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Impact of Soil Parameter Integration on Hydrologic Response Simulated by FLO-2D Model

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The spatial processes in rainfall-runoff models provide a means of representing the catchment for modeling. Rainfall-runoff models cover a wide spectrum of spatial processes and they are classified into lumped and distributed models. Each cell has distinct input and parameter and shows separate hydrologic response in distributed rainfall-runoff models. However spatial variability of catchment parameters is disregarded and is set as equal for entire area in lumped models. Each type has pros and cons and the spatial processes and output produced may practically determine the type of model needed. It is important how to describe the surface characteristics in catchment hydrology and the specification of the surface characteristics is crucial to have flowrate simulated by rainfall-runoff model. It is hard to conceive that all spatial scales of the surface map in need of application match the rainfall-runoff model. This study examines how the integration of soil parameters affect the hydrologic output simulated by two-dimensional rainfall-runoff model. The study focuses on the parameters of both Green-Ampt and SCS Curve method. The FLO-2D is facilitated in a small catchment to compare the differences of hydrologic output depending on the three different representing method of soil parameters; 1) a separate value for each cell, 2) a representative as most frequent occurring value for entire area, 3) a representative as arithmetic mean value for entire area. Three different methods are applied to FLO-2D and the trend and peak flowrate are examined in relative terms. This study would provide intuition and guideline in determining model selection in catchment hydrology.

Key words: Rainfall-runoff, Lumped, Distributed, Parameter, Integration, FLO-2D

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