

SONNE 303

BIOGIN – IIOE2

La Réunion – Colombo, 23.01. – 19.02.2024

3. Weekly Report

22.01.-28.01.2024



Start of the alternative program "Biogeochemistry of carbon and nitrogen in the Arabian Sea: a contribution to the International Indian Ocean Expedition 2 (BIOGIN-IIOE2)

On Tuesday, after a long wait and weeks of uncertainty, we were finally able to take the last container on board in La Réunion. In addition to the analytical equipment for the most important water chemistry parameters, the container also contained the chemicals and gases for all the working groups on board. We were now able to set up all the equipment and prepare for the analysis. As the northern and central Arabian Sea could not be approached due to the security situation in the region, we proposed an alternative cruise program (BIOGIN-IIOE2), which was accepted by the Federal Ministry of Education and Research. On the afternoon of January 23rd, we started the journey to the new working area with a new travel program.

The plan is to investigate the influence of the water masses from the Arabian Sea on the equatorial and southern hemispheric water masses in a profile section from 15°S to 8°30`N. The southern extent of the Arabian Sea's oxygen minimum zone will be recorded in order to determine whether it has expanded in recent years as a result of global warming and eutrophication. Following the global trend, the oxygen minimum zone may have intensified and expanded compared to past studies. The fluctuations of the oxygen minimum zone in the recent geological past will be reconstructed using sediment cores. With the proposed profile section, we also tie in with our ongoing work in the INDEX region (German exploration area in the Rodrigues Triple Junction) and can follow the water masses further north. This new research plan integrates all the working groups on board and the expertise and equipment can be utilized as planned.

On January 27, after a journey of more than three days, we reached the southernmost station at 15°S and 67°30`E in 2900 m water depth. The station work began at 04:20 a.m. shipboard time with a hydroacoustic survey of the seabed. These recordings were then used to select two suitable locations for sediment sampling. Next, we deployed a drifting sediment trap system (Photo) to collect sinking particles at 7 depths between 50 m and 600 m water depth. This drifting system is equipped with an Iridium GPS transmitter and can be located and later retrieved. Water samples were then taken at a high vertical resolution, which will be used to determine trace gases and nutrients on board. Samples are also taken for incubation experiments, which are used to investigate processes in the nitrogen cycle in more detail. As almost all working groups are investigating water samples, the CTD and water sampler was used three times to bring a total of 720 liters of water to the surface. Plankton samples were then taken using two different multi-nets. In the meantime, the geologists had selected two suitable stations for sediment sampling,

one to the west and one to the east of the Central Indian Ridge. As the ridge consists of fresh basalt, it was important to use hydroacoustics to find basins in which sufficient sediments are deposited. In both basins we found enough sediment cover to take multicorer samples and a gravity corer. In the early morning of January 28, RV SONNE headed for the drifter and it was successfully recovered. Material was collected in all the sediment traps, which will be examined microscopically and used for experiments on board.

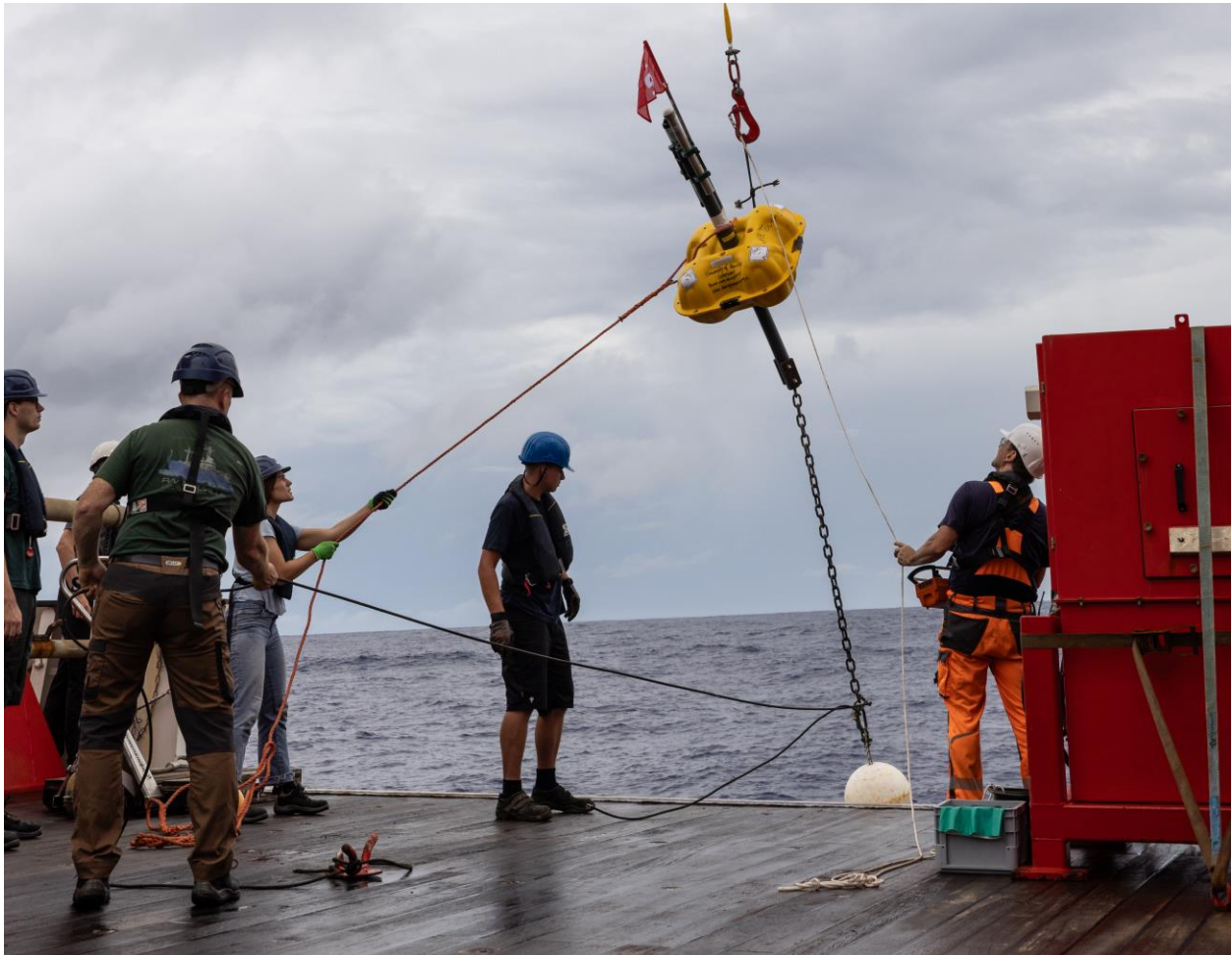


Photo: Deployment of a drifter-system. © Lisett Kretzschmann

We are currently on our way to the second station, which we will reach early Monday morning. The mood is very good, as all the work at the first station went well and successfully and we are looking forward to the stations in the north.

With best wishes from on board to everyone at home

Birgit Gaye
Chief Scientist