

Reaching and abandoning the furthest ice extent during the Last Glacial Maximum in the Alps

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During the Last Glacial Maximum (LGM) in the European Alps (late Würm) local ice caps and extensive ice fields in the high Alps fed huge outlet glaciers that occupied the main valleys and extended onto the forelands as piedmont lobes. Records from numerous sites suggest advance of glaciers beyond the mountain front by around 30 ka (Ivy-Ochs 2015 and references therein). Reaching of the maximum extent occurred by about 27-26 ka, as exemplified by dates from the Rhein glacier area (Keller and Krayss, 2005). Abandonment of the outermost moraines at sites north and south of the Alps was underway by about 24 ka. In the high Alps, systems of transection glaciers with transfluences over many of the Alpine passes dominated, for example, at Grimsel Pass in the Central Alps (Switzerland). ^{10}Be exposure ages of 23 ± 1 ka for glacially sculpted bedrock located just a few meters below the LGM trimline in the Haslital near Grimsel Pass suggest a pulse of ice surface lowering at about the same time that the foreland moraines were being abandoned (Wirsig et al., 2016). Widespread ice surface lowering in the high Alps was underway by no later than 18 ka. Thereafter, glaciers oscillated at stillstand and minor re-advance positions on the northern forelands for several thousand years forming the LGM stadial moraines. Final recession back within the mountain front took place by 19-18 ka. Recalculation to a common basis of all published ^{10}Be exposure dates for boulders situated on LGM moraines suggests a strong degree of synchrony for the timing of onset of ice decay both north and south of the Alps.

Ivy-Ochs, S., 2015, Cuadernos de investigación geográfica 41: 295-315.

Keller, O., Krayss, E., 2005, Vierteljahrschr. Naturforsch. Gesell. Zürich 150: 69-85.

Wirsig, C. et al., 2016, J. Quat. Sci. 31: 46-59.