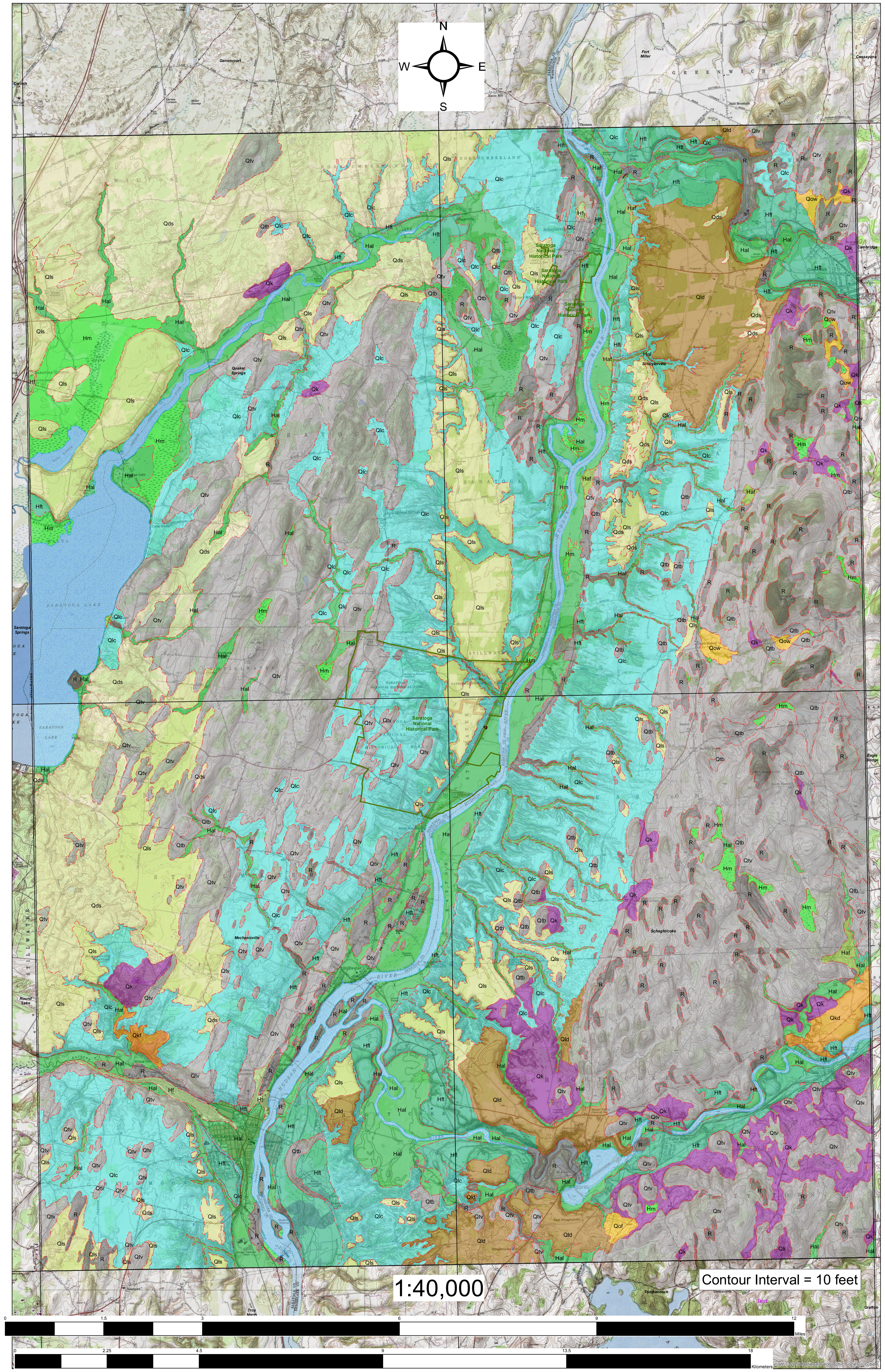
Surficial Geologic Map of Saratoga National Historical Park and Vicinity, New York



Legend and Surficial Map Unit Descriptions

NPS Boundary

7.5' Quadrangle Boundary

water — approximate — known or certain — water or shoreline — scratch boundary

Hf - Fill (Holocene)
Variable materials used as artificial fill along rail beds, road beds, embankments and low lying areas. Only a few major continuous areas of fill are shown on the map that includes the extensive railroad complex west of Mechanicville. The map would be cluttered by showing numerous smaller areas of fill. You can correctly infer some of these unmarked areas of fill by noting the thin elevated areas along railroad tracks; railroad grades are typically raised to make them level and elevate them above the 100 year flood plain. Approaches to bridges and overpasses are other areas of extensive fill. Low areas of roads where culverts have been installed are also smaller areas of fill.

Hm - Muck (Holocene)
Organic sediment, mostly silt and clay in wetlands and swamps; can include peat; low lying flat lands prone to flooding. The map shows large and continuous areas of muck along the flood plains of the major waterways. In addition, some closed depressions with wetlands in upland areas have been marked as muck. For simplicity, many small wetland areas are not delineated

Hal - Alluvium (Holocene)
Stream flood plains; fine sand, silt and gravel of river channel, bar, and bank areas; river bottom lands; variable permeability but usually intermediate to low; often wet sites and prone to flooding; can be good aquifer if sufficiently thick. The flood plain sediment along the Hudson River has a typical grain size from very fine sand to silt. Alluvium dominates the flood plains of the major waterways - Hudson River, Batten Kill, Hoosic River and Fish Creek. Smaller tributary streams that have sections of flood plain with alluvium that are wide enough and continuous enough to show at the scale of the map are marked. However, smaller and discontinuous areas of alluvium along these minor tributaries are too narrow at the map scale to show.

Haf - Alluvial Fan (Holocene)
Tributary stream deposits; gravel, silt and sand, often poorly sorted; gently to moderately sloping lands located at the base of steep slopes and at stream junctions; variable permeability but usually intermediate to low; fair aquifer if sufficiently thick and permeable. Some of the minor tributary streams have deposited small alluvial fans where they emerge from the uplands onto the flood plains of the Hudson River, for example. These fans may have been deposited during the early Holocene| when sea level was still rising due to glacier melting. The small streams have typically downcut through these fans to erode to base level along the Hudson River flood plain during later Holocene through to the present.

Hft - Fluvial Terrace (Holocene)
Old flood plains; fine sand, silt and gravel generally less than 5 meters thick overlying other material; flat to gently sloping lands; variable permeability but usually intermediate; old stream terrace deposits above the flood plain; soils are often deep, well drained loams suitable for agriculture; water table may be sufficiently deep to allow for conventional septic systems; perc rates may be locally variable and wet areas are not uncommon; banks above streams may be prone to failure; fair aquifer. Excellent gravel and sand sources.

There are some extensive fluvial terraces along the major waterways that include the Hudson River, Batten Kill, Hoosic River and Fish Creek. The highest terraces along the Hudson River are likely from late glacial periods of high discharge that flowed from the Champlain Lowland into the Hudson Lowland through an outlet known as the Fort Ann Outlet and Channels. Commercial gravel mining in one of these terraces has revealed the cobbles carried during this major glacial event from ca 12,200 years ago.

A slightly older and shorter period of high discharge came down the Mohawk Valley and part of this flow came through a complex of channels now occupied by Round Lake, Ballston Lake, Saratoga Lake and their outlet creeks. The Anthony Kill and Fish Creek show evidence of the high discharge that eroded their valleys through much or all of the glacial deposits and into bedrock. The current creeks are too small to have eroded these valleys and are known as under-fit streams. Lower fluvial terraces along the Hudson record Holocene alluviation on a flood plain that was primarily eroded by the high discharge Fort Ann outflow event.

Fluvial terraces along the Batten Kill and Hoosic River are at many levels and record the downcutting of these streams through glacial deposits to erode to the base level of the Hudson River. These terraces likely date from throughout the Holocene with the highest terraces being the oldest and lower terraces the youngest.

Qds - Dune Sand (Pleistocene)
Wind blown sand with arcuate through elongate dune forms; the sand is well sorted and of fine to medium grain size, typically deposited on exposed lake sand plains and along beaches; permeable and excessively well drained; a fair aquifer due to limited thickness and aerial extent; prone to wind and water erosion and fires; typically vegetated with fire adapted species such as the pitch ine and scrub oak ecological system.

Dune sand occurs to some extent on areas marked as lake sand and lake delta but those areas are not typified by dune landforms. Areas marked as dune sand are dominated by dune landforms and the classical windblown sand grain size and high degree of sorting. Dunes date from the latter part of the last glacial cycle. The source sand for the dunes was lake and delta deposits along glacial lake shorelines. The glacial lakes went through a stepped lowering of level. Each lowering of the lake level resulted in narrower lake. The exposed lake shore was formerly shallow water of lake sand or deltas. A prevailing northwest wind blew the unvegetated sand and collected it into dunes of several types. Some dunes form long, linear or longitudinal dunes arranged parallel to the prevailing wind. Some dunes form long, linear ridges arranged approximately perpendicular to the wind and are termed transverse dunes. Some dunes are isolated or barchan dunes with a horn-shaped end and rounded, steeper and higher opposing end. Still other dunes are a complex mixing of the above types. By the latest glacial times and into the Holocene, the lands became sufficiently vegetated and the time of dune formation came to an end.

The largest areas of dune sand stretch across much of the Quaker Springs quadrangle and the Northwest portion of the Mechanicville quadrangle. These exist because the lake bottom was always shallower here versus in the Hudson Valley. Also, the glacial Hudson River deposited a lot of sand into the lakes through Glens Falls, Hudson Falls and Fort Edward. The prevailing lake currents carried this sand southward through Quaker Springs

Qld - Lake Delta (Pleistocene)
Stream deposits of gravel and sand accumulated in a lake with topset and foreset beds marking lake level; all are fan deltas in the mapped region; well sorted stratified sand and gravel or sand; usually well drained and thick deposits which make good unconfined aquifers. These landforms are highly valuable as gravel and sand resources.

The Batten Kill and Hoosic River deposited large deltas into the Hudson Valley glacial lakes. The Hoosic River deposited 2 notable deltas into 2 lakes. The higher delta and lake was Lake Albany II. That delta was partly eroded when the lake lowered and a new delta was deposited into the succeeding lake, Lake Quaker Springs. Both deltas were extensively eroded as time went on and the lakes drained in steps to lower lakes and finally to the time of the great high discharge flows from the Champlain Lowland. The Batten Kill deposited one major and beautiful delta into Lake Quaker Springs that has only been slightly modified by later erosion.

Qls - Lake Sand (Pleistocene)
Well sorted laminated fine to medium sand underlying plains; prone to gullying and headward erosion; moderately good aquifer if thick, poor if thin.

Lake sand was deposited in the shallower portions of the glacial lake bottoms. The sand may overlie finer lake silt and clay, especially when the glacial lakes lowered and formerly deep lake bottom became shallow. An area of lake sand extends south from the Batten Kill delta and records the southward prevailing current in the glacial lakes that resulted from the prevailing northwest wind.

Dunes exist in portions of the lake sand map areas. However, these dunes do not dominate the landscape. Rather, the land is primarily level with minor or no dunes.

Qlc - Lake Clay (Pleistocene)
Fine grained varved or thinly laminated deposits of silt and clay accumulated in the deeper portions of lake basins; gravel and sand lenses may be present within the sequence especially near the bottom where melt water streams coming from the glacier may have deposited this coarse sediment into the bottom of the lake; prone to landslides and gullying; poorly drained and a poor aquifer. Lake clay and silt dominate the deep Hudson Valley axis where the thickness commonly exceeds 100 feet. The landform is of an exposed lake bottom plain. Deltas of the Batten Kill and Hoosic River partly extend over lake clay and silt. The lake clay and silt drape over the underlying topography. Thus, there are places where till or rock may protrude above the lake plain.

Qow - Outwash (Pleistocene)
Outwash & outwash fan; glacial melt water deposits of well sorted gravel and sand; gently sloping to flat lands which may be pitted due to melted ice blocks; outwash fans occupy topographic setting similar to alluvial fans; intermediate to high permeability; high gravel-sand resource potential. There are fairly small areas of OW and OF in the mapped area.

Qof - Outwash (Pleistocene)
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Qkd - Kame Delta (Pleistocene)
Lake delta with proximal ice contact facies displaying deformation of sediments; gravel and sand to sand, stratified; may have diamicton beds; generally well sorted within individual beds; well drained soils; typically thick deposits; high gravel and sand resource potential; good to excellent aquifer.
One area of kame delta is marked in the eastern portion of the Schaghticoke quadrangle along the Hoosic River. This is an older and higher delta that likely resulted from both river and ice sources. The elevation of this single kame delta coincides with the oldest and highest glacial lake, Lake Albany I.

Qkf - Kame Fan (Pleistocene)
subaqueous; sand and gravel deposits from melt water deposited into the bottom of a lake along the retreating ice margin; subaqueous fan sediments are well sorted and well stratified; typically found in direct contact with bedrock; overlain by lacustrine silt, clay and sand; good aquifer if thick and aerially extensive. The Willow Glen kame fan on the Mechanicville quadrangle is part of an extensive deposit that to the north may have emerged from the lake surface to form a delta but the exposures cannot verify this any longer.

Qk - Kame (Pleistocene)
Undifferentiated hummocky to flatter terrain; glacial deposits from streams, slumps and deposition by ice; stratified and unstratified sand, gravel and boulders with variable silt; rolling, hilly lands to individual hills; intermediate to high permeability; high gravel-sand resource potential; fair to good aquifer limited by variable thickness and aerial extent. Some of these deposits may be deltaic in origin but do not display a deltaic landform. Other areas marked kame underlie lake clay and silt and represent former melt water streams that issued from the glacier and deposited subaqueous fans of sediment. These fans were later buried by deep water accumulations of lake clay and silt. Smaller areas of kame along the flanks of rock and till ridges and hills represent deposition from melt water streams along these higher elevation areas. They are generally quite small.

Qtb - Till, thick or blanket (Pleistocene)
Ice derived deposits of hardpan silt, boulders, gravel and sand which are unsorted and unstratified and deposited beneath the glacier; may contain deformed stratified units that may be re-deposited diamictons from subaqueous or subglacial flows; thickness greater than 3 meters (10 feet) but rock outcrops may be common; surface boulders or erratics are common; smoothed and streamlined hills in the valley and gently undulating slopes on the lower mountain flanks to nearly flat plains dotted with erratics; low permeability; unstable slopes in excavations; prone to significant slope failures along stream banks. Till mapped as thick must be verifiable as thick from well logs or exposures. Rock or ledge exposures are infrequent but may occur.

Qtv - Till, thin or veneer (Pleistocene)
Ice derived deposits of hardpan silt, boulders, gravel and sand which are unsorted and unstratified and deposited beneath the glacier; thickness less than 3 meters (10 feet) with rock outcrops or ledge frequent; surface boulders or erratics are common; moderate to steep mountain slopes and summit areas; low permeability; steep slopes are unstable and slides are common.

R - Rock Outcrop (Precambrian-Cambrian-Ordovician)
Exposed areas of ledge/outcrop or areas mostly ledge/outcrop; includes areas of predominantly outcrop with patches of till or slump/slide debris; outcrop areas directly recharge bedrock aquifers; poor sites for septic systems; slopes are generally stable except steep very slopes where rock slides and rock falls may occur. Please consult the accompanying bedrock map for details of the rock types in the map area

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