New York State Museum

New York State Geological Survey
Dr. Andrew L. Kozlowski, Director

DRIFT THICKNESS OF BROOME COUNTY, NEW YORK

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Introduction

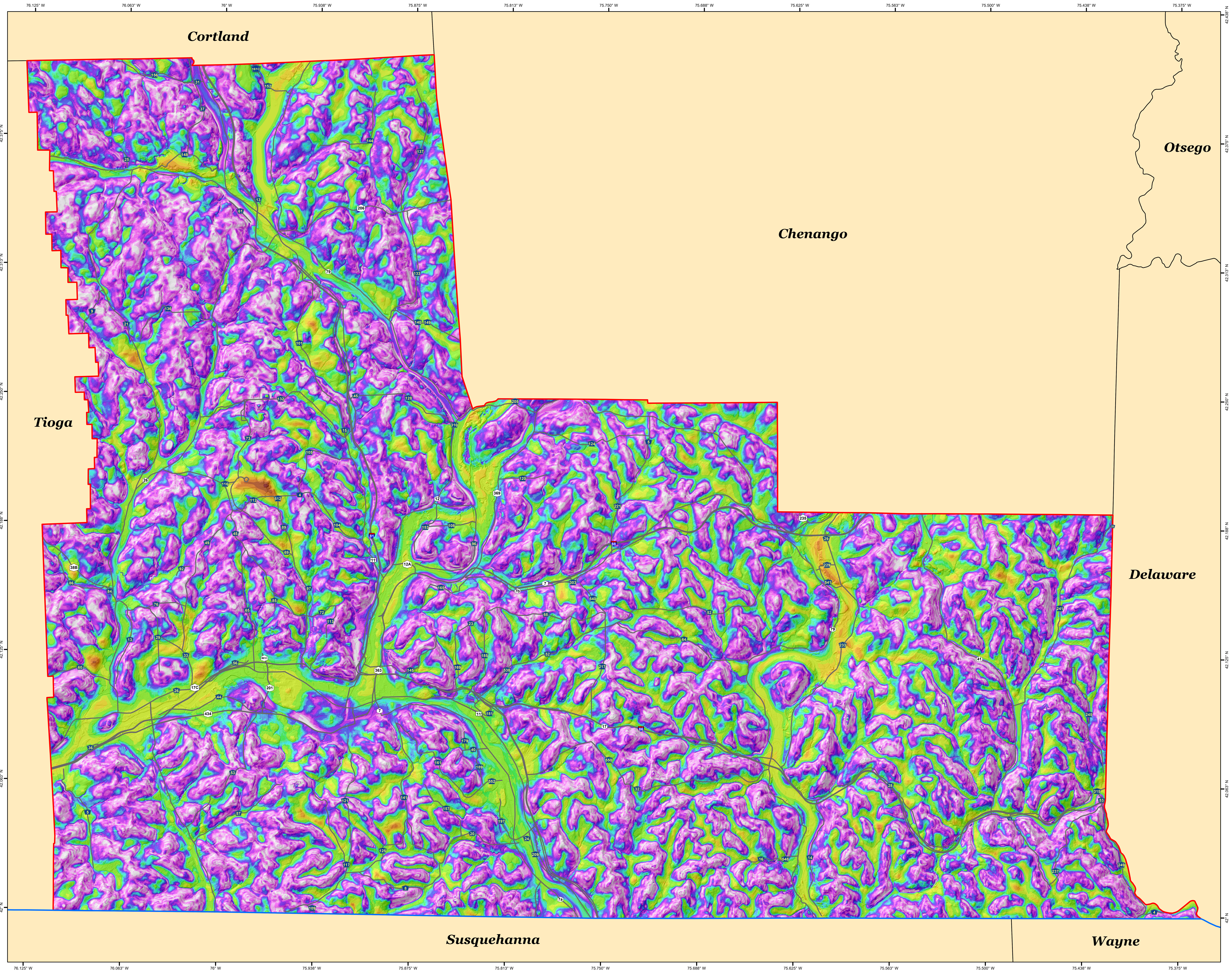
Beginning in 2019, under the guidance and funding provided by the United States Geological Survey - Great Lakes Geological Mapping Coalition (award G20AC00418), the New York State Museum - Geological Survey began a statewide effort to conduct geologic mapping of bedrock elevations throughout New York. Broome County is in the glaciated terrain that spans from the Catskill Mountains to the Allegheny Plateau physiographic provinces. The county is adjacent Chenango, Cortland, Delaware, and Tioga counties in New York and Susquehanna and Tioga counties in Pennsylvania. 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 drift thickness map provides a detailed representation of sediment thickness across Broome 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 2,286 bedrock control points were used to delineate bedrock topography in Broome County. 1,832 water wells, 72 engineering boreholes, 50 field sampling points and 12 known bedrock outcrops 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 the highest available resolution LIDAR DEM data available and subsequently resampled to a cell size/resolution of 1m x 1m. Bedrock elevations were calculated at each location by subtracting the depth-to-bedrock from the ground surface elevation. Bedrock elevation contours generated by ArcMap 10.8/ArcPro 3.2.2 at a 50-foot interval were 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, the product of which is the county-wide bedrock topography map. 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 Drift Thickness Map for Broome 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.



SCALE 1:100,000

Kilometers: 0, 2.5, 5, 10, 15, 20

Meters: 0, 10,000, 20,000

Miles: 0, 1, 2, 4, 6, 8

Feet: 0, 6,250, 12,500, 25,000, 37,500, 50,000

Digital Data and Cartography by K. Backhaus, A. Blake and J. Rogerson, 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 2019 FEMA 1m lidar data set (http://gis.ny.gov/elevation/index.cfm)

NOTICE

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

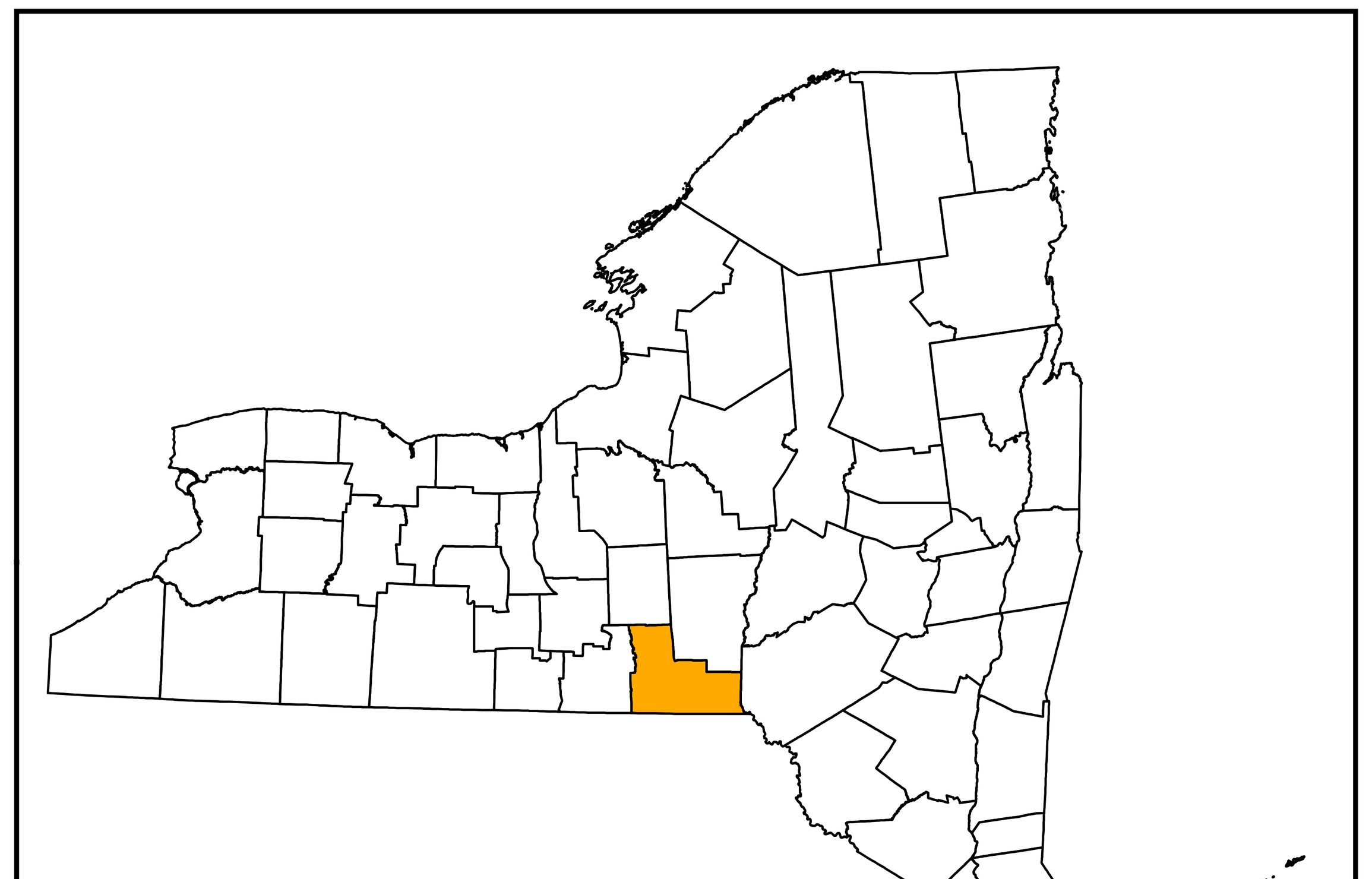
Explanation

- Data Point
- 50ft Bedrock Elevation Contour
- 100ft Bedrock Elevation Contour
- New York State Line
- Broome County Line
- Adjacent County

Drift Thickness

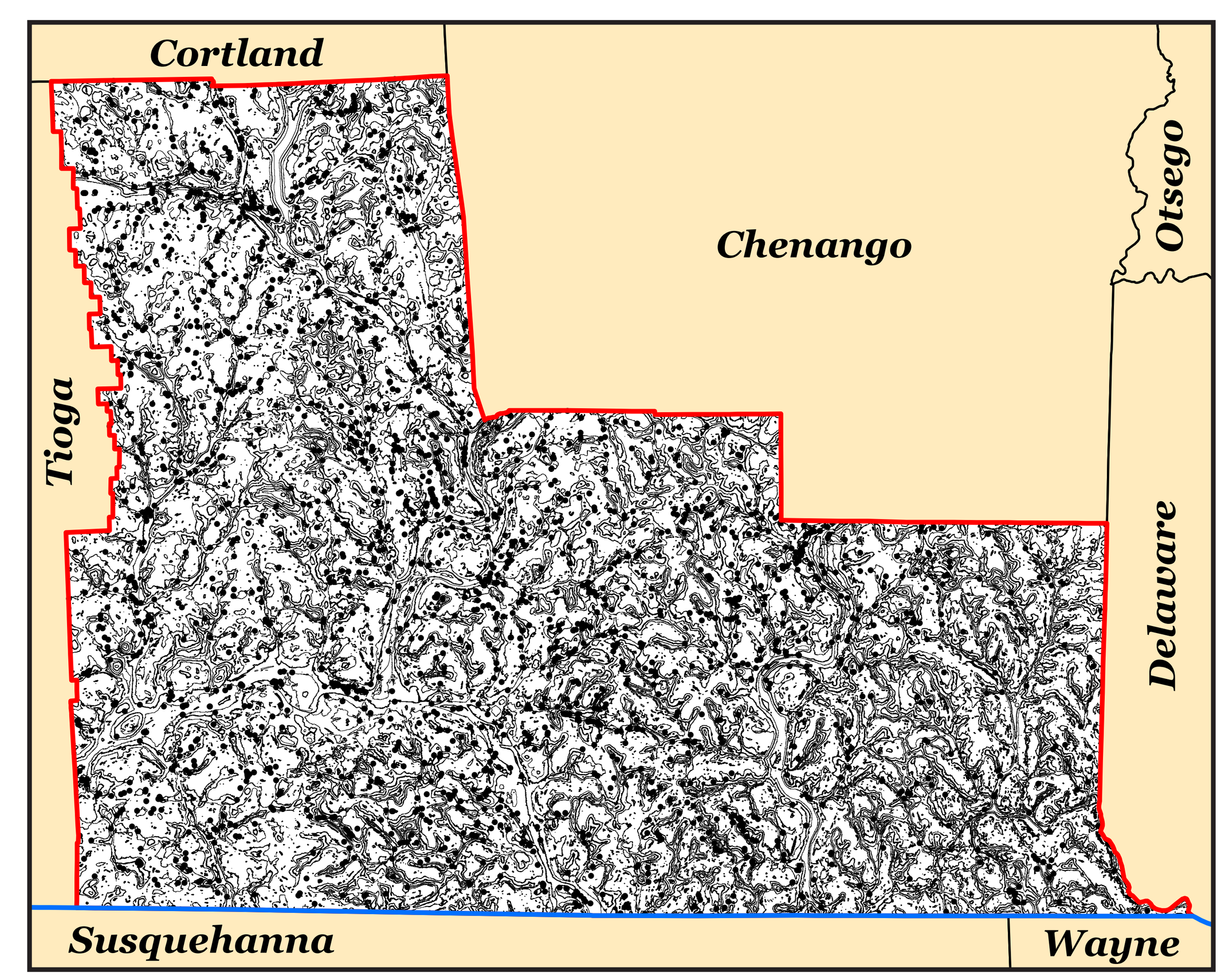
Feet Thick

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- 300 - 350
- 350 - 400
- 400 - 450



COUNTY LOCATION

DRIFT THICKNESS CONTOUR MAP



New York State Museum Map & Chart No. 228

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