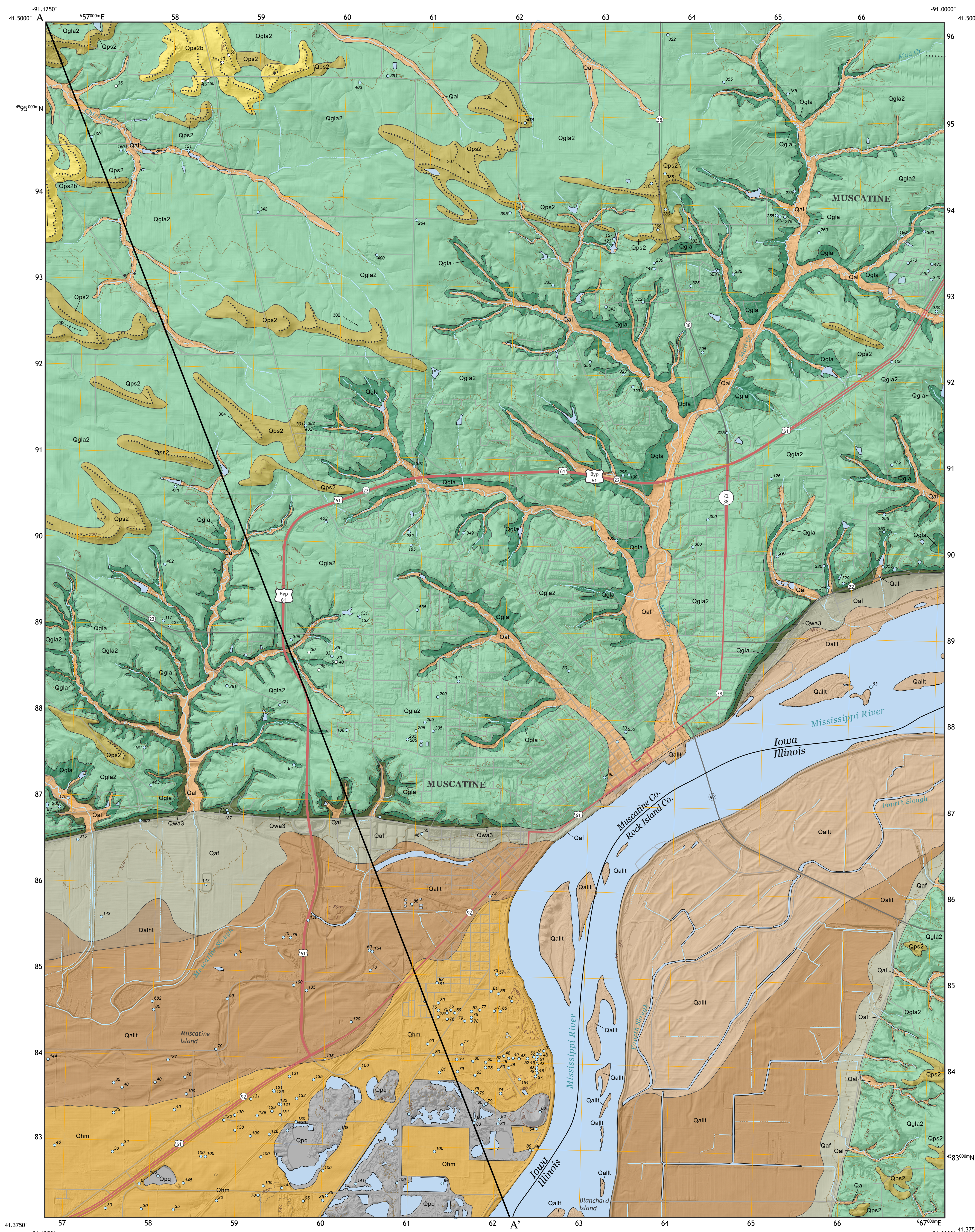


SURFICIAL GEOLOGIC MAP OF THE MUSCATINE 7.5' QUADRANGLE, MUSCATINE COUNTY, IOWA, ROCK ISLAND COUNTY ILLINOIS

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INTRODUCTION

The Muscatine 7.5' Quadrangle is located mainly in Muscatine County, Iowa with the southeast corner in Rock Island County, Illinois. Unlike most areas in eastern Iowa, this mapping area does not have bedrock outcrops. The bedrock surface can be over 50 m (165 ft) below the modern surface in areas, though some portions may have bedrock within 10 m (33 ft). This is due to the presence of the various bedrock channels that were formed and filled by multiple Quaternary ice advances. The landscape of the mapping area is divided between the Illinoian Till Plain and the Mississippi River Valley.

The mapping area includes Wisconsinian colluvial deposits. Upland dunes in the northwest corner of the quadrangle can be over 15 m (50 ft) high but generally thin to the southeast. Loess, on the other hand, thickens towards the Mississippi River Valley. Paleowind indicators from dune forms show sediments of the Peoria Formation were carried by a northerly wind. A large portion of this sediment was likely sourced from the Cedar River Valley which lies just beyond the mapping area to the northwest. Below the loess and sand, the uppermost till in the uplands is the Glasford Formation. The Sangamon Geosol can be present or absent under the Peoria Formation, which suggests a period of erosion during the Late Wisconsinian Episode.

The Mississippi River Valley comprises the southeastern portion of the mapping area. The valley contains stratified sands and gravels of the Henry Formation. These materials were deposited during the Late Wisconsinian. The western valley appears to be formed from one scarp which was likely formed by a diversion event during the Late Wisconsinian. Downslope of this valley wall, the Henry Formation is covered by Holocene-aged alluvial fans of the Corrington Member, which is part of the DeForest Formation. These can be over 10 m (33 ft) above Holocene terraces.

Ultimately, the mapping area is a complex, polygenetic landscape that has been developing through multiple glacial cycles. The relationships between these materials and geomorphologic processes will continue to be investigated in future mapping projects. Data collected for this mapping project included 11 drill cores, 8 hand probe locations, and 2 exposures.

MAP UNITS

Alluvium

Qal - Alluvium (DeForest Formation-Undifferentiated) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous to calcareous, stratified silt clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hill slopes, and in closed depressions. May overlie Glasford Formation or Wolf Creek/Alburnett Formation till. Associated with low-relief modern floodplains, closed depressions, modern drainageways, or toeslope positions on the landscape. This unit also includes colluvial deposits derived from adjacent map units. Seasonal high water table and potential for frequent flooding.

Qaf - Alluvial Fan (DeForest Formation-Corrington Member) Variable thickness of 2 to 5 m (7-16 ft) of dark brown to yellowish brown, noncalcareous, silt loam to loam with interbedded lenses of fine sand and silts. A pebble lag is commonly found at or near the fan surface. Within the Mississippi River Valley, alluvial fans overlie older silt clay to sandy loam alluvium of Holocene terraces or thick sand and gravel of the Henry Formation.

Terraces

Qallt - River Channel Belt - Low Terrace (DeForest Formation-Camp Creek and Roberts Creek members) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous, stratified silt clay loam, loam, or clay loam, associated with the modern channel belt of the Mississippi River. Overlies sand and gravel of the Henry Formation. Occupies lowest position on the floodplain (i.e., modern and historic channel belts). Oxbow lakes and meander scars are common features associated with this terrace level. Mapped primarily using aerial imagery and LiDAR. Seasonal high water table and frequent flooding potential.

Qalit - Intermediate Terrace (DeForest Formation-Camp Creek, Roberts Creek, and Gunder members) Variable thickness of less than 1 to 5 m (3-16 ft) of very dark gray to brown, noncalcareous, stratified silt clay loam to loam that overlies the Henry Formation. Occupies terrace position above the modern floodplain in the Mississippi River Valley. Seasonal high water table and frequent flooding potential.

Qalht - High Terrace (DeForest Formation-Gunder and Corrington members) Variable thickness of less than 1 to 7 m (3-22.5 ft) of very dark gray to brown, noncalcareous, silt clay loam, loam alluvium or colluvium. Overlies the Henry Formation. Occupies terrace and valley margin position 2 to 3 m (7-10 ft) above the modern floodplain in the Mississippi River Valley. Seasonal high water table and rare flooding potential.

Meltwater Sediment

Qhm - Sand and Gravel (Henry Formation-Muscatine Member) Generally 3 m (10 ft) to more than 60 m (200 ft) of yellowish brown to gray, poorly to well sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel. This unit is found in the Mississippi River Valley and underlies Holocene alluvium and other terrace deposits.

Eolian Sediment

Qps2 - Eolian Sand and Interbedded Silt (Peoria Formation-sand facies) Generally 5 to 10 m (16-32 ft) of yellowish brown to gray, moderately to well stratified noncalcareous or calcareous, fine to medium, well sorted, colluvial sand. May contain interbeds of yellowish brown to gray, massive, silt loam loess. Overlies eroded, massive, fractured, loamy glacial till of the Glasford or Wolf Creek/Alburnett formation or periglacial sediments along smaller drainages.

Qps2b - Eolian Sand and Interbedded Silt (Peoria Formation-sand facies) Over 10 m (> 33 ft) of yellowish brown to gray, moderately to well stratified noncalcareous or calcareous, fine to medium, well sorted, colluvial sand. May contain interbeds of yellowish brown to gray, massive, silt loam loess. Overlies eroded, massive, fractured, loamy glacial till of the Glasford Formation.

Colluvial Sediment

Qgla2 - Periglacial and Eolian Sediments Shallow to Glacial Till (unnamed erosion surface sediment) Generally 1 to 3 m (3-10 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted, loamy, sandy, and silt clay erosion surface sediment. Map unit includes some areas mantled with less than 2 m (7 ft) of Peoria silt or sand. Overlies massive, fractured, firm glacial till of the Illinoian Glasford Formation.

Glacial Sediment

Qgla - Till (Glasford Formation) Generally 3 to 10 m (10-33 ft) of very dense, massive, fractured, loamy glacial till of the Illinoian Glasford Formation with or without a thin loess mantle (Peoria Formation-less than 2 m) and intervening clayey Farmdale/Sangamon Geosol. This unit overlies Pre-Illinoian diamictic of the Wolf Creek/Alburnett formation and outcrops along the Mississippi River Valley, Mad Creek, and tributaries.

Qwa3 - Till (Wolf Creek & Alburnett formations) Generally 15 to 60 m (50-200 ft) of very dense, massive, fractured, loamy glacial till. This unit overlies Paleozoic bedrock and is only shown on the cross-section.

OTHER MAPPING UNITS

Qpq - Pits and Quarries Sand and gravel pits and rock quarries. Extent mapped as shown on the county soil surveys and as identified on aerial imagery.

CORRELATION OF MAP UNITS

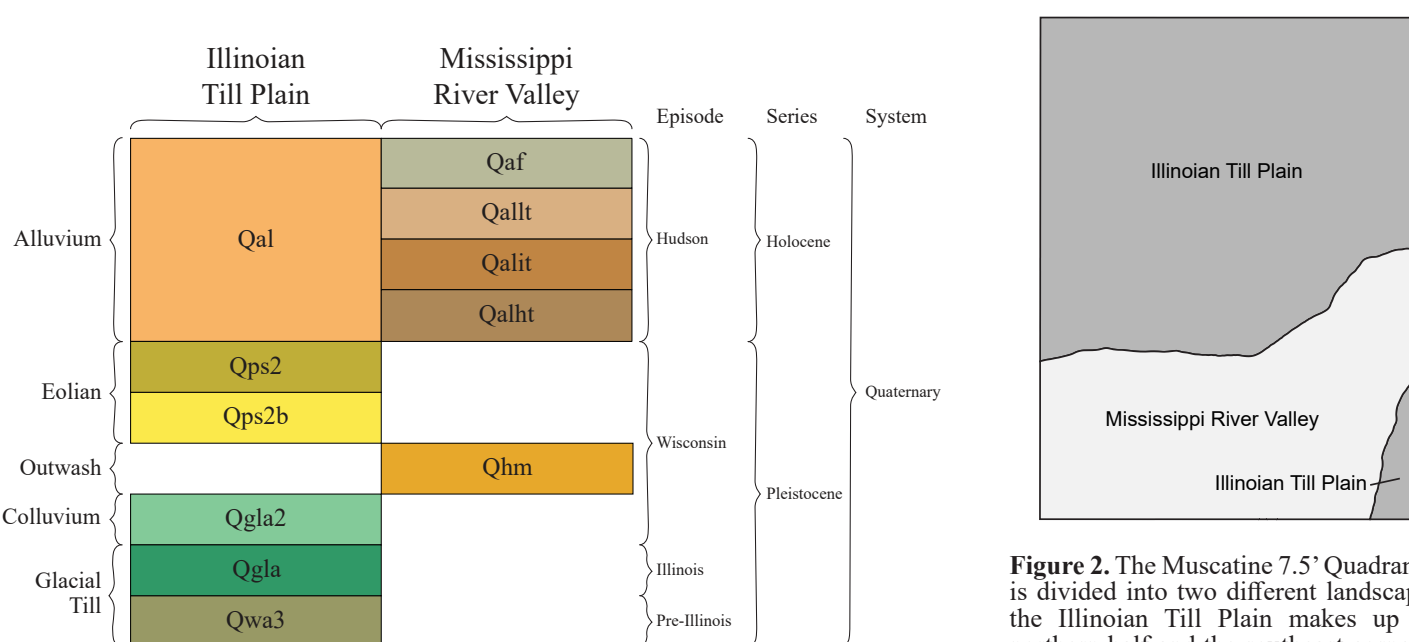


Figure 2. The Muscatine 7.5' Quadrangle is divided into two different landscapes, the Illinoian Till Plain makes up the northern half and the southeast corner in Illinois.

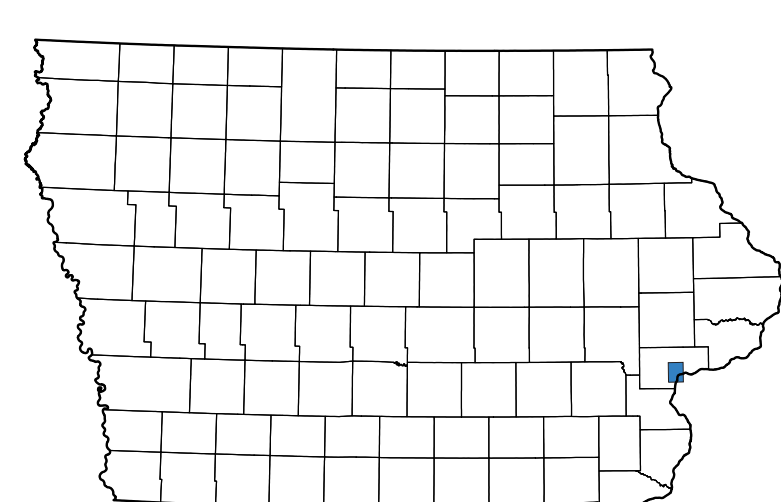
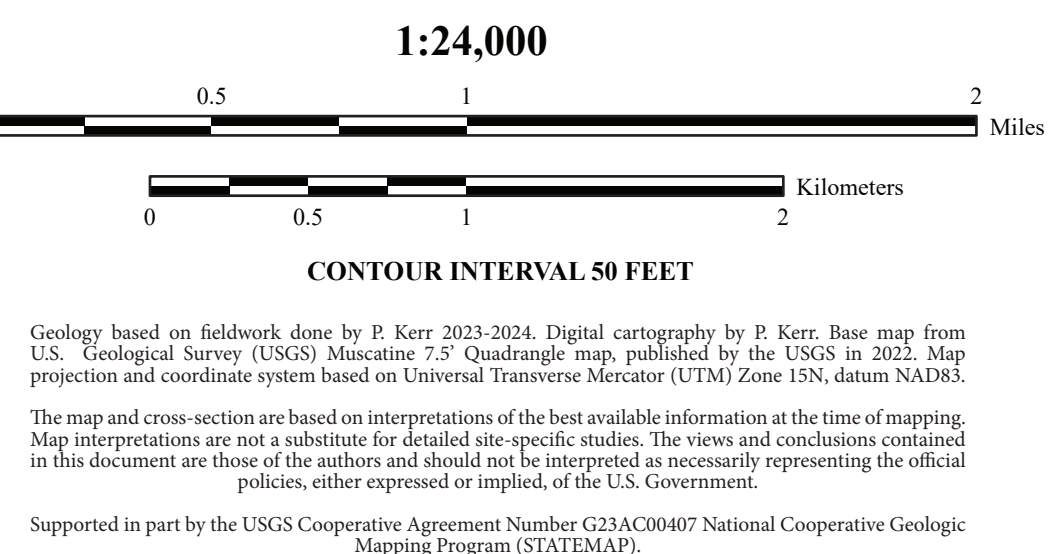
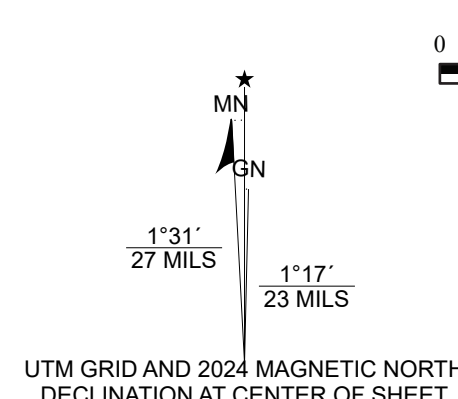


Figure 1. The location of the Muscatine Quadrangle in Iowa.



1	2	3
1 Atalissa, IA	2 Wilton IA	3 Durant, IA
4 Muscatine NW, IA	5 Illinois City, IA, IL	6 Letts, IA
7 Blanchard Island, IA, IL	8 Eliza, IL	

Road Classification	
	expressway
	secondary hwy
	US Route
	local connector
	local road
	state route

Map Symbols

- Quaternary section
- water well with total depth
- stratigraphic core
- unit contact
- dune crest
- paleowind direction from dune form
- elevation contour
- cross-section
- water body
- stream
- hillshade

Cross-Section Legend

- W-7475 GeoSam sampling point
- contact

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GEOLOGIC CROSS-SECTION A-A'

