



10Be production rate calibration in Scotland

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Recent surface exposure ages of late glacial moraines have been interpreted as evidence for the persistence of ice at low elevations in north-west Scotland during Greenland Interstadie 1 (ca. 14.7-12.9 ka). This contrasts previous suggestions that Scotland was largely ice-free during the interstadie based on Lateglacial pollen sites near the centre of ice dispersal. Similarly, surface exposure ages from Loch Lomond Stadial (Greenland Stadial 1) moraines frequently yield younger than expected ages. This puts into question the validity of the global reference production rate used for calculating the surface exposure ages.

We have determined a local ^{10}Be production rate for Scotland in the type area of the Loch Lomond Stadial. Independent age control comes from previously published macrofossil radiocarbon ages in an organic layer buried by a varved sequence of sediments. The varves record the existence of a glacially dammed lake that drained when the Loch Lomond Glacier retreated from its maximum position. ^{10}Be concentrations measured in terminal moraine boulders marking this maximum glacial position have been used to determine a new ^{10}Be production rate of 4.3 ± 0.2 atom/g/year, lower and more precise than the currently used global ^{10}Be reference production rate. Application of the new production rate to existing chronologies resolves many of the existing conflicts in NW Scottish glacial history.