



**FS MARIA S. MERIAN**  
**Cruise MSM118, Ponta Delgada – St. John´s**  
**Weekly Report Nr. 3, 26.06. - 02.07.2023**



## **NOVA SCOTIA MARGIN (NOVAMAR 2)**

The second week of cruise MSM118 was dedicated to geological sampling of Holocene and Late Quaternary hemipelagic sediments with the multi- and gravity corers. A total of 22 stations, distributed on the deeper continental margin, in glacier channels on the outer shelf, and in the near-coast inner shelf basins, were sampled for surface sediments and up to 11 m long sediment cores. These will serve the reconstruction of climate changes in the western North Atlantic for the last 25.000 years. Together with the sedimentary archives retrieved during MSM101 in 2021, a unique collection of marine climatic archives for paleoceanographic and biogeochemical studies is available now for the Nova Scotia Margin. Particularly, sampling and preliminary shipboard analyses of biogeochemical and isotopic properties of the different water masses, as well as of pore waters and near-surface sediments was the ultimate goal of cruise MSM118. For this purpose, all stations were sampled with water bottles according to the CTD derived temperature, salinity, oxygen, and turbidity profiles, indicative of the different water masses from the surface to the deep ocean. These water samples will be analyzed for nutrients and isotopic chemistry onshore.



*Fig.: CTD and Rosette water sampler deployed at a deep-sea station along the Halifax Monitoring Line (Photo L. deGelleke).*

For comparison with the water column data, bottom and porewaters were taken from the multicorer sediment cores. The porewater profiles will serve the quantification of remineralisation rates of organic matter and element fluxes at the water-sediment interface.

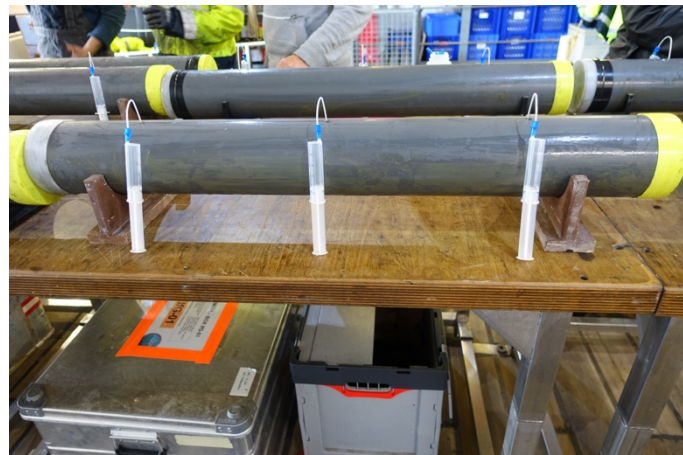
The surface sediments are void of oxygen a few millimeters below the surface. Hence, porewater sampling has to be performed under oxygen-free conditions. For this purpose, the sediment column was sampled in the shipboard cool room, either with Rhizons or under argon atmosphere in a glovebag with centrifuge extraction afterwards. Both

methods yielded similar results, however, the latter is more suitable due to larger liquid volumes available for analyses of a multitude of chemical parameters. In contrast, for in-situ porewater extraction from the longer gravity cores, the nearly non-destructing Rhizon method is applied after the sediment cores are accessible in the core lab. The more sophisticated element and isotope sampling will then be performed later at the shore-based laboratories.



*Fig. (left): Porewater extraction from a Multicorer with Rhizons in 1 cm intervals in the shipboard cool room (Photo F. Scholz)*

*Fig. (below): Porewater extraction from a gravity core section with Rhizons in the shipboard Geolab (Photo N. Schmidt)*



With the last deep sampling station at the easternmost part of the Nova Scotian Margin, close to the Laurentide Channel, a glacier-formed distinct sea-floor feature, the station work during MSM118 was successfully finished Sunday afternoon, July 2<sup>nd</sup>. Until the harbor of St. John's will be reached Tuesday, July 4<sup>th</sup>, the final laboratory work will be executed and the gained samples packed and prepared for transportation back to Halifax and Kiel. Afterwards, cleaning of the equipment and laboratories will take place and the official reception by invitation of the German embassy in Canada, scheduled for Wednesday July, 5<sup>th</sup> onboard the Maria S, prepared.

The entire planned work program was executed very successfully, timely, and without any technical problems. Hence the scientific party of cruise MSM118 honors the continuous support of the entire crew of Maria S. Merian for this great accomplishment. Crew members and scientists are well and look forward to the arrival at St. John's, Newfoundland.

With best regards from FS MARIA S. MERIAN

Ralph Schneider

July 2<sup>nd</sup>, 2023