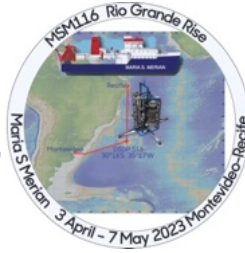


# RV MARIA S. MERIAN

MSM116 "RIOGRANDERISE"  
03.04. - 07.05.2023



4. Weekly Report  
24. - 30.04.2023

Last week we made good progress in the exploration of the stratigraphy of the pelagic sediments on Stocks Seamount at 2 locations with a total of 4 MeBo deployments. After successfully drilling (first washing, i.e. without core recovery) to 105m depth and deploying a logging probe (magnetic susceptibility, natural gamma ray, as well as an installed CTD, the original plan was to briefly raise MeBo again, move it 20m, and then better core the uppermost approx. 30m, and flush through the difficult foraminiferal sands. This plan was initially implemented on Monday, but unfortunately the coring unit jammed at about 34m. However, based on the cores obtained in this operation, we now know that we have already reached the middle Miocene at this depth (ca. 13.5-15.5 Ma), again with varying proportions of foraminiferous sands with nannofossils, or foraminiferous ooze with nannofossils. Thus, we have actually achieved one of the original goals of the cruise, surprisingly despite all odds, but with still relatively little core recovery so far. During another deployment of the MeBo200 at the same location (without equipment recovery) we lost drill string circulation and had to abort this double deployment for the time being. We used the set-up time for the next MeBo deployment to improve our maps and depth profiles of the Stocks Seamount working area. Late Tuesday evening we were able to set MeBo200 down again, this time about 6 nautical miles to the west, again to minimise coarser grained foraminiferous sands.

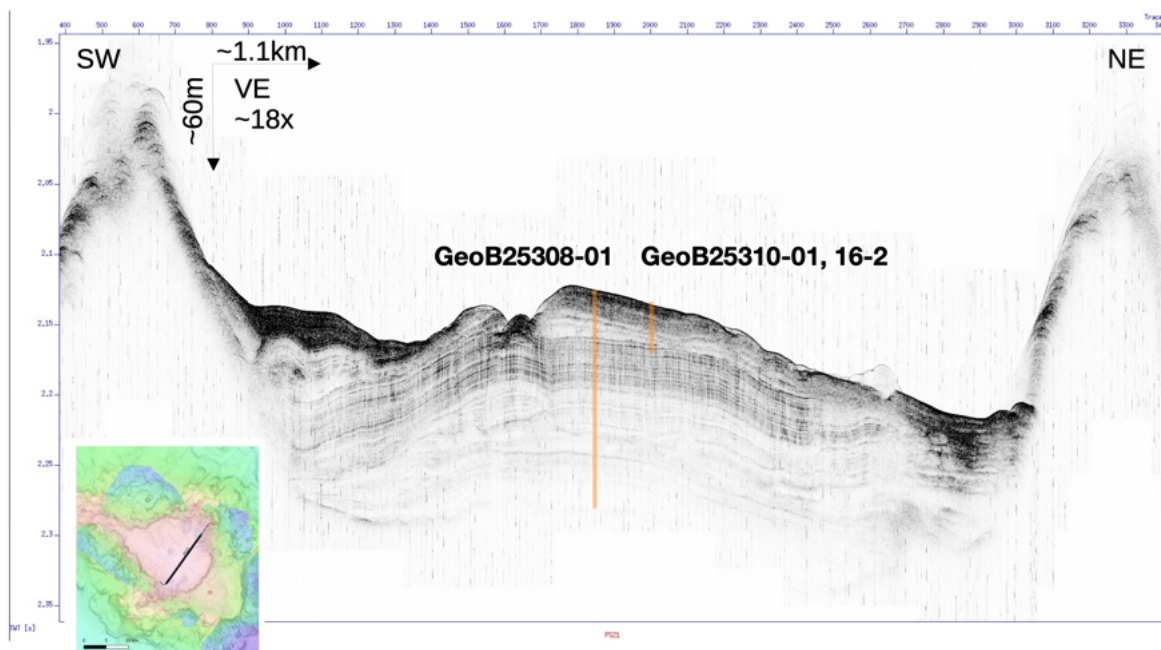


Figure 1: Parasoundprofile of the first two MeBo locations.

At this new location, Station 18-1, we were able to drill continuously for over 40h with core recovery. At a depth of about 72m, as predicted by our parasound data, we then reached a hard layer, which we initially suspected to be the underlying basalt of the seamount. This time we were also able to successfully use a sonic velocity probe to measure the in-situ sound velocity of the sediments. After recovering the cores, we had the highest core recovery so far. In the middle layers (ca. 34m depth) we now also found very well preserved nanofossils from the late Eocene (ca. 35.7 Ma, and 37.6 Ma) while the lowest and oldest layer so far above and below a 2cm thick piece of limestone corresponds to the latest Paleocene (57Ma), with intercalated / reworked sediments from the Cretaceous. Thus, with respect to the archive of pelagic sediments from geological "warm periods", this seamount has actually proven to be more efficient than the Rio Grande ridge for the depth that MeBo can reach. After further mapping, we drilled again at the same location to better sample the paleogene layers, and at 15:00 board time on Sunday, 30.4.2023 (18:00 UTC, 20:00 CEST) we were also able to drill about 2-3m into the lowest hard layer. This borehole will now also be logged with the magnetic susceptibility and other logging tools, and on Monday early morning we expect the next recovery of the MeBo200 with a trove of sediments. We are now planning one or two further MeBo deployments, depending on the time available (until Friday 5 May), before we then come into port next Sunday.

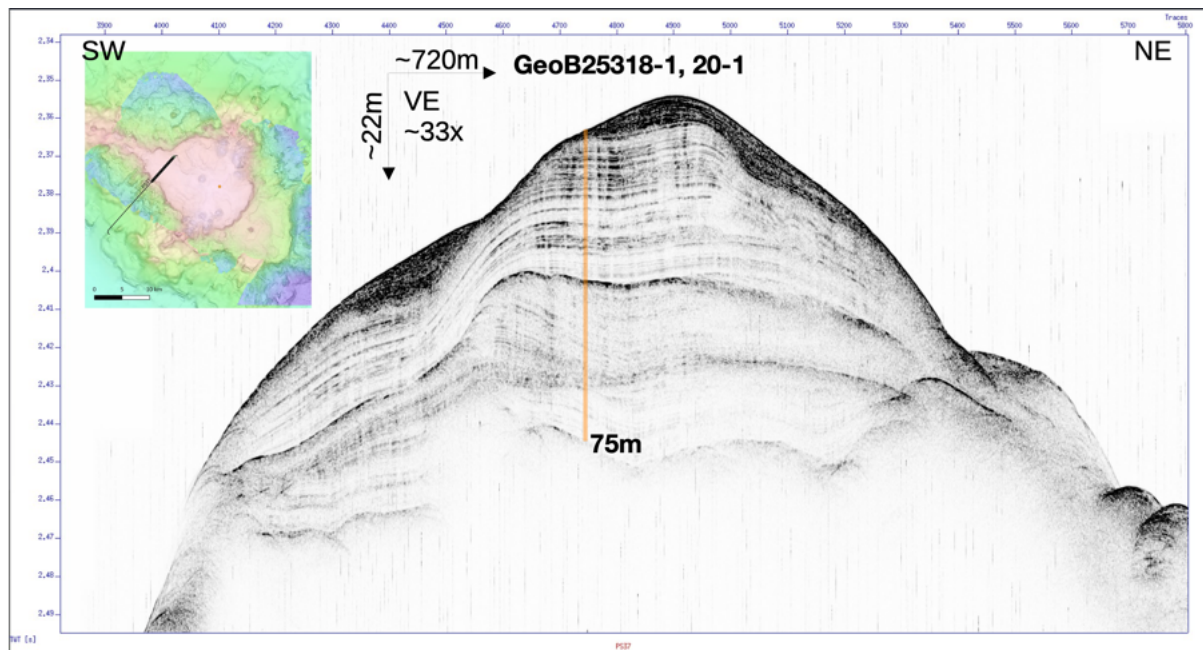


Figure 2: Parasoundprofile of the second coring location on Stocks Seamount.



Figure 3 (H. Pälike): Clearly higher core recovery, as shown by the number of D-tubes. Far right: Oldest sediment recovered so far (late Paleocene).

All aboard are doing well, and we greet colleagues, friends, partners, children and family back home. On behalf of the MSM116 team, we extend our warmest greetings to you

Heiko Pälike  
(Universität Bremen / MARUM)

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