



River Flow Simulation in the Ghorichay Watershed using the Wetspa Model

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1-Introduction

Simulation of the rainfall-runoff process in a watershed is highly important from the point of view of hydrological issues, water resources management, river engineering, flood control structures and its storage (Moradipor, 2010). Rainfall-runoff estimation using a distributed hydrological model and the technique of GIS has become possible, practical and common. The Wetspa model is a distributed model simulating runoff and water balance that is performed at different time scales including hourly or daily basis (Najafinejad, 2020).

2-Methodology

In this research, the discharge is simulated using Wetspa model in the Ghorichay watershed. This watershed (as one of the sub-watersheds of Gorganrood) with an area of 2481.5 ha is located in the south of Ramian city in Golestan province. The data used by the model are land use maps, soil texture, digital elevation model, precipitation, evaporation, temperature and discharge (for calibration and validation of the model). Calibration of 13 parameters was performed manually and automatically for 7 years at the beginning of the statistical period and model validation was performed for a period of 5 years.

3-Results and Discussion

The results of the model evaluation show the accuracy of discharge simulation and very good agreement between the simulated data and observations based on the Nash-Sutcliffe criterion of 67.21% in the calibration period and 76.34% in the validation period. Also, the discharge calculated by the Wetspa model for the whole watershed was 28.31%, which in comparison with the observed discharge of 30.12% indicates a good simulation of the model.

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4-Conclusions

Since the Vetspa model has the ability to simulate runoff in the entire cellular network of the basin. This model capability allows managers and experts to identify different areas in terms of runoff and sediment potential before performing any operation.

Keywords: WetSpa model, Simulation, River flow, Ghorchay.

5-References

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