



Cyanobacterial Harmful Algal Blooms (cyanoHABs) & Drinking Water

Frequently Asked Questions

What are cyanobacteria?

Cyanobacteria are a type of bacteria capable of photosynthesis. Although they are not true algae, they were formerly known as “blue-green algae.” Cyanobacteria frequently impart off-tastes and odors to the water in which they grow, and sometimes excessive growth can produce toxins that can be harmful to the health of humans and other animal species. Although problems related to cyanobacteria most often occur in freshwater (i.e., lakes, streams, etc.), cyanobacteria can also be found in marine waters (i.e., saltwater).

What are cyanobacterial harmful algal blooms (cyanoHABs)?

A cyanoHAB is the name given to the excessive growth, or “bloom”, of cyanobacteria, which may produce one or more types of potentially harmful toxins (cyanotoxins). CyanoHABs occur under suitable environmental conditions of light, temperature, nutrients (particularly high concentrations of phosphorus), and calm water. CyanoHABs may result in a thick coating or “mat” on the surface of a waterbody, often in late-summer or early fall.

What are cyanotoxins?

Some cyanoHABs can potentially be harmful to humans and other animal species through the release of toxins, collectively referred to as cyanotoxins, into the water. Cyanotoxins are usually contained within cyanobacterial cells and are released during cell death and cell rupture (lysis); however, some cyanobacterial species are capable of releasing toxins into the water without cell rupture or death. The most commonly observed cyanotoxins in the United States are microcystins, cylindrospermopsin, anatoxin-a, and saxitoxin.

Can drinking water be effected by cyanotoxins?

Some drinking water sources such as rivers, lakes, and reservoirs can be impacted by cyanoHABs; however, water systems are aware of the occurrence of cyanoHABs in the source water and monitor for signs of a bloom. Some systems also have the ability to take preventative measures to reduce the likelihood of a bloom from occurring in their water source area(s). This can be

achieved through decreasing both external phosphorus loading (i.e., reducing stormwater and/or agricultural runoff) and internal phosphorus loading (i.e., installing mechanical aeration in the reservoir, inactivation of nutrients, etc.). Reducing nutrient loads means less “food” for cyanobacteria and, thus, reduces the chance of cyanoHABs occurrence and cyanotoxin production. Most water systems with conventional treatment have the ability to treat cyanotoxins effectively at the water treatment plant.

Based on sampling during the Fourth Unregulated Contaminant Monitoring Rule (UCMR4) from 2018 to 2020, (<https://www.epa.gov/sites/production/files/2018-10/documents/ucmr4-data-summary.pdf>), the data shows that exposure to cyanotoxins from treated drinking water is rare. If cyanotoxins break through the treatment processes and enter the distribution system at levels above established health advisories (see below for more detail), your water provider will notify you as soon as possible.

If you are a private well owner with an older well and/or are living near a lake, see <https://www.state.nj.us/dep/watersupply/pdf/HAB-factsheet.pdf> for additional information. If you suspect a cyanoHAB in your source water, it is advised that you follow the recommendations set forth below.

Can I use water containing cyanotoxins for cooking, food preparation, and/or infant formula?

No, if you receive a Cyanotoxin Drinking Water Advisory (Advisory) from your water purveyor, you and/or your pet should not consume the water until the Advisory is lifted. You should use an alternate source of water for drinking, making infant formula, making ice, preparing food (i.e., water for oatmeal, soup, pasta, rice, washing vegetables, etc.), and preparing beverages.

Will boiling my water remove cyanotoxins?

No, boiling water will not remove the cyanotoxins and may increase the cyanotoxin concentrations in your water due to evaporating off the water. If you receive an Advisory from your water purveyor, you should not drink the water until the Advisory is lifted.

Can I water my vegetable garden with water containing cyanotoxins?

It is recommended that leafy vegetables/greens irrigated with cyanoHAB contaminated water not be consumed. There is not a lot of research regarding root vegetables and fruits. Out of an abundance of caution, consumption of root vegetables and fruits from gardens irrigated with confirmed cyanoHAB contaminated water should be avoided or kept to a minimum.

Can I bathe or shower with water containing cyanotoxins? What about other household needs?

You may use tap water for showering, bathing, washing hands, washing dishes, flushing toilets, and for laundry; however, infants, young children under the age of six, and pets should be supervised while bathing and during other tap water-related activities to prevent accidental

ingestion of water.

What do we know about the occurrence of cyanotoxins in drinking water?

All large public surface water systems (serving over 10,000 customers), surface water purchasing systems, and a representative subset of smaller water systems were required to test for certain cyanotoxins (microcystins, cylindrospermopsin, and anatoxin-a) as part of USEPA's Fourth Unregulated Contaminant Monitoring (UCMR4) program. The results from the sampling are publicly available on USEPA's website at <https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule>. Of the thousands of samples submitted by New Jersey water systems, there were two detections from one sampling event. The water system that detected cyanotoxins reported their detected results in their Consumer Confidence Report, which is provided annually to all customers and may be available online at your water provider's website.

It is important to note that cyanotoxins are different from other contaminants because, when they occur, they are present for only a short (or limited) time, while other contaminants are generally present long-term. This could account for the very low-detection frequency during UCMR4 (i.e., this specific monitoring was not focused on sampling when cyanoHABs were present). Contact your water provider for more information on cyanotoxin monitoring in your drinking water.

What are the health risks of cyanotoxins?

Depending on the cyanobacterial species and the type of cyanotoxins being produced, the ingestion of drinking water that contains cyanotoxins can have a variety of adverse health effects. Potential health effects from acute exposure are listed in the table below (Table 1). Additionally, very high or repeated exposures to some types of cyanotoxins can cause additional effects such as liver and kidney damage. Some groups of cyanotoxins can affect your nervous system, resulting in tingling, burning, numbness, and respiratory complications. It is important to note that these potential health effects are only a concern if you ingest water containing cyanotoxins at elevated concentrations.

Table 1. Health Effects of Common Cyanotoxins.

Type of Cyanotoxin	Acute Health Effects in Humans*
Microcystin-LR	Abdominal Pain, Headache, Sore Throat, Vomiting and Nausea, Dry Cough, Diarrhea, Blistering around the Mouth, Pneumonia, Liver Toxicity
Cylindrospermopsin	Fever, Headache, Vomiting, Bloody Diarrhea, Liver Inflammation, Kidney Damage
Anatoxin-a	Tingling, Burning, Numbness, Drowsiness, Incoherent Speech, Salivation, Respiratory Paralysis Leading to Death
Saxitoxin	Tingling or numbness around the mouth or digits, headache, dizziness, nausea, vomiting, incoherent speech, shortness of breath, muscular paralysis, Respiratory Paralysis Leading to Death

*More information can be found in *2021 Cyanobacterial Harmful Algal Bloom Freshwater Recreational Response Strategy*: <https://www.state.nj.us/dep/hab/download/HAB2021StrategyFinal.pdf>.

Are cyanotoxins regulated in drinking water?

No, a federal (USEPA) or New Jersey (NJDEP)-specific drinking water standard has not been established for cyanoHABs. In June 2015, USEPA released 10-day Health Advisories (HAs) for two cyanotoxins (microcystin and cylindrospermopsin). These HAs are based on health impacts which would occur over an exposure time of 10 days (Table 2). HAs are non-regulatory, non-enforceable values that serve as informal technical guidance to assist federal, state, and local officials, and managers of public or community water systems to protect public health from contaminants.

NJDEP Division of Science and Research reviewed the scientific information considered by USEPA, as well as more recent scientific information on the health effects of cyanotoxins, to develop draft NJ Guidance Levels for three cyanotoxins in drinking water (microcystin, anatoxin-a, and cylindrospermopsin), released in August 2017. These Guidance Levels are intended to be applied for the same 10-day exposure duration as the USEPA HAs. In May 2021, NJDEP released a Guidance Level for saxitoxin.

Table 2. USEPA Health Advisories and NJDEP Draft Guidance Levels for Common Cyanotoxins

Cyanotoxin	USEPA 10 Day HA (µg/L*)	DRAFT** NJ Guidance Level (µg/L)
Microcystin		
≤ 6 years of age	0.3	0.07
6 years of age and older	1.6	0.3
Cylindrospermopsin		
≤ 6 years of age	0.7	0.2
6 years of age and older	3.0	1.0
Anatoxin-a		
≤ 6 years of age	--	0.7
6 years of age and older	--	3.3
Saxitoxin		
≤ 6 years of age	--	0.025
6 years of age and older	--	0.11

*micrograms per liter concentration is equal to parts per billion (ppb)

**these numbers are draft until the point that more feasible testing is available

Why are there different cyanotoxin Health Advisories for younger children?

Younger children have an increased risk of experiencing health effects from cyanotoxins because they consume more water relative to their body weight than do older children and adults.

What is NJDEP doing about cyanoHABs in drinking water sources in New Jersey?

NJDEP is currently working with New Jersey’s surface water systems to develop policies, protocols, and guidance to be better prepared for and respond to cyanoHABs. If a cyanoHAB develops in a drinking water source area, NJDEP has developed emergency response protocols to respond to and communicate with water systems during a cyanoHAB event.

What can I do to help?

There are various actions that customers can take to help prevent the occurrence of cyanoHABs in source water. You can help reduce nutrient pollution both at home and in your yard. It is important to inspect and pump out your septic system regularly. Do not use household products containing phosphorous, and only apply fertilizers when necessary.

More information about actions you can take to help can be found here:

<https://www.epa.gov/nutrientpollution/what-you-can-do>

<https://www.jerseyyards.org/>

<https://www.state.nj.us/dep/hab/download/HABGuideNorth0520.pdf>

<https://www.state.nj.us/dep/hab/download/HABGuideSouth0520.pdf>

Additionally, you can assist NJDEP by identifying and reporting HABs in your area by using the following information: <https://www.state.nj.us/dep/hab/docs/HABsFactSheet2023.pdf>

Contacts and Helpful Links

For questions regarding drinking water, contact your local water supplier or NJDEP Division of Water Supply and Geoscience (watersupply@dep.nj.gov; 609-292-2957):

<http://www.nj.gov/dep/watersupply>

NJDEP Hotline: 1-877-WARNDEP (1-877-927-6337)

<http://www.nj.gov/dep/warndep.htm>

NJDEP Harmful Algal Bloom Website:

<https://www.nj.gov/dep/hab/>

NJDEP HAB Reporting and Communication System:

<https://survey123.arcgis.com/share/993bfe45dc494666af762b5397c12b9c>

Current Status of New Jersey HABs:

<https://njdep.maps.arcgis.com/apps/opsdashboard/index.html#/49190166531d4e5a811c9a91e4a41677>

NJDEP Bureau of Freshwater & Biological Monitoring (njcyanoabs@dep.nj.gov):

<http://www.state.nj.us/dep/wms/bfbm>

<http://www.state.nj.us/dep/wms/bfbm/CyanoHABHome.html>

NJ Department of Health Public Health and Food Protection Program (PHFPP):

<https://www.nj.gov/health/ceohs/phfpp/>

Local and County Health Departments in New Jersey:

<https://www.nj.gov/health/lh/community/index.shtml>

Rutgers New Jersey Agricultural Experiment Station Blue-Green Algae in Waterways:

<http://njaes.rutgers.edu/pubs/fs1216/>

USEPA Cyanobacterial Harmful Algal Blooms (including links to other states' information):

<https://www.epa.gov/cyanoabs>

USEPA Frequently Asked Questions:

https://www.epa.gov/sites/default/files/2016-11/documents/harmful_algal_blooms_and_cyanotoxins_frequently_asked_questions.pdf

National Oceanographic and Atmospheric Administration (NOAA):

<https://oceanservice.noaa.gov/hazards/hab/>

New York Department of Environmental Conservation Blue-Green Harmful Algal Blooms:

<http://www.dec.ny.gov/chemical/77118.html>