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CRUISE REPORT

Ship Name: R. D. Conrad

Cruise No: 19-02

Departure: 13 August, 1975 from Brooklyn, N.Y.
Date Port

Arrival: 24 August, 1975 at Piermont, New York
Date Port

Days at Sea: 11 Days Foreign Port: 0
No. of days in arrival port

Area of Operation:

East Coast of United States

Program Description:

Gravity Survey

Participants: (All L-DGO unless otherwise specified)

G. Carpenter	Chief Scientist
Steve Asquith	Core Describer
Bogart, Richard	Camera
Bye, Michael	Core Bosun
Carmichael, Dennis	E. T.
Crowell, Bruce	E. T.
Coyle, Patrick	Core O. S.
Diebold, John	Airgun/Core Crew
Kostecki, John	Core Describer
Lindgren, K.	Core O.S.
Schroeder, Fred	Velocimeter
Paisley-Smith, Van	Gravity
Williar, James	E. T.

All inquiries regarding cruise should be made to the chief scientist.

Cruise Expectations

The proposed work was largely designed around a series (7) of acoustical surveys (with station work) over several types of bottom sediments. The acoustics experiment uses a 3.5 kc pinger sending to either a telemetering bottom hydrophone or a recording OBH. It was expected that normal incidence reflections, wide angle reflections, and refraction data would be obtained yielding detailed velocity information for the surface sediments. At least 3 piston cores, as long as possible, were to have been taken in the immediate area of the pinger/hydrophone drop for cross correlations of the acoustic/lithologic data sets. Bulk density and velocimeter measurements will be done on each core as soon as possible after it comes aboard.

Sites were selected so as to sample as wide a variety of surface lithologic and textural variability as possible. Hydrophone drops and station work were planned for areas with the following surface sediment types.

1. Proximal portions of the Hatteras Abyssal Plain. Proximal sediments are characterized by large grain size, low porosity and relatively thick bedding.
2. Distal portions of the Abyssal Plain. These sediments tend to have small grain size, high porosity and relatively thin bedding. (It was expected that layer thickness as thin as 40 cm [one wavelength of 3.5 kc at $V = 1.5$ km/sec] could be resolved.
3. Unreflective, homogeneous, pelagic and clays.
4. Highly reflective, current controlled, intensely stratified, calcareous muds and oozes as found on the Bermuda rise area.
5. One drop site was planned on the scar of a submarine mud slide. Roughly 50-100 meters are missing so it provided a chance to make this sort of

measurement rather deeper in the section than is ordinarily possible.

The décollement surface of the slide is exposed and it was hoped that a detailed velocity analysis and the sediment cores would yield clues as to why sediments fail on very shallow gradients.

The initial phase of the cruise was to be devoted to a gravity survey of the East coast of the U.S. with the hope of further defining the structure and extent of various sedimentary basins. (Baltimore Trough, etc.) that parallel the margin.

A limited number of sonobuoys were planned to study normal mode propagation in shallow water. In order to get as wide a spectrum as possible, it was hoped that explosives would be available as a sound source. The sonobuoys were to have been recorded on tape, broadband and unclipped, so as to preserve amplitude information.

A single low speed crossing of the Blake-Bahama plateau and outer ridge using the large Mobil Airgun was planned. This would have filled a critical gap in our data in this area and hopefully would have provided some detailed information on the deeper structure of these features.

Cruise Results

I had hoped to run the gravity survey continuously so as to avoid gaps in the data and at as high a ship's speed as possible to allow more time for other work. However, several of the longer ship's breakdowns provided opportunities for station work. Three stations were taken, one on the upper Rise off Cape Hatteras and two in shallow water on the Blake Bahama'plateau.

The first station (on the Rise) included a core and a bottom acoustics experiment. The acoustics work was a failure as the release did not function. The hydrophone and coiled cable were raised and lowered three times to free the release but no separation was observed on the shipboard recorder so the

unit was brought aboard for repair. A core was taken and yielded 12 meters of foraminiferal marl and clay. [I judged that in view of the inexperienced crew and the rather fickle surface currents it would be best not to take multi-wire stations so camera work was omitted at this station].

The two cores on the Blake-Bahama plateau were taken in roughly 400 fathoms. One yielded 5m of foram ooze while the other taken on a hard bottom (probably manganese pavement) consisted of a few nodules, some coral and bryozoa fragments, and a shark's tooth. No hydrophone experiments were performed at these sites because of our high drift rate (2 knots +). A camera station was done at the last site. Twelve photos were developed which showed a sand bottom with pronounced current

The gravity survey was completed and on leaving the Blake-Bahama area we intended to utilize the Mobil gun for a low speed crossing of the margin. Unfortunately adequate electrical power was unavailable so the plan was abandoned.

Two sonobuoys were run for the normal mode propagation study using the Lamont airgun. This work was successful although the short life of both buoys was distressing. On Conrad sonobuoys are stored in the magazine under conditions of high temperature and humidity which seems to guarantee premature activation of the sea-water batteries. Both buoys lasted less than an hour and a check of others showed that many of the batteries were indeed generating minute amounts of current.

Shortly after completion of the gravity survey the ship's condition was deemed inadequate and the cruise was aborted. Very little data was collected on the return run as most of the equipment was shut down because of fear of catastrophic failures induced by the temperature in the dry lab (120°F).

