

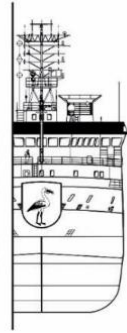
RV MARIA S. MERIAN - MSM108

06.06. - 02.07.2022, Tromsø - Tromsø

2nd Weekly Report

13. - 19.06.2022

MSM108
RV MARIA S. MERIAN
LTER HAUSGARTEN
Tromsø - Tromsø
06.06. - 02.07.2022



"Gardening" to the extent possible

Last week's work was greatly influenced by the ice conditions in the working area. The station work had to be limited to areas east of longitude 4 degrees east, with otherwise excellent weather conditions (low winds, wave height max. 1 m). Water sampler (CTD / Rosette Water Sampler), plankton nets (Apstein net and Multi-net) and bottom grabs (multicorer and box corer) were used in regular succession.

On Tuesday, 12 June, we were able to successfully recover a free-fall device (bottom lander; Fig. 1), which was deployed from RV PoOLARSTERN in the summer of last year, carried out physical and chemical measurements on the seabed in 2500 m water depth for one year and recorded the deposition of particulate matter from the water column with a small funnel-shaped sediment trap (Fig. 2). The organic fraction of these particles (primarily dead plankton) forms the nutritional basis for all organisms of the deep seafloor, whereby in fact only about 2% of the material produced at the sea surface reaches the seabed due to degradation processes in the water column - this shows in an impressive way: the organisms of the deep sea are true survival specialists!

In the middle of last week, the stationary and mobile freefall devices already mentioned in the first weekly report, the bottom lander with the acidification experiment and the crawler (benthic crawler) with various equipment for recording remineralisation rates (oxygen microsensors, incubation chambers) were deployed on the seabed for the first time for short-term missions. The recovery of both devices, scheduled for Friday, 17 June, had to be postponed at short notice, as, due to the prevailing winds, an extensive ice field had pushed over the position of the uncontrolled ascending systems. We will continuously monitor the ice situation and as soon as the area is free of ice again, we will immediately make another attempt to recover the devices.

New in the programme is the exploration of a geological structure on the seafloor, which was already discovered in a short section during a POLARSTERN expedition in 2004. A section of the channel-shaped structure (about 200 m wide and on average about 25 m deep) on the north-western flank of the Vestnesa Ridge off Spitsbergen was originally interpreted as the outlet of the Kongsfjord Canyon off western Svalbard. A large-scale survey of the area carried out during our voyage with the multibeam sonar system of the RV MARIA S. MERIAN now showed us, that there is in fact no

connection to the Kongsfjord outlet, that the channel structure extends across the entire Vestnesa Ridge and is probably due to tectonic processes (and an associated landslide).

The biologists on board expect clear differences in the colonisation of the seabed inside and outside the channel and so a small observation programme was designed *ad hoc* in which this seabed structure is to be investigated with a towed photo/video system (Ocean Floor Observation System, OFOS; Fig. 3) and various bottom grabs (multicorer, large box grab) in a station grid. In the meantime, the OFOS has also been equipped with a mini ROV (Remotely Operated Vehicle; Fig. 4) in order to be able to specifically investigate smaller structures and larger organisms on the seabed at short distances. If ice conditions allow, we plan to conduct additional, large-scale observations with our Autonomous Underwater Vehicle (AUV) "PAUL" to get an even better impression of the conditions in the area of this channel.

At the end of the week we set out for the easternmost and shallowest stations of the HAUSGARTEN station network. Directly off the Kongsfjord, two stations with water depths around 300 m were sampled with the CTD / Rosette Water Sampler and the multicorer in order to continue our ecological time series work in this area of Fram Strait as well. The large box grab (unfortunately) cannot be used at these stations, as the seabed off the fjord is densely covered with so-called dropstones. These stones of all sizes are transported to the sea with the ice of glaciers and "rain out" there due to their weight when the ice melts. On the otherwise very soft seabed, they represent hard substrates that are commonly used by sessile bottom organisms (e.g. sponges, sea anemones) as a substrate. In next week's report we will then report in detail on the water column work of our planktologists, microbiologists and geochemists.

The atmosphere on board is still very good!

We send greetings to our loved ones at home,

Thomas Soltwedel

Alfred Wegener Institute, Helmholtz-Center for Polar- and Marine Research (AWI)



Fig. 1: Recovery of the Long-Term Bottom-Lander after one year at the central HAUSGARTEN site



Fig. 2: Carousel of sampling bottles of the sediment trap to assess the flux of particulate matter to the deep seafloor.



Fig. 3: Deployment of the towed photo/video system OFOS (Ocean Floor Observation System) for seafloor mapping and to assess distribution patterns of larger benthic organisms.

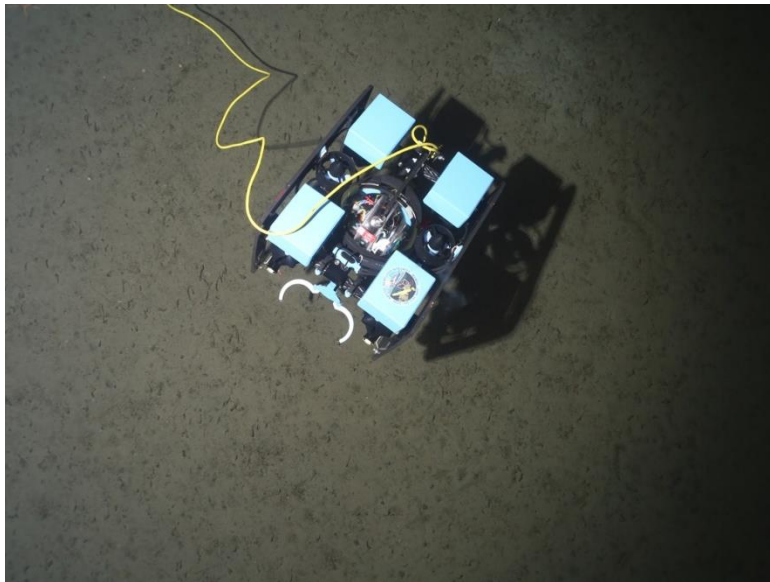


Fig. 4: Survey of the Mini-ROV attached to the Ocean Floor Observation Systems (OFOS), observed by the OFOS camera system at 2500 m water depth off Spitsbergen.