

What's the Harm in Harmful Algal Blooms?

Grascen Shidemantle, PhD
Executive Director
Community Science Institute

Rural Finger Lakes Environmental Health Summit
September 15, 2025
NY Kitchen 800 South Main St. Canandaigua, NY

Agenda

Intro: Community Science Institute

HABs 101

What's the Harm in HABs?

HAB Monitoring Initiatives

Wrap Up

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Community Science Institute

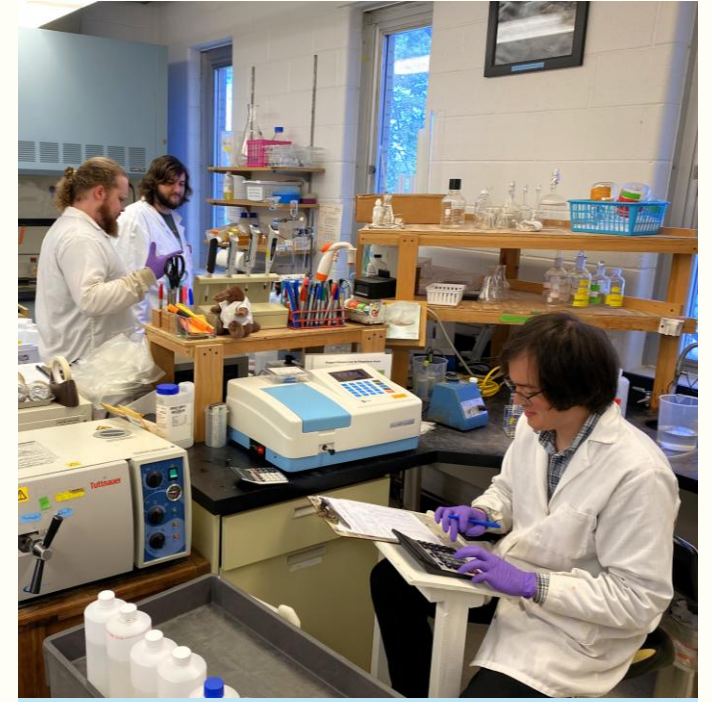
CSI is a 501(c)3 non-profit and NYSDOH-ELAP certified water testing lab in Ithaca, NY



Volunteer Water Monitoring Partnerships



Outreach and Education



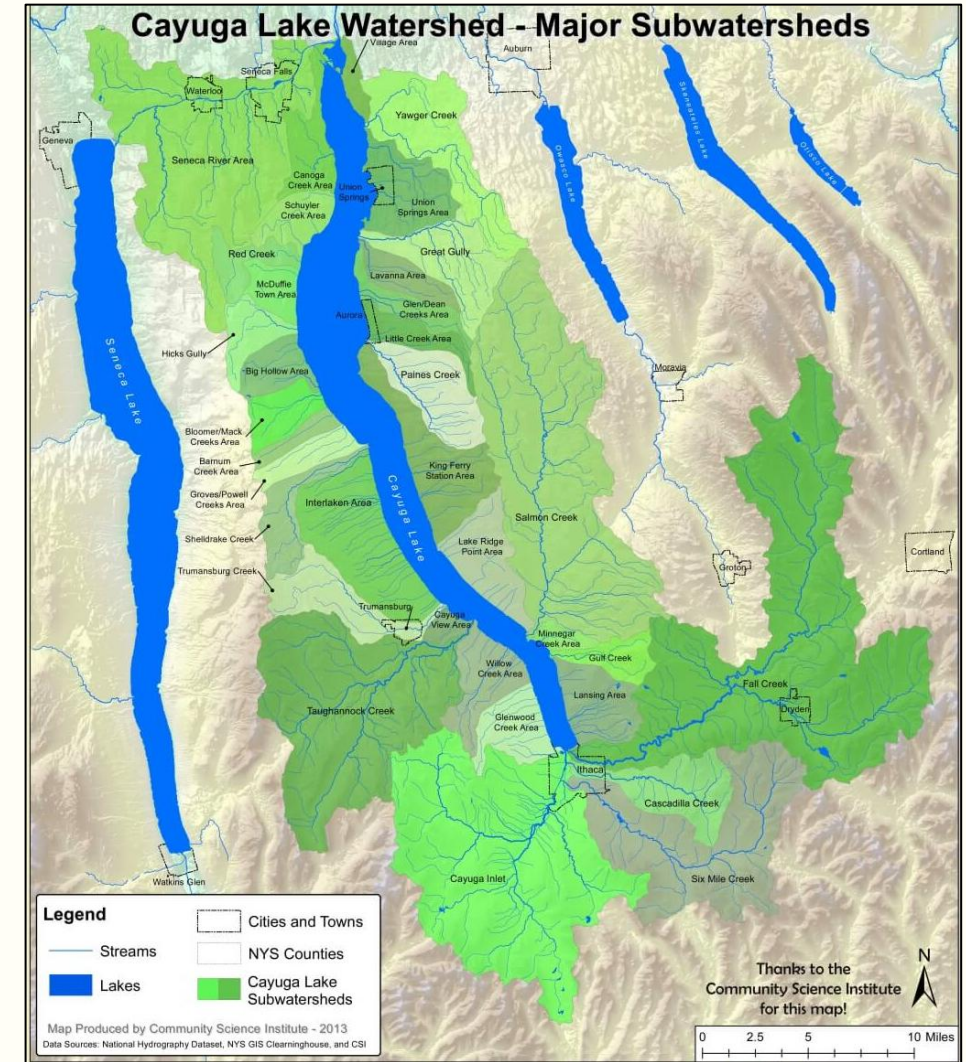
Fee-for-Service Water Testing

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

Community Science Institute

Our work is centered around the Cayuga Lake Watershed

Proudly serve other watersheds, too (e.g., Seneca Lake, Upper Susquehanna River)



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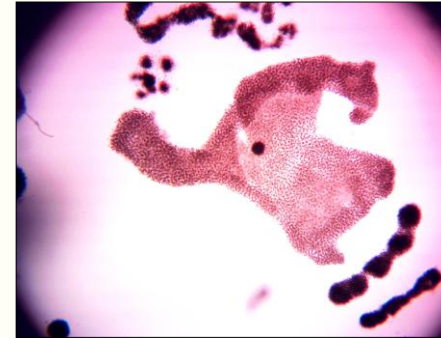
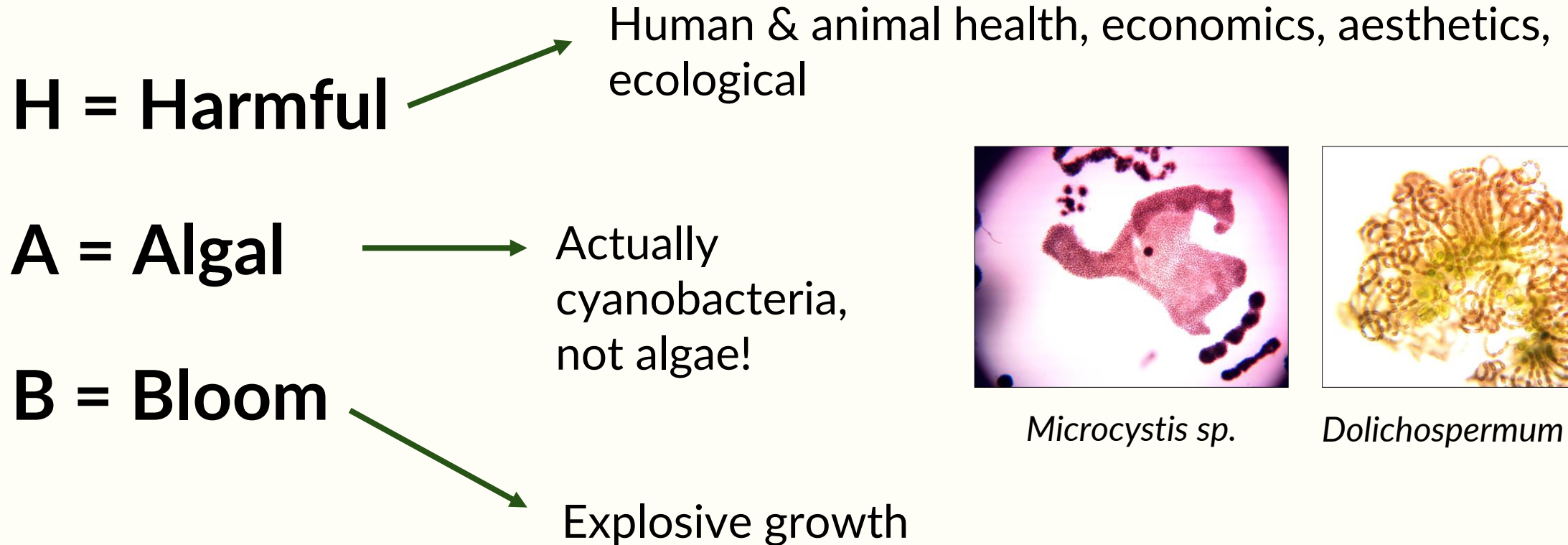
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Harmful Algal Blooms (HABs)



Microcystis sp.

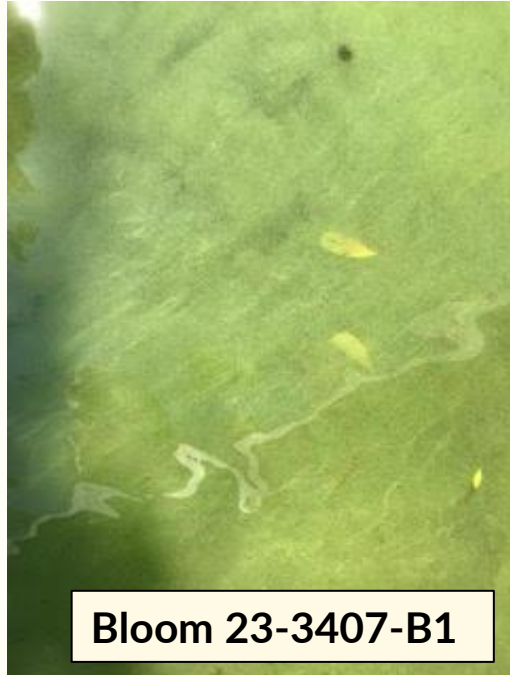


Dolichospermum sp.

Harmful Algal Blooms (HABs)

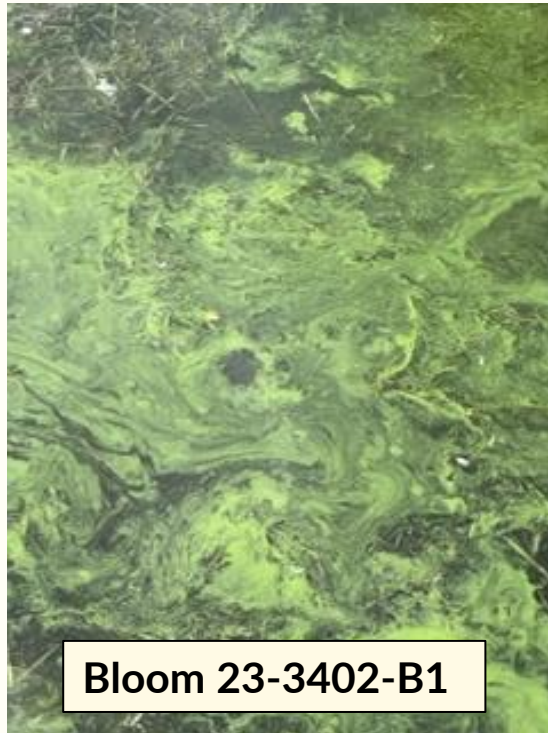


Department of
Environmental
Conservation

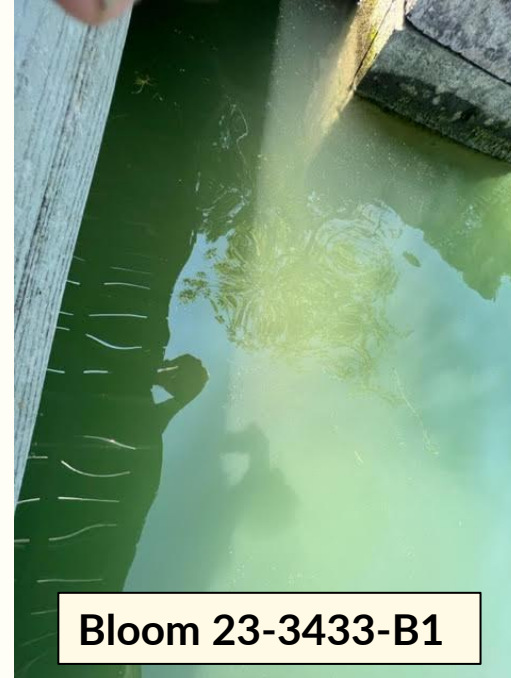


Bloom 23-3407-B1

Avoid it!



Bloom 23-3402-B1

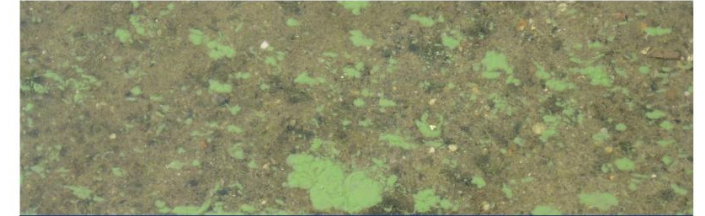


Bloom 23-3433-B1

Report it!



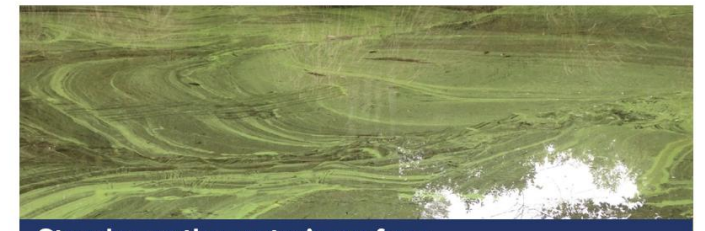
Pea soup appearance



Floating dots or clumps



Spilled paint appearance



Streaks on the water's surface

Image from Cayuga Lake HABs Action Plan

Know it!

THE FOLLOWING **ARE NOT** HARMFUL ALGAL BLOOMS

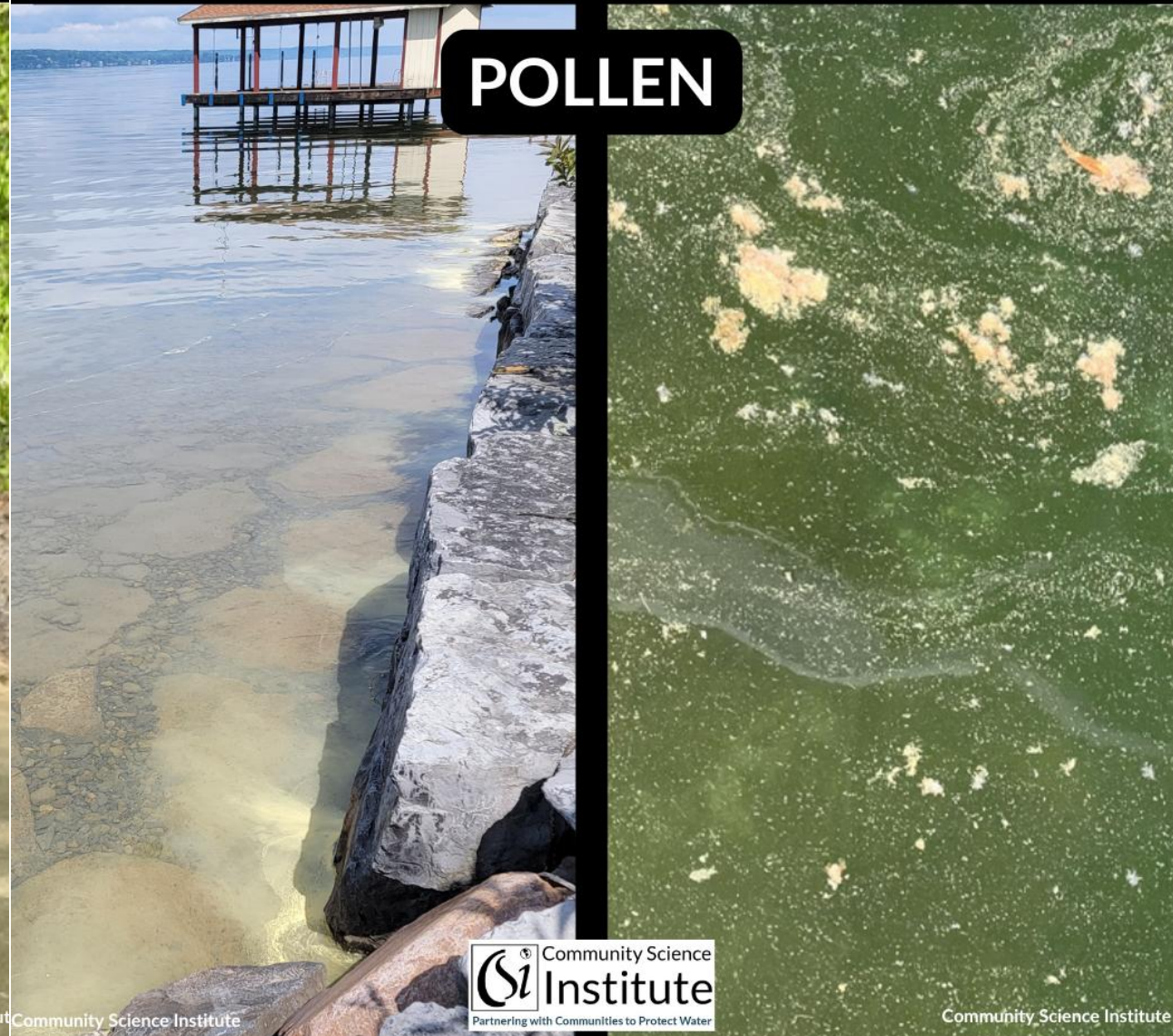
POLLEN



Community Science Institute

THE FOLLOWING **ARE NOT** HARMFUL ALGAL BLOOMS

POLLEN



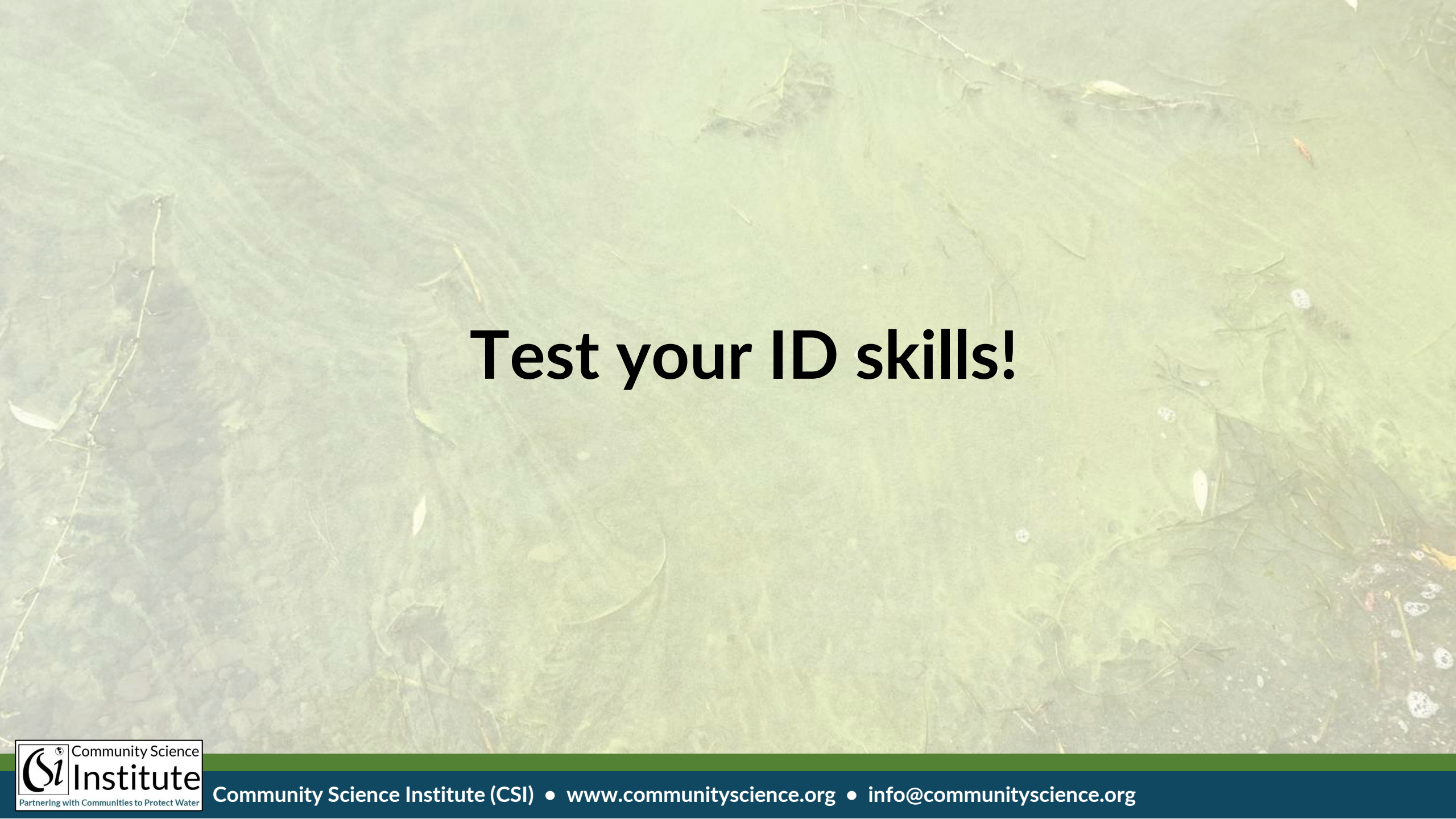
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Community Science Institute (CSI) • www.communityscience.org • info@communityscience.org

THE FOLLOWING **ARE NOT** HARMFUL ALGAL BLOOMS





Test your ID skills!

Test your ID skills



HAB ✓

Test your ID skills



✗ NOT a HAB

Test your ID skills

✗ NOT a HAB



Test your ID skills

HAB ✓



Test your ID skills



HAB ✓

Test your ID skills

✗ NOT a HAB



Test your ID skills



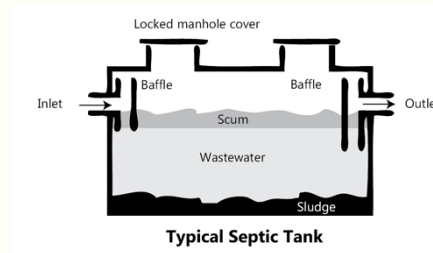
HAB ✓

HABs often accumulate in and around docks and coves

What Causes HABs?



Climate Change

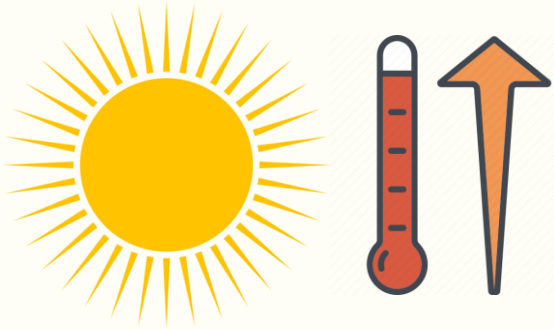


Nutrients



Invasive Species

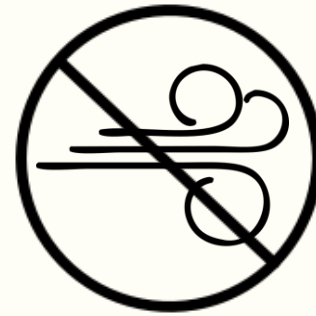
Under what conditions are we most likely to see HABs?



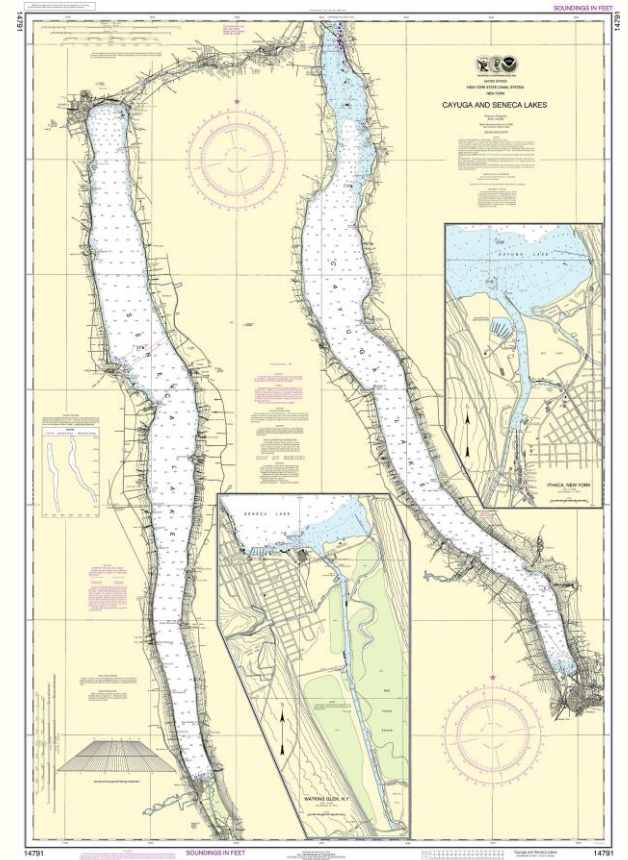
Hot, sunny
weather



1-2 days after
rainfall



Little to no wind



Long lake fetch

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HABs 101

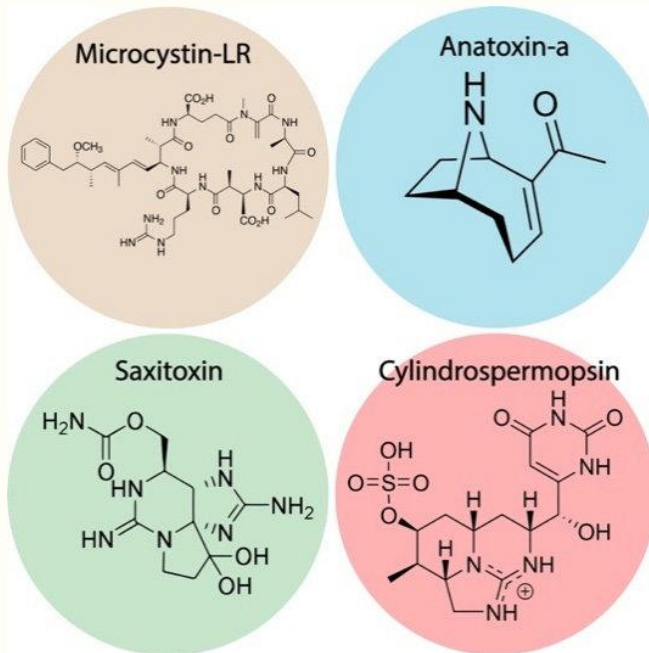
What's the Harm in HABs?

HAB Monitoring Initiatives

Wrap Up

What's the Harm in HABs?

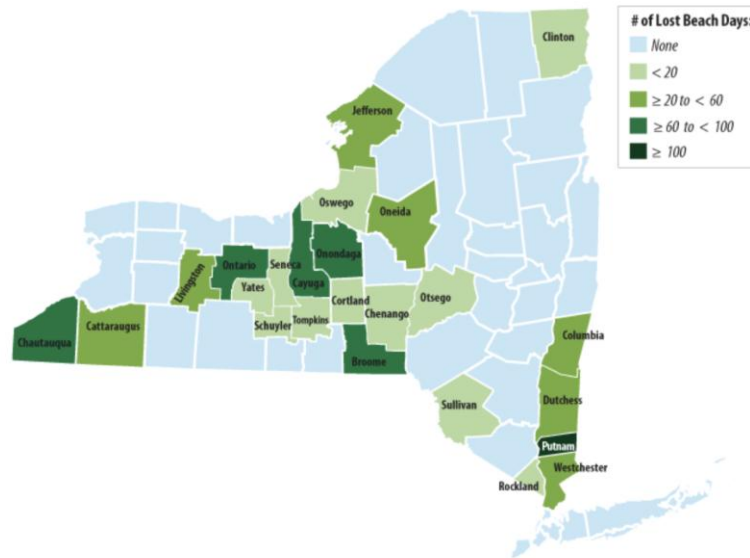
Health



Miglione et al. 2021

Economy

2024 Summary Data



NYSDOH HAB-related Beach Closure Summary (2024)



Ecology

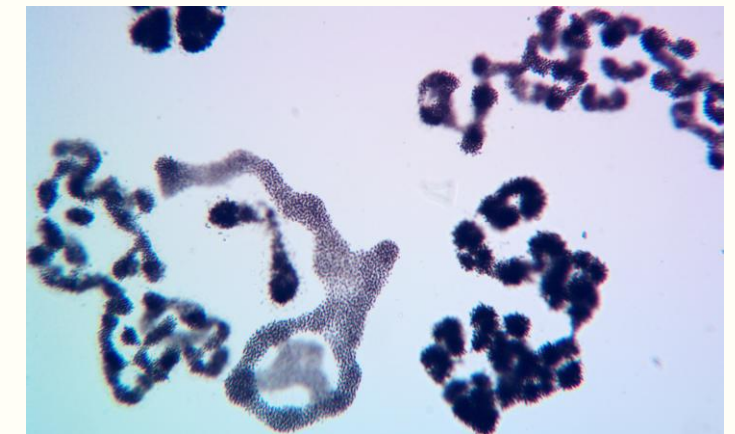
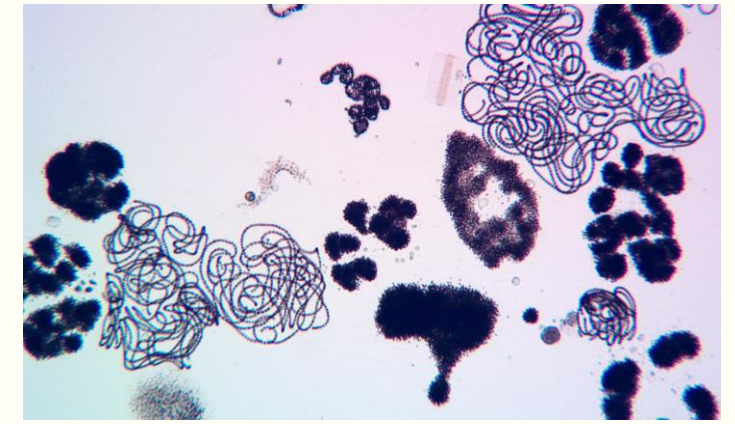


NOAA

HABs and Health

Cyanotoxins:

- Microcystins (*liver toxin*)
 - Most common in NY
- Anatoxins (*neurotoxin*)
- Saxitoxins (*neurotoxin*)
- Cylindrospermopsins (*liver and kidney toxin, DNA damage*)
- Endotoxins/Lipopolysaccharides (*skin irritants and allergens*)

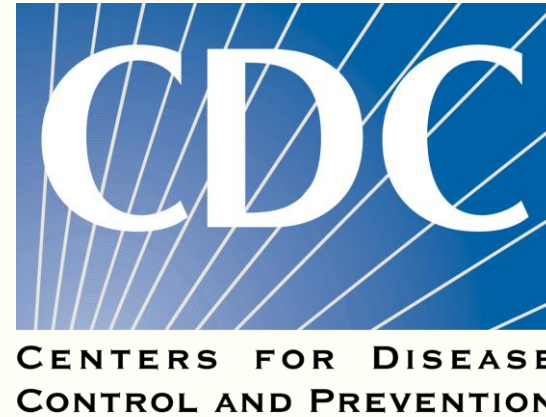


Can not determine toxicity by **LOOKING** at a HAB

HABs and Health

Potential health effects:

- Diarrhea, nausea, vomiting
- Skin, eye, or throat irritation
- Allergic reactions
- Headache
- Muscle weakness
- Dizziness
- Liver damage



National Institutes
of Health



Department
of Health

Routes of Exposure to HAB Toxins:

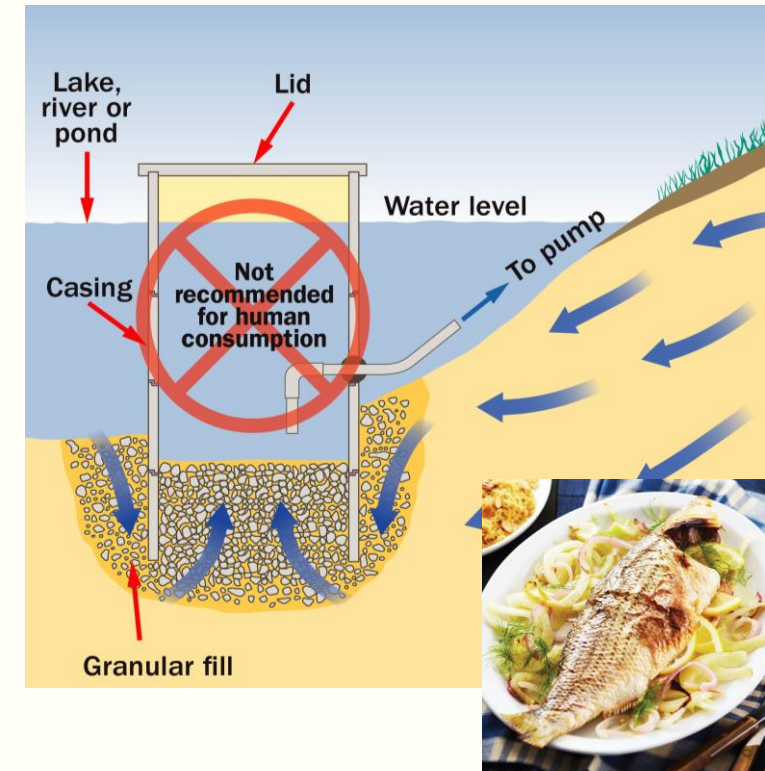
Dermal



Inhalation



Consumption



Any exposures should be reported to your local county department of health!

Animal Exposure to HABs



If you suspect your dog has been exposed, seek immediate veterinary care!

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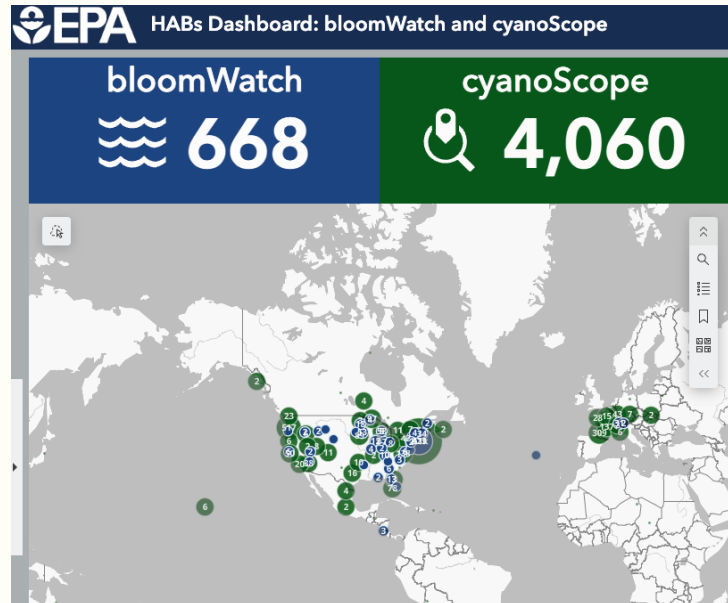
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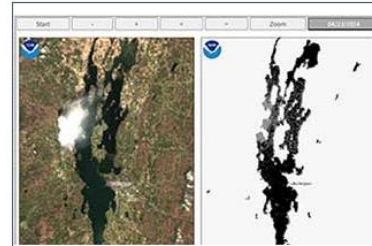
Wrap Up

Federal Level

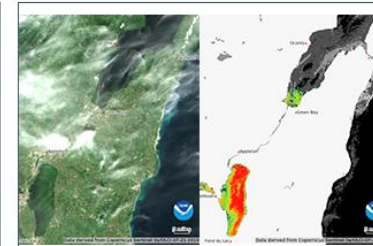


NCCOS

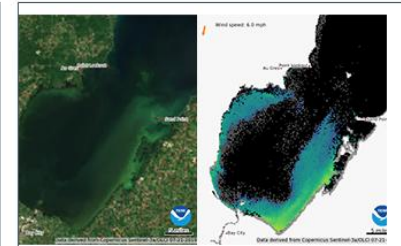
NATIONAL CENTERS FOR
COASTAL OCEAN SCIENCE



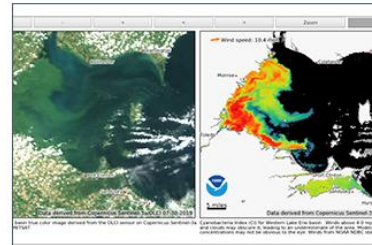
Lake Champlain



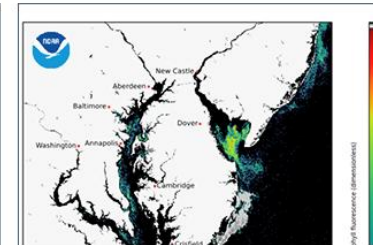
Green Bay, WI



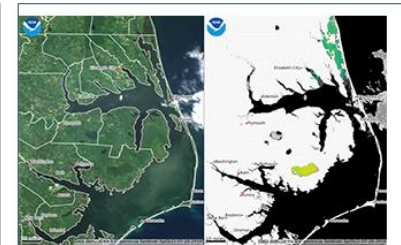
Saginaw Bay, MI



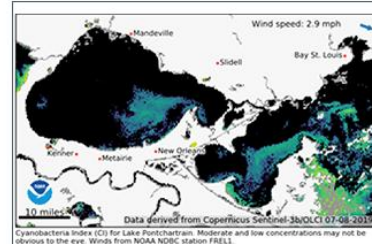
Western Lake Erie



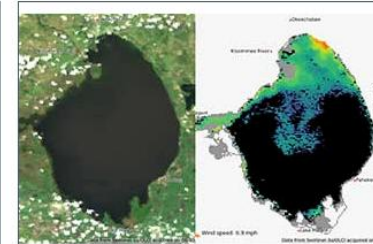
Chesapeake Bay



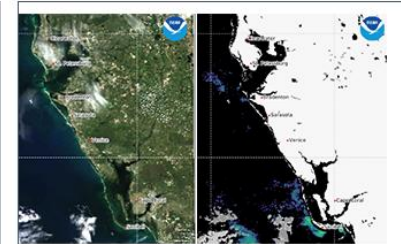
Albemarle Sound, NC



Lake Pontchartrain, LA



Lake Okeechobee, FL

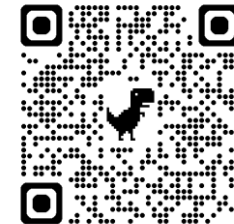
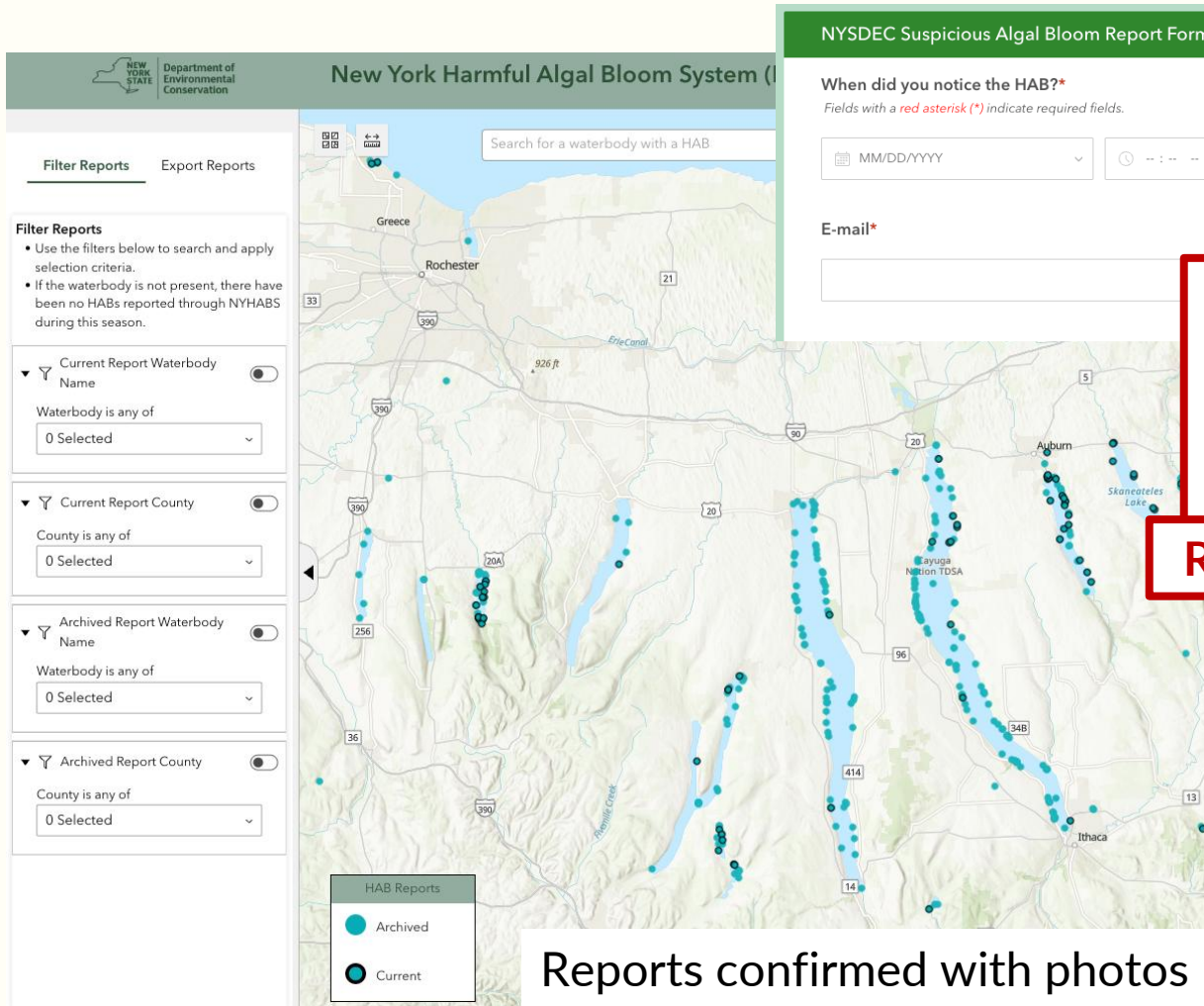


Southwest Florida

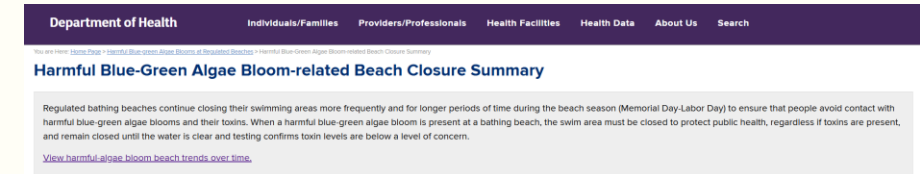
State Level - NYHABS



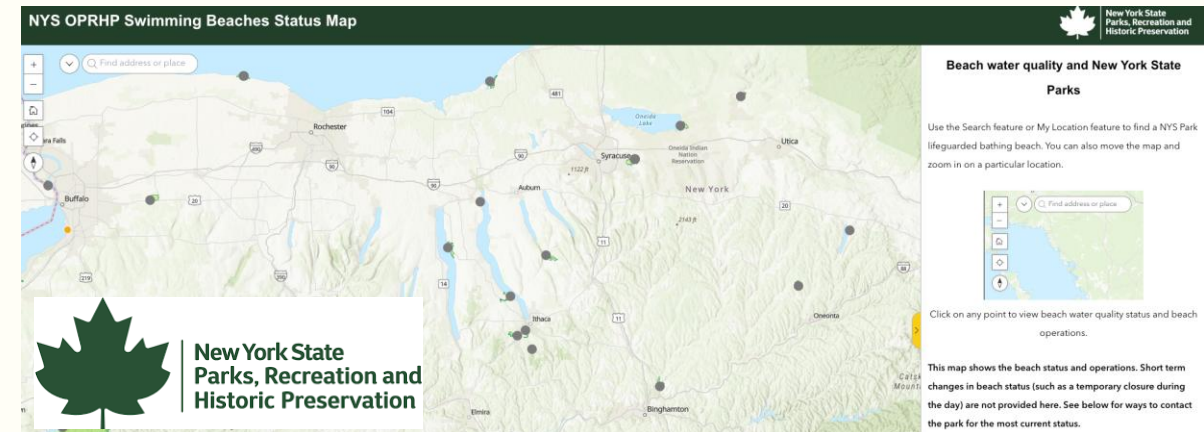
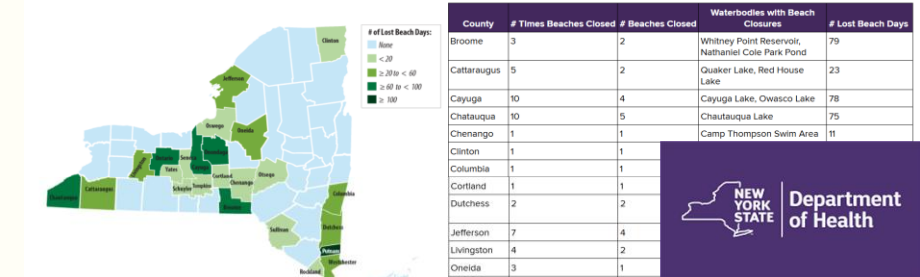
Department of
Environmental
Conservation



Report a HAB



2024 Summary Data



Lake Level – e.g., Cayuga Lake HAB Monitoring Program

Led by CSI since 2018 in partnership with:



~100 volunteers



Purpose: to collect and publish actionable data on cyanobacterial blooms, protect public health, and communicate timely results as efficiently as possible.

Lake Level – e.g., Cayuga Lake HAB Monitoring Program



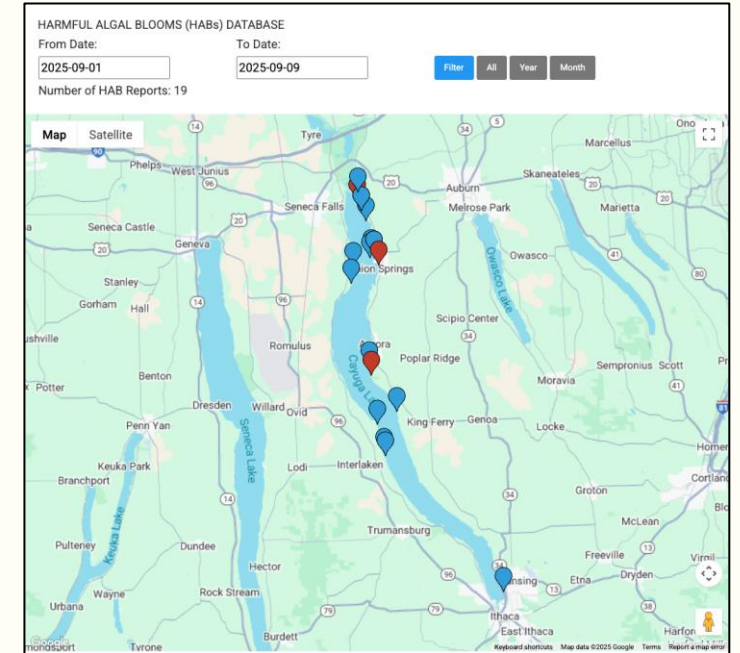
HAB Harriers perform weekly shoreline surveys for HABs



Blooms are reported to CSI via HABs Hotline

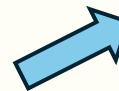


Samples are analyzed in CSI's lab

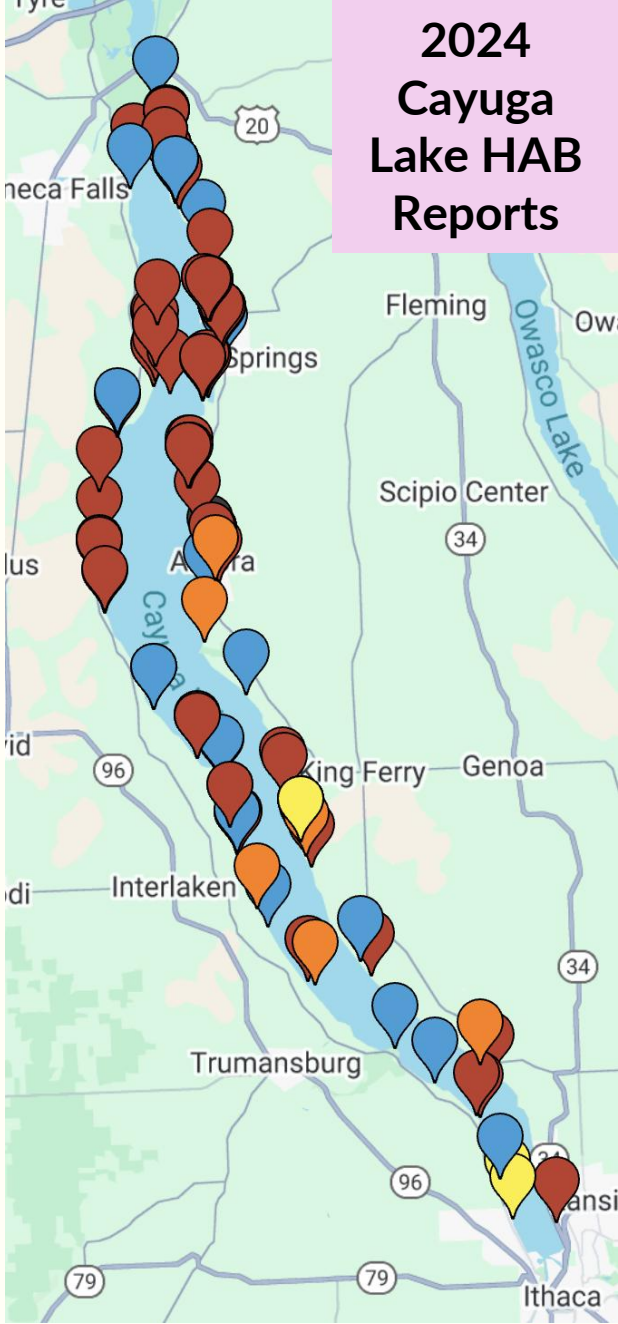
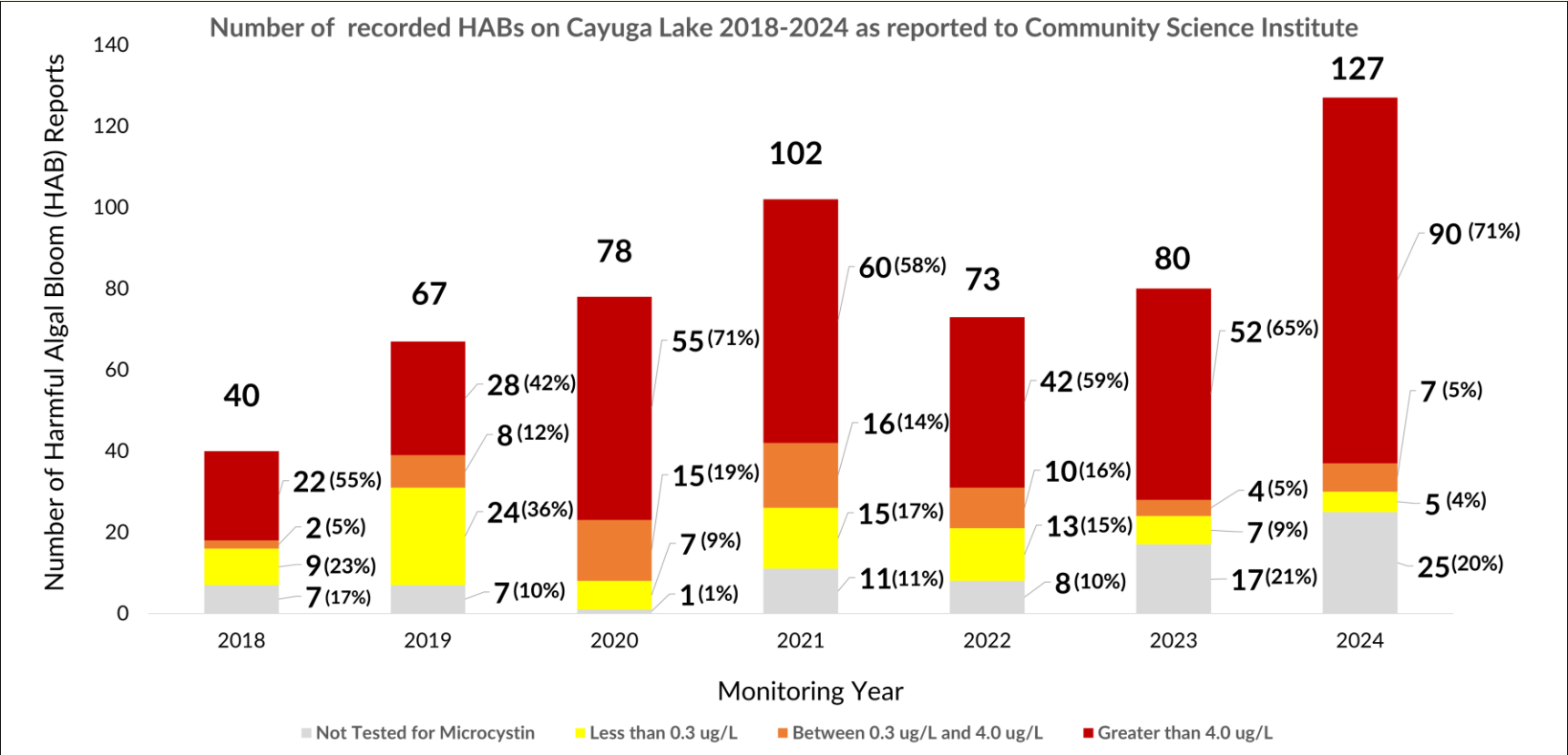


Alerts public to HABs

- CSI's interactive map/database
- NYSDEC NYHABs
- County Health Depts



2024 Cayuga Lake Harmful Algal Bloom (HAB) Monitoring Season



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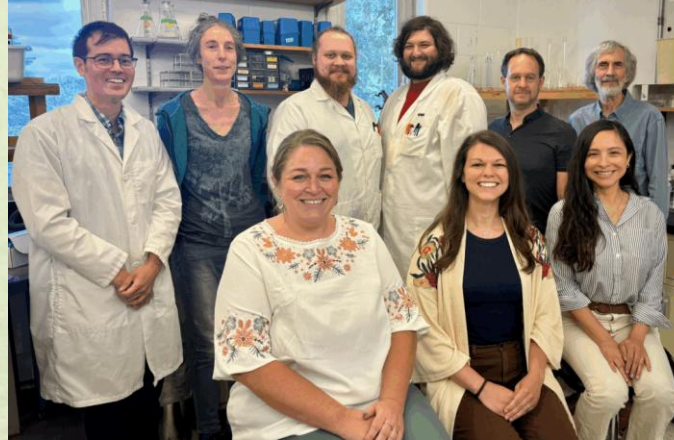
Wrap Up

Acknowledgements

Dedicated volunteers!



CSI Staff Past and Present



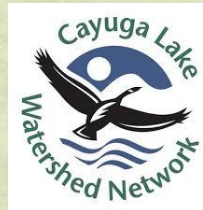
CSI Members

Business Members



INN AT
TAUGHANNOCK FALLS

Partners



FARMER GROUP




FINGER LAKES
Wealth Management

Local Governments



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Further Reading

► [Life \(Basel\)](#). 2022 Mar 14;12(3):418. doi: [10.3390/life12030418](#) 

As We Drink and Breathe: Adverse Health Effects of Microcystins and Other Harmful Algal Bloom Toxins in the Liver, Gut, Lungs and Beyond

[Apurva Lad](#)¹, [Joshua D Breidenbach](#)¹, [Robin C Su](#)¹, [Jordan Murray](#)¹, [Rebecca Kuang](#)¹, [Alison Mascarenhas](#)¹,
[John Najjar](#)¹, [Shivani Patel](#)¹, [Prajwal Hegde](#)¹, [Mirella Youssef](#)¹, [Jason Breuler](#)¹, [Andrew L Kleinhenz](#)¹, [Andrew P Ault](#)²,
[Judy A Westrick](#)³, [Nikolai N Modyanov](#)¹, [David J Kennedy](#)^{1,*}, [Steven T Haller](#)^{1,*}




Harmful Algae

Volume 141, January 2025, 102768



Microcystins bioaccumulate but do not biomagnify in an experimental aquatic food chain

[Dani Glidewell](#), [Jessica E. Beyer](#), [K. David Hambricht](#)  

CENTER FOR ENVIRONMENTAL HEALTH



Harmful Blue-green Algae Blooms: Understanding the Risks of Piping Surface Water into Your Home



One Health Harmful Algal Bloom System (OHHABS)

EXPLORE THIS TOPIC 

Q SEARCH

About the One Health Harmful Algal Bloom System (OHHABS)

For Everyone
FEB. 23, 2024

KEY POINTS

- CDC's One Health Harmful Algal Bloom System (OHHABS) collects data about harmful algal blooms and the human and animal illnesses they cause.
- State and territorial public health departments voluntarily report to OHHABS.
- OHHABS is a reporting system that gathers information to better understand harmful algal blooms and prevent associated illnesses.



Articles

Detections of cyanobacteria harmful algal blooms (cyanoHABs) in New York State, United States (2012–2020)

[Rebecca M. Gorney](#) , [Stephanie G. June](#), [Karen M. Stainbrook](#) & [Alexander J. Smith](#)

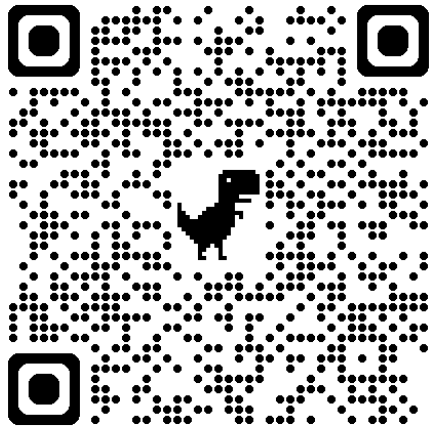
Pages 21-36 | Published online: 08 Feb 2023

 Cite this article  <https://doi.org/10.1080/10402381.2022.2161436>



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monthly updates



Community Science Institute
Partnering with Communities to Protect Water



This striking photo was captured by one of our dedicated volunteers in Varick, on the west side of Cayuga Lake. It showcases a sediment plume flowing from the mouth of a creek—officially labeled by FEMA as "Unnamed Tributary #3 to Cayuga Lake in the Town of Varick." A sediment plume is a visible cloud of suspended particles spreading from a disturbance, in this case, caused by heavy rainfall and melting snow and ice from the previous day's weather. This natural phenomenon is a great reminder of how land and water are closely connected—highlighting the importance of protecting our watersheds from excess runoff!

Photo: Thomas Björkman, Synoptic Stream Monitoring Volunteer
02/27/25 - Varick, NY

February 2025 Monthly Update

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Set up a meeting with me

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