



## **Meteorological thresholds for landslide initiation and its potential application in a landslide early warning system in the Wanzhou section of Three Gorges Reservoir Area, China.**

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The rainfall threshold is often used to indicate the critical value which initiates the deformation and damage of slopes. Its determination is often regarded as the key issue to forecast the landslide occurrence based on rainfall data. For different landslide types, geology and related topography, rainfall thresholds vary significantly. When studying the rainfall threshold of landslides associated with water reservoirs, one should fully consider the changes of formation lithology and reservoir water level besides in order to address different early warning settings.

In this study, we classify the landslides in the Wanzhou section of the Three Gorges Reservoir Area and divide the stage of reservoir water level changes according to the operation of the reservoir. Applying mathematical statistics and analysis, the landslide displacement monitoring data and rainfall data are analyzed. The corresponding rainfall thresholds are obtained for different early warnings which relate to various rates of landslide displacement. Single-day rainfall and multi-day effective rainfall data are used to calculate the respective rainfall thresholds.

The results show in the flood season, that landslides with stratigraphic lithology of sand shale interbedding damage temporary and dilapidated buildings that can be reinforced at any time by simple remedies when the multi-day effective rainfall threshold exceeds 40mm and the single-day rainfall threshold 30mm respectively. Further studies are required to link the delineated landslide-initiating rainfall thresholds also to other environmental conditions in order to serve within a reliable landslide early warning system.