New York State Museum & Science Service New York State Geological Survey Dr. Andrew L. Kozlowski, Mapping Program Director Mark Schaming, Director Wayne Cayuga **Yates Tompkins** Schuyler Digital Data and Cartography by K. Backhaus, 2022-23 SCALE 1:62,500 Universal Transverse Mercator, Zone 18 N North American Datum of 1983 Geographic and hydrography data obtained from the NYSGIS Clearinghouse: The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily presenting the official policies, eith 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 Departmer ("NYSED") makes no representation or warranty, expressed or implied, with respect to its accuracy, completeness, or usefulness for any particular purpose or scale NYSED assumes no liability for damages resulting from the use of any information, apparatus, method, or process disclosed in this map and text, and urge independent sitle-specific verification of the information contained herein. Any use of trade, product, or firm names is for descriptive purposes only and does no imply endorsement by NYSED.

BEDROCK TOPOGRAPHY OF SENECA 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 G20AC00401), the New York State Museum - Geological Survey began a statewide effort to conduct geologic mapping of bedrock elevations throughout New York. Seneca County, of central New York, extends from the Erie-Ontario Lowlands to the Allegheny Plateau physiographic provinces. The county is nestled between Cayuga, Ontario, Schuyler, Tompkins and Wayne counties. Seneca County is also located along two large bodies of water, Cayuga 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 Seneca 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

Explanation

Seneca County Line

Bedrock Topography

750 - 800

850 - 900

900 - 950

950 - 1,000

1,000 - 1,050

1,100 - 1,150

1,150 - 1,200

1,300 - 1,350

1,350 - 1,400

1,400 - 1,450

1,500 - 1,550

1,550 - 1,600

A total of 999 bedrock control points were used to delineate bedrock topography in Seneca County. These points consist of 936 water wells, 21 waterfall locations, 20 engineering boreholes, 20 known bedrock outcrops and two exploratory 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 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.

Summary

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



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