

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

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

Edited by
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Preface

This volume presents a series of manuscripts that outline recent advances in the emerging field of Ecohydrology. Ecohydrology can be described as the science that seeks to describe the hydrological mechanisms that underlie ecological patterns and processes at different scales. We live in a time when the boundaries between many scientific disciplines are becoming blurred. Indeed, with increasing pressures on the environment there is a strong incentive to manage the environment as ecosystems and this requires collaboration between the disciplines. Many disciplines are now being brought together to solve environmental problems. Interdisciplinary science involves the “explicit joining of two or more areas of understanding into a single conceptual-empirical structure”. Integration of disciplines in this way can be done along additive or extractive lines. The additive case is where two areas of study are combined, more or less intact, into a new composite understanding; in the extractive case, by contrast, different areas of study provide components that are fused to yield a new understanding. Both processes are used in Ecohydrology, depending on the nature of the problem at hand and the state of knowledge in the different disciplines. In the science of Ecohydrology, where the investigator seeks to unravel mutual interactions between the hydrological cycle and ecosystems at different scales, additive studies have dominated. Despite acceleration in the number of research publications in the area of Ecohydrology since the 1980s, few have been extractive in nature. Thus, the case can be made that development of new paradigms within this emerging discipline has been restricted.

Interdisciplinary research in catchment and river ecosystems is a relatively young endeavour and one that is fraught with problems – linking across scales and integrating different disciplinary approaches and conceptual tools. Frameworks are useful tools for achieving this, helping to define the bounds for the selection and solution of problems; they indicate the role of empirical assumptions, carry the structural assumptions, show how facts, hypotheses, models and expectations are linked, and indicate the scope to which a generalisation or model applies. The interdisciplinary science of Ecohydrology does lack such an integrative framework. A framework is neither a model nor a theory: models describe how things work and theories explain phenomena, whereas conceptual frameworks help to order phenomena and materials, thereby revealing patterns. In order to advance interdisciplinary arenas like Ecohydrology, we require the development and articulation of a framework to unify the field of study and ensure interdisciplinary interaction at appropriate scales.

This volume is an outcome of the symposium on *Ecohydrology of Surface and Groundwater Dependent Systems: Concepts, Methods and Recent Developments* organized by the IAHS International Commission on Continental Erosion (ICCE), on Groundwater (ICGW), and on Surface Water (ICSW) in Hyderabad, India, 6–12 September 2009. The contributions in this volume provide an exciting contribution to the field of Ecohydrology. As a collective they represent an expansion of this emerging field of science, from its initial focus on the relationships between water and vegetation in different landscape settings to one that considers the Ecohydrology of riverine landscapes (the focus of Theme 1 of the symposium) to Ecohydrology and groundwater systems (Theme 2) and Ecohydrology and catchment land-use issues. The contributions provide examples from a range of environmental settings, different spatial and temporal scales as well as demonstrating the practical applications of the research.

The organizers of this symposium wish to acknowledge and thank our colleagues who assisted in reviewing the manuscripts, often under very limited time frames, as well as the patience of all authors in getting this issue together. Finally, Penny Perrins and Cate Gardner of IAHS Press are provided with the biggest THANK YOU – you were absolutely amazing in getting this entire issue together.

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Contents

Preface by Martin Thoms, Kate Heal, Eva Bøgh, Antonio Chambel & Vladimir Smakhtin v

1 Ecohydrology of Riverine Landscapes

- The wetting and drying regime of a terminal flood plain–wetland system: implications for waterbird habitat *Scott C. Rayburg & Martin Thoms* 3
- The effect of flow on the macrozoobenthos structure in a re-opened oxbow lake: a case study of the Słupia River, northern Poland *Krzysztof Tadeusz Obolowski, Katarzyna Glińska-Lewczuk & Szymon Kobus* 13
- A transdisciplinary approach for modelling macroinvertebrate habitats in lowland streams *Jens Kiesel, Daniel Hering, Britta Schmalz & Nicola Fohrer* 24
- Modelling the spatial variations of stream temperature and its impacts on habitat suitability in small lowland streams *Eva Boegh, Martin Olsen, John Conallin & Esbern Holmes* 34
- The character and behaviour of flood plain vegetation landscapes *Rajendra L. Shilpakar & Martin Thoms* 42
- An assessment of temporal habitat availability in a gravel-bed river using a Lidar-derived CFD model *Neil S. Entwistle, David J. Milan & George L. Heritage* 53
- Mapping stream surface flow types by balloon: an inexpensive high resolution remote sensing solution to rapid assessment of stream habitat heterogeneity? *Michael A. Reid & Martin C. Thoms* 62
- An investigation of the role of geomorphology in influencing biotope distribution *George L. Heritage, David J. Milan & Neil S. Entwistle* 68
- Fuzzy logic-based expert system for native fish habitat assessment in a scarcity information context *R. I. Meza & H. X. Vargas* 77
- The development of interdisciplinary flow-ecology models for the wetlands of the northern Murray-Darling Basin *Neil Saintilan, Joanne Ling & Li Wen* 86
- Hydrological indices for quantifying ecologically relevant flow conditions in intermittent alluvial plain rivers *J. Schmidt, S. T. Larned, D. Arscott & J. C. Dietrich* 94
- The potential effect of re-snagging on hydraulic habitat *Mark Southwell, Martin Thoms & Craig Boys* 103
- An index of river health for river plain network regions *Ying Zhang, Ling Liu, Jianzhong Wang, Juan Chen & Chengpeng Lu* 112

Computation methods of minimum and optimal instream ecological flow for the upper Huaihe River, China *Qiongfang Li, Tao Cai, Hongjie Wang, Yunhong Xue, Linlong Bai, Peng Li & Bin You* 122

The ecohydrology of stream networks *Celeste Harris, Martin Thoms & Murray Scown* 127

2 Ecohydrology and Groundwater Systems

The effect of groundwater supply on the hydrochemical diversity of flood plain lakes in the temperate climatic zone *Katarzyna Glińska-Lewczuk, Szymon Kobus, Krystian Obolewski & Jarosław Chormański* 139

Groundwater–surface water interactions at a fen margin: hydrological controls on the micro-habitat of an indicator snail species *Vertigo geyeri* *Anna Kuczyńska, Paul Johnston & Bruce Misstear* 151

Enhanced groundwater modelling methods for analyses in ecohydrology *Deborah L. Hathaway, Nabil Shafike & Karen MacClune* 161

Estimation of hydrological dynamics and ecohydrological effects in the Karst region of southwest China *Xi Chen, Zhicai Zhang, Pen Shi & Xuanwu Xue* 170

The contribution of groundwater to soil moisture in *Populus euphratica* root zone layer *Yonghua Zhu, Liliang Ren, Qicheng Zhang, Haishen Lü, Zhongbo Yu, Yanqing Wu & Huali Feng* 181

3 Ecohydrology and Catchment and Land-use Issues

Onset of the rainy season and crop yield in sub-Saharan Africa – tools and perspectives for Cameroon *Patrick Laux, Greta Jäckel, Munang Tingem & Harald Kunstmann* 191

Comparative study of the treatment of eutrophic water of different submerged plants with different planting densities *X. F. Chen, L. L. Ren & B. H. Guan* 201

The effect of gravel-sand mulch on soil moisture in the semi-arid loess region *Haishen Lü, Yonghua Zhu, Zhongbo Yu & Long Xiang* 208

Simulating the evolution of potential natural vegetation due to long-term climate change and its effect on the water balance of the Hanjiang River basin, China *Fei Yuan, Liliang Ren, Qinghua Luan & Zhongbo Yu* 216

Water balance and mean water residence time of the Vembanad Wetland of Kerala State, India *R. Gopakumar & K. Takara* 223

Key word index 233