Long Lake Management Plan

November 2021

This plan was prepared by the Lake Champlain Lake George Regional Planning Board for the Long Lake Association with funding provided by the New York State Department of Environmental Conservation through the Environmental Protection Fund.

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Long Lake at a Glance
Town of Long Lake, Hamilton County New York

Lake Characteristics	
Surface Area	4,164 acres
Shoreline Length	48.5 miles
Maximum Depth	45 feet
Mean Depth	12.7 feet
Flushing Rate	10 times/year

Lake Designations	
Trophic Status	Mesotrophic
Acidity	Circumneutral
Acid Neutralizing Capacity	Moderate
Road Salt Influence	Present - Low
DEC Lake Classification	B
PWL Assessment	Impaired
HABs Susceptibility	Low, no blooms observed
Invasive Vulnerability	Moderate, invasive species present

Watershed Characteristics	
Watershed	St. Lawrence River Raquette River
Subwatershed	Big Brook-Raquette River HUC-10
Watershed Area	188,729 acres

Watershed Land Use	
Surface Water	2%
Deciduous Forest	41%
Evergreen Forest	19%
Mixed Forest	8%
Wetlands	17%
Agriculture	0%
Residential	1%
Local Roads	24 miles
State Roads	23 miles

Figure 1: Long Lake, Hamilton County, New York.
Source: modelmywatershed.org

Our Goals for the Long Lake Community

The Long Lake Association (LLA) of Long Lake, NY was established over 30 years ago with the mission to preserve and enhance the health and beauty of Long Lake and to promote its wise use for the benefit and enjoyment of present and future generations. The recommendations provided in this document support and advance this mission.

Introduction

The Town of Long Lake in Hamilton County, New York was settled around 1833. The Town has a year-round population of approximately 711 people (2010 US Census), a number that grows exponentially in the summer due to seasonal residents and tourism. The Town is rich in natural resources and is well known for its waterbodies including its namesake, Long Lake. Other significant waterbodies in the town include Raquette Lake, Lake Eaton, Uncas Lake, Marion River, Lake Cora, Forked Lake, Lake Lila, South Pond, and Little Tupper Lake.

Long Lake is a 14-mile-long lake located in a nearly 200,000-acre watershed dominated by forested land. Long Lake is one of the 376 significant freshwater lakes, ponds, and reservoirs that are encompassed by the larger Saint Lawrence River watershed which drains the northern and western Adirondack Mountains and the lake plain region of the Saint Lawrence River Valley.

Long Lake was formed as the result of a glacial widening of the Raquette River, which flows northeast from its origin point at Raquette Lake to its terminus in the Saint Lawrence River.

User Survey Results Summary

In the Summer of 2019, a survey was distributed to the Long Lake community in order to understand how users of Long Lake perceived the lake, how they use it, and what they felt were the major issues in regard to the water quality of the lake. The survey was distributed both online via surveymonkey.com and in person during community events. The results of the survey are summarized below:

- 45 total responses
- The most common uses of the lake were for aesthetic enjoyment, canoeing/kayaking/paddling, and swimming
- Most respondents described the water quality of Long Lake as excellent
- Respondents felt that aquatic invasive species and deicing salt are having the greatest negative impact on Long Lake
- In response to an open-ended question regarding the priorities of this plan, most responses included invasive species control and prevention

Lake Characteristics

The water quality of Long Lake is largely influenced by the environmental conditions within its watershed. Influencing conditions include topography, soils, land cover, and climate; as well as the lake's physical features such as depth and water residence time. Owing in part to its forested and pristine surroundings in the Adirondack Park, Long Lake enjoys a high level of water quality. This plan represents a proactive approach to water quality rather than a reactive approach initiated only after a problem has arisen.

In the United States, there is a hierarchy of hydrological unit codes (HUCs) which divide the country into regions, subregions, basins, subbasins, watersheds, and subwatersheds. The number of HUC digits increase as the areas they represent get smaller. The New York State Department of Environmental Conservation (NYSDEC) uses the HUC-10 subwatershed unit for the purposes of collecting water quality data and assigning potential impairments. For this report, the HUC-10 subwatershed Big Brook-Raquette River will be used for evaluation. In addition to Long Lake, this subwatershed includes Lake Eaton, a few smaller lakes in the northwest portion of the watershed, and South Pond, Salmon River and Salmon Pond to the southeast. The watershed is in the northeastern portion of Hamilton County and drains a small portion of northwestern Essex County.

Figure 2: Big Brook-Raquette River HUC-10 Subwatershed. Source: modelmywatershed.org

Waterbody Assessments and Classifications

The New York State Department of Environmental Conservation (NYSDEC) Division of Water utilizes information gathered through its monitoring programs to assess the health of New York State's waterbodies and the watershed draining them. Watershed-wide water quality reports are a compilation of periodic health assessments that assist the NYSDEC to prioritize protection and restoration activities in waterbodies. Following the last monitoring of Long Lake in 2008, the Lake was found to be impaired by metals (mercury), impacting fish consumption. No other uses are considered to be impaired.

Potential Impairments

The entire Northeast region of the United States is impacted by local, regional, and global mercury deposition sources and shares the common problem of large contributions of mercury deposition from sources outside of the region. Although mercury deposition is not necessarily uniform across the entire region, a shared interest in addressing mercury deposition and demonstrated success in regional efforts makes the case for a regional-scale approach for reduction.

The Northeast Regional Mercury TMDL (total maximum daily load) was developed in response to mercury levels in lakes throughout the region lakes. A TMDL, is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet its waterquality standards. The plan covers the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont and was developed in cooperation with the New England Interstate Water Pollution Control Commission (NEIWPCC). The initial TMDL target was set at 0.3 parts per million (ppm) and implementation goals for reductions were divided into three phases. Phase 1, from 1998 to 2008, set a goal of 50% reduction from the 1998 baseline and Phase 2 (2002-2010) calls for 75% reduction, or 1,569 kg/yr. from in-region sources and 2,090 kg/yr. from out-of-region sources. While there is little that can be done at the local level to address this TMDL, it is important to understand the impacts of mercury deposition in Adirondack lakes.

New York State's waterbodies are also assigned a "best use" classification. Long Lake is a Class B waterbody. Class B indicates that the lake's best uses are for primary and secondary contact recreation and fishing and the lake is suitable for fish propagation and survival. Best use classifications help developwater quality standards the specify a maximum amount of a pollutant that can be present in a waterbody and still allow it to achieve its best use classification.

Long Lake is included on the New York State 2008 Section 303(d) List of Impaired Waters. The lake is included on Part 2b of the list as a Fish Consumption Water due to the health advisory related to mercury levels. However, the Northeast Regional Mercury TMDL which was approved in 2007 provided coverage for waters that are identified as being impaired by mercury from atmospheric deposition. It is anticipated that Long Lake will be delisted from the NYSDEC List of Impaired Watershed because of coverage under the TMDL.

Topography

The watershed's average elevation above sea level is 1955.38 feet and the maximum elevation is

3,600 feet above sea level and the average slope is 12.4% although there are some areas in the watershedwhere the slope is over 90%. The areas in the watershed with the steepest slopes are in the southeast and northwest portions of the watershed.

Soils

The soils in this watershed are primarily classified as Group C. Group C soils are sandy clay loam and are characterized by slow infiltration rates when thoroughly wetted. There is a relative high runoff potentialin areas with Group C soils which could impact conditions in Long Lake. Areas with the slowest infiltration rates are in the southern portion of the watershed. This corresponds with areas of steep slopes making this portion of the watershed particularly vulnerable to runoff and erosion.

Land Use and Land Cover

There is very little development in the Big Brook-Raquette River HUC 10 subwatershed where land cover is predominantly forested with Deciduous Forest, Mixed Forest, and Evergreen Forest comprising nearly over 95% of the watershed and Open Water comprising approximately 12% (National Land Cover Database, 2011).

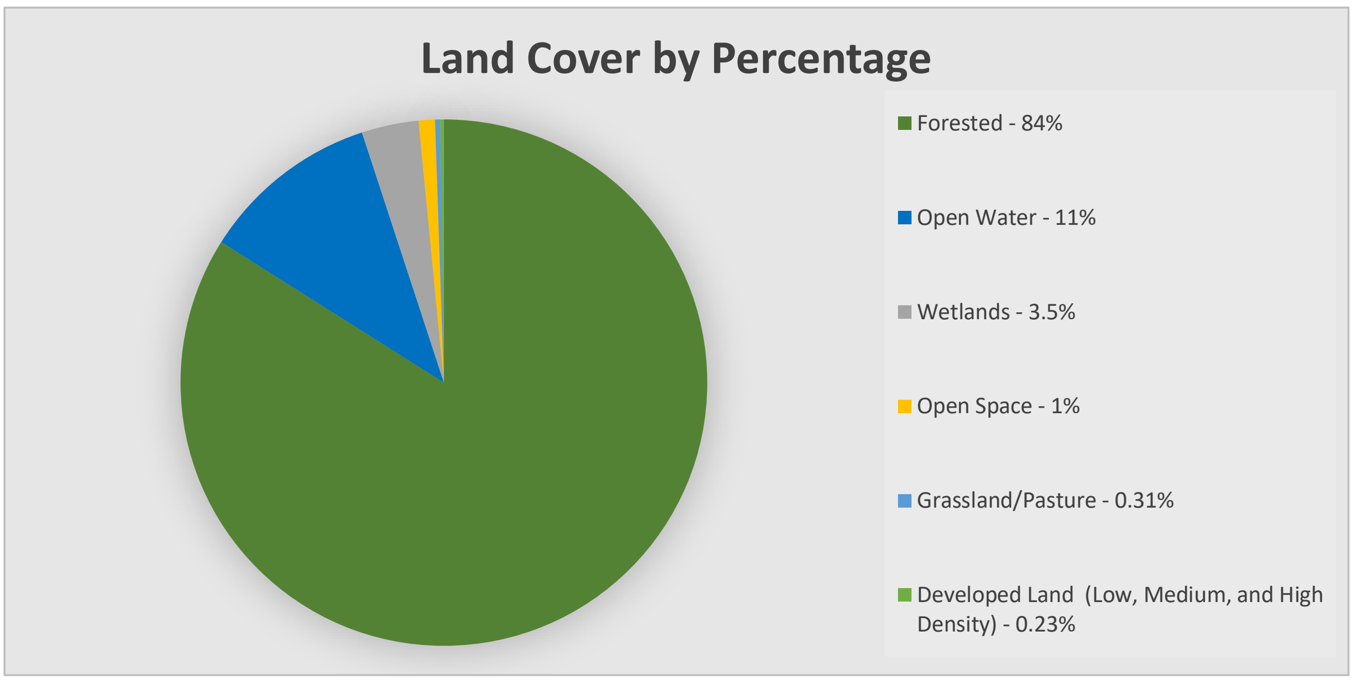


Figure 3: Land Cover Type by Percentage in the Long Lake Watershed. Source: NLCD, 2011

Inventory of Long Lake

Water Quality Monitoring

In the Spring of 2016, the Long Lake Association enrolled in the Adirondack Lake Assessment Program (ALAP). ALAP analyzes water samples collected by volunteers to determine the water quality of Adirondack Lakes based on a variety of water quality indicators. Long Lake has collected data for five years and a trend analysis has been completed for most indicators. In addition to ALAP monitoring, the Hamilton County Soil and Water Conservation District (HCSWCD) performs water quality monitoring on 21 lakes in Hamilton County through the summer months. HCSWCD has collected lake monitoring data for over 20 years. Table 1 below shows the monitoring data collected by HCSWCD for Long Lake from 2000 to 2020.

Table 1: Long Lake Monitoring Data 2000 – 2020
Source: Hamilton County SWCD, Lake Monitoring Program

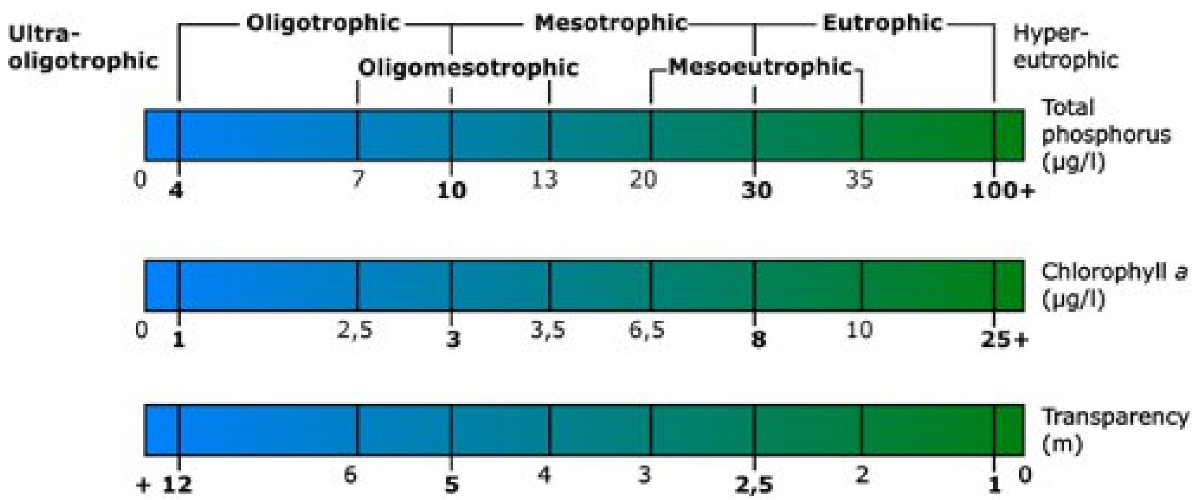
Sampling Year	Average of Transparency (m)	Average of Total Phosphorus (ug/L)	Average of Chl-a (ug/L)	Average of Alk (mg/L)	Average of Chloride (mg/L)	Average of Sodium (mg/L)
2000	3.3	8.0	5.4	1.6		
2001	3.8	11.4	6.3	1.6		
2002	2.9	4.6	5.3	2.3		
2003	3.5	3.5	4.8	3.5		
2004	2.9	12.3	6.2	2.9		
2005	3.6	14.7	5.3	3.5		
2006	2.9	32.3	5.3	2.4		
2007	2.9	26.0	6.1	2.2		
2008	3.4	21.0	5.0	3.4		
2009	2.9	14.0	5.3	3.0		
2010	4.5	17.0	5.3	3.6		
2011	3.0	14.7	4.2	3.0		
2012	4.1	10.0	6.6	4.3		
2013	3.2	7.3	6.8	2.7	5.5	2.2
2014	3.2	6.8	3.7	3.6	4.9	2.5
2015	2.9	6.2	4.8	4.5	3.5	2.4
2016	3.0	4.5	3.9	6.8	3.7	2.9
2017	3.0	6.4	8.5	5.4	4.1	2.3
2018	3.4	4.6	3.4	5.5	3.8	3.2
2019	3.1	5.2	3.7	3.4	4.4	3.3
2020	3.4	5.2	3.1	3.6	5.3	3.8
Average	**3.28**	**10.74**	**5.21**	**3.39**	**4.46**	**2.85**

Trophic State Assessment. The level of productivity of a lake is defined by three parameters: total phosphorus concentration, Secchi disk transparency, and chlorophyll-a concentration (a measure of algal abundance). Based on transparency depth and chlorophyll-a concentration, Long Lake is classified as a mesotrophic lake, but based on total phosphorus concentration, Long Lake is oligotrophic. This disparity is typical for lakes experiencing phosphorus limitation.

Oligotrophic lakes have a low level of biological activity resulting in good water quality and a high level of transparency while mesotrophic lakes have an intermediate level of biological activity, are commonly clear and have beds of submerged aquatic plants with medium levels of nutrients.

Figure 4: Lake Trophic Classification Diagram

Source: Quebec Volunteer Lake Monitoring Program



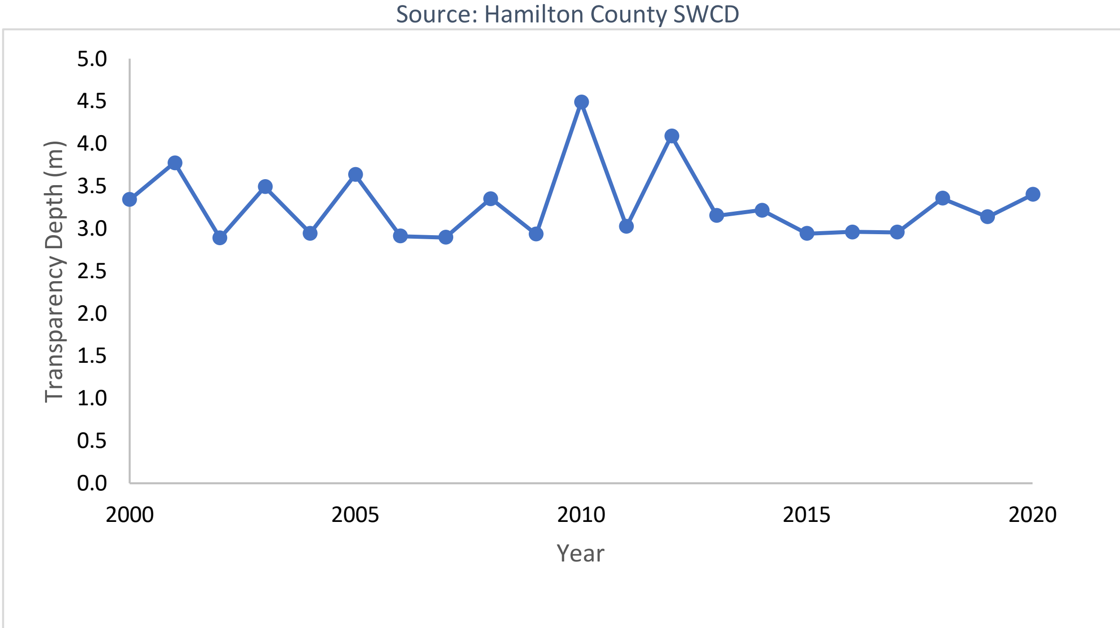
Water Cycle. The retention time of Long Lake is 0.1 years, meaning Long Lake flushes 10 times a year. Lake retention time, or residence time, is the average time that water spends in the lake. This number is especially important when discussing pollutants in the waterbody.

Transparency. Transparency or clarity is a great indicator of lake condition because it is influenced by many factors related to water quality and human perception. Transparency is measured using a Secchi disk reading which is obtained by lowering a black and white disk into the water until it is no longer visible from the surface. The distance measured before the disk can no longer be seen is known as the Secchi reading. Reduction in the transparency of water can be a result of the presence of algae or suspended inorganic materials, such as sediment. The transparency of many lakes in the Adirondacks is influenced by the amount of colored dissolved organic material in the water. Long Lake's transparency averaged 12.46 feet during the 2020 sampling season (ALAP, 2021). Generally, the more transparent the water, the better its quality. A decrease in transparency over the years could indicate a deterioration in water quality.

Based on data collected by Hamilton County SWCD, the transparency of Long Lake has remained relatively stable from 2000 – 2020 with an overall average of 3.28 meters (10.76 feet) across 20 years with minor spikes in transparency in 2010 and 2012 (Table 1). Of the 21 Hamilton County lakes sampled over the same time, the transparency of Long Lake is equivalent to the median value of transparency and below the average for all 21 Hamilton County lakes sampled in 2020. The twenty years of data collected in Long Lake, shown below in Figure 5 indicates no long-term trend in transparency.

Figure 5: Long Lake Transparency Data 2000 - 2020

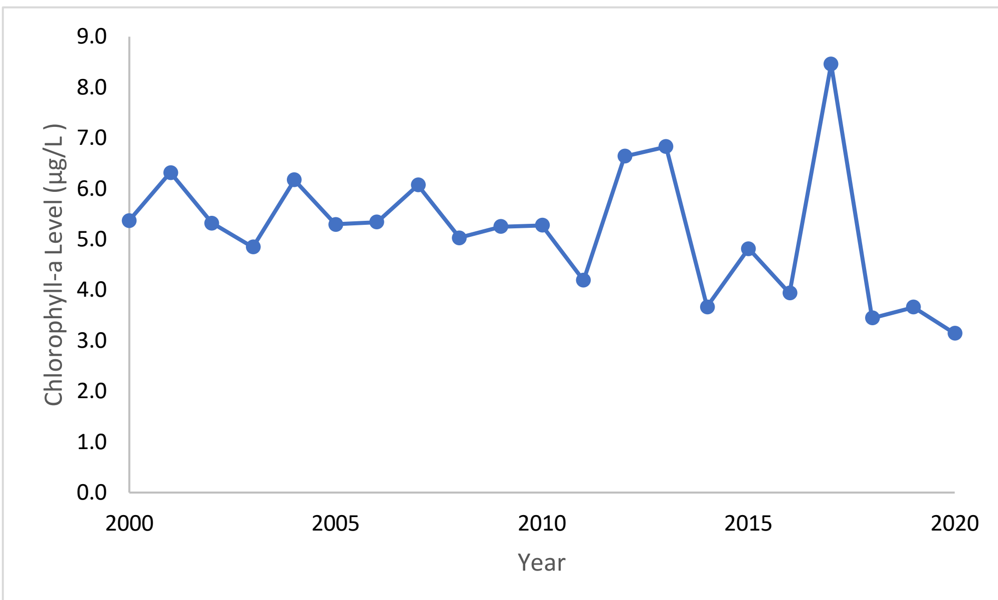
Source: Hamilton County SWCD



Chlorophyll-a. Chlorophyll-a (Chl-a) is tested in lakes to determine how much algae are present in the lake. Algae is important in lakes because it adds oxygen to the water as a by-product of photosynthesis, however, excess algae can create a host of issues within a waterbody. As algal concentration increases, the water transparency decreases, meaning that less light can penetrate through the water, blocking sunlight from underwater plants. When the algae eventually die, the oxygen in the water is consumed as part of the decomposition process, making it difficult for aquatic life to survive. The average chlorophyll-a level in Long Lake during the 2021 sampling season was 2.9 µg/L a minor decrease from the average recorded in 2018 (ALAP, 2020). Of the 21 Hamilton County lakes monitored in 2020, the average Chl-a concentration in Long Lake is above both the overall average and median. Data collected by Hamilton County SWCD between 2000 and 2020 (Figure 6) indicates no overall trend in Chl-a concentrations in Long Lake.

Figure 6: Long Lake Chlorophyll-a (Chl-a) Data 2000 - 2020

Source: Hamilton County SWCD



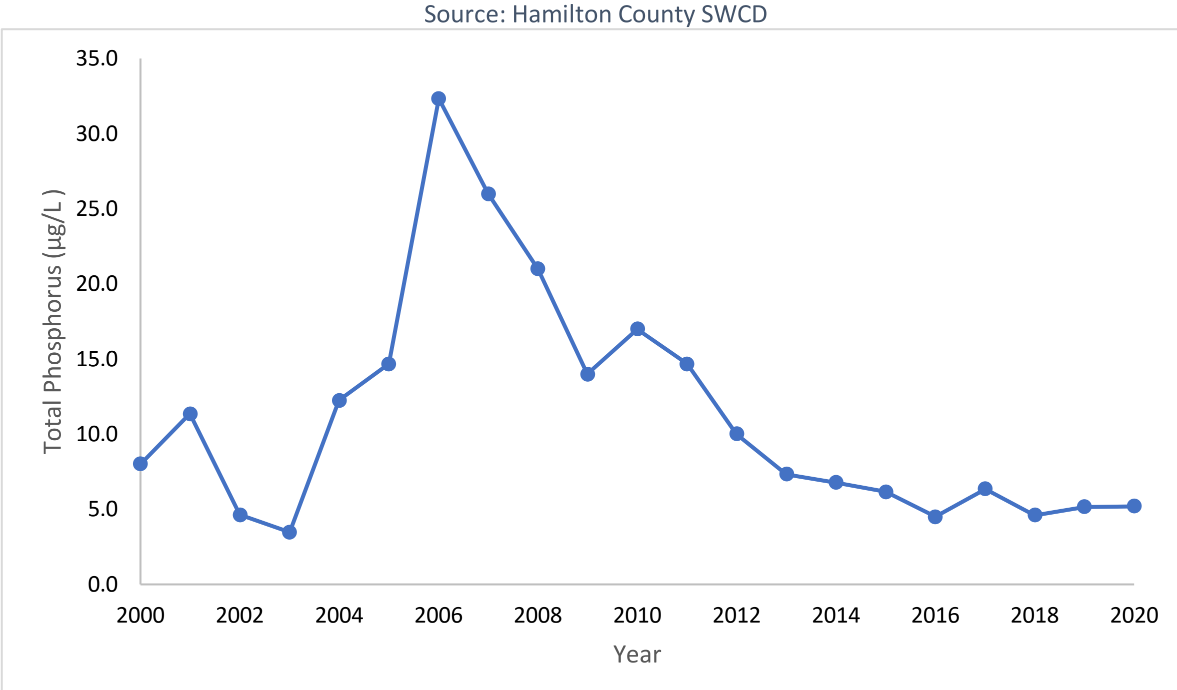
Total Phosphorus. Total phosphorus (TP) measures both ortho-phosphate and the phosphorus in plant and animal fragments. TP levels are more stable than other measurements of phosphorus, and an annual mean can tell us a lot about the lake's water quality and trophic state.

In most freshwater systems, phosphorus is a limiting nutrient. This means that everything that plants and algae need to grow is available in excess (sunlight, warmth, water, nitrogen) except phosphorus. Phosphorus originates from a variety of sources, many of which are related to human activities. Major sources include human and animal wastes, soil erosion, detergents, septic systems, and runoff from fertilized lawns.

During the 2020 sampling season average total phosphorus levels measured 4.2 µg/L, a modest decrease from 2018 sampling data (ALAP, 2021). This measurement of TP indicates that Long Lake is an oligotrophic lake. Compared to other lakes monitored in Hamilton County in 2020, Long Lake had total phosphorus levels below the average and equal to the median (Figure 11). Between 2000 and 2020, TP sampling in Long Lake revealed no long-term trends in total phosphorus (Figure 7).

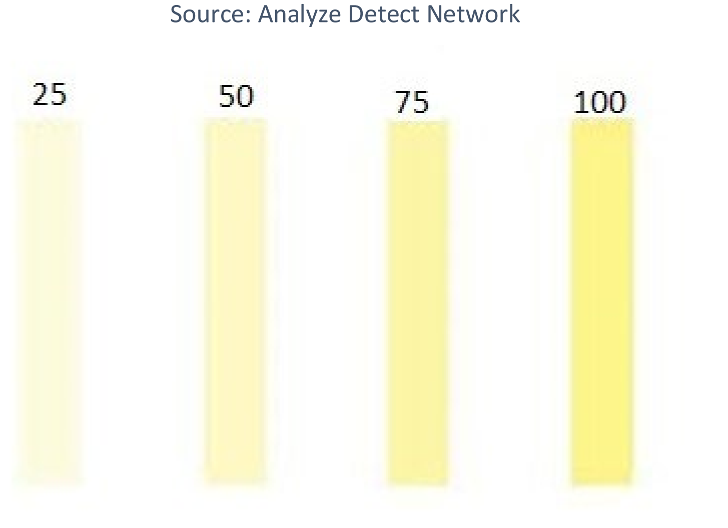
Figure 7: Long Lake Total Phosphorus Trends 2000 - 2020

Source: Hamilton County SWCD



Apparent Color (Pt-Co). The observed color of a lake is a visual property that results from light being scattered upwards.Analysis of color can provide us with information about the quantity of dissolved organic matter in the water. The average color of Long Lake during the 2020 sampling season was 41.8 Pt-Co (ALAP, 2021). The Pt-Co scale (Platinum-Colbat Scale) is a color scale that was introduced in 1892. Color on the Pt-Co scale ranges from 0 to 500, the lowest value of 0 is referred to as white water (clear) and 500 is distinctly yellow. Long term trend analysis and comparisons to other lakes is not available because Hamilton County SWCD does not track this data. Data collected through the ALAP program (2016-2021) for Long Lake reveal observed color ranging from 15 Pt-Co to 55 Pt-Co with no obvious trends.

Figure 8: Pt-Co Color Scale
Source: Analyze Detect Network



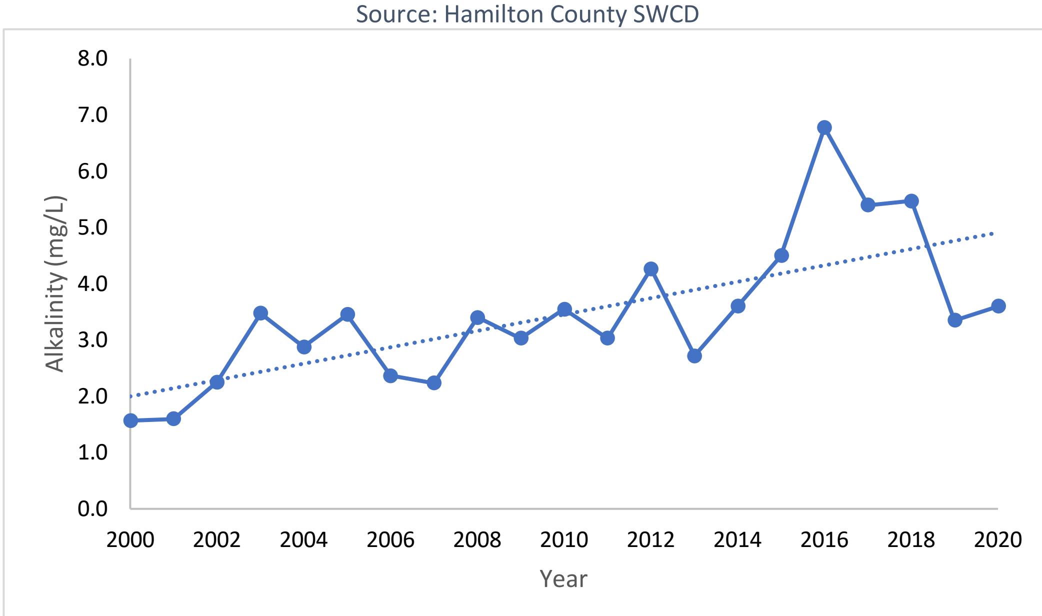
Alkalinity. Alkalinity is a measurement of the ability of a waterbody to neutralize acids and bases in order to maintain a stable pH level. Alkalinity is important to the health and welfare of a lake because a sudden shift in pH is detrimental to organisms living in the water.

Alkalinity is a property of water that is dependent on the presence of chemicals in the water, such as bicarbonates, carbonates, and hydroxides. Water with a high alkalinity will experience less of a change in its acidity when inputs like acid rain are introduced into the waterbody. Waters with higher alkalinity are better able to maintain a relatively constant pH.

Most Adirondack lakes are found in areas with granitic bedrock that has a slow rate of calcium carbonate generation, and therefore a lower acid neutralizing ability. The alkalinity of the water in Long Lake measured 6.4 mg/L on August 20, 2018, and 7.9 mg/L on August 21, 2020. While no conclusions can be drawn from two independent samples, the measurements indicate that Long Lake has moderate sensitivity to acid deposition. Compared to other lakes in Hamilton County, the average alkalinity of Long Lake in 2020 was far below the average and the median values (Figure 11), however a significant increasing trend is shown in data collected between 2000 and 2020 (Figure 9). As alkalinity increases, there is a greater resistance to a change in pH.

Figure 9: Long Lake Alkalinity Trends 2000 - 2020

Source: Hamilton County SWCD



Sodium and Chloride. Adirondack lakes have naturally low concentrations of chloride and sodium; however, widespread use of road deicers have significantly increased the concentrations of these chemicals in the environment. Each year approximately 98,000 metric tons of road deicers are spread across state roads in the Adirondacks and concentrations of sodium and chloride in Adirondack lakes have been found to be directly proportional to the density of state roads within the watershed. Assessment of sodium and chloride concentrations in a waterbody may serve as an index for the level of hydrologic connectivity a lake has with salted roads in its watershed.

Sodium and chloride concentrations were measured in Long Lake once during the 2020 sampling season on August 21, 2020. Sodium was measured at 3.7 mg/L, a 0.6 increase from the 2018 sampling season and chloride was measured at 5.9 mg/L, a 2.8 mg/L increase from the 2018 sampling season. The average chloride and sodium concentrations for Long Lake were far below the average and median of all lakes sampled in 2020 (Figure 11), however data collected in Long Lake between 2000 and 2020 indicate a significant increasing trend in sodium (Figure 10). These measurements indicate that the chemistry of Long Lake is influenced by the winter road maintenance techniques used on the approximately 76 miles of roads in the watershed.

Figure 10: Long Lake Chloride & Sodium Trends 2000 – 2020

Source: Hamilton County SWCD

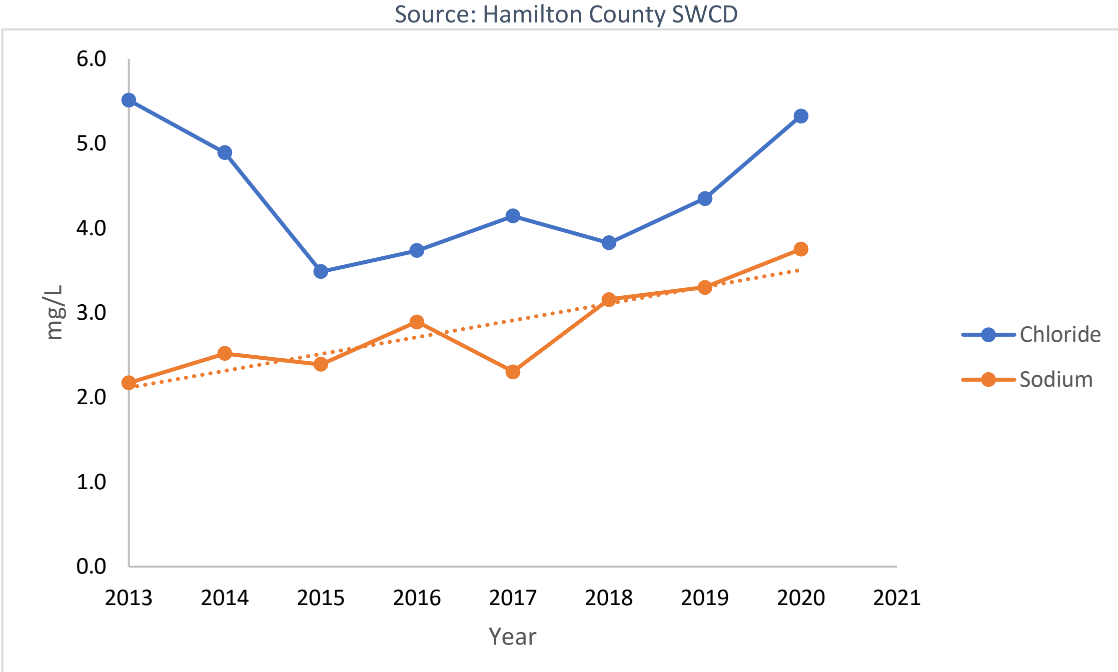


Figure 11: 2020 Averages from Hamilton County Lake Monitoring Program

Source: Hamilton County SWCD

Lake	Average of Transparency (m)	Average of Chl-a (ug/L)	Average of Total Phos (ug/L)	Average of Alk (mg/L)	Average of Chloride (mg/L)	Average of Sodium (mg/L)
Blue Mountain Lake	8.58	0.94	4.00	7.8	22.07	13.8
Eighth Lake	5.20	1.13	3.90	16.1	23.05	14.42
Fawn Lake	4.53	2.46	5.17	2.9	1.13	0.63
Fifth Lake	3.08	3.11	6.55	17.2	20.72	12.48
Fourth Lake	5.46	2.35	5.48	12.3	12.87	8.1
Indian Lake	3.50	3.08	7.08	4.3	4.15	2.97
Lake Abanakee	2.91	3.01	6.95	6.1	4.28	3.2
Lake Adirondack	2.31	5.00	9.20	30.8	16.4	8.05
Lake Algonquin	2.18	5.92	10.48	19.7	11.03	7.02
Lake Eaton	5.30	1.19	3.90	4.1	15.2	9.6
Lake Pleasant	3.70	1.73	4.78	10.3	12.43	7.23
Limekiln Lake	6.94	1.17	4.08	2.35	1.93	1.4
Long Lake	**3.40**	**3.14**	**5.20**	**3.6**	**5.32**	**3.75**
Morehouse Lake	3.60	2.78	7.25	1.95	0.53	0.6
Oxbow Lake	2.68	3.71	9.65	9.3	23.775	14.17
Piseco Lake	3.38	2.62	5.50	5.2	6.525	3.72
Raquette Lake	3.60	2.31	5.05	2.9	5.45	3.72
Sacandaga Lake	4.00	2.41	5.45	10.8	8.925	5.52
Seventh Lake	5.00	1.32	3.78	11.8	12.35	7.97
Sixth Lake	4.68	1.12	4.08	12.6	14.475	9.22
Spy Lake	4.34	2.69	5.18	3.3	18.4	10.7
Overall Average	**4.21**	**2.53**	**5.84**	**9.31**	**11.48**	**7.06**
Overall Median	**3.70**	**2.46**	**5.20**	**7.80**	**12.35**	**7.23**

Assessing Needs and Identifying Issues

Aquatic Invasive Species

Non-native invasive species are species that are introduced beyond the borders of their historic range, reproduce rapidly, and displace native species. Invasive species are considered one of the greatest threats to global biodiversity, second only to habitat loss and can affect Long Lake and its watershed by inhibiting recreation, degrading fisheries, impacting forestry and agricultural resources, carrying disease, contaminating drinking water, decreasing property values, degrading wildlife habitat, displacing native species, altering food webs, and reducing biodiversity.

With no natural population controls, such as predators, parasites or pathogens, invasive plants and animals can proliferate quickly. Invasive species can establish a competitive advantage or adaption which allows them to outcompete their native counterparts.

The diversity and magnitude of impacts posed by invasive plants and animals will vary by species, type of habitat invaded, scale of infestation, and associated stressors, among others. Rapidly identifying and addressing invasive species is critical to increase opportunities for successful management and to minimize impacts on the ecology and vitality of the watershed. As an invasive population increases in size, it demands greater resources for management and inflicts greater impacts. Expansive populations are unlikely to be eliminated even with sustained treatment efforts. Some species, once established, have no known control methods.

Long Lake currently only has variable leaf milfoil in limited areas; however, many Adirondack lakes have been infested with invasive species that can spread from lake to lake. Early identification and strategic management of new infestations is critical to minimize their negative impacts on our waterways.

Photo by A. Fox *Photo by Meghan Johnstone* *Photo by Robert Videki* *Photo by R. Old*

Photo 1: Source: LCLGRPB Guide for Lakefront Homeowners

The Boat Wash and Lake Steward programs sponsored by the Town of Long Lake, LLA and Paul Smith's College Adirondack Watershed Institute(AWI) provide an important opportunity to educate the public about the dangers of invasive species and how to prevent their spread. Lake Stewards and NYSDEC boat launch staff who staff the boat wash stations also perform visual inspections of boats before launch to further prevent the spread of invasive species.

New York State Aquatic Invasive Species Transport Law – In June 2021, State lawmakers in the assembly and the senate unanimously passed a bill that will strengthen, and make permanent, a law against spreading aquatic invasive species in the Adirondack Park. The law aims to reduce the spread of aquatic invasive species in Adirondack lakes by requiring owners and operators of motorized boats, who have not had their boat cleaned, drained, and dried, to stop at a boat washing station for cleaning and inspection. The law also imposing fines for those who do not follow this protocol. This law is now awaiting the governor's signature.

AIS Best Management Practices

Clean — Remove all visible plants, animals, fish and mud from your boat, trailer, and other equipment and dispose of it in a suitable container. Clean any gear with hot water heated above 140 degrees F.

Drain — Empty water from bilge, live wells, ballast tanks and any other locations with water in them before leaving the launch.

Dry — Boats, trailers, equipment, and anything else that is not washable should be dried for at least 5 days before reusing it in another waterbody.

Shoreline Erosion: Erosion is the geologic process by which earthen materials are worn away and transported by natural means. While erosion is a natural process, human activity can increase it. The alteration of the vegetation of an area is perhaps the biggest human factor contributing to erosion. Trees and plants hold soil in place and when they are cut down or plowed over the soil becomes more vulnerable to being washed or blown away. Some of the natural factors impacting erosion in a landscape include climate, topography, vegetation, and tectonic activity. Eroding soils can become a major source of phosphorus loading to a waterbody because phosphorus particles can easily bind to eroding sediment particles which are then carried into a nearby waterbody by stormwater running over the land.

Best Practices for Shoreline Erosion Prevention

Vegetated Shoreline Buffers: Buffers are tree, shrubs, and groundcover that catch sediment and non-point source pollution before it enters a waterway. Buffers benefit the environment in many ways by providing food, shelter, and nesting for birds and other wildlife and protecting water quality by intercepting nutrients and reducing runoff and sedimentation, controlling shoreline erosion, and deterring nuisance wildlife.

Creating plant buffers along the shoreline helps keep soil in place and can absorb a substantial amount of phosphorus and other nutrients before they enter the lake.

Photo 2: Best Practices for Shoreline Erosion Prevention. Source: Lake Champlain Lake George Regional Planning Board

Inadequate Septic Systems

Aging and antiquated septic systems are among the main sources of increasing nutrients in waterbodies and may have significant impacts on water quality, public health, and the local economy. Approximately 23% of US households have on-site septic systems and the USEPA estimates that there is an average 20% failure rate for on-site systems nationwide. Many homeowners rely on their septic systems for safe and effective treatment of their wastewater before it filters into the soil and if the system is not working properly, it can contaminate nearby waterbodies and wells.

Septic System Best Practices

Septic Inspection upon Property Transfer Law Ordinance

The Town of Inlet, Hamilton County was the first Adirondack town to enact a septic inspection ordinance more than a decade ago. The ordinance requires homeowners to have a completed inspection of their septic system prior to sale/conveyance of property.

The Towns of Queensbury and Bolton, Warren passed ordinances requiring homeowners to obtain a detailed inspection of the on-site wastewater treatment system by a certified professional or a town-designated official. During a house sale, the real estate agent is required by law to disclose any information about failing infrastructure on the property including the septic system. Any inadequacies in the system must be repaired prior to the completion of any property transfer. Since the onset of this program, the Town of Queensbury has found that approximately 80% of systems that have been inspected need replacement or repair.

Septic Pump Out Programs

Schroon Lake. Septic systems need regular cleanouts to be effective (usually every three to five years), or they will eventually fail. In 2014 and 2015, the Schroon Lake Association and the East Shore Schroon Lake Association, using funding from a New York State Department of State grant, conducted a septic pump out program for lakefront homeowners. Costs for the program were shared between the homeowners and the Associations using grant funding.

Septic Dye Testing

A septic dye test is one of the simplest methods of pinpointing issues with a septic system and is most often used to check for leakage due to broken pipes or incorrect installation The test is performed by adding dye, usually green or red, to the septic system, flushing water into the system and waiting to see if the dye appears anywhere above ground. The dye makes escaping effluent visable and traceable. If there is a problem with the system, the dye may show up in the drain field, your yard, or a nearby waterway.

Although common, a dye test is not exhaustive and can only tell part of the story about the septic system in question. It is possible to get inaccurate results from a dye test by using too little or too much water. Recent rain or snow, a layer of leaves, and tall grass can obscure any dyed effluent on the soil surface. Additionally, even if no dyed effluent appears, it does not conclusively prove the system is working optimally.

Road Salt

The use of road salt over the last several decades has significantly increased the concentration of sodium and chloride in the environment. Some lakes in the Adirondacks now have up to 300 times the background concentrations of chloride. Based on chloride concentrations alone, it is believed that approximately 72% of lakes that participate in the ALAP program are influenced by road salt.

Road salt can have direct and indirect effects on aquatic ecosystems and can also negatively impact drinking water supplies by seeping through the soil into household wells. Contaminants from road salt enter water resources by infiltration to groundwater, runoff to surface water and through storm drains. Water contaminated with road salt will have a higher density and will settle in the deepest part of the waterbody, this can lead to a chemical stratification which can impede turnover and mixing, preventing the dissolved oxygen within the upper layers of the water from reaching the bottom layers and nutrients within the bottom layers from reaching the top layers. This leads to the bottom layer of the waterbody becoming void of oxygen and unable to support aquatic life.

Road Salt Reduction Best Practices

Lake George Watershed Road Salt Reduction Initiative

Road salt reduction is a high priority for the communities within the Lake George Watershed. This initiative includes education and outreach, training of winter road maintenance crews, and annual Salt Summit conferences to advocate for more environmentally sensitive winter road maintenance practices. Using funding from a New York State Department of State Local Waterfront Revitalization Program (LWRP) grant, municipalities purchased equipment and implement best management practices to reduce road salt pollution in the watershed.

Best Management Practices for winter road maintenance:

- **Pre-wetting:** the practice of applying a brine mixture on roadways before a known storm event and when the surface temperature is less than 20°F. The brine dries on the road surface, preventing ice from forming. This practice reduces the quantity of coarse rock salt that is needed during storms, thereby reducing stormwater pollution to adjacent streams, waterbodies, and groundwater.
- **Snowplow Technology:** Participating municipalities utilize live-edge plow technology which allows the removal of more snow on the first pass than tradition single plow carbides. Removing snow on the first pass reduces the amount of ice that forms on the roadway and requires less road salt application.

Photo 3: Technologies like brine spreaders and live-edge plows allow reduce the need for road salt application during winter storms. Source: Post-Star

Recommendations

Organizational

- Continue to regularly coordinate with the Raquette Lake Association and the Town
- Expand educational outreach opportunities for tourists and visitors on the importance of environmental stewardship in Long Lake

Water Quality Monitoring

- Continue to work with Paul Smith's College (AWI) and ALAP to collect water quality samples annually
    - Establish baselines for water quality indicators in Long Lake

Aquatic Invasive Species

- Continue and expand the aquatic invasive species prevention program
    - Pursue NYSDEC grant for variable leaf milfoil harvesting
        - *Estimated funding gap between $30-$40k*
    - Continue Lake Steward Program – DEC Funding assured through 2023 for five days/week. Expand funding to cover 7-day staffing
    - Continue support of the boat wash facility until sponsored by NYSDEC
    - Investigation and management plan for AIS in Long Lake and Jennings Pond
    - Evaluate and implement strategy for ongoing mapping of the lake

Shoreline Erosion

- Work with Hamilton County SWCD to identify areas of erosion on private property around Long Lake
- Promote native riparian buffers to stabilize shoreline where feasible

Inadequate on-site septic systems

- Conduct education and outreach to homeowners around the lake to inform about the link between failing septic systems and water quality
- Create Homeowners Pamphlet/Guide – best practices for on-site septic systems including locating your system and recommended frequency for pump outs
- Work with the Town to examine the feasibility of a mandated septic maintenance program

Road Salt

- Work with AWI to continue monitoring salinity levels of the lake
- Work with NYSDOT and Hamilton County DOT to evaluate the impacts of road salt on local waterbodies and explore potential alternatives

Appendix A – Sources of Additional Information

Water Quality Monitoring:
Hamilton County Soil and Water Conservation District: https://www.hamiltoncountyswcd.com/

Paul Smith's College Adirondack Watershed Institute: https://www.adkwatershed.org/adirondack-lake-assessment-program-alap

Invasive Species:
Adirondack Park Invasive Plant Program: https://adkinvasives.com/

Hamilton County Soil and Water Conservation District: https://www.hamiltoncountyswcd.com/

Lake George Association: https://www.lakegeorgeassociation.org/protect/lake-friendly-boating/preventing-spread-invasive-species/ and http://www.protectlakegeorge.com/

Paul Smith's College Adirondack Watershed Institute:
https://www.adkwatershed.org/https:/www.adkwatershed.org/research/invasive-species

Erosion:
Hamilton County Soil and Water Conservation District: https://www.hamiltoncountyswcd.com/

Lake George Association. *Lake Friendly Living*: https://www.lakegeorgeassociation.org/protect/lake-friendly-living/

Road Salt Reduction:
ADK Action: https://www.adkaction.org/project/reducing-road-salt/

Paul Smith's College Adirondack Watershed Institute:
https://www.adkwatershed.org/https%3A/www.adkwatershed.org/research/road-salt-research

Septic Systems:
Lake George Association. (2020). *The Complete Guide to a Safe Septic System from Fixing to Financing*: http://safesepticsystems.org/

Navitsky, C. (2018). *Town of Lake George Septic Initiative Program: An analysis of the management of onsite wastewater treatment systems in the Town of Lake George:* https://lgpc.ny.gov/system/files/documents/2021/07/town-of-lg-septic-iniative-report-01-2019.pdf

Parker, H. (2021) *The Homeowner's Guide to Septic Dye Testing:* https://homereference.net/septic-dye-testing/

Town of Queensbury. (2018). *Septic Inspection Upon Property Transfer:* https://www.queensbury.net/wp-content/uploads/2018/10/ADOPTED-Chapter-137-NEW-CHAPTER-Septic-Inspection-Upon-Property-Transfer-October-15-2018.pdf

U.S. Environmental Protection Agency. (2017). How your Septic System Can Impact Nearby Water Sources: www.epc.gov/septic/how-your-septic-system-can-impact-nearby-water-sources