

DRIFT THICKNESS OF YATES 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 G20AC00401), the New York State Museum - Geological Survey began a statewide effort to conduct geologic mapping of bedrock elevations throughout New York. Yates County, of central New York, is within the Alleghany Plateau physiographic province. The county is nestled between Ontario, Seneca, Schuyler, and Steuben Counties. Yates County is also located along three large bodies of water, Canandaigua Lake, Keuka Lake, and Seneca 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 Yates 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 1,174 bedrock control points were used to delineate bedrock topography in Yates County. These points consisted of 930 water wells, 214 bedrock outcrops and 30 thruway engineering boreholes. These data were compiled from a variety of public sources and imported into ESRI's ArcMap 10.8 software platform. Ground surface elevations for all control points were extracted from a digital elevation model (DEM) which was 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. Fifty-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 Yates 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.

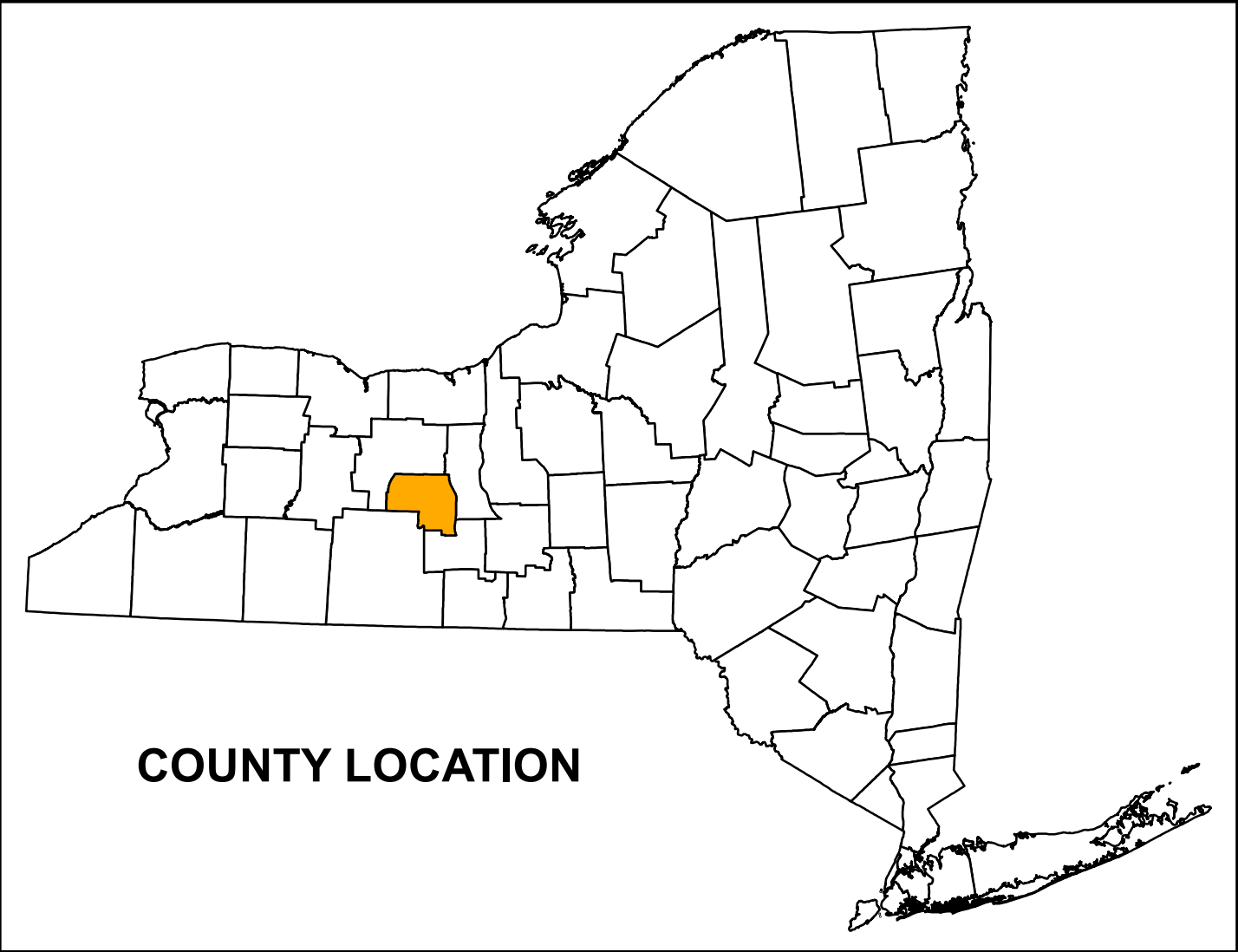
Explanation

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

Drift Thickness

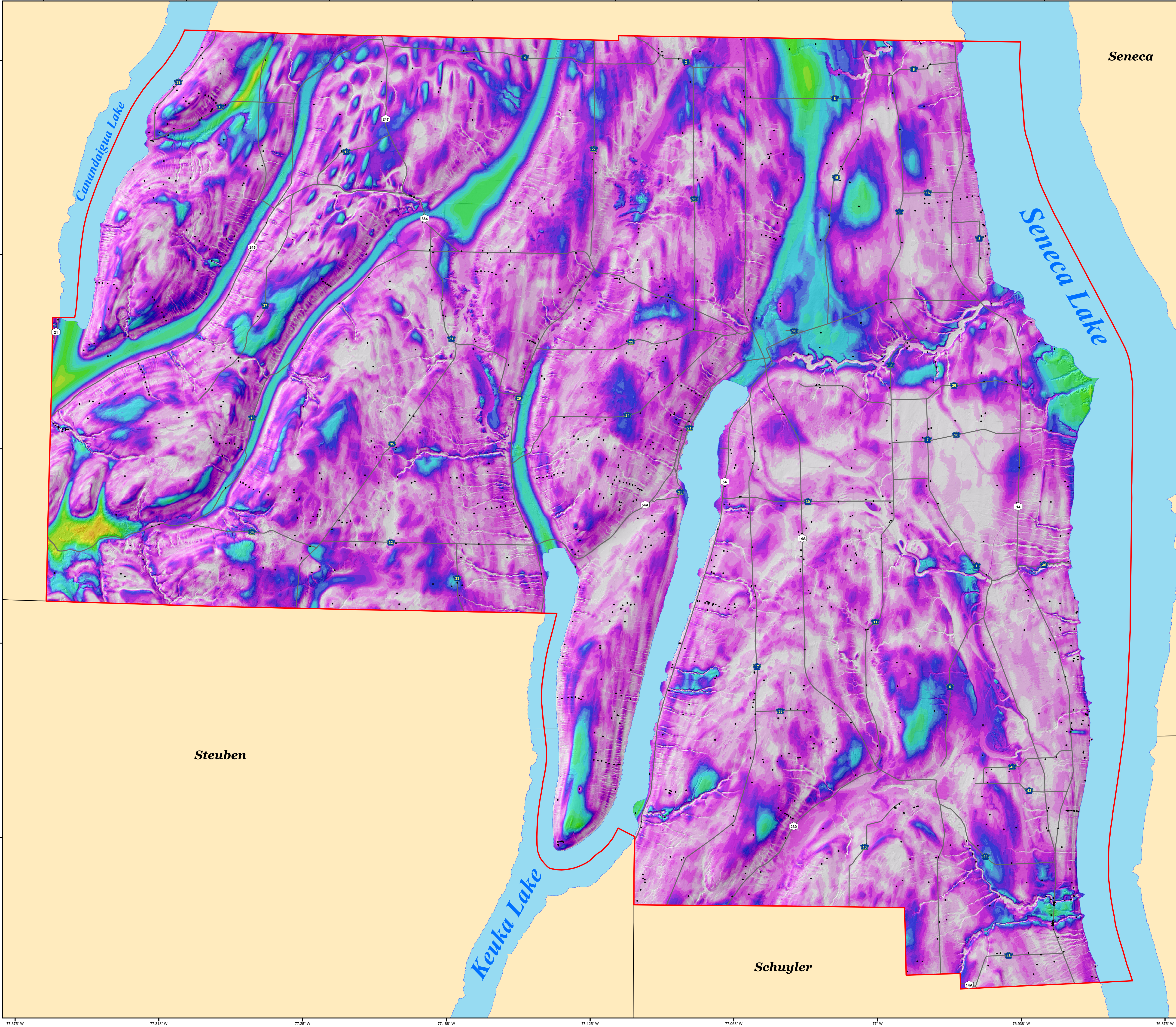
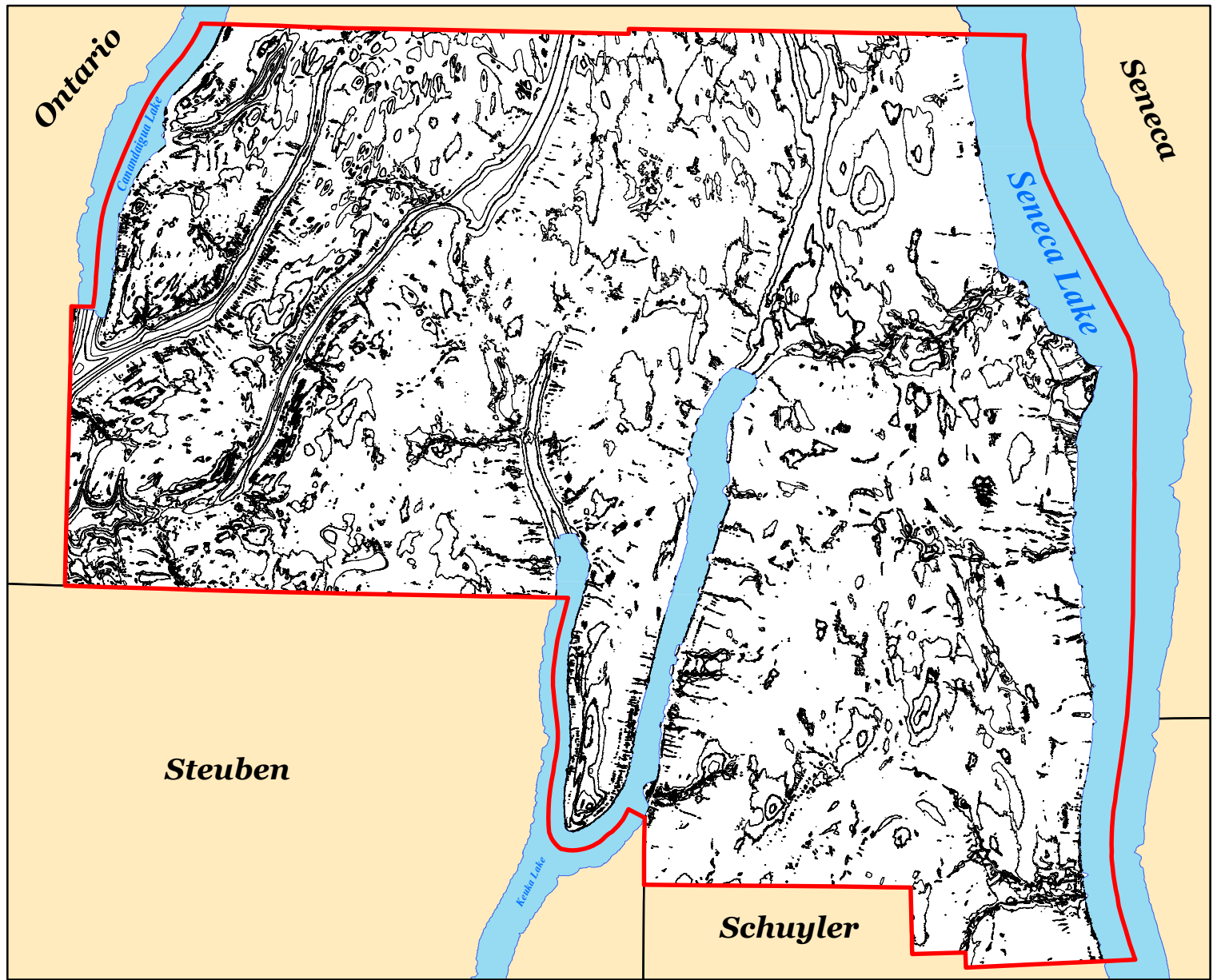
Feet Thick

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100
- 100 - 125
- 125 - 150
- 150 - 175
- 175 - 200
- 200 - 225
- 225 - 250
- 250 - 275
- 275 - 300
- 300 - 325
- 325 - 350
- 350 - 375
- 375 - 400
- 400 - 425
- 425 - 450
- 450 - 475



COUNTY LOCATION

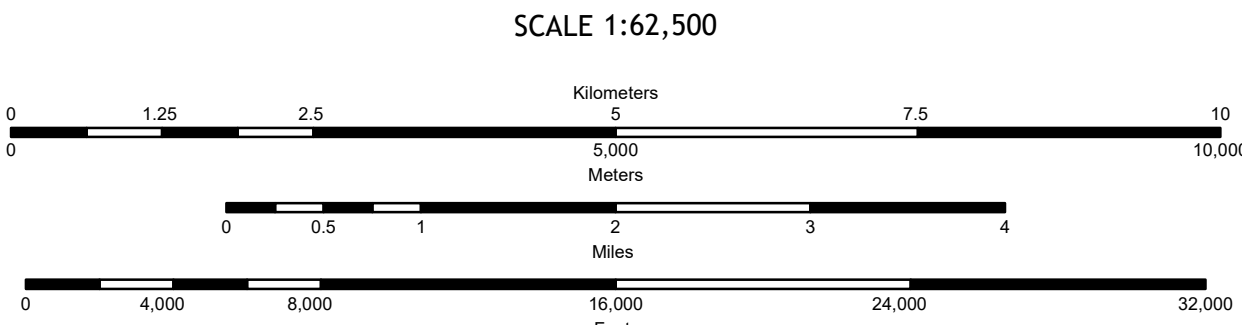
DRIFT THICKNESS CONTOUR MAP



Digital Data and Cartography by H. Forgeng, R. Frieman and K. Backhaus, 2022-24

Universal Transverse Mercator, Zone 18 N North American Datum of 1983
Geographic and hydrography data obtained from the NYSGIS Clearinghouse
(<https://gis.ny.gov/>)

Shaded relief from the 2020 Central Finger Lakes 1m and the 2019
FEMA 1m lidar datasets
(<https://elevation.its.ny.gov/arcgis/rest/services>)



NOTICE
This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program (STATEMAP award number G304020416 in the year 2021).
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