



Late Quaternary extent and retreat of the Laurentide Ice Sheet in Clyde Inlet and its adjacent continental shelf, northeastern Baffin Island (Arctic Canada)

Pierre-Olivier Couette (1,2), Patrick Lajeunesse (1), Boris Dorschel (3), Catalina Gebhardt (3), Dierk Hebbeln (4), Jean-François Ghienne (2), and Etienne Brouard (5)

(1) Centre d'études nordiques & Département de géographie, Université Laval, Québec, Canada, (2) Institut de Physique du Globe de Strasbourg (IPGS), UMR 7516 CNRS - Université de Strasbourg/EOST, Strasbourg, France, (3) Alfred Wegener Institute (AWI) Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany, (4) MARUM – Center for Marine Environmental Sciences, University of Bremen, Bremen, Germany, (5) Département des Sciences de la Terre et de l'atmosphère, Université du Québec à Montréal (UQAM), Montréal, Canada

The maximal extent of the Laurentide Ice Sheet (LIS) on eastern Baffin Island during the Last Glacial Maximum (LGM; about 20 000 years ago) has been widely debated during the last decades as different palaeo-glaciological models have been proposed. Spatial and temporal variability of ice sheets extension during Quaternary glaciations complicate the establishment of a reliable reconstruction of the ice margin. Furthermore, the lack of geophysical data in most of the fjords, and seaward, makes it difficult to reconcile the proposed terrestrial and marine glacial margins. Here we use high-resolution swath bathymetry imagery, combined with acoustic stratigraphy data and sediment cores collected during various oceanographic expeditions, focusing on the ice dynamics in the area of Clyde Inlet since the LGM. Our data reveal possible positions of the maximal extent of the LIS near the continental shelf edge. The deglaciation on the shelf was rather slow and episodic, as indicated by the presence of grounding-zone wedges, recessional moraines, as well as time-transgressive glacial lineations. Ice retreat in the fjord occurred more rapidly, most likely due to increased water depths. However, the presence of multiple moraine systems reveals periods of ice-margin stabilizations. This study provides additional information to the terrestrial data and, thus, helps improve the models of glacial dynamics in the northeastern sector of the LIS.