



A multidisciplinary methodology for the characterization of a large rock spread in the Northern Calcareous Alps (Eastern Alps)

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The Northern Calcareous Alps are characterized by complex lithological and tectonic settings, which are a consequence of the multiphase Alpine orogeny. Several tectonic events caused a varying structural anisotropy with a high susceptibility towards certain types of gravitational mass movement.

Mt. Plassen is situated west of the Hallstatt village (Upper Austria). It is composed of Jurassic limestone, which overlies Permian fine-grained clastic rocks and evaporites (mainly part of the so-called Haselgebirge). This geotechnical predisposition causes rock spreading of the more hard and rigid limestone on the weak, mainly clayey rocks. Associated to this large slope instability are secondary rockfall and sliding processes. Further common process chains include rockfall triggering slides and/or earth flows by undrained loading of the ductile clay material. Thus, such fast moving flows/slides may endanger the houses and infrastructures in the Salzberg high valley and Hallstatt village.

Recent rockfall activity at Mt. Plassen provide evidences for greater, perhaps accelerating displacement rates of the rock spread. A multidisciplinary assessment strategy was chosen to analyse the ground conditions, to characterize the potential failure mechanisms in more detail and to evaluate the hazard potential of future events. Methods include field mapping (geologic, engineering geologic and geomorphologic), sampling and determination of soil parameters in active process areas, geophysical surveys (airborne geophysics and geoelectric measurements) and kinematic measurements (tape dilatometer and geodetic measurements over a period of 50 years).

Results of this multidisciplinary approach form the basis for further decision making such as the installation of a monitoring system or other preventive measures.