New York State Museum
Mark Schaming, Director

NYSGS
NEW YORK State Museum

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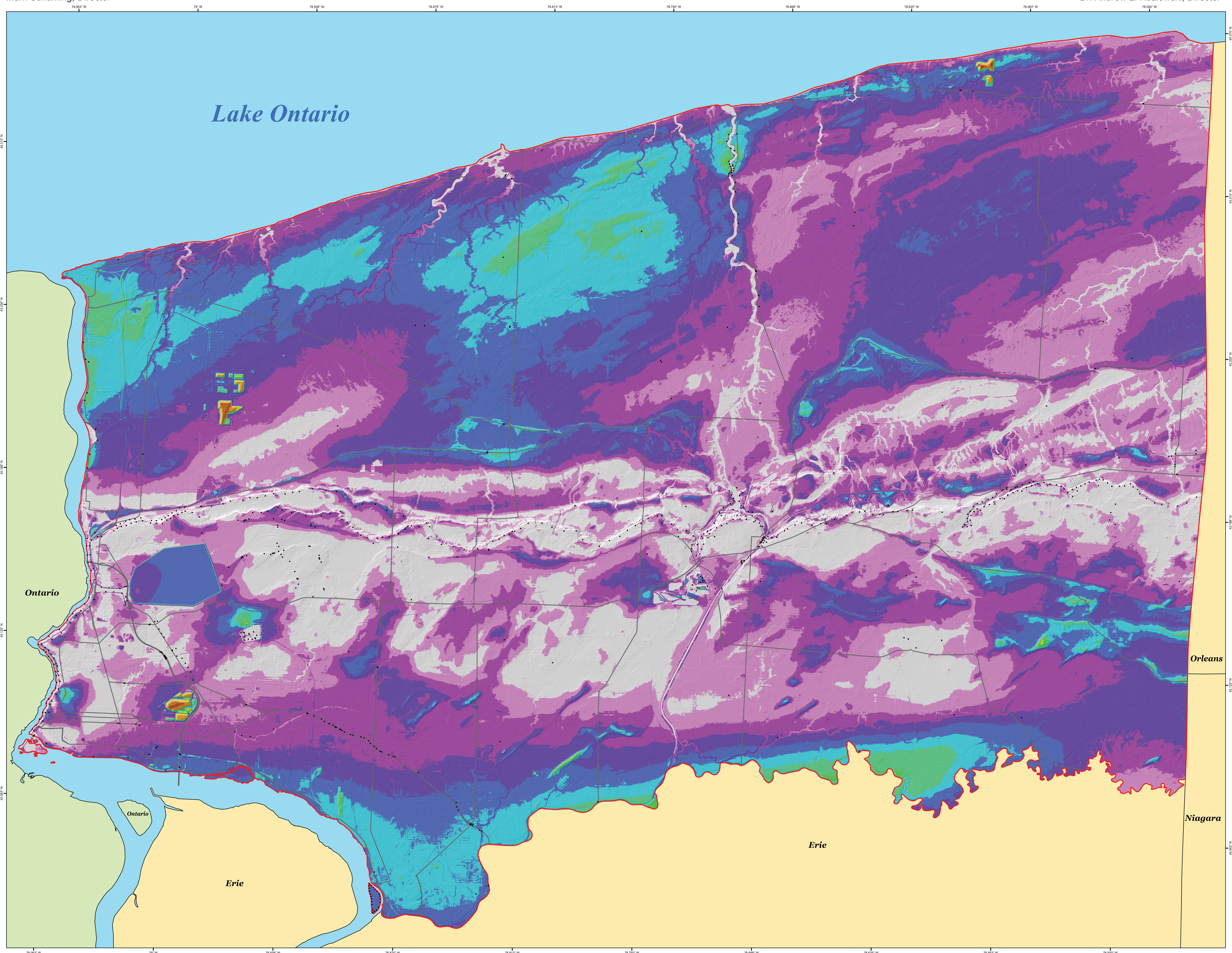
DRIFT THICKNESS OF NIAGARA COUNTY, NEW YORK

Hailey M. Forgeng and Akeed Alrubay

2024



Digital Data and Cartography by H. Forgeng, K. Backhaus and A. Alrubay, 2022-23.

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 1-meter lidar data sets by FEMA
(http://gis.ny.gov/elevation/index.cfm)

SCALE 1:62,500

Kilometers: 0, 1.5, 3, 6, 9, 12
Meters: 0, 6,250, 12,500
Miles: 0, 0.5, 1, 2, 3, 4
Feet: 0, 4,000, 8,000, 16,000, 24,000, 32,000

NOTICE

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

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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. Niagara County, of northwestern New York, lies within the Erie-Ontario Lowlands physiographic province. The county is north of Erie County and west of Orleans and Genesee Counties, with Canada's Ontario Province to the west. Niagara County is also bordered by Lake Ontario to the north. 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 Niagara 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 437 bedrock control points were used to delineate bedrock topography in Niagara County. These points consisted of 114 water wells, 159 thruway engineering boreholes, 139 bedrock outcrops, and 25 waterfall locations. 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 Niagara 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.

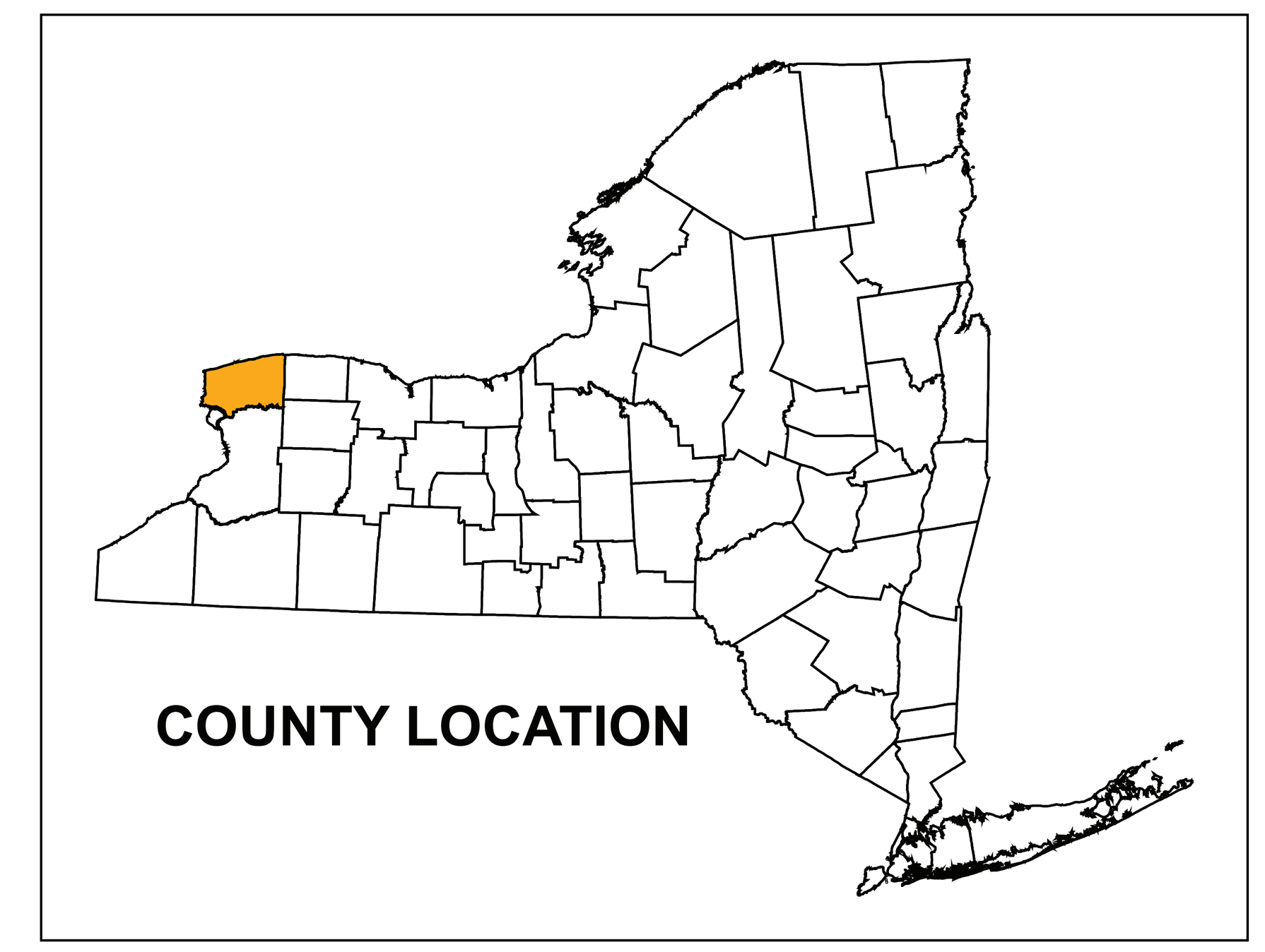
Explanation

- Data Point
- 50ft Drift Thickness Contour
- 100ft Drift Thickness Contour
- Highway
- Niagara County Line
- Adjacent County
- Canadian Province
- Water Body

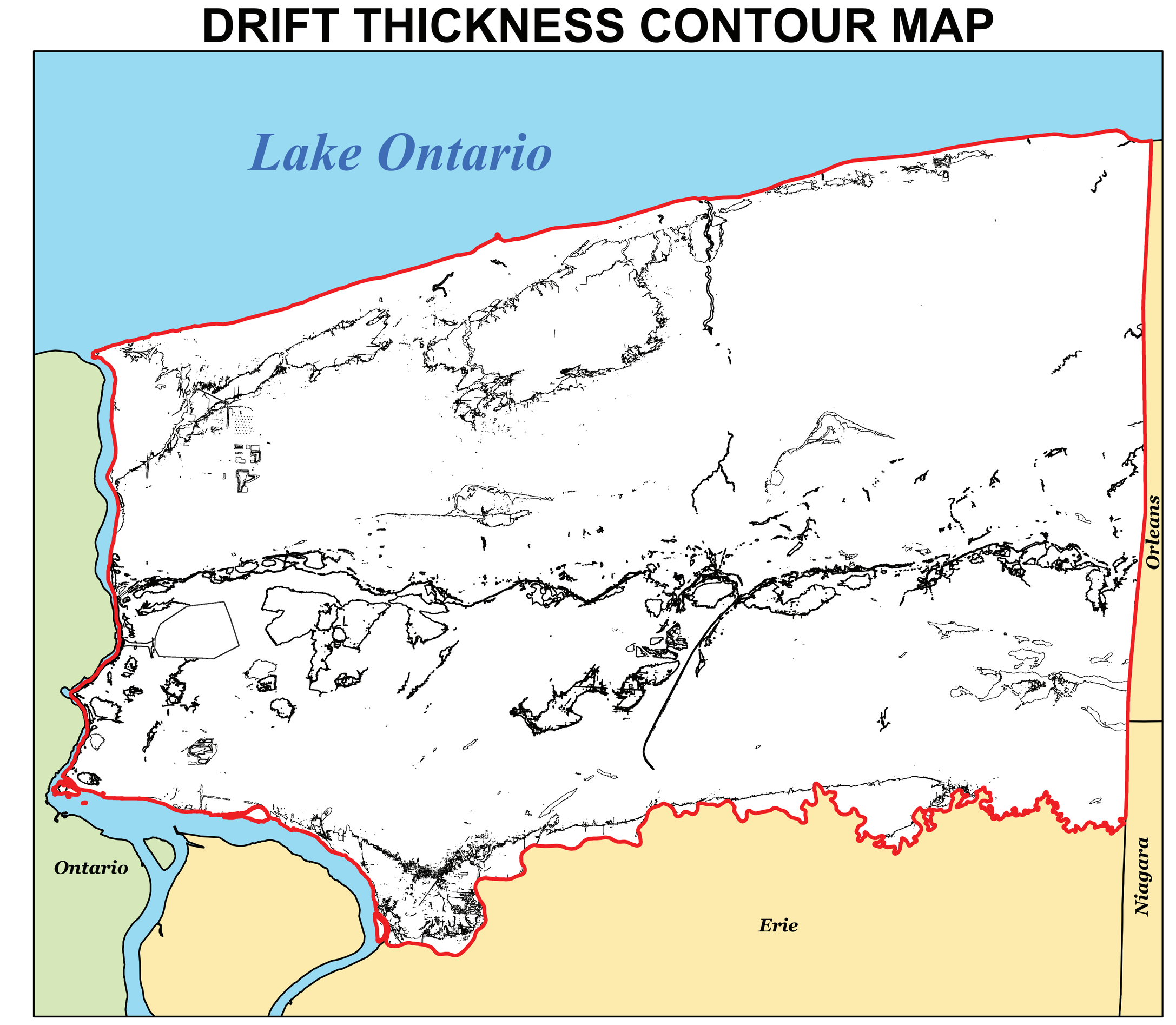
Drift Thickness

Feet Thick

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100
- 100 - 150
- 150 - 200
- 200 - 250



DRIFT THICKNESS CONTOUR MAP



New York State Museum Map & Chart No. 184
ISSN:0097-3793 ; ISBN:978-1-55557-438-3