Geologic Map of the Adona Quadrangle, Conway and Perry Counties, Arkansas

Geology by Boyd R. Haley, Charles G. Stone and Angela K. Chandler
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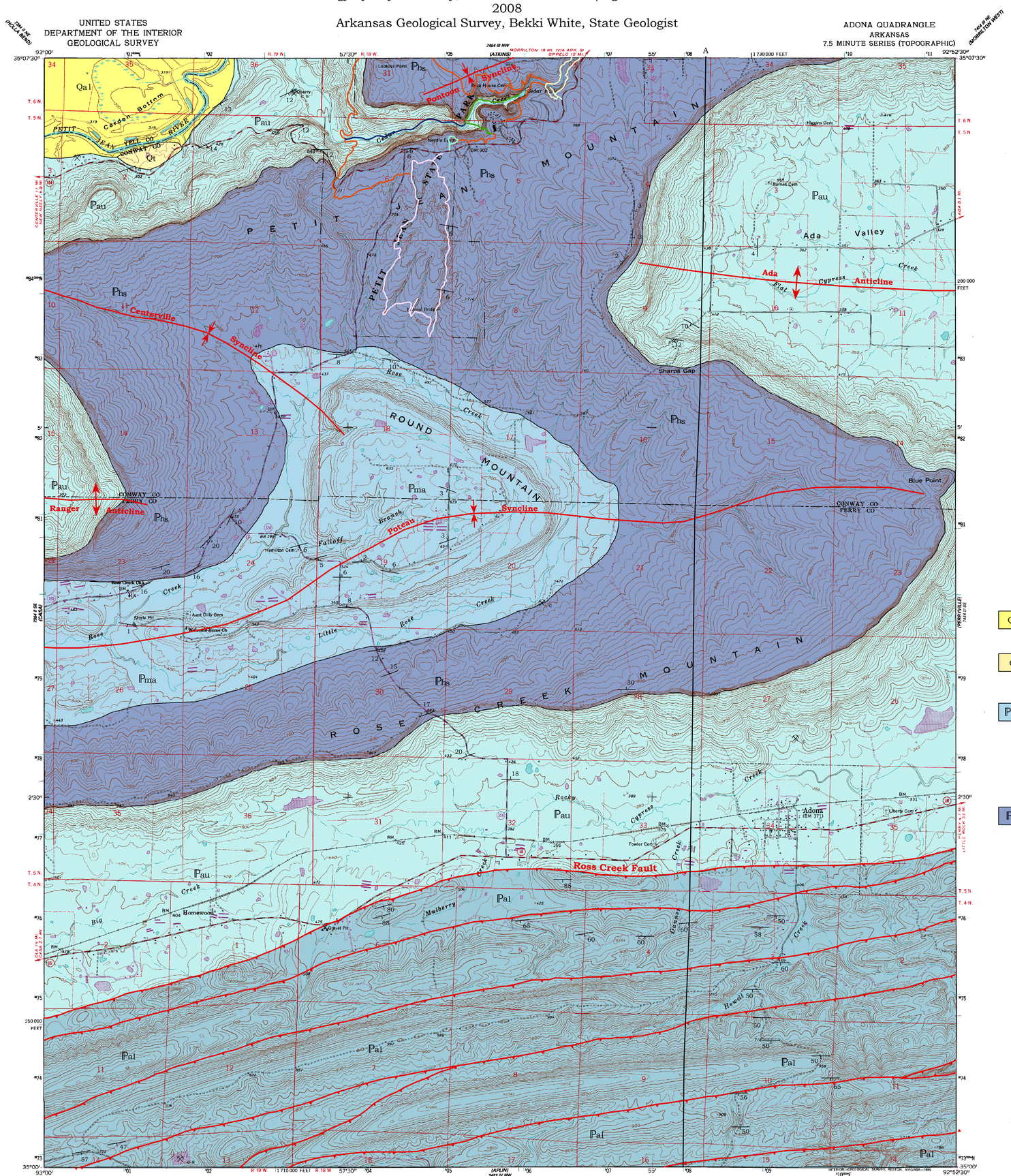
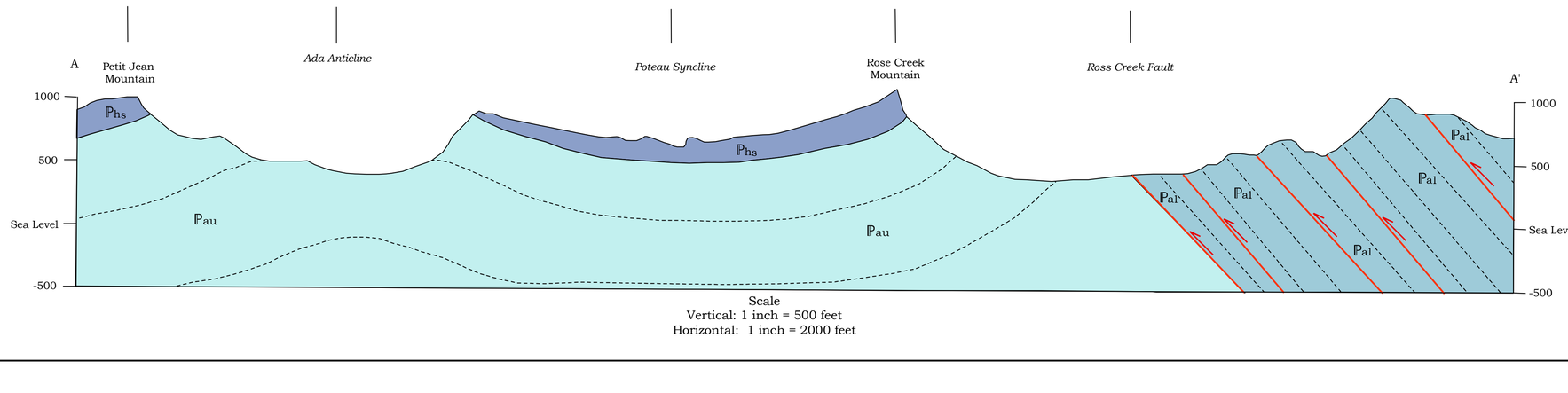




Correlation of Map Units

Qal	Holocene	Quaternary
Unconformity		
Qt	Pleistocene	Quaternary
Unconformity		
Pma	Desmoinesian	Pennsylvanian
Phs	Desmoinesian	Pennsylvanian
Unconformity		
Pau	Atokan	Pennsylvanian
Thrust fault		
Pal	Atokan	Pennsylvanian

Introduction

The Adona quadrangle was mapped by Boyd R. Haley and Charles G. Stone in 1995 through COGEOMAP, a cooperative mapping project with the Oklahoma Geological Survey and the U.S. Geological Survey. This area was revisited in 2007 for a State Park Series centered on Petit Jean State Park and as a result this map was digitized and the layout compiled as a Digital Geologic Map, DGM-AR-00005.

The majority of the Adona quadrangle is located in the Arkansas River Valley physiographic region. Several structures (anticlines and synclines) are present as a result of the tectonic forces from the Ouachita orogenic (mountain building) event. This area contains broad valleys consisting of non-resistant shales with resistant sandstones forming the ridges.

The Ross Creek Fault marks the northern edge of the Ouachita Mountain physiographic region which contains the majority of thrust faults. Several thrust faults are present south of the Ross Creek Fault system creating steeply inclined southward dipping rocks.

Description of Map Units

Qal **Alluvium deposits (Quaternary. Holocene)** – Consists of alluvial deposits, tan to buff in color, composed of sand, clay and gravel. Approximately 30-40 feet is exposed in northwestern corner of quadrangle.

Qt **Terrace deposits (Quaternary, Pleistocene)** – Consists of various low to high level terrace deposits, reddish-orange in color, composed of sand, clay and gravel. Approximately 30-50 feet of section is exposed along the Petit Jean River.

Pma **McAlester Formation (Pennsylvanian, Desmoinesian)** – Consists of very thin bedded silty micaceous shales and siltstones with occasional thin-bedded sandstone. The shales and siltstones are charcoal-gray to black on fresh surfaces but weather buff to orange in color. This formation is exposed on Round Mountain just south of Seven Hollows Trail and Petit Jean State Park. This formation contains plant fossils and a thin coal bed is identified as the "lower Hartshorne coal seam". The McAlester Formation is conformable with the underlying Hartshorne Sandstone. Approximately 250-300 ft. thick in the Round Mountain area.

Phs **Hartshorne Sandstone (Pennsylvanian, Desmoinesian)** – A very fine to medium-grained micaceous sandstone that is thin to massive-bedded. The massive beds contain tabular cross-beds. The sandstone is usually a light red or orange to buff or white on fresh surfaces but weathers a dark-gray. The quartz grains are angular to sub-rounded. Also contains some intervals of siltstone and shale. The formation is exposed on top of Petit Jean Mountain and along the Seven Hollows Trail and contains the well known "turtle rocks" and box-work or "carpet rock" seen in the park. The sandstone also forms the scenic ridges along Rose Creek Mountain. The Hartshorne Sandstone is unconformable with the underlying Atoka Formation. The unconformable contact can be seen beneath Cedar Falls approximately 15 feet above pool level. Approximately 200-300 ft. thick in this area.

Pau **Atoka Formation (Pennsylvanian, Atokan)** – The Atoka Formation is divided into lower, middle and upper members based on regionally mappable shale or sandstone intervals (McFarland, 1998). Only the upper and lower members are exposed on this map. The middle member is absent due to the action of the Ross Creek Thrust Fault in the lower portion of the mapped area.

Upper member – Consists of micaceous silty shales, siltstones and thin-bedded sandstones. The shales and siltstones are charcoal-gray to black on fresh surface and weather a dark-gray. Some silty sequences contain very thin-bedded rounded concretions. The sandstone is fine-grained with sub-angular to sub-rounded grains and is gray to buff on fresh surfaces. This unit contains limonite pebble beds and occasional fossiliferous beds containing mostly gastropods and bivalves. More commonly seen are plant fossils and trace fossils such as *Conostichus*. Coal stringers and thin coal beds less than one inch are abundant in this member. The upper member is present along the hillsides of Petit Jean Mountain and in the surrounding valleys. Approximately 650-700 ft. of section is exposed in this area.

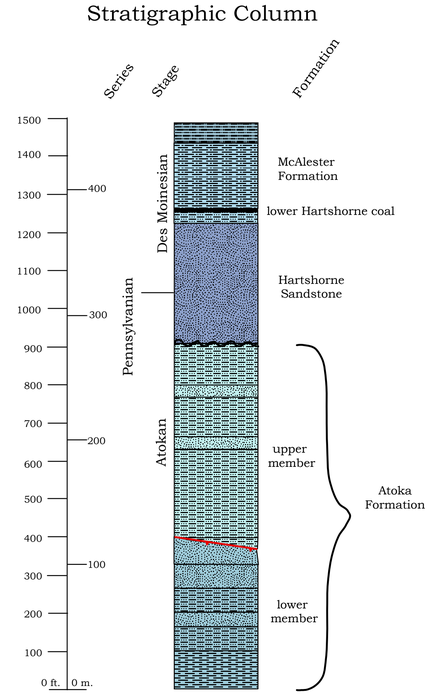
Pal

Lower member – Consists of thin to thick-bedded sandstone, micaceous siltstone and black fissile shale (Stone et. al., 1981). The siltstone and shale contain coalified plant fragments and sideritic iron concretions. Trace fossils are abundant in this unit. The lower member is exposed south of the Ross Creek Fault in the southern part of the map. Approximately 300-500 ft. of section is exposed on southern part of map.

Symbols

- Formation contact
- Syncline
- Anticline
- Thrust fault (barb on upthrown plate)
- 12 — Strike and dip of inclined bedding
- Quarry (coal)
- Quarry (crushed stone)
- Gravel pit
- Bedding
- Arrow showing direction of fault movement

Stratigraphic Column



Trails

- Bear Cave Trail
- Boy Scout Trail
- Canyon Trail
- Cedar Creek Trail
- Cedar Falls Trail
- Seven Hollow Trail

References

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Acknowledgments: This geologic map is a compilation of the Adona quadrangle that was mapped in 1995 for COGEO, Cooperative Geologic Mapping Program, a program with the US Geological Survey. Many thanks to Charlie Stone and Boyd Haley for their assistance in creating this digital map with layout.