# In Print & Online

## View Wetlands Maps Via Google Earth

***National Wetlands Inventory***

*U.S. Fish and Wildlife Service*

U.S. Fish and Wildlife Service maps of the National Wetlands Inventory are now available for viewing using Google Earth software. The inventory includes wetlands data for around 60 percent of the conterminous United States and portions of Alaska, Hawaii, and Puerto Rico.

*To access the maps, visit www.fws.gov/nwi/WetlandsData/GoogleEarth.htm.*
*Note: Google Earth v4.2 or higher is required.*

## Groundwater Recharge Related to Climate, Geology

***Ground-Water Recharge in the Arid and Semiarid Southwestern United States***

*U.S. Geological Survey*

This comprehensive treatment of groundwater recharge in the Southwest consists of 11 separately authored papers. It begins with an overview of the climatic and hydrogeologic framework of the Southwest and a regional analysis of natural groundwater recharge across the study area. An overview of site-specific case studies next represents different and diverse subareas of the Southwest. Eight case studies describe findings in basins of California, Arizona, Nevada, New Mexico, and Utah.

The regional analysis includes detailed hydrologic modeling within the framework of a high-resolution geographic information system. Results are used to explore both the distribution of groundwater recharge for mean climatic conditions as well as the influence of two climatic patterns—the El Niño-Southern Oscillation and Pacific Decadal Oscillation—that impart significant variability to the hydrologic cycle. The case studies employ a variety of geophysical and geochemical techniques to investigate recharge processes and relate them to local geologic and climatic conditions. Each case study makes use of naturally occurring tracers to quantify recharge. Thermal and geophysical techniques developed in the course of the studies are described in appendices.

*USGS Professional Paper 1703, "Ground-Water Recharge in the Arid and Semiarid Southwestern United States," edited by D. Stonestrom, J. Constantz, T. Ferre, and S. Leake, is available at pubs.usgs.gov/pp/pp1703/.*

## All About Texas Water—In Maps

***Texas Water Atlas***

*Lawrence E. Estaville and Richard A. Earl*

A new book published by the River Systems Institute at Texas State University and Texas A&M University Press uses innovative maps to explain water resources issues facing Texas. Sections describe climate issues, surface water and groundwater, water hazards associated with floods and drought, water quantity and quality, water projects, pollution, water recreation, and future water supply and demand. The book is targeted to a broad audience, from high school students to policymakers and environmentalists.

The book is notable for its graphics. For example, a map of the Edwards Aquifer shows the location of springs along the contributing recharge and artesian zones. A series of maps indicates which regions of Texas have been most affected by flash floods, catastrophic storms and hurricanes, and lists the intensity of rainfall associated with these events.

*The book is available for $24.95 from Texas A&M University Press, www.tamu.edu/upress/.*

## Water Utilities Confront Climate Change

***Climate Change and Drinking Water***

*AWWA Research Foundation*

In 2003, the American Water Works Association Research Foundation (AwwaRF) began to sponsor research to assess and plan responses to the impacts of climate change by drinking water utilities. This report summarizes existing and ongoing AwwaRF research and findings with respect to water utilities, water resources, water quality, infrastructure, energy and environment, management and communication.

*The 32-page report is a special issue of AwwaRF's Drinking Water Research, vol. 18 no.2, available at www.awwarf.org/newsAndEvents/pressRoom/DWRvol18no2.pdf.*

## Climate Change Impacts on Ecosystems

***The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States***

*U.S. Climate Change Science Program*

This report considers the effects of climate change on U.S. agriculture, land and water resources, and biodiversity based on scientific literature and recent assessments of the historical and potential impacts of climate change and climate variability.

Regarding water resources, the authors noted that "reliance on past conditions as the foundation for current and future planning and practice will no longer be tenable as climate change and variability increasingly create conditions well outside of historical parameters and erode predictability." In addition, they found:

- The trend toward reduced mountain snowpack and earlier spring runoff in the West is likely due to long-term warming, although a shift in the Pacific Decadal Oscillation in the late 1970s may also be a factor. These trends are likely to continue where they have already been detected and will impact reservoir operations.
- Most water quality changes observed so far in the United States are likely *not* attributable to climate change.
- Stream temperatures are likely to increase with warming climate, especially during low-flow periods. This will have direct and indirect effects on aquatic ecosystems.
- Climate simulations predict substantial decreases in annual stream runoff in the West.

- Increased water use efficiency may result in declining per capita water consumption; pressure to reallocate water will increase in areas of greatest population growth.
- The existing hydrologic observing system was not designed to detect climate change or its effects on water resources. Many systems are technologically obsolete or have significant data gaps and poorly integrated data.

The peer-reviewed report was written by 38 authors from universities, national laboratories, federal agencies, and nongovernmental organizations.

*The 202-page report is available at www.usda.gov/oce/global_change/files/CCSPFinalReport.pdf.*

## The Scoop on Nanomaterials

***Nanomaterials: New Emerging Contaminants and Their Potential Impact to Water Resources***

*William E. Motzer*

Manufactured nanomaterials (MNM) are a relatively new class of elemental metals, chemical compounds, and engineered materials with particle sizes ranging from 1 to 100 nanometers (nm). In comparison, a water molecule is approximately 0.3 nm across. MNMs contain several classes, including carbon- and metal-based substances, dendrimers (a type of polymer), and bio-inorganic composites.

Several classes of MNMs are now globally manufactured in hundreds to thousands of metric tons per year for structural applications, skin care products, information and communication technologies, biotechnology, and environmental technologies—which means they inevitably will reach the environment and water resources. Concern is growing at water treatment facilities and water districts about the potential of MNMs to affect the quality of both surface and underground drinking-water sources.

Motzer's paper describes general characteristics and behavior of MNMs, their occurrence in the environment, detection and analysis techniques, toxicity, transport and fate, regulatory issues, and the status of MNM remediation research.

*The 9-page paper is available from the Groundwater Resources Association of California at www.grac.org/Nanomaterials_and_Water_Resources.pdf. A summary is in GRAC's* Hydrovisions*, www.grac.org/Spring_2008.pdf.*

## Dealing with Natural Disasters on the Border

***Natural Disasters and the Environment Along the U.S.-Mexico Border***

*Good Neighbor Environmental Board*

The Good Neighbor Environmental Board (GNEB), an independent presidential advisory committee to the U.S. Environmental Protection Agency, released a report in March recommending ways for U.S. and Mexican officials to improve cooperation when coping with floods and other natural disasters and their impacts along the border.

The report focuses on natural disasters such as hurricanes, mudslides, tornadoes, wildfires, and earthquakes. It looks at the effects of these events on human health, wildlife, and ecosystems; the capabilities of existing institutions and frameworks to manage them; and promising emergency management initiatives that could provide help. Recommendations include supporting local initiatives to implement appropriate zoning codes, building codes, and other types of planning; building capacity for transboundary cooperation when responding to natural disasters, as well as cooperating at the local, state, regional, and tribal levels; better integrating existing emergency management systems and practical exercises; and expanding current domestic and international agreements so they reflect the need for border-specific measures to effectively manage natural disasters.

*The 64-page report is available at www.epa.gov/ocem/gneb/gneb11threport/English-GNEB-11th-Report.pdf.*