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AquaticsinBrief

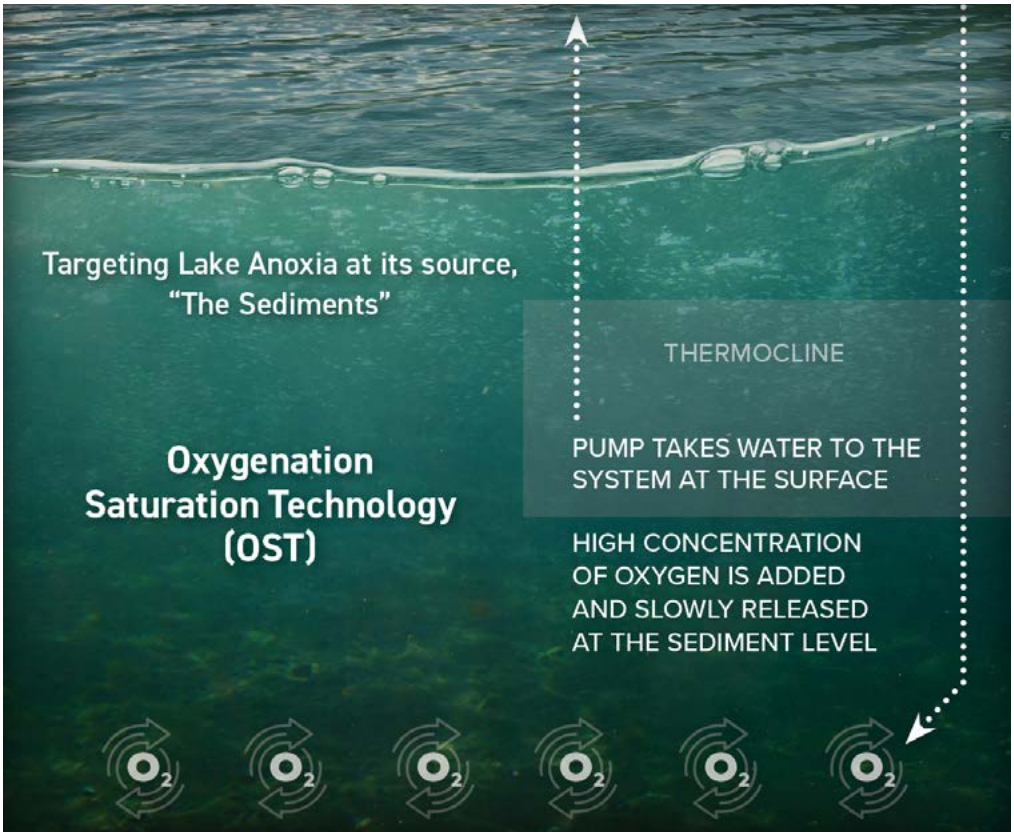
INSIDE:

SOLITUDE LAKE MANAGEMENT

A Full Service Lake, Pond, Wetland and Fisheries Management Company

Four Ways to Introduce Dissolved Oxygen Into Your Waterbody

By **Marc Bellaud, Director of Technical Services, Aquatic Biologist**



Lakes and ponds help us manage stormwater, yield drinking water, provide fishing and recreation opportunities, and maintain beauty in our communities. But ongoing management is necessary to ensure they continue to function properly and remain healthy. To maintain a balanced waterbody, one crucial element needs to be present: oxygen. One management tool professionals have relied on for decades to introduce oxygen into waterbodies is aeration. Oxygenation can be achieved with several types of aeration equipment:

1. A new and exciting industry innovation is Oxygen Saturation Technology (OST). Unlike other solutions, this tool targets lake anoxia and water quality problems at the source — the sediment. This premium water quality management solution injects oxygen directly into the water column which allows the oxygen to stay in solution and disperse, blanketing lake sediments with high levels of oxygen. Furthermore, this system can introduce oxygen at a specified depth without

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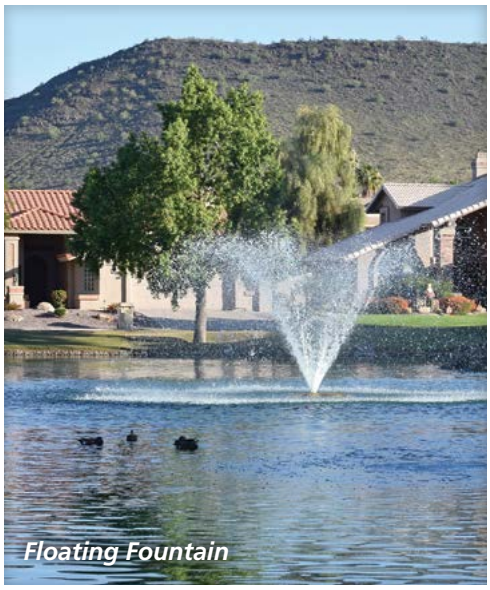
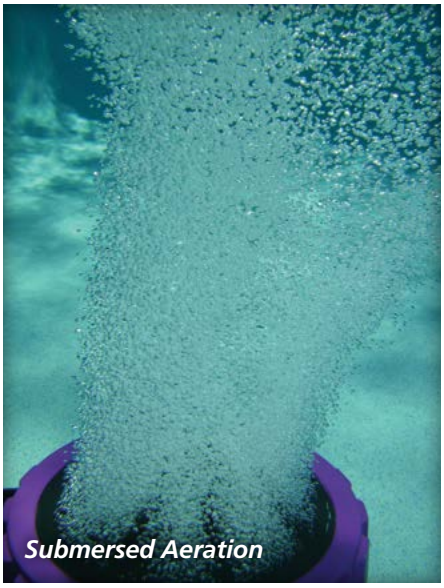
Dissolved Oxygen

Continued from front cover

impacting the thermal stratification or layers of colder water. This allows for oxygen to be placed, and stay where it is needed most at the sediment-water interface. This game-changing technology adds five to ten times the amount of oxygen compared to traditional aeration systems with comparable or often times lower electrical cost. OST helps reduce the reliance on chemicals, with the potential for no herbicide use over an entire season. This innovation also has the capability to reduce or even eliminate organic muck build-up at the bottom of lakes and ponds.

2. Submersed aerators, on the other hand, provide aeration through circulation. Compressed air is pumped through diffusers placed on the lake or pond bottom. As bubbles rise, they circulate the water and bring bottom water with low oxygen levels to the surface where oxygen can be absorbed. This circulation pattern mixes the water and provides oxygen at lower depths.
3. Floating fountains spray water with pleasing patterns into the air. As the water falls across the surface, it creates turbulence that facilitates the transmission of oxygen into the water column while allowing submersed gasses to escape. Fountains provide multi-faceted benefits and can even be adorned with lighting for added beauty. When it comes to oxygenation, fountains are most beneficial in shallower waterbodies.
4. Nanobubble Technology systems pump water out of the lake or pond, inject it with nanobubbles and then release the water into the waterbody. Nanobubbles are microscopic—so small that they do not rise to the surface; instead, they drift and eventually dissolve, releasing oxygen after several days or weeks. Nanobubble treatments are best-suited for smaller, shallow waterbodies (approximately 3 acres or less).


Floating Fountain


Submersed Aeration

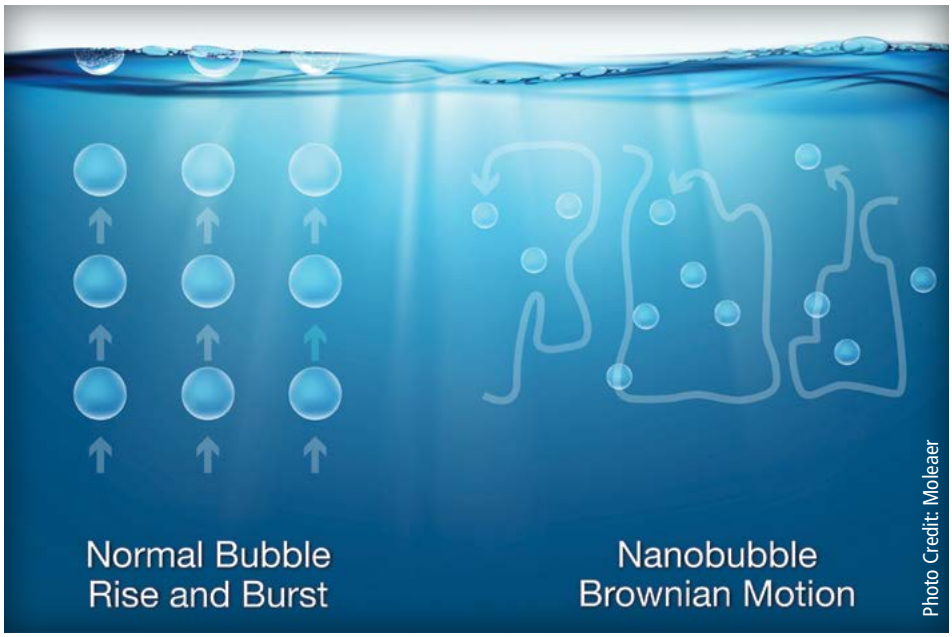


Photo Credit: Moleaer

Each of these tools functions in different ways, but they are all designed to cultivate a well-balanced waterbody. So, what does an oxygen-rich waterbody look like? Oxygen creates water quality conditions that help neutralize phosphorus and nitrogen—common nutrients that, in excess, can pollute our valuable water resources.

Lakes and ponds with more balanced water quality conditions are less hospitable to algae and nuisance weed growth. In turn, this prevents the release of potential algal toxins, limits the development of bottom muck and bad odors, and supports the proliferation of beneficial microbes, zooplankton, native fish, and other healthy aquatic life.

Aeration is a crucial tool in our toolbox of sustainable solutions — which also includes scientific laboratories, drone technology, highly-targeted herbicides, and more — but it alone cannot keep your waterbody balanced. Every aquatic ecosystem is different and requires a unique combination of strategies to achieve the trifecta of health, beauty, and functionality.

The most efficient and budget-friendly way to achieve your goals is through an annual management program, which leans on an entire toolbox of solutions so that your waterbody receives the most effective and customized care all year round. ■



Stay Ahead of Water Quality Issues with Annual Management

By **John Phelps, Environmental Scientist, Senior Business Development Consultant**

We have all heard the adages about being proactive: "The early bird gets the worm" and "Never do tomorrow what you can do today." These principles apply to nearly every facet of life, including lake and pond management. Much like the human body, when a lake or pond is 'young,' it typically requires less effort and funds to keep it healthy and functional. But a lifetime of neglect can lead to premature aging and serious imbalances.

Without ongoing management, waterbodies become inundated with organic matter, sediment, debris, and other pollutants that cause aesthetic, ecological, and functional problems. These can arise in a multitude of ways, including recurring water quality issues, nuisance weeds and algae, and foul odors—and even scarier issues may lurk unnoticed beneath the water for many years before they manifest. When they do finally appear, it is generally a sign that the waterbody requires significant intervention.

The number of tools necessary to restore an imbalanced lake or pond depends on many factors, and the benefits can be fleeting if not done consistently. That's why year-round maintenance is key. To begin developing a SOL Pro Annual Management Plan, aquatic specialists conduct preliminary assessments that examine the biological, physical, and chemical properties of the water. Detailed visual inspections and baseline water quality tests provide valuable insights into the overall health of the waterbody and establish an important foundation of data to inform future management decisions.

Once preliminary assessments are completed, a customized management program can be designed. The most effective programs lean on cutting-edge technologies, comprehensive data collection, routine laboratory analysis, and premium services like nutrient remediation, algae ID, biological augmentation, oxygenation, and erosion control solutions that help stakeholders achieve health, functionality, and beauty in their waterbody. And these solutions are underscored by the guidance and expertise of scientists who specialize in freshwater management.

Lakes and ponds exhibiting more mild issues or those with budgetary limitations can still be supported by the basics like periodic visual monitoring, nuisance vegetation control, buffer management, and decorative pond dye. These ongoing efforts help lay the groundwork until more advanced solutions come into the picture. Consulting with your lake and pond management professional can help you make the most appropriate decision for your property and your wallet.

Lakes and ponds are an investment, but the upfront costs to kickstart your management program will help to reduce expenses that are often much larger and more concerning down the road. While every aquatic ecosystem has different needs, they all benefit most from comprehensive maintenance strategies supported by the most effective and sustainable technologies available to us. Like most other facets of life, when it comes to lake and pond management "an ounce of prevention is worth a pound of cure." ■

SOL PRO ANNUAL MANAGEMENT PLAN PERKS	PREMIUM	PLUS	ESSENTIAL
Visual Inspections	**As Needed**	**2/Month**	**1/Month**
Algae & Aquatic Weed Treatments	●	●	●
Shoreline Weed Control	●	●	●
Buffer Management	●	●	●
Eco-friendly Pond Dye Treatments	●	●	●
Water Quality Testing	*Premium Assessment*	*Enhanced Assessment*	*Water Wellness Check*
Annual Algae Testing and ID	●	●	
Nutrient Remediation	●	●	
Permitting Assistance	●	●	
Monthly Fountain/Aeration Maintenance	●		
Dedicated Customer Support Line	●		
Annual In-person Meeting with Client/Board	●		
5% Discount on Products or One-time Services for Life of Contract	●		

Identifying and Managing Nuisance and Invasive Wildlife

By **Christina Kennedy, Aquatic Biologist**

Nuisance and invasive species are not inherently bad, but they can negatively impact our waterways. Let's take a look at some common invaders that may be lurking in your backyard:

Island Apple Snails (*Pomacea maculata*) — Native to South America

Apple snails can be hard to identify as they closely resemble their native counterparts. However, their vastly different eating habits can take a toll on the environment. Unlike native species that feed on mostly algae and detritus, this invader voraciously feasts on the rooted aquatic plants that serve as beneficial littoral buffers around our watersheds.

Containment screens near water inflows and outflows can help prevent further spread. Containment screens should be installed carefully to ensure the structure is functioning properly and not at risk for flooding. Physical removal may also be conducted by hand or with specialized mechanical equipment. In extreme cases, a molluscicide may be applied by a licensed professional.

Armored Catfish (*Pterygoplichthys sp.*) — Native to Central and South America

Armored catfish, also known as suckermouth catfish, are popular aquarium animals. They can be distinguished from

native catfish species by their bony plating and the location of their mouth. In the wild, however, they are known for burrowing into the sides of ponds and canals to mate and lay eggs. This causes erosion, muck development, and dangerous shoreline destabilization over time.

Management of armored catfish can be difficult. Strategic electrofishing, trapping, and physical removal are effective, but may require consistent and sometimes multi-year efforts.

Zebra Mussels (*Dreissena polymorpha*) and Quagga Mussels (*Dreissena rostriformis bugensis*) — Native to Eastern Europe

Zebra and Quagga mussel populations, first discovered around 1990, are now found in at least 28 states. These tiny invaders adversely affect phytoplankton and zooplankton populations, interrupt fish spawning, clog water supply pipes, and kill native mussels. They spread to other waterbodies by attaching themselves to boat motors and trailers.

Be sure to inspect all water equipment before leaving a site to ensure these species are not hitching a ride. In severely threatened waters, licensed professionals may need to apply an EPA-registered molluscicide to establish full control.

Mosquitoes (Culicidae family) and Midge Flies (Chironomidae family) — Native Nuisances

Mosquitoes and midges both reproduce in standing water, but differ in many ways. Mosquitoes bite, causing itchy bumps and the transmission of deadly diseases. Midges of the family Chironomidae do not bite but are known to roam in large swarms that coat cars, pools, and outdoor lights, trigger allergies, and emanate the smell of rotting fish when they die off.

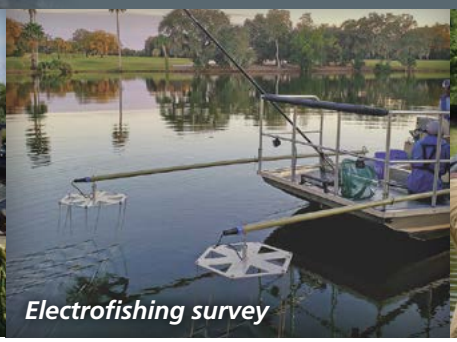
Plant native buffers to attract predator dragonflies, stock fish to feast on eggs and larvae, and introduce aeration systems to circulate stagnant waterbodies. When needed, EPA-registered larvicides and adulticides can be applied by ground crews, drones, and even aerial fleets to target the nuisances at all stages of their lifecycle.

When exotic species are identified early on, it's much easier to intervene. For help determining if one of these invaders has taken up residence on your property, contact your lake management professional who can help you design a customized management plan that protects your aquatic ecosystem. ■

12 Ways to Create a Thriving, Balanced Fishery

By **Aaron Cushing, Fisheries and Wildlife Biologist, Environmental Scientist**

Fish Feeder



Electrofishing survey

Stocking forage fish

Establishing a successful fishery doesn't happen overnight. Consider these twelve strategies when developing a healthy, productive fishery:

1. Determine Your Goals

Goals will directly influence the management methods chosen to enhance a fishery. Are you striving to grow trophy Largemouth Bass or establish a fun fishing spot for the kids? Answer these questions before implementing a Fisheries Management Plan.

2. Develop a Fisheries Management Plan

A professional Fisheries Management Plan (FMP) serves as the foundation for any fisheries program and should be designed based on a waterbody's current status, the goals, and the budget of the stakeholder.

3. Conduct an Electrofishing Survey

Electrofishing is a sampling tool used to gather fish population data. Lake and pond owners who desire to know more about the species in their waterbody and implement professional management strategies should ensure an electrofishing study is conducted to inform initial decision making.

4. Test Water Quality

Poor water quality significantly stresses fish. Even with plenty of available food, fish will not grow or develop properly in imbalanced water conditions. To support fish habitat productivity, water quality tests should be conducted on a regular basis.

5. Introduce Aeration

Lake and pond aeration improves circulation of the water column and increases dissolved oxygen levels, therefore preventing stratification. As a result, aerated waterbodies support higher levels of fish productivity and reduce the risk of fish kills.

6. Manage Plankton Levels

Maintaining desirable plankton species is a great way to increase the amount of fish that a pond can support. Waterbodies with properly maintained plankton blooms, which serve as the foundation of the food chain, can sustain three to four times the typical biomass of fish.

7. Implement a Feeding Program

Automatic fish feeders are an ideal method to feed many species of fish, including both forage fish and predator fish. The additional food source supports a greater biomass of fish while also creating an active fishing spot for kids.

8. Plant Beneficial Emergent Vegetation

Installation of non-invasive beneficial emergent plant species around the perimeter of a lake or pond provides food and habitat for a wide variety of fish and organisms.

9. Add Fish Cover

Natural and artificial fish cover provide needed refuge to small fish and create more dynamic hunting habitats for predator fish. One of the biggest benefits is increased angler catch rates.

10. Stock Supplemental Forage Fish

Stocking supplemental forage fish keeps a fisheries forage base strong and abundant. The species and quantity of fish is dependent on the goals and current needs of the fishery, as well as local stocking regulations.

11. Stock Rainbow Trout

Stocking Rainbow Trout is an easy way to create diversity for anglers and add excitement to winter fishing. Rainbow Trout can be stocked in regions where water temperature drops into the 60s or lower for a couple of months per year.

12. Perform Liming

Liming increases the water's alkalinity levels, directly affecting the availability of nutrients to aquatic organisms, therefore, improving productivity. Low alkalinity levels reduce productivity and cause broad swings in pH levels, which is stressful to fish.

It's important to note that time of year, geographic location, and the current state of a fishery will determine when or whether these strategies should be implemented. Speak with a Fisheries Biologist to start developing your Fisheries Management Plan. ■

Colleagues Volunteer 480 Hours on Company-Wide Volunteering Day

The SOLution, our corporate volunteering and community outreach program, was established in 2012. Since then, several community outreach programs have been introduced. In April, our colleagues, family, and friends joined together for our third Annual Heart & SOL Day where team members were encouraged to take time off during regular business hours to support a cause or organization they are passionate about.

Across SOLitude's 35+ nationwide offices, participants volunteered 480 total hours through trash pick-ups at nature preserves, parks, beaches, etc., visiting food pantries and animal sanctuaries, restoring shorelines, writing cards and making bracelets for cancer patients, donating blood, assisting with virtual elementary science fairs, planting wildflower plugs, and more.

Our team was thrilled to get back out into their communities and make a positive impact! To learn more about The SOLution, visit www.solitudelakemanagement.com/the-solution ■

Celebrating The SOLution's Volunteers of Quarter 1 and 2

We are pleased to spotlight our volunteers of the first and second quarters! The company has named Customer Service Representative Raquel Mason of Pompano, FL, the Volunteer of the Quarter for Q1. Raquel and her mother collectively dedicated 114 hours to write over 250 handmade greeting cards for Cardz For Kidz, an organization that delivers cards to children, seniors, and families in hospitals to help uplift their spirits. Raquel's efforts helped those card recipients feel special and valued!

The Volunteer of the Quarter for Q2 is District Manager Patrick Mefferd of Tyler, TX. Patrick dedicated his time to serve as a volunteer firefighter at the Bullard Volunteer Fire Department in Texas. From January to June, Patrick has dedicated 292 hours of volunteer time responding to service calls, participating in training sessions, and improving certifications for the volunteer role. His efforts truly make a difference in his community! ■

Volunteer of the Quarter Q1, Raquel Mason (Pompano, FL)

Volunteer of the Quarter Q2, Patrick Mefferd (Tyler, TX)

Before & After Showcase

Nuisance Aquatic Weed (Water Lettuce) Management

Property type:
Community Pond

Acreage:
1.4 Acres

Chance Williams, Aquatic Specialist, FL

Filamentous Algae Management

Property type:
Country Club

Acreage:
1 Acre

Luke Malanchuk, Aquatic Specialist, VA

SOX Erosion Solution Install

Property type:
Golf Course

Footage:
340 Linear Feet

Josh McGarry, Regional Sales Manager, FL

Filamentous Algae Management

Property type:
Reservoir & Recreational Lake

Acreage: 260 Acres (10 Acres Treated)

Katelyn Behounek, Aquatic Biologist, CO

THANK YOU TO OUR VENDOR PARTNERS

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LAKE MANAGEMENT

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- **Biological Augmentation**
- **Mechanical Harvesting & Hydro-Raking**
- **Erosion Control & Bioengineered Shorelines**

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BBB RATING: A+

Download our educational drone one-sheet: solitudelakemanagement.com/one-sheets

The Sky's the Limit: Introducing Drone Technology

By **Sam Sardes, Weed Science and Laboratory Director**

SOLitude's mission is to effectively and safely manage lakes and ponds with long-lasting management approaches. In recent years, our toolbox of solutions has expanded, setting new precedents across the industry and elevating the expectations of our clients. Now, we are excited to introduce one of our latest advancements, drone technology.

Our unmanned aerial systems (UAS) are custom-built by leading manufacturers for professional applications. Each drone exhibits a 6ft wingspan and is equipped with GPS navigation features that allow our licensed pilots to pre-program flight routes with precise maneuverability to target nuisance and invasive aquatic plants such as Phragmites, Cattails, Water Hyacinth, and Giant Salvinia.

Getting a bird's-eye view of an aquatic ecosystem helps our team of scientists with surveillance, data collection, and improves the mapping capabilities in areas that are normally inaccessible to ATVs and ground specialists. In addition, this technology eliminates the need to enter unsafe terrain where endangered or dangerous species like snakes and alligators may be present.

With this exciting technology, we can complete herbicide treatments remotely and more efficiently than ever before. Aerial drones can help optimize product use and maximize funds.

Our team of experts are excited to use drones to further support the safety of our teams and enhance results for our clients! ■