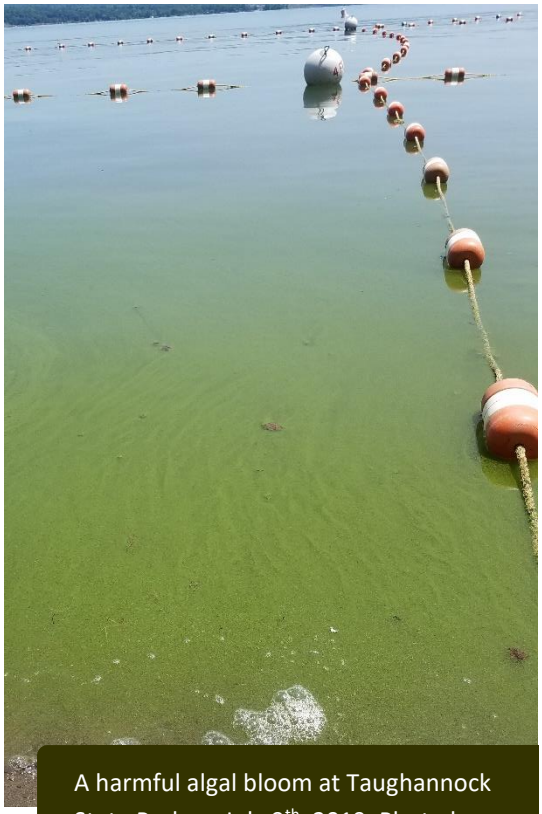
Cayuga Lake HABs Volunteer Monitoring Information Packet – 2020

Dear Cayuga Lake HABs Harriers,

Thank you for volunteering to take part in the 2020 Cayuga Lake HABs Monitoring Program! Cyanobacteria blooms, commonly referred to as harmful algal blooms (HABs), pose a threat to residents around the lake, summer visitors, and to the lake ecosystem. Some strains of cyanobacteria produce toxins that can cause sickness and potentially lead to death in people, pets and other animals. Cyanobacteria blooms have the potential to impair Cayuga Lake as a source of drinking water and as a desirable place to live or vacation. In 2019, the Cayuga Lake HABs Monitoring Program documented 67 cyanobacteria blooms on Cayuga Lake, an increase of 27 blooms from 2018. Among these 67 cyanobacteria blooms, 28 were found to have toxin levels above limits set by the NYS Department of Health for waters used for recreation. All 28 of these high-toxin blooms occurred along the northern fifth of the lake's shoreline and 27 occurred from late August to early October. This year, it is imperative that we continue to work together as a community to monitor when and where HABs occur on Cayuga Lake as closely as possible. As a HABs Harrier, you will serve an essential role in protecting Cayuga Lake by helping us track, understand, and ultimately manage this emerging threat.

*Harrier: [**har**-ee-er] **noun**, from the verb harry, to harass or attack repeatedly. Example: A Harrier Hawk attacks small game.*



A harmful algal bloom at Taughannock State Park on July 9th, 2019. Photo by HABs Harrier David Johnson.

Context and Objectives

Initiated in 2018, the Cayuga Lake HABs Monitoring Program is led by the Community Science Institute (CSI) in collaboration with the Cayuga Lake Watershed Network (CLWN), and Discover Cayuga Lake (DCL). Our program operates under the general auspices of the New York State Department of Environmental Conservation (NYSDEC). The objective of this monitoring program is to:

1. Maintain vigilant surveillance of the Cayuga Lake shoreline to observe and sample suspicious algal blooms so that users of the water in affected areas may be alerted to the potential threat the bloom may pose; and

2. Develop long-term HABs data that can help us understand where, and under what conditions, cyanobacteria bloom in Cayuga Lake. Establishing a robust dataset is the first step in effectively managing HABs.

Training Workshop

Before you can begin your harrying duties, you'll need to attend one of three workshops offered by CSI. At the workshop, the Cayuga Lake HABs Monitoring Program Coordinator at CSI and a representative from the DEC will explain what cyanobacteria are and how to recognize and distinguish blooms of cyanobacteria from other types of algal blooms. You will also be provided with sampling instructions, kits for sample collection, and other helpful resources.

As part of the training workshop, immediately following NYSDEC's presentation, staff from CSI or CLWN will consult with you to select your shoreline monitoring area (zone). We will also review essential program logistics including sample chain of custody and drop-off procedures.

Training Dates

Friday, June 12th
10:00 – 11:00 AM
Online Webinar

Monday, June 15th
10:00 – 11:00 AM
Online Webinar

Monday, June 15th
6:00 – 7:00 PM
Online Webinar

The recorded webinar(s) will become available for review on CSI's website following these dates.

Survey Period and Frequency:

- Once a week, every week, June 29th – September 30th, 2020

The 2020 Cayuga Lake HABs monitoring season will start on Monday, June 29th and continue through the end of September. This survey period reflects the time frame when cyanobacteria blooms are most likely to occur. The Cayuga Lake HABs Hotline (habshotline@gmail.com or, alternatively, 607-257-6606 during normal business hours) will be open year round, in order to allow time to manage any issues that may arise or accept any suspicious bloom reports outside of the official HABs season.

Weekly Survey Schedule:

Once a week, as a HABs Harrier, you'll walk, kayak, or boat along the length of your monitoring zone to look for cyanobacteria blooms. For help in recognizing suspicious blooms, you can refer to the pictures found within the Reference Materials section on page 7 or watch the HABs Identification Training Video on the Harmful Algal Bloom Monitoring information page on our website at www.communitscience.org.

The survey can be done Sunday, Monday or Tuesday each week, preferably between the hours of 10 AM and 2 PM. Cyanobacteria blooms are most likely to be near, or at, the water's surface during direct midday sunlight.

We are providing a 3-day window for your shoreline survey because sometimes conditions are such (windy, rough water, or rainfall) that observing cyanobacteria blooms is unlikely and being on the water can be dangerous. If you plan on surveying on a Sunday and conditions are not right, move your day to Monday or Tuesday when conditions are more suitable for survey work. You may conduct additional surveys of your zone during the week. You must submit a "No Bloom Report" for each survey.

The reason for this time frame is that any suspicious bloom sample needs to be cooled on ice immediately and delivered to the lab **no later than the day following sample collection** in order to meet the requirements for the certified method to test for microcystin.

How to Monitor for HABs

1. **Prepare** to monitor your zone by making sure you have the following items with you:
    - **a.** Sample Kit: bottle, gloves, and "CSI Shoreline Survey Form/Chain of Custody"
        - **i.** *You will need these materials if you observe a bloom.
    - **b.** Camera or cell phone with camera
2. **Survey** the full length of your zone for one of two possible outcomes:
    - **a.** No blooms observed
    - **b.** Suspicious bloom observed
3. **Take the following actions** based on your observations:
    - **a.** **No Bloom –** file a "No Bloom Report" using the form available on CSI's website.
    - **b.** **Suspicious Bloom**
        - **i.** Take two pictures of the suspicious bloom: one close up to show bloom composition and one from far away to show bloom extent.
        - **ii.** Label the sample bottle with the following information: **sample collector's name, waterbody name, sample code, date, time.**
            1. If you are not able to determine the GPS coordinates, instead provide a street address or a physical landmark near the observed bloom.
        - **iii.** Carefully collect sample following NYSDEC protocol, being sure to wear gloves.
        - **iv.** Fill out the "CSI Shoreline Survey Form/Chain of Custody." Make sure information on the form matches the label on the sample bottle. Take a picture of the completed form.
        - **v.** Report the suspicious bloom on CSI's online "Report a HAB" form at www.communityscience.org. You must fill all the required fields to submit the form online. Ensure that you have also attached the two photos of the suspicious bloom before submitting the form.

          OR

          Email pictures of the bloom and the "CSI Shoreline Survey Form/Chain of Custody" to habshotline@gmail.com immediately. The email's subject line should be formatted as follows: ***CYANOBACTERIA BLOOM PICTURES *zone#* *GPS coordinates/landmarks* *date* *time*** EXP. CYANOBACTERIA BLOOM PICTURES, zone 5, 42.6761 -76.7189, 8/23/18, 1330

iv. Store sample in a cool, dark place (preferably on ice or refrigerated) until you can deliver it **on ice**, along with the "CSI Shoreline Survey Form/Chain of Custody," to the CSI lab at 95 Brown Rd, Room 283, Ithaca, NY. If possible, the sample is to be delivered the same day it is collected, but **no later than 4:00 PM the following day**.

Sample Drop-off at CSI Lab

The Community Science Institute is located at 283 Langmuir Lab, 95 Brown Rd, Ithaca, NY and is open Monday – Friday, 9:00 AM – 5:00 PM. If possible, samples should be dropped off at the CSI lab between 9:00 AM and 4:00 PM on weekdays. When you arrive, please give us a call at (607) 257-6606 and a staff member at the lab will meet with you to accept the sample, complete the chain of custody form, and provide you with a new sampling kit.

If you are unable to transport the sample all the way to the CSI lab in Ithaca, there is a bloom relay system that may be used on an as-needed basis. It is a system of two mid-way sample drop-off locations, one in the Village of Aurora and the other in the town of Ovid. If you need to use this drop-off system to transport samples to the lab, please contact Nathaniel Launer at nathaniel.launer@communityscience.org or call the CSI lab at (607) 257-6606.

If you are unable to drop off a sample between 9:00 and 4:00 a weekday, an after-hours drop-off location is available behind the Langmuir Lab building in a small covered structure near the dumpsters (Figure 1). Place samples and completed "CSI Shoreline Survey Form/Chain of Custody" in the provided cooler inside the fenced structure. **Please be sure to fill out the chain of custody information at the bottom of the form.** This is the date and time that the sample was dropped off, not the date and time that the sample was collected. In this structure there will also be a box containing fresh sampling kits for you to take if you drop off a sample.

Figure 1) HABs sample drop-off location for the weekend and after normal business hours

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.

What happens to the samples?

CSI will visually examine suspicious bloom samples for cyanobacteria using microscopy and determine the concentration of total chlorophyll a as a measure of bloom biomass. Together, these two measurements will help provide confirmation that the bloom sampled was a HAB. CSI will also analyze HAB samples for microcystin (dependent on funding) using the certified EPA method 546.

Where are the results reported?

CSI will report all results as they become available from our lab, with a goal of reporting all results for suspicious blooms within 24-72 hours. Results will be posted on CSI's website at www.communityscience.org on our Cayuga Lake HABs Reporting Page. Results will include the cyanobacteria taxa identified in the sample, and total chlorophyll a and microcystin concentrations. CSI lab will be reporting all suspicious bloom reports and results from bloom sample analysis at CSI lab in Ithaca to the NYSDEC on a weekly basis. This HABs data from Cayuga Lake will be used on the NYSDEC's NYHABs state-wide HABs reporting database. The link for the NYHABs reporting database is: https://nysdec.maps.arcgis.com/apps/webappviewer/index.html?id=ae91142c812a4ab997ba739ed9723e6e

In addition, CSI will send a summary of results as well as survey reminders to HABs Harriers every week during the monitoring season. We will also notify regional Health Departments, local stakeholders, and the general public via email, press releases, website articles and social media with the recent reports of suspicious bloom and the results of suspicious bloom sample analysis as they become available. The CLWN will be sending out weekly summaries of recent bloom activity on Cayuga Lake to the public during the summer months. To receive these weekly updates, please contact CLWN at the email listed below.

Reference Materials and Contact Information

The process described in this document is presented as a flowchart in Attachment A. Please take a moment to look at the flowchart, identify your activities as a volunteer (in green boxes), and note how they are critical to the entire process of monitoring HABs on Cayuga Lake.

HABs Harriers can find an electronic copy of NYSDEC's HABs Volunteer Guide on CSI's Harmful Algal Bloom Monitoring information page on our website (see Resources below). This guide has excellent photos of HABs that you can use as a reference to help you identify suspicious algal blooms. Recorded training webinars, bloom identification videos, an electronic copy of this guide, and other resources can also be found on that page.

The NYSDEC maintains an excellent website at: on.ny.gov/HAB that can be referred to for additional information.

Please don't hesitate to contact your local HABs leadership team if you have any questions!

Community Science Institute
Outreach Coordinator, Cayuga Lake HABs Monitoring Program Coordinator – Nathaniel Launer, nathaniel.launer@communityscience.org | (607) 257-6606

Cayuga Lake Watershed Network
Programs Manager – Jennifer Tufano, programs@cayugalake.org

Northwest Quadrant Leader
Bill Ebert – wsebert@yahoo.com

Northeast Quadrant Leader
Christy VanArnum – christyvanarnum95@yahoo.com

Southeast Quadrant Leader
Glenn Ratajczak - gratajczak@boltonpoint.org

Southwest Quadrant Leader
John Abel - jfa5@cornell.edu

Resources

Community Science Institute website: www.communityscience.org

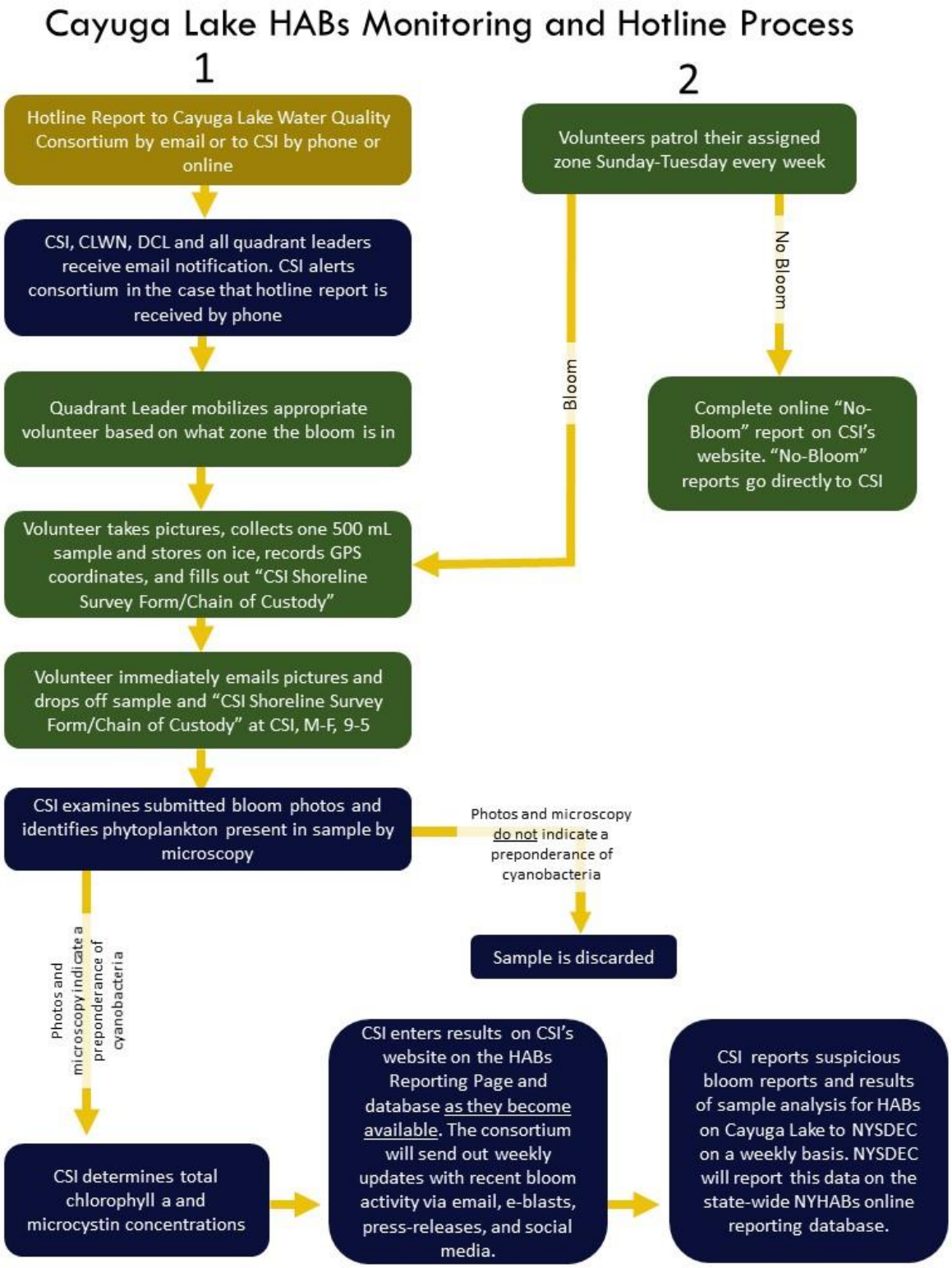
Harmful Algal Bloom information page: http://www.communityscience.org/volunteer/harmful-algal-bloom-monitoring/

Cayuga Lake HABs Reporting Page: http://www.communityscience.org/volunteer/harmful-algal-bloom-monitoring/cayuga-lake-habs-reporting-page/

Report A HAB online: www.communityscience.org/report-a-hab/

HABs Hotline Email (report a HAB via email): habshotline@gmail.com

State-wide DEC NYHABs Reporting Page: on.ny.gov/nyhabs


Cayuga Lake HABs Monitoring and Hotline Process
1
2
Hotline Report to Cayuga Lake Water Quality Consortium by email or to CSI by phone or online
CSI, CLWN, DCL and all quadrant leaders receive email notification. CSI alerts consortium in the case that hotline report is received by phone
Quadrant Leader mobilizes appropriate volunteer based on what zone the bloom is in
Volunteer takes pictures, collects one 500 mL sample and stores on ice, records GPS coordinates, and fills out "CSI Shoreline Survey Form/Chain of Custody"
Volunteer immediately emails pictures and drops off sample and "CSI Shoreline Survey Form/Chain of Custody" at CSI, M-F, 9-5
CSI examines submitted bloom photos and identifies phytoplankton present in sample by microscopy
Photos and microscopy do not indicate a preponderance of cyanobacteria
Sample is discarded
Photos and microscopy indicate a preponderance of cyanobacteria
CSI determines total chlorophyll a and microcystin concentrations
CSI enters results on CSI's website on the HABs Reporting Page and database as they become available. The consortium will send out weekly updates with recent bloom activity via email, e-blasts, press-releases, and social media.
CSI reports suspicious bloom reports and results of sample analysis for HABs on Cayuga Lake to NYSDEC on a weekly basis. NYSDEC will report this data on the state-wide NYHABs online reporting database.
Volunteers patrol their assigned zone Sunday-Tuesday every week
Bloom
No Bloom
Complete online "No-Bloom" report on CSI's website. "No-Bloom" reports go directly to CSI

HABs may look like parallel streaks, usually green, on the water surface.

HABs may look like green dots, clumps, or globs on the water surface.

HABs may look like blue, green, or white spilled paint on the water surface.

HABs may make the water look bright green or like pea soup.

Attachment C: Picture of what a Cayuga Lake "No Bloom" report looks like online

(A link that will give you access to this Google form will be provided in the coming weeks. Access to this form can also be found on CSI's website under the tab "Harmful Algal Bloom Monitoring")

Cayuga Lake No-Bloom Report

Complete this form following weekly shoreline survey only if no bloom is observed.

* Required

Name of HABs Harrier *

Your answer

Waterbody Name *

Your answer

Zone Number *

Your answer

Date the Zone Survey was Completed *

Date

mm/dd/yyyy

Time the Zone Survey was Completed *

Time

: AM

Observations

Your answer

SUBMIT

Never submit passwords through Google Forms.

Volunteer

Suspicious Cyanobacteria Bloom Sample Tracking Sheet

Bloom Code: _____

Cayuga Lake Shoreline Survey Form and Certified Lab Chain of Custody

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 on CSI's website at www.communityscience.org **OR** email pictures, GPS Coordinates, location description, date and time of observation to habshotline@gmail.com.
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

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

OR

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

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.	_____	_____	_____	_____	_____	_____

Bloom Extent Determination Descriptions (NYSDEC)

Small Localized: Bloom affects a small area of the waterbody, limited from one to several neighboring properties.

Large Localized: Bloom affects many properties within an entire cove, along a large segment of shoreline, or in a specific region of the waterbody.

Widespread: Bloom affects the entire waterbody, a large portion of the lake, or most to all of the shoreline.

Go to www.communityscience.org or www.database.communityscience.org
to see test results and confirmed bloom locations

Attachment E: Picture of the CSI's online suspicious bloom reporting form

(This form can be access on CSI's website at www.communityscience.org under the tab "Harmful Algal Bloom Monitoring. All required fields must be filled out and pictures must be attached to submit the report.