

## **IODP Expedition 351: Izu Bonin Mariana Arc Origins**

### **Week 7 Report (6–12 July 2014)**

#### **Operations**

Our transit to a safe standby location east of Site U1438, as a result of the proximity of Typhoon Neoguri, began at 1230 h on 6 July. En route, the track of Typhoon Neoguri veered further to the west, allowing us to shorten the traveled distance to a standby location. At 0600 h on 7 July, the sea passage ended with the ship positioned 144 nmi east of Site U1438. While waiting for the typhoon to move a safe distance past Site U1438, the drill and marine crew caught up on routine maintenance projects. By 9 July, the storm was moving more on an easterly track along the southern coast of Japan and had weakened (sustained winds of 50 kt with gusts to 70 kt) although gale force winds extended 325 nmi from the storm's center. With the storm now on a track well north of the site and moving on an easterly course, the decision was made to move the ship back to Site U1438. At 1800 h on 9 July, the transit back to Site U1438 began and was completed by 0830 h on 10 July. Upon arriving back on site, we continued to wait for the sea conditions to moderate enough to resume operations. By 1900 h, the weather had sufficiently ameliorated so we began picking up drill collars and making up the rotary core barrel (RCB) bottom-hole assembly (BHA) with a new core bit (Ulterra CC-7). The drill string was then deployed in preparation for reentering Hole U1438E. However, the deployment of the subsea camera system for reentry was deferred for ~18 h because erratic and high heave (2.9 m) resulting from the combination of a fairly strong surface current (+0.5 kt; 190°) and large swell (~5 m; 250°) precluded the resumption of RCB coring operations. At 1315 h on 11 July, we deployed the subsea camera system and Hole U1438E was reentered at 1655 h. The subsea camera system was recovered by 2000 h and the drill bit was lowered to the total depth of the hole (~1319 mbsf) without incident. No drag was observed and there was no fill on bottom. RCB coring resumed with non-magnetic core barrels and Core U1438E-51R was recovered at 0215 h on 12 July. RCB coring of the sediment continued and Core U1438E-57R was recovered at 0100 h on 13 July from a depth of 1386 mbsf.

#### **Science Results**

The core description team finalized the descriptions through Core U1438E-50R, the final core recovered before the typhoon. During the operational downtime, they worked on revising their methods section for the *Proceedings* volume, finalized the visual core description (VCD) sheets, and prepared DESClogik spreadsheets for the expected igneous rocks. They also conducted several meetings regarding postcruise science plans and the ideas for sharing of samples/instruments in order to minimize sample loss and optimize the impact of the expected

results. Cores U1438E-51R and 52R were recovered on 12 July and were described shortly thereafter.

The micropaleontology team analyzed Samples U1438E-44R-CC to 52R-CC. These samples are barren of foraminifera and nannofossils. Radiolarian occurrences are low to moderate in the majority of samples, although preservation is poor such that species determination was not possible.

The geochemistry group completed the data analysis and reporting of the entire interstitial water (IW) analysis dataset; the site report was updated accordingly. An unknown precipitate was found in several of the stored and acidified IW residues and X-ray diffraction (XRD) analyses are planned. They compared and discussed their results thus far with the other laboratory groups to better understand the potential rock-water interactions at Site U1438. Finally, inductively coupled plasma-atomic emission spectroscopy (ICP-AES) was switched over to analyze solid phase samples and a standards curve was prepared.

The paleomagnetic team continued measuring and demagnetizing archive half core sections from Hole U1438E, and measuring anisotropy of low field magnetic susceptibility on discrete samples from Hole U1438D.

The physical properties team continued to work on the backlog of cube samples cut from Hole U1438E. They completed all moisture and density (MAD) and seismic velocity measurements of these samples. Once coring resumed, the team continued with sonic velocity, MAD, and thermal conductivity measurements from Hole U1438E. A re-analysis was made of the APCT-3 temperature values with explicit error bounds from Hole U1438B. These were then used in a Bullard-type analysis to estimate the heat flux with the temperature and thermal conductivity measurements from Hole U1438B. The team also revised the physical property methods section for the *Proceedings* volume.

The downhole logging group worked on data interpretation with both the physical properties and the geochemistry groups. They also worked on the logging and physical properties report drafts.

## **Education and Outreach**

Work continued on deliverables for the Expedition. Two scientist interviews were completed and uploaded to YouTube (<https://www.youtube.com/user/OceanLeadership>), and additional interviews were conducted for the “Story of a Scientist” project. Educational program materials development continued work on *JOIDES Resolution*-inspired Next Generation Science Standards (NGSS) posters. Video broadcasts occurred throughout the week, and preparations were made for upcoming sessions. Social media outlets were maintained, and updates focused on ship life and current ship operations. Twitter (<https://twitter.com/TheJR>) and Instagram ([http://instagram.com/joides\\_resolution](http://instagram.com/joides_resolution)) were updated, and Facebook

(<https://www.facebook.com/joidesresolution>) experienced growth in the New Page Likes (17 new Likes, 6% increase) for a total of 4,728 “Likes.”

## **Technical Support and HSE Activities**

The first part of the week was spent waiting on weather. When coring resumed on 11 July, the technical group was mainly involved in core handling. Specific activities of the laboratories and support groups included:

### Core Laboratory

- Personal sampling was completed for cores on board.

### Application Developers and Information Technology

- The LIMS Reports phase III work continued on the reporting framework.
- Additional work on the data systems included, DrillReport and smear slide (SED) sample entry.
- Participated in continued efforts to get the Kochi Core Center (KCC) connected for full SampleMaster usage. Data cataloging is operational; however, label printing is not yet the way they want it to work due to remote network and variances in hardware configuration.

### Miscellaneous

- In preparation for the end of the expedition, off-going shipments are currently being assembled and shipping papers prepared.
- Shipboard inventory has been updated.

### Health and Safety Activities

- The eyewash and safety showers were tested.
- A boat and fire drill took place on July 8.