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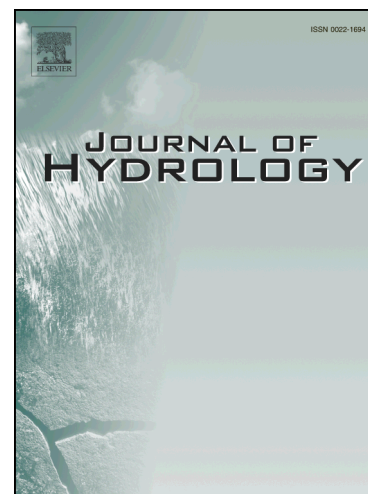
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Drought evolution and its impact on the crop yield in the North China Plain

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Abstract: The understanding of the impact of drought on the agricultural ecosystem is key to minimize drought-related yield losses. In this study, we analyzed the spatiotemporal characteristics of drought events in the North China Plain (NCP) based on the Standard Precipitation Evapotranspiration Index (SPEI) and investigated the impact of drought on winter wheat and summer maize yields. The results indicate an overall drought and wetting trend during the winter wheat growing season in the Henan and Shandong provinces, respectively. A significant wetting trend was detected in the NCP during the summer maize growing season at the 1-, 3-, 6-, and 12-month scales. Moreover, the drought episodes clearly reveal that the drought pattern has changed from summer and autumn droughts in the 1980s, to autumn and winter droughts in the 1990s, and to winter and spring droughts in the recent decade. Our results also show that the annual variations in the detrended SPEI can explain extensive fluctuations associated with both

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