Aquatics in Brief
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The Cost of Procrastination in Lake Management

They say procrastination is the thief of time. In lake and pond management, delaying action can diminish the value of your waterbody. When taking a more reactive approach instead of proactive, the negative impact is felt by all stakeholders.

For property managers, it diverts attention from community improvements towards complaints. For golf course superintendents, it shifts focus from delivering excellent player experiences to troubleshooting preventable waterbody issues. For private or public lakes, it means less time spent making memories fishing, swimming, or boating with friends and family.

Most lake and pond problems don't appear overnight; they develop over months or years. It can be easy to ignore early warning signs, like a receding shoreline, or gradual muck accumulation. However, by the time issues become obvious, the damage is already done. What could've been a proactive fix, turns into reactive decisions, hoping for instant results.

Reactive management involves addressing symptoms with short-term fixes, such as using algaecides to temporarily control toxic cyanobacteria (blue-green algae), or applying blue dye to mask a pond's poor water clarity. Without addressing the root cause, problems only compound, along with the cost of delaying action.

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

INSIDE

SOLITUDE LAKE MANAGEMENT

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Restoring Balance.
Enhancing Beauty.

The Cost of Procrastination in Lake Management

Continued from front cover

In fact, studies estimate that homes adjacent to lakes with frequent cyanobacteria blooms sell for 22% less than those on clear lakes[1]. Others have found that a 3-foot decrease in water clarity may result in a loss of nearly $700 per foot of shoreline frontage[2].

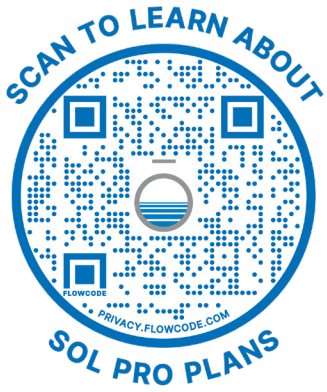
Reactive management also limits your options. What was once a wide range of proactive solutions, quickly narrows to a few urgent and expensive fixes, reducing flexibility and forcing rushed decisions.

For example, introducing native vegetation to help slow erosion is significantly more manageable than rebuilding a collapsed shoreline. Using aeration or nutrient management strategies to promote an environment that's more resilient to muck build-up is a healthier and more cost-effective approach, as opposed to dredging.

Don't wait until you find yourself facing drastic decisions, such as whether to address a degraded waterbody, risking fines or property damage, or to prioritize essential needs of everyday life. Too often, the only way to handle these situations is by raising dues, taxes, or increasing visitor rates.

Our SOL Pro Annual Management Plans are designed to make the unpredictable, predictable. Instead of being reactive to problems, our structured approach focuses on early detection, so imbalances can be corrected before they escalate. This means fewer disruptions, less stress, and more time for the people who use and enjoy the body of water.

The financial impact of healthy waterbodies is significant. Across the U.S., a 10% improvement in water quality could translate into an increase of $6 to $9 billion in lakefront property value[3]. There is no better time than the present to get started and set yourself up for success. Take care of your waterbody now while you still have options, rather than waiting until you don't. ■



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1 Bloom and bust: Toxic algae's impact on nearby property values | Ecological Economics
2 Lakeshore Property Values and Water Quality | Mississippi Headwaters Board, Bemidji State University
3 Valuing water quality in the United States using a national dataset on property values

The "Softscaping" Revolution: Protect Your Shoreline & Repair Erosion Damage

Shoreline erosion will often start quietly. While thinning grass, uneven grooves, or sedimentation along the bank may seem minor at first, these subtle changes are the start of serious deterioration.

Though many see erosion as a simple cosmetic concern, it can affect much more:

- Decreased value of waterfrontage
- Reduced property values
- Increased risks of flooding and infrastructure damage
- Potential lawsuits resulting from shoreline safety incidents
- Unhealthy water quality conditions

Erosion is naturally caused by wind, rain, temperature fluctuations, and wildlife activity, but it can be greatly accelerated by human influences such as recreation, landscaping, and new construction.

Urban development reduces natural green spaces that would normally absorb rainwater. Instead, runoff is diverted into nearby waterbodies. As water travels over roads, sidewalks, and other hard surfaces, it accelerates, hitting the shoreline with increased force. This creates a stronger and more persistent wave action. Because of this, additional protections are frequently introduced in areas most vulnerable to water movement.

For decades, the standard response was “hardscaping” with concrete seawalls, bulkheads, and rip-rap. However, what appears to be unyielding protection can create new problems. Water doesn’t stop when it hits these barriers; it’s deflected back into the waterbody, often intensifying erosion in adjacent areas. Erosion can also occur behind these structures if installed incorrectly.

A growing trend in shoreline protection is “softscaping.” Bioengineered living shorelines—which are widely considered the gold standard—work with nature, not against it. They’re designed to absorb wave energy, slow water movement, and blend with the surrounding environment.

Bioengineered shorelines are constructed by filling durable geotextile fabric with organic material and anchoring it to the shoreline. Once secured, sod, seed, or a buffer of deep-rooted, native vegetation can be integrated into the material; their root systems offer additional stability as they develop.

The benefits of softscaping extend beyond shoreline stability:

Highly customizable – No two waterbodies are the same. Bioengineered shorelines can be tailored to the desired shape and slope to align with the natural aesthetic of the property.

Reclaim lost land – In many cases, several feet of lost land can be restored, potentially elevating property values and community desirability.

Natural filtration – Native vegetation helps slow and filter organic matter that’s picked up by flowing rainwater, such as animal waste, leaves, grass clippings, and fertilizers. Keeping these nutrient sources out of the water can help reduce water quality issues.

Phased approach – Restoration doesn’t have to happen at once. Projects can be completed in sections, prioritizing the most vulnerable areas first and expanding over time. This phased approach makes budgeting and long-term planning easier while steadily improving shoreline health.

Habitat for wildlife – Beautiful vegetative buffers attract native birds and wildlife, including mosquito-eating dragonflies.

Shoreline erosion will always be a challenge as seasons change, rainwater flows, and urban development continues. Ongoing professional assessments are critical for identifying early signs of wear and taking action before the health and beauty of your shoreline is compromised. ■

Low Oxygen & Nutrients: The Hidden Drivers of Water Quality Issues

Every waterbody is different, but all healthy waterbodies have one important thing in common: balanced dissolved oxygen (DO) and nutrient levels. Beneficial bacteria and zooplankton—the foundation of the aquatic food web—require oxygen and nutrients, just like we do. But what happens to water quality when the balance is disrupted?

SIGNS OF LOW DO LEVELS

Ecosystems are intricately connected, meaning one small imbalance can ripple through the entire system. One of the most obvious signs of low DO is a fish kill, when large populations of fish or mollusks die at once. This isn't uncommon following periods of hot, dry weather or after storms when the turbulence from heavy rainfall causes DO to fluctuate rapidly; however, unexplained fish kills may signal a more severe issue.

Another sign of low DO is more easily overlooked. When plants and aquatic species die off, they are decomposed by aerobic bacteria that thrive in DO-rich environments. Decomposition can consume DO faster than it can be replenished from the atmosphere. If DO is deficient, the beneficial bacteria are replaced with anaerobic bacteria. Organic matter cannot be broken down properly under these conditions, leading to foul odors, slimy bottom muck, and elevated nutrient levels.

RISKS OF ELEVATED NUTRIENT LEVELS

An overabundance of nutrients combined with low DO creates a destructive cycle. Nutrients fuel the excessive growth of aquatic weeds and algae, but decomposition can't keep up when they die. Muck accumulates and releases nutrients back into the water, fueling new growth.

As a waterbody fills with organic matter over time, it will become shallower, stagnant, and more costly to restore. Health and safety risks can also increase, including more frequent flooding during rainstorms, dangerous shoreline deterioration, and harmful algal blooms.

Luckily, there are numerous tools available to restore balance and break this cycle.

Increase dissolved oxygen levels

Fountains and aerators help oxygenate and circulate the water column. While floating fountains provide both aesthetic and functional benefits, surface aerators and submersed aerators are designed for more powerful water movement and oxygen distribution.

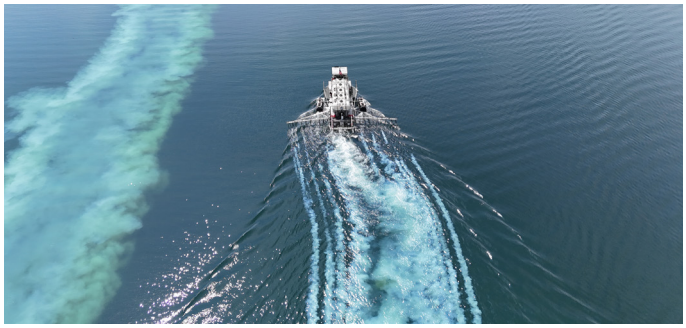
To learn more about how each system works and which is right for your waterbody, explore our in-depth article on page 7.

Decrease nutrient levels

A range of eco-friendly solutions are available to “deactivate” excess nutrients within the water column and sediments, helping interrupt the cycle that drives poor water quality.

LANTHANUM-MODIFIED BENTONITE

This nutrient remediation solution binds with phosphorus particles suspended in the water column and bottom sediments. It is typically used on smaller ponds and stormwater systems.



ALUMINUM SULFATE (ALUM)

Alum is a nutrient management tool with a history of over 60 years. It binds with phosphorus in the water column and sinks it to the bottom, permanently locking it in the sediment. It is best suited for large lakes, drinking water reservoirs, and wastewater holding ponds.

BENEFICIAL BACTERIA

These naturally occurring microorganisms can be added to a pond to help control anaerobic bacteria. This balance of beneficial bacteria assists in metabolizing excess nutrients and breaking down organic matter, similar to a probiotic for your waterbody.

ECOSYSTEM RESTORATION

New ecosystem restoration solutions are designed to address DO and nutrient imbalances in tandem. This approach increases oxygen in the bottom sediment to help beneficial bacteria break down nutrient-rich muck more efficiently, leaving behind a firmer, sandy bottom.

Just like most things in life, balance is key. A proactive approach that includes ongoing water quality monitoring and maintenance best practices can help ensure your waterbody is on the right track to meet your goals year-round. ■

BEFORE & AFTER SHOWCASE

SHORELINE EROSION REPAIR

Property type:
Mobile Home Park

Location: Cape Coral, FL

FILAMENTOUS ALGAE CONTROL

Property type:
Public Park

Location: Richmond, VA

WATER HYACINTH CONTROL

Property type:
Community Pond

Location: Ft. Pierce, FL

FILAMENTOUS ALGAE CONTROL

Property type:
Community Pond

Location: Palatine, IL

Aeration: The Most Cost-Effective Upgrade for Aging Waterbodies

Aeration doesn't always get the credit it deserves. Though it may seem simple or outdated, it's a proven, time-tested tool. By increasing and circulating dissolved oxygen, aeration supports nearly every aspect of water quality and helps form the foundation of a healthy, balanced waterbody.

Aeration was first used in the 1950s to prevent winter fish kills. Then, in the 1960s, its use expanded as a tool to help manage eutrophication— the decline in water quality caused by an increase in nutrient levels due to the accumulation of muck, sediment, dead plant matter, and other organic materials.

The bacteria responsible for breaking down nutrient-rich materials thrive in oxygen-rich environments. When paired with other proactive solutions, aeration can help maintain balanced oxygen levels and slow eutrophication, promoting clearer water, reduced odors, and fewer recurring water quality issues.

A range of aeration solutions are available in lake and pond management. In many cases, a combination of aeration methods can be used to achieve the best results by addressing both surface and deeper water conditions.

Floating Fountains:

Floating fountains can add beauty and dimension to any waterbody with customizable spray patterns and lighting options, while also offering important functional benefits. As water falls from the air, it causes surface agitation that promotes oxygen transfer and circulation in shallow areas. These systems are most effective in depths of 4 to 6 feet.

Surface Aerators:

Surface aerators look similar to fountains and may include decorative lighting options, but instead of graceful spray patterns, they use large, slow-moving propellers to create a boil-like flow that can inject up to 3 pounds of oxygen per horsepower per hour into the water. Surface aerators are recommended for waterbodies 4 to 8 feet deep.

Submersed Aerators:

Submersed aerators use an on-shore compressor to pump air through subsurface tubing to the bottom, where diffusers release fine bubbles. As air bubbles rise, they help spread oxygen across the entire water column. Submersed aerators are appropriate for depths over 6 feet and are often paired with surface systems for maximum effectiveness.

Because every waterbody is different, system selection and positioning matter. Factors like size, depth, shape, and overall management objectives play a role in determining the right approach. Choosing the right system helps ensure it performs as intended and delivers the expected long-term benefits.

From a cost perspective, aeration is one of the most reliable ways to help reduce long-term maintenance expenses. When water quality is balanced, waterbodies are less prone to recurring issues that often require costly reactive treatments. Rather than repeatedly addressing the same problems, aeration can help reduce both the frequency and intensity of interventions over time.

Just as important, aeration is one of the few management tools that works in harmony with natural processes rather than against them. This means healthier water quality from day one and a stronger, more resilient foundation for the future. ■

Floating Fountain

Surface Aerator

Submersed Aerator

Beyond the Jon Boat: Innovative & Unique Lake Management Tools

Most waterbody owners and managers are familiar with seeing a service truck topped with a Jon boat. These lightweight, maneuverable boats allow aquatic experts to efficiently complete routine tasks, such as fountain service, aquatic weed and algae control, bathymetric mapping, and general inspections. However, when management needs extend beyond the basics, so must the equipment used to tackle them.

Below are some of the specialized tools and vessels we use to manage complex projects across a range of unique conditions and environments:

MECHANICAL HYDRO-RAKES

Purpose: Physical removal of rooted aquatic weeds, nutrient-rich muck, and debris; helps restore depth and prolongs the need for dredging.

Features: Comparable to a barge equipped with a backhoe. Each scoop removes up to 500 pounds of debris and deposits it onshore for disposal. Operates in water as shallow as one foot and can restore depths up to 10 feet.

DREDGES

Purpose: Large-scale removal of accumulated sediment to restore the waterbody's original depth and volume; completely resets the aquatic ecosystem.

Features: Mechanical dredges use buckets to excavate and transfer sediment to barges or trucks for disposal. Hydraulic dredges use a rotating cutter and pumps to move sediment as a slurry through a floating pipeline.

MECHANICAL HARVESTERS

Purpose: Selective, large-scale removal of floating vegetation; creates open-water channels and restores waterbody access.

Features: A floating craft that physically cuts vegetation. Plant matter is transported on board with a conveyor belt and later offloaded for disposal.

ELECTROFISHING VESSELS

Purpose: Fish species and population assessments; supports trophy fisheries management.

Features: Specialized vessels with onboard generators that produce a low-voltage electric current in the water. Fish are temporarily stunned, collected with dip nets, and held in tanks on board for assessment before being safely released back into the water.

ALUM BARGE

Purpose: Large-scale aluminum sulfate applications; supports water quality restoration.

Features: Custom barge outfitted with a fathometer, GPS-based speed tracking, in-line pressure gauges, and flowmeters to monitor and control application rates in real time, ensuring uniform coverage.

AMPHIBIOUS VEHICLES

Purpose: Navigating soft-bottom, marshy, and overgrown areas.

Features: Also known as a Marsh Master or Mobitrac. Vehicles designed to operate on both land and water, allowing for continuous work across shifting environments. They are used for herbicide applications, as well as mowing and cutting wetland vegetation.

AIRBOATS

Purpose: Navigating shallow and densely covered waterbodies.

Features: Flat-bottom vessels powered by an elevated propeller system, allowing movement over dense vegetation and extremely shallow water to reach areas inaccessible to conventional boats.

DRONES / UNMANNED AERIAL SYSTEMS (UAS)

Purpose: Mapping and surveillance; supports highly targeted applications in ecologically sensitive and hard-to-reach areas.

Features: Our commercial drones feature a 6-foot wingspan, GIS-programmed routes, and extended flight range, allowing them to transport approximately 35 pounds of product. Capable of treating up to 200 acres per day.

Every lake and pond project is different, and success often depends on having the right tools for the job. With a full fleet of specialized vessels, professionals can match the right equipment to the task and tailor their approach to each site, allowing work to be conducted as safely, efficiently, and cost-effectively as possible. ■

The Ecosystem Saboteurs: Why Misguided Efforts Hurt Your Waterbody

At first glance, many waterbody issues can seem like they have simple, straightforward solutions. As a result, those with a problem-solving mindset often take matters into their own hands by researching and attempting to treat the problem themselves. But far too often, well-intentioned "quick fixes" or do-it-yourself efforts only make conditions worse or provide short-lived results.

Lakes and ponds are far more complex than they seem. Every element, from nutrients and oxygen levels to plants and bacteria, plays a role in maintaining balance. Addressing one problem without understanding how it connects to the entire ecosystem can trigger a chain reaction of unintended consequences. This is why many DIY approaches fall short.

For example, introducing a colorful, exotic plant may seem like a fast way to improve aesthetics, but non-native species can quickly outcompete beneficial vegetation, reducing biodiversity and leading to infestations that, in some cases, take years to control.

Similarly, pond dye is sometimes applied with the belief that it will control algae by reducing light penetration and slowing photosynthesis. Unfortunately, without correcting elevated nutrient levels or low dissolved oxygen levels in the water, algae growth often reappears as soon as conditions allow.

Aquatic weed control is one of the most frequent concerns for lake and pond owners, and many herbicide products are widely available over the counter. Though easy to obtain, using them effectively requires more precision than many people realize. Cutting corners or making minor errors in dosing, timing, or application methods can have harmful outcomes.

Overuse, for example, may cause vegetation to break down too quickly, depleting oxygen levels and increasing the risk of fish kills. Underuse may only partially resolve the issue and require repeat treatments.

Even actions that seem harmless can sometimes make the problem worse. Physical weed removal efforts often backfire without proper planning. For instance, many aquatic plants can regrow from small fragments, so improper removal may unintentionally spread invasive growth to new areas.

Over time, these well-intentioned efforts can compound, turning a simple fix into a problem that becomes unnecessarily more complex and costly to manage.

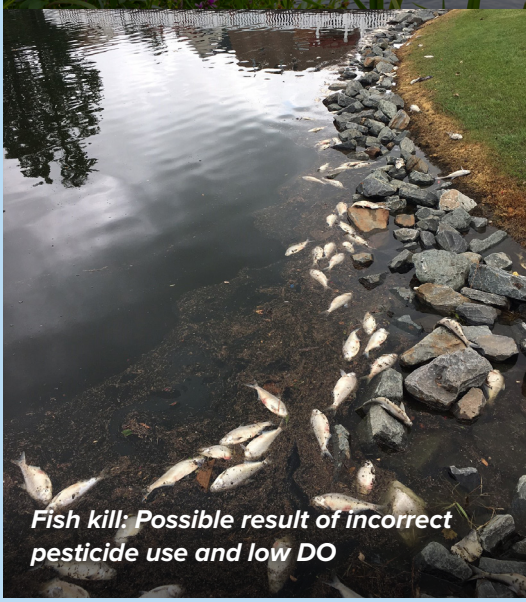
Professional lake and pond managers take a different approach. Rather than reacting to visible symptoms, they work to identify underlying causes through data collection, ongoing monitoring, and a strong foundational understanding of aquatic systems. Before taking action, they consider factors such as _, plant species, geography, and seasonal shifts to limit unnecessary disruptions.

This doesn't mean taking a passive role. It's still important to stay engaged in the health of your lake or pond by monitoring conditions, maintaining open dialogue with experienced professionals who have the tools to address challenges correctly, and adhering to best practices.

Ultimately, effective waterbody management isn't about doing more. The goal should be to do the right things - at the right time - with the right tools, while minimizing the need for intervention. A deliberate, informed approach will almost always yield more predictable and long-lasting results than quick fixes. ■

Hand pulling weeds can cause them to spread

Planting invasive flowering plants can harm beneficial vegetation



Fish kill: Possible result of incorrect pesticide use and low DO

SŌLITUDE IN THE NEWS

Restoring Water Quality in Lake Yale, Florida

Lake Yale, a 4,041-acre public lake in Lake County, Florida, has long been a popular destination for fishing and recreation. In recent years, however, it earned the designation of the most impaired lake in the county. Over time, the lake has experienced more frequent and prolonged harmful algal blooms (HABs), resulting in repeated safety advisories from the Florida Department of Health.

A LONG HISTORY OF WATER QUALITY IMBALANCES

Phosphorus is the primary nutrient driving Lake Yale's HABs and water quality problems. In some areas, levels have been recorded as high as 2,500 parts per billion, with typical readings around 500 parts per billion. These levels are 10-50+ times higher than desirable to limit the growth of potentially harmful cyanobacteria.

What made the issue especially difficult to address was the source of the phosphorus:

- Roughly 80% of the phosphorus originates from internal sediments
- Decades of accumulated organic matter created a significant nutrient reserve
- Phosphorus has been continuously released back into the water column

This internal loading created a self-sustaining cycle, allowing algal blooms to persist even when external inputs were reduced and making natural improvements unlikely without targeted intervention.

PLANNING AND IMPLEMENTATION

After more than a decade of study, coordination, and stakeholder alignment, the Lake County Water Authority board approved an aluminum sulfate (alum) treatment in 2019 as part of a multi-year restoration strategy. SOLitude was selected to carry out the work and began applications in January 2026.

SOLitude has successfully completed more than 200 alum applications across over 35,000 acres of recreational lakes and drinking water reservoirs nationwide. Each project follows strict scientific protocols, adheres to all permitting requirements, and is conducted using state-of-the-art equipment.

HOW ALUM IMPROVES WATER QUALITY

When applied, alum quickly forms a floc that binds phosphorus and other particles in the water column. The floc settles to the bottom, creating millions of phosphorus-binding sites that help prevent nutrients from re-entering the water.

Alum provides both immediate and long-term benefits that can last for decades:

- Improved water clarity
- Enhanced oxygen levels and fish habitat
- Reduced frequency and severity of algal blooms
- Decreased phosphorus levels in bottom sediments

REGULATORY DEVELOPMENTS IN FLORIDA

While alum has been used in lake restoration for decades, its application on public lakes in Florida became more feasible after the Florida Department of Environmental Protection updated its permitting framework. Under this framework, alum treatments are approved as habitat improvement projects and proactive strategies to reduce HABs.

Lake Yale's alum program serves as a pilot project, demonstrating a scalable, science-based approach to restoring other impaired lakes across the region. ■

SCAN TO WATCH ALUM APPLICATION IN ACTION

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