

Preface

This book was written in response to the positive feedback received from the wetland community with respect to the book *Wetlands Systems to Control Urban Runoff* by Miklas Scholz and published by Elsevier (Amsterdam) in 2006. Moreover, this new textbook covers all key types of wetland systems and not just those controlling urban runoff. The subtitle “Storm Water Management Control” emphasizes the shift in focus.

The book covers broad water and environmental engineering issues relevant for the drainage and treatment of storm water and wastewater, providing a descriptive overview of complex ‘black box’ treatment systems and the general design issues involved. The fundamental science and engineering principles are explained to address the student and professional markets. Standard and novel design recommendations for predominantly constructed wetlands and related sustainable drainage systems are provided to account for the interests of professional engineers and environmental scientists. The latest research findings in diffuse pollution and flood control are discussed to attract academics and senior consultants who should recommend the proposed textbook to final-year and postgraduate students, and graduate engineers, respectively.

This original and timely book deals comprehensively not only with the design, operation, maintenance, and water-quality monitoring of traditional and novel wetland systems, but also with the analysis of asset performance and modeling of treatment processes and performances of existing infrastructure predominantly in developed countries, as well as the sustainability and economic issues involved therein.

The book has five chapters. Chapter 1 provides an introduction to wetland systems. It is followed by a comprehensive chapter comprising a diverse selection of wetland case studies, and then by a brief chapter on carbon storage and fluxes within freshwater wetlands. Chapter 4 summarizes wetland systems used in sustainable drainage and flood control applications. The final chapter covers a novel modeling application.

This comprehensive textbook is essential for undergraduate and postgraduate students, lecturers, and researchers in civil and environmental engineering, environmental science, agriculture, and ecological fields of sustainable water management. It is an essential reference for the design, operation, and management of wetlands by engineers and scientists working for the water industry, local authorities, non-governmental organizations, and governmental bodies. Moreover, consulting engineers should be able to apply practical design recommendations and refer to a large variety of practical international case studies including large-scale field studies.

The basic scientific principles should also be of interest to all concerned with constructed environments including town planners, developers, engineering technicians, agricultural engineers, and public health workers. The book was written for a wide readership, but enough hot research topics have been addressed to guarantee the book a long shelf life.

Solutions to pressing water quality problems associated with constructed treatment wetlands, integrated constructed wetlands, farm constructed wetlands and storm water ponds, and other sustainable biological filtration and treatment technologies linked to public health engineering are explained in the book. The case study topics are diverse: wetlands including natural wetlands and constructed treatment wetlands; sustainable water management including sustainable drainage systems and sustainable flood retention basins; and specific applications such as wetlands treating hydrocarbons. The research projects are multidisciplinary, holistic, experimental, and modeling-orientated.

The book is predominantly based on experiences of the author over the last 12 years. Original material, published in more than 80 high-ranking journal papers and 100 conference papers, has been revisited and analyzed. Experience gained as an editorial board member of more than ten peer-reviewed journals ensures that this textbook will contain sufficient material to fill gaps in knowledge and understanding and allow the author to discuss the latest cutting edge research in areas such as integrated constructed wetlands and sustainable flood retention basins.



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Wetland Systems

Storm Water Management Control

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