

Water-Resources Investigations in Wisconsin, 2002

Open-File Report 02-300



WATER-RESOURCES INVESTIGATIONS IN WISCONSIN, 2002

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U.S. DEPARTMENT OF THE INTERIOR

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BASIC MISSION AND PROJECTS

U.S. Geological Survey

The U.S. Geological Survey was established by an act of Congress on March 3, 1879, to provide a permanent Federal agency to conduct the systematic and scientific “classification of the public lands, and examination of the geological structure, mineral resources, and products of national domain.” An integral part of that original mission includes publishing and disseminating the earth-science information needed to understand, to plan the use of, and to manage the Nation’s energy, land, mineral, and water resources.

Since 1879, the research and fact-finding role of the U.S. Geological Survey (USGS) has grown and has been modified to meet the changing needs of the Nation it serves. As part of the evolution, the USGS has become the Federal Government’s largest earth-science research agency, the Nation’s largest civilian map-making agency, the primary source of data on the Nation’s surface-water and ground-water resources, and the employer of the largest number of professional earth scientists in the Nation. Today’s programs serve a diversity of needs and users. Programs include:

- Conducting detailed assessments of the energy and mineral potential of land and offshore areas.
- Investigating and issuing warnings of earthquakes, volcanic eruptions, landslides, and other geologic and hydrologic hazards.
- Conducting research on the geologic structure of land and offshore areas.
- Studying the geologic features, structure, processes, and history of the other planets of our solar system.
- Conducting topographic surveys and preparing topographic and thematic maps and related cartographic products.
- Developing and producing digital cartographic data bases and products.
- Collecting data on a routine basis to determine the quantity, quality, and use of surface water and ground water.
- Conducting water-resource appraisals to describe the consequences of alternative plans for developing land and water resources.
- Conducting research in hydraulics and hydrology, and coordinating all Federal water-data acquisition.
- Using remotely sensed data to develop new cartographic, geologic, and hydrologic research techniques for natural resources planning and management.
- Providing earth-science information through an extensive publications program and a network of public access points.
- Manage water, biological, energy, and mineral resources.

Along with its continuing commitment to meet the growing and changing earth-science needs of the Nation, the USGS remains dedicated to its original mission to collect, analyze, interpret, publish, and disseminate information about the natural resources of the Nation—providing “Earth science in the public service.”

WATER RESOURCES DISCIPLINE

The mission of the Water Resources Discipline (WRD) is to provide the hydrologic information and understanding needed for the optimum utilization and management of the Nation's water resources for the overall benefit of the people of the United States. This mission is accomplished, in large part, through cooperation with other Federal and non-Federal agencies, by:

Collecting, on a systematic basis, data needed for the continuing determination and evaluation of the quantity, quality, and use of the Nation's water resources.

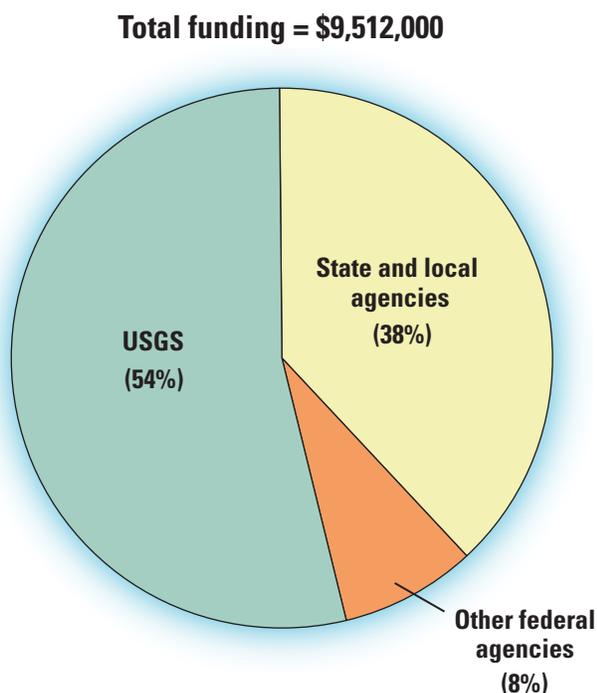
Conducting analytical and interpretive water-resource appraisals describing the occurrence, availability, and physical, chemical, and biological characteristics of surface water and ground water.

Conducting supportive basic and problem-oriented research in hydraulics, hydrology, and related fields of science to improve the scientific basis for investigations and measurement techniques and to understand hydrologic systems sufficiently well to quantitatively predict their response to stress.

Disseminating the water data and the results of these investigations and research through reports, maps, computerized information services, and other forms of public releases.

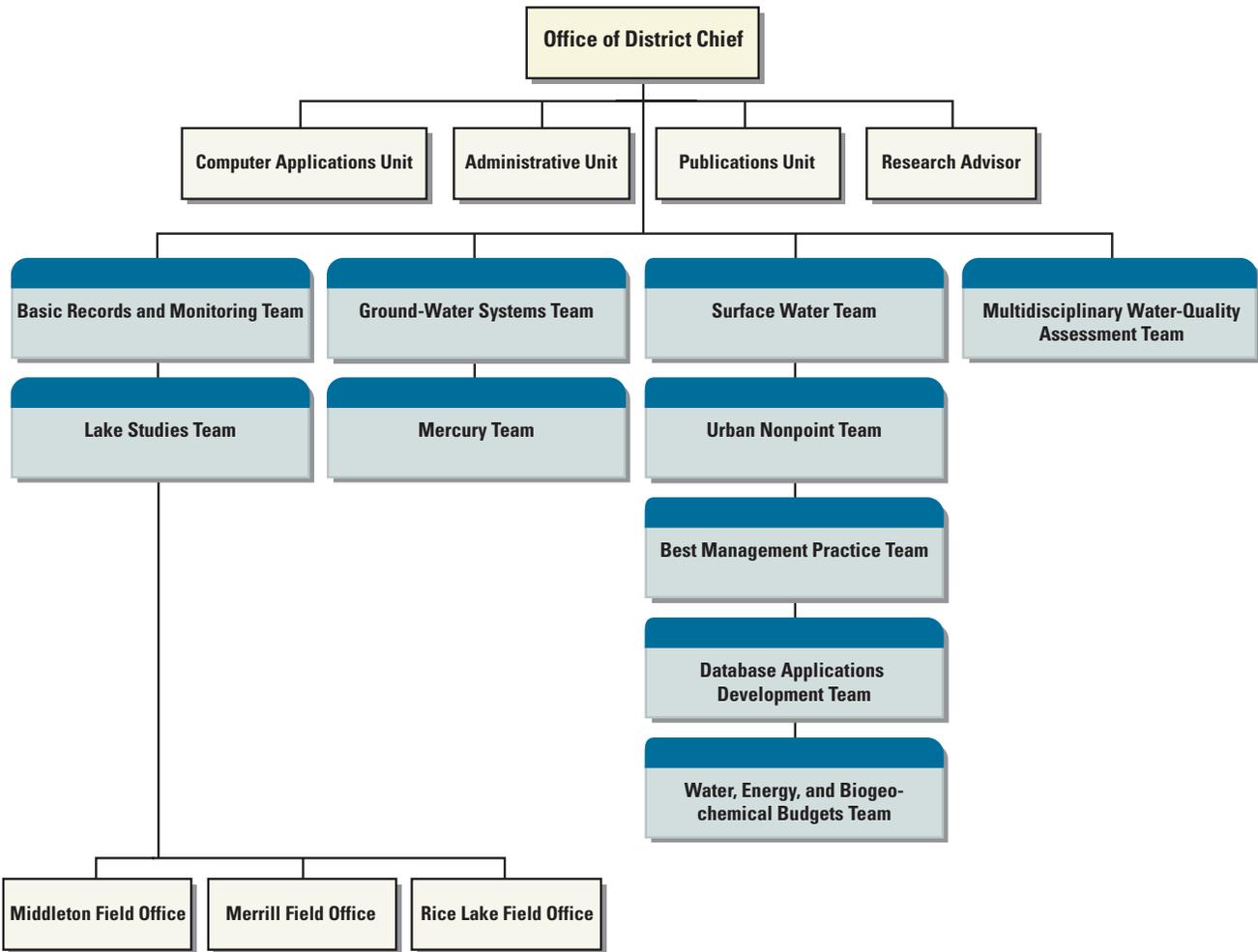
Coordinating the activities of Federal agencies in the acquisition of water data for streams, lakes, reservoirs, estuaries, and ground water.

Providing scientific and technical assistance in hydrologic fields to other federal, state, and local agencies, to licensees of the Federal Energy Regulatory Commission, and to international agencies on behalf of the U.S. Department of State.



Funding sources for the water-resources program in Wisconsin for the 2002 fiscal year.

Water Resources Discipline, Wisconsin District



Organization chart of the U.S. Geological Survey, Water Resources Discipline, Wisconsin District.



Location of offices in Wisconsin District.

COOPERATORS

State Agencies

University of Wisconsin, Madison
Wisconsin Department of Agriculture, Trade, and Consumer Protection
Wisconsin Department of Natural Resources
Wisconsin Department of Transportation
Wisconsin Geological and Natural History Survey
Wisconsin State Laboratory of Hygiene
Florida Department of Environmental Protection

Local Agencies

City of Barron
City of Beaver Dam
City of Brookfield
City of Fond du Lac
City of Fort Atkinson
City of Hillsboro
City of Madison
City of Middleton
City of Milwaukee
City of Peshtigo
City of Sparta
City of Thorp
City of Waupun
County of Bayfield
County of Milwaukee
Dane County Lakes and Watershed Management
Dane County Land Conservation Department
Dane County Regional Planning Commission
Dane County Department of Planning & Development
Fontana/Walworth Water Pollution Control Commission
Geneva Lake Environmental Agency
Green Bay Metropolitan Sewerage District
Joint Water Quality Commission of Danbury and St. Croix Chippewa
Indians of Wisconsin
Madison Metropolitan Sewerage District
Marathon County Highway Department
Milwaukee Metropolitan Sewerage District
Rock County Public Works Department
Southeastern Wisconsin Regional Planning Commission
Village of Wittenberg
Walworth County Metropolitan Sewerage District

Other Federal Agencies

U.S. Army Corps of Engineers,
Detroit District
Rock Island District
St. Paul District
Vicksburg, MS
Federal Energy Regulatory Commission licensees
Black River Falls Municipal Utilities

Other Federal Agencies (continued)

Stora Enso, Niagra Mill
Dairyland Power Cooperative
Northern States Power Company
Northwoods Hydropower
Wisconsin Electric Power Company
Wisconsin Public Service Corporation
Wisconsin Valley Improvement Company
National Park Service

U.S. Environmental Protection Agency

Indian Tribes

Bad River Band of Lake Superior Chippewa
Lac Courte Oreilles Tribe
Lac du Flambeau Band of Lake Superior Chippewa
Menominee Indian Tribe of Wisconsin
Oneida Tribe of Indians of Wisconsin
St. Croix Tribe of Wisconsin
Stockbridge-Munsee Band of Mohican Indians
Sokaogon Chippewa Indians of Wisconsin
Ho-Chunk Nation of Wisconsin

Lake Districts

Benedict/Tombeau Lake Management District
Buffalo Lake District
City of Muskego
Eagle Spring Lake Management District
Green Lake Sanitary District
Lauderdale Lakes Lake Management District
Little Cedar Lake Protection and Rehabilitation District
Little Green Lake Protection and Rehabilitation District
Little Muskego Lake Management District
Little St. Germain Protection and Rehabilitation District
Middle Genesee Lake District
Okauchee Lake District
Pike Lake Management District
Potter Lake Rehabilitation and Protection District
Powers Lake District
Silver Lake Protection and Rehabilitation District
Whitewater Rice Lake Management District
Wind Lake Management District
Town of Delavan
Town of Hubbard
Town of Sand Lake
Town of Wascott
Village of Oconomowoc Lake
Village of Hustisford
Town of Baraboo

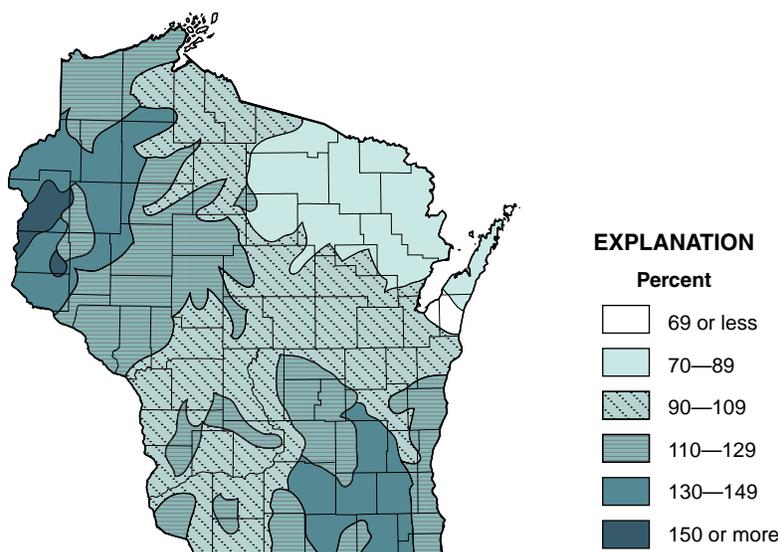
SUMMARY OF HYDROLOGIC CONDITIONS

Streamflow

The statewide average precipitation of 34.83 inches for the 2001 water year was 3.15 inches greater than the normal annual precipitation of 31.68 inches for water years 1961–90. Average precipitation values affecting streamflow conditions ranged from 92 percent in northeast Wisconsin to 122 percent in southwest Wisconsin with a statewide average of 110 percent (summary tables provided by Lyle Anderson and Ed Hopkins, State Climatology Office, University of Wisconsin, Madison, written commun., 2002).

The year started out very dry with all regions of the state below 50% of the long-term October average. November precipitation, which was approximately normal, was followed by a December which had record-setting snowfall in most of southern Wisconsin and heavier than normal snowfall the rest of the state. This snowfall total was boosted by the colder than normal temperatures that increased the snowfall depth for water content. The state had the first emergency snow declaration since 1979 with 14 counties receiving aid for December snow clean-up (Wisconsin State Journal, Dec. 15, 2001). Statewide precipitation in January was close to normal. February precipitation was above normal in northwest, north central and all of southern Wisconsin. Elsewhere in the state precipitation was close to normal. In March all regions of the state were very dry with total precipitation below 50% of the long-term March average. In April, the northwest corner of the state had precipitation over three times normal, north central had more than double normal and west central also had precipitation significantly above normal. The rest of the state was also above normal. In May, precipitation in the southern and central parts of the state was about 160 percent of normal. From mid June to mid July there was a statewide dry spell, with most of the state receiving less than 1 inch of rain. August precipitation was close to normal for most of the state with some localized very heavy rains of over 11 inches in southwest and south central Wisconsin. In September, the southern part of the state was above normal, the northwest part of the state was below normal and the rest of the state was about normal.

Runoff for rivers in the state ranged from 67 percent of the average annual runoff (1964–2001) at the Kewaunee River site in the northeast part of the state to 160 percent of the average annual runoff (1944–2001) at the Eau Galle River at Spring Valley site in the west central part of the state. Departures of runoff in the 2001 water year as a percent of long-term average runoff in the state (determined using stations with drainage areas greater than 150 square miles and at least 20 years of record) are shown in figure 4.



2001 runoff as percentage of long-term average runoff.

Water Quality

Suspended-sediment yields from four watersheds in southern Wisconsin in water year 2001 ranged from 47 to 140 percent of normal, as indicated by loads measured at relatively long-term monitoring sites on these four watersheds. Sediment yields at Brant River in southwestern Wisconsin and Yahara River at Windsor in south-central Wisconsin were 47 and 64 percent of normal, respectively. Yields at Jackson Creek Tributary near Elkhorn in southeastern Wisconsin and Green Lake Inlet near Green Lake were 98 and 140 percent of normal, respectively.

Phosphorus yields in water year 2001 from three watershed in southern Wisconsin, on which there are long-term monitoring sites, ranged from 72 to 102 percent of normal. The phosphorus yield for Yahara River at Windsor was 72 percent of normal, the yield for Jackson Creek Tributary was 95 percent of normal, and the yield for Green Lake Inlet was 102 percent of normal.

Ground-Water Levels

In general, shallow ground-water levels during the 2001 water year were normal to above normal for most of the wells in the State. Wells in Dane, Grant, and LaFayette Counties had below normal ground-water levels at the beginning of the water year, and these levels remained below normal for the entire water year. The large extent of normal and above-normal ground-water levels can be attributed to near normal rainfall during the 2001 water year and normal rainfall during the previous water year.

Further information about the hydrologic information for Wisconsin can be found in "Water Resources Data—Wisconsin, Water Year 2001."