Partnering with communities to monitor water quality in Cayuga County

Cayuga County WQMA Meeting
5/4/2023, 10 AM

Grascen Shidemantle, Ph.D.
Executive Director

Community Science Institute
Partnering with Communities to Protect Water

Agenda

- Introduction to CSI
- Synoptic Stream and Lake Monitoring Partnership in Cayuga County
- Harmful Algal Bloom Monitoring Partnership in Cayuga County
- Biomonitoring Partnership in Cayuga County
- CSI and WQMA – how can we work together?

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Community Science Institute

Nonprofit 501(c)3 Organization

NYSDOH and EPA Certified Lab

Lake & Stream Chemistry

Volunteer Water Monitoring Partnerships

HABs

BMI Monitoring

Public Water Quality Database

Outreach and Education

CSI's Mission

To empower communities to protect water quality through volunteer stream and lake monitoring.

Water Quality Monitoring Partnerships

Four Monitoring Partnerships

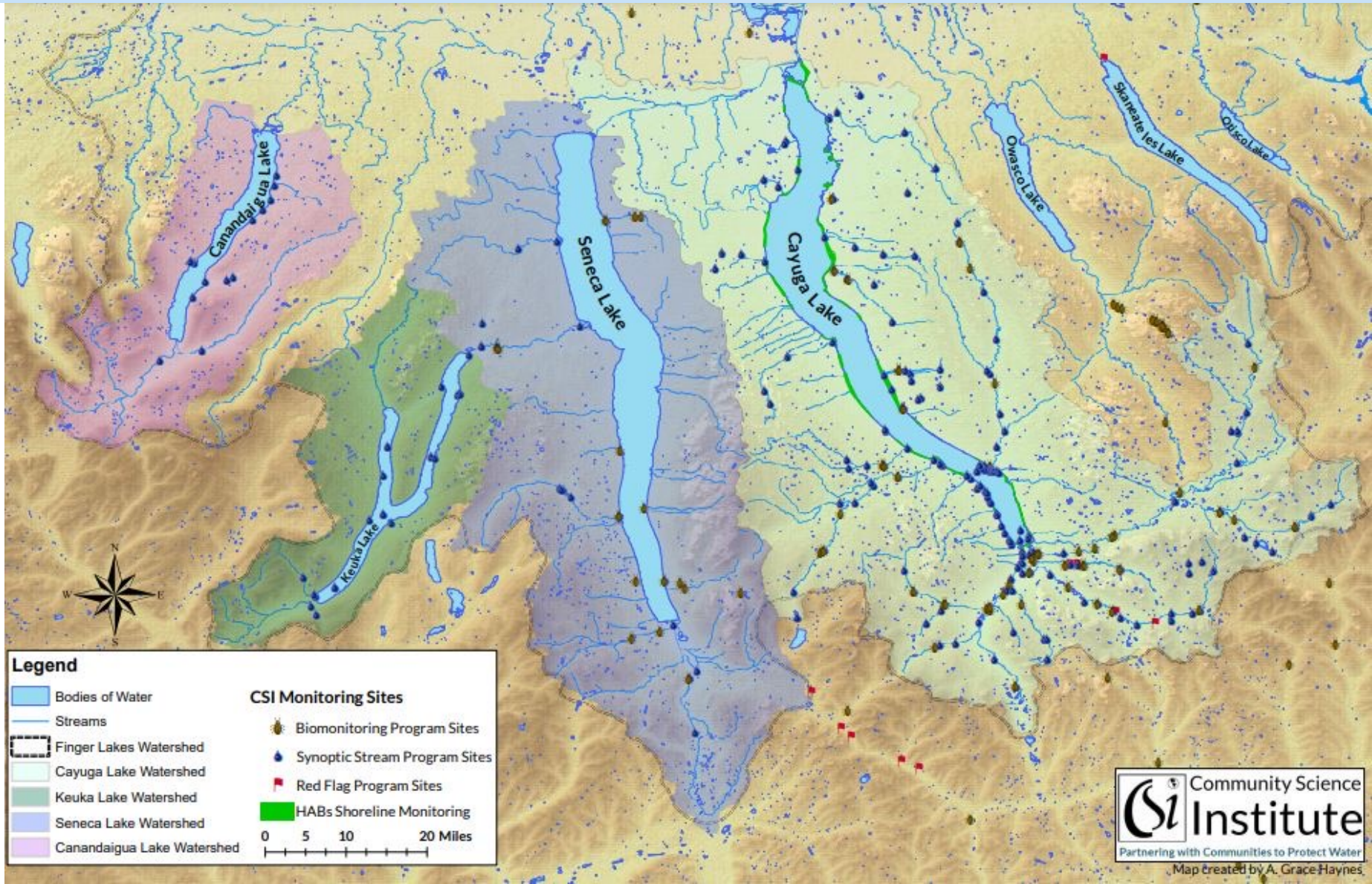
Synoptic Stream and Lake Chemistry Monitoring

Harmful Algal Bloom (HAB) Monitoring

Biomonitoring (Benthic Macroinvertebrate Monitoring)

Red Flag Monthly Stream Monitoring

CSI recruits, trains, and coordinates over 250 volunteers



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Synoptic Stream and Lake Monitoring Partnership

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

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.

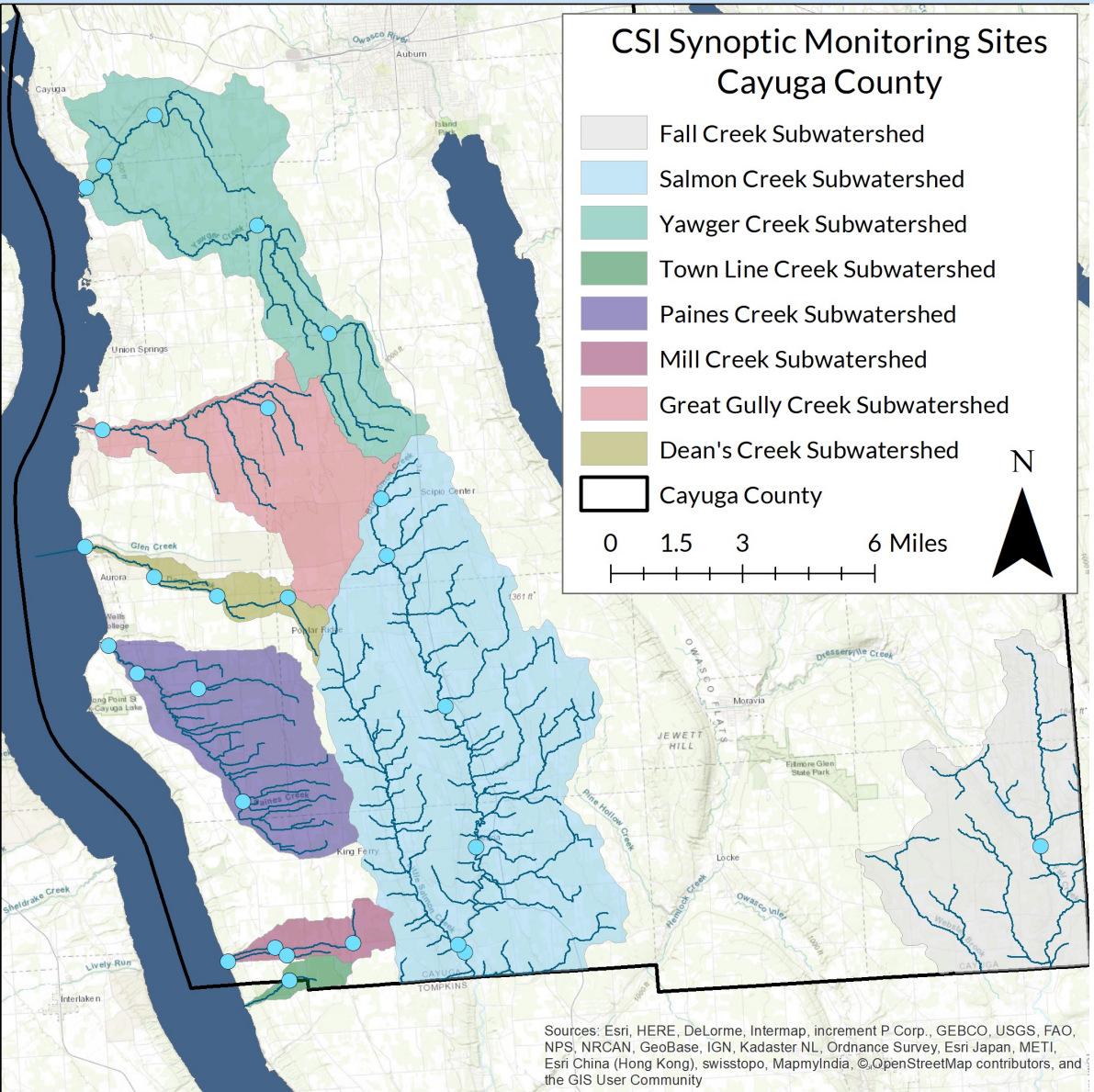
Monitor streams and lakes for:

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

Volunteers collect samples from their designated stream 3-4 times each year

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

Synoptic Stream Monitoring in Cayuga County

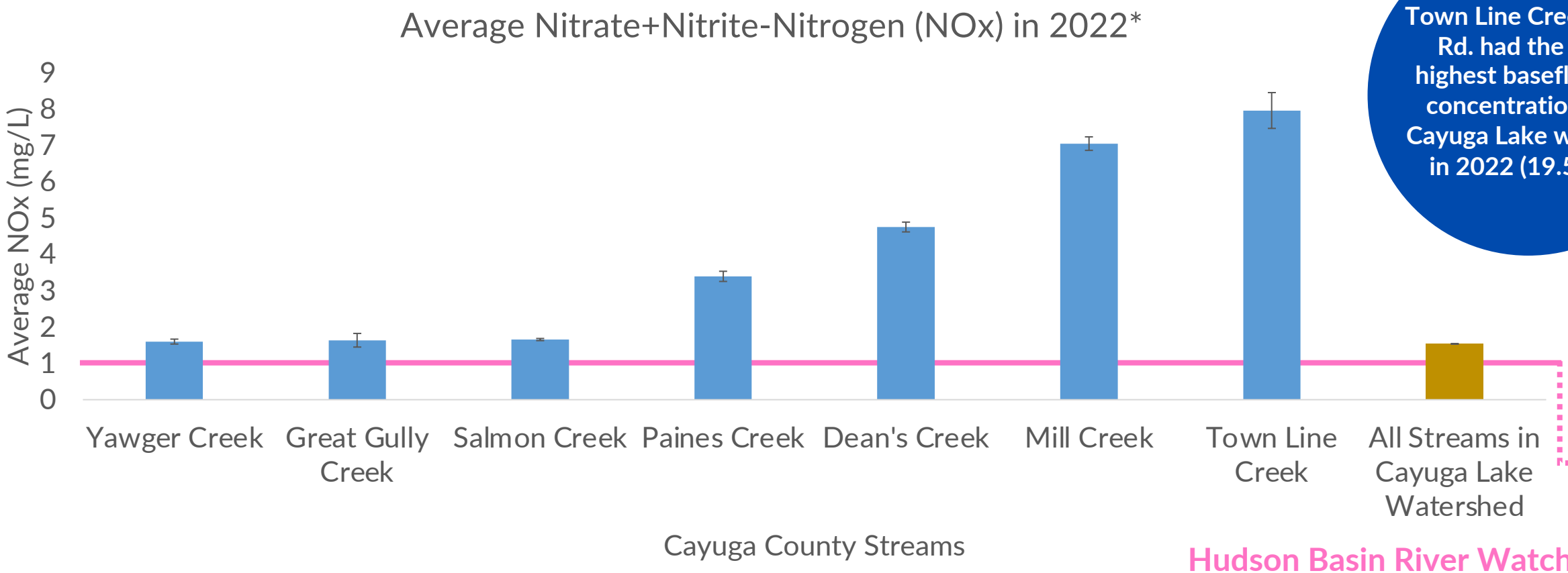


CSI's synoptic stream volunteers monitor the following Cayuga Lake tributaries in Cayuga County:

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



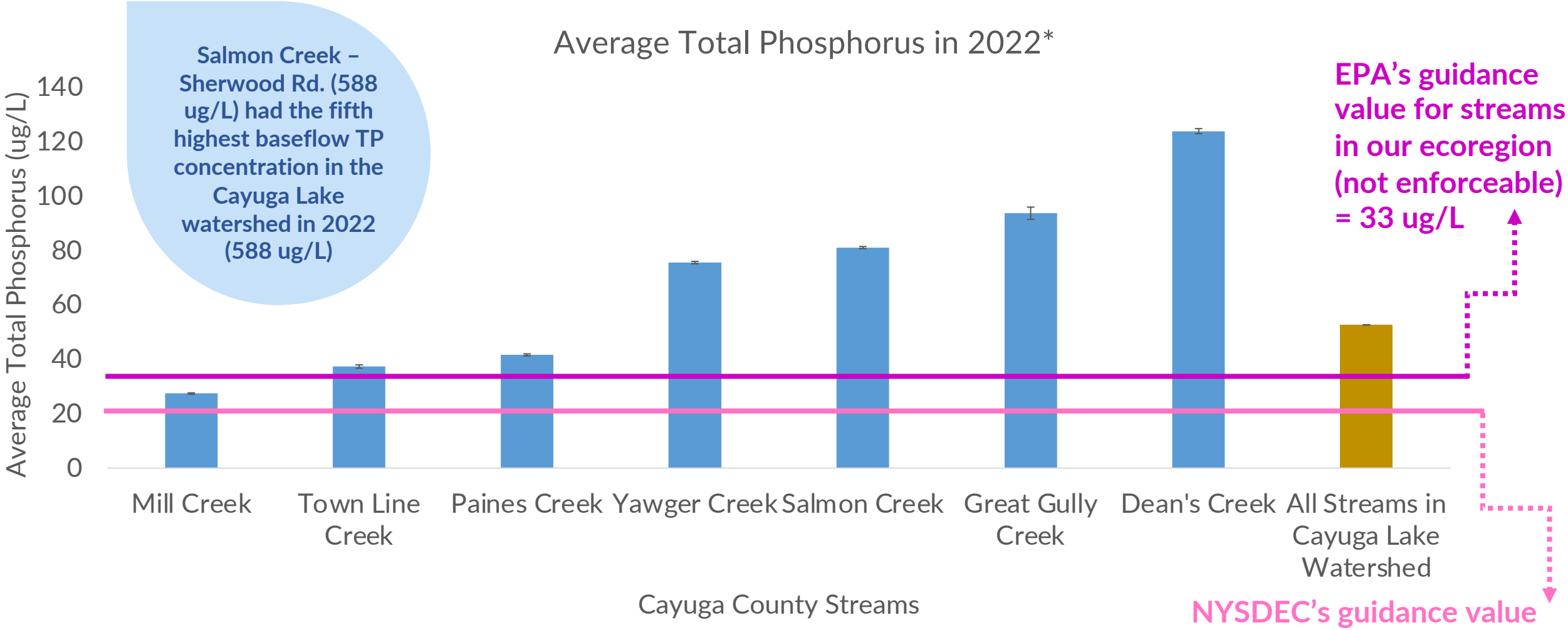
Town Line Creek – Lake Rd. had the fourth highest baseflow NOx concentration in the Cayuga Lake watershed in 2022 (19.5 mg/L)

Hudson Basin River Watch guidance value for a healthy stream (not enforceable) = 1 mg/L

**All data represented here are from baseflow sampling events.*
No stormwater data were collected in Cayuga County in 2022 due to drought-like conditions.

Synoptic Stream Monitoring in Cayuga County

Salmon Creek – Sherwood Rd. (588 ug/L) had the fifth highest baseflow TP concentration in the Cayuga Lake watershed in 2022 (588 ug/L)



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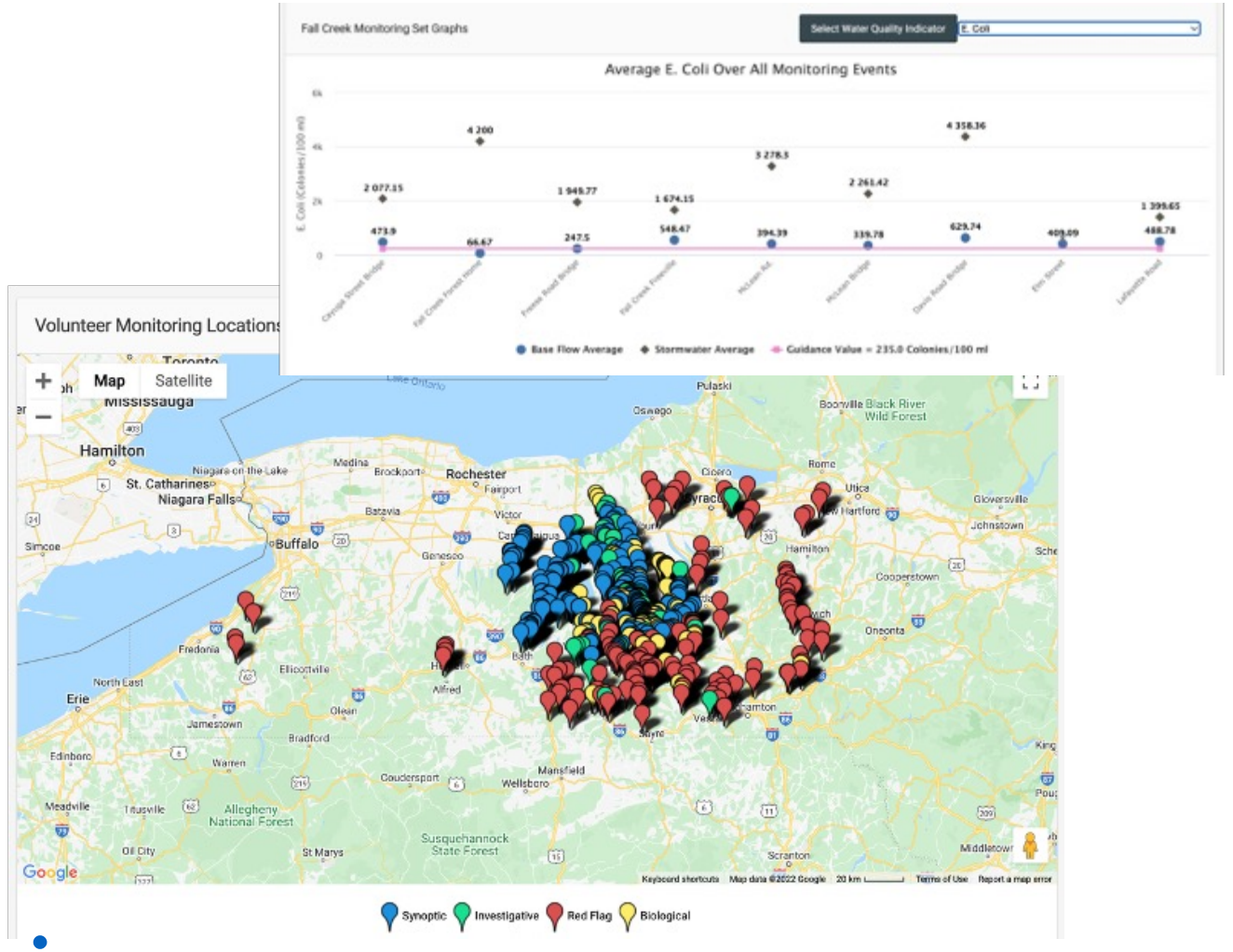
Online Public Database – Stream and Lake Chemistry

Our database houses over 100,000 regulatory-quality measurements of water quality!



www.database.communityscience.org

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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.

Test HABs samples to:

- Identify cyanobacteria genera
- Measure chlorophyll a
- Measure cyanotoxins (e.g., microcystin)

HABs Harriers perform weekly shoreline surveys for HABs

Blooms are reported to CSI via our HABs Hotline

Samples are analyzed in our state certified lab

Bloom information is uploaded to our NEW HABs Database

Collaboration with CLWN

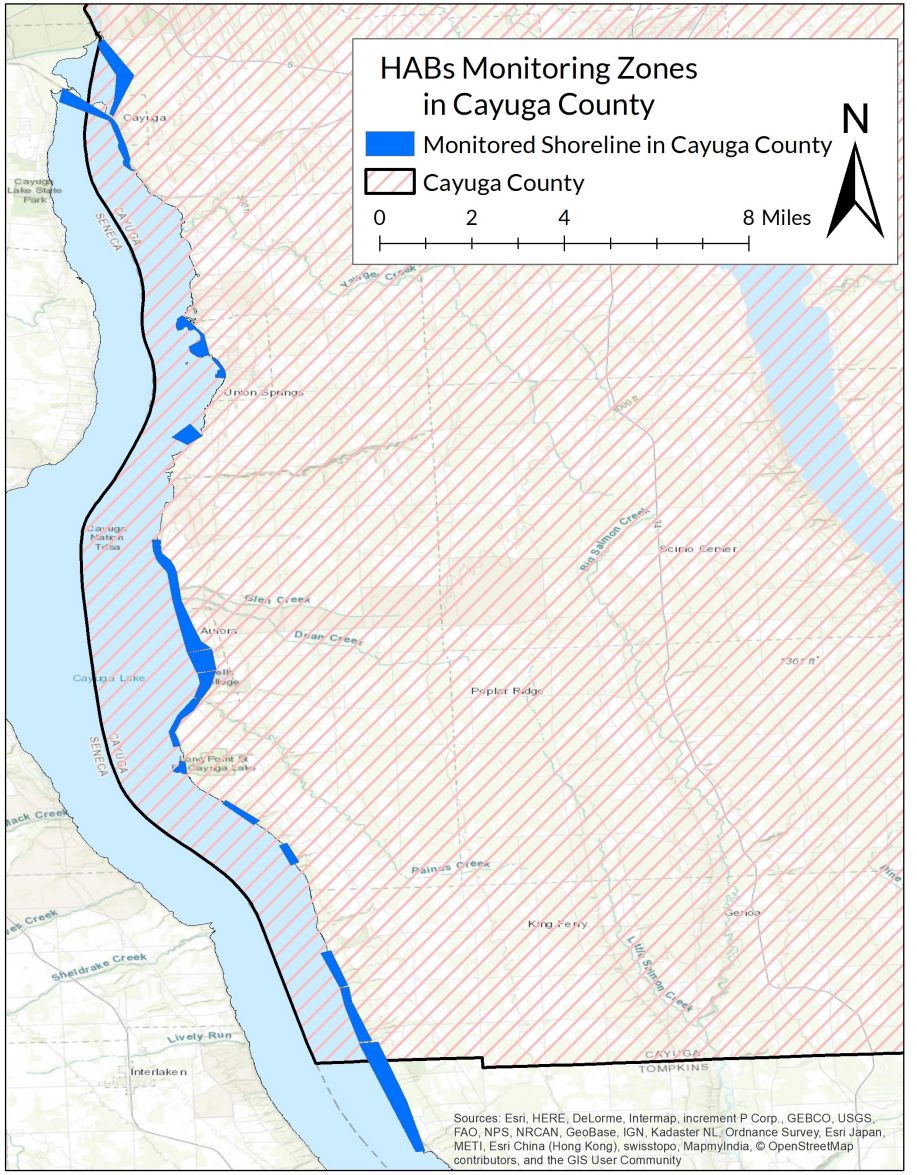
HAB Monitoring in Cayuga County

CSI's HABs Harriers monitor 53% of the shoreline in Cayuga County

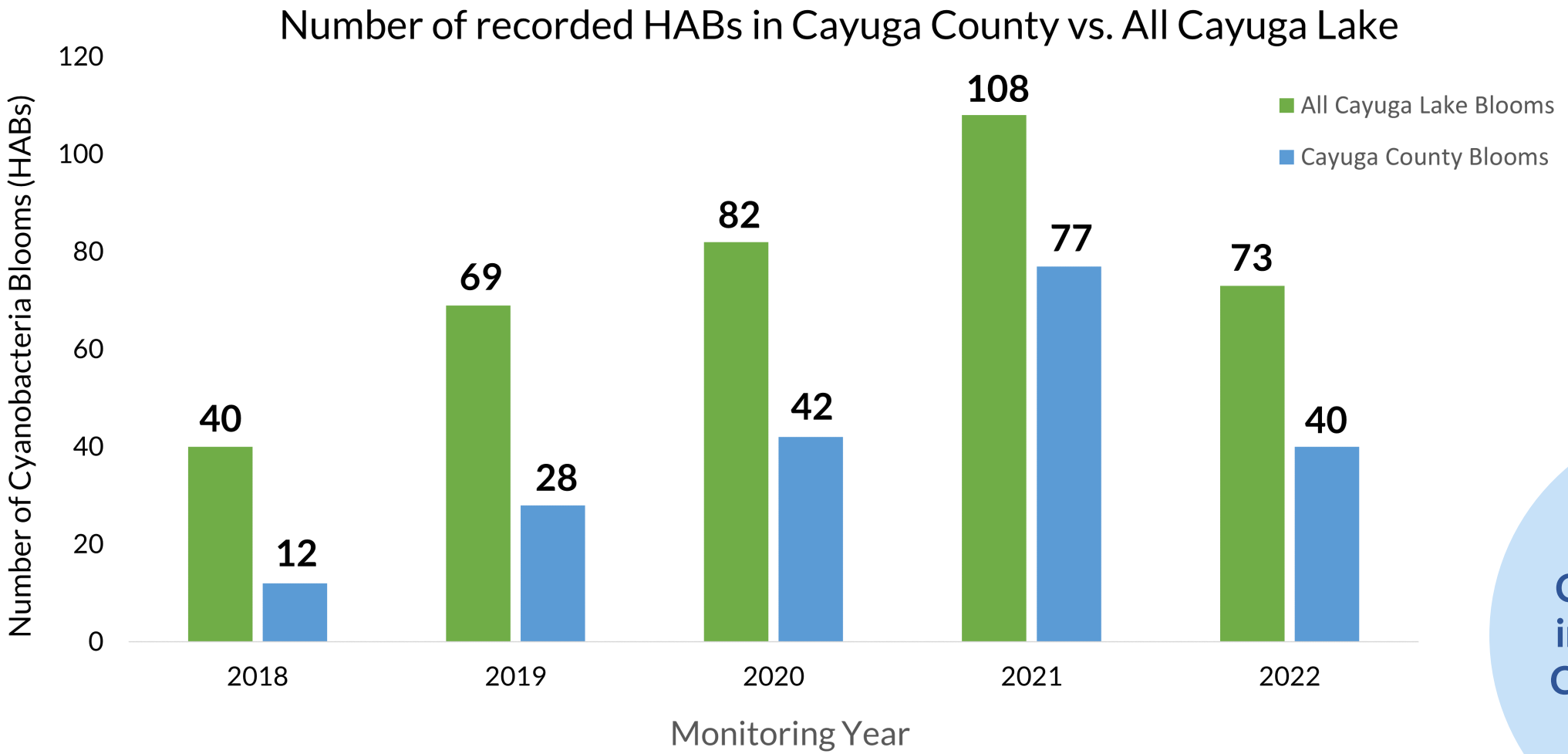
Members of the public can also report HABs to our HABs hotline

Thank you to Cayuga County for supporting our HAB monitoring program in Cayuga County!

We are always looking for more volunteers to fill in the gaps! For more information, email Grace at aghaynes@communityscience.org



HAB Monitoring in Cayuga County



Learn more about Cayuga Lake HABs in 2022 at CLWN's Cayuga Lake Spring Conference on May 18.

CSI's Public HABs Database

Landing Page

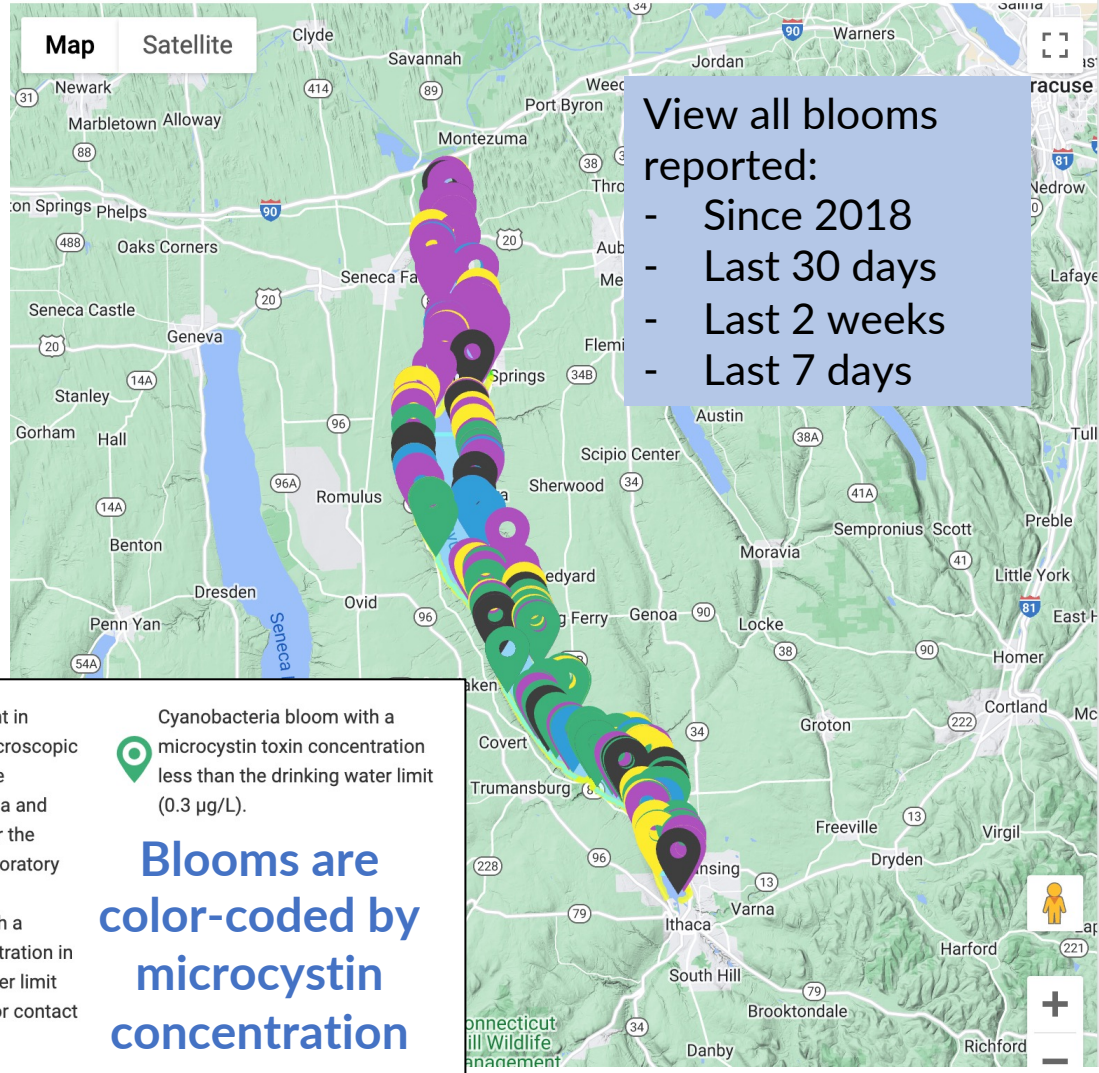
Events

	Bloom Code	Observed	Segment	Extent
1	22-3492-B2	October 05, 2022	Lakeshore Segment Southeast 1: Elmwood Point to Lake Ridge Point	Small Localized (few properties)
2	22-3458-B7	September 30, 2022	Lakeshore Segment Northeast 1: Northern Marshes to Harris Park	Large Localized
3	22-3492-B1	September 30, 2022	Lakeshore Segment Southeast 1: Elmwood Point to Lake Ridge Point	Large Localized
4	22-3414-B1	September 24, 2022	Lakeshore Segment Northeast 10: Long Point State Park to Elmwood Point	Small Localized (few properties)
5	22-3410-B1	September 24, 2022	Lakeshore Segment Northeast 9: Long Point State Park	Widespread
6	22-3478-B2	September 24, 2022	Lakeshore Segment Southeast 1: Elmwood Point to Lake Ridge Point	Large Localized

Table of HAB Events with links to lakeshore segments and blooms

Map defaults to display all HABs since 2018. Use drop-down menu to select recent bloom reports

All Blooms since 2018



378

HABS REPORTED SINCE 2018

Tally of the number of blooms reported since the start of our monitoring program

Suspicious Bloom. Photos indicate that the suspicious bloom is highly likely to be a harmful algal bloom (HAB). No laboratory results are yet available.

Cyanobacteria bloom with a microcystin toxin concentration that exceeds the limit for contact recreation (4.0 µg/ L).

Cyanobacteria are present in bloom (HAB) sample. Microscopic examination indicates the presence of cyanobacteria and therefore the potential for the bloom to be harmful. Laboratory results are pending.

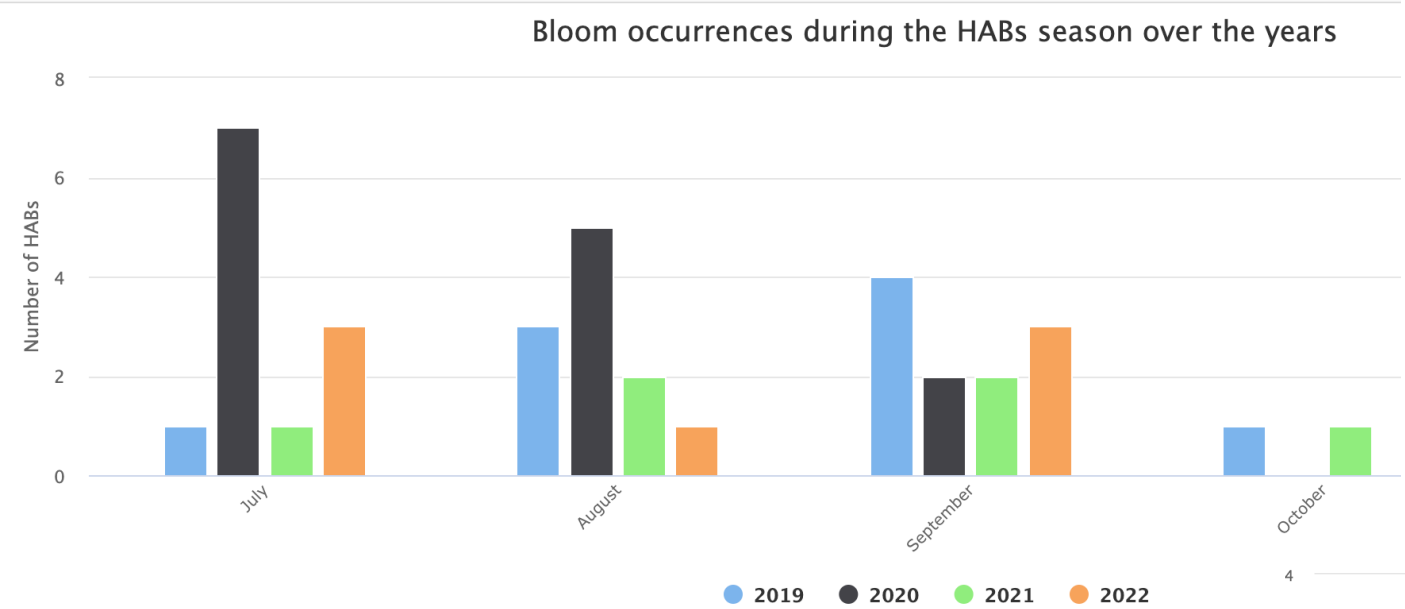
Cyanobacteria bloom with a microcystin toxin concentration in between the drinking water limit (0.3 µg/L) and the limit for contact recreation (4.0 µg/L).

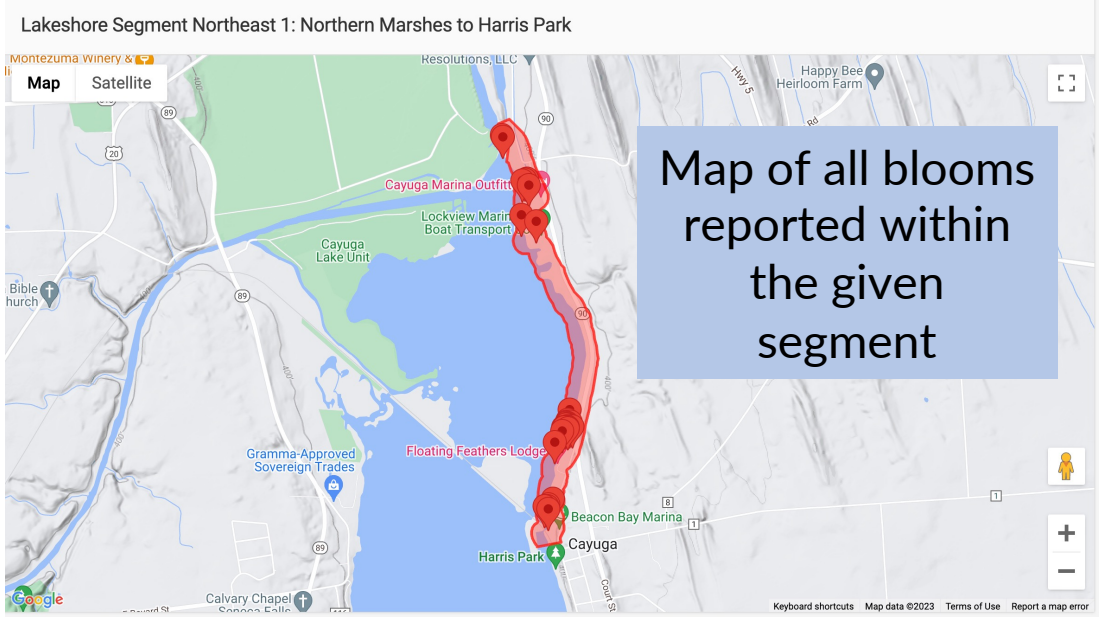
Cyanobacteria bloom with a microcystin toxin concentration less than the drinking water limit (0.3 µg/L).

Blooms are color-coded by microcystin concentration

CSI's Public HABs Database

Segment Page

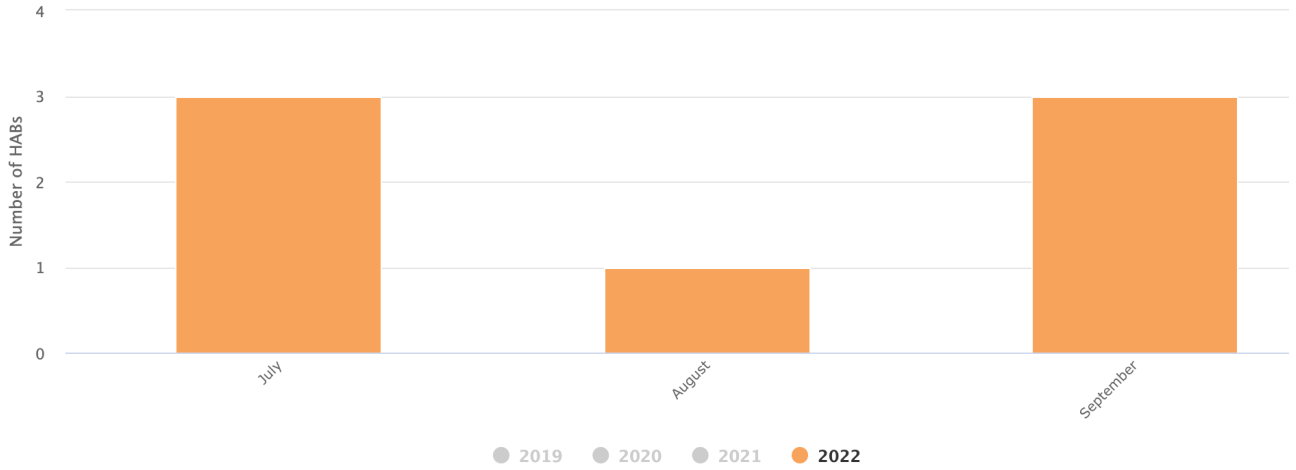




Map of all blooms reported within the given segment

Visualize monthly trends in HABs during each year of our monitoring program

Graphs can be modified to include multiple years or just one year

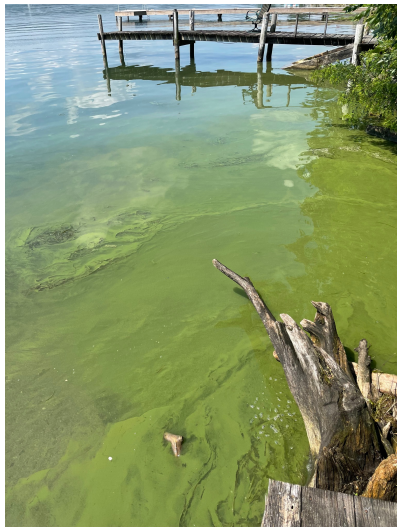


CSI's Public HABs Database

Event Page

Where, When, and What details for a single bloom

Photo of bloom



Harmful Algal Bloom (HAB) Event Information

Bloom Code 22-3473-B2

Where

Water Body	Cayuga Lake
LatLong	42.63014, -76.68778
Segment	Lakeshore Segment Southwest 9: Frontenac Point to Lively Run
County	Seneca
Extent	Large Localized

When

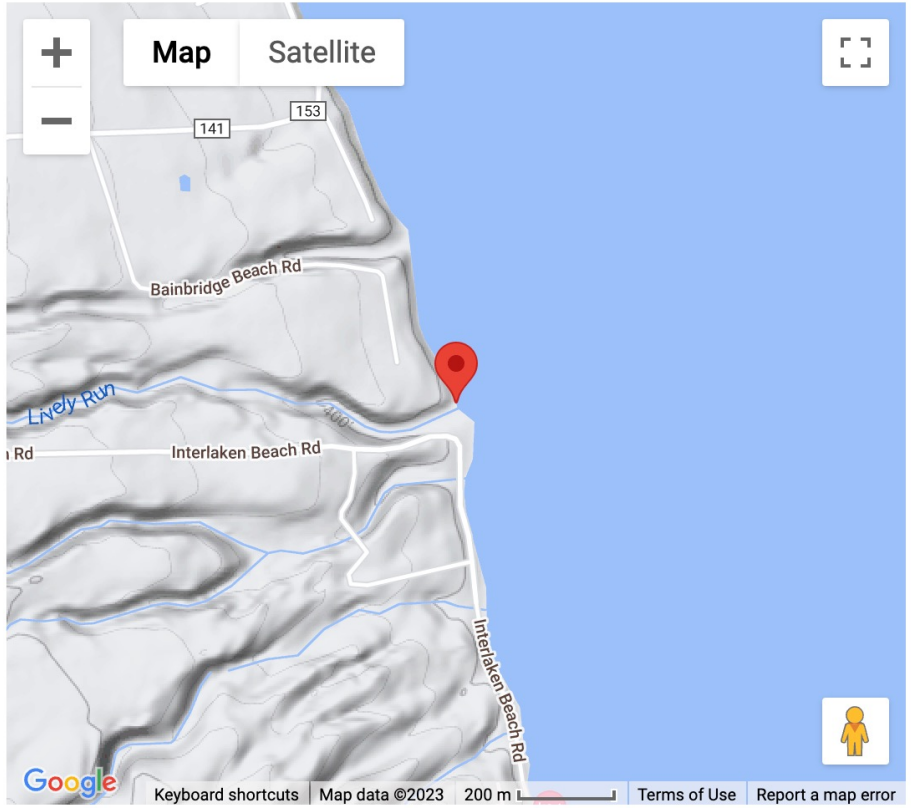
Bloom Reported	September 13, 2022
Bloom Sampled	September 13, 2022
Microscopic Examination	September 14, 2022

What

Bloom Genera [1]

Bloom Chemistry

Map



Bloom Description

shoreline along Interlaken Beach Rd, just east of Shepherdess Cellars

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Biomonitoring Partnership

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

non-impacted
slightly impacted
moderately impacted
severely impacted

Volunteers collect samples in the field during the summer.

They sort and identify organisms during Open Lab Nights in the winter.

Biological Monitoring Results – Database in progress!

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.

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CSI and WQMA – How can we work together?

Two Questions for WQMA:

1. When CSI finds concerning water quality results in Cayuga County, what would WQMA like us to do?*

2. When new stream data is published on our database, I email the volunteers in that monitoring group to let them know. Would a representative from WQMA like to be included in those emails?

**All HABs are reported to Cayuga County Health Dept. as soon as possible*

Thank you!

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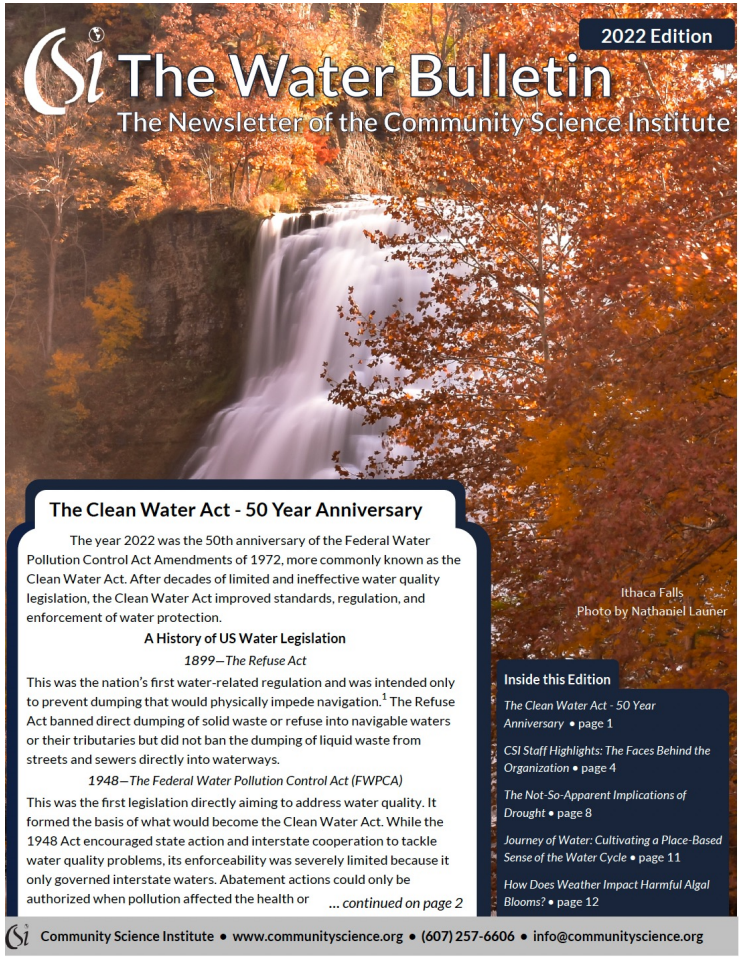
@communityscienceinstitute

@CSIwater

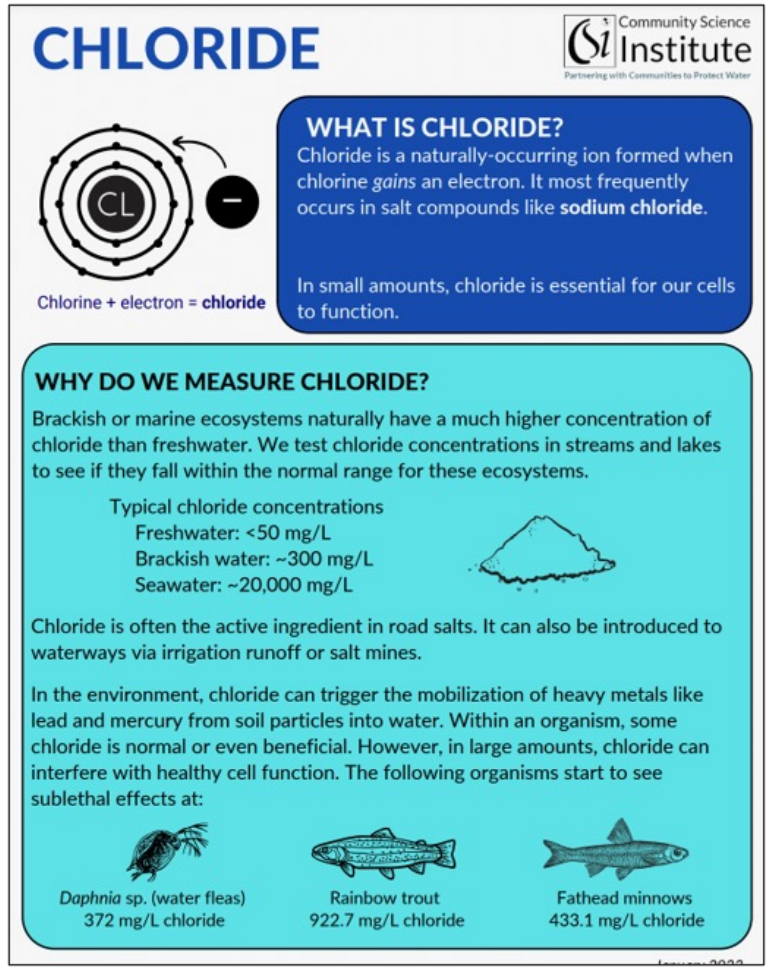
Extra Slides

Outreach and Education

4-H2O Summer Youth Education Program



Annual Water Bulletin Newsletter



Free Learning Materials

Outreach and Education

CSI's Outreach and Education Committee provides an opportunity for community members to get involved in educating their friends and neighbors about water quality.

Meeting are held via Zoom once per month

Jody, an educator for over 40 years, serves on CSI's outreach and education committee

Jody and her husband, Griff, also monitor Sheldrake Creek and are HABs Harriers!

Impact of Synoptic Stream Monitoring: Seneca-Keuka 9E Plan

2013 – SLPWA started collaborating with CSI to monitor water quality in Seneca Lake tributaries.

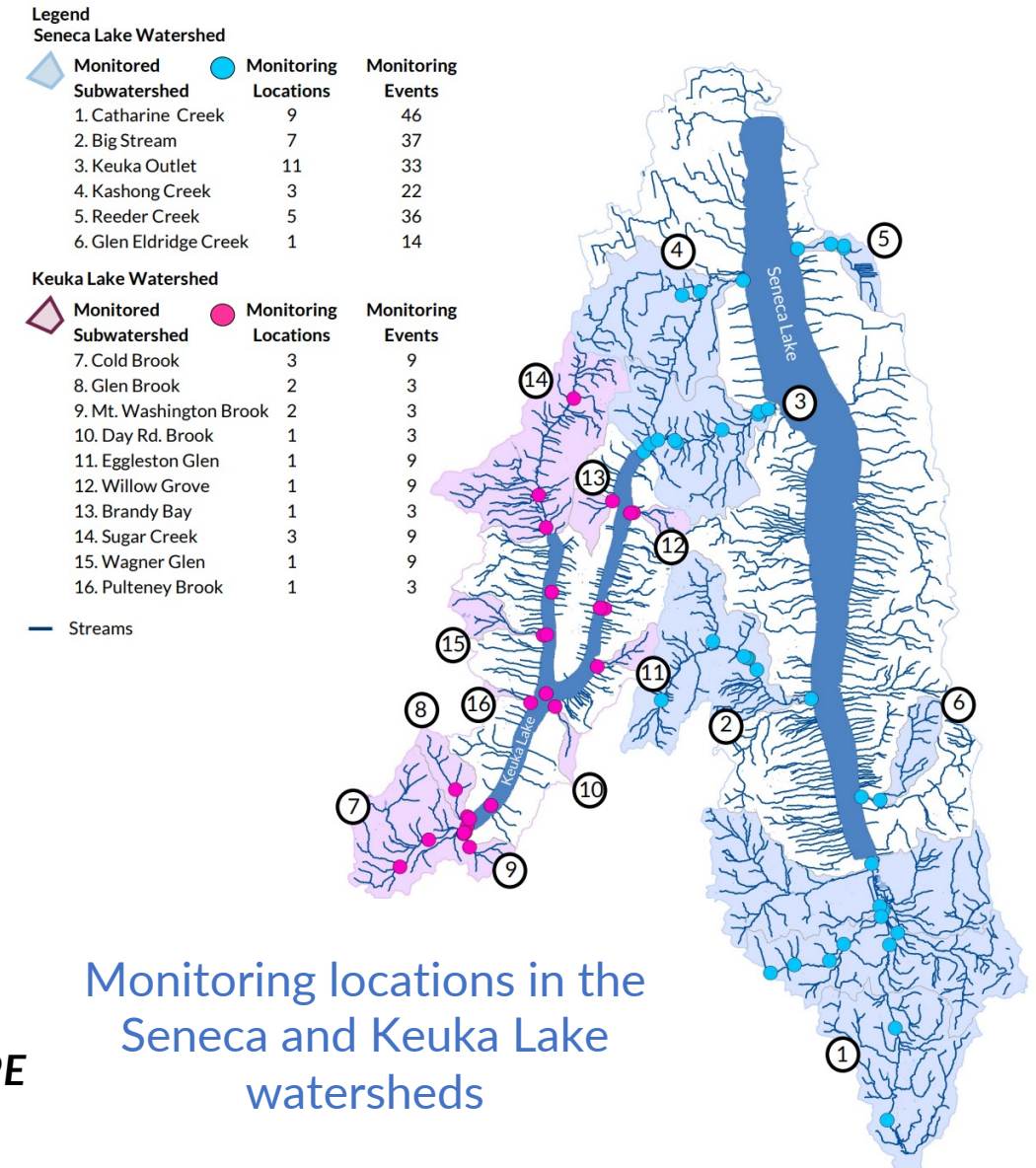
2017 – KLA started collaborating with CSI to monitor water quality in Keuka Lake tributaries.

CSI's role:

- **Provide volunteer training and supplies**
- **Certified water testing**
- **Publish data on public database**

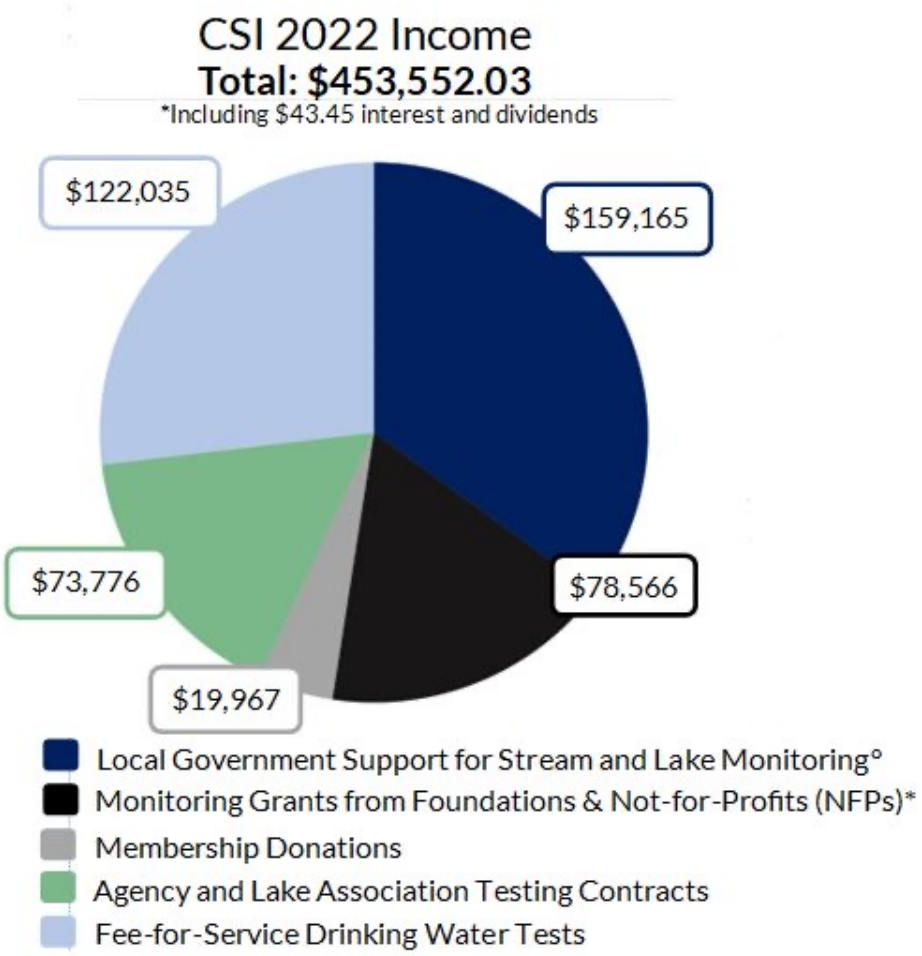
2022 - The samples collected by SLPWA and KLA volunteers and analyzed in CSI's certified lab were foundational to the formation of the now approved Seneca-Keuka 9E Plan.

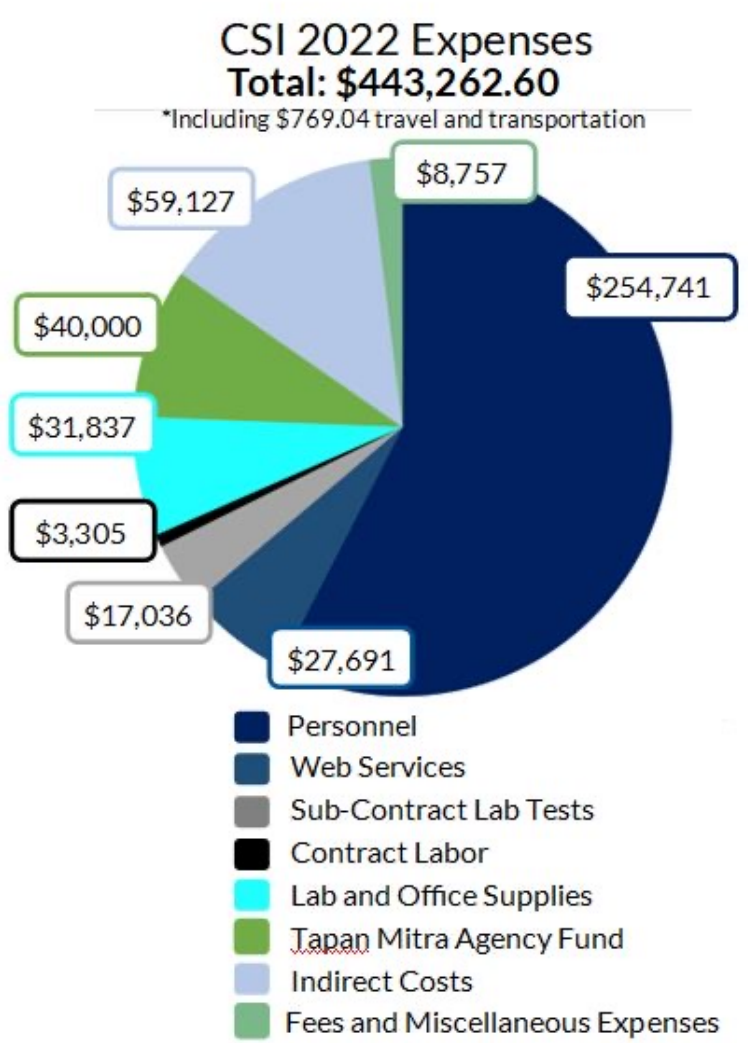
Read more about CSI's role in the Seneca-Keuka 9E plan in our 2021 Water Bulletin Newsletter!



Monitoring locations in the Seneca and Keuka Lake watersheds

CSI's 2022 Finances





Thank you to the local governments who support CSI's monitoring partnerships!

Town of Enfield	$2,550
Town of Lansing	$7,000
Town of Hector	$1,000.00
Town of Caroline	$3,365.00
Town of Danby	$4,290.00
Town of Ulysses	$6,438.00
City of Ithaca	$10,579.00
Town of Dryden	$11,196.00
Town of Ithaca	$22,396.00
Town of Newfield	$6,404.00
Cayuga County	$24,447
Seneca County	$6,000.00
Tompkins County	$53,500.00*

*Tompkins County provided CSI with $25,000 for the development of our HABs database in 2022