



**Department of
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What's new at the DEC HABs Program?

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**2017 NYSFOLA Conference
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Acronym time: HABs

H: Harmful toxins

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

B: Blooms: proliferation
of cells, dense
concentrations.



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Cyanobacteria – Blue-green Algae - HABs

- Highly specialized and competitive
- Best in high temps, high light, high nutrients
- Gas vacuoles (moderate buoyancy)
- Fix nitrogen



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Algae need Nutrients and Light to Thrive

- Lakes that have higher nutrients (are eutrophic) are more likely to have HABs
- However, present in low nutrient waterbodies too (Finger Lakes, Lake Placid)
- Causes not fully understood



Three Main Toxins

Microcystins (liver toxin)

- Impacts liver
- Most common toxin in New York

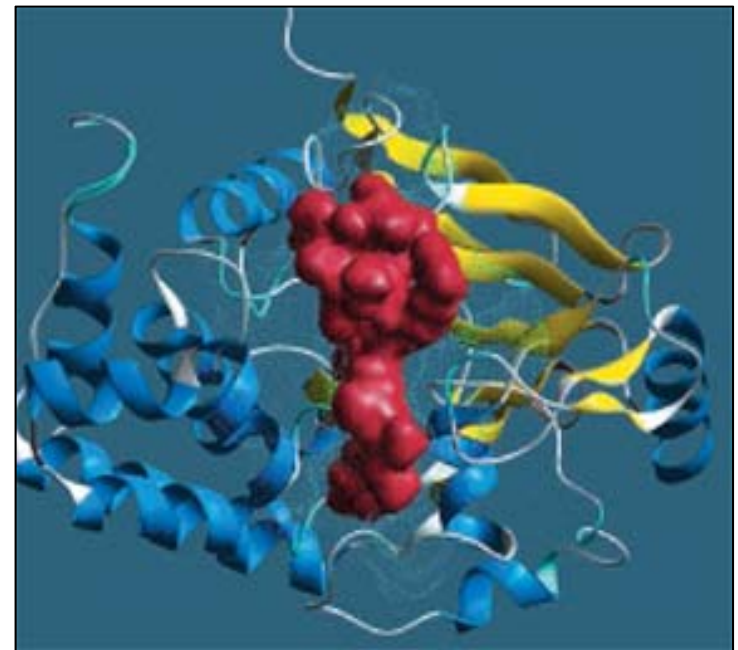
Anatoxins (nerve toxin)

- Impacts nerves
- Potentially fatal to dogs

Lipopolysaccharides (endotoxins)

- Skin irritants and allergens
- Produced by most cyanobacteria

Others (Cylindrospermopsin, Saxitoxins, BMAA, etc.)



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Routes of exposure to toxins



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

Hamilton Reservoir, Platte River Power Authority, Fort Collins, CO



Batesville, MI



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Not just NY!

Lake Chao Hu, China

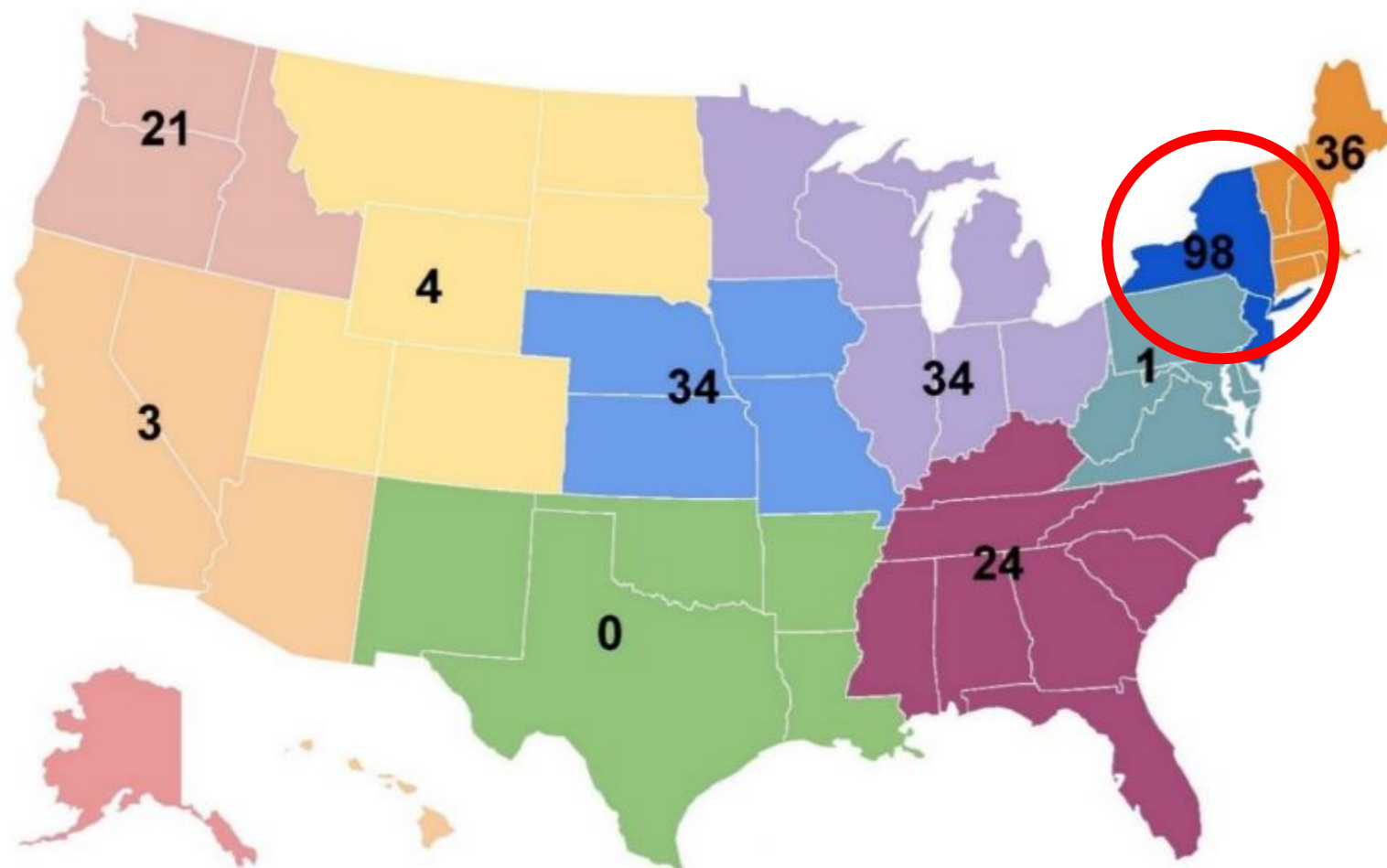


Lake Mead, AZ



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Figure 2-2. State-reported HAB Advisories by EPA Region, January 1 to August 12, 2016



DEC HABs Program

What do we do?

The DEC HABs Program

Surveillance/sampling

- Funded through EPA recurrent grant to DEC (2011-present)
- MOUs with SUNY ESF and Stony Brook for lab analyses: fluorometry (chlorophyll), microscopics & toxins
- Coordinate with sampling programs: CSLAP, LCI, NYC, Suffolk Co., Owasco, Seneca and more
- Additional sampling and reporting by DEC, DOH & OPRHP

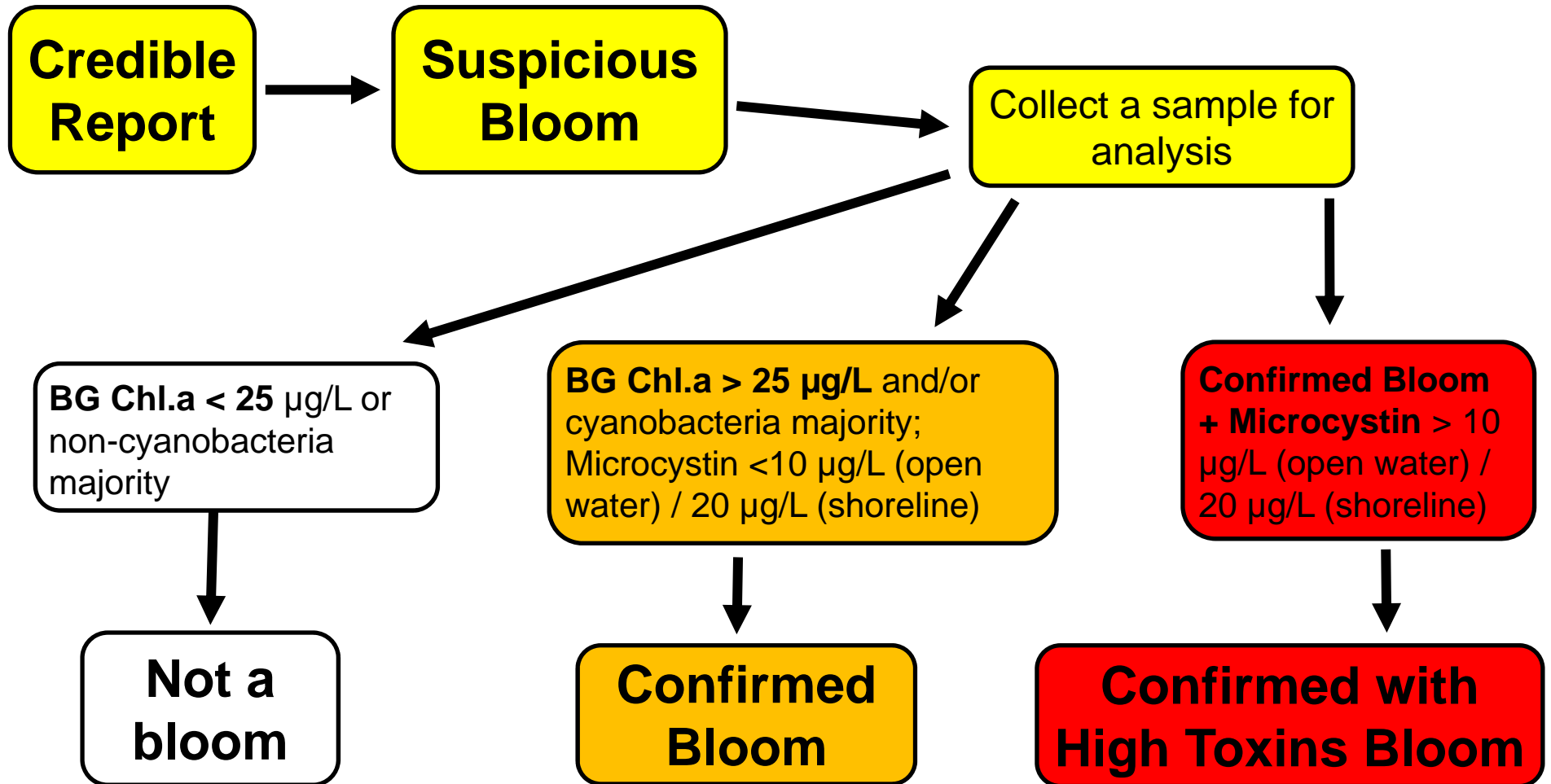
Bloom Status

- Determine bloom status (**Suspicious, Confirmed, or Confirmed with High Toxins Blooms**) based on surveillance and sampling data

The DEC HABs Program

Education & Outreach

- Website with HABs primer, FAQs, photos, notifications, map, and past archive data
- Conduct presentations & trainings
- Weekly MakingWaves, Twitter, FaceBook updates
- Summary results in DEC & CSLAP reports
- **NEW!** Brochure and Program Guide
- County email lists of agency and regional staff, lake association contacts. Notifications sent with date, bloom status, photos, raw data for most blooms

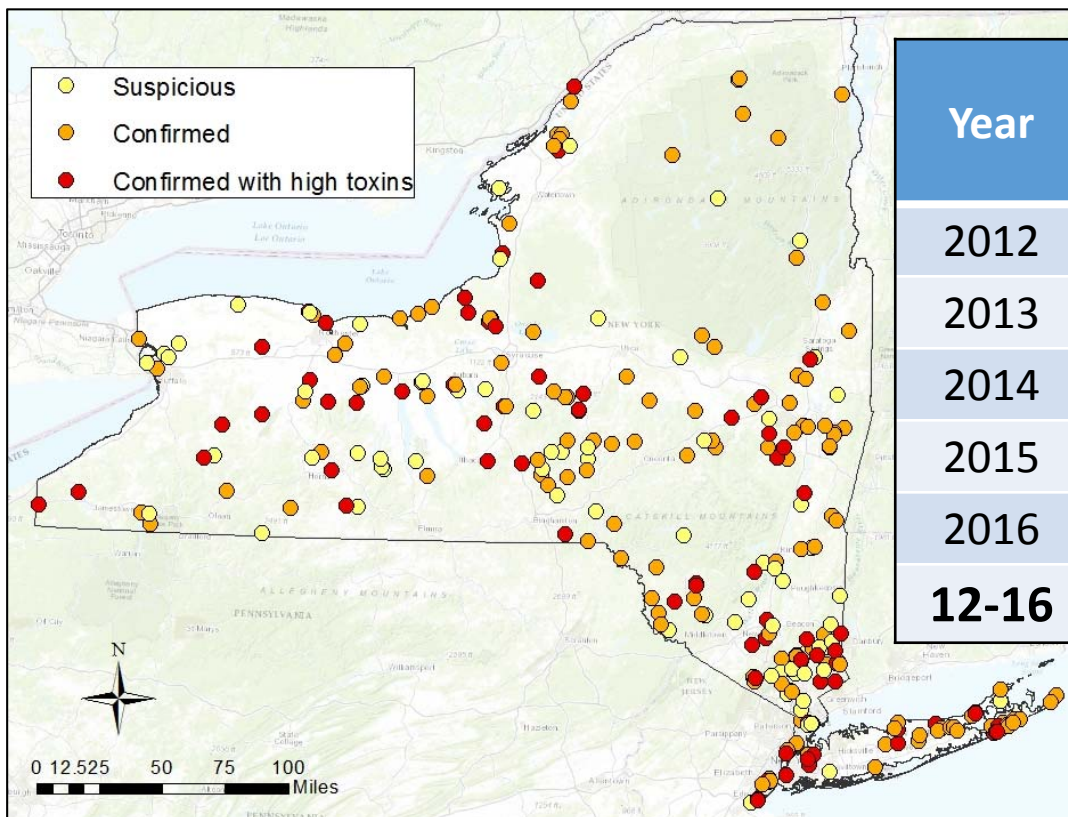


DEC HABs Bloom Status

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 through digital photos, suspicious bloom form, or email drop box (HABsInfo@dec.ny.gov)

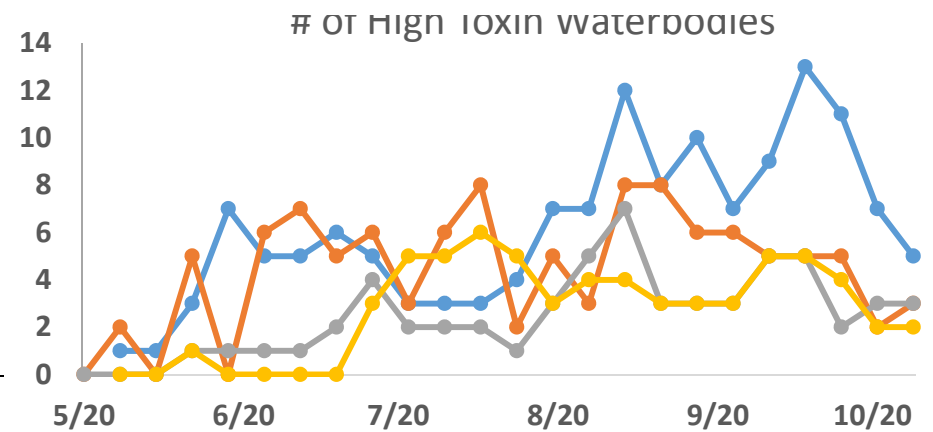
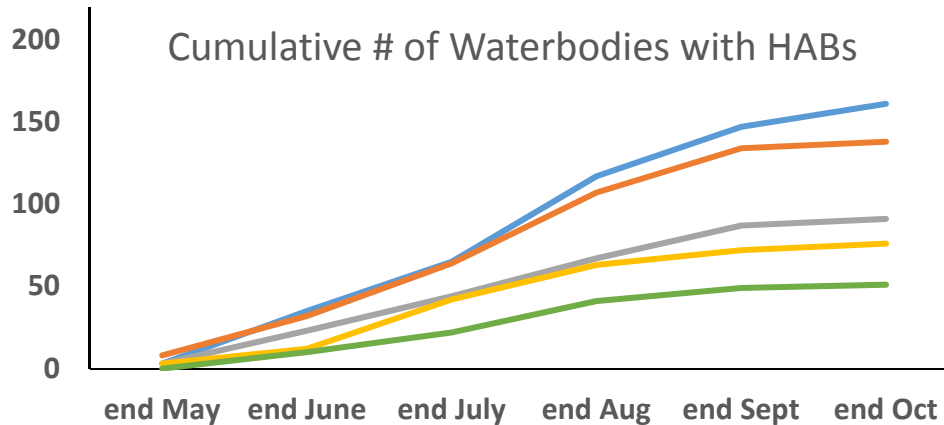
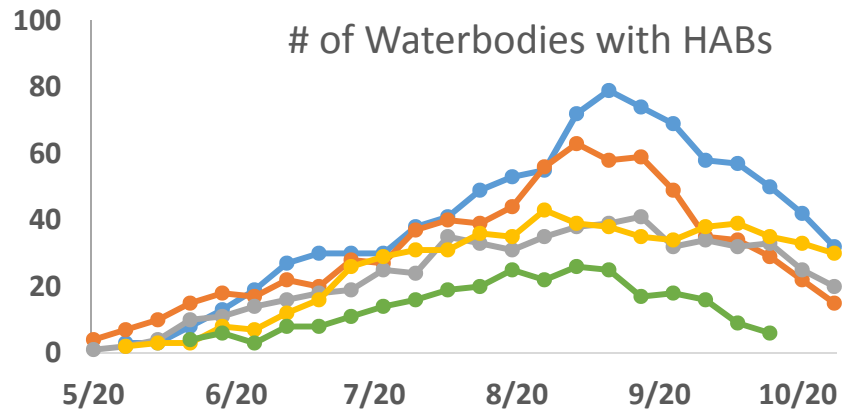
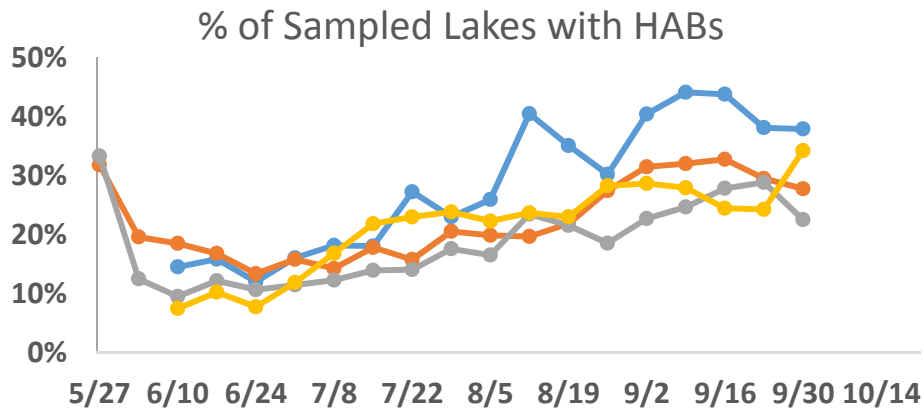
HABS in New York 2012-2016



Year	Suspicious	Confirmed	High Toxins	Total
2012	20	29	9	58
2013	17	37	22	76
2014	19	51	23	93
2015	40	62	35	137
2016	41	95	38	174
12-16	75	133	77	285

Is the problem getting worse?

—●— 2016 —●— 2015 —●— 2014 —●— 2013 —●— 2012



New(s) for 2017

- CSLAP in all Finger Lakes, Hub in place
- Continued monitoring in NYC, Suffolk County, Owasco & Seneca Lakes
- Inaugural year for Otisco Lake
- Expanded river and stream HABs sampling
- DEC Lakes Database up and running

New(s) for 2017

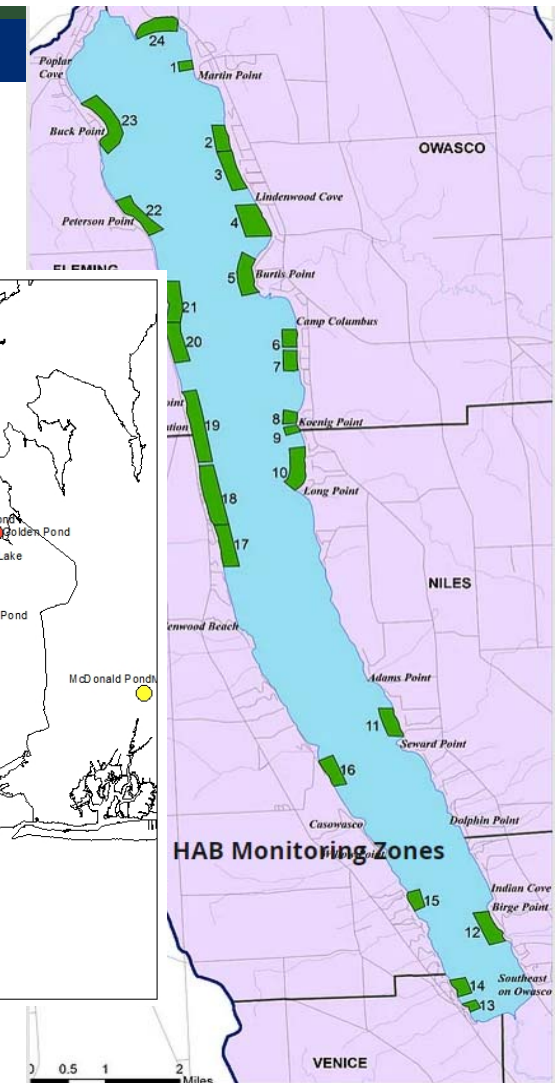
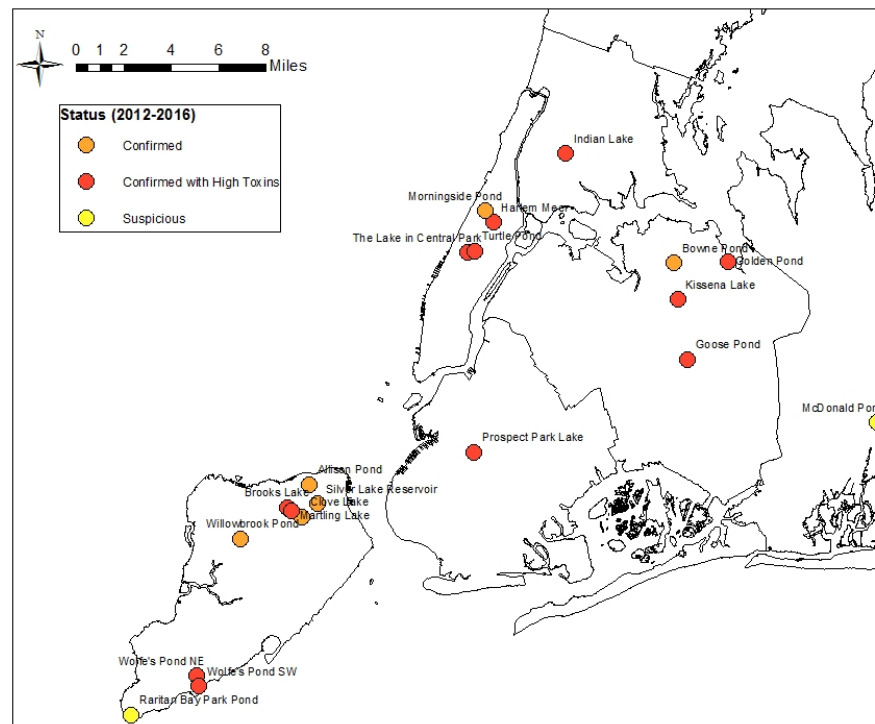
- HABs continue to be a high profile issue
- Press release soon for new documents
- Expanded collaboration with Parks and DOH



So what now?

More.....

- Research
- Surveillance programs
- Collaborations
- Community planning
- Education



Thank You!

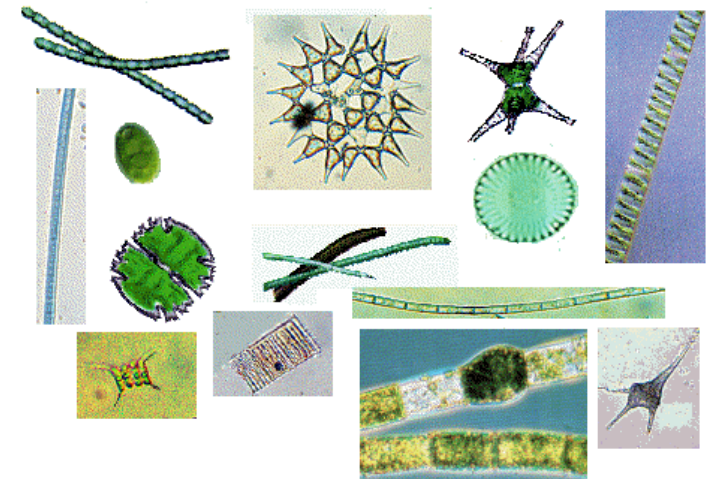
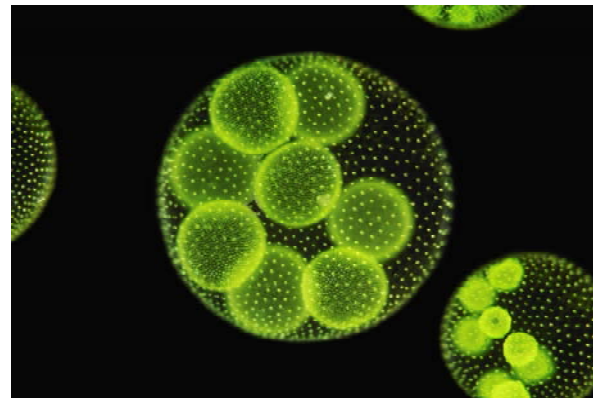
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What are Algae?

- Single-celled plants
- Possess chlorophyll
- Conduct photosynthesis.



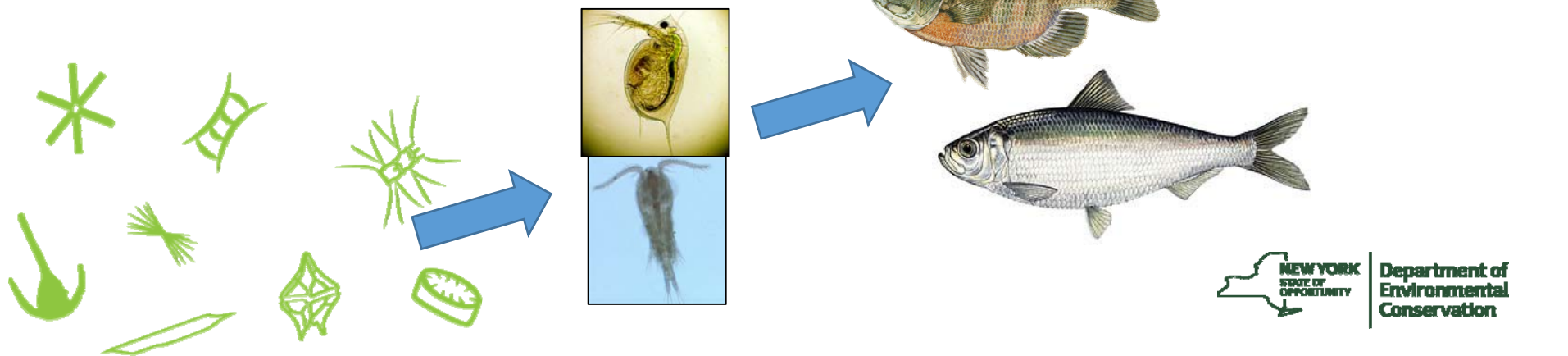
Normally, NOT HARMFUL



- Algae are present in all lakes and oceans
- Most kinds do not produce toxins
- Diverse communities of many types of algae

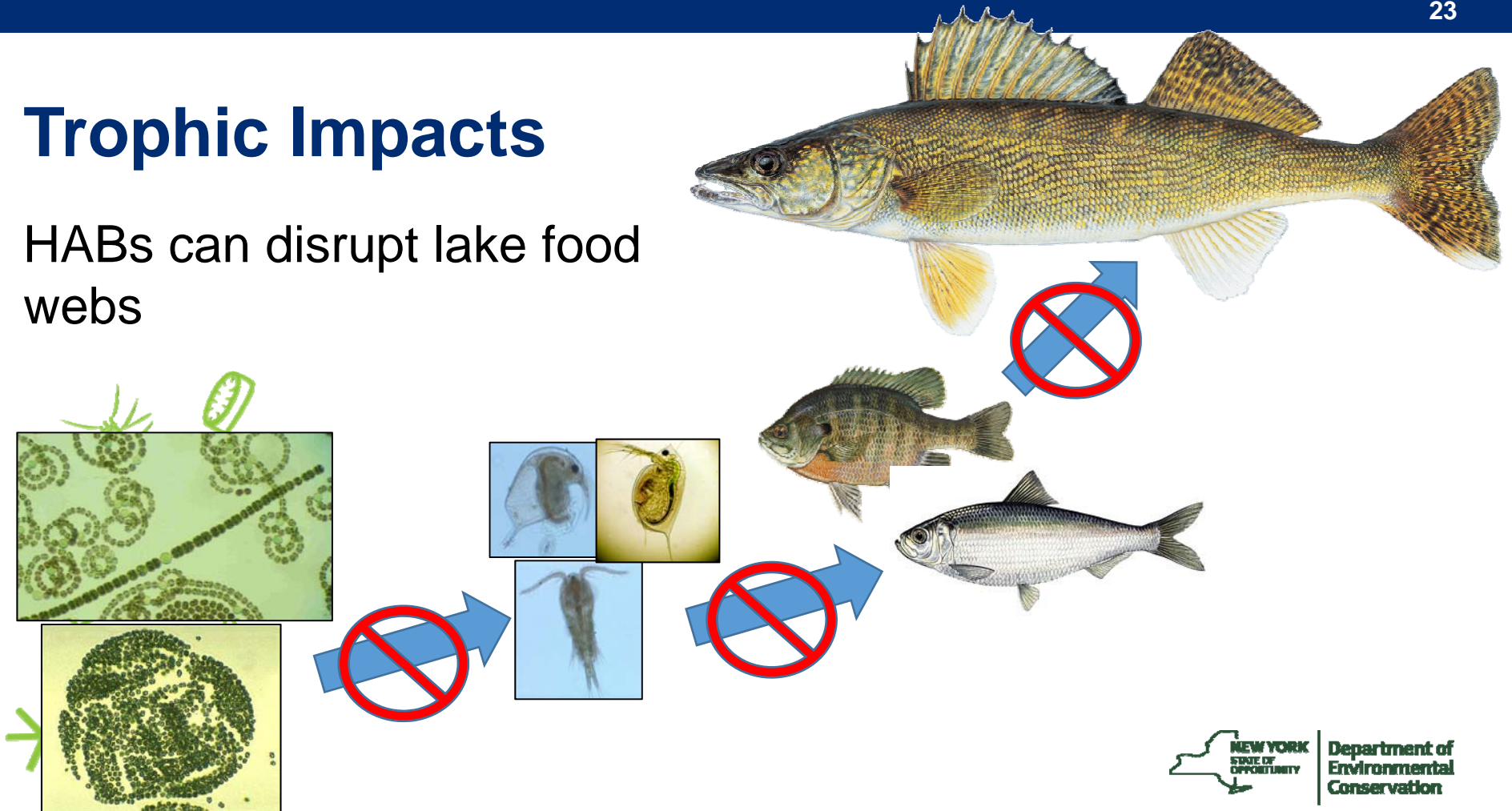
Algae & Fish

- Algae are a crucial part of lake food webs:
- Algae->Zooplankton->Fish



Trophic Impacts

HABs can disrupt lake food webs



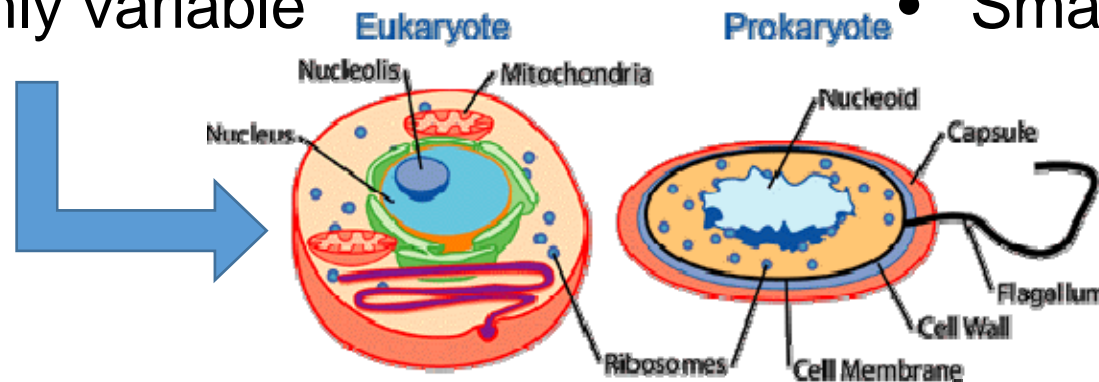
Remember Cell Bio?

Eukaryotes

- Possess nucleus, organelles
- Most algae
- Generally bigger cells
- Highly variable

Prokaryotes

- No nucleus
- Cyanobacteria
- Ancient life form
- Small cells, form colonies



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