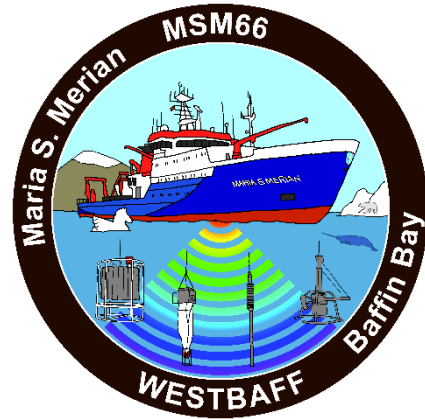


RV *Maria S. Merian*

Expedition MSM66 – WESTBAFF

22.07. – 28.08.2017

Nuuk (Greenland) – Reykjavik (Iceland)



2. Weekly report

23.07. – 30.07.2017

Last week started with an extensive geological sampling campaign followed by a long transit to the northern Baffin Bay. This transit was only interrupted to recover a sediment core from an inshore site in a fjord in Melville Bay.

On Sunday, we finished the mapping of elongated seabed features on the upper continental slope of Greenland and commenced sampling these features. Based on the new bathymetric maps, we identified up to 10 km long furrows and levees. The furrow measured ca. 500 m across and were in places incised more than 30 m deep into the seabed. In the 40 km stretch we mapped, they continued almost parallel to the continental slope. Unfortunately, due to the ice situation, we were not able to extend our survey northward to map the full extent of these features. We nevertheless defined the depth interval in which these features occur. In the areas below 1120 m water depth, no structures were discernible in the bathymetric data while in the areas shallower than 750 m water depth, iceberg plough marks overprinted any potential feature that might have been there in the first place. Concerning the origin of these features, it is difficult to identify the processes that generated these features at this stage. One possibility would be that giant icebergs scoured the seabed creating furrow and side berms. However, it is also possible that other processes, for example bottom currents, formed these furrows and levees.

Once the bathymetric survey was finished, the sampling work started. It commenced with measurements of the water column followed by plankton tows for culturing experiments on board. At three stations, we collected geological samples with a box core and duplicate gravity cores. A site located in a water depth deeper than the mapped features was cored as a reference site for the background setting. In addition, the bases of the furrows were sampled to estimate the minimum age of these features by later analyses. So far, our work has been

successful. Moreover, despite the many stones in the sediments in this area, we have not damaged any coring equipment yet.

After the sampling work, we commenced a reconnaissance survey along the continental slope of Greenland. The track of this survey crossed the shelf edge and the continental slope in many places. In this way, we systematically collected information on the occurrence of glacial landforms. Where glacial landforms occur on the seabed, they can provide information on glaciation history. For example, the occurrence glacial lineation and drumlins that form at the base of an ice sheet in the contact zone of ice and the underlying rock, provide evidence for an ice sheet in an area in the past. Marine terminating ice sheets with an ice shelf frequently form grounding zone wedges. In addition, terminal moraines often form at the maximum extent of ice sheets and during ice sheet retreat. All these landforms can be identified in bathymetric data. From the distribution of mapped glacial landforms, we hope to get information on the maximum extent of the Greenland Ice Sheet during past glacial periods. A first glance at the recorded data already indicates that potential glacial landforms occur in several places along our reconnaissance survey.

We interrupted the reconnaissance survey to collect a sediment core from a fjord in the Innugsulk Bugt in front of the Igdlugdliip Sermia we visited during MSM44 in 2015. The top metre or so was missing in the core we collected in 2015, so this time we sampled the very soft and water-rich sediments with an 18 m long gravity core that we lowered carefully to the seafloor. With this strategy, we retrieved a nice 13.12 m long sediment core. Furthermore, the detour in the fjord provided the opportunity to take spectacular pictures of icebergs in front of the Greenland ice sheet with perfect weather conditions.



Icebergs in the Innugsulk Bugt in front of the Igdlugdliip Sermia.

Photo S. Dreutter, AWI

After finishing the geological station, we returned to the continental slope to commence our reconnaissance survey, continuously working our way to the northern Baffin Bay where we plan more surveys and sampling work in the southern Nares Strait over the next few days.

It was amazing to see how fast everybody settled into routine on board. Without any problems and delay, the teams formed and picked up their work. Also the cooperation and communication with the ship was excellent right from the start. It is hard to believe that we are only a little more than a week at sea.

On behalf of all on board, I send greetings from the, unfortunately, grey and overcast southern Nares Strait.

Boris Dorschel