

Brawley Consulting Group, LLC

Land Conservation and Management Services

Memo

Date: April 11, 2024
To: Bantam Lake Protective Association
From: Brawley Consulting Group
Re: Results of Cyanobacteria Monitoring of April 9, 2024

Summary

Based on cell concentrations in samples collected from the lake and other water quality characteristics measured at the lake on April 9, 2024, the risk to the public from cyanobacteria and harmful algal blooms was low. Cyanobacteria cell concentrations at the three sampling sites, and the lake average were consistent with the State's Visual Rank Category 1 conditions. No public interventions for Category 1 are recommended for these conditions (CT DPH & CT DEEP 2021).



Methods and Conditions

On Tuesday, April 9th, the Brawley Consulting Group collected samples from the lake and analyzed those the next day as part of the biweekly Cyanobacteria Monitoring Program. Detailed methods have been described in past summaries. Data and samples were collected at the North Bay, Center Lake, and South Bay sites.

Arrival at the Lake was at approximately 1 PM. Lake water turbidity was generally low, i.e., clarity was good. Visible surface blooms were not observed. The skies were generally clear and sunny and winds were calm ([Weather Underground 2023](#)).

Cyanobacteria and Algae Community

A total of 13 genera were identified in the plankton net or whole water samples. Cyanophyta (aka cyanobacteria or blue-green algae) were represented by four genera. Bacillariophyta (aka diatoms) and Chrysophyta (aka golden algae) were represented by 3 genera each. Two other algal groups were represented by 1 to 2 genera.

Cyanobacteria were the dominant taxon in the planktonic algae community, constituting between 76% and 85% of all cells counted in samples from the three sites. Chrysophyta (aka golden algae) and diatoms comprised were subdominant.

The most abundant cyanobacteria genus in all samples was the filamentous *Aphanizomenon spp.* which constituted between 72% and 85% of all cells counted at the three sites.

Although the relative abundance was generally high, actual cyanobacteria cell concentrations were low. Concentrations at the three sites were between 1,900 and 3,000 cells/mL. For comparative purposes, the CT DEEP recommends using a threshold of 20,000 cells/mL as the cut of between low public risk and moderate public risk from harmful algal blooms.

Water Quality

Several other indicators of cyanobacteria productivity and water quality measured as part of this monitoring program were Secchi disk transparency and relative phycocyanin concentration. Secchi transparency is a measurement indicating how far light transmits through the water column. The more algae and other particulate matter suspended in the water column, the less Secchi disk transparency will be and vice versa. Secchi transparencies on April 9th were approximately 3.5 meters at 3 of the 4 sites. The Folly Point Site Secchi disk transparency was 2.9 meters. The lake average was 3.39 meters.

Phycocyanin is a photosynthetic pigment mostly unique to freshwater cyanobacteria. It is measured throughout the water column with the fluorimeter in the scientific instrumentation used in the monitoring program. Measures are relative in that the meter is not calibrated with a primary standard. Although relative, they are useful in that they are comparable to measurements collected at different depths and dates. The average for the top three meters of the water column were used here, as they have in the past.

Relative phycocyanin levels on April 9th were very low and consistent with cyanobacteria cell concentrations. For comparative purposes, we regressed relative phycocyanin concentrations against corresponding cyanobacteria cell concentrations from 2020 to 2023 to create a simple model of Bantam Lake. The April 9th data was added as a separate dataset (Fig. 1). The April 9th data was at the extreme end of the model where water quality is at its best.

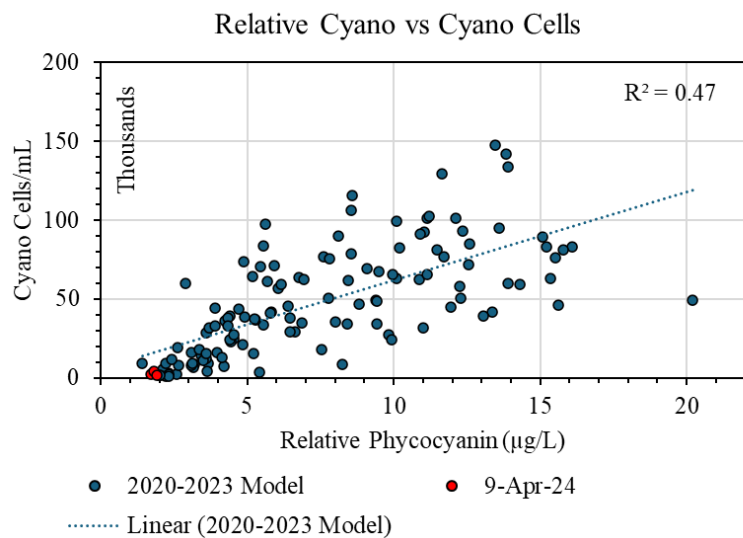


Figure 1. Regression of cyanobacteria cell concentrations and corresponding relative phycocyanin concentrations from 2020 to 2023. The April 9, 2024 was added as a separate dataset (in red).

Table 1. Table 1. Site characteristics and cyanobacteria cell concentrations at Bantam Lake on October 10, 2023.

Sites	Cyanobacteria cells (cells/mL)	Total Depth (m)	Secchi Transparency (m)	Temperature Top/Bottom (°C)	Oxygen Top/Bottom (mg/L)
North Bay	1,954	6.56	3.49	9.5 / 5.8	12.9 / 12.5
Center Lake	3,931	8.40	3.50	10.5 / 5.9	12.9 / 12.3
South Bay	1,913	4.7	3.63	9.6 / 7.0	12.7 / 12.9
Folly Point	---	6.97	2.94	7.7 / 5.7	12.7 / 12.6

Site Condition

The water columns at all sites visited were generally mixed although some temperature change with depth was observed (Table 1). Oxygen concentrations were high throughout the water column at all sites.

Conclusions

The public risk from cyanobacteria at Bantam Lake on April 9, 2024, was low. Cyanobacteria cell concentrations were, on average, low. Concentrations at all three sites and the lake average were within the Visual Rank Category 1 level. Secchi transparency was good and relative phycocyanin levels were low.

Analysis by



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Literature Cited

Connecticut Department of Public Health and Connecticut Department of Energy and Environmental Protection. 2023. Guidance to Local Health Departments for Blue-Green Algae Blooms in Recreational Freshwaters. See <https://portal.ct.gov/-/media/DPH/EHDW/Blue-Green-Algae-Blooms/Guidance-to-LHD-for-Blue-Green-AlgaeBlooms.pdf>