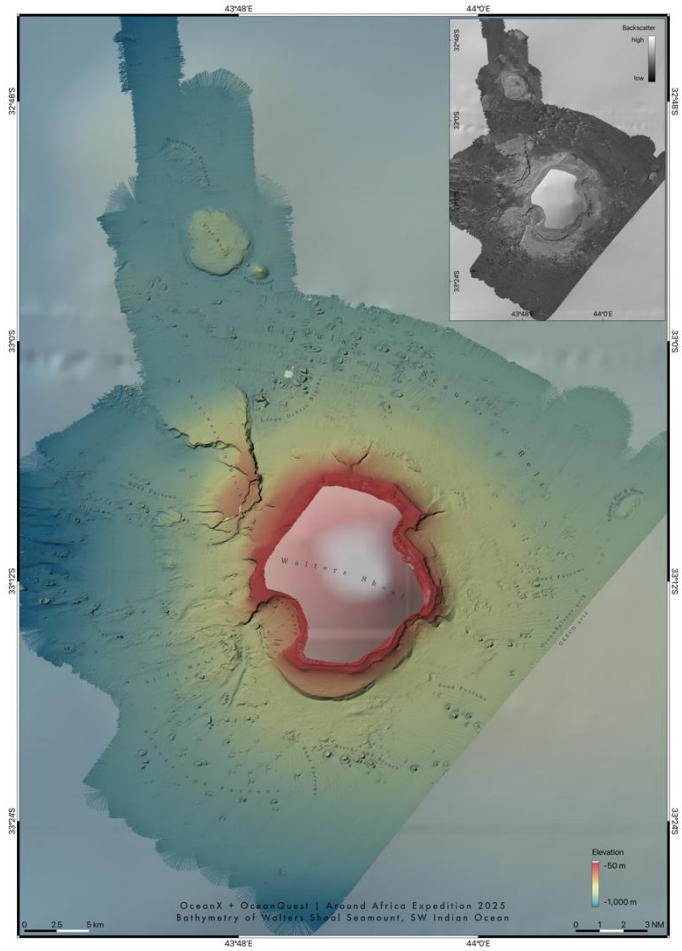
OceanX + OceanQuest - Around Africa Expedition 2025

Leg 1, Moroni, KM – Cape Town, ZA

Weekly Report 3 (07 – 13 February 2025)

Week 3 of our expedition started with strong winds, high swells of up to 3.5 meters, and rain, which created challenging conditions for launching OceanXplorer's diving assets. Since deploying the ROVs and submersibles was not an option on Friday, we focused on seafloor mapping around Walters Shoal, to expand our high-resolution bathymetric coverage.

By Saturday, the weather had improved enough for us to resume active operations. We conducted a CTD cast, deployed the ROV, and carried out plankton net sampling. The dive took place along the escarpment of a significant landslide on the south-western flank of Walters Shoal. The seafloor here was stunning, featuring steep cliffs and a rugged, heavily eroded landscape teeming with marine life. While the overall diversity of species was comparable to our first dive, the density of organisms appeared to be significantly higher, providing exciting insights into the ecological distribution in this region.



Our updated high-resolution bathymetric map now includes all the data collected from Walters Shoal. Some of the shallowest areas, those less than 50 meters deep, remain unmapped due to vessel limitations. However, future expeditions with autonomous shallow-water mapping vehicles may help fill in these missing pieces.

A special acknowledgment goes to the all-female surveyor team aboard OceanXplorer, who played an essential role in processing and refining the bathymetric data. Their meticulous work enabled production of stunningly detailed seafloor maps that will provide valuable insights into the geological history, sediment transport, and ocean currents shaping the Walters Shoal region.

With the improved sea conditions, we launched both submersibles and the ROV on Sunday to explore a striking cliff formation on the northeastern flank of Walters Shoal. Aboard the submersibles were Jorge Sitoe (Wildlife Conservation Society, Mozambique), Lara Atkinson (SAEON, South Africa), and Sinothando Shibe (SANParks, South Africa).

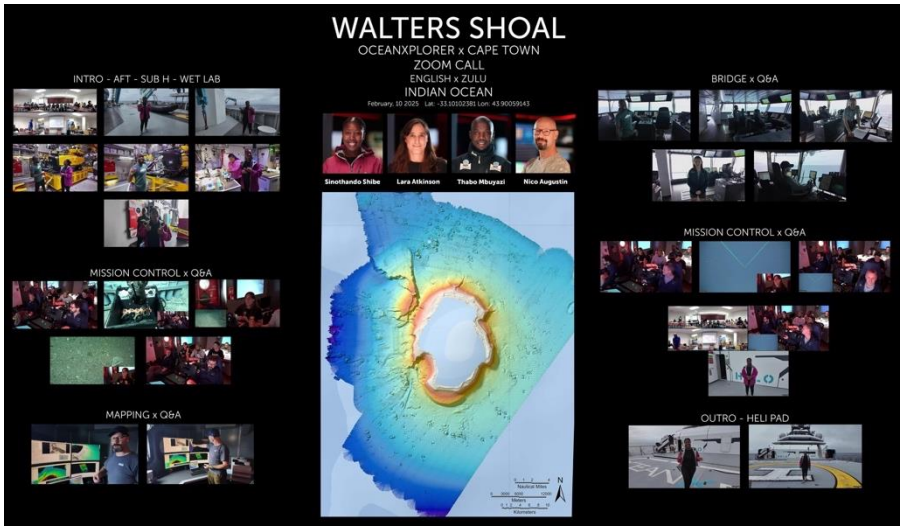
This site also revealed a higher density of marine life, potentially influenced by its morphology and ocean currents. The first dive followed the steep outward shoulder of the escarpment, while the two subsequent dives were planned along the inside - an aspect to be studied in greater detail in the coming months.

While the submersibles Nadir and Neptune made their descent, the ROV Chimaera was also deployed. Thabo Mbuyazi from South Africa, who has experience with observational ROVs and scuba diving, assisted with launch and recovery operations. It was an exciting day for Lara Atkinson (SAEON), who, after weeks of coordinating logistics for Leg 1, finally had the opportunity to experience a deep-sea dive firsthand in the Neptune submersible.

Monday marked our last operational day at Walters Shoal as worsening weather conditions loomed over both the Agulhas Plateau and our current location. Our final dive targeted a seafloor valley between the main Walters Shoal structure and a large northwestern block, believed to have broken off from the main shoal due to ancient tectonic activity, possibly predating the extinction of dinosaurs.

As the submersibles and ROV descended, they encountered unexpectedly strong currents exceeding 2 knots (1 m/s), which significantly affected maneuverability. This forced us to shorten the dive and recover the assets earlier than planned. We quickly adjusted our strategy and shifted operations to an alternative dive site at a northern Y-shaped structure, deploying only the ROV to maximize our remaining time at Walters Shoal.

Simultaneously, we hosted a live-streamed educational event for high school children in South Africa. Due to the delayed ROV descent, the young audience had to wait longer than expected, but the media team delivered an engaging and immersive experience. Scientists and crew members gave live insights from different locations aboard OceanXplorer, including the ROV operations room, the seafloor mapping control center, the bridge and the ship’s deck, where they described the exciting research underway.



The live stream event was an intensive but successful endeavor this week. Thanks to the combined efforts onshore and onboard, it was well received and earned positive engagement from the audience.

Following the live stream, we completed our final ROV sampling and wrapped up operations at Walters Shoal. The collected data will be instrumental in ecosystem characterization, especially as the region recovers from decades of commercial fishing, which ceased in 2018. Our findings will provide a fresh understanding of erosion-driven seabed formations and marine biodiversity in this underexplored part of the ocean.

Interesting Fact: To be classified as a seamount, an underwater mountain must rise at least 1000 meters above the surrounding seafloor. Walters Shoal, which stands at approximately 700 meters, is technically a knoll rather than a seamount, making it a fascinating subject for geomorphologists.

Brisingid starfish (upper left), vibrant hard and soft corals along with sponges (upper right and lower left), and abundant marine life, including a moray eel (lower right), were observed along the flanks of Walters Shoal. Notably, at 300m depth, our observations revealed a high density of marine animals.

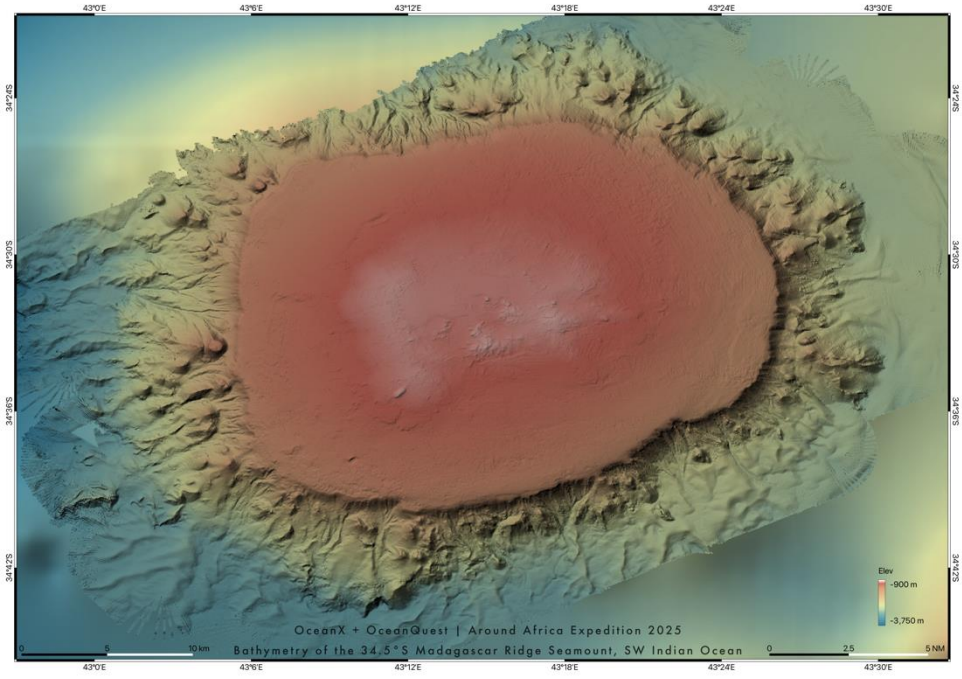
On Monday evening, we left Walters Shoal and set sail 85 nautical miles southwest to explore a much larger and deeper seamount located on the southern edge of the Madagascar Ridge. Due to persistent rough seas, our activities were initially limited to CTD sampling while we continued to map the structure.

Tuesday, February 11th, marked the International Day of Women and Girls in Science. Aboard the OceanXplorer, we proudly recognized this occasion, showcasing the international team of women contributing to our expedition, as seen here. (Photo: OceanX)

By Wednesday, the weather had improved enough for further CTD casts and the first ROV dive at this newly mapped seamount. While global bathymetric models suggested its general shape, our detailed mapping confirmed its massive size: rising 2000 meters above the surrounding seafloor, with an extensive 32-kilometer-wide flat summit – a characteristic feature of a so-called guyot.

Guyots like this one, with a flat summit, were once close to the sea surface shortly after their formation – possibly even existing as tropical islands for a few million years. As they gradually subsided into the abyss, coral reefs formed along their slopes, and wave erosion contributed to shaping their flat tops. Eventually, these seamounts became atolls, and when they sank too deep for coral growth and wave action, they largely retained their shape. This marks the first complete high-resolution bathymetric survey of this seamount and the first video documentation of its southeastern flank via ROV.

Over the past week, we collected over 200 samples, including biological specimens, carbonate and volcanic rocks, and numerous water samples. Our four planned dive sectors at Walters Shoal were successfully completed, ensuring a comprehensive biological assessment of the area.



This particular type of seamount is known as a guyot. Once shallow tropical islands, their peaks eroded by waves over millions of years before sinking into deeper waters. Coral reefs likely flourished along their slopes, contributing to their distinctive topography. The wavy patterns surrounding the seamount indicate large sediment rafts, similar to desert dunes, transported by deep-sea currents. This dataset represents the first complete bathymetric mapping of this unnamed seamount.

Beyond that, we have mapped the entire Walters Shoal knoll and its surroundings with unprecedented detail. Additionally, we conducted high-resolution mapping of a second, larger seamount southwest of Walters Shoal. While not a primary target of the expedition, this fully mapped structure will contribute valuable data to global bathymetric datasets, and the biological ROV dive provided key insights into its deep-sea ecosystem.

Although we expect challenging weather conditions in the coming days, Leg 1 of the OceanX + OceanQuest Around Africa Expedition has already been a phenomenal success. The team has demonstrated resilience, adaptability, and teamwork, pushing the boundaries of deep-sea exploration in the Indian Ocean.

The Operations Center aboard OceanXplorer serves as the expedition's nerve center, where hydroacoustic mapping, ROV, and submersible dives are coordinated. This is where the entire scientific team gathers, watching in real-time as the ROV streams high-definition footage from the deep ocean.

While submersibles offer an immersive experience for those on board, the ROV allows everyone on the vessel to participate in exploration and discovery together.

With so many exciting discoveries behind us and more ahead, we remain eager, well-prepared, and fully committed to uncovering the secrets of our next target, Africana Seamount.

Greetings from RV OceanXplorer.

Nico & Lara