



# GROUND WATER ATLAS OF THE UNITED STATES

James A. Miller, Editor

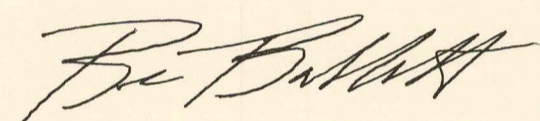
U.S. Department of the Interior  
U.S. Geological Survey

Reston, Virginia 2000



## FOREWORD

Ground water is one of the Nation's most precious natural resources. The Ground Water Atlas of the United States describes the location, extent, and geologic and hydrologic characteristics of the most productive aquifers in the United States, from which we derive the ground water that is the supply source for more than half of the people of this country. The Atlas is written so that those who are not hydrologists can gain an understanding of the occurrence, movement, and quality of ground water. The Atlas summarizes in one publication the most important ground-water information that has been collected over many years by the U.S. Geological Survey, other Federal agencies, and State and local water-management agencies. The hidden nature of ground water and the complexity of the underground systems that govern the flow and quality of ground water make this volume a critical addition to our understanding and stewardship of our Nation's ground-water resources.



BRUCE BABBITT  
Secretary of the Interior

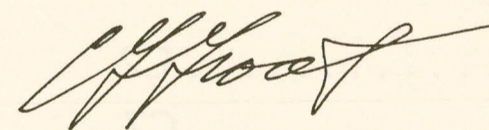


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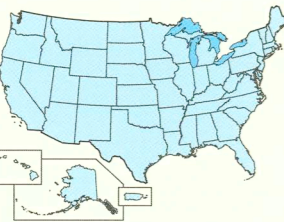
The Ground Water Atlas of the United States presents a comprehensive summary of the Nation's ground-water resources and is a basic reference for the location, geography, geology, and hydrologic characteristics of the major aquifers in the Nation. The information was collected by the U.S. Geological Survey and other agencies during the course of many years of study. Results of the Regional Aquifer-System Analysis Program, a systematic study of the Nation's major aquifers by the U.S. Geological Survey, were used as a major, but not exclusive, source of information of the Atlas.

The Atlas, which is designed in a graphical format that is supported by descriptive discussions, includes 13 chapters, each representing areas that collectively cover the 50 States and Puerto Rico, as well as the U.S. Virgin Islands. Each chapter of the Atlas presents and describes hydrogeologic and hydrologic conditions for the major aquifers in each regional area. The scale of the Atlas does not allow portrayal of minor features of the geology or hydrology of each aquifer presented, nor does it include detailed discussion of minor aquifers. Those readers who seek detailed local information for the aquifers will find extensive lists of references at the end of each chapter. The introductory chapter in this volume presents an overview of ground-water conditions Nationwide and gives an example of an aquifer in each of six hydrogeologic settings.



Charles G. Groat  
Director, U.S. Geological Survey

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CONVERSION FACTORS

For readers who prefer to use the International System (SI) units, rather than the inch-pound terms used in this report, the following conversion factors may be used:

<i>Multiply inch-pound units</i>	<i>By</i>	<i>To obtain (SI) metric units</i>
<b>Length</b>		
inch (in)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
<b>Area</b>		
square mile (mi <sup>2</sup> )	2.590	square kilometer (km <sup>2</sup> )
<b>Volume</b>		
acre-foot (acre-ft)	1,233	cubic meter (m <sup>3</sup> )
<b>Flow</b>		
gallon per minute (gal/min)	0.06308	liter per second (L/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m <sup>3</sup> /s)
billion gallons per day (Bgal/d)	3.785	million cubic meters per day (Mm <sup>3</sup> /d)
cubic foot per second (ft <sup>3</sup> /s)	0.02832	cubic meter per second (m <sup>3</sup> /s)
acre-foot per year (acre-ft/yr)	0.00003909	cubic meter per second (m <sup>3</sup> /s)
<b>Transmissivity</b>		
foot squared per day (ft <sup>2</sup> /d)	0.0929	meter squared per day (m <sup>2</sup> /d)
<b>Temperature</b>		
degree Fahrenheit (°F)	5/9(°F–32)=°C	degree Celsius (°C)

Sea Level: In this report, “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called “Mean Sea Level”. This datum has not been extended to Hawaii, Puerto Rico, or the Virgin Islands. Local datums are therefore used in these areas.

ACKNOWLEDGMENTS

The Ground Water Atlas of the United States was conceived in 1985 as a result of a meeting between senior ground-water hydrologists and publications personnel of the U.S. Geological Survey. The Atlas is a product of the Survey’s Regional Aquifer-System Analysis (RASA) Program and was prepared under the general supervision of Eugene P. Patten, Thomas E. Reilly, and William M. Alley, successive Chiefs or Acting Chiefs of the Office of Ground Water, and Ren Jen Sun and Hayes F. Grubb, successive Coordinators of the RASA Program. Direct supervision was by James A. Miller, Project Chief, who was responsible for the overall technical content and style of the book. Cartographic design and production were done under the general successive supervision of Gregory J. Allord and Wendy J. Danchuk, who, along with Christine M. Bebow, determined the design, layout, and cartographic style.

The Atlas originated from the ideas of James A. Miller, Eugene P. Patten and Robert L. Laney, formerly of the Office of Ground Water. However, the uniqueness and high technical quality of the book are due to the hard work and dedication of the authors and cartographers whose names appear on the contents page of each chapter.

Although individual acknowledgment of all editors, reviewers, illustrators, and typists who participated in the preparation of this book is not feasible, their cooperation and many contributions made the Atlas possible. The following persons, however, deserve special mention: Seymour Subitzky for guidance during planning; Eugene R. Hampton and Donald E. Hillier for providing technical and editorial guidance and setting the standards for style; Celso Puente, John V. Flager, and Donald G. Jordan for technical review; James O. Whitmer, Wendy J. Danchuk, Sidney J. Freitag, and Robert J. Olmstead for cartographic editorial review; Janet S. Sachs, Elizabeth A. Ciganovich, and Martha M. Smith for editorial review; Jamaica Pettit for typesetting; Melita Vadjeis, John M. Watermolen, John Evans, Rosemary S. Stenback, and Paco San Emitterio for assisting with illustrations; Steven Denowski and Joel Skalet for geographic data processing; and the numerous State Geologists and members of their staffs who provided technical review.

The Atlas was printed by the Printing Branch of the National Mapping Division. The text font used is Korinna.

For sale by the U.S. Geological Survey  
Branch of Information Services  
Box 25286  
Denver, Co 80225-0286

Library of Congress Cataloging-in-Publication Data

Ground water atlas of the United States / James A. Miller, editor.  
p. cm.  
Includes bibliographical references.  
ISBN 0-607-94179-0 (hardcover)  
1. Groundwater--United States--Maps. I. Miller, James A. (James Andersen), 1939-II. Geological Survey (U.S.)

G1201.C34 G7 2000  
551.49'0973'022--dc21

00-030003 00037653