



# WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

## NATIONAL WATER-QUALITY ASSESSMENT PROGRAM—Ozark Plateaus

### BACKGROUND

The U.S. Geological Survey (USGS) began to implement a National Water Quality Assessment (NAWQA) program during 1991 to provide a nationally consistent description of water-quality conditions for a large part of the Nation's water resources. The long-term goals of the NAWQA program are to describe the status and trends in the quality of the Nation's ground- and surface-water resources and to provide a sound understanding of the natural and human factors that affect the quality of these resources. To meet these goals, the program will produce and integrate water-quality information useful to policy makers and managers at different areal scales—local, study unit, regional, and national.

Investigations will be conducted on a rotational basis in 60 river basins or aquifer systems (referred to as study units) throughout the Nation, with assessment activities commencing in 20 study units in 1991. The study-unit investigations comprise the principal building blocks of the program on which regional- and national-level assessment activities will be based. The 60 study units cover areas that range in size from 1,200 to more than 65,000 square miles and incorporate about 60 to 70 percent of the Nation's water use and population served by public water supply.

Regional and national synthesis of information from the study units will be the foundation for the comprehensive assessments of the Nation's water quality. Nationally consistent information on water quality, and factors such as climate, geology, hydrology, land use, and agricultural practices will be integrated to focus on a specific water-quality issue that affects large contiguous hydrologic regions. For example, a concern that will be addressed early in the program is the relation of the presence of pesticides in ground and surface water to application rates and cropping practices, and to climatic, geologic, and soil factors. In 1991, the Ozark Plateaus region was among the first 20 NAWQA study units selected for study under the full-scale implementation plan.

### DESCRIPTION OF THE OZARK PLATEAUS STUDY UNIT

The Ozark Plateaus study unit is approximately 65,000 square miles in size and includes parts of four States: northern Arkansas, southeastern Kansas, southern Missouri, and northeastern Oklahoma. The boundaries of the study unit approximate the natural flow boundaries of the Ozark Plateaus aquifer system.

The extensive karst features of the Ozark Plateaus create an intricate ground-water flow system, which results in rapid and

complex interactions between ground and surface water. The vast network of solution channels and conduits in the mostly carbonate aquifers directly affects the fragile environment in the study unit. Contaminants are transported quickly from recharge areas, which often include sinkholes and losing streams; the contaminants then are intercepted by wells or discharged at springs. Water-quality degradation has occurred in many areas as a result of land-use practices and increased agricultural and industrial activity.

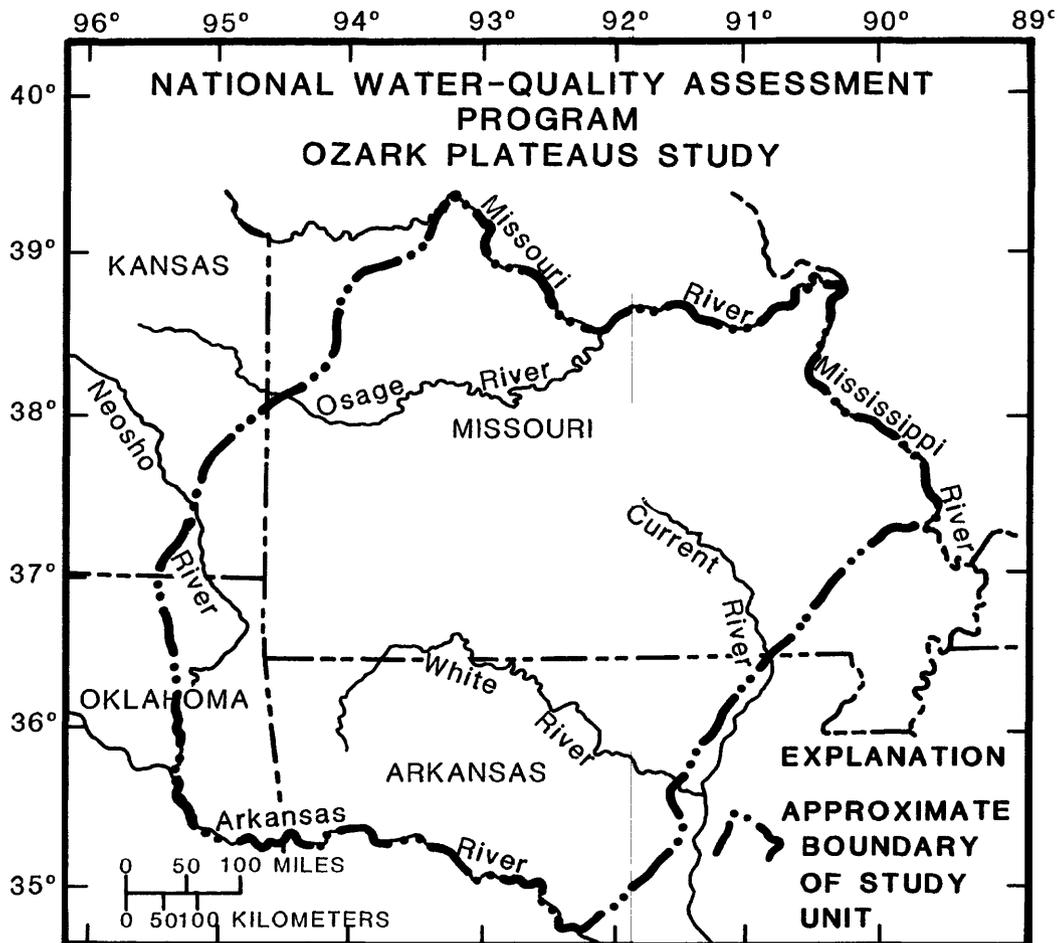
### WATER-QUALITY ISSUES

Recurring local and regional problems related to managing and protecting water quality in the Ozark Plateaus study unit will be addressed. Waste products from poultry, cattle, and swine production, along with waste discharges from septic tanks, sewage-treatment lagoons, and municipal wastewater-treatment facilities have introduced elevated concentrations of nitrate, ammonia, and bacteria in surface and ground water in the area. Degradation locally in the quality of surface and ground water has occurred because of abandoned lead and zinc mines in parts of Kansas, Missouri, and Oklahoma, and active lead mining in southeastern Missouri. Elevated levels of radionuclides (radium 226 and 228) are evident in numerous public water-supply wells throughout the Ozark area, and highly saline ground water along the western boundary has resulted in abandoned wells. Hazardous-waste sites, underground storage tanks, solid-waste landfills, and the transportation of petroleum products and agrichemicals via railroads, trucking, and pipelines are other potential major sources of contamination.

### STUDY OBJECTIVE AND APPROACH

The objective of the Ozark Plateaus NAWQA study is to identify, describe, and explain the major factors that affect observed water-quality conditions and trends. Major activities include formation of a liaison committee during the initial planning stage for external coordination of local interests; compilation and analysis of existing water-quality information; network design and intensive sample collection and analysis for a wide array of physical, chemical, and biological properties for ground- and surface-water resources; and interpretation and reporting of results.

External coordination at all levels is an integral component of the NAWQA program in the Ozark Plateaus study. Information exchange and coordination through a study-unit liaison committee will help ensure that the water-quality information produced by the program is relevant to local and regional



interests. The Ozark Plateaus NAWQA liaison committee will include representatives from academia; local, State, and Federal agencies; and the private sector with water-related technical and management interests in the Ozark Plateaus region of Arkansas, Kansas, Missouri, and Oklahoma.

Water-quality data available from all sources will be assembled, screened, evaluated, and stored in a computerized USGS data base during the early phase of the study. These data will provide an initial description of water-quality conditions and help define additional data needs. Supplemental data, including quality assurance and ancillary information, such as local climate, geology, hydrology, land use, and agricultural practices, also will be stored in the computerized data base.

A 3-year sample network design and intensive sample-collection program will emphasize regional water quality, including water-quality degradation caused by point and non-point sources. Fixed-station surface-water sampling will describe the seasonal and long-term variation and frequency of the occurrence of selected water-quality constituents at selected sites; intensive sampling at a large number of sites during a short period will provide an instantaneous description of conditions for specific times; and studies of selected stream-sampling reaches will address narrowly focused water-quality issues. Ground-water sampling activities include regional sampling throughout

each major aquifer, targeted sampling of known or suspected water-quality problem areas, and long-term sampling to describe trends.

Analysis of water samples will focus on a national list of physical properties and target constituents, including pesticides and other synthetic organic compounds, nutrients, certain metals and trace elements, radionuclides, and sediment. Biological measurements will be used to assess the biological processes that affect the physical and chemical aspects of water quality as it relates to the protection of fish and wildlife resources and public health.

The Ozark Plateaus NAWQA study will be headquartered in the USGS, office in Little Rock, Ark., with assistance from USGS personnel in Lawrence, Kans.; Rolla, Mo.; and Oklahoma City, Okla. Further information on the National Water-Quality Assessment program and the Ozark Plateaus study can be obtained from:

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