Abstract

In this study, we present a method to carry out flood frequency analysis when the assumption of stationarity is not valid. A wavelet transform model is used to flood discharge estimation. A full series is applied to flood discharge estimation using two different wavelet functions. The energy function of wavelet was used to estimate flood discharge. The data were decomposed into some details and one approximation through different wavelet functions and decomposition levels. The approximation series was employed to estimate flood discharge. This was performed using daily maximum discharge data from on the Tamer hydrodynamic station in the north of Iran. In this way, the data from 1970 to 2009 were evaluated by wavelet analysis. Results illustrate that the decomposition levels in wavelet transform have a significant role in the flood discharge estimation. For instance, in 100 years return period, the flood discharges are 13.06 and 110.92 by Haar (db1) mother wavelet in decomposition level of 1 and 8, respectively. It is shows a more than 8 time growth in flood discharge. The higher decomposition levels are closer to traditional statistical methods such as annual maximum and partial duration series.
References


Index Terms

Computer Science  Signal Processing
Keywords

Flood Discharge Estimation, Tamer Watershed, Haar, Daubechies, Time Series, wavelet Transform.