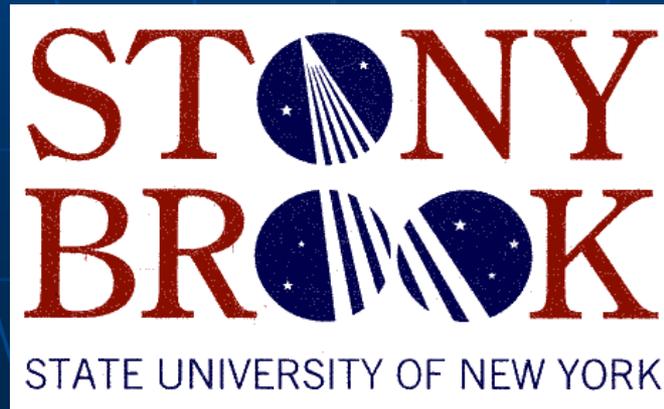


Field Studies: Exciting Science is Just Outside Your Door

Gilbert N. Hanson



Why is it important for Earth Science Teachers to do research?

- Would you hire a music teacher who

Encourage Observational Earth Science Research

- In classes –
 - Required of all Earth Science students
 - Undergraduate or Graduate
- As independent research projects
 - Teachers
 - MAT Students

Possible Projects on Campus

- Hydrology
- Environmental Science
- Microclimates
- Glacial Geology
- Stratigraphy
- Petrology of Erratics
- Land Use History

Motto

- Earth Science is just outside the door.

Where are the Projects

- For teachers on or near their school grounds
- For students
 - On Stony Brook Campus
 - Or in a park or preserve.

How do they present results?

- Write a research report
- Prepare a Science Walk
- If they are of adequate quality, post on web
- Poster or Oral presentation at Conference on the Geology of Long Island and Metropolitan New York

Examples of Research Projects

Fate of Campus Storm Water

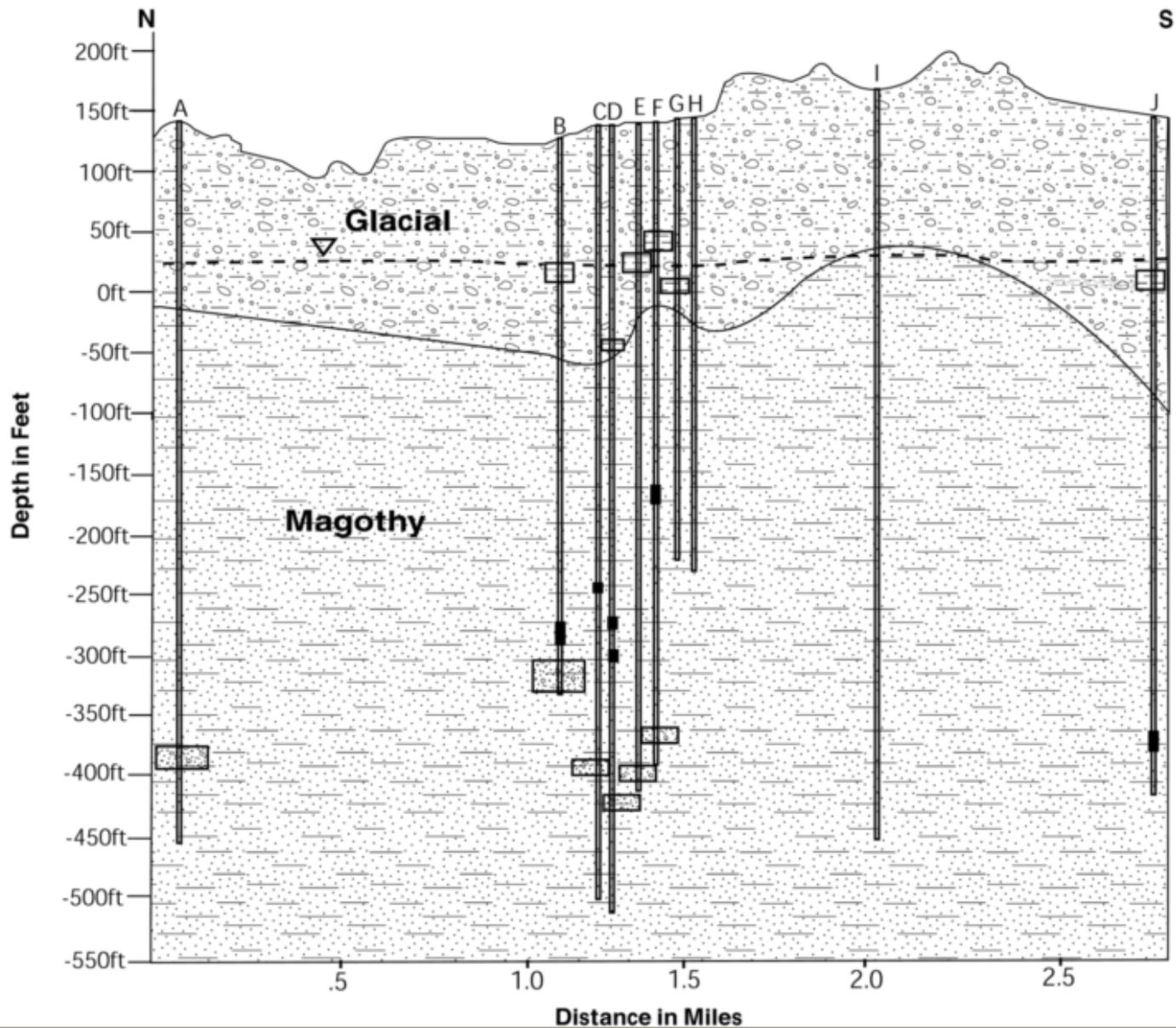
by Andrew Tuomey and Steven Gessler



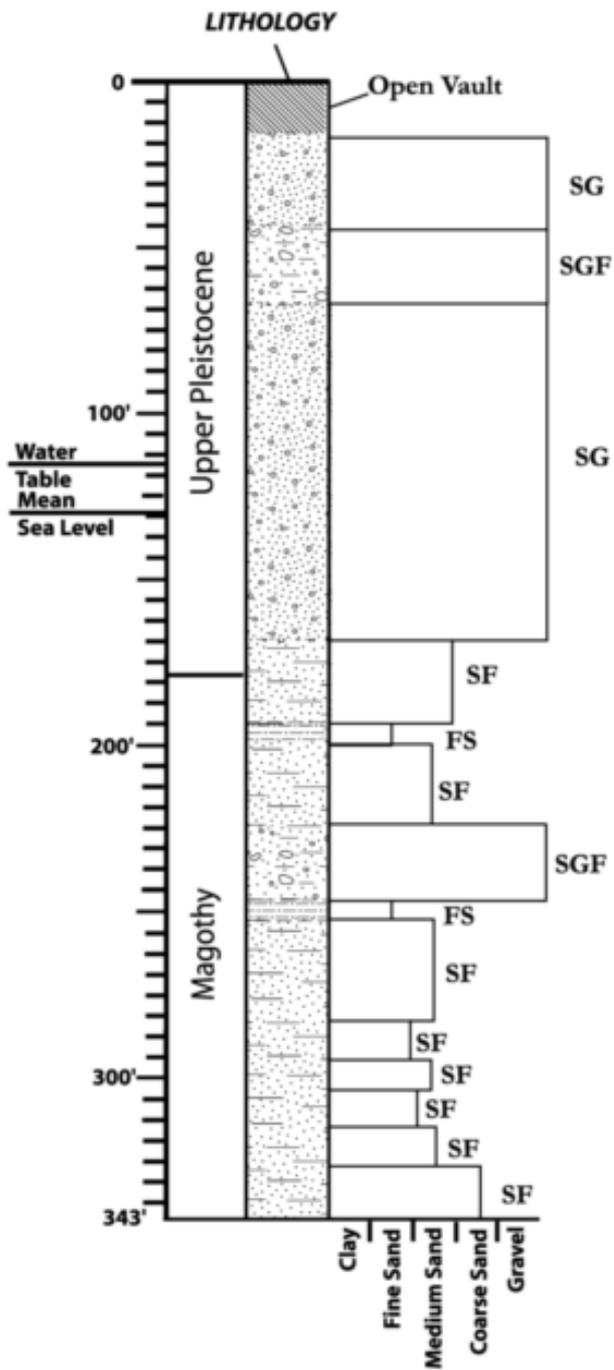




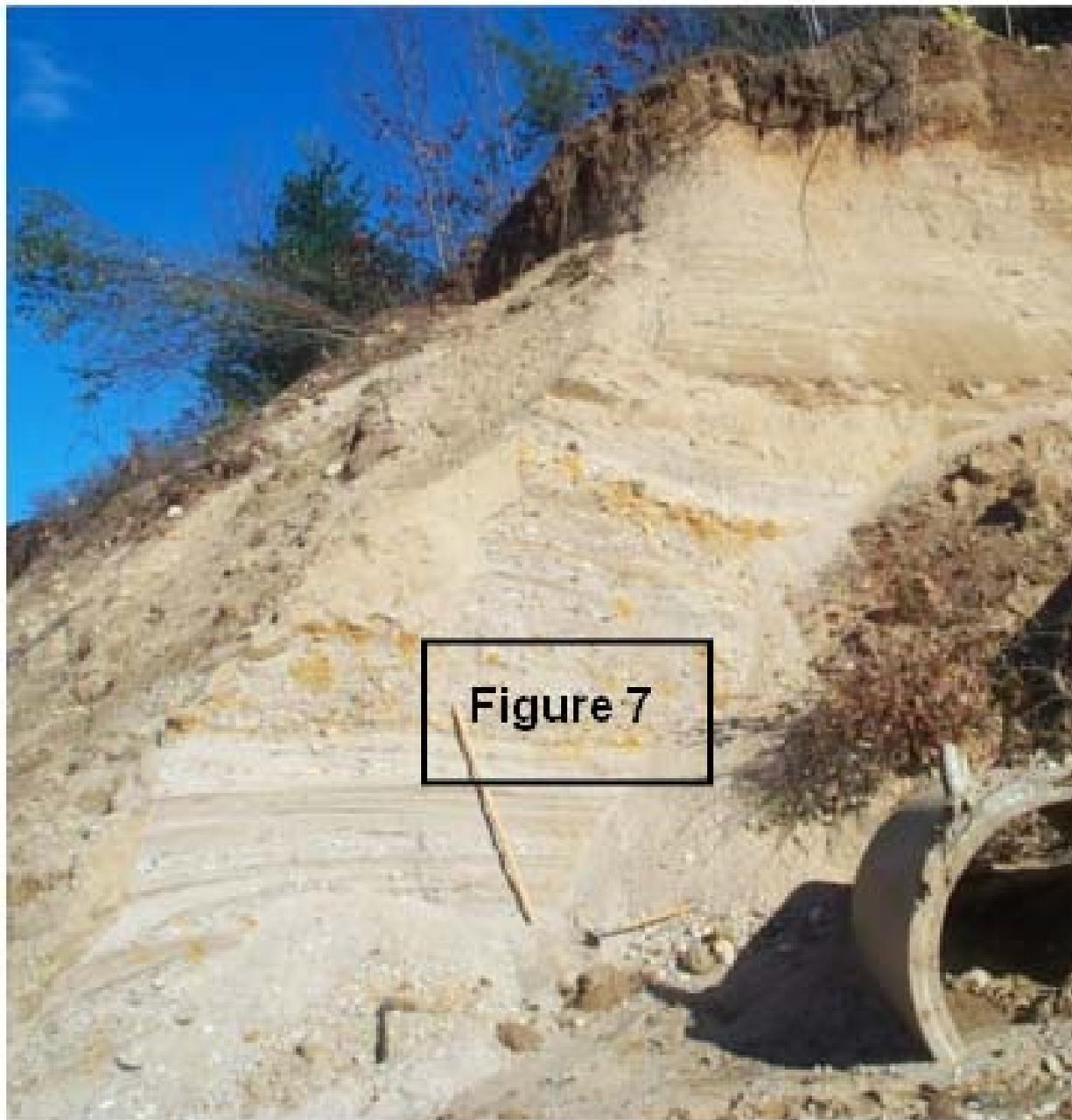
Environmental Impacts
of different types of
Landscaping by
Olga Crynosija



Stratigraphy of Stony Brook Campus
by Jessica Nienstedt



Code	Lithofacies
F	Clay
FS	Sandy CLay
SF	Clayey Sand
S	Sand
SG	Gravelly Sand
G	Gravel
SGF	Sand, gravel & clay
FG	Gravelly Clay
FGS	Gravelly and sandy clay
L	Lignite present



Soil

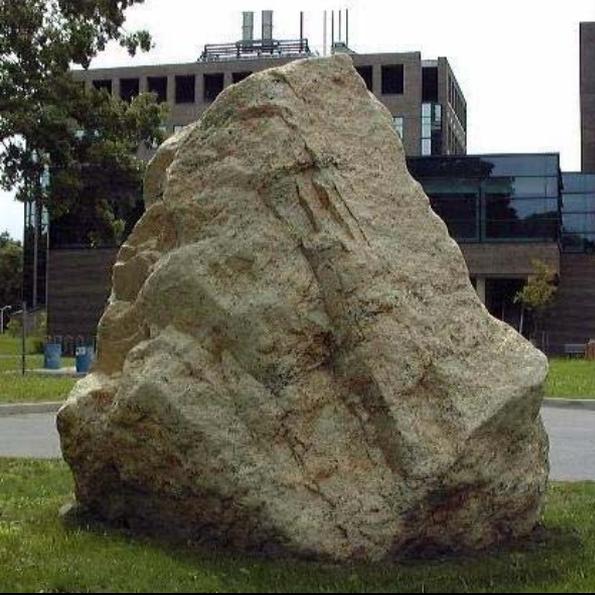
Till

Cross Stratified
Sand, pebbly,
Sp

Stratified
Gravels, Gh

Figure 7

Cross-
stratified
sands
containing
pebbles, St



Erratics on Stony Brook Campus by Waldemar Pacholik

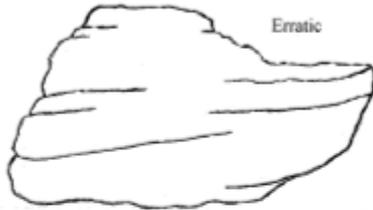


Microclimates around campus

Hallie Thaler & Lawrence Mendonca

Measure T, P, dew point, wind speed and wind direction

Example of Science Walks



Station 7. Erratic

Glaciers are capable of transporting large boulders, which are deposited when the ice melts. Such boulders are called erratics, because they were derived from a distant source. Boulders are often broken, rounded, and polished during transport. This erratic, however, appears hardly disturbed. Look carefully; can you see the nearly horizontal fractures? Can you see that the blocks in this erratic have only shifted slightly? It is almost miraculous that the glacier could transport this boulder any distance without the blocks separating.

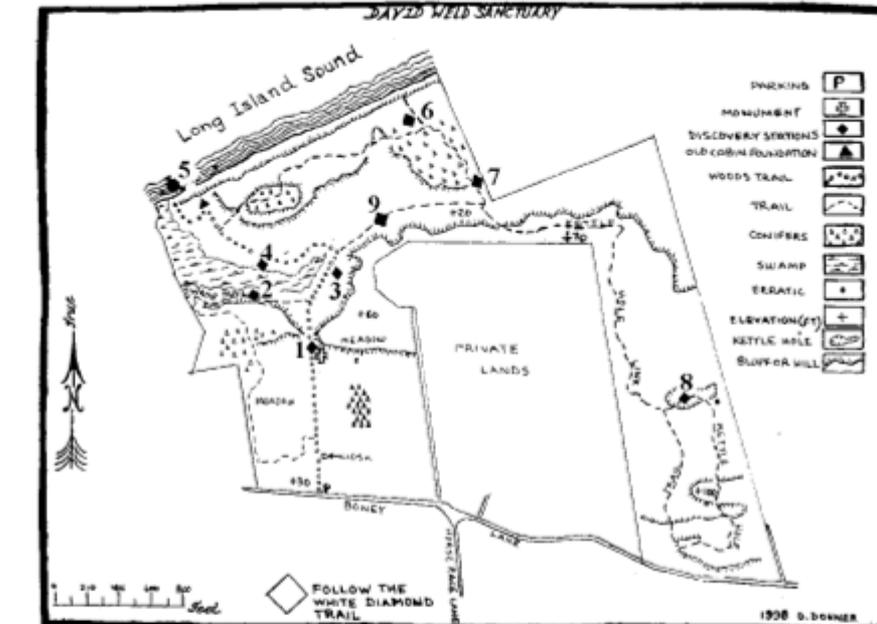
Continue south on the trail, pass the intersection and continue on the Kettle Hole Trail for about one-half mile to the large depression, "The Kettle Hole".

Continue south on the trail, pass the intersection and continue on the Kettle Hole Trail for about one-half mile to the large depression, "The Kettle Hole".

Station Eight: Kettle Hole

You are surrounded by walls because you are standing in a kettle hole. A massive block of ice was buried here. When the ice melted, a pit was left in the sediment. You can visualize how a kettle hole forms by imagining a block of ice put into an empty box. Fill the box with sand covering the ice. When the ice melts the water drains to the bottom of the box and a depression is left in the sand. That depression is a kettle hole. The bottom of the depression could have water in it if the depression intersects the water layer on the bottom of the box.

If the bottom of a kettle hole intersects the water table, it becomes a kettle lake. The water table is



the surface where the underlying sediments are saturated with water. This has been proposed for the origin of Lake Ronkonkoma. There are many kettle holes on Long Island. As you can imagine kettle holes come in a wide range of sizes. At this site, the surrounding surface is at an elevation of about 100 feet. The bottom of the kettle hole is at an elevation of about 40 feet. Approximately how deep is this kettle hole (in feet)? When the ice melted, where did the water go?

Return north on the Kettle Hole Trail about one-half mile to the intersecting trail from the west. Take the intersecting trail.

Station Nine: Abandoned Stream Channel

As you approach marker nine, you are walking down a steep embankment. This is the south side of an abandoned stream channel. In the summer it may be difficult to see the north side of the channel due to the vegetation. In this area, the channel runs in an east-west direction and it can be followed back to the lowest point in the sanctuary: the swamp. The southern slope is extreme in places, compared to the gradual slope on the north. Can you see the slopes?

Continue on this trail until you reach the trail to the beach. Head south and back to the parking lot.

The David Weld Sanctuary *Village of Maspeth, Smithtown* Self-Guided Science Walk



Written by

Diane E. Donner
for the
Earth Science Research Project
of the
Department of Geosciences
State University of New York
Stony Brook



The motorcar:

After Henry Ford revolutionized the manufacturing of the motorcar, cars became more and more accessible to Long Islanders. Throughout the 1900's many roads were built which opened access to eastern Long Island. As the population and traffic began to increase, the need for more roads increased and were built in concert. In 1964 County Road 97, Nicolls Road, was constructed to serve the growing need to link major East/West roadways, as well as serve the rapidly growing Stony Brook University (www.nycroads.com/roads/CR-97/). The road was named after Sir Richard Nicoll's, the first governor of New York in 1664, and continues to be a major traffic route today. Much of the present day Nicolls road between Oxhead Road and Lower Sheep Pasture Road was built on top of the old cartroad, erasing evidence of its existence. However, the section you stand on today, was preserved.

GEOLOGY:

Long Island was formed as a result of the Wisconsin glacial period ending approximately 20,000 years ago. These glaciers left behind massive moraines, including the Stony Brook Moraine, upon which you stand at this site. Evidence of this glacier activity is all around you in the topographic features and the underlying sediments. The southward moving glaciers brought the material you stand on from the north, including the large boulders within the forest here. The interface between the base of a glacier and the underlying sediments is known as till. The underlying sediments on campus are dominantly sands and gravels deposited by streams in front of the glacier. As the glacier advanced, it covered these sands and gravels leaving a layer of till at the surface. Till, which is commonly about three feet thick in this area, is composed of a heterogeneous mixture of clay, silt, sand, pebbles, cobbles, and boulders. Because till was compressed by hun-

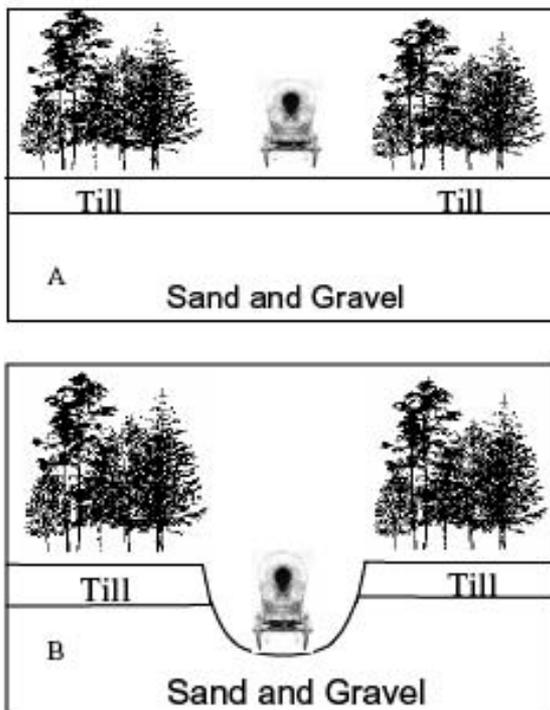
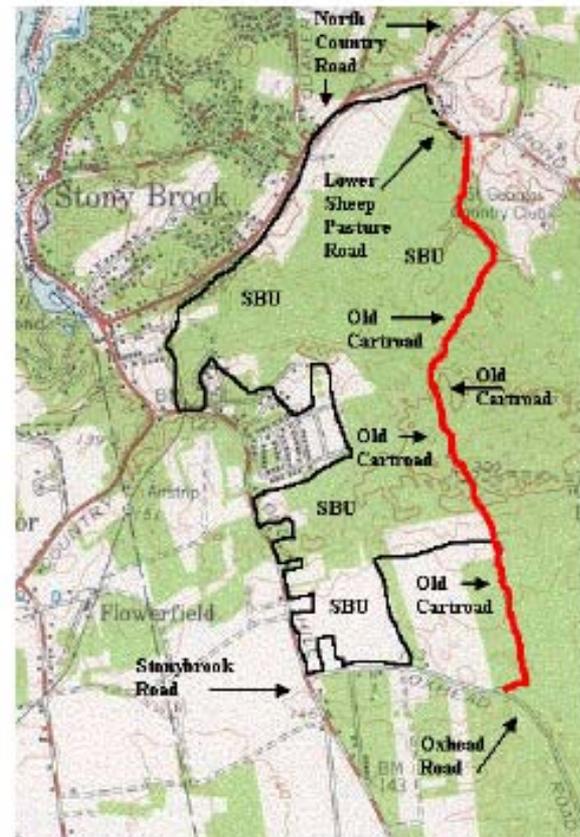


Fig. 2 When the road was first traveled the wagons traveled on top of the till (A). With time travel down the slope here resulted in the wagon wheels cutting through the till into the less resistant sand and gravel

dreds of feet of overlying ice it is very compact and resistant to erosion. This thin veneer of till at the surface has allowed for the preservation of the glacial topographic features on campus. The till along the old road has been cut by the traffic along this once active thoroughfare exposing the more easily eroded sands and gravels. This activity has resulted in the steep slopes you see at this site.

Copies of this guide and guides to other science walks may be downloaded at www.geo.sunysb.edu/esp/



From USGS 15' Map of Stony Brook 1955-6

History and Geology of old Nicolls Road

William Marrs
Earth Science Research Project
Summer 2006

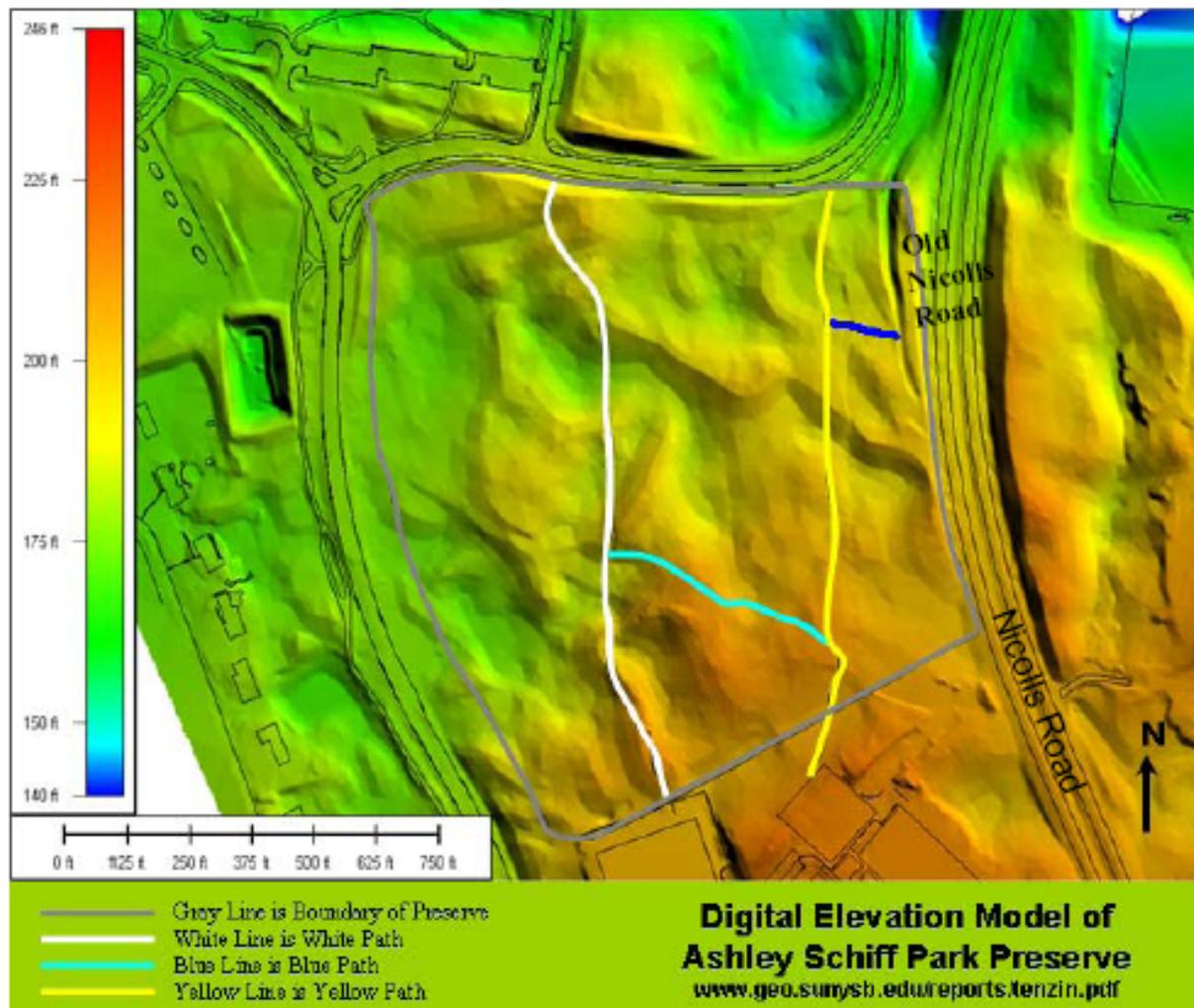


Fig. 1 Digital elevation model of Ashley Schiff Park Preserve. On the east side is the present Nicolls Road. In the northeast corner of the park along the west side of Nicoll's road is the Old Nicolls Road. This picture clearly shows where the road has eroded the underlying sediments. The dark blue line is the trail to the Old Nicolls Road from the yellow trail

INTRODUCTION:

This walk follows the Old Nicolls Road within the Ashley Schiff Park Preserve on the Stony Brook University campus. The preserve is a 26 acre wooded area that preserves evidence

of Long Islands geology as well as its history. The path leads to a dirt road that may have been used as early as the 1700's. This section of the preserve offers an opportunity to explore the science and the history of the area.

LOCATION:

The early road you see before you runs in a North/South direction. It connected with Oxhead Road in the South and with Lower Sheep Pasture Road to the North (see cover map, red line). The section of road within the Ashley Schiff Preserve is less than 0.2 miles in length. The section you see before you runs from just south of the underpass, which leads to Stony Brook University Hospital to the North and is cut by Nicolls Road to the South.

HISTORY:

Colonial Times

The English began settling on Long Island, in the mid-1600's. Travel during this time was primarily by boat to and from eastern and western Long Island and New England to the North. The use of horse and wagon was soon established with the development of dirt roads. Most of the population at this time were either farmers or fishermen.

Farming:

As farming techniques improved, farming became a way of life on eastern Long Island. Farming became more of a local commodity as western Long Island farms were then providing food products for rapidly growing New York City. The easterners used newly constructed dirt path roads called "cartpaths" to connect the farms with town centers and with the coast. These early roads were also used to transport cordwood for shipment to New York City and Connecticut by boat via the Long Island Sound. The cordwood was traded for horse manure, which was shipped back for use as fertilizer on the farms back east. Long Island wood was used extensively in the outlying larger townships for energy often as charcoal, and as building construction material.

Presentation at Conference on the Geology of Long Island and Metropolitan New York

- On a Saturday in April.
- Teachers get contact hours for in-service credit

EVIDENCE OF TILL SOUTH OF RONKONKOMA MORaine

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Lance Mion: Riverhead High School - Lance.Mion@riverhead.net

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INTRODUCTION

The generally accepted glacial history of Long Island is that the Ronkonkoma Moraine is the terminal moraine of Late Wisconsinan glaciation for this area. Surface sediments south of this moraine are generally considered to be part of an outwash plain (Fuller, 1912; Lewis and Stone, 1991; Sirkin, 1986). Sanders and Merguerian (1994), however, proposed that lake sediments exposed at Montauk Point required the existence of a now-vanished moraine south of Montauk which acted as a freshwater dam. We provide here evidence for the presence of till south of the Ronkonkoma Moraine from Westhampton to the east to North Amityville to the west provides evidence that a glacier extended south of the Ronkonkoma moraine. (Figure 1). The till generally is a surface layer often covered by loess. Immediately underneath the till are stratified sand and gravel or clay.

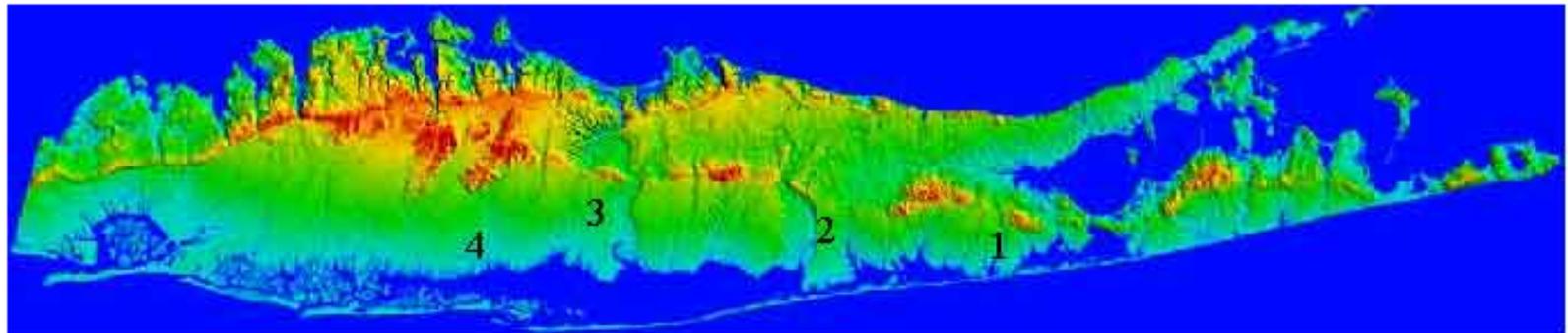


Figure 1. Locations of till (diamictite) found in excavations on south shore of Long Island.



Advantages of Doing Research

- Teachers see how they are adding to knowledge
- Can use results as examples in teaching
- Can take students or other teachers on field trips
- Can encourage students to take on research projects.

Earth Science Research Project



www.geo.sunysb.edu/esp



Environmental Science Workshops

for Science Teachers in High Needs Schools
Monday Aug. 9 to Friday Aug. 13
and
Monday Aug. 16 to Friday Aug. 20
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