NEW YORK STATE | Department of Environmental Conservation

Harmful Algal Bloom Frequently Asked Questions and Answers

2026

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Acronyms

AGM	Department of Agriculture and Markets
ARP	Advanced Restoration Plans
BMP	Best Management Practice
CALM	Consolidated Assessment and Listing Methodology
CFA	Consolidated Funding Application
CSLAP	Citizens Statewide Lake Assessment Program
CWIA	Clean Water Infrastructure Act
DAC	Disadvantaged Community
DEC	Department of Environmental Conservation
DOH	Department of Health
DOW	NYS DEC Division of Water
EFC	Environmental Facilities Corporation
ELAP	Environmental Laboratory Assurance Program
GV	Guidance Value
HABs	Harmful Algal Blooms
MCL	Maximum Concentration Limit
µg/L	Micrograms per liter (equivalent to 1 part per billion)
MS4	Municipal Separate Storm Sewer System
9E	Nine Element Plans
NPG	Non-Agricultural Nonpoint Source Planning and Mapping Grant
NYHABS	New York Harmful Algal Bloom System
NYS	New York State
OPRHP	Office of Parks Recreation and Historic Preservation
SPDES	State Pollutant Discharge Elimination System
TMDL	Total Maximum Daily Load plans
USEPA	US Environmental Protection Agency
WQIP	Water Quality Improvement Program

HABs Background

What are HABs?

Harmful algal blooms (HABs) in freshwater (lakes, ponds, rivers, and streams) generally consist of visible patches of cyanobacteria, also called blue-green algae. Cyanobacteria are naturally present in low numbers in most aquatic systems. Under certain conditions, cyanobacteria may multiply rapidly and form blooms that are visible on the surface of the waterbody. Sometimes cyanobacteria produce toxins that can pose health risks to people and animals through ingestion, skin contact, or inhalation. Regardless of toxin production, HABs can still pose a health risk.

Causes of HABs

What causes HABs?

The organisms that cause HABs need light, nutrients, and warm water to multiply rapidly, but other factors contribute as well. Calm winds can allow the cyanobacteria to float to the surface, forming streaks, blobs or scums. Other drivers include human-caused nutrient run-off (i.e., eutrophication), global climate change, and invasive species. In 2018, the Department of Environmental Conservation (DEC) published 12 HABs Action Plans that identified factors associated with the likelihood of a HAB in New York, which include the above factors, the presence of invasive dreissenid mussels, and natural features like lake fetch and lake orientation in the landscape. The lake fetch is the uninterrupted distance over a lake's surface which wind travels and can accumulate cyanobacteria into bloom densities.

There has been increased reporting of HABs in lakes with low to moderate levels of nutrients across the world in recent years. Across the state, DEC has received HAB reports on several lakes with very low levels of phosphorus, including Lake George and Skaneateles Lake.

Are HABs increasing?

While national data suggests HAB reports have increased, a DEC study on HAB frequency, intensity, and duration from 2012-2020 suggested that increased public awareness may have played a role in an apparent increase within New York. Data suggested HAB conditions had not worsened during the study period, but continued monitoring is needed to understand long-term trends. Successful communication, outreach, and public reporting are key to public safety when it comes to HABs. However, improved outreach and education make it difficult to separate increasing HAB frequency from increasing awareness and reporting.

HAB Signage

Are there any signs that can be printed for local stakeholders to post at access points?

A downloadable and printable sign that can be posted by local entities where there is need to keep other informed of the presence of a HAB. The sign is available at: https://www.health.ny.gov/publications/6637.pdf. A multi-language version is available: https://www.health.ny.gov/publications/6740.pdf

HAB Resources

Are there any resources that can be shared with the public to educate about HABs?

DEC's HAB brochure is a helpful resource for HAB information. There is additional information about HABs and DEC's HAB Program in our program guide. NYS Department of Health also has available HAB resources here.

HAB Data

Does DEC have any data on HABs in New York State?

DEC data is available on OpenNY. OpenNY data includes the annual summary presentation of HABs by Waterbody. Open Data depicts each waterbody with HAB reports that year on a single row, along with the date of the first report, the date of the last report, and the number of reports submitted through NYHABS.

Another option for data retrieval is via the Division of Water (DOW) Monitoring Data Portal. Details of how to download the data from the monitoring portal are at the top right of the page in the 'About this Portal' box.

Reduction of HABs

What is DEC doing to address and reduce HABs?

Of the many causes of HABs, the only controllable factor linked to the formation of HABs is nutrients (i.e., phosphorus and nitrogen). With nutrient reduction as a primary goal, DEC has developed a holistic approach for addressing and reducing HABs statewide:

- Deliberate Clean Water Planning to improve nutrient reduction efforts;
- Water protection grants to implement clean water plans, best management practices, and other nutrient reduction strategies;
- Applied research on HABs that focuses on understanding the prevention, mitigation, monitoring, and modeling of HABs to help understand their causes; and,
- Short-term HAB mitigation efforts to reduce in-waterbody impact from HABs Mitigation.

DEC reviews and analyzes water quality data from lakes and uses that information to develop Clean Water Plans. Clean water plans are a watershed-based approach to outline a strategy to improve or protect water quality in a waterbody, often through nutrient reduction. These plans document pollution sources, set pollutant reduction goals, and identify strategies that communities may use to improve water quality. See DEC's Clean Water Planning site to see if your lake has an approved clean water plan or to learn more about the process.

Outcomes from Nutrient Reduction Efforts

Do nutrient reduction efforts work immediately?

Nutrient reduction efforts can take years or even decades to show measurable improvement in water quality due to lag time in response, which may be influenced by factors such as ecosystem dynamics and hydrology. In the short-term, HAB treatment and mitigation strategies may be utilized. However, most mitigation technologies are temporary, don't address underlying causes, or simply have not been demonstrated to be effective in a lake environment. There is no silver bullet solution to HABs. A holistic approach combining short-term mitigation with watershed-level nutrient reduction is important. Note that HABs can still occur in low-nutrient lakes.

Programs, Initiatives, and Funding to Help Reduce HABs

Does DEC provide funding for grants or invest in research that support the reduction of HABs?

Continued investment in nutrient reduction is a priority, as it's the primary controllable cause of HABs. New grant rounds continue this investment. Funding projects that may help reduce the occurrence of harmful algal blooms (HABs) remains a high priority for the Division of Water and the DEC. DEC Division of Water offers funding opportunities that address the source of HABs through nutrient control practices. The Non-Agricultural Nonpoint Source Planning and MS4 Mapping (NPG) program provides funding for planning, feasibility and engineering reports for nonpoint source best management practices, such as streambank stabilization and restoration, as well as in-waterbody controls for nutrients, such as aeration

and dredging. The Water Quality Improvement Program (WQIP) provides funding for implementation of nutrient reduction efforts, including projects for wastewater treatment improvement, land acquisition for source water protection, and nonpoint source reduction, specifically implementation of in-waterbody controls for nutrients. Through 2025, New York has awarded more than $614 million in grants designed to reduce the frequency of algal blooms across the state by targeting phosphorus and nitrogen pollution, controllable factors that can contribute to the occurrence of HABs, and more than $14 million to research and development, pilot projects, and advanced monitoring.

What is DEC doing to support underserved/disadvantaged communities experiencing HABs?

DEC prioritizes investments in Potential Environmental Justice Areas (PEJA)/Disadvantaged Communities (DAC) through grant programs, affording additional points in application evaluations. In 2024, a high percentage of WQIP and NPG awarded funding went directly to or benefited PEJA/DACs.

What projects have been funded across the state to support HAB reduction?

There are multiple tools to view NYS investments across diverse funding programs. NYS Regional Economic Development Councils maintain a repository of CFA-funded projects. DEC publishes annual award lists with project descriptions for various grant programs. DEC DOW has developed an interactive mapping tool for WQIP and NPG grant programs. EFC and AGM also maintain online lists of grant awards.

Can private citizens apply for funding to conduct HAB mitigation directly?

Private citizens are not eligible applicants for DEC Division of Water grants but are encouraged to partner with eligible applicants to complete a project (e.g., municipalities, soil and water conservation districts). DEC offers funding through NPG (i.e., planning for nonpoint source Best Management Practices and in-waterbody controls) and WQIP (i.e., implementation of nutrient reduction efforts). Currently, DEC funds nutrient control projects to support the reduction of HABs. Examples of successful projects that have been conducted through partnerships include shoreline stabilization, drainage improvement, wastewater plant upgrades, and feasibility studies for in-waterbody nutrient control.

Private citizens are encouraged to partner with local municipalities for funding through NPG and WQIP grant programs.

Does DEC protect waterbodies from HAB's through land acquisition?

WQIP's Land Acquisition for Source Water Protection category funds land acquisition that protects public drinking water sources. Acquired lands act as natural filters for pollutants like nutrients. In 2024, over 1,280 acres were protected. To date, WQIP has made 67 land acquisition grant awards totaling nearly $100M.

A recent land acquisition success in the Skaneateles Lake watershed, the Shotwell Brook Conservation Area, is an example of land conservation that helps protect water quality. This area was identified as a conservation priority due to its location near the headwaters of the Shotwell Brook, a key tributary of Skaneateles Lake, and its location where there are intense development pressures.

What is DEC doing to reduce nutrients entering the watershed?

As directed in Governor Kathy Hochul's 2024 State of the State initiatives to protect clean water, DEC has also developed a draft nutrient guidance value and implementation package for phosphorus that is expected to be finalized in 2026. This effort developed targets for assessment and clean water planning, as well as updates to the existing implementation strategy for addressing phosphorus in State Pollutant Discharge Elimination System permits (TOGS 1.3.6).

Are there voluntary nutrient reduction programs?

NYS has made significant investments in voluntary agricultural and non-agricultural BMP funding for many decades. These incentive-based programs have been effective in reducing nonpoint source pollution to our waterbodies. This framework has been central to major watershed initiatives statewide. For more information on DEC's grant opportunities, please see the Grants Application page. Other state

agencies offer grant cost-share opportunities. As an example, AGM's AEM program leads to farmers adopting conservation practices for long-term environmental benefit.

Can cover crops help reduce nutrients?

Cover crops are planted on bare fields to reduce erosion from rainfall, protect soil, add organic matter, and trap nutrients. They are a high-priority best management practice in DEC's HABs Action Plans. DEC has partnered on projects implementing thousands of acres of cover crops in the Finger Lakes and Upper Susquehanna/Chemung River Watersheds.

Does DEC offer funding for septic replacement?

DEC provides funding for property owners to replace failing septic systems near priority waterbodies in coordination with the Environmental Facilities Corporation through the Septic System Replacement Program. Replacing systems reduces nutrient sources (i.e., phosphorus and nitrogen) from entering groundwater and surface water. Nutrients from failing or inadequate septic systems can contribute to HABs. Suffolk County uses funding for enhanced systems that significantly reduce nitrogen. The goal is to encourage all counties to use funding for enhanced phosphorus and nitrogen treatment. The program is funded through the CWIA. Altogether, $120 million has been allocated across 5 rounds, with $33.9 million reimbursed as of May 19, 2025. Find more information on the program here.

In-Waterbody Control Measures for HABs

What HAB treatments are available and has the DEC evaluated any of them?

DEC has evaluated both commercially available treatment technologies, as well as new technologies in the research and development phase. These physical, biological, and chemical technologies include non-metal-based algaecides, ultrasonic devices, nanobubble and cavitation systems, electrochemical oxidation systems, in-waterbody controls for nutrients, and harvesting and transformation system technologies. Many current treatments are not scalable, vary in effectiveness, or are too expensive to implement in larger waterbodies. More research and waterbody-specific analyses are needed. New technologies are being developed by various industry and academic institutions, but selecting the appropriate options is difficult due to the variability of HABs; no single technique will work everywhere. In-waterbody controls should be considered in concert with watershed nutrient reduction strategies to ensure that phosphorus, as a long-term, controllable cause of HABs, is managed. However, in some low nutrient lakes, phosphorus controls alone may be insufficient to address HABs.

What steps do I need to take to use HAB mitigation treatments in my waterbody?

Individuals interested in undertaking any type of treatment or in-waterbody control measure are directed to consult with DEC Regional Environmental Permit Administrators to ensure necessary permits are received prior to any treatment or technology installation.

Are nutrient inactivants, such as aluminum sulfate or other products meant to bind phosphorus, a permittable activity in NYS? If not, why not, and are there plans to allow their use?

The use of nutrient inactivants in NYS is not currently permitted. DEC is evaluating a potential permitting pathway for the use of nutrient inactivants to control internal phosphorus in lake bottom sediments. To inform that effort, DEC has undertaken nutrient inactivant pilot projects to understand efficacy, potential unintended impacts to water quality and ecosystem health, and refine treatment dosing calculations and requirements. Any future pathway will build upon the body of information available, and lessons learned from these pilots.

What do the preliminary result of DEC's three nutrient inactivant pilot studies suggest with regard to the efficacy of reducing internal phosphorus sources in lakes?

Nutrient inactivants can be effective, but careful dosing calculations and monitoring are critical for achieving long-term improvements, to ensure water quality standards (WQS) are not violated during application, and to avoid toxic effects to fish and wildlife. Lessons learned from these studies include the importance of selecting lakes with high internal loads and controlled watershed nutrient sources; continuously working to address external phosphorus loading post application; and, accurately identifying dosing based on sediment phosphorus loads. Lakes with higher internal loads and controlled watershed nutrient sources are likely better candidates for sustained water quality improvement. However, nutrient inactivation is not a permanent solution.

What type of permitting controls does DEC have in place to help address HABs? For example, are there pollution discharge permits that target nutrient reductions on the landscape that could help reduce the occurrence of HABs?

Several permit types address phosphorus' contribution to the occurrence of HABs. DEC issues SPDES permits with phosphorus limits for wastewater facilities. General SPDES stormwater permits regulate runoff from construction and industrial activities and municipal storm sewers. Construction Stormwater General Permits require erosion and sediment control and post-construction controls, with enhanced phosphorus controls in nutrient-impaired watersheds. MS4 General Permits require stormwater management programs, with additional controls for phosphorus-impaired watersheds.

Do waterbodies that experience HABs need Total Maximum Daily Load plans?

The 303(d) List is a list of waters violating WQSs, not supporting best use(s), and that require a total maximum daily load (TMDL). HABs alone are not documentation of a WQS violation or that a water is not supporting its best use; they are not a pollutant, but rather a symptom of a pollutant. While DEC acknowledges the impact of HABs on the quality of NY's surface waters, a TMDL is not appropriate for waterbodies experiencing HABs without an identified pollutant that can be reduced by implementing the TMDL. Waterbodies are identified for TMDLs by a specific set of criteria published in DEC's Consolidated Assessment and Listing Methodology (CALM). If a waterbody is identified as impaired for a pollutant following the methods described in the CALM, then that waterbody will be placed on the 303(d) list of impaired waters. TMDL planning is prioritized through DEC's Vision Approach for the pollutants identified on the 303(d) list. Traditionally, HABs have been problematic in high nutrient systems, such as those with excess phosphorus. However, there are many lakes in NYS that experience HABs that have low levels of phosphorus due to other drivers (e.g., invasive mussels, local weather conditions, climate change).

NYS has several planning tools for nutrient reduction or protection, including TMDLs, Nine Element (9E) Plans, or Advanced Restoration Plans (ARPs). These plans quantify pollution sources, identify actions, and receive funding priority. See DEC's Clean Water Planning page for more information about these plan types.

Additionally, DEC's nutrient guidance value proposal expands statewide protection from phosphorus and its impacts to water quality which includes nuisance algae and HABs.

Local Stakeholder Stewardship

What more can I do to reduce HABs?

With or without an approved Clean Water Plan, there may be local organizations in your watershed working on water protection or improvement. Reach out to your lake association, watershed groups, municipal governments and planning departments, and Soil and Water Conservation Districts to learn more. Everyone can play a part in reducing nutrients which are utilized by HABs. Pumping out septic systems, using zero-phosphorus law fertilizer, allowing vegetated riparian zones to grow along streams and lakes, and minimizing sediment run off from bare ground are just a few of the ways. In addition, Diet for a Small Lake includes nutrient control strategies for those interested in nutrient reduction measures.

HAB Reporting and Sampling

What public monitoring for HABs is occurring?

Public and trained volunteers provide visual reports to DEC, through the NYHABS system. Visual observations are critical for understanding HAB extent and informing the public. Visual confirmation and reporting on NYHABS is the most efficient way to communicate HAB occurrence for public health, as blooms are dynamic and lab analysis takes time. Public communication is key - "Know It, Avoid It, Report It".

Lake groups that participate in DEC's Citizens Statewide Lake Assessment Program (CSLAP) survey their lakes and report HABs if observed. Some lakes have additional coordinated volunteer networks to specifically look for and report shoreline HABs. Lakes with these networks include Canandaigua, Otisco, Owasco, Seneca, Skaneateles, Keuka, Cayuga, and Otsego. Waterbodies with robust volunteer surveillance networks often generate many HABs reports each season. Additionally, institutions such as Stony Brook University and Community Science Institute, also conduct targeted HAB sampling.

How is DEC empowering citizens and lake associations to act on HAB mitigation directly?

DEC provides resources on HAB outreach, education, reporting, and control, as well as general stewardship. DEC manages CSLAP in collaboration with the NYS Federation of Lake Associations, and engages with other organizations to educate and increase awareness. Citizen scientists with an understanding of water quality can engage local managers to inform them on key means for reducing HABs and implementing nutrient control strategies described above.

How does DEC confirm a HAB has occurred?

DEC staff review submitted reports and evaluate photos to visually confirm the presence of a HAB. Where necessary, such as for source waters for drinking water or at regulated bathing beaches, DEC notifies and engages with DOH for appropriate response. Reports of HABs are posted publicly on NYHABS. It is important to note, the absence of a report on NYHABS does not necessarily mean a HAB is not present. HABs may be present in other waterbodies or other places within the same waterbody, and conditions may have changed since the HAB was reported.

Does the NYHABS reporting platform identify waterbodies with the worst HABs?

No, NYHABs is a platform that receives reports of HABs from the public, trained users, and professional staff to help the inform the public, beach managers, DEC, DOH, and other users on HAB occurrence. The reports contain important supporting information like photos and the reporter's observation of the HABs size, but does not contain quantitative, objective data on HABs. NYHABS and public reporting is an important component of HAB monitoring and can help identify waterbodies where HABs occur. However, DEC has documented, along with peer reviewed literature, that public reporting can introduce observational bias by overreporting occurrence of HABs on waterbodies with the most use, access, and "eyes on the water".

Why doesn't DEC collect HAB samples when a HAB is reported?

HABs can be temporary and may move around or within a waterbody, toxin production can vary, and lab analyses take time. Regardless of toxin production, HABs can still have health effects so visual confirmation provides the most protective, efficient method of communicating HAB occurrence through NYHABS. DEC has found strong agreement between visually confirmed HABs and paired samples, giving confidence in the visual evaluation approach for the purpose of public awareness.

Sampling occurs for specific needs such as for public water supplies, beach reopening, core DOW monitoring programs, and research. Current DOW programs focus on broad, representative monitoring for long-term changes for nutrients and background levels of algae.

How can I get my water tested for toxins from HABs?

Sampling and analysis take time, not all toxins can be analyzed, and blooms are dynamic. HABs can pose a health risk regardless of toxins, so DEC relies on visual confirmation of a bloom for public communication.

If an individual is interested in monitoring for cyanotoxins, DEC recommends reviewing ELAP-certified labs for total microcystins that are listed on the DOH ELAP website.

Is it possible to monitor HABs using satellite technologies?

DEC is evaluating the potential for satellite monitoring to complement surface water monitoring programs and NYHABS reporting in the identification of HABs. Satellites capture a broad area, can see many waterbodies at once, remove human biases, have a predictable schedule, and are free to use. There are potential limitations to satellite use such as cloud cover that disrupts visibility of HABs, they may miss ephemeral HABs, and they struggle to identify smaller HABs along the shoreline.

Drinking Water

How does DEC communicate the presence of a HAB in a drinking water supply to DOH?

Using NYHABS, DEC and DOH coordinate closely on reports for public water supplies. Under DOH programs, public drinking water is treated, disinfected, monitored, and optimized to address HABs, their toxins, and other water supply contaminants.

HABs and Beach Closures

How does NYS handle HABs at regulated bathing beaches?

DEC and OPRHP have adopted beach closure protocols developed by DOH. Closures are based on visual observation of a HAB in the regulated swimming areas for rapid response. Beaches may reopen 24 hours after a bloom visually dissipates and samples confirm toxin levels are below DOH health advisory level (≤ 4 µg/L total microcystins – microcystin is a common toxin created by several types of cyanobacteria).

Pet Illness

How can HABs affect animals?

Pet and livestock illness/deaths can happen if animals consume large amounts of water containing blooms, scums or benthic mats. Rinse pets with clean tap water right away and do not allow them to lick their fur. Immediately seek veterinarian care if noticing any symptoms in your animals.

Fishing and HABs

Are anglers allowed to fish on a waterbody with a HAB?

DEC recommends avoiding areas with visible HABs. HABs have the potential to be harmful if contact occurs with the skin, eyes, or is ingested. When fish are handled during fishing, water may splash onto skin or into eyes, so it is not advisable to fish where HABs are occurring.

Should we avoid eating the fish in a waterbody where HABs have been reported?

NYS recommends that anglers not eat fish caught directly from the portion of a waterbody with a bloom. DOH can be consulted for more specific advice about fish consumption in waterbodies with blooms: About Chemicals and Bacteria in Fish and Additional Information.

How do HABs impact the fishing community?

The direct impact on fish from HABs is still being researched. However, excess algae of any kind, not just HABs, can consume dissolved oxygen in the water as they die off. When excess algae dies, decomposition can deplete dissolved oxygen. If oxygen depletion becomes severe, fish kills can occur. Oxygen levels can be altered by other natural environmental events, such as lake turnover, which may cause physiological stress to fish.

HAB Prediction

Is it possible to install real-time water quality monitoring stations to help monitor and even predict the formation and persistence of HABs?

A pilot project on Skaneateles Lake has real-time sensors collecting HAB-relevant data, with results on prediction expected in 2025. These real-time systems are experimental and as yet unvalidated. Existing technologies cannot accurately predict HAB formation, only their likelihood over a season. Importantly, factors for bloom formation vary by lake, and the findings from this project may not be applicable elsewhere.

Invasive Species and HABs

What role do invasive mussels play in the occurrence of HABs? Are there any existing control measures that DEC is using or aware of for use?

Research shows dreissenid mussels (Zebra and Quagga mussels) increase the probability of a HAB occurring by preferentially consuming green and other types of beneficial algae, allowing cyanobacteria to reproduce with fewer competition in the water column.

Prevention is the first line of defense against would-be invaders and is the preferred management strategy. If invasive species are already present, hand removal of mussels is can work for very small areas, but not feasible for widespread colonization. Chlorination is effective in pipes, but not in open water due to harm to non-target organisms. Other treatments exist but widespread controls are cost-prohibitive and can damage native organisms and ecosystems.