

Aquatics **in** Brief

Volume 5, Issue 1

Inside:

Page 2

Snowmageddon 2011?

Page 3

The Adventure of Ice Fishing.....

Page 4

Snoopy Rod and Reel: How Fishing Can Affect Your Pond

Page 5

Seasonal Turf Practices and Your Pond

Page 6

Getting to Know Your Aquatic Weeds: Curly-Leaf Pondweed

Page 7

Heavy Rains, Floods, and Stormwater Ponds

Year-round Fountains

By **Greg Blackham, Aquatic Specialist**



Your fountain is one of the greatest assets to your pond and community. It provides an attractive display of water and lights year-round while also providing your pond with essential aeration and circulation. As you get further north where temperatures tend to be much lower in the winter season, ponds freeze much faster and the ice gets much thicker. This colder weather can prevent the year-round benefits of running the fountain. Many communities even have to remove their fountains from the water until warmer conditions return.

In theory, if a fountain continues to operate twenty-four hours a day, seven days a week, the water around and under the fountain would never freeze because it would be constantly moving. In practice, this can sometimes be just too risky. If the wind blows one direction for an extended period, ice could start to form. A plastic bag, leaves, or debris, can clog the fountain and impair the output enough to let the encroaching ice solidify and damage the motor seals. These possibilities and other rare events can make running the fountain in the winter a possible liability.

There is one solid and tested solution for keeping a fountain running through the bitter months of winter regardless of how cold it gets. Bottom diffused aeration systems make a perfect companion to a fountain. These aeration systems transport air from a land-based compressor to diffuser disks placed at the bottom of a pond. They then produce a conical stream of bubbles vertically approaching the surface. When placed directly under a fountain, this constant stream of air will prevent the water directly around the fountain from freezing all winter. This coupling of aeration systems will keep your beautiful fountain running all year long, and will also provide a dramatic increase in water quality due to the supplemental benefits of bottom diffused aeration. In a sense, "You can have your cake and eat it too!" ■



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Snowmageddon 2011?

By **Shannon Junior, Aquatic Ecologist**

As record amounts of snow fell throughout the Washington Metropolitan area during the 2009/2010 winter, the extensive impacts of the harsh weather began to accumulate throughout our communities. And while the world was covered in a thick layer of ice and snow, the last thing on our minds was the health of our local lakes and stormwater ponds. But once the last traces



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of winter disappeared, the lingering effects of the heavy snows on the structural, ecological, and aesthetic integrity of our ponds began to surface. With Winter upon us, I can't help wondering if we're in for a repeat performance.

Stormwater ponds are designed to be filters, removing sediment, nutrients and other pollutants from runoff to protect downstream water resources such as our major rivers and the Chesapeake Bay. The huge mountains of snow that were deposited along roadways and in parking lots during snow removal activities were loaded with road salt, car exhaust, and other pollutants, as evidenced by their grey-black coloration. As the mounds melted, the pollutant-laden runoff eventually found its way into nearby water bodies. Although melting snow is a more gradual phenomenon than a major rain event, the snow actually contains more pollutants because it lingers for long periods of time before it becomes stormwater runoff. As these pollutants accumulate in nearby ponds, the organisms that rely on these habitats may begin to suffer.

While fish can actually benefit from small amounts of salt, they cannot survive excessive amounts or very rapid changes in salinity. We have seen fish kills in local ponds during the spring melt where the measured salinity level was 10 times the normal concentration. Since we stock large numbers of fish to ponds each spring to control nuisance vegetation and mosquito populations, we need to ensure that the water quality conditions are adequate for their survival. But even if we do find that certain parameters

are outside of normal limits, in most cases there is nothing we can do to treat the conditions – we just need to wait until “cleaner” runoff enters the ponds to dilute the water.

It's not just the fish that may be susceptible to impaired water quality. Frogs and other amphibians actually breathe through their skin at certain times, so they are extremely sensitive to salt and other pollutants. Macroinvertebrates such as insect larvae, small worms, and arthropods may also suffer when contaminants are present. Since these

organisms are near the base of the food web, the entire pond ecosystem may be compromised by their decline. Plants, too, may have trouble surviving in ponds with elevated salinity levels. We encourage our clients to establish unmowed buffer areas around their ponds, and also to plant beneficial emergent vegetation along the shoreline. These plants help the ponds by filtering incoming runoff and also by taking excess nutrients out of the water to support their growth, which thereby reduces the prevalence of nuisance algae blooms in the ponds. Excessive salt or other pollutants in the water during the active spring growth period may reduce beneficial plant biomass throughout the entire year.

Other than the impacts to the pond ecosystem, the winter weather also caused other difficulties for ponds in the Metro area. In this geographic region, we do not generally remove fountains from ponds during the winter season. Because most surface aerators have oil-cooled motors, they are able to remain in the water and in operation throughout the year. However, the excessive snow and ice conditions this past winter caused many of our fountains to look like frozen waterfall formations. Severe freezing conditions can cause damage to the equipment, such as cracked floats and compressed motor cans.

Perhaps the most devastating long-term impact to ponds and lakes may be budget shortfalls. We heard from a few communities this year that snow removal expenditures caused them to reallocate funds, and that the new fountain or bathymetric study that they had budgeted for in 2010 will need to be put on hold. Still others had to cut out their pond maintenance contracts altogether, which will certainly lead to increased problems with algae and aquatic weeds. I'm sure none of us imagined when the snow was falling on our ponds in January that we might feel the impacts throughout the year. I love the snow, but for the sake of the ponds, I am hoping for a milder winter in 2011! ■

The Adventure of Ice Fishing.....

By **David Beasley, Fisheries Biologist**

When most people think of the sport “Ice Fishing” they often think of crazy people voyaging out onto an unsafe, freezing cold, snowy lake. Although these images may be accurate, there is a side to the sport of which many are unaware. Ice fishing has evolved into a much different activity in the last 10-15 years. Current technology and innovations make ice fishing both more enjoyable and more successful.

Fishing in freezing conditions can be brutal and is not ideal for even the avid ice fisherman. Modern portable ice huts (shanties) and propane heaters allow fishermen to keep air temperatures in the 60's while having the flexibility to easily move to different locations to find active fish. Many ice shanties can be set up within seconds and are capable of comfortably holding 2 or more fishermen. Many shanties have comfortable seats, making the outing much more relaxing; and, with a couple people fishing together, the sport allows for a social atmosphere. Current fish finding technology allows you to locate fish and understand how they are behaving providing you a better understanding of how to catch them. Using ultrasonic sound waves and a colored screen (also known as a flasher) fishermen know exactly how deep the water is, if there are fish nearby, and

where their lure is located. The units are very accurate, letting you understand where the fish are and how they are reacting to your lure and your fishing technique. Sometime fish species such as Walleye are very picky and they will actually put your lure in their mouth to determine the texture of the bait, but never pull on the line to make you aware that your lure is momentarily sitting in their mouth. Unfortunately for the fish, these modern fish finders show that the fish is within inches of your line, allowing avid fishermen to hook into fish that would normally have never been caught.

These fish finders make fishing very exciting, allowing an individual to catch dozens, even hundreds of fish over the course of a day. Staying entertained while also staying warm makes the sport very enjoyable. Other tools like power augers (used to drill holes through the ice), snowmobiles and hand held GPS units allow fishermen to travel to and set up at prime fishing locations quickly, providing more fishing time and far less time exposed in the elements.

For the avid ice fishermen, most days are spent catching far more fish than most would believe while relaxing in a comfortable, warm environment in the middle of a freezing cold lake, often miles from civilization. ■



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Snoopy Rod and Reel: How Fishing Can Affect Your Pond

By **Ethan Chappell, Aquatic Specialist**

I remember getting my first Snoopy fishing pole like it was yesterday. I must have caught hundreds of large mouth bass, crappie, and sunfish with that little rig in the creeks and stock tanks around my boyhood home. I would fish alongside my dad and watch and learn the finer points of the art of fishing. With my trusty three foot rod and cartoon encrusted reel, I was some fisherman. One afternoon I hooked a real monster. I pulled back on the rod and the tip almost touched the handle as the mighty fish thrashed on the line. All at once the cap popped off the reel and the spinner would not turn. The cap slid away to reveal a tangled mess of fishing string. I panicked and looked to my Dad. He grabbed the rod from my stunned hands and began feverishly working to untangle the mess. Normally a calm man, he was immediately overcome by the intense frustration that stems from a knotted fishing reel. Perhaps you have felt it. It is bad enough in the comfort of your workshop when you are stringing a reel, but pitted against a true adversary in the wild- it's life or death! To my astonishment, after a few fumbling moments my father reared back and flung the entire mess into the tank, fish, line, and sinker. He took a deep breath, relaxed, and looking me in the eyes said, " Son, it's time for your first real fishing pole."



are fishing has a fountain in it.

Birds, fish, and turtles can become wrapped up in discarded fishing line and it can be deadly. If fish swallow a bunch of lures or artificial bait they can not process, they become emaciated. They can starve to death with a full stomach. Hooks will breakdown over time, but they can do physical damage that stays with the animal forever. Turtles and birds that become fouled in a rat's nest of discarded line can lose limbs or even be choked to death.

Fountains can suffer a similar fate when faced with the perils of fishing gear. They have a power cable that runs along the bottom of the pond. While this cable is insulated and water proof, it is not hook proof. If a fish hook becomes snagged and the hook sets deep enough it can cause a ground fault or a short to ground. Electricity is allowed out of the cable and water is allowed in. This can be a very expensive problem. Sometimes these

cables are in the range of several thousand dollars to replace. Imagine a \$4000 cable foiled by a \$.04 fish hook. Fortunately, these cables can be spliced. Removing the damaged section can fix it provided the cable has not been flooded for a long time allowing water to creep through the entire length.

The motor on a fountain also has a seal. The seal allows the shaft to spin while keeping water out of the motor itself. Fishing line can become wrapped around the shaft if it is sucked into the unit. On the shaft the line grabs other debris and begins to create drag on the motor that shortens the life of the unit. Not to mention it is very hard to get off! If it goes unchecked, it works its way under the seal. Water can then leak into the motor housing wreaking havoc on the inner working of the fountain eventually causing damage that can be very costly to repair.

Don't get me wrong, I am the last guy that wants to see a no fishing sign when he comes up on a "honey hole". However, it falls to the lovers of the outdoors to make a serious effort to properly dispose of the seemingly insignificant leftovers from a day of fishing. After all, how fun would it be to spend a day fighting through hooks, dead birds, and snagged lines, only to catch an emaciated bass filled with rubber worms? So take care when fishing around fountains and remember the wildlife and the environment are the reason you are there. It is not called catching, it is called fishing for a reason. There is a search inherent in the term that inspires those of us with the "bug", and if you hook an old Snoopy rod and reel some day... let me know. ■

It is fairly common for a line to become stuck in some way and every fisherman has had to cut one from time to time. This is usually done with mild regret and then forgotten as soon as the next jig is tied.

I think about that day when I see a young fisherman cutting his teeth at a pond where I am working. I am also reminded of it when I see line and tackle hung up on trees or snagged just out of reach. It is fairly common for a line to become stuck in some way and every fisherman has had to cut one from time to time. This is usually done with mild regret and then forgotten as soon as the next jig is tied. However, it is important to consider that discarded tackle and line. It can become a problem for wildlife. It can also become a serious problem if the pond you

Seasonal Turf Practices and Your Pond

By **Dave Ellison, Aquatic Biologist**



Landscaping practices often cause significant impacts on the water quality and plant and algae growth within a pond. Buffer management, debris falling into the pond, and poorly managed fertilizer applications are some of the practices that attribute to problems in ponds. Excessive application of fertilizer will allow for more nutrients to enter the pond and creating a source of food for algae to grow.

When applying fertilizer you should make sure it is done responsibly to ensure that the product is utilized by the grass and not washed away. One of the first things that you should do is read the label on the product you are applying. Labels on fertilizer bags show three numbers. The first number lists the amount of nitrogen in the bag, the second is the amount of phosphorous, and the third lists the amount of potassium. A soil test could be performed to determine what fertilizer would work best for your lawn. Phosphorous free fertilizers often work well on most lawns. Phosphorous is often the growth limiting nutrient for algae and when lower amounts of phosphorous are present, algae typically has a difficult time growing.

Application of fertilizer does not have to be done to the edge of the water. Excess fertilizer will likely accumulate at the water's

edge and this can be avoided by using a rotary spreader to spread adequate amounts of fertilizer to the grasses near the edge of the pond. Application can often be done just once a year for many types of grasses with fall being the best time for application. This season is often best because the lawn will frequently need nutrients to recover from the stress of the summer months and the turf will be able to become stronger going in to the winter and the following year.

Many people like to apply fertilizer during the spring growing season, but this is not needed. Spring is often better to concentrate on the prevention of crabgrass and other weeds and your yard will thank you in the coming months. The fertilizer can sometimes get washed away and run off with spring rainfalls before grasses have established themselves for the growing season.

One of the most important things to remember is to prevent spills and spreading the product in to drains or ditches that flow into ponds. Runoff is a major source of nutrient input for ponds and the added input from fertilizer will further degrade the water quality in your pond. Responsible lawn practices are not only beneficial for your lawn, but also will prevent long term pond problems. ■

Getting to Know Your Aquatic Weeds: Curly-Leaf Pondweed

By **Lee Abernathy, Environmental Scientist**

Invasive species reach our waterways in many different ways, but the most common seems to be through human oversight. Such is the case of Curly-Leaf Pondweed. Introduced into the Great Lakes region in the late 1800s, *Potamogeton crispus*, was used by hobbyists in aquariums and was later dumped out into tributaries that fed the Great Lakes or into the lakes themselves. Now this plant is causing problems all over the United States.

Curly-leaf pondweed is an aquatic perennial native to Eurasia, Africa and Australia. The plant is fairly easy to identify. Unlike most aquatic plants that are green, curly-leaf has reddish-green leaves that are oblong and about 3 inches long. The leaves have very distinct wavy edges that are finely toothed. The stem grows from one to three feet long and is reddish brown. This is one of the few plants that lives in cold



water and can be seen in late fall and also in early spring. With its ability to live in cold water, curly-leaf pondweed gets a head start on all other aquatic weeds and takes advantage of the open water areas in which it can live. By early July you should no longer see this plant as it will drop to the bottom of the pond. Like other aquatic weeds, Curly-leaf pondweed produces turions, overwintering buds that can act as storage organs for the parent plant. This is the main method of reproduction.

While it does not play a prominent role during the summer months, it is important to treat curly-leaf pondweed when it emerges in the early spring to prevent it from getting out of control. Contact SÖLitude Lake Management® if you believe that you have a Curly-leaf pondweed or any other aquatic plant problem. ■

Virginia Lake Management. New Name. Same Commitment.

In 1998 Virginia Lake Management Company was born out of our love for water and the outdoors and our desire to preserve our natural resources. Our incredible success and growth has made it necessary to redefine for our customers who we are, what we stand for, and where we are going. We have chosen a new name for our company that better reflects the principles that define us and the markets we serve. SÖLitude Lake Management will continue to be your environmental partner, working with you every day to improve water quality and preserve your natural resources, reducing our environmental footprint, and leaving our world a better place. We very much look forward to the journey ahead.

SÖLitude \söl-i-tüd, söl-i-tüd\ *n* - 1. the harmony found with sun, self, land and water through appreciation and preservation of lake and freshwater ecosystems. 2. the peaceful calm resulting from the reflection on and centering of self through the restoration of ecological balance. — *syn.* see also Virginia Lake Management.



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Heavy Rains, Floods, and Stormwater Ponds

By **Dave Ellison, Aquatic Biologist**

Stormwater ponds in communities are meant to service the influx of rainwater within the surrounding area. Nutrient rich water enters the pond, and, if the stormwater pond is functioning properly, as water exits the outflow, the water should contain fewer nutrients than when it entered. Several factors influence whether the pond keeps this cycle working properly, among these factors are extreme rainfall events.

The National Weather Service and USGS have classifications for extreme rainfall events and list them as 2, 5, 10, 25, 50, and 100 year storms. Each year storm has a separate rainfall rate and flooding potential associated with a specific locale. The chance of the storm occurring is based on the probability of that storm happening in a given year, such that a 100 yr storm has a 1 in 100 chance of occurring in a given year. Six to seven inches of rain in a 24 hour period is an estimate of what may represent a 50 year storm in some locations.

Rainfall rates this high can lead to flash flooding likely clogging many drains as debris flows into ponds. Extremely saturated soils from previous storms or snowmelt will add to the rainfall runoff increasing the chance for flooding. Frozen or excessively dry soil can act in the same manner as saturated soils. No water will enter the soil and the water will runoff the soil like it does on concrete.

Most ponds will experience high turnover rates during these rain events. This brings a lot of anoxic water off the bottom of the pond creating less oxygen throughout the water. This is not as much of a concern during the colder months because the cooler water naturally contains more oxygen than warmer water.

The high rainfall rates can also drastically raise the water level and, if a water feature or fountain is in the pond, it may rise and fall with the quick influx of water. Properly installed and maintained units will likely not experience many problems during this quick influx of water. As the rain decreases so should the water level in the pond over time.

Stormwater ponds are designed to collect rain and funnel it from within the community. Sometimes extreme rain events are too much for the ponds to handle and flooding does occur. Usually this is due to 50 and 100 year-type storms. The best way to prepare for this is to have a pond maintenance program in place and to keep your inflows and outflows clear of debris, so that nothing will clog them in the event of such storms. ■

Check Us Out...

SōLitude Lake Management® will be participating in the following events over the next couple of months. We encourage you to come see us! If you need information on attending any of these events, please call our office.

January 17-20

Virginia Turgrass Conference, Fredericksburg Expo Center, Fredericksburg, VA

January 24-27

Mid-Atlantic Horticulture Short Course, Founders Inn, Virginia Beach, VA

February 5

Southeastern Virginia Chapter of Community Associations Institute's 2011 CA Day Trade Show and Education Expo, Virginia Beach, VA

February 10

Central Virginia Chapter of Community Associations Institute Annual CA Day and Trade Show, Richmond, VA

March 6-8

Virginia Water Conference (Virginia Lakes and Watersheds Association), Richmond, VA

March 12

Washington Metro Chapter of Community Associations Institute's 2011 Conference and Expo, Washington, DC

April 14

Pennsylvania/Delaware Valley Chapter of CAI's Annual Trade Show, Citizens Bank Park, Philadelphia, PA

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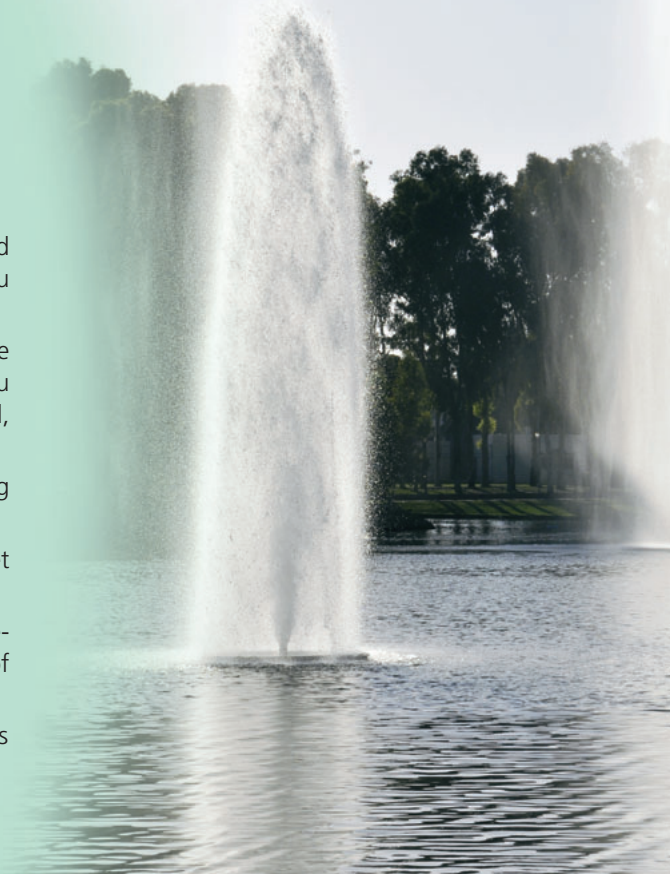
SONIC SOLUTIONS^{LLC}



"Pond"er These Thoughts

Sōlitude Lake Management® wants to be certain that your pond is prepared for 2011. With this in mind, we recommend that you consider the following during the winter months:

- Review your lake/pond budget and replacement reserves to ensure that funds are provided for bathymetry to determine if and when you will have a need for dredging. If bathymetry or dredging is needed, schedule early!
- Consider installing a Sonic Solutions algae control device prior to spring to help prevent the onset of algae blooms as the weather warms.
- Evaluate your pond and determine if you need to add aeration to meet your management goals and objectives.
- If you have not been maintaining the vegetative buffer along the shoreline and the sloped areas adjacent to your pond, schedule thinning of the vegetation in these areas
- Schedule annual maintenance for your fountains and aeration systems
- Implement an annual maintenance program for your lake or pond ■



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