

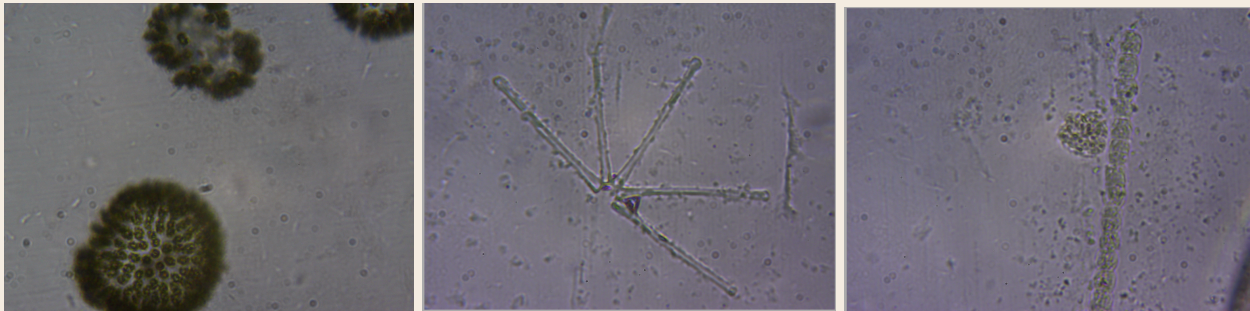
# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Green Hill Park Pond - October 2021

### Sampling Conditions

October 16th was a sunny, windy Saturday at 67°F. Green Hill Pond's sample was taken at the southeast end of the pond. The water's surface was 64.5°F with some floating leaf litter. The water was turbid with a faint odor. There was no rain the day before the sample was taken.

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



*Woronichinia* Cyanobacteria

*Asterionella* Diatom

Decomposed *Dolichospermum* Cyanobacteria

Several varieties of cyanobacteria were observed under the microscope, including *Woronichinia* and *Dolichospermum*, in addition to some diatoms. While no FlowCam sample was analysed, fluorometry data suggests that the threat of a cyanobacteria bloom is low.

### 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, Green Hill Park Pond had undetectable levels of phycocyanin, meaning that it is at low risk for a bloom. A pond becomes at risk for a bloom when it is at levels above 50 Au.

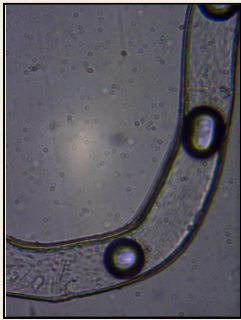
# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Green Hill Park Pond - July 2021

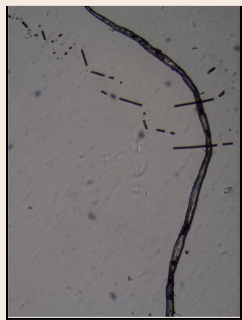
### Sampling Conditions

July 17th was a partly cloudy Saturday at 73°F with a light breeze coming from the northwest. Green Hill Park Pond's sample was taken at the southeast end of the pond where there was .4 inches of rainfall the day before before the sample was taken. Surface temperature was 77°F and the water had average wave activity. The water was slightly turbid with no odor. Small particles were observed along the surface, as well as feathers and bird droppings. In the pond, there was significant subsurface plant growth.

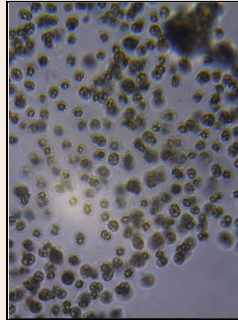
### Microscopic Findings from the Plankton NET on July 17th



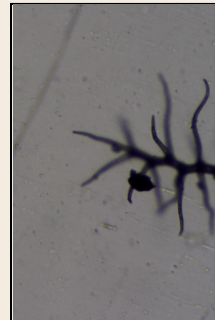
400x



Plant fiber



Microcystis - 400x



40x



Anabaena - 400x

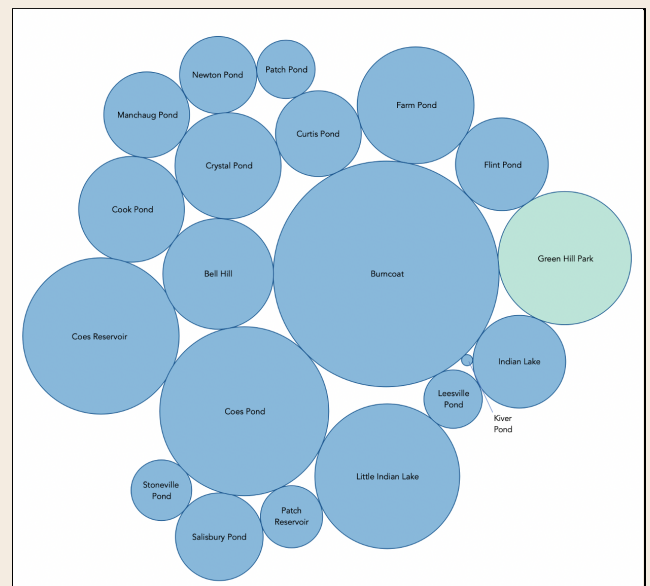


### FlowCam Findings from the GRAB Sample

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 Green Hill Park Pond was 1,792 particles/ml in July, which is a decrease from 3,786 particles/ml in June. 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. Green Hill Park Pond held at 21 Absorbance Units (Au) between the months of June and July. A pond becomes at risk for a bloom when levels rise above 50 Au.





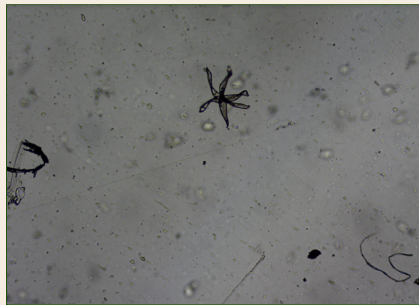
# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Green Hill Park Pond - June 2021

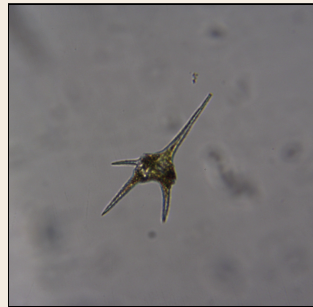
### Sampling Conditions

June 19th was a mostly cloudy, Saturday at 73.6°F with a light breeze coming from the southwest direction. Green Hill Park Pond's sample was taken at the southeast end of the pond where there was some rain two days before the sample was taken. The surface temperature was 72°F and the water was calm with little wave activity. The water was slightly turbid with no odor, with pollen and no evidence of scums along the top. Lots of human activity was observed in the park, as well as fish and vegetation along the shoreline.

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



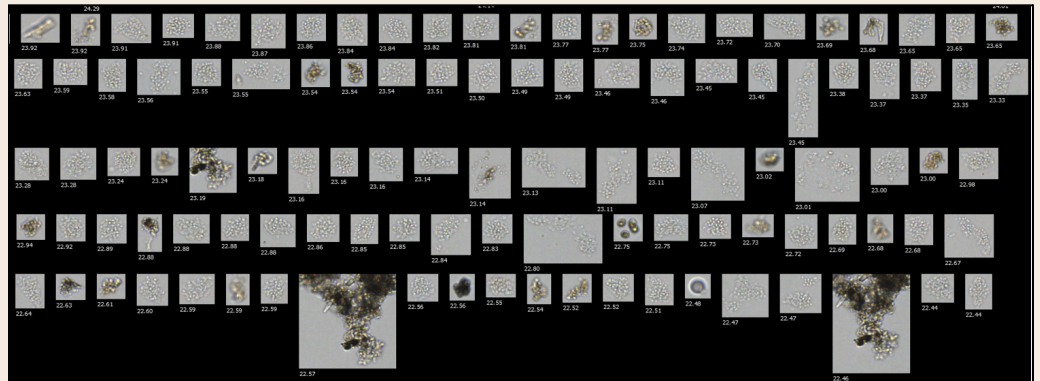
Trichome - 40x



Ceratium - 100x

### FlowCam Findings from GRAB Sample

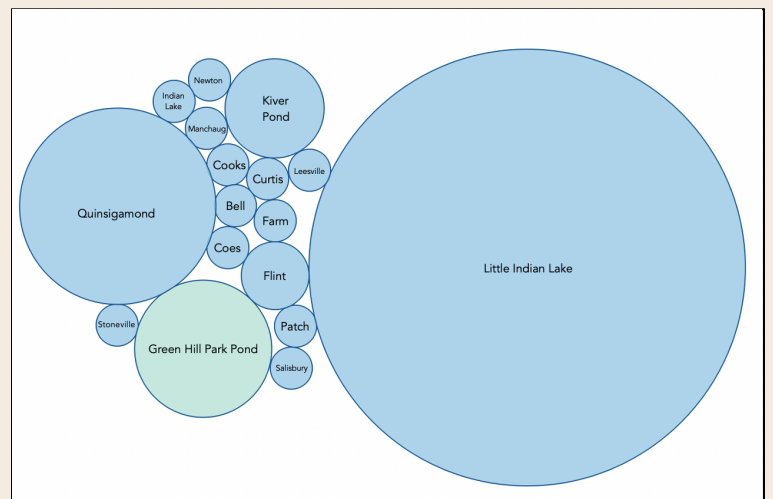
The FlowCam is advanced microscopy technology that uses a high speed camera to photograph individual cells as they pass through a thin flow cell. The computer's image recognition technology will then sort the cells based on parameters used to distinguish cyanobacteria from other organisms, and eventually 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 Green Hill Pond was 3,786 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 Pond, Kiver Pond, Lake Quinsigamond, Green Hill Park Pond, and Little Indian Lake.



# WORCESTER CYANOBACTERIA MONITORING COLLABORATIVE

## Green Hill Park Pond

May 2021

Green Hill Pond is located in Green Hill Park, one of the most popular recreational parks in Worcester. The pond was created in 1878 when a dam was erected at the southwestern end of bear brook valley. A spillway on the dam is the primary water outlet. The waters are 31 acres in area and 12 feet deep at its deepest point. The 2021 sampling season will be Green Hill Pond's first year of sampling with the WCMC.



### Sampling Conditions

May 22nd was a mostly cloudy, spring Saturday at 66°F. There was a light breeze coming from the southwest direction. Green Hill Park Pond's sample was taken at the southwest end of the pond where there was no rain over the past 48 hours. The water surface temperature was 68°F and the water was calm with little wave activity. The water was slightly turbid with no odor, with pollen and leaf litter observed along the surface. There was low activity in the park while samples were taken, only a few people walking by.

### Monthly Overview

Underneath the microscope this month, volunteers found four different colonies of Dolichospermum cyanobacteria, as well as a type of zooplankton. Dolichospermum is commonly found in many lakes and ponds around Worcester, especially throughout the month of June. Once we have more fluorometry data, we will have a better understanding of the significance of these observations, and look forward to learning more in June.

### Microscopic Findings



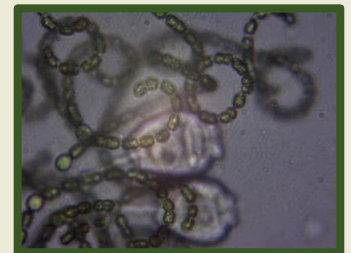
Cladocera (100x)  
Zooplankton



Dolichospermum (100x)  
Cyanobacteria



Dolichospermum (100x)  
Cyanobacteria



Dolichospermum with Vorticella (400x)  
Cyanobacteria

Thank you to Brian, Yahaira, and all other volunteers!