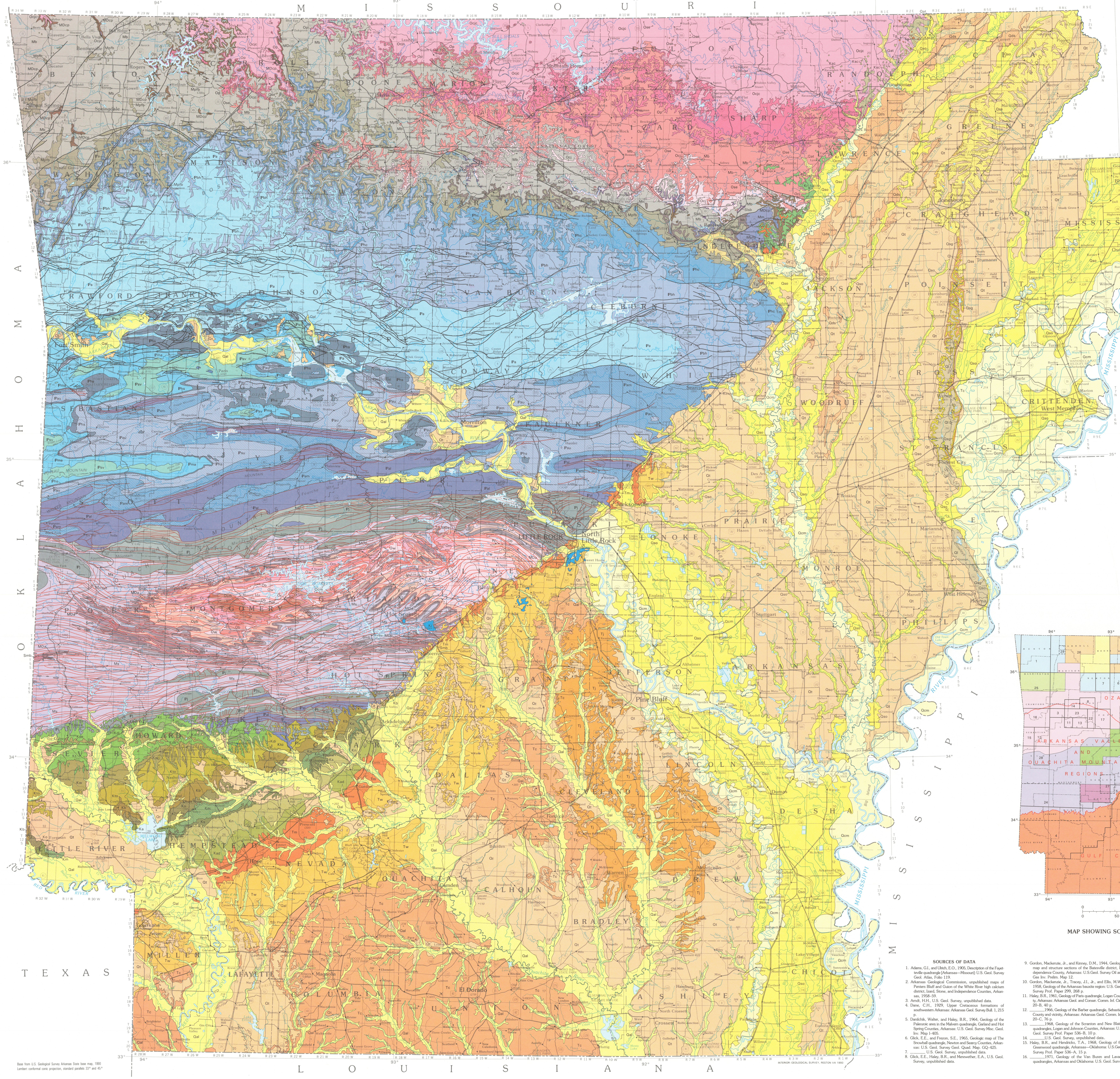
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



Base from U.S. Geological Survey Arkansas State base map, 1990
Lambert conformal conic projection, standard parallels 33° and 45°

INTERIOR–GEOLOGICAL SURVEY, RESTON, VA–1993

MISSISSIPPI EMBAYMENT

System	Series	Map unit	Description
QUATERNARY	Holocene		**Alluvium**—Both units are equivalent in age
		Qcm	**Alluvial deposits in major stream channels or in mappable meanders of major streams**—Includes alluvial deposits in natural levees in some areas
		Qso	**Alluvial deposits of local streams or of overbank flow of major streams**—In some areas includes deposits in abandoned meanders of major streams
	Pleistocene	Qt	**Terrace deposits**—Alluvial deposits on one or more terrace levels
		Qds	**Dune sand**—Deposited mostly on terrace deposits of the second level. Younger than some terrace deposits, older than others
		Qss	**Silt and sand**—Contains lenses of gravel and clay
		Ql	**Loess**
		Qsg	**Sand and gravel**
TERTIARY	Eocene	Tj	**Jackson Group**
		Tc	**Claiborne Group**
		Tw	**Wilcox Group**
	Paleocene	Tm	**Midway Group**

GULF COASTAL PLAIN

System	Series	Map unit	Description
QUATERNARY	Holocene	Qal	**Alluvium**—Alluvial deposits of present streams
	Pleistocene	Qt	**Terrace deposits**—Alluvial deposits on one or more terrace levels
TERTIARY	Eocene	Tj	**Jackson Group**
		Tc	**Claiborne Group**
		Tw	**Wilcox Group**
	Paleocene	Tm	**Midway Group**
CRETACEOUS	Upper Cretaceous	Kad	**Arkadelphia Marl**
		Kn	**Nacatoch Sand**
		Ks	**Saratoga Chalk**
		Km	**Marlbrook Marl**
		Ka	**Annona Chalk**
		Ko	**Ozan Formation**
		Kb	**Brownstown Marl**
		Kto	**Tokio Formation**
		Kw	**Woodbine Formation**
	Lower Cretaceous	Kkg	**Kiamichi Formation and Goodland Limestone**
		Kt	**Trinity Group (Kt)**
		Kde	Kde, **De Queen Limestone**
		Kdi	Kdi, **Dierks Limestone**

GULF COASTAL PLAIN, OZARK REGION, AND ARKANSAS VALLEY AND OUACHITA MOUNTAINS REGIONS

System	Map unit	Description
CRETACEOUS	Ki	**Igneous rocks**—Includes undifferentiated altered sedimentary rocks of Paleozoic age at Granite Mountain, Pulaski County, and Murfreesboro, Pike County **Acid to intermediate**—Nepheline syenite complexes at Magnet Cove, Hot Spring County, and Potash Sulphur Springs, Garland County, stocks at Granite Mountain, Pulaski County and in Saline County, explosion breccias, Saline and Conway Counties, and dikes and sills (principally trachyte, tinguaite, phonolite, some ranging from quartz syenite to diabase) **Basic to ultrabasic**—Lamproite pipes (Murfreesboro, Pike County) and dikes and sills (principally lamprophyres of fourchite, ouachitite, and monchiquite)

OUACHITA MOUNTAINS REGION

System	Map unit	Description
PALEOZOIC	Pzi	**Olistoliths of Metagabbro and Soapstone-Serpentine**—Altered peridotite

SYMBOLS

Symbol	Explanation
—	**Contact**
—	**Normal Fault**
—	**Thrust fault**—Also cross fault in some areas, dashed under Lake Ouachita to show continuity

OZARK REGION

System	Series	Map unit	Description
QUATERNARY	Pleistocene and Holocene	Qat	**Alluvium and terrace deposits**—Alluvial deposits of present streams and on one or more terrace levels
TERTIARY		Tg	**Gravel**—Gravel on isolated hills within 40 miles (64 km) of the Mississippi Embayment. Many small deposits to the west not shown
CRETACEOUS (?)		Ksc	**Sand and clay**
CRETACEOUS	Upper Cretaceous	Kr	**Cretaceous rocks**
PENNSYLVANIAN	Atokan	ℙa	**Atoka Formation**
	Morrowan	ℙbh	**Bloyd Shale, and Prairie Grove Member of the Hale Formation**
		ℙhc	**Cane Hill Member of the Hale Formation**
MISSISSIPPIAN	Chesterian	Mpfb	**Pitkin Limestone, Fayetteville Shale (including the Wedington Sandstone Member), and Batesville Sandstone (including the Hindsville Limestone Member)**
	Meramecian	Mr	**Ruddell Shale**
		Mm	**Moorefield Formation**
	Osagean	Mb	**Boone Formation**
MISSISSIPPIAN / DEVONIAN		MDcp	**Chattanooga Shale (Lower Mississippian and Upper Devonian), Clifty Limestone (Middle Devonian), and Penters Chert (Lower Devonian)**
SILURIAN		Slsb	**Lafferty, St. Clair, and Brassfield Limestones**
ORDOVICIAN		Ocj	**Cason Shale and Fernvale Limestone (Upper Ordovician) and Kimmswick Limestone, Plattin Limestone, and Joachim Dolomite (Middle Ordovician)**
		Ose	**St. Peter Sandstone and Everton Formation (Middle Ordovician)**
	Lower Ordovician	Op	**Powell Dolomite**
		Ocjc	**Cotter and Jefferson City Dolomites**

ARKANSAS VALLEY AND OUACHITA MOUNTAINS REGIONS

System	Series	Map unit	Description
QUATERNARY	Holocene	Qal	**Alluvium**—Alluvial deposits of present streams
	Pleistocene	Qt	**Terrace deposits**—Alluvial deposits on one or more terrace levels
PENNSYLVANIAN	Des Moinesian	ℙby	**Boggy Formation**
		ℙsv	**Savanna Formation**
		ℙma	**McAlester Formation**
		ℙhs	**Hartshorne Sandstone**
	Atokan	ℙa	**Atoka Formation**, undivided
		ℙau	Upper part
		ℙam	Middle part
		ℙal	Lower part
	Morrowan	ℙjv	**Johns Valley Shale**
		ℙj	**Jackfork Sandstone**
MISSISSIPPIAN		Ms	**Stanley Shale**—Includes Chickasaw Creek Chert equivalent of Harlton (1938) near top and Hatton Tuff Lentil and Hot Springs Sandstone Member near base
MISSISSIPPIAN / DEVONIAN		MDa	**Arkansas Novaculite**—Includes upper division (Mississippian), middle division (Mississippian and Devonian), and lower division (Devonian)
SILURIAN		Smb	**Missouri Mountain Shale and Blaylock Sandstone**—The Blaylock Sandstone is present only in the Cross, Cossatot, and Trap Mountains. Missouri Mountain Shale is mapped with Polk Creek Shale and Bigfork Chert in the area between Paron, Saline County, and Little Rock
ORDOVICIAN		Opb	**Polk Creek Shale (Upper Ordovician) and Bigfork Chert (Upper and Middle Ordovician)**
		Ow	**Womble Shale (Middle Ordovician)**
	Lower Ordovician	Ob	**Blakely Sandstone (Middle and Lower Ordovician)**
		Om	**Mazarn Shale**
		Ocm	**Crystal Mountain Sandstone**
		Oc	**Collier Shale**

CHANGES IN STRATIGRAPHIC NAMES

Lithologic boundaries and stratigraphic nomenclature, when they differ from the Geologic Map of Arkansas (Arkansas Geological Survey, 1929), are summarized as follows:

GULF COASTAL PLAIN

The contact between the Claiborne Group and the Jacksonian Stage was established by Wilbert (1953). The stratigraphic rank was changed from formation to group for the Midway, Wilcox, Claiborne, and Jackson Groups by Gordon, Tracey, and Ellis (1958).

OZARK REGION

The Jefferson City Dolomite was first identified in Arkansas by E. O. Ulrich (in Purdue and Miser, 1916). The Jefferson City Dolomite and the overlying Cotter cannot be separated on the basis of lithology and are shown as a single unit on this map.

The Cotter Dolomite, the Powell Dolomite, and the Everton Formation were mapped in Marion County by McKnight (1935). These three formations were mapped eastward from Marion county to the Mississippi Embayment for this map. The upper part of the Powell as shown on this map in southeastern Sharp, northern Lawrence, and southern Randolph Counties includes rocks that were divided into the Smithville Limestone and the overlying Black Rock Limestone on the Geologic Map of Arkansas (1929).

Two map units, the Cane Hill Member of the Hale Formation, and the Prairie Grove Member of the Hale Formation and the Bloyd Shale, have been recognized eastward from the Evansville section, southwestern Washington County, described by Henbest (1953). The Cane Hill Member is considered Pennsylvanian in age in the western part of Arkansas but it spans the Mississippian—Pennsylvanian boundary in the area east of Newton County, where fossils have been collected and identified as being of latest Mississippian age by Gordon (1964).

ARKANSAS VALLEY AND OUACHITA MOUNTAINS REGIONS

The ages of two formations are changed on this map: the Collier Shale is changed from Cambrian to Early Ordovician because it contains conodonts of that age (Repetski and Ethington, 1973); the Crystal Mountain Sandstone is changed from Ordovician(?) to Early Ordovician.

The upper part of the Stanley Shale includes beds of chert and siliceous shale equivalent to those in Oklahoma in the Chickasaw Creek Formation of Harlton (1938). The Hot Springs Sandstone is reduced in stratigraphic rank on this map to a member of the Stanley Shale. It is overlain and underlain by unnamed members of the Stanley in most places.

The Jackfork Sandstone is of Pennsylvanian (Morrowan) age in Arkansas, according to Gordon and Stone (1973).

The Johns Valley Shale near Boles, Scott County, was mapped in detail by Reinemund and Danilchik (1957). Erratic boulders from pre-Mississippian age formations are recognizable in Scott and extreme western Yell Counties, but not elsewhere.

The base of the McAlester Formation in Arkansas was established by Collier (1907); it coincides with the top of the lower sandstone member of the Hartshorne Sandstone in Oklahoma. The contacts between the McAlester, Savanna, and Boggy Formations were traced from their type localities in Oklahoma into Arkansas by Hendricks and Parks (1950), and were later modified by Haley (1961).

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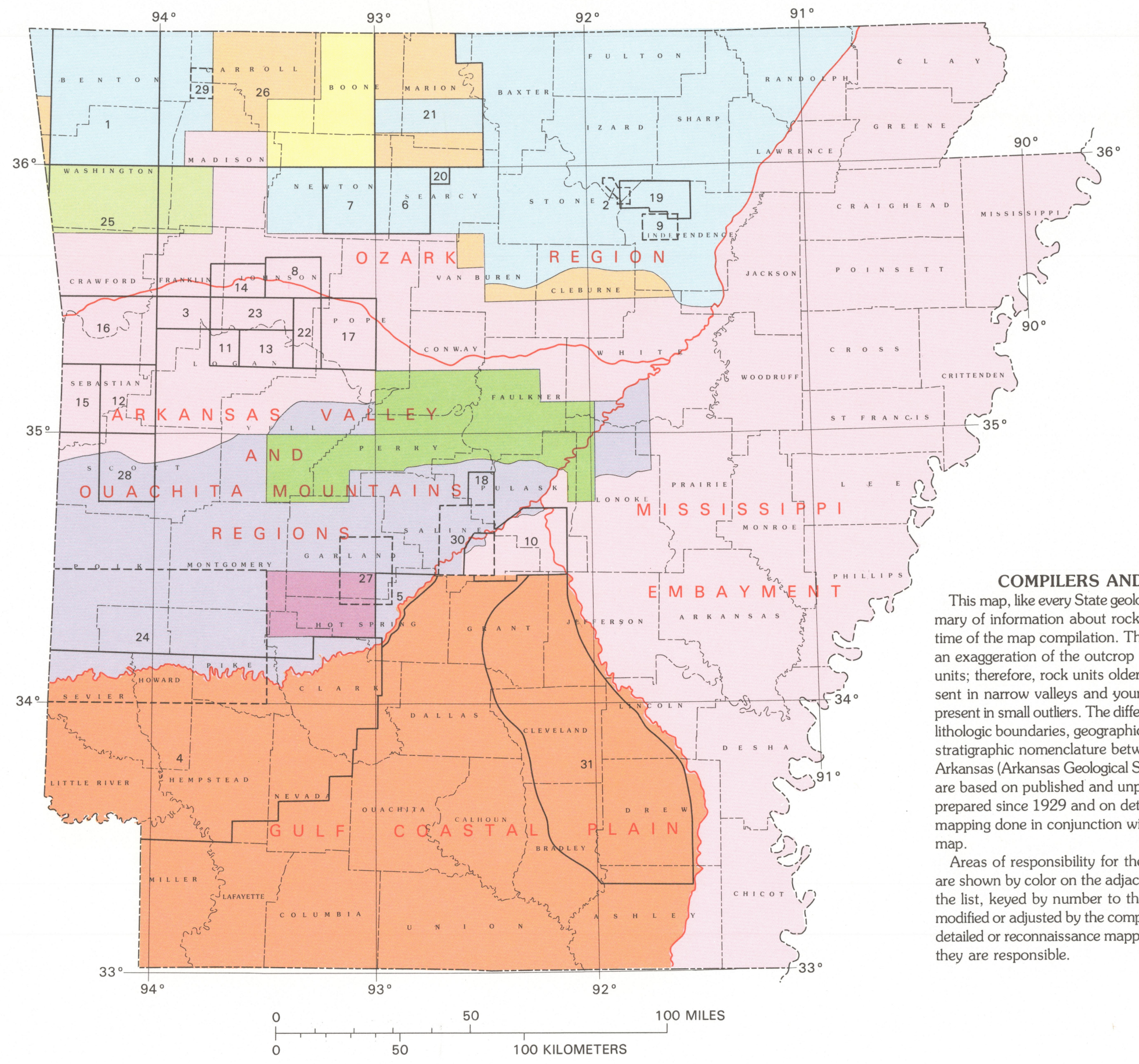
O Z A R K   R E G I O N
A R K A N S A S   V A L L E Y   A N D
O U A C H I T A   M O U N T A I N S   R E G I O N S
M I S S I S S I P P I
E M B A Y M E N T
G U L F   C O A S T A L   P L A I N
94°
93°
92°
91°
90°
36°
35°
34°
33°
0
50
100 MILES
0
50
100 KILOMETERS

MAP SHOWING SOURCES OF GEOLOGIC DATA

COMPILERS

Color	Compiler
🟨	Bush, W.V.[1]
	Bush, W.V., and Haley, B.R.[2]
🟧	Clardy, B.F.[1], and Bush, W.V.
🟦	Glick, E.E.[2]
	Haley, B.R.
	Haley, B.R., and Zachry, D.L.[1]
🟩	Stone, C.G.[1]
🟪	Stone, C.G., and Haley, B.R.
	Woodward, M.B.[1], Stone, C.G., and Haley, B.R.

[1] Arkansas Geological Commission
[2] United States Geological Survey

Symbol	Explanation
18	Sources of data
—	Region used in Geologic Map Explanation

COMPILERS AND SOURCES

This map, like every State geologic map, is a graphic summary of information about rock units in the State at the time of the map compilation. The scale of the map forces an exaggeration of the outcrop width of the thinner map units; therefore, rock units older than shown may be present in narrow valleys and younger than shown may be present in small outliers. The differences in tectonic features, lithologic boundaries, geographic extent of rock units, and stratigraphic nomenclature between the Geologic Map of Arkansas (Arkansas Geological Survey, 1929) and this map are based on published and unpublished geologic reports prepared since 1929 and on detailed and reconnaissance mapping done in conjunction with the preparation of this map.

Areas of responsibility for the compilation of the map are shown by color on the adjacent map. Sources cited in the list, keyed by number to the map, have been locally modified or adjusted by the compilers who also contributed detailed or reconnaissance mapping for the areas for which they are responsible.

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PREPARED COOPERATIVELY BY THE
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NORMAN F. WILLIAMS, DIRECTOR
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UNITED STATES GEOLOGICAL SURVEY
DALLAS A. PECK, DIRECTOR

GEOLOGIC MAP OF ARKANSAS

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and William V. Bush, Benjamin F. Clardy, Charles G. Stone,
Mac B. Woodward, and Doy L. Zachry, Arkansas Geological Commission

1993
(Revised from the 1976 edition)

SCALE 1:500 000

10 0 10 20 30 40 50 MILES
10 0 10 20 30 40 50 60 70 KILOMETERS

NATIONAL GEODETIC VERTICAL DATUM OF 1929

Cartography directed by James Queen, U.S. Geological Survey
Cartography linework and lettering by Lawrence Brence
Color separations by Jennifer Fowler and Tony Coehlo

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