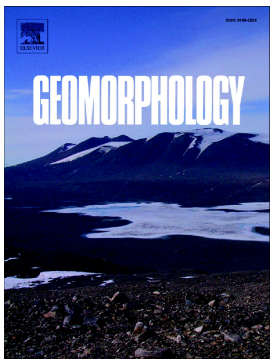

Submarine geomorphology of northeast Baffin Bay and its implications for local paleo-ice sheet dynamics

Patricia Slabon, Boris Dorschel, Wilfried Jokat, Francis Freire

PII: S0169-555X(18)30238-1
DOI: doi:10.1016/j.geomorph.2018.06.007
Reference: GEOMOR 6422

To appear in: *Geomorphology*

Received date: 12 November 2017
Revised date: 8 June 2018
Accepted date: 11 June 2018

Please cite this article as: Patricia Slabon, Boris Dorschel, Wilfried Jokat, Francis Freire , Submarine geomorphology of northeast Baffin Bay and its implications for local paleo-ice sheet dynamics. Geomor (2017), doi:10.1016/j.geomorph.2018.06.007

Submarine geomorphology of northeast Baffin Bay and its implications for local paleo-ice sheet dynamics

Patricia Slabon[a*], Boris Dorschel[a], Wilfried Jokat[a,b], Francis Freire[c]

[a]*Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI), Am Alten Hafen 26, D-27568 Bremerhaven, Germany*

[b]*University of Bremen, Department of Geoscience, Klagenfurter Straße 4, 28359 Bremen, Germany*

[c]*Geological Survey of Sweden, SGU, Villavägen 18, 751 28 Uppsala, Sweden*

*Corresponding author. Tel.: 0049 471 4831 1226; E-mail: patricia.slabon@awi.de

Abstract

High-resolution bathymetric data from close to the northwest Greenland coast in northern Melville Bay, northeast Baffin Bay, reveal a range of glacial and nonglacial landforms. The glacial landforms include crag-and-tails, mega-scale glacial lineations (MSGL), rock drumlins, and roche moutonnées that indicate paleo-ice sheet dynamics. The nonglacial landforms include steep ridges that are interpreted as volcanic dykes (Neoproterozoic Thule dyke swarms and Paleoproterozoic Melville Bugt dyke swarms). These dykes are glacially overprinted and may have channeled ice and subglacial meltwater flow through narrow subglacial cavities.

Some of the glacial landforms eroded into bedrock indicate a southward paleo-ice stream orientation; while other glacial landforms, including the sedimentary depositional landforms, indicate a westward paleo-ice stream orientation. The glacial landforms were likely produced during at least two epochs and under changing thickness of the ice streams. The glacial landforms eroded into the bedrock are likely older than the sedimentary glacial landforms and were likely produced by a thin south/southeastward ice