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MSM116 "RIOGRANDERISE"
03.04. - 07.05.2023



3. Weekly Report
17. - 23.04.2023

After passing over a seamount of the Bahia Chain with about 40m of sediment at the end of last week, the Stocks Seamount turned out to be very promising. Initial Parasound profiling and multibeam mapping indicated that the plateau of this seamount is at a depth allowing deployment of the MeBo200, and that the Parasound data indicate patterns typical for sedimentary features to a depth of about 90-100m below the seafloor. Previous publications that had sampled this seamount with a dredge up the side slope (Skolotnev et al., 2011) reported softer and harder carbonates of Pliocene-Miocene and Cretaceous age.

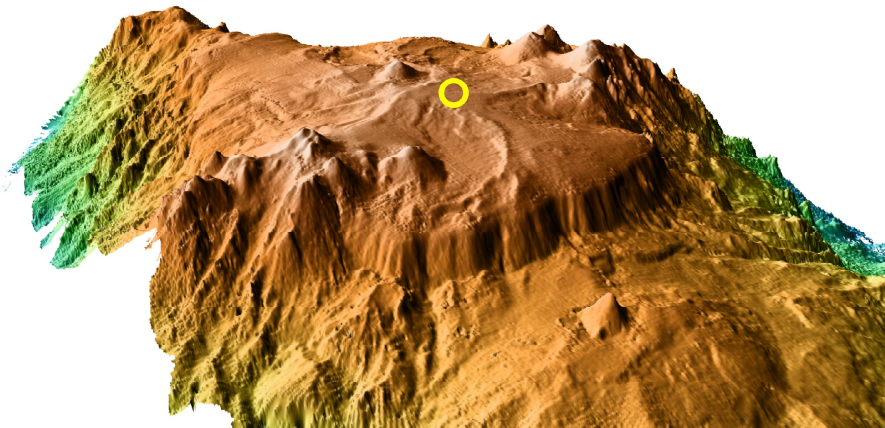


Figure 1: MSM116 multibeam map of Stocks Seamount. The length of the plateau covers about 10 nautical miles (figure with large vertical exaggeration), and the plateau is in about 1600m water depth (yellow circle marks approximate first MeBo location). MSM116 Hydroacoustic Team: Paul Berndt, Marcus Lermen Kochhann, Rodrigo Azivedo Nascimento, Jakob Quabeck.

On Monday early afternoon we started with the deployment of the MeBo200 on Stocks Seamount. There we were able to reach a depth of 49m in the first borehole and sample the upper 24m of sediment. The first sediment plumes of the drill head showed white material, so that we hoped to have found pelagic sediment. Initial indications during drilling suggested that layers of sand-sized particles in the upper 25m would make sampling difficult. We ultimately obtained several meters in seven cores back on deck in the first well. The drilled lithologies of the upper 25m contain medium sized foraminifer sand as well as foraminifer muds with nanofossils. Biostratigraphic dating using nanofossils indicates a normal age progression from Pleistocene (1.7 Ma) to Pliocene (ca. 4-4.5Ma) in the upper 24m. Foraminifera are moderately well preserved. It appears that we actually found an exciting alternative location to our initially planned drill target, and then attempted to optimize the parameters of the drill rig to better sample the entire sedimentary layer.

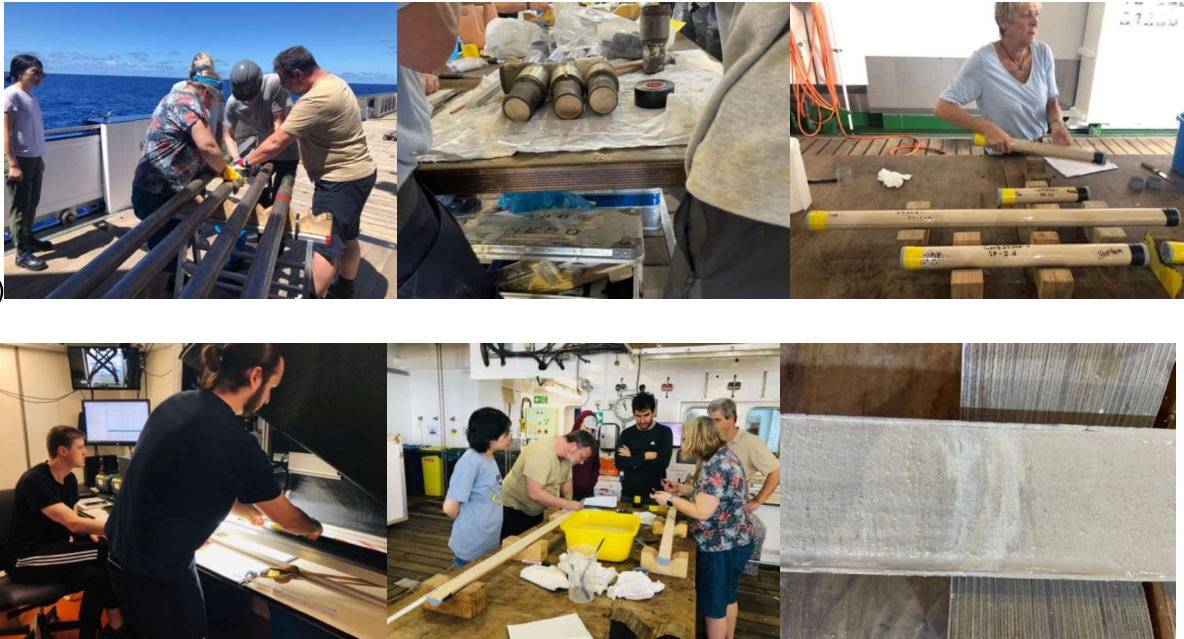


Figure 2: First core opening and description of the cores on the ship and detail of a sediment layer. Photos: (U. Röhl 1-5, H.Pälike 6.

The team is pleased to be able to characterize and describe previously unknown sediments for the first time. The relatively shallow water depth of the seamount holds good prospects for achieving very interesting new research results.

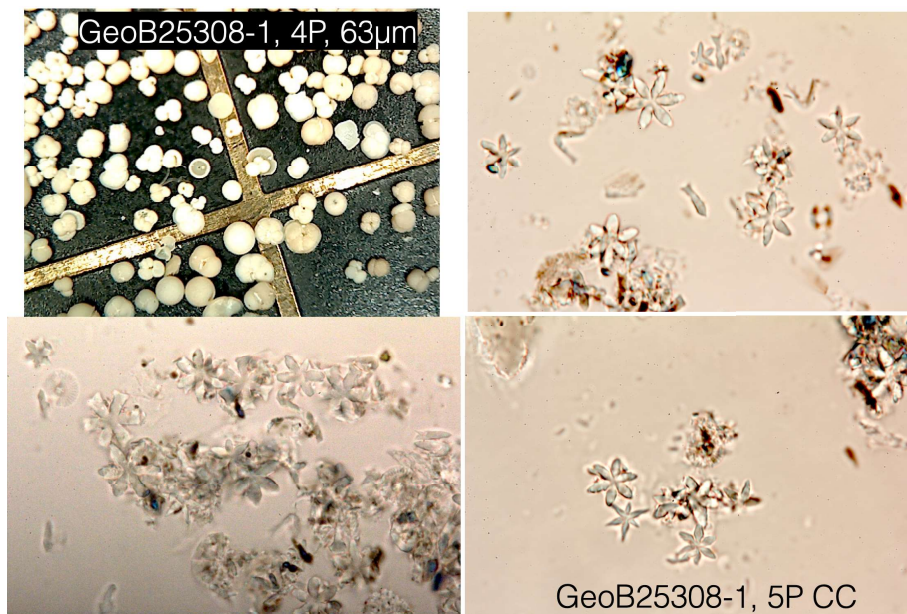


Figure 3: MSM116 Biostratigraphy Team Heather Jones + Jens Herrle. Foraminifera (upper left), and various *Discoaster* nannofossils.

After a subsequent mapping session, we again deployed MeBo a short distance from the first location on Thursday (to minimize the thickness of the granular foraminiferal layers), and began with the plan to first drill a hole without coring to ~100m, characterize this hole with logging probes, and finally drill again with core recovery after a short lift-off. The use of the logging sonde worked, and we obtained a sequence of parameters directly from the formation to 105m depth

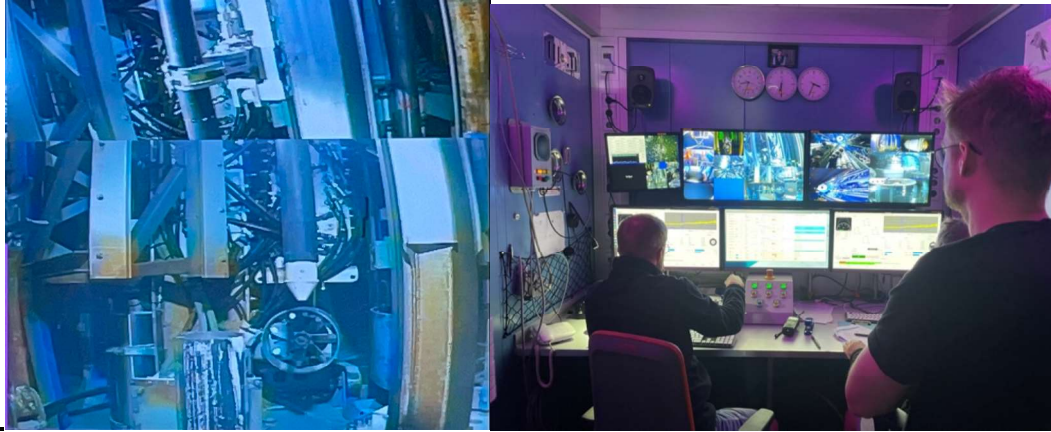


Figure 4: The tip of the MeBo logging string shortly before insertion into the borehole. Part of the MeBo team in the control container at concentrated work. Photos: H. Pälke.

Unfortunately, there was a problem that occurred during stowing the very last drill pipe, which prevented us from continuing drilling directly. On Sunday, we used the time to perform a heat flow/temperature gradient transect in the area and will deploy MeBo again on Sunday evening at the previous position to obtain cores below 30m depth.



Figure 5: Recovery of the temperature loggers from the heat gradient lance. Photo: U. Röhl.

All aboard are doing well. We continue to enjoy the excellent hospitality and greet those back home. On behalf of the MSM116 team, we extend our warmest greetings to you.

Heiko Pälke (Universität Bremen / MARUM)

Our Logbook is here: <https://www.marum.de/en/Discover/Ship-s-Log-MSM116.html>