New York State Museum
Mark Schaming, Director

NYSGS — NEW YORK State Museum

New York State Geological Survey
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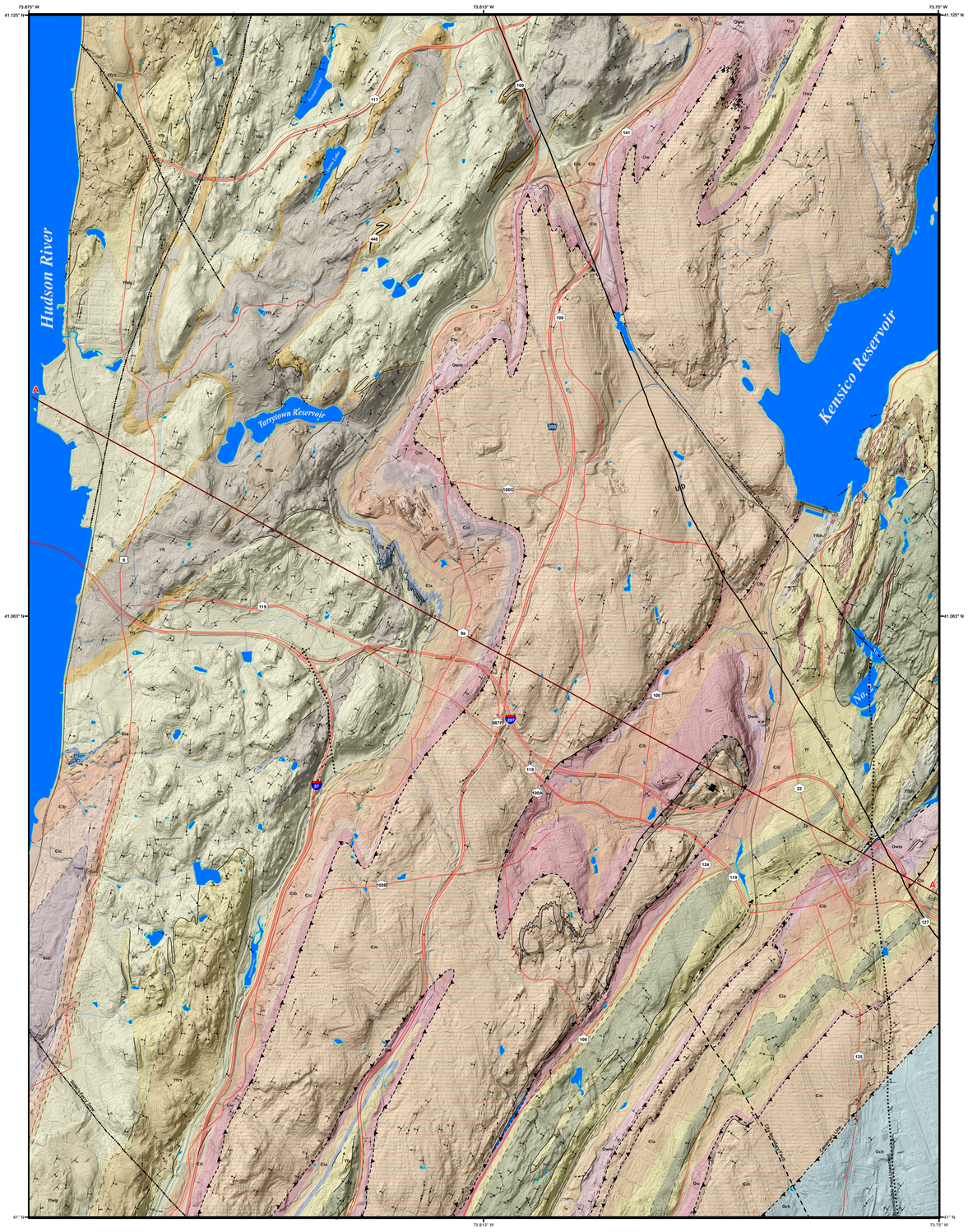

Universal Transverse Mercator, Zone 18 N
North American Datum of 1983

Hydrology and planimetry layers from the New York State DOT raster quadrangle for Westchester County (https://gis.ny.gov/gisdata/inventories/member.cfm?OrganizationID=108)
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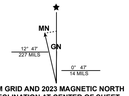
Field map, notes and draft maps available through the NYSGS Open File (https://www.nysm.nysed.gov/research-collections/geology/collections/open-file)

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 L. Hall, 1981-1984
Digital data and cartography: J. Manchester, B. Bird and K. Backhaus, 2011, 2016, 2023-2024



UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

BEDROCK GEOLOGY OF THE WHITE PLAINS 7.5-MINUTE QUADRANGLE, WESTCHESTER COUNTY, NEW YORK

Leo M. Hall
2024

BEDROCK GEOLOGY OF THE WHITE PLAINS 7.5-MINUTE QUADRANGLE, WESTCHESTER COUNTY, NEW YORK

prepared by
Leo M. Hall, Janet Manchester, Brian C. Bird and Karl J. Backhaus

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

DESCRIPTION OF MAP UNITS

Autochthonous Rocks

ORDOVICIAN — Walloomsac Formation

Ow — **Walloomsac Formation (Ow)**
Gray or dark gray, fissile, sillimanite-garnet-muscovite-biotite schist that is commonly rusty-weathering due to the presence of sulfides; it is locally interbedded with calcite marble near the base, and calcite-bearing dark gray schist is locally present.

Owm — **Phlogopitic Marble Member (Owm)**
Tan-weathering, gray, white, or blue-gray calcite marble that is commonly phlogopitic and is locally present at the base of the formation.

Unconformity

CAMBRIAN — Inwood Marble

Cid — **Inwood Marble (Member D)**
Interbedded gray dolomite marble, gray calcite marble, calcite-dolomite marble, and some calc-schist.

Cic — **Inwood Marble (Member C)**
Thick-bedded, gray or blue-gray, and clean dolomite marble.

Cib — **Inwood Marble (Member B)**
Interbedded gray, buff, pinkish tan, or cream dolomite marble, tan or reddish-brown calc-schist, purplish brown or tan siliceous calc-schist and granulites, tan quartzite, and calcite-dolomite marble are the dominant rock types; bedding 0.5 to 4 feet thick is prominent.

Cia — **Inwood Marble (Member A)**
Well-bedded white, gray, or blue-gray dolomite marble.

CAMBRIAN — Lowerre Quartzite

Clg / Cl — **Lowerre Quartzite (Cl & Clg)**
Tan- or buff-weathering, feldspathic quartzite or quartz-rich granulite, vitreous quartzite, and micaceous quartzite are typical; brownish- and locally rusty-weathering granulites and schists that commonly contain sillimanite are present locally at the base, particularly in the east. Clg is gray granulite shown separately on the northeast side of Beaver Hill.

Unconformity

MESOPROTEROZOIC — Yonkers Gneiss

Zy — **Yonkers Gneiss (Zy)**
Pink, pale orange, or pale purplish-blue, well-foliated, biotite-hornblende-quartz-plagioclase-microcline gneiss; ferrohastingsite with 2V of 10° to 20° the typical amphibole; garnet, ilmenite, magnetite, fluorite, and pyrite (which is commonly altered to goethite) are locally present as accessory minerals; black or dark greenish-black amphibolite is often observed but constitutes less than 5 percent of the entire rock unit.

Discontinuity of Uncertain Nature

MESOPROTEROZOIC — Fordham Gneiss

Yfcv — **Childrens Village Unit (Yfcv)**
Gray biotite and/or hornblende-quartz-feldspar gneiss with local garnet, brown-weathering garnet-biotite-quartz-feldspar gneiss, and amphibolites constitute the main rock types in this member; graphite is a common accessory mineral in many of the rocks to the southwest.

Yfh — **Harriman Road Reservoir Unit (Yfh)**
Gray garnet-biotite-quartz-feldspar gneiss with local sillimanite and abundant amphibolite characterize this unit; deformed poikilitic garnets up to 6 inches in the long dimension are present in the garnetiferous gneisses; pyroxene that is rimmed by amphibole is common in the southwest and, although not indicated on the map, amphibolite can be mapped separately in the vicinity of the Harriman Road Reservoir.

Yfei / Yfeip — **East Irvington Unit (Yfei &Yfeip)**
Gray or dark-gray biotite- and/or hornblende-quartz-feldspar gneiss, commonly with epidote and with minor amounts of calcite locally; the gneiss typically contains numerous white or pink quartz-feldspar layers and lenses; amphibolite is present in many exposures but is subordinate; Yfeip consists of pink hornblende-biotite-quartz-feldspar layers and lenses, commonly migmatitic, that are abundant in places and are common at or near the upper and lower contacts of Yfei but not restricted to these positions.

Yfi — **Interchange 9 Unit (Yfi)**
Rusty-weathering sillimanite-garnet-biotite-quartz-feldspar schist or schistose gneiss with characteristic lavender garnet typifies this member; interbedded siliceous biotite gneiss or quartzite and local calcite and/or dolomite marble are also present. The marbles are known primarily in the vicinity of Gore Brook.

Yft — **Tarrytown Reservoir Unit (Yft)**
Interbedded gray garnet-biotite-quartz-feldspar gneisses with local quartz, gray biotite-rich quartz-feldspar gneiss, gray hornblende-biotite-quartz-feldspar gneiss, brown- to rusty-weathering biotite-quartz-feldspar gneiss, and brown amphibolite characterize this unit; locally sillimanite is prominently abundant in the gneisses.

Yfta — **Tarrytown Reservoir Unit (Yfta)**
Gray biotite-quartz-feldspar gneiss with local garnet, bearing granular feldspar augen up to 1 inch in the long dimension; present locally at the base of Yft.

AGE UNCERTAIN — Fordham Gneiss

Yfbh / Yf / Yfg — **Fordham Gneiss (Yf, Yfg & Yfbh)**
The eastern outcrop area is largely undivided stratigraphically but two lithic units are mapped separately. Light gray- to dark gray-weathering biotite-quartz-feldspar gneisses with hornblende and/or garnet are the most abundant rock types. Local brown- and rusty-weathering gneisses also occur and amphibolite is fairly common. These rock types are interlayered and layering is common to the unit in general. Yfg is a garnetiferous biotite-quartz-feldspar gneiss and Yfbh is a gray biotite-hornblende-quartz-feldspar gneiss.

Allochthonous Rocks

ORDOVICIAN — Hartland Formation

Och — **Hartland Formation (Och)**
Interbedded schists, schistose gneisses, granulites, and amphibolites. These rocks are brown-, gray-, or rusty-weathering, and many of the micaceous rocks have a spangled appearance as viewed on the foliation. Pegmatites are relatively common in this unit.

CAMBRIAN — Manhattan Schist

Cm — **Manhattan Schist (Cm)**
Predominately brown-weathering, feldspathic, sillimanite-garnet-muscovite-biotite schist or schistose gneiss and minor amphibolite; sillimanite nodules are locally common in the pelitic rocks; magnetite is a typical accessory mineral and rocks in many exposures attract a magnet strongly; although siliceous beds are prominent locally, bedding is not commonly clearly defined.

Cmcp — **Manhattan Schist (Central Park Avenue Amphibolite Member)**
Discontinuous amphibolite and minor schist common at or near the base of Cm.

Intrusive Rocks

AGE UNCERTAIN

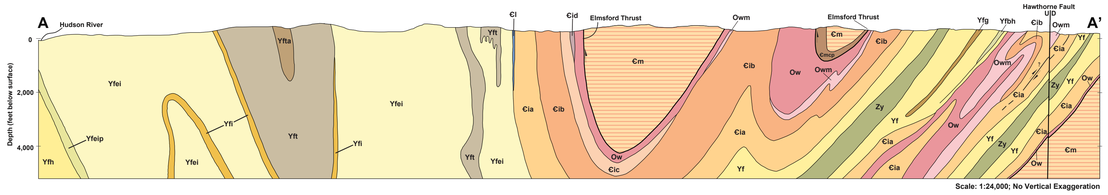
Z?pg — **Pegmatite (Z?pg)**
Light gray pegmatite in the vicinity of the White Plains Reservoirs; very coarse pegmatite with feldspar up to 3 feet long and coarse-grained quartz; also contains biotite, garnet, and hornblende; intrusive into the Yonkers Gneiss and may be Paleozoic.

Zg — **Pegmatite (Zg)**
Pale pink to pinkish-gray or gray granitic gneiss in the North White Plains region, perhaps related to the Yonkers Gneiss.

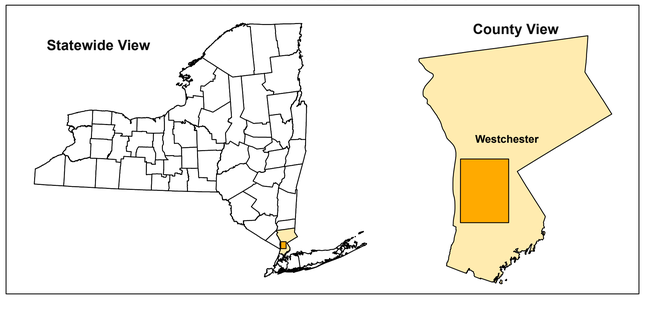
SYMBOLS

- Highway
- Railroad
- Water Body
- Stream
- Contour
- Waterline
- Contact, Position Definite
- Contact, Position Approximate
- Contact, Position Inferred
- Fault, Position Definite
- Fault, Position Approximate
- Fault, Position Inferred
- Thrust Fault, Position Approximate
- Thrust Fault, Position Inferred
- Fracture Zone
- Topographic Lineament
- Horizontal Fold Axis
- Fold Axis Lineation
- Bedding
- Overturned Bedding
- Lineation
- Foliation
- Vertical Foliation

CROSS-SECTION A-A'



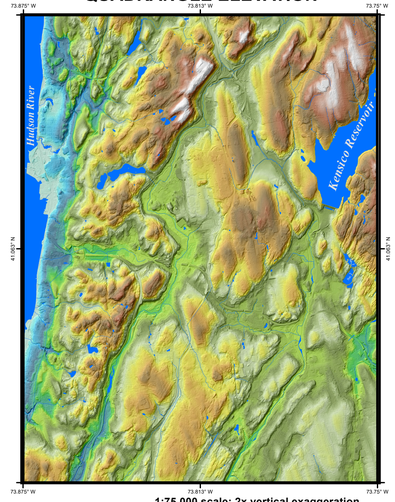
QUADRANGLE LOCATION



ADJOINING QUADRANGLES

Haverstraw	Ossining	Mount Kisco
Nyack	White Plains	Glenville
Yonkers	Mount Vernon	Mamaroneck

QUADRANGLE ELEVATION



Feet-amsl
730 — 1380

1:75,000 scale; 2x vertical exaggeration

Shaded relief generated from 2019 FEMA 1m lidar data set.

New York State Museum Map & Chart No. 153

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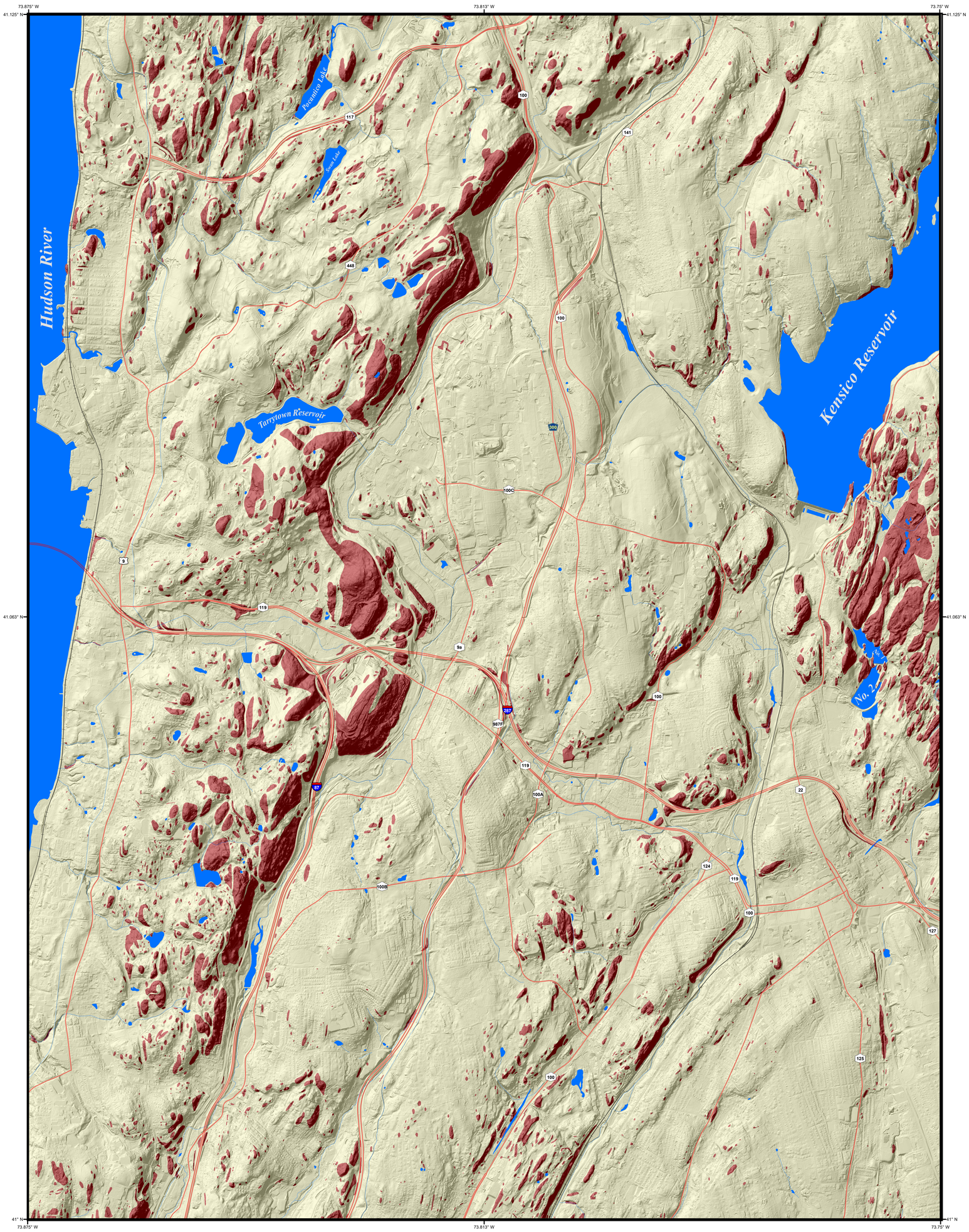

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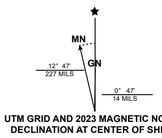

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prepared by
Leo M. Hall, Janet Manchester and Karl J. Backhaus

Supported in part by the U.S Geological Survey's
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SYMBOLS

Highway — Railroad — Water Body — Stream

DESCRIPTION OF MAP UNITS

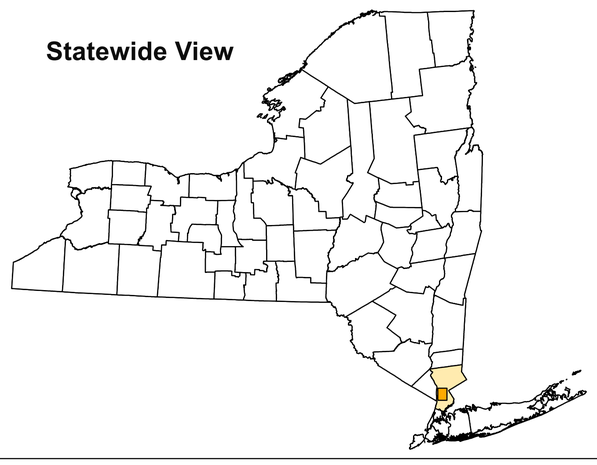
Br

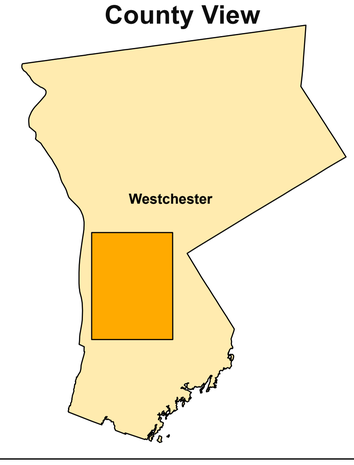
Bedrock Outcrop (Br)
Metamorphic rock that can range from Mesoproterozoic to Ordovician in age. May be covered by one meter or less of Quaternary-aged glacially and non-glacially derived sediment.

Qc

Quaternary Cover (Qc)
Glacially or non-glacially derived sediment of varying thicknesses overlying older metamorphic rock (Br).

QUADRANGLE LOCATION





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NOTICE

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