

Cyanotoxins in Missouri Recreational Waters

FACT SHEET



The Missouri Coalition for the Environment (MCE) has submitted a petition urging the Missouri Department of Natural Resources (MDNR) to adopt the Environmental Protection Agency's (EPA) recommended water quality criteria for two types of dangerous cyanotoxins, microcystin and cylindrospermopsin. These cyanotoxins are harmful to human and animal health and can result in the closure of Missouri's lakes and reservoirs to activities such as fishing, swimming, and boating. Currently, the state of Missouri does not have standards in place to regulate either of these cyanotoxins.



Photo Credit: <https://showme.missouri.edu/2020/controlling-light-could-leave-toxic-algae-dead-in-the-water-mu-researchers-find/>

What are cyanotoxins?

Cyanotoxins are toxic compounds produced by cyanobacteria.¹ Cyanobacteria, also known as blue-green algae, are naturally occurring and are found in freshwater and marine ecosystems.² Under certain environmental conditions, such as elevated levels of nutrients,³ cyanobacteria can grow rapidly to form harmful algal blooms known as “HABs.”

¹ EPA, 822-F-19-001, Fact Sheet: Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin (May 2019), <https://www.epa.gov/sites/production/files/2019-05/documents/hh-rec-criteria-habs-factsheet-2019.pdf> [hereinafter EPA Fact Sheet].

² *Id.*

³ *Id.* In addition to elevated levels of nutrients, other environmental conditions that can promote the growth of cyanobacteria include “warmer temperatures, still water, and plentiful sunlight.” *Id.*

What are the effects of cyanotoxins?

The Centers for Disease Control and Prevention (CDC) calls cyanotoxins “among the most powerful natural poisons known,” as they can cause adverse health effects in humans and animals.⁴ In addition, cyanotoxins can devastate ecosystems and subsequently harm local economies.

Health Effects

Cyanotoxins can cause liver failure and cancer, in addition to allergic reactions, dermatitis, gastroenteritis, and seizures.⁵ In pets and livestock common signs of cyanotoxin poisoning include skin rash or hives, inactivity, loss of appetite, abdominal swelling, stumbling, vomiting, diarrhea, seizures, and in some cases death.⁶ Exposure to cyanotoxins can occur from drinking water and through recreational activity, via accidental ingestion, skin contact, or inhalation.⁷

Economic Effects

Cyanotoxins also have harmful economic consequences. The closure of waters polluted with cyanotoxins can have economic impacts such as loss of recreational revenue, impacts to commercial fisheries, recreational fishing, tourism, decreased property values, and increased drinking water treatment costs.⁸

In Missouri, cyanotoxins pose a particular economic threat, as outdoor recreation is a key industry which generates \$889 million in state and local tax revenue annually.⁹

What are Missouri’s current standards for cyanotoxins?

The majority of states currently have quantitative water quality guidelines for cyanobacteria, cyanotoxins, or both.¹⁰ Missouri, however, has only qualitative guidelines for cyanotoxins, consisting of a presence/absence test for microcystins and cylindrospermopsin, and no guidelines for cyanobacteria.¹¹ The presence/absence test for cyanotoxins may take place once clear visual indicators, such as surface scum, are present; however, toxin concentrations of HABs can rapidly increase before a visible bloom is observed and persist after the bloom fades, making presence/absence testing inadequate.¹²

What are the EPA’s recommended water quality standards for cyanotoxins?

The EPA recommends a limit of or below 8 micrograms/liter (µg/L) for microcystins and 15 µg/L for cylindrospermopsin to ensure safe recreation involving water contact.¹³ MCE is requesting that the MDNR establish criteria for microcystin and cylindrospermopsin in accordance with these recommendations.

⁴ CDC, CS258158, Cyanobacterial Blooms FAQs, https://www.cdc.gov/habs/pdf/cyanobacteria_faq.pdf.

⁵ U.S. Geological Survey, Open-File Report 2016-1174, Cyanobacterial Harmful Algal Blooms and Science Capabilities: U.S. Geological Survey Science Capabilities, at 2 (Dec. 2017).

⁶ EPA, 822-R-19-001, Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin (May 2019), <https://www.epa.gov/sites/default/files/2019-05/documents/hh-rec-criteria-habs-document-2019.pdf> [hereinafter EPA Recommended Water Quality Criteria].

⁷ *Id.*

⁸ Walter K. Dodds et al., *Eutrophication of U.S. Freshwaters: Analysis of Potential Economic Damages*, 43 ENV'T SCI. AND TECH. 12 (2009).

⁹ Missouri, OUTDOOR INDUS. ASS'N, https://outdoorindustry.org/wp-content/uploads/2017/07/OIA_RecEcoState_MO.pdf (last visited Oct. 11, 2021).

¹⁰ EPA Recommended Water Quality Criteria, *supra* note 6 at B-1.

¹¹ *Id.* at B-18.

¹² EPA Fact Sheet, *supra* note 1, at 1.

¹³ EPA Recommended Water Quality Criteria, *supra* note 6 at 17.