2024
Volunteer Training Workshop
Harmful Algal Blooms
on Cayuga Lake

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Community Science Institute (CSI)

Cayuga Lake Watershed Network

Community Science Institute
Partnering with Communities to Protect Water

Discover CAYUGA LAKE

NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation

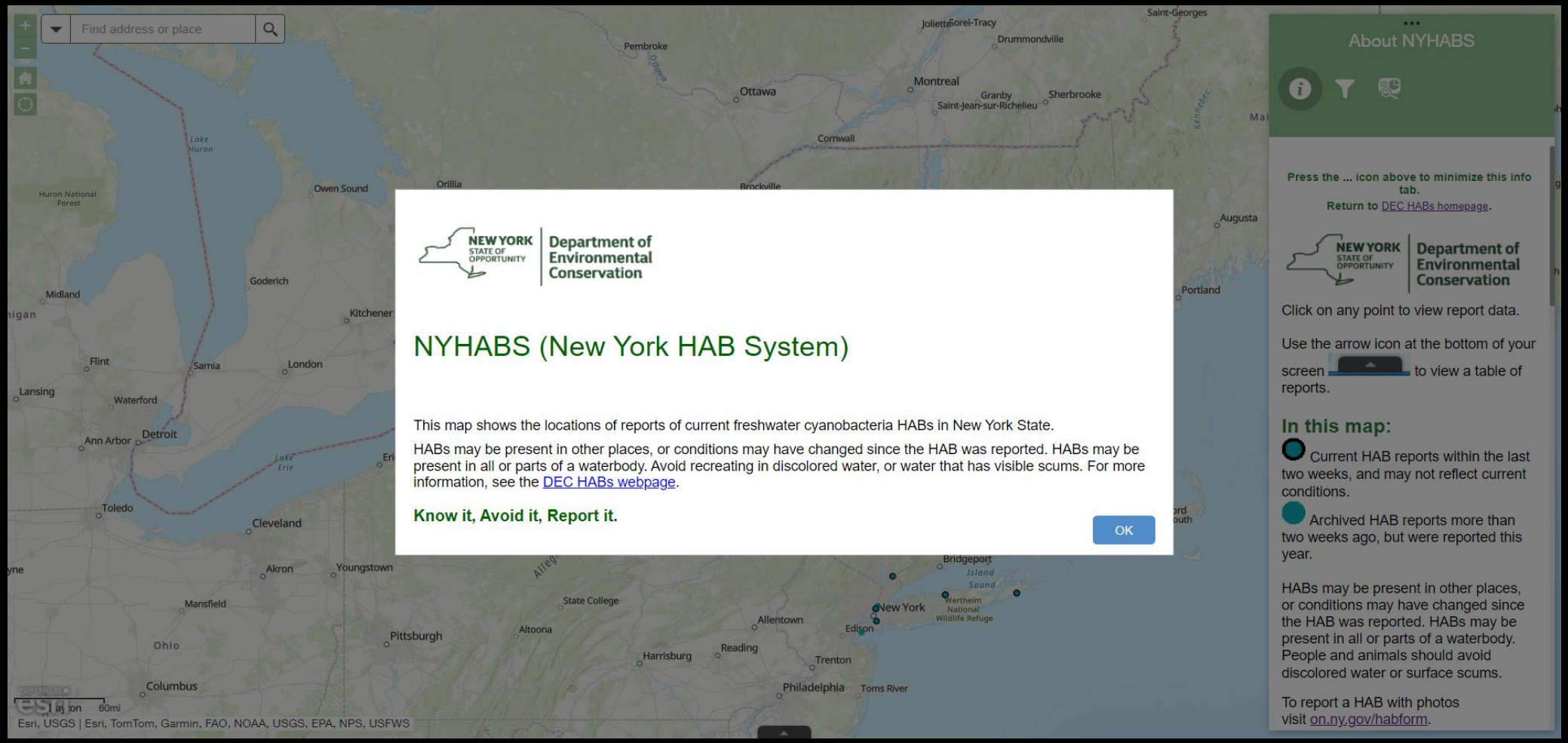
Cayuga County Health Department

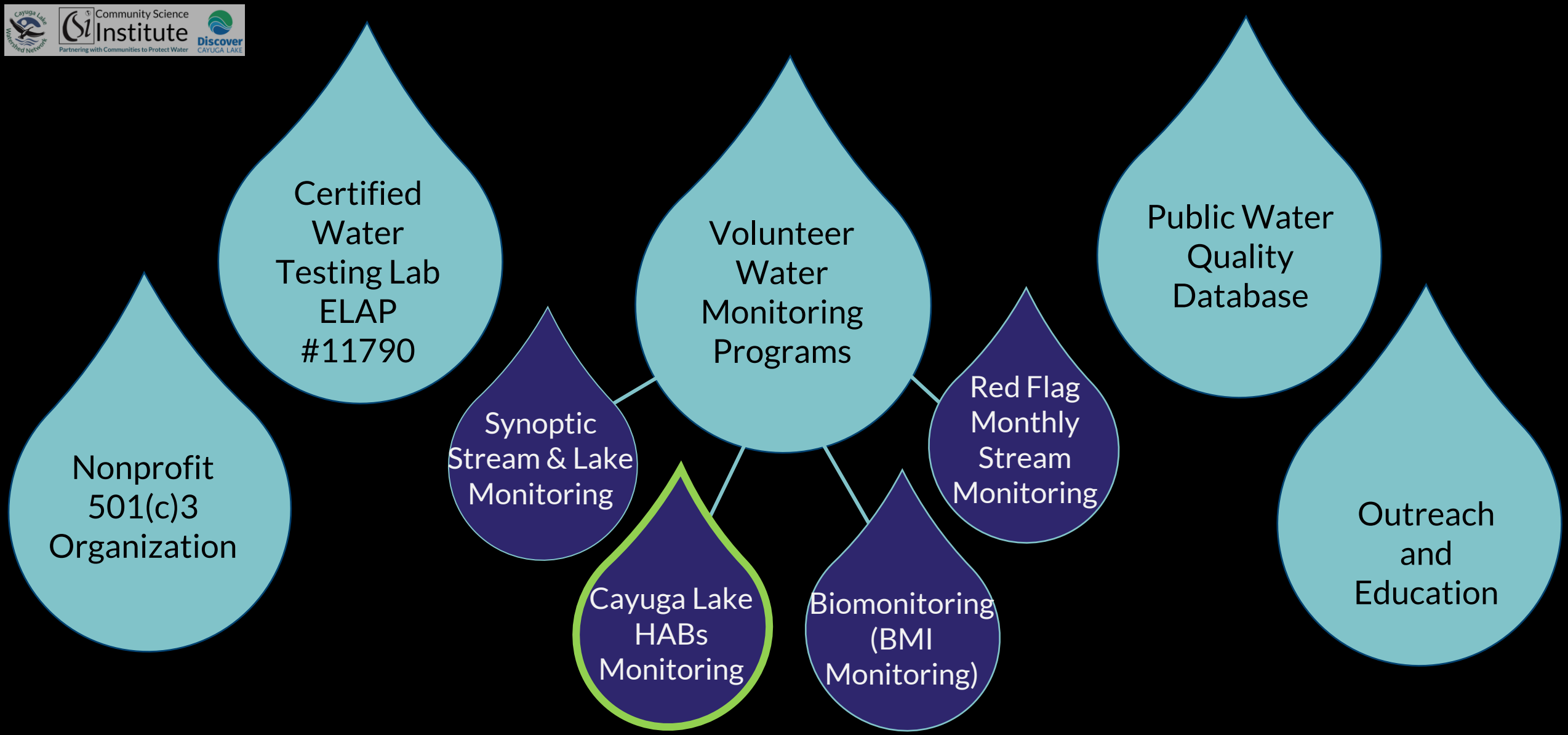
Public Health
Prevent. Promote. Protect.
Seneca County, NY

TOMPKINS COUNTY Whole Health

Photo by Seneca Falls Homeowner, 6/3/24 HAB

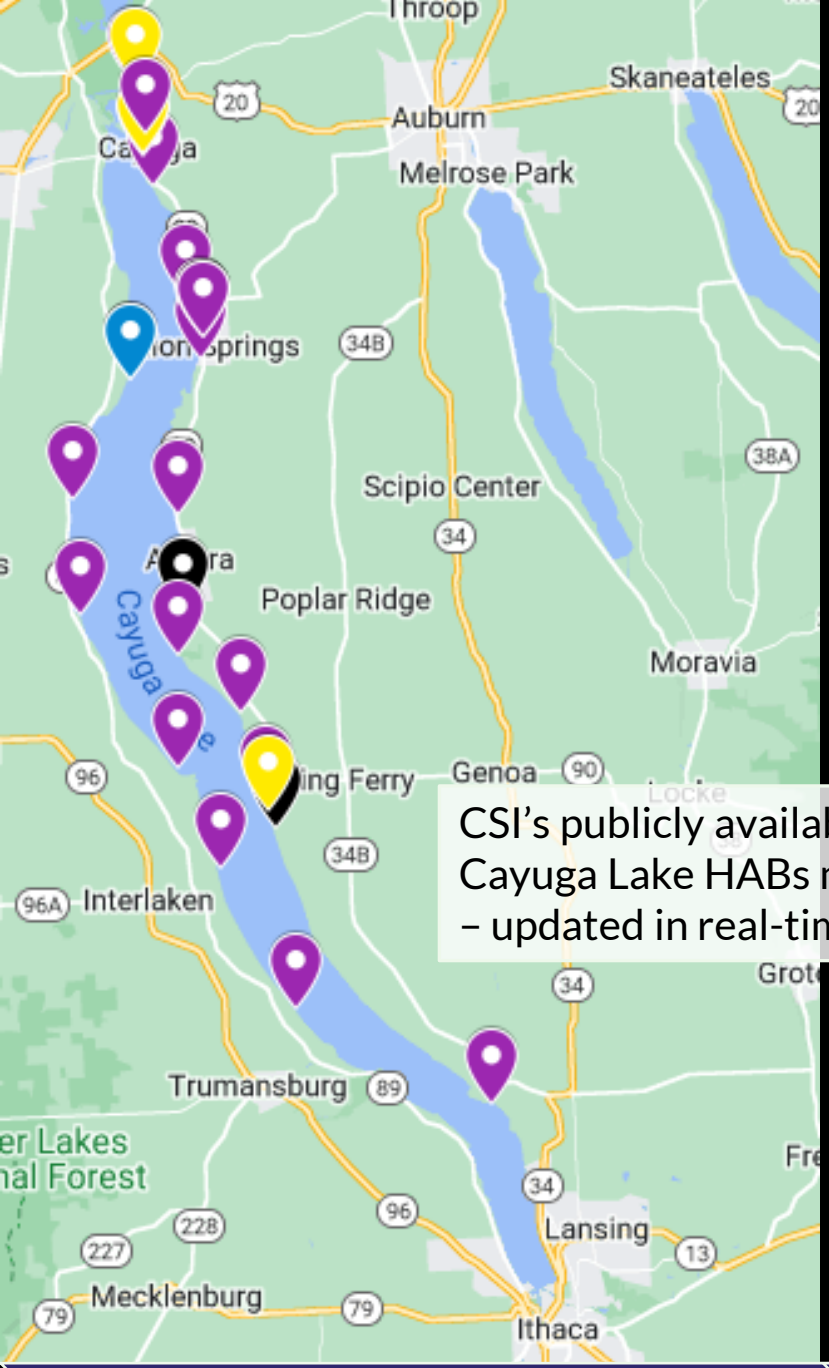
2024 HABs Updates as of 1 pm 6/18/24





Community Science Institute's Mission

To empower community members to protect water through volunteer stream and lake monitoring



CSI's publicly available Cayuga Lake HABs map – updated in real-time!

Cayuga Lake HABs Monitoring Program

- Began in 2018
- Purpose is twofold:
  - Provide **timely** public health information on HABs on Cayuga Lake
  - Collect data on trends in HAB formation and characteristics on Cayuga Lake to further scientific understanding

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New York State of Opportunity
Department of Environmental Conservation

Cayuga County Health Department

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Seneca County, NY

Tompkins County Whole Health

1. What is a “harmful algal bloom”?

- Cyanobacteria and HABs ecology
- Impacts of freshwater HABs

2. Identifying HABs

- Things that are NOT HABs
- Things that ARE HABs

3. Reporting HABs

- CSI’s Cayuga Lake HABs Monitoring Program
- Volunteer duties

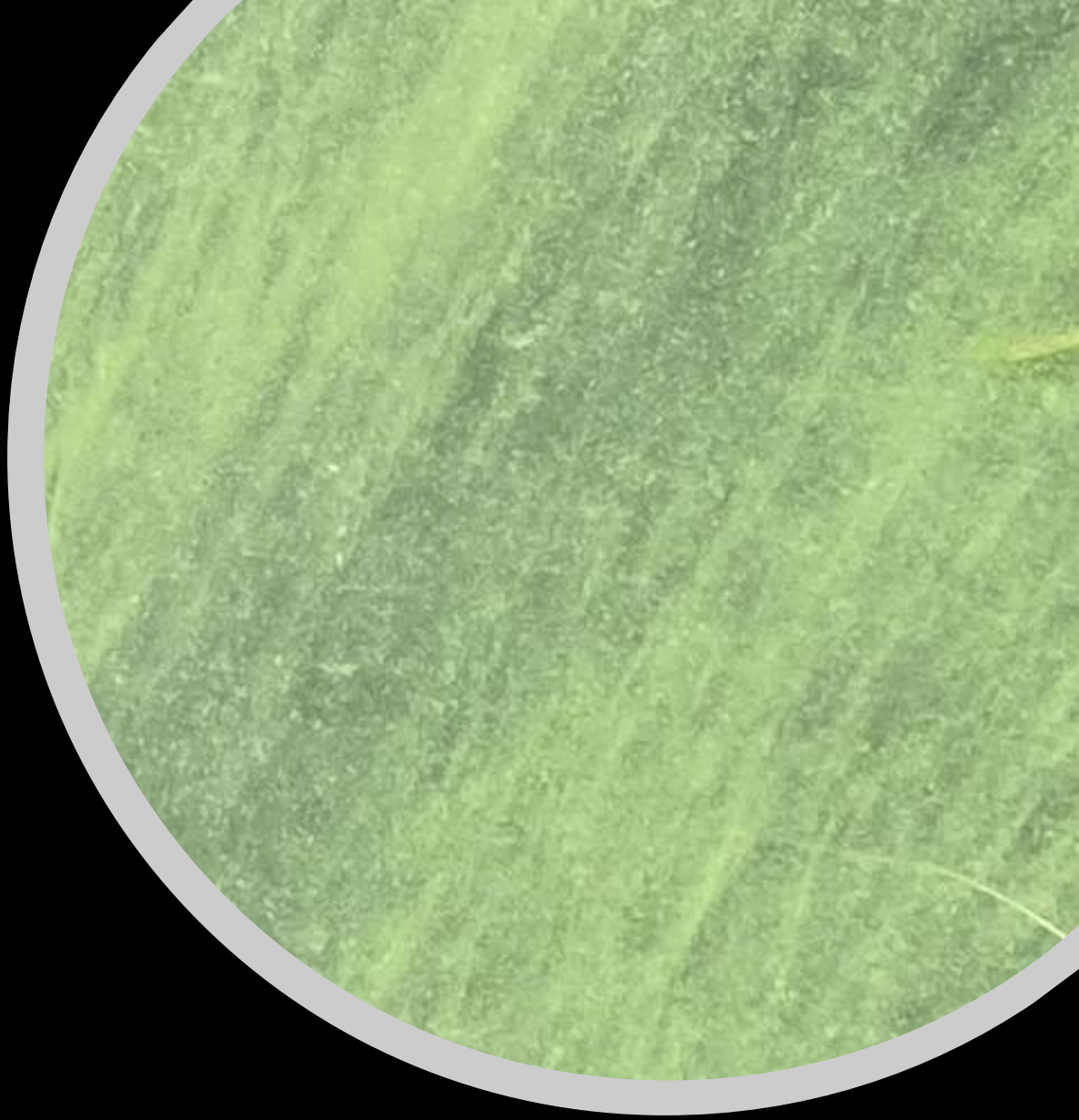
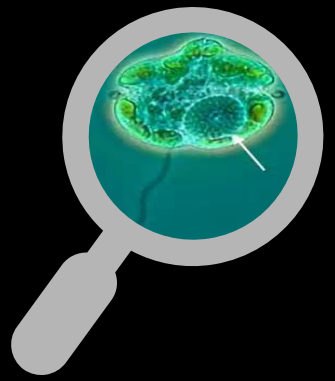


Photo by Jeanne Sullivan, CSI HABs volunteer

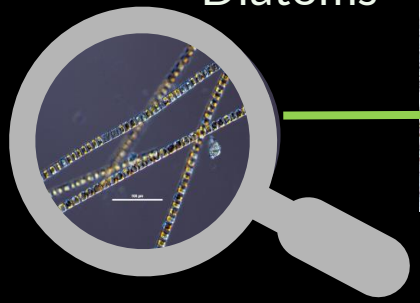
What is a “Harmful Algal Bloom”?

It’s largely a misnomer!

Dinoflagellates

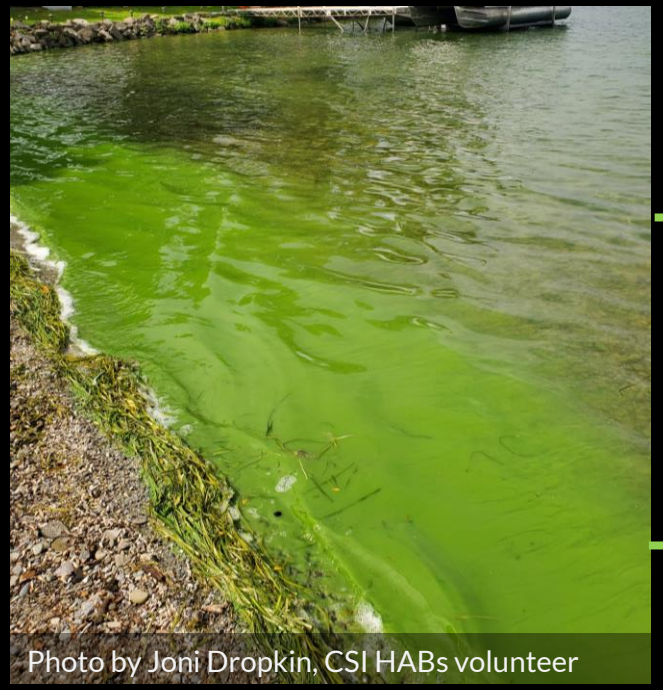


Diatoms

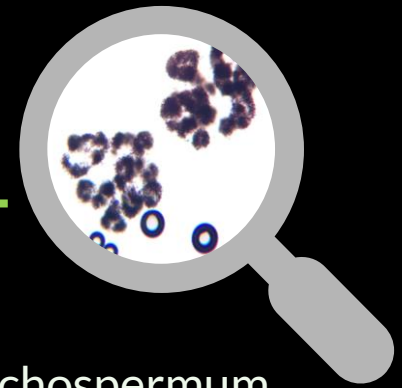


Marine “harmful algal blooms”
Aka “red tides”

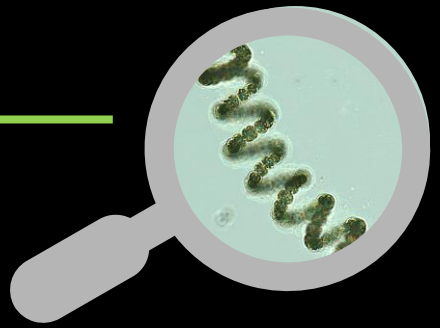
Freshwater “harmful algal blooms”



Microcystis



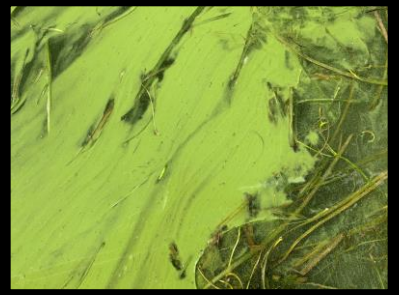
Dolichospermum



What is a freshwater “Harmful Algal Bloom”?

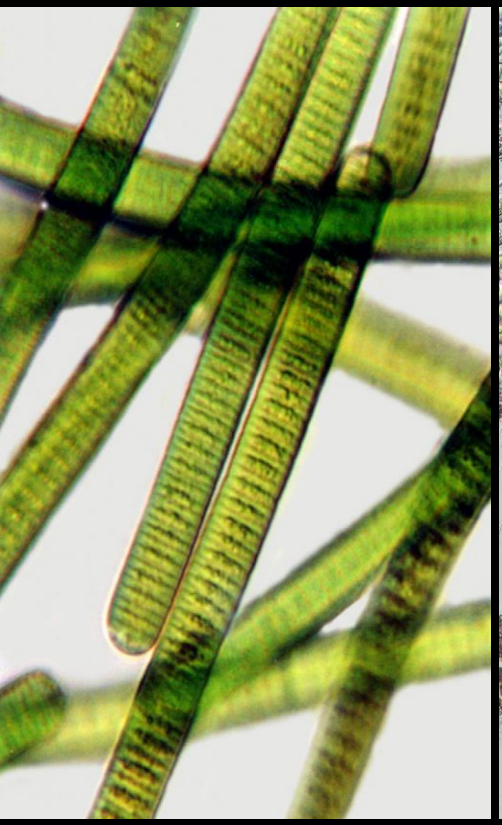
Photo by Ken Riemer, CSI HABs volunteer

Cyanobacteria

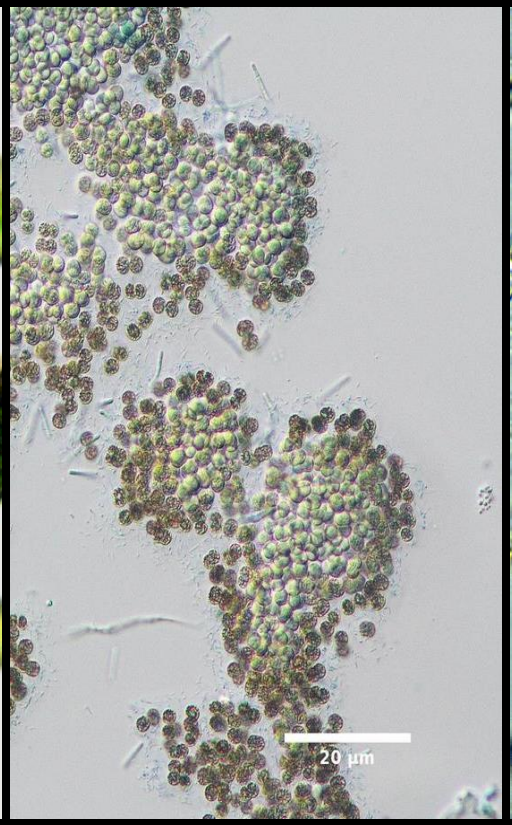


Photos by Holly Davidson and Joni Dropkin, CSI HABs volunteers

What are cyanobacteria?

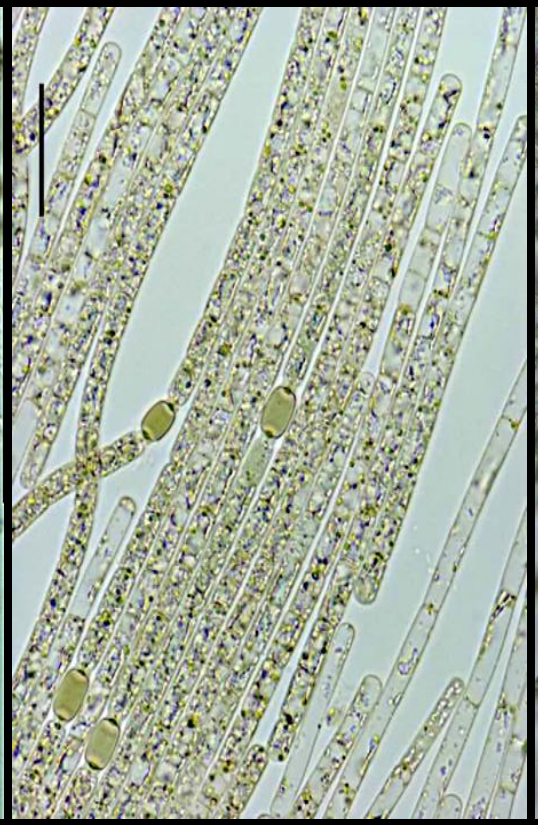


Oscillatoria



Microcystis

Woronchinia

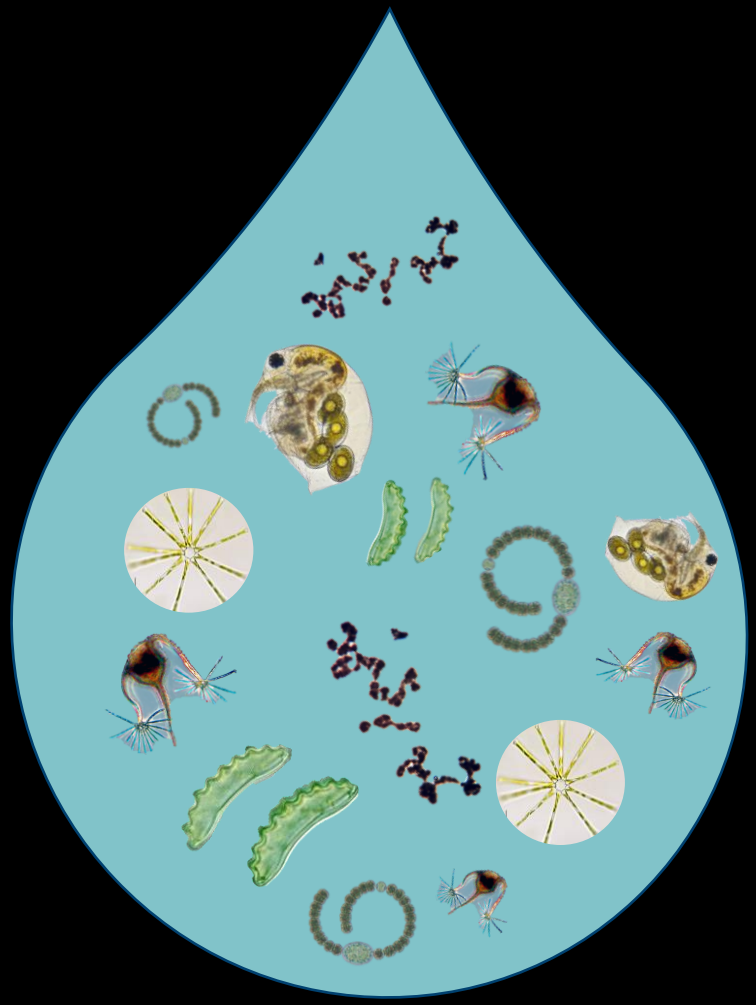


Aphanizomenon

Dolichospermum

Cyanobacteria

Part of a healthy, balanced , normal freshwater ecosystem



Cyanobacteria produce chemical compounds

Beneficial compounds	Harmful compounds ("cyanotoxins")
• Anti-cancer drugs • Anti-viral drugs (can help treat HIV) • Antibacterial drugs	• Liver toxins • Neurotoxins

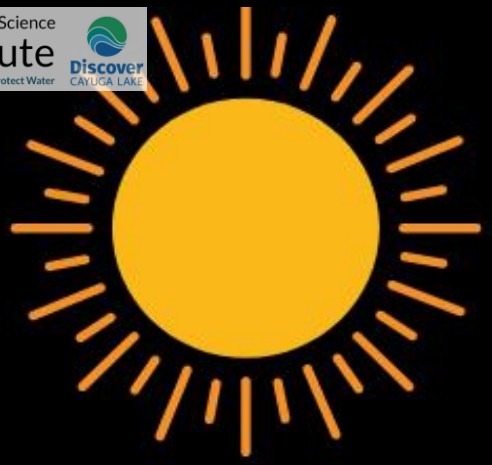
Namikoshi and Rinehart 1996, Singh et al. 2011

Impacts of HABs

Impacts on human health

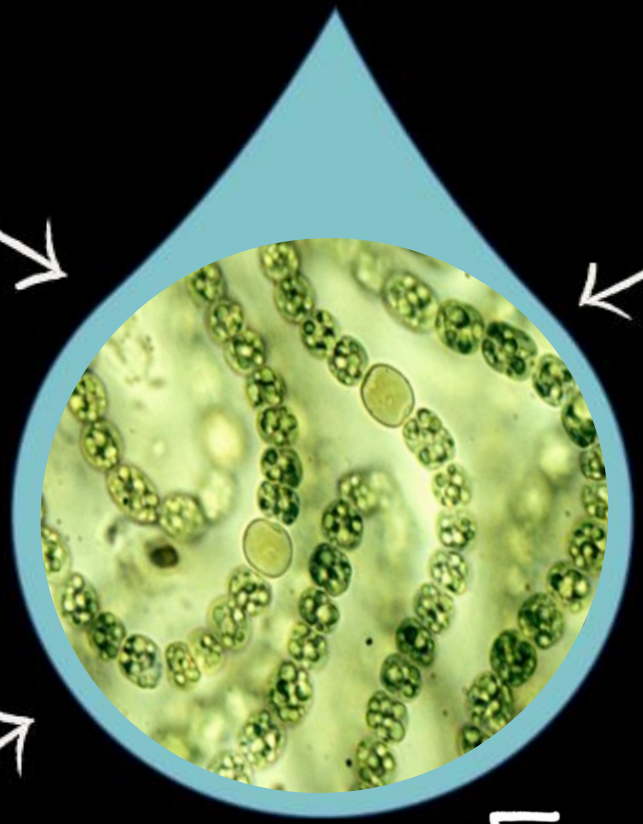
Economic impacts

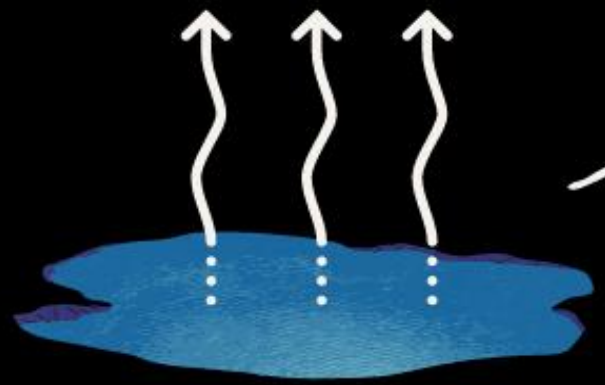
Ecological impacts



sunlight

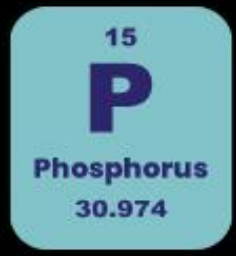
calm conditions





increased temperature

Zebra mussels



nutrients

Photo by Michelle Jenkins, CSI HABs volunteer

What is a "HAB"?

H: Harmful
- Toxins, economic, aesthetic, ecological

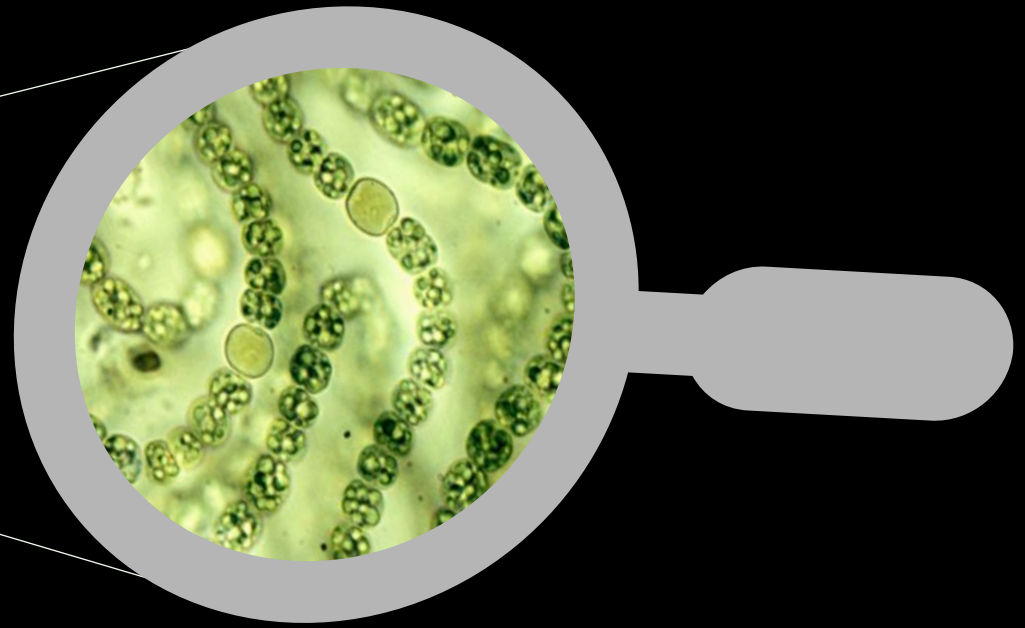
A: Algal
- Freshwater HABs refer to cyanobacteria. Not true algae.

B: Bloom
- Proliferations of cells, dense concentrations

Photo by Dave Shafer, CSI HABs volunteer

When do they become “harmful”?

A “HAB” is an explosive population growth of these cyanobacteria, which may produce toxins



NEW to HABs Harriers in 2024:
Clump or Benthic Cyanobacteria

An atypical HAB to look out for

- Reported by CSI volunteers in 2022 and 2023
- Some samples collected for microscopy and microcystin/anatoxin analysis by CSI 2022-2023
- This summer CSI is inviting volunteers to help report and sample
- Sampling protocol later in the presentation…

What does this phenomenon look like from the shore?

- Floating clumps of material that are sometimes mistaken for goose poop
- More substantial than typical HABs.
- WILL attach to the end of a stick pulled slowly through a clump (unlike other HABs).
- Can be seen any time of year, NOT just during the typical late summer HAB season

Oscillatoriales

Test Your Skills

Test Your Skills

Yes!

Test Your Skills

Test Your Skills

No!

Muddy water, storm water

Test Your Skills

Test Your Skills

Yes!

"Clump HAB"

Test Your Skills

Test Your Skills

No!

Pollen

Test Your Skills

Test Your Skills

Yes!

Test Your Skills

Test Your Skills

No!

Blue-green algae

Test Your Skills

Test Your Skills

Yes!

Test Your Skills

Test Your Skills

Maybe?

What would you do?

Test Your Skills

Test Your Skills

No!

Lily pads, muddy water, stormwater

Test Your Skills

Test Your Skills

No!

Blue-green algae or filamentous algae (or both!)

Test Your Skills

Test Your Skills

No!

Pollen

Test Your Skills

Test Your Skills

Yes!

Test Your Skills

Test Your Skills

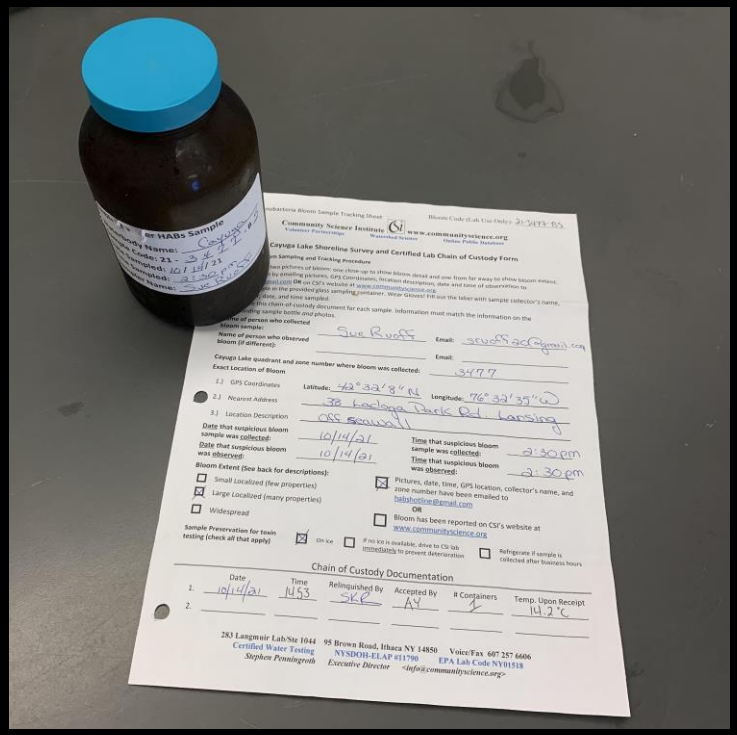
No!

Duckweed

Survey Period & Frequency

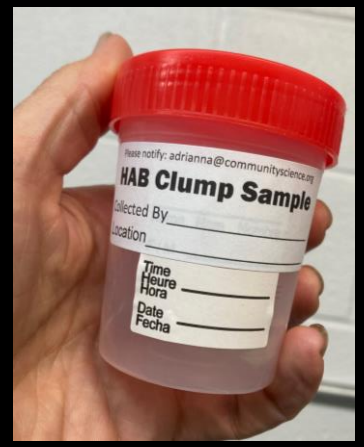
- The **NYSDEC** monitoring season begins July 1st and ends September 30th, 2024
- The **2024 Cayuga Lake HABs** monitoring season: begins the week of Sunday, June 30th, and continues through the last week of September, ending the season officially on Saturday October 5th.
  - Includes weekly monitoring
  - Ideally occurs on the same day of the week at approximately the same time of day
  - Includes sample collection + submitting HAB Report Form
  - Submit No Bloom Report in weeks where no HAB is detected

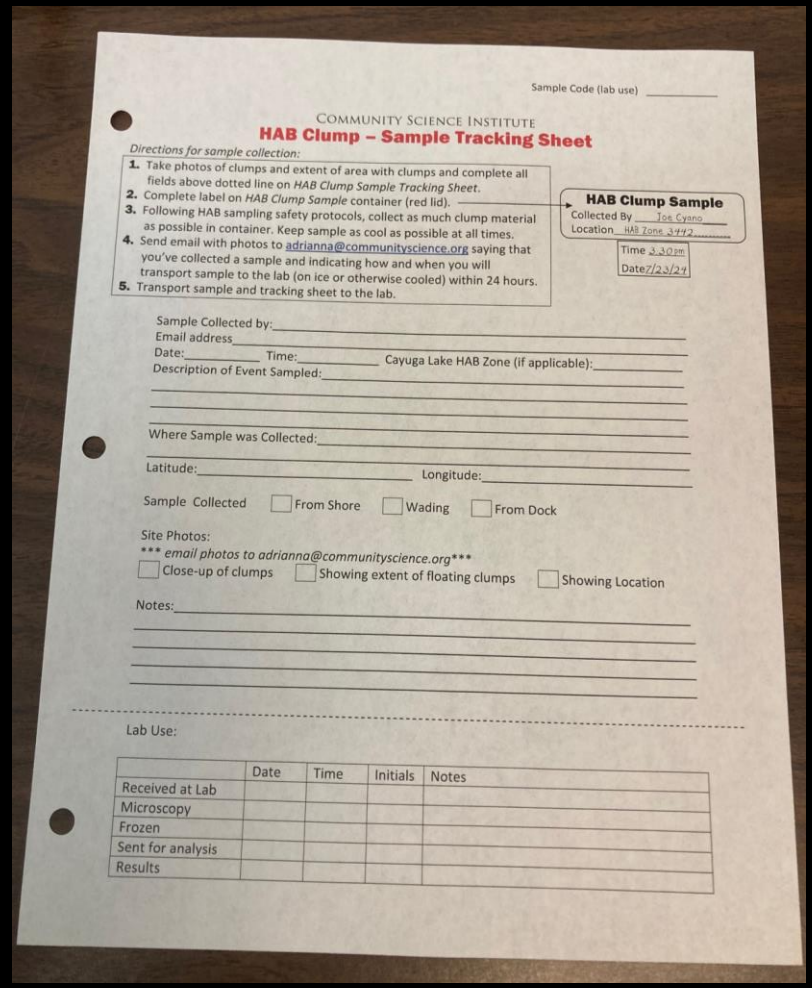
  - "PRE and POST" season:
  - Includes monitoring on an "as-needed" or "as available" basis
  - Submit report only if HAB is suspected
  - No samples collected during "pre" season, but samples may be collected during "post" season depending on available resources. TBD
  - Do not need to submit "No Bloom Report" during "pre" season, only "post" if you're remaining involved



What about the Clump or Benthic Cyanobacteria?

- At **ANYTIME**, if you observe floating clumps that you suspect to be a HAB:
  - Take some photos showing the extent of clump distribution and a close-up of one clump
  - Collect a sample using the supplied bottle OR a clean container like a mason jar or food storage container
  - Simply just scoop some of the clumps up into the cup
  - Treat the sample like other HABs samples, and keep it cool
  - Fill out the appropriate sample report form
  - E-mail Adrianna to alert her that a **Benthic/Clump HABs** has been collected
  - Ensure delivery of the sample and form to the lab





Sample Code (lab use) _____

COMMUNITY SCIENCE INSTITUTE

HAB Clump – Sample Tracking Sheet

Directions for sample collection:

1. Take photos of clumps and extent of area with clumps and complete all fields above dotted line on *HAB Clump Sample Tracking Sheet*.
2. Complete label on *HAB Clump Sample* container (red lid).
3. Following HAB sampling safety protocols, collect as much clump material as possible in container. Keep sample as cool as possible at all times.
4. Send email with photos to adrianna@communityscience.org saying that you've collected a sample and indicating how and when you will transport sample to the lab (on ice or otherwise cooled) within 24 hours.
5. Transport sample and tracking sheet to the lab.

HAB Clump Sample
Collected By Tos Cyano
Location HAB Zone 3442
Time 3:30pm
Date 7/23/24

Sample Collected by: _____
Email address _____
Date: _____ Time: _____ Cayuga Lake HAB Zone (if applicable): _____
Description of Event Sampled: _____
Where Sample was Collected: _____
Latitude: _____ Longitude: _____
Sample Collected ☐ From Shore ☐ Wading ☐ From Dock
Site Photos:
*** email photos to adrianna@communityscience.org***
☐ Close-up of clumps ☐ Showing extent of floating clumps ☐ Showing Location
Notes: _____

Lab Use:

	Date	Time	Initials	Notes
Received at Lab				
Microscopy				
Frozen				
Sent for analysis				
Results				

HABs Harriers: Monitoring for Harmful Algal Blooms on Cayuga Lake

If you **do** see a bloom:

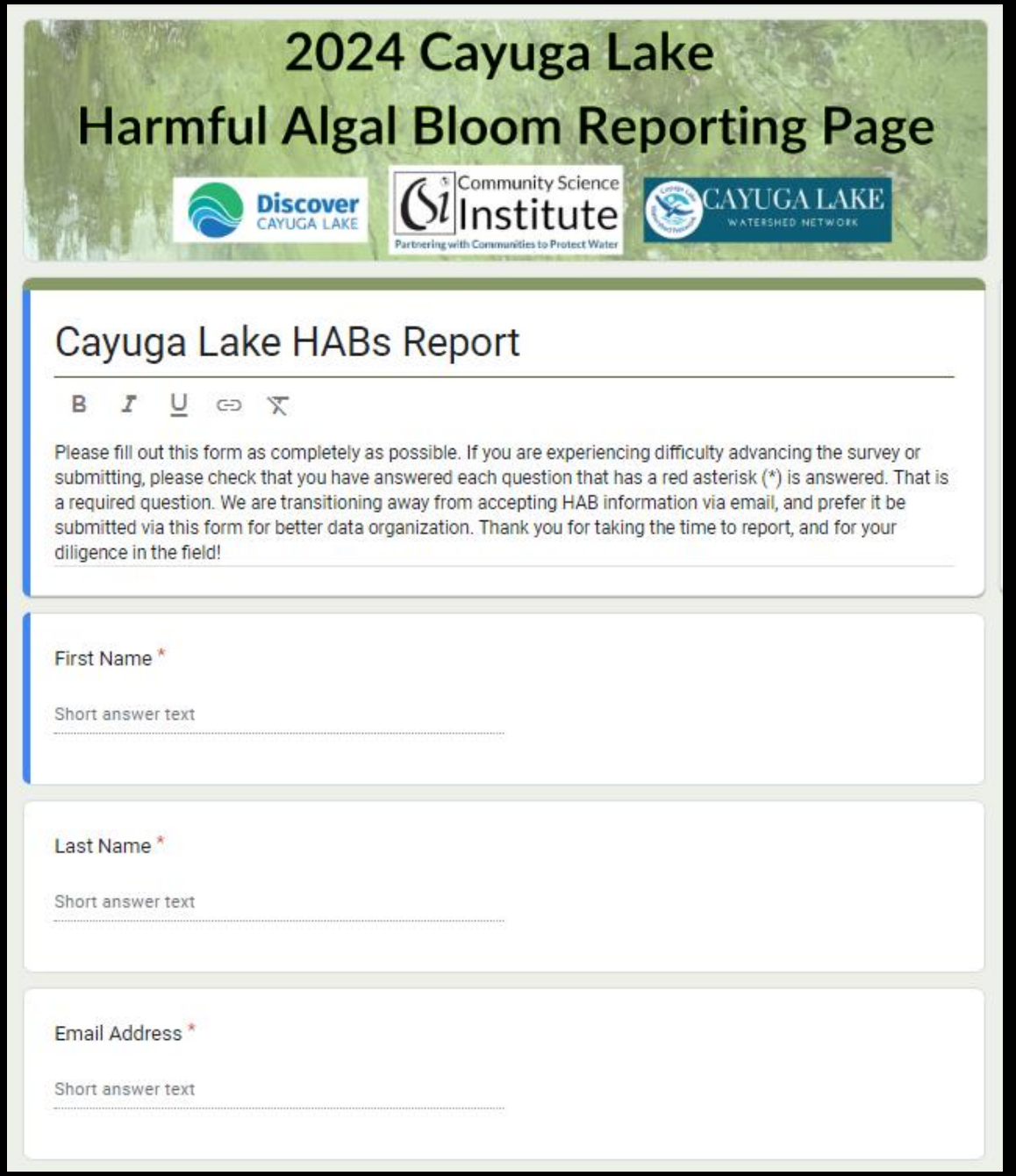
1. Fill out Cayuga Lake HAB Report via Google Forms
   (no longer just sending info to HABshotline@gmail.com!)
2. Take photos
   (1 up close, 1 further away to capture the big picture)
3. Collect a sample
4. Fill out the Chain of Custody form
5. Get that sample to CSI!
   Drive it yourself, or coordinate with your Quad Leader/Water Carriers to ensure the sample stays cool and arrives to the CSI lab ASAP

If you **do** see a bloom:

2024 Cayuga Lake Harmful Algal Bloom Reporting Page

You can access the form via an internet browser

- Click the link in your email, and it should open up in Google Chrome, Safari, FireFox.
- I will send the link out as often as needed
- Bookmark the form to save it!



HABs Photos examples

Close up

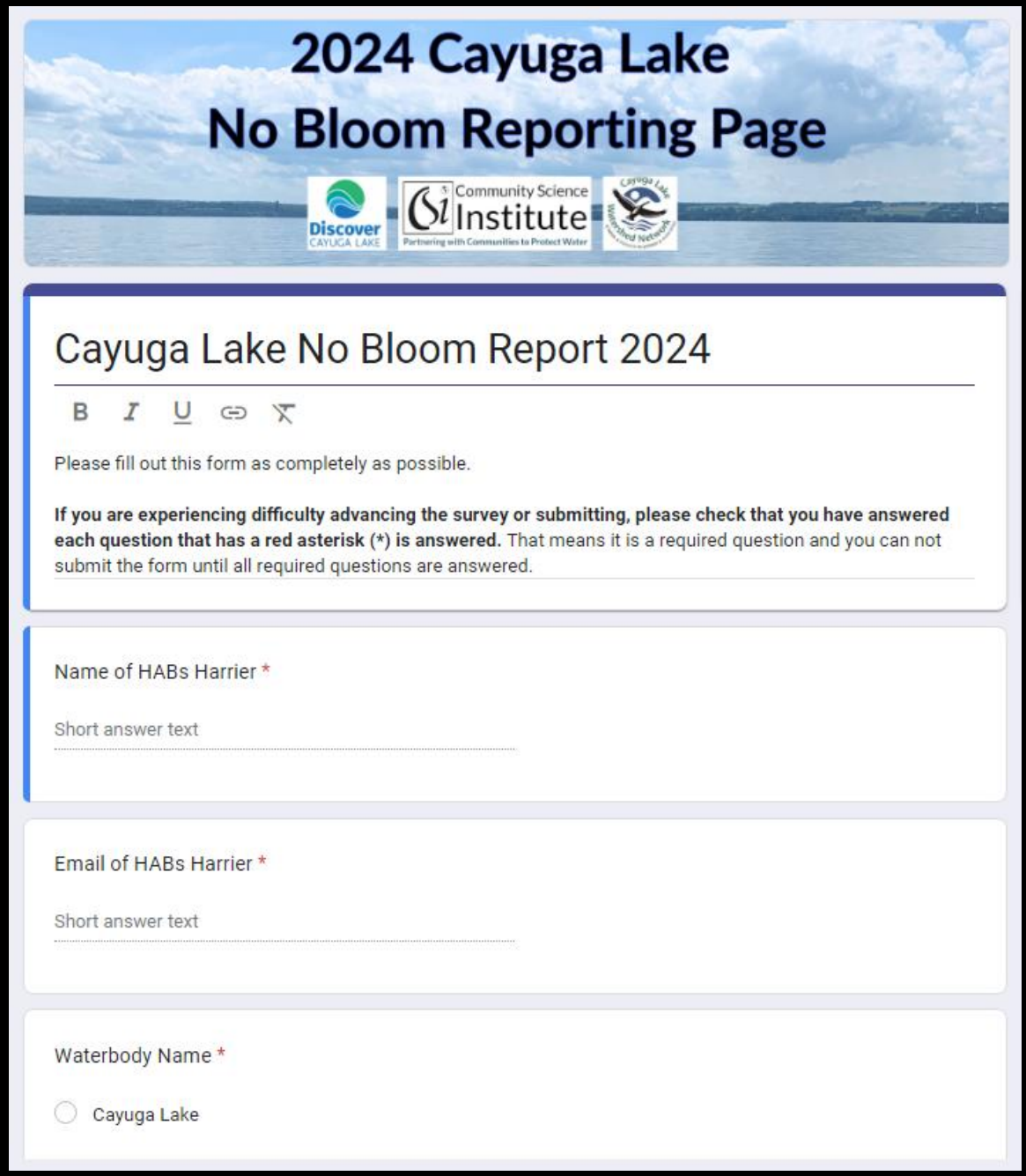
Far away

If you **do not** see a bloom:

No Bloom Report

Like the Bloom Report Form, you can also access this form via an internet browser on your phone/tablet

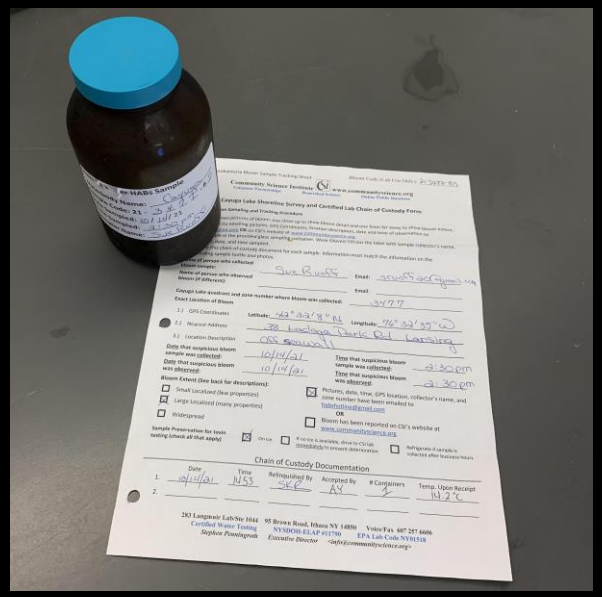
- Click the link in your email, and it should open up in Google Chrome, Safari, FireFox.
- I will send the link out as often as needed
- Bookmark the form to save it!

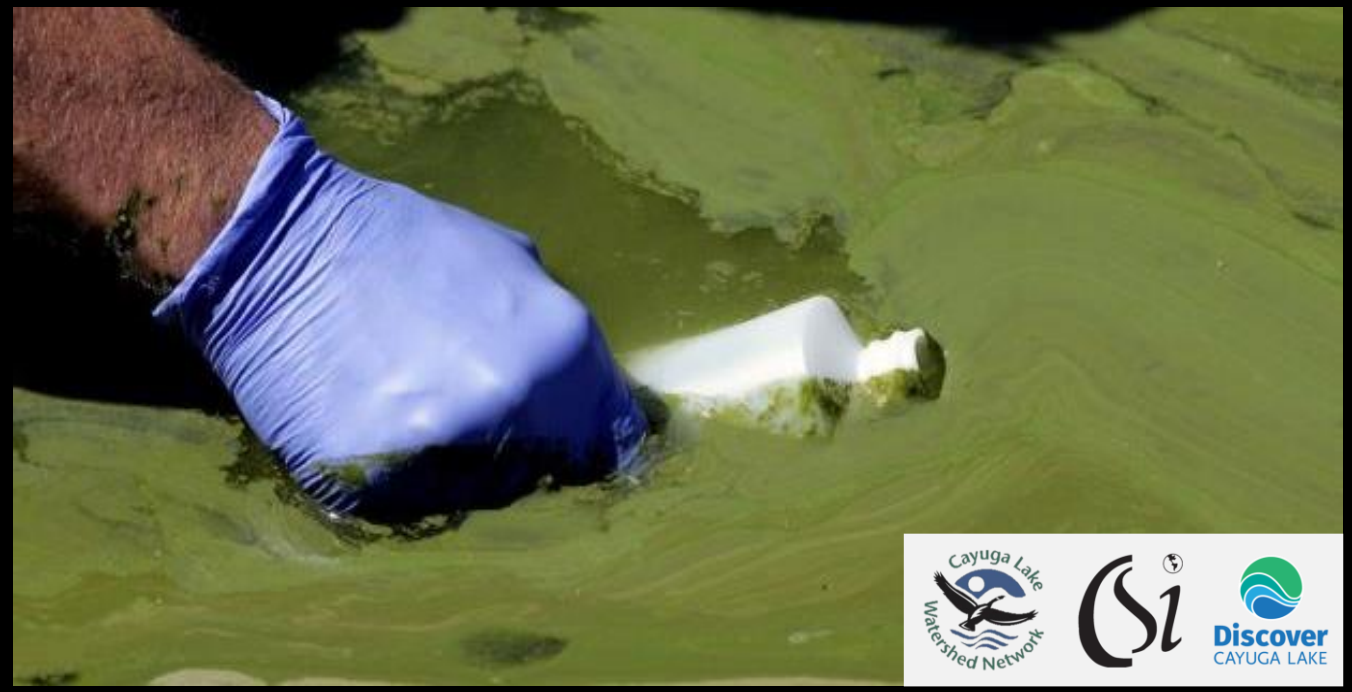


Collecting the sample

AFTER you've submitted the Bloom Report online:

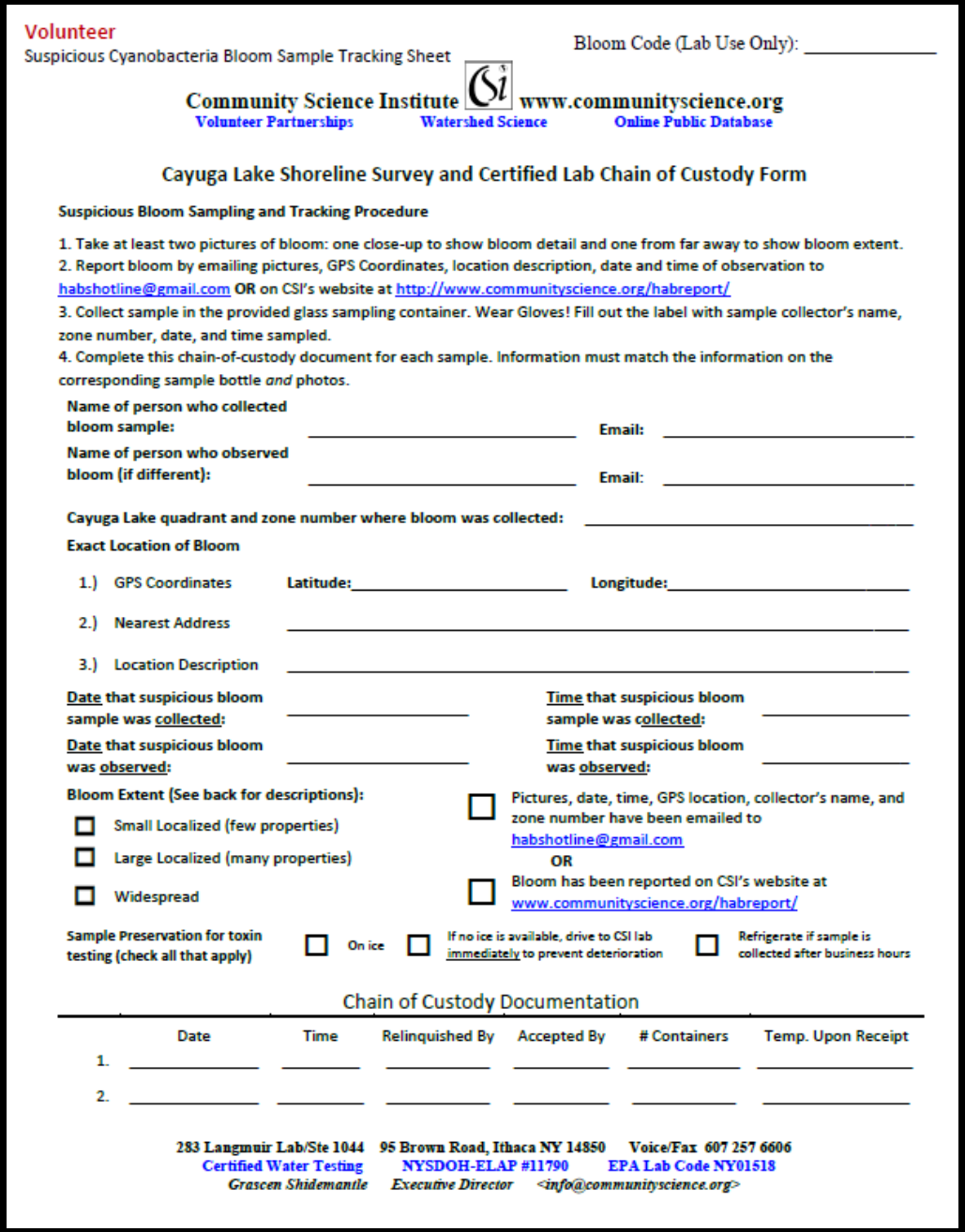
- Label the bottle first
- Wear gloves!
- Sample the **densest** part of the bloom
- Make only ONE pass through the water, not multiple passes
- Fill out the Chain of Custody Form





Chain of Custody Form

- GPS Coordinates
- Description
- Date and time of collection
- Bloom Extent



Volunteer
Suspicious Cyanobacteria Bloom Sample Tracking Sheet

Bloom Code (Lab Use Only): _____

Community Science Institute www.communityscience.org
Volunteer Partnerships Watershed Science Online Public Database

Cayuga Lake Shoreline Survey and Certified Lab Chain of Custody Form

Suspicious Bloom Sampling and Tracking Procedure

1. Take at least two pictures of bloom: one close-up to show bloom detail and one from far away to show bloom extent.
2. Report bloom by emailing pictures, GPS Coordinates, location description, date and time of observation to habshotline@gmail.com **OR** on CSI's website at http://www.communityscience.org/habreport/
3. Collect sample in the provided glass sampling container. Wear Gloves! Fill out the label with sample collector's name, zone number, date, and time sampled.
4. Complete this chain-of-custody document for each sample. Information must match the information on the corresponding sample bottle *and* photos.

Name of person who collected bloom sample: _____ **Email:** _____

Name of person who observed bloom (if different): _____ **Email:** _____

Cayuga Lake quadrant and zone number where bloom was collected: _____

Exact Location of Bloom

1.) GPS Coordinates **Latitude:** _____ **Longitude:** _____

2.) Nearest Address _____

3.) Location Description _____

Date that suspicious bloom sample was collected: _____ **Time that suspicious bloom sample was collected:** _____

Date that suspicious bloom was observed: _____ **Time that suspicious bloom was observed:** _____

Bloom Extent (See back for descriptions):

- ☐ Small Localized (few properties)
- ☐ Large Localized (many properties)
- ☐ Widespread

- ☐ Pictures, date, time, GPS location, collector's name, and zone number have been emailed to habshotline@gmail.com
  OR
- ☐ Bloom has been reported on CSI's website at www.communityscience.org/habreport/

Sample Preservation for toxin testing (check all that apply) ☐ On ice ☐ If no ice is available, drive to CSI lab immediately to prevent deterioration ☐ Refrigerate if sample is collected after business hours

Chain of Custody Documentation

	Date	Time	Relinquished By	Accepted By	# Containers	Temp. Upon Receipt
1.						
2.						

283 Langmuir Lab/Ste 1044 95 Brown Road, Ithaca NY 14850 Voice/Fax 607 257 6606
Certified Water Testing NYSDOH-ELAP #11790 EPA Lab Code NY01518
Grascen Shidemantle Executive Director <info@communityscience.org>

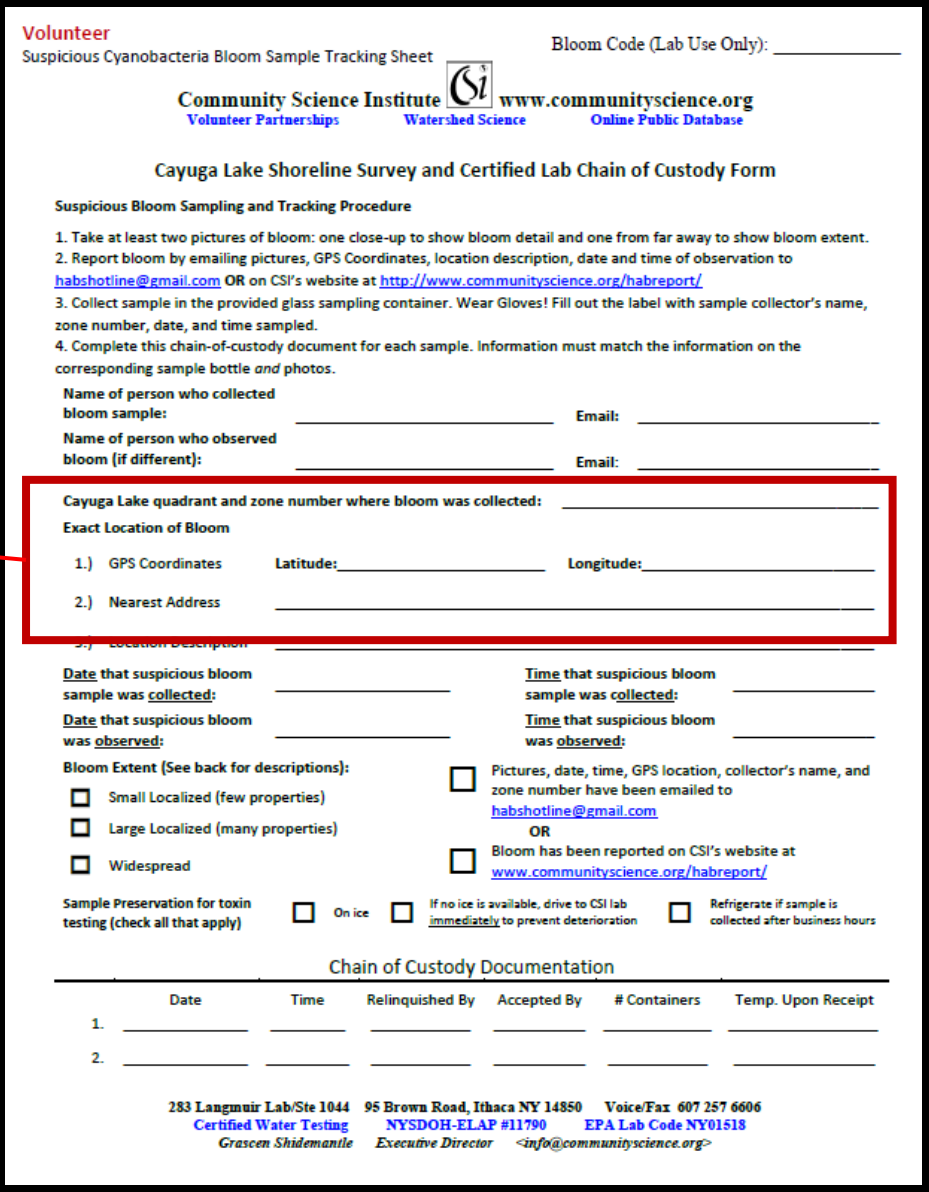
Chain of Custody Form

Cayuga Lake quadrant and zone number where bloom was collected: _____

Exact Location of Bloom

1) GPS Coordinates **Latitude: _____ Longitude: _____**

2) Nearest Address _____



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Volunteer Partnerships | Watershed Science | Online Public Database

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2.) Nearest Address _____

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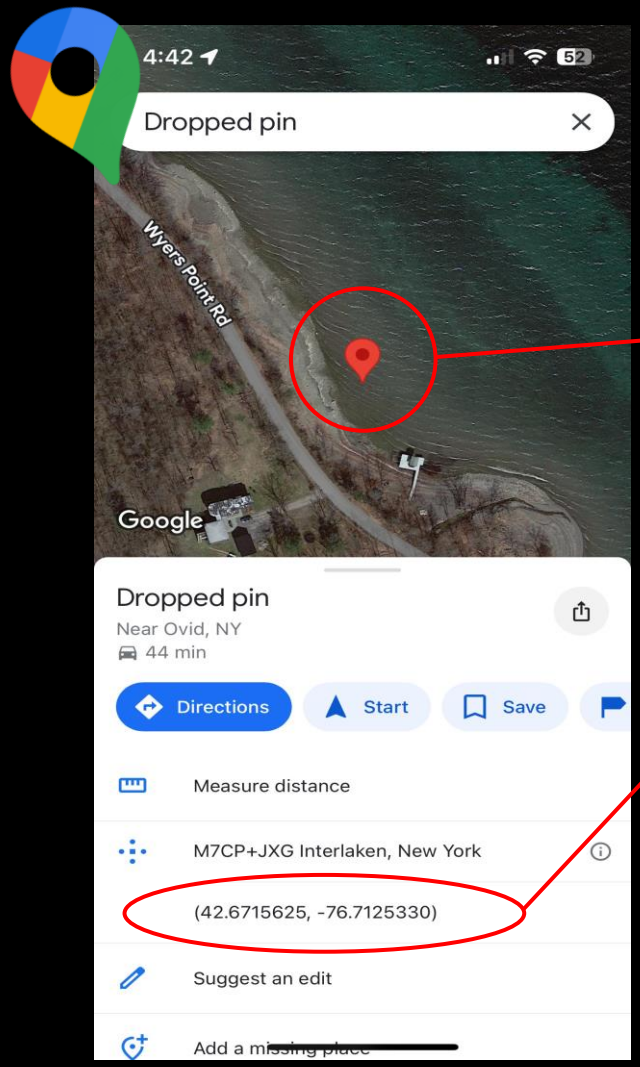
283 Langmuir Lab/Ste 1044 95 Brown Road, Ithaca NY 14850 Voice/Fax 607 257 6606

Certified Water Testing NYSDOH-ELAP #11790 EPA Lab Code NY01518

Grascen Shidemantle Executive Director <info@communityscience.org>

Chain of Custody Form

If you're using a smartphone:



1. Open Google Maps or whatever map/navigation map you use

2. Press and hold on the map where your HAB location is and a "pin" will appear

3. GPS Coordinates of the point will populate somewhere on the screen, depending on which app you use.

If you're NOT using a smartphone:

1. Open www.google.com/maps

2. Double-click a spot on the map.

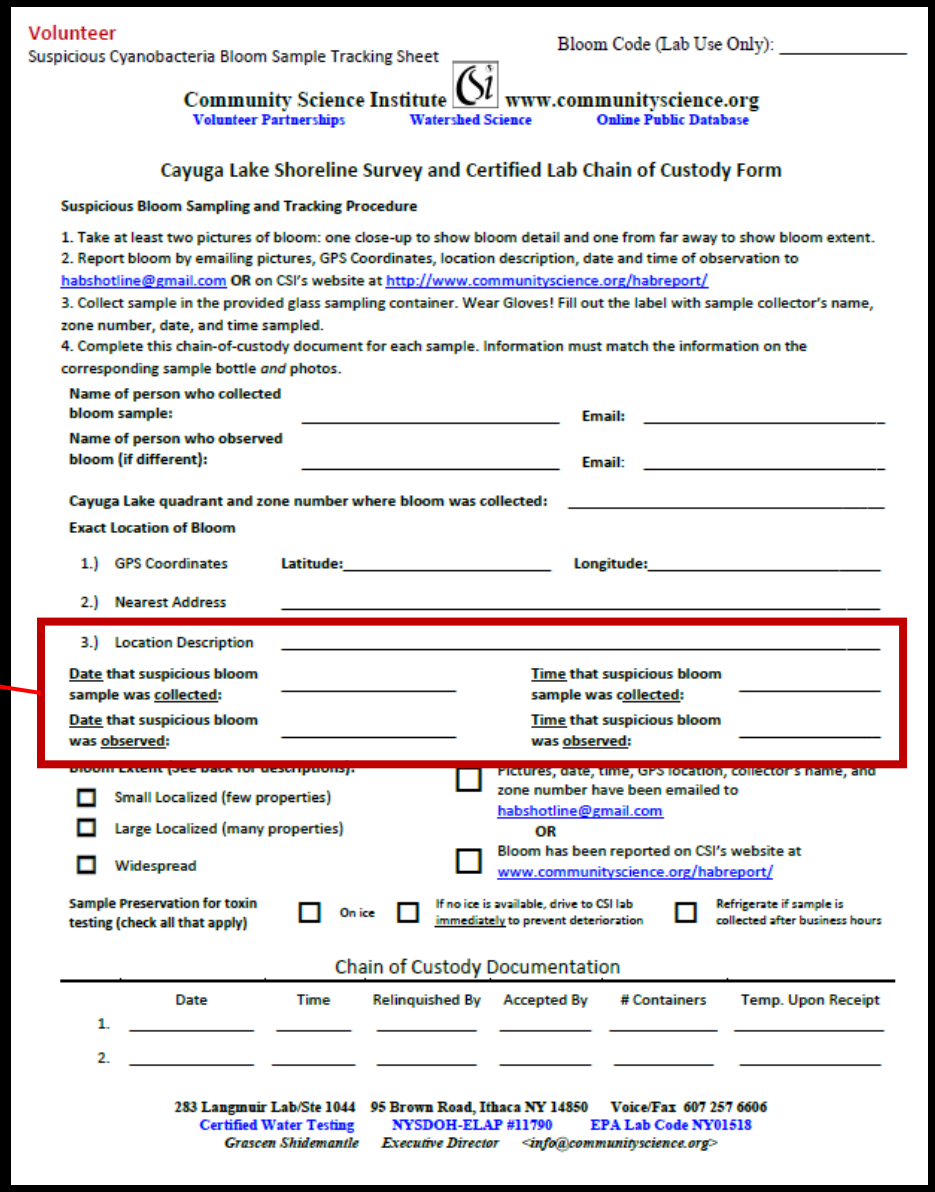
3. GPS Coordinates of the point will pop up below.

Chain of Custody Form

3) Location Description _____

Date that suspicious bloom sample was collected: _____ **Time that suspicious bloom sample was collected:** _____

Date that suspicious bloom sample was observed: _____ **Time that suspicious bloom sample was observed:** _____



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4. Complete this chain-of-custody document for each sample. Information must match the information on the corresponding sample bottle *and* photos.

Name of person who collected bloom sample: _____ Email: _____

Name of person who observed bloom (if different): _____ Email: _____

Cayuga Lake quadrant and zone number where bloom was collected: _____

Exact Location of Bloom

1.) GPS Coordinates Latitude:_____ Longitude:_____

2.) Nearest Address _____

3.) Location Description _____

Date that suspicious bloom sample was collected: _____ Time that suspicious bloom sample was collected: _____

Date that suspicious bloom was observed: _____ Time that suspicious bloom was observed: _____

Bloom Extent (see back for descriptions):

☐ Small Localized (few properties)

☐ Large Localized (many properties)

☐ Widespread

☐ Pictures, date, time, GPS location, collector's name, and zone number have been emailed to habshotline@gmail.com

OR

☐ Bloom has been reported on CSI's website at www.communityscience.org/habreport/

Sample Preservation for toxin testing (check all that apply) ☐ On ice ☐ If no ice is available, drive to CSI lab immediately to prevent deterioration ☐ Refrigerate if sample is collected after business hours

Chain of Custody Documentation

	Date	Time	Relinquished By	Accepted By	# Containers	Temp. Upon Receipt
1.						
2.						

283 Langmuir Lab/Ste 1044 95 Brown Road, Ithaca NY 14850 Voice/Fax 607 257 6606

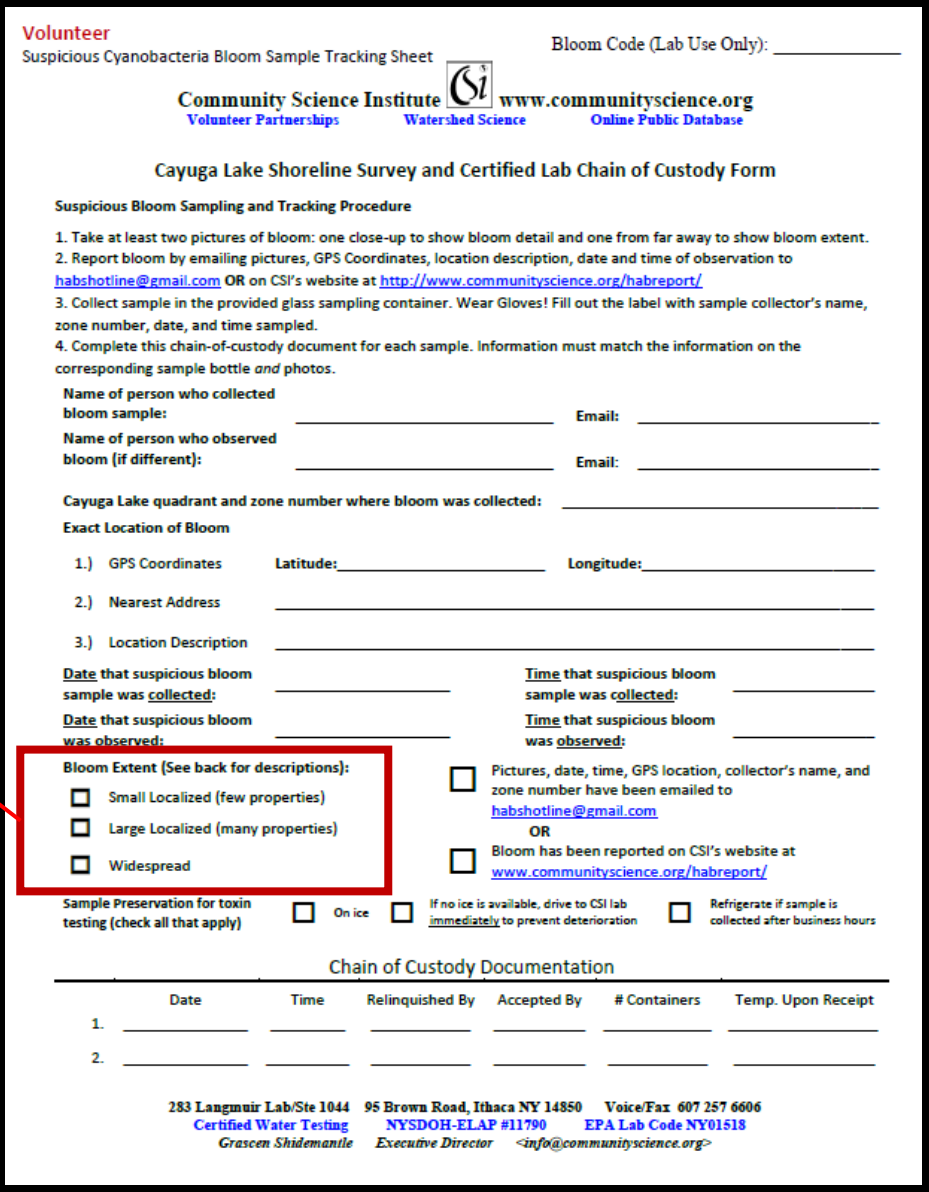
Certified Water Testing NYSDOH-ELAP #11790 EPA Lab Code NY01518

Grascen Shidemantle Executive Director <info@communityscience.org>

Chain of Custody Form

Bloom Extent (See back for descriptions):

- ❑ **Small Localized (few properties)**
- ❑ **Large Localized (many properties)**
- ❑ **Widespread**



Volunteer

Suspicious Cyanobacteria Bloom Sample Tracking Sheet

Bloom Code (Lab Use Only): _____

Community Science Institute www.communityscience.org

Volunteer Partnerships | Watershed Science | Online Public Database

Cayuga Lake Shoreline Survey and Certified Lab Chain of Custody Form

Suspicious Bloom Sampling and Tracking Procedure

1. Take at least two pictures of bloom: one close-up to show bloom detail and one from far away to show bloom extent.
2. Report bloom by emailing pictures, GPS Coordinates, location description, date and time of observation to habshotline@gmail.com **OR** on CSI's website at http://www.communityscience.org/habreport/
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Date that suspicious bloom sample was collected: _____ **Time that suspicious bloom sample was collected:** _____

Date that suspicious bloom was observed: _____ **Time that suspicious bloom was observed:** _____

Bloom Extent (See back for descriptions):

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- ☐ Large Localized (many properties)
- ☐ Widespread

- ☐ Pictures, date, time, GPS location, collector's name, and zone number have been emailed to habshotline@gmail.com
  OR
- ☐ Bloom has been reported on CSI's website at www.communityscience.org/habreport/

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Chain of Custody Form

Chain of Custody Documentation

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Grascen Shidemantle Executive Director <info@communityscience.org>

Collect a sample

- Keep the sample on ice!
- Very important or else the sample will start to degrade and the lab will not be able to analyze the sample, making this whole process a waste of effort.

Sample Transport: CSI needs to receive the sample ASAP

Before transporting the sample, double check:

- ☑ Complete the Cayuga Lake HAB Report via Google Forms
- ☑ Fill out the Chain of Custody
- ☑ Make sure the sample bottle is labeled
- ☑ Make sure the sample will be transported/left with ice

If you need assistance in transporting the sample to the CSI lab, please contact your Quadrant Leader AND email HABshotline@gmail.com (just in case your Quad Leader is unavailable, myself or someone else will be able to help)

- NW Quadrant: Ken Riemer
- NE Quadrant: Marie & David Eckhardt
- SW Quadrant: John Abel
- SE Quadrant: Glenn Ratajczak

Sample transportation via Water Carriers depends on their availability and may not be available immediately! Just get the sample to the closest drop-off WITH enough ice to last awhile, even over night.

Sample Transport – SW and SE Quadrants

(SW – south of Sheldrake Point; SE – south of Elmwood Point)

Harriers in these two Quadrants should bring their samples directly to CSI's laboratory at:

Langmuir Lab, Room 283
95 Brown Rd.
Ithaca, NY 14850

Room 283 during business hours

(9am – 5pm M-F)

Or in the after-hours fridge located behind the lab building

Map to drop-off location: Follow the blue arrow to the drop-off location marked by the green star. The cooler will be inside the fenced structure (see right).

Fenced structure with cooler: The door to the structure will be unlocked. Please close the door after depositing the sample.

Sample Transport – NW Quadrant

After contacting your Quad Leader/habshotline@gmail.com:

Drop your sample off (ON ICE) at:

Ken's "HABs Shack"
6041 Lakeview Ln.
Romulus, NY

(this is ¼ mile south of Dean's Cove on the west side of the lake)

This is Ken's home address. He has a Canada goose mailbox and a place to turn around –

drive up his driveway to find a cooler and replacement kits

Sample Transport – **NE** Quadrant

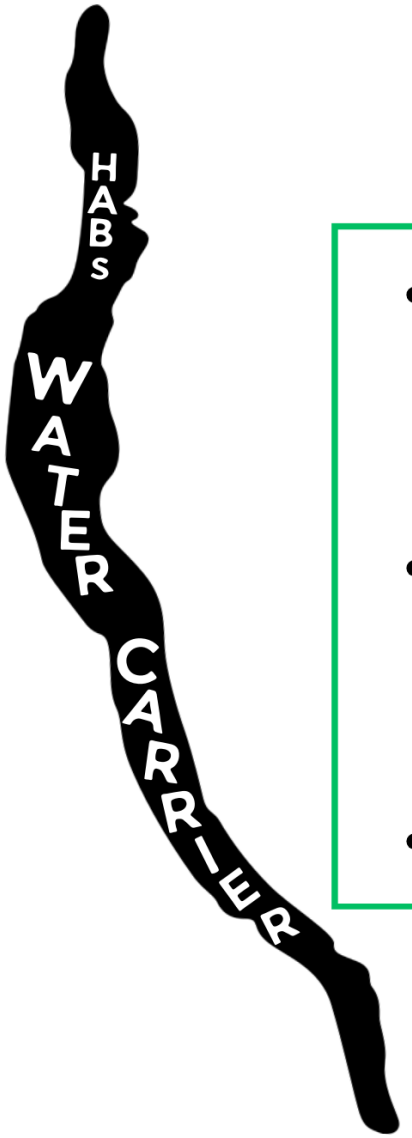
After contacting your Quad Leader/habshotline@gmail.com:

Drop your sample off (ON ICE) at:

Village of Aurora Fire House
456 Main St
Aurora, NY 13026

There will be a cooler and replacement HABs sampling kits here.

HAB Water Carrier Duties & Responsibilities



On an as-needed basis

- Be “on call” from July-September to assist in the relay/transport of HABs samples from around Cayuga Lake to the CSI lab by the airport
- Communicate/coordinate transport logistics among with Quadrant Leaders and other volunteers
- Frequency of trips depends on frequency of HABs

Sample Transport – Water Carriers

- Alyssa will double-check to make sure that she has a current mobile phone number for you.
  - Can you receive texts? Sometimes it's easier to communicate this way!

- We realize you're "on-call" but can't always drop everything at a moment's notice to help out, however:
  - as long as the samples are kept cool by the Harrier who collected them

and

  - dropped off at the HABs Shack or the Aurora FD and kept cool while they wait to be picked up by a Water Carrier

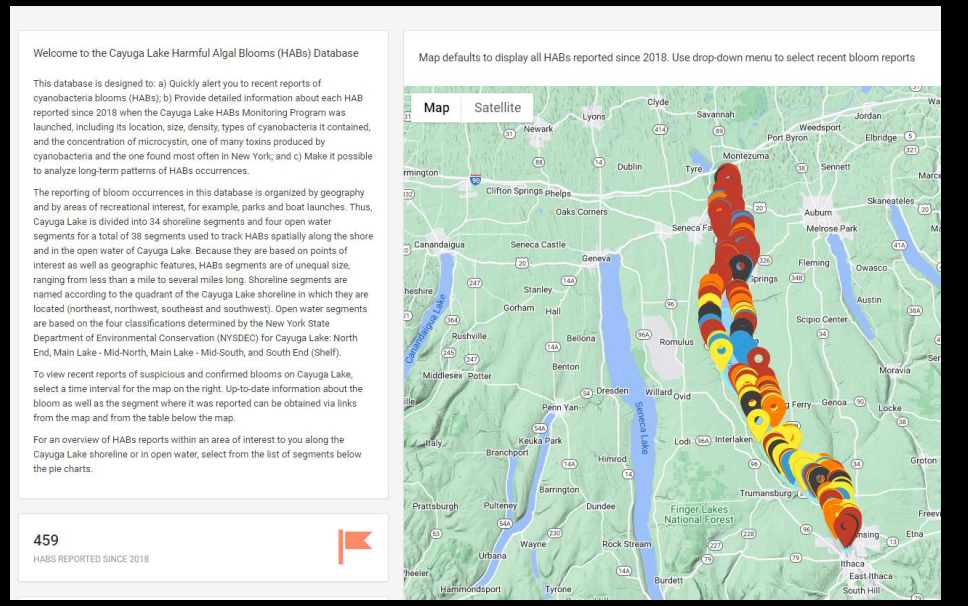
and

kept cool by the Water Carriers (please keep a cooler with you, and stock it with ice or at least ice packs before you pick up!) during transit, the samples should be ok!

From the time the sample is collected, the CSI lab needs it in our possession within 48 hours. We do need it quickly, but there is a little wiggle room!

Staying Up-To-Date

CSI's HABs Database & Monthly Updates!



CLWN Weekly Updates to the Public

Did someone forward this email to you? Click HERE to subscribe directly!

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!

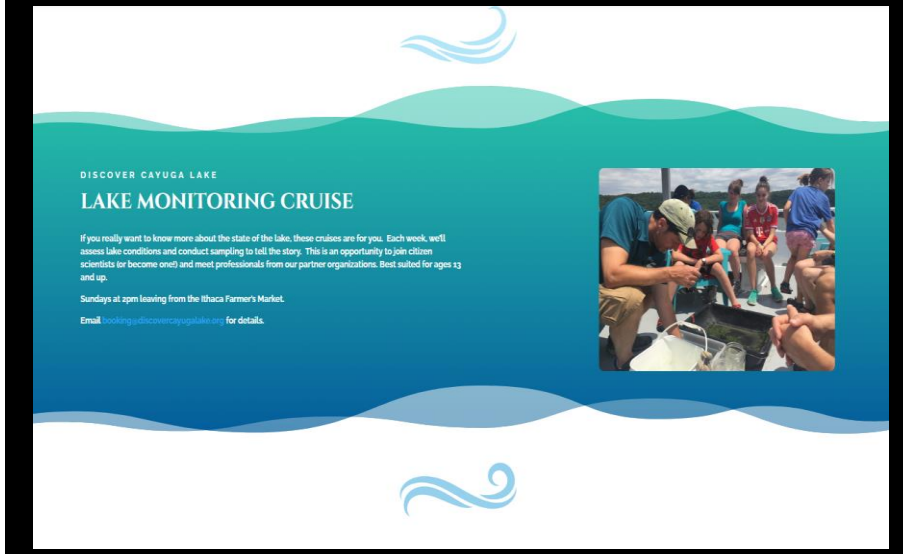
If you spot a suspicious bloom or potential HAB avoid it and report it. Share as much information as possible including GPS coordinate location or address, date, time, and photos.

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

DCL Sunday Community Cruises



To Recap:

- Not currently accepting samples BUT please do keep an eye out for HABs especially due to this hot weather. Please submit HABs Report online.
- OUR monitoring season (with sampling) begins Sunday, June 30 and ends Saturday, October 5th
- “No Bloom Reports” need to be submitted until 6/30 and after
- Please only contact Alyssa about blooms at HABshotline@gmail.com
- Volunteer Info Packets by 7/1/24

Community Science Institute
Partnering with Communities to Protect Water

Any questions?

facebook.com/CommunityScience

instagram.com/CommunityScienceInstitute