



A new physically-based model considered antecedent rainfall for shallow landslide

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Rainfall is the most significant factor to cause landslide especially shallow landslide. In previous studies, rainfall intensity and duration are take part in the physically based model to determining the occurrence of the rainfall-induced landslides, but seldom considered the antecedent rainfall. In this study, antecedent rainfall is took into account to derive a new physically based model for shallow landslides prone area predicting at the basin scale. Based on the Rosso's equation of seepage flow considering the antecedent rainfall to construct the hillslope hydrology model. And then, the infinite slope stability theory is using to construct the slope stability model. At last, the model is apply in the Baisha river basin of Chengdu, Sichuan, China, and the results are compared with the one's from unconsidered antecedent rainfall. The results show that the model is simple, but has the capability of consider antecedent rainfall in the triggering mechanism of shallow landslide. Meanwhile, antecedent rainfall can make an obvious effect on shallow landslides, so in shallow landslide hazard assessment, the influence of the antecedent rainfall can't be ignored.