

GP8-00-KA  
NOAA Ship Ka'imimoana  
Kwajalein, Marshall Islands - Honolulu, HI  
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#### ACQUISITION:

Fifty-two CTD profiles were collected on this cruise. Twenty-three profiles were collected along 165E from 8N to 8S, and twenty-seven profiles were collected along 180 from 8S to 9N and along the ship's trackline to 12N. Station 39 was the only deep cast to 4000m. The rest were to 1000 meters. Two profiles were collected at 20.5N, 161.5W before going in to Honolulu, but these were not processed or archived at sea.

PMEL's Sea-Bird 9plus CTD s/n 09P10881-0390 measuring pressure (s/n 58950), the ship's temperature (s/n 2027, 2026), and the ship's conductivity (s/n 1537, 1536) was used for all casts (PMC23.CON). The ship's CTD was found to have a bad connector during GP500 and will be sent to Sea-Bird for repair over the winter inport.

The CTD was mounted in a custom 24-bottle frame with Sea-Bird rosette sampler s/n 88. The CTD data stream was passed through Sea-Bird 11plus deck unit s/n 376 with factory settings. An analog signal was recorded onto the audio portion of VCR tape as a backup. Digitized data were sent to a Dell 5133 personal computer equipped with Sea-Bird's SEASOFT acquisition software (version 4.216) 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 QIC-80 1/4" cartridge tapes and returned to PMEL for post-cruise processing. Cruise data were also archived on 8 mm tape and CD-ROM.

Cast 0181 was replayed from VCR tape. .BTL files for casts 7 and 18 were built from .BL files post-cruise.

#### SALINITIES:

Seawater was collected at 12 depths each cast and salinity samples drawn. Two salinity samples were taken from the deepest Nisken. Duplicate samples were analyzed on a subsequent day from the rest. Salinity analysis was performed using Guildline Autosol 8400B salinometer s/n 61.383. IAPSO standard seawater batch #P136 dated April, 1999, was used for all casts. Standard laboratory operating temperature was approx 23 degrees Celsius.

#### POST-CRUISE CONDUCTIVITY CALIBRATIONS:

GP800S.CAL of primary (s/n 2027, 1537) sensor data (not including any duplicate salts) was created at sea. It's completeness and correctness were scrutinized and ammended where needed.

Final pressure and temperature (s/n 2027) calibrations were pre-cruise. Drift (0.000528 C) and viscous (-0.0006 C) corrections were applied to temperature. Conductivity fit coefficients were determined using Matlab program CALCOS2:

number of points used	456
total number of points	552
% of points used in fit	82.61
fit standard deviation	0.003373
fit bias	-0.00089020402
min fit slope	1.000093
max fit slope	1.0001995

Slope, bias, and pressure correction values were applied to CTD data and converted directly into netCDF format using CNV\_EPS; and to bottle file data using CALMSTR and CLB\_EPS.

#### 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.

TRANS converts the data file from binary to ASCII format.

Program CNV\_EPS applies post-cruise temperature corrections and conductivity calibration coefficients, recomputes the derived variables in DERIVE, and converts the ASCII data files to netCDF format. CNV\_EPS skips bad records near the surface (typically the top 3 m) as well as any records containing -9.990e-29, and copies back 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, CNV\_EPS removes raw data records where a sigma-theta inversion is greater than -0.01 kg/m<sup>3</sup>. Data are linearly interpolated such that a record exists for every 1 db. When data are copied back 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 CALMSTR applies post-cruise temperature corrections and conductivity calibration coefficients and recomputes the derived variables in ROSSUM. CLB\_EPS converts the ASCII bottle data file into individual cast netCDF data files. The following sample salinities were flagged as bad and removed from individual bottle files: station 7 sample 105, station 18 samples 103 and 105, stations 23, 28, 31, and 43 sample 103.

Final CTD and bottle files were moved to DISK\$EPIC1:[HAYES.DATA.GP800.CTD] and included in the MySQL data management tables on January 9, 2001.