

**U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science Directorate
Geologic Resources Division**



Pea Ridge National Military Park

GRI Ancillary Map Information Document

Produced to accompany the Geologic Resources Inventory (GRI) Digital Geologic Data for Pea Ridge National Military Park

peri_geology.pdf

Version: 11/16/2022

Geologic Resources Inventory Map Document for Pea Ridge National Military Park

Table of Contents

Geologic Resources Inventory Map Document.....	1
About the NPS Geologic Resources Inventory Program.....	3
GRI Digital Maps and Source Map Citations.....	5
Index Map.....	6
Map Unit List	7
Map Unit Descriptions.....	8
Qat - Alluvium and terrace deposits (Holocene and Pleistocene).....	8
Mf - Fayetteville Shale (Upper Mississippian, Chesterian).....	8
Mfw - Fayetteville Shale, Wedington Sandstone Member (Upper Mississippian, Chesterian).....	8
Mfl - Fayetteville Shale, lower part (Upper Mississippian, Chesterian).....	9
Mbv - Batesville Sandstone, Hindsville Limestone Member (Upper Mississippian, Meramecian).....	9
Mb - Boone Formation, undivided (Lower Mississippian, Osagean and Kinderhookian).....	10
Mbsj - Boone Formation, St. Joe Limestone Member (Lower Mississippian, Kinderhookian).....	10
Dcc - Chattanooga Shale and Clifty Sandstone, undivided (Devonian).....	11
Opw - Powell Dolomite (Lower Ordovician).....	11
Oc - Cotter Dolomite (Lower Ordovician).....	11
Geologic Cross Sections.....	12
Cross Section A-A'.....	12
Cross Section B-B'.....	12
Ancillary Source Map Information.....	13
Garfield Quadrangle.....	13
Introduction.....	13
Correlation of Units.....	14
Stratigraphic Column.....	15
Joint Diagram.....	16
Symbols.....	17
Photograph: Paleokarst in Powell Dolomite.....	18
Photograph: St. Joe Member Units.....	19
Photograph: Clifty Sandstone.....	20
Photograph: Shale in Powell Dolomite.....	21
References.....	21
Acknowledgments and AGS Disclaimer.....	22
Pea Ridge Quadrangle.....	22
Introduction.....	22
Correlation of Units.....	23
Stratigraphic Column.....	24
Joint Diagram.....	25
Symbols.....	26
Photograph: Fayetteville Shale near Bentonville-Pea Ridge Fault.....	27
Photograph: Recent Rockfall.....	28
References.....	29
Acknowledgments and AGS Disclaimer.....	29
GRI Digital Data Credits.....	30

Geologic Resources Inventory Map Document



Pea Ridge National Military Park, Arkansas and Missouri

Document to Accompany Digital Geologic-GIS Data

[peri_geology.pdf](#)

Version: 11/16/2022

This document has been developed to accompany the digital geologic-GIS data developed by the Geologic Resources Inventory (GRI) program for Pea Ridge National Military Park, Arkansas and Missouri (PERI).

Attempts have been made to reproduce all aspects of the original source products, including the geologic units and their descriptions, geologic cross sections, the geologic report, references and all other pertinent images and information contained in the original publication.

This document contains the following information:

- 1) **About the NPS Geologic Resources Inventory Program** – A brief summary of the Geologic Resources Inventory (GRI) Program and its products. Included are web links to the GRI GIS data model, and to the GRI products page where digital geologic-GIS datasets, scoping reports and geology reports are available for download. In addition, web links to the NPS Data Store and GRI program home page, as well as contact information for the GRI coordinator, are also present.
- 2) **GRI Digital Maps and Source Map Citations** – A listing of all GRI digital geologic-GIS maps produced for this project along with sources used in their completion. In addition, a brief explanation of how each source map was used is provided.
- 3) **Map Unit List** – A listing of all geologic map units present on maps for this project, generally listed from youngest to oldest.
- 4) **Map Unit Descriptions** – Descriptions for all geologic map units. If a unit is present on multiple source maps the unit is listed with its source geologic unit symbol, unit name and unit age followed by the unit's description for each source map.
- 5) **Geologic Cross Sections** – Geologic cross section graphics with source geologic cross section abbreviations.
- 6) **Ancillary Source Map Information** – Additional source map information presented by source map.
- 7) **GRI Digital Data Credits** – GRI digital geologic-GIS data and ancillary map information document production credits.

For information about using GRI digital geologic-GIS data contact:

Stephanie O'Meara
Geologist/GIS Specialist/Data Manager
Colorado State University Research Associate, Cooperator to the National Park Service
Fort Collins, CO 80523
phone: (970) 491-6655
email: stephanie_o'meara@partner.nps.gov

About the NPS Geologic Resources Inventory Program

Background

The Geologic Resources Inventory (GRI) provides geologic map data and pertinent geologic information to support resource management and science-informed decision making in more than 270 natural resource parks throughout the National Park System. Geologic resources for management consideration include both the processes that act upon the Earth and the features formed as a result of these processes. Geologic processes include: erosion and sedimentation; seismic, volcanic, and geothermal activity; glaciation, rockfalls, landslides, and shoreline change. Geologic features include mountains, canyons, natural arches and bridges, minerals, rocks, fossils, cave and karst systems, beaches, dunes, glaciers, volcanoes, and faults.

The GRI is one of 12 inventories funded by the National Park Service (NPS) Inventory and Monitoring Program. The Geologic Resources Division of the NPS Natural Resource Stewardship and Science Directorate administers the GRI. The NPS Geologic Resources Division partners with the Colorado State University Department of Geosciences to produce GRI products. Many additional partners participate in the GRI process by contributing source maps or reviewing products.

The GRI team undertakes three tasks for each park in the Inventory and Monitoring program: (1) conduct a scoping meeting and provide a summary document, (2) provide digital geologic map data in a geographic information system (GIS) format, and (3) provide a GRI report. These products are designed and written for nongeoscientists.

Products

Scoping Meetings: These park-specific meetings bring together local geologic experts and park staff to inventory and review available geologic data and discuss geologic resource management issues. A summary document is prepared for each meeting that identifies a plan to provide digital map data for the park.

Digital Geologic Maps: Digital geologic maps reproduce all aspects of traditional paper maps, including notes, legend, and cross sections. Bedrock, surficial, and special purpose maps such as coastal or geologic hazard maps may be used by the GRI to create digital Geographic Information Systems (GIS) data and meet park needs. These digital GIS data allow geologic information to be easily viewed and analyzed in conjunction with a wide range of other resource management information data.

For detailed information regarding GIS parameters such as data attribute field definitions, attribute field codes, value definitions, and rules that govern relationships found in the data, refer to the NPS Geology-GIS Data Model document available at: <https://www.nps.gov/articles/gri-geodatabase-model.htm>

Geologic Reports: GRI reports synthesize discussions from the original scoping meeting, follow up conference call(s), and subsequent research. Chapters of each report discuss the geologic setting of the park, distinctive geologic features and processes within the park, highlight geologic issues facing resource managers, and describe the geologic history leading to the present-day landscape. Each report also includes a poster illustrating these GRI digital geologic-GIS data.

For a complete listing of GRI products visit the GRI publications webpage: <https://go.nps.gov/gripubs>. GRI digital geologic-GIS data is also available online at the NPS Data Store: <https://irma.nps.gov/DataStore/Search/Quick>. To find GRI data for a specific park or parks select the appropriate park(s), enter "GRI" as a Search Text term, and then select the Search button.

For more information about the Geologic Resources Inventory Program visit the GRI webpage: <https://www.nps.gov/subjects/geology/gri.htm>. At the bottom of that webpage is a "Contact Us" link if you need additional information. You may also directly contact the program coordinator:

Jason Kenworthy
Inventory Coordinator
National Park Service Geologic Resources Division
P.O. Box 25287
Denver, CO 80225-0287
phone: (303) 987-6923
fax: (303) 987-6792
email: Jason_Kenworthy@nps.gov

The Geologic Resources Inventory (GRI) program is funded by the National Park Service (NPS) Inventory and Monitoring (I&M) Division. Learn more about I&M and the 12 baseline inventories at the I&M webpage: <https://www.nps.gov/im/inventories.htm>.

GRI Digital Maps and Source Map Citations

The GRI digital geologic-GIS maps of Pea Ridge National Military Park, Arkansas and Missouri (PERI) is listed below.

Digital Geologic-GIS Map of Pea Ridge National Military Park and Vicinity, Arkansas and Missouri (*GRI MapCode PERI*)

The above map was compiled from the following component GRI digital geologic-GIS maps.

Digital Geologic-GIS Map of the Garfield Quadrangle, Arkansas and Missouri (*GRI MapCode GARF*)

The source map used to produce the above GRI digital geologic-GIS map is listed below. The full extent of the source map was used and all geologic features within the map's extent were captured.

Chandler, Angela K., and Ausbrooks, Scott M. (digital compilation by Mayfield, Walter K.), 2009, Geologic Map of the Garfield Quadrangle, Benton County, Arkansas: Arkansas Geological Survey, Digital Geologic Quadrangle Map, DGM-AR-00320, scale 1:24,000 ([Garfield Quadrangle](#)). (*GRI Source Map ID 75177*).

Digital Geologic-GIS Map of the Pea Ridge Quadrangle, Arkansas and Missouri (*GRI MapCode PRDG*)

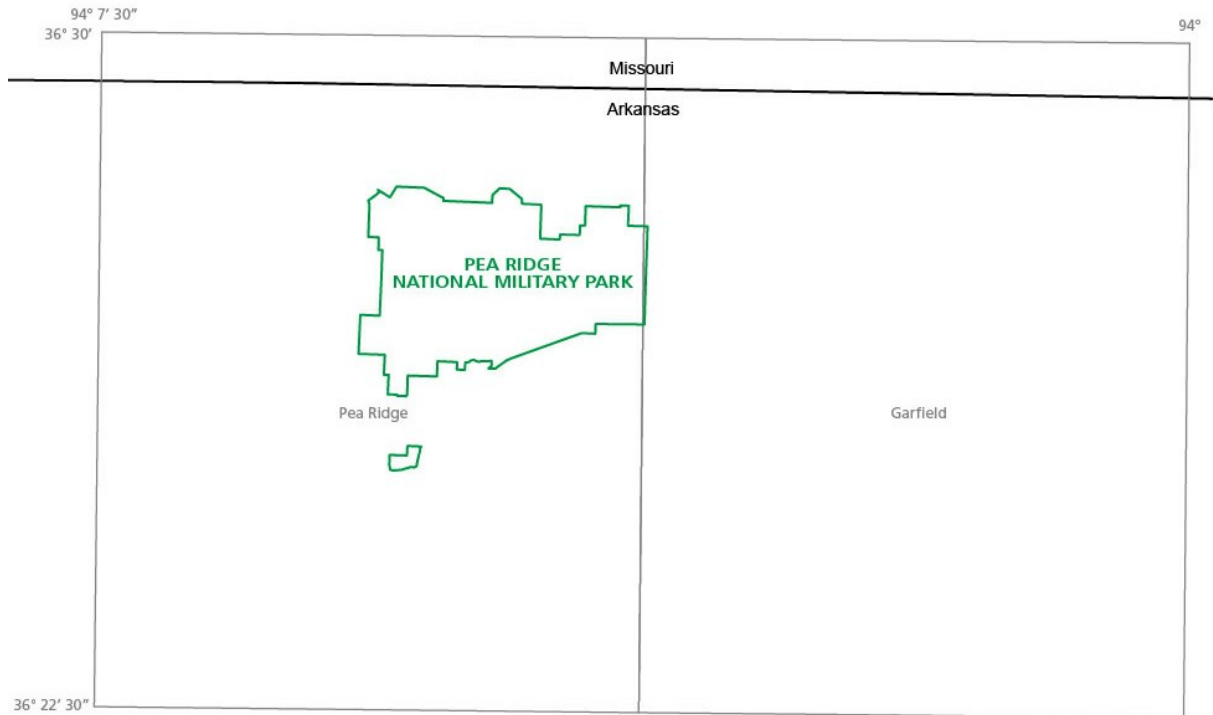
The source map used to produce the above GRI digital geologic-GIS map is listed below. The full extent of the source map was used and all geologic features within the map's extent were captured.

Chandler, Angela K., and Ausbrooks, Scott M. (digital compilation by Mayfield, Walter K.), 2009, Geologic Map of the Pea Ridge Quadrangle, Benton County, Arkansas: Arkansas Geological Survey, Digital Geologic Quadrangle Map, DGM-AR-00682, scale 1:24,000 ([Pea Ridge Quadrangle](#)). (*GRI Source Map ID 75176*).

Additional information pertaining to each source map is also presented in the GRI Source Map Information (PERIMAP) table included with the GRI digital geologic-GIS data.

Index Map

The following index map displays the extents of the GRI digital geologic-GIS maps produced for Pea Ridge National Military Park (PERI). The boundary for Pea Ridge National Military Park (as of November, 2022) is outlined in green. The extent of the Garfield and Pea Ridge 7.5' quadrangles are also shown in gray.



Index map by Stephanie O'Meara (Colorado State University).

Map Unit List

The geologic units present in the digital geologic-GIS data produced for Pea Ridge National Military Park, Arkansas and Missouri (PERI) are listed below. Units are listed with their assigned unit symbol and unit name (e.g., Qat - Alluvium and terrace deposits). Units are listed from youngest to oldest. No description for water is provided. Information about each geologic unit is also presented in the GRI Geologic Unit Information (PERIUNIT) table included with the GRI digital geologic-GIS data.

Cenozoic Era

Quaternary Period

[Qat](#) - Alluvium and terrace deposits

Paleozoic Era

Mississippian Period

[Mf](#) - Fayetteville Shale (Upper Mississippian)

[Mfw](#) - Fayetteville Shale, Wedington Sandstone Member

[Mfl](#) - Fayetteville Shale, lower part

[Mbv](#) - Batesville Sandstone, Hindsville Limestone Member

[Mb](#) - Boone Formation, undivided

[Mbsj](#) - Boone Formation, St. Joe Limestone Member

Devonian Period

[Dcc](#) - Chattanooga Shale and Clifty Sandstone, undivided

Ordovician Period

[Opw](#) - Powell Dolomite

[Oc](#) - Cotter Dolomite

Map Unit Descriptions

Descriptions of all geologic map units, generally listed from youngest to oldest, are presented below.

Qat - Alluvium and terrace deposits (Holocene and Pleistocene)

Qat - Alluvium and terrace deposits (Holocene and Pleistocene)

Landslide deposits (Quaternary) – Sandstone blocks of the Wedington Sandstone Member from a rock fall event in January 2008.

Unconsolidated clay, silt, sand and gravel including deposits on one or more terrace levels.

Approximately 5-10 feet (1-3 m) exposed in the creeks. Description from source map: [Garfield Quadrangle](#)

Qat - Alluvium and terrace deposits (Holocene and Pleistocene)

Unconsolidated clay, silt, sand and gravel including deposits on one or more terrace levels.

Approximately 5-10 feet (1-2 m) exposed in the creeks. Description from source map: [Pea Ridge Quadrangle](#)

Mf - Fayetteville Shale (Upper Mississippian, Chesterian)

Mf - Fayetteville Shale (Upper Mississippian, Chesterian)

The Fayetteville Shale can be divided into a lower part and an upper part separated by the Wedington Sandstone Member. Only the lower part and the Wedington Sandstone are present in this quadrangle. The Fayetteville Shale is unconformable with the underlying Hindsville Member of the Batesville Sandstone. Description from source map: [Garfield Quadrangle](#)

Mf - Fayetteville Shale (Upper Mississippian, Chesterian)

The Fayetteville Shale can be divided into a lower part and an upper part separated by the Wedington Sandstone Member. Only the lower part and the Wedington Sandstone are present in this quadrangle. The Fayetteville Shale is unconformable with the underlying Batesville Sandstone. Description from source map: [Pea Ridge Quadrangle](#)

Of note, this unit is not mapped as an undivided unit on either the Pea Ridge or Garfield Quadrangle Maps, however, a general description of the undivided unit was provided on both source maps. See [Mfw](#) - Fayetteville Shale, Wedington Sandstone Member, and [Mfl](#) - Fayetteville Shale, lower part, for unit member descriptions.

Mfw - Fayetteville Shale, Wedington Sandstone Member (Upper Mississippian, Chesterian)

Mfw - Fayetteville Shale, Wedington Sandstone Member (Upper Mississippian, Chesterian)

A fine- to medium-grained sandstone that contains thin to very thin, ripple bedded siltstones at the base. The sandstone is thin- to medium-bedded and contains cross-beds, liesegang banding and pock-marks or honeycomb weathering. Plant fossils, bryozoans and brachiopods are also present. The sandstone is yellowish to reddish or white on fresh surfaces but weathers gray. Sandstone concretions are present in this member near the Bentonville-Pea Ridge fault in the northwest corner of the map. The contact with the underlying lower part was rarely seen, but at one location consists of interbedded shale with very thin-bedded ripple-bedded silt to very fine grained sandstone. The Wedington Sandstone is a small bluff former that caps the hills in this quadrangle. Ranges from 30-80 feet (9-24 m) of sandstone exposed above the lower part of the Fayetteville. Description from source map: [Garfield Quadrangle](#)

Mfw - Fayetteville Shale, Wedington Sandstone Member (Upper Mississippian, Chesterian)

A fine to medium-grained sandstone that contains thin- to very thin, ripple bedded siltstones at the base. The sandstone is thin- to medium-bedded and contains cross-beds, Liesegang banding and pock-marks or honeycomb weathering. Plant fossils, bryozoans and brachiopods are also present. The sandstone is yellowish to reddish or white on fresh surfaces but weathers gray. The contact with the underlying lower part was rarely seen, but at one location consists of interbedded shale with very thin-bedded ripple-bedded silt to very fine-grained sandstone. The Wedington Sandstone is a small bluff former that caps the hills in this quadrangle. Approximately 20-60 feet (6-18 m) exposed above the lower part of the Fayetteville. Description from source map: [Pea Ridge Quadrangle](#)

Mfl - Fayetteville Shale, lower part (Upper Mississippian, Chesterian)**Mfl - Fayetteville Shale, Lower part (Upper Mississippian, Chesterian)**

Lower part – A black clay shale that contains ironstone concretions at a few localities. It is unconformable with the underlying Hindsville Limestone Member of the Batesville Sandstone. Approximately 40-50 feet (12-15m) thick. Description from source map: [Garfield Quadrangle](#)

Mfl - Fayetteville Shale, Lower part (Upper Mississippian, Chesterian)

A black clay shale that contains ironstone concretions at a few localities. Unconformable with the underlying Hindsville Limestone Member of the Batesville Sandstone. Approximately 20-30 feet (6-9 m) thick. Description from source map: [Pea Ridge Quadrangle](#)

Mbv - Batesville Sandstone, Hindsville Limestone Member (Upper Mississippian, Meramecian)**Mbv - Batesville Sandstone, Hindsville Limestone Member (Upper Mississippian, Meramecian)**

This interval is entirely made up of the Hindsville Limestone Member in this quadrangle.

A thin-bedded, fine to coarsely crystalline limestone. The rock is light to dark gray on fresh surfaces, but generally weathers to light-gray or brown. It usually has a strong petroliferous odor on freshly broken surfaces. The limestones are fossiliferous and/or oolitic, contain pyrite, and at various localities are interbedded with thin layers of clay shale and thin beds of siltstone to fine-grained sandstone. A breccia containing angular chert and limestone fragments at the base of this interval is present at one locality in the quadrangle (Sec 23, T 21 N, R 29 W). This unit is unconformable with the underlying Boone Formation. Approximately 40-70 feet (12-21 m) thick. Description from source map: [Garfield Quadrangle](#)

Mbv hv - Batesville Sandstone, Hindsville Limestone Member (Upper Mississippian, Meramecian)

Consists of very fine grained thin-bedded micaceous sandstone. The sandstone is light brown to gray on fresh surfaces but weathers orange buff to light gray. Contains pyrite and green shale partings which give the sandstone a greenish color at a few localities. Also contains, trace fossils, crinoid molds, laminae and cross-bedding. The sandstone is conformable with the Hindsville Limestone Member. Ranges from 5-15 feet (1-5 m).

Hindsville Limestone Member - A thin-bedded, fine- to coarsely crystalline limestone. The limestone is light- to dark- gray on fresh surfaces, but generally weathers to a light-gray or brown. Usually has a strong petroliferous odor on freshly broken surfaces. The limestones are fossiliferous and/or oolitic, contain pyrite and at various localities are interbedded with thin layers of clay shale and thin beds of siltstone to fine-grained sandstone. A breccia containing angular chert and limestone fragments at the base of this interval is present at one locality in the quadrangle. Approximately 60-80 feet (18-24 m) thick. Description from source map: [Pea Ridge Quadrangle](#)

Mb - Boone Formation, undivided (Lower Mississippian, Osagean and Kinderhookian)

Mb - Boone Formation (Lower Mississippian, Osagean and Kinderhookian)

Coarse-grained fossiliferous and fine-grained limestones interbedded with anastomosing and bedded chert. The rock is light to medium gray on fresh surfaces but usually weathers to dark gray. Chert varies in color from white to light gray in the upper portion to dark gray or blue gray in the lower portion. Fairly chert-free sections are present and contain brachiopods, corals and crinoids. An oolitic limestone, possibly equivalent to the Short Creek Oolite, is present in the upper part of the Boone at a few localities. Springs and sinkholes are abundant. The Boone Formation caps the Springfield Plateau on this quadrangle and exhibits a relatively flat topography. The Boone regolith, consisting of red to orange clay with chert, can be up to 40 feet thick. The St. Joe Limestone Member is not exposed in this quadrangle. Approximately 200-240 feet (61-73 m) of section exposed on this quadrangle. Description from source map: [Garfield Quadrangle](#)

Mb - Boone Formation (Lower Mississippian, Osagean and Kinderhookian)

Coarse-grained fossiliferous and fine-grained limestones interbedded with anastomosing and bedded chert. Light to medium gray on fresh surfaces but usually weathers to a dark gray. The chert varies in color from white to light gray in the upper portion to dark gray or blue gray in the lower portion. Fairly chert free sections are petroliferous and contain brachiopods, corals and crinoids. A white oolitic limestone, possibly equivalent to the Short Creek Oolite, is present in the upper part of the Boone at a few localities. Springs and sinkholes are abundant. The Boone Formation caps the Springfield Plateau on this quadrangle and exhibits a fairly flat topography. The Boone regolith consists of red to orange clay with chert fragments and can be up to 40 feet (12 m) thick in this area. Approximately 340-400 feet (103-116 m) exposed on this quadrangle. Description from source map: [Pea Ridge Quadrangle](#)

Mbsj - Boone Formation, St. Joe Limestone Member (Lower Mississippian, Kinderhookian)

Mbsj - Boone Formation, St. Joe Limestone Member (Lower Mississippian, Kinderhookian)

Consists of medium to coarsely crystalline and fine-grained thin-bedded limestone. These units are recognized as Formations in Missouri as follows: Bachelor, Compton, Northview and Pierson, respectively from oldest to youngest. These same units can be recognized in the St. Joe Limestone Member in Arkansas. Ranges from 20-40 feet (6-12 m) thick.

Pierson – Fine to coarsely crystalline, thin to thick planar bedded crinoidal limestone. Gray to white on weathered surfaces and gray to reddish gray on fresh surfaces. Forms the upper 10-15 feet (3-5 m) of the St. Joe bluff above the Northview re-entrant.

Northview – Fine-grained argillaceous limestone. Red to gray green on fresh and weathered surfaces. Forms 2-3 feet (1m) re-entrant between the Compton and Pierson Limestones.

Compton – Fine-to medium-grained crinoidal limestone; thin bedded with wavy or nodular bedding. Gray to reddish gray on fresh surfaces but weathers light-gray to white. Contains brown to reddish chert with white crinoid fragments and horizontal trace fossils. Ranges from 12-15 feet (3-5 m) thick.

Bachelor – A gray green clay shale. Contact with underlying Chattanooga Shale is sharp and unconformable. Ranges from 0-1 foot (0-.3 m) thick.

Description from source map: [Garfield Quadrangle](#)

Dcc - Chattanooga Shale and Clifty Sandstone, undivided (Devonian)

Chattanooga Shale (Devonian)

A clay shale that is black on fresh and weathered surfaces. It contains very small iron concretions and pyrite-marcasite concretions that vary in size from one inch to three inches (76 mm) in diameter. Ranges from 10-40 feet (3-12 m) thick.

Clifty Sandstone (Devonian)

A fine-grained thin-to thick- bedded, silica-cemented sandstone. White on fresh surfaces and gray to orange on weathered surfaces. At some localities the sand is friable but more commonly is silica-cemented. Usually two sandstone beds can be distinguished within the sandstone ledge; however at a few localities several sandstone beds can be differentiated. The Sylamore Sandstone which is the basal member of the Chattanooga Shale may be present in the upper portion of this sandstone (Manger, 1985) at Beaver Dam. The sandstone contains chert fragments and pebble clasts/molds on the basal portion of bedding planes. At one locality mostly bedded chert is present. The Clifty Sandstone is unconformable (locally angular) with the underlying Powell or Cotter Dolomites. Ranges from 2-10 feet (.5-3 m) thick.

Description from source map: [Garfield Quadrangle](#)

Opw - Powell Dolomite (Lower Ordovician)

Opw - Powell Dolomite (Lower Ordovician)

A very fine-to fine- grained thin-to medium-bedded argillaceous and mottled dolostone. White to light-gray on fresh and weathered surfaces. The dolostone contains calcite vugs, gastropods and stromatolites. Very thin bedded gray-green to reddish shales are interbedded with the dolostone at a few localities. The basal contact is placed at the appearance of banded chert nodules and/or chert breccia in the upper portion of the Cotter Dolomite. Ranges from 0 - 30 feet (0-9 m) thick. Description from source map: [Garfield Quadrangle](#)

Oc - Cotter Dolomite (Lower Ordovician)

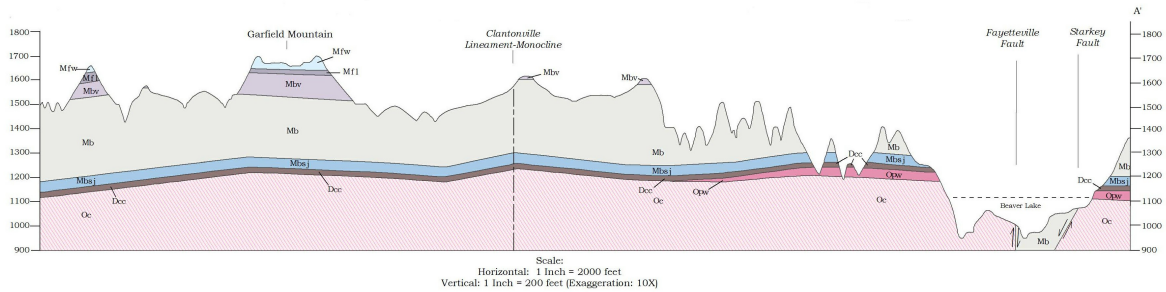
Oc - Cotter Dolomite (Lower Ordovician)

A fine-to medium- grained dolostone with interbedded mottled dolostone. Light gray on fresh surfaces but weathers dark gray. The dolostone contains banded chert or angular chert fragments at the upper contact with the Powell Dolomite. This unit also contains stromatolites, oolitic chert fragments and drusy quartz. At a few localities greenish clay shale is present as well as white coarse-grained sandstone in the upper portion of the dolostone. Small vugs containing pink dolomite are present in the dolostone in the Indian Creek area. Approximately 60 -100 feet (18-30 m) of section is exposed around Beaver Lake. Description from source map: [Garfield Quadrangle](#)

Geologic Cross Sections

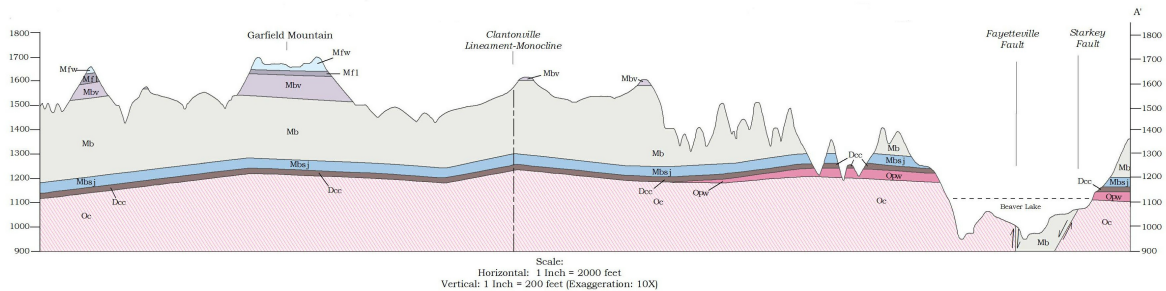
The geologic cross sections present in the GRI digital geologic-GIS data produced for Pea Ridge National Military Park, Arkansas and Missouri (PERI) are presented below. Cross section graphics were scanned at a high resolution and can be viewed in more detail by zooming in (if viewing the digital format of this document).

Cross Section A-A'



Graphic from source map: [Pea Ridge Quadrangle](#).

Cross Section B-B'



Graphic from source map: [Garfield Quadrangle](#), Note the cross section is A-A' on the source map.

Ancillary Source Map Information

The following section present ancillary source map information associated with sources used for this project.

Garfield Quadrangle

The formal citation for this source.

Chandler, Angela K., and Ausbrooks, Scott M. (digital compilation by Mayfield, Walter K.), 2009, Geologic Map of the Garfield Quadrangle, Benton County, Arkansas: Arkansas Geological Survey, Digital Geologic Quadrangle Map, DGM-AR-00320, scale 1:24,000 (*GRI Source Map ID 75177*).

Prominent graphics and text associated with this source:

Introduction

This map illustrates the surface geology of the Garfield 7.5 minute quadrangle. This quadrangle was previously mapped at a 1:24,000 scale by Ernest E. Glick in 1970 before the damming of Beaver Lake.

Approximately 700 feet of Upper Ordovician, Middle to Upper Devonian and Lower and Upper Mississippian age strata are present on this quadrangle. Upper Ordovician and Devonian strata crop out around Beaver Lake and its tributaries. The Lower Mississippian Boone Formation comprises the surface rock over the majority of this quadrangle and forms the surface of the heavily dissected Springfield Plateau. Upper Mississippian age strata are present on the higher hills that are capped by resistant sandstone of the Wedington Member of the Fayetteville Shale.

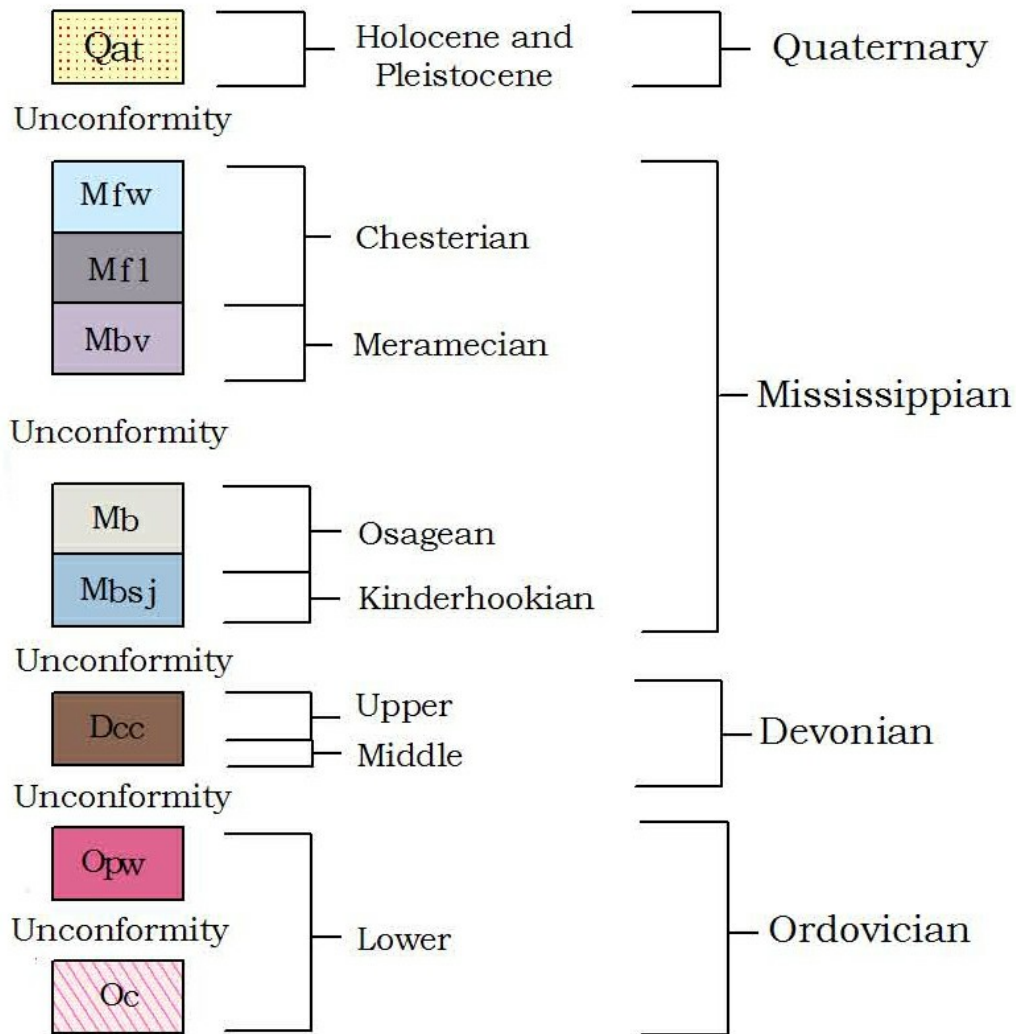
Lineaments and faults characteristic of northwest Arkansas are present in this quadrangle. The Fayetteville Fault is concealed by Beaver Lake in the southeastern part of the quadrangle but can be seen to the southwest on the War Eagle Quadrangle. This fault is the west side of a graben that has down-dropped the Boone Formation to lake level. The Starkey Fault bounds the east side of the graben. Both faults trend approximately N 450E. One section of the Starkey fault trends N 60-700E.

The Clantonville Lineament – Monocline is a northeast to southwest trending structural feature that extends from north of Clantonville to Ventris Hollow. The location of this feature was determined from the 1:24,000 three dimensional quadrangle and from structural disparities in the Lower Mississippian rock units. This structural feature could be responsible for the presence of lead-zinc mineralization in an old prospect near Clantonville. The trend of this lineament to monocline is N 30-400E. Smaller monoclines are present in the southern portion of the quadrangle and correlate with faults from the War Eagle Quadrangle. Trend of these opposing structural features are N 45-500 W. Paleokarst features within the top of the Powell Dolomite are present around Beaver Lake and coincident with a lineament in Limekiln Hollow.

Text from source map: [Garfield Quadrangle](#).

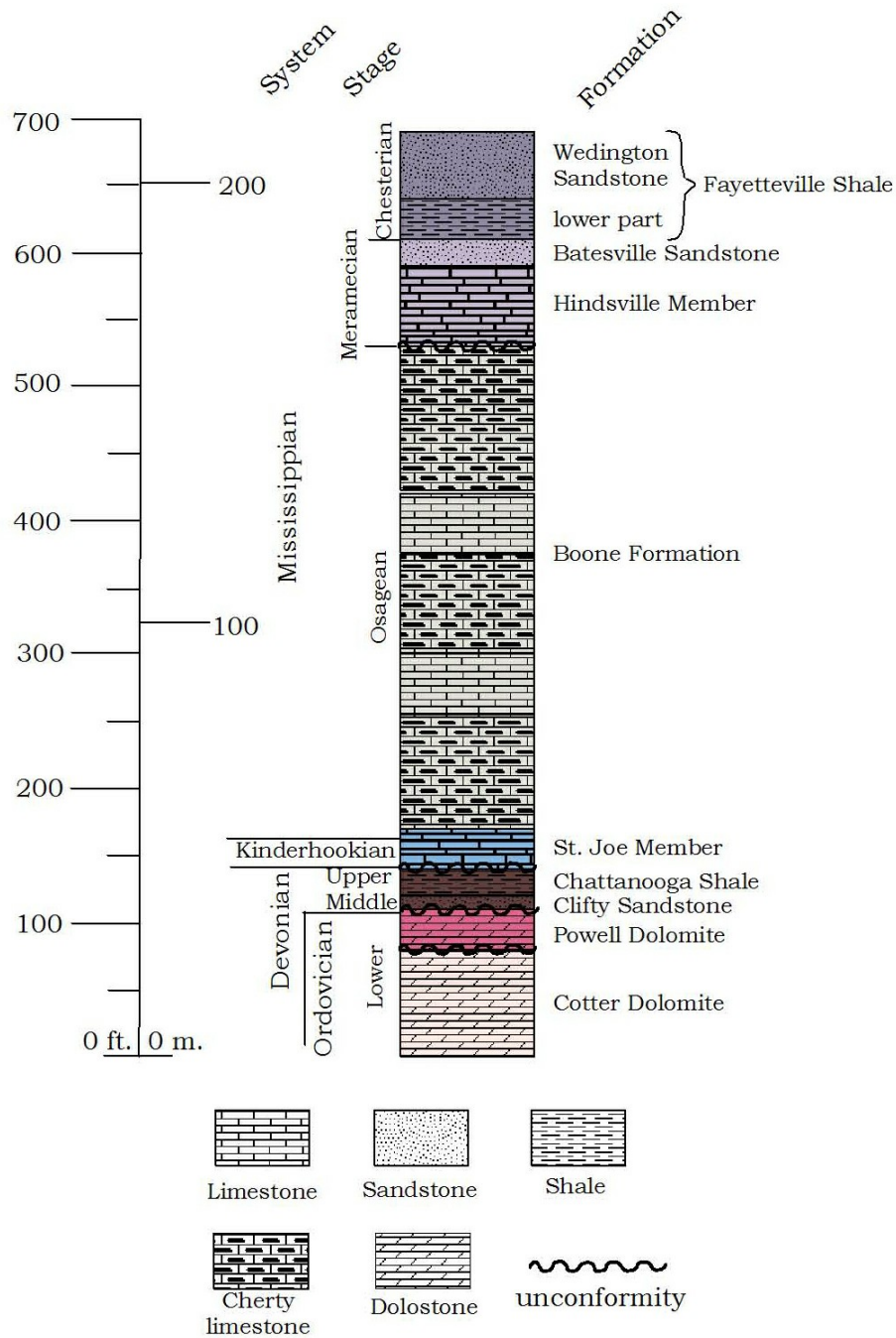
Correlation of Units

Correlation of Map Units



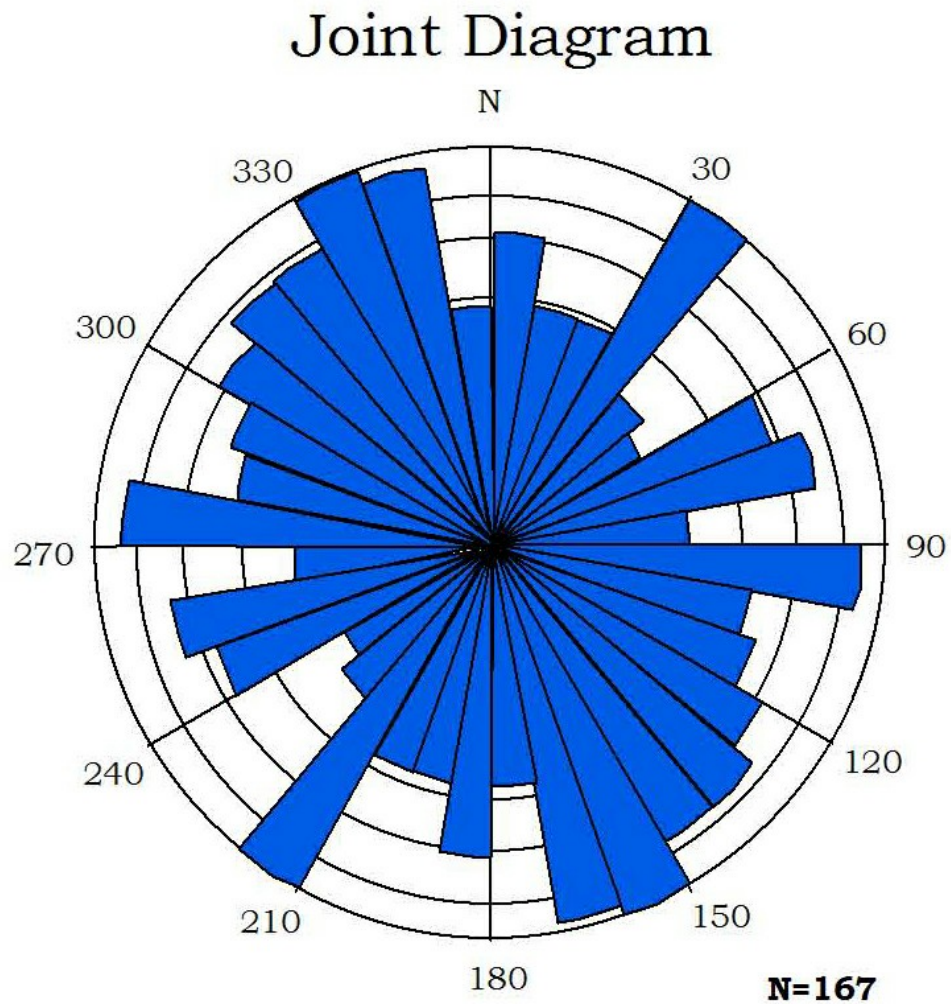
Graphic from source map: [Garfield Quadrangle](#).

Stratigraphic Column



Graphic from source map: [Garfield Quadrangle](#).

Joint Diagram

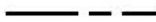


Rose diagram of strike frequency of joints recorded within the Garfield Quadrangle.

Graphic from source map: [Garfield Quadrangle](#).

Symbols

Symbols

	Contact
	Fault - U - upthrown D - downthrown
	Fault - concealed
	Lineament
	Strike and dip of inclined bedding
	Monocline
	Lead and zinc prospect
	Quarry
	Limekiln tunnels

Graphic from source map: [Garfield Quadrangle](#).

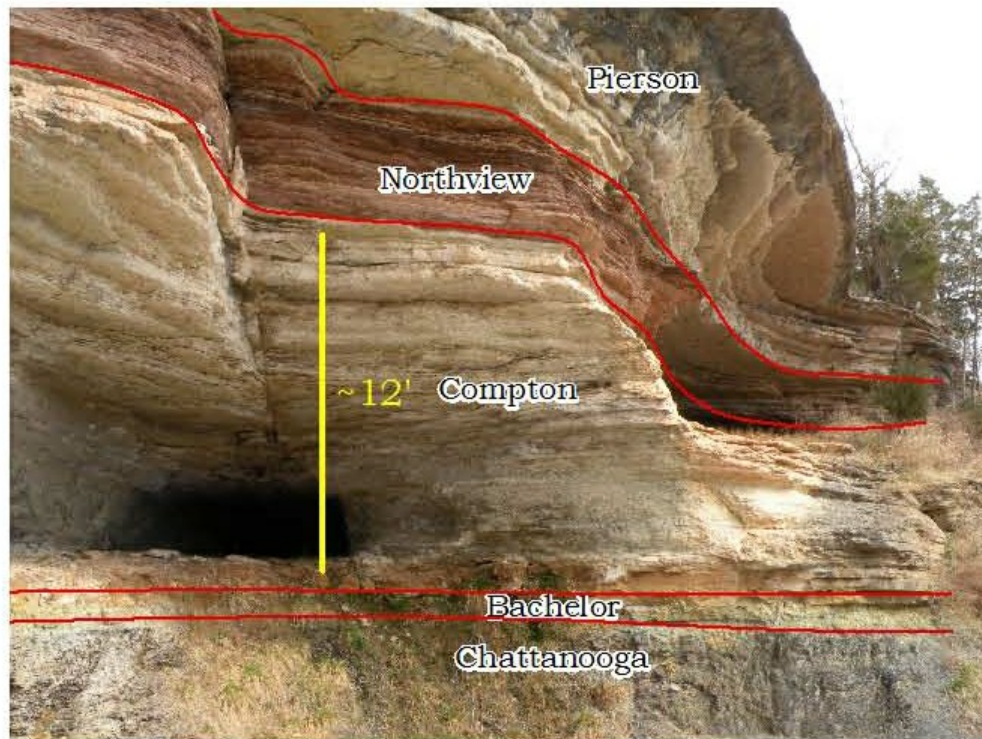
Photograph: Paleokarst in Powell Dolomite



Sandstone filling a paleokarst feature in the upper part of the Powell Dolomite.

Graphic from source map: [Garfield Quadrangle](#).

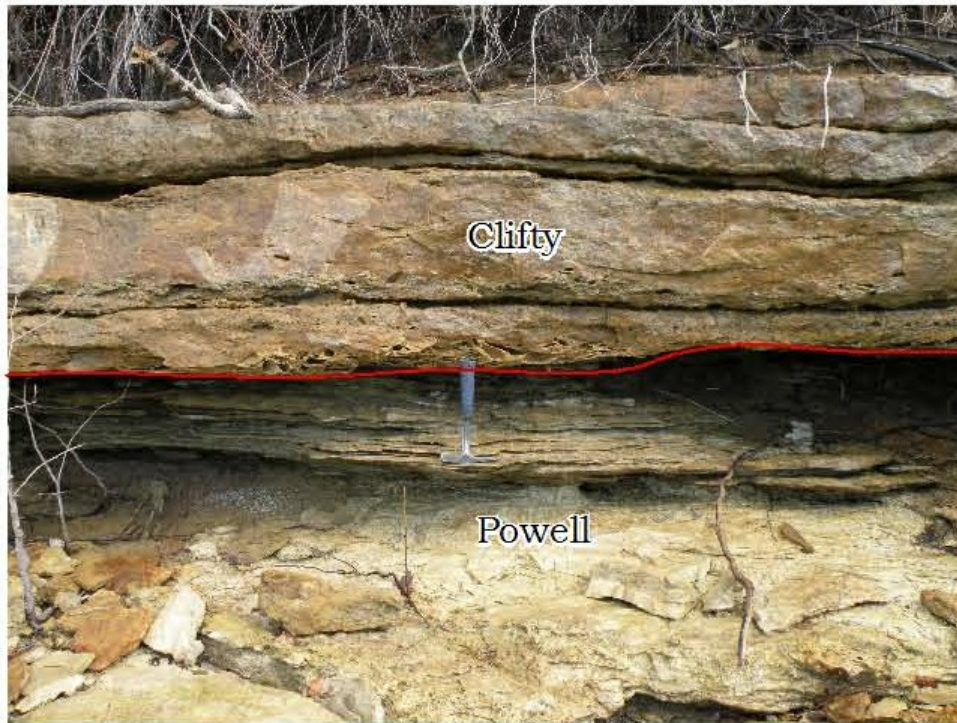
Photograph: St. Joe Member Units



The St. Joe Member above the Chattanooga Shale showing four recognizable units.

Graphic from source map: [Garfield Quadrangle](#).

Photograph: Clifty Sandstone



The Clifty Sandstone above the Powell Dolomite.

Graphic from source map: [Garfield Quadrangle](#).

Photograph: Shale in Powell Dolomite



Very thin-bedded shale in the Powell Dolomite.

Graphic from source map: [Garfield Quadrangle](#).

References

- Glick, E.E., 1970, Geologic map of the Garfield Quadrangle Benton County, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1:24,000 scale.
- Glick, E.E., 1970, Geologic map of the Beaver Quadrangle Benton and Carroll Counties, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1:24,000 scale.
- Haley, 1969, Reconnaissance geologic map of the Pea Ridge Quadrangle, Benton County, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1:24,000 scale.
- Howard, J.M., 2008, Arkansas mineral commodity database; Arkansas Geological Survey, in house data.
- Manger, Walter L., 1985, Devonian – Lower Mississippian lithostratigraphy, northwestern Arkansas; Department of Geology, University of Arkansas Fieldtrip Guidebook for South-Central Section Meeting of Geological Society of America, 25 pages.
- Sullivan, Robert A. and Boss, Stephen K., 1999, Bedrock Geology of War Eagle Quadrangle; University of Arkansas Master Thesis.

References from source map: [Garfield Quadrangle](#).

Acknowledgments and AGS Disclaimer

This map was produced for STATEMAP, Cooperative Agreement Award 08HQAG0108, a matching-funds grants program with the U.S. Geological Survey under The National Cooperative Geologic Mapping Program. Special thanks to private landowners who graciously allowed access to their property.

This map was prepared in a digital format using ArcView 9, ArcGIS 9 software on computers at the Arkansas Geological Survey. The Arkansas Geological Survey does not guarantee the accuracy of this map especially when used on any other system or with any other software. As mapping continues and is refined, the data presented on this map may be updated. For the latest edition of this publication please contact our office.

Text from source map: [Garfield Quadrangle](#).

Pea Ridge Quadrangle

The formal citation for this source.

Chandler, Angela K., and Ausbrooks, Scott M. (digital compilation by Mayfield, Walter K.), 2009, Geologic Map of the Pea Ridge Quadrangle, Benton County, Arkansas: Arkansas Geological Survey, Digital Geologic Quadrangle Map, DGM-AR-00682, scale 1:24,000 (*GRI Source Map ID 75176*).

Prominent graphics and text associated with this source:

Introduction

This map illustrates the surface geology of the Pea Ridge 7.5 minute quadrangle. This quadrangle was previously compiled at a 1:24,000 scale from the Fayetteville Folio (Adams and Ulrich, 1905) by Boyd Haley in 1969.

Approximately 400 feet of Lower and Upper Mississippian age strata are present in this area. The Lower Mississippian Boone Formation comprises the surface rock over the majority of the quadrangle and forms the surface of the Springfield Plateau. Upper Mississippian age strata are present on Elkhorn Mountain which is capped by sandstone of the Wedington Member of the Fayetteville Shale. Upper Mississippian units are also present on the north side of the Bentonville-Pea Ridge Fault.

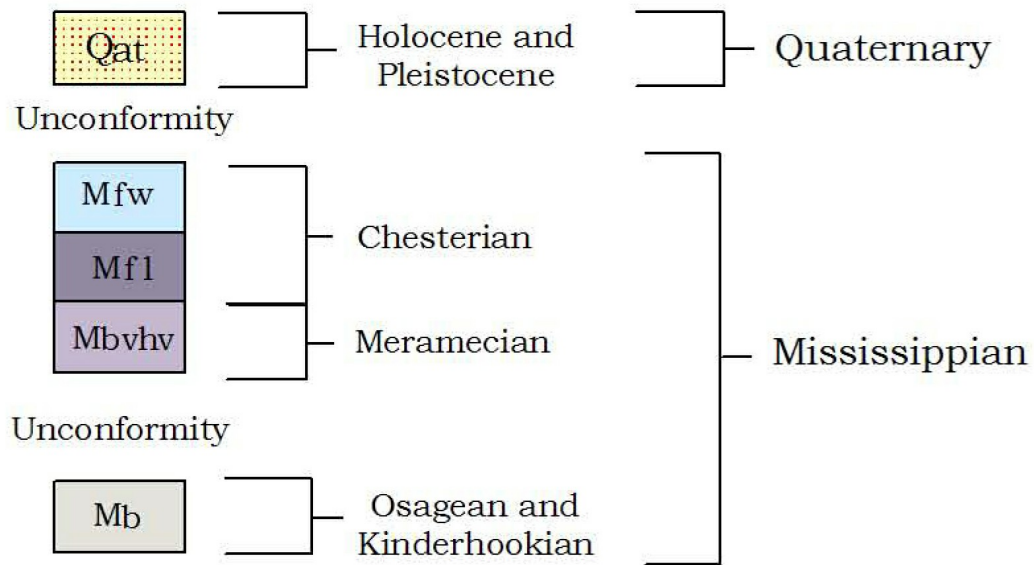
Lineaments and faults characteristic of northwest Arkansas are present in this quadrangle. The Bentonville-Pea Ridge Fault is present in the northwest part of the quadrangle and trends N 60-700 E. It is an off-shoot of a much longer fault that continues to Bentonville and southwest to Siloam Springs. This fault has a trend similar to the Fayetteville and Drakes Creek Fault to the east.

The Chambers Lineament-Monocline is a northeast to southwest trending structural feature that extends from the headwaters of Brushy Creek to Roller Ridge. The location of this feature on this quadrangle was determined from the 1:24,000 digital ortho-photograph. It is named from the Chambers Spring Syncline (Adams and Ulrich, 1905), near Cincinnati, which appears to be on trend with the structure found on this quadrangle. The trend of this lineament is approximately N 500 E. Other lineaments trend N 450 E, E-W and N 25-400 W.

Text from source map: [Pea Ridge Quadrangle](#).

Correlation of Units

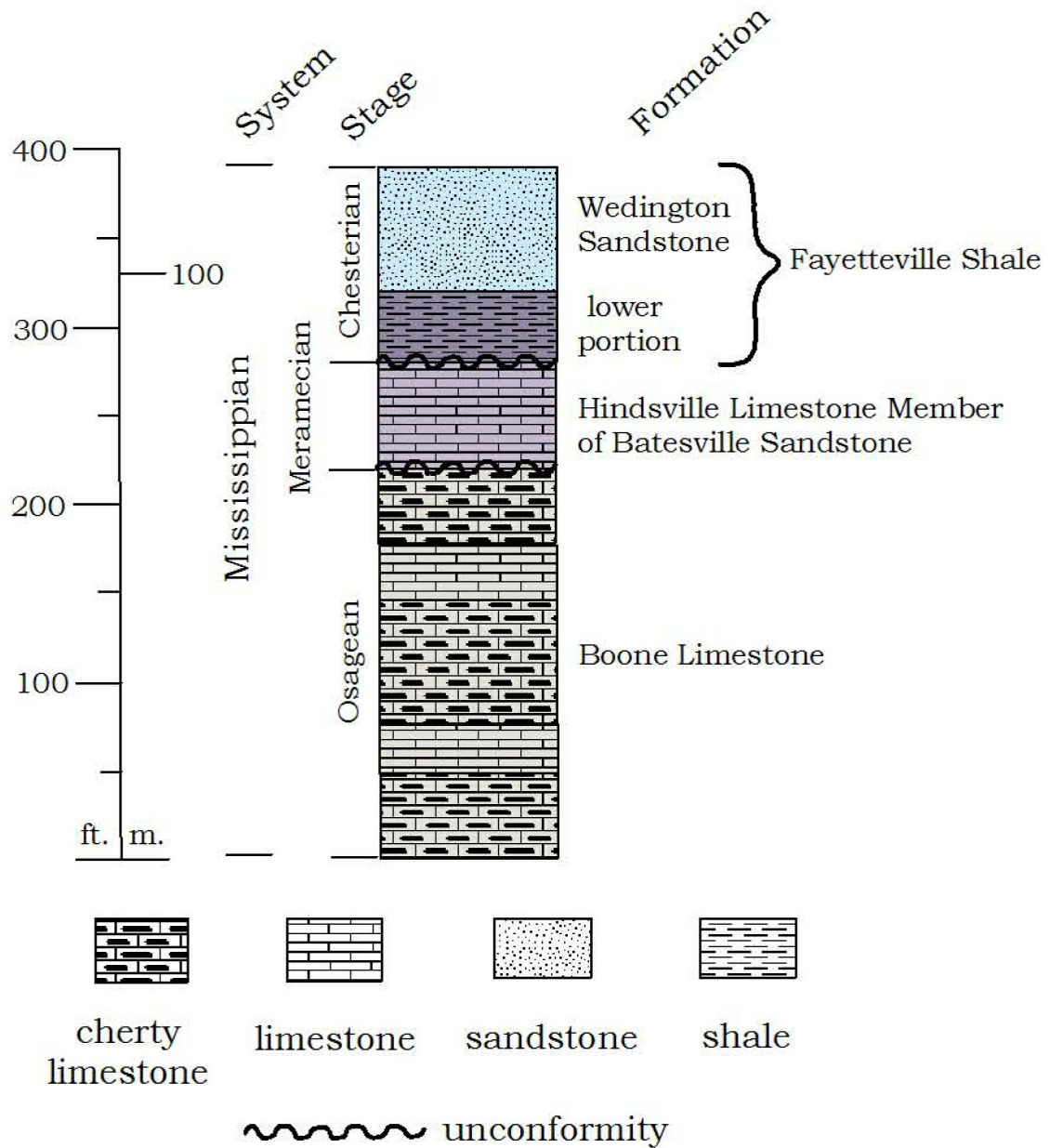
Correlation of Map Units



Graphic from source map: [Pea Ridge Quadrangle](#).

Stratigraphic Column

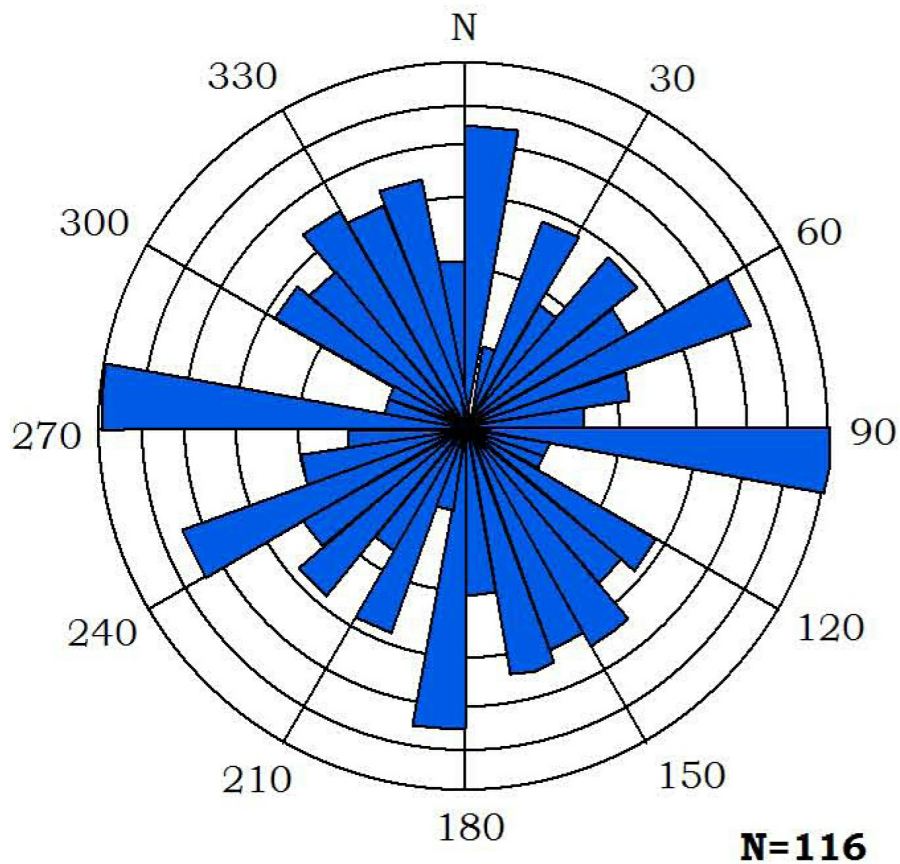
Stratigraphic Column



Graphic from source map: [Pea Ridge Quadrangle](#).

Joint Diagram

Joint Frequency



Rose diagram of strike frequency of joints recorded within the Pea Ridge Quadrangle.

Graphic from source map: [Pea Ridge Quadrangle](#).

Symbols

Symbols

	Contact
	Fault - U - upthrown D - downthrown
	Fault - inferred
	Fault - concealed
	Lineament
	Strike and dip of inclined bedding
	Monocline
	Gravel pit
	Quarry
	Pea Ridge National Park Boundary

Graphic from source map: [Pea Ridge Quadrangle](#).

Photograph: Fayetteville Shale near Bentonville-Pea Ridge Fault



Photo 1 - Lower part of the Fayetteville Shale
near the Bentonville-Pea Ridge Fault.

Graphic from source map: [Pea Ridge Quadrangle](#).

Photograph: Recent Rockfall



Photo 2 - Recent rockfall of Wedington Sandstone at the East Overlook in Pea Ridge National Park.

Graphic from source map: [Pea Ridge Quadrangle](#).

References

Adams, George I., and Ulrich, E.O., 1905, Fayetteville Folio Arkansas-Missouri: U S Geological Survey, Geologic Atlas of the United States, no. 119.

Glick, E.E., 1970, Geologic map of the Bentonville North Quadrangle, Benton County, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1:24,000 scale.

Glick, E.E., 1970, Geologic map of the Garfield Quadrangle Benton County, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1:24,000 scale.

Haley, 1969, Reconnaissance geologic map of the Pea Ridge Quadrangle, Benton County, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1:24,000 scale.

Howard, J.M., 2008, Arkansas mineral commodity database: Arkansas Geological Survey, in house data.

Dowell, J.C., Hutchinson, C.M., and Boss, Stephen K, 2004, Bedrock Geology of Rogers Quadrangle: University of Arkansas Master Thesis.

References from source map: [Pea Ridge Quadrangle](#).

Acknowledgments and AGS Disclaimer

This map was produced for STATEMAP, Cooperative Agreement Award 08HQAG0108, a matching-funds grants program with the U.S. Geological Survey under The National Cooperative Geologic Mapping Program. Special thanks to the National Park Service and private landowners who graciously allowed access to their property.

This map was prepared in a digital format using ArcView 9, ArcGIS 9 software on computers at the Arkansas Geological Survey. The Arkansas Geological Survey does not guarantee the accuracy of this map especially when used on any other system or with any other software. As mapping continues and is refined, the data presented on this map may be updated. For the latest edition of this publication please contact our office.

For information on obtaining copies of this map and other Arkansas Geological Survey maps and publications call: Publication Sales @ 501-296-1877

Text from source map: [Pea Ridge Quadrangle](#).

GRI Digital Data Credits

This document was developed and completed by Stephanie O'Meara (Colorado State University) for the NPS Geologic Resources Division (GRD) Geologic Resources Inventory (GRI) Program. Quality control of this document by Ron Karpilo (Colorado State University).

The information in this document was compiled from GRI source maps, and is intended to accompany the digital geologic-GIS maps and other digital data for Pea Ridge National Military Park, Arkansas and Missouri (PERI) developed by Stephanie O'Meara and Dave Green (Colorado State University) (see the [GRI Digital Maps and Source Map Citations](#) section of this document for all sources used by the GRI in the completion of this document and related GRI digital geologic-GIS maps).

GRI finalization by Stephanie O'Meara.

GRI program coordination and scoping provided by Bruce Heise, Jason Kenworthy and Tim Connors (NPS GRD, Lakewood, Colorado).