

Climate changes impact on water resources in Yellow River Basin, China

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ABSTRACT

The linkage between climate change and water security, i.e., the response of water resource to the future climate change, have been of great concern to both scientific community and policy makers. In this study, the impact of future climate on water resources in Yellow River Basin in North of China has been investigated using the Coupled Land surface and Hydrology Model System (CLHMS) and IPCC AR5 projected future climate change in the basin.

Firstly, the performances of 14 IPCC AR5 models in reproducing the observed precipitation and temperature in China, especially in North of China, have been evaluated, and it's suggested most climate models do show systematic bias compared with the observation, however, CNRM-CM5, HadCM5 and IPSL-CM5 model are generally the best models among those 14 models.

Taking the daily projection results from the CNRM-CM5, along with the bias-correction technique, the response of water resources in Yellow river basin to the future climate change in different emission scenarios have been investigated. All the simulation results indicate a reduction in water resources. The current situation of water shortage since 1980s will keep continue, the water resources reduction varies between 28 and 23% for RCP 2.6 and 4.5 scenarios. RCP 8.5 scenario simulation shows a decrease of water resources in the early and mid 21th century, but after 2080, with the increase of rainfall, the extreme flood events tends to increase.

Keywords: Coupled land surface-hydrology model, Water resources, climate change, hydrological process simulation, Yellow River Basin

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