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Combining spaceborne-derived precipitation and ground- based geo-datasets for landslide susceptibility mapping: Test case of the Isfara – Batken region of Kyrgyzstan

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Water content in the upper surface layers is a critical factor within the context of landslide hazard and risk, especially for those landsides triggered by earthquakes (Hong and Adler, 2008). In particular, knowing the recent rainfall and considering weather predictions has the potential to allow some form of forecasting in terms of the potential for landslide activity (Varnes, 1984). Such forecasting should also take into consideration expected levels of earthquke-induced ground motion, based on seismic hazard assessments. This involves a so-called multi-hazard and risk approach, where the interactions between different natural hazards are explicitly considered. However, in the Isfara – Batken area of the Kyrgyzstan, there is a lack of rain gauge data. Therefore, it is necessary to make use of satellite-based observations, such as those provided by the Tropical Rainfall Measuring Mission (TRMM). The products derived from TRMM may provide a temporal dimension to landslide susceptibility mapping, where the spatial variability is a function of various geo-datasets (geology, topography, land cover, seismicity). In fact, seismicity itself may be said to have a temporal dimension, given the different probabilities (return periods) for given levels of ground motion. This work presents the first efforts to develop landslide susceptibility maps that accommodate variability in both time and space for this region.

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Varnes, D.J. (1984) Landslide hazard zonation: a review of principles and practice, UNESCO, ISBM 92-3-101895-7