

Scientific report for IODP³ – NSF Expedition 501

New England Shelf Hydrogeology



Weekly report – 4th February to 11th February 2026

1. Location

Bremen Core Repository, MARUM – Center for Marine Environmental Sciences, University of Bremen, Germany.

2. Activity summary

During the last week of the Exp. 501 Onshore Operation, core processing continued for Site M0113 and was completed on Saturday, 7th February. On Thursday the 5th of February, and Monday the 9th of February, scientific summaries for Sites M0112 and M0113 were presented. The science team were busy revising and preparing the manuscripts for the IODP³ Proceedings Site Reports papers for all three sites (M0111, M0112, M0113), with completion scheduled for the 11th of February.

Over the four weeks of the OnO, a cumulative total of 873.24 m of cores were split, analysed, and described, and 1268 samples were collected during Week 4 (Table 1). 671 squeeze cake splits were sampled. In total, 5035 samples were collected during the Onshore Operation.

The Expedition 501 Onshore Operation came to an end on the 11th of February with all description, scanning, sampling, archiving and report writing tasks completed. It was a hugely successful four weeks with the new IODP³ programme off to a flying start, and many scientific collaborations begun and friendships cemented.

Hole	Total core length (m)	Split core described (m)	Total samples recovered
M0111A	50.37	50.37	178
M0111B	201.33	201.33	889
M0111C	65.57	65.57	201
M0112A	255.96	255.96	1059
M0112B	58.52	58.52	246
M0113A	241.49	241.49	1791

Table 1 – Progress summary (cumulative) for Week 4 (4th January to 11th February 2026)

3. Scientific assessment

The Science Team was in full swing during week four of Onshore Operations where they presented results from Site M0112 and Site M0113, completed core processing, worked on finalising their Methods and Site M0111 reports, and drafted and revised their Site M0113 reports. While maintaining this pace to finish Onshore Operations, the Science Team also had exciting science discussions about integration of data across the sites and about collaborative post-expedition research.

The sedimentology and lithostratigraphy team completed visual core descriptions and smear slide analyses for Site M0113. Overall, Site M0113 contains a finer-grained succession compared to Sites M0111 and M0112. Five major sedimentary packages were defined based on lithological

changes. Lithostratigraphic Unit 1 is sand-dominated, with some shell-rich intervals. Lithostratigraphic Unit 2 is mud-dominated, with sparse clasts of various compositions. Lithostratigraphic Unit 3 is also mud-dominated but is characterised by a substantial increase in biogenic carbonate content, mainly driven by the abundance of calcareous nannofossils observed in smear slides. The top of Lithostratigraphic Unit 4 is characterised by glauconitic and shell-bearing sands that transition into poorly sorted, brown-coloured sands. Lithostratigraphic Unit 5 is dominated by dark, bioturbated, and laminated mud-rich sediments with a high abundance of organic material and pyrite.

The biostratigraphy team finished their analysis of Site M0113 at the end of Tuesday the 10th of February. Site M0113, in comparison to Sites M0111 and M0112, has the most abundant assemblages of planktic foraminifera and calcareous nannofossils. Thirty four samples were examined for nannofossils, and 30 for planktic foraminifera. Age distributions of both calcareous nannofossils and planktic foraminifera spanned from the Pleistocene to the Cretaceous.

The physical properties team had a busy week completing all thermal conductivity measurements on whole round cores. The team also finished all linescan and colour reflectance measurements on cores, as well as all moisture and density, undrained shear strength, and discrete P-wave velocity measurements on discrete samples. Also, formation factor was calculated for Site M0113 from measurements of electrical conductivity. The team summarised both offshore and onshore results at the Site M0112 and Site M0113 meetings, including some comparison with downhole logging, geochemical, and lithological data.

The geochemistry team dedicated significant effort to quality control/quality assurance (QA/QC). Interstitial water analyses were repeated for samples from freshened water intervals to confirm results for low concentrations of target compounds. Drilling mud samples collected during operations at all three sites were analysed with the same methods used for interstitial water samples to identify the geochemical fingerprint of potential contamination. Core images were carefully inspected to identify cores in which the integrity of the sediment had been disturbed during drilling. Samples and data from cores with a high contamination risk were flagged. In addition, the geochemists finished processing sediment samples that had been taken from the split cores throughout onshore operations. A total of 116 samples has been freeze-dried, ground, and split into 348 subsamples for mineralogical and geochemical analyses of the solid phase. At the end of the week final analyses were ongoing in the laboratories of the Geosciences Department. As onshore operations wrap up, geochemists were finalising reports on approximately 14,500 data points generated during the past four weeks.

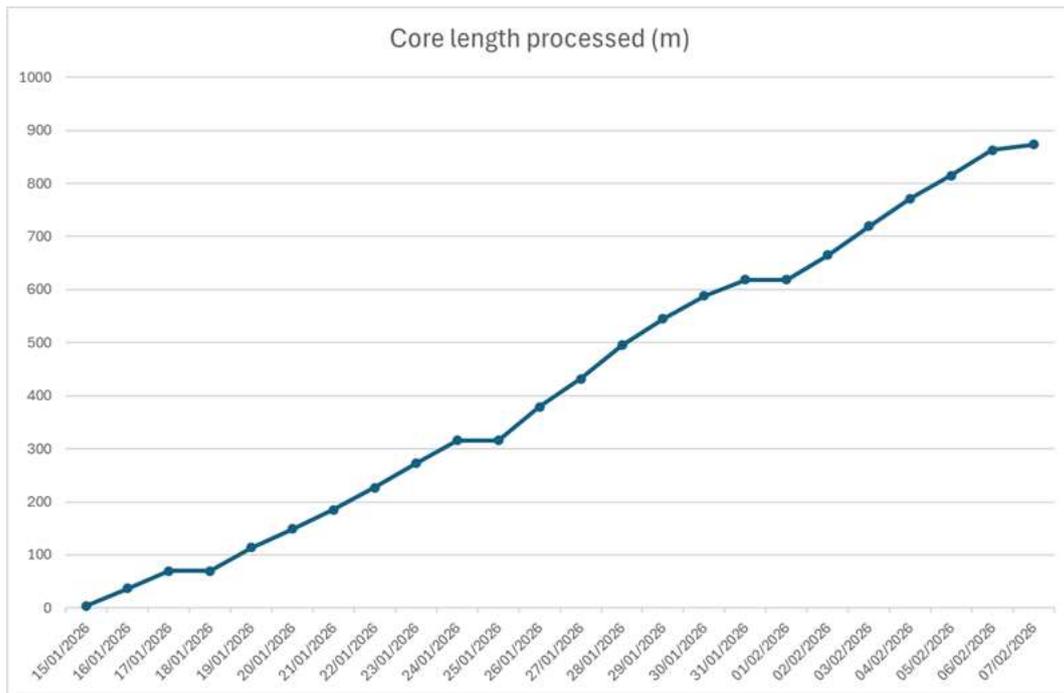


Figure 1 – Core progress chart (from the Onshore Operation start date 15th of January 2026 until 22:30 on the 7th of February 2026). Core processing completed on the 7th of Feb, 2026



Photo 1. Expedition 501 onshore operation team (Diekamp@ECORD_IODP³_NSF_501_Team)

Photo 2. Science and ESO team members joined by Co-Chiefs Brandon Dugan and Rebecca Robinson on core discussion (Phillips@ECORD_IODP³_NSF_IMG_3235)

Photo 3. Scientist Bryce Mitsunaga and Bremen student assistant Leola Pfaffling taking core samples (Pachiadaki@ECORD_IODP³_NSF_0652)

Photo 4. Scientist Ann Cook measuring colour reflectance of the core (Pachiadaki@ECORD_IODP³_NSF_IMG_0697)