ABSTRACT

Recent mass movements currently comprise one of the main morphogenetic processes in the extensive anthropogenic relief of the foreground of the Krušné Hory Mountains in the Czech Republic. These mass movements result in several types of deep-seated slope failures, depending on the type of movement, lithological, structural, and geotechnical conditions and the water saturation of the landslide material. This thesis presents broad set of various methods of geomorphology, geophysics, engineering geology, dendrogeomorphology and geodesy in an attempt to fully understand the problem of slope failures in the Jezeří area located at the boundary between the Krušné Hory Mountains and the Most Basin (Czech Republic). An interdisciplinary approach has enabled an in-depth review of both the dynamics and development of recent slope failures as well as morphology and structure of slope failures. There are two sectors – Southeast and Southwest – with different types of slope failures. In the Southwest sector, mass movements occur in thick colluvial mantle and weathered Tertiary claystones. The main factors influencing their development include rainfall culminations, groundwater flowing from the valley of Šramnický Brook and former slope failures. All of the slope failures that have occurred here have originated at former slope failure sites. There is evidence to suggest that, over recent research (before 1980s), the site had been subjected to progressive deformation caused by the collapse of an old mine gallery. However, climatic data show that the reactivation itself was triggered by a dramatic rise in the water table induced by rapid snowmelt during a period of winter warming. Development of deep-seated slumps occurring in the Southeast sector. In assessing the climatic factors affecting landslide genesis, we evaluate two or three-year term anomalies in long-term precipitation balance. These anomalies cause the genesis of deep-seated landslides with a one or two-year delay. Furthermore, geophysical profiling has been used to characterise the internal sructure of landslides. The results show that fissures are continuing to develop above the reactivated landslide scarp while highly saturated stiff-fissured claystones provide an incipient slide plane. It is, however, clear that future landslide events will occur due to the favourable lithological, structural, and geotechnical conditions. Finally, we propose that future landslide activity at the site may be predicted by the height of water table as this defines a theoretical pore pressure at the depth of the shear plane.

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