

April 3, 2005

IODP EXPEDITION 306: NORTH ATLANTIC CLIMATE 2 WEEK 4 REPORT

OPERATIONS

HOLE U1313A: APC coring continued without incident in Hole U1313A through Core 33H to a total depth of 308.6 mbsf. The drill string was pulled clear of the seafloor at 1300 hr 29 March 2005 officially ending Hole U1313A. Tensor core orientation was used for all cores beginning with Core 3H from a depth of 14.7 mbsf. Drill-over of stuck APC barrels was required only for the recovery of Cores 32H and 33H. All core barrels fully stroked except for the last core, 33H. Non-magnetic core barrels were used for recovery of the first 31 cores and alloy steel barrels were utilized for Cores 32H and 33H. The cored interval for this hole was 308.6 m and 319.64 m were recovered for an average recovery of 103.6%.

HOLE U1313B: The drill ship was offset 25 m due north (000°) of Hole U1313A. The bit was positioned at a depth of 3421.0 mbrf or 2.0 m deeper than for Hole 1313A. Hole U1313B was spudded at 1430 hr 29 March and Core 1H recovered 5.90 m of sediment establishing a rig floor corrected seafloor depth of 3424.6 mbrf. APC coring continued through Core 20H to a depth of 186.4 mbsf. At that time operations personnel were advised that the core breaks between Holes U1313A/B were possibly becoming aligned. As a precaution, to ensure adequate overlap between holes, the driller was advised to advance the bit 2.0 m further before shooting Core 21H. Coring then continued until 1930 hr 30 March through Core 32H to a total depth of 302.4 mbsf. Tensor core orientation was used for all cores beginning with Core U1313-3H from a depth of 15.4 mbsf. All core barrels fully stroked and no drill-over was required in this hole. Non-magnetic core barrels were used in the recovery of all 32 cores. The cored interval for this hole was 300.4 m and 306.54 m were recovered for an average recovery of 102.0%.

Because the total depth for Holes U1313C/D was apt to be less than Holes U1313A/B it was decided that we should recover the wireline logs from Hole U1313B. A wiper trip was conducted from total depth (TD) to 74.9 mbrf and back to TD without difficulty. No fill, drag, or over-pull was detected. The hole was swept with one final 30 barrel mud sweep and the Lockable Float Valve (LFV) go-devil was pumped down to lock open the LFV for the wire line logging tools. The hole was displaced with 140 barrels of Sepiolite logging mud and by 0130 hr 31 March the drill pipe was pulled back uphole and the bit positioned at a depth of 80.7 mbsf.

The Schlumberger wireline logging sheaves were rigged up and the first tool suite, the triple combo (including the GPIT and MGT tools), was assembled and deployed at 0400 hr. Soon after beginning to RIH (~400-500 mbrf) the Schlumberger telemetry cartridge, located just below the MGT at the top of the tool string, started "dropping its link" and the Schlumberger engineer suspected a problem with the cable head or wiring through the MGT. The tools were recovered back aboard for inspection and testing at 0450 hr. During inspection water was observed dripping out of the base of the MGT measurement sonde and water was also identified in the pins at the top of the telemetry cartridge. The Triple Combo (w/GPIT) was reassembled using the backup telemetry cartridge and the tools were run back in the hole at 0545 hr.

The triple combo tool suite reached to within 2.0 m of hole TD, which was 3727.0 mbrf, and logging proceeded without any problem. By 1110 hr 31 March the first suite of tools were

rigged down. The scheduled deployment of the Formation Micro Scanner (FMS)-sonic tool was cancelled because the the resistivity signal was too weak to make it worthwhile.

After recovery of the wireline tools a brief test was conducted of new software for the Schlumberger wireline heave compensated logging winch. Approximately 45 minutes were spent testing under a variety of conditions and the results appeared to be "very promising". The Schlumberger logging sheaves were rigged down and the drill string was pulled clear of the sea floor at 1310 hr 31 March. This officially ended Hole U1313B.

HOLE U1313C: The drill ship was offset 25 m due east (90°) of Hole U1313B. The bit was positioned at a depth of 3417.0 mbrf or 2.0 m shallower than for Hole 1313A. Hole U1313C was spudded at 1440 hr 31 March. Core 1H recovered 2.71 m establishing a rig floor corrected seafloor depth of 3423.8 mbrf. APC coring continued without incident through Core 32H to a total depth of 293.4 mbsf. The drill string was pulled clear of the seafloor at 2140 hr 1 April 2005 officially ending Hole U1313C. Tensor core orientation was used for all cores beginning with core 4H from a depth of 21.7 mbsf. Drill-over was required for recovery of Cores 29H through 32H. All core barrels fully stroked except Cores 30H-32H. The bit was advanced by the 8.73 m of recovery prior to shooting Core 32H. Non-magnetic core barrels were used for recovery of the first 30 cores and alloy steel barrels were utilized for Cores 31H and 32H. The cored interval for this hole was 293.4 m and 305.79 m of sediment were recovered for an average recovery of 104.2%.

HOLE U1313D: The drill ship was offset 25 m due south (180°) of Hole U1313C. The bit was positioned at a depth of 3423.0 mbrf or 4.0 m deeper than for Hole 1313A. Hole U1313D was spudded at 2255 hr 1 April. Core 1H was recovered full (9.80 m) therefore the seafloor depth of 3423.0 mbrf was considered suspect. A valid seafloor depth was not critical for this hole because successful mudlines were obtained in the previous holes. APC coring continued without incident in Hole U1313D through Core 16H to a total depth of 152.0 mbsf. Tensor core orientation was used for all cores beginning with core 3H from a depth of 19.0 mbsf. All core barrels fully stroked and no drill-over was required. Non-magnetic core barrels were used for recovery of all 16 cores. The cored interval for this hole was 152.0 m and 159.27 m were recovered for an average recovery of 104.8%.

The drill string was pulled clear of the seafloor at 1310 hr 2 April 2005 and during the pipe trip positioning beacon SN 2199 was recovered at 1430 hr. After recovering and storing the drill string the ship was secured for transit, all thrusters and hydrophones pulled, and at 2030 hr 2 April the ship was switched from DP to cruise mode and got underway for alternate Site U1314 (GAR-1B).

TRANSIT TO SITE U1314: The transit to Site U1314 was not a comfortable one with the ship continuously rolling and pitching 3-5 degrees. Because of the derrick "shadow" effect the true course of 010° to 020° prevented connecting with the RigNet satellite. Periodic heading changes to ~050° were made to allow for internet email transfer and any required telephone calls. As of midnight Sunday, 3 April, the ship had traveled 238 nmi north toward Site U1314 and had maintained an average speed of 9.9 knots. The distance remaining to the drill site is 669 nmi and our estimated time of arrival is presently 1900 hr 6 April 2005.

SITE U1313 PRELIMINARY SCIENCE RESULTS

The sedimentary sequence at Site U1313 is composed of upper Miocene to Quaternary terrigenous and biogenic components. The most common lithologies are nannofossil ooze, foraminifer nannofossil ooze and silty clay nannofossil ooze. Calcium carbonate content

ranges from 31.5 to 96.7 wt%. Mainly based on sediment color, carbonate content, and reflectance values, two lithological units were distinguished. Unit I (0 to ~120 mbsf; Holocene to late Pliocene) is characterized by alternating color bands (medium light gray, light olive gray, light gray, olive yellow, green and white), variable carbonate contents between 31.5 and 93.2%, and high-amplitude variations in reflectance values. The uppermost cores in Unit I (1H-3H) are moderate to highly bioturbated. Unit II (~120 mbsf to the bottom of the hole, late Pliocene to late Miocene) is predominantly white nannofossil ooze with carbonate content ranging between 86 and 96.7%. Several graded foraminiferal sand layers were documented in the sedimentary records from Holes U1313A, B, C and D.

Calcareous microfossils are abundant and exhibit good preservation. Siliceous microfossils (diatoms and radiolarians) are abundant locally, particularly in Core 1H from all holes where they reach up to 20%. The biostratigraphic framework of Site U1313 was built upon a series of calcareous nannofossil, foraminifer, diatom and radiolarian events. Sedimentation rates appear to have been higher in the late Miocene (13-14 cm/ky) and reduced since the uppermost late Miocene to the Holocene (averaging ~4.3 cm/ky).

Paleomagnetic directional data provide unambiguous identification of the Brunhes, Matuyama, Gauss and Gilbert Chronozones. The Jaramillo and Olduvai normal polarity zone also are clearly identified. A continuous stratigraphic sequence was successfully constructed for the upper 160 m providing an exceptional correlation of color reflectance (lightness; L^*) with the benthic marine oxygen isotope record. Correlation was more difficult below 160 m because of a very uniform sediment composition. Downhole logging data look outstanding for core-log integration. Overall magnetic susceptibility, natural gamma ray, density, and color reflectance provide excellent high resolution records for hole to hole correlation. The reoccupation of DSDP Site 607 at Site U1313 provides a unique record of central Atlantic detrital layer stratigraphy, as well as a means of monitoring NADW, within a well-constrained chronostratigraphy.

TECHNICAL SUPPORT AND HSE ACTIVITIES

A fair weather departure from the protection of the Azores permitted the unexpected viewing of a 2351 m snow covered volcano on one of the islands. Underway data was collected while in transit to Site U1313. The port magnetometer sensor provided an improved record over the starboard unit.

LABORATORY STATUS: Routine APC coring soon saturated the core lab and eventually filled the 'over flow' core rack on the core-receiving platform. All lab equipment worked very well with the exception of the AMST. The computer was eventually exchanged for a freshly configured replacement with mirrored software. A snippet of debugging code surprisingly revived the instrument.

We are presently standing watches underway to Site U1314. High resolution scanning of core sections using the MST has slowed splitting those remaining.

HSE: Windy and rainy weather made lowering the lifeboats too dangerous but instruction on lowering the boat was presented with emphasis on accounting for all hands and repeating from other drills. In the unlikely event of finding oneself in one of the lifeboats, people were instructed to head in a general direction towards the Azores.