



## **A 35.000-year long record of major ice-marginal fluctuations in SE Greenland**

Nicolaj Larsen (1), Karina Jacobsen (1), Kurt Kjær (2), Jesper Olsen (3), Bent Odgaard (1), and Anders Bjørk (2)  
(1) Department of Geoscience, Aarhus University, Denmark (nkl@geo.au.dk), (2) Centre for GeoGenetics, Natural History Museum of Denmark, University of Copenhagen, Denmark, (3) Department of Physics and Astronomy, Aarhus University, Denmark

In 2011 cores from the Torqulertivit Imiat (TI) threshold lake in SE Greenland were retrieved to constrain the Holocene glaciation history of the Greenland ice sheet. The cores were analysed using XRF core scanning, magnetic susceptibility, loess-on-ignition, and grain-size analysis. A total of 20 terrestrial macrofossils and bulk sediment samples were used to date the 3.5 m long main core from the central part of the lake. The age-depth model of the main core show increasing age with depth down to 35 cal. ka BP except two outliers in the upper part of the core. The results suggest that the bulk ages in the lower part of the core are reliable although comparison between bulk and terrestrial macrofossil from the same interval show an age difference between 500-1.000 years. Our preliminary interpretation of the TI record suggests that the Greenland ice sheet advanced to the LGM position on the shelf from c. 26-20 cal. ka BP where there is a hiatus in the TI record. At c. 20 cal. ka BP the sedimentation resumed in TI and it continued up to c. 10.7 cal. ka BP suggesting that the ice margin had retreated behind the present coastline. Then follows a hiatus at c. 10.7 cal. ka BP suggesting that the ice made a readvance and covered the coastal areas including TI, after which the sedimentation continued up to the present. The final Early Holocene deglaciation of TI corresponds to independent cosmogenic exposure ages from the same locality showing deglaciation between c. 11-10 ka (Roberts et al., 2008). During the Holocene Thermal Maximum (HTM) the ice margin retreated behind its present position and out of the catchment of TI and here it remained until the Neoglacial where it returned to its present position. The new results demonstrate that lake records may survive a full glaciation like the LGM and may reveal important information about the longterm glacial history of the Greenland ice sheet.

Roberts, D.H., Long, A.J., Schnabel, C., Freeman, S., Simpson, M.J.R., 2008. The deglacial history of southeast sector of the Greenland Ice Sheet during the Last Glacial Maximum. *Quaternary Science Reviews* 27, 1505-1516.