

What Is Dissolved Oxygen and Why Is It Important for My Waterbody?



Dissolved oxygen (DO) refers to the concentration of oxygen in water. DO is vital for healthy lakes and ponds and key to the survival of fish, other aquatic life, and beneficial bacteria. DO also helps prevent muck build-up by supporting the decomposition of organic materials like dead plants and animal waste.

Waterbodies with insufficient DO are more likely to experience water quality and nutrient imbalances that may lead to:

- Nuisance weeds
- Algae
- Toxic cyanobacteria (blue-green algae)
- Fish kills
- Foul odors
- Bottom sludge
- Loss of depth and flooding

Fortunately, many solutions are available to correct DO deficiencies, promote healthy water quality, and help prevent future issues.

Fountains and surface aerators are some of the most recognizable tools designed to help oxygenate and circulate water. Both types of units improve water quality by creating surface movement and are most effective in waterbodies between 4-8 feet deep.

Fountains use specialized pumps to spray water into the air in decorative patterns. As it falls, it creates turbulence that facilitates the transfer of oxygen into the water column. However, the water quality benefits of fountains are often secondary to the aesthetic benefits.

Continued on page 2

We believe clean lakes promote good health, happiness and meaningful experiences.

INSIDE

- 3 A Guide to Grants & Funding for Water Quality Restoration
- 4 Why Hydro-raking Is Becoming a Popular Lake Management Tool
- 5 Restoring 1,800 Linear Feet of Pond Shoreline with Erosion Repair Technology
- 6 The SOLution: Volunteer Highlights
- 7 Before and After Showcase
- 8 Is Your Stormwater Management System Showing These Red Flags?

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Continued from front cover



Surface Aerator



Submersed Aerator



Floating Fountain

[Surface aerators](#) are low-profile units with strong propellers that create a boil-like flow. Though they're less eye-catching than fountains, these systems can infuse up to 72 pounds of oxygen into the water in 24 hours, making them an excellent choice if water quality improvement is the priority.

For waterbodies greater than 6-8 feet deep, experts may recommend a [submersed aerator](#), which uses an on-shore compressor to pump air through tubing to the bottom of a lake or pond where it is released through diffusers. The fine bubbles that are produced help oxygenate and circulate the water column as they rise. Submersed aerators can be placed directly under or near a fountain or surface aerator for maximum benefits.

In addition to fountains and pond aerators, which have been used in the lake management industry for decades, there are also several new premium solutions for improving oxygen levels in waterbodies. [Nanobubbles](#), oxygen injection technology, and other modern technologies help provide a more direct means of elevating DO.

Nanobubbles are microscopic bubbles that are continuously injected into the water with a compact, on-shore unit. They are negatively charged, allowing them to oxidize and degrade positively charged algal cells, toxins, and excess nutrients when they come in contact. Because they also lack natural buoyancy, they can remain in the water for months.

Oxygen injection technology offers comparable benefits to traditional

aeration without producing bubbles. By injecting oxygen at low pressure through suction and discharge lines into specific water depths, this method achieves five to ten times the oxygenation efficiency. The oxygen-rich water is then infused into bottom sediments, where it remains for extended periods.

New innovations are continuing to emerge. [Photocatalyst products](#) are the latest technology in lake management and eliminate the need for external energy sources by using sun activation to trigger bioreactions that enhance oxygen availability. This helps disrupt the nutrient cycles that directly contribute to nuisance weeds, algae, and muck build-up while aiding in muck decomposition.

DO is crucial for maintaining the health of any waterbody and there are now more oxygenation solutions than ever before. [Speak with an expert](#) today to find the right solution for your waterbody. ■





A Guide to Grants & Funding for Water Quality Restoration

Maintaining clean recreational lakes and drinking water reservoirs presents a significant challenge. This is not only due to the complex nature of water management but also the regulatory hurdles and funding required. These challenges often delay or prevent water quality restoration projects like [aluminum sulfate](#) (alum) applications from being implemented, thus leaving communities with unhealthy and unsightly water.



What many community leaders and decision-makers may not realize is that millions of dollars in state and federal funding and grant programs are available to help ensure safe, clean water is accessible to all. To successfully obtain these financial resources, it's important to understand the complexities of the process.

[Grant and funding programs](#) vary widely among states, with different application processes and varying levels of available resources. For

example, Wisconsin offers up to \$200,000¹ per alum application, Minnesota boasts a yearly environmental fund of over \$100² million, and Washington offers up to \$50,000³ for assessing a lake's condition. Florida operates grant programs addressing [Harmful Algal Blooms](#) (HABs)⁴, which can have detrimental effects on the environment and human health.

State grants are often underutilized due to a lack of awareness or errors made in the application process. To secure funding, it's important to develop compelling proposals that showcase project efficacy, potential environmental impacts, and the provider's qualifications including their experience, past successes, and their ability to integrate the latest industry standards and technologies.

The technology used in alum water treatment is crucial for project effectiveness. Advanced equipment and innovations, such as GPS-guided vessels, bathymetric mapping technology, and advanced water quality testing, show a provider's ability to lead a project effectively and achieve desired outcomes accurately and safely. Ensuring project success is crucial, as unsuccessful attempts may compromise future funding eligibility. Partnering with an experienced company that's well-versed in the

application process can greatly benefit stakeholders.

When securing funding, it's crucial to obtain permits with specific execution guidelines, product use, equipment, work schedules, and authorized personnel, which vary by state. Compliance with permits post-funding is essential to avoid regulatory fines and redirect resources from public health needs.

Alum applications require precise execution for lasting water quality results. SOLitude has used alum to improve over 35,000 acres of water across [hundreds of projects](#). Our custom-built, state-of-the-art application vessels use computerized equipment that maintains a target dose rate by accounting for changes in vessel speed and depth. All application equipment is integrated with GPS tracking to ensure a uniform and verifiable application area and rate.

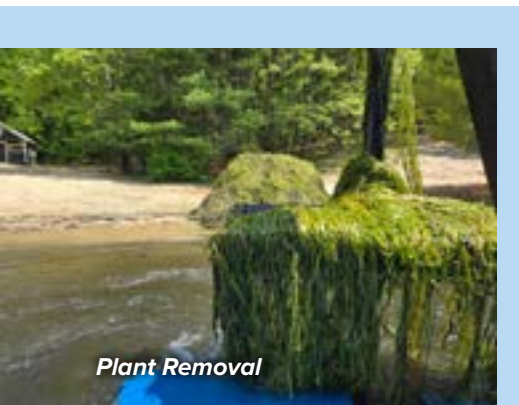
Our [experienced professionals](#) and partners have helped diverse stakeholder groups navigate the competitive application process and boost their chances of securing funds. From handling all meticulous paperwork and permitting documents to educating stakeholders and conducting treatments, we lead projects to ensure accurate and timely completion. [Contact our experts](#) today to get started. ■

¹ Wisconsin Department of Natural Resources
² Legislative-Citizen Commission on Minnesota Resources
³ State of Washington Department of Ecology
⁴ Florida Fish and Wildlife Conservation Commission

Why Hydro-raking Is Becoming a Popular Lake Management Tool

Have you received complaints about bottom sludge or bad odors coming from your waterbody? Is your view of the water obstructed by dense nuisance vegetation? Is flooding becoming more common during rainstorms? These are telltale signs of an “aging” aquatic ecosystem. To preserve your property’s beauty, safety, and value, it’s crucial to prevent these issues from escalating further.

[Mechanical hydro-raking](#) is gaining renewed popularity in restoring aging waterbodies thanks to its cost-effectiveness and minimal environmental impact. A hydro-rake is a floating backhoe with a hydraulic arm that physically [removes accumulated muck](#), debris, and vegetation from the bottom of a waterbody. The materials are then transported off-site for disposal or composting.



Plant Removal

It’s normal for lakes and ponds to fill with sediment, dead plant matter, and other organic debris. Over time, these nutrient-rich materials will decompose and accumulate as bottom muck,

creating a fertile environment for nuisance weeds and algae. As aquatic weeds and algae die at the end of each season, they form additional muck, creating a cycle of water quality and muck issues. In natural aquatic ecosystems, this process continues over hundreds of years until the ecosystem’s health declines and the waterbody fills in completely.

Unfortunately, human influence is accelerating this aging process in developed areas. Ponds that are regularly inundated with lawn and garden fertilizers, grass clippings, construction and agricultural runoff, trash, animal waste, and other nutrient-rich pollutants can fill in within a few decades if left unmanaged.

With the ability to carry up to 500 pounds in each scoop, the hydro-rake can remove significant amounts of muck and debris in a short time. Depending on the material being removed and where the material deposit area is located, one acre can be restored within a week or less. This makes it an excellent alternative to delay the need for [dredging](#)—a costly process that restores a waterbody to its original depth and volume. Extending your waterbody’s lifespan through proactive hydro-raking allots more time for lake and pond owners and managers to budget for a large-scale restoration project.

Another advantage of hydro-raking is its ability to [selectively target rooted vegetation](#) like cattails and

invasive phragmites, without removing desirable plants and fish populations. The hydro-rake can also dig out buried root systems, seeds, rhizomes, and tubers to help prevent the plants from regenerating. However, it is important to note that hydro-raking is not suitable for plants that spread through fragmentation. Plants like milfoil and water chestnut may break apart, leading to further spread.



Muck Removal

A notable feature of a hydro-rake is its versatility. The hydro-rake is operated directly from the water and propelled by paddle wheels, allowing it to access areas as shallow as 18 inches to as deep as 10 feet. Property owners and managers can rest assured that their shorelines and beautiful waterfront properties should not be impacted during the process. Whether you need to clear a specific part of a lake for swimming or address muck build-up near stormwater pond equipment, hydro-raking can help you do so with safety and precision. ■



Before

After

Restoring 1,800 Linear Feet of Pond Shoreline with Erosion Repair Technology

A 55-plus living community in New Jersey was searching for a solution to [repair the shoreline erosion](#) on their two ponds located at the neighborhood's entrance. These ponds were once a place where residents could take an evening stroll, however, the damaging effects of erosion turned the ponds into eyesores and potential liabilities.

Constructed in 2006, these community ponds had experienced severe erosion due to stormwater runoff, weather events, and human and wildlife activity. As a result, the shoreline began to recede, threatening the integrity of the surrounding fence and diminishing the aesthetics of the neighborhood's entrance. The unstable and uneven banks made it unsafe for residents to use the pond as they once did. This also created a [liability risk](#) for the Homeowners Association (HOA), putting residents and landscapers in danger due to the unstable shoreline. To restore the safety of the ponds, improve resident satisfaction, and boost community appeal, the HOA began researching erosion repair solutions.

After two years of exploring various erosion control options, including riprap, coconut fiber logs, gabion baskets, and other bank softening techniques, community leaders

decided to install a [bioengineered living shoreline](#) on both ponds. This solution would help regain lost land, stabilize the bank, and enhance aesthetics at the entrance of the neighborhood.

The project commenced in the fall of 2023. Prior to the installation of the bioengineered system, the shrubs along the bank were cleared to provide a clean shoreline for installation. Then, the durable mesh material was laid out along the pond's perimeter and anchored to the stable part of the shoreline. Once the system was secured to the shoreline, it was filled with organic material. In some cases, organic material can be sourced from the bottom of a pond and removed via a hydro-rake or dredge. However, this community utilized 800 cubic yards of sandy material to fill the system.

40 pallets of sod were placed over the secured system to promote a natural-looking shoreline. The roots from the sod will penetrate through the system and down into the soil, further stabilizing the shoreline. [Establishing vegetation](#) along a pond's shoreline can also help filter excess nutrients like phosphorus from rainwater as it washes into the waterbody. Phosphorus is known to cause water quality imbalances that promote

nuisance weed and algae growth.

In just eight weeks, four weeks to complete each pond, the community regained a total of 1,800 linear feet of shoreline. The bioengineered living shoreline not only enhanced the beauty and property value of the neighborhood but also created a safer environment, allowing residents to peacefully stroll along the shoreline.



Installed system prior to sodding

Remember that shoreline erosion, no matter how minimal, should never be ignored. The risks associated with eroded shorelines can lead to resident complaints, financial problems, and liability risks for property owners or managers. Stay ahead of erosion by establishing beneficial buffers made up of [native plants](#) to help stabilize the soil. If damage has already occurred, it's important to promptly address it, not only to protect the safety of stakeholders but also to safeguard and enhance your pond's health. ■

The SOLution creating a better world

Volunteering Highlights from Our Passionate Colleagues

The SOLution, a company-wide volunteering and community outreach program, has been an integral part of SOLitude's mission to enhance the communities we serve beyond managing lakes and ponds. In 2024, SOLitude colleagues continued to dedicate their time and talents to their local communities. From volunteering at local churches to conducting trash clean-ups, our colleagues have generated over 900 volunteer hours so far this year.

Individual Volunteer Highlights

Raquel Mason,
Accounts Receivable, FL

One of SOLitude's most active volunteers, Raquel Mason, creates homemade cards for Cardz for Kidz, an organization dedicated to uplifting the spirits of children in the hospital. Raquel's mother joins her in this activity and together, they have created hundreds of cards!



Matthew Drake,
Operations Manager, FL

Matthew Drake regularly volunteers with Guns n Hoses Pipes n Drums of Southwest Florida. The band includes active and retired first responders and military members who perform at various events across the region.



Earlier this year, colleagues gathered to celebrate SOLitude's 5th Annual [Heart & SOL Day](#), a company-wide volunteering day that encourages team members to improve the communities where they work and live. More than 100 team members participated, supporting 32 organizations. Here are some highlights from the event!



The Colorado office worked with Protect Our Rivers where they picked up trash along St. Vrain Creek.



Team members from our South Carolina office cleaned up debris at Folly Beach.



Our Virginia Beach, VA office removed trash from several stormwater ponds throughout the community.

BEFORE & AFTER SHOWCASE

CONTROLLING FILAMENTOUS ALGAE

Property type:
Community Stormwater Pond

Location: Virginia

Hunter Poland
District Manager



REPAIRING EROSION DAMAGE WITH BIOENGINEERED LIVING SHORELINE

Property type:
Apartment Complex Pond

Location: Illinois

Chris Broch
Business Development
Consultant



MANAGING A TOXIC ALGAL BLOOM

Property type:
Private Lake

Location: Texas

Rafe Dean
Operations Manager



FLOATING AQUATIC WEED CONTROL

Property type:
Community Pond

Location: Florida

Anthony Mauri
District Manager



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For helpful lake, pond, wetland and fisheries management tips visit:



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Is Your Stormwater Management System Showing These Red Flags?



Stormwater ponds are important for managing excess rainfall to prevent flooding, filtering pollutants, and enhancing beauty. When left unmanaged, they can create potential hazards. It's important to watch for the "red flags" and address issues before they become bigger problems. Stormwater pond warning signs include:

1 Corrosion, fractures, cracks, or signs of collapse on inlet or outlet structures. When left unaddressed, these small deficiencies can diminish the functionality of your stormwater system and may lead to costly repairs. Have your pond professionally inspected yearly for damage and address any damage early on.

2 Recurring water quality issues. Stormwater ponds filter pollutants from runoff before the water is released into local waterways. The captured excess nutrients can lead to water quality issues

like [algae and weed growth](#). Combat these issues by reducing nutrient levels through proactive solutions like [shoreline buffers](#), [nutrient remediation](#), or [aeration](#). When nutrient levels are balanced, algae and weeds are less likely to thrive.

3 Built-up sediment and muck. Over time, stormwater ponds accumulate sediment which can limit its holding capacity or block the flow of inlet and outlet structures. This can increase the risk of flooding and overwhelm drainage systems if the water is not released at a controlled rate. To prevent this, conduct regular bathymetric surveys to determine overall storage volume and track any depth changes over time. This allows you to accurately budget for future dredging, one of the costliest expenses a pond owner or manager can face.

[Contact our experts](#) to get your stormwater pond assessed. ■