New York State Museum & Science Service

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

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

prepared by
Karl J. Backhaus and Richard A. Frieman

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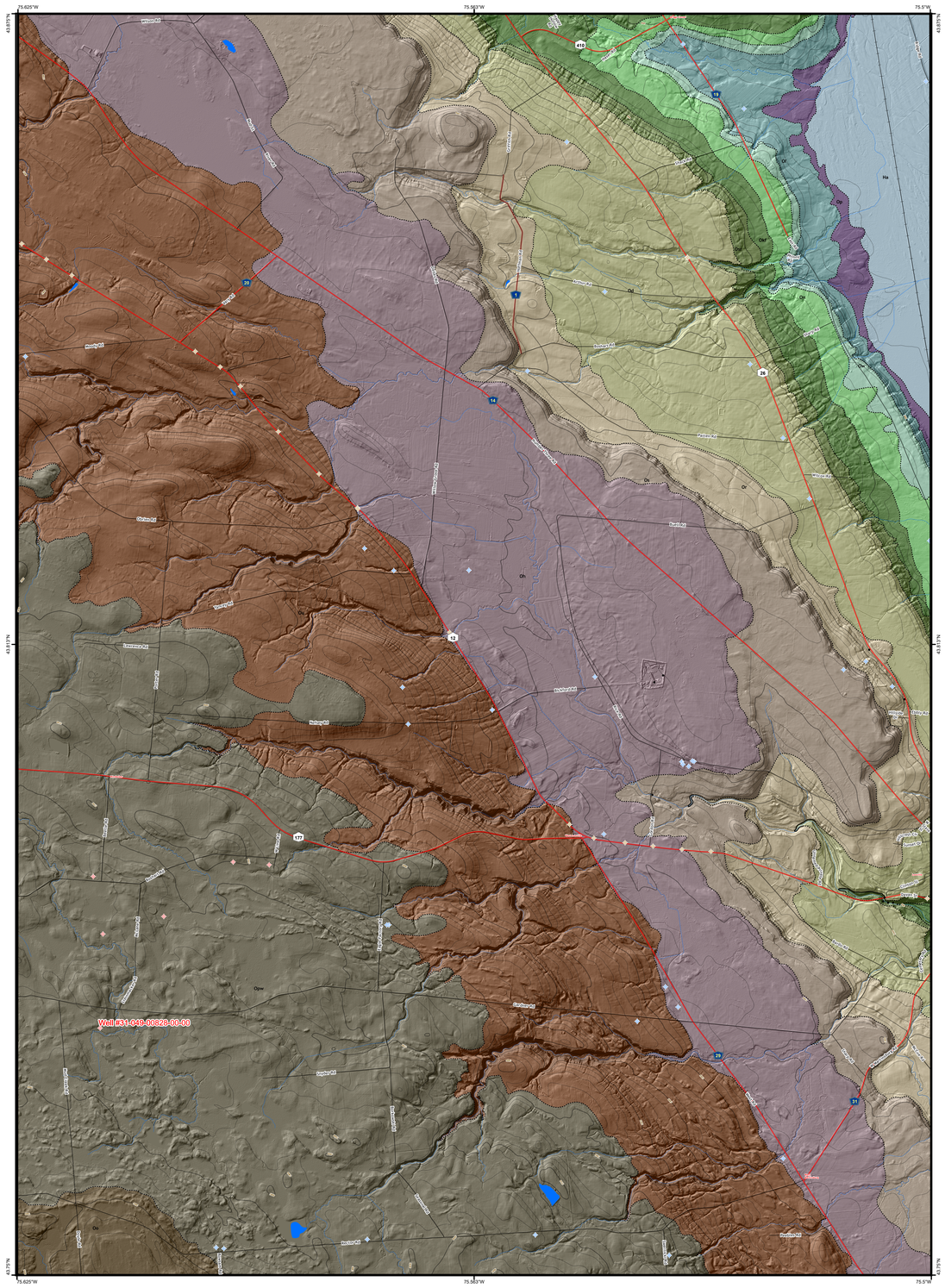


Universal Transverse Mercator, Zone 18 N
North American Datum of 1983

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 hydrography (https://www.census.gov/cgi-bin/geo/shapefiles/index.php)

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

MN 12° 30' GN
222 MILS
0° 23'
7 MILS

UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

DESCRIPTION OF MAP UNITS

Holocene

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.

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 gray, 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 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 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.

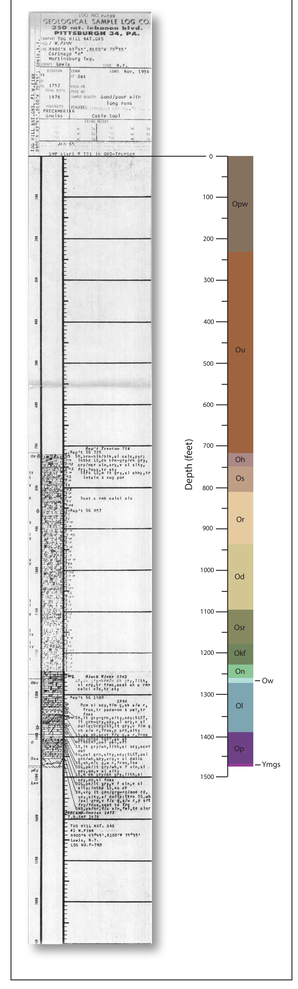
Black River Group

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.

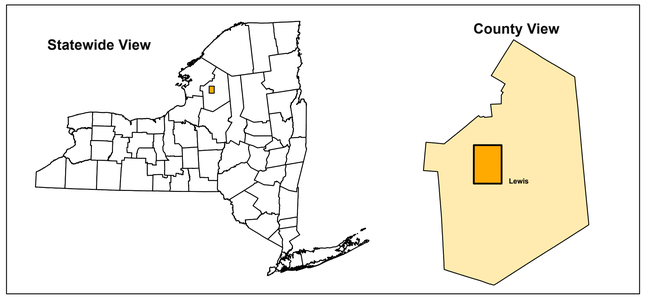
Well #31-049-00828-00-00



SYMBOLS

- Street
- Highway
- Railroad
- Water Body
- Stream
- Contour
- Waterline
- Cross-Section Line
- Definite Contact
- Inferred Contact
- NYSGS Sample Location
- NYSDEC Water Well Location
- NYSDOT Boring Location
- NYSDEC Oil & Gas Well Location

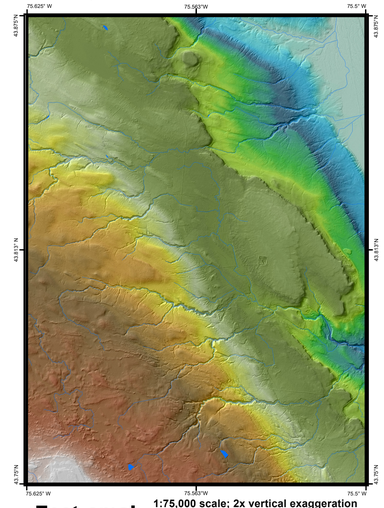
QUADRANGLE LOCATION



ADJOINING QUADRANGLES

Copenhagen	Carthage	Croghan
New Boston	West Lowville	Lowville
Sears Pond	Page	Glenfield

QUADRANGLE ELEVATION



Feet-amsl
725 1955

1:75,000 scale; 2x vertical exaggeration
Shaded relief generated from the 2019 FEMA and 2022 Lake Ontario/Hudson River 1m lidar data sets

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2024

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