

IODP Expedition 372: Creeping Gas Hydrate Slides and Hikurangi LWD

Week 3 Report (11–17 December 2017)

Operations

The 3419 nmi transit to Site U1517 ended at 0200 h (UTC + 13 h) on 16 December. The voyage took 291.9 h (12.2 d) at an average of 11.7 kt. The thrusters were lowered and the ship moved to the site coordinates at 0247 h. The vessel deployed an acoustic beacon at 0433 h and settled over the site coordinates. The advanced piston corer (APC)/extended core barrel (XCB) bottom-hole assembly (BHA) was put together in preparation for Hole U1517B. The logging-while-drilling (LWD) tool string was assembled and contained the geoVISION, SonicScope, NeoScope, TeleScope, and proVISION tools. This LWD BHA is 190.72 m long.

The precision depth recorder (PDR) placed the seafloor at 722.5 mbsf, and the BHA was lowered to a depth of 672 mbsf for flow and pressure testing of the LWD tools to determine the flow rates at which the tools activate. The subsea video camera was deployed to observe the drill bit tag the seafloor, which occurred at 1755 h. The seafloor depth for Hole U1517A is 725.3 mbsl. The camera system was retrieved and Hole U1517A was started at 1935 h on 16 December. LWD in Hole U1517A continued through 17 December, reaching the total depth of 205 mbsf at 1115 h. After a mud sweep, the drill pipe and LWD BHA were pulled from the hole, with the logging tools recording sonic measurements. The bit cleared the seafloor at 1245 h and the rotary table at 1840 h on 17 December, ending Hole U1517A.

The vessel was offset 20 m to the southeast for coring operations in Hole U1517B. The APC/XCB BHA was assembled and run to a depth of 704 mbsl. The week ended with the drillers spacing out the bit in preparation for starting Hole U1517B.

Science Results

The Expedition 372 science party spent the week preparing for LWD and coring operations.

Early in the week, the laboratory teams submitted drafts of their Methods chapters for review by the Co-Chief Scientists and Expedition Project Manager. The Downhole Measurements and Physical Properties teams finalized the logging data templates for the site report chapters. Scientists were given core flow tours that provided an introduction to core handling and shipboard analyses. The Operations Superintendent led three tours of the ship for science party members. All of the scientists participated in survival suit training. The pre-Site U1517 meeting was held, which highlighted the science objectives for this locality and presented the science party with an overview of planned operations.

Several curatorial tasks took place, including: training scientists in core sampling and how to enter samples into the database system; developing a plan for whole-round core samples for postcruise research; and confirming personal sampling plans and special shipping requirements.

A protocol was developed for identifying and extracting gas hydrates from piston cores on the core receiving platform. This included training scientists and technical staff to operate the infrared (IR) cameras, discussions on preserving hydrate for postcruise analysis, and prioritizing samples for interstitial water chemistry.

Members of the IODP management team and the ship's crew, the Co-Chief Scientists, and a Schlumberger LWD engineer held a pre-drilling meeting for Site U1517 on 14 December to review the planned operations for Holes U1517A (LWD) and U1517B (piston coring).

The ship arrived onsite at 0200 h on 16 December and LWD operations began at 1935 h the same day. The Downhole Measurements scientists began observing the LWD data in real time for safety monitoring and identifying potential gas hydrate zones. The real-time data include the borehole caliper, resistivity at bit, annular pressure, gamma ray, velocity, porosity, bulk density, and nuclear magnetic resonance.

Education and Outreach

Thirteen live video broadcasts were completed this week. These included ship tours, explanations of expedition science, and Q&A sessions with scientists and technical staff. Ongoing live broadcast scheduling has also been taking place, with new broadcasts being scheduled for the upcoming weeks.

The social media posts for this week include: seven posts made to Twitter (<https://twitter.com/TheJR>), six posts to Instagram (http://instagram.com/joides_resolution), and ten posts to Facebook (<https://www.facebook.com/joidesresolution>). Three videos of events or ship tours are currently in production. Eleven blog posts were made and posted to the <http://joidesresolution.org> web page. Topics included interviews with individuals on the ship and activities at sea. Styrofoam cups were decorated by scientists and technical staff members and sent down to the seafloor with the subsea camera.

Technical Support and HSE Activities

IODP JRSO technical staff engaged in various maintenance projects and laboratory technical cross-training, as well as preparing for coring operations.

Laboratory Activities

- Prepared for gas hydrate sampling on the core receiving platform.
- All technicians received IR camera training.
- The H₂S sensors were calibrated and the technicians attended a H₂S basic awareness meeting.
- The underway manual is being updated.
- The pXRF user guide and laboratory safety manual are being reviewed.
- A class was held for the technical staff on magnetics and the operation of the superconducting rock magnetometer (SRM).
- The advanced piston corer temperature tool (APCT-3) shoes are being prepared for deployment.
- The liquid nitrogen generator is out of service. The vendor has been contacted for assistance. We currently have over 100 L of liquid nitrogen in dewars, which will support the expedition's needs until we reach port.

Application Support and I.T. Activities

- The replacement application for the physical properties gantry software, called VELOCITY, was deployed after testing by technical staff and science party members.
- Confirmed that the whole-round multisensor tracks are ready for operation.
- Assisted with entering sample request codes into LIMS.
- The rebuilt moisture and density software, MADMax, was distributed.
- Worked on the QAQC internal project.
- Installed Bruker Topas and Kaleidagraph on work stations.
- Replaced six RigWatch workstations.
- Assisted the engineers and scientists in setting up the flow meter for the pressure core degassing manifold.
- Continued to troubleshoot an issue with the cruise evaluation form not sending attachments to shore.

HSE Activities

- The technical staff completed the weekly check of the safety showers and eyewash stations.
- The weekly fire and boat drill was held on 17 December.