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Special Issue: **Sustainable Development of Water Resources**

IAHS International Commission on Water Resources Systems

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Global Warming, River Flows and Water Resources

edited by Nigel Arnell

published 1996 by John Wiley & Sons Ltd, Baffins Lane, Chichester, West Sussex PO19 1UD, UK; 224 + vii pp; price £17.99; ISBN 0-471-96599-5

This book is highly welcome because, probably, it is the first attempt to compile knowledge of the impacts of global warming on hydrology and water resources, knowledge which is scattered over a huge number of publications, mainly scientific journals and the proceedings of symposia. The field of hydrological and water resources activities related to global warming has significantly developed during the last two decades. Such activities are described in the book which devotes eight chapters to the following topics: climate change and hydrological processes; assessing the effects of climate change; catchments, models and scenarios for the Great Britain case study; changes in water resources in Britain; changes in river flows over time; changes in water quality; and implications for water resources and water management. The first chapter introduces the subject of the book and describes its structure. The book comprises 224 pages containing many graphs and diagrams.

The book intends to be comprehensive, i.e. it covers almost all the relevant aspects of hydrology and water resources related to climate change. However, since it is limited to 224 pages, many interesting and important methods of assessing climate change impacts are presented with very few equations and hardly any details, thus not allowing the reader to obtain a better knowledge of these important methods. For example, the link of space and time scales in hydrological modelling is not discussed at all. Lettenmaier & Gan (1990) and Mimikou *et al.* (1991) used medium size catchments in their studies but different model time resolution (daily and monthly respectively). The medium size of the catchment is compatible with the daily time step but not with the monthly step. This clarification is omitted in the relative point of reference (chapter 3, page 54), although, as is apparent from the above example, the methods used in climate change estimation must be chosen very carefully.

Although the book concentrates on the consequences of global warming for river flows and water resources in Britain, it presents numerous examples from other countries. These examples are possibly not the most suitable since there are many recent works related to large field experiments and projects such as EPOCH (European Program on Climate and Natural Hazards), ECHIVAL (European Project on Climate and Hydrological Interactions between Vegetation, Atmosphere, and Land Surfaces), EFEDA (ECHIVAL Field Experiment in Desertification-threatened Area), HAPEX (Hydrologic-Atmospheric Pilot Experiment), etc. which were very recently set up and are the most promising directions for future research.

The book is an excellent summary of almost all the current knowledge in the field of the assessment of the potential impacts of climate change on water resources. It represents valuable reading for all those who want to become familiar with the various aspects of climate change and its impacts on water resources. For those who want to have a profound knowledge on climate change effects, however, the contents of the book are not sufficient. It is hoped that a second edition will follow which will provide the necessary information.

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