

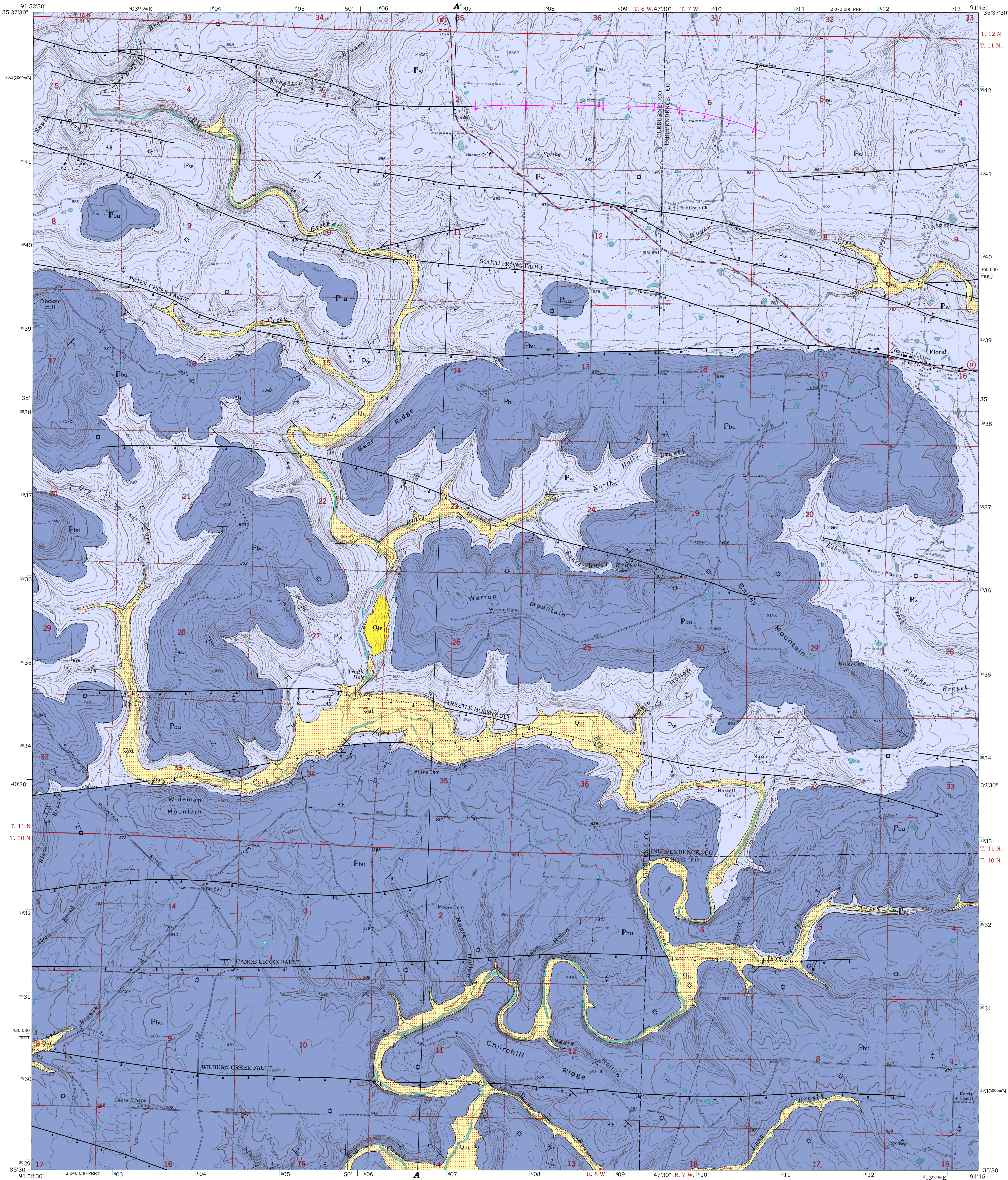


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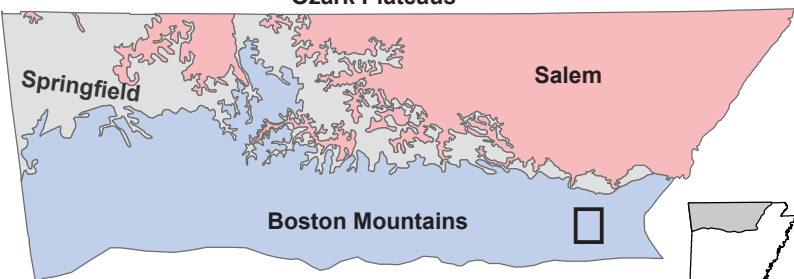
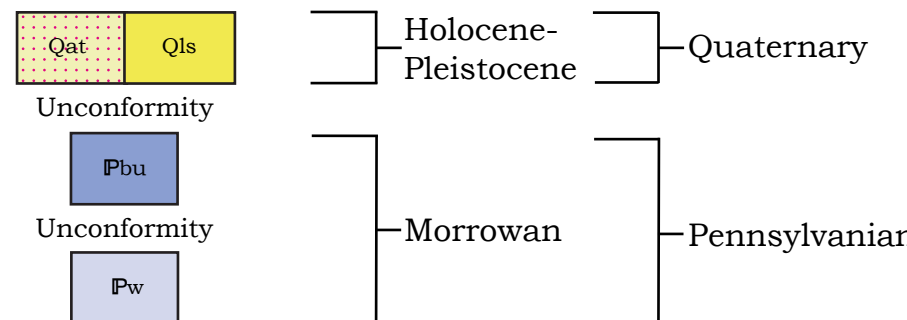
Geologic map of the Floral quadrangle, Cleburne, Independence, and White Counties, Arkansas

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2026
Scott M. Ausbrooks, Director and State Geologist

Digital Geologic Quadrangle Map
Floral Quadrangle, Arkansas
DGM-AR-00291



Correlation of Map Units



Location of the Floral quadrangle on the Boston Mountains Plateaus in the Ozark Plateaus Physiographic Province

Description of Map Units

Alluvium and terrace deposits (Quaternary) – unconsolidated clay, silt, sand, and gravel, including deposits on one or more terrace levels along larger streams.

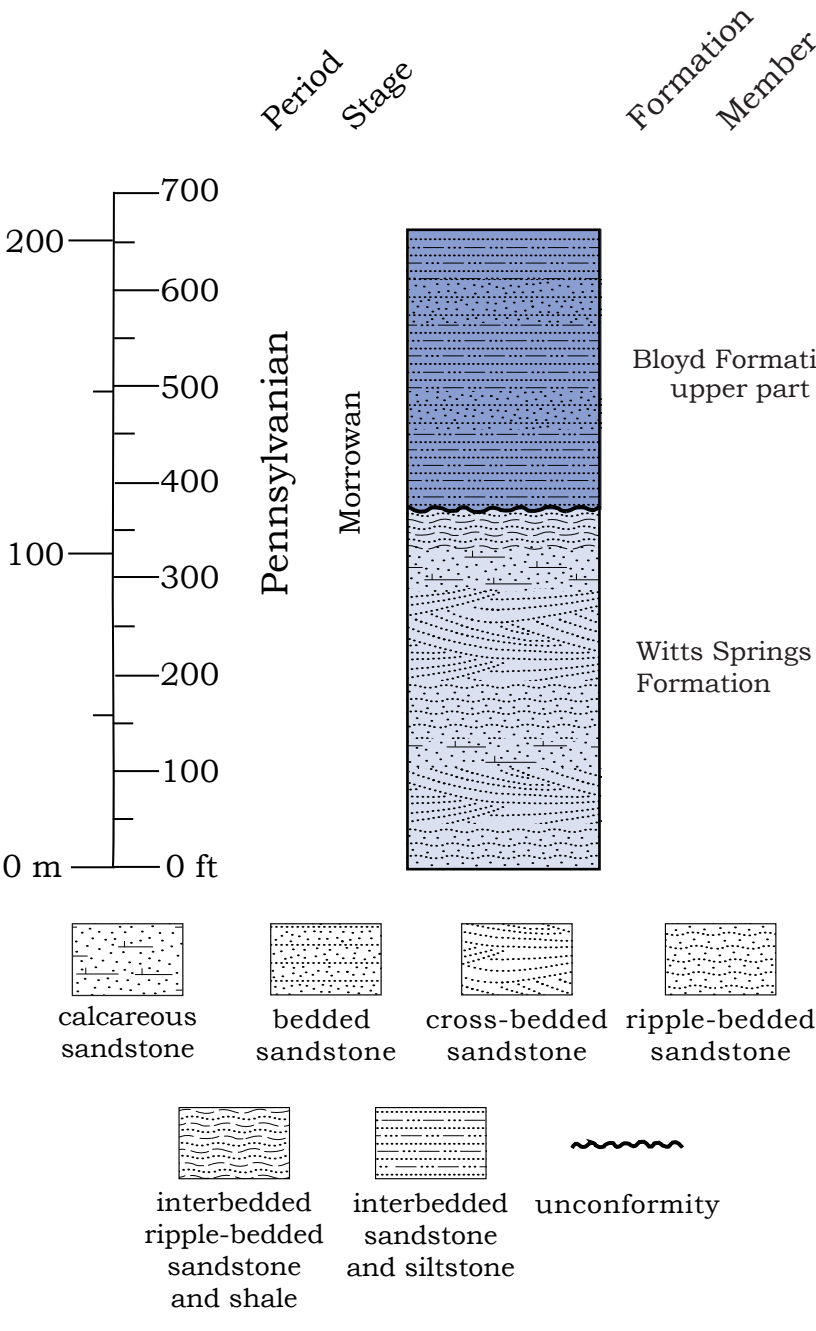
Landslide deposits (Quaternary) – a mass of rock and debris that has moved downslope due to gravity. Only the largest landslide deposits are depicted.

Blond Formation (Lower Pennsylvanian, Morrowan) – The Blond Formation is informally divided into lower and upper parts that are separated by the “middle Blond sandstone.” Locally, the lower part is equivalent to the upper Witts Springs Formation and the “middle Blond sandstone” cannot be recognized. Only the upper part is present within the mapping area.

Upper part – consists of interbedded sandstone, siltstone, and shale. The sandstone is generally very fine to fine grained and micaceous, but locally grain sizes can range from very fine to coarse. Bedding is commonly thin to medium and irregular to lenticular. Locally well indurated, contains abundant iron, and exhibits ripple bedding, cross bedding, cut-and-fill structures, and liesegang banding. Buff to light brown on fresh surfaces but weathers dark to light brown with a massive, rounded or blocky appearance. Locally contains rounded milky quartz pebbles and granules, clay pebbles, pebble molds, shale partings, and trace fossils. Sparse fossiliferous intervals contain crinoid, brachiopod, and gastropod molds and casts. Shale is generally poorly exposed, and is clay to silty. Dark gray to black on fresh surfaces and weathers light gray to tan. Siltstone is very thinly bedded and light brown to tan on fresh surfaces but weathers brown to grayish brown. A few conglomeratic zones interbedded with shale and siltstone are calcareous and contain very fine- to coarse-grained quartz sand, milky quartz pebbles, clay pebbles, iron pebbles and concretions, and abundant fossil fragments. Unconformable with the underlying Witts Springs Formation. Up to 300 feet (91 meters) thick.

Witts Springs Formation (Lower Pennsylvanian, Morrowan) – predominantly sandstone with minor amounts of limy sandstone. Shale and siltstone units are commonly interbedded. Sandstone is commonly fine grained but locally ranges from very fine to medium and is friable with iron case hardening. It is typically thin to thick bedded but locally thin to medium bedded. Weathering commonly masks bedding, giving the sandstone a massive and rounded or blocky appearance. Reddish orange to orangish brown or buff on fresh surfaces, it weathers brown to dark brown. A prominent bluff former, it locally contains joint caves and bluff shelters. Typical sedimentary features include cut-and-fill structures, cross bedding, ripple bedding, and soft-sediment deformation. Liesegang banding, stylolites, and honeycomb weathering are common. Locally contains pebble molds, shale pebbles, trace fossils, and fossil wood prints and molds. Sparse zones of limy sandstone contain fossil fragments including crinoids, brachiopods, gastropods, and corals. Locally, conglomeratic intervals present throughout the formation contain milky quartz pebbles and granules, shale pebbles, iron concretions, and fossil fragments. Shale and siltstone units are light to dark gray or black on fresh surfaces and weather tan to light brown. Up to 360 feet (110 meters) thick.

Stratigraphic Column



Introduction

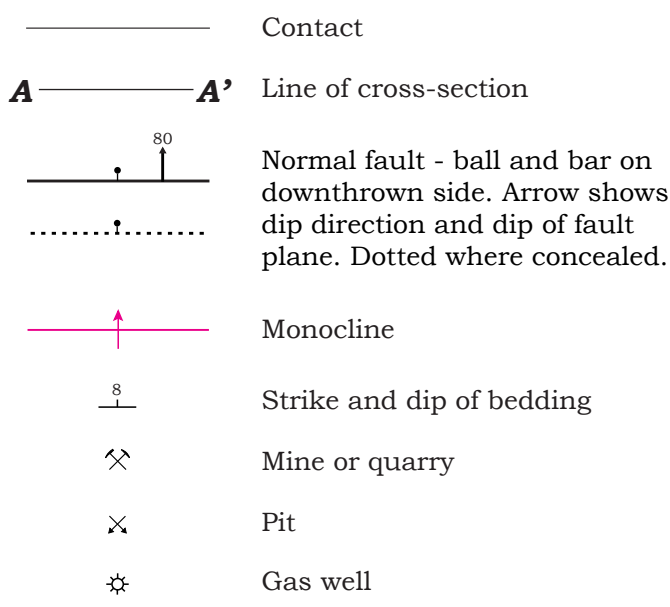
This map depicts the bedrock and surficial geology of the Floral 7.5-minute series USGS topographic quadrangle in Cleburne, Independence, and White Counties, Arkansas. The mapping for this project was partially funded through a grant from the National Cooperative Geologic Mapping Program (NCGMP).

The map area is situated on the southern flank of the Boston Mountains Plateaus surface, the southernmost and highest surface within the Ozark Plateaus Physiographic Province. This plateau surface is developed mostly on sandstone, siltstone, and shale derived from sediments deposited in near-shore marine, deltaic, and fluvial environments. The upper part of the Blond Formation and Witts Springs Formation are the two primary units within the quadrangle. Approximately 660 feet (201 meters) of Lower Pennsylvanian (Morrowan) clastic rocks are exposed.

Strata within the region generally dip slightly south, away from the core of the Ozark Dome, but can vary due to the presence of normal faults and monoclines. In areas where sandstone is medium to coarse grained, deformation band ridges and clusters serve as indicators of faulting. Several normal faults are present within the quadrangle, the majority downthrown to the south, and a few downthrown to the north. Of the faults mapped in the area, six are named. In the northern portion of the quadrangle, the South Prong fault and the Peter Creek fault are down-to-the-south normal faults with approximately 40 feet (12 meters) and 60–80 ft (18–24 meters) of displacement, respectively. Both faults trend east-west, converging just west of the town of Floral and continuing beyond the quadrangle boundary. In the northeastern section of the quadrangle, a small down-to-the-north normal fault branches off the down-to-the-south Wagon Wheel Creek fault to form a southeast-trending graben that is offset approximately 40–50 feet (12–15 meters) south of Warren Mountain. The Trestle Hole fault trends east-west and is downthrown approximately 60–80 feet (18–24 meters) to the south. The Canoe Creek and Wilburn Creek faults are the major structural features in the southern portion of the quadrangle. Both are down-to-the-south normal faults with offsets of approximately 60–80 ft (18–24 meters).

Previous mapping in this area was conducted in preparation for the Geologic Map of Arkansas. These mapping efforts produced a worksheet displaying the geology of the Batesville-Heber Springs east area drawn on the 1:250,000-scale Memphis quadrangle and an in-house field sheet of the 1:24,000-scale Floral quadrangle displaying the approximate location of three fault traces (Glick, 1973a, ca. 1973b). This map builds on the work previously conducted and depicts stratigraphy and structural features in greater detail. The geology depicted is interpreted from field observations made from September 2025 to April 2026. Representative rock samples were collected from the field area and described in detail. Data and site locations were recorded on a portable GPS device and integrated into a geodatabase.

Symbols



Upper Blond exposure along Bram Road consisting of silty shale underlying a thin- to medium-bedded sandstone unit showing cross bedding and cut-and-fill structures.



Asterozoma trace fossil from the upper part of the Blond Formation. Found in alluvium deposit along Big Creek.

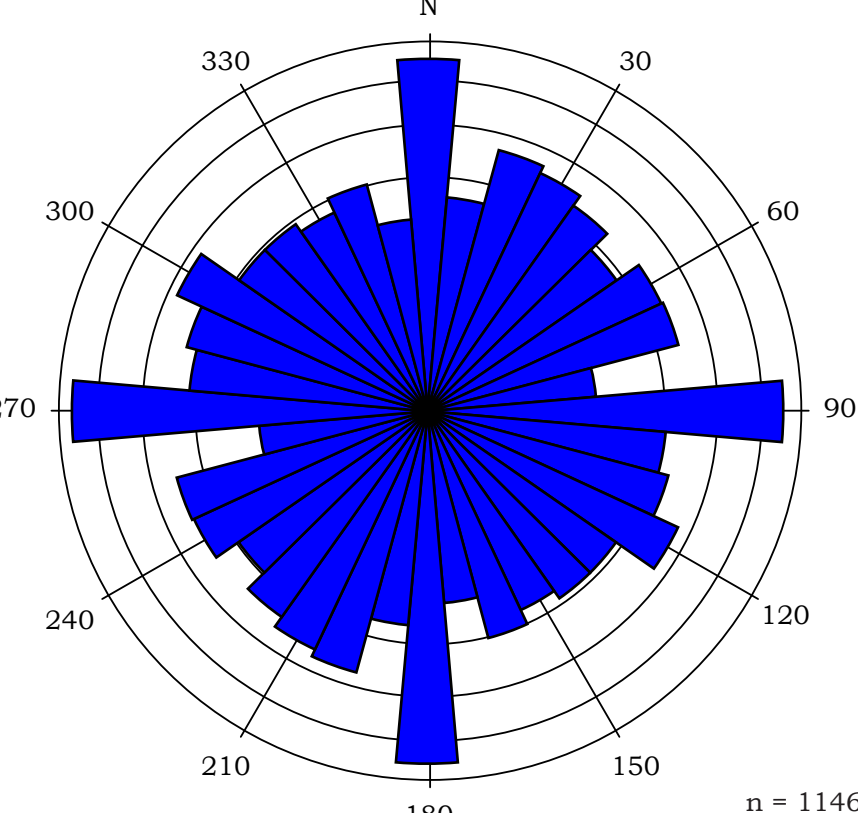


Thin ripple bedded Witts Springs sandstone, cropping out in the bed of Big Creek near Trestle Hole.

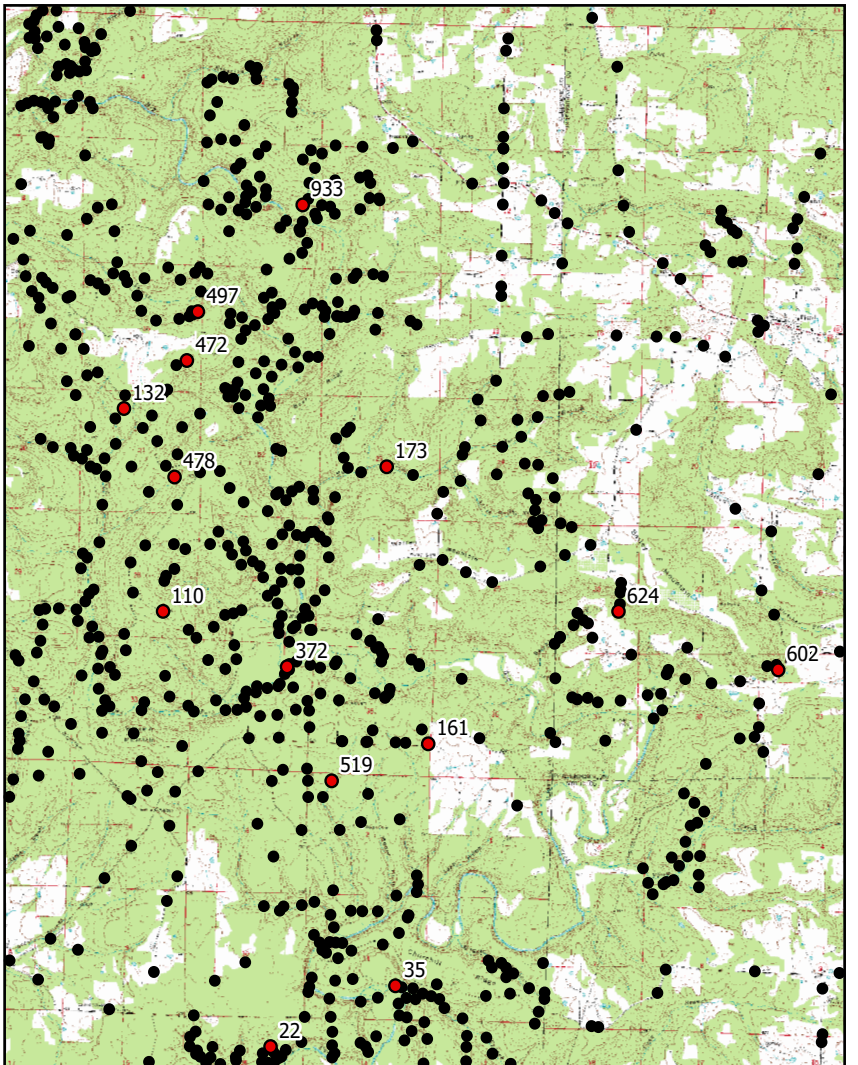


Steeply dipping Witts Springs sandstone exposed along Big Creek just north of the Trestle Hole fault trace.

Joint Frequency



Rose diagram of the strike frequency of joints recorded on the Floral quadrangle.



Topographic map of the Floral quadrangle showing location of data collection points in black. The numbered points in red represent locations sampled for thin section analysis.

References

- Glick, E.E., 1973a, Batesville-Heber Springs east on the Memphis quadrangle, Arkansas Geological Commission, Geologic Worksheet, 1 sheet, 1:250,000.
- Glick, E.E., ca. 1973b, Floral quadrangle, Cleburne, Independence, and White Counties, Arkansas Geological Commission: In-house field sheet, 1 sheet, 1:24,000.

Acknowledgements: This project was partially funded by a STATEMAP grant from the National Cooperative Geologic Mapping Program (NCGMP) administered by the U.S. Geological Survey under Cooperative Agreement Award G25AC0043. Special thanks to the many private landowners who graciously allowed access to their properties, and to Greenbay Packaging, Potlatch-Deltic, Arkansas Natural Heritage Commission, and Arkansas Game and Fish Commission. A very special thanks to Richard Hutto for serving as principal investigator and assisting with mapping.

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

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<https://www.geology.arkansas.gov/maps-and-data/geologic-maps/geologic-quadrangle-maps-for-arkansas-1-24k-scale.html>

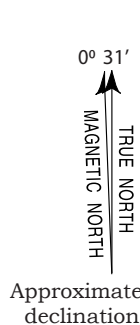
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Map and cross section digitized by Brian Kehner.

This topographic base is a Digital Raster Graphic (DRG). The DRG is a scanned image of a U.S. Geological Survey 7.5-minute series topographic map published in 1973.

10,000-foot grid based on Arkansas coordinate system, North Zone.

1000-meter Universal Transverse Mercator grid ticks, zone 15, 1927 North American Datum.



SCALE 1:24,000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



Adjoining Quadrangles
North
West
East
South

ROAD CLASSIFICATION

Secondary highway

Light duty road

Unimproved road

