



Glacial evolution of Central-East Greenland Margin: a GLANAM project contribution

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The dynamic evolution of the Greenland Ice Sheet is directly related to the Northern Hemisphere glaciation. The ice sheet has influenced the Greenland margins construction conditioning their morphology and their reply to other control factors in the evolution, as tectonic and oceanographic events. Thus, the sedimentary record preserved around Greenland has registered the glacial oscillations of the Northern Hemisphere, as well as the influence of other conditioning factors in the development of a permanent ice sheet on Greenland. The aim of this work is to summarize the new insights of Central-East Greenland glacial evolution reached within the framework of the Marie Curie Initial Training Network (ITN-FP7-PEOPLE-2012-ITN): Glaciated North Atlantic Margins (GLANAM) project.

Several multichannel seismic profiles have been acquired along Central-East Greenland Margin, with both research and exploration proposes. They enable the large-scale reconstruction of the major stratigraphic events from late Miocene to Present, in agreement with an age correlation with ODP sites along the margin. High-resolution seismic, sub-bottom profiles, swath bathymetry and sediment cores are also locally available supporting detailed interpretation of the Quaternary sedimentary record. While ice-rafted debris (IRD) in the northern seas have been interpreted as indicators of tidewater glaciers on Greenland, the acoustic and seismic evidences summarized in this work allow reconstruction of different episodes of cross-shelf advances of the Greenland Ice Sheet along the central-east margin.

The results of this work reveal an early cross-shelf glaciation occurred off Blossville Kyst during late Miocene and early Pliocene followed by major ice-stream activity off Scoresby Sund during early Quaternary and glacial advance off Liverpool Land in late Quaternary. Higher resolution of the Quaternary data off Liverpool Land suggests that the intense ice-stream of the Scoresby Sund fjord was gradually taken over by the northern-placed ice-stream of Kong Oscar Fjord during Pleistocene, and later moved farther north to Kejser Franz Joseph Fjord. Overall, the study reveals a no-coupled development of the cross-shelf ice-streams along Central-East Greenland Margin with a marked northward advance from late Miocene to Present.

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