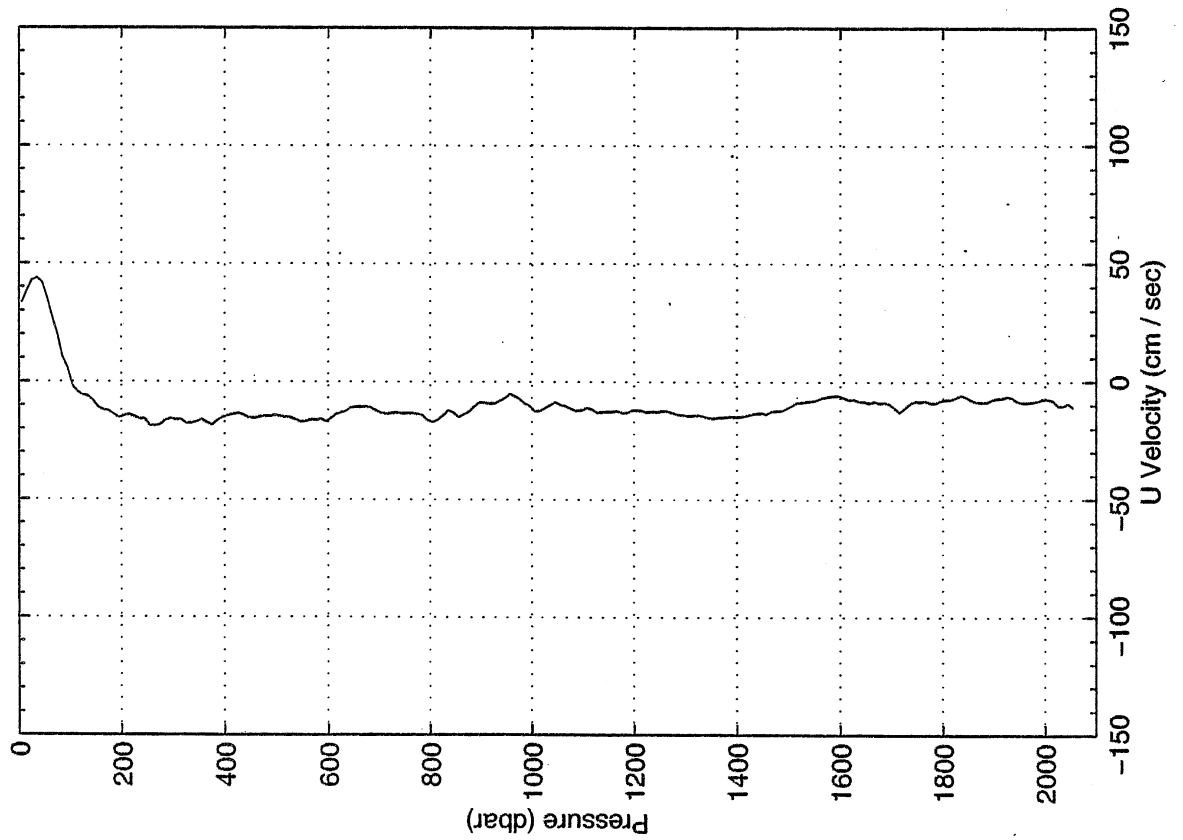
04-Dec-1998 11:28 Z



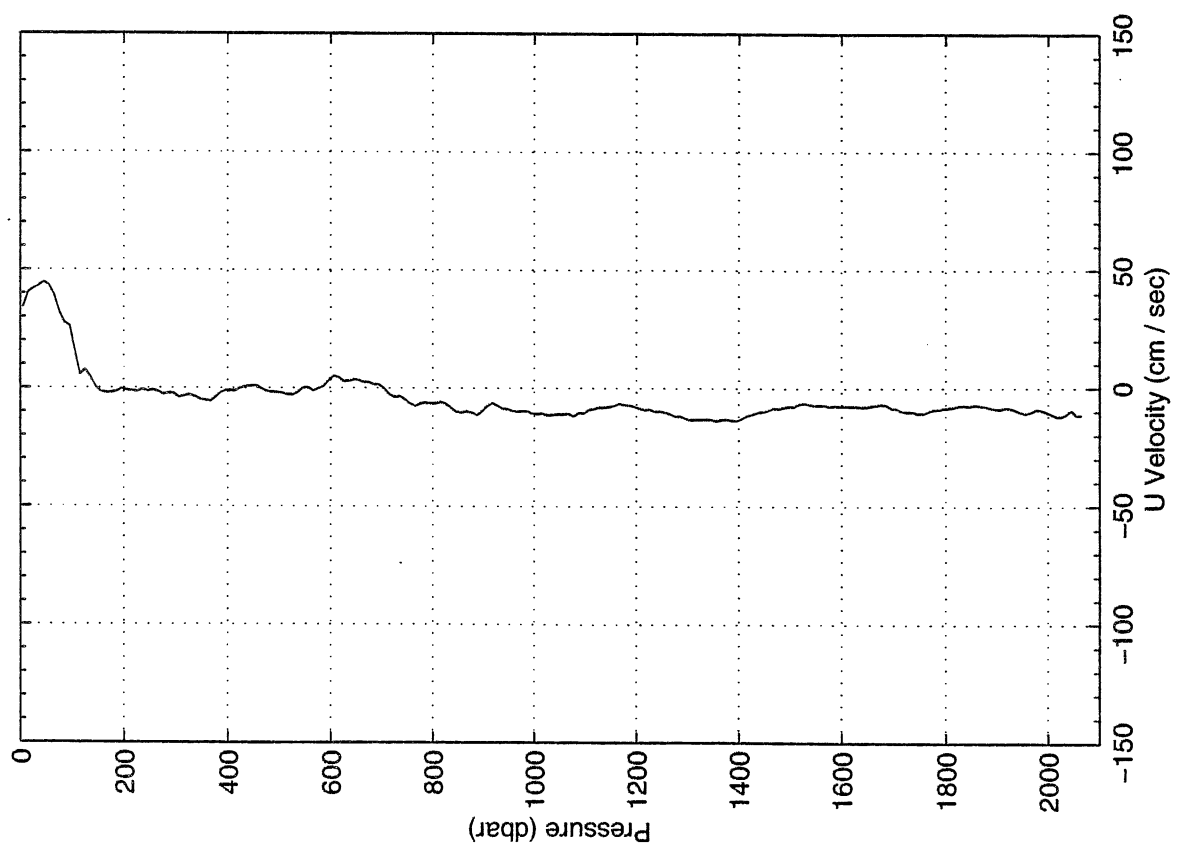
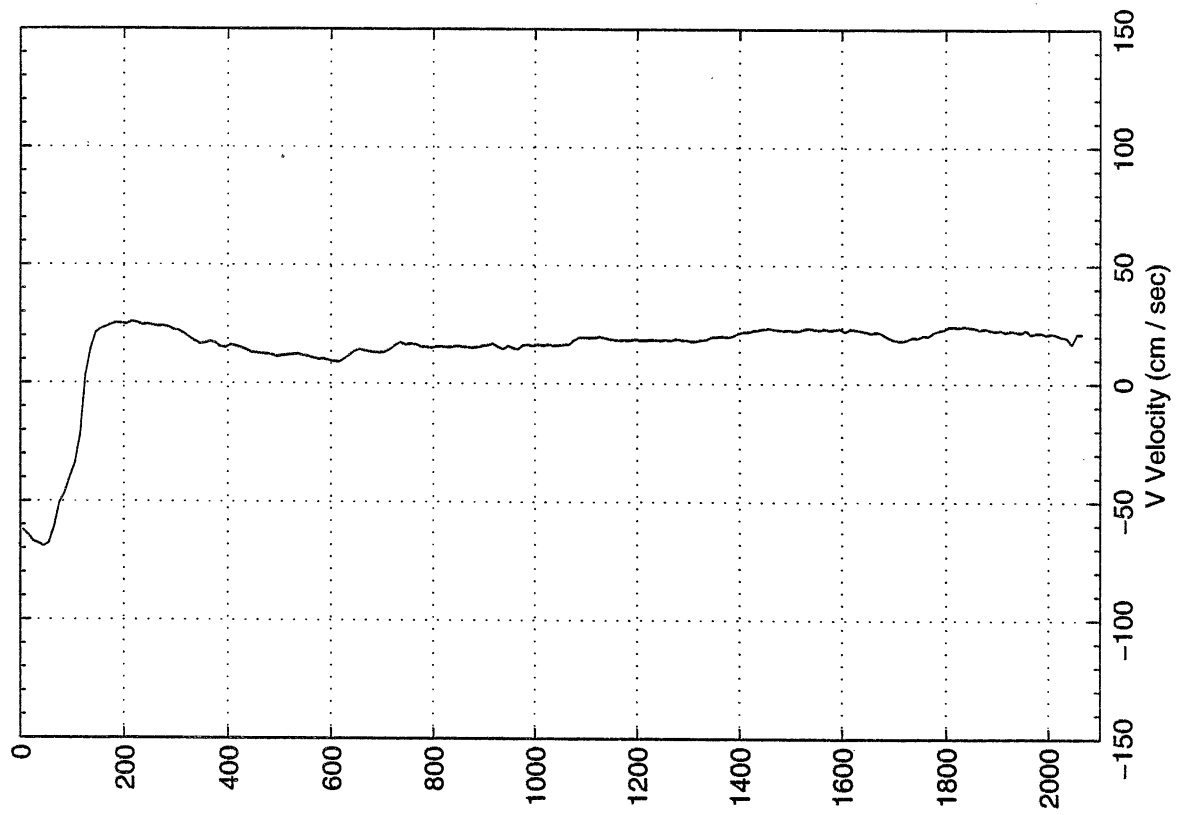
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LADCP Station 45 (98045)  
Latitude 4.279 N Longitude 47.147 W  
04-Dec-1998 14:59 Z



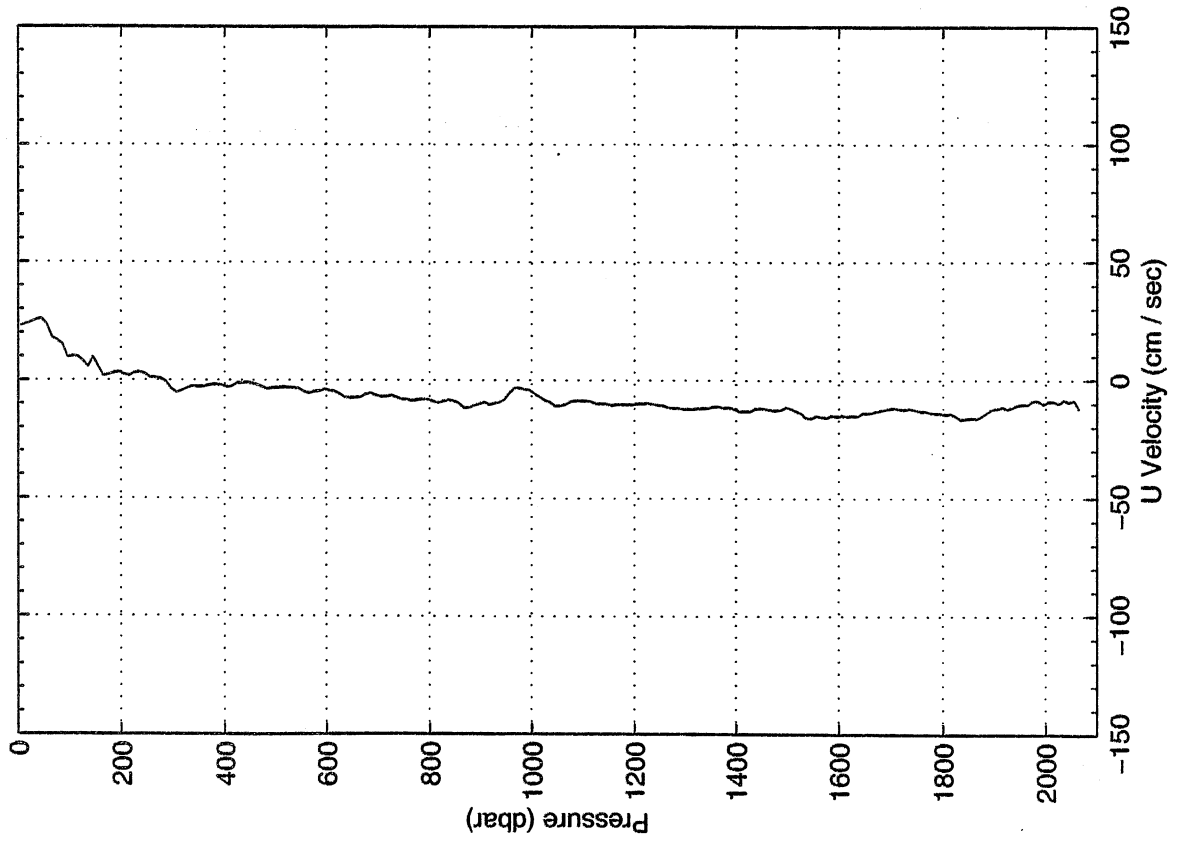
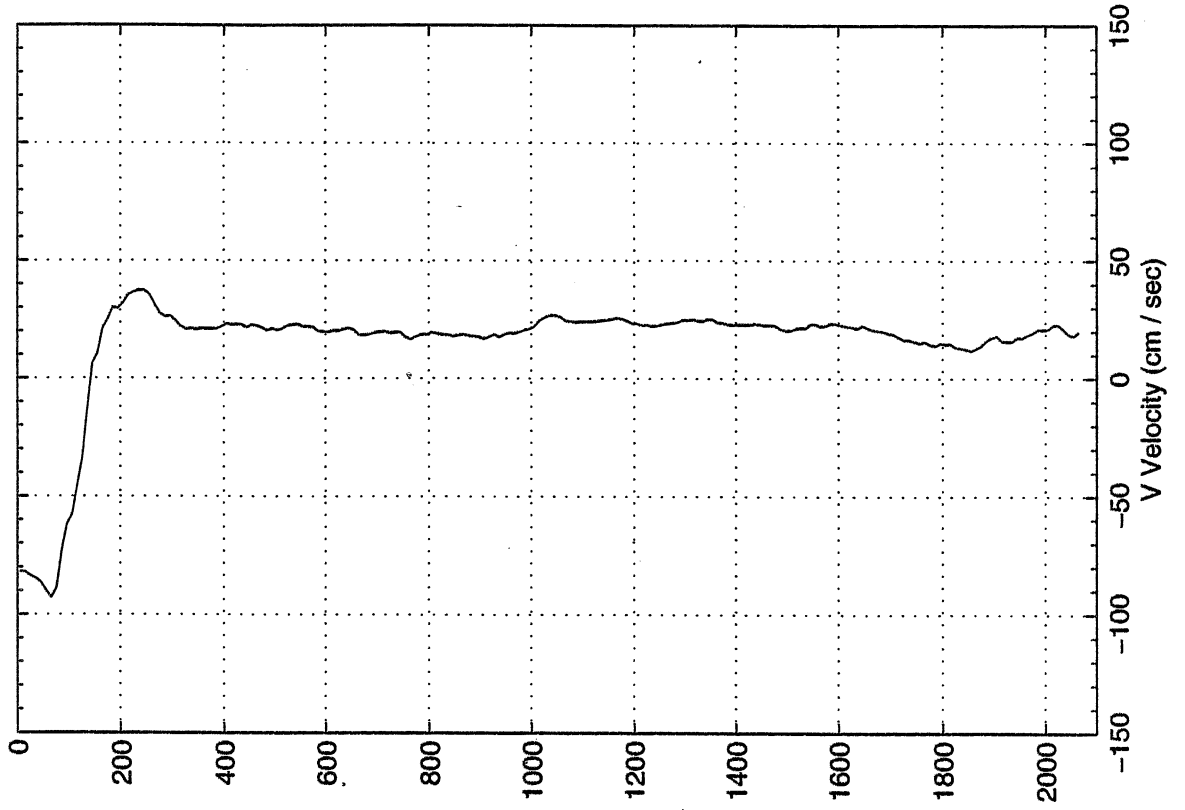
NBC-1 R/V SEWARD JOHNSON  
LADCP Station 46 (98046)  
Latitude 5.996 N Longitude 47.087 W  
05-Dec-1998 03:01 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 47 (98047)  
Latitude 6.036 N Longitude 47.163 W  
05-Dec-1998 07:20 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 48 (98048)  
Latitude 6.091 N Longitude 48.008 W  
05-Dec-1998 11:57 Z



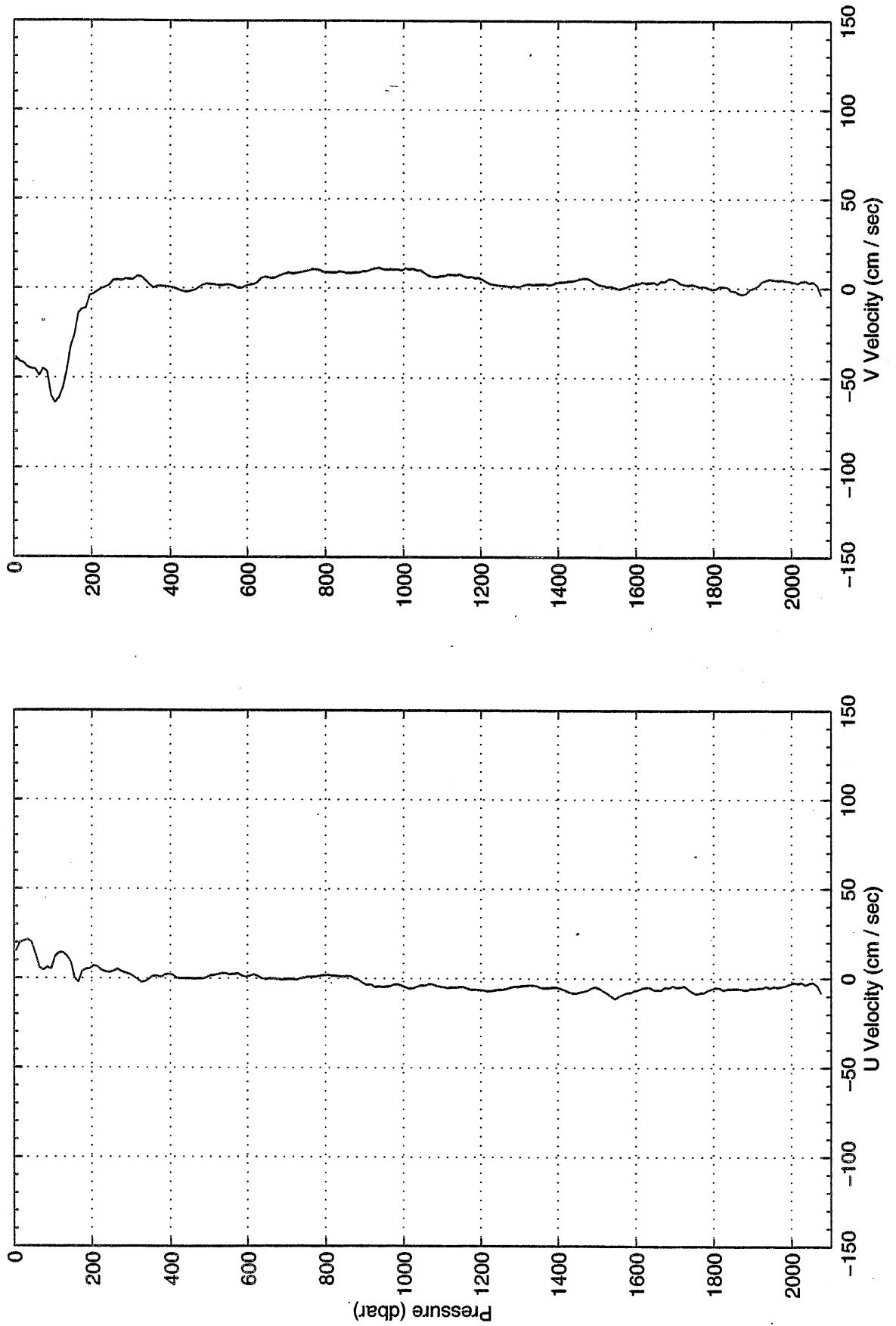


NBC-1 R/V SEWARD JOHNSON

LADCP Station 49 (98049)

Latitude 6.161 N Longitude 49.010 W

05-Dec-1998 16:17 Z

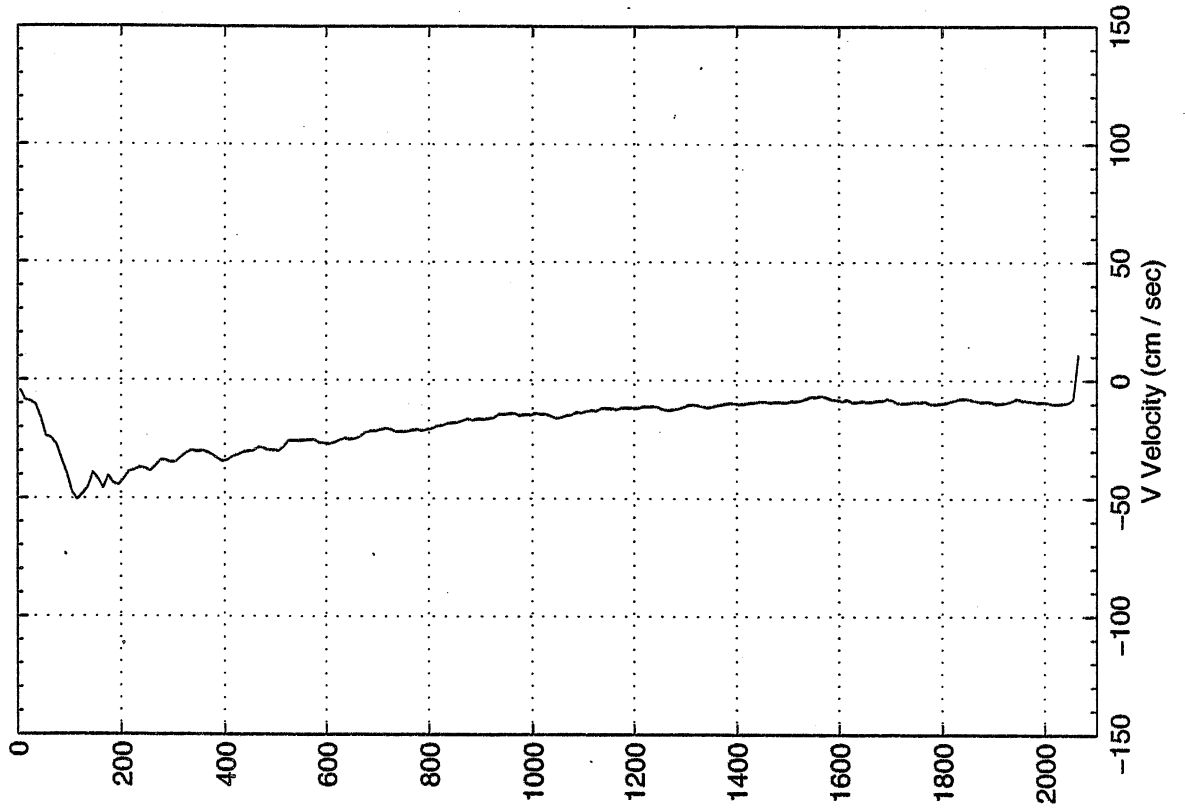
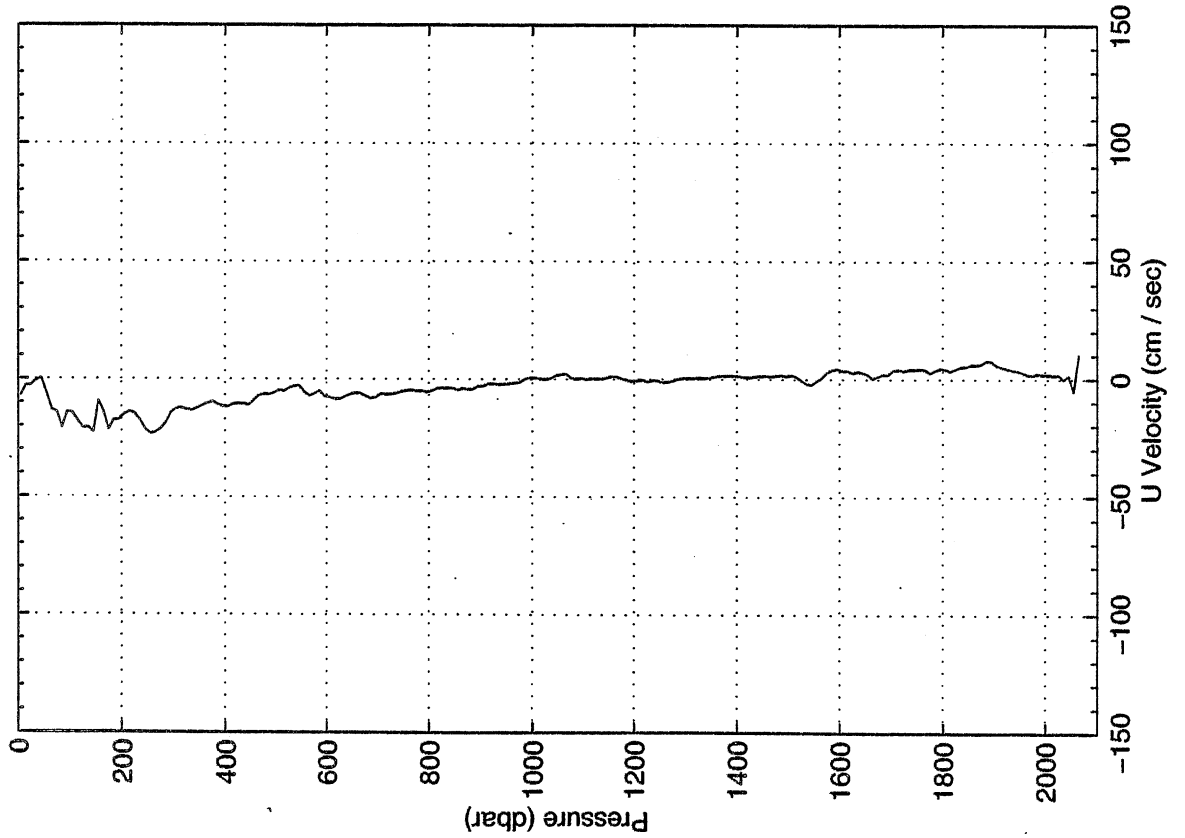


NBC-1 R/V SEWARD JOHNSON

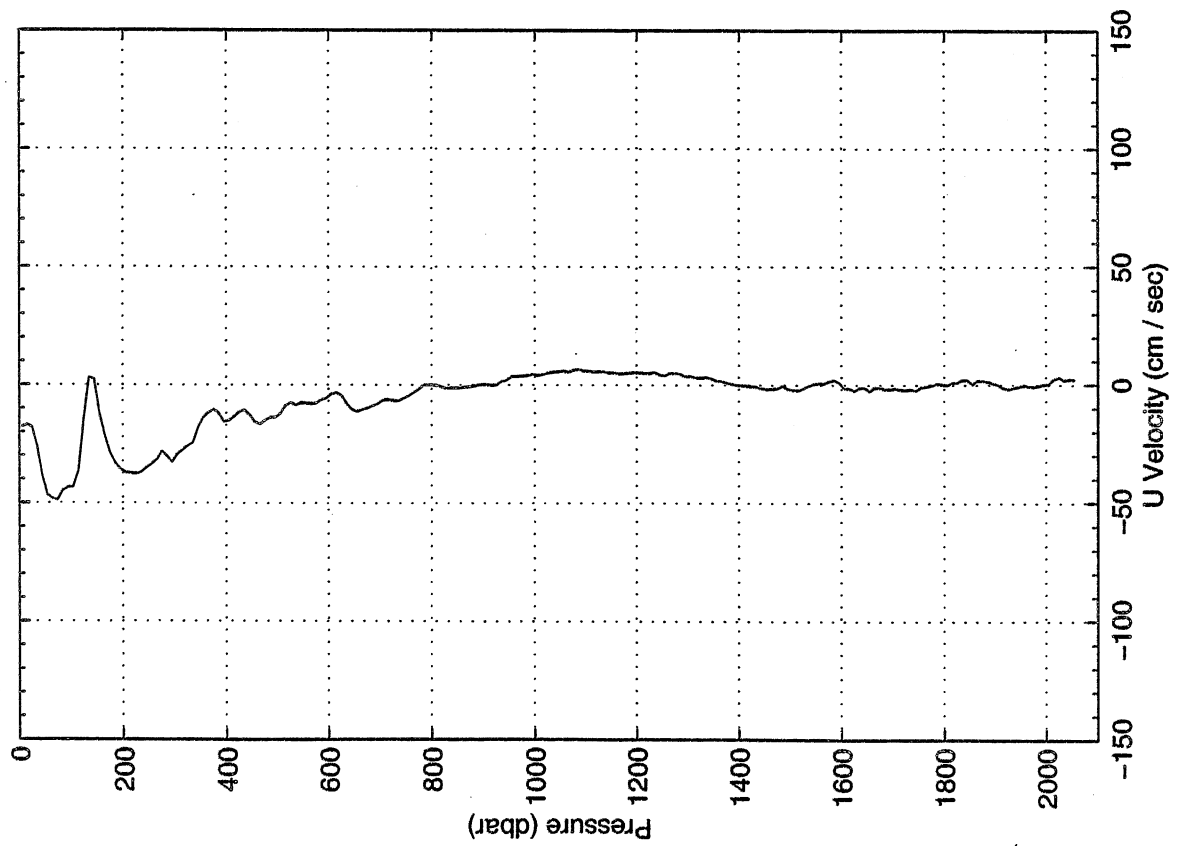
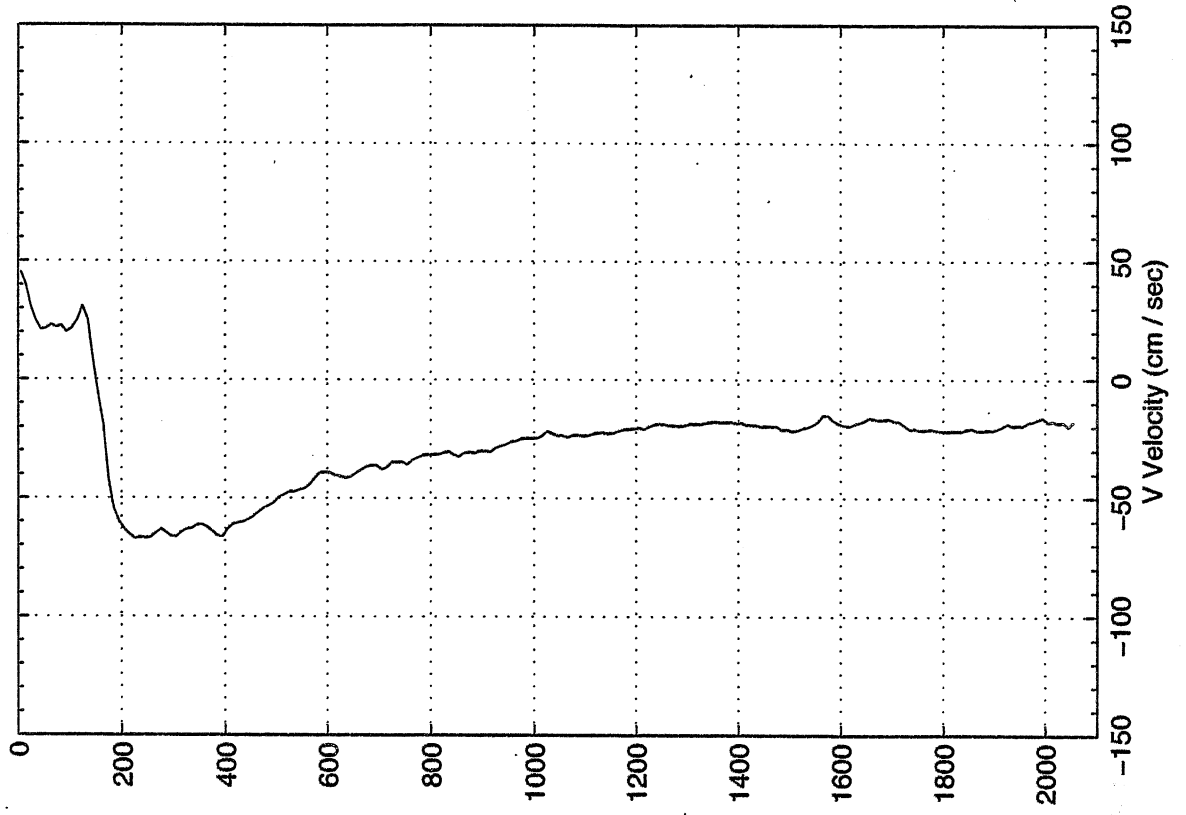
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Latitude 6.231 N Longitude 49.004 W

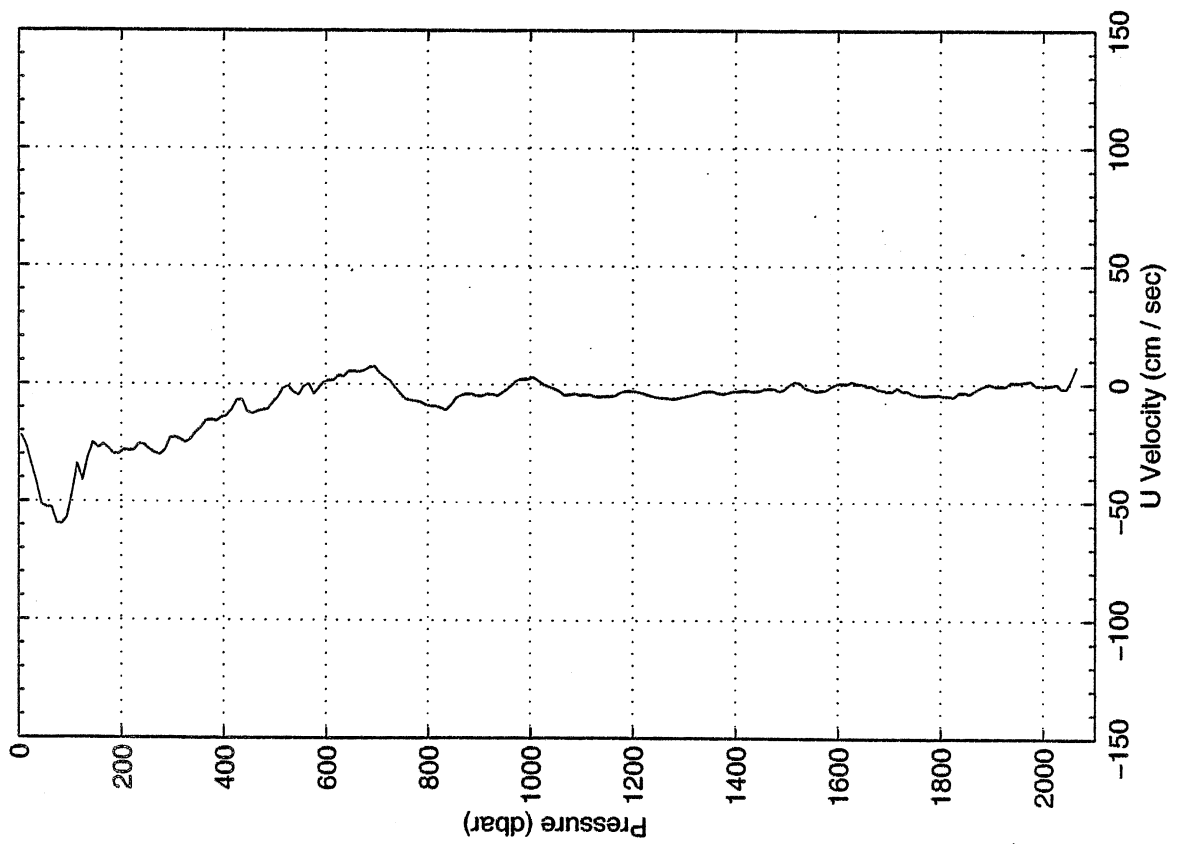
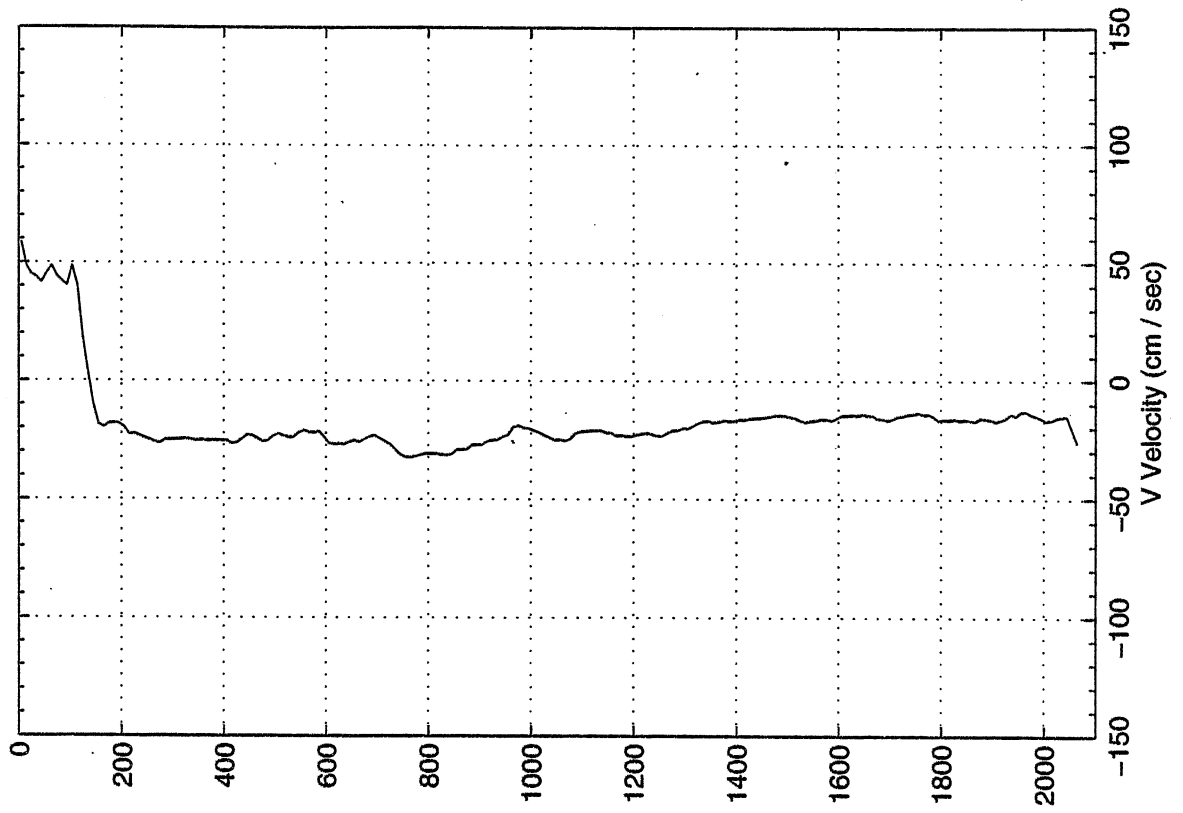
05-Dec-1998 21:02 Z



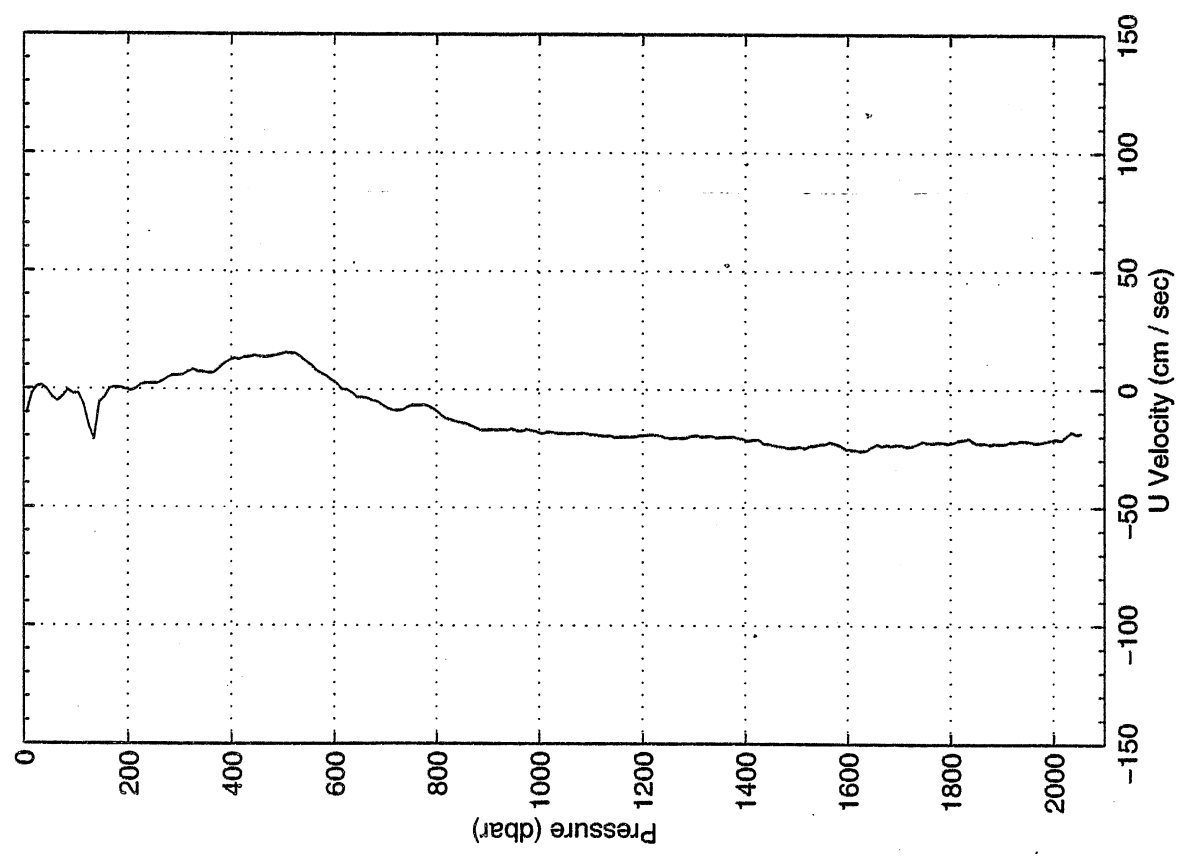
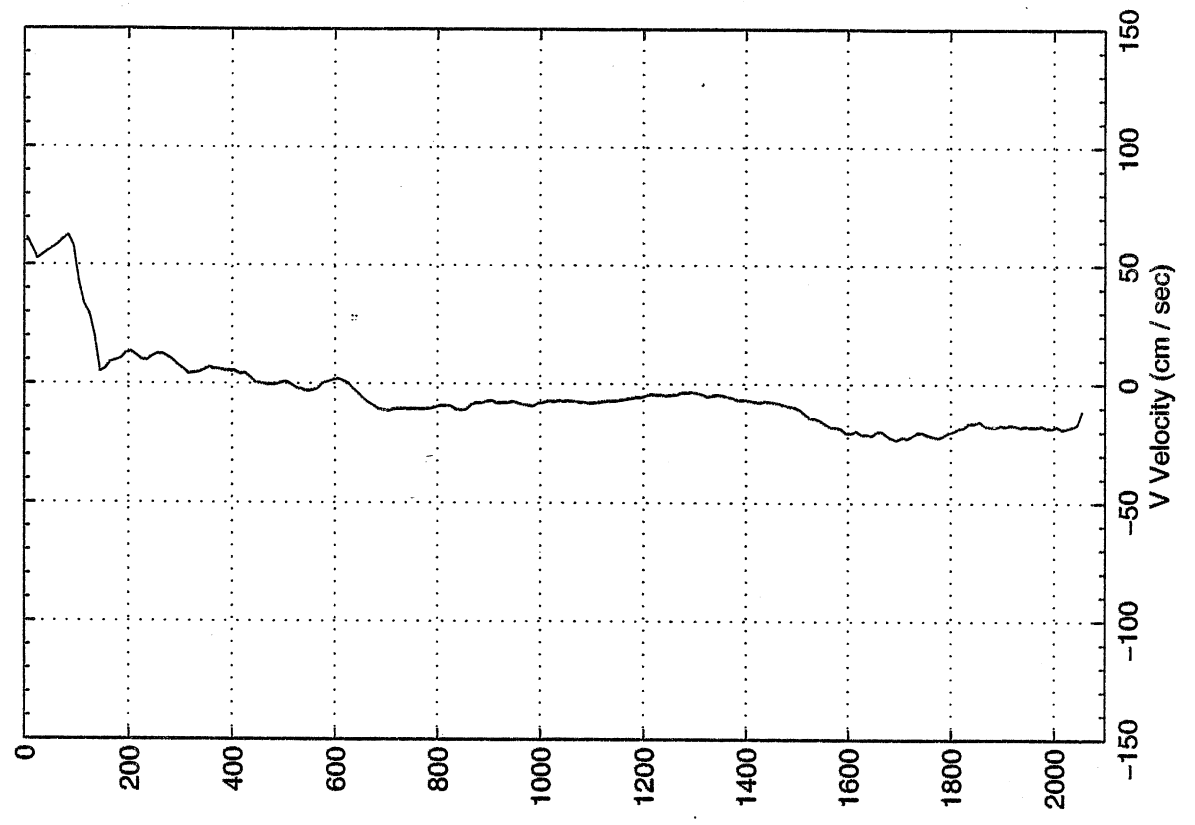
NBC-1 R/V SEWARD JOHNSON  
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Latitude 6.284 N Longitude 50.009 W  
06-Dec-1998 01:04 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 52 (98052)  
Latitude 6.400 N Longitude 50.010 W  
06-Dec-1998 05:21 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 53 (98053)  
Latitude 7.098 N Longitude 50.109 W  
06-Dec-1998 11:46 Z

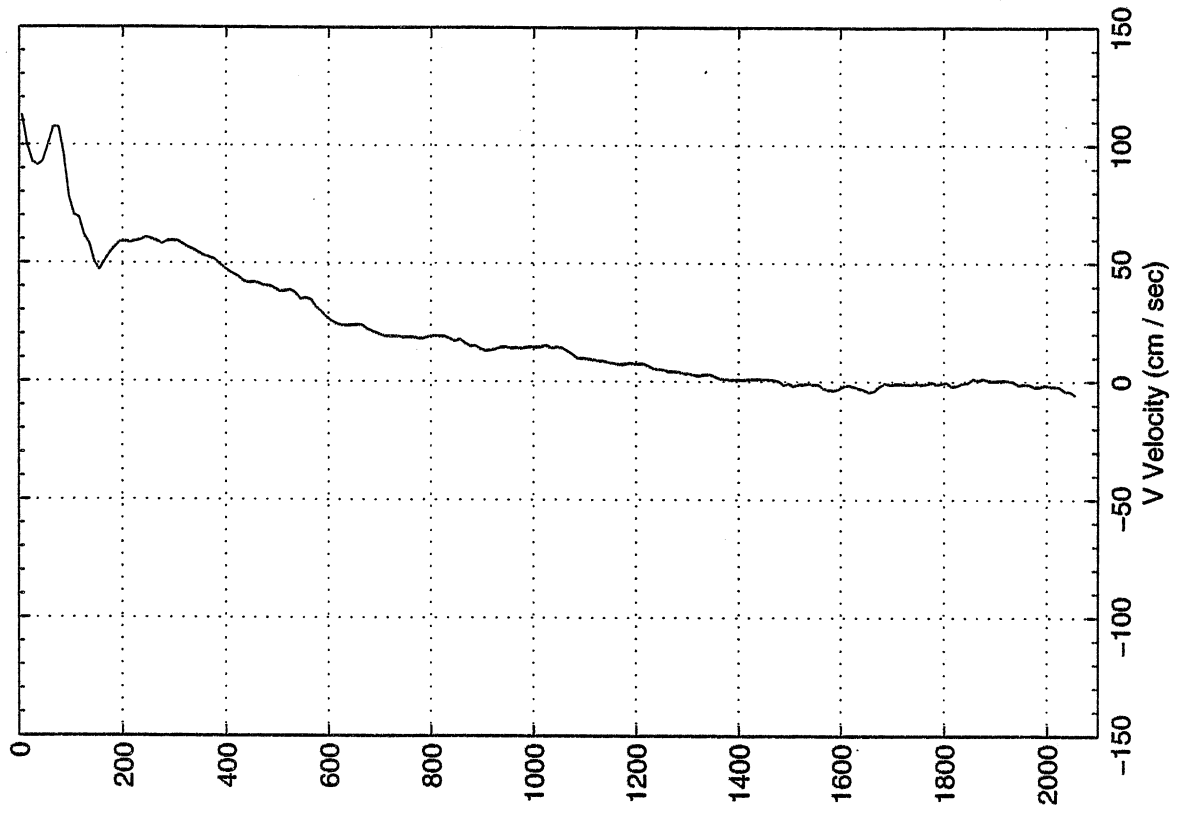
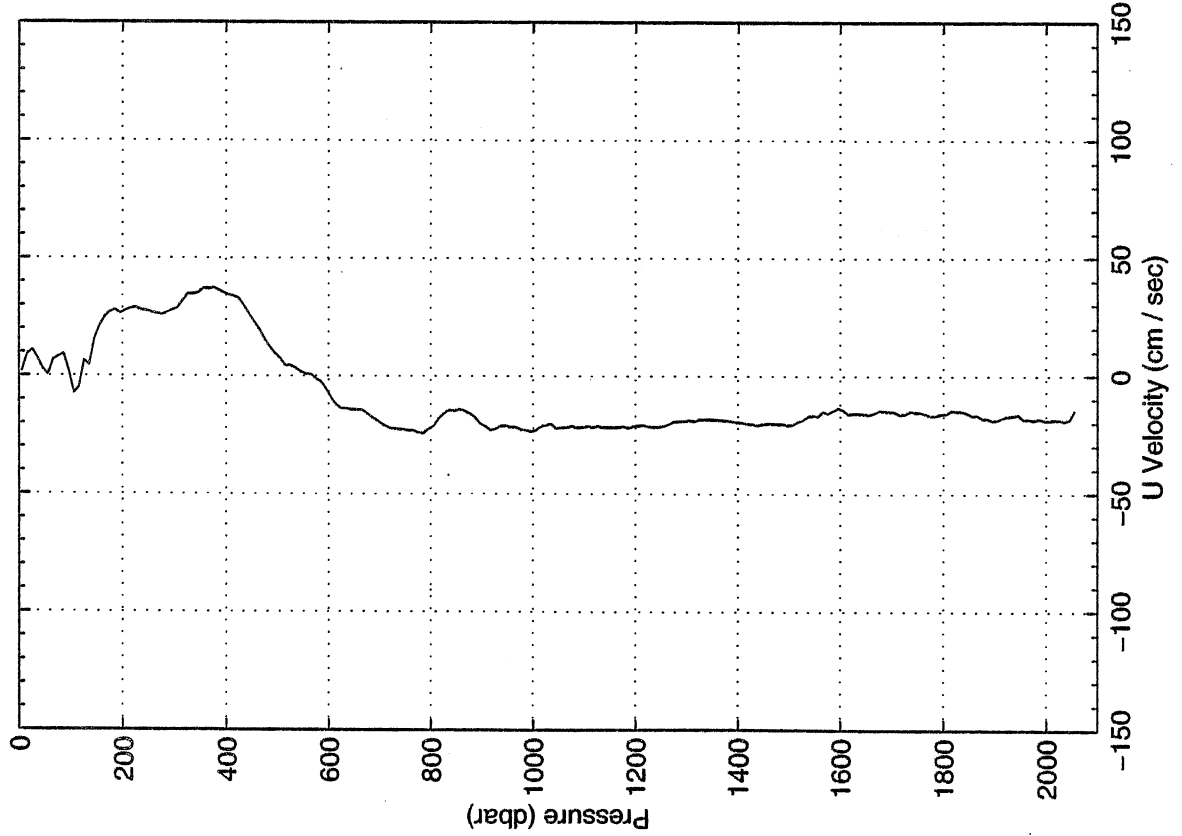


NBC-1 R/V SEWARD JOHNSON

LADCP Station 54 (98054)

Latitude 7.286 N Longitude 51.034 W

06-Dec-1998 15:40 Z

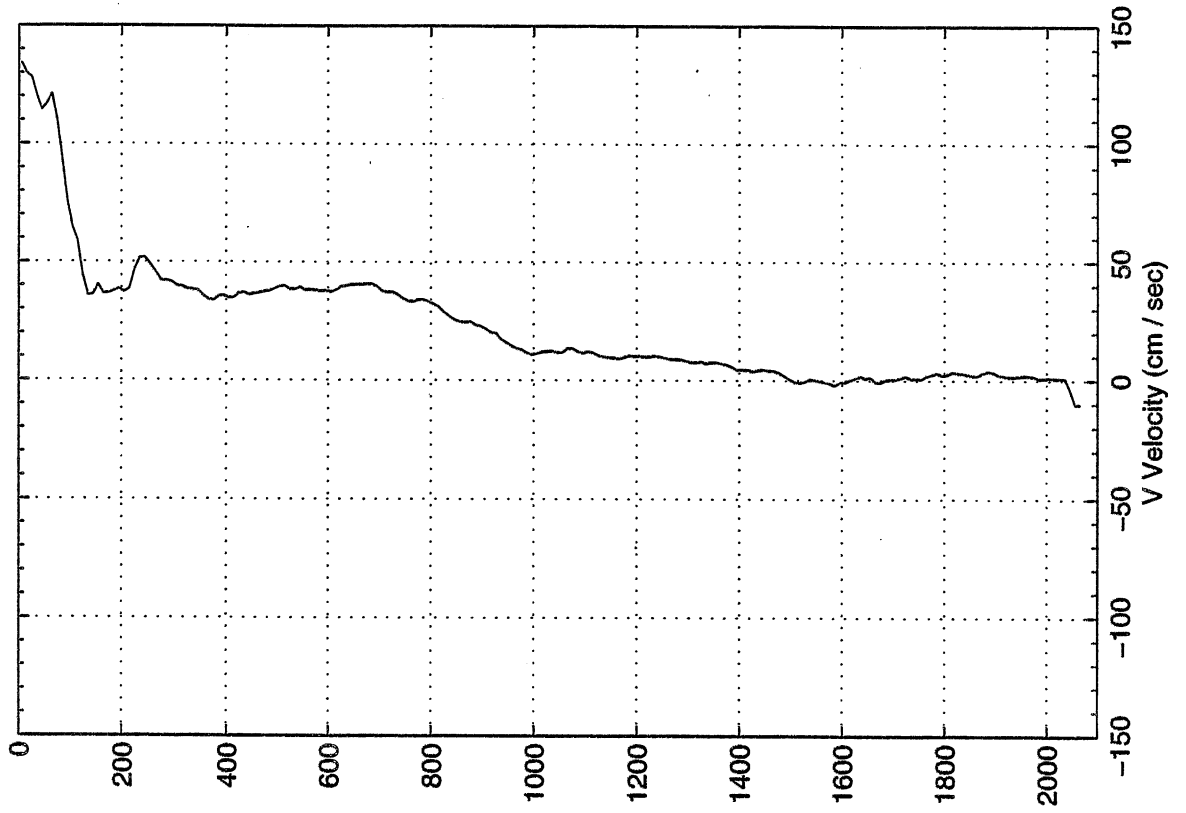
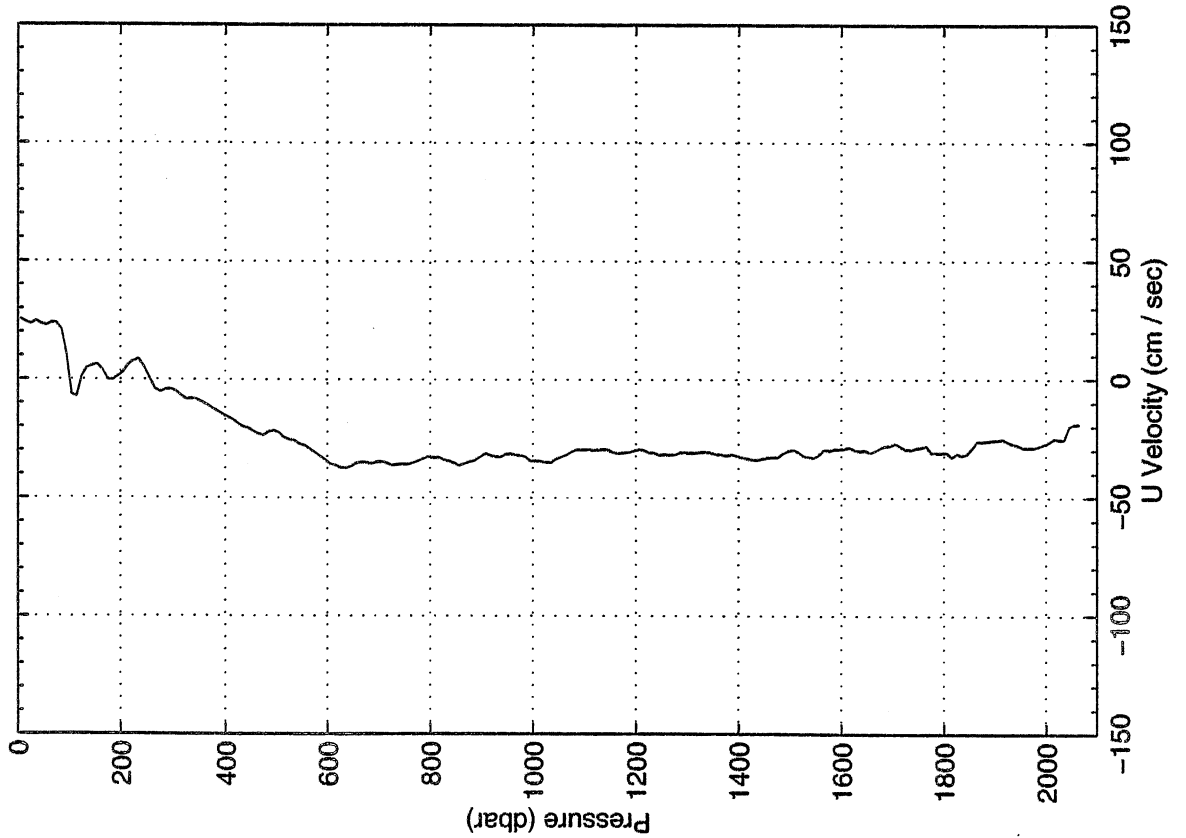


**NBC-1 RV SEWARD JOHNSON**

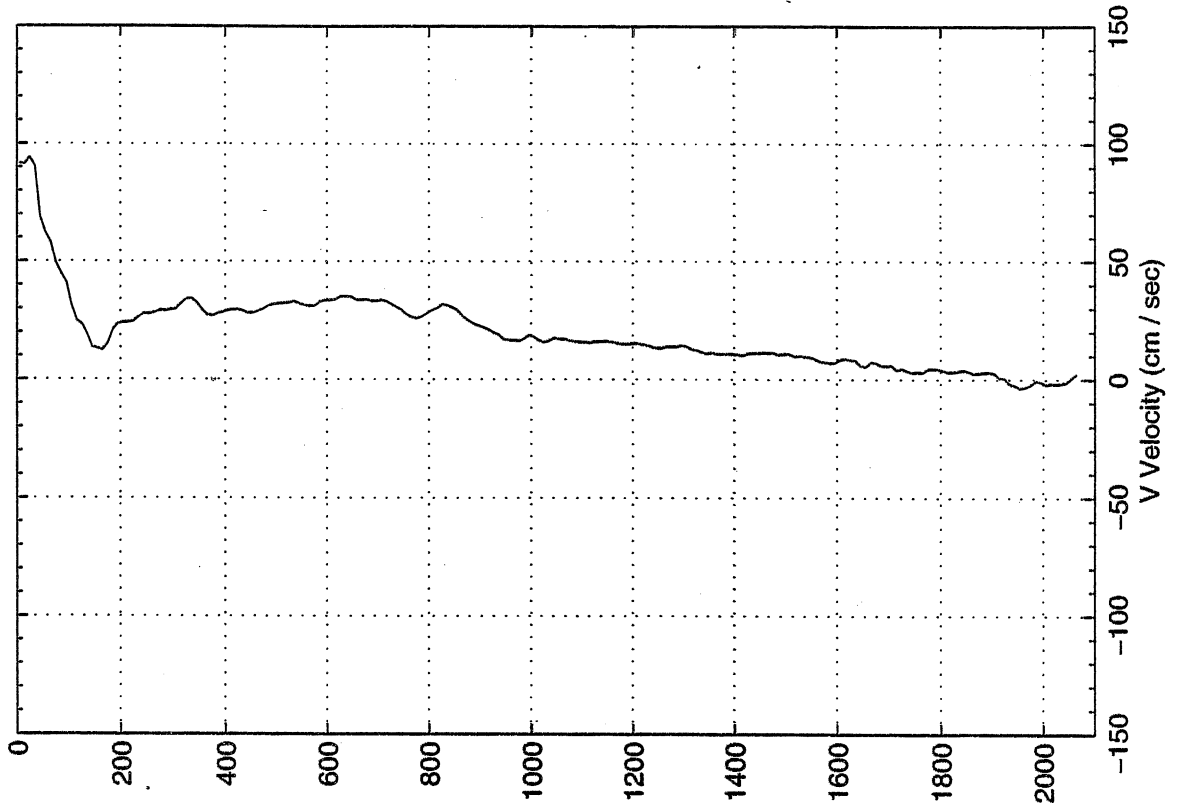
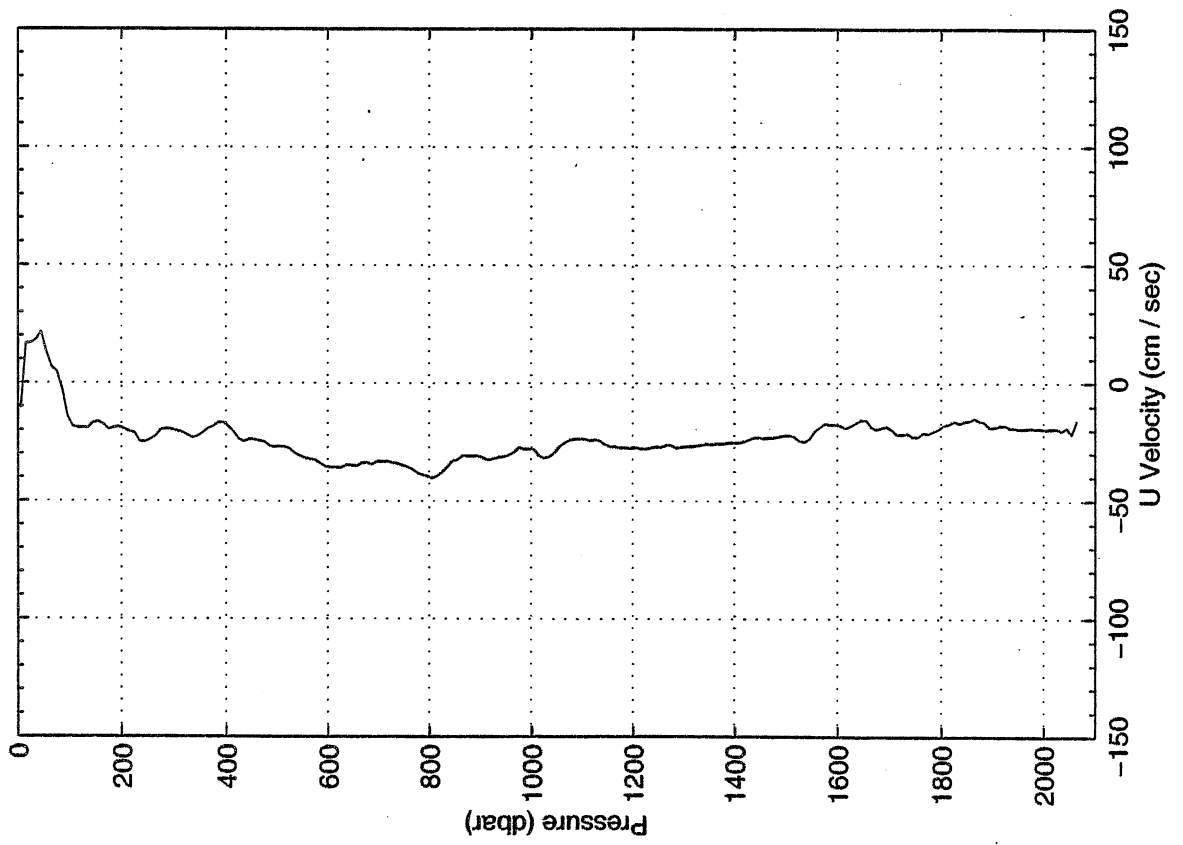
**LADCP Station 55 (98055)**

**Latitude 7.528 N Longitude 51.149 W**

**06-Dec-1998 19:48 Z**

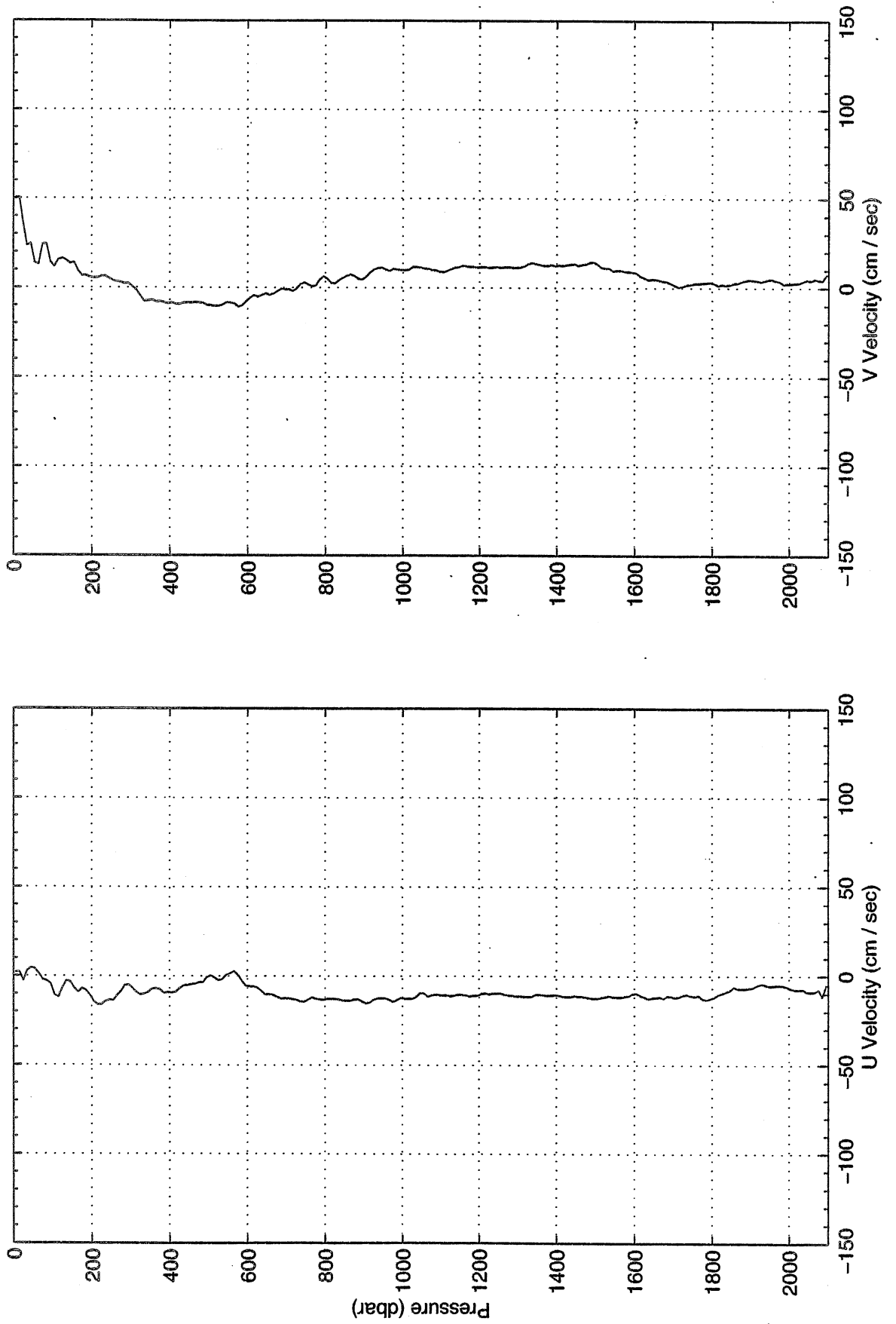


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LADCP Station 56 (98056)  
Latitude 7.770 N Longitude 52.074 W  
06-Dec-1998 23:43 Z

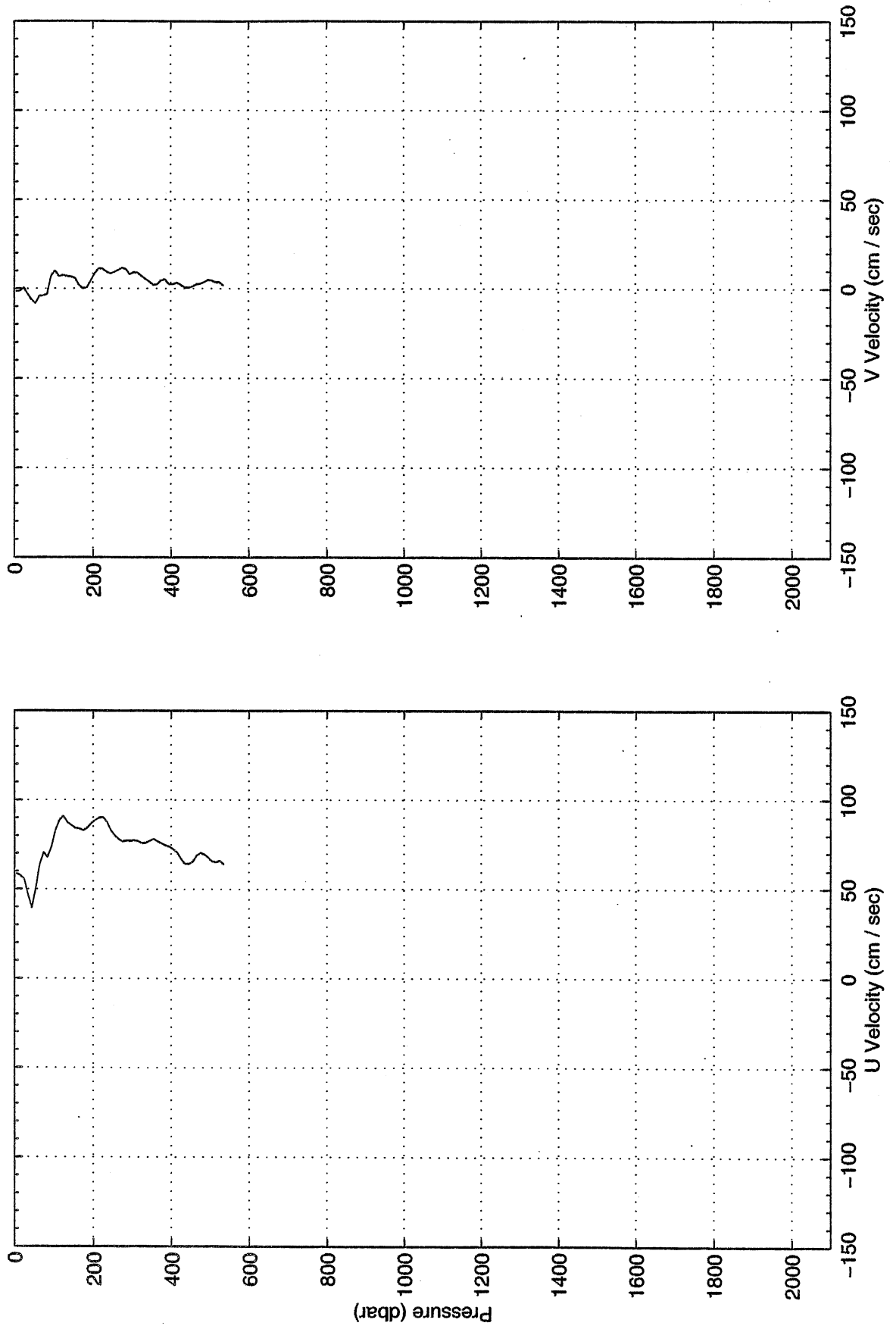




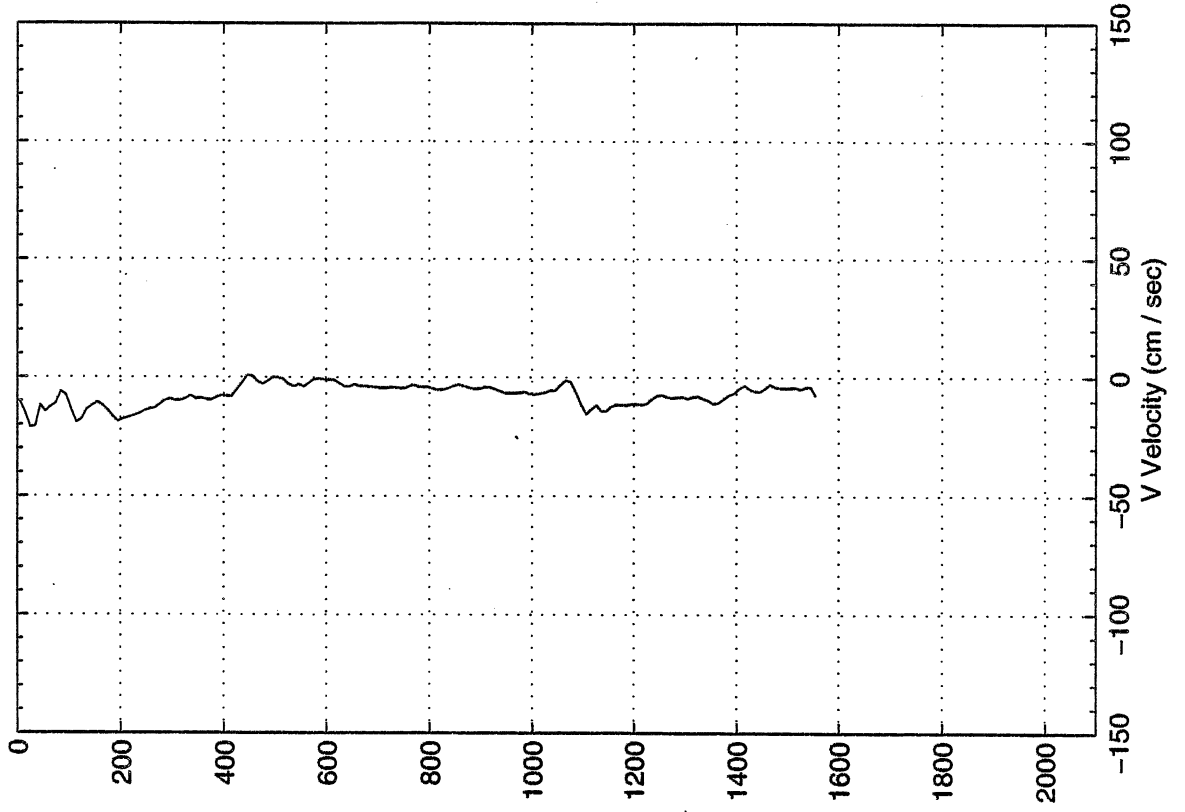
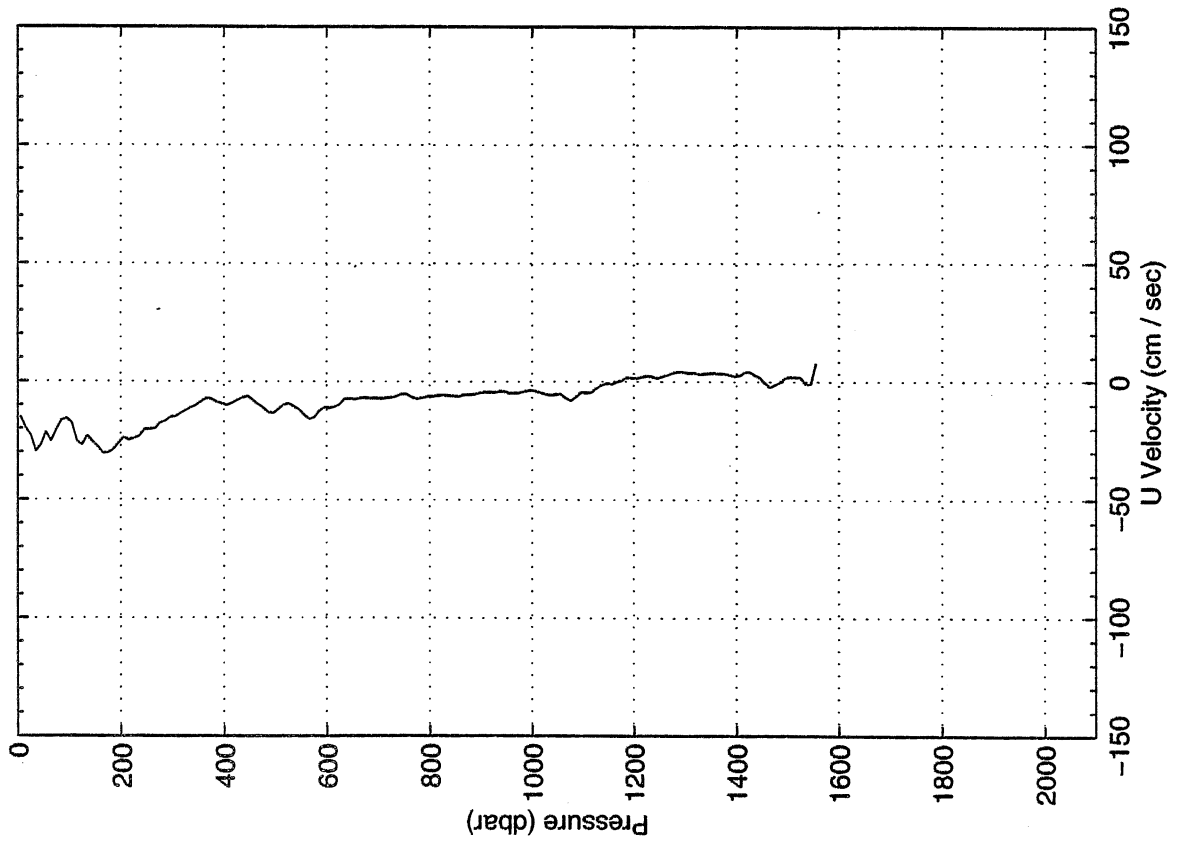
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Latitude 7.865 N Longitude 52.026 W  
07-Dec-1998 03:30 Z



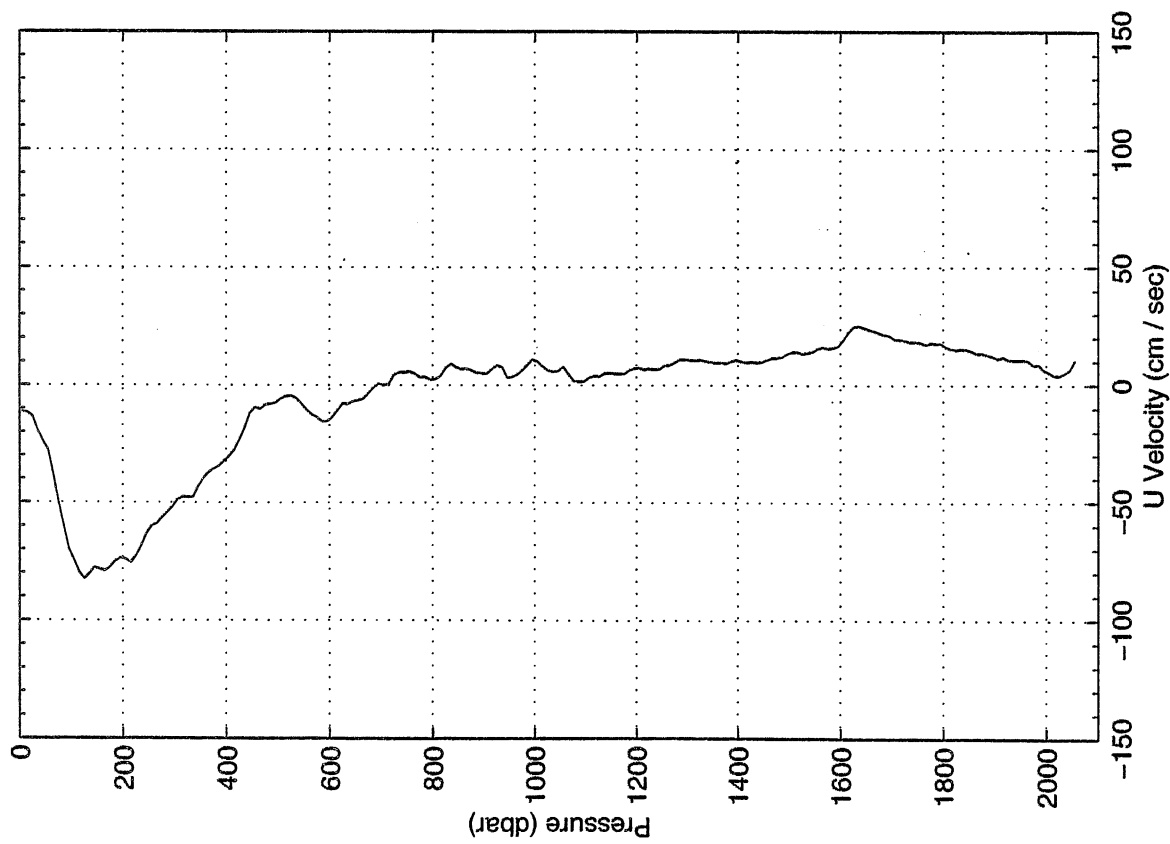
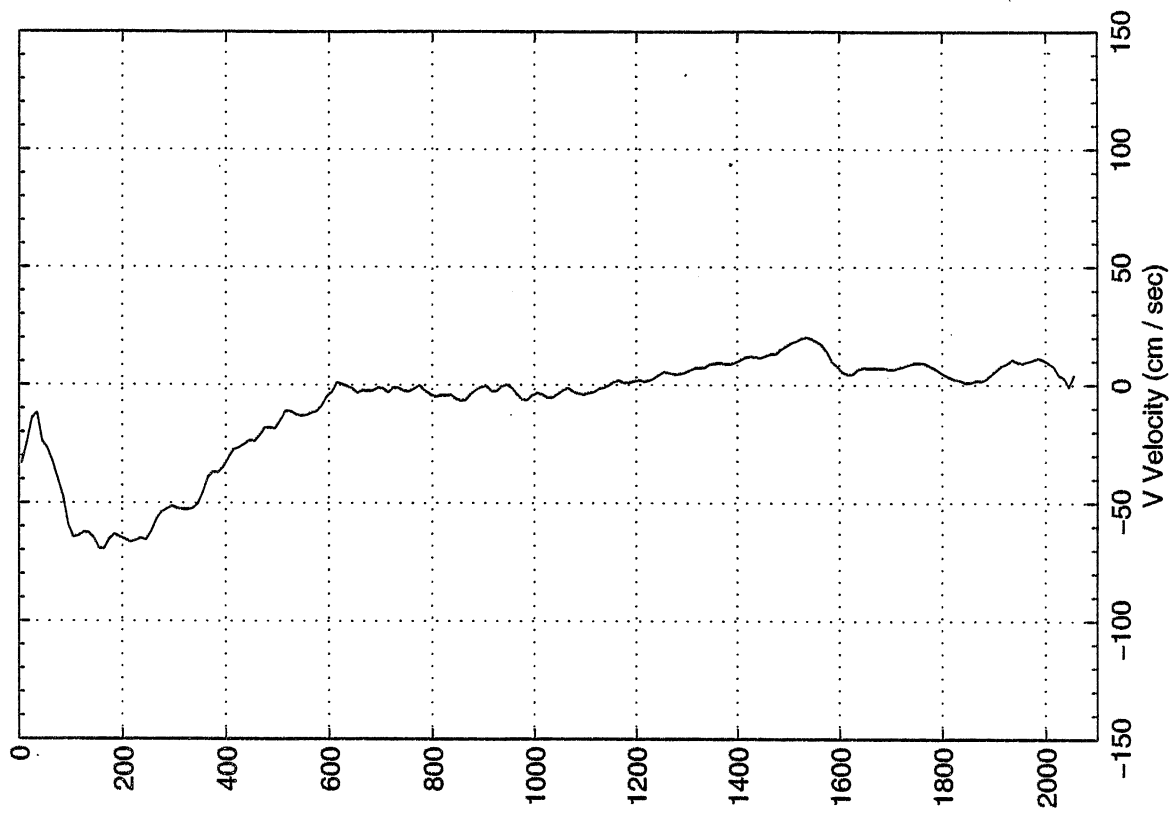
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LADCP Station 58 (98058)  
Latitude 7.389 N Longitude 55.078 W  
09-Dec-1998 00:43 Z



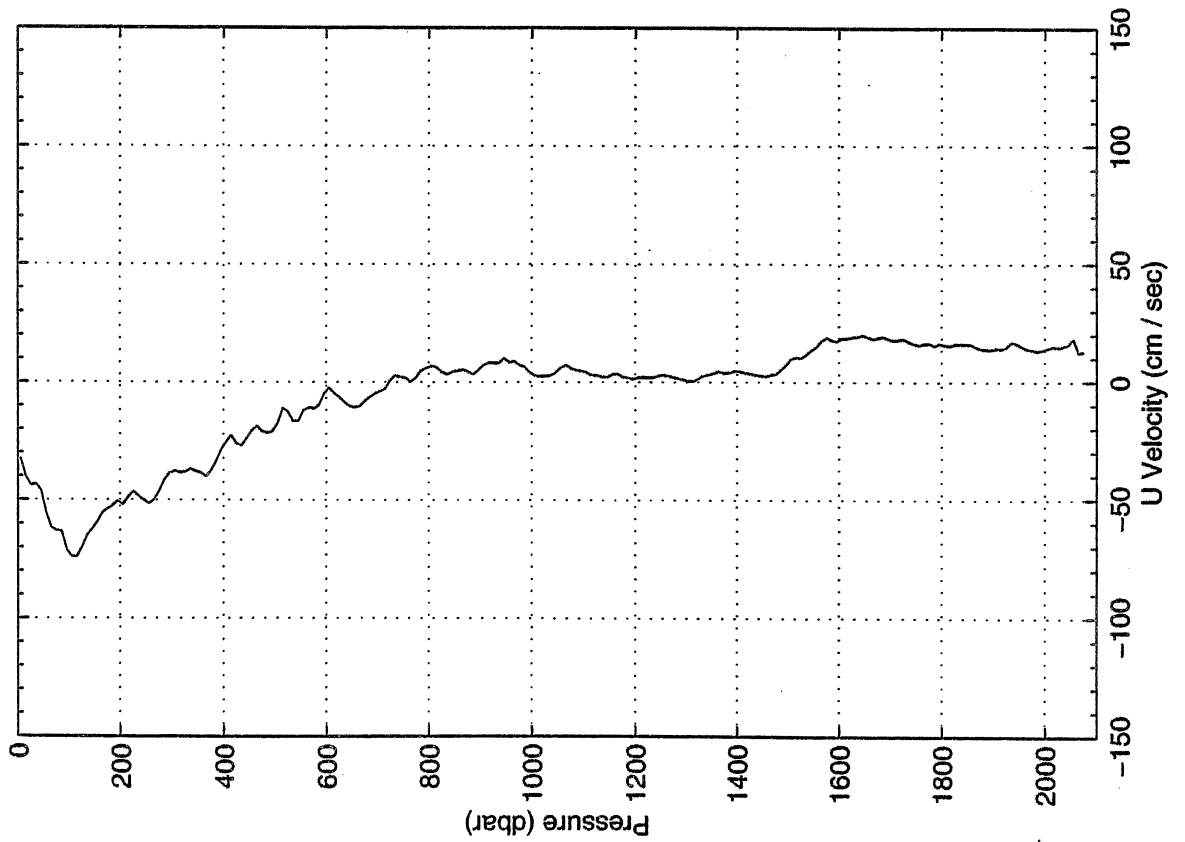
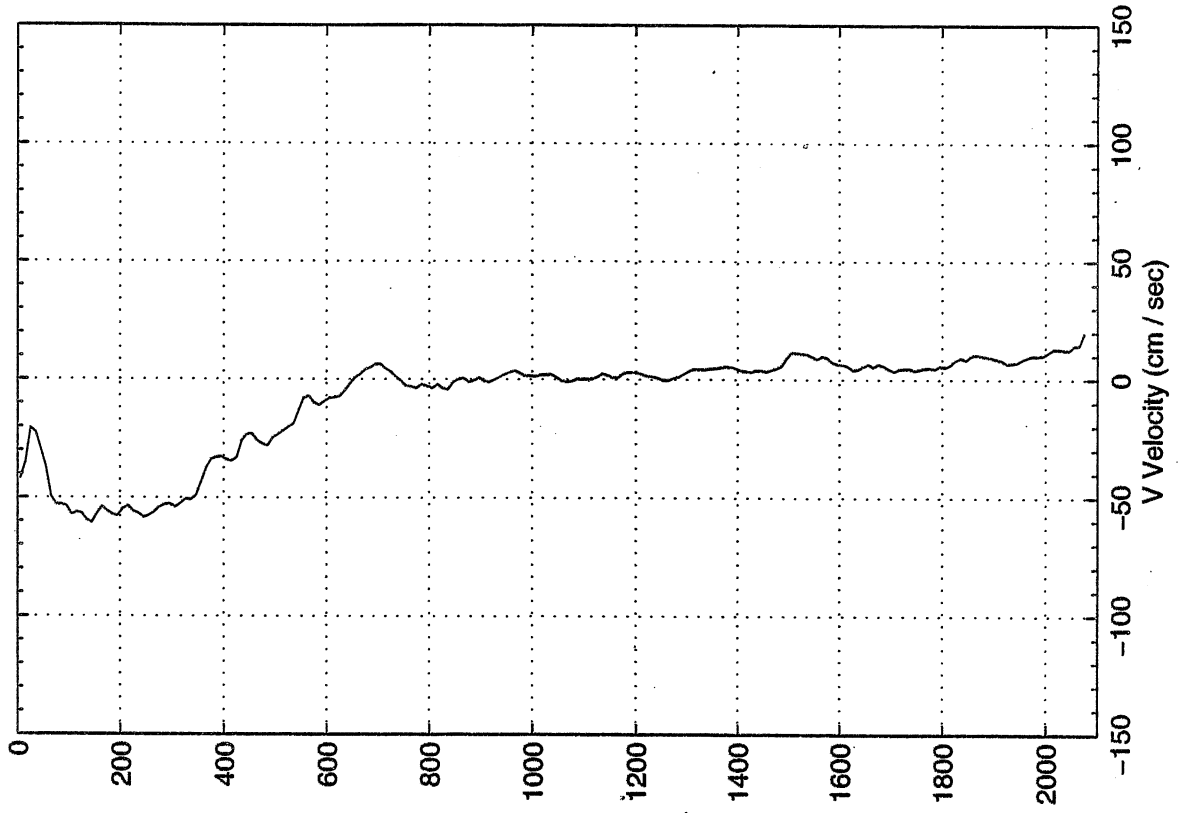
NBC-1 RV SEWARD JOHNSON  
LADCP Station 59 (98059)  
Latitude 7.638 N Longitude 55.021 W  
09-Dec-1998 03:00 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 60 (98060)  
Latitude 7.945 N Longitude 55.086 W  
09-Dec-1998 06:14 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 61 (98061)  
Latitude 8.263 N Longitude 55.025 W  
09-Dec-1998 09:46 Z

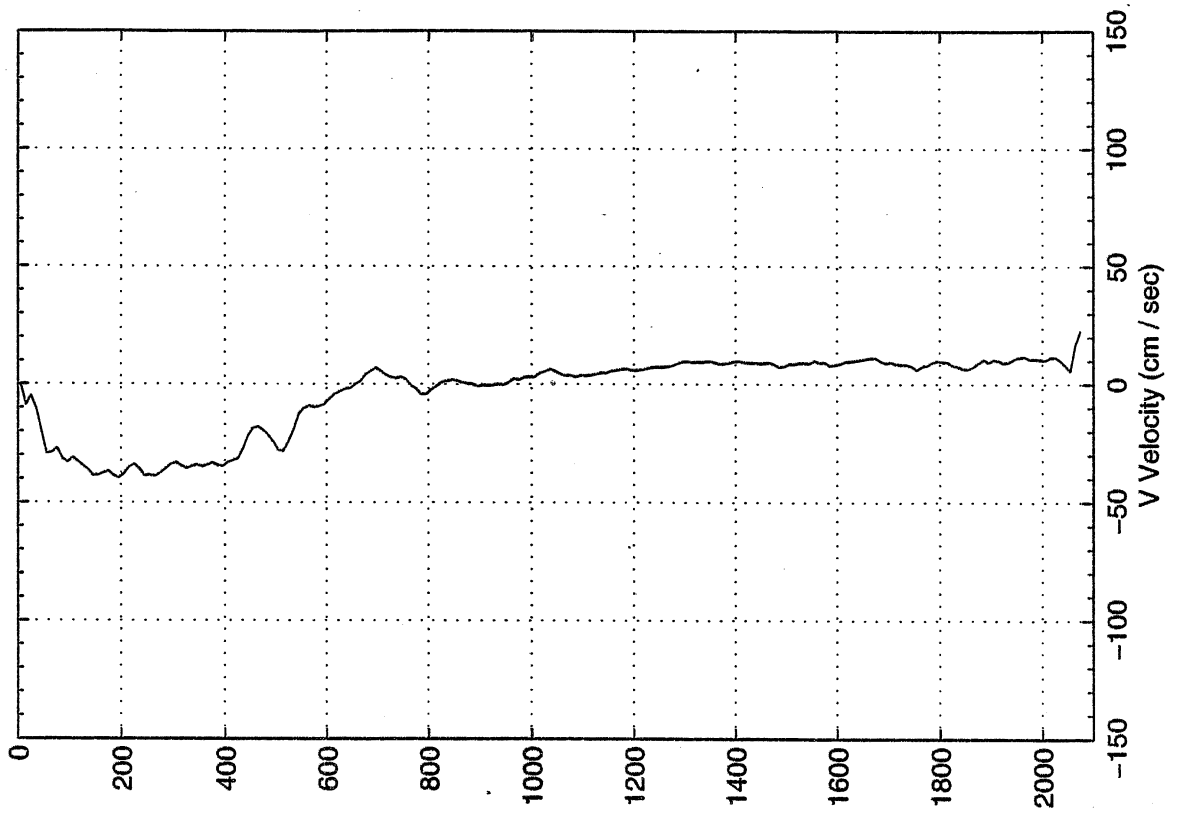
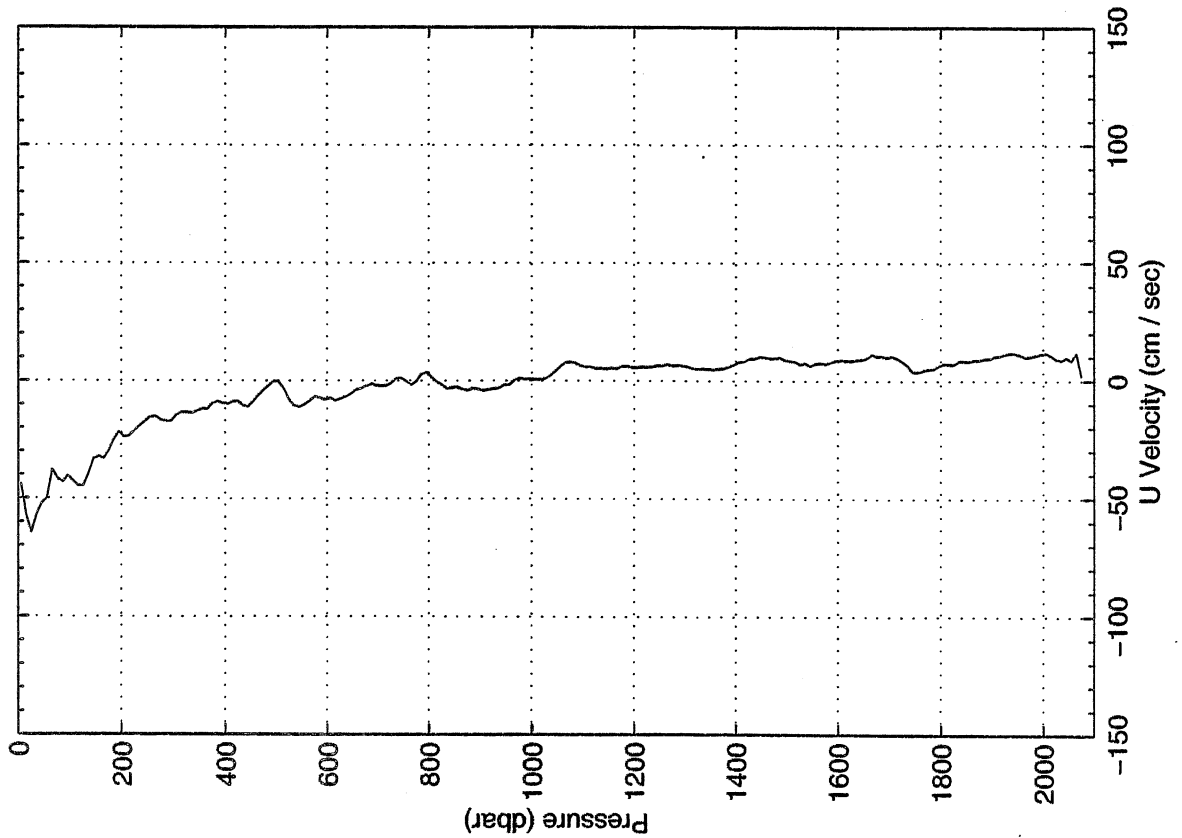


NBC-1 R/V SEWARD JOHNSON

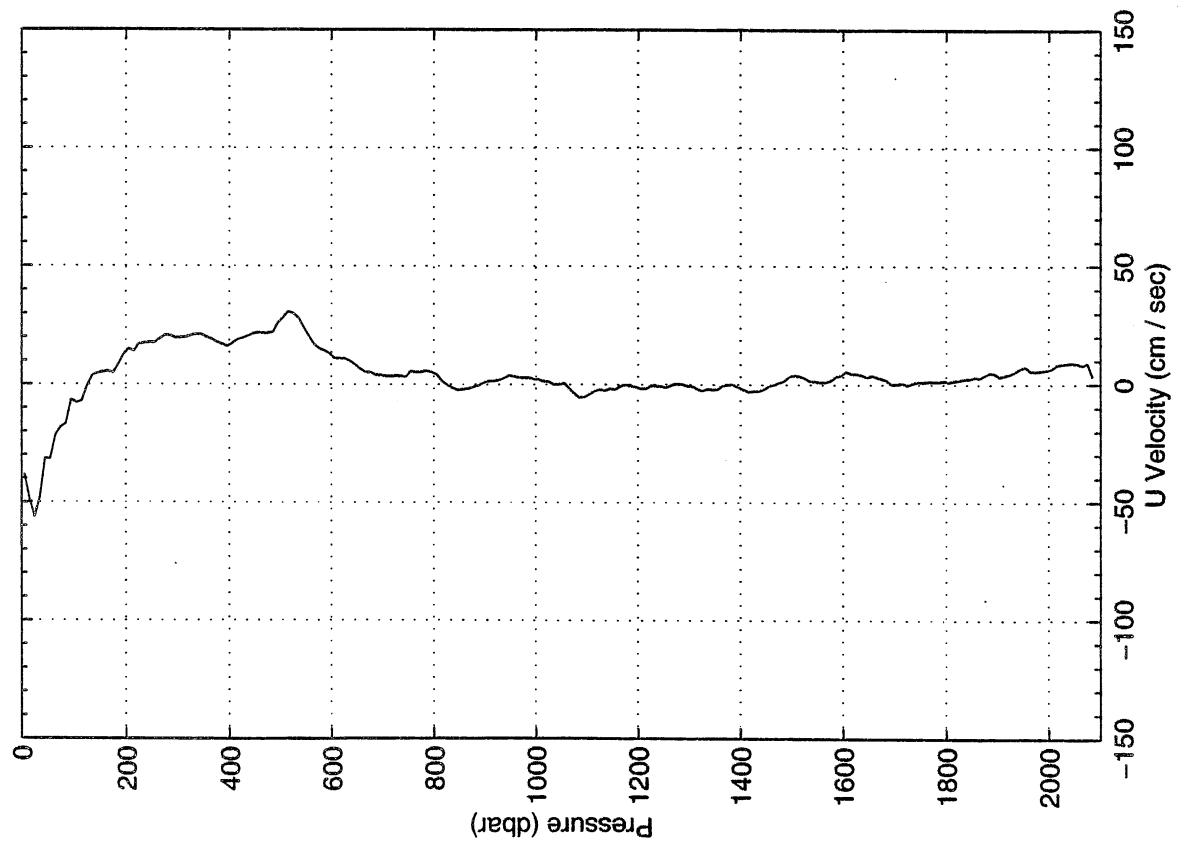
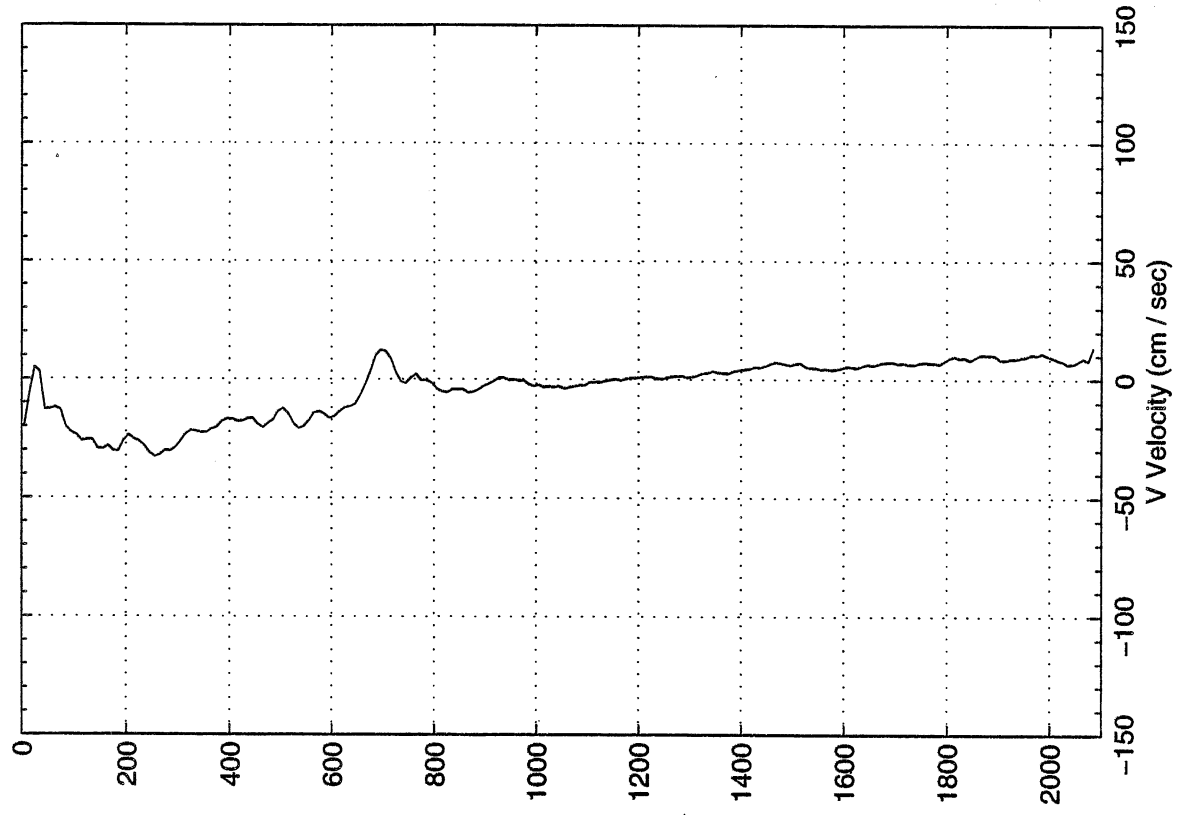
LADCP Station 62 (98062)

Latitude 8.583 N Longitude 56.026 W

09-Dec-1998 13:11 Z



NBC-1 R/V SEWARD JOHNSON  
LADCP Station 63 (98063)  
Latitude 8.901 N Longitude 56.014 W  
09-Dec-1998 16:31 Z

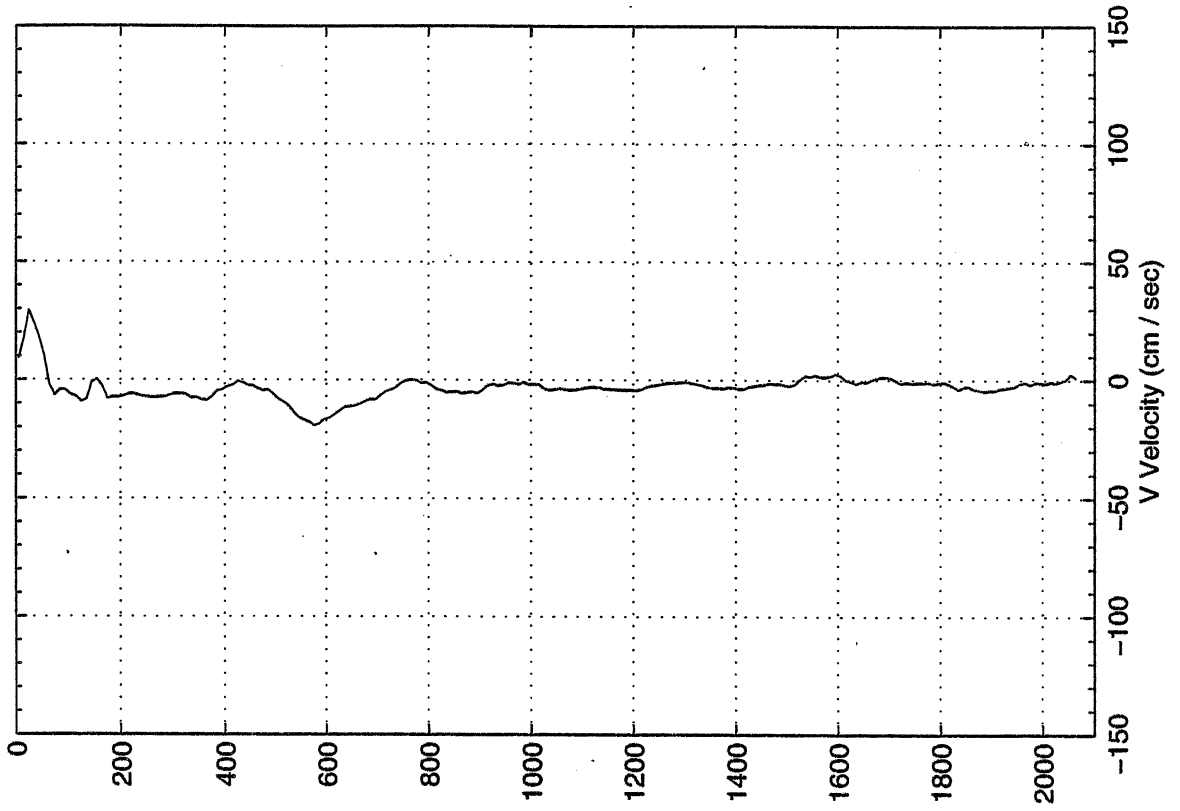
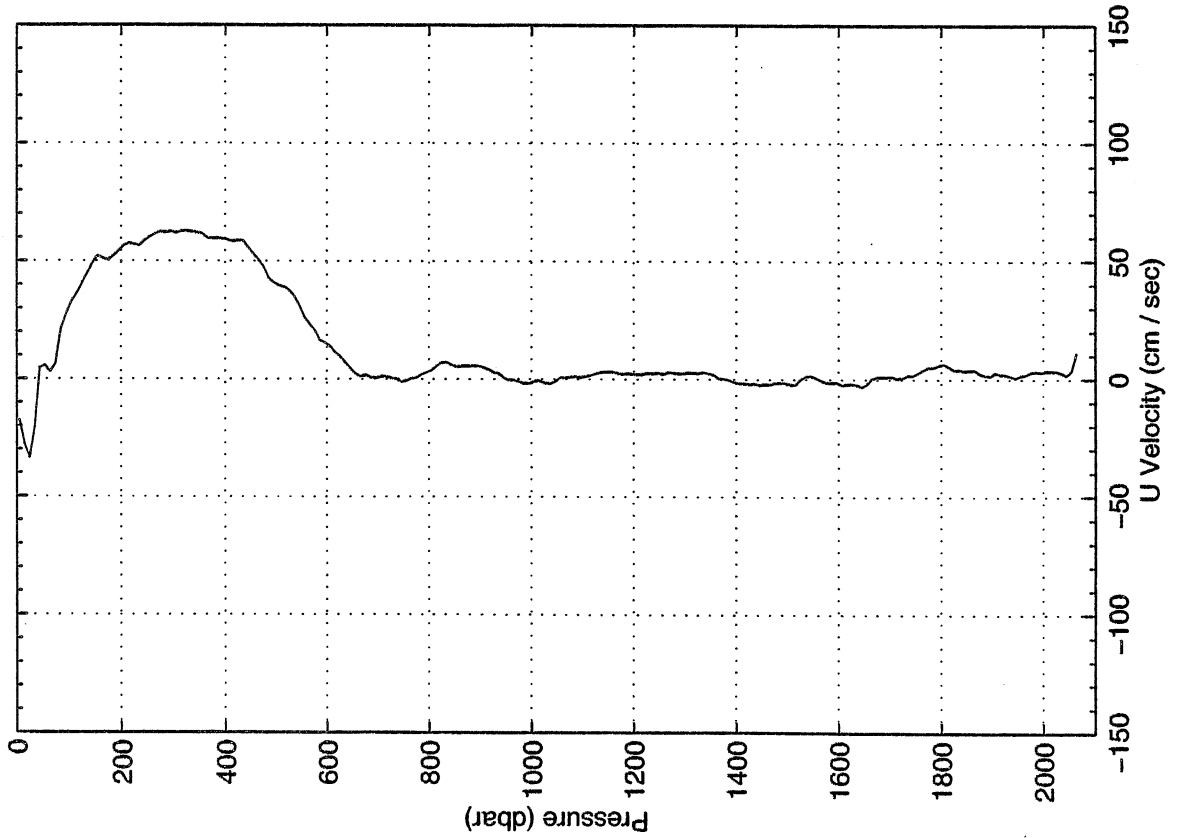


NBC-1 R/V SEWARD JOHNSON

LADCP Station 64 (98064)

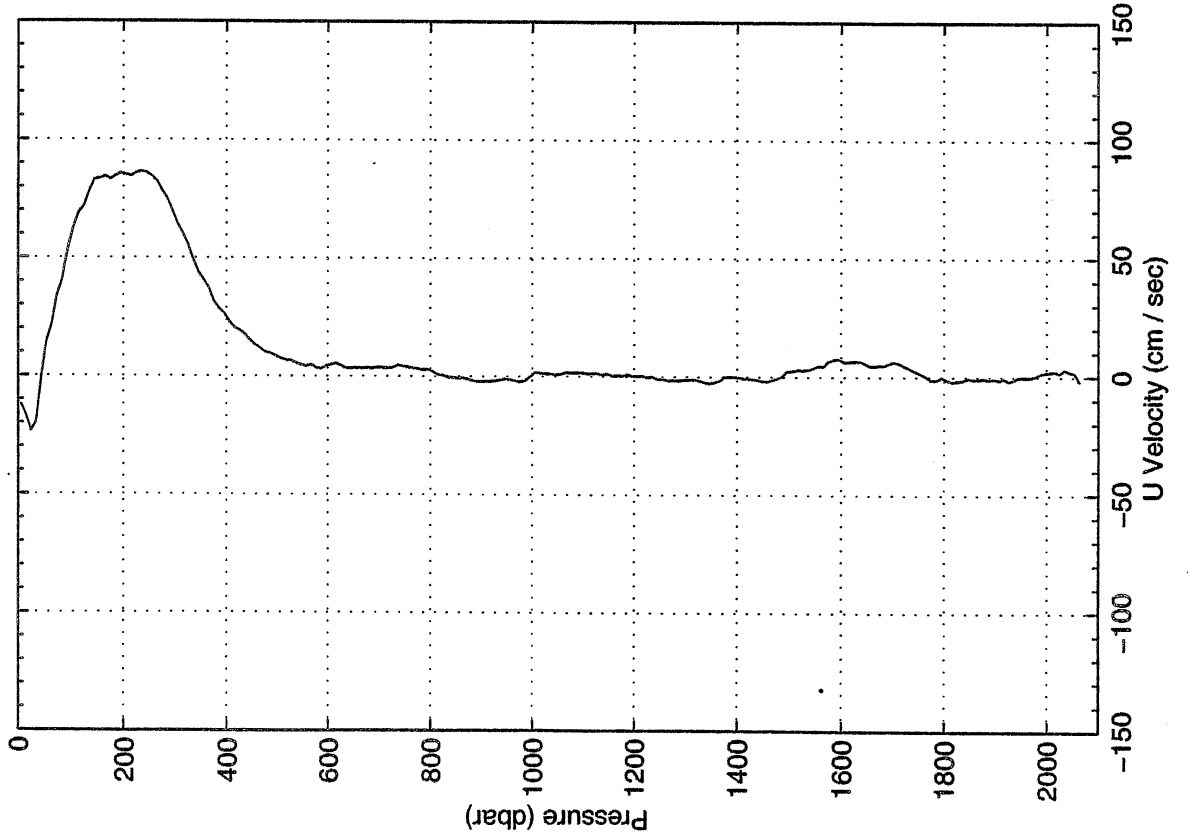
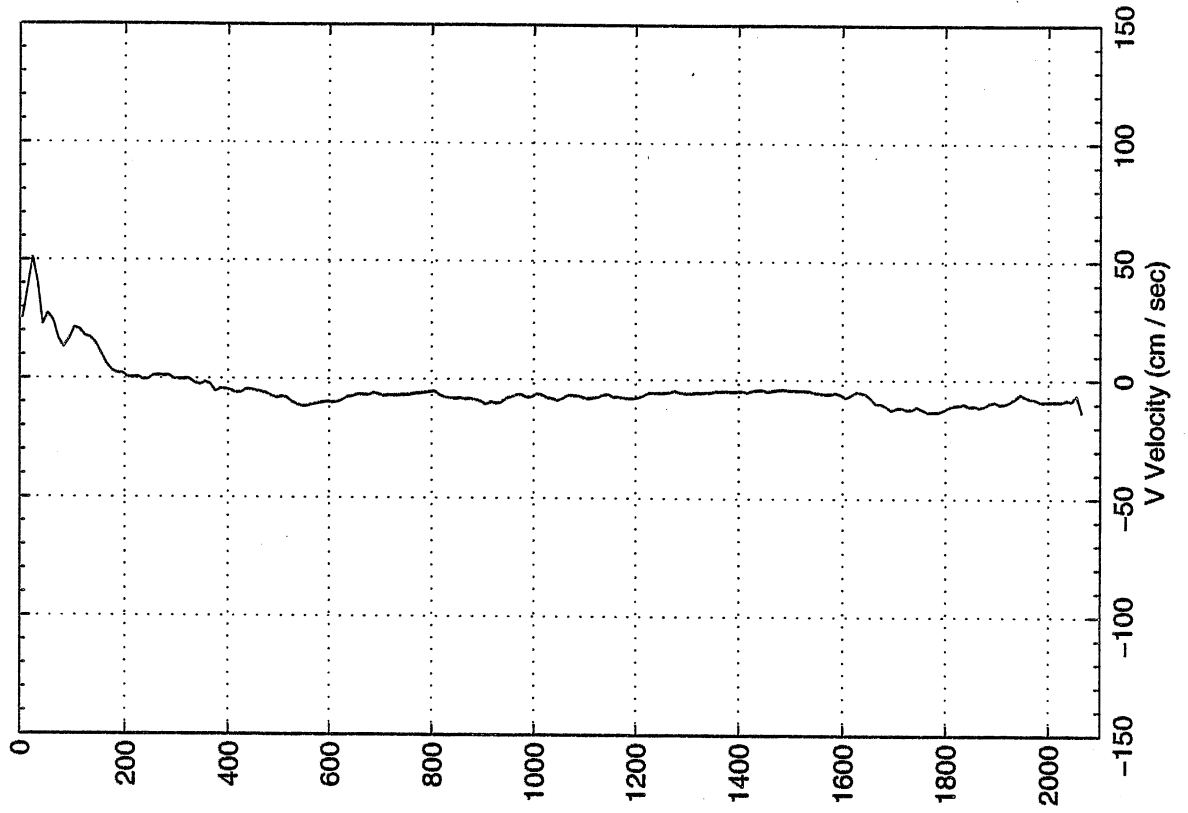
Latitude 9.217 N Longitude 56.037 W

09-Dec-1998 20:02 Z





NBC-1 R/V SEWARD JOHNSON  
LADCP Station 65 (98065)  
Latitude 9.540 N Longitude 56.047 W  
09-Dec-1998 23:37 Z

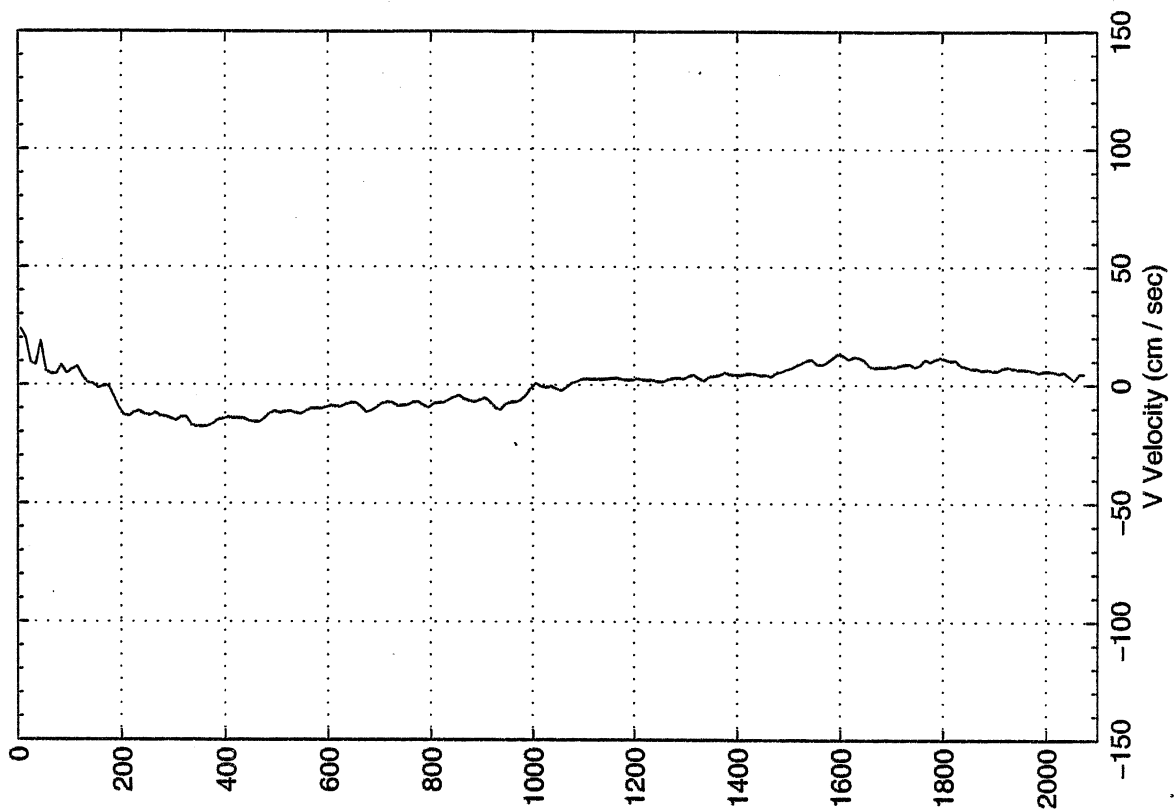
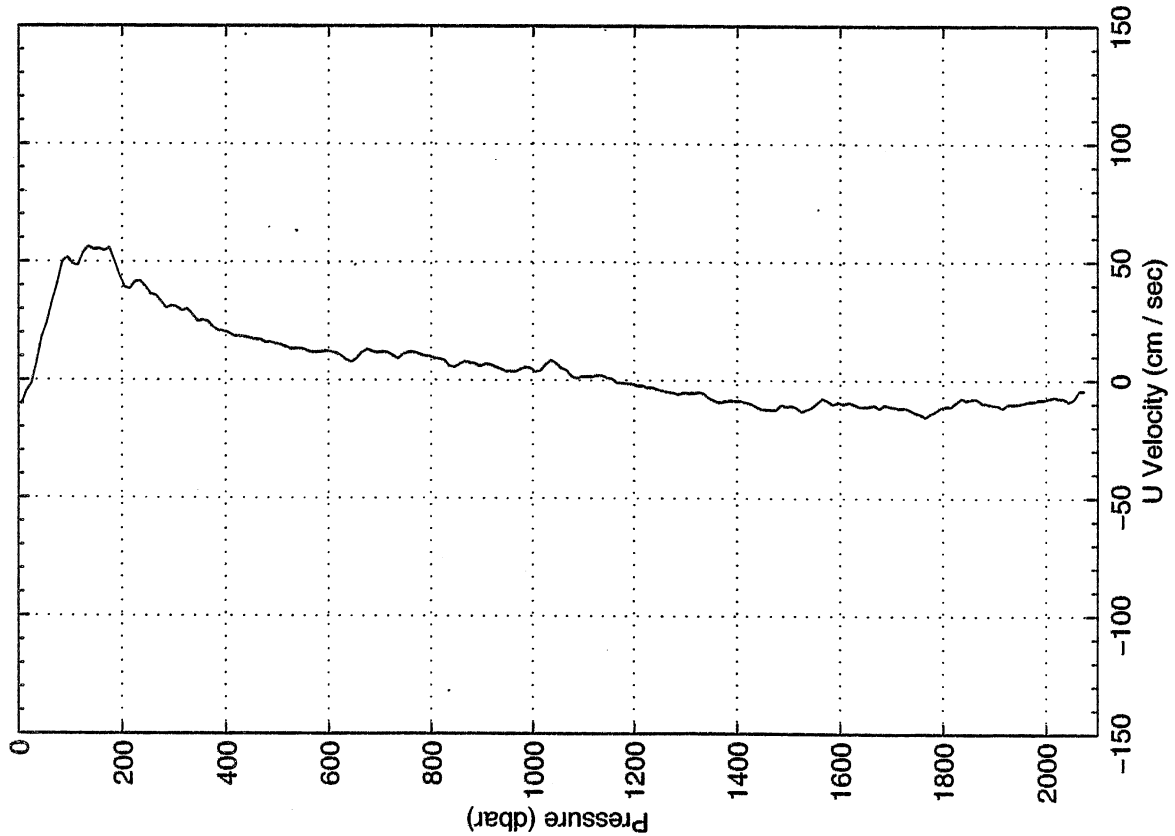


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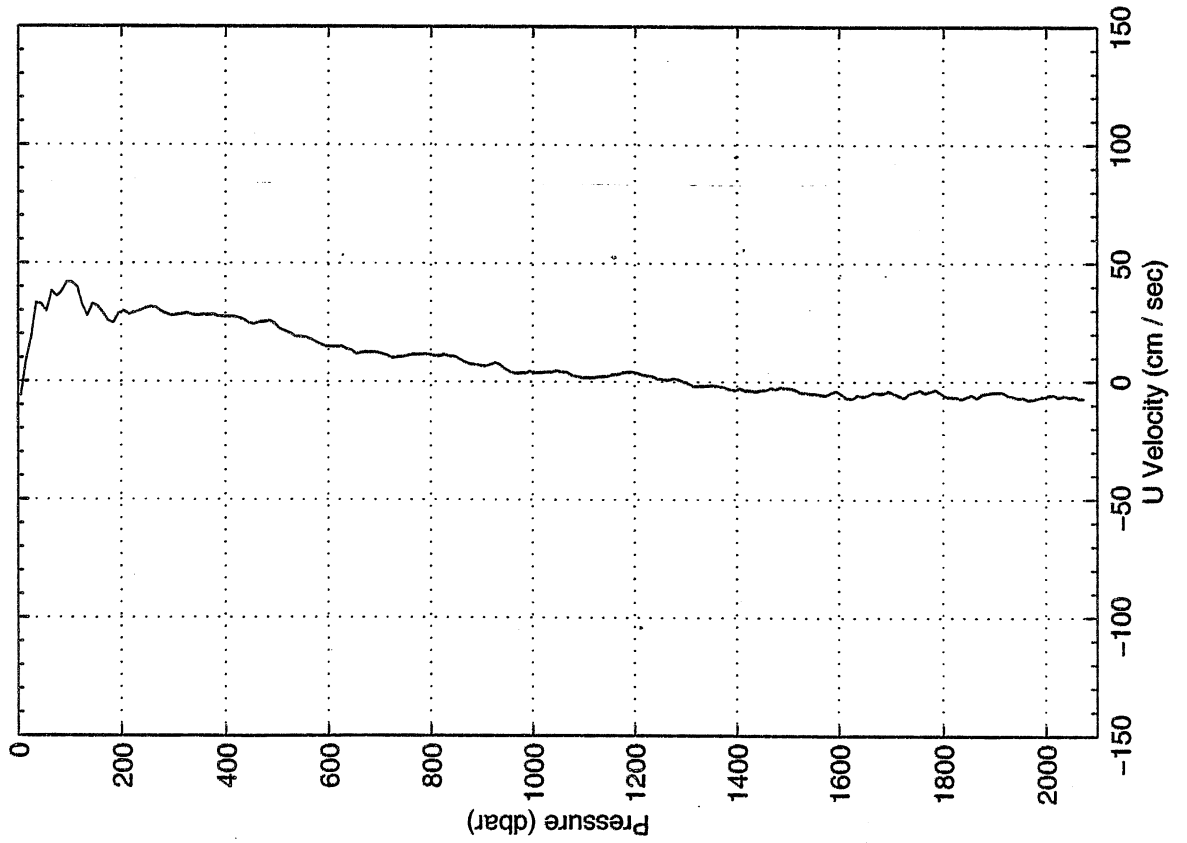
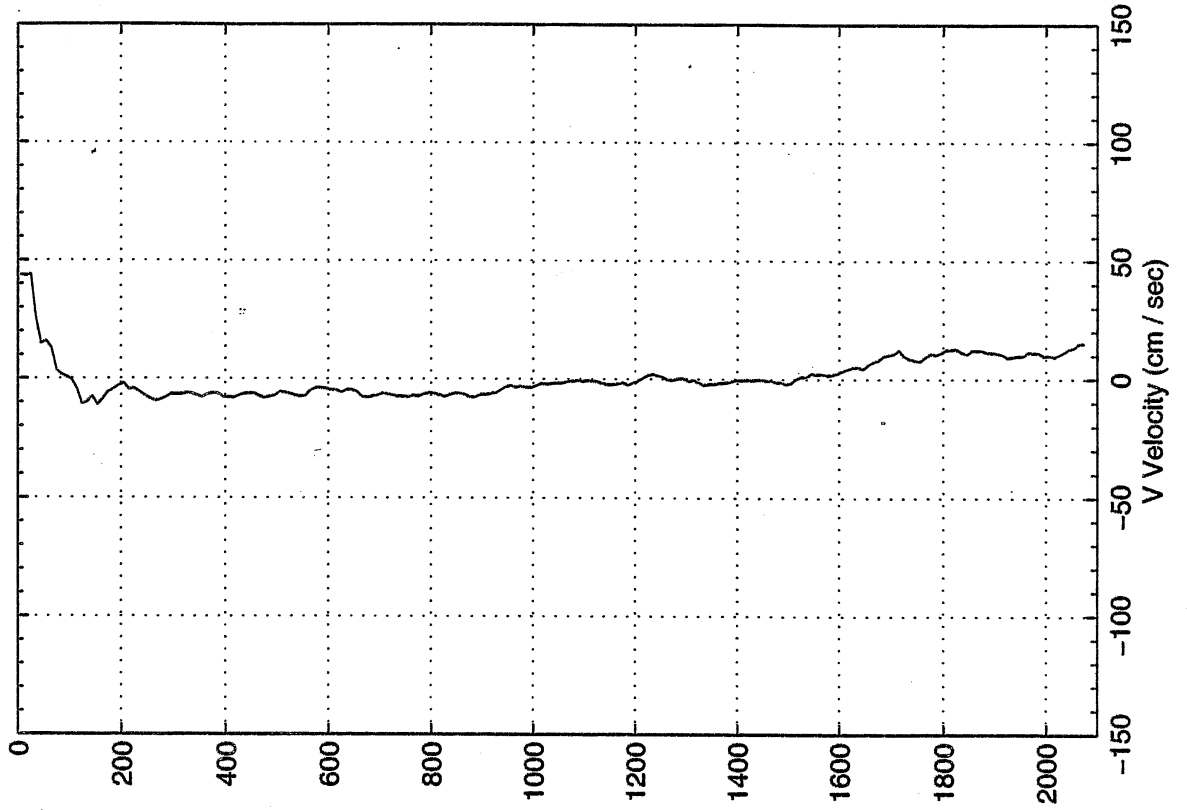
LADCP Station 66 (98066)

Latitude 9.838 N Longitude 56.048 W

10-Dec-1998 03:13 Z



NBC-1 RV SEWARD JOHNSON  
LADCP Station 67 (98067)  
Latitude 10.174 N Longitude 56.060 W  
10-Dec-1998 06:59 Z

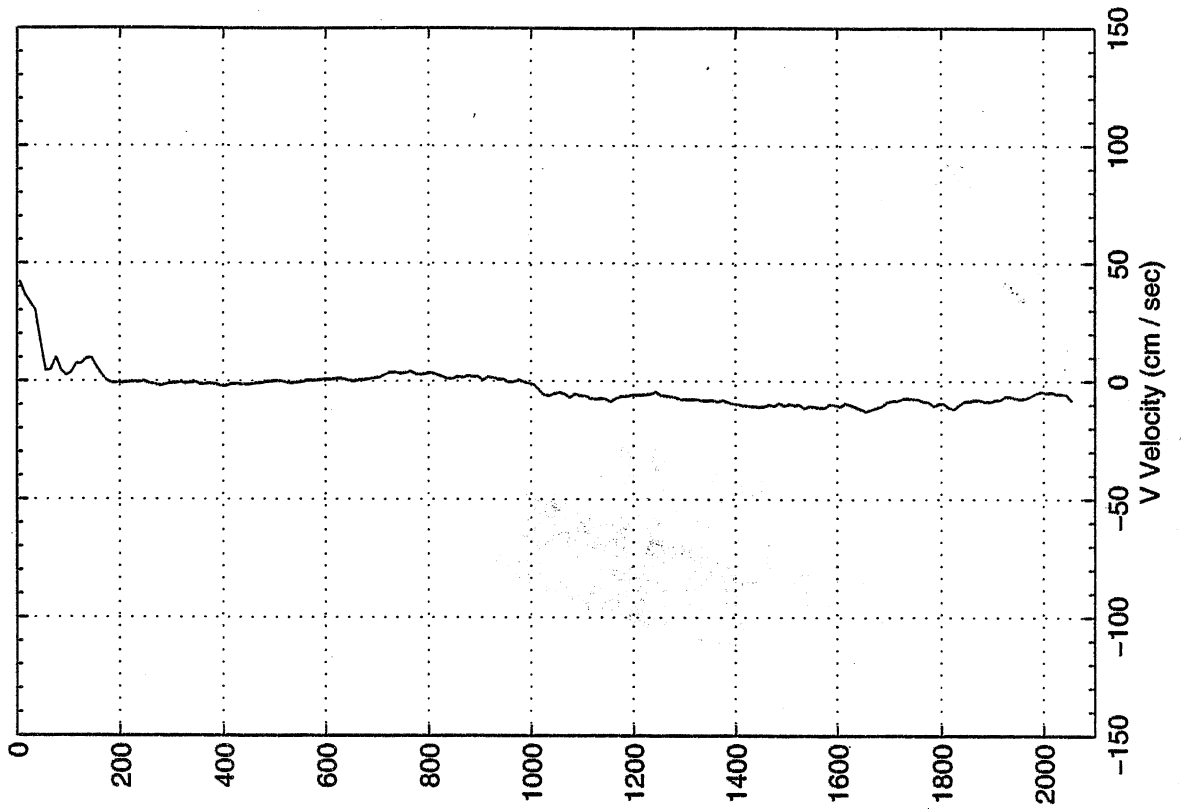
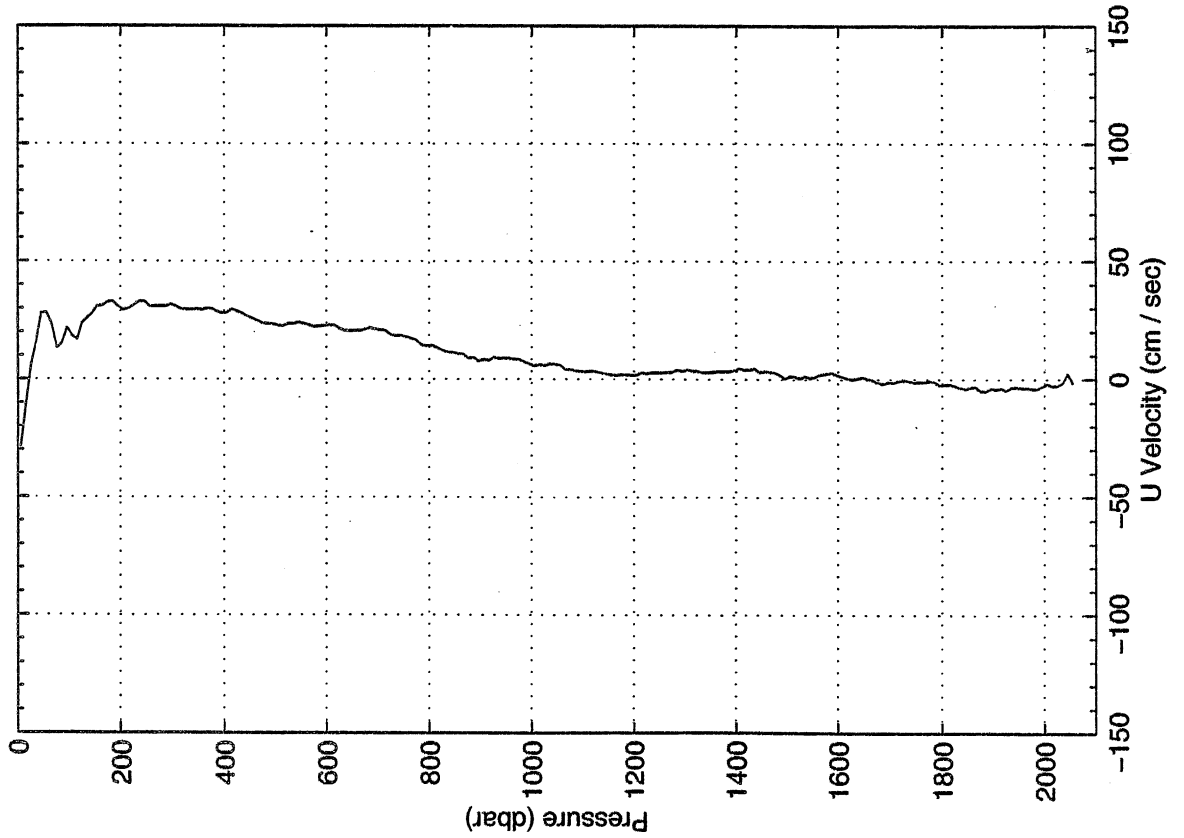


**NBC-1 R/V SEWARD JOHNSON**

**LADCP Station 68 (98068)**

**Latitude 10.479 N Longitude 57.047 W**

**10-Dec-1998 10:34 Z**



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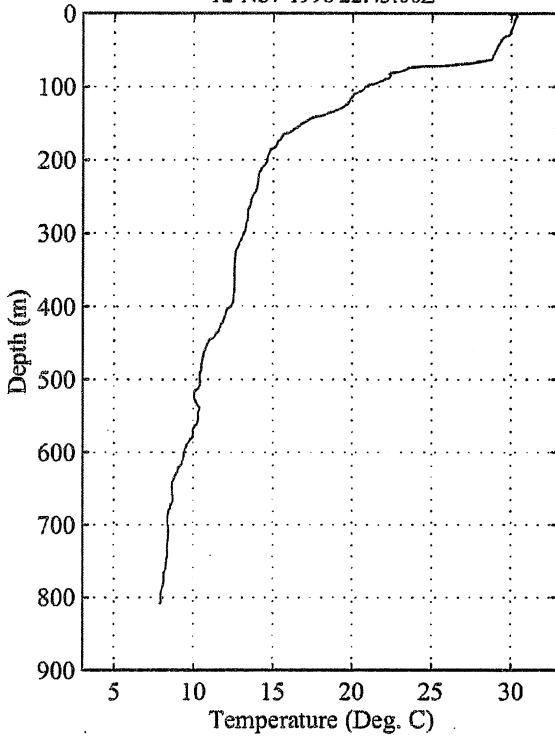
**APPENDIX C**

**XBT DATA**

NBC-1 R/V SEWARD JOHNSON XBT Drop 001

Lat. 9.912 N Long. 53.493 W

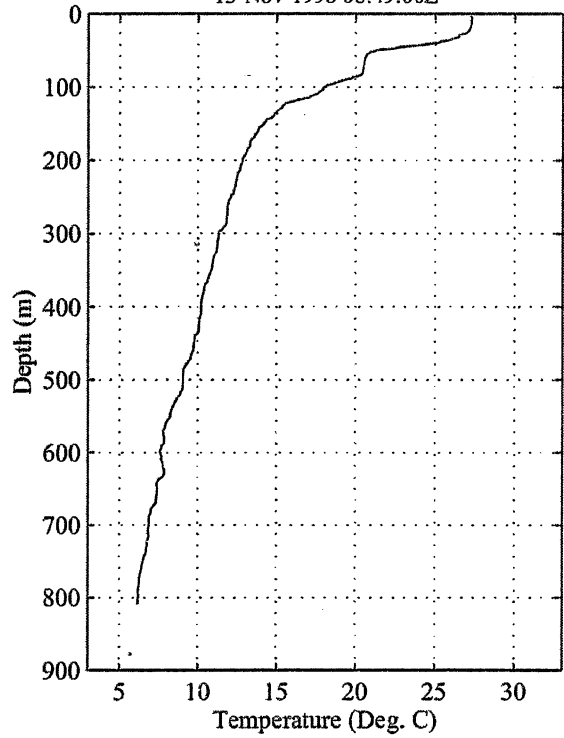
12-Nov-1998 22:45:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 002

Lat. 9.390 N Long. 53.280 W

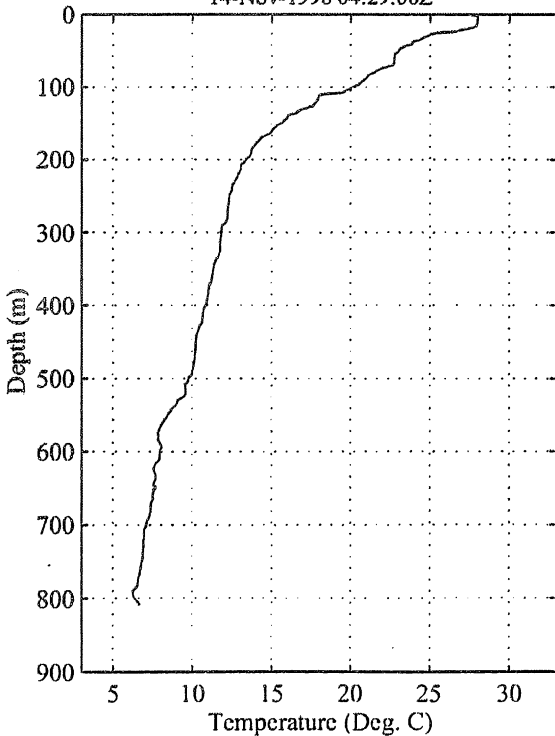
13-Nov-1998 08:49:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 003

Lat. 8.535 N Long. 53.395 W

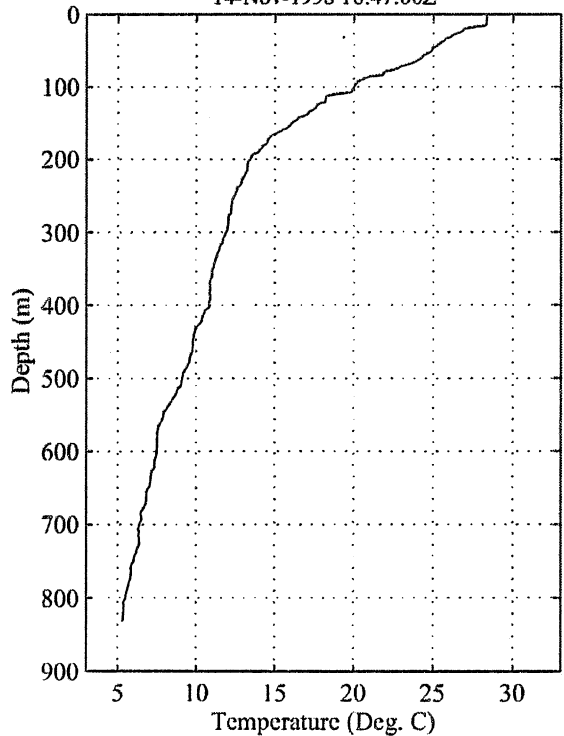
14-Nov-1998 04:29:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 004

Lat. 7.823 N Long. 53.512 W

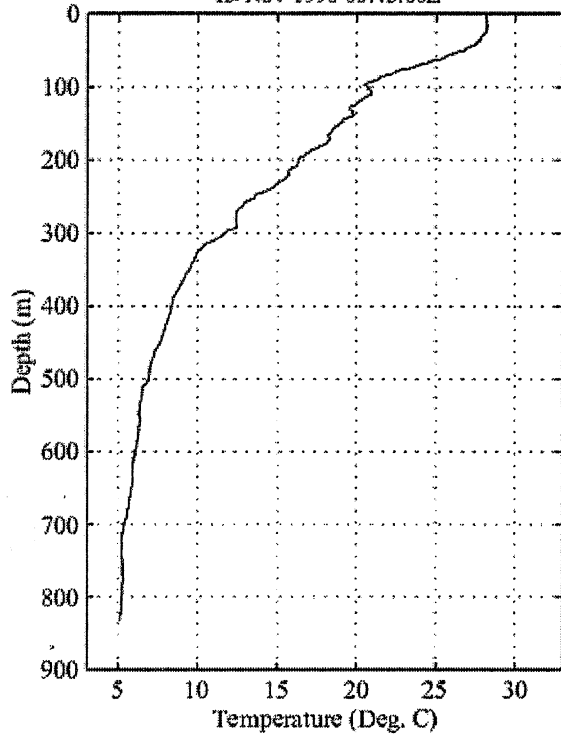
14-Nov-1998 16:47:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 005

Lat. 8.250 N Long. 52.745 W

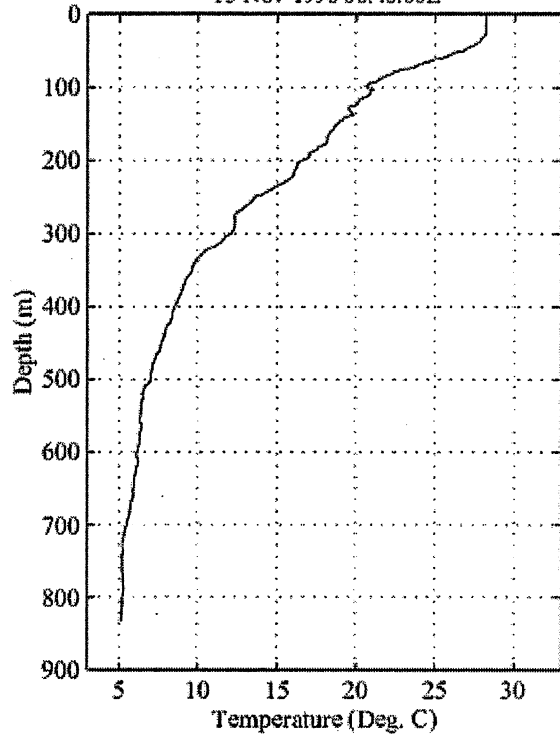
15-Nov-1998 08:45:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 006

Lat. 8.250 N Long. 52.745 W

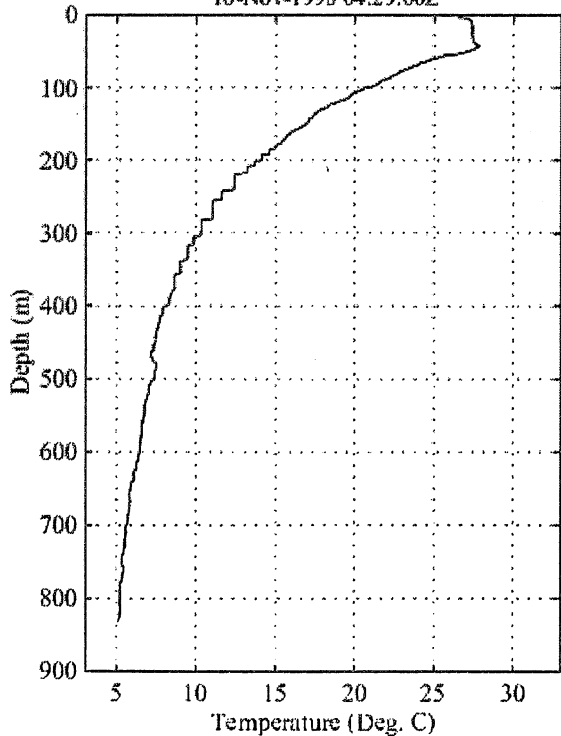
15-Nov-1998 08:48:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 007

Lat. 9.395 N Long. 52.127 W

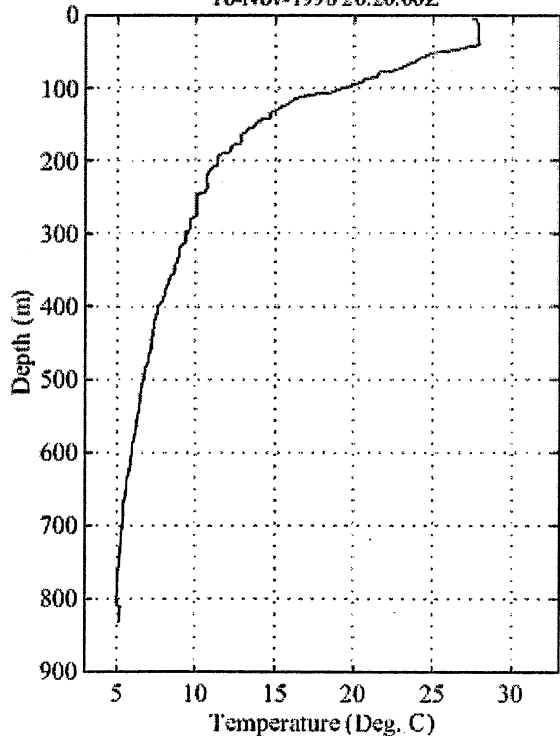
16-Nov-1998 04:29:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 008

Lat. 9.438 N Long. 50.615 W

16-Nov-1998 20:20:00Z

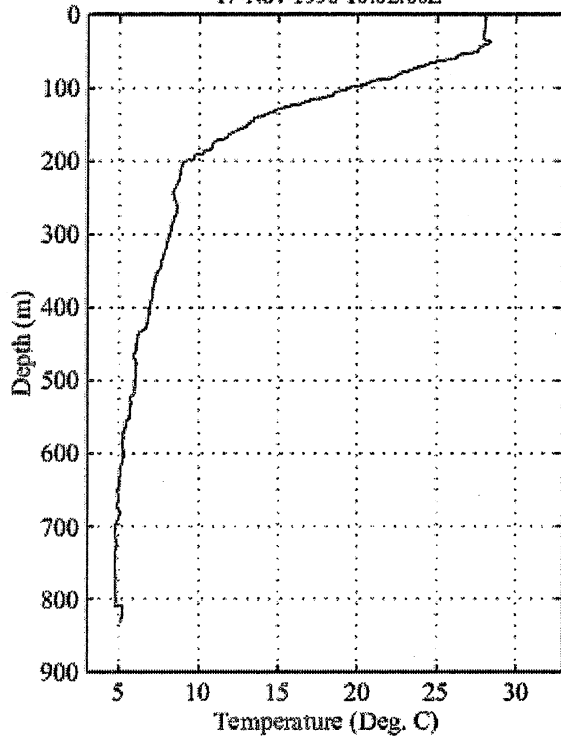




NBC-I R/V SEWARD JOHNSON XBT Drop 009

Lat. 8.465 N Long. 50.490 W

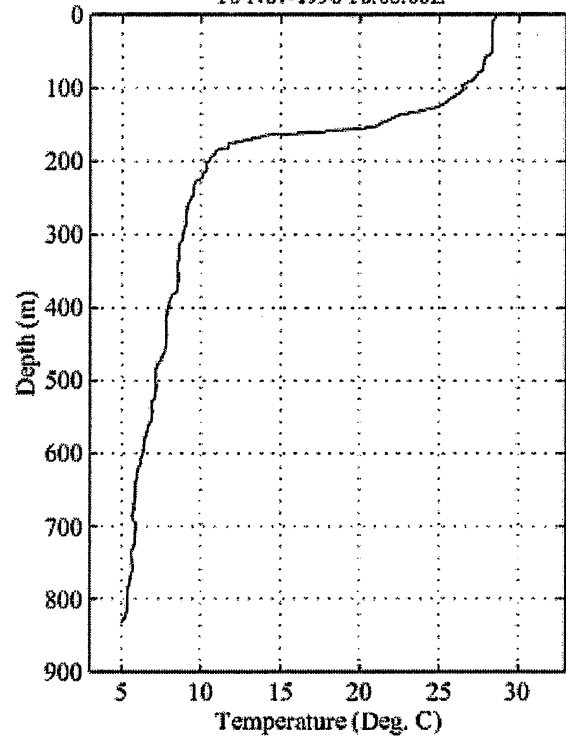
17-Nov-1998 10:02:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 010

Lat. 6.987 N Long. 49.468 W

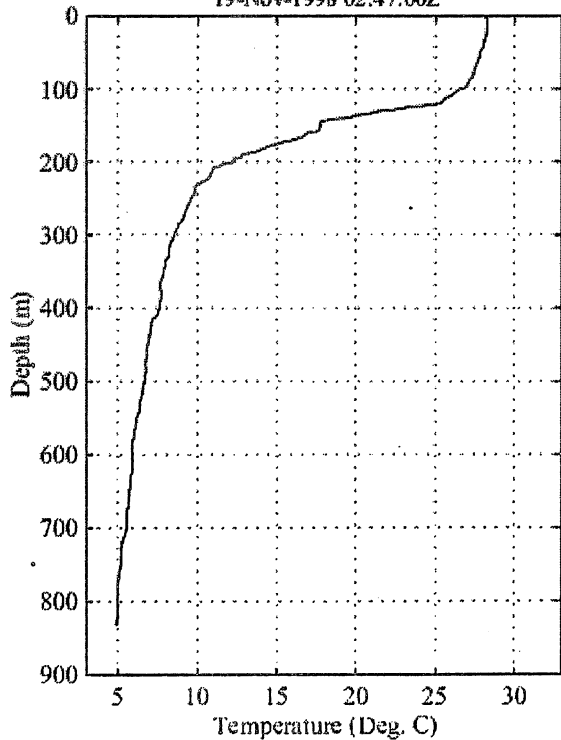
18-Nov-1998 16:08:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 011

Lat. 6.235 N Long. 50.323 W

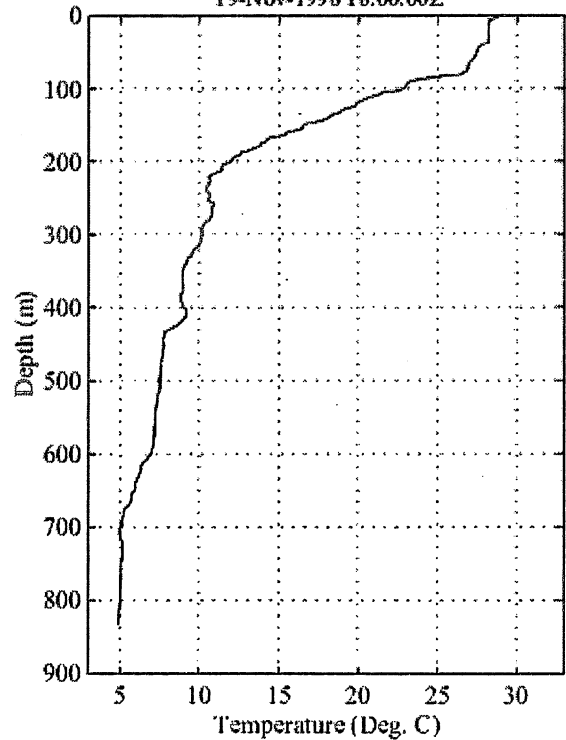
19-Nov-1998 02:47:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 012

Lat. 5.895 N Long. 51.065 W

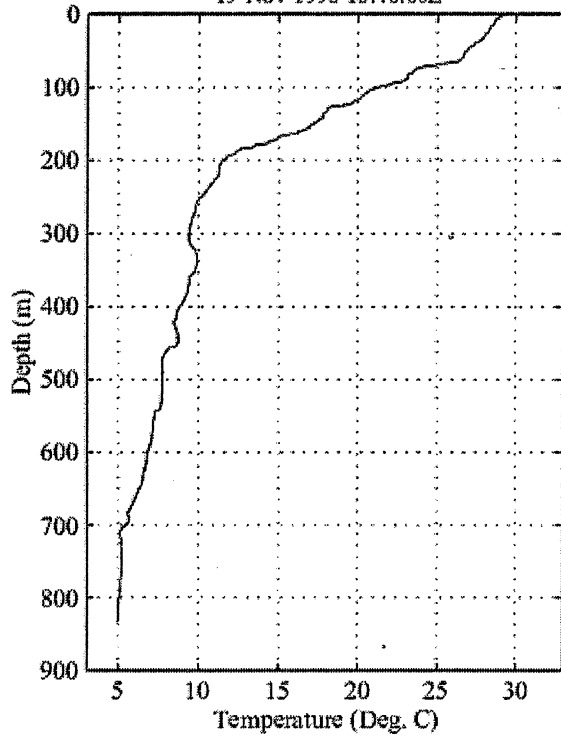
19-Nov-1998 18:06:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 013

Lat. 5.830 N Long. 51.152 W

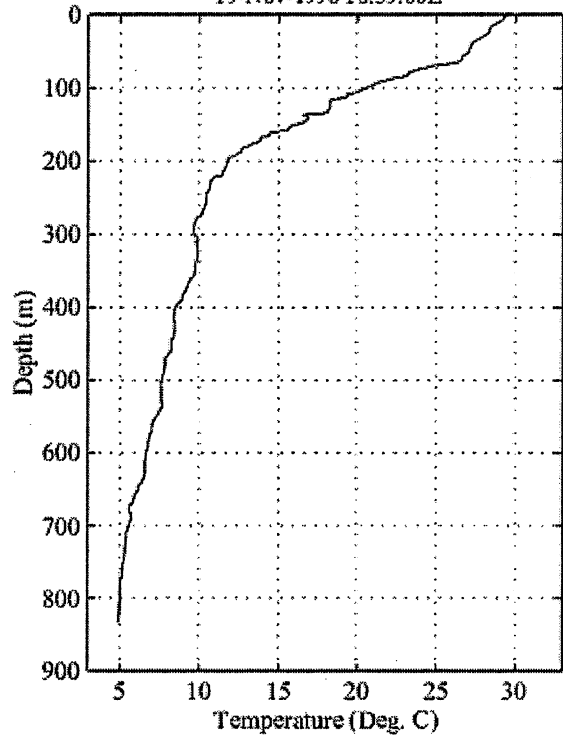
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NBC-1 R/V SEWARD JOHNSON XBT Drop 014

Lat. 5.792 N Long. 51.200 W

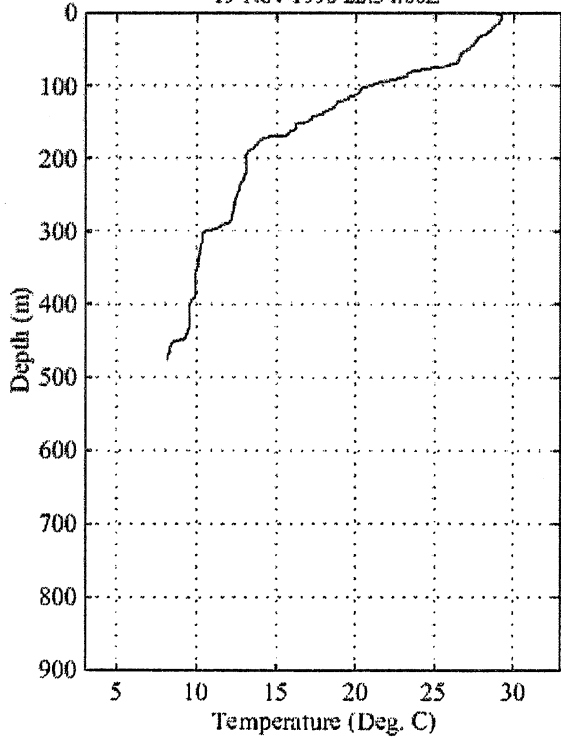
19-Nov-1998 18:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 015

Lat. 5.752 N Long. 51.272 W

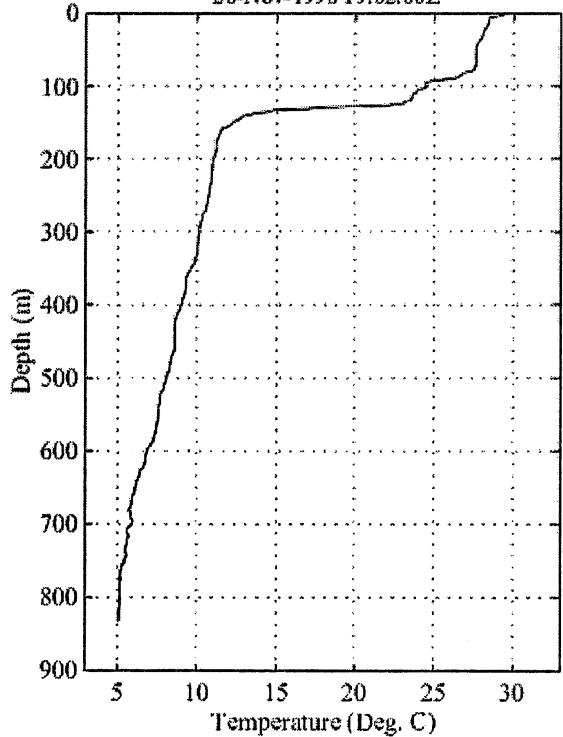
19-Nov-1998 22:54:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 016

Lat. 4.877 N Long. 49.260 W

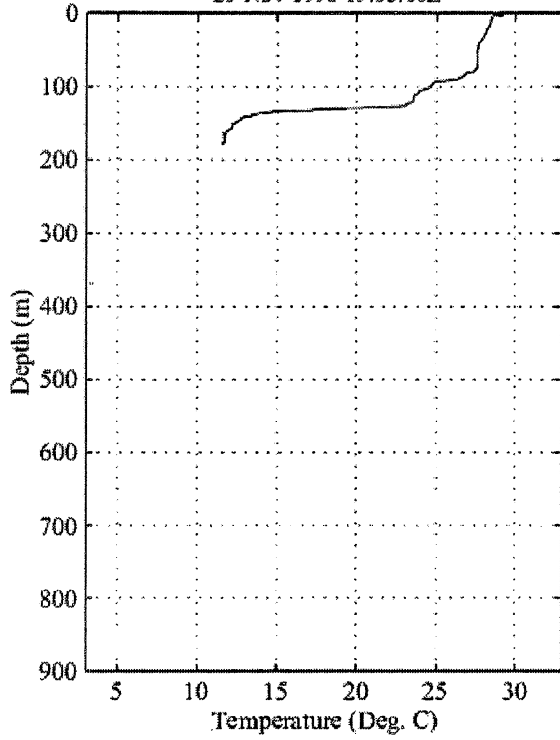
20-Nov-1998 19:02:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 017

Lat. 4.883 N Long. 49.248 W

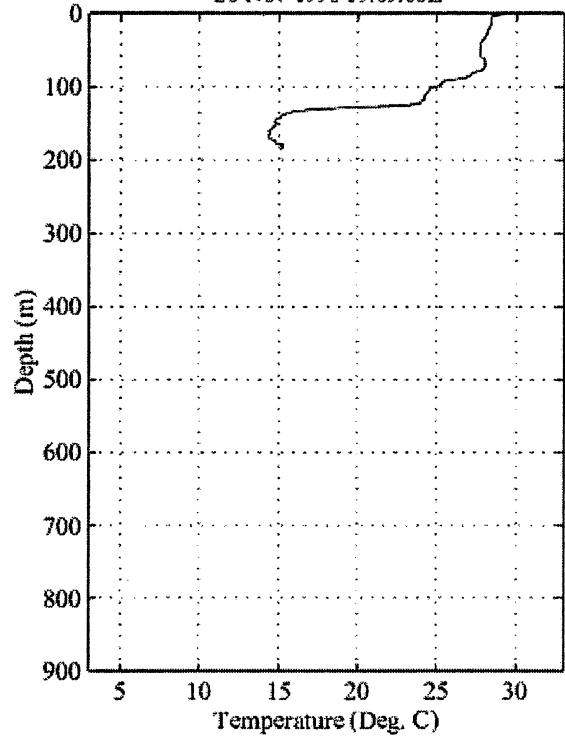
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NBC-1 R/V SEWARD JOHNSON XBT Drop 018

Lat. 4.888 N Long. 49.240 W

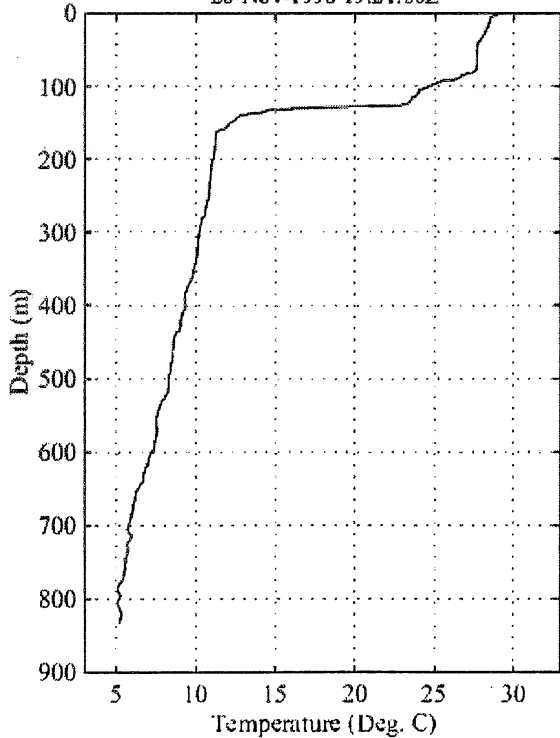
20-Nov-1998 19:09:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 020

Lat. 4.910 N Long. 49.208 W

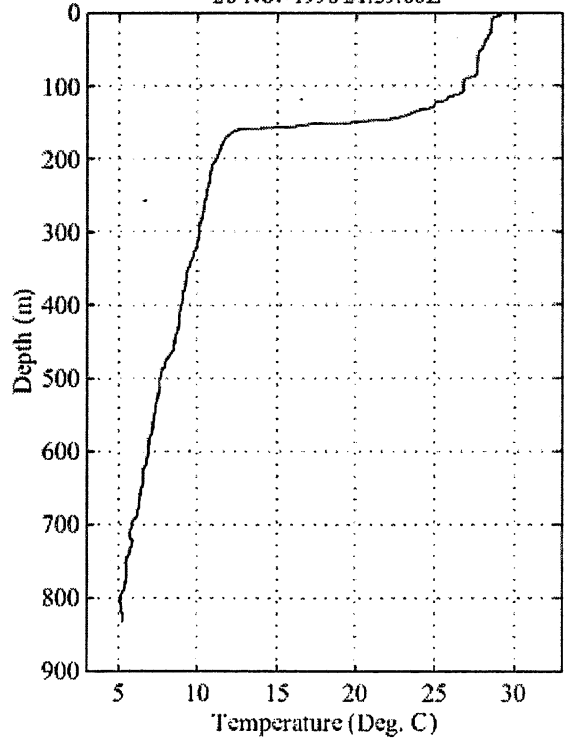
20-Nov-1998 19:21:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 021

Lat. 5.152 N Long. 48.850 W

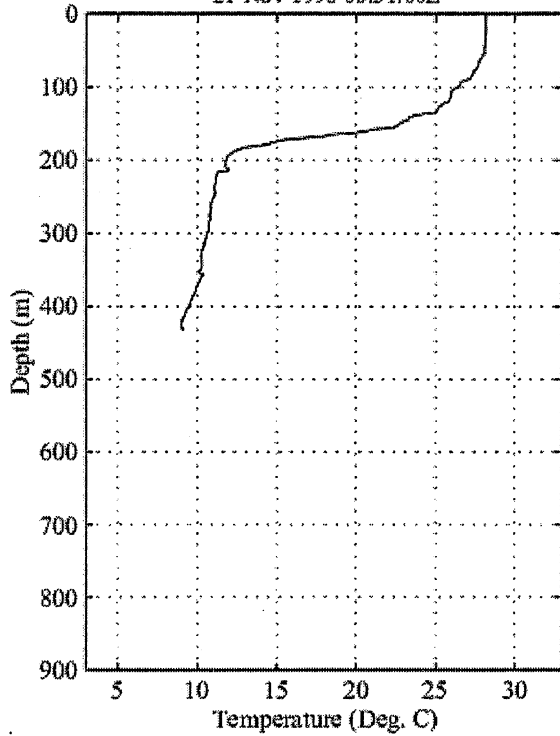
20-Nov-1998 21:39:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 022

Lat. 6.123 N Long. 48.098 W

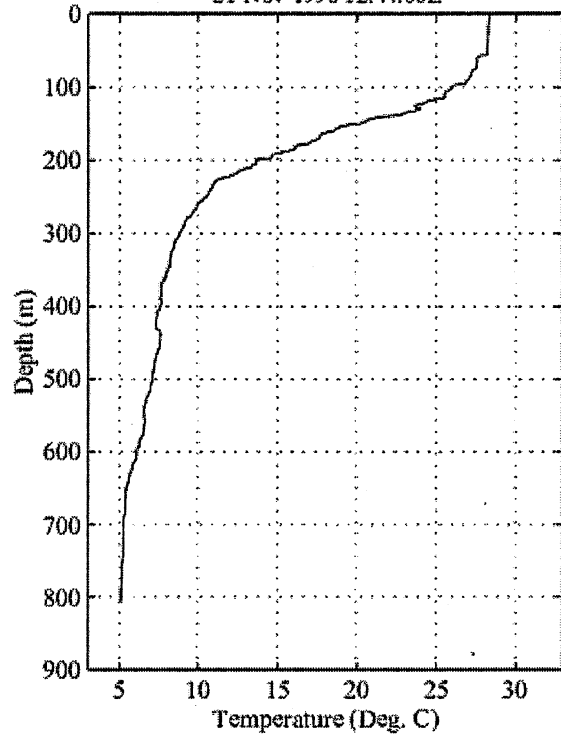
21-Nov-1998 08:31:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 024

Lat. 6.813 N Long. 47.850 W

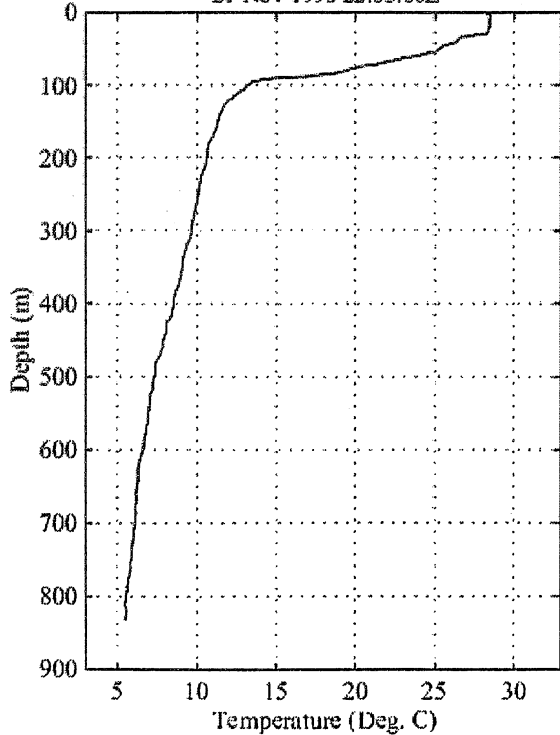
21-Nov-1998 12:44:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 025

Lat. 7.203 N Long. 46.927 W

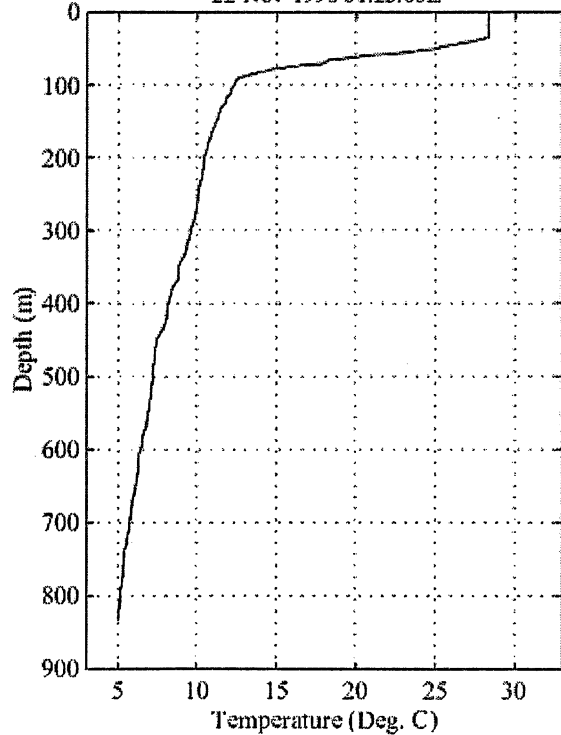
21-Nov-1998 22:05:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 026

Lat. 7.205 N Long. 46.318 W

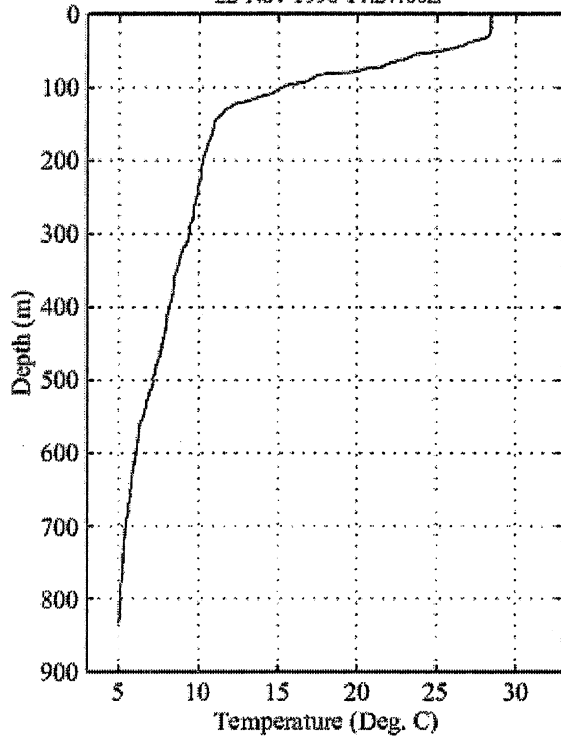
22-Nov-1998 01:23:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 027

Lat. 6.335 N Long. 45.887 W

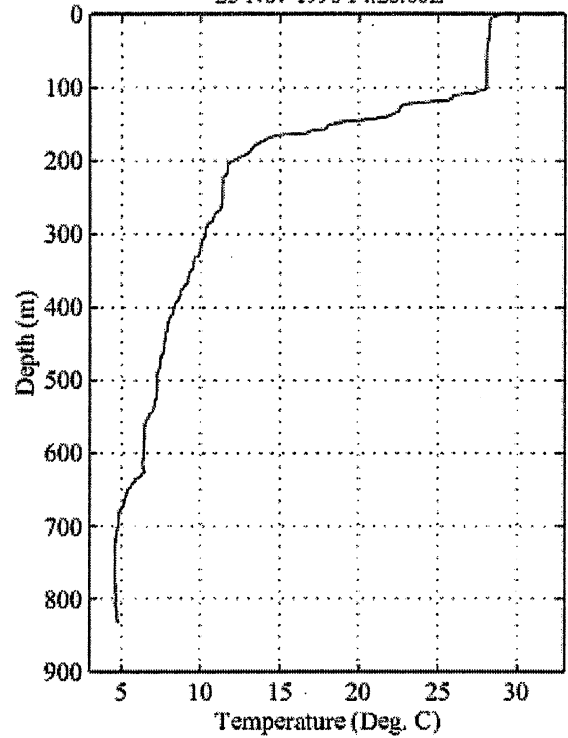
22-Nov-1998 14:27:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 028

Lat. 3.445 N Long. 47.022 W

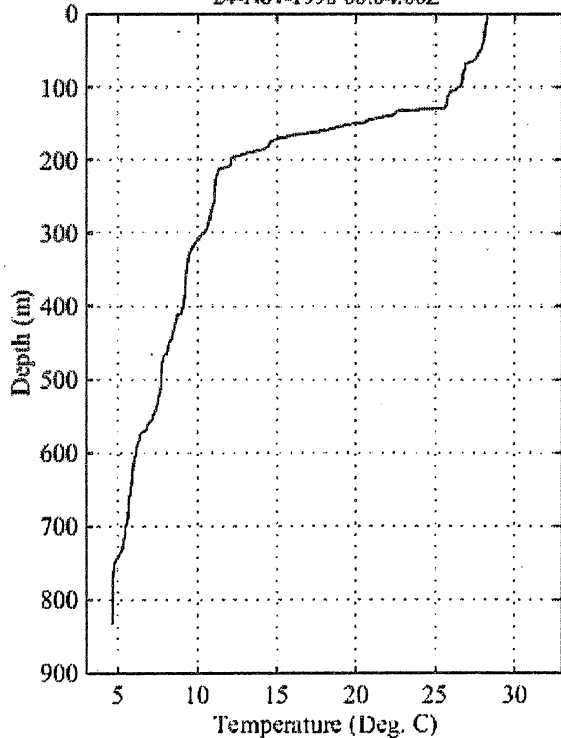
23-Nov-1998 14:28:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 029

Lat. 2.332 N Long. 47.468 W

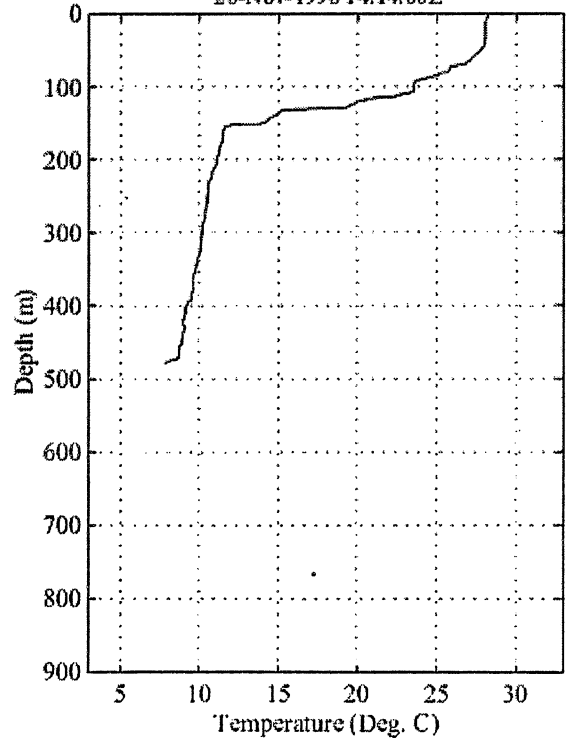
24-Nov-1998 06:04:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 030

Lat. 2.302 N Long. 47.488 W

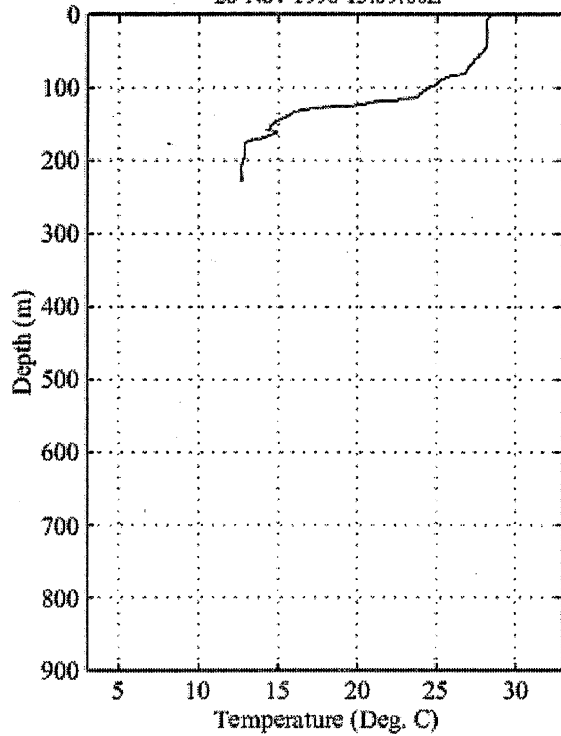
28-Nov-1998 14:14:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 031

Lat. 2.460 N Long. 47.425 W

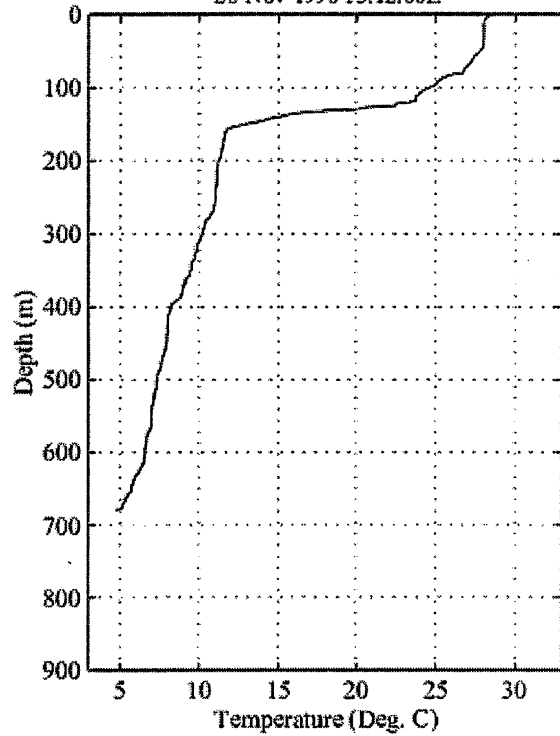
28-Nov-1998 15:09:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 032

Lat. 2.472 N Long. 47.420 W

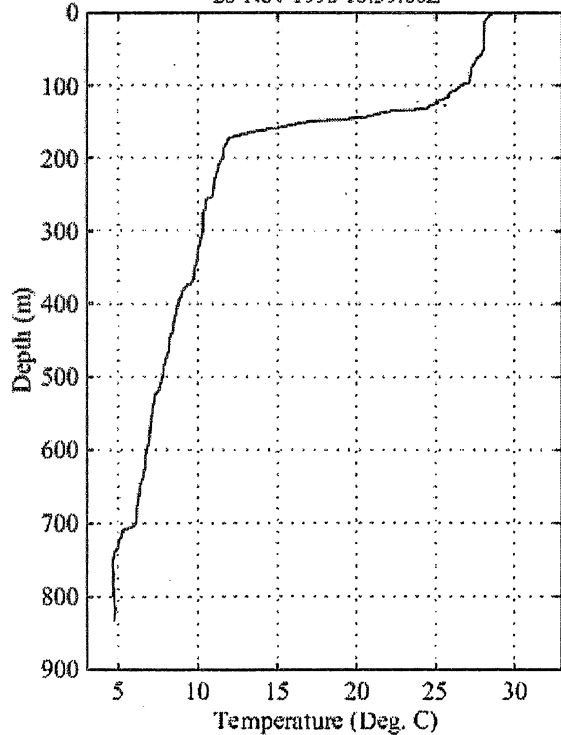
28-Nov-1998 15:12:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 033

Lat. 2.797 N Long. 47.293 W

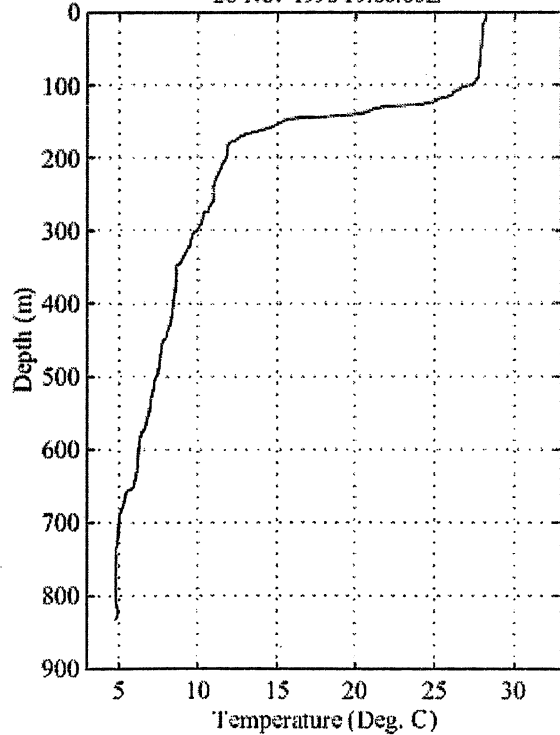
28-Nov-1998 16:39:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 034

Lat. 3.177 N Long. 47.143 W

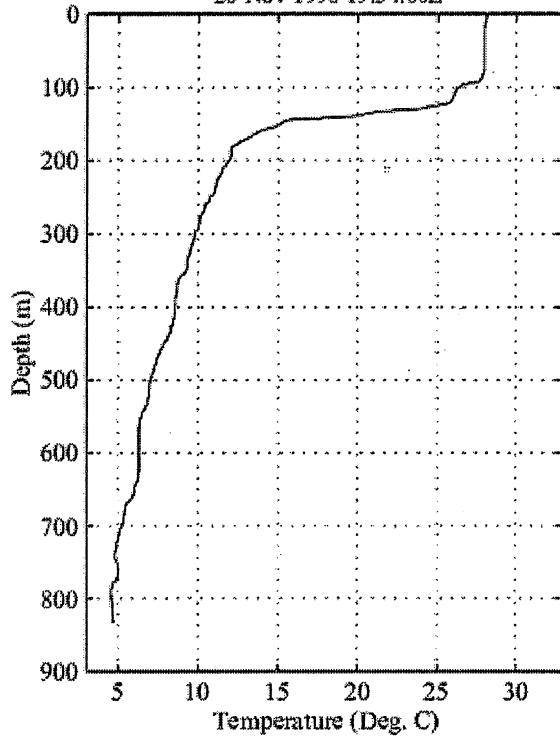
28-Nov-1998 19:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 035

Lat. 3.342 N Long. 47.077 W

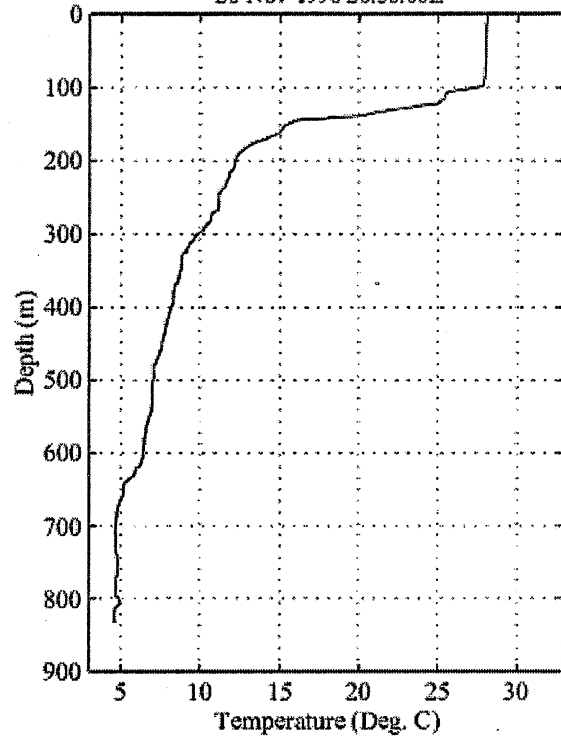
28-Nov-1998 19:54:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 036

Lat. 3.528 N Long. 47.005 W

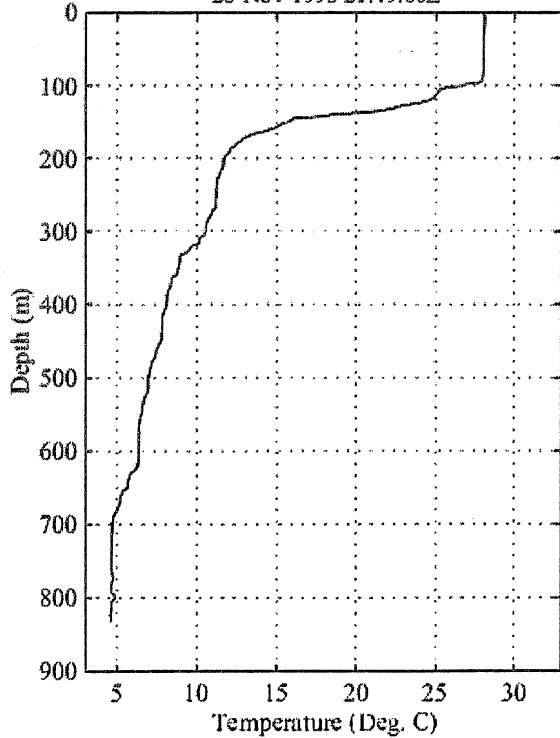
28-Nov-1998 20:56:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 037

Lat. 3.683 N Long. 46.955 W

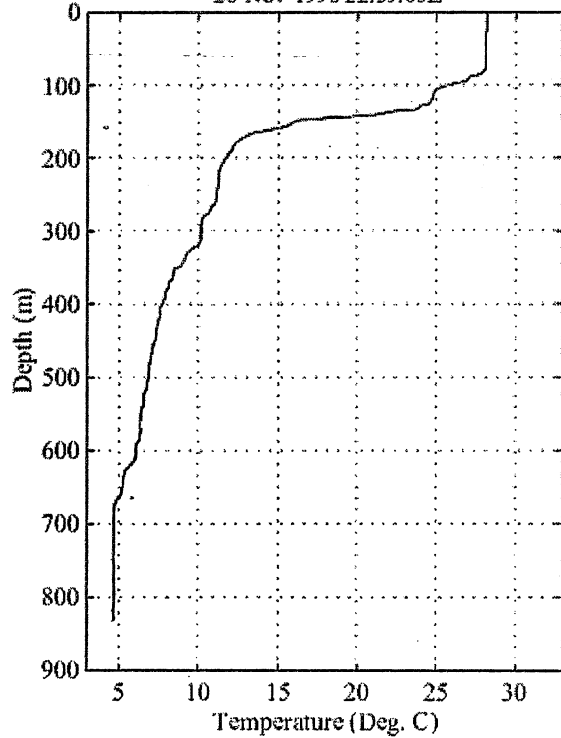
28-Nov-1998 21:49:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 038

Lat. 3.867 N Long. 47.092 W

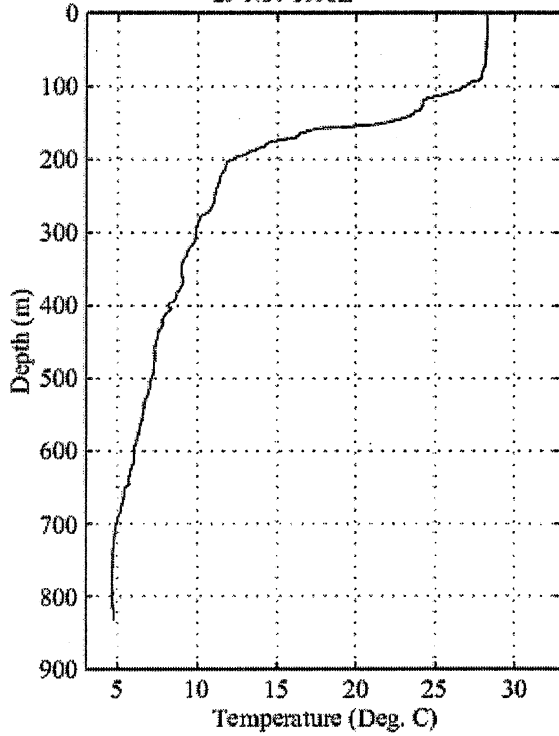
28-Nov-1998 22:59:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 039

Lat. 4.018 N Long. 47.207 W

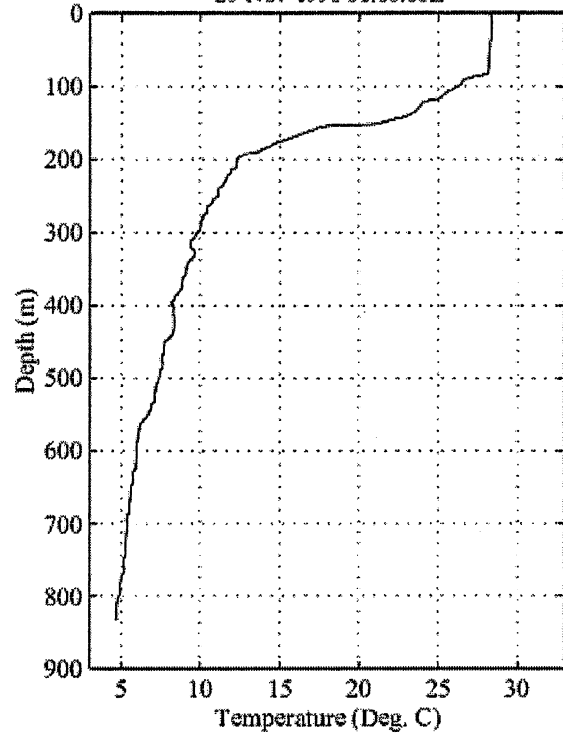
29-Nov-1998Z



NBC-I R/V SEWARD JOHNSON XBT Drop 040

Lat. 4.153 N Long. 47.333 W

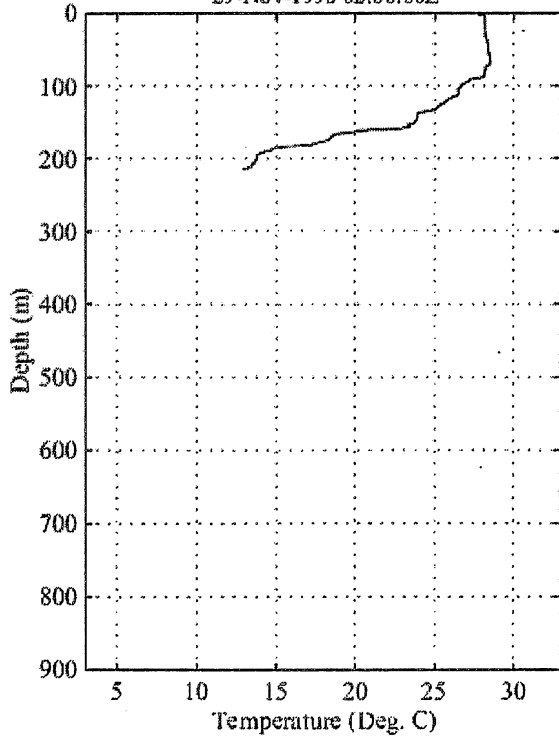
29-Nov-1998 01:00:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 041

Lat. 4.280 N Long. 47.477 W

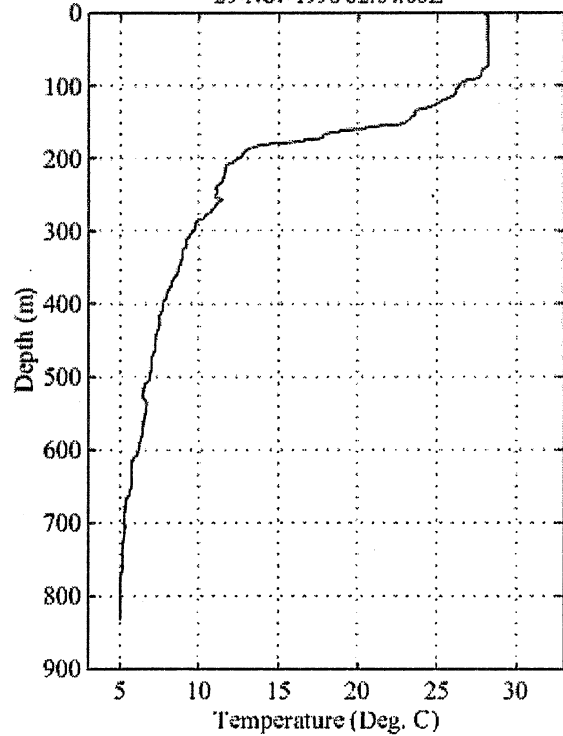
29-Nov-1998 02:00:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 042

Lat. 4.288 N Long. 47.485 W

29-Nov-1998 02:04:00Z

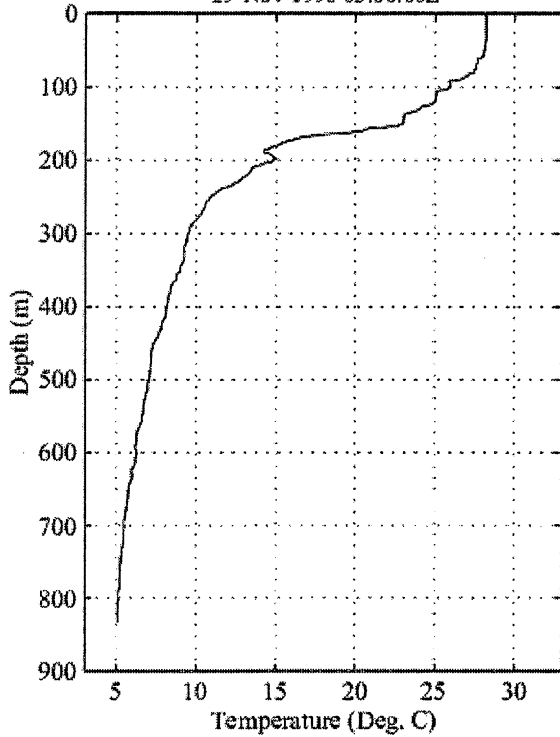




NBC-1 R/V SEWARD JOHNSON XBT Drop 043

Lat. 4.418 N Long. 47.592 W

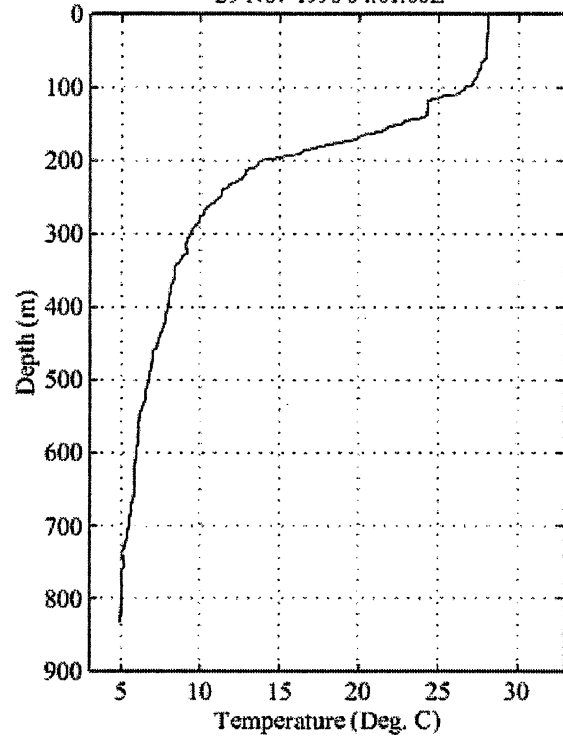
29-Nov-1998 03:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 044

Lat. 4.557 N Long. 47.718 W

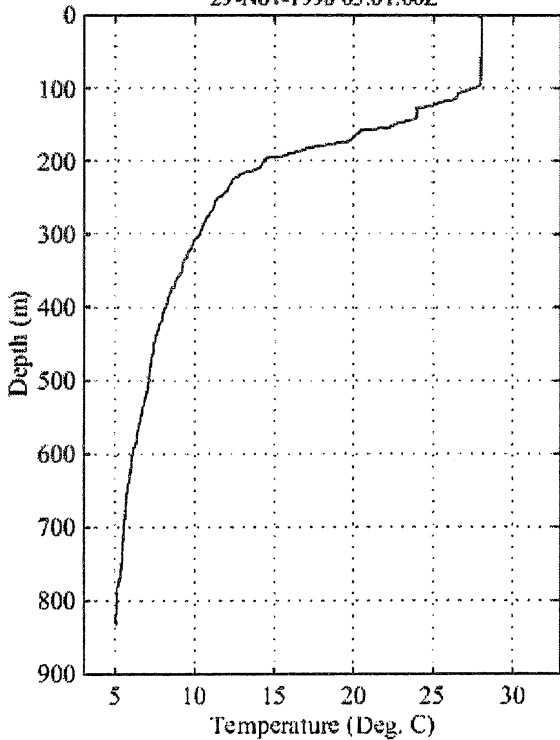
29-Nov-1998 04:01:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 045

Lat. 4.682 N Long. 47.858 W

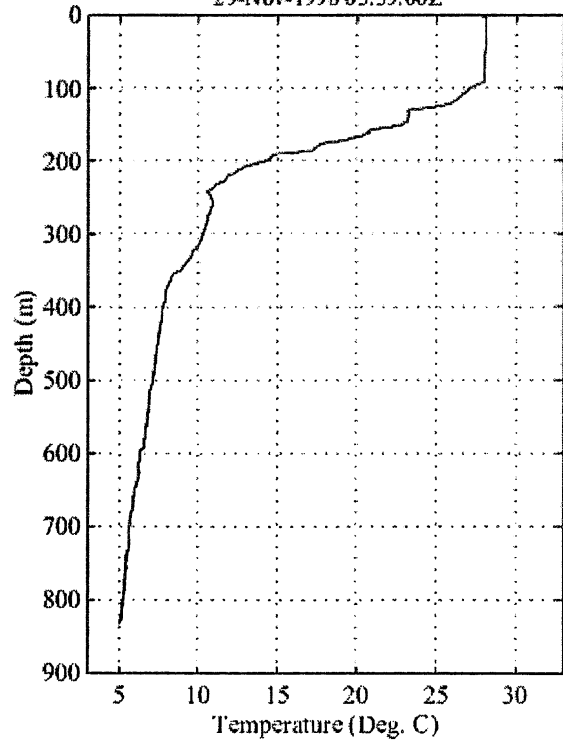
29-Nov-1998 05:01:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 046

Lat. 4.818 N Long. 47.982 W

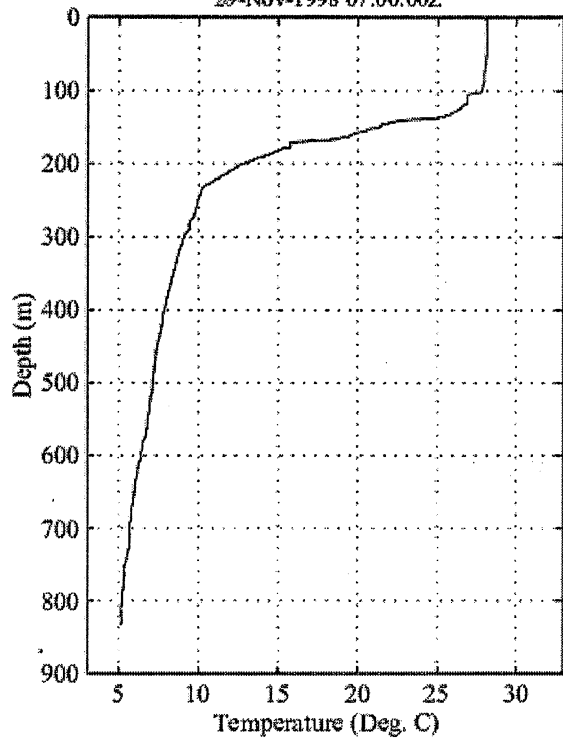
29-Nov-1998 05:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 047

Lat. 4.965 N Long. 48.113 W

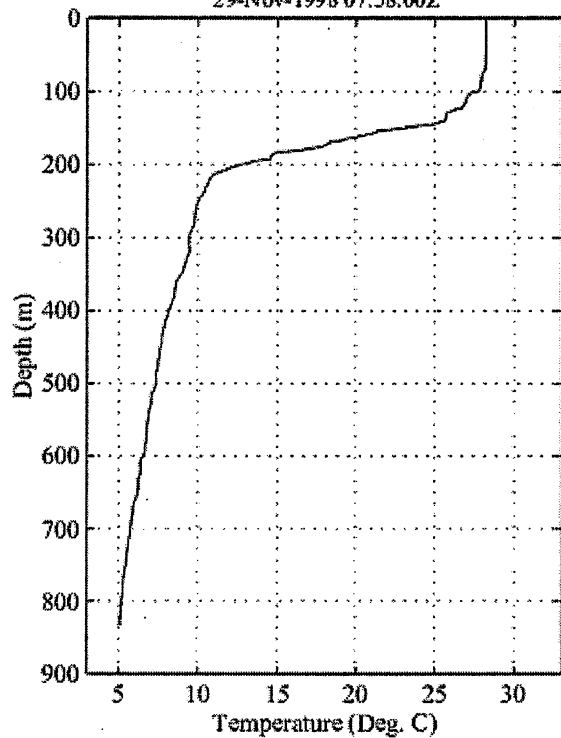
29-Nov-1998 07:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 048

Lat. 5.103 N Long. 48.240 W

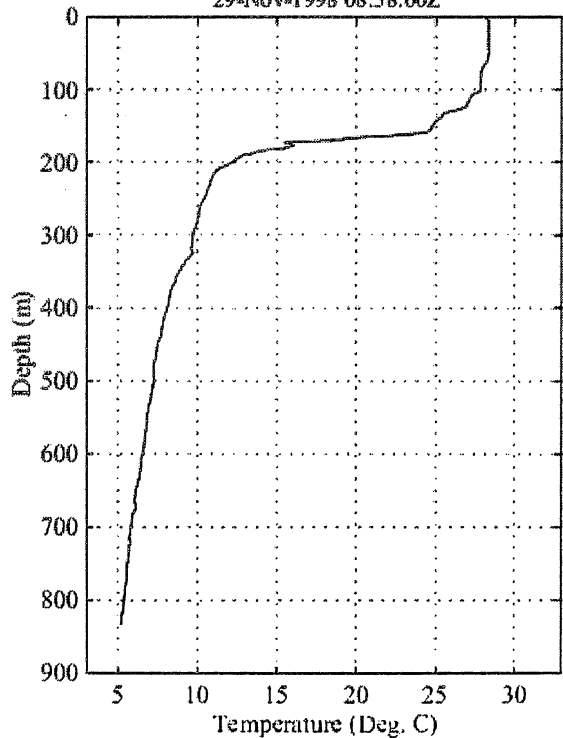
29-Nov-1998 07:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 049

Lat. 5.247 N Long. 48.367 W

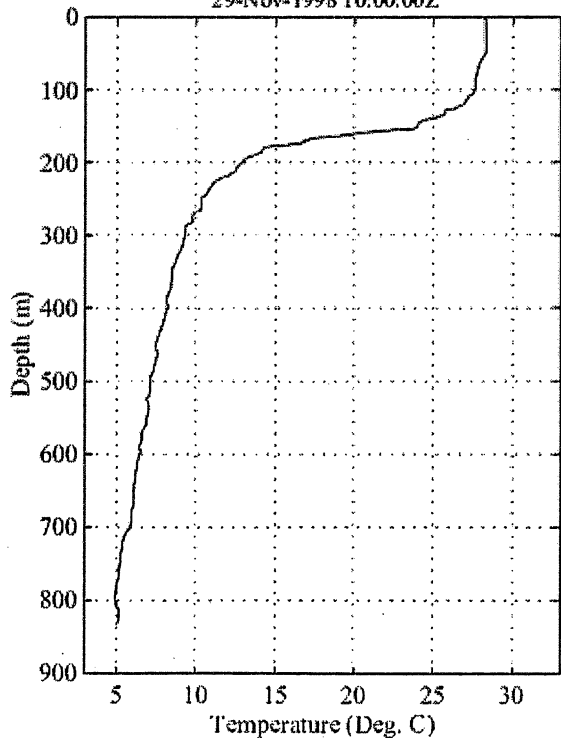
29-Nov-1998 08:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 050

Lat. 5.393 N Long. 48.500 W

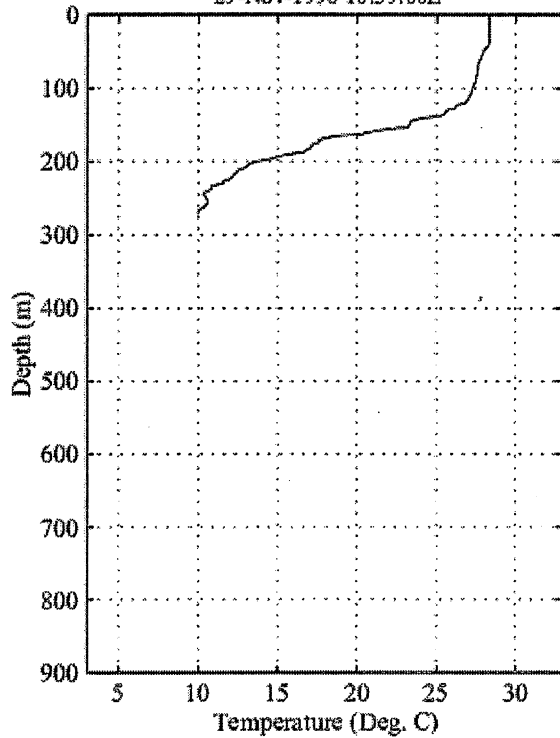
29-Nov-1998 10:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 051

Lat. 5.535 N Long. 48.627 W

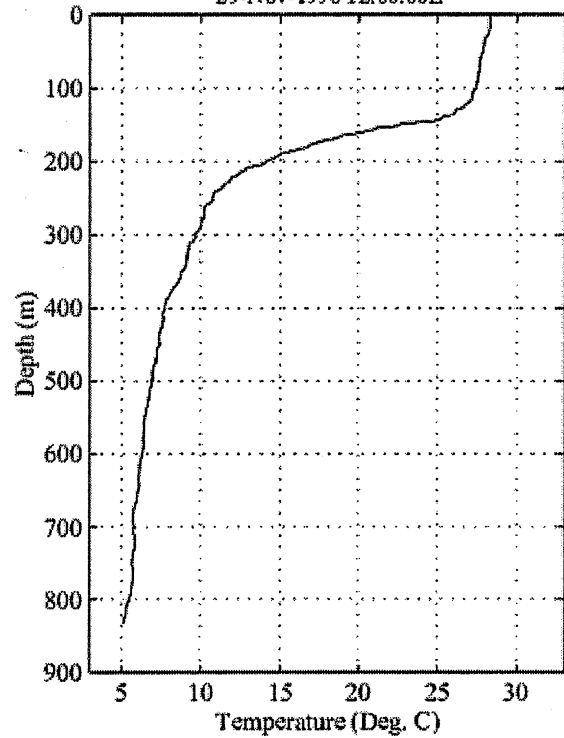
29-Nov-1998 10:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 052

Lat. 5.677 N Long. 48.755 W

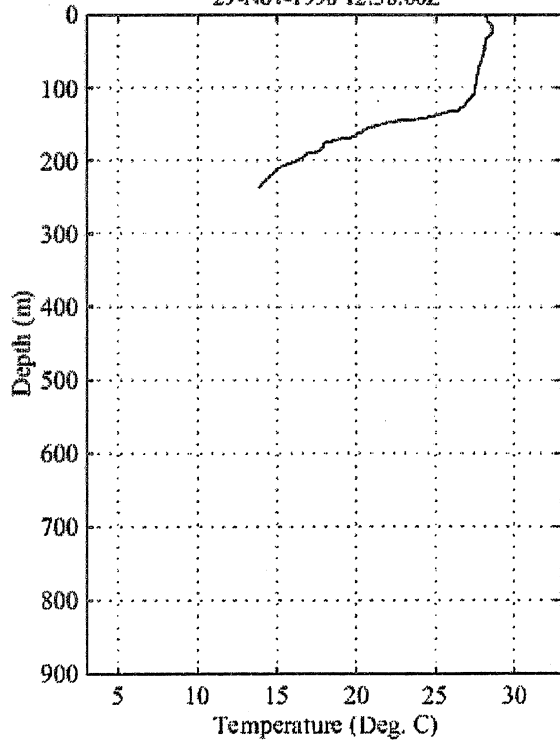
29-Nov-1998 12:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 053

Lat. 5.815 N Long. 48.882 W

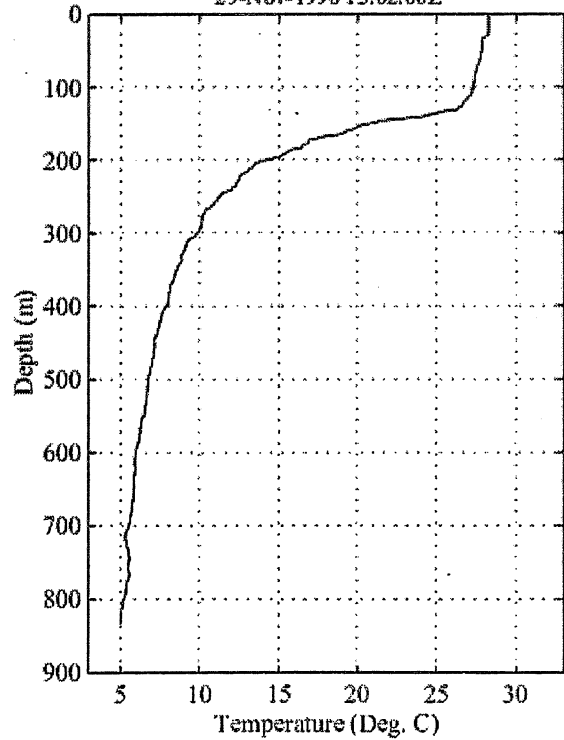
29-Nov-1998 12:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 054

Lat. 5.823 N Long. 48.890 W

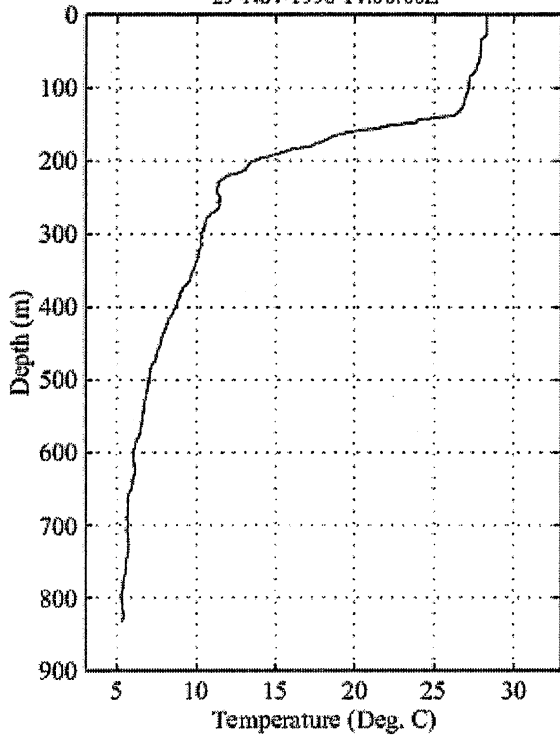
29-Nov-1998 13:02:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 055

Lat. 5.963 N Long. 49.013 W

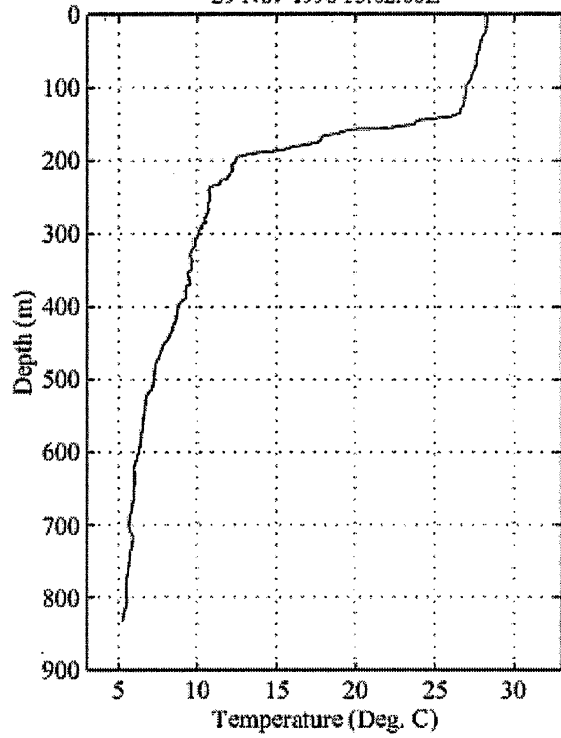
29-Nov-1998 14:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 056

Lat. 6.115 N Long. 49.152 W

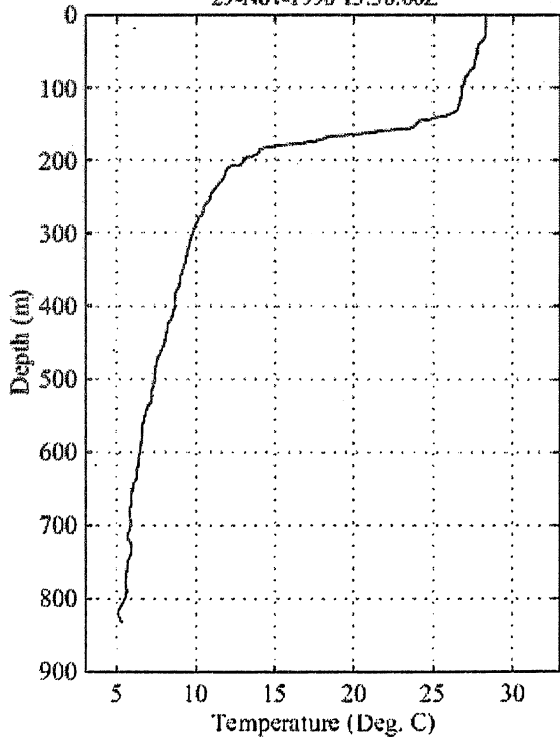
29-Nov-1998 15:02:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 057

Lat. 6.253 N Long. 49.275 W

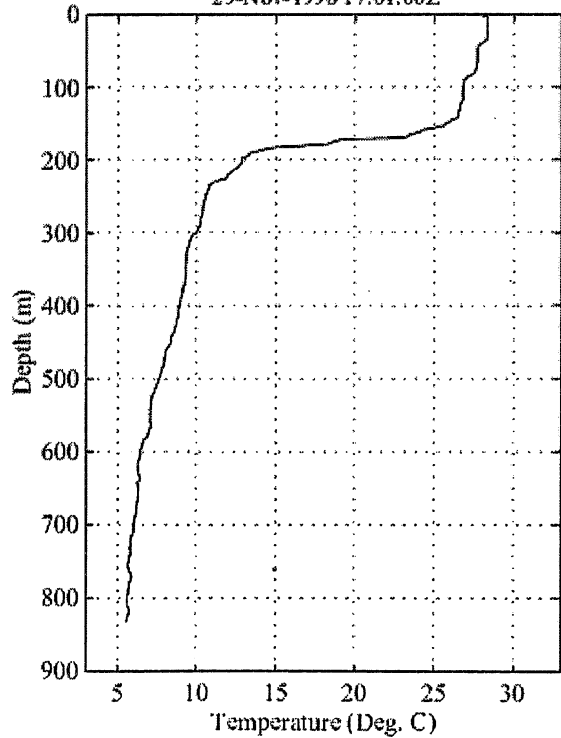
29-Nov-1998 15:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 058

Lat. 6.387 N Long. 49.400 W

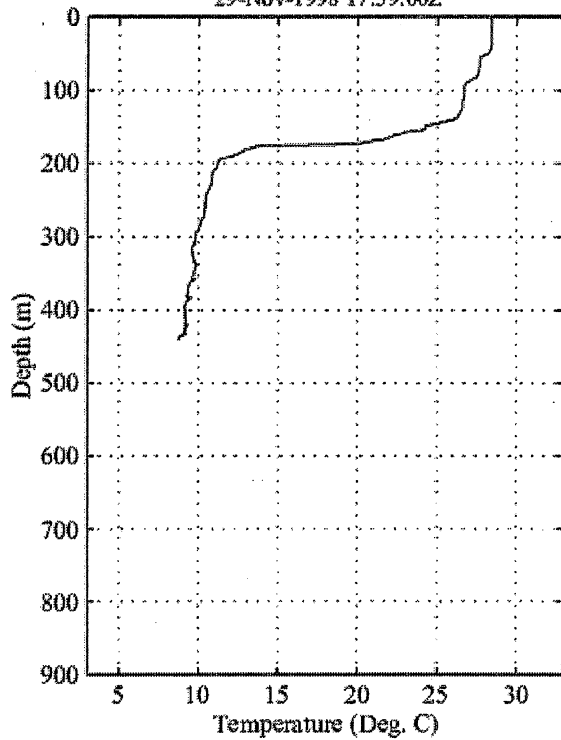
29-Nov-1998 17:01:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 059

Lat. 6.528 N Long. 49.528 W

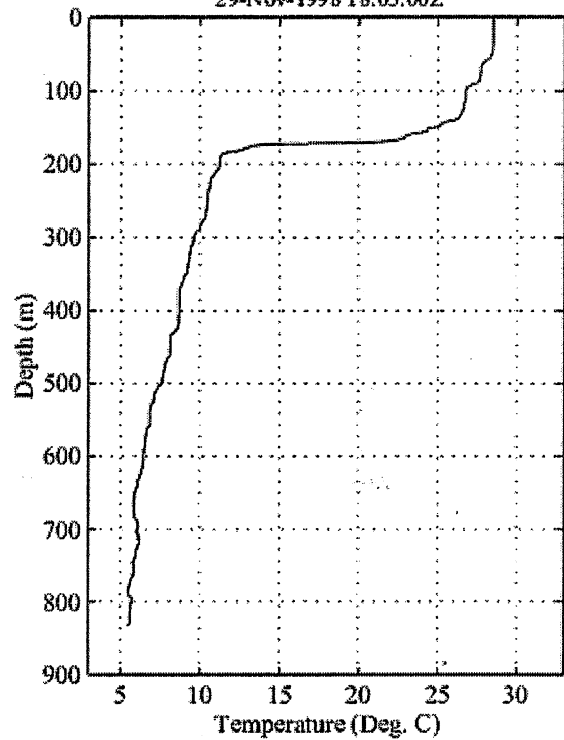
29-Nov-1998 17:59:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 060

Lat. 6.537 N Long. 49.537 W

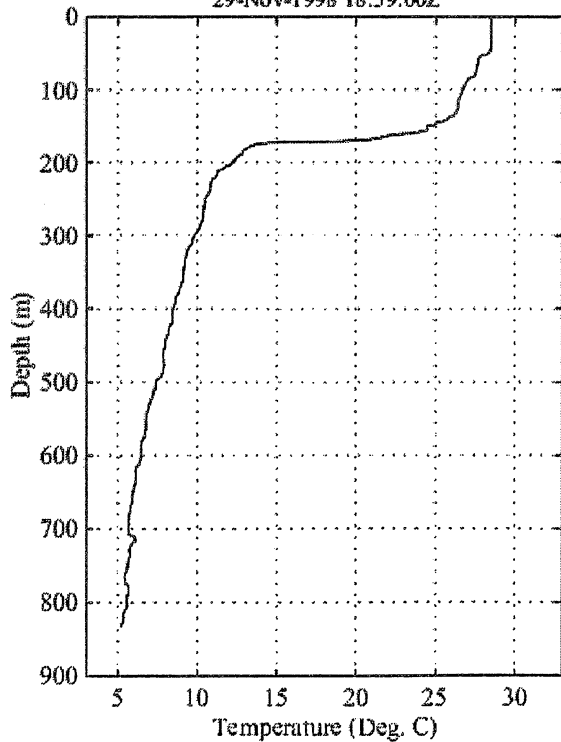
29-Nov-1998 18:03:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 061

Lat. 6.675 N Long. 49.665 W

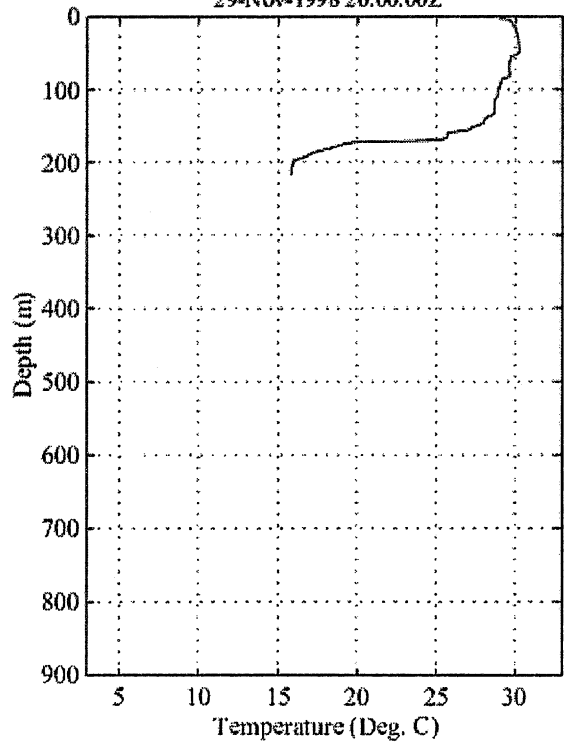
29-Nov-1998 18:59:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 062

Lat. 6.825 N Long. 49.798 W

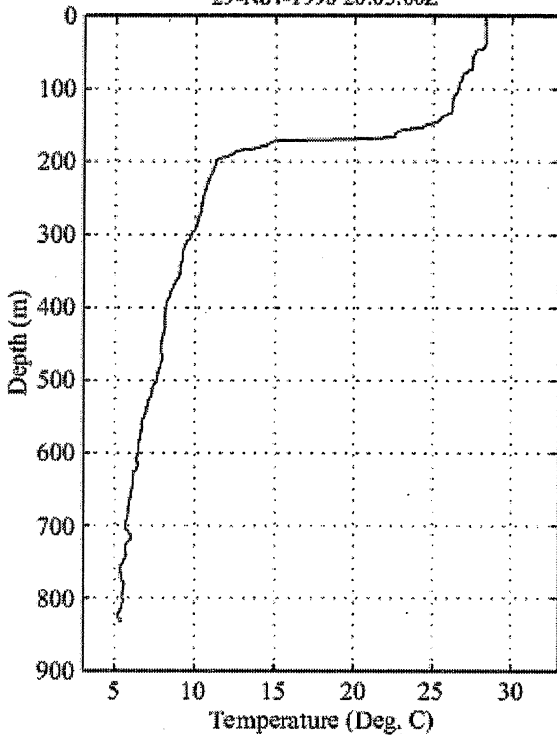
29-Nov-1998 20:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 063

Lat. 6.832 N Long. 49.805 W

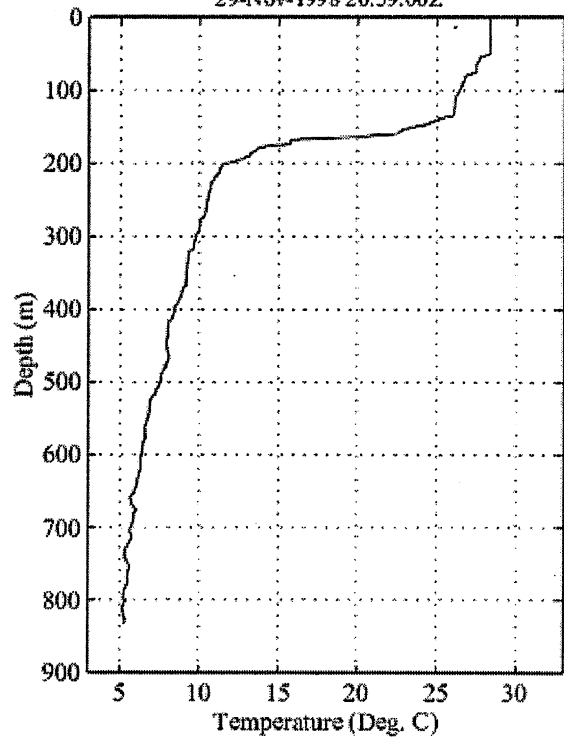
29-Nov-1998 20:03:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 064

Lat. 6.970 N Long. 49.925 W

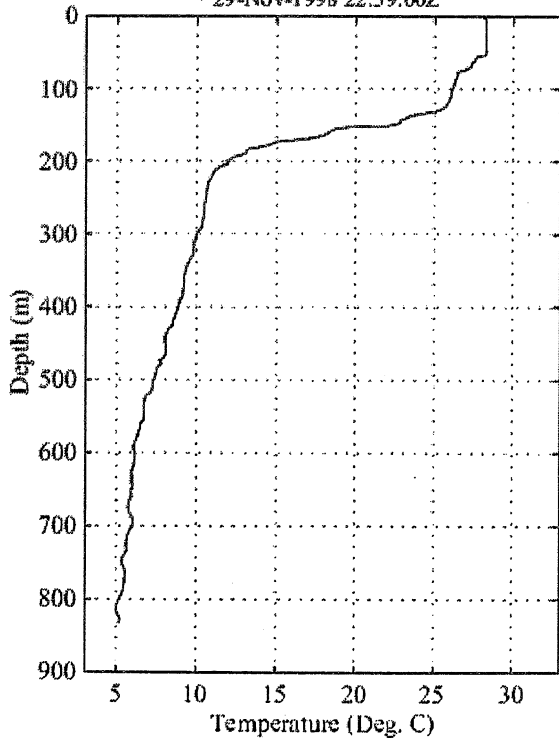
29-Nov-1998 20:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 066

Lat. 7.253 N Long. 50.197 W

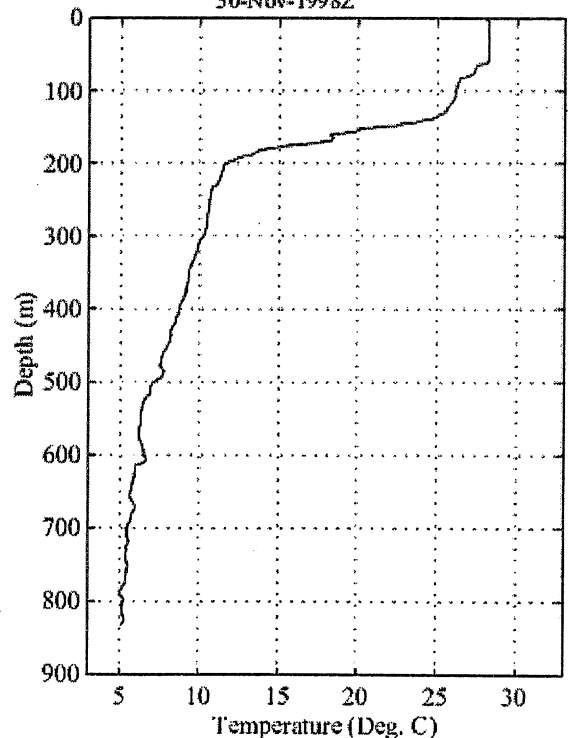
29-Nov-1998 22:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 067

Lat. 7.392 N Long. 50.335 W

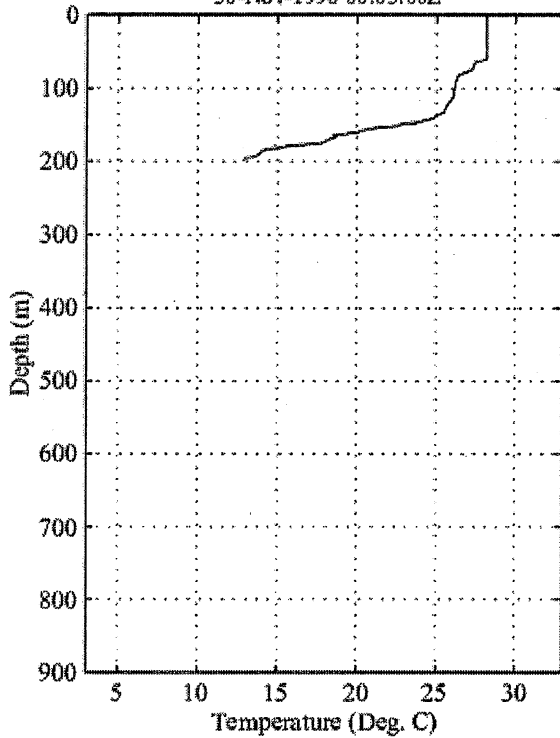
30-Nov-1998Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 068

Lat. 7.403 N Long. 50.347 W

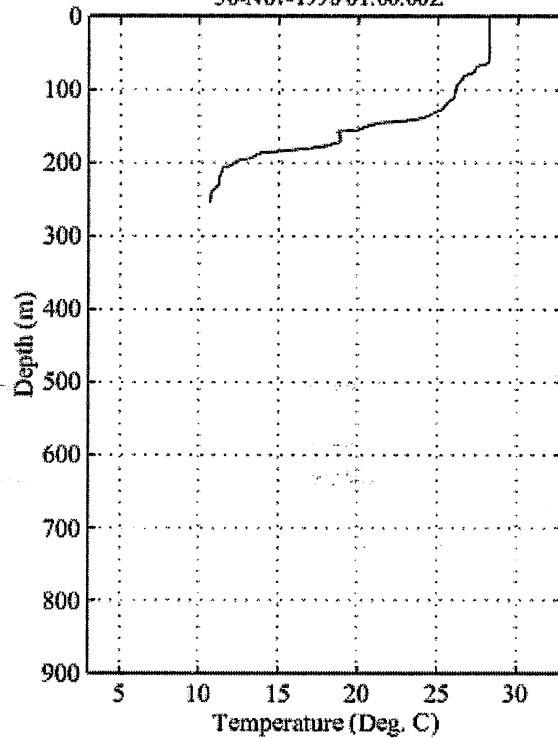
30-Nov-1998 00:05:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 069

Lat. 7.533 N Long. 50.470 W

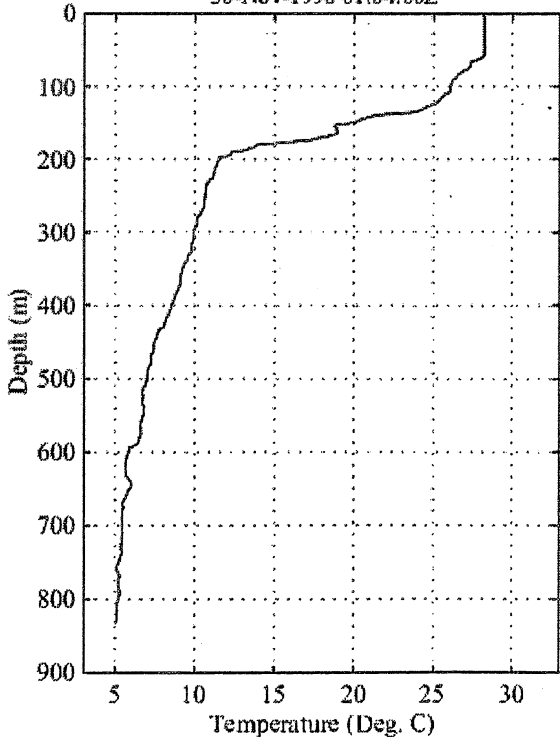
30-Nov-1998 01:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 070

Lat. 7.543 N Long. 50.478 W

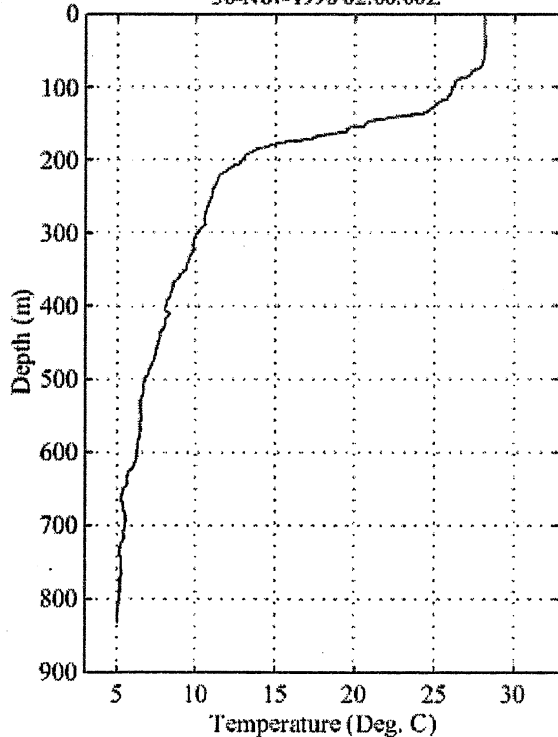
30-Nov-1998 01:04:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 071

Lat. 7.677 N Long. 50.603 W

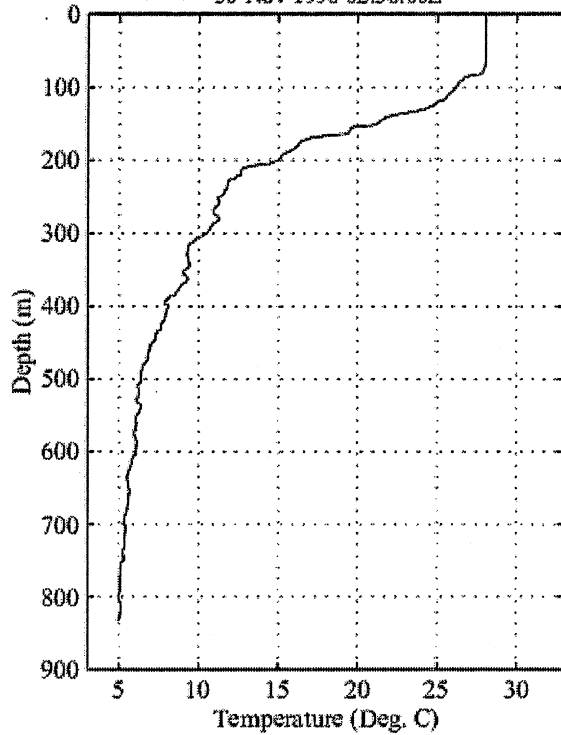
30-Nov-1998 02:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 072

Lat. 7.813 N Long. 50.732 W

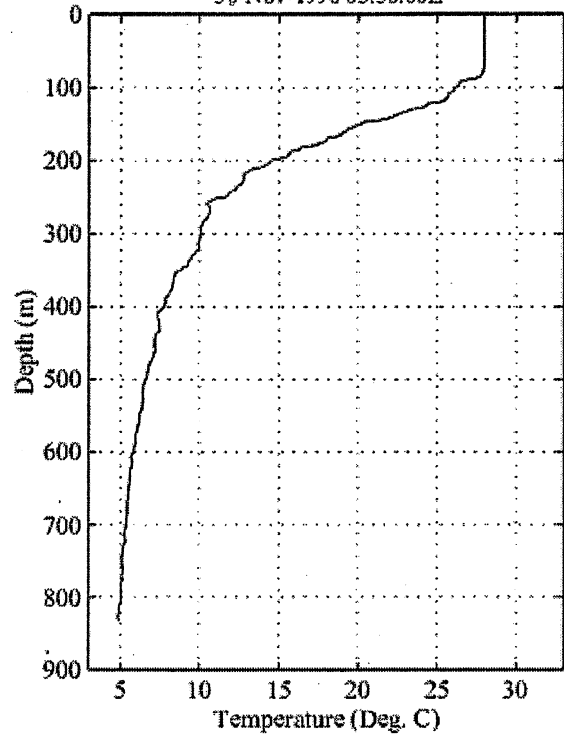
30-Nov-1998 02:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 073

Lat. 7.948 N Long. 50.858 W

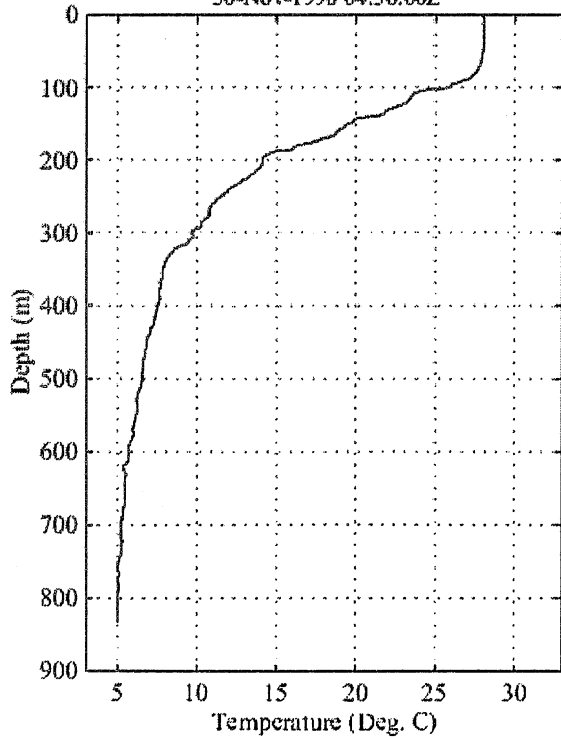
30-Nov-1998 03:56:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 074

Lat. 8.088 N Long. 50.992 W

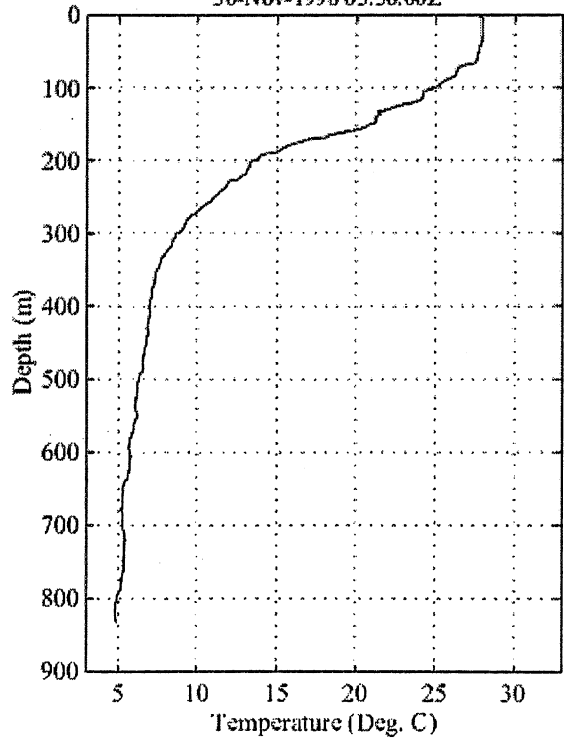
30-Nov-1998 04:56:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 075

Lat. 8.233 N Long. 51.128 W

30-Nov-1998 05:56:00Z

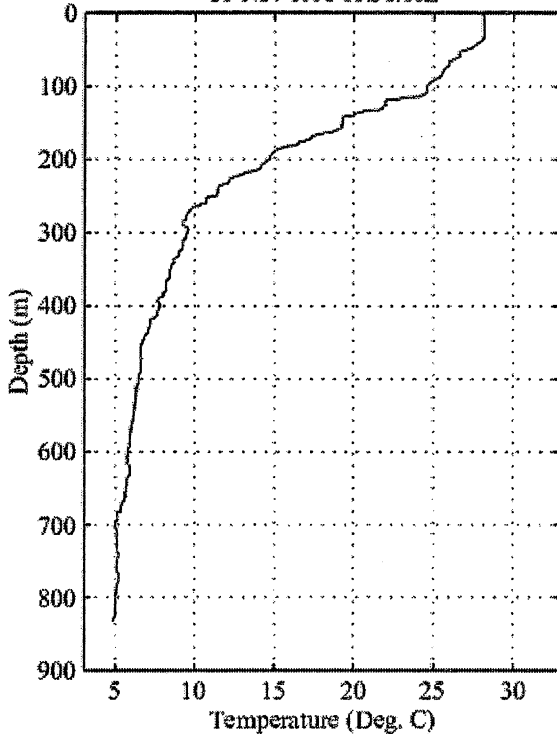




NBC-1 R/V SEWARD JOHNSON XBT Drop 076

Lat. 8.380 N Long. 51.263 W

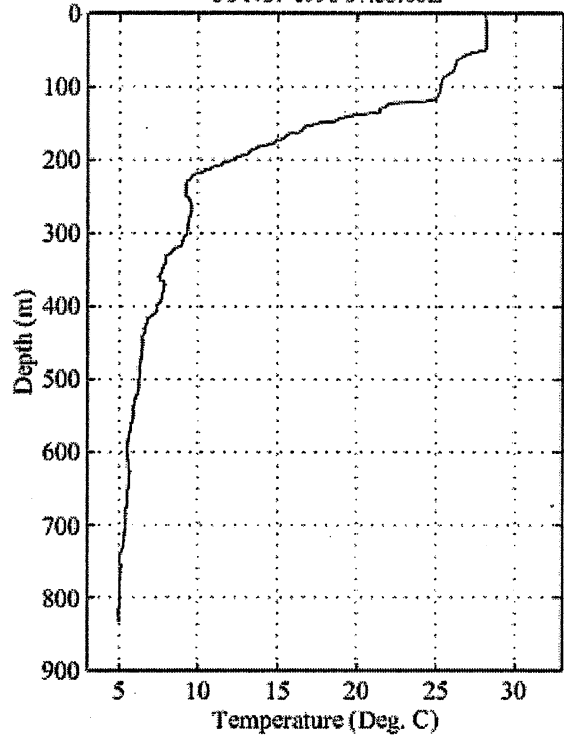
30-Nov-1998 06:56:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 077

Lat. 8.527 N Long. 51.397 W

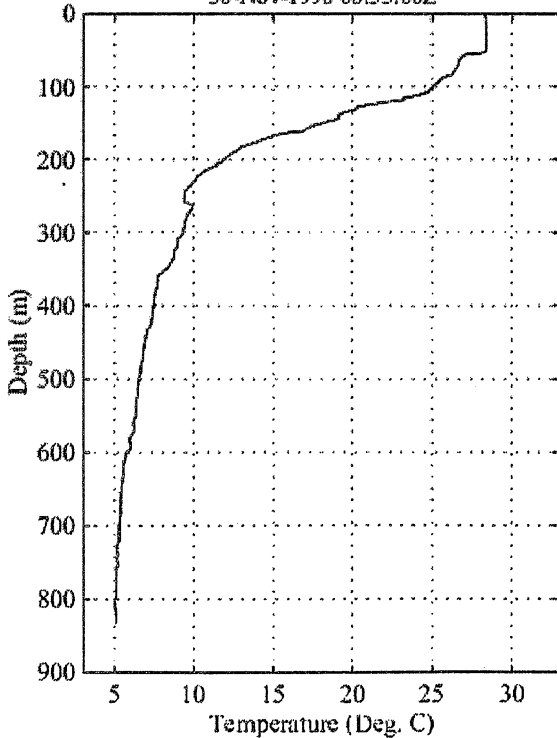
30-Nov-1998 07:55:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 078

Lat. 8.670 N Long. 51.528 W

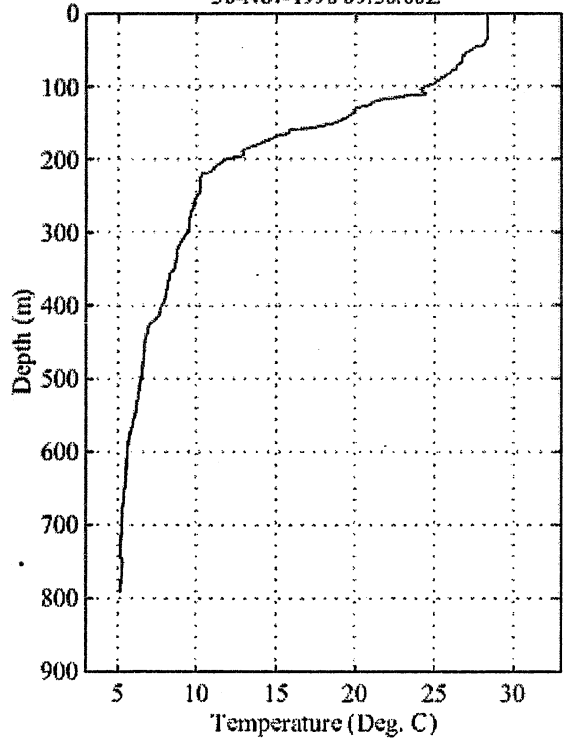
30-Nov-1998 08:55:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 079

Lat. 8.812 N Long. 51.657 W

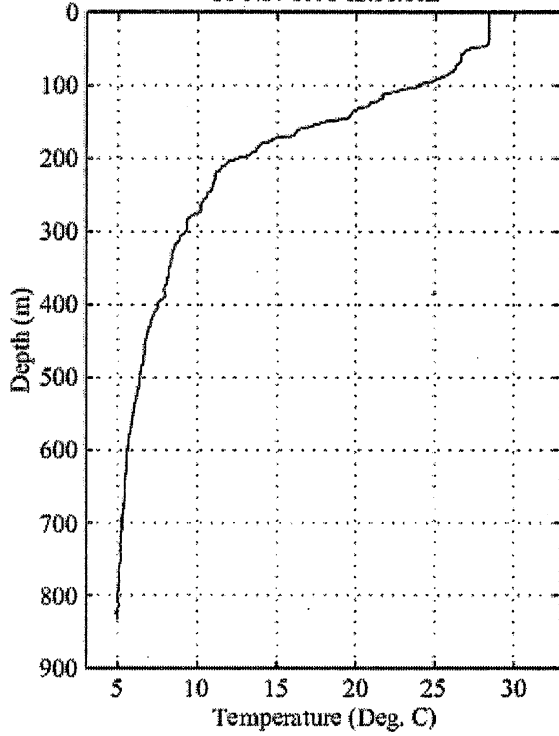
30-Nov-1998 09:56:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 080

Lat. 8.797 N Long. 51.368 W

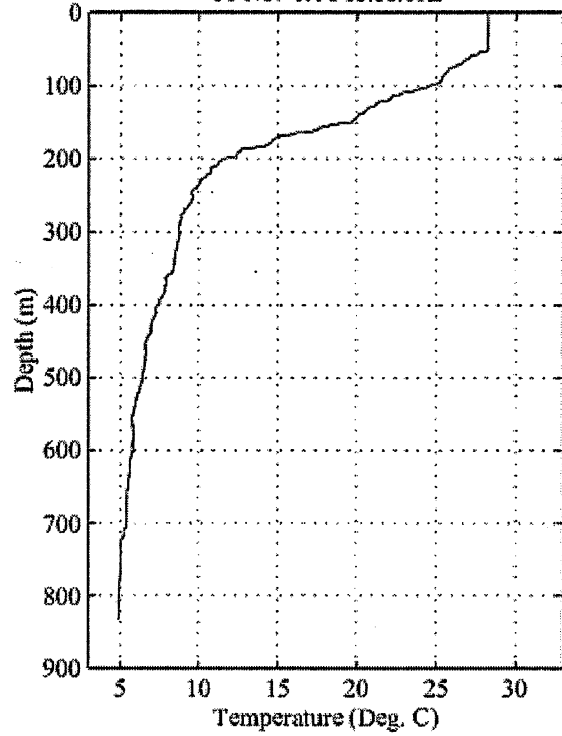
30-Nov-1998 12:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 081

Lat. 8.722 N Long. 51.015 W

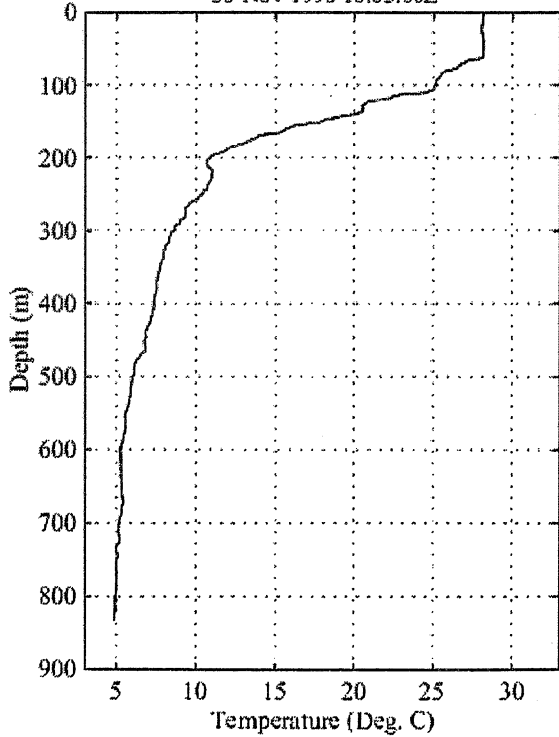
30-Nov-1998 13:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 082

Lat. 8.640 N Long. 50.630 W

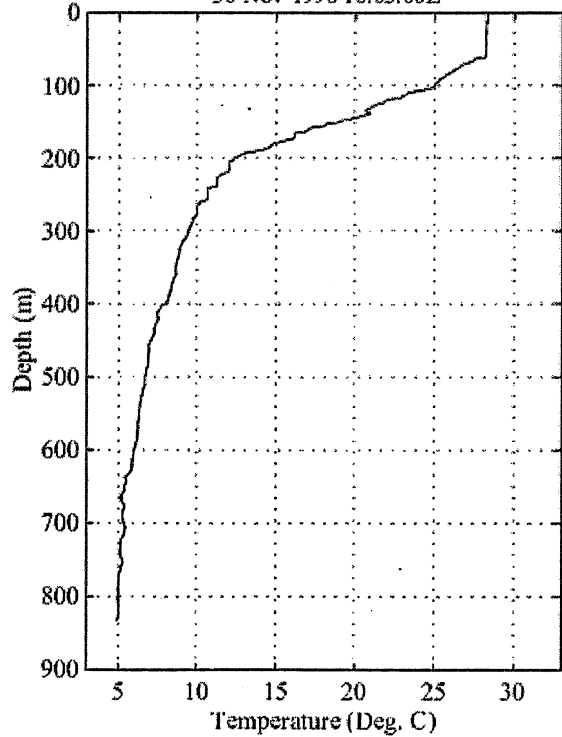
30-Nov-1998 16:03:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 083

Lat. 8.565 N Long. 50.258 W

30-Nov-1998 18:03:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 084

Lat. 8.487 N Long. 49.897 W

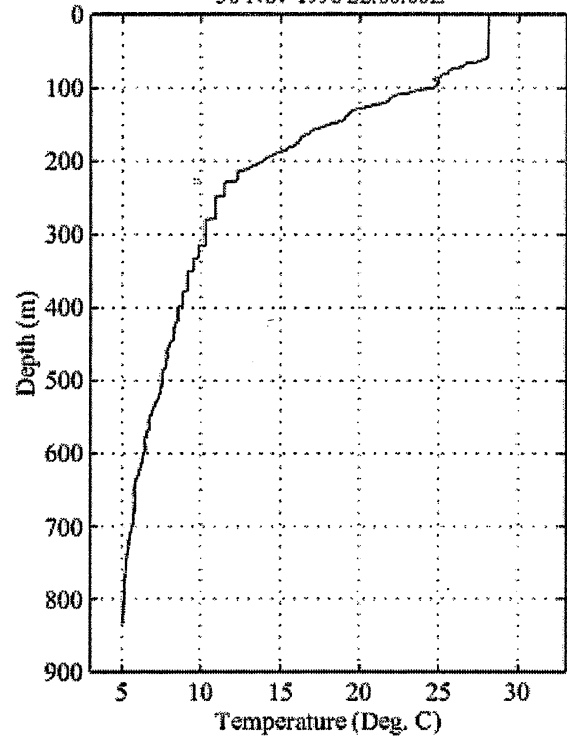
30-Nov-1998 19:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 085

Lat. 8.400 N Long. 49.522 W

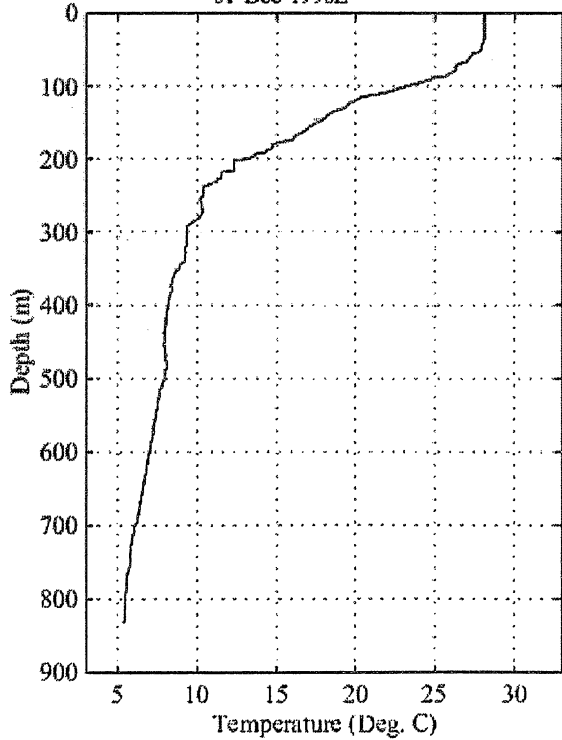
30-Nov-1998 22:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 086

Lat. 8.340 N Long. 49.153 W

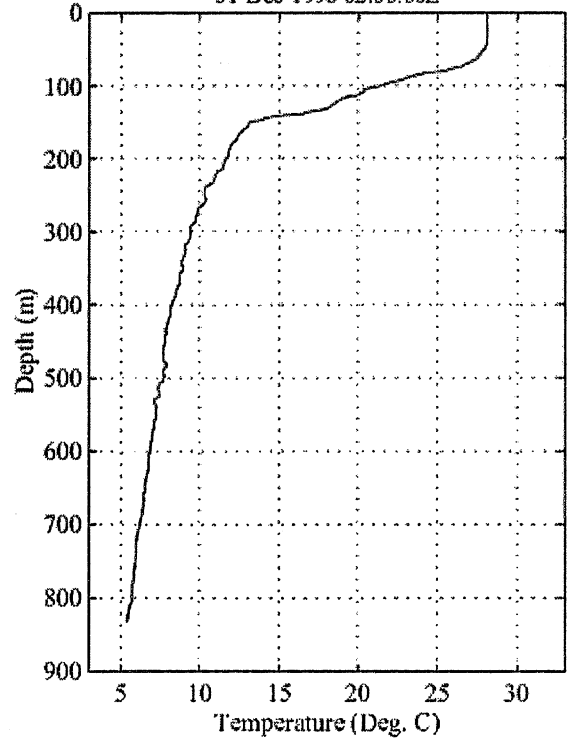
01-Dec-1998Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 087

Lat. 8.263 N Long. 48.787 W

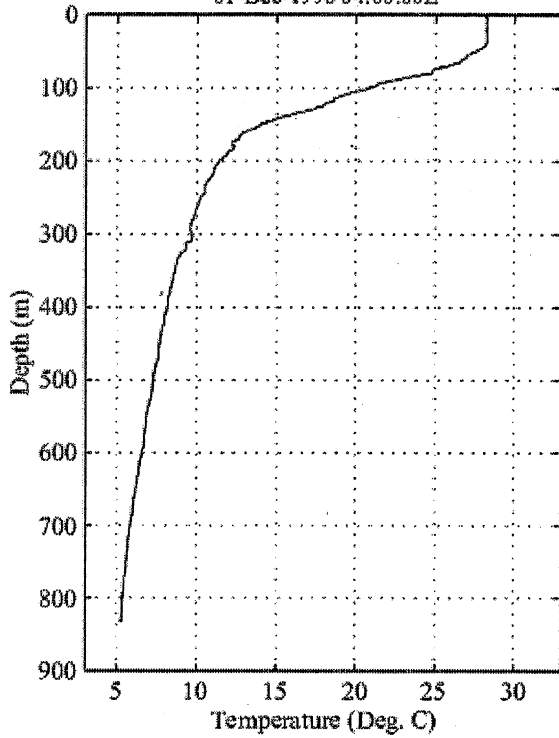
01-Dec-1998 02:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 088

Lat. 8.193 N Long. 48.438 W

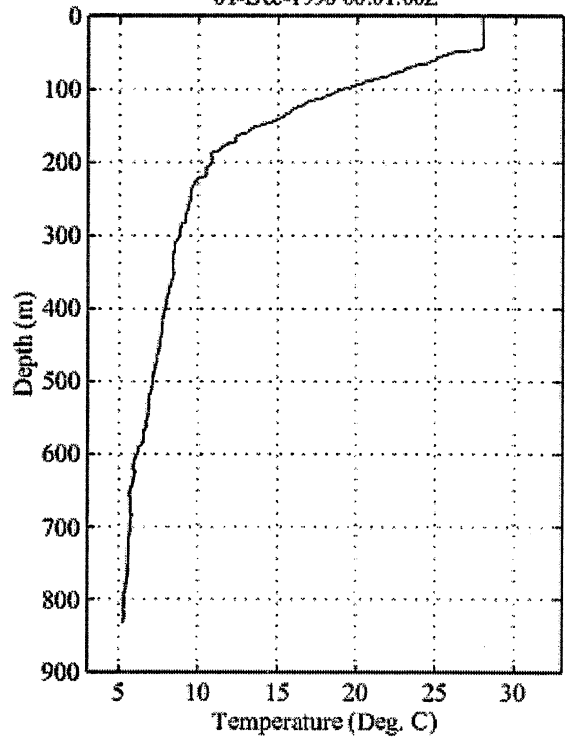
01-Dec-1998 04:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 089

Lat. 8.120 N Long. 48.092 W

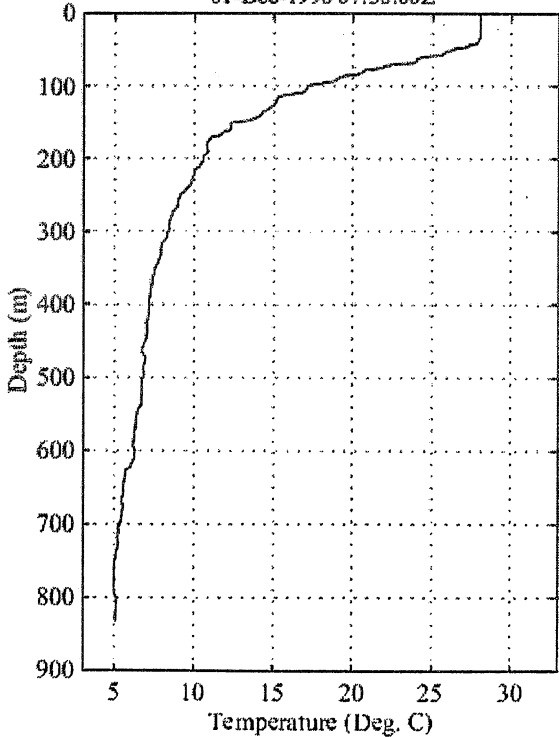
01-Dec-1998 06:01:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 090

Lat. 8.055 N Long. 47.770 W

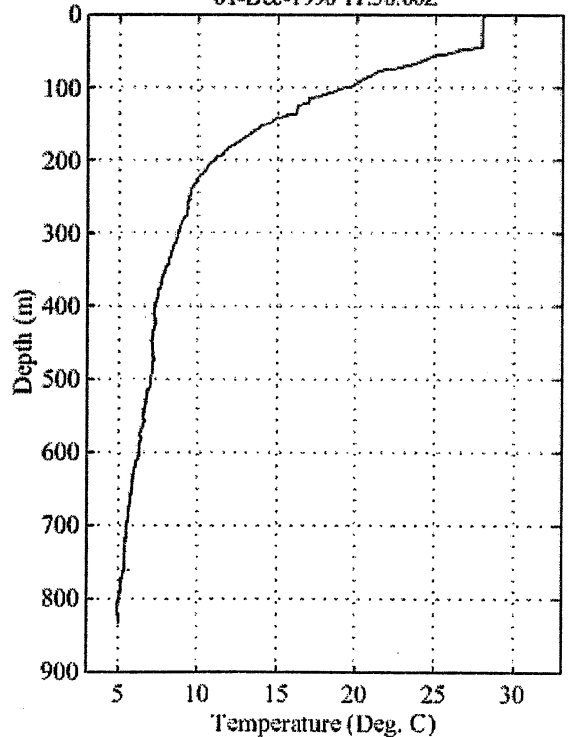
01-Dec-1998 07:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 091

Lat. 7.895 N Long. 47.787 W

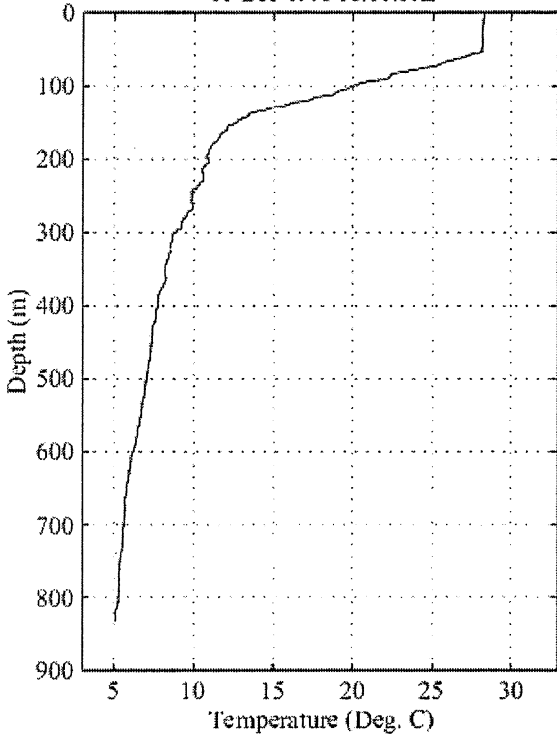
01-Dec-1998 11:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 092

Lat. 7.528 N Long. 48.170 W

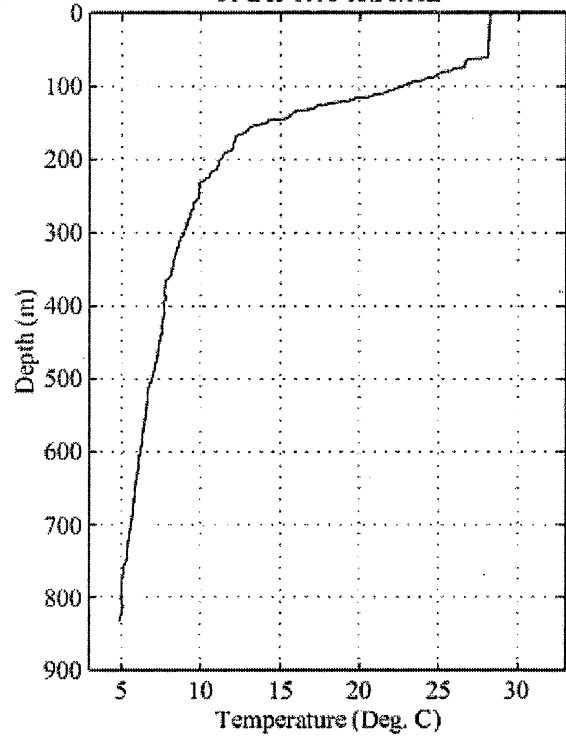
01-Dec-1998 16:01:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 093

Lat. 7.353 N Long. 48.308 W

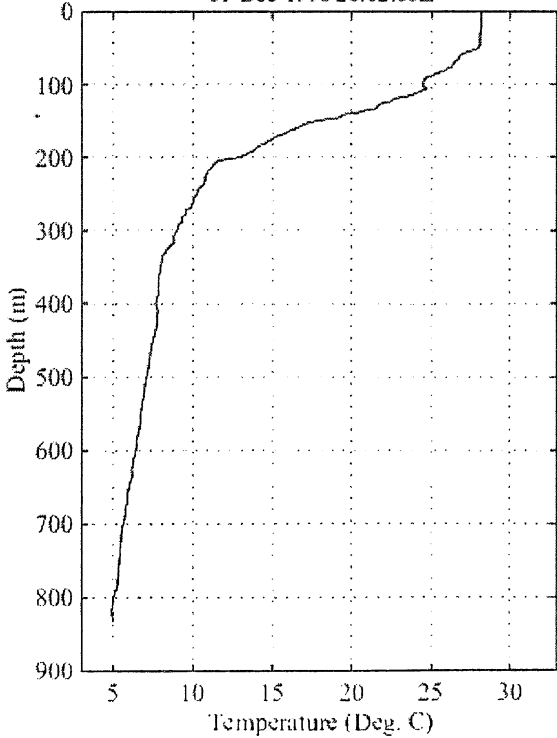
01-Dec-1998 18:58:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 094

Lat. 7.220 N Long. 48.438 W

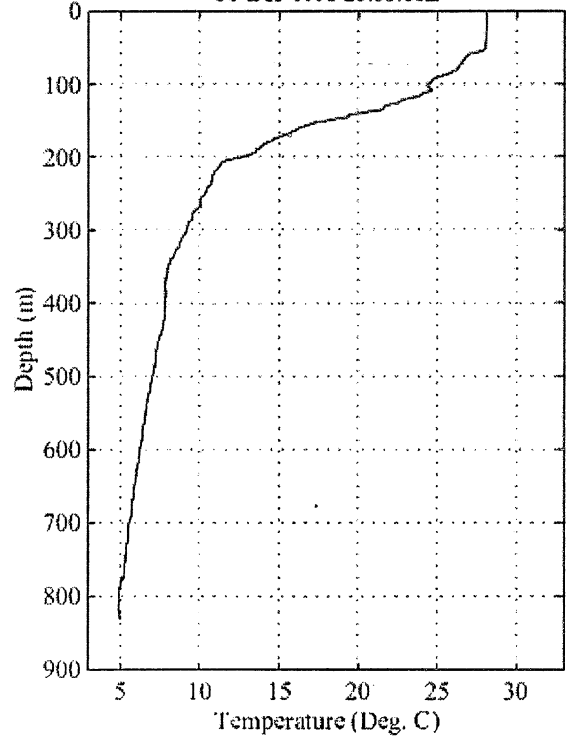
01-Dec-1998 20:02:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 095

Lat. 7.213 N Long. 48.447 W

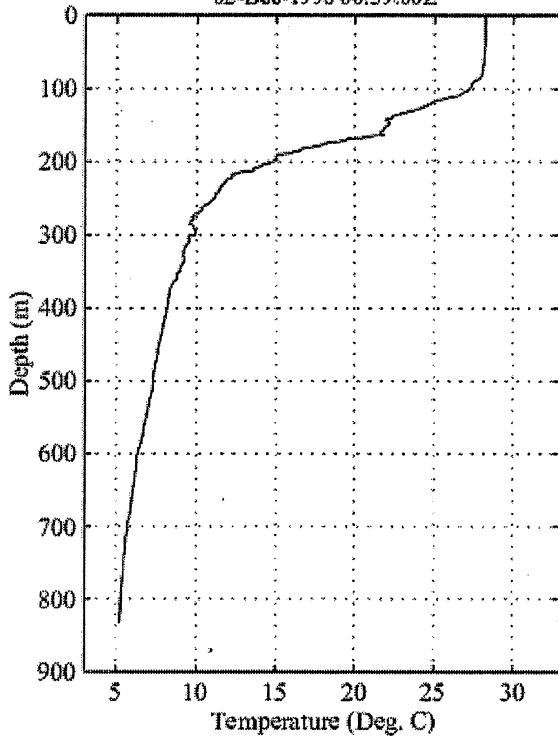
01-Dec-1998 20:05:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 096

Lat. 6.867 N Long. 48.843 W

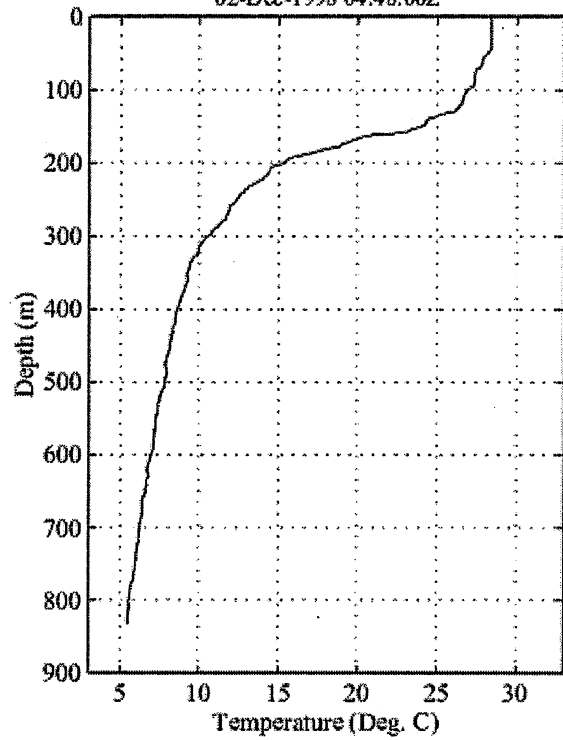
02-Dec-1998 00:39:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 097

Lat. 6.520 N Long. 49.217 W

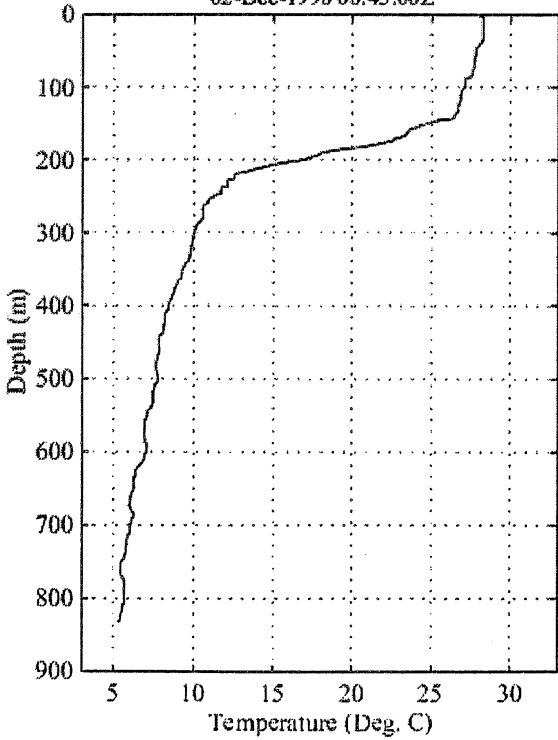
02-Dec-1998 04:48:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 098

Lat. 6.227 N Long. 49.548 W

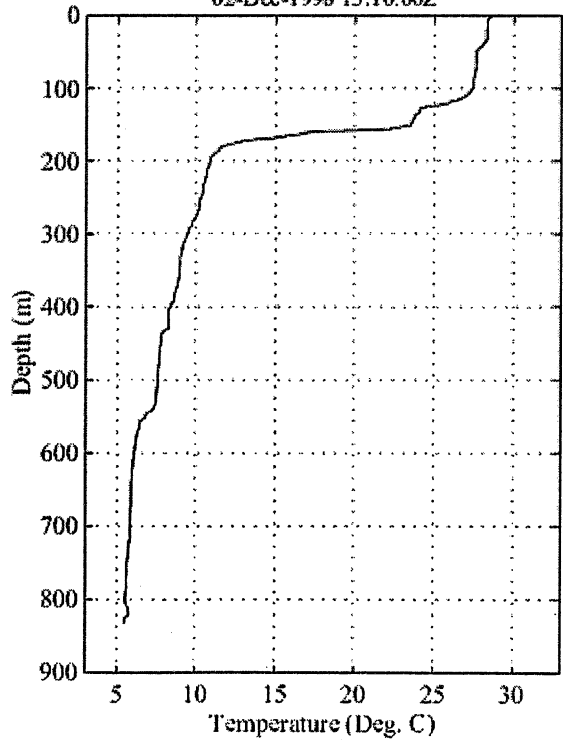
02-Dec-1998 08:43:00Z



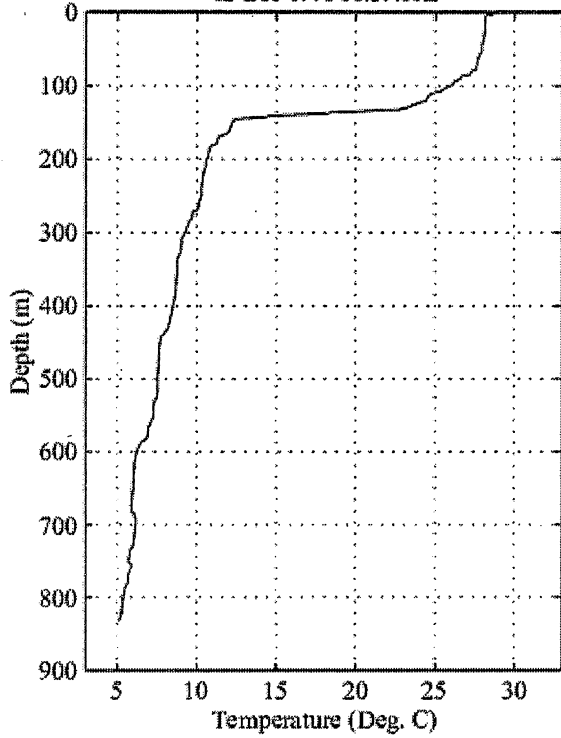
NBC-1 R/V SEWARD JOHNSON XBT Drop 099

Lat. 5.862 N Long. 49.945 W

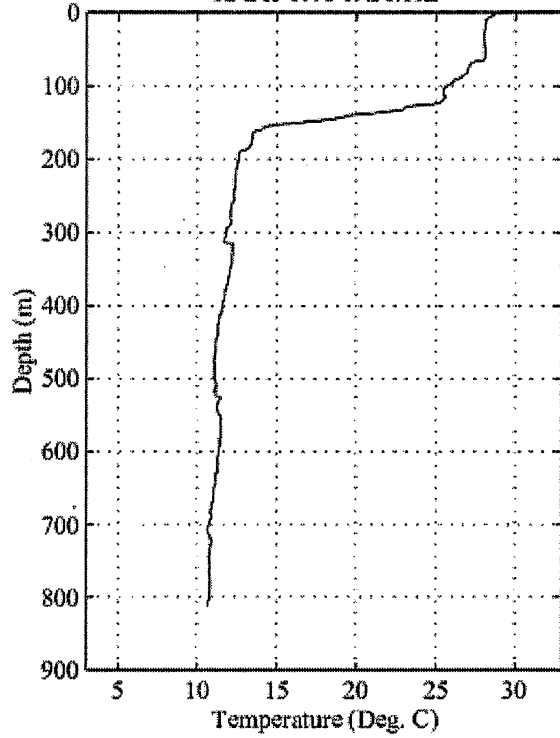
02-Dec-1998 13:10:00Z



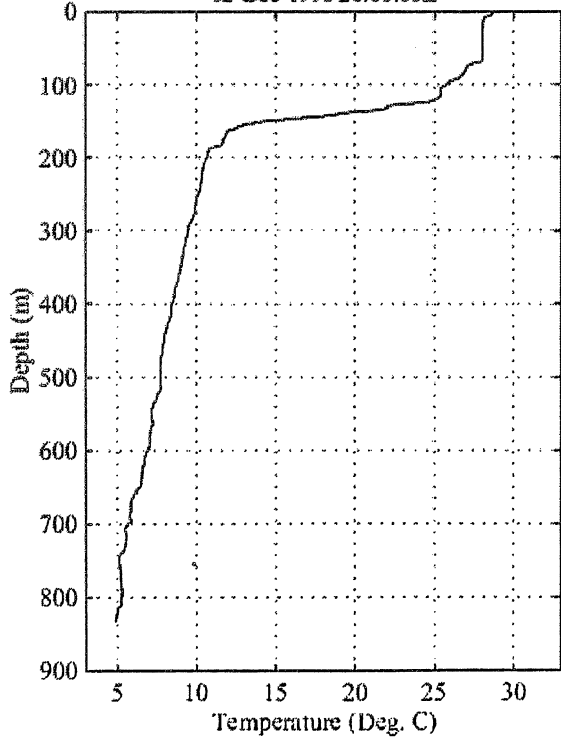
NBC-1 R/V SEWARD JOHNSON XBT Drop 100  
Lat. 5.628 N Long. 50.207 W  
02-Dec-1998 16:39:00Z



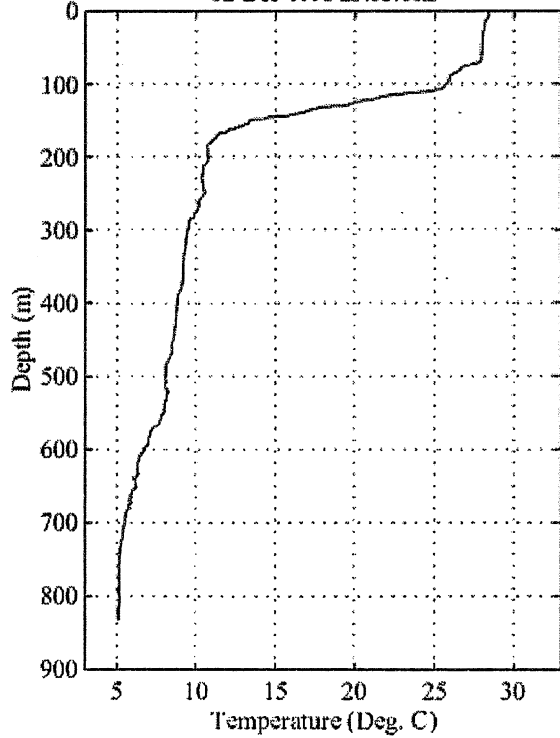
NBC-1 R/V SEWARD JOHNSON XBT Drop 101  
Lat. 5.445 N Long. 50.418 W  
02-Dec-1998 19:56:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 102  
Lat. 5.437 N Long. 50.425 W  
02-Dec-1998 20:00:00Z



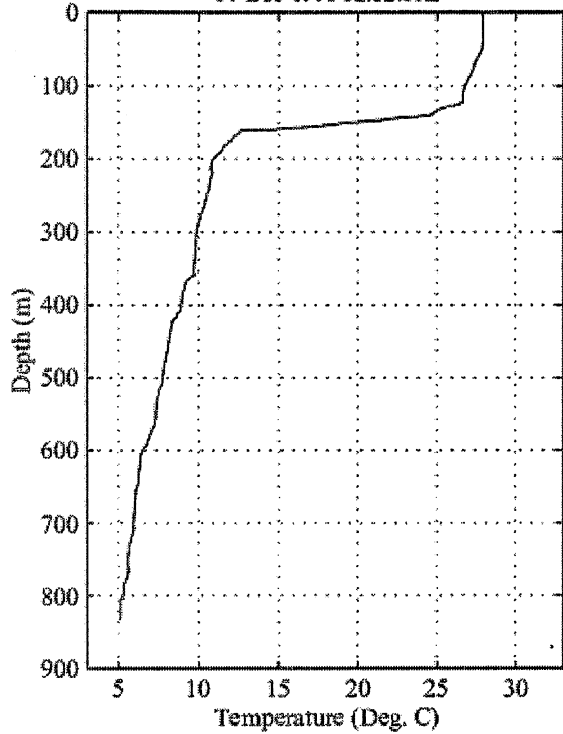
NBC-1 R/V SEWARD JOHNSON XBT Drop 103  
Lat. 5.320 N Long. 50.545 W  
02-Dec-1998 23:05:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 104

Lat. 3.490 N Long. 48.342 W

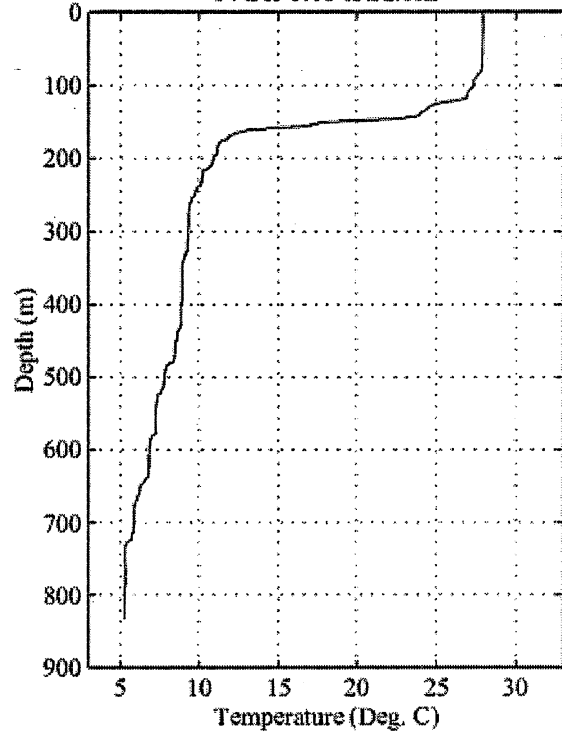
04-Dec-1998 02:32:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 105

Lat. 3.680 N Long. 48.152 W

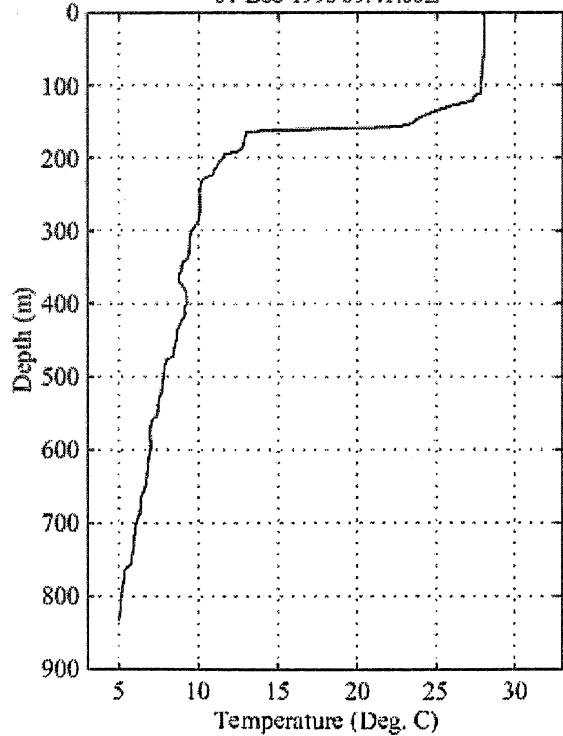
04-Dec-1998 05:52:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 106

Lat. 3.890 N Long. 47.915 W

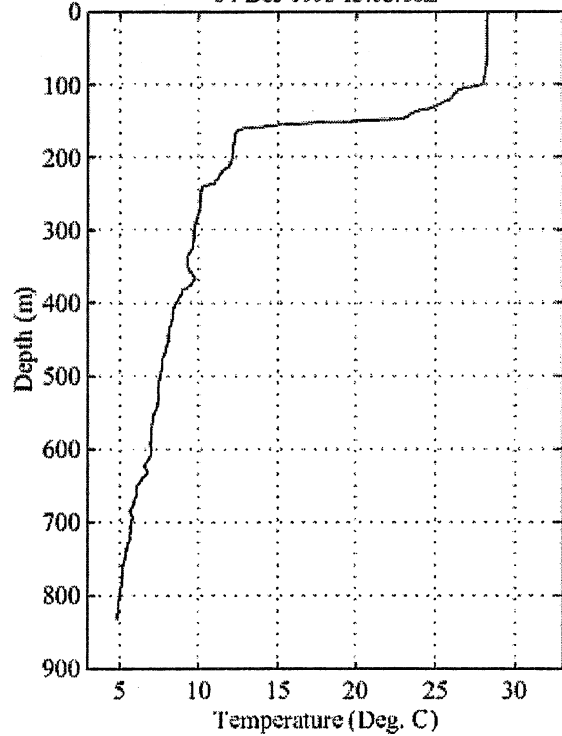
04-Dec-1998 09:41:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 107

Lat. 4.148 N Long. 47.633 W

04-Dec-1998 13:13:00Z

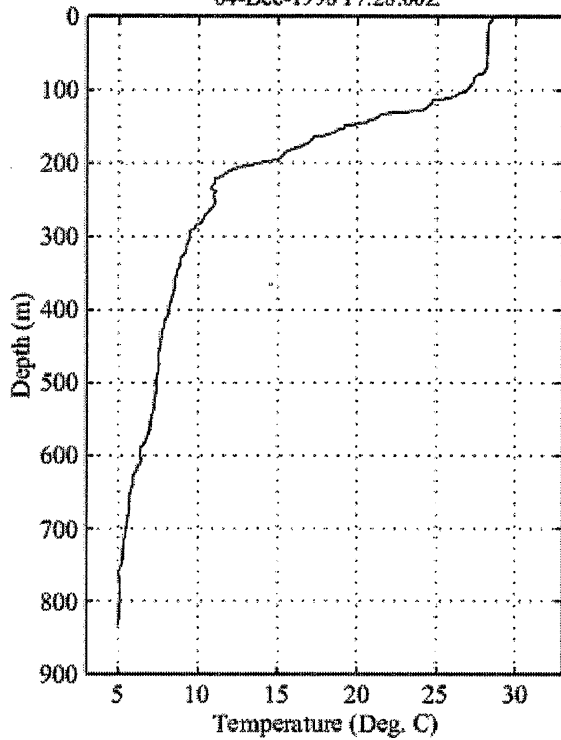




NBC-1 R/V SEWARD JOHNSON XBT Drop 108

Lat. 4.602 N Long. 47.432 W

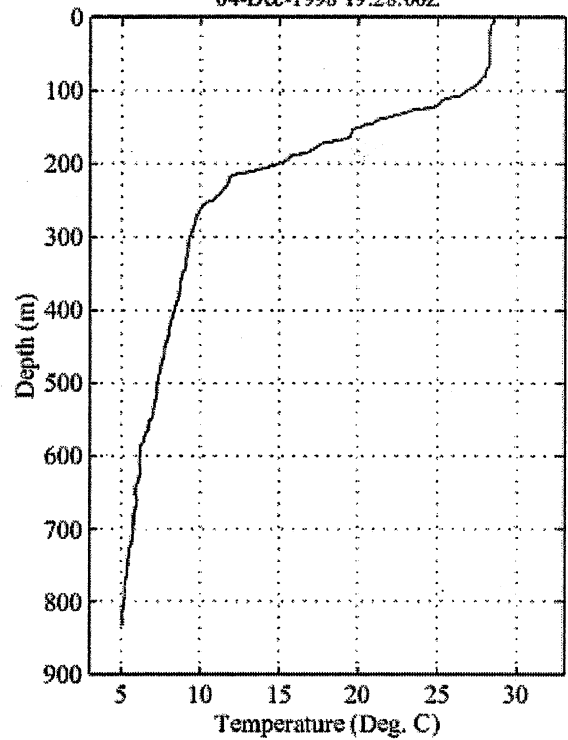
04-Dec-1998 17:28:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 109

Lat. 4.967 N Long. 47.382 W

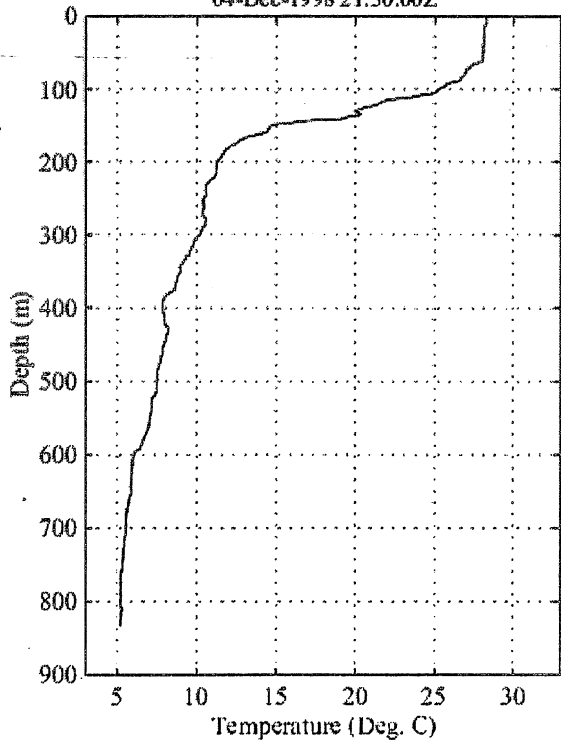
04-Dec-1998 19:28:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 110

Lat. 5.332 N Long. 47.333 W

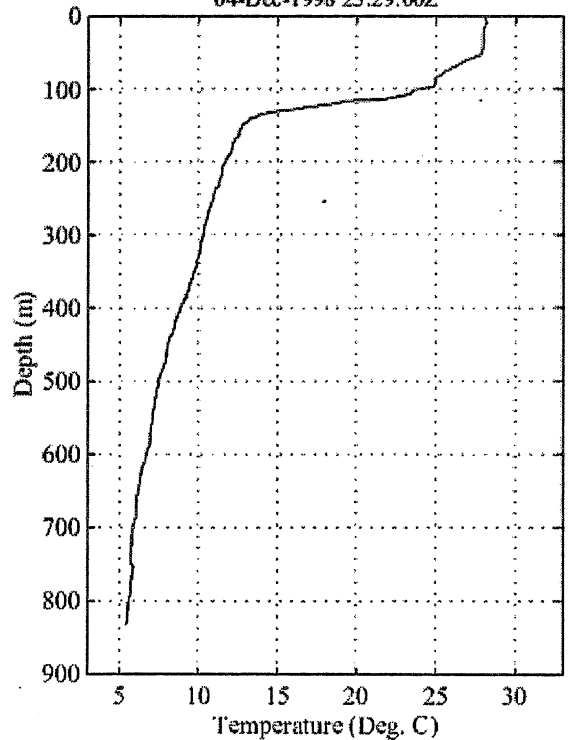
04-Dec-1998 21:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 111

Lat. 5.693 N Long. 47.285 W

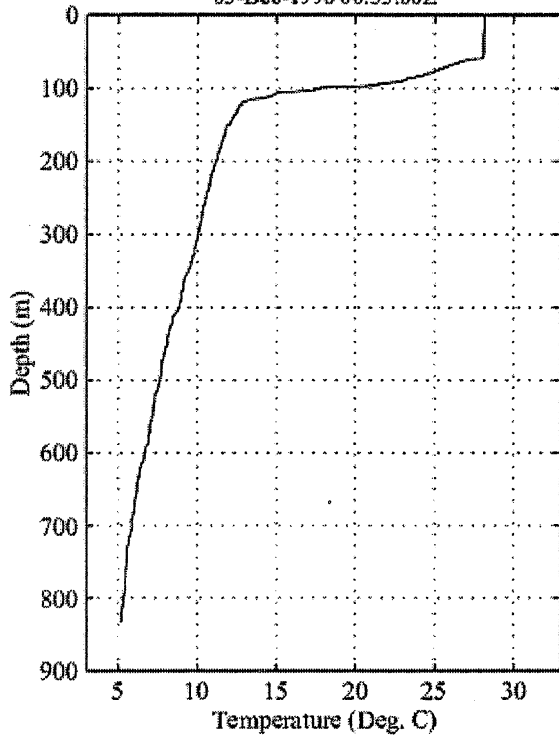
04-Dec-1998 23:29:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 112

Lat. 5.950 N Long. 47.255 W

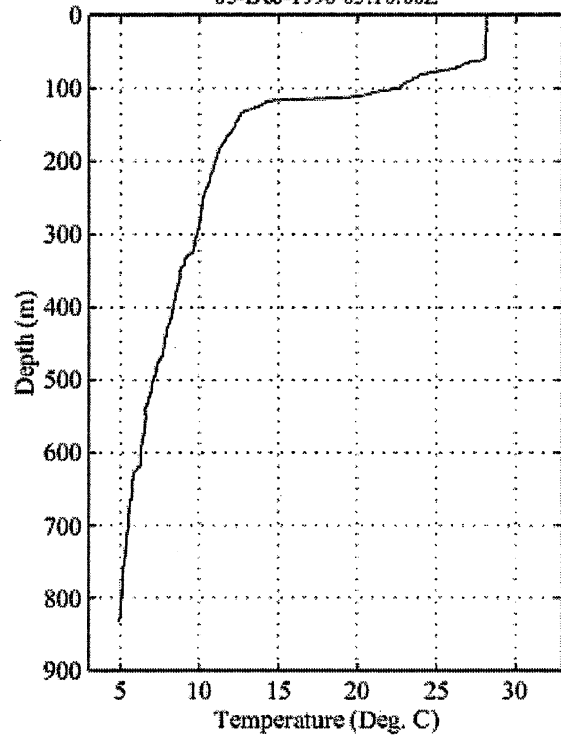
05-Dec-1998 00:53:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 113

Lat. 6.020 N Long. 47.755 W

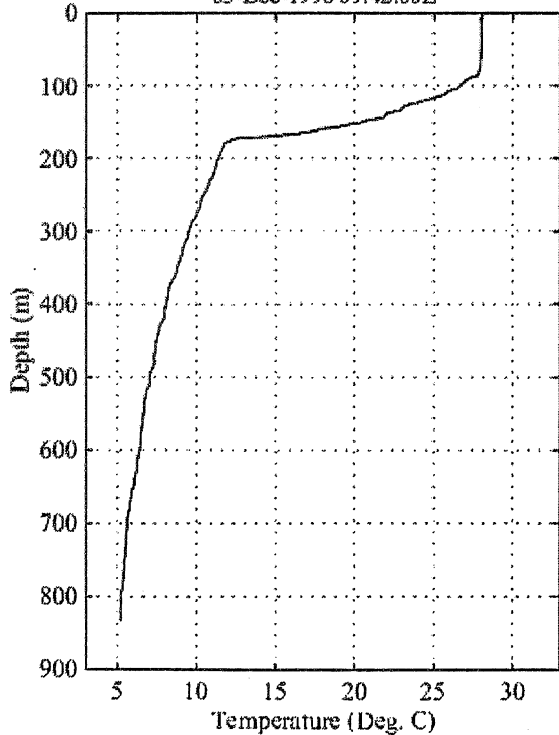
05-Dec-1998 05:10:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 114

Lat. 6.075 N Long. 48.247 W

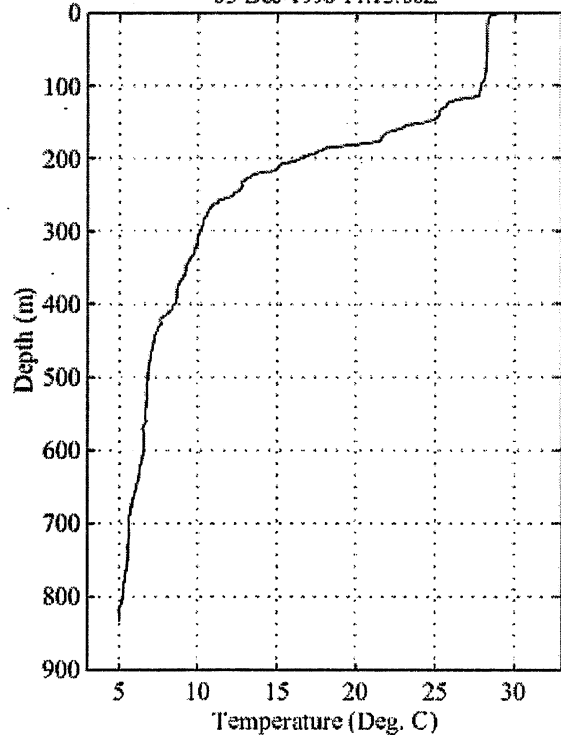
05-Dec-1998 09:42:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 115

Lat. 6.135 N Long. 48.770 W

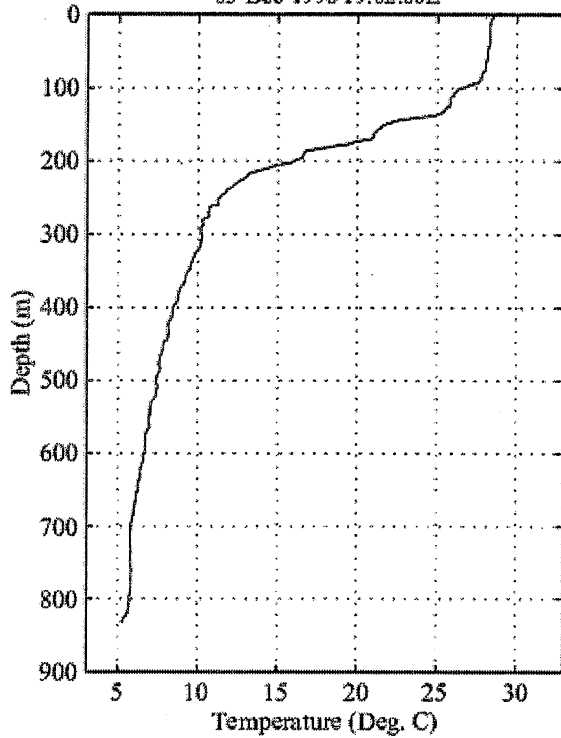
05-Dec-1998 14:13:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 116

Lat. 6.173 N Long. 49.258 W

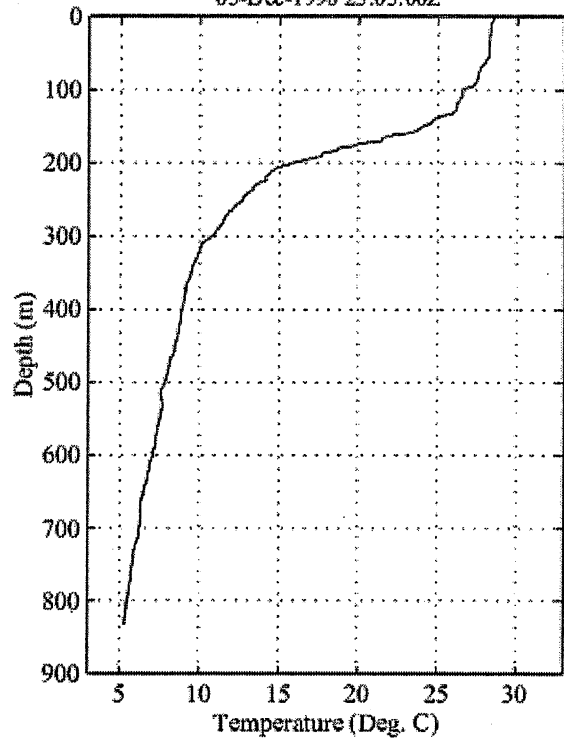
05-Dec-1998 19:02:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 117

Lat. 6.260 N Long. 49.762 W

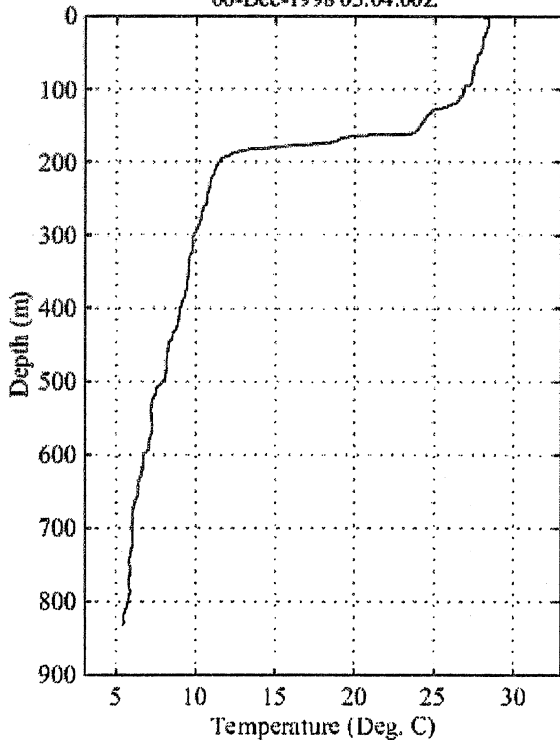
05-Dec-1998 23:05:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 118

Lat. 6.307 N Long. 50.247 W

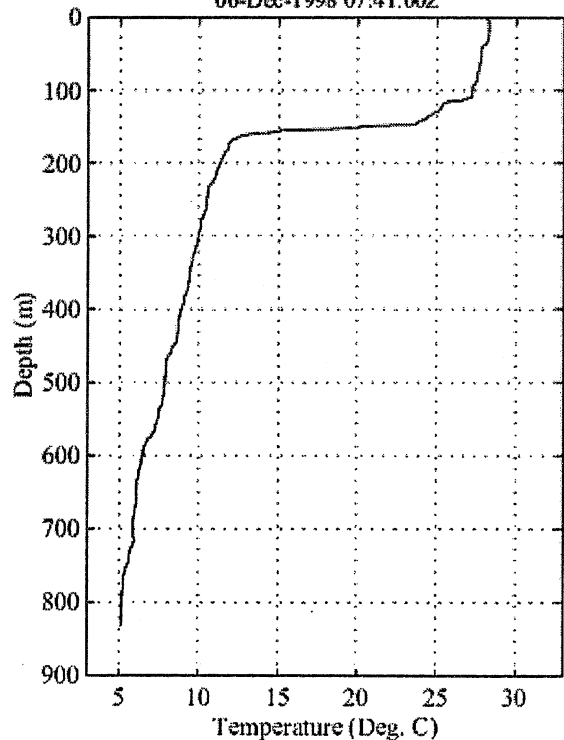
06-Dec-1998 03:04:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 119

Lat. 6.585 N Long. 50.702 W

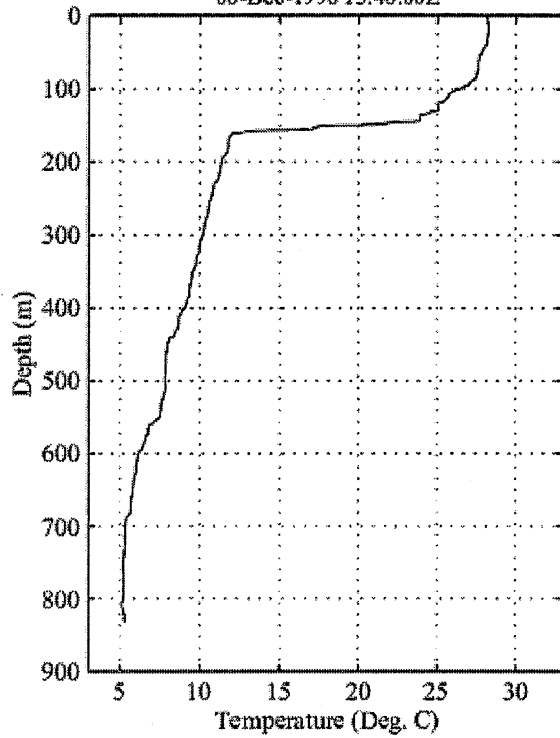
06-Dec-1998 07:41:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 120

Lat. 7.188 N Long. 50.982 W

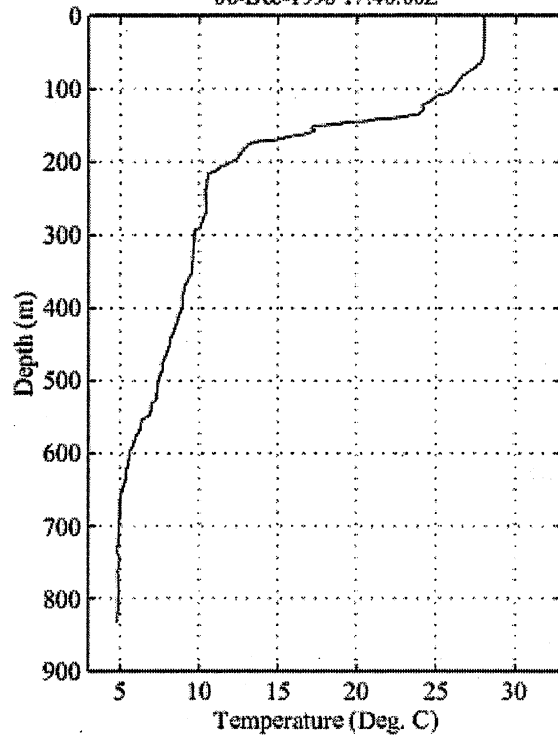
06-Dec-1998 13:48:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 121

Lat. 7.398 N Long. 51.422 W

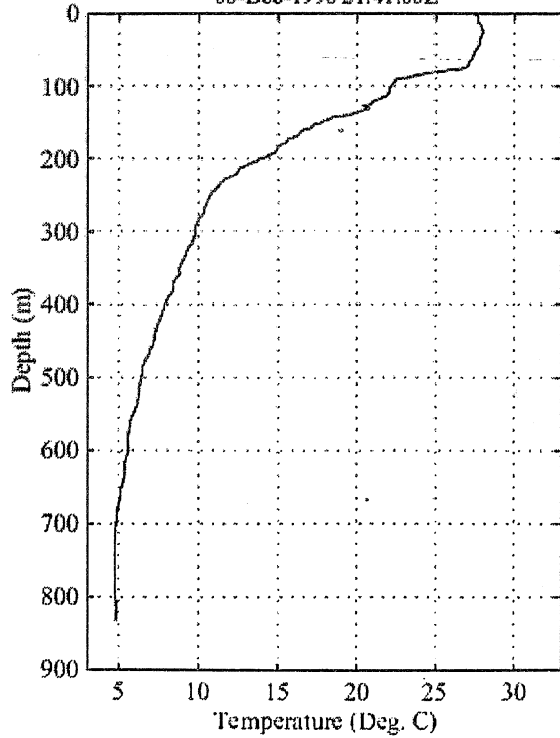
06-Dec-1998 17:40:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 122

Lat. 7.660 N Long. 51.823 W

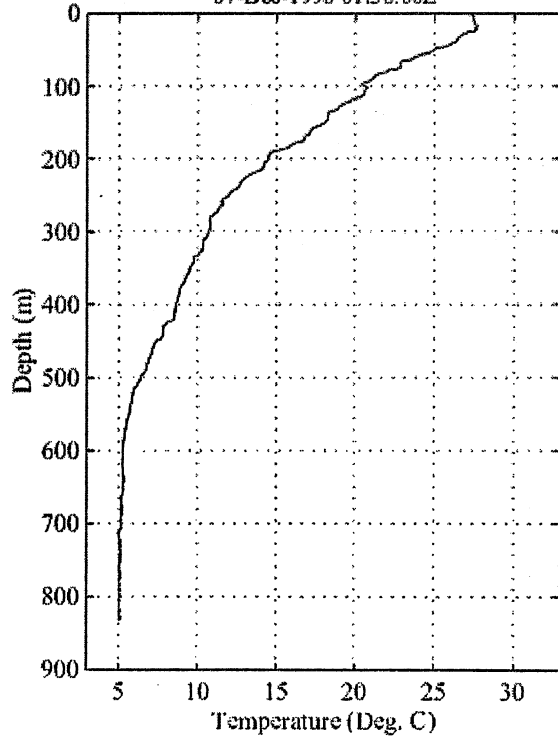
06-Dec-1998 21:41:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 123

Lat. 7.858 N Long. 52.308 W

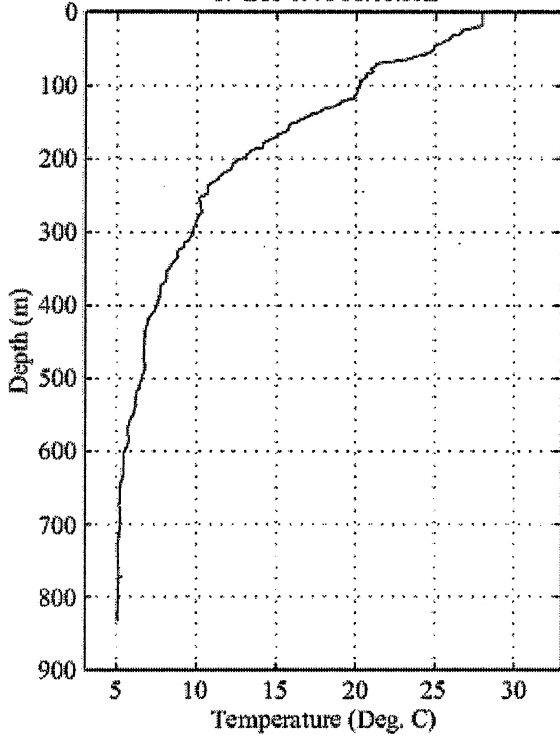
07-Dec-1998 01:38:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 124

Lat. 8.232 N Long. 52.747 W

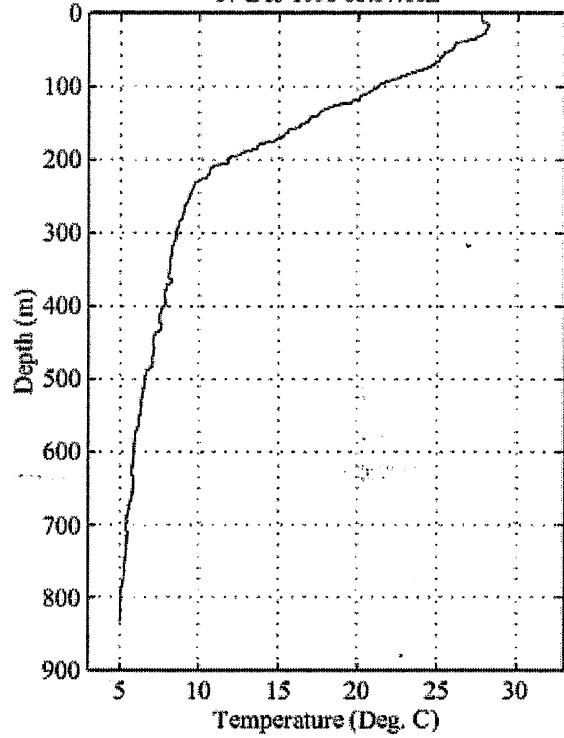
07-Dec-1998 06:16:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 125

Lat. 8.553 N Long. 52.957 W

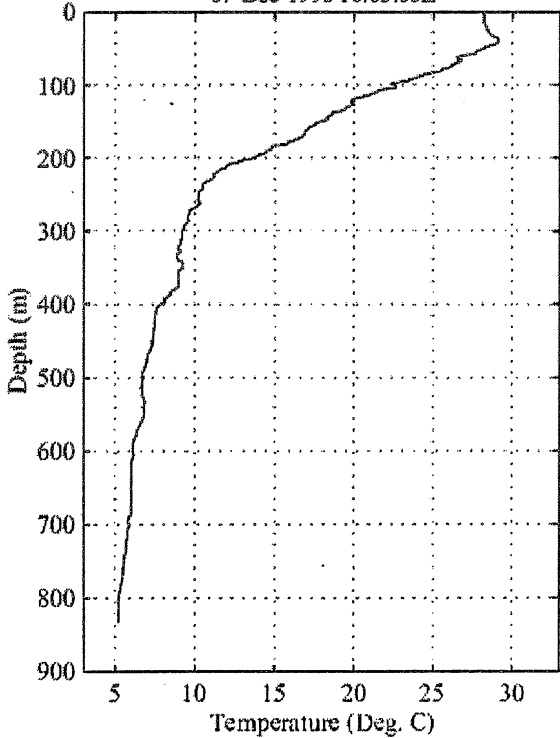
07-Dec-1998 08:07:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 126

Lat. 8.895 N Long. 53.177 W

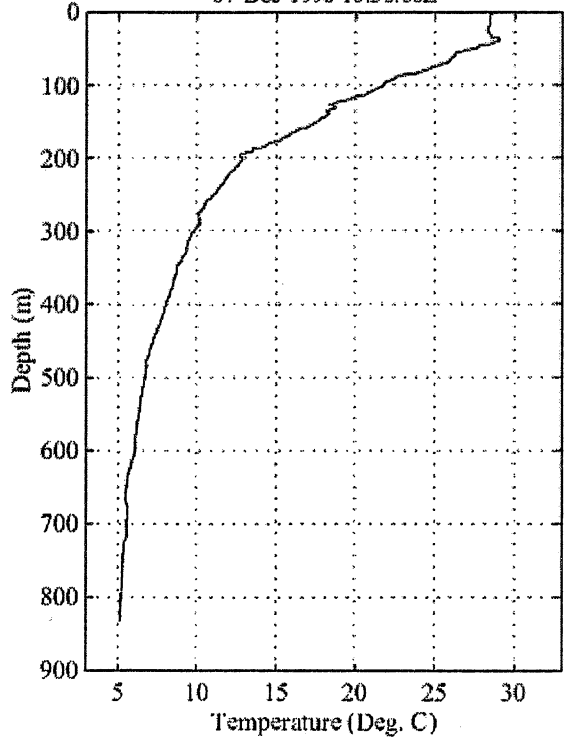
07-Dec-1998 10:05:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 127

Lat. 9.045 N Long. 53.282 W

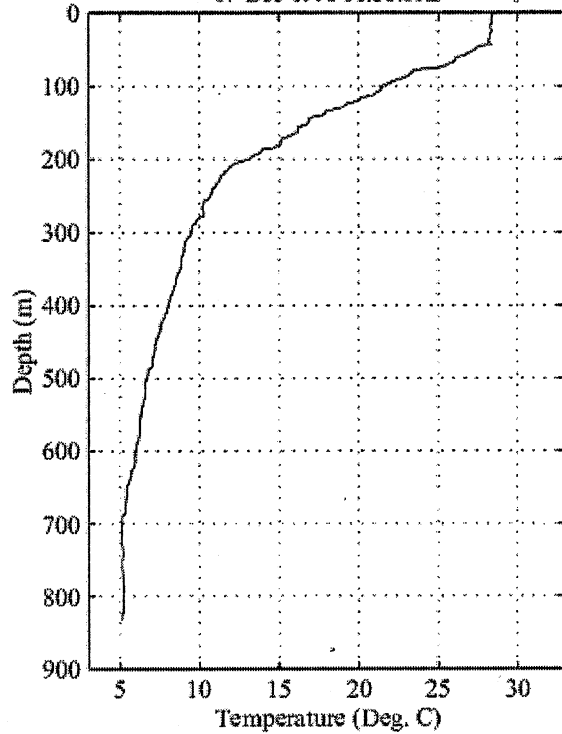
07-Dec-1998 10:58:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 128

Lat. 9.222 N Long. 53.395 W

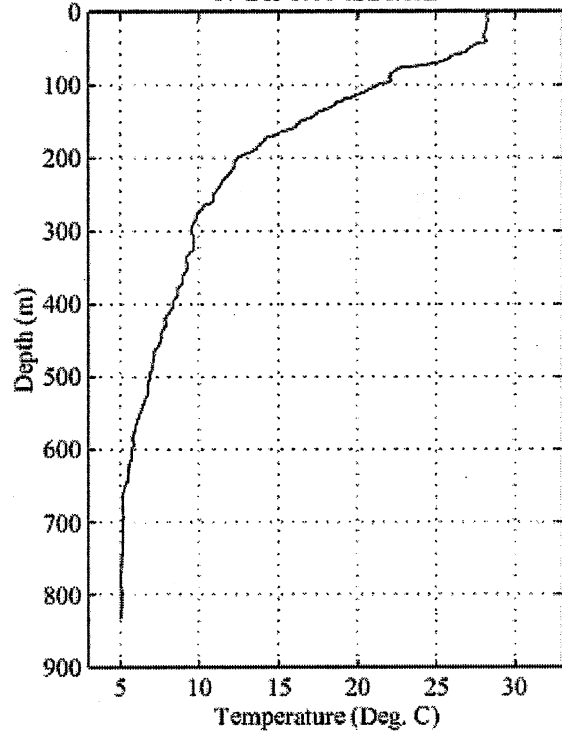
07-Dec-1998 11:58:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 129

Lat. 9.332 N Long. 53.468 W

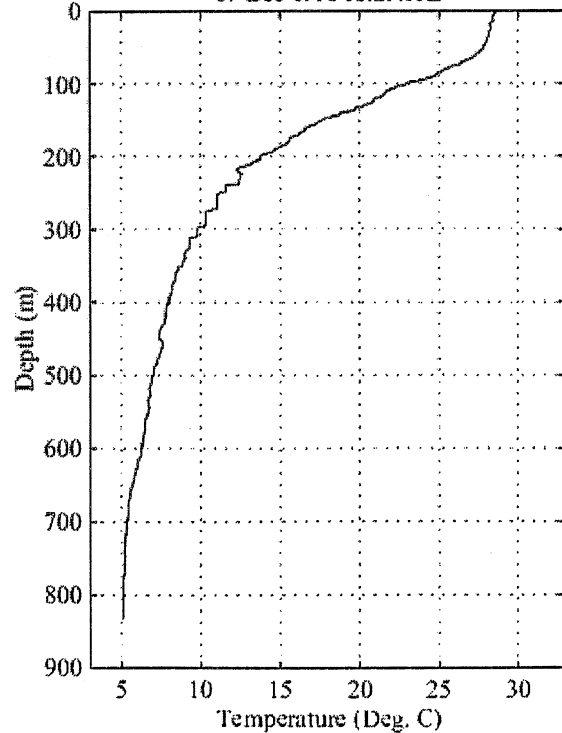
07-Dec-1998 12:36:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 130

Lat. 9.333 N Long. 53.647 W

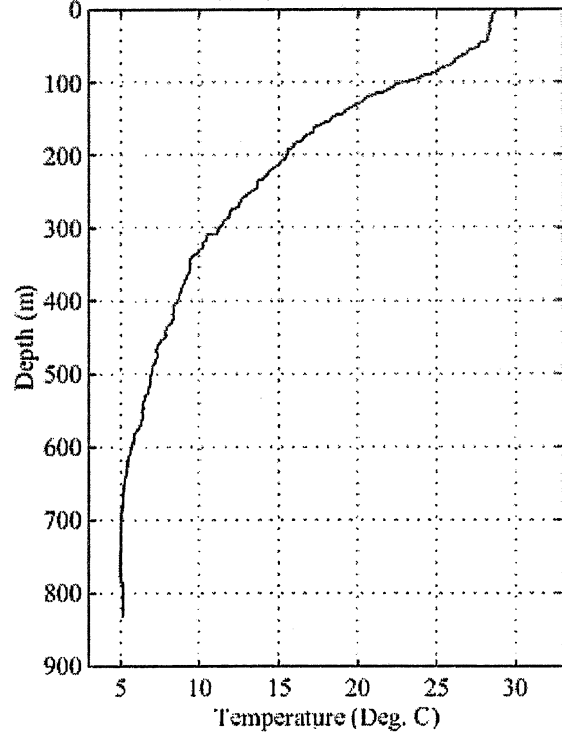
07-Dec-1998 13:29:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 131

Lat. 9.332 N Long. 53.888 W

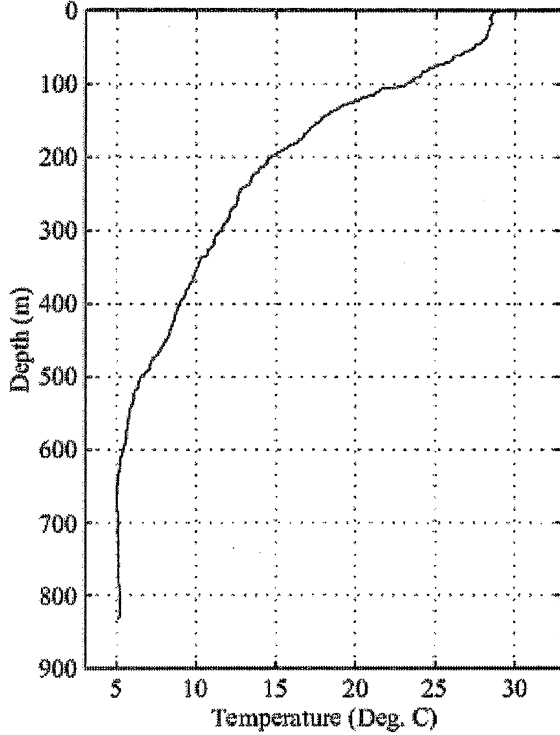
07-Dec-1998 14:40:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 132

Lat. 9.335 N Long. 54.053 W

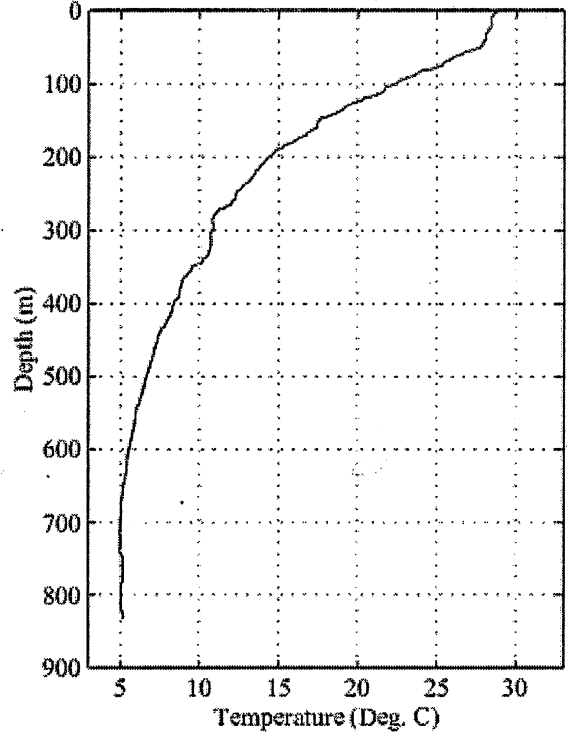
07-Dec-1998 15:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 133

Lat. 9.333 N Long. 54.250 W

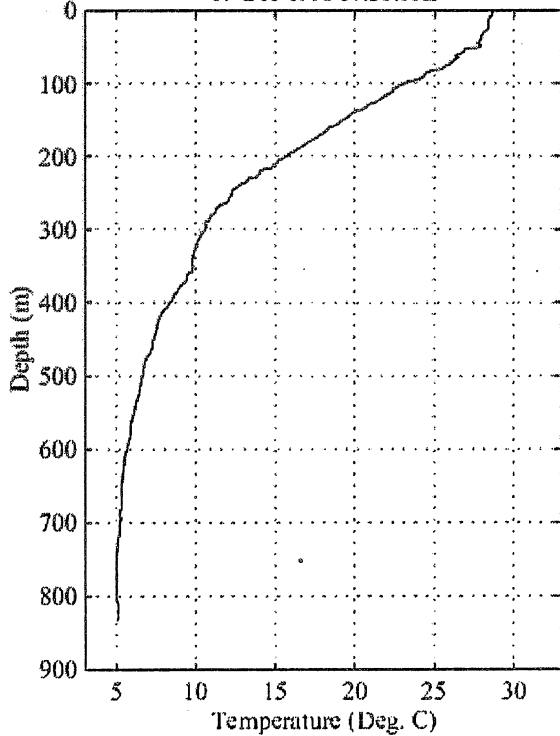
07-Dec-1998 16:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 134

Lat. 9.332 N Long. 54.450 W

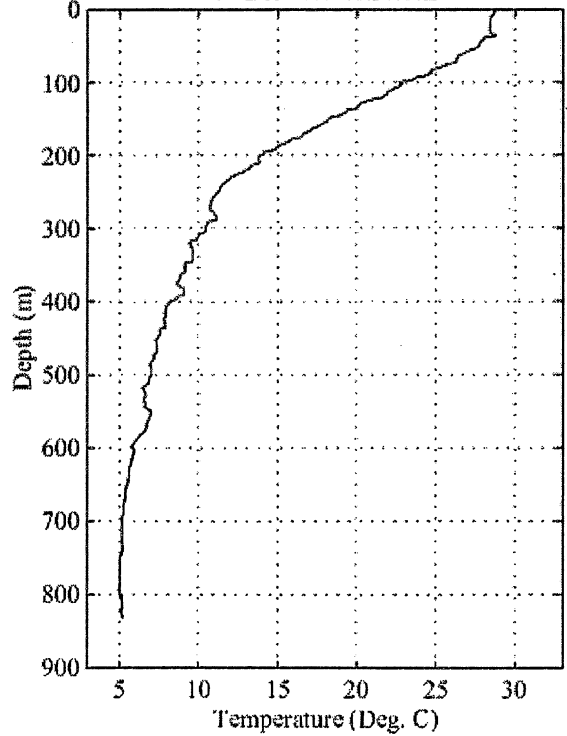
07-Dec-1998 17:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 135

Lat. 9.333 N Long. 54.648 W

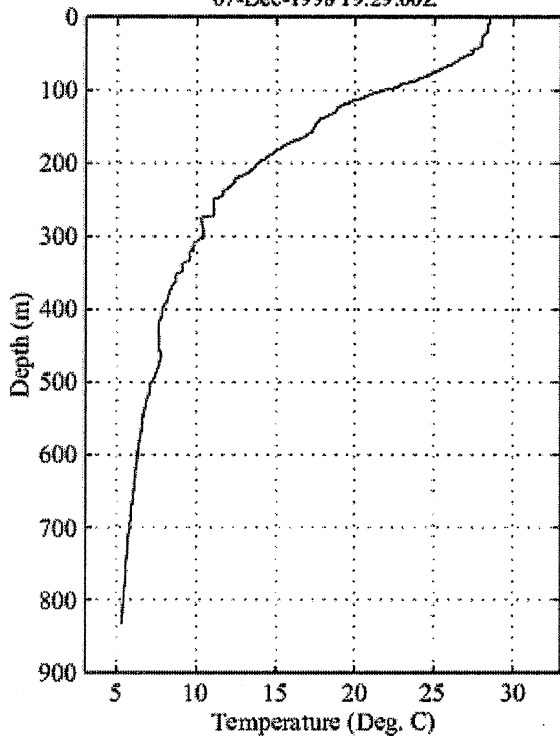
07-Dec-1998 18:30:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 136

Lat. 9.332 N Long. 54.838 W

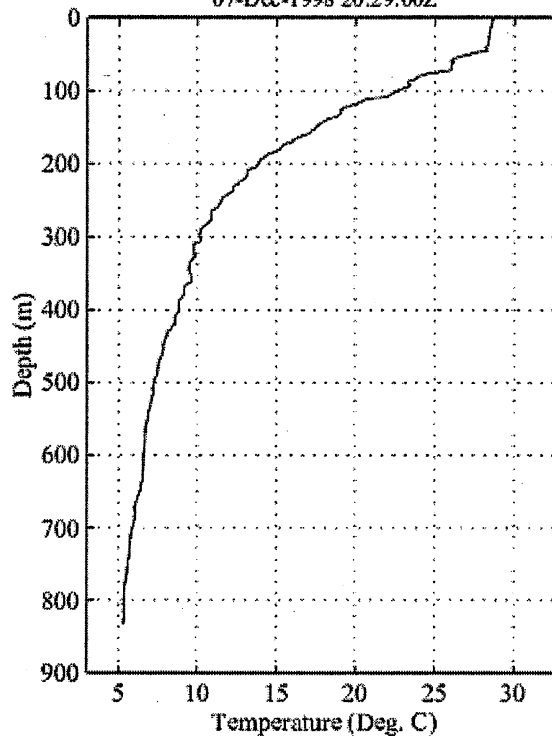
07-Dec-1998 19:29:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 137

Lat. 9.315 N Long. 55.035 W

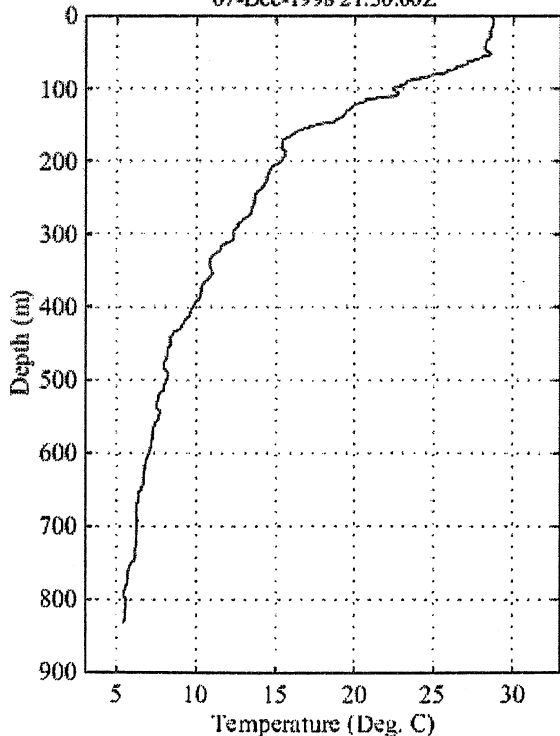
07-Dec-1998 20:29:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 138

Lat. 9.278 N Long. 55.227 W

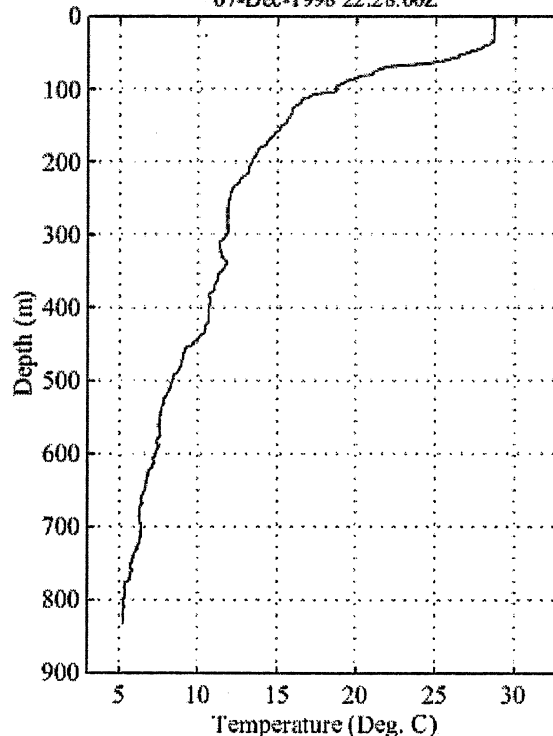
07-Dec-1998 21:30:00Z



NBC-I R/V SEWARD JOHNSON XBT Drop 139

Lat. 9.212 N Long. 55.407 W

07-Dec-1998 22:28:00Z

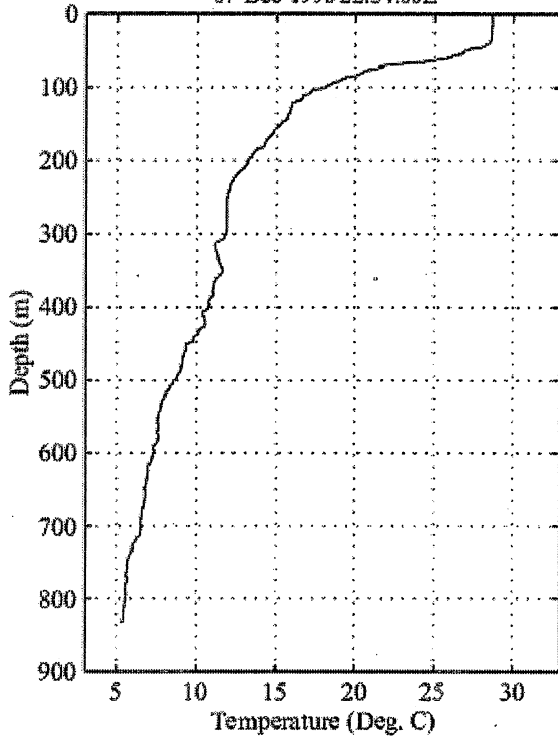




NBC-1 R/V SEWARD JOHNSON XBT Drop 140

Lat. 9.203 N Long. 55.428 W

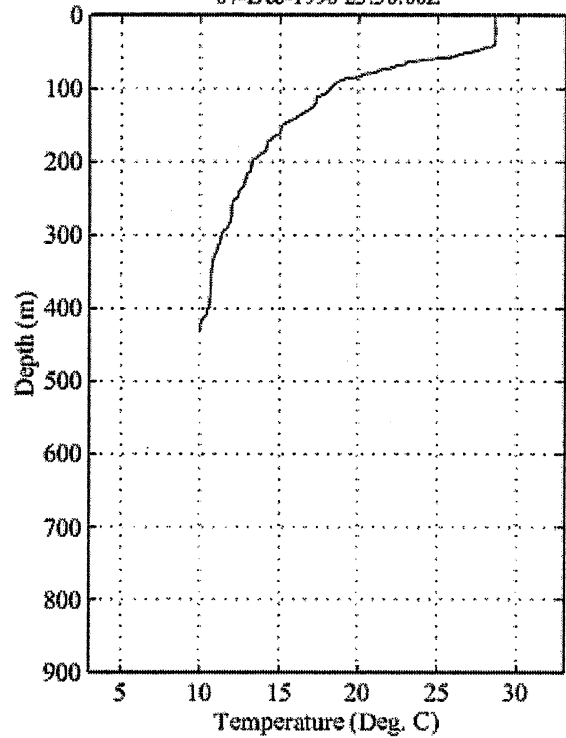
07-Dec-1998 22:34:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 141

Lat. 9.143 N Long. 55.598 W

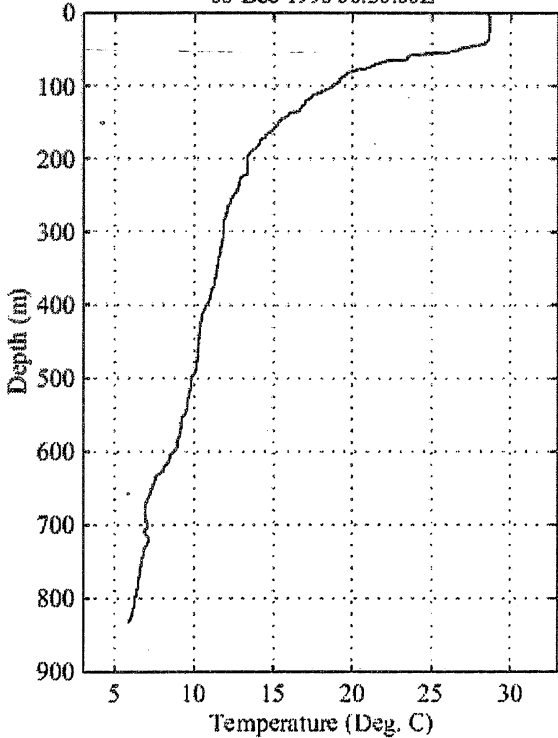
07-Dec-1998 23:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 142

Lat. 9.075 N Long. 55.787 W

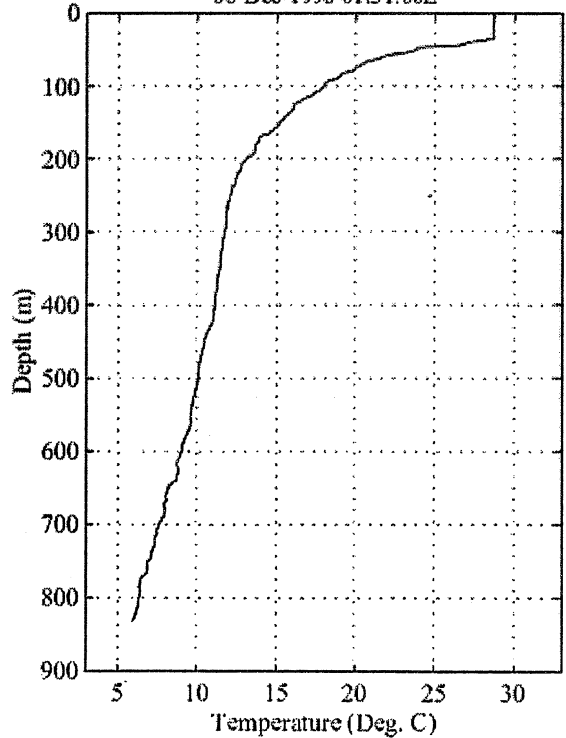
08-Dec-1998 00:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 143

Lat. 9.008 N Long. 55.995 W

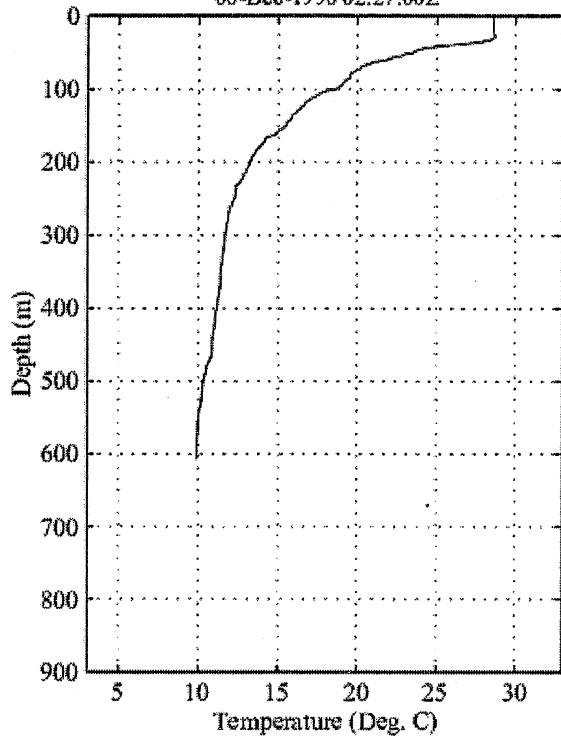
08-Dec-1998 01:31:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 144

Lat. 8.903 N Long. 56.150 W

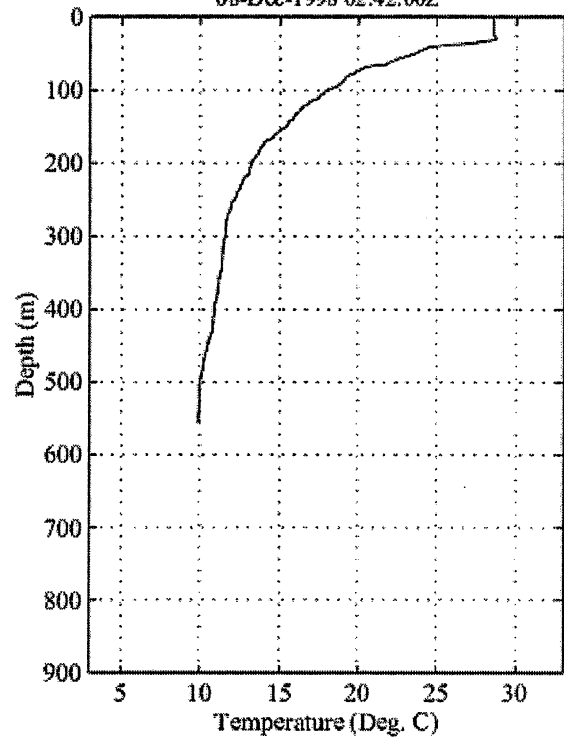
08-Dec-1998 02:27:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 145

Lat. 8.880 N Long. 56.183 W

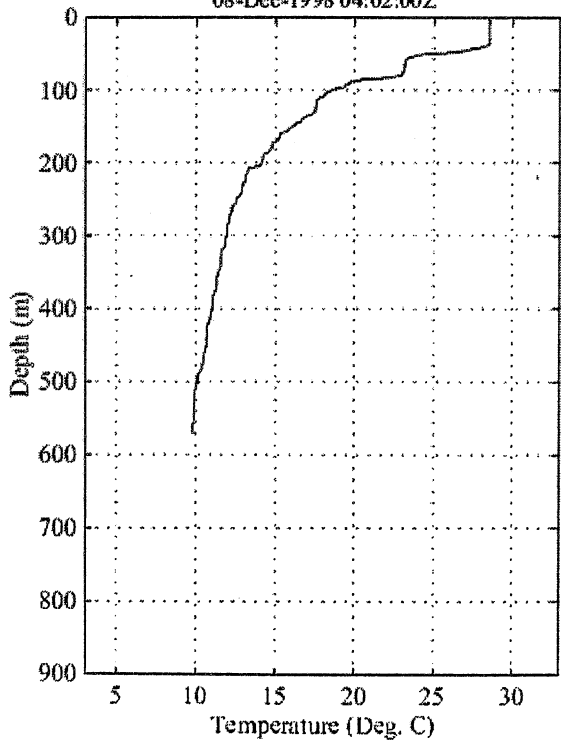
08-Dec-1998 02:42:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 146

Lat. 8.755 N Long. 56.365 W

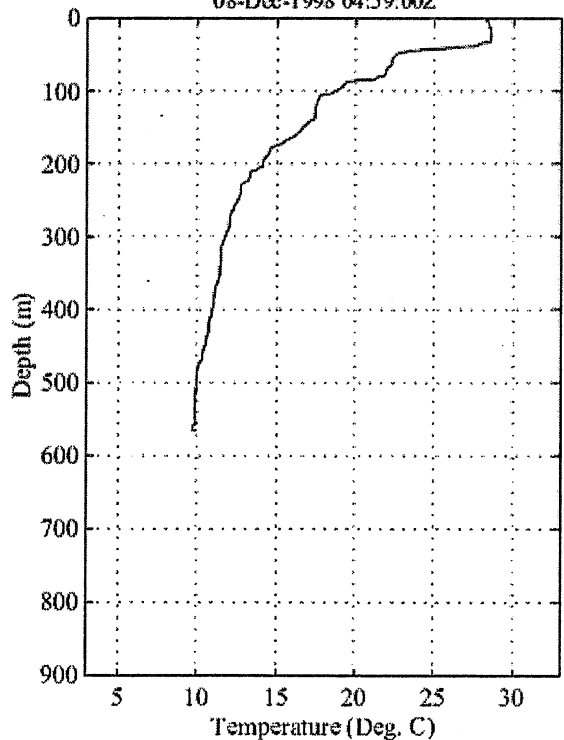
08-Dec-1998 04:02:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 147

Lat. 8.650 N Long. 56.518 W

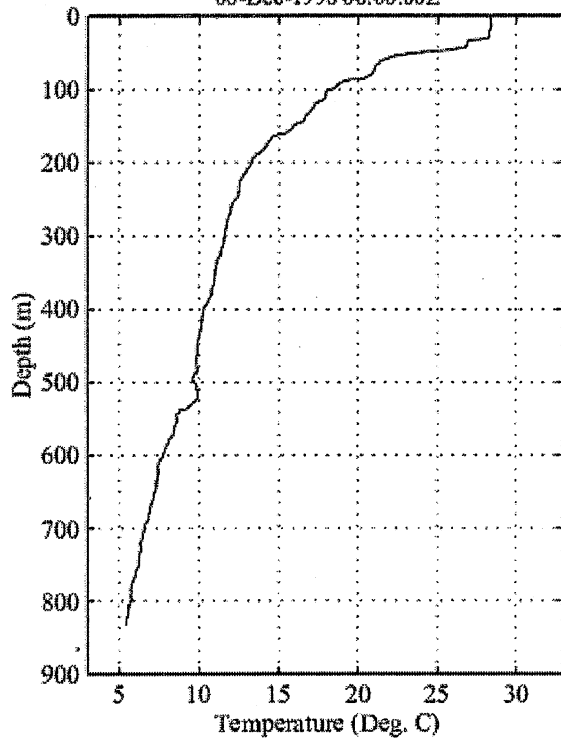
08-Dec-1998 04:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 148

Lat. 8.537 N Long. 56.680 W

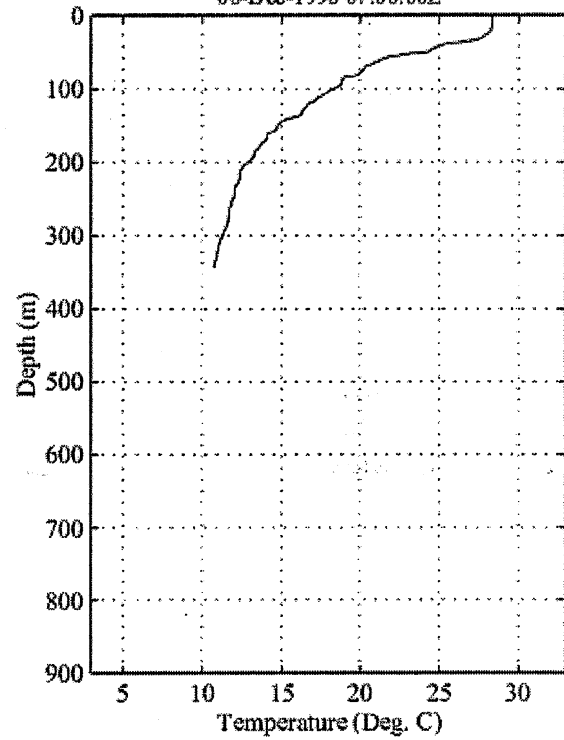
08-Dec-1998 06:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 149

Lat. 8.428 N Long. 56.838 W

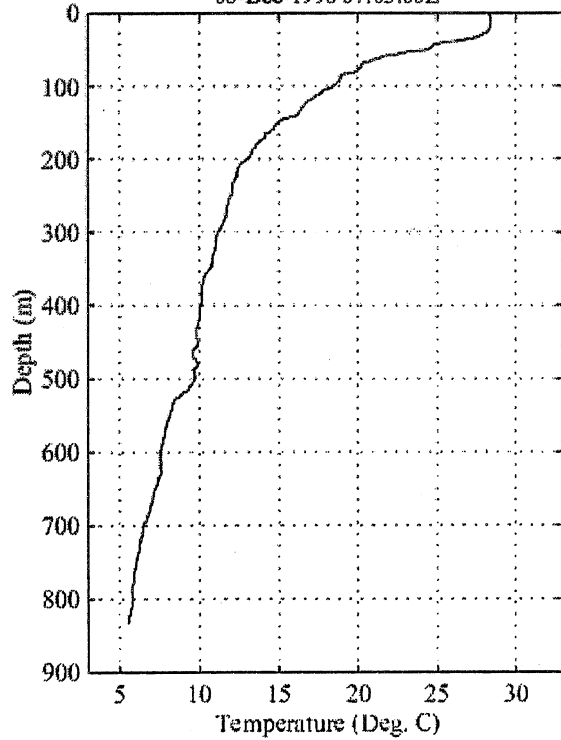
08-Dec-1998 07:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 150

Lat. 8.422 N Long. 56.847 W

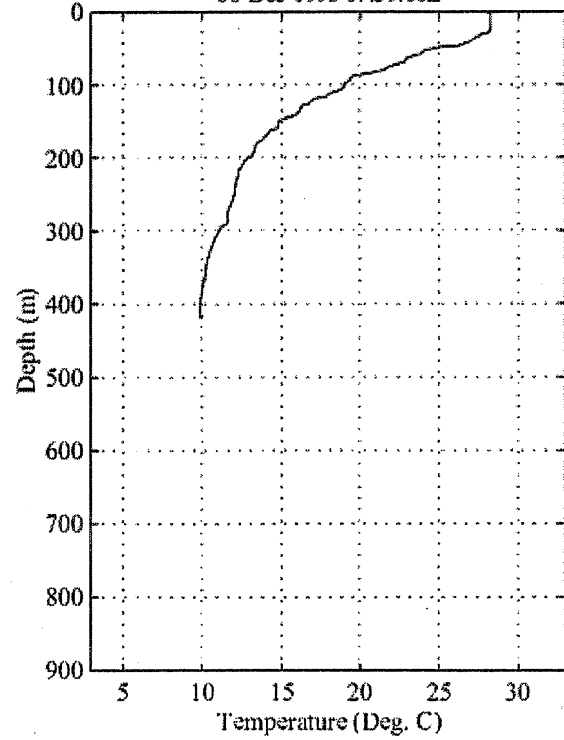
08-Dec-1998 07:03:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 151

Lat. 8.318 N Long. 56.998 W

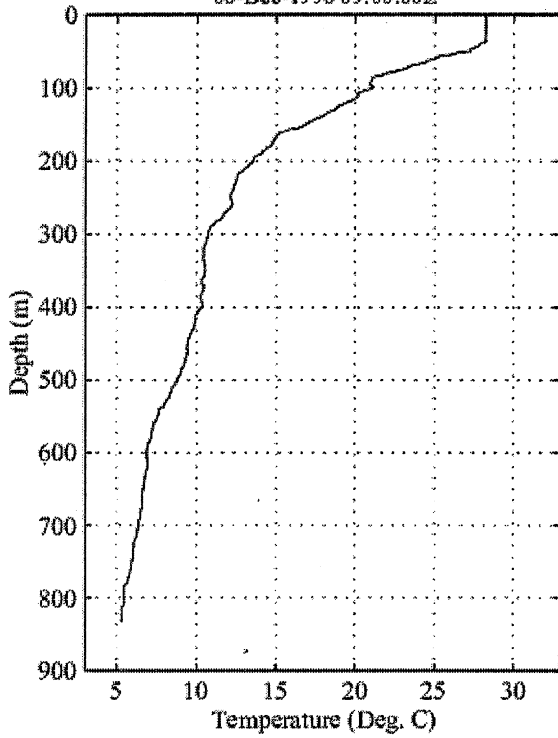
08-Dec-1998 07:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 152

Lat. 8.203 N Long. 57.163 W

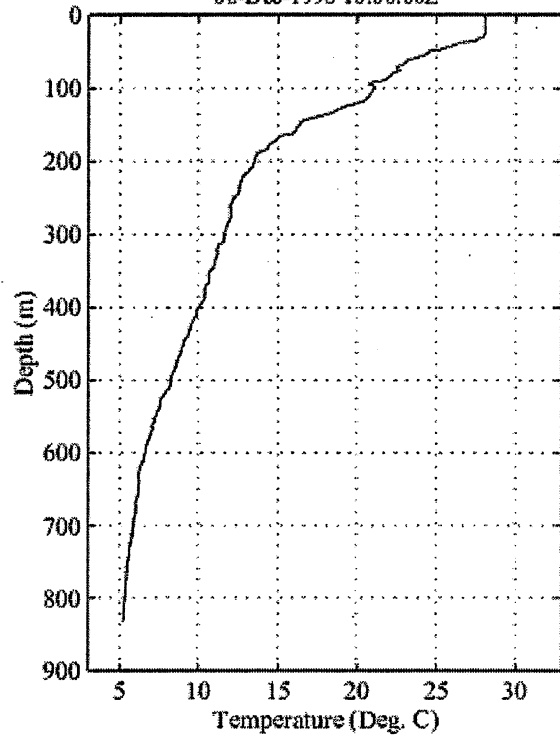
08-Dec-1998 09:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 153

Lat. 8.097 N Long. 57.332 W

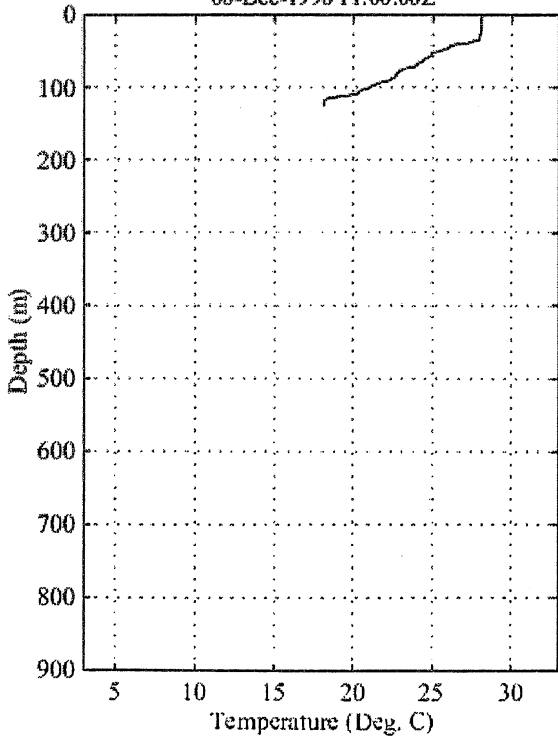
08-Dec-1998 10:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 154

Lat. 7.977 N Long. 57.500 W

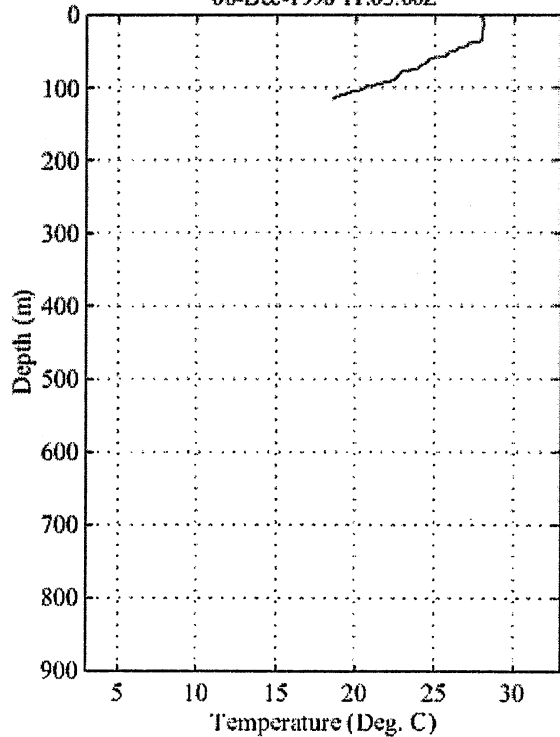
08-Dec-1998 11:00:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 155

Lat. 7.970 N Long. 57.510 W

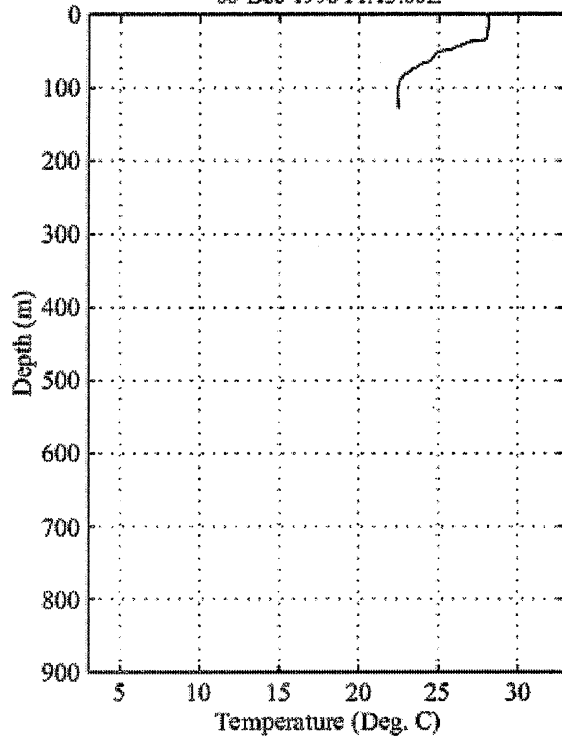
08-Dec-1998 11:03:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 156

Lat. 7.953 N Long. 57.535 W

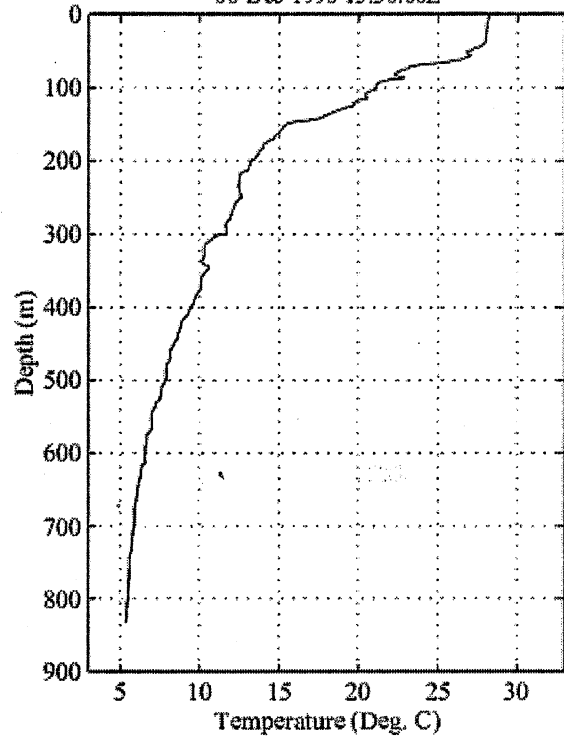
08-Dec-1998 11:13:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 157

Lat. 7.725 N Long. 56.855 W

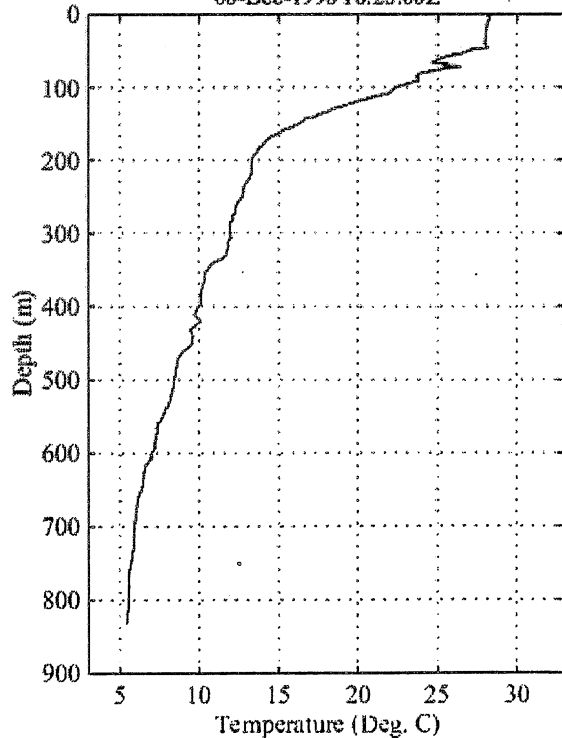
08-Dec-1998 15:30:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 158

Lat. 7.677 N Long. 56.687 W

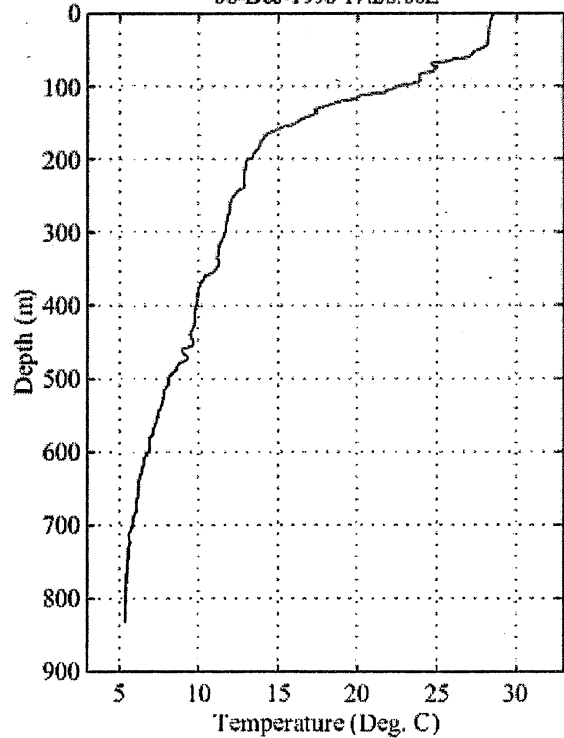
08-Dec-1998 16:28:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 159

Lat. 7.627 N Long. 56.515 W

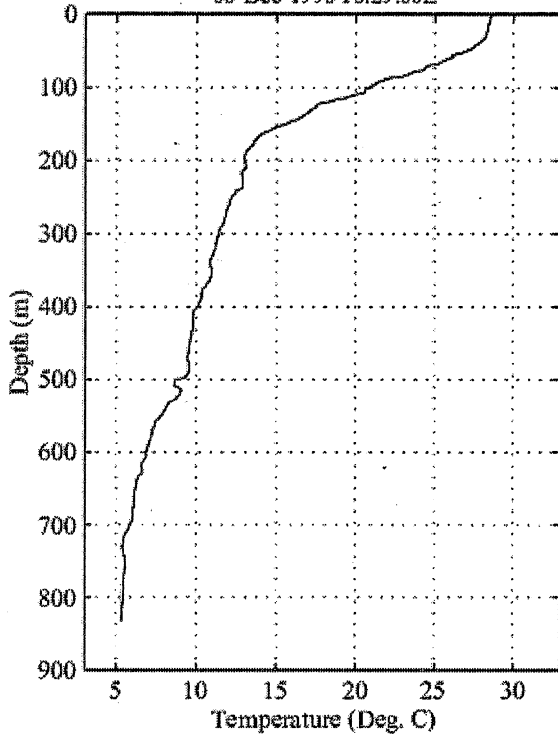
08-Dec-1998 17:28:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 160

Lat. 7.578 N Long. 56.342 W

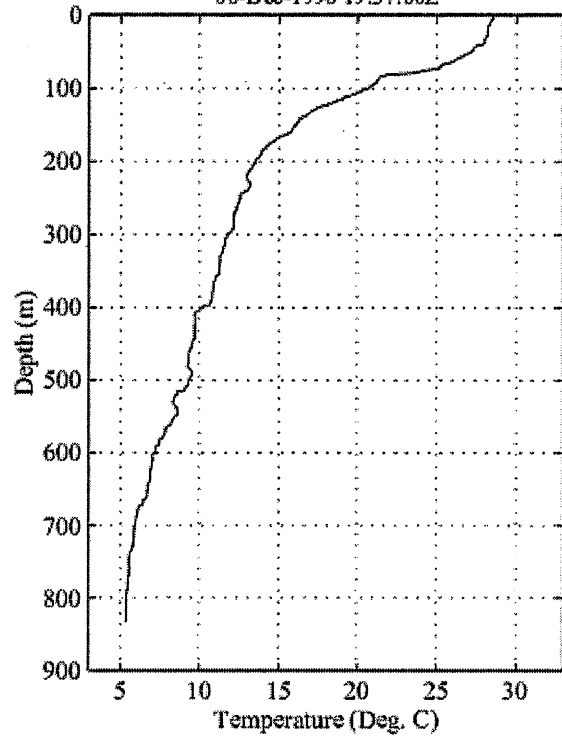
08-Dec-1998 18:29:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 161

Lat. 7.522 N Long. 56.143 W

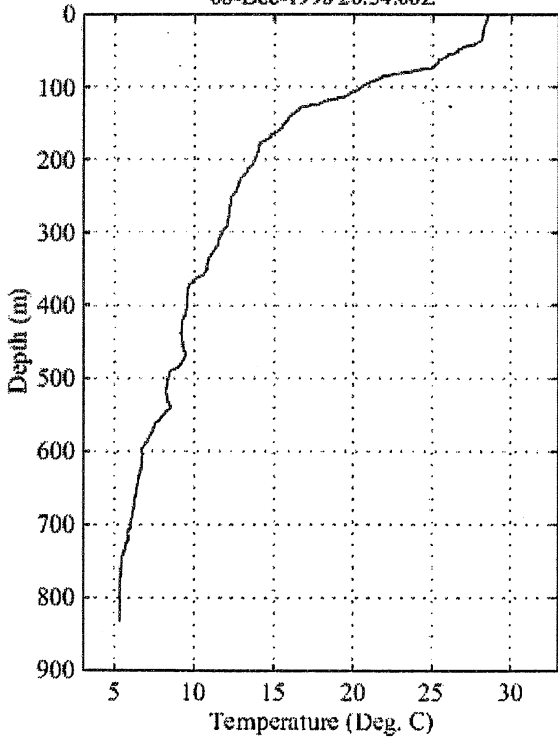
08-Dec-1998 19:37:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 162

Lat. 7.472 N Long. 55.975 W

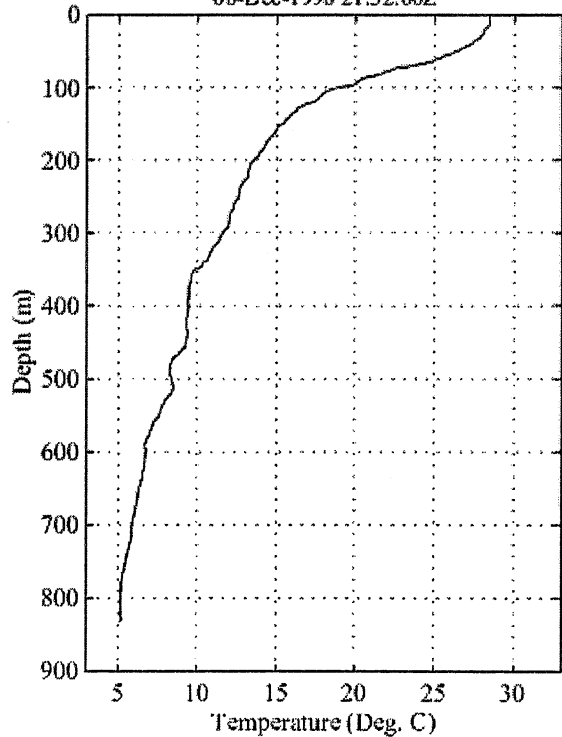
08-Dec-1998 20:34:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 164

Lat. 7.418 N Long. 55.800 W

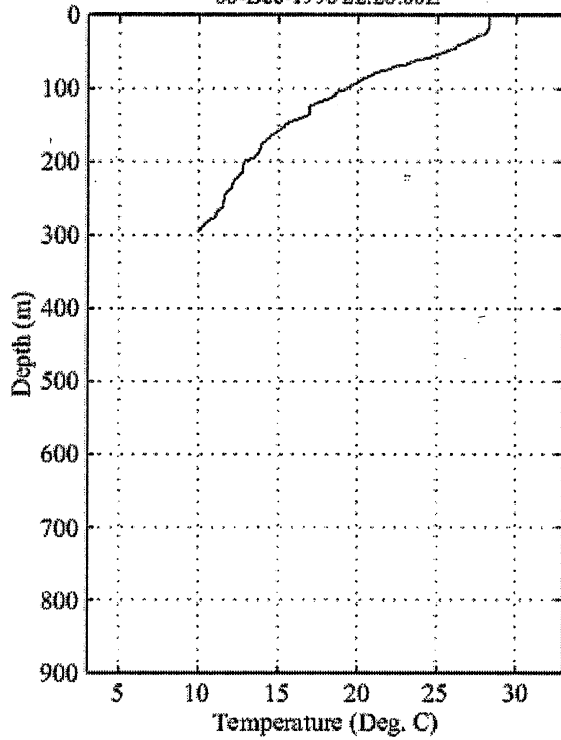
08-Dec-1998 21:32:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 165

Lat. 7.368 N Long. 55.627 W

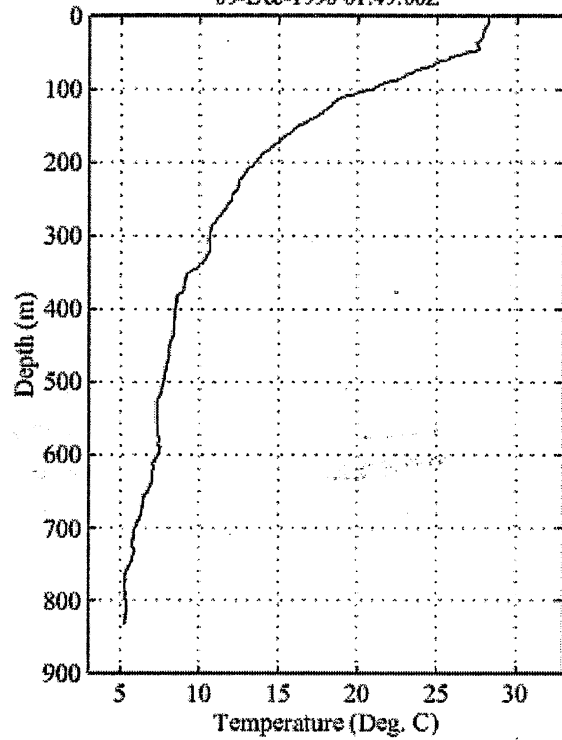
08-Dec-1998 22:28:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 166

Lat. 7.530 N Long. 55.477 W

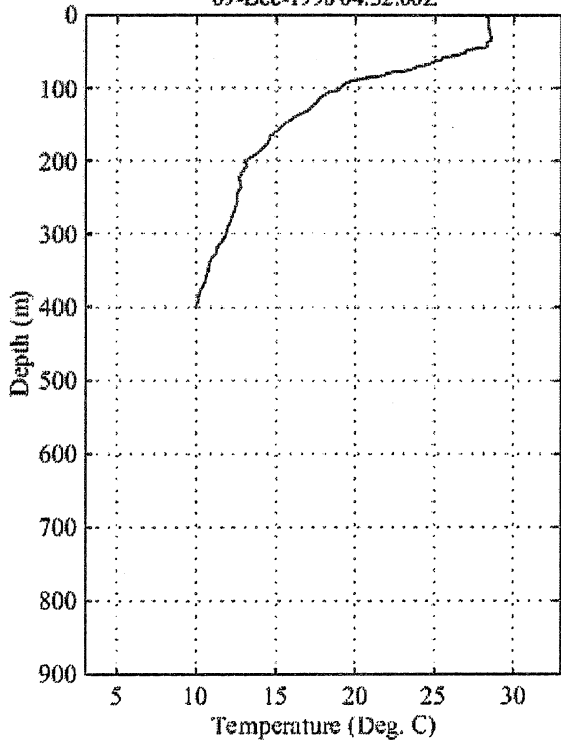
09-Dec-1998 01:49:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 167

Lat. 7.790 N Long. 55.597 W

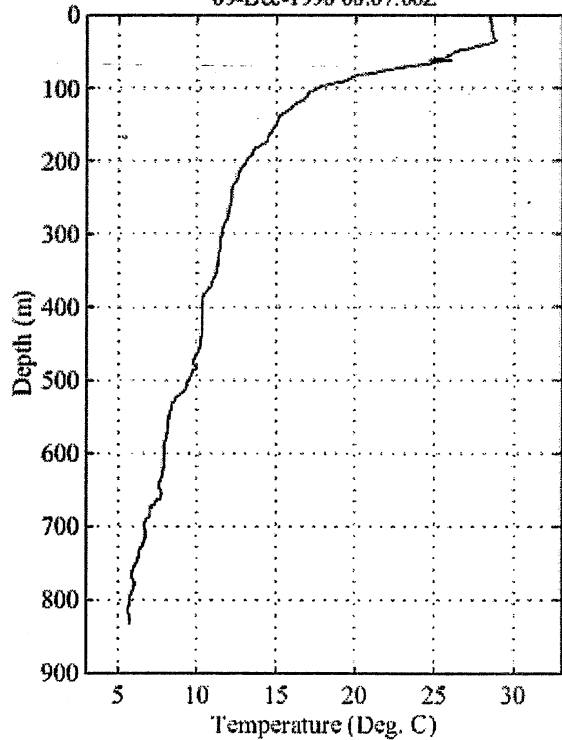
09-Dec-1998 04:32:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 168

Lat. 8.120 N Long. 55.767 W

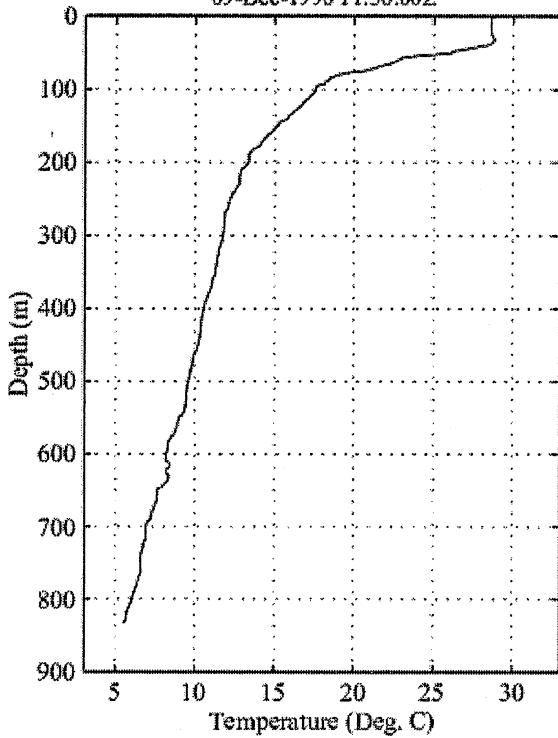
09-Dec-1998 08:07:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 169

Lat. 8.433 N Long. 55.940 W

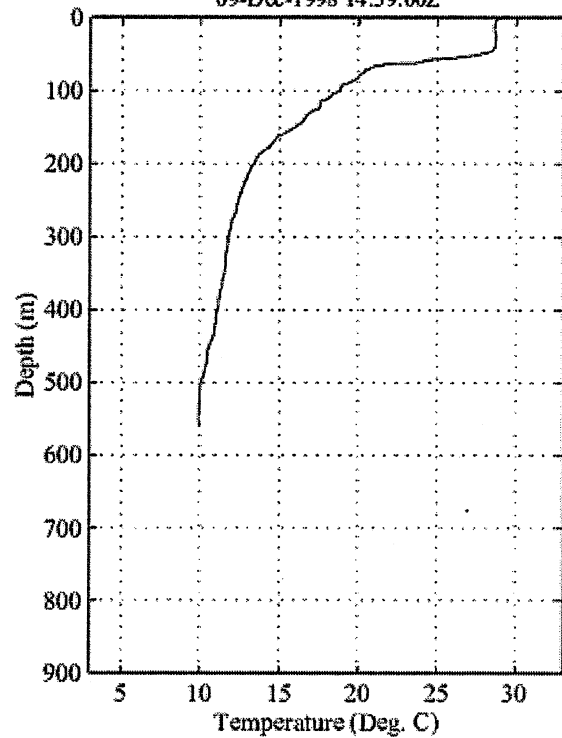
09-Dec-1998 11:36:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 170

Lat. 8.760 N Long. 56.110 W

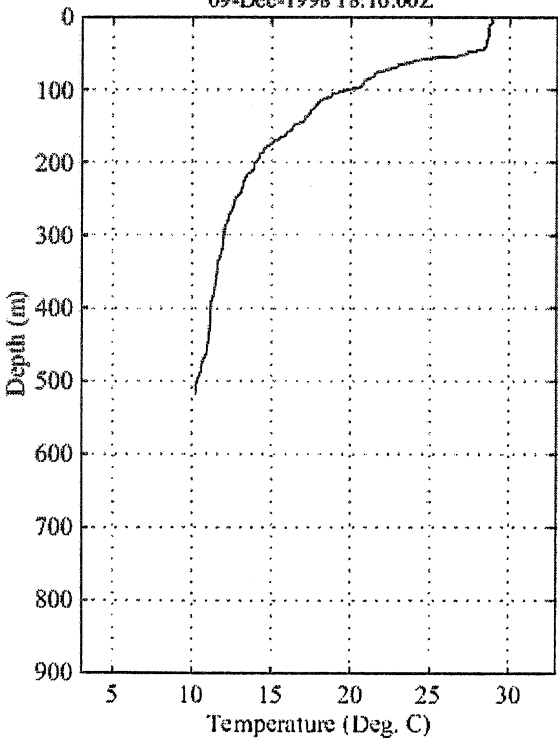
09-Dec-1998 14:59:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 171

Lat. 9.052 N Long. 56.272 W

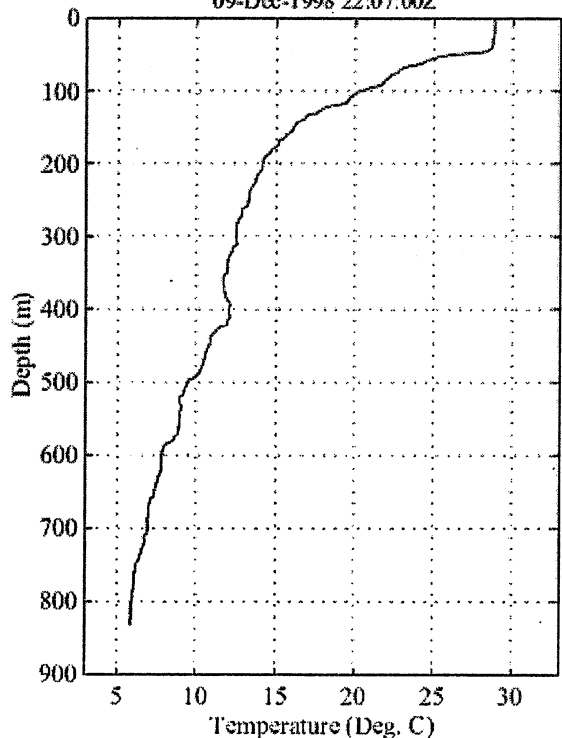
09-Dec-1998 18:16:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 172

Lat. 9.413 N Long. 56.482 W

09-Dec-1998 22:07:00Z

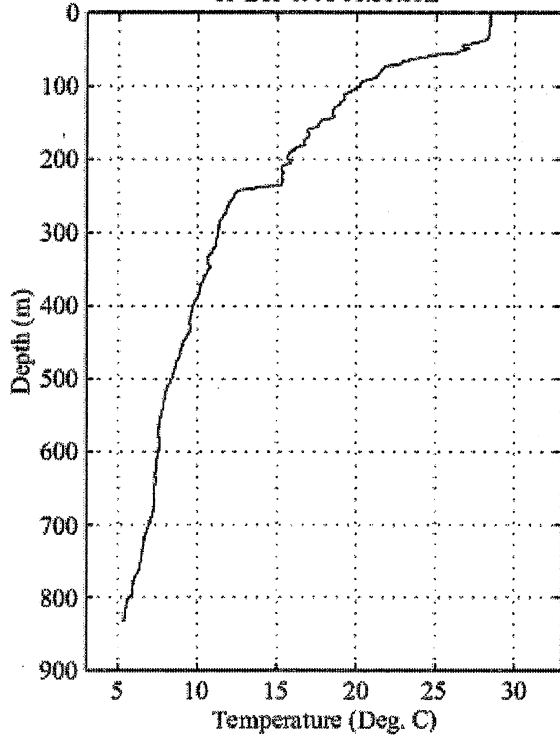




NBC-1 R/V SEWARD JOHNSON XBT Drop 173

Lat. 9.703 N Long. 56.635 W

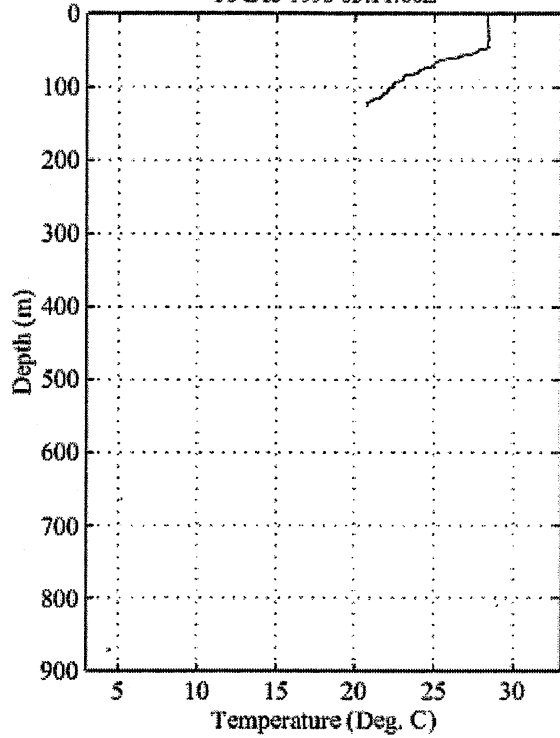
10-Dec-1998 01:31:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 174

Lat. 9.998 N Long. 56.807 W

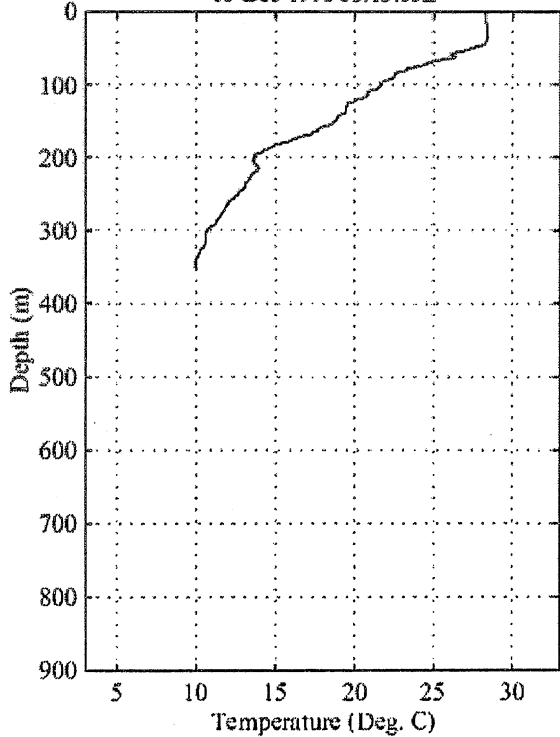
10-Dec-1998 05:11:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 175

Lat. 10.008 N Long. 56.813 W

10-Dec-1998 05:15:00Z



NBC-1 R/V SEWARD JOHNSON XBT Drop 176

Lat. 10.317 N Long. 56.977 W

10-Dec-1998 08:54:00Z

