



Glacigenic landforms and sediments in Store Koldewey Trough, NE Greenland – preliminary results.

Ingrid Olsen (1), Matthias Forwick (1), Jan-Sverre Laberg (1), Tom Arne Rydningen (1), and Katrine Husum (2)
(1) UiT The Arctic University of Norway, Department of Geosciences, Norway (ingrid.i.olsen@uit.no), (2) Norwegian Polar Institute, NO-9296 Tromsø, Norway

The glaciation history of NE Greenland remains poorly constrained, resulting in conceptual and uncertain reconstructions of the configuration of the Greenland Ice Sheet during the Last Glacial Maximum (c. 24-19 ka BP), as well as the timing and the dynamics of the deglaciation. New studies suggests that the ice sheet in NE Greenland probably was more dynamic than previously thought, extending all the way to the shelf edge during the last glacial (Laberg et al., 2013, 2017).

Swath bathymetry, high-resolution seismic data and sediment cores from Store Koldewey Trough, off NE Greenland, reveal glacigenic landforms and deposits, providing evidence of the presence and subsequent retreat of the Greenland Ice Sheet in the middle part of the continental shelf. Mega-scale glacial lineations oriented parallel to the trough axis are identified along with a complex pattern of transverse ridges. These lineations are interpreted to be products of a fast-flowing ice stream draining eastward towards the shelf break, whilst the transverse ridges are inferred to be formed subglacially as crevasse fills or at the grounded ice front. Sediment cores contain a characteristic sequence of compact clast-rich diamicton with muddy matrix, absent of shells and bioturbation. This is overlain by laminated mud and massive mud. IRD is generally observed in the upper part of the cores. The diamicton is suggested to be basal till, whereas the overlying deposits are interpreted to be of glaciomarine origin, going from an ice-proximal to a more ice-distal environment. The laminated mud supports deposition from turbid meltwater plumes with variable discharge in an ice-proximal setting, whereas the massive mud indicates deposition from more ice-distal conditions. Within the massive mud the abundance of IRD in the cores increased relative to the surrounding material, probably reflecting increasing distal conditions where deposition from icebergs dominates compared to deposition from suspension settling.

References:

- Laberg, J.S., Forwick, M. & Husum, K. (2013). A re-evaluation of the Pleistocene behavior of the Scoresby Sund sector of the Greenland Ice Sheet. *Geology*, 41 (12), 1231-1234.
- Laberg, J.S., Forwick, M. & Husum, K. (2017). New geophysical evidence for a revised maximum position of part of the NE sector of the Greenland ice sheet during the last glacial maximum. *Arktos*, 3:3.