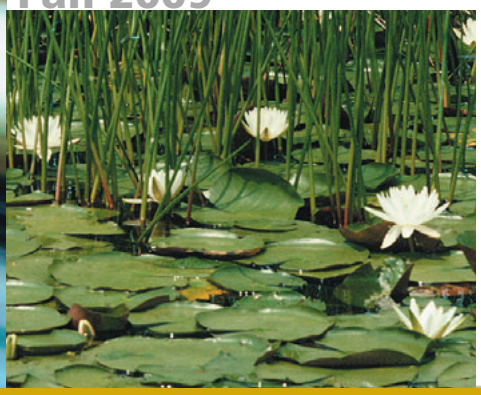
Fall 2009

AquaticsinBrief



Volume 3, Issue 4

Inside:

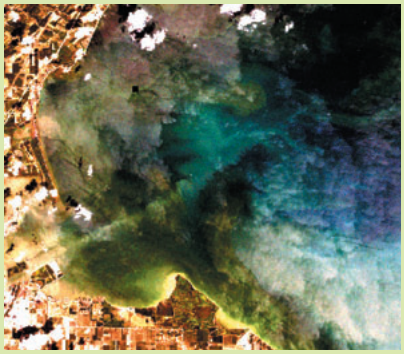
VIRGINIA LAKE MANAGEMENT

A Full Service Lake and Pond Management Company

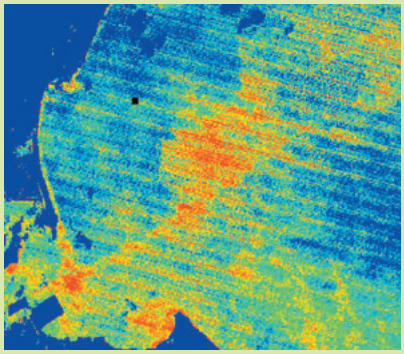
Blue Water Satellite

Virginia Lake Management is excited to announce its partnership with Blue Water Satellite, Inc. This partnership will allow us to revolutionize the way we are able to monitor water quality for our clients.

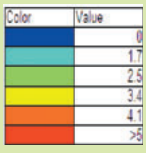
Blue Water Satellite uses the US government's Landsat satellites (Landsat 5 & 7) and a patented algorithm to detect water pollution in drinking and recreational use water bodies world wide. Satellite based remote sensing data is a much more cost effective way to determine levels of water pollution, sometimes at 1/200 the cost of conventional "boat in lake" sampling. Blue Water Satellite has developed a high level of correlation between ground based samples and satellite data from over 2 years of work and over $1 M in funding from the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA).



Landsat Natural Color Image



Landsat Processed Image (ppb) of Cyanobacteria Concentrations



The Landsat Satellites measure the reflected light in seven spectral imaging bands and Blue Water Satellite's patented technology combines this information to detect "the fingerprint" produced by the biological or chemical constituent.

The science behind Blue Water Satellite technology is that various water pollution elements produce a unique "spectral signature" from reflected light. The Landsat Satellites measure the reflected light in seven spectral imaging bands and Blue Water Satellite's patented technology combines this information to detect "the fingerprint" produced by the biological or chemical constituent.

Today, Blue Water satellite is able to detect Cyanobacteria, Phosphorus on land, Phosphorus in the water, total vegetation coverage and E. Coli. The technology is continuing to be advanced to allow for more water quality parameters to be tested and monitored in this way in the future.

Continued on page 2

Phragmites Control During the Fall Months

By **Kyle Finerfrock, Environmental Scientist**

Coastal salt marshes of North America have been invaded by an aggressive non-native wetland plant commonly known as Phragmites. This exotic species of marsh plant is thought to have been brought over by European colonists to thatch roofs in America. The stalks of this plant make for excellent thatching because they are sturdy and decompose slowly. The introduction of a non-native species into a new environment can sometimes cause detrimental effects on the native species already established. In the case of Phragmites, it can alter the delicate balance of the marsh ecosystem. Salt marsh ecosystems provide habitat to a diverse population of many plants and animals. Phragmites grows in dense patches out-competing all other native plants. A recent study indicates that Phragmites even excretes a toxic chemical that actually kills surrounding native plants, making it even easier to invade the wetland ecosystems. Attempting to restore the habitat to healthier conditions requires the removal of these exotic species.

Phragmites grows in dense patches out-competing all other native plants.

There are several different ways to eradicate Phragmites. One of the most effective ways to eliminate this species is to apply herbicides and to burn or cut and remove the dead stalks. This process can take several years to regain control over the plant. Applying a broad spectrum herbicide like glyphosate or imazapyr will systemically kill the plants from tip to roots and to the rhizomes. Applying the herbicide at the right time of year will give you the best results. Treating the plants at the end of the growing season (during September and October) is best. During this time the plant is translocating nutrients down to the roots and rhizomes in preparation for winter. Treating these plants during this time will let the plant do the work of carrying the herbicide down to the roots. This method can be a very effective way to improve control of Phragmites.

Phragmites, the brown reed shown above dispersed through healthy green grasses, and at left, is a destructive plant that can kill surrounding ecosystems.

Regardless of when you treat, persistence in monitoring and follow up treatments each year to handle any re-growth of the plant is key to the long term control and eventual eradication of this problem species. Simply treating it one time and walking away will not achieve the long term control that is so vital to the restoration of our valuable natural wetland habitats. ■

Blue Water Satellite *Continued from cover*

Blue Water Satellite technology is ideal for sampling large water bodies where ground based sampling is impractical and not cost effective. It allows for whole lake monitoring without the limitations of singled out sampling points, giving lake owners a vastly superior option to traditional water quality monitoring techniques. Blue Water Satellite has the capability to detect incipient Cyanobacteria blooms at parts per billion (ppb) levels. Phosphorus and E. Coli are detectable in the low parts per million (ppm) range. Satellite overpasses occur every 8 days and historical data is available to be analyzed up to 27 years in the past. Blue Water Satellite offers a monthly monitoring service in NC, VA, WV, MD, DE, PA, NJ, & NY through Virginia Lake Management Company, and is currently sampling water bodies in AL, AZ, IA, IN, OH, FL, MI, and Canada as well. Water testing data is supplied in GIS compatible files and is available to customers in a secure area on the web. An example of satellite scanning is shown on the newsletter cover (front page).

For more information please contact Virginia Lake Management Company at 866-697-2584, www.virginialakemanagement.com, or go to www.bluewatersatellite.com ■

The Life of a Pond

By **Randy Bolin**

Just what does it mean, when someone asks: *"What is the life of a pond?"* I get this question all the time from customers who are unsure of the purpose and function of their storm water retention ponds. Generally my response is, "the life of a pond is the time between construction and the time when excavation or dredging would be needed to remove the excessive sediment that has been deposited in the pond through run-off." A good rule of thumb for determining when excavation or dredging will be needed is when the pond has filled in half of its original design water storage capacity with sediment.

So, how long will it take to reach a point when excavating or dredging is needed? Ten years, twenty years, thirty years, more?? The answer is different for every pond, so let's discuss what a storm water retention pond is, how it functions, and how, with the proper pond management program, many years can be added to the life of your pond to avoid the enormously high cost of dredging.

Storm water retention ponds are widely used in new development and are among the most effective storm water treatment practices. They remove pollutants by slowing the flow of fast moving storm water and holding it long enough to allow sediment, nutrients and other pollutants to settle out of the water column. Storm water ponds are essential in the filtration of these pollutants that would otherwise flow from our cities into our rivers, streams, bays and oceans. Storm water ponds may also help communities meet the "control measures" required by new federal and state regulations. In addition to removing pollutants, many ponds are designed to create an aesthetic site amenity, wildlife habitat and/or develop a focal point or recreational area. In order for these ponds to work properly, communities must facilitate proper pond management practices.

When ponds absorb the storm water run-off, the sediment left at the bottom, after the pond does its job, is loaded with large amounts of nutrients such as nitrogen and phosphorus from fertilized lawns or from organics such as grass clippings, fallen leaves, animal feces and more. The high nutrient levels created from such pollutants find a home in the sediment at the bottom of the pond, and over time this sediment becomes a thick sludge that produces food and fuel for problematic algae and aquatic weed growth. Once this muck gains a foothold on your pond, controlling algae blooms and aquatic weeds becomes much more difficult.

With proper pond management practices, it is possible to extend your pond's life. Good buffer zones which slow the influx of sediment and nutrients and aid in erosion and sediment control are a must. Beneficial bacteria applications will help metabolize high nutrient levels and digest organic matter and bottom muck. Dye applications will help to lessen the ability of photosynthesis to occur which will help to slow the growth of algae and other aquatic weeds. Aeration, perhaps the most important, will help break down the bottom muck, push poisons out and replenish your pond with oxygen. All of these practices, along with monthly monitoring and treatment of algae blooms and aquatic weeds will extend *the life of your pond*.

Storm water retention ponds are widely used in new development and are among the most effective storm water treatment practices.

So, what will be *the life of your pond*? No one can say for sure, as every pond is different. However, those who implement and maintain good cultural practices combined with proper pond management programs will have a much longer, functional pond life than those who do not. ■

Check Us Out…

In each issue of our newsletter, we dedicate one section for the purpose of keeping you informed of events that may be beneficial or enjoyable for you as well as letting you know where we will be and what we are "up to". Virginia Lake Management is proud of our participation in many organizations including six chapters of Community Associations Institute. Every month our highly qualified team of Environmental Scientists, Aquatic Biologists, and Fisheries Biologists are always on hand to share their knowledge and provide tips on how to improve the aquatic features that make our world not only a more beautiful place in which to live, but a more functional one too.

Kevin Tucker, President, Virginia Lake Management speaks at a recent CVC-CAI Luncheon in Williamsburg, Virginia.

If you have a question about your lake, pond, dry pond, bmp or whatever term you use to describe the stormwater vessel that resides in your neighborhood, please do not hesitate to contact us. You can always visit our website www.virginialakemanagement.com for a wealth of general information. From there, you can click on the "contact us" page or just send an email to info@vlmc.net. Also, be sure to take part in one of the many educational sessions that we hold in conjunction with the CAI (Community Associations Institute) Chapters. Each Chapter has a website with an event calendar and can let you know if we have a session pending. If you would like to hold an educational session in your office or Board meeting place, simply contact our office and we will arrange for one of our professionals to come to your location.

Everyday we have the privilege of helping to improve upon and restore the glorious beauty that Mother Nature and Man have provided. We, as a group and a staff, are passionate about the environment and we are reminded each day how fortunate we are to be able to be a partner with nature. It is our passion that drives us to educate others and to share our mission. We hope to see you at an event soon! Please call our office at 866-697-2584 if you have questions or requests. ■

Differences Between Aerating Fountains and Bottom Diffused Air Systems

By **Rudi Huber, Northeast Regional Sales Manager, AquaMaster Fountains and Aerators**

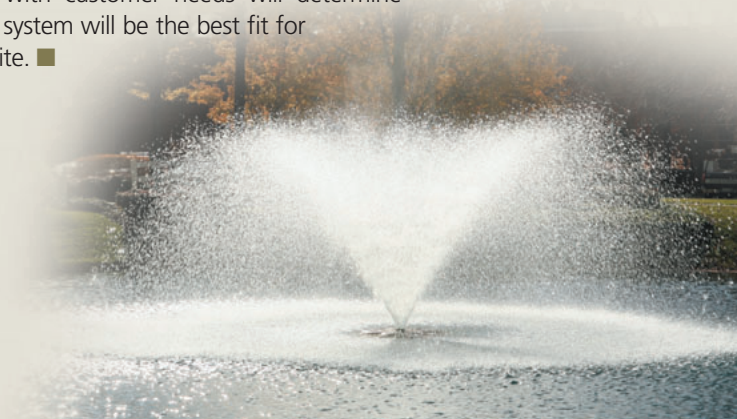
Aeration is an effective, natural, environmentally safe solution to the problems of algae build up, aquatic weeds, bottom sludge, and aquatic odors in lakes and ponds. Aeration is the preferred method of water quality control because it effectively attacks the causes while other methods simply treat the symptoms. Two methods of aeration are Aerating Fountains and Bottom Diffused Air System.

Aerating Fountains, also known as surface spray aerators, create a vertical circulation under the water to depths of 6 to 8 feet. This circulation helps mix the thermal layers of the water. This is important since cooler water can absorb more oxygen than warmer water. Also the oxygen entering the water at the surface needs to reach the bottom where the beneficial aerobic bacteria utilize it to consume excess nutrients.

Aerating Fountains offer a secondary effect, an aesthetically pleasing spray pattern which also provides a benefit. As the water droplets hit the air they absorb oxygen which is then transferred to the body of water when they hit the surface. This creates wave action which helps with additional oxygen absorption by increasing the surface area of the body of water. This also aids in deterring insect infestations by minimizing stagnant areas of water.

Bottom Diffused Air Systems provide a similar vertical circulation under the water; however, they are effective in depths up to 35 feet. Compressed air from a shore mounted compressor is carried through weighted tubing to membrane diffusers at the bottom of the body of water. These membrane diffusers use micro-bubble technology to synergistically lift cooler bottom water to the surface where oxygen is absorbed and then transferred throughout the water column. A water boil at the surface is the only visual effect that will be noticed when using Bottom Diffused Air Systems.

In conclusion, both Aerating Fountains and Bottom Diffused Air Systems are effective aeration tools. Pond size and depth along with customer needs will determine which system will be the best fit for each site. ■



DO Feed the Fish: The Benefits of Supplemental Feeding

By **David Beasley, Fisheries Biologist**

A common vision for many pond owners is to have a healthy population of fish in their pond. Fish need the proper food sources to maintain a healthy successful population. Often times in ponds, the base of the food chain is lacking, limiting the available food for the ponds smaller fish. This has a negative impact on the larger fish that are relying on smaller fish to grow and prosper. When the pond's fish population is balanced, the overall ecosystem will benefit from the productivity.

Supplemental feeding is a great way to provide the needed food source to establish and maintain a healthy fish community. Supplement feeding can be done by stocking bait fish or by providing artificial feed. Feeding artificial feed using automatic feeders is often the most cost effective option.

Having the ability to observe your fish up close can be both fun and productive as well, allowing you to observe fish health and growth.

Incorporating automatic feeders into a pond management strategy is beneficial for many reasons and should be highly considered when a healthy fishery is desired. Bait productivity will improve with the added artificial food source, reducing the need to stock bait fish. Improved growth rates, survival rates, and reproduction rates are all great benefits to feeding.

Having the ability to observe your fish up close can be both fun and productive as well, allowing you to observe fish health and growth. Kids especially love this feature as it gives them an up close view of different fish. When it comes to fishing, the feeders provide great fishing holes. Fish will usually stay in relatively close proximity of the feeder which makes fishing near feeders very successful.

Pellet feed is five times less expensive than stocking forage fish, which reduces costs associated with creating and maintaining a healthy fish community. In times of reduced budgets, feeding rates can be cut back, but a reasonable amount of pellet fish food can still be affordable, allowing you to keep feeding and maintain a healthy fish community.

Ponds naturally go through cycles where predator fish over populate and forage fish become overwhelmed and nearly eliminated through predation. Providing an additional food source will not prevent predator fish from over populating, so it is good to remove some of the intermediate size predator fish such as bass from the pond when fishing. Keeping predator numbers under control will reduce some of the predation pressure on the bait fish, allowing the bait fish needed relief to maintain a healthy prosperous population. Teaming a bass harvest program with supplemental feeding will greatly improve the health and balance of a fish community.

Fish feeders are an investment, allowing the ability to feed fish for a very reasonable price year after year. Two pounds of fish food will convert into approximately one pound of fish growth. This 2:1 growth rate conversion makes feeding very cost effective. To provide the best supplemental feeding program, a long lasting reliable feeder is the best cost effective approach. Having a feeder that will feed every time on time is important. Having a feeder that is in need of constant attention to ensure the feed is dispensing properly, or one with parts that are continually not functioning properly is a hassle and can negatively impact the fish.

Virginia Lake Management has experience with many brands of fish feeders, and has found through our experience that the Sweeney fish feeders are a very high quality and reliable feeder that should be considered when implementing feeders into a management plan. The quality and longevity of their feeding systems will pay for themselves time and time again. If you are looking to improve the health of your fish community, supplemental feeding should be highly considered. Please contact our office if you have any questions about the fish population in your pond or if you have would like to know if supplemental feeding is right for your pond. We have experts on our staff who will be happy to visit your pond and determine the best plan for you. ■

Preparing Your Investment for Winter

By **Lee Abernathy, Environmental Scientist**

During the summer months your fountain helps to maintain your pond with constant aeration while providing a pleasing view. As winter approaches, it is time for your fountain to receive some maintenance coupled with some well-deserved "TLC." Virginia Lake Management offers ways to help your fountain run at peak performance during the cold winter months and all year round.

The first thing that should be considered for every fountain is an oil and seals change. This important task ensures that the fountain is running with clean oil and that your seals are working as designed, preventing any water from leaking into the unit. Changing the oil in your fountain works much like changing the oil in your vehicle: the cleaner the oil, the smoother it runs. Virginia Lake Management can provide this service on any brand of fountain that utilizes oil cooled submersible motors. Most manufacturers recommend these oil and seals change maintenance services be performed every three years. Our highly trained and professional staff can remove your fountain's power unit, perform the oil and seals maintenance service, and have it back in the water quickly with little downtime. Everyone who owns a fountain should consider this service.

Adding submersed aeration to your pond will improve the overall health of the pond and placing diffusers under the fountains will help keep the ice open in the area of the fountain, which will also allow for year round fountain operation.

For our customers located in areas that are more prone to consistent hard freezing, we offer a program for removal and storage of your fountain for the winter months. We can prevent the risk of damage from severe cold and ice by removing the fountain motor and float from the lake, sealing the underwater power cable disconnect, performing a detailed inspection and cleaning of the unit. At this time we'll make any necessary repairs, and store the unit for the winter in our warehouse or any other location designated by the client.

The benefits of aeration are equally important in the winter, so for those clients who live in the colder climates who are willing to leave their fountains in the water during the winter, we have strategies that will allow you to do so safely and effectively. If the fountain runs 24 hours a day, there is typically no risk of hard freeze or damage to the fountain. Adding submersed aeration to your pond will improve the overall health of the pond and placing diffusers under the fountains will help keep the ice open in the area of the fountain, which will also allow for year round fountain operation. The top to bottom aeration and circulation created in this scenario will also help year round with improving water quality and prevention of algae.

Regardless of how you choose to manage your fountain in the winter, remember that your fountains are a valuable asset to the pond, and as such, it is important to keep them running at their best. Please do not hesitate to contact Virginia Lake Management with any questions you may have about preparing your fountain for winter. ■

Know your Green

By **David Ellison, Aquatic Biologist**

Sometimes lake managers are called upon to look at ponds that are completely covered in some form of aquatic vegetation. Usually the whole surface of the lake is completely green and the pond owner assumes that they have an algae problem. While algae is sometimes the cause of the green layer across the pond, there are other types of vegetation that will completely cover the pond surface as well.

Algae blooms will often begin as small areas in the pond, but can grow quickly if untreated to cover the entire body of water. Filamentous and planktonic algae are the two basic types of algae found in lakes and ponds. Filamentous algae is long, stringy and slimy and grows in large mats or patches. Patches of filamentous algae are often bright green with shades of brown mixed in. Planktonic algae is usually light green, but sometimes there are blooms of red planktonic algae. There is no substance to planktonic algae when you try to pick it up as it is made up of individual plankton cells. Blooms of planktonic algae will often blow across the pond with the wind and collect in corners of the pond.

While algae is sometimes the cause of the green layer across the pond, there are other types of vegetation that will completely cover the pond surface as well.

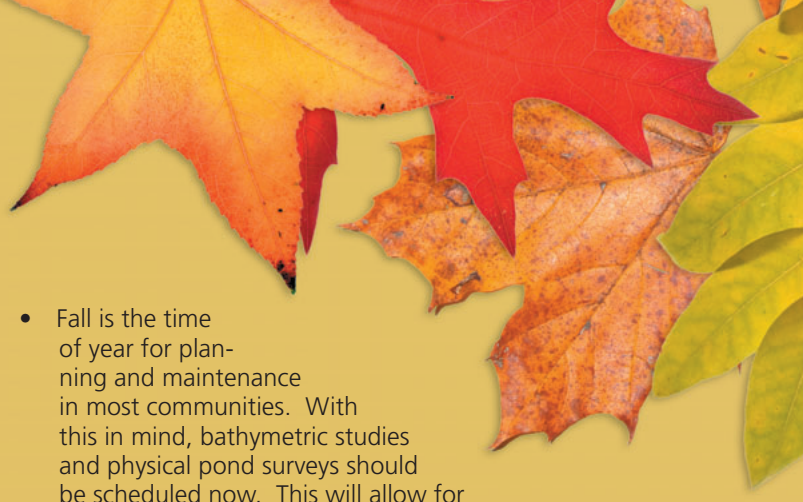
Watermeal (*Wolffia spp.*) is a very small plant that is often confused for algae. It is a light green, floating plant that has no roots and grows very rapidly. The plant can easily be identified by its extremely small seed like shape and gritty texture. Like planktonic algae, watermeal will be blown across a pond and collect in corners of the pond. Watermeal can be easily transported from one body of water to another from ducks, geese and other waterfowl. Quick action is recommended in bodies of water where watermeal is present so the plant can be killed before it overtakes the pond. Ponds with watermeal will often have duckweed as well.

Duckweed (*Lemna minor*), like watermeal, grows aggressively and can quickly overtake a pond, covering it in a layer of green plants. Identification of duckweed can be easily made by the small root extending into the water under a very small floating leaf. Quick action is also recommended for treating a pond with duckweed due to its aggressive growth. Ducks will often transport duckweed from pond to pond as the plants are part of their diet.

Although algae, watermeal, and duckweed all may give the general appearance of the same problem, with some simple identifying markers you will be able to distinguish them from each other. Recognizing specifically what plant or algae you have will allow you to prepare for the proper treatment, as each of these problems actually requires a different treatment protocol. Working in conjunction with your professional lake management provider will help you deal with these issues correctly and keep your pond surface from becoming a green layer of unwanted growth. ■

The pond shown above is covered with duckweed and watermeal.

"Pond"er These Thoughts



Virginia Lake Management wants you to be prepared for Fall and all of the wonderful weather it brings. With this is mind, we recommend you consider the following tips as you enjoy the autumn months on your lake or pond:

- Fall is a good time to think about repairing and maintaining the areas around your lake. Be sure to trim the buffer zone and repair any eroded areas around your lake. Erosion repair can easily be done in the fall months when you can overseed and apply an erosion blanket to allow for soil stabilization until the new seed germinates.
- While sprucing up lawns in the fall, it may be tempting to over-fertilize. However, it is best to limit the amount of fall fertilization in all communities with stormwater ponds
- If you live on a lake, do not blow leaves and other yard debris into the water. Try to keep leaves, clippings and other organic debris out of the water as this adds unwanted nutrients and will likely result in excessive algae growth in the spring.
- Fall is the time of year for planning and maintenance in most communities. With this in mind, bathymetric studies and physical pond surveys should be scheduled now. This will allow for proper budgeting and repair of any physical problems with your pond and its related structures.
- This is the perfect time to schedule the 3-year Oil and Seals Change Service maintenance for your fountain!
- For those of you who live in the colder climates, you may desire removal and winter storage for your fountain. If so, this should be completed by early December.

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