Geophysical Research Abstracts
Vol. 18, EGU2016-17834, 2016
EGU General Assembly 2016

The pre-LGM evolution of the Uummannaq ice Stream system in West Greenland

David Roberts (1), Tim Lane (2), Brice Rea (3), and Stewart Jamieson (1)

(1) Durham University, Geography, Durham, United Kingdom (d.h.roberts@durham.ac.uk), (2) Department of Geography, Liverpool John Moores University, Byrom Street, Liverpool, UK, (3) Geography and Environment, School of Geosciences, University of Aberdeen, Elphinstone Road, Aberdeen, Scotland, UK

Ice streams are a key component of an ice sheet system. They are fast flowing, dynamic corridors of ice that play a pivotal role in modulating ice flux from the interior of an ice sheet to its terrestrial or marine margin. The behaviour of marine-terminating ice streams in particular is critical in determining the dynamic (in)stability of ice sheets and ice/ocean interaction through time. However, despite an increase in palaeo-ice stream reconstructions and improvements in numerical modelling, in many instances we know little about the evolution of ice streams beyond the last glacial cycle. This is particularly true for topographically-guided or constrained ice stream systems that must represent the end-member state of a system that has developed over million year time scales. Recent research suggests that topographic focussing, subglacial geology, meltwater routing and calving margins are the primary controls on ice stream evolution. However, few studies have considered the combined role of geology, pre Quaternary landscapes and uplift in pre-conditioning a landscape for ice stream onset. This paper explores the factors that have controlled the evolution of the Uummannaq Ice Stream (UIS) system in West Greenland. During the last glacial cycle the UIS was a topographically-guided system, but the variables that led to ice stream onset prior to the Late Quaternary remain poorly understood. Geology, selective linear erosion and dynamic feedbacks were all important controls, but the influence of rifting, early uplift and pre-glacial topography in particular may have been pivotal controls on the evolution and location of the UIS onset zone.