

Glen Lake Association Alligator & Inspiration

Glen Lake: Yesterday, Today and Tomorrow

A Message from Our President Andy DuPont



It is late January as I write this letter and I realize that I have only had to plow the driveway 4 or 5 times so far. Winter was slow coming this year and I wonder if it will be just as slow leaving. We do look forward to some increased precipitation, as we will ultimately need the water to help restore some of the shortfall we have had in the region.

Your Board of Directors is on a meeting break for a couple of months, but there is still a lot happening. We have just finished looking at the financial results of 2011 and have finalized a budget for 2012. For four consecutive years now, our annual revenues have covered the full cost of our operations while we continue to grow our Endowment and Watershed Protection Funds. You, of course, have made this possible and we share your desire to protect this truly unique area for generations to come. With your support, 2012 will continue our success of running within our means while tackling an ever increasing list of issue that must be managed.

A recent major focus has been the Hatlem Creek settling pond that has historically protected our lakes from sediment and pollutants that flow into the creek. The settling pond is now at capacity for these solids, which are now overflowing into Big Glen Lake, especially during major rain events. While the pond is primarily on one property, the source of the pollutants come from many upstream locations, both private and public. We are currently working with interested parties to facilitate an effective resolution.

Working with governmental agencies to change speed limits is proving to be a slow process, but one that we hope to succeed in ultimately. We are planning conference calls with Representative Ray Franz

this winter to seek some help based on the petition that many County Road 675 residents signed. If successful, we will look at expanding the approach to other roads around the lakes.

For those of you that are interested in keeping property tax valuation caps in place when a close relative inherits property, you should look at House Bill 4753. Glen Arbor Township has already supported this and we will look for other ways for this bill to get appropriate attention and action.

I have only touched on a few of the active issues we are working on this winter. Even though winter does bring a more restful pace to “life up north”, please know that your Association is still actively working to keep our watershed the very special place it is. Remember our new slogan... “It’s All About the Ice”... I mean “Water” ;-). If you get homesick or just want to catch up on the latest news, be sure to visit the website, glenlakeassociation.org. In the meantime, enjoy reading the excellent articles in this newsletter which, along with the website, can keep you up to date on our activities.

Have a great winter,

Andy



The Glen Lake Association, Inc. is a non-profit organization dedicated to the protection, preservation and continued improvement of the beautiful Glen Lake area.

Winter 2012

Karner's Korner	2
Water Quality	3
Water Level	4-5
Finance Report	6
Effects of Sandy Beaches	7



Karner's Korner

From Your Glen Lake Association Biologist
Rob Karner

Effects of Climate Change on Glen Lake

Since we are in the middle of a “warm” fall and winter, it seems fitting that I talk about the effects of our unseasonably warm fall and winter on Glen Lake. So often, the words “climate change” or “global warming” are used but the real effects are often obscured by what seems to be “normal” lake conditions. Experiencing little or no snow and temperatures in the low 50’s in January makes it easier to apply the terms climate change to what we observe.

So what are some of the effects of climate change on Glen Lake? Simply put, the warm temperatures throughout the spring, summer, and fall cause the lake water to be thermally stratified longer. (a bad thing) Under normal conditions, cold water sinks to the bottom and warm water rises to the top (just like cold air sinks and warm air rises). Then when fall arrives with colder air temperatures and lower sun angles, the water at the top cools down. As it cools, the density of water increases causing it to sink. As a result, the sinking water pushes the cold water at the bottom up. (a good thing) This is referred to as fall turnover. In the fall, usually in October, the fall turnover causes the lake to no longer be thermally stratified, the temperature layers disappear, and the lake water is totally mixed from top to bottom. (a good thing) The result is that dissolved oxygen replenishes the oxygen-poor water at the bottom of the lake. (a good thing for Lake Trout since they require oxygen-rich water)

If the cold water at the bottom of the lake is trapped by the warm water above, then there is no mixing top to bottom. So if there is no mixing because our fall was much warmer than normal, then the cold water at the bottom becomes stagnant and “trapped” in the deep basin (a bad thing) and oxygen-poor water remains at the bottom because it is thermally separated from the oxygen-rich water above. (a bad thing)

You might ask, why is the bottom layer of water oxygen-poor or even absent? Two main reasons are that the bottom water does not have any interface with the top layer where wind and wave action cause oxygen to be added to the lake. Secondly, when all life forms in the lake die and sink to the bottom of the lake, both plant and animal, they decompose by the action of decay bacteria. Bacteria use up all the available oxygen as decomposition occurs. And then, to make matter’s worse, all the phosphorous that has been deposited in our lake over time will come out of the sediment and into the lake water. This can trigger algal blooms and excessive aquatic plant growth.

My recent fall hydrolab testing on Big Glen showed an extended oxygen-poor condition at least 60 days beyond what

is typical. In fact, my last 2011 hydrolab showed no signs of fall turnover as a result of our mild temperatures in late October and early November.

So the only way to replenish the oxygen supply at the bottom of Big Glen is to have a fall turnover. If the turnover occurs later and later in the fall – even if it extends into the early winter, then that increases the total amount of time that Big Glen is oxygen-poor at the bottom. The two most negative effects of having the bottom water being oxygen-poor or anoxic (without oxygen) is it places stress on our Lake Trout population and releases phosphorous from the sediment and puts it into solution. With increased levels of phosphorous being released from the bottom sediment and into the lake water will stimulate algal blooms and aquatic plant growth. Obviously, some phosphorous released into the water is good but too much phosphorous released is undesirable. All plants need phosphorous to grow but excess growth increases the deterioration of water quality.

So what can we do? One might feel helpless when we consider the climate change issue. Global warming is the result of the increasing levels of carbon dioxide and one practical way to reduce these levels is to preserve or increase the plant life around your property. Plants are the main way carbon dioxide gas is removed from the atmosphere. In simple terms, one could simply go outside and plant trees.

The other thing you can do is to reduce or eliminate any chance of adding phosphorous into the lake where it ultimately stays – either in the water or bound in the sediments. Remember, every molecule of phosphorous that is bound in the sediment at the bottom of Big Glen is less available to plants and algae than if it is released into the water and becomes a growth stimulant to excessive algal blooms and aquatic weeds, and most importantly, giving an invasive species a better chance to survive in our lake. The action steps needed to reduce or eliminate phosphorous mainly can come from not using phosphorous containing fertilizers, using phosphorous-free detergents, and regular pumping of your septic tank – every three years depending on your use.

I will be anxious to see how our oxygen levels look in April at the bottom of Big Glen. Hopefully when the ice goes and there is mixing of water as it begins a new cycle of temperature stratification, I will see oxygen levels return to a normal level. Until then, let’s all do our part to lessen the harmful effects of climate change on our lake.

Glen Lake Association News

From the Water Quality Committee

Phragmites Control a Top Priority in Leelanau County

The Glen Lake Association at their January 12, 2012 board meeting passed a resolution to support a Phragmites Eradication Protocol for Glen Arbor and Empire Townships. It is hoped that both Glen Arbor and Empire Township Boards will pass this protocol for their townships in their January or February board meetings.

During the past spring and summer the Glen Lake Water Quality Committee has found five stands of the non-native Phragmites australis in the Glen Lake-Crystal River Watershed. Along shorelines 5 stands were found: 2 on Big Glen, 1 on Little Glen, 1 on Brooks and 1 on Fisher Lake. One stand was found in a Big Glen Wetland. Two of these stands have been treated and hopefully in late summer of 2012 the other 3 stands will be treated. It takes several years of treatment to eradicate these stands.

The purpose of the proposed protocol is to provide guidelines so that all properties along shorelines both on Lake Michigan and on inland lakes in the Glen Lake-Crystal River Watershed with non-native Phragmites can be surveyed and receive effective treatment. Treatment consists of the use of a systemic herbicide and/or cutting and burning. It usually takes two successive years of treatment for effective eradication.

A single stand of Phragmites can spread 30 to 60 feet in one season. It grows to a height of 15 feet and can block views and access to the water resulting in a decrease in property values. It drives out native plant species and cannot be used as a habitat for native wildlife. The non-native Phragmites most likely came here from Europe as it was used for packing in containers in ships. It has also spread across the United States via ditches along roadsides. Native Phragmites grows to about 8' tall, is pale to yellow green with a red-purple stem with well defined black spots on the stems. It flowers in July-August and in the winter the leaves fall off and the stems collapse. Non-native Phragmites grows up to 16' tall, has dark blue-green leaves and stems with blurry spots on the stem. It flowers in August-September and in the winter the leaves adhere to the stems and do not collapse.



Phragmites control is currently a Leelanau County and Grand Traverse County priority and a great deal of work has been done to survey and eradicate this very invasive plant throughout these two counties.

Education: As proposed the Township Boards will work with the Glen Lake Association to encourage ongoing education of all lake front/stream/ and wetland property owners about how to identify, treat and eradicate non-native Phragmites within the watershed.

Surveying: The township supervisors will jointly appoint or contract for the services of a Phragmites administrator to annually conduct an inspection of the shoreline property of all lakes with public access within the Township. Before entering onto a shoreline or wetland for surveying and also for treatment, the appointed administrator will obtain written consent from the property owner.

Eradication: The administrator will work with the Leelanau Conservation District to apply for a DEQ permit authorizing Phragmites treatment and engage the services of a professional authorized to undertake Phragmites treatment. The cost of the Phragmites treatment will be the responsibility of the affected property owner, however the administrator will work with the Leelanau Conservation District to solicit grant/ and other funds to offset costs associated with surveying and overseeing eradication and follow-up in subsequent years to validate the effectiveness of the treatment plan.

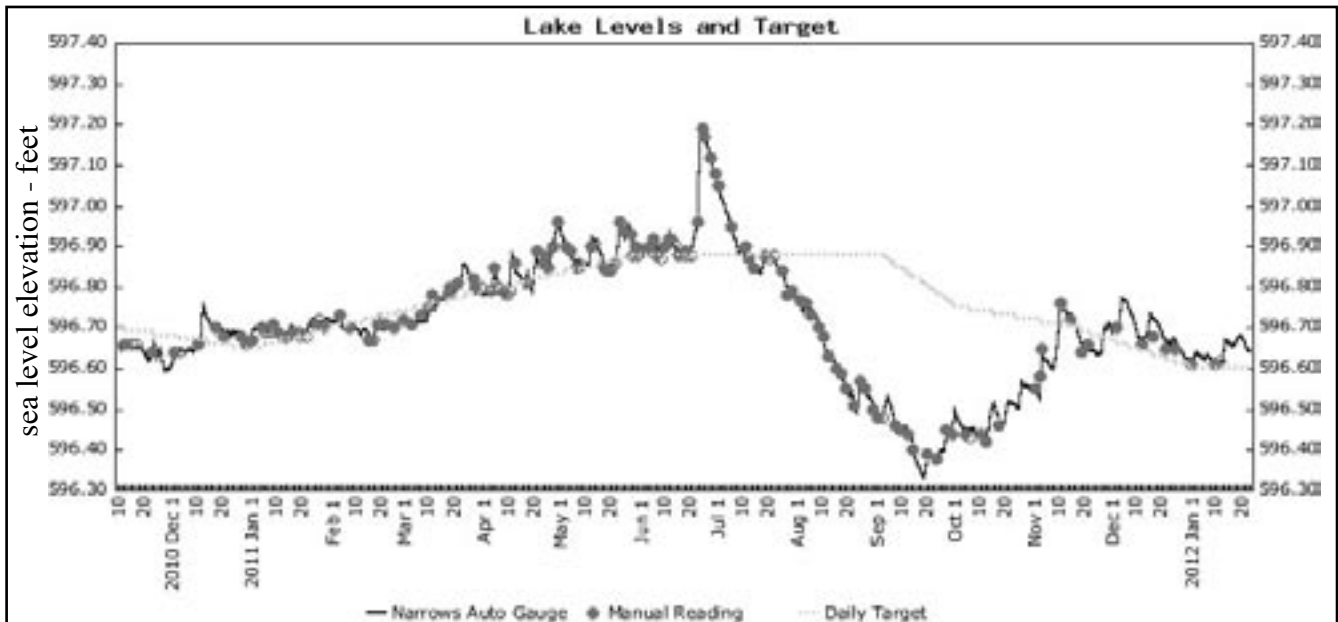
We strongly support the passage of this protocol for our watershed. Early identification and rapid response keeps the cost of this process to a minimum. Let your township supervisor and board know you support this protocol. If you see a plant that you suspect is non-native Phragmites along your shoreline or wetland please contact the Glen Lake Water Quality Committee. 334-3612

Glen Lake Association News, continued

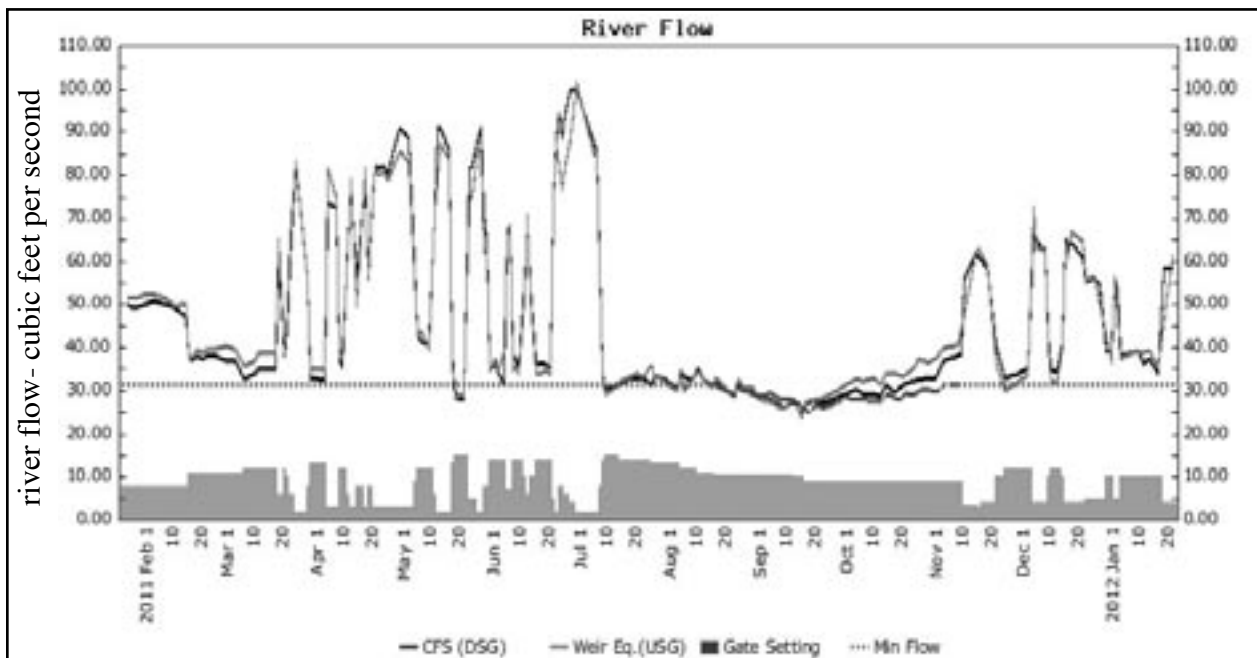
From the Water Level Committee

Glen Lake Level and Crystal River flow Rates

2011 ended smoothly for the WLC activities. The two charts below show how the Glen Lake level and the Crystal River flow tracked since October 1st.



The lake level was restored to the planned targets when the rains resumed in October.



The peak river flows in the final quarter were in response to high lake levels after we caught up to the lake level plan.

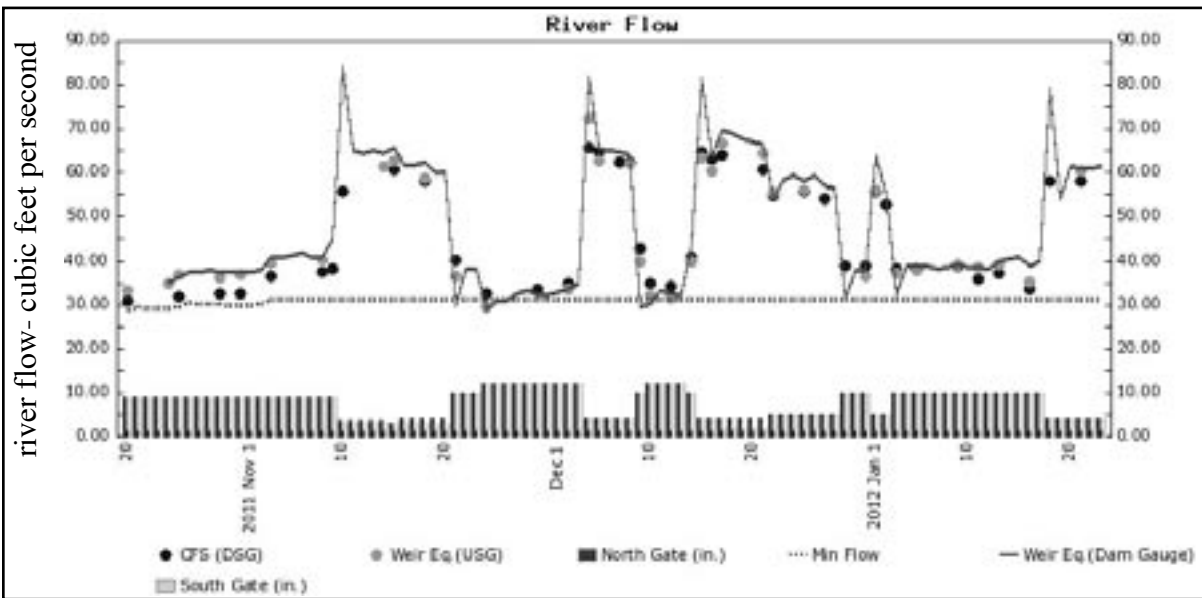
...continued on page 5

Auto-Gauge Instrumentation

We have been monitoring the Glen Lake level at the narrows bridge with a remote sensor (auto-gauge) that is tied into our web site with wireless telemetry for more than a year. This continuous lake level read out (first chart) is more accurate than the manually read gauge, does not expose our volunteers to hazardous conditions during the winter, is available at all times and is the basis for our day to day lake level management decisions. We read and report the manual gauge fixed to the bridge twice a week weather and conditions permitting as this is still the official gauge.

With this success behind us, we installed a second auto-gauge upstream of the Crystal River dam to measure the river flow. The river flow has been estimated with an USGS algorithm that uses the river level downstream of the dam and a flow table provided by the USGS. The flow table is updated about six times a year to account for changes in the river bed. This measurement continues as the “official” river flow measurement.

The new auto-gauge lets us measure the Crystal River flow continuously. No geometric corrections are necessary other than the dam gate positions. The flow measurement uses the water upstream level and the dam gate positions and is based on the classic weir equation. This auto-gauge was activated this past fall.



The auto-gauge is very accurate, and operates continuously. The USGS method flow estimates are limited to a twice a week cycle plus special readings because of practicality considerations. Minor differences between the flow rates are attributed to the data collection process and offsets caused by natural changes in the river bed.

While the USGS flow estimate remains the official flow estimate, the auto-gauge flow rate is accurate, can be viewed on-line and shows changes in the river flow immediately. We are using the auto-gauge river flow measurement as the basis for day to day river management.

The Glen Lake level and the Crystal river flow rate shown on the GLA web site are updated continuously as is the Glen Lake water temperature at the Narrows.

Glen Lake Level Targets

The WLC recently decreased the winter lake level target to 596.60 feet. This level is now targeted from November 1st through March 15th. The summer lake level targets have not been changed.

Crystal River Dam Portage

The WLC and the GLA Recreation Committee are studying needed improvements to the portage around the Crystal River Dam. The increased recreational use of the river has had a toll on the upstream landing and downstream launching areas as well as the short path in between. We are working with the DNR and the National Park Service on this project. Funding will be through the GLA and private donations. We hope to complete this project by June 1st, 2012.

Proposed Expansion on the Narrows Creates Concern



photo courtesy of Leelanau Enterprise

There were over 80 people who showed up on January 26th for a special meeting of the Glen Arbor Township Board to discuss the expansion permit requested by the owners of the On The Narrows Marina. The Marina wishes to increase the number of slips from 7 to 46 and increase the moorings from 12 to 16 buoys.

To see the complete permit application and additional details, go to our web site: glenlakeassociation.org

From the Finance Committee

12 Months Ending December 31, 2011

	2011	2012
Revenues	Actual	Budget
Members	\$87,214	\$82,900
Other	<u>25,482</u>	<u>17,240</u>
Total Revenues	\$112,696	\$100,140
Expenses		
Water Quality	\$42,222	\$31,285
Water level	10,280	11,800
Member communications	15,519	12,250
Invasive species	26,911	28,500
Administrative support	<u>15,838</u>	<u>16,205</u>
Total Expenses	\$110,770	\$100,040
Excess of revenues over expenses	\$1,926	\$100

A Sandy Beach is Great, But...



The creation and maintenance of a sandy beach is often an objective of shorefront residents along the shoreline of their property. Creating a sandy beach, however, can negatively impact water quality.

Physical Impacts

Lakes act as settling basins for surrounding watersheds, collecting and accumulating materials that drain into them. Over long periods of geologic time, as a lake ages it gradually fills in with sediment. Any activity that adds material to a lake, in addition to the natural supply, will increase the rate of lake filling. The regular addition of sand to a lake or shoreline where it can erode into the lake accelerates the filling process. If a shoreline does not have a natural beach, a constructed beach will likely require periodic addition of sand. The dumped sand will drift away with shoreline currents. Although the sand disappears from view, it does not leave the lake. The sand is added to the natural sediment load to the lake and hastens the filling and aging process.

Chemical Impacts

The mineral composition of sand is not consistent. Although clean, washed beach sand is primarily quartz, which is relatively inert, it can contain other materials. Clay, if present in the deposited sand, can cause reduced water clarity. If phosphorus is

contained in the dumped sand, it may contribute to increased plant growth in the lake. Recent studies have also found beach sand to be a breeding ground for bacteria.

Biological Impacts

The physical process of filling in a lake with deposited sand has major biological impacts. Dumping sand along the shore of a lake can smother bottom-dwelling algae and invertebrates, reduces the amount of available habitat, and may cause a disruption in the food chain of higher organisms including fish. Deposited sand may also destroy spawning or nesting sites for fish. Turbidity from the deposited sand may clog gills and interfere with normal fish behavior. A shallower lake has less volume of water to dilute and assimilate incoming contaminants, including phosphorus. With a constant level of phosphorus input, a lake's productivity (algae growth) will increase as the lake's depth decreases. Also, as a lake becomes shallower, more sunlight hits the lake-bottom and thus, there is a greater potential for increased rooted plant growth.

Reprinted with permission from The Michigan Riparian, Fall 2011



P.O. Box 245
Glen Arbor, MI 49636

U.S. Postage
PAID
Glen Arbor, MI
Permit No. 22

**Glen Lake Community
Concerned Over Expansion
Plans on the Narrows
read more on page 7**

General Boxholder
or Rural Route Holder

Winter 2012

GLEN LAKE ASSOCIATION 2011-2012

BOARD OF DIRECTORS

OFFICERS

Andy DuPont	President
Ann Davey	Secretary
Roy Pentilla	Treasurer

DIRECTORS

Peter Anderson	John Kassarian
Dennis Becker	Joan Kramps
Bob Boles	Mike Litch
Cara Cassard	Matt Wiesen
Shirley Hoagland	

Watershed Biologist Rob Karner

COMMITTEE CHAIRS

Auxiliary	Joan Kramps
Communications	Bob Boles
Development	Charles Ofenloch
	John Pepler
Finance & Investment	Roy Pentilla
Historian	Joan Kramps
Invasive Species	Denny Becker
Long Range Planning	Peter Anderson
Membership & Records	Andy DuPont
Newsletter	Sue Meserve
Nominating	James Dutmers
Recreation & Water Safety	Matt Wiesen
Water Level	John Kassarian
Water Quality	Sarah Litch
	Mike Litch
Web Site Webmaster	Shirley Hoagland

GLEN LAKE ASSOCIATION OFFICE

Sallyanne Morris - Office Manager
P.O. Box 245 231-334-7645
Fax 231-334-7470

GLEN LAKE ASSOCIATION WEB SITE

www.glenlakeassociation.org
email: glenlakeassociation@gmail.com