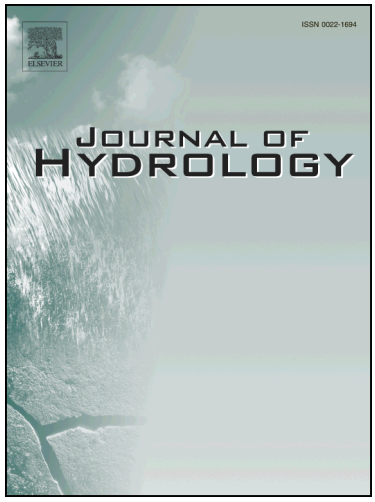

Research papers

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A modelling study of rainfall-induced shallow landslide mechanisms under different rainfall characteristics

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Abstract

Rainfall-induced shallow landslide is a common geological hazard around the world that can pose serious threat to both lives and property. Previous studies suggested that rainfall induced shallow landslides always occurred either above the bottom of a downward wetting front in infiltration, or below a rising water table. This paper proposed a different mechanism of shallow landslides in a modelling approach. The comprehensive physics-based Integrated Hydrology Model (InHM) and the infinite slope stability model were employed on a virtual slope to simulate the hydrologic response and estimate the slope stability. Different failure mechanisms with various characteristics were investigated under diverse rainfall scenarios (i.e., various combinations of rainfall depths, durations and temporal patterns). The results showed a novel mechanism of shallow landslides: a significant vertical change in saturated hydrologic conductivity causes the accumulation of infiltrated water, and