

May 2, 2005

**IODP EXPEDITION 307:
MODERN CARBONATE MOUNDS: PORCUPINE DRILLING
WEEK 1 REPORT**

OPERATIONS

PORT CALL: The ship arrived dockside at Ocean Pier, Berth 32, Dublin, Ireland from Expedition 306 at 1551 hr 25 April. Aside from the normal on/off loading of freight the ship also took on 1044 metric tons of marine gas oil by truck. Other port call activities included ODL and IODP/TAMU crew change/crossover, offloading of all Expedition 306 frozen and "keep-cool" core/samples, the dispatching of all Expedition 306 scientists, and the boarding of all Expedition 307 scientists.

PORT CALL SECURITY & SAFETY: During the Dublin port call the ship operated under a security level of MARSEC Level 1 (Yellow) and appropriate security measures were in effect. All personnel were required to register with the ship's staff before being allowed on the ship and were also required to wear proper identification at all times. All personnel who had not sailed within the last 6 months were given safety briefings and participated in a safety drill upon their arrival.

TRANSIT TO SITE U1316 (Prospectus Site PORC-4A): The last line away from Berth 32, Dublin, Ireland was at 2057 hr on 28 April ~2.5 days ahead the scheduled departure time. The pilot was dispatched at 2230 hrs and the vessel was underway at full speed for Site U1316. The transit was relatively benign with the ship rolling/pitching moderately while averaging 9.7 knots over the 302 nmi distance. During the transit preparations were made for oriented non-magnetic APC coring operations. Thrusters were lowered at 0343 hr 30 April. The vessel was placed in dynamic positioning mode by 0403 hr and hydrophones were lowered.

HOLE U1316A: A positioning beacon was deployed at 0410 hr officially marking the beginning of operations for Hole U1312A. However, the beacon failed shortly thereafter and was recovered followed by deployment of a 2nd beacon. After deploying the drill string to 6.4 m above bottom (based on precision depth recorder), the first attempt to spud the hole returned a water core. The drill string was lowered 7 m, and Hole U1316A was spudded at 1120 hr 30 April and returning a 7.3 m of core.

Hole U1316A was intended to be the logging hole and the target depth was set for 162.0 mbsf so that the tools could log the intervals of interest. APC coring was routine from Cores 1H through 6H to 54.8 mbsf with recovery averaging over 100%. APC temperature measurements were taken on Cores 3H and 6H, and orientation was taken on APC cores 3H through 7H. Core 7H short-stroked with a 3.24 m core. After Core 7H, the Tensor tool was removed and the non-magnetic core barrel was replaced with a standard steel barrel. Core 8H short-stroked and became stuck. The driller picked up with 80 klbs over-pull with no success and the core barrel was finally released after over-drilling 1.5 m. The coring assembly was switched to XCB. We encountered difficult coring conditions during XCB Cores 9X through 21X. The coring times were long and recovery erratic. The XCB shoe on Core 18X failed in torsion, but remained on the core barrel, and heat checking was evident on other shoes. The average penetration rate was less than 3 m/hr. Coring was suspended at

2015 hr on 1 May because the time required for further advancement had reached a diminishing return.

Preparations began for logging Hole 1316A. A wiper trip was run from bottom to 30 mbsf and back down to bottom using the top drive. One meter of fill was found and the hole was displaced with 45 bbls of sepiolite mud. The top drive was used to pull up to 98 mbsf and then set back. The bit was then pulled up to logging depth of 30 mbsf. Schlumberger commenced rigging up for logging.

SCIENCE SUMMARY

Portcall: For the shipboard scientific party, Expedition 307 began with a pre-cruise workshop in Dublin, Ireland on April 26th and 27th, hosted by the Geological Society of Ireland and organized by Jean-Pierre Henriet, the chief proponent of the proposal to drill the Porcupine Bight Carbonate Mounds. The aim was to provide a background on previous work on the Porcupine Mounds, introduction of individual scientists' work and plans for the expedition, and discussion of sampling plans. This enabled the science party to concentrate on learning their laboratory equipment and tasks once they had boarded the ship on April 27th.

Sedimentary strata recovered from Hole U1316 A are mostly siliciclastic and divided into two distinct units, in terms of consolidation, color and biostratigraphic age. Cores U1316A-1H to 5H are brown-gray partly bioturbated silty clay of late Pleistocene age (Brunhes normal magnetic polarity), and contain dropstones. Two coral rudstone/floatstone layers occur in Core 6H (55.1-59.1 mbsf), and preliminary biostratigraphy indicates that they are late Pliocene to early Pleistocene in age. Cores 7H to 21X (59.1-134.0 mbsf) are early Miocene in age and are greenish gray siltstone, with grain size generally decreasing downhole. The siltstone is rich in glauconite and yields microfossils (calcareous nannofossils and foraminifers) and mollusks.

Interstitial water sulfate decreased with increasing depth to a final concentration of about 5 mM at 130 mbsf. Methane was first detected at 80 mbsf and increased with a concave up profile through the rest of the hole. Low concentrations of ethane were also detected at 80 mbsf and increased in concentration with depth to the bottom of the hole. The C_2/C_1 ratio of ethane to methane decreased from a peak at 80 mbsf to low values at the bottom of the hole, and was indicative of preferential oxidation of methane in the sulfate zone. Beyond ethane, no higher hydrocarbons were detected. In the first tens of meters of sediment, the total prokaryote counts were low, which is consistent with the apparently reworked nature of the sediment (it contains many Cretaceous microfossils).

TECHNICAL SUPPORT ACTIVITIES

The Expedition 307 technical staff boarded the vessel on April 26. Crossover took place with the off coming crew and training started for the new staff in the Physical Property, Paleomagic, Thin Section and Underway laboratories. There was a service call for the microscopes. The chemistry laboratories had an Agilent service call. Two trucks of surface freight were loaded and the off going air shipment picked up. The off going surface shipment was left onboard to be shipped at Mobile; it contained no time-critical items. On April 27 cores were off-loaded and the cold and frozen shipments picked up for shipment. Tours of the vessel were conducted. On April 28 an introduction meeting was held with the science crew. Both the scientists and the technicians were given an H_2S safety course. The vessel sailed in the evening.

During the short one day transit to the first site, the technical crew prepared the shipboard laboratories for the commencement of coring. The scientific staff was introduced to the laboratories and technical staff, and the laboratories were prepared for the start of coring. A pre-site meeting was held and the marine mammal policy reviewed to prepare for the upcoming VSP logging.

HSE ACTIVITIES

A fire and H₂S drill was held on 29 April for the entire ship's complement. The technical staff was instructed in the use of the Scott air packs and fixed air systems in preparation for H₂S should it be encountered.