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# Climate indexes and high runoff relations in Lanjiang River Basin, China

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Quantifying the relations between climate indexes and high runoff is of importance for seasonal flood forecasting and non-stationary flood frequency analysis. This study aims to investigate the relationship between three climate indexes (PDO, SOI and EASMI) that are of influence, and high runoff events for the Lanjiang River Basin, East China. To accomplish this aim, the relationships between precipitation and runoff, precipitation and three climate indexes, runoff and three climate indexes at Jinhua and Quzhou stations in the basin are studied. The linear and multiple regression methods are used to compute Pearson and Spearman correlation coefficients. The final results show that both Jinhua and Quzhou have a positive high relationship between precipitation and runoff. Generally, a rainfall event with lag time of zero days and a temporal resolution of three days is sufficient to gain an optimal correlation value. The relationship between the PDO index and the precipitation is found to be positively significant for both areas but the relationship between the PDO and the runoff at Jinhua is not significant any more. The optimal temporal resolution for Jinhua starts at 9.5 years and for Quzhou at 14 years, both with a lag time of 1.5 years. For the long term, the SOI index has a negative relationship with the precipitation. The relationship between the precipitation and the EASMI index is negatively significant for Quzhou but not significant for Jinhua. The multiple regression showed that for most combinations of climate indexes, the correlations between climate indexes and precipitation or runoff are higher than the linear regression.