

Preface

The application of tracer experiments and numerical models to solve hydrogeological questions and hydrological problems has increased tremendously over the last fifteen years. Techniques using natural tracers and isotopes, as well as various artificial tracers, are now contributing to the understanding and quantification of flow and transport processes in complex hydrological systems, and particularly in hydrogeological systems. At the same time, the reliability of predictive simulations obtained by groundwater modelling depends largely on the calibration and validation of these models on the basis of measured data. Significant progress has been made in the incorporation of all this available information into the modelling of processes.

One of the main objectives of the International Commission on Tracers (ICT) of the International Association of Hydrological Sciences (IAHS) is to provide guidance on, and to promote the use of tracers and isotopes through dissemination of results to interested scientists and practitioners.

There is neither an ideal tracer, nor a perfect isotope that is suitable, or can be recommended for use in all hydrogeological contexts and purposes. The good choice of an adequate methodology involving the most suitable tracing products is of prime importance to the accuracy of any study. Again, when interpreting results, the good choice of an adequate modelling tool, ensuring that chosen conceptual assumptions are respected, is of overwhelming importance to the reliability of the interpreted results. It is not only the direct results that are relevant; the uncertainty of the values obtained must also be assessed. That is why a conference such as TraM'2000 (Tracers and Modelling in Hydrogeology) complements conferences like ModelCARE 99 (Calibration and Reliability in Groundwater Modelling, Zurich, September 1999).

TraM'2000 provided the opportunity for specialists from different branches of hydrological science (chemists, hydrogeologists, hydrologists) who have in common the challenging goal of developing "tracer techniques", to meet together and with numerical and geostatistical specialists who require the data for model calibration, validation, conditional simulations, etc. An increasing number of scientists combine work in both fields (modelling and tracer experiments) and can now provide interesting theoretical and practical research results.

The topics of the conference focused on practical approaches to assessing groundwater quality, protection methods, solutions to contamination problems, and waste disposal impact studies, at different time and spatial scales.

This book includes the Proceedings of the TraM'2000 Conference, but unfortunately, due to limited space, not all the contributions presented could be included. LGIH, University of Liège, has published an additional volume of some of the poster papers.

The papers published here are grouped according to the conference session in which they were presented:

- 1 Tracers studies for modelling dispersion, transport, existing contamination and protection measures
- 2 New tracer techniques, methodologies and results on tracer behaviour
- 3 Tracers and modelling for assessing reactive transport, organic contamination and natural attenuation
- 4 Tracers and modelling of double porosity, macropores and fractured/karstified rocks
- 5 Tracer studies for studying infiltration, recharge and hydrological processes in the unsaturated zone
- 6 Tracers studies and modelling of regional groundwater systems
- 7 Tracer studies for investigating groundwater–surface water interactions

The TraM'2000 Conference was promoted by the International Commission on Tracers (ICT) of the International Association of Hydrological Sciences (IAHS) and by the Belgian National Committee of the International Association of Hydrogeologists (IAH). Thank you to all colleagues who have made it a great success!

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