

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Identifying Benthic Cyanobacteria in Lakes

July 7, 2026| Lake Champlain Committee & Tetra Tech



Gina LaLiberte, Bureau of Water Quality

Cyanobacteria are EVERYWHERE!
But... blooms are NOT a problem everywhere.



ITRC Guidance for Planktonic and Benthic HCBs



Visit HCB-2 Website

Home

Interactive Tools >

1. Overview >

2. Using this Guidance for Cyanobacterial Bloom Response >

3. Introduction to the Cyanobacteria >

4. Monitoring >

5. Strategies for Communication and Response Planning for HCBs >

6. Management and Control Strategies for HCBs >

7. Strategies for Use in Nutrient Management >

8. Recommendations >

References

Strategies for Preventing and Managing Harmful Cyanobacterial Blooms (HCB-1)



Source: Wyoming DFO

Cyanobacteria are microscopic, **photosynthetic** organisms that can be found naturally in all aquatic systems. Under certain conditions, **cyanobacteria** can multiply and become very abundant, discoloring the water throughout a water body or accumulating at the surface. These occurrences are known as blooms. **Cyanobacteria** may produce potent toxins (cyanotoxins) that pose a threat to human health. **Cyanobacteria** can also harm wildlife and domestic animals, aquatic ecosystems, and local economies by disrupting drinking water systems and source waters, recreational uses, commercial and recreational fishing, and property values.

This guidance is focused on strategies that you may use in response to cyanobacterial blooms that are found in freshwater aquatic environments, including lakes, streams, rivers, reservoirs, ponds, and freshwater-influenced estuaries. It is intended to help you select **monitoring, excess nutrient reduction, in-lake management, and communication** approaches that may be suitable for use in your water body. We provide interactive tools to help you explore options in **monitoring, management, and nutrient reduction**. Our **Visual Guide** will help you recognize **cyanobacteria** and other common aquatic phenomena that can be confused with them.

Together, this information, interactive tools, and embedded resources will help you respond to and manage for **cyanobacteria**.

ITRC has created two guidance documents, one focused primarily on **planktonic HCBs, HCB-1**, and the other focused primarily on **benthic HCBs, HCB-2**. While each document has a primary focus, each document has sections that are applicable to all **HCBs**, including several interactive tools. The **framework** shows how the two guidance documents are related and where they overlap.



Visit HCB-1 Website

Home

Interactive Tools >

About ITRC

Navigating this Website

1. Introduction >

2. Cyanotoxins >

3. Monitoring for benthic cyanobacteria >

4. Introduction to treatment strategies >

5. Communication and response planning strategies >

8. Recommendations >

Appendix >

References

Acknowledgments

Document Feedback

Strategies for Preventing and Managing Benthic Harmful Cyanobacterial Blooms (HCB-2)

HARMFUL CYANOBACTERIAL BLOOMS (HCBs)

Harmful Cyanobacterial Blooms (HCBs) are complex ecological phenomenon that can occur where cyanobacteria proliferate and dominate aquatic ecosystems including lakes, streams, rivers, reservoirs, ponds, and freshwater-influenced estuaries. They serve as vibrant hubs for recreation, tourism, and local identity. Human activities can influence and alter their natural ecological equilibrium. Freshwater inland lakes and reservoirs supply approximately 70% of our nation's drinking water and industry withdrawals.

HCBs can occur in many parts of a water body. Planktonic HCBs occur when cyanobacteria dominate the water column (pelagic zones) of water bodies. In addition to being suspended in the open water, some cyanobacterial species grow attached to surfaces in a water body. These attached cyanobacteria can grow at the bottom of a water body (benthic zone) but may also be found nearer to the surface growing on submerged vegetation or woody debris.

ITRC has created two guidance documents, one focused primarily on planktonic HCBs, **HCB-1**, and the other focused primarily on benthic HCBs, **HCB-2**. While each document has a primary focus, each document has sections that are applicable to all HCBs, including several interactive tools. The framework shows how the two guidance documents are related and where they overlap.

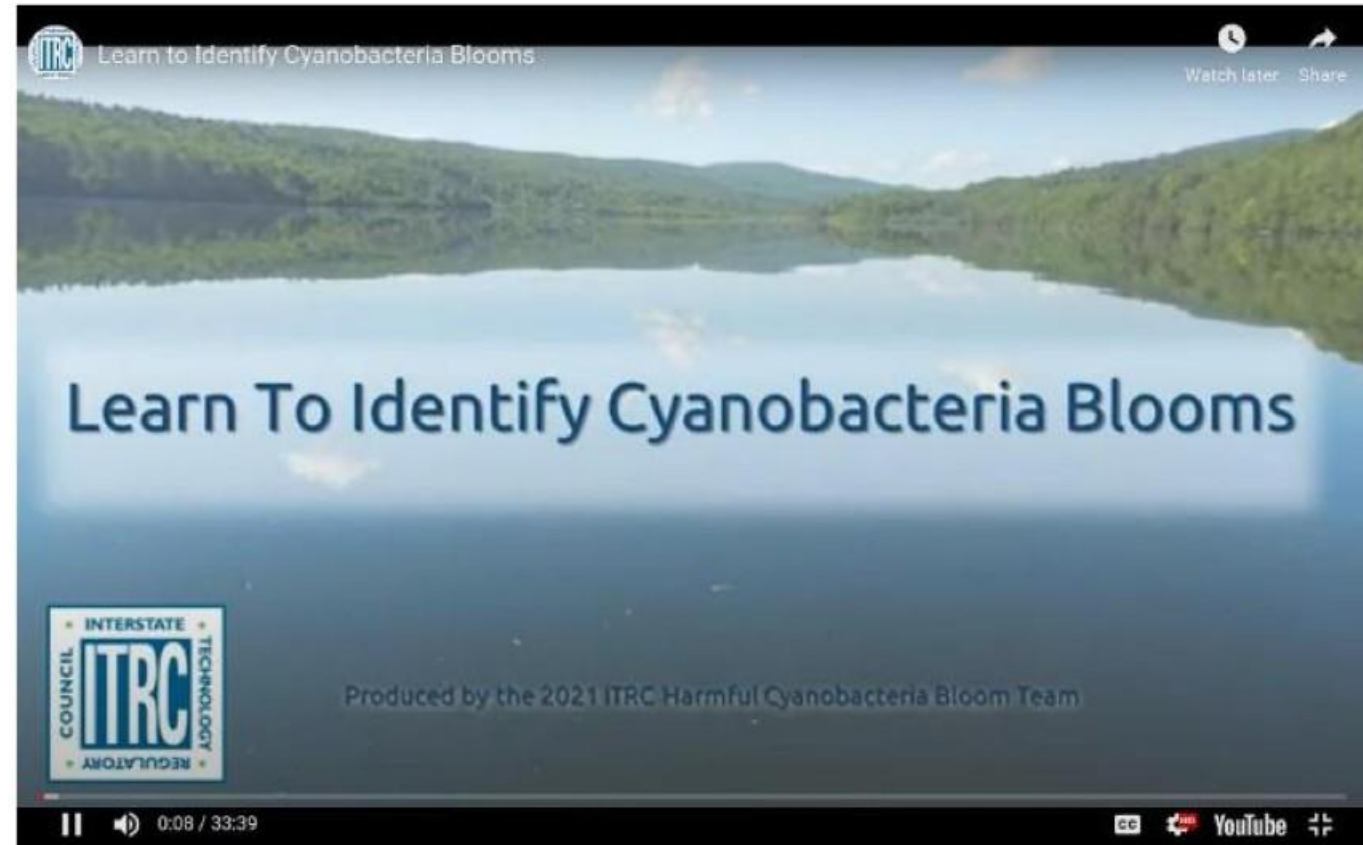
Framework of HCB Guidance Documents



Harmful Cyanobacterial Bloom (HCB) Training

Learn to Identify Cyanobacteria Blooms Video

- ▶ Published with help from the Lake Champlain Basin Program
- ▶ Identifies and describes different types of cyanobacteria
- ▶ Includes guidance on best management and safety practices



Benthic cyanobacteria can be cryptic.



P. McCormick – WDNR



D. Blumer – SEH Inc.

Benthic cyanobacteria can be cryptic.

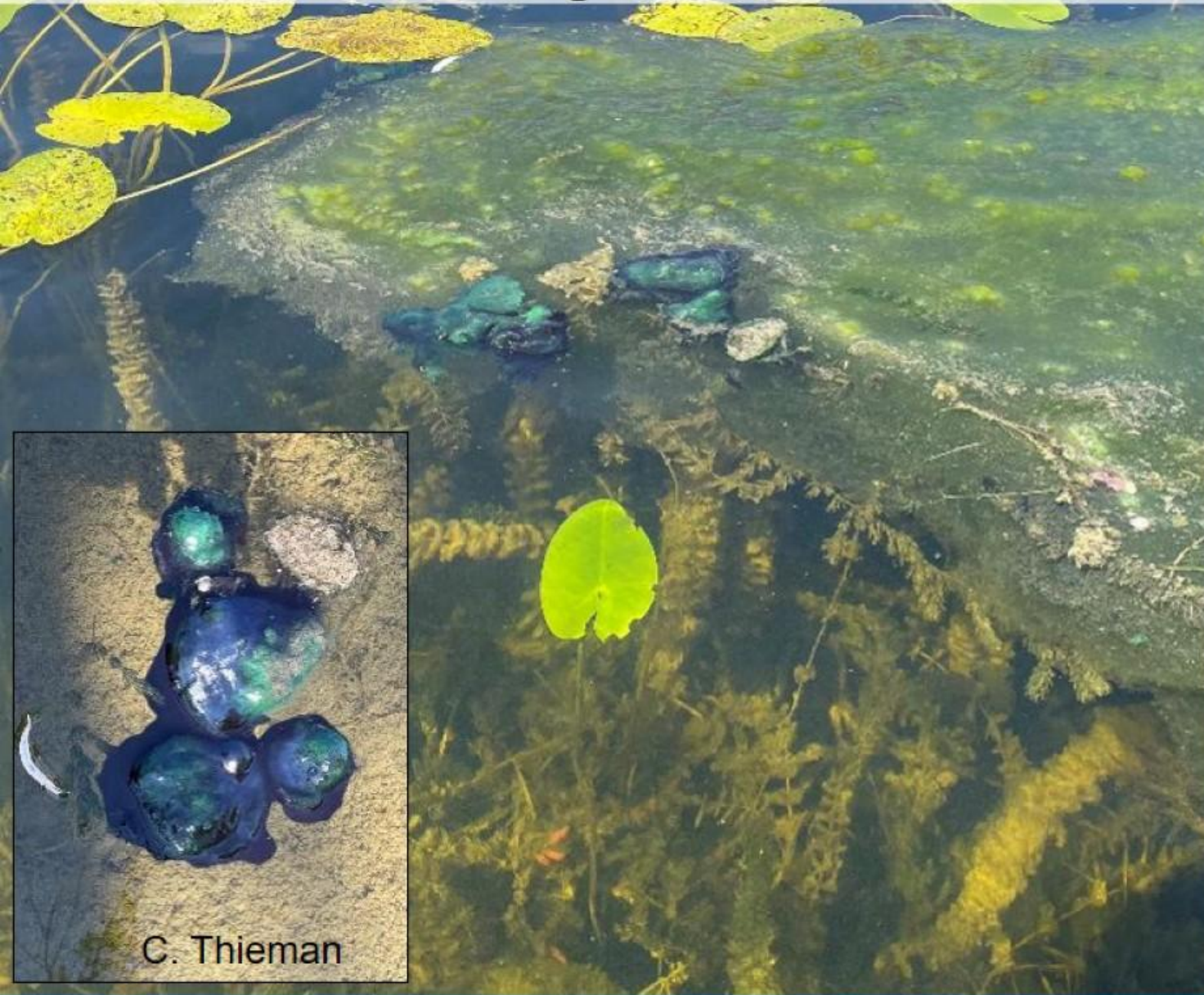


C. Helker - WDNR

Benthic cyanobacteria can be cryptic.



Benthic cyanobacteria need clear water.



Gloeotrichia echinulata

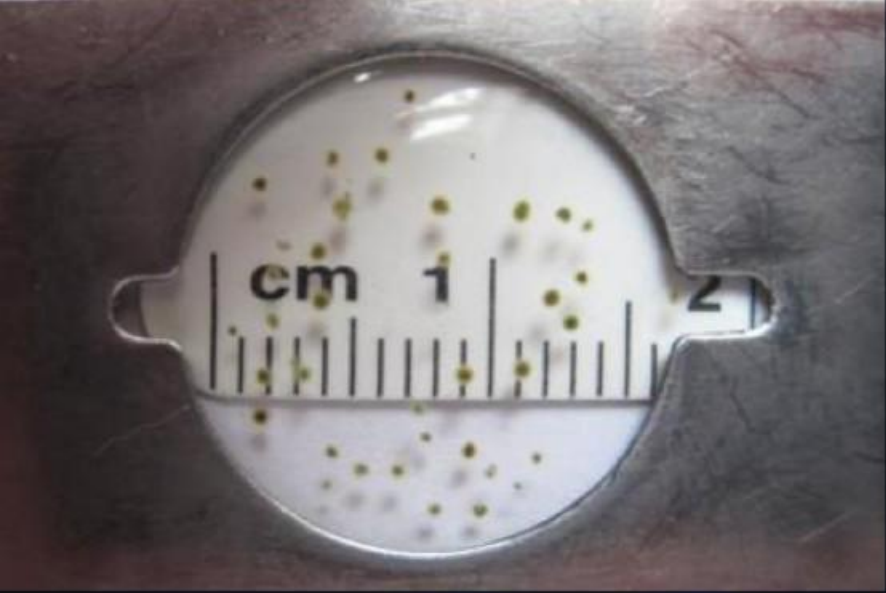


J. Williamson



J. Williamson

Gloeotrichia echinulata



Clean Lakes Alliance Monitoring Volunteer

Benthic filamentous cyanobacterial mats



B. & G. Gustafson



The phycospheres of benthic mats
are very diverse.

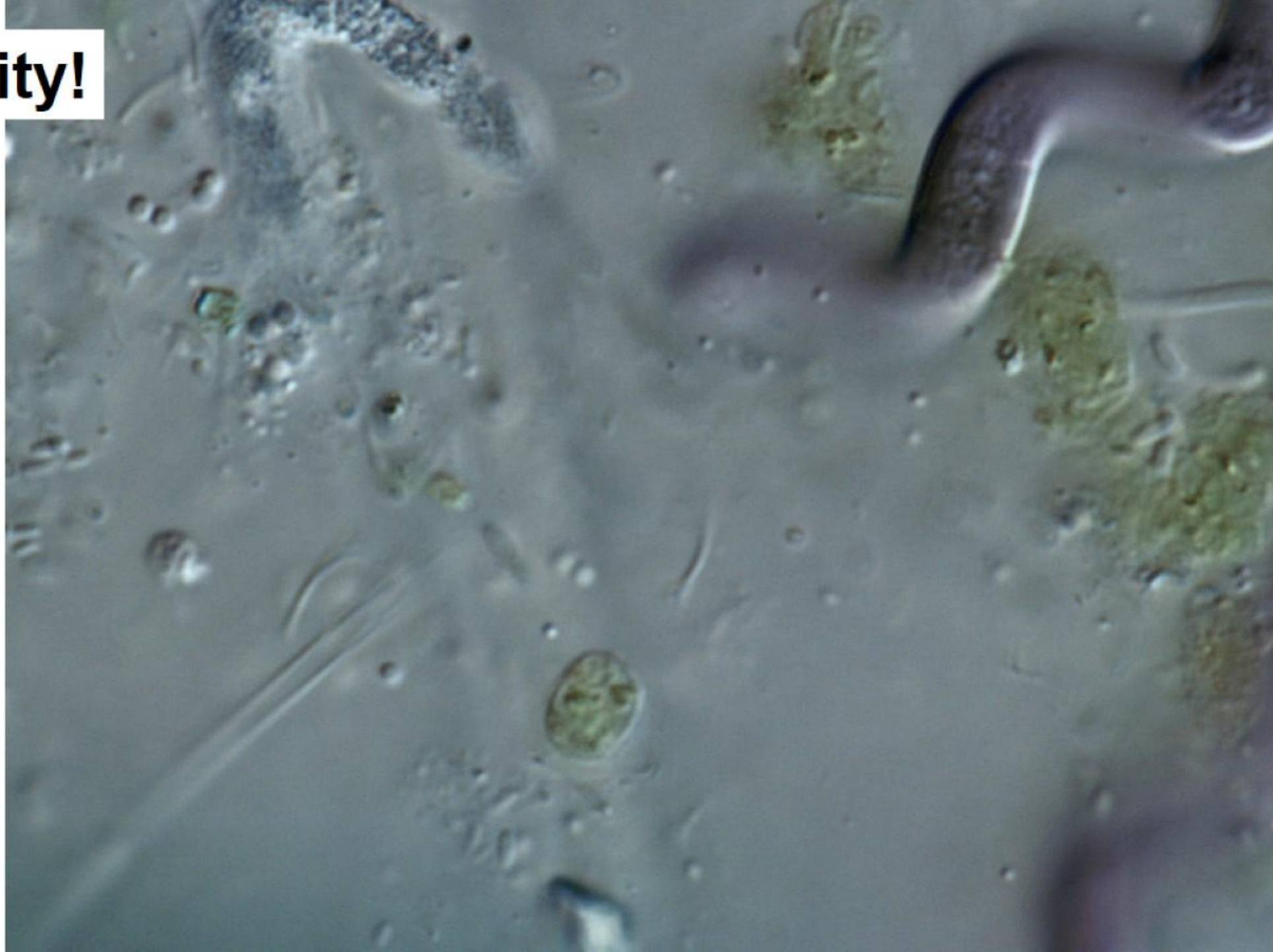


B. & G. Gustafson

Motility!



Motility!



Benthic mats float off the bottom of lakes & rivers.



D. Blumer



S. Caven



E. Evensen – WDNR

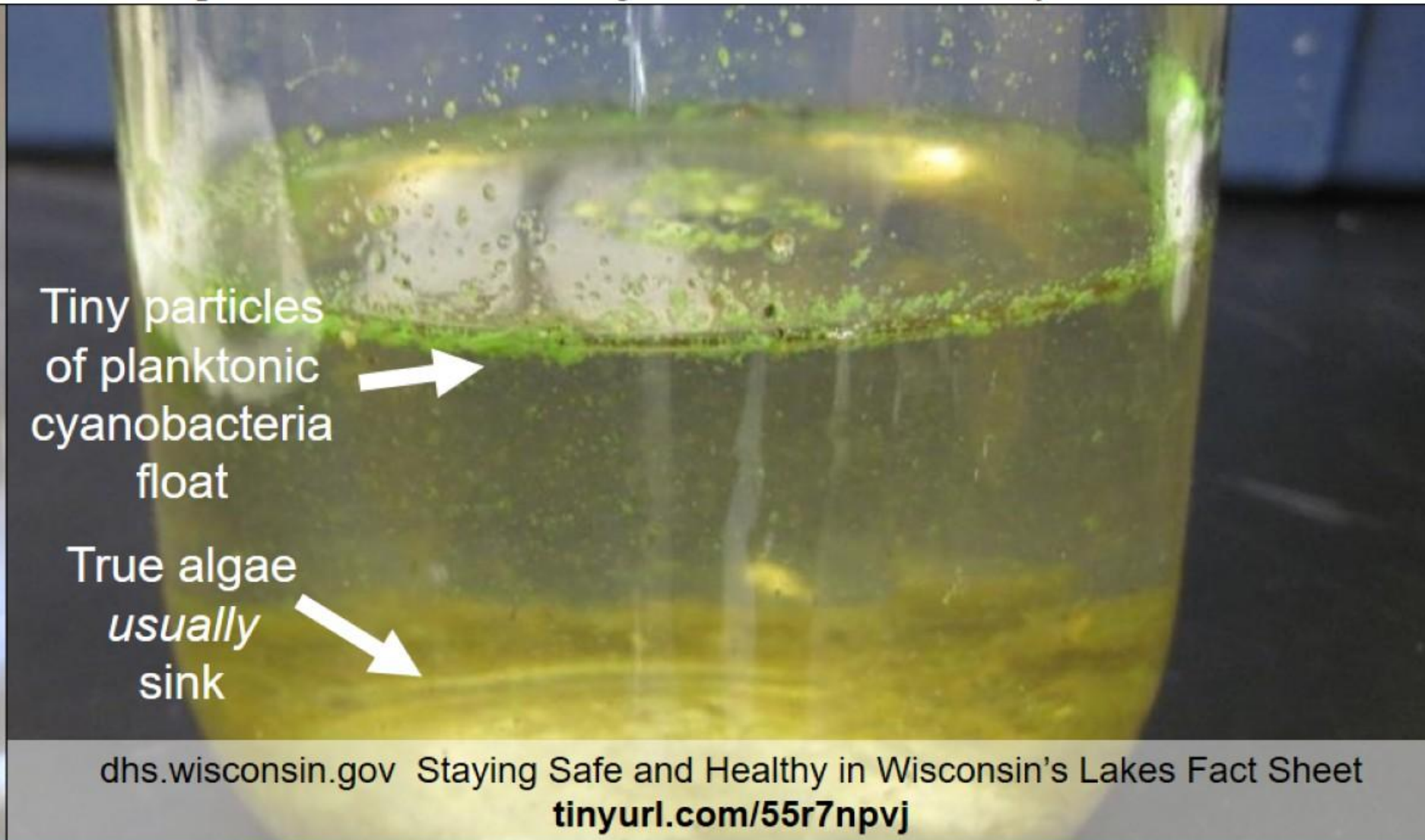
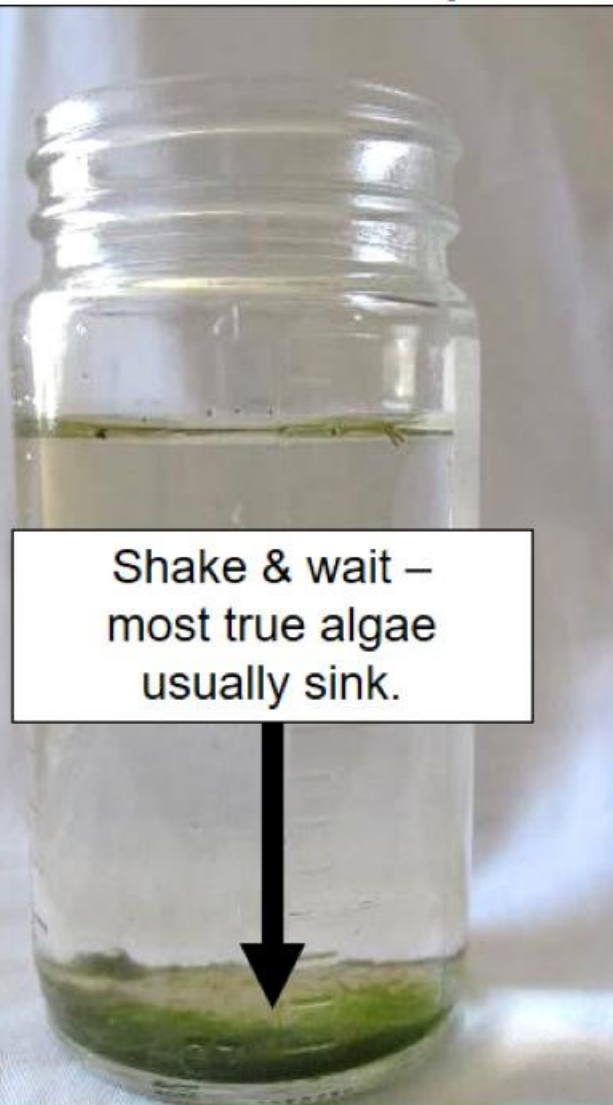




**How can you tell if green water or mats
are cyanobacteria, or something else?**

Simple Field Tests

Do a “**Jar Test**” to see if a floating layer forms (indicates **planktonic** cyanobacteria)



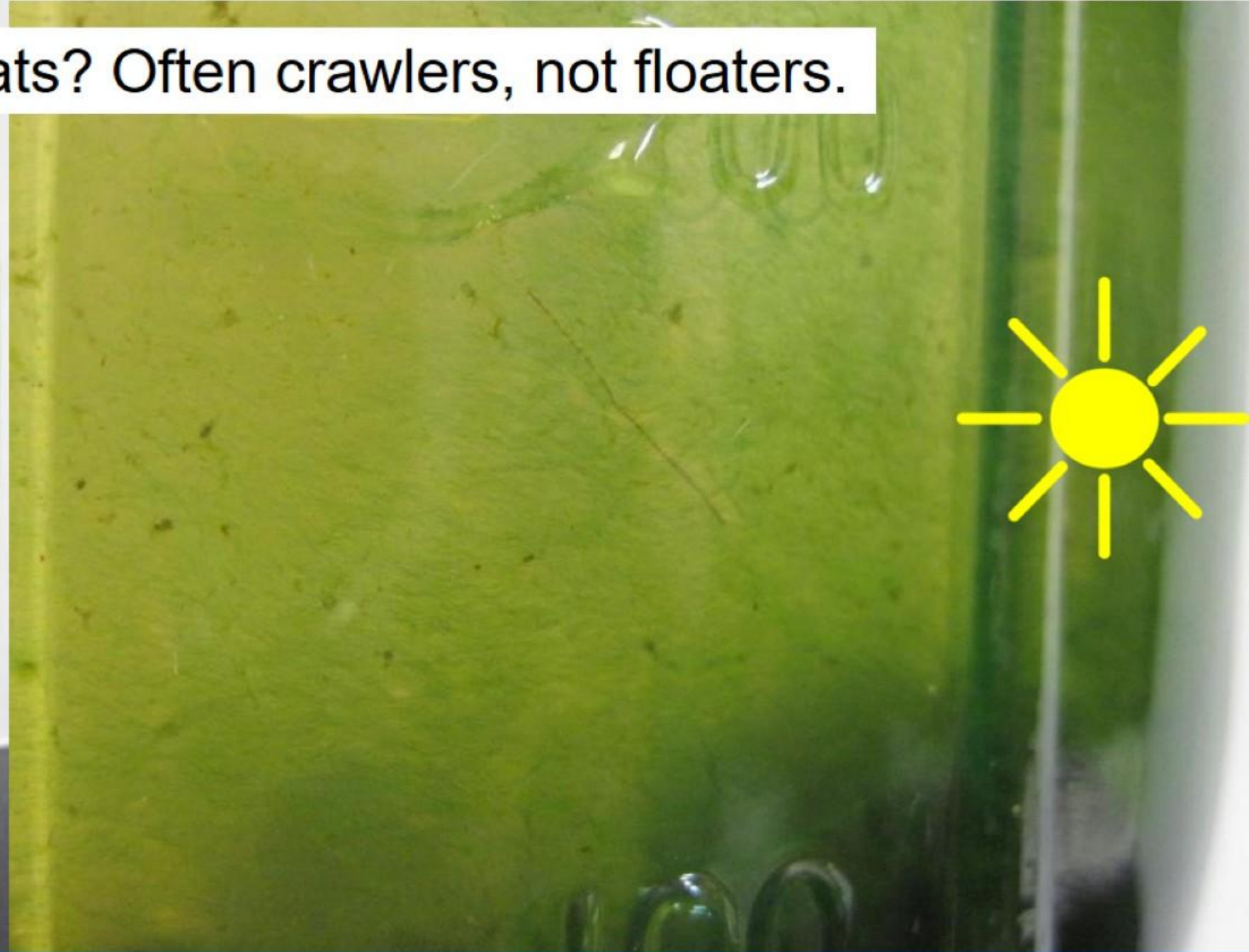
dhs.wisconsin.gov Staying Safe and Healthy in Wisconsin's Lakes Fact Sheet
tinyurl.com/55r7npvj

Floating Benthic Mats?



B. & G. Gustafson

Floating Benthic Mats? Often crawlers, not floaters.

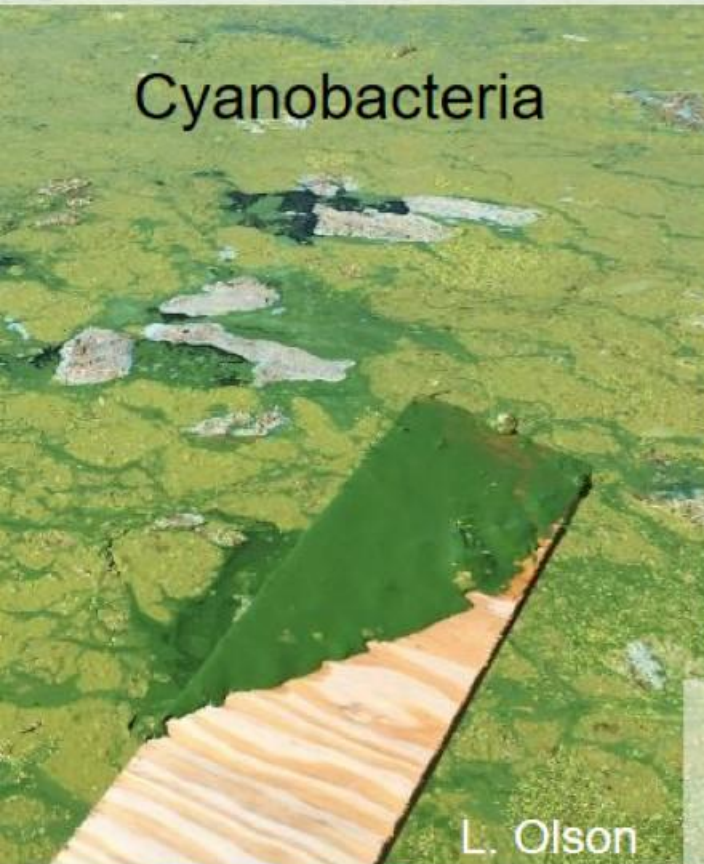


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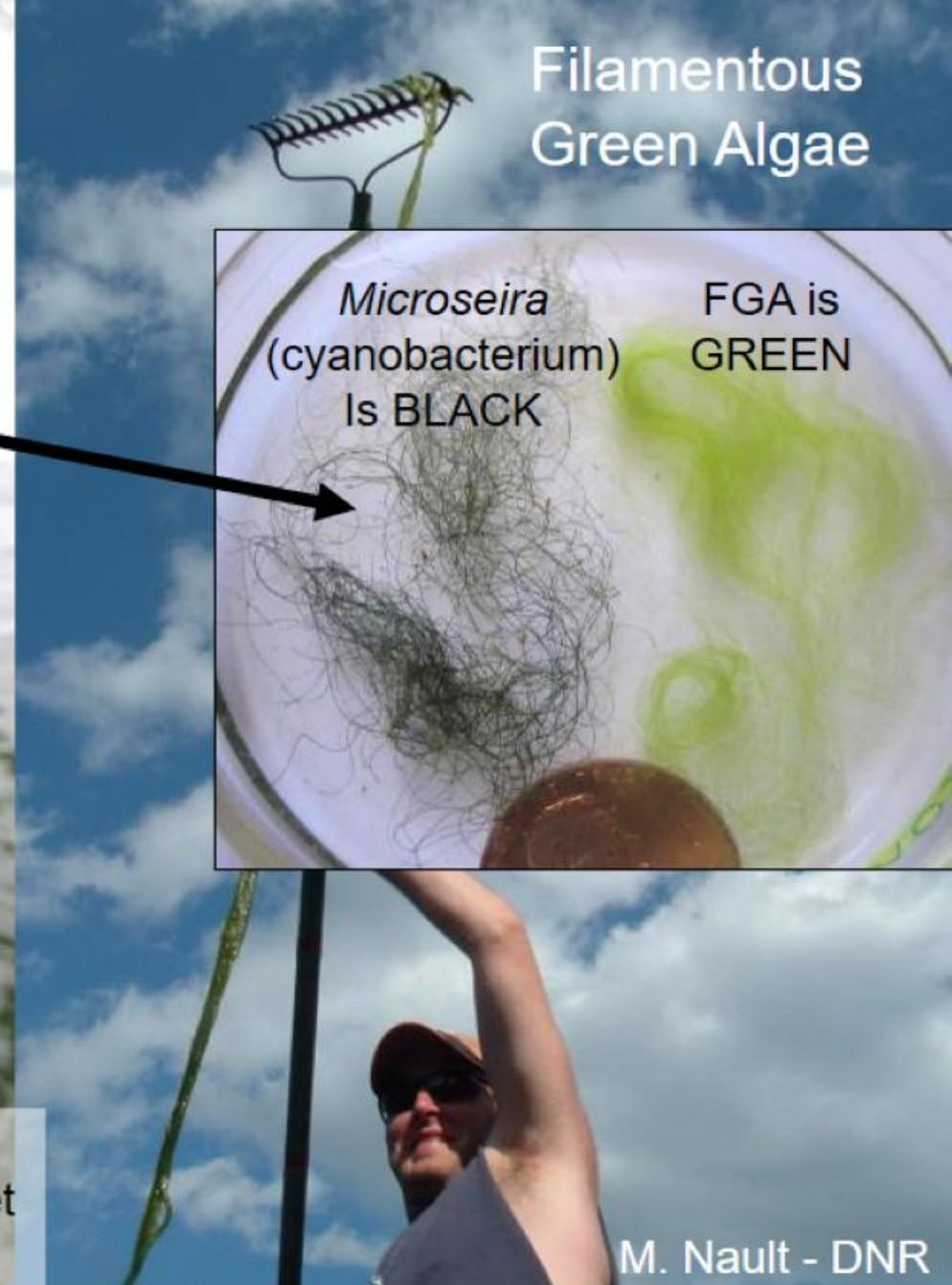
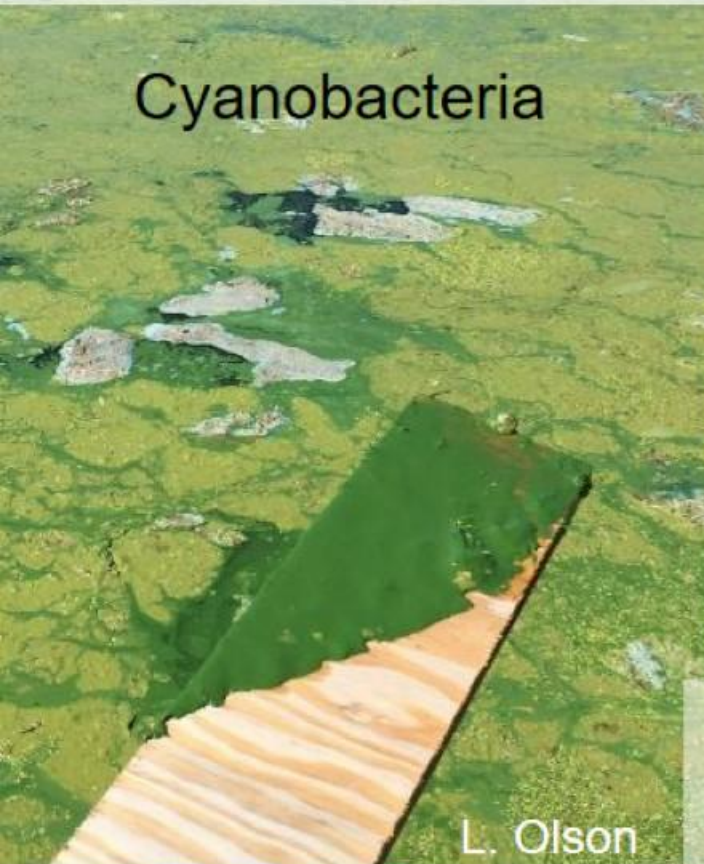
Are you seeing floating cyanobacterial mats or something else?

“Stick Test” – does it coat a stick like paint?
Does it drape over a stick like green hair?
(There is 1 exception, so look at color.)

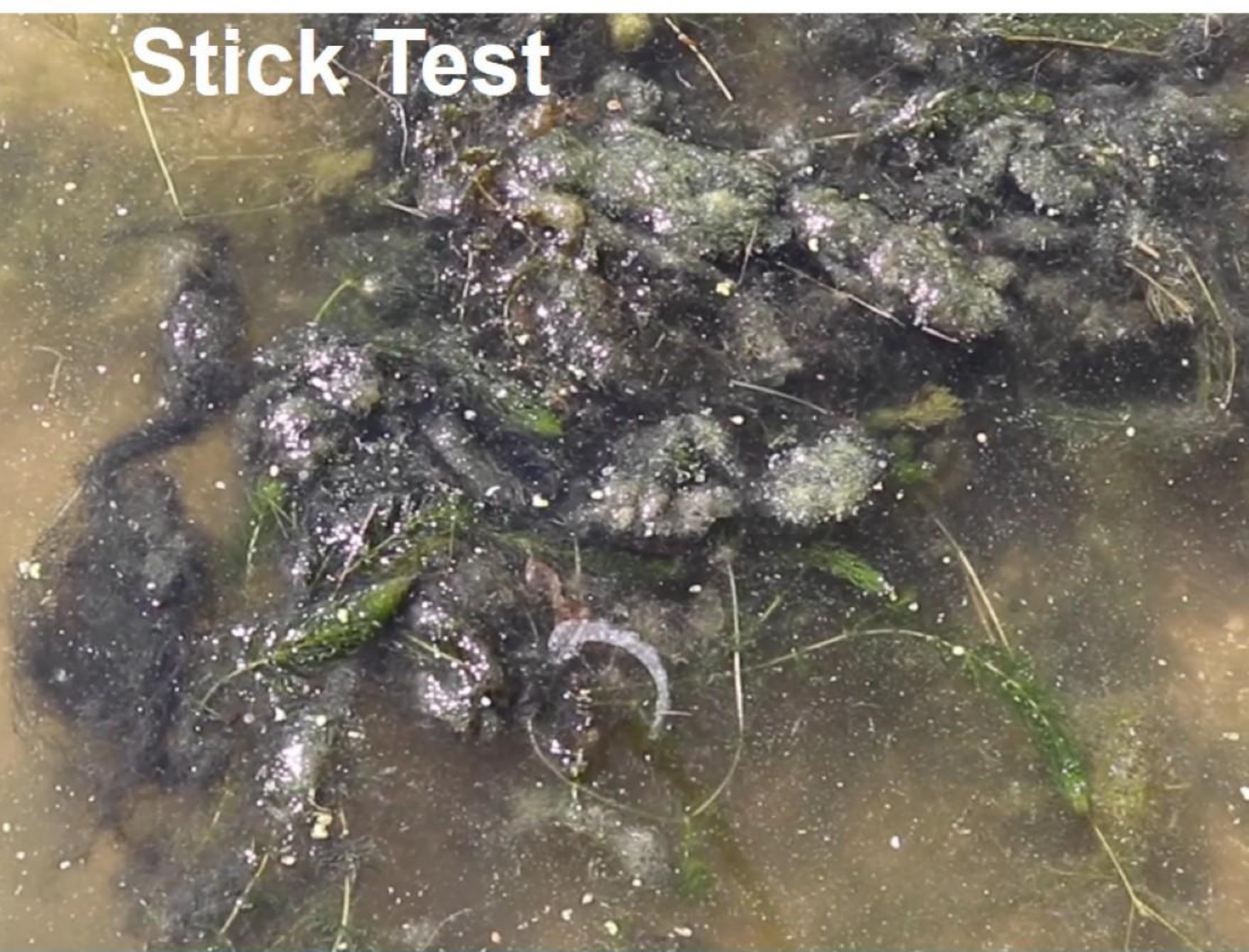


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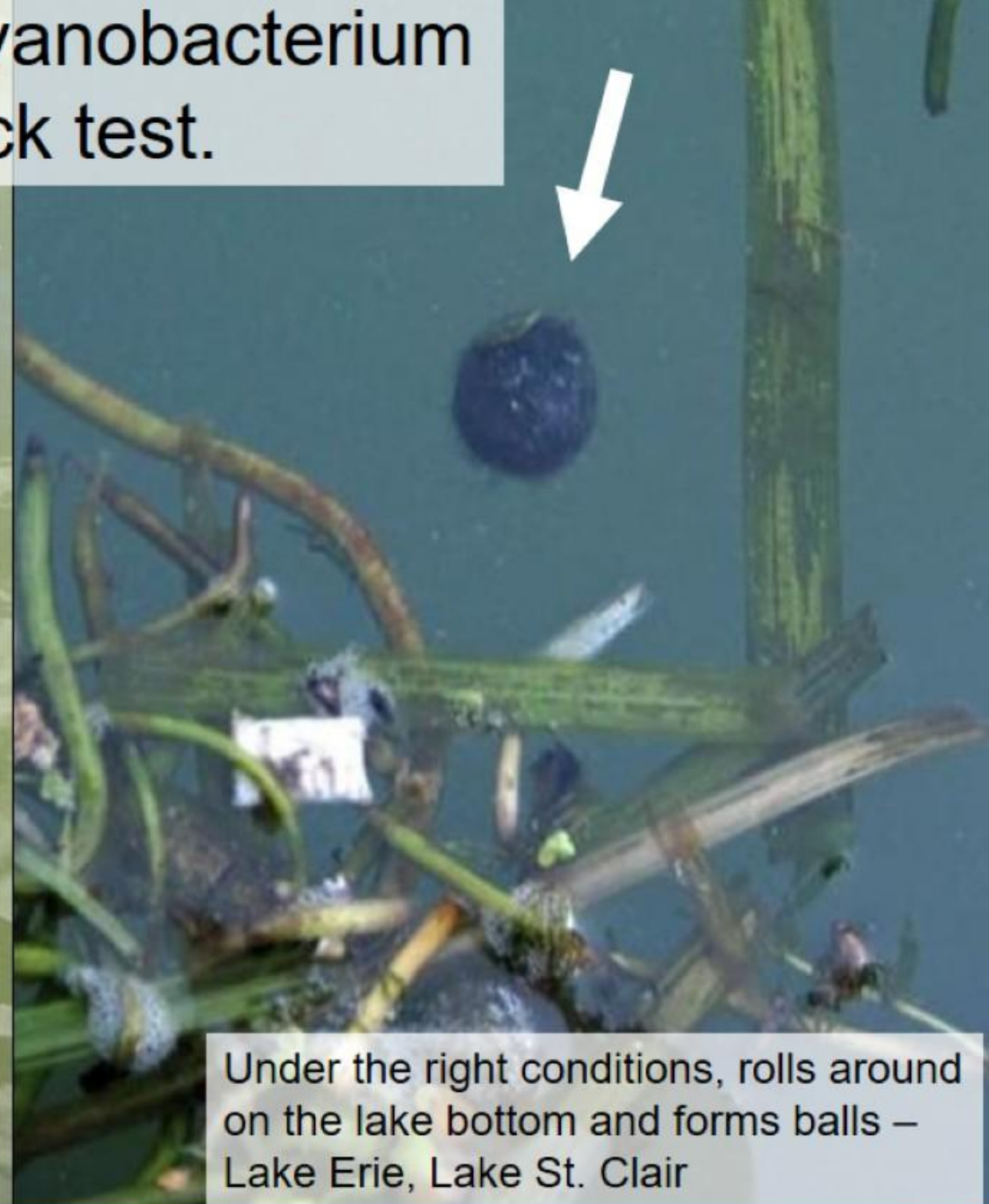
Stick Test



Microseira wollei is the filamentous cyanobacterium that is the exception to the stick test.



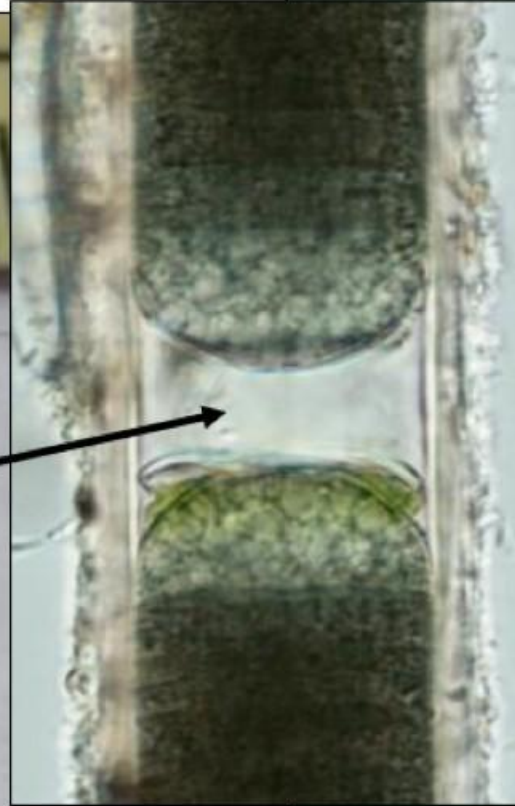
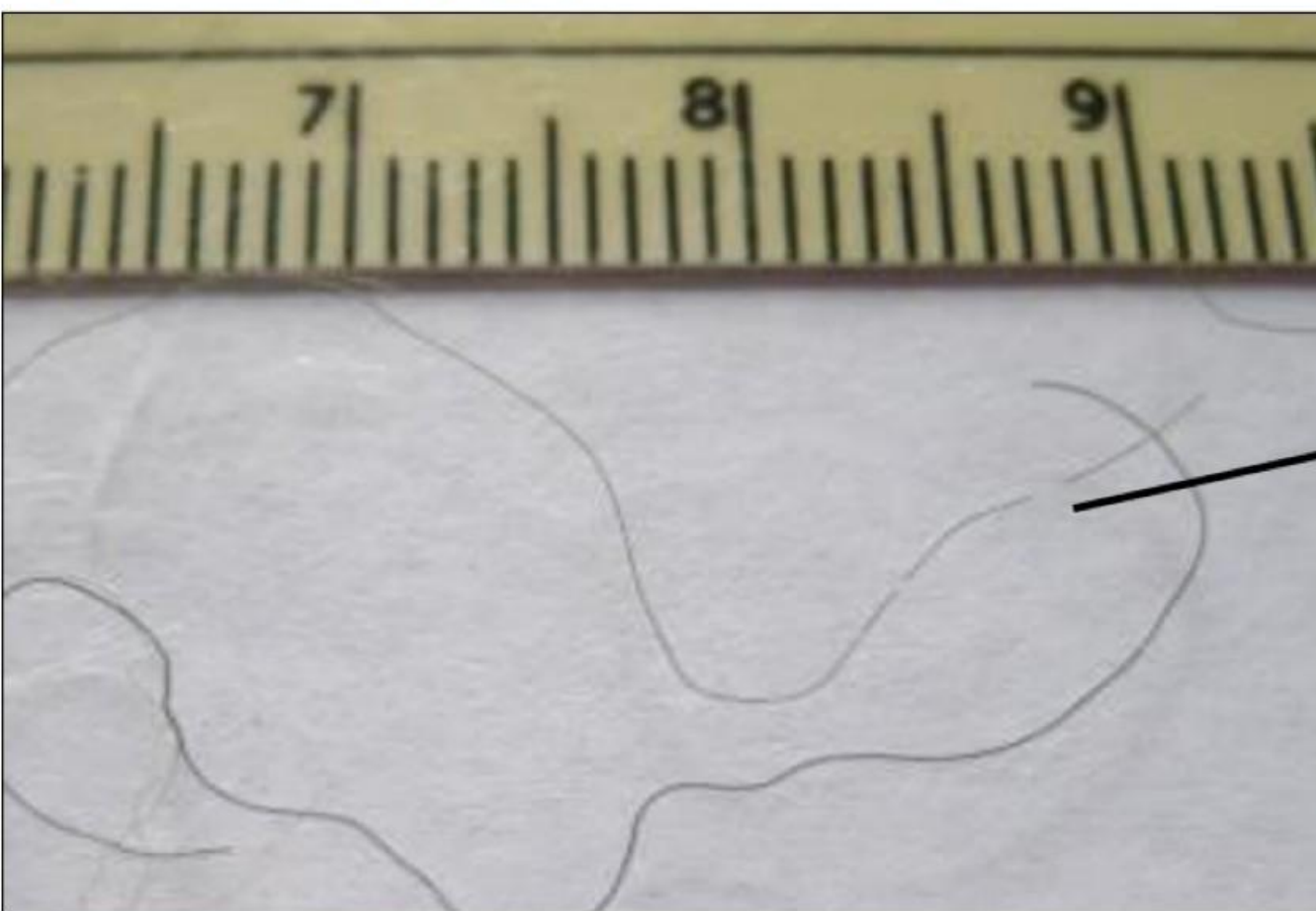
Grows entangled with aquatic plants.



Under the right conditions, rolls around on the lake bottom and forms balls – Lake Erie, Lake St. Clair

Microseira wollei

(formerly *Lyngbya*, *Plectonema*)



False branching
may occur

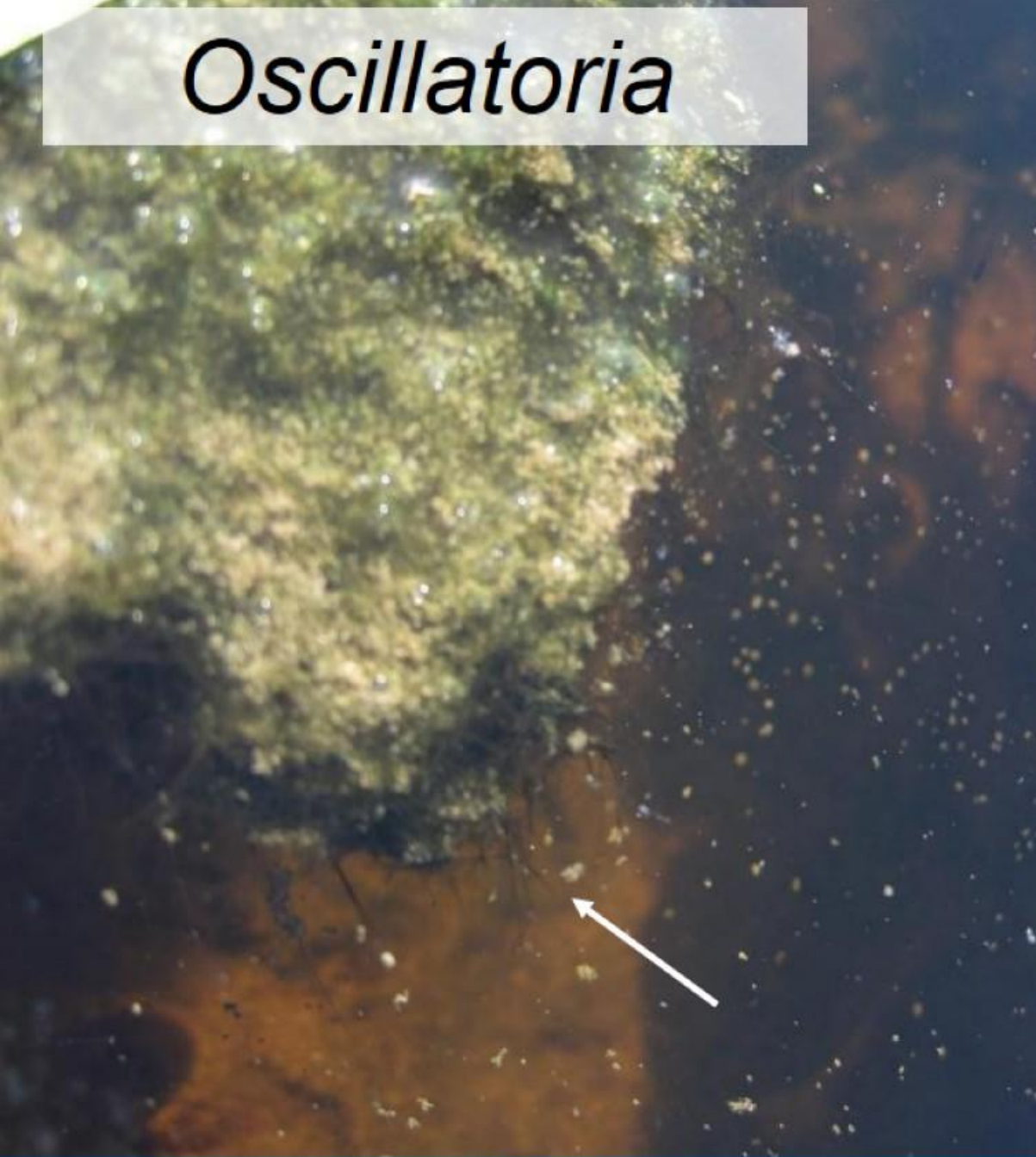
Up to several cm long - huge for a cyanobacterium.
“Breaks” are gaps between trichomes inside sheath.

Microseira wollei

(formerly *Lyngbya*, *Plectonema*)



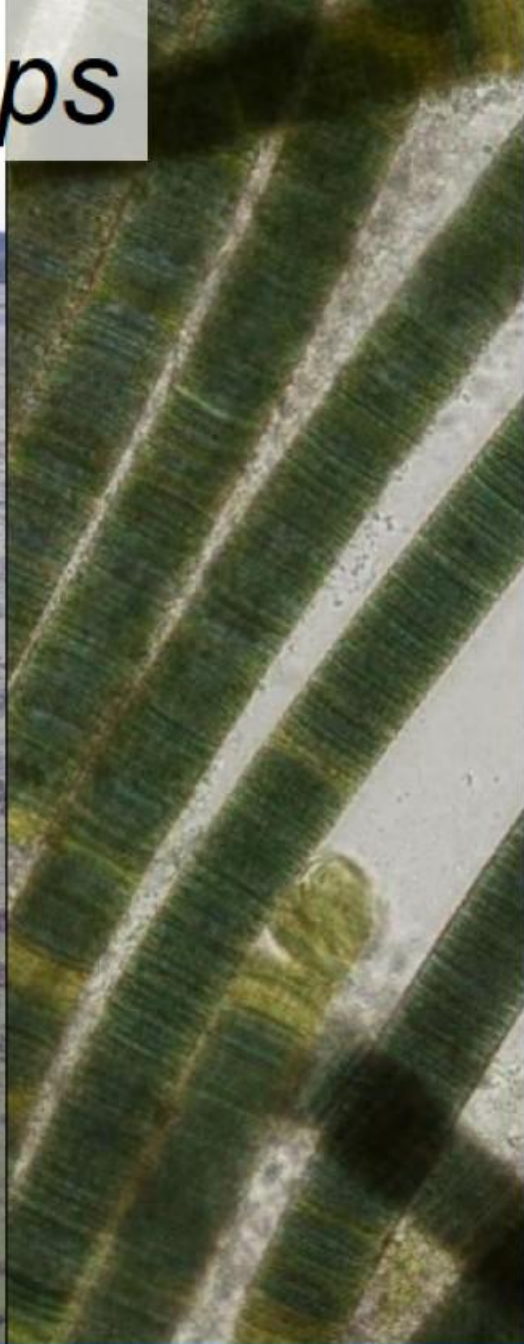
Oscillatoria



Oscillatoria



Oscillatoria princeps



Planktothrix

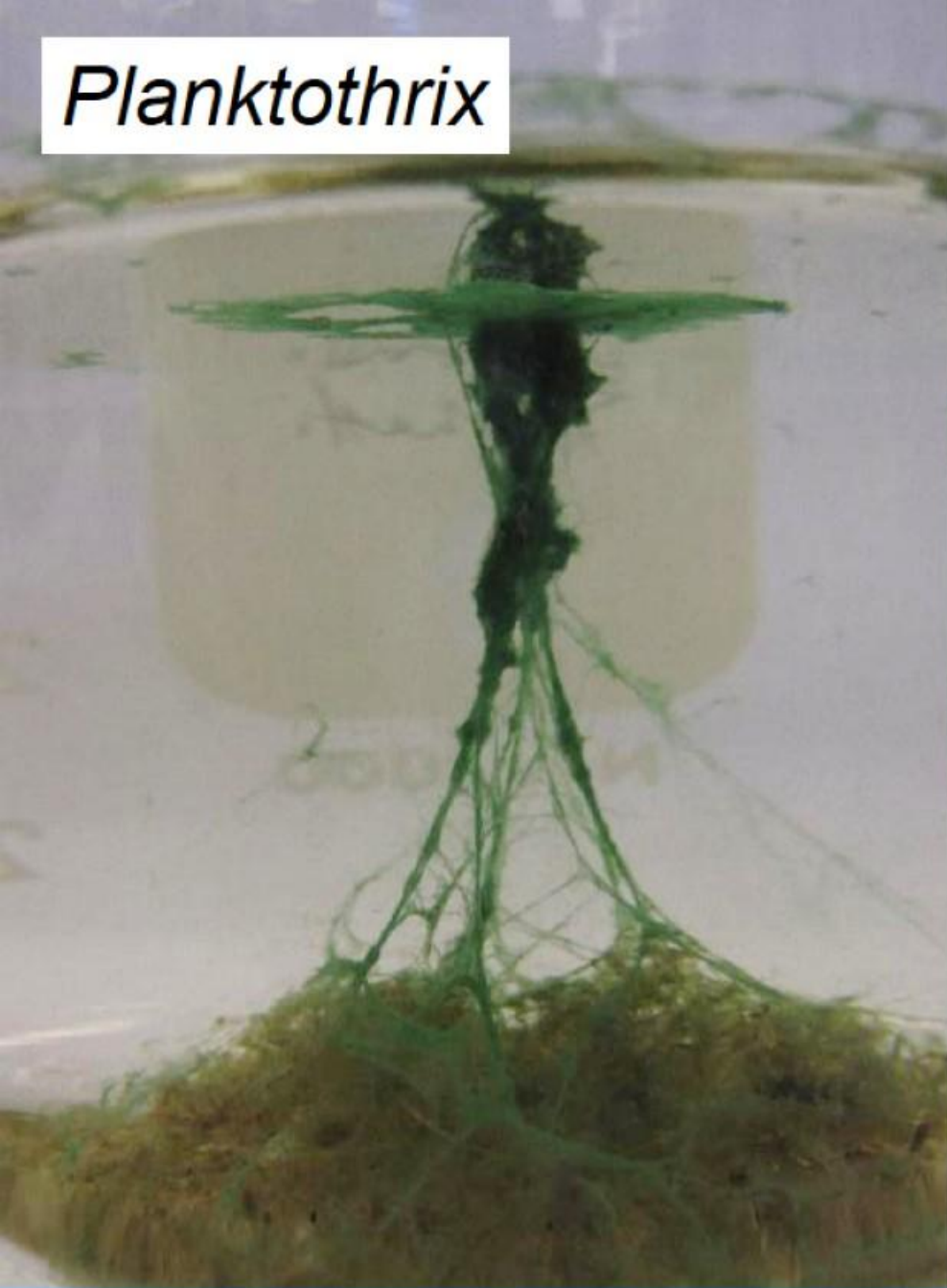


S. Caven



J. Klosiewski – WDNR

Planktothrix

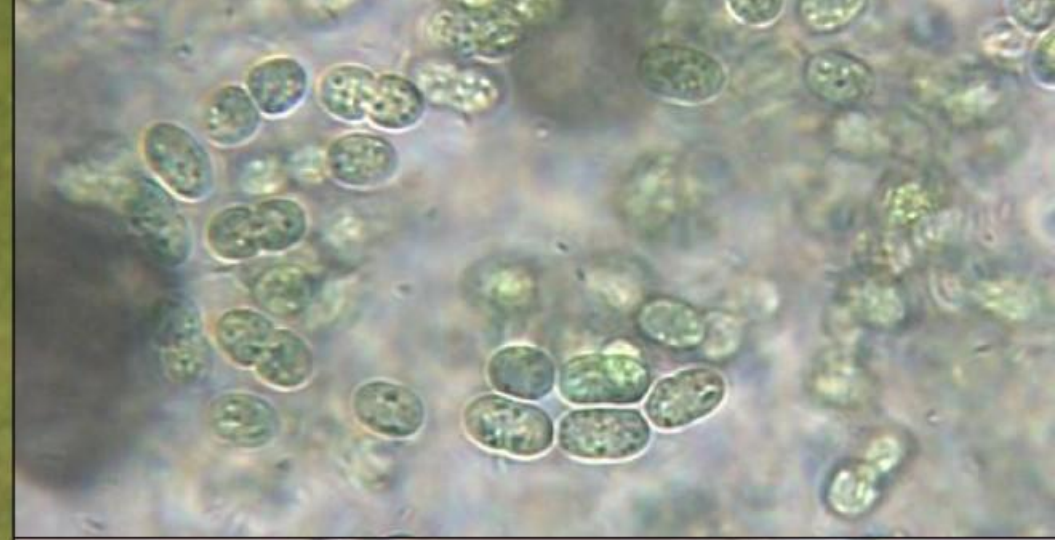


Benthic cyanobacterial colonies or globules



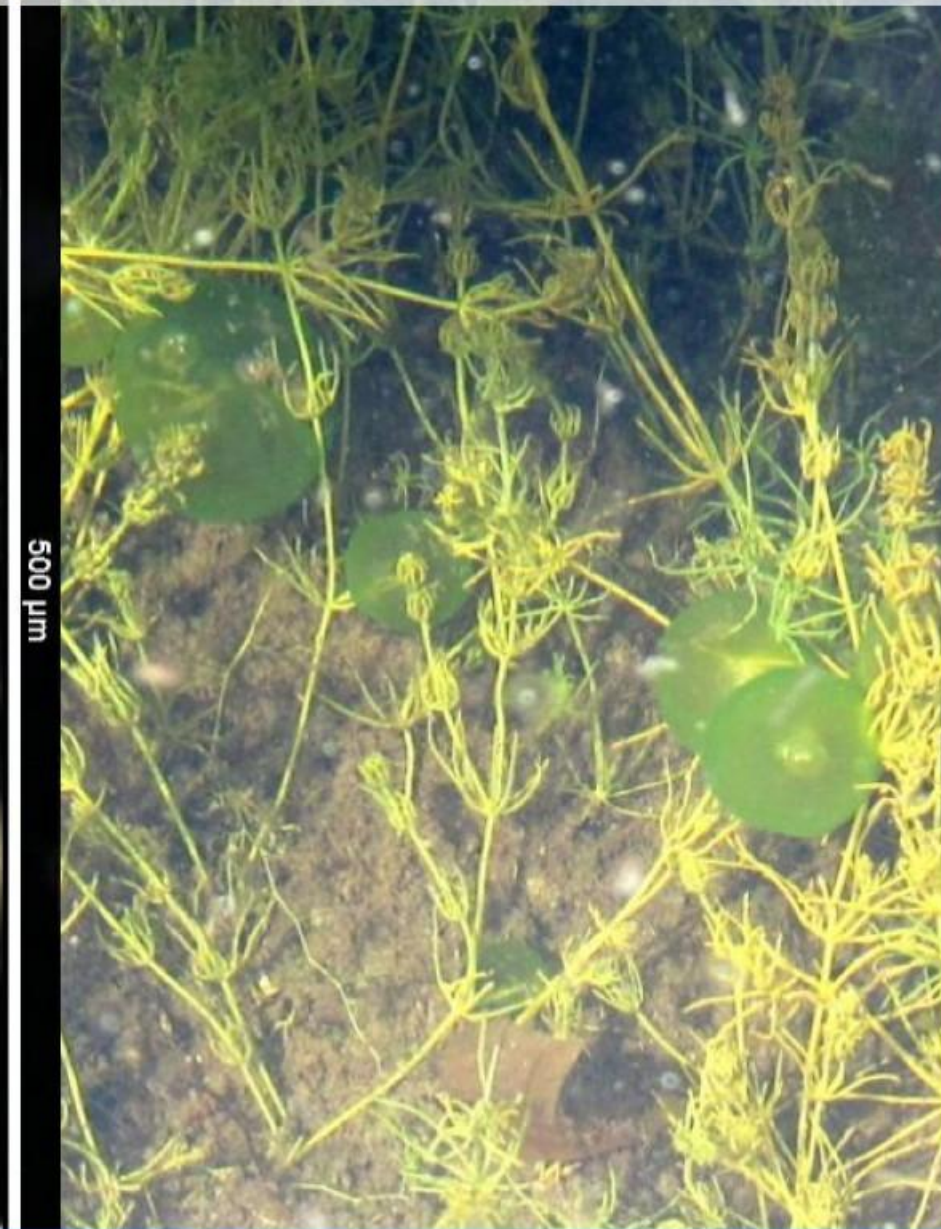
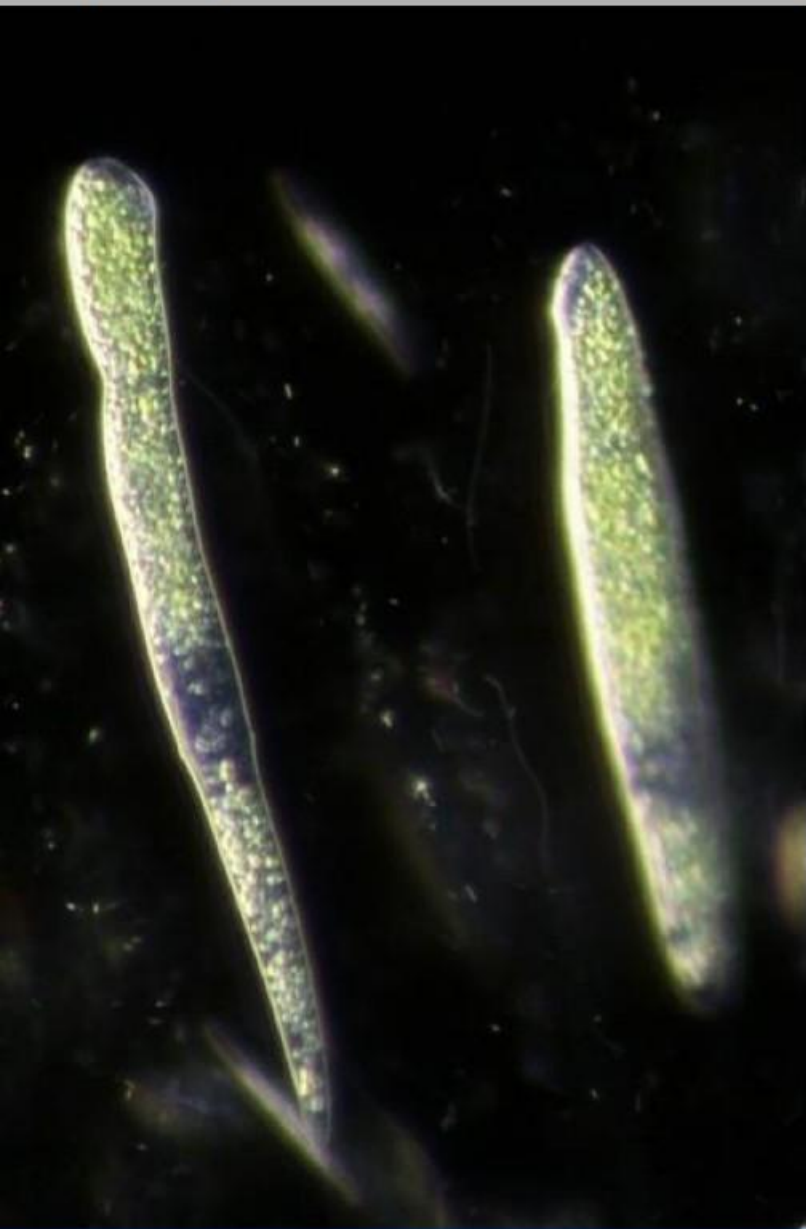
P. Skawinski

Aphanothece stagnina



P. Skawinski

Ophrydium versatile (colonial protozoan – NOT a cyanobacterium)



WISCONSIN



NOSTOC

SEP

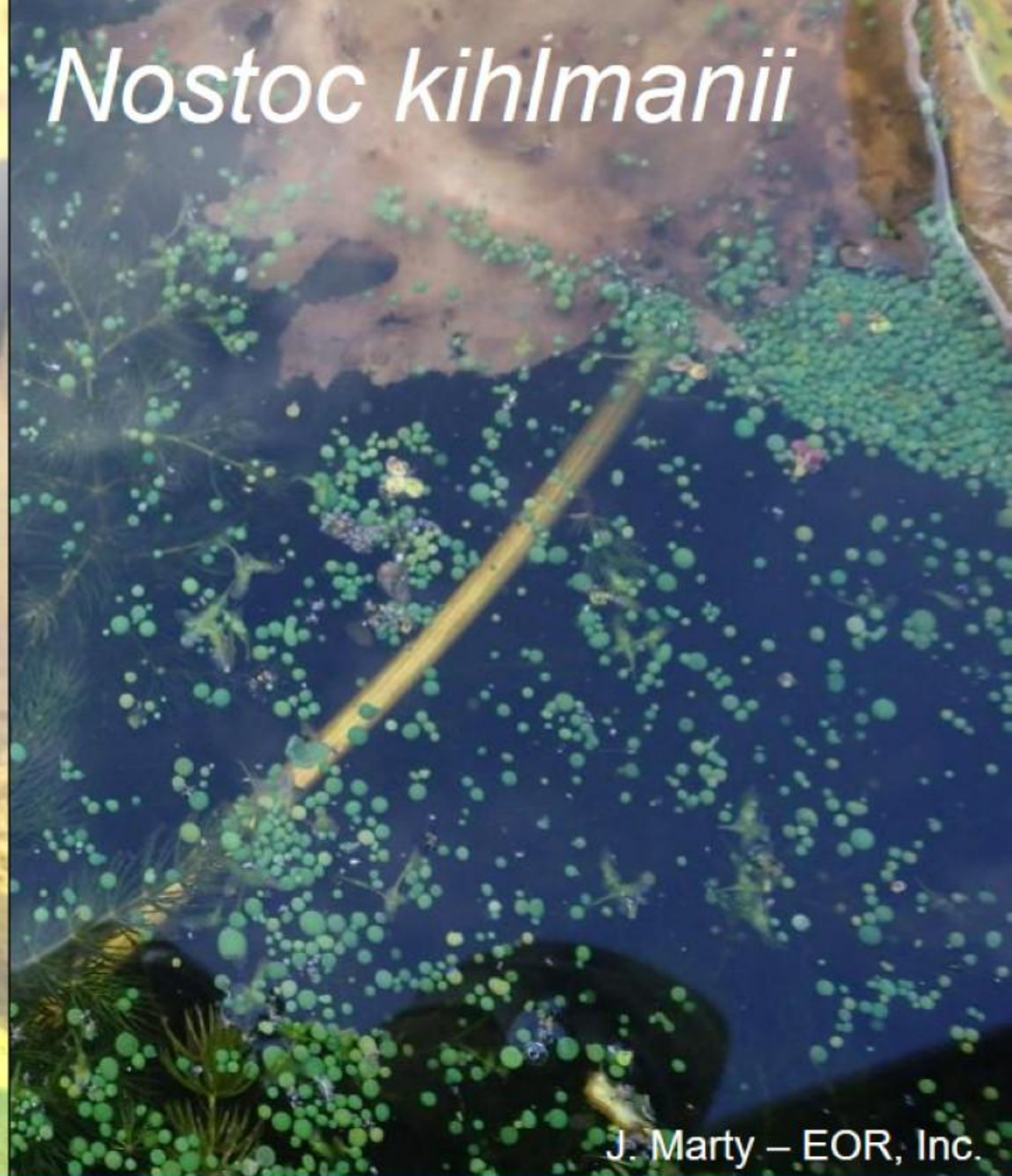
Endangered Resources

26 

Nostoc kihlmanii



J. Marty – EOR, Inc.



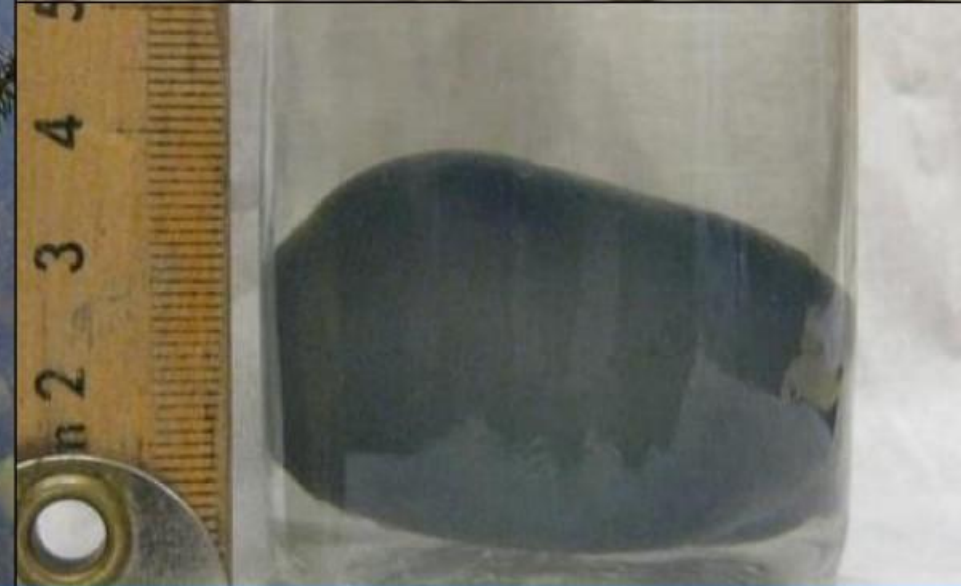
J. Marty – EOR, Inc.



Nostoc kihlmanii

J. Gunderson

Nostoc pruniforme “lake plums”



www.bio.no

Nostoc zetterstedtii
“lake blackberries”



Keep your pets safe around water!

- **Supervise pets** & keep them out of unsafe water.
- **Prevent pets from drinking untreated water and eating floating or onshore material**, to avoid parasites, waterborne diseases, & cyanotoxins.
- Choose the clearest, cleanest water for swimming; **avoid shallow, warm, stagnant water bodies.**
- **Wash dogs off with clean water** after swimming.
- Provide **shade access & clean drinking water.**
- Use **flat objects for retrieval**; keep splashing games short & give your dog **frequent breaks** from playing.
- Don't use lake water on your lawn during a bloom.



PetMD.com

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"WILD WISCONSIN:
OFF THE RECORD"