

## CRUISE REPORT, LANG1

84019

Vessel: R/V Langley  
 Cruise number: LANG1  
 Parent project: Geology of Chesapeake Bay  
 Funding agency: USGS-Virginia Institute of Marine Science (VIMS)-Maryland Geological Survey (MGS) Cooperative  
 Funding amount: 25,000 first year  
 Contract number: USGS/VIMS Coop agreement no. 14-08-0001-A-0203  
 Contract start and end dates: July, 1984, 1 year renewable

Area of operations: Southern Chesapeake Bay  
 Cruise dates: October 15-26, 1984  
 Chief scientist(s): Steve Colman, Geologist, USGS  
 C. H. Hobbs III, Geologist, VIMS  
 Other scientific party: Dave Nichols, Electronics Tech., USGS  
 Brian Atwater, Geologist, USGS, Oct. 20-26  
 Bob Oldale, Geologist, USGS, Oct. 15-16  
 Susan Bartsch-Winkler, Geologist, USGS, Oct. 15-16  
 Jeff Williams, Geologist, USGS, Oct. 24  
 Don Wright, Geologist, VIMS, Oct. 16  
 Malcolm Green, Geologist, VIMS, Oct. 16  
 George Thomas, Tech., VIMS, Oct. 15-19, 21-26  
 Rick Berquist, Geologist, William and Mary and Va. Div. Mineral Resources, Oct. 18  
 Gerre Johnson, Geologist, William and Mary, Oct. 22  
 Heather McDonald, Geologist, William and Mary, Oct. 22  
 Jeff Halka, Geologist, MGS, Oct. 16-18  
 Randy Kehrin, Geologist, MGS, Oct. 24  
 Ship's captains: Charles Machen, VIMS, Oct. 15-23  
 Paul Oliver, VIMS, Oct. 24-26

## Purpose of cruise:

Collection of high-resolution seismic-reflection and side-scan sonar data in order to define the geology and shallow structure of the Chesapeake Bay. The data will contribute to understanding the history and evolution of the Bay, and will provide basic data for management and planning decisions concerning the Bay, including those related to waste disposal; pollution control and clean-up; dredging; and sand, gravel, and fisheries resources.

## Navigation:

Positions were determined from Loran-C time delays, using lines 9960-X-27155 to 27310 and 9960-Y-41270 to 41810. Coordinate locations were recorded on a Texas Instruments Silent 700 printer/recorder automatically at five-minute intervals and at course changes and other times as necessary. Coordinate locations were also written at these times directly on the analogue seismic records.

## Scientific equipment employed:

ORE Geopulse system; sled and boomer plate, power supply (run at 280  
 joules), and pre-amp/filter/amplifier  
 Innerspace 20-element streamer without pre-amp  
 EPC-4603 graphic recorder  
 Northstar-6500 Loran-C system with Texas Instruments Silent 700  
 recorder/printer  
 Hewlett-Packard 8-track analogue recorder  
 IRIG-B time code clock  
 EG&G-SMS-960 side-scan sonar system  
 Back-up equipment used  
     EG&G-234 energy source (300 joules)  
     EPC-4100 graphic recorder  
     Teledyne-300 amplifier  
     Hewlett-Packard 4-track analogue recorder

#### Equipment performance:

All equipment performed smoothly and satisfactorily with the following  
 exceptions: (1) the ORE power supply failed (blown capacitor) during the  
 second week of the cruise, and was replaced by the EG&G unit; (2)  
 intermittent minor problems with the key signal from the EPC recorders  
 occurred and were very difficult to trace; the cause seemed to be build-  
 up of carbon and moisture inside the recorder and an incorrect ground  
 connection in a switching box.

#### Cruise Summary:

The cruise was very successful, due in part to excellent weather and to  
 little equipment-related down-time. More than 700 km (380 nm) of  
 seismic-profile lines were obtained in 11 days at sea. Local problems  
 with penetration were encountered, apparently due to gas in the sediments  
 or to hard substrates (packed sand or oyster reefs). However,  
 penetration depths were typically about 75 m (0.1 seconds two-way travel  
 time), allowing excellent resolution for the entire Quaternary section  
 and for the upper part of the Tertiary section. On-board observation of  
 the records suggests that cyclic incision and deposition related to sea-  
 level changes is recorded in the Quaternary sediments, and that filled  
 paleochannels are commonly unrelated to present bathymetry. The side-  
 scan sonar records showed most of the bay bottom to be smooth and  
 featureless, but local areas of distinct bedforms were encountered,  
 especially near the present channels.

#### Attachment: track chart

cc: W. Dillon	J. Williams
W. Green	D. Nichols
T. O'Brien	G. Folger
R. Bailey ✓	R. Oldale
T. Aldridge	

