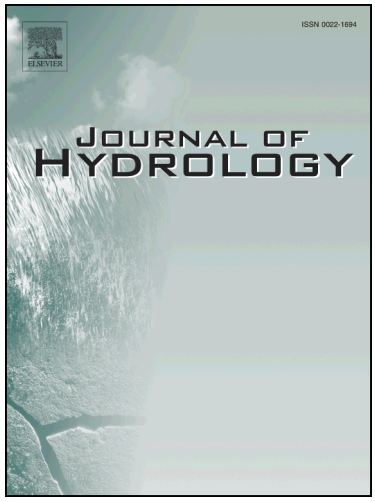

Review papers

Role of slope on infiltration: a review

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Role of slope on infiltration: a review

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Abstract

Partitioning of rainfall at the soil-atmosphere interface is important for both surface and subsurface hydrology, and influences many events of major hydrologic interest such as runoff generation, aquifer recharge, and transport of pollutants in surface waters as well as the vadose zone. This partitioning is achieved through the process of infiltration that has been widely investigated at the local scale, and more recently also at the field scale, by models that were designed for horizontal surfaces. However, infiltration, overland flows, and deep flows in most real situations are generated by rainfall over sloping surfaces that bring in additional effects. Therefore, existing models for local infiltration into homogeneous and layered soils and those as for field-scale infiltration, have to be adapted to account for the effects of surface slope. Various studies have investigated the role of surface slope on infiltration based on a theoretical formulations for the dynamics of infiltration, extensions of the Green-Ampt approach, and from laboratory and field experiments. However, conflicting results have been reported in the scientific literature on the role of surface slope on infiltration. We summarize the salient points from previous studies and provide plausible reasons for discrepancies in conclusions of previous authors, thus leading to a critical assessment of the current state of

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