IODP Expedition 390C: South Atlantic Transect Reentry Systems

Week 4 Report (25–31 October 2020)

Operations

During Week 4 of the International Ocean Discovery Program (IODP) Expedition 390C, South Atlantic Transect Reentry Systems, we completed the transit to our first site and began coring with the advanced piston corer/extended core barrel (APC/XCB) system.

Transit

The *JOIDES Resolution* (JR) completed the 3608 nmi transit from Las Palmas, Canary Islands, and arrived at Site U1556 (proposed Site SATL-53B) at 0206 h on 28 October 2020. Total transit time was 299.5 h (12.5 d) at an average speed of 12.2 kt. We switched from cruise mode to dynamic positioning mode at 0230 h, starting operations for Site U1556.

Hole U1556A

The APC/XCB bottom-hole assembly was made up and deployed to 5006 m below sea level (mbsl), based on the precision depth recorder (PDR) reading. We then pumped a "pig" (pipe cleaning device) through the drill string to remove rust. At ~2200 h on 28 October, the sinker bars and core orientation tool were installed and the core barrel was lowered. We spudded Hole U1556A at 2300 h. Mudline Core U1556A-1H arrived on deck at 2335 h and recovered 9 m. This established a seafloor depth of 5006.4 mbsl.

Cores U1556A-1H through 16H advanced to 151.4 m below seafloor (mbsf) and recovered 155.13 m (103%). These cores were oriented with the Icefield MI-5 core orientation tool. Formation temperature measurements were taken on Cores 4H, 7H, 10H, and 13H with the advanced piston corer temperature (APCT-3) tool. Cores 11H to 13H were partial strokes due to the stiffness of the sediment but had good recovery; Cores 14H and 15H were full strokes. Because Core 16H had to be drilled over to release it from the formation, we changed to the XCB coring system using the polycrystalline diamond compact (PDC) cutting shoe. Cores 17X through 29X advanced to 273.6 m and recovered 79.53 m (65%). The rate of penetration was <10 m/hr for Cores 17X to 20X, and increased to an average of 15.2 m/hr for Cores 21X to 29X.

Core U1556A-30X encountered a hard layer that decreased the rate of penetration dramatically. Upon recovery, this layer was confirmed to be basement, which was determined to be at 278 mbsf. Cores 31X to 32X attempted additional coring of the altered basalt basement material. By midnight, we had recovered 3.13 m of basement material out of an advancement of 4.3 m advance (73%), reaching 282.3 mbsf. The sediment/basement interface in Core 30X had the lowest recovery of basement (23%), but we experienced higher recovery in subsequent cores.

Science Results

Cores U1556A-1H through 29X have been split and measured on the track systems. In addition, we took 1–2 whole-round samples per core for chemical analysis of interstitial waters. Cores 30X through 32X will not be split during Expedition 390C but were measured on the whole-round track systems. No core description will occur during Expedition 390C.

Outreach

No Onboard Outreach Officer is sailing during Expedition 390C. Limited social media posts were made via the JR Facebook and Twitter accounts.

Platform	# of posts	Analytics	Notes
Facebook	8	1036 engagements (comments, shares, likes, or clicks on parts of the post)	
Twitter	7	1372 engagements (including 49 retweets, 5 comments, 352 likes), 11 new followers	Does not include retweets of other accounts

Technical Support and HSE Activities

Laboratory Activities

- The *P*-wave velocity logger water pump on the Whole-Round Multisensor Logger failed and was replaced.
- The towed magnetometer was retrieved prior to arrival at Site U1556. Roughly 200 m of towed cable was twisted, but no signal was lost. The problem was communicated to the vendor and to shore.
- An inventory was conducted and a work scope plan was submitted for the Sonar Dome and echo sounder repair.
- The 12 kHz echo sounder produced an accurate PDR depth, although the SEGY file was not automatically generated.
- The Haskris water chiller removed from the X-ray diffractometer (XRD) was repaired and will be kept on board as a spare.
- Repairs to the Logitech slide frosting jigs are ongoing in the Thin Section Laboratory.
- A remote login attempt to the Panalytical XRD for the Aries sample changer repair was attempted by the vendor but was unsuccessful.

- The supply of QP101 Calibration Cards used for the Section Half Imaging Logger (SHIL) are running low and will be reordered more frequently.
- Laboratory tours were provided to Siem Offshore and Entier personnel.
- Laboratory cross-training continued, including an introduction to planned operations, and instruction on how to use the magnetic orientation tools.
- Staff contributed to projects including GEODESC, the Catwalk sampling module, and diversity, equity, and inclusion (DEI) initiatives.

Application Support Activities

- Continued work on the Catwalk sampling module and GEODESC.

IT Support Activities

- Workstation security policies were adjusted to be in line with TAMU security practices.
- A workstation audit was conducted with the TAMU Division of IT.
- A new Video Distribution Unit and 32″ TV were installed in the Publications Office.
- SnapTV issues were resolved with GlobeTech. All TVs are working again.
- Issues with the Drill Shack RigWatch computer were corrected. A configuration file issue caused server communication problems.
- Troubleshooting of the Aeris XRD instrument internet connection was conducted so that the vendor can remote in.

HSE Activities

- We tested emergency shower and eye wash stations.