

Editorial: Impact of climate change on the hydrological cycle

Climate change manifests itself primarily through changes in the water cycle. As climate changes, droughts, floods, melting glaciers, sea-level rise and storms intensify or alter, often with severe consequences. Climate change impacts have direct consequences for water security and conflict. To achieve the Sustainable Development Goals, climate change adaptation will have to build climate resilience. An integrated view on water, the biosphere and environmental flows is required to devise sustainable agricultural and economic systems that will allow us to decelerate climate change, protect us from extremes and to adapt to the unavoidable at the same time.

This special issue aims to contribute to the understanding of hydrological processes and efficient water management strategies in changing climate. We invited contributions (including original research and reviews) in any of the following areas or related ones: climate extremes and impacts on water resources, water availability in a changing climate, climate change and impacts on water supply, climate change mitigation measures and adaptation strategies for water resources in a changing environment.

Global climate change and human activities are increasingly affecting the regional water resource carrying capacity (WRCC). The paper by Qiu *et al.* used a fuzzy comprehensive evaluation model and combined the natural and social attributes of WRCC to assess the WRCC status. The authors constructed a WRCC-level evaluation model and used it to evaluate the carrying level of two typical cities in China, Shijiazhuang and Langfang, for the 2006–2015 period.

To get insights into the effects of sea ice change on the Arctic climate, the paper by Liu & Lu used a polar atmospheric regional climate model to perform two groups of numerical experiments with prescribed sea ice cover of typical mild and severe sea ice and showed that the degree of significance in pressure change is modulated by atmospheric stratification stability.

Sea-level rise is a worldwide concern, as a high percentage of the population is located in coastal areas. The paper by Mills *et al.* describes, as the physical, chemical and biological components of estuaries are sensitive to changes in salinity, the purpose of the study is to further evaluate salt intrusion in the Guadiana Estuary caused by sea-level rise. There was an overall increase in salinity and land inundation in the estuary in response to sea-level rise.

The special issue features nine papers developed from the 3rd International Conference on Sustainable Development of Water and Environment (ICSDWE2020). The papers span a wide range of promising areas for climate change. We hope that this special issue will provide some new insights into the impact of climate change on the hydrological cycle and help to identify new directions for future research.

Finally, we thank all paper authors who have accepted our invitation to contribute to this Special Issue, reviewers for their comprehensive and valuable comments to these studies and also the excellent editorial team of *Journal of Water and Climate Change* for their efforts and professional commitment.

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Qiu, Q., Liu, J., Li, C., Jiao, Y., Yu, F. & Li, X. Evaluation of water resources carrying capacity of two typical cities in northern China.

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