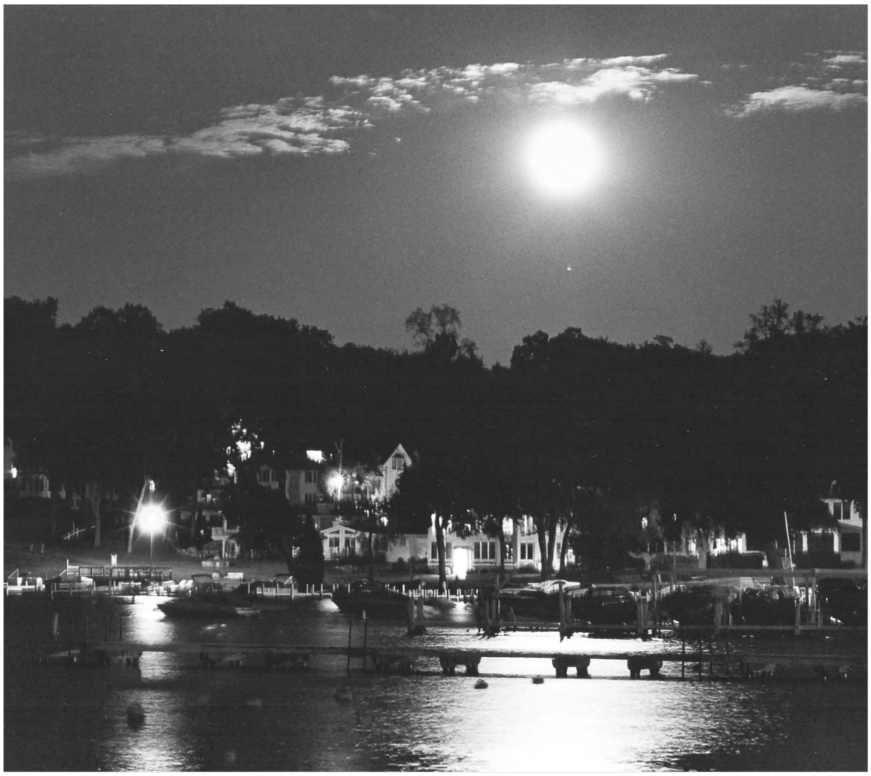
Geneva Waters

Summer 2016 - Vol. 32, No. 3



"Abiding Lights" Photo by Fred Noer

Geneva Lake Environmental Agency

Quarterly Publication

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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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HOT, HOT, HOT, AND MORE HOT!

We waited with great anticipation for the cool spring to pass and summer to arrive, and, boy, has it. During June, July, and half of August we have had 47 of 72 days (64 percent) of temperatures in the 80s. That includes two days in the 90s in July and one day in August. These temperatures are recorded at the Geneva Lake Atmospheric Monitoring Station on a 10-meter tower. Ground temperatures may be even warmer during the summer and colder during the winter.

If you think this summer is hotter than last summer, you are right. (Table 1) NASA calculated that globally July was the hottest month since 1880 when temperatures were first recorded.

Locally, as of August 11, the daytime highs, nighttime lows, and the average monthly temperature are all higher for 2016 than recorded in 2015. The average monthly daytime high temperatures for June, July, and the first half of August were 3.9, 2.9, and 4.5 degrees higher, respectively, than in 2015. Likewise, the average nighttime lows for June, July, and the first half of August 2016 were 8.2, 4.3, and 3.3 degrees, respectively, higher than 2015.

Table 1. Comparison of temperatures between summer 2015 and 2016.

2016						
	Day time high			Night time low		
Month (# of day)	lowest high	highest high	avg	lowest low	highest low	avg
June (30)	64.0	89.6	79.8	49.2	69.0	59.8
July (29)	69.3	91.3	82.5	54.0	70.6	64.9
August (11 days)	80.6	90.1	85.0	62.3	71.5	66.8
2015						
	Day time high			Night time low		
Month (# of day)	lowest high	highest high	avg	lowest low	highest low	avg
June (30)	61.5	87.9	75.9	41.0	67.1	56.8
July (29)	67.3	87.4	79.6	49.7	71.6	61.0
August (11 days)	73.5	87.3	80.5	59.0	66.4	63.4
Source: GLEA and National Atmospheric Deposition Program						

What does this mean? Well, for one, it means we are less comfortable when working outside or trying to sleep at night and air conditioning needs to work harder to maintain our comfort zone.

Some of the discomfort may be from high dew points but heat, wet or dry, is hot. Plants and invertebrate animals, including insects and nematodes, require a certain amount of heat to develop from one point in their life cycles to another. Higher degree days, or warmer days, may cause insects to hatch before their food or predators are around. Lakes heat up earlier and increase the amount of loss to evaporation, causing a drop in the lake level.

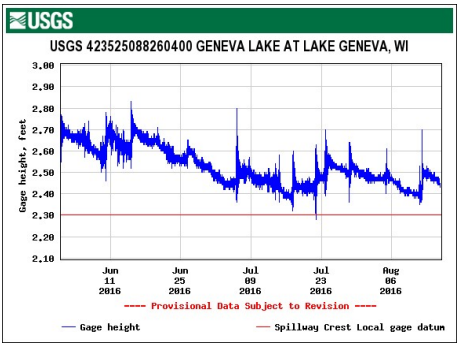
2016 PRECIPITATION AND LAKE LEVEL

As of the end of July, we are approximately 2.66 inches behind the 25-year average for 2016 precipitation. Five of the last seven months have been below the 25-year average. March was wet, with 2.3 inches above average, for a monthly total of 4.48 inches. When viewed from the perspective of the last five years, we are over 14.7 inches above the cumulative average. This includes the very dry year of 2012 when we were seven inches short of the average. This was negated by a very wet 2013 and 2015, 10.24 inches and 8.46 inches above average, respectively.

During June, July, and half of August we have had 16 days with .01 inches of precipitation or greater for a total of 6.55 inches. The greatest single-day rain of the summer was during the early morning of August 12 when we received 1.27 inches of rain.

The lake level has been on a general downward trend throughout the summer. However, the level has remained above the spillway. The lake-level drop is not unusual, as evaporation exceeds precipitation at this time of the year. What is interesting is the response of the lake to precipitation events. (Figure 1) Each spike in the lake level as shown in Figure 1 is preceded by a rain within 24 hours.

Figure 1. Geneva Lake Level



MEET THE 2016 GLEA INTERN

Greetings! My name is Cassie Taplin, and I am the summer intern with the Geneva Lake Environmental Agency. I grew up in Williams Bay and currently live right up the street from George

Williams College. I am going to be a senior this coming year at UW-Superior. I will be graduating with a major in biology with a focus on freshwater ecology and fisheries and a minor in earth science. Aside from biology, my biggest passion is music. I've played the saxophone for 10 years, and I'm a self-taught flutist. My near-term future plans are to go to UW-Milwaukee for a master's degree in freshwater resources and technology. My career aspirations are to work at a fishery, in lake management, or with aquatic macroinvertebrates.

LAKE BOTTOM SAMPLING

This summer the agency is conducting its lake-bottom community study. Every four years since 1996, when zebra mussels were first identified as being in Geneva Lake, the agency has sampled the lake-bottom community to assess the impact of the zebra mussels on the community. Specifically, the studies have focused on looking at the biodiversity and richness of this

The 2016 Geneva Lake littoral-benthic macroinvertebrate research team (left to right): Haley Leasure, Hank Peters, Cassie Taplin, Ted Peters, and Chris Wells.

community. Zebra mussels, being bottom-dwelling organisms, have been known to change the number and types of organisms living on the bottom of the lake as the mussels infest this area.

The study involves collecting three dredge samples at seven different locations twice during the summer. The first samples were collected July 13, and the second set of samples is scheduled to be collected August 16. An area approximately eight inches square is sampled, with all specimens preserved for latter identification. Cassie Taplin, the agency's intern for the summer, has been doing the organism separation and identification. Her experience while working at the Lake Superior Research Institute as a microinvertebrate assistant has been very helpful.

MORE ZEBRA MUSSELS STUDIES

Another aspect of the Geneva Lake Environmental Agency's study on the zebra mussel and Geneva Lake is the substrate study. Artificial substrates are suspended in the lake at different locations, and the colonization of these substrates by zebra mussels is monitored. Once a month the

A zebra mussel artificial substrate.

substrates are removed and the mussels on the different plates are counted. Each substrate has four plates – 6, 8, 10, and 12 inches – with the largest on the bottom and the smallest on top.

The early counts on the substrates had very few large zebra mussels. However, small dot-like structures had densely colonized the underside of the plates. Each dot was about the size of a sand particle. Upon looking at the dots under a scope, they were found to be small developing zebra mussels. It will be interesting to see what the growth and colonization rates are in July and August.

ZOOPLANKTON STUDY

Over the last few years there has been a decrease in small microscopic plankton (free-floating) animals that play a vital role in the well-being of Geneva Lake. These little critters (0.1 – 0.5 mm), called rotifers, are mostly of the zooplankton community and can be found at densities of tens of thousands per square meter of water.

Several reasons have been put forward as to why the rotifer population is decreasing. None have been confirmed. Decreasing

food sources, changes in lake temperature, increase predation, the introduction of pesticides from the watershed, or even missing them in the sampling protocol are a few. It is most likely several of these may be acting together to cause this change.

Rotifers play an important role as a food source for other zooplankton and small fish. Rotifers are the base of the lake's food chain and eat particulate organic detritus, dead bacteria, algae, and protozoans, playing an important role in keeping the water clean and clear. Although the rotifers can be found in different sizes, they all have small hair-like structures that surround the mouth. In concerted sequential motion, they resemble a wheel moving. This action moves water and food to the rotifers for feeding.

Cassie rinsing down the plankton net.

Most rotifers move throughout the water. Not strong swimmers, they can be moved by currents and waves. Rotifers generally follow their food, but it has been documented that they do significant upward movements during the night and downward movements during the day.

To better inventory the zooplankton community the agency recently conducted diurnal sampling every two hours over a 24-hour period. At each sampling a plankton net was pulled vertically through the water from depths of 41 meters to 14 meters and from 14 meters to the surface. Fourteen meters represented the bottom of the thermocline. All sampling was done at the deepest part of the lake. We are hoping we will see more of the rotifers in the zooplankton community with this comprehensive sampling and that the decrease in numbers may be more a matter of their change in movement than in numbers.

A BIG THANKS TO OUR SUPPORTERS

If it were not for the generosity of the agency's supporters we would not be able to conduct the research on Geneva Lake that we do. The Geneva Lake Association has supported us over the years with grants to assist in our intern program, allowing us to hire quality interns for research during the summer. The Lake Geneva Garden Club and the Lake Geneva Jaycees have generously supported us with grants that have allowed us to purchase needed equipment and supplies. Gordy's has made available a boat for use whenever needed. For years the Walworth-Fontana Rotary Club supported our camp scholarship program that allowed us to send youth to nature adventure camps.

Over the years, assistance has been given to us by so many: Geneva Lake Conservancy, The Environmental Education Foundation, ClearWater Outdoor, Fred Noer for our wonderful and inspiring cover pictures on *Geneva Waters*, and Jesse Wirth for our Web page. We could go on. Just as important are the four funding communities and the many individuals who contribute to our operation. We are humbled and hope all of you accept our sincere thank you.

(If we have missed anybody, we apologize).

CYANOBACTERIA

If you follow lake news this summer, you most likely have heard of cyanobacteria. They can be found in many lakes, including Geneva Lake, but it's not so much their presence but how many of them are in the water that makes them a problem.

Cyanobacteria are primitive bacteria that get their energy from photosynthesis. They were once classified as a blue-green alga, but scientists felt it was more developed than plants and thus classified it as a bacterium. So, instead of being a sophisticated plant, it is now a primitive bacterium. The problem with cyanobacteria is not only do they physically foul surface waters, but when they die and decompose they release toxins that can affect

the human body in many different ways depending upon the specific toxin and type of exposure. Some toxins have been known to cause death to livestock and pets.

A cyanobacteria bloom on Lake Petenwell.
Courtesy of Wisconsin Public Radio

Often the reason they become a problem is the coming together of several environmental conditions to make the "perfect storm." Heavy rains early this summer, followed by hot, calm, sunny days, have supplied the nutrient pollution in runoff, the warming of water, and the energy of the sun to give cyanobacteria the environment they love.

Cyanobacteria can be identified by their distinct blue-green or turquoise color. They tend to float on the surface and form mats that cover the whole surface. If you see any of this type of material in water, it would be wise to not come in contact with it. You are especially at risk of suffering from the toxins if it gets into any soft membrane surfaces or is ingested.

MICRO FILTER BALLS BY THE ROZALIA PROJECT

A new product is expected to be released to the public in 2017 that could reduce the amount of synthetic micro fibers getting into our waterways. These fibers are so small and buoyant that they generally are not removed in the typical wastewater treatment plant. Research has shown that each load of laundry produces almost 2,000 microfibers *per garment*. That adds up to the equivalent of about 14 plastic water bottles per year.

The product is a small ball-shaped device dropped into the washing machine and collects the microfibers. Anticipated to be relatively inexpensive, it could go a long way toward addressing a problem that could be rather expensive to resolve. The Linn Sanitary District has encouraged its residents with private on-site wastewater treatment systems (POWTS) to use effluent filters on the septic tank outlet pipes to trap these microfibers. Hopefully, these micro-filter balls also will help in keeping these fibers out of soil absorption systems on POWTS and keep them out of our surface waters. For more information about the product and the research that is being done, check out Rozalia Project on the internet at www.rozaliaproject.org.

UNITED STATES USING LESS WATER TODAY

The United States uses less water today than the country did 35 years ago, despite a 30-percent population increase. Declines in water use are partly attributable to alternative cooling methods at power plants and more efficient irrigation systems. According to the latest USGS water use report, nearly half of all water used in the United States goes to cooling thermoelectric power plants. Irrigation accounts for 31 percent. Eleven percent of water is used for public supply, and the remaining nine percent is used for industrial, livestock, aquaculture, mining, and rural domestic uses. For details, check out http://water.usgs.gov/watuse/.

NEONICOTINOIDS INSECTICIDES

In a recent article in *Nature Communications*, research led by the Centre for Ecology and Hydrology, using data provided by Fera Science and the Bees, Wasps, and Ants Recording Scheme, have found recently popular neonicotinoid insecticides or neonic insecticides have contributed to the large-scale and long-term decline of bees. Matthew Forister of the University of Nevada and his colleagues reported August 16 in *Biology Letters* that drops in butterfly species in California's Central Valley and the increased use of neonicotinoids in this area may be linked.

At a time when there is a big effort to encourage wild insect pollinators, this is troubling news.

Neonic insectides are taken up by the seeds and incorporated into the different parts of the plant, including the flowers. When insects feed on plants that have been treated with neonic insectides, they pick up the insecticide and have been found to have less resistance to diseases and have a difficult time finding their way back to their colonies. Wild bees provide crop pollination services worth billions. It has been estimated that 80 percent of the insect plant pollinators are bees.

FREE SHUTTLE SERVICE IN LAKE GENEVA

In an attempt to reduce downtown traffic and parking issues, the City of Lake Geneva offers free shuttle service from Home Depot to downtown Lake Geneva. The shuttle service will pick up and drop off every 20 minutes.

Parking is available at Home Depot with drop-offs in front of US Bank downtown. The service will run for the following events and times.

Taste of Geneva

Saturday ONLY, September 10

8 a.m.-8 p.m.

Oktoberfest

Saturday and Sunday, October 8-9

8 a.m.-8 p.m.

Winterfest (2017)

Saturday and Sunday, February 4-5

8 a.m.—8 p.m.

LAKE NOTES

- The Wisconsin DNR has hired two new environmental enforcement officers for water quality compliance with state agricultural and runoff requirements. The officers will focus on concentrated animal feeding operations.

WISCONSIN
DEPT. OF NATURAL RESOURCES

-- A recent study by the Harvard T.H. Chan School of Public Health in Boston and Harvard University in Cambridge, Massachusetts, found that polyfluoroalkyl and perfluoroalkyl (PFASs) were detectable at the minimum reporting levels required by the EPA in 194 out of 4,864 water supplies in 33 states across the United States. PFASs are used in products ranging from food wrappers to clothing to nonstick cookware to firefighting foams. PFASs have been linked with an increased risk of kidney and testicular cancers, hormone disruption, high cholesterol, and obesity. Test your water.

-- A Dane County circuit court judge has ruled that Act 21 does not limit the DNR's authority to set limits on large dairy feedlots to protect water from pollution. Earlier in 2016, State of Wisconsin attorney general Brad Schmiel had released an opinion, at the request of legislative leadership, that Act 21, a 2011 law, limited DNR's authority to only powers expressly given it by statutes.

-- Wisconsin DNR warden Juan Gomez has announced the state is cracking down on property owners and residents who are illegally feeding and baiting deer. Walworth County and the entire southern portion of the state are in zones where feeding and baiting deer are illegal. Violators face fines between $343 and $745 if a citation is issued by the DNR.

-- Although predicted, it is sad to see all the dead ash trees. The ash borer is taking its toll in a very complete manner. The number of leafless ash trees with light brown splotchy patches on the bark is a sign of the ash borer's impact on these beautiful trees, a type of flashback to the 1960s and the American elm.

The adult emerald ash borer
(http://dnr.wi.gov/)

-- The Village of Fontana now allows the walking of dogs on the municipal beach between October 15 and March 31. It is hoped

the presence of dogs will reduce the number of geese and other waterfowl that spend time and leave their waste on the beach. During the rest of the year, dogs are welcomed at the dog park at the Duck Pond Recreation Area "dog track" area. Dog owners are asked to pick up all dog waste and dispose of it properly.

-- The Town of Linn recently acted to accept the bid of Community Planning & Consultants for a 2015 Comprehensive Plan update.

-- Starting September 12, every Monday and Thursday at 4:30 p.m. Kiswauketoe Nature Conservancy will be harvesting wild seeds from 4:30 until 6 p.m. Participants should meet at the main entrance, 251 Elkhorn Road, across from Subway. For further information, contact Harold at 262-903-3601 or haroldf43@gmail.com.

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.

GLEA's Geneva Waters Newsletter 'Green Option'

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Geneva Lake Environmental Agency

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