



The expression of the Heinrich Event 1 in the Alps, evidence from the Maritime Alps

Matteo Spagnolo (1), Adriano Ribolini (2), Paolo Roberto Federici (2), Darryl E Granger (3), Marta Pappalardo (2), and Andrew J Cyr (4)

(1) University of Aberdeen, Geography and Environment Department, Aberdeen, United Kingdom (m.spagnolo@abdn.ac.uk), (2) Dipartimento di Scienze della Terra, Università di Pisa, Italy, (3) Department of Earth and Atmospheric Sciences, Purdue University, USA, (4) U.S.G.S., Menlo Park, USA

One of the most important post LGM cold climatic oscillation is that of the Heinrich Event 1 (HE1), during which a variation in the North Atlantic Ocean circulation caused a significant decrease of sea surface temperature that was accompanied by a general increase of sea-ice surface area (Hemming, 2004; McManus, 2004). In the Alps, the HE1 manifested itself as a general readvance of the Alpine glaciers known as the Gschnitz stadial. According to palaeo-glacial models developed from reconstructed Gschnitz glaciers and their ELA, this stadial has been attributed to the severest cold climatic conditions of the Lateglacial period in the Alps, in agreement to the climatic importance of the HE1 (Kerschner et al., 1999). However, and somewhat surprising given its relevant palaeo-climatic implications, this stadial has been relatively understudied in the Alps, and the actual extension of the Alpine Gschnitz glaciers and exact chronology is largely unknown.

Here, we present the results of our geomorphological study of the Gesso Valley, in the Maritime Alps (SW Alps), where we have been able to identify, date and reconstruct the extent of the Gschnitz stadial. ^{10}Be cosmogenic dating of Ponte Murato (PM) moraine constrains the first clear glacier readvance experienced by the main Gesso Glacier during the retreat that followed the LGM. The obtained age of $16,820 \pm 510$ Ka (average) marks the first date of this stadial in the whole Western sector of the Alps. Both this age and the ELA corresponding to the reconstructed Gesso glacier at PM appear to be consistent with other Gschnitz moraines ages and relative ELAs in other sectors of the Alps (van Husen, 2004; Ivy-Ochs et al., 2006). This suggests that the global climatic HE1 had a synchronized and comparable glacial effect throughout the entire Alpine chain.