The U.S. Geological Survey (USGS) is the principal Federal earth-science agency dedicated to collecting, analyzing, interpreting, publishing, and disseminating information about the Nation's energy, land, mineral, and water resources. The USGS is unique among Government organizations because it has neither regulatory nor developmental authority—its sole product is information. The primary role is that of a scientific organization concerned with providing credible, relevant, impartial, and timely information to all interested parties.

The USGS was established by an act of Congress on March 3, 1879, to provide a permanent Federal agency to conduct systematic and scientific classification of the public lands and examination of the geological structure, mineral resources, and products of national domain. Since 1879, the research and fact-finding role of the USGS has both grown and evolved to meet the changing needs of the Nation.

Fulfilling the mission of the USGS is provided in major part by the Water Resources Division (WRD). WRD supplies 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. The USGS Kentucky District investigates the occurrence, distribution, quantity, movement, and chemical and biological quality of Kentucky's surface and ground water. Water-resources activities of the Kentucky District include (1) maintenance and analysis of long-term (since 1898) quantitative and qualitative data for streams, reservoirs, estuaries, and ground water; and (2) shorter-term interpretative investigations of specific water-resources issues on a local, State, regional, and national level. Such investigations include brine contamination from oil and gas development, nonpoint-source contamination in ground water, and trace-element contamination in streams and reservoirs.

**Flood waters on the Kentucky River** completely covered lock 2 in December 1990. The Kentucky River crested at 36.25 feet—13 feet above flood stage.

**MISSION of Kentucky WRD:**

The mission of the Kentucky District is to provide the hydrologic information and understanding needed for the optimum utilization and management of the Nation’s water resources.

**VISION of Kentucky WRD:**

We are leaders in providing timely and accurate water-resources and related earth-science information for current and future generations.

... the principal Federal earth-science research agency
District Organization

Water-resources activities of the Kentucky District are conducted by a highly trained staff that consists of more than 40 hydrologists, geologists, engineers, hydrologic technicians, and a variety of support personnel. The District maintains three offices: the District office in Louisville and field offices in Paducah and Williamsburg.

Louisville District Office
9818 Bluegrass Parkway
Louisville, KY 40299
Randolph B. See, District Chief
(502) 493-1900

Paducah Field Office
501 Broadway, Room M-17
Paducah, KY 42001
Alan C. Brown, Field Office Chief
(502) 443-1252

Williamsburg Field Office
P.O. Box 1028
Williamsburg, KY 40769
F. Dave Byrd, Field Office Chief
(606) 549-2406

For information on specific programs, please contact the Kentucky District office in Louisville:
Telephone (502) 493-1900
Internet: dc_ky@usgs.gov

Cooperative Program

Inclusion in the Federal-State Cooperative Program is considered when a proposed jointly funded study is mutually advantageous to the USGS and the Commonwealth or local agency or government. Cooperative funding is provided to those projects which present significant opportunities to transfer or regionalize hydrologic information, to expand our understanding of hydrologic systems and processes, or to develop new tools or methods for studying the same.

Funding Sources

Financial support for District hydrologic-data collection and investigations comes from three sources:
1. Federal-State Cooperative Program (COOP), where funds from local, regional, or Commonwealth agencies and governments are matched with USGS funds;
2. Reimbursable funding from other Federal agencies (OFA) such as the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency; and
3. Direct congressional appropriations to the USGS (Federal) for hydrologic networks and investigative programs.

These cooperative, jointly funded programs are reviewed and renegotiated annually to ensure that they are responsive to the needs of the Commonwealth and localities, and also to the national priorities of the USGS. Current agencies or governments supporting cooperative water-resources programs in Kentucky include—

- Bullitt County, Kentucky
- Carroll County Water Supply Planning Board
- City of Elizabethtown
- City of Georgetown
- City of Louisville
- Glasgow Water Company

Kentucky Cabinet for Human Resources, Department of Health Services
Kentucky Natural Resources and Environmental Protection Cabinet, Department of Environmental Protection — Division of Water — Division of Waste Management
Kentucky Office of Geographic Information Systems
Kentucky Regional Planning and Development Agency
Kentucky River Authority
Kentucky Utilities Company
Louisville, and Jefferson County Metropolitan Sewer District
University of Louisville

... cooperative research and data collection
HYDROLOGIC-DATA COLLECTION

Hydrologic data, also referred to as basic data, are critical to the investigations conducted by the USGS and other researchers. The basic data programs conducted by the District provide streamflow, ground-water level, sediment, precipitation, water-quality, and water-use information essential for the utilization and management of the Commonwealth's water resources. The District's hydrologic data are available on computer disks and are published in the USGS annual data report titled “Water-Resources Data for Kentucky” and in other USGS publications.

New Program

**Evaluation of Ground-Water Quality of the Ohio River Alluvial Aquifer in Jefferson County, Kentucky**

Cooperator: City of Louisville

Purpose: A systematic collection and reporting of ground-water quality data are necessary to assess existing and future water-quality conditions in the Ohio River alluvial aquifer.

Goals:
- Compile existing ground-water quality data
- Install a network of monitoring wells and conduct a systematic sampling program
- Create and maintain a ground-water quality data base
- Disseminate information through geographical information system products
- Document variations and trends in the quality of ground water

Continuing Programs

**District Sediment Laboratory**

Cooperators: USGS Districts Nationwide

Sediment plays an important role in the transport of constituents in surface-water and karst-aquifer systems. The Kentucky District operates a laboratory capable of suspended-sediment analysis to define suspended-sediment and streambed-sediment loads.

**Surface-Water Network**

Cooperators:
- Bullitt County, Kentucky
- City of Campbellsville
- City of Georgetown
- Glasgow Water Company
- Kentucky Cabinet for Human Resources
- Kentucky Division of Water
- Kentucky River Authority
- Kentucky Utilities Company
- Louisville and Jefferson County Metropolitan Sewer District
- University of Louisville

The Kentucky District currently operates and maintains 118 gaging stations of which 80 provide near-real-time stage data, 81 provide daily discharge data, 76 provide precipitation data, and periodic water-quality sampling is done at 31 sites. Data are also collected at six crest-stage/peak-flow stations and eight special studies stations.

**Ground-Water-Level Observation Network**

Cooperators:
- Louisville and Jefferson County Metropolitan Sewer District
- City of Elizabethtown

The Kentucky District maintains a network of observation wells to provide long-term ground-water-level data. The ground-water resource information is useful to measure the effects of human activities and natural events and to assist in the prediction of future water supplies and ground-water management. The network consists of 20 wells located throughout the Commonwealth with an additional 63 monitoring wells in Jefferson County.

**Surface-Water-Quality Monitoring Network**

The Kentucky District monitors two sites on the Ohio River as part of the National Stream-Quality Accounting Network (NASQAN). The NASQAN program provides a National data base designed to define and monitor the physical, chemical, and biological quality of surface streams for the planning, management protection, and assessment of the surface-water resources of the country.

**Chemical Quality of Precipitation**

The Kentucky District participates in the National Atmospheric Deposition Program (NADP) of the USGS. The NADP supports research on atmospheric deposition and its effects on water resources, agriculture, and forest lands.

**Water Use**

Cooperator: Kentucky Division of Water

Information concerning where, how, and in what quantities water is being used is gathered and compiled as part of a computerized statewide water-use data base. Water-use information for the Commonwealth is published every 5 years as part of a National water-use report.

... collecting hydrologic data critical to scientific investigations...
Water-Resources Activities of the Kentucky District

JEFFERSON COUNTY DATA COLLECTION AND HYDROLOGIC INVESTIGATIONS ACTIVITIES

HYDROLOGIC-DATA COLLECTION
- Evaluation of Ground-Water Quality of the Ohio River Alluvial Aquifer in Jefferson County, Kentucky
- Ground-Water-Level Observation Network

HYDROLOGIC INVESTIGATIONS
- Geohydrologic Framework and Ground-Water Flow at the Naval Surface Warfare Center, Louisville, Kentucky
- Assimilation Capacity of Selected Stream Reaches in Jefferson County
- Urban Hydrology and Surface-Water Quality of Jefferson County
- Hydrologic Simulation of the Beargrass Creek Basin
- Urban Flood Characteristics for Jefferson County

Cooperator: U.S. Army Corps of Engineers

Cooperator: National Stream-Quality Assessment Program (NASQAN) Gage
- National Atmospheric Gage
- Precipitation Gage

Simulated by: Carrol - Public Water Supply

Louisville District Office
Randolph B. See, District Chief

Cooperator: Distler Brickyard (USEPA)
Hardin County

Perryville Field Office
Alan C. Brown, Chief

Mussel-Monitoring near Olmsted Locks and Dam

Cooperator: U.S. Army Corps of Engineers

Map showing the distribution of various data collection and investigation activities in Jefferson County, Kentucky.
Modeling of Herrington Lake Reservoir
Cooperator: Kentucky Division of Water

Superfund Technical Assistance Program
Maxey Flats (KNREPC) Fleming County

Superfund Technical Assistance Program
Tarter Farms (USEPA) Pulaski County

NATIONAL PROGRAMS -- COOPERATOR

- District Sediment Laboratory -- USGS Districts
- Water Use -- Kentucky Division of Water
- Scour at Bridge Foundations -- University of Louisville

STATE PROGRAMS -- COOPERATOR

- GIS Data Base for Hydrologic Research -- Kentucky Office for GIS and the University of Louisville
- Hydrologic Assessments at Underground Storage Tank Sites -- Kentucky Division of Waste Management
HYDROLOGIC INVESTIGATIONS

A wide-ranging program of hydrologic investigations and research provides information essential to the protection and management of the water resources of Kentucky. Investigations cover, to some degree, all aspects of hydrology, water quality, and aquatic biology.

New Programs

**Modeling of Herrington Lake Reservoir**
Cooperator: Kentucky Division of Water

Purpose: In recent years the Commonwealth of Kentucky has determined that Herrington Lake, an important hydropower, water supply, and recreational reservoir in central Kentucky, is exhibiting characteristics of eutrophic reservoirs (i.e., low dissolved oxygen, algal blooms, taste and odor problems, and occasional fish kills). Sediment is also accumulating in the upper reaches of the reservoir restricting navigation during low-flow periods.

Goals:
- Perform a detailed analysis of the trophic status of Herrington Lake
- Determine the nutrient assimilation capacity of the reservoir

**Geohydrologic Framework and Ground-Water Flow at the Naval Surface Warfare Center**
Cooperator: U.S. Department of the Navy

Purpose: The Naval Surface Warfare Center located in southwest Louisville, Kentucky, is entering a "privatization" phase as part of the U.S. Department of Defense base realignment and closure procedure. An accurate assessment of the geohydrologic framework and ground-water flow system is needed to identify potential pathways for migration of contaminants at the Center before ownership of the property can be transferred to the Louisville-Jefferson County Redevelopment Authority.

Changing the sediment regime during the construction and operation of the Olmsted Locks and Dam on the Ohio River could result in water-quality degradation and habitat alteration for a population of endangered orange-footed pearly mussels. The objective of the study is to develop, design, and implement the technology needed to monitor the changes in elevation of the riverbed.

**Assimilation Capacity of Selected Stream Reaches in Jefferson County**
Cooperator: Louisville and Jefferson County Metropolitan Sewer District

Reaches of the lower Middle and South Forks of Beargrass Creek are studied to assess their assimilation capacity with respect to regions of significant combined sewer overflow inputs.

**Urban Hydrology and Surface-Water Quality of Jefferson County**
Cooperator: Louisville and Jefferson County Metropolitan Sewer District

Information is collected on rainfall, streamflow, surface-water quality, and stormwater-runoff quality to assess water-quality conditions and to define long-term trends in water-quality conditions for surface streams in Jefferson County, particularly with respect to land-use practices.

**Simulation of Ground-Water Flow in Carrolton, Kentucky**
Cooperator: Carroll County Public Water Supply Board

This study has been designed to collect and manage needed data to incorporate into a regionally consistent flow model of the Ohio River alluvium that can be used as the basis for water use and environmental planning.

**Urban Flood Characteristics for Jefferson County**
Cooperator: Louisville and Jefferson County Metropolitan Sewer District

Urban development generally alters hydrologic response leading to increased rates and volumes of surface...
runoff. The objective of the study is to develop the tools, techniques, and equations needed to determine peak-discharge-frequency estimates for urban basins.

GIS Data Base for Hydrologic Research

Cooperators: Kentucky Office for GIS University of Louisville

The demand is rapidly increasing for digital data bases to assist in modeling, mapping, data storage and management, interactive display and query, and interpretation of hydrologic data. This program is conducted to manage, maintain, update, and improve a hydrology-related geographic information system (GIS) data base for Kentucky.

Hydrologic Assessments at Underground Storage Tank Sites

Cooperator: Kentucky Division of Waste Management

The Kentucky Division of Waste Management (KDWM) has requested technical assistance from the Kentucky District on hydrologic issues related to leaking underground storage tanks. The District provides a wide range of technical support to KDWM while developing technology and applied research concerning hydrocarbons and other chemical contamination of underground storage tank sites.

Superfund Technical Assistance Program

Superfund Sites: Distler Brickyard (USEPA) Maxey Flats (KNREPC) Tarter Farms (USEPA)

At selected sites, the U.S. Environmental Protection Agency (USEPA) and the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) have requested technical assistance from the USGS on hydrologic issues. The Kentucky District provides support during the remedial investigation and remedial action process to the sites listed above.

PUBLIC-INFORMATION AND PUBLIC-SERVICE ACTIVITIES

Kentucky District staff is involved in numerous other activities in addition to our regular programs of hydrologic-data collection and investigations. Information is provided on a wide range of hydrologic, geologic, geographic, and environmental topics to landowners, water users, public officials, business concerns, professional consultants, and the general public. District staff is also involved in public education, and routinely serve as guest speakers at primary and secondary schools and meetings of public-interest groups, instructors and guest lecturers at colleges and universities, and as science-fair judges.

District staff also routinely serve as members of advisory committees, task forces, and work groups of professional societies and Federal, Commonwealth, or local governmental agencies. Select groups include the following:
- Advisory Committee of the Ohio River Basin Commission
- American Society of Civil Engineers’ Task Committee on Bridge Scour
- Committee on Research and Policy of the Kentucky Water Resources Research Institute
- Coordinating Committee for Mammoth Cave Agricultural Nonpoint Source Demonstration Project
- Federal Emergency Management Agency Interagency Flood Assessment Team
- Kentucky Ground-Water Advisory Council
- Kentucky Ground-Water Data Management Committee
- Kentucky Ground-Water Monitoring Guideline Committee
- Kentucky Natural Resources and Environmental Protection Cabinet Scholarship Committee
- Kentucky Rivers Assessment Advisory Committee
- Kentucky Soils Survey Work Planning Group
- Kentucky Water Availability Advisory Committee
- Kentucky Water Interagency Coordinating Committee for Agricultural Nonpoint Source Pollution Prevention
- Nonpoint Source Advisory Committee of the Kentucky Division of Water
- Ohio River Basin Consortium for Research and Education
- Technical Review Committee for the Master Storm Water Management Plan of the Louisville and Jefferson County Metropolitan Sewer District
- U.S. Department of Agriculture Federal Interagency Review Group for Nonpoint Source Demonstration and Hydrologic Unit Projects

... providing Earth Science in the Public Service
NEW PUBLICATIONS FOR KENTUCKY, FY 1995-96

Statewide


Water-resources data for Kentucky—Water years 1994, 1995 (one volume for each year)


Kentucky River Basin


Purchase Area


Western Coalfield


Outer Bluegrass


Eastern Coalfield


Louisville/Jefferson County


General


... interpreting, publishing, and disseminating needed information...