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Editorial
Modeling of Water Quality, Quantity, and Sustainability

Yongping Li,[1] Guohe Huang,[2] Yuefei Huang,[3] and Xiaosheng Qin[4]

[1] *MOE Key Laboratory of Regional Energy Systems Optimization, S-C Resources and Environmental Research Academy, North China Electric Power University, Beijing 102206, China*
[2] *Environmental Systems Engineering Program, Faculty of Engineering and Applied Science, University of Regina, Regina, SK, Canada S4S 0A2*
[3] *State Key Laboratory of Hydro-Science and Engineering, Tsinghua University, Beijing 100084, China*
[4] *School of Civil & Environmental Engineering, Nanyang Technological University, Blk N1-01c-82, 50 Nanyang Avenue, Singapore 639798*

Correspondence should be addressed to Yongping Li; yongping.li@iseis.org

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For decades, water shortage, flooding, and water deterioration problems have led to a variety of adverse impacts on socioeconomic development and human life. Challenges of water quality and quantity management adhering to the principle of sustainable development have been of significant concerns to many researchers and decision makers [1–6]. These issues are highly complicated, involving a large number of social, economic, environmental, technical, and political factors, coupled with complex spatial variability and cascading effect [7, 8]. Climate change and human interference could affect the related management systems at a regional scale and lead to more significant spatial and temporal variations of water quantity and availability as well as the associated environmental and ecological conditions. Such complexities force researchers to develop more robust mathematical methods and tools to analyze the relevant information, simulate the related processes, implement mitigation strategies, assess the potential impacts/risks, and generate sound decision alternatives. Therefore, it is desired that mathematical techniques be developed to aid decision makers in formulating and adopting cost-effective and environment-benign water management plans and policies.

The paper "*River flow estimation from upstream flow records using support vector machines*" by H. Karahan et al. proposed a novel architecture for flood routing model and validated the model efficiency on several problems by employing support vector machines. The results showed that the proposed architecture advances the model performance under noisy and missing data conditions and the support vector machines can be powerful alternative in modeling flood routing.

The paper "*Mathematical modeling and simulation of SWRO process based on simultaneous method*" by A. Jiang et al. developed a spiral-wound model for simulating seawater reverse osmosis (SWRO) process. The model was described by differential and algebraic equations with some inequality and equality constraints of equipment and water quality. A case study of a SWRO plant was used to validate the formulated model and solution method. The study work was helpful to gain an in-depth insight into the mechanism of SWRO process and had a significant potential for helping in energy saving through the optimized operation.

The paper "*Water demand forecast in the Baiyangdian Basin with the extensive and low-carbon economic modes*" by T. L. Qin et al. analyzed the effects of extensive and low-carbon economic modes on water demand of the Baiyangdian Basin, China. Results can support generation of ecoenvironmental conservancy target and water resources allocation scheme under many conflicting factors being balanced due to complexities of the real-world problems.

The paper "*A conjunction method of wavelet transform-particle swarm optimization-support vector machine for streamflow forecasting*" by F. Zhang et al. developed a wavelet transform particle swarm optimization support vector machine (WT-PSO-SVM) model to forecast monthly streamflow of Tangnaihai hydrology station in the Yellow River.