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CRUISE REPORT

R/V ENDEAVOR Cruise EN-017

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Project: Coring Test Cruise

Funding: NSF OCE78-04380

Objectives: Testing of standard piston coring system, large diameter piston corer, large diameter gravity corer, associated handling systems, winch system, sediment processing operations, and 3.5 kHz subbottom profiling system

Schedule: Departed 15 January 1978, Narragansett, R. I.  
Returned 22 January 1978, Narragansett, R. I.

Study Region: Gulf Stream Outer Ridge; 36°N - 66°W

Instruments and Equipment: Standard Piston Corer (SPC)  
Large Diameter (11.4 cm) Piston Corer (LDPC)  
Large Diameter Gravity Corer (LDGC)  
3.5 kHz ship-mounted system  
Bottom camera  
XBT set

Scientific Personnel:

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Operations

- A) Pre-cruise. During the three weeks preceding departure, considerable effort was devoted to installation of special core handling equipment, modifications to the winch to increase pull-out capabilities and installation of the 3.5 kHz transducer array. A core weight cradle was borrowed from WHOI and modified to fit near the J-frame. Unfortunately the cradle design was not well suited for use on the ENDEAVOR, but it was determined to be workable. The LDPC davit/trolley system had to be modified considerably. Due to dock and ship configurations, it was necessary to turn the ship port side to the dock on the day of departure so that final fitting and installation of the outboard trolley rail could be completed.

The SPC was assembled and the cradle, core weight and corer were lashed outboard along the starboard rail during transit.

- B) Transit. Due to weather conditions, deck work was very limited during transit to the site. Security of the core weight was affected, but addition of turnbuckles to lash the cradle to the deck remedied the situation. The 3.5 kHz system was checked out during transit.

- C) Site Work. Work was limited by weather and sea state constraints and therefore actual time available for piston coring was quite small. Following is a brief recapitulation of events:

1. Make up and load test trawl wire termination.
2. Repair and adjustments to trawl winch system.
3. LDGC on trawl wire - 600 lb. corer, 10 ft. barrel, 10 ft. free-fall. Location of core cradle makes launching of LDGC from the J-frame time consuming. Corer overpenetrated but otherwise functioned well.
4. Lower camera with hydrowinch (camera malfunctioned).
5. LDGC on trawl wire - 450 lb. corer, 10 ft. barrel, 5 ft. free-fall. Launch and retrieval was efficient, but evidently lower-half core barrel was sheared off during launch--probably against side of ship during heavy roll.
6. Rig and launch SPC - 3000 lb. core weight, 30 ft. core barrel, 17 ft. free-fall. Maneuvering of core cradle outboard in a controlled fashion was completed by rigging the hydrowire outboard on the J-frame working against a block and tackle inboard to the deck. Due to position of STD sheave with respect to the trawl wire sheave (a load cell on the trawl sheave brought the sheave in closer to the ship) and incorrect rigging, some difficulties were encountered during lowering of the trigger core. Otherwise the launch went fairly well.

35° 51.5' N, 166° 11.0' W  
 35° 52.5' N, 166° 11.2' W  
 35° 05' N, 166° 57.5' W

The corer was triggered at the bottom but was lost due to failure of the termination at the eye socket. Failure is attributed to a combination of heavy core weight, short barrel, soft sediment and metal defect in termination.

7. Camera lowered - strobe not working properly. One good photo obtained.
8. LDPC - Plans were made to assemble a 40 ft. LDPC with the lighter (WHOI) core weight (1800 lb.) while steaming to a site on the Continental Slope. However, severe weather and sea state conditions made this plan inoperative, and it was necessary to abandon this part of the program.
9. XBT transect - Due to the sea state, it was not possible to launch the XBT's.
10. Core processing - One section of GC-1 was extruded and processed. GC-2 extruded.

### Results

Following is a summary of results:

1. 3.5 kHz system - satisfactory.
2. LDGC - Corer works well but different launch and recovery techniques necessary.

Two cores recovered:

- \* GC-1 - 4.5 meters (1.5 meter overpenetration into core weight pipe). One section (1.5 meters) of core extruded and processed.
- \* GC-2 - 2.5 meters (1.5 meter overpenetration into core weight pipe). Core extruded and partially processed. Sample disturbed and contaminated due to core barrel fracture.

3. SPC - Corer lost. Launch operations workable. Main problem is with core weight cradle.
4. Camera - Problems with strobe unit. One good bottom photograph obtained.
5. LDPC - Corer assembly system is functional. Extrusion system must be relocated aft to allow clearance for extrusion. Booster system for pull-out force was assembled and seems to be operational but was not put to use.
6. Trawl winch - A number of problems were encountered, and certain modifications must be made to make the winch fully effective.

\* Need field data.

Summary and Recommendations

1. Subbottom Acoustics

The newly installed 3.5 kHz subbottom profiling system worked well.

2. Piston Coring

System changes must be made for a fully efficient large diameter piston coring operation.

3. Gravity Coring

It is recommended that gravity coring be done with the hydrowire off the stern with a 1/4" cable unit.

4. Winches

All winches should be thoroughly checked, tested and maintained.

5. Core Storage

A refrigerated van should be available for core storage. The best location seems to be on the upper deck near the hydrowinch.

17 Jan (2) GC-01 35° 51.0' N : 66° 10.9' W  
 19 Jan GC-02 35° 54.2' N : 66° 14.9' W

20 Jan GC-03 35° 54.0' N : 66° 16.5' W  
 21 Jan GC-04 35° 52.8' N : 66° 12.0' W  
 22 Jan GC-05 35° 51.5' N : 66° 11' W  
 23 Jan GC-06 35° 46.5' N : 66° 12.0' W  
 19 Jan heat PC 35° 46.5' N : 66° 12.0' W