

May 16, 2005

**IODP EXPEDITION 307:
MODERN CARBONATE MOUNDS: PORCUPINE DRILLING
WEEK 3 REPORT**

OPERATIONS

HOLE U1318A: Coring in Hole U1318A was completed with Core 15H at 142.2 mbsf (562.5 mbrf). APC temperature measurements were made on Cores 6H, 9H and 12H. The Tensor tool was run through Core 13H. The drill pipe was pulled clear of the seafloor at 0905 hr 9 May, ending Hole U1318A.

HOLE U1318B: The drill ship was offset 20 m south of Hole U1318A. The bit was positioned at a depth of 415.3 mbrf, and Hole U1318B was spudded at 1010 hr 9 May. Core 1H recovered 5.0 m, establishing the seafloor at 419.8 mbrf. APC coring continued through Core 14H to 128.5 mbsf (548.3 mbrf). No contamination tracers were run during APC coring. The Tensor tool was run on Cores 3H through 14H. Cores 7H, 9H, and 11H through 14H experienced incomplete strokes and the coring system was switched to XCB coring. Cores 15X and 16X had virtually no recovery and the XCB cutting shoe spacer and flow sleeve were changed from short configuration to long configuration and recovery increased 100%. XCB coring continued to final depth with Core 27X at 244.6 mbsf (664.4 mbrf) on 0630 hr 10 May. PFTs and microsphere tracers began on Core 19X and ended on Core 26X.

Hole U1318B was prepared for logging with wiper trip from TD to 60 mbsf and back to TD. No hole problems were encountered and there was only 1 m of fill. The hole was displaced with 102 bbls of sepiolite mud, and the drill pipe was tripped to the logging depth of 70 mbsf. The triple combination logging string was run in the hole, working through the restrictions at 70 and 96 mbsf, but reaching TD at 244.6 mbsf. The hole was logged without incident. Data quality was good so a second pass was not necessary. The second logging run was with the FMS-sonic tool string, which successfully completed two passes. After rigging down the logging tools, the drill pipe was tripped out of the hole and pulled clear of seafloor at 2110 hr 10 May, ending Hole U1318B.

HOLE U1318C: The vessel was offset 25 m south of U1318B, and Hole U1318C was spudded at 2245 hr 10 May. Core 1H recovered 2.9 m, which established a seafloor depth of 420.9 mbrf. The hole was drilled down to 70.0 mbsf followed by APC coring through Core 7H to 125.7 mbsf (546.6 mbrf). No PFT's and microsphere tracer material were run. The Tensor tool was run on Cores 2H through 7H. Cores 2H through 7H had incomplete stroke, and Cores 5H through 7H had overpulls of 20 Klbs. The coring system was switched over to XCB and the final depth was reached with Core 10X at 154.5 mbsf (575.4 mbrf) on 0745 hr 11 May. The drill string was pulled clear of the seafloor at 0900 hr 11 May. The rig was secured for transit to Site PORC-3A at 1015 hr 11 May, ending Hole U1318C and Site PORC-2A.

HOLE 1317E: The transit to Site PORC-3A. took 1.5 hours. The vessel was offset 50 m south-southeast of Hole U1317C. Hole U1317E was spudded at 1430 hr 11 May. A seafloor depth was established at 792.2 mbrf. Continuous APC coring was conducted from through Core 18H to 158.6 mbsf (950.8 mbrf). No contamination tracers were run. The Tensor tool was run on Cores 3H through 15H. Overpulls were experienced on Cores 7H, 9H through 12H, 14H and 15H, and 17H and 18H. Core 17H and 18H experienced incomplete strokes and Core 17H had to be drilled over. The drill pipe was tripped out of the hole and pulled clear of seafloor at 0100 hr 12 May. The ship was underway at 0429 hr 12 May, ending operations at Site 1317.

TRANSIT TO PONTA DELGADA, AZORES: The estimated 1026 nmi transit to Ponta Delgada was underway at 0429 hr 12 May 2005. Arrival at the pilot station expected to be 0500 hr 16 May, Azores local time. As of 2400 15 May the ship was within 38 nmi of the pilot station.

SCIENCE SUMMARY

SITE U1318: Sediments from the Site U1318 were divided into three units based on sediment colors, erosional surfaces, and biostratigraphy. The late Pleistocene Unit 1 consists of brown-colored silty clay with black mottled structure, which is partly laminated and bioturbated. Dropstones are common in this unit. A distinct erosional surface at 82 mbsf marks the top of Unit 2, which mainly consists of olive-gray, medium-fine sand interbedded with dark yellowish-brown silty clay. The sand beds are normal graded with sharp lower and upper boundaries. Dropstones, up to 3 cm in diameter, are found in both sand and clay horizons. The base of this unit (87 mbsf) is a conglomerate resting on a distinct erosional surface. It is 5-10 cm thick, and associated with black-colored apatite nodules. Unit 3 (87-244 mbsf) consists of dark green siltstone, which frequently intercalates with sandstone layers in the upper and lower horizons. The siltstone tends to become calcareous downhole. Hole U1318B was logged with the Triple Combo and FMS-sonic tool strings to 244 mbsf.

Periods of rapid sedimentation overlying hiatuses have profoundly affected the chemistry and microbial activity of the Site U1318 sediments. Chlorinity exhibits a constant concentration of 570 mM in Unit 1, but below this, a broad excursion in the chloride concentration between 100 and 160 mbsf of up to 580 mM (at 140 mbsf). This excursion may be correlated to a major oceanographic low water stand, e.g., the Messinian Salt Crises in the Late Miocene.

Hole U1317E was the last hole of the expedition, located near the top of the mound, and was cored to collect a mound sediment sequence unaffected by downslope transport. The core sections were left unsplit to be opened in College Station while frozen. From MST physical properties measurements, the layers can be correlated to the other holes at Site U1317. The mound base is at 155.2 mbsf in this hole.