RV SONNE Expedition SO-306
COWIO (Port Louis, 08.08.2024 – Durban, 09.09.2024)

3rd Weekly Report (19. - 25.08.2024)

This week began with a big surprise: with the multibeam echosounder survey on Monday night, we were able to identify a single mound structure off Tanzania at a depth of around 900 meters, which was an impressive 80 meters high. Curious to see what kind of structure it was, everyone eagerly awaited the first ROV images from the seabed.

And then came the surprise: this was not a cold-water coral mound or a landslide mass - we had discovered a substantial mud volcano on the passive continental margin of Tanzania. During the first ROV dive, we saw many large boulders standing on top of each other more or less chaotically. Then we found a field with empty shells of the clam *Calyptogena*. This is typical of methane seepage and was the first indication of a so-called seep structure. Further upslope, we then found large areas that were covered with living bivalves of the species *Bathymodiolus* - another typical bivalve for seeps. In other areas of the mud volcano, however, we also observed a colourful assemblage of cold-water corals. Immediately after the recovery of the ROV, we positioned one of the landers in one of the bivalve fields, where it recorded a wide range of hydrographic data from Monday to Sunday.

After a total of three ROV dives over the course of this week, we now have a fairly detailed picture of this mud volcano. In the multibeam data we were even able to detect flares, which are the echographic images of rising gas bubbles.

However, due to the swell of around 2 meters and, above all, the strong currents of up to 2 knots, these dives also took us to the limits of what the ROV SQUID could achieve. As the currents became even stronger over the course of the week, we unfortunately had to stop the ROV work on the mud volcano. However, we were still able to obtain further sample material with the help of the video-guided box corer.

In the end, we were also unable to investigate a target for the next ROV dive closer to the coast

A web-logbook for this expedition dan be found here https://www.marum.de/Logbuch-SO306.html

Living and fossil seep bivalves (© MARUM – Center for Marine Environmental Sciences, University of Bremen)

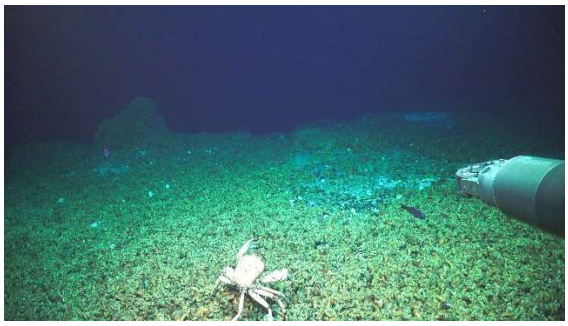
Recovery of the video-guided box corer during sunset (© MARUM – Center for Marine Environmental Sciences, University of Bremen)

at a water depth of just 300 m, as the current velocity there was even >3 knots. Nevertheless, we were able to get a good overview of another small mound structure with the video-guided box corer, which turned out to be a slide mass colonised by a diverse benthic fauna.
In addition to these observations, we carried out further sampling with the gravity corer, the multinet, the epibenthic sledge, the water sampler and the CTD.

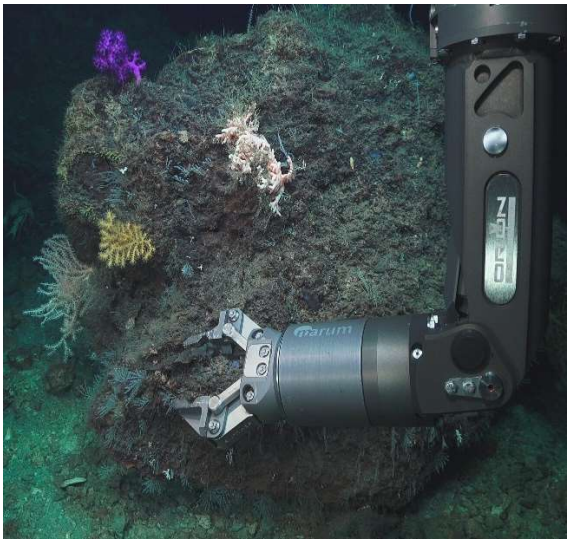
The atmosphere on board continues to be very good, and the scientists on board benefit immensely from the great support of the crew of RV SONNE.

Best wishes from on board on behalf of all participants!

Dierk Hebbeln



Large areas covered by almost 100% by the seep bivalve *Bathymodiolus* (© MARUM – Center for Marine Environmental Sciences, University of Bremen)



Colourful cold-water corals on a block consisting of authigenic carbonates (© MARUM – Center for Marine Environmental Sciences, University of Bremen)