LAKE COMO

State of the Lake Report
&
Watershed Management Plan

September 2007

Cayuga County Department of Planning and Economic Development,
Cayuga County Soil &Water Conservation District
&
The Lake Como Association

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Section 1: Watershed Characteristics

Geography of the Lake

Lake Como is a small lake that extends in a northwesterly direction and is located in southern Cayuga County, New York, in the Town of Summer Hill. It is located in the Oswego-Seneca-Oneida River Basin, south of the Seneca River.

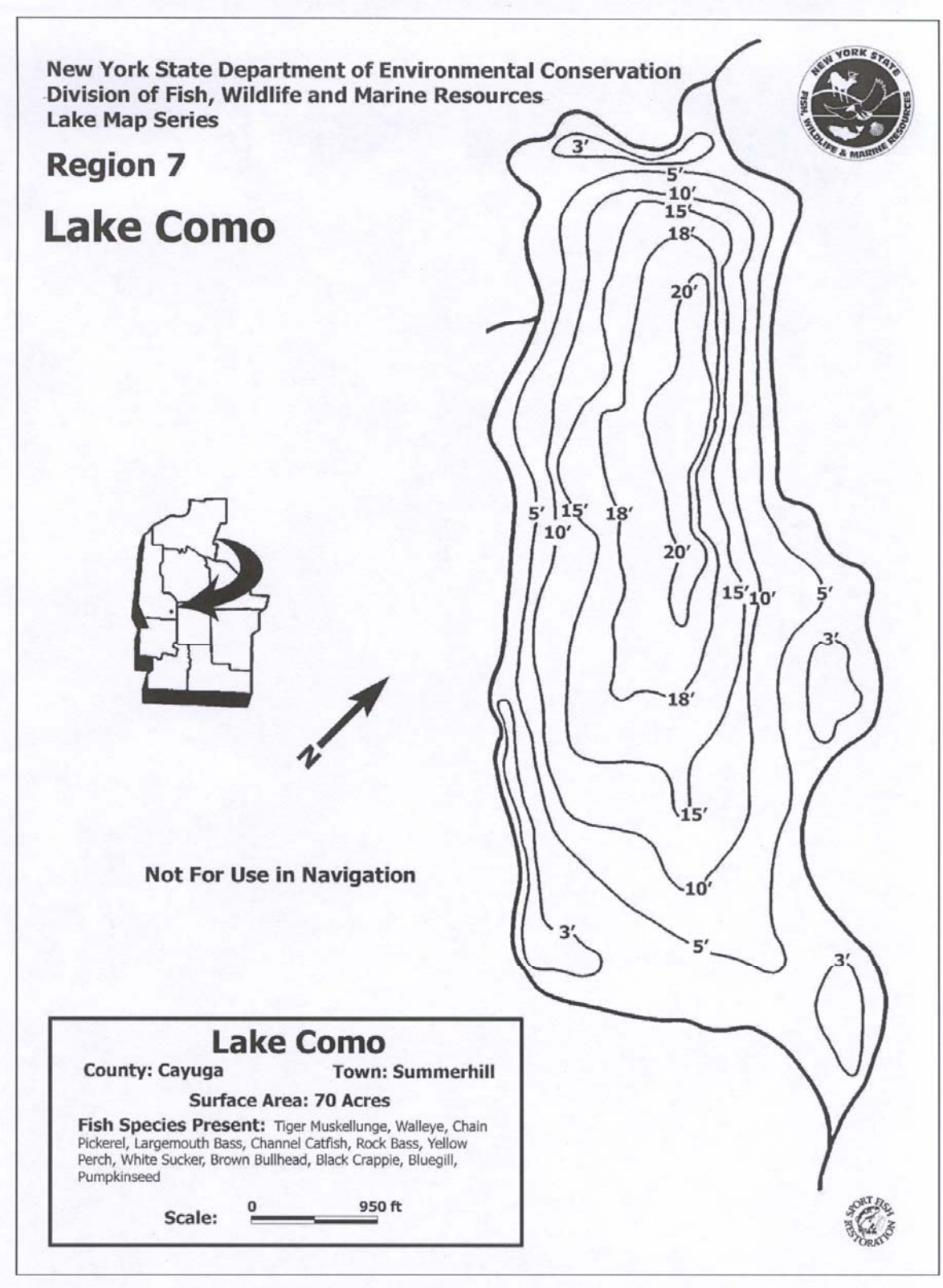
Lake Como is a relatively shallow lake with a mean depth of 10 feet (3 m) and a maximum depth of 22 feet (6.7 m) (Effler et al., 1988). The deepest water is found in the center of the lake (see Figure 1). Lake Como is a relatively small lake with a length of 0.62 miles (1 km), a maximum width of 0.25 miles (0.4 km) and a surface area of 64 acres (0.26 km^2). It has a mean elevation of 1309 feet above sea level (*Lake Como, USGS Sempronius (NY) Topo Map*, 2007). For more information, see Table 1.

Lake Como is an upland lake, which is a lake that is formed in the upper portions of a watershed and that tends to be part of extensive wetland systems (Hennigan, 1992). Both the north and south end of the lake contain wetlands and there is a steep ridge that extends northwesterly on the west side of Lake Como. There are homes and camps along most of the shoreline. Two unnamed tributaries enter Lake Como in the north and the Lake flows out the Lake Como Outlet in the south. The Lake Como Outlet enters Fall Creek, which flows into Cayuga Lake.

Table 1: Geographic and Morphometric Information on Lake Como, NY.

		Source
Latitude	42.677ºN	*Lake Como, USGS Sempronius (NY) Topo Map*, 2007
Longitude	76.303ºW	*Lake Como, USGS Sempronius (NY) Topo Map*, 2007
Preliminary Watershed County	Cayuga	Cayuga County GIS
Surface Area	64 acres (0.26 km^2)	NYSDEC and NYSFOLA, 2006
Length	0.62 miles (1 km)	Effler et al., 1988
Maximum Width	0.25 miles (0.4 km)	Hennigan, 1992
Shoreline	1.5 miles (2.4 km)	Hennigan, 1992
Mean Depth	10 feet (3 m)	Effler et al., 1988
Maximum Depth	22 feet (6.7 m)	Effler et al., 1988
Estimated Volume	221 Million gallons	Hennigan, 1992
Retention Time	0.36 years	NYSDEC and NYSFOLA, 2006
Preliminary Watershed Area	2793 acres (11.3 km^2)	Cayuga County GIS
Runoff	0.508 m/year	NYSDEC and NYSFOLA, 2006
Elevation	1309 ft.	*Lake Como, USGS Sempronius (NY) Topo Map*, 2007
NYSDEC Water Quality Class	B	NYSDEC

Figure 1: Depth Contour Map of Lake Como (*Lake Como (Summer Hill) Contour Map*, 2007)



Classification of the Lake

The New York State Department of Environmental Conservation (NYSDEC) classifies Lake Como as a Class B waterbody. The best usages of Class B waters are primary and secondary contact recreation and fishing; and these waters shall be suitable for fish propagation and survival (*6 NYCRR Part 701 Classifications-Surface Waters and Groundwaters*, 2007). Data from the 2005 New York State Citizens Statewide Lake Assessment Program (CSLAP) for Lake Como indicates that Lake Como could be classified as mesoeutrophic (moderately to highly productive) (NYSFOLA and NYSDEC, 2006).

Priority Waterbodies List

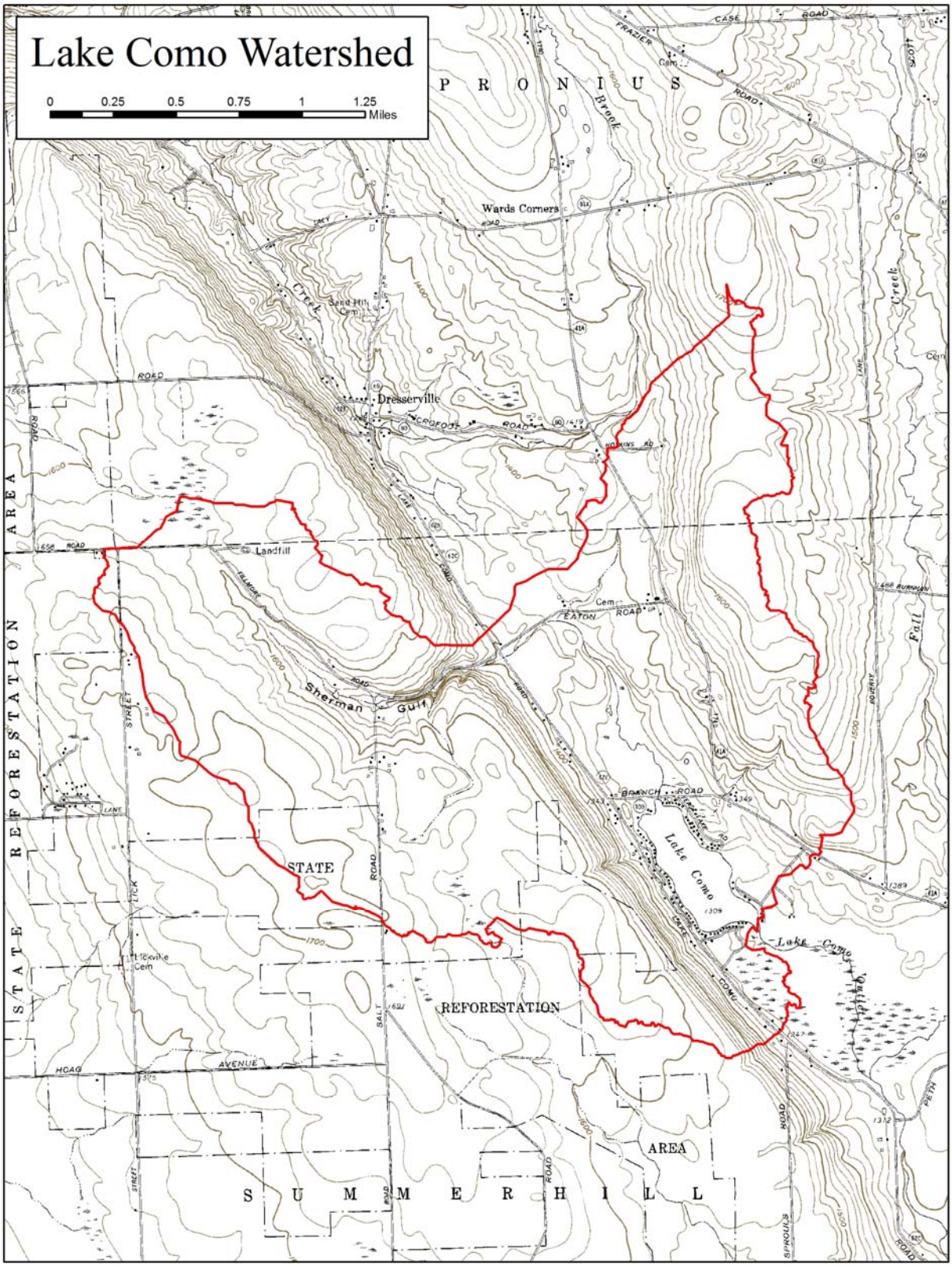
Lake Como is listed in the NYSDEC publication "The 1996 Priority Waterbodies List for the Oswego-Seneca-Oneida River Basin" with a primary use impairment of boating, a primary pollutant of nutrients and a primary source of on-site systems. Additional use impairments include bathing being stressed, fish survival being threatened, and fishing and aesthetics being impaired (NYSDEC, 1996). Additional pollutants are silt (sediment), oxygen demand, water level/flow, pathogens and aesthetics; and additional sources include streambank erosion, agriculture, and roadbank erosion (NYSDEC, 1996). Further details from this document state (NYSDEC, 1996) :

> *Use Impairment: Rooted aquatic vegetation covering 50% of the lake impairs boating, fishing and bathing use of the lake. Reduced or zero oxygen levels in the hypolimnion threatens fish survival.*
>
> *…It is considered eutrophic with the abundant weed and algae problems. Large accumulations of sediment exist on the lake bottom which provide ample rooting substrate for nuisance macrophytes. Aesthetics are impaired by algal blooms, dense weed beds, and garbage found in lake waters.*
>
> *Primary source of nutrients appears to be on-site systems from surrounding lake residences. Agricultural runoff from manure-spread fields, and cows in stream also contribute nutrients. Farm, streambank and roadbank erosion contribute sediment. Health department has measured high coliform levels at times. Changes in water level due to beaver dams on inlet and outlet have flooded some residences possibly causing more nutrient loading from leach fields. Flooding also results in floatables, garbage, trash entering lake from certain properties close to lake where these items are dumped.*

Watershed Description

A watershed is the area of land that drains into a river, stream or lake. The Lake Como Watershed is the area of land that drains into Lake Como. The Cayuga County GIS staff developed a preliminary watershed for Lake Como by utilizing digital elevation data for Cayuga County. The preliminary Lake Como watershed (hereafter referred to as the watershed), or area of land that serves as the drainage basin for the lake, is approximately 2793 acres (see Figure 2). The majority of the watershed is located within the Town of Summer Hill in Cayuga County. The upper reaches of the watershed are in the Town of Sempronius and a small portion of the Town of Locke. The ratio of land to lake surface area is 43.6 acres of watershed per acre of lake surface area.

Figure 2: Preliminary Lake Como Watershed. Cayuga County GIS.



Two unnamed tributaries enter the north end of Lake Como and the water flows southward and exits the Lake Como Outlet. However, Miller (1978) lists Lake Como as a spring fed lake, so the majority of the water entering the lake is probably groundwater.

Topography

Lake Como and its watershed are located in Plateau Country, which extends from the Catskills to the Western end of the State (Cayuga County EMC, 1979). This area was once a high plain that has been cut into hill and valley topography by erosion and glacial pressure (Cayuga County EMC, 1979). The highest elevations in the watershed occur in the western reach of the watershed (1720 feet above sea level) and northeastern reach (1700 feet above sea level). The lowest elevation is the lakeshore at 1309 feet above sea level.

Directly west of the lakeshore stretching northwest and southeast is a ridge that blocks prevailing winds which, along with elevation, makes the Lake Como area slightly colder than surrounding areas (Blake, 2002).

Geology

Bedrock Geology

The bedrock that underlies the Lake Como watershed is sedimentary and originated between the Upper Silurian Period (approximately 420 million years ago) and the Devonian Period (approximately 385 million years ago) (GFLRPC and Ecologic, 2000). Most of this bedrock was formed while the area was overlain by an inland sea and this area eventually underwent glaciation and erosion.

The bedrock in this area is part of the Portage Formation, which includes Sherbourne sandstone and Ithaca shales with some Enfield shales on the highest elevations (Cayuga County Planning Board, 1969). These rocks are thinly bedded shales and fine ground dense sandstones that are predominately grey in color, are non-calcareous and contribute most of the material in the glacial till in this portion of the County (Cayuga County Planning Board, 1969). The soils they form are mainly those of the Lordstown, Valois, Langford and Erie series which are generally low in lime and with medium potassium supplying power (Cayuga County Planning Board, 1969).

Surficial Geology

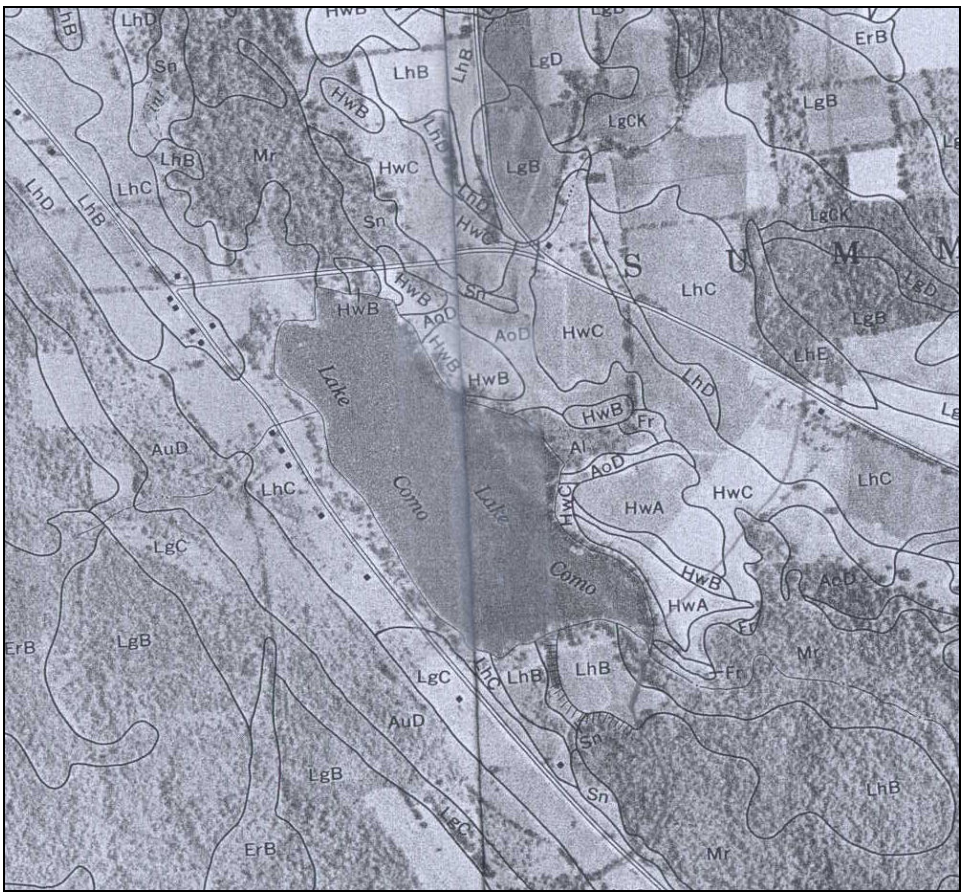
The surficial geology materials of the northern portion of Lake Como and its watershed are till of variable texture and thicknesses (GFLRPC and Ecologic, 2000). Along the southern portion of the lake and its watershed, the surficial geology materials are lacustrine sand deposits which are well sorted stratified arrangements of permeable quartz sand (GFLRPC and Ecologic, 2000).

Soils

Soil associations are intended to broadly describe the soil characteristics that are most dominant in an area. It gives a general idea of the soils in the area. The soil association that makes up most of Lake Como and its adjacent watershed is the Howard Langford Association. This association consists of approximately 40% Howard soils and 25% Langford soils (Cayuga County Planning Board, 1969). The topography is rolling to moderately steep and is subject to serious erosion only on the steepest slopes (Cayuga County Planning Board, 1969). These soils are good for agriculture, are favorable to irrigation and have slight limitations for septic systems or drainage fields (Cayuga County Planning Board, 1969). There are granular materials under the dominate soils and wells provide good water yields (Cayuga County Planning Board, 1969).

The soil association that makes up the upper reaches of the watershed is the Langford Erie Association. This soil association consists of approximately 60% Langford soils and 20% Erie soils (Cayuga County Planning Board, 1969). These are poor crop soils that tend to have strongly expressed fragipans that interfere with roots and water movement (Cayuga County Planning Board, 1969). They provide a good supply of surface water, but the shale bedrock makes poor aquifers even though the wells tend to not go dry (Cayuga County Planning Board, 1969).

Figure 3: Soil Survey of the Lake Como Area (Hutton et al., 1971)



Soil series are the smallest levels of soil classification and the ones closest to Lake Como are shown in Figure 3. All of the following soils series information is from the United States Geological Survey's (USGS) document "Soil Survey: Cayuga County New York" (Hutton et al., 1971). Most residences in the Lake Como watershed are found on the shorelines of Lake Como. Therefore, the soil series along the shoreline can have an effect on these residences and their effect on the lake. The western shoreline consists of mainly Langford Howard gravelly loam with 8 to 15% slopes (LhC). These soils have severe limitations for septic tank effluent disposal due to variable permeability. The northeastern shoreline consists of mainly Howard gravelly loam with 3 to 8% slopes (HwB) with some Alton-Howard soils with 15 to 25% slopes (AoD). The Howard gravelly loam has slight limitations for septic system effluent while the Alton-Howard soils have severe limitations due to slope. The southeastern shoreline consists of mainly Howard gravelly loam with 8-15% slopes (HwC) and 0-3% slopes (HwA) and these soils have slight limitations for septic system effluent.

The southern shoreline of the lake consists of Langford Howard gravelly loam with 2 to 8% slopes (LhB), which has slight limitations for septic system effluent. There is also some Sloan silt loam (Sn) on the southern shoreline where houses have been built. This soil is poorly drained and flooded several times a year and has severe limitations for septic tank effluent due to flooding and prolonged wetness. There are also deep muck soils (Mr) at the northern and southern ends of the lake where water enters and exits the lake. On the central eastern side of the lake, there is also some alluvial land (Al), which is recent deposited soil and sediment adjacent to streams.

Lake Bottom

The lake bottom mainly consists of very deep loose organic and inorganic muck that generally exceeds 13 feet (4 m) in depth (Miller, 1978). The sediment composition of the bottom consists of muck and silt (20% sand, 74% silt and 6% clay), except for the northeast corner which consists of hard sand (77% sand, 20% silt and 3% clay) and a small cove with sand and cobbles (Miller, 1978). There was substantial human debris on the bottom when Miller did his aquatic vegetation survey in 1977, which included glass and steel containers, appliances, tires and toys.

Climate and Precipitation

The climate of the Lake Como watershed area is a humid continental type with warm summers and long cold winters (GFLRPC and Ecologic, 2000). The area lies near or on the major west to east track of cyclonic storms and is characterized by variety and frequent periods of stormy weather, especially in the winter (GFLRPC and Ecologic, 2000).

The weather station utilized for climatological data was a U.S. Climate Reference Network (USCRN) climate station developed as part of the National Oceanic and Atmospheric Administration (NOAA). This station is located approximately 14 miles south from Lake Como. Temperature and precipitation are from records dated 1971-2000.

Temperature

The normal annual average temperature is 46.1ºF (7.8ºC), with July having the warmest average temperature (68.7ºF/20.4ºC) and January having the coldest (22.6ºF/-5.2ºC).

Precipitation

Precipitation is well distributed throughout the year with an average rainfall of 36.71 inches per year. Monthly averages (water equivalent) range from 2.06 inches in February to 3.87 inches in June.

The late fall and winter have frequent snow squalls and the average snowfall is 67.3 inches per year. The maximum monthly average for snowfall occurs in January with 16.9 inches.

Hydrology

Runoff

As precipitation lands on a lake's watershed it can infiltrate the soil, percolate into groundwater, evaporate into the atmosphere, or runoff. Runoff occurs when precipitation flows over Earth's surface into streams or other surface waters. The amount of water running into Lake Como has not been quantified. The retention time, or how long water stays in the lake, has been stated to be 0.20 years (Hennigan, 1992) and 0.36 years (NYSDEC and NYSFOLA, 2006).

Groundwater

The hydrologic budget is not quantified but groundwater is believed to be significant to annual water budget for Lake Como (Effler et al., 1988). Miller (1978) also stated that Lake Como is a spring fed lake.

The area around Lake Como and its immediate watershed consists of the Howard Langford Soil Association, which tends to have wells with good water yield (Cayuga County Planning Board, 1969). The Langford Erie Soil Association, which makes up the upper portions of the Lake Como watershed, tends to not be a good aquifer due to the shale bedrock, but the wells do not usually go dry (Cayuga County Planning Board, 1969).

Lake Levels

There are no gauges on Lake Como to measure lake level and no studies were found on its levels. There has been public concern about the lake levels based on visual observations. Miller (1988) found that beaver dams in Fall Creek were causing lake level issues. Beaver dams in Fall Creek were a concern in 2006 and beaver baffles were installed to reduce the lake level.

The preliminary Flood Insurance Rate Map from FEMA (2005) shown in Figure 4 shows that that there are houses located in the special flood hazard areas that are subject to the 1% annual chance flood.

Figure 4: Special Flood Hazard Areas from the Preliminary Flood Insurance Rate Maps (FEMA, 2005)