



14<sup>th</sup> July 00:00 – 20<sup>th</sup> July 24:00 EDT Eastern Daylight Time (UTC -4)

## 1. Operations

The first day of week 9 of the expedition was busy, starting on the 14<sup>th</sup> of July with the removal of CHD to deck to remove damaged sections and then running the CHD back into Hole M0112B. After water circulation to improve ground conditions, the ship crew, drillers, and Expedition 501 team helped to deploy the SCIMPI, which was successfully installed in less than three hours. The CHD and casing was then tripped out and we cleared the deck and secured our containers. At 16:00 we began the transit to the next site, arriving at 20:25 and then starting the pre-loading sequence.

Pre-loading was completed and deck access allowed at 09:00 on the 15<sup>th</sup>. Preparations were completed for drilling, including adjusting the moonpool, and casing was run in to seabed by 16:00. After running in the CHD and repairing some sensors on the drill right, HPC coring began at 18:10, with the first core of 2.9m on deck at 18:25. Coring continued using the HPC until midnight.

The 16<sup>th</sup> of July saw a good day for coring with the HPC, and a total of 41.64 m of core recovered from 32 cores. 78 samples were taken, and 44.54m of core run through the MSCL. At 22:00, coring was paused to wash in casing.

The casing was washed down to 56.33 mbsf on the 17<sup>th</sup>, with a short break to pause for lightning nearby in the morning. The CHD was tripped out and casing plug material added and pressurised by 14:30. The plug was allowed to set until 20:40 when washing CHD commenced and continued until midnight.

The borehole was advanced by 23.4m on the 18<sup>th</sup> and the casing was reset. Although the casing was set on the previous day no cuttings returns had been observed and after consideration of the lithologies being cored it was decided to reset the casing in the competent clay cored at ~73mbsf.

The morning of the 19<sup>th</sup> saw the washing down to the bottom of the casing and drilling through the plug. There followed a full day of coring using both the hydraulic piston corer (HPC) and Alien (ALN) core barrels. A total of 14 cores were recovered, 8 with the HPC and 6 with the ALN corer, with a total drilled length of 22.35 m and 20.06 m recovered. The successful transfer of 10 ESO staff and scientists off and 9 on including two journalists from the Associated Press was also carried out between 1630 and 1800hrs.

Another full day of coring save for a short break due to a lightning storm which passed quickly. The accompanying rain however lasted longer but did not dampen the spirits of the team who continued to forge on under layers of waterproofs, advancing the hole to 135.99 m by midnight.

## 2. Hole Summary – 14<sup>th</sup> to 20<sup>th</sup> July

Hole	M0113A
Latitude	40.618333°N
Longitude	70.136972°W
First Core	501_M0113_A_001H
Last Core	501_M0113_A_081R
Cores Recovered	81
Drilled Length (coring)	135.99 m
Drilled Length (open hole)	0
Recovered Length	110.72 m
Depth in Hole	135.99 m
Hole Recovery	82.76 %

### 3. Science

During Week 9 the Expedition 501 Science Team wrapped up Site M0112 with gamma ray logging and installing of a Simple Cabled Instrument for Measuring Parameters In Situ (SCIMPI) system in Hole M0112B, science overview presentations of data from Site M0112, and characterization of cores and samples from Hole M0113A.

Gamma ray logging through drill pipe at Hole M0112B provided high-quality data for lithologic characterization and for correlation with Hole M0112A. The correlation between Hole M0112A and Hole M0112B shows strong ties in most of the drilled section with depth offsets less than 2 m. The gamma ray log data also provided constraints on the lithology where the SCIMPI modules were set. The installed SCIMPI system has four measurement modules at four depths that will be sealed in the borehole as it collapses. Each measurement module will record in situ pressure, temperature, and electrical resistivity for multiple years before being recovered during a future, non-drilling operation.

Science presentations for Site M0112 summarized the lithology, physical properties, hydrogeology, and water chemistry encountered at the site. Through-liner core descriptions, multi-sensor core logger (MSCL), and wireline log data show good agreement of a sand- and mud-dominated system. Some initial correlations with similar lithologies at Site M0111 were also presented. Nuclear magnetic resonance log data show variance in porosity, notably the free fluid volume, that correlates with the lithologic interpretations. Comparison of interstitial water and pumped groundwater between Site M0112 and M0111 documents fresher water at Site M0112 as anticipated based on Site M0112 being closer to shore and based on the marine resistivity survey showing more resistive layers at Site M0112. Initial analyses of data from pumping tests at Site M0112 indicate a complex hydrogeological subsurface that requires additional shore-based investigation to better characterize hydrogeology and solute transport.

Upon starting to collect cores at Site M0113, which is farthest offshore, the science teams immediately began analyzing the data and its relation to Sites M0111 and M0112. The sedimentology team completed through-liner core descriptions of cores from 0 to 86 mbsf. The upper portion of the described section is dominated by dark grey and grey-tan/brown sand with a range of particle sizes. Shell fragments were routinely observed in this upper portion. In the middle portion, sand was coarser grained and brownish grey in color. The deepest portion of the described section is grey/dark grey mud with some small intervals of fine sand. Shell fragments were rare in the mud. MSCL natural gamma radiation showed variability that aligned with the visual core descriptions.

Salinity, alkalinity, pH, and ammonium were measured on interstitial water samples up to about 100 mbsf. Salinity has near-seawater values in much of the section with a minor amount of freshening at depth. This decrease in salinity correlates with an increase in resistivity in the MSCL data. pH and ammonium increase moderately with depth, whereas alkalinity decreases moderately over the same depth interval. Multiple interstitial water and microbiological subsamples were taken and preserved for onshore-based research.

The science team also welcomed and trained new scientists who joined the expedition for operations at Site M0113.

### 4. HSE Activity

The ship's deck was checked regularly for stranded seabirds.

The X501 team were instructed to remain inside during the transit and pre-loading process at the new site from the 14<sup>th</sup> to 15<sup>th</sup> of July, and during lightning storms on the 17<sup>th</sup> and 20<sup>th</sup> of July.

X501 team members continued to be made aware of hazards associated with operational changes from coring to pump testing and logging. The team were also reminded of protocols for Billy Pugh basket transfers and to take care appropriate to weather conditions (e.g. sunscreen or slip hazards).

## 5. Outreach Activity

A varied week of outreach activity included:

- 1 blog post and corresponding stories: <https://expedition501.wordpress.com/>
- Several social media posts including collaborative posts/reposts on X/Twitter (4), Bluesky (4) and Instagram (5) linking the blogsite plus corresponding stories.
- 2 published short videos on social media.
- 4 Haiku by team members as comments under Poetry-Blogpost and on Instagram.
- Visit by a videographer and Chief Photographer for the Associated Press over the 19<sup>th</sup> and 20<sup>th</sup> of July
- The third ESO Offshore Outreach Officer, Maïke Rademaker joined the vessel.

## 6. Figures

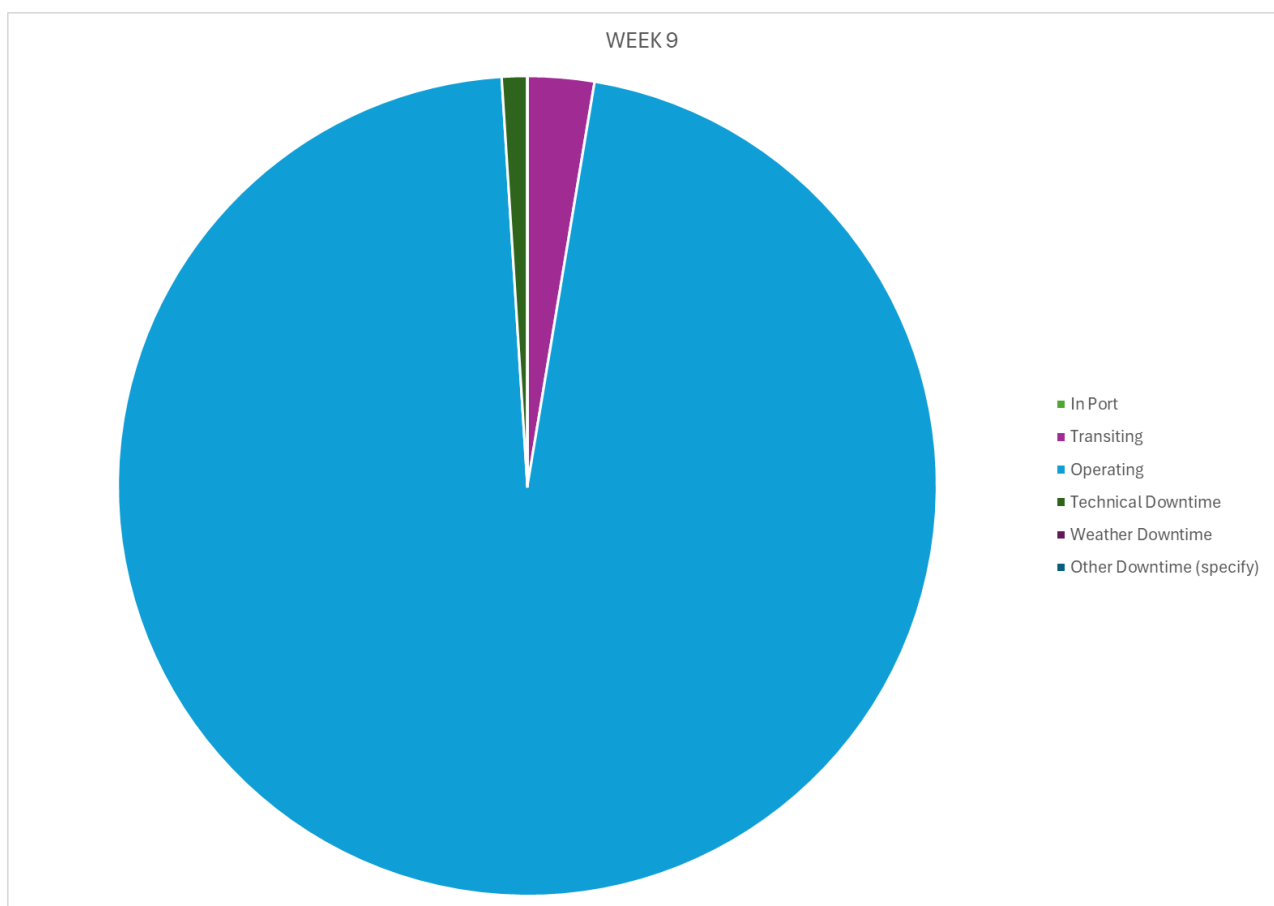


Figure 1: Breakdown of hours for week 9 (14<sup>th</sup> to 20<sup>th</sup> of July).

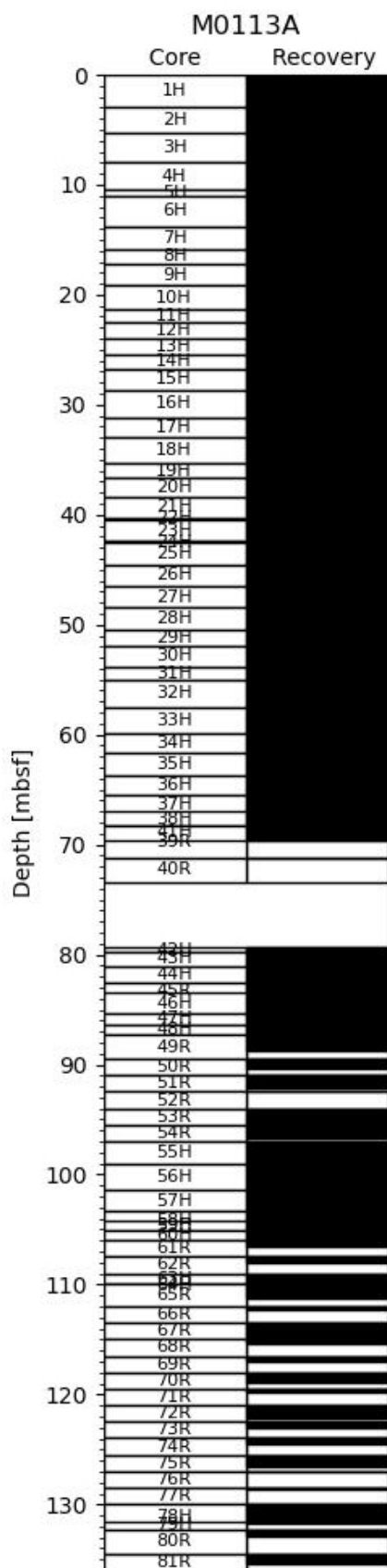
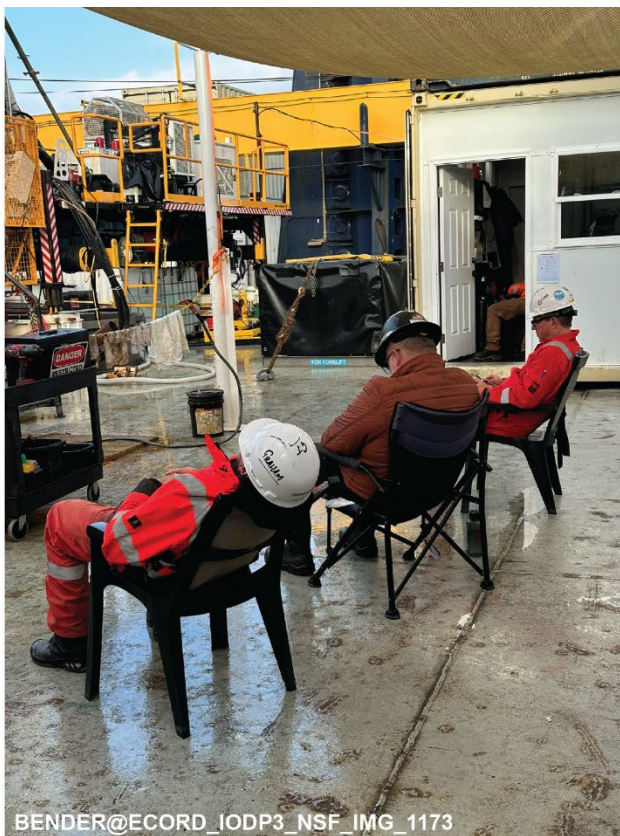


Figure 2: Recovery Plot for Week 9, 14<sup>th</sup> July to 20<sup>th</sup> July. Sediment infill from 73.4 mbsf necessitated the driller removing a number of rods to clear. An additional rod was added to the string before coring continued, resulting in a forced advance and potential loss of 6m core recovery.



## 7. Photographs



*Clockwise from top left: EPM Margaret Stewart heading up her final crossover meeting; Exhausted team members after a particularly long shift; Approaching the L/B Robert to start Rotation 9; Alizé Longeau taking a sample at the curation table; Preparing the SCIMPI for deployment; Un gâteau pour le 14 Juillet.*