

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.

August 2009

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