



Spatio-temporal analysis of extreme drought events in Yellow River Basin, China

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Drought is one of the recurrent nature hazards in Yellow River Basin (YRB), China and has taken great influence to socio-economic development and people's lives. In this study, the spatio-temporal variations of drought in YRB are analyzed by annual and monthly Palmer Drought Severity Index (PDSI) during 1960-2009. The variation of annual PDSI shows that a slight dry trend is detected in the whole basin during the last 50 years. The frequency of drought shows that drought in the northern part is occurred more frequently than that in the southern part. The results also indicate that drought risk in the northern part of upper and middle reach is high, while drought risk in the lower reach of YRB is low. It is worth noting that the frequency of extreme drought is a little decreased before 1980s while increased again after 1980s and the number of extreme drought is the largest in the 21st century. From the Mann-Kendall trend analysis, annual PDSI of most stations (46 over 54 stations) present a dry trend during 1960-2009, and five stations show an evident dry trend which are located in some regions of Gansu, Shanxi and Shaanxi province. Monthly PDSI in spring, autumn and winter shows a similar variation of annual PDSI in most stations that dry trend are found in most stations and wet trend are only detected in some regions of Qinghai, northern part of Inner Mongolia and southeastern part.