

FEATURE II

Virgil Range, Aurora Country Club



Prolonging the "BIG DIG"

Over the past year, a lot of golf courses have had algae problems in their ponds and lakes. Many of those same ponds and lakes are used for irrigating. Superintendents rely on irrigation systems for their success, so it is vital that those bodies of water be healthy. Some superintendents have had to resort to dredging, but there are several different ways to remove, control, and manage algae in golf course ponds and lakes before it's necessary to dredge. The first step is to better understand the changes that are going on in your lake.

Bathymetry is the science of three-dimensional lake mapping, in which surface area is shown and corresponding subsurface depths are indicated. It shows the underwater mountains and valleys. It shows the very shallow parts of your pond. Bathymetry also gives information on the quantity, location, and types of sediment sitting at the bottom of your pond. When compared to the original plans, it will also allow you to calculate the rate at which your pond is filling in with sediment. This information allows you to tailor your dredging plan and budget. It reduces the unknowns and takes the guess work out of your long-term reserve planning and budgeting.

Dredging

Dredging is the removal of earth or sediments from the bottom of bodies of water. This can be done with a type of scoop or a suction apparatus. This material, often called a "spoil," is deposited along the shore, formed into an island, or can be transported off site. You also have the option of having the material placed in an out-of-play location on your course.

The challenge is to restore your lakes and ponds without destroying your course. Draining ponds and excavating with conventional equipment is subject to the weather. The potential for damage from heavy trucks is great. The cleanup alone may cost more than the dredging.

There are pros and cons. Dredging creates a deeper and a much cleaner pond or lake. It may be beneficial to the

environment if, for example, you are trying to create an island or a contoured shoreline as a nursery habitat for fish, ducks, or other wildlife.

Increasing or enlarging your pond to create a larger water surface allows it to support additional wildlife and biological diversity. This could help you get into the National Audubon Society. With a larger water surface, you can better estimate watering usage on your course.

That can be very helpful if you pay for water to fill your pond or lake. These are potential benefits of the dredging process. Even though it may disturb the normal balance and productivity of an aquatic ecosystem, the long term benefits can outweigh the short term effects.

There are some environmental fallouts from dredging. It can disturb the natural ecological balance of the pond through the direct removal of aquatic life. For example, certain

bottom dwelling organisms or plants that are providing food for your fish. Eliminating them from the food chain could have a dramatic effect on fish reproduction and health.

Sediment released by dredging has the potential to cover and destroy fish feeding and breeding habitats. Dredging may release contaminants that had accumulated and been buried over time, causing them to re-enter your water source. Finally, dredging can release additional amounts of nutrients, which can cause pond eutrophication. This can cause oxygen depletion, which has the potential to kill fish and other aquatic organisms.

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Before you resort to dredging, you should consider installing a pond aeration system. This will provide additional oxygen for your fish and other wildlife. It will also assist in releasing additional nutrients from your pond to avoid stagnation and the replenishment of the sediment that you are dredging to get rid of.

Aeration

Aeration is an important part of any lake management strategy. Specifically, it can help prolong the time before dredging is required. The movement of water generated by aeration keeps sediment in a suspended state, not allowing it to settle out and add to the bottom of your pond. By adding oxygen and movement to the water, you can slow the accumulation of organic sediment and even help to break down the majority of sediments. This is done with microbial processes that are enhanced by the aeration. Minimizing the organic sediment accumulation on the bottom of the pond will greatly extend the life of your pond and push back the timeline for dredging.

No matter what you choose—fountains, vacuums, filters, skimmers, windmill aeration systems, electrical aerators, circulators—they will all help keep your pond water moving and provide essential oxygen. Some methods provide more aeration than others. In any size pond, subsurface or bottom up aeration is more effective than surface aeration.

Pond aeration speeds up the decomposition of decaying matter that lies at the bottom. If you do not aerate the water, then this dead organic matter starts building up and depleting more and more oxygen. As this occurs it opens the door to a host of problems. The most likely is the presence of algae and its widespread growth on the pond's surface.

Fish Stocking (Grass Carp)

Stocking the pond with grass carp is another effective way to control algae and increase the time before dredging is required. Grass carp provide a biological control for nuisance aquatic vegetation and algae. Because they are herbivores, they go after only the vegetation. Removing harmful vegetation not only improves the pond's look, but also removes organic matter that can build up and increase the rate of filling. By consuming these plants, the fish are effectively removing any of the nutrients that might be recycled and used for growth of new plants.

Biological Augmentation

Another way to decrease the nutrient build up in your pond is through biological augmentation, which is the addition of natural bacteria and enzymes ("biologicals") to your pond or lake. Biologicals are naturally occurring bacteria that use excess nutrients in the water for their own growth. This means that they remove the food source that algae and other nuisance vegetation require. These bacteria are also responsible for helping to break down the organic sludge sitting on the

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The spoil from the big dig, dried out makes interesting shapes.

bottom of the pond. Coupled with aeration, biologicals effectively remove nutrients and break down the organic layer. This slows the filling of your pond.

One common short-term practice is to treat with Copper sulfate products. However, this is a weekly or bi-weekly practice depending on the severity of the algae problem. It can result in copper build-up in the sediment that leads to a sterile bottom. A sterile bottom means a lack of beneficial bacteria and can cause, among other things,

high algae blooms, which reduce the chances for aquatic plant growth, because thick algae lead to excess shade at the bottom.

There are several ways to avoid dredging your pond. These are just a few of the more effective strategies to prevent pond filling. With proper management, you can have a pond that looks great and gives you more time to plan for your "big dig."

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- *5 Tips for healthy water: Follow these guidelines to improve the ecological health and aesthetics of ponds of lakes on your golf course*
- *Springing to life in the water garden: Early spring is an ideal time for pond maintenance and cleanup that almost guarantees a low-maintenance summer*
- *Bubble bath: Keeping golf course ponds clean using oxygen circulation and barley straw*