

# AUTUMN 2022

## Seneca-Keuka Watershed Partnership

### WHAT'S INSIDE

- ◆ Lake Monitoring and Research...2
- ◆ Water Treatment...3
- ◆ Agricultural Projects...4
- ◆ Voices from the Lake...5
- ◆ Soil & Water Highlights...6
- ◆ Community Outreach...7
- ◆ Municipal Voices...8
- ◆ Contributing Authors...9
- ◆ Credits...10

### *Note from the lake specialists:*

This newsletter – and the partnership responsible for making it happen – was started in conjunction with development of the *Seneca-Keuka Watershed Nine Element Plan for Phosphorous* to share a broad array of water quality related information and, in turn, spark public participation in development of the 9E. With the final version of the 9E now approved, we enter a new phase where our work will be focusing on executing the actions proposed in it. Moving forward, this newsletter will be focused on sharing information about specific improvement projects, and follow a biannual spring/fall release. While we hope you enjoy reading this edition – and will continue reading future editions – there is a lot of work to be done and we all best get on doing it!



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# Lake Monitoring and Research

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.

## Exploring New Method for Wastewater Source Tracking

Recently, SWIO and the Finger Lakes Institute have been exploring the use of optical brighteners as indicators of wastewater in surface waters.

For those unfamiliar, optical brighteners (OBs for short) are fluorescent whitening agents that are excited by near-ultraviolet range light. They are added to laundry soaps and detergents to make clothing brighter – think “whitening your whites” – and toilet paper as well. As a result, OBs can be found in significant levels in wastewater. Because OBs dissolve slowly except through photo-decay, their presence in surface waters makes them a good indicator that one or more wastewater discharges are influencing water quality at a given location. While there are other more accurate ways of determining this such as genetic testing, none are as quick or cost effective. Monitoring for OBs is therefore a comparatively easy and scalable means of looking for wastewater signals.

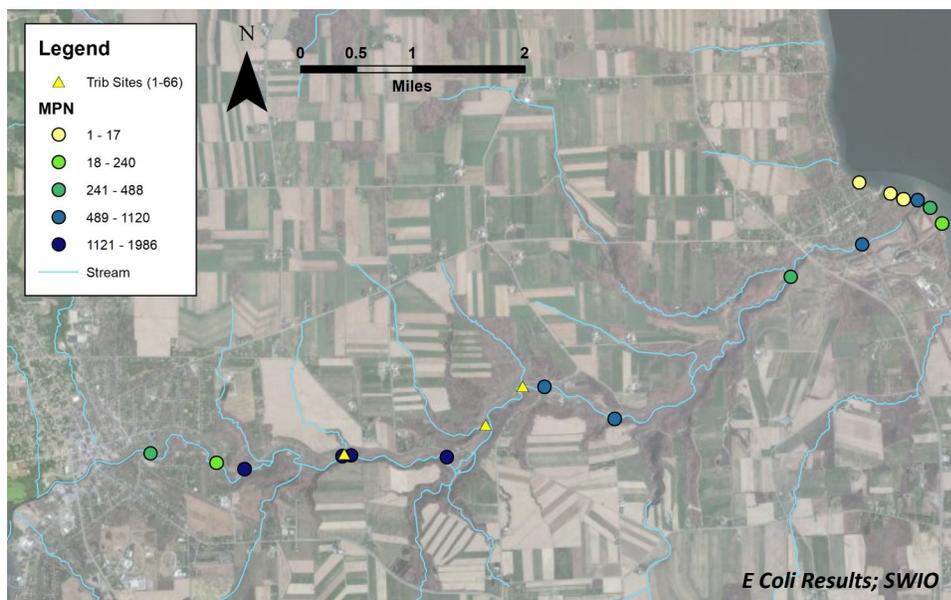
One application of this is an examination of water quality conditions along Keuka Lake Outlet. Pure Waters’ volunteers have been monitoring the Outlet for multiple years with results indicating that *E Coli* levels frequently exceed water quality standards for swimming in certain areas. An obvious question then becomes what is the source of this; wastewater, agricultural runoff, birds, something else? Monitoring for OBs gives us a means to potentially implicate or absolve wastewater as the source.

Twenty samples were collected in a three hour window along the length of the Outlet and nearby Seneca Lake shoreline. These samples were then analyzed for both *E Coli* and OBs. *E Coli* results show high concentrations starting just downstream from the Penn Yan WWTP treatment plant discharge point and decreasing to below 488 MPN (most probably number) somewhere between Cascade Mill and the unnamed tributary just upstream of Route 14, after which they start to increase again prior to dilution in Seneca Lake. OBs were found in all samples minus those between the Cascade Mills parking area at Ridge Road and the same unnamed tributary.

DEC permitted the Penn Yan WWTP with the assertion that the Outlet allowed for sufficient dilution/treatment of the plant’s wastewater prior to entering Seneca Lake. At least during the time we sampled, these results suggest that is indeed the case. Furthermore, there is an indication that

at least some portion of the *E Coli* present between the Route 14 Bridge and Keuka Outlet – Seneca Lake confluence is derived from wastewater; most probably as a result of septic failure.

While analysis such as this has its limitations, this information can be used to support targeted improvement efforts and access dollars. In this case, data could support efforts to access dollars available for septic improvement and replacement while helping direct these limited dollars towards areas where they can have the greatest impact. This is merely one use case and we will continue to explore additional opportunities of applying this monitoring tool to answer additional questions around flow pathway uncertainty, well contamination and others going forward.



# Water Treatment

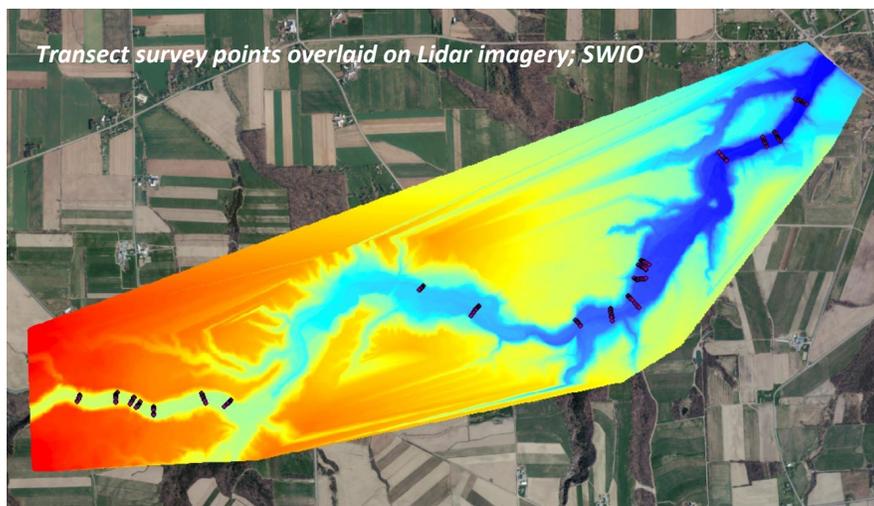
Focusing on how we can treat the water prior to it entering the lake is essential for the future quality of our waterways.

## *Crooked Lake Canal Project: Updates and Announcements*

In the Spring 2022 edition of the newsletter we introduced our *Reviving the Crooked Lake Canal as a Riparian Runoff Reduction Ecosystem* project. In short, we are looking to repurpose remnants of the old canalway as wetlands to capture and treat stormwater flows.

Since then SWIO, Yates County Soil and Water, and Natural System Engineering have been working to gather information and generate tools that can help us develop a conceptual plan of exactly how to design such a system to meet our goals.

The first question in need of an answer was: *What elevation do we need to set our diversion structure (e.g. a culvert) at to incept water under targeted stormflow conditions?* To address this we began by collecting stream elevation – commonly referred to as *stage height* or just *stage* – and discharge data at multiple locations along the Outlet. This would in turn allow us to see the extent of change in stage height at varying locations under different flow conditions. The next step was to collect transect survey data for both the Outlet stream channel and our proposed wetlands to pair with our stage data and countywide Lidar (a form of 3-D laser scanning to measure ranges to objects).

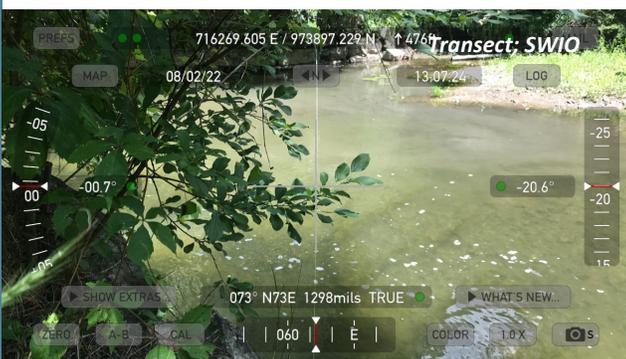


With all this information at hand, we were then able to construct a HEC-RAS model for the Outlet. HEC-RAS stands for *Hydrologic Engineering Center – River Analysis System* and is a one-dimensional model designed to aid engineers in channel flow analysis and floodplain determination. In our case, it begins to help us identify how water moves (or does not move) into our proposed wetlands under varying flow conditions.

This is our current point of progress and we are now on to answering the second big question: *How do we size our inlet and outlet structures to achieve a target residence time and treatment efficiency for each of our proposed wetlands?*

We had hoped to complete our conceptual design work by the end of October but thanks to the dry summer and some demolition at Cascade Mill, early December looks like the likely completion date. We're happy to say that it won't be the end of the project though.

In May, we officially received over \$300K in funds from the EPA through the Great Lakes Restoration Initiative that will enable us to take the next steps and make the concept become a reality. It was only through those initial local investments of time and money by all partner organizations and their citizens/members that we were able to get this far. Obviously, there is a lot of work to be done, but we are excited by what lies ahead and the benefits we can achieve.



# Agricultural Projects

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

## **Watershed Collaboration Yields Returns**

In a previous edition we announced receipt of \$195K in funding from the Great Lakes Commission (GLC), which alongside New York State Agriculture & Markets funds and gracious landowners commitments, are being used to support agricultural best management practice implementation and outreach throughout the Seneca Lake watershed. We are just shy of one year into the project and much progress has been made by the districts towards reaching – and more likely than not – exceeding our goals.

On the implementation side, the project can be broken down into two elements: *management improvements* and *construction improvements*. The former focuses principally on the implementation of cover crops that provide short-term (e.g. annual, seasonal) benefits while the latter includes any number of landscape alteration practices that provide long-term benefits.

If you are reading this newsletter, it is probably safe to say you are familiar with cover crops to at least some degree. This was one of the highest priority action recommendations within the *Seneca-Keuka Watershed Nine Element Plan* and for good reason. From both a cost-benefit ratio perspective and the sheer number of applicable locations where the practice can be implemented, there is arguably no single action likely to yield as significant a return if implemented at scale.

That said, the annual/seasonal nature of crop cropping, combined with the need for special equipment, a short window for implementation, and long return times on investment make adoption a challenge. This is where grant funding and the Soil & Water Conservation Districts (SWCD) can step in.

Over the life of this project, multiple Districts in the Seneca watershed will be working with landowners to implement cover crops. Schuyler County SWCD, who owns a cover crop planter of their own (a rarity for most Districts), implemented over 1,000 acres of cover crops in October of 2021, resulting in an estimated reduction of 2,908 pounds of phosphorus and 2,140 tons of sediment. The Districts in Ontario and Seneca counties have lined up landowners

interested in implementing cover crops of their own and will begin implementation later this fall.

Construction projects are by their nature more complicated and costly, but they have the advantage of yielding benefits over a longer timeframe; potentially decades if properly maintained. Yates County SWCD is working with multiple landowners in both Yates and Seneca counties to implement a diverse array of such practices.

Earlier this summer the Yates County SWCD completed installation of one such practice called a water & sediment control basin (WASCOB) on a farm in the Keuka Outlet subwatershed. We have featured WASCOBs in this newsletter before as they are highly effective from both a

water quality improvement and landscape preservation perspective. While this one is only projected to reduce annual phosphorus and sediment loading by roughly 19 pounds and 16.4 tons respectively, it will provide these benefits for several years to come while simultaneously ensuring the land remains farmable.

The weather has been favorable this summer from an implementation perspective, and Yates County SWCD is finishing up additional construction projects on another four farms which will be featured in a future issues once complete. Thanks to GLC, New York State Agriculture & Markets and all participating landowners for making this work possible!

**Schuyler County SWCD**



**Yates County SWCD**



# Voices from the Lake

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

## ***Biochar: An Overdue Introduction***

In recent editions of this newsletter we have been sharing insights on our effort to develop phosphorous capture systems using a mixture of biochar and iron oxide based acid mine drainage. Sometimes we can be guilty of falsely assuming familiarity, so in light of some feedback from readers I'll take some time here to answer a simple question: *What is the deal with biochar?*

The internet is a seemingly endless array of encyclopedic information so I won't go into heavy detail on the physical properties other than to say biochar is black carbon produced by the thermal and/or chemical conversion of biomass carbon (e.g. the carbon in wood chips, manure, food scrapes, etc.) into a more stable form. Essentially, it is a specific means of producing charcoal. The important thing here is to understand the impact of this process.

Though an ancient "technology", biochar has become a buzzword in certain environmental circles over recent years, largely due to its climate change fighting characteristics. Firstly, the long term stability of biochar – measured in centuries or even millennia – means it offers an opportunity to store carbon away in the soil rather than in the atmosphere. A second benefit is the process of generating biochar itself can be a carbon negative; that is it removes more carbon than it emits. While these are certainly appealing characteristics, it is really its soil properties that are of most interest to water quality improvement goals.



*Hunt Country Vineyards*

Thousands of years ago, biochar was used by indigenous groups to create fertile soils called "terra preta" in the largely nutrient poor Amazon Basin. The theory goes, biochar along with other kitchen/fire waste was mixed into the soil which over time greatly increased the soil fertility and cation exchange capacity.

This effect has two significant benefits: 1) it increases (or simply allows for) crop production; and 2) allows for greater retention of nutrients and water within the soil (and is linked to the former benefit as a result). If we follow this to its logical conclusion, this means that the addition of biochar to soils can increase the hydrologic resiliency and nutrient retention of a field during storm events.

Sustainability minded producers, or even those just simply intrigued by the potential for higher yields, have begun exploring the addition of biochar to their soils as a result. One such local producer is Hunt Country Vineyards of Branchport, NY.

Hunt has been a strong advocate of biochar in recent years having hosted workshops in partnership with the International Biochar Institute and Cornell University, while also creating and applying biochar on their own lands. Co-owner Suzanne Hunt says, "biochar presents a low tech, low cost opportunity for farmers and gardeners to enrich their soil... and like compost, farmers can make biochar with resources that they already have on their farms."

Given the composition of the watershed, the economically sustainable nature of biochar, and our long term goals around water quality improvements, we think biochar has a significant role to play in the coming years. If this has piqued your own interest in making and/or using biochar please let us know and maybe we will look at having workshops in the future!



# Soil & Water Highlights

Each quarterly newsletter will feature local Soil & Water Conservation Districts (SWCD) and some of their efforts that are helping to improve our watershed.

## Summer Soil Health Workshop

The Ontario and Yates County Soil & Water Conservation Districts worked together to put on a summer soil health workshop with local farmers on July 20, 2022. The event included a talk about drainage and stormwater best management practices that can be used to improve farm viability while also helping to protect the watershed. The event was held at a local farm in Penn Yan. The workshop included a wagon tour of several installed projects

The purpose of the workshop was to have an open discussion on ways for farms to deal with extreme weather events, review recent farm projects, and discuss water management and tile drainage. While it seems hard to contemplate with this summer's rain fall patterns, all farms in the area are facing increased issues with heavier than normal runoff events when the rain does fall. Topics of discussion included farmstead runoff control, field based erosion control, and manure management practices. Presenters discussed how climate change impacts the amount and intensity of water resulting in problems for the entire watershed as a whole. Discussion ensued on how these runoff events impact agriculture and how the practices we install need to factor in these increased rainfall events. Farmers walked away with some ideas on types of projects that could be used on their farm.



Ontario County SWCD



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# Community Outreach

Learn about our recent event where presenters discussed the Seneca-Keuka Watershed 9E and plans for a healthy ecosystem.

## ***Back in the Right Direction***

On July 21, 2022, staff from the Finger Lakes Partnership for Regional Invasive Species Management (PRISM), Finger Lakes National Forest, Southern Tier Regional Planning, Schuyler County Soil & Water Conservation District (SWCD) and Seneca Watershed Intermunicipal Organization (SWIO), in addition to area volunteers, gathered along Hector Falls Creek in Hector, NY to once again aim at controlling – and one day eradicating – water chestnut (*Trapa natans*).

Populations of water chestnut alters water quality and clarity, suppress most other aquatic plant growth, and inhibit recreational use in the impacted areas. Because of this, water chestnut is ranked as a “very high” priority invasive in New York State alongside hydrilla and other well-known invasives. Fortunately, water chestnut has a weakness that can be exploited; it is an annual.

For the last four years Finger Lakes PRISM and Schuyler County SWCD have been leading efforts to control and eventually remove the population in Hector Falls Creek. Unfortunately, last year saw a dramatic increase in the total amount removed compared to previous years; 458 pounds. The reasons for this sharp increase were uncertain but it looked as if we were going in the wrong direction.

What a different a year can make. 2022 saw a total of only 97.1 pounds pulled; the least amount recorded since control efforts began!!! This was welcome news after the moral defeat that was 2021. It truly looks like efforts are proving effective and are preventing the population from expansion. The water chestnut seed can stay viable for up to a decade though, so with a few more years of coordinated effort we stand a good chance of removing this population from the watershed.



*Schuyler County SWCD*



*Finger Lakes PRISM*

Efforts on Hector Falls Creek will continue, but new collaborative opportunities lie ahead on this front as well. Forest Service staff revealed they had recently surveyed water chestnut populations on Finger Lakes National Forest ponds, likely introduced by migrating waterfowl. We are now actively exploring opportunities to expand this partnership to tackle these populations in future years.

Thanks to everyone who made this year’s efforts such a success. It’s nice to get a “W” every now and then!



# Municipal Voices

This section focuses on different municipalities and their role in protecting the water quality of the Seneca-Keuka Watershed. Learn what the Town of Geneva is doing to make this goal a reality.

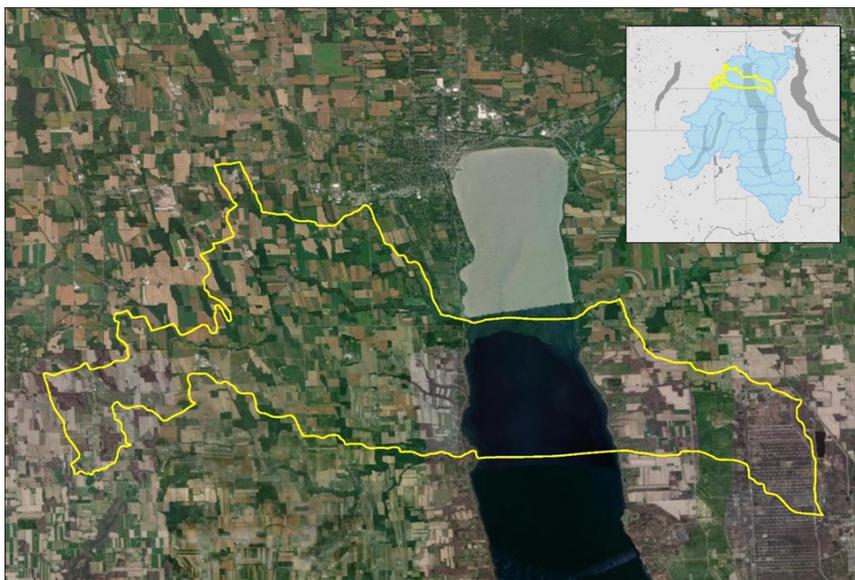
## A Change of Plans

An article in the winter 2021/2022 edition of the newsletter introduced Great Lakes Commission's *Conservation Kick* program that seeks to test the potential market for water quality credits that support and track projects over time; a mechanism often referred to as *Payment for Ecosystem Services*. The Town of Geneva was awarded \$10,000 from the program to implement improvements on a local farm earlier in the year.

Unfortunately, the initial proposed site and scope were unable to meet the program deadlines so a change is needed. Thankfully, an alternative is already in the works.

The new project will still consist of two upland water retention basins, but unlike with a traditional water and sediment control basin (WASCOB), these basins will have outlet controls as well as long term water storage. As result they will function more like a wetland or vernal pool, and, if model outputs are accurate, will yield additional benefits over the more traditional design.

Originally sited in the Castle Creek subwatershed, the new project location is on a farm in the Wilson Creek – Seneca Lake subwatershed. With a modeled annual load of 0.79 pounds of phosphorus per acre, the *Seneca-Keuka Watershed Nine Element Plan* identifies this subwatershed as a priority subwatershed and sets a target phosphorus load reduction of 30%. As such, this is hopefully one of many such improvements to be implemented in the coming years in this area.



Ontario County SWCD

Things do not always go according to plan, but much like the natural environment itself, we must be adaptable in our approach. Change and compromise, though harder, is almost always the more desirable outcome than simply giving up. Who knows... maybe in the end we will actually end up with a better outcome than originally conceived.

The Town of Geneva is being assisted by Tucker Kautz of the Ontario County Soil & Water Conservation District (SWCD), as well as representatives of the Great Lakes Commission (GLC). Without their continued support this certainly would not be possible.

For more information on the Conservation Kick program please visit:

<https://www.glc.org/work/enviromarkets>



# Thank you to the contributing authors:

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**Tom Eskildsen** is the Senior District Technician for Yates County 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 bachelors of science degree in agronomy from Cornell University in 1997. Tom has worked for the Soil & Water Conservation District for 24 years managing the agricultural program. Tom is a certified crop advisor and New York State certified Agricultural Environmental Management planner.

**The Ontario County Soil & Water Conservation District** staff and Board of Directors members are committed to providing technical assistance and education to the residents of Ontario County to ensure the wise use of soil, water, and other natural resources. Ontario County is rich in natural resources: it contains or shares five of the Finger Lakes. Rich agricultural lands, extensive forests, abundant wildlife and water resources enhance the quality of life for all residents of the county. It is the duty and privilege of the Ontario County SWCD to preserve and protect these resources while helping to maintain farming as a viable, profitable and environmentally sound enterprise.



# Credits

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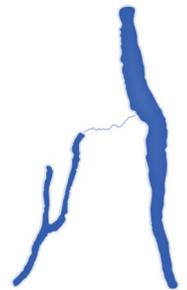
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