Digital Geologic Map Ouachita Mountains
DGM-OMR-001

Geologic Map of the Ouachita Mountain Region and a portion of the Arkansas Valley Region in Arkansas

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OKLAHOMA

Description of Map Units

Quaternary undifferentiated – Sand, silt, clay, and gravel.

Tertiary undifferentiated – Sand, silt, and clay.

Cretaceous undifferentiated – Sand, gravel, and clay.

Cretaceous igneous rocks – Cretaceous igneous intrusions of alkalic rocks.

Savanna Formation (Pennsylvanian) – Buff to black, often silty, shale, buff to brown sandstone, at least six coal beds, and ironstone concretions ranges from about 1,100 to 1,600 feet in thickness.

McAlester Formation (Pennsylvanian) – Gray to black shale, brown sandstone, and coal beds. The formation ranges from about 1,400 to 2,300 feet in thickness.

Hartshorne Formation (Pennsylvanian) – White to gray, clean, fine- to coarse-grained, thin-to-thick bedded sandstone with minor gray silty shale. Extensive cross-bedding and migrating stream channels characterize some exposures. The formation ranges from about 50 to 300 feet in thickness.

Atoka Formation (upper) (Pennsylvanian) – Gray-black shale with brown, micaceous, silty, fine- to coarse-grained, lenticular sandstone. Few coal beds and fossiliferous limestone concretions are found. The formation ranges from about 3,000 to over 6,500 feet in thickness.

Atoka Formation (middle) (Pennsylvanian) – Gray-black shale with three thick brown, micaceous, fine- to medium-grained sandstones that make up the upper portion of the sequence. This part of the Atoka ranges from about 4,100 to over 6,200 feet in thickness.

Atoka Formation (lower) (Pennsylvanian) – Gray-black shale with thin, fine-grained, lenticular, micaceous sandstones, which are often lenticular. This part of the Atoka ranges from about 5,500 to over 16,000 feet in thickness. Limited faunal data suggest that some of the basal lower Atoka is late Morrowan age.

Johns Valley Formation (Pennsylvanian) – Gray-black, fissile shale with minor sandstone and coal. Thin- to massive-bedded, brownish-gray sandstone. Some siliceous shale and chert are present – notably near the top of the unit. Erratic Arkosic and Ozark foreland limestone blocks and masses occur in western Arkansas. True thickness is difficult to estimate, but is about 1,200 to 1,500 feet.

Jackfork Formation (Pennsylvanian) – Light brown to gray, fine-grained, quartzitic sandstone, blue, black to brown siltstone and gray-black shale. Fossils, plant fragments, and conglomerates are present but not common within this unit. The formation ranges about 7,500 feet in thickness.

Stanley Formation (Mississippian) – Interbedded gray-black to brownish-green shale with minor quantities of thin- to massive-bedded, fine-grained to silty, feldspathic, brownish-gray sandstone. Some siliceous shale and chert are present. Minor conglomeratic and tuff beds occur in the lower part of the unit. Bedded barite is known to occur in the basal part of the unit in the Hot Springs and Glenwood, AR areas. The formation ranges from about 12,000 to 12,800 feet in thickness.

Arkansas Novaculite Formation (Mississippian/Devonian) – White, light gray and black novaculite with lesser amounts of gray chert, olive-green to black shale, white to gray siltstones and sandstones. Novaculite is a nearly pure silica rock and is thin- to massive-bedded. The unit can be divided into three informal members: the lower cherty unit, the middle black siliceous shale rich part, and the upper thin-bedded part. The formation ranges from about 60 to 900 feet in thickness. The best known use for novaculite is as a raw material for whetstones and tripoli.

Missouri Mountain, Blaylock and Polk Creek Formations (Silurian/Ordovician) - The Missouri Mountain is typically olive, maroon, buff to gray shale with minor novaculite, conglomerate, sandstone, and limestone. The formation ranges from about 50 to 1,000 feet in thickness. The Blaylock Formation consists of thin, brownish-gray, very fine- to fine-grained sandstone and gray shale layers. The formation ranges from about 5 to 1,200 feet in thickness. The Polk Creek Shale is black, fissile shale with minor thin chert layers or nodules, and a thin gray limestone. Graptolites are successus in this unit. The formation ranges from about 50 to 225 feet in thickness.

Bigfork Formation (Ordovician) - Gray to black, thin-bedded fractured chert, dense gray limestone, gray calcareous siltstone and thin-bedded black pyritic shale. Graptolites are common in the shale units. The formation ranges from about 450 to 750 feet in thickness. The unit is utilized as an aggregate resource and for water production.

Womble Formation (Ordovician) - Dark gray to black shale with minor amounts of brownish-gray calcareous siltstone and some brownish-gray sandstone. Exotic manaus occur in the Little Rock area of metagabbro and soapstone-serpentinite. Limestones yield conodonts which have been extensively studied, and quartz veins are common. The formation ranges from about 900 to 1,200 feet in thickness.

Blakely Formation (Ordovician) – Brownish-gray, thin to massive, fine- to medium-grained, sometimes silty or calcareous sandstones, black, gray, and olive shales, micritic blue gray limestone and some conglomeratic sandstones. Conodonts occur in some limestones and graptolites occur in some shale intervals. The formations ranges from about 1,000 to over 2,000 feet in thickness. Quartz veins and clear quartz crystals occur and are mined some places.

Mazarn Formation (Ordovician) – Mostly black shale with minor amounts of brownish-gray, very fine-grained, silty sandstone, brownish-gray sandstone, dense blue-gray limestone, and black chert. Conodonts, graptolites, and trace fossils occur in the unit. The formation ranges from about 2,500 to 3,500 feet in thickness. Quartz veins are common near intensely sheared and ruptured sequences.

Crystal Mountain Formation (Ordovician) – Light-gray to orange-brown, medium-grained sandstone interbedded with black, gray, and buff shales, with conglomeratic and sandstone lenses and minor amounts of limestone and black chert. Conodonts occur in the limestones. Generally the formation ranges from 500 to 850 feet thick but thins in places to about 50 feet or less of thin sandstone, shale and chert. Clear quartz crystal deposits occur in veins and cavities in the Mt. Ida to Jessieville area.

Collier Shale (Ordovician) – Gray to black shale interbedded with thin to thick intervals of dense, very fine-grained bluish-gray limestone which sometimes maybe sandy to pellatoidal or conglomeratic. Minor amounts of gray-black chert, gray siltstone, fine-grained sandstone, conglomeratic sandstone and tuff beds occur in the unit. Fossils and conodonts have been reported in some of the limestones represent several late Cambrian biomere zones. The formation is about 1000 feet in thickness, but the is difficult to determine due to the amount of deformation. Collier Shale is the host rock for the diamonds in the Murfreesboro Mountains of Arkansas. Clear quartz crystal deposits occur in veins and cavities in sheared and faulted intervals.

Disclaimers

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Symbols

Contacts

Thrust Faults

Tear Faults

Normal Faults

Igneous Dikes

Strike and Dip

Overturned Strike and Dip

Mines/Quarries

Pits

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Compilers and Sources

This map is a graphic summary of information about rock units in the State at the time of the map compilations. 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 small areas. The map is based on the following sources: rock unit boundaries, geographic extent of rock units, and stratigraphic nomenclature between the Geologic Map of Arkansas (Arkansas Geological Survey, 1976) and this map are based on published and unpublished geologic reports listed under References. Field checking and photogeologic mapping done in conjunction with the preparation of this map.

Sources cited in the list have been locally modified or adjusted by the compilers who also contributed detailed reconnaissance mapping for the areas for which they are responsible.

The base used in the making of this map was acquired online from GeoStor. The data is DRG200k (Digital Raster Graphics, 1:100,000, USGS.

Arkansas

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Scale
Approximately 1:125,000
5 2.5 0 5 10 15 20 25 Miles

Contact between the Hartshorne and Atoka Formations.

Alternating sandstone and shale in the Jackfork Formation.

Turbidite sequence in the Jackfork Formation.

Folds in the Big Fork Formation.

Folds in the Stanley Formation.

Quartz crystals occurring in the Ouachita Mountains.