**Large-scale evolution of central-east Greenland glaciated margin**

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The central-east Greenland margin has been influenced by oceanographic and cryospheric processes since the late Miocene when the southwards flow of the East Greenland Current (EGC) initiated together with the first advance of the ice sheet along the margin. However, the relative control of these processes over the sedimentation and their influence through time remains little understood. Morpho-structural and seismo-stratigraphic analyses of the central-east Greenland margin have been done on multichannel seismic, high-resolution single-channel seismic, chirp sub-bottom profiles and swath bathymetry. In addition, the ODP site 987 of the leg 162 is located in the southern Greenland Sea offshore of Scoresby Sund and has been used for age estimations.

The continental shelf along central-east Greenland is irregular, locally reaching more than hundred kilometres in width. It is characterized by several, glacially carved transverse troughs that constitute the oceanward extension of the major fjords and the main paths for the ice-streams (Fig. 1). Some of these ice-streams have developed offshore glacial trough mouth fans (TMFs) through successive phases of glacial advances. The present-day average water depth is shallower than 300 m in inter-trough areas, deepening to 600 m in the major glacial troughs (Fig. 1). Oceanwards of a steep slope, the seafloor falls into the 2250 m deep basin of the Greenland Sea.

Seven major stratigraphic discontinuities could be identified within the sedimentary record of central-east Greenland margin. They restrict eight major seismic units, named from 8 to 1, in upward stratigraphic order. The distribution and seismic facies of these units reveal the evolutionary sequence of the study area from early Cenozoic to Present. The lowest unit, Unit 8, is post-basalt to middle-late Miocene age and represents a pre-glacial depositional stage where tectonic events controlled the sedimentation. Deposition of Unit 7 occurred by late Miocene, revealing glacial-related deposits and ice-streams along the central-east Greenland margin. Unit 6 was formed during early Pliocene by glacial advance over the continental shelf leading to strong erosive surfaces in the shelf area. The thin Unit 5, formed in late Pliocene, is related to retreat of the ice in central-east Greenland despite of the regional glaciated context. Unit 4, likely deposited during late Pliocene to Pleistocene, displays progradation along the shelf edge and Mass Transport Deposits (MTDs) in the basin, indicating a return to active ice-streams along the margin and intense glaciation of the hinterland. Units 3 and 2 were formed during early Pleistocene and reveal a continued glacial advance over the continental shelf. From late Pleistocene to Present, Unit 1 indicates major sedimentary input from the Scoresby Sund ice-stream and the presence of an important ice sheet, which occasionally reaches the continental shelf edge.

More detailed seimic-stratigraphic analysis of this upper unit suggests major interaction between the along- and down-slope processes during the Quaternary period. Its stratigraphic architecture reveals MTDs related to glacial influenced down-slope sedimentary processes. The distribution of the MTDs reveals the influence of distinguished ice-stream systems along the margin. The glacial influence over the margin has been interrupted by periods of stronger activity of the along-slope bottom current flow, evidenced by the presence of intercalated buried contourite systems. They may denote that the EGC periodically controlled the sedimentation.

*Figure 1: Bathymetric map of the central-east Greenland margin based on the International Bathymetric Chart of the Arctic Ocean (IBCAO, Jacobsson et al., 2012). Grey isobaths every 50 m from 0 to 1000 m; thick black isobaths every 500 m. Notice the troughs revealed by the bathymetry off the fjords of the margin.*

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