

The Handbook of Environmental Chemistry

Founded by Otto Hutzinger

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Volume 59

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The Rivers of Greece

Evolution, Current Status and Perspectives

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ISSN 1867-979X ISSN 1616-864X (electronic)
The Handbook of Environmental Chemistry
ISBN 978-3-662-55367-1 ISBN 978-3-662-55369-5 (eBook)
<https://doi.org/10.1007/978-3-662-55369-5>

Library of Congress Control Number: 2017954950

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Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer-Verlag GmbH, DE
The registered company address is: Heidelberger Platz 3, 14197 Berlin, Germany

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- Aims and Scope
- Instructions for Authors
- Sample Contribution

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Aims and Scope

Since 1980, *The Handbook of Environmental Chemistry* has provided sound and solid knowledge about environmental topics from a chemical perspective. Presenting a wide spectrum of viewpoints and approaches, the series now covers topics such as local and global changes of natural environment and climate; anthropogenic impact on the environment; water, air and soil pollution; remediation and waste characterization; environmental contaminants; biogeochemistry; geoecology; chemical reactions and processes; chemical and biological transformations as well as physical transport of chemicals in the environment; or environmental modeling. A particular focus of the series lies on methodological advances in environmental analytical chemistry.

Series Preface

With remarkable vision, Prof. Otto Hutzinger initiated *The Handbook of Environmental Chemistry* in 1980 and became the founding Editor-in-Chief. At that time, environmental chemistry was an emerging field, aiming at a complete description of the Earth's environment, encompassing the physical, chemical, biological, and geological transformations of chemical substances occurring on a local as well as a global scale. Environmental chemistry was intended to provide an account of the impact of man's activities on the natural environment by describing observed changes.

While a considerable amount of knowledge has been accumulated over the last three decades, as reflected in the more than 70 volumes of *The Handbook of Environmental Chemistry*, there are still many scientific and policy challenges ahead due to the complexity and interdisciplinary nature of the field. The series will therefore continue to provide compilations of current knowledge. Contributions are written by leading experts with practical experience in their fields. *The Handbook of Environmental Chemistry* grows with the increases in our scientific understanding, and provides a valuable source not only for scientists but also for environmental managers and decision-makers. Today, the series covers a broad range of environmental topics from a chemical perspective, including methodological advances in environmental analytical chemistry.

In recent years, there has been a growing tendency to include subject matter of societal relevance in the broad view of environmental chemistry. Topics include life cycle analysis, environmental management, sustainable development, and socio-economic, legal and even political problems, among others. While these topics are of great importance for the development and acceptance of *The Handbook of Environmental Chemistry*, the publisher and Editors-in-Chief have decided to keep the handbook essentially a source of information on "hard sciences" with a particular emphasis on chemistry, but also covering biology, geology, hydrology and engineering as applied to environmental sciences.

The volumes of the series are written at an advanced level, addressing the needs of both researchers and graduate students, as well as of people outside the field of

“pure” chemistry, including those in industry, business, government, research establishments, and public interest groups. It would be very satisfying to see these volumes used as a basis for graduate courses in environmental chemistry. With its high standards of scientific quality and clarity, *The Handbook of Environmental Chemistry* provides a solid basis from which scientists can share their knowledge on the different aspects of environmental problems, presenting a wide spectrum of viewpoints and approaches.

The Handbook of Environmental Chemistry is available both in print and online via www.springerlink.com/content/110354/. Articles are published online as soon as they have been approved for publication. Authors, Volume Editors and Editors-in-Chief are rewarded by the broad acceptance of *The Handbook of Environmental Chemistry* by the scientific community, from whom suggestions for new topics to the Editors-in-Chief are always very welcome.

Damià Barceló
Andrey G. Kostianoy
Editors-in-Chief

Preface

Greece is a small mountainous country with a remarkably varied relief, complex geological structure, a rich palette of microclimates, and diverse aquatic ecosystems hosting particularly rich biodiversity.

There is an erroneous perception that Greece is a dry country. This perception is derived from the fact that large areas of East and Southeastern Greece, which are popular tourist destinations, face water scarcity. In reality, the Greek Peninsula contributes over the double of river runoff in the European Mediterranean Sea (16%) compared to the surface area of the country (7%). The country is characterised by numerous, diverse, and highly fragmented small to medium-sized mountainous rivers and streams, running through steep narrow valleys. Large lowland areas that are diffused within prevailing rift valleys are drained by medium and large perennial rivers, which frequently form extensive flood and deltaic plains. Semi-arid landscapes are marked by intermittent to episodic streams. When considering this highly variable landscape, the uniqueness and diversity of aquatic flora and fauna is not surprising.

Water is according to Thales of Miletus (c. 624 – c. 546 BC) the originating principle of nature. Ancient Greeks defied rivers and created myths which conceal real physical-geological events. Since the second millennium BC, hydraulic and land reclamation works were conducted for water supply and protection against droughts and floods. Nowadays, to address the challenges of the unevenly spatial and temporal distribution of water resources, water managers diverted rivers and constructed numerous dams. Thus, the vast majority of medium and large rivers of the country are fragmented. The main pressures affecting running waters in Greece are hydromorphological modifications, agro-industrial wastewaters, agrochemicals, malfunctioning wastewater treatment plants, and, locally, mining. These pressures and particularly their combination with drought and water scarcity, triggered by gradual diminishing river flows, threaten lotic and riparian ecosystems.

Despite the vital importance of river ecosystems to the Greek civilization since ancient times, a comprehensive knowledge on their natural characteristics and diversity or the extent to which they have been exploited and degraded is limited.

This book volume is designed to provide a fundamental knowledge on the running waters of Greece covering topics related to potamology, either through means of review chapters or specific case studies. The topics covered include geomorphology, biogeography, hydrology, hydrogeochemistry, hydrobiology, geomorphological, geological and biogeochemical processes, human pressures and ecological impacts, water management, both in the antiquity and today, and river restoration. This volume can be used as a basic or supplementary text in undergraduate and post-graduate courses or lectures in river ecology, river basin management, and conservation.

Acknowledgements

All chapters have been reviewed by the editors of this book volume and by a series of external reviewers which we are delighted to acknowledge here for their valuable help: Dr. Stefania Erba (IRSA-CNR, Italy), Dr. Nikolaos Nikolaidis (TUC), Dr. Niki Evelpidou (UOA, Greece), Dr. Angela Rouvalis (UOP, Greece), and Dr. Panagiotis Michalopoulos, Dr. Vasilis Kapsimalis, and Dr. Christos Anagnostou (HCMR, Greece). Finally, we would like to express our gratitude to Martha Papathanasiou (HCMR, Greece) for linguistic and grammar check of all contributions and to Dr. Andrea Schlitzberger (Springer DE) for her cooperation and support during the preparation of this volume.

Anavissos, Greece
Anavissos, Greece
Anavissos, Greece

Nikos Skoulikidis
Elias Dimitriou
Ioannis Karaouzas

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