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Flood frequency study in the lower reach of the Yellow River by regional L-moments analysis method

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Abstract Regional L-moments analysis has been applied to flood frequency in the lower reaches of the Yellow River. Screening of the data has been carried out by employing a discordancy measure (D_i) in terms of the L-moments. Homogeneity of a region has been tested using the heterogeneity measure (H) through Monte Carlo simulation using the four-parameter Kappa distribution. It has been observed that the data at eight sites in the lower Yellow River constitute a homogeneous region. Among five distributions tested, i.e. GEV, GNO, GLO, GPA and PE3, it was found that the GLO is the probability distribution that best models the data at the eight sites in the homogeneous region. Also, a regional flood frequency expression has been developed using the regional L-moments analysis for the GLO distribution, which has potential application to estimation of the flood frequencies in ungauged areas.

Key words flood frequency; GLO distribution; regional analysis; L-moments, return period; ungauged area