Groundwater Characterization, Management and Monitoring

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Preface

This book provides a systematic framework for groundwater development. It is conceived to be not only a textbook for students of groundwater and water resources management, but also to be a reference for engineers, hydrogeologists and water resources and water managers in general.

It is presented, using the current thinking in groundwater management, including the theoretical and technical backgrounds that will help to find efficient decisions.

Intending that aquifers have to be classed as vulnerable water sources and only carefully designed interventions will allow the appropriate use and protection of its resources, the book presents decision model building and resolution, and particular aspects of the use of decision models for groundwater management and their application to solve real world groundwater management problems.

As decision can only be taken if based on information, the book presents the review of groundwater monitoring network design methods with a problem-oriented approach. The analysis starts by stating the general problems that need solution, followed by a presentation of the methods available to solve them. Problem types include monitoring for general groundwater quantity/quality status (compliance) and trend analysis, early detection of contamination related to specific sources, and evaluation of remediation procedures – cleanup status.

As many of the methods used in decision models and monitoring methods require a thorough understanding on groundwater flow and on the transport and fate of solutes in groundwater, the main equation are first introduced.

This book, using a comprehensive approach, aims at contributing for a better engineering and management practices in the groundwater field.

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