Week 5 Drilling and Scientific Report for IODP Expedition 381
Corinth Active Rift Development 2017

20th Nov 00:00 – 26th Nov 24:00 EET Eastern European Time (UTC+2)

1. Operations

Rotary coring continued throughout the morning of Monday 20th November, until 07:35 when there was a pause to take an in-situ CPT/temperature measurement at approx. 300.00 mbsf. During the afternoon, there was a short pause in coring operations due to wind speeds of up to 74 knots (137 km/h). Following this, coring recommenced and continued uninterrupted throughout Tuesday 21st.

Shortly after midnight on 22nd November, another in-situ CPT/temperature measurement was taken at approx. 400.00 mbsf. Rotary coring then continued throughout the day, and was progressing well at 24:00 hrs.

On 23rd November, coring progressed without pause. During coring, it was noted that rates of advance were slowing as soil conditions were becoming notably harder. Coring continued with little interruption (besides a short pause for maintenance to a barrel head) throughout Friday 24th, through the 25th and 26th.

2. Hole summary

Hole	M0079A
Latitude	38° 9' 30.243" N
Longitude	22° 41' 43.316" E
First core	69R
Last core	143R
Cores recovered	75
Drilled length (Coring)	356.0 m
Drilled Length (Open Hole)	0
Recovered length	323.33 m
Depth in hole	630.3 mbsf
Hole recovery	91%

Table 1 - Hole M0079A progress (20th Nov 00:00 - 26th Nov 24:00)

Hole	**M0078A**	**M0078B**	**M0079A**	**M0080A (tbc)**
Status	Complete	Complete	Current	Planned
Cores recovered	176	15	143	N/A
Drilled length (Coring, m)	610.43	55.85	630.30	N/A
Drilled length (Open hole, m)	0	0	0	N/A
Recovered length (m)	533.99	52.17	575.81	N/A
Recovery (%)	87%	93%	91%	N/A
Final depth / Depth at midnight (mbsf)	610.43	55.85	630.30	N/A
Proposed site depth (mbsf)	750.00	N/A	750.00	479.00

Table 2 - Expedition 381 progress update

3. Science

During week 5, cores from the 275-625 mbsf interval at Site M0079 have been examined. This represents the majority of the upper syn-rift stratigraphic unit deposited within the rift, and the most recent phase of rifting. The boundary between this unit and the underlying earlier unit and rifting phase is expected at ~700 mbsf. In addition, comparisons have been made of the results from the two sites drilled so far (Site M0078, a thinned section on a horst block and Site M0079, an expanded section within the main graben), and attempts made to correlate between them.

Pore water geochemistry results from M0078 and M0079 appear to indicate a strong, yet complex, response to sea level change over the Holocene and Pleistocene. For example, alkalinity and ammonium concentration profiles, although smooth, show strong inflections at multiple depths in both locations. To better understand modern oceanographic conditions, water samples have been taken from surface waters for a large suite of geochemical measurements.

Paleontological analyses of core catchers and of scrapings from some pore water whole rounds have continued to show a range of paleoenvironments within Hole M0079A, and probably include examples of mixing of in situ and transported fauna. For example, benthic forams commonly reported in shallow marine environments have been observed.

Correlation of potential marker horizons or distinctive intervals/beds between the two sites drilled so far has been attempted using sedimentological, paleontological and physical properties indicators. The deeper part of the section drilled at Site M0079 shows more complexity and heterogeneity than the equivalent section sampled at Site M0078, which may be a consequence of the expansion and completeness of the section at M0079.

Preparations have been made for logging at this site, coming up in the next few days. Planning discussions between the logging and operations teams and the co-chiefs have focussed on prioritising logging measurements and maximising the chances of success based on logging operational experience at Site M0078.

Presentations on results from Site M0078 (Holes A and B) were given on 22nd November by the scientists and shared with the rest of the science party onshore, and an informal science discussion took place on 24th November.

4. HSE Activity

On the 26th of November all staff attended monthly Safety Meeting convened by Fugro with the focus reinforcing the ‘Fugro Golden Rules’ of HSE in light of a recent fatality on another Fugro vessel.

5. Outreach Activity

During the week 3 blogs were published to the WordPress blog page. After teething issues most likely caused by the ESO WiFi network transmitters and the steel structure of the ship interfering with transmissions, a successful drone UAV was carried out. This is in preparation for further flights for outreach video once the weather improves following the 29th of November.

Between the 20th and 26th November, the Expedition blog-site received 916 views, 170 visitors, and is being followed in 17 countries. Daily reports detailing coring progress and a brief scientific summary are also released onto the ECORD Expedition 381 webpage.

6. Figures

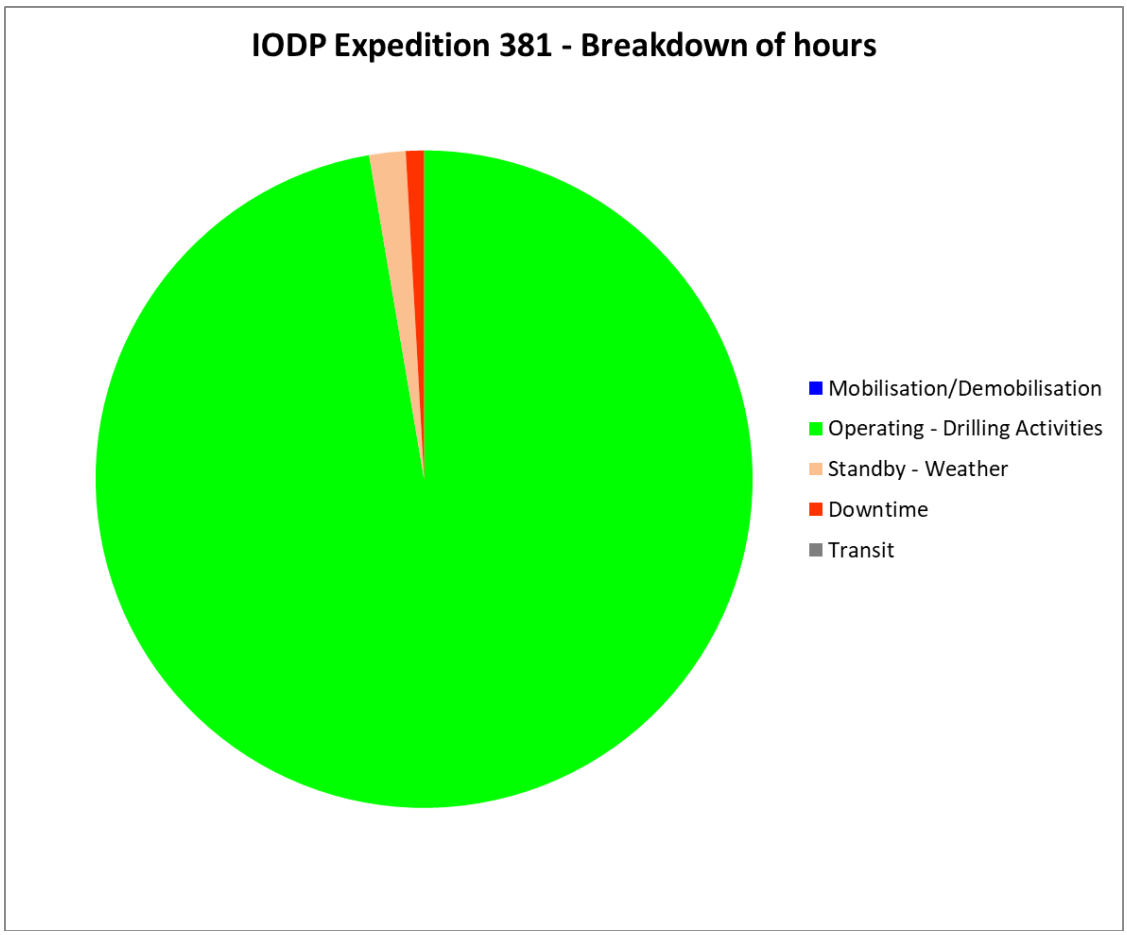

Figure 1: Breakdown of hours from 00:00 November 20th to 24:00 November 26th 2017.

M0079A

Expedition 381
Corinth Active Rift

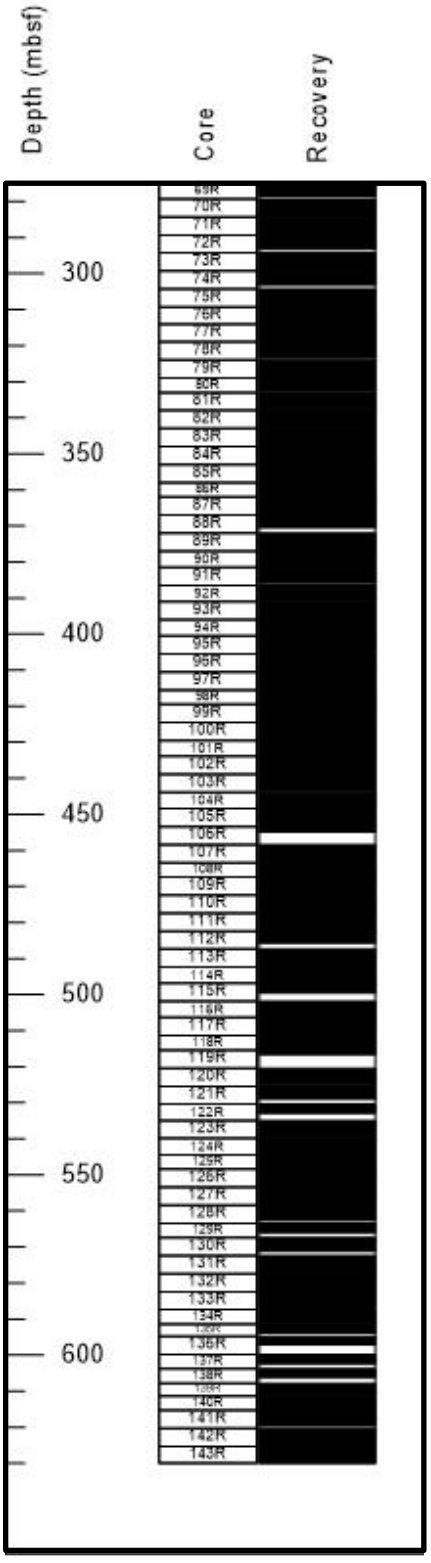

Figure 2: Core recovery for Week 5 (20th Nov to 26th Nov 2017).

7. Photographs

Figure 3: Photos from Week 5 of Expedition 381.