NHDES Cyanobacteria Program Updates

**2023 New Hampshire Environmental Regulatory Conference
September 12, 2023**

Harmful algal blooms are a major environmental problem in all 50 states. Red tides, blue-green algae and cyanobacteria are examples of harmful algal blooms that can have severe impacts on human health, aquatic ecosystems, and the economy.

Hello!

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Today's Takeaways

Cyanobacteria Program Overview

Cyanobacteria Plan + Strategies

Relevant Funding Programs & Process

1.

Cyanobacteria Program Overview

Let's start with some information on cyanobacteria in NH and NHDES' response based monitoring and outreach programs

Cyanobacteria Overview

- Originated over 3.5 billion years ago
- Microscopic
- Native to NH lakes
- Formerly "blue-green algae"
- Can produce a variety of toxins that cause nausea, skin irritation, tingling/numbness, seizures, and promote tumor growth
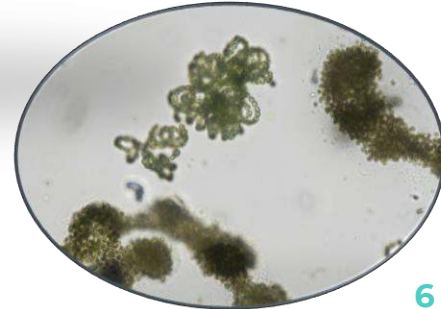
Response Based Monitoring - 2023 Program Improvements

Cyanobacteria Bloom Reporting – ArcGIS Survey123

- Collects critical information for our CyanoHAB Coordinator to respond
- Alert issued based on photo before sampling
- Advisories are warnings when the cell density is > 70,000 cells per mL

Healthy Swimming Mapper

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Current Fecal Bacteria Advisories

on Corcoran's Pond) - Issued on 6/15/2023

GREGG LAKE

Status	Advisory
Town	Antrim
Most Recent Sampling Date	6/20/2023
Date Issued	6/20/2023
Bloom Description	Green clouds and surface scum accumulations along shorelines.
Initial Cyanobacteria Identified	Dolichospermum
Initial Total Cyanobacteria Density (cells/mL)	134,600
2023 Advisory History	6/20 - ACTIVE
Historical Advisories	View

GREGG LAKE

bacteria Alerts

on 6/22/2023

bacteria Warnings (Advisories)

on 6/20/2023

n 6/19/2023

Advisories issued increased

May – August saw more advisories issued each month and exceeded the record of the number of advisories exceeded in a single month

(18 vs. 15 in 2022)

Bloom reports increased*

Almost 100 more reports to date vs. this time last year

Long Durations

Between 2018 and 2022, average advisory duration was 25 days; 3 lakes currently > 50 days

NH House Bill 1066 (2022)

"...prepare a plan to prevent the increase of, and eventually control, cyanobacteria blooms in NH's lakes and other waters. Such plan shall be supported by scientific data and shall include measurable milestones.

2.

Cyanobacteria Plan + Strategies

"Strategy without tactics is the **slowest route to victory**.

Tactics without strategy is **the noise before defeat**."

Tzu, Sun. 2010. The Art of War. PDF. Capstone Classics. Chichester, England: Capstone Publishing.

Summary of NH's Statewide Cyanobacteria Plan Strategies

1 To develop the policies and practices to reduce, control, and prevent nutrient inputs that cause cyanobacteria blooms.

2 To advance education and outreach efforts that allow individuals who recreate or use surface waters to assess the cyanobacteria risks and respond accordingly.

4 Establish polices and procedures for prevention, early detection and response, and treatment of cyanobacteria blooms and cyanotoxins in surface waters that serve as public drinking water supplies to minimize risks to customers.

3 Enhance cyanobacteria monitoring to track when and where blooms occur and clearly communicate current conditions to the public.

Cyanobacteria Blooms & Nutrient Loading

Stormwater

Unmanaged stormwater is the primary cause of excessive nutrient loading

Internal Loading

Lake bottom sediments can contribute large nutrient loads when DO is < 1 mg/L

Other External Sources
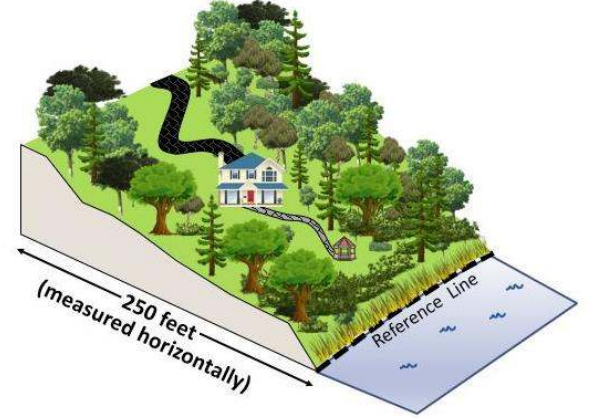
Fertilizers and failing or old, unmaintained (or flooded) septic systems can contribute unnecessary loads

NPS Management Program & Watershed Based Planning

Soak up the rain NH

TMDL Program

Shoreland Program (Shoreland Protection Act)

250 feet (measured horizontally)

Reference Line

Current Programs focused on Reducing Nutrient Pollution & Cyanobacteria Prevention

15

Tactics to support the Statewide Strategy to Reduce Nutrient Pollution

- Promote, implement & fund state and local regulations and practices that address the sources of nutrient inputs

- Increase staffing and financial support for watershed and lake management efforts

- Develop the laws, rules and guidance that clearly define permitting requirements and processes for lake management activities designed to remediate cyanobacteria

3.

Relevant Funding Programs + Process

A combination of new and existing funding programs **focused on watershed-based planning, stormwater management, and nonpoint source reduction,** supplemented with local match is necessary to make progress to reduce the occurrence, frequency, and duration of cyanobacteria blooms.

Roadmap

Water Quality Planning
- Federal s604b grants for water planning projects
- Planning Loan (with PF) match

Diagnostic Evaluation of the Feasibility and Applicability of In-Lake Treatment – Funding?
What is the internal loading?
Will in-lake treatment be effective and for how long?

Long-term Monitoring Demonstrating WQ Improvement

6 Projects Ranked for 2023 for CWSRF Planning Loan with 100% PF - over $500K
- Watershed management and protection plans
- Phosphorus control planning
- Lake drainage study

Problem ID or Prevention

Plan Implementation to Reduce External Loading
- Federal s319 grants (~ $500K)
- CWSRF Stormwater Infrastructure Loans
- SOAK Up the Rain
- Land protection grants
- Local skin in the game (match)

Design and Implementation of In-Lake Treatment – Funding?

NEW! $1 Million Cyanobacteria Mitigation Loan Fund

What
- Established in 2023 State Budget HB2
- Provide low interest loans and grants to eligible entities

Why
- Begins to fill in the funding gap to implement watershed projects to reduce and control nutrient pollution (strategy!)
- Last year's request was over $4.2 M; approx. $630K funded

When
- Program Development and required rulemaking to administer the program are underway
- Expect more information over the coming months

Case Study - Nippo Lake Watershed Management Plan & Cyanobacteria Remediation Project

Start
2010 Nippo Lake in Barrington, NH began experiencing persistent cyanobacteria blooms.

Stop 1 - Evaluate
Continued monitoring of the water quality data showed an increasing trend in total phosphorus and the bottom depths of the lake lacked oxygen (low DO).

Stop 2 - Develop Plan
A watershed-based plan was developed in 2019 which set the annual nutrient concentration for the epilimnetic zone (7.2 ppb) & restoration strategies to achieve the target.

Action!
- Spent $$$ to improve a primary dirt road that led to the lake and eroded every time it rain, carrying nutrient pollurion into the waterbody.
- Homeowner stormwater management (SOAK Up the Rain)

Action!
- Sediment testing confirmed that treatment was necessary to reduce the internal phosphorus load.
- Alum treatment planned, developed and permitted

Continued Improvement!
- Monitoring indicates the internal load decreased by 90% and target concentration in the upper layer has been met
- Still actively improving the watershed and are currently working to preserve land from development around the watershed.

Thanks!

Any questions?

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