Estimating flood quantiles in southwestern part of Saudi Arabia

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Abstract

Estimating of flood quantiles is an important requirement in the proper management in the proper management of water resources in any country. In this study, regional regression analysis was performed for the purposes of estimating flood quantiles in some of the watersheds located in the western and southwestern parts of Saudi Arabia. The Generalized Least Square approach as opposed to the widely used Ordinary Least Square approach was used in the regression analysis. The dependent parameters of the regression analysis were the quantiles predicted by the Log Pearson Type III model and the independent parameters Type III model and the independent parameters were the watershed physiographic parameters such as area, main channel length, main channel slope and watershed average slope. In contrast to the usual watershed phsiographic parameters, the watershed response time measured as time-to-peak of the flood stage curve and watershed order number were also used to predict the flood quantiles. Results showed that the watershed response time measured as the watershed time-to-peak and the watershed order number are significant parameters in predicting flood quantiles in some of the studied watersheds.