



2024 Cayuga Lake Harmful Algal Bloom Season in Review: Earliest, Latest, and Most Blooms Ever

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Outreach and Programs Coordinator
Community Science Institute*

Cayuga Lake Watershed Network
Spring 2025 Community Conference in Canoga
Canoga Volunteer Fire Department, June 25, 2025

Agenda

- Community Science Institute
- “HABs 101”
- Health & HABs
- Cayuga Lake HABs Monitoring Program
- Partner Organizations & Agencies
- 2024 Monitoring Season in Review
- Get Involved!
- Acknowledgements & Q&A



Community Science Institute



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

CSI offers three types of programming:

Fee-for-Service Water Testing

Volunteer Water Monitoring Partnerships

Outreach and Education

CSI's Mission & Vision Statements

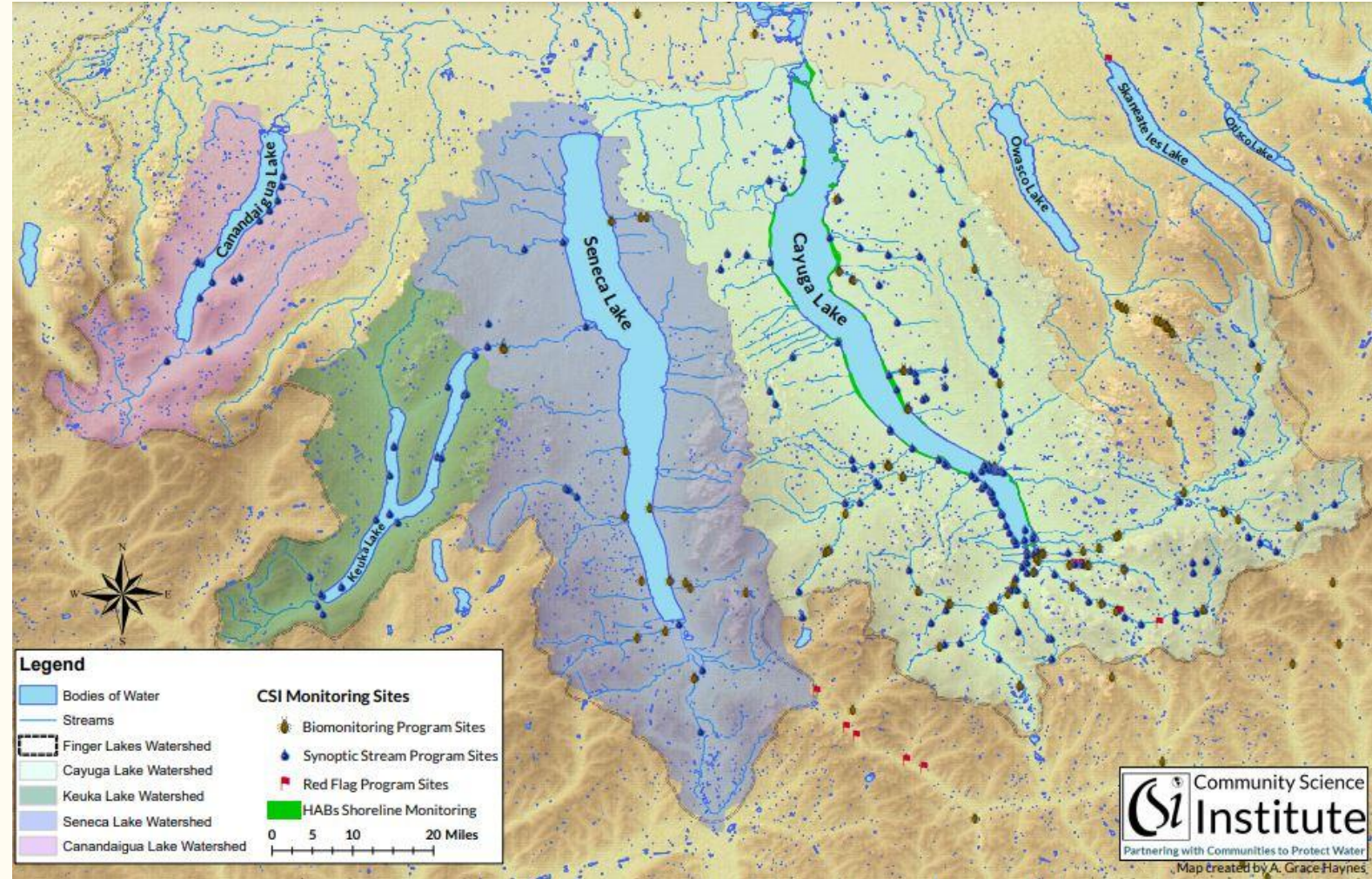
Mission: To inspire and empower communities to safeguard water resources by cultivating scientific literacy through volunteer water quality monitoring, certified laboratory analyses, and education.

Vision: Communities empowered by science to sustain, protect, and restore our shared water resources.

CSI's Water Monitoring Partnerships

1. Synoptic Stream and Lake Monitoring
2. Biomonitoring
3. Harmful Algal Bloom (HAB) Monitoring

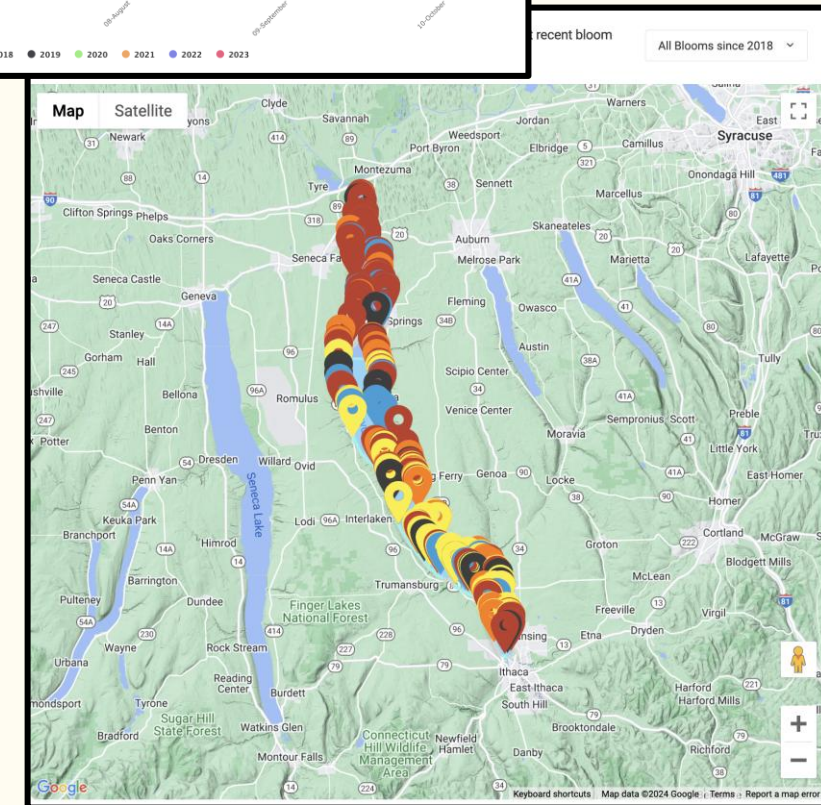
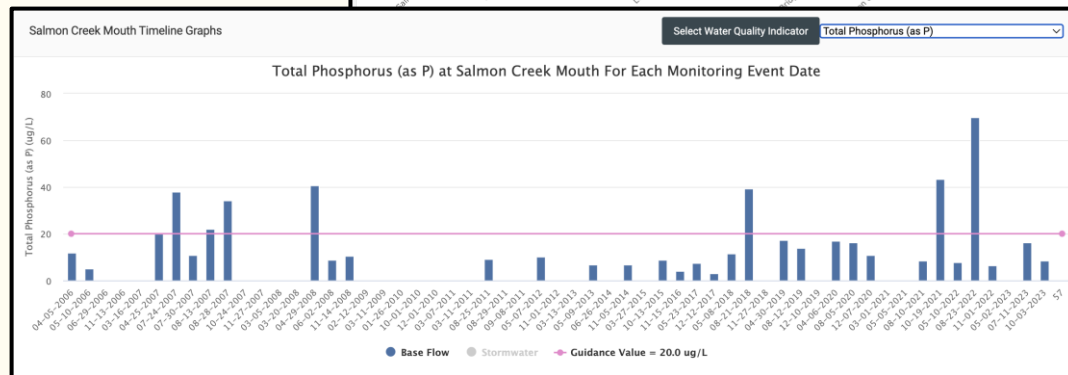
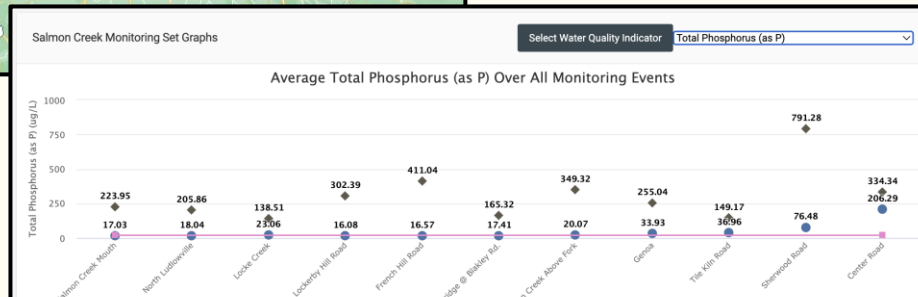
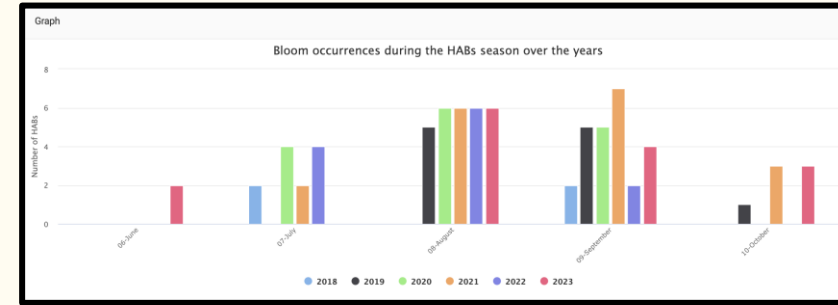
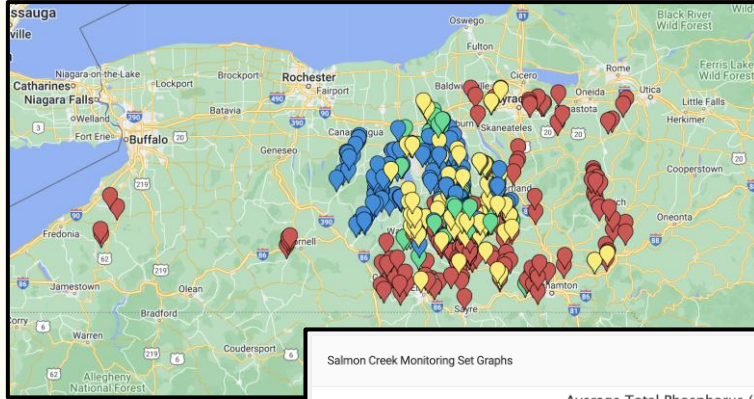
CSI recruits, trains, and coordinates over 250 volunteers!



CSI's Water Quality Database

Harmful Algal
Blooms

Stream and
Lake
Chemistry



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HABs 101: What is a **HAB**?

H: Harmful

- Human & Animal Health, Economics, Aesthetics, Ecological

A: Algal

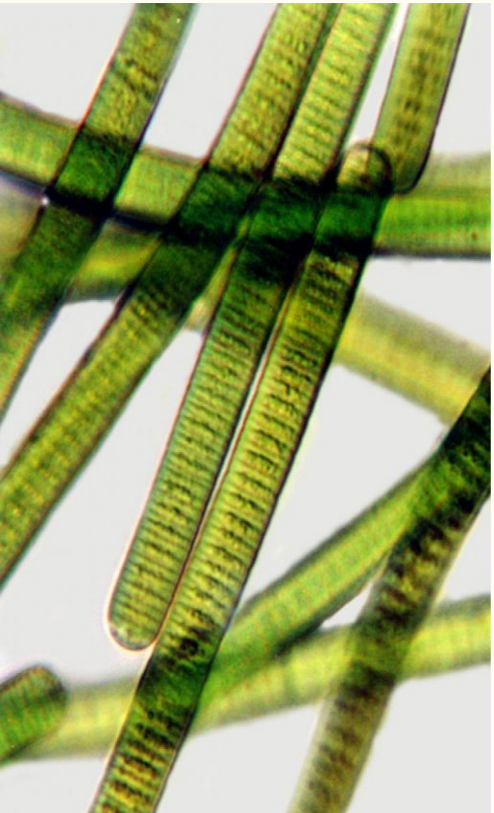
- Freshwater HABs refer to **cyanobacteria**
- Not true algae

B: Bloom

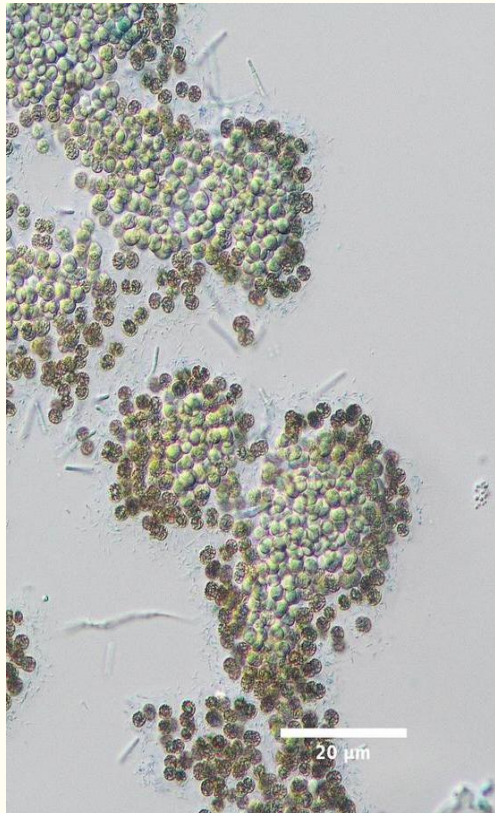
- Proliferations of cells, dense concentrations



What are cyanobacteria?



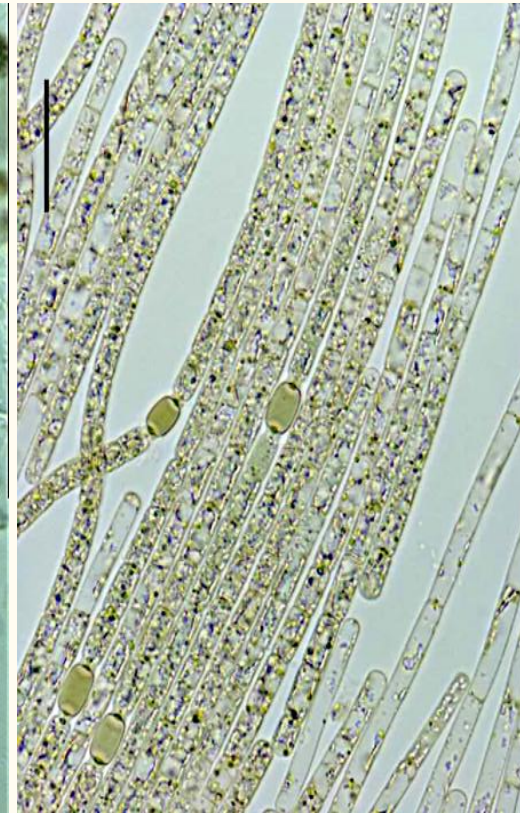
Oscillatoria



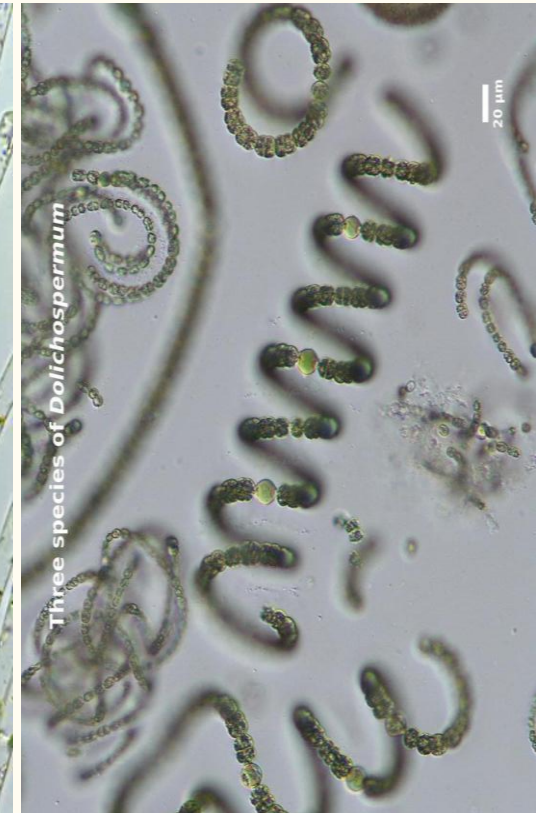
Microcystis



Woronchinia



Aphanizomenon



Dolichospermum



Summer 2024 – Cayuga Lake

Summer 2024 – Cayuga Lake





Summer 2024 – Cayuga Lake



Summer 2024 – Cayuga Lake

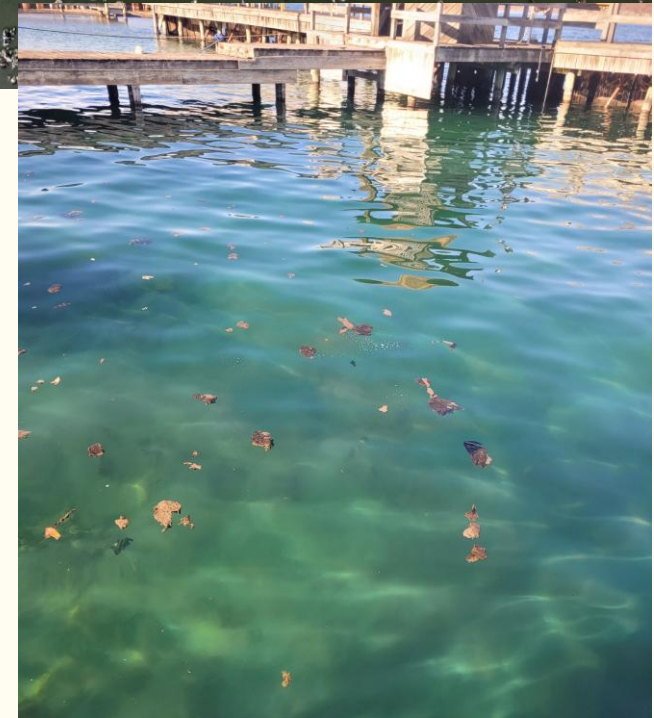


Canandaigua Lake

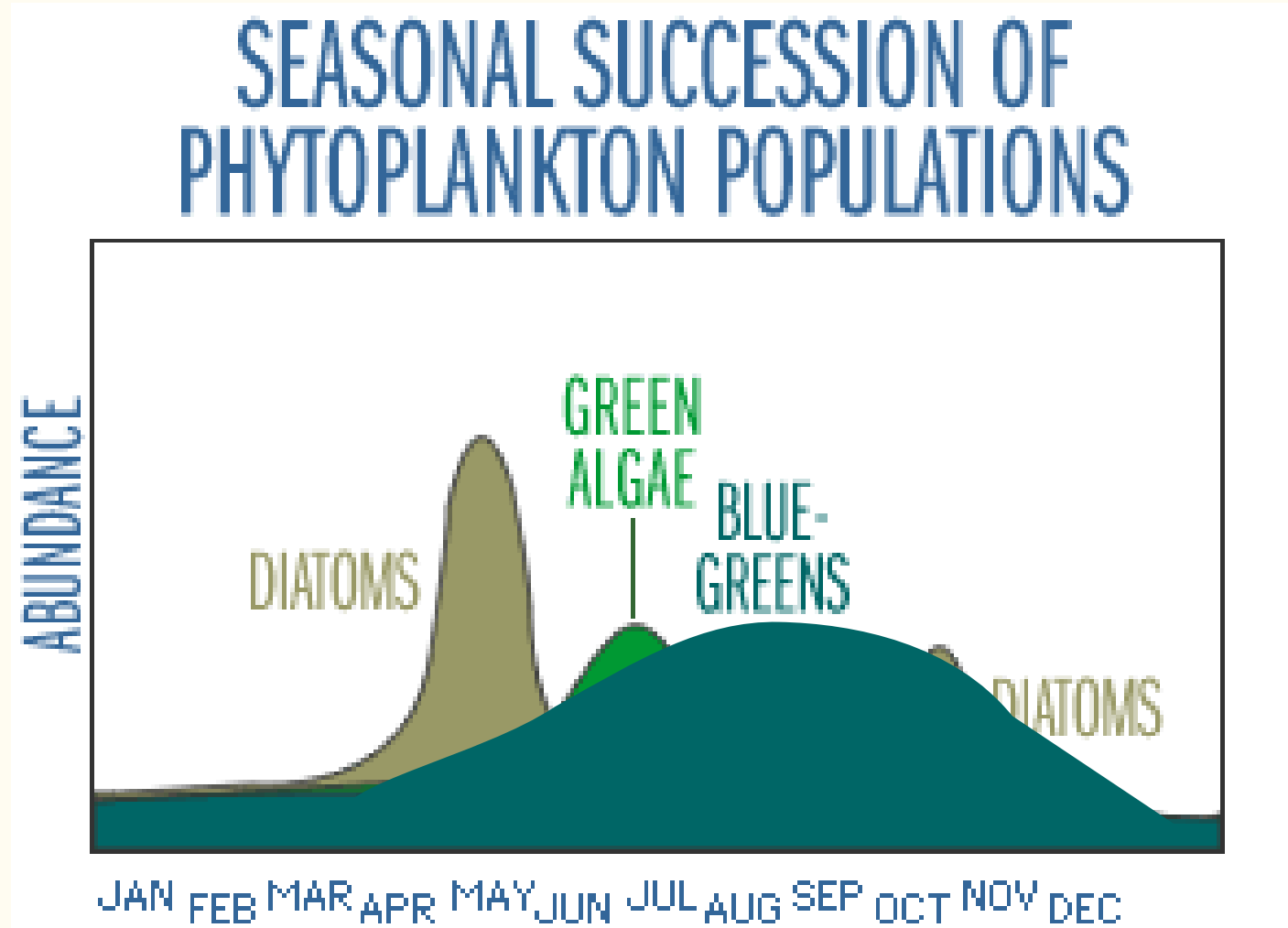
HABs Identification: Clumps

Physical characteristics:

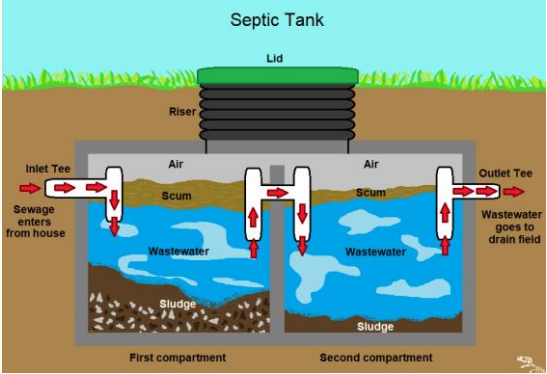
- Floating clumps found floating on the surface of the water
- Dislodged from the lake bottom (benthic)
- Often confused with goose poop



Conducive Conditions for a **HAB**:



Conducive Conditions for a HAB:



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Cayuga Lake HABs Monitoring Program

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 /Online Report Form



2025 Cayuga Lake Harmful Algal Bloom
Volunteer Reporting Page



Cayuga Lake HABs Volunteer Report Form

Please fill out this form as completely as possible.

If you are experiencing difficulty advancing or submitting the form, please check that you have answered each question that has a red asterisk (*) is answered. That means it is a required question and you can not submit the form until all required questions are answered.

Thank you for taking the time to report, and for your diligence in the field! If you are experiencing any difficulties reporting a HAB, please contact Alyssa directly.

The name, email, and photo associated with your Google account will be recorded when you upload files and submit this form

* Indicates required question

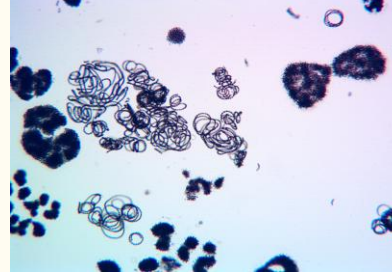
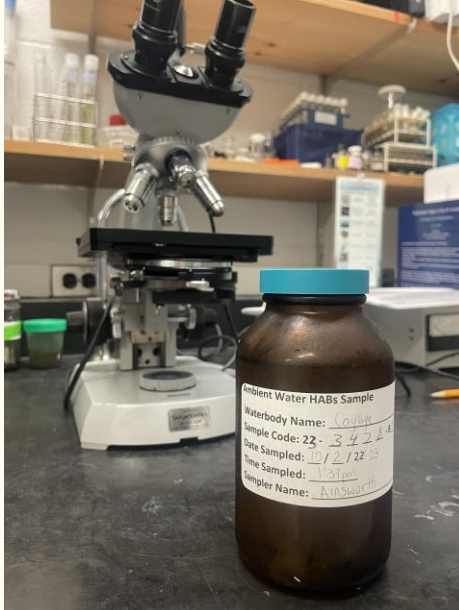
Cayuga Lake HABs Monitoring Program



Microscopy is performed to confirm presence of cyanobacteria



Samples are analyzed in CSI's state certified lab



HAB samples are analyzed to:

- Identify cyanobacteria genera
- Measure chlorophyll a (EPA 446.0 Rev. 1.2)
- Measure microcystin (EPA 546)



Cayuga Lake **HABs** Monitoring Program



Alerts local DOH, posts HAB report/results on the database



Seneca County
Health Department



Cayuga County
HEALTH DEPARTMENT



Cayuga Lake HABs Monitoring Program

Community Science Institute

Database Home

About the Database

Streams and Lakes Chemistry

Download Streams and Lakes Data

Harmful Algal Blooms (HABs)

Download Harmful Algal Blooms

Regional Groundwater Baseline

Download Groundwater Data

Welcome to the Cayuga Lake Harmful Algal Blooms (HABs) Database

What is a Harmful Algal Bloom (HAB)?
A harmful algal bloom (HAB) occurs when aquatic microorganisms, primarily cyanobacteria on Cayuga Lake, grow rapidly under favorable conditions. These blooms have the potential to impact the public health with regard to recreation (swimming) and consumption.

Purpose of this Database
This database is designed to:
a) Quickly alert you to recent reports of cyanobacteria blooms (HABs)
b) Provide detailed information about each HAB reported
c) Make it possible to analyze long-term patterns of HABs occurrences.

Background
The Cayuga Lake HABs Monitoring Program was launched in 2018, recording HABs and their location, approximate size, density, genera of cyanobacteria it contained, and concentration of microcystin (a toxin created by the most commonly detected genera of cyanobacteria on Cayuga Lake). The reporting of bloom occurrences in this database is organized by geography and by areas of recreational interest, for example, parks and boat launches. Thus, Cayuga Lake is divided into 34 shoreline segments and four open water segments for a total of 38 segments used to track HABs spatially along the shore and in the open water of Cayuga Lake.

How to Use
Navigate the map to see HABs by geography. To view most recent suspicious and confirmed HABs click All, Year or Month at the top right. To view additional data select From/To dates and click Filter. Up-to-date information about a bloom, and the segment where it was reported, can be obtained by clicking the pins on the map or the list below.

More Info & Reporting a HAB
[Click here](#) for more information about our Cayuga Lake HABs Monitoring Program. To report a HAB on Cayuga Lake, please e-mail HABshotline@gmail.com

127
HABs REPORTED
2024-06-01 00:00:00 to 2024-10-31 23:59:59

Segments

| | Segment | Events |
|---|--|--------|
| 1 | Lakeshore Segment Northeast 10: Long Point State Park to Elmwood Point | 4 |
| 2 | Lakeshore Segment Northeast 1: Northern Marshes to Harris Park | 52 |
| 3 | Lakeshore Segment Northeast 2: Harris Park | 13 |
| 4 | Lakeshore Segment Northeast 3: Harris Park to Frontenac Park | 98 |
| 5 | Lakeshore Segment Northeast 4: Frontenac Park | 26 |

HARMFUL ALGAL BLOOMS (HABs) DATABASE

From Date: 2024-06-01 To Date: 2024-10-31 Filter

Number of HABs: 127

Map Satellite

Suspicious Bloom. Photos indicate that the suspicious bloom is highly likely to be a harmful algal bloom (HAB). 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).

Microscopic exam: presence of cyanoc... suspicious bloom Cyanobacteria blo... concentration that contact recreation

Harmful Algal Bloom (HAB) Event Information

Bloom Code 24-3459-B1

Where

Water Body Cayuga Lake

Latitude and Longitude 42.854127, -76.704981

Segment Lakeshore Segment Northeast 3: Harris Park to Frontenac Park

County Cayuga

Extent Small Localized (few properties)

When

Bloom Reported July 01, 2024 02:30 AM

Bloom Sampled July 01, 2024 03:00 AM

Microscopic Examination July 02, 2024

What

Bloom Genera [1]

| Microscopy | Present | Dominant |
|----------------|---------|----------|
| Dolichospermum | ✓ | |
| Microcystis | ✓ | ✓ |

Bloom Chemistry

| | |
|--|--------------|
| Total Microcystin and Nodularins (EPA 546) [2] | 5000.0 ug/L |
| Total Chlorophyll a | 10400.0 ug/L |

[1] Genera - plural of genus, a category of classification in biology that ranks between the family level and the species level. Because there are many different species of bacteria that are difficult to distinguish, it is **more** useful to classify bacteria by genus rather than species.

[2] Microcystin

Map of HAB event

Map Satellite

Bloom Description

Several small, green paint areas at 4901 & 4903 Springport Cove Rd, Cayuga 13034

Weather

Weather Sunny

Wind speed

Wind direction

Water Temp

Air Temp

NYSDOH Contact Limits:
Drinking water 0.3 µg/L
Recreation: 4 µg/L

Community Science Institute
Partnering with Communities to Protect Water

Community Science Institute (CSI) • www.communityscience.org • info@communityscience.org

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Partner Organizations & Agencies



Seneca County
Health Department



Cayuga County
HEALTH DEPARTMENT



Discover
CAYUGA LAKE



Partner Organizations & Agencies



**Department
of Health**



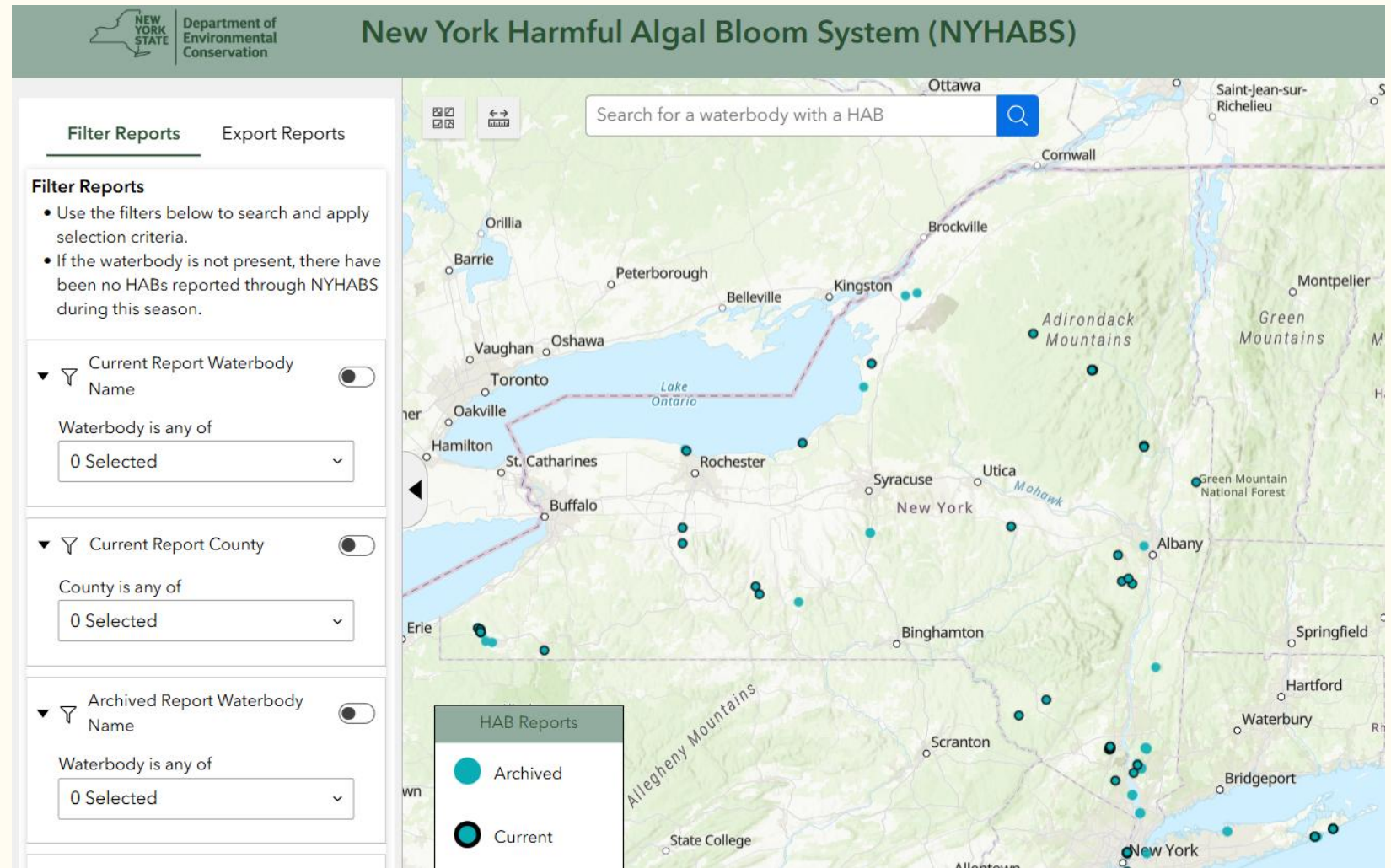
**New York State
Parks, Recreation and
Historic Preservation**

- Interagency collaborative effort (DEC, OPRHP, DOH)
- Operates NYHABS with DOH and OPRHP and issues bloom notifications
 - Health concerns & drinking water treatment overseen by local operators and DOH
 - Regulated swimming areas (beaches) have a protective response protocol based on visual observations

Partner Organizations & Agencies

NYHABS Map

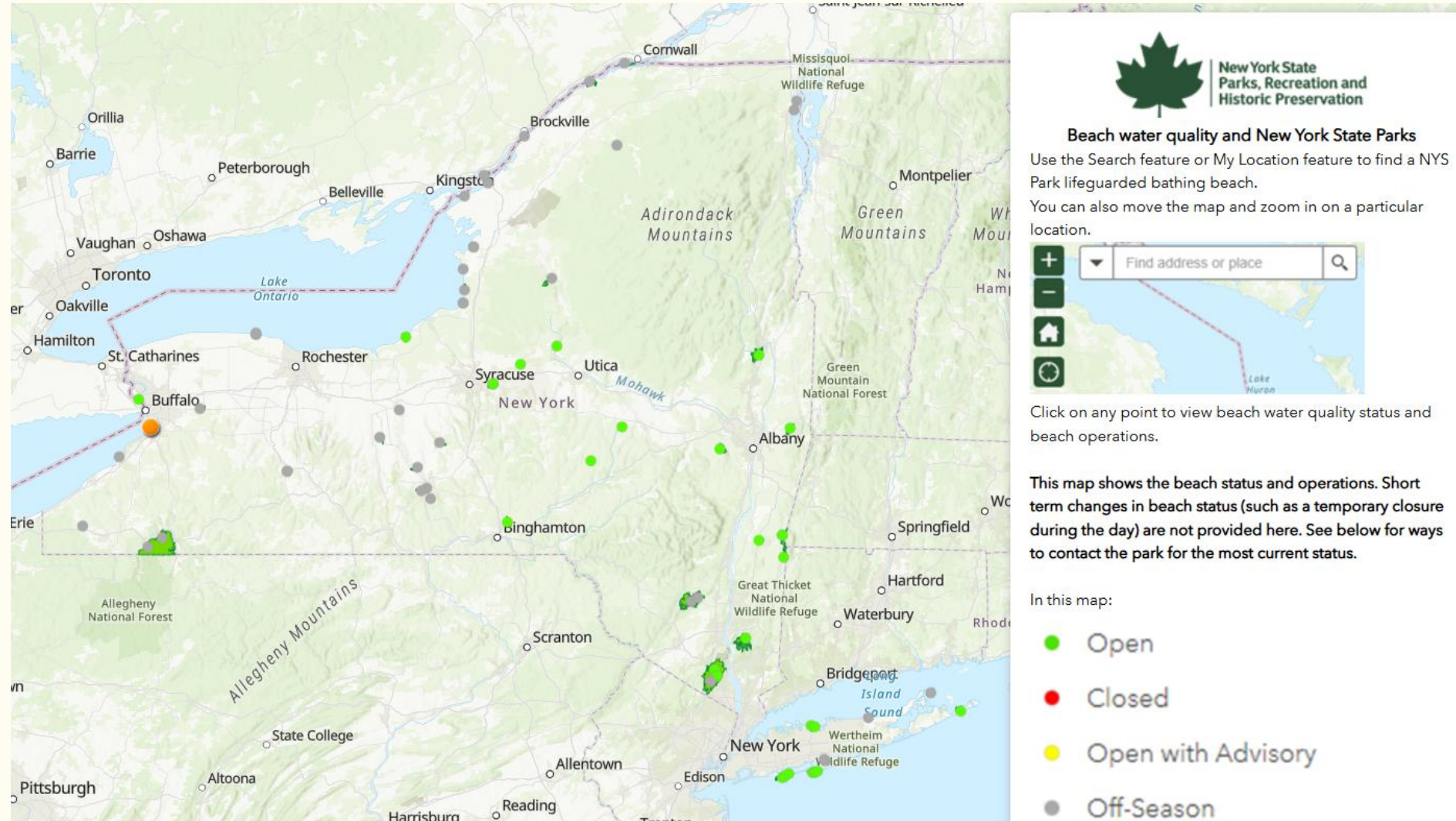
6/24/25 @ 4:30 pm



Partner Organizations & Agencies

OHPRP Beach Closure Map

6/24/25 @ 4:30 pm



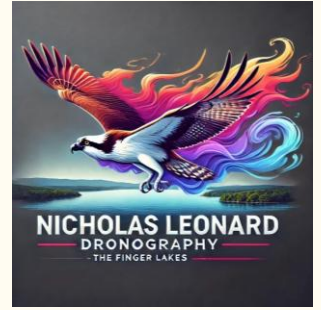
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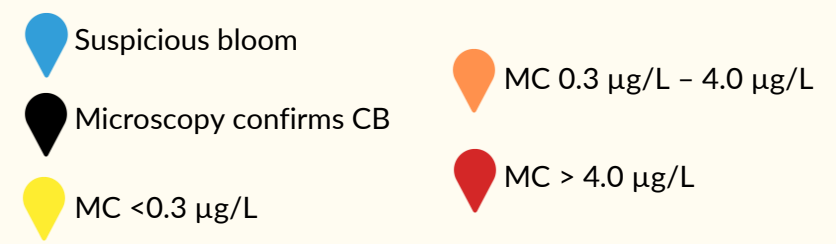


2024 Monitoring Season in Review

- Number of volunteers: 98 HAB Harriers; 8 HAB Carriers
- 1 volunteer drone operator + Sky Dive Seneca Lake
- HABs Reported: 127
- CSI received HABs reports from June 03, 2024 – October 28, 2024
- Pilot study: HAB Clumps
11 samples collected and analyzed



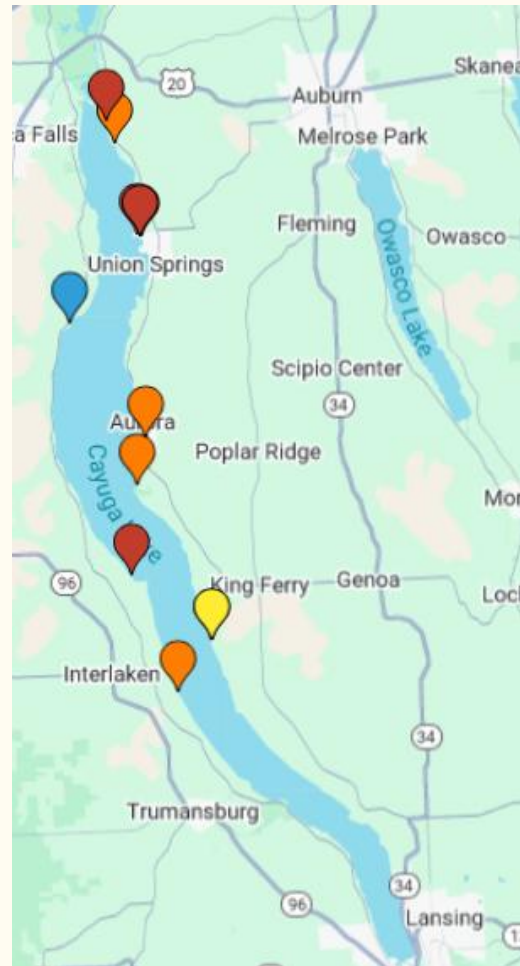
2024 Monitoring Season in Review



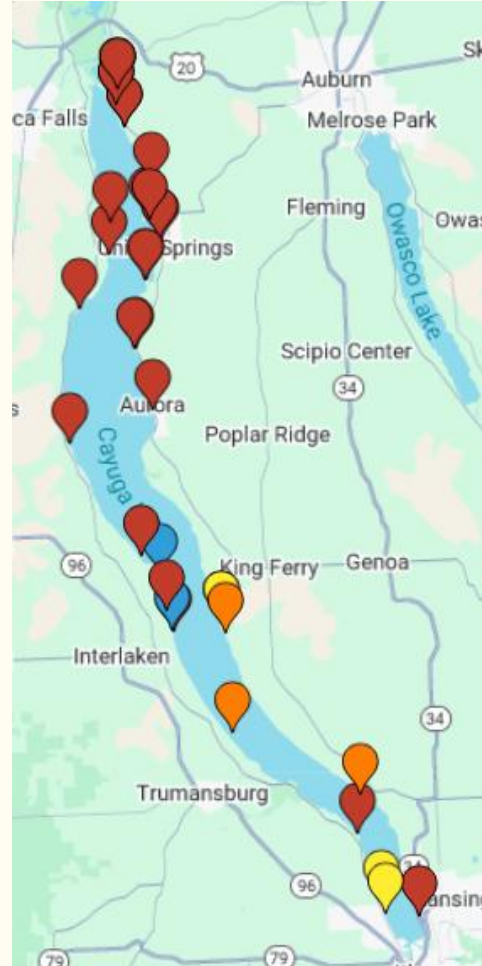
June



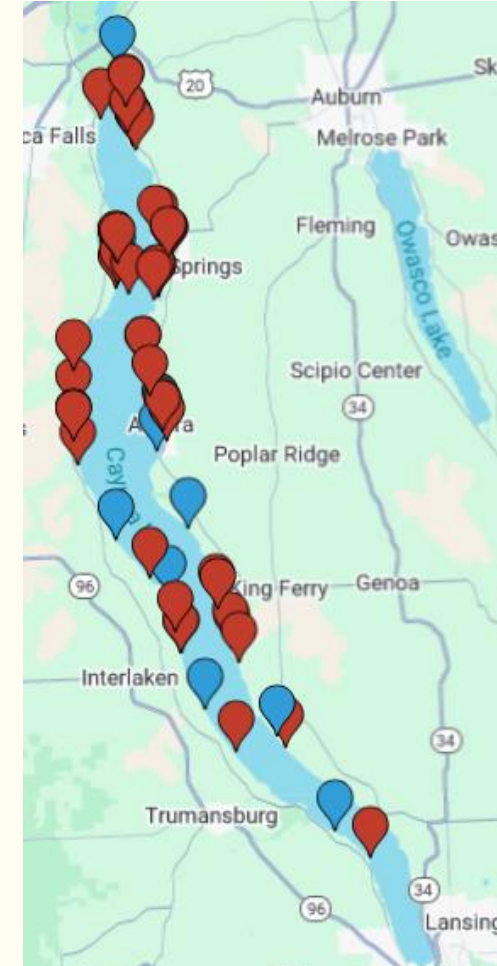
July



August



September

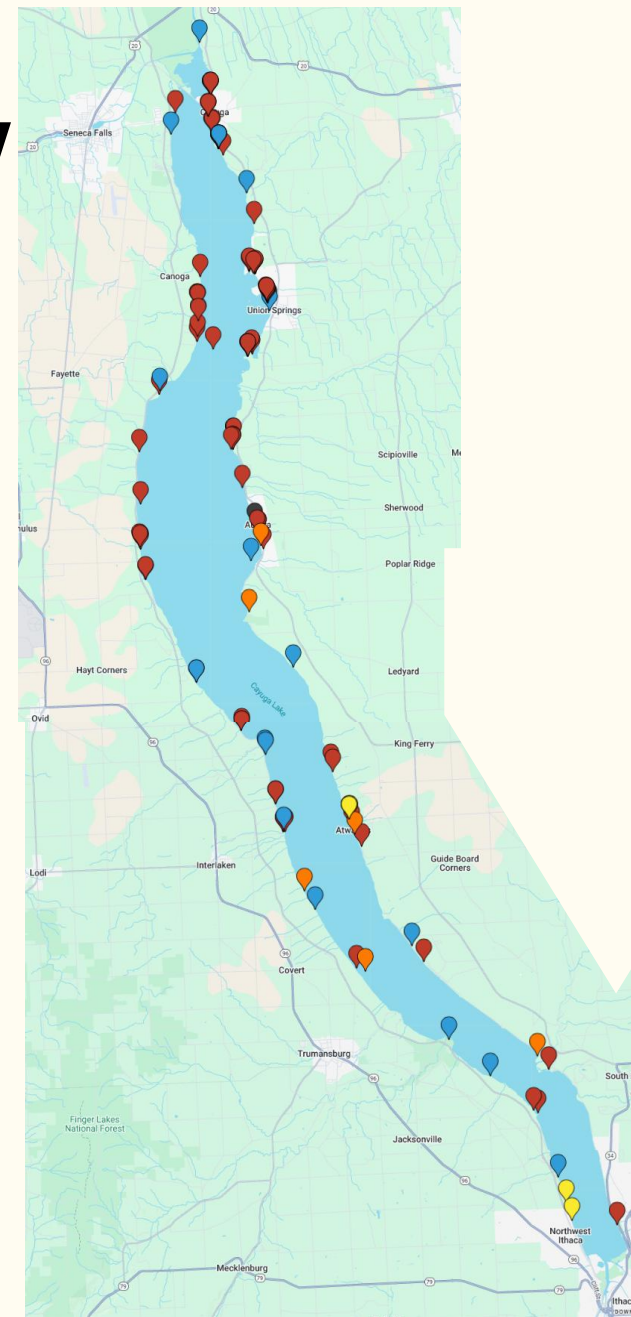
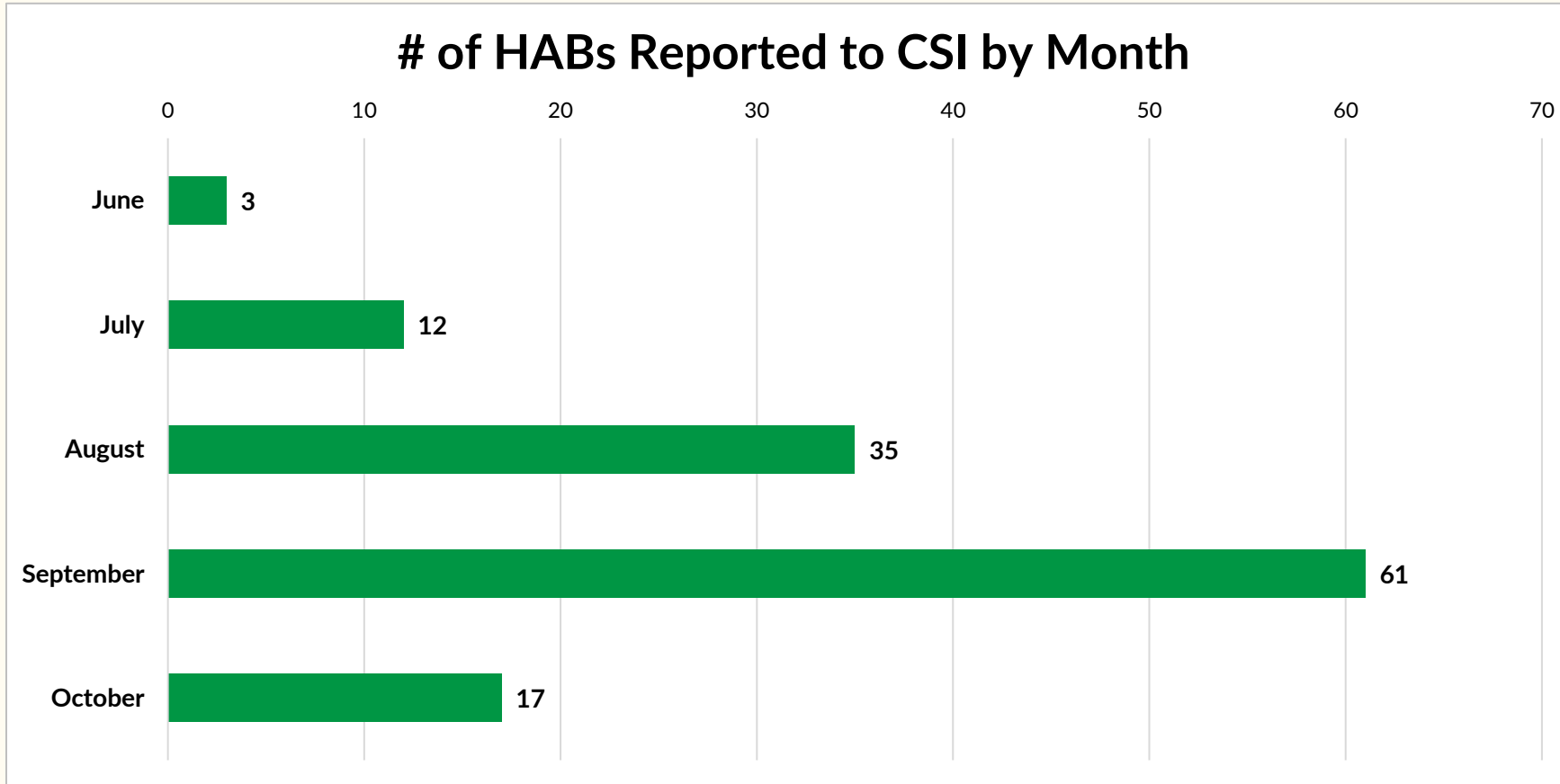


October



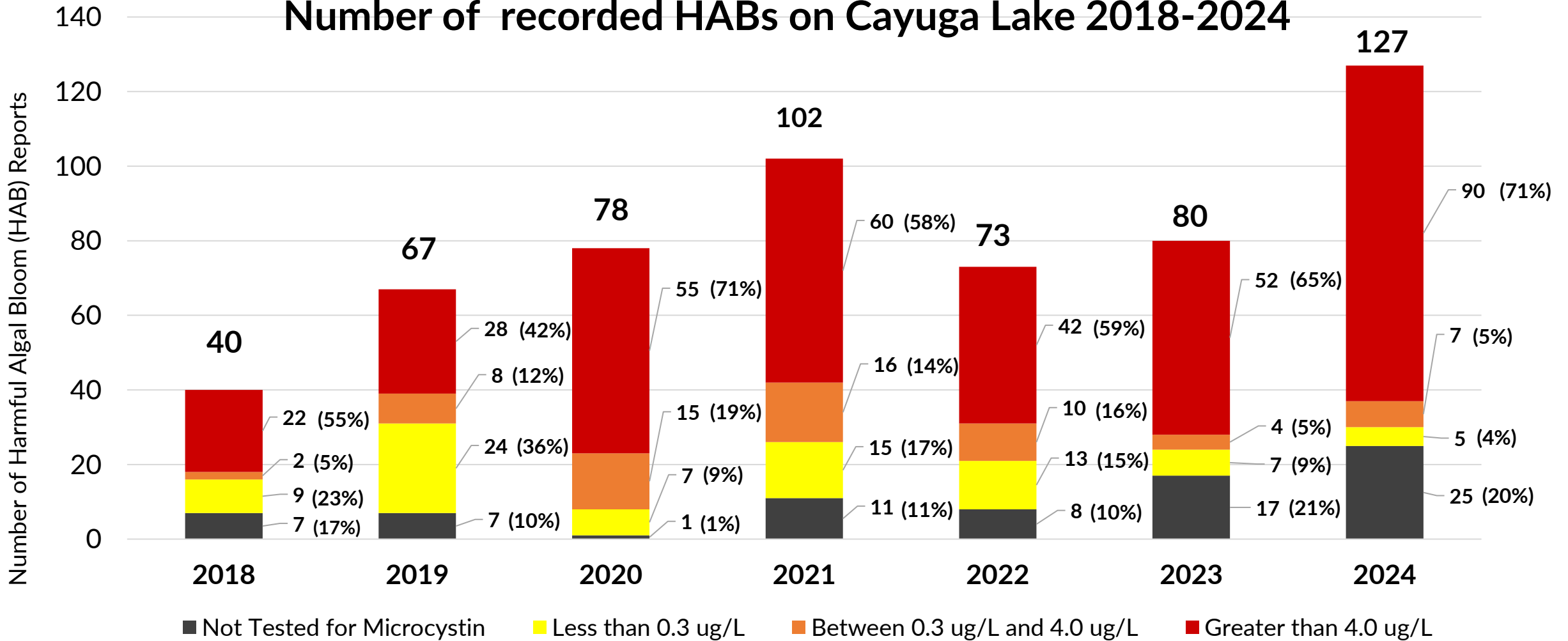
2024 Monitoring Season in Review

127 total!

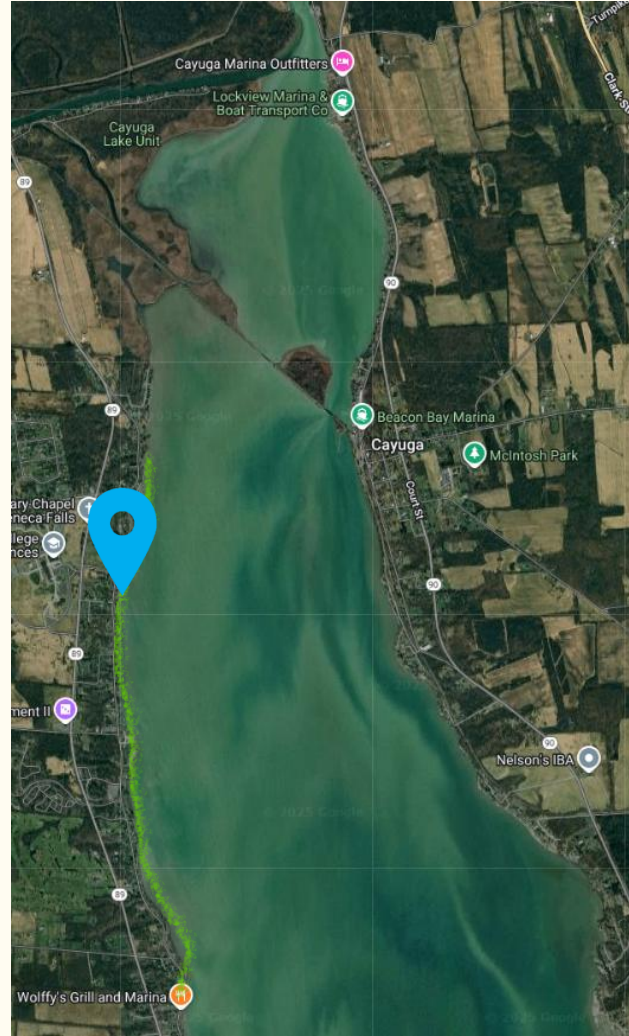


The most **HABs** reported in a single year:

Number of recorded HABs on Cayuga Lake 2018-2024

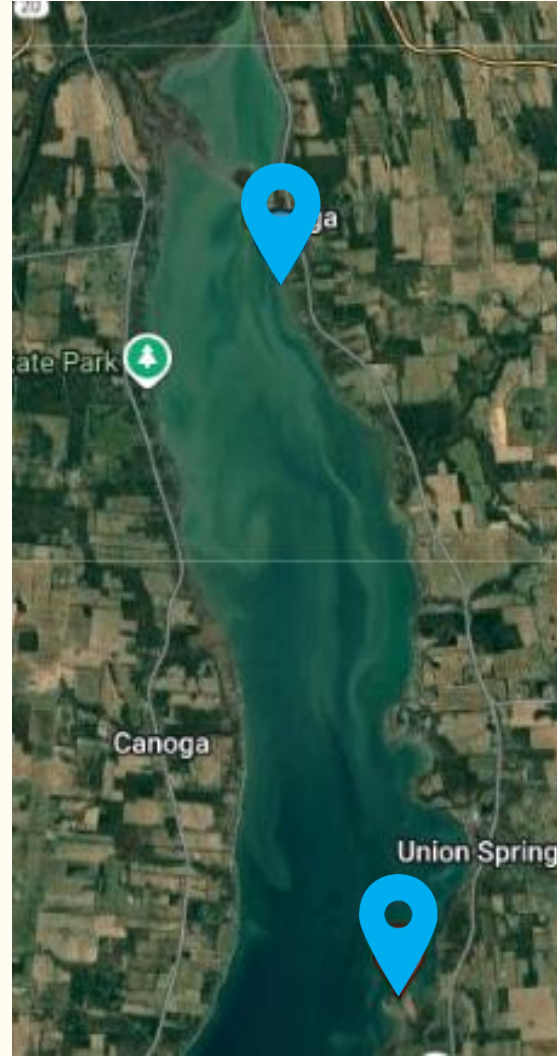


The earliest **HAB** reported on CSI's record:



- June 3rd, 2024
- 1 reported by homeowner on Lower Lake Road, Town of Seneca Falls
- Anecdotal reports the bloom stretching for close to 2 miles along the western shore

The latest **HABs** reported on CSI's record:



- October 28th, 2025
- 2 reported by HABs Harriers
- Harris Park in Cayuga
- Farley's Point in Union Springs

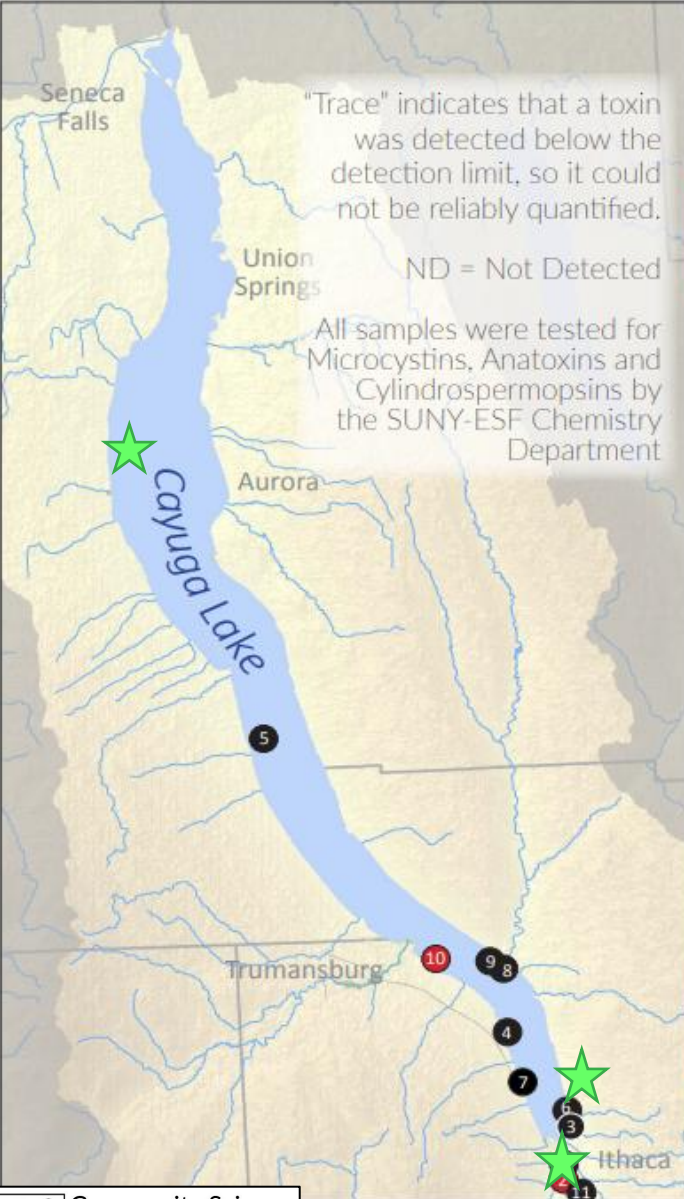
2024 Pilot Study: HAB Clumps

- 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 |

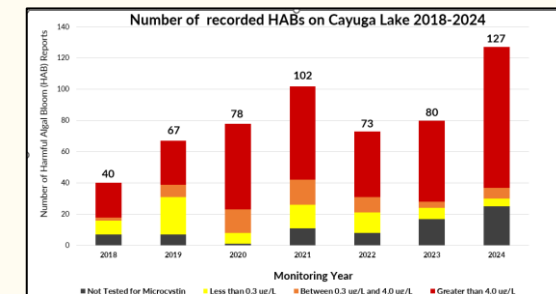
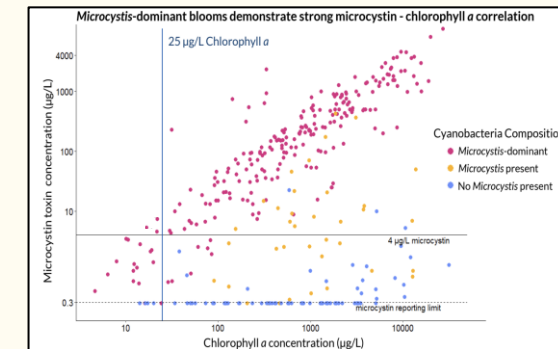
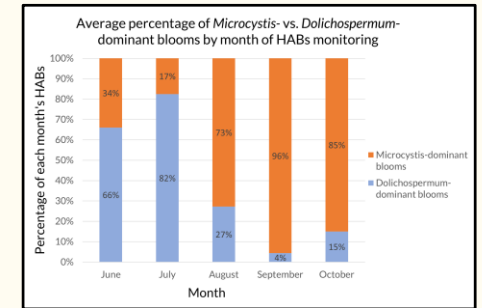


2025 Samples Collected

Adrianna Hirtler

2024 HABs Season Takeaways

- From June – July, Cayuga Lake HABs tend to be dominated by *Dolichospermum* sp.. From August to October, blooms tend to be dominated by *Microcystis* sp.
- Blooms that are *Microcystis*-dominant usually have higher levels of microcystin toxin than blooms that are **not** *Microcystis*-dominant
- There is a strong positive relationship between chlorophyll a and microcystin concentration in HABs that are *Microcystis*-dominant.
- Since 2020, more than half of the HAB samples collected each year have microcystin concentrations greater than the contact recreation limit (4 ug/L)
- The number of HAB reports increased from 2018-2021, then plateaued in 2022-2023, and took off again in 2024
- What will 2025 bring? So far, so good!



To HAB or Not to HAB?

✗ NOT a HAB (probably)



To **HAB** or Not to **HAB**? Test your ID skills:



HAB ✓

To HAB or Not to HAB?



✗ NOT a HAB

To HAB or Not to HAB?

HAB ✓



To **HAB** or Not to **HAB**?



HAB ✓

To HAB or Not to HAB?

✗ NOT a HAB



To HAB or Not to HAB?

HAB ✓



To HAB or Not to HAB?



✗ NOT a HAB



To **HAB** or Not to **HAB**?



HAB ✓

To HAB or Not to HAB?

✗ NOT a HAB



To **HAB** or Not to **HAB**?



HAB ✓

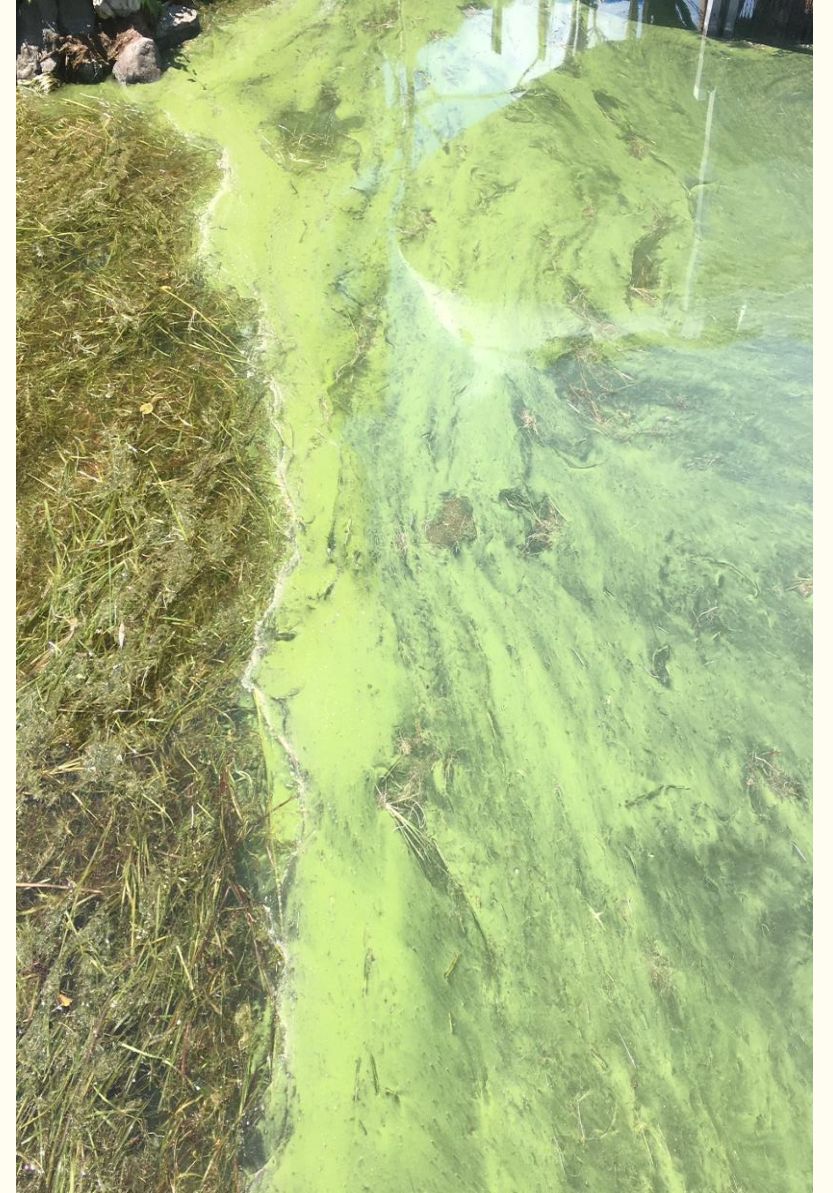
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Get Involved:



2025 Community Member Cayuga Lake HABs Report Form


[Community Science Institute](#) oversees all daily operations of the Cayuga Lake HABs Program including volunteer coordination, sample collection, sample analysis, and reporting to NY State.

This form is to be used by community members to report a suspected harmful algal bloom (HAB) on Cayuga Lake. Receiving as much information as possible, as quickly after you've spotted the HAB, is very helpful to CSI's Cayuga Lake HABs Monitoring Program Coordinator. Upon receipt of your report, the Coordinator will reach out to you directly to follow up. Please be sure you are available to respond to a text/call/email!

Receiving a report of a suspected HAB hours or days after it has been observed is not usually helpful as HABs can dissipate quickly.


To view all of the HABs reports/data collected to CSI on Cayuga Lake (2018-present), visit the [CSI HABs Database](#).

Or email HABsHotline@gmail.com

 **Community Science Institute**
Partnering with Communities to Protect Water

CAYUGA LAKE VOLUNTEERS NEEDED:

Harmful Algal Bloom (HABs) Monitoring




There are TWO ways to get involved:


- 1) Monitor an assigned shoreline "zone", 1x/week
- 2) Assistance with the transport of samples from Romulus/Aurora to the CSI Lab in Ithaca


- Orientation/training is provided!
- The official monitoring season runs **6/29/25 - 10/1/25**.
- Monitoring Volunteers are expected to check their assigned "zone" at least 1x/week during this time period.
- If a HAB is observed: take 2 pictures and submit them via an online report form.
- Sample Transport Volunteers are contacted "as-needed" to assist with transporting samples to the CSI lab for analysis.


Contact Community Science Institute for more information:
607-257-6606
info@communityscience.org


IN PARTNERSHIP WITH:

 **Seneca County**
Health Department

 **Cayuga Lake**
Watershed Network

 **Discover**
CAYUGA LAKE

 **TOMPKINS COUNTY**
Whole Health

 **Cayuga County**
HEALTH DEPARTMENT

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JUNE 4, 2024

Cayuga Lake had its first confirmed Harmful Algal Bloom (HAB) of 2024 on Monday, June 3rd. It was spotted by a vigilant homeowner on Lower Lake Rd in the town of Seneca Falls who promptly reported the bloom. Many thanks to the homeowner for taking excellent photos and including all the relevant information using the bloom reporting form so that all the necessary information could be documented and reviewed by our partners at the Community Science Institute (CSI). Since then, there have been additional reports of blooms in the area. The Cayuga Lake State Park Beach is closed and signs have been posted.

Anyone can report a HAB! Fill out the form!

If you spot a suspicious bloom or potential HAB avoid it and report it. Share as much information as possible including GPS coordinate location or address, date, time, and photos.

[Click here to view the HABs Reporting Form](#)

Important Reminders:

1) While blooms do occur in early June, there is also a lot of pollen in the environment due to blooming trees and other plants. Pollen on water can

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Acknowledgements

CSI Staff Past and Present

- Grace Haynes, former Cayuga Lake HABs Coordinator
- Grascen Shidemantle, Executive Director
- Noah Mark, Laboratory Director
- Adrianna Hirtler, Biomonitoring Coordinator
- Rama Hoetzlein, Database Developer

**ALL 101 DEDICATED
HABs HARRIERS &
CARRIERS!!!**

Programmatic Support



CSI Members & NEW Business Members



Questions?

Photo: Bill Hecht