Geophysical Research Abstracts
Vol. 21, EGU2019-12048-1, 2019
EGU General Assembly 2019

Analyzing the Impacts of Climate Change on Hydro-Environmental Conflict-Resolution Management

Xiang Fu, Xuefeng Chu, and Yuni Xu
China (xfu@whu.edu.cn)

Conflict-resolution methods have been applied to water resources management to balance conflicting interests of stakeholders. Due to the climate change impacts on hydrologic processes, the strategy selections of conflict-resolution methods can be influenced, resulting in different selection rules for historical and future periods. This study aims to quantify the impacts of climate change on the strategy-selection rules of the conflict-resolution methods for better long-term strategic decision-making. The methodology of this study consists of climatic, hydrological, environmental and multi-objective optimization models, two fuzzy social choice methods (FSCMs) and four game-theoretical bargaining methods (GTBMs). The hydro-environmental conflict-resolution management in the Yangtze River of China is selected as the case study. The results show that the strategy selection of GTBMs is more stable and results in a better balance between hydropower and environmental objectives, compared to that of FSCMs. Moreover, considering climate change, under the appropriate environmental flow pattern, the stabilities of the strategy selections of FSCMs and GTBMs are slightly influenced, and the average satisfied degrees of both objectives obtained by FSCMs and GTBMs in the future period (2021-2080) are lower than those in the base period (1950-2012). The findings from this study provide guidance for hydro-environmental conflict-resolution management from a sustainable development perspective.