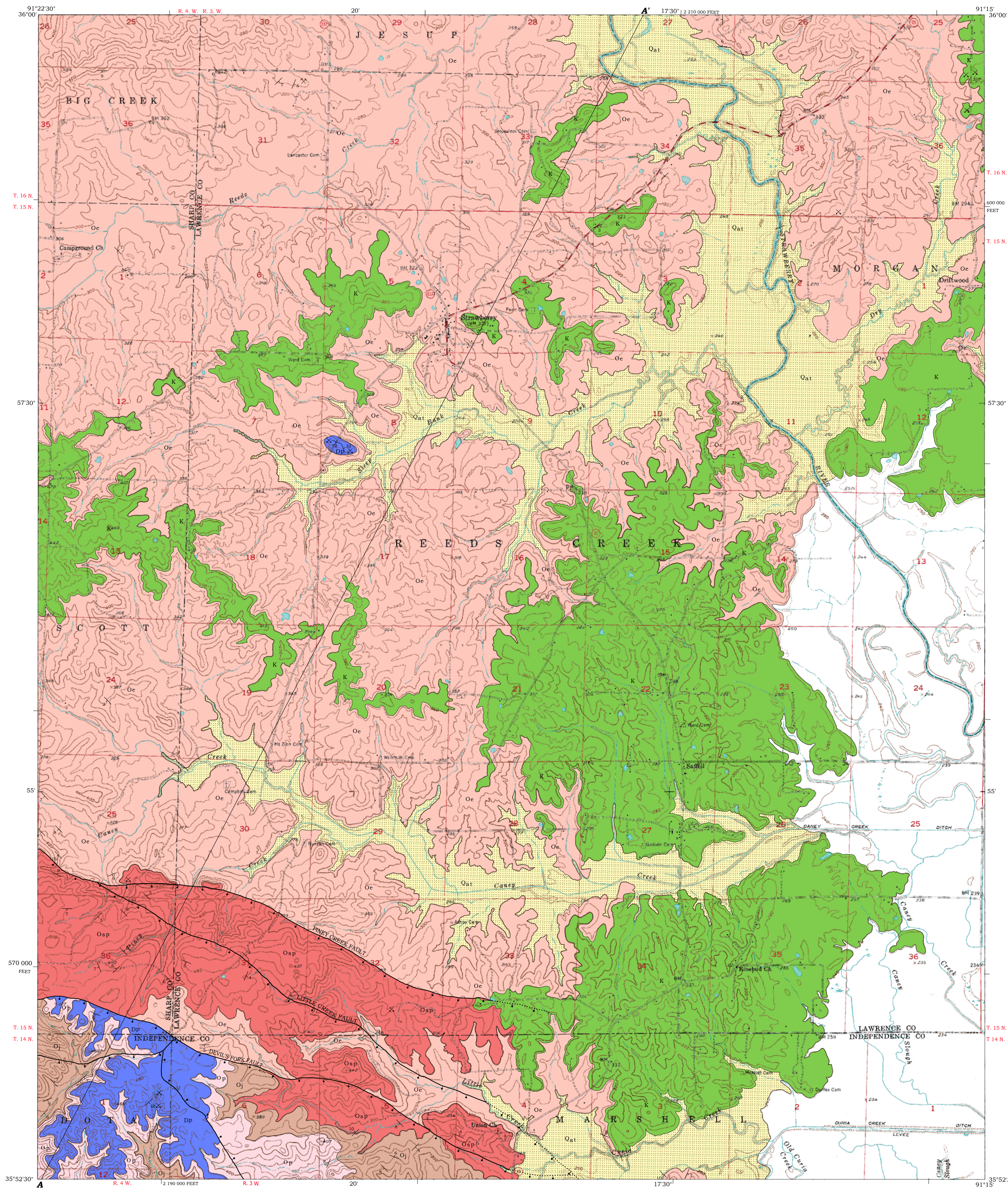


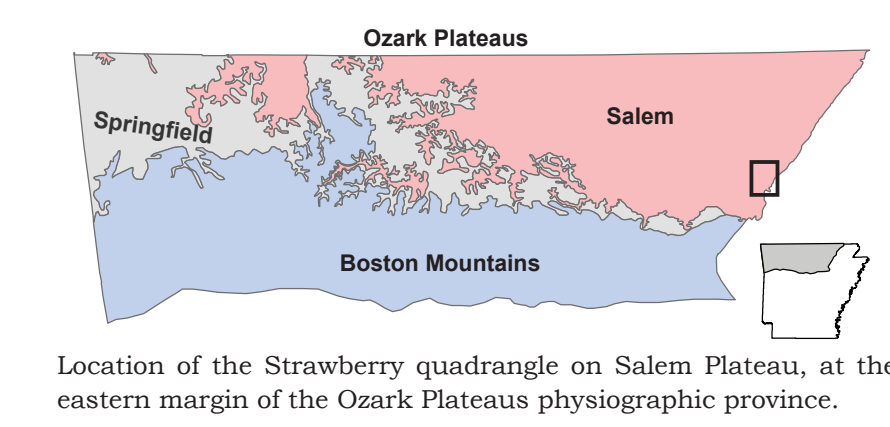
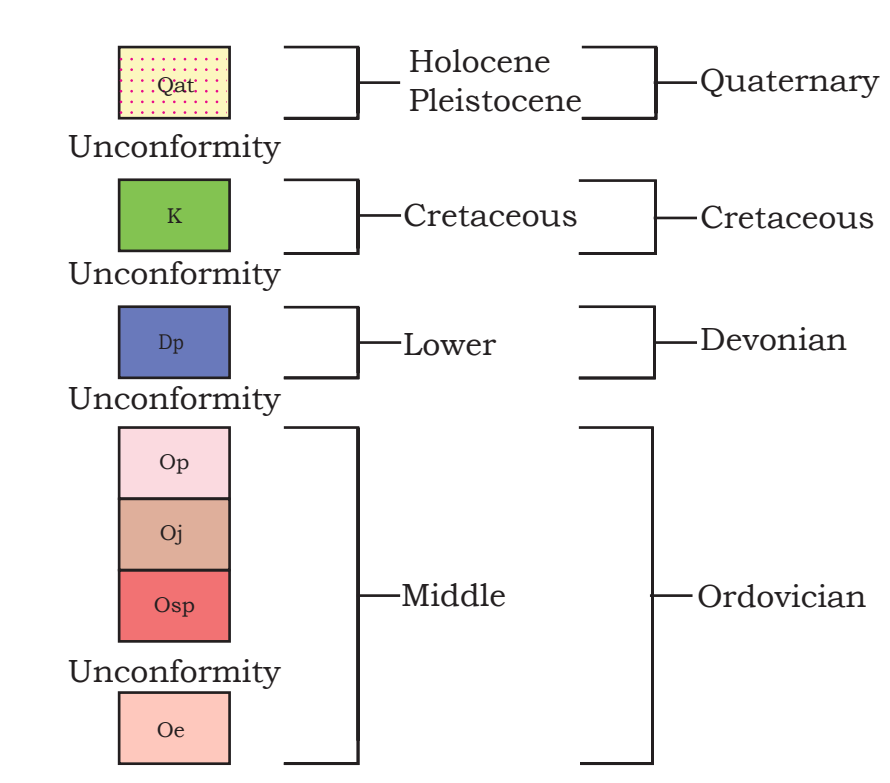


Geologic Map of the Strawberry Quadrangle, Lawrence, Sharp, and Independence Counties, Arkansas

John T. Gist and Thomas J. Liner
2023
Scott M. Ausbrooks, Director and State Geologist



Correlation of Map Units



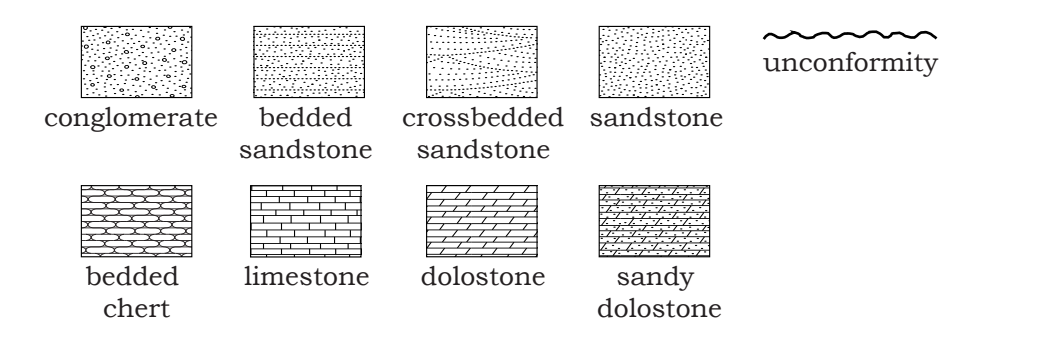
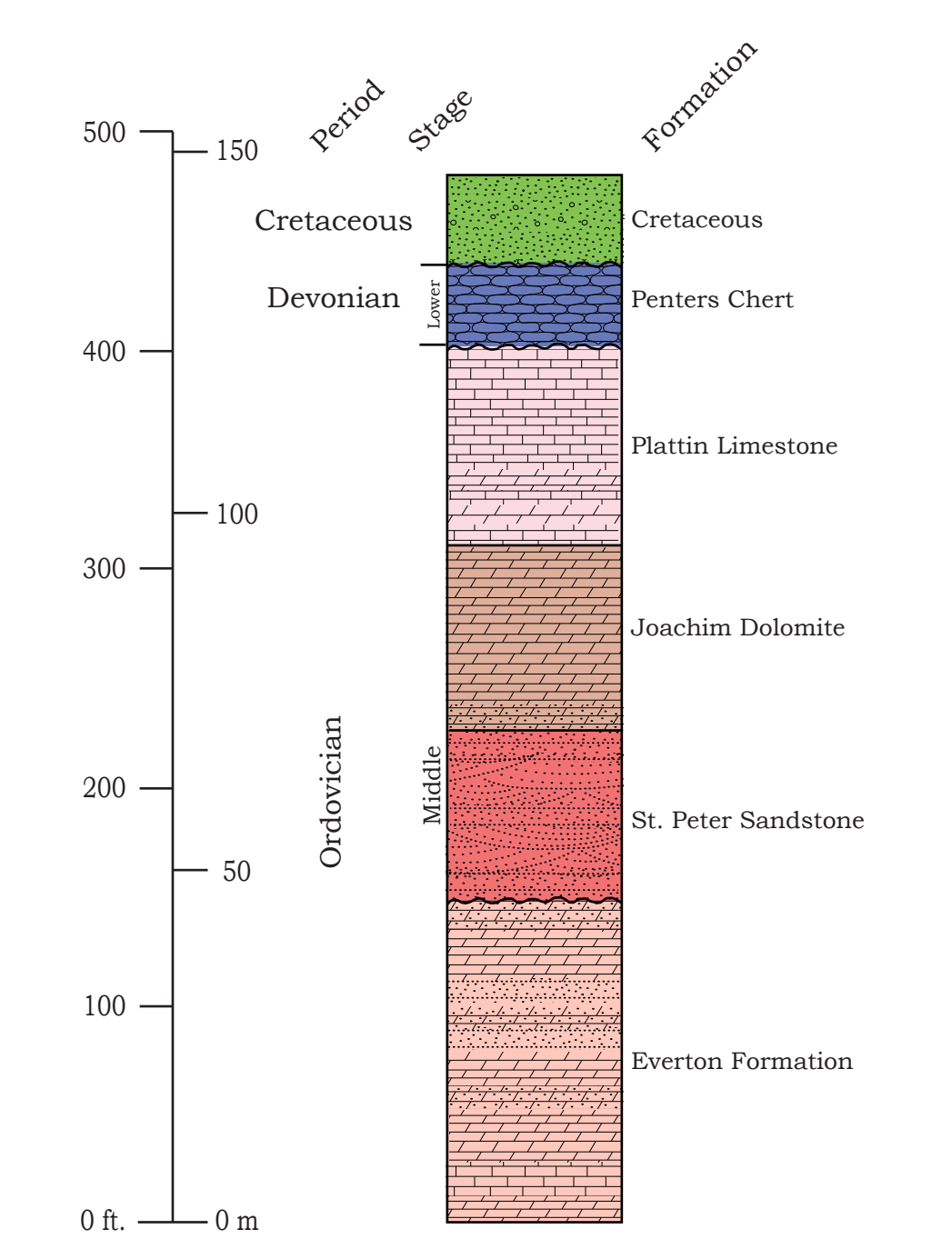
Introduction

This map depicts the bedrock and surficial geology of the Ozark Plateau portion of the Strawberry quadrangle, a 7.5-minute series USGS topographic quadrangle. This mapping project was partially funded by a grant from the National Cooperative Geologic Mapping Program (NCGMP). The geology of the Mississippi River Alluvial Plain and was not mapped as part of this project. The western portion contains the highest elevations on the quadrangle with a high point over 500 feet (150 meters) above sea level. At the fall line between the Ozark Plateau and Mississippi River Alluvial Plain, the elevation is approximately 250 feet (75 meters), and near the southeast corner, drops to 230 feet (70 meters). The majority of the area is drained by the Strawberry River and its tributaries with the southern part of the map flowing into Curia Creek. Both systems flow east to join the Black River. Karst features such as springs, sinkholes, and caves are common throughout the area. Much of the land area and streams have been engineered for flood control, erosion mitigation, and agriculture and livestock enterprises. The area is part of the Salem Plateau of the Ozark Plateau physiographic province and regionally dips gently to the south away from the core of the Ozark Dome in southeast Missouri. Approximately 475 feet (145 meters) of Middle Ordovician, Devonian, and Cretaceous sedimentary rocks crop out at the surface. Dolostone, along with lesser amounts of limestone and sandstone of the Everton Formation comprises the bedrock for the majority of the area. A clay regolith is commonly developed where the Everton Formation is exposed at the surface. The Ordovician St. Peter Sandstone, Joachim Dolomite, Plattin Limestone, and Devonian Penters Chert crop out in the southwestern portion of the map near a series of normal faults. Maximum displacement is approximately 100 feet (30 meters) along the southeast trending Devils Fork Fault where the Penters Chert contacts the St. Peter Sandstone. Some areas of the map record deposition of loosely consolidated Cretaceous sand, clay, and gravel on an eroded Paleozoic surface. Locally, a thin veneer of chert and sandstone gravel is present. Areas in the eastern portion of the map have a sparse outcrop cover of yellowish-brown loess with a maximum observed thickness of 12 feet (4 meters). The geology of the Strawberry quadrangle was mapped previously by Glick (1973) in preparation for the 1:500,000 scale Geologic Map of Arkansas. This map builds on this work and depicts the structure and stratigraphy in greater detail. Field data for this map was collected between August 2022 and April 2023. Representative rock samples were collected and made into thin sections for petrographic studies. Data and site locations were recorded on a portable GPS data collector and integrated into a geodatabase.

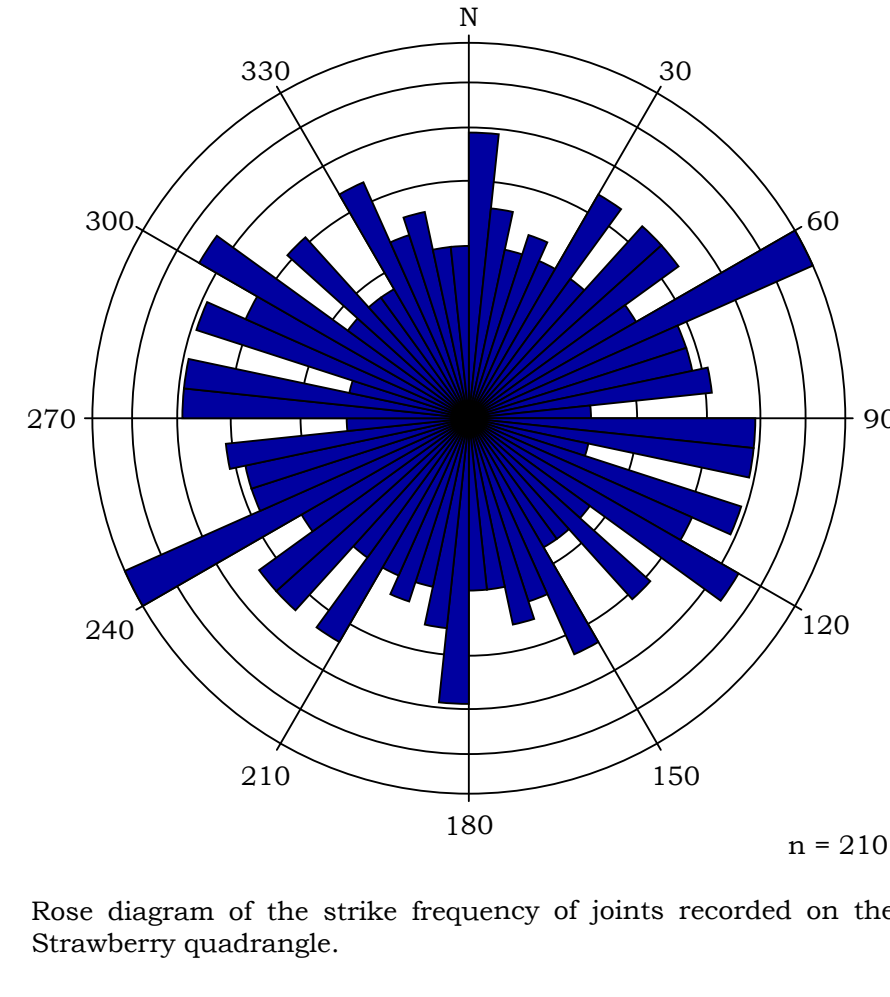
Description of Map Units

- Qat** Alluvium and terrace deposits (Quaternary) - unconsolidated clay, silt, sand, and gravel, including deposits on one or more terrace levels along Curia Creek, Strawberry River, and its tributaries. Ranges from 20-40 feet (6-12 meters) thick.
- K** Cretaceous (Cretaceous) - medium- to coarse-grained, dark red to brown, locally interbedded with light gray or red clay. Locally contains abundant iron cemented beds, concretions, and tubes in shapes consistent with leaping banding. Contains rounded chert and sandstone pebble conglomerate in some areas. Highly prone to gully erosion. Upper surface is locally hummocky. Unconformable with the underlying Plattin Limestone. Ranges from 10-60 feet (3-18 meters) thick.
- Dp** Penters Chert (Lower to Middle Devonian) - medium- to thick-bedded chert. Gray and white banding is common. Red, orange, and white mottling is also locally present. Commonly brecciated and highly fractured. Contains drusy quartz and manganese oxide coatings. Residual chert boulders are locally present on hilltops. Locally, residual chert from the Lower Mississippian Boone Formation may also be present and included in this interval. Unconformable with the underlying Plattin Limestone. Ranges from 20-40 feet (6-12 meters) thick.
- Op** Plattin Limestone (Middle Ordovician) - micritic to finely crystalline, very thin- to medium-bedded limestone. Light to medium gray on fresh surfaces but weathers white to light gray and is locally mottled. Locally contains stromatolites. Interbedded dolostone is commonly present at the lower contact. Locally contains abundant pyrite blebs. Limestone glades containing abundant solutionally enlarged, orthogonal joint sets are common. Sinkholes and springs are abundant. Conformable with the underlying Joachim Dolomite. Ranges from 20-80 feet (6-24 meters) thick.
- Oj** Joachim Dolomite (Middle Ordovician) - finely to medium crystalline, thin- to medium-bedded dolostone and sandy dolostone. Medium to dark gray on fresh surfaces, weathers light gray to white. Mudcracks are common. Locally contains calcite blebs and veins, stromatolites, and dolostone breccia. Commonly crops out in glades. Contains solutionally enlarged joints, caves, and springs. Conformable with the underlying St. Peter Sandstone. Ranges from 20-100 feet (6-30 meters) thick.
- Op** St. Peter Sandstone (Middle Ordovician) - fine- to medium-grained, thin- to massive-bedded calcite-cemented sandstone. Commonly cross-bedded. Ripple marks were observed at one location near Curia Creek. Quartz grains are sub-angular to rounded and locally frosted. White to light gray on fresh surfaces but weathers light brown to gray. Friable when broken. Commonly silica-cemented near faults. Glades are common. Long ridges or walls composed of tightly spaced deformation bands commonly stand in relief adjacent to faults. Sinkholes, springs, and caves are common. Ranges from 40-120 feet (12-37 meters) thick.
- Oe** Everton Formation (Middle Ordovician) - interbedded dolostone, sandstone, and limestone. Dolostone is finely to coarsely crystalline, thin to medium bedded. Typically medium gray on fresh surfaces, but weathers light gray and is locally mottled. Locally petroliciferous when broken. Contains mudcracks and calcite or dolomite blebs, veins, and nodules. Sandstone is very thin to medium bedded. Brown to light gray on fresh surfaces but weathers light brown to white. Quartz grains are fine to medium grained and sub-angular to rounded and locally silica cemented. Limestone is thin to medium bedded and micritic to fine grained. Typically light gray with calcite blebs and veins. Limestone is generally restricted to the northern half of the quadrangle. Springs and solutionally enlarged orthogonal joints are common. Total thickness exposed is over 200 feet (60 meters).

Stratigraphic Column



Joint Frequency

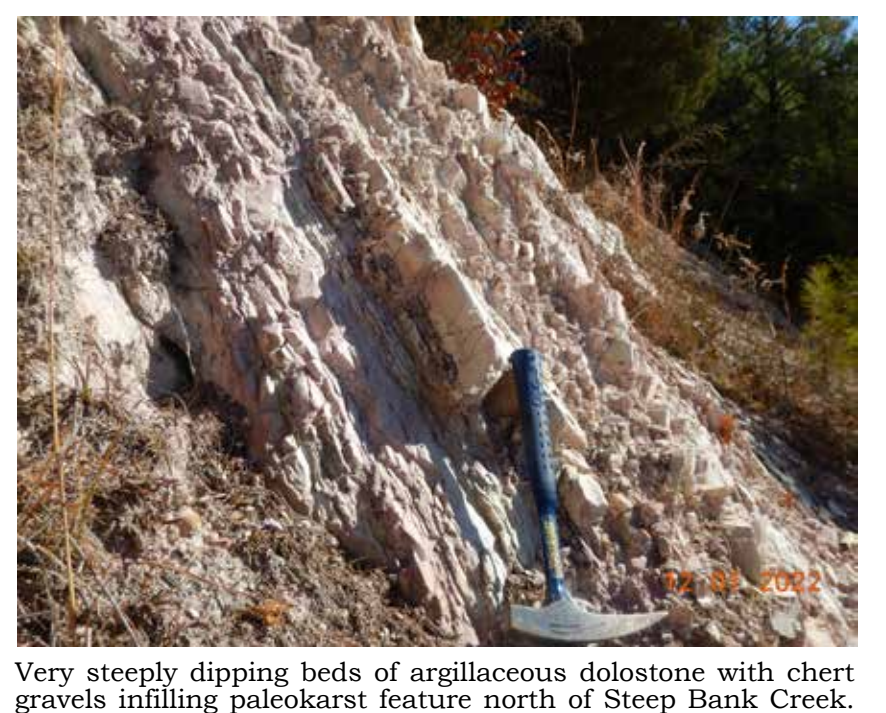


Symbols

- Contact
- Line of cross-section
- Normal fault - ball and bar on downthrown side. Dashed where inferred. Dotted where concealed.
- Strike and dip
- Mine
- Pit



Gully erosion in loosely consolidated Cretaceous sand with sub-rounded pebbles and iron cemented concretions.



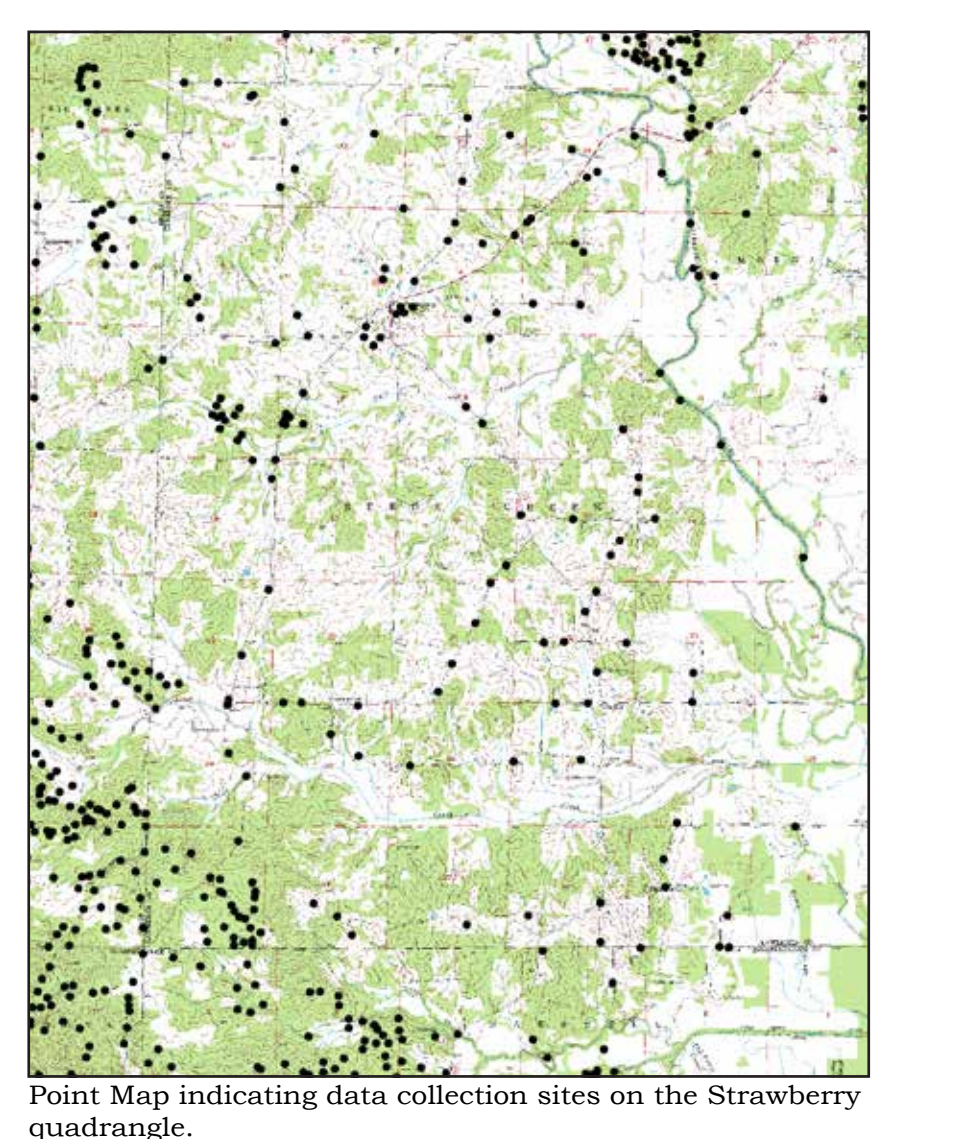
Very steeply dipping beds of argillaceous dolostone with chert gravel in the Pinery Creek fault zone north of Sheep Bank Creek. Rock hammer measures 1 foot (30 centimeters).



Deformation band ridge in the St. Peter Sandstone on the footwall of the Pinery Creek Fault. These ridges commonly occur adjacent to faults because they are more resistant to erosion than adjacent rocks. Orange knife is 4 inches (10 centimeters).



Interbedded dolostone and micrite in the Everton Formation at an abandoned quarry.



Point Map indicating data collection sites on the Strawberry quadrangle.

References

Glick, E.E., 1973, Geologic map of the Strawberry quadrangle, Lawrence, Sharp, and Independence Counties, Arkansas: Arkansas Geological Survey Geologic Worksheet, 1 sheet, 1:24,000.

Acknowledgments: This map was produced for the STATEMAP grant program administered by the U.S. Geological Survey under Cooperative Agreement Award G22AC00358. Special thanks to the private landowners who graciously allowed access to their properties. A very special thanks to Angela Chandler for mapping assistance and serving as principal investigator.

Limitations: This map, like all geologic maps, is based on interpretations which were made at the time it was created. As new information is collected, the features depicted on this map may be changed.

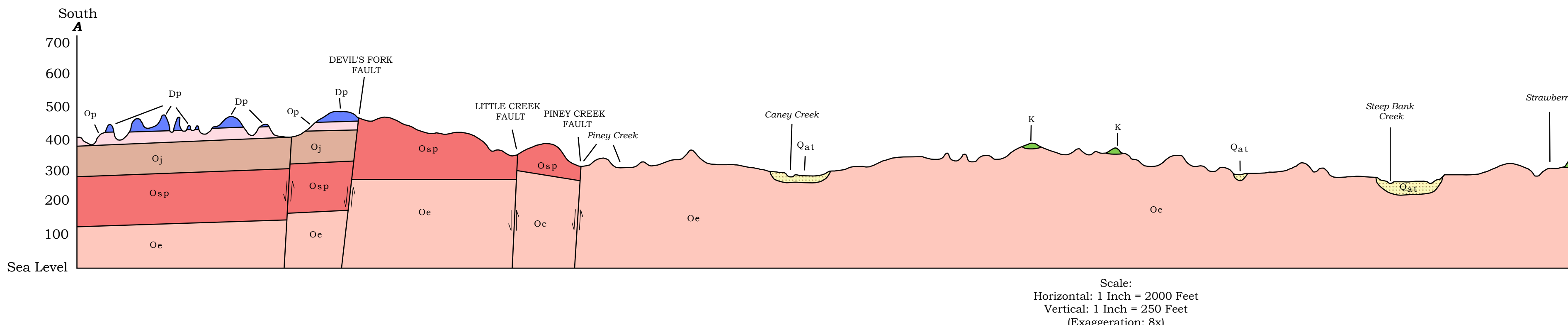
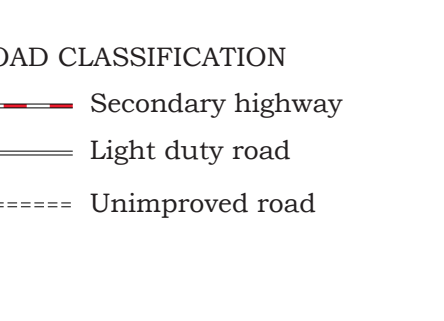
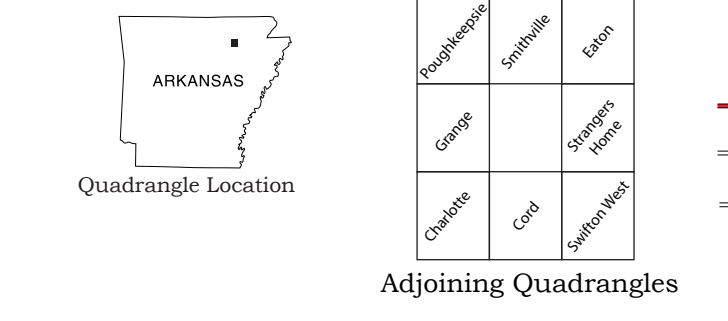
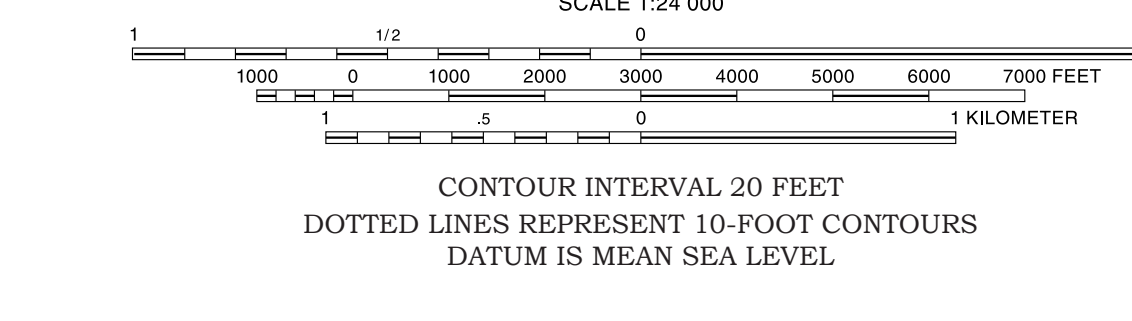
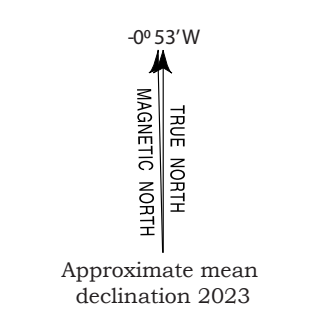
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Map and cross section digitized by Quante Crawford.

The topographic base is a collarless Digital Raster Graphic (DRG). The DRG is a scanned image of a U.S. Geological Survey 7.5-minute series topographic map published in 1980.

Polycyclic projection, 1927 North American datum 10,000-foot grid based on Arkansas coordinate system, north zone



Scale:
Horizontal: 1 inch = 2000 Feet
Vertical: 1 inch = 250 Feet
(Exaggeration: 8x)