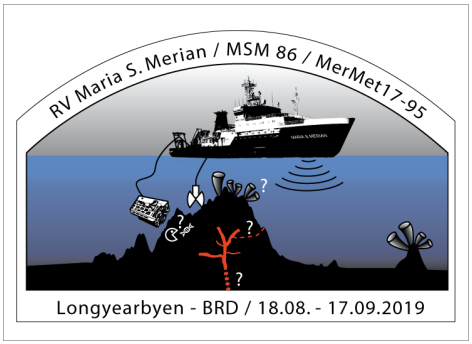
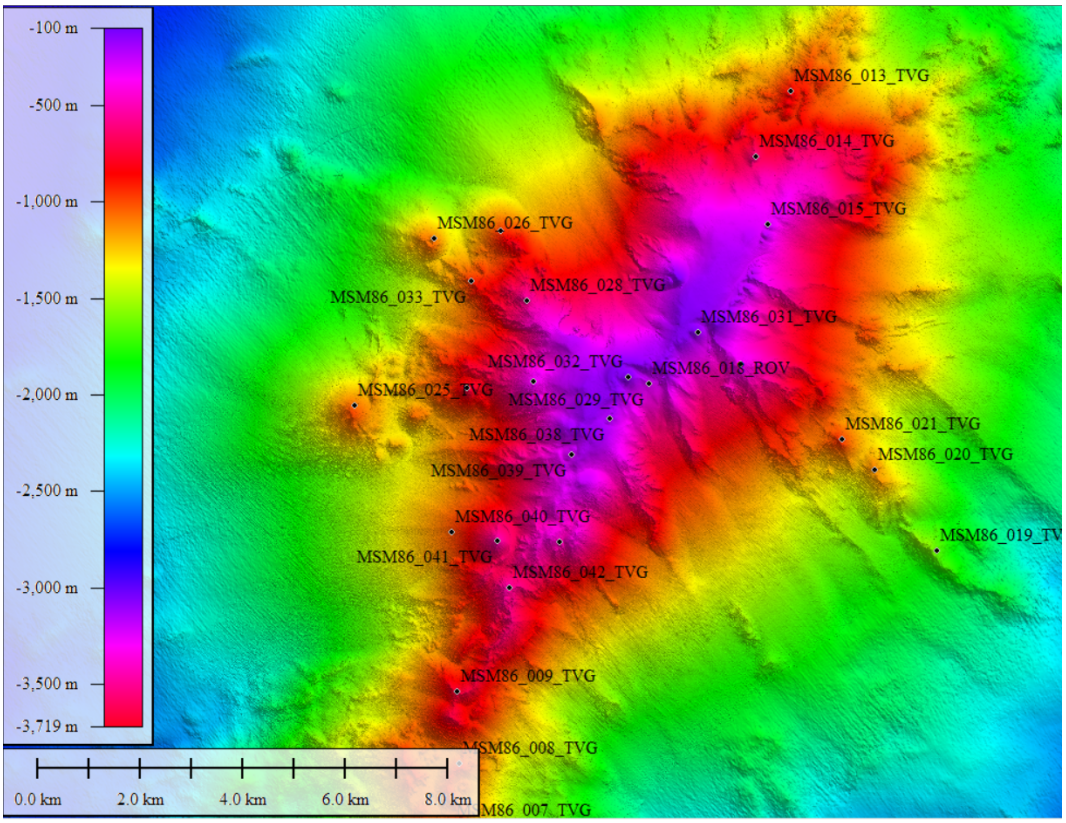
FS Maria S. Merian Expedition MSM-86
Longyearbyen – Emden (18.8. – 17.9.2019)

2nd weekly report



In the second week of our expedition, we were busy mapping and sampling Vesteris Seamount at 73°30'N and 9°W. This young volcano rises to >3000m above the floor of the Greenland Basin, and its origin and evolution are not understood. We have now mapped Vesteris Seamount entirely with the ship's modern echosounding systems and generated excellent data that allow us to see numerous detailed structures. They are witnesses of eruptions and land slides that shaped this enigmatic volcano. Comprehensive rock sampling followed by geochemical studies in the home laboratories will enable us to reconstruct the magmatic evolution of Vesteris Seamount.



The echosounding systems of our ship produced wealth of data that our bathymetry-specialists Anne Strack and Laura Kramer from the University of Bremen worked into phantastic maps. Numerous samples have already been collected, but further sampling is planned.

When we run a station for the TV-guided grab, many of us will meet in the lab with the instrument controls to see Eduard Fabrizius at work. The technician already retrieved countless samples in cooperation with scientists under the leadership of Christoph Beier (University Helsinki) and a crewmember operating the ship's winch.

In the control station of the TV-guided grab in one of the ship's labs crew, technicians, and scientists work together closely to recover precious samples of rocks and animals from the seafloor. (Photo Beate Slaby)

Samples of sponges are processed with highest priority once the TV-grab or ROV are back on board. These seemingly primitive organisms are sampled for genetic and zoological studies. The makeup and functioning of the microbial communities that live within the sponges is of particular interest to our biologists.

Twice last week did we have to run from storms that swept through our main work area. The first time this happened, we went 130 km southwest of Vesteris and mapped another seamount that hasa very different appearance. The very steep flanks lead from 2000m deep to a large (7x12 km) and flat plateau at 400 m water depth. Thanks to the high resolution of our bathymetry data we were able to recognize distinct scourings that are most likely scratch marks produced by icebergs that grounded at the seamount's summit. We sampled the seamount with the TV-grab and recovered diamict sediments with dropstones and angular pieces of fresh basalt that likely represent the local volcanic basement.

The other time we had to get out of harms way we went to the northeastern corner of our larger work area to map and sample seamounts there. The basement rocks recovered show that the seamounts are not of volcanic origin but are instead made-up by mantle and plutonic rocks that formed at great depths and were brought to the seafloor by detachment faulting. These oceanic core complexes are typical for very slow spreading ridges such as the Mohns Ridge – the active spreading center to the east of us. It is hence not too surprising to find this kind of basement composition. However, the occurrence of oceanic core complexes has not been reported from this part of the North Atlantic and we are hence excited about our discovery.

A large demosponge recovered by the TV-grab is cleaned from sediment and prepared for laboratory work. (Photo Beate Slaby)

Today, we are back at Vesteris Seamount and our ROV just completed another spectacular dive about which I'll write next week.

Kind regards, also on behalf of the entire science party,

Wolfgang Bach
University of Bremen

September 1, 2019, at sea 73°30'N, 9°10'W