Cape Cod Ponds Network

August 14, 2025

Cape Cod Museum of Natural History, Brewster

APCC
Association to Preserve Cape Cod

CAPE COD COMMISSION

Overview of APCC's Freshwater Monitoring Programs

Cape Cod Regional Pond Monitoring Program

Cape Cod Pond Watcher Bio-survey

APCC Association to Preserve Cape Cod

Pond Watcher Name: _____

Email: _____

Pond Name: _____	**Date:** _____
Pond ID: _____	**Time Start:** _____
Town: _____	**Time End:** _____
Observation location: _____	

CONDITIONS

Air Temp (F): _____ **Surface Water Temp (F):** _____ **Substrate:** Sand /Organic Muck/ Silt/ Gravel/ Other	**Water Level:** High / Medium / Low **Ice cover:** None / Partial / Entire Pond **Surface Scum:** Yes / No **Foam:** Yes / No

VEGETATION – Check out APCC's Bio-survey resources on APCC's website! Can you spot any of the plants pictured? Start by scanning the shoreline, then look for plants emerging from the water. See any floating leaves or flowers? If the water's clear and you can spot submerged plants (maybe from a boat or while snorkeling?), be sure to record them! Along with the plant name, note its location and how it's spread—sparse, dense, or patchy. Thanks for your help!

Plant name:	**Where did you observe this plant?** (e.g. Shoreline, emerging from water, submerged)	**Was plant distribution sparse, dense or patchy?**	**Photo? (X)**
1._____	_____	_____	_____

APCC's Cyanobacteria Monitoring Program

Cape Cod Pond Watchers Bio-Survey Program Overview

- **Monitor and document pond biology and ecology** by recording observations of plants, animals, and environmental conditions.
- **Engage the community in citizen science**
  - to help foster a connection to local freshwater ponds
  - to build a long-term record of ecological conditions and changes in Cape Cod's freshwater ponds.
- **Support conservation efforts** with locally gathered data to inform pond protection and management strategies.

How does this survey work?

- Hosted on the app Survey123 but paper forms are also available
- Open to anyone, no need for prior experience
- Upload photos, record observations, select confidence level
- Designed for **both learning and data collection**

What does submitting a Bio-Survey involve?

- You can submit **as many or few** Bio-Surveys as you want
- You can submit a Bio-Survey **with just one observation**
- You can use plant ID apps like Seek or iNaturalist or bird call ID apps like Merlin ID to help with identification.
- **Become a detective!** If you see snail trails, footprints, scat or other clues of who has visited your local pond please record them.

Long-term vision

- Create a **Cape Cod Pond Species ID Guide** to help identify local plants and critters
- Incorporate findings into a **pond health assessment framework using bioindicator species**
- Use community data to help **guide pond management decisions**
- Develop a **public map** with observations by pond (with sensitive species redacted)
- **Connect people with their ponds** through hands-on science and stewardship
- Support broader **conservation and education efforts** across Cape Cod

If you are interested in filling out a Bio-Survey, please check out the Training video on our website: apcc.org

If you have any questions, please reach out to us at pondwatchers@apcc.org

APCC's Cyanobacteria Monitoring Program

APCC
Association to
Preserve Cape Cod

Cyanobacteria Monitoring Program Partners

Friends of Cedar Lake

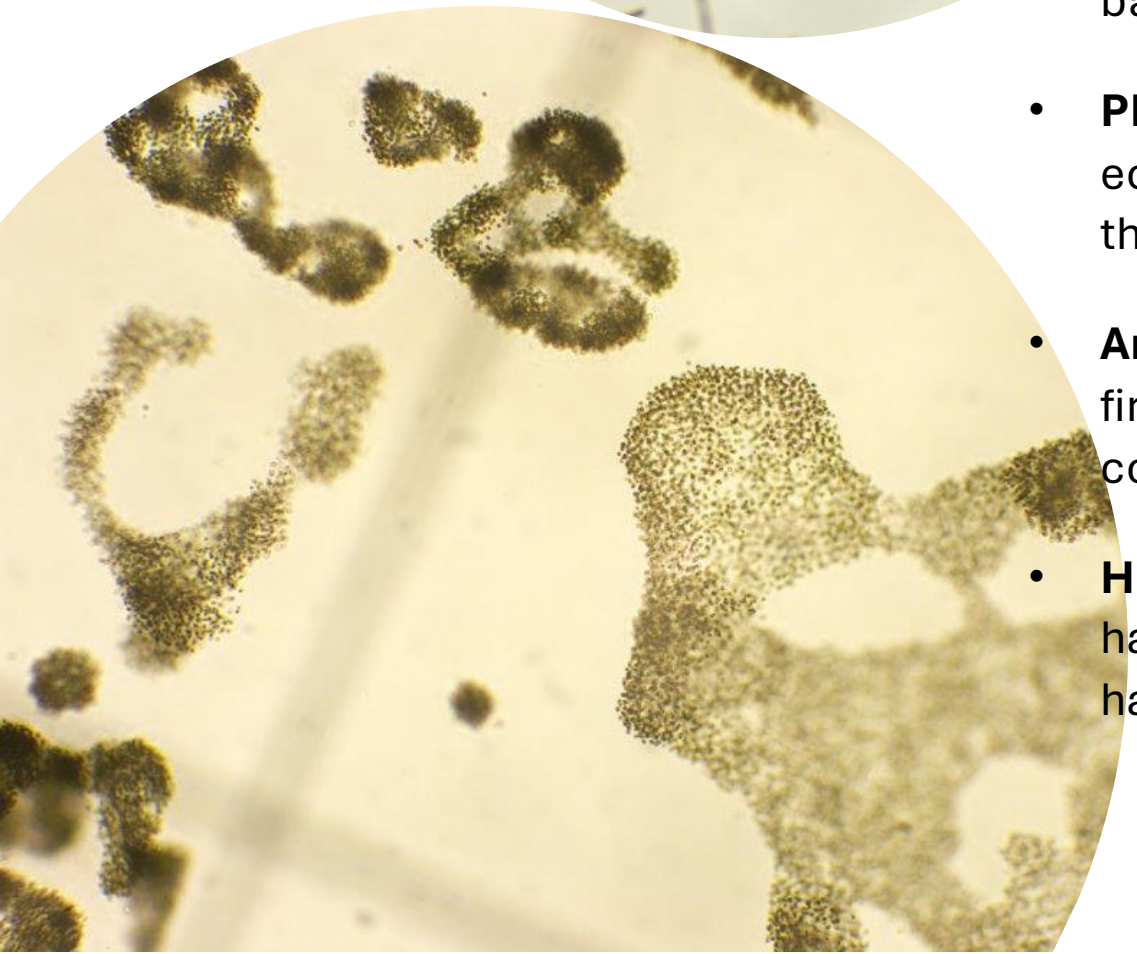
Gull Pond Area Conservation Association

Orleans Pond Coalition

Friends of Long Pond Marstons Mills

Oyster Pond Environmental Trust

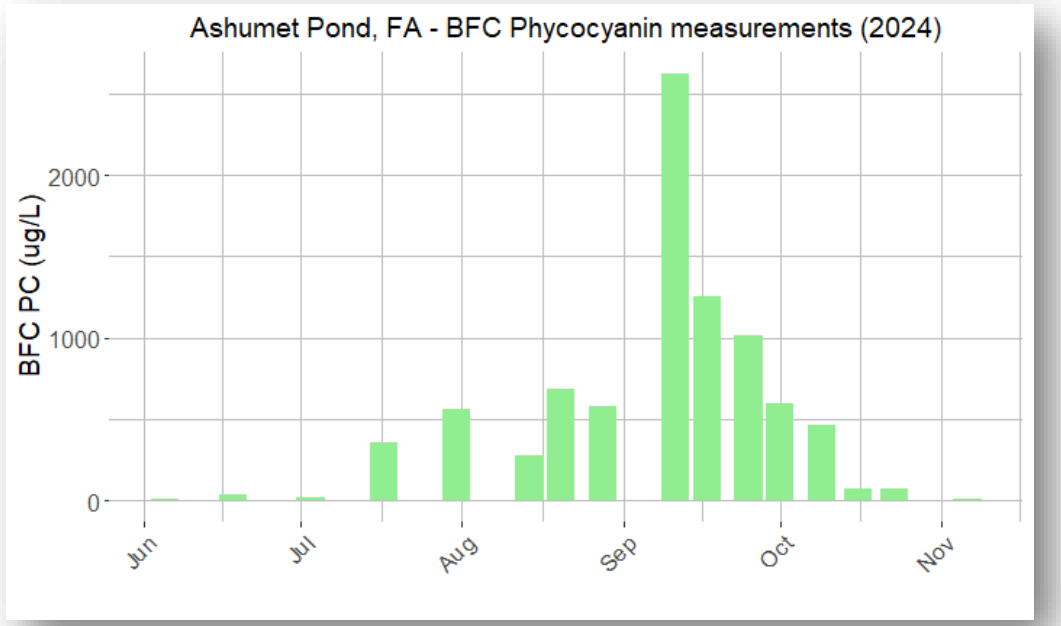
What are Cyanobacteria?



- **Microscopic Organisms**: A diverse group of photosynthetic bacteria found in all types of ecosystems, primarily aquatic.
- **Phytoplankton**: Major component of phytoplankton in freshwater ecosystems, contributing to primary production and serving as the base of the food web.
- **Ancient Origin**: Appeared over 3.5 billion years ago as one of the first photosynthetic organisms. Played a crucial role in contributing to the rise of oxygen.
- **Harmful Blooms**: Under certain conditions, some species form harmful cyanobacteria blooms (HCBs) that can produce toxins harmful to humans, animals, and aquatic life.

Communicating Risk 2025 – for more information check out APCC.ORG

Here is what informs APCC's public CyanoMap:



Town Health Agents

Communicating Risk 2025 – for more information check out APCC.ORG

APCC 2025 Cyanobacteria Risk Tiers

Acceptable

- A cyanobacteria scum was not detected, and the Bloom Forming Colony sample had a phycocyanin measurement <500ug/L.
- A cyanobacteria scum was detected but was determined to be visually insignificant and the Bloom Forming Colony sample had a phycocyanin measurement <100ug/L.

Potential for Concern

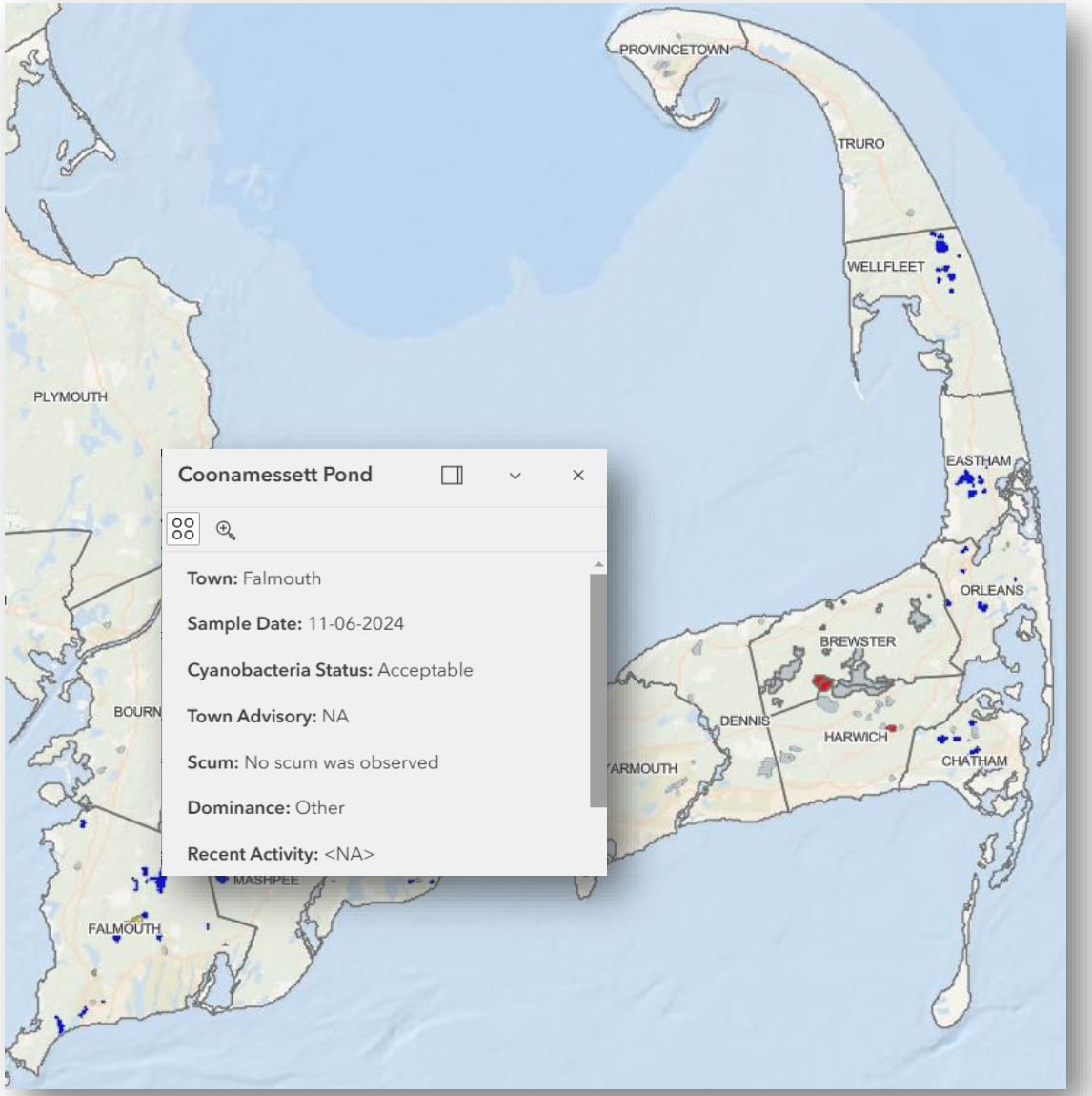
- A cyanobacteria scum was not detected but the Bloom Forming Colony sample had a phycocyanin measurement ≥500ug/L.
- A cyanobacteria scum was detected and determined to be visually significant and/or the Bloom Forming Colony sample had a phycocyanin measurement ≥100ug/L.

Stripes are added on the map if the town posts a warning that is not an official Public Health Advisory.*

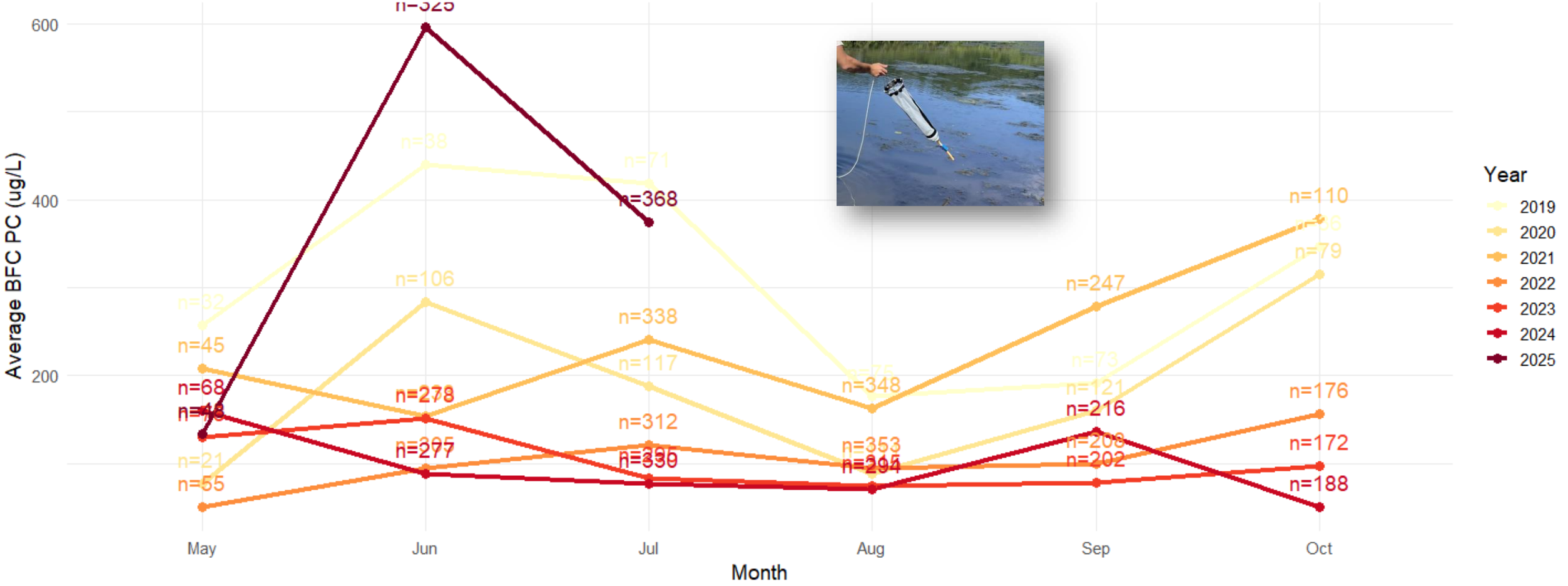
Use Restriction Warranted

- The town posts a Public Health Advisory.
- Microcystin test measures ≥8 ppb (MassDPH guidance).
- Once a pond is categorized as Use Restriction Warranted it will remain in this category for two consecutive Acceptable sampling events (MassDPH guidance).

Stripes are added on the map if the town posts a Public Health Advisory and are removed once the town removes the Public Health Advisory.**If and when the town informs APCC of their action*



Comparing BFC PC across seasons – preliminary data



Key Observations from 2025 Data

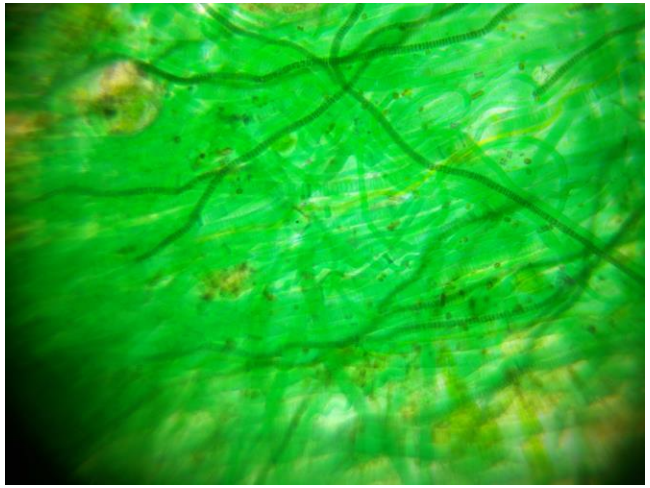
- **2025 appears to be a higher biomass year** than recent seasons, more in line with 2019 and 2020

→ **Number of ponds monitored in early years (2019–2020)** were smaller, limiting direct comparison.

- High **interannual variability** likely reflects:
  - Differences in **precipitation timing and intensity**
  - **Hydrological variation** (wet vs. dry years)
  - Natural **ecological fluctuations** on relatively short timescales

- We're still early in our long-term monitoring timeline - patterns should be interpreted in the context of both climatic variability and expanding pond coverage.

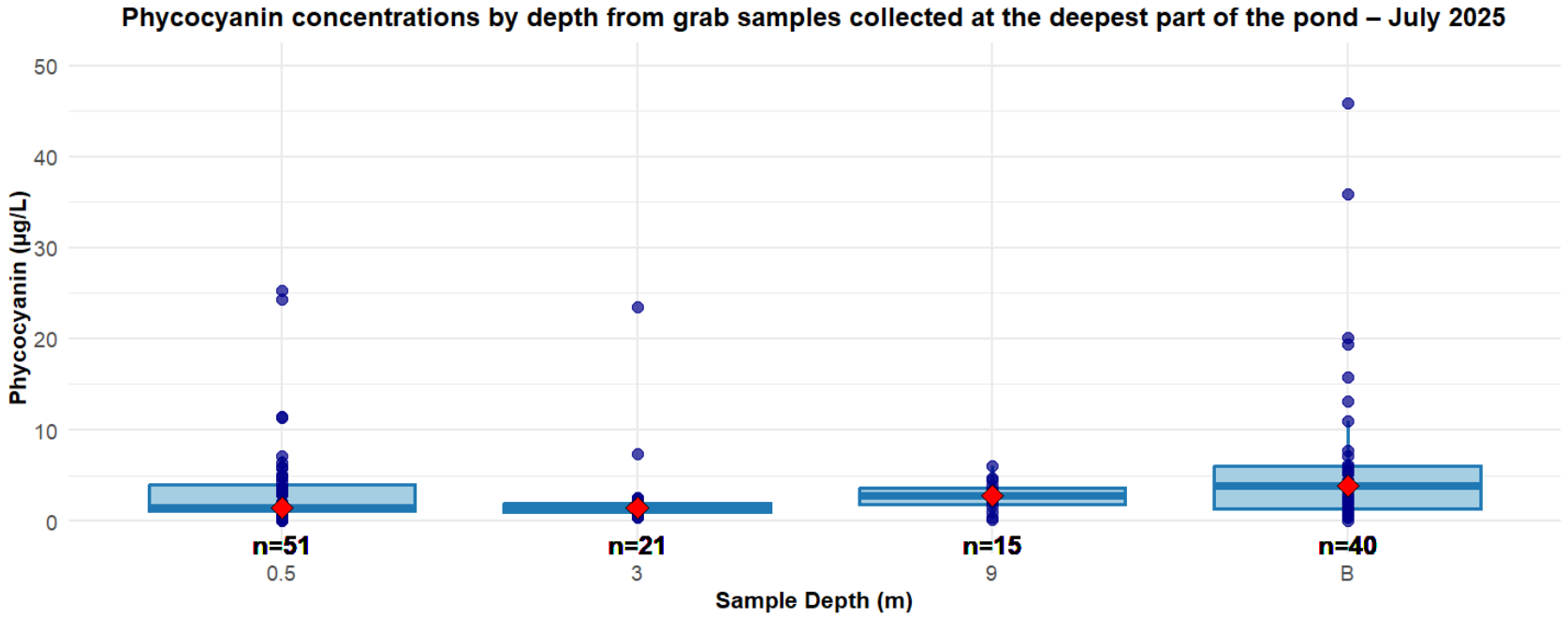
A few other updates from the 2025 cyano season so far:



New anatoxin guidance published by MassDPH:
Anatoxin is a neurotoxin known to be produced by *Dolichspermum* and other cyanbacteria genera

Toxin testing APCC:

Anatoxin: >46 strip tests done
Microcystin: >49 strip tests done



Cyanobacteria Monitoring Program Partners

In summary:

We have a lot left to learn! Thank you so much to all our Program Partners and interns, we appreciate you and all you contribute to this valuable dataset.

Friends of Cedar Lake

Gull Pond Area Conservation Association

Orleans Pond Coalition

Friends of Long Pond Marstons Mills

Oyster Pond Environmental Trust

APCC Cyanobacteria Vet Survey

APCC
Association to
Preserve Cape Cod

APCC is an equal opportunity provider and employer

About me

- Caroline Berney
- APCC Cyanobacteria Program Intern
- Public outreach, pond monitoring program
- Needham, MA & Orleans
- Senior at Bowdoin College - computer science and math

Dyer Pond, Wellfleet

Image: Alexandra Grabbe, Chezsven Blog

Cyanobacteria

- Naturally occurring in all freshwater bodies
- Many species
- Some can produce cyanotoxins – incl. neurotoxins, hepatotoxins, dermatoxins
- Form blooms in warm, nutrient-rich conditions

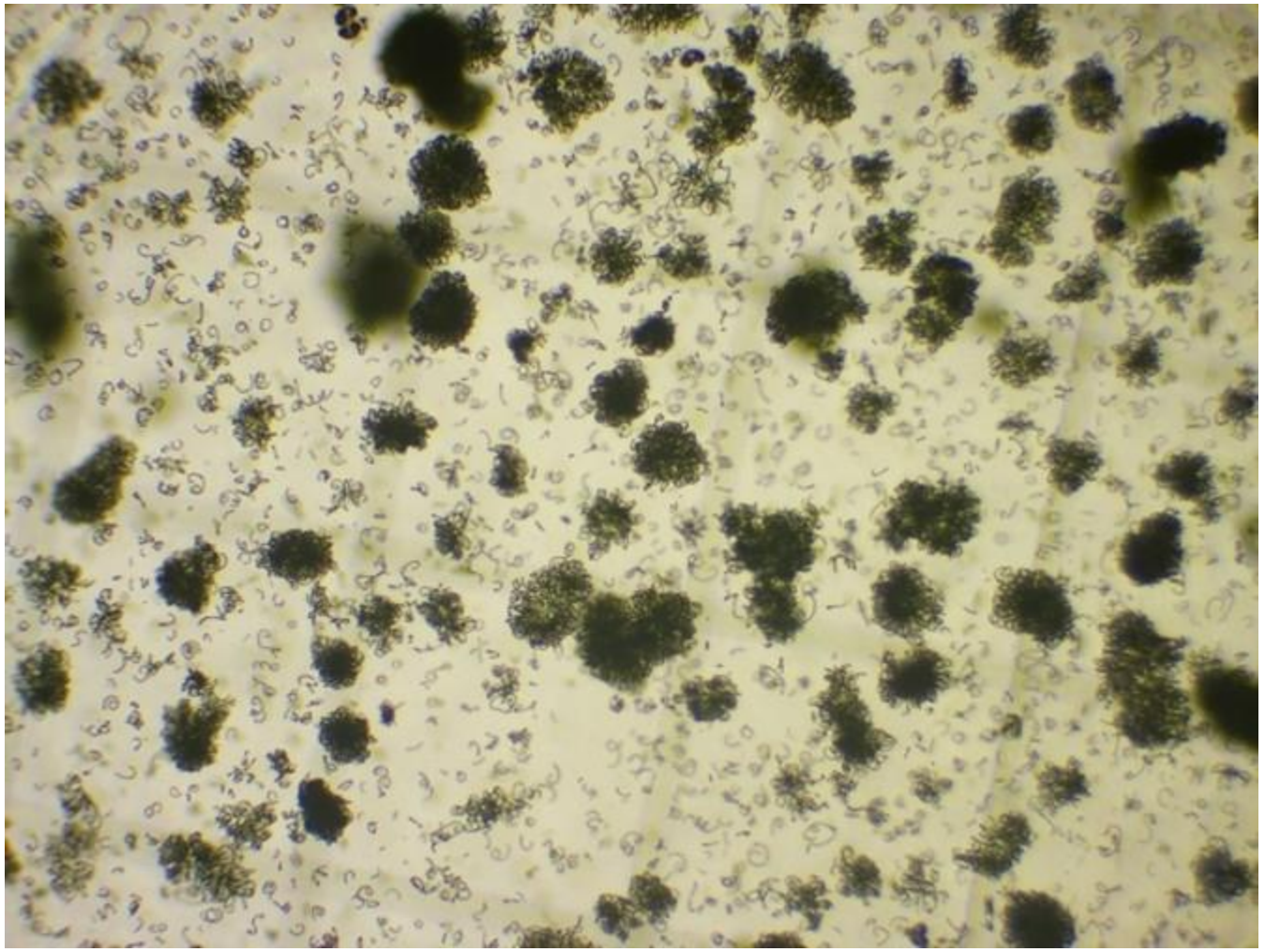


Image: APCC Cyano intern team

Dolichospermum sp. under the microscope

Risks to Animals

- Pets and wild animals don't know to avoid HCBs
- Smaller size → more vulnerable
- Blooms → anoxic water → fish kills

Image: Sophie Corsaro

Ducklings swimming in West Reservoir, Harwich, August 6, 2025

Local Incident

- Family of swans died near Weeks and Shivericks ponds in Falmouth
- Undetermined cause
- Cyanobacteria detected at both ponds
- Benthic mats

Shivericks Pond, July 2025

Weeks Pond, July 2025

Images: APCC Cyano intern team

Dogs and HCBs

- Uniquely vulnerable
- Exposures can be lethal
- No antidote – supportive treatment only
- **Prevention is key**


How big is this problem?
We don't know!

Limited Data

- CDC – One Health Harmful Algal Bloom System
  - Receives reports
- Varied state efforts
  - CA a standout – WQMC
- No one has comprehensive info

Figure 1: States reporting HAB events for 2022

15 states reported to OHHABS for 2022.

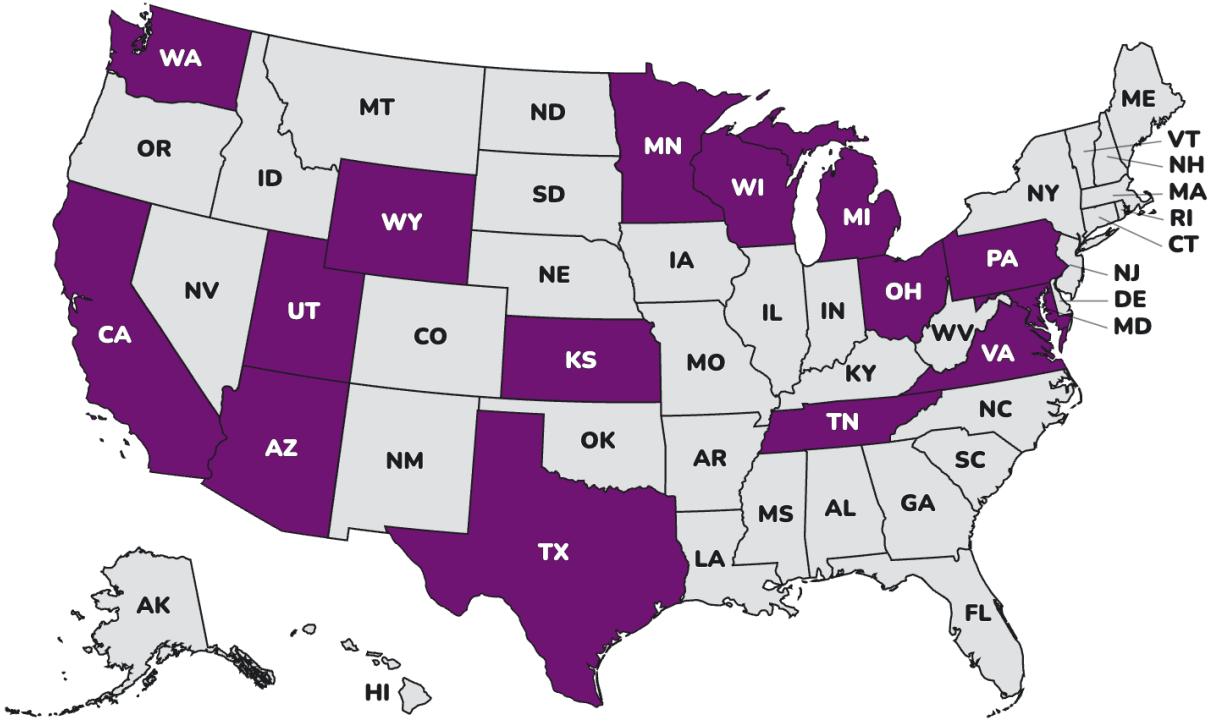


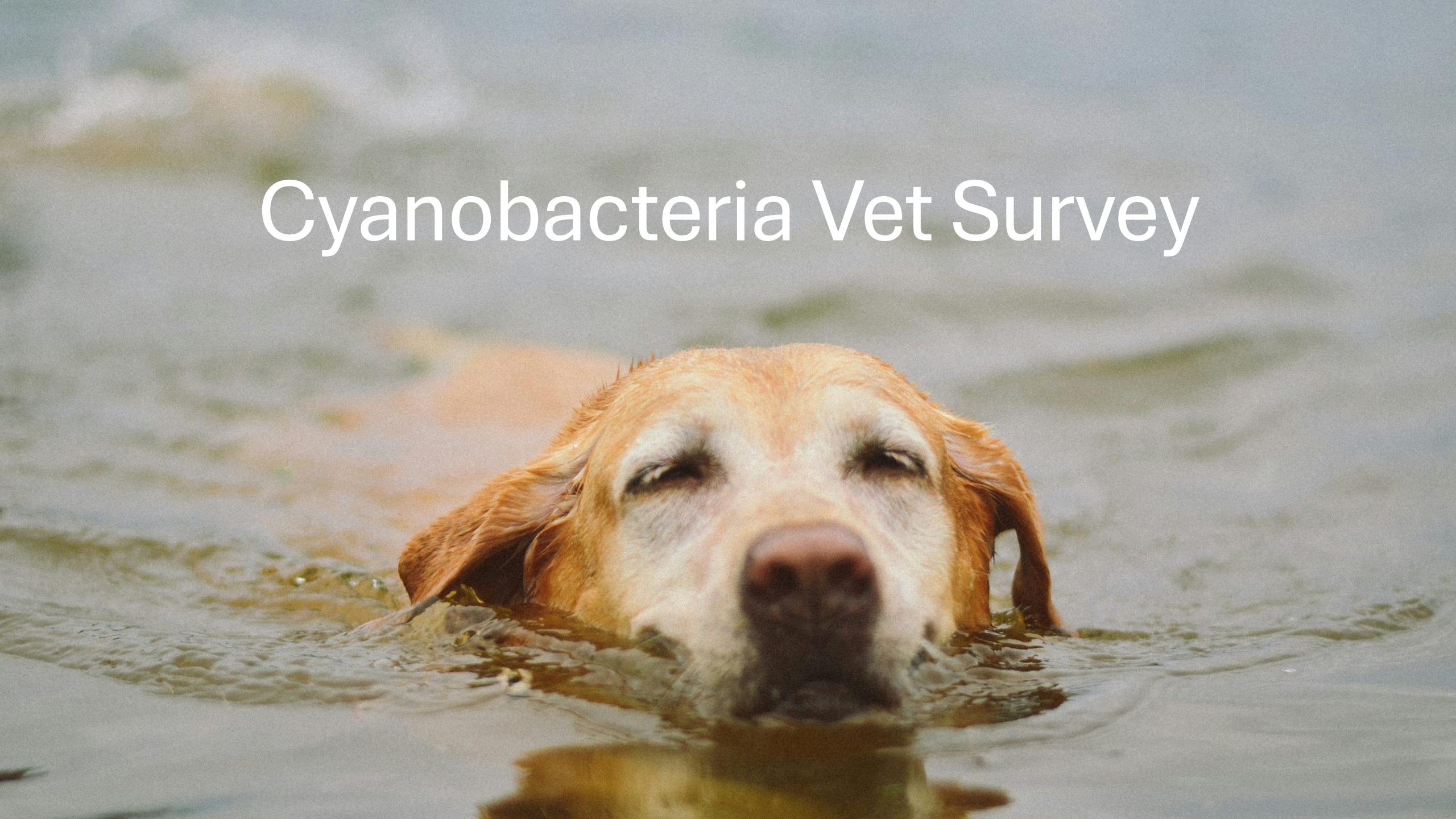
Image: OHHABS

Limited State Involvement

- MassDEP: local health departments manage HCBs
  - Exception: drinking water
- State doesn't track human or animal illnesses
- MassDPH HCB monitoring program 2009-2014, do some now on limited basis
  - Limited public data accessibility
- Unknown animal specimen testing capabilities

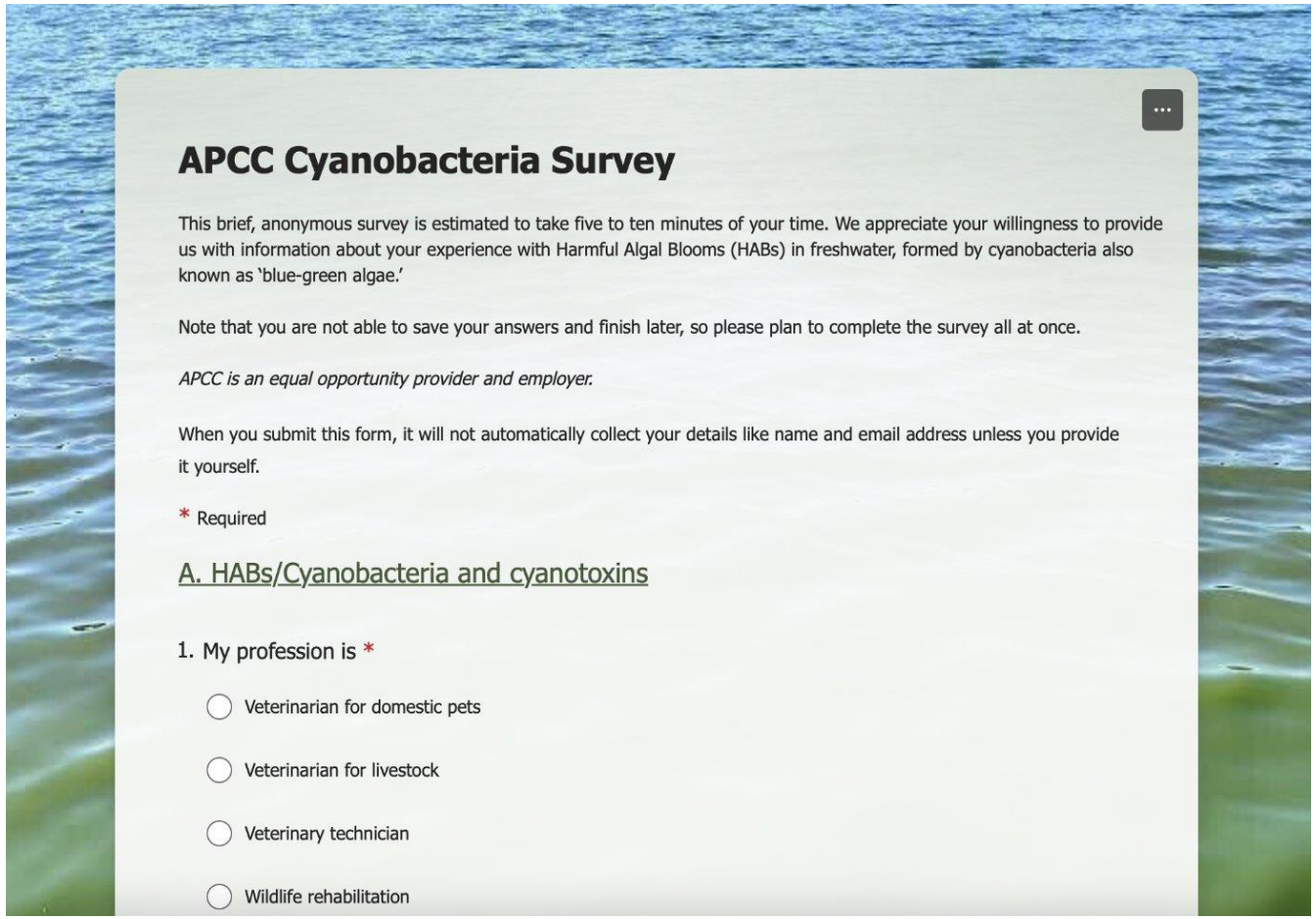
Image: MassDEP website

Cyanobacteria Vet Survey



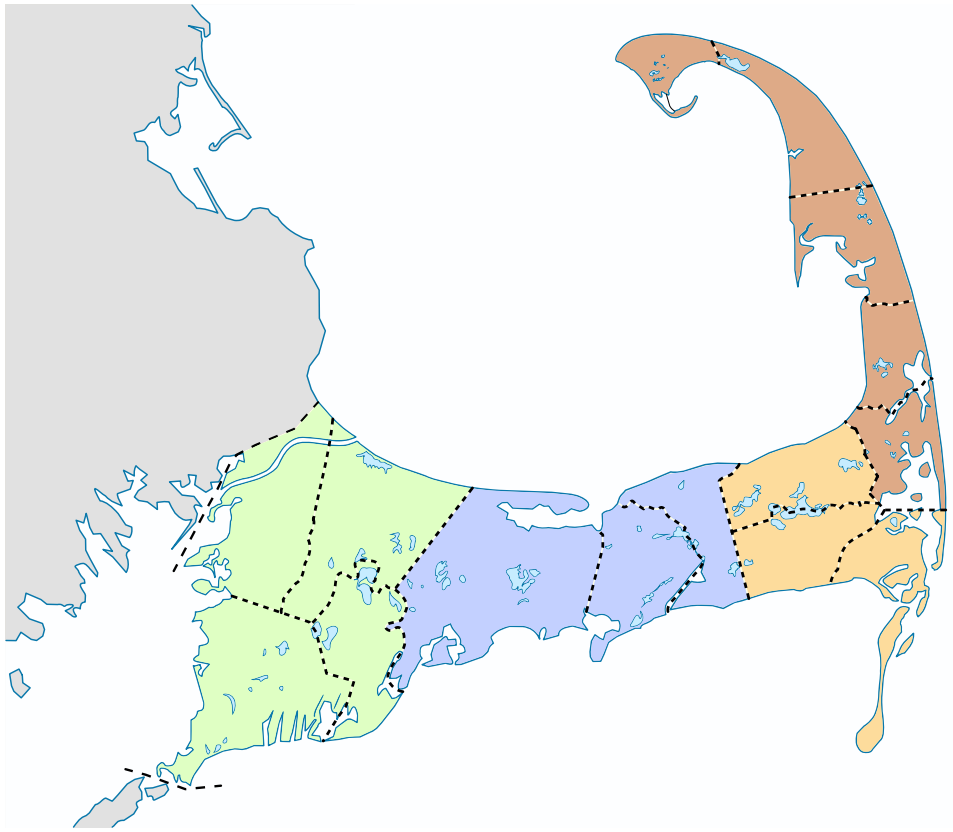
Vet Survey – Design

- Developed survey for vets, wildlife rehabbers, AC officers
- Knowledge and experience with animal cyano exposures
- Interest in webinar, online resource, database, brochures



Vet Survey – Implementation

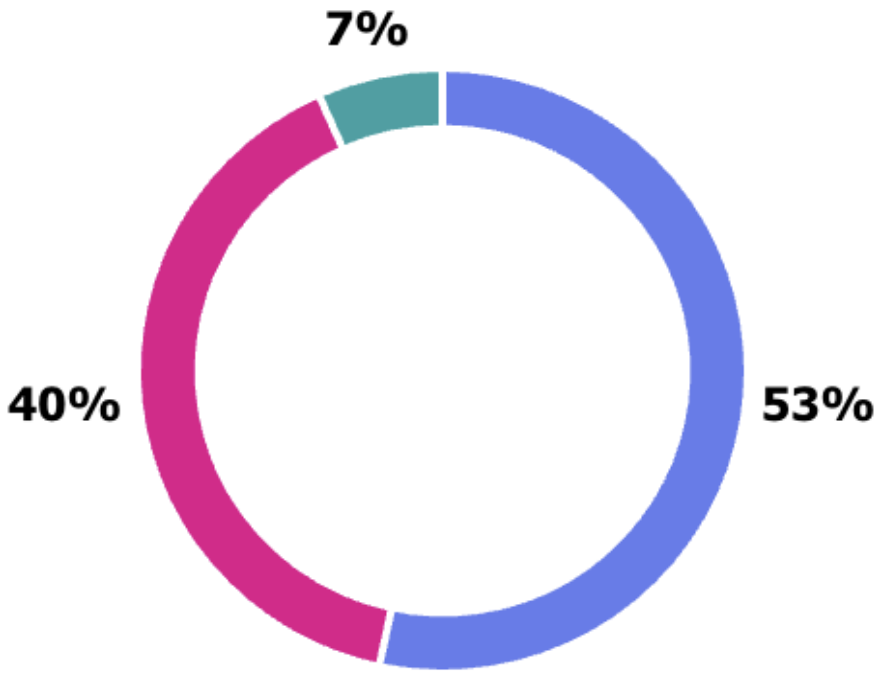
- Contacted every provider/office on Cape
- July 7 – July 31
- Received 15 responses
  - 6 vets/vet offices
  - 1 wildlife rehab
  - 8 AC officers



Vet Survey – Results

2. How aware are you about potentially toxic cyanobacteria blooms on Cape Cod? More details

Very aware	8
Somewhat aware	6
Not on my radar	1

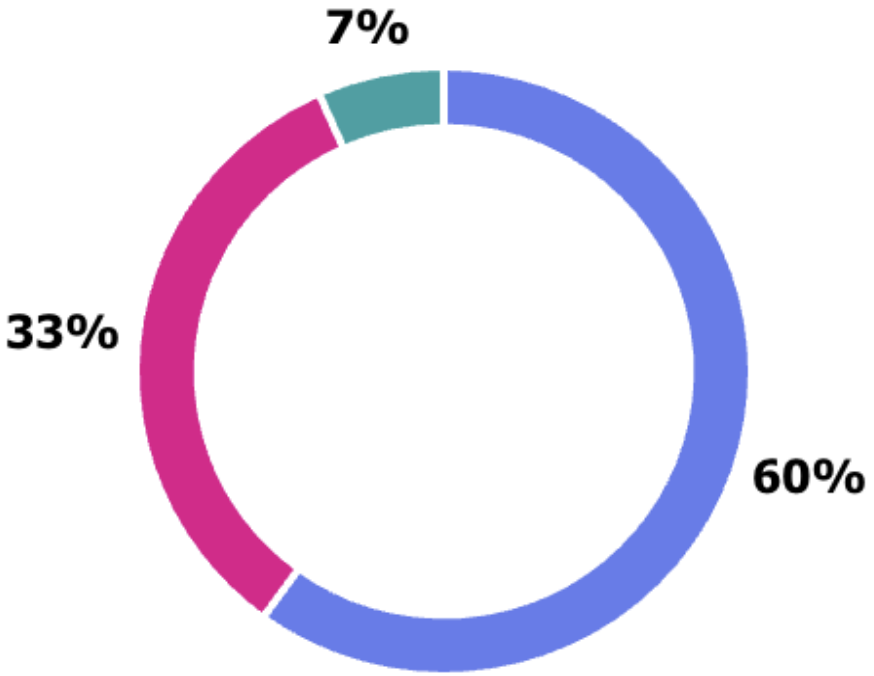


Vet Survey – Results

11. Would you be interested in learning more about cyanotoxins?

More details

Very interested	9
Somewhat interested	5
Not interested/not relevant to my practice	1

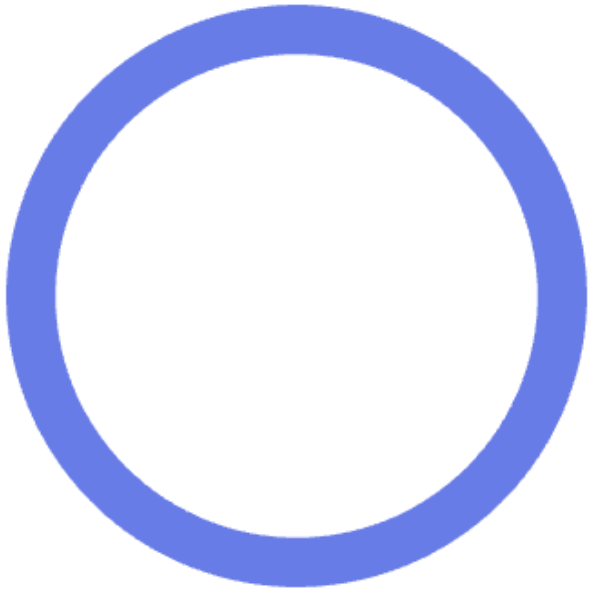


Vet Survey – Results

19. In your opinion, how important is it to inform the public about protecting their p ets from exposure to potentially toxic cyanobacteria blooms?

More details

Very important	15
Somewhat important	0
Not important	0
Unsure	0



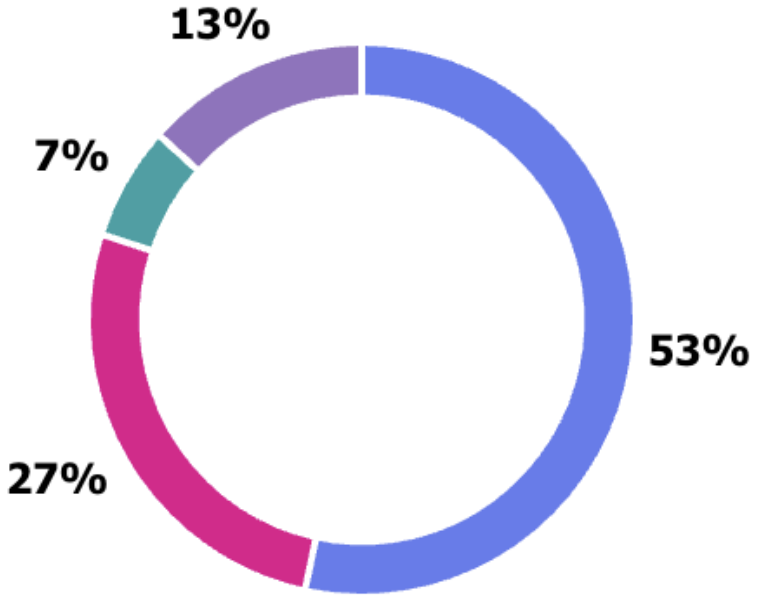
100%

Vet Survey – Results

8. In your profession, what has been the frequency of suspected or confirmed cases of cyanotoxin poisoning that you've encountered (on average per year)?

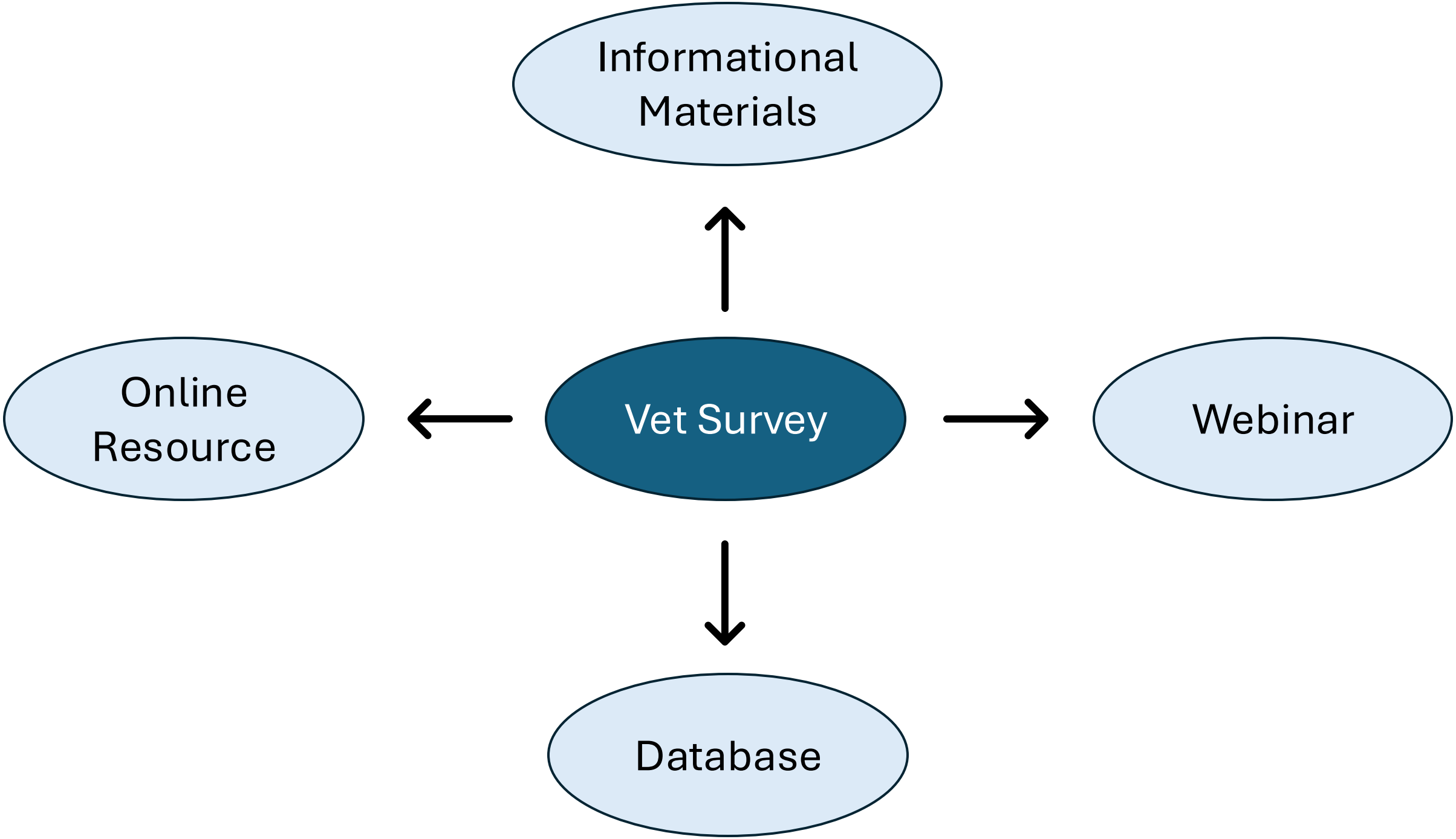
More details

None	8
Less than 5	4
More than 5	1
Unsure	2



At minimum, about 9 cases annually on CC

Moving Forward


Informational Materials
Online Resource
Vet Survey
Webinar
Database

WHOI Collaboration

- Survey: informing pet owners important + interest in materials
- Working with WHOI to design and print posters + brochures
- Plan to distribute to vet offices, libraries, pond bulletin boards

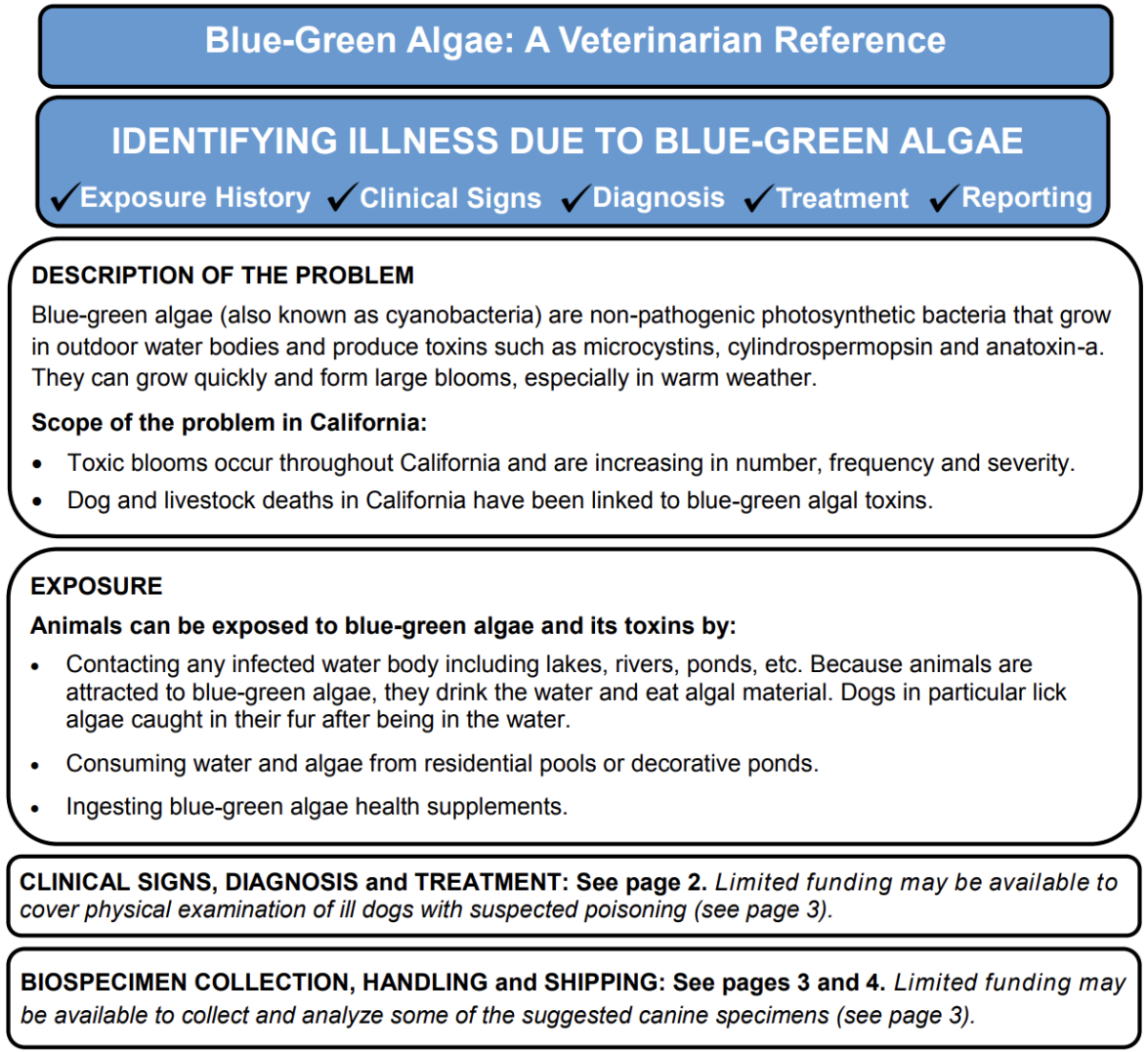
Image: Google Maps

Potential for Webinar

- Idea: informational webinar for vets and vet techs
- Would work with expert vet
- Recognizing and treating cyanotoxin poisoning
- Potential for CE accreditation

Longer-term Ideas

- Online Resource for vets
  - Cyanotoxin exposure symptoms
  - Treatment options
  - Lab information
- Database
  - Track suspected and confirmed cyanotoxin exposures
  - Submit reports via online form



Blue-Green Algae: A Veterinarian Reference

IDENTIFYING ILLNESS DUE TO BLUE-GREEN ALGAE

✓Exposure History ✓Clinical Signs ✓Diagnosis ✓Treatment ✓Reporting

DESCRIPTION OF THE PROBLEM

Blue-green algae (also known as cyanobacteria) are non-pathogenic photosynthetic bacteria that grow in outdoor water bodies and produce toxins such as microcystins, cylindrospermopsin and anatoxin-a. They can grow quickly and form large blooms, especially in warm weather.

Scope of the problem in California:

- Toxic blooms occur throughout California and are increasing in number, frequency and severity.
- Dog and livestock deaths in California have been linked to blue-green algal toxins.

EXPOSURE

Animals can be exposed to blue-green algae and its toxins by:

- Contacting any infected water body including lakes, rivers, ponds, etc. Because animals are attracted to blue-green algae, they drink the water and eat algal material. Dogs in particular lick algae caught in their fur after being in the water.
- Consuming water and algae from residential pools or decorative ponds.
- Ingesting blue-green algae health supplements.

CLINICAL SIGNS, DIAGNOSIS and TREATMENT: See page 2. *Limited funding may be available to cover physical examination of ill dogs with suspected poisoning (see page 3).*

BIOSPECIMEN COLLECTION, HANDLING and SHIPPING: See pages 3 and 4. *Limited funding may be available to collect and analyze some of the suggested canine specimens (see page 3).*

Image: California WQMC


Questions?

Old Ladies Against Underwater Garbage
Now on track to clean more than 20 ponds this summer

OLAUG

CONTACT: To arrange a Cleanup Scouting

Email: OLAUG.MA@gmail.com
Follow us on Instagram:
@olaug_capecod
https://olaug-ma.com/