Geophysical Research Abstracts
Vol. 14, EGU2012-5070, 2012
EGU General Assembly 2012

Chronology of glacial and periglacial deposits in front of the 1850 moraine of the Goldberg-Glacier, Sonnblick area (Salzburg/Austria)

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Since the Sonnblick-Observatory (3705 m) was founded in 1887, the nearby situated Goldberg Glacier (also termed Goldbergkees) was subject to numerous glaciological investigations. During the Würm glaciation the Goldberg Glacier covered the Rauris Valley and flew to the north. A giant landslide occurred in the upper Rauris Valley partly overlying moraines at an altitude of 1700 m.

Based on morphostratigraphic relationships relative age sequences were established in the 1960ies. The 1850 moraine of the Goldberg Glacier was mapped at an altitude of 2200 m, and scarce remnants of older and younger moraines are preserved. Applying several new methods we want to date moraine stages in front of the 1850 moraine. Based on a detailed geological and geomorphological mapping using LIDAR topography we selected boulders on glacial stadials and on landslides for dating their surface exposure using the cosmogenic nuclide Be-10. The lithology of boulders on stadials is mostly gneiss whereas boulders of landslides are mostly biotite schist, garnet-mica schist and quartzite. We also applied the Schmidt-Hammer method as a proxy for estimating the degree of weathering of exposed boulders in order to establish a relative chronology of their deposition. In addition C-14 dating of peat deposits bordering the landslide will be used for establishing a robust time frame of glacier retreat and events of mass movements. The field work revealed temporal relationships of cross-cutting landscape elements due to the fact that the dominant glacial stadial overlies the giant landslide of the upper Rauris Valley, and the supposed Egesen stadial moraine itself is topped by a younger landslide of smaller dimension.

Our goal is to decipher the chronologic evolution of the Goldberg Glacier as well as the landscape development of the Rauris Valley from the Alpine Lateglacial to the Holocene. Especially the effects of the cold spells of the Younger Dryas (12.7-11.6 ka BP) and of the “8,2 ka event” in this inner-Alpine mountain range, both linked to circulation changes in the North Atlantic, are of the essence for Quaternary stratigraphy and paleo-climatological reconstructions.