

## Rising Water Threatens Septic Systems and Drinking Wells

Although the Great Lakes shorelines are grabbing attention as shorelines erode and houses fall into the water, inland flooding is of similar concern. High groundwater tables mean inland lakes and their residents could be susceptible to environmental contamination and public health risks. Inland flooding could result in flooded and failing septic systems and drain fields, contaminated drinking water wells, and releases of chemicals or fuels from flooded basements and garages into our waters.

Here are some tips for inland lake property owners as we face flooding from high groundwater tables.

### **Make Sure your Septic System is Functioning Properly**


If the soil in your drain field becomes saturated and flooded, the wastewater from your septic system will not be treated and will become a source of pollution.

#### **How do I know if my septic field is failing?**

Toilets or sinks backing up or draining slowly, in spite of using plungers and drain cleaners, may indicate that drain field soils are becoming saturated. Wet areas, lush grass, or foul odors around the drain field indicate that effluent, or liquid waste, is surfacing and are warning signs that the septic system is not functioning properly. In shoreline areas, noticeable algae and plant growth or a distinctly colored patch of bottom sediment developing near the drain field can indicate excessive nutrient enrichment from a malfunctioning septic system.

#### **What do I do if my septic field is not functioning properly?**

While not pleasant for anyone, septic system failure does occur and requires prompt action to protect public health and local waters. **Immediately call the local Health Department.** They will be able to provide expert advice and refer you to septic system professionals who can help you solve your problem.



To alleviate the problem, have the septic tank completely pumped out and ask the septic system professional to inspect the tank for cracks or other problems. Reduced water use will also help. Also, fence off the wet area around the drain field to minimize contact with wastewater. Keep in mind that these are only temporary fixes and further action is required to assess and correct the problem. Pumping may not help if the household piping is clogged or if high water levels are the problem.

Remember that a permit from the local Health Department is required for repair, replacement, or new construction of a septic system. Always be sure to follow the requirements or your local sanitary code and hire only reputable septic system installation firms.

Health Department of Northwest Michigan

#### **Antrim**

209 Portage Dr.  
Bellaire, MI 49615  
231-533-8670

#### **Charlevoix**

220 W. Garfield  
Charlevoix, MI 49720  
231-547-6523

#### **Emmet**

3434 M-119, Suite A  
Harbor Springs, MI 49740  
231-347-6014

#### **Otsego**

95 Livingston Blvd.  
Gaylord, MI 49735  
989-732-1794

### **Make Sure your Drinking Water Well is Protected**

#### **How can I ensure my drinking water well isn't contaminated as a result of high waters?**

Ensure your septic system is functioning properly so it doesn't contaminate your drinking water well. Also, the casing on your drinking water well should extend at least 12 inches above the ground for sanitary protection. If the casing on your well becomes submerged, your drinking water can become contaminated. Likewise, if you do not have at least 12 inches of casing above ground, you do not have the same degree of protection from surface contamination. Well casing can easily be extended to ensure this minimum depth.

#### **How can I get my drinking water tested?**

The Health Department of Northwest Michigan has test kits available for many types of water sampling, including the two most common: bacteriological and partial chemical, which tests for fluoride, chloride, hardness, iron, sodium, sulfates, nitrites, and nitrates. Due to the executive order issued March 23, 2020, the only Environmental Health services being completed at this time are those that are necessary to sustain or protect life or constitute an imminent threat to public health. All other applications will be processed, and placed into pending until normal business operations resume. You can stop by any of the Health Department offices to pick up one or both of the test kits once they resume normal business hours. For more information, visit <http://www.nwhealth.org/mobile/eh.html>





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## Reflections From Our Executive Director

The Watershed Council is excited to announce the addition of three new staff members this spring. They each bring extensive experience and knowledge to work for us. You can read about them on the back page under, "Announcing our New Staff." In addition to these new faces, our long standing staff continue to address the important topics and issues facing our critical waters. While we have implemented some of our programs for decades, others are new and address emerging issues. We make the same effort to ensure that all of our work is completed carefully and thoroughly.



Gail Gruenwald  
Executive Director

This spring issue of our newsletter includes a report on our monitoring programs. We are also reporting on several studies from last year, including a tributary study of the Black Lake streams and the final report on our Zequanox study on Round Lake in Emmet County.

Once again we are reporting on the impacts and needed adaptation to high water levels on the Great Lakes and inland lakes in our service area. We have devoted extensive staff time to this growing concern and will be conducting outreach throughout the region this spring and summer. We hope the material presented here is useful to you. Please watch for additional information soon.

Our watershed management planning program has received a funding boost this year with two new grants: one to develop a much needed watershed management plan for Mullett Lake, along with an update to the Lower Black and Cheboygan Rivers Watershed Management Plan, and the second to expand upon our work with the Little Traverse Bay Watershed Advisory Committee. Summaries of those two projects are also included in this newsletter.

There are other new projects that we will bring to you this summer, including a mobile boat washing station initiative. We are excited to undertake this effort.

As you can see, we are planning a busy spring and summer with a diverse set of programs. You are always welcome to participate. Also, please join us for this year's annual meeting and other events. Make sure to check our events calendar on our website or Facebook for potential schedule changes. We look forward to seeing you soon!

## Changes to Freshwatercenter.org

Collecting data is one important activity of water protection, but making it accessible to others after it is collected contributes to data's usefulness. Freshwatercenter.org is a site that currently serves as the data repository for the Watershed Council. Volunteer, Watershed Academy, and whole-lake survey data are available on the site, as well as Comprehensive Water Quality Monitoring (CWQM). However, the Watershed Council will be gradually shifting that data to our home website, [www.watershedcouncil.org](http://www.watershedcouncil.org). This is not

an immediate change, and we will be working with partners using our data for outreach purposes once we begin this transition. We remain dedicated to making information about Northern Michigan water quality and health available to the public.





# Could Moving Your Home Back From the Shoreline Be the Answer to Rising Water Levels?



Photo Credit: MLive

When existing shoreline homes are threatened by high water and erosion, the costs and benefits of moving the structure back from the lakeshore should be weighed along with other alternatives. Moving a home back can compare favorably to other alternatives economically, and prove to be environmentally and aesthetically better in the long run.

## How do you move a house?

In the most simple of explanations, moving a house is a four-part process:

1. Site preparation for the new location
2. Building preparation
3. The move
4. Setting the home in its new location

## What does the process of moving a house look like?

Before the big move, there's a list of items for the professionals, but the homeowner can leave the house contents alone. The homeowner will need to work with a general contractor on site and building preparation and other aspects of the move, including obtaining permits, disconnecting and reconnecting utilities, excavation, and laying the new foundation. Utilities must be shut off and disconnected from the house.

Depending on the size and shape of a home, the actual moving of the structure can be completed within a day or two. If the situation is dire for a property owner, the home can be moved before the new foundation is laid, although this will increase the cost. Homes can be moved back on the same lot or, if there is not enough room, houses can be relocated to a new lot.

## How much does moving a house cost?

As you might imagine, moving a house is not a "flat fee" type of service. There are many factors that go into the pricing of a home move, including square-footage, as well as the structure's length, width, weight, and construction method. Garages, additions,

porches, decks, balconies, chimneys, fireplaces, and other accessories can almost always be moved with the house, but add time and increase the project cost.

The total cost of moving a home ranges from as little as \$12,000 for a ranch up to \$100,000, or potentially more, for larger, more complex sites. On average, costs for the industry seem to land between \$12 and \$16 per square foot.

## Why is moving a house a better option?

Moving structures away from eroding shorelines is a better long-term solution than installing and maintaining shoreline protection. Shoreline armoring can adversely affect the health of the Great Lakes as well as neighboring properties. As waves hit the large boulders or concrete seawalls, energy is directed downwards and sideways. Energy directed downwards erodes, or scours, the lake bottom. Scouring of the lake bottom increases with lake size and wave height, causing a loss of habitat. In addition, seawalls cause wave flanking in which energy is deflected sideways towards neighboring properties, causing erosion in places that may not have been experiencing it.

Furthermore, once a bluff or beach is reinforced, it is an ongoing financial investment to maintain the structure, which will be worn down by the lake over time. Homeowners are civilly liable for damage caused to neighboring properties by failing or incorrectly installed seawalls or riprap. In addition, any property owner whose house falls into the lake is responsible for cleaning up all debris.

While high and low water levels can have a significant impact on human lives, it is also important to recognize that the Great Lakes are a living, dynamic ecosystem. By manipulating them to accommodate our needs, we are creating more problems. In the long-term, moving a house can often be better for your pocket book, your neighbors, and the Great Lakes.

## Home Movers Serving Michigan

Contact	City/State	Contact	Phone Number
D & B House Movers	Monroe, MI	<a href="http://www.dbhousemovers.com">www.dbhousemovers.com</a>	734-497-7956
Ceitz House Moving Engineers, Inc.	Muskegon, MI	<a href="mailto:deitzmovers@aol.com">deitzmovers@aol.com</a>	231-773-8964
Dingey Movers, Inc.	Zanesville, OH	<a href="http://www.dingeymovers.com">www.dingeymovers.com</a>	740-453-6724
HD House Movers, LLC	Lake City, MI	<a href="https://hdmoversllc.com">https://hdmoversllc.com</a>	231-229-4213
J & R Building Movers	Petoskey, MI		231-348-9571
Lykowski Construction Inc.	South Bend, IN	<a href="http://www.lykowskiconstruction.com">www.lykowskiconstruction.com</a>	574-291-8858
Rollaway Movers, Inc.	Grand Rapids, MI	<a href="http://www.rollawayhousemovers.com">www.rollawayhousemovers.com</a>	616-453-0123
Talaski Building Movers	Bad Axe, MI		989-269-6008
Wolfe House and Building Movers	North Manchester, IN	<a href="https://www.wolfehousebuildingmovers.com">https://www.wolfehousebuildingmovers.com</a>	260-982-0302

This list is not comprehensive and listing or omission of a company does not imply endorsement or disapproval. Tip of the Mitt Watershed Council does not make any endorsement or representation of any qualifications by any of the listed individuals or companies.

# Testing PFAS to Protect Public Health

In 2019, Tip of the Mitt Watershed Council, with generous funding from the Charlevoix County Community Foundation and the Petoskey-Harbor Springs Area Community Foundation, tested surface water resources for PFAS (Per- and Polyfluoroalkyl substances) in our region. PFAS are fluorinated, organic compounds found widely in manufactured products, from firefighting foam to stain-resistant carpets. These substances can cause health problems and accumulate in our bodies and the environment, and have been detected in Michigan water bodies. We collected 24 samples from 15 sites within nine water bodies located within Emmet and Charlevoix Counties to test for the presence of PFAS, including Lake Charlevoix, Boyne River, Susan Lake, Walloon Lake, the Bear River, Round Lake (Emmet County), Paradise Lake, Maple River, and Stover Creek.

The locations were chosen based upon their proximity to sites with potential PFAS use or contamination, such as fire departments, landfills, airports, biosolid land application sites, plating and polishing facilities, waste treatment/storage sites, and electroplaters. Samples were collected at various depths in each water body, and each site was sampled in the spring and fall to account for seasonality.

Two sets of samples were collected in accordance with Michigan Department of Environmental Quality (now Michigan Department of Environment, Great Lakes, and Energy) surface water sampling protocols, and tested using United States Environmental Protection Agency (EPA) Method 537 Rev.1.1, which can detect the presence of certain PFAS in drinking water. One sample set was collected on May 24 and 25, while the second set was collected on October 8 and 9. The samples were analyzed at the University of Michigan

Biological Station for 14 of the common PFAS chemicals.

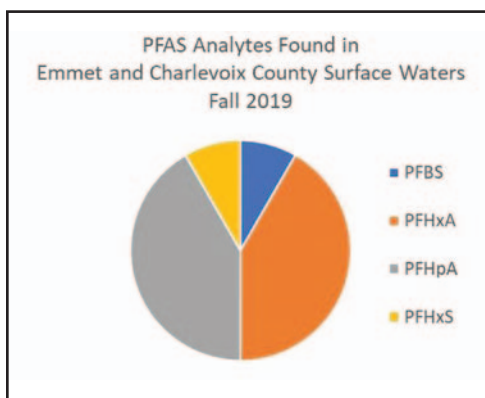
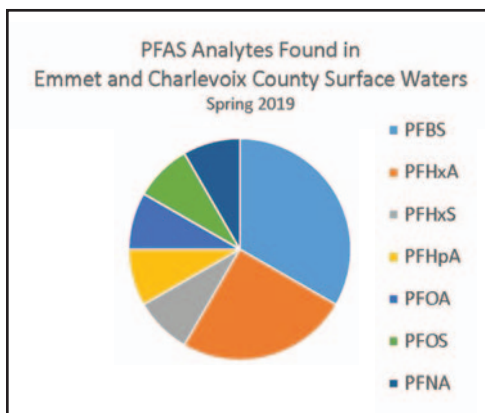
These water- and oil-repellent compounds are known to degrade slowly over time, and have been found in humans, drinking water, and even in Arctic ecosystems. As such, we were not surprised that we found PFAS in 78% of the water bodies sampled. Only two of the nine water bodies, Boyne River and Stover Creek, did not have detectable levels of PFAS.

While PFAS were found in the majority of water bodies sampled, they were not found in significant quantities or concentrations. The average concentration of PFAS found was 4.0 parts per trillion (ppt). The highest concentration found was 26 ppt, reported from the surface of the West Basin of Walloon Lake during the spring sampling. This was the compound PFBS (perfluorobutanesulfonic acid), which currently has no surface water quality standard in the State of Michigan.

For those PFAS compounds that do have surface water quality standards, PFOS (perfluorooctanesulfonic acid) and PFOA (perfluorooctanoic acid), the reported quantities were significantly below State surface water quality standards. For PFOS, the only positive sample was in Round Lake at 1.7 ppt compared to the State standard of 12 ppt, or 11 ppt if the surface water is a source of drinking water. The Maple River was the only positive sample for PFOA at 2.1 ppt. The surface water standard is 12,000 ppt, or 420 ppt if the surface water is a source of drinking water.

Overall, while PFAS were found in the majority of water bodies sampled, the limited findings and low concentrations indicate that PFAS may not be a primary threat to surface waters in Emmet and Charlevoix County. However, it is important to note that this was a preliminary sampling effort. There are nearly 5,000 types of PFAS, some of which have been more widely used. This testing only focused on 14 types of PFAS. Additionally, not all of the surface waters within Charlevoix and Emmet Counties were tested. Further testing of additional water bodies and additional PFAS chemicals would provide greater confidence that PFAS do not pose a threat to public health and the environment in Northern Michigan from surface waters.

For more information on the PFAS Surface Sampling and to see the full results, check out the “Testing PFAS to Protect Public Health: Summary Report” on our website, <https://www.watershedcouncil.org/pfas.html>.



## The 14 analytes tested for include:

- perfluorooctanoic acid (PFOA)
- perfluorooctanesulfonic acid (PFOS)
- perfluorobutanesulfonic acid (PFBS)
- perfluorohexanoic acid (PFHxA)
- perfluoroheptanoic acid (PFHpA)
- perfluorononanoic acid (PFNA)
- perfluorodecanoic acid (PFDA)
- perfluoroundecanoic acid (PFUnA)
- perfluorododecanoic acid (PFDoA)
- perfluorotridecanoic acid (PFTriA)
- perfluorotetradecanoic acid (PFTeA)
- N-methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)
- N-ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)
- perfluorohexanesulfonic acid (PFHxS)





Michigan is in the process of establishing limits for certain PFAS compounds in drinking water. Once enacted, the rules will cover seven forms of PFAS, including six that the Watershed Council tested for. The proposed rule will establish Maximum Contaminant Levels (MCLs) for seven types of PFAS.

Draft Regulations for PFAS MCL	
Specific PFAS	Drinking Water MCL
PFNA	6 ng/L (ppt)
PFOA	8 ng/L (ppt)
PFHxA	400,000 ng/L (ppt)
PFOS	16 ng/L (ppt)
PFHxS	51 ng/L (ppt)
PFBS	420 ng/L (ppt)
GenX	370 ng/L (ppt)

The standards would apply to about 2,700 water supplies in Michigan and establish sampling, public notification, and laboratory certification requirements for public supplies that serve more than 25 people. The regulations would not directly impact Michigan households that draw groundwater from a private well because the State cannot require homeowners to test their own water.

The Watershed Council participated in the public comment period for the proposed rules. While we are supportive of the efforts to establish a rule to create a maximum contaminant level (MCL) for PFAS, we provided recommendations to make Michigan's proposed PFAS drinking water standards more comprehensive and protective of public health. Our recommendations included implementing a class-based MCL to account for the growing body of scientific research that indicates the class collectively poses similar threats to human health and the environment, and developing a total PFAS MCL to account for the high potential additive and synergistic effects of the seven PFAS not only with one another, but with the thousands of other PFAS in the environment. We also urged the State to commit to revisiting these standards by a certain date, preferably within two years, to ensure Michigan's standards incorporate the best available scientific data. Lastly, we urged the State to concurrently establish cleanup criteria for PFAS to provide the State with the legal tools necessary to address PFAS contamination and protect Michigan's environment and its citizens' health.

The process for the proposed MCLs is slated to be complete in early May 2020.

# Protections for Wetlands and Streams Eliminated

On Thursday, January 23, the Trump administration released the final version of the revised Navigable Water Protection Rule, otherwise known as the Waters of the United States or WOTUS rule. The final rule eliminates Clean Water Act protections for the majority of the nation's wetlands and more than 18% of streams, and is the largest rollback since the modern law was passed in 1972. Waters that have been protected for almost 50 years will no longer be protected under the Clean Water Act.

Specifically, the new rule will erase protections for ephemeral streams, which flow only after rain or during snowmelt. Those streams account for more than 18% of waterways nationwide, according to the U.S. Geological Survey's National Hydrology Dataset. While they don't flow year-round, when active they almost always drain into larger permanent waterways that often serve as drinking water sources.

The rule also erases protections for wetlands that do not have surface water connections to intermittent or perennial streams, which account for more than 51% of the nation's wetlands. Wetlands serve as the nation's kidneys, filtering pollution, buffering stormwater, and absorbing floodwaters, as well as acting as habitat for wildlife. Erasing protections for wetlands endangers these critical resources.

The Environmental Protection Agency (EPA) finalized the rule despite its scientific advisory board raising concerns in late December that it was "in conflict with established science... and the objectives of the Clean Water Act." The criticism was notable because the majority of the board members were handpicked by the Trump administration.

There is no doubt that the Trump administration's new rule will be the subject of litigation across the country, as environmental groups and some states will file lawsuits. Additionally, the group Public Employees for Environmental Responsibility (PEER), which includes many EPA employees, scientists, and lawyers, already filed a lengthy complaint with the Inspector General. In the complaint, PEER argues that the new rule violates EPA's "Scientific Integrity Policy," which EPA employees must follow when making decisions. PEER alleges that top employees at the EPA did not follow this policy because the rule was not based on science, and EPA staff with expertise in the area were not consulted. So, while the new rule is the final WOTUS rule currently, we'll have to wait and see how long it will last.



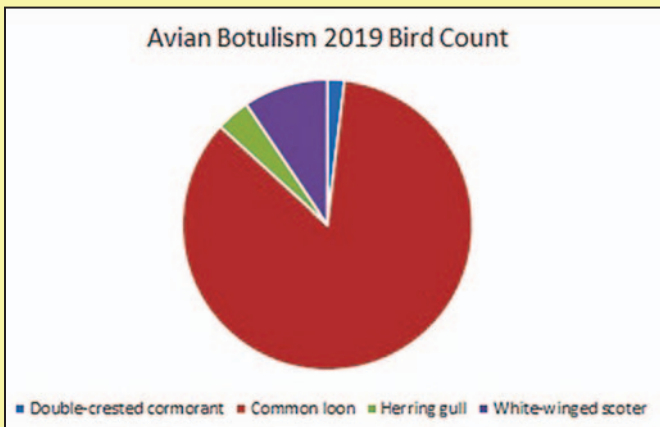
Photo Credit: EGLE



## High Water Levels May Keep Avian Botulism at Bay

While the Great Lakes' high water levels are a bane to beach-lovers and riparian property owners, they could be a boon for birds. According to researchers from the University of Wisconsin-Madison, low water levels and higher water temperatures are associated with higher numbers of bird deaths from avian botulism. High water levels and cool lake temperatures appear to reduce the production of a naturally-occurring toxin called botulinum. Botulinum is a neurotoxin that makes its way from algae to water fowl, causing paralysis, and eventually death from botulism.

In fall 2019, high water levels made it hard for volunteers to monitor beaches—some even had to resort to wearing waders or kayaking! The absence of beaches reduced collection points for washed up birds, so volunteers focused on coves and bays that were “hot spots” in previous years. In total, Watershed Council volunteers walked 120 miles of Lake Michigan shoreline in their search and found 66 dead birds. The mortality doubled last year’s count of 31 birds, but this is not a concern compared to 2012 when 900 dead birds were documented. Common loons made up the majority of dead birds in the 2019 study, followed by white-winged scoters. Of the 66 birds found, ten were sent to the Michigan Department of Natural Resources to test whether avian botulism was the cause of death. Five of the ten birds likely died of avian botulism based on testing results. The Watershed Council’s data is used to estimate total Lake Michigan mortalities and predictions for next year. Botulism outbreaks throughout the Great Lakes are mapped using the Wildlife Health Information Sharing Partnership (WHISPers), which can be viewed at <https://whispers.usgs.gov/home>.



## Monitoring Highlights Changes in Streams

During spring and fall of each year, volunteer stream monitors and Watershed Academy students perform biological monitoring by collecting aquatic insects and other macroinvertebrates—organisms without backbones that can be seen with the naked eye—to assess stream ecosystem health. Macroinvertebrates are the quintessential “canary in the coal mine,” as they serve as key water quality indicators. Several macroinvertebrate orders, such as mayflies, stoneflies, and caddisflies, are highly sensitive to environmental change or pollution. A healthy variety of these pollution-sensitive macroinvertebrates indicates a healthy ecosystem with high water quality, while a stream with only pollution-tolerant aquatic worms and midges suggests an ecosystem is likely suffering. Volunteers have monitored streams with the Watershed Council since 2005, and Watershed Academy students have been collecting data since 2015.

A water quality grade is assigned to each monitoring site using a weighted numeric scoring system based on total taxa from *Ephemeroptera*, *Plecoptera*, *Trichoptera*, and sensitive taxa indices. Taxa are groups of organisms; for example, *Ephemeroptera* are the mayfly order, *Plecoptera* are the stonefly order, and *Trichoptera* are the caddisfly order. These are insects that live parts of their life cycles in the water. A poor grade for a scored stream does not necessarily signal poor water quality, but could instead indicate the presence of a pollution-tolerant macroinvertebrate community. Or, for example, some slow flowing streams don’t provide the conditions necessary to support sensitive species.

Because so many factors can affect macroinvertebrate counts, it’s important to compare biological data over many years. From year to year, macroinvertebrate grades can vary and sometimes can’t be explained by water quality or habitat changes. The timing of seasons or hatches could be the culprit. A lowered grade one year is less concerning if the overall average is still high and the stream returns to its typical grade. This year, macroinvertebrate scores were most affected by high flow events triggered by storms, high Great Lakes water levels, and not enough macroinvertebrates collected.

Here are the streams with 2019 scores that differed from their overall average score:

### Bessey Creek= D

Bessey Creek flows from Lancaster Lake and is the largest tributary to Douglas Lake (Cheboygan County). It flows through two nature preserves and is heavily wooded with some marshy areas. Bessey Creek has only been monitored since 2018. While its score dropped from a “B” to a “D,” high water flows may have contributed to less diversity and fewer sensitive macroinvertebrates.



Volunteer Stream Monitors at Bessey Creek



**Boyne River = B**

Flowing from Thumb Lake to Elmira, west into Lake Charlevoix, the Boyne River has been monitored since 2005. For the second year in a row, the Boyne River has received a “B” rating, less than its average score of “A.” High water levels in Lake Charlevoix, which is connected to Lake Michigan, prevented monitoring in the fall at one site.



Boyne Falls Watershed Academy students monitoring the Boyne River

**Minnehaha Creek = C**

The Minnehaha Creek is a coldwater tributary of Crooked Lake. In late 2018, Tip of the Mitt Watershed Council completed a second road/stream crossing improvement project as part of our “Improving Aquatic Connectivity in the Crooked River Watershed” project. Volunteers monitored at Maxwell and Pickerel Lake Roads to help assess biological improvements as a result of these road/stream crossing projects. Although the Creek’s score decreased from an average B score to a C, we suspect this is because sediment built up behind the culverts prior to the road/stream crossing improvements is flushing through. It will likely take a few years before the substrate reaches an equilibrium and macroinvertebrate habitat improves.



Volunteer Stream Monitors at Minnehaha Creek

**Mullett Creek = B**

Mullett Creek is a tributary of Mullett Lake originating near Riggsville Road and the University of Michigan Biological Station on Douglas Lake. The crossing at Crump Rd. was replaced with a new culvert in summer 2017. The site retained its “A” score after the improvement and the whole stream received a “B.”



Mullett Creek new culvert installment

**Mill Creek = A**

Mill Creek has been monitored by the Watershed Academy since 2016. It drains Dingman Marsh, a perched wetland in the Mackinaw State Forest. It flows to Lake Huron through the Historic Mill Creek Discovery Park. From 1790 to 1839, a sawmill operated on the Creek to supply timbers to the Straits of Mackinac. Since 1984, a rebuilt dam and operational sawmill reflect the same era. This site’s score increased from a “B” to an “A” in 2019.

**Sturgeon River = B**

The Sturgeon River normally receives an “A” grade, however this year the Watershed Academy collection yielded a “B” grade and the Volunteer Stream Monitoring yielded a “C” grade. The Sturgeon River remains a high quality stream. The lower macroinvertebrate score is attributed to high water levels.



Wolverine Watershed Academy Students Monitoring the Sturgeon River



Mackinaw City Watershed Academy Students Monitoring Mill Creek

A	B	C	D
Berry Creek	Birney Creek	Bear River	Shanty Creek
Black River	Bissell Creek	Cable’s Creek	Stover Creek
Inwood Creek	Boyne River,	Fineout Creek	Tannery Creek
Maple River	Eastport Creek	Five Mile Creek	Sturgeon River
Mill Creek	Iron Ore Creek	Horton Creek	
Milligan Creek	Kimberly Creek	Minnehaha Creek	
Pigeon River	Mullett Creek	Oden Creek	
	Stoney Creek	Schoof’s Creek	
	Sturgeon River		

# Volunteer Lake Monitoring

Since 1986, Tip of the Mitt Watershed Council's Volunteer Lake Monitors (VLM) have ventured out on the inland lakes of the region to collect invaluable data that helps to conserve and protect important resources of Northern Michigan. Volunteers measure water clarity and chlorophyll-*a* weekly, which can tell us about a lake's productivity. For a lake, productivity is the ability to support aquatic life. Water that is clear can indicate a lake without a lot of plant growth, while water that is turbid, or cloudy, can indicate abundant plant life.

Water clarity is measured by lowering a black and white Secchi disk into the water and recording the depth at which it is no longer visible. Chlorophyll-*a*, a pigment found in all green plants and algae, is collected by filtering a water sample, which is later analyzed to estimate the density of phytoplankton in the water column. Higher chlorophyll-*a* concentrations indicate greater phytoplankton densities, which reduce water clarity. Since algae and small phytoplankton in the water column are consumed by filter-feeding invasive mussels, lakes harboring large numbers of these mussels could show evidence of reduced chlorophyll-*a* levels. Reduced chlorophyll-*a* has indeed been observed across a majority of our lakes throughout the summer season. Environmental conditions such as temperature and nutrient inputs can also play a significant role in chlorophyll-*a* levels.

Trophic State Index (TSI) is a way to classify lakes and how they process nitrogen and phosphorus. Nutrient availability, water volume, and the rate at which water is added to or lost from a lake are just a few of the factors determining some of this productivity. TSI values range from 0 to 100. Lower values (0-38) indicate an oligotrophic or low productivity system, medium values (39-49) indicate a mesotrophic or moderately productive system, and higher values (50+) indicate a eutrophic or highly productive system. Lakes with greater water clarity and lower phytoplankton densities score on the low end of the scale, while lakes with greater turbidity and more phytoplankton score on the high end.

Lakes classified as oligotrophic or mesotrophic release relatively little nitrogen and phosphorus, producing fewer nutrients for plants and algae to grow. Half of the lakes monitored in 2019 were mesotrophic and half were oligotrophic. Table 1 shows the compiled results for TSI scores, averaged Secchi disk depths, and median chlorophyll-*a* results for comparison with other lakes monitored in 2019.

The data indicate that the surveyed lakes are relatively clear compared to a high productivity, or eutrophic, lake. This isn't a bad thing. While the clarity as measured by the Secchi disk could be in part the result of invasive mussels eating algae and phytoplankton, these mesotrophic and oligotrophic

lakes also indicate some success in keeping excess nutrients from outside sources out of the lakes.

The State of Michigan recently lost funding for their Cooperative Lakes Monitoring Program and Volunteer Stream Monitoring Program. The Watershed Council's programs are NOT affected by the funding. Our programs will continue and we will eventually need more lake and stream monitors. Stay tuned to our website and social media for information about future training events.

Lake	Secchi (ft)	TSI-Secchi	Trophic State	Chlor-a
<b>Mesotrophic Lakes</b>				
Benway	9.89	44.09	Mesotrophic	0.09
Black	13.62	39.48	Mesotrophic	0.26
Crooked	10.42	43.34	Mesotrophic	0.45
Douglas, Cheboygan	10.94	42.64	Mesotrophic	0.65
Larks	8.58	46.13	Mesotrophic	0.89
Munro	7.21	48.65	Mesotrophic	0.69
Nowland	9.87	44.11	Mesotrophic	1.00
Pickereel	11.97	41.34	Mesotrophic	0.44
Six Mile	6.82	49.45	Mesotrophic	1.14
Thayer	8.96	45.51	Mesotrophic	0.76
<b>Oligotrophic Lakes</b>				
Burt	20.08	33.88	Oligotrophic	0.66
Charlevoix	18.64	34.96	Oligotrophic	0.30
Douglas, Otsego	21.33	33.01	Oligotrophic	0.30
Elk	18.83	34.80	Oligotrophic	0.24
Intermediate	ND	ND	Oligotrophic	0.21
Mullett, Main	16.46	36.75	Oligotrophic	0.25
Mullett, Pigeon Bay	16.27	36.91	Oligotrophic	0.42
Skegemog	ND	ND	Oligotrophic	0.10
Thumb (Louise)	20.00	33.94	Oligotrophic	0.53
Twin Lakes	17.20	36.11	Oligotrophic	0.54
Walloon	11.85	41.48	Oligotrophic	0.43

**Table 1. 2019 data for all lakes in the Volunteer Lake Monitoring Program.**



# Work Begins on a New Watershed Management Plan for Mullett Lake and the Lower Black and Cheboygan Rivers

Tip of the Mitt Watershed Council has recently commenced work on an update to the Watershed Management Plan for the Lower Black and Cheboygan River Watersheds, and started a new protection-oriented plan for the Mullett Lake Watershed.

The primary purpose of a watershed management plan is to guide watershed coordinators, resource managers, policy makers, and community organizations to restore and protect the quality of lakes, rivers, streams, and wetlands in a given watershed. Watershed plans identify problems and threats to water resources, and develop frameworks to address issues within a specific watershed. They're intended to be a practical tool with specific recommendations on practices to improve and sustain water quality.

This watershed management planning effort will yield important baseline water quality data and help to identify sources of nonpoint source pollution that may be originating from streambank erosion, road/stream crossings, forestry and agricultural operations, and stormwater runoff. After working collaboratively with stakeholders to identify threats to local water resources, the process will result in a framework to address issues within these Watersheds and identify water quality protection priorities.

The Watershed Council will bring together a broad range of stakeholders representing partners from local governments, lake associations, property owners, business leaders, and others for the first Watershed Advisory Committee meeting later this summer. The meeting will include presentations and discussion about the purpose for developing the Watershed Management Plan and opportunities for future engagement. All members of the public are welcome and encouraged to attend. Please stay tuned for details as we determine a date and location for the meeting.

Over the course of the summer, the Watershed Council will conduct field inventories of potential sources of nonpoint source pollution and water quality monitoring of Mullett Lake, the Lower Black and Cheboygan Rivers, and their respective tributaries. Results and recommendations for water quality improvements and restoration efforts will be incorporated into the Watershed Management Plan and submitted for approval by the U.S. Environmental Protection Agency and the Michigan Department of Environment, Great Lakes, and Energy in 2022. We anticipate that this 2.5 year project will help to ensure that Mullett Lake and the Lower Black and Cheboygan River Watersheds are protected for generations to come.

This important project is made possible by a generous grant from the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division.



*Dodge Point on Mullett Lake in Cheboygan, MI*

Photo Credit: Wikicommons



## Learning More about Black Lake's Tributaries

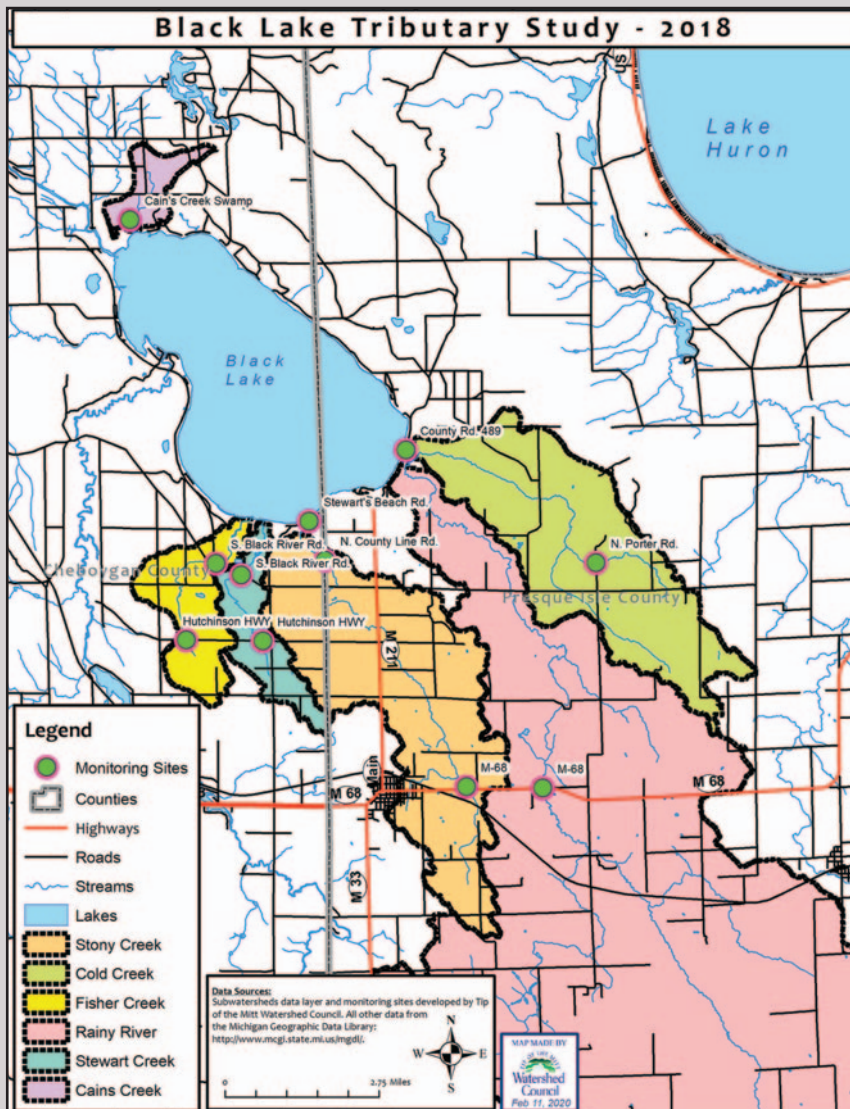
Tributaries—the rivers and streams that flow into larger bodies of water—are vital parts of watersheds because they help determine the quality of the lakes they drain into. However, relatively little is known about the water quality of tributaries around Black Lake. While a variety of organizations have conducted fish and macroinvertebrate surveys on larger tributaries like the Rainy River and Upper Black River, the remaining tributaries were more of a mystery, until now. In 2018, the Watershed Council monitored six tributaries of Black Lake: Cain's Creek, Cold Creek, Fisher

Creek, Rainy River, Stewart Creek, and Stoney Creek. Eleven sites on the tributaries were monitored four times, once in the spring, twice in the summer, and once in the fall.

Black Lake has a large Watershed compared to its surface area, making it more susceptible to water quality impacts compared to similarly sized lakes. This is because a smaller lake has less water to dilute pollutants that enter the watershed. While much of the Watershed is protected by the Pigeon River State Forest, tributaries closer to the Lake drain golf courses and agricultural areas, which can be sources of excessive nutrients from fertilizers. While some nutrients are helpful for plant and algae growth, too much can cause an overabundance of plants and algae, which can impact stream health and habitat. Dissolved oxygen and temperature are also important, as coldwater fish need certain levels to survive. Salt, measured using chloride and conductivity levels, is an indicator of pollution, too. That's why testing tributary water is an important step towards ensuring watershed health.

A host of factors were studied to help describe the water quality of the Black Lake tributaries. Here are the highlights:

- Cold Creek and Fisher Creek are perennial streams that dry up in the summer.
- Fisher Creek, Stoney Creek, and the confluence of the Rainy River and Cold Creek had dissolved oxygen levels that were too low to support coldwater fish in the summer months.
- Summer temperatures at all sites except for Stewart Creek, Cain's Creek, and Fisher Creek had temperatures that were too high for coldwater fish like brook trout.
- While chloride levels were below U.S. Environmental Protection Agency (EPA) standards for surface waters, they were often above concentrations normally found in Northern Michigan streams. Fisher Creek at South Black River Road had the highest concentrations of chloride, and Rainy Creek at M-68 had the second highest.
- All streams except for Fisher Creek had total phosphorus results above EPA reference conditions at some point during the year. Stoney Creek at North County Line Road had the highest phosphorus.





# Expanding Knowledge on Invasive Mussel Management

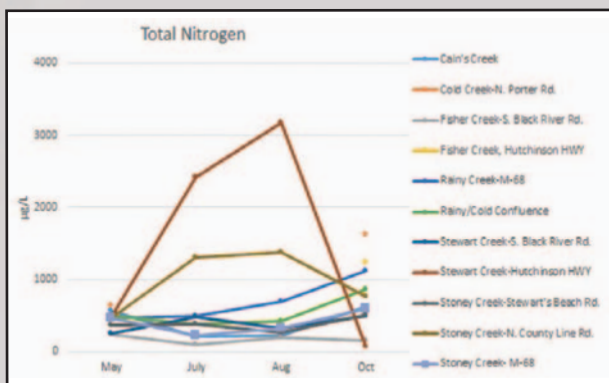


Figure 1. Total nitrogen results from 11 sites in Black Lake tributaries

- Stewart Creek at South Black River Road had the highest nitrogen, at values six or seven times greater than typical minimally impacted conditions.
- Macroinvertebrates collected by Watershed Academy students on Stoney Creek at North County Line Road showed that the stream is supporting sensitive macroinvertebrates.

The high nutrients from this study also correlated with other data from recent years. A 2017 survey of Black Lake's shoreline showed more *Cladophora*, a stringy algae that is an indicator of excess nutrients, on the south side of Black Lake. The streams in this study with high nutrients also run into the south side of Black Lake. Comprehensive monitoring data from 2019 also showed the highest nitrogen recorded by the Watershed Council since 1995.

One blue-green algal bloom that occurred in July 2019 was also located on the southern shore. According to the Michigan Department of Environment, Great Lakes, and Energy (EGLE), blue-green algal blooms are very hard to predict. High nitrogen may not be the culprit, or at least it may not be the only culprit. It is hard to say what happened at Black Lake last year, but algal toxin monitoring by EGLE across many Michigan lakes from 2016 to 2019 supports the idea that selective feeding by zebra mussels drives blue-green algae growth in clear lakes like Black Lake.

These findings provide context for decision-making and stewardship around Black Lake. Additional targeted monitoring along sections of Fisher, Stewart, and Stoney Creeks would narrow down nutrient sources. Watershed-wide education on how land use practices impact water quality could also help curtail water quality impacts. Reporting algal blooms to EGLE will help predict and understand what causes them. Suspicious-looking algae can be reported to EGLE by calling the Environmental Assistance Center at 1-800-662-9278 or sending an e-mail to [AlgaeBloom@Michigan.gov](mailto:AlgaeBloom@Michigan.gov).

Invasive mussels, such as zebra and quagga mussels, can filter large amounts of water, removing almost all the microscopic aquatic plant and animal life that other animals feed on. They reproduce rapidly and can cover docks and clog water intake pipes. In an effort to control their populations, *Zequanox*, a dead soil bacterium (*Pseudomonas fluorescens*) that interferes with the mussels' digestive systems, was tested on Round Lake in Emmet County in 2017. A variety of partners, including the United States Geological Survey (USGS), Michigan Natural Features Inventory (MNFI), and the University of Michigan Biological Station, worked with the Watershed Council to study the effects of *Zequanox* in 2017 and 2018 on invasive mussels, native mussels, and water chemistry.

A custom engineered, boat-mounted application system was used to deliver *Zequanox* to the bottom of Round Lake. The application technique is similar to other techniques used for managing aquatic invasive species, but this was the first application without the use of an enclosure to concentrate the *Zequanox*.

Results from the study revealed that

- *Zequanox* applied without an enclosure did not significantly reduce the number of invasive zebra mussels.
- There was no significant difference in the number of zebra mussels attached to native unionid mussels after *Zequanox* treatment. This is notable because zebra mussels can immobilize and kill native mussels by colonizing them in large numbers.
- Native Eastern pond, giant floater, and fat mucket mussels were present in the study areas, and of those, only the fat mucket was found in large enough numbers to provide a comparison of before and after treatment. The *Zequanox* treatment did not significantly affect the number or average shell dimensions of fat muckets, meaning that native mussels did not seem to be affected by the treatment.
- Glycogen was monitored as a way to determine the energy mussels were able to store, and their ability to reproduce. If *Zequanox* was to have a negative impact on native unionid mussels, then glycogen storage would be reduced. While the USGS found lower than baseline glycogen stores in native mussels used in the study, they cannot be attributed to *Zequanox*. This is because glycogen differences could be attributed to seasonal changes, stress from being handled, and possible differences in study habitat.
- Concentrations of the treatment were well below levels necessary for reduced glycogen stores in native mussels due to the lack of an enclosure around the application area. While this study yielded few effects, it highlighted the importance of a containment system to prevent *Zequanox* from being diluted.

The most recent experiment using *Zequanox* was conducted on Good Harbor Reef near Sleeping Bear Dunes in 2019. This time, researchers laid a plastic tarp over treated areas for up to about 8 hours. The tarp is intended to act as a containment barrier. Results from this study are pending.





# New Mobile Boat Washing Station to Protect Michigan Waterways

Aquatic invasive species are adversely impacting Northern Michigan's lakes, streams, and wetlands, and efforts to identify them and prevent their spread are more important now than ever. That's why Tip of the Mitt Watershed Council has partnered with the U.S. Forest Service, under the U.S. Department of Agriculture, and a range of local lake associations and nonprofit partners to kick off a brand new mobile boat washing station to service local lakes across the region. Our new station will use high-pressure, heated water to effectively clean most invasive species from trailers and boats.

But first, you may wonder, what is an invasive species? According to the State of Michigan, an invasive species is one that is not native and whose introduction causes harm, or is likely to cause harm to Michigan's economy, environment, or human health. Over 185 non-native aquatic organisms have colonized the Great Lakes since the 1800s. Some common aquatic invasive species in our area that the new boat washing station will help to combat are Eurasian watermilfoil, curly leaf pondweed, and quagga mussels, among many others.

Aquatic invasive species can have serious economic and ecological impacts on our region. Ecologically, aquatic invasive species can cause major food web disruptions, native species reductions or loss, water quality degradation, and the introduction of pathogens. According to the Michigan Department of Natural Resources (MDNR), 42 percent of threatened or endangered species are considered at risk due to non-native species.

Economically, the threats are just as grave. According to the MDNR, as of 2017, the Great Lakes region annually lost \$200 million due to the effects of shipborne invasive species on sport fishing, commercial fishing, wildlife watching, and raw water usage. Without concerted community and policy level engagement, this figure is anticipated to rise.

We can do a lot locally to tackle this problem! That's why every weekend from early June through Labor Day, Tip of the Mitt Watershed Council will be educating boaters and washing boats throughout our Northern Michigan service area. We're teaming up with dedicated volunteers from lake associations to help us spread the word and broaden our impact. A schedule of events will be available on our website in the near future. If you'd like to volunteer at a boat washing event in your area this summer, please contact our Watershed Policy and Program Coordinator Ashley Soltysiak at 231-347-1181. Together, we can help to protect the Great Lakes and inland waterways that we cherish here in Northern Michigan.



*Watershed Council's new boat washing station*



Photo Credit: Sylvia Kay



Local ordinances can be used to protect water quality. We want to remind our Charlevoix County members that we have a wonderful resource available on the web that promotes understanding and acceptance of the need for common shoreline protection standards. A few years ago, the Watershed Council teamed up with Land Information Access Association (LIAA) on a grant project to help the 10 jurisdictions on the Lake Charlevoix shoreline coordinate their efforts to protect the Lake. The website is [www.lakecharlevoixprotection.org](http://www.lakecharlevoixprotection.org). It includes pages devoted to each jurisdiction: City of Charlevoix, Boyne City, East Jordan, Bay Township, Charlevoix Township, Eveline Township, Evangeline Township, Hayes Township, Marion Township, and South Arm Township. It also includes recommendations for each to improve protections along with a final report for the project.

**SEPTIC SEMINAR HELD IN NOVEMBER**

For the Love of Water (FLOW) hosted a Michigan Septic Summit in Traverse City on November 6, 2019, in partnership with

sponsoring organizations, including Tip of the Mitt Watershed Council. The Summit was successful with more than 160 attendees.

Grenetta Thomassey, watershed policy director, participated on a panel called Local Efforts to Control Risks. She presented information showing that Michigan is the only state that lacks a uniform sanitary code. Michigan does not require periodic inspection and maintenance of septic systems. Neither do we collect data on existing systems. In Michigan, local health departments set policies for new septic systems. The problem is, once new systems are installed, most on-site septic systems in the State are not legally required to be inspected again. Because there is no requirement for additional inspections, some aging systems have not been replaced, might not be maintained, and could be failing or in danger of failing. The Watershed Council continues to work with local and statewide groups to address this issue. For more information, please visit our website or contact Grenetta at 231-347-1181 ext. 1118.

## Pour for More

Tip of the Mitt Watershed Council was fortunate to be selected by the nonprofit Pour for More to receive donations throughout 2020. What's Pour for More? Pour for More is a collaboration of local beverage establishments, including breweries, coffee shops, cafes, bars, cideries, and wineries to help promote community good works. All throughout the year, the participating establishments make donations to twelve nonprofits. This year the Watershed Council was included. All you need to do to support this fundraiser is find one of the Pour for More Venues, ask for their Pour for More beverage, and enjoy. The participating organizations are listed below.

The Watershed Council kicked off its Pour for More events with an evening at Rare Bird Brewpub in early January. For our second event, we were welcomed into Short's Brewing Company. We collected several donations from generous Short's customers who understand that good beer comes from clean water.

Please stop by the following venues throughout 2020 to try their wonderful food and Pour for More beverage, and help support the Pour for More fundraiser:

- |                                  |                                    |
|----------------------------------|------------------------------------|
| Rare Bird Brewery                | Cultured Kombucha Co.              |
| Short's Brewing Company          | The Workshop Brewing Company       |
| BLK MRKT                         | Chateau Chantal Winery             |
| The Little Fleet                 | Fresh Coast Beer Works & Ubrew     |
| Taproot Cider House              | Homebrew Supply                    |
| Earthen Ales                     | Mama Lu's - A Modern Day Taco Shop |
| Oryana Community Co-op           | MiddleCoast Brewing Company        |
| The Filling Station Microbrewery | Tandem Ciders                      |
| Poppycocks                       | Red Spire Brunch House             |
| Brewery Terra Firma              |                                    |



# UPCOMING EVENTS

Although we would love for you to attend our events, the recent health crisis has been challenging for everyone. We ask that you please contact the Watershed Council at 231-347-1181 before planning to attend, or check our social media sites on Facebook and Twitter for updates. Thanks so much for your understanding.

July 18, 8 a.m. to 2 p.m.

## Whale of a Sale, a huge rummage sale for water recreation lovers

Irish Boat Shop Storage Unit,  
7580 S. State Rd., Harbor Springs

July 23, 9 a.m. to noon

## Annual Meeting

Bay View Inn and the Bay View Association.  
Come learn about the benefits of rain gardens and other Watershed Council initiatives, and take a tour of the Bay View Association rain gardens. Members can register for this event at [www.watershedcouncil.org](http://www.watershedcouncil.org).

## STAY TUNED: Adapting to Great Lakes Water Levels

Thanks to the Charlevoix County Community Foundation, the Watershed Council received funding to respond to the urgent issue of high lake levels. In partnership with local, state, and federal partners, we will host a series of educational events, including workshops in Charlevoix and Beaver Island, and a webinar, to provide information to shoreline residents on how to appropriately deal with current high water levels. We will also help communities make more informed and comprehensive long-term decisions by clarifying current thinking on how Great Lakes water levels are projected to change, and describing an approach for incorporating variation in future lake levels into a decision framework. Look for more information on these initiatives soon on our website and social media.

CHARLEVOIX COUNTY COMMUNITY  
FOUNDATION



Giving Back. Moving Forward.

## Putting Water First in Little Traverse Bay

Tip of the Mitt Watershed Council is pleased to announce that we've recently been awarded a Water First grant for the Little Traverse Bay Watershed on behalf of the Great Lakes Protection Fund and the Council of Michigan Foundations. This unique project is part of the Great Lakes One Water Partnership, which is designed to advance collaborative water projects to help secure a sustainable water future for the Great Lakes Basin. The Upper Lake Michigan Region portion of this effort is called "Water First." The focus of the Watershed Council's project is to enhance green stormwater infrastructure throughout the Little Traverse Bay Watershed. Target areas for watershed improvement could range from strengthening local ordinances and bolstering public education efforts, to hosting contractor training opportunities and increasing water quality monitoring in the area. Over the course of the next year, the Watershed Council will work with a diverse group of stakeholders to develop policy and water quality protection measures to help preserve the beautiful Little Traverse Bay Watershed.



Photo Credit: Kristy Beyer

## Growing Green Infrastructure Grant

Tip of the Mitt Watershed Council is excited to receive a grant for our proposal, Growing Green Infrastructure Awareness in the Little Traverse Bay Watershed, thanks to the Petoskey-Harbor Springs Area Community Foundation's Little Traverse Bay Protection and Restoration Fund. Watershed Council staff will be working with the City of Harbor Springs to implement a hands-on rain garden workshop and develop conceptual green infrastructure plans for the City. Stay tuned for more details and announcements for the workshop.



Petoskey-Harbor Springs Area  
community foundation



## Welcome New Members!

New Members since 9/30/2019

Ms. Mary Margaret Abood  
Mr. and Mrs. Melvin C. Aschenbrenner  
Joe and Kathy Audia  
Mrs. Patricia R. Baker  
Mr. and Mrs. John B. Beery  
Louis and Chris Bell  
Shaun and Shauna Bezilla  
Richard J. and Susan Bingham  
Thomas and Collette Bouwhuis  
Michelle Palmer and Margaret Cadieux  
Stephen Calkins  
Tim and Marimartha Clark  
Tec Cummings  
Bonnie Dawson  
Ms. Marguerite Demmer  
Mr. and Mrs. Pat Dougherty  
Bizzy Driscoll  
Mr. and Mrs. Thomas J. Durfee  
Mr. and Mrs. R. David Eick  
Mr. and Mrs. Ronald Faupel  
William and Birute Fleck

Matthew Glaser  
Pam and Bill Gnodtke  
Mr. and Mrs. Gregory G. Gorno  
Sheila Harkaway  
Lawrence and Kathleen Hintz  
Mark and Kathryn Jarvie  
C. Christopher Jones  
Mr. Christian Kindsvatter  
Mr. and Mrs. William F. Klco  
Vern and Laura Kors  
Mr. and Mrs. Richard Kowalski  
Dr. John Lignell  
Lowell and Sue Loweke  
Mr. and Mrs. William Martin  
Dan Mayhew  
John and Marylou McIlwraith  
Mr. and Mrs. Edward McLaughlin  
Meriel C. Meehan  
Caroline E. Moellering  
Robert and Elizabeth Mueller  
Mr. and Mrs. M. Richard Olsaver

PARLake, LLC  
Larry and Linda Pelowski  
Thomas and Barbara Pickett  
Dr. and Mrs. Roger L. Plummer  
Mr. and Mrs. Brett Schneider  
Theresa Schurman  
Mr. Chris Shepler  
Karla L. Sherman  
Alan and Stacy Sollenberger  
Mr. and Mrs. Thomas Sothard  
Mr. and Mrs. Frederick W. Stehr  
Mr. Larry Thomas  
David and Laurie Valasek  
Ben and Erika van Dam  
Adam and Jennifer Waldo Wright  
J. Patrick and Debby Wright  
Philip and Shelley Zalewski

## Tribute Gifts

### In Honor of...

Caroline Keson  
*Charlevoix Public Library*  
*Petoskey Regional Audubon*

Chase and Jena Offield  
Eric Blesi  
Mr. and Mrs. Alex Taylor  
Mr. and Mrs. James Fabiano  
Mr. and Mrs. James Ramer  
Mr. and Mrs. Michael Pettibone  
Mr. and Mrs. Steven Nowrocki  
Mr. and Mrs. Thomas Prior  
Nick White  
Robert Sears  
*Evening Star Joinery*

David and Pam Johnson  
Tim and Kristine Weaver  
*Nicholas White*

Jennifer Buchanan  
*Allene T. Carlile*

Linda Badalucco  
Nancy and Brian Nowitzke  
*Linda Heller*

Mr. and Mrs. E.J. Frey, Jr.  
*David M. Culver*

Sue Maxey-Hovey  
*Jim and Therry Colombo*

Jennifer McKay  
*Roland J. Watts*  
*John H. Zobus*

#overboardchallenge  
*Michigan Overboard*

### In Memory of...

Jacquelyn Bell  
John Kromer  
*Birchwood Association of Mullett Lake*

Lee Albrecht  
*Suzanne L. Kasten-Schell*

Marlou Johnson  
*Karen Michaels Niemi*  
*Britta Campton*

Mary Behrens Sorrell  
*Clifton B. Sorrell*

Mary Frances Weber  
*Jeffrey Rogers*  
*Fred Malpass*

Mary Grauel Webber  
*Jamie Lynch*

Terry Stinson  
*Elaine and Bowden Brown*

Vesi  
*Michael Nuorala*

## Your financial support helps fund:

- Education & Outreach Programs
- Monitoring & Research Programs
- Policy & Advocacy Programs
- and so much more!



Non-Profit Org.  
USPS Mktg.  
Mail  
Petoskey, MI  
Permit No. 108

## Community Collection Events

Visit [www.pillsinthepod.com/locations](http://www.pillsinthepod.com/locations) for complete details. These events may be subject to change, so please be sure to check the website before stopping in.

**Friday, June 12, 2020** 5:00 – 8:00 p.m.

**Saturday, June 13, 2020** 9:00 a.m. – 1:00 p.m.

Charlevoix County Road Commission Garage  
11705 Shaw Road, Charlevoix

**Wednesday, July 8, 2020**

9:00 a.m. – 1:00 p.m.

McLaren Northern Michigan, Cheboygan Campus  
Entrance North of the Emergency Department

**Wednesday, July 15, 2020**

7:00 a.m. – 4:00 p.m.

McLaren Northern Michigan, Petoskey Campus  
Hospital Circle Drive off Mitchell Street



This newsletter contains information worth sharing.

When you're done reading it, don't throw it out.

**Pass it on!**

ADDRESS SERVICE REQUESTED



*Jen*



*Ashley*



*Molly*

## Announcing our New Staff

Tip of the Mitt Watershed Council welcomes three new staff members: Jennifer DeMoss, Ashley Soltysiak, and Molly Voorheis.

Jen joined the Watershed Council in January 2020. As the communications director, Jen is responsible for public communications about Watershed Council initiatives. Jen became interested in science communication during her time as a doctoral student at the University of Georgia, where she graduated in fall 2019. She also participated in the American Association for the Advancement of Science Mass Media Fellowship in summer 2019. She is very happy to participate in conversations about the Northern Michigan waters she loves so dearly.

Ashley joined the Watershed Council as watershed policy and program coordinator in January of 2020. She holds a degree in Environmental Biology and Zoology from Michigan State University and a Master of Public Administration from Cornell University. After leading international and domestic research teams, she directed environmental policy campaigns for HEAL Utah and the Utah Sierra Club. When she isn't working to protect Northern Michigan's watersheds, you'll find her snowboarding, backpacking, or exploring the north country with her trusty dog, Jim Bridger.

Molly joined Tip of the Mitt Watershed Council in March 2020 as the business manager. She is a graduate of Calvin College and taught in the Forest Hills Public School System for ten years. She also obtained her master's degree in Holocaust and genocide studies from The Richard Stockton College of New Jersey. Molly has a love for all animals, and especially dogs. In her spare time, you will find Molly enjoying a concert, befriending a dog, or fighting for the underdog.