Scientific report for IODP^3 – NSF Expedition 501

New England Shelf Hydrogeology

Weekly report – 14th January to 20th January 2026

1. Location

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

2. Activity summary

At the start of the Onshore Operation (OnO), scientists were welcomed, and a 1.5-day meeting was held to introduce OnO procedures and Health and Safety rules. The scientists presented initial scientific results and were introduced to IODP^3 standard laboratory measurements. On the 16th of January, core splitting, describing and sampling procedures began with Hole M111A, and by the end of the first week, cores from Hole M111B were being processed. By the 20th of January, a total length of 149.41 m of core had been split and described, and 546 samples had been taken.

Hole	Total core length (m)	Split core described (m)	Total samples recovered
M0111A	49.58	49.58	179
M0111B	372.14	99.04	367
M0111C	147.62	0	0
M0112A	326.93	0	0
M0112B	419.82	0	0
M0113A	369.19	0	0

Table 1 - Progress summary for Week 1 (14th to 20th of January)

3. Preliminary Scientific Assessment

The first day of core processing was a combined shift with all Science Team members working together to learn (1) overall core flow, (2) their roles and responsibilities within the core flow, and (3) develop cooperative approaches to completing all required measurements, sampling, and reporting during our Onshore Operations. After initial group training, shift work started on 16th January. We worked in two shifts with a 6.5-hour overlap that allowed us to each shift spend a portion of the day sampling and analysing data and a portion of the day working on reporting tasks, and to have a daily cross-over meeting to share information. Core processing started with Site M0111. By the end of week 1, all cores from Hole M0111A and approximately half of the cores from Hole M0111B had been described and sampled.

The sedimentology and lithostratigraphy team started the week by finalising their dictionary for descriptions and then began describing the cores with visual core descriptions and smear slide analyses. Sediments above seismically interpreted unconformity U2 were sand-dominated and were shell-rich in some intervals. The described sediments below the unconformity were mud-dominated with some fine-sand components, shell fragments, and soft-sediment deformation. Some intervals contained wood fragments and pyrite. The bottom of the described section contained alternating thin beds of mud and sand.

Biostratigraphy worked in parallel the sedimentology team to characterize sediment age. Calcareous nannofossils in the shallowest section were rare and Pleistocene in age. Benthic forams were also rare, and planktonic forams were rare and of Pliocene age. Although not an age indicator, sponge spicules were also abundant in some intervals.

The physical properties and petrophysics team worked on line scanning and colour reflectometry on half round cores. Both of these half round analyses required some real-time adjustments to characterize intervals with high variability in colour and variability in half round volume where half round liners ranged from partially to completely full within and between sections. The team also worked through training and implementation of a series of discrete measurements including moisture and density, shear strength, formation factor and discrete P-wave.

Geochemistry opened with introductions to their complicated workflow for sample processing. The team defined a protocol for subsampling frozen squeeze cakes for personal sampling and approximately a third of those samples have been processed. The team prepared samples for sediment and interstitial water chemistry analyses to be conducted in MARUM laboratories.

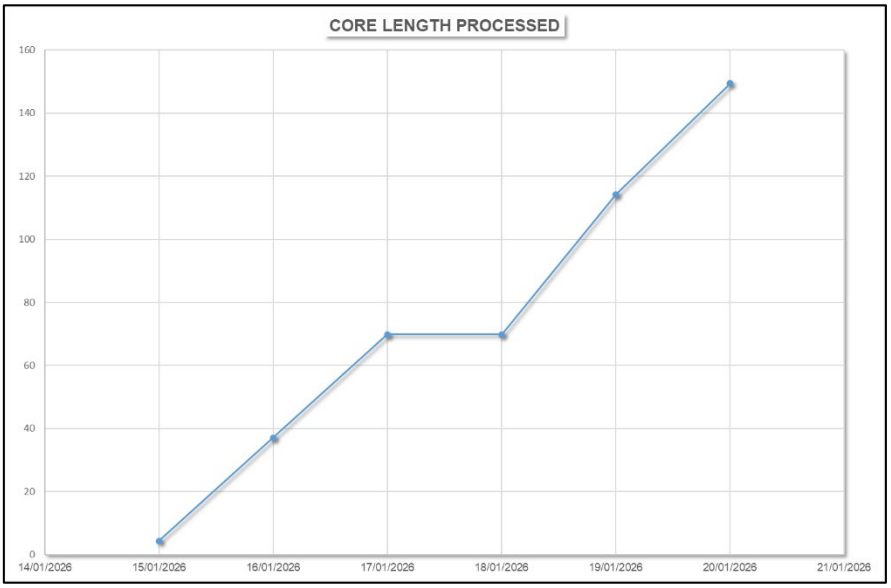

Figure 1 - Core progress chart (22:30 hrs on the 20th of January 2026)

Photo 1. Student helpers Jana Steffen and Sungan Kim transport freshly split core to the labs (Mowat@ECORD_IODP3_NSF_20260119_143157803)

Photo 2. Scientists Maria Pachiadaki and Avishek Dutta taking samples from a core (Le_Ber@ECORD_IODP^3_NSF)

Photo 3. Science Team members join micropalaeontologist Gretl King in the search for forams (Le_Ber@ECORD_IODP^3_NSF_P1054785)