

MARCH 2021

Seneca-Keuka Watershed Partnership

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Note from the lake specialists:

We Want to Hear from You!

Hello reader and thank you for your continued interest in our watershed! In this edition we have a special request... ***we want to hear from you on what you think needs to be done to improve and protect the watershed.*** One of the fundamental elements of watershed planning is identifying the actions that can be taken to positively impact watershed resources. Actions can cover a wide array of categories that have the potential to impact water quality including, but not limited to, engineered systems, active management techniques, educational programs, local laws, and research. Remember that one of the principal reasons for developing a 9E is to help secure additional funding. If an action is identified within an approved 9E, identifying it *now* will help make it happen in the future. We have developed a chart that you can fill out with ideas you have for the watershed. [CLICK HERE](#) to directly access the template on the Seneca Watershed Intermunicipal Organization (SWIO) website or go to [page 17](#) in this newsletter. You can either email or mail the form to Ian Smith (address and email below). We will be compiling recommended actions throughout the next several months. Please send us any ideas or input you have! In the fall we will be hosting our second public outreach event where we will present the list of recommended actions as well as the resulting impact expected from modeled actions. As always thank you for your interest and participation in the development of the Seneca-Keuka Watershed 9E!



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Watershed Planning

In order to sustain our watershed, much of it will depend on planning and applying actions to maintain and continue to improve, protect, and preserve our watershed.

Lake Level Management

2020 was a dry year. “Thanks for stating the obvious!” I hear you saying. As I sit here writing this article on January 25, 2021, 42.94% of New York State (NYS), including most of the Seneca-Keuka watershed, remains under drought conditions. While this is a significant improvement from where conditions were in late summer and early fall, this is in stark contrast to conditions a year ago when not a single part of NYS was in a drought. Watershed planning activities are usually focused on the challenges posed by too much rain and snow. In drought conditions, we have to think about increased crop stress, potential fire hazards, and the reduction or even lack of surface water. For Seneca and Keuka, the impact of reduced surface water volume can be frustrating such as not being able to get a boat off a lift. This can also be life threatening such as not being able to operate a drinking water facility. With that concerning thought, let us discuss how the water level is managed.

For Keuka, the level is managed by the Keuka Lake Outlet Compact or KLOC for short. This is an inter-municipal corporation composed of representatives from the eight municipalities around the lake. The level is controlled by a series of six gates located at the Main Street Bridge in Penn Yan. KLOC aims to keep the lake level between 714.2 and 713.7 feet above sea level in the summer months and between 712.5 and 712.0 feet in the winter months. During extended dry periods it can be extremely difficult to maintain these levels due to reductions in inflow from watershed streams and groundwater, as well as increases in evaporation. Closing the gates completely is not permitted as a minimum discharge



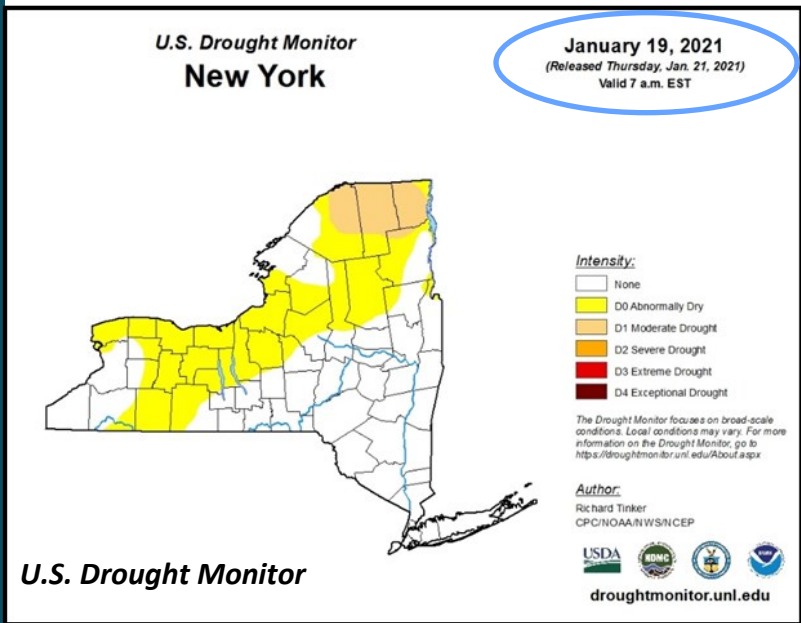
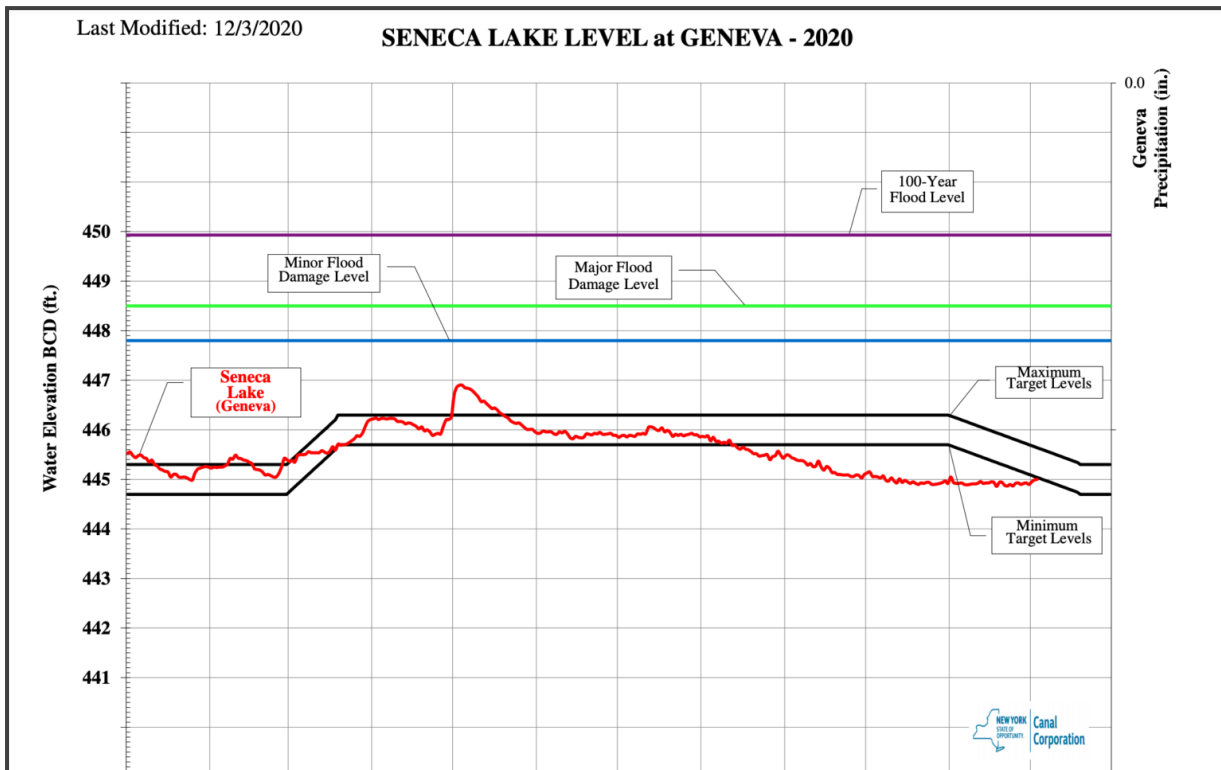
of 20 cubic feet per second is needed to operate the Penn Yan wastewater treatment plant.

For Seneca Lake, the situation is slightly different. Gravity Renewables owns and operates the hydroelectric power plant located along the Seneca-Cayuga Canal in Seneca Falls. Like with the gates in Penn Yan, the hydroelectric plant is used to maintain a target water level for Seneca Lake; 446.3 to 445.7 feet above sea level in the summer and 445.3 to 444.7 feet in the winter. While Keuka is guided by the requirements of the Penn Yan wastewater treatment plant, Gravity Renewables must comply with requirements set forth by both the Federal Energy Regulatory Commission and the New York State Canal Corporation (NYSCC). NYSCC is particularly important during periods of drought as this organization is responsible for assuring that the State’s canal network stays navigable as thus may require discharges from the Seneca Falls plant to maintain navigation.

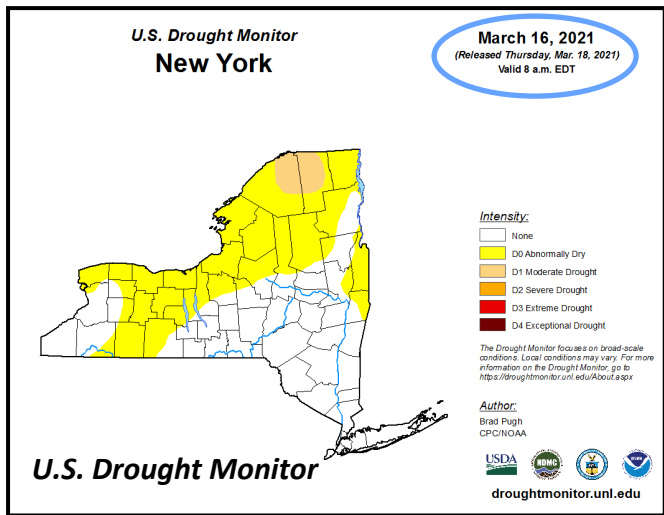
Lake level management can lead to conflict given the wide-range of uses for both lakes. For example, maximizing flood prevention means keeping lake levels low; recreational and drinking water withdraw benefit from higher lake levels. Rule curves are the historic compromise to balance competing interests, with avoidance of severe flooding or drought conditions given the highest priority. Despite these potential challenges, management between Seneca and Keuka Lake is relatively minimal. The Nine Element Plan offers an opportunity to improve our understanding of lake level management issues and pursue additional solutions that maximize every gallon of water... all 4 trillion of them.



Watershed Planning Continued...



[Click here for the most recent U.S. Drought Monitor Map for New York](#)



Finger Lakes Land Trust

Learn about what the Finger Lakes Land Trust has been working on to protect our natural resources throughout the watershed.

Land Trust Protects Over 500 Acres of Farmland Overlooking Watkins Glen

Dave Barber operates a 518-acre dairy farm in Schuyler County on land that his family has been farming for four generations, dating back to 1910. The farm sprawls across the hillside east of the Village of Watkins Glen and affords spectacular views of Seneca Lake and the gorge in Watkins Glen State Park. Not surprisingly, Dave has been approached over the past few years by developers offering to buy some or all of his farmland, with the intention of turning it into housing tracts. Given the challenges currently facing small dairy farms, including a prolonged period of extremely low milk prices, it would be tempting for Dave to take the money and run. But he was adamant about one thing: “I didn’t want to see it get developed.”

The good news is that, with the help of the Land Trust, the Barber farm recently received a \$1.14 million grant from the State of New York under its Farmland Protection Implementation Grants (FPIG) program. The grant establishes two perpetual conservation easements on the land—to be administered by the Land Trust—that prevents future development, while providing funds to help support the farm’s operations in a time of transition to new or next-generation ownership. The Barber farm began that transition in 2015, when James Barber, Dave’s uncle and the farm’s owner at the time, passed away. James and Dave had been farming the land alongside each other since the 1980s, and the two had an agreement under which Dave would inherit a portion of the farm and purchase the remainder from the estate. While his

uncle’s will was going through probate, Dave reached out to the Land Trust about protecting the farm. After taking over management, Dave began upgrading the farm’s dairy operations with an eye toward long-term growth. He expanded the dairy herd from 30 to 100 cows and built a new, more-efficient milking parlor. Within a year of completing those upgrades, the farm had increased its milk production tenfold. In addition to the

improvements to the dairy business, Dave took steps to further diversify the sources of income for the farm. He implemented a new rotational grazing scheme for his growing herd of beef cattle, sold hay and grain as feed to other local farmers, and selectively harvested some timber from the land. Barber is also currently renovating two former family homesteads on the property to be used for rental income. Despite these efforts, the farm continues to face challenges to achieve financial sustainability, and the COVID-19 pandemic “put the icing on the cake,” said Dave. “It’s the worst it’s ever been.” So the FPIG grant approval came at a particularly critical time for the farm.

The conservation easement helps improve water quality and wildlife habitat through the designation of 100 acres of the farm as a Resource Protection Area. This includes forested buffers on the slopes of St. John’s Creek and steep hillsides adjacent to Queen Catharine Marsh Wildlife Management Area. Dave indicated that the grant application process required some patience. Because the farm is partly located in the town of Hector and partly in the town of Montour Falls, it needed two town board approvals, as well as the Schuyler County Planning Board, before it even made it to the state level. Not to mention the surveys, appraisals, and soil inspections that were also part of the process. But because of his love for the farm, Dave Barber remained focused and persistent, and he says it was all worth it in the end. “It’s good to know the farm will still be here, no matter what.”



Max Heitner



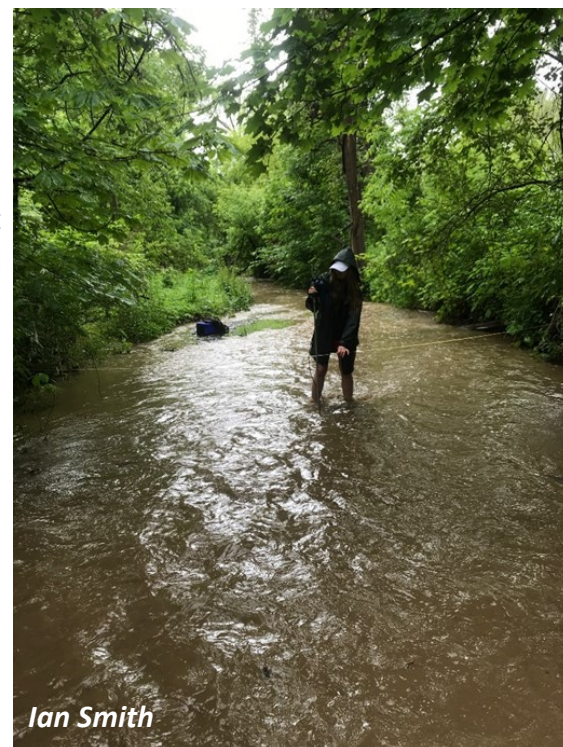
Lake Monitoring

Monitoring lake conditions is crucial to identifying the problems and figuring out a solution. Keeping up to date with the science of our water quality is essential.

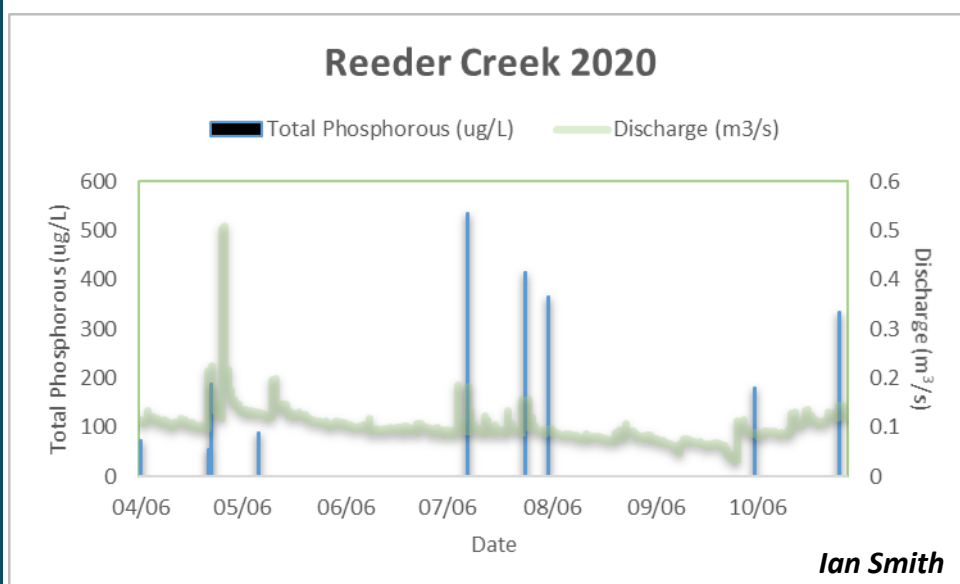
2020 9E Monitoring

The statistician George Box popularized the saying “all models are wrong, but some are useful.” He and others recognized that models will always fall short of the complexities of reality but can still be useful if they are capable of replicating at least some of this complexity. A common everyday example includes weather forecast models. While hardly 100% accurate, they are accurate enough with their predictions these days that people can plan a winter weekend to the Adirondacks to take advantage of predicted snowfall or rethink that upcoming Outer Banks trip if a hurricane is on its way. Model accuracy is heavily dependent on the availability of data collected from the real world. The Soil & Water Assessment Tool (SWAT) model developed as part of the Nine Element Plan (9E) uses multiple types of data to explain watershed conditions and test impacts of proposed future actions. As the name suggests, water quality data is one of the most critical components of its design. With this in mind, the 9E partnership group, Department of Environmental Conservation (DEC) Finger Lakes HUB staff, EcoLogic LLC and Anchor QEA developed a water monitoring strategy for 2020 to address the gaps in existing datasets and ensure the SWAT model will meet our performance standards.

To inform management decisions, water quality data needs to address two key questions: *how much of something is in the water; how much does this impact water downstream?* You need to know both the concentration (mass of something within a known volume; i.e. pounds per gallon) and the load (mass of something flowing downstream over a length of time; i.e. pounds per day) to answer these questions. Seneca Lake Pure Waters Association, Keuka Lake Association, Hobart and William Smith Colleges, and others had collected some of this data, particularly concentration data, in the past at certain locations. This was the starting point for our monitoring plan since we wanted to be able to incorporate historical data. From this



Ian Smith



point we selected 11 sites that had previously been monitored and were relatively characteristic of the diversity around the watershed. With the *where* figured out, we then had to figure out the *how*. At each of the sites, 4 baseflow samples (collected during times when no surface runoff is contributing to a stream) and 2 stormflow samples (collected during periods of significant rainfall and surface runoff) were collected between March

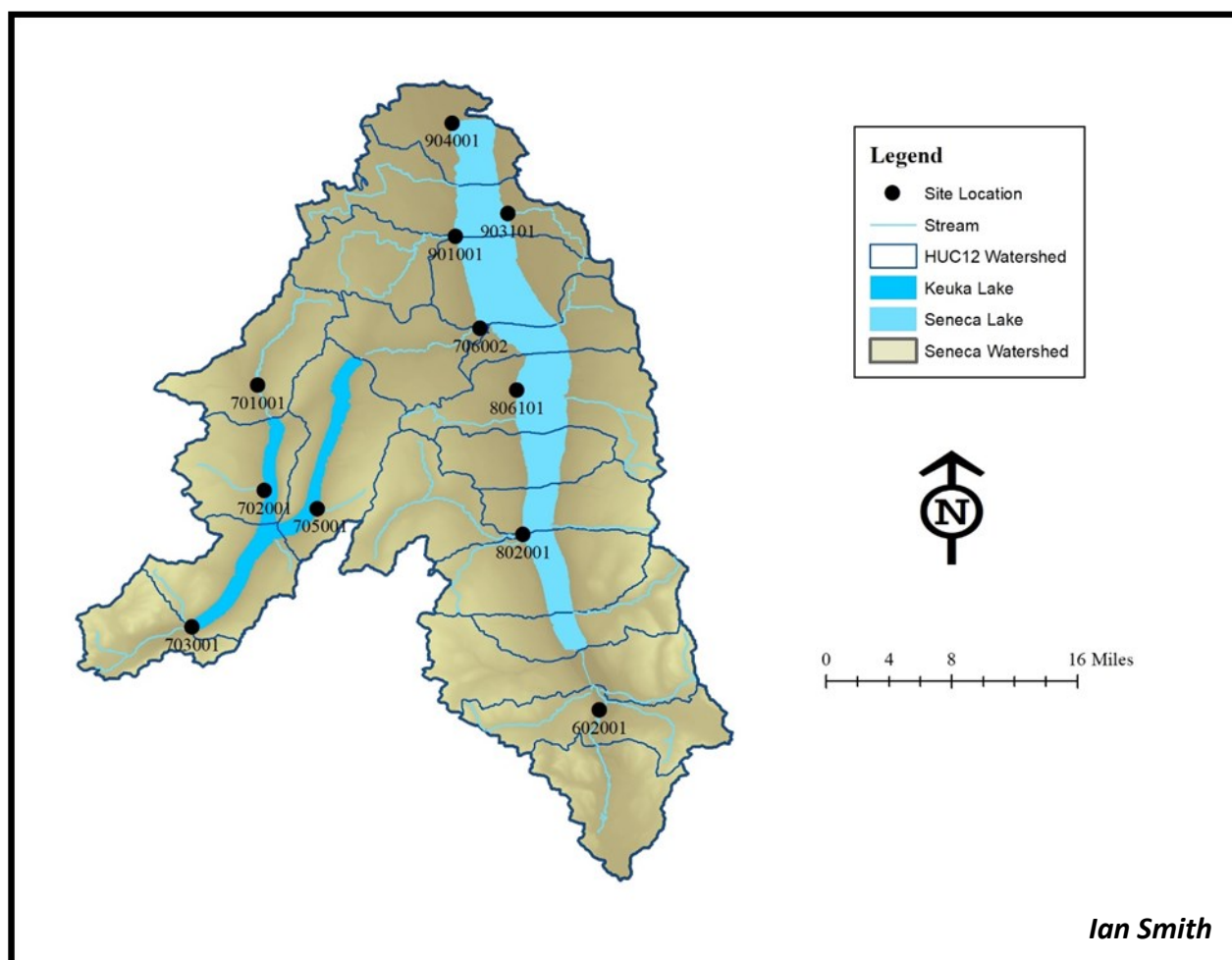


Lake Monitoring Continued...

and November. For the first time, two high intensity storm samplings were also conducted at two of the sites. For these samplings, water samples are collected every few hours over a 24-hour period starting just before a heavy rain event. This type of sampling, while extremely labor intensive and costly, greatly increases our understanding of how pollutants make their way into a waterway. Once collected, all samples were analyzed at the Community Science Institute in Ithaca for a mix of nutrient and sediment parameters. This gave us a good understanding of concentrations around the watershed under various conditions.

The other data component needed was stream discharge; i.e. the amount of water moving down a stream at a given time. Historically this data was very limited around the watershed with the United States Geological Survey (USGS) gauge on the Keuka Outlet the only reliable record. Fortunately, USGS installed gauges on Catharine Creek and Sugar Creek in 2019 and we were able to handle the rest. We opted to install our own continuous monitoring systems in all but one location (Eggleston Glen) where it was not feasible and by the end of October we finished up our field season and removed all the equipment.

With this data in hand, the modelers worked to incorporate it into the model design and we are now hitting our performance targets. So, while it can be argued that our model is wrong, we can confidently say it is useful and will be a powerful management tool moving forward.



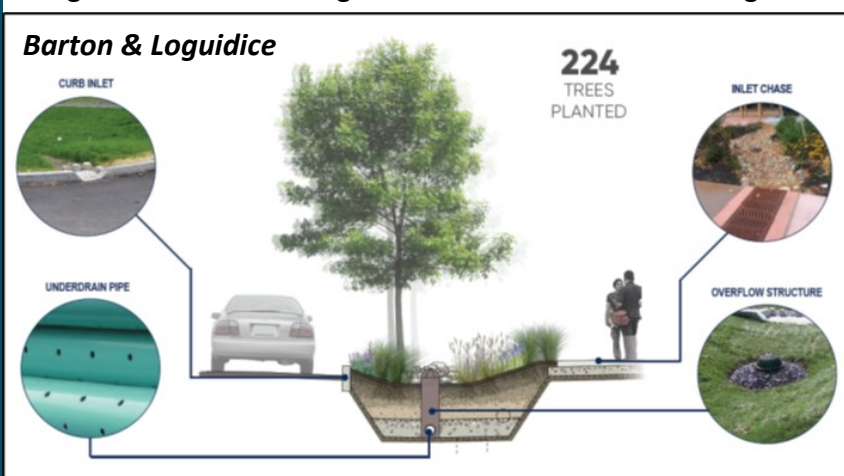
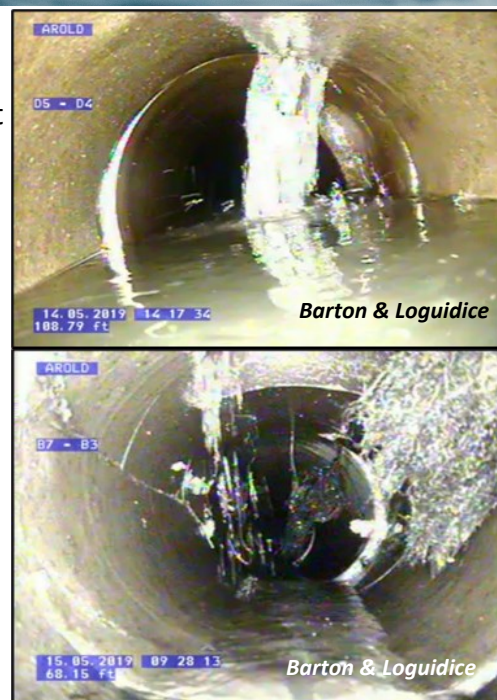
Water Treatment

Focusing on how we can treat the water prior to entering the lake is essential for the future quality of our waterways.

Green Infrastructure and Wastewater Treatment

Pop quiz: heart is to veins, as wastewater treatment plant is to...? If you said *sewer lines* give yourself a gold star. A disturbing analogy perhaps but a fairly apt one. Similar to the way the heart oxygenates blood, a wastewater treatment plant (WWTP) is tasked with treating and improving the water quality characteristics of sewage. Similar to veins that transport de-oxygenated blood to the heart, sewer lines are tasked with collecting and transporting raw sewage from homes and businesses to the WWTP for treatment. While sewer lines are often *out of sight, out of mind*, they too require maintenance and upkeep to function properly just like more visible WWTPs. Inflow and infiltration (I&I) refers to the various ways groundwater and/or stormwater enter into sewer lines, and it presents a major management challenge (see examples of I&I in photos to the right). There are many sources of I&I and can range from a basement sump pump connected to a sewer line, to cracks in pipes that allow stormwater/groundwater to enter. Regardless of the source(s), the consequences are the same: discharges of untreated or partially treated sewage into the environment and higher WWTP operational costs.

Addressing I&I through replacement and/or repair of lines was the traditional approach to reduce I&I but due to limited cost-benefit returns, alternative approaches have increasingly been explored. One such approach is the incorporation of green infrastructure (GI) into urban and suburban landscapes. This is slightly counterintuitive as a principal goal of several GI systems is to reduce stormwater runoff by increasing groundwater infiltration, which in turn could actually increase I&I. There is a limited number of studies that have looked into this question. One study in Milwaukee and another in Pittsburgh concluded GI would result in a net reduction in I&I as the resulting decrease in stormwater derived I&I would significantly outweigh the increase in groundwater I&I. As always, proper design is critical in ensuring these benefits are realized. For example, placing GI systems 10 to 50 feet from sewer lines, depending on the scale of the GI system, was found to greatly reduce the likelihood of I&I. Similarly, incorporating well-draining soils such as sand into designs can yield similar benefits, particularly in areas dominated by clay soils. GI has some obvious management and maintenance benefits over pipe replacement since the costs of both maintenance and monitoring are so much lower. This summer, the City of Geneva will begin installation of several GI systems along Seneca and Exchange Street with future work along Routes 5 and 20 scheduled for 2022. Though the



primary focus of the project will be addressing stormwater concerns, these systems are likely to reduce I&I. Hobart and William Smith Colleges' students, the City of Geneva's engineering consulting firm Barton & Loguidice, and SWIO are working together to develop a long term monitoring and maintenance plan for these systems to quantify and preserve these benefits. We will have more details on all the elements of this project in a future issue!



Agricultural Projects

Ag in the Seneca & Keuka Lake Watershed is extremely diverse and active. Ag Best Management Practices continue to evolve throughout the watershed.

Removal of nitrate from agricultural tile drainage using a denitrifying bioreactor

In the summer of 2016, the Yates County Soil & Water Conservation District (SWCD) partnered with Dr. Larry Geohring of Cornell University to install a denitrifying bioreactor to remove nitrate from tile drainage water in agricultural lands. The nitrate form of nitrogen is readily taken up by plants and microbes in the soil, but is also susceptible to leaching downwards through the soil profile. This depends on factors like soil temperature, soil type, organic matter, soil porosity, root growth, soil moisture, and amount of nitrogen in the soil profile. The Yates County SWCD worked with a local farmer to select a site that would be appropriate for installation. Dr. Geohring was able to provide grant funding and the necessary engineering for the project in on-going efforts to test and refine the practice in support of the Natural Resource Conservation Service (NRCS) Denitrifying Bioreactor Conservation Practice Standard (606).

The bioreactors function by providing an environment void of oxygen for anaerobic bacteria to thrive in. These bacteria still need oxygen to survive so they strip the nitrate (NO_3) of its oxygen and release harmless nitrogen gas (N_2). An underground chamber is constructed to allow for the tile drainage water to reside in while the bacteria work. The chamber is lined with plastic, plumbed into the tile drainage system, filled with wood chips as a medium for the bacteria to live on, covered with soil, and reseeded. Each system is designed for a certain residency period of the drainage water to maximize results based upon the volume of water coming into the system.



Open chamber lined with plastic



Chamber filled with wood chips



Completed denitrifying bioreactor

Dr. Geohring installed several of these projects around New York State in a variety of soils and conditions according to the NRCS standard. Overall results showed that the bioreactors were effective at removing approximately 50% of nitrate entering the system. Results were variable based upon time of year and volume of inflow.

So why aren't these systems installed everywhere? The bioreactor systems work best under summer and fall conditions when soils are warmer and microbial activity is higher. While these are the same conditions when nitrate is most likely to be in the soil profile, drainage flows tend to be their highest during colder portions of the year when denitrifying bacteria are less active. The diverse, sloping landscape also poses challenges for siting. The farm they installed this system on grows crops on over 1000 acres, but only two sites were found suitable for installation due to local hydrology and site conditions.

Managing nitrate in the environment is amongst the most difficult due to the variability involved. Tried and true management of fertilizer and manure nutrient applications for efficient use by crops remains our best tool to limit nitrate losses. While not applicable for all situations, the denitrifying bioreactor does provide another "tool in the toolbox" to help remove residual nitrogen and protect and preserve the Finger Lakes.



Voices from the Lake

Highlighting people that spend an incredible amount of time and effort to protect and preserve our watershed.

Tournament Fishing in the Finger Lakes: Seneca, Keuka, and Beyond

The Finger Lakes region has long been home to some of the finest multi-species angling in the state of New York and according to many, the entire United States. Of these 11 water bodies, at least 9 of them play host to some form of a competitive fishing tournament throughout the course of the year, ranging from local level events with a dozen boats to national level circuits with \$100,000 winning prizes. If you're a trout angler, there's a tournament for that. Perch fishermen? Yup, you can fish a few derbies each year. However, if you want to fish a tournament every weekend from late June until snow flies in November, it is bass tournaments that should have your attention. The format of these bass tournaments is fairly simple: teams of 1-2 anglers fish for 8 hours for the heaviest 5 fish limit of largemouth and/or smallmouth bass. Anglers are required to keep their fish alive throughout the day and may cull out smaller fish as they improve upon their catch. Dead fish may not be culled and the team incurs a weight penalty for each dead fish they bring to the scales. This can often mean the difference between bringing home several hundred dollars in prize money or walking away empty handed, making fish care one of the highest priorities of any serious tournament angler.

Taking a closer look at Keuka and Seneca Lakes specifically, both are home to numerous fishing tournaments annually with the overwhelming majority of the Keuka tournaments focusing on largemouth and smallmouth bass. While Seneca has long been known for its trophy lake trout and yellow perch fisheries, it is rapidly gaining popularity among bass anglers with an increasing number of bass specific tournaments being held there each season. A typical winning bag of fish may range from 15-20+ lbs. depending on the weather conditions and mood of the fish on that particular day. Since the recent downturn of the alewife population in Keuka lake, 15-18 lb. winning bags appear to have become the norm. Large schools of smallmouth that used to favor these baitfish have become scattered, relying more heavily on crayfish and yellow perch as their primary forage. As for Seneca, the handful of tournaments that are being held on the lake often produce 5 fish bags in excess of 20 lbs., an impressive average for any northern fishery. Pelagic baitfish populations (such as alewives) remain strong in Seneca but can make summertime smallmouth difficult to pattern as they roam the open water in search of this offshore buffet. As a result, tournament fishermen are forced to rely more heavily on the lake's nearshore largemouth population to produce winning catches during these periods. Adapting to changes in fish behavior throughout the course of a day and season is in essence what it means to be a competitive fisherman. While the seasonal patterns of game fish in these lakes may be ever changing, populations still appear strong overall and as long as there are bragging rights on the line, you can bet tournament anglers will find a way to catch them.



Tucker Kautz (Ontario County SWCD) and Ethan Hall (Yates County SWCD) pose for a brief post-tournament photo before releasing their catch back into Keuka Lake.



Soil & Water Highlights

Learn about the history of Soil & Water Conservation Districts!

The Origin of Conservation Districts

In the early 1930s, along with the Great Depression, came an equally unparalleled agricultural and ecological disaster known as the Dust Bowl. Huge black dust storms that stretched across the nation blotted out the sun and swallowed the countryside. On Capitol Hill, while testifying about soil erosion problems, soil scientist Hugh Hammond Bennett drew back the curtains to reveal a sky blackened by dust. Congress immediately declared soil and water conservation a national policy and priority. Since about three-fourths of the land in the United States is privately owned, Congress realized that only active support from landowners would guarantee the success of



conservation on private land. The idea of Soil and Water Conservation Districts was born!

In their beginnings, Soil & Water Conservation Districts (often referred to as Districts) focused their programs on rural America, assisting farmers and ranchers in conservation measures to prevent their soil from blowing and washing away. Districts have a proud history in leading efforts to provide assistance in water quality, soil erosion control, and rehabilitating farmlands and forests. As land use patterns changed, new pressures on natural resources begin to mount. Other types of non-point source pollution occur due to the actions of development in rural and suburban areas. Lack of knowledge about land and resource management creates erosion problems due to the development of sensitive areas without proper conservation measures in place. It became clear to Districts that their role must evolve in order to serve this new and expanding clientele, in addition to their agricultural customers. Today's citizens appreciate access to the educational and technical expertise that Districts can provide.



New York's 58 Soil & Water Conservation Districts are referred to as "gateways" to natural resource management in their local communities. Districts provide linkages between land users, and a host of conservation service providers, including state, federal and local governments, conservation organizations, and the agricultural community. Districts continuously scan the needs of their communities, work with others involved in conservation to set local priorities, and develop action plans to help solve natural resource problems. They provide the public with a point of access in their communities to practical, everyday aspects of natural resource management. These efforts by Districts allows citizens to manage their land for a cleaner, healthier, and more productive New York.

Seneca County SWCD



Seneca County SWCD



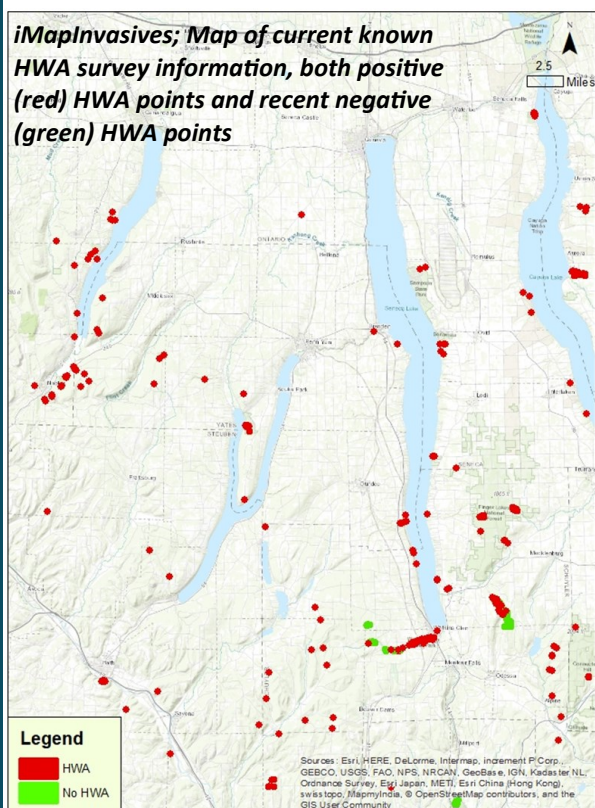
Community Outreach

Each and every person can make an impact on our waterways. Learn how local organizations are working with our communities to improve our watershed.

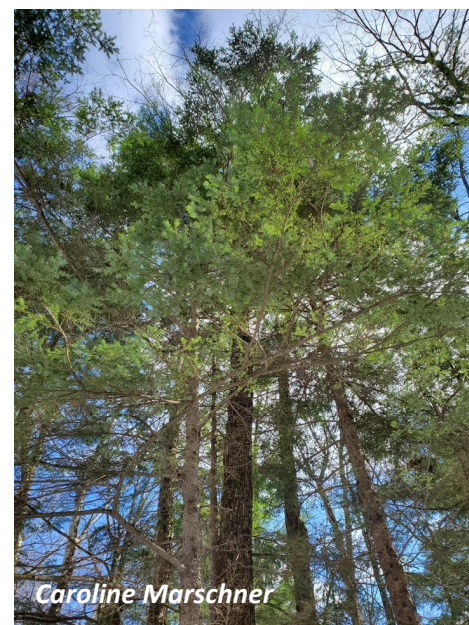
Hemlocks and Hemlock Woolly Adelgid in the Western Finger Lakes

Eastern hemlocks are an iconic and ecologically important part of the landscape and watersheds of the western Finger Lakes. They help stabilize stream flows, help keep streams cool for trout, grow in our steep gorges and near streams, and provide shelter and food for many species. Hemlocks are the most shade tolerant of our evergreen trees, and provide a habitat that will not be easily replaced if they are lost from our landscape. Hemlock Woolly Adelgid (HWA) is a tiny but very damaging forest pest that is killing hemlocks across the eastern United States. It has been in the western Finger Lakes since the early 2000s, and is spreading north and west through the region. This pest kills hemlocks in 6-20 years in New

York, and treatment is available to protect our valuable hemlock resources. HWA has been found in locations around both Keuka and Seneca lakes, so now is the time to search and manage HWA in our region. To save our hemlocks, we need to know where both the hemlocks and HWA are. If you are a homeowner or a hiker, please look for the white, woolly bundles on hemlock twigs that are the tell-tale sign of HWA infestation. These are easy to see from November - April, when the insect is actively growing and creating fresh 'wool', but it can be seen any time of year. Look on the undersides of twigs on low branches, on twigs dropped on the forest floor by porcupines feeding in the treetops in



winter, and also for small scraps of wool caught in the bark of hemlock trunks (it washes down the trunks in rain). If you find HWA, please report your find to [iMap Invasives](#). If the pest is found on your property, please consider treating your trees for HWA. Information on HWA management can be found at the [New York State Hemlock Initiative \(NYSHI\) website](#). If you have a large property, consider developing a management plan for hemlock conservation; the NYSHI has a [tool](#) to help landowners decide which hemlocks are most important to conserve. Hemlocks are a critical part of our Finger Lakes landscape and support the lands and waters we love. Let's work together to keep this beautiful and valuable species alive and well in our region.



Did You Know?

Learn more about the Finger Lakes National Forest.

Why We Burn

If you come to visit the Finger Lakes National Forest during the last few weeks of March or the month of April and see smoke rising from one of our grasslands or shrublands, don't be alarmed! What you're most likely witnessing is one of the United States Forest Service's most powerful land management tools: a prescribed fire. One might be tempted to question why we would unleash such a powerful force of nature on the

landscape, especially with what has gone on in the western United States over the past decade. The answer is simple...when utilized correctly, fire is probably the most cost-effective and best way to manage our important grasslands and shrublands here in the Finger Lakes.

Furthermore, these prescribed burns are done with the utmost care and involve highly trained wildland firefighters from around the northeastern region of the United

States. Safety is our priority and each burn unit is prepared beforehand to minimize risk of having a fire escape the perimeter of our management unit. We utilize prescribed fire for several different reasons. One of the primary reasons is that regular treatment of these grasslands and shrublands by fire lessens the build-up of hazardous fuels. Wildfires have been devastating out west largely due to the fact that the Forest Service has been effective for so long at keeping fires out of areas that the fuel load reaches tremendous levels making fires travel more quickly and burn more intensely. By burning our grasslands every few years, we consume the



fuel and keep these areas safer over the long term. Another aspect of prescribed fire that makes it a great management tool for our grasslands is that it helps eliminate vegetation that competes with native grasses and forbs. Invasive species are of particular concern in our grasslands as they grow quickly and spread prolifically. Prescribed fire, when utilized correctly, has been proven to decrease prevalence of invasive species and encourage growth of native grasses and forbs that are important to wildlife and native pollinator species. Currently, the Finger Lakes National Forest is working on conducting a trial of different treatment methods to determine which will benefit the forest the most. These trials include a summer burn, multiple treatments in a year, and utilizing fire as a prep for planting Native Warm Season Grasses and Native Wildflowers. Here at the Finger Lakes National Forest, we have a "burning" desire to do what is best for our local environment. Specialists in every aspect of natural resources are consulted before any unit is burned and mitigations are followed so that Best Management Practices are employed every time fire touches the ground. Many areas on the forest are managed using prescribed fire every year and we plan to use this powerful and useful tool well into the future!



Industry Input

Many of the businesses within the watershed are here because of the lakes. Each newsletter will feature a local industry that is impacted by our lakes.

Sustainable Viticulture Practices

The Finger Lakes region has been a center for wine production since the 1860s and has perhaps the most diverse array of native *Labrusca*, interspecific hybrid, and *V. vinifera* cultivars of any production area in eastern North America. Over 30 varieties are processed into wine, with *Labrusca* types comprising 60%, hybrids about 25%, and *V. vinifera* about 15% of the 10,000 acres in production. Grape production in the Finger Lakes extends from the southwest side of Canandaigua lake to the east side of Cayuga Lake. Temperature moderation for the region comes from Lake Ontario, with additional moderation on a local (mesoscale) scale from the Finger Lakes themselves. Seneca (446 ft elevation, 632 feet deep) and Cayuga (380 ft elevation, 435 feet deep) Lakes are the deepest and lowest, and they rarely freeze. They provide the most moderation and longest growing season. Keuka Lake (710 ft elevation, 187 ft deep) and Canandaigua lake (686 ft elevation, 262 ft deep) provide a lesser, but still substantial amount of winter moderation locally. Higher elevation, however, leaves these areas prone to earlier fall frosts than the area immediately around the larger lakes. Slopes surrounding the lakes rise 500 to 1,500 ft above lake levels, with surrounding elevation increasing from north to south. Most vineyards on Seneca and Cayuga Lakes are below 1,000 ft of elevation, while on Keuka and Canandaigua Lakes, vineyards are between 1,000 and 1,200 ft in elevation.



What is VineBalance and how can it help our local grape growers?

VineBalance is a joint effort by the wine and juice grape industry, Cornell Cooperative Extension, and the New York Department of Agriculture and Market's Soil and Water Conservation Committee to define and promote the use of sustainable growing practices on the 33,000 acres of vineyards in New York. To visit the website, go to www.vinebalance.com.

The program's major goals are to promote and document grape production practices that:

- ◆ Protect the environment (specifically water quality and soil health)
- ◆ Protect the health of workers, neighbors, and consumers
- ◆ Increase or maintain the profitability of grape production.

The foundation of the program is the [grower self-assessment workbook](#). Designed to both document sustainable grape growing practices already in place and [promote sustainable practices](#) throughout the industry, the workbook is primarily an educational tool to bring awareness to the economic, environmental and social implications of specific viticultural practices. The self-assessment provides a baseline for potential modifications detailed in an [action plan](#) drawn up after completing the workbook.

The potential benefits to participating growers include:

- ◆ Eligibility for cost-sharing opportunities for farm improvements through state and federal conservation agencies
- ◆ Increased product marketability for the grapes and grape products produced through sustainable means
- ◆ Economic and environmental savings through efficient use of fertilizers and agrichemicals
- ◆ Improved neighbor relations and industry reputation.

Grape production is a high-profile agricultural enterprise. By making it an industry-wide goal to produce grapes, juice, and wine using sustainable practices, participating growers will help themselves and the state by reducing environmental risks and ensuring a healthy future for New York's grape growing industry.



Municipal Voices

This section focuses on different municipalities and their role in protecting the water quality of the Seneca-Keuka Watershed. Learn what Penn Yan has done to make this goal a reality

The evolution of Keuka Lake water level management over time

Anyone who has spent time on or around a lake knows that water levels vary throughout each season and even throughout the course of a single day depending on weather conditions. During periods of spring snow melt or flashy storm events, large volumes of water can be observed pouring off the landscape into the lake's tributaries, thousands of gallons at a time. Keuka Lake is no exception with plenty of steep ravines to convey water from the upper reaches of the catchment to the lake itself in a relatively short amount of time. Of course, if the lake level is impacted by these wet weather conditions, it goes

without saying that it is also heavily impacted by extended periods of dry weather. Needless to say, it didn't take long for early settlers of the area to realize that it would be in their best interest to maintain the lake level and flow conditions of the Keuka outlet. Since the late 1700's, Keuka Lake water levels have been controlled to varying degrees by a gate structure at the Main St. bridge in Penn Yan, although early water level



regulation was aimed primarily at maintaining enough discharge to move freight between Keuka and Seneca Lake. Looking ahead to the early 1900's, flow management was geared more toward generating hydroelectricity at the Seneca Mills station and later, in 1963, operation of the wastewater treatment plant. A major flood event in May of 1956 resulted in considerable damage to the outlet and the eventual formation of an intermunicipal organization responsible for maintenance of the channel. This organization, known as the Keuka Lake Channel Perimeter

Committee, would eventually be reformed into the Keuka Lake

Outlet Compact (KLOC) in August of 1990 and would be responsible for managing the 6 gates that we have in place for controlling the lake level today. However, unlike the early years of water level control on the lake, current management efforts are focused primarily on flood control around the lakeshore and protection of public safety. So, who determines when the lake level should be raised or lowered and how do they decide when these adjustments are appropriate? The KLOC Commissioners have been given the authority to instruct the Director of Public Works for the Penn Yan Municipal Utility Board based upon the "Reservoir Regulation Manual-Keuka Lake Outlet" (developed by the United States Army Corps of Engineers). This elevation above sea level is measured at the Penn Yan Water Plant and updated every two hours on the [Keuka Lake Association's \(KLA\) website](#). As the lake level approaches the upper limit, gates are opened to release excess water and as levels approach the lower limit, gates are closed to maintain levels within the guide curve. This of course is an over-simplification of the process, which is still not an exact science, despite having access to relatively precise discharge calculations for various gate settings, also found on the KLA website. At the end of the day, nature ultimately dictates the lake level, as the gates are only capable of releasing so much water during major storm events and can only hold back water to a limited extent during dry periods while still maintaining flow for the wastewater treatment plant. As time marches on, the process for managing water levels in Keuka Lake is steadily improving but will ultimately remain a challenge due to the unpredictable and dynamic nature of the local climate and watershed.



Partnership Organizations

Learn about our partner organizations and how they are helping with the 9 Element Plan for the Seneca-Keuka Watershed.

Updates from the Finger Lakes Institute

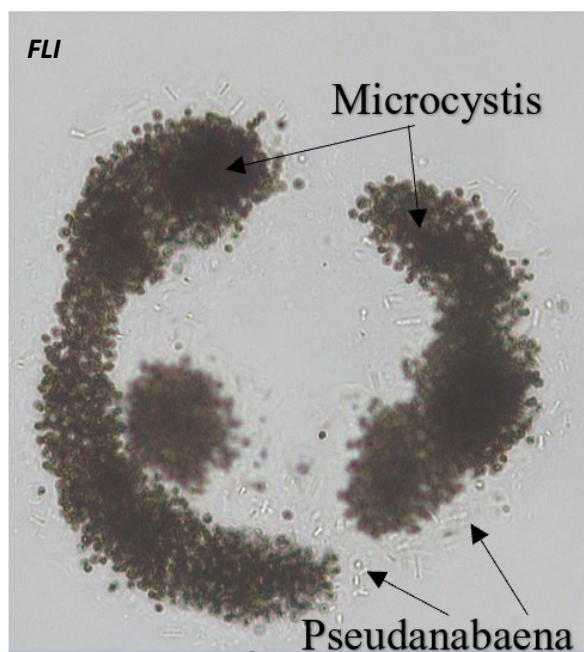
Water resources and natural capital such as landscapes and agriculture are the economic heart of the Finger Lakes region. The Finger Lakes Institute (FLI) at Hobart and William Smith Colleges (HWS) serves an important role in protecting and promoting these natural assets by connecting activities at the FLI and in HWS academic departments to regional, state, and federal needs. Specifically, the FLI provides: (i) relevant, actionable scientific information for the region; (ii) research and professional development opportunities for HWS students, faculty, and staff; (iii) capacity to pursue funding to support research, education, management and demonstration projects focused on Finger Lakes environmental issues; and (iv) a place for student and community education about interconnected environmental issues including water, food, energy, and waste.

A big focus of the FLI over the past several years has been harmful algal blooms (HABs) or the presence of cyanobacteria (aka bluegreen algae) that are capable of growing to high concentrations in warm and calm conditions. These organisms can produce toxins that affect the health of organisms including humans and dogs. People and pets can be exposed to these compounds through swimming and boating in the lakes as well as through drinking water.

In 2020, the FLI collaborated with Cornell University (Prof. Ruth Richardson, Civil and Environmental Engineering), Community Science Institute, and watershed groups from Seneca, Cayuga and Canandaigua Lakes on a New York State Water Resources Institute-funded research project to better understand the development of cyanobacteria communities and the production of toxins from July through October. This project engaged citizen scientists to collect weekly water samples as well as HAB samples when present. Samples were analyzed at the FLI for chlorophyll concentrations using the bbe FluoroProbe and microcystin

using the United States Environmental Protection Agency standard methods. At Cornell, samples are being analyzed for genetic material including DNA and RNA to identify the specific species of phytoplankton present as well as other organisms such as bacteria and viruses that comprise the HAB microbiome. Genetic analysis will also identify if the genes that are responsible for toxin production are present in the cyanobacteria samples.

The Cornell/FLI research connection will begin a new project in 2021 building off these findings. The new project will focus on bloom dynamics in the offshore areas of the lake as well as nearshore areas. The project will also include optical measurements of the water to provide data to help ground truth data collected from drones and satellites regarding the presence and concentrations of cyanobacteria over the HAB season. For more information, email cleckner@hws.edu.



Finger Lakes Microcystis colonies (large dark cells) surrounded by mucilage. Another genus of cyanobacteria, Pseudanabaena, represented by the light rods, is embedded in the mucilage. Image is magnified 200 x.



National Park Service News Release

National Park Service News Release, Release Date: March 1, 2021

National Park Service invites public input on Finger Lakes National Heritage Area Feasibility Study

NEW YORK STATE — The National Park Service (NPS) invites public input on a study to determine the feasibility of designating the Finger Lakes region of New York as a national heritage area. The 90-day comment period for the Finger Lakes National Heritage Area Feasibility Study will extend from March 1 to June 1, 2021. More information about the study is available at <https://parkplanning.nps.gov/FingerLakes>.

“Input from the public regarding the creation of a national heritage area in the Finger Lakes is critical to the study process. We also hope to learn more about the region from the people who know it best,” said Allen Cooper, regional chief of planning, National Park Service. “The information, interest and inquiries we receive from the public help inform our work as we assess the Finger Lakes as a potential National Heritage Area.”

The Finger Lakes National Heritage Area Feasibility Study was authorized by the John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019, which directed the Secretary of the Interior to evaluate the natural, historic, cultural, educational, and recreational resources of the Finger Lakes. The study will assess if it is nationally worthy of recognition, conservation, interpretation, and continuing use; through designation as a national heritage area.

The legislation identified the following counties to be considered as part of the study: Cayuga, Chemung, Cortland, Livingston, Monroe, Onondaga, Ontario, Schuyler, Seneca, Steuben, Tioga, Tompkins, Wayne, and Yates. The feasibility study will also assess the demonstrated support of the community including businesses, residents, nonprofit organizations, and appropriate local, state and federal agencies.

The study’s assessment, along with any recommendations from the Secretary of the Interior, will be reported to Congress. The study will assess the region’s unique and important American stories, how they can be experienced by the general public, and how a potential new national heritage area would be organized by a coordinating entity, if one were to be designated by Congress. The study is expected to run through 2023.

The NPS has prepared the following materials to inform the public about the study and to solicit public comment:

- **An online ‘Story Map’** explaining the study’s purpose, authorities, and a summary of resources within the 14 county study area the NPS’ research has identified thus far can be found here: <https://arcg.is/0eCKrj>.
- **A draft narrative summary** of the NPS’ research and a detailed list of resources in table format can be found on the project website at: <https://parkplanning.nps.gov/FingerLakes>.
- ◆ **The public comment submission portal** can be accessed from the Story Map’s “Comment Now” buttons for the project website’s “Open For Comment” tab (see links above).
- ◆ **Submissions by mail** can be sent to:
National Park Service, Denver Service Center
Attn: Finger Lakes NHA / Charles Lawson
12795 West Alameda Pkwy
Denver, CO 80228

As a strategy for community-led conservation and development, national heritage areas are places where historic, cultural, and natural resources combine to form cohesive, nationally important landscapes. If designated by Congress, national heritage areas are managed by local coordinating entities that accomplish goals of interpreting the heritage area history and traditions through partnerships with governments, organizations, businesses, and individuals. National heritage area coordinating entities collaborate with communities to determine how to make heritage relevant to local interests and needs. A national heritage area is not a unit of the National Park System, nor is any of its land owned or managed by the NPS, unless such land was previously set aside as a unit of the National Park System. The creation of a new national heritage area does not change existing private property rights. Learn more about the NPS National Heritage Areas program here: <https://www.nps.gov/subjects/heritageareas/index.htm>.

Contact: Charles_Lawson@nps.gov



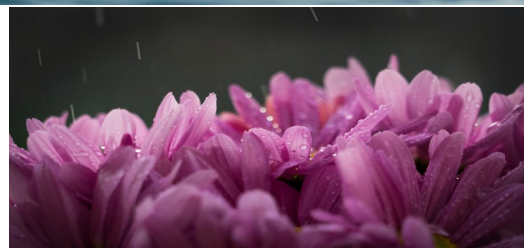
Recommended Actions: Seneca-Keuka Watershed Nine Element Plan

Instructions: Provide as much information as you can but partial information is fine. Project ideas can be as general or extremely specific; for example you could say: *reduce streambank erosion around the watershed, or reduce stream bank erosion along Kashong Creek upstream of Route 14 Bridge with State and Federal dollars.* We'll take on the task of grouping and categorizing ideas for simulation and prioritization as applicable. And don't be afraid to think outside the box!

Location	Problem Description	Corrective Action	Who Pays for It
<i>Example: Kashong Creek</i>	<i>Streambank erosion and sediment</i>	<i>Stream restoration</i>	<i>State and Federal grants</i>

Thank you to the contributing authors:

Ian Smith is the Seneca Watershed Steward for the Seneca Watershed Intermunicipal Organization. He works at the Finger Lakes Institute office at Hobart and William Smith Colleges. The Seneca Watershed Intermunicipal Organization – SWIO for short – was formed in 2015 to preserve, protect and remediate ecological and water quality concerns in Seneca Lake and its surrounding watershed.



Jeff Tonole has been a member of the Finger Lakes Land Trust (FLLT) since 2001. As a professional freelance writer, he contributes his writing and editing skills to the FLLT's quarterly newsletter "The Land Steward."

Tom Eskildsen is the Senior District Technician for Yates County Soil & Water Conservation District (SWCD). Tom grew up on a dairy, crop, and vineyard farm in Yates County, received an associates of science degree from Alfred State College in 1995, and a bachelor of science degree in agronomy from Cornell University in 1997. Tom has worked for the Soil & Water Conservation District for 24 years (this year) managing the agricultural program. Tom is a certified crop advisor and NYS certified AEM planner.

Ethan Hall has been working as a Conservation District Technician for Yates County SWCD going on 4 years now. Prior to Yates County SWCD, Ethan spent two years working with the Finger Lakes Institute performing seasonal water quality monitoring work. A graduate of Finger Lakes Community College and the College of Environmental Science and Forestry (ESF), Ethan continues to assist in the Keuka Lake Associations' monthly sampling efforts.

Erin Peruzzini is the District Manager for the Seneca County SWCD. While in college at ESF she interned with the Seneca Lake Area Partners in Five Counties (SLAP-5, now SWIO) to conduct a road ditch evaluation survey. After graduating she supervised a lakefront property owner Home-A-Syst survey. Erin also worked for Seneca Lake Pure Waters Association for a brief time until starting at Seneca County SWCD in 1999. Erin started as a Technician and oversaw the non-ag operations at the District. She assisted landowners with permits along the lakeshore and worked with the Town & County Highway Departments to implement best management practices. Erin has been with Seneca County SWCD for 22 years.

Caroline Marschner is the Invasive Species Extension Associate for the New York State Hemlock Initiative (NYSHI). She has been with New York State Hemlock Initiative since 2015, where she coordinates NYSHI's outreach efforts, works with partners to facilitate conservation planning, and assists with program management.

The Finger Lakes National Forest lies on a ridge-called the backbone-between Seneca and Cayuga Lakes in the Finger Lakes region. It is New York State's only national forest. The forest has over 30 miles of interconnecting trails that traverse gorges, ravines, pastures and woodlands. The forest is managed to provide a diversity of native forestlands, shrublands and grasslands, including areas of native older forests, diverse wildlife habitats, quality recreation areas and forage for livestock.

The College of Agriculture and Life Sciences at Cornell is home to one of the top viticulture and enology programs in the world and is internationally recognized for its expertise in breeding table, juice and wine grapes adapted to cool climate growing regions.

Dr. Lisa Cleckner is the Director of the Finger Lakes Institute (FLI) at Hobart and William Smith Colleges (HWS). She is an expert in collaborative aquatic research, community outreach, and administration. Since joining the FLI, Lisa has secured new funding for the development of initiatives in aquatic invasive species including the FLI's recently launched Watercraft Steward Program, sustainable community development, a video baseline of the Finger Lakes ecosystems, water quality of green infrastructure installations, and trace metals and mercury in the Seneca Lake watershed. Lisa also has a faculty appointment in the Environmental Studies Department at HWS.



Credits

This project is sponsored with funding provided by the New York State Department of State under Title 11 of the Environmental Protection Fund.

Additional Funding is provided by:

Seneca Watershed Intermunicipal Organization (SWIO)

Seneca Lake Pure Waters Association (SLPWA)

Keuka Watershed Improvement Cooperative (KWIC)

Keuka Lake Association (KLA)

The Finger Lakes Institute (FLI) at Hobart and William Smith Colleges

Seneca County

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