

INTRODUCTION

The economy of west-central Missouri is primarily agricultural. Livestock products and feed crops are the greatest source of farm revenue. Principal population centers include Kansas City in the north-west, Springfield and Joplin in the south, and Jefferson City in the northeast. In addition, the centrally located Lake of the Ozarks has developed into an important recreation area. Although populations of most of the rural counties have decreased steadily since about 1900, the population of several counties near the larger cities and recreational areas have increased significantly in recent years. For example, the population of Camden, Cass, and Greene Counties increased by 37.2, 30.6, and 20.1 percent, respectively, during 1960-70. Future development is expected to result from continued urban expansion and from increasing recreational use of the four large reservoirs either completed or under construction.

Knowledge of the water resources of west-central Missouri is necessary in planning the use and development of the area. The purpose of this atlas is to present a general summary of information concerning the occurrence, availability, use, and quality of water. A general description of existing and potential problems related to the development of the water resources is also included.

The atlas covers approximately 16,000 square miles and includes all or parts of 35 counties. The area is bounded on the north by the south edge of the Missouri River flood plain, on the east by the eastern drainage divide of the Ozark and Noddy River basins, and on the west and south by the Missouri State line. Water resources of the Missouri River valley are described in the published atlases shown on the index map.

This investigation was made in cooperation with the Missouri Geological Survey and Water Resources. Appreciation is expressed to the many individuals, public utilities, private industries, and representatives of other State and Federal agencies who furnished information and assistance for this study. The nomenclature used in this atlas follows that of the U.S. Geological Survey and varies somewhat from the current usage of the Missouri Geological Survey and Water Resources.

EXPLANATION

- Approximate location of selected mineral resources
- Cool deposits
- Major and minor (active and inactive)
- Central Missouri Barite District
- Tri-State Zinc-Lead District
- Iron deposits

Drainage divide

THE EXTRACTION OF MINERAL RESOURCES AFFECTS THE WATER RESOURCES OF AN AREA. Extensive mining alters the natural storage and circulation of water above and below the ground surface. The natural level of drainage may be increased by erosion from spoil banks. Chemical reactions such as the oxidation of pyrite and other metallic sulfides in flooded mine shafts, strip pits, or tailing piles may adversely affect the quality of water in streams and aquifers. Fish kills in some streams have been attributed to acid drainage from mining areas, although acid drainage is not a widespread problem at present (1977).

EXPLANATION

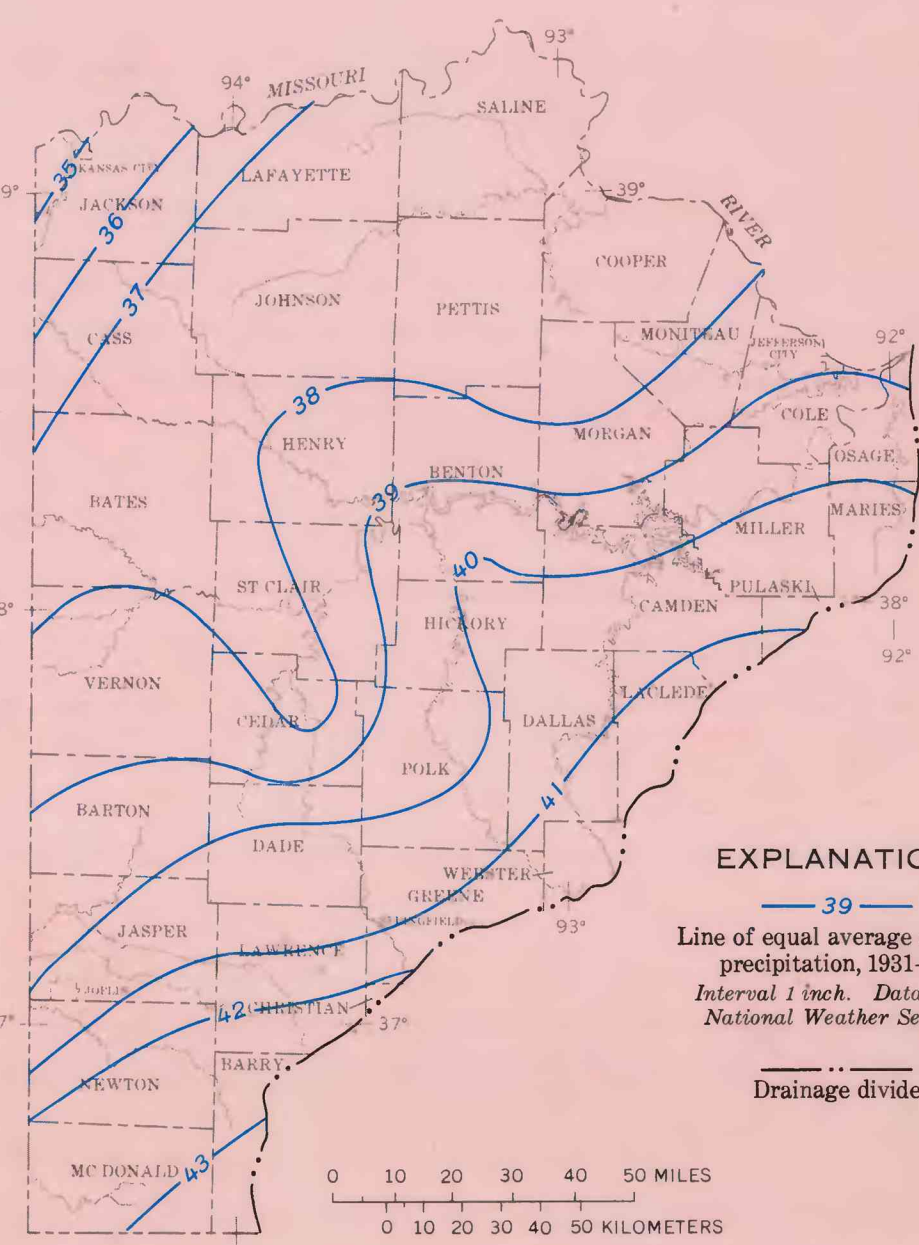
- Diagrams indicate the approximate percentage of the total land area in each county that had the indicated land usage in 1967
- Other
- Forest land
- Cropland
- Pasture and range

Approximate physiographic boundary

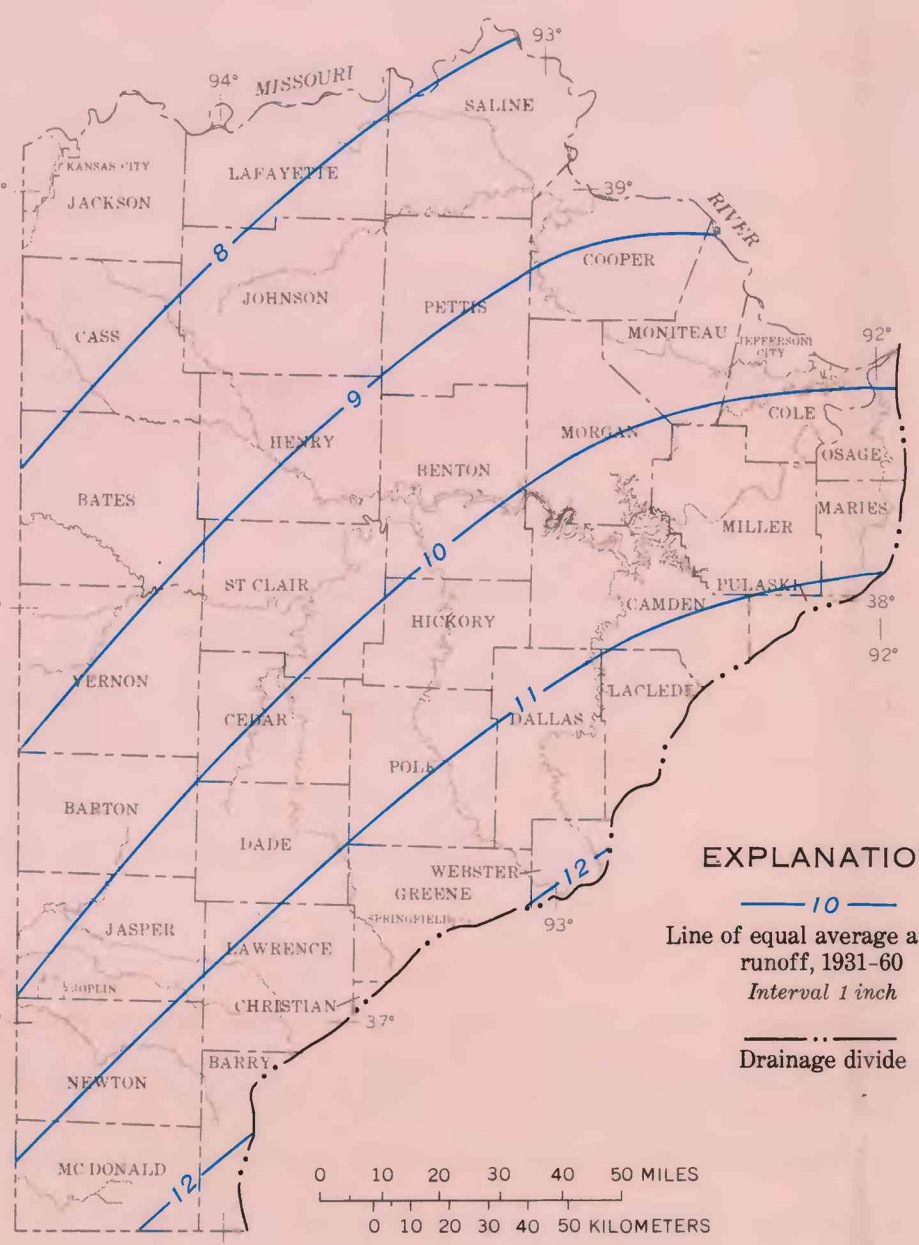
Drainage divide

LAND USE VARIES WITH PHYSIOGRAPHIC SECTION—Cropland is the predominant land use in the Ozark Plateau and in the northern part of the Springfield Plateau. The more rugged Salem Plateau and the southern part of the Springfield Plateau are used primarily as forest land. The percentage of the total land area of each county used as pasture and range is fairly constant and averages about 12 percent.

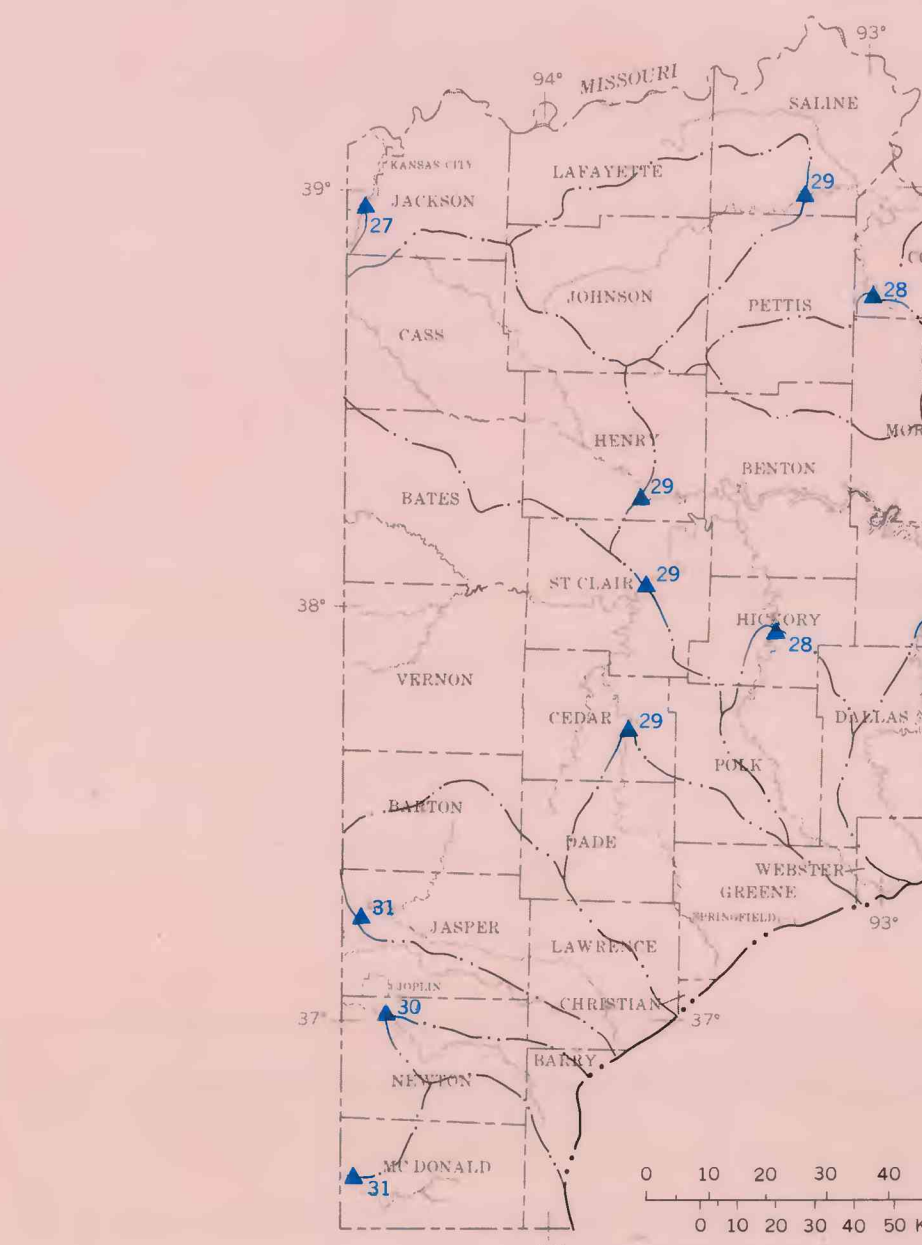
GENERALIZED WATER BUDGET



Precipitation
38.4 inches



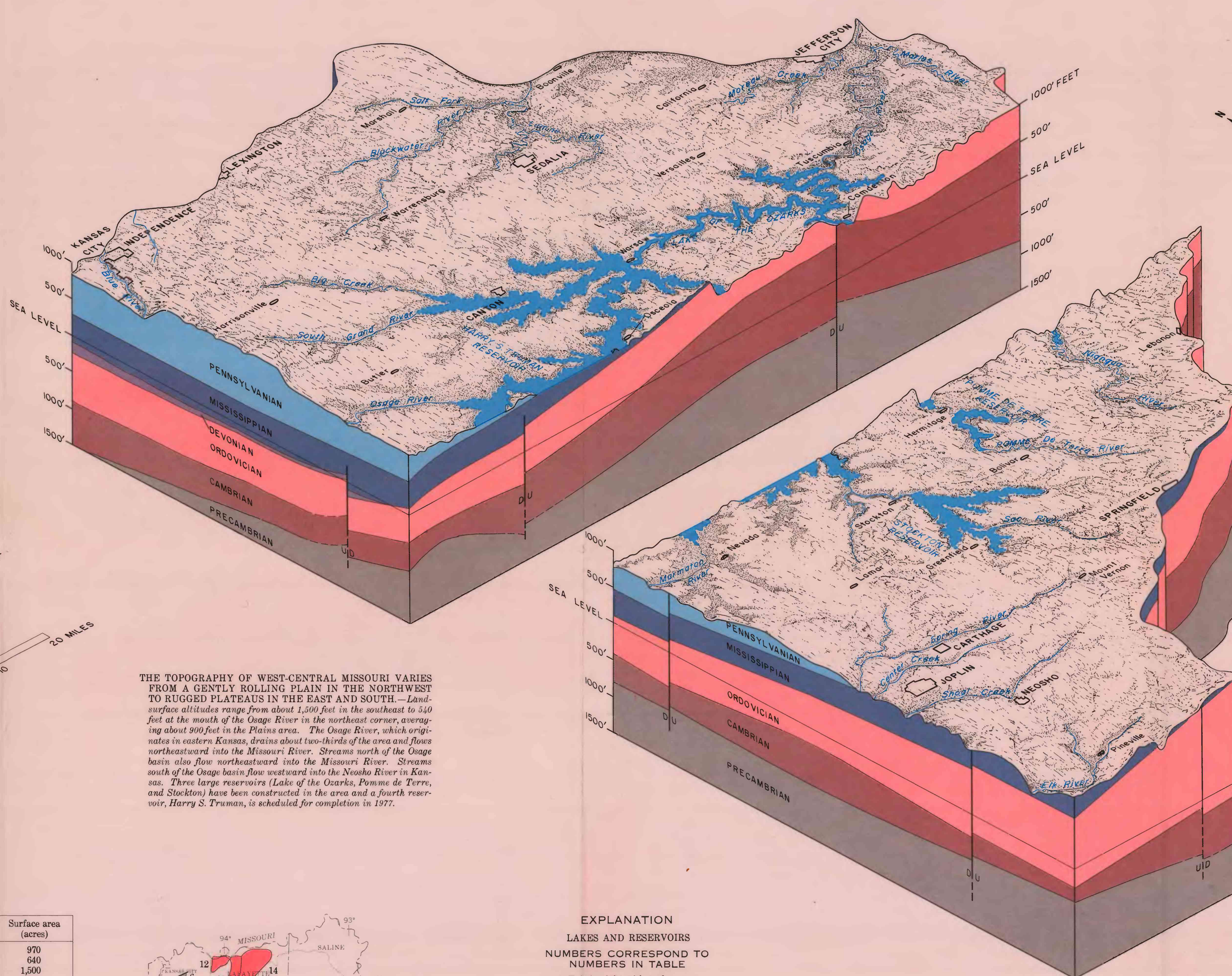
Runoff
9.2 inches



Water Loss
29.2 inches

APPROXIMATELY 24 PERCENT OF THE AVERAGE ANNUAL PRECIPITATION APPEARS AS STREAMFLOW.—The remaining 76 percent is lost primarily to evapotranspiration. Although ground-water storage may vary from year to year, the long-term change in storage is considered to be zero. The amount of water flowing out of the area is not known, but is assumed to be negligible in comparison with runoff and evapotranspiration. Average figures include contributing drainage areas in Kansas and Arkansas.

PHYSICAL SETTING



THE TOPOGRAPHY OF WEST-CENTRAL MISSOURI VARIES FROM A GENTLY ROLLING PLAIN IN THE NORTHWEST TO RUGGED PLATEAUS IN THE EAST AND SOUTH. Land surface altitudes range from about 1,500 feet in the northwest to 150 feet at the mouth of the Osage River in the southeast corner, averaging about 900 feet in the Plains area. The Osage River, which originates in eastern Kansas, drains about two-thirds of the area and flows northward into the Missouri River. Streams south of the Osage basin flow northward into the Missouri River. Streams south of the Osage basin flow westward into the Noddy River in Kansas. Three large reservoirs (Lake of the Ozarks, Pomona de Terre, and Stockton) have been constructed in the area and a fourth reservoir, Harry S. Truman, is scheduled for completion in 1977.

EXPLANATION

- NUMBERS CORRESPOND TO NUMBERS IN TABLE
- Existing lake with surface area in excess of 400 acres
- Existing reservoir
- Authorized Corps of Engineer reservoir as of January 1969

WATERSHED PROJECTS

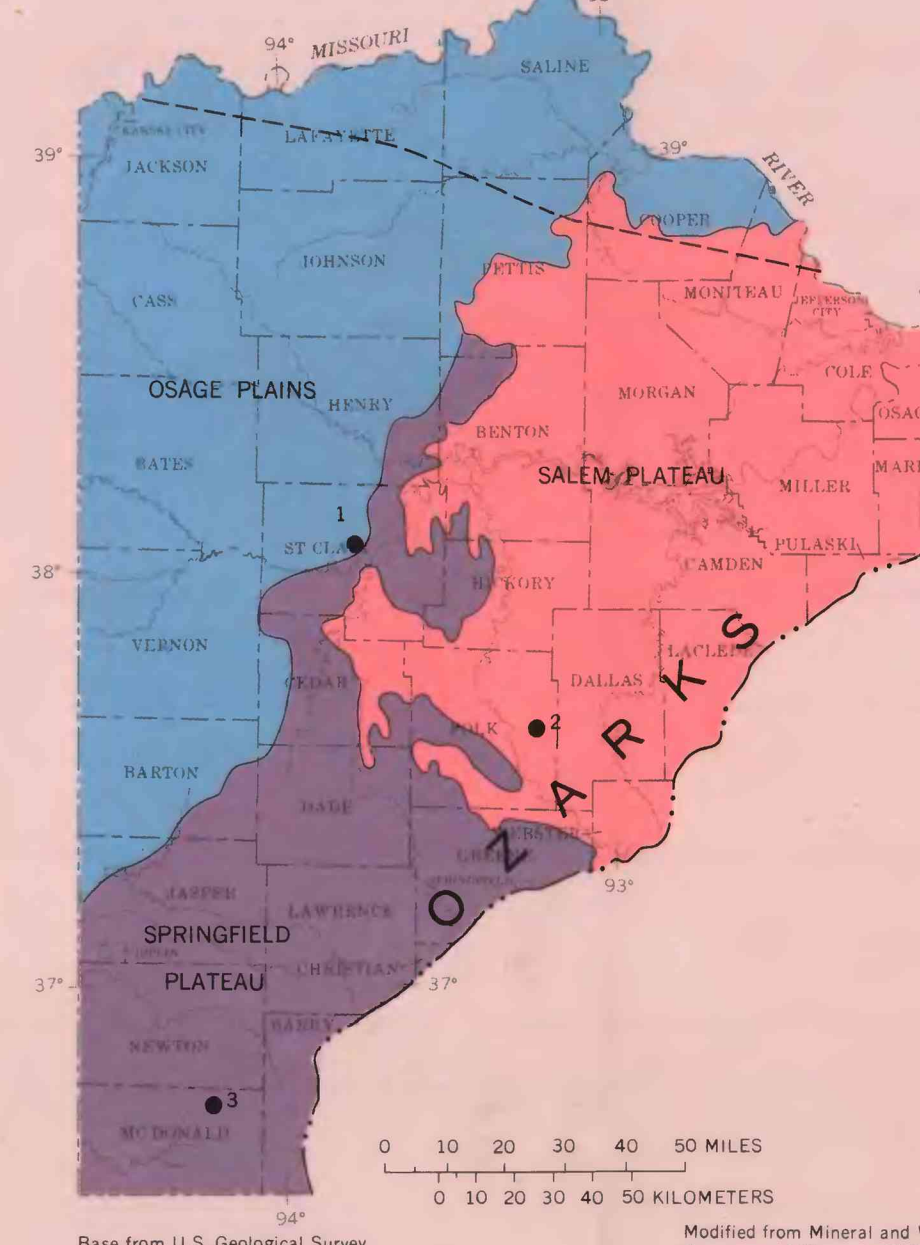
Active Soil Conservation Service watershed projects as of January 1970

- Application approved
- Planning authorized
- Work plan approved for construction
- Project completed

Drainage divide

LAKES, RESERVOIRS, AND WATERSHED PROJECTS HELP TO STABILIZE STREAMFLOW TO REDUCE DAMAGE FROM FLOODS AND EROSION, AND TO PROVIDE SITES FOR WATER-BASED RECREATION. Approximately 200 lakes, mostly man-made, with surface areas in excess of 1 acre are shown in west-central Missouri. In addition, numerous small farm ponds and strip water pits exist and several reservoirs and water shed projects have been approved for future construction.

PHYSIOGRAPHIC CHARACTERISTICS



EXPLANATION

PHYSIOGRAPHIC SECTIONS

- Osage Plains

(Includes a small area of dissected till plains)

Underlain mostly by rocks of Pennsylvanian age. Plain of low relief with gently rolling topography; broad, shallow valleys; and low-gradient (1:100 to 1:200) meandering streams.

- Springfield Plateau

Underlain by cherty dolomite of Ordovician and Cambrian age with several limestone outcrops of Mississippian age. Substantially dissected plateau with rolling topography; broad, shallow valleys; and low-gradient (1:100 to 1:200) meandering streams in narrow, deep valleys. Rugged topography, near major stream valleys. Springs common in northern part.

- Salem Plateau

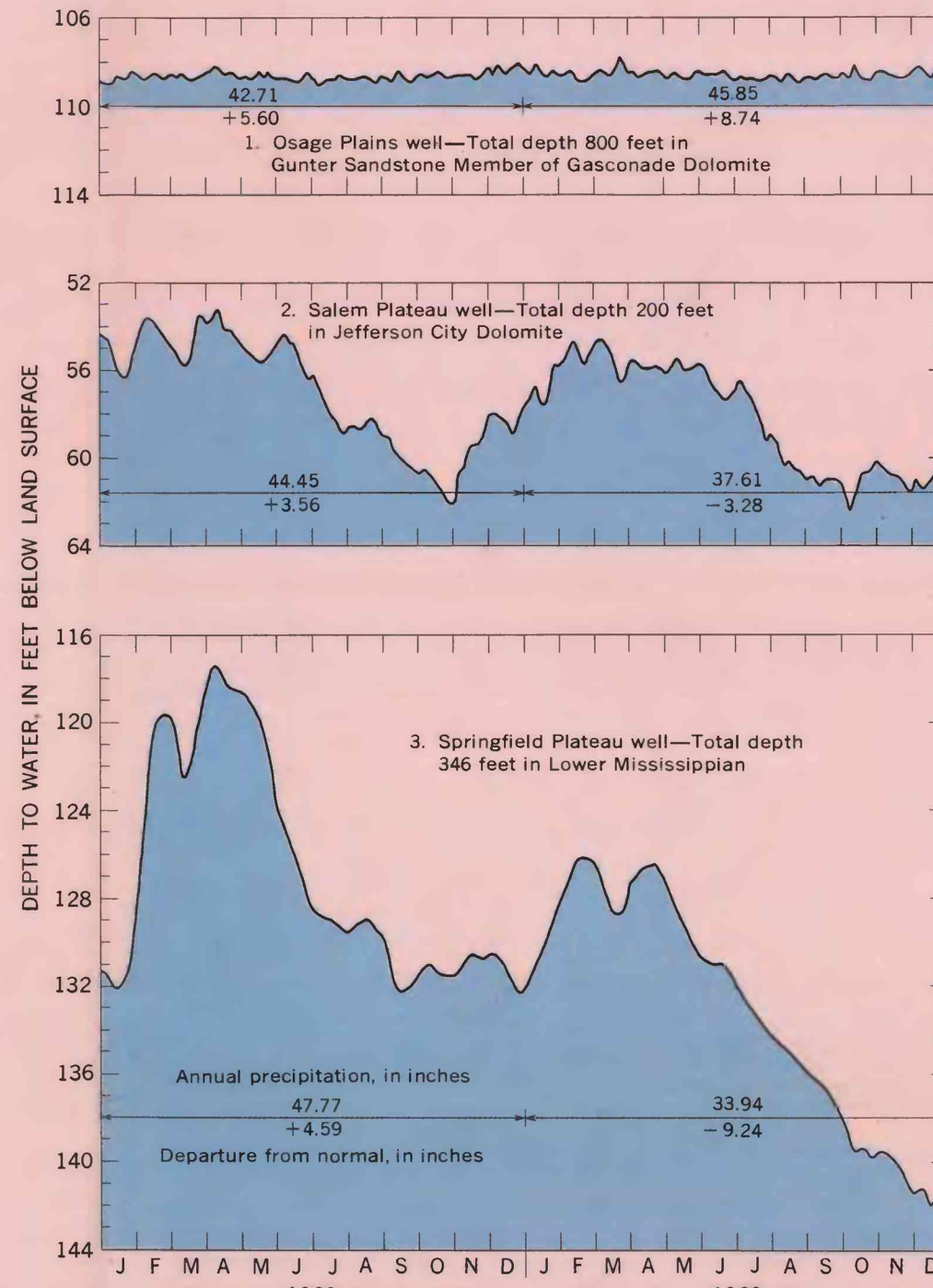
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Approximate physiographic boundary

Approximate southern limit of glacial

Location and identification number of observation well for which hydrograph is shown at right

Drainage divide



WELL HYDROGRAPHS ILLUSTRATE TYPICAL GROUND-WATER RECHARGE CHARACTERISTICS OF THE THREE PHYSIOGRAPHIC SECTIONS.—In the Osage Plains, where rocks of Pennsylvanian age occur, vertical recharge is limited. Well hydrographs generally show little seasonal variation in water level except where influenced by nearby pumping. In the Springfield Plateau and the southern part of the Salem Plateau, where solution development is more extensive, recharge occurs locally and water-level fluctuations are greater. Solution openings are best well developed toward the northwest in the Plateau and recharge characteristics in the vicinity of the Plateau-Plains boundary approach those of the Osage Plains.

WATER RESOURCES OF WEST-CENTRAL MISSOURI

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