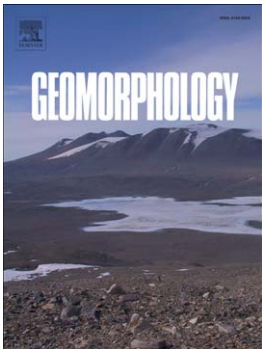

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Predicting the occurrence of channelized debris flow by an integrated cascading model: A case study of a small debris flow-prone catchment in Zhejiang Province, China

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Abstract

Excessive water in a channel is an important factor that triggers channelized debris flows. Floods and debris flows often occur in a cascading manner, and thus, calculating the amount of runoff accurately is important for predicting the occurrence of debris flows. In order to explore the runoff-rainfall relationship, we placed two measuring facilities at the outlet of a small, debris flow-prone headwater catchment to explore the hydrological response of the catchment. The runoff responses generally consisted of a rapid increase in runoff followed by a slower decrease. The peak runoff often occurred after the rainfall ended. The runoff discharge data were simulated by two different modeling approaches, i.e., the NAM model and the Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) model. The results showed that the NAM model performed better than the HEC-HMS model. The NAM