Preface

Human activities have become major drivers of change in the Earth's biosphere, resulting in deterioration of water quality, overexploitation of freshwater resources, adverse effects of hydrological hazards and landscape degradation, which make water problems complex and wicked. The same activities also affect the functioning of ecosystems and their ability to provide goods and services on which human well-being depends. There is a need for community based transdisciplinary management tools to provide a better understanding of water as both an abiotic resource and as a service delivered by ecosystems.

This book was launched at the 10th IHP/IAHS George Kovacs Colloquium, which preceded the 19th Session of the Intergovernmental Council of the International Hydrological Programme of UNESCO, and was held at UNESCO, Paris, 2–3 July 2010. The theme of the book is *Hydrocomplexity: New Tools for Solving Wicked Water Problems*. It contains papers by the invited keynote speakers and extended abstracts by poster presenters, focusing on the issues of complexity of wicked water problems and the type of tools that can be used to solve these problems.

This Colloquium was a continuation of a series of biannual international scientific meetings organised jointly by the International Hydrological Programme (IHP) of UNESCO and the International Association of Hydrological Sciences (IAHS) in the most challenging fields of water resources research. These scientific meetings commemorate the late George Kovacs, an established authority on hydrology, who served as Chairman of the Intergovernmental Council of IHP and as Secretary General and President of IAHS. George Kovacs was a brilliant groundwater scientist from Hungary who graduated from the Budapest University of Technology in 1947. From 1969 to 1970 he worked for UNESCO in Nairobi, Kenya, coordinating scientific and training activities in hydrology and hydrogeology in 34 African countries. He subsequently became increasingly involved in international hydrological activities. Between 1970 and 1975 he was Secretary General of IAHS, subsequently Vice-President, and in 1983 he was elected President of the Association.

This colloquium focused on many emerging tools to solve wicked water issues in a variety of ecosystems and climatic zones using examples from a number of countries. There were three key objectives of this colloquium:

- Synthesize hydrocomplexity and wicked water problems in different geographical settings.
- Show how tools describing interrelationships between the hydrological cycle, livelihoods and ecosystems can contribute to more cost-effective and environment-friendly water management.
- Highlight systems solutions and technology transfer opportunities through North–South and South–South linkages.

The papers and extended abstracts presented at the colloquium are arranged into the following sections of this book:

- Monitoring and evaluating the water cycle
- Linking climate change with water cycle management
- Parsimonious *vs* complicated approaches
- Whole-of-system and adaptive approaches
- Need for transdisciplinary approaches to deal with water-related ecosystems
- Integrated approaches

- Role of knowledge platforms for community engagement
- From artificial to embodied intelligence
- Water allocation dilemma
- Water quality – a critical issue
- Managing hydrohazards

As editors we wish to thank all the authors of full and extended papers who did a great job in providing their papers according to a tight schedule and responding promptly to our editorial requests. We are grateful to Cate Gardner of IAHS Press for her continuous advice, assistance and dedicated efforts in making production of this book possible, and to Penny Perrins for assisting with this. We also thank our colleague Georgette Gobina for efficient secretariat support and management of all matters related to the preparation of the colloquium. We thank Sarantuyaa Zandaryaa and Carolina Llovera from the UNESCO Division of Water Sciences for their help with the review of papers and extended abstracts.

We gratefully acknowledge the financial support by the UNESCO Division of Water Sciences for the organisation of the 10th Kovacs Colloquium. This pre-proceedings volume was made available to all the participants thanks to the special support provided by IAHS.

EDITORS

Shahbaz Khan
Water and Sustainable Development Section
Division of Water Sciences, Natural Science Sector
UNESCO, 1 rue Miollis, F-75732 Paris Cedex 15, France
S.Khan@unesco.org

Hubert Savenije
Delft University of Technology
PO Box 5048, 2600 GA Delft, The Netherlands
h.h.g.savenije@tudelft.nl

Siegfried Demuth
Hydrological Processes and Climate Section
Division of Water Sciences, Natural Science Sector
UNESCO, 1 rue Miollis, F-75732 Paris Cedex 15, France
s.demuth@unesco.org

Pierre Hubert
UMR Sisyphe, Université Pierre and Marie Curie
Case 105, 4 Place Jussieu, F-75252 Paris Cedex 05, France
pjy.hubert@free.fr