



# **Harmful Algal Blooms in PA: Pennsylvania's Interagency HABs Task Force**

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PA DEP  
Bureau of Safe Drinking Water

**Josh Shapiro, Governor**

**Richard Negrin, Secretary**

# Overview

Who/What is the PA HABs Task Force

HABs resources in PA

HAB Monitoring Efforts

- Recreational use
- Drinking Water sources

Cyanotoxin analysis for water supplies

- Analytical methods
- Key considerations and lessons learned



# PA Interagency HAB Task Force



## Interagency Approach

### Coordinating Efforts Across Agencies

- **Awareness:** fact sheets, FAQs, website content, blogs, social media, videos, briefings...
- **Monitoring:** sample collection protocols, data management/communication systems...
- **Response:** advisory thresholds for various uses (e.g., recreation, drinking water)...
- **Prevention:** integrating several existing programs to address HABs...

# Agency Authority / Role



DEP

## **PA Department of Environmental Protection (DEP):**

Monitoring water quality, development and implementation of water quality standards, support and oversight of public drinking water systems, addressing nutrient loading (Clean Water Act, Safe Drinking Water Act)



DOH

## **PA Department of Health (DOH):**

General authority for the protection of public health, mitigating risk & exposure and regulating public swimming beaches (Public Bathing Law)



## **PA Department of Conservation and Natural Resources (DCNR):**

Monitors and manages swimming beaches at State Parks and improves water quality through land protection and ecological restoration efforts

# Agency Authority / Role



PDA

## **Pennsylvania Department of Agriculture (PDA):**

Nutrient management on ag lands, oversees animal health



## **PA Game Commission (PGC):**

Oversees management of State Game Lands, protects game species and a touch point for recreators



## **PA Fish and Boat Commission (PFBC):**

Protects aquatic species, works to ensure healthy aquatic ecosystems, touch point for water-based recreational users



## **Pennsylvania Emergency Management Agency (PEMA):**

Responds to public health and environmental emergencies and assists with communities' recovery

# PA DOH HABs Website



Department of Health

I am a/an:

I'm looking for:

About Us

Feedback

<https://www.health.pa.gov/topics/envirohealth/Pages/HABs.aspx>

[Health](#) > [All Health Topics](#) > [Environmental Health](#) > [HABs](#)

## Harmful Algal Blooms

[Contact Us](#)

A harmful algal bloom (HAB) occurs when certain kinds of microscopic organisms multiply and produce toxins in a waterbody or waterway. The microscopic organisms that most commonly cause HABs in Pennsylvania's fresh and brackish waters are cyanobacteria, or blue-green algae. While cyanobacteria are a natural part of many aquatic ecosystems, under certain conditions, like high nutrients and warm temperatures, some kinds of cyanobacteria can produce cyanotoxins. HABs can form at any time but most often in late summer or early fall.

People and animals can encounter HABs that are in the environment by physically touching, ingesting, and inhaling cyanobacteria and/or cyanobacteria toxins while swimming and boating; eating fish caught in contaminated water; using contaminated water to prepare food; or drinking contaminated water. For dogs and livestock, eating scum or algae and licking fur after swimming in contaminated water could be HABs exposures.


DOH is working closely with many other state entities, including the Department of Environmental Protection, the Department of Conservation and Natural Resources, the Fish and Boat Commission, and the Game Commission, to understand and prevent HABs from affecting Pennsylvania residents.

# PA DOH HABs Website

<https://www.health.pa.gov/topics/envirohealth/Pages/HABs.aspx>

If you have any health-related questions about HABs, contact us at [env.health.concern@pa.gov](mailto:env.health.concern@pa.gov). For other inquiries about HABs or to report a HAB, contact [HABs@pa.gov](mailto:HABs@pa.gov).

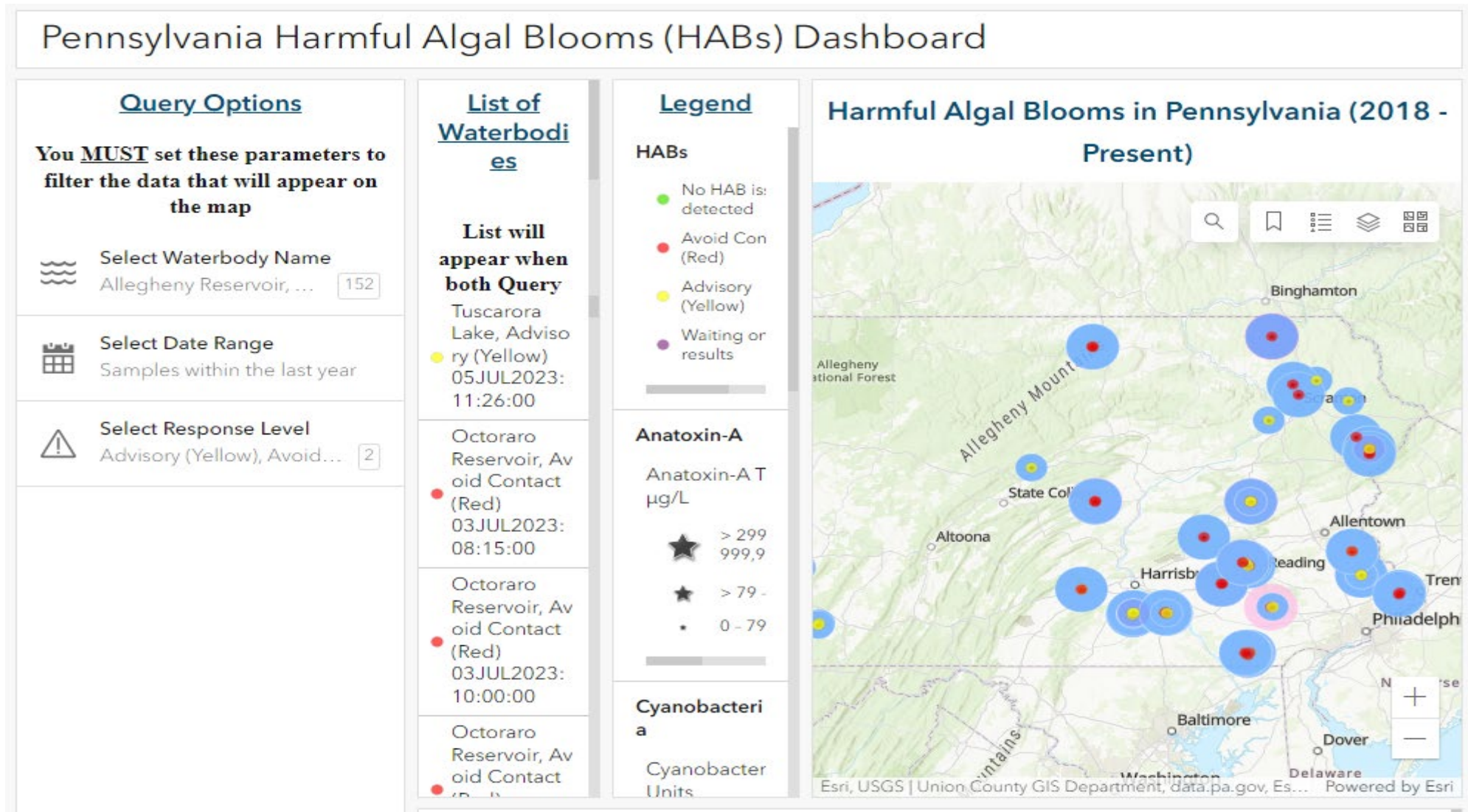
[Pennsylvania Harmful Algal Blooms \(HABs\) Dashboard](#): This interactive dashboard displays HAB-related water sampling data from 2018 – present. The dashboard integrates field and laboratory data to increase public awareness of HABs and assist individuals in making decisions to prevent/minimize HAB exposures from recreational waterbodies. The [Harmful Algal Blooms \(HABs\) Dashboard User Guide](#) provides information on the data used to create the dashboard and delivers guidance on how to use the dashboard.

[Harmful Algal Blooms \(HABS\) in PA training](#)  This course describes harmful algal blooms (HABs) and explores the response strategies that have been employed by agencies in the Commonwealth of Pennsylvania. The learner will discover the coordination and implementation of response activities among Commonwealth agencies to minimize the public's exposure to HABs and reduce negative impact of HABs.

- [HABs Training Summary Document](#)
- [HABs Fact Sheet](#)
- [HABs Fact Sheet for Health Professionals](#)
- [HABs Frequently Asked Questions](#)

# PA DOH HABs Dashboard

<https://www.health.pa.gov/topics/envirohealth/Pages/HABs.aspx>





# PA DEP HABs Website

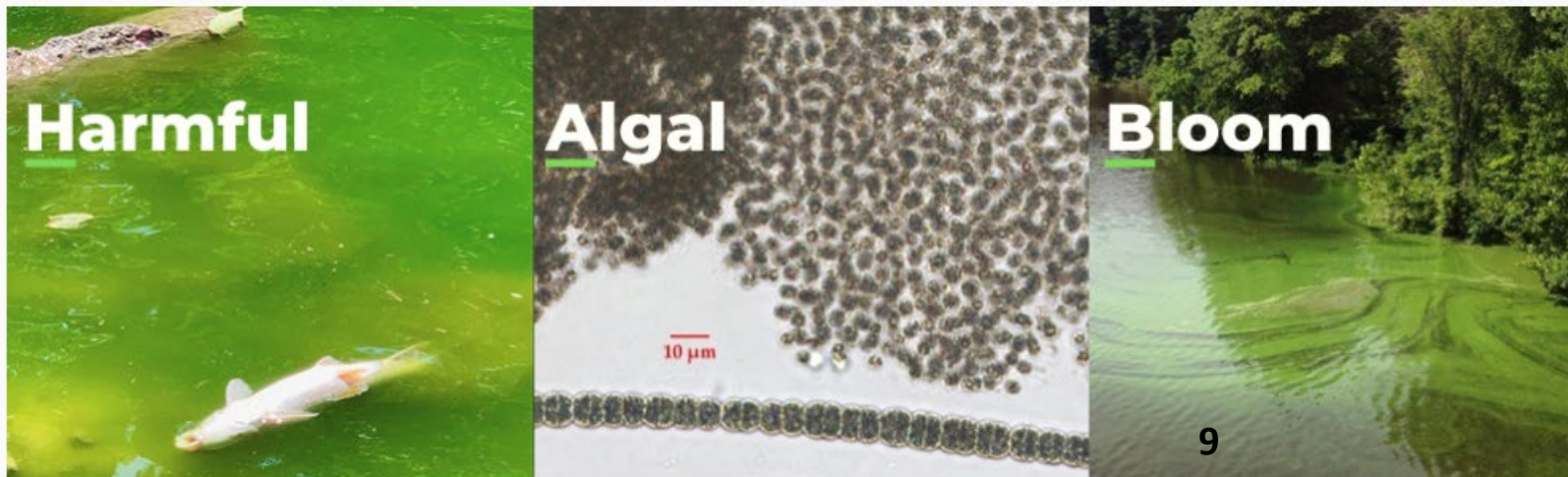
<https://www.dep.pa.gov/Business/Water/HABs/Pages/default.aspx>

## What are HABs?

A **Harmful Algal Bloom (HAB)** occurs when certain kinds of microscopic organisms in a waterbody or waterway produce toxins or other chemical compounds in concentrations that can harm people, pets, or other animals. The microscopic organisms that most commonly cause HABs in Pennsylvania are known as cyanobacteria or blue-green algae.

Cyanobacteria are a natural part of many aquatic ecosystems, but some kinds of cyanobacteria can produce toxins known as cyanotoxins. In high enough concentrations, cyanotoxins can be harmful to people, pets, fish, shellfish, and other animals that come in contact with or ingest the toxins.

**Let's break it down:**



# Primary Contact Recreation Threshold Guidance

Response Level	Microcystins (ppb)	Anatoxin-a (ppb)	Cylindrospermopsin (ppb)	Saxitoxins (ppb)	Colony Count (colonies/mL)
Advisory	8.0	80	15	0.8	300
Avoid Contact Warning	20	300	20	3.0	1500

**LOOK OUT FOR Harmful Algal Blooms**

**Be Alert!**  
Water conditions at this location make the water susceptible to harmful algal blooms (HABs). HABs occur when microscopic organisms in a waterbody produce toxins or other harmful compounds that can harm people, pets, or wildlife. In Pennsylvania, HABs are most commonly caused by cyanobacteria.

**What to Look For:**  
HABs can be hard to forecast and detect. HABs can only be identified with water testing, but visual conditions can often indicate a potential HAB. Before entering the water, check for and avoid areas with:  
• Noticeable green, green/blue, blue, brown, gold, or red colors in, on, or near the water's edge  
• Algae-like scum, foam, mats, or clumps  
• Paint-like streaks

**Follow Safe Water Recreation Practices**

**ALWAYS**  
WASH WITH SOAP AND WATER IMMEDIATELY after any contact with untreated water

**DO NOT**  
Ingest untreated water

**CAUTION**  
Check water conditions before engaging in or allowing

PEOPLE PETS BOATING SWIMMING FISHING PETS

For more information contact HABs@pa.gov or the water management agency.  
Publication shared courtesy of DCNR

## Watch

Used at locations during time periods when conditions exist that make a cyanobacteria bloom more likely, leading to a sense that conditions at the site make it susceptible to HAB development.

**ADVISORY AVISO**

**TOXIC ALGAE MAY BE PRESENT - BE ALERT**  
Algas tóxicas pueden estar presentes - Esté atento

**DO NOT ingest untreated water**  
No ingiera agua no tratada

**WASH IMMEDIATELY after contact with untreated water.**  
Lávase o dúchese inmediatamente después de contacto con agua no tratada.

**CAUTION: Avoid contact with discolored water or scum**  
Precaución: Evite contacto con agua descolorada o espumada

Swimming Natación Boating Navegación Pets Mascotas

Call your doctor, veterinarian, or the poison control center if you or your pet becomes ill or shows signs of poisoning.  
Llame a su médico, veterinario, o Centro de Toxicología si usted o su mascota tiene una enfermedad o síntomas de envenenamiento.

Poison Control Center: 800-222-1222  
Animal Poison Control Center: 888-426-4435  
For more information: HABs@pa.gov  
Para más información: HABs@pa.gov

Publication shared courtesy of DCNR

## Advisory

Convey that certain conditions exist that require that special considerations should be taken before using the water for certain activities and some activities should be limited.

**WARNING ALERTA**

**TOXIC ALGAE PRESENT**  
Algas tóxicas están presentes

**DO NOT TOUCH UNTREATED WATER**  
No toque el agua no tratada

**Keep out of water - No swimming.**  
Manténgase fuera del agua - Prohibido nadar.

**Do not ingest untreated water.**  
No ingiera agua no tratada.

**Keep pets out of water and from drinking untreated water.**  
Mantenga a sus mascotas fuera del agua y de beber agua no tratada.

**Do not boat or paddleboard in water with scum or discoloration.**  
No vaya en bote o remar en agua con descolorada o espumada.

Call your doctor, veterinarian, or poison control center if you or your pet becomes ill or shows signs of poisoning.  
Llame a su médico, veterinario, o Centro de Toxicología si usted o su mascota tiene una enfermedad o síntomas de envenenamiento.

Poison Control Center: 800-222-1222  
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Publication shared courtesy of DCNR

## Warning

Convey that certain conditions exist that limit the permissible activities.

# PA DEP HABs Website

## What To Do if You Suspect a HAB

**If a HAB is suspected or confirmed** to be occurring in a body of water, it is strongly recommended for people and pets to follow safe water recreation practices to limit exposure:

- Wash your hands after contact with untreated water
- Shower or bathe people and pets immediately after participating in water-based recreation activities
- Avoid swallowing and inhaling untreated water during recreational activities
- Avoid contact with water that has foam, scum, or discoloration
- Seek and follow any waterbody advisories or closures

**If you or your pet becomes ill or shows signs of poisoning** after being in or around a waterbody with a suspected or confirmed HAB, call your doctor, veterinarian, or the poison control center: Poison Control Center 800-222-1222; Animal Poison Control Center 888-426-4435.

**If you have any health-related questions** about HABs, please contact the Division of Environmental Health Epidemiology at the Pennsylvania Department of Health at [env.health.concern@pa.gov](mailto:env.health.concern@pa.gov). **To report a suspected HAB**, or for other inquiries about HABs, contact the Pennsylvania HABs Task Force at [HABs@pa.gov](mailto:HABs@pa.gov).

# PA DEP HABs Website

The United States Environmental Protection Agency (US EPA) has also issued the following **10-day drinking water health advisories** for two cyanotoxins.

	Microcystins	Cylindrospermopsin
Bottle-fed infants and pre-school children	0.3*	0.7*
School-age children and adults	1.6*	3.0*

\* *recommended values from [US EPA](#)*

Here are some additional resources on what you can do if you encounter a suspected or confirmed HAB.

## Recreational use resources

- US EPA: [Protect Your Pooch](#)
- US EPA: [Tools for Waterbody Managers to Monitor for and Respond to HABs](#)

## Drinking water resources

- US EPA: [Managing Cyanotoxins in Public Drinking Water Systems](#)
- US EPA: [Drinking Water Health Advisories for Cyanotoxins](#)
- Ohio EPA: [Public Water System Harmful Algal Bloom Response Strategy](#)

# Goal: Build Public Awareness

## Cyanobacteria and HABs

**What are Cyanobacteria?**

Cyanobacteria (*Microcystis* sp.) colony under magnification.

Cyanobacteria are among some of the earliest forms of life to inhabit the Earth. These microscopic organisms can be found in various terrestrial and aquatic habitats. They normally use carbon dioxide, water, and sunlight to make their own food. Even though cyanobacteria are often called "blue-green algae," they are not a true algae. They may look similar to algae but are actually bacteria. The term "cyanobacteria" refers to many different types of bacteria. There are more than 600 species.

**Harmful Algal Blooms (HABs)**

**HOW ARE HABs FORMED?**  
When colonies of algae, bacteria, and other related organisms that are normally found in a body of water multiply very quickly, harmful algal blooms (HABs) can form. A HAB occurs when certain kinds of microscopic organisms in a waterbody or waterway produce toxins or other chemical compounds in concentrations that can harm people, pets, or wildlife. The microscopic organisms that most commonly cause HABs in Pennsylvania are known as cyanobacteria.

Blooms need sunlight and nutrients to survive. They can form at any time, but most often occur in late summer or early fall due to the warm, slow-moving waters that are rich in nutrients from sources such as fertilizer runoff and sediment buildup.

**HOW TO IDENTIFY HABs?**  
Blooms can be hard to forecast and detect. HABs can only be identified with water testing, but visual conditions can often indicate a potential HAB. HABs may look like foam, scum, or mats, particularly when the wind blows them toward a shoreline. The blooms can be blue, bright green, brown, or red. They may also look like paint floating on the water's surface. As cyanobacteria in a bloom die, the water may smell bad, similar to rotting plants.

**Beneficial Bacteria**

Not all species of cyanobacteria are harmful and many play a critical role in the environment. Cyanobacteria are not a new organism; their fossils are some of the oldest recorded. Due to the processes that some cyanobacteria completed long ago, they have contributed to certain oil deposits in the Earth's crust.

Today, some of their living descendants have a mutually beneficial relationship with things like farms. These organisms show potential to help with agricultural crop production, biofuel production, and carbon sequestration.

**HABs affect People, Pets, and the Environment**

Exposure to HABs, even through small amounts of accidental contact and consumption, can lead to illness and even death in certain situations. If you are exposed to HABs, wash immediately with soap and water.

**PEOPLE**  
People may come in contact with toxins or other harmful compounds from HABs:  
• Physically contact swimming or boating  
• Eating food contact preparation  
• Drinking untreated water  
• Improperly washing

**PETS**  
Dogs are most likely to drink untreated water, grooming, or eating algae scum or mats.  
These organisms show potential to help with agricultural crop production, biofuel production, and carbon sequestration.

**ENVIRONMENT**  
HABs can block sunlight, deplete oxygen, and cause eutrophication.

## BE AWARE



### Harmful Algal Blooms (HABs) ...

**What is a Harmful Algal Bloom?**  
HABs are so named because many of these blooms may produce poisons (or toxins) that can cause illness, irritation or even death. While HABs are commonly referred to as "blue-green algae," they are not true algae. They are actually cyanobacteria.

HABs have been observed worldwide including Lake Erie and other Pennsylvania waters and can occur almost anywhere lakes, ponds, stormwater retention basins, rivers, streams, or reservoirs.

**How dangerous are HABs?**  
Humans, pets, livestock and wildlife that come into contact with, or ingest HAB toxins can experience sickness, paralysis or even death.

**Know the signs of HAB poisoning:**  
• Humans: rashes, blisters and hives, and eye and nose irritations. If swallowed, diarrhea, vomiting, abdominal pain, numbness of lips, tingling in fingers and toes, dizziness, headache.  
• Pets/livestock/wildlife: staggering, difficulty breathing, convulsions, salivation, weakness, and vomiting.

**How will I know if there is a HAB?**  
Confirmation of HABs can only be made under a microscope. HABs generally occur from late summer into early fall when water temperatures are warmest and an abundance of sunlight and nutrients are available.

**Check for posted HAB advisories** or ask the park manager about any recent HABs because colorless toxins can still be in the water after visible blooms have faded.

Where can I report a bloom or find more information?  
Report a bloom to: The Pennsylvania Department of Environmental Protection (PADEP) at 814-332-6839  
For more information, visit [www.pasagrant.org](http://www.pasagrant.org)

### CERTIFICATION NEEDED

To view cable restraint training course schedules, visit [www.pgc.pa.gov](http://www.pgc.pa.gov), or contact the Game Commissioner's Hunter-Trapper Education Division at 717-787-7015.

Trappers shall keep the certificate from the training course in possession while setting or checking sets using cable restraints, and present the certificate upon the request of a game warden.

In addition to the certificate, those using cable restraints must possess a valid furtaker license, or qualify for license and fee exemptions under Section 2706 of the act relating to resident license and fee exemptions, or qualify for trapping exceptions under Section 2363 of the act relating to trapping exceptions for certain persons.



## HARMFUL ALGAL BLOOMS THREATEN PEOPLE AND PETS

Harmful algal blooms (HABs) occur each year in Pennsylvania, often from mid-June through September, but also at other times of year if conditions are right.

They can be harmful to people, pets, fish, shellfish and other animals that come in contact with them or ingest the toxins they contain.

HABs can look like foam, scum, mats, or paint floating on or below the surface of water. They might look blue, green, brown, yellow, orange or red.

Exposure to HABs may cause a range of symptoms in people and animals. The duration, type, and severity of symptoms can vary depending on the duration and type of exposure, and the particular toxin involved.

Human symptoms of HAB exposure include rashes, eye and nose irritation, diarrhea, vomiting, or abdominal pain. If you exhibit any of these after exposure to a known or suspected HAB, call your doctor or a Poison Control Center at 800-222-1222.

Animal symptoms may include staggering, difficulty breathing, or vomiting. If your pet exhibits any of these symptoms, contact a veterinarian or ASPCA Animal Poison Control Center at 888-426-4435.

For more information on HABs, visit [www.dep.gov/HABs](http://www.dep.gov/HABs).

PENNSYLVANIA GAME COMMISSION

**pennsylvania**  
DEPARTMENT OF HEALTH

**HARMFUL ALGAL BLOOMS**  
INFORMATION FOR HEALTH PROFESSIONALS

A harmful algal bloom (HAB) occurs when certain kinds of microscopic organisms multiply and produce toxins in a waterbody or waterway. The organisms that most commonly cause HABs in Pennsylvania's fresh and brackish waters are known as cyanobacteria or blue-green algae. Some HABs can cause water to smell like rotting plants and be blue, green, brown, or red, and resemble paint floating on the water, foam, scum, or mats. While cyanobacteria are a natural part of many aquatic ecosystems, certain conditions such as high nutrients and warm temperatures allow cyanobacteria to produce cyanotoxins. In high enough concentrations, cyanotoxins can be harmful to humans, pets, and wildlife that come in contact with or ingest the toxins.

**HOW ARE PEOPLE AND ANIMALS EXPOSED TO HABs?**  
People and animals can encounter HABs by physically touching, ingesting, and inhaling cyanobacteria and/or cyanotoxins while swimming and boating; eating fish caught in contaminated water; using contaminated water to prepare food; or drinking contaminated water. For dogs and livestock, eating algae and licking fur after swimming in contaminated water could expose them to HABs.

**WHAT ARE SYMPTOMS OF HAB-ASSOCIATED ILLNESS?**  
Exposure to HABs may cause a range of mild to severe symptoms in humans and animals, referred to as HAB-associated illnesses. The duration and type of symptoms can vary depending on how they were exposed, how long they were exposed, and the particular HAB toxin involved.

Human symptoms may include:  
• Rashes, blisters, or hives  
• Eye and nose irritations  
• Diarrhea or vomiting  
• Abdominal pain  
• Numbness of lips  
• Tingling in fingers and toes

Animal symptoms may include:  
• Staggering, stumbling, or falling  
• Difficulty breathing  
• Convulsions, tremors, or seizures  
• Excessive drooling  
• Vomiting or mouth foaming

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**2021 Pennsylvania Fishing Summary/Boating Handbook**

**MENTORED YOUTH TROUT DAY**  
March 27 (Saturday)  
**FISH-FOO-FREE DAYS**  
May 30 and July 4

**TROUT OPENER April 3 statewide**  
[www.fishandboat.com](http://www.fishandboat.com)

Multi-Year Fishing License—page 5

**PROTECTING** places like this for generations, THANKS TO YOU!

The Western Pennsylvania Conservancy preserves our region's quality of life by caring for and restoring land, water and wildlife. Planning, permitting, and construction. Contact us at [www.wpc.org](http://www.wpc.org) or call 724-838-1100. #ProtectOurPennsylvania

**MORE ROOM FOR CASTING** MAKES FOR BETTER FISHING

**FISH PA**

Visit [www.fishpa.com](http://www.fishpa.com) for the 2021 Pennsylvania Fishing Regulations and Laws.

**HARMFUL ALGAL BLOOMS**  
Threaten people and pets

Harmful algal blooms (HABs) occur each year in Pennsylvania, often from mid-June through September, but also at other times of year if conditions are right.

They can be harmful to people, pets, fish, shellfish, and other animals that come in contact with them or ingest the toxins they contain. HABs can look like foam, scum, mats, or paint floating on or below the surface of water. They might look blue, green, brown, yellow, orange, or red.

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For more information on HABs, please email [HABs@pa.gov](mailto:HABs@pa.gov).



Like Share Suggest Edits ...

**Pennsylvania Department of Environmental Protection**  
August 21 at 1:10 PM

Visitors to Lake Wallenpaupack this weekend should be on the lookout for Harmful Algal Blooms, and avoid swimming, fishing, and letting pets play in affected areas. To report a possible Harmful Algal Bloom, please contact [HABs@pa.gov](mailto:HABs@pa.gov). More information about Harmful Algal Blooms and how they form can be found here:

Home  
About  
Posts  
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DEPPA.GOV

**So what exactly are HABs and what should you do about them?**

# HAB Monitoring

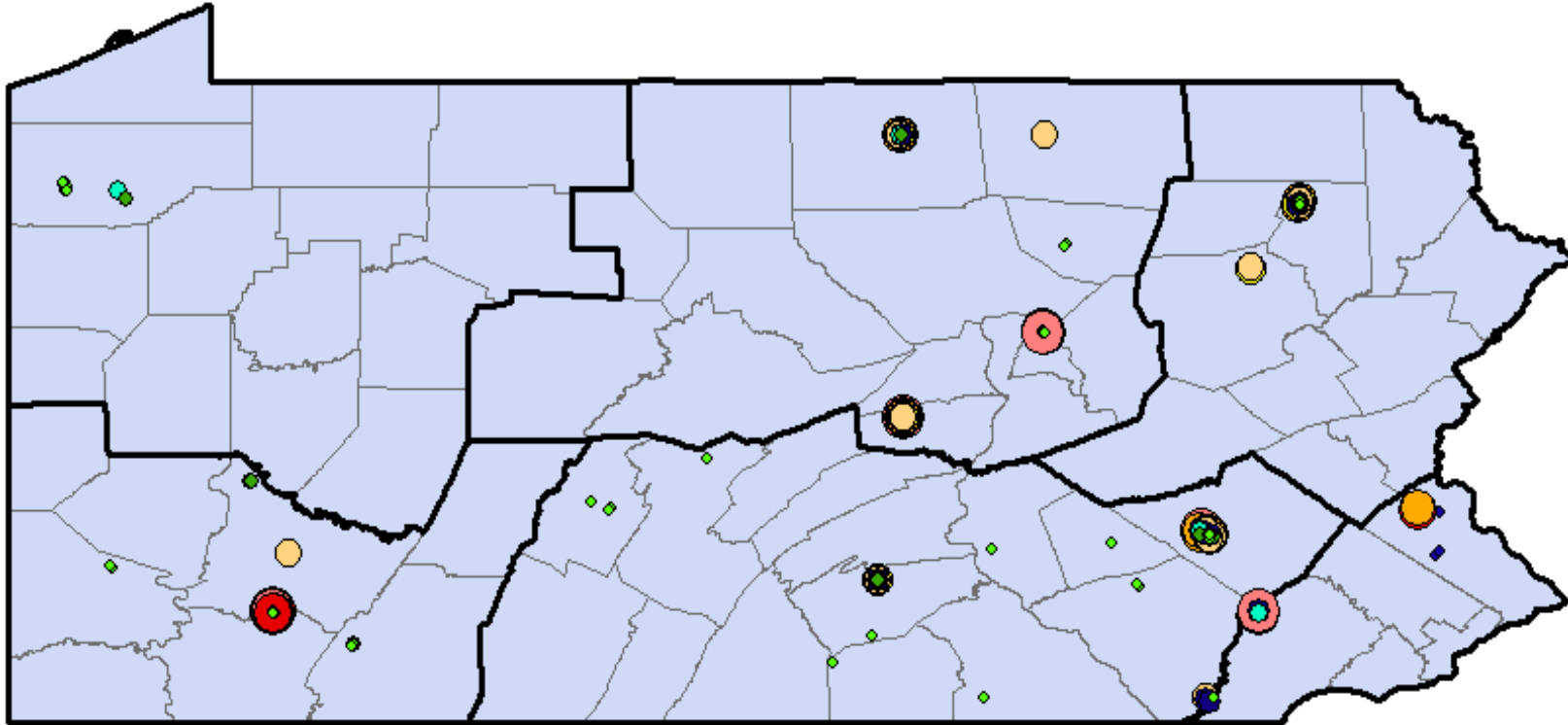
## How are HABs Monitored?

- **Unaided visual observation**
- **Grab samples**
  - Microscopy
  - Measurement of cyanotoxins
  - Measurable chemical factors
- **Satellite/aerial imagery**
- **Reported/documentated illness or death**
- **Historic evidence**



# 2021 HAB Data ALL

(Waterbodies = 34, Sites = 94)



Colony Count results by BOL  
>300 colonies/mL → Toxin Testing  
>300 colonies/mL → Watch

# Cyanotoxins

- Cyanobacteria blooms are made up of bacteria that can also produce **cyanotoxins**

- Microcystins

- Cylindrospermopsin

- Anatoxin

- Saxitoxin

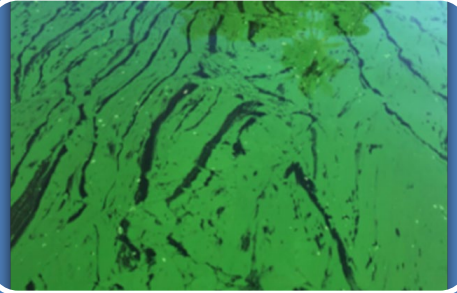
## EPA Ten-Day Health Advisory Levels (HALs) in Finished Water

	Total Microcystins	Cylindrospermopsin
Children Under 6, incl. bottle-fed infants	0.3 µg/L	0.7 µg/L
Children 6 and Older, and Adults	1.6 µg/L	3.0 µg/L

  
*Treatment Target*



# DETAILS MATTER!!!



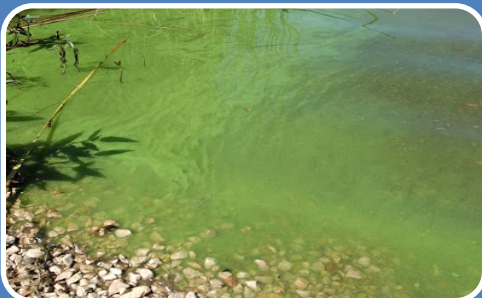
“We’ve identified a harmful algal bloom”

- How? What specific algae or cyanobacteria?
- Is it affecting the PWS source or entering the treatment plant?



“Toxin producing algae were detected”

- Where, relative to the PWS intake?
- Have actual toxins been detected, and at what levels?



“Cyanotoxins are present at low levels”

- Which cyanotoxins, and what methods were used for analysis?
- Relative to 10-day drinking water HAL or recreational levels?

# ➤ BSDW Cyanotoxin Screening – Purpose and Goals

- Identification of high-risk PWS sources for cyanotoxin sampling, regardless of bloom conditions
- Monitoring at sources that may not have been historically targeted for monitoring
- Obtain cyanotoxin data for sources not historically monitored or prioritized
- Evaluate whether additional monitoring should occur at high-risk sources
- Does a lack of a visually observable CyanoHAB appear to correlate with low or no risk of toxins, even in high-risk sources?

# Analytical Methods for drinking water

## EPA Method 545:

Determination of Cylindrospermopsin and Anatoxin-a in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)

## EPA Method 546:

Determination of Total Microcystins and Nodularins in Drinking Water and Ambient Water by Adda Enzyme-Linked Immunosorbent Assay (ELISA)

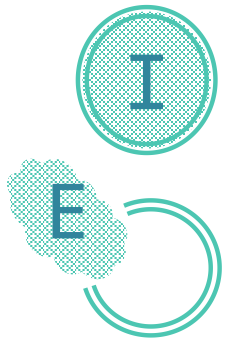
# When requesting analysis for cyanotoxins

- Carefully consider sampling location and number of samples needed for representative sampling



- Finished water only?                      – Within treatment plant?
- Raw source water?                        – Upstream of intake?

- Total toxin analysis (intracellular plus extracellular) or differentiated toxin analysis (intracellular v. extracellular)?



- Which method(s) are needed?

545?

546?

- What is the turn around time needed for results?
- What sampling supplies are needed?



# Laboratories for Cyanotoxin Analysis

## Laboratory selection

- No PA accreditation program, so no PA-accredited labs
- NELAP accreditation is available, but very few NELAP labs
- UCMR 4 approval, but no ongoing oversight

- **Follow approved methods with no deviations?**
- **Follow all QA/QC and acceptance criteria?**
- **Reporting limits?**
- **Performance testing?**

# Summary

- Interagency HAB Task Force created to coordinate awareness, monitoring, response, and prevention strategies
- Monitoring efforts with different priorities and goals can complicate response
  - EPA drinking water HALs
  - Recreational thresholds
- Communication between and among agencies is key



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Safe Drinking Water

**Jill Anderson**

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