IODP Expedition 327: Juan de Fuca Ridge-Flank Hydrogeology

Week 9 Report (30 August–5 September 2010)

5 September 2010

OPERATIONS

Hole U1362B Positioning Beacon Recovery

Following the L-CORK installation in Hole U1362B at 2217 hr on 29 August, a grappling hook was fitted to the VIT frame and the ship was positioned over the location of a positioning beacon that had failed to release. The VIT was lowered to the seafloor, the grapple engaged the beacon tether, and by 0300 hr on 30 August the beacon was on deck. It was discovered that the tether had become entangled and did not allow the weight holding it to the seafloor to release.

Transit to Grizzly Bare Seamount

The *JOIDES Resolution* departed Site U1362 at 1300 hr on 30 August 2010 and the 31 nmi transit to Grizzly Bare outcrop took 3 hr at an average speed of 10.0 kt. Upon arrival the thrusters and hydrophones were lowered and the ship was moved in DP mode to a location midway between the three projected Grizzly Bare holes so that a positioning beacon could be deployed.

Hole U1363A

At 1730 hr on 30 August the ship was offset to Hole U1363A (proposed site GRB-1A). A 2-stand advanced piston corer (APC)/extended core barrel (XCB) bottom-hole assembly (BHA) was made up and tripped to the seafloor and an XCB center bit was deployed. The seafloor was tagged at 2250 hr on 30 August at 2689 m. Drilling without coring continued for 2-1/2 hr to the basement contact at 58 m below seafloor (mbsf). The XCB center bit was recovered and the drill string was pulled out of the seafloor. The sole purpose of drilling Hole U1363A was to determine the depth of basement to avoid a possible impact with an APC core barrel or temperature shoe at the next hole.

Hole U1363B Coring and Temperature Measurements

The ship was offset 10 m on a bearing of 135° and Hole U1363B was spudded at 0530 hr on 31 August at a depth of 2690 m. APC Cores 1H through 6H advanced to 42.5 mbsf by 1300 hr, at which point the APC was not able to penetrate the sandy turbidite formation. APCT3 temperature measurements were taken with Cores 3H through 6H. Cores 7X and 8X advanced to 55.0 mbsf by 1610 hr. The first SET temperature measurement was taken at ~56 mbsf and coring continued with Core 9X, which advanced through the sediment/basement interface to 57 mbsf. Core 10X advanced to 61 mbsf and was on deck by 2100 hr. The drill string was pulled clear of the seafloor at 2140 hr on 31 August.

Hole U1363C Coring and Temperature Measurements

The ship was offset in DP mode to the coordinates for Hole U1363C (GRB-3A), the deepest of the 3-hole transect at Grizzly Bare. Hole U1363C was spudded at 2255 hr on 31 August at a depth of 2689 m. Hole U1363C was drilled without recovering cores to 170 mbsf. A SET temperature measurement was taken at ~171 mbsf, followed by Cores 2X and 3X to a depth of 183.2 mbsf. A second SET temperature was taken at ~184 mbsf, followed by Cores 4X and 5X to a depth of 202.4 mbsf. A third SET temperature measurement was taken at ~204. At 1445 hr on 1 September, the SET tool became stuck inside the outer core barrel due to the sandy formation and the drill string had to be recovered back to the ship. The SET tool was retrieved at 0145 hr on 2 September and the ship was offset 10 m on a bearing of 135°.

Hole U1363D Coring and Temperature Measurements

Hole U1363D was spudded at 0745 hr on 2 September at a depth of 2689 m. Drilling without coring continued using an XCB bit to 198 mbsf. Cores 2X-5X advanced to 231 mbsf by 0035 hr on 3 September and the drill string was pulled out of the seafloor at 0700 hr, ending Hole U1363D.

Hole U1363E

Hole U1363E was spudded at 0840 hr on 3 September and was drilled without coring to establish the depth to basement. The sediment/basement interface was confirmed at 36 mbsf at 1000 hr. The drill string was pulled out of the seafloor at 1125 hr, ending Hole U1363E.

Hole U1363F Coring and Temperature Measurements

Hole U1363F was spudded at 1200 hr on 3 September and Cores 1H to 4H advanced to 35 mbsf by 1600 hr. APCT3 temperature measurements were taken with Cores 3H and 4H. The drill string was pulled out of the seafloor at 1735 hr, ending Hole U1363F.

Hole U1363G Coring and Temperature Measurements

The ship was offset and basement contact was again established at 17 mbsf by washing down. Hole U1363G was spudded at 2000 hr on 3 September and Cores 1H to 3H advanced to 24.9 mbsf by 2250 hr. The true advance is closer to 17 mbsf as the last core recovered mostly flow-in material. An APCT3 temperature measurement was taken with Core 2H.

Transit to Victoria, British Columbia, Canada

The rig floor was secured for transit and the thrusters were raised at 0930 hr. The *JOIDES Resolution* was underway at full speed at 1015 hr. The pilot boarded at 0752 hr on 5 September and the first line ashore at Ogden Point, Victoria, was at 0836 hr.

SCIENCE RESULTS

Geochemists collected whole-round samples for shipboard and shore-based pore water analyses.

Microbiologists collected headspace gas samples for shipboard safety analyses and whole-round samples for shore-based analyses.

Site U1363 core sections were described, measured on the whole round and section half multisensor tracks, digitally imaged, and run on the cryogenic magnetometer.

Sediments are composed of turbidite sequences interspersed with hemipelagic mud. Several lithologic units can be distinguished. A few pieces of cryptocrystalline plagioclase phyric basalt were recovered.

The physical properties group collected discrete samples for shipboard *P*-wave velocity and moisture and density analyses.

Thermal conductivity measurements were made on every whole-round core section.

Temperature measurements were collected with the APCT-3 and SET tools at Holes U1363B–U1363G. Several good measurements were obtained with both tools.

Personal samples were collected for postcruise research.

OUTREACH
Outreach officers finalized their projects and participated in videoconferences with Jean Marie Gautier's "Jean Vilar" school in St. Sever Calvados, France, and the Quibbletown Middle School in Piscataway, New Jersey.

TECHNICAL SUPPORT AND HSE ACTIVITIES
HSE activities: None to report.

Laboratory activities:
Staff continued to provide support for science and education projects. Laboratory projects in progress include the following: whole core multisensor logger software upgrade in user testing, moisture and density/pycnometer software upgrade, and laboratory documentation updates. Minor updates were released for several LIMS applications. Data and sample boxes were prepared for shipping. Laboratories were cleaned and prepared for the next expedition.