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Hydrological
Programme

Urban Water

UNESCO-IHP URBAN WATER SERIES

Series Editors:

Čedo Maksimović, J. Alberto Tejada-Guibert, Sarantuyaa Zandaryaa



International Hydrological Programme
Division of Water Sciences



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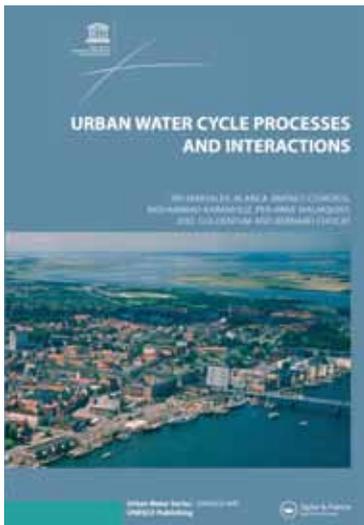
UNESCO International Hydrological Programme, Paris, France

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The UNESCO-IHP Urban Water Series, comprising a set of books on urban water management, addresses fundamental issues related to the role of water in cities and the effects of urbanization on the hydrological cycle and water resources. Focusing on integrated approaches to sustainable urban water management, the Series provides valuable scientific and practical information for urban water practitioners, policy-makers and educators throughout the world.





Urban Water Cycle Processes and Interactions

Jiri Marsalek, Pascal Breil, Blanca Jiménez-Cisneros, Mohammad Karamouz, Per-Arne Malmquist, Joel Goldenfum and Bernard Chocat. 2007

Effective management of urban water should be based on a scientific understanding of the impact of human activity on both the urban hydrological cycle – including its processes and interactions – and the environment itself. Such anthropogenic impacts, which vary broadly in time and space, need to be quantified with respect to local climate, urban development, cultural, environmental and religious practices, and other socio-economic factors.

Urban Water Cycle Processes and Interactions represents the fruit of a project by UNESCO's International Hydrological Programme on this topic. The volume begins by introducing the urban water cycle concept and the need for integrated or total management. It then explores in detail the manifold hydrological components of the cycle, the diverse elements of urban infrastructure and water services, and the various effects of urbanization on the environment – from the atmosphere and surface waters to wetlands, soils and groundwater, as well as biodiversity. A concluding series of recommendations for effective urban water management summarize the important findings set forth here.

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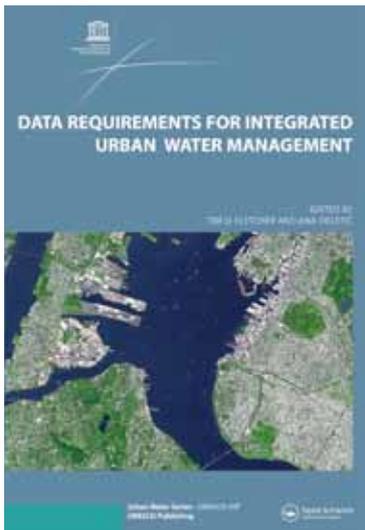
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Data Requirements for Integrated Urban Water Management

Edited by Tim D. Fletcher and Ana Deletić. 2007

Integrated urban water management relies on data allowing us to analyse, understand and predict the behaviour of the individual water cycle components and their interactions. The concomitant monitoring of the complex of urban water system elements makes it possible to grasp the entirety of relations among the various components of the urban water cycle and so develop a holistic approach to solving urban water problems.

Data Requirements for Integrated Urban Water Management – issuing from UNESCO's International Hydrological Programme project on this topic – is geared towards improving integrated urban water management by providing guidance on the collection, validation, storage, assessment and utilization of the relevant data. The first part of this volume describes general principles for developing a monitoring programme in support of sustainable urban water management. The second part examines in detail the monitoring of individual water cycle components. Two case studies in the final part illustrating attempts to deliver an integrated monitoring system help demonstrate the fundamental principles of sustainable urban water management elaborated here.

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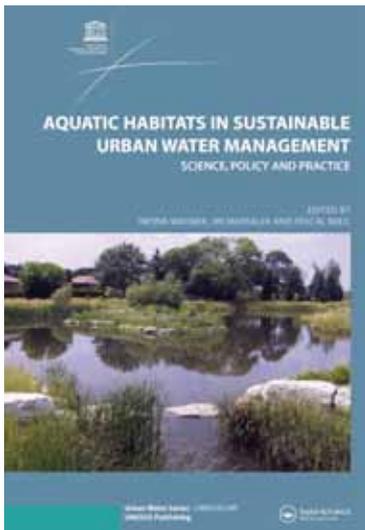
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Aquatic Habitats in Sustainable Urban Water Management Science, Policy and Practice

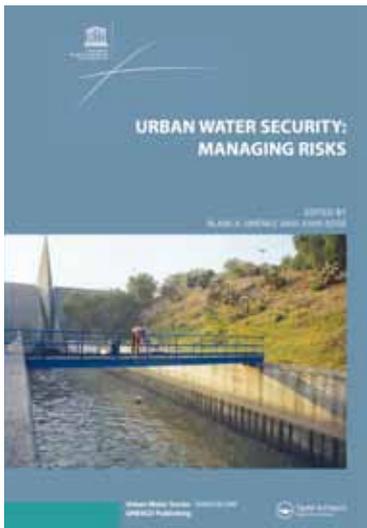
Edited by Iwona Wagner, Jiri Marsalek and Pascal Breil. 2007

Aquatic habitats supply a wide range of vital ecosystem benefits to cities and their inhabitants. The unsustainable use of aquatic habitats, including inadequate urban water management, however, tends to alter and reduce their biodiversity and thereby diminish their ability to provide clean water, protect us from waterborne diseases and pollutants, keep urban areas safe from flooding, and support recreational ecosystem services and even the aesthetic enjoyment of our world.

Aquatic Habitats in Sustainable Urban Water Management – the result of collaboration between UNESCO's International Hydrological Programme and its Man and the Biosphere Programme – aims at improving our understanding of aquatic habitats, related ecosystem goods and services, and conservation and sustainable use – with a special focus on their integration into urban water management. The first part of this volume reviews basic concepts and challenges in urban aquatic habitats, as well as strategies for their management integration. The second part examines technical measures related to habitats management and rehabilitation, along with their incorporation into urban planning and their role in human health. The final part looks at current urban aquatic habitat issues and practical approaches to solving them through the lens of case studies from around the globe.

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Urban Water Security: Managing Risks

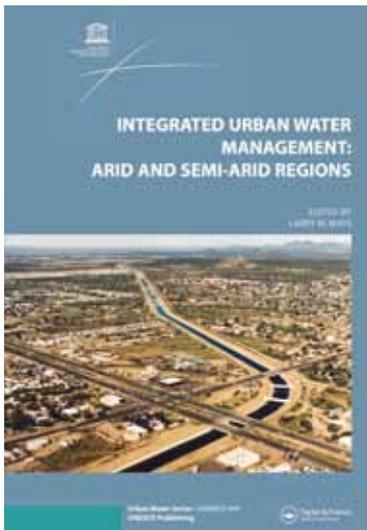
Edited by Blanca Jiménez and Joan Rose. 2009

Understanding the impacts of urbanization on the urban water cycle and managing the associated health risks demand adequate strategies and measures. Health risks associated with urban water systems and services include the microbiological and chemical contamination of urban waters and outbreak of water-borne diseases, mainly due to poor water and sanitation in urban areas, and the discharge of inadequately treated, or untreated, industrial and domestic wastewater. Climate change only exacerbates these problems, as alternative scenarios need to be taken into consideration in urban water risk management.

Urban Water Security: Managing Risks – the result of a project by UNESCO's International Hydrological Programme on the topic – addresses issues associated with urban water risks. The first section of the volume describes risks associated with urban water systems and services. The volume then discusses the concept of risk management for urban water systems and explores different approaches to managing and controlling urban water risks. A concluding section presents case studies on managing urban water risks.

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Integrated Urban Water Management: Arid and Semi-Arid Regions

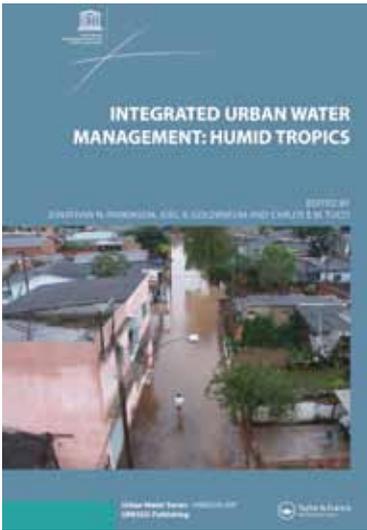
Edited by Larry W. Mays. 2009

Integrated Urban Water Management (IUWM) is a new approach to managing the entire urban water cycle in an integrated way, a key to achieving the sustainability of urban water resources and services. The IUWM incorporates: the systematic consideration of the various dimensions of water, including surface and groundwater resources, quality and quantity issues; the fact that water is a system and component which interacts with other systems; and the interrelationships between water and social and economic development.

Integrated Urban Water Management: Arid and Semi-Arid Regions – the outcome of UNESCO's International Hydrological Programme project on the topic – examines the integrated management of water resources in urban settings, focusing on issues specific to arid and semi-arid regions. The urban water management system is considered here as two integrated processes: water supply management and water excess management. The first six chapters provide an overview of the various aspects of IUWM in arid and semi-arid regions, with emphasis on water supply technologies, such as artificial recharge, water transfers, desalination, and rainwater harvesting. Water excess management is examined in the context of both stormwater management and floodplain management. Case studies from developed and developing countries are presented in order to emphasize the various needs and challenges of water management in urban environments in arid and semi-arid regions worldwide. These case studies include: Mexico City, Mexico; Tucson, Arizona; Awash River Basin, Ethiopia; China; and Cairo, Egypt.

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Integrated Urban Water Management: Humid Tropics

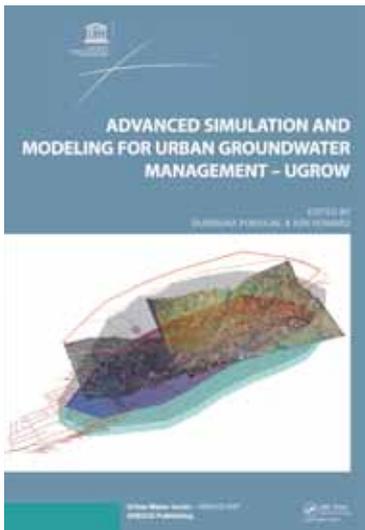
Edited by Jonathan N. Parkinson, Joel A. Goldenfum and Carlos E.M. Tucci. 2010

Excess water in the urban environment leads to flooding, which in turn causes structural damage, risks to personal safety and disruption to city life. Water is also a major contributory factor in disease transmission as well as being the transport medium of many pollutants. These problems are of increasing concern due to climate changes and are particularly apparent in the humid tropics.

Integrated Urban Water Management: Humid Tropics – the output of a project by UNESCO's International Hydrological Programme on the topic – focuses on engineering aspects related to water supply, wastewater and stormwater management in the humid tropics. Flood control is dealt with, focusing on reducing vulnerability to flood disasters in urban areas. The book also addresses environmental health concerns related to the different components of the urban water system and proposes strategies for their control. It illustrates different aspects of integrated water management in the urban environment by drawing upon a set of case studies – predominantly from South America.

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Advanced Simulation and Modeling for Urban Groundwater Management – UGROW

Edited by Dubravka Pokrajac and Ken Howard. 2010

Groundwater plays a vital role in the urban water cycle but is frequently ignored. The assessment and evaluation of urban water systems rarely consider the contribution of groundwater to the urban water budget, and available decision-support tools for integrated urban water management often fail to include aquifer storage and the strong two-way interaction that commonly occurs between groundwater and surface water and other urban water system components.

Advanced Simulation and Modelling for Urban Groundwater Management - UGROW presents the result of a project of UNESCO's International Hydrological Programme on the topic. The book presents UGROW—a complete and fully integrated modelling package—for simulating urban water systems. As a decision-support tool for urban water management, it focuses on urban groundwater, but all other key urban water system elements are fully represented and seamlessly linked. The theory behind UGROW is thoroughly described in the book, with three case studies illustrating how UGROW can be applied in practice. A CD-ROM containing a fully functional version of UGROW is included in the book.

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Urban Water Conflicts

Integrated Urban Water System Interactions

Integrated Urban Water Management: Temperate Climates

Integrated Urban Water Management: Cold Climates

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