

FS MARIA S. MERIAN MSM99 GPF 18-1_097), Emden - Emden Weekly Report Nr. 1, 25.02. - 28.02.2021

Baltic Deep Water Circulation



Cruise MSM99 "**Deep Baltic**" is the continuation of the work program of expedition MSM51 (2015) and MSM62 (2017) with the main goal to document the formation and the propagation of the deep-water body in the northern and towards the central Baltic deep basins during winter at modern times and during the Holocene. MSM99 aims especially at collecting Holocene sediments, which have been deposited in the Baltic Deeps after the so called Littorina transgression, during which the sea level reached its maximum height after the last Ice Age. In addition, the winter mixing of the water column below sea ice and along its edges is measured aiming to investigate the oxygen supply in the deeper northern basins. The Holocene sediments are explored as excellent archives to reconstruct changes in the northern deep-water circulation and oxygenation for ancient warmer and colder climate periods on decadal and centennial time scales.

Once all new expedition members spent several days in hotel quarantine and underwent multiple covid-19 tests the journey of MSM99 started as planned on Thursday, February 25th, 2021 by departing in Emden Harbor. After uploading the scientific equipment and embarkment of all 18 expedition participants from Kiel, Warnemünde and Stettin, the expedition headed towards the first working area, the Arkona Basin, north of the Island of Rügen.



Fig. 1: Maria S. Merian leaving Kiel-Holtenau locks at 7:00 am (Foto R. Schneider).

After three lockings in Emden Harbor, Brunsbüttel and Kiel Holtenau and with easy passage through Kiel Canal we entered open water and set out towards Fehmarn on Friday, February 27th, 2021. After 9 hours of transit, station work started in the Arkona Deep. At two geology stations, CTD, multicorer and gravity corer were successfully deployed. The coring

locations were already selected based on PARASOUND echosounder and KONGSBERG swath bathymetry surveys from expedition MSM62 in 2017. With the

conduction of a new survey profile, work was completed in the Arkona Basin and we started the transit to the next working area, the Bornholm Basin.

After a 9 hours hydroacoustic survey at night, geological work continued with two successful multicorer stations on Saturday, February 27th. Again, during the following night, we conducted the 185 nm long transit towards the first east-west profile in the eastern Gotland Deep in Latvian waters.

Today, February 28th, started with an early morning CTD profile at the IOW mooring station GoNW-03, at which the recent upper boundary of more saline, but oxygen-free deeper water was found at 80 m water depth. Afterwards, the first hydroacoustic survey of the eastern slope of the Gotland Deep was carried out. On this slope we are just now finishing the sampling of Holocene sediments at four geological stations with multi- and gravity corer. Tomorrow, on Monday, March 1st, we will continue our work with a second east-west profile, similar to today's profile.

Fig. 2: Before the first Multicorer with Holocene and post-glacial sediments from the Arkona Basin is sampled, it is inspected by our students (Foto B. Hentzsch).

For six of our seven students on board, these first days of sea based scientific work and living on a large research vessel have been an exciting experience. Despite the still ongoing hygiene measures on



board, their great enthusiasm is obvious. The same applies for all cruise participants, who executed their various tasks in routine manner during our first stations. Supported by wonderful sunshine and calm seas, we are looking forward to the next week of cruise MSM99.

With best regards from FS MARIA S. MERIAN in the working area offshore Latvia.

Ralph Schneider (Christian-Albrechts-University Kiel) 28 March 2021