



Investigation of Bronze and Iron Age Mass Movements in a Prehistoric Salt Mine in Hallstatt, Austria

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Since long ago mass movements (e. g. rockfalls, landslides, earth and debris flows) are one of the most threatening natural hazards (if not the most) for mankind. Nowadays recent and active mass movements can be found all over the world, especially in mountainous areas with steep slopes. It can be assumed, that occurrence and frequency of mass movements in the past and in the present are roughly of the same order of magnitude. But mainly due to erosion and weathering relics of ancient mass movements are more difficult to identify and less frequent than relics of recent ones.

Hallstatt Village is recognized for its salt deposits. They have been exploited since the Neolithic period. Due to steep relief and unfortunate bedding conditions, mass movements have been frequent in the past and continue to affect the site today. The geotechnical situation - rigid rock caps overlying ductile subsoil - sets the most prevalent types of mass movements. Spreading, toppling, falling and sliding are the most common types of motion in hard rock whereas earth flows and earth and debris slides are the primary types of mass movements recorded in soft soil.

Archeological excavations indicate that prehistoric mining activities were seriously affected by the impact of large mass movements. Several different prehistoric mining cavities from the Bronze to the Iron Age (1600-300 BC) were found, that are filled by deposits from mass movements. To narrow down the type of the mass movements and their source the deposits were investigated sedimentologically. The deposits consist mainly of silt and clay but contain larger clasts as well. The results show lithological differences of the clasts and indicate different sources of the mass movements.