# AUSTIN LAKE GOVERNMENTAL LAKE BOARD NEWSLETTER
# GOVERNMENTAL LAKE BOARD

Spring 2014

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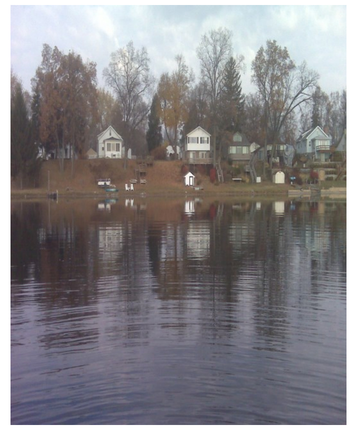
## 2014 Agenda For Austin Lake

The aeration system in the South Basin was thoroughly monitored again in 2013 to determine the results of the second year of operation. The aeration system was implemented with bacteria and enzymes to biodegrade the sludge-like sediments in the basin to allow for more water depth and better recreational benefits, among other valued benefits. To date, the average muck loss in the South Basin has been a measured 5-7 inches in 2012 and 2 inches in 2013. The loss may vary over time.

Additionally, the water quality remains good and the ammonia is being reduced from the sediments. Staff from RLS will be on the lake soon to collect more data and to also look at other areas of the lake for overall lake health determinations.

Be sure to visit the website cited below for all of the updates and links to reports and other important Austin Lake information.



Austin Lake Governmental Lake Board Members:

Brian Johnson, Austin Lake Property Owner

Ed Sackley, Chair

Jim Pearson,
Portage City Council

John Zull, Kalamazoo County Commissioner

Patricia Crowley,
Kalamazoo County Drain Commissioner

## Results From The South Basin Aeration System

The second year results of the efficacy of the laminar flow aeration system look quite promising. In general, most areas exhibited a uniform concentration of dissolved oxygen after activation of the system and even into the upper layers of lake sediment. This finding is encouraging since it means that the aeration system is thoroughly mixing the waters of the South Basin, which we would expect due to the engineering design. The percentage of cover of the invasive aquatic plant, Eurasian Watermilfoil also decreased significantly, without any negative impacts to favorable native aquatic vegetation.

The long-term goal is to have enough reduction in sediment to allow for increased water depths, and a decrease in black silt in the basin, along with a decrease in toxic sediment nutrients like ammonia.

The key to a healthy lake ecosystem is to allow the system to breathe, which means that adequate dissolved oxygen must be present both in the water column and in the lake sediments.

*The Austin Lake Governmental Lake Board has partnered with your local lake Association to allow use of their website as a collection point for relevant information such as meeting minutes, studies, etc.*

*Visit the website at:*

*http://www.austinlakeportage.com*

*Regular updates on lake board meetings, minutes, project findings, and other helpful information may be found on the website.*

# Fish kills and harsh winters

The retreat of lake and stream ice can sometimes leave a grim reminder of winter's effects: dead fish. When snow and ice cover a lake, they limit the sunlight reaching aquatic plants. The plants then cut back on the amount of oxygen they produce. If vegetation dies from lack of sunlight, the plants start to decompose, which uses oxygen dissolved in the water. If oxygen depletion becomes severe enough, fish die. Winterkill potential is worse in winters with abundant or early snowfall. Lower autumn water levels increase the probability and severity of winterkill. **Early ice-on and late ice-out dates also increase the winterkill potential.** Fish kills can be caused by a variety of factors including dissolved oxygen depletion, extreme water temperatures, and fish diseases or introduction of pollutants, but most fish kills are considered natural events (CDEEP 2011).

Wetlands and shallow, soft-bottom lakes are more winterkill-prone than deeper, hard-bottomed lakes (MDNR 2014). Winter kills also more often occur most frequently in very shallow, nutrient rich ponds that are subject to abundant growth of aquatic plants and algae (CDEEP 2011).

Winterkills seldom result in the death of all fish in a lake. Lakes with regular winterkill events are usually dominated by bullhead species. A study with southern Michigan lakes by Cooper and Washburn (1949) showed that heavy winterkills were observed in lakes with very low dissolved oxygen. They also found that while mortality was greatest with bluegill and largemouth bass, pumpkinseeds, pickerel, northern pike, chub suckers, bullheads, and golden shiners had large survival rates even when dissolved oxygen was low.

Winterkill can have some beneficial effects. In lakes with overabundant panfish, winterkill can result in increased growth rates and less competition for survivors. It also can greatly reduce carp abundance, allowing for improved water quality and increased success of subsequent fish stocking efforts.

From the recent harder than normal winter, officials say dead fish and other aquatic creatures may be a common sight in Michigan because of the severely cold winter weather (MDNR 2014). The Michigan Department of Natural Resources says dead fish, turtles, frogs, toads and crayfish may be found after ice and snow melt.

The cold weather has boosted ice cover and has been accompanied by heavy snow, creating conditions that threaten fish. MDNR fish production manager Gary Whelan says in a statement Wednesday that such fish kills are localized and typically do not affect the overall health of the fish populations.

Largemouth bass as a result of winter fish kill.

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# FRESHWATER JELLYFISH IN MICHIGAN?

Freshwater jellyfish (Craspedacusta sowerbyi) can be found in calm, freshwater lakes, reservoirs, man-made impoundments, and water-filled gravel pits or quarries. They can also be found in recreational fishing and boating areas. They have been seen in large river systems such as the Allegheny River, the Ohio River, and the Tennessee River. The jellyfish prefer standing water rather than currents. So, they generally are not seen in fast flowing streams or rivers. These jellyfish eat tiny, microscopic animals called zooplankton that are found throughout the water and are considered an exotic species to Michigan. In the Great Lakes Region, freshwater jellyfish were first discovered in the Huron River near Ann Arbor, MI, in 1933, and in Lake Erie shortly thereafter (Mills et al. 1993). It has since been recorded in Lake Huron and Lake St. Clair, as well as dozens of inland lakes and streams throughout the region, in the states of IL, IN, MI, MN, NY, OH, PA, and WI (McKercher et al. 2013). In Canada, freshwater jellyfish have been known in Quebec since 1955 and in Ontario since 1980 (Peard, 2002).

Freshwater jellyfish were first probably transported with ornamental aquatic plants, especially water hyacinth (Eichhornia crassipes), from its native region in China. In the United States, polyps and resting bodies are probably translocated accidentally with stocked fish and aquatic plants or by waterfowl (McKercher et. al 2013).

A tiny, stalked form of the jellyfish (the polyp) lives as colonies attached to stable underwater surfaces such as rooted plants, rocks, or tree stumps. The microscopic polyp colonies feed and reproduce during the spring and summer months.

Freshwater jellyfish and relative size.

The appearance of the jellyfish is described as sporadic and unpredictable. Often, jellyfish will appear in a body of water in large numbers even though they were never reported there before. The following year they may be absent and may not reappear until several years later. This is also consistent with MDNR (Ameling 2012). It is also possible for the jellyfish to appear once and never appear in that body of water again (Peard 2005). This is consistent with the Michigan Department of Natural Resources in that the MDNR has called the jellyfish occurrences rare. In Michigan, there are records of the jellyfish dating back to the 1800's, according to MDNR Fisheries Division Manager Jay Wesley (Ameling 2012).

Most of the adult freshwater jellyfish are about the size of penny up to the size of a quarter and very sporadic. The impact of this widespread jellyfish on surrounding ecosystems is unclear and is currently being studied. Dodson and Cooper (1983) proposed *C. sowerbyi's* preference for predatory zooplankton, such as the rotifer *Asplanchna*, could influence relative species structure. Spadinger and Maier (1999) agreed with theorized effects on zooplankton communities finding that *C. sowerbyi* hydromedusae prefer larger zooplankton (0.4–1.4 mm) and vigorous prey such as copepods. Under laboratory conditions and in 4 mm of water, C. sowerbyi polyps apparently killed and fed on striped bass larvae (Dendy, 1978).

Spadinger and Maier (1999) noted that freshwater jellyfish are generally not considered an important predator of eggs or small fish. Crayfish are considered the only important predator of the hydromedusa phase (McKercher et. al 2013).

Can these freshwater jellyfish can harm humans? It depends. Like true jellyfish, they do have stinging cells. However, no "hard" evidence that these organisms can penetrate human skin (though some have claimed otherwise).

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# EMERGENT SHORELINE INVASIVES CAN POSE PROBLEMS FOR LAKES

Invasive plants have some characteristics in common that define them as invasive. They all have fast growth, rapid reproduction, high seed dispersal ability, phenotypic plasticity (can alter their own form to adapt to a specific habitat type), high tolerance for a wide range of environmental conditions, can adapt to a wide range of food types and a wide range of nutrients, a connection to human inhabitation, can either be a native species or an exotic, normally brought in to the area by some vector (boat, cultivation, ornamental, bird species, etc.). Invasive species may drive local native species to extinction via competitive exclusion, niche displacement, or hybridization with related native species (Odendaal et al. 2008).

Invasive species can impact outdoor recreation, such as fishing, hunting, hiking, wildlife viewing, and water-based activities. They can damage a wide array of environmental services that are important to recreation, including, but not limited to, water quality and quantity, plant and animal diversity, and species abundance.

Economic losses can also occur through loss of recreational and tourism revenues (Pimental et al. 2005). The following are a few invasive species commonly seen on Michigan lake shorelines.

The most problematic shoreline invasive plants include common reed, reed canary grass, purple loosestrife, moneywort, flowering rush, yellow flag iris, and narrow-leaved cattail. *Phragmites australis var australis*, common reed, commonly forms extensive stands. *Phragmites* are so difficult to control that one of the most effective methods of eradicating the plant is to burn it over 2-3 seasons combined with herbicide treatment.

*Lythrum salicaria*, purple loosestrife, is a flowering plant belonging to the family Lythraceae, native to Europe, Asia, northwest Africa, and southeastern Australia. It is a herbaceous perennial plant, that can grow 1–1.5 m tall, forming clonal colonies 1.5 m or more in width with numerous erect stems growing from a single woody root mass.

Purple loosestrife near an inland lake.

Phragmites colony near an inland lake


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