Estimating flood quantiles in southwestern part of Saudi Arabia

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Abstract: Estimating flood quantiles is an important requirement in the proper management of water resources in any country. In this study, regional regression analysis is 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 is used in the regression analysis. The dependent variables of the regression analysis are the quantiles predicted by the Log Pearson Type III model and the independent variables are the physiographic variables such as area, main channel length, main channel slope, and watershed average slope. In contrast to the usual watershed physiographic variables, the watershed response time measured as time-to-peak of the flood stage curve and watershed order number are also used to predict the flood quantiles. Results show 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 Saudi Arabia.