



Glacial response to the 8.2ka Event in Iceland: new evidence for a short-lived, extreme cooling of regional winter temperatures

L. Sugden (1), N. Hulton (1), A. Dugmore (1)

(1) School of GeoSciences, University of Edinburgh, Scotland

We present the first geomorphic evidence of a glacial advance phase in Iceland at the time of the “8.2ka cooling event”, the highest magnitude climate reversal in the Holocene. The high magnitude cold event is associated with freshening of North Atlantic surface waters due to the sudden drainage of two North American glacially dammed lakes, and represents an analogy for potential response mechanisms to future ice sheet melt due to global warming. Clear glacial limits in the Borgarfjörður Eystri region of NE Iceland represent glacier advances dated to 7.53 cal. ka. B.P using radiocarbon and tephrochronology. High resolution geomorphic mapping reveals that glaciers were debris-covered, and that ablation of ice would have been inhibited. This enabled glaciers to survive for a significant time in warmer conditions after the most intense phase of cooling. Field evidence combined with modelling experiments indicate a cooling in the region of 5-7°C lasted for 60-100 years, providing new constraints on the magnitude and impact of the “8.2ka event” in the mid-North Atlantic.