

## Regional climatic significance of relict rock glaciers in the Eastern Alps

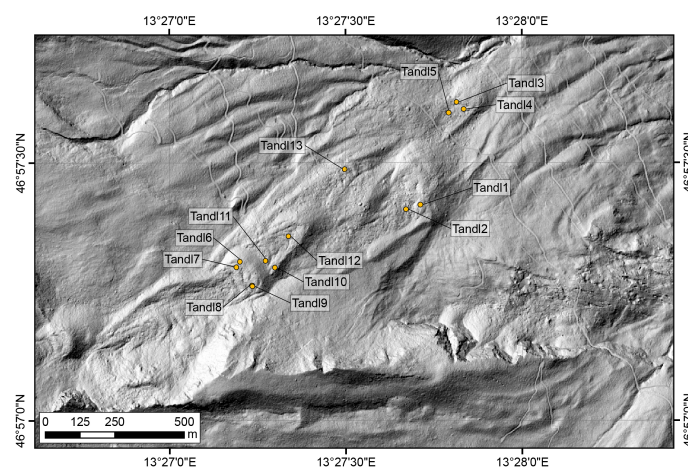
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The Tendl rock glacier deposit is located in the province of Carinthia (Austria), at the western valley side of the Maltatal along the north facing flank of the Reisseck mountain range. It presents an outstanding and complex occurrence of series of very low-reaching relict rock glaciers. The rock glacier deposit covers a total area of approximately 0.9 km<sup>2</sup>. Its lowest part reaches down to 1220 m above sea level (a.s.l.) and hence lies nearly 1300 m below modern permafrost limits, thus, representing the lowest relict rock glacier of the Eastern Alps (Reitner, 2007). This characteristic makes the Tendl rock glacier a good source for regional paleoclimatic reconstruction. The lower limit of intact rock glaciers can be used as a proxy for the lower limit of discontinuous permafrost on a regional scale. So the terminal position of relict rock glaciers will allow conclusions to be drawn about the discontinuous permafrost at the time when the rock glaciers were active. It has been shown that cosmogenic nuclides can be used to date how long since a rock glacier stabilized (end of a cold period), but have been only applied in few cases world-wide (Ivy-Ochs et al., 2009). Based on modeling estimates in these areas (Avian & Kellerer-Pirklbauer, 2012) the formation of such features even prior to the Younger Dryas is plausible. First results of recently completed 10Be

exposure dating of two gneiss boulders of the second lowest lobe of the rock glacier confirms these predictions. The lowest lobe may be even older. Therefore, in fall 2015 eleven more samples on different lobes were collected and will be prepared for 10Be exposure dating in 2016. The close proximity of the rock glaciers to likely Gschnitz stadial moraines provides an opportunity to combine rock glacier and moraine paleoclimate inferences. Furthermore, to assess the influence of the exposition of the rock glacier a second study area with the lowest southern facing rock glacier deposits of the Reisseck mountains (Reitner, 2007) will complete this study. In a side valley (Im Goassel) north of Mühlendorf nine samples were collected at two small rock glaciers no further than 10 km south-west of the Tendl rock glacier deposit. One has its lowest limit around 1680 m a.s.l. and also consists of several rock glacier lobes. The other a comparable small one is on a western face and has its lowest lobe around 1530 m a.s.l.. The detailed study, including field mapping as well as 10Be exposure dating on two sites with different geographical exposition, is an exceptional opportunity to elucidate regional paleoclimatic variations during the Lateglacial. Results will be compared with those from equilibrium line depression reconstructions from Lateglacial paleoglaciers and lake studies proxy data.



**Figure 1:** DEM ([https://www.data.gv.at/katalog/dataset/land-ktn\\_gelandeschummerung-karnten](https://www.data.gv.at/katalog/dataset/land-ktn_gelandeschummerung-karnten)) of the Tendl rock glacier showing the sampling locations.