Geophysical Research Abstracts
Vol. 15, EGU2013-147-1, 2013
EGU General Assembly 2013

Ice Sheet Deglaciation, Younger Dryas Readvance and Palaeoclimatic Implications in the Cairngorm Mountains, Scotland.

Matthew Standell (1), David Graham (1), Richard Hodgkins (1), and Ángel Rodés (2)

(1) Loughborough University, Department of Geography, Loughborough, United Kingdom (M.R.Standell@lboro.ac.uk), (2) NERC CIAF, East Kilbride, United Kingdom

The Cairngorm Mountains contain an outstanding assemblage of glacial landforms from both the deglaciation of the last British-Irish Ice Sheet and the Younger Dryas Readvance; these can provide a wealth of information about palaeoclimate and glacier-climate interaction. Previous interpretations have left doubt over the extent and style of the Younger Dryas readvance. In addition, although the ice sheet deglaciation of the northern margin of the Cairngorms is relatively well understood, the pattern and timing of deglaciation on the southern margin and particularly how local and external ice masses interacted is unclear.

New geomorphological mapping from aerial images and fieldwork has been compiled in a GIS for a 600km^2 area of the Cairngorm Mountains. This systematic mapping covers all previously reconstructed Younger Dryas glaciers and the landform assemblages associated with ice sheet deglaciation. For the first time, Cairngorm-wide patterns of deglaciation have been mapped and comparisons between the northern and southern margins made. Interpretations suggest that during ice sheet deglaciation, outlet glaciers were fed by locally-sourced plateau ice caps. On both the northern and southern margin of the Cairngorms, large ice-dammed lakes formed between locally sourced ice and neighbouring ice masses. The presence of these lakes indicates that ice masses in the Cairngorms began to recede early in deglaciation, most likely as a result of precipitation starvation.

Detailed mapping, combined with new surface exposure ages taken from areas of ‘hummocky moraine’ previously subject to differing interpretation, will assist in determining the extent of Younger Dryas glaciation. The new ages will also guide new modelling of snow delivery to the surface of Younger Dryas glaciers. Preliminary results suggest snow blow factors cannot account for the low ELAs of some previously reconstructed valley glaciers. As a result, either very strong precipitation gradients existed within the Cairngorms during the Younger Dryas or previously reconstructed glaciers did not occur simultaneously. The geomorphological evidence and palaeoclimatic inferences are important alongside a growing number of palaeoglaciological studies in acting as evaluation areas for current numerical models of ice sheet growth and decay.