GP6-98-RB
NOAA Ship Ronald H. Brown
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ACQUISITION:

Thirty-eight CTD profiles were collected on this cruise. A test
cast was made at 11N, 113W enroute to the 110W line. Sixteen CTD
profiles were collected along 110W from 8N to 8S; and 21 were
collected along 95W from 8S to 8N. The majority of CTD casts
were to 1000 m; three were deep to 3000 m and 3 shallow (<200 m).

The ship's Sea-Bird 9plus CTD s/n 09P9852-0382 measuring pressure (s/n
58955), temperature (s/n 1713, 2378), and conductivity (s/n 1473, 1921)
was used for all casts. Both TC pairs were calibrated just prior to
this cruise.

The CTD was mounted in the ship's 12-bottle frame with Sea-Bird rosette
sampler s/n 37. The CTD data stream was passed through 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 a Gateway G6-200 personal computer equipped with Sea-Bird's SEASOFT
Windows software (version 1.03) where calibrated data were displayed
in graphical form in real-time, as well as stored in raw form onto hard
disk. Backups of the raw data were made on Zip disk and CD-ROM disk
and returned to PMEL for post-cruise processing.

SALINITIES:

MBARI requests 8 bottles be tripped between 200 m and the surface. The
remaining 2 bottles were used for calibration purposes. Positions 3 and
9 couldn't be fired due to the placement of the hanging bail. There were
no duplicate samples taken. Salinity analysis was performed using a
Guildline salinometer s/n 61668 and IAPSO standard seawater batch #P133.
The autosalinometer was standardized with each cast of samples; no drift
was applied.

POST-CRUISE CONDUCTIVITY CALIBRATIONS:

GP698S.CAL of primary sensor data and sample salinities was created post-
cruise.

Final pressure and temperature calibrations were pre-cruise. A viscous
heating correction of -0.0006 C was applied to temperature. Conductivity
fit coefficients were determined using Matlab programs CALCOPn:

Stations 1-18 Calcop3: number of points used   120
                total number of points 151
                % of points used in fit 79.47
                fit standard deviation 0.00127
                fit bias   -0.014603804

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               fit co pressure fudge   3.7086808e-006
               min fit slope           1.000187
               max fit slope           1.0002701

Stations 19-35 Calcop2: number of points used   138
               total number of points  181
               % of points used in fit 76.24
               fit standard deviation  0.001378
               fit bias                -0.01127753
               fit co pressure fudge   9.4984781e-007
               min fit slope           1.0002516
               max fit slope           1.0003121
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Slope, bias, and pressure correction values were applied to CTD data using
PMEL Fortran program GP698_EPIC; and to bottle file data using CALMSTR6.

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 GP698_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. GP698_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, GP698_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. Program GP698_SEC was used to process secondary sensor data for station 26 cast 1 with pre-cruise temperature and conductivity cals.

PMEL program CALMSTR6 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. There were many bad salts flagged in GP698S.CLB: station 22 sample 106, 23 sample 202, 26 sample 207, 27 sample 111, 28 samples 108 and 110, 29 sample 102, and 29 sample 208. These bottle data were not included in the EPIC .BOT files.

Final CTD and bottle files were moved to DISK$EPIC1:[HAYES.DATA.GP698.CTD] and included in the RIM data management tables on December 14, 1998.