

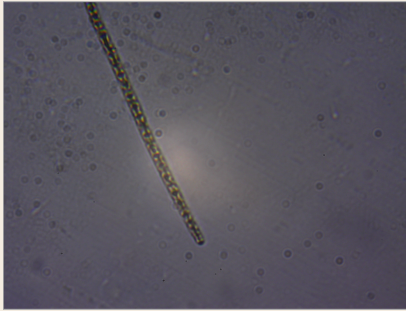
# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Burncoat Pond - October 2021

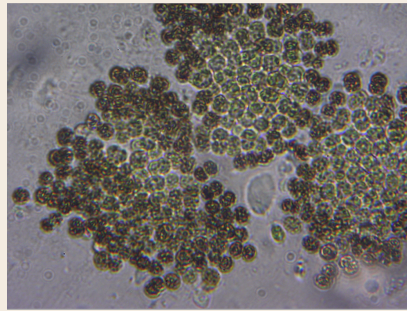
### Sampling Conditions

October 16th was a partly cloudy, breezy Saturday at 73°F. There was no rainfall the day before the sample was taken. The water was 70°F and slightly cloudy with no visible scum.

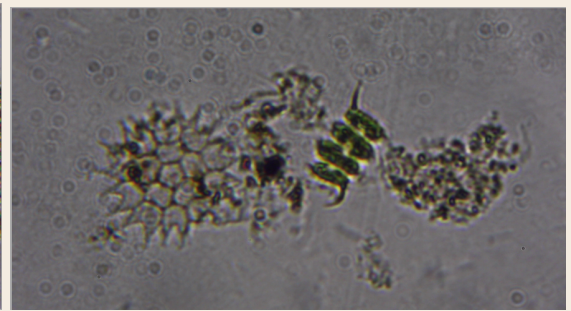
### Microscopic Findings from the Plankton NET



*Aphanizomenon* Cyanobacteria



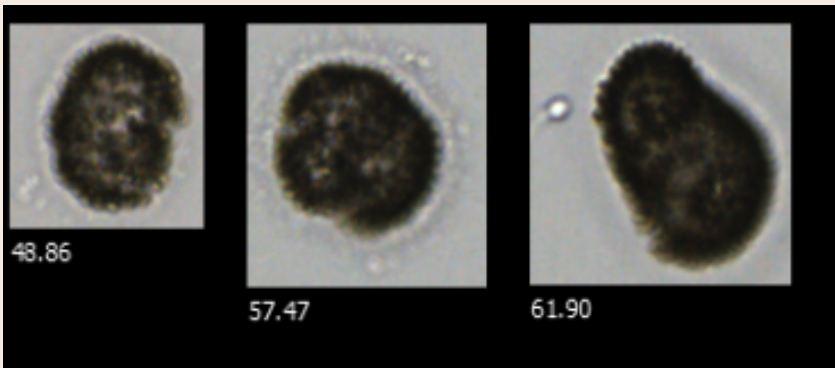
*Microcystis* Cyanobacteria



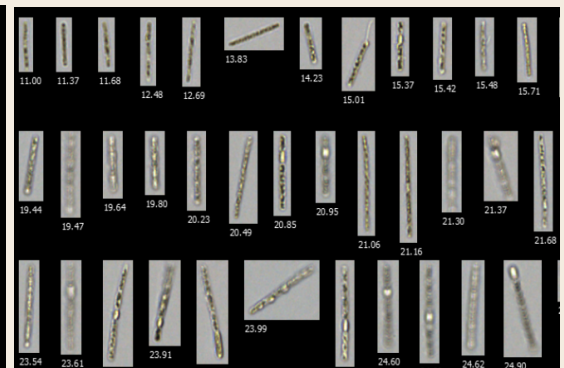
*Pediastrum* and *Scenedesmus* Green Algae

### FlowCam Findings from the GRAB Sample

The particle density at Burncoat Pond was 3653 particles/ml in October, according to the FlowCam, which was much less than what was observed in September. The sample was dominated by cyanobacteria, including *Aphanizomenon*, *Microcystis*, and *Dolichospermum*. However, there were significantly fewer organisms than in the previous month.



*Woronichinia* Cyanobacteria



*Dolichospermum* Cyanobacteria

### Fluorimetry Data from the Integrated Tube Sample

We used the fluorometer to find the amount of phycocyanin in the sample, which we can use as an indicator of cyanobacteria. In October, Burncoat Pond had 48 Aus of phycocyanin pigment, down from 118 Aus in September. A pond becomes at risk for a bloom when it is at levels above 50 Au.

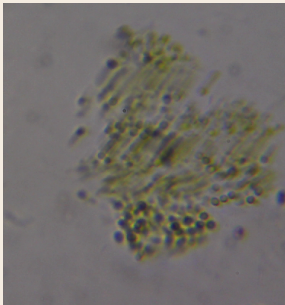
# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Burncoat Pond - September 2021

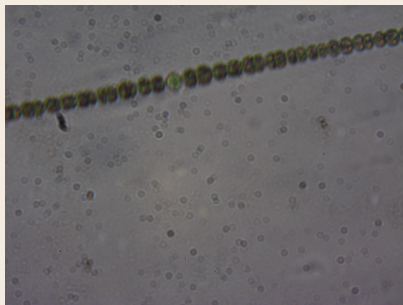
### Sampling Conditions

September 25th was a sunny Saturday at 69°F with a light breeze. There were .34 inches of rainfall the day before the sample was taken. The water was 75°F with streaks of green scum at the water's edge.

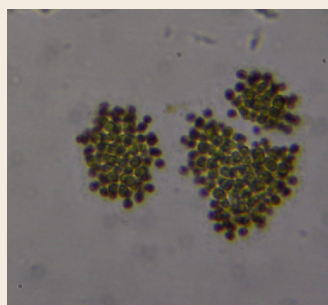
### Microscopic Findings from the Plankton NET



*Aphanocapsa*



*Dolichospermum*



*Microcystis*



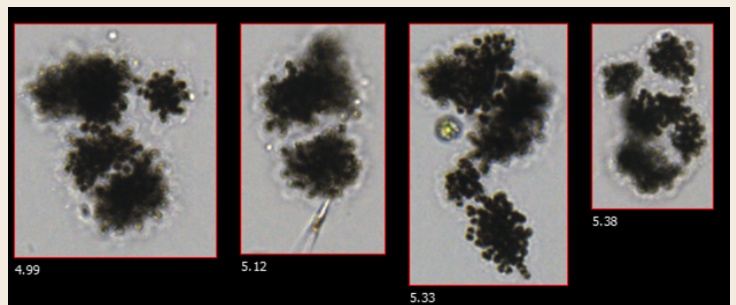
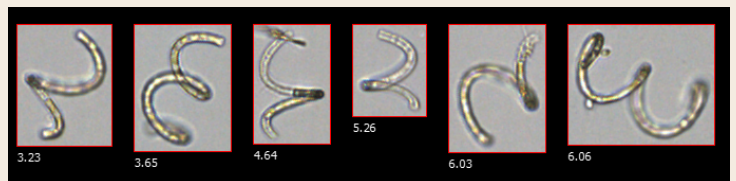
*Dolichospermum*

### FlowCam Findings from the GRAB Sample

The particle density at Burncoat Pond was 19297 particles/ml in September, according to the FlowCam, which was slightly less than what was observed in August. The sample was dominated by the cyanobacteria Aphanizomenon, but also contained *Microcystis* and *Cylindrospermopsis*. In general, the sample was more diverse than in August, and contained more diatoms.

### Fluorimetry Data from the Integrated Tube Sample

We used the fluorometer to find the amount of phycocyanin in the sample, which we can use as an indicator of cyanobacteria. In September, Burncoat Pond had 118 Au of phycocyanin pigment, which is relatively high compared to other lakes in the program. A pond becomes at risk for a bloom when it is at levels above 50 Au.



*Cylindrospermopsis* and *Microcystis* Cyanobacteria.

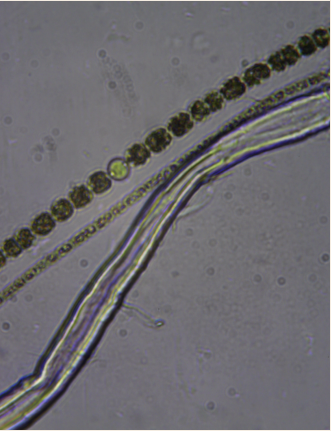
## WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

# Burncoat Pond - August 2021

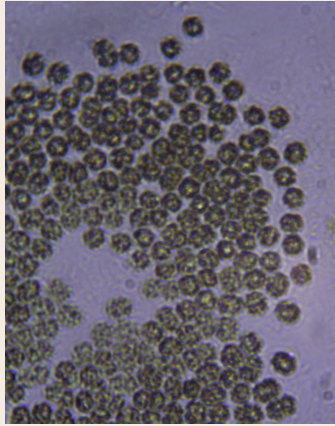
### Sampling Conditions

August 21st was a partly cloudy Saturday at 78°F with a light breeze. There were .4 inches of rainfall the day before the sample was taken.

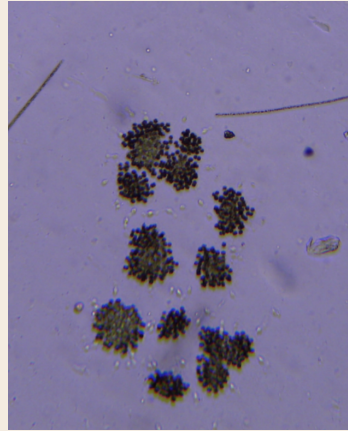
### Microscopic Findings from the Plankton NET



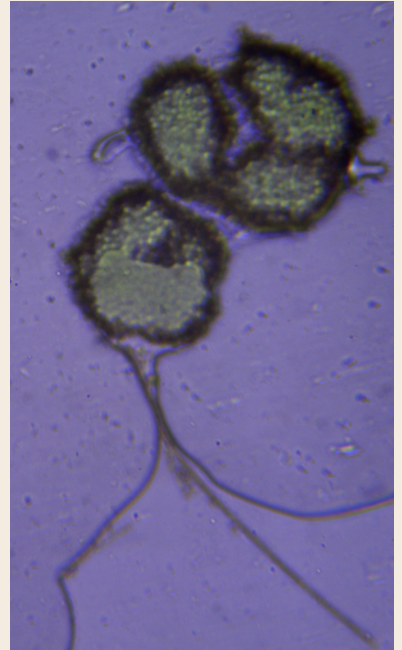
*Dolichospermum*



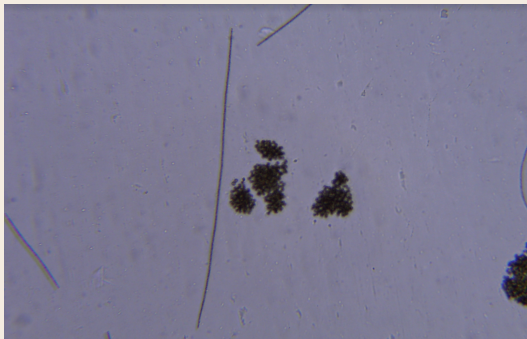
*Microcystis*



*Dolichospermum*



*Microcystis*



*Dolichospermum*



Trichome

### FlowCam Findings from the GRAB Sample

The particle density at Burncoat Pond was 28,751 particles/ml in August, according to the FlowCam, which was much more than what was observed in July. The sample was dominated by the cyanobacteria genus *Aphanizomenon*. While no fluorometry analysis was conducted, based on observations of green scum, it is understood that a bloom is occurring in Burncoat Pond.

### Fluorimetry Data from the Integrated Tube Sample

No IT sample could be taken due to bloom indicators of unsafe water.

# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Burncoat Pond - July 2021

### Sampling Conditions

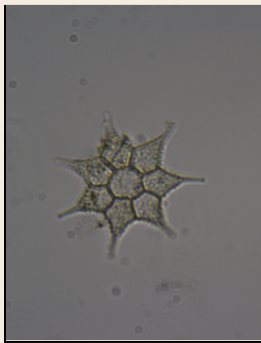
July 17th was a partly cloudy Saturday at 73°F with a light breeze from the northeast. There were about .4 inches of rainfall the day before. The surface temperature of the water was 79°F and the water was calm with small ripples. The water was slightly turbid, with light scum along the edges. Fish, insects, and litter were observed in the water as well as two groups of anglers. .



### Microscopic Findings from the Plankton NET on July 17th



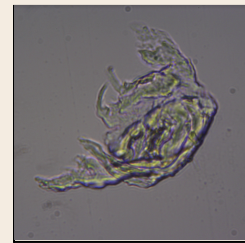
Oscillatoria- 400x



Pedastrum



Gloeocapsa - 400x



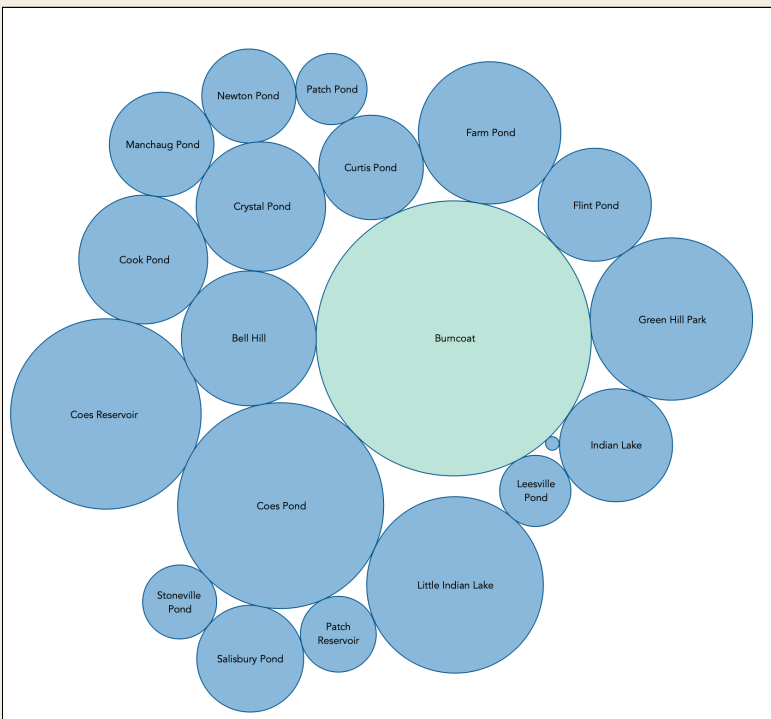
Detritus



Spirogyra - 400x

### FlowCam Findings from the GRAB Sample

The FlowCam, an advanced microscopy technology, was run for all organisms in the water sample including green algae, golden algae, cyanobacteria, diatoms, and debris. The particle density at Burncoat Pond was 10,411 particles/ml in June, and decreased to 9,679 particles/ml in July. This figure can be used to help us understand how productive the water is. The figure provides a snapshot of some of the images that were seen by the camera at this lake.



### Fluorimetry Data from the Integrated Tube Sample

Using the fluorometer to find phycocyanin levels, the following graph represents the relative cyanobacteria pigment in each pond. Burncoat Pond was not sampled in June, but now shows to be about 62 Absorbance Units (Au) in July. A pond becomes at risk for a bloom when it is at levels above 50 Au.

# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Burncoat Pond - June 2021

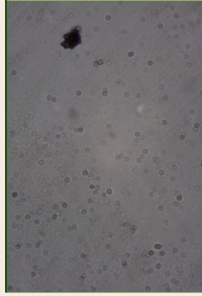
### Sampling Conditions

June 19th was a mostly cloudy Saturday at 76°F with a light breeze from the south direction. There were about .25 inches of overnight sprinkles the night before the sample was taken. The surface temperature was 74°F and the water was still with no waves. The water was slightly turbid, but had no evidence of scums or odor. Plants in bloom were observed along the water's edge.

### Microscopic Findings from Plankton NET on June 19th



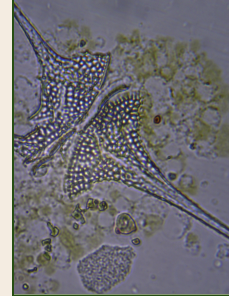
Asterionella and Pediastrum - 100x



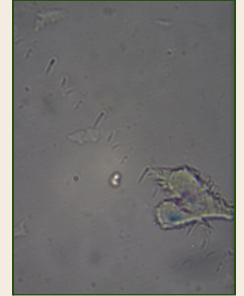
Debris - 400x



Scenedesmus - 400x



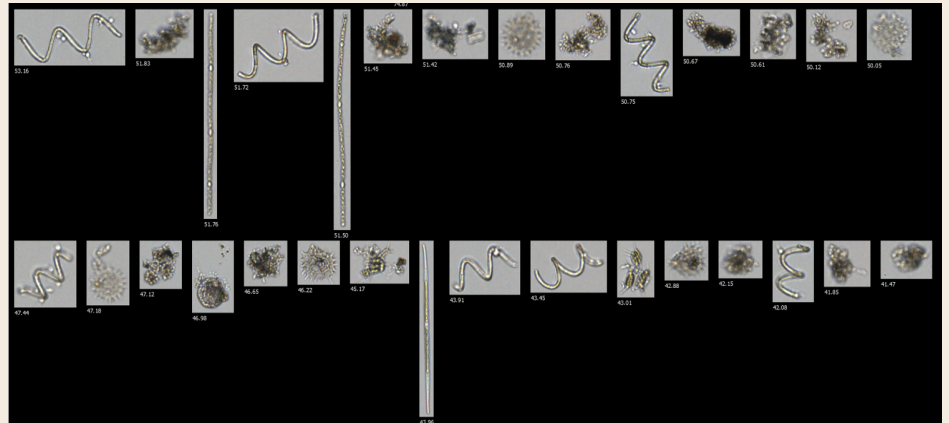
Ceratium - 400x



Debris - 400x

### FlowCam Findings from GRAB Sample

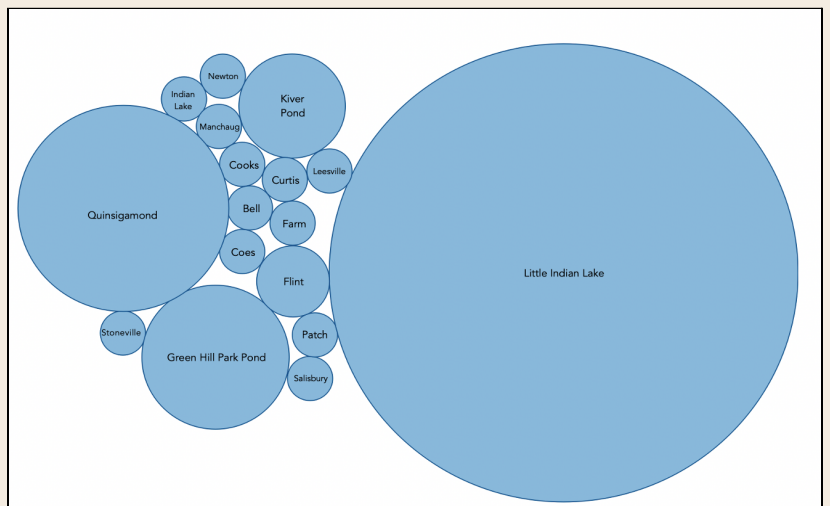
The FlowCam is advanced microscopy technology that uses a high speed camera to photograph individual cells as they pass through a thin flow cell. The computer's image recognition technology will then sort the cells based on parameters used to distinguish cyanobacteria from other organisms, and eventually count them. While we still have some work to do to train the computer to cell counts, we were able to do an initial scan on June's samples.



The particle density at Burncoat Pond was 10,411 particles/ml. Keep in mind that this number includes all organisms in the water sample, including green algae, golden algae, cyanobacteria, diatoms, and debris. Further work with the FlowCam will allow us to tease the groups apart, but for now, this figure can be used to help us understand how productive the water is. Here also is a snapshot of some of the images that were seen by the camera at this lake.

### Fluorimetry Data from IT Tube

A spectrometer is a scientific instrument used to measure specific fluorescent components of a substance. Using this machine, we are able to measure the amounts of phycocyanin - a pigment specific to cyanobacteria - in a water sample. From these measurements we are able to determine the relative amounts of cyanobacteria in Worcester's waters. The graph provides the relative amounts of cyanobacteria found in the month of June. This month, only five water bodies presented with a distinguishable amount of cyanobacteria: Flint, Kiver, Quinsigamond, Green Hill, and Little Indian Lake. All other ponds, including Burncoat Pond, showed no distinguishable levels of phycocyanin.



# WORCESTER CYANOBACTERIA MONITERING COLLABORATIVE

## Burncoat Pond

May 2021

Burncoat Pond is located in Burncoat Park along I-290 and across from The Hanover Insurance Company. The original pond was built on the marsh land surrounding the channel of Cole Mine Brook, a small stream that drained into Lake Quinsigamond. As the city grew around the park, the ponds were connected to the cities storm water system to drain the roads and surrounding neighborhood. After the construction of I-290 during the 1960's, storm drains from the highway were also connected to the pond. As both ponds became solely dependent on rainwater from the storm drain system. Burncoat Pond is a small 6 acres and shallow, which may make the waters susceptible to cyanobacteria blooms. In efforts to improve water quality installed a valve that diverted potable water to the ponds to control the water level and turbidity. The 2021 sampling season will be the second year the WCMC has sampled Burncoat Pond, following 2019.

### Sampling Conditions

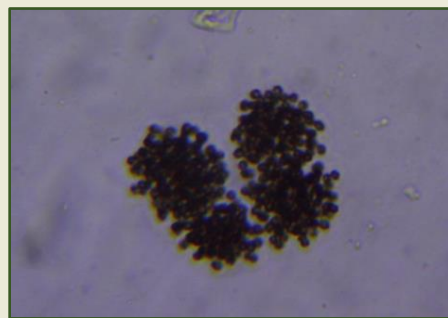
May 22nd was mostly cloudy, spring Saturday at 77°F with no wind. There was no rain in the 48 hours prior to taking the sample. The surface water temperature was 73°F and the water was still with no waves. The water was turbid but had no evidence of scums or odor. Large fish, birds, and native plants were observed along the shore, as well as people walking dogs and engaging in catch and release fishing.



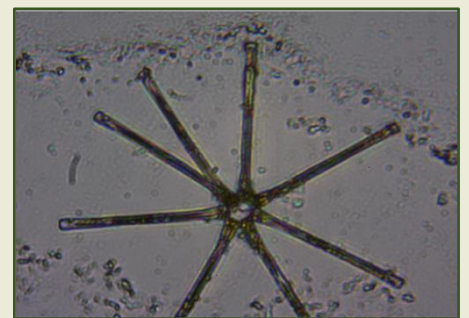
### Microscopic Findings



*Ceratium* dinoflagellate (100x)



*Microcystis* cyanobacterium  
(100x)



*Asterionella* diatom (400x)

### Monthly Overview

Underneath the microscopes, a small colony of *Microcystis* cyanobacteria was found by volunteers. This is commonly seen in Burncoat Pond, based on past years observations.

Thank you to Jamie, Meredith, and all our volunteers!