

**April 25, 2005**

**IODP EXPEDITION 306: NORTH ATLANTIC CLIMATE 2  
WEEK 7 REPORT**

**OPERATIONS**

CORK/THERMISTOR DEPLOYMENT AT SITE U1315, HOLE U1315A (continued): Hole 1315A was drilled to a depth of 179.07 mbsf and cased with 10-3/4" casing. The base of the casing was cemented and the casing string was displaced with bentonite mud. In preparations for deploying the CORK, Hole 1315A was reentered for the 3<sup>rd</sup> and final time at 04:48 hr April 19. Space out was tight given the short length of the CORK stinger (20.85 m). For the thermistor string deployment, the CORK head was left 9.0 m shy of landing out in the 16" casing hanger. This left ~12.3 m of stinger in the hole and allowed the pipe to be hung off at the rotary table for breaking the drill pipe connection and deployment of the thermistor string.

The thermistor string, specially designed for long term monitoring of the upper 150 mbsf of the sediment column, was assembled and deployed via wire line at 10:30 hr April 19 and latched in. The drill string was lowered the remaining 9.0 m and the CORK head landed out at the correct pipe depth. After verifying that the CORK head was properly latched, the CORK was successfully released. Installation of the Hole U1315A CORK was officially completed as of 12:37 hr April 19.

HOLE 642E: The Hole 642E reentry cone was found using sonar and the underwater VIT system 548 m south of Holes 642A/B on a bearing of 173° at 067°13.1850' N latitude by 002° 55.7789' E longitude. According to the documentation the cone should have been located 450 m to the southeast (a bearing of 135°). Hole 642E was reentered at 13:05 hr 19 April; a total of 16-1/4 hours after the search was initiated. Hole 642E was drilled to a total depth of 1229.4 mbsf on ODP Leg 104. It was left cased 62.5 m into basement placing the casing shoe at 371.5 mbsf. To minimize disturbance in the hole the end of the pipe was placed only 15.3 m below seafloor.

A downhole record of temperature was obtained using the Lamont Temperature, Acceleration, and Pressure (TAP) tool in combination with the Triple Combo to a total depth of 588 mbsf, where an impassable obstruction was reached. In addition, the Formation Micro Scanner (FMS)-Sonic tool was deployed. The drill string was retrieved and the bit cleared the sea floor/reentry cone at 10:05 hr and by 13:10 hr all drill pipe had been recovered aboard ship. The rig floor was secured, all thrusters/hydrophones raised, and the drill ship was underway for Dublin, Ireland at 13:15 hr on April 21.

Under favorable weather and calm seas, the 977 nmi transit south to the Dublin pilot station was completed at an average speed of 10.3 kt at 9:00 hr on April 25, a full 19 hours ahead of schedule. The transit to our assigned berth in Dublin was short and at 13:00 hr April 25, 2005 we put our first line ashore officially ending IODP Expedition 306.

**SCIENCE UPDATE**

The primary objective at Site U1315 is to document bottom water temperature variations and monitor its subbottom diffusion over a 5-year period. Bottom water temperature and salinity variations are monitored with instrumentation that sits in the water column via an elevated reentry cone. Diffusion of the thermal wave through the subsurface is monitored with a 150 m thermistor string deployed in a cased and CORKed borehole.

To assess current background thermal conditions in the region, a downhole record of temperature from nearby Hole 642E was obtained. Results from the TAP tool indicate a bottom water temperature at the seafloor of  $\sim 0.2^{\circ}\text{C}$ . The upper 10 m of the borehole has a very steep gradient ( $\sim 2500^{\circ}\text{C}/\text{km}$ ). Below this depth, the borehole has a relative low gradient of  $\sim 22^{\circ}\text{C}/\text{km}$ . At a depth of  $\sim 500$  mbsf, a strong positive temperature excursion to  $\sim 42^{\circ}\text{C}$  may indicate inflow. FMS imaging of the hole yielded good results and will allow the correlation to existing core data and filling in the gaps ( $\sim 60\%$  of the formation). In combination with detailed FMS resistivity measurements and imaging, and sonic data, it will be possible to get reliable permeability estimates. Understanding the permeability will allow better understanding of fluid flow and temperature gradients observed in the borehole.

### **TECHNICAL SUPPORT AND HSE ACTIVITIES**

LABORATORY REPORT: The laboratories and instruments are basically in stand-by mode while the hole prepared for the thermistor string was finished and the logging program at Site 642 was concluded. Cleaning is in progress for port call in Dublin. Shipping papers for the cores and a small off going shipment are being prepared. The cleaned labs are being used by the science staff, working on their final reports.

HSE: Fire and Boat Drill included monitoring and verification of the alarm bells, including those in the lab stack. The lifeboats were lowered to the embarkation level, doors opened and engines started. Information on the EPIRBs, lifeboat emergency locator beacons, and radar reflectors was provided. The beacon transmits to satellites that relay the position to rescue resources. The radar reflector aids planes in locating the lifeboat from high search pattern.