

Prologue: special issue on data driven modeling and evolutionary optimization for river basin management

Following the 10th International Water Association (IWA) Specialist Conference on Watershed and River Basin Management, September 2005, Calgary, Canada, the IWA Watershed and River Basin Management Specialist Group was approved to assemble a Special Issue on Data Driven Modeling (DDM) and Evolutionary Optimization (EO) for River Basin Management within the *Journal of Hydroinformatics*.

The discipline of DDM and EO is the study of computer algorithms that improve automatically through experience. Data driven models rely upon methods of computational intelligence and machine learning, and thus assume the presence of a considerable amount of data which describes the modeled system's physics. Applications of DDM range from data-mining programs that discover general rules in large data sets, to information filtering systems that automatically learn users' interests. The most utilized techniques of DDM are artificial neural networks, model trees, fuzzy-rule based systems, and support vector machines. Since the last decade DDM in both hydrology and water resources research is gaining an increasing interest.

This Special Issue reflects this tendency. It is comprised of six manuscripts covering the following topics: a review paper on DDM techniques describing existing methods and highlighting new approaches and research directions (Solomatine and Ostfeld, p.3); stochastic multi-reservoir operation (Lee *et al.*, p.23); multivariate statistical analysis of spatial and temporal variations in river water quality (Shrestha *et al.*, p.43); flooding probability estimation of

urban areas using decision trees and artificial neural networks (Chen *et al.*, p.57); optimization for sustainable management of water scarce basins (Cetinkaya *et al.*, p.69); and a multiobjective genetic algorithm application for watershed calibration (Hejazi *et al.*, p.97).

We wish to thank all the contributing authors and in particular all the reviewers whose valuable comments have improved substantially the quality of this Special Issue. Finally, we would like to acknowledge the ongoing support of Prof. Vladan Babovic, the Journal Editor-in-Chief, and the assistance of Miss Emma Gulseven, Journals Production Editor, IWA Publishing.

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