



WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY GROUND-WATER STUDIES IN ARKANSAS

GROUND-WATER ISSUES

Ground water is an important source of water in Arkansas. In 1985, ground-water sources supplied 65 percent of the State's water for public, rural, industrial, and irrigation uses. The largest withdrawal of ground water—3,300 million gallons per day (Mgal/d)—was for irrigation, mainly in eastern Arkansas. Nearly all municipal and industrial supplies in the southeastern half of Arkansas are obtained from ground-water sources. Ground-water sources supply 65 Mgal/d for self-supplied industrial use and 165 Mgal/d for public and rural domestic use. More than half the population of Arkansas (about 1,479,000 people) depends on ground water for their drinking water. Ground-water use in the State increased by about 35 percent between 1975 and 1985. The major issues related to ground water in Arkansas are:

- Declining ground-water levels,
- Ground-water contamination, and
- Saltwater intrusion.

U.S. GEOLOGICAL SURVEY PROGRAMS

The U.S. Geological Survey (USGS), established in 1879, is the principal source of scientific and technical expertise in the earth sciences within the Federal government. The mission of the Water Resources Division of the USGS is to develop and disseminate scientific information on the Nation's water resources. The activities of the Water Resources Division in Arkansas are conducted by more than 45 hydrologists, technicians, and support staff in Little Rock and Fort Smith.

The USGS program in Arkansas includes an extensive ground-water data-collection network. In 1987, ground-water-level measurements were made at 24 continuously-monitored sites, 720 periodically-monitored long-term sites, and 76 periodically-monitored short-term sites. Ground-water-quality data were collected from 25 periodically-monitored long-term sites and 35 periodically-monitored short-term sites.

These data are used by State and local agencies to make decisions that affect the water resources of Arkansas. In fiscal year 1988, the USGS program in Arkansas included nine ground-water investigations. Three examples of USGS investigations designed to address specific ground-water issues in Arkansas are discussed in the following sections.

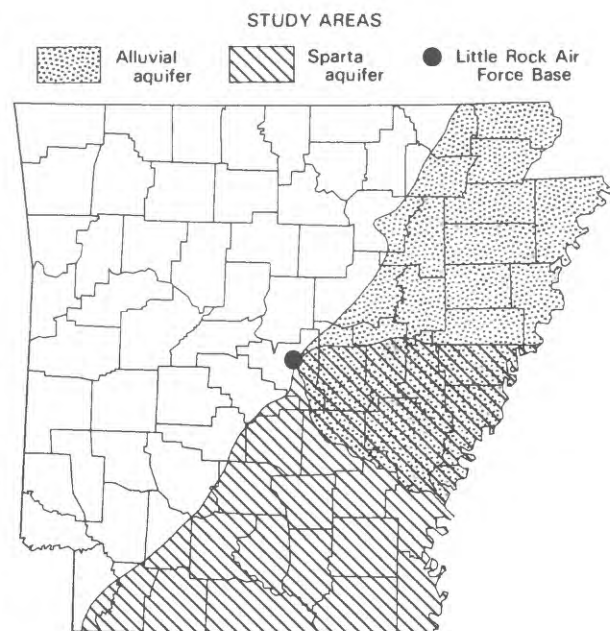
Alluvial Aquifer

The USGS is studying an alluvial aquifer in eastern Arkansas that supplies irrigation water for rice, cotton, and soybean crops.

In 1985, about 3,560 Mgal/d of water was withdrawn from approximately 35,000 wells that tap the aquifer. In parts of Arkansas, Lonoke and Prairie Counties, the water levels have declined more than 80 feet; in some places, only 20 feet of water-saturated sediments remain in the alluvial aquifer. Owing to these declines, saltwater from deeper zones has begun to intrude into the alluvial aquifer in some areas in eastern Arkansas. During this study, the hydrologic conditions in the alluvial aquifer are being defined and a ground-water flow model is being developed to evaluate pumping strategies. The model will help the U.S. Army Corps of Engineers, the U.S. Soil Conservation Service, and the Arkansas Soil and Water Conservation Commission to define areas of deficient ground-water supply, and to plan for future surface-water development to augment ground-water supplies in these areas.

Sparta Aquifer

The Sparta aquifer is an important regional aquifer capable of yielding large quantities of potable water. The USGS is studying the Sparta aquifer in southern and southeastern Arkansas and in parts of northern Louisiana and northwestern Mississippi. Locally heavy pumpage has caused substantial water-level



declines in wells in the Sparta aquifer. In Union County, Ark., water withdrawals from the Sparta aquifer caused water levels to decline 320 feet and have changed the direction of natural ground-water flow. Consequently, saltwater has migrated toward the center of pumping near El Dorado. Large water withdrawals from the aquifer have also lowered the water level more than 240 feet near Pine Bluff and more than 260 feet near Magnolia. A ground-water flow model of the Sparta aquifer is being used to evaluate the effect of present and future pumping. The Arkansas Soil and Water Conservation Commission and local water superintendents will use the model to assess the feasibility of plans for proposed pumping.

Little Rock Air Force Base

The Little Rock Air Force Base is one of several government and industrial sites with potential ground-water contamination problems. Previous operations at the Little Rock Air Force Base have resulted in the generation, accumulation, and disposal of hazardous wastes, such as solvents and jet fuels. Several sites have been identified that require hydrogeologic investigation to determine if any environmental hazards exist. The USGS, in cooperation with the U.S. Air Force, is investigating the presence and (or) absence of ground-water contamination in the areas around various disposal sites on the base. A feasibility study will develop remedial alternatives for contaminated sites that threaten human health and the environment.

GROUND-WATER MANAGEMENT

The principal State agencies responsible for ground-water management in Arkansas are the Arkansas Department of Health, Arkansas Soil and Water Conservation Commission, Arkansas Geological Commission, Arkansas Department of Pollution Control and Ecology, and Arkansas Oil and Gas Commission. The Department of Health is responsible for the protection of municipal and rural drinking-water supplies. The Soil and Water Conservation Commission is responsible for the Arkansas State Water Plan, which is used to evaluate surface- and ground-water resources, problems, and management strategies. The Geological Commission provides much of the geologic and hydrologic data for the State's water-resource planning. The Department of Pollution Control and Ecology is responsible for the control of ground-water quality and the execution of federally-delegated programs. The Oil and Gas Commission shares responsibility for the control of underground injection of oil-field brines with the Department of Pollution Control and Ecology. During 1987-88, the following Federal, State, and local agencies entered

into interagency or cooperative cost-sharing agreements with the USGS to conduct ground-water investigations in Arkansas:

Arkansas Geological Commission
Arkansas Soil and Water Conservation Commission
Arkansas Department of Pollution Control and Ecology
U.S. Air Force
U.S. Army Corps of Engineers
 Memphis District
 Little Rock District
 Waterways Experiment Station
U.S. Soil Conservation Service

SELECTED REFERENCES

- Broom, M.E., Kraemer, T.F., and Bush, W.V., 1984, A reconnaissance study of saltwater contamination in the El Dorado aquifer, Union County, Arkansas: U.S. Geological Survey Water-Resources Investigations Report 84-4012, 47 p.
- Bryant, C.T., Ludwig, A.H., and Morris, E.E., 1985, Ground water problems in Arkansas: U.S. Geological Survey Water-Resources Investigations Report 85-4010, 24 p.
- Freiwald, D.A., and Plafcan, Maria, 1987, Ground-water levels in Arkansas, spring 1987: U.S. Geological Survey Open-File Report 87-459, 66 p.
- Louthian, B.L., and Gann, E.E., 1985, Current water resources activities in Arkansas, 1984-85: U.S. Geological Survey Open-File Report 85-554, 57 p.
- Morris, E.E., and Bush, W.V., 1986, Extent and source of saltwater intrusion into the alluvial aquifer near Brinkley, Arkansas, 1984: U.S. Geological Survey Water-Resources Investigations Report 85-4322, 123 p.
- U.S. Geological Survey, 1984, National water summary 1983—Hydrologic events and issues: U.S. Geological Survey Water-Supply Paper 2250, 243 p.
- 1985, National water summary 1984—Hydrologic events, selected water-quality trends, and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, 467 p.

Further information on technical reports and data related to ground water in Arkansas can be obtained from:

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