



The influence of clay minerals on slope stability in Quaternary sediments in landslide areas of the Wienerwald Flysch Zone

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The Rhenodanubian Flysch of the northern Vienna Forest is composed of various layers of sandstones, marly shales, calcareous marls and clay schists which are covered by Quaternary periglacial cover beds and loess deposits. This area at the margin of the eastern Alps represents an undulating landscape of the Austrian low mountain regions.

The Vienna Forest Flysch region is considered to be susceptible to landslides. The alternating sequences of permeable and impermeable layers influence the stability of slopes negatively. Therefore slope stability is mainly dependant on the distribution of Quaternary layers and its specific clay mineralogy of clayey and marly layers.

In general, Quaternary sediments are situated on top of flysch sandstone. The base of the Quaternary deposits derives from periglacial solifluction processes, namely the Basal Periglacial Cover Bed, and consists of clays and marls mainly which have a high content of the swellable clay mineral smectite. Therefore the Basal Periglacial Cover Bed is characterized by a high plasticity and impermeability. These features are responsible for the formation of potential slip surfaces in the study area. The hanging layer is composed of up to four metres of permeable loess, which was deposited during the Würmian period. The top of the sequence is characterised by a further periglacial cover bed, composed of a mixture of loess and sandstones, which originates from the Late Glacial (Upper Periglacial Cover Bed).

On the basis of field surveys, sedimentology, mineralogy and slope stability modelling, the results from investigations on recent landslides are demonstrated.