Uncertainty Evaluation of Baseflow Separation Filter methods: A Case Study of the Urmia Lake Basin in Iran

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Abstract

In this study, we evaluated uncertainties in baseflow separation filter methods focusing on changes in recession constant (α) values, which include Lynie & Holick (LH) algorithm, Chapman algorithm, Eckhardt filter, and EWMA filter. Here, we analyzed daily streamflow data at 14 stations in the Urmia Lake basin, Iran, from 2015 to 2019. The α values were computed using three different approaches from calculating the slope of a recession curve by averaging the flow over all seasons, a correlation method, and a mean value of the ratio of Q_{t+1} to Q_t. In addition to the α values, the BFImax (maximum value of the baseflow index (BFI)) was determined for the Eckhardt filter through the backward filter method. As results, it indicates that the estimated baseflow is dependent upon the selection of filter methods, their parameters, and catchment characteristics at different stations. In particular, the EWMA filter showed the least changes in estimating the baseflow value by changing the α value, and the Eckhardt filter and LH algorithm showed the highest sensitivity to this parameter at different stations.

Keywords : **Baseflow separation, filter methods, recession constant value, uncertainty evaluation**

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