

BEDROCK TOPOGRAPHY OF BROOME COUNTY, NEW YORK

Avery W. Blake, Julia E. Rogerson and Karl J. Backhaus

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. 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 bedrock elevation map provides a detailed representation of bedrock topography 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/ ArcGIS Pro 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.

Explanation

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

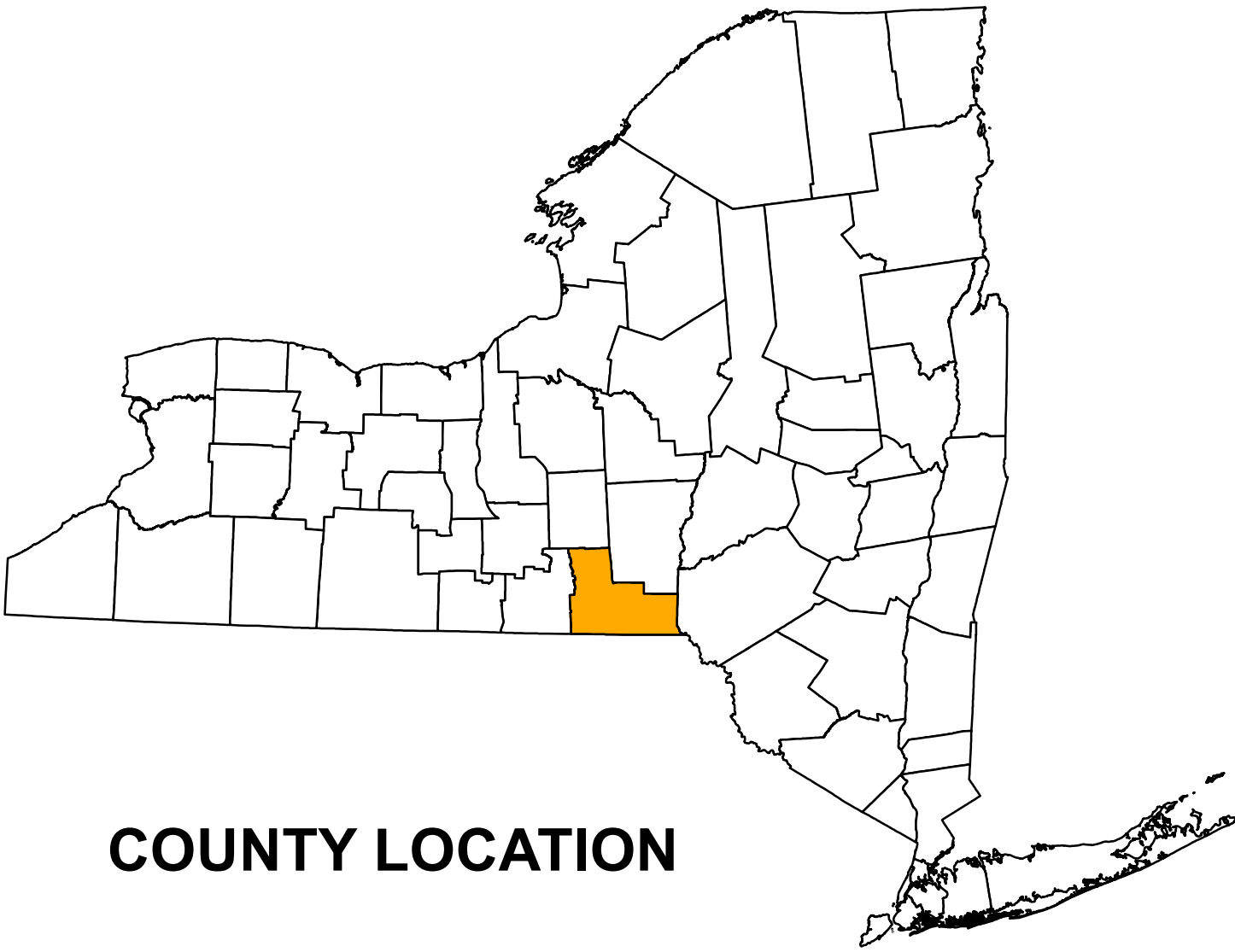
Bedrock Topography

Feet-amsl

- 600 - 650
- 650 - 700
- 700 - 800
- 800 - 900
- 900 - 1,000
- 1,000 - 1,100
- 1,100 - 1,200
- 1,200 - 1,300
- 1,300 - 1,400
- 1,400 - 1,500
- 1,500 - 1,600
- 1,600 - 1,700
- 1,700 - 1,800
- 1,800 - 1,900
- 1,900 - 2,000
- 2,000 - 2,100

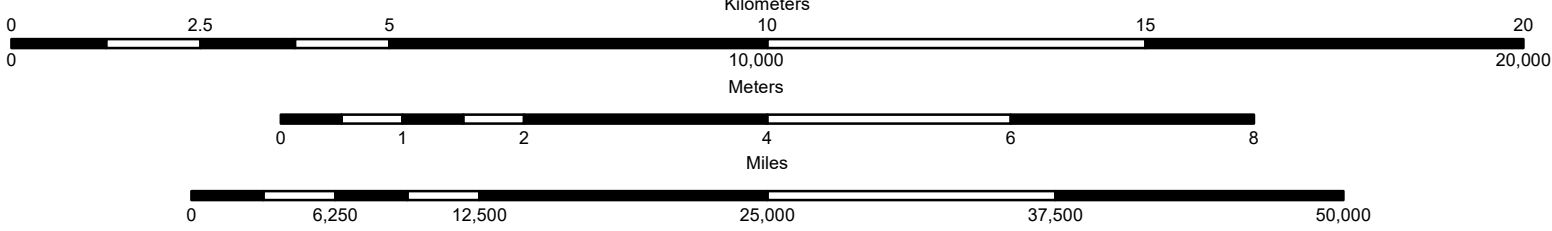
Summary

The New York State Museum – Geological Survey has developed a detailed Bedrock Topography 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.



COUNTY LOCATION

SCALE 1:100,000



NOTICE
This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program STATEMAP award number G20AC00418 in the year 2021.
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.
While every effort has been made to ensure the integrity of this digital map and the factual data upon which it is based, the New York State Education Department (NYSED) assumes no responsibility or warranty, expressed or implied, for the accuracy, completeness, suitability for any particular purpose or value of the data. Users are advised to verify the accuracy and completeness of the data and to use the data for purposes other than those for which it was originally intended. Any use of this product, or firm reliance is for descriptive purposes only and does not constitute a warranty by NYSED.

