



Geophysical survey of permafrost lenses under a hanging bog at low elevation (Untertal, Austria)

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Local permafrost distribution is not only dependent on aspect and elevation. Small scale topographic and microclimatic features can cause considerable deviations from the large scale distribution. Numerous investigations have verified the existence of ice lenses or at least ice-rich sediments under the foot of coarse-grained scree slopes. Combined with north-facing orientation, permafrost may occur at surprisingly low altitudes. We report on an interesting example from a sub-cooled scree slope near Schladming in the Untertal, Styria, at 900 m a.s.l. which makes it one of the lowest-lying examples in the Alps. Multi-method geophysical investigations (GPR, ERT, SR) have been carried out in combination for permafrost detection, flanked by microclimatic measurements and vegetation mappings.

Our investigations proved the existence, characteristics and location of permafrost lenses and could relate these occurrences to unique moss vegetation patterns and to the position of cold air blowholes. The change in the extent of frozen ground during the year was surprising because the smallest extent was found in June, and not in autumn as expected before. 2D-resistivity profiling (ERT) turned out to be the best suited method for the investigation, while the performance of GPR and seismics was poorer.