The Grapevine

Newsletter of the HONEOYE VALLEY ASSOCIATION

Volume 36 One Lake One Community Fall/Winter 2018

Mission Statement

The Honeoye Valley Association is a not-for-profit, volunteer organization that works in a variety of ways to protect and preserve the environmental quality of the Honeoye Lake watershed.

The HVA acts as an advocate for the protection and improvement of the Honeoye Lake Watershed. Activities include communicating with governmental agencies and political representatives, educational outreach, monitoring of the lake ecosystem, and acting as a clearinghouse for information related to these activities.

Walleye Fingerling Stocking Pictures from 6/20/18

The NYSDEC has been stocking 8.6M walleye fry in Honeoye Lake for many decades. However, in recent years the walleye fry recruitment has been very low. Therefore, the NYSDEC stocked ~20,000 ~2 inch walleye fingerlings in Honeoye Lake today! This was done to address the declining walleye population in the lake. In 2000 the walleye population was estimated to be ~32,000 adults. In 2010 the walleye population was estimated to be ~6,000 adults. Walleye catch rates have been declining every year for the last several years. We are hoping to see an improvement in the walleye population size and catch rates in a few years. ...Terry

HLWTF Chairman's 2018 Project Update: Terry Gronwall

HLWTF projects to improve water quality in Honeoye Lake and its watershed.

The common focus of these Honeoye Lake Watershed Management Plan-based projects is to implement Best Management Practices (BMP's) to reduce external sources of nutrients and sediments reaching Honeoye Lake.

NYSDEC WQIP Round 11 Grant Project: Ontario County Soil and Water Conservation District and HLWTF have received a NYSDEC Water Quality Improvement Program (WQIP) Round 11 Grant for over $170,000 including local match funding to address stream bank erosion in public road right of ways, build several detention basins and vernal pools in the Honeoye Lake Watershed. Implementation in progress. Will be completed in 2018.

NYSDEC WQIP Round 12 Honeoye Lake Inlet Restoration Project: This project includes four elements that work together to allow inlet stream flows during storms to spread out, slow down and drop sediment and nutrient loadings before reaching the lake. OCSWCD received the grant award for $300,000 with $100,000 local match to fund the implementation of this project, which began in September and was completed in early October 2016. Several project enhancements were implemented in 2017.

Blue-Green Algae Monitoring Project: At the request of NYSDC, BGA samples were collected weekly from Honeoye Lake June through October 2017 for testing of blue-green algae blooms and toxin levels. Results are posted on DEC Harmful Algal Blooms web site on Friday afternoons:

http://www.dec.ny.gov/chemical/83310.html

Collected lake water quality data June-Sept. – HLWTF collected weekly surface water temperature, dissolved oxygen, and water clarity data. Also, we collected water samples twice a month (Jun-Sep) for lab testing for phosphorus and nitrogen.

Electronic Macrophyte Mapping Service – HLWTF provide three (Early Jul, Late Jul, Late Aug) macrophyte maps to our weed harvesting team to help them focus weed harvesting efforts in the areas of greatest macrophyte density. Bathymetric and Bottom Hardness maps have been produced too.

Cornell-FLCC-HLWTF Honeoye Lake Research Collaboration: Professors Nelson Hairston (CU) and Bruce Gilman (FLCC), in collaboration with HLWTF Chairman Terry Gronwall and Dorothy Gronwall are studying the causes of summer blooms of cyanobacteria (blue-green algae). This 3-year (2016-2018) research project is funded by a grant from the US Department of Agriculture.

Finger Lakes Institute Fluoro Probe Project: The goal of this 2017 project was to characterize algal blooms throughout a summer season in Honeoye Lake. Assessing the water chemistry conditions before, during and after successive algal blooms will help to determine factors associated with the blooms.

Finger Lakes Institute Nitrogen Research Project: Freshwater systems are thought to be phosphorus limited. Current management practices aim to curb harmful algal blooms (HABs) by phosphorus control strategies. Despite these controls, HABs continue to proliferate. Research shows cyanobacteria growth is higher with the addition of both phosphorus and nitrogen compared to either nutrient alone. The goal of this 2016-2018 project is to determine if nitrogen is a factor in Honeoye Lake HABs.

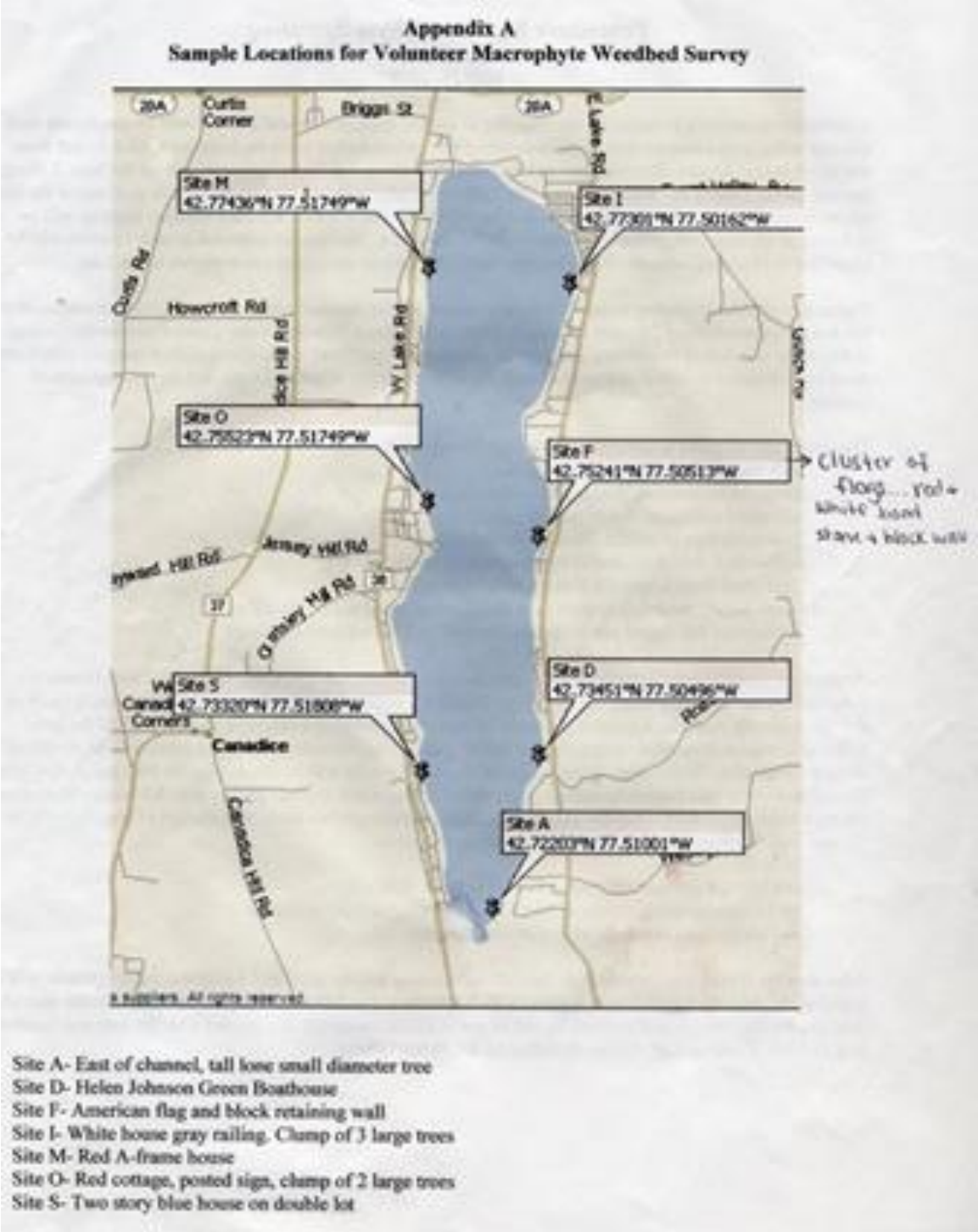
Sponsored a fall yard waste disposal initiative: The Town of Richmond allowed watershed residents to properly dispose of yard waste in their town brush pit. This keeps leaf nutrients from reaching the Lake. OCPD, HVA, and HLWTF promoted this initiative.

These efforts to improve Honeoye Lake and watershed water quality are a true partnership between The Nature Conservancy, NYS DEC, Ontario County Planning Department, Ontario County SWCD, Finger Lakes Community College, Finger Lakes Institute, Cornell University, Honeoye Valley Association, the Towns of Richmond, Canadice, Bristol, South Bristol and Naples; and all lake residents and users. We appreciate everyone's support. For more information, please contact me at: Terry Gronwall, HLWTF Chairman (585)367-3000 watershedtaskforce@gmail.com

THE SEARCH FOR MACROPHYTE INVADERS IN HONEOYE LAKE

First of all, you are probably wondering what a macrophyte is? Macrophytes are plants which are most often aquatic in nature and are visible with the naked eye.

Volunteers from Honeoye have been searching the lake bottom for macrophytes for the past 11 years. With the guidance and direction of Jack Starke, volunteers have been searching to find invasive plants that have been shown to be of great harm to lakes around North America as well has creating a overall picture of the state of plant life in Honeoye Lake. Jack identified 7 locations around the lake as well as the procedure that would be followed. An 8th location has been added at the State Boat Launch.



(Cont. page 3)
There is good news. Over the 11 years period no hydrilla, starry stonewort or water chestnut has been found. These plants have choked lakes around the state. Millions of dollars have been spent on killing hydrilla in Cayuga Lake and hand pulling water chestnut in the Finger Lakes area. Left to right is hydrilla, water chestnut and starry stonewort

The idea behind doing surveys is to have early detection which "could" provide an opportunity to eradicate the harmful plants before they get out of control. On June 23rd 6 volunteers braved threatening weather to search for these harmful plants as well as continue to get a picture of what the plant community trends are. Thank you goes out to Ken Klump, Anrut Patel, Karen Haskell, Frank Powell, Linda Vanderbeck, Don Cook and all the other volunteers from years past.

The predominant plant found was small leaf pondweed with some curly pondweed (always early) and coontail.

Here are summary reports from 2016 and 2017.

(Cont. page 4)

PLANT SUMMARY

2016

June 26th PLANTS FOUND - CURLY LEAF PONDWEED, COONTAIL, EELGRASS, EURASIAN MILFOIL, WATER STAR GRASS, LARGE-LEAF PONDWEED, ELODEA, FLAT-STEM PONDWEED,

FILAMENTOUS ALGAE, SMALL LEAVED PONDWEED, BLADDERWORT

Predominately Small Leaved Pondweed and Curly Leaf Pondweed

Density/Amount - moderate to heavy at South end (4 locations) light at Southeast location (2 locations)

mostly light on Eastside (2 locations)

moderate to heavy at Northeast corner (3 locations)

moderate at Northwest corner (1 location)

moderate at middle Westside (3 locations)

light in close, heavy at 100 and none farther out at southwest side (2 locations)

New York State Boat Launch - 3 locations - north, west and south are light

Plants found were filamentous algae, curly leaf pondweed, Coontail, Eel Grass, and Eurasian Milfoil

August 20th PLANTS FOUND - CURLY LEAF PONDWEED, COONTAIL, EELGRASS, EURASIAN MILFOIL, WATER STARGRASS, LARGE-LEAVED PONDWEED, ELODEA, FILAMENTOUS ALGAE, SPIRA GIRA, BLADDER WORT, NAIAD

Predominately Coontail and Water Stargrass and Eurasian Milfoil (in order of abundance)

Density/Amount - heavy, heavy to light at South End (3 locations)

light to moderate Southeast (2 locations)

moderate to light at Eastside (2 locations)

moderate, heavy and light at Northeast (3 locations)

light at northwest (1 location)

moderate at west (3 locations)

moderate to light at southwest (2 locations)

New York State Boat Launch - 3 locations - north, west and south at light

Plants found were coontail, eel grass, eurasian milfoil, filamentous algae and spira gira

(Cont. page 5)

PLANT SUMMARY

2017

June 24th PLANTS FOUND - COONTAIL, EELGRASS, EURASIAN MILLFOIL WATERSTARGRASS, ELODEA, SMALL LEAF PONDWEED, FLAT-STEMMED PONDWEED, SPIROGYRA

Predominantly Flat Stemmed Pondweed

Density/Amount - moderate to light at South end (3 locations) light at Southeast location (2 locations)

light to heavy on Eastside (2 locations)

light to heavy at Northeast corner (4 locations)

nothing at Northwest corner (2 location)

moderate to very heavy middle Westside (2 locations)

heavy in close, heavy at 10 and none farther out at southwest side (1 locations)

New York State Boat Launch - 3 locations - north light, west heavy and south moderate

Plants found were curly leaf pondweed, coontail, Eurasian millfoil and eel grass

August 20th PLANTS FOUND - CURLY LEAF PONDWEED, COONTAIL, EELGRASS, EURASIAN MILFOIL, WATER STARGRASS, LARGE-LEAVED PONDWEED, ELODEA, FILAMENTOUS ALGAE, SPIRA GIRA, BLADDER WORT, NAIAD

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moderate, heavy and light at Northeast (3 locations)

light at northwest (1 location)

moderate at west (3 locations)

moderate to light at southwest (2 locations)

New York State Boat Launch - 3 locations - north, west and south at light

Plants found were Coontail, Eel grass, Eurasian Milfoil, Filamentous Algae and Spira Gira

Taking A Closer Look
At How Nitrogen Promotes Harmful Algal Blooms On Honeoye Lake
By Dr. Roxanne Razavi, SUNY-ESF

Harmful algal blooms were frequent on Honeoye Lake in 2017.
Credit: Dr. R. Razavi Figure 1

Harmful algal blooms, a complicated but important problem for lake front residents. In the last ten years, Honeoye Lake residents have unfortunately become very familiar with large blooms of cyanobacteria, commonly referred to as 'blue green algae' that occur in the summer months and disrupt recreational uses of this beautiful lake (Figure 1).

Some of these blooms can produce toxins that are a risk to the health of humans, pets, and wildlife. Blooms are referred to as harmful algal blooms or HABs for short, when they produce toxins or severely limit the amount of oxygen available for aquatic life.

Figure 2

Lake scientists (aka limnologists) know that excess nutrients are in part responsible for HABs. Finding a solution to this problem, however, requires a mechanistic understanding of how nutrients influence HABs, and this is where things can get complicated.

Why research nitrogen?

This photograph showing algal blooms present on the side of a lake where phosphorus was added compared to where it was not, was instrumental in proving the role of nutrients in harmful algal bloom occurrence. Credit: iisd.org

Since the famous whole lake nutrient addition experiments took place in the Experimental Lakes Area in Canada in the 1970s, (Figure 2) phosphorus has been the focus of many actions aimed at reducing the occurrence of HABs and excess plant and algal growth in lakes.

Reductions in phosphorus in detergents and effluents of wastewater treatment plants and other point sources were effective in reducing HABs in the years after that landmark experiment. However, since the late 1990s and early 2000s, HABs have come back with a vengeance, with an important difference from the blooms decades earlier. Specifically, there has been a shift in the species that dominate many of the HABs we see today. *Microcystis* species (Figure 3) are often the dominant phytoplankton of HAB events as seen in Lake Erie as well as in lakes in the northeast and as far away as China. Unlike some cyanobacteria, *Microcystis* are not capable of nitrogen fixation, which is the process of converting the unlimited nitrogen gas available in the atmosphere into a usable form of energy for these cyanobacteria.

This means current blooms of *Microcystis* must get their nitrogen from sources already in the lake. Nitrogen enters a lake just like phosphorus, from the watershed or from releases from sediments, the mud at the bottom of the lake. So, a key part of finding a solution to HABs will be to understand how much nitrogen is in the lake that could be used by nonnitrogen fixing species like *Microcystis* (Figure 3.) *Microcystis* species

Photo credit: J. D. Wehr, Fordham University retrieved from https://www.epa.gov/nutrient-policydata/cyanobacteriacyanotoxins.

Figure 3

(Cont. from Page 7)
Different forms of nitrogen and processes that affect their occurrence. There are different forms, or types of nitrogen present in the water. Inorganic (without carbon) forms of nitrogen include nitrate (NO3-) and nitrite (NO2-). Organic forms of nitrogen include ammonium (NH4) and urea. Ammonium is the form of nitrogen that cyanobacteria like *Microcystis* will preferentially consume. When all the ammonium is used up, plankton will then use urea, and then finally turn to nitrite and nitrate, which can be converted in the cell to ammonium. Few monitoring studies measure all these forms of nitrogen, especially the forms like ammonium that are so important for the plankton but are present in very low concentrations.

There are many processes that convert one form of nitrogen to another in the lake. One important process is called denitrification (Figure 4). This is how a lake naturally loses excess nitrogen, just as the human body releases excess nitrogen as waste. Denitrification is the loss of N2 gas out of the lake and back to the atmosphere. When N2 gas is formed, it reduces the nitrogen available for phytoplankton to use in the lake. If a lake has a low denitrification rate, nitrogen can build up and fuel the occurrence of HABs.

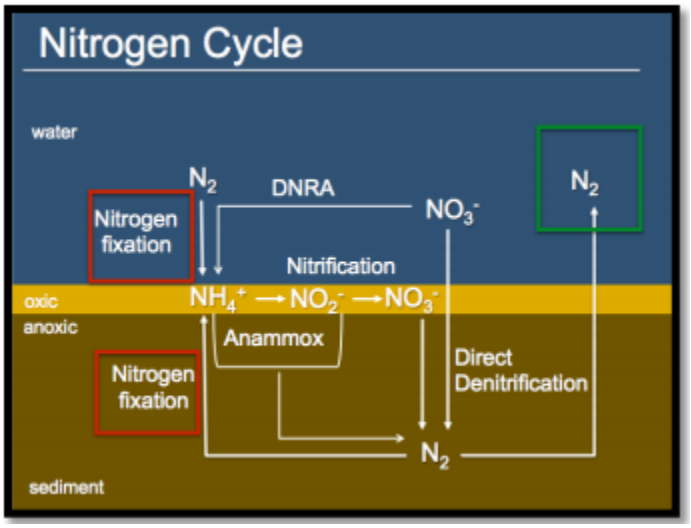


Figure 4.
The nitrogen cycle is complex. Two key processes are the nitrogen loss mechanism called denitrification, which is how the lake naturally loses excess nitrogen as N2 gas is released back to the atmosphere (green box). Another is nitrogen fixation, which keeps nitrogen in the lake (red boxes). Image modified from S. Newell.

Collaboration between Finger Lakes Institute and Wright State University to measure nitrogen in Honeoye Lake. Dr. Mark McCarthy and Dr. Silvia Newell at Wright State in Dayton, OH, are two experts in nitrogen.

Facilitated by grants from the Ontario County Water Resources Council (2016, 2017) and the Great Lakes Research Consortium (2017), myself, Dr. Lisa Cleckner, and a team of FLI staff and undergrads have been working with Terry and Dorothy Gronwall to measure different nitrogen forms in the lake on a weekly basis. Samples of nitrogen species in the water have been collected in the epilimnion (i.e., surface waters) and hypolimnion (i.e., bottom waters) at 4 offshore locations on the lake. Four nearshore sites have also been sampled at the surface only. In addition to measuring the different forms of nitrogen, McCarthy and Newell and their graduate student, Justin Myers, have conducted controlled lab experiments on sediments from Honeoye Lake to measure the rates of transformation between the different nitrogen forms. These findings will lead to a better understanding of how quickly nitrogen is lost (via denitrification) or gained (via nitrogen fixation) in the lake sediments and water column.

Findings to date:

Analysis of the large amount of data collected in the last two summers on Honeoye Lake is still ongoing. However, the preliminary findings below are helping us better understand the role of nitrogen in contributing to HAB events in the lake.

Finding #1. Sediments are a source of bioavailable nitrogen and phosphorus to Honeoye Lake

Concentrations of nutrients that can easily be used by cyanobacteria including the biologically preferred organic forms of nitrogen - urea and ammonium - and soluble reactive phosphorus, were released in high concentrations from sediments. This shows that Honeoye Lake's HABs can be fueled from the nutrients that are already available in the lake.

(Cont. from page 8)
Finding #2. Significant differences in nutrient concentrations occur between non-*Microcystis* and *Microcystis* dominated blooms in 2016

In 2016, surface water phosphorus (soluble reactive phosphorus, SRP) and bottom water urea concentrations were significantly different between the non-*Microcystis* (i.e., Anabaena) and *Microcystis* dominated bloom periods. A large rain storm occurred between these periods resulting in a mixing of the water column and a release of nutrients that had been building up in the bottom waters of the lake from the sediments into surface waters. This increase in both the bioavailable forms of phosphorus and nitrogen is contributing to the blooms of non-nitrogen fixing *Microcystis* on Honeoye Lake.

Finding #3. Natural nitrogen removal from Honeoye Lake sediments is low

Experimental results showed that there is not enough nitrate in Honeoye Lake sediments for denitrification to occur, which limits the natural removal mechanism of nitrogen from Honeoye Lake). Adding to this, calculations of the gains of nitrogen into the sediments (i.e., nitrogen fixation rates) were also high. This means that the conditions in Honeoye Lake sediments facilitate more nitrogen formation that can be used by cyanobacteria that form HABs, ultimately resulting in a buildup of nitrogen in the sediments.

Next Steps

Water column sampling and sediment core incubations will occur in 2018. These are necessary to understand the impact of different weather events including spring and summer rain, summer temperatures, and wind events on the occurrence of HAB events and the types of cyanobacteria that comprise the blooms. Future work may also include the incubation of sediment cores with water collected from streams entering Honeoye Lake and with other external nutrient sources.

Winners of our first ever HVA Photo Contest

This summer marked the first annual "Picture the Valley" Photo Contest sponsored by the Honeoye Valley Association. We announced the contest in early April and accepted entries up to July 7th. We were thrilled to receive 28 incredible entries, wow!

Photos were displayed at our Annual Meeting on July 13th, where attendees voted for their favorites. The number of votes each image received determined our first, second and third place winners – this year we had a tie for 3rd. Photos ranged from serene lake sunrises and sunsets, to some beautiful wildlife images. We look forward to sharing some of our favorites on our facebook page throughout the year – be sure to follow us to see the images. And don't forget to snap photos of the lake and valley throughout the seasons to submit in our 2019 contest! Stay tuned for an announcement with contest details in the near future.

We are pleased to share our winners below, who received prizes from some great local businesses including Mill Creek Café, Cornerstone Market, Country Creek Apparel, and more.

1st Place Winner:
"A Splash of Honeoye" by
Rebecca Higgins (Age 13)

3rd Place (tie):
"Mother of the Year" by Dawn Steiger

2nd Place:
"Serenity Before the Storm" by Jaime Stryker

3rd Place (tie):
"Reflections of Glory" by Jaime Stryker

Picture the Valley
PHOTO CONTEST

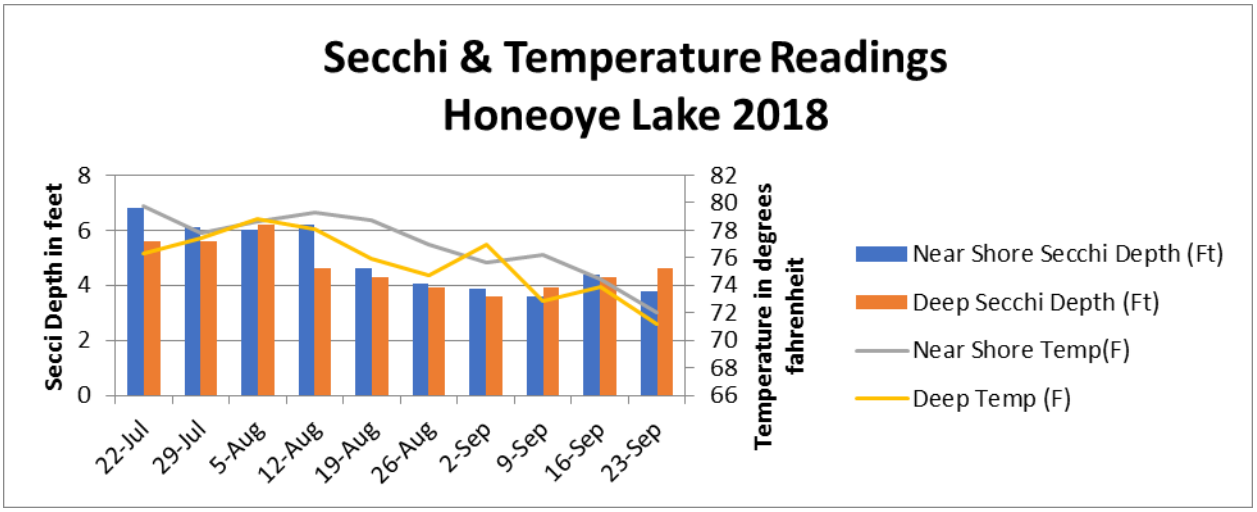
2018 HVA Secchi Disk Volunteer Pilot Program

Last July the HVA initiated a Pilot Secchi Disk volunteer program to start collecting weekly near shore water clarity, surface water temperature, and additional HAB data to augment the water quality information being collected at four deep water locations and ten HAB near shore HAB monitoring locations.

Six volunteers participated in our pilot Secchi Disk program last summer. Two volunteers in the Northern Lake Basin and four volunteers in the Southern lake basin. We thank and recognize these volunteers for their dedication.

The near shore average water clarity and water temperature data that these volunteers collected is shown along with the data we collected at the deepest location on the lake. The near shore water clarity was slightly higher than the deep location in July and August and somewhat mixed in September. The near shore water temperature was warmer than the deep location most of the summer. See graph below:

We are looking for 2-3 more Secchi Disk volunteers for the Northern Lake Basin for the summer of 2019. Please let us know if you are interested in learning more about this volunteer opportunity by contacting us at watershedtaskforce@gmail.com



HVA Membership Form please print clearly or join online! http://www.hvaweb.org
Today's Date: _____Email Address: _____
Last Name: _____First name:_____

	Mailing Address		Lake Address	
			☐ *Check box if same as mailing address*	
Street:				
City:				
State:		Zip:		Zip:
Phone #:				

☐	Single Membership	$ 20.00	Individual, single vote
☐	Family Membership	$ 30.00	Two adults and children living in same household; each adult eligible for a single vote
☐	Business Membership	$ 50.00	No votes; recognition of membership on website

☐ Cash ☐ Check _____ ☐ Please invoice me

☐ Additional tax-deductible donation for lake projects: $ _____

☐ I am interested in assisting with HVA activities, please contact me. My area of interest/expertise is: _____(optional)

Please mail form and payment to: Honeoye Valley Association / PO Box 165 / Honeoye, NY 14471

Honeoye Valley Association
P. O. Box 165
Honeoye, New York 14471

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