



Arc Hydro Groundwater

GIS for Hydrogeology

Arc Hydro Groundwater: GIS for Hydrogeology describes the groundwater data model, a new geodatabase design for representing groundwater systems using ArcGIS® software. The groundwater data model shares a common framework with the surface water components of the Arc Hydro data model, offering a comprehensive overview of water resources. Examples illustrating concepts and uses of the data model for management, visualization, and analysis, make this book an invaluable resource for hydrologists, water professionals, GIS specialists, and students who work with groundwater data to research and solve water resource problems.

Arc Hydro Groundwater uses sample datasets from the Edwards Aquifer and other locations in Texas to address the following:

- The Arc Hydro framework
- 3D subsurface representation in GIS
- Geological mapping
- Aquifers, wells, and boreholes
- 3D hydrogeologic models
- Time series for hydrologic systems
- Groundwater simulation models

Groundwater data used in the book, as well as slides and additional resources, are available for download from the Arc Hydro Resource Center: <http://resources.arcgis.com/archydro>.

Gil Strassberg is the main architect of the Arc Hydro Groundwater data model. He is a senior product engineer at Aquaveo LLC, and part of the Arc Hydro Groundwater tools development team.

Norman L. Jones is a professor in the Department of Civil and Environmental Engineering and director of the Environmental Modeling Research Laboratory at Brigham Young University.

David R. Maidment is Hussein M. Alharthy Centennial Chair in Civil Engineering and director of the Center for Research in Water Resources at the University of Texas at Austin.

108893
RRD3M1/11dc

Printed in the USA

Cover photo by Yory Frenklakh, courtesy of Shutterstock



ISBN 978-1-58948-198-5



Foreword **vii**

Clint Brown

Preface **ix**

Chapter 1 Introduction **1**

David R. Maidment

Chapter 2 Arc Hydro framework **13**

David R. Maidment and Gil Strassberg

Chapter 3 Three-dimensional ArcGIS for subsurface representation **31**

Gil Strassberg

Chapter 4 Geologic maps **39**

Gil Strassberg

Chapter 5 Aquifers, wells, and boreholes **47**

Gil Strassberg and Norman L. Jones

Chapter 6 Hydrostratigraphy **67**

Gil Strassberg, Norman L. Jones, and Timothy Whiteaker

Chapter 7 Time series for hydrologic systems **87**

Timothy Whiteaker, David R. Maidment, and Gil Strassberg

Chapter 8 Groundwater simulation models **111**

Norman L. Jones and Gil Strassberg

Chapter 9 Implementation **127**

Steve Gris  and Gil Strassberg

Afterword **141**

Glossary **143**

About the authors **149**

Index **150**