



Natural variation and Human-induced Changes of drought pattern in China

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The new version of PRC-GLOBWB model was applied to evaluate the hydrological drought under natural conditions and human influences at a high spatial resolution (10 km by 10 km) for the period of 1961-2016. The new version of PCR-GLOBWB model performance well in simulating river discharge over China, considering the water management in the modeling framework. Results show that human activities reduce the drought frequency and standardized drought deficit volume (StDef) up to 80% in parts regions of southeast of China during the period of 1961-2016. Human water management reduce the drought frequency in south east regions about 20%-100% compared to the natural variability. Return period of the severest drought year in each province or city demonstrates that human activities release the StDef of southeast region, while natural variability play a major role in the north parts of China. Human water use (irrigation and reservoir) has influences on the changes of hydrological drought characteristic of China during 1961-2016.