

Partnering with communities to monitor water quality in Seneca County

Seneca County WQCC Meeting
4/19/23, 1:30 PM

Grascen Shidemantle, Ph.D.
Executive Director



CSI Agenda

- Introduction to CSI
- Synoptic Stream and Lake Monitoring Partnership in Seneca County
- Harmful Algal Bloom Monitoring Partnership in Seneca County
- Biomonitoring Partnership in Seneca County
- CSI's Outreach and Education Initiatives
- How to Get Involved



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.

CSI Water Quality Monitoring Partnerships

Four Monitoring Partnerships

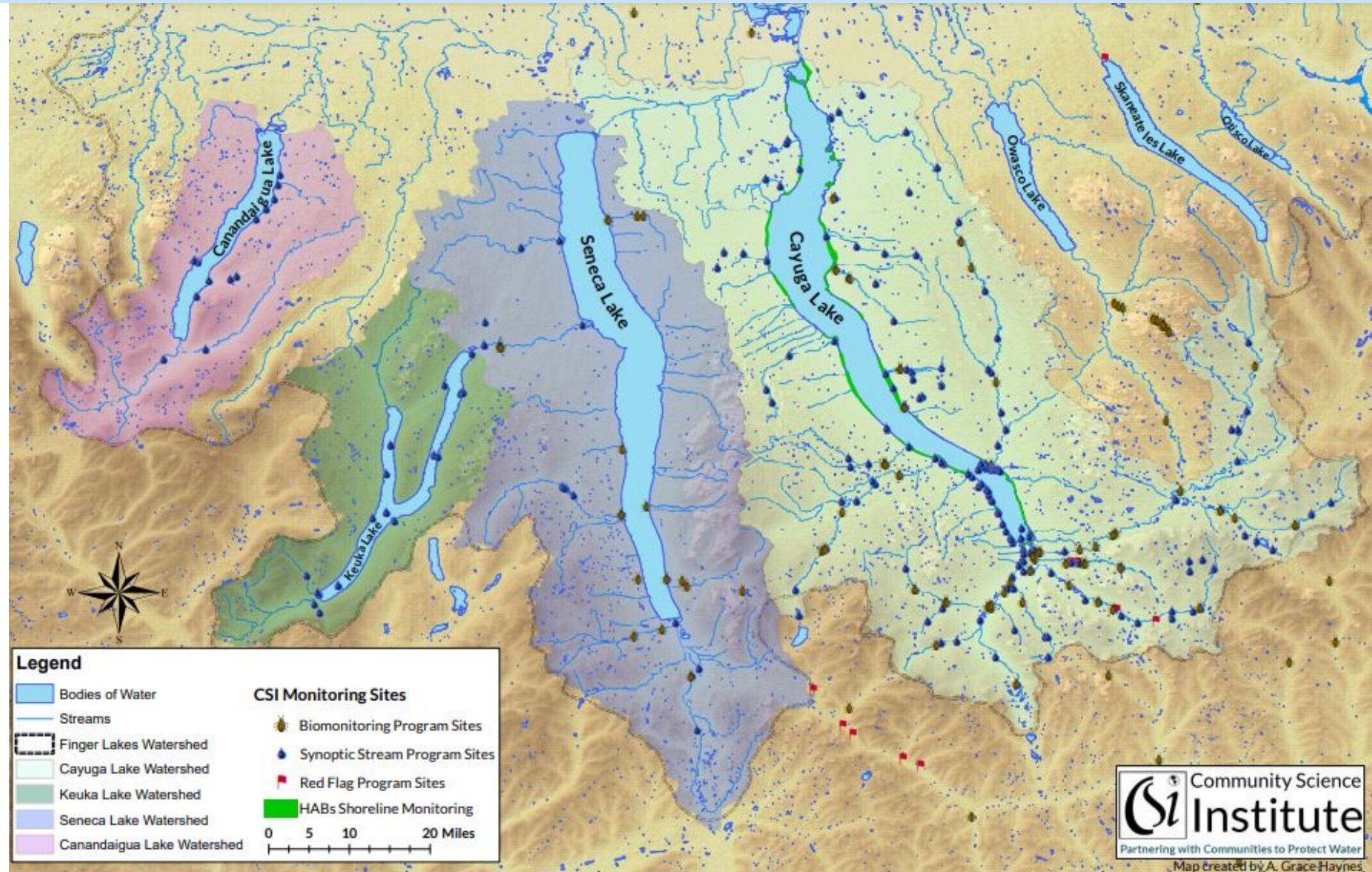
Synoptic Stream and Lake
Chemistry Monitoring

Harmful Algal Bloom (HAB)
Monitoring

Biomonitoring
(Benthic Macroinvertebrate
Monitoring)

Red Flag Monthly Stream
Monitoring

CSI recruits, trains,
and coordinates
over 250
volunteers

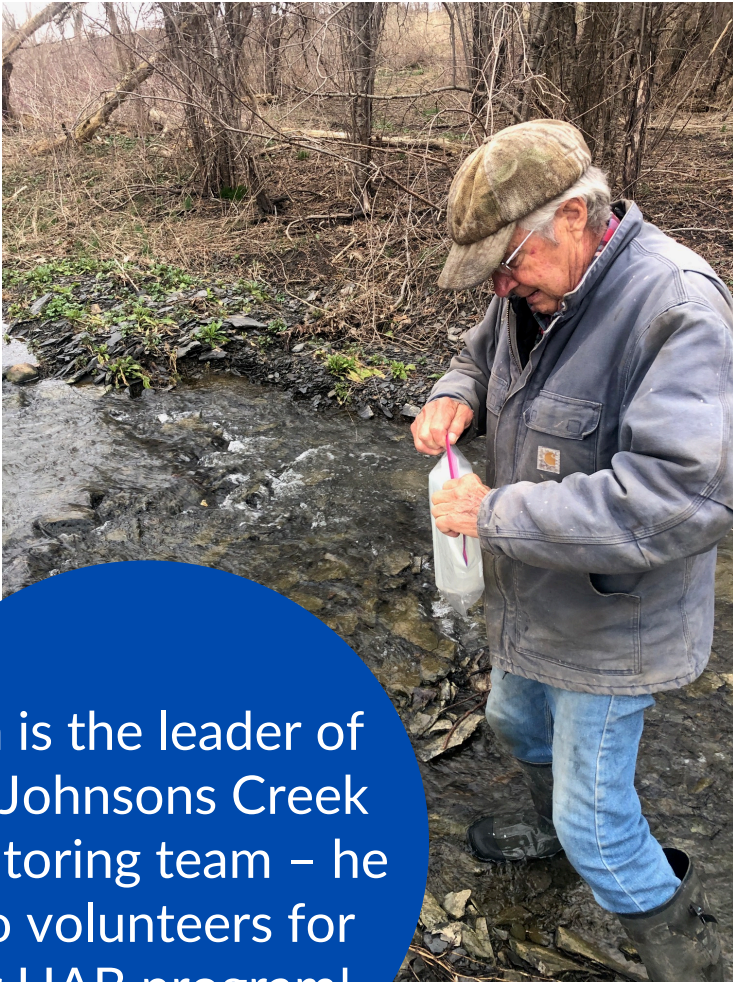


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CSI Synoptic Stream and Lake Monitoring Partnership



Ken is the leader of our Johnsons Creek monitoring team – he also volunteers for our HAB program!

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.

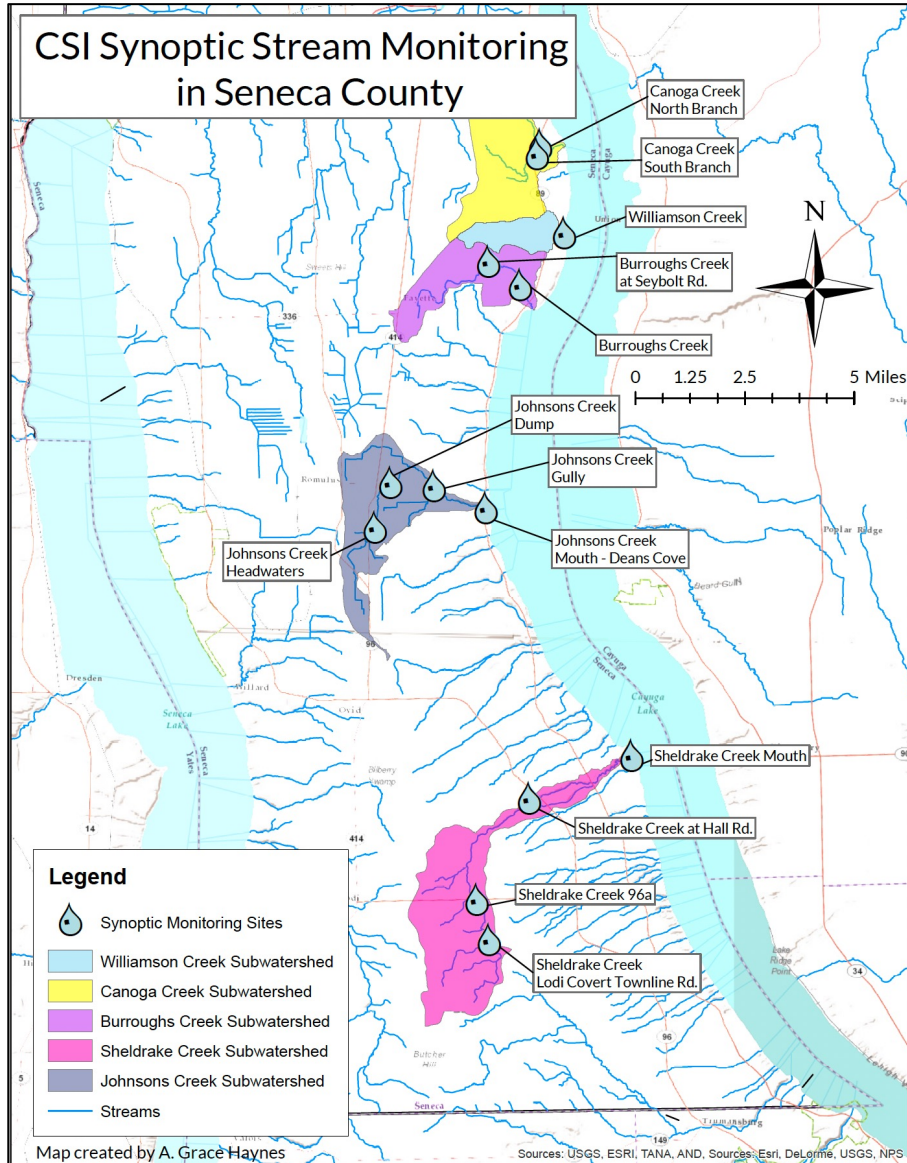
Monitor streams and lakes for:

- Nutrients (TP, SRP, NO_x)
- 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

CSI Synoptic Stream Monitoring in Seneca County



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

1. Canoga Creek
2. Williamson Creek
3. Burroughs Creek
4. Johnsons Creek
5. Sheldrake Creek

These volunteers monitor 13 locations in Seneca County

CSI also collaborates with SLPWA to monitor Seneca Lake tributaries like Reeder Creek.

CSI 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

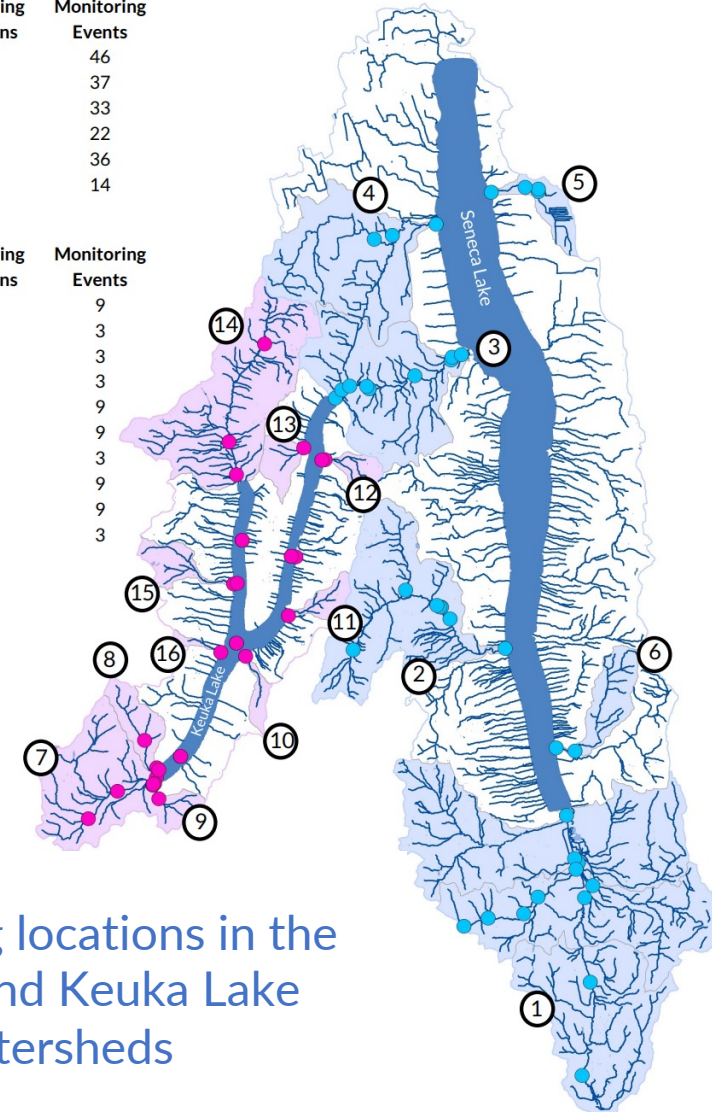
2022 - The samples collected by SLPWA and KLA volunteers and analyzed in CSI's certified lab were foundational to the formation of the now approved Seneca-Keuka 9E Plan.

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

Legend		
Seneca Lake Watershed		
Monitored Subwatershed	Monitoring Locations	Monitoring Events
1. Catharine Creek	9	46
2. Big Stream	7	37
3. Keuka Outlet	11	33
4. Kashong Creek	3	22
5. Reeder Creek	5	36
6. Glen Eldridge Creek	1	14

Keuka Lake Watershed		
Monitored Subwatershed	Monitoring Locations	Monitoring Events
7. Cold Brook	3	9
8. Glen Brook	2	3
9. Mt. Washington Brook	2	3
10. Day Rd. Brook	1	3
11. Eggleston Glen	1	9
12. Willow Grove	1	9
13. Brandy Bay	1	3
14. Sugar Creek	3	9
15. Wagner Glen	1	9
16. Pulteney Brook	1	3

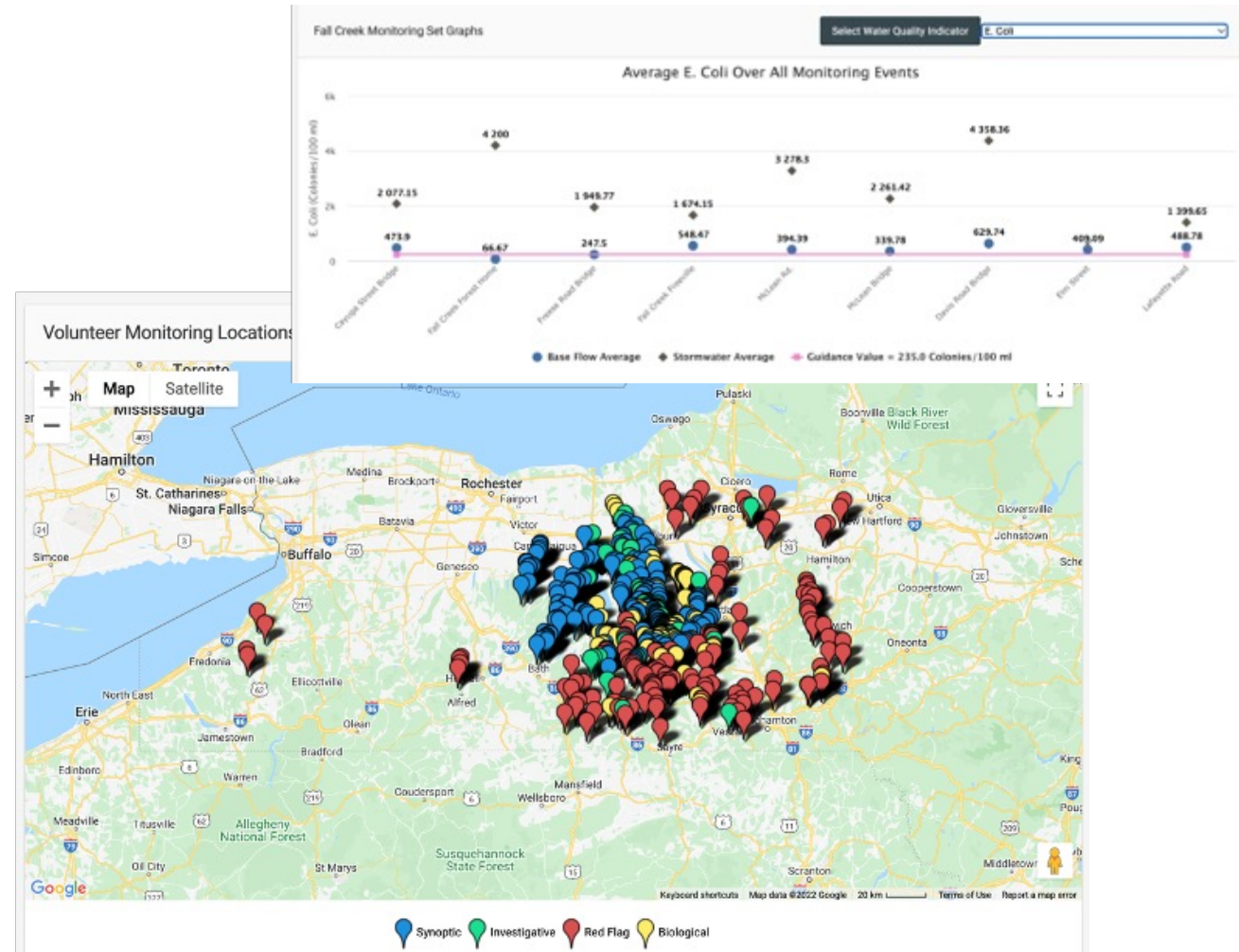
— Streams



Monitoring locations in the Seneca and Keuka Lake watersheds

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)

Bloom information is uploaded to our
NEW [HABs Database](#)

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



Collaboration with
CLWN

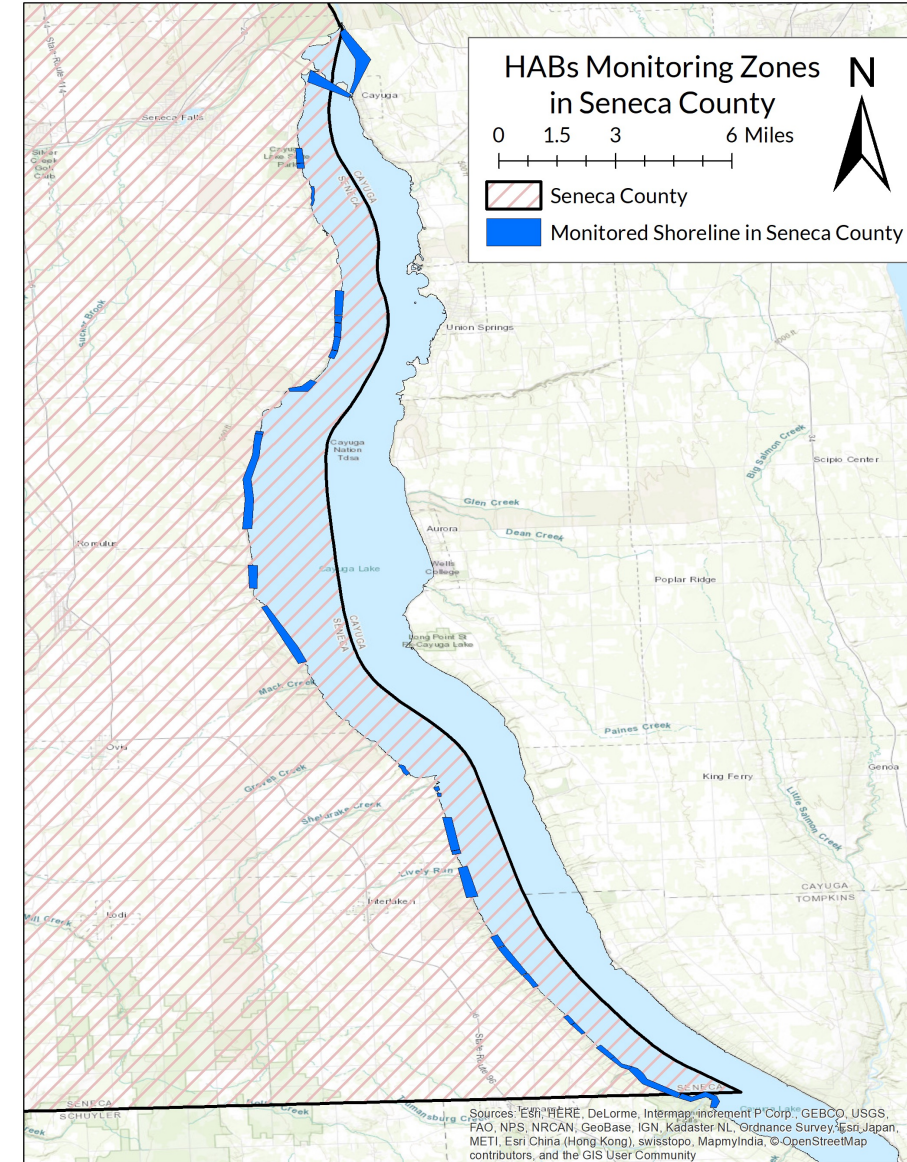
CSI HAB Monitoring in Seneca County

CSI's HABs Harriers monitor 42% of the shoreline in Seneca County

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

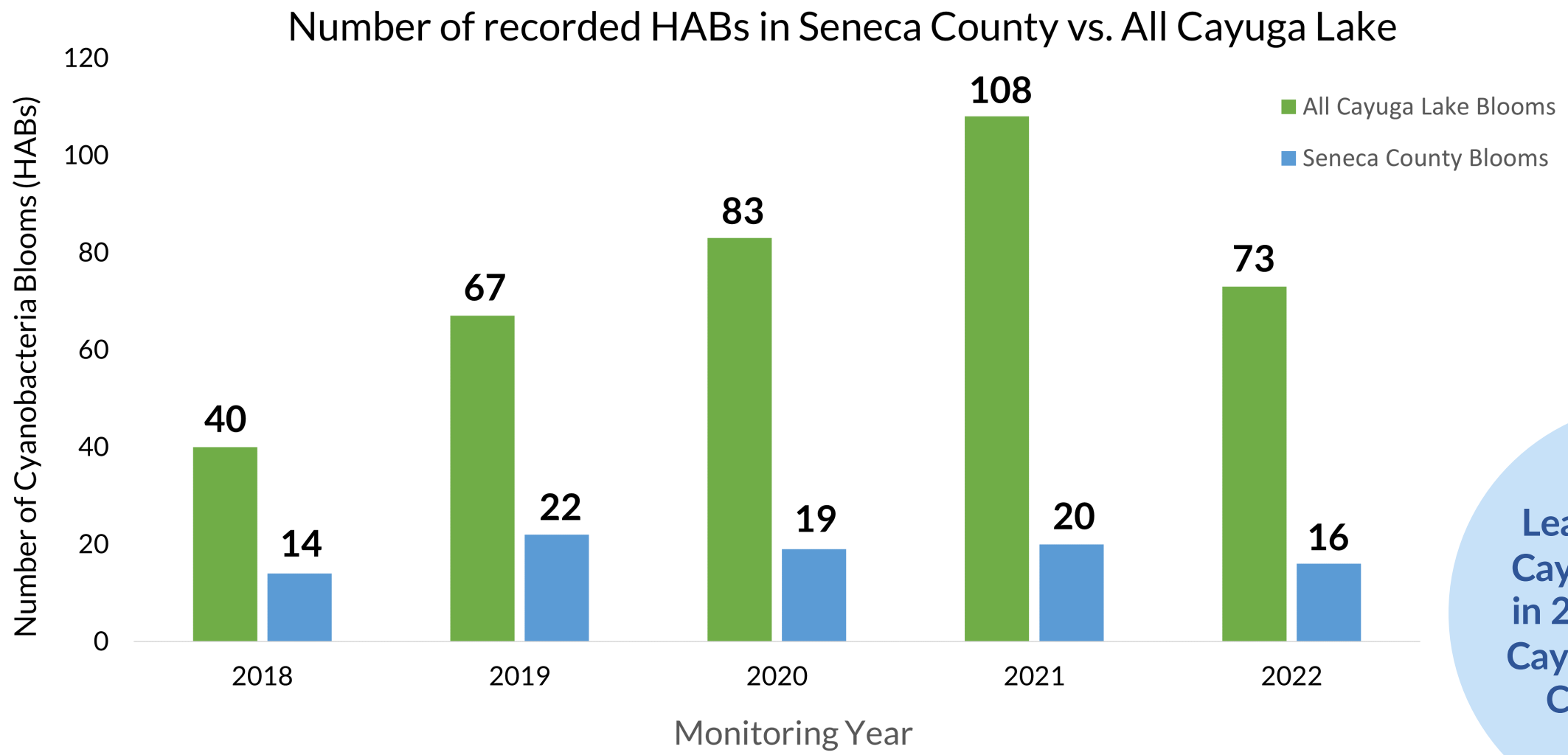
Thank you to Seneca County for supporting our HAB monitoring program in Seneca County in 2022 and again in 2023!

We are always looking for more volunteers to fill in the gaps!





HAB Monitoring in Seneca County



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

Landing Page

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

All Blooms since 2018

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

View all blooms reported:


- Since 2018
- Last 30 days
- Last 2 weeks
- Last 7 days


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.

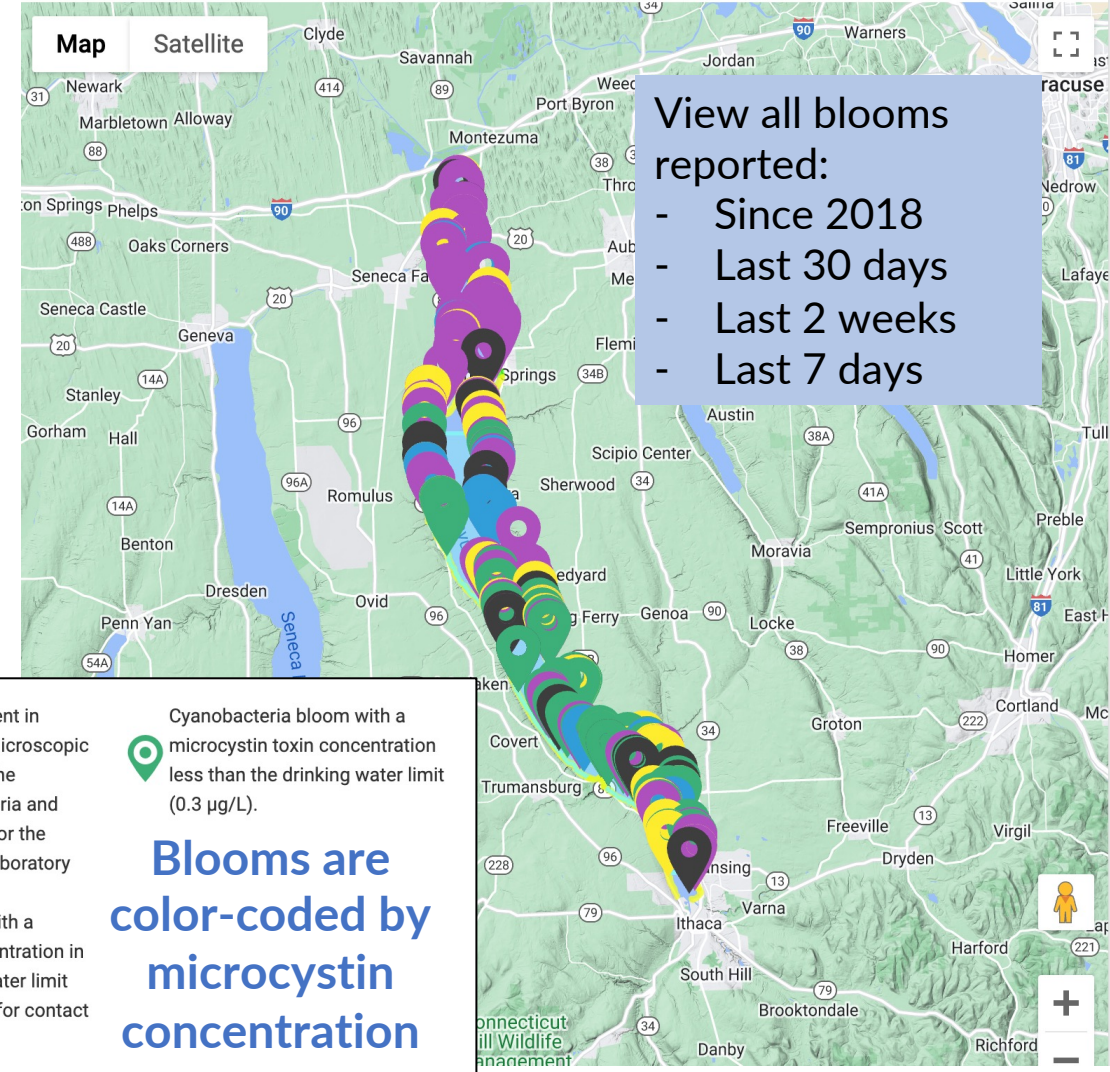
 Cyanobacteria bloom with a microcystin toxin concentration that exceeds the limit for contact recreation (4.0 µg/L).

 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).

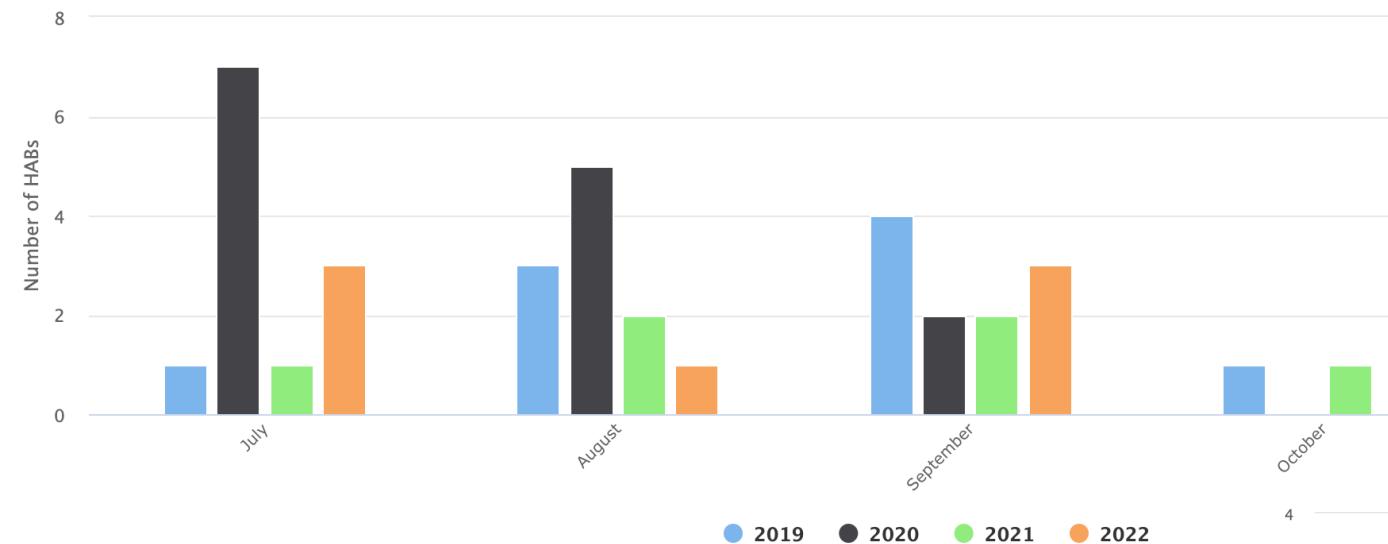
Blooms are color-coded by microcystin concentration



CSI's Public HABs Database

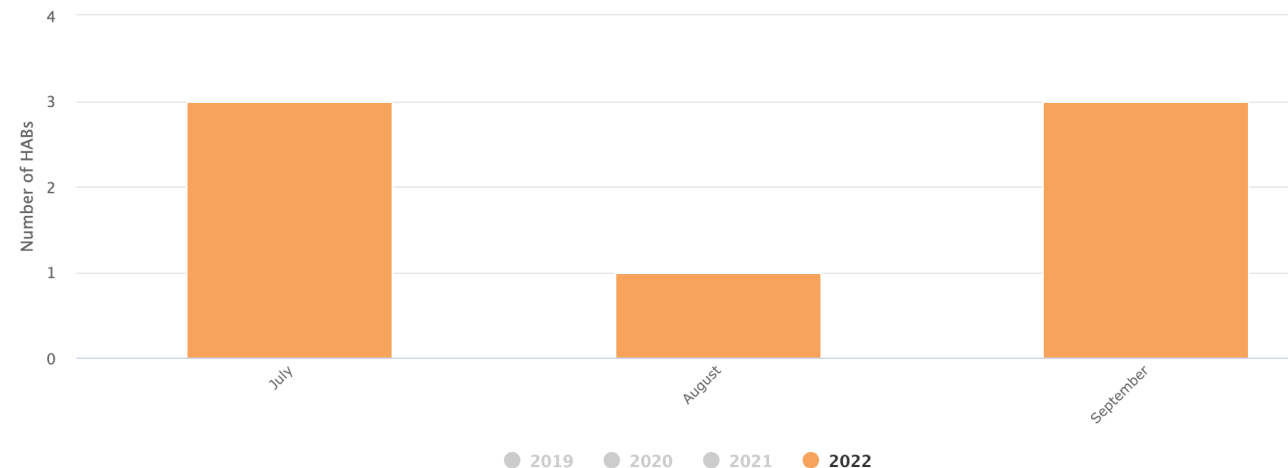
Segment Page

Bloom occurrences during the HABs season over the years



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

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



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

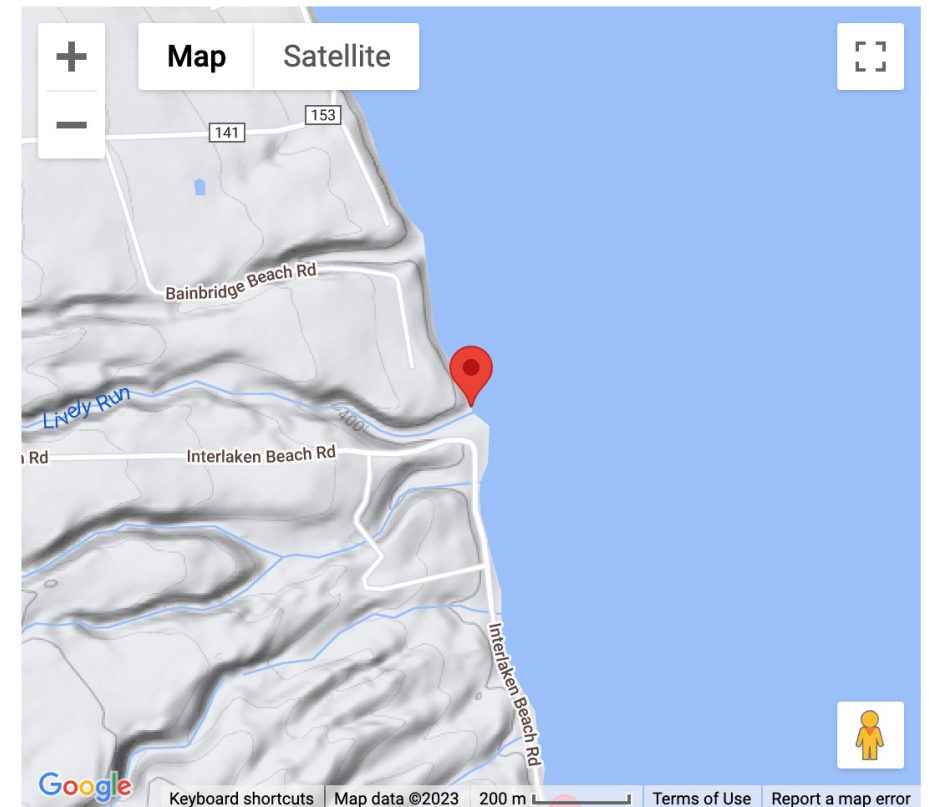
Microscopic Examination September 14, 2022

What

Bloom Genera ^[1]

Bloom Chemistry

Map

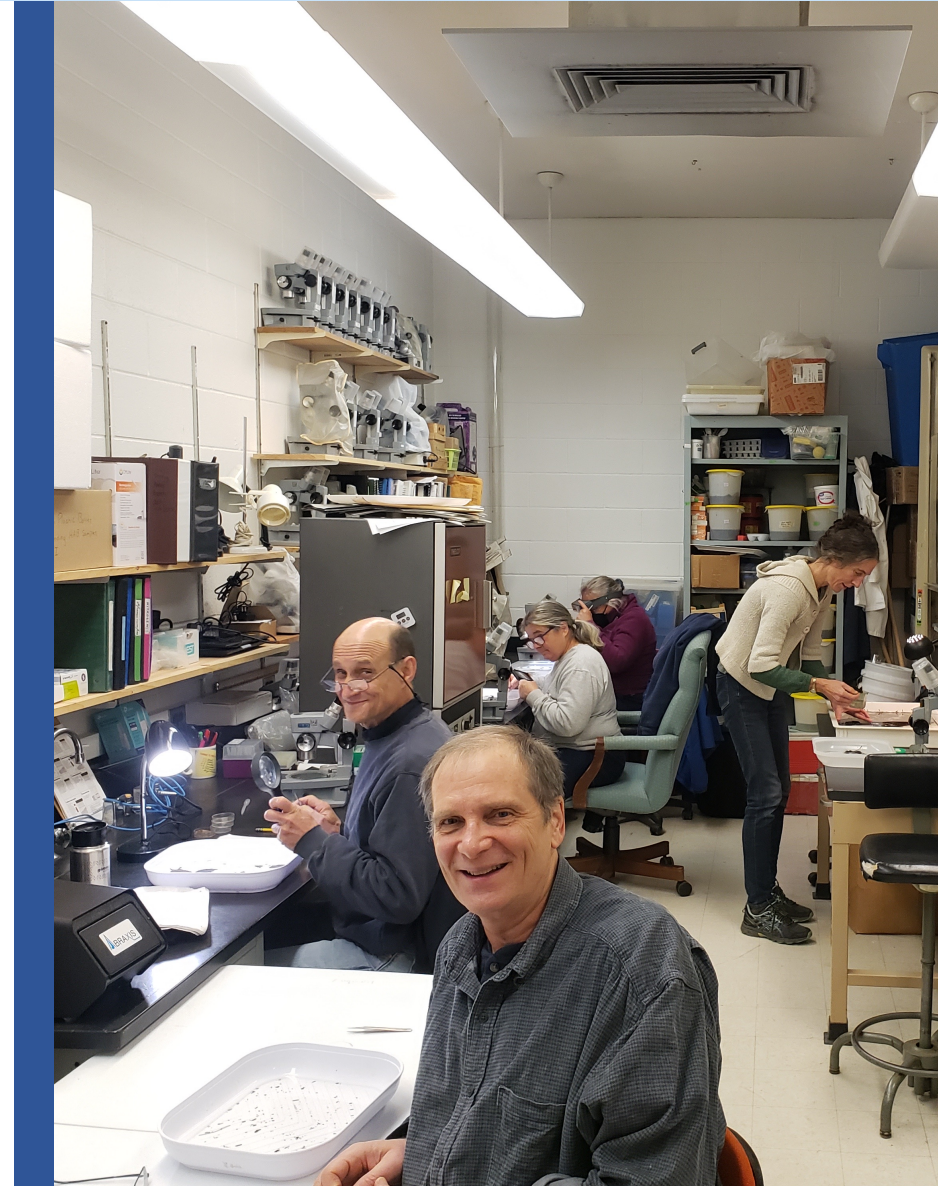


Bloom Description

shoreline along Interlaken Beach Rd, just east of Shepherdess Cellars

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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 Seneca County



We are adding a biomonitoring location on Canoga Creek this summer!

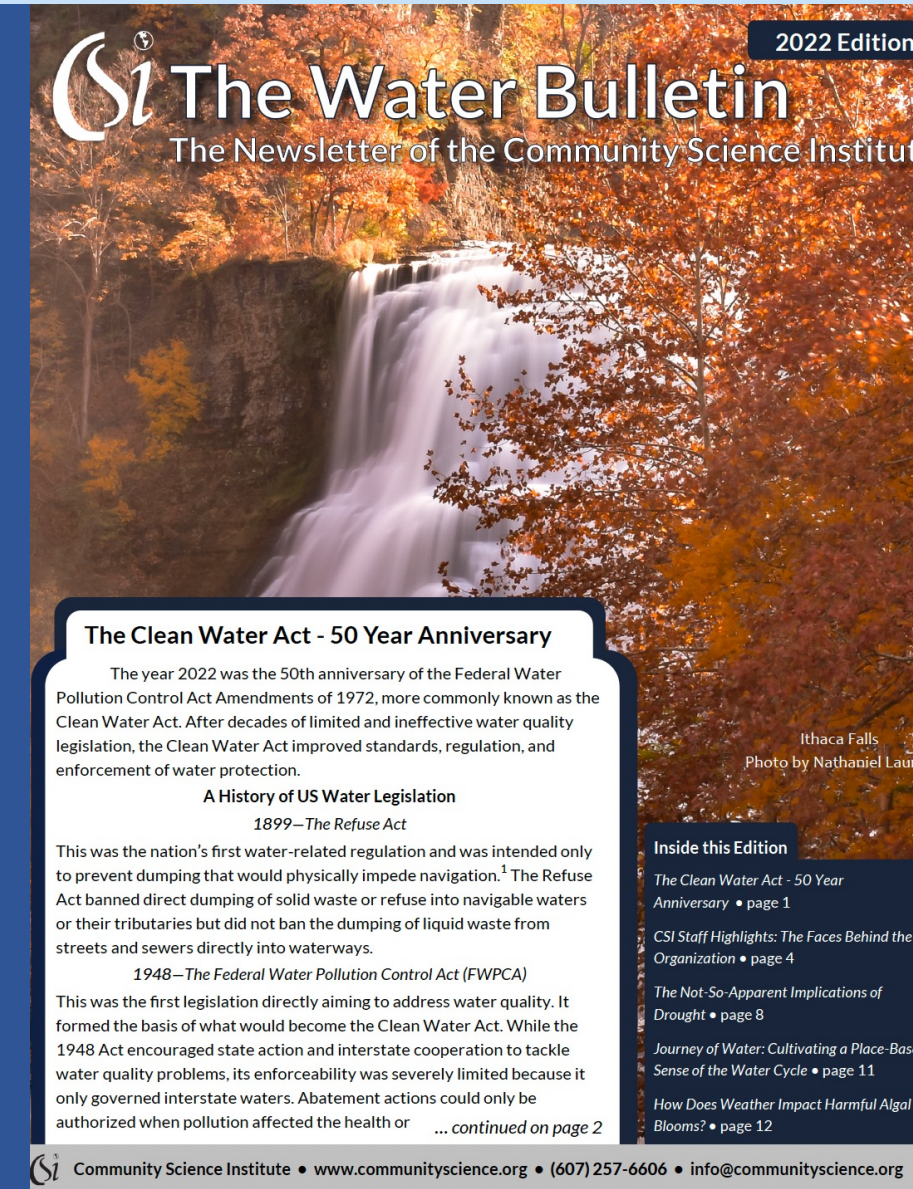
Join us to learn about the fascinating aquatic biodiversity in our local streams!

We will also hold an Open Lab Night in Fayette this Winter.

Thank you to the Town of Fayette for generously sponsoring this monitoring!

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CSI The Water Bulletin

The Newsletter of the Community Science Institute

2022 Edition

The Clean Water Act - 50 Year Anniversary

The year 2022 was the 50th anniversary of the Federal Water Pollution Control Act Amendments of 1972, more commonly known as the Clean Water Act. After decades of limited and ineffective water quality legislation, the Clean Water Act improved standards, regulation, and enforcement of water protection.

A History of US Water Legislation

1899—The Refuse Act

This was the nation's first water-related regulation and was intended only to prevent dumping that would physically impede navigation.¹ The Refuse Act banned direct dumping of solid waste or refuse into navigable waters or their tributaries but did not ban the dumping of liquid waste from streets and sewers directly into waterways.

1948—The Federal Water Pollution Control Act (FWPCA)

This was the first legislation directly aiming to address water quality. It formed the basis of what would become the Clean Water Act. While the 1948 Act encouraged state action and interstate cooperation to tackle water quality problems, its enforceability was severely limited because it only governed interstate waters. Abatement actions could only be authorized when pollution affected the health or ... continued on page 2

Ithaca Falls
Photo by Nathaniel Laur

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The Not-So-Apparent Implications of Drought • page 8

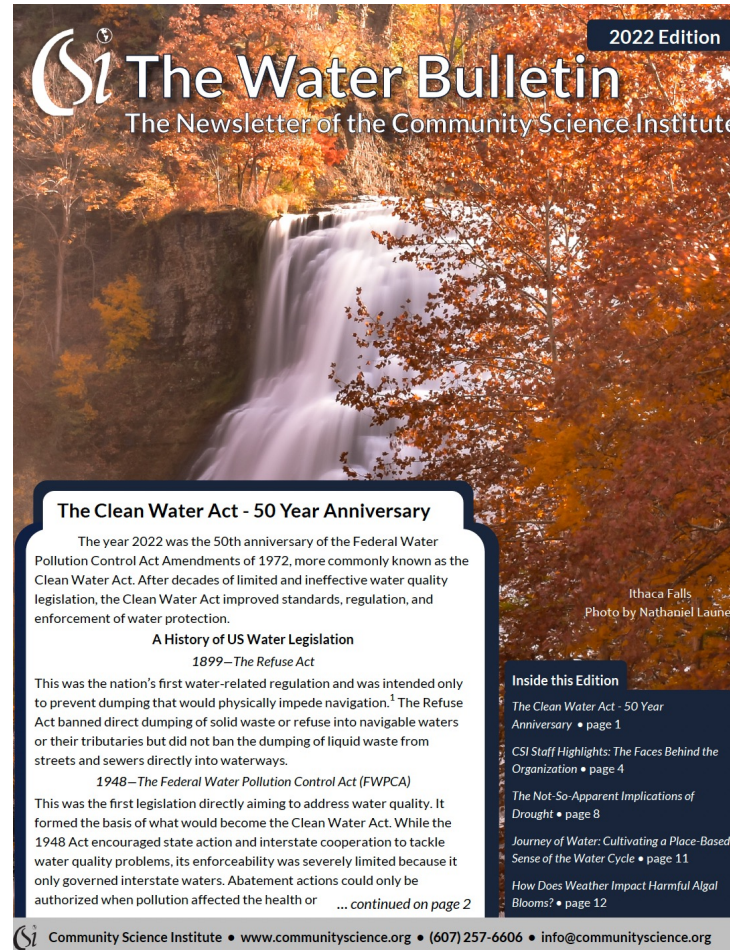
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How Does Weather Impact Harmful Algal Blooms? • page 12

CSI Outreach and Education



4-H2O Summer Youth Education Program



Annual Water Bulletin Newsletter

CHLORIDE

Community Science Institute
Partnering with Communities to Protect Water

Chlorine + electron = chloride

WHAT IS CHLORIDE?

Chloride is a naturally-occurring ion formed when chlorine *gains* an electron. It most frequently occurs in salt compounds like **sodium chloride**.

In small amounts, chloride is essential for our cells to function.

WHY DO WE MEASURE CHLORIDE?

Brackish or marine ecosystems naturally have a much higher concentration of chloride than freshwater. We test chloride concentrations in streams and lakes to see if they fall within the normal range for these ecosystems.

Typical chloride concentrations

Freshwater:	<50 mg/L
Brackish water:	~300 mg/L
Seawater:	~20,000 mg/L

Chloride is often the active ingredient in road salts. It can also be introduced to waterways via irrigation runoff or salt mines.

In the environment, chloride can trigger the mobilization of heavy metals like lead and mercury from soil particles into water. Within an organism, some chloride is normal or even beneficial. However, in large amounts, chloride can interfere with healthy cell function. The following organisms start to see sublethal effects at:

 Daphnia sp. (water fleas) 372 mg/L chloride	 Rainbow trout 922.7 mg/L chloride	 Fathead minnows 433.1 mg/L chloride
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Free Learning Materials

CSI 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.

Meetings 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!

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How to get involved

Synoptic Stream and Lake Monitoring



Email Grascen at
gshidemantle@communityscience.org

HAB Monitoring



Email Grace at
aghaynes@communityscience.org


Biomonitoring



Email Adrianna at
Adrianna@communityscience.org

Outreach and Education Committee

CHLORIDE



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Email Grace at
aghaynes@communityscience.org

Sign up for our email list for monthly updates!



Thank you!



Community Science
Institute

Partnering with Communities to Protect Water

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