



IAHS Publications

September 2009

Brief descriptions of several books recently published by the International Association of Hydrological Sciences, IAHS, are provided here. More information about them, with abstracts of the contributions, are available at <http://www.iahs.info>, click on **Publications**, with details of the many other IAHS publications.

Climate and the Hydrological Cycle

Edited by Marc Bierkens, Han Dolman & Peter Troch

An in-depth overview of the role of the hydrological cycle within the climate system; it includes climate change impacts on hydrological reserves and fluxes, and the controls of terrestrial hydrology on regional and global climatology.

This textbook, composed of self-contained chapters by specialists in hydrology and climate science, fills the need of graduate/postgraduate courses in climate, hydrology and hydroclimatology for a text focused on the interface between the two disciplines, and of scientists and engineers interested in the water cycle, weather prediction and climate change.

Special Publ. 8 (2008) 344 + xvi pp. £50.00
ISBN 978-1-901502-54-1

Leonardo Da Vinci's Water Theory:

On the origin and fate of water

by Laurent Pfister, Hubert H. G. Savenije & Fabrizio Fenicia

Leonardo Da Vinci (1452–1519) was not only one of the greatest artists of his time, he was also an engineer and scientist. A large part of his scientific work was to understand the movement, circulation and physical characteristics of water. Two hundred years before Newton, Perrault or Halley, he was doing hypothesis-driven science and describing hydrological processes, e.g. he came close to our definition of the hydrological cycle, recognising that water passes through the major river systems countless times, summing up to volumes much greater than those contained in the world's oceans.

This book, illustrated with Da Vinci's sketches, carefully reports his work and provides a modern hydrological backdrop.

Fascinating, revealing and inspiring

Special Publ. 9 (2009) 92 + xx pp. £25.00
ISBN 978-1-901502-34-3

Published in September

Ecohydrology of Surface and Groundwater Dependent Systems: Concepts, Methods and Recent Developments

Edited by Martin Thoms *et al.*

Publ. 328 ISBN 978-1-901502-99-2 240 + viii pp. £51

Trends and Sustainability of Groundwater in Highly Stressed Aquifers

Edited by Makoto Taniguchi *et al.*

Publ. 329 ISBN 978-1-907161-00-3 318 + x pp. £62.50

Improving Integrated Surface and Groundwater Resources Management in a Vulnerable and Changing World

Edited by Günter Blöschl *et al.*

Publ. 330 ISBN 978-1-907161-01-8 382 + x pp. £71.50

Hydroinformatics in Water Resources, Hydrogeology and Hydrology

Edited by Ian D. Cluckie *et al.*

Publ. 331 ISBN 978-1-907161-02-5 528 + viii pp. £92.00

New Approaches to Hydrological Prediction in Data-sparse Regions

Edited by Koray K. Yilmaz *et al.*

Publ. 333 ISBN 978-1-907161-04-9 344 + x pp. £66

The Role of Hydrology in Water Resources Management

Edited by H.-J. Liebscher, R. Clarke, J. Rodda, G. Schultz, A. Schumann, L. Ubertini & G. Young

Publ. 327 (2009)

ISBN 978-1-901502-94-7 332 + xii pp. Price £67.00

Water resource projects require historical and new hydrological data on surface water and groundwater, forecasts and predictions and other information for application in planning, design, construction and optimizing water-related systems. Thus, hydrological networks form the basis for planning and operation of water projects and systems. They must provide for the monitoring of water quality and be sufficiently close-meshed to cover all regions with human population. Efficiency and reliability in managing water resource systems depends largely on the quantity and quality of the hydrological information used in their planning and operation.

Hydrology in Mountain Regions: Observations, Processes and Dynamics

edited by Danny Marks

Publ. 326 (2009)

ISBN 978-1-901502-89-3, 184 + viii pp. Price £45.00

Many mountain regions, ranging from arctic to tropical, provide water from orographic-induced rain and snow that can sustain ecosystems, agriculture, and populations in areas that might otherwise be quite arid. Climate warming will alter patterns of mountain precipitation, changing seasonal snow cover and hydrology. It is critical that we understand how climate interacts with snow and mountain hydrology, how streamflow and ecosystems will be affected, and how these changes will translate into impacts on water supply downstream.

Sediment Dynamics in Changing Environments

Edited by J. Schmidt, T. Cochrane, C. Phillips, S. Elliott, T. Davies & L. Basher
IAHS Publ. 325 (2008)

ISBN 978-1-901502-84-8, 626 + xiv pp. Price £105

To understand *Sediment Dynamics in Changing Environments* we need to advance our knowledge of sedimentary processes and systems, and in particular of associated scaling issues. This knowledge, derived from information and analysis of historical sediment archives and system analysis and modelling, enhances our abilities to assess impacts of global change on sedimentary systems. Most importantly, we need to find ways to link our understanding and models of sedimentary systems with impacts on human environments, including hazard and risk assessment, improvement of management, and feedback into policy frameworks. The papers in this book, first presented at an IAHS Symposium in New Zealand in December 2008, document the international research efforts on the themes of:

- *Unlocking the archives – dating and source tracing technologies*
- *Processes and scales in sedimentary systems – from point to continents*
- *Global change and erosion*
- *Linking erosion with environmental and societal impacts*

Groundwater Quality: Securing Groundwater Quality in Urban and Industrial Environments

Edited by Michael G. Trefry

IAHS Publ. 324 (2008)

ISBN 978-1-901502-79-4 566 + x pp. Price £90.00

Our relationship with groundwater is bipolar. Increasingly we depend on it for our very survival, in developed and developing nations. But, our urban and industrial activities involve routine and detrimental impacts to the quality of groundwater reserves. This book focuses on:

- *major instances of groundwater contamination and consequent human impact,*
- *emerging chemicals of concern, ability of the environment to assimilate them,*
- *new contamination assessment, characterization and remediation techniques,*
- *data integration and analysis for decision making,*
- *development of water management policy and controls,*
- *groundwater quality transformations near receiving environments.*

BENCHMARK PAPERS IN HYDROLOGY

The IAHS Series that collects together, by theme, the papers that provided the scientific foundations for hydrology

STREAMFLOW GENERATION PROCESSES

Selection, Introduction and Commentary by **Keith J. Beven**

ISBN 978-901502-53-4 (2006)
A4 format, softback, 432 + x pp., £40.00

EVAPORATION

Selection, Introduction and Commentary by **John H. C. Gash & James W. Shuttleworth**

ISBN 978-901502-98-5 (2007)
A4 format, softback, 526 + x pp., £40.00

GROUNDWATER

Selection, Introduction and Commentary by **Mary P. Anderson**

Reprints 35 papers. Fundamentals are covered with a translation of Darcy's experimental results, and classic papers by Meinzer, Theis and Hubbert. The development of pumping test theory and approaches to estimating aquifer parameters in the field, and flow system analysis are dealt with. Concerns regarding quantification of uncertainty, how recognition of groundwater interaction with surface water grew, and early research on contaminants are included, giving an excellent insight to the development of groundwater research.

ISBN 978-901502-74-9 (2008)
A4 format, hardback, 626 + x pp., £55.00

 SAHRA Sponsored by SAHRA, University of Arizona

River Basins – From Hydrological Science to Water Management

Edited by **Ioulia Tchiguirinskaia, Siegfried Demuth & Pierre Hubert**

IAHS Publ. 323 (2008)
ISBN 978-1-901502-69-5, 154 pp. Price £40.00



A joint IAHS / UNESCO-IHP publication – proceedings of the 9th Kovacs Colloquium

A review of the practice and realities of undertaking research for river basin management (how to involve the public as stakeholders, building trust with decision-makers, the research funding situation), the tools we have available (hydrological models, how good are they, how can we reduce uncertainties and explain them to policy makers), their application and the current situation regarding water monitoring and management in El Salvador, India, Romania, Russia and South Africa. The authors' main conclusions and recommendations are summarized in a final section which proposes issues for future consideration in hydrological research and management.

Hydrological Research in China: Process Studies, Modelling Approaches and Applications

Edited by **Dawen Yang, Fuqiang Tian, Lihua Tang & Zhiyu Liu**

IAHS Publ. 322 (2008)
ISBN 978-1-901502-64-0 272 pp. Price £55.00

China is changing from traditional water resources development to water resources management for sustainable development, and needs advanced hydrology for this. The contributions here, selected from an International PUB (Predictions in Ungauged Basins) meeting in China, provide a cross-section of the innovative research there.

Groundwater–Surface Water Interaction: Process Understanding, Conceptualization and Modelling

Edited by **Corinna Abesser, Thorsten Wagener & Gunnar Nuetzmann**

IAHS Publ. 321 (2008)
ISBN 978-1-901502-59-6, 214 pp. Price £48.00

There is a pressing need to identify and develop methods that provide an appropriate framework for the integrated investigation, conceptualisation and modelling of surface–subsurface systems and their interfaces. The increasing focus on understanding the impacts of climate variability and change on water resources and ecosystems requires connection of these systems to atmospheric variables. The aim of such a framework is to improve the conceptual understanding of groundwater–surface water interactions in different landscapes and at different scales, leading to robust algorithms for simulating the effects of management strategies on surface water/groundwater systems. The contributions are selected from a symposium during IUGG 2007 that provided a forum for scientists from many disciplines to advance the integrated analysis of groundwater/surface water systems.

Calibration and Reliability in Groundwater Modelling: Credibility of Modelling

Edited by **J. C. Refsgaard, K. Kovar, E. Haarder & E. Nygaard**

IAHS Publ. 320 (2008)
ISBN 978-1-901502-49-7, 358 pp. Price £67.00

ModelCARE 2007 was sixth in the international conference series on calibration and reliability in groundwater modelling. This volume comprises 57 peer-reviewed papers selected from the conference organised as follows:

- *Development in modelling and uncertainty assessment*
- *Credibility in modelling for practical approaches*
- *New data types and monitoring systems*
- *Integrated hydrological modelling*
- *Reactive and density affected transport*
- *Parameter estimation and calibration*
- *Geological models and conceptual model uncertainty*

This publication was sponsored by

COWifonden www.cowifonden.dk

Hydrological Sciences for Managing Water Resources in the Asian Developing World

Edited by **Xiaohong Chen, Yongqin David Chen, Jun Xia & Hailun Zhang**

Publ. 319 (2008)
ISBN 978-1-901502-44-2 422 pp. Price £72.00

Many regions in Asia are experiencing unprecedented rapid development causing pressures on the environment and management of natural resources. An insight to the innovative work there:

- *Novel hydrological analysis methods*
- *Hydrological modelling*
- *Hydrological impacts of global change*
- *Optimal allocation of water resources*
- *Resources/watershed management*
- *Water environment and aquatic ecosystems*

Glacier Mass Balance Changes and Meltwater Discharge

Edited by **P. Ginot & J. E. Sicart**

IAHS Publ. 318 (2007)
ISBN 978-1-901502-39-8 210 pp. Price £46.00

Mountain snow cover and glaciers contribute considerably to streamflow in many parts of the world, and modify runoff quantity, timing and variability. Their role is emphasized in the context of globally-increasing freshwater demand and potential impacts of climate change.

Reducing the Vulnerability of Societies to Water Related Risks at the Basin Scale

Edited by **A. Schumann & M. Pahlwa**

IAHS Publ. 317 (2007)
ISBN 978-1-901502-29-9 450 pp. Price £78.00

The need for Integrated Water Resources Management (IWRM) approaches to deal with complex water resources management issues in both the developed and developing world is well recognised, yet, in many places, IWRM is still only a concept and not established practice. This volume, of peer-reviewed papers selected from the Third International Symposium on IWRM (2006, Bochum, Germany), accounts for the heterogeneity of world water problems and addresses: What has to be integrated? How can it be accomplished? What are the options to balance the different views? The question of how to cope with water-related vulnerability of societies is the overarching theme. Together, the papers provide an excellent overview of current IWRM research worldwide.

Orders and enquiries:

jilly@iahs.demon.co.uk

Mrs Jill Gash, IAHS Press,
Centre for Ecology and Hydrology
Wallingford, Oxfordshire
OX10 8BB, UK

tel: +44 1491 692442
fax: + 44 1491 69244

We accept payment by VISA and MasterCard
Prices include packing and postage world-wide
IAHS Members may obtain discounts on books
bought for personal use; please ask when ordering.