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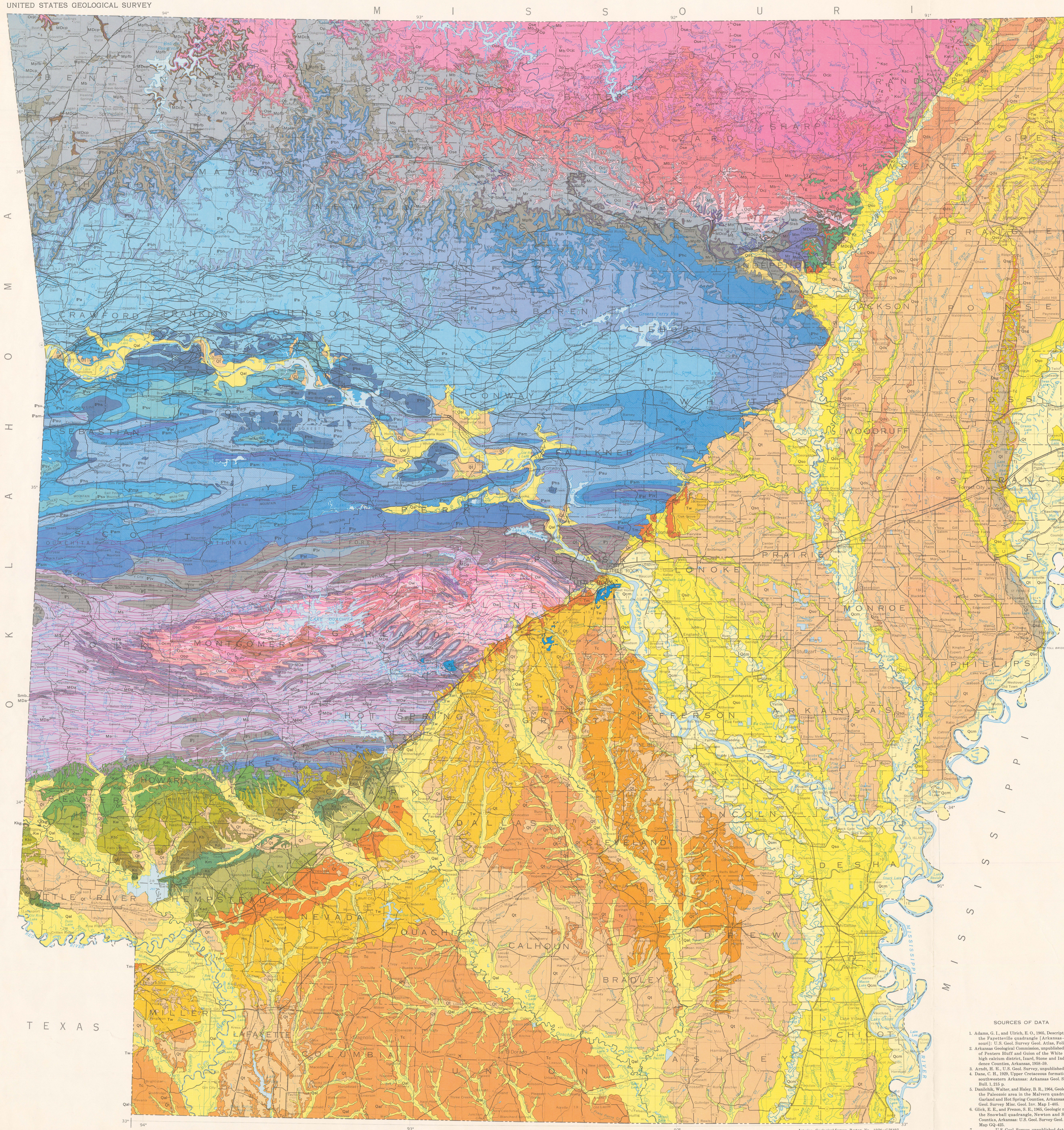
UNITED STATES GEOLOGICAL SURVEY



MISSISSIPPI EMBAYMENT

QUATERNARY — Holocene

- Qcm — ALLUVIUM—*Both units are equivalent in age* *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*

QUATERNARY — 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, Paleocene

- Tj — JACKSON GROUP
- Tc — CLAIBORNE GROUP
- Tw — WILCOX GROUP
- Tm — MIDWAY GROUP

GULF COASTAL PLAIN

QUATERNARY — Holocene, Pleistocene

- Qal — ALLUVIUM—*Alluvial deposits of present streams*
- Qt — TERRACE DEPOSITS—*Alluvial deposits on one or more terrace levels*

TERTIARY — Eocene, Paleocene

- Tj — JACKSON GROUP
- Tc — CLAIBORNE GROUP
- Tw — WILCOX GROUP
- 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

CRETACEOUS — 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

CRETACEOUS

- Ki — IGNEOUS ROCKS—*Includes undifferentiated rocks of Paleozoic age at Granite Mountain and Murfreesboro*
  Acid to intermediate—Nepheline syenite complexes at Magnet Cove and Potash Sulphur Springs, stocks at Granite Mountain and in Saline County, and dikes and sills (principally trachyte, tinguaite, phonolite, some ranging from quartz syenite to diabase)
  Basic to ultrabasic—Peridotite or kimberlite pipes (Murfreesboro) and breccias (Benton), and dikes and sills (principally fourchite, ouachitite, and monchiquite)

OUACHITA MOUNTAINS REGION

PALEOZOIC

- Pzi — SOAPSTONE-SERPENTINE—*Altered peridotite*

SYMBOLS

- CONTACT
- NORMAL FAULT
- THRUST FAULT—*Also cross fault in some areas, dashed under lake Ouachita to show continuity*

OZARK REGION

QUATERNARY — Pleistocene and Holocene

- Qat — ALLUVIUM AND TERRACE DEPOSITS—*Alluvial deposits of present streams and on one or more terrace levels*

CRETACEOUS(?) 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 — Upper Cretaceous

- Ksc — SAND AND CLAY
- Kr — CRETACEOUS ROCKS

PENNSYLVANIAN — Atokan, Morrowan

- IPa — ATOKA FORMATION
- IPbh — BLOYD SHALE, AND PRAIRIE GROVE MEMBER OF THE HALE FORMATION
- IPhc — CANE HILL MEMBER OF THE HALE FORMATION

MISSISSIPPIAN — Chesterian, Meramecian, Osagean

- Mpfb — PITKIN LIMESTONE, FAYETTEVILLE SHALE (INCLUDING THE WEDINGTON SANDSTONE MEMBER), AND BATESVILLE SANDSTONE (INCLUDING THE HINDSVILLE LIMESTONE MEMBER)
- Mr — RUDDELL SHALE
- Mm — MOOREFIELD FORMATION
- Mb — BOONE FORMATION

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)

ORDOVICIAN — Lower Ordovician

- Op — POWELL DOLOMITE
- Ocjc — COTTER AND JEFFERSON CITY DOLOMITES

ARKANSAS VALLEY AND OUACHITA MOUNTAINS REGIONS

QUATERNARY — Holocene, Pleistocene

- Qal — ALLUVIUM—*Alluvial deposits of present streams*
- Qt — TERRACE DEPOSITS—*Alluvial deposits on one or more terrace levels*

PENNSYLVANIAN — Des Moinesian

- IPby — BOGGY FORMATION
- IPsv — SAVANNA FORMATION
- IPma — McALESTER FORMATION
- IPhs — HARTSHORNE SANDSTONE

PENNSYLVANIAN — Atokan

- IPa — ATOKA FORMATION UNDIVIDED
- IPau — Upper part
- IPam — Middle part
- IPal — Lower part

PENNSYLVANIAN — Morrowan

- IPjv — JOHNS VALLEY SHALE
- IPj — 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*

DEVONIAN MISSISSIPPIAN

- 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 (MIDDLE ORDOVICIAN)
- Ow — WOMBLE SHALE (MIDDLE AND LOWER ORDOVICIAN)

ORDOVICIAN — Lower Ordovician

- Ob — BLAKELY SANDSTONE
- Om — MAZARN SHALE
- Ocm — CRYSTAL MOUNTAIN SANDSTONE
- Oc — COLLIER SHALE

GEOLOGIC MAP OF ARKANSAS

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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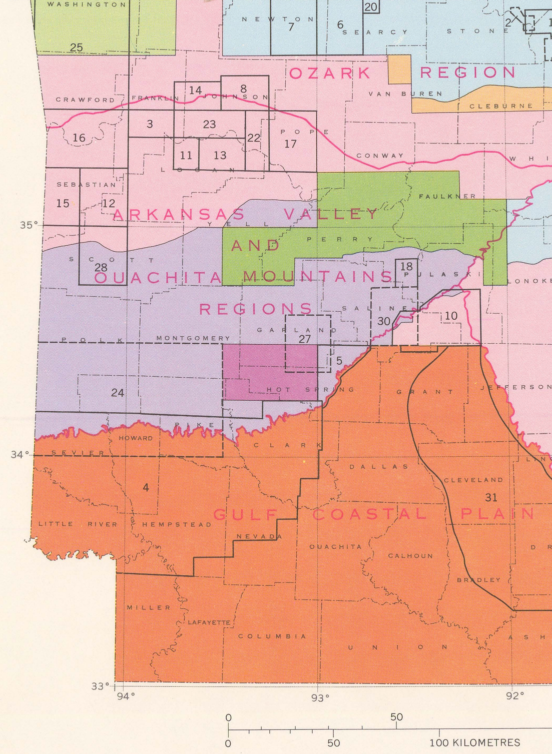

MAP SHOWING SOURCES OF DATA

COMPILERS

- 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

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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GEOLOGIC MAP OF ARKANSAS

By

Boyd R. Haley, U.S. Geological Survey

Assisted by Ernest E. Glick, U.S. Geological Survey
and William V. Bush, Benjamin F. Clardy, Charles G. Stone,
Mac B. Woodward, and Doy L. Zachry, Arkansas Geological Commission

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