



## **Late Glacial Dynamics of the Greenland Ice Sheet on NE-Greenland**

D. Winkelmann (1), W. Jokat (2), L. Jensen (2), and H.-W. Schenke (2)

(1) GEOMAR | Helmholtz Centre for Ocean Research Kiel, Germany (dwinkelmann@ifm-geomar.de, +49 431 600 2941), (2) Alfred Wegener Institute for Polar and Marine Research Bremerhaven, Germany

The reconstruction of large ice masses in the past is a crucial element for current climate models as correct input and base line parameter as well as for the implementation of associated ice sheet dynamics. For a long time, the ice sheet extent of the Greenland Ice Sheet (GIS) was reconstructed mainly on the basis of terrestrial work. Accordingly, the outer limit of the GIS during the Late Glacial Maximum (LGM) was placed close to the current coastline. Advances in our understanding on the dynamic behaviour of the GIS, especially offshore NE-Greenland, came from hydro-acoustic surveys which indicated a much larger extent of GIS during the LGM. Here, we present hydro-acoustic data acquired with RV "Polarstern" from fjord systems to the shelf edge of NE-Greenland, including the first hydro-acoustic data of Dijnphna and Hekla Sunds. We found morphological evidence for fast-flowing ice filling the fjords, extending onto the shelf as ice stream and reaching the shelf break. Mega-scale glacial lineation, recessional moraines and grounding line wedges document a highly dynamic behaviour of this Westwind Ice Stream of the GIS on NE-Greenland. The ice advance was followed by a rapid retreat to a mid-shelf position where the ice margin repeatedly deposited sets of recessional moraines. A second rapid retreat, probably accompanied by a lift-off of the ice followed and placed the ice margin at the mouth of Dijnphna Sund. A last retreat established the modern ice margin in the area. Post-glacial sedimentation was affected by mud diapirism, neo-tectonic activity and submarine mass-wasting inside Dijnphna and Hekla Sunds.