

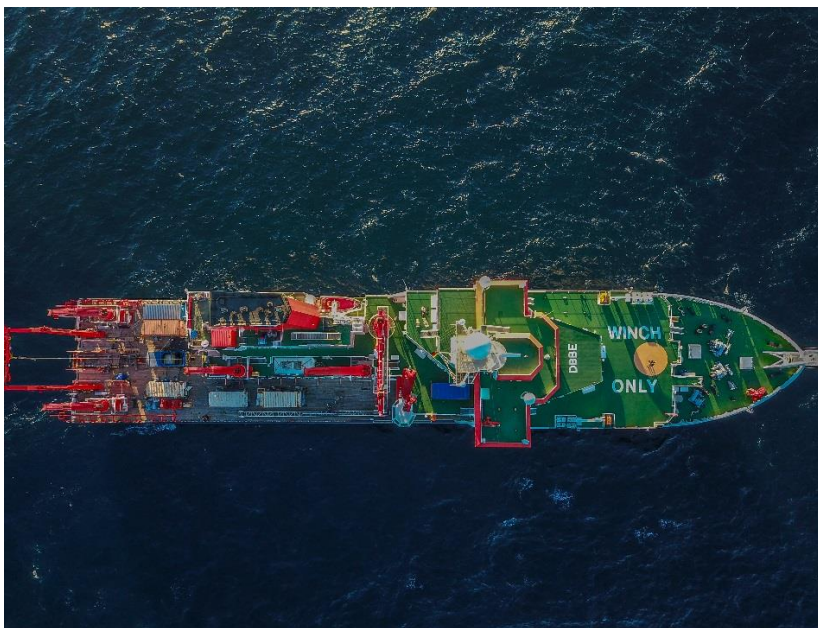
## Weekly Report No. 5

### SO260/2

05.02.2018 – 11.02.2018



The focus of the second leg of expedition SO260 is the retrieval of deep sub-seafloor sediment cores using the seafloor drill rig MeBo70 of the MARUM. Our first MeBo target was a deep-depression structure near the Mar del Plata Canyon filled with 80-meter thick, undisturbed sediments. This target was picked based on detailed seismic surveys taken during our first expedition leg. After the first MeBo70 deployment had to be cancelled due to technical difficulties, drilling was continued at this location on Monday February 5, 2018. Sediments down to 32.80 m depth were retrieved and revealed, in contrast to the expected fine-grained material, mostly sandy deposits with some intercalated cohesive sediment intervals.



**Figure 1:** Bird's eye – or better: drone's eye - view of RV SONNE. (Photo: Thorsten Klein).

Prior to the next deployment of MeBo70, surface sediments were sampled using a Grab Corer in areas where, based on Parasound surveys, coral mounds were expected. In contrast to our expectations, the hard substance turned out to be sandstone and not a coral mound and thus no gravity cores were taken at this location.

The goal of the second MeBo70 deployment was the recovery of sediments for biogeochemical and microbial studies with a focus on the impact depositional

conditions, as well as the quality and quantity of organic material, have on biogeochemical processes and the microbial communities – especially regarding deep-subsurface iron reduction processes. The selected site for these studies is located off Uruguay, at 1400 m water depth. Pore water data of a 10-meter long gravity core retrieved during a previous expedition (M78/3) indicated iron reduction processes below the sulfate-methane transition as well as the occurrence of deep sub-seafloor gas hydrates at this location. The MeBo70 drilling was very successful, and after 36 hours of drilling the maximum drill depth of 70.2 meters was accomplished on February 8, 2018. Sediments were recovered on the morning of February 9, after the retrieval of MeBo70. As expected, the sediments showed gas expansion below approximately 20-meter sediment depth related to high methane concentrations. Preliminary data from samples taken for geochemistry revealed the occurrence of dissolved iron for the entire sediment column below approximately 7 m sediment depth, indicating the iron reduction process. Core recovery less gas-expansion gaps was almost 80 %.



**Figure 2:** Haul onboard of the seafloor drill rig MARUM MeBo70 on RV SONNE.  
(Photo: Sabine Kasten)

On our way back to the Argentine work area, we passed again a pod of dolphins – more than 100 dolphins – near the confluence zone where the warm, southbound Brazil current meets the northbound cold Malvinas current (Figure 3). Reaching again the southern part of the Ewing Terrace, we dedicated the entire weekend to the third MeBo70 drilling. Seismic surveys in this area suggested the occurrence of buried coral mound structures. The drilling is still ongoing and we are excited and curious to see and sample the recovered sediments that will be recovered on Monday.





**Figure 3:** A pod of dolphins passing the RV SONNE. (Photo: Thorsten Klein).

All the best from the SONNE crew and scientific party of expedition SO260,

Sabine Kasten (Chief Scientist)