Field and Laboratory Guide to harmful Cyanobacteria for Native American Tribes in the United States

Barry H. Rosen, Ph. D.

Office of the Southeast Regional Director

(CFLWSC) Orlando, FL

brosen@usgs.gov

407-803-5508

USGS
science for a changing world

Background

- Presented Harmful Algal Bloom 101 to USET
- Obvious concern about exposure of tribal members to cyanobacteria and their associated cyanotoxins
- After the presentation, one-on-one conversations lead to the vision on this Guide
- Field recognition of a bloom and laboratory identification of key organisms

USGS
science for a changing world

Field and Laboratory Guide to Freshwater Cyanobacteria Harmful Algal Blooms for Native American and Alaska Native Communities

brosen@usgs.gov

Open-File Report 2015–1164

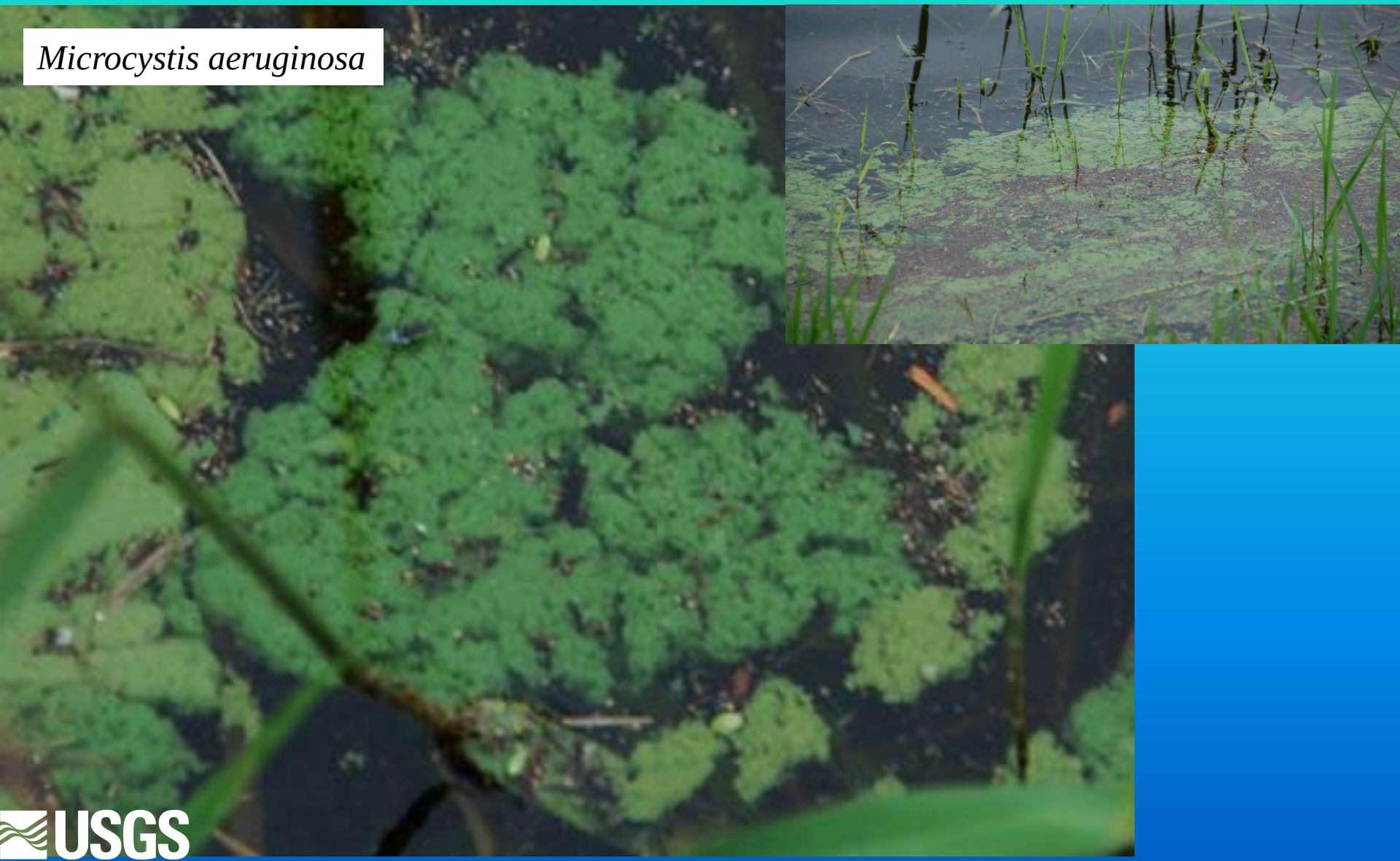
U.S. Department of the Interior
U.S. Geological Survey

USGS
science for a changing world

Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)

USGS
science for a changing world

Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)

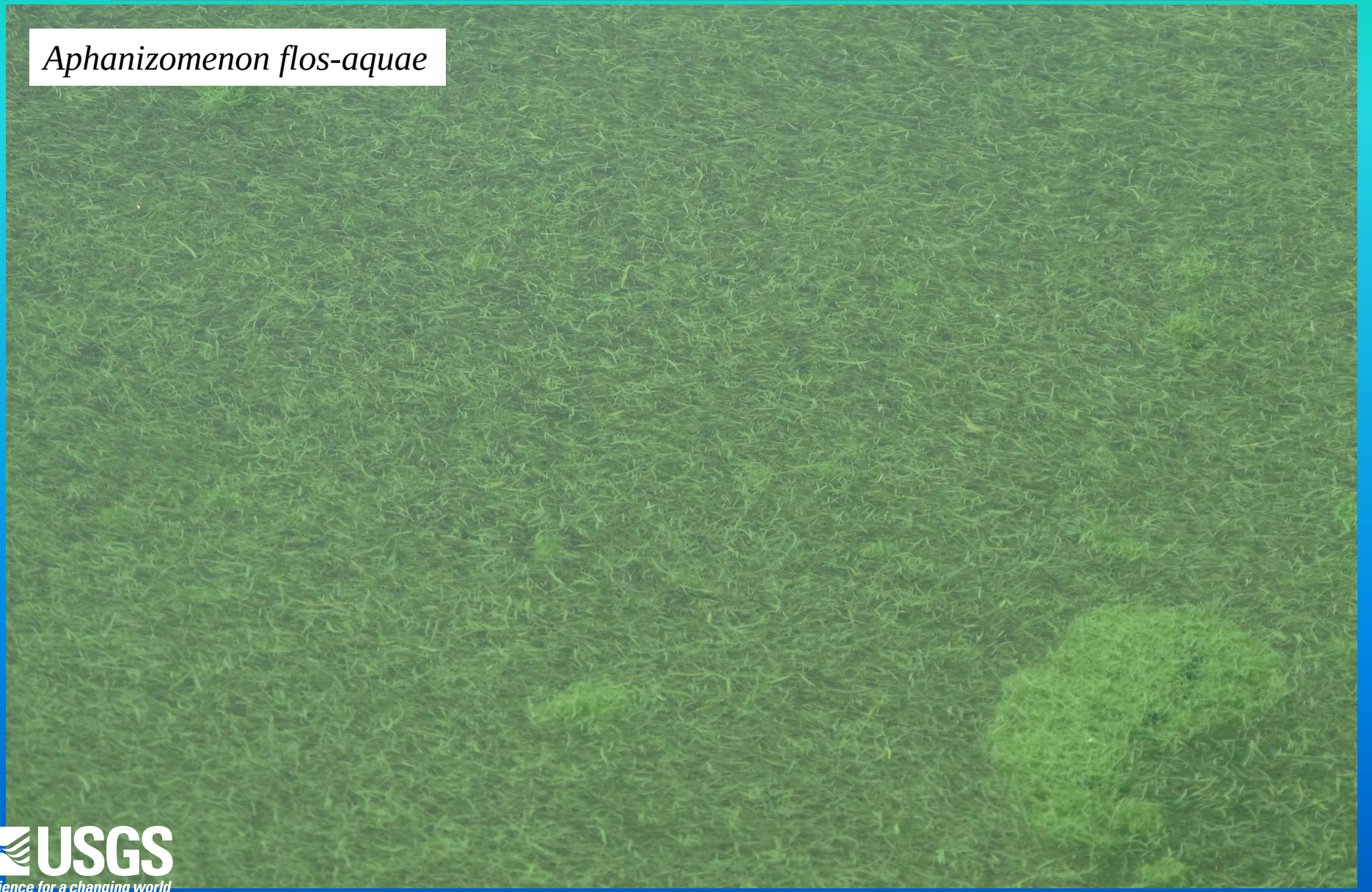


USGS
science for a changing world

Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)

USGS
science for a changing world

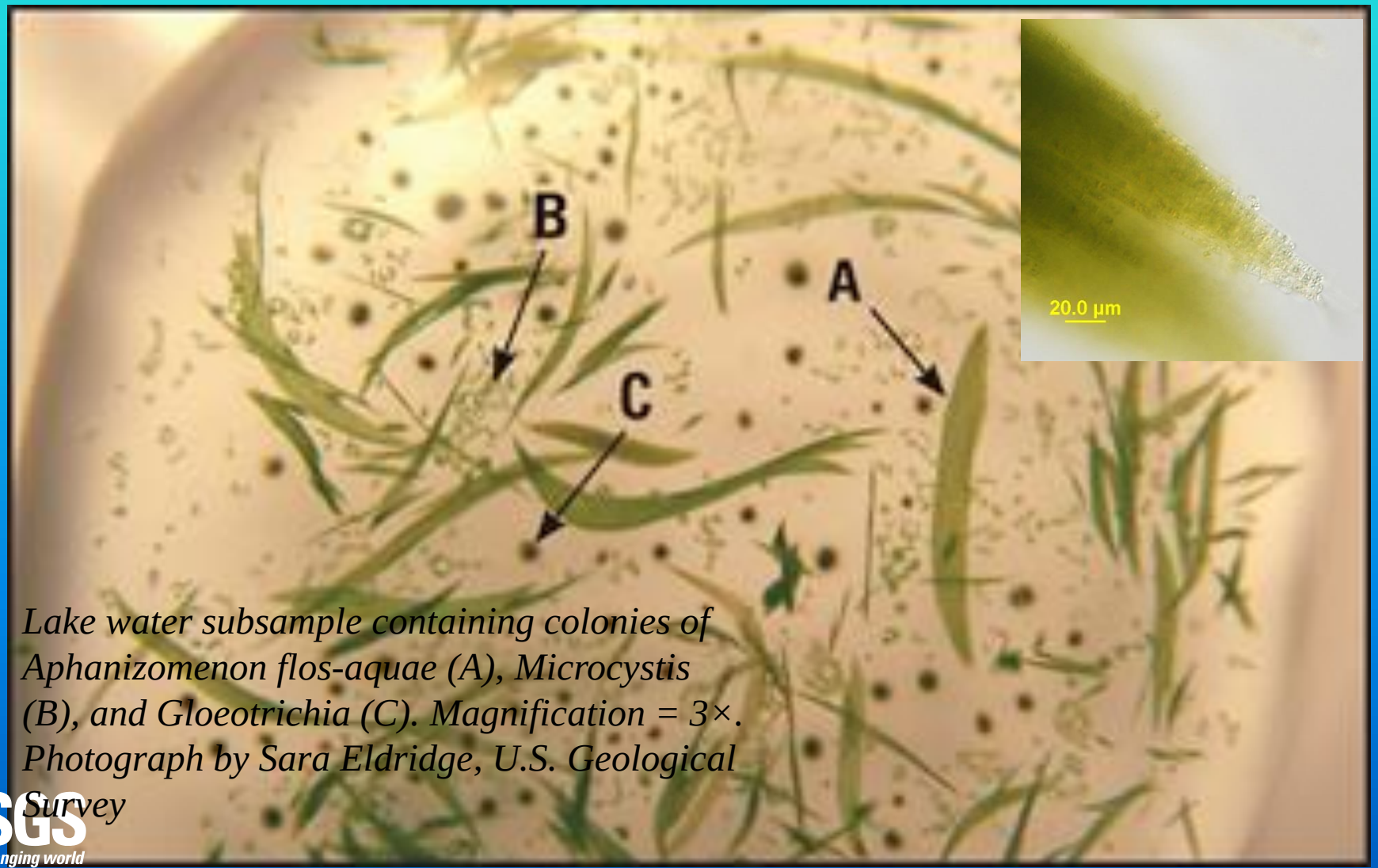
Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)



USGS
science for a changing world

Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)

Aphanizomenon flos-aquae, etc.

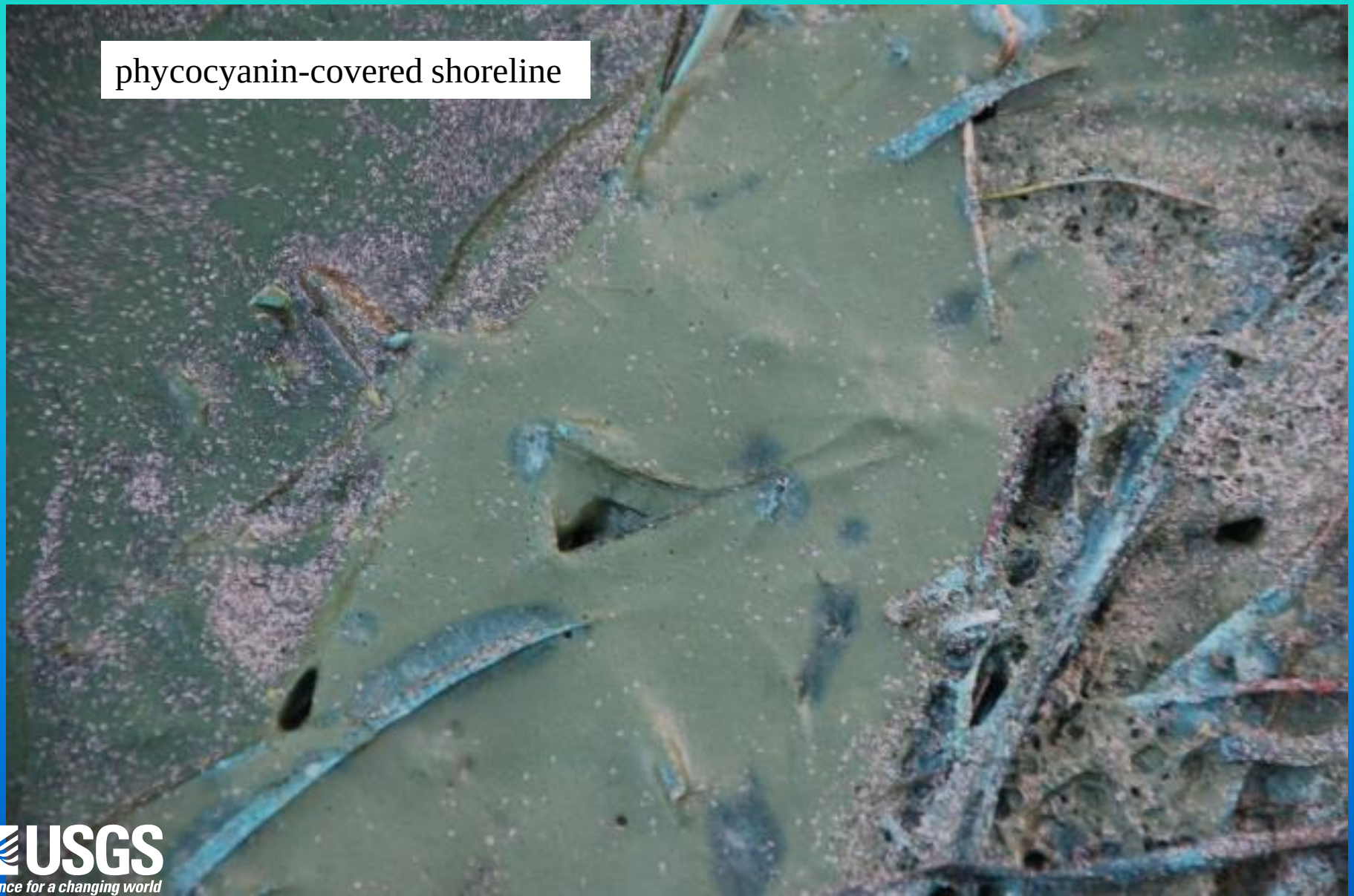


Lake water subsample containing colonies of Aphanizomenon flos-aquae (A), Microcystis (B), and Gloeotrichia (C). Magnification = 3×. Photograph by Sara Eldridge, U.S. Geological Survey

USGS science for a changing world

Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)

Recognizing a cyanobacteria bloom: field images (blue-green to greenish in color)



USGS
science for a changing world

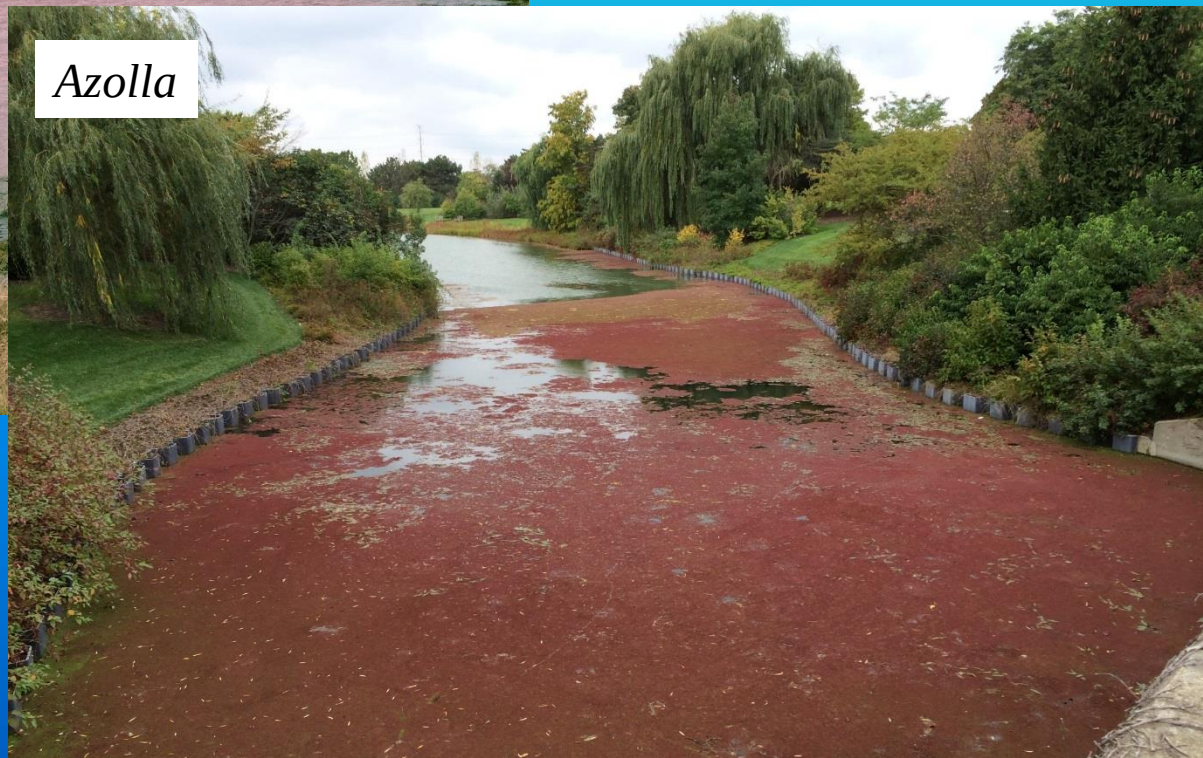
Recognizing a cyanobacteria bloom: field images (brown in color)

Nodularia spumigena

Woronichinia naegeliana

USGS
science for a changing world

Recognizing a cyanobacteria bloom: field images (reddish/pink color)



USGS
science for a changing world

Not Cyanobacteria

USGS
science for a changing world

Not Cyanobacteria

USGS
science for a changing world

Not Cyanobacteria

USGS
science for a changing world

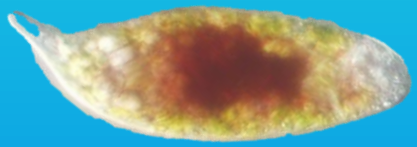
Prokaryotes (Bacteria)

Cyanobacteria

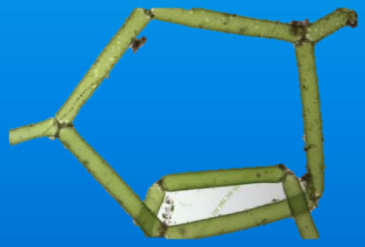
Eukaryotes

Haptophytes

Dinoflagellates

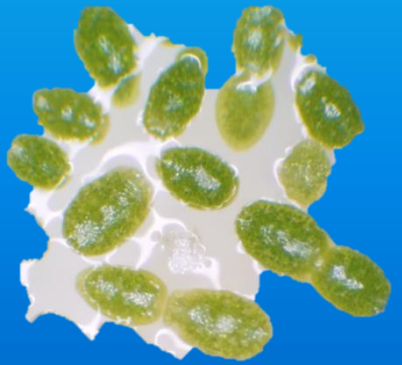


Euglenophytes



Chlorophytes

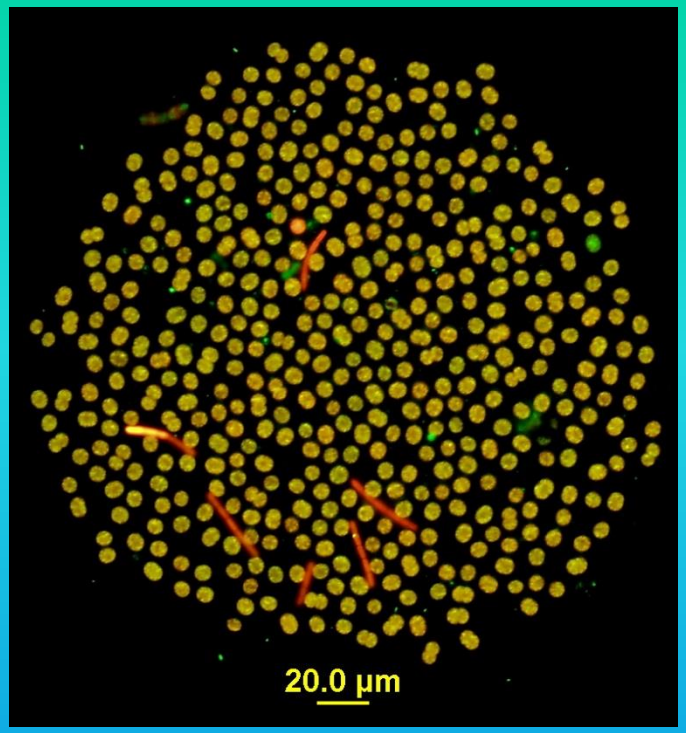
Charophytes

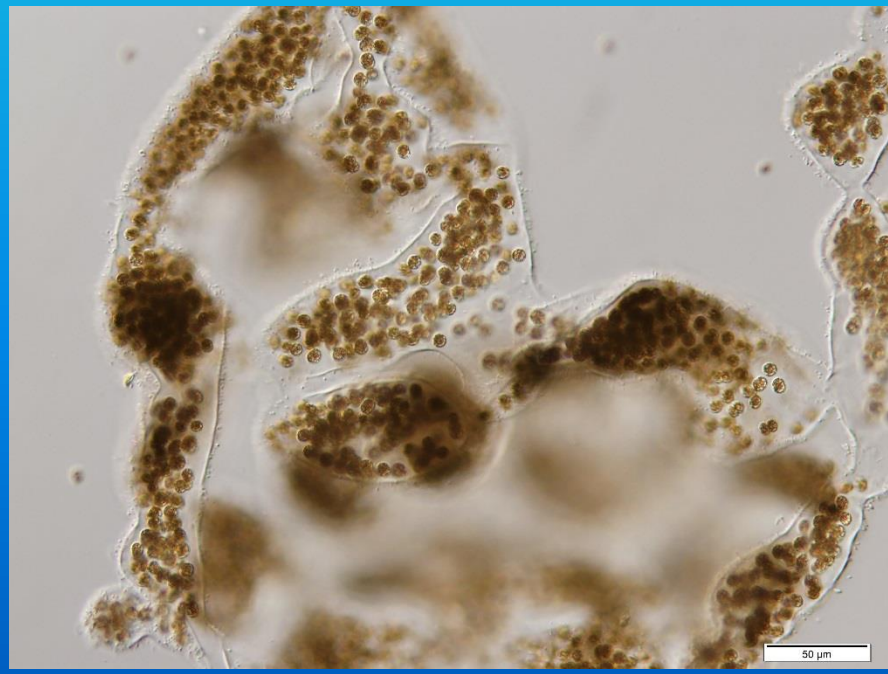


Plants

USGS
science for a changing world

Microcystis



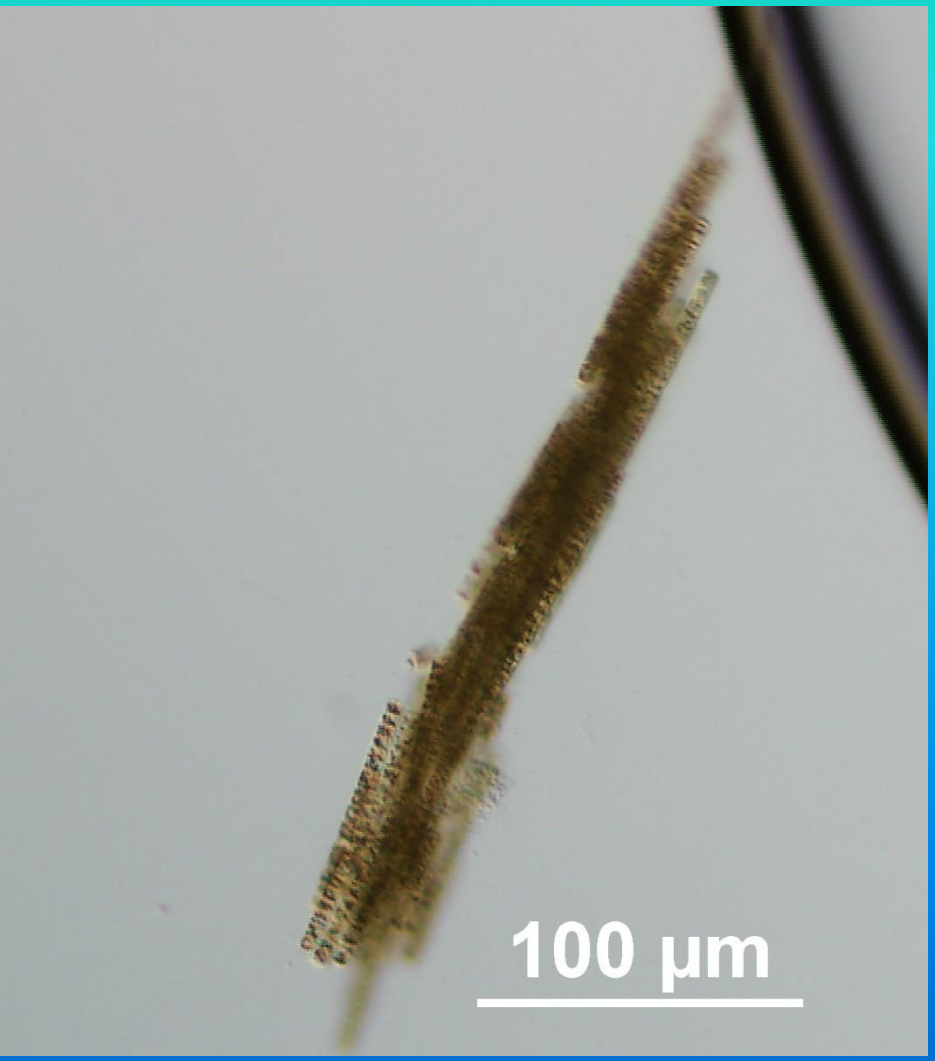


USGS
science for a changing world

Dolichospermum

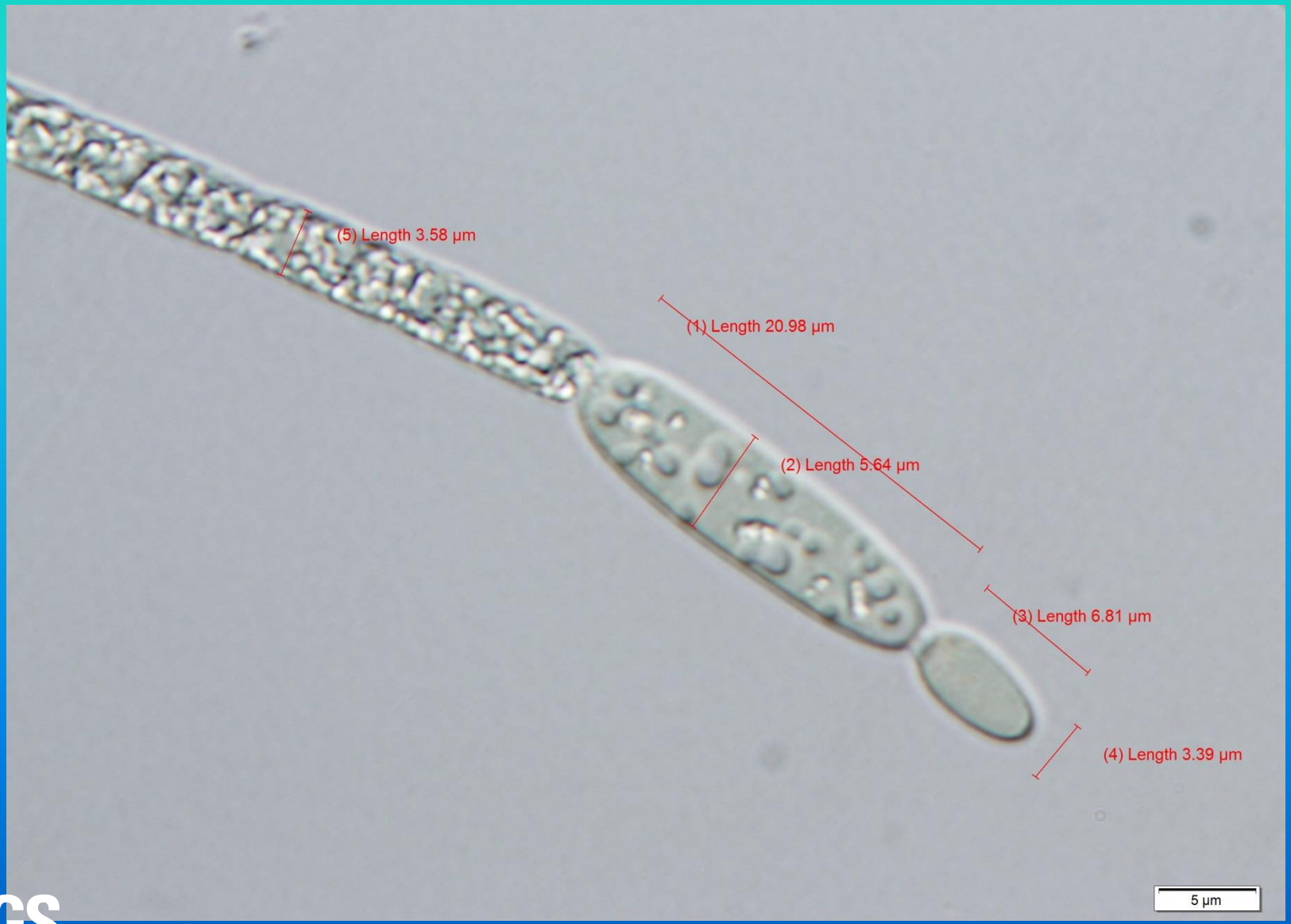
USGS
science for a changing world

Aphanizomenon



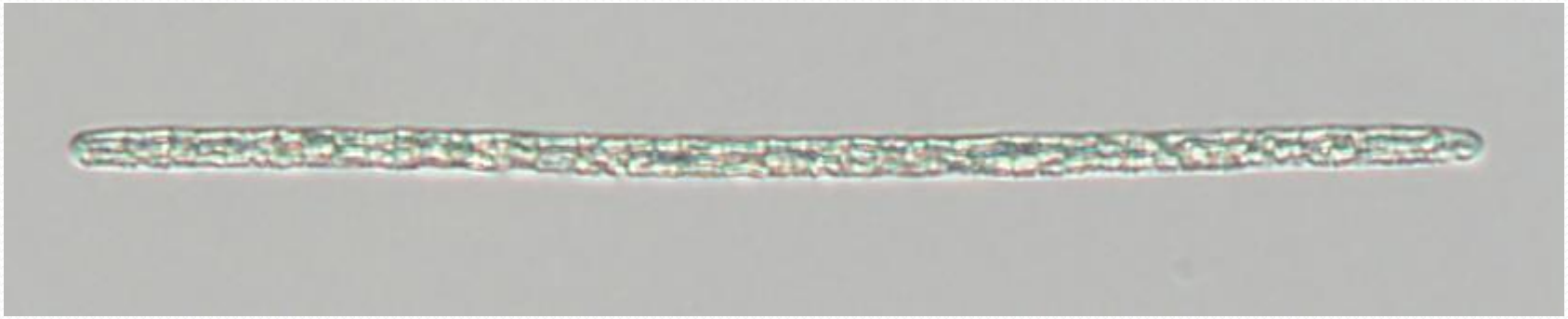
USGS
science for a changing world

Aphanizomenon

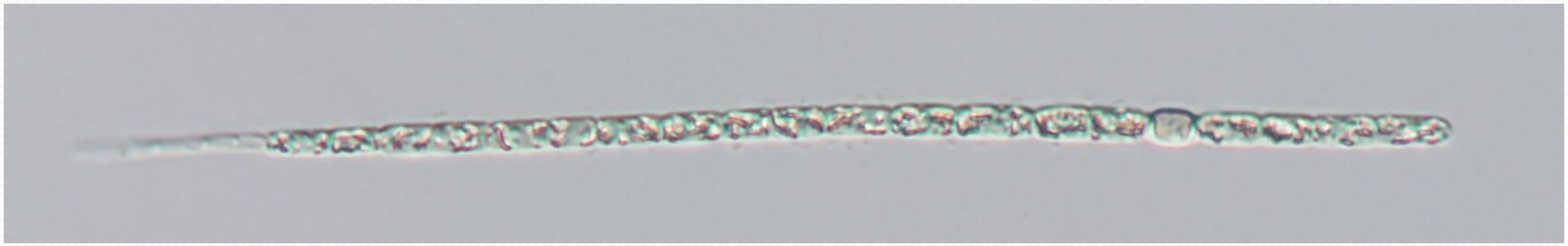


USGS
science for a changing world

Planktothrix



Cuspidothrix issatschenkoi



USGS
science for a changing world