Bedrock Elevation and Quaternary Thickness Maps of the Keystone South 7.5' Quadrangle, Benton County, Iowa

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Open File Map: **OFM-20-10**

IOWA GEOLOGICAL SURVEY
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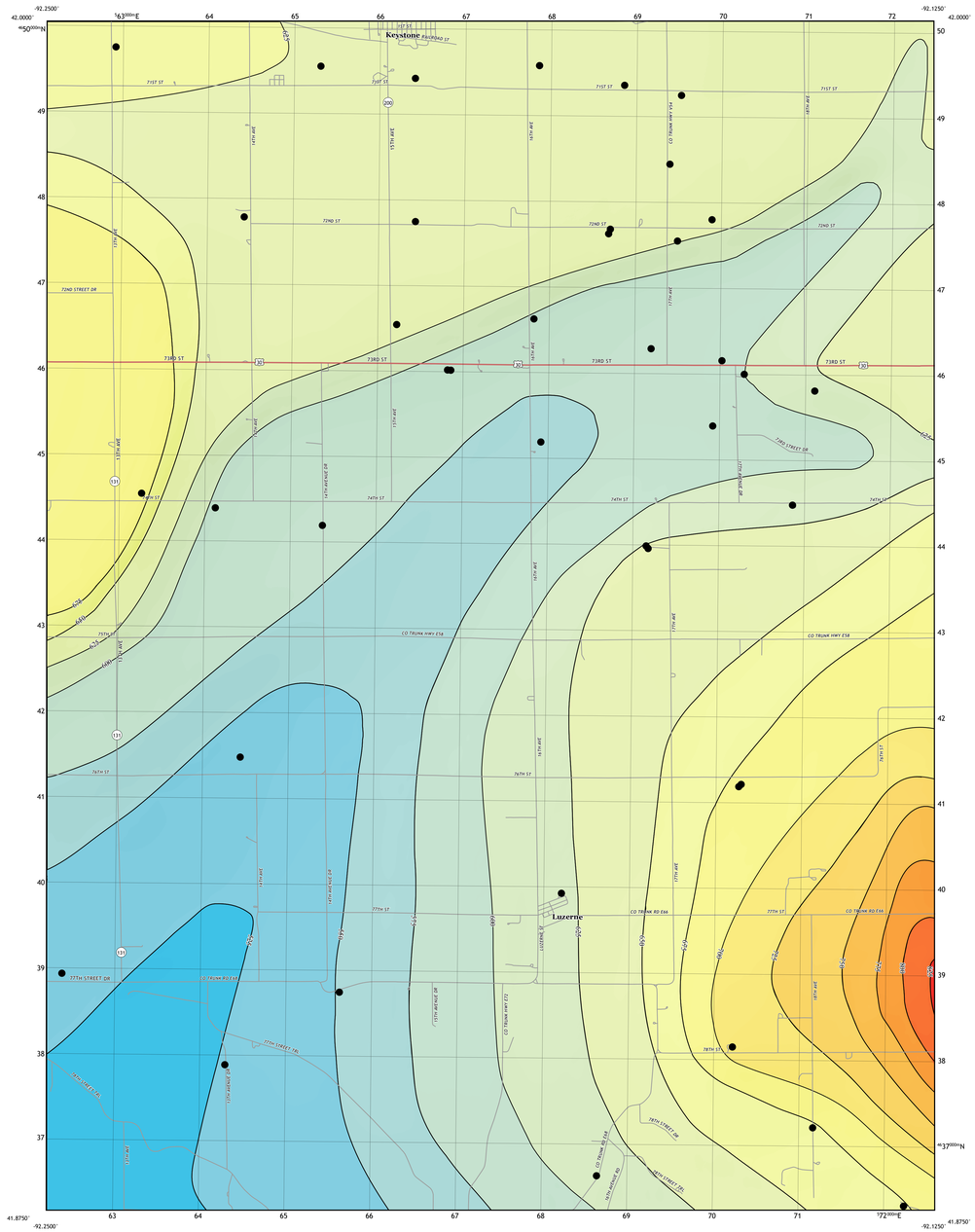
Bedrock Elevation



Introduction

The Bedrock Elevation and Quaternary Thickness Maps of the Keystone South 7.5' Quadrangle were produced in conjunction with the surficial geologic map. The bedrock surface within the quadrangle, like much of Iowa, is concealed by glacial deposits. The boundary between Paleozoic bedrock and unconsolidated Quaternary materials is likely just as irregular as the land surface itself. Therefore, the thickness of Quaternary deposits varies widely across the quadrangle, ranging from 22 to 120 m (100-400 ft).

Bedrock topographic lines were drawn based on borehole data used for the construction of the Surficial Geologic Map of the Keystone South 7.5' Quadrangle (OFM-20-9). Due to the depth of bedrock in this area, bedrock topographic detail is muted. The thickness of Quaternary materials was generated by subtracting the elevation of the bedrock surface from the land surface elevation. The Surficial Geologic Map of the Keystone South 7.5' Quadrangle (OFM-20-9) provides further information regarding the nature and extent of Quaternary deposits within the mapping area.

Methodology

The Bedrock Elevation and Quaternary Thickness Maps of the Keystone South 7.5' Quadrangle were constructed using the same dataset as the surficial geologic map. 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 companies and quarry operators.

Geologists evaluated 36 boring records from the IGS GeoSam database, including both driller's logs and lithologic descriptions of well cutting samples (strip logs) for the Keystone South Quadrangle. Each record was checked for locational accuracy using information from the driller's logs, historic plat books, 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.

Bedrock elevation contours were digitized 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 ArcMap 10.6. 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 then later smoothed.

Bedrock Elevation

feet above sea-level

- ≥825
- ≥800
- ≥775
- ≥750
- ≥725
- ≥700
- ≥675
- ≥650
- ≥625
- ≥600
- ≥575
- ≥550
- ≥525
- ≥500

Map Symbols

- GeoSam point
- topographic line
- water body
- river/stream

Road Classification

- U.S. Route
- State Route
- Local road

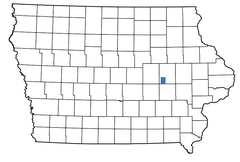
Quaternary Thickness

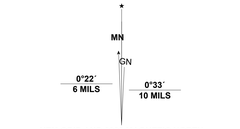
feet below surface

- ≤75
- ≤100
- ≤125
- ≤150
- ≤175
- ≤200
- ≤225
- ≤250
- ≤275
- ≤300
- ≤325
- ≤350
- ≤375
- ≤400

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES
1 Elberon, IA
2 Keystone North, IA
3 Van Horne, IA
4 Belle Plaine, IA
5 Blairstown, IA
6 Hartwick, IA
7 Ladora, IA
8 Marengo, IA





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Base map from the USGS Keystone South 7.5' Quadrangle map, published by the US Geological Survey in 2018. Map projection and coordinate system based on Universal Transverse Mercator (UTM) Zone 15N, datum NAD83.

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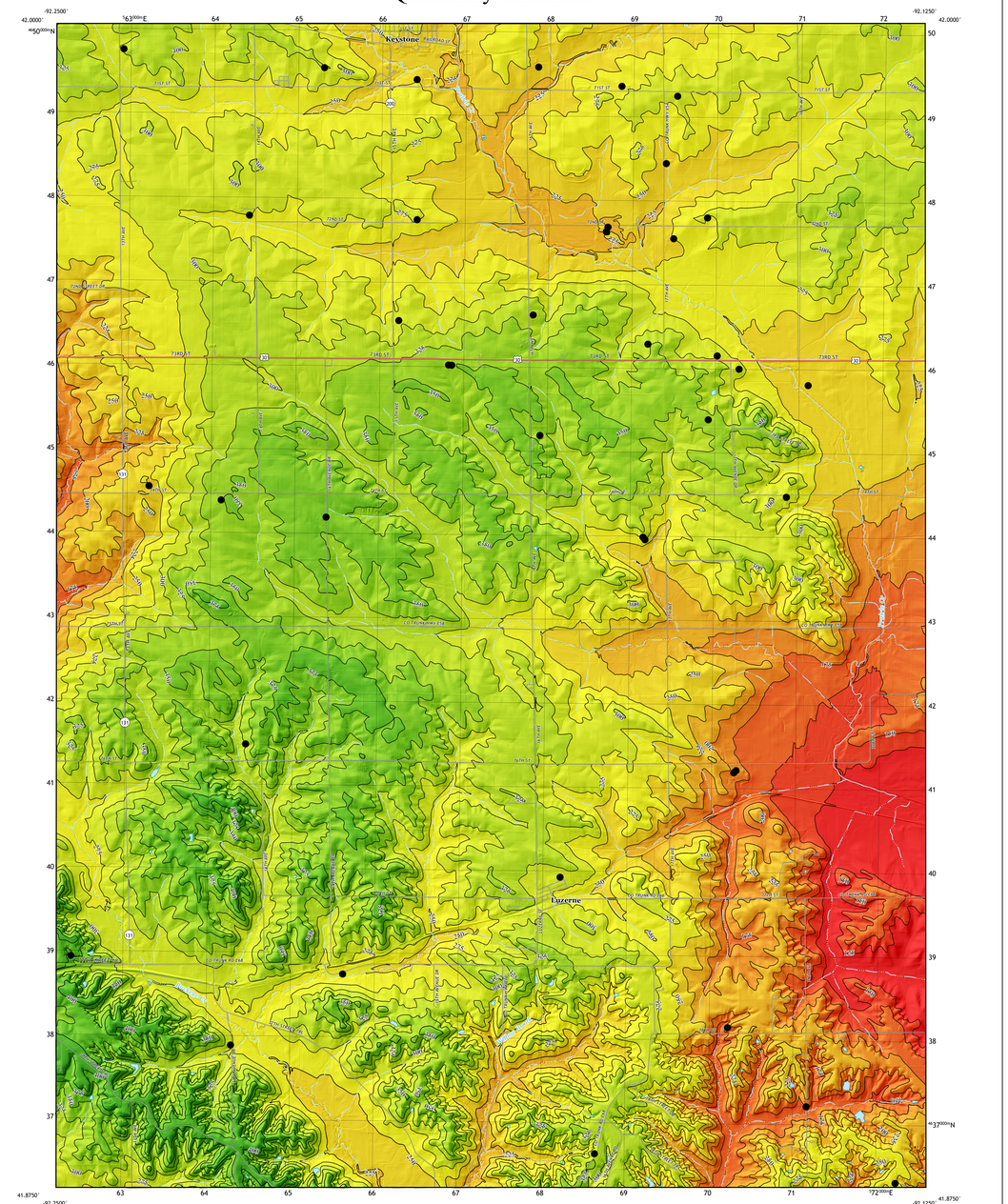
Quaternary Thickness



1:24,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

CONTOUR INTERVAL 25 FEET

1:24,000

0 0.5 1 2 Miles

0 0.5 1 2 Kilometers

CONTOUR INTERVAL 25 FEET