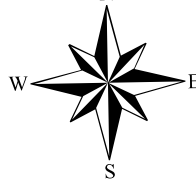
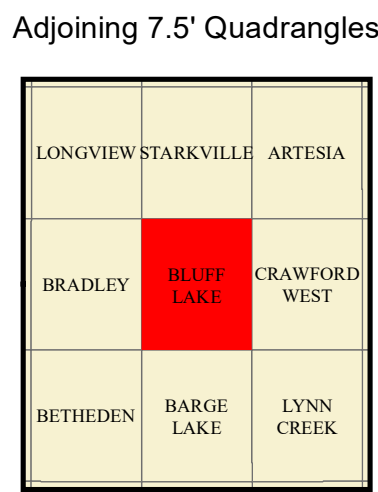


Base Map produced by the Mississippi Geological Survey  
Coordinate System: NAD 1983 UTM Zone 16N  
Projection: Transverse Mercator  
Datum: North American 1983  
Units: Meter  
Declination: World Magnetic Model, June 30, 2025, estimated Magnetic North  
declination in 7.5-Minute Bluff Lake Quadrangle center area is 2.55° W ± 0.35°  
changing by 0.07° W per year.  
Base map data sourced from <https://narris.mississippi.edu/>.  
Contours are derived from LIDAR data.  
Borehole data from Mississippi Office of Geology.

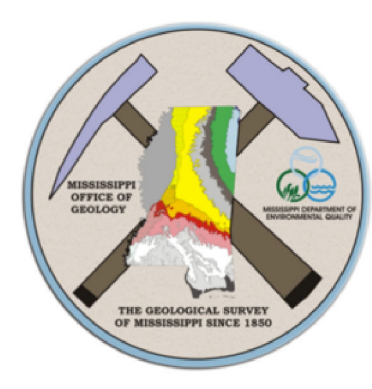


Mississippi Office of Geology  
Open-File Report 353  
**GEOLOGIC MAP of the BLUFF LAKE  
7.5-MINUTE QUADRANGLE**

Okibbeha, Noxubee, and Winston Counties, Mississippi  
2025

Geology by

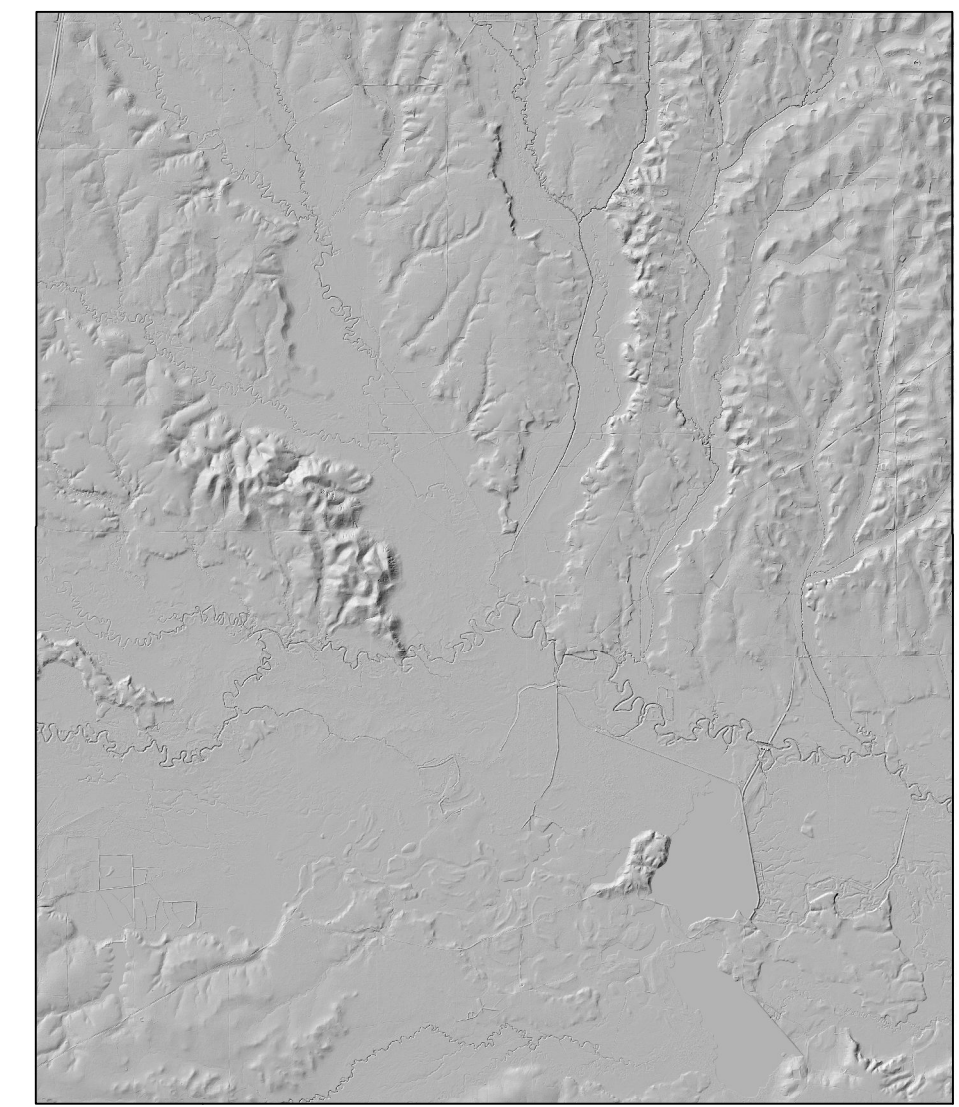
Jonathan R. Leard, RPG, Timothy J. Palmer, RPG, and James E. Starnes, RPG



Mississippi Department of Environmental Quality  
Mississippi Office of Geology - Surface Mapping Division  
Mississippi Geological Survey  
700 North State Street  
Jackson, Mississippi 39225

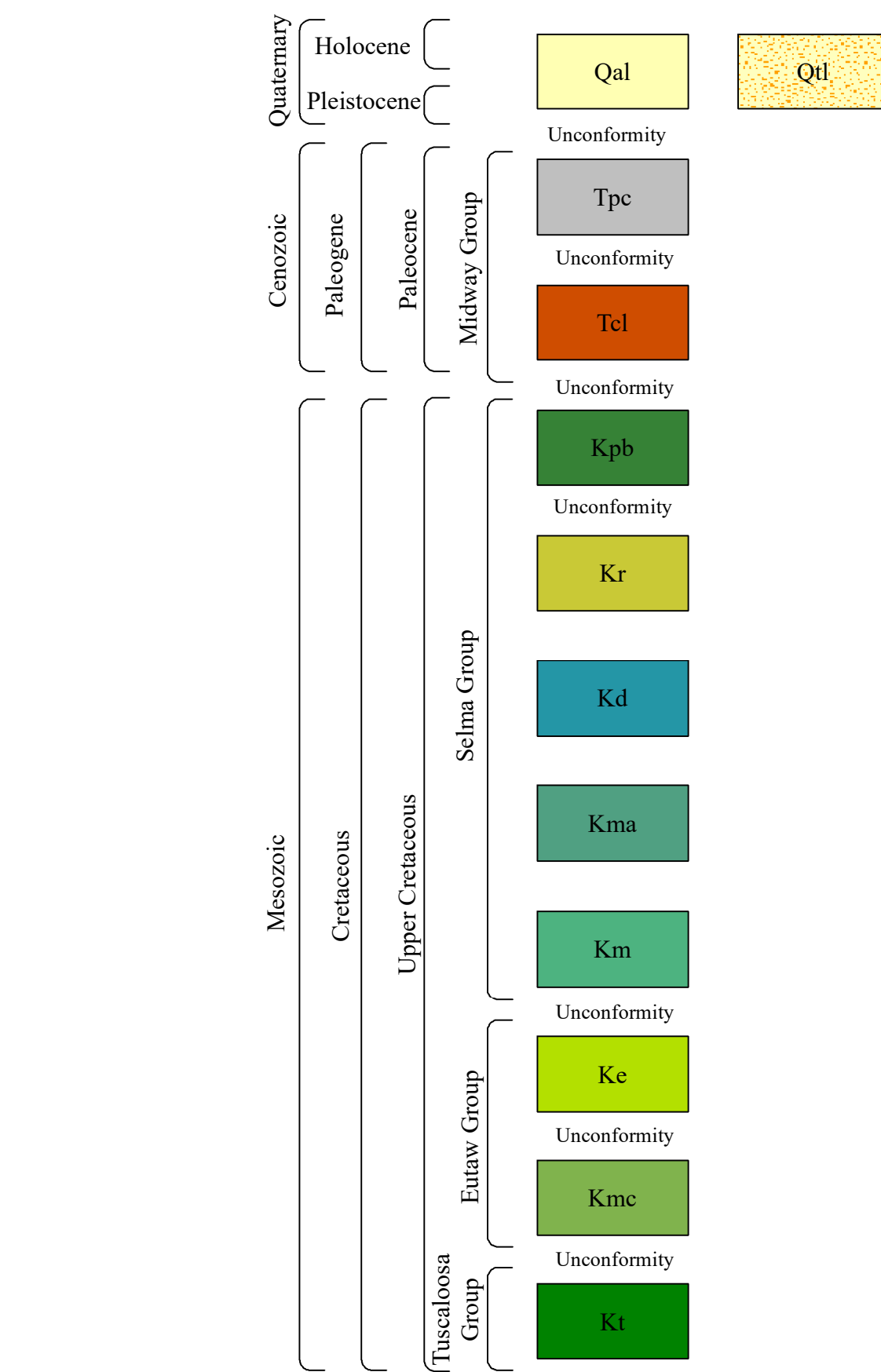
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- Surface Mine  
Drill Hole Locality and Identification Number  
Formational Contact  
Line of Section



LIDAR derived from Earth Hillshade  
Geologic maps are only a guide to current understanding and do not  
eliminate the need for detailed investigations of specific sites for specific  
purposes. The views and conclusions contained in this Open-File Report  
are those of the geologists and should not be interpreted as representing  
the official policies, either expressed or implied, of the State of  
Mississippi or of the United States Government.

### Correlation of Map Units



### Descriptions of Map Units

- Qal**  
**Alluvium (Holocene to Pleistocene)**  
Sand, yellow- to brownish-white in color, fine- to coarse-grained, subrounded to rounded, predominately quartzose, silty, clayey; humus lenses common. Streams on chalk or clay subcrop will exhibit shallow, wide alluvial plains while streams on sand subcrop tend to incise creating steep, narrow alluvial plains, silicified wood and Pleistocene vertebrate fossils common. Thickness approximately 15 feet along larger streams, thinning up tributaries.
- Qtl**  
**Stream Terrace (Holocene to Pleistocene)**  
Stream Terrace; Sand, orange to tan colored, fine- to medium grained, predominately quartzose; Clay, red to brown, kaolinitic. Abandoned floodplain deposits of clay, silt, and quartz sand. Generally yellowish - orange, orange, and tan, may contain organic matter, may contain Pleistocene vertebrate fossils. Thickness variable depending on the drainage, thickness rarely exceeds 10 feet.
- Tpc**  
**Porters Creek Formation (Paleocene)**  
Dominantly clay, gray to blue-gray, weathers to chocolate brown; jointing common, montmorillonitic. An anomalous ridge-forming sand body containing interbedded silty to sandy clay occupies the elevations above 280 feet between the Chinchachoma and Cypress Creek/Noxubee River confluences has been interpreted as part of the Porters Creek fm. An alternate interpretation could be the remnants of a confluence stream terrace. Seeps emanate from the basal contact of the sand body. Unconformably overlies the Clayton Formation. Total thickness not observed in this quadrangle.
- Tcl**  
**Clayton Formation (Paleocene)**  
Silty Clay, gray to tan, weathers to red. Sands massive to cross-bedded, confined to the basal part and as incised channels into the underlying Prairie Bluff Formation, fossiliferous with *pyconotus pulaskensis* oysters inducted in a glauconitic sandstone mark the basal section. Unconformably overlies the Prairie Bluff Formation. Thickness approximately 15 feet but can be more than 30 feet where channels are incised.
- Selma Group**  
**Prairie Bluff Formation (Cretaceous)**  
Chalky marl with some beds of chalk, blue to gray, weathers white, massive, silty; very fossiliferous, interlaminated thinly bedded calcareous glauconitic sands. Unconformably overlies the Ripley Formation. Thickness approximately 55 feet.
- Kr**  
**Ripley Formation (Cretaceous)**  
Clay in lower portion conformably transitioning from underlying Demopolis Chalk. Sand, Chalk and limestone above the transitional clay. Transitional clay is laminated to thin bedded; dark greenish gray, medium gray and reddish tan where highly weathered; locally sandy; and fossiliferous. Sand, chalk and limestone are interbedded. Contains lenses of sand, chalky sand, silty chalk or chalky limestone. Sands are tan to red where weathered; fine grained; micaceous; calcareous; and fossiliferous. Chalks are gray to tan; often silty and sandy; and fossiliferous. Limestones are light gray to nearly white where weathered; often sandy; and fossiliferous. A coarse grained, tan to brown fossiliferous sand, indurated at places, occurs at the top. Thickness approximately 80 feet.
- Kd**  
**Demopolis Chalk (Cretaceous)**  
Massive-bedded chalk and dirty chalk. Medium to light gray and bluish gray, weathers to tan. Contains subordinate amounts of pyrite, glauconitic, and mica. Conformably overlies the Arcola Limestone. Upper marl referred to as the Bluffport marl member. Very Fossiliferous. Thickness approximately 420 feet.
- Kma**  
**Arcola Limestone**  
Hard, buff colored limestone that marks the contact between the Demopolis Formation and the Mooreville Formation. Conformably overlies the Mooreville Formation. Thickness approximately 15 feet.
- Km**  
**Mooreville Formation (Cretaceous)**  
Massive-bedded marly chalk and calcareous clay. Medium to light gray, and blueish-gray, weathers to tan. Locally sandy and contains subordinate amounts of glauconite. Fossiliferous in many locations. Unconformably overlies the Eutaw Formation. Thickness approximately 180 feet.
- Eutaw Group**  
**Eutaw Formation (Cretaceous)**  
The Eutaw Formation unconformably overlies the McShan Formation. Sand, tan, yellow, brown, reddish-brown, light to dark gray, greenish gray, glauconitic, fine to coarse-grained, cross-bedded, with laminae of dark gray flaky clay, and stringers of small chert gravel, locally carbonaceous and locally fossiliferous. Thickness approximately 260 feet.
- Kme**  
**McShan Formation (Cretaceous)**  
The McShan represents the basal Eutaw Formation. Sand, cross-bedded and thinly laminated, greenish-gray, micaceous, glauconitic, small chert gravels may be present. Unconformably overlies the Tuscaloosa Formation. Thickness approximately 120 feet.
- Kt**  
**Tuscaloosa Formation (Cretaceous)**  
Light and varicolored irregularly bedded sand, clay, and gravel; gravel occurs mostly in the basal portion. Unconformably overlies Paleozoic basement rock. Total thickness not represented on this map.

### Field Photographs



A panorama of Bluff Lake taken from the Noxubee Wildlife Refuge Office Headquarters in Section 5, Township 16 North, Range 15 East.



Alluvial fines of clayey sand in the floodplain of Oktoc Creek in Section 6, Township 16 North, Range 15 East.



Terrace sands cropping out on a walking trail on the Noxubee Wildlife Refuge in Section 5, Township 16 North, Range 15 East.



Rip up clasts of Porters Creek clay in the alluvium of a small drainage of Bluff Lake in Section 5, Township 16 North, Range 15 East.



Porters Creek clay in tire ruts on a maintenance road for the Noxubee Wildlife Refuge in Section 4, Township 16 North, Range 14 East.



Clayton Formation cropping out below the spillway of Bluff Lake along Oktoc Creek in Section 4, Township 16 North, Range 15 East.



Weathered outcrop of fossiliferous Prairie Bluff marls in a road ditch along Blocker Road in Section 24, Township 17 North, Range 14 East.



Well developed Pleistocene prairie soils overlying a channelized creek of fossiliferous Prairie Bluff Formation in Section 1, Township 17 North, Range 14 East.



Well developed Pleistocene prairie soils overlying a channelized creek of fossiliferous Prairie Bluff Formation in Section 1, Township 17 North, Range 14 East.



*Mosasaurus hoffmanni* lumbar vertebrae found along a gravel bar in a channelized creek of fossiliferous Prairie Bluff Formation in Section 1, Township 17 North, Range 14 East.



Sands of the Ripley Formation cropping out beneath a bridge on Robinson Road southwest of Oktoc in Section 19, Township 17 North, Range 15 East.

### Structural Cross-Section of the Bluff Lake 7.5-Minute Geologic Quadrangle

