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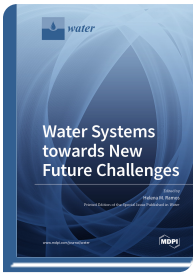

Water Systems towards New Future Challenges

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Edited by
Helena M. Ramos

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This book comprises components associated with smart water which aims at the exploitation and building of more sustainable and technological water networks towards the water–energy nexus and system efficiency. The implementation of modeling frameworks for measuring the performance based on a set of relevant indicators and data applications and model interfaces provides better support for decisions towards greater sustainability and more flexible and safer solutions. The hydraulic, management, and structural models represent the most effective and viable way to predict the behavior of the water networks under a wide range of conditions of demand and system failures. The knowledge of reliable parameters is crucial to develop approach models and, therefore, positive decisions in real time to be implemented in smart water systems. On the other hand, the models of operation in real-time optimization allow us to extend decisions to smart water systems in order to improve the efficiency of the water network and ensure more reliable and flexible operations, maximizing cost, environmental, and social savings associated with losses or failures. The data obtained in real time instantly update the network model towards digital water models, showing the characteristic parameters of pumps, valves, pressures, and flows, as well as hours of operation towards the lowest operating costs, in order to meet the requirement objectives for an efficient system.

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