Relations between parameters in the linear reservoir and kinematic wave models

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Abstract

The objective of this study is to explore the relation between the sets of parameters involved in the kinematic wave model and the linear reservoir model in runoff analyses. In the study, an approximate function of recession curves, obtained from the results of indoor rainfall-runoff experiments, is used to characterize the parameters involved in the two models and to explore the relations between the corresponding sets of parameters. Additionally, the observed hydrographs resulting from different rainfall durations and intensities on both bare and weed hillsides obtained from the rainfall experiments are simulated applying the two models. The simulation results indicate the applicability of the conversion relation between the two sets of parameters, which were determined based on the recession constants. This provides a better understanding of the link between the two models.

KEY WORDS kinematic wave model; linear reservoir model; hydrograph recession; surface water hydrology; Manning's equation; rainfall-runoff experiments