

Weekly Report – 2nd February to 8th February 2018

1. Location

IODP Bremen Core Repository, MARUM – Center for Marine Environmental Sciences, University of Bremen, Germany
Onshore Science Party

2. Activity Summary

At the start of the Onshore Science Party (OSP), a meeting was held to introduce the science party to the expedition objectives, initial results, offshore operations, IODP-MSP measurements, OSP procedures, as well as health and safety measures at the OSP, and to introduce members of the science party and their scientific interests. Discussion were conducted to coordinate and refine sampling plans for ‘shipboard’ analyses and for post-cruise personal research. On February 2nd, splitting, description, sampling and measurement of the cores began, starting with Site M0078.

Processing of cores (splitting, describing, sampling and undertaking IODP Standard Measurements) continued throughout the week. By 24:00 on Thursday 8th February, approximately 500 m of core from Hole M0078A had been processed, leaving the final approx. 30 m to process during the morning of Friday 9th.

By the end of the 8th February, a total length of 506 m of core was split and described, and 2,747 samples had been taken (Table 1).

3. Activities for Next Week (9th – 15th February)

Friday 9th – Finish splitting, describing and sampling Hole M0078A.
Friday 9th – Start splitting, describing and sampling Hole M0078B.
Saturday 10th – Finish splitting, describing and sampling Hole M0078B.
Saturday 10th – Start splitting, describing and sampling Hole M0079A.
Saturday 10th – Science Meeting to present preliminary results & observations from Site M0078.
Saturday 10th to Thursday 15th – Continue processing cores from Site M0079.

4. Current Status

The status as of 24:00 on 8th February was as follows:

Hole	Total Core Length (m)	Split Core Described (m)	No. Samples Collected
M0078A	534	506	2,747
M0078B	52	0	0
M0079A	611	0	0
M0080A	449	0	0

Table 1 - Progress summary for Week 1 (2nd - 8th February).

5. Preliminary Scientific Assessment

During the first day of core processing, both the early and late shifts worked together to harmonize approaches to core description, to undertake IODP-MSP measurements, sampling, etc. for the OSP. Normal shift schedules began on February 3rd – the group are typically working 07:30 to 22:30 with 6.5 hours where both shifts are in the Bremen Core Repository. Characterization and sampling of Hole M0078A was nearing completion by the end of week 1.

The split cores from Hole M0078A are revealing much more detail on the variations in the syn-rift sedimentary section than from the initial analysis of the full cores through the liners and core catcher

material offshore. The boundaries between the hypothesized marine and 'isolated' periods of Seismic Unit 2, which are controlled by the combined effects of fluctuating sea level and sills at the boundaries of the basin, are being better defined. Micropaleontological analysis indicates complex assemblages representing these changing conditions.

In the upper unit (Seismic Unit 2), as initially observed offshore, sedimentological characterization has identified greenish-grey mud with thin interbeds of silt and fine sand gravity flow deposits and organic matter. Finely laminated sediments are also common, particularly within the non-marine intervals. The systematic variations in the sediment lithology between marine and 'isolated' intervals appears to be showing a good correlation with offshore and new onshore micropaleontological analysis. In the lower unit (Seismic Unit 1), as observed offshore and from the seismic data, sediments and their physical properties become more homogeneous, composed of fine-grained that is buff to light grey in colour. A possible candidate for the unit boundary was identified.

Core physical properties analysis includes strength measurements and half-round Multi-Sensor Core Logger (MSCL) P-wave in an attempt to gather good core P-wave data, in addition to the standard shipboard measurements. Measurements of density on discrete core samples show broad agreement with MSCL data acquired on whole cores offshore. Shear strength measurements on the cores during the OSP also show consistent trends to penetrometer measurements offshore.

The structural geologists have been characterizing structures observed in the core, including both small faults and structures induced by drilling.

The paleomagnetists are determining natural remanent magnetization and magnetic susceptibility on shipboard samples from Hole M0078A. Data quality is good for measurements made so far; with promising potential for age constraints in particular around the unit boundary and in the lower unit.

The geochemistry team has focused on further analysis of pore-fluid samples taken offshore, and have obtained measurements of major and trace elements, ions, dissolved inorganic carbon, and phosphate.

The core-log seismic integration effort has focused on comparing MSCL densities with those measured on discrete samples during the OSP to refine the synthetic seismograms for Hole M0078A. New synthetic seismograms have also been calculated for M0080A using the MSCL densities and sonic logs obtained throughout this hole.

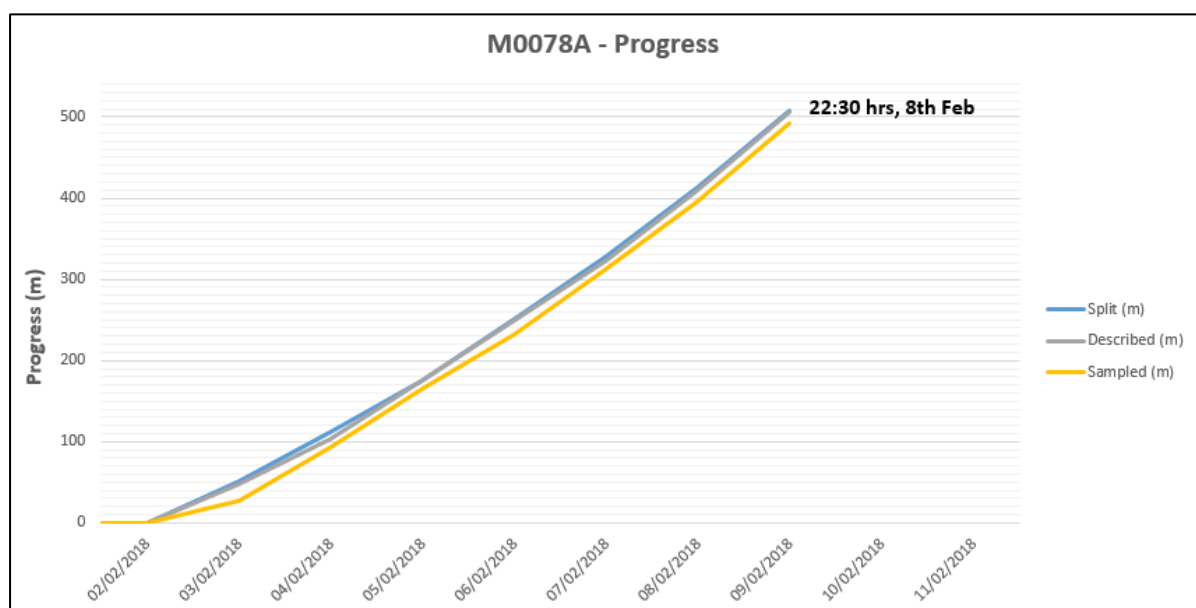


Figure 1 - Core progress chart (22:30 hrs on 8th February 2018).

6. Photographs

