

Simulation of Inflow to Urmia Lake Using SWAT Model

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Abstract

Urmia Lake, located in north-west of Iran, has been exposed to various threats such as drought, construction of dams, land use changes and increased global temperature. Due to the importance of Urmia Lake, it is feasible to conduct different kinds of studies to identify the problems of its watershed. The main objective of this study was to evaluate SWAT program's ability to simulate runoff in Urmia Lake watershed with an area of 52000 km². The model was run for the 1980-1997 period. Calibration and validation periods were from 1980 to 1991 and from 1992 to 1997, respectively. The results of calibration for 10% and 85% of hydrometric stations were very good and suitable, respectively. Also, validation results for 25% and 45% of hydrometric stations were very good and suitable, respectively. These results show the high ability of SWAT model to simulate discharges in Urmia Lake watershed. Moreover, some factors influencing inflow to the lake in recent years were evaluated. The outcomes revealed that recent changes (dam constructions, climate change and land use change) in the watershed have caused inflow volume to the lake to decrease by 80%. So, if natural management conditions had prevailed in the watershed, the Lake's conditions would have been much better.

Keywords: Urmia Lake, Natural flow, SWAT, Uncertainty analysis.

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