# WATER RESOURCES – HAZARDS AND RISKS

## The effect of sediment and water properties on landslide occurrence

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Loess-paleosol bluffs can become unstable as a result of urbanization when houses are being built on them because of the panorama. The general effect of water in landslides is well known but still a hot topic. In this study, we explore the connection of landslides to weather conditions, such as the amount of rainfall or water level changes of the River Danube. The periodic behavior of the Danube water level was analyzed by wavelet spectrum analysis, and abrupt changes – using Bayesian changepoint analysis - were sought for in rainfall amount time series. These results were compared to the timing of landslides in Kulcs (1964, 1966, 1977, 2006, 2011, 2013), Hungary.
Chemical and physical properties of some layers of the bluff were also characterized to understand which ones were changed related to the mass movement. For this reason, 10 red clay layers were analyzed from three locations, 1) recent sliding surface and its environment (6 samples), 2) samples from a transect with water outflow (3 samples), and 3) surface sample from the riverside (1 sample). Granulometric parameters, main element composition, modal composition and petrographic properties were studied in these samples.
Results show that only two mass movements can be related to the hydrological conditions of the area. Furthermore, the red clay samples are weathered mainly from the transect samples. On the sliding surface, carbonate agglomerates are present, which are deformed due to the landslide. Hydrological properties, human activity and geochemical changes may all together affect landslide events.

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## Evaluation of shallow groundwater vulnerability to pollution using three different methods - Application to the shallow aquifer of Southeastern Hungary

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The groundwater system is universally recognized as under in-creasing threat due to overexploitation and pollution. Additionally, when dealing with the vulnerability to pollution, shallow aquifer systems with near-surface water tables are highly susceptible to diffusion pollution and suffer long-lasting damage.