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Topographic control on palaeoglaciation: a case study from the Brecon Beacons, South Wales, UK.

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Glacial geomorphology within the Brecon Beacons, UK, represents the most marginal evidence for Younger Dryas (YD) glaciation within the British Isles. Regional reconstructions of YD glaciation within the upland regions of the UK have been used to infer regional climate conditions during the YD. Standard methods of interpreting palaeoclimates from glaciers rely on assumed relationships between balance gradients and ELA's derived from modern analogues, and do not account for the variation of glacier-form attributed to the effects of localised topography. Consequently, the effects of topography on glacier dynamics and palaeoclimate in a marginal region such as the Brecon Beacons are critical, and therefore require detailed consideration.

This poster presents a glaciological approach to glacier-climate reconstructions for 7 sites of potential YD glaciation in the Brecon Beacons. Glacier reconstruction is based on the position of ice-marginal landforms and combined with palaeoclimatic data derives total mass-balance models for the glaciers. This method allows the distinction between broader climatic variables from topographically controlled components in reconstructing palaeoglacier mass-balance. To determine the significance of topographic variables on these glaciers a Digital Elevation Model (DEM) was constructed of the glacier surfaces and surrounding topography for two sites. Grid-based analysis of relief effects on direct solar radiation potential and snow-remobilisation potential where undertaken to separately account for these variables. Comparison of the two variables with respect to glacier hypsometry suggests that both variables were crucial factors for YD glaciation within the Brecon Beacons. The strength of this approach is demonstrated as each main variable is independently assessed allowing the clear separation of localised and regional climatic variables during the development of niche glaciation.