

Impacts and Adaptation

Research Advances in Impacts of Natural Climate Variability and Anthropogenic Climate Change on Streamflow

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摘要 Based on the review of the successive four assessment reports of the IPCC WGII on climate change impacts on streamflow from 1990 to 2007, it is summarized that the first (FAR) and second (SAR) assessment reports were regarded as the first generation studies, featuring the impacts of mean climate change on streamflow and the adaptation, while the third (TAR) and fourth (AR4) assessment reports as the second generation studies, emphasizing the impacts of anthropogenically and naturally forced climate changes on streamflow and the adaptation. The development process and existed problems of traditional assessing methodologies of the impacts of climate change on hydrology and water resources are analyzed. It is pointed out that the impacts of decadal and multi-decadal variabilities of climatic variables on streamflow can be identified in the traditional methodology of hydrological impact studies, but without consideration of daily, seasonal and interannual variabilities, which are related with changes in the frequency and intensity of extreme events. As the results, the negative impacts of climate warming on droughts, floods and water demand of irrigation might be underestimated. As for further studies, the paper comes to a conclusion suggesting the enhancement of the interdisciplinary study of hydrology and climatology in the next IPCC assessment report.

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