

# **Terrestrial Environmental Sciences**

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# Chinese Water Systems

Volume 3: Poyang Lake Basin

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# Preface

Situated in the rugged beauty of rural Jiangxi Province, China's largest freshwater lake, Poyang Lake, is not only famous for being the scene of historic dynastic struggles like the Battle of Lake Poyang in 1363 AD but also for its highly diverse subtropical flora and fauna, including remarkable assemblages of endemic species such as the freshwater finless porpoise. From October to March each year, vast areas of marsh and small water areas appear in the alluvial plain of Poyang Lake are a habitat of international importance for hundreds of thousands of migratory birds from Siberia and Northern China. In addition, Poyang Lake provides a vital source of resources to millions of people in Jiangxi Province living either at its shoreline or in the hinterland of the basin.

Although having a relatively higher water quality compared to other Chinese lakes, the water resources of Poyang Lake are threatened due to land reclamation, sand dredging, overexploitation, and the exposure of the aquatic system to pesticides from agricultural sources. Moreover, existing and proposed dam projects and changing climatic conditions already adversely impact the seasonal water balance of Poyang Lake. Since the 1990s, the Chinese government has made substantial efforts to address the problem of polluting freshwater resources. More recently, in April 2015, the Action Plan for Prevention and Control of Water Pollution was launched which requires that by 2020, the implementation of adequate protection measures will have improved the water quality of 70% of the water areas of the seven key basins including Yangtze River Basin, which contains Poyang Lake, to be "excellent" or "good" according to the Chinese standard.

In his speech at the 19th National Congress of the Communist Party of China last October, President Xi Jinping demanded the adoption of a holistic approach to conserving natural resources and protecting the environment. Considering that a sustainable management of aquatic resources must be built upon a thorough assessment of status and dynamics of the water resource in relation to human impacts, a research-oriented, multi-disciplinary approach is required. Transferring this approach to Poyang Lake, a research symposium called "sustainable water management and ecosystem restoration in the Poyang Lake Basin," held in Nanchang in November 2014, allowed bringing together German and Chinese

scientists from different disciplines such as hydrology, ecology, climate research, and information science as well as involving authorities and stakeholders from the Poyang Lake Basin. Consequently, the Poyang Cooperation group was formed in 2015 to build a joint Sino-German network to encourage synergy between the research groups and to facilitate research on environmental aspects of the Poyang Lake Basin.

This book compiles scientific results achieved by members of the aforementioned joint research group. In addition, experts from renowned research facilities such as Jiangxi Normal University, the Leibniz-Institute of Freshwater Ecology and Inland Fisheries, and Tomsk Polytechnic University made valuable contributions to this book volume. Although far from covering all current environmental research on Poyang Lake and its basin, the present book provides a comprehensive overview in English about current environmental research topics at Poyang Lake. This is of particular interest for those readers who are not able to access the great volumes on the hydrology of Poyang Lake written in Chinese by Shengrui Wang (Chinese Research Academy of Environmental Science) or the combined work of Wenbin Zhou and Jinbao Wan (Nanchang University) together with Jiahu Jiang (Nanjing Institute of Geography and Limnology).

Summarizing, we hope that the positive outcomes and experiences of the joint research recorded here can also prove to be useful for both scientists and funders aiming to design and implement water resource protection projects in other areas and practitioners looking for a modern methodological framework to assess, document and present the state of an aquatic system. Furthermore, this book is the third volume in the Springer series *Chinese Water Systems* that presents the application of state-of-the-art approaches in environmental research to Chinese water systems of national and international importance, namely:

- Song, Yonghui, et al. (eds.). *Chinese Water Systems: Volume 1: Liaohe and Songhuajiang River Basins*. Springer, 2018.
- Sachse, Agnes et al. (eds.). *Chinese Water Systems: Volume 2: Managing Water Resources for Urban Catchments*. Springer, 2018.

Few books are without errors, and this book is likely no exception. Should you discover errors that should be corrected, we would be grateful if you let us know to help improve this book.

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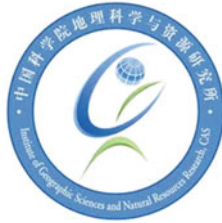
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The second part of the book is introducing the Research Centre for Environmental Information Science (RCEIS) initiated by the Helmholtz Association of German Research Centers and the Chinese Academy of Sciences. The following Helmholtz Centers and Institutes of the Chinese Academy of Sciences contributed to RCEIS. The funding of RCEIS by the Network Fund of the Helmholtz Association (HIRN-0002) is greatly acknowledged.





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