

## 5. Weekly Report - Maria S Merian MSM94



Photography of a cold water coral from the Kap Desolation region, Greenland (after Kenchington et al. 2017).

This weekly report coincides with the end of the MSM94 measurement program. Last week, we were able to successfully complete all planned work. First we were able to recover a "bottom-lander", which we installed 2 years ago in rugged undersea terrain off the coast of Greenland at a depth of about 1000m. The measurements were motivated by earlier findings of cold-water corals (*Lophelia Pertusa*) in the region<sup>1</sup>. In contrast to the well-known warm-water corals, which exist relatively close to the surface under the influence of sunlight, cold-water corals live in total darkness and with corresponding consequences for food availability. Despite the apparently difficult conditions, cold-water corals are common at the continental shelves in the Atlantic Ocean. From previous measurements we found a connection between the occurrence of the corals and very strong currents, which in the tidal rhythm whirl up material from the bottom and feed it to the corals for

food intake. We wanted to check whether this correlation also applies to the region off Greenland with the measurements. The first examination of the data showed that strong currents do indeed exist at the continental shelf, which are also associated with the whirling up of material from the bottom. The data also showed us that the bottom lander dropped by 25 m within only 15 minutes a few months after installation - it is unclear to us what could have happened. Further analyses will follow.

We finished our work in the region by mapping the complex seabed around the bottom-lander and headed east to another mooring area. Here, three moorings, which we operate in a field with eight other moorings of our colleagues from the Woods Hole Oceanographic Institution, USA, were replaced. These moorings measure the inflow into the Labrador Sea, while the 53°N array we replaced last week measures the outflow.

After replacing the moorings and measuring the distribution of various parameters in the water column using the CTD probe, we arrived at Cape Farwel, the southernmost point of Greenland, on



W. Martens disassembling the bottom-lander in the hangar of the Merian (Photo: J. Karstensen)

<sup>1</sup> Kenchington et al. (2017) *Polar Biol* **40**, 321–337 (<https://doi.org/10.1007/s00300-016-1957-3>).

Thursday morning. Under the low clouds we had a good view of the fascinating Greenlandic mountains and also saw icebergs.

Only a short time later we met by chance with the Danish research vessel "Dana", which had departed from Hirtshals, Denmark, to carry out work in Baffin Bay. On board were mostly Canadian and US-American scientists, some of whom we even knew personally. Information about the voyages on both ships was exchanged by maritime radio.



Iceberg, Western Greenland  
(Photo: N. Niebaum)

Another CTD survey was started on a south-easterly course, starting from Cape Farwel and in initially very calm weather. However, the weather changed drastically within a few

hours and wind and waves made it difficult for the CTD stations as well as our progress.



RV Dana, off Kap Farwel, Southern Greenland  
(Photo: R. Witt)

After the CTD survey was completed, another section was started along the OSNAP West line. During this we met a second time with the US research vessel RV Neil Armstrong (named after the astronaut). About 3 weeks ago, shortly before entering St. Johns, Canada, we had already spoken. Again we talked over marine radio and exchanged the advances of the two voyages. Like us, the colleagues were very satisfied with their expedition.

Due to waves and wind we made slow progress and had to finish the work on Saturday afternoon, after the 70th CTD station was completed. We now have about 3500 km of transit ahead of us to Emden. The time will be used to store the equipment in the four containers we have on board, process data and check its quality, as well as to prepare the reports.

This journey has once again shown us what a great ship the Maria S Merian is for our research. This fact is mainly due to the officers and the crew who, under the leadership of Björn Maaß and with bosun Sebastian Plink, exhausted all possibilities to make our work possible. A big "Thank you!" to all.

With greetings from the transit to Emden, Johannes Karstensen (GEOMAR) on behalf of the MSM94 participants



Die grönländische Küste bei Kap Farwel (Foto: H. Olbricht)