MSM140 – 2. Weekly Report

Got there! On site!
After four days of transit we reached our working area on the Vøring Plateau at the beginning of the week. We started with the deployment of our electromagnetic ocean-bottom receivers (OBEM) around IODP drill hole U1571 above Skoll High. These receivers measure the decay of an electric pulse emitted by a sensor that is towed just a few metres above the seafloor. The decay depends on the presence of conductors (such as seawater saturated sediments or porous basalt) or resisters (such as massive basalt layers) in the underground. However, our sender had a few technical issues and we decided to first deploy our ocean-bottom seismometers (OBS) as well, and we conducted a small geoacoustic (multibeam bathymetry and sediment echosounder) survey of the outer Vøring Plateau during the night. These data allowed appreciating the total lack of any sign of fluid venting or fluid accumulation in the underground of the area. On Wednesday, taking advantage of calm seas we acquired several lines of 2D seismic data (Fig. 1) and also generated seismic signals for the OBS.

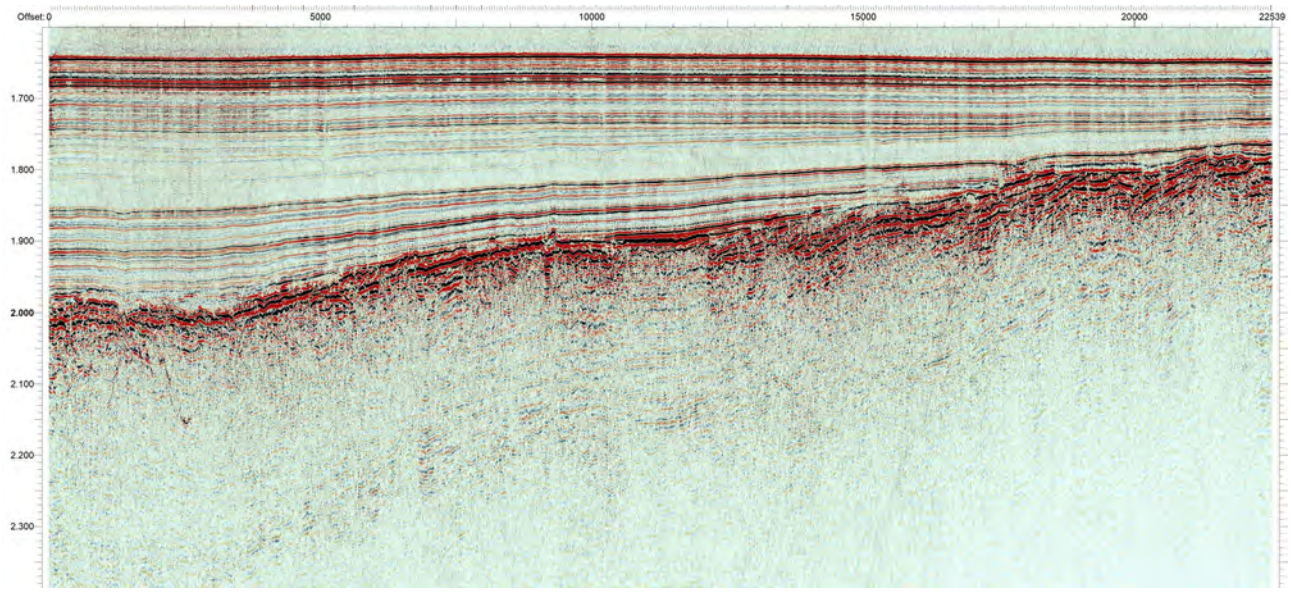

Fig. 1: Seismic profile running from the NE towards Skoll High. The top of basalt, onlapping lower sediment packages und well-stratified, undisturbed upper sediments are identifiable.

The profiles show well-stratified deposits overlying the basaltic basement whose surface has different expressions along the profile indicating different surface structures of the top of basalt. The top of basalt dips towards the North and West, thus well defining Skoll High. In the West the top of basalt shows signs of horst-and-graben structures that extend as faults into the overlying sediments. Both syn- and post sedimentary faults are visible. Penetration of our seismic signal into the basalt is satisfactory and the vertical resolution will allow reaching our scientific objectives. However, the seismic profiles require further processing and interpretation.

At the end of our 2D-seismic work at Skoll High the controlled-source electromagnetic sender (CAGEM) was ready for a successful 24 hours deployment. CAGEM is 6.5 x 6.5 frame (Fig. 2) that is towed with 0.6 knots roughly 10 metres above the seafloor. Following the deployment we recovered the OBEM, saved the data, and re-deployed the instruments with a new storage card for an additional, spatially adjacent measurement. We repeated this procedure once more during the night from Saturday to Sunday, and we are currently at our third CAGEM measurement on Skoll High. In the upcoming week we will continue our work slightly further West around ODP site 642. Unfortunately, a strong depression is building up north of our working area. Keep fingers crossed that it will not have too much impact on our work.

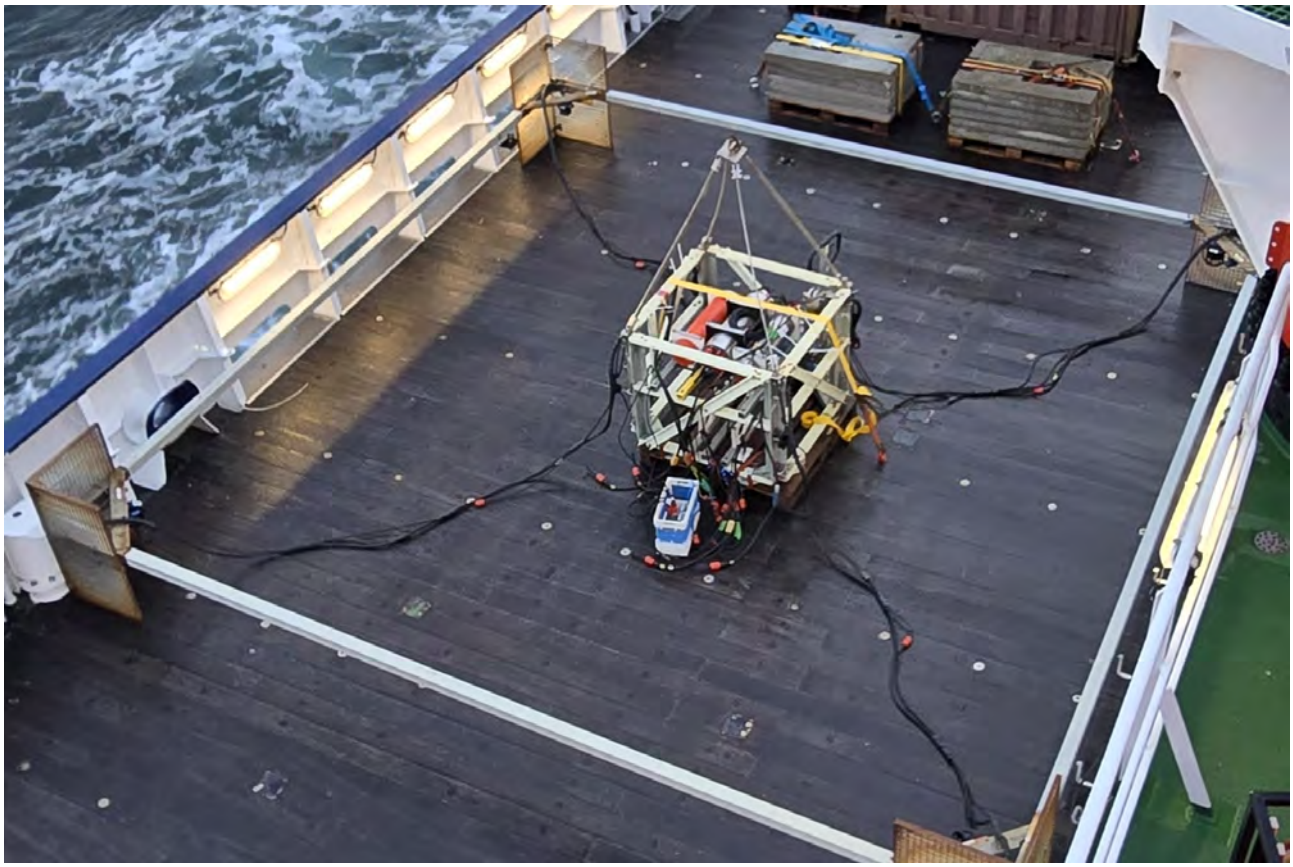

Abb. 2: Tight fit: The controlled-source electromagnetic (CAGEM) sender onboard RV MARIA S. MERIAN.

By now all on board are well acquainted with the vessel and life at sea, and look forward in high spirits to the upcoming weeks.

On behalf of everyone onboard I am sending best regards,
Ingo KLAUCKE
Chief Scientist MSM140