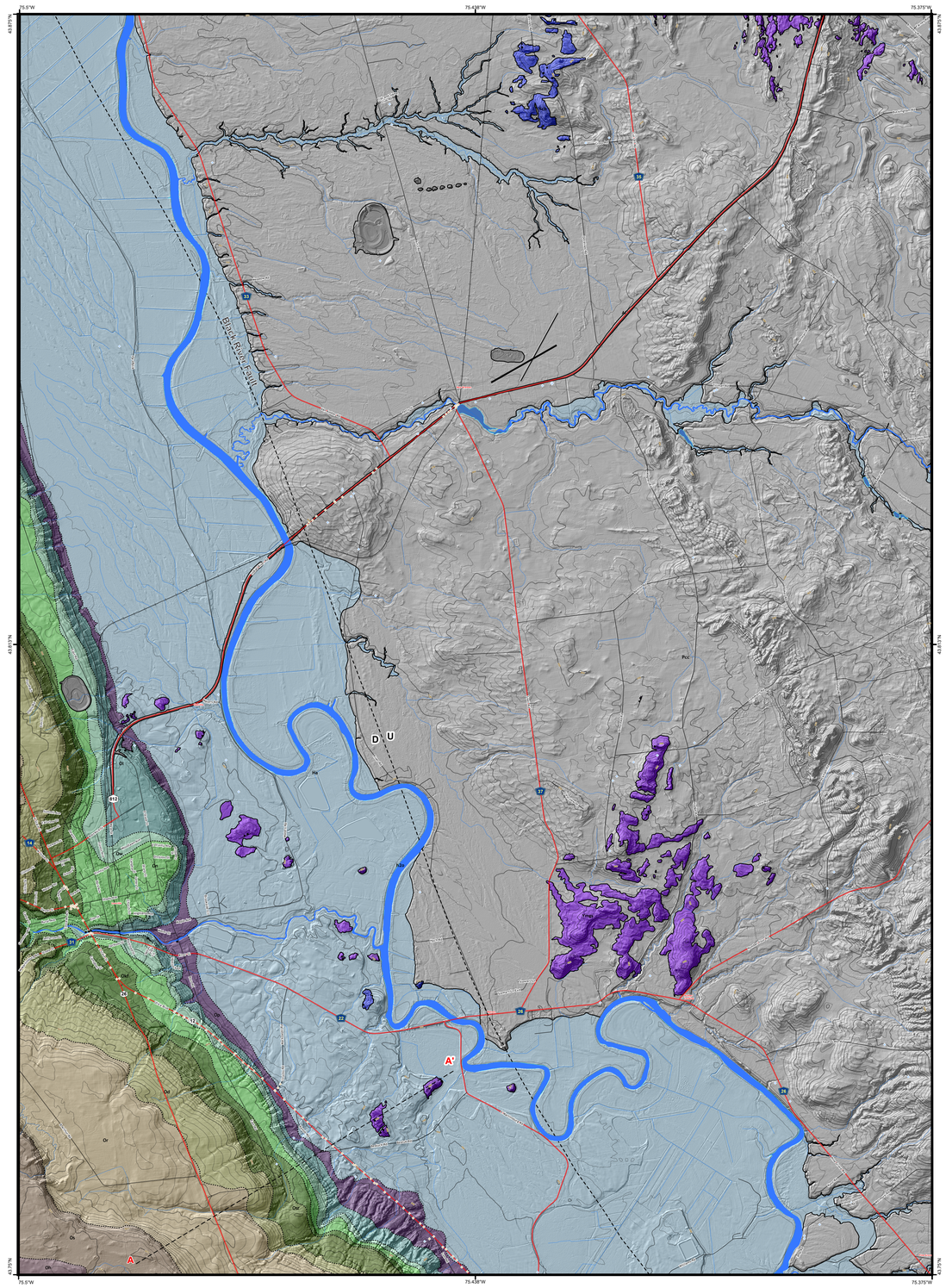
New York State Museum & Science Service

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



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 2020 TIGER/Line shapes for transportation and hydrography (https://www.census.gov/cgi-bin/geo/shapefiles/index.php)

Shaded relief from 2022 Lake Ontario and Hudson River 1m lidar data set (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, 2023-24

MN
GN
12° 34'
223 MILS
0° 18'
3 MILS

UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

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

Richard A. Frieman

2024

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

prepared by

Karl J. Backhaus and Richard A. Frieman

Supported in part by the U.S Geological Survey's
National Cooperative Geologic Mapping Program STATEMAP Award Number G22AC00366

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 transported anthropogenically and used for construction purposes.

h2o — **Water bodies (h2o)**
Surficial bodies of water that may include ponds, lakes, and reservoirs. Formed as a result of pre-glacial processes or as a direct result of glacial processes.

Ha — **Holocene alluvium (Ha)**
Unconsolidated sediments of modern alluvial origin.

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

Trenton Group

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

Os — **Steuben Formation (Os)**
Dark grey, 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 grey 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 grey-to-black, thinly-to-medium-bedded, fine-to-medium-grained fossiliferous limestones; dark grey, 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 grey, 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 (Okf)**
Unconformably overlying top of Black River Group formations. Interbedded fine-grained limestones with dark grey, 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 grey, 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 grey, thinly-bedded, fine-to-coarse limestones interbedded with dark grey, fine-grained stylolitic or fossiliferous limestones; medium-to-dark grey, lumpy-bedded, coarse biodastic 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.

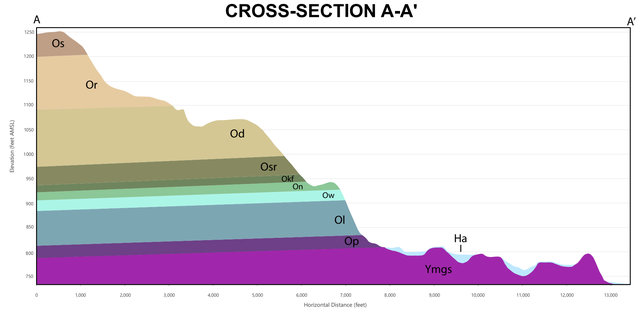
Middle Proterozoic

Ungrouped Formations

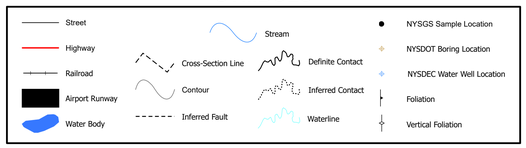
Ymgs — **Metagranite and Metasyenites (Ymgs)**
Light gray-to-pink-to-reddish, fine-to-medium-to-coarse-grained, mesoperthite + quartz + hornblende + biotite + plagioclase ± clinopyroxene gneiss. Foliation is highly variable from non-foliated to strongly-foliated. Foliation development depends on modal 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.

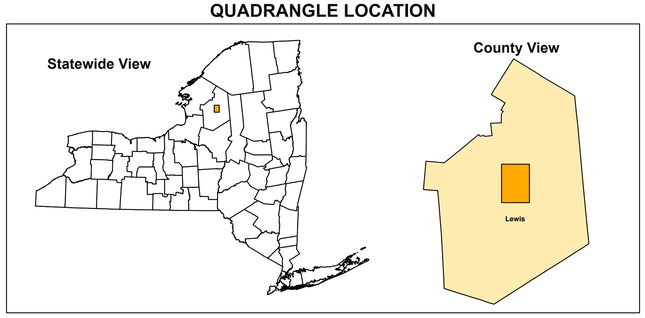
CROSS-SECTION A-A'



SYMBOLS



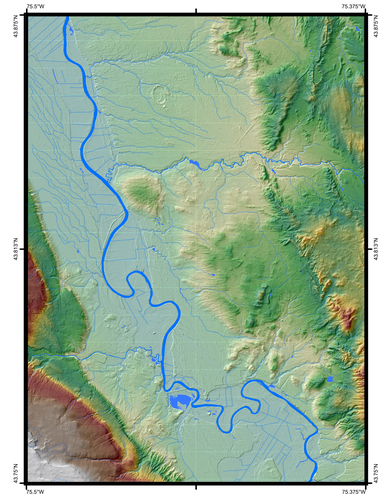
QUADRANGLE LOCATION



ADJOINING QUADRANGLES

CARTHAGE	CROGHAN	BELFORT
WEST LOWVILLE	LOWVILLE	CRYSTAL DALE
PAGE	GLENFIELD	BRANTINGHAM

QUADRANGLE ELEVATION



Feet-amsl
730 2115

1:75,000 scale; 2x vertical exaggeration

Shaded relief generated from 2022 Lake Ontario and Hudson River 1m lidar data set

New York State Museum Map & Chart No. 172

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