



From subglacial bedforms to flow patterns to ice sheet reconstruction; mapping procedures and ‘flowset-ology’

C. Clark, S. Greenwood, A. Hughes, and M. Spagnolo.

Department of Geography, University of Sheffield, Sheffield, UK.

c.clark@sheffield.ac.uk

There are a variety of methods for reconstructing the extent, flow configuration and surface morphology of palaeo ice sheets and many reasons for doing so, including elucidating ice and climate links and understanding palaeo sea level change. An important method for understanding the evolution and dynamics of palaeo ice sheets is to map, understand and interpret the geomorphological and geological evidence that they left behind. Drumlins and moraines, for example, can be converted (or inverted) into information about the ice sheet; flow configuration and margin position respectively.

This paper will review and illustrate methods, procedures and pitfalls in the mapping of subglacial bedforms from satellite images and digital elevation models. Once mapped, a number of quality control procedures are employed yielding GIS layers of individual elements. These, which typically number tens of thousands, then require spatial data reduction and interpretation to produce ice flow events (flow sets) and a relative age stack that can act as building blocks for reconstructing the evolving ice flow patterns through time. The most complex part is the grouping of landforms into logically coherent flow sets and deducing their glaciodynamic context (e.g. retreat pattern; ice stream; migrating ice divide; time-transgressive; isochronous etc). Informally, we call this ‘flowset-ology’, and our recent insights and procedures will be illustrated with case studies from the last British, Irish and Laurentide ice sheets.