

91015

CRUISE REPORT

R/V CALETA 91-1

10 June-14 June, 1991

Inner Shelf Survey off Little Egg Inlet, N.J.

by

David Twichell
U.S. Geological Survey
Woods Hole, MA

CRUISE REPORT

Vessel:

R/V CALETA

Area of Operation:

The survey area was a 3 by 1.5 nm area on the inner continental shelf offshore of Little Egg Inlet, New Jersey. The approximate bounds of the study area were: 39° 26'N-39° 30'N and 74°13'W-74°17'W. Water depths ranged from 8-18 m, and the survey covered one sand ridge and the adjacent troughs on either side.

Dates:

10 - 14 June, 1991

Day trips from Rutgers Marine Field Station, Tuckerton, N.J.

Personnel:

R. Laubly, Captain
D. Twichell, USGS - Chief Scientist
K. Parolski, USGS - Electronics Technician
B. Irwin, USGS - Navigation Technician
K. Able, Rutgers Univ
N. Psuty, Rutgers Univ.

Equipment:

Klein 100-kHz sidescan sonar
QMIPS data acquisition system
3.5-kHz surface towed subbottom profiler
Miniranger navigation system
Benthos acoustic ranging system for acquiring range from ship to sidescan fish
Odem digital echo sounder

Objective:

The purpose of the project was to study the sedimentology and depositional processes of an inner shelf sand ridge offshore of Little Egg Inlet, NJ to understand sand ridge development and how they are affected by modern oceanographic conditions. This cruise marked the initiation of a major program to be conducted primarily by personnel from Rutgers University to monitor the biology, chemistry and physical processes of this inner shelf setting. In light of this program, data from this cruise provide a baseline geologic setting upon which to base the sample design for the rest of the program.

Narrative:

This cruise was the shakedown cruise for Rutgers University's new coastal research vessel. The CALETA is a 30 ft vessel with an inboard/outboard drive and a small pilot house and space for two bunks in the forepeak of the boat. She did not have enough electric power for our gear, so we brought our own generator which had to be set up on the fantail. Lab space was very confined, but we managed to get everything aboard and operational. Weather was a more serious problem. When seas reached about 3 feet, the data quality was degraded enough to require retrieving the gear and waiting for improved weather. One day was a complete loss due to weather, and during the other 4 days we surveyed for a total of about 15 hours, and collected about 115 km of trackline data.

The objectives of surveying the surficial geology and shallow subsurface stratigraphy of this inner shelf sand ridge were successfully achieved although we were unable to survey a second sand ridge as we originally had hoped because of the time lost to weather.

The sidescan sonar images revealed two basic facies in the study area. Much of the area was covered by a low-backscatter facies, but high-backscatter bands and patches were found on the seaward side of the sand ridge, in the trough on the seaward side of the sand ridge and around its northern end, and on the face of the slope shoreward of the sand ridge. The high-backscatter bands were discontinuous, and in places appeared to cross each other giving the appearance of a braided stream. Ripples were not apparent in the high backscatter bands, and if they were present they either had been smoothed over by biological activity or were too small to

be resolved by the sidescan sonar system. The high backscatter areas had no apparent relief with the surrounding sea floor as has typically been seen in other places. The apparent absence of ripples and the lack of relief along the edges of these bands may indicate that they were relatively old.

The 3.5-kHz subbottom profiles showed a southeasterly trending buried channel below the study area, and three distinctive shallow subsurface acoustic facies in the study area. The sand ridge itself was covered by an acoustically transparent lens that reached as much as 3 m in thickness, and pinched out along its edges. The upper 5-6 m of the subbottom section of the northeastern half of the study area away from the sand ridge was characterized by an acoustically laminated facies. The southeastern half of the study area was characterized by a prolonged acoustic return. The distribution of these echo character patterns did not correspond with the patterns seen on the sidescan sonar images, but instead appear to record a longer period of stratigraphic differences in the evolution of this section of the inner shelf.

Tabulated Information:

A. Days at sea:
4

B. Amount of data collected

System	Amount of data collected
Klein	18 km ²
Odem	115 km
3.5 kHz	112 km

