

Cyanobacteria Bloom Response Coordination Between the
Florida Department of Environmental Protection, the Florida Department of Health, and Local
County Health Departments
December 2021

Introduction

Cyanobacteria blooms are an annual occurrence in the State of Florida. The Florida Department of Environmental Protection (DEP) and the Florida Department of Health (DOH) have worked together for many years, along with other state and local government agency staff, to respond to these bloom events. A variety of tools and techniques have been applied over the years in an effort to best protect public health. The intent of this document is to clearly articulate each agency's responsibilities and roles when responding to cyanobacteria blooms, and to explain the current best practices being followed to communicate and coordinate cyanobacteria bloom response with the local county health departments.

Regulatory Roles

The DEP is an executive branch agency (Chapter 403, Florida Statutes) and is the state's lead agency for environmental management and stewardship, protecting our air, water, and land. Surface water quality in Florida is regulated through the DEP's implementation of the United States Environmental Protection Agency's (EPA) Clean Water Act and 40 CFR 131. Florida's surface water quality standards are published in Chapter 62-302, Florida Administrative Code (FAC).

Drinking water quality is regulated through the DEP's and the DOH's implementation of the EPA's Safe Drinking Water Act (SDWA). Florida's primary drinking water standards are published in Chapter 62-550, FAC. The DEP is the primary agency responsible for implementing the SDWA, however, the DOH implements the program in seven counties (Hillsborough, Lee, Miami-Dade, Palm Beach, Polk, Sarasota, and Volusia).

The DOH is an executive branch agency (Chapter 20.43, Florida Statutes) and is the state's lead agency for public health. The DOH is led by a State Surgeon General, who serves as the State Health Officer and is directly appointed by Florida's Governor and confirmed by Florida's Senate.

The DOH is comprised of a state health office in Tallahassee, with statewide responsibilities; Florida's 67 County Health Departments (CHDs); 22 Children's Medical Services (CMS) area offices; 12 Medical Quality Assurance (MQA) regional offices; nine Disability Determinations regional offices; and three public health laboratories. Facilities for the 67 CHDs are provided through partnerships with local county governments. These 67 CHDs have a total of 255 sites throughout the state, providing a variety of services, and ranging from small to large in location size.

Cyanobacteria Bloom Response Sampling and Analysis

The DEP is the lead agency for cyanobacteria bloom response sampling and analysis. The DEP maintains both the Algal Bloom Dashboard (<https://floridadep.gov/AlgalBloom>) and the Protecting Florida Together (<https://protectingfloridatogether.gov/>) webpage. Both webpages provide information about tools the public can use to notify the state about a cyanobacteria bloom through a toll-free hotline number or an online reporting page. All calls to the hotline are entered by DEP staff into the online reporting tool.

DEP staff review the submitted reports on a daily basis and use the information to schedule and prioritize site visits for sampling reported blooms. Site visits and sampling activities are performed by FDEP, Water Management District (WMD), Fish and Wildlife Conservation Commission (FWC), and trained local government (county and city) staff. Blooms in privately owned ponds, lakes, and stormwater retention ponds are not sampled as part of the State's cyanobacteria bloom response. Private landowners with blooms are typically referred to UF/IFAS or their local government for further assistance. Landowners may also wish to have their private waterbodies tested by a private laboratory. The DOH maintains a database of certified laboratories at <https://glik.dep.state.fl.us/anon/sense/app/17c7c199-2c02-4f1e-9288-ad20a293694a/sheet/2c856f40-bcad-4024-ba35-88276ab274c3/state/analysis>.

The Algal Bloom Dashboard includes a map showing where sampling has occurred. Samplers use a smart phone app to drop a pin on the map where they are sampling and to answer a few basic questions about whether they see a bloom at the time of their site visit and whether they collected a sample. This information is available to the public in near real time. The public can click on the sample location pin, and a dialog box will open providing this information, as well as the analytical results once they are available. The public can also review the sampling and analysis information in a table format as well. Anyone can save this information as a CSV file and open it in an Excel Spreadsheet.

Cyanobacteria bloom samples that are collected by DEP, or any of the other agency or local government staff, are sent to the DEP laboratory in Tallahassee, Florida for analysis. During the active bloom season, the samples are analyzed, and the results are posted online within 3-4 days. During the cooler months when blooms are less common and less intense, the results are posted online weekly.

Cyanobacteria Bloom Public Health Notification Thresholds for Recreational Waters

The DOH recommends that local county health departments use two cyanobacteria bloom thresholds as the basis for issuing public health notifications.

1. The dominance or co-dominance of a cyanobacteria species in a sample collected from a waterbody (indicating a bloom),
2. The presence of any detectable levels of cyanotoxins in a sample collected from a waterbody.

The DOH, with concurrence of DEP staff and with input from members of Florida's Blue Green Algae Task Force, has decided that it is most appropriate to use these very conservative thresholds over other published numeric cyanotoxin thresholds, such as those published by the United States Environmental Protection Agency (EPA) ([Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin Documents | Water Quality Criteria | US EPA](#)) or the World Health Organization (WHO) (<https://apps.who.int/iris/bitstream/handle/10665/338066/WHO-HEP-ECH-WSH-2020.6-eng.pdf>) for several reasons:

1. The speed with which cyanobacteria blooms in Florida waters can form, concentrate, disperse, and migrate;
2. The amount of time it takes to collect, ship, analyze, report, and disseminate algal bloom sample results;
3. The lack of adequate human health data for a large number of cyanotoxins that are known to potentially co-occur along with the limited number of cyanotoxins for which human health thresholds are available; and
4. The lack of commercially available analytical standards (used to quantify the level of cyanotoxin in the sample) for most cyanotoxins.

Some cyanobacteria, like *Microcystis aeruginosa* which is one of the most common cyanobacterial bloom species in Florida, form surface scums. These surface scums can accumulate through wind, current, and wave action and then dissipate over a period of hours. This means that conditions that are present when the sampler collected a given sample may be very different than the conditions when a person visiting the water is deciding whether to recreate in and/or on the water. It typically takes no less than 3 days to collect, ship, analyze, report, and post the results to the DEP webpage, and site conditions can change dramatically over that timeframe. By basing the public health notifications on the simple presence of cyanobacteria or their toxins, rather than some specific numerical threshold, the DOH ensures that the public is protected even if conditions worsen.

Both the EPA's and the WHO's recreational threshold for microcystins are based on decades old toxicological data for only one microcystin congener, microcystin-LR (MC-LR). There have been approximately 250 microcystin congeners identified, and while many of these are believed to be less toxic than MC-LR, some of them are more toxic. The EPA and WHO thresholds simply assume that all congeners are equally toxic as MC-LR. The EPA's recommended thresholds for microcystin apply whether the laboratory is measuring only MC-LR, a dozen congeners, or whether they're using a microcystin ELISA kit that measures the total of all microcystin congeners. As a result, laboratories could report values that are orders of magnitude different from each other for the same sample. Similarly, EPA guidance on collecting the samples is not prescriptive enough to guarantee that different sampling entities would collect samples that are equivalent, leading to the potential for conflicting public health messaging.

Communicating Cyanobacteria Bloom Results to the Local County Health Departments

Staff at the DOH in Tallahassee, Florida review the DEP's Algal Dashboard each morning for the most current analytical results. An Excel spreadsheet is prepared that identifies waterbodies that have blooms present, whether cyanotoxins were detected, or have toxin results pending for each affected county. The DOH notification process was updated on May 27, 2021, based on feedback indicating that the DOH's existing method of notifying HAB-related environmental conditions was not always consistent throughout the state. Previously, reliance was on signage at impacted locations. Now, the DOH asks that the local county health department issue a *Caution* notification if cyanobacteria are the dominant or co-dominant taxon/taxa in the sample collected from the waterbody. The DOH state health office instructs the local county health department to issue a *Health Alert* notification if cyanotoxins are detected in the sample collected from the waterbody. While signage is not required, it may still be used if local stakeholder's desire.

In summary:

For a *Caution* – the presence of a bloom constitutes a *Caution*. The CHD will follow established local alert notification procedures to notify the public.

For a *Health Alert* – the presence of a toxin constitutes a *Health Alert*. In addition to the above for the *Caution* notification, the CHD will issue a press release. Press releases will be posted on www.FLHealth.gov/HABNotifications.

For a *Lift Alert* – a *Health Alert* is lifted once negative toxin analyses are obtained from DEP-coordinated resampling of the bloom, or 30 days have elapsed since the last sampling date. If a *Health Alert* has been issued, the CHD can rescind it at this time. A *Caution* can remain in effect if blooms are present or throughout the bloom "season."

Cyanobacteria Bloom Outreach

A wide variety of materials are being used to raise awareness about HABs in Florida from multiple stakeholders, including:

1. Print materials—brochure, leaflet, poster, infographic, sign or billboard, fact sheet, door hangers, informational wallet card, newsletter, press kit (media package), column in newspaper, magazine, or scientific journal;
2. Presentations or training materials—slide presentation, poster presentation, curriculum or lesson plan, speech, guidelines, manual, text, or reference book;
3. Multimedia—website, social media campaigns with frequent updates, online map, hotline, emailing list, public service announcement or interview on TV, newspaper, radio, video; and
4. Promotional materials/events—button, T-shirt, sticker, magnet, frisbee, pen or pencil, health fair display, museum display.

FWC/DOH Public Health Guidance Document for HABs

In addition to notifying the local county health departments about cyanobacteria bloom conditions, the DOH and the FWC, with assistance from the Florida Harmful Algal Bloom Task Force Public Health Technical Panel, developed a document entitled “Resource Guide for Public Health Response to Harmful Algal Blooms in Florida” was originally published in 2009 and has recently been revised in 2021 (<https://f50006a.eos-intl.net/F50006A/OPAC/Details/Record.aspx?BibCode=5544705>). This document provides a wealth of information and guidance for local county health department staff to use in their response to local harmful algal bloom issues (see Table of Contents below).

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