

IODP Expedition 317: Canterbury Basin Sea Level

Week 6 Report (6-12 December 2009)

14 December 2009

Operations

The week began with RCB drilling at 162 m DSF in Hole U1352C with the center bit installed. The hole was advanced to 300 m DSF and the center bit was pulled, inspected and re-installed. The hole was further advanced to 575 m DSF, where the center bit was pulled by wireline and a rotary core barrel was dropped. The hole was spot-cored with the RCB system from 574.7-603.6 m DSF, with a recovery of 12.8 m (44.3%). The center bit was reinstalled and drilling continued to 660 m DSF. The center bit was again pulled and rotary coring resumed from 660 to 1004 m DSF with 20 barrel high viscosity mud sweeps every 50 m of coring to clean the cuttings from the hole. At 1007 m DSF (1900 h on 8 December), a 50 barrel sweep was pumped, followed by an 8-h wiper trip to ~200 m DSF. Coring resumed at 0400 h on 9 December and continued with highly variable core recovery, including nearly full barrels and essentially empty barrels. Several attempts were made to improve recovery including runs with the bit de-plugger and cutting half cores rather than full cores. At week's end RCB coring is at 1426 m DSF. A total of 788 m were cored and 352 m of core were recovered for an average recovery of 45%.

Science Results

Cores from Hole U1352B opened for description during this week (Cores U1352B-73X to 94X; 629-831 m DSF) contain mainly greenish gray to very dark greenish gray sandy mud. Coring in this hole ended at 831 m DSF (Core U1352B-94X). Cores from Hole U1352C opened for description to date are Cores U1352C-2R to 88R (575-604 and 660-1381 m DSF). Cores from overlapping intervals consist of greenish gray sandy marlstone and sandy calcareous mud. The RCB cores typically recovered 1-3 m of these marlstones, with occasional nearly full core barrels. They constitute the same lithology found jamming XCB core catchers, but otherwise not recovered, at similar depths in Hole U1352B. Cores from below 834 m CFS contain the same lithology, dark greenish gray sandy marlstone with heavy bioturbation and very rare shell fragments. Burrows, such as *Chondrites*, *Thalassinoides*, *Planolites*, *Teichichnus* have been identified. Decimeter-scale dark gray layers of sandy mudstone begin to occur in Core U1352C-78R (1313 m CSF) within the greenish-gray sandy marlstone background sediment and increase in frequency downhole. The layers typically have sharp, burrowed basal contacts and several can occur within a single 1.5 m core section. Geochemical analyses are being run on these layers.

The Pliocene/Miocene boundary occurs in Core U1352C-73X (1275-1285 m DSF), based on planktonic foraminifer analysis. Early Pliocene (4.49-5.49 Ma) planktonic foraminifer species are found above 1265 m CFS (Core U1352C-72R-CC), whereas planktonic foraminifers below 1284 m CFS (Core U1352C-73R-CC) indicate a latest Miocene age. Benthic foraminifer assemblages indicate deepening of slope paleoenvironment downhole.

All routine laboratory measurements are carried out on all cores from Holes U1352B and U1352C, including core logging (magnetic susceptibility, natural gamma radiation, bulk density, colorimetry); measurements of thermal conductivity, sediment strength, moisture and density; and natural remanent magnetization and associated rock magnetic experiments. Interstitial water constituents below 100 m CSF in Hole U1352B show a remarkable increase of calcium and magnesium from ~400 m CSF to total depth. Calcium and magnesium contents remain high from ~580 to 1150 m CSF in Hole U1352C. HS measurements from 580 to ~1330 m in Hole U1352C show a gradual increase in ethane and propane and a gradual decrease in methane contents.

Logging data processing for Hole U1352B is completed. Caliper, gamma ray, density, porosity and resistivity logs (triple combo), and FMS/sonic were run above ~460 m WSF. Total gamma ray values show high amplitude variations below ~220 m WSF.

Technical Support and HSE Activities

The shipboard labs were processing cores and samples from Hole U1352C. Shipboard laboratory SOPs are being updated and system performance documentation are being reviewed. A fire and boat drill was held on 6 December for the entire ship's complement.