

## **IODP Expedition 346: Asian Monsoon**

### **Week 3 Report (11–17 August 2013)**

#### **Operations**

The transit to Site U1422 (proposed site JB-3) continued this week with yet another low pressure cell crossing behind our path. This one did not impact the transit as much as the earlier one, although the seas and wind did increase on 11 August. Winds averaging 21 kt (gusting to 26 kt) and average waves/swells reaching 8–9 ft with maxima of 12–14 ft were experienced that day. Excellent speed averaging 11.2 kt was maintained with the aid of the tail wind. The final three time zone changes also took place this week with the clock turned back an additional three hours placing the ship at UTC + 9, which is the local time for all Expedition 346 sites as well as Japan and Busan, Korea. A pre-spud meeting covering the first three sites of the expedition (proposed Sites JB-3, JB-2, and JB-1) was held as a final preparation before getting on-site. The ship maintained good speed (over 11 kt) during the final days of the transit until entering the heavily trafficked Tsugaru Strait south of Hokkaido. A strong current on the bow reduced the vessel's speed-over-ground (SOG) through the strait to 6.0 kt. This lost time was made up once exiting the strait and turning to a more northerly course where an average speed of 11.7 kt was achieved during the last day of the transit. The ship arrived on Site U1422 (JB-3) and the sea passage ended at 1448 h on 17 August 2013. Control of the ship was shifted from bridge "cruise" mode to DP (dynamic positioning) at 1528 h. A strong gale that was blowing as the ship arrived on location complicated the vessel's maneuvering over the location coordinates. However, the ship was soon steadied at Site U1422 and the rig crew began picking up drill collars and making up the Advanced Piston Corer (APC)/Extended Core Barrel (XCB) bottom hole assembly (BHA). All tubular joints were strapped (measured) and drifted (ID clearance checked) as they were made up into the drill string. By 2400 h on 17 August, the drill string had been deployed to a depth of 2932.5 mbrf.

#### **Science Results**

We continued to use "practice" cores collected by the previous expedition to calibrate and train on the broad range of instruments and applications we will utilize during this expedition. The scientific party is now established into the "Day" and "Night" shift patterns and eagerly awaiting core on deck. All laboratory procedures have been described in the Methods chapters of the Expedition Reports. Senior shipboard personnel held the operational "pre-spud" meeting for the northernmost sites in our coring program (JB-3 [Site U1422], JB-2 and JB-1), and the expedition co-chief scientists presented the scientific objectives and operations plan for these sites to the science party. In addition, science party members have given two scientific presentations per day during the transit.

In the Sedimentology Laboratory we trained on the core description software DESClogik and learned how to use the Section Half Imaging Logger (SHIL) and Section Half Multisensor Logger (SHMSL) to generate high resolution core imagery and measure the sediment point magnetic susceptibility and color reflectance. We reviewed the core descriptions from ODP Legs 127 and 128 and practiced core flow and refined laboratory procedures.

In the Micropaleontology Laboratory, we adjusted the microscopes and analyzed micropaleontological samples from the “practice” core. We refined the DESClogik micropaleontological templates and experimented with the software and the laboratory equipment, including the new scanning electron microscope (SEM). We carried out a comprehensive search on Sea of Japan/East Sea literature on micropaleontology and taxonomy for the different calcareous and siliceous microfossil groups that we expect to recover.

In the Physical Properties and Paleomagnetism Laboratory, we calibrated and tested the shipboard instrumentation, including the balance system, moisture and density (MAD) measuring instruments, automated vane shear device, *P*-wave velocity instruments, the superconductor rock magnetometer (SRM), the spinner magnetometer, and the magnetic susceptibility instruments. We discussed ways of calibrating the spectrophotometer as well as the removal of wrap effects. Ultimately, we conducted core flow and data acquisition on practice cores. The test paleomagnetic data were used to adjust MATLAB and Python paleomagnetic tools developed for processing shipboard paleomagnetic data.

The geochemistry group completed training on all analytical equipment to be used and initial tests were completed for measuring ammonium and phosphate in preparation for the analyses of interstitial water samples. Furthermore, the elemental analyzer system was tested for the measurement of the concentrations of C, N, and S. The anticipated workflow of the Geochemistry Laboratory was also discussed as a group (based on shifts) to better prepare for the core samples (HS and IW) before the first cores are recovered.

The IODP programmers completed modifications to both the LIMS2Correlator and AffineSplice Uploader programs. At this point both hardware and software are ready for use. We completed the programming to extract RGB and spectral data from the SHIL and are working on the interface with the LIMS database such that we will be able to download the data to Correlator in the same manner as all other LIMS data. USIO technical staff have been working with the science party to test proposed speed modifications to the STMSL (Special Task Multisensor Logger) and WRMSL (Whole-Round Multisensor Logger) such that we can use both interchangeably (and at the same time) to process individual cores in either the “fast-track” or “slow-track” modes. This should help to speed this component of core flow. Finally, we have worked our way through a 30-unit noise factor observed after installation of 90 mm susceptibility loops on both the STMSL and WRMSL. It turns out that they interfere with one another across the aisle (they can be frequency adjusted at the factory for use in close proximity). An aluminum plate shielding has been installed on the STMSL side, eliminating the interference, providing a good work-around.

## **Technical Support and HSE Activities**

The technical staff has been fully committed to supporting preparations for core and sample processing in the laboratories. The final week of the transit was spent ensuring that all instruments were calibrated/configured and ready to go. Laboratories were stocked with needed supplies and new hands instructed on what to expect.

Logistics:

- No activities to report.

Laboratory:

- Physical Properties Laboratory:
  - Section Half Imaging Logger (SHIL): Completed development and testing of the new SHIL release and was approved for deployment for this expedition. On the request of the science party, we are extracting and saving RGB curves. New SHIL User's "Quick Start" guide written.
  - Section Half Multisensor Logger (SHMSL): USIO staff worked with science party testing the system and measuring color standards.
  - Whole-Round Multisensor Logger (WRMSL) and Special Task Multisensor Logger (STMSL): Optical switches installed on both tracks; Software logic errors repaired by developers; 90 mm MS Loops installed on both tracks but began to cross talk. Staff installed an aluminum plate blocking the cross talk. The first cores ran through both tracks show good data agreement.
- Magnetism Laboratory:
  - No issues to report; should be running the first cores through by the end of this day.
- Core Description:
  - No issues to report.
- Underway Geophysics:
  - Magnetometer continued to have problems and was pulled for inspection. A split in the cable's covering was found about a meter in front of the tow fish. Also, flexing the cable in this area causes a dead short. After speaking with the vendor, we suspected that both transceiver boxes are dead due to an overvoltage caused by the intermittent dead short. There is a sacrificial resistor that has blown and will require vendor repair. As time permits during the expedition we'll cut back the cable and re-terminate the connection to the tow fish. Transceivers will be sent to shore for repair at the end of the expedition.
- Chemistry Laboratory:
  - The natural gas analyzer (NGA) is up and running but problems began with GC3 on Sunday morning. Troubleshooting in progress.
  - The broken Cary pump was repaired onboard and is back in service.

The following HSE activities took place:

- Weekly fire and boat drill held as scheduled, weekly.
- Safety shower and eyewash station inspection completed.