

Enbridge Submits Tunnel Applications - Opportunities for Participation

Michigan Public Service Commission Permit Application

Enbridge submitted an application in April to the Michigan Public Service Commission (MPSC) under the law that governs oil pipeline siting to approve the construction of a new pipeline in a proposed tunnel beneath the Straits of Mackinac.

Without approval, Enbridge cannot proceed with its plans to construct a new pipeline underneath the Straits. Given the magnitude of the decision that will be made by the MPSC, Tip of the Mitt Watershed Council, in partnership with Michigan Environmental Council (MEC), National Wildlife Federation (NWF), and the Grand Traverse Bay Bands of Odawa Indians (GTB), have formally intervened to become a party to the case.

By intervening, we will ensure that the Great Lakes and citizens of Michigan are adequately represented, and that Michigan laws are fully met. We will make sure there is robust analysis of the impacts of the tunnel and the risks to Michigan's waters from operation of an oil pipeline for another 99 years. The process will take months of technical analysis with thousands of pages of documents, testimony, and legal papers submitted. In the end, we fully intend to provide proof that the Michigan Public Service Commission needs to stand up for Michigan's citizens and the environment. It is critical for the Watershed Council, MEC, NWF, and GTB to intervene in the administrative action in order to ensure that a sound decision, supported by policy and law, is made to protect the Great Lakes and Michigan's citizens.

You can help protect Northern Michigan from the risks of Line 5. Please consider giving to the Watershed Council today to help pay for expert witnesses and legal fees needed in the MPSC intervention. Include "Enbridge MPSC" on the memo line of checks. You can also donate by calling (231)-347-1181. Your support is vital to our success!

The MPSC has launched a dedicated website to enable the public to monitor Enbridge's application. For more information regarding Enbridge's application before the Commission, or to learn more about the Act 16 process and ways to participate, please visit www.michigan.gov/MPSCLine5.

Michigan Department of Environment, Great Lakes, and Energy/ U.S. Army Corps of Engineers Permit Applications

Enbridge also submitted permit applications to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and U.S. Army Corps of Engineers (USACE) for the Straits of Mackinac Tunnel Project.

EGLE has deemed Enbridge's application for the Tunnel Project administratively incomplete and has requested additional information from the company. In particular, Enbridge must submit a complete assessment of the alternatives, outline plans to mitigate damage the Tunnel Project could cause to wetlands and federally-protected plants, offer details about ongoing lawsuits that could affect the tunnel's fate, and add other missing pieces to the application.

The USACE, on the other hand, is moving forward. On May 11, 2020, the U.S. Army Corps of Engineers issued the public notice for Enbridge Energy's application for the proposed oil pipeline tunnel project beneath the Straits of Mackinac. The original notice provided only a limited twenty day public comment period, which began May 15 and ended on June 4, 2020. Tip of the Mitt Watershed Council led the effort requesting that the USACE extend the public comment period and require a public hearing be held when it is safe to convene members of the public after the risk of COVID-19 transmission subsides. The comment period now ends on July 14, 2020.

We will need all of our members who care about the health of Northern Michigan's waters to participate in the public comment periods available for Line 5, including the MPSC, EGLE, and USACE. For information on how to effectively participate in the pipeline permitting process, we have webpages with valuable information and tools available at <https://www.watershedcouncil.org/pipeline-permitting.html>. We also have the guidebook Pipeline Permitting in Michigan - Citizen Involvement in the Decision-Making Process. This is available for download on our website, or hard copies are available by contacting our office at (231)-347-1181 or info@watershedcouncil.org.

Together, we can help protect the Great Lakes and citizens of Northern Michigan!



426 Bay Street, Petoskey, MI 49770
(231) 347-1181 • (231) 347-5928 fax

www.watershedcouncil.org

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Reflections From Our Executive Director

Watershed Council Programs Continue Through COVID-19

As must be apparent to all of our readers, the recent outbreak of the novel coronavirus has dramatically altered daily operations of the Watershed Council and our lives. First, concern for the health of family members, friends, and our community has come to the forefront of our minds. The stay-at-home order required us to change the ways we interact as we balance safety with our efforts to support and protect clean, healthy Michigan waters. Luckily, our staff is resourceful, and we've found ways to continue the work you depend upon despite restrictions.



Gail Gruenwald
Executive Director

Much of the work we normally perform in person is now taking place virtually, from advisory meetings to gatherings with government officials. However, with these challenges have come opportunities to diversify our offerings. Our Annual Meeting will be held on Zoom, with a virtual presentation by Watershed Protection Director Jen Buchanan about green infrastructure, including a video on rain gardens. Rather than holding our annual Bear River Cleanup in person, we are hosting a week-long volunteer cleanup featuring water bodies near you. Staff have also taken this opportunity to work on a training video for volunteer lake monitoring, with more in the works.

Recent changes haven't stopped our Watershed Protection Team. They have been diligently working on stormwater monitoring, analyzing data, and planning for the summer field season. Keep an eye out for our mobile boat washing station at a lake near you this summer. Our crew can help you prevent the spread of aquatic invasive species by cleaning your boat.

The Policy and Advocacy Team has also been hard at work. We are wrapping up a comprehensive social indicator survey measuring attitudes, beliefs, and behaviors regarding water resources in the Lake Charlevoix Watershed. We are hard at work on Enbridge Line 5 (see cover story), and we are working hard to educate residents and government officials about high water levels.

While we were sad that school was cancelled, along with some fun events, our Water Resources Education Coordinator Eli Baker is making the most of his time. He's been collecting data for the Watershed Academy program, and creating online content for teachers to use in virtual lessons.

Due to the stay-at-home order, some of our grants have been delayed. We thank our generous members, many of whom recently increased their donations, for making it possible for our staff to continue their vital work.

We are working on finding ways to return to the office while also protecting our most vulnerable staff, and we appreciate your patience. We are still monitoring our phone messages and email, and we want to be as responsive to your needs as possible. Thank you so much for your support during these uncertain times.



Welcome Interns

Summer brings us many great things, including interns! This summer, we have three wonderful interns at the Watershed Council, two of them returning after working with us previously.

First, you may remember Elizabeth Michaelson, or Lizy, who worked with us during the summer of 2018. Lizy is back to work with our Watershed Protection (WP) Team. She is a senior at University of Michigan and expects to graduate in December with a Bachelor's degree in Earth and Environmental Science. In her spare time, Lizy is an environmental activist. When she's not passionately spreading awareness about issues she cares about, you can find her swimming in a lake, getting some sunshine, or gardening.

Next, Garrett Greer is back with the WP Team after working with us last summer. Garrett graduated from North Central Michigan College with an Associate's Degree in Environmental and Sustainability Studies. He is currently attending Delta Community College, working toward a Bachelor's degree in Environmental Studies. Garrett enjoys hunting, trail riding, kayaking, and hiking. Anything that gets him outside is his favorite thing to do.

Finally, we have a new intern, Hadley Haas, working with the Policy & Advocacy Team. Hadley attends Grand Valley State University. She is working on a Bachelor's degree in Environmental and Sustainability Studies, with a minor in Advertising and Public Relations. Hadley expects to graduate in 2022. In her free time, she likes to go hiking, fish, read, or play a pickup game of soccer.

We are pleased to welcome them all!



RESOURCES

New High Water Level Resources Available

Thanks to generous funding from the Charlevoix County Community Foundation and the Petoskey-Harbor Springs Area Community Foundation, Tip of the Mitt Watershed Council has new resources available to assist property owners with rising high waters.

We have multiple fact sheets covering Great Lakes water levels, shoreline protection measures, home moving, and inland lake flooding concerns, such as septic system failure and drinking water contamination. The fact sheets are available for download on the Watershed Council website, www.watershedcouncil.org, or you can obtain hard copies or email copies by contacting the Watershed Council at 231-347-1181 or info@watershedcouncil.org.

In addition, the Watershed Council held a webinar, "Rising Water Levels in Northern Michigan: A Webinar for Shoreline Property Owners," on Thursday, May 14, 2020. The webinar featured experts from the U.S. Army Corps of Engineers, Michigan Department of Environment, Great Lakes, and Energy, and the Charlevoix-Cheboygan-Emmet Office of Emergency Management. It provided shoreline property owners with guidance in addressing high water issues in a manner that is ecologically and economically responsible. A recording of the webinar is available on the Watershed Council website, www.watershedcouncil.org/great-lakes-water-levels.html.

Watershed Council staff are also available for individual Zoom meetings or webinars with lake associations that may be interested in learning more or obtaining more information. If you are interested, please contact our policy director, Jennifer McKay at info@watershedcouncil.org.

Input on the Future of Lake Street Dam Sought

Thanks to support from the Great Lakes Fishery Trust, Tip of the Mitt Watershed Council embarked upon an engineering alternatives study for the Lake Street Dam, the lowermost barrier on the Bear River in Petoskey. Tip of the Mitt Watershed Council has enlisted OHM Advisors, an architecture, engineering, and planning firm with local offices, to conduct the study on behalf of the City of Petoskey, which owns the dam. The project has allowed representatives of the Michigan Department of Environment, Great Lakes, and Energy (EGLE), U.S. Fish and Wildlife Service (USFWS), Little Traverse Bay Bands of Odawa Indians (LTBB), other resource groups, and community members to weigh in on potential alternatives, including replacement, removal, or modification of the structure. If the existing concrete structure, estimated at over 100 years old, were to be modified or removed, more native and desired fish species would be allowed to pass upstream to valuable spawning habitat.

Preliminary design alternatives include modifying the height of the structure to allow for improved fish passage, while incorporating permanent or seasonal barriers to prevent the upstream migration of invasive sea lamprey. Other options include removing the structure altogether and installing a separate upstream barrier, at a point to be determined, that would serve as a sea lamprey barrier. Lastly, the option to keep the structure in place remains a viable option.

Ultimately, the study will provide critical information to help direct the management of the dam, while taking into account stream health, the Bear River and Little Traverse Bay fisheries, safety, cost, and recreational opportunities.

As part of the engineering study, project partners are looking for community input from anglers, paddlers, and others who value and spend time enjoying the Bear River. An initial public survey conducted in the fall, along with a public open house, yielded several key results:

- The majority of respondents (54.95%) spend their time fishing on the Bear River.
- Of those, the majority (23.08%) fish primarily for steelhead trout. However, many of those anglers would utilize additional fishing platforms to fish for other species, if made available.
- The majority of anglers who responded (39.56%) are mostly concerned with the Bear River fishery as it relates to the future management of the Lake St. Dam.
- The majority of anglers (40.66%) believe that if the structure were removed or modified for increased fish passage, they would catch more fish altogether.
- For paddlers, those who responded (28.56%) believe they would paddle through to the bay if the existing structure were modified or removed to allow for safe passage.

A second public open house was hosted on June 23 via Zoom. OHM Advisors, the Watershed Council, resource agency representatives, and the City of Petoskey shared more detailed information regarding the alternative engineering options. A recording of the open house is available for viewing at <https://tinyurl.com/LakeStreetDamPetoskey>. The city will use the information gained through the study to inform future management of the dam.





Making the Connection Between Shoreland Stewardship and Good Water Quality

What exactly does it mean to practice good shoreland stewardship? It means considering all aspects of how you maintain your riparian property and how these practices may affect the health of our lakes and water quality. That includes preserving, protecting, and restoring critical vegetation along the shoreline and within the buffer zone, maintaining your septic system, refraining from applying fertilizer within 35 feet of the water's edge, capturing stormwater runoff and encouraging it to soak into the ground, and so much more. It means making the connection between us and the waters we love.

Shoreland stewardship applies to all four zones of what is known collectively as the shoreland. These zones include the lake, shoreline, buffer, and upland. The lake zone includes the open water portion of the lake that abuts the land. The shoreline zone includes the area where the lake meets the land. The buffer zone is the area that extends from the shoreline landward for approximately 35 feet. The upland zone extends from the edge of the buffer zone to the most landward edge of your property, which varies depending on the depth of your lot. This zone typically includes most of the structures such as the house, driveway, and garage.

There are many best stewardship practices for these zones, and their collective impact is essential for maintaining the high-quality lakes of Northern Michigan. We encourage you to visit www.mishorelandstewards.org to learn more about good shoreland stewardship practices. In the meantime, here are a few highlighted practices that every riparian property owner should know and practice to keep our lakes healthy for your enjoyment and for the benefit of the fish and wildlife that depend upon them.

Lake:

Maintain any beds of aquatic plants growing in nearshore areas. If you need to remove them for swimming, wading, and boat access, minimize the amount you remove as they help protect the shoreline from waves while providing essential habitat for fish, aquatic insects, and other wildlife. Removal of aquatic plants may require a permit by the Michigan Department of Environment, Great Lakes, and Energy if certain conditions apply. Please visit https://www.michigan.gov/documents/deq/WRD_WLSU_Vegetation_Removal_Handout_May_2018_FINAL_622133_7.pdf and www.michigan.gov/lakesandstreams for more information.

Shoreline:

Minimize any disturbance to the shoreline zone, but avoid adding beach sand or using sea walls. Altering the shoreline can accelerate erosion from waves and ice to both your and your neighbors' properties. Alterations can also degrade water quality and prevent shoreline-dependent species from accessing land and water, which is critical to their survival.

Buffer:

Maintain a robust greenbelt of native vegetation along at least 75% the length of your shoreline and extend the vegetative buffer a minimum of 35 feet from the shoreline zone. The best greenbelts include a variety of trees, shrubs, and herbaceous plants like sedges, non-turf grasses, and wildflowers that hold shoreline soils in place, provide cooling shade, and offer habitat to shoreline and buffer-dependent species of wildlife, including frogs and turtles.

Upland:

Minimize the amount of impervious surfaces, including buildings, walkways, driveways, and other infrastructure that prevent the infiltration of runoff. If runoff is draining from these surfaces, consider directing it to a rain garden or other landscaped area that can capture it and encourage infiltration into the ground where pollutants, such as nutrients and sediments, can be filtered before entering the lake.

Thank you for doing your part to practice good shoreland stewardship! Please visit www.watershedcouncil.org and www.mishorelandstewards.org for more great information.



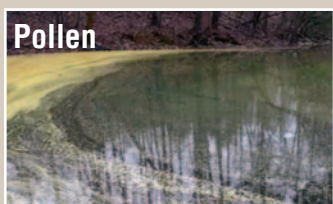
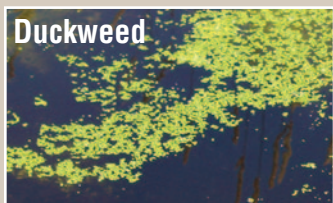
Harmful Algal Bloom Complaints Creep North

While algae, bacteria, and plants are normal inhabitants of lake ecosystems, sometimes they can grow excessively and become harmful. Specifically, colonies of a particular kind of cyanobacteria (also known as blue-green algae) can produce toxins that are harmful to humans, pets, and other animals. The algae are called microcystis, and the toxin they produce is called microcystin. The result is a harmful algal bloom (HAB). Microcystin is a toxin that mostly affects the liver if ingested in large doses. Externally, it can produce a skin rash or other irritations. If ingested, it can cause gastrointestinal symptoms, and inhalation of water droplets containing microcystin can irritate the eyes and throat. While there have been no human deaths from microcystin, dogs, wildlife, and livestock have died following exposure. In the past few years, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) has taken the lead in responding to HABs in Michigan.

Worldwide, HABs are increasing in their frequency, magnitude, and intensity. A recently published EGLE report found that HAB complaints in Michigan are increasing, and suggests that increased attention to HABs plays a part. HABs are not a widespread problem across Michigan, but are more likely to occur in southern Michigan. Lakes with a water control structure, such as a dam, accounted for the majority of lakes with blooms in the last few years. Large human populations, development along riparian areas, climate change, intense agriculture, and urban land use all contribute to the risk of HABs. Some research points to zebra mussels as the culprit in lakes with seemingly good water quality. Zebra mussels filter particles out of the water, allowing sunlight to jumpstart algae growth. They don't eat microcystis, allowing the algae to grow without competition. Zebra mussels can also release nutrients such as phosphate and ammonia into the water, giving algae another boost.

It is difficult to predict when HABs will occur for a few reasons. The genes of microcystis populations differ from lake to lake, causing them to react slightly differently to changes in water quality. Also, the chemical make-up of algae changes within lakes over the summer. Usually when HABs occur in lakes, they are localized, not lake-wide. Once EGLE receives a HAB complaint, they alert the Michigan Department of Health and Human Services, which alerts local health departments and lake associations.

Below are some ways to identify HABs.



Not A Harmful Algal Bloom

Individual leaves (3-5mm) floating on the surface of the water
Likely duckweed

Attached to rocks or you can pick it up with a stick
Likely *Cladophora*, another kind of algae that grows in hair-like strands

Yellow
Likely pollen

Turquoise like the Caribbean Sea
Clear water mixed with limestone deposits causes this beautiful phenomenon

Maybe a Harmful Algal Bloom

- Small, green, pinhead-sized particles that collect in a layer on the water's surface in calm weather
- Looks like a paint spill or pea soup
- Water is brownish-green, milky green, or bluish
- Forming clumps, smells like grass clippings or rotting garbage



Photo: Todd Marsee, Michigan Sea Grant

If you suspect an algal bloom...

DO

Email algaebloom@michigan.gov with the location and a picture.

If you suspect you or your pet have come into contact with an active bloom, call the MI-TOXICS and Health hotline at 1-800-648-6942.

You can also call the Michigan Department of Agriculture and Rural Development for pet concerns at 1-800-292-3939.

Remember: not all algal blooms are harmful, but we can't know for sure unless the bloom is tested for the microcystin toxin.

DON'T

Don't swim and don't let pets drink the water of a bloom.

Don't sample the bloom yourself.

Volunteer Monitoring: Weathering the Storm

We've had to make a few changes to our volunteer programs this year due to uncertainty and concerns surrounding COVID-19. First, Volunteer Stream Monitoring was cancelled. Our stream monitoring normally happens in the second half of May, which regretfully fell in the middle of Michigan's stay-at-home order. We hope to be able to offer stream monitoring in the fall, with at least a refresher training video for returning volunteers, and possibly an in-person training for new volunteers.

Volunteer Lake Monitoring is proceeding as it normally would. However, there was no solicitation for new volunteers and veteran lake monitors were mailed their supplies. There may be some delay because of boats and docks getting into the water late, but we're confident we'll get another summer of data. Volunteer Botulism Monitoring is on for the late summer and fall but new volunteers will be solicited with an online training video and outreach. Existing volunteers will be mailed their supplies.

Thanks to our volunteers for their commitment to protecting local lakes and rivers—we really couldn't do it without you. We are excited to meet new volunteers when the time is right, and we'll be ready for you!



Two volunteer stream monitors helping to collect valuable data for the Watershed Council in 2019.

Participating in Democracy During the COVID-19 Crisis

Good governance and wise outcomes depend on each citizen's ability to participate fully in democracy through robust public involvement in important policy questions. Public participation contributes to better decisions because decision makers have more complete information in the form of additional facts, values, and perspectives obtained through public input.

However, as COVID-19, the disease caused by a novel coronavirus, has spread throughout Michigan, opportunity for full and meaningful public participation has become hindered. COVID-19 has created emergency and disaster conditions across the state, resulting in a state of emergency and a state of disaster being declared across the State of Michigan. This has limited gatherings and travel and required workers who are not necessary to sustain or protect life to remain at home. It is extremely challenging, if not impossible, for individuals to provide public comment or to devote resources toward engagement in public processes when there are more pressing health and family concerns.

Recognizing the importance and value of public participation and the difficulty imposed by COVID-19, the Watershed Council has been actively working to ensure the public's

voice remains heard. We had multiple discussions with Governor Whitmer's office, the Environmental Justice Public Advocate, and Michigan Department of Environment, Great Lakes, and Energy. We encouraged that permit review and public comment periods be delayed or extended, and that public hearings must be held in person.

Our goal is to ensure that all Michigan citizens in every community who are interested in participating in the public comment process have ample opportunity to offer their views on permit applications, including at public hearings.

Many of the permit applications of greatest concern are related to Enbridge's Line 5 Tunnel Project (see the cover story), but we are concerned about any permit application that requires full and proper public engagement as required by law.

We will continue to work with the state and federal governments to make sure that your voice is heard, through COVID-19 and beyond. We strive to ensure, above all, that those affected by a public policy decision can affect that decision.

Comprehensive Water Quality Monitoring Shows Lakes on the Rebound

Since 1987, the Watershed Council has tracked the health of Northern Michigan's waters, monitoring on a 3-year schedule. 2019 marked the 11th round of comprehensive water quality monitoring for water bodies in our service area. This extensive dataset now spans over three decades, and includes 57 different water bodies. The data we collect helps us assess the quality of water for different uses, including aquatic life, ecosystem services, fishing, and recreation. These uses are called "designated" or "desired" uses, and each lake and river has its own designations, assigned by federal, state, and tribal law.

What Kind of Data do We Collect?

Dissolved oxygen is perhaps the best indicator of water quality. Dissolved oxygen (DO) is simply the amount of oxygen that is dissolved in the water. A dissolved oxygen level that is too high or too low can harm aquatic life and affect water quality. Levels of dissolved oxygen vary depending on a variety of factors, including water temperature, time of day, season, depth, altitude, and rate of flow. Human factors, such as the addition of sewage and nutrients, water flow changes, increase in water temperature, and the addition of chemicals can also affect dissolved oxygen levels.

Conductivity is a measure of the ability of water to conduct an electric current, which is dependent upon the concentration of charged particles (ions) dissolved in the water. Significant increases in conductivity may be an indicator of pollution. Many products associated with human activities, such as deicers,

water softeners, fertilizers, and bleach, contain chloride and other ions. Conductivity levels in lakes and streams tend to rise as population and human activity in a watershed increase.

Temperature is another important measurement that reflects water quality. Water temperature is a governing factor for aquatic life: it controls the rate of metabolic and reproductive activities, and therefore, life cycles. For example, trout and other coldwater aquatic organisms require water below 68°F to thrive. Water temperature is also a driving force behind algae and plant growth, which provide the base of the food chain for all organisms. Vegetation removal, impoundment, and industrial use can raise water temperatures, resulting in impacts to aquatic ecosystems.

We use pH to measure the concentration of hydrogen ions. The pH scale ranges from 0 to 14, with a pH of 7 considered neutral. A pH of less than 7 is acidic and a pH of greater than 7 is basic. As a measure of alkalinity or acidity of water, pH tells us a great deal about our lakes and rivers. In lakes, pH can be lowered by decaying organic matter, which produces carbon dioxide (CO₂), an acidifying gas. Rivers and streams with high or low pH readings often indicate that acidic or alkaline pollutants are entering the water body. State water quality standards require Michigan waters to fall between 6.0 and 9.0, a range acceptable for native fish and plants.

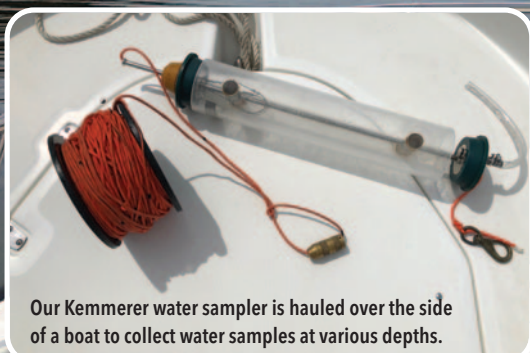
Chemical Monitoring

Chloride, a component of salt, is naturally present at low levels (typically less than 5 milligrams per liter [mg/L]), in Northern Michigan surface waters. Chloride is a reliable indicator of human activity in a watershed because many products associated with people contain chloride (e.g., deicing salts, water softener salts, fertilizers, and bleach). Furthermore, chloride is not removed by chemical or biological processes in soil or water and, therefore, persists over time.

Tools on Board



A new probe (and 300 foot-long cord) measures pH, temperature, depth, conductivity, and dissolved oxygen.



Our Kemmerer water sampler is hauled over the side of a boat to collect water samples at various depths.

Phosphorus is usually the most important nutrient in terms of aquatic ecosystems and nutrient pollution. It is the greatest variable for change for algae and plant growth. It directly influences biological productivity (the generation of the total amount of organisms) in most of our lakes and streams. Excessive phosphorus inputs can cause problematic algal blooms and nuisance aquatic plant growth, which has led to legislation banning it in soaps, detergents, and fertilizers.

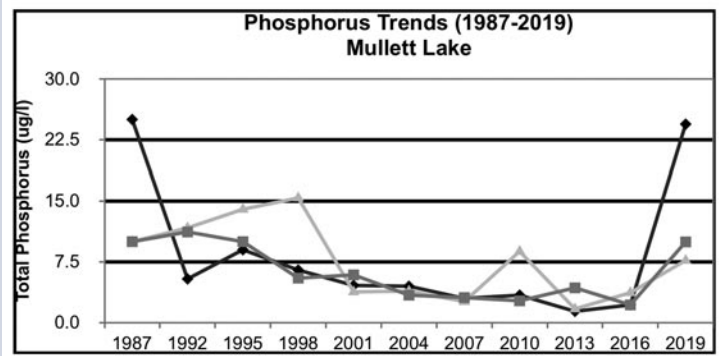


Figure 1. Mullett Lake is an example of a lake that has seen a marked decrease in phosphorus corresponding to a zebra mussel invasion in the late 1980s and early 1990s. Mullett Lake phosphorus levels have recently started to rebound with an increase in 2019.

Nitrogen is an abundant element throughout the earth’s surface and is a major component of all plant and animal matter. It is also generally abundant in our lakes and streams. Nitrogen can enter water through nonpoint source pollution, including fertilizers. Measuring concentrations of total nitrogen in water bodies helps to detect nonpoint source pollution. Nitrate, a biologically-available form of nitrogen, can stimulate excessive plant growth in surface water.

2019 Monitoring Results and Trends

We are lucky to have some of the state’s cleanest water, fed from abundant springs and pristine watersheds. On some water bodies, our data has remained consistent with the first readings taken in 1987. For these water bodies, the baseline of data serves as a tool to ensure future protection. In other waterways, impacts from human activities are evident, as pollutant values have increased over time.

The data is used in a variety of ways. Data showing water quality concerns is included in watershed management plans, which helps guide protection and restoration efforts within a watershed. The data is also used as a “report card” to encourage water-friendly management practices around lakes and rivers. Government entities may find important evidence to enact water quality laws, standards, and ordinances. Water quality data can also be used to show improvements gained from restoration and green stormwater infrastructure. The state can use water quality data to pursue enforcement action in water bodies that are not clean enough to support designated uses.

Summary

We know if water quality is good or bad by using a set of criteria to assess if the water can meet the uses of fishing, swimming, recreation, habitat, etc. The criteria stems from federal and state laws and recommendations, specifically the Clean Water Act of 1972 and recommendations created from (you guessed it) data collected over large spans of time and geographic regions. We use criteria from both Michigan standards and U.S. Environmental

Protection Agency (EPA) ecoregion (or ecosystem region), along with references to trends in our own area.

Of the 56 water bodies monitored in 2019, here’s what we found. On the following scale of one to five raindrops, one raindrop indicates that few or no water bodies are meeting criteria, and five indicate that all or most water bodies are meeting criteria. We found that most or all water bodies had good dissolved oxygen, temperature, pH, conductivity, and chloride. Slightly less than half of water bodies did not meet criteria for total nitrogen, and three water bodies did not meet phosphorus criteria.

Parameter	Score (symbolized with raindrops)
Dissolved Oxygen	
Temperature	
pH	
Conductivity	
Chloride	
Total Nitrogen	
Total Phosphorus	

What does this data tell us?

Overall, water quality in Northern Michigan is good. Nearly all water bodies met criteria for dissolved oxygen, temperature, pH, conductivity, and chloride. A large number of lakes saw increased nitrogen in 2019, although it’s unknown why. Phosphorus, which is called a “limiting nutrient,” is the nutrient most likely to change water quality. Its naturally small quantities coupled with high demand from plants and algae makes increases of phosphorus a larger concern. Increases in phosphorus could be attributed to the recent decline of zebra mussels, which were introduced to the Great Lakes in the 1980s. Zebra mussels consume vast quantities of algae and zooplankton from the water column. They contributed to a decrease in biological productivity in many lakes in 1990s, but they’ve now eaten themselves out of house and home. The scarcity of their food leaves us with clear water and dead zebra mussels. We can document the decrease in biological productivity with total phosphorus. Nearly one quarter of lakes tested are rebounding from the decreased total phosphorus in years past. Our future monitoring will keep gauge whether these lakes return to their pre-zebra mussel nutrient levels, and may be a useful tool in detecting changes from other invaders.

Table 1. Individual 2019 surface data for all sites in the Comprehensive Water Quality Monitoring Program. Results that met criteria for good water quality are shown in green and results that did not meet criteria are shown in red. Assessment criteria included State standards, EPA ecoregion criteria, and regional trends.

Water Body	Date	Dissolved Oxygen (mg/L)*	Specific Conductivity (µS/cm)*	pH (units)	Nitrate-Nitrogen (µg/L)*	Total Nitrogen (µg/L)*	Total Phosphorus (µg/L)*	Chloride (mg/L)*
Bass Lake	5/12/2019	10.94	323.50	8.36	119.7	732	17.4	3.37
Bear River	5/14/2019	10.15	328.60	8.06	54.9	471	4.9	12.38
Bellaire Lake	4/22/2019	11.97	371.90	7.99	427.0	861	6.2	10.88
Ben-way Lake	5/3/2019	10.82	337.80	8.02	288.5	473	9.1	7.60
Birch Lake	4/21/2019	11.32	326.30	8.20	279.9	809	13.7	8.06
Black Lake	5/21/2019	11.04	299.70	8.27	28.3	603	5.9	4.63
Black River	5/21/2019	10.05	310.50	8.11	20.8	372	4.2	3.72
Boyne River	5/6/2019	9.92	415.80	8.07	368.0	942	1.1	11.86
Burt Lake	5/17/2019	11.52	323.00	8.20	110.2	331	5.6	10.10
Charlevoix, Main Basin	5/6/2019	12.98	340.80	8.15	457.2	536	1.8	11.03
Charlevoix, South Arm	5/7/2019	12.29	335.70	8.19	634.1	759	4.9	9.34
Cheboygan River	5/21/2019	11.34	317.80	8.29	61.4	448	1.9	8.29
Clam Lake	5/3/2019	11.88	369.70	8.14	<5	720	4.7	4.11
Crooked Lake	5/17/2019	9.81	308.90	8.13	302.7	465	5.0	9.37
Crooked River	5/13/2019	11.79	308.20	8.37	119.5	583	5.4	8.81
Deer Lake	5/7/2019	11.49	317.00	8.24	72.3	789	5.7	13.15
Douglas Lake	5/17/2019	10.89	229.00	7.89	192.2	741	1.7	8.74
Elk Lake**	4/21/2019	9.90	300.47	7.82	229.9	758	2.5	9.68
Elk River	4/21/2019	13.19	319.10	8.19	230.0	811	ND	9.73
Ellsworth Lake	5/3/2019	11.10	348.30	7.90	162.4	408	8.9	7.82
Hanley Lake	4/24/2019	10.85	344.40	7.88	268.1	465	5.8	7.39
Huffman Lake	5/13/2019	11.21	344.90	8.25	66.4	159	8.6	3.37
Huron, Duncan Bay	5/22/2019	11.40	280.00	8.37	192.2	741	1.7	8.74
Indian River	5/18/2019	11.27	328.60	8.27	103.7	349	6.0	10.75
Intermediate Lake	4/24/2019	11.44	407.20	7.90	593.0	555	4.2	9.91
Jordan River	5/6/2019	11.08	367.50	8.16	1054.3	2186	0.7	7.18
Lancaster Lake	5/17/2019	9.49	223.70	7.98	8.1	661	21.6	7.25
Larks Lake	5/17/2019	10.35	221.00	8.51	42.0	228	3.2	4.01
Little Sturgeon River	5/13/2019	ND	ND	ND	42.0	228	3.2	4.01
Long Lake	5/21/2019	10.98	230.70	8.32	30.9	796	3.8	8.24
Maple River	5/13/2019	9.69	261.90	7.89	133.5	784	5.3	5.64
Michigan, Bay Harbor***	5/24/2019	12.99	303.30	8.22	284.4	923	1.6	14.01
Michigan, Grand Traverse Bay	4/21/2019	ND	ND	ND	268.8	560	3.4	12.18
Michigan, Little Traverse Bay	5/15/2019	13.58	287.30	8.37	291.2	768	1.0	12.15
Mullett Lake	5/21/2019	11.77	331.00	8.32	87.0	488	10.0	10.27
Munro Lake	5/17/2019	11.09	224.30	8.56	44.1	704	6.8	4.43
Nowland Lake	5/12/2019	11.26	216.30	8.41	18.7	279	4.3	4.36
Paradise Lake	5/17/2019	10.29	198.10	8.21	54.2	200	8.8	9.09
Pickereel Lake	5/15/2019	10.62	272.30	8.13	158.4	142	3.0	5.35
Pigeon River	5/21/2019	10.30	338.30	7.98	44.1	745	4.6	5.93
Pine River, Charlevoix	5/7/2019	13.39	316.10	8.21	372.1	315	0.9	11.62
Round Lake (Emmet Cty)	5/15/2019	11.18	340.90	8.40	30.9	707	7.3	27.05
Silver Lake (Wolverine)	5/15/2019	5.50	219.70	7.63	41.8	261	4.3	5.18
Six Mile Lake	5/7/2019	10.96	309.40	8.03	231.3	701	3.1	8.92
Skegemog Lake	4/21/2019	12.31	308.90	8.15	231.3	701	3.1	8.92
Spring Lake	5/24/2019	10.44	677.00	8.11	914.4	1570	13.9	78.57
St. Clair Lake	5/3/2019	11.28	338.10	8.10	132.6	407	9.7	6.55
Sturgeon River	5/3/2019	11.08	393.80	8.08	163.6	423	1.8	12.81
Susan Lake	5/12/2019	11.73	313.60	8.34	19.2	221	6.7	9.91
Tannery Creek	5/14/2019	10.47	550.00	8.33	715.9	1461	2.8	32.81
Thayer Lake	4/24/2019	9.87	77.30	8.19	<5	487	9.7	6.65
Thumb Lake	5/12/2019	11.62	235.10	8.13	90.8	251	5.3	5.02
Torch Lake, North	4/24/2019	13.13	319.50	8.21	575.1	569	2.9	9.99
Torch Lake, South	4/24/2019	13.01	319.80	8.16	1.8	600	4.3	9.40
Twin Lakes	5/21/2019	11.11	305.00	8.38	28.9	527	3.1	3.23
Walloon, Foot	5/14/2019	11.74	307.60	8.12	111.6	263	2.2	13.49
Walloon, Mud Basin	5/12/2019	12.40	327.80	8.36	111.6	263	2.2	13.49
Walloon, North Arm	5/14/2019	11.20	347.40	8.26	111.6	263	2.2	13.49
Walloon, West Arm	5/14/2019	12.29	304.10	8.20	191.8	522	3.0	11.95
Walloon, Wildwood Basin	5/14/2019	12.04	301.00	8.27	103.2	591	3.2	12.46
Wildwood Lake	5/15/2019	11.25	292.70	8.26	458.6	346	6.9	10.09
Wilson Lake	5/3/2019	10.81	340.40	7.90	216.9	492	14.2	7.59

*Unit descriptions: mg/L = milligrams/liter (parts per million), µg/L = micrograms/liter (parts per billion), µS/cm = microSiemens per centimeter

**Elk Lake DO, SPC, and pH are October readings

ND=no data

Where Does the Data Go?

Each year, Tip of the Mitt Watershed Council lake monitoring volunteers work throughout the spring and summer months to collect water quality data on inland lakes throughout our service area. This data helps to inform our local efforts, from our comprehensive watershed management plans to our initiatives to improve water quality through green stormwater infrastructure, bioengineering, nutrient reduction, and much more. However, this intensive monitoring also serves a greater regional purpose.

First, let's dig into what measurements our volunteers are taking. Volunteer Lake Monitors (VLM) explore a range of parameters that indicate the health of a lake. These include measuring water clarity and sampling concentrations of chlorophyll-a, which is an indicator of algae growth. Volunteers also keep an eye out for any aquatic invasive species or any notable biotic changes, like an algal bloom. Data is collected routinely for each lake, which helps to track trends or changes over time.

Each year, the Watershed Council also submits our volunteer collected data to the U.S. Geological Survey (USGS) and the Michigan Department of Environment, Great Lakes, and Energy (EGLE). These agencies then utilize this volunteer collected data to help predict water clarity for other inland lakes in Michigan. With this data, the agencies developed two tools, the Lake Water Clarity Viewer (<https://mymlsa.org/usgs-michigan-lake-water-clarity-interactive-viewer/>) and Lake Water Quality Assessment (<https://mi.water.usgs.gov/splan1/sp00301/cmiinland.php>), which now play an important role in extrapolating data to lakes where sampling is not able to be conducted. These could not have been created without the help of many dedicated volunteers.

According to Marcy Knoll with EGLE, "The data was previously used to relate Secchi disk transparency measurements to the satellite imagery to develop a regression model. This regression model is then used to predict water clarity for the thousands of un-sampled inland lakes in Michigan." Simply put, results from the Secchi disk readings, which measure water transparency, are then compared with satellite imagery to see how closely the results match. That essentially multiplies one facet of the work conducted by volunteers to help increase our predictive capacity for water quality across the region.

Even though EGLE Comprehensive Lake Monitoring Program (CLMP) has been put on hold for this year, Tip of the Mitt Watershed Council's volunteers will continue to survey lakes in our region. Collection of this data will continue to inform future conservation efforts in our region for decades to come.



Some of the Watershed Council's volunteer lake monitors showcasing two VLM tools, a Secchi disk and chlorophyll-a sampler.

Watershed Council Education Programs Move Online

In response to the COVID-19 crisis, the State of Michigan closed all schools from mid-March until the end of the 2019-2020 school year. With the cancellation of school came the cancellation of the Watershed Council's planned education and outreach programs, including the Watershed Academy, the Water Resources Education Program, the Students Experience Lake Charlevoix Program, and the Earth Week Plus Expo. While these events and programs may have been canceled, we are looking with hope to the future. We are working with our partners to offer all programs next year, and have completed all monitoring for the Watershed Academy so that there is not a gap in the data.



Watershed Council staff visited the Watershed Academy monitoring sites this spring and collected water chemistry and macroinvertebrate data. The data was shared with the teams online so that students can continue to assess the health of their local water resources. We also created a video to showcase the streams that are monitored by the Watershed Academy teams each year, and to celebrate the hard work of our students to protect Northern Michigan's water resources!

In addition to working to make our education programs available to students online, Watershed Council staff have been sharing posts and videos about Northern Michigan watersheds on our social media accounts. Posts include everything from updates on policy regarding water resources to the amazing animals and water bodies that make up Northern Michigan! To see these posts and more, check out our Facebook, Instagram, and Twitter accounts, and our website, www.watershedcouncil.org.

Douglas Lake Still Free from Invasive Plants

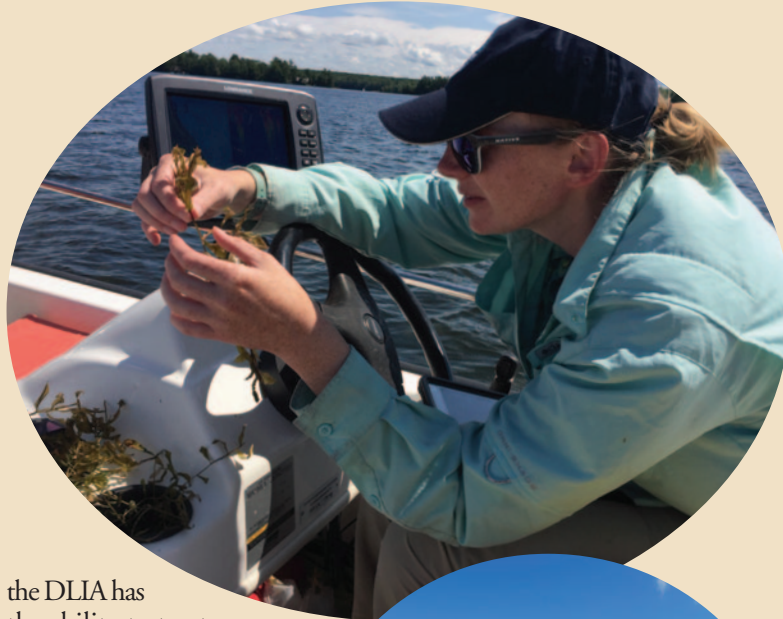
As water lovers, we hear a lot about why invasive species are bad, how to prevent them, and how to get rid of them. But how do we really know we're doing a good job? How do we know for certain there are no invasive plant species in a particular water body? Answer: A systematic plant survey! We conducted a lake-wide plant survey on Douglas Lake in Cheboygan County throughout the summer and fall of 2019. The study followed similar surveys performed in 2012 and 1978. The purpose of the study was to find out if invasive plant species were present in Douglas Lake.

Using the H2Observer, the Watershed Council's Boston Whaler, Watershed Council staff and volunteers from DLIA surveyed 253 sample sites with a grappling hook thrown in the four cardinal directions to collect vegetation floating or growing on the lake's bottom. Surveyors collected data on plant species and density at each site. Some sites had no plants at all, and some had as many as 14 species. In total, 23 different species were found. The most common species found were a few pondweeds ("seaweed" to those of you who have touched it with your foot) and a calcium-loving and stinky algae called muskgrass.

Douglas Lake has great diversity of plants, allowing it to harbor an array of fish species and provide food for water fowl. Plants were densest in the middle part of the lake (east of Pell's Island) and along sloping areas of the lakebed's five kettle basins. Pondweeds were present in over 15% of the lake's area. Nearly 80% of Douglas Lake was found to have little or no vegetation. In contrast with the 2012 survey, less of the lake's area is covered in vegetation today, but the areas remaining are denser. Most lakes in the Watershed Council's service area have more vegetation coverage, but the plants are sparser.

Douglas Lake Improvement Association (DLIA) has worked to educate boaters and riparian property owners to maintain an invasive-free lake. The DLIA hands out information on invasive species and shoreline practices annually to everyone in the association. Different committees monitor the boat launch for invasive plants and are equipped to report the locations of suspected invasive species. The DLIA board attends statewide conferences and trainings on invasive species and lake research. They are also participating in the Watershed Council's mobile boat washing program.

In addition to prevention and education, the association has the lake surveyed periodically and has purchased an invasive species mat which can smother small infestations before they get out of hand. Therefore,



the DLIA has the ability to treat small invasive species populations quickly. The association serves as a hub of information for its members, maintaining signage and a website with statewide resources focusing on invasive species and shoreline practices.

Douglas Lake's proactive approach to invasive species has helped keep the lake free of invasive plants. Periodic monitoring provides a baseline for normal plant populations unaffected by invasive species. Boaters following Clean-Drain-Dry practices, watchful eyes on the lake, and the education and reporting structure set up by the DLIA should prevent invasive species from entering the lake and help handle any invasions.



Thank you to our volunteers: Mary Ellen Sheridan, Pete Klaas, Sue Klaas, and Adam Schubel.

Photos:

Top: Watershed Council staff member Caroline Keson examines aquatic plants during the Douglas Lake survey.

Middle: Volunteer Mary Ellen Sheridan gathering plant samples with the rake.

Bottom: Plant sample.

Background: Loons on Douglas Lake.



Hungerford's Crawling Water Beetle Deserves our Protection

When we think of endangered species, we often think of animals in far off places being hunted for their horns or fur, but it turns out we don't have to look very far at all to find endangered species in the places we call home. Northern Michigan is home to the Hungerford's crawling water beetle (*Brychius hungerfordi*), which has been designated as a federal and state endangered species for over two decades.

This slow-swimming beetle measures less than ¼ inch and is yellowish brown with dark markings and stripes along its back. The beetles make their homes in rocky sections of cool streams with moderate to fast water flow. They have also been found below beaver dams or other similar structures. Since this species was discovered in 1952, it has only been confirmed to exist in nine streams in Northern Michigan, and three streams in Ontario.

Until recently, the beetle was thought to only inhabit the East Branch of the Maple River, the North Branch of the Boyne River, the Carp River, and stretches of the Upper Black River. The beetles' population is estimated to be a few hundred to one thousand.

The small population and distribution of the Hungerford's crawling water beetle is most likely due to a variety of factors, including the historic dredging and channelization of Michigan's

streams that came with the logging era. The primary threat to the beetle today is the modification of its habitat. This can take the form of dredging, channelization, bank stabilization, impoundments, or road-related construction.

There is also concern that climate change and the increase in stream temperatures could negatively impact the beetle population. As humans continue to change and impact the environment, we put species like the Hungerford's crawling water beetle in danger of extinction.

However, there is hope for the species. As we learn more about the beetle's life cycle and habitat, we better understand how to protect it. Recently, the Watershed Council took a closer look at old volunteer stream monitoring samples and found one new record of the Hungerford's crawling water beetle in Mullett Creek, collected in 2009. This is an exciting find, because it may show that the beetle can be found in a larger range of habitats than previously thought.

This discovery opened our eyes to the role that Watershed Council staff and volunteers can have in the protection of this species. Several Watershed Council staff have received training in the identification of the beetle. We are taking steps to ensure that any beetles that our volunteers find are correctly identified, reported to the U.S. Fish and Wildlife Service, and safely returned to their home stream. We are excited to be working with the U.S. Fish and Wildlife Service and Michigan Department of Natural Resources to ensure that future monitoring and projects that take place here in Northern Michigan protect the Hungerford's crawling water beetle.

Above: *Brychius hungerfordi* adult. Courtesy of Vandekopple, UMBS

Below: *Brychius hungerfordi* larva from Mullett Creek





Road/Stream Crossing Inventory

Watershed Council staff and interns spent time in the field learning how to inventory road/stream crossings (RSX). RSX can be a source of pollutants, like sediment, and can also block passage of fish and other aquatic organisms from reaching important habitat upstream and downstream of the crossing. Interns and staff will spend time this summer inventorying RSX in the Mullett Lake, Lower Black, and Cheboygan River Watersheds as part of the Watershed Council's grant through the Michigan Department of Environment, Great Lakes, and Energy.





Mobile Boat Washing Station

This summer is our first season running our new mobile boat washing station. We'll be visiting lakes throughout our community, educating boaters about aquatic invasive species that can hitchhike from lake to lake on boats and trailers, and using our high powered sprayer to clean plants and debris off boats. If you see us, come say hi!

Above from left to right: Jen Buchanan, Eli Baker, Garrett Greer, Lizy Michaelson, and Ashley Soltysiak take a break from training with the Watershed Council's new Mobile Boat Washing Station.



Lizy Michaelson sets up an information station about aquatic invasive species at a boat launch on Crooked Lake.



From left to right: Ashley Soltysiak, Lizy Michaelson, Garrett Greer, and Thomas Oelke from the Pickerel-Crooked Lakes Association gear up for the inaugural boat washing event.



Garrett Greer power washing a boat to prevent the spread of aquatic invasive species.



WHALE of a SALE

Boat Preview Online July 11 & 12, 2020

www.watershedcouncil.org/wos

Boat Sale • July 13-17, 2020

This year, our Whale of a Sale will feature boats only, and we'll be working hard to keep you safe while you shop! Our boat preview will be online July 11& 12 at <https://www.watershedcouncil.org/wos.html>. There, you can find pictures of boats that will be available during the sale.

The boat sale will be July 13-17 at the Irish Boat Shop Storage Unit, 7580 S. State Rd. in Harbor Springs. We will be social distancing to keep you safe. You must register to view boats at the above link, or call 231-347-1181.





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

41st Annual Meeting

Thursday, July 23, 2020

10:00am - 12:00pm

Our Annual Meeting will take place online this year, and it is unfortunate that we won't be able to see our members in person. After our brief membership meeting, Watershed Protection Director Jen Buchanan will present on green infrastructure alternatives for your home to prevent pollution from excess stormwater. She will also take members on a virtual rain garden tour. Please call our office at 231-347-1181 for instructions on registering for the event. The Annual Meeting takes place on Thursday, July 23, from 10:00 a.m. to 12 p.m. **RSVP by July 21.** We look forward to hearing from you; please join us!



This newsletter contains information worth sharing.

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

Pass it on!

ADDRESS SERVICE REQUESTED



Prescription and Over-the-Counter Drug Drop-off (POD) Community Collection Events

Visit www.pillsinthepod.com/locations.html for complete details. Please note, these events may be subject to change due to COVID-19, so please be sure to check the website before stopping in.

Friday, September 11, 2020

5:00 p.m. – 8:00 p.m.

Charlevoix County Road Commission Garage
11705 Shaw Road, Charlevoix

This event is part of the Charlevoix County Household Hazardous Waste (HHW) event. If you would like more information or to register for the HHW event, please contact Charlevoix County Recycling at 231-547-7221.

Saturday, September 12, 2020

9:00 a.m. – 1:00 p.m.

Charlevoix County Road Commission Garage
11705 Shaw Road, Charlevoix

This event is part of the Charlevoix County Household Hazardous Waste (HHW) event. If you would like more information or to register for the HHW event, please contact Charlevoix County Recycling at 231-547-7221.

Wednesday, October 14, 2020

7:00 a.m. – 4:00 p.m.

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

Wednesday, October 21, 2020

9:00 a.m. – 1:00 p.m.

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



Visit our website for disposal preparation instructions.

www.pillsinthepod.com