

IODP Expedition 354: Bengal Fan

Week 1 Report (29 January–1 February 2015)

Operations

The ship was scheduled to arrive at Loyang offshore terminal in Singapore in the early morning of 29 January, but had to anchor outside the port. The ship occupying our intended berth had a mechanical problem and the arrival had to be shifted to the next day (30 January). In the late afternoon, water taxis were used to disembark the Indian Monsoon Expedition (353) scientists and *JOIDES Resolution* Science Operator (JRSO) staff. The Bengal Fan Expedition (354) Chief Scientists and JRSO staff also boarded the ship by water taxi.

At 0600 h on 30 January, the pilot boarded the ship and we started the short 9 nmi transit to Loyang port. The first line ashore at 0821 h marked the end of the Indian Monsoon Expedition 353 and the start of the Bengal Fan Expedition 354. This first day of port call activities included the boarding of the Bengal Fan scientists, ship operator crew change, offloading of the Expedition 353 core and sample shipments, as well as a variety of shipments to and from the ship. The Bengal Fan scientists got settled in their rooms, were introduced to life on board, and then were given an initial safety orientation, laboratory tours, and an introduction to the information technology on the ship.

On 31 January, the scientists and JRSO technical staff were introduced to each other and then the Chief Scientists kicked off the expedition with a presentation of the expedition science objectives. In the afternoon, the Captain introduced key staff and gave the overall ship safety orientation. The IODP Expedition Project Manager then gave the scientists an orientation to what we are going to accomplish during the expedition and how we are going to do it. Port call activities continued with loading of the drilling mud, fueling of the ship, a variety of shipments to and from the ship, and tours for a group of Texas A&M alumni from Singapore and journalism students from Nanyang Technological University. We are currently anticipating to depart Singapore at ~0930 h on 3 February.

Science Results

Expedition 354 will drill a transect of holes in the Bay of Bengal to address interactions among the growth of the Himalaya and Tibet, the development of the Asian monsoon, and processes affecting the carbon cycle and global climate. Because sedimentation in the Bengal Fan responds to both climate and tectonic processes, its terrigenous sediment records the past evolution of both the Himalaya and regional climate. The histories of the Himalayan/Tibetan system and the Asian monsoon require sampling different periods of time with different levels of precision.

Accordingly, we plan to drill a transect of six holes in the fan at 8°N with two complementary

objectives. (1) We will study the early stages of Himalayan erosion, which will bear on the India-Eurasia collision and the development of the Himalaya and Tibet as topographic features. We will drill a deep site (MBF-3A to ~1500 m) in the west flank of the Ninetyeast Ridge where a reflector interpreted as a Paleocene–Eocene unconformity could be reached at a reasonable depth. (2) We will study the Neogene development of the Asian monsoon and its impact on sediment supply and flux. Our east–west transect of drill sites at 8°N will include Site MBF-3A and two other 900 m penetration sites (MBF-1A and MBF-2A) to reach sediment at least as old as 10–12 m.y. Records from the Arabian Sea and the Indian subcontinent suggest that at ~7–8 Ma the intensity of the monsoon increased and C₄ plants expanded. Moreover, these changes appear to be linked to changes in the erosional regime as recorded by Ocean Drilling Program Leg 116 and possibly to the tectonic evolution of southeast Asia. This transect will allow study of the extent to which a strengthening of the monsoon encompassed the Bay of Bengal, where increased rainfall, not strengthened wind, characterizes the monsoon, and will allow quantitative studies of the interrelations of climate change and sediment accumulation. In addition, three sites (MBF-4A, MBF-5A, and MBF-6A) will document how the depocenter migrated across this transect during the Pleistocene and will provide the most complete record of channel-derived terrigenous material through this time interval.

Education and Outreach Activities

As part of our preparation for the Education and Outreach activities for the Bengal Fan Expedition, we updated our primary expedition page at <http://joidesresolution.org/> as well as the official social media outlets. We also set up guest blog accounts for interested science party members. To prepare for our live video interactions with schools and museums around the world, we continued to communicate with shore-based educators to schedule broadcasts and took inventory and started testing webcasting equipment and workflows. Finally, we prepared and delivered a presentation about our E&O goals and plans to the science party.

Technical Support

Science Mission Support, Portcall

Day 1: Technical staff moved aboard via water launch and conducted a very brief handover with departing staff.

Day 2: Staff completed the majority of logistic activities and began the distribution of oncoming freight. Introduction and safety meetings were conducted for oncoming science party.

Day 3: Staff continued with material distribution. The Science Party was introduced to their laboratories, met technical staff, and was trained on data systems and instrument host software. Staff assisted catering with food loading.

Day 4: Science party laboratory introductions continued. Technicians secured laboratories and storage areas for departure.

Other Technical Activities

- Repurposed the spare conference room projector for use in the movie room.
- The top 100 m of Site U1444 core were moved into the laboratories for study and training.
- Conducted a demonstration of the “Quality” method for acquiring spectrum and L*a*b calculations on the Section Half Multisensor Logger reflectance spectrophotometry and colorimetry analysis.

HSE Activities

- The science party and new technical staff completed Siem’s safety induction and the IODP’s Laboratory Safety Tour. An antipiracy and ship’s security presentation was given by the First Mate and a practice drill was conducted.
- Met with the ship’s manager to discuss safety issues.
- The weekly fire and abandon ship drill was held as scheduled.