GLACIAL DEPOSITS IN THE MOHAWK AND SACANDAGA VALLEYS OR A TALE OF TWO TONGUES REDUX

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PURPOSE

The purpose of this field trip is to examine the late glacial deposits of the Mohawk and Sacandaga Valleys, particularly the recessional and interlobate moraines preserved in the vicinity of Gloversville, NY. The glacial sediments exposed in the area were deposited during the waning stages of the last ice sheet, when the local topography split the thinning and wasting ice sheet into the Mohawk and Sacandaga glacial tongues. Sediment-laden meltwaters from these lobes deposited a complex of moraines and glacial lake sediments from Gloversville to Galway. The three-dimensional distribution of sedimentary facies record the demise of these tongues and provide a framework for one of the most productive aquifers in NYS.

This study focuses on three 7-1/2 quadrangles: Gloversville, Broadalbin, and Northville. Adjacent 7-1/2 minute quadrangles studied include Amsterdam, Tribes Hill, Galway, Jackson Summit, and Peck Lake (Figure 1).

INTRODUCTION

The study of the glacial stratigraphy of the Mohawk and Sacandaga Valleys has enjoyed a resurgence in the past thirty years after a lull of nearly forty years. Brigham (1928) published a map and lengthy interpretation of the glacial deposits of the central and western Mohawk Valley. This map and its associated text stood as the "last word" until Robert LaFleur and his graduate students began to re-examine glacial deposits and glacial history of the area in the early sixties (LaFleur, 1965; Yatsevitch, 1968). Yuri Yatsevitch completed a Masters Thesis in 1968 that outlined the framework of the late Wisconsinan history of the valleys. LaFleur (1969, 1975, 1979, 1983) built upon Yatsevitch's thesis, paying particular attention to evidence for a Late Wisconsinan readvance (the Yosts Readvance) and the wide-spread distribution of a dark gray, clay-rich till (the Mohawk Till). Later, Dineen and Hanson continued LaFleur's and Yatsevitch's work while mapping for the New York State Geological Survey's Surficial Mapping Project (see Cadwell and Dineen, 1986). They refined the geologic mapping and stratigraphy in the eastern Mohawk Valley while Jack Ridge refined the mapping and stratigraphy in the western Mohawk (Dineen and Hanson, 1985; Muller and Ridge, 1986; Ridge, 1991; Dineen et al., 1992).

SUMMARY OF EASTERN MOHAWK AND SACANDAGA VALLEY GEOLOGY

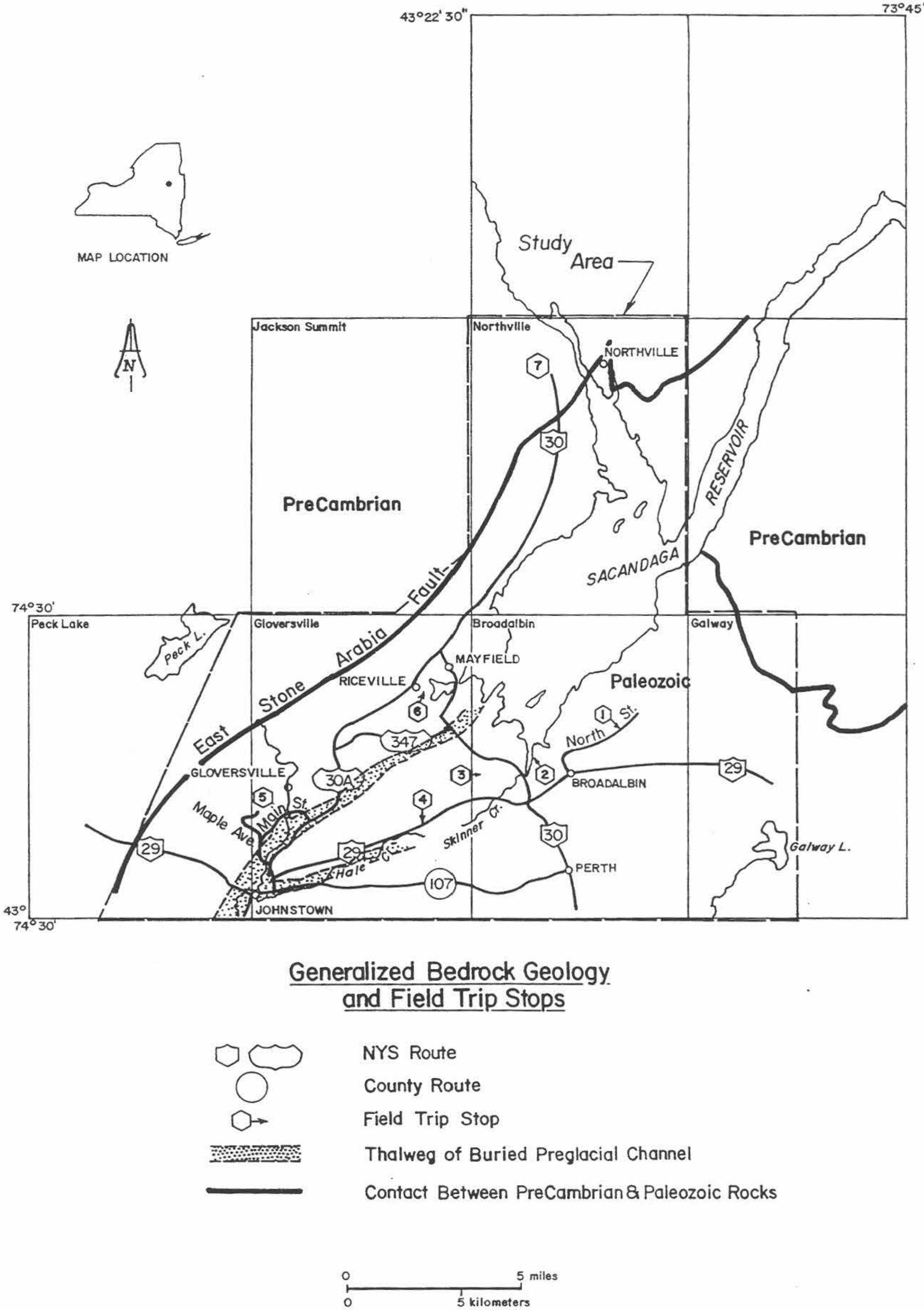
Bedrock and Structure

The eastern Mohawk Valley is underlain by lower Paleozoic sedimentary rocks, including shales, dolostones, limestones, and sandstones. These rocks dip off of the dome of the Adirondack Mountains. They have been broken into a series of half-grabens, which strike north-northeast and dip down to the west (Fisher, 1980). The grabens are bounded on their eastern edges by normal faults that are, from east to west: the Hoffmans, Tribes Hill, Fonda, Noses (south of Johnstown), and East Stone Arabia (north of Johnstown) faults (Roorbach, 1913; Fisher et al. 1970; Fisher, 1980).

The present topography is controlled by bedrock hardness and structure. Sandstone, dolostones, or gneiss underlie the high, eastern edges of the half-grabens (Roorbach, 1913). Shaley dolostones and shales underlie their low western edges.

The Sacandaga Valley is a half-graben underlain by Paleozoic shales and sandstones. The uplands that border the basin on the west, north, and east are underlain by PreCambrian gneiss and quartzites (Fisher et al, 1970).

In Garver, J.I., and Smith, J.A. (editors), Field Trips for the 67th annual meeting of the New York State Geological Association, Union College, Schenectady NY, 1995, p. 39-55.



Generalized Bedrock Geology and Field Trip Stops

Figure 1

The PreCambrian rocks have been uplifted by the Fonda and East Stone Arabia faults.

Cenozoic Drainage

During the Cenozoic Era, stream systems carved primary, strike streams into the lower, western portions of the half-grabens. Shorter streams drained the dipslopes along the higher portions of the half grabens. The preglacial Sacandaga River was a large strike stream that drained the Sacandaga basin (Fig. 1), and flowed south into the preglacial Mohawk River (Brigham, 1929; Arnow, 1951). The preglacial Mohawk River drained east across the bedrock structure into the Hudson Lowlands.

Regional Glacial Movement

The preglacial strike valleys were oriented at nearly right angles to the movement of the Mohawk Sublobe of the Hudson Glacial Lobe, and were subparallel to the movement of the Adirondack Sublobe of the Hudson Lobe. The strike valleys channeled the Adirondack Sublobe and the high edges of the half-grabens split the Adirondack Sublobe into multiple subordinate ice tongues, including the Sacandaga tongue. Interglacial and glacial sediment have been preserved from glacial erosion by the high eastern buttresses of the half-grabens resulting in the accumulation of thick, complex sequences of Pleistocene deposits.

GLACIAL DRIFT IN THE MOHAWK AND SACANDAGA LOWLANDS

The products of the Wisconsinan stage glaciation preserved in the Mohawk and Sacandaga Valleys include striae, drumlins, eskers, recessional moraines, interlobate moraines, and outwash systems. The glacial drift was deposited in the subglacial, ice marginal, and proglacial environments.

The texture of the glacial drift provides clues to glacial movement. The grain sizes and clast lithologies of the glacial drift are influenced by the bedrock lithologies that were eroded by the glacier. Crystalline and metamorphic rocks, and sandstone form sandy glacial deposits in response to glacial grinding. Glacial erosion grinds carbonates, phyllites, schists, siltstones, and shales into fine-grained debris. The drift in the Sacandaga basin is a bouldery, silty, sand. Gravel and clay are not important components of the Adirondack Till. The shales and carbonates in the Mohawk Valley were milled into a bouldery, gravelly, silty, clay forming the Mohawk Till (Fig. 2a). Drumlins and thick ground moraine were deposited in the lower areas of the grabens. The higher portions of the half-grabens were blanketed by thin ground moraine. The drift texture was subsequently modified through sorting by mass wasting, wind, and water. The topography controlled the relatively intensity of the various drift-modifying processes.

Features that form beneath the ice are subglacial. Subglacial features or deposits record the movement of a glacier. Striae and drumlins record the direction of ice flow.

Striae are glacial scratches on rock or compact, fine-grained sediment surfaces (such as till or lake clay). They are parallel to ice movement. **Drumlins** are ellipsoidal, streamlined hills that are orientated with their long axes parallel to the ice direction. Their tapered or "pointed" ends indicate the direction that the ice is moving towards. They are composed of concentric laminae of till or contain cores of older till, stratified drift, or bedrock with an outer skin of till. **Eskers** are elongated ridges of sand and gravel that were deposited by streams flowing within, under, or on the glacier. They record the orientation of the ice margin.

Ground moraine records the previous extent of the ice. It is an irregular blanket composed of a mixture of compact, fissile till, loose till, and stratified drift. Exposures of the compact till break into pencil-sized fragments along shear planes (fissility). Shear planes are also present in underlying sediments (see Stop 1). The ground moraine contains loose to firm till, with lenses of varying proportions of silt, sand, and/or gravel as well. The loose till contains significantly less clay than the compact till. A boulder pavement often occurs at the top of any underlying till unit. The bedrock underlying the ground moraine is often polished and striated.

Ice Marginal features form along the edge of the ice and include recessional moraines, interlobate moraines, and outwash systems.

Recessional moraines are large "dumps" of sediment forming arcuate ridges. They include till and stratified drift that accumulate along the margins of the ice sheet or lobe during hesitations in glacial retreat.

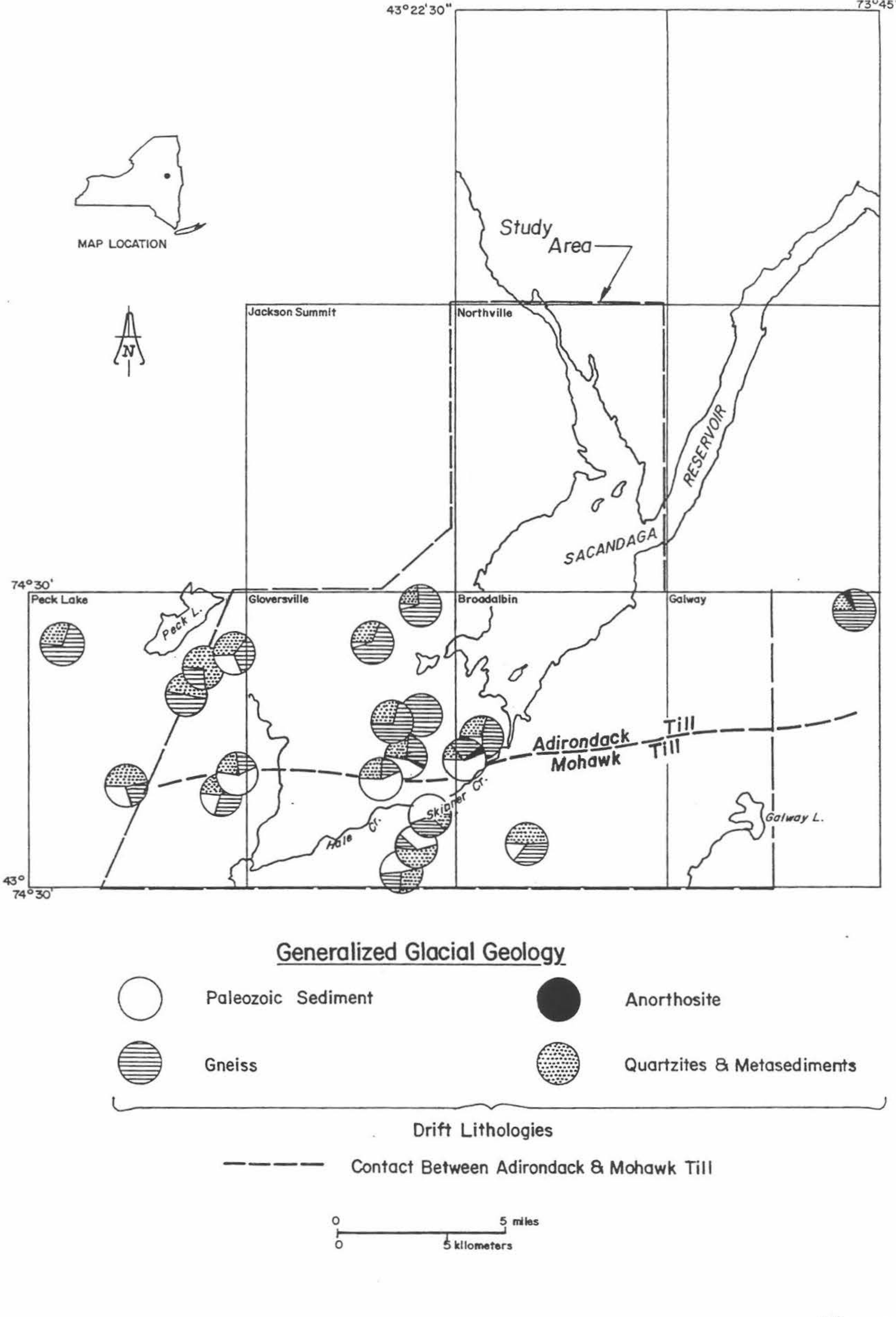
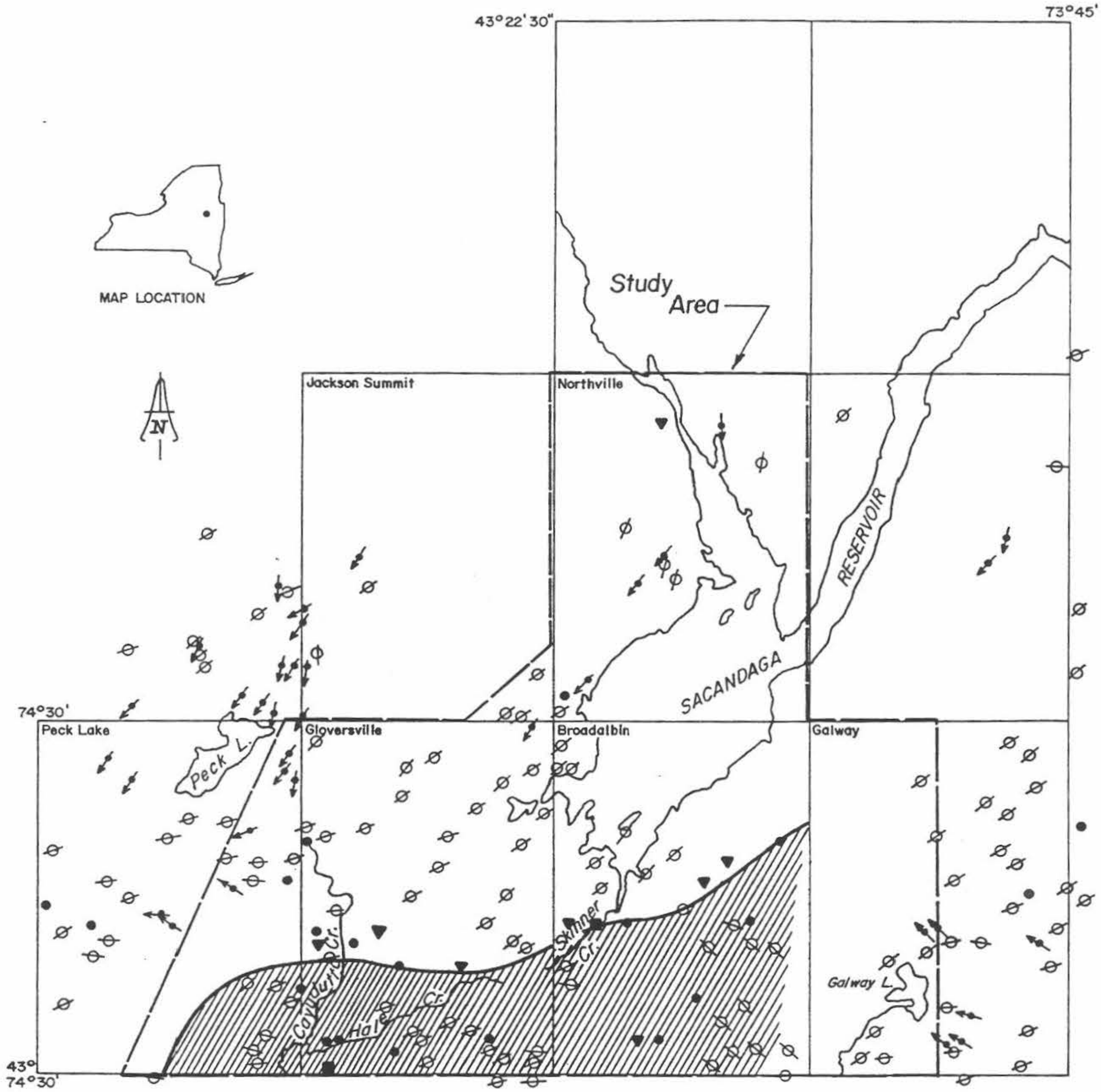

43°22'30"
73°45'
MAP LOCATION
N
Study Area
Jackson Summit
Northville
RESERVOIR
SACANDAGA
74°30'
Peck Lake
Gloversville
Broadalbin
Galway
Peck L.
Adirondack Till
Mohawk Till
Hale Cr.
Skinner Cr.
Galway L.
43°
74°30'
Generalized Glacial Geology
Paleozoic Sediment
Anorthosite
Gneiss
Quartzites & Metasediments
Drift Lithologies
Contact Between Adirondack & Mohawk Till
0
5 miles
0
5 kilometers

Figure 2a



More Generalized Glacial Geology

- Drumlin Orientation
- Buried Soil Zones
- Striae Location
- Exposure w/ Till-Over-Outwash or Lacustrine
- Well w/ Till-Over-Outwash or Lacustrine
- Area w/ Stratified Drift Under Lodgement Till (Yost Readvance)

0 5 miles
0 5 kilometers

Figure 2b

Interlobate moraines are wide ridge complexes deposited between two or more glacial lobes. The ridges are usually hummocky or irregular, with numerous pits or depressions that mark the locations of melted ice blocks. The moraines are composed of variable quantities of stratified drift and till.

Proglacial deposits form beyond the ice margin. **Outwash** is deposited in meltwater stream systems that carried meltwater away from the ice. The outwash abruptly terminates along the ice margin at the head of outwash. Outwash also includes alluvial fans that originated at the ice margin. **Glacial lake sediments** are deposited in lakes adjacent to, under, and in front of the ice. The glacial lake sediments underlie planar areas or terraces, and are composed of fine sand, silt, and/or clay.

ICE MOVEMENT IN THE MOHAWK AND SACANDAGA VALLEYS

Drumlins and other ice movement indicators were mapped in the Mohawk and Sacandaga Valleys based on topographic maps, airphoto interpretation, and field observations. The drumlin data was supplemented by observations of rocdrumlins (composed almost entirely of glacially streamlined bedrock), flutes (low, elongated, smooth bedrock ridges), grooves (elongated, streamlined depressions), and roche moutonnee (whale-back shaped rock ridges). Flutes, grooves, and rocdrumlins were observed most frequently on the upper slopes of the grabens.

The drumlins and striae in the Sacandaga Valley are oriented east of north (Fig. 2b). They record the northeast-to-southwest ice movement of the Adirondack Sublobe, down the Sacandaga Valley, and across gneiss and anorthosites in the eastern Adirondack Mountains. The drumlins and striae in the Mohawk Valley record ice movement that was predominantly flowing from east to west, with a radial deflection of the Mohawk Sublobe to the northwest. The ice had flowed across Paleozoic shales, graywacke, and carbonates.

The drumlins are cored with Adirondack Till and sandy stratified drift in the Sacandaga Valley. These drumlins are oriented northeast to southwest (some drumlins appear "flipped" on the topographic maps, with the rounded end on south side!). Drumlins contain Mohawk Till in Mohawk Valley. They are oriented east-west, with some drumlins oriented northwest-southeast south of Perth Moraine. The Mohawk drumlins also contain some stratified drift.

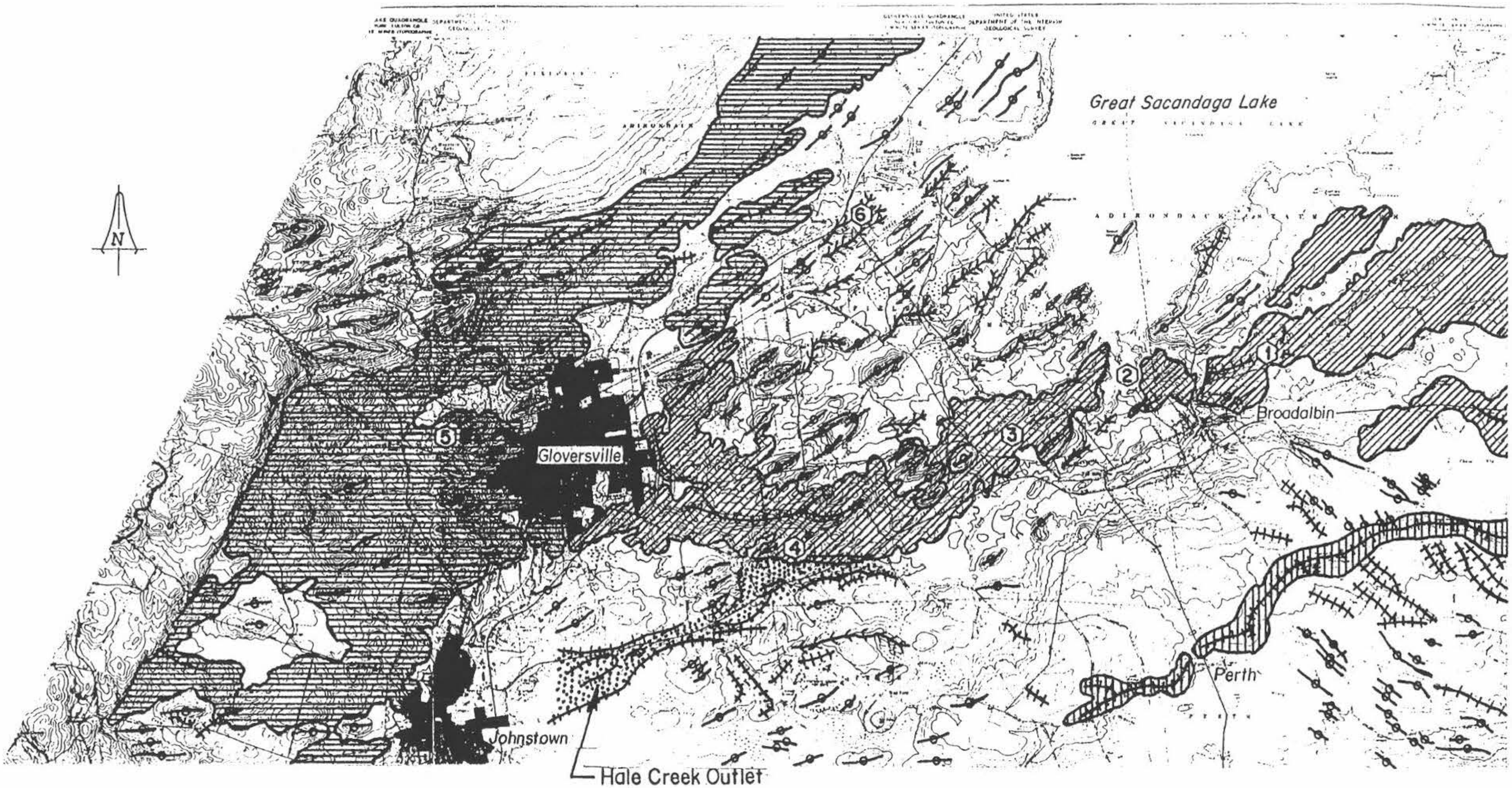
MORAINES IN THE MOHAWK AND SACANDAGA VALLEYS

Morainal features in the Gloversville vicinity include recessional and interlobate moraines. The locations of the moraines were controlled by the ice margin positions, which were controlled by the topography. Recessional moraines were deposited on the valley sides along the edges of the glacial tongues and in the valley bottoms, along the end of the glacial tongue. The glacial tongues advanced or remained further down valleys and receded along the uplands. Several recessional moraines were deposited in the vicinity of Gloversville. These include the Jackson Summit Recessional Moraine, Perth Recessional Moraine, and Gloversville Kame Complex (Fig. 3). The Broadalbin Interlobate Moraine was deposited along the suture between the Mohawk and Adirondack glacial tongues.

The Jackson Summit and Perth recessional moraines illustrate the influence of topography. The Jackson Summit Recessional Moraine is a 5 to 50-meter thick mass of sand and sandy till that is draped on the scarp of the East Stone Arabia Fault (Fig. 3; Dineen and Hanson, 1985). The moraine becomes thicker and its top surface is higher in elevation from southwest to northeast. The Perth Recessional Moraine extends from Perth to Galway Lake and consists of a 5- to 15-meter high narrow ridge of interbedded compact silty clay till and massive to planar bedded gravelly sand outwash (Dineen and Hanson, 1985).

The Gloversville Kame Complex (GKC) and Broadalbin Interlobate Moraine (BIM) form a zone of morainal topography that extends from the base of the East Stone Arabia fault block through Gloversville to Broadalbin and Galway. The Gloversville Kame Complex is a nested series of sandy moraine loops. The GKC and BIM form a series of concentric recessional moraine-interlobate moraine couplets from Clip Hill (at the East Stone Arabia Fault scarp) through Gloversville to the present-day Lake Sacandaga shoreline at Munsonville (Fig. 3).

The BIM is a wide ridge of silty sand and gravel that exhibits rapid changes in texture and bedding. It is 15 to 50 meters thick, and extends from Gloversville to Galway Lake. The moraine contains numerous loose, silty flow tills, reworked tills, and mud flows. The tills are interbedded with planar to cross-stratified sand with silt and gravel. Cross-laminated sand and silt dominate the distal portion of the moraine. Cross-bedded sands with silt and flowtills dominate the proximal portion of the moraine. The deposits are block faulted. The Town of Broadalbin,



Recessional and Interlobate Moraines in the Sacandaga Basin

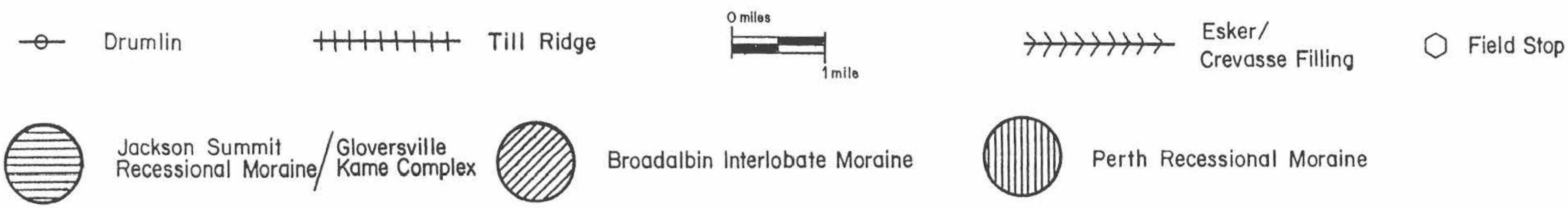


Figure 3

Herba, Rex Excavating, and Twin Cities Sand and Gravel pits are exposures in the proximal-through-distal BIM (Stops 1, 3, 4, and 5 in the field trip log, below). The southeastern edge is mantled with till that was deposited by the Yosts Readvance.

Glacial Lakes Gloversville and Sacandaga occupied the Sacandaga Valley and Glacial Lake Schoharie occupied the Mohawk Valley (Brigham, 1928; Yatsevitch, 1968; LaFleur, 1965, 1969, 1975, 1979). The lake sediments have a sandy texture in the Sacandaga Basin, where the Adirondack Till was reworked by water. The lake sediments have a clayey texture in the Mohawk Valley, because of reworking of the Mohawk Till.

The moraine systems are surrounded by fine sands that were deposited in the ice marginal lakes. The lakes included Glacial Lake Gloversville (GLG) at elevations from 870 to 840 feet above sea level (asl). GLG drained through an outlet near the Sammons Cemetery (south of Johnstown) into 690 to 600-foot asl Lake Schoharie in the Mohawk Valley. The subaqueous fan exposed in the Twin Cities Sand and Gravel pit at Gloversville (Stop 5) was deposited in GLG. Glacial Lake Sacandaga had water levels from 840 to 800 feet asl. It drained through the Hale Creek outlet into Glacial Lake Schoharie. As the ice retreated into the upper Sacandaga basin, ice-contact subaqueous fans were deposited in Glacial Lake Sacandaga. The Scotia Pit (Stop 2) at the lake shore near Broadalbin is an exposure of a fan.

Eskers and crevasse fillings occur in the area of ground moraine and lake plains that lies between Gloversville and Mayfield. The eskers (and, to a lesser extent, the crevasse fillings) contain trough cross-bedded sand with some gravel and silt, till lenses, and a mantle of till and/or aeolian sand. One to three meters of wind-blown silt and silty fine sand mantles many of the deposits in the area. Frost-heaved stones are common in the aeolian deposits. The interior of the eskers is exposed at Stop 6.

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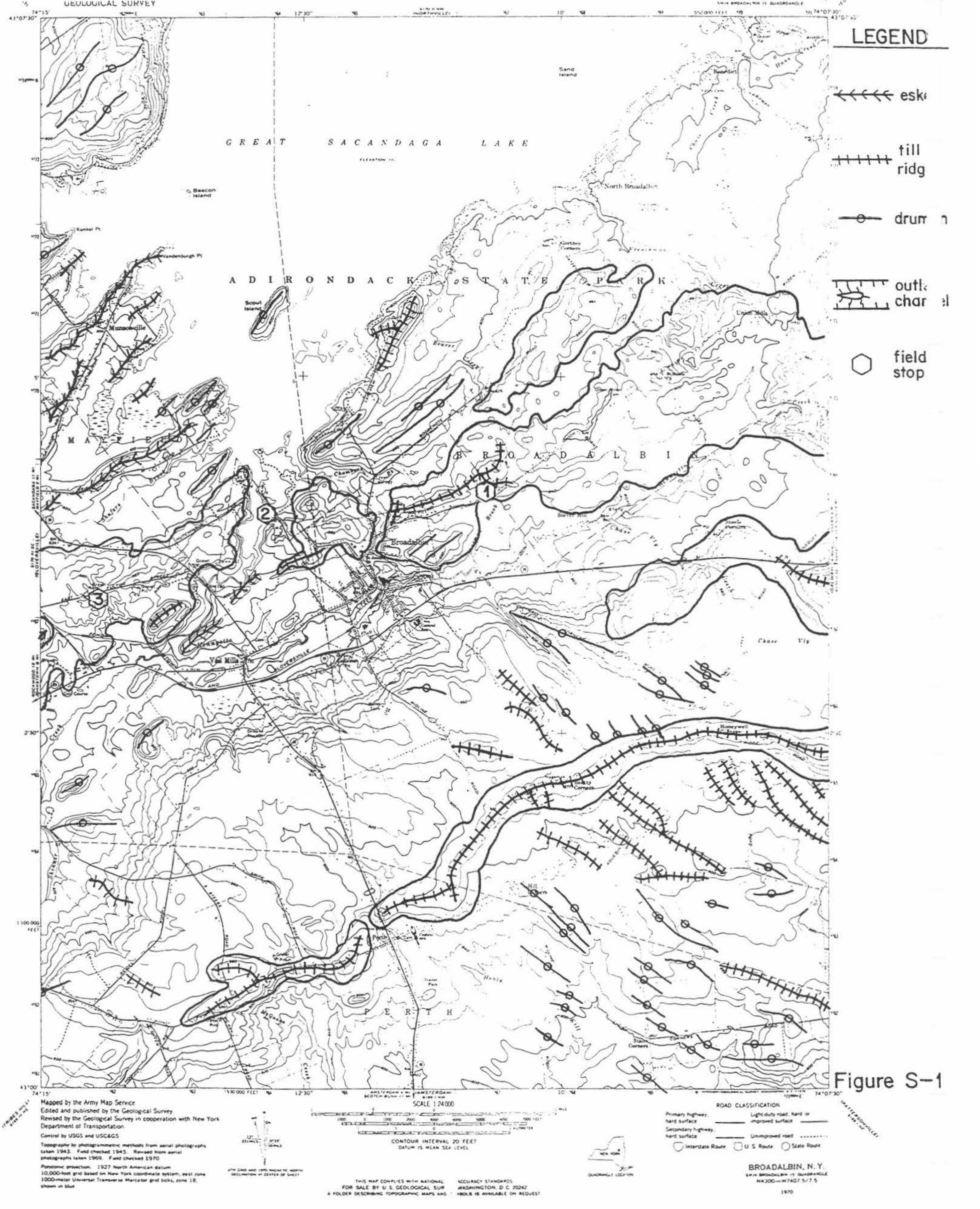
GLACIAL DEPOSITS IN THE MOHAWK AND SACANDAGA VALLEYS OR A TALE OF TWO TONGUES REDUX

FIELD TRIP LOG

Miles from Start	Miles from Last Stop	
0.0	0.0	Leave the main entrance of Union College. Turn right onto Union St. and proceed west.
0.5	0.5	Turn left onto Erie Blvd.
1.1	1.1	Turn right onto the entrance ramp of I-890 (west) and proceed west.
–	–	Enter the NYS Thruway (I-90) and proceed west.
–	–	Crossing the western edge of the Hudson Lowlands.
–	–	Crossing the trace of the Hoffmans Fault.
16.7	16.7	Exit the Thruway onto NYS Route 30 (north). Proceed north through the City of Amsterdam.
		We are proceeding across ground moraine of Mohawk Drift. The hills are drumlins, many of which have stratified drift cores.
–	–	Crossing the Perth Recessional Moraine.
26.6	26.6	Fulton County Route 155/ Main Street Broadalbin. Proceed straight (east) into the Village of Broadalbin on Route 30. Route 30 turns left.
28	28	Turn right (north) onto North Street.
28.5	28.5	Turn right onto Union Street, proceed east.
29.6	29.6	**Stop 1:** Town of Broadalbin Pit-on the left side of Union street, next to the Broadalbin Town Hall.

Stop 1: **Town of Broadalbin** (see Figures S-1 and S-2a).
This exposure is in the southeast, Mohawk Drift portion of the BIM. The eastern slope was the ice-proximal side. The area was overridden from the southeast by the Yosts Readvance. The overriding ice plowed into the moraine, shearing and displacing the drift to the northwest. The deposit later collapsed by normal faulting and slumping when the Yosts ice melted. The outwash and ice-contact stratified drift exposed in the pit was deposited by meltwater flowing east to west along the margin of the Mohawk tongue. This conclusion is based on cross-bedding and climbing ripple orientations.

In 1984, the Section exposed at the Town of Broadalbin Town Pit was as follows:
6 m: Top of section.



GEOLOGICAL SURVEY
LEGEND
till
ridg
drum
field
stop
GREAT SACANDAGA LAKE
Sand Island
Beacon Island
Kunkel Pt
Vandenburgh Pt
Scout Island
North Broadalbin
ADIRONDACK STATE PARK
Mussonsville
Union Mills
BROADALBIN
Broadalbin
Vail Mills
Honeywell Corners
Beaty Corners
Hill Corners
Perth
PERTH
State Corners
1
2
3
Mapped by the Army Map Service
Edited and published by the Geological Survey
Revised by the Geological Survey in cooperation with New York Department of Transportation
Control by USGS and USC&GS
SCALE 1:24 000
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
ROAD CLASSIFICATION
BROADALBIN, N. Y.
1970

Figure S-1

4.5 to 6 m: 10 YR 6/4 Fine sand with little gravel, in planar beds and climbing ripple laminae. Contorted to the east. Upper 50 cm is massive and fissile.
4.5 m: Disconformity.
3.5 to 4.5 m: 10 YR 6/2 Climbing-ripple and ripple-trough-laminated fine sand with lenses of gravel near its base.
3.5 m: Disconformity.
2.5 to 3.5 m: 10 YR 6/4 Trough cross-laminated, fine to coarse sand with fine gravel in 1 to 3 m wide, 1 to 1.5 m deep channel fills inset into ripple laminated very fine sand. The unit is contorted and overturned to the northwest and gravity faulted to the east. The upper 50 cm is fissile and sheared. The unit contains lenses of coarsening-up, silty, sandy matrix-to clast-supported diamicts.
2.5 m: Disconformity.
Base to 2.5 m: 10 YR 6/4 Planar cross-laminated fine sand with lags of gravel on truncation surfaces. Ripple laminated to the east. Faulted down to the southeast.

A pit 70 m west of this Stop contained 5 meters of contorted, ripple-bedded sand. The upper portion of the sand was deformed by shearing, and was overturned to the northwest. The sand was overlain by 1 to 2 meters of compact, fissile, sandy matrix-supported diamict.

Leave Stop **1**, turn left and proceed west on Union Street.

30.7	1.1	Turn south (left) onto North Street.
30.9	1.3	Turn right (north) onto North Main Street.
31.9	2.3	Turn left onto North Second Street, **Stop 2** is immediately on the right.

Stop 2: **Scotia Sand and Gravel** (see Figure S-1):
This subaqueous fan contains planar, trough, and ripple-laminated sand and silty sand. Cross beds suggest that the sand was deposited against the ice by meltwater flowing from the east and southeast. The Sacandaga tongue lies to the northwest, in the vicinity of the present shoreline of the Sacandaga Reservoir.

Leave Stop 2 and proceed south on North Second Avenue.

32.7	0.8	Turn left onto Main Street (Fulton County 155).
33.6	1.7	Turn right onto NYS Route 30 (north).
34.4	2.5	Turn left onto Sand Creek Road.
35.3	3.4	**Stop 3** Herba Pit is on the left, the Mayfield Landfill is on the right.

Stop 3: **Herba Pit** (see Figures S-1 and S-2b).
This exposure is in the northwestern portion of the BIM, on the Adirondack Drift side. The ice was on the northwestern side of the moraine. Many flow tills and a few compact lodgement tills are observed in this pit.

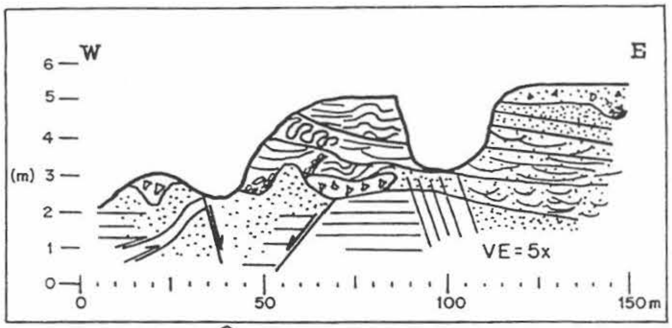
In 1983, the Section exposed at the Herba Pit was as follows:
9.7 m: Top of section.
9 to 9.7 m: 7.5 YR 6/8 Sand and silt matrix-supported diamict. Some cobbles are present.
8.6 m to 9 m: 10 YR 6/3 Trough cross-bedded, cobbly gravel.
6 to 8.6 m: 10 YR 7/6 Lenticular, trough cross-bedded, cobbly sand and gravel.
4.8 to 6 m: 10 YR 5/4 compact, sandy matrix-supported, massive to laminated diamict. Lenses of fine sand are present.
3.9 to 4.8 m: 10 YR 7/2 Interbedded sandy massive to planar-bedded diamict with greasy, rotten shale clasts. The lower 20 cm is sheared.
3.9 m: Truncation surface;
Base to 3.9 m: 10 YR 7/2 Cross-bedded cobbles and sand. The cross beds dip 10 S80E.

Leave Stop 3, turn right onto Sand Creek Road, proceed east.

36.1	0.8	Turn right onto NYS Route 30 (south).
37.3	1.2	Turn right onto NYS Route 29 (west).
41	3.7	**Stop 4** on the right side of the road.

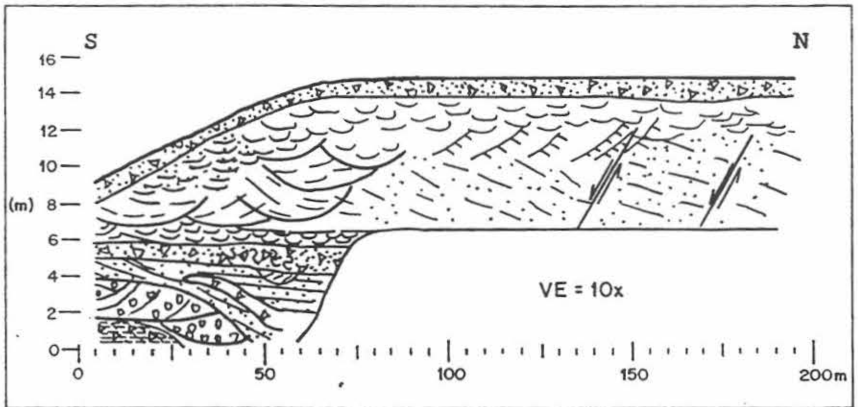
Stop 4: **Rex Excavating** (see Figures S-3 and S-2c).

2a.



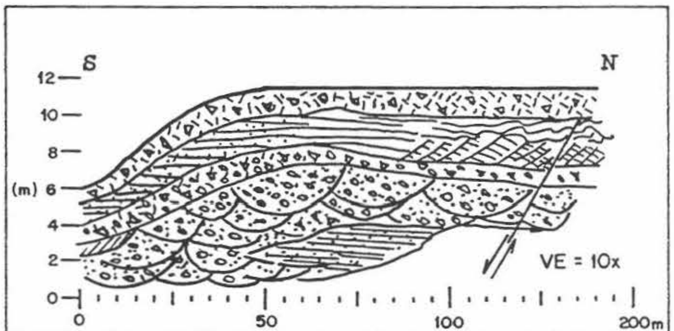
STOP (1) – Broadalbin Town Dump

2b.



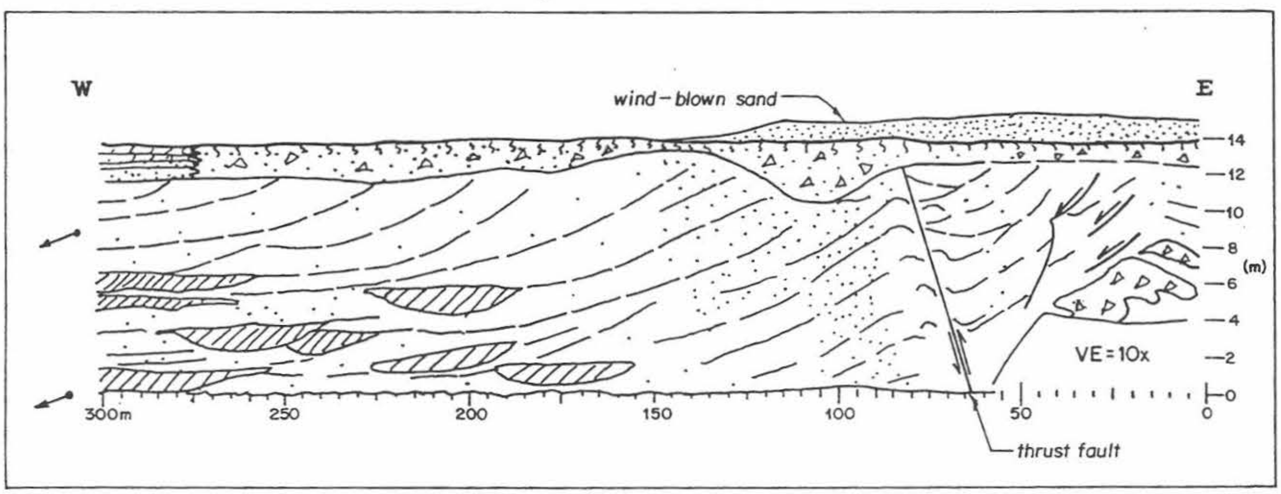
STOP (3) – Herba Pit

2c.



STOP (4) – Rex Excavating

2d.

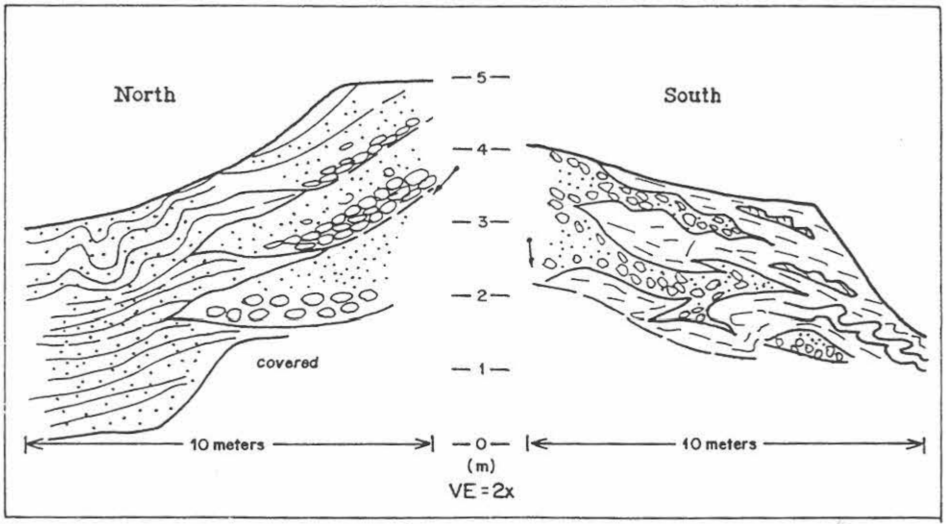


STOP 10 – Twin Cities Sand and Gravel

Field Sketch of Exposures

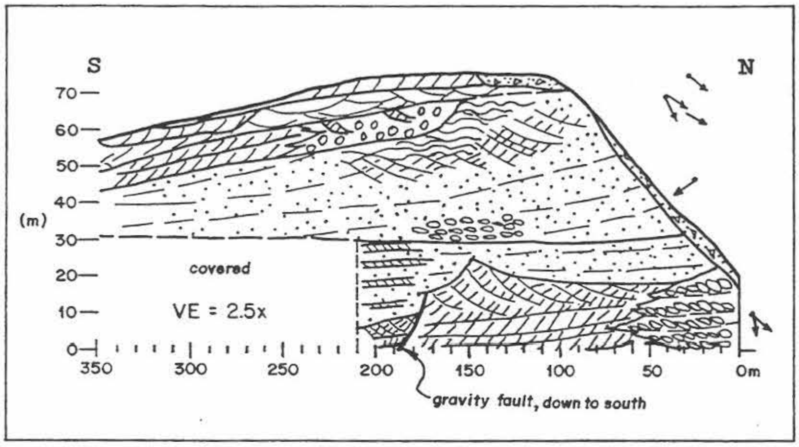
Figure S–2

2e.



STOP (6) – Mayfield Pits

2f.



STOP (7) – Bradt Pit

LEGEND (for Exposure Sketches 2a – 2f)

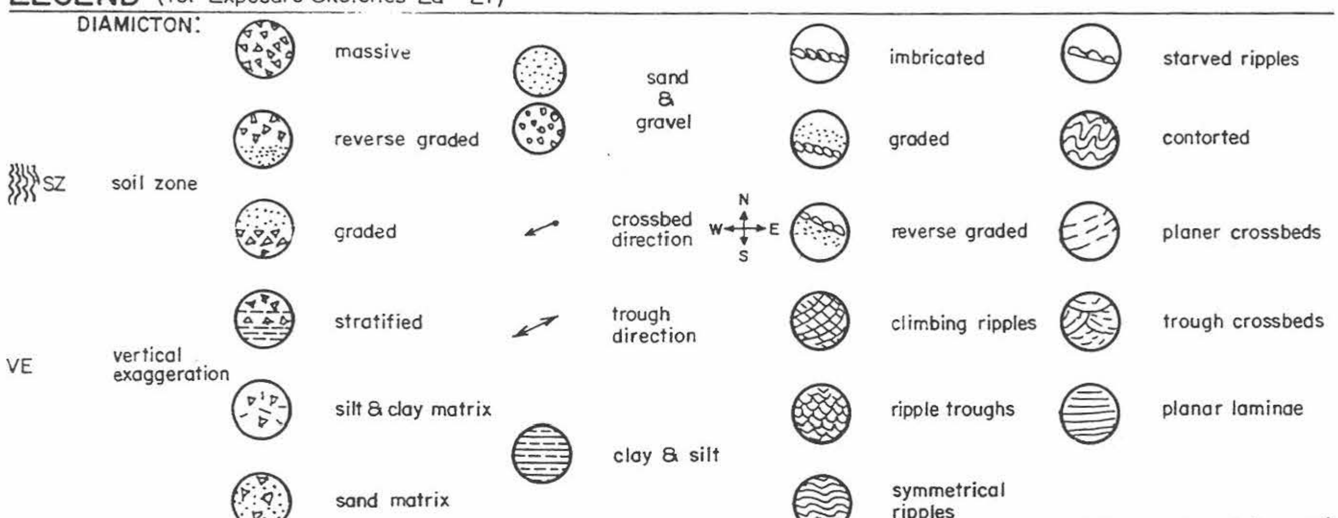


Figure S-2 (cont.)

This exposure is in the southwestern portion of the BIM, on the Mohawk Drift side. Southeast was the ice-proximal side. The pit contains several till and lacustrine sequences that suggest the ice margin was oscillating. It was overridden by the Yosts Readvance. A similar exposure lies 1.7 km to the east.

In 1984, the Section exposed at the Rex Excavating Pit was as follows:

11.3 m: Top of section.
9.7 to 11.3 m: 10 YR 4/2 silt matrix-supported diamict. The unit is faintly laminated with sand stringers at the base. The base has a sheared contact with:
8 to 9.7 m: 10 YR 6/4 Irregularly-laminated fine sand and silt. Cobbles of rotten shale are present.
7.7 to 8 m: 10 YR 4/6 Laminated, silt matrix-supported diamict.
6.6 to 7.7 m: 10 YR 6/3 Planar-laminated fine sand with cobbles. Unit is locally cemented.
2 to 6.6 m: 10 YR 5/3 Planar cross-bedded, gravelly sand with a trace of boulders. The cross beds dip 10 to 15 N60W.
Base to 2 m: 10 YR 5/3 Silt matrix-supported diamict with striated boulders.

Leave Stop 4, turn right onto NYS Route 29 (west).

45.2	4.2	Cross NYS Route 30A onto Briggs Street (City of Gloversville).
45.7	4.7	Turn right (north) onto North Perry Street.
46.6	5.6	Veer left onto Maple Avenue, proceeding northwest.
47.4	6.4	**Stop 5** on the right.

Stop 5: **Twin Cities Sand and Gravel** (see Figures S-3 and S-2d)
This pit is in the distal portion of the BIM and contains distinct subaqueous fan features (foreset beds and starved ripples). Both gravity and thrust faults are common in the eastern (proximal) portion of the pit. Aeolian sand mantles the upper 4 m of the pit. The upper cross-bedded sand is the leading edge of an aeolian dune. The upper sandy diamict is wind-blown silt and sand.

In 1984, the Section exposed at the Twin Cities Sand and Gravel Pit was as follows:

14 m: Top of section.
12 to 14 m: 10 YR 5/4 Cross-laminated fine sand.
10 to 12 m: 10 YR 6/3 Laminated to massive (west to east) sand matrix-supported diamict. This unit fills in depressions in the lower unit. The top contact has a soil zone.
Base to 10 m: 10 yr 6/4 Planar cross-bedded fine sand with lenses of trough laminated medium to coarse sand. Faulted and interbedded with contorted lenses of silty matrix-supported diamict to the east.

Leave Stop 5, turn left onto Maple Street.

48.2	0.8	Turn right onto North Perry Street.
48.6	1.2	Turn left (east) onto Townsend Road.
50.1	1.5	Turn left onto NYS Route 30A (north).
57.5	8.9	Turn right onto NYS Route 30 (south). **Stop 6** is immediately on the left.

Stop 6: **Mayfield Pit** (see Figure S-3 and S-2e).

This pit is in an esker that pokes above the Glacial Lake Sacandaga plain.

In 1984, the Section exposed at the Mayfield Pit was as follows:

6.5 m: Top of section.
5 to 6.5 m: 10 YR 7/3 Beds of contorted laminated fine to medium sand to thin rhythmetrically-laminated, very fine sand to silt.
2 to 5 m: 10 YR 7/3 Fining-upward, planar-bedded, imbricated cobbles to silt, beds dip 10 S50W.
Base to 2 m: Covered.

Leave Stop 6, turn left onto NYS Route 30 (north).

68.8	20.2	**Stop 7** is on the left side of the road.

Field Trip Stops

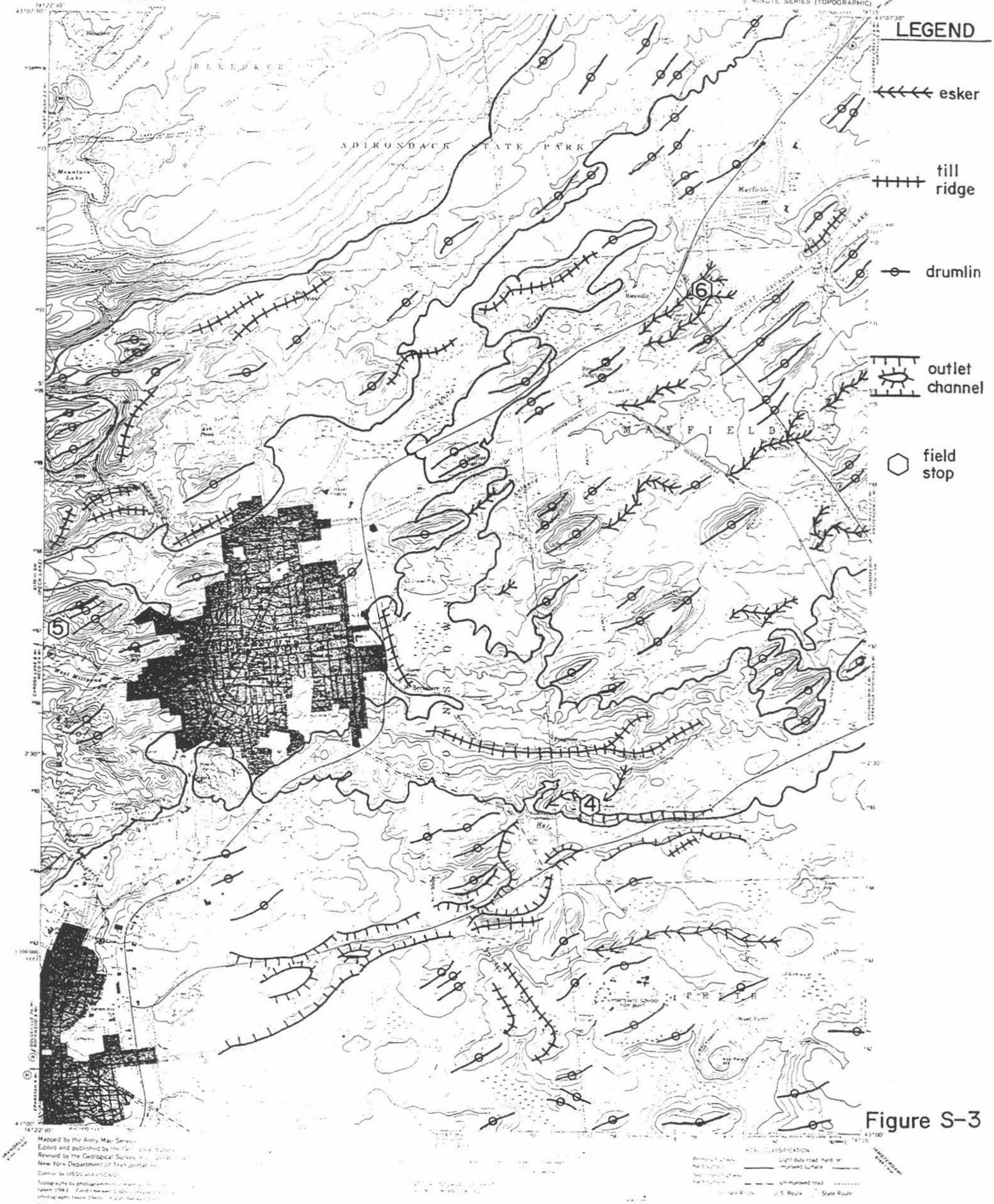


Figure S-3

Field Trip Stops

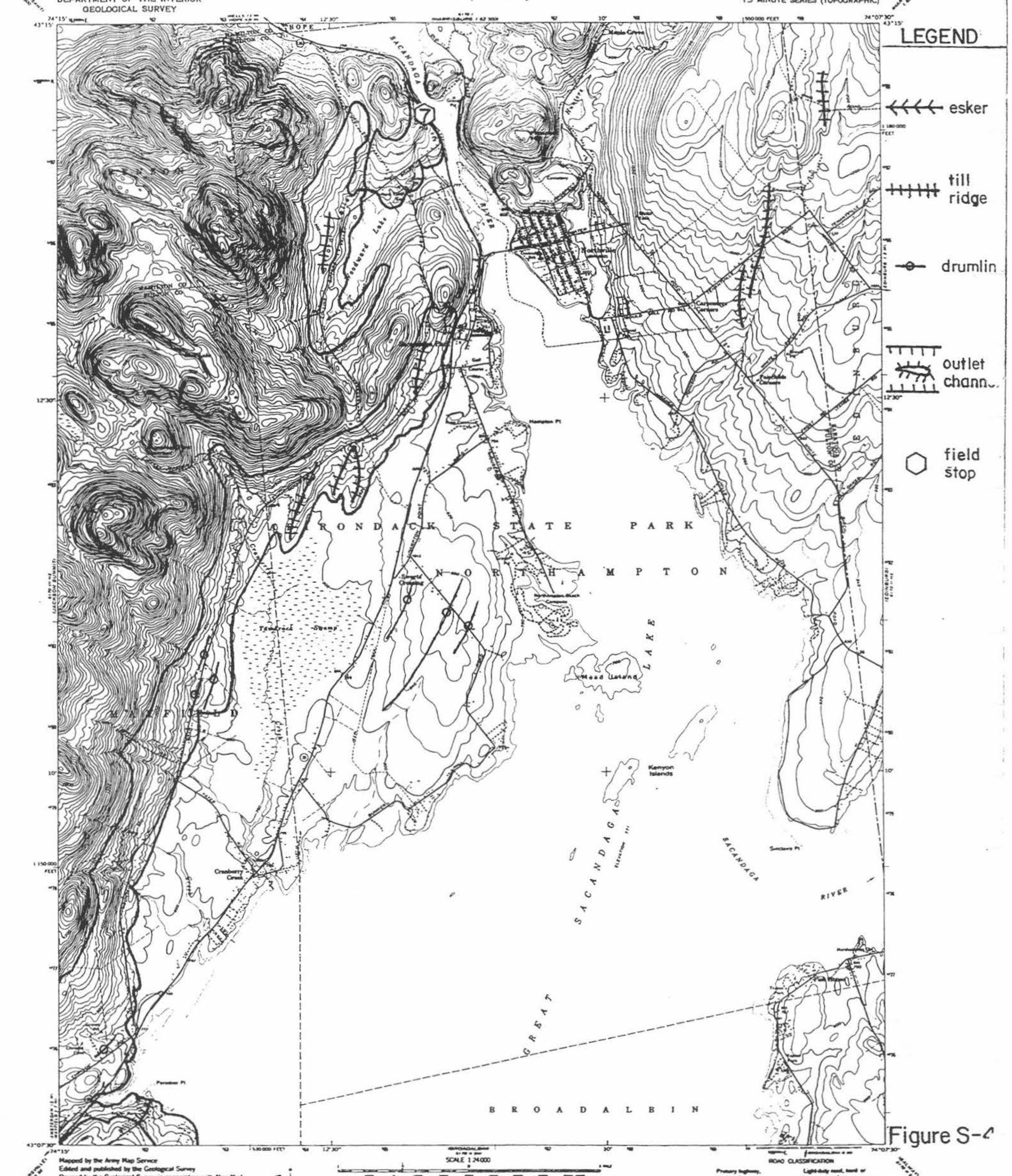


Figure S-4

Stop 7 **Bradt Pit** (see Figures S-4 and S-2f)
This pit is a deep cut into a kame delta that was built into a 900 ft asl glacial lake, possibly an ice-marginal portion of Lake Gloversville. The exposure was 65+ m high and 350 m long in 1984!

In 1984, the Section exposed at the Bradt Pit was as follows:

65 m: Top of section

50 to 65 m: 10 YR 5/4 Shallow, trough cross-bedded, fine to medium sand, some gravel grading down into fining upwards, 10 YR 6/2 planar cross- bedded boulders through coarse sand, dipping 5 to 10 S60E.

45 to 50 m: 10 YR 6/4 Planar cross-bedded, fine to medium sand and ripple-laminated, gravelly, fine to medium sand, dipping 15 S30W.

30 to 45 m: 10 YR 6/2 Coarsening upwards, planar cross bedded, cobbly, gravelly, fine to coarse sand, dipping 15 S50W. Cobbles are subangular to subrounded.

15 to 30 m: 10 YR 6/4 Planar cross-bedded, fine to medium sand with trace cobbles. Beds dip 10 to 15 N60W.

Base to 15 m: 10 YR 6/2 Imbricated, open-work, subangular to subrounded boulders in 1 to 1.5 m cross beds. Imbrication dips N20E.

End of field trip, proceed homeward on Route 30 to the NYS Thruway.