



# WATER FACT SHEET

U.S. DEPARTMENT OF THE INTERIOR, U.S. GEOLOGICAL SURVEY



## NATIONAL WATER-QUALITY ASSESSMENT PROGRAM--Southern High Plains, Texas and New Mexico

### BACKGROUND

In 1991, the U.S. Geological Survey (USGS) began a National Water-Quality Assessment (NAWQA) program. The long-term goals of the NAWQA program are to describe the status of, and trends in, the quality of a large, representative part of the Nation's surface- and ground-water resources and to identify the major natural and human factors that affect the quality of these resources. In addressing these goals, the program will produce a wealth of water-quality information that will be useful to policy makers and managers at the National, State, and local levels.

The NAWQA program emphasis is on regional water-quality problems. The program will not diminish the need for smaller studies and monitoring designed and currently being conducted by Federal, State, and local agencies to meet their individual needs. The NAWQA program, however, will provide a large-scale framework for conducting many of these activities and an understanding about National and regional water-quality conditions that cannot be acquired from individual, small-scale programs and studies.

Studies of 60 hydrologic systems that include parts of most major river basins and aquifer systems (study-unit investigations) are the building blocks of the National assessment. The 60 study units range in size from 1,000 mi<sup>2</sup> (square miles) to more than 60,000 mi<sup>2</sup> and represent 60 to 70 percent of the Nation's water use and population served by public water supplies. Twenty study-unit investigations were started in 1991, 20 additional are starting in 1994, and 20 more are planned to start in 1997. The Southern High Plains study unit was selected as one of 20 study units to begin assessment activities in 1994. This study will be run from the New Mexico District office of the USGS in Albuquerque, New Mexico.

### SOUTHERN HIGH PLAINS STUDY UNIT

The Southern High Plains study unit encompasses about 39,590 mi<sup>2</sup>, including 5,940 mi<sup>2</sup> in eastern New Mexico and 33,650 mi<sup>2</sup> in the Texas Panhandle. The study focuses on the 28,645-mi<sup>2</sup> southern High Plains plateau south of the Canadian River, and includes the upper reaches of the Red, Brazos, and Colorado River Basins. The High Plains plateau is underlain by the High Plains (Ogallala) aquifer and contains about 22,000 shallow depressions, termed playas,

that accumulate runoff from local watershed areas following heavy rainfalls. This results in minimum runoff into the intermittent streams (located in "draws" or "dry washes") that traverse the plateau. Some of the playas also receive water and effluent from nonpoint-source agricultural runoff, feedlot runoff, urban storm-water discharges, and petroleum activities. Water infiltrating around the periphery of the playas is considered to be the major source of recharge to the High Plains aquifer in the study area. The study unit is situated in the Central Flyway, a route traversed by millions of waterfowl on their annual migrations. The High Plains of west Texas is exceeded only by the Texas Gulf Coast as the most important waterfowl wintering region of the Central Flyway, primarily due to the playa habitat.

The Southern High Plains has a semiarid climate and mild winters. Mean annual precipitation over the area ranges from about 14 to 23 inches, with most falling in thunderstorms between May and October. Ground water provides most of the water used in the study area. During 1990, about 56 percent of the total population of 1,052,000 was supplied by ground water, and irrigation with ground water accounted for about 88 percent of the total water used. Ground- and surface-water use during 1990, shown respectively in million gallons per day, is as follows: public supply--90/44; irrigation--3,357/28; and other (commercial, domestic, industrial, mining, thermoelectric, and livestock)--270/15. Major land uses are agricultural cultivation (both irrigated and dryland), livestock grazing, and petroleum production activities. Cropland and pasture comprise about 50 percent of the total area and the main crops are upland cotton, wheat, grain sorghum, and corn; rangeland comprises about 46 percent.

The High Plains aquifer has been severely depleted in some areas by extensive pumpage. Water levels have declined significantly (as much as 200 feet), especially in intensely irrigated areas. Water quality in certain areas in the southern part of the High Plains aquifer has deteriorated due to upward leakage from underlying aquifers containing more highly mineralized water.

Under Texas law, underlying percolating ground water is the property of the surface land owners. In part of the study unit in Texas, 10 local Underground Water Conservation Districts regulate or manage ground water