



**Department of
Environmental
Conservation**

NY HABs and NYHABS

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NYSFOLA Conference

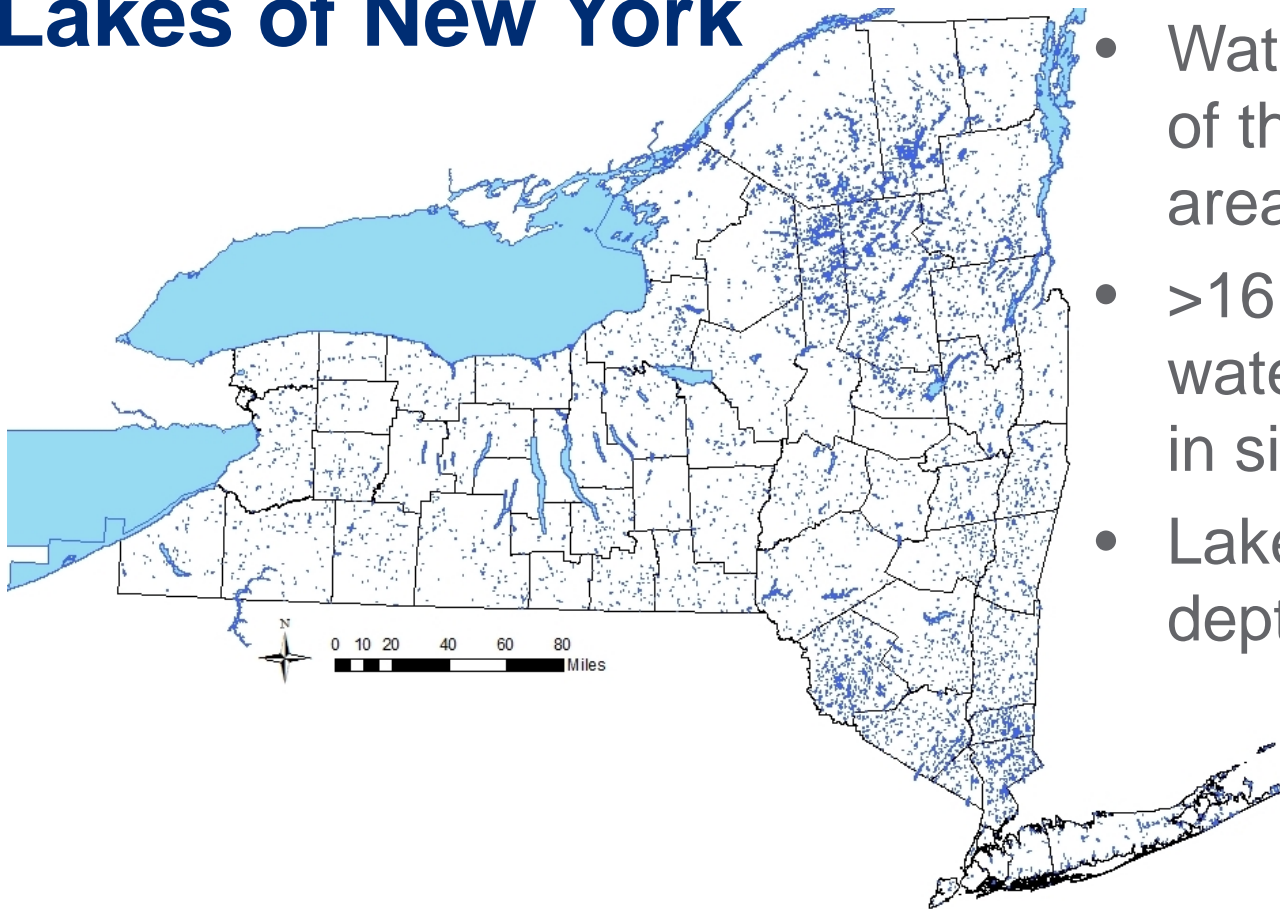
April 29th, 2021

Outline

- Background – NYS and HABs
- HABs vs look-a-likes
- NYS HABs Program
- NYHABS

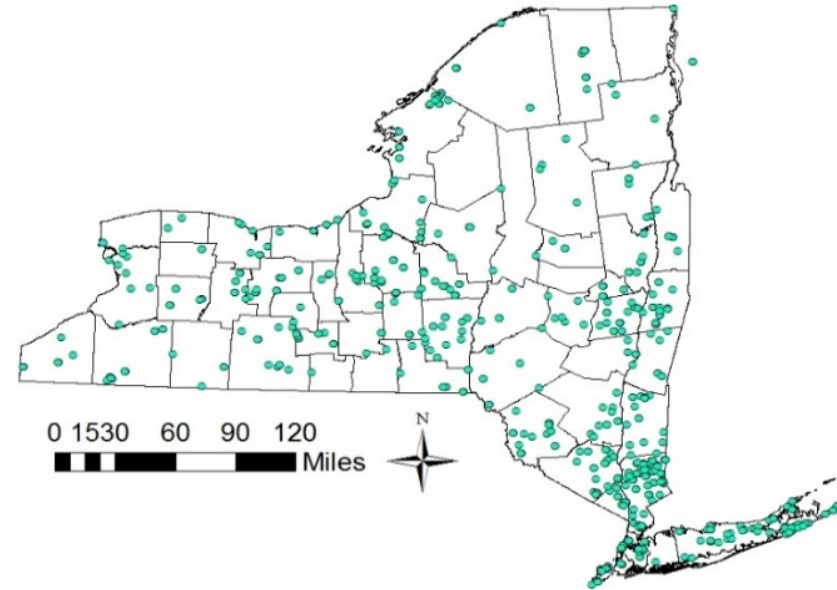
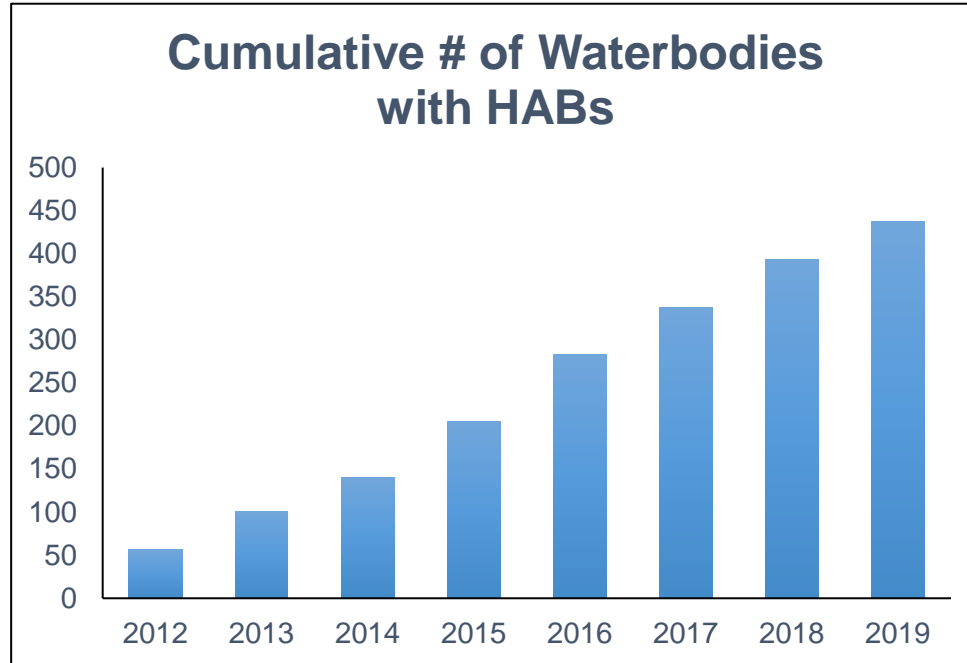


Lakes of New York



- Water covers over 10% of the state surface area!
- >16,000 distinct ponded waters over ~0.1 acre in size
- Lakes vary in size, depth, trophic status

Statewide Distribution of HABs



What is a HAB?

H: Harmful (toxins, economic aesthetics, ecological)

A: Algal (freshwater HABs refer to cyanobacteria, not truly algae)

B: Bloom (proliferation of cells, dense concentrations)



The Lake in Central Park

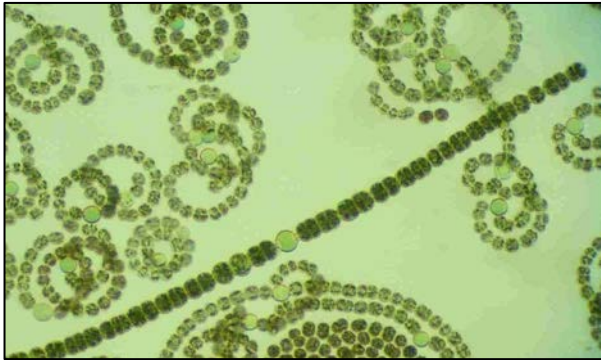
Cyanobacteria – Blue-green Algae – HABs

- Highly specialized and competitive ancient bacteria
- Some types can regulate buoyancy or fix nitrogen
- Grow best in high temperature, high light, high nutrient conditions
- Causes not fully understood, hard to predict



Common types of Cyanobacteria

Dolichospermum



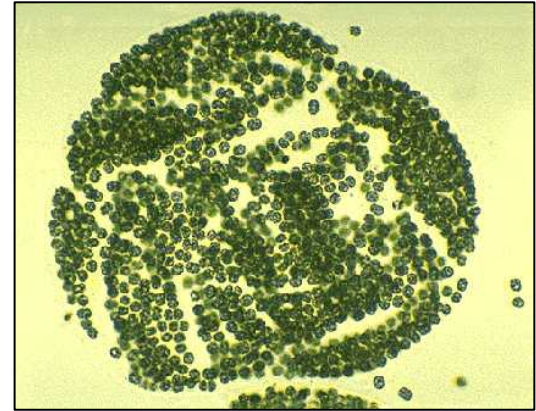
- Fixes Nitrogen
- Can produce anatoxin (nerve toxin) and others

Aphanizomenon



- Adjusts buoyancy
- Can produce microcystin (liver toxin)

Microcystis



Seasonal Changes in Algae

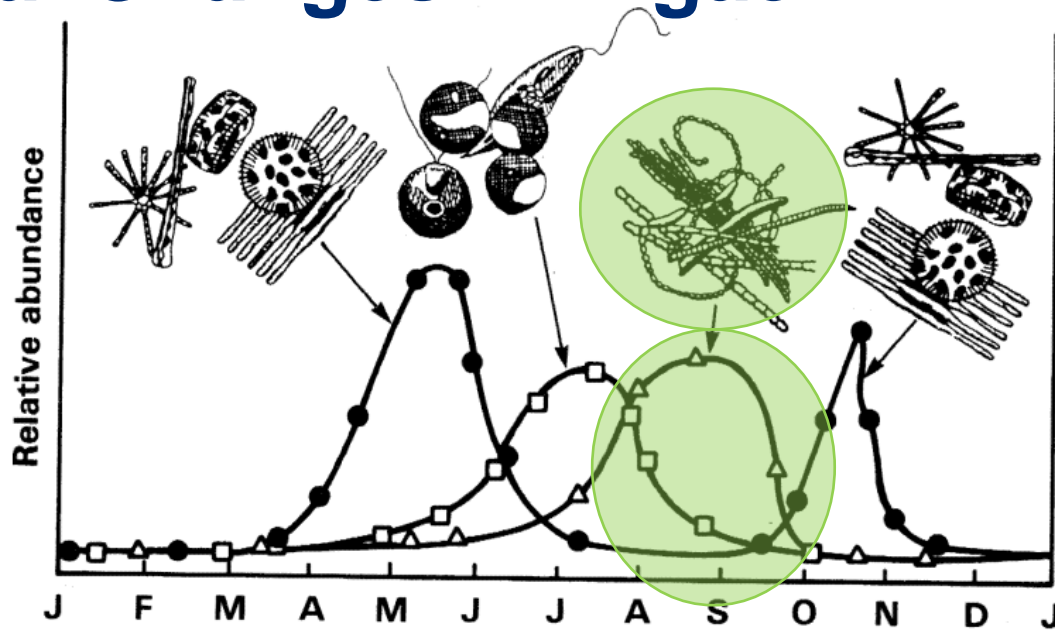
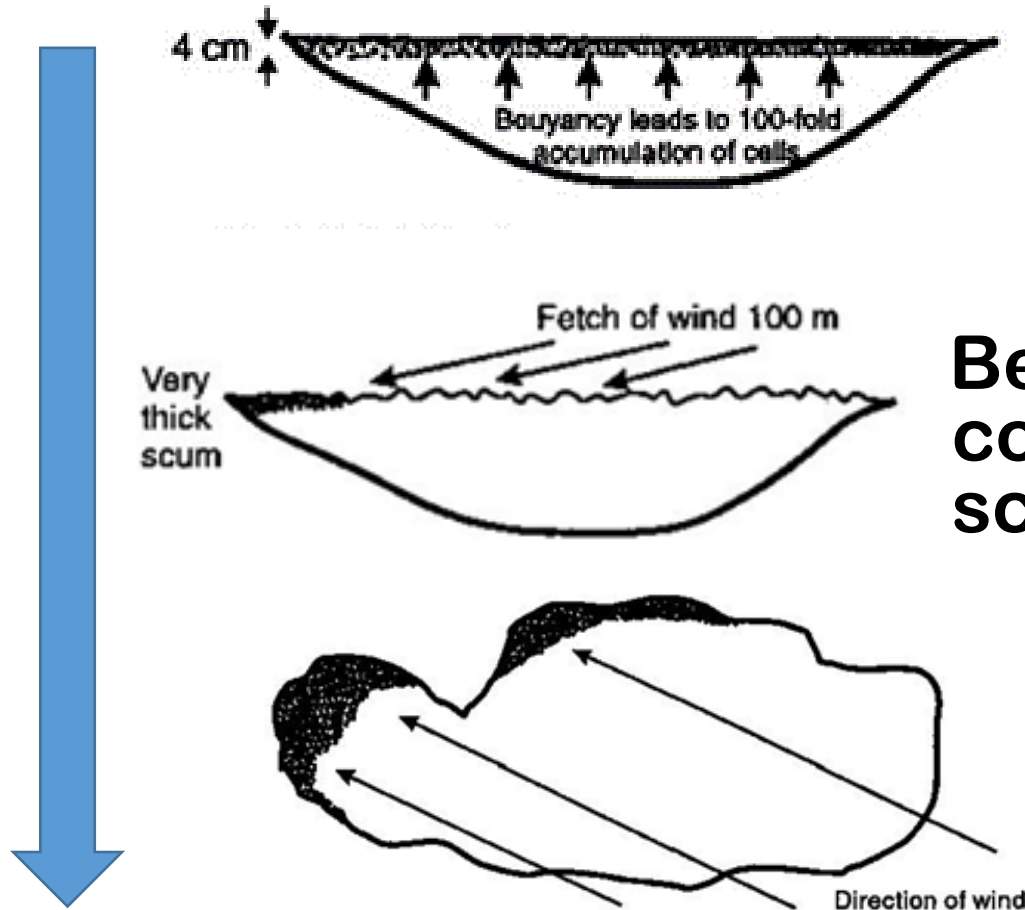


Figure 5. Seasonal Succession of Phytoplankton (Olem and Flock, 1990)

Diatoms tend to dominate in spring and fall, with greens and blue-greens dominant during summer, but many variations are possible.



Each level
has 10-
1000x
increase
in cells

**Be careful of wind
concentrated
scums!**

Cyanotoxins

Microcystins (liver toxins)

- Most common toxin in New York

Anatoxins (nerve toxins)

- Potentially fatal to dogs

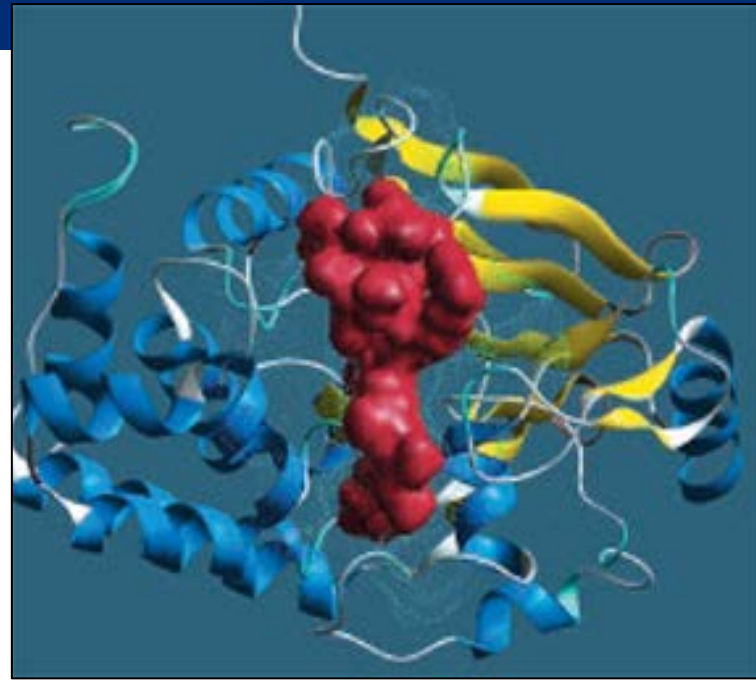
Lipopolysaccharides (endotoxins)

- Skin irritants and allergens
- Produced by most cyanobacteria

Other Toxins (Cylindrospermopsin, Saxitoxin, BMAA, etc.)

No visual cues that toxins are present

Toxin production not well understood



Routes of exposure to HABs and toxins



1. Consumption: incidental swallowing, drinking water
2. Inhalation: aerosols created during household use or recreation
3. Dermal: skin contact during recreation

- Consider visiting a healthcare provider if you, your family, or your animals experience symptoms related to HABs.

Potential Symptoms:

- Allergic reaction
- Skin, eye, or throat irritation
- Diarrhea
- Nausea
- Vomiting
- Respiratory difficulties

- For more information:
www.health.ny.gov/HarmfulAlgae

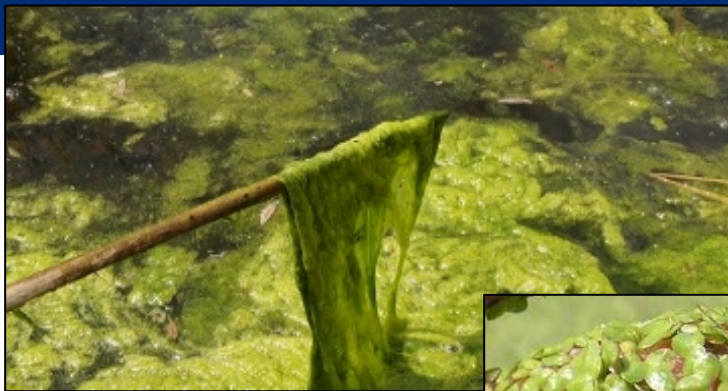


To HAB or not to HAB?



NOT HABs

Filamentous = wet cloth, hair



Duckweed/watermeal = very small plants



Pollen = In Spring, very yellow, breaks apart



Whiting Events



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Filamentous green algae

Common types:
Cladophora
Mougeotia
Spirogyra

Spirogyra – bright green “cloud”, under the surface



Examples of *Spirogyra* green algae blooms.

Duckweed

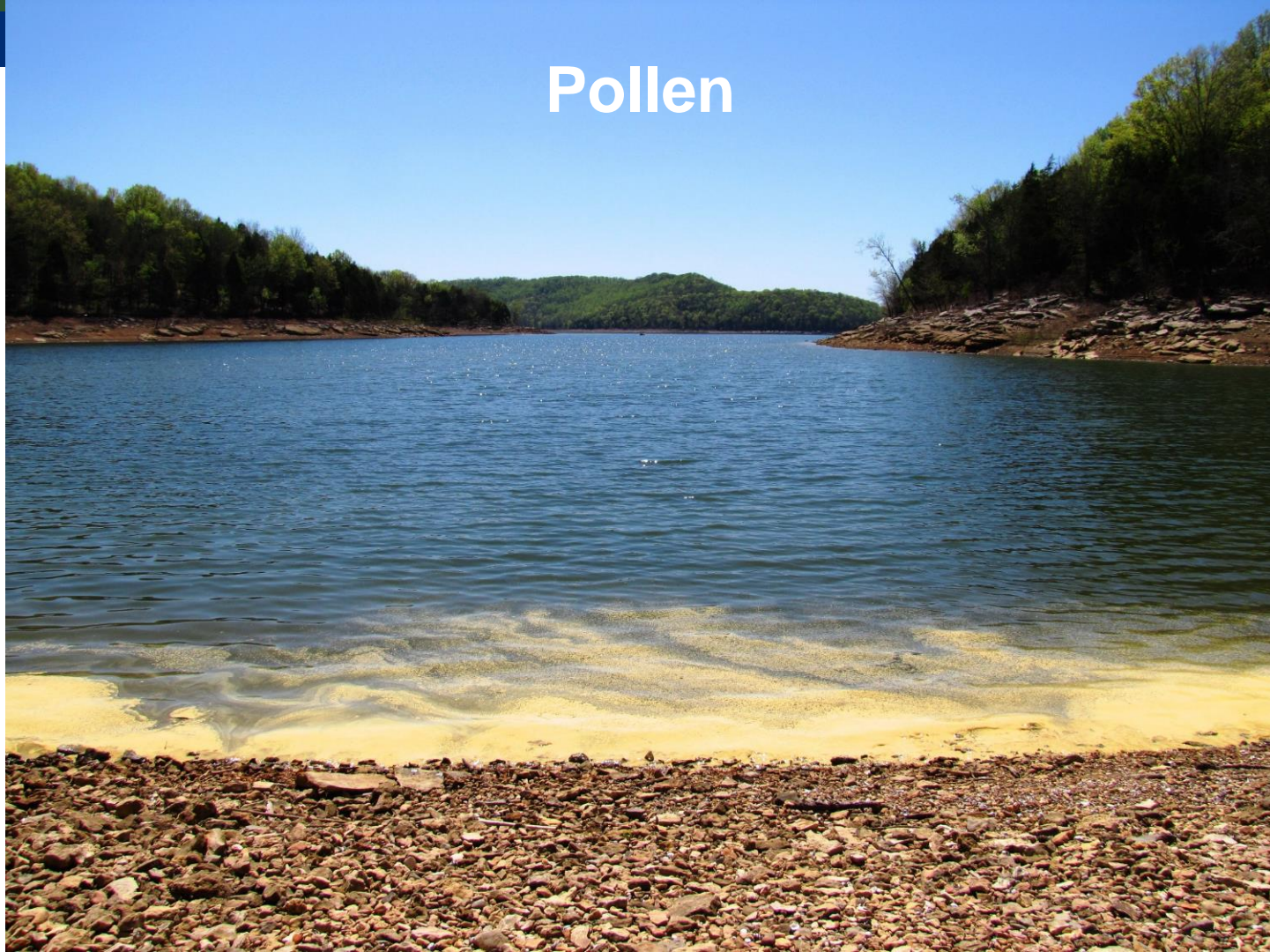


Watermeal

17



Pollen





Pollen

- Bright yellow in color (which is not typical of HABs)
- Breaks up easily
- Most common in spring/early summer

Whiting Event

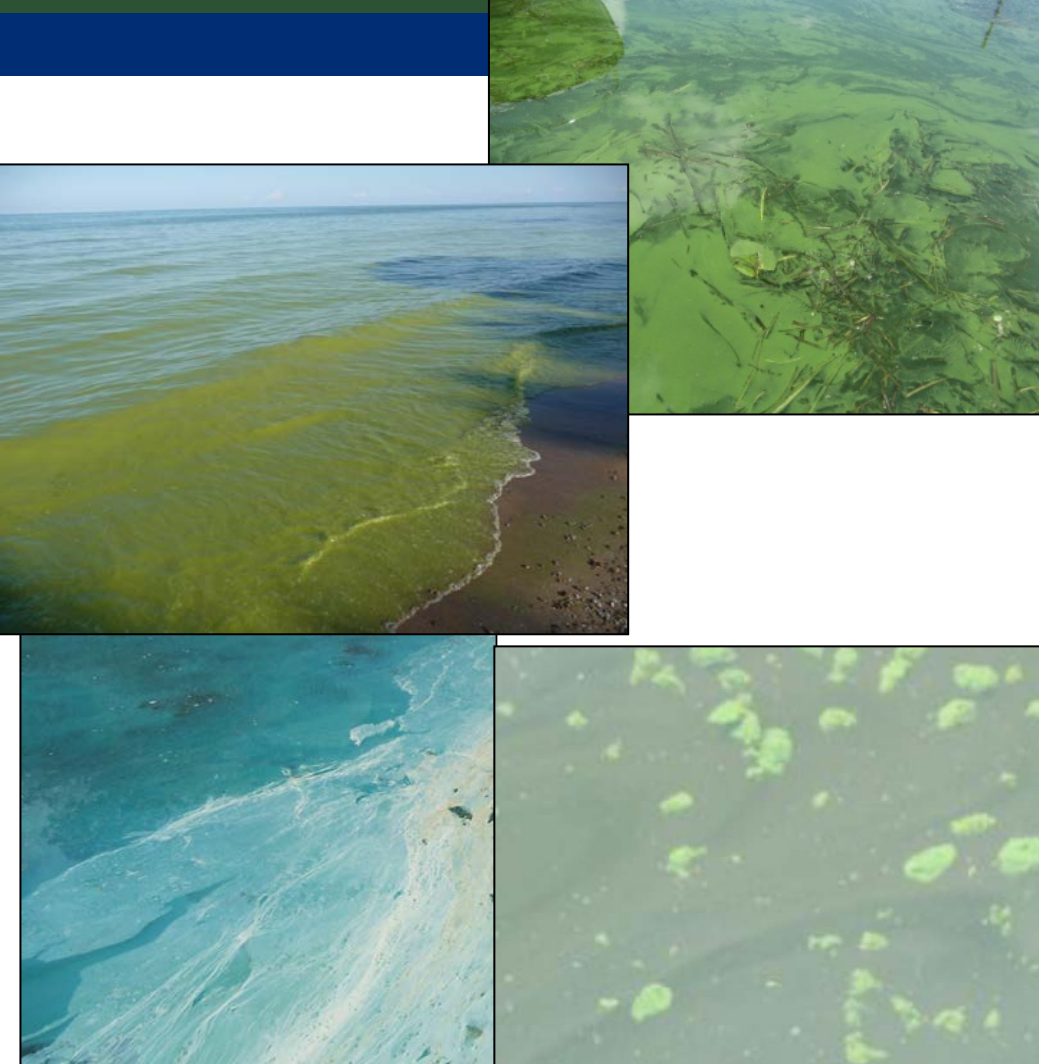
- Lightening or whiting of water color
- Fine particles of calcium carbonate form



HABs

Likely to be HABs

- Oily, shiny, sheeny
- Pea soup appearance
- Surface scums, foamy
- Spilled paint on the surface
- Discolored (green or blue green) streaks
- Floating clumps or globs
- Other



Oily, shiny, sheeny



Pea Soup, Scum, Foamy



Paint, scum, foamy



Paint, scum, foamy



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Surface or mixed in water column



Surface or water column



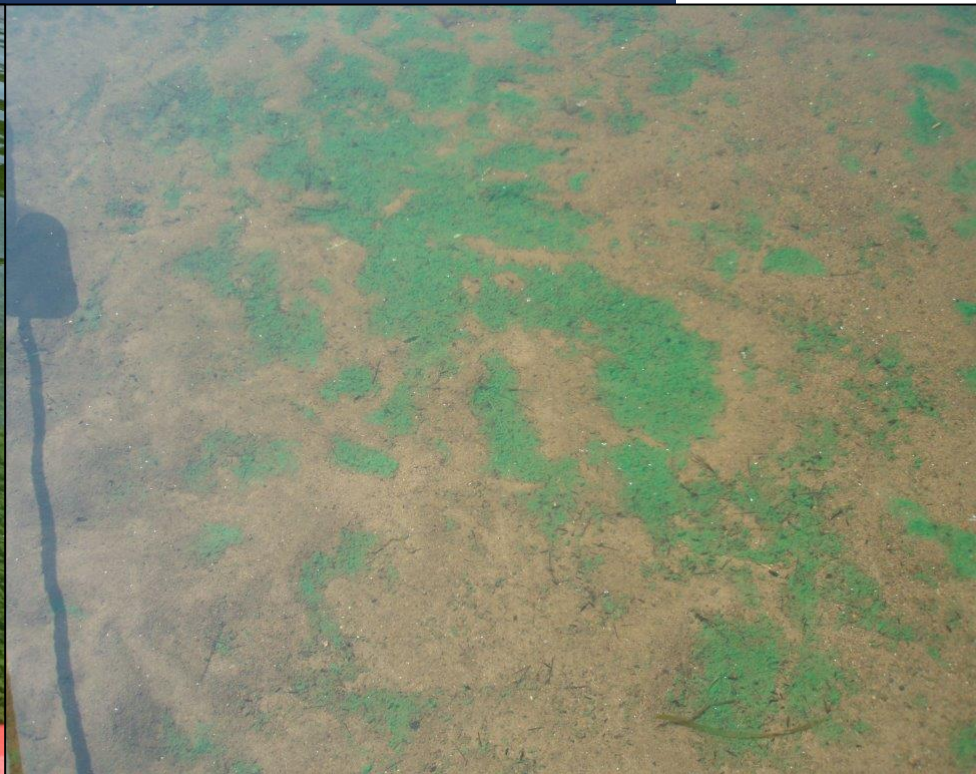
Accumulates on shorelines, docks or coves



Accumulates on shorelines, docks or coves



Streaks, clumps, globs



Streaks, clumps, globs



Other

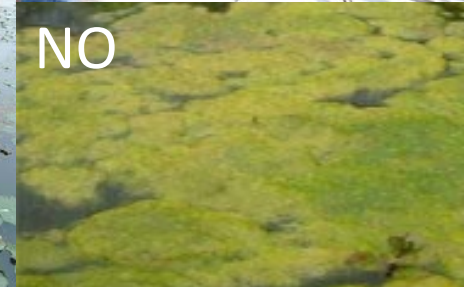
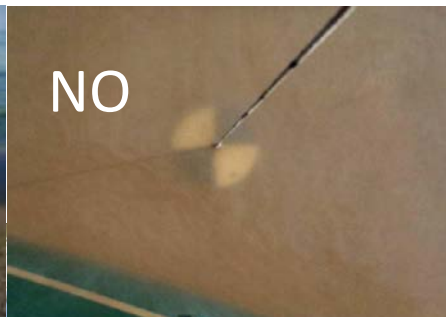


Photo Credit: Istvan Szabo



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Test your skills



Test your skills continued



Visual Based Response: Why?

- Symptoms possible with or without toxins
- Sampling and analysis takes time
- Not all toxins analyzed
- Blooms are dynamic:
 - Spatial, temporal & toxin gene expression
- Not practical to sample all waters at all times
- **Know it, Avoid it, Report it!**



The Difficulty of HABs



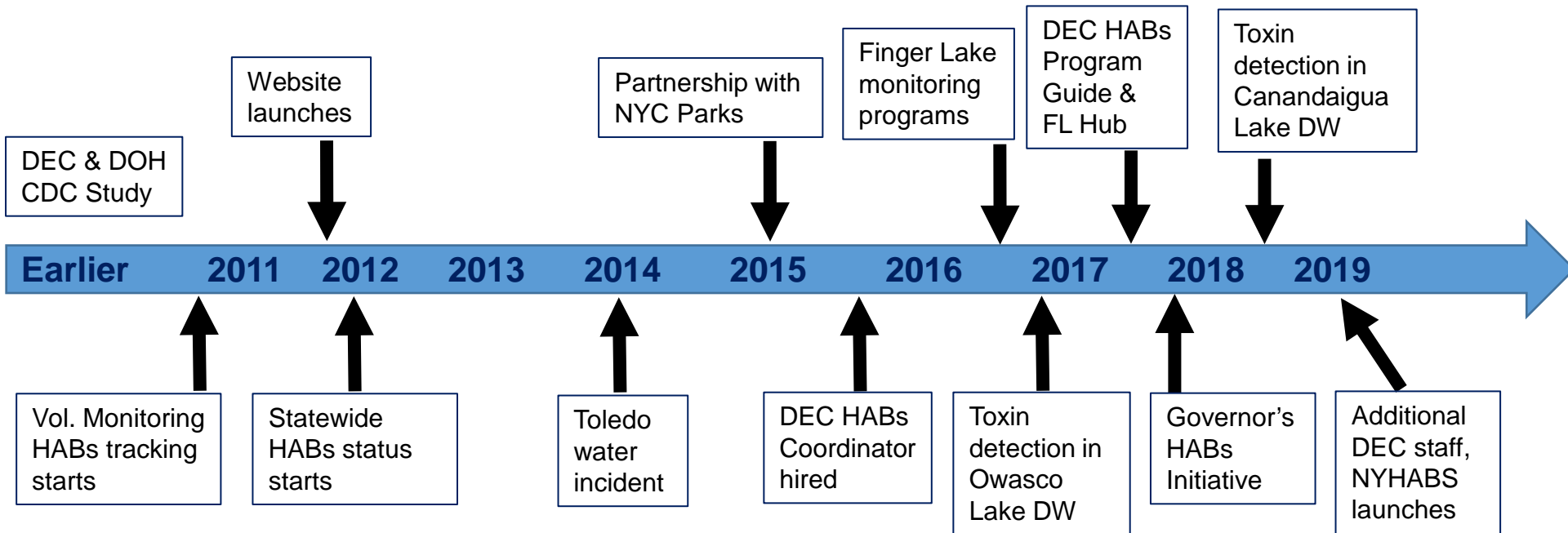
NYS HABs Program

What do we do?



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Timeline of NYS HABs Program



DOH – State Parks – DEC: Separate but overlapping

- DOH oversees drinking water testing & reporting, health concerns related to exposure to HABs
- DEC provides near real time interagency and public bloom notifications
- DEC, DOH and Parks operate regulated swimming areas; communicate HABs-related closures to DEC
- Agency staff communicate regularly

How does NYS define a bloom?

- If HAB accumulations are visually apparent, there is the potential for toxins and other harmful compounds to be present; contact should be avoided
- Visual scums are satisfactory criteria for beach closure and bloom notification procedures to occur

Know it, Avoid it, Report!



The NYSDEC HABs Program



Surveillance & Sampling

- Paired water quality monitoring in many waterbodies (DEC and citizen scientists)
- Both visual surveillance and grab sampling support program outreach
- HABs sampling mostly by trained volunteers, DEC staff, partnership programs
- Drinking water is the jurisdiction of DOH & local providers

For all blooms....

- **Avoid exposure.** Keep children and pets away from scums or discolored water
- Seek immediate medical assistance for symptoms consistent with exposure
- Report any symptoms to local/state Health Department
- Report additional and on-going blooms to DEC



NYS Harmful Algal Bloom System (NYHABS)



New Bloom Reporting & Notification

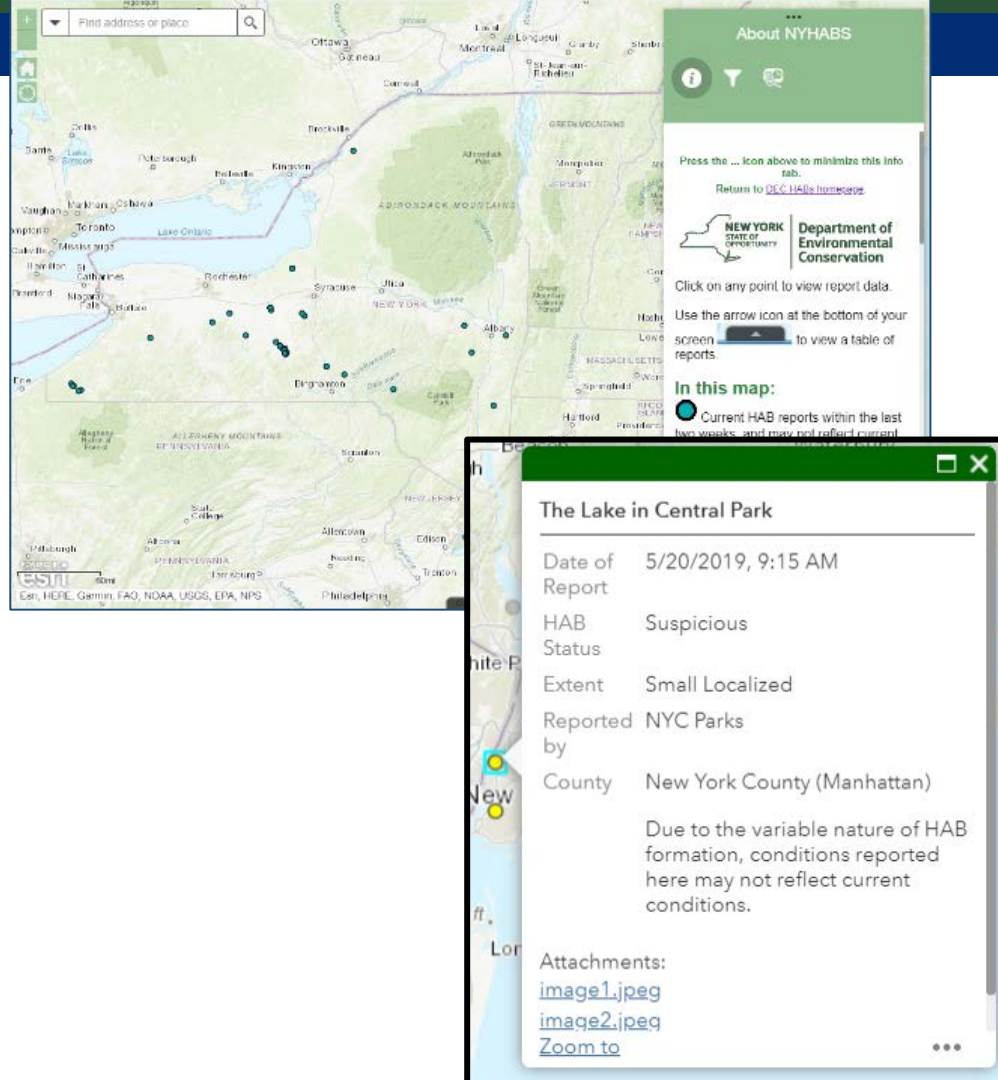
- New and improved reporting system using ArcGIS Online
- Mobile-ready Suspicious Algal Bloom Report Form for HAB reporting
 - Works on any platform (desktop, mobile, tablets)
- Streamlined quality control of HAB reports by DEC
- Rapidly disseminate information internally to other state agencies

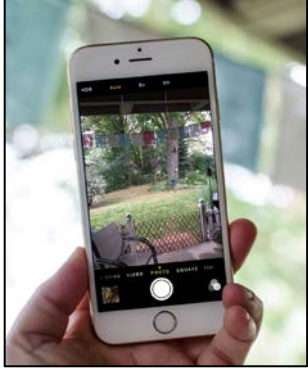


New York Harmful Algal Bloom System NYHABS

- Interactive map of HAB reports, updated daily
- Reports include photos, status, extent, reported by, exact location
- Reports remain Current on map for 2 weeks
- After 2 weeks, all HABs remain visible as Archived
- User can filter by lake or county and export reports

on.ny.gov/nyhabs

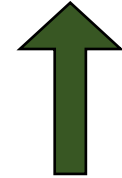




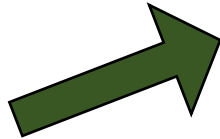
DEC Evaluation



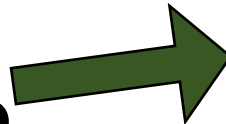
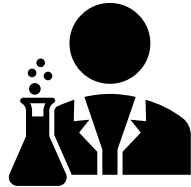
NYHABS



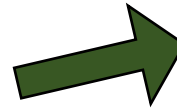
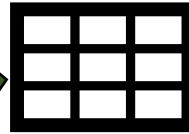
Sample



Lab
Analysis



Results



DEC Evaluation

NYHABS Links

- Live Map: on.ny.gov/nyhabs
- Suspicious Algal Bloom Report Form: on.ny.gov/habform
- Trained User Report Form: on.ny.gov/habproform



Questions?

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