sandstone-rich member of late Campanian-early Maastrichtian age is exposed at the St. Veit/Gölsen quarries. Sandstones are rich in quartz with minor feldspar, mica and rare carbonate grains (mainly biogenic). They are strongly compacted and calcite cement fills minor pores, thus resulting in low primary porosity values.
In principle, the massive sandstones have the potential to act as reservoirs in the Vienna Basin basement. However, as primary and secondary porosity of these sandstones is low, fractured reservoirs of the Altlengbach Formation as present near faults and thrust planes may be the primary target for exploration within these rocks.

3D Landslide Change Detection using Terrestrial Laser Scanning

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Landslides are highly dynamic processes, which often appear after long and intensive rainfall events on sloped terrain. Areas with occurrence of landslides suffer from heavy erosion affecting infrastructure, causing loss of soil, degragation of agricultural land, and lowering attractiviness of landscape, with negative impacts on tourism industry. In this study we present a point cloud based method to describe and monitor changes on existing shallow landslide slopes. The test site investigated is located in the Schmirn Valley (Tyrol, Austria). Two terrestrial laser scans from 2011 and 2012 are used to analyse surface changes in 3D. The landslide is characterized by backward erosion at the top scar. First the scans are registered, georeferenced and filtered. Filtering is needed to remove outliers and high objects such as trees. The change detection proceedure is based on a point-based segmentation of landslide sub-parts (object primitives). Statistical features such as roughness and orientation are calculated for each sub-part. The sub-parts are handled as moving and deforming objects, which are tracked between time stamps. The presented poof of concept shows that this workflow is well suited to track changes of natural surfaces over time and can be used to calculate true area and volume changes on the level of object primitives.

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 (ground penetrating radar/GPR, 2D-resistivity profiling/ERT, seismics/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. ERT turned out to be the best suited method for the investigation, while the performance of GPR and SR was poorer.