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

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One hundred and seventy-eight 7.5-minute (1:24,000) quadrangles in the Ouachita Mountain region and a portion of the Arkansas Valley region in Arkansas were mapped by Charles G. Stone (Arkansas Geological Commission) and Boyd R. Haley (U.S. Geological Survey) under the COGEO Map project (a precursor to the National Cooperative Geologic Mapping Program's STATEMAP component). The task of mapping this area took eight years and was completed in 1995. The maps completed during this project were compiled onto 1:100,000 USGS topographic quadrangle maps and then digitized and published (Haley and Stone, 2006). The map includes parts of the Fort Smith, Russellville, Conway, Searcy, Mena, Little Rock, DeQueen, Arkadelphia, and Malvern 1:100,000 quadrangles, and all of the Lake Ouachita quadrangle. Files from the ten digitized 1:100,000 quadrangles were merged in such a way as to produce seamless layers. Editing by the authors and additional staff members of the Arkansas Geological Commission was performed after each individual map was completed and after the compilation map product was produced. To make each map, heads-up digitizing was done over scanned base maps using ESRI ArcGIS 9.x software. Upon completion of the individual quadrangles, a new view was created and all files pulled together into a master file set.

Features included in these data sets are the surface geology (which includes formation contacts, strike and dip symbols, thrust, tear and normal faults, quarry, mine and pit symbols, igneous intrusions and igneous dikes), correlation chart, formation descriptions, and a few representative pictures of various geologic features encountered in the mapped area. The digital pictures are relatively new to our maps, and we hope they give the viewer a better understanding of rock types, structures, and outcrop appearances.

Formations that occur on this map from oldest to youngest are the Paleozoic Collier Shale (Oc); Crystal Mountain Sandstone (Ocm); Mazarn Shale (Om); Blakely Sandstone (Ob); Womble Shale (Ow); Big Fork Chert (Obf); Polk Creek Shale (Opc); Blaylock Sandstone (Sb); Missouri Mountain Shale (Sm); Arkansas Novaculite (MDa); Stanley Shale (Ms); Jackfork Sandstone (IPj); Johns Valley Shale (IPjv); Atoka lower, middle, and upper (IPal, IPam, and IPau); Hartshorne Sandstone (IPhs); McAlester (IPma); Savanna (IPsv); Mesozoic Cretaceous igneous (Ki) and undifferentiated (Ku); Cenozoic Tertiary undifferentiated (Tu); and Quaternary undifferentiated (Qu). In some instances, the Polk Creek Shale, Missouri Mountain Shale, and Blaylock Sandstone have been grouped together. When this occurs, the units are grouped under the SO symbol.

Economic resources that occur in this part of the state are coal, natural gas, cinnabar, antimony, novaculite, tripoli, crushed stone, dimension stone, shale, slatey shale, sand and gravel, clay, quartz, barite, manganese, copper, lead, zinc, vanadium, columbium, titanium, molybdenum, soapstone, and water. Landslides, most of which are induced by human activities, are the main geohazard in this area of the state. Ground subsidence can be a problem where historic underground coal mining has occurred. Controlled lakes built by the Corp of Engineers in this part of the state have greatly reduced the potential for major flooding, though minor flooding can occur when heavy rains occur in smaller tributaries.

Users of this map are state, regional, and local planners; local, state and federal government agencies; explorers of economic minerals; risk assessors; and those directly involved with earth sciences. Copies are available from the Arkansas Geological Commission, Little Rock, AR. A .pdf image can be accessed from the AGC website (www.state.ar.us/agc/agc.htm), which is about 350 Mb.

REFERENCE

Haley, B.R., and Stone, C.G., 2006, Geologic map of the Ouachita Mountain region and a portion of the Arkansas Valley region in Arkansas: Arkansas Geological Commission Map DGM-OMR-001, scale 1:125,000.