



**water**



*Special Issue Reprint*

## New Challenges in Water Systems

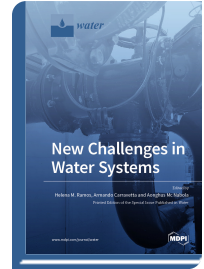
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New challenges in water systems toward safety, efficiency, reliability, and system flexibility will be fundamental in the near future. In this book, readers can find different approaches that include safety analysis, system efficiency improvements, and new innovative designs. The risk function is a measure of its vulnerability level and security loss. Analyses of transient flows associated with the most dangerous operating conditions, are compulsory to grant system liability in terms of water quantity, quality, and system management. Specific equipment, such as air valves, is used in pressurized water pipes to manage the air inside, associated with the emptying and filling process. Advanced tools are developed toward near-future smart water grids. The water system efficiency and water–energy nexus, through the implementation of suitable pressure control and energy recovery devices, as well as pumped-storage hydropower, provide guidelines toward the most technical and environmental cost-effective solutions. Integrated analysis of water and energy allows more reliable, flexible, and sustainable eco-design projects, reaching better resilience systems. Hydraulic simulators and computational fluid dynamics (CFD), conjugating with field or experimental tests, supported by advanced smart equipment, allow a better design, control, and complex event anticipation occurrence to attain high levels of water system security and efficiency.



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