

Abstract

Watershed study performed in Ahar chai with area 786/57 km² in the province Azarbayjan sharghei. In this study simulation (Statistical period 1386-1381) distributed hydrological model-where WetSpa, model rainfall by precipitation, evapotranspiration, temperature and daily discharge data and also combination three main map of the models include of DEM, soil and land use. Then the model was calibrated. Results of the calibration model based on the standard Nash-Sutcliffe obtained about %64.8 for maximum flow rates %76.65 and for the minimum flow rates %61.28. also obtained %3.65 Bays model to balance the flow volume (water balance) of the model and RMSE of the model %78.18. After obtaining the appropriate values to set the desired parameters for calibration, optimization of parameters in the calibration phase, with constant parameter values, statistically validated model for the second period (1391-1386) took place. The validation of the model based on the standard Nash-Sutcliffe about %57/17, for flow rates of up to %74.44 and the rate of at least %48.49 of the Bays model to balance the flow volume (water balance) %1.88 and RMSE model %91/62 respectively. The results of the sensitivity analysis of model parameters in such domains Kg (groundwater loss parameter) was identified as the most sensitive parameter in the model. This value indicates the acceptability of the results of the model to simulate daily flows. The other side of the results obtained from the WetSpa to model water balance demonstrates. Distributed hydrological model parameters, the water balance components such as evaporation, runoff (surface, subsurface, groundwater) and the initial loss is well estimate. The model for future land use conditions were also simulated. The results showed that by applying the optimistic scenario that leads to increased levels of forest and agricultural land than the pessimistic scenario, the land barren land and pasture is switching. The results of optimistic and pessimistic scenarios show that the pessimistic scenario, the total runoff and peak flood discharge areas, respectively, 21.3 and 21.7 percent increase.

Keywords: Flood simulation, Landuse change, Ahar Chai watershed, WetSpa model



University of Zabol
Graduate school
Faculty of Wather and Soil
Department of Range and Watershed Management

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**Effect of land use change on flood behavior using
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Supervisor:
Dr.A.R.Moghadamnia
DR.A.Pahlevanravi

Advisors:
Dr. H. Zeinivand

By:
S. Nazargikloo

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