

7th May 2016 – 13th May 2016

1. Operations

Coring continued throughout the 7th May with rates gradually increasing as the lithology became more competent. Recovery and quality of core remained extremely high; 7 cores were collected in total and the hole advanced by a further 24.40 m to 753.09 mbsf. In addition to drilling operations, a media event was hosted on the vessel with a total of 24 journalists transported to the platform via the *Linda F* supply boat. Visitors came on board in small groups and were given tours of the facilities and operations and the Co-chief scientists gave presentations about the scientific objectives. The press included local newspapers, and national and international TV channels.

The high quality coring continued on the 8th May, with the majority of the cores measuring the full 3.05 m in length. The only exception was during coring of Core 99R when the bit became blocked and as a result, a short run was recovered. Following this, coring resumed with excellent recovery rates and high quality cores collected. A total of 11 cores were collected, advancing the hole to 783.59 mbsf. Recovery of high quality cores continued through the 9th May, again with blocked bits causing the runs of Core 117R and Core 119R to be shortened. The 11 cores taken on the 9th May increased the overall hole depth to 811.94 mbsf.

Coring continued throughout the morning of 10th May. While drilling Core 123R, a loss of circulation was noted at ~821 mbsf (~5% mud loss). Loss Circulation Material (LCM) was pumped down the hole followed by drilling mud which resolved the issue, and coring resumed. Following several unsuccessful attempts to core, the drill string was tripped for a suspected worn bit. After recovering the BHA and confirming that the bit was indeed worn, a new bit was installed, the pipe was run in and reached the base of the hole, and coring recommenced towards the end of the day.

A further two cores of excellent quality and 100% recovery were taken in the early hours of 11th May. Following this, attempts to core continued however the drill bit was not advancing within the hole. A decision was made to trip the drill string to inspect the BHA as there were concerns the bit had worn. The BHA was recovered and the bit had indeed worn. After changing the bit the pipe was then run into the hole and coring recommenced. However, the core run was short as the bit blocked off due to a crumpled liner. As coring continued, the hole depth at midnight measured 830.09 mbsf which is an advance of 6.85 m from the previous day. Coring initially progressed slowly without interruption on the 12th May. Four cores were recovered during the morning shift and a further three during the afternoon. The cores continued to be of a high quality and a 100% recovery rate was achieved. The day finished with the hole advanced by a further 17.30 m to 847.54 mbsf.

On 13th May, coring continued from the previous day. During coring of Core 136R, the barrel became blocked and the run was recovered early. Despite torque remaining steady and mud flow constant, no penetration was made on a further attempt to core and it was concluded that the bit had worn. As a result, the majority of the morning and early afternoon was spent tripping out/in the hole and replacing the bit. Coring commenced during late afternoon with short (0.4-0.7 m) cores recovered initially. The final two cores of the day (Core 140R and Core 141R) were recovered following full runs, measuring 3.10 m each. The final hole depth for this week was 859.54 mbsf.

2. Hole summary

Hole	M0077A
Latitude	21°26.996' N
Longitude	89°56.968'W
First core	90R
Last core	141R
Cores recovered	52

Drilled length (Coring)	130.85 m
Drilled Length (Open Hole)	0 m
Recovered length	133.57 m
Depth in hole	859.54 m
Hole recovery	100%

3. Science

At the beginning of the week we transitioned from melt-bearing impact breccia to clast-poor impact melt. The clasts are mostly granitic and the size of the clasts increased with depth. The melt zones were clearly identifiable in the physical property logs.

Later on in the week we transitioned into granite, and observed another change in physical properties. Sections of continuous granitic core increased to several meters in length and showed evidence of faulting as well as calcite veins. The granite is fractured: some of the fractures are open with signs of grain size reduction (comminution), other fractures are discrete, and there are pervasive zones of healed microfaults. The petrophysical properties are interesting, and are consistent with the granite being fractured. The visual and physical properties of the granite show only subtle variations, with the occasional unusual features such as a section with a pegmatic texture and the occasional green-colored vein.

There were multiple drilling issues during the week and progress was a bit slow. At the end of the week we drilled into melt rocks again, with some transitions between melt and granite. This section proved very difficult to drill – the granite was much softer than the melt.

4. HSE Activity

N/A

5. Outreach Activity

Expedition participants continued to blog at;

<https://esoexpedition364chicxulubimpactcrater.wordpress.com/>

ESO outreach facebook page was frequently updated; for the week of 7th – 13th May, **44,785** people were “reached”, with **311** “page views”. Since the start of Exp 364, the page has received **402** “likes”, **54** of those from between 7th – 13th May 2016.

<https://www.facebook.com/ESO-outreach-305621560212/>

On Saturday 7th May, a total of 24 journalists and media crew (national and international) came on board for a tour of the *L/B Myrtle* and an introduction to the drilling operations. Interviews with various scientists and the co-chiefs were conducted. The final printed newspaper reports in the Mexican media were very positive.

Kevin Kurtz (USIO) came aboard on Tuesday 10th and disembarked on Friday 13th May. During his time here, numerous live-streaming events were undertaken to classrooms from all over the United States. Through these events, the students not only got a feel for what life on a research cruise is like but also had the opportunity to ask the scientists and co-chiefs any scientific questions they had regarding the drilling project.

On Tuesday 10th and Friday 13th, a team of three reporters from the University of Texas and UK-based photographer came on board for two two-day visits, where they spoke with scientists and the co-chiefs, and captured daily life aboard the *L/B Myrtle* platform.

6. Figures

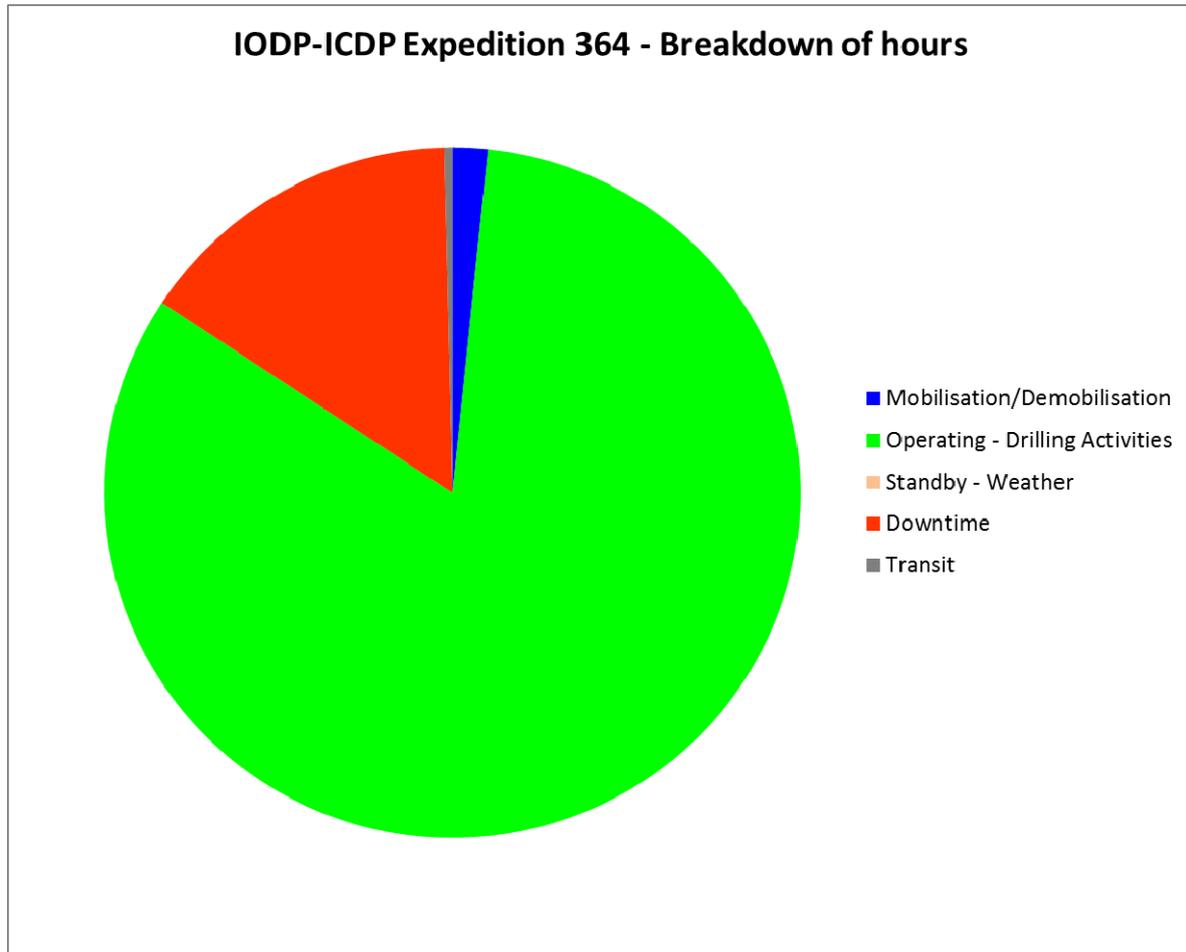


Figure 1: Breakdown of hours from 00:00 April 5th to 24:00 May 13th.

Expedition 364 Chicxulub Impact Crater
 Offshore Data Summary
 Week 5: May 07 2016 to May 13 2016
 M0077A
 Chix-03B

21 27.009 N
 89 56.962 W
 Water Depth: 19.8m (Drillers Depth)

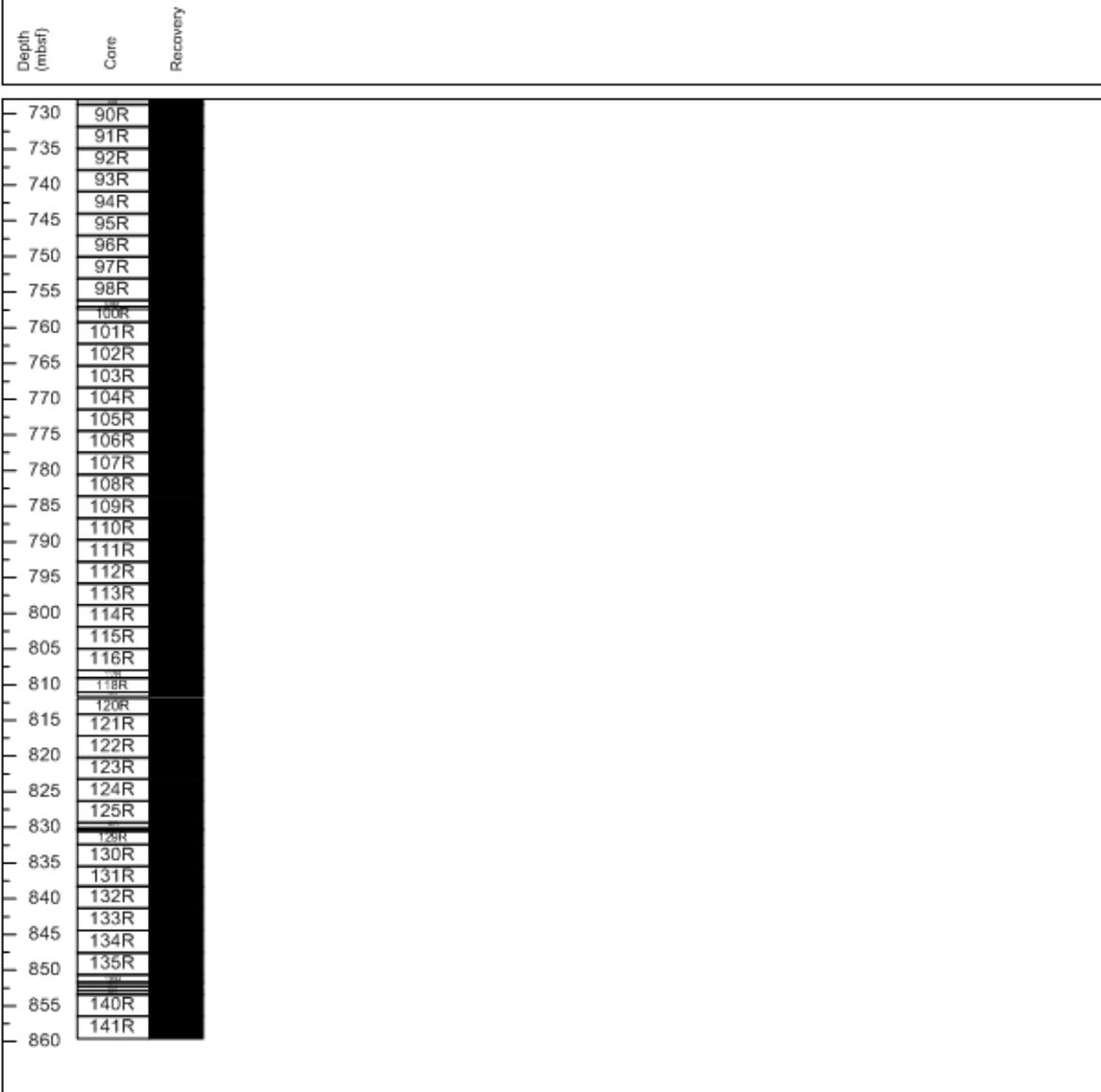


Figure 2: Core Recovery during operations from 00:00 May 7th to 24:00 May 13th

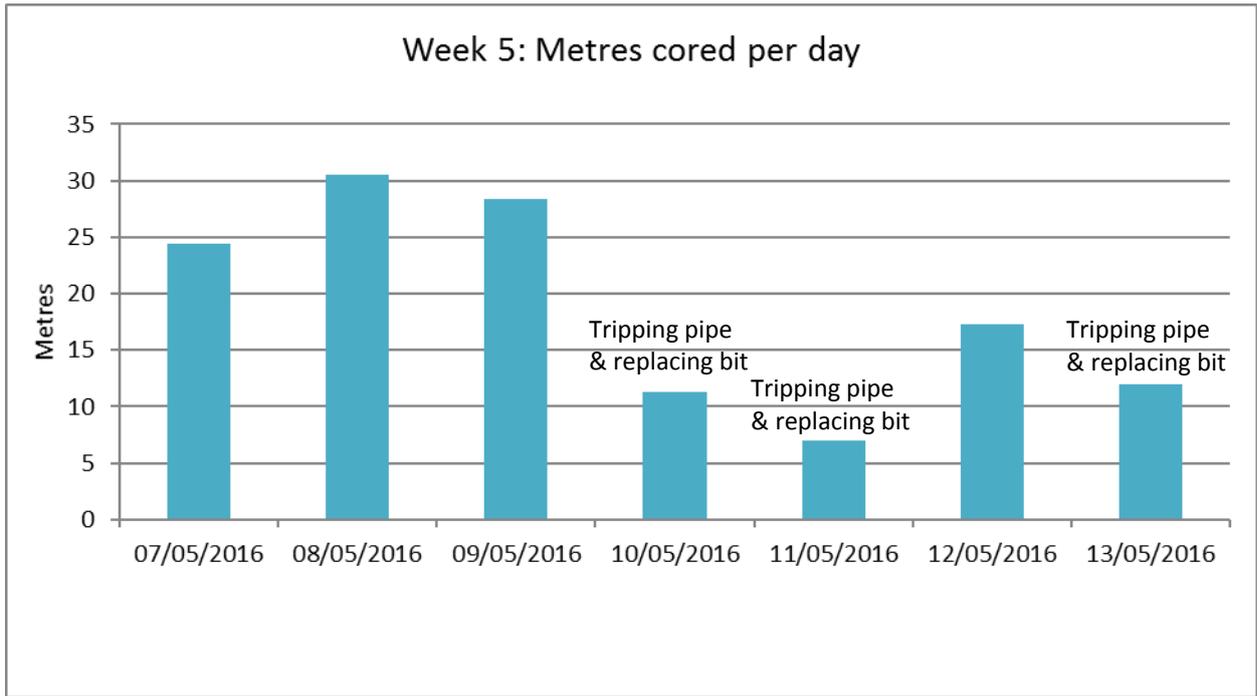


Figure 3: Week 5 coring rates.

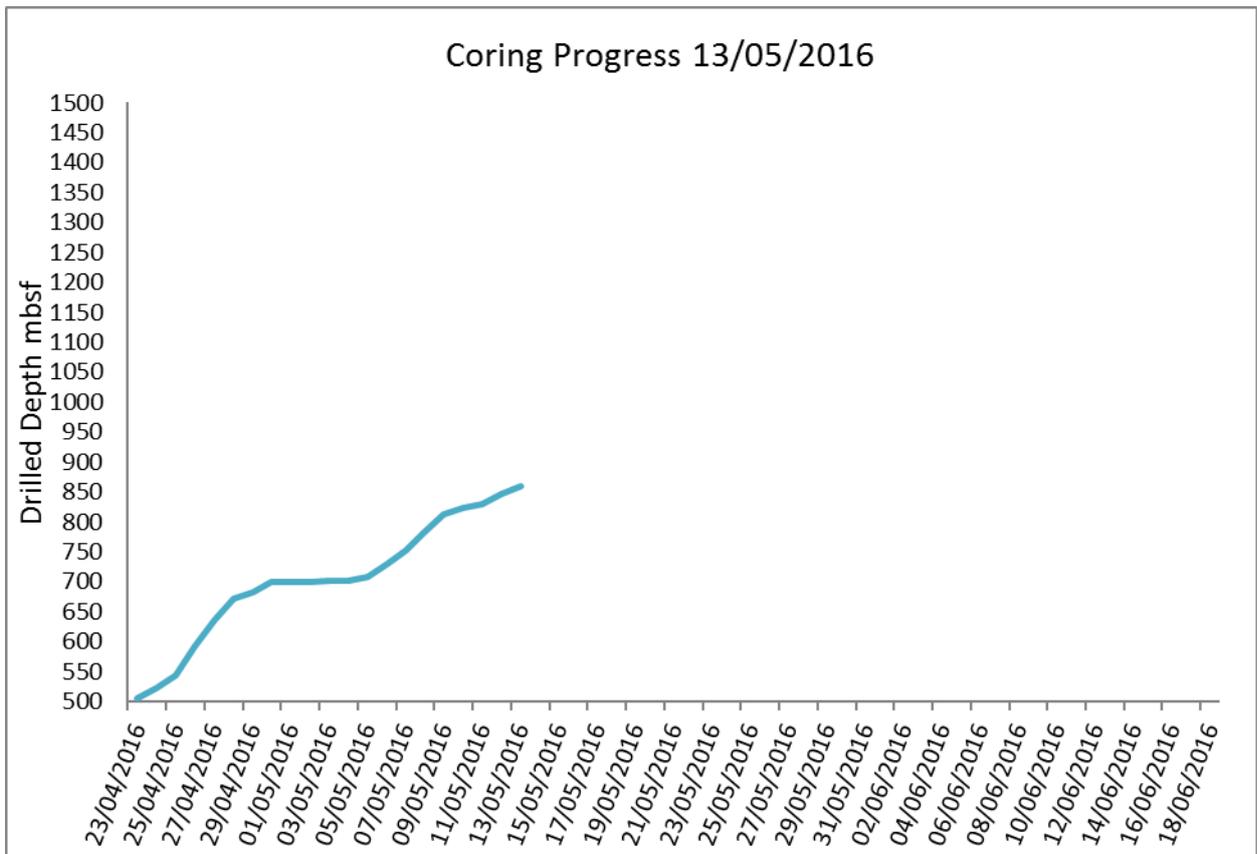


Figure 4: Coring progress at end of week 5, May 13th.

7. Photographs

