GP8-99-RB
NOAA Ship Ronald H. Brown
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ACQUISITION:

Fifty-one CTD profiles were collected on this cruise. Twenty-three CTD profiles were collected along 110W from 8N to 8S; 28 were collected along 95W from 8S to 12N. The majority of CTD casts were to 1000 m; only 3 were deep; none shallow.

PMEL's Sea-Bird 9plus CTD s/n 09P8431-0315 measuring pressure (s/n 53960), temperature (s/n 1370, 1455), and conductivity (s/n 1177, 1180) was used for all casts (TAO9907.CON).

The CTD was mounted in a 24-bottle frame with PMEL's Sea-Bird carousel s/n 53. The CTD data stream was passed through PMC Sea-Bird 11plus deck unit s/n 367 with factory settings. An analog signal was recorded onto the audio portion of VCR tape as a backup. Digitized data were sent to the ship's Gateway G6-200 personal computer equipped with SEASAVE for Windows 95/NT (version 1.03) and DOS SEASOFT acquisition software (version where calibrated data were displayed in graphical and fixed forms in real-time, as well as stored in raw form onto hard disk. Backups of the raw data were made on Zip disks and CD-ROM and returned to PMEL for post-cruise processing.

Cast 28 and 49 (0-866 db) data were recovered from VCR tape post-cruise.

SALINITIES:

Twelve Niskens were fired each cast. Salinity analysis was performed using Guildline Autosal 8400B salinometer s/n 61.668 (aka Dallas). IAPSO standard seawater batch #P134 was used for all casts. Salinity values were computed interactively using Sea-Bird's SEACALC utility. Standard laboratory operating temperature was approx 24 degrees Celsius.

POST-CRUISE CONDUCTIVITY CALIBRATIONS:

GP899S.CAL of primary sensor data and GP8992S.CAL of secondary sensor data were created at PMEL post-cruise. Residual plots of CTD-bottle conductivities
revealed the secondary conductivity sensor to be more stable (no jumps) and in better health than the primary sensor (offset by -0.01 mS/cm). Final pressure and secondary temperature calibrations were pre-cruise. Drift (0.0000262 C) and viscous (-0.0006 C) corrections were applied to secondary temperature. Secondary conductivity fit coefficients were determined using Matlab program CALCOS0:

number of points used	490
total number of points	584
% of points used in fit	83.9

fit standard deviation	0.002210
fit bias	-0.016829929
fit slope	1.0004461

Slope, bias, and pressure correction values were applied to CTD data using PMEL Fortran program GP899_EPIC; and to bottle file data using CALMSTR8.

FINAL PROCESSING:

The following are the standard SEASOFT processing modules used to reduce Sea-Bird CTD data:

DATCNV converts raw data to engineering units and creates a bottle file if a Sea-Bird rosette sampler was used. (MARKSCAN creates a bottle file if a General Oceanics rosette was used.)

ROSSUM averages the bottle data specified in the DATCNV or MARKSCAN output and derives salinity, theta, sigma-t, and sigma-th. These bottle files are transfered to the PMEL VAX where post-cruise calibrations are computed.

WILDEDIT makes two passes through the data in 100 scan bins. The first pass flags points greater than 2 standard deviations; the seond pass removes points greater than 20 standard deviations from the mean with the flagged points excluded.

CELLTM uses a recursive filter to remove conductivity cell thermal mass effects from the measured conductivity. In areas with steep temperature gradients the thermal mass correction is on the order of 0.005 psu. In other areas the correction is negligible. The value used for the thermal anomaly amplitude (alpha) is 0.03. The value used for the thermal anomaly time constant (1/beta) is 9.0.

FILTER applies a low pass filter to pressure with a time constant of 0.15 seconds, and to conductivity with a time constant of 0.03 seconds. In order to produce zero phase (no time shift) the filter is first run forward through the file and then run backwards through the file.

LOOPEDIT removes scans associated with pressure slowdowns and reversals. If the CTD velocity is less than 0.25 m/s or the pressure is not greater than the previous maximum scan, the scan is omitted.

BINAVG averages the data into 1 db bins. Each bin is centered around a whole pressure value, e.g. the 1 db bin averages scans where pressure is between 0.5 db and 1.5 db.

DERIVE uses 1 db averaged pressure, temperature, and conductivity to compute salinity, theta, sigma-t, sigma-th, and dynamic height.

SPLIT removes decreasing pressure records and keeps only the downcast data.

TRANS converts the data file from binary to ASCII format. These data are transfered to the PMEL VAX.

PMEL programs GP899_EPIC applies post-cruise temperature corrections and conductivity calibration coefficients, recomputes the derived variables in DERIVE, and converts the ASCII data files to EPIC format. GP899_EPIC skips bad records near the surface (typically the top 5 m) as well as any records containing -9.990e-29, and extrapolates raw data to the surface (0 db) within 10 db. Because the SBE module LOOPEDIT does not handle package slowdowns and reversals well in the thermocline where gradients

are large, GP899_EPIC removes raw data records where a sigma-theta inversion is greater than -0.01 kg/m3. Data are linearly interpolated such that a record exists for every 1 db. When data are extrapolated to the surface, the WOCE quality word is '888'; when interpolated over greater than 2 db, the WOCE quality word is '666'. The WOCE quality word consists of a 1-digit flag for pressure, temperature (ITS-90), and salinity.

PMEL program CALMSTR8 applies post-cruise temperature corrections and conductivity calibration coefficients and recomputes the derived variables in ROSSUM. EPICBOMSTR converts the ASCII bottle data file into individual cast EPIC data files. Station 33 sample 120 was flagged as questionalbe.

Final CTD and bottle files were moved to DISK$EPIC1:[HAYES.DATA.GP899.CTD] and included in the RIM data management tables on January nn, 2000.