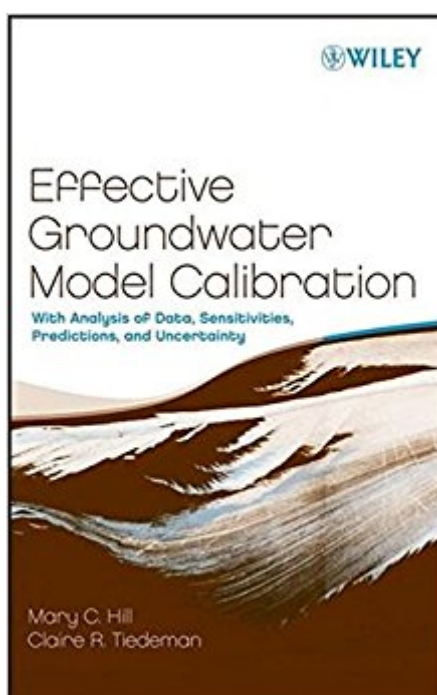The book was found

Effective Groundwater Model Calibration: With Analysis Of Data, Sensitivities, Predictions, And Uncertainty

Synopsis

Methods and guidelines for developing and using mathematical models Turn to Effective Groundwater Model Calibration for a set of methods and guidelines that can help produce more accurate and transparent mathematical models. The models can represent groundwater flow and transport and other natural and engineered systems. Use this book and its extensive exercises to learn methods to fully exploit the data on hand, maximize the model's potential, and troubleshoot any problems that arise. Use the methods to perform: Sensitivity analysis to evaluate the information content of data Data assessment to identify (a) existing measurements that dominate model development and predictions and (b) potential measurements likely to improve the reliability of predictions Calibration to develop models that are consistent with the data in an optimal manner Uncertainty evaluation to quantify and communicate errors in simulated results that are often used to make important societal decisions Most of the methods are based on linear and nonlinear regression theory. Fourteen guidelines show the reader how to use the methods advantageously in practical situations. Exercises focus on a groundwater flow system and management problem, enabling readers to apply all the methods presented in the text. The exercises can be completed using the material provided in the book, or as hands-on computer exercises using instructions and files available on the text's accompanying Web site. Throughout the book, the authors stress the need for valid statistical concepts and easily understood presentation methods required to achieve well-tested, transparent models. Most of the examples and all of the exercises focus on simulating groundwater systems; other examples come from surface-water hydrology and geophysics. The methods and guidelines in the text are broadly applicable and can be used by students, researchers, and engineers to simulate many kinds systems.

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Customer Reviews

"This is an excellent textbook that addresses a topic, optimization of multiparameter models, which is of broad interest." (Journal of American Water Resources Association, October 2007) "The book represents a very good combination of long-time expert knowledge and being up to date." (Clean, January 2008) "Ã¢â ¬Â¦a welcome addition to my collection of hydrogeologic booksÃ¢â ¬Â¦a valuable reference for ground water scientists who use models." (Ground Water, January-February 2008)

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This is THE definitive reference to have if you are interested at all in leaning how to apply inverse methods to groundwater modeling. In fact the tools and techniques used in this book may be applied to modelling in many disciplines, not just groundwater modeling.The fundamental topics of this book include information of the methods of inverse analysis: sensitivity analysis, data assessment strategies, calibration techniques, and uncertainty evaluation. This revolves around the "fourteen guidelines" (a copy of which I have hanging in my office); all are practical in nature. There are also suggestions for effectively communicating the calibration results in a statistically robust, quantitative manner (a particular pet peeve of mine).Additional resources are provided including exercises, answers, software, and PowerPoint files available through a companion website. As such, this book is useful in an academic setting. However, professionals should add this book to their library as well. Plan on referring to it frequently.Dwaine Edington, Ph.D. Colorado School of Mines

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