

Fig. 2. Map showing the headwater area of the Carmans River and the stops in this science drive.

trates the surface. At some depth the water fills the pore spaces of the sediment or bedrock where it is called groundwater. The top surface of the groundwater is called the **water table**. As the water table or elevation of groundwater below the surface began to rise along with the rising of sea level thousands of years ago, it began to

fill some depressions in the land surface such as kettles. This resulted in the development of kettle lakes and ponds. A well-known Long Island example of a kettle lake is Lake Ronkonkoma. Long Island has many kettles only a few of which have water in them.

Several wide and deep valleys on Long Island cut the

Ronkonkoma Moraine and head toward the Great South Bay and the Atlantic Ocean. The Carmans River Valley lies within one of these valleys a larger Ancient valley of unknown origin. Figure 2 shows the extent of the larger Ancient Valley, which cuts the Ronkonkoma Moraine. The action of glacial ice and meltwater are likely suspects for the formation of this valley.

Branching tributaries developed within the ancient valley. These branches can be seen on the Digital Elevation Map of this area provided on the web page at www.geo.sunysb.edu or in the areas shown as kettle valley in Fig. 2. The tributary valleys run down East Bartlett Road on the west and down Wading River Hollow Road on the east. As the glacier retreated these tributaries became dry. Later as the water table rose, the low-lying valley presently occupied by the Carmans River and some of the kettles were flooded with groundwater. The tributary on the east side of the Ancient Valley is still above the water table and is the site of Wading River Hollow Road. Just west of this valley is Artist Lake, a kettle lake. The west side tributary left behind kettle valley topography, and several kettle lakes and ponds; the largest of which is Spring Lake.

Heading east from Route 112 (2.3 miles), on Route 25 through Coram and Middle Island, you are on the north side of the moraine. Look at the map provided to orient yourself. Make a mental note of where the Ronkonkoma Moraine, water bodies, and major roads are located. As you descend along the hilly topography to the south, at the intersection of Bartlett Road and Route 25 (just after Bartlett Pond Park) is the first of several areas of kettle valley topographies in this area. (We will stop here later to discuss the area in more detail). When you reach the top of the next rise (in front of Carl Harts Bicycle Shop) 0.5 miles after Bartlett Road, look down toward the Longwood Library, it is on the south side of Rt. 25 at the base of the hill (0.3 miles). Make a left turn into the repair shop across from the library and park in the dirt lot behind it. This stop 1.

Stop 1. The elevation change from the top of the rise to the base is about 80 feet. This rise is the western wall of a larger Ancient Valley. The valley that the Carmans River and its estuary now occupy extends northward to Route 25A (~4 miles north of here). A repair shop, the library, and an old lumberyard now occupy this part of the Carmans River headwaters area. Remnants of the headwaters can be found in the small pond and wetland area behind the repair shop. You may see a ring of the common reed phragmites (a common invasive wetland plant), as you look northward into the woods. The phragmites tend to thrive in areas that are periodically submerged in water. Because current topographic elevation and the regional groundwater table elevation are about the same (~50' above mean sea level) these are a

groundwater fed pond and wetland. That means the water table is at or above the land surface.

Continuing up the rise through Middle Island you are ascending the east side of the Carmans River Valley within the larger Ancient Valley. As you reach the top of the rise you are at an elevation of 90 feet above sea level. You should be able to see a lake in the valley to your right as you descend the rise. This is Artist Lake. Park on the east side of the shopping center lot across from the lake and close to the road. (0.6 miles from the library)

Stop 2. Artist Lake-

The lake, contrary to popular belief is not man made. The bottom of the lake is at an elevation of 47 feet, which is about 3 to 5 feet below the regional water table. How deep is the lake? You are standing in the parking lot of K-Mart and looking southwest toward the lake. There was a time when the northeastern most side of the lake continued across the road and into the parking lot where you stand.

The lake was given its name in the middle 1800s by locals who hoped to attract artists and painters to the area. It worked. A man by the name of Alonzo Chappel moved here in 1869. He painted historic revolutionary war scenes and historic people, which hang in museums all over the world. If you look at the map of the lake in figure 3, you will see that it resembles a painters palette. The lake is believed to be a kettle lake and lies in the middle of the larger Ancient Valley. If it is indeed a kettle lake, can you imagine the size of the block of glacial ice that was buried here?

Continuing east 0.7 miles on Route 25 you will ascend to a terrace, a flat area within a valley. The terrace is just above the kettle valley topography and below the eastern wall of the Ancient Valley. At 0.7 miles make a right turn on Wading River Hollow road and continue to its end 1.5 miles south to Longwood Road. As your driving, look to your left or east. Is there a significant change in elevation beyond the houses? This is the eastern wall of the Ancient River Valley (See Fig. 2). At Longwood road, make a left turn, drive to the top of the rise and pull over on the side of the road just before the school. If school is not in session you can park in the school lot.

Stop 3. Longwood High school-

Make your way to the south end of the school parking lot on foot or with your vehicle. You should be able to see the Middle Island Country Club and tall pine trees in front of you as you look to the west. The school lies north of the Ronkonkoma Moraine and east of the Carmans River. This is a rather spectacular view across the Ancient Valley. As you can see from the map you are standing near the edge of the eastern wall of the Ancient Valley looking to the western wall, which is the prominent tree line about a mile away.

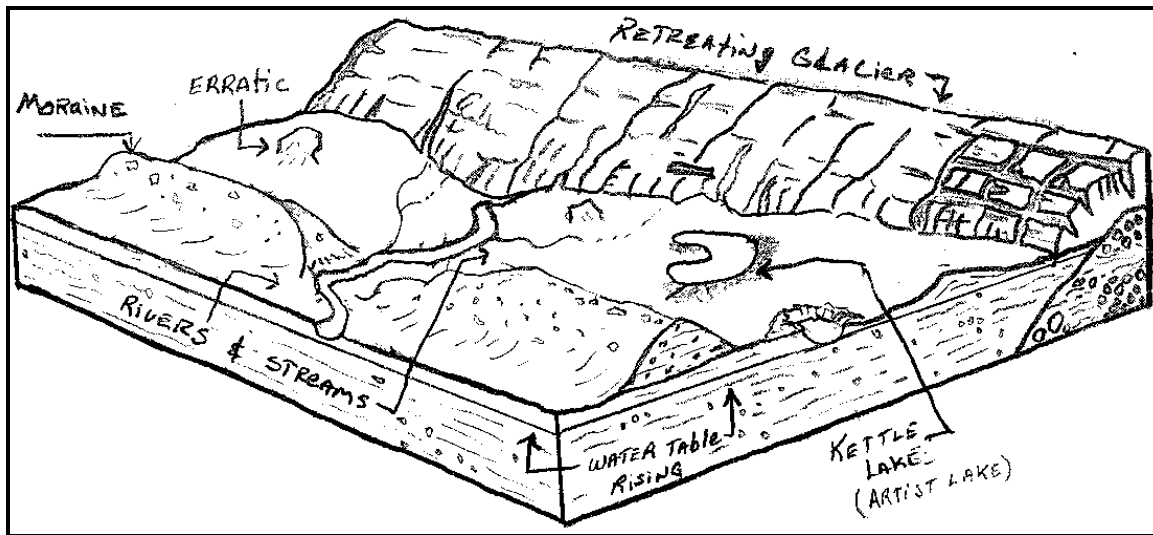


Fig. 3 Perspective view of the headwaters area as the glacier is retreating.

Head west on Longwood road to the intersection of Route 21 (0.25 miles) notice the change in elevation. At the end of Longwood road, directly across the street, lies Cathedral Pines County Park (stop3). Make a left turn onto Route 21 and quick right into the park. You can park in the lot on the south side of the road.

Stop 4. Cathedral Pines County Park-

As you enter the park you crossed the Carmans River. The park encompasses the entire area of the modern Carmans River headwaters. The headwaters run parallel to Route 21 for about ¾ miles before turning northwest and ending behind the Longwood Library and Wal-Mart. A large percentage of the pines in the park were planted in the early 1800's. In 1812, a man named "Uncle Billy" Dayton planted some white pine trees on his land on the road to Yaphank (Rt. 21). They soon grew so tall and beautiful that people who came to see them called them "The Pine Cathedral and "Prossers Cathedral Pines," after the next family to live there. This area is located just north and east of here at the Prosser Pines County Nature Preserve (see map).

At the south end of the parking lot is the beginning of a bike trail marked with a wooden sign. The trail is outlined on the figure 2. The headwaters run parallel to the trail and then cross East Bartlett Road through a culvert pipes to the Upper Lake (see figure 2). This culvert pipe represents the transition from the headwaters to the beginning of the Upper Lake region of the Carmans River. This area is the focus of my research, which is de-

scribed in the web site. The area is also a major part of the fresh water wetlands that ring the park. The park and wetlands support a variety of wildlife, which include deer, several varieties of hawks, migratory birds (ducks, geese etc.), and egrets. The aquatic habits have been known to support trout, chain pickerel and many macro-invertebrates (bugs that live in or near water). The headwaters of many river systems are vital in the survival of the downstream ecosystems therefore; contaminants that could get into the river in this area could have significant impacts downstream. The land use in the area is mostly parkland, residential homes, and agriculture. What types of contaminants might you expect to occur in surface water runoff or in the groundwater?

Exit the park and head south (miles) on Route 21 past East Bartlett Road and watch for the Middle Island Country Club, as you pass the entrance to the club notice that on the left or east of the road is a significant increase in elevation, while on the west side of the road there is a depression. This is the eastern wall of the Ancient Valley where it cuts the Ronkonkoma Moraine (See figure 2). Continue south on Rt. 21 for 1.5 miles from the park. On your right before the traffic light is Swezy Park stop 5.

Stop 5. Carmans River Upper Lake-Swezy Park

The upper and lower lakes of the Carmans River have been dammed since the late 1700s to early 1800s for conveying logs to a mill on the river in Yaphank. The mill no longer exists however; some historical buildings remain. Walk down to the shore and look too the northwest. The

line of trees in the background is along the west side the Ancient Valley where it cuts the Ronkonkoma Moraine (See figure 2). Head back north on route 21 to East Bartlett road. Make a left turn onto East Bartlett and continue ½ mile west to the intersection of Ashton and East Bartlett roads. Make a left on Ashton and continue a 1/8 of a mile to Silvia lane this is stop 6. Park on Silvia or Ashton Road.

Stop 6. Western valley wall of Ronkonkoma Moraine-

Walk another 1/8 mile south to the power lines on the west side of the road. The terrain is steep so take care when walking. Hike up the trail about 1/8 of a mile. Look back east to see your change in elevation. Continue up the hill for another 1/8-mile until you find utility pole #106 and look back east (for a better view climb to the top of the cliff). The buildings in the distance are part of Longwood High School, which lies at the top Ancient Valley wall at stop 2. You are now standing in the trees we were viewing at stop 2 (about a mile away). The change in elevation from Silvia Lane to your current position is about 120 feet. The highest point of the moraine in this area is about 210 feet above sea level, impressive for Long Island. As you make your way down the moraine, look at the small drainage valley on the north side of the trail.

Head north, back up Ashton Road to East Bartlett Road, at the intersection continue straight up east Bartlett for about a 1.5 miles. On your left or west side, you will start to see small ponds these are part of the continuing kettle valley topography that drained into the Ancient Valley from the west. (Look at your map to locate them). At the stop sign, you will see the Spring Lake Golf Club on your left. Proceed north, parallel to the course to a small park on the left (it is a gravel parking lot with a few picnic tables) this is stop 7, and great place to have a snack and enjoy the view.

Stop 7. Spring Lake-

Spring Lake is a kettle lake. A common misconception of kettle lakes is that the source of water is the melting of the glacier ice block. However, the melt waters would have seeped into the ground or been diluted by rainwater shortly after their formation. The small ponds to the north of the main body of water are man made. They were constructed as a water hazard for the golf course, which was built in the 1950's. The ponds were once a partially submerged fresh water wetland that continued across RT 25, behind the strip mall and then a ½-mile west before drying up. The depressions were filled in to make way for new housing about the same time the golf course was built.

Rt. 25 is just at the end of Bartlett Road you should be able to find your way back home from there.

Visit the web site at www.geo.sunysb.edu for copies of this Science Drive and other science walks on Long Island.

Science Drive of Carmans River Headwaters

By Joseph Gabrinowitz

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About twenty thousand years ago, the Wisconsinan glacier, which covered much of North America, reached the present location of Long Island. If the terminus of the glacier remains in place for a few years (no net change in ice deposits), a distinct ridge of sediment called a moraine forms along the front edge of the ice. On Long Island there are two such ridges the Ronkonkoma Moraine in the center of Long Island that also forms the southern fork of Long Island and the Harbor Hill Moraine along the north shore of Long Island and that forms the northern fork of Long Island.

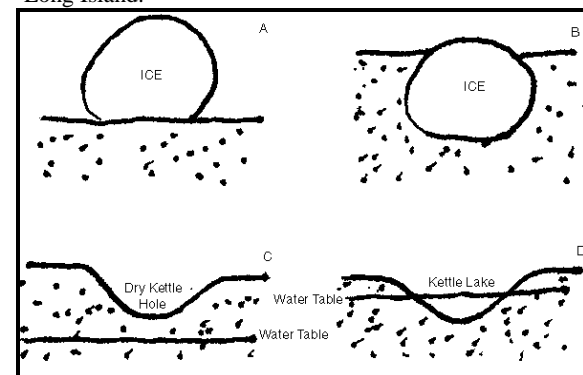


Fig.1. Cross sections showing the development of kettle holes and kettle lakes. A. A block of ice is left behind by the retreating glacier. B. Sediments from the glacier bury the block of ice. C. After the ice melts a depression is left behind. The kettle is dry if the water table is below the bottom of the kettle. D. A kettle lake forms if the water table is higher than the bottom of the kettle.

As the front of the glacier retreats it sometimes leaves behind huge blocks of ice which becomes surrounded by sediments carried by glacial melt water streams. As the ice block melts, a depression forms called a **kettle**. If the bottom of the kettle is filled with fine-grained sediment or the groundwater table intersects the bottom of the kettle, the kettle may have standing water in it and it becomes a **kettle lake** or **kettle pond** (see Fig. 1.)

As rain falls or snow melts some of the water infil-

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