

# SURFICIAL GEOLOGY OF THE DAMASCUS 7.5-MINUTE QUADRANGLE, SULLIVAN COUNTY, NEW YORK

prepared by  
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Supported in part by the National Park Service Task Agreement Number P15AC01482 in the year 2015.

## DESCRIPTION OF MAP UNITS

### Holocene

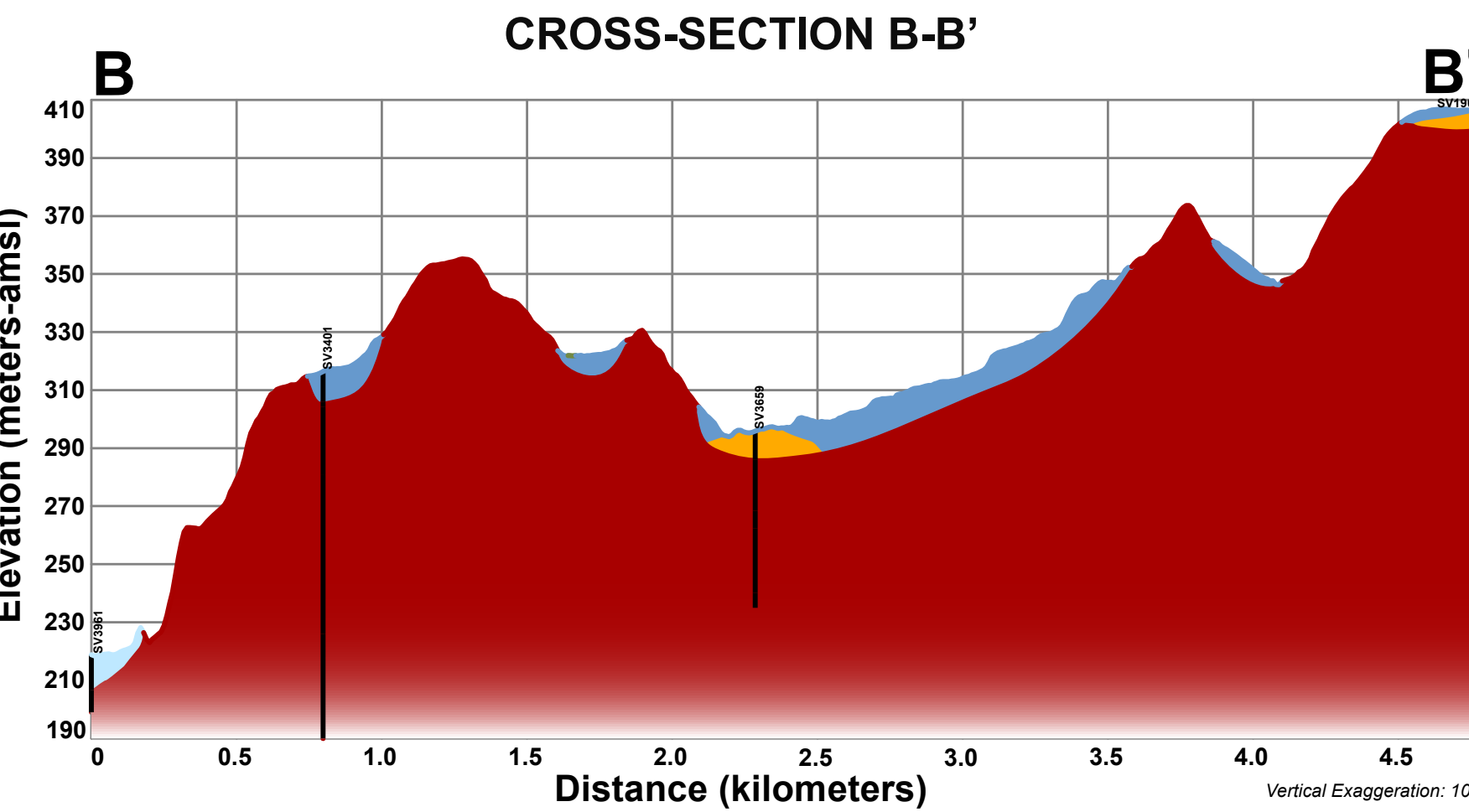
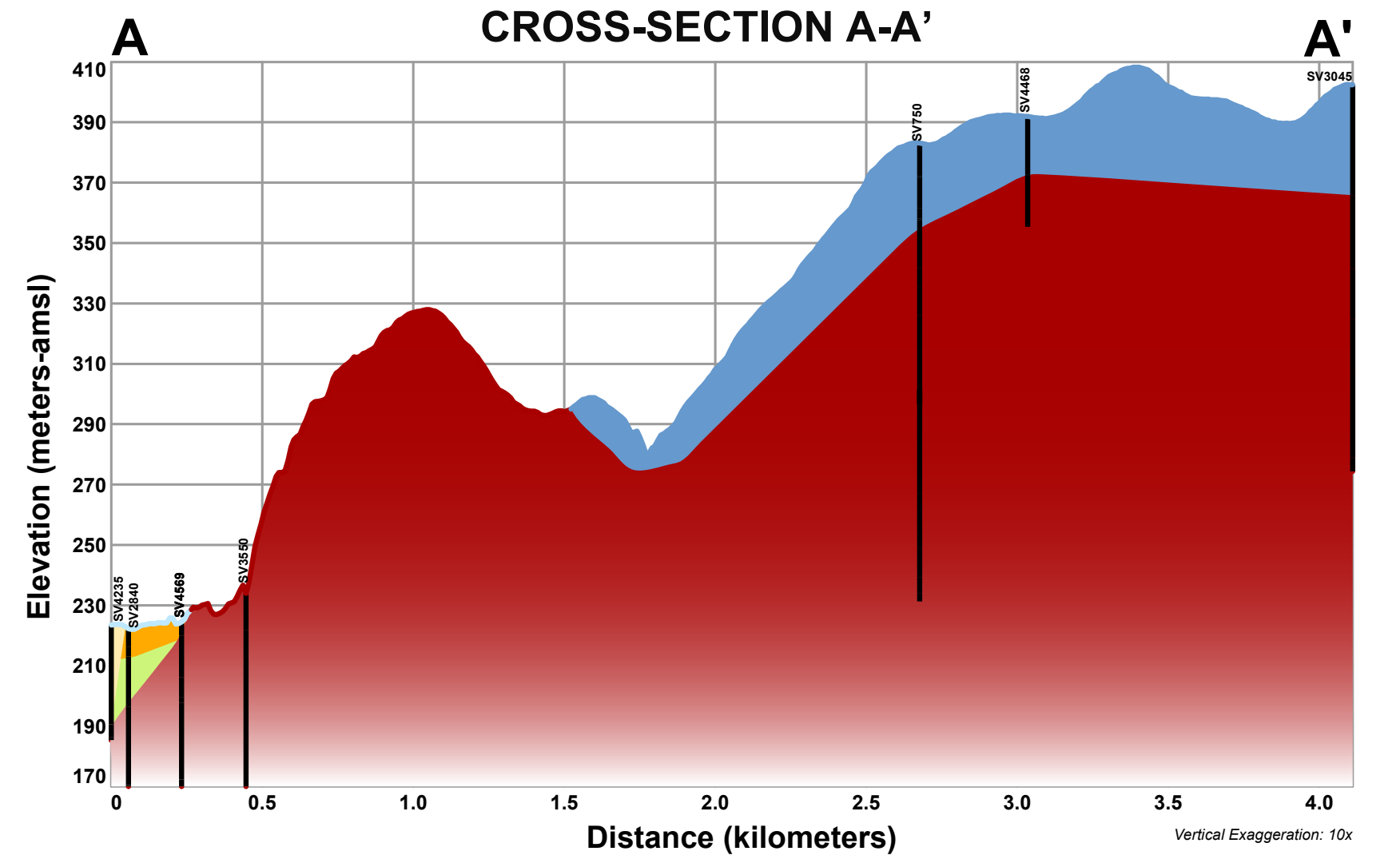
- Ha** **Stratified silt, sand and gravel (Ha)**  
Sorted and stratified silt, sand, and gravel, deposited by rivers and streams. May include cobbles and boulders. Inferred as post-glacial alluvium and includes modern channel, over-bank and fan deposits
- Hw** **Wetland Deposit (Hw)**  
Peat, muck, marl, 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, clay, with boulders/cobbles possible. Described as a mass-wasting deposit at the base of steep hillslopes and cliffs as part of a slump or hillslope failure.

### Pleistocene

- 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.
- Pd** **Diamicton (Pd)**  
An admixture of unsorted sediment ranging from clay to boulders. Generally matrix supported, massive, clast-rich and interpreted to be glacial till.

### Pre-Pleistocene

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



### Introduction

The geology of the Damascus 7.5-minute Quadrangle was mapped during 2016 and 2017 as part of the National Parks Service Task Agreement P15AC01482 for Geologic Mapping of the Upper Delaware Scenic and Recreational River (UDSRR). This map is part of Phase I of the mapping project in Sullivan County, New York. The purpose of this map was to identify and delineate various geologic formations in the Damascus Quadrangle with the intent that this information can guide the National Parks Service and municipalities in land use, environmental, and natural resource decisions. The Damascus Quadrangle is within the Mid-Hudson Region in southeastern New York along the state border with Pennsylvania. The towns of Delaware, Cocheton, and Tusten are within the quadrangle. The quadrangle is mainly wooded with large tracts of land for lumber and recreation. Bluestone mining is another major land use in the quadrangle and surrounding area.

Situated at the western edge of the Catskill Mountain physiographic province the landscape varies from floodplain in the Delaware River Valleys to mountainous topography. The highest elevation is at 1,381 feet, or 421 meters, above mean sea level (amsl) in the northeastern portion of the quadrangle with the lowest elevation being 687 feet, or 209 meters, where the Delaware River exits the map to the south. The sediments found in the quadrangle includes sand, gravel, diamicton (interpreted as glacial till) and bedrock exposed throughout the quadrangle.

The portions of the Damascus Quadrangle within the boundaries of the UDSRR, consist primarily of exposed bedrock, till over rock, and alluvium on the floor of the Delaware River Valley. The topography of the Damascus Quadrangle is noticeably subdued compared to adjacent areas. Some summits and hill slopes have exposed bedrock but much of the quadrangle's hill tops are covered with till. There are also valleys that have deposits of sand and gravel hummocks and terraces along the walls.

Clastic Upper Devonian rocks make up virtually all bedrock in this region. These shales, mudstones, fine to coarse sandstone were observed in the area. There are some quartz pebble conglomerate beds and there is the possibility to have localized lacustrine carbonate beds (Ver Straeten, 2013). Multiple cycles and similar facies, that cover 25 million years, make this area difficult to correlate without spending great amounts of time exclusively mapping the bedrock.

Extensive geophysical, geochemical, and fossil identification would need to be carried out to create a comprehensive bedrock map of the region. The age of the rocks spans the Frasnian stage, ~385 million year ago (Ma) to ~360 Ma. In that time, this region was an expansive coastline with a complex river system, transporting massive amounts of sediment coming from the ancestral Acadian Mountains, which occupied present day eastern New England

### Methods

Field mapping for this quadrangle was completed during the 2016 and 2017. Mapping efforts included traversing the quadrangles primarily by vehicle along roadways, with some mapping taking place on private land. Sample collection was taken by pick and shovel from outcrops in drainage ditches, road and streams cuts or within quarry/sand and gravel pits. Sample collection was also taken with a two-meter long hand auger to collect samples below the soil layer where possible. A total of 66 observation points were made during the mapping process, with 29 samples collected for grain size analysis.

Water wells (36 in total) from the Department of Environmental Conservation, and engineering borings (15 in total) by the Department of Transportation were also used to decipher the subsurface geology of the Eldred quadrangle. The subsurface data from these wells were simplified using the drillers descriptions to more standard and uniform descriptions. The location, thickness and depths of all lithologies were also recorded and used to create cross-sections and 3D borings logs within the quadrangle.

Field data were digitized in ArcMap 10.6. Polygons were created based upon the lithology of the surface material and the sample and boring locations were plotted. The boring logs and map data were created using the Adobe Illustrator CS6 using the data created in the ArcMap program.

### Surficial Map Units

#### Artificial Fill (Af)

This material is found throughout the Village of Hancock within the quadrangle. This lithology is generally composed of coarse/fine, large cement mounds and/or crushed rock anthropogenically transported and used for construction purposes.

#### Holocene Alluvium (Ha) and Holocene Wetland Deposits (Hw)

Post glacial sediments occupy the low areas or land depression throughout the quadrangle. Ha is associated with fluvial process in areas along the three sections of the Delaware River and its tributaries. This lithology generally consists of stratified silt, sand, and gravel. Hw is associated with low areas and depressions in the highlands of the quadrangle where wetlands form due to poor drainage. This lithology consists of peat, marl, clay or sand in these areas of poor drainage.

#### Pleistocene Sand and Gravel (Psg)

Characterized as well-sorted and stratified sand and gravel this unit is interpreted to be deposited by glacial meltwater at or very near the glacier and is upwards of 130ft thick in the valleys. Psg is found within the valleys of the Upper Delaware River and the tributary valleys flowing in from the west.

#### Pleistocene Diamicton (Pd)

This unit is a mixture of sediment grains that range from clay to boulders in size. In this quadrangle, all diamicton in interpreted to be glacial till, sediment deposited directly beneath the glacier. This material is found throughout much of the quadrangle covering most of the hillslopes. It is generally matrix supported, sand-dominant, and tan and reddish brown in color.

### Summary and Discussion

The Damascus Quadrangle located in the New York State's Mid-Hudson Region on the western edge of the Catskill Mountains. The region is like the surrounding Catskill Mountains with greenish blue to dark grey sandstones with zones of crossbedding, and red shales of the Devonian Period Catskill Delta making up the bedrock of the mountains. The light brown to reddish brown diamicton, till, is deposited along the slopes of the mountain sides, shorter hillslopes are till covered as well. Sand and gravel deposits in the form of kame terraces and hummocks is found in the Upper Delaware River Valley and its tributaries. The valley of the main branch of the Upper Delaware River is primarily alluvium floodplain deposits.

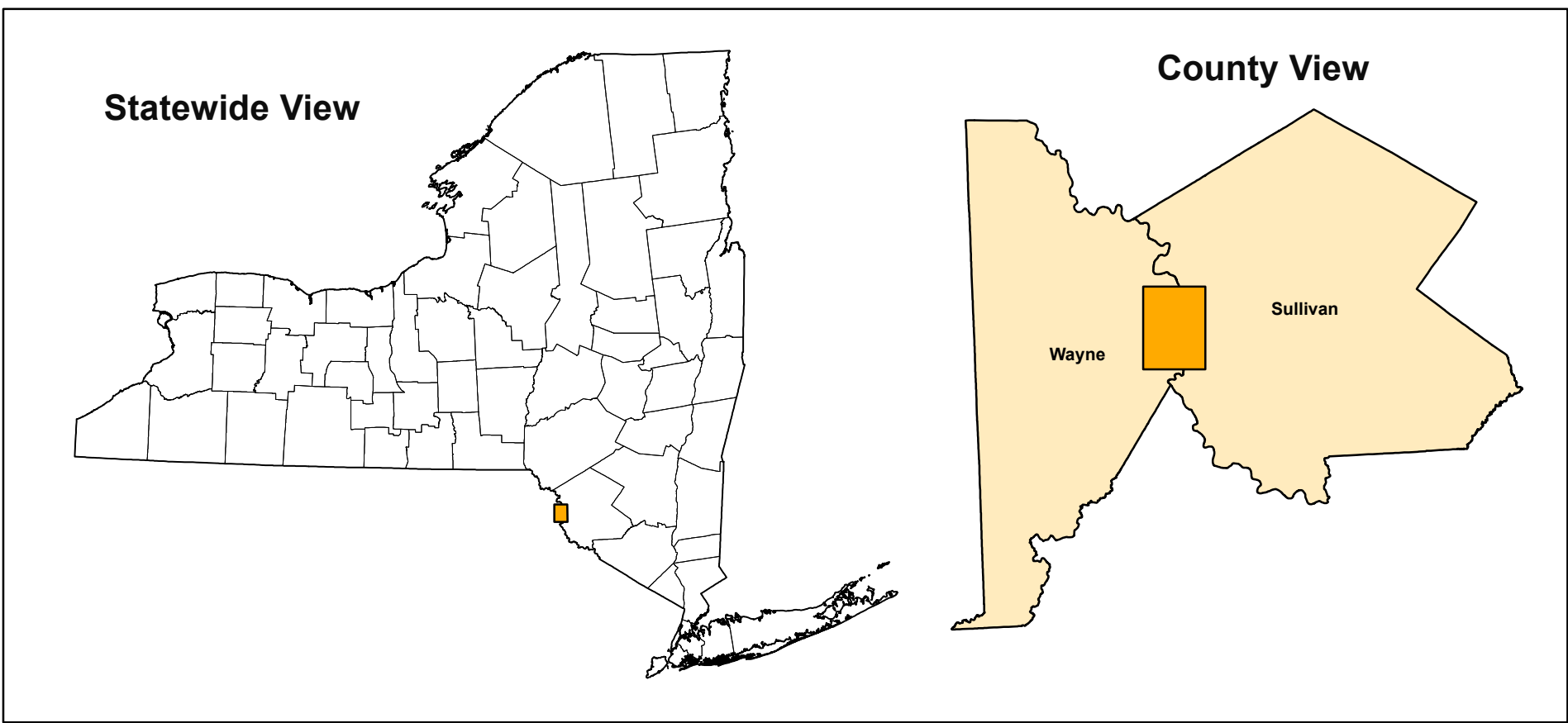
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## SYMBOLS

Streets	State Line	Cross-Section Lines
Highways	Water Bodies	NYSGS Soil Sample Location
Railroads	Streams	NYSDEC Boring Location
Airport Runway	Contours	NYSDEC Water Well Location

## QUADRANGLE LOCATION



## ADJOINING QUADRANGLES

Long Eddy	Callicoon	Jeffersonville
Galilee	Damascus	Lake Huntington
White Mills	Narrowsburg	Eldred

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### NOTICE

This geologic map was funded in part by the National Park Service Task Agreement Number P15AC01482 for the Geologic Mapping in Upper Delaware Scenic and Recreational River Phase 1 in the year 2015.

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