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Evaluating a cosmogenic nuclide calibration site at Mt Billingen, Sweden

D. Fabel (1), A. P. Stroeven (2)

(1) Department of Geographical and Earth Sciences, The University of Glasgow, Glasgow, UK, (2) Department of Physical Geography and Quaternary Geology, Stockholm University, Stockholm, Sweden (Derek.Fabel@ges.gla.ac.uk / Fax: +44 141 3304894 / Phone: +44 141 3302262)

During retreat of the Fennoscandian ice sheet, a large ice-dammed lake formed along its south-eastern margin. The ice damming this Baltic Ice Lake (BIL) was breached at the northern tip of Mt Billingen, resulting in a catastrophic drainage of $\sim$9400 km^3 of meltwater and an associated lowering of the BIL by $\sim$25 m. This event occurred at $\sim$11500 calibrated ^{14}C yr, determined using bio-, litho, and chrono-stratigraphic data from numerous lake and bog cores in the immediate vicinity of Mt Billingen (e.g. Björck, 1995) and the varve chronology from the Baltic Sea tied to the GRIP δ^{18}O record (Andrén et al., 2002). The dramatic fall in the level of the BIL is recorded by raised shorelines, isolation of lake basins, and changes in the characteristics of marine sediments (Bodén et al., 1997; Lambeck, 1999).

We collected material for a pilot study from (1) scoured bedrock directly in the path of the meltwater outflow, (2) large ($>$ 2m x 2m x 2m) sandstone boulders derived from the northern tip of Mt Billingen and transported by the flood, (3) bedrock from a meltwater-scoured area further down-current (called Klyftamon), and (4) cobbles from the surface of thick floodwater deposits downstream of the scoured Klyftamon bedrock surface.

The results of ^{10}Be analysis of these samples are internally consistent between the sampling locations, and we compare these to the available ^{14}C data in order to assess the validity of the site as a potential calibration site for cosmogenic nuclide methods.

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