New York State Museum & Science Service

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

BEDROCK GEOLOGY OF THE GLENFIELD 7.5-MINUTE QUADRANGLE LEWIS COUNTY, NEW YORK

prepared by
Richard A. Frieman and Karl J. Backhaus

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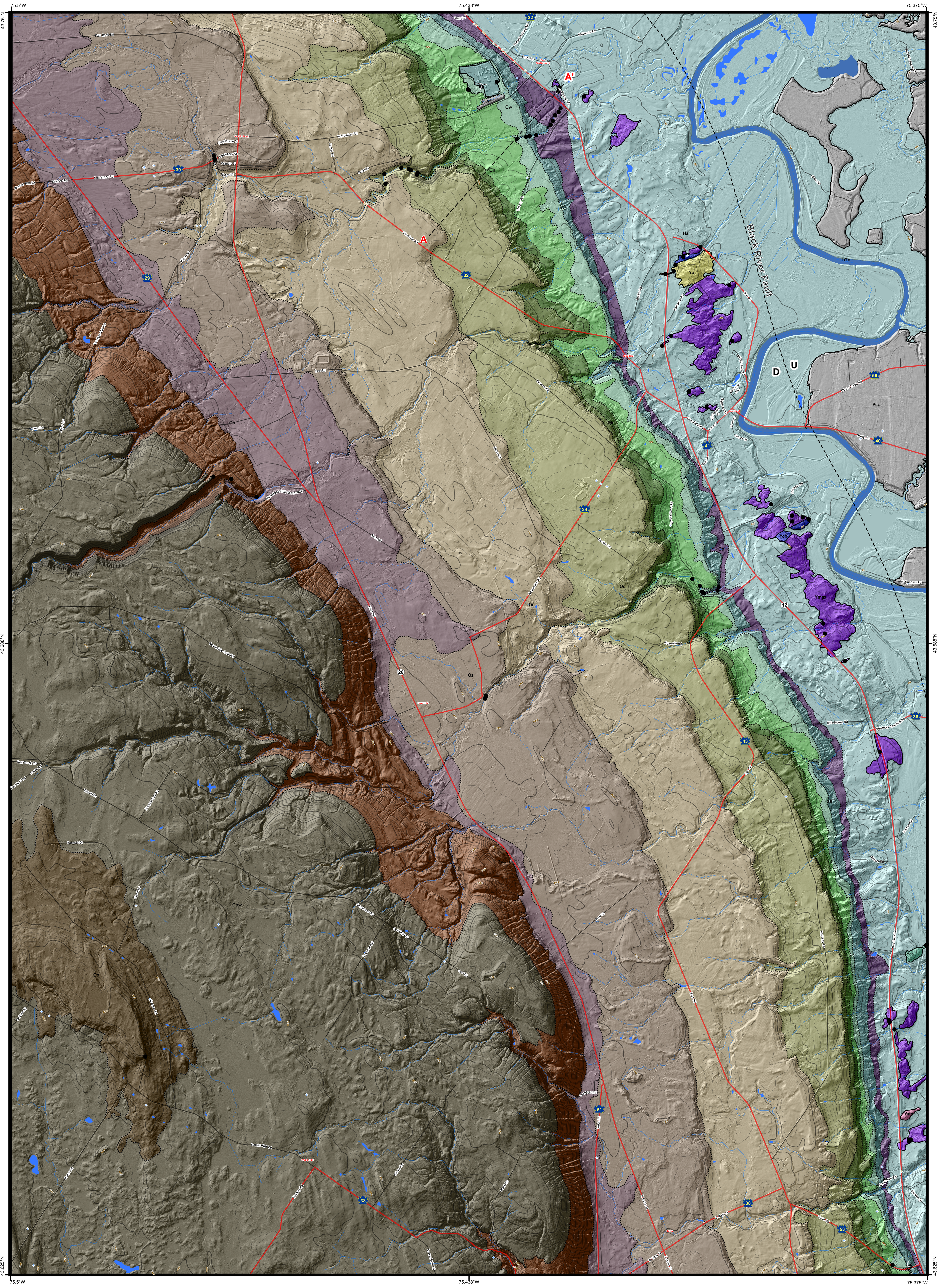
National Cooperative Geologic Mapping Program (STATEMAP)



Universal Transverse Mercator, Zone 18 N
North American Datum of 1983

Hydrology, and planimetry layers from the New York State DOT Raster Quadrangle separates for Lewis County
(https://gis.ny.gov/gisdata/inventories/member.cfm?OrganizationID=108)

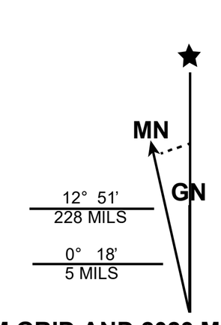
Geographic data layers from 2023 TIGER/Line shapes for transportation and hydrograpghy (https://www.census.gov/cgi-bin/geo/shapefiles/index.php)

Shaded relief from 2019 FEMA and 2022 Lake Ontario/Hudson Rover1m lidar data sets
(http://gis.ny.gov/elevation/index.cfm)

Magnetic declination from the NOAA online Declination Calculator:
(http://www.ngdc.noaa.gov/geomag-web/#declination)

SCALE 1:24,000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1 MILES
1000 500 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 FEET
CONTOUR INTERVAL: 10 FEET

Geologic mapping by R. Frieman, 2023-24
Digital data and cartography, R. Frieman and K. Backhaus, 2022-24



UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

DESCRIPTION OF MAP UNITS

Holocene

Af — **Artifical 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 to be post-glacial alluvium and includes modern channel, over-bank and fan deposits.

Pleistocene

Pcc — **Pleistocene cover over Adirondack province crystalline rock (Pcc)**
Unconsolidated glacial sediments covering and obscuring direct observation of buried Adirondack-related metamorphic and igneous rock. May include various glacial deposits such as sand, sand and gravel, diamicton, and silt and clay.

Late Ordovician
Ungrouped Formations

Oo — **Oswego Formation (Oo)**
Massive, gray, fine grained quartz sandstone with few thin shale partings. Cross bedding abundant, and may contain other sedimentary structures, including sole markings. Can exceed 30m thick in some localities. Fossils absent. Interpreted as having been deposited in a high energy, nearshore environment.

Lorraine Group

Opw — **Whetstone Gulf Formation (Opw)**
Dark gray to black shale with minor fine sand laminations. Coarsening upwards. Up to 65m thick. Contains sparse fossils. Interpreted as a shallowing sequence following the deeper water deposition of the Utica Shale.

Ou — **Utica Shale (Ou)**
Black to gray, fissile to massive shales and calcareous mudstone. Up to 230m thick. Graptolites common, trilobites sparse. Deposited in the distal, deep regions of the basin.

Trenton Group

Oh — **Hillier Limestone (Oh)**
Wavy-bedded argillaceous calcarenite and nodular wackestones with interbedded shales.

Os — **Steuben Formation (Os)**
Dark gray, medium- to coarse-grained, massive crinoidal limestone with minor shale partings. Up to 8m thick. May contain abundant crinoids, brachiopods, gastropods, and trilobites, as well as corals somewhat less commonly. Deposited within range of wave base, in a subtidal, energetic environment.

Or — **Rust Formation (Or)**
Formerly the Rust Member of the Cobourg Formation. Nodular-to-wavy-bedded coarse-grained packstones and grainstones. Includes a wide variety of fauna, such as trilobites, echinoderms, crinoids, and brachiopods, among others. Within the Mill Dam member of the Rust Formation, large-scale ripple marks can be observed. Deposition of the Rust Formation occurred at a shallower depth than the underlying Denley Formation, but it includes several internal shallowing-upward cycles.

Od — **Denley Formation (Od)**
Sequence of dark gray fine-grained to very fine-grained limestones and argillaceous limestones interlayered with dark grey, laminated calcareous shales. Up to 70m thick. Brachiopods, bryozoans, trilobites, cephalopods, and crinoids present. Deposited in a deep shelf, subtidal environment; possibly turbiditic or storm-influenced sedimentation.

Osr — **Sugar River Formation (Osr)**
Dark gray to black, thinly- to medium-bedded, fine- to medium-grained fossiliferous limestones; dark gray, thinly-laminated calcareous shales. Up to 16m thick. Diverse fauna include bryozoans, crinoids, trilobites, and brachiopods. Interpreted as having been deposited in a subtidal, quiet shelf environment.

Okf — **Kings Falls Formation (Okf)**
Dark gray, medium- to thickly-bedded, coarse-grained fossiliferous limestones with a primarily micrite matrix; thinly-bedded calcareous shales; interlayered fossiliferous limestones and coquina. Up to 20m thick. Lower portion brachiopod dominated including some corals; upper portion bryozoan dominated including trilobites, gastropods, and crinoids. Depositional environment transitions from subtidal offshore shoal (concentrating fossil fragments) to a shallow shelf.

On — **Napanee Formation (On)**
Unconformably overlying top of Black River Group formations. Interbedded fine-grained limestones with dark gray, thinly-laminated calcareous shale. Up to 6m thick. Fossil fragments sparse, with low diversity. Deposited in a subtidal, shallow shelf to lagoonal environment.

Black River Group

Ow — **Watertown Limestone (Ow)**
Dark gray, thickly-bedded, fine-grained limestone including fossil fragments floating in a micrite matrix. Often includes chert nodules. Up to 3m thick. Fossils abundant; nautiloids, stromatolites, and coral fragments reworked by biogenic activity as indicated by the presence of horizontal burrows. Deposited in a subtidal, flat-bottomed nearshore environment.

Ol — **Lowville Formation (Ol)**
Pale to medium gray, thinly-bedded, fine to coarse limestones interbedded with dark gray, fine-grained stylolitic or fossiliferous limestones; medium to dark gray, lumpy-bedded, coarse bioclastic limestones; and fine- to medium-grained dolomitic sandstones. Up to 18m thick. Fossiliferous intervals include trilobites, ostracodes, corals, gastropods, bryozoans, and pelecypods. Interpreted as having been deposited in oscillating environments, including restricted intertidal mudflats; protects subtidal lagoons and channels and aerated shoals seaward of the lagoons.

Op — **Pamelia Formation (Op)**
Primarily fine-to medium-grained dolomitic sandstones. Thinly- to medium-bedded, wavy- to thinly-laminated and can include mudcracks. Up to 6m thick. Fossils rare; ostracodes, trilobites, and vertical burrow trace fossils have been observed. Deposited in a supratidal dolomitic mudflat environment along a passive paleo-shoreline. In the Black River Valley, thins to the south where it pinches out and the overlying Lowville Formation directly overlies Precambrian basement.

Middle Proterozoic
Ungrouped Formations

Ymgs — **Metagranite and Metasyenites (Ymgs)**
Light gray to pink to reddish, fine- to medium- to coarse-grained, mesoperthite + quartz + hornblende + biotite + plagioclase ± clinopyroxene gneiss. Foliation is highly variable from non-foliated to strongly-foliated. Foliation development depends on modal abundance of mafic minerals. Mafic-rich lithologies are strongly foliated; mafic-free rocks show no obvious foliation, and are described as alaskites or leucogranites. Modal abundance of quartz varies from less than 5% (metasyenite) to 5-20% (meta-quartz syenite), to greater than 20% (metagranite). Commonly contains layers of amphibolite ranging in width from a few centimeters to 10m; not mappable at this scale. Contacts with amphibolite are sharp. Foliation-parallel milky quartz veins and granitic pegmatites common. Cross-cutting granitic pegmatites occur locally.

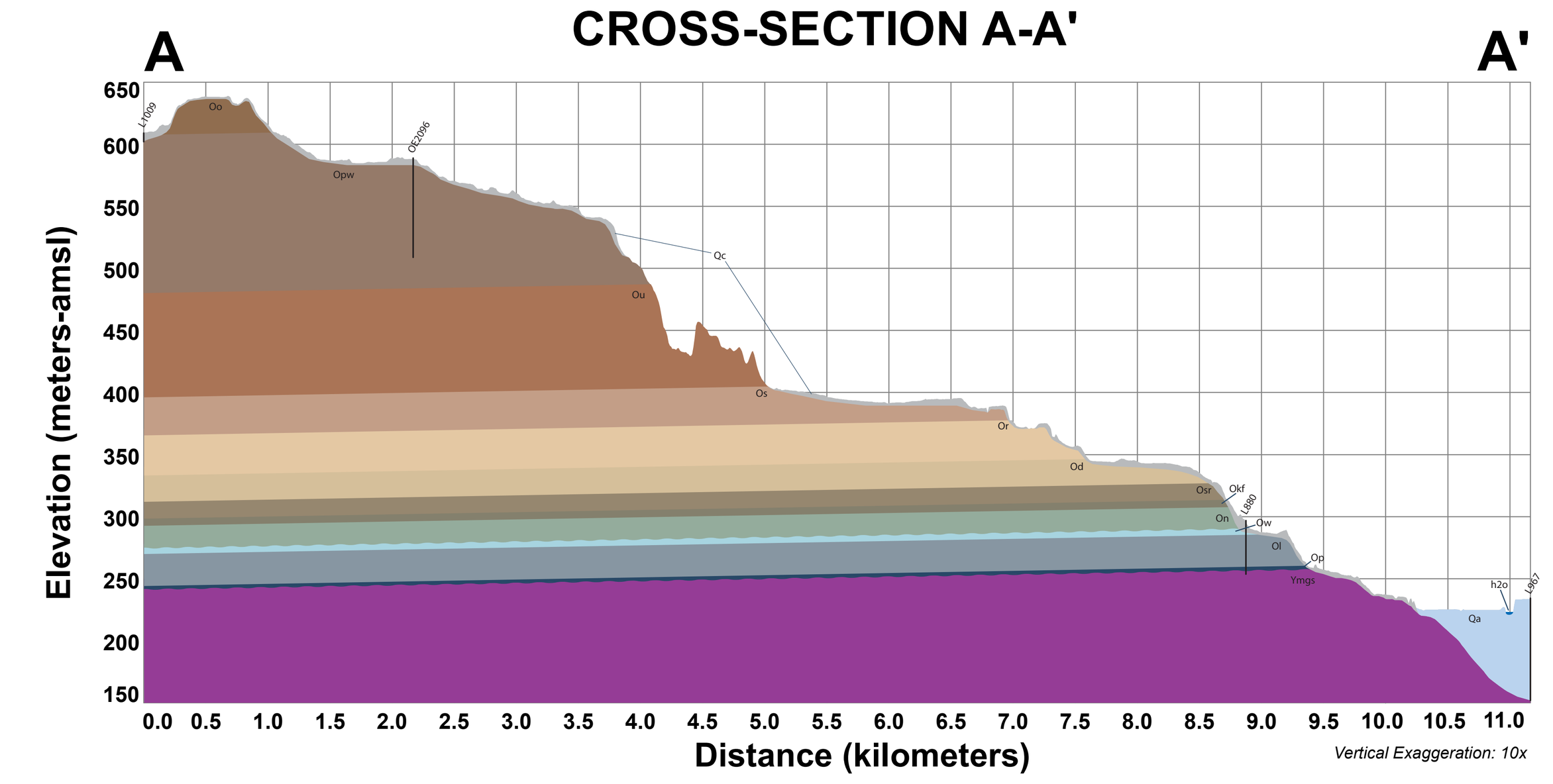
Ych — **Charnokite Gneiss (Ych)**
Light brown to rusty brown, fine- to medium-grained, mesoperthite + quartz + hornblende ± hypersthene gneiss. Weakly foliated as mafic minerals are lacking. Hornblende is dominant mafic phase.

Ycs — **Calc-Silicate Gneiss (Ycs)**
Light to medium greenish gray, medium- to coarse-grained, moderately to strongly foliated, quartz + microcline + diopside + scapolite + titanite + calcite ± wollastonite ± blue-green amphibole gneiss. Modal abundance of minerals highly variable. Highly contorted and generally heterogeneous. Individual layers are 1 to 20 cm wide, but may be wider. Commonly contains concordant and distorted milky quartz veins and segregations. Isoclinal folds and lineations on foliation planes observed locally.

Yu — **Undifferentiated calc-silicate and hornblende-rich feldspathic Gneiss (Yu)**
Medium-grained, highly-foliated, mixed calc-silicate and hornblende-rich feldspathic gneisses. Color varies from light greenish gray to dark green to brownish gray. Some lithologies are distinctly calc-silicate-rich (augite + microcline) and others more hornblende- and microcline-rich; others are mixtures.

Yam — **Amphibolite Gneiss (Yam)**
Medium to dark gray, medium- to coarse-grained, granoblastic, weakly- to moderately-foliated, and locally lineated plagioclase + hornblende + augite + hypersthene + biotite ± quartz gneiss; garnet is absent. Lineation is sub-horizontal and defined by hornblende- or plagioclase-rich accumulations. Some cross-cutting plagioclase + hornblende pegmatite dikes.

CROSS-SECTION A-A'

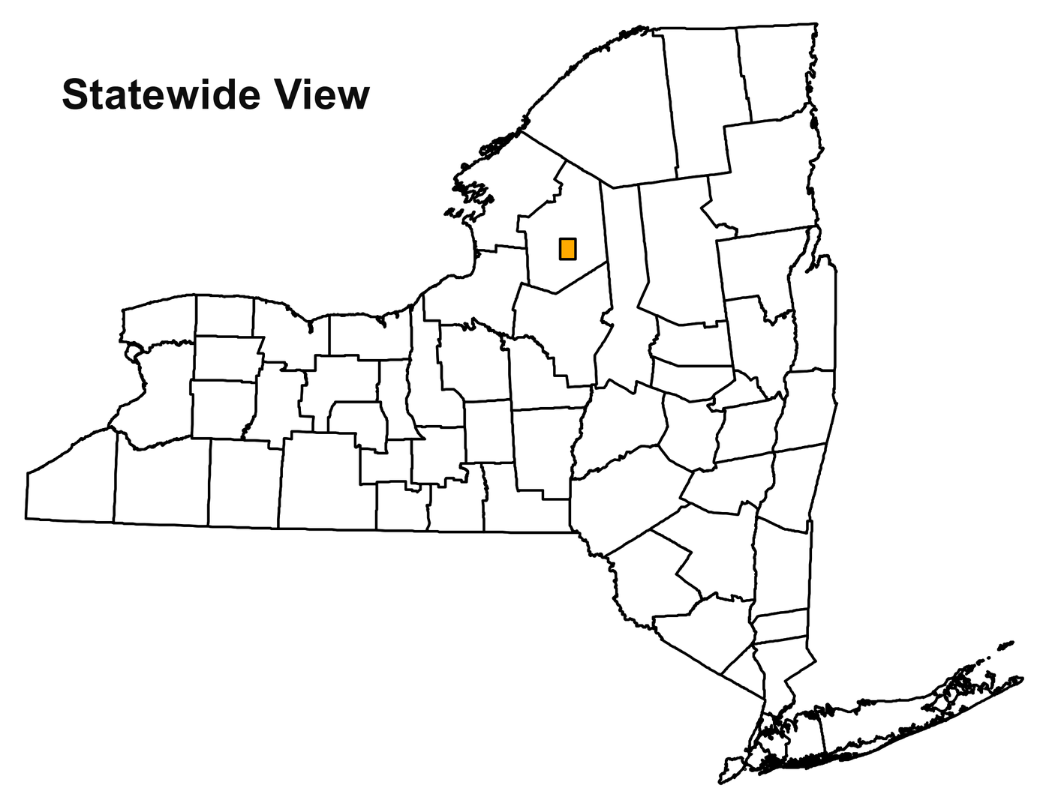


SYMBOLS

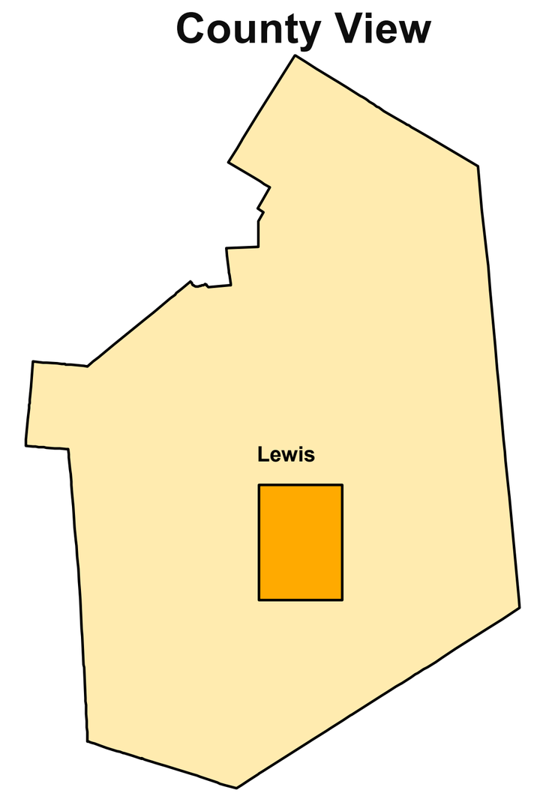
Street	Waterline	Contour
Highway	Water Body	NYSGS Sample Location
Definite Contact	Stream	NYSDOT Boring Location
Inferred Contact	Cross-Section Line	NYSDEC Water Well Location
Inferred Fault		Strike and Dip

QUADRANGLE LOCATION

Statewide View



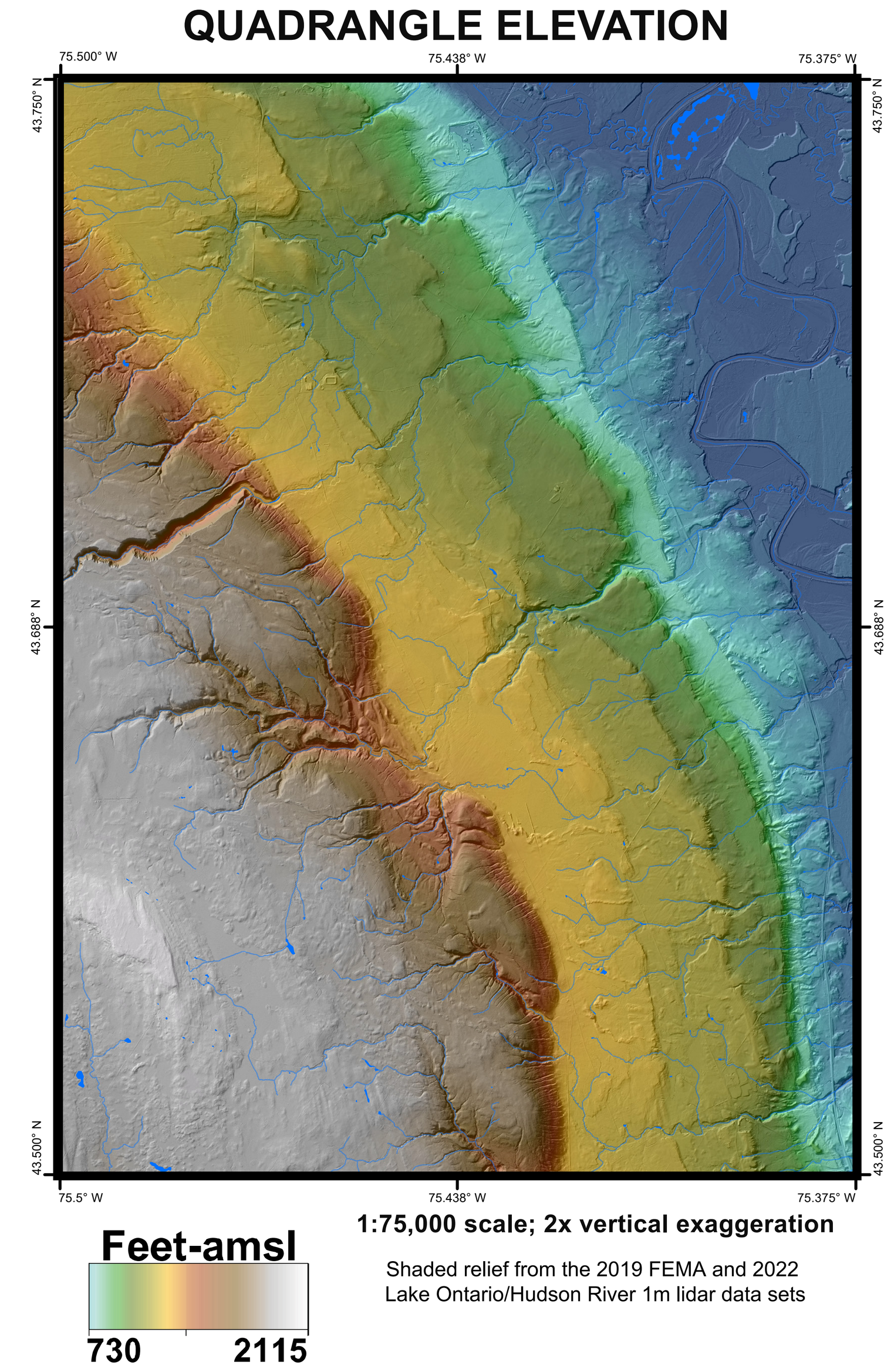
County View



ADJOINING QUADRANGLES

West Lowville	Lowville	Crystal Dale
Page	**Glenfield**	Brantingham
High Market	Constableville	Port Leyden

QUADRANGLE ELEVATION



1:75,000 scale; 2x vertical exaggeration

Shaded relief from the 2019 FEMA and 2022 Lake Ontario/Hudson River 1m lidar data sets

NOTICE

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program Great Lakes Mapping Coalition award number G21AC10697 in the year 2022.

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2024

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