

Water for the Nation— An Overview of the USGS Water Resources Division

Mission

The Water Resources Division (WRD) of the U.S. Geological Survey (USGS) provides reliable, impartial, timely information needed to understand the Nation's water resources. WRD actively promotes the use of this information by decisionmakers to:

- Minimize the loss of life and property as a result of water-related hazards such as floods, droughts, and land movement.
- Effectively manage ground-water and surface-water resources for domestic, agricultural, commercial, industrial, recreational, and ecological uses.
- Protect and enhance water resources for human health, aquatic health, and environmental quality.
- Contribute to wise physical and economic development of the Nation's resources for the benefit of present and future generations.

Capabilities

Using its scientific infrastructure and expertise, the WRD provides a wide variety of water-data collection and management capabilities:

- Data base development and data management
- Data dissemination from a national water data base
- Development of data-collection methods and standards
- Infrastructure required for national data-collection efforts
- Flood studies (real-time river stage and streamflow discharge data)
- Precipitation-runoff modeling
- Flow and transport modeling for surface and ground waters
- Geographic information systems
- Hydrologic network design
- Chemical, biological, and microbiological analyses
- Laboratory methods development

Geochemistry studies

- Isotope studies and age dating of ground water
- Borehole and surface geophysics
- Subsidence studies
- Sediment transport studies
- Agricultural contamination (herbicides, pesticides, and fertilizers)
- Watershed studies
- Limnological studies
- Paleohydrology and climate change
- Training and technology transfer
- Outreach and public education in water resources

Serving the National Need for Water Information

At the heart of USGS water activities are scientists helping managers and public officials to develop, evaluate, and implement improved, cost-effective, and balanced water-resources management efforts. In fulfilling its public service mandate, information provided by the WRD on availability and use of surface water and ground water is used by water-resource agencies at all levels of government and by the private sector to determine (1) how pumping from water-supply wells affects the flow and quality of water in nearby wells, springs, and streams; (2) how land applications and waste disposal affect the availability and quality of water; (3) how the reliability of water supplies can change as a result of changes in water demand, dam operations, land use, and climate, and (4) how well-designed monitoring strategies provide cost-effective methods of protecting sources of drinking water.

Natural Hazards

Other important areas of public service are contributing to reducing the loss of life and property, moderating the impacts of floods, and improving

flood disaster response. Emergency management and public safety officials need accurate forecasts of floods to make evacuation decisions, as well as decisions on where to focus flood-fighting efforts. The U.S. National Weather Service, an agency of the National Oceanic and Atmospheric Administration, relies on streamflow information from USGS streamflow gaging stations in making its flood forecasts. USGS information on the discharge, height, and velocity of potential floods is also used by transportation agencies and engineering firms to help design bridges and roadways.

Water Contamination

Water can be polluted from point sources (such as chemical spills), non-point sources (such as urban runoff, fertilizers, manure, mining activity), atmospheric deposition (acid rain and particulates), and naturally occurring geologic conditions. Water managers use USGS water-resources information to identify relative contributions of contaminants to rivers and ground water from specific sources. Such water-quality information has proven useful in setting policies on water-quality issues, safeguarding public health, and reducing water costs.

The USGS helps to manage the Nation's waters by assisting water management at all levels to determine more efficient and effective uses of resources that will help ensure plentiful, clean water for current and future generations. The WRD helps water managers, as well as the general public, to understand and to manage water resources better.

Data Management

A hallmark of USGS water-resources activities is the consistent organizing, archiving, and disseminat-

ing of water data and information.

Data are stored in nationally consistent data bases that are distributed in a variety of formats and delivery methods. Access and distribution of hydrologic data and information for use in geographic information systems and other applications has been enhanced with the availability of information on the World Wide Web (WWW) of the Internet. Real-time and historic data are available for streamflow gaging stations, as well as increasing information about water quality. USGS research has also resulted in the development of mathematical models that are used to predict the behavior of water, heat, and a wide range of contaminants in surface and ground water. These models and all water data are available on the WWW. To access available information, use the url:

<http://water.usgs.gov>

Activities

Consistent with its mission, the WRD provides impartial, credible, and excellent science that is applied to issues relevant to water-resources management, protection from and mitigation of hydrologic hazards, environmental protection, and other public policies.

In a world with many competing demands on water resources and considerable public attention focused on water issues, the WRD conducts its activities in a manner that best serves the Nation.

Primary WRD activities include:

- Collecting, storing, and disseminating basic hydrologic data on the quantity, quality, and uses of water.
- Conducting assessments of availability of water, quality of water, and water-related hazards at scales that range from single data-collection sites to regional and national scale.
- Conducting interpretive studies and developing predictive models that describe the potential consequences

of water-related management actions.

- Providing knowledge and expertise to assist various levels of government (Federal, State, and local) in understanding and solving critical water-resource problems.
- Developing new methods for acquiring water-resources information, including methods of data collection, quality assurance, data management, laboratory analysis, data analysis, and simulation modeling.
- Producing new understanding that describes or explains processes important to water-related issues.

Priority Water-Resource Issues

Issues of public policy related to water resources in which the WRD focuses its activities include:

- Effects of urbanization and suburbanization on water resources.
- Effects of land use and population increases on water resources in the coastal zone.
- Drinking water availability and quality.
- Suitability of aquatic habitat for biota.
- Waste isolation and remediation of contaminated environments.
- Hydrologic hazards.
- Effects of climate on water-resources management.
- Surface-water and ground-water interactions as related to water-resources management.
- Hydrologic system management, including optimization of ground-water and surface-water use.

The WRD has the scientific infrastructure and expertise to address these pressing national issues. Through partnerships within the USGS and with the academic community, scientists at all levels of government, the public sector, and the international scientific arena, the WRD continues to build on and enhance these strengths.

For more information:
Int'l Water Resources Branch
U.S. Geological Survey
420 National Center
Reston, VA 20192
Fax: 703-648-6687

Verne Schneider
Chief
703-648-5230

Anna Lenox
Deputy Chief
703-648-5053

Additional water, earth, mapping, and biological information can be found by accessing the USGS Home Page on the World Wide Web at <http://www.usgs.gov>

The USGS provides maps, reports, and information to help others meet their needs to manage, develop, and protect America's water, energy, mineral, biological, and land resources. We help find the natural resources needed to build tomorrow, and supply the scientific understanding needed to help minimize or mitigate the effects of natural hazards and environmental damage caused by natural and human activities. The results of our efforts touch the daily lives of every citizen.