

Quantitative Methods: Student Work

My main aim was to produce an inventory of the geomorphology of of Ben More Coigach, Northwest Scottish Highlands in relation to glacier fluctuations elsewhere in Scotland.

I undertook fieldwork for 2 weeks in the area around Ben More Coigach massif, Scotland. I was mainly ground-proofing the aerial photography and I wanted to establish the distribution of landforms which are difficult to identify on aerial photographs (e.g. river terraces). I also measured the orientation of ice-moulded bedrock.

How did you apply Quantitative Methods to your work?

I made 3-D reconstructions, using Arc-GIS, NEXTMap and Edina, of the glaciers to make inferences about the Loch Lomond stadial (the period of lower temperature between and interglacial warm period). I also examined the retreat of the glaciers using graphical and statistical analysis (in particular regression analysis) to look at the influence of external factors such as basin morphology, aspect and glacier size on retreat patterns.



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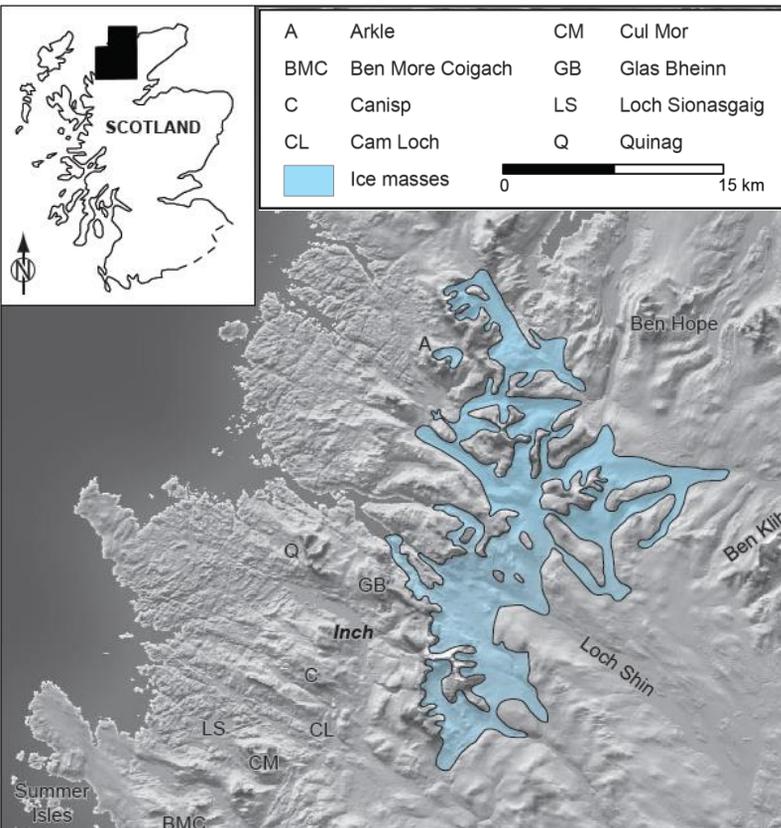


Fig. Digital Terrain Model of Northwest Scotland, showing the regional context of the study site and its proximity to the West Sutherland mountain icefield (Lukas and Bradwell, 2010a). Hill shaded relief map derived from Digital Terrain Model of NEXTMap Britain (Intermap Technologies Inc. provided by NERC via the Earth Observation Data Centre).

Key findings

- Geomorphological evidence for three locally-nourished glaciers on Ben More Coigach was established. These were assigned to the Loch Lomond stadial.
- Glacier-derived precipitation estimates suggest wetter conditions during the Loch Lomond stadial compared with the present day, contrary to previous assertions.
- Examination of retreat dynamics suggests the Ben More Coigach glaciers underwent active retreat in a similar fashion to that currently being experienced by modern temperate glaciers.

Assessors views

“This dissertation really interrogates the datasets collected. Ben has used appropriate methods to develop a plausible model of the mass-balance, dynamics and palaeoclimatic setting of the former glacier.”