

Lake Montclair

Water Quality Testing, Assessments and Advisories

Dated: June 2024

Water Quality is perhaps the most important concern for management of Lake Montclair. On-going monitoring and assessment activities of Lake Montclair and Powells Creek Watershed ecosystem will provide information vital for evaluating water quality to determine whether the lake is safe for swimming, fishing, boating and other uses. This document serves as a guide for the Montclair Property Owners Association (MPOA) Management Staff and Lake Management Committee in assessing water quality relative to E coli and Harmful Algae Blooms.

Testing objectives include:

- Provide information to advise Montclairions on water quality issues that could impact their health.
- Sustain water quality and healthy aquatic biological communities.
- Monitor water quality and provide reporting to better enable timeliness of actions.
- Provide information for community engagement, notification, and education relative to lake issues.

Escherichia Coli (E. Coli)



E. Coli bacteria is found in the environment, foods, and intestines of people and animals. E. Coli are a large and diverse group of bacteria. Although most strains of E. Coli are harmless, others can make people sick. Some kinds of E. Coli can cause diarrhea, while others cause urinary tract infections, respiratory illness, and pneumonia, and other illnesses.

All warm-blooded animals have some E. Coli living in their lower intestines and found in their feces. While E. Coli is not likely to cause illness on its own, it is relatively easy to detect in the lab, making it a useful biological indicator of contamination. If a water sample has high concentrations of E. Coli, other more dangerous and infectious organisms may be present. While most E. Coli strains are harmless, their presence can mean that illness-causing pathogens are also present.

Because of the risk posed to public health, one of the primary reasons for beach closures is when elevated levels of E. Coli are detected. Those who are most at risk to develop illness are children, the elderly, and people with compromised immune systems. Healthy individuals who get an infection will normally not develop serious problems and recover on their own with rest and drinking plenty of fluids. Unfortunately, those at higher risk can develop more severe illnesses.

E-COLI TESTING AND ADVISORY PROCEDURES

Surface water testing for E-Coli is conducted weekly at all three of Montclair’s beaches during the summer swimming months. Past testing has generally indicated overall good conditions. MPOA contracts for water testing at beaches to examine the level of fecal coliform and to assess possible impact on the health of swimmers; long term trends of fecal coliform counts at each beach and causes and potential actions to correct issues stemming from fecal coliform. The Table below shows results of those tests conducted during the 2023 swimming season. Results were recorded using one 100 ml sample from each beach tested for counts of fecal coliform.

Surface Water Testing for E-Coli Testing Conducted by Joiner Lab during 2023 Swimming Season					
MPN 3-dilutions - Acceptable readings 235/100ml for single sample maximum and 126/100 ml monthly average limit					
Date	#1-Beaver Landing	#2-Dolphin	#3-West	Day Air Temp F *	Night Air Temp F
5/23/2023	12 MPN/100mL	64 MPN/100mL	6 MPN/100mL	75	61
6/1/2023			18 MPN/100mL	84	59
6/6/2023	38 MPN/100mL	82 MPN/100mL	55 MPN/100mL	83	61
6/20/2023	32 MPN/100mL	6 MPN/100mL	96 MPN/100mL	81	72
6/28/2023	40 MPN/100mL	19 MPN/100mL	32 MPN/100mL	82	68
7/5/2023	22 MPN/100mL	38 MPN/100mL	21 MPN/100mL	93	76
7/11/2023	9 MPN/100mL	111 MPN/100mL	3 MPN/100mL	90	71
7/18/2023	17 MPN/100mL	98 MPN/100mL	15 MPN/100mL	90	74
7/25/2023	7 MPN/100mL	22 MPN/100mL	19 MPN/100mL	89	72
8/1/2023	8 MPN/100mL	20 MPN/100mL	98 MPN/100mL	81	68
8/9/2023	66 MPN/100mL	457 MPN/100mL	108 MPN/100mL	86	71
8/14/2023	8 MPN/100mL	345 MPN/100mL	88 MPN/100mL	91	73
8/15/2023	8 MPN/100mL	36 MPN/100mL	86 MPN/100mL	88	76
8/22/2023	10 MPN/100mL	11 MPN/100mL	36 MPN/100mL	84	72
8/29/2023	9 MPN/100mL	44 MPN/100mL	91MPN/100mL	81	73

Montclair’s monitoring program uses the U.S. Environmental Protection Agency standard, which triggers short-term swimming advisories when bacteria levels exceed 235 Most Probable Number (MPN). The "Advisory" standard of 235 MPN /100 mL (E. coli in water) was adopted based upon data from three EPA studies. These studies indicate that E. coli and/or Enterococci are the best bacterial indicators to assess the risk of acquiring a gastrointestinal illness because of using recreational waters.

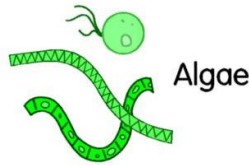
With E. coli counts under 235 MPN/100 mL, the beach has no advisories or warnings issued. **Once the E. coli count is greater than 235 MPN/100 mL management will issue an advisory. Once a reading is reported more than 235 MPN organisms per 100ml sample management will order additional test and lift advisories once samples are below 235 MPN.**

Daily removal/disposal of goose droppings and pet waste from beaches during the beach season is accomplished to reduce the E-coli counts. Goose droppings are the main contributor to higher levels of E-Coli in the lake, creating human health hazards, aesthetic losses, & property damage.

Sample Swim Advisory

Caution: Water Quality Advisory. Increased risk of illness may be present based on recent monitoring for E Coli bacteria. Swim at your own risk. For your safety: Do not ingest lake water, Shower after swimming, Wash hands before eating and do not swim if you are ill.

Algae



Algae are naturally occurring microscopic organisms that are found in freshwater lakes including Lake Montclair. Many are beneficial because they are major producers of oxygen and food for many of the animals that live here. Most algae do not harm people, wildlife, or the environment.

But some types of algae can be dangerous. Some algae species may multiply rapidly when environmental conditions are favorable. The excessive number of algal cells in the water results in what is called an algal bloom. A bloom often (but not always) results in a color change in the water. Most algal blooms are not harmful, but some can affect fish, birds mammals including pets and humans. A large, often considered excessive, growth of algae on or near the surface of water, because of an oversupply of nutrients is known as Harmful Algal Blooms (HABs).

Cyanobacteria

Cyanobacteria, or blue-green algae are single-celled organisms that naturally exist in fresh waters. They use sunlight to make their food. When there are a lot of nutrients available in the water, the bacteria can grow rapidly or “bloom” to form a visible film or scum on the surface of the water. This is more likely to occur in warm spring and hot summer months, however, unseasonably warm temperatures in fall and winter can produce blooms. Cyanobacterial blooms are often green or blue green in color but not always.

The development and proliferation of algal blooms likely result from a combination of environmental factors including available nutrients, temperature, sunlight, ecosystem disturbance (stable/mixing conditions, turbidity), hydrology (flow and water storage levels) and the water chemistry. However, the combination of factors that trigger and sustain an algal bloom is not well understood and it is not possible to attribute algal blooms to any specific factor.

Algae Actions Taken

In the summer of 2021 lake Montclair experienced Harmful Algal Blooms (HAB). Lab testing results confirmed excessive cyanobacteria. 08/31/2001 lab test. Since then, testing at the three beaches have been routinely tested prior to Memorial Day and up until Labor Day during the swimming season. These samples are taken by MPOA management and sent to SePRO Labs for testing and analysis reporting.

In 2023 Lake Montclair is experienced elevated levels of harmful Algae. Lab testing results confirmed harmful cyanobacteria. Some test results has two HABs identified and the total of both readings determined the alert index. Test results from 08/15/2023 at West Beach were extreme where scum/mats was identified.

Lake Montclair - Hazardous Algae Test Results							
YEAR	Date	HAB Identification	1- Dolphin Beach	2- West Beach	3-Beaver Landing	Day Air Temp F	Night Air Temp F
2023	5/23/2023	Aphanizomenon	910	24,100	290	75	61
2023	5/23/2023	Aphanocapsa sp.		10,200		75	61
2023	6/6/2023	Aphanocapsa sp.	5,200	3,400	4,200	83	61
2023	6/6/2023	Aphanizomenon		1,100		83	61
2023	6/20/2023	Aphanizomenon		< 40	< 40	81	72
2023	6/20/2023	Gloeocystis	4,400	< 40	< 40	81	72
2023	7/5/2023	Snowella	2,600	4,800	990	93	76
2023	7/18/2023	Aphanizomenon	6,300	5,900	9,900	90	74
2023	7/18/2023	Woronichinia sp.	5,100			90	74
2023	7/18/2023	Trachelomas sp.		250		90	74
2023	8/1/2023	Aphanizomenon	43,800	54,400	38,700	81	68
2023	8/15/2023	Aphanizomenon	25,700		14,600	88	76
2023	8/15/2023	Phormidium		154,500	11,900	88	76
2023	8/18/2023	Phormidium		121,600		84	71
2023	8/18/2023	Aphanizomenon		32,900		84	71
2023	8/29/2023	Aphanizomenon	34,200	39,800	13,600	81	73
2023	8/29/2023	Dolichospermum	14,800	7,500	6,700	81	73

ALERT INDEX		
SeSCRIPT* ALERT INDEX	EXPOSURE RISK	CYANOBACTERIA LEVELS (cells/mL)
★	Low	<20,000
★★	Moderate	20,000 to 100,000
★★★	High	>100,000
★★★★	Extreme	>100,000 with scums/mats
<i>See the following Cyanobacteria Alert Guide for additional information</i>		

Once algae test results reach moderate and high levels of exposure risk MPOA management posts signs at all three beaches.



The type of tests completed are an Algae Identification Panels. The results include algae identification, classification, description, and cell density are identified within each SePro Lab – SeSCRIPT Analysis Report.

Decisions concerning the beaches are based on the type of algae and the cell density (cells/mL). Following Virginia Department of Health criteria on cyanobacteria, MPOA management issues advisories for the beaches.

HAB TESTING AND BLOOM ADVISORY PROCEDURES

Maintaining transparency and trust of the Montclair Community is vital. If a cyanobacteria bloom is known to be present residents need to be made aware of this issue, as well as the possible health risks should exposure occur (that they may produce toxins, etc.).

Observation data includes visual and basic observations such as weather condition, color, turbidity and presence/absence of algal scums and mats. Also - is aquatic life (fish, macroinvertebrates, etc.) present. Collecting visual observations and water chemistry data at least weekly will help with tracking seasonal/trend conditions in the waterbody.

Understanding when the lake gets to optimal conditions to support algae blooms is key. Cyanobacteria tends to like consistently warm temperatures. Blooms tend to become more stable from July-August because nightly temperatures aren't dropping too low in the summer evenings. The conditions within each cove may be very different from the lake proper. Conditions in the morning, afternoon, and evening can differ widely. A bloom visible in the morning may dissipate by afternoon.

Identifying cyanobacteria requires lab analysis. Sampling are taken every two weeks at the onset of an Algae bloom which is consistent with VDH recommendations. VDH advisories in VA are issued due to elevated cell counts, not elevated toxins. Samples are collected, packaged, and shipped overnight to the lab. The analysis report can take up to (3-4 days) to complete. Lab turn-around times are important when results are needed to make informed decisions.

Once a bloom is established and becomes consistent and the presence of scum areas in excess an advisory will be issued. Scum is dead HAB that has risen to the surface is giving off toxics and should be completely avoided. Animal mortalities or extensive toxigenic scums, if present, indicate a continued risk of human HAB exposure.

Once an advisory is issued, then sampling will be conducted to lift the advisory and determine when it's safe to enter into lake waters and swim in the lake. Two consecutive sample events, with acceptable Cyanobacteria levels of cell counts at least 10 days apart which indicate total PTOX taxa densities are below advisory thresholds will be used to determine when to lift an advisory.

Well established blooms in July/Aug, commonly persist into the fall months. Weather event can change water conditions of the bloom.

Sample testing will not extend beyond Labor Day.

By 1 October the advisories will be lifted, even if prior sample results indicate thresholds are exceeded. HABs may continue beyond the recreational season, therefore public messaging and outreach should clearly indicate that while advisories are being lifted, the risk of human HAB exposure may continue, especially for those who engage in activities likely to result in accidental ingestion within the waterbody.

Laboratory services are provided by SePro. See collection procedures document provided below. Water samples will be collected and shipped to SePro labs per instructions. The goal is to issue advisories and drop advisories based on accurate information. Winter is generally a reset for cyanobacteria, clearing the set for the next summer season.

Harmful Algae Bloom Advisories

Virginia Department of Health, Guidance for Cyanobacteria Bloom Recreational Advisory Management will be used for determining when to issue an advisory. A hybrid approach for microcystin and Microcystis has been used by VDH since 2012. This was expanded in 2018 to include cylindrospermopsin and additional potentially toxigenic taxa. Below are the Cyanobacteria bloom recreational advisory thresholds using cell densities.

Metric	Concentration
Microcystis species	≥40,000 (total cells/mL)
total potentially toxigenic (PTOX) cyanobacteria taxa	≥100,000 (total cells/mL)

Cell counts of the Microcystis species of cyanobacteria above 40,000 will trigger an advisory.

Cell count above 100,000 of any combination of the species on VDH list below will trigger an advisory.

Virginia Department of Health list of regional potentially toxigenic (PTOX) cyanobacteria taxa based on literature reviews, other state plans, and discussions with regional partners: Anabaena; Anabaenopsis; Aphanizomenon; Chrysoosporum; Cuspidothrix; Dolichospermum; Lyngbya; Microcystis; Microseira; Nodularia; Nostoc; Oscillatoria; Phormidium; Planktolyngbya; Planktothrix; Raphidiopsis; Sphaerospermopsis; Woronichinia.

Examples of Harmful Algal Bloom Community Notices and Updates

Month, XX, 20XX

Toxic harmful algal bloom occurring in lake Montclair.

Public advised to avoid water contact

High levels of toxic algae have been found in Lake Montclair. A harmful algal bloom of _____ is occurring in the waterbody. This type of blue-green algae produces a toxin that can cause rashes and other illness. The Virginia Department of Health warns citizens to stay out of the water and to keep their pets and children out as well. Due to low body weight, children and pets are at greater risk of severe illness if the water is ingested. The lake will continue to be monitored and when the HAB levels drop below (safety thresholds) these advisories will be lifted.

Harmful algal blooms occur when warm water and nutrients combine to make conditions favorable for blue-green algae growth. The algae become so abundant that they can turn the water green or bluish-green and may produce and release toxins. Microcystin, one type of toxin which can be produced by blue-green algae, can develop in green, blue, or white clumps or glops on the surface of the water. It may also look like thick, green-blue paint on the surface of the waterbody.

To prevent illness, people should:

Avoid contact with any area of the waterbody where water is green, or an advisory sign is posted. Keep children and pets out of affected areas too, and quickly wash them off with soap and water after coming into contact with algae and never drink untreated water.

X or TWITTER and FACEBOOK

“WARNING—Water Contact Might Cause Illness. The water at Lake Montclair contains [cyanotoxins or cyanobacteria] at levels that could cause harm. Do not swim.

“Lake Montclair is contaminated with [cyanotoxins or cyanobacteria]. Water samples were tested on [dates] for [cyanotoxin or cyanobacteria name] and show levels that may cause harm. People, and pets should avoid any contact with the water, scum, foam or algae.

AUTOMATED TEXT MESSAGES

“Advisory has been posted for Lake Montclair. Levels of [cyanotoxins or cyanobacteria] at potentially harmful levels. People and pets should avoid contact with the water.



Cyanobacteria Alert Guide

The water sample analyzed from this water body exceeded a threshold cyanobacteria level and consequently produced a SeSCRIPT Cyanobacteria Alert (Table 1). This SeSCRIPT Alert Index highlights potential risks associated with toxic cyanobacteria and provides general management options for consideration.

Table 1. Alert levels of cyanobacteria in freshwaters (modified from World Health Organization 1999).

SeSCRIPT* ALERT INDEX	EXPOSURE RISK	CYANOBACTERIA LEVELS (cells/mL)	POTENTIAL EXPOSURE RISKS
★	Low	< 20,000	Although cyanobacteria may currently be at low levels, presence is an indicator the water body may support conditions that could fuel levels of health concern for animals and humans.
★★	Moderate	20,000 - 100,000	Moderate probability of short-term adverse health outcomes (skin irritations, gastrointestinal illness). Potential for long-term illness with chronic exposures.
★★★	High	>100,000	High probability of short-term adverse health outcomes (skin irritations, gastrointestinal illness). Potential for long-term illness with chronic exposures.
★★★★	Extreme	>100,000 with scums/mats	High potential for significant respiratory, gastrointestinal and neurological impacts. Potential for acute poisonings. Potential for long-term illness with chronic exposures.

Cyanobacteria Facts

Cyanobacteria, also known as blue-green algae, are readily present in freshwaters throughout the United States. Cyanobacteria blooms often appear as bluish-green surface scums or thick mats (Images 1 and 2), although some infestations are dispersed through the water and provide slight discoloration (Image 3). With rapid growth rates under certain conditions, these organisms have the ability to achieve levels of concern in short order. Some cyanobacteria have the ability to form surface scums through buoyancy regulation and become highly concentrated in static or windblown areas of water bodies. Caution should be taken around cyanobacteria infestations to avoid exposure and resultant potential health risks.



Image 1. Cyanobacteria scum



Image 2. Cyanobacteria mat



Image 3. Discolored water

Cyanobacteria Impacts

Cyanobacteria are capable of producing toxins that can pose significant risks to humans and wildlife. Common cyanobacteria associated toxins includes; hepatotoxins (impacts liver/kidney), neurotoxins (impacts brain), dermatitis toxins (impacts skin, digestive system) and gastrointestinal toxins (impacts digestive system). Animal mortalities from cyanobacteria toxin exposure have, in part, included: cows, dogs, pigs, and ducks (Cook et al. 1989; Mez et al. 1997; Wood et al. 2007). Human exposure is commonly from inhalation of aerosolized toxins, ingestion/consumption of contaminated water/ algae cells, or recreational skin contact with cyanobacteria infestations. A summary of toxins groups and exposure signs and symptoms is presented in Table 2. Correlations have been made between chronic cyanotoxin exposure and neurodegenerative diseases, such as ALS and Alzheimer's (Bradley & Mash 2009), and human mortalities have been observed (Carmichael 2001) in extreme exposure scenarios.

Table 2. Partial summary of cyanobacteria toxin types and associated exposure signs and symptoms (modified Codd et al. 1999; WHO 1999; Graham 2007, Jewet et al. 2008).

Toxin Group	Toxin Name	Exposure Signs & Symptoms
Hepatotoxins (liver/kidney)	Microcystins Nodularins Cylindrospermopsin	Numbness of lips, tingling in fingers/toes, dizziness, headache, diarrhea, jaundice, shock, abdominal pain/distention, weakness, nausea/vomiting, severe thirst, rapid/weak pulse, acute pneumonia
Neurotoxins (brain)	Anatoxins Saxitoxins β -Methylamino-L-alanine	Tingling, burning, numbness, drowsiness, incoherent speech, paralysis, weakness, staggering, convulsions, difficulty in breathing, vomiting, muscle twitching, gasping, backward arching of neck in birds, and death
Dermatitis/Gastrointestinal toxins (skin/digestive)	Aplysiatoxins Lipopolysaccharides Lyngbyatoxin	Rash, redness, burning, skin irritation, acute dermatitis, hives, blisters, abdominal pain, vomiting, diarrhea

Cyanobacteria Management

Even if toxins are not at detectable levels, we cannot conclusively say there are no risks associated with cyanobacteria infestations due to, 1) the continued discoveries of new toxins and other secondary metabolites and consequent lack of knowledge regarding their toxicological effects or analytical detection, and 2) the production of toxins is intermittent (some algae may not produce today, though may tomorrow or next week). Therefore, source control of the potential toxin producing culprits (i.e. cyanobacteria) is recommended to shut off the potential toxin source, remove the exposure and offset consequent risks. Management can be proactive (phosphorus management) to prevent further growth and/or reactive (algaecides). Management programs are developed on a site specific basis by incorporating characteristics of the algae (density, structure, location etc.), characteristics of the water (nutrient levels, hardness, pH etc.) and the designed formulation of solutions (phosphorus inactivation, copper formulation, surfactant presence, etc.). See the Treatment Guidance section of your SeSCRIPT report for a customized, site-specific management program and contact your SePRO Aquatic Specialist for additional assistance.

References

- Abe, T., Lawson, T., Weyers, J.D.B. and Codd, G.A. 1996. Microcystin-LR inhibits photosynthesis of *Phaseolus vulgaris* primary leaves: implications for current spray irrigation practice. *New Phytol.*, 133, 651-658.
- Bradley, W.G. & D.C. Mash. 2009. Beyond Guam: The cyanobacteria/BMAA hypothesis of the cause of ALS and other neurodegenerative diseases. *Amyotrophic Lateral Sclerosis* 10(s2): 7-20
- Carmichael, W.W., Azevedo, S.M.F.O., An, J.S., Molica, R.J.R., Jochimson, E.M., Lau, S., Rinehart, K.L., Shaw, G.R., Eaglesham, G.K. 2001. Human fatalities from cyanobacteria: Chemical and biological evidence for cyanotoxins. *Environmental Health Perspectives* 109(7), 663-668.
- Codd, G., Steven Bell, Kunimitsu Kaya, Clive Ward, Kenneth Beattie, James Metcalf. 1999. Cyanobacterial toxins, exposure routes and human Health. *Eur. J. Phycol.* 34: 405-415.
- Cook, W.O., Beasley, R., Lovell, A., Dahlem, A.M., Hooser, S.B., Mahmood, A. & Carmichael W. W. 1989. Consistent inhibition of peripheral cholinesterases by neurotoxins from the freshwater cyanobacterium *Anabaena flos-aquae*: studies of ducks, swine, mice and a steer. *Environmental Toxicology and Chemistry* 8, 9 15-922.
- Graham, J.L. 2007. Harmful Algal Blooms: Fact Sheet 2006-3147. U.S. Department of the Interior, U.S. Geological Survey.
- Jewett, E.B., Lopez, C.B., Dortch, Q., Etheridge, S.M, Backer, L.C. 2008. Harmful Algal Bloom Management and Response: Assessment and Plan. Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean Science and Technology. Washington, DC.
- Kos, P., Gorzo, G., Suranyi, G. and Borbely, G. 1995. Simple and efficient method for isolation and measurement of cyanobacterial hepatotoxins by plant tests (*Sinapis alba* L.). *Analyt. Biochem.*, 225, 49-53.
- MacKintosh, C., Beattie, K.A., Klumpp, S., Cohen, P. and Codd, G.A. 1990. Cyanobacterial microcystin-LR is a potent and specific inhibitor of protein phosphatases 1 and 2A from both mammals and higher plants. *FEBS Letters*, 264, 187-192
- Mez K, Beattie KA, Codd GA, Hauser KHB, Naegeli H, Preisig HR. 1997. Identification of a microcystin in benthic cyanobacteria linked to cattle deaths on alpine pastures in Switzerland. *Eur J Phycol* 32:111-117.
- Rogers, E.D., T. B. Henry, M. J. Twiner, J. S. Gouffon, J. T. McPherson, G. L. Boyer, G.S. Sayler, and S. W. Wilhelm. 2011. Global Gene Expression Profiling in Larval Zebrafish Exposed to Microcystin-LR and *Microcystis* Reveals Endocrine Disrupting Effects of Cyanobacteria. *Environ. Sci. Technol.*, 45 (5), pp 1962–1969.
- Persson, P.E. 1983 Off-flavors in aquatic ecosystems - An introduction. *Wat. Sci. Technol.*, 15, 1-11.
- WHO. 1999. Chapter 5: Safe Levels and Safe Practices, In: Toxic Cyanobacteria in Water. A guide to their public health consequences, monitoring and management. I. Chorus and J. Bartram, eds. Taylor and Francis. New York and London. 416 pp.
- Wood, S.A., Selwood AI, Rueckert A, Holland PT, Milne JR, Smith KF, Smits B, Watts LF, and Cary CS. 2007. First report of homoanatoxin-a and associated dog neurotoxicosis in New Zealand. *Toxicon* 50, 292-301.
-

Collection Procedures



SeSCRIPT® Analysis

Procedures for Sample Collection & Shipment

The following procedures are provided to ensure that algae and water collections are adequate for analysis and that sample integrity is maintained during shipment. It is critical that these steps are followed to provide accurate results.

Prepare Labels and Chain of Custody

Complete the Chain of Custody (COC) form online at <https://sepro.com/sync/aquatics/sescript-chain-of-custody> for the corresponding sample including analyses requested. Write out a label for EACH sample bottle that will be used at the sample collection site beforehand. Include ECOC number on each sample label. Place label on bottles after collection procedure.

NOTE: Only use black or blue ballpoint pens or permanent marker. Other ink types can be washed away by condensation.

Sampling for Algae ID

1. Grab one (1) 250 mL non-preserved sample bottle from your supplies. Label this bottle with the prepared label above for this sample collection site.
2. Triple rinse the sample bottle with water from the sample collection site.
3. Fill the sample bottle with a representative sample of water from the sample collection site. **Do not overfill**; fill to the bottom of the neck of the bottle.
4. If sampling an algae mat, do not stuff the bottle full; take a small sample of the mat and place in water in the bottle.
5. Seal the bottle well and place inside cooler on ice or with ice packs.



Non-Preserved

Sampling for Water Quality Analysis

1. Two (2) 250 mL plastic bottles are required for each sample collection station; one (1) preserved sample bottle and one (1) non-preserved sample bottle. Label these bottles with the prepared labels above for this sample collection site.

- NOTE: The preserved bottle contains sulfuric acid, which can cause burns.**
2. Triple rinse the non-preserved sample bottle with water from the sample collection site.
 3. Fill the sample bottle with a representative sample of water from the sample collection site. Using appropriate personal protective equipment (gloves, safety glasses, etc.), open the preserved bottle and pour sample water from non-preserved bottle into the preserved bottle. **Do not overfill**; fill to the bottom of the neck of the bottle. Seal the bottle well and place inside cooler on ice.
 4. Refill the non-preserved bottle with water from this same sample collection site. **Do not overfill**; fill to the bottom of the neck of the bottle. Seal the bottle well and place inside cooler on ice.



Non-Preserved



Preserved

Sample Shipment

1. Place fresh ice packs or ice in leak-proof bags into cooler and immediately **ship via Overnight Express** (morning delivery please). Samples should be 39°F upon arrival to ensure sample integrity. Packages that are leaking do not get delivered to the SRTC.
2. FedEx is the preferred freight method. **Do not ship via U.S. Mail.**

NOTE: Do not ship on a Friday.

3. Ship samples to:

SePRO Research & Technology Campus
16013 Watson Seed Farm Road
Whitakers, NC 27891
E-mail: srtclab@sepro.com

Questions?

If you have questions pertaining to sample collection, please contact your SePRO Aquatic Specialist.

Lake Montclair - Water Sample Field Conditions

Monitor Name(s): _____ Date Samples: _____

Water temp _____

Dolphin Beach Sampling Site Water Temp: _____

Was the sample taken between 9AM and 10AM? Yes _____ No _____ If no, what time? _____

Was the sample taken at a depth of 1' to 1.5'? Yes _____ No _____ If no, what depth? _____

Was the sample taken from same location? Yes _____ No _____ If no, where? _____

What was the water conditions? Clear _____ Green _____ Brown _____

Are surface scums or mats present? Yes _____ No _____

If yes, What is the color of the mats? Green _____ Blue _____ Yellow _____ Brown _____

Are dead or dying animals present? Yes _____ No _____

Are there any unusual odors? Yes _____ No _____.

West Beach Sampling Site Water Temp: _____

Was the sample taken between 9AM and 10AM? Yes _____ No _____ If no, what time? _____

Was the sample taken at a depth of 1' to 1.5'? Yes _____ No _____ If no, what depth? _____

Was the sample taken from same location? Yes _____ No _____ If no, where? _____

What was the water conditions? Clear _____ Green _____ Brown _____

Are surface scums or mats present? Yes _____ No _____

If yes, What is the color of the mats? Green _____ Blue _____ Yellow _____ Brown _____

Are dead or dying animals present? Yes _____ No _____

Are there any unusual odors? Yes _____ No _____.

Beaver Landing Sampling Site Water Temp: _____

Was the sample taken between 9AM and 10AM? Yes _____ No _____ If no, what time? _____

Was the sample taken at a depth of 1' to 1.5'? Yes _____ No _____ If no, what depth? _____

Was the sample taken from same location? Yes _____ No _____ If no, where? _____

What was the water conditions? Clear _____ Green _____ Brown _____

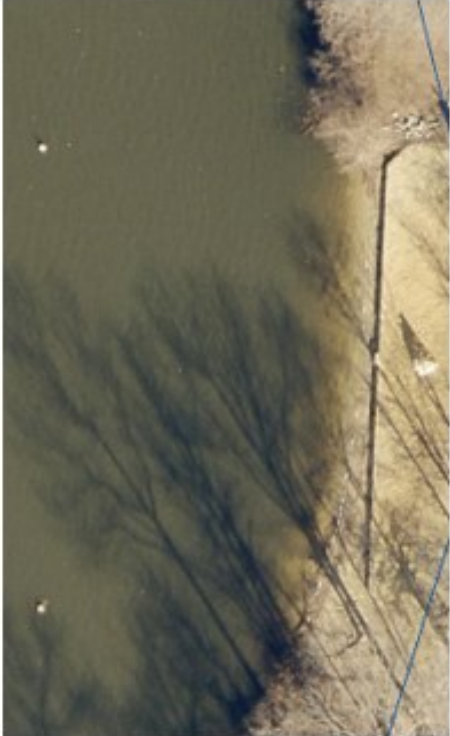
Are surface scums or mats present? Yes _____ No _____

If yes, What is the color of the mats? Green _____ Blue _____ Yellow _____ Brown _____

Are dead or dying animals present? Yes _____ No _____

Are there any unusual odors? Yes _____ No _____.

On the lake maps mark the location of harmful algae



Other Reference links for Further Education

Centers for Disease Control and Prevention – There are several articles covering blue green algae

<https://search.cdc.gov/search/?query=blue%20green%20algae&dpage=1>

Intergovernmental Oceanographic Commission (UNESCO)

Harmful Algal Information

https://hab.ioc-unesco.org/?option=com_content&view=featured&Itemid=100001

Solutions for managing cyanobacterial blooms: A scientific summary for policy makers.

<https://oceanexpert.org/document/26293>

Environmental Protection Agency - Harmful Algal Blooms (HABs) in Water Bodies

<https://www.epa.gov/habs/protecting-human-health-cyanotoxin-exposure-during-recreation>

Virginia Department of Health (VDH) – Harmful Algal Blooms

<https://www.vdh.virginia.gov/waterborne-hazards-control/harmful-algal-blooms/>

VDH- Beach Monitoring

<https://www.vdh.virginia.gov/waterborne-hazards-control/beach-monitoring/>

Michigan Natural Shoreline Partnership – scroll down the page to a PDF link to Natural Shorelines for Inland Lakes. This is an excellent PDF on Simple Solutions for Lakefront Property Owners.

<https://www.shorelinepartnership.org/library.html>