

GP8-95-MB
NOAA Ship Malcolm Baldrige
Pago Pago, Samoa - Rodman, Panama
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ACQUISITION:

Twenty-two CTD profiles were collected during this cruise covering two meridionals from 8S to 5S along 170W and 5S to 8N along 155W. Three profiles were collected along 170W, and 15 along 155W. The majority of casts were to 1000 m; 3 casts were deep. Four casts were made at mooring sites enroute to Rodman at 5N, 125W, 2N, 110W, and 2N and 8N, 95W.

All casts used TAO's Sea-Bird 9plus CTD s/n 09P10881-0390 measuring pressure (s/n 58950), temperature (s/n 1708), and conductivity (s/n 1467). The CTD was mounted in AOML's 24-bottle frame with a Sea-Bird rosette sampler. The CTD data stream was passed through AOML's Sea-Bird 11plus deck unit with factory settings. An analog signal was recorded onto the audio portion of VCR tape as a backup. Digitized data were sent to a Zenith personal computer equipped with Sea-Bird's SEASOFT acquisition software (version 4.209) where calibrated data were displayed in graphical form in real-time, as well as stored in raw form onto the hard disk. Backups of the raw data were made on 200 Mbyte Syquest tapes and returned to PMEL for post-cruise processing.

There was no cast 24. Cast 33 was replayed from VCR tape at PMEL.

SALINITIES:

Salinity analysis was performed using Guildline Autosol salinometer s/n ??? (last calibrated ???) and IAPSO standard seawater batch #P125. Instrument calibrations were not applied to the bottle salinities used to calibrate this data set, only a drift-during-run linear interpolation correction. Standard operating temperature was 24 degrees Celsius.

POST-CRUISE CONDUCTIVITY CALIBRATIONS:

GP7-895A.CAL was created at PMEL using program SBECAL. Anomalous differences between CTD and bottle salinities were scrutinized. Bottle salinities were checked against their original log sheets for typos.

Final pressure and temperature calibrations were pre-cruise. Conductivity calibration coefficients were best determined using a station-dependent linear fitting routine, CALCOS1, written by Greg Johnson in MATLAB for three groups of casts.

Casts 1-17: total number of points = 231
% pts used in fit = 83.12
fit standard deviation = 0.003314
fit bias = 0.0031766107
min fit slope = 1.000352

max fit slope = 1.000414

Casts 18-33: total number of points = 226
% pts used in fit = 95.13
fit standard deviation = 0.001368
fit bias = 0.0062562787
min fit slope = 1.000090
max fit slope = 1.000164

Casts 34-37: total number of points = 47
% pts used in fit = 95.74
fit standard deviation = 0.0009389
fit bias = 0.0022208026
min fit slope = 1.000339
max fit slope = 1.000344

Slope and bias values were applied to CTD data using PMEL Fortran program GP895_EPIC; and to bottle files using CALMSTR7.

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 transferred 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 second 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

