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Rainfall–Runoff Simulation Using WetSpa Model in Golestan Dam Basin, Iran

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Abstract : Flood simulation and prediction is one of the most active research areas in surface water management. WetSpa is a distributed, continuous, and physical model with daily or hourly time step that explains precipitation, runoff, and evapotranspiration processes for both simple and complex contexts. This model uses a modified rational method for runoff calculation. In this model, runoff is routed along the flow path using Diffusion-Wave equation which depends on the slope, velocity, and flow route characteristics. Golestan Dam Basin is located in Golestan province in Iran and it is passing over coordinates 55° 16´ 50" to 56° 4´ 25" E and 37° 19´ 39" to 37° 49´ 28"N. The area of the catchment is about 224 km², and elevations in the catchment range from 414 to 2856 m at the outlet, with average slope of 29.78%. Results of the simulations show a good agreement between calculated and measured hydrographs at the outlet of the basin. Drawing upon Nash-Sutcliffe model efficiency coefficient for calibration periodic model estimated daily hydrographs and maximum flow rate with an accuracy up to 59% and 80.18%, respectively.

Keywords : watershed simulation, WetSpa, stream flow, flood prediction
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