Surficial Geologic Map of the Durant 7.5' Quadrangle, Muscatine, Cedar, and Scott Counties, Iowa

Phil Kerr, Stephanie Tassier-Surine, and Alyssa Bancroft
Iowa Geological Survey, IIHR-Hydroscience & Engineering, University of Iowa, Iowa City, Iowa

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Keith Schilling, State Geologist
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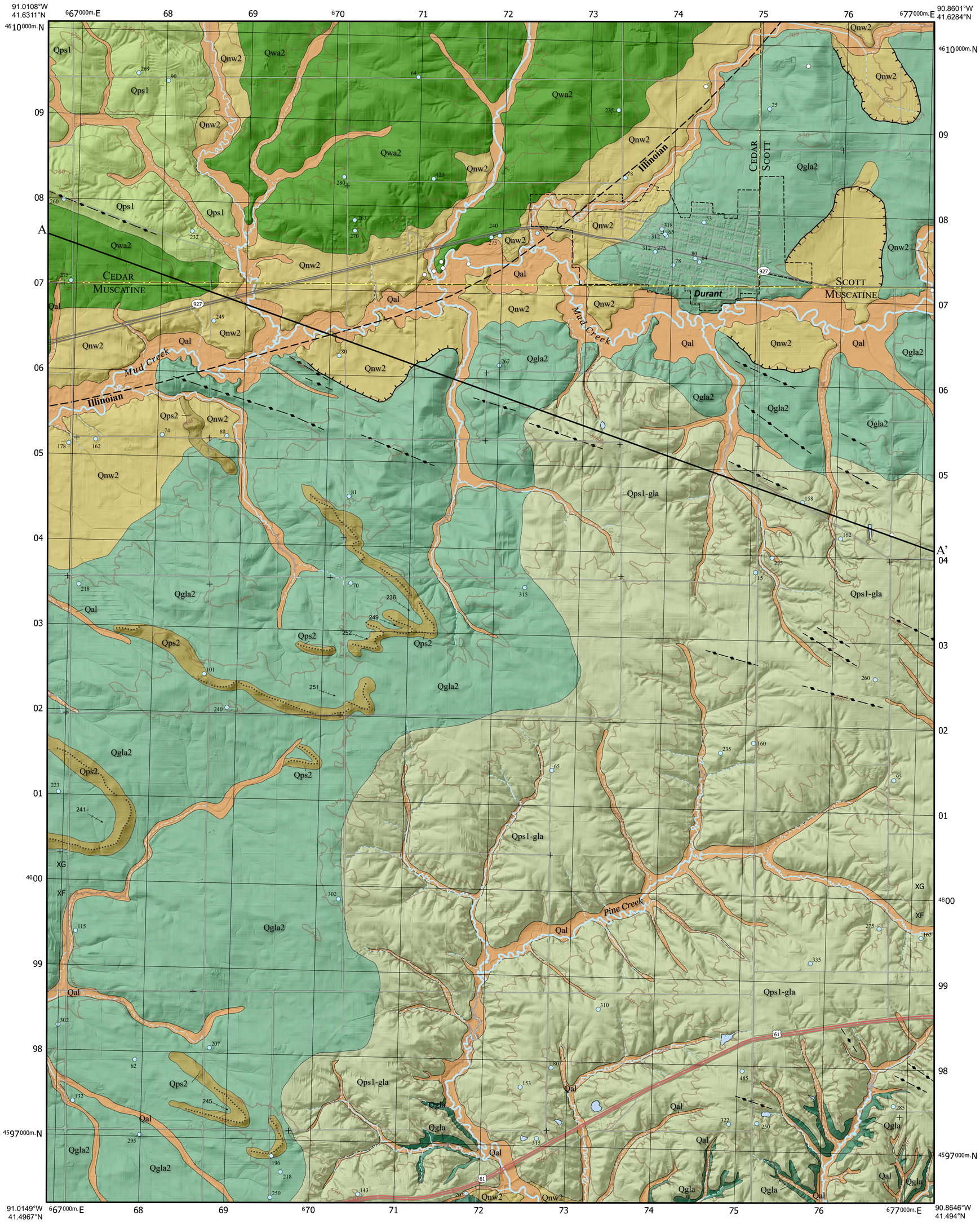


Introduction

The Durant 7.5' Quadrangle is located mainly in Muscatine County, Iowa with small portions in Cedar and Scott counties. Unlike other areas in eastern Iowa, the mapping area does not have bedrock outcrops due to the presence of the Cleona Bedrock Channel. The bedrock surface is generally 50 to 75 m (165 - 115 ft) below the modern surface across large portions of the landscape. This buried valley contains glacial deposits from multiple Quaternary ice advances. The landscape of the mapping area is mainly on the Illinoian Till Plain while the northeast corner lies on the older Pre-Illinoian Till Plain.

Portions of the upland area are blanketed by 2 to 5 m (7-16 ft) of eolian sediment of the Peoria Formation. Some locations in the mapping area can be over 10 m (33 ft) of windblown silt. The Sangamon Geosol can often be found beneath the thick loess. This soil developed in the uppermost 1 to 2 m (3-7 ft) of the Glasford or Wolf Creek/Alburnett formation tills. The rest of the upland areas typically lack the Sangamon Geosol and have thin eolian sediments over sediment reworked during the Late Wisconsin Episode. The alluvial sediments of the Holocene DeForest Formation are typically fine-grained. Data collected for this mapping project included 3 drill cores and 4 hand probe locations.

Description of Map Units

Alluvium

Qal — **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 silty clay loam, clay loam, loam to sandy loam alluvium and colluvium in stream valleys, on hill slopes, and in closed depressions. May overlie Wolf Creek/Alburnett formation till or Noah Creek Formation sand and gravel. Associated with low-relief modern floodplains, closed depressions, modern drainageways, or toeslope positions on the landscape. Unit also includes colluvial deposits derived from adjacent map units. Seasonal high water table and potential for frequent flooding.

Eolian Sediment

Qps1 — **Qps1 - Loess and Intercalated Eolian Sand** (Peoria Formation-silt and/or sand facies) Generally 2 to 5 m (7-16 ft) of yellowish brown to gray, massive, fractured, noncalcareous grading downward to calcareous, silt loam and intercalated fine to medium, well-sorted sand. Sand is most abundant in the lower part of the eolian package. Overlies massive, fractured, loamy glacial till of the Wolf Creek/Alburnett formation with or without the intervening clayey Farmdale/Sangamon Geosol.

Qps1-gla — **Qps1-gla - Loess and Intercalated Eolian Sand** (Peoria Formation-silt facies) Two to five meters of yellowish brown to gray, massive, fractured, noncalcareous grading downward to calcareous silt loam and intercalated fine to medium, well sorted, sand. Sand is most abundant in lower part of the eolian package- eolian dunes 0.5 to 2.5 m (2-8 ft) thick may be present at the base of this unit. Overlies massive, fractured, loamy glacial till of the Illinoian Glasford Formation with or without intervening clayey Farmdale /Sangamon Geosol.

Qps1 — **Qps2 - Eolian Sand and Intercalated 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, eolian sand. May contain interbeds of yellowish brown to gray, massive, silt loam loess. Overlies eroded, massive, loamy glacial till of the Glasford Formation or periglacial sediments along smaller drainages.

Colluvial Sediment

Qnw2 — **Qnw2 - Sand and Gravel** (Noah Creek Formation) Generally 2 to 8 m (7-26 ft) of yellowish brown to gray, poorly to well-sorted, massive to well stratified, coarse to fine feldspathic quartz sand, pebbly sand and gravel with few intervening layers of silty clay. A thin mantle of loess, reworked loess or fine-grained alluvium may be present. This unit includes silty colluvial deposits derived from the adjacent map units. This unit encompasses deposits that accumulated in low-relief stream valleys during the Late Wisconsin. Seasonal high water table and some potential for flooding.

Qgla2 — **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 silty erosion surface sediment. Map unit includes some areas mantled with less than 2 m (7 ft) of Peoria silt or sand. Overlies glacial till of the Glasford Formation.

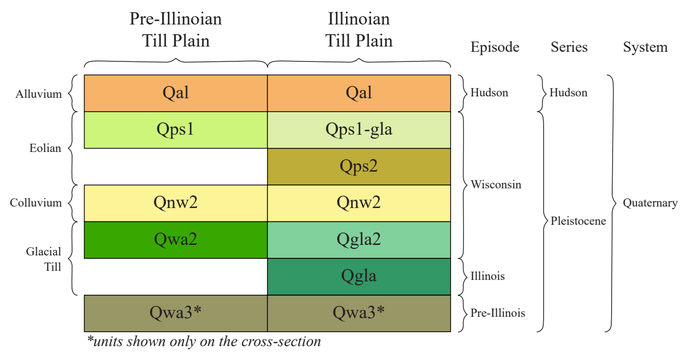
Qwa2 — **Qwa2 - Periglacial and Eolian Sediments Shallow to Glacial Till** (unnamed erosion surface sediment) Generally 1 to 3 m (3-10 ft) of yellowish brown to gray, massive to weakly stratified, well to poorly sorted loamy, sandy and silty erosion surface sediment. Map unit includes some areas mantled with less than 2 m (7 ft) of Peoria silt or sand. Overlies glacial till of the Pre-Illinoian Wolf Creek/Alburnett formation.

Glacial Sediment

Qgla — **Qgla - Till** (Glasford Formation) Generally 3 to 15 m (10-50 ft) of very dense, massive, fractured, loamy glacial till of the Illinoian Glasford Formation. Overlies the Yarmouth Paleosol formed in Pre-Illinoian till. This mapping unit encompasses narrowly dissected interfluves and side slopes, as well as side valley slopes. Drainage is variable from well drained to poorly drained.

Qwa3 — **Qwa3 - Till** (Wolf Creek & Alburnett formations) Generally 15 to 90 m (50-295 ft) of very dense, massive, fractured, loamy glacial till of the Wolf Creek and/or Alburnett formations. This unit overlies Paleozoic bedrock and is only shown on the cross-section.

Correlation of Map Units



*units shown only on the cross-section

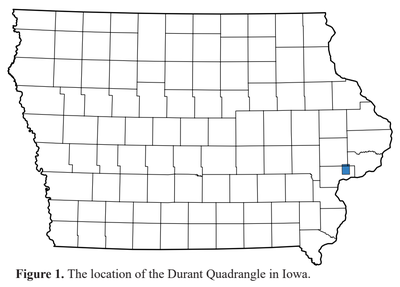


Figure 1. The location of the Durant Quadrangle in Iowa.

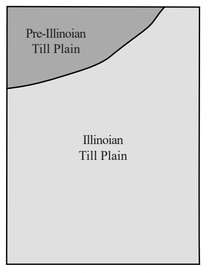
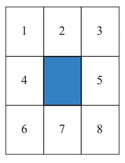
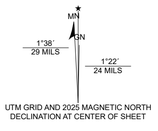


Figure 2. The Durant 7.5' Quadrangle is divided into two landscapes. The Illinoian Till Plain occupies most of the mapping area while the older Pre-Illinoian Till Plian is found in the northwest corner. Shown at a 1:200,000 scale.



ADJOINING QUADRANGLES
1 Lime City, IA
2 Bennett, IA
3 Dixon, IA
4 Wilton, IA
5 Walcott, IA
6 Muscatine, IA-IL
7 Illinois City, IA-IL
8 Montpelier, IA-IL



UTM GRID AND 2025 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

1:24,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

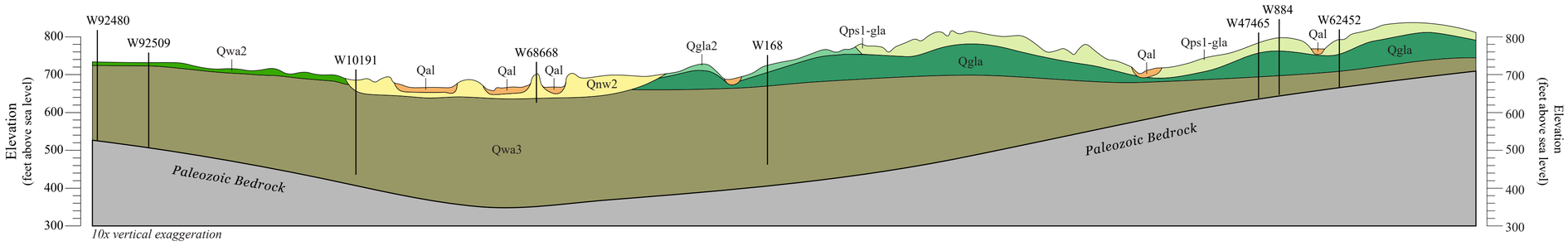
CONTOUR INTERVAL 50 FEET

Road Classification
- U.S. Route
- State Route
- Local Road

Map Symbols
- 400 water well with total depth
- stratigraphic core
- geophysical station
- dune crest
- 294 paleowind direction from dune form
- scarp headwall
- aligned ridge
- glacial margin, location inferred
- unit contact
- 750 elevation contour
- cross-section
- water body
- stream
- hillshade

Cross-Section Legend
- *W-73165* GeoSam sampling point
- contact

Geologic Cross-Section A-A'



10x vertical exaggeration

Acknowledgements

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The map and cross-section are based on interpretations of the best available information at the time of mapping. Map interpretations are not a substitute for detailed site-specific studies. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

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