Lamont-Doherty Earth Observatory of Columbia University

DATA REDUCTION CRUISE SUMMARY

EW-9702

A study of continental shelf and slope

stability along the east coast of the United States

Savannah, GA - P. Canaveral, Fla.

05/03/97 (JD 123) - 05/16/97 (JD 136)

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R/V MAURICE EWING

Participants:

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SCIENCE OVERVIEW:

The U.S. Navy is continuing to evaluate continental shelf and slope stability along the east coast of the United States. Three study areas have been chosen along the eastern margin to observe variations in seafloor stability that occur along different slope environments over short time periods (approx. 2 wks.). The survey objectives are to (1) collect detailed geologic and oceanographic measurements across three differing slope environments, (2) assess the interaction of shelf and slope oceanographic and sedimentary processes on the seafloor stability over short time periods, (3) identify any resultant seafloor features and conditions and (4) determine potentially unstable or hazardous seafloor slopes.

TRUE TIME CLOCK:

Instrument: *Kinemetric/TrueTime Division Model GPS-DC GPS Synchronized Clock*
Logging: 1 minute intervals
NOTE: The True Time clock is used to adjust the CPU clock of the logging computer. The logging computer captures the continuous time records from the clock and provides these as a service to the rest of the network via a UDP broadcast. This enables the computers on the network to adjust their CPU times to UTC time.

DAY	TIME	COMMENTS
123	2000	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing

SPEED AND HEADING:

Instrument: *Furuno CI-30 2-axis Doppler speed log, Sperry MK-27 gyro*
Logging: 3 second intervals
Checking: visual check of plot of data
Smoothing: mean value of all good values within the same minute

DAY	TIME	COMMENTS
123	2000	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing

GPS SATELLITE FIXES:

Instrument: *Magnavox MX-4200 Global Positioning System receiver 1 & 2*
GPS Trimble NT200D receiver
Logging: 10 second intervals on all four receivers

Checking: (GPS-MX 4200 1 & 2, GPS Trimble NT200D receiver)
minimum number of SATs: 3
dilution of precision maximum: north = 4.0, east = 4.0
speed maximum: 20.0
compared GPS speed and course with Furuno smooth speed and heading
reject fixes with high drifts in navigation
reject fixes producing Eotvos correction errors in gravity larger than 5 mGals

Interpolation: interpolated positions at 00, 30 seconds of each minute
Smoothing: smoothed interpolated positions with 9 point running average.

Note:
The Selective Availability (SA) enforced by the Department of Defense (DoD) causes us to take a GPS fix every twenty minutes, and DR in between.

DAY	TIME	COMMENTS
123	2000	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing

NAVIGATION:

A "1 minute navigation" is produced from the above sources. Acceptable fixes are merged at 1 per minute with priority given to GPS. The smooth speed and heading data is used to fill any gaps of 2 minutes or longer between fixes by computing 1 minute DR'ed positions corrected for set and drift between fixes. The DR'ed positions are produced at 00 seconds of each minute.

Chief scientist's final data: 1 minute navigation.

FORMAT: n.ddd
yy+ddd:hh:mm:ss.mmm N 12 12.1234 E 123 12.1234 id 123.1 12.1
yr. day time lat. lon id set drift

Lamont database: 1 minute navigation, in NetCDF format.

DAY	TIME	COMMENTS
123	2000	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing

SEA TEMPERATURE:

Instrument: *Omega DP10 Series*
Logging: 1 minute intervals
Checking: none
Smoothing: none

Chief scientist's final data: none.
Lamont database: one minute data, merged with navigation.

FORMAT: ct.nddd
yy+ddd:hh:mm:ss:mmm N 12 12.1234 E 123.1234 26.3
yr day time lat lon sea_temp (in ºC)

DAY	TIME	COMMENTS
123	2000	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing

BATHYMETRY:

Instrument: *Krupp Atlas Hydrosweep Center Beam*
Logging: At each ping of *Hydrosweep*, data is being broadcast real time to the network, which is received by data logger. The logger computer then extracted the center beam depth.
Checking: Visual checking aided by graphic editor to remove major spikes.

Chief scientist's final data: final calibrated and cleaned center beam data, two nearest point to the minute interpolated to even minute.
Merged with final navigation. Depth is in meters.

FORMAT: hb.nddd
yy+ddd:hh:mm:ss:mmm N 12 12.1234 E 123 12.1234 2222.0
yr. day time lat. lon depth_in_meters

Lamont database: final calibrated and cleaned data, interpolated to even minute.
Merged with final navigation. NetCDF format. Depth is in meters.

DAY	TIME	COMMENTS
123	2242	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing

MAGNETIC:

Instrument: *Varian V75 magnetometer*
Logging: 6 second intervals
Checking: visual check of plot of data
Reference field: International Geomagnetic Reference Field 1990
(*IGRF 1990*) model of the main field at 1985.0 and a predictive model of the secular variation for adjusting to dates between 1990.0 and 1995.0.
Residual field: Applied by bi-linear interpolation across a 1 degree square.

Chief Scientist's final data: interpolated total intensity value at 00 second of each minute.

FORMAT: mg.nddd

yr+ddd:hh:mm:ss.mmm N 12 12.1234 E 123 12.1234 41200.8 -367.1
yr. day time lat lon total_intensity anomaly

Lamont Database: interpolated total intensity value at 00 second of each minute NetCDF format.

NOTE:

DAY	TIME	COMMENTS
124	1000	maggie in the water
126	2142	maggie out of the water ; end of survey

WEATHER STATION:

Instrument: *R.M./. Young Precision Meteorological Instruments 26700 Series*
Logging: 1 minute interval
Checking: none

Chief scientist's final data: none.
Lamont database: as is.

FORMAT: wx.rddd

Port bird is bird #1; starboard bird is bird #2.

```
94+022:00:00:00.244   3.4 231 9.3   15.4    13.2     21.1   271   261
date    time                  tspd tdir wsi1  wss1  wsm1  wsx1 wdc1 wds1

  6       12.6  15.9    15.6    20.7   261   253       6     66.7  66.7
wdm1 wsi2  wss2  wsm2 wsx2 wdc2 wds2 wdm2 tcur    tavg

66.5  67.0 66 58  68 1016.8
tmin  tmax  rh rhn rhx   baro
```

tspd = true speed
tdir = true wind direction
wsi1/2 = wind speed, instantaneous, bird #1/#2
wss1/2 = wind speed, 60 second average, bird #1/#2
wsm1/2 = wind speed, 60 minute average, bird #1/#2
wsx1/2 = wind speed, 60 minute maximum, bird #1/#2
wdc1/2 = wind direction, current, bird #1/#2
wds1/2 = wind direction, 60 second average, bird #1/#2
wdm1/2 = wind direction, 60 minute average, bird #1/#2

tcur = temperature, current
tavg = temperature, 60 minute average
tmin = temperature, 60 minute minimum
tmax = temperature, 60 minute maximum

rh = relative humidity
rhn = relative humidity, 60 minute minimum
rhx = relative humidity, 60 minute maximum

baro = barometric pressure

DAY	TIME	COMMENTS
123	2000	start of cruise, started logging/processing
136	1200	end of cruise, stopped logging/processing