Monitoring water quality in the Cayuga Lake watershed with volunteers in Cayuga County

Cayuga County WQMA Meeting
7/10/25, 10 AM

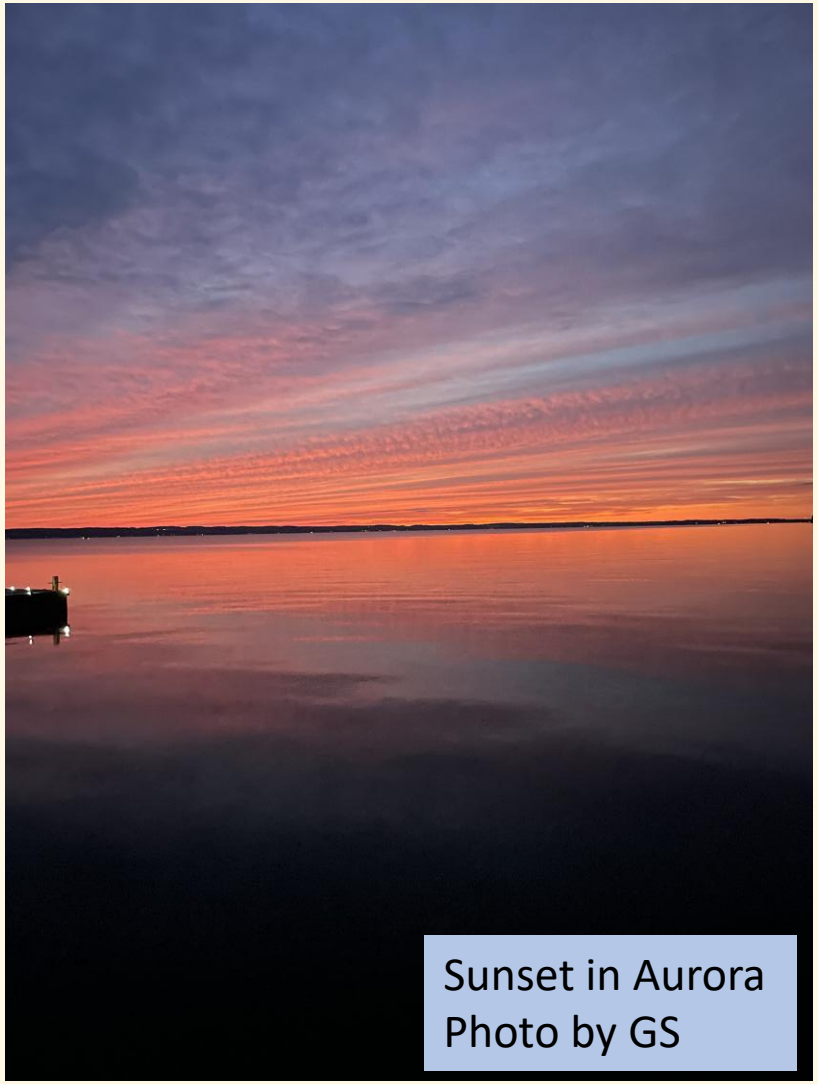
Grascen Shidemantle, PhD
Executive Director
Community Science Institute

Community Science Institute
Partnering with Communities to Protect Water

Salmon Creek at Center Road
Photo by volunteer, Andy Stadler

Agenda

- Intro: Community Science Institute
- Synoptic Stream and Lake Monitoring Partnership in Cayuga County
- Cayuga Lake Harmful Algal Bloom Monitoring
- Biomonitoring in Cayuga County
- Acknowledgements and Questions



Sunset in Aurora
Photo by GS

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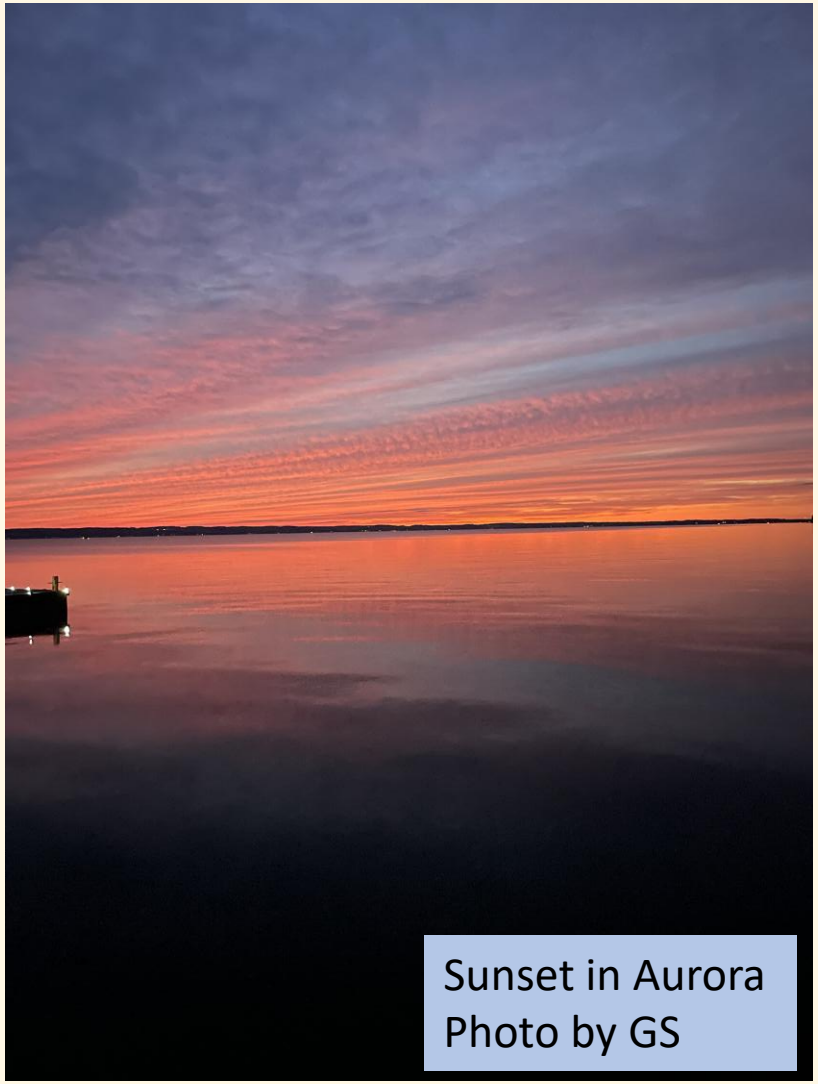


Sunset in Aurora
Photo by GS

Community Science Institute

Community Science Institute
Partnering with Communities to Protect Water

CSI is a 501(c)3 non-profit and NYSDOH-ELAP certified water testing lab in Ithaca, NY

CSI offers three types of programming:

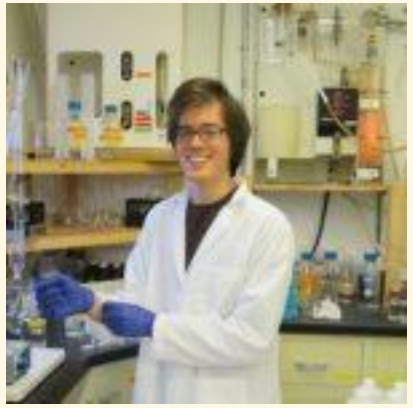
- **Volunteer Water Monitoring Partnerships**
- **Outreach and Education**
- **Fee-for-Service Water Testing**

CSI's Mission

To inspire and empower communities to safeguard water resources by cultivating scientific literacy through volunteer water quality monitoring, certified laboratory analyses, and education.

Community Science Institute

Grascen Shidemantle
Executive Director



Noah Mark
Laboratory Director

Adrianna Hirtler
Biomonitoring Coordinator

Katia Appel
Office Administrator

Alyssa Johnson
Outreach and
Programs Coordinator

Seth Bingham
Water Quality Scientist

Dan Pascucci
Water Quality Scientist

Rama Hoetzlein
Database Developer

Bill George
Data Entry Specialist

CSI's Volunteer Water Monitoring Partnerships

Monitoring Partnerships

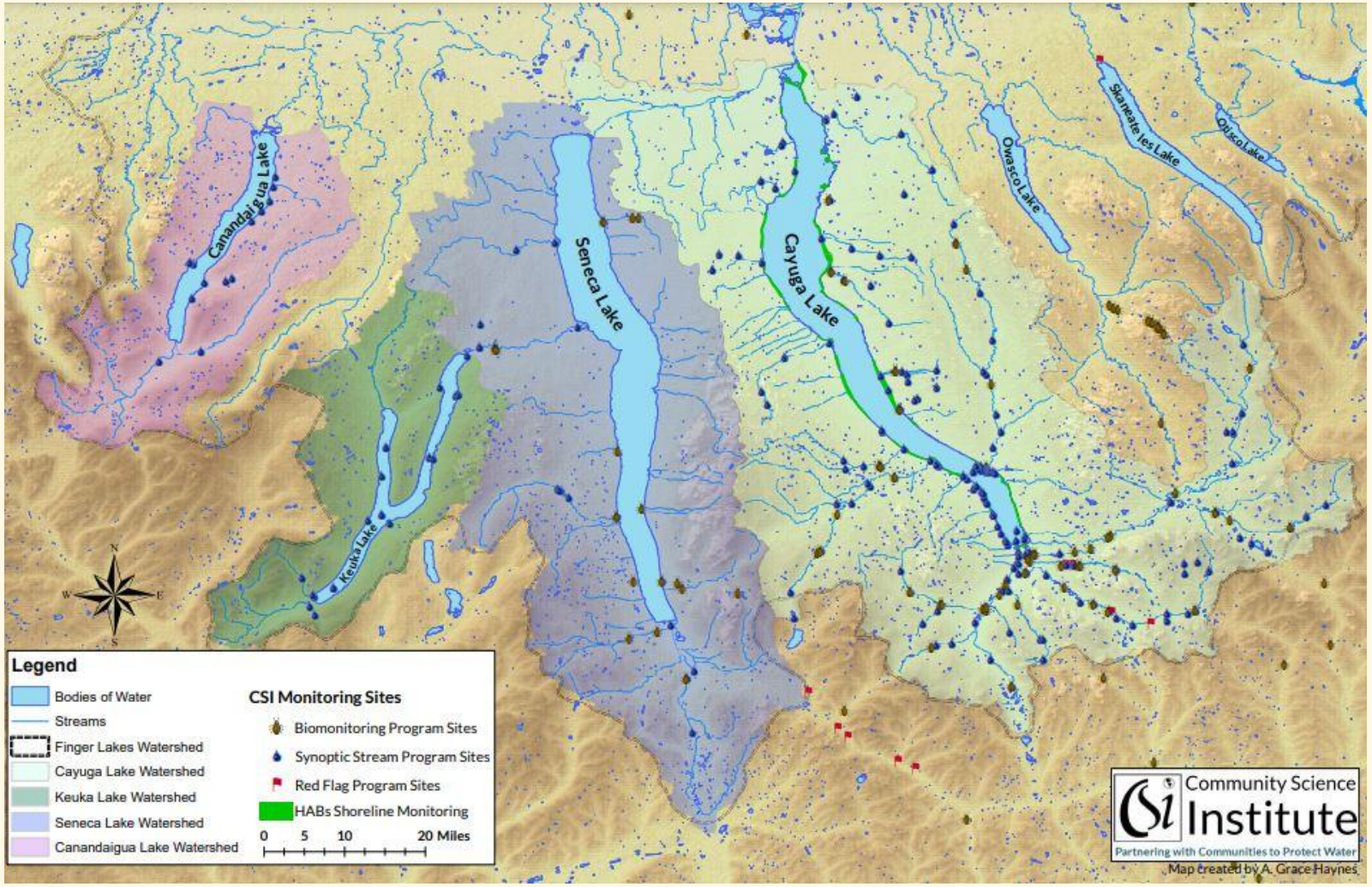
1. Synoptic Stream and Lake Monitoring

2. Harmful Algal Bloom (HAB) Monitoring

3. Biomonitoring

4. Other projects as need or interest arises

We retired CSI's Red Flag Monitoring Program at the end of 2024



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Synoptic Stream and Lake Monitoring Partnership in Cayuga County

Cayuga Lake Harmful Algal Bloom Monitoring

Acknowledgements and Questions

Questions

Salmon Creek at Tile Kiln Road

Synoptic Stream Monitoring in Cayuga County

CSI's synoptic stream volunteers have been monitoring Salmon Creek since 2006!

Salmon Creek at Tile Kiln Road

Purpose: Produce regulatory-quality stream and lake water chemistry data that can inform water resource management decisions as well as keep the public informed on the state of their local water resources.

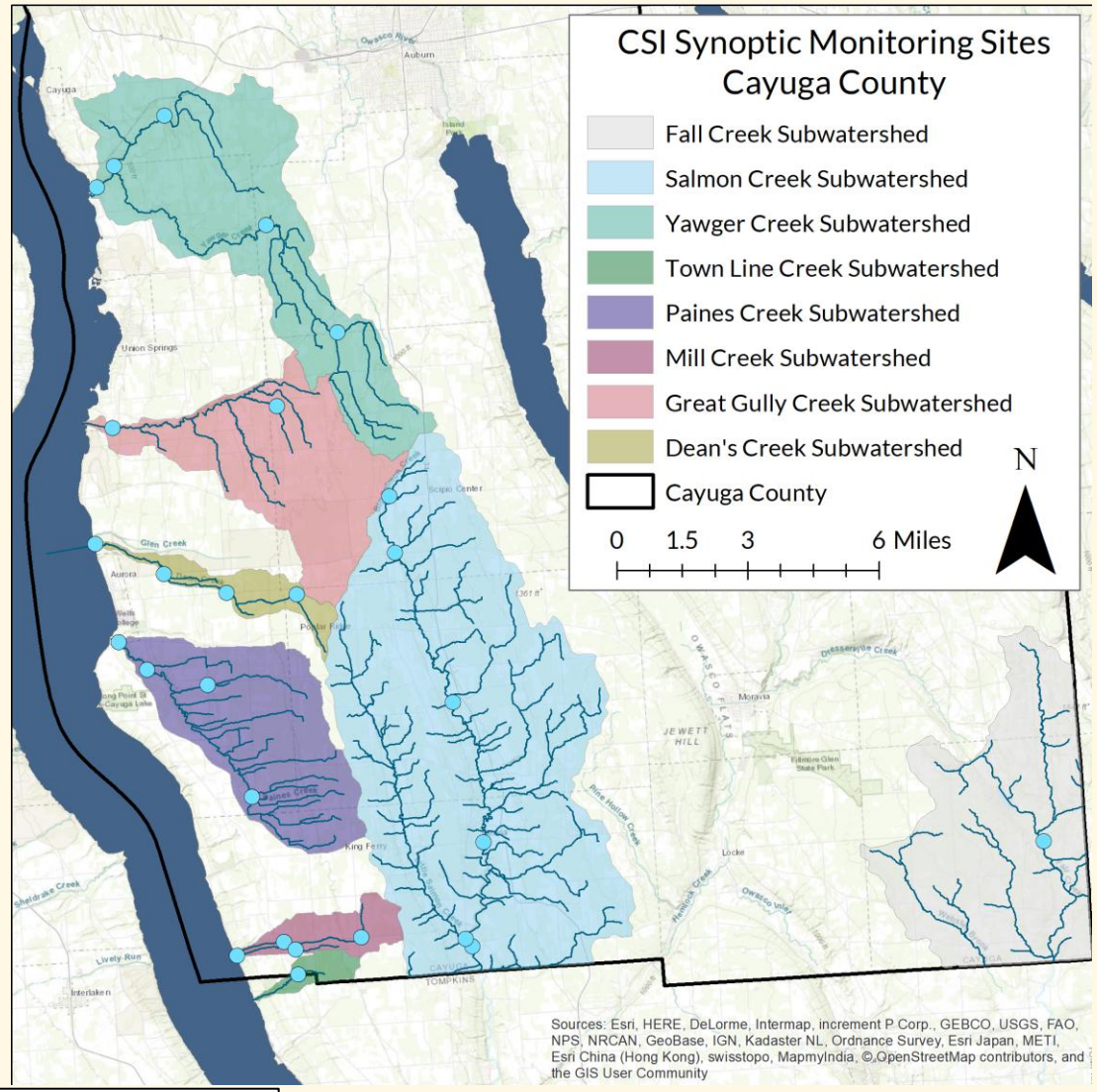
Monitor streams and lakes for:

- Nutrients (TP, SRP, NOx)
- Sediment (TSS)
- Bacteria (*E. coli*)
- Salt (Chloride)
- pH, hardness, alkalinity, turbidity, conductivity

Volunteers collect samples from their designated stream 3 times each year

Samples are analyzed in CSI's state-certified water testing laboratory

Synoptic Stream Monitoring in Cayuga County



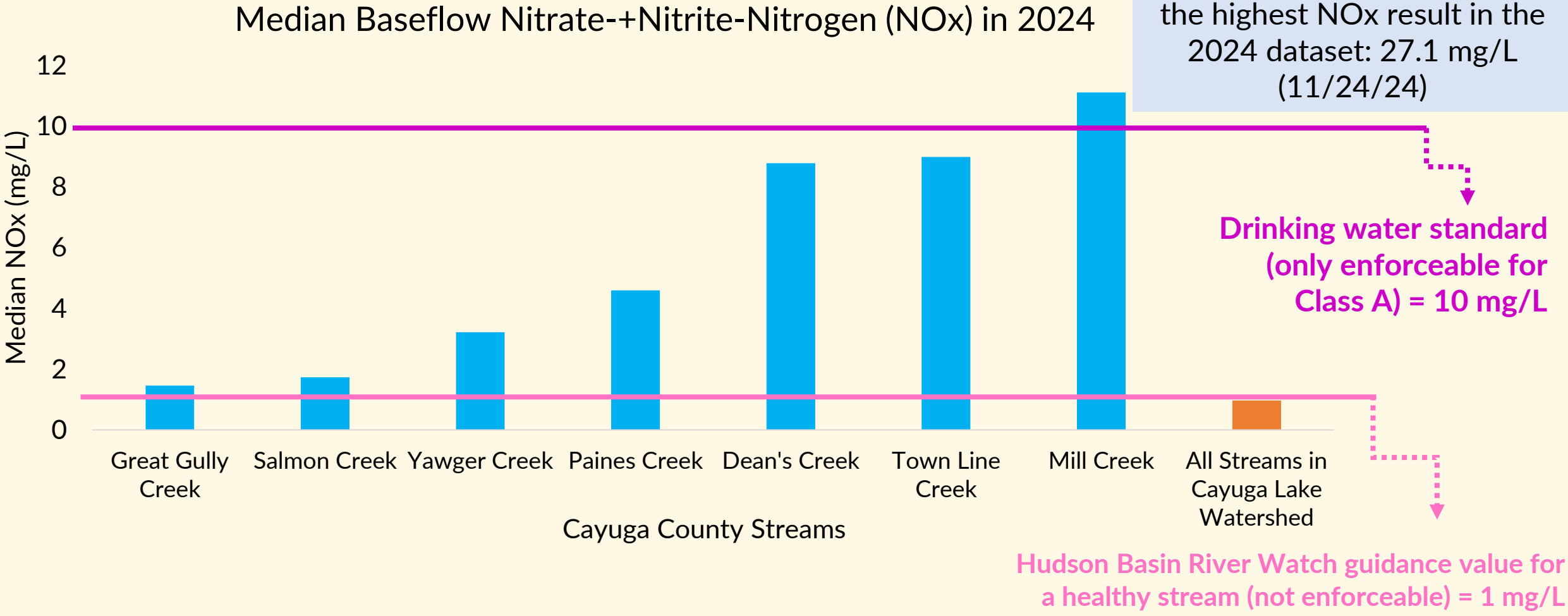
CSI's synoptic stream volunteers monitor the following Cayuga Lake tributaries in Cayuga County:

1. **Yawger Creek**
2. **Great Gully Creek**
3. **Dean's Creek**
4. **Paines Creek**
5. **Mill Creek**
6. **Town Line Creek**
7. **Salmon Creek**

Thank you to Cayuga County for supporting our stream monitoring efforts in Cayuga County since 2018!

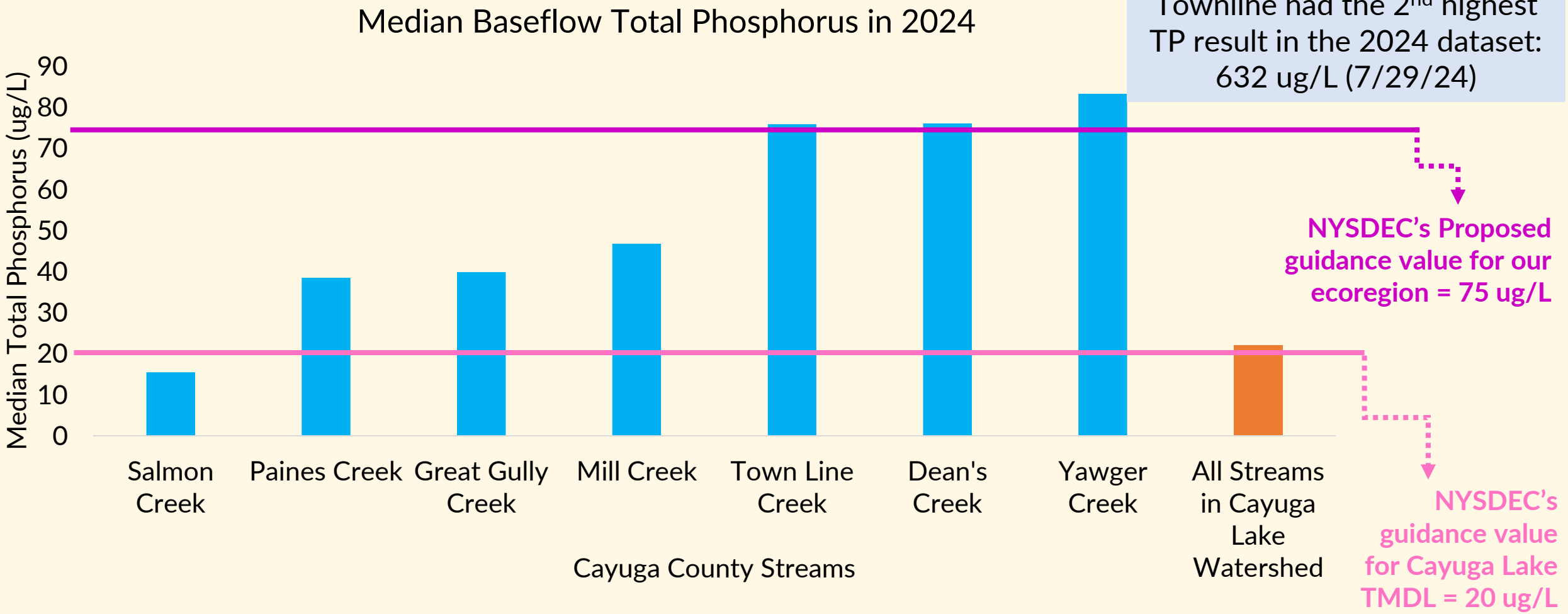
Synoptic Stream Monitoring in Cayuga County

Mill Creek at Belltown Rd. had the highest NOx result in the 2024 dataset: 27.1 mg/L (11/24/24)

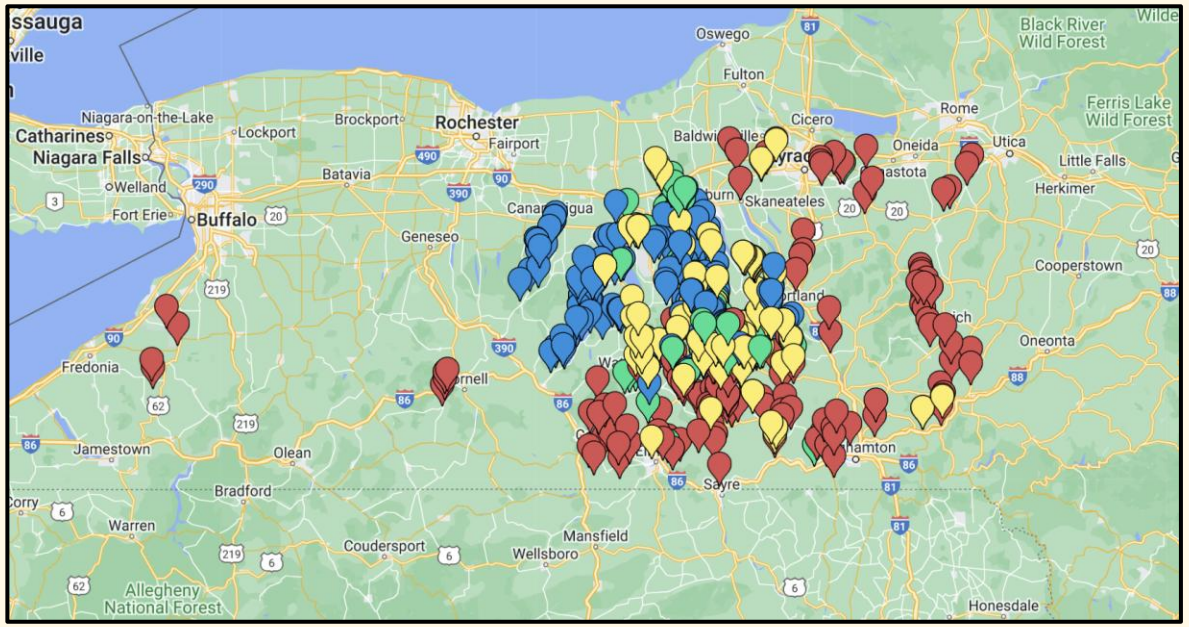


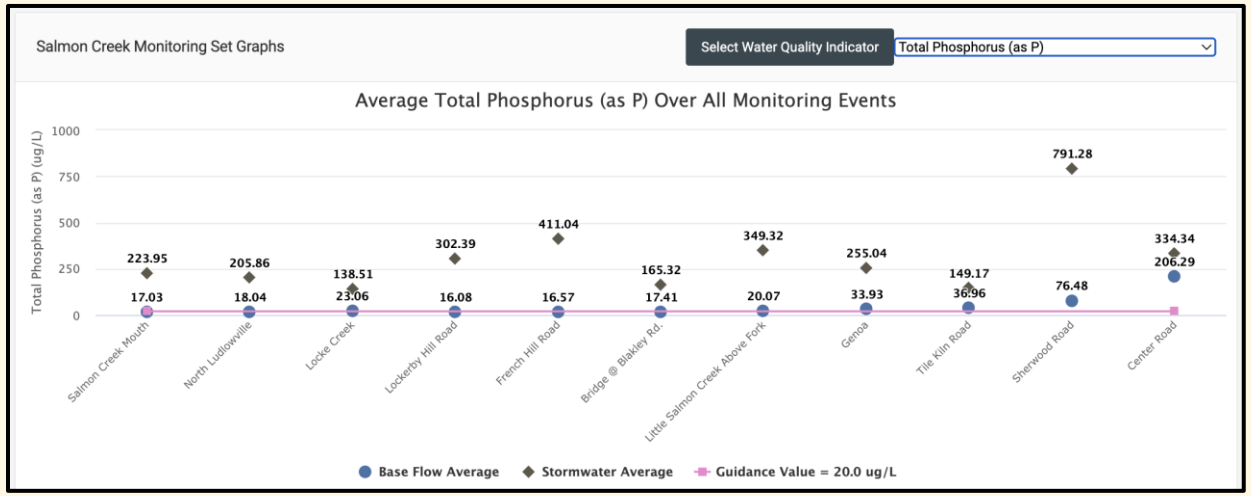
Synoptic Stream Monitoring in Cayuga County

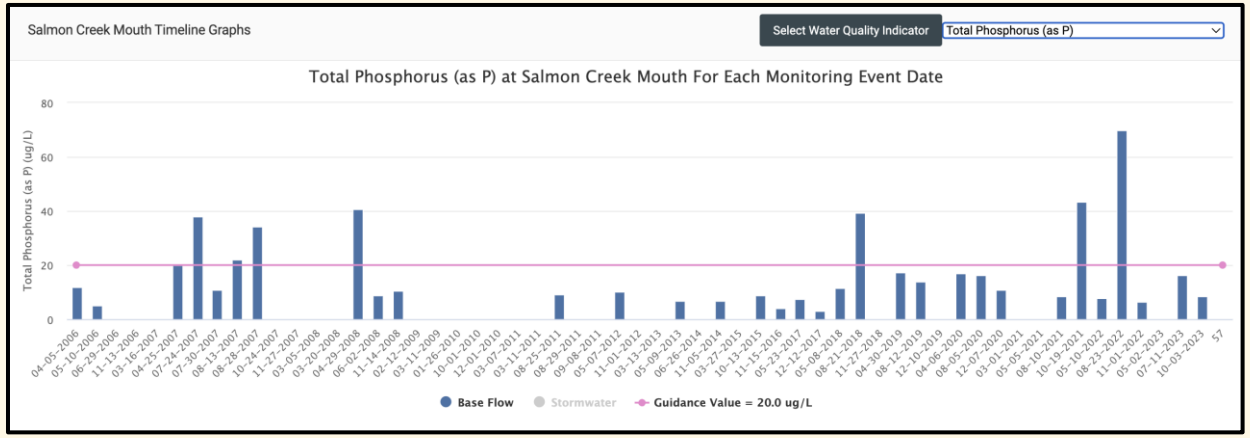
Yawger Creek @ Cork and Townline had the 2nd highest TP result in the 2024 dataset: 632 ug/L (7/29/24)



CSI's Water Quality Database – Stream and Lake Chemistry







http://www.database.communityscience.org/

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Cayuga Lake Harmful Algal Bloom Monitoring

Biomonitoring in Cayuga County

Acknowledgements and Questions

Cayuga Lake Harmful Algal Bloom (HAB) Monitoring Partnership

Cayuga Lake Harmful Algal Bloom (HAB) Monitoring Partnership

Purpose: Collect actionable data on cyanobacteria blooms, protect public health, and relay bloom information and testing results quickly and efficiently.

HABs Harriers perform weekly shoreline surveys for HABs → **Blooms are reported to CSI via HABs Hotline** → **Samples are analyzed in CSI's state certified lab*** → **CSI alerts public to HABs**

Thank you to Cayuga County for supporting our HABs Monitoring Program!

The Cayuga Lake HABs Monitoring Program is led by CSI in collaboration with CLWN and DCL

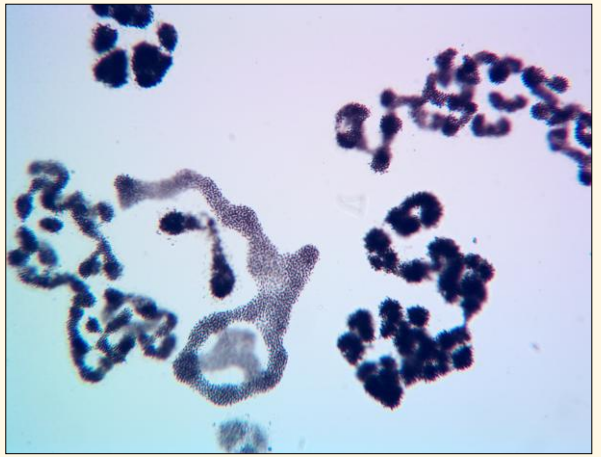
Cayuga Lake Harmful Algal Bloom (HAB) Monitoring Partnership

HAB samples are analyzed to:

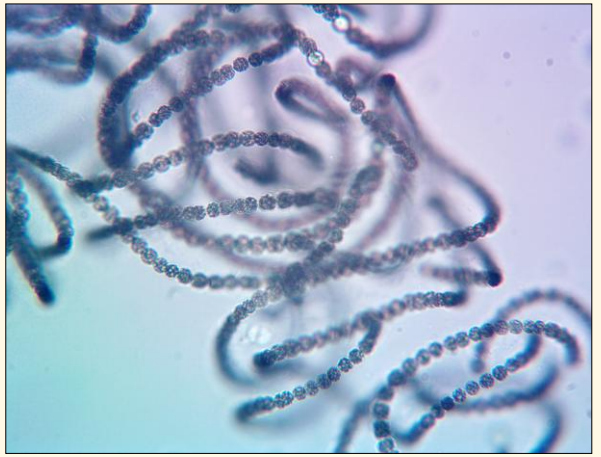
- Identify cyanobacteria genera
- Measure chlorophyll a
- Measure microcystin

Bloom information is uploaded to CSI's Cayuga Lake HABs Database

CSI reports all blooms to county health department officials and NYSDEC

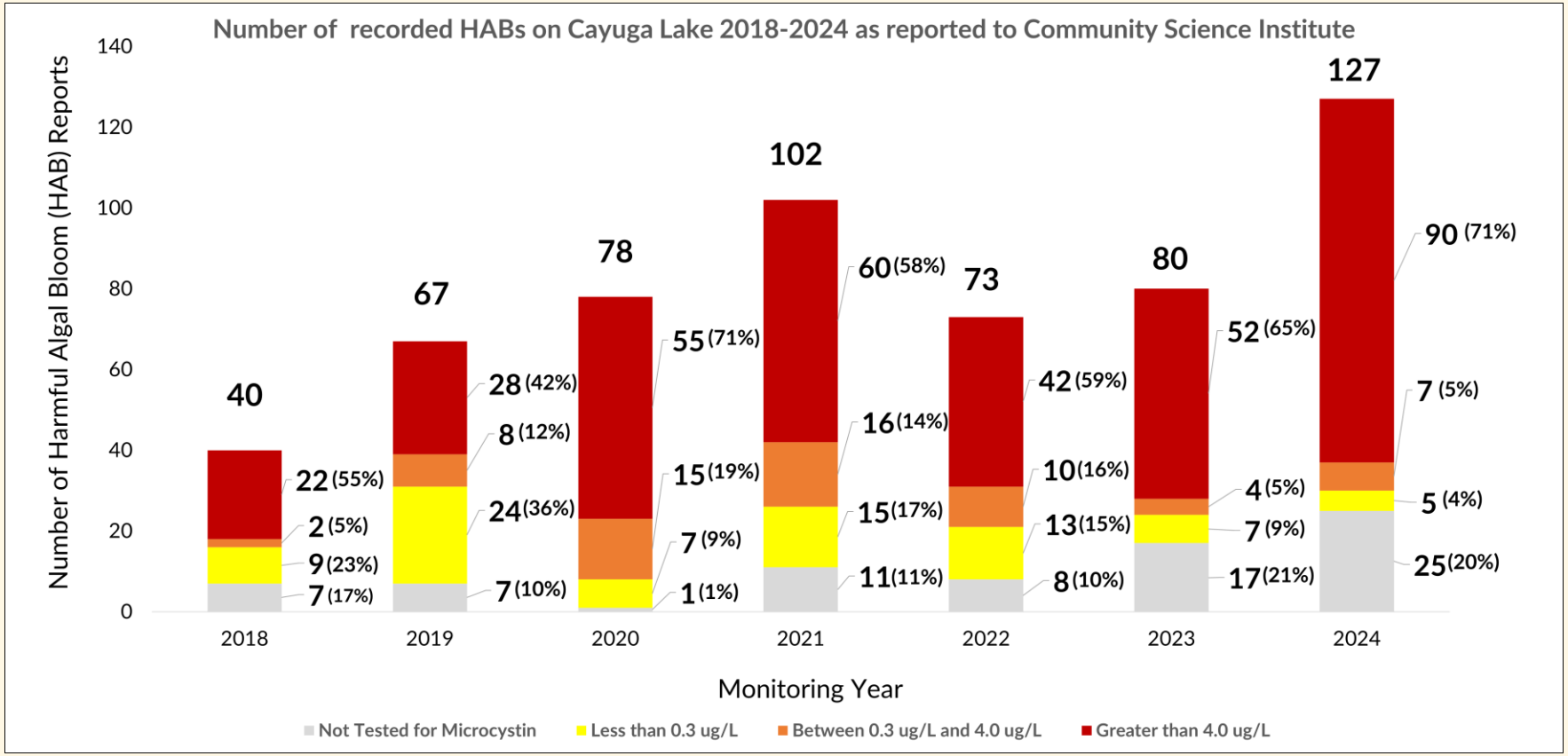


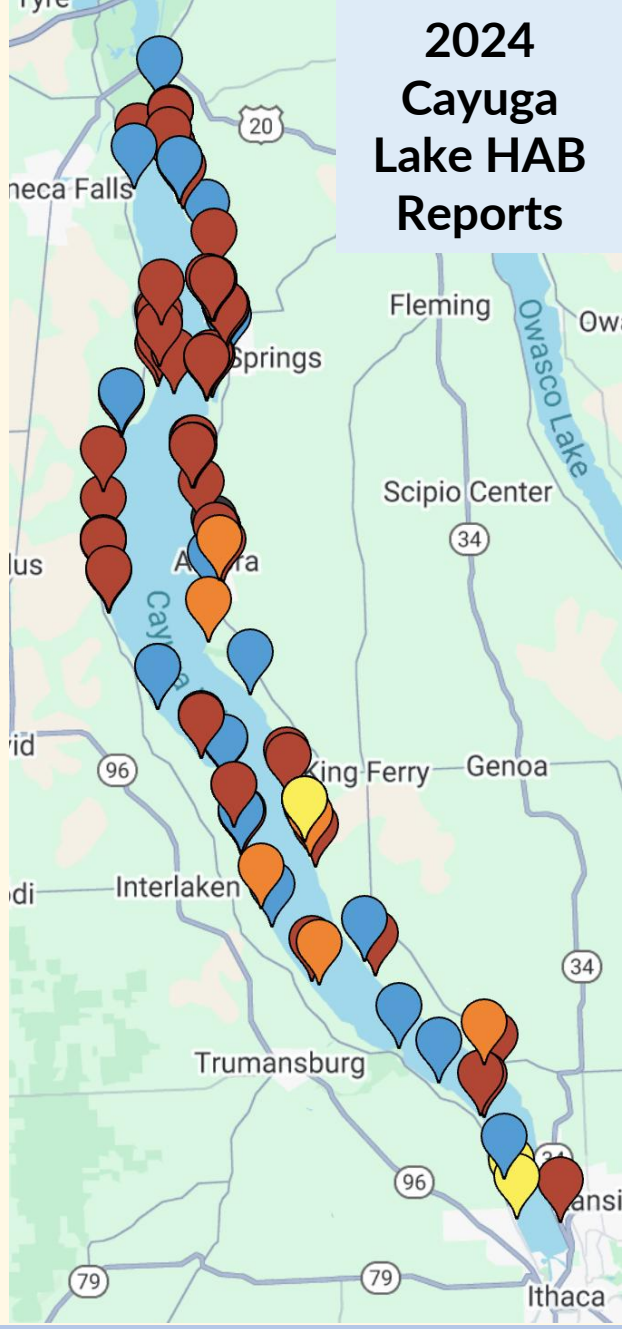
Microcystis sp.



Dolichospermum sp.

2024 HAB Monitoring Season





2024 had the most HABs reported since the start of the monitoring program

2024 HAB Monitoring Season

Suspicious bloom

Microscopy confirms CB

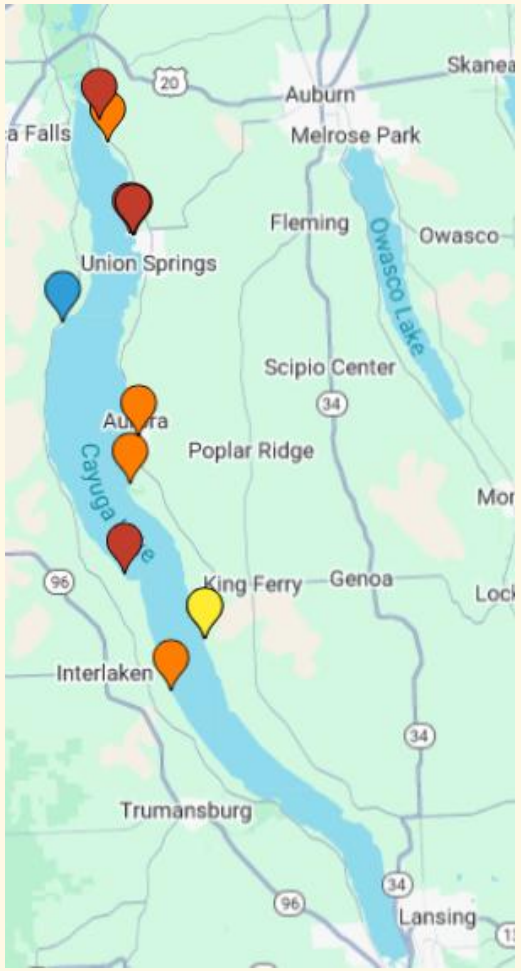
MC <0.3 µg/L

MC 0.3 µg/L – 4.0 µg/L

MC > 4.0 µg/L

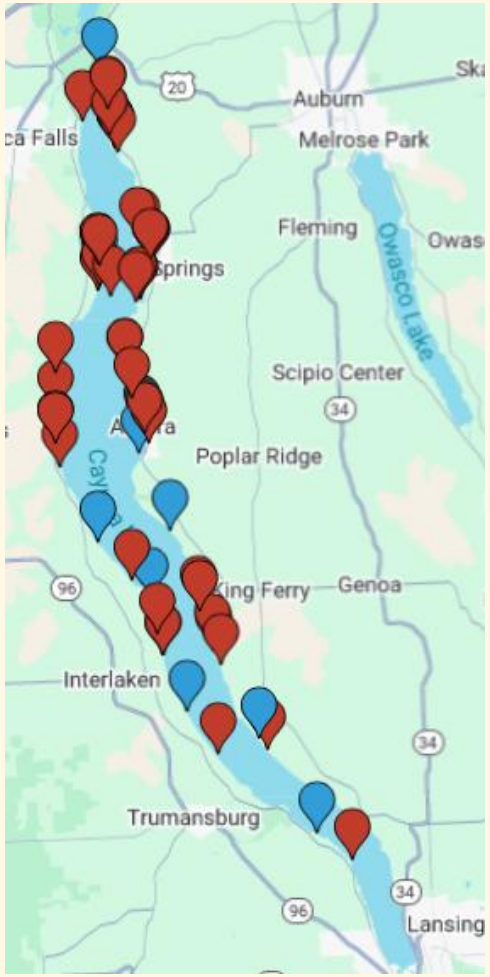
June

July



August

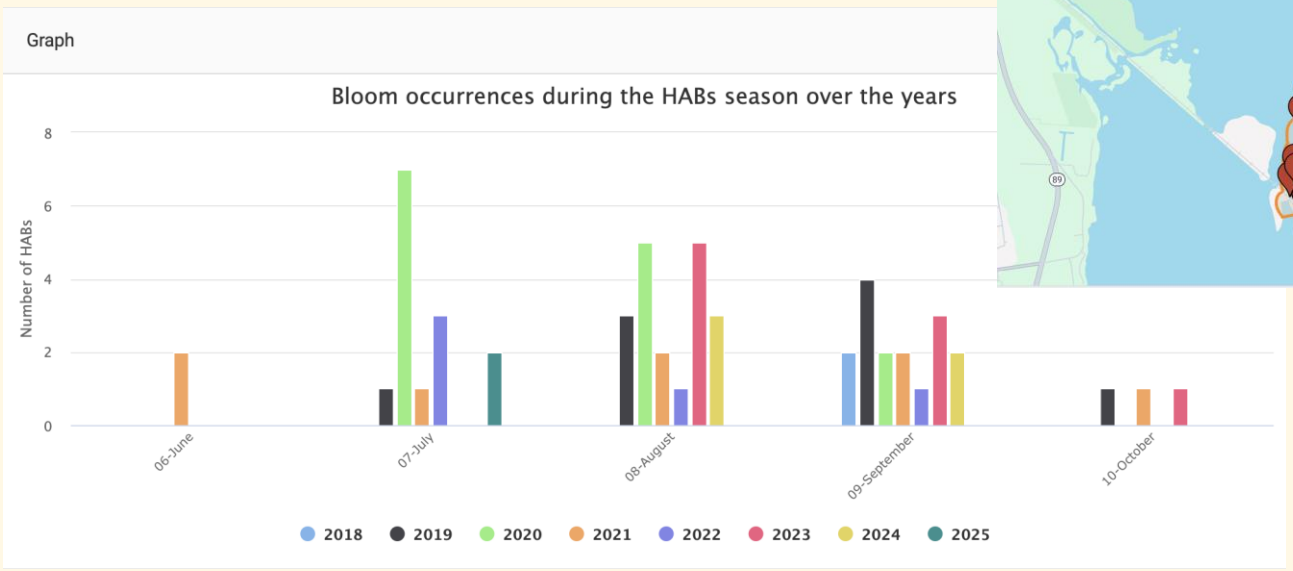
September

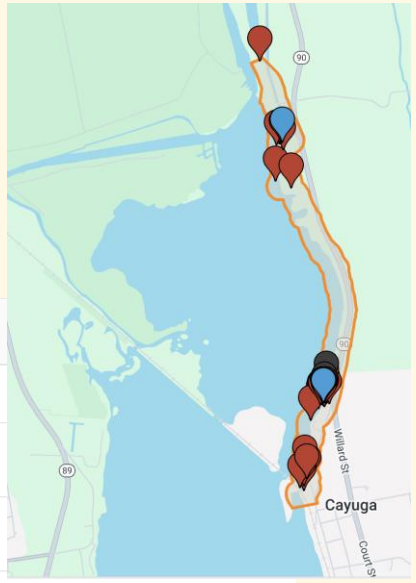


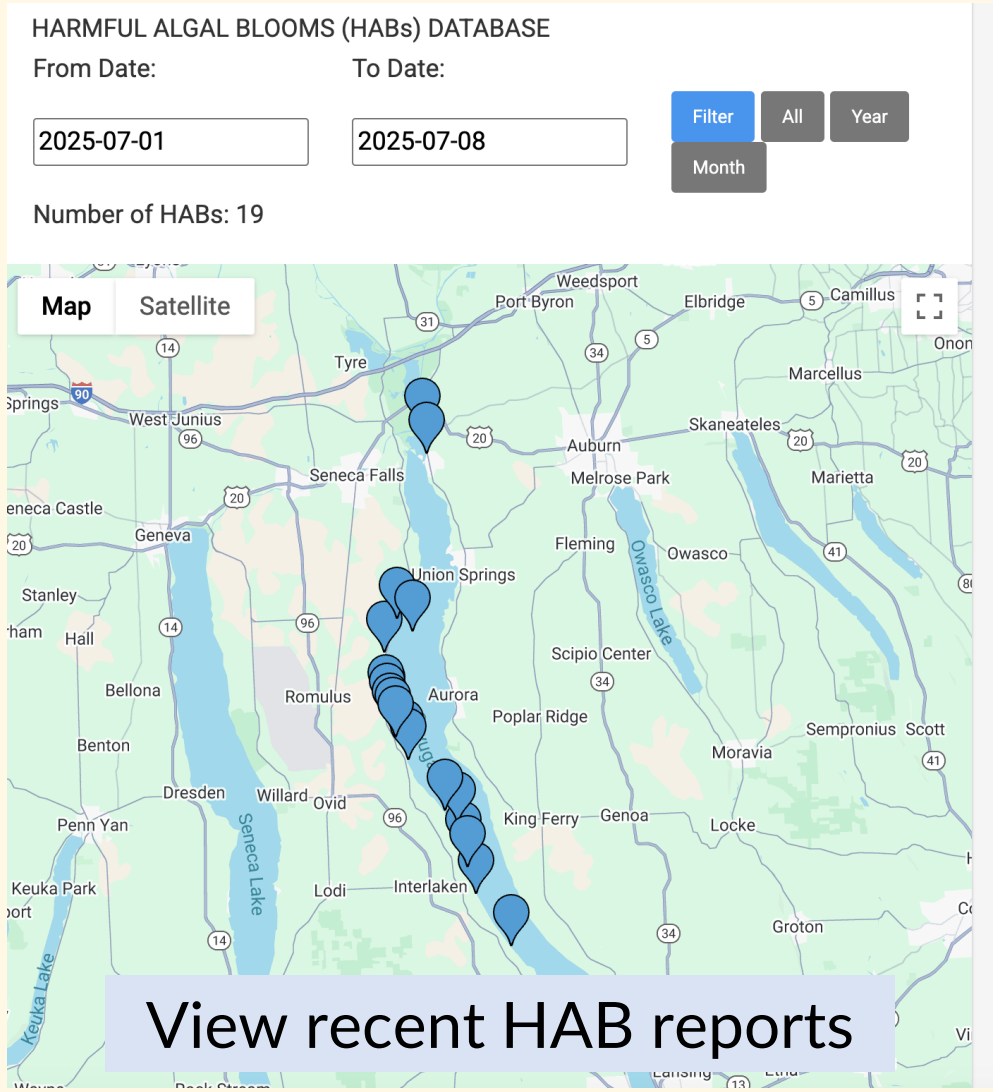
October

CSI's Cayuga Lake HAB Database

View historic HAB reports







View recent HAB reports

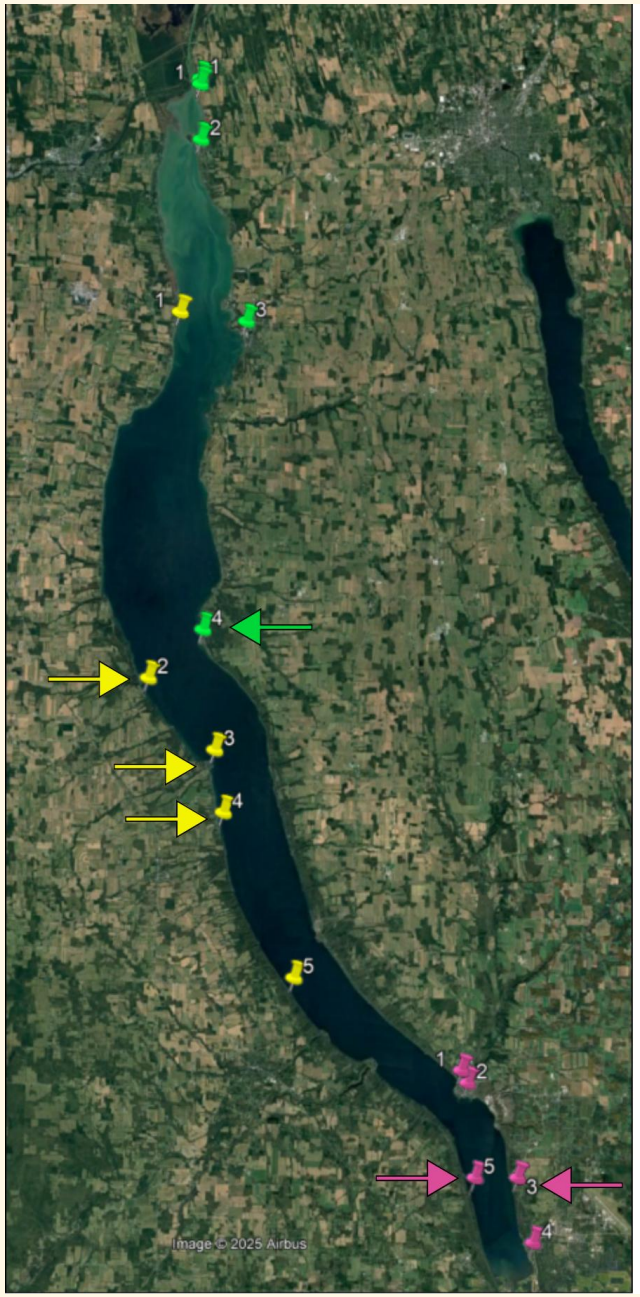
database.communityscience.org/hab

2025 Updates

While HAB *monitoring* will continue for as much of the Cayuga Lake shoreline as possible, HAB *sampling* will only take place at 14 priority locations identified by Cayuga, Tompkins, and Seneca County Health Departments.

Why cut back on sampling?

- Resource strains
- Volunteer fatigue
- Similar HAB characteristics from year to year
- Beyond what is done for most HAB monitoring programs in NYS



Cayuga County

1. Lockview Marina & Boat Transport **OR** Cayuga Marina Outfitters, Cayuga
2. Harris Park, Cayuga
3. Frontenac Park, Union Springs
4. **Long Point State Park, Aurora**

Seneca County

1. Seneca Falls Water Treatment Plant, Seneca Falls
2. **Thirsty Owl Wine Company, Ovid**
3. **Sheldrake Point, Ovid**
4. **O'Malleys & Cayuga Shoreline, Interlaken**
5. Spotted Sandpiper, Trumansburg

Tompkins County

1. Salt Point Preserve, Lansing
2. **Lansing Harbor, Lansing**
3. Bolton Point Intake, Ithaca
4. East Shore Park, Ithaca
5. **Glenwood Apartments/Ithaca Yacht Club, Ithaca**

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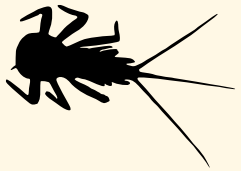
Biomonitoring



Purpose: Determine the ecological and long term health of streams while educating community members about local aquatic biodiversity

Collect and identify samples of benthic macroinvertebrates (BMI) to calculate:

- Total Family Richness
- EPT Richness
  - Ephemeroptera = mayflies, Plecoptera = stoneflies, Trichoptera = caddisflies
- Family Biotic Index
- Percent Model Affinity
- Biological Assessment Profile

Volunteers collect samples in the field then sort and identify organisms in the lab

Biological Monitoring Results

Biomonitoring in Cayuga County Streams

non-impacted
slightly impacted
moderately impacted
severely impacted

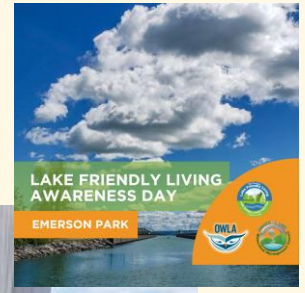
Long term monitoring site on Salmon Creek typically shows “Slight Impact”

	Total Family Richness	EPT Richness	Family Biotic Index	Percent Model Affinity	Density Orgs/sample	BAP Value Biological Assessment Profile
Salmon Creek 7/18/23 42.539959N, 76.543486W Myers Point	**10.0** slight impact	**4.0** slight impact	**5.26** slight impact	**52%** slight impact	933	**5.7** slight impact

This site was monitored again in 2024, results will be available soon!

A BMI sample was also collected from Grout Brook (Skaneateles watershed) in 2024 – results pending

Biomonitoring in 2025 – Owasco Lake Watershed!



May 17, 2025 – CSI BMI Sample from Sucker Brook
Lake Friendly Living Awareness Day

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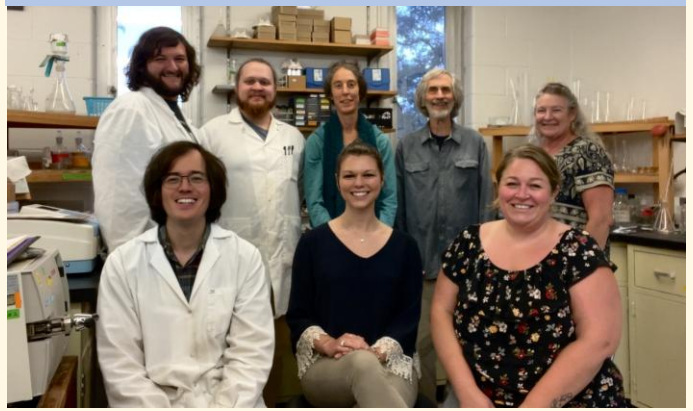
Cayuga Lake at Long Point State Park

Acknowledgements

Dedicated volunteers!

CSI Members

CSI Staff Past and Present



Partners

Cayuga Lake Watershed Network

Cayuga Lake Watershed Intermunicipal Organization

Discover Cayuga Lake

Seneca Lake Pure Waters Association

Al Hazzard Chapter Trout Unlimited #089 Binghamton NY

New York State of Opportunity. Parks, Recreation and Historic Preservation

West Shore Neighborhood Association

Local Governments

Cayuga County
Seneca County
Tompkins County
City of Ithaca
Town of Caroline
Town of Danby
Town of Dryden
Town of Enfield
Town of Ithaca
Town of Lansing
Town of Newfield
Town of Scipio
Town of Ulysses
Village of Cayuga Heights

Thank you!

Stay in touch!

Join CSI's email list for monthly updates

Follow us on social media

@communityscienceinstitute

Set up a meeting with me

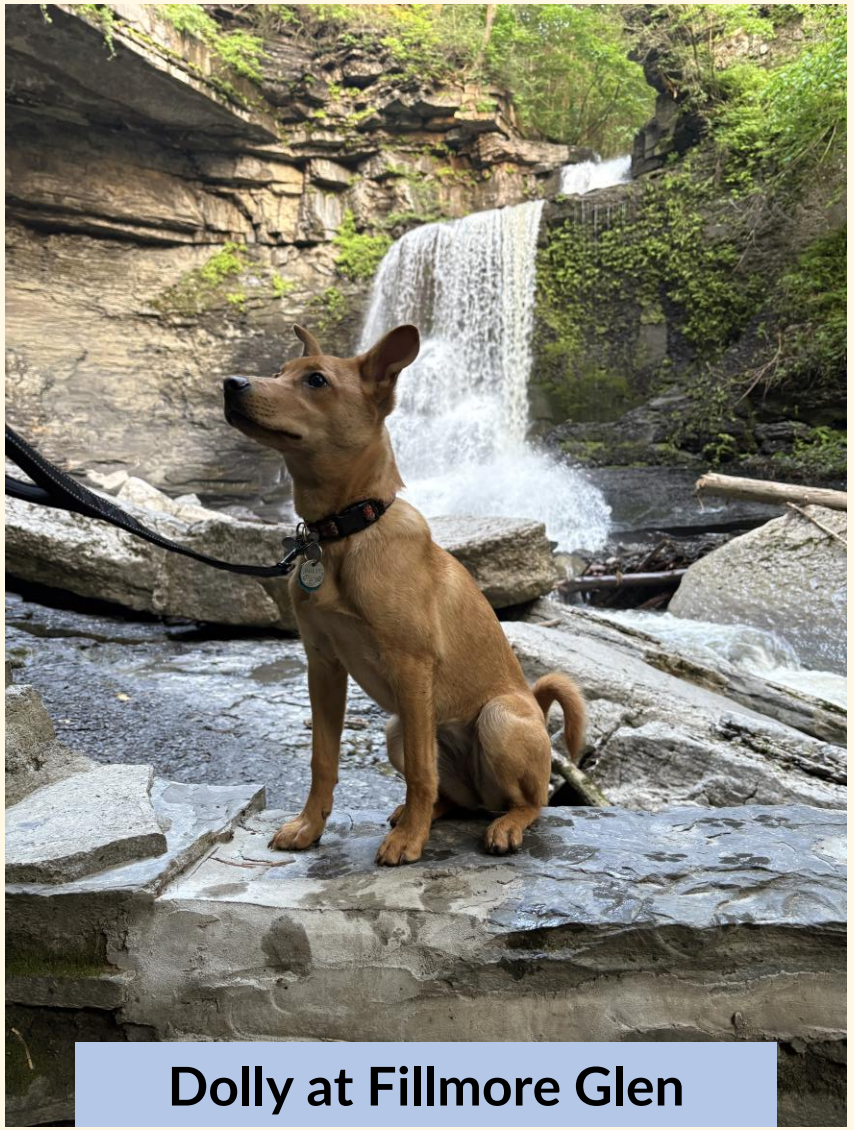
gshidemantle@communityscience.org

(607) 257-6606

www.communityscience.org

Questions

Kita on Skaneateles Lake

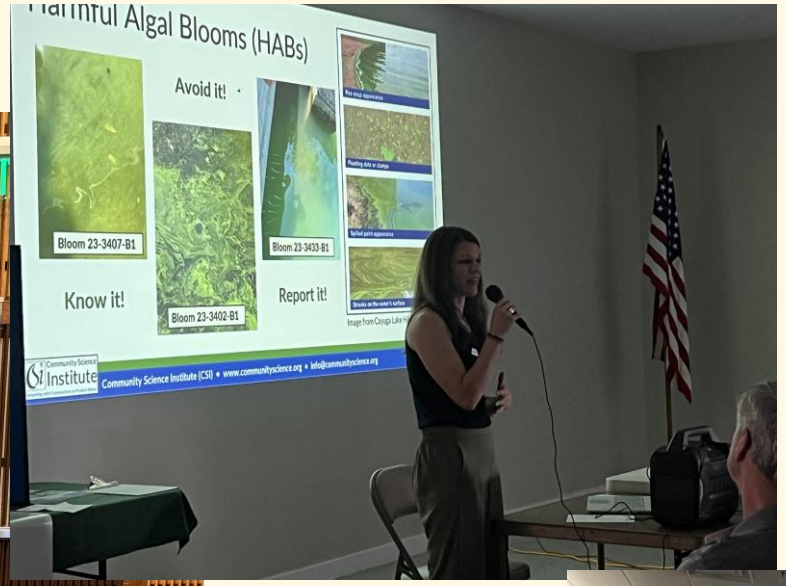


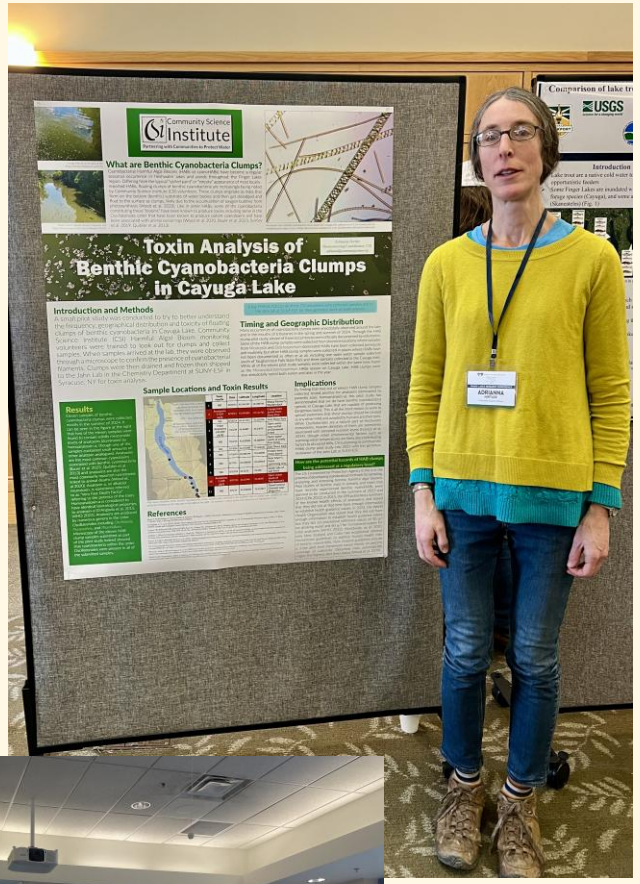
Dolly at Fillmore Glen

Extra Slides

Journey of Water Summer Youth Education Series

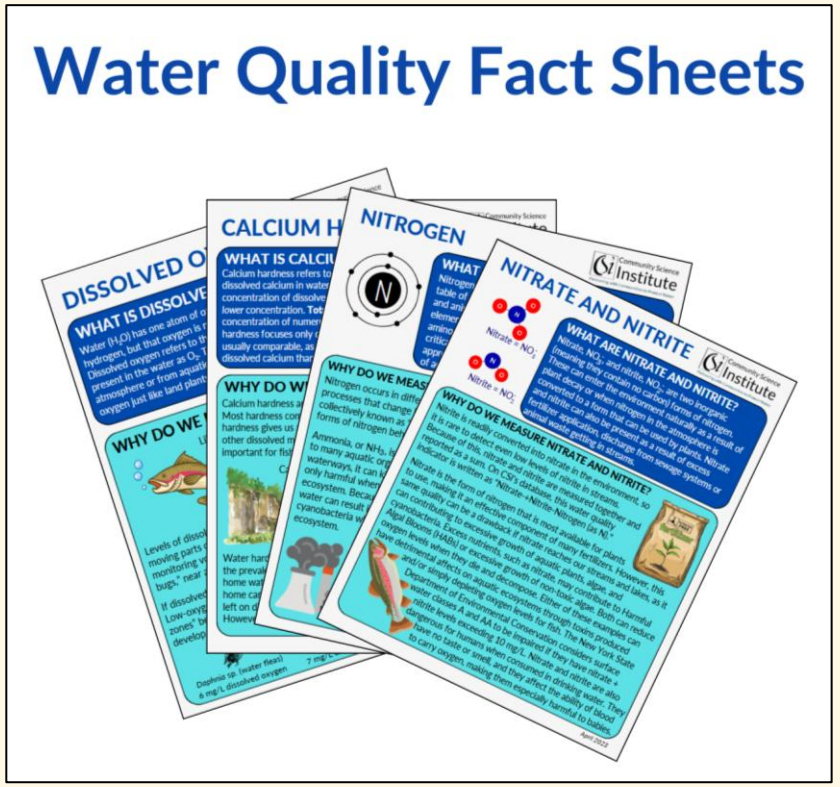
Public Events and Presentations



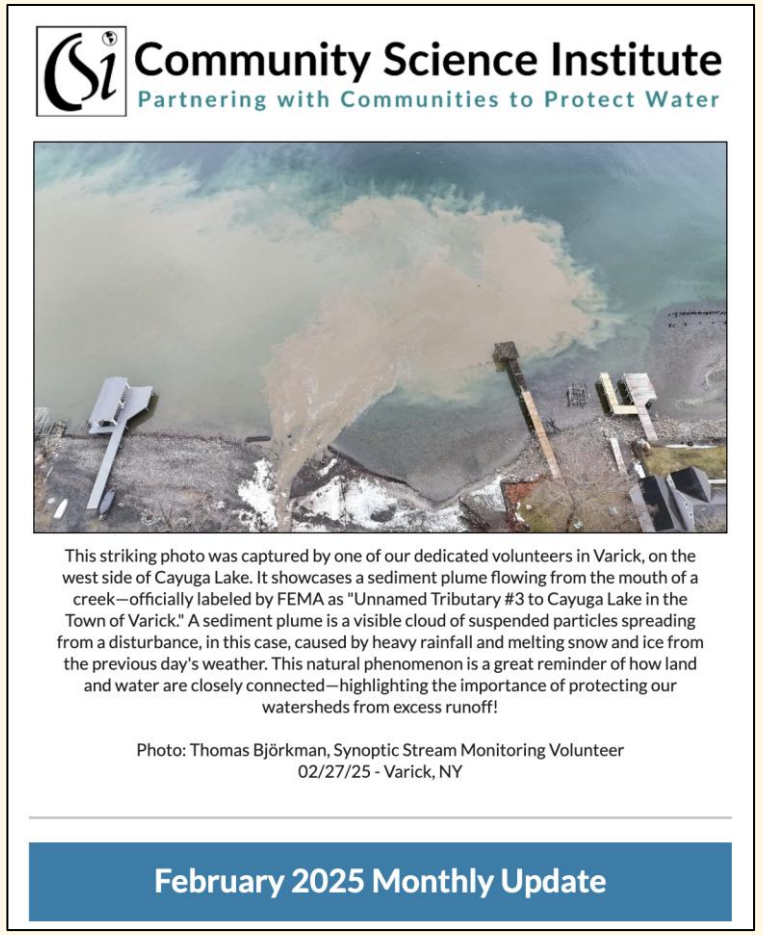


Educational Materials

Annual Water Bulletin Newsletters



Online Learning Materials

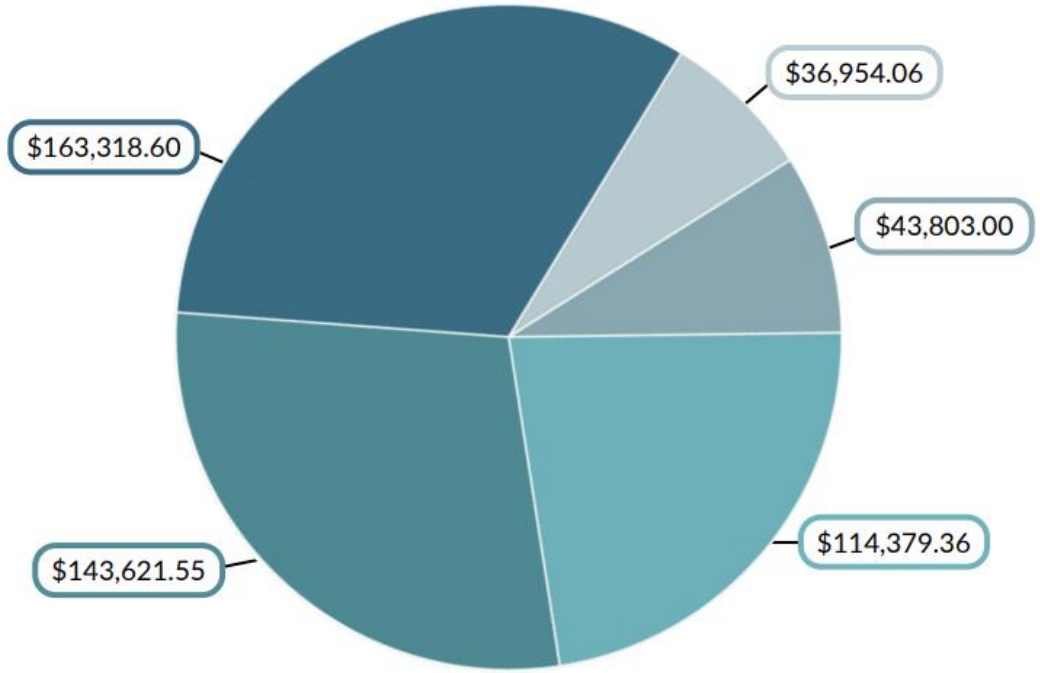


Monthly Email Updates

2024 Financial Report

CSI's Total 2024 Income*: $502,977.96

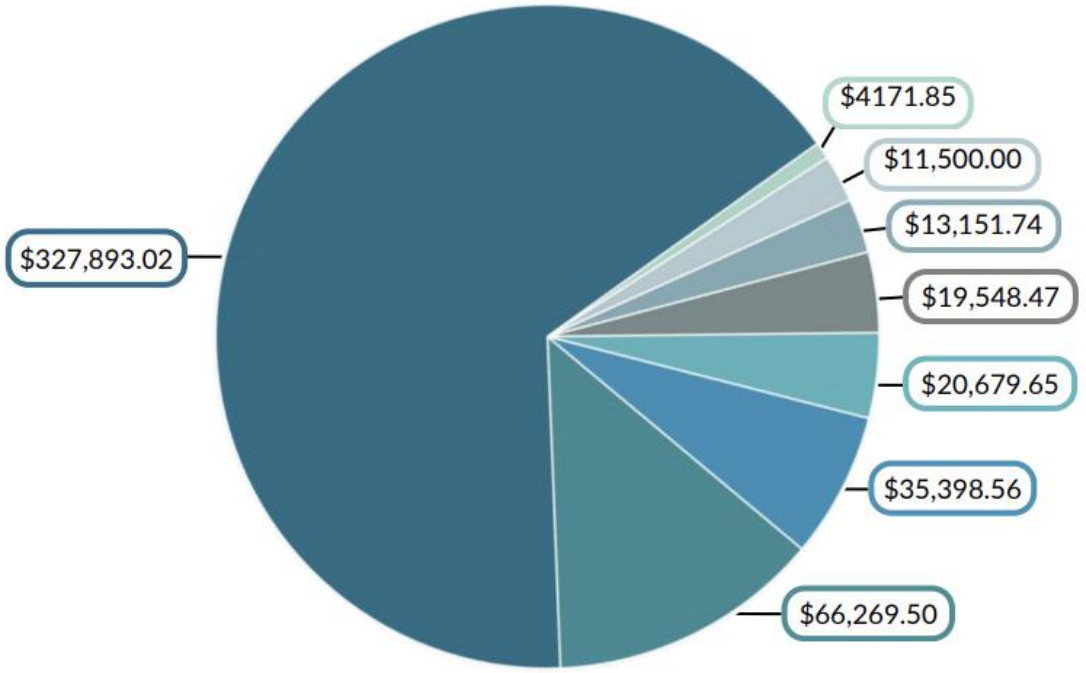
*Includes $901.39 interest and dividends.



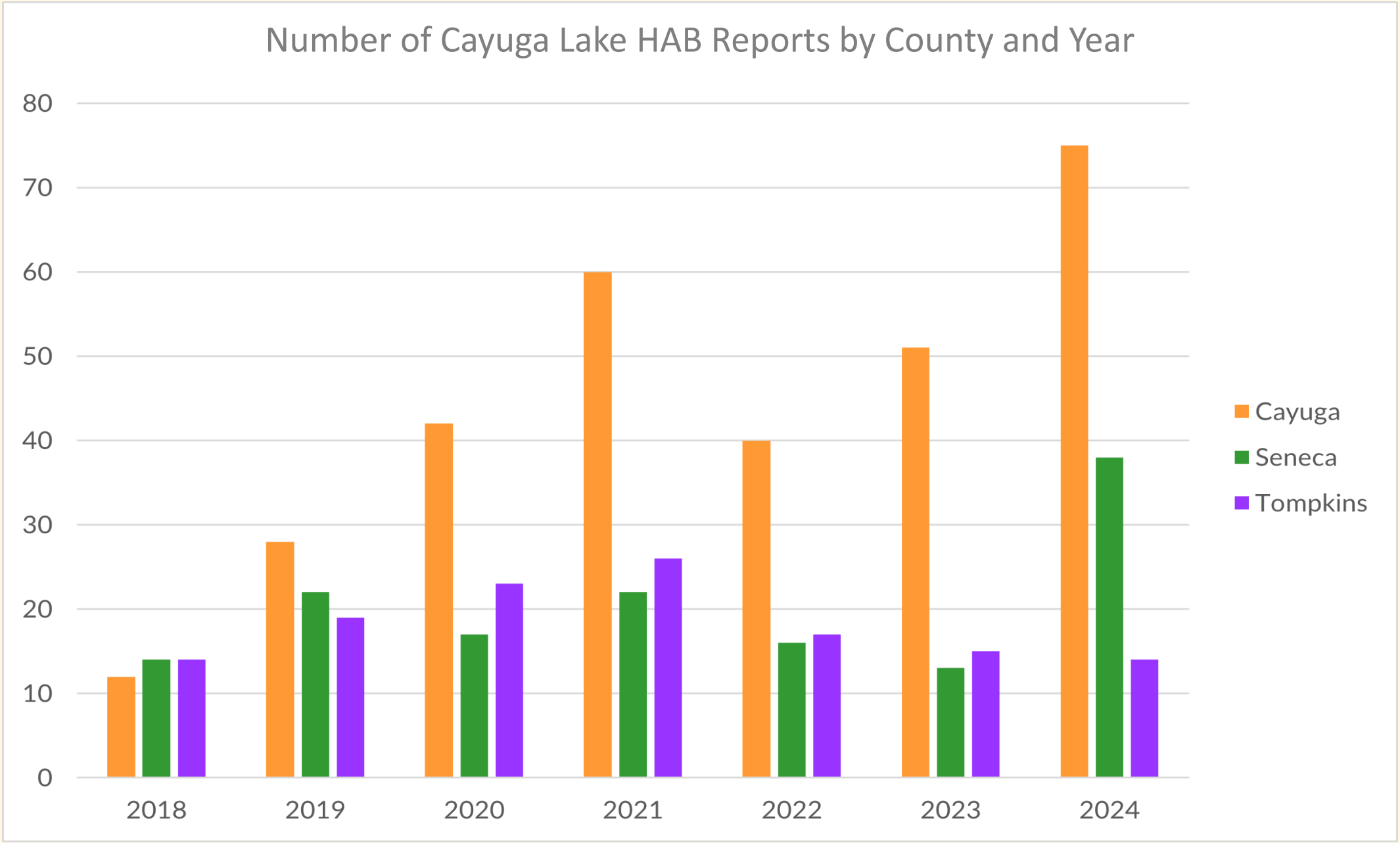
- Donations - 7%
- Fee-for-Service General Public - 29%
- Grants - 9%
- Local Government Support - 32%
- Fee-for-Service Contracts - 23%

CSI's Total 2024 Expenses*: $500,008.25

*Includes $1395.46 travel and transportation.



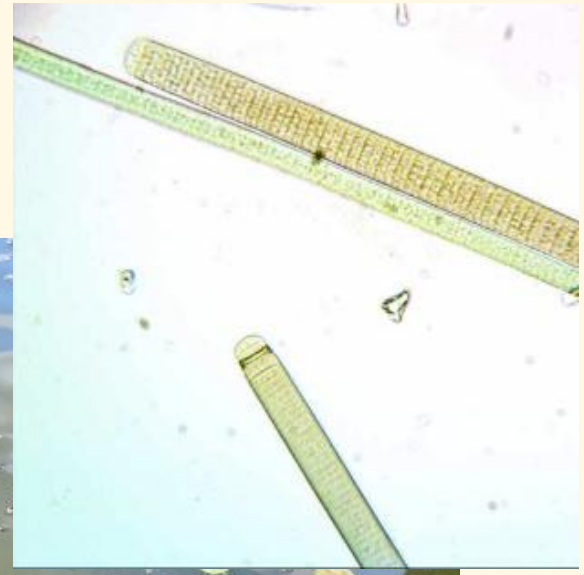
- Contract Labor - 1%
- Fees & Miscellaneous Expenses - 4%
- Strategic Planning - 2%
- Sub-Contract Lab Test - 4%
- Indirect Costs - 13%
- Web Services - 3%
- Lab & Office Supplies - 7%
- Personnel - 66%


Number of Cayuga Lake HAB Reports by County and Year
80
70
60
50
40
30
20
10
0
2018
2019
2020
2021
2022
2023
2024
Cayuga
Seneca
Tompkins

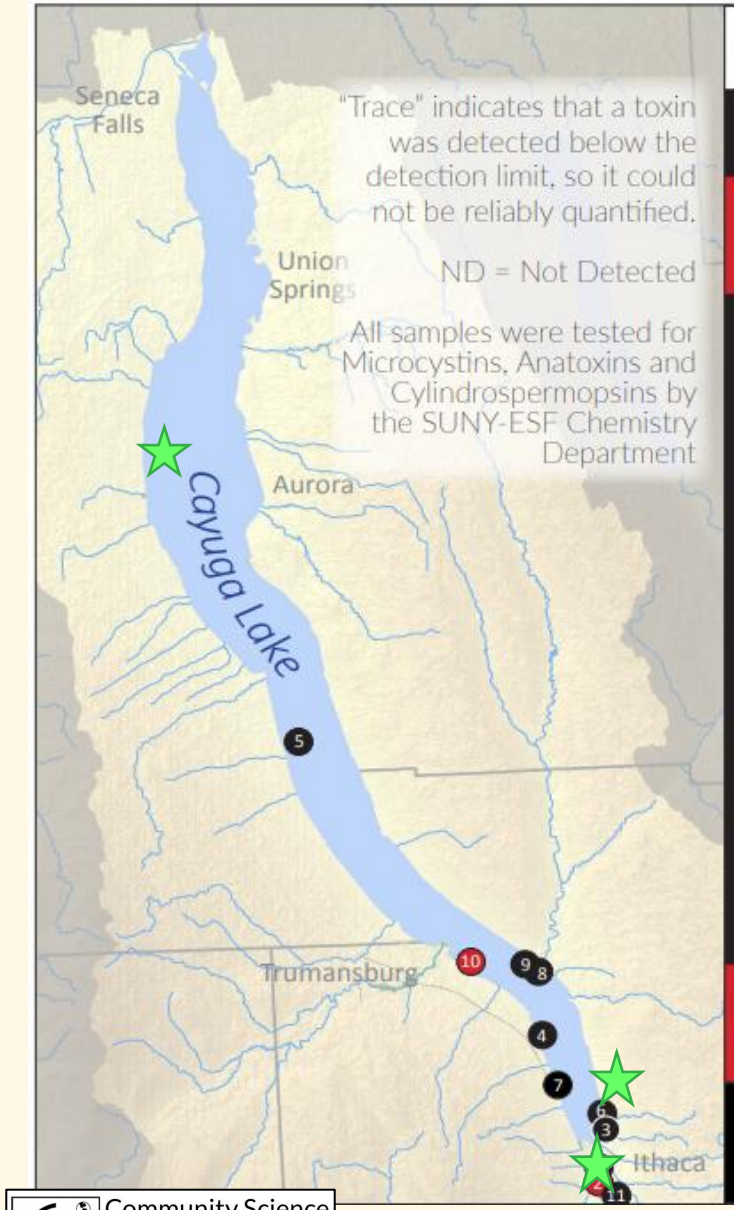
2024 Pilot Study: HAB Clumps

- Found in Cayuga Inlet and Southern end of Cayuga Lake in 2022 and 2023
- The appearance of these clumps contradicts traditional HAB ID guidance
- One sample was collected in 2023 and tested for a suite of toxins by Greg Boyer's lab at SUNY ESF. No toxins were detected.
- In 2024, CSI invited volunteers to help report and sample these clumps
- Continuing in 2025

Order Oscillatoriales



2024 Toxin Analysis of Benthic Cyanobacteria Clumps in Cayuga Lake



	Toxin results	Date	Latitude	Longitude	Location
1	ND	6/26/23	42.451327	-76.509745	Ithaca Farmer's Market dock
2	Anatoxins 3.424 µg/g	6/19/24	42.442883	-76.511762	Cayuga Inlet across from Deep Dive
3	ND	6/19/24	42.471473	-76.503798	East Shore Park
4	Trace Anatoxins (<0.044 µg/g)	7/12/24	42.49487	-76.53679	Open water near outfall of Glenwood Creek
5	ND	7/12/24	42.633056	-76.686944	Open water north of Lively Run Creek
6	ND	7/14/24	42.472490	-76.504185	East Shore Park
7	ND	7/15/24	42.482194	-76.533695	Private west shore beach
8	ND	8/7/24	42.538568	-76.549924	Near Myer's Point swimming area
9	ND	8/13/24	42.3219	-76.330	South side of Salt Point
10	Anatoxins 1.349 µg/g	8/27/24	42.53749	-76.58387	Open water south of Taughannock
11	ND	9/5/24	42.436366	-76.512617	Flood Control Channel near Wegmans

2025 Samples Collected

Adrianna Hirtler

Fee-for-Service Water Testing

We test water from private wells, municipal water systems, swimming beaches, effluents, and more!

We serve:

Residents
- Home sales
- Routine testing
- Health/taste/quality concerns

Local Businesses
- Farms
- Restaurants
- Breweries
- Wineries
- Mobile Home Parks
- Apartment Buildings

Government Agencies
- Tompkins County Health Dept.
- NY State Parks
- NYS Dept. of Environmental Conservation
- NYS Dept. of Health

In 2024, CSI's lab tested more than 2,900 drinking water and wastewater samples!

NYSDOH-ELAP #11790

In-House Testing

Potable Only
Total Coliform/*E.coli*
Standard Plate Count
Nitrate, Nitrite
Calcium Hardness
Sulfate
Conductivity
Turbidity
Orthophosphate (SRP)

Both
pH
Chloride
Alkalinity
Total Dissolved Solids
Turbidity
Microcystin

Non-Potable Only
E.coli Enumeration
Fecal Coliform
Nitrate+Nitrite (NOx)
Total Kjeldahl Nitrogen (TKN)
Ammonia Nitrogen
Soluble Reactive Phosphorous
Total Hardness
Total Solids
Total Suspended Solids
Dissolved Oxygen
Chlorophyll a

We partner with larger labs to subcontract testing for other analytes such as heavy metals, PFAS, BOD, etc.

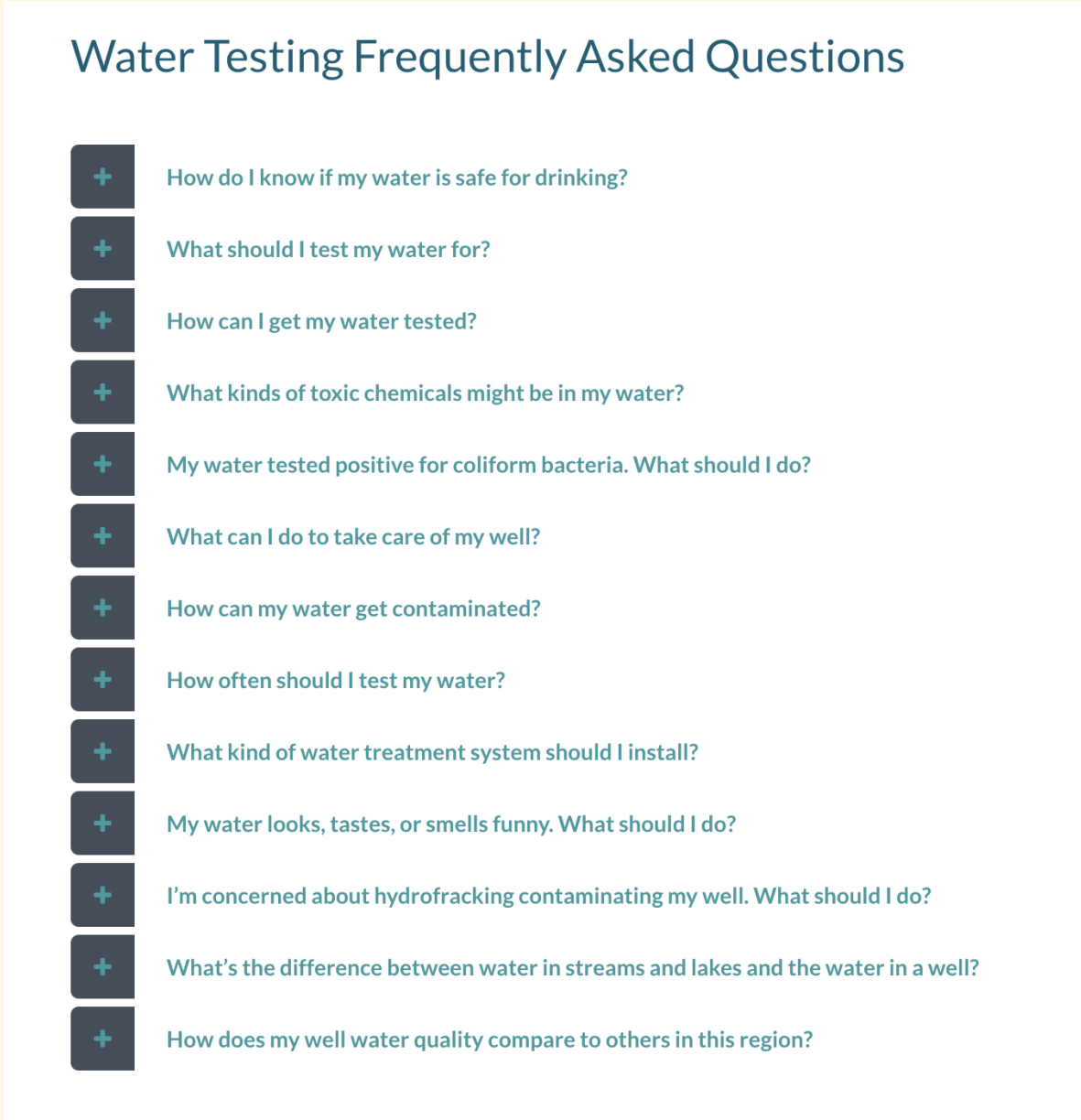
Resources

FAQ page on CSI's website

Handouts on common questions such as how to shock a well, iron and manganese bacteria, and microcystin in beach wells

Referrals for local water treatment specialists

Sample bottles available for pick up at:
- CSI's Lab by the Ithaca Airport
- Greenstar on Cascadilla Street
- ShurSave in Trumansburg
- A new location near you??



Water Testing Assistance Fund

We are proud to provide discounted drinking water tests* to those who otherwise could not afford the cost of these analyses.

**Applies to "in-house" water tests only. Based upon availability of funds.*

We believe that everyone has the right to know if their water is safe to drink!

Why offer this service?

It is needed!

CSI is the only commercial ELAP-certified lab in Tompkins County and the Cayuga Lake watershed

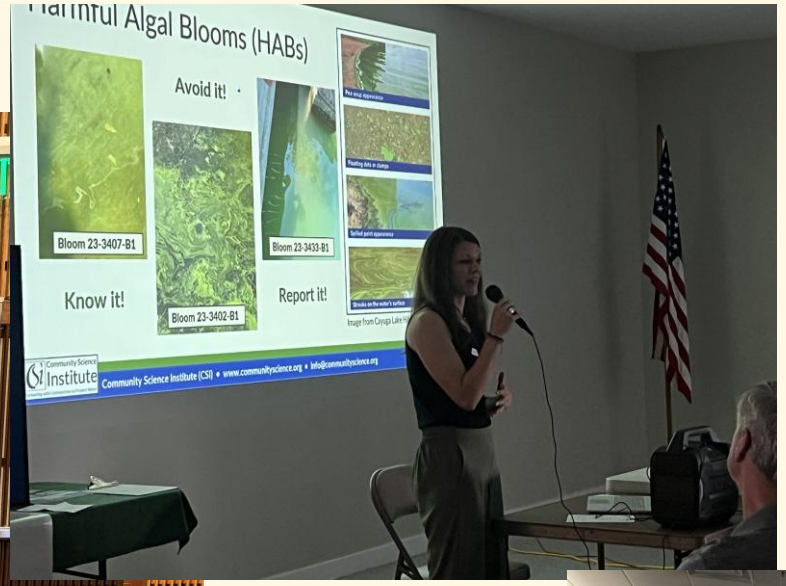
Filling in the gap for a large lab in Syracuse that lost its certification

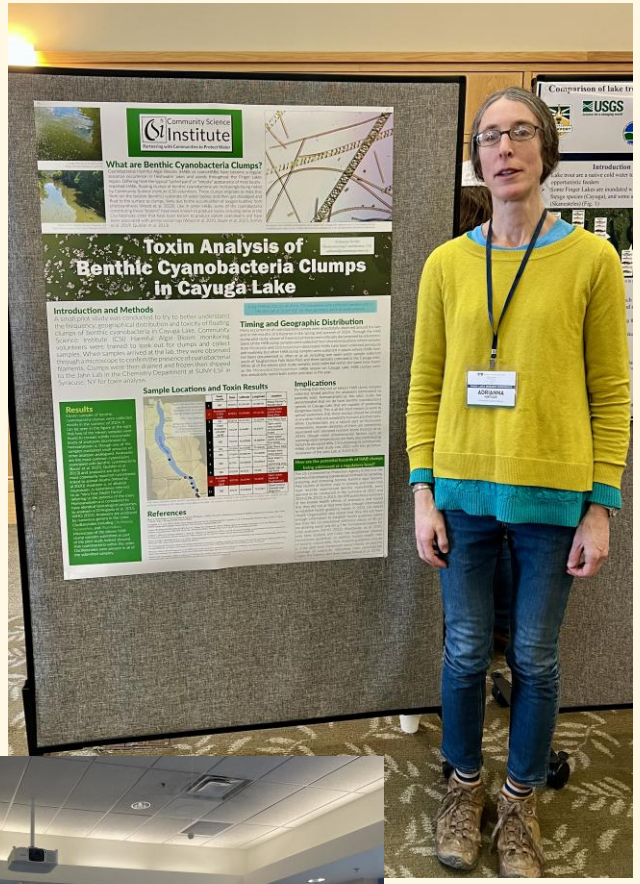
We provide valuable education to clients about their drinking water resources and recommended testing to fit their specific needs and budgets

Provides a sustainable source of income (~ 50% of our income in 2024)

Journey of Water Summer Youth Education Series

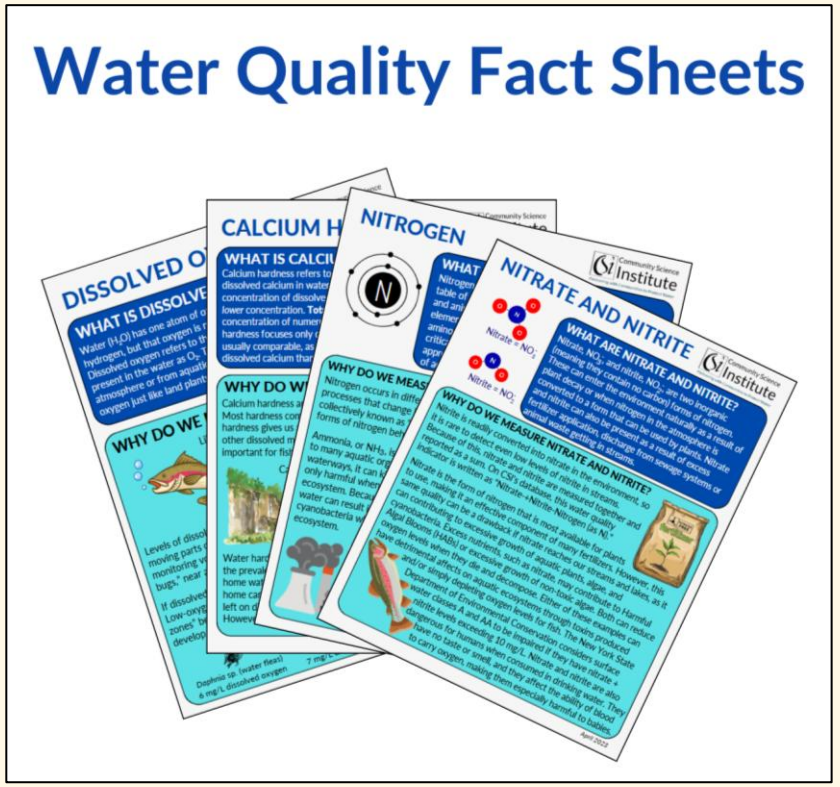
Public Events and Presentations



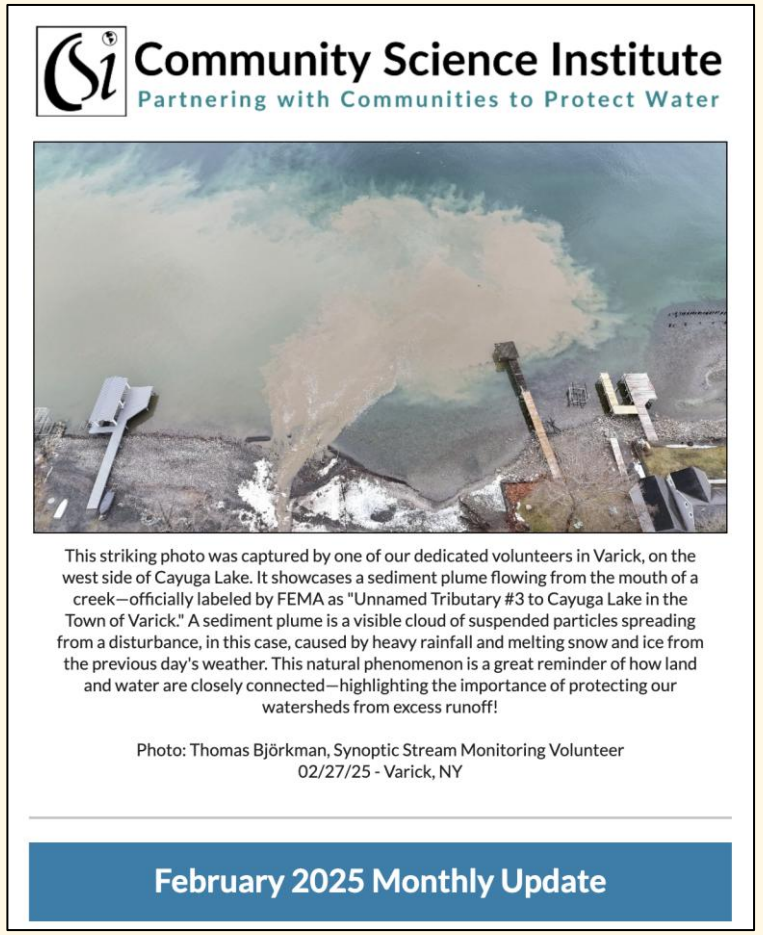


Educational Materials

Annual Water Bulletin Newsletters



Online Learning Materials

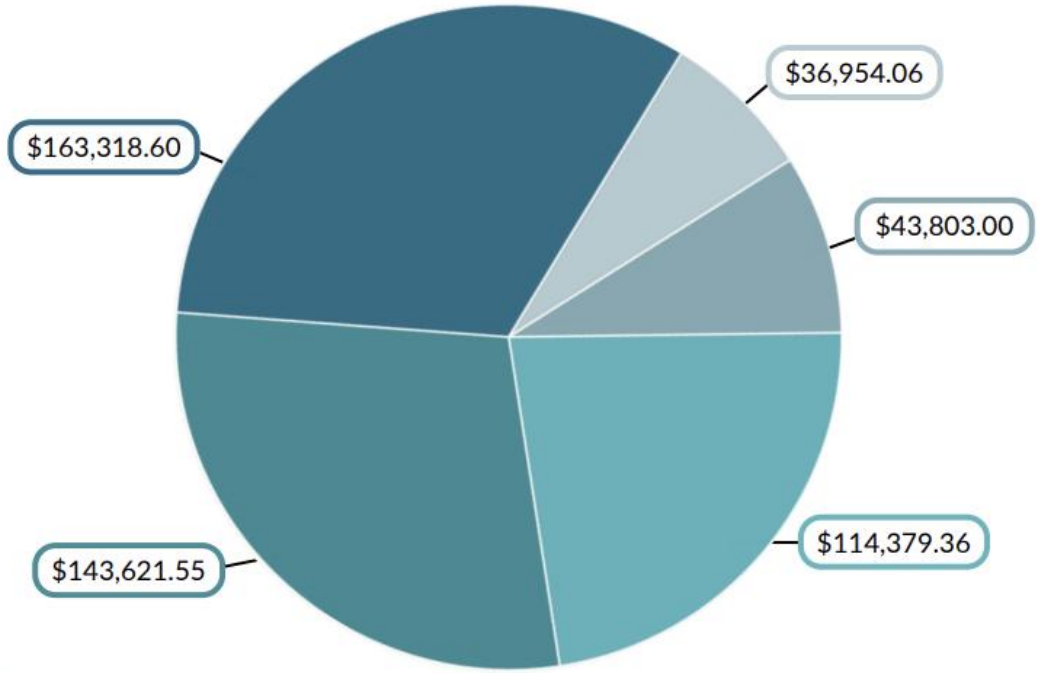


Monthly Email Updates

2024 Financial Report

CSI's Total 2024 Income*: $502,977.96

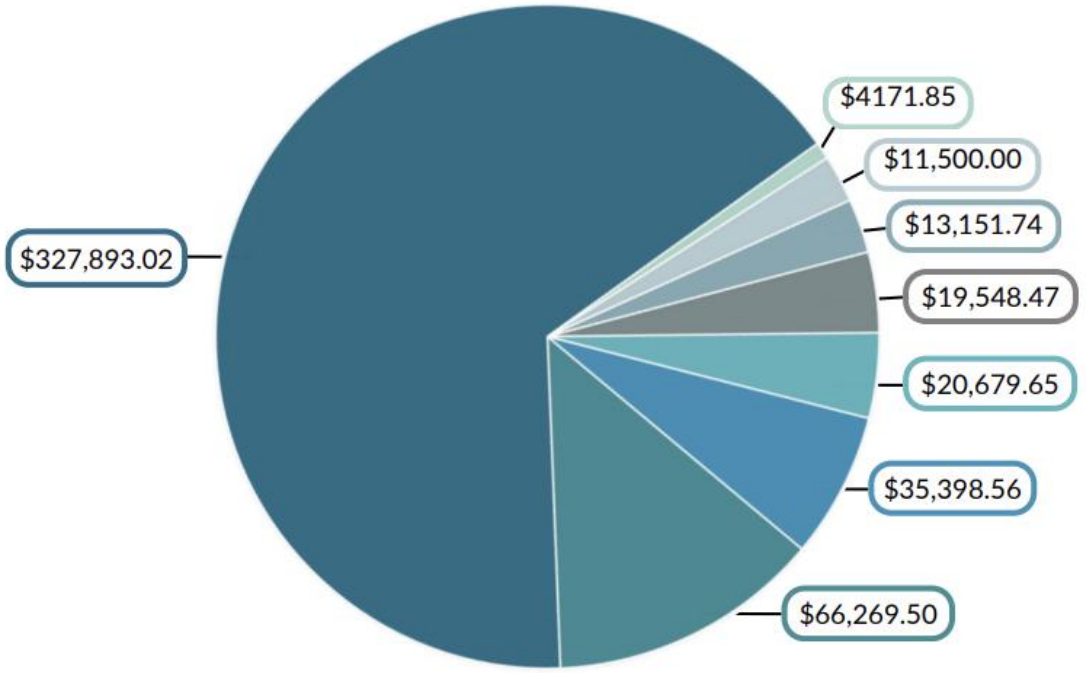
*Includes $901.39 interest and dividends.



- Donations - 7%
- Fee-for-Service General Public - 29%
- Grants - 9%
- Local Government Support - 32%
- Fee-for-Service Contracts - 23%

CSI's Total 2024 Expenses*: $500,008.25

*Includes $1395.46 travel and transportation.



- Contract Labor - 1%
- Fees & Miscellaneous Expenses - 4%
- Strategic Planning - 2%
- Sub-Contract Lab Test - 4%
- Indirect Costs - 13%
- Web Services - 3%
- Lab & Office Supplies - 7%
- Personnel - 66%

Biomonitoring in Cayuga County

The Community Science Institute
Great Gully Bio-monitoring Results

non-impacted
slightly impacted
moderately impacted
severely impacted

	Total Family Richness	EPT Richness	Family Biotic Index	Percent Model Affinity	Density Orgs/sample	BAP Value Biological Assessment Profile
Great Gully Creek 9/26/21 42.807746N, 76.701681W Upstream Rte 90	9.0# moderate impact	4.0# slight impact	4.66# slight impact	63%# slight impact	44	6.1# slight impact
Great Gully Creek 9/29/22 42.807746N, 76.701681W Upstream Rte 90	15.0# no impact	6.0# slight impact	4.95# slight impact	60%# slight impact	77	7.2# slight impact

Total number of organisms collected in sample was less than 100 required for accurate metrics calculations. Organism counts were lower than previous seasons for many samples, likely due to heavy flow conditions washing organisms away. Some sites seemed to take longer than expected to repopulate.

BAP is a composite index that incorporates Total Family Richness, Family Biotic Index, EPT Richness and Percent Model Affinity.

Want to help monitor this site? Email Adrianna at Adrianna@communityscience.org

Continued monitoring at this site is needed to understand if low abundance is typical for this site.