



Cyanobacteria Monitoring Bi-Weekly Report of Orleans Ponds.

Sampling for the week of: July 18th, 2022

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Report prepared for: The Town of Orleans and the Orleans Ponds Coalition

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Reviewed by Kevin Johnson, Ecologist.

Sample collection by: Members of the Orleans Pond Coalition and Members of the Brewster Ponds Coalition

For more information: <https://apcc.org/our-work/science/community-science/cyanobacteria/>

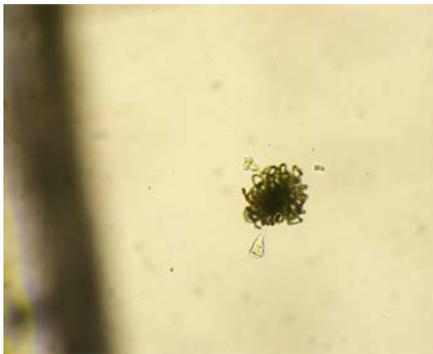
Pond	Sample Date	Pond Water Temp (F)	General Turbidity	Dominant Genus	BFC PC ave. (ug/L ⁻¹) *	Estimated BFC microcystin concentrations (ug/L ⁻¹)			Net growth rate (ud ⁻¹)			Cyano. Scum	Recent Activity	Current Risk Category
						MC (Cl-) *	MC *	MC (Cl+) *	<50um	WLW	BFC			
Bakers	7/13/22	75	Clear	DS	37	-	-	-	-	-	-	-	6/1/22- Acceptable 6/15/22- Acceptable 6/29/22- Acceptable	Acceptable
Boland	7/19/22	78.3	Clear	NA	5	-	-	-	-	-	-0.04	-	6/7/22- Acceptable 6/21/22- Acceptable 7/5/22- Acceptable	Acceptable
Cedar	7/19/22	78	Turbid, Brown	NA	9	-	-	-	-	-	-	Algae Scum seen.	6/21/22- Acceptable 7/5/22- Potential for Concern 7/13/22- Acceptable	Acceptable
Crystal	7/19/22	78	Clear	DS	3	-	-	-	-	-	-	-	6/21/22- Acceptable 7/5/22- Potential for Concern 7/13/22- Potential for Concern	Acceptable
Ice House	7/19/22 7/20/22	77.7 -	Clear Clear	- NA	- 4	-	-	-	-	-	-	NOTE: an error on the 7/19 sample so APCC sampled again.	6/7/22- Acceptable 6/21/22- Acceptable 7/5/22- Acceptable	Acceptable

Pilgrim	7/19/22	77.5	Clear	DS	66	-	-	-	-	-	0.25	-	6/21/22- Acceptable 7/5/22- Potential for Concern 7/13/22- Acceptable	Potential for Concern
Uncle Harvey's	7/19/22	78.4	Clear	WO	82	-	-	-	-	-	0.07	-	6/28/22- Potential for Concern 7/5/22- Potential for Concern 7/13/22- Potential for Concern	Potential for Concern

* Phycocyanin and microcystin concentrations ($\mu\text{g L}^{-1}$) reported to the nearest whole number. Complete data set available upon request.

Notes

Pilgrim and Uncle Harveys are in APCC's Potential for Concern category due to elevated net daily cyanobacteria growth rates, and we recommend retesting these ponds next week. No concerning cyanobacteria results for the other Orleans sites at the time and place of sampling.



Above: DS found in Pilgrim Lake on July 19th, 2022.

Abbreviations:

C&D (Composition and Dominance) Identifies the dominant genus of cyanobacteria found in the sample.

BFC PC (Bloom Forming Colonies Phycocyanin Concentration)

WLW (Whole Lake Water)

DS (*Dolichospermum*) Common genus of cyanobacteria. Produces regulated toxins at low level.

MC (*Microcystis*) Common genus of cyanobacteria. Produces regulated toxins at relatively high levels.

Mixed Indicates that no single genus of cyanobacteria was found to be dominant. A genus must be found to have a composition and dominance of at least 70% to be considered the dominant genus in a sample.

WO, AZ (*Woronochinia* and *Aphanizomenon*) Additional genera of cyanobacteria that are believed to produce regulated toxins at a similar rate to *Dolichospermum*.

Risk Category Descriptions

Cyano Status: Acceptable

Definition: No concerning cyanobacteria results at the time and place of sampling. To the best of our knowledge and based on our monitoring results, regular recreational usage of the pond is safe with respect to cyanobacteria and toxins. Map color is blue. Formerly the Low Warning Tier.

Cyano Status: Potential for Concern

Definition: Monitoring results at the time and place of sampling indicate either moderate risk for potential exposure to cyanobacteria toxins or a likelihood for higher cyanobacteria risks in the near future. While these conditions pose low health risks to adults, risks are higher for children or pets, particularly if contaminated water is incidentally ingested. Children may inadvertently consume pond water while swimming and pet exposure can result from directly drinking pond water or from grooming after swimming. Due to lower body masses, children and pets are more susceptible to cyanobacteria risks than adults. A “Pet Advisory” may be posted at public access points. Map color is yellow. Formerly the Moderate Warning Tier.

Cyano Status: Use Restriction Warranted

Definition: Monitoring results at the time and place of sampling indicate a high risk for potential exposure to cyanobacteria toxins, based on one or more of the following criteria: 1) exceedance of microcystin according to MDPH guidance, 2) presence of cyanobacteria scum layers according to MDPH guidance, or 3) a municipal health agent issues a closure for any other reason related to cyanobacteria. Recreational risk to adults is moderate following exposure. Recreational risks are especially high for children and pets following exposure through accidental ingestion of contaminated water. Children may inadvertently consume pond water while swimming and pet exposure can result from directly drinking pond water or from grooming after swimming. Due to lower body masses, children and pets are more susceptible to cyanobacteria risks than adults. A “Use Restriction Advisory” has been recommended for public access points. Map color is red. Formerly the High Warning Tier.

2022 Risk Category Criteria

APCC 2022 Cyanobacteria Risk Categories				
Criteria		APCC Acceptable	APCC Potential for Concern	Use Restriction Warranted
Microcystin	Estimated microcystin calculated by APCC.	Less than the confidence interval for phycocyanin converted to 8 ppb <u>estimated</u> microcystin in APCC’s BFC (bloom-forming colonies) sample for <i>Microcystis</i> spp. dominated samples ^{2,4} .	Within or greater than the confidence interval for phycocyanin converted to 8 ppb <u>estimated</u> microcystin in APCC’s BFC sample for <i>Microcystis</i> spp. dominated samples ^{2,4} .	
	Measured microcystin by BCDHE Water Quality Lab.	Less than 4 ppb microcystin <u>measured</u> in GRAB sample.	Between or equal to 4 and 8 ppb microcystin <u>measured</u> in GRAB sample.	Greater than 8 ppb microcystin <u>measured</u> in GRAB sample ³ .
Cyanobacteria Biomass	Cyanobacteria daily growth rate calculated by APCC.	Less than 0.05 in all APCC samples ^{1,2,4} .	Greater than or equal to 0.05 and where the genus specific biomass concentration remains elevated in any APCC sample ^{1,2,4} .	
	Cyanobacteria bloom material confirmed by APCC.	None present at the time and place of sample collection.	A slight cyanobacteria scum or small patches of cyanobacteria bloom material sampled and confirmed ¹ .	Significant cyanobacteria scum or large patches of cyanobacteria bloom material sampled and confirmed ^{1,3} .
Notes	<p>To interpret cyanobacteria data using this table, the most hazardous result determines the category the pond is placed in from right to left. A pond that meets even a single criterion in the “Use Restriction Warranted” column will be placed in that category. Likewise, a pond that meets even a single criterion in the “APCC Potential for Concern” category, but does not meet any criteria in the “Use Restriction Warranted” category, will be placed in the “APCC Potential for Concern” category. If a pond meets no criteria in the “Use Restriction Recommended” or the “APCC Potential for Concern” category, that pond is placed in the “APCC Acceptable” category.</p> <p>¹ Developed with recommendations from Karen Malkus-Benjamin, former Coastal Health Agent for the Town of Barnstable. ² Developed with recommendations from Nancy Leland of Lim-Tex Inc. and affiliated with the University of New Hampshire Center for Freshwater Biology. ³ Criteria attributed to MDPH. ⁴ Predictive cyanobacteria metrics that project and estimate risks, rather than reactive cyanobacteria metrics that measure risk after a bloom has occurred.</p>			

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