

# IODP Expedition 395C: Reykjanes Mantle Convection and Climate: Crustal Objectives

## Week 5 Report (4–10 July 2021)

### Operations

During Week 5 of the International Ocean Discovery Program (IODP) Expedition 395C, Reykjanes Mantle Convection and Climate: Crustal Objectives, we continued operations at Hole U1554F (proposed Site REYK-6A) and began coring at Site U1562 (proposed Site REYK-3B).

#### *Hole U1554F*

Coring continued in Hole U1554F (60°07.5136'N, 26°42.1140'W) with Cores U1554F-12R to 20R advancing from 678.2 to 721.7 m below seafloor (mbsf). Following Core 20R, the drill bit had reached 50 rotating hours. The drill string was pulled from the hole to change the drill bit and the bit cleared the seafloor at 1840 h and the rotary table at 2210 h on 5 July 2021. A new C-7 rotary core barrel (RCB) drill bit was made up to the bottom-hole assembly (BHA). The drill string was assembled and the subsea camera, along with the Conductivity-Temperature-Depth (CTD) sonde, was deployed for the reentry. The bit reentered Hole U1554F at 0405 h on 6 July. The subsea camera was recovered and the drill string advanced to 721.7 mbsf. RCB coring resumed from 721.7–779.9 mbsf with the recovery of Cores U1554F-21R to 32R. In total, 30 cores over an interval of 159.9 m were recovered from Hole U1554F. The core recovery for this hole was 100.15 m (63%). The basement cores advanced at an average rate of 1.76 m per hour (m/h).

Following coring operations, the hole was conditioned for downhole wireline logging with a 50-barrel high-viscosity mud sweep. The drill pipe was pulled out of the hole and the subsea camera deployed to observe operations. The drill bit cleared the seafloor at 0643 h on 8 July and the ship was offset 20 m to the northeast. A rotary shifting tool (RST) was run to release the drill bit and allow the logging tools to exit the drill pipe. The bit was released at 0756 h and at 0955 h the pipe reentered Hole U1554F. The subsea camera was recovered and the drill string deployed to a depth of 589.2 mbsf, inside the casing string. The triple combo logging tool string was made up and run for two passes of the borehole from a depth of 602 mbsf, the base of the casing string, to the bottom of the hole at 779 mbsf. At 2010 h, the triple combo tool string reached the drill floor and was broken down. The Formation MicroScanner (FMS)-sonic tool string was made up and run at 0410 h on 9 July. After making two logging passes, the FMS-sonic tool string was recovered to the rig floor, disassembled, and laid out. The Ultrasonic Borehole Imager (UBI) tool string was then made up and deployed to the bottom of the hole. The UBI made two logging passes, taking 360° images of the borehole wall. The UBI tool string was recovered and laid out at 1425 h. The drill pipe was pulled up from a depth of 588 mbsf to 69 mbsf in preparation of running the Versatile Seismic Imager (VSI) from the base of the hole up through the casing string. However, foggy conditions throughout the afternoon and evening inhibited visibility and prevented the start of the Protected Species Observation protocols. At daybreak, visibility had

worsened and conditions were not forecasted to improve until evening. Because of the time allocated to Site U1554, the decision was made to abandon the VSI logging run and begin operations at proposed Site REYK-3B. The drill pipe was pulled up and cleared the seafloor at 0755 h on 10 July, ending Hole U1554F and Site U1554.

#### *Hole U1562A*

The vessel began the 6.1 nmi transit from Hole U1554F to proposed Site REYK-3B under dynamic positioning mode. The crew continued to pull up the pipe with the end of the pipe clearing the rotary table at 1130 h on 10 July. At 1306 h, the vessel arrived at Site U1562 (proposed Site REYK-3B) and the advanced piston corer/extended core barrel (APC/XCB) BHA was made up. The drill pipe was run to 1996 m below sea level (mbsl) to take the first APC core. Hole U1562A (60°06.3030'N, 26°30.1245'W) was spudded at 2115 h and Core U1562A-1H recovered the mudline and 2.08 m of core, establishing a seafloor depth of 2003 mbsl. Coring continued with the recovery of Core 2H from a depth of 11.5 mbsf.

### **Science Results**

The JRSO technical staff processed the cores and samples in the ship laboratories, following the measurement and sampling plan constructed by the shore-based Expedition 395 Co-Chief Scientists and science party members. Core description, biostratigraphy, and analysis of shipboard data will take place postcruise.

The science party held a Site U1554 results overview meeting on 9 July.

#### *Hole U1554F*

Cores were run through the whole-round (WR) track systems and the split section half track systems. The WR core measurements included magnetic susceptibility (MS), gamma ray attenuation (GRA) bulk density, and natural gamma radiation (NGR). The split cores were imaged and measured for *P*-wave velocity, thermal conductivity, color reflectance, point magnetic susceptibility (MSP), magnetic properties, and X-ray fluorescence (XRF) using a portable X-ray fluorescence spectrometer (pXRF). WR rock pieces were routinely collected for postcruise microbiology studies and select core pieces were scanned using the superconducting rock magnetometer (SRM).

Cores U1554F-11R to 32R (673.5–779.9 mbsf) are composed of basalt that contains glass and has varying degrees of alteration that include calcite veins, infilled vesicles, and staining. The shore-based petrology group provided sampling intervals for inductively coupled plasma–atomic emission spectroscopy (ICP-AES) measurements and thin sections.

### **Education and Outreach**

This week the Education and Outreach effort was focused on social media.

### *Social Media Posts*

Social media is spread across three platforms: [Facebook](#), [Twitter](#), and [Instagram](#). The table below summarizes the metrics and impacts of original posts (retweets not included). This includes impressions, which are the number of times a post has been displayed, and engagements, which include likes, shares, and comments.

Social media is a collaborative effort, with many of the Expedition 395 science party and Expedition 395C technical staff engaged in posting original content and sharing posts from the *JOIDES Resolution* accounts.

<b>Platform</b>	<b>Number of Posts</b>	<b>Impressions</b>	<b>Engagements</b>
Facebook	18	30,757	1,434
Twitter	23	92,858	2,563
Instagram	8		422 likes

### **Technical Support and HSE Activities**

The JRSO technical staff were engaged in laboratory and project activities.

#### *Laboratory Activities*

- The technical staff received and processed core from Holes U1554F and U1562A.
- All sampling and measurements were taken by the technical staff.
- The CTD sonde was deployed at Hole U1554F.
- The configuration and testing of the NaviPac navigation and location software continued.
- Preparations are underway for the end-of-expedition shipments.

#### *IT Support Activities*

- All of the Windows machines were updated to patch the Microsoft Print Spooler vulnerabilities.
- Chrome and Firefox were updated on all computers.
- The logging winch telemetry to RigWatch failed. The host was removed for repair.
- We continued researching and testing for a full visual display unit (VDU) video distribution replacement.

#### *Developer Support Activities*

- Issues were discussed with the technical staff regarding the slow update speed of the Catwalk application.
- The new Zeiss camera software API links were investigated.
- The development of the QCViewer program is ongoing and has been deployed for viewing and testing.

#### *Health and Safety Activities*

- The safety shower and eye wash stations were tested.
- A life boat drill was held on Sunday 4 July.