



## **MSM67 - SEGMENT**

### **Structure and evolution of the NE Greenland continental margin in relation to the conjugate margin**

**(Reykjavik – Longyearbyen, 31.08.-04.10.2017)**

#### **Weekly report #5**

During the last week we were quite successful. From Sunday 24<sup>th</sup> 02:00 until Monday Sep. 25<sup>th</sup> in the afternoon all ocean-bottom seismometers have well been recovered. Initial evaluation shows that the data quality is promising and phase picking already started. This deep crustal transect along the shelf is intended to study the nature of the crust and also the distribution of high velocities in the lower crust, indicating magmatic additions.

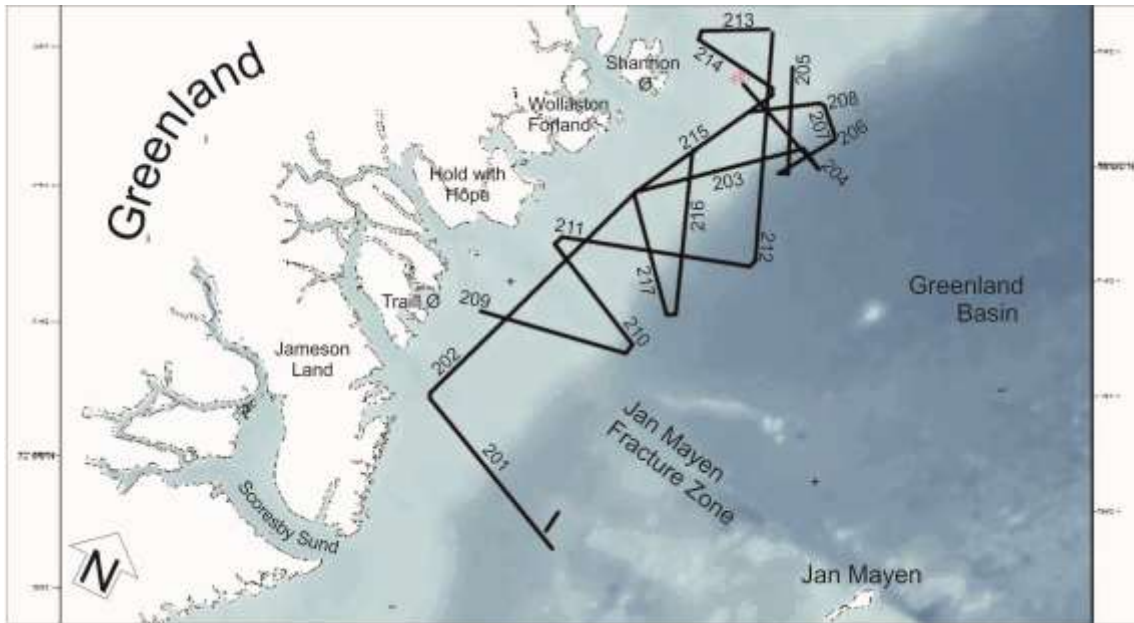
After redeployment of the streamer, geophysical profiling restarted on Monday Sep. 25<sup>th</sup>, at 22:30. Line 209 was completed by Sep. 26<sup>th</sup> at 11:00. A short interruption of acquisition was due to a distant detection of marine mammals. Line 210 was completed by Sep. 27<sup>th</sup> at 2:00, line 211 at 22:30. Stronger winds dominated during acquisition of line 212 until finalization on Thursday Sep 28<sup>th</sup> at 22:00. However the vessel's course in wind direction enabled the acquisition of high-quality data (see image below). On Friday Sep. 29<sup>th</sup>, we had to go around floating icebergs, which occurred occasionally along lines 213 and 214. Thus, there are a couple of kinks in the profiles. The remaining geophysical profiles 215-217 were acquired without problems. Profiling was successfully finished on Sunday Oct. 1<sup>st</sup> and from 12:00 to 21:00 the scientific equipment was recovered. Currently we are heading for the harbor in Longyearbyen (SV) where we will berth on Oct. 4<sup>th</sup>, as scheduled.

The circumstances of this cruise necessitated to predominantly concentrate on data acquisition; there was little room for data processing and data interpretation had to be postponed. Thus, results can only be expected after careful data processing and interpretation after that cruise. However, we are confident that with the dataset at hand, the goals of this project will be reached. As an example, the brute-stack of line BGR17-212 is shown below, running in an S-N direction from the deep sea onto the shelf. Distinct seaward dipping reflectors (SDRs) are located at the continental slope, merely at the position predicted from the literature. These are typically interpreted as thick lava flow units, the expression of abundant volcanism during breakup of a continent. However, we identify two separated, consecutive SDR wedges. This might be an indication for two phases of volcanic activity, at breakup time and some million years later. Interestingly, along this profile, the thickness of the lava flows increases with time.

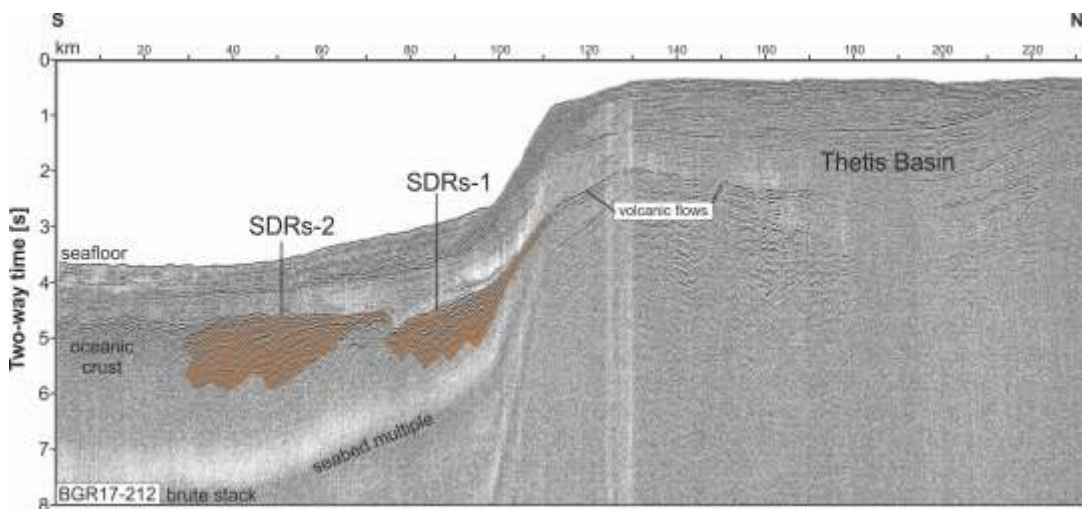
The success of this cruise, despite all circumstances, is mainly due to the great efforts of the scientific personnel on board but equally due to the perfect support of the vessel's leadership and crew. Being the first time on a research cruise, our younger colleagues immediately accepted to support acquisition and processing of the magnetic and gravity data. Besides working in a tight schedule they were fortunate enough to observe orcas and humpback whales during transit, north of Island and sperm whales close to the mid-oceanic ridge when being at the observation deck together with the marine biologists.

On behalf of the members of the scientific crew with kind regards from R/V MARIA S. MERIAN

Dieter Franke  
Chief Scientist



Location of the geophysical profiles, which were acquired during cruise MSM67.



Brute stack of profile BGR17-212. Two distinct seaward dipping reflector (SDR) wedges are imaged. SDRs are typically interpreted as expression of break-up related, intense volcanism.