Consequences of Spatial Variability in Aquifer Properties and Data Limitations for Groundwater Modelling Practice

by

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Aquifer models are important predictive tools, but their value is limited. This is because such models, by their nature, are incomplete descriptions of physical and chemical processes. This book is intended to point out the major sources of aquifer model error and to provide a review of modern methods to deal with them. The publication is divided into two parts.

Part A (161 pages) is a state-of-the-art review of groundwater models, their data requirements, field methods for obtaining these data, sensitivity analysis methods, geostatistics, and inverse methods of parameter identification. The review and discussion are based upon over 300 journal articles and books which are carefully analysed and presented in the text, tables, and figures. Numerous examples are included, which are applicable to a wide variety of field situations.

Part B (110 pages) consists of selected papers presented at the IAHS Workshop on Spatial Variability held during the XIXth General Assembly of the International Union of Geodesy and Geophysics in Vancouver, BC, August 1987. These papers give an idea of the current and future directions in this area.

The book is both a resource and a vehicle for transfer of complex technology to the practicing hydrogeologist interested in new ways of dealing with model uncertainty and spatial variability in aquifer properties.

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The Working Group comprised the following members: Prof. Dr G. B. Engelen (The Netherlands), Mr G. P. Jones (Chairman, UK), Mr W. Struckmeier (Secretary, FR Germany), Prof. Dr G. S. Vartanyan (USSR), Mr H. J. Colenbrander (President ICGW, The Netherlands), Dr Zhang Youshi/Dr J. S. Gladwell (Project Officers IHP Secretariat).

This Working Group report contains two major parts: Part I deals with methodology and general aspects of groundwater flow systems. Part II presents a number of regional case studies at different scales and under different socio-economic, climatological and geological conditions.

This publication demonstrates the basis and value of a broad systems approach to groundwater studies which ideally complements the modern concepts of numerical modelling.
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