

# Harmful Algal Blooms

Implications for Tap/Drinking Water and Recreational Waters



## Harmful Algal Blooms (HABs)

Cyanobacteria, often called blue-green algae, are commonly found in Ohio lakes, ponds, and slow-moving rivers. Although many species of blue-green algae do not produce toxins, some species of blue-green algae can cause Harmful Algal Blooms (HABs).

HABs occur when there is a shallow body of fresh water, warm temperatures, sunlight, and excessive amounts of nutrients (phosphorus and nitrogen) in the water. Phosphorus and nitrogen are commonly found in animal and human waste and in fertilizers.

Under the right conditions, the numbers of blue-green algae can dramatically increase or “bloom” in a body of water. Some of these HABs are visible as thick mats or scum on the surface of the water. These mats can vary in color, including bluish-green, bright green, or even red or maroon.



## HABs Can Produce Harmful Toxins, Including Microcystin

HABs can produce toxic chemicals in the form of neurotoxins (which affect the nervous system), hepatotoxins (which affect the liver), and dermatotoxins (which affect the skin).

Toxin	Type of Toxin
Anatoxin-a	Neurotoxin
Anatoxin-a(s)	Neurotoxin
Cylindrospermopsin	Hepatotoxin
Lyngbyatoxin	Dermatotoxin
Microcystin	Hepatotoxin
Saxitoxin	Neurotoxin

All of these toxins can potentially impact the health of people who come into contact with water contaminated with them, depending upon the type and levels of toxins in the water, and the type of contact with the contaminated water.

### Common Ways for Contact with HABs

The most common ways to come into contact with HABs are:

- **Drinking/Swallowing** - Drinking HABs-contaminated water from a public water system during a drinking water advisory or the incidental/accidental swallowing of contaminated water such as during water-related recreational activities.
- **Skin Contact** - Swimming, skiing, tubing and other recreational activities in HABs-contaminated waters.
- **Inhaling** - Breathing aerosolized water droplets (misting) of HABs-contaminated water from recreational activities such as jet-skiing or power boating.



Other than through water droplets (misting) such as caused by recreational water activities, HABs toxins **do not release** into the air and pose a health risk.

Some of the blue-green algae produce odor-generating by-products that **are not** toxic but have a very unpleasant smell which can cause sensitive individuals to become nauseated (upset stomach, vomiting) and develop headaches.

## Health Problems Exposure to HABs Can Cause in People & Pets

### Drinking/Swallowing HABs-Contaminated Water

- Severe diarrhea and vomiting
- Liver toxicity (abnormal liver function, abdominal pain)
- Kidney toxicity
- Neurotoxicity (weakness, salivation, tingly fingers, numbness, dizziness)
- Difficulty breathing
- Death

### Skin Contact with HABs-Contaminated Water

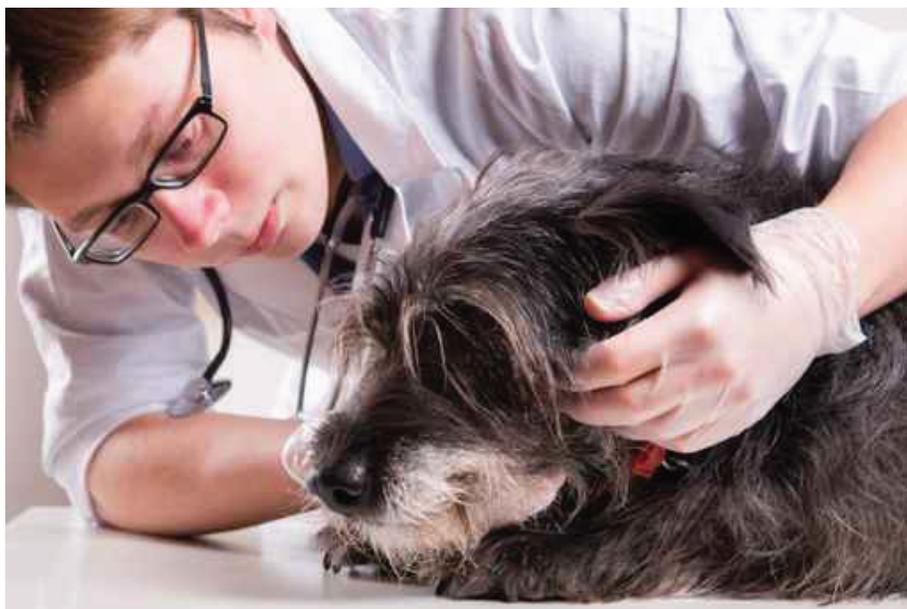
- Rashes
- Hives
- Skin blisters (especially on the lips and under swimsuits)

### Inhaling HABs-Contaminated Water

- Runny eyes and nose
- Sore throat
- Asthma-like symptoms
- Allergic reactions

Individuals should seek medical attention if they believe that they have been exposed to algal toxins and are having adverse health effects.

Contact a veterinarian immediately if pets show signs of illness.



## Advisories for HABs-Contaminated Drinking Water

Ohio communities and/or public water systems issue two types of Drinking Water Advisories depending upon the level of HABs toxins in the finished drinking water.

Type of Advisory	Microcystin	Anatoxin-a	Cylindrospermopsin	Saxitoxin
<p><b>Do Not Drink Advisory for:</b></p> <ul style="list-style-type: none"> <li>• Bottle-fed infants and children younger than school age</li> <li>• Pregnant women</li> <li>• Nursing mothers</li> <li>• Individuals with pre-existing liver conditions</li> <li>• Individuals receiving dialysis treatment</li> </ul> <p>As a precautionary measure, the elderly and individuals with compromised immune systems may want to consider using an alternate water source as well</p>	0.3 µg/L	20 µg/L	0.7 µg/L	0.2 µg/L
<p><b>Do Not Drink Advisory for:</b></p> <ul style="list-style-type: none"> <li>• All people of all ages</li> <li>• Pets</li> <li>• Livestock</li> </ul>	1.6 µg/L	20 µg/L	3 µg/L	0.2 µg/L

Note that values are reported in µg/L (microgram per cubic liter), which is equal to one (1) part per billion (ppb).

During a drinking water advisory, an alternative water source, such as bottled water, should be used for:

- Drinking
- Making infant formula
- Making ice
- Preparing food
- Brushing teeth

During a drinking water advisory, healthy individuals may continue to use the water for:

- Washing hands
- Bathing
- Washing dishes
- Doing laundry

Children five years old and younger should be supervised when bathing to prevent accidental ingestion.

Skin irritation, such as a rash may occur from exposure when washing hands and bathing.

Providing a final rinse of skin with uncontaminated water is recommended, especially for items that go into the mouths of infants and children under the age of six years (i.e., teething rings, nipples, bottles, toys, silverware).

Do not boil the water. Boiling the water will not remove the toxins.

## Advisories for HABs-Contaminated Recreational Waters

The Ohio Department of Health (ODH) issue two types of Recreational Water Advisories depending upon the level of HABs toxins in such waters.

Type of Advisory	Microcystin	Anatoxin-a	Cylindrospermopsin	Saxitoxin
Recreational Public Health Advisory – A sign is posted on beaches when toxin levels exceed the recommended threshold, warning individuals who are elderly or very young and people with compromised immune systems that swimming and wading are not recommended	6 µg/L	80 µg/L	5 µg/L	0.8 µg/L
Recreational No Contact Advisory – A sign is posted on beaches when toxin levels exceed the recommended threshold and there is at least one probable case of human illness or a pet death attributable to HABs. The sign notes that ODH is aware of at least one HABs-related illness that season, and swimming and wading are not recommended	20 µg/L	300 µg/L	20 µg/L	3 µg/L

Note that values are reported in µg/L (microgram per cubic liter), which is equal to one (1) part per billion (ppb).

## Public Health Guidance in Specific Settings During Drinking Water Advisories

ODH offers public health guidance for specific settings after a community and/or its public water system issues a drinking water advisory. For information about any current drinking water advisories, go to [ohioalgaefinfo.com](http://ohioalgaefinfo.com).

ODH offers this [guidance](#) in the following settings on its website at [odh.ohio.gov](http://odh.ohio.gov) under “Harmful Algal Blooms” in the A-Z Index:

- Ambulatory Surgical Facilities
- Birthing Centers
- Campgrounds/Resident Camps
- Daycare/Day Camp/Preschool Facilities
- Dental Offices/Clinics
- Dialysis Centers
- In-Home Dialysis
- Fire Departments
- Food and Beverage Manufacturing
- Food Service Operations
- Retail Food Establishments



- Home Health
- Hospice
- Hospitals
- Nuclear Power Stations
- Office Buildings
- Pet Stores
- Pools/Waterparks/Spas
- Private Homes
- Private Water Systems
- Residential Care/Assisted Living Facilities
- Skilled Nursing Facilities/Long-Term Care Facilities
- Schools and Universities
- Women, Infant and Children Program

## How to Treat People and Pets Exposed to HABs Toxins

If you come into contact with HABs-contaminated water, rinse off with clean, fresh water as soon as possible.

Thoroughly rinse off your pets with clean, fresh water. Pets that have been in HABs-contaminated water may ingest toxins by drinking the water and/or licking their fur afterward.



Seek immediate medical attention if you think that you, your pet or your livestock might have been poisoned by HABs toxins.

As a resource for healthcare providers, a HABs [Physician Reference](#) is posted on ODH's website at [odh.ohio.gov](http://odh.ohio.gov) under "Harmful Algal Blooms" in the A-Z Index.

As a resource for veterinarians, a HABs [Disease in Animals](#) fact sheet is posted on ODH's

website at [odh.ohio.gov](http://odh.ohio.gov) under “Harmful Algal Blooms” in the A-Z Index.

## Eating Fish Caught in HABs-Contaminated Waters

The Ohio Department of Natural Resources Division of Wildlife works closely with the Ohio Environmental Protection Agency and ODH to monitor fish tissue.

Preliminary fish tissue monitoring and research indicates that fish caught in areas affected by HABs should be safe to eat as long as the [Ohio Sport Fish Health and Consumption Advisory guidelines](#) are followed. The guidelines are posted on the Ohio EPA’s website at [epa.ohio.gov](http://epa.ohio.gov).



There is minimal evidence in scientific literature suggesting the accumulation of microcystin toxins in fish fillets with transmission to people who eat them. Fish appear to metabolize microcystin toxins relatively quickly, although evidence suggests that the toxins may concentrate in fish livers.

It is recommended that fish and fish fillets be rinsed with clean water before consumption as a precaution. **Do not** eat internal organs since microcystin toxins and other contaminants have the potential to concentrate in them.

## How to Report a Suspected HABs Illness to ODH

Individuals who are concerned that they may be experiencing HABs illness symptoms after exposure to contaminated water should contact their healthcare provider. Healthcare providers who rule out other potential causes of the symptoms and suspect a HABs illness, should notify their local health district.

Local health districts should complete forms for reports of human illnesses associated with either [recreational](#) or [public water system](#) exposure to HABs toxins. Both forms are posted on ODH’s website at [odh.ohio.gov](http://odh.ohio.gov) under “Harmful Algal Blooms” in the A-Z Index. Completed forms should be faxed to the ODH Bureau of Environmental Health and Radiation Protection secure fax: 614-466-4556.



Pet and livestock owners who are concerned that their animal may be experiencing HABs illness symptoms after exposure to contaminated water should contact their veterinarian. Veterinarians who rule out other potential causes of the symptoms and suspect a HABs illness, should complete an [animal illness report](#) form which is also posted on the ODH website. Completed forms should be faxed to the ODH Zoonotic

Disease Program secure fax: 614-564-2437.

## References and Additional Information

Ohio Department of Health Harmful Algal Blooms webpages,  
<http://www.odh.ohio.gov/odhprograms/eh/HABs/algalblooms.aspx>

Ohio Environmental Protection Agency Harmful Algal Blooms webpages,  
[Ohioalgaeinfo.com](http://Ohioalgaeinfo.com)

CDC Environmental Hazards & Health Effects, Harmful Algal Blooms,  
<http://www.cdc.gov/nceh/hsb/hab/default.htm>

U.S. Environmental Protection Agency, 2015 Drinking Water Health Advisories for Two Cyano-bacterial Toxins, Office of Water 820F15003, June 2015,  
<http://www2.epa.gov/sites/production/files/2015-06/documents/cyanotoxins-fact-sheet-2015.pdf>

