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Timing of deglaciation in the northern Alps based on cosmogenic nuclide data

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Recent re-evaluations of production rates for cosmogenic 10Be now necessitate recalculation of 10Be exposure ages from sites in the Alps that we have studied over the past 20 years. In the Alps we have the unique opportunity to exposure date in well constrained field situations, supported by more than a century and a half of detailed field mapping. Sites considered here range from moraines left by Last Glacial Maximum (LGM) foreland piedmont lobes to early Holocene moraines and rock glaciers. The timing of the onset of deglaciation at the end of the LGM is based on exposure dated boulders located at Wangen a.d. Aare (Switzerland). For the Lateglacial period (which in the Alps begins as soon as the glaciers have receded back inside the mountain front around 19-18 ka), moraines are attributed to stadials based on morphologic characteristics and equilibrium line altitude depressions. Never-the-less glacier advances during the stadials must necessarily be linked to cold intervals recorded by, for example, paleobotanical data that are dated with radiocarbon. Gschnitz stadial moraines mark the first clear post-LGM readvance of mountain glaciers, when glacier termini were already situated well inside the mountains. Based on the size of glaciers at the time as well as radiocarbon dates from critical sites, Gschnitz stadial glacier advances took place during the early Lateglacial (pre-Bølling). Sparse radiocarbon dates from bogs formed in tongue basins and regional morphostratigraphic relationships led to linking of Egesen stadial glacier advances to the Younger Dryas cold period. This was later confirmed by exposure dating of Egesen stadial moraines. In other words, time intervals for moraine formation and abandonment can be estimated independently. We will discuss the accuracy and applicability of recently suggested production rates for Alpine sites.