Bedrock Elevation and Quaternary Thickness Maps of the Illinois City 7.5' Quadrangle, Muscatine County, Iowa and Rock Island County, Illinois

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Open File Map: **OFM-22-7**
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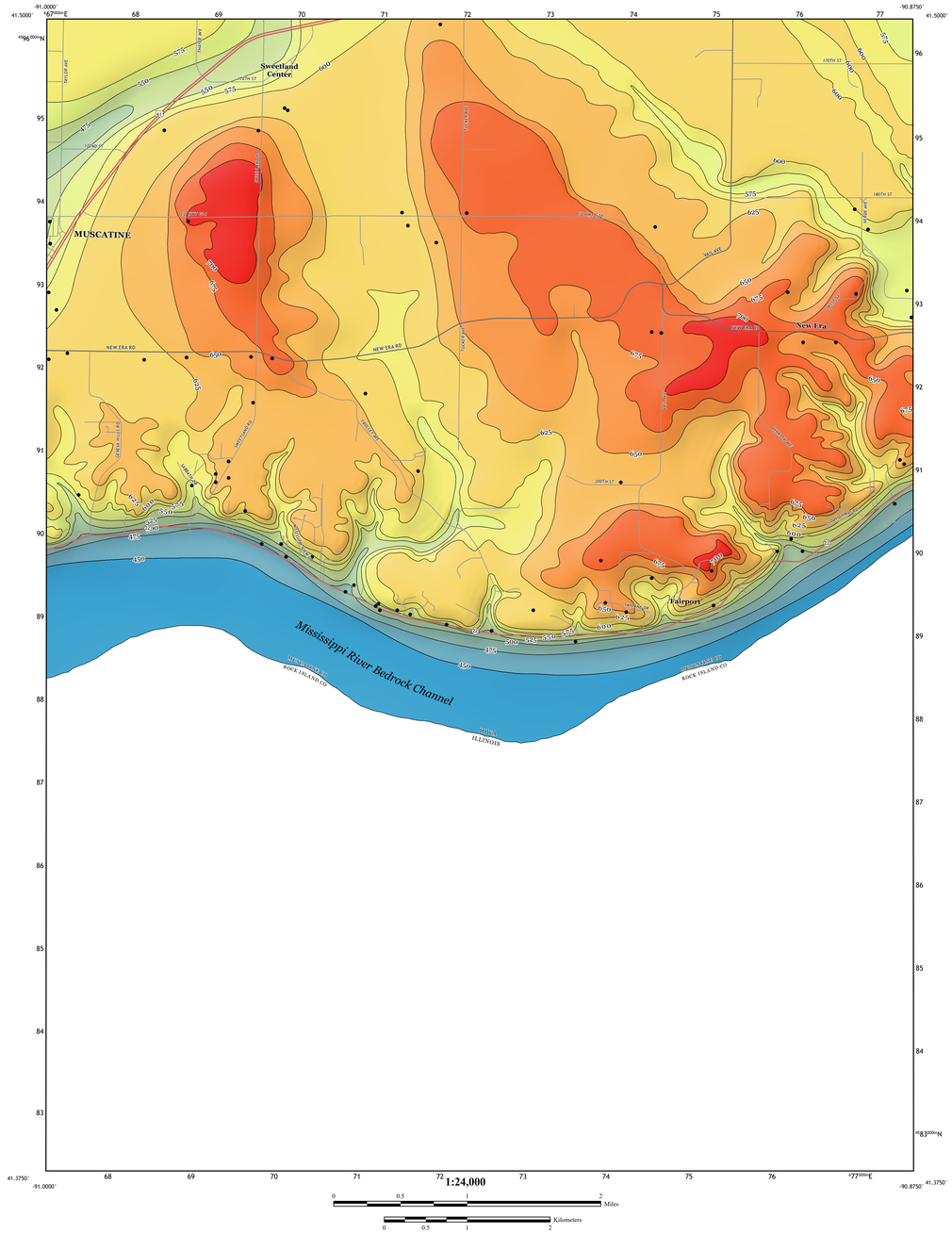
Bedrock Elevation



Introduction

The Bedrock Elevation and Quaternary Thickness Maps of the Muscatine 7.5' Quadrangle were produced concurrently with the Bedrock Geologic Map (Open File Map OFM-22-4). Like much of Iowa, the bedrock surface within the quadrangle is mostly concealed by glacial deposits. The boundary between Paleozoic bedrock and unconsolidated Quaternary deposits is likely just as irregular as the land surface itself, as a result, the thickness of the Quaternary varies widely across the quadrangle and ranges from 7 to 100 m (25-325 ft).

Methodology

The Bedrock Elevation and Quaternary Thickness Maps of the Muscatine 7.5' Quadrangle were constructed using the same datasets as the Bedrock Geologic Map (Open File Map OFM-22-4). Geologic information utilized included drilling records housed in the Iowa Geological Survey (IGS) GeoSam database, existing maps and technical reports, Iowa Department of Transportation data, and reports from engineering projects and quarry operators.

More than 200 boring records from the IGS GeoSam database, including both driller's logs and lithologic descriptions of well cutting samples (strip logs), were evaluated for the Muscatine Quadrangle. Each record was checked for locational accuracy using information from the driller's logs, historic plat blooks, county assessor information, and direct communication with landowners. The depth to the surficial-bedrock contact was determined for each well and assigned an elevation value by subtracting it from the surface digital elevation model (DEM). These data points provided the framework for the Bedrock Elevation Map. Additional information was gained from an assessment of the Natural Resources Conservation Service county soil survey by identifying soil series that indicate shallow bedrock.

To create the Bedrock Elevation Map bedrock elevation contours were digitized manually on-screen using ArcGIS software at a 25-foot contour interval. The bedrock elevation raster was generated using interpolations of the bedrock surface created with the 'Topo to Raster' and 'Empirical Bayesian Kriging' tools in ArcGIS Pro 3.0. The Quaternary Thickness Map was created by subtracting the bedrock elevation raster values from the surficial DEM raster. The resulting surface was rounded to the nearest integer and contours were generated from this result and then smoothed.

Bedrock Elevation (feet above sea-level)

- ≥700
- ≥675
- ≥650
- ≥625
- ≥600
- ≥575
- ≥550
- ≥525
- ≥500
- ≥475
- ≥450
- ≥425

Map Symbols

- bedrock outcrop
- GeoSam point
- contour interval
- hillshade

UTM GRID AND 2022 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Quaternary Thickness (feet below surface)

- ≤25
- ≤50
- ≤75
- ≤100
- ≤125
- ≤150
- ≤175
- ≤200
- ≤225

ADJOINING QUADRANGLES

1. Wilton, IA
2. Durant, IA
3. Walcott, IA
4. Muscatine, IA-IL
5. Motpelier, IA-IL
6. Blanchard Island, IA-IL
7. Eliza, IL
8. Buffalo Prairie, IL

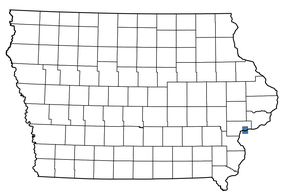


Figure 1. The location of Illinois City Quadrangle in Iowa.

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Base map from U.S. Geological Survey (USGS) Illinois City 7.5' Quadrangle map, published by the USGS in 2018. Bedrock topography raster created internally for this map project illinois_city_BE_3m.mxd, version 8/01/22 (ArcGIS Pro 3.0). Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15N, datum NAD83.

The maps 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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Quaternary Thickness