

## Geomorphology Project Ideas I - Glacier reconstruction in the uplands of the British Isles

**Introduction:** The mapping of glacial limits using erosional (e.g. glacial striae) and depositional evidence (e.g. moraines) can reveal detail about ice thickness, extent and direction of flow. The mountains of the English Lake District, Snowdonia and Scotland were last occupied by Younger Dryas (Loch Lomond) Stadial glaciers some 11,500 years ago, during a short-lived 1000 year duration cold episode at the end of the last Ice Age, the Devensian Glaciation or Marine Isotope Stage 2-4 (80,000-11,500 years ago), at the maximum of which ice extended south in the Vale of York and Wolverhampton. The Younger Dryas cold episode has been dated to between 12,600-11,500 years ago, and saw glaciers re-established and advancing in the uplands of the British Isles. The uplands and lowlands of the northern British and Irish Isles contain a geomorphological or landform record that allows the reconstruction of former ice-sheets, smaller glaciers and the nature of the land-forming processes.

However, there remains much debate over the actual extent of these glaciers in North Wales (e.g. Cwm Llydaw and Cwm Dyli), the Lake District (e.g. around Scafell) and in Scotland (e.g. Loch Assynt). There are numerous projects the aim of which would be re-assessing the published glacial limits (see example references), field mapping of the

Fig 1 Fresh hummocky moraine in Mickelden Beck, Langdale, English Lake District.



landform record and evaluating any discrepancies. As part of the project you will interpret the landform and sedimentary evidence from your field data, and use these data to reconstruct the form and shape of the glacier and, by comparing with present-day valley glaciers, calculate its Equilibrium Line Altitude (the line separating the zones of accumulation and ablation on a glacier) and the palaeotemperature.

**Methods:** In association with your teacher or lecturer identify a suitable accessible study area. Define your limits and do not over-extend yourself (e.g. maybe one or two adjacent small valleys). Quality is more important than quantity. Map the glacial landforms onto 1:10 000 scale base maps with a 10m contour interval. Use modern technology to help you; e.g. a hand held GPS and aerial photography, e.g. from [Google](http://www.google.com) (Far Easedale). Record any supporting evidence from exposures of sediment. Your finished product after your fieldwork will be a good quality field map and your notebook to document exposures, sediments and your photography.

**Equipment:** Base maps, pencils and pens, compass or GPS, tape measure (for sediment exposures), camera, appropriate clothing (be prepared).

### Reading:

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- Wilson, P. 2004 Description and implications of valley moraines in upper Eskdale, Lake District. *Proceedings of the Geologists' Association* 115 (1), pp. 55-61