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Palaeoglaciological investigations exploiting remote sensing, elevation models and GIS

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Evidence-based reconstructions of the configuration and behaviour of the last great mid latitude ice sheets have been executed by either a bottom-up approach (i.e. 'cut and paste' of a multitude of field-scale observations) or top-down (ice sheet scale mapping of moraines and flow patterns, controlled by selected field observations). Wide differences in data quality and interpretation, and patchy coverage make reconstructions by the bottom-up approach difficult. For the Laurentide and Scandinavian ice sheets the top-down approach has been used to good effect yielding coherent reconstructions at the ice sheet scale. We argue that this is a good approach, and it operates at a scale appropriate for testing numerical ice sheet models and helps guide as to the most pertinent field sites for detailed investigation. However, although providing good building blocks for reconstruction it can be hard to link the landform patterns to the wealth of literature on field-scale observations including stratigraphy and dating control. Both approaches can be integrated using a GIS, and this work is now under way for the British Ice Sheet. Evidence pertaining to the Dimlington Stadial British Ice Sheet is being entered into a GIS for the purpose of making a full ice sheet reconstruction and producing a glacial map of Britain.

With regard to the mapping of large-scale glacial geomorphology, recent developments will be reviewed and illustrated via a series of case studies. The new higher resolution (15 m) afforded by Landsat-7 ETM + data will be discussed, as will the advantages of acquiring data with a low solar elevation and thin snowcover, and the use of digital elevation models. The case studies will draw on palaeoglaciological information derived by these methods for ice sheet behaviour of Ireland; Kola Peninsular, Arctic Russia; and Altai Mountains, Russia.