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^{10}Be cosmogenic nuclide chronology of the latest Pleistocene glacial stages in the High Tatra Mountains

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During the Pleistocene glaciers readvanced several times, shaping the mountains and building the variety of landforms which can be used to reconstruct paleo-glaciers and better understand their response to climate changes as well as the influences from the local topography. The aim of this project is to investigate the timing and geometry of glacier advances during the final stages of the last glaciation in the Tatra Mountains. This study comprises detailed geomorphological mapping of landforms, absolute and relative dating, which were applied in the the Vel'ká Studená Valley, selected as a case study for the Tatra Mountains. The ^{10}Be cosmogenic nuclide dating method was used to investigate the deglaciation history by dating the absolute time since the rock surface has been exposed by glacier. Surfaces selected for dating were also tested using the Schmidt-hammer tool to establish a relative chronology of landforms in the valley.

In the highest parts of the mountains two well-developed systems of moraines and relict rock glaciers are present. The younger system can be attributed to glaciers activity during the Younger Dryas whereas the older one represents most likely pre-Bolling-Allerod glacier activity. Both systems are limited to the glacial cirque but are significantly different in their geometry, reconstructed direction of glacier advance and observed landform freshness. In addition, an analysis of snow persistence using Landsat imagery and a Normalized Differential Snow Index (NDSI) has been performed. Patterns obtained from NDSI reveal recent late-spring and early-summer snow patches and indicate sites prone to glacier inception, growth and readvance in accordance with the spatial extent of glaciers during their last activity in the investigated mountain range.

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