

Preface

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Shallow lakes, especially in Europe and North America, have been receiving increased attention since the late 1980s, not only from lake managers, fishery biologists and water-works authorities but also from limnologists and aquatic ecologists. Climatic change and unanticipated and sometimes drastic changes in water levels, both surface and underground, have further contributed to water-quality issues. Therefore, both the ecology and management of these ecosystems have been receiving greater attention during the last few decades. Overall concerns over deteriorating water quality, due to pollution and the increased pace of eutrophication of many lakes in northern European countries, have given a great impetus

to both fundamental ecological as well as applied studies on many of these threatened lakes. There is also a noticeable increase in the number and frequency of international conferences and meetings dealing with the ecology of shallow lakes, leading to greater international contacts among researchers.

Published studies vividly demonstrate that the water-quality deterioration in many of these lakes, particularly since the 1950s, is primarily a sequel to the intensification of urban activities and agriculture in the lake catchment areas, and overexploitation of fish. The studies have given us deeper insights into the functioning of food-webs in shallow waters, nutrient dynamics in open water, and in the complexities of interactions in littoral and pelagic regions, and of the sediment-water interphase. We are now starting to implement the knowledge gained in order to rehabilitate some lakes, if not restore them.

Concomitantly with the above-mentioned developments, there is a spurt of publications on shallow lakes in the peer-reviewed, international journals, especially *Hydrobiologia* where traditionally many of the conference proceedings have been published. It is perhaps opportune to mention here that 1989 was an important year. In this year, the proceedings of the first such international conference *Bio-manipulation As Tool For Water Management* was held at Amsterdam (8–11 August 1989). The proceedings of this scientific

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Shallow lakes in a changing world

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meeting which were published in 2000 in *Hydrobiologia* (Vols. 200/201: 628 pp.), triggered great interest among freshwater ecologists and fishery biologists. Starting in the early nineties, four such triennial international conferences have been held in Europe, at Silkeborg (Denmark), Mikolajki (Poland), Berlin (Germany) and Balatonfüred (Hungary). The proceedings papers of these conferences deal with a variety of issues facing lakes, especially changes in water chemistry and nutrients, plankton biology relating to deterioration of water quality caused by increased eutrophication and pollution, perennial blooms of cyanobacteria and loss of biodiversity. Many of the threatened lakes have responded to restoration works by showing a notable decrease in turbidity, i.e., an improvement in underwater light climate, following a decrease in phytoplankton abundance, and the subsequent increase in macrophytes. Even though the improvement in water-quality is generally only transitory, i.e., a shift from a turbid-water state dominated by phytoplankton to a clear-water state generally dominated by macrophytes, it has given us grounds for further theoretical speculations on the existence of so-called *alternative stable states* in these lakes undergoing restoration.

Following up the traditions of the preceding four symposia, the '5th International Symposium on Shallow Lakes' was held at Dalfsen, in the eastern part of The Netherlands, from 5 to 9 June 2005, at the Conference Centre 'De Bron' situated on the bank of the River Vecht. About 250 participants from 33 countries attended this meeting, which had the theme *Shallow Lakes in a Changing World*. The theme is obviously a reflection on the ongoing climatic change, the increased occurrence of bio-invasions, and the decrease in biodiversity of lake biota in general. The conference schedule included plenary lectures (8 invited keynote speakers), which dealt with harmful biota, biodiversity, global change, ecological restoration, evolutionary ecology, and water fowl. The oral presentations (111) were divided into parallel sessions. There were 80 poster presentations, and five thematic workshops

in the evenings. The subject matter of both the oral sessions and poster presentations related to general limnology, food-webs, biodiversity, climate change, the EU Water Framework Directive, nutrients and evolution, fishes and birds. The evening workshops dealt with five topics: lake biomanipulation, resistance of lakes to changes, Lakes Peipsi and IJsselmeer, the EU Water Framework Directive and Mediterranean shallow lakes. There was a full day of mid-conference excursions to various sites of interest, including protected water reserves (Ramsar Sites).

The participants were given until 31 October 2005 to prepare and submit manuscripts based on their presentations at the conference. In total 63 manuscripts were submitted. Each manuscript was sent to two or three anonymous reviewers and in several cases there was a second review round. This proceedings volume contains 41 peer-reviewed manuscripts that were finally accepted by Dr. Koen Martens, the Editor-in-Chief of *Hydrobiologia*.

The guest editors are thankful to the manuscript authors for their cooperation in keeping to the deadlines for the review process. We are highly indebted to the reviewers, some of whom reviewed more than one manuscript and also helped in improving the language. Finally we thank the members of the local organising committee (Paul Boers, conference chairman; Lowie van Liere, conference secretary; Maarten Ouboter; Tabe Tietema and Bas van der Wal) for their help in many ways. The financial help from the Ministry of Environment and Public Health, Ministry of Transport and Public Works, and Foundation of Applied Water Research (STOWA) is gratefully acknowledged. Petra Angelone and Anette Bisseling-Visser helped in the administrative work of the conference.

The *Shallow Lakes 2008* conference will be held in November 2008 in Uruguay. It is being organized by the Faculty of Sciences, Universidad de la República at Punta del Este, Uruguay. For information see website: <http://www.shallowlakes2008.org>.