

Geneva Waters

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"Beckoning"

By Fred Noer

Geneva Lake Environmental Agency

Quarterly Publication

Featured in this issue:

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Geneva Lake Environmental Agency

Our Mission:

The Geneva Lake Environmental Agency is determined to maintain Geneva Lake's resources by protecting, preserving and enhancing a desirable lake and watershed quality.

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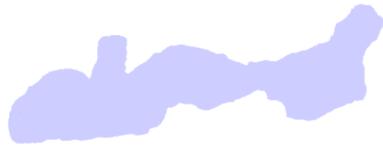
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THIS IS SPRING

Spring can offer us a wonderful rendering of colors just as much as fall does. The flowers of blooming shrubs, trees, and bulbs all add a variety of red, yellows, whites, and blues. The many different shades of green show the beginning of a new season as awaking plants shed their bud sheaths and open the new leaves to accept the sun. Perhaps it is because after months of browns, whites, and grays any difference in the green hue appears to excite the eye.

In the woods, trout lilies' delicate white bell-shaped flowers are just about finished for another season. Trilliums have risen and are opening their deep red and often white flowers. May-apples have also risen above the ground cover, and their inconspicuous white flowers are just opening. Soon the little apples will be forming under their umbrella-like leaves. Was that a wild geranium flower seen in the woods early this morning? Soon the pink flower will be a part of the wood's floor. Let us hope for a good morel season.



As the flora awakes, so does the fauna. Turkeys are strutting their stuff to attract the attention of the hens. Soon the does will be on their beds fawning. A bat was seen search-

ing the skies for insects. There have been several reports of rose-breasted grosbeaks visiting the oranges and grape jelly left out for feeding. Orioles are not far behind if the early scouts aren't already here. A whippoorwill was heard last evening at sunset telling us spring is here. For the last month, the silence of the night has been interrupted by owls hooting for responses. More recently, our amphibian friends have embellished the night sounds with their chorus.

With all the good comes some bad. Flies and mosquitoes have been out for some time. Ticks have been removed from the animals as well as the self. Make sure to wear protective clothing and to do a complete tick check when returning from outside activities. Local ticks have been identified as carrying other infections in addition to Lyme disease.

SPRING WEATHER

It has been said that if you don't like the weather stick around a day, as it will change, since this is Wisconsin. This is probably truer during a Wisconsin spring than any other time of the year.



Spring has been a bit slow in arriving, with many cool and wet days in March and April. The flowers that have bloomed have stayed



around long because of the cooler temperatures. The last recorded below freezing temperature as of the first week of May was recorded April 12, early in the morning, when the average hourly temperature was recorded as 29.4 degrees. March's coldest recorded hourly temperature was 7.5 on March 2. One week later, the warmest recorded temperature for March, 66.7, was recorded on March 9.

April showed signs of warming. Its lowest hourly temperature was 19.8 on April 9. Just nine days later on April 18, April's highest hourly temperature of 81.8 was recorded. The last recorded hourly temperature below freezing was 29.4 on April 12.

The atmospheric monitoring site did not record a hourly average temperature below freezing during May. However, in the early morning of May 15th frost was observed on the deck. Low areas may have had some cool air settle in on the cool, calm nights of May 4-5. May's highest temperature of 84.0 was recorded on May 25. The temperatures will likely get warmer as the summer approaches.

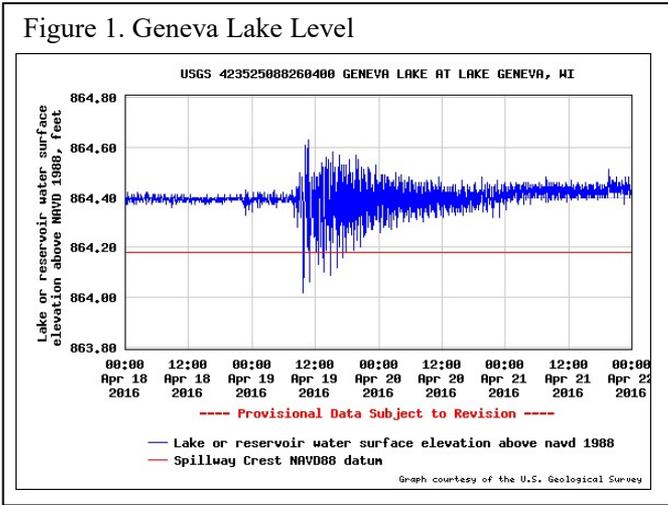
GENEVA LAKE AND THE WHITE RIVER

Geneva Lake's official ice-off date was March 11. Ice-on was January 20, making for a total of 51 days of poor ice cover. Other than 2012 when we did not have official ice-on, fifty-one days is the shortest ice cover in the last 10 years.

Geneva Lake level has been variable during the spring, as might be expected. However, due to the large volume of water in Geneva Lake, actual annual lake level fluctuation is relative small, less than a foot between the annual maximum and annual minimum. During 2015, although managed, lake level peaked during mid-July around 864.81 ft. NAVD88 and was lowest in mid-November at a level around 864.06 NAVD 88. While the lake rocks in its basin, lake level can fluctuate several inches within an hour.

Lake level "rocking" is driven primarily by the wind. On April 19, at 6 a.m. the wind was out of the east at 8-10 mph. By noon the same day the wind had shifted around to the west, and although it didn't increase by more than a few miles per hour, it had a pronounced impact on the lake's "rocking." (Figure 1)

Figure 1. Geneva Lake Level

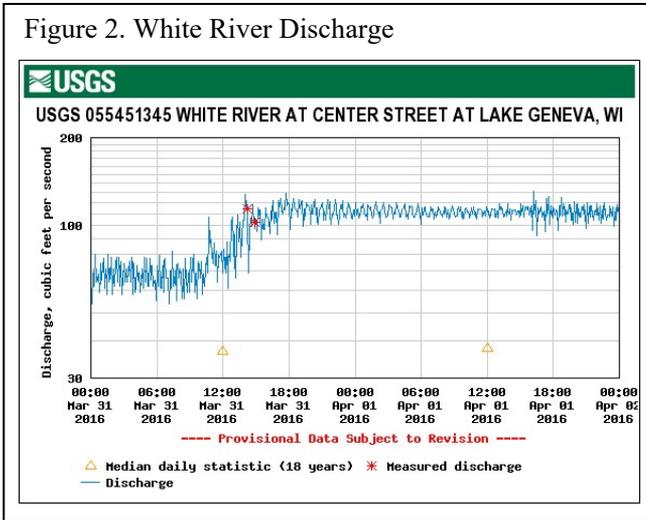


Since the beginning of 2015 to November 2015, the lake level was relatively close to the 12-year historical mean. During the end of 2015 and early 2016, the lake level was higher than the 12-year mean for that time of the year. With an increase in released water in early 2016, the lake level dropped to meet the natural increase in the spring lake level from the rains and snow melt. As of early May, the lake level is pretty close to the 12-year historical mean, with a May 5 lake level of 864.48 ft. NAVD88.

The Geneva Lake Level Corporation manages the lake level and tries to minimize lake-level changes with passive level management. The organization does have a minimum and maximum level at which point the group will open or close the outlet gates to allow for lake-level changes to approach the normal.

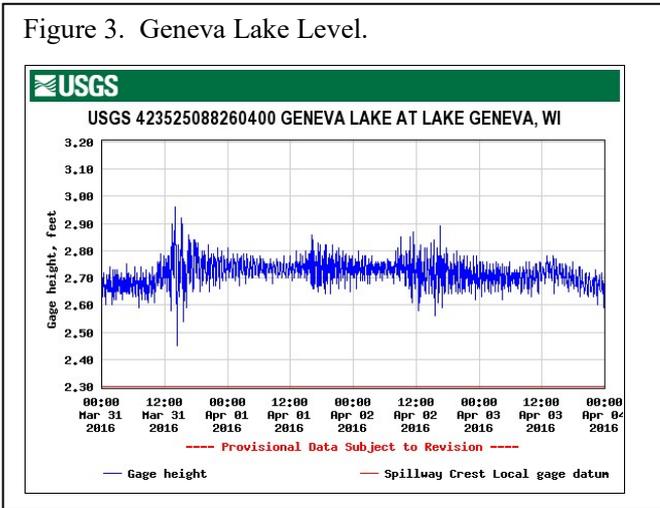
On March 31 around 10 a.m., the outlet gates were opened slightly, and the White River flow increase from around 65 cubic feet per second to around 110 cfs (Figure 2).

Figure 2. White River Discharge



Following that increased release, lake level showed an increase rather than a decrease (Figure 3). Between March 29 and April 2, 1.32 inches of rain fell within the Geneva Lake watershed, increasing the lake level despite an increase in the amount of water leaving the lake through the outlet gates.

Figure 3. Geneva Lake Level.



AQUATIC PLANT SURVEY FINDINGS

As mentioned in previous issues of *Geneva Waters*, an extensive aquatic plant survey was conducted last summer. Nicholas McCraney, a George Williams College student, did his capstone project looking at the distribution of plants, specifically the invasive species, and presented his findings as a poster at the Wisconsin Lakes Convention. Overall, the aquatic plant survey showed the plant community to be in good shape with good diversity and species richness. (Table 1)

Table 1. Aquatic Plant Survey Results, Geneva Lake WI

Summer, 2015. Source: GLEA

	Total # of sites with vegetation	Max. Depth (ft.)	Diversity Index	Species Richness
Geneva Lake	653	41.6	0.91	31

Diversity Index is the Simpson Diversity Index with the closer to one the more diverse (healthier) the community.

Species Richness based on number of species found.

In his assessment Nicholas broke the lake down into sub-sections and looked at the distribution and abundance of two major aquatic invasive plants, *Myriophyllum spicatum* (Eurasian water milfoil) and *Potamogeton crispus* (curly leaf pondweed).

(Table 2)

Table 2. Aquatic Plant Survey Results by Lake Section, Geneva Lake WI

Summer 2016. Source: GLEA

	% of sites with Invasive Species	Average Depth (ft.)	Diversity Index	Species Richness
Williams Bay	9 %	19.2	0.91	20
Fontana, North Shore	7 %	20	0.91	15
Fontana, South Shore	11 %	28	0.88	12
South Shore. Trinke Area	12 %	27	0.83	18
Big Foot Beach State Park	8 %	27	0.92	19
Geneva Bay,	13 %	25	0.87	17
Cedar Pt. to Narrows	6 %	19.6	0.90	18

Invasive aquatic macrophytes were found in high concentrations at major boat launches on the lake (Williams Bay, Geneva Bay, South Shore, and Geneva Lake Narrows), as these are entry points where species are introduced and also areas of disturbance. It was discovered that even though these areas had patterns of invasive aquatic macrophytes the communities of aquatic species were quite different in composition. Eurasian water milfoil was found as one of the top three species in Geneva Bay, South Shore, and Geneva Lake Narrows. Within these three sub-areas aquatic invasives were found at 11-13 percent of the sample sites. At the other subsections invasives were found at 6-8 percent of the sites. Sites with aquatic invasive plants also had the lowest biodiversity index of 0.83–0.88. (1.0 is the best) The Species Richness was also found to be the lowest among these regions. As biodiversity decreased, the invasive macrophyte percentage increased as expected. Disturbances subsequently caused by human activity in certain areas have created a window for the establishment of these aquatic invasives in various concentrated areas throughout Geneva Lake.

Other invasive species clusters were a bit more challenging to explain. A relationship between these invasive species cluster and past herbicide spraying may offer some explanation but needs more investigation.

GLEA SUMMER INTERN AND SUMMER PROJECT

It has been four years since the impact of zebra mussels on the lake bottom community has been studied. Since 1996, when zebra mussels were first confirmed at being established in Geneva Lake, the GLEA has conducted surveys of selected location around Geneva Lake to study the changes in the lake bottom as a result of zebra mussels being present.

This summer, the GLEA will be revisiting the lake bottom community to see what changes have taken place in the 20 years of zebra mussels. Seven pre-selected locations will be sampled and inventoried twice during the summer, once in late June-early July and the other in mid-August.

The GLEA has hired Cassandra Taplin to work on our zebra mussel project and to help out with day-to-day lake management. Cassie graduated from Williams Bay High School and is a junior at UW-Superior pursuing a degree in biology. She has worked at the Lake Superior Research Institute doing similar work on the Lake Superior's bottom community. We are looking forward to working with Cassie and helping her in her professional aspirations as she learns more about Geneva Lake.

ENVIRONMENTAL EDUCATION FOUNDATION AWARDS SCHOLARSHIP AND GRANTS TO AREA SCHOOLS AND STUDENTS.



For 36 years the Environmental Education Foundation (EEF) has offered scholarships and grants to area schools and student for the advancement of environmental education. For 2016 the foundation budgeted over \$34,000 in scholarships and grants. At the April foundation board meeting, the EEF voted to increase the scholarships and grants to area schools and students. The Thomas E. Reynolds Endowment Scholarship now awards a four-year scholarship for a total of \$12,000 – \$3,000 a year for four years. One EEF scholarship is offered to each of the area high schools in the amount of \$3,000 each. Up to \$4,000 in scholarships is offered to area to college students and up to \$5,000 to graduate students. A new scholarship is the Geneva Lake Dark Sky Initiative Scholarship for \$2,500. The scholarship is coordinated with Yerkes Observatory and the Geneva Lake Dark Sky Initiative. Working with Aurora University, the EEF offers a \$2,500 George Williams College Scholarship to an area high school senior who is registered to attend George Williams and study the natural sciences. In addition, the EEF offers a \$1,000 Yerkes Outreach Educational Grant, a \$500 Natural Resource Career Workshop grant, and Outdoor Education Grants totaling \$6,600.

For more information about the grants and scholarship, go to <http://eefscholars.org>.

MAY IS AMERICAN WETLAND MONTH

As the marsh marigolds and skunk cabbage give way to summer wetland vegetation, let's get out into our wetlands and see what beauty they offer. May is American Wetlands Month. Everyone is encouraged to follow the EPA on Twitter (@EPAwater) and share pictures of you and others celebrating American Wetlands Month.

The Wisconsin Wetlands Association encourages Wisconsin residents to get out and visit our "Wetland Gems." Wetland Gems are ". . . high-quality habitats that represent the wetland riches – marshes, swamps, bogs, fens and more – that historically made up nearly a quarter of Wisconsin's landscape."

We have all heard of the importance of wetlands in protecting our waters, flora, and fauna biodiversity and the valuable functions as passive storm water management tools. Hunters and anglers also realize the importance of wetlands for their role in a healthy game and fish community.

Local designated Wetland Gems are Beulah Bog and Lulu Lake Bog in northeastern Walworth County and Scupper-

nong River Area located in the Southern Unit of the Kettle Moraine State Forest. If you look closely enough, most wetlands are gems. You just have to appreciate the finer things of life. For more information, see <http://wisconsinwetlands.org/gems.htm>

BE AWARE OF THE BAG LADY, SHE MAY BE COMING TO YOUR COMMUNITY

How many times have you been driving down the road and a plastic bag gets blown in front of you? Or how many times have you seen trees and shrubs with plastic bags blowing from the branches? Check out the ditches along our road and see how many plastic bags are trapped there, blown from somewhere to get tangled in the branches or vegetation. They can even plug storm drains and cause flooding. Jennie Romer, an attorney who has become known as the country's expert in plastic-bag legislation, has taken on the cause of doing something about these nuisance bags.

Some plastic bags have their place and purpose, but way too often they become a major component of litter. Decomposition is very slow – if at all. Plastic bags just break into small pieces and smaller pieces and smaller pieces. Their movement then becomes even greater. They can get into our waterways and be mistaken as food by aquatic animals

and fish. Most everyone, by now, is aware of the large accumulations, or gyres, of plastics and other debris in the oceans. Plastic bag bits are a part of those floating dumps.

Because of the popularity and convenience, banning plastic bags is not popular with consumers. Most everyone agrees something should be done. Complete bans now exist in San Francisco, Los Angeles, and San Jose. New York City is considering plastic bag legislation similar to what Washington, D.C. presently has. Although not an outright ban, the law attempts to change behavior by charging a fee for plastic bags.

Have these efforts been successful? Washington, D.C., has reported a 66-percent reduction in plastic bags in surrounding rivers after initiating a five-cent-per-bag fee. After its ban, San Jose saw an 89-percent reduction in plastic bags in its storm drains. Since a 15-(Euro) cent per bag fee was imposed in Ireland in 2002, use of plastic bags has fallen there by 94 percent. (Source: From Stormwater Weekly, May 3, 2016, Janice Kaspersen, Editor, "A Bag Lady With a Mission.")

The argument could be made that better recycling and cooperation by users, providers and communities would reduce the plastic bag litter. Unfortunately, it hasn't work in

the past, and as a result we are stuck with all this free roaming plastic litter.



STUDY LINKS NITROGEN IN LAKES TO GROUNDWATER

In an article in the May 2, 2016, Storm Water Solutions Newsletter reference is made to a recent scientific study by the U.S. Geological Survey that found the role of groundwater in the nitrogen budgets of lakes is critically important, more so than originally thought.

Nitrogen is an important nutrient for the growth of amino acids, proteins and cells as a whole. Yet when found out of place and in excess, dealing with it can become a nightmare. Harmful algal bloom, foul drinking water, fish kills and health issues are all the down side of having too much nitrogen in the wrong place such as our lakes and groundwater. “The link between hydrology, chemistry, biology in both the laboratory and the field makes this research exciting, and may even point to natural processes that can help mitigate nutrient contamination from groundwater under certain conditions,” said U.S. Geological Survey hydrologist and lead author of the study, Deborah Stoliker.

With groundwater being a major source of the annual water load to Geneva Lake, what is in the groundwater is important. Past studies on Geneva Lake (A Water Quality Management Plan, Southeastern Wisconsin Regional Planning Commission, Community Assistance Planning Report No. 60, 1985) found that groundwater was the third largest contributor of nitrogen to Geneva Lake after atmosphere and perennial stream. More recent studies may show that groundwater may be an even bigger player in Geneva Lake's nitrogen budget.

We have a pretty good idea of the general groundwater quality in regard to nitrogen. In the 2014 GLEA well-sampling program over 400 groundwater wells were tested for nitrite and nitrate nitrogen. Both of these forms of nitrogen are very soluble and can enter the groundwater and move with it. Only two of the over 400 wells tested exceeded 10.0 mg/l of $\text{NO}_2 + \text{NO}_3 - \text{N}$, and neither was near the lake.

Lake Notes



-- After last Winterfest's cars on ice incident, there has been discussion on regulating parking on the ice. An idea being discussed is if you were on the ice doing something it would be OK to park, but if you are parking on the ice and then going into town and leaving the vehicle on the ice, that would be prohibited.

-- The GLEA gives a big thanks to Audrey Green, Walworth County's past lake specialist, who recently retired. Audrey helped many lakes and lake groups with her expertise, especially when dealing with aquatic invasives.

-- The Linn Sanitary District will be conducting a survey of its residents to identify their preferred future sanitary waste management. Residents will be asked to complete a five question online survey on whether they would prefer to stay with on-site treatment or have sanitary waste collected and treated at a central plant.

-- An international research team led by the Max-Planck Institute for Intelligent Systems in Germany has designed a microbot capable of removing contaminants such as lead and other heavy metals from water.

-- One broken sprinkler head can waste 25,000 gallons of water in just six months. To avoid issues like this, EPA is reminding homeowners to give their sprinklers a little spruce up prior to the onset of warmer weather and increased outdoor watering. Have a professional give your system a check.

-- If you get an opportunity, check out the County's White River Park. A master plan is being developed for the 200-acre park. It has some really nice resources, including several miles of hiking trail, open area, woods, a pond, and the White River. Visit the Walworth County Public Works, Parks, and Recreation Web site and click on White River Park at the bottom of the page.

-- NASA says the global temperature of land and sea was 1.1 degree Celsius warmer in April 2016 than the average temperature for April in 1951-80.



Save Geneva Lake

Phosphorus is the most problematic pollutant in the lake. Most lawns in our area don't need phosphorus. When lawn fertilizers run off into the Geneva Basin, they feed the **unsightly, smelly and potentially toxic** algal bloom and promote the growth of weeds in the lake.

**USE OF PHOSPHORUS FERTILIZERS IN
THE GENEVA LAKE SHORELINE AREAS
IS REGULATED.**



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