

R/V MARIA S. MERIAN  
 MSM101, Emden - Emden, 12.06. - 20.07.2021  
 5<sup>th</sup> Weekly Report, 05.07. - 11.07.2021

## NOVA SCOTIA MARGIN (NOVAMAR)



The work program of the fifth week of MSM101 started Monday morning (05.07.) with three geological stations in the Scatarie Basin, the easternmost shelf basin off Nova Scotia and west of Cabot Strait, the outflow area of the Gulf of St. Lawrence. Here, sediment cores up to 10 m long were recovered, filled with Deglacial and Holocene clayey muds. We then sailed across the shelf platform more than 150 nm southward to the upper continental slope to conduct surveys with the multibeam and sediment echosounder in water depths between 2,400 and 4,200 m to identify suitable geological stations. Until Wednesday evening (07.07.) sediment cores for paleoclimatic investigations could be obtained at three stations, despite the already described very difficult depositional conditions due to turbiditic and mass transport deposits along deep-sea trenches. In contrast to the sediment cores from the shelf with Holocene sediment thicknesses of several meters, the cores from the continental slope often contain only a few decimeters of Holocene, followed by series of colorful glacial clays, often interrupted by silty-sandy debris layers. Nevertheless, these sediments provide sufficient material to reconstruct changes in the deeper water masses, including the Scotian Slope Water, from the last Glacial to the present warm period.

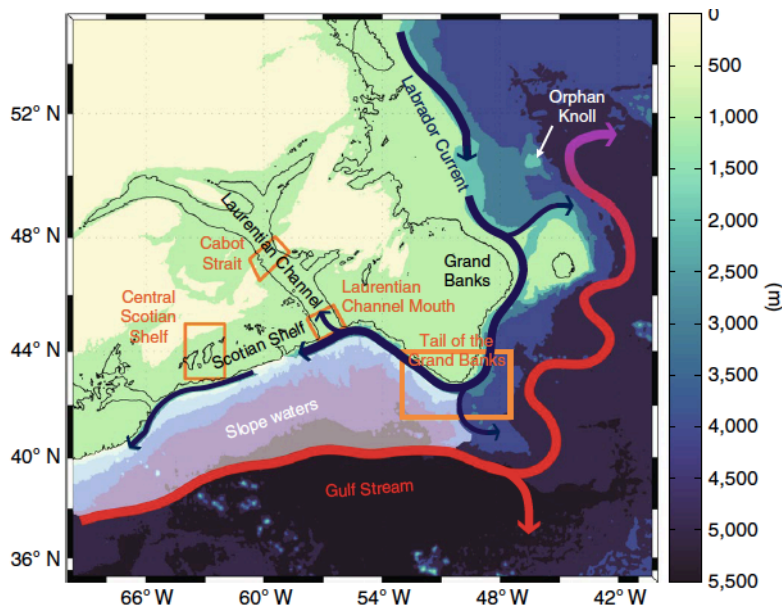


Fig. 1: Circulation of the near-surface and deep water masses off Nova Scotia and Newfoundland. The grey shaded region of "slope waters" represents the large-scale region of mixing of cold water masses from the Labrador Sea with warmer water masses from the western Atlantic (from Claret et al. 2018).

During the night from Wednesday (07.07.) to Thursday morning (08.07.) we conducted further survey work across the slope back onto the shelf into the Canso Basin. Here we revisited a geology station that could not be sampled the week before due to poor weather conditions. This allowed us to complete the north-south transect of all shelf basins off

Nova Scotia and to start our work 260 nm away off Newfoundland. After a 24-hour transit, on Friday (09.07.) at noon, we reached the Halibut Basin and after briefly surveying a sediment drift body, conducted a geology station in 160 m water depth. After further small-scale surveys during the following night into Saturday (10.07.) we successfully sampled three more geological stations with CTD, MUC and gravity corer. On our last day in the working area, we sampled current-induced sediment drift bodies in water depths between 150 and 230 m on the western slope of a glacial channel off Placentia Bay. Again, we recovered Holocene sediments several meters in thickness. Here the last geology station ended on Saturday evening (10.07.) at 11 pm.



*Fig. 2: Last deployment of the Multicorer in the Halibut Basin off Newfoundland.*

In total, about 240 m of sediment cores were recovered and more than 2,500nm of multibeam bathymetry and sediment echosounder profiles were recorded during the past 16 working days.

Today, Sunday (11.07.) we are already on our way back towards the English Channel, which we will pass through at the end of this week. Until then, a lot of work is waiting for us in order to split all sediment cores, describe them lithologically, as well as to photograph and store them all in the reefer until the end of the cruise. Also, the hydroacoustic data must be processed, cataloged, and saved for data storage, and, as a preliminary interpretation, sediment description results will be correlated with the sediment echosounder profiles. In parallel, the hydroacoustic measurements are continued along the route to the English Channel and will be made available to the German Alliance for Marine Research (DAM) Underway Data project.

After an extremely successful work program, we are now back over the Grand Bank and, thanks to sophisticated streaming technology and the support of colleagues in Kiel, are following the European Championship soccer final live with great excitement.

With best regards from the science and ship's crew on board R/V MARIA S. MERIAN.

Ralph Schneider  
(Kiel University)

July 11, 2021