

SURFICIAL GEOLOGY OF THE MECKLENBURG 7.5-MINUTE QUADRANGLE, SCHUYLER AND TOMPKINS COUNTIES, NEW YORK

prepared by
Karl J. BackhausSupported in part by the U.S Geological Survey Cooperative Agreement Numbers G20AC00418 and G22AC00366
National Cooperative Geologic Mapping Program (STATEMAP)**SUMMARY AND CONCLUSIONS: Continued...**

At the lowest elevations along these creeks, silty fine to medium sand deposits (Ps) were identified adjacent to or just above the modern floodplain. At stop MBG-23-120, located along State Route 228 above Taughannock Creek near the western edge of the mapping area, stratified sand, and gravel with massive beds of fine to medium sand were observed. An Optically Stimulated Luminescence (OSL) sample was collected at this site and may aid in constraining the timing of the ice retreat in the former Glacial Lake Cayutaville basin. The deposits at this location are interpreted to be the final remnants from the retreating Ontario Lobe. Additional evidence supporting this interpretation was found throughout the valley traversed by State Route 228, where more sand, sandy gravel, and glaciolacustrine deposits were discovered atop glacial till, bounded by a significant moraine to the south-west. In the quadrangle's extreme northwest corner, a small deposit of cemented sand and gravel (Pcsg) was located adjacent to a past ice-marginal position in the Finger Lakes National Forest. These Pscg deposits, formed from ice-contact meltwater, are similar to those found in adjacent quadrangles.

While the topography gradually rises in elevation towards the south-central portion of the Mecklenburg quadrangle, the surface is predominantly flat-lying and dissected by modern stream channels. The region features six principal east-west ice marginal landforms: the Mecklenburg, Beck Road, Perry City, Aiken, Black Oak, and Cayutaville Moraines, ordered from north to south. These moraines are comprised of clast-supported diamictom (Pdcs), deposited over previously deposited glacial till (Pd), while the Enfield Moraine is distinctly classified as a kame moraine comprised of ice-contact sand and cobbles. Streamlined landforms are only present between the Aiken and Black Oak moraines, suggesting a possible surge event during one of the Ontario Lobe's southward advances. Towards the southern mapping area, the terrain becomes mountainous and is draped with hummocky topography featuring ice-contact cobbles and sand, clast-supported diamictom, and medium sand and gravel. Within the deposits just north of Cayutaville Road lies a lone, kame deposit, characterized by bedded medium sand interspersed with subrounded gravel clasts.

Upon completion of field mapping within this portion of the Mecklenburg quadrangle, the geomorphic features and distribution of deposits suggests that the expansive glacial till and defined ice margins are likely due to the retreat of the Ontario Lobe to the north. Evidence for a previously undefined glacial lake, named by the authors as Glacial Lake Cayutaville, was discovered in the southwest quadrant. This former glacial lake basin partially overlaps with the current Cayuta Lake basin and is surrounded by extensive swamp deposits. The small patch of isolated drumlins in the central mapping area may suggest a minor readvance from the Aiken Moraine to the Black Oak Moraine, however, more evidence is necessary to accurately determine the overall timing of the advance and recession of the ice sheet in this area.

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DESCRIPTION OF MAP UNITS

Holocene

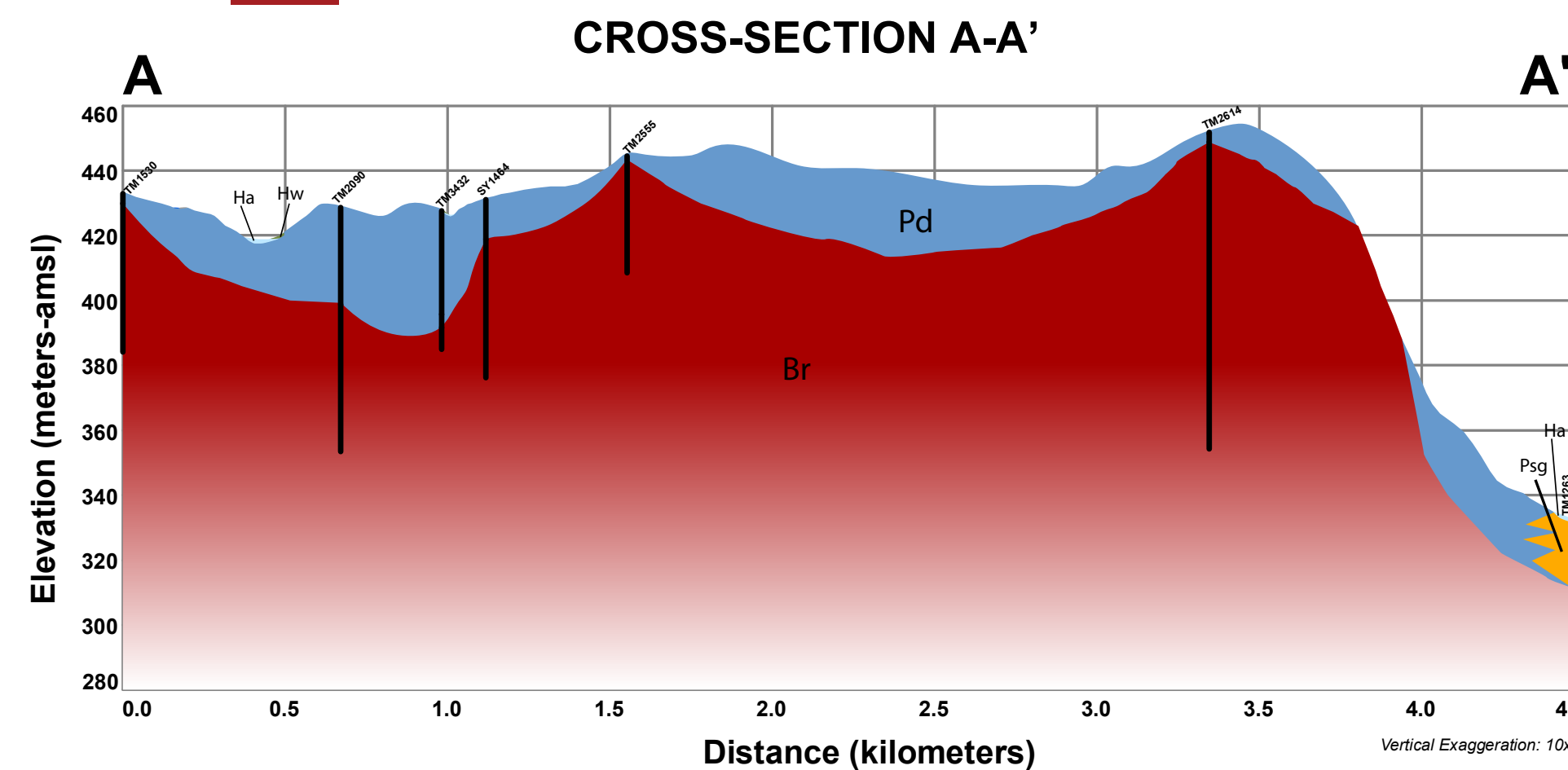
Af	Artificial fill (Af)
This unit is generally comprised of coarse-to-fine materials, such as large cement mounds and/or crushed rock, which have been anthropogenically transported and used for construction purposes.	
Ha	Stratified silt, sand, and gravel (Ha)
Sorted and stratified silt, sand, and gravel, deposited by rivers and streams. May include cobbles and boulders. Inferred as post-glacial alluvium and includes modern channel, over-bank and fan deposits.	
Hw	Wetland deposit (Hw)
Peat, muck, marl, silt, clay, or sand deposited in association with wetland environments. Various sediments can be present at transitional boundaries from one facies to another.	
Hdc	Diamict colluvium (Hdc)
Unsorted and unstratified deposit of gravel, sand, silt, and clay, with boulders/cobbles possible. Described as a mass-wasting deposit at the base of steep hillslopes and cliffs that was formed as part of a slump or landslide failure.	

Pleistocene

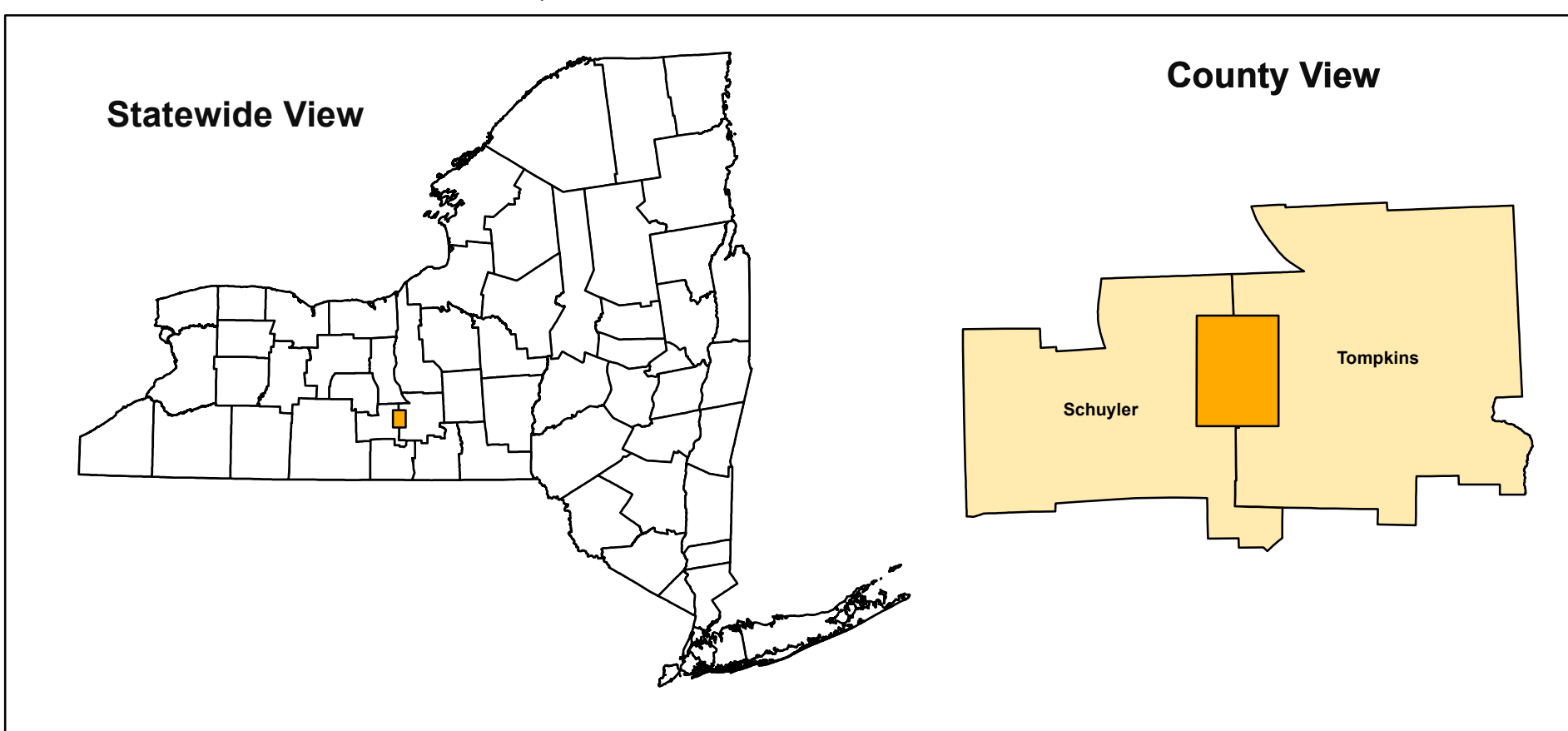
Plsc	Silt and clay (Plsc)
Stratified, fine-grained sediment consisting of fine sand, silt, and clay-size particles. Inferred to have been deposited in mid-shore to deep water settings of glacial lakes. May include marl, rhythmites, and varves.	
Pics-lw	Ice contact silt and clay (Pics-lw)
Stratified, fine-grained sediment consisting of fine sand, silt, and clay-size particles. Constrained to isolated pockets and inferred to have been deposited in circular depressions within or upon former ice sheets.	
Ps	Stratified sand (Ps)
Well-sorted and -stratified sand deposited by fluvial, lacustrine, or eolian processes. Inferred to be deposits associated with distal glacial environments.	
Psg	Stratified sand and gravel (Psg)
Well-sorted and -stratified sand and gravel. May include cobbles and boulders. Inferred to be delta, fan, or lag deposits in glacial channels or near former ice margins.	
Pcsg	Cemented sand and gravel (Pcsg)
Poorly-sorted and matrix-supported sand and gravel in most locations. Matrix consists of well-sorted sands cemented with well-developed calcite or silicate rinds surrounding clasts. Clasts are predominantly from local Paleozoic bedrock but include exotic lithologies such as granite and gneiss and range widely in size from pebble to cobble. Inferred to be subaqueous or proglacial outwash deposits.	
Pics	Cobbles to sand (Pics)
Stratified ice contact deposits: variable coarse-grained sediment consisting of boulders to sand-size particles. Inferred to have been deposited along an ice margin. May include interbedded coarse lenses of gravel and clast-supported diamictom (flow till).	
Pd	Matrix-supported diamictom (Pd)
An admixture of unsorted sediment ranging from clay to boulders. Generally matrix-supported, massive and clast-rich.	

Pre-Pleistocene

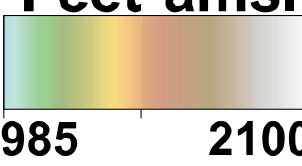
Br	Bedrock (Br)
Non-glacially derived hard rock, pre-Pleistocene in age. May be covered by up to a meter with diamictom, sand and gravel, or sand and clay in areas marked as Br.	

**SYMBOLS**

—	Street	~	Stream	+	NYSDEC Water Well Location
—	Highway	~	Contour	+	NYSDEC Boring Location
—	Airport Runway	—	Cross-Section Line	+	NYSDEC Oil & Gas Well Location
—	County Line	•	NYSOG Soil Sample Location	+	Drumlins
—	Water Body	~	Ice Margin		

QUADRANGLE LOCATION**ADJOINING QUADRANGLES**

Lake	Trompsburg	Lake
Burrill	Mecklenburg	Black Oak
Montrose Falls	Alpine	West Cayuga

Feet-amsl1:75,000 scale; 2x vertical exaggeration
Shaded relief generated from 2020 Central Finger Lakes 1-meter Lidar data set by the New York State Group Purchasing Organization**New York State Museum Map & Chart No. 142**
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