

3. Weekly Report of MARIA S. MERIAN Expedition MSM127

Las Palmas - Las Palmas (Gran Canaria)

18.03. – 20.04. 2024

At the beginning of the third week bad news: The umbilical for MeBo, a new development which was used for the first time and successfully tested on previous leg MSM127-1, was damaged at a length of 50 to 100 m above the device. The wires of the steel casing had shifted, creating exposures of the underlying aramid fibers as well as overlaps in the wires themselves. The reason was probably the violent swinging back and forth of the floats installed there as a result of the strong bottom current that was observed during the last operation. Such pulses from Southern Central and Intermediate Water masses are well known in the region off northwest Africa. With the help of the MARIA S. MERIAN's deck crew, 100 m of cable was unwound and shortened, the new end was attached to the drill rig, and fragile sections were protected with shrink hose. After four days of intensive work by the MeBo team's technicians, the drill rig was ready for use again and was deployed on a cold-water coral mound, this time in working area D at 17°N, which we - in order to bridge the time - had meanwhile explored in detail. This coral mound also didn't show any active life on its surface, so it must have died some time ago, probably since the end of the last ice age termination around 11,600 years ago.



Fig.: GeoB26015-4 - maximum drilling depth of 72,80 mbsf, 29 barrels on deck.

Once again, MeBo70 was able to land safely on the top of the coral mound with an area of barely more than 20 x 20 m in an extremely precise maneuver, minimizing the risk of slipping on the side slopes. Two days later we can report that the MeBo team was able to drill another deep hole in a coral mound to a maximum depth of 72.80 mbsf, with a recovery of 83%, excluding the sandy horizons at the surface, at 10 and 35 mbsf, and in the two bottom segments even 93%.

The reconstruction days were also used to carry out the planned work in the southernmost area E, including the mapping and sampling of seeps that had been discovered in this area during preliminary investigations by Spanish colleagues. Here, a profile of three gravity cores was taken in water depths between 300 and 500 m, each supplemented by a multicorer, to investigate the deglacial history of methane degassing and its effect on the local carbon cycle in connection with sea level rise after the last ice age. In addition, a channel levee complex was investigated on a flat terrace along the northern edge of the Mauritania Canyon, from which a gravity core was obtained during METEOR cruise M65-1, providing a climatic reconstruction of dust input and agricultural use over the last 3200 years in NW Africa, with almost decadal resolution (Mulitza et al. 2010, Nature). Again, multiple gravity cores were taken in a special arrangement to investigate the robustness of the proxy record and the heterogeneity of the recorded sediment signal, allowing better quantification of the uncertainty of sediment records and providing boundary conditions for proxy forward modeling and the optimization of future sampling and measurement campaigns.

Last Wednesday we had midpoint of the expedition, the work is progressing well, and the mood is still good on board.

Best regards from board Maria S. Merian,

Torsten Bickert

07. April 2024