

RV MARIA S MERIAN
MSM111“BAFFDEEP”
02.09. - 04.10.2022



1st Weekly Report
02. - 04.09.2022

The expedition M111 of the ice-margin research vessel MARIA S. MERIAN began with the departure from Reykjavik on September 2 in the afternoon. Our destination is Baffin Bay, an Arctic sea that separates Greenland from Canada and into which the largest glaciers of the Greenland ice cap flow. On board are scientists from MARUM - Center for Marine Environmental Sciences at the University of Bremen, together with colleagues from the Alfred-Wegener-Institute Helmholtz Centre for Polar and Marine Research, Aarhus University (Denmark), GEOTOP of the Université du Québec à Montréal (Canada) and the University of Tübingen.

The cruise is part of the research program in the Cluster of Excellence of the University of Bremen "The ocean floor – Earth's uncharted interface", which is located at MARUM. Its research goal is to recover marine sediments from Baffin Bay that contain a record of the last collapses of the Greenland ice cap. This new climate archive will allow us to study how ice sheet collapse, oceanic circulation, and changes in the marine environment in Baffin Bay are related. These findings will help to better understand the stability and melting behavior of the largest ice mass in the Northern Hemisphere in a future warmer Earth climate. The largest recent partial collapses of the Greenland ice cap occurred during the warm periods 130,000 and especially 420,000 years ago. Marine sediments from this period are thought to be located off Greenland at depths of up to 100 meters below the seafloor. To reach them, the seafloor drilling rig MARUM-MeBo 200 will be deployed in Baffin Bay. In addition, water samples as well as plankton and sediment material will be collected during the cruise, which will be used to develop new approaches to decipher the history of the polar oceans and marine life. This includes studies of marine plankton ecology, as well as their fossil remains, organic molecules and ancient DNA deposited on the seafloor. Thus, the scientific program of the voyage begins already during the transit to Baffin Bay.



From top left: RV MARIA S. MERIAN in the port of Reykjavik, setting up and testing the MeBo 200 in the harbor basin, and leaving the harbor, with a panorama of Reykjavik's urban center. All photos: Volker Diekamp

After intensive work with setting up the labs and especially with setting up the MeBo 200, we were able to sail from Reykjavik at 5 p.m. on September 2 after a successful port basin test. The intense rain of the previous days had calmed down, allowing us to enjoy a beautiful view of the island's dramatic volcanic and icy landscape under blue skies. Once out at sea, we advanced westward along the northwestern flank of the mid-ocean ridge, leaving the continental shelf of Iceland and entering the deep-sea plain of the North Atlantic. Here, on Saturday, we recovered three sediment cores at two stations for our colleagues from the GLOBE Institute in Copenhagen. The cores record the history of climate and marine life around Iceland during the last ice age and will be analysed using ancient DNA. In addition to the gravity cores, we also collected short cores with the multicorer, which allows us to recover pristine samples of the seafloor that contain sediments from the last decades to centuries. The deployment at about 1700 m water depth of the 12 m gravity corer and the multicorer were successful at both stations, but our attempt to get an 18 m core at the first station failed: at 6 m depth the long gravity corer got stuck in a layer of coarse volcanic sediment. Due to the force of the impact, the middle tube was bent in half and almost torn off during extraction.



Top left: the multicorer is lowered to the seafloor, the recovered short cores are separated from the instrument on deck (center) and processed in the laboratory (right). Bottom left: the gravity corer is prepared on deck, deployment is monitored in the geolab (center). The 18 m gravity corer accidentally bent in the middle of the tube back on board with volcanic rocks in the core catcher (left). All photos: Volker Diekamp.

Shortly after the coring station, on our way to Baffin Bay, we left the EEZ of Iceland for international waters of the North Atlantic. Here, Sunday morning, the first CTD profile was acquired and plankton nets were deployed from which we plan to collect planktonic foraminifera and cultivate them in the laboratory. The continuing good weather made for unexpectedly calm seas and a good atmosphere, and the cloudless allowed us to enjoy beautiful Northern Lights in the evening. Our voyage now continues towards Greenland, whose southern tip with Cape Farewell we will round in the next few days.

All participants are well, enjoy the excellent food and the very pleasant and cooperative atmosphere on board and send their greetings to all left on dry land.

For all participants

Michal Kucera
(MARUM/ University of Bremen)

To learn more, follow us on:

<https://www.marum.de/en/Discover/MARIA-S.-merian-on-course-for-baffin-bay.html>

<https://twitter.com/lilafisch>

<https://twitter.com/HenriekaD>

<https://twitter.com/VolkerDiekamp>

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Northern lights on the cloudless horizon, evening of 3.9. Photo Raphael Morard.