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Estimating the style and duration of former glaciation in the mountains of Britain and Ireland

Iestyn Barr[1], Jeremy Ely[2], Matteo Spagnolo[3], Ian Evans[4], and Matt Tomkins[5]
[1]Manchester Metropolitan University , UK (i.barr@mmu.ac.uk)
[2]University of Sheffield, UK
[3]University of Aberdeen, UK
[4]Durham University, UK
[5]University of Manchester, UK

With a view to better understanding landscape evolution, we model the style and duration of former mountain glaciation in Britain and Ireland during the Quaternary (i.e., the past 2.6 Ma). We use a simple mass balance model, driven by published temperature depression data from the Greenland Ice Core Project (for the past 120 ka), and from a benthic δ18O stack (for the Quaternary as a whole). Though there are limitations to this approach, results provide first-order estimates and indicate that during the Quaternary as a whole, the mountains of Britain and Ireland were glacier-free for 1.1 ± 0.5 Ma; occupied by small (cirque) glaciers for 0.3 ± 0.2 Ma; and occupied by large glaciers for 1.1 ± 0.4 Ma. During the most recent glacial cycle specifically (i.e., the last 120 ka), these areas were glacier-free for an average of 52.0 ± 21.2 ka; occupied by small (cirque) glaciers for 16.2 ± 9.9 ka; and occupied by large glaciers, including ice sheets, for 51.8 ± 18.6 ka. Here, we investigate some of the regional variability in these estimates, and consider implications for long-term landscape evolution.