Ocean Drilling Program Leg 210 Drills the Newfoundland Basin

Kathleen M. Marsaglia*
Department of Geological Sciences, California State University Northridge
18111 Nordhoff St, Northridge, CA 91330-8266, USA
kathie.marsaglia@csun.edu

Brian E. Tucholke
Department of Geology and Geophysics, MS
Woods Hole Oceanographic Institution, Woods Hole, MA

Jean-Claude Sibuet
IFREMER Centre de Brest, B.P. 70, France

Adam Klaus
Ocean Drilling Program, Texas A & M University, College Station, TX, USA

and

Ocean Drilling Program Leg 210 Scientific Party.

ABSTRACT

The north-central Atlantic Ocean is flanked by the non-volcanic rifted margins of Newfoundland and Iberia. Ocean Drilling Program (ODP) Leg 210 drilled in the Newfoundland Basin to investigate the tectonic history and sedimentary development of this rift. The drilling was conjugate to previous scientific drilling on the Iberia margin (ODP Legs 149 and 173, and Deep Sea Drilling Project Leg 47B), which facilitates comparison with the Iberian margin and investigation of the evolution of the full ocean basin. The primary focus of Leg 210 was Site 1276, drilled in a zone of crust that is interpreted from geophysical data to be transitional between continental and oceanic. Basement at the site was estimated to be ~2000 m below the seafloor (mbsf), and the section was continuously cored from 800 to 1739 mbsf with excellent core recovery (85%). The cored section is lower Oligocene to lower Albian (uppermost Aptian?), and it is dominated by silty to pebbly gravity-flow deposits that show a wide variety of depositional styles and thicknesses. The gravity-flow deposits are mixtures of siliciclastic and carbonate components, and they are interbedded with 'background' hemipelagic sedimentary rocks that include Albian-Cenomanian black shales. Drilling was terminated because of hole instability associated with undercompacted sediments between a series of apparently alkaline diabase sills intruded into the Aptian(?)-Albian section at the base of the hole. The sedimentary section recovered at Site 1276 is similar to that at DSDP Site 398 on Galicia Bank (Iberia margin), although the Site 1276 section is much more dominated by gravity-flow deposits. Near the end of Leg 210, Site 1277 was drilled into a basement high 40 km southeast of Site 1276. Beneath ~100 m of sediment cover, a thin succession of basalt, gabbro, and volcanic breccia was

recovered above serpentinized peridotite that appears to represent true basement. The crust at this site is interpreted to be oceanic, formed by slow or magma-limited seafloor spreading in Barremian time.