

Application of time series in drought prediction (case study: Orumiyeh and Chahriq stations)

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Abstract

Drought prediction is of great importance in water resources engineering studies because of its vital role in drought crisis management and efficient water resources planning. The main goal of this research is the prediction of drought severity and its frequency, using precipitation synthetic data generation. The generation of synthetic data was performed employing the linear time series, ARMA, at two selected stations in the West basin of Orumiyeh Lake, West Azarbaijan, Iran. In this regard, normality and homogeneity of the time series have been performed and ARMA model was utilized to simulate normalized data sets. According to less Akaike information criterion, the model of ARMA (1,0) was chosen as the best model. To select the most suitable model for simulation of time series, annual precipitation data were predicted corresponding to the number of statistical years in 1000 samples. Finally, drought indices of SPI and PNPI were calculated and their frequencies were determined for periods of 1, 10, 25, 50, 75 and 99.

Key words: ARMA model, drought index, drought severity, prediction, time series model