

Harmful Algal Blooms (HABs)

River Watchers Training
Program



Photograph credit: NJDEP (<https://www.state.nj.us/dep/hab/photo.html>)

Musconetcong Watershed Association

- Founded in 1992 in Asbury, NJ
- The Musconetcong Watershed Association (MWA) is:
 - an independent, non-profit organization dedicated to protecting and improving the quality of the Musconetcong River and its Watershed, including its natural and cultural resources.



Site of Finesville Dam restoration project

What the MWA Does

- Deliver educational programs
- Advocate for the river at all levels
- Monitoring river ecology and health
- Support environmental restoration projects



Why the MWA Does All This

- Education and advocacy raise awareness
 - Communicating our dependence on healthy environments as well as current threats
- Monitoring and restoration are critical activities
 - Preserve what we have and bring everything else as close to that standard as we can

River Watchers- A Monitoring Necessity

- Citizen science water quality monitoring program, in its 14th year
- 7 sites are sampled four times every year
- Benefits
 - See how changes in watershed (AKA "the land") affect river health
 - Measure the value of restoration
 - Detect new invasive species
 - Get citizens involved with the river

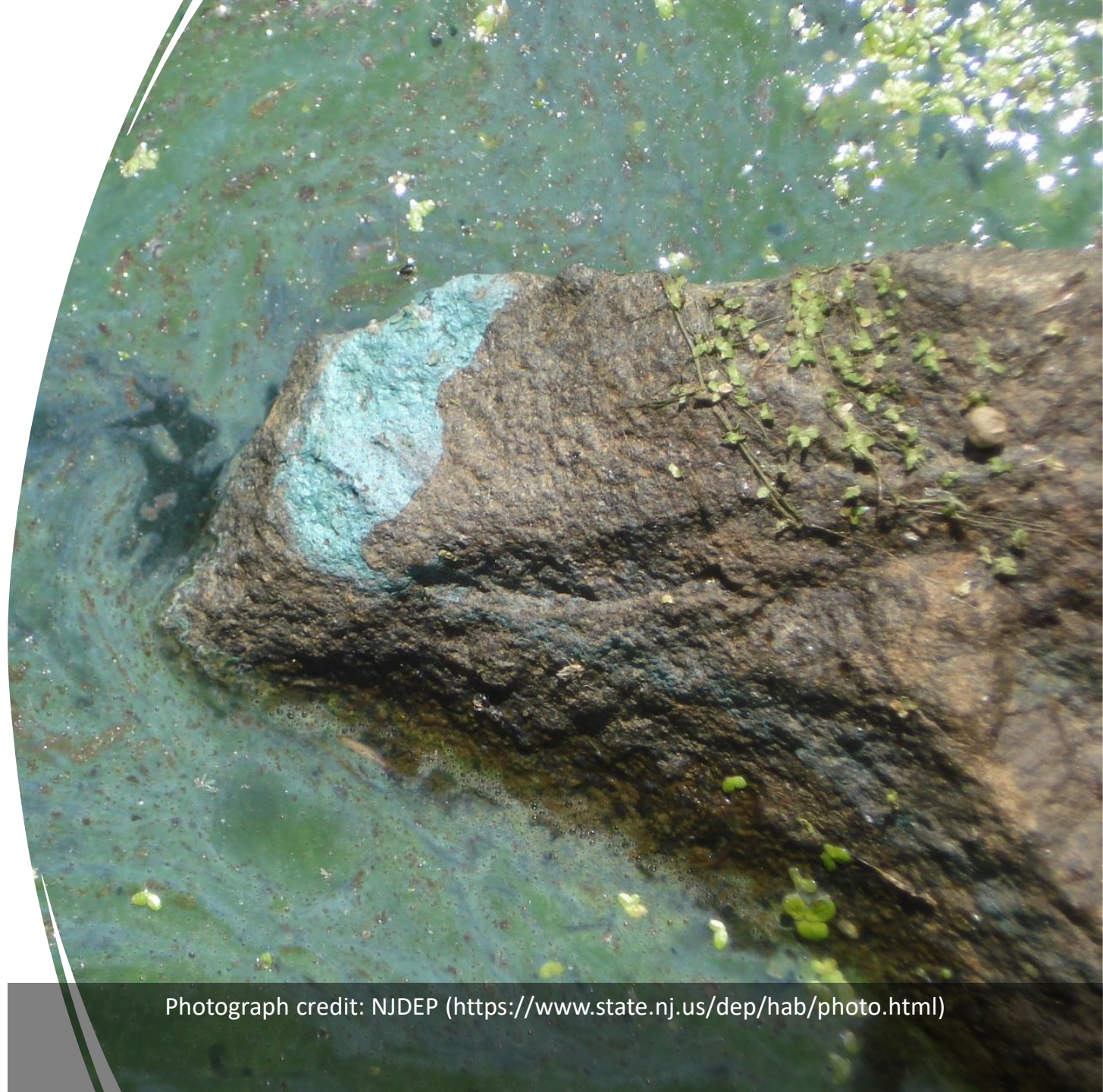
And now...

- Add harmful algal bloom (HAB) monitoring to that list
 - Represents another threat to the Musconetcong River Watershed
- New funding has made available the expansion of the program through the Watershed Institute



What is a HAB?

- A surge of certain cyanobacterial populations (not actually algae) in a body of water, in response to certain environmental conditions:
 - Water temperature
 - Nutrients
 - Flow
 - Sunlight



Photograph credit: NJDEP (<https://www.state.nj.us/dep/hab/photo.html>)

A note on terminology

- Although we use the phrase "HAB" (Harmful Algal Bloom), get used to calling the organisms responsible for HABs cyanobacteria.
- Many types of algae are not dangerous in the way HABs are, so referring to cyanobacteria can help distinguish it from other kinds of algae.

Where might you find a HAB?

- Mainly in lakes and reservoirs
- Require slow-moving (or nonmoving) bodies of water
 - Less common in rivers and streams, but possible in spots

When might you find a HAB?

- Height of summer and early fall
- Rare to see them other parts of the year (even in June, it may be pollen build-up on surface)

Don't worry, it's only pollen!



Photograph credit: The Pond Guy
(<https://www.thepondguy.com/product/learning-center-pl-oily-pond-scum/learning-center-pl-weekly-pond-talk>)

How do HABs take over?

- At warm temperatures, HAB-causing cyanobacteria grow faster than other types of algae.
- Can also regulate their buoyancy to move through water column
- Can fix nitrogen to access more sources of food

Why are HABs a problem?

- Can cause fish kills and threaten life of other organisms in the water
- Pose health risks for humans eating fish or swimming
- Negatively affect businesses that rely on water-based recreation

HAB Photographs

- Parallel lines of green



Photograph credit: NJDEP (<https://www.state.nj.us/dep/hab/photo.html>)

HAB Photographs

- Teal, bluish, or whitish coloration on the surface, with an "oily" or "spilled paint" appearance




Photograph credit: NJDEP (<https://www.state.nj.us/dep/hab/photo.html>)

HAB Photographs

- The whole area of water appearing to be green, especially with small green "dots"



Photograph credit: NJDEP (<https://www.state.nj.us/dep/hab/photo.html>)



Photographs of HAB Imposters

- This is duckweed, which is actually a small flowering plant



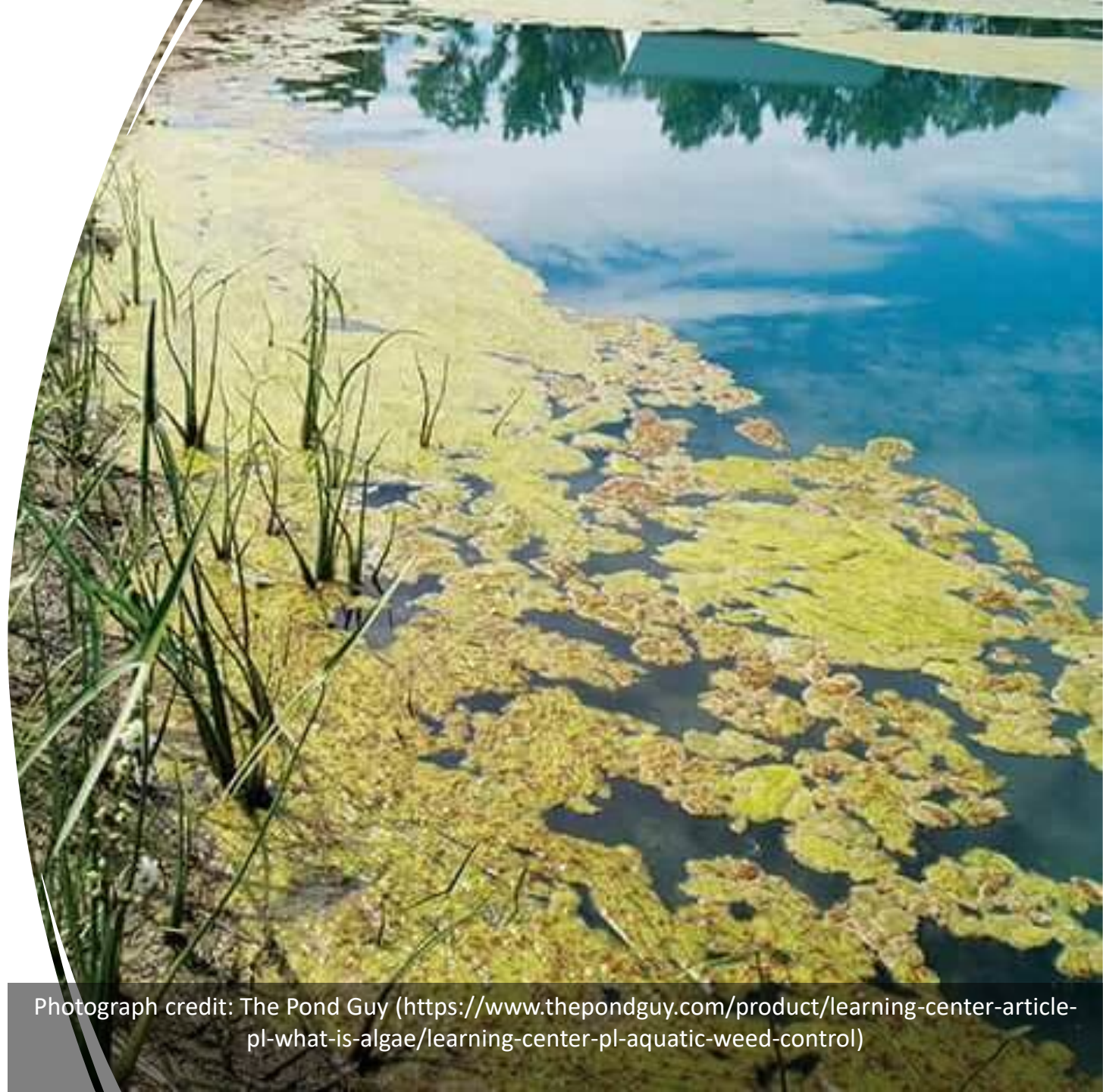
Photograph credit: NJDEP (<https://www.state.nj.us/dep/hab/photo.html>)



Photograph credit: The Pond Guy (<https://www.thepondguy.com/product/learning-center-article-pl-treat-control-duckweed>)

HAB Imposters

- Decaying organic matter, from other aquatic plants
- If you could scoop up "chunks" of material from the surface, it's probably not a HAB.
- The "Stick Test": Take a stick and run it through the water where you see any potential HAB. Does the stick pull anything up?



Photograph credit: The Pond Guy (<https://www.thepondguy.com/product/learning-center-article-pl-what-is-algae/learning-center-pl-aquatic-weed-control>)

HAB Imposters

- Filamentous algae
 - Again, this kind of algae is substantial and stringy.
 - Another instance where the "Stick Test" can help



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HAB Imposters

- Pollen from trees (more common in spring and early summer)



Photograph credit: The Pond Guy (<https://www.thepondguy.com/product/learning-center-pl-oily-pond-scum/learning-center-pl-weekly-pond-talk>)

How we monitor for HABs

- DEP-approved Turner Designs FluoroSense handheld fluorometer
- Easy-to-obtain, real-time results

Turner Designs FluoroSense Fluorometer

- Measures phycocyanin, a protein that helps absorb light for photosynthesis
- Device is correlated so that phycocyanin levels serve as a proxy for cyanobacteria cell counts

Using the FluoroSense



Monitoring sites in the Musconetcong Watershed

- Tilcon Lake and Saxton Lake
- Agricultural ponds
- Lake Musconetcong and Lake Hopatcong are already being monitored.



Watch



Advisory



Warning



Danger



Beach Closed



Winter Watch*

Engaging the Public on HABs

- Make them aware of hazards:
 - Eating fish from a waterbody with an active HAB
 - Swimming in or drinking water contaminated with a HAB (same for pets)
- DEP can't close a waterbody (just beaches), so they only post "advisories" of varying intensity
 - Still, it's best to follow what the advisories say

Engaging the Public on HABs

- Cyanobacteria are naturally-occurring, but the density of a bloom is what makes them a problem.
- Humans can help by addressing the conditions we inadvertently create
 - Extra-high summer water temperatures
 - Too much nutrient runoff/input
 - Low flow in rivers and streams
 - Lack of shade over rivers and streams



More Resources

- State of NJ
 - <https://www.state.nj.us/dep/hab/>
 - <https://www.nj.gov/dep/wms/bfbm/CyanoHABHome.html>
- EPA
 - <https://www.epa.gov/cyanohabs>
- National Institute of Health (NIH)
 - <https://www.niehs.nih.gov/health/topics/agents/algal-blooms/index.cfm#:~:text=What%20are%20the%20health%20effects,cause%20paralysis%20and%20even%20death.>
- NRDC
 - <https://www.nrdc.org/stories/freshwater-harmful-algal-blooms-101>