AL527 1. Weeks report (for the period 6.9.-9.9.2019)

AL527 is a student cruise, organized by the University of Kiel for bachelor students in the *Physik des Erdsystems,* program are getting familiar with marine geophysical methods. This year, the conveyed methods include a seismic system using small airguns and a *Norbit shallow-water echo sounder* in addition to ALKOR's permanently installed systems, such as the *EK60 fishfinding echo sounder* and the *Innomar sediment echo sounder*.

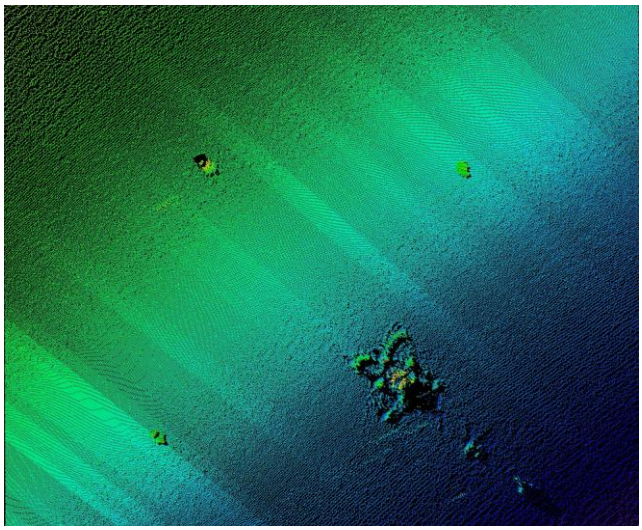

Figure 1: New bathymetric map showing the seafloor observatory at Boknis Eck.

The cruise pursues two specific goals. On one hand, we are trying to find out what has happened to *Geomar*'s biological submarine observatory off *Boknis Eck*. The observatory consists of an 8m-high tower for instruments and two 1x2m steel cages, for power supply and housing of several scientific sensors. The connection to the observatory broke down the previous week and since then, research divers only found broken remains of the steel cages.

On the other hand, we are exploring potential areas for future experiments, funded by the ministry for economy (BMWi), in which air will be injected into the seafloor to assess the seafloor response. Those experiments will presumably take place on a larger research vessel next year.

We left Kiel port at 08:00am on Friday morning, the 6th of September, with 8 students and 4 instructors heading for the observatory's last known position off *Boknis Eck* in the northern part of the *Eckernförder Bucht*. Upon arrival, we lowered the *Norbit* echo sounder through the moon pool and calibrated it with previously taken sound velocity data. Using this system we mapped the seafloor with a vertical resolution of a few centimeters and a lateral resolution of a few decimeters showing, for example, a 15 cm deep and 2 m wide trawl mark and numerous smaller features.

We continued acquiring multi-beam data until Sunday evening. We were able to identify the instrument tower and four stacks of railway wheels, which were used as the observatory's anchors, and another object that is about 2m high and is located south-east of the tower (Fig. 1). We suspect the latter one to be one of the steel cages.

Sunday evening we surveyed an area within the *Hohwachter Bucht* with seismic instruments, passing a recently deployed survey stations of the Bundesamt für Naturschutz. The data will be used in future studies on marine noise pollution. Afterwards, we acquired more data that are now being processed by the students to map large-scale geological structures.

Since Sunday afternoon, we surveyed and mapped a post-glacial beach deposit, which is buried underneath Baltic Sea mud in the southern part of the *Lübecker Bucht*. We intend to use these data to plan the operations within the BMWi project.

On behalf of the cruise participants,

Christian Berndt

Fahrtleiter