



Impact of climate change and anthropogenic activity on terrestrial water cycle and water resources in East Monsoon Area of China

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The water cycling changes and the water resource variability in China Eastern Monsoon Region (EMR) is rather complicated associated with frequently occurred droughts and floods in this area, which is mostly related to the aspects of both strong monsoon influences of natural changes and climate change induced by carbon dioxide emissions due to anthropogenic forcing. The major changes in the terrestrial water cycle of China is the combined action caused by the greenhouse gas emissions and the evident natural climate variability in the EMR, with the natural climate variability account for approximately 70% and the anthropogenic forcing about 30%. The occurrence of extreme droughts and floods will probably increase in EMR in the future with future increasing CO₂ emissions contribution rate. On the other hand, the rising temperature will also influence the agricultural water consumption, and finally exert large impact on the food security in China. The agricultural water consumption will increase about 4% of the total water consumption as the temperature increased by 1 °C. Therefore, the climate change will probably have significant impacts in the EMR, which covers almost the eight large major river basins in China, such as Yangtze River, Yellow River, Huai River, Hai River and Pearl River, as well as the major south-to-north water transfer project (middle route) in China. For the water security issue, it is necessary to take adaptive countermeasures and measures to reduce the vulnerability of water resources and their risks.