عنوان مقاله:

Flood Analysis in Karkheh River Basin using Stochastic Model

محل انتشار:

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خلاصه مقاله:

This study analyzed the annual streamflow of Karkheh River in Karkheh river basin in the west of Iran for flood forecasting using stochastic models. For this purpose, we collected annual stremflow (peak and maximum discharge) during the period from 1958 to 2015 in Jelogir Majin hydrometric station (upstream of Karkheh dam reservoir). A time series model (stochastic model or ARIMA) has three stages consists of: model identification, parameter estimation and diagnostic check. Model identification was done by visual inspection on the Autocorrelation and Partial Autocorrelation Function. Three types of ARIMA(p,d,q) models (0,1,1), (1,1,1) and (4,1,1) suggested for the studied series. The suggested model parameters were computed using the Maximum Likelihood (ML), Conditional Least Square (CLS) and Unconditional Least Square (ULS) methods. In model verification, the chosen criterion for model parsimony was the Akaike Information Criteria (AIC) and the diagnostic checks include independence of residuals. The best ARIMA model for this series was (4,1,1), with their AIC values of 88.9 and 77.8 for annual peak and maximum streamflow respectively. Forecast series up to a lead time of ten years future (2006 to 2015) were generated using the accepted ARIMA models. Model accuracy was checked by comparing the predicted and observation series by coefficient of determination (R2). Results show that the ARIMA model was adequate for the flood analysis in Karkheh River and the forecast of the series in short time at future.

کلمات کلیدی:

Stochastic Model; Flood Analysis; Maximum Likelihood; Karkheh River Basin