



## Rainfall-type landslide prediction based on landslide mechanism

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In general the determination of landslide rainfall threshold is mainly based on the empirical statistics of historical landslide disaster and rainfall. However, which often results in unsound prediction accuracy of regional rainfall-type landslide due to neglecting the difference effect of rainfall on diverse types of landslide disaster. In order to obtain accurate critical threshold of rainfall inducing landslides, based on the influence of rainfall on landslide mechanism and hydrological, in this paper a precise geological model is established and the soil water, ground water level and slope position shift of the landslides are monitored in real-time. By coupling the simulation results with the relationship between rainfall process and slope deformation, the regulation of slope failure induced by rainfall is discussed. The results indicate that a cumulative rainfall of 150 mm can make the landslide fully saturated, and generate the overall landslide instability along the soil-rock interface. Moreover, when the cumulative rainfall reaches 90 millimeter and lasts for more than 3 days, the displacement of bedding rock landslide exceeds 10 cm. This may be because of the deterioration of the mechanical properties and the increase of the pore water pressure caused by the rainfall infiltration. The prediction criteria for landslide instability established from mechanism analysis can provide a theoretical basis for accurate prediction of rain-sensitive landslides.

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