

April 10, 2005

## IODP EXPEDITION 306: NORTH ATLANTIC CLIMATE 2 WEEK 5 REPORT

### OPERATIONS

TRANSIT TO SITE U1314: The remaining transit to Site U1314 was made in sea states that were by now routine for Expedition 306. Our progress was slowed due to the large, short period swells. Heavy to moderate rolling/pitching of the ship was typical throughout the transit. The ship arrived on location at the GAR-1B drill site (IODP Site U1314) early Thursday morning and by 03:30 hr April 7<sup>th</sup> a positioning beacon was deployed officially beginning operations at Site U1314. The ship completed the 943 nmi transit at an average speed of 9.2 knots.

HOLE U1314A: Hole U1314A was spudded at 0950 hr April 7<sup>th</sup>. APC coring continued in Hole U1314A until Core 28H at a depth of 258.4 mbsf. The overshot pin sheared while attempting to recover Core 28H and drill down was proceeding in preparation for the next core, resulting in damage to the APC system. Because it was going to take an hour or more to repair and rebuild the APC system, we elected to terminate coring in Hole U1314A and proceed with the next hole. After repairing the APC the drill string was pulled clear of the seafloor at 11:00 hr April 8<sup>th</sup> officially ending Hole U1314A.

Problems with swollen or imploded core liners were more prevalent in this hole than experienced previously at the other sites. Of 28 cores recovered, 4 liners suffered some swelling (Cores 12H, 15H, 16H, and 23H) and 6 core liners either shattered (Core 20H) or imploded (Cores 18H, 22H, 26H, 27H, and 28H). In addition, 4 barrels mechanically sheared during deployment (Cores 2H, 4H, 6H, and 11H). These problems were most likely heave induced and led to more disturbed/lower quality core than normally experienced with the APC coring system. The cored interval for this hole was 258.4 m and 267.34 m of sediment were recovered for an average recovery of 103.5%.

HOLE U1314B: The drill ship was offset 25 m due north (000°) and Hole U1314B was spudded at 12:20 hr April 8<sup>th</sup> APC coring using non-magnetic core barrels continued without incident in Hole U1314B through Core 30H to a depth of 279.5 mbsf. The cored interval for this hole was 279.5 m and 285.36 m of sediment were recovered for an average recovery of 102.1%. The drill string was pulled clear of the seafloor at 11:55 hr April 9<sup>th</sup> officially ending Hole U1314B.

Core quality was improved in this hole however there still were some core liner incidents. Four liners were recovered swollen (Cores 15H, 21H, 22H, and 26H) and another 3 were imploded at the bottom end (Cores 9H, 19H, and 27H). The overshot pin sheared once on Core 6H requiring a second wire line run to recover the core barrel.

HOLE U1314C: The drill ship was offset 25 m due east (90°) And Hole U1314C was spudded at 13:20 hr April 9<sup>th</sup> APC coring using non-magnetic core barrels continued in Hole U1314C through Core 22H to a depth of 207.7 mbsf. During this period the weather deteriorated as a major gale approached our location bringing with it high winds and steadily building seas/swells. By Sunday morning we had long period heave cycles in excess of 5 m and storm force winds are forecast for the GAR-1B location by late Sunday/early Monday. The cored interval for this hole was 207.7 m and 212.93 m of sediment were recovered for an average recovery of 102.5%. The drill string was pulled clear of the seafloor at 09:15 hr April 10<sup>th</sup>, 2005. At 1545 hr 10 April the ship was switched from DP to cruise mode and

began the sea voyage for Site U1315.

TRANSIT TO SITE U1315 (PROSPECTUS SITE ODP 642): The transit to Site U1315 began with weather and sea state conditions rapidly deteriorating at Site U1314. Fortunately our planned course to the next Site will take us away from the elements with the high winds coming from astern and high following seas/swells. As of midnight Sunday, April 10<sup>th</sup>, with the vessel rolling/pitching moderately, we have covered 90 nmi at an average speed of 10.9 knots. Our present ETA on-site is early Friday morning, April 15<sup>th</sup>, 2005.

#### **SITE U1314 PRELIMINARY SCIENTIFIC RESULTS**

The sedimentary sequence recovered from Holes U1314A and U1314B consists mainly of Holocene to Upper Pliocene gray, greenish gray, olive gray and dark gray biosiliceous silty clay, silty clay with nannofossils, silty clay biosiliceous nannofossil ooze, and nannofossil ooze with biosilica. Thin greenish laminae frequently occur throughout. In many of the samples the coarse fraction contains rare to abundant lithic grains of quartz, volcanic glass, basalts, and other rock fragments, including some gravel-size rocks.

At Site U1314, nannofossils and planktonic foraminifers are abundant and well- to moderately well-preserved whereas the preservation of diatoms and radiolarians is relatively good in some levels but poor in others. The calcareous and siliceous plankton bioevents identified in the core catcher samples of Site U1314 indicate that a continuous sedimentary record extending from the Late Pliocene (~ 3 Ma) to the Holocene was recovered at this site. Site U1314 is located within the subpolar plankton province and therefore polar and subpolar calcareous and siliceous plankton assemblages are dominant throughout the Pliocene and Pleistocene with a lower proportion of North Atlantic transitional species. As most subtropical and temperate species are absent or very rare in this region, the subpolar to transitional species were preferred for the construction of the stratigraphic framework. Sedimentation rate, estimated using the approximate core depths of the bioevents defined in this study, was relatively constant throughout the Pleistocene (7.5 to 8 cm/ky), increasing to 12 cm/ky in the Late Pliocene.

The Brunhes/Matuyama boundary was identified at 57.3 m in Hole U1314A, and at 56.6 mbsf in Hole U1314B. In Hole U1314A, the Jaramillo and Olduvai normal polarity zones were identified at 74.4 to 79.8 and 138.9 to 155.3 mbsf, respectively. The Jaramillo normal polarity zone corresponds to the depth interval 73.1 and 80.7 mbsf in Hole U1314B. In Hole U1314A, the Reunion normal polarity subzone was identified between 175.8 and 178.4 mbsf, and the Matuyama/Gauss boundary at 224.7 mbsf.

Preliminary results from Holes U1314A and U1314B (and the topmost cores from Hole U1314C) indicate that all physical properties measured show prominent cyclic variations that can be used for stratigraphic correlation between holes. Furthermore the depth offset between the holes ensures that intervals missing within a given hole are recovered in at least one of the adjacent holes. It is therefore likely that a complete composite section will be constructed for Site U1314.

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

LABORATORY REPORT: Underway measurements continued during transit to the Gardar drill site. Bathymetry data quality was diminished for much of the transit crossing by abrupt ridge topography and sailing in rough seas. Magnetometer data were good quality. Cores from the previous holes were processed prior to reaching Site U1314.

Core sections and samples were supported by all lab instrumentation. Back-logged cores from Site U1314 will be processed in transit to Site U1315.

HSE: The Fire and Boat drill was conducted while the ship was underway. Those assigned to the boats were accounted for; all life jackets were inspected for accessories and that they were properly fastened. The drill was briefer than most as waves occasionally sprayed over the bow and the beam wind was numbing.