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#DATA_DATES: 1997/08/02 01:10:00 --- to --- 1997/09/06 19:59:00
#LON_RANGE: 61.46 W --- to --- 39.48 W
#LAT_RANGE: 64.27 S --- to --- 54.29 S
#DEPTH_RANGE: 31 --- to --- 503 m
#SAC_CRUISE_ID: 00377
#PLATFORM_NAME: R/V N.B. Palmer
#PRINCIPAL_INVESTIGATOR_NAME: R.Muench
#PI_INSTITUTION: Earth and Space Research
#PI_COUNTRY: USA
#PROJECT: DOVETAIL (Deep Ocean Ventilation Through Antarctic
          Intermediate Layers)
#CRUISE_NAME: nbp9705
#PORTS: Punta Arenas, Chile and return
#GEOGRAPHIC_REGION: Southern Ocean
#PROCESSED_BY: Earth and Space Research
#NAVIGATION: GPS
#QUALITY_NAV: good
#GENERAL_INFORMATION:

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CRUISE NOTES

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CHIEF SCIENTIST ON SHIP      : A.Gordon
INSTITUTE                    : Lamont-Doherty Earth Observatory
COUNTRY                      : USA
SIGNIFICANT DATA GAPS      : none
SPECIAL SHIP TRACK PATTERNS :
COMMENTS                     :

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The objectives of Palmer Cruise 97-5 is: 1. to set out the array of Dovetail moorings which is designed to monitor for a period of 8 to 16 months the highly variable circulation within the Weddell-Scotia-Confluence region; 2. to deploy drifters for monitoring of sea ice response to wind and the sea ice divergence; and 3. to investigate ocean thermohaline, oxygen, velocity profile and tracer chemistry stratification in the region separating the circumpolar water masses from those of the Weddell Gyre and intervening Weddell-Scotia Confluence. Of specific interest is: 1. the outflow of dense bottom water from the Weddell Sea; 2. the spill-over and spreading of dense Weddell waters across the South Scotia Ridge; and 3. nature of the winter mixed layer and its relationship to the pycnocline and WDW t-max. A more general objective of the Dovetail program is to establish a design for a cost effective, long term monitoring strategy for the bottom water outflow from the Weddell Sea and secular variability of water column stratification.

The observational program includes: CTD/Oxy and Lowered ADCP sensors; water samples for salinity, oxygen, nutrients, CFC, Tritium/Helium, stable isotopes; 12 moorings; 6 ice drifter. Besides basic navigation, the underway observations included hull ADCP, SeaBeam as required for mooring site survey, meteorological monitoring.

DOVETAIL priorities parallel, and the results will contribute to, ongoing global change research. The processes responsible for vertical and horizontal fluxes within the ocean and associated interaction with the sea ice and atmosphere in polar regions must be properly represented in global circulation and climate models. The DOVETAIL study region, off the tip of the Antarctic Peninsula serves as the primary gateway between the southern polar waters and the global ocean. This region can therefore be considered as a "vital" location for long term monitoring of the discharge of cold Antarctic Water into the global ocean. Results from the DOVETAIL experiment will aid in establishing long-range monitoring of this critical region. Both the Global Ocean Observing System (GOOS) and the ocean component of the Global Climate Observation System (GCOS) have been established by a number of international bodies to provide such monitoring data.

DOVETAIL is a component of the International Antarctic Zone (iAnzone) program. The US research in DOVETAIL is funded by the Office of Polar Programs of the National Science Foundation.

ADCP INSTRUMENTATION

MANUFACTURER : RDI
 HARDWARE MODEL : VM-150
 SERIAL NUMBERS :
 FIRMWARE VERSION :

ADCP INSTALLATION

METHOD/DESCRIPTION OF THE
 ATTACHMENT TO THE HULL :
 LOCATION/DEPTH ON HULL : nominally at 7m
 REPEATABLE ATTACHMENT : < NO > < YES >
 DATE OF MOST RECENT ATTACH. :
 ACOUSTIC WINDOW : < NO > < YES - EXPLAIN >
 COMMENTS :

ADCP INSTRUMENT CONFIGURATION

DEPTH RANGE : 31 to 503m (bin centers)
 BIN LENGTH : 8m
 NUMBER OF BINS : 60
 TRANSMIT PULSE LENGTH : 8m
 BLANKING INTERVAL : 16m
 ENSEMBLE AVERAGING INTERVAL : 150 s
 SOUND SPEED CALCULATION : FUNCTION OF TEMP AT TRANSDUCER
 BOTTOM TRACKING :
 DIRECT COMMANDS :
 COMMENTS :

ADCP DATA ACQUISITION SYSTEM

SOFTWARE DEVELOPERS :
 SOFTWARE VERSIONS :
 DATA LOGGER, MAKE/MODEL :
 ADCP/LOGGER COMMUNICATION : UE4
 USER BUFFER VERSION : 1920
 CLOCK :
 COMMENTS :

SHIP HEADING

INSTRUMENT MAKE/MODEL : Ratheon Yokogawa Navitec MCM 2300X gyro
 SYNCHRO OR STEPPER :
 SYNCHRO RATIO :
 COMPENSATION APPLIED :
 GPS ATTITUDE SYSTEM : YES - Ashtech 3DF GPS
 LOCATION OF ANTENNAS :

The GPS satellite signals are received using four microstrip antennas mounted on the main mast and behind the wheel house. Each antenna is connected to a low noise amplifier (LNA) and the four LNAs are connected to the 3DF receiver located in the main lab. The 3DF receiver utilizes 24-channels configured as four 6-channel sections to make carrier-phase measurements and perform real-time differential processing to obtain attitude, position, velocity, and time measurements. The data is output from an RS-232 port to the R/V NATHANIEL B. PALMER computer network.

RIGID ATTACHMENT : yes
 LOGGING RATE : 2 Hz
 COMMENTS: Up to nine 60-kHz Syncro Loads
 35V step output, 2 amps max load
 RS422 Digital Outputs (2400/4800 BPS)
 FLUXGATE COMPASS : Cetrek Model 930551; one per SATCOM

ANCILLARY MEASUREMENTS

SURFACE TEMP AND SALINITY : thermosalinograph, Chelsea Instruments
 PITCH/ROLL MEASUREMENTS : yes
 HYDRO CAST MEASUREMENTS : yes
 BIOMASS DETERMINATION :
 DATE OF LAST CALIBRATION :
 CALIBRATION COEFFICIENTS :
 BEAM-AVERAGED AGC AVAILABLE?: < NO > < YES >
 CALIBRATION NET TOWS? : < NO > < YES >

COMMENTS :

ADCP DATA PROCESSING/EDITING

PERSONNEL IN CHARGE : Susan Howard
 DATE OF PROCESSING :
 ADDED TO NODC DB : FEB 2000
 NOTABLE SCATTERING LAYERS :
 COMMENTS :
 Standard editing procedures applied to set the bottom and to eliminate interference from the winch wire. CTD data used to correct the soundspeed (with salinity of 34.2757 psu).

There were many areas of low percent good data as the shipped moved through ice between stations. Entire profiles were flagged (between stations).

NAVIGATION

GPS : YES
 MAKE/MODEL : FURUNO GP500 GPS Sat Nav
 SELECTIVE AVAILABILITY : < NO > < YES >
 P-CODE : < NO > < YES >
 DIFFERENTIAL :
 SAMPLE INTERVAL :
 LOCATION OF ANTENNA
 RELATIVE TO TRANSDUCER :
 TIME OBTAINED RELATIVE TO
 START/END OF ENSEMBLE :
 AVERAGING/EDITING APPLIED :
 LOGGED WITH ADCP DATA : YES - using E.Firing's user exit program
 LOGGED INDEPENDENTLY : < NO > < YES - HOW >
 COMMENTS :
 OTHER :

CALIBRATION

GYROCOMPASS CORRECTION : Ashtech used
 mean angle: 1.263
 std angle: 0.792
 BOTTOM TRACK METHOD : YES
 WATER TRACK METHOD :
 Time range 215.50 to 247.66
 Calculation done at 99- 2-12 13:55
 delta-u min = -100.00, max = 100.00;
 delta-v min = -100.00, max = 100.00
 clip_amp = 0.04, clip_ph = 3.0
 clip_dt = 60, clip_var = 0.050

rotated 5

Number of edited points: 10 out of 114
 amp = 1.0061 + -0.0004 (t - 235.2)
 phase = -2.18 + -0.0454 (t - 235.2)
 median mean std
 amplitude 1.0040 1.0061 0.0252
 phase -2.4295 -2.1786 1.4276
 nav - pc 1.5000 4.6000 12.0757
 var 0.0340 0.0335 0.0161
 min var 0.0270 0.0274 0.0119
 delta-u 1.5850 0.7650 3.6098
 delta-v -1.4250 -1.0430 3.0792

rotated 7

Number of edited points: 9 out of 99
 amp = 0.9904 + 0.0000 (t - 233.1)
 phase = -1.49 + 0.0014 (t - 233.1)
 median mean std
 amplitude 0.9840 0.9904 0.0215
 phase -1.4940 -1.4878 1.5907
 nav - pc 6.0000 8.1111 11.3737
 var 0.0330 0.0400 0.0168

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min var      0.0320   0.0316   0.0073
delta-u      -1.3900  -0.9578   2.8552
delta-v      -2.2200  -0.7156   4.3255

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rotated 9

Number of edited points: 9 out of 82

amp = 0.9916 + -0.0002 (t - 234.8)

phase = -2.00 + -0.0067 (t - 234.8)

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           median      mean      std
amplitude  0.9980     0.9916   0.0137
phase      -1.3360   -1.9966   1.6003
nav - pc   12.0000   14.8889  15.6000
var        0.0490     0.0480   0.0161
min var    0.0360     0.0363   0.0082
delta-u    -1.1100   -0.3644   3.2116
delta-v    -2.3500   -1.0256   3.7963

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FINAL SELECTION : AMPLITUDE=1.000 PHASE= -2.000

AGREEMENT WITH PREVIOUS

CRUISES

SOUND SPEED CORRECTIONS

COMMENTS

:
:
:

NAVIGATION CALCULATION

NAVIGATION USED : GPS

REFERENCE LAYER DEPTH RANGE : bins 5 to 20, PG_min=30

FILTERING METHOD FOR

SMOOTHING REFERENCE LAYER

VELOCITY (FORM/WIDTH) : Blackman window function of width T(.14 hr):

$$w(t) = 0.42 - 0.5 * \cos(2 * \pi * t / T) + 0.08 * \cos(4 * \pi * t / T).$$

FINALIZED SHIP VEL/POSITIONS

STORED IN DATABASE : YES

COMMENTS

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REFERENCES (DATA REPORTS,ETC.) :

Gordon, A. 1998. Dovetail N.B.Palmer 97-05 Cruise Report.

Lamont-Doherty Earth Observatory.