

the brown shingled house and is now seen to the left and right of Brewster Hill Rd flowing north until it empties into the Setauket Mill Pond. The stream derives most of its water from precipitation in the form of rain or snow. Some of the water infiltrates and becomes groundwater, which eventually enters the stream. The rest of the water comes from runoff. What are the streams sources of water?

Return to N. Country Road and drive north on Main Street for 0.6 miles. When you reach the Setauket Neighborhood House, 95 Main Street, on the right, park here, *the walk consist of Steps 4 through 6, starting here.*

Stop 4. Duck Weed: Walk across Main St. observe the upper Setauket Mill Pond. During the summer *Lemnaoideae* is the plant life on the surface of the water, which flourishes during moderate temperature conditions. *Lemnaoideae* is referred to as duckweed because it is an important high-protein food source for waterfowl. Duckweed is a light green free-floating, seed-bearing plant. Duckweed has one to three leaves or “fronds”. Extending from those leaves is a single root which allows for reproduction. This small flowering plant sur-

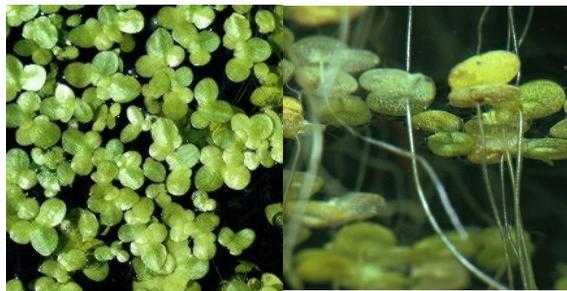


Fig. 4 Common duckweed. Showing surface appearance on the left and appearance with roots

vives in both summer and winter by producing buds that sink to the bottom of the pond. Duckweed flourishes in calm waters, allowing for ponds to serve as a perfect habitat. Pond water has minimum currents, the only small currents that are present are driven by a stream that empties into the pond or by moderate winds. Silt content at the



Fig. 5 Showing spartina or cord grass on the left and phragmites or common reed on the right.

bottom of the pond protect dormant seeds during the winter which become covered by silts and sediments that serve as protection until good growing conditions return. What protects duckweed seeds during the Winter? Why are ponds a favorable habitat for duck weed?

Stop 5. Pond Depth: Walk further down Main St. until you reach the Stone Bridge. From the Stone Bridge the upper and lower part of Mill Pond can be observed. The original depth of the pond was up to 8 to 10 ft in the 1930s. The maximum depth of the pond presently is 4 feet due to silt, sand, and accumulation of aquatic vegetation. Detmer Farm is a culprit for the sources of runoff and silt contributing to the deterioration of the pond. Therefore, if runoff were to originate at stop #2 (Detmer Farm), where would all the run off go? As runoff flows along the ground, sediment and contaminants are picked up and make their way to the pond. The pond currently has silt alongside with small roots, grasses, and full of duckweed. Define impermeable. What contaminants does surface runoff grab along the way?

Stop 6. Wetlands: At the Northern end of the Park a stone dam confines the mill pond’s fresh water. Fresh water flows over the dam and empties into Conscience Bay. Here fresh water meets the salt water of

the Bay. The interface results in a marsh with an assortment of grasses, reeds, and sedges. The height of the standing water in this region is dependent upon the tides. Mud makes up the base of the marsh where two distinctive grasses are found. Phragmites, or common reed, is a tall freshwater plant tolerant of salt water that is found up to the dam. Further to the north, approximately 200 feet, the salt marsh can be spotted by the dominate smaller grass *Spartina*, commonly known as cord grass. This is diagnostic of where salt and fresh water meet. You can see the salt marsh is rimmed with *Spartina* grass. What serves as a good indicator for the fresh water, salt water, interface?

Conclusion: Water is the most vital natural resource we have on the planet. Hydrologists study water and the problems water can cause today and in our future. The quality of water we have is an important area that any hydrologist studies. Understanding what particularly affects the quality of the water in a area needs to be addressed as well as ways that this water quality can be improved. Therefore, hydrologists are important individuals to support and encourage in all areas. If you have a desire for science and want to make a positive difference, studying hydrology may be right for you.

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The Setauket Mill Pond



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Purpose: The purpose of this walk is to expose you to the history and hydrology of the Setauket Mill Pond. You will also develop a better understand of the area, plant life, and location of where fresh water meets salt water of the sound.

History: The first English settlers came to Setauket from Southold, Southampton and New England in 1655. They settled along the stream because it was a source of fresh water. A dam at the north end of the stream since about 1644, has created the mill pond. *Figure 1.*

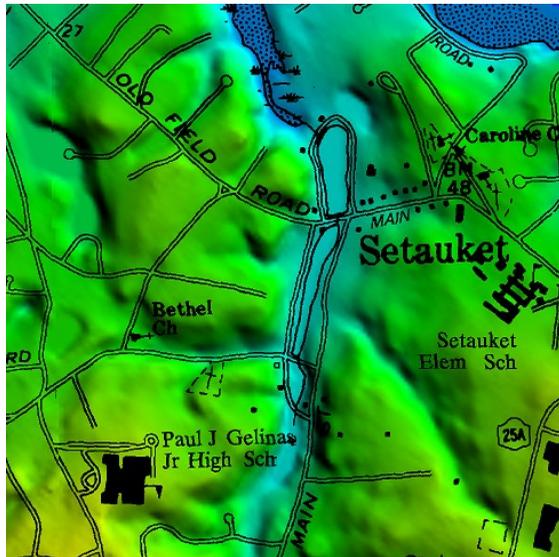


Figure 1. In this DEM the lowest levels of elevation are blue, and highest levels of elevation are yellow. The stream on the southern end of the pond and the pond are at the base of a valley.

Introduction: The trip begins with a drive in your car, and concludes with a 1 mile walk around the Setauket Mill Pond. The Pond is located off Main St. west of the Setauket Post Office. The Mill Pond is in a valley formed during glacial times and is fed by the stream, water table, and surface runoff.

Precipitation is the source of all fresh water on Long Island. Precipitation enters the groundwater system by infiltration through the porous soil at Long Island's surface. About one half of the water infiltrates to the water table. The other half is lost to

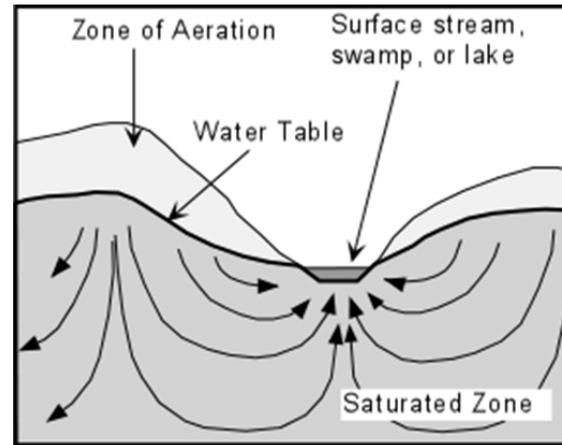


Figure 2. Cross section of the water table intersecting a stream. Water that resides underneath the surface will eventually make its way back to the surface when exposed at a stream, swamp or lake.

evaporation or transpiration by plants. Above the water table the sediments have air as well as water between the sediment grains. This zone is the zone of aeration. Below the water table the sediments are saturated with water and it is known as the saturated zone. This saturated zone forms the aquifer from which we get our drinking water. *Figure 2* is a cross section showing the zone of aeration, water table and saturated zone. It also shows how the ground water flows and provides water to depressions that intersects the water table forming streams, swamps or lakes.

Surface runoff is water, from rain, snowmelt, of other sources, that flows over the lands surface. As urbanization increase, such as pavement, houses, and buildings, more of the ground surface becomes impermeable. The impermeable surfaces do not allow percolation of water down through the soil to the aquifer where the water falls.

Runoff water in developed settings accumulates and carries silt and contaminants such as petroleum, pesticides, or fertilizers as it travels to streams, ponds or recharge basins.

Starting Point: North entrance to Stony

Brook University.

For the first two stops remain in your vehicle.

Turn left onto Nicolls Road, continue for 0.13 miles, until you reach 25A. Turn right onto 25A heading east and continue for 0.3 miles. Then, left onto North Country Road, drive for 0.2 miles until you reach the Thompson House on your right, across the street from Gallery North. Pull into the driveway just before the Thompson House on your right.

Stop 1. Underground Drainage Surface:

Located to the right, back corner of the Thompson House there is a spring that was dug to form a pond. The pond is groundwater fed by the water table. A stream starts from the north end of the pond and continues behind the Thompson House and the Three Village Historical Society where it enters a concrete culvert under N. Country Road. The stream resurfaces in the backyard of the brown shingled house across the street. A culvert from Gelinus Jr. High drains runoff water from impermeable surfaces which also contributes water to the stream.

Stop 2. Detmer Farm:

Where N. Country Road turns into Main St. make a right on Ridgeway Ave. After 0.2 mi, Detmer Farm can be observed on your right, pull off to the shoulder. The plants at this farm are at times in pots sitting on black plastic sheets, or extend from the soil and make there way through precut holes in the black sheets. The sheets reduce weeds, increase heat through absorption of sunlight, prevents precipitation from being absorbed so essentially all of the precipitation that falls on this area becomes runoff. How does Detmer Farm contribute to surface runoff?

Return to N. Country Road and drive north on Main Street. Continue for approximately 0.15 miles until you reach Brewster Hill Road, make a left. Park before Brewster Ct. where the stream continues under Brewster Hill Rd heading North.

Stop 3. Brewster:

The Stream continues from

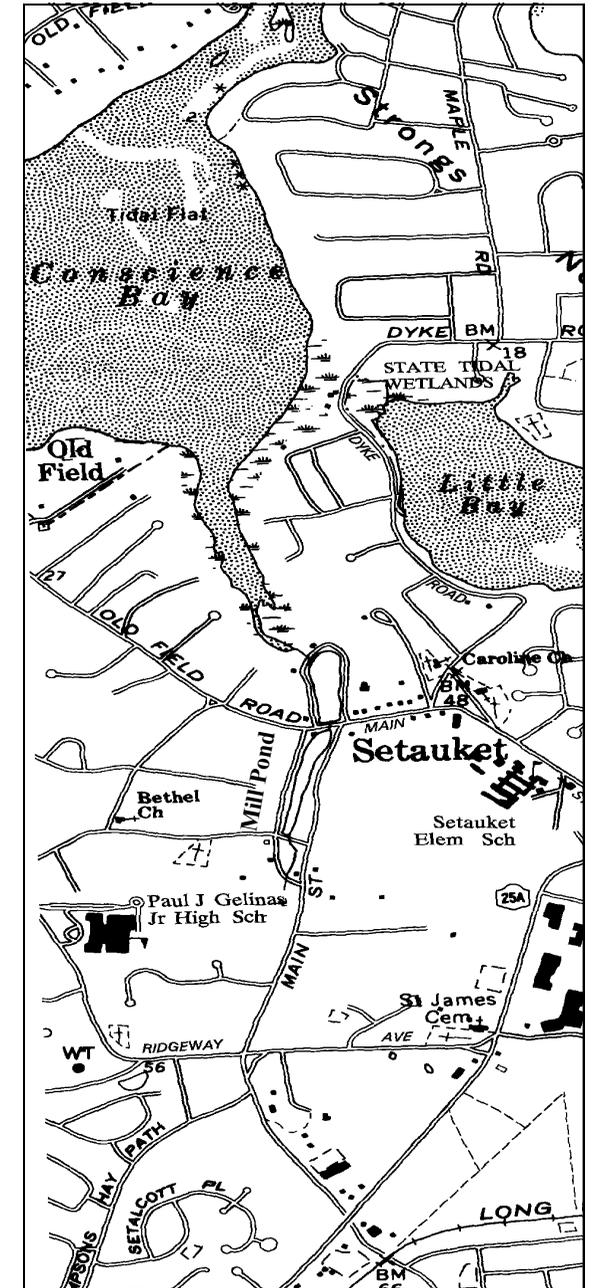


Fig. 3 Map showing the Mill Pond in Setauket.