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Hydrograph and Flood Volume Prediction using HMS SMA: A case study

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Abstract:
Hydrologic simulation of watersheds is required for estimation of peak flow and flood volume for design of dams and other water structures. In this study, we apply the Stanford Watershed Model-IV (SWM-IV) and HMS Soil Moisture Accounting (SMA) models for evaluating mean daily flows, peak flows, monthly and annual flood volume from the Khosrow Shirin Watershed, situated at the north-western of Fars Province in Iran. A 5-yr record (2002-2007) of rainfall and discharge data is available from the Dehkadeh Sefid hydrometric station situated at the outlet of this watershed. Sensitivity analysis of twelve model parameters was performed to determine the important effective parameters. Available data from 2002-2005 (hydrological years) were used for model calibration and 2005-2007 records of data for model validation. Simulations of HMS SMA for mean daily flow, peak flow and monthly discharge volume and SWM-IV for annual flood volume had higher efficiency. The results of this study emphasize the use of hydrologic models on data scarce watersheds.

Keywords: Continuous Hydrologic Modeling, SWM-IV, HMS SMA, Khosrow Shirin Watershed, Iran