# Community Science Institute: Empowering Communities Through Water Science

Danby Conservation Advisory Council
4/8/2025

Grascen Shidemantle, PhD
Executive Director
Community Science Institute

Community Science Institute
Partnering with Communities to Protect Water

*Michigan Creek, Danby State Forest*
*March 21, 2025*

# Agenda

Intro: Community Science Institute

Volunteer Monitoring & Water Quality Databases

Fee-for-Service Water Testing

Outreach and Education

CSI Staff

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**Intro: Community Science Institute**

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# 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:**

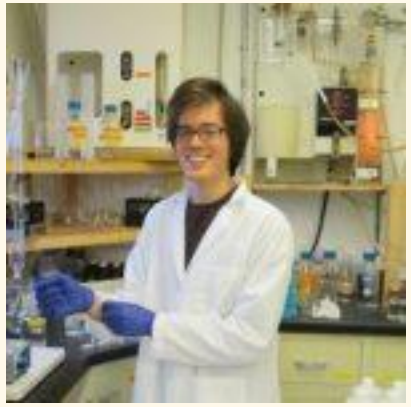
- **Volunteer Water Monitoring Partnerships**
- **Outreach and Education**
- **Fee-for-Service Water Testing**

## 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

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Biomonitoring Coordinator

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Outreach and
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Water Quality Scientist

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Water Quality Scientist

Rama Hoetzlein
Database Developer

Bill George
Data Entry Specialist

# Agenda

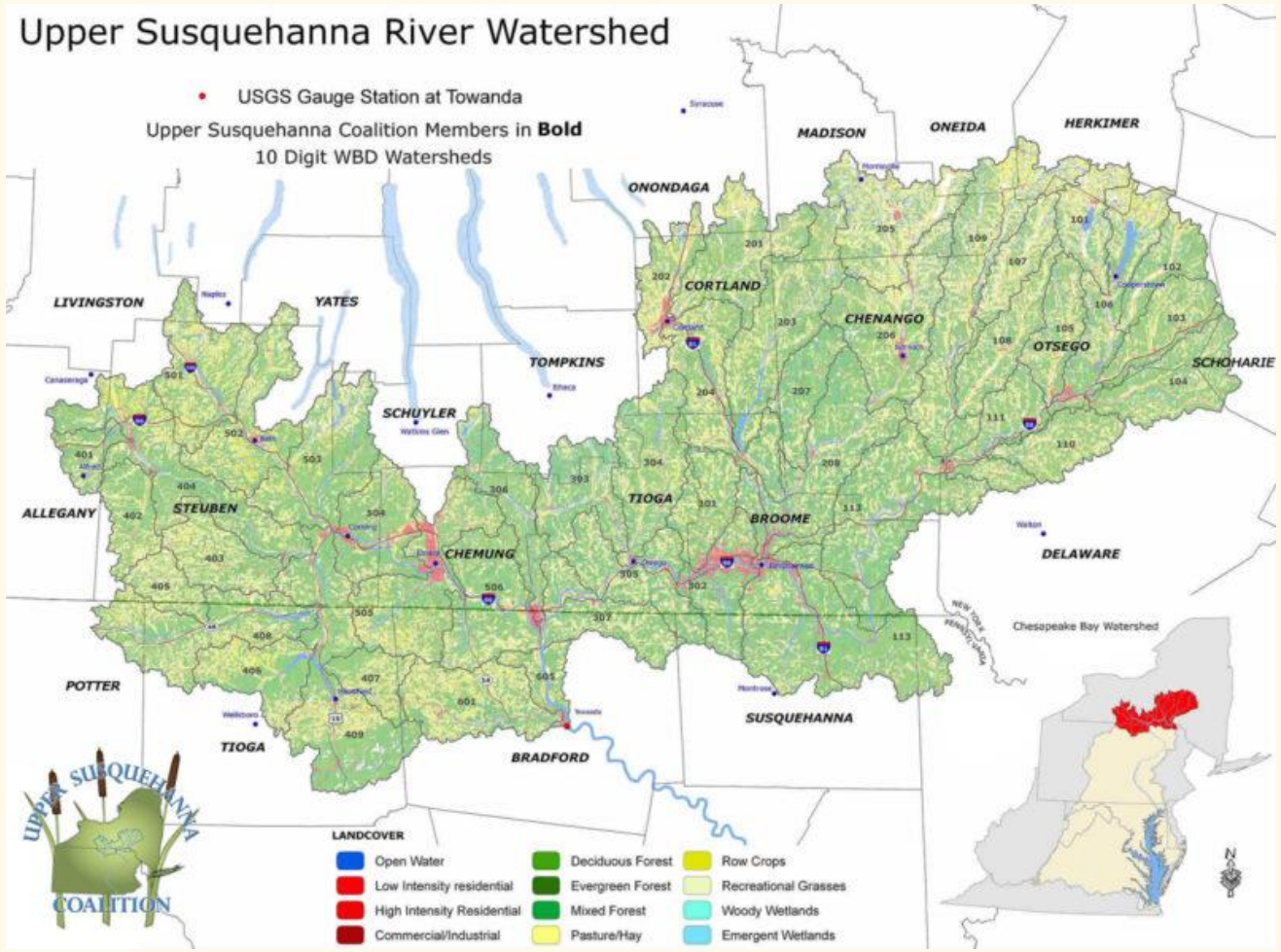
Intro: Community Science Institute

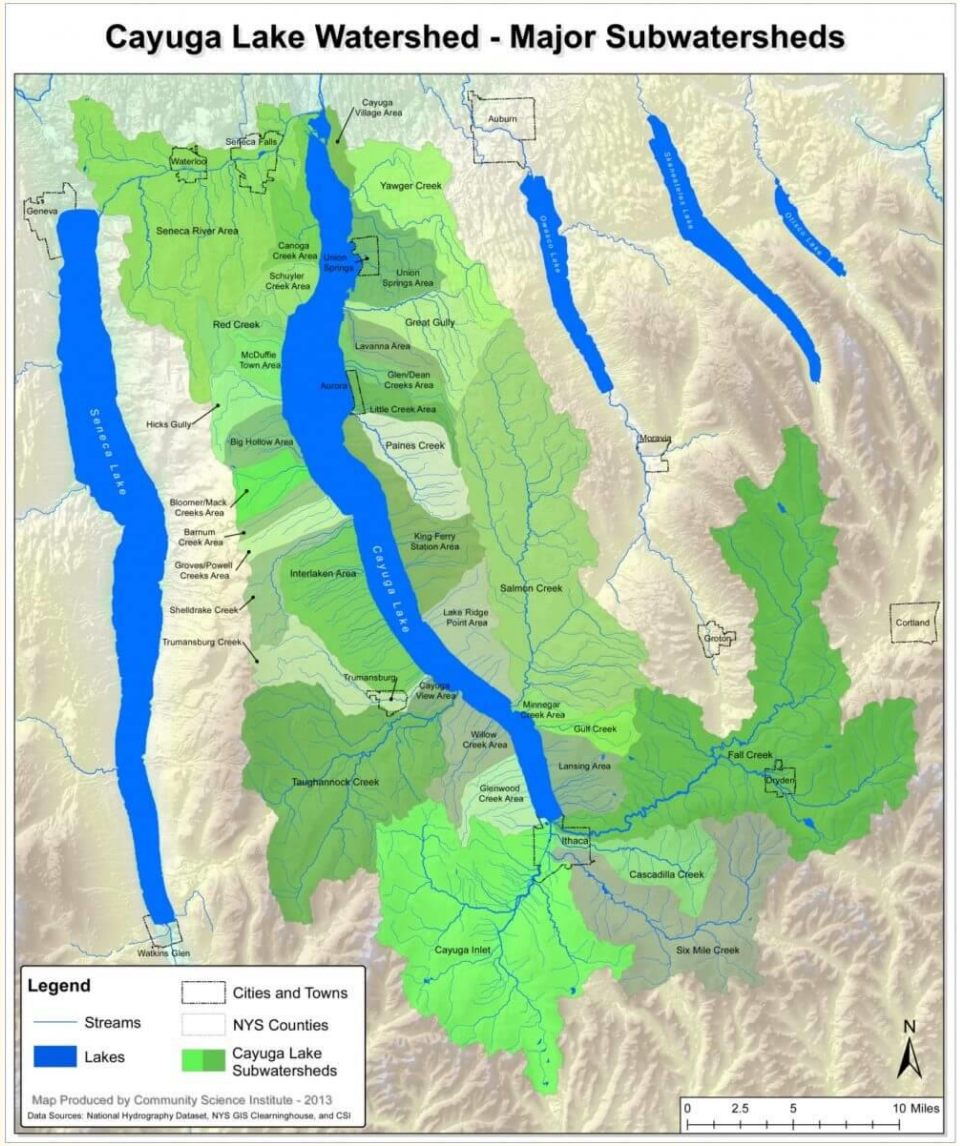
**Volunteer Monitoring & Water Quality Databases**

Fee-for-Service Water Testing

Outreach and Education

# Town of Danby Watersheds



# CSI's Volunteer Water Monitoring Partnerships

## Monitoring Partnerships

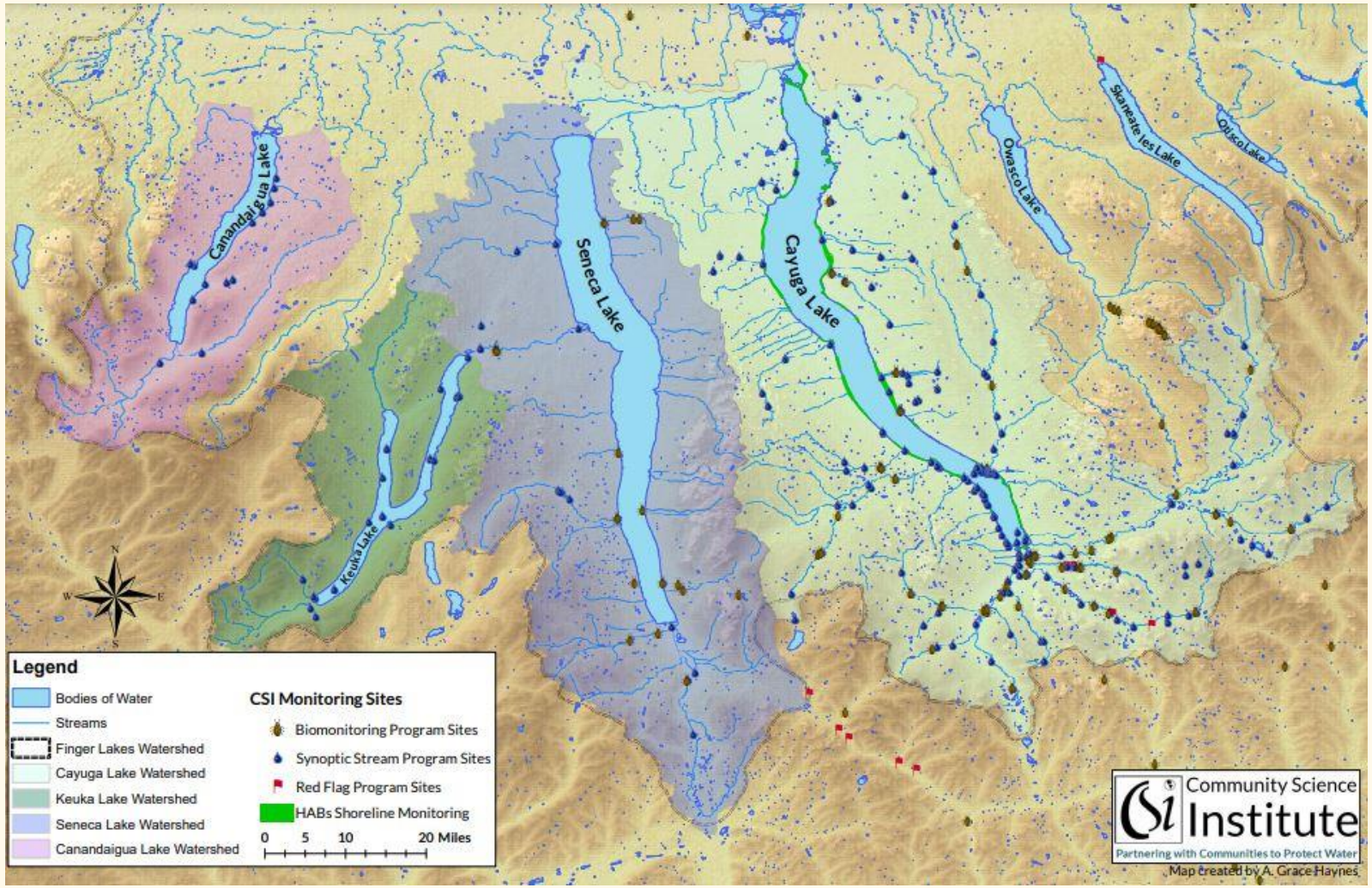
1. Synoptic Stream and Lake Monitoring

2. Biomonitoring

3. Harmful Algal Bloom (HAB) Monitoring

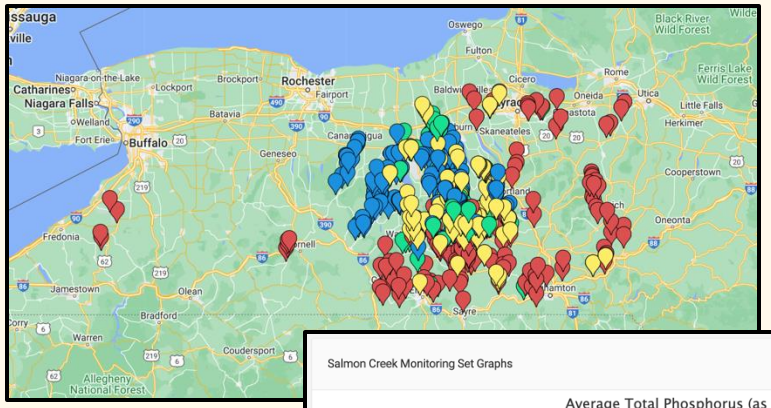
4. Other projects as need or interest arises

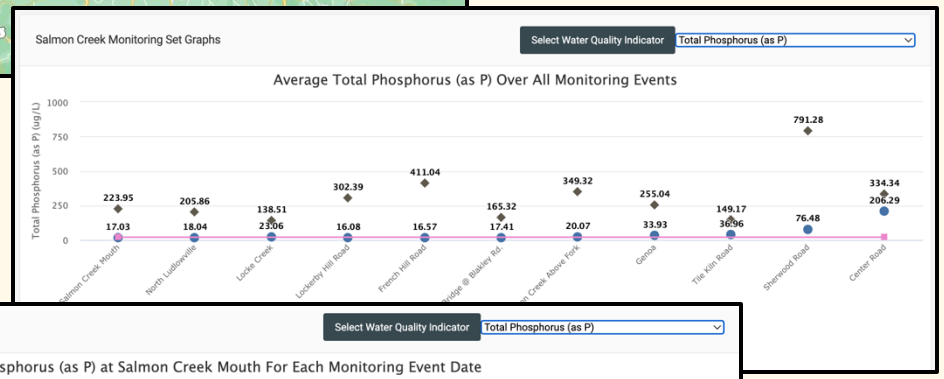
*We retired CSI's Red Flag Monitoring Program at the end of 2024*

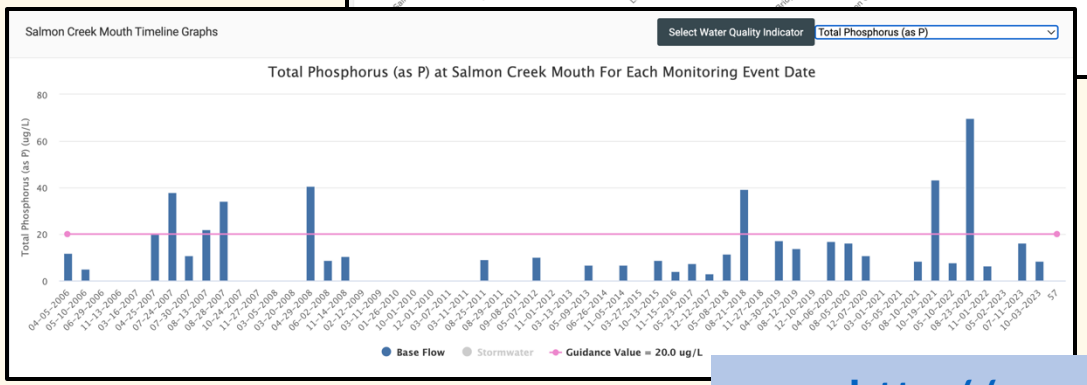


# CSI's Water Quality Database

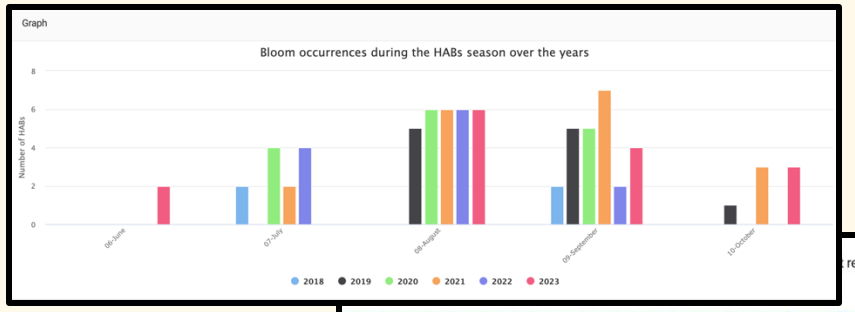
## Stream and Lake Chemistry

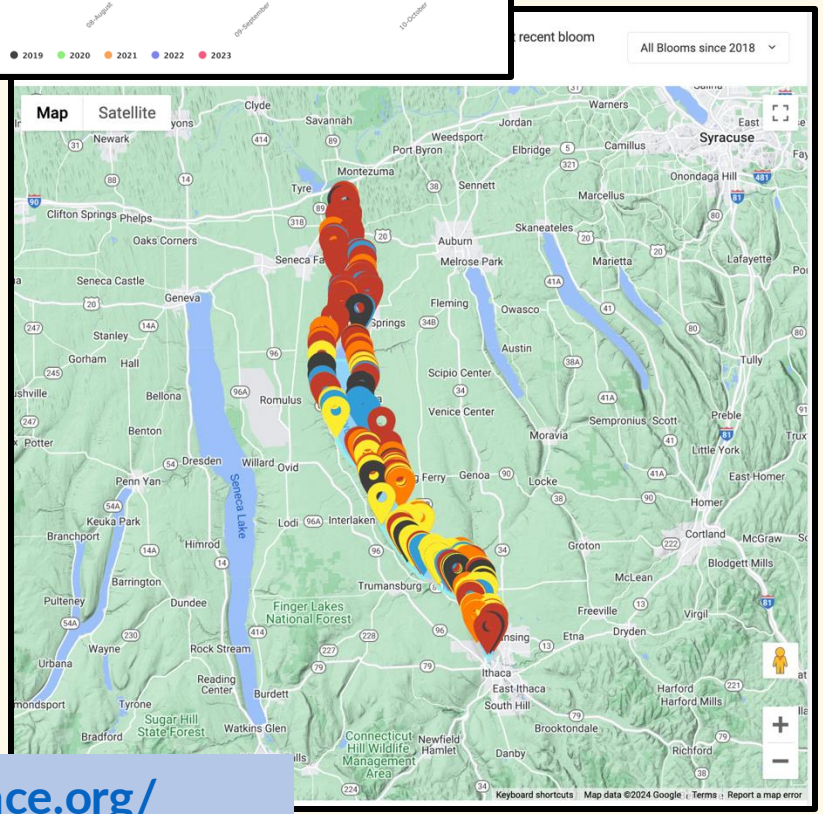



## Harmful Algal Blooms




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

# Synoptic Stream and Lake Monitoring

David has been monitoring water quality on Fall Creek with us since 2002!

**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
- Sediment
- Bacteria
- Salt
- pH, conductivity, temperature, etc.

# Synoptic Stream and Lake Monitoring

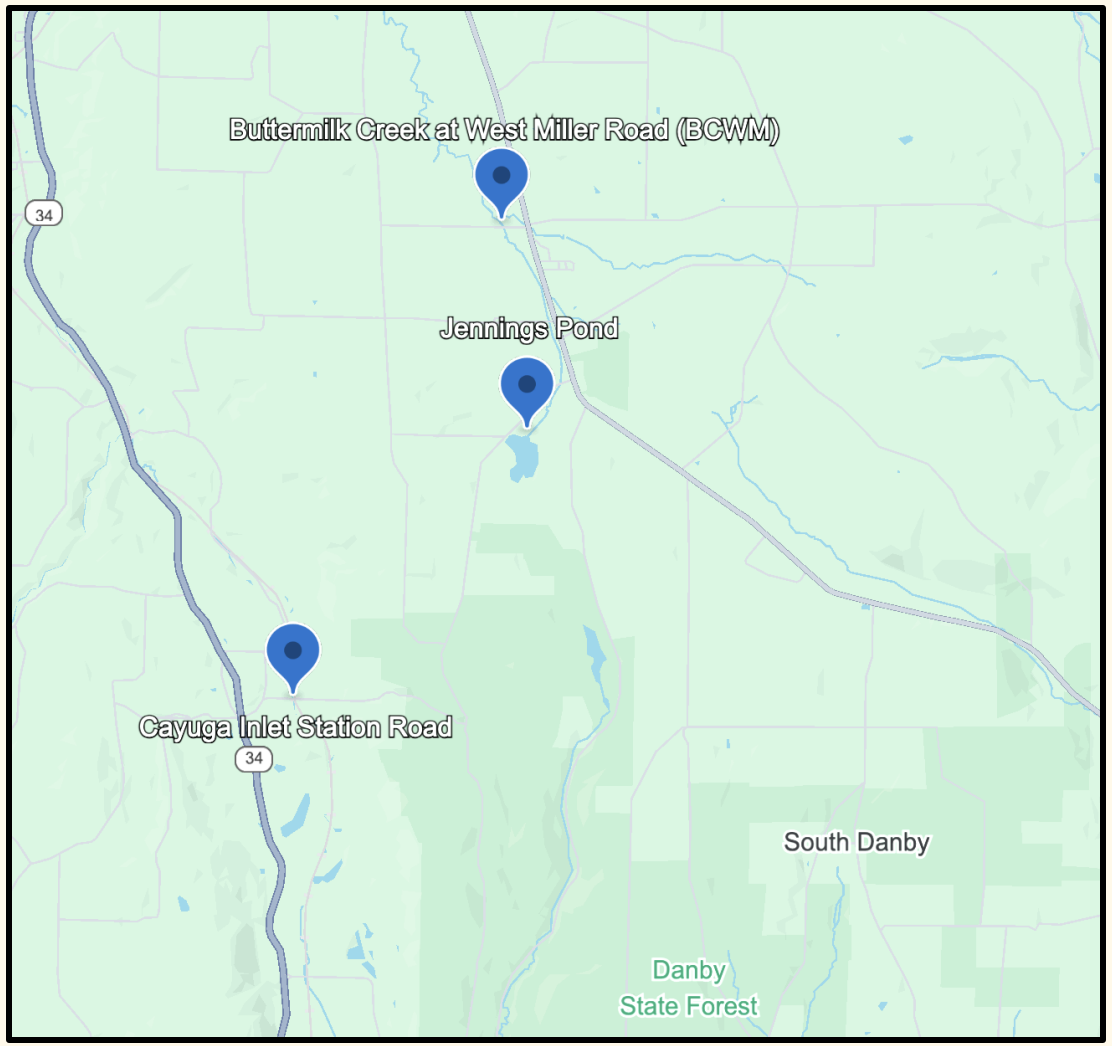


Davi
monit
quality
with us

Volunteers collect samples from their designated stream 3 times each year under "stormwater" & baseflow conditions

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

# Synoptic Monitoring in the Town of Danby




Volunteers have been monitoring Cayuga Inlet since 2007

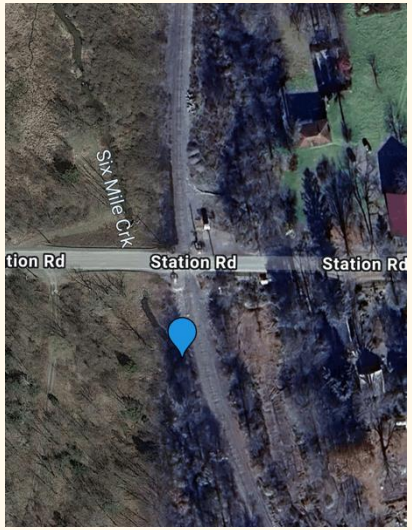
There are 25 actively monitored sites on Cayuga Inlet and its tributaries

Three sites in the Town of Danby:

- Buttermilk Creek at West Miller Road
- Buttermilk Creek at Jennings Pond
- Cayuga Inlet Station Road

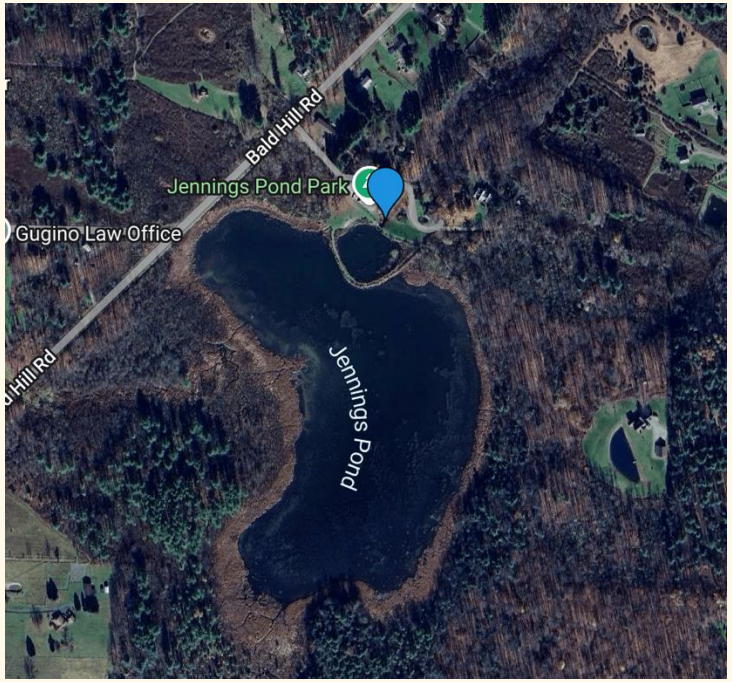
# Synoptic Monitoring in the Town of Danby

- Cayuga Inlet Station Road
  - Low *E.coli*, chloride, conductivity, nutrients
  - Sometimes elevated phosphorus

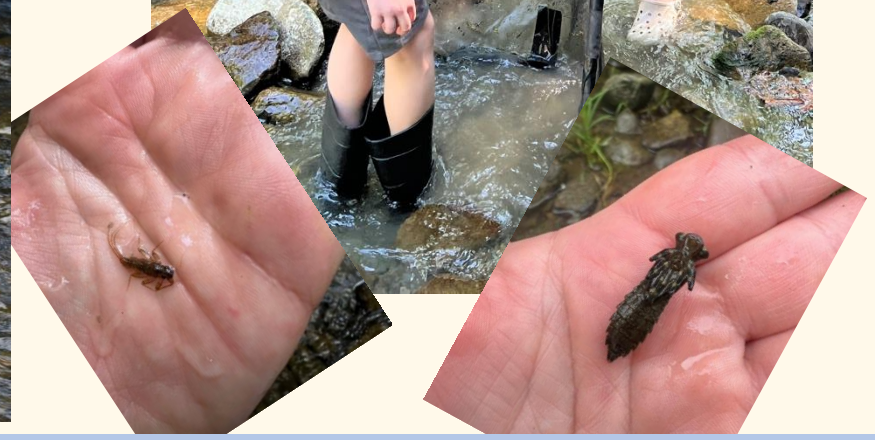



- Buttermilk Creek at West Miller Road
  - Only routinely monitoring for E.coli
    - *E.coli* has sometimes reached high levels, but generally low

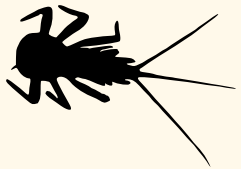

- Buttermilk Creek at Jennings Pond
  - Low chloride, *E.coli*, nitrogen, conductivity
  - Phosphorus sometimes elevated, particularly in the summer

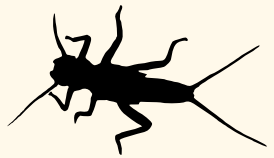


# Biomonitoring Partnership



# 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

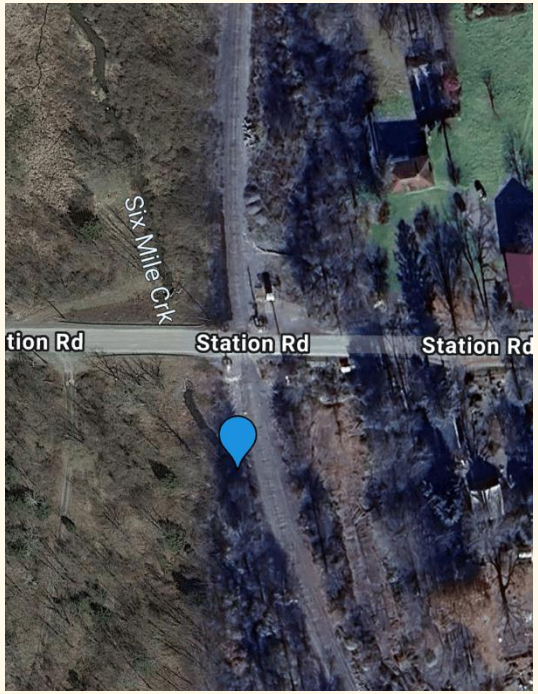
Biological Monitoring Results

# Biomonitoring in the Town of Danby

Cayuga Inlet or its tributaries are monitored each year

These streams consistently have BAP scores of "non-impacted" or "slightly impacted"

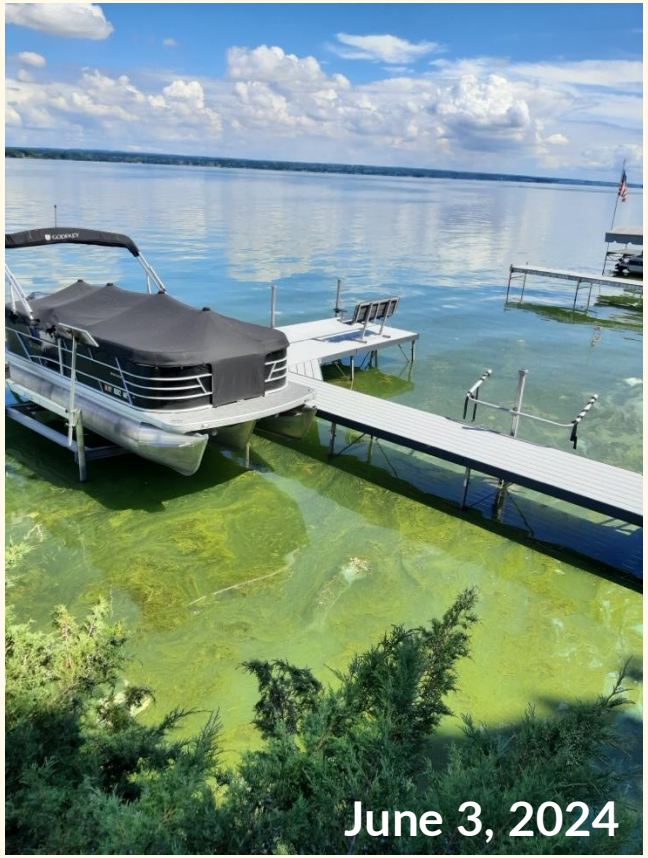
| |
|---|
| non-impacted |
| slightly impacted |
| moderately impacted |
| severely impacted |



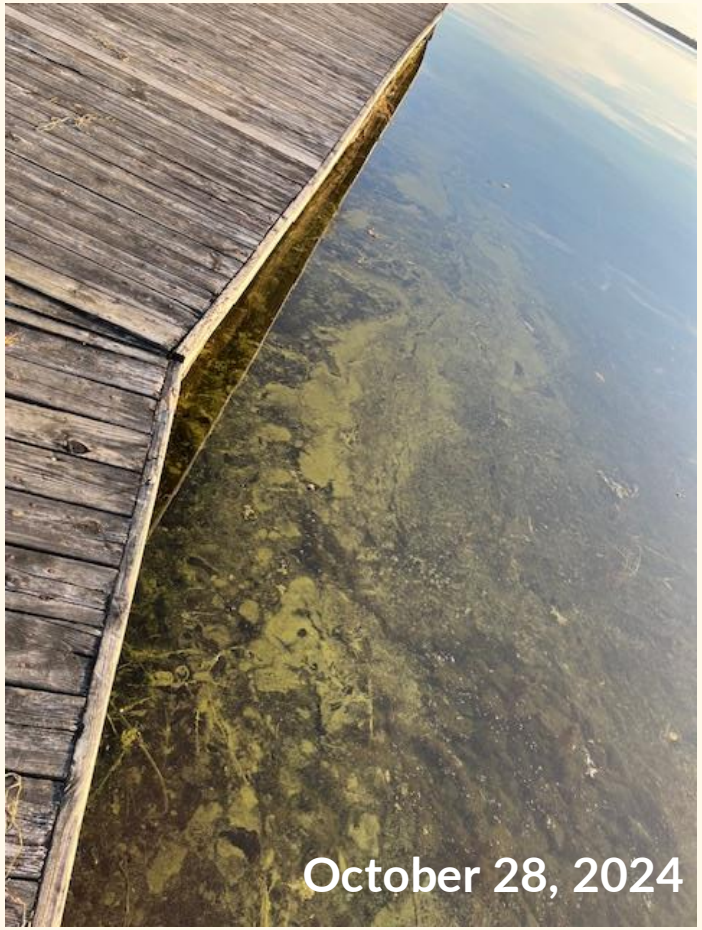

## Most Recent Biomonitoring Event in Danby

| | Total Family Richness | EPT Richness | Family Biotic Index | Percent Model Affinity | Density Orgs/sample | BAP Value Biological Assessment Profile |
|---|---|---|---|---|---|---|
| **Cayuga Inlet 8/27/20** 42.3201519, 76.518236W upstream of Station Rd, West Danby | **17.0** no impact | **7.0** slight impact | **4.68** slight impact | **60%** slight impact | 2,154 | **7.8*** no impact |

# 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.

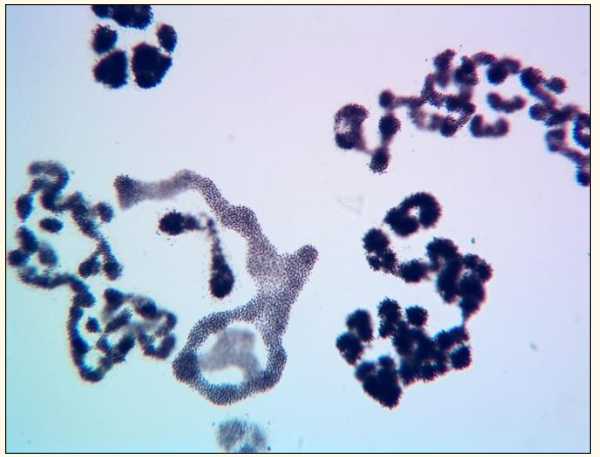
**HABs Harriers perform weekly shoreline surveys for HABs** → **Blooms are reported to CSI via HABs Hotline** → **Samples are analyzed in CSI's state certified lab** → **CSI alerts public to HABs**

*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



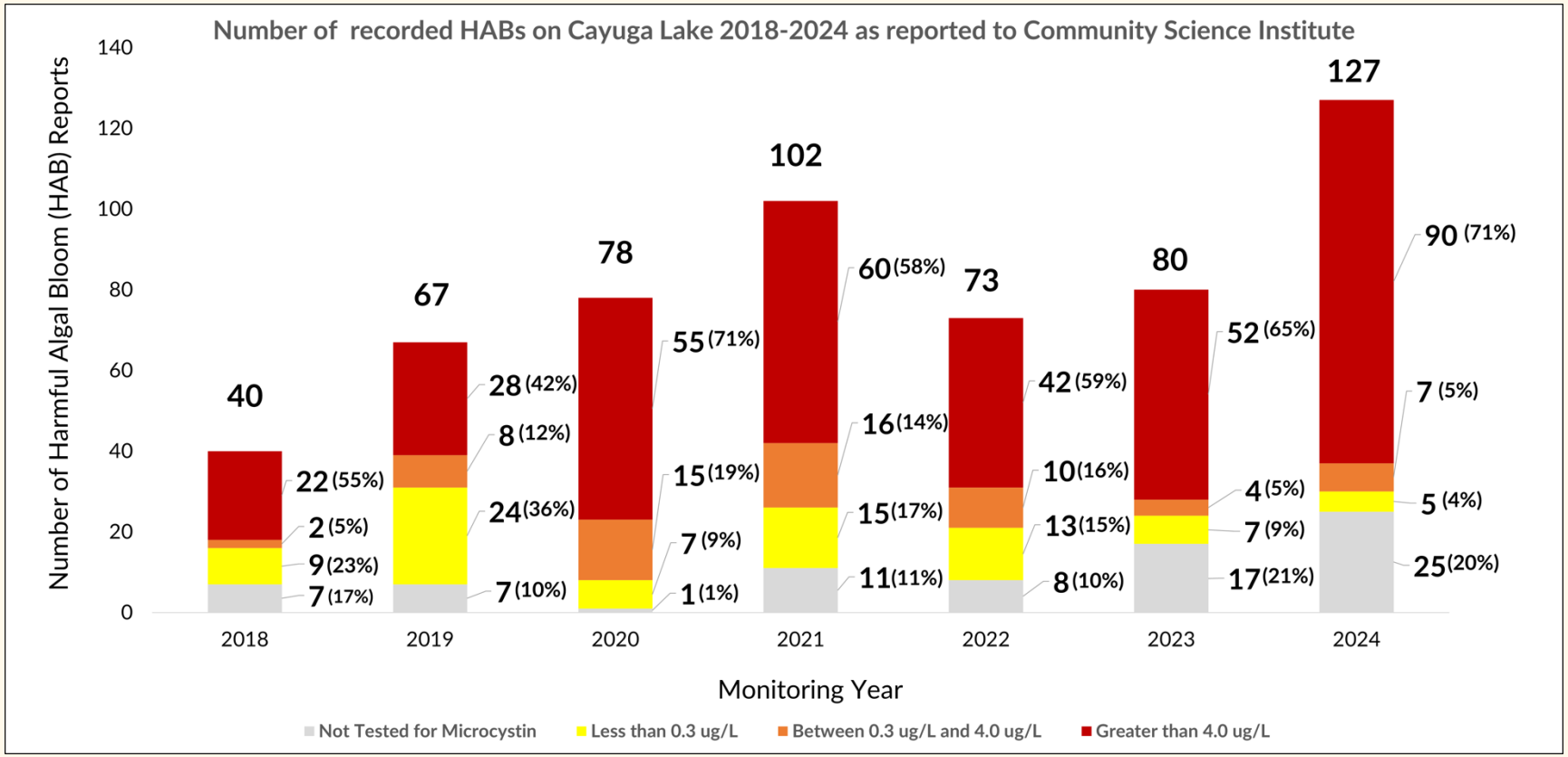
*Microcystis sp.*

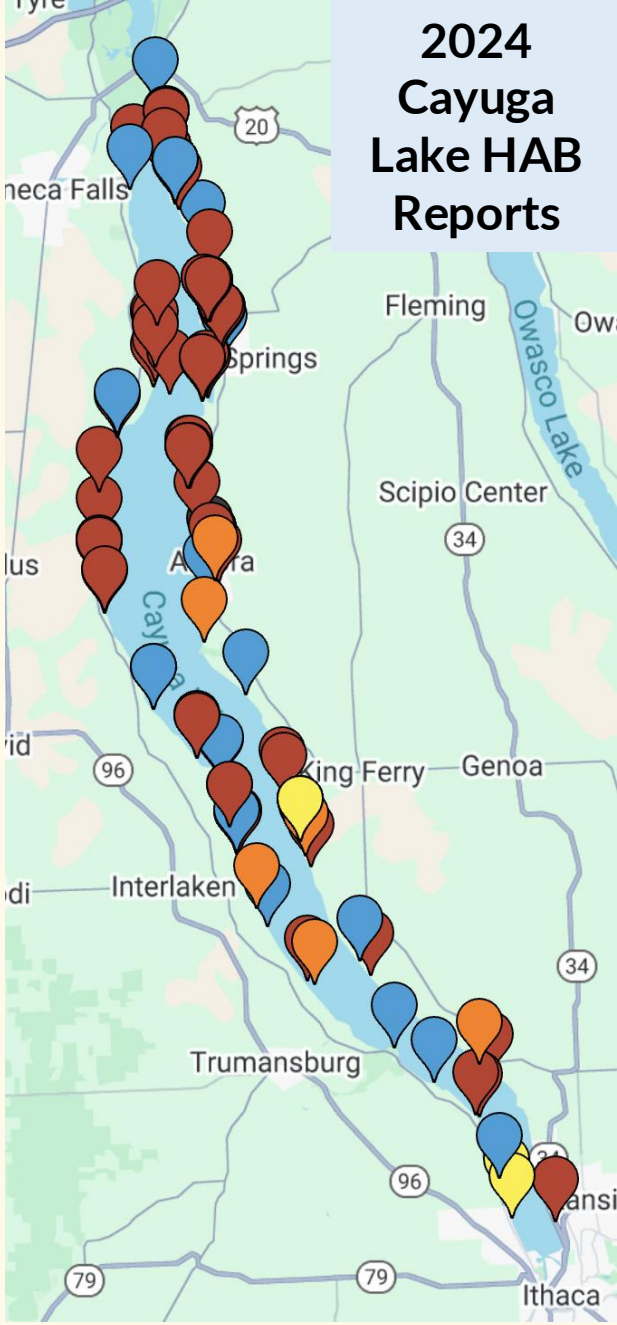
**Bloom information is uploaded to CSI's NEW HABs Database**

CSI reports all blooms to county health department officials and NYSDEC

*Dolichospermum sp.*

# Cayuga Lake Harmful Algal Bloom (HAB) Monitoring Partnership



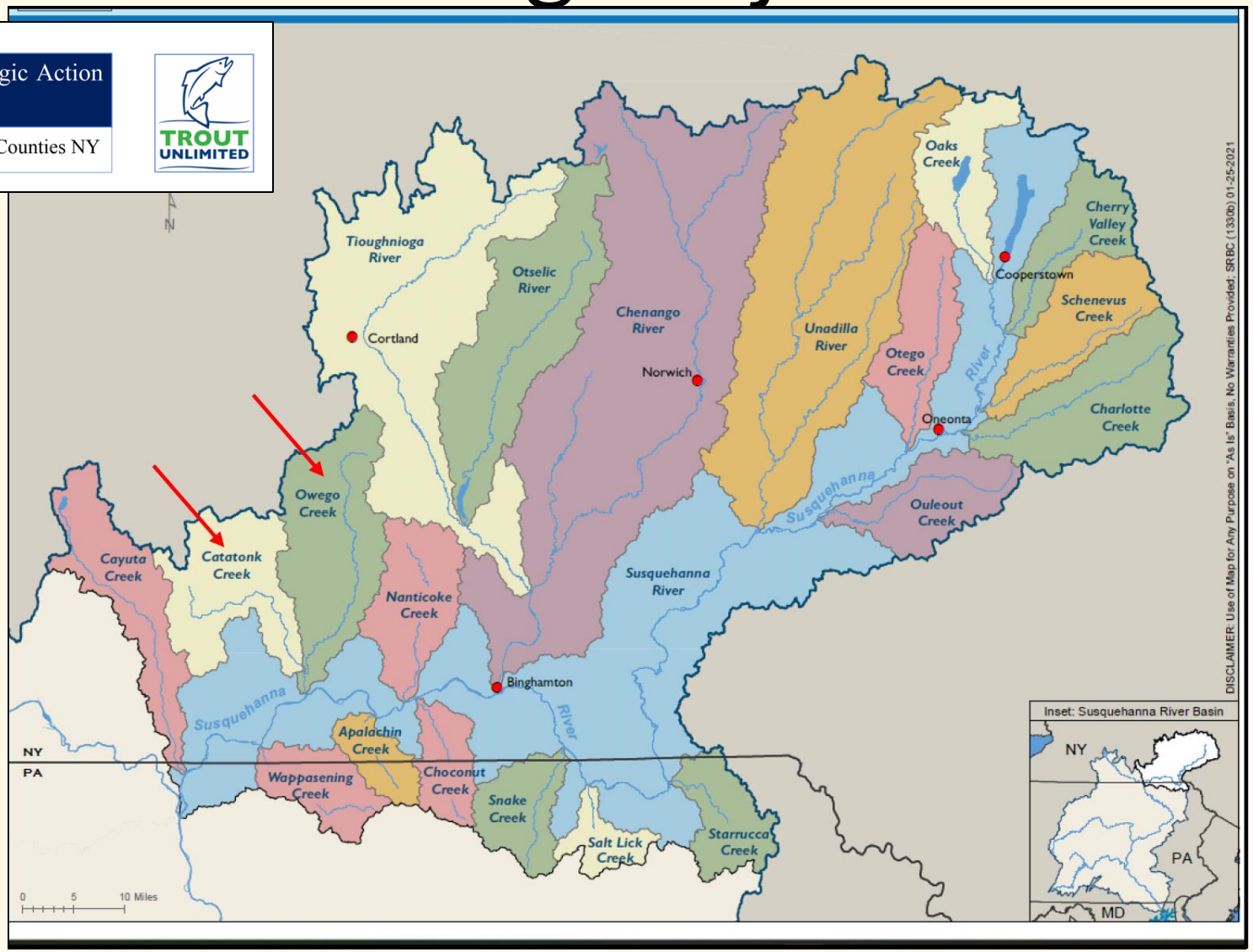



# NEW! Owego Creek Monitoring Project

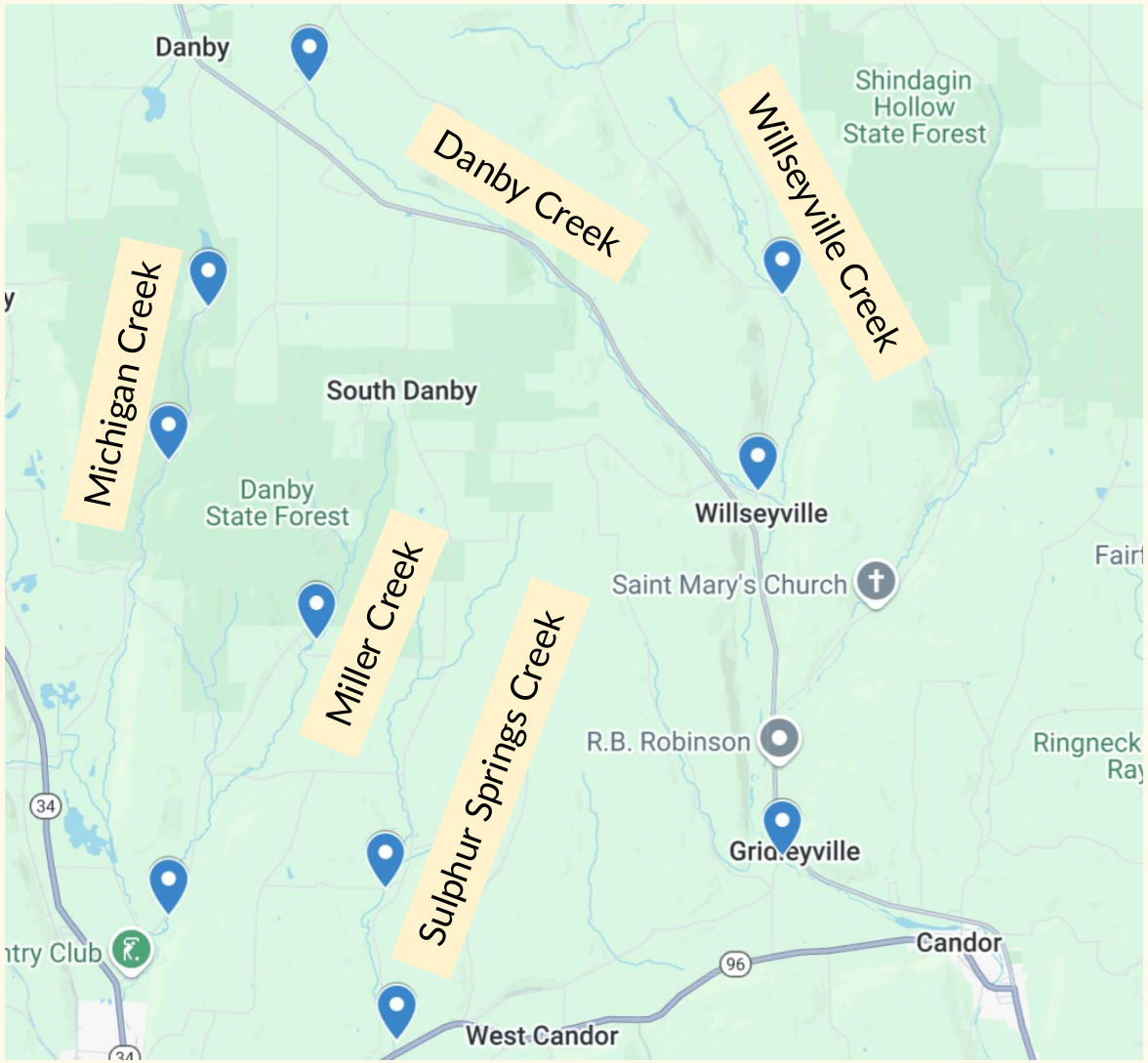
Trout Unlimited Watershed Strategic Action Plan (2024-2029):

Owego Creek–Tioga/Tompkins/Cortland Counties NY

AL HAZZARD CHAPTER
BINGHAMTON NY
TROUT UNLIMITED #031



# NEW! Owego Creek Monitoring Project



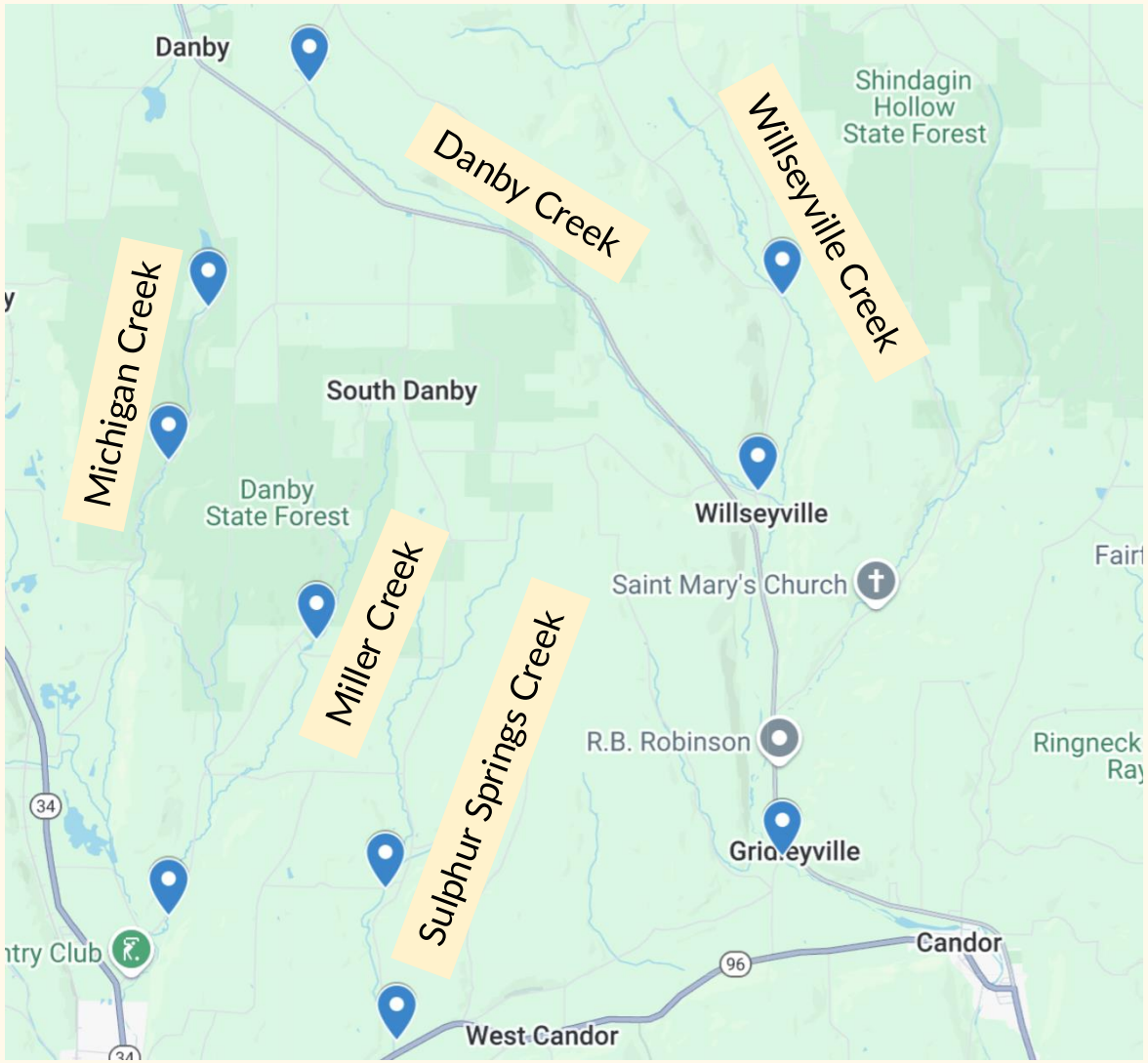

Partnership with the Al Hazzard Chapter of Trout Unlimited

Project duration: 2025-2026

Monitoring five tributaries of Catatonk Creek *(tributary of Owego Creek)* for water quality indicators relevant to trout health

Goal: Identify critical trout spawning habitat in tributaries of the Owego Creek system so that native, wild trout can be reintroduced or introduced in these areas.

# NEW! Owego Creek Monitoring Project





**Only one spot remaining at Saturday's training!**

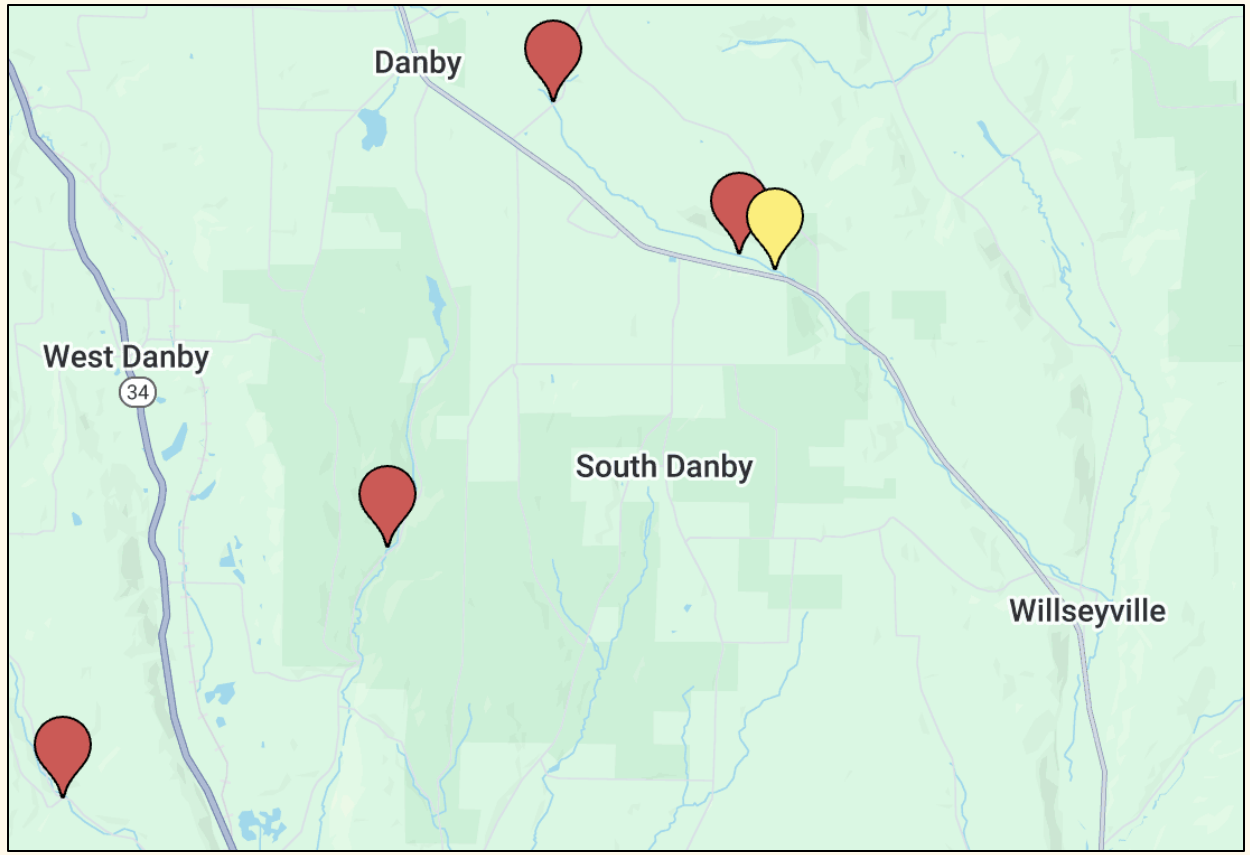
# Historic Monitoring in Danby – Red Flag Monitoring Program

**Purpose:** Establish baseline water quality for parameters related to shale gas wells, specifically hydrofracking; and should hydrofracking begin in New York, to document whether impacts on streams and lakes occur as a result.

**Monitored streams for:**

- Temperature
- pH
- Dissolved oxygen
- Total hardness
- Conductivity

Volunteers performed quality-assured tests in the field using testing kits

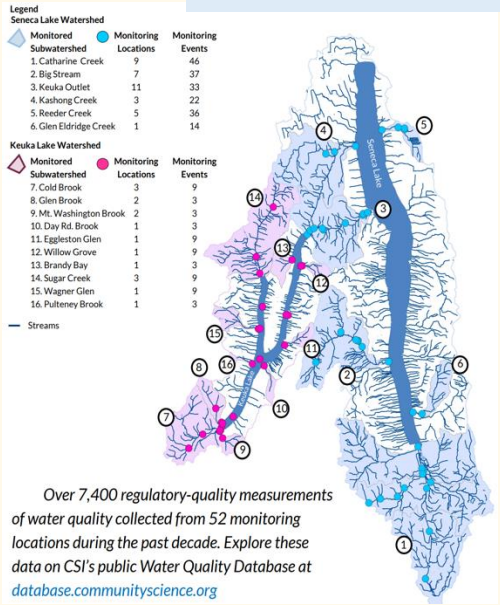


# CSI Data Makes a Difference

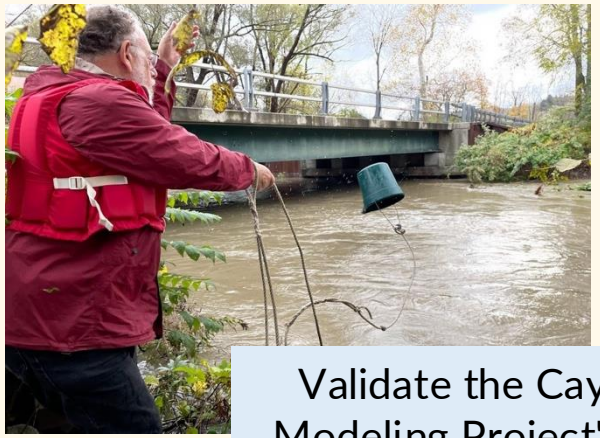
Removal of the southern end of Cayuga Lake from the 303(d) list for pathogenic bacteria

Trumansburg Wastewater Plant upgrades

Seneca-Keuka 9E Plan




*Over 7,400 regulatory-quality measurements of water quality collected from 52 monitoring locations during the past decade. Explore these data on CSI's public Water Quality Database at database.communityscience.org*



Validate the Cayuga Lake Modeling Project's model of Fall Creek phosphorus loading

Peer-reviewed research

**Using Citizen Based Science to Provide Insights on Toxic Cyanobacteria Blooms in a New York Lake**

Howarth, R., Swaney, D., Smith, C., Marino, R., Figueroa, A., & Penningroth, S. (2023). Using Citizen Based Science to Provide Insights on Toxic Cyanobacteria BLooms in a New York Lake. Abstract of presentation at the meeting of the *Association of the Sciences of Limnology and Oceanography (ASLO)* "Resilience and Recovery in Aquatic Ecosystems" – Mallorca, Spain; June 4-9, 2023

**Community-Based Risk Assessment of Water Contamination from High-Volume Horizontal Hydraulic Fracturing**

Penningroth, S. M., Yarrow, M. M., Figueroa, A. X., Bowen, R. J., & Delgado, S. (2013). Community-Based Risk Assessment of Water Contamination from High-Volume Horizontal Hydraulic Fracturing. NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy, 23(1), 137–166. https://doi.org/10.2190/NS.23.1.i

**Long-Term Study of Soluble Reactive Phosphorus Concentration in Fall Creek and Comparison to Northeastern Tributaries of Cayuga Lake, NY: Implications for Watershed Monitoring and Management**

O'Leary, N.; Johnston, R.; Gardner, E.L.; Penningroth, S.M.; Bouldin, D.R. Long-Term Study of Soluble Reactive Phosphorus Concentration in Fall Creek and Comparison to Northeastern Tributaries of Cayuga Lake, NY: Implications for Watershed Monitoring and Management. *Water* 2019, *11*, 2075. https://doi.org/10.3390/w11102075

*Read "The Power of Community-Collected Data" for more details: http://www.communityscience.org/2022/09/22/power-of-community-collected-data/*

Community Science Institute
Partnering with Communities to Protect Water

# Agenda

Intro: Community Science Institute

Volunteer Monitoring & Water Quality Databases

**Fee-for-Service Water Testing**

Outreach and Education

# 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.*

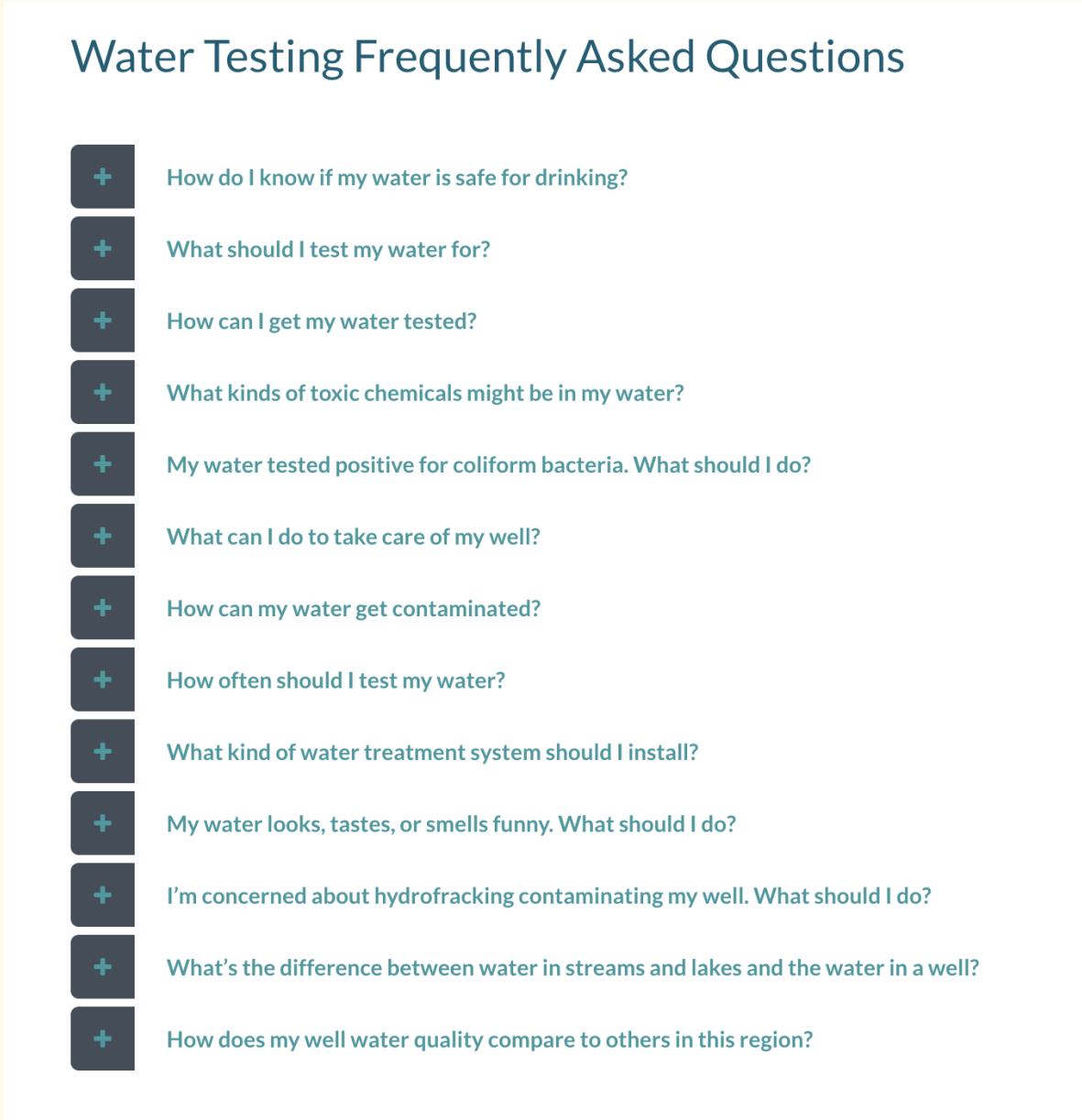
# Resources

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)

# Fee-for-Service Water Testing Q&A

## Testing Your Water at CSI's Certified Lab

**Hours of Operation:** Monday – Friday 9 AM – 5 PM

**Sample Drop-Off Hours:**

- **Monday – Thursday**
- **9:00 AM – 3:00 PM**

*Please note: Samples dropped off outside of these times may or may not be accepted, at the discretion of CSI staff. If you are unable to drop off samples during these hours, please call 607-257-6606 to make special arrangements.* ***Bacteriological samples cannot be accepted on Fridays.***

# Agenda

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Fee-for-Service Water Testing

**Outreach and Education**

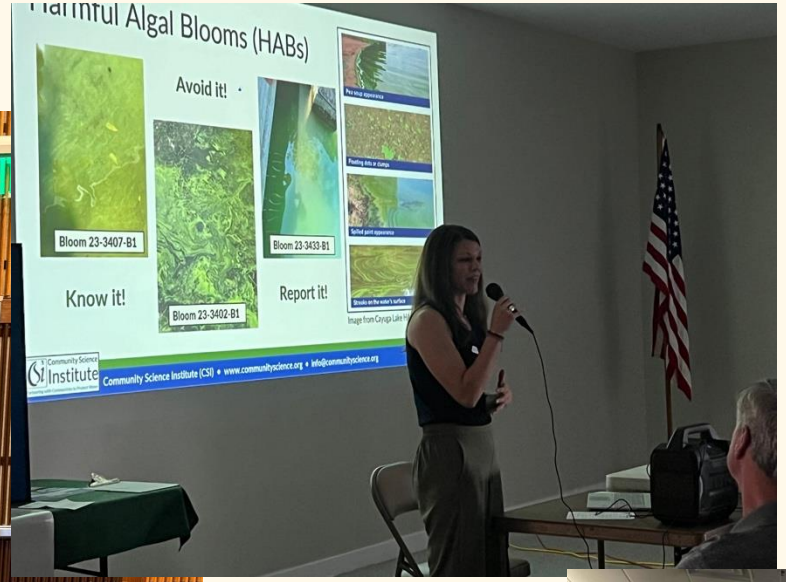
# Journey of Water Summer Youth Education Series

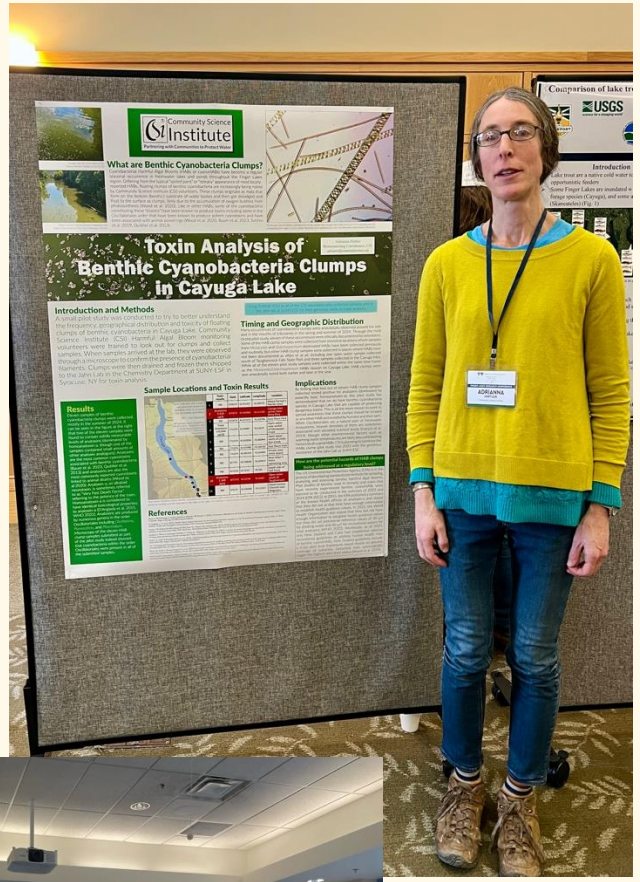


The JOURNEY of Water
Community Science Institute
Partnering with Communities to Protect Water

PARK FOUNDATION

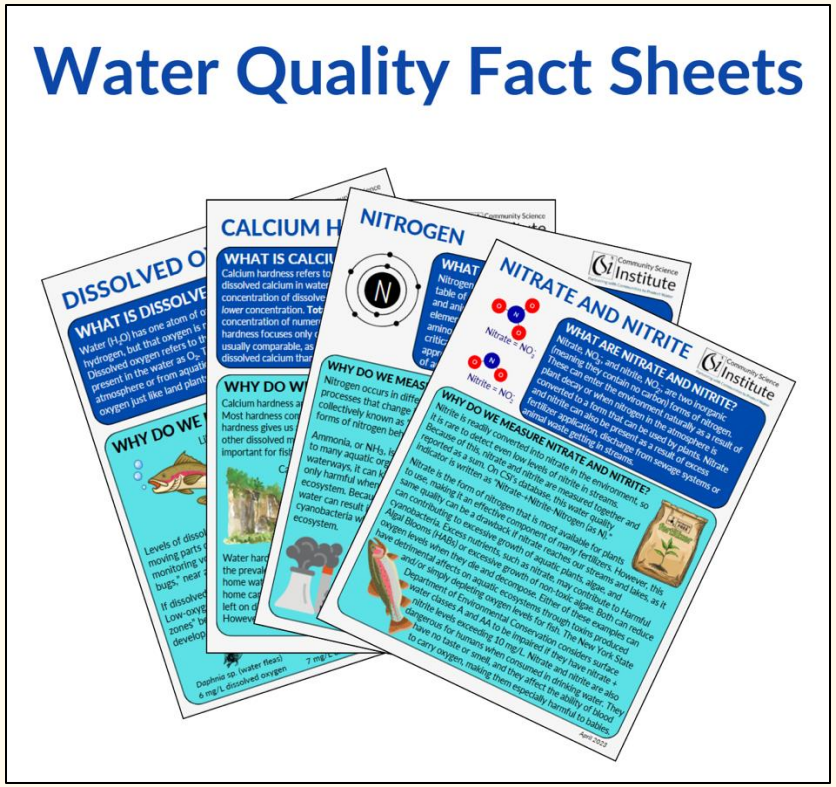
# Public Events and Presentations


# Educational Materials


**Annual Water Bulletin Newsletters**




**Online Learning Materials**


**Monthly Email Updates**

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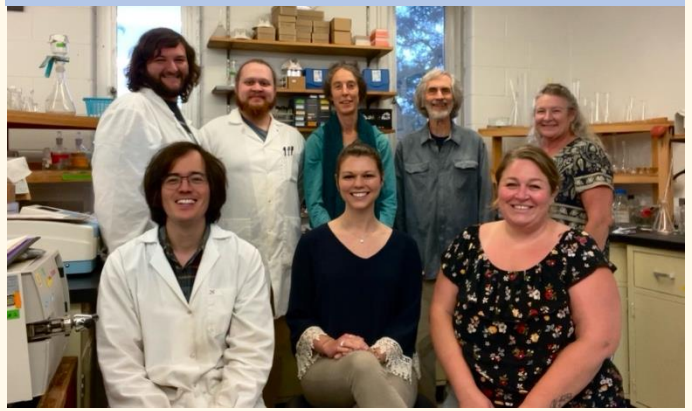
# Acknowledgements


**Dedicated volunteers!**

## CSI Staff Past and Present



## Partners

## CSI Members

## 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 the shore of Lake Ontario

*Water from the Town of Danby flows from the Cayuga Inlet, into Cayuga Lake, out the Seneca River where it joins the Oswego River, and into Lake Ontario*