

Preface

As radar hydrology is rapidly developing, its combined use with distributed hydrological modelling creates powerful numerical tools for forecasting storms, floods and related natural disasters. Such tools when used with historical observations can also contribute rich information for water resources assessment. In the last 20 years or so, considerable attention has been focused on radar hydrology and distributed hydrological modelling. However, fundamental issues of model development associated with the existence of uncertainties or errors in radar rainfall estimation and prediction, and in distributed model parameters, still remain unresolved. Clarification as to how hydrological prediction accuracy will be improved, or how prediction/estimation uncertainty will be reduced by combining spatially distributed radar rainfall information with a distributed hydrological model, was a basic motivation for organizing the present volume. Scale issues of distributed hydrological modelling also need further study. Suitable model resolution and required forcing resolution might be a function of catchment scale, but the relationship between them is still unknown. In association with the scale issues, assessing in what environment a distributed hydrological model shows better performance than a lumped model, is also an important research topic.

To address these research issues, a symposium entitled “Weather Radar Information and Distributed Hydrological Modelling” was held during IUGG 2003, the XXIII General Assembly of the International Union of Geodesy and Geophysics from 30 June to 11 July 2003 at Sapporo, Japan. The symposium was organized by the International Commission on Surface Water (ICSW) of the International Association of Hydrological Sciences (IAHS).

This volume of proceedings contains 42 papers presented at the symposium, and is organized into four sections:

- Weather Radar Information for Hydrological Prediction
- Assessment of Uncertainty in Distributed Hydrological Modelling
- Assessment of Performance in Distributed Hydrological Modelling
- Application of Distributed Hydrological Models in Watershed Management

The first group of 11 papers addresses radar rainfall estimation and prediction combined with hydrological models and numerical simulation of precipitation, as well as precipitation field analysis related to hydrological predictions. The next group of 10 papers focuses on the uncertainties in radar rainfall estimation/prediction and in parameter distribution in distributed hydrological modelling, and these papers contribute to efforts to assess the utility of a distributed hydrological model. The next 11 papers

address the model performance of distributed hydrological models associated with parameter sensitivity as well as scale issues in model resolution and forcing resolution. The final group of 10 papers demonstrates the applications of distributed hydrological models to various areas of many different hydrological environments, and provides examples of distributed hydrological models for watershed management.

The editors hope that this volume contributes to hydrology and water resources management through the development of radar hydrology and distributed hydrological modelling.

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