Geophysical Research Abstracts,
Vol. 11, EGU2009-1248, 2009
EGU General Assembly 2009

The sedimentological and glaciological relationships between tills, flutes and crevasse-fill ridges during a surge, Eyjabakkajökull, Iceland

A. Ferguson (1), J.J.M. van der Meer (1), Í.Ö. Benediktsson (2), A. Schomacker (2), and T. Andersson (3)

(1) Queen Mary, University of London, Department of Geography, London, United Kingdom (a.ferguson@qmul.ac.uk), (2) Institute of Earth Sciences, University of Iceland, Askja, Reykjavík, Iceland, (3) Bioenergy Department, Swedish Board of Agriculture, Jönköping, Sweden

Compared to other landforms and landform assemblages in glacier forelands, limited research has been carried out into crevasse-fill ridges and their relationship to flutes and the sediments below them. This is partly due to the ephemeral nature of the features and the effect of dead ice decay, but also the restrictions caused by the inaccessibility of potential sites. Eyjabakkajökull is a surging glacier situated on the North Eastern margin of Vatnajökull, Iceland, where as a consequence of recent surges, a variety of landforms, including crevasse-fill ridges and flutes, have been superimposed on the pre-existing landscape.

At Eyjabakkajökull the crevasse-fill ridges appear to be draped across the flutes; this observation contradicts with previously published models which suggest that flutes indicate coupling to the bed whilst the crevasse-fill ridges are taken to reflect de-coupling from the bed. Sedimentological and micromorphological analysis of these landforms, individually and at points of intersection, have identified characteristic structures associated with them. Initial results suggest that the flutes and crevasse-fill ridges at Eyjabakkajökull appear to have formed from two tills. The crevasse-fill ridges suggest de-coupling from the bed has occurred and the till has been squeezed up. Where a crevasse-fill ridge intersects with a flute the till is forced up through the flute, but the cross-section through the crevasse-fill ridges shows little evidence of the flute's existence. Although these landforms developed in the same surge it does suggest that they did not form concurrently; instead the flute appears to have formed before the crevasse-fill ridge squeezed up and pushed through it. The present contribution discusses how flutes and crevasse-fill ridges relate to each other and thus adds a new layer of information to our understanding of modern glacial environments which is crucial for realistic palaeoenvironmental reconstructions of Quaternary glacial landforms and landform assemblages.