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NYSGS
NEW YORK State Museum

New York State Geological Survey
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DRIFT THICKNESS OF MADISON COUNTY, NEW YORK

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2024

Introduction

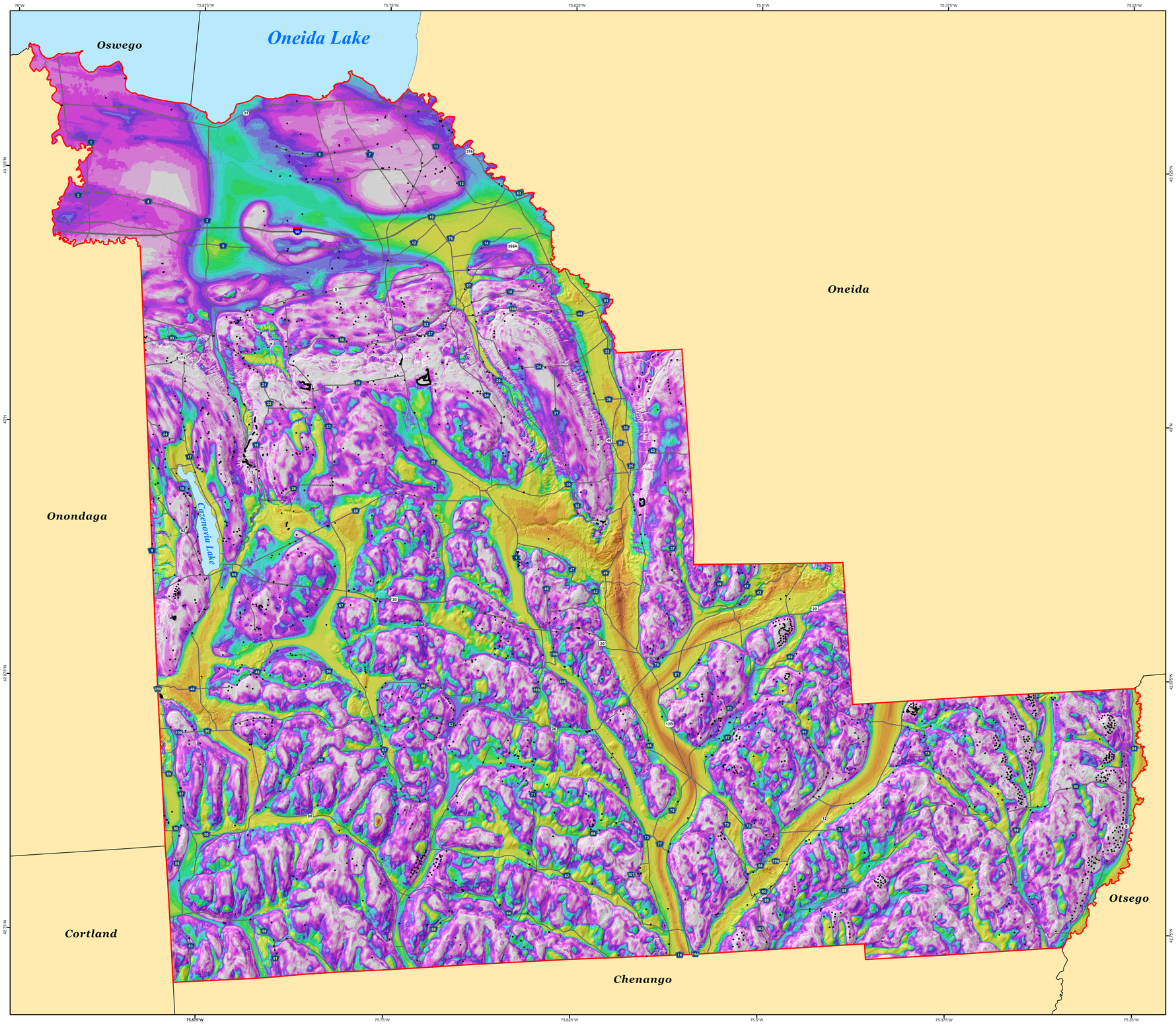
Beginning in 2019, under the guidance and funding provided by the United States Geological Survey - Great Lakes Geological Mapping Coalition (award G20AC00418), the New York State Museum - Geological Survey began a statewide effort to conduct geologic mapping of bedrock elevations throughout New York. Madison County, of Central New York, is in the physiographic provinces of the Allegheny Plateau and the central lowlands. The county is adjacent to Chenango, Cortland, Oneida, Onondaga and Oswego counties. Madison County is also located along the southern shoreline of Oneida Lake. Surficial and subsurface bedrock point data and maps were compiled from publicly available sources, vetted, and organized into a comprehensive geospatial database. A technical workflow was developed to categorize the overall geology and differentiate between the underlying bedrock and overlying unconsolidated sediments. The resulting bedrock elevation map provides a detailed representation of bedrock topography across Madison County. This map is useful for various applications, including geological studies, engineering and construction, natural resource management (such as water or mineral resources), and environmental studies.

Methodology

A total of 4,411 bedrock control points were used to delineate bedrock topography in Madison County. These points consisted of 3,182 water wells, 1,191 bedrock outcrops, 20 thruway engineering boreholes, 17 waterfall locations, and one oil and gas well. These data were compiled from a variety of public sources and imported into ESRI's ArcMap 10.8/ArcPro 3.2.2 software platform. Ground surface elevations for all control points were extracted from a compilation of three separate digital elevation models (DEM) which were resampled to match a 1-meter LIDAR DEM cell size. Bedrock elevations were calculated at each location by subtracting the depth-to-bedrock from the ground surface elevation. 50-foot bedrock elevation contours were auto-generated and manually refined through a multi-step quality control process to resolve any interpolation errors. The finalized contours were converted into a 1-meter raster, using the "Topo to Raster" tool, that represents county-wide bedrock topography. Lastly, the "Raster Calculator" tool is used to subtract the surface elevation from the bedrock elevation to determine the thickness of the drift in the county.

Summary

The New York State Museum – Geological Survey has developed a detailed Bedrock Topography Map for Madison County. This map represents a compilation of various surficial and subsurface bedrock data sources, analytical methods, and quality control procedures. The resulting bedrock elevations reveal a range of distinct geological features including a variety of Paleozoic bedrock erosional profiles, and evidence of past glaciation. These characteristics are likely the result of a variety of functions including bedrock stratigraphy, structural deformation, and erosional processes such as past glaciation and fluvial geomorphology. This map is significant for applications in geological research, engineering, natural resource management, and environmental studies. Continued research and work on subsurface geology will provide additional data and insight and enhance the geologic framework of bedrock geology throughout New York State.



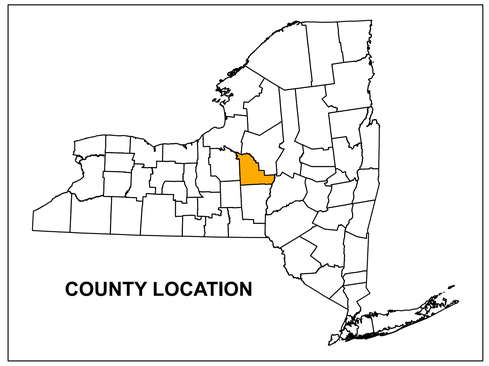
Explanation

- Data Point
- 50ft Drift Thickness Contour
- 100ft Drift Thickness Contour
- Highway
- Madison County Line
- Adjacent County
- Water Body

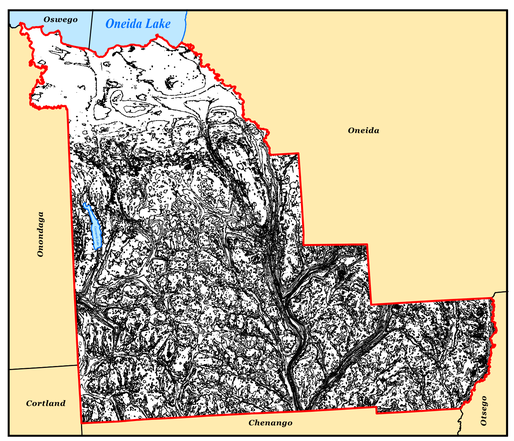
Drift Thickness

Feet Thick

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100
- 100 - 110
- 110 - 120
- 120 - 130
- 130 - 140
- 140 - 150
- 150 - 250
- 250 - 350
- 350 - 450
- 450 - 550
- 550 - 650
- 650 - 750



DRIFT THICKNESS CONTOUR MAP



Digital Data and Cartography by S. Grasing and K. Backhaus, 2022-24

Universal Transverse Mercator, Zone 18 N North American Datum of 1983

Geographic data obtained from the NYSGIS Clearinghouse (https://gis.ny.gov/)

Shaded relief from 2019 FEMA 1m lidar data set (http://gis.ny.gov/elevation/index.cfm)

SCALE 1:100,000

Kilometers 0 2.5 5 10 15 20
10,000 20,000
Meters
0 1 2 4 6 8
Miles
0 5,000 10,000 20,000 30,000 40,000
Feet

NOTICE

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program STATEMAP award number ***G20AC00418*** *in the year 2021.*

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