

Department of Environmental Conservation

DEC Harmful Algal Bloom Program

Division of Water, Bureau of Water Assessment and Management

Rebecca Gorney Adirondack Lake Symposium August 1, 2019

What is a HAB?

H: Harmful (toxins, other harmful compounds, economic, aesthetics, ecological)

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

B: Bloom (proliferation of cells, dense concentrations)





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 Aphanizomenon

Microcystis







- **Fixes Nitrogen**
- Produces anatoxin (nerve toxin) and others
- Adjusts buoyancy •
 - Produces microcystin (liver toxin)





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.

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HABs need Nutrients and Light to Thrive

- Lakes that have higher nutrients are more likely to have HABs
- HABs are present in low nutrient waterbodies too (Finger Lakes, Schroon Lake, Lake Placid)
- Causes not fully understood
 - Some low P systems bloom, some high P systems don't bloom
 - Interannual variability within lakes





Wild Cards Affecting HABs

- 1. Climate change
- 2. Trophic interactions
 - increased nutrient recycling
 - selective feeding by dreissenid mussels
- 3. Emerging contaminants





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 toxins





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

Any health effects should be reported to your local health department!

NEW YORK STATE OF OPPORTUNITY

HABs & Health

Potential Symptoms

- Allergic or irritative skin, eye, ear, throat reaction
- Diarrhea
- Nausea
- Jaundice
- Vomiting
- Respiratory difficulties
- Neurological



HABs & Dogs

- Dog deaths have occurred, including in NYS
- Greater chance of ingestion of HAB-impacted water or shoreline scum
- Cyanobacteria stick to fur and are ingested during grooming





NYS HABS Program What do we do?



The NYS HABs Program



- Interagency collaborative effort (DEC, OPRHP, DOH)
- Reports of HABs go to DEC or DOH
- DEC coordinates extensive monitoring; >400 lakes/year & notification on their website: <u>on.ny.gov/hab</u>
- Drinking water overseen by local operators and DOH, see more info: <u>www.health.ny.gov/harmfulalgae</u>
- Regulated swimming areas (beaches) have a protective response protocol based on visual observations



2019 NYS DEC HABs Partnerships

- Citizen scientist lake monitoring: >150 lakes; 8x/summer
- DEC ambient lake monitoring : ~100 lakes; 1-4x/summer
- Enhanced shoreline surveys: ~10 lakes; weekly
- Academic researchers (SUNY ESF and Stony Brook University): >20 lakes; weekly
- VT DEC, USACE, NYC Parks, NYC DEP and others: >30 lakes; variable frequency
- Regulated swimming areas: >1,400 locations; nearly daily
- Research efforts: additional lakes and rivers; variable

DEC HABs Program Role



The DEC HABs Program

Interpretation: Bloom Status

 Determine bloom status (Suspicious, Confirmed, or Confirmed with High Toxins) based on surveillance (visual evidence) and sampling data

Education

- Maintain website with HABs primer, FAQs, photo gallery and more (<u>on.ny.gov/hab</u>)
- Publish articles, respond to press inquiries, etc.
- Public presentations and training workshops

Outreach

• Weekly updates to website (map), social media, etc.







For <u>all</u> blooms.... (Suspicious, Confirmed, or Confirmed with High Toxins)

- 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 2012-2018

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
2017	45	84	36	165
2018	57	83	40	180
12-18	122	171	101	394



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HABs in the ADKs

- 2012 2018: Most reports have been short lived and haven't occurred more than once
- 2019: Meacham Lake (new), Eagle Pond, Lake Champlain



High Profile Events

- Finished drinking water detections & threats
- HABs in all 11 Finger Lakes
- Over 30 miles of the Wallkill River, 2016
- Illness reporting tracked by DOH
- Record 98 waterbodies with HABs on 9/14/18



Combatting HABs in NYS

Governor Cuomo's 2018 HABs 4point initiative

- 1. Selection of priority lakes
- 2. Regional HABs summits
- 3. Completion of Action Plans
- 4. Pilot new methods of treatment and monitoring





Selection of Priority Lakes

- Lakes are water supplies or critical tourism drivers
 - Western Group: Conesus; Honeoye; Chautauqua Lakes
 - Central Group: Owasco;
 Skaneateles; Cayuga Lakes
 - North Country Group: Parts of Lake Champlain; Lake George
 - Greater Hudson Valley Group: Lake Carmel; Palmer Lake; Putnam Lake; Monhagen Brook watershed (five small reservoirs)



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Regional HABs Summits

- Daytime private/Evening open to the public
- 12 lakes divided into 4 regions
- National experts brought in
- Presentations and discussions on:
 - Sources of nutrients
 - Nutrient Reduction Strategies
 - Algal ecology
 - HABs treatment
 - Regionally specific topics







- 12 plans, one for each priority waterbody
- Summary of lake, water quality and HABs history
- Waterbody and statewide analysis of HAB triggers
- Lake and watershed implementation projects to address HABs
- <u>http://www.dec.ny.gov/chemica</u>
 <u>I/113733.html</u>



HABs Mitigation & Monitoring Pilots

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Download Data Clos	e

- Evaluation of mitigation methods
 - Nutrient inactivants
 - Hydrogen peroxide
 - Ultrasonic devices
- DEC & USGS collaboration: deployment of advanced monitoring platforms <u>https://ny.water.usgs.gov/maps/h</u> <u>abs/</u>



New Reporting System! Introducing...

NYHABS – The NY HABs System

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

NYHABS (on.ny.gov/nyhabs)





Bloom Report Form on.ny.gov/habform



So you have a HAB...

- Know it, Avoid it, Report it!
- Educate your community members
- Rinse off with clean water if exposed
- Wait for bloom to dissipate before resuming use of the water

WARNING

Avoid Harmful Blue-green Algae Blooms while swimming, fishing and boating



Keep kids and pets away from areas with blooms or scum. Swim, fish and boat in areas with no blooms or scum.

Contact can make people and animals sick.

If contact occurs, rinse with clean water. If symptoms occur, contact a medical provider.



Blooms can look like streaks, spilled paint, pea soup, floating clumps or dots.

6637 Learn more: www.health.ny.gov/HarmfulAlgae and on.ny.gov/hab 7/18

Find out more online

DEC website on.ny.gov/hab:

- Map of bloom locations
- Photo guide FAQ, general info, and more

DOH website

www.health.ny.gov/HarmfulAlgae:

- Health information
- Sign template
- Beach manager info, and more



Interagency Collaborative Effort



Thank You!

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