



MSM 30 CORIBAR

– Ice dynamics and meltwater deposits: coring in the Kveithola trough –

Western Barents Sea

Tromsø – Tromsø

July 15th – August 16th, 2013

3rd Weekly Report – July 29th to August 04th, 2013

Specialists and the MeBo technicians have repaired the hydraulic system of MeBo during our stay in the harbor of Tromsø from Monday to Thursday. This stay was also efficiently used by the diligent crew for maintenance work on MARIA S. MERIAN. We have arrived again in our study area on Friday night.

New technical complications have, however, continued to hamper the successful deployment of MeBo. The three MeBo stations at which we drilled up to now had each to be interrupted at an early stage. Currently (Monday morning), MeBo is starting to drill into the best developed of the *grounding-zone wedges* in the Kveithola glacial trough.

For the case that complications might occur, due to bad weather conditions or technical problems, we had developed a contingency plan prior to this cruise. One strategy is *offset coring* at places where the stratigraphic subbottom architecture provides the suited precondition: the successive depositional units vary laterally in thickness and pinch out, or are just eroded at a certain location. Taking sediment cores along a lateral transect leads then to a separate sampling off each of these units (see Figure).

Another contingency strategy is to investigate an extended area through sediment-echosounder profiling and conventional sediment sampling. The shipboard PARASOUND system has an outstanding vertical resolution of less than 50 cm and a general signal penetration depth of several tens of meters (Figure). A grid of profiles enables an area-wide correlation of prominent sub-

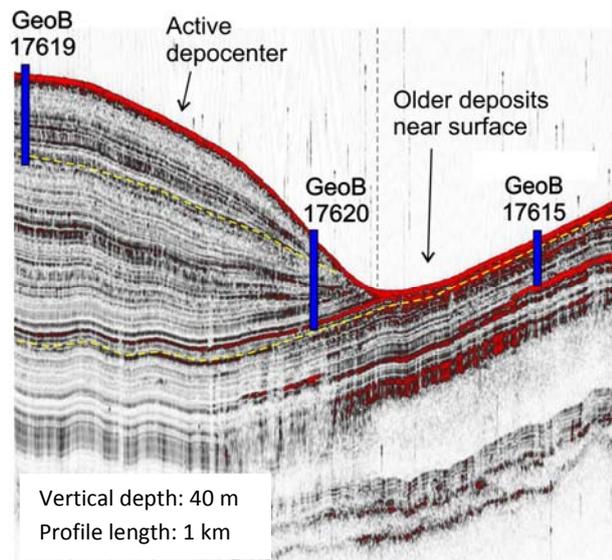


Figure: The concept of offset coring.

Instead drilling one long core on the left side which would penetrate down to the oldest strata, a set of shorter cores (up to 10 m long) leads to a lateral composite of the stratigraphic succession (core positions are slightly projected into a PARASOUND profile).



bottom reflectors, which themselves originate from buried beds of ice-rafted debris or other changes in sediment composition. This profiling, supported by coring, allows a detailed interpretation of the glacial and post-glacial sedimentary processes and environmental changes. The final aim is the construction of a sound, three-dimensional concept for polar continental margins.

Weather and waves have provided the best coring conditions during the entire time of our cruise up to now and we have worked at 23 stations, collecting sediment cores with a total core recovery of 128 m. As soon as the sediments arrive on deck, the analyses which required an immediate treatment are performed. Roger Urgeles (CSIC, Barcelona) performs first shear strength tests on the cut surfaces of each core section. Anna Sabbatini (PUM, Arcona) and Line Nicolaisen (GEUS, Copenhagen) separate living foraminifers and preserve them in alcohol. Renata Lucchi and Michele Rebesco (OGS, Trieste) extract pore-water samples from the sediment core for methane analysis. All, including Andrea Carbulotto (OGS, Trieste) and Giacomo Osti (UiT, Tromsø), prepare together the cores for storage and transport at 4°C. At the same time, Tanja Hörner (AWI, Bremerhaven) feeds the detailed station data into the complex registration software of the MARUM core repository, Jaume Llopart (CSIC, Barcelona) and Hendrik Lantzsch (GeoB, Bremen) prepare the coring equipment for the next station, and Asli Özmaral (MARUM, Bremen) is starting the PARASOUND system to record the next sediment-acoustic profile after leaving this station. What a great team! And we will meet soon again to decide about the next steps in our program.

Till Hanebuth

Chief Scientist

Kveithola Trough, western Barents Sea, August 5th, 2013, 74°51'N 16°54' E