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The sensitivity of climatic drivers to the meteorological drought variability in the north of China

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Drought is a major natural hazard measured by precipitation or water availability evidently below normal level over an extended period of time for a region that can have destructive impacts on regional food supplies, water resources, ecosystems, economy, and the environment. In this study, we use the Standardized Precipitation Evapotranspiration Index (SPEI) computed from meteorological observations at 97 stations in the Yellow River Basin, China (YRB) to study the drought variability during 1960-2013. Also, the sensitivity of climatic factors to the drought variability is also analyzed. It is revealed that there is a slight dry trend in the YRB during the past several decades, and the drought frequency in the north is more frequently than in the south of the YRB. The multiple linear regression indicates that both the precipitation and atmospheric demand of evaporation (reflected by potential evapotranspiration (PET) here) plays an important role in the drought variability in the YRB. Under most occasions, the dry/wet trends mainly caused by either the precipitation or PET, will be intensified by the other climatic factors and finally result in a more serious aridification/ humidification trends.