



Freshwater Blooms: Introduction and 2019 Recap

Lake Anna State Park – Saturday July 28, 2019

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Topics Overview

- Harmful Algal Bloom (HAB) Freshwater Primer
- Working Draft - Freshwater HAB Recreational Advisory Guidance
- 2019 Freshwater Advisory Summary
- 2019 Virginia HAB Task Force Meetings & Outreach

Freshwater HABs = Cyanobacteria

Freshwater Primer



Harmful Algae Blooms (HABs)

Bloom = occurs when environmental conditions are favorable – *light, temp, nutrients*

– Blooms may pose an **environmental**, **human**, and/or **animal** health threat

- **Some cyanobacteria may produce toxins**
 - **Toxins are most dangerous if ingested**
- Reduces oxygen in water (dead zones, fish kills)
- Inhibits sunlight = impacts aquatic vegetation

Of the ~73,000 species of algae, ~300 species may form blooms, <100 known to produce toxins


Benthic Cyanobacteria

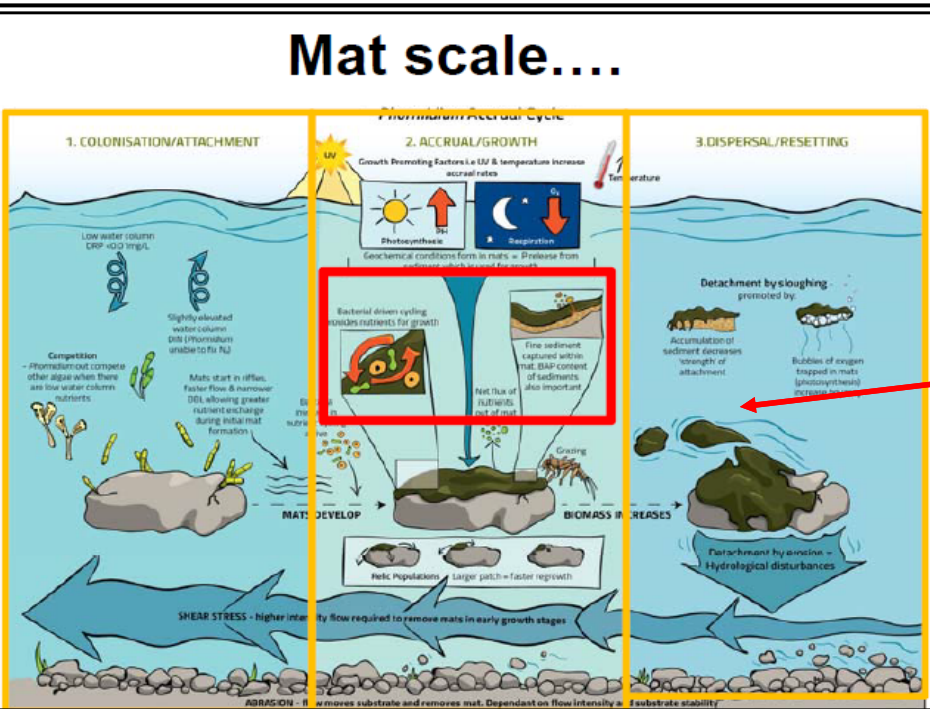
Freshwater Primer

Planktonic cyanobacteria – slower moving systems such as lakes and estuaries

Benthic cyanobacteria – growth habit in rivers with greater velocity, light reaches bottom substrate

7/10/17 1st Benthic HAB Workgroup Webinar:
Benthic Cyanobacteria and Toxin Production in New Zealand Rivers

Susie Wood & Jonathan Puddick 



- May detach from the benthic substrate
- Mats float up to surface & may accumulate down-river along shorelines
- Challenges: collection/analytical methods, survey, assessment of coverage, public messaging

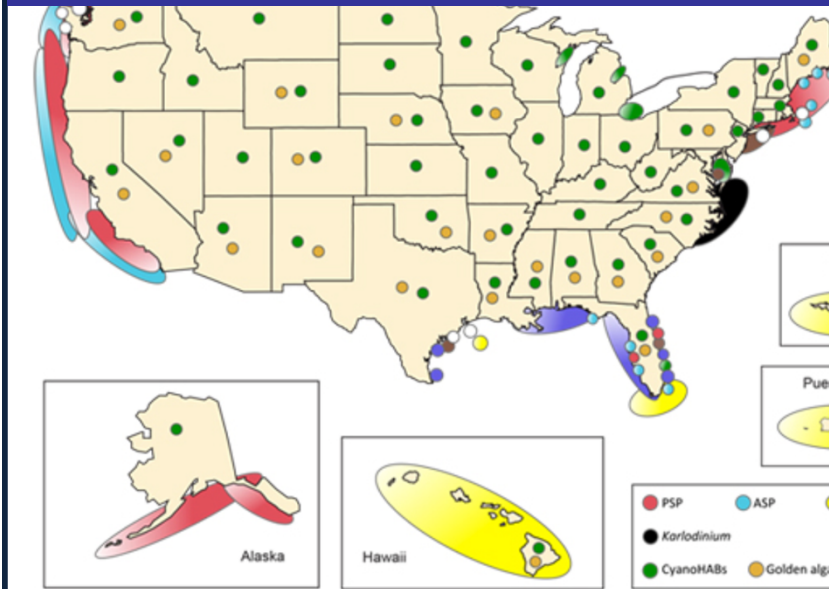
- *Anabaena*, *Phormidium*, *Planktothrix* are examples of potential toxin-producing benthic cyanobacteria



<https://www.epa.gov/cyanohabs/epa-newsletter-and-collaboration-and-outreach-habs#benthic>

Cyanobacteria & Toxins have Global Distribution

Freshwater Primer



LOCAL Lake Erie, S. Florida algae crises share common toxins and causes

By Tom Henry | BLADE STAFF WRITER | 30
Published on July 24, 2014 | Updated 12:04 p.m.



or thick with algae laps the shore of the St. Lucie Estuary. Phosphorus-rich water released. PALM BEACH (FLA)

Tap Water Ban for Toledo Residents

By EMMA G. FITZSIMMONS | AUG. 3, 2014



Salem reissues do-not-drink alert after toxins found again in drinking water

Jonathan Beck and Sarah Lyons | *Statnews Journal* | Published 10:50 a.m. PT June 6, 2018 | Updated 7:08 p.m. PT June 6, 2018

<https://www.whoi.edu/redtide/regions/us-distribution>

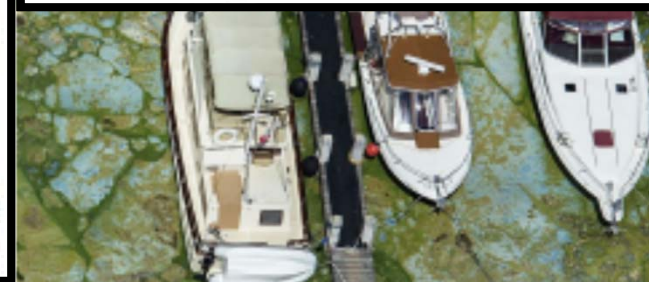
North Carolina Woman Issues Warning After Her 3 Dogs Die Within Hours of Playing in Pond

POSTED 9:48 AM, AUGUST 12, 2019, BY CNN WIRE, UPDATED AT 12:58 PM, AUGUST 12, 2019

Abby, Izzy, & Harpo



Florida needs to deal with long-term health risks from harmful algal blooms | Tampa Bay Times



ALGAE BLOOM INGREDIENTS Some Increasing With Climate Change

MORE HEAVY PRECIPITATION

Washes additional nutrients into waters

WARMING WATER

Favors growth of some types of toxic algae

Source: USGCRP Climate and Health Assessment, 2016

CLIMATE CENTRAL

Freshwater HAB Recreational Advisory Guidance

Working Draft

Applies to Recreational Advisories in Fresh and Brackish Waters

5,000 to <20,000	Toxicogenic species	➤ Local agency notification; initiate bi-weekly water sampling
<i>Microcystis</i> species	≥ 40,000cells/ml*	= Issue swimming advisory
Total of Toxicogenic Species	≥ 100,000cells/ml**	= Issue swimming advisory
“HYBRID APPROACH” – cell densities and/or toxins		
Microcystin	≥ 8ug/L*	= Issue swimming advisory
Cylindrospermopsin	≥ 15ug/L*	= Issue swimming advisory
Blue-green algal “scum” or “mats” on the water surface = Issue swimming advisory if in high recreational use swimming area		



*EPA 2019 Revised Recreational HAB Advisory Recommendations

**WHO 2003 Recommendations

2020 – VDH will pursue formal adoption of this guidance

Advisories typically lifted after 2 consecutive samples below thresholds; VDH may lift with fewer results under certain circumstances.

- Resource limitations – do not have capacity to analyze Anatoxin-a and Saxitoxin; no human health advisory thresholds for either

2019 Freshwater Responses

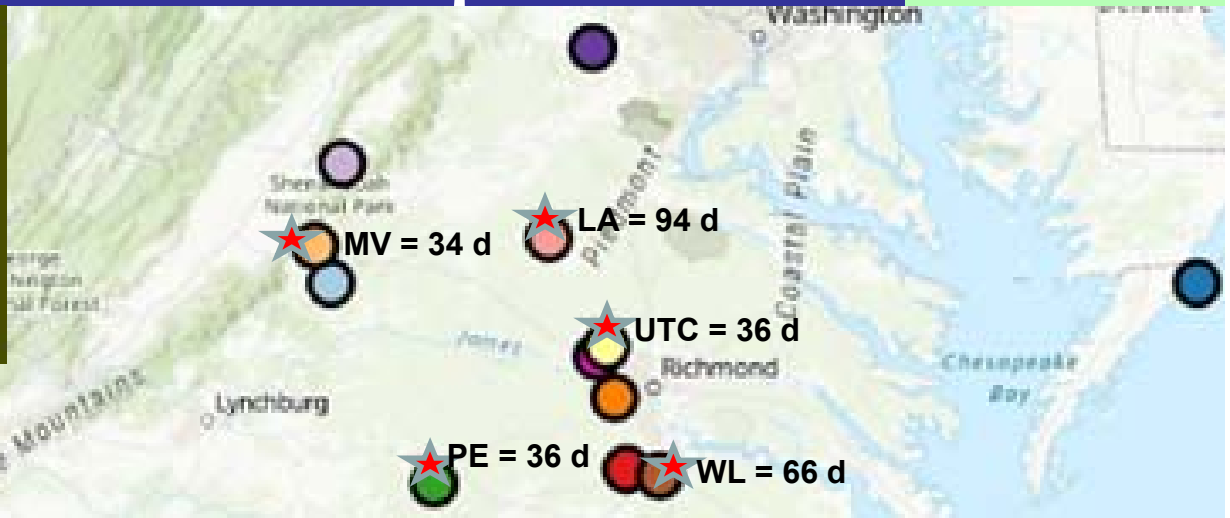
Overview of Responses - Handout



WHEN IN DOUBT, KEEP PETS OUT!

Don't let your pets swim in, play in, or drink discolored or scummy water. Find out why at www.cdc.gov/habs

★ F = 12 d



sample collections	April	May	June	July	Aug	Sept	Oct	Total	Days under advisory
Albemarle Co.					1			1	
Chincoteague Pond							2	2	
Flannagan Lake				7	11			18	12★ F
Goodwin & Prince Edward Lake						6	2	8	36★ PE
Lake Anna	3	12	6	16	16	11	10	74	94★ LA
Lake Chesdin						3		3	
Little Tuckahoe Creek							1	1	
Mint Springs Valley Park									34★ MV
Moorefield Pond						2		2	
Shenandoah River				1	7			8	
Silver Lake	3							3	
Upper Chickahominy tributary					4	3	2	9	36★ UTC
Wilcox Lake					3	5	4	12	66★ WL

Total Number of Freshwater samples 141

“Red” = Advisory Issued
= Number of samples collected

No HAB-related pet illnesses or deaths have been confirmed in VA

2019 Freshwater Advisories

Lake Anna

2019 Recreational Advisory – 94 days*
2018 Recreational Advisory – 76 days
2017 Recreational Advisory – none

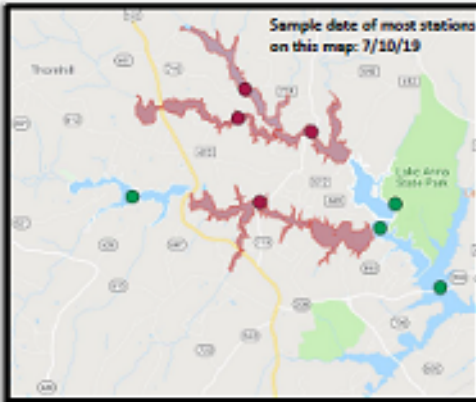
*monitoring began in April 2019 vs. Aug 2018

Sampling & Advisory Management changes from 2018 to 2019:

- Sampling at sites **above** Rt. 208 monthly or bimonthly
- Only shoreline sample at Lake Anna State Park
- HAB map displays “polygon” area under advisory
- Fact sheets distributed to a list of internal and external area stakeholders after each sample event regardless of advisory status
- Edits to Cyanobacteria Toxins & Health Effects List

Lake Anna - Harmful Algae Bloom (HAB) Report

Issued Tuesday 7/16/19
Next Issue: First week of August (weather dependent)



Sample date of most stations on this map: 7/10/19

- Harmful algae (cyanobacteria) concentrations exceed safe levels.
- Harmful algae (cyanobacteria) concentrations below safe levels.
- Lake area under swimming advisory

Helpful Tip!
Visit www.SwimHealthyVa.com and click on the Harmful Algae Bloom Map to review sample results near you!
Expand the map using the symbol in the upper right hand map title bar, then click on the magnifying glass. You can search my location name or address!
View the news release in the VDH Newsroom: www.vdh.virginia.gov/news/2019-news-releases/


How do I protect myself, my family, and my pets from cyanobacteria blooms?

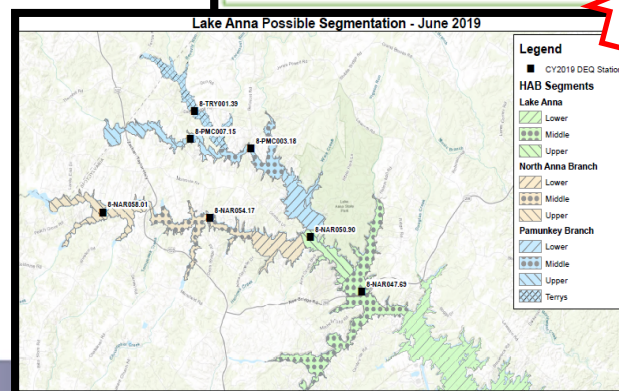
- Don't swim, water ski, or boat in areas where the water is discolored or where you see foam, scum, or mats of algae on the water's surface.
- Do not allow children or pets to play in or drink scummy water.
- If you do swim in water that might contain harmful cyanobacteria, rinse off with fresh water as soon as possible afterward.

BE AWARE of Harmful Algae Blooms

Water quality is tested to determine if health risks may be present.

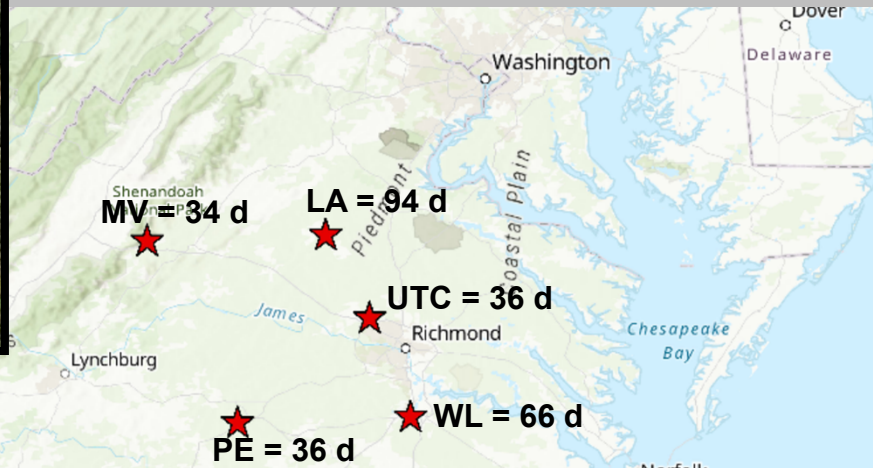
During an algae bloom, water may have surface scum, mats, or films with red, green, white streaks, or glops.





2019 Freshwater Advisories

Other
Advisories



Mint Springs Valley – Crozet

- swimming lake - private lake management company analyzed samples

Lower J.W. Flannagan Reservoir – Russell County

- 1st recreational advisory
- HAB observed during winter months since 2017
- high recreational use

Twin Lakes State Park - Prince Edward County

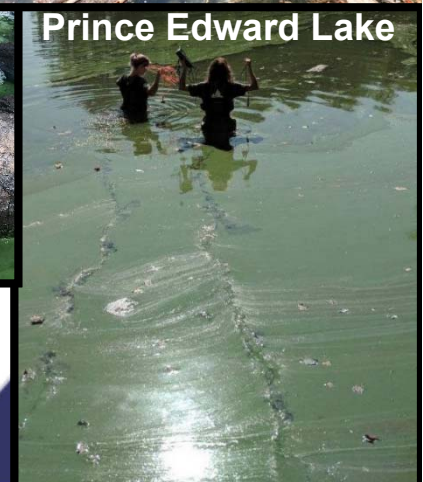
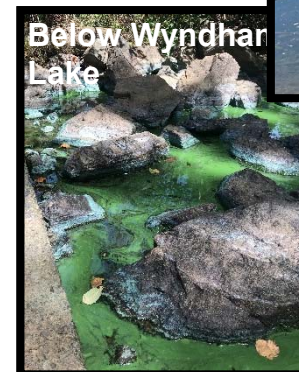
- Prince Edward Lake – fishing & kayaking

UT Chickahominy River – Henrico County

- Quasi – public use; stream behind Shady Grove Ele.
- Wyndham Lake – promoted the concern about irrigation use

Wilcox Lake - Petersburg

- Public lake primarily used for fishing & kayaking



2019 Virginia HAB Task Force Meetings & Outreach

Events of Note

Environment Virginia

March 26-28 (Lexington, VA)
HAB panel organized by Chesapeake Bay Foundation

VDH Climate Change Summit

June 10 (Henrico, VA)
HAB session

Lake Anna Civic Association (LACA)

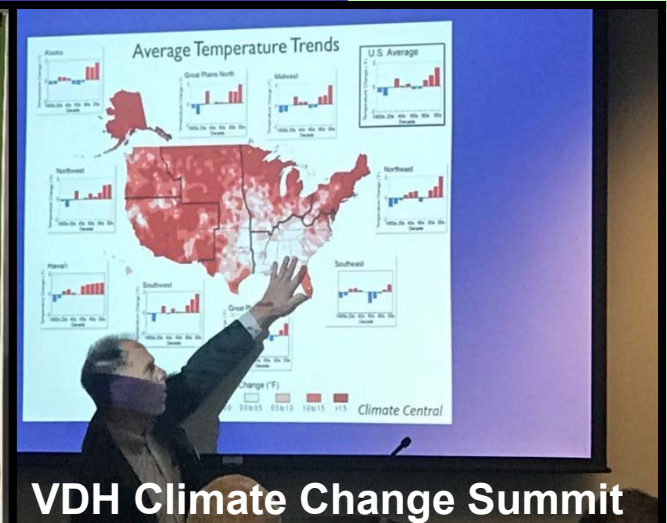
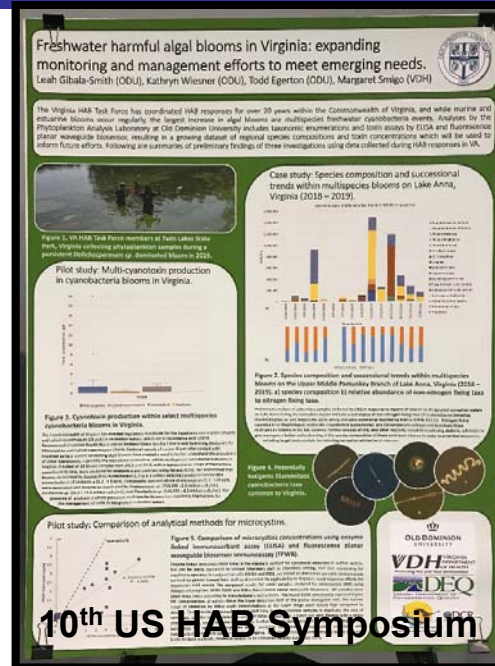
Annual Meeting
July 27 (Spotsylvania, VA)

NASA Remote Sensing Workshop

August 21-22 (Greenbelt, MD)
Virginia HAB advisory challenges

10th US HAB Symposium

November
(Orange Beach, AL) – Multiple posters & talks from VA HAB TF partners



VDH Climate Change Summit



10th US HAB Symposium