How to Collect a Harmful Algal Bloom Sample

Division of Water, Bureau of Water Assessment and Management

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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)
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
- Produces anatoxin (nerve toxin) and others

Aphanizomenon

Microcystis
- Adjusts buoyancy
- Produces microcystin (liver toxin)
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.
Be careful of wind concentrated scums!

Each level has 10-1000x increase in cells.
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
Any health effects should be reported to your local health department!

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
HABs & Health

Potential Symptoms

• Allergic or irritative skin, eye, ear, throat reaction
• Diarrhea
• Nausea
• Jaundice
• Vomiting
• Respiratory difficulties
• Neurological
To HAB or not to HAB?
NOT HABs

Filamentous = wet cloth, hair

Duckweed = very small plants

Pollen = In Spring, very yellow, breaks apart
Filamentous green algae

Common types:
Cladophora
Mougeotia
Spirogyra
Spirogyra – bright green “cloud”, under the surface

Examples of Spirogyra green algae blooms.
Duckweed
Pollen
Pollen

- Bright yellow in color (which is not typical of HABs)
- Breaks up easily
- Most common in early summer
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
Oily, shiny, sheeny
Pea Soup, Scum, Foamy
Paint, scum, foamy
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
Test your skills

- YES
- NO
- YES
- MAYBE?
- YES?
- NO
- NO
Shorebloom Sample Collection

- Protect yourself - wear gloves
- Wash any exposed areas with clean water
- Collect surface scum by skimming surface; Capture “worst case scenario”
- Document with pictures

CSLAP Training Video: https://www.youtube.com/watch?v=X5os1xFd_3w
Sampling Supplies

- Keep supplies ready
- Please take photos
- Split sample:
  - Collect directly into large sampling bottle
  - Gently invert to homogenize
  - Pour off into 2 smaller bottles
- Ship both bottles to UFI
Label your samples!

Use this format:
Year – CSLAP Lake # - B Sample#

So, for 3rd sample this year from Cyano Lake (23) would be:
19-23-B3
Sample Shipment

- Samples need to be kept cool, especially if kept overnight, **Do Not Freeze**
- Send labeled sample bottle in cooler with filled out Chain of Custody
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: on.ny.gov/hab
- Drinking water overseen by local operators and DOH
- Regulated swimming areas (beaches) have a very protective response protocol based on visual observations
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 (on.ny.gov/hab)
- Publish articles, respond to press inquiries, etc.
- Public presentations and training workshops

Outreach

- Weekly updates to website (map), social media, etc.
For all 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)
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 results internally to other state agencies
- https://arcg.is/5mT4v
Introducing.....NYHABS

Weekly updated interactive map with sampling points (current and year-long archive) + narrative text
More info on HABs Updates: Webinar

- Demonstration of how to view and use NYHABS
  Thursday, May 16
  10-11:30 am

- Watch your email for more information on how to log-in
Thank You!

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