

Occupational Exposure Guidelines for Blue-Green Algae in Florida

Blue-green algae present potential exposure through incidental ingestion, skin contact (dermal), and breathing (inhalation) hazards. This guidance is for employers and employees whose jobs (commercial fishers, eco-tourism operators, lifeguards, water sampling staff, waterfront restaurant employees, etc.) may require them to work on a waterbody affected by blue-green algae. When possible, preventative measures should be taken. Individuals should consider if their circumstances allow for preventative measures and appropriate personal protective equipment (PPE) after speaking with their health care provider.

Blue-Green Algae (Cyanobacteria)

What is blue-green algae? Blue-green algae may look like foam, scum, paint-like streaks, or a floating mat on the surface of the water.^{1,2} However, some blue-green algae may not be visible and can exist beneath the surface of the water. Blue-green algae often discolor the water, emit an unpleasant odor, and can be green, blue, red, or brown.^{3,4}

Where and when is blue-green algae common? Blue-green algae are frequently found throughout freshwater environments such as lakes, rivers, and streams but also occur in brackish and marine waterbodies.^{3,4} Conditions that contribute to blue-green algal bloom production are sunny days, warm water temperatures, still water conditions, and a plentiful supply of nutrients in the waterbody. Blue-green algal blooms can occur at any time but are most frequent in the summer and early fall.²

What health concerns are associated with blue-green algae? Some, but not all, blue-green algae can produce toxins.⁴ It is not possible to tell if a blue-green algal bloom is harmful just by looking at it, and toxins can be present in a waterbody without a visible bloom.⁴ When exposed to blue-green algae toxins, various health effects may occur. The primary routes of exposure are incidental ingestion and contact with the skin (dermal) during occupational activities. When these toxins are ingested, the most common symptoms are nausea, abdominal pain, and diarrhea. Contact with the skin can lead to hives, blisters, rashes, itching, and irritation. Breathing in the toxins (inhalation) could cause respiratory irritation. Individuals with preexisting conditions may be more sensitive than others. Additionally, the decay of blue-green algal blooms can produce hydrogen sulfide. While unpleasant to smell, the amount of hydrogen sulfide produced in open, outdoor air during decay is not found to be harmful.

How to prevent exposure to blue-green algae: Some best practices to prevent exposure to blue-green algae toxins are to avoid unnecessary contact with water that could have blue-green algae present, avoid inhaling water spray, rinse skin after contact with water, and wash hands before eating and drinking (avoid hand-to-mouth contact). PPE that can be used to help protect against toxins associated with blue-green algae includes respirators, proper diving equipment that covers exposed skin, waterproof gloves, and waders. Check with your health care provider before using PPE. It is also recommended for occupations that sample and monitor blue-green algae to use sampling equipment that helps limit direct contact with bloom water, such as sampling poles and Secchi disks.

¹ ProtectingFloridaTogether.gov/BGAsignageEnglish

² FloridaHealth.gov/environmental-health/aquatic-toxins/harmful-algae-blooms/

³ ProtectingFloridaTogether.gov/education-center/blue-green-algae

⁴ FloridaDEP.gov/sites/default/files/freshwater-algal-bloom-faqs_2019.pdf

Table 1

	Inhalation	Ingestion	Skin Contact
Common Toxins and Irritants	• Microcystins ◦ Hepatotoxin • Hydrogen sulfide (H₂S) and other decomposition products	• Microcystins ◦ Hepatotoxin • Nodularins ◦ Hepatotoxin • Cylindrospermopsins ◦ Cytotoxin, Neurotoxin, Hepatotoxin • Anatoxins ◦ Neurotoxin • Saxitoxins ◦ Neurotoxin	• Lyngbyatoxin-a ◦ Dermatoxin • Lipopolysaccharides ◦ Endotoxin • Associated organisms
Possible Symptoms and Signs	• Upper respiratory irritation (wheezing, coughing, and shortness of breath) • Runny nose • Sore throat • Headache	• Nausea • Abdominal pain • Diarrhea	• Hives • Blisters • Rashes • Itching • Irritation • Conjunctivitis • Eye irritation
Prevention	• Avoid inhaling spray or getting spray in eyes. • Avoid proximity to the water at times of inshore winds • Do any prep work outside of affected areas. • Test water before use in industrial or agricultural activities (e.g., mining and irrigation).	• Avoid swimming in blue-green algae affected areas. • Wash hands before eating and drinking; avoid hand-to-mouth contact. • Use equipment that doesn't rely on in-water exposure. • Avoid conditions that can contribute to accidental immersion. • Avoid drinking blue-green algae contaminated water.	• Avoid contact with waters where blue-green algae could be present. • Use equipment that doesn't rely on in-water exposure.
PPE	• Respiratory protection: Respirator	• Diving protection: dry suit, full face mask, breathing from a tank, or skin covering as necessary	• Waterproof gloves • Eye protection • Waders or boots
Occupational Category	• Near water • On-water • In-water	• In-water	• On-water • In-water
Treatment Options	• Leave the area • Go to an air-conditioned area • Rescue inhaler for asthmatic individuals	• Talk to your health care provider • Seek symptom relief treatment options	• Rinse exposed areas with soap and clean water • Rinse equipment with clean water

Table 1. Report symptoms from exposure to a blue-green algae bloom or any aquatic toxin to a Florida Poison Control Center. Call 800-222-1222 to speak to a poison specialist immediately.

Refer to the *Resource Guide for Public Health Response to Harmful Algal Blooms in Florida* for additional information.
[MyFWC.com/research/redtide/research/scientific-products/tr14/](https://myfwc.com/research/redtide/research/scientific-products/tr14/)



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