IODP Expedition 362: Sumatra Seismogenic Zone
Week 7 Report (18–24 September 2016)

OPERATIONS

Week 7 of Expedition 362 (Sumatra Seismogenic Zone) began with the *JOIDES Resolution* docked at the Loyang Offshore Terminal for Elmagco brake repairs. Once the repairs were completed, the vessel was secured for transit. The last line was released at 1206 h on 18 September, and the sea passage back to Site U1481 began at 1354 h after the pilot left the vessel. The 989 nmi transit was completed in 93.1 h at an average speed of 10.6 kt. The vessel arrived at Site U1481 at 1100 h on 22 September, we lowered the thrusters and hydrophones, and we deployed an acoustic seafloor-positioning beacon at 1242 h. A rotary core barrel (RCB) bottom-hole assembly (BHA) was assembled and the drill string was lowered to just above the reentry cone. The subsea camera was deployed to aid with the reentry, which took 3.75 h to complete. Hole U1481A was reentered at 0150 h on 23 September, and the drill string was lowered until it encountered fill at 552.2 mbsf (~178 m up from the bottom of the cased hole). After drilling through the fill, we started drilling without coring at 734.1 mbsf. We pulled the center bit every ~100 m to inspect it and recovered a small sediment sample from the core barrel when doing this at a depth of 1033.0 mbsf. At the end of the week, we continued drilling ahead without coring at a depth of 1052.5 mbsf.

SCIENCE RESULTS

This week, we finalized the Site U1480 Biostratigraphy, Downhole Measurements, and Core-Log-Seismic Integration reports.

Sedimentology and Petrology

We continued to work on the Site U1480 chapter and discussed potential manuscripts that might result from shipboard analyses.

Structural Geology

We completed revisions of the Site U1480 chapter and updated the Methods chapter. Final analysis of drilling parameters data and correlation with physical properties and seismic data took place. Confirmation of the interpretations awaits shore-based geomechanical testing of whole-round samples collected during the expedition.

Paleomagnetism

We conducted alternating field demagnetization of Hole U1480B discrete samples and continued to analyze the paleomagnetic data from Site U1480. The discrete sample declinations from Hole U1480B validate the corresponding advanced piston corer (APC) section data, and are in general agreement with data from Holes U1480E and U1480H. These results confirm the presence of anomalous declinations that are 180° off from those expected after applying the correction from the orientation tool. To further narrow down the possible origin of this anomaly, IODP and Siem Offshore staff conducted rig-floor experiments with both the Icefield and FlexIt orientation tools. Initial results show that although the magnetic tool face is aligned with the double line on the core liner, the recorded direction is offset by ~200°, possibly explaining the declination discrepancy. We also identified several polarity shifts in Section U1480G-61R-5 and apparent rotations of structural trends in Section U1480G-69R-7 that were most likely caused by the coring process. We also continued to work on the Site U1480 report.

Geochemistry

We encountered problems with the Ion Chromatograph at the end of our analytical measurements for Hole U1480H. After changing columns and the peristaltic pump tubing, we conducted a series of tests and the final set of standards showed the instrument to be performing well (reproducibility better than 1% for both anions and cations). We conducted extractions on carbonate samples to quantify extractable silica and finalized the Site U1480 report.

Physical Properties

We continued to work on the Site U1480 report and on a geomechanical experiment plan for postcruise studies.

EDUCATION AND OUTREACH

This week we conducted 19 videoconferences in Canada, France, Romania, and the USA. The most interesting videoconference of the week was with a nursing home in Ohio whose activity director found out about us through Scholastic News. We continued working on more detailed scientific blogs, such as a small poster on the 2004 Sumatra-Andaman-Nicobar Islands earthquake and tsunami and an in-depth explanation of biostratigraphy.

TECHNICAL SUPPORT AND HSE ACTIVITIES

During the transit back to Site U1481, technical staff continued to support science activities in the laboratories, prepared for coring to resume, worked on end-of-expedition activities and technical reports, and conducted a test of the FlexIt and Icefield tools on the rig floor.

Laboratory Systems

We tested the FlexIt and Icefield tools on the rig floor with the APC assembly to check the relationship of the core double line to the orientation tool's tool face. The results of the test showed a ~200° deviation for both tools from the expected value. We are in discussions with the core technicians and the Operations Superintendent to understand this discrepancy. During the break in operations, we deployed IMS 9.2 changes (from the SRM project) to the common architecture of the WRMSL, SHIL, and SHMSL tracks. The reported *P*-wave caliper units were corrected from meters to millimeters in the software, and these Site U1480 data were corrected in the database. Minor problems were also corrected on the carbonate report. We reviewed end-of-expedition procedures with the Marine Computer Specialists and Application Developers, and completed an assessment of the web services project. Finally, we started preparing the core, personal samples, and equipment shipments.