

IODP Expedition 390C: South Atlantic Transect Reentry Systems

Week 1 Report (5–10 October 2020)

Operations

Port Call Activities

International Ocean Discovery Program (IODP) Expedition 390C, South Atlantic Transect Reentry Systems, started in Kristiansand, Norway, at 0800 h (UTC + 2 h) on 5 October 2020 with the arrival and boarding of 18 JRSO personnel on the *JOIDES Resolution* (JR). Two additional JRSO staff were already on board. Three JRSO staff crossed over and departed on the same day. There is no science party on Expedition 390C.

All arriving personnel followed preboarding protocols to mitigate the risk of a COVID-19 infection on the ship, including a two-week shelter-in-place period prior to travel, a pretravel COVID-19 test, and a five-day quarantine in a hotel in Kristiansand. Personnel passed three additional COVID-19 tests during this quarantine. Shipboard personnel are wearing masks and following social distancing protocols.

The vessel had been tied up for over one month (Expedition 390P), during which time the Schlumberger wireline winch heat exchanger was replaced. During port call, final maintenance and deliveries were completed, including the delivery of new asbestos-free brake bands for the drawworks.

The ship departed Kristiansand on 7 October 2020, with the last line released at 0918 h. The ship will transit to Las Palmas, Gran Canaria, Canary Islands, Spain, for a refueling stop. The ship's clock was set back 1 h on 8 October to UTC + 1 h. By midnight on 10 October, the ship had completed 967 nmi of the 2190 nmi transit to Las Palmas at an average speed of 11 kt.

Science Objectives

The primary goal of Expedition 390C is to install reentry systems at five sites in advance of Expeditions 390 and 393. The sites form a transect starting near the Mid-Atlantic Ridge overlying crust ~7 Ma and moving away, onto progressively older basalt crust up to ~63 Ma. Expeditions 390 and 393 will drill the crust and overlying sediment to examine how crustal alteration proceeds over time. Microbiology objectives include documenting sediment and crustal microbial communities and metabolic capabilities as a function of substrate composition and age. A number of paleoceanographic objectives through the entire Cenozoic can also be addressed through sediment coring.

At each of the five sites designated for Expedition 390C, we will core a single advanced piston corer (APC) hole to basement to conduct gas safety monitoring and to determine the exact depth of basement. A second hole at each site will have a reentry system with a casing string installed. These installations will save operational time during Expeditions 390 and 393.

Sediment cores will be run through the track systems, including the Whole-Round Multisensor Logger (WRMSL), the Natural Gamma Ray Logger (NGRL), the Section Half Multisensor Logger (SHMSL), the Section Half Imaging Logger (SHIL), and the superconducting rock magnetometer (SRM). One whole-round sample per core will be taken for squeezing and geochemical analyses of interstitial waters. Core catcher samples will be distributed to micropaleontologists staffed on Expeditions 390 and 393, so that a preliminary age model can be developed prior to the full expeditions. No discrete samples will be taken. Core description and additional analyses will be conducted during Expeditions 390 and 393 in 2022.

Science Results

Laboratory upgrades, maintenance, and staff cross-training were conducted to ensure readiness for coring. The Operations Superintendent and Staff Scientist met to discuss the operations plan as well as contingency plans for situations in which a greater or lesser amount of operational time is available. Plans for shipboard sediment core analyses were discussed with the Laboratory Officer and Assistant Laboratory Officers. Communication with the Expedition 390 and 393 Co-Chief Scientists, micropaleontologists, and paleomagnetists confirmed details of planned measurements.

Outreach

No onboard Outreach Officer is sailing during Expedition 390C. Limited social media posts were made via the JR Facebook and Twitter accounts. The Dover Strait Shipping Facebook page captured a photo of the JR in transit and posted about the ship and the expedition.

Platform	# of posts	Analytics	Notes
Facebook	16	3096 engagements (comments, shares, likes, or clicks on parts of the post)	
Twitter	52	1448 engagements (260 retweets, 25 comments, 1163 likes), 25 new followers	Includes retweets

Technical Support and HSE Activities

Laboratory Port Call and Transit Activities

- The sonar dome hatch in the forward thyrig room was opened and inspected. No flooding was found. The hatch plate was found to be rusty and the cable connection looked like it had been stepped on. All connections tested ok. Further planning is to replace the hatch plate, add a protection cover for the cable connector, and possibly inspect the connection inside the dome, which can only be done during a tie-up.
- We connected an oxygen-free nitrogen bottle through the O₂ sensor and observed no further spikes of O₂ for three days. We concluded that the O₂ sensor is working properly. When we switched the N₂ line back to the N₂ generator, O₂ spikes appeared immediately. We will continue to log O₂ activities.
- Repair Carver Press oil leaks.
- Remove Carver Press manual venting valves to prevent unfamiliar users from operating the system manually, which results in oil leaks.
- Convert chlorinity program to Labview.
- A new Haskris water chiller was installed in the X-ray Laboratory, so the old one can be repaired. The plan is to leave the old one onboard once it is repaired.
- A Bruker X-ray Diffractometer (XRD) was set up, tested, and is ready to use.
- Set up an MM400 grinder and replaced the old mixer mill.
- Review and update Logitech instrument user guide.
- Developing soft-sediment thin section procedure (including face freezer), including draft procedures for grain mounts and Kemvac vacuum impregnator.
- The Haskris chiller in the Paleomagnetism Laboratory was drained and cleaned.
- The SRM application crashed following a Windows update and computer reboot. We restored the SRM folder from a 24 h old image, which restored all functions.
- We will retrap the SRM's internal field, measure, and verify the results.
- Replaced drain lines in splitting room.
- Installed new pull down faucets in the Paleo Prep Laboratory.
- Calibrated the SHIL and eliminated the red/green band issue.
- Set up new rulers on one of the core description tables.
- Adding missing T-shirt logo in the stairway.
- Develop Catwalk module user guide and quick start guide.
- Secured new -86° freezer and other instruments for rough seas.
- Set up a Confluence COVID-19 page for all related documentation.
- Worked on GEODESC, Catwalk, and Confluence laboratory notebook projects.

Application Support Activities

- Deployed a new version of the Catwalk module with a few bug fixes.

- Corrected a problem with the drill report.
- Working on a problem with relaunching the SRM application following Windows updates; all functions working again after restoring the SRM configuration files.

IT Support Activities

- Making corrections to Windows servers to bring them in line with recommended TAMU security guidelines.
- Set up a new O₂ sensor device in the Chemistry Laboratory for network access and assisted with software installation on the Coulometer instrument host.

HSE Activities

- Emergency shower and eye wash stations were tested.
- A bomb search drill was conducted.