

R/V MARIA S. MERIAN

Cruise MSM98/2 (GPF20-3_073)

Development of the glacio-tectonic complex at Heligoland and investigation of the lateral extent and age dating of the Tampen landslide off Norway.



Emden – Emden

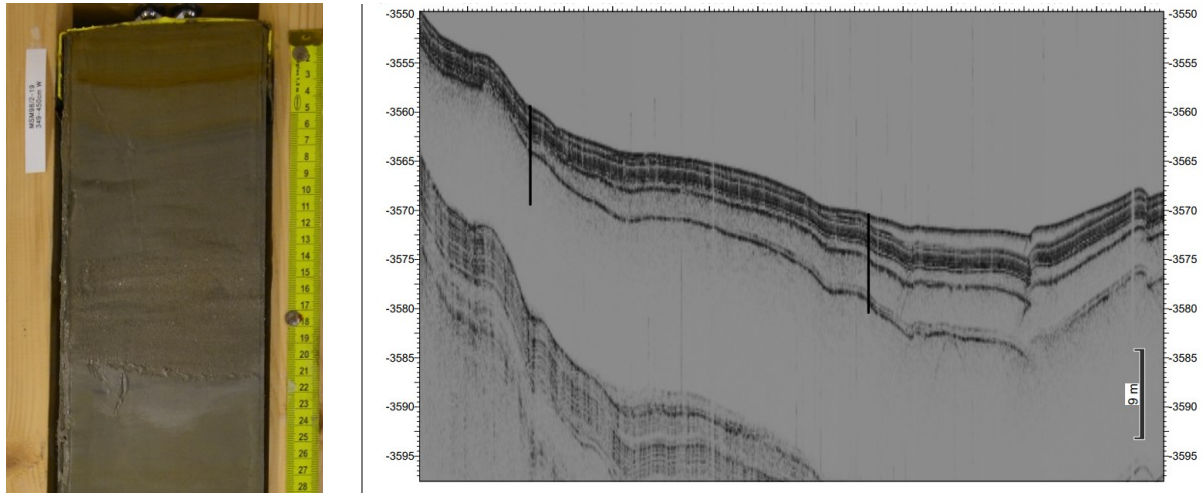
2nd weekly report, 01. - 07.02.2021

For the past week, we have been in the working area between the European continental slope and the so-called Aegir Ridge in the Arctic Ocean at the level of the Arctic Circle between Iceland and Norway. Thanks to the Gulf Stream, we are able to carry out the work on deck at pleasant plus degrees, while in Germany the deepest winter has set in. This outdoor work includes the deployment and retrieval of a 120 m long cable towed at the surface at 4-5 knots for multi-channel seismic measurements, as well as seafloor sampling using a gravity corer deployed down to 4,000 m water depth.

We are very lucky with the weather in this very exposed working area at this time of the year, because with the prevailing conditions of 7-8 Beaufort and 3-4 m seas during our voyage, it is still possible to work well on the research vessel "MERIAN".

Using seismic methods, we succeeded in detecting the so-called Tampen landslide in the sub-surface downslope. In order to verify our hypothesis that the Tampen slide can be correlated with a turbidite in the area of the Aegir Ridge, additional analysis of the data is necessary. In the past, our British colleagues have dated a turbidite in the area of the Aegir Ridge to 50,000 years. If this turbidite originated from the Aegir landslide, the Tampen landslide is significantly younger than previously thought. This would have fundamental implications for the origin of these large landslides on the Norwegian and other continental slopes. Furthermore, we wanted to sample the 50,000-year-old turbidite at other locations on the ridge. The challenge was to find locations where the presumed 50,000 year old Tampen turbidite or adjacent turbidites of unknown origin were deposited near the surface, or were not eroded or deeply buried by the famous but younger Storegga landslide. Only in this way would we have a chance to get a seafloor sample of turbidite with our 10-15 m deep gravity corer. Our persistence in 24 hour operation and long polar nights with a Corona reduced team of only 13 scientists and 24 crew members paid off, because with the 5th gravity core we found what we were looking for (see figures). Further analysis at home, as well as age dating, will allow the reconstruction of the genesis of the identified turbidites.

Having successfully completed our work on the Aegir Ridge, we are currently steaming back upslope to survey in detail a critical site for correlating the seismic findings with the turbidites on the Aegir Ridge. There we will continue our seismic measurements today (Sunday, 07.02) at 21:00 h before we will transit to the second working area north of Helgoland in the middle of next week.



Left: Small but of great value: a sediment sample with a sandy layer (14-21 cm) as a clear indication of turbidite deposition in the 4000 m deep Aegir Ridge. **Right:** The core was taken based on the seismic image in a formation with evidence for redeposited sediment pinching out at shallow depths.

We wish the people at home staying power in this difficult time and we will report again next week from our exciting expedition.

Jens Schneider von Deimling (Christian-Albrechts-Universität zu Kiel)
Auf See, 65° N , 2° W