

High Water:

Questions & Answers Facts & Data



WATERSHEDCOUNCIL.org

231.347.1181

426 Bay Street · Petoskey, MI 49770



SPECIAL THANKS TO: Petoskey-Harbor Springs Area
Community Foundation and Charlevoix County Community
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Where are current Great Lakes water levels?

The Great Lakes are experiencing the highest water levels since 1986. Lake Superior, Lake St. Clair, Lake Erie and Lake Ontario set new record high water levels over the summer of 2019. Lakes Michigan and Huron have reached monthly mean record high levels in 2020.

What are the impacts of high water levels?

While water level fluctuations are considered vital to the health and functioning of the Great Lakes ecosystem, they can adversely impact those who live on or use the Great Lakes or their connecting waters. We are seeing flooding, erosion, and high water tables. Throughout Michigan, these exceptionally high water levels have caused millions of dollars in damage to private property and public infrastructure, including roads and Michigan state parks. Water levels are also impacting community water systems and causing other public health concerns. In addition, a high ground water table could pose problems for inland lakes with respect to flooding, septic systems, and drinking water wells.

Why are lake levels so high?

Water levels on the Great Lakes are cyclical, with periods of low and high water. Each period may last for several years depending on the amount of precipitation, runoff, and evaporation that occurs. Persistent wet conditions across the Great Lakes Basin continue to drive current high water levels. Many cities across the Basin set records in 2019 for the wettest period on record. The warmer than average temperatures in December led to greater runoff due to snow pack melting, especially on Lakes Superior, Michigan and Huron, leading to more water supply. The warm air also caused less evaporation off the lakes' surfaces, which led to more water in the system.



What resources are available to help with high water issues?

Michigan Department of Environment, Great Lakes, and Environment
www.Michigan.gov/EGLEHighWater

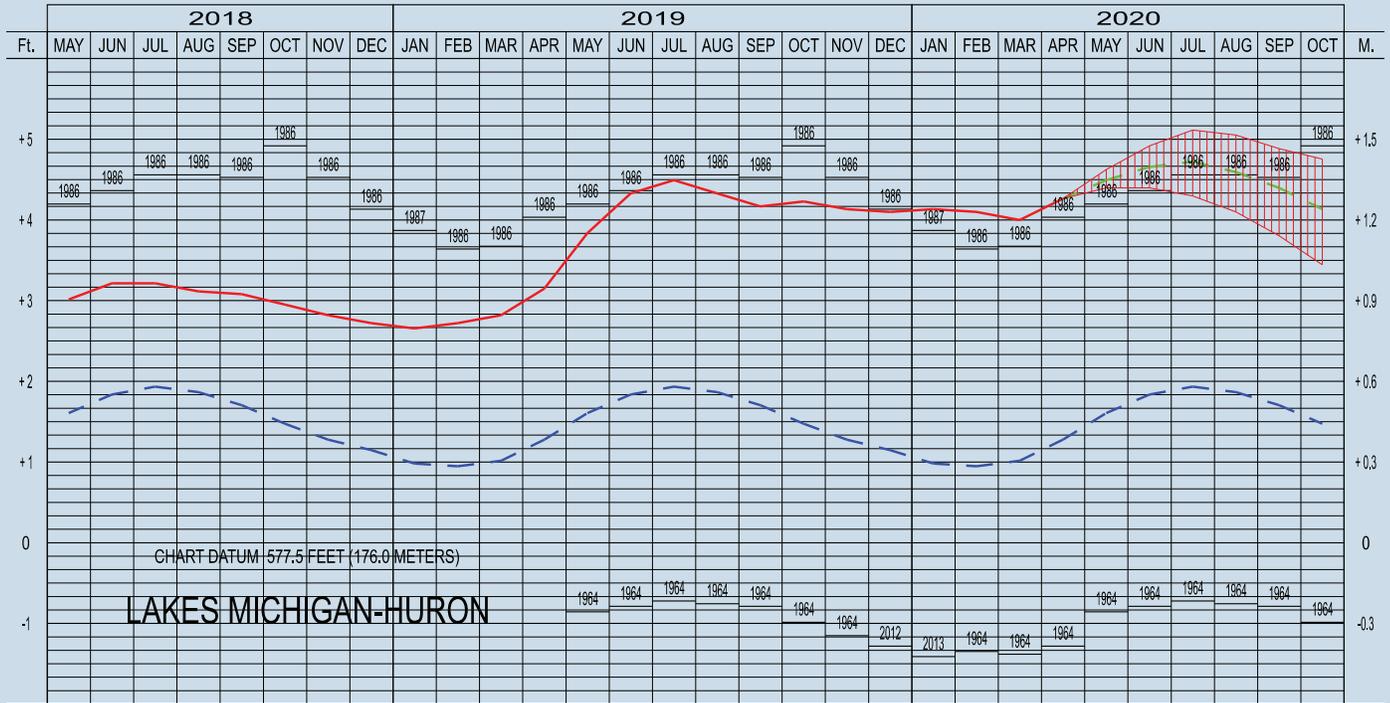
U.S. Army Corps of Engineers
www.lre.usace.army.mil/About/Great-Lakes-High-Water

Health Department of Northwest Michigan
www.nwhealth.org

What are predictions for future water levels?

According to the U.S. Army Corps of Engineers, the most recent six-month forecast of Great Lakes water levels shows levels continuing to be well above average over this period.

LAKES MICHIGAN-HURON WATER LEVELS - MAY 2020



Credit: U.S. Army Corp of Engineers

The black dashed line and the green dashed line are the two lines to focus on.



BLACK DASHED LINE: current record level for each month.
GREEN DASHED LINE: most likely forecast water level

The current forecast shows Lakes Michigan-Huron above records for the next six months. The forecast has a hatched red widening area surrounding the green dashed line. This red hatched area shows a reasonably likely range of values for the future lake levels.

It is projected that Lakes Michigan-Huron will remain above the monthly record high water levels through August 2020, by approximately 1 - 5 inches. All of the other Great Lakes are expected to peak below 2019 levels.

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How can I protect my shoreline and property from high water levels?

When considering what actions to take along the shore to combat high waters, it is important to consider the health and the dynamic variability of both the Great Lakes and inland lakes and the potential impacts on neighboring property. Excessive or poorly designed structures can increase damage to neighboring properties and disrupt natural processes along the shoreline.

What is the best way to protect existing structures?

The best option for the health of the lake and your pocketbook, is to protect existing structures by moving them back from the shoreline. Home movers can successfully remove a house from its foundation and put the structure on a new foundation at a safer location. Moving your house farther landward gives you a natural buffer from shoreline erosion and often costs much less than construction and maintenance of permanent shore protection. Visit watershedcouncil.org for FAQs on Moving Your House.

For example, sandbags are not an effective solution for long-term shore protection. Sandbags are not a preferred method of protecting against erosion as the bags are temporary; they cannot withstand wave energy or ice movement. The bags break open and become litter that impacts water quality and wildlife on the shoreline and in the lake; they slump and cannot hold the slope, and shoreline erosion continues.

In addition, using lake bottomlands as a source of sand to fill sandbags also has an adverse impact on the environment and public trust. This will likely not be permitted because doing so removes natural sand from the water's edge that provides necessary material for shoreline and beach creation, stabilization, erosion protection, and wave energy dispersal.

Excessive boulders or concrete walls are not ecologically preferred solutions. Hardening the shoreline, through riprap or revetments, can actually create erosion for your property and adjacent areas. They can alter sand movement and water current, and can create unpleasant visual and aesthetic impacts. Furthermore, once a bluff or beach is reinforced, it is an ongoing financial investment to maintain the structure, which will be battered and worn down by the lake over time. It is also important to note that homeowners are responsible for damage caused to neighboring properties from their individual actions. If a seawall or riprap is installed incorrectly or fails and causes erosion of your neighbor's property, you are civilly liable for the damages your actions caused.



Photo Credit: Brian Marshall, EGLE

Could bioengineering be another option for shoreline protection on inland lakes?



Another option for inland lakes is bioengineering. Bioengineering is a form of erosion control that incorporates biological, ecological, and engineering concepts to produce a living, functioning shoreline system through the use of live and dead plant material, native soils, and structural materials.

It can be used to restore a shoreline where native vegetation has been removed. Bioengineering provides fish and wildlife habitat and water quality benefits that may be lost with other stabilization methods. It can be designed in conjunction with riprap for high energy systems, allowing the shoreline to be stabilized while providing additional benefits to the lake ecosystem.

Bioengineering is usually less expensive than structural methods like concrete seawalls. Some applications can be done by the homeowner while other applications will require a contractor. The estimated cost of installing a natural shoreline, including bioengineering materials, averages from ten to twenty dollars per linear foot. The financial cost of hard armoring the shore (using seawalls and bulkheads) can range from forty-five to two hundred dollars and up per linear foot. Contact the Watershed Council for guidance and recommendations with respect to developing plans for an appropriately-designed bioengineered shoreline.

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What happens if my home falls into the lake?

A property owner is legally responsible for ensuring that their structures, such as homes and docks, are removed from lake bottomlands and water in the event these structures fall into the water.



What permits are needed for shoreline protection activities?

To install shoreline protection on the Great Lakes, you will need a permit from both the Michigan Department of Environment, Great Lakes, and Energy (EGLE) and the United States Army Corps of Engineers (USACE).

Only one application is needed for both agencies; however, the permits are issued separately. For inland lakes, a permit is only needed from EGLE.

The Joint Permit Application is submitted through www.Michigan.gov/MiWaters. Other local regulations may also apply.

Many shore protection projects qualify for expedited review under general permits. In addition, permits will be expedited, often within a matter of days, if a house or critical infrastructure is in immediate danger due to high water levels. EGLE can also issue emergency conditional permits when needed to protect the public health, safety, or welfare. These emergency permits are often granted the same day they are applied for. It is important to note that if there is not active and ongoing erosion onsite, a permit should not be approved for modification of the shoreline, as this would be to the detriment of the environment, public trust, and riparian interests of adjacent owners.

It is also recommended that anyone considering a shoreline protection project contact EGLE prior to submitting a permit application. Shoreline property owners can request a pre-application meeting with EGLE Water Resources Division staff. A pre-application meeting can provide landowners with a written copy of EGLE's findings regarding the need for a permit along with any other written comments or suggestions such as ways to avoid impacts to aquatic resources. You can contact EGLE's Water Resource's Division Gaylord District Office at 989-731-4920.

Who can I contact for general shoreline questions?

ELGE Assistance Center (EAC)
800-662-9278
EGLE-Assist@Michigan.gov
www.Michigan.gov/HighWater

EAC is staffed Monday to Friday,
8:30 a.m. to 4:30 p.m.
Tell the operator that you are calling about shoreline erosion; you will be transferred to a field staff person. After hours, leave a message, and someone will reply on the next business day.

USACE High Water Levels Website
www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Information.aspx#ICG_ETH_22302

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Photo Credit:
MLive

Could moving your home back from the shoreline be the answer to rising water levels?

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 and prove to be economically, environmentally, and aesthetically better in the long run.

How is a house moved?

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's the process of house moving?

Before the big move, there's a punch list of items for the professionals, but the homeowner can leave the house's contents alone. To begin the project, the homeowner will need to work with a general contractor. The general contractor will help with site and building preparation and other aspects of the move including obtaining permits, disconnecting and reconnecting utilities, excavation, and laying the new foundation. The utilities must be shut off and disconnected from the house, including electric, water, sewer/septic, gas, telephone, cable, etc.

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. Digging the hole for the foundation in advance could decrease the cost, but it depends on how long it takes to get the foundation poured. 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 (modular vs. stick built, etc.). Accessibility, move distance, and other obstacles (e.g., power lines, accessibility, structural integrity) also factor into the cost to move a home or building. 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.

For property owners located on islands, such as Beaver Island, there may be increased costs due to getting the necessary equipment to the island, if there is not a contractor on the island available. To reduce costs, it is recommended to work with neighbors and other shoreline property owners on the island to coordinate moving back homes. Bringing equipment over to the island for multiple jobs will defray the costs for all parties.

How do I find a home mover?

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) compiled a small list of home movers that work in the State of Michigan. This list is not comprehensive and listing or omission of a company does not imply endorsement or disapproval. Neither EGLE nor Tip of the Mitt Watershed Council makes any endorsement or representation of any qualifications by any of the listed individuals or companies.

Contractor	City/State	Website	Telephone
D & B Home Movers	Monroe, MI	dbhousemovers.com	734-497-7956
Deitz House Moving Engineers	Muskegon, MI	deitzmovers@aol.com	231-773-8964
Dingey Movers, Inc.	Zanesville, OH	dingeymovers.com	740-453-6724
HD House Mover, LLCs	Lake City, MI	hdmoversllc.com	231-229-4213
J & R Building Movers	Petoskey, MI	jandrbuildingmovers@outlook.com	231-348-9571
Rollaway Movers, Inc.	Grand Rapids, MI	rollawayhousemovers.com	616-453-0123
Talaski Building Movers.	Bad Axe, MI		989-269-6008
Wolfe House and Building Movers	North Manchester, IN	wolfehousebuildingmovers.com	260-982-0302

How do I get a quote?

One local house mover in Northern Michigan is J&R Building Movers, located in Petoskey. To get a quote, email pictures of your house from all sides, as well as a photo from the distance showing the lay of the land, and information about the house, including dimensions and address to jandrbuildingmovers@outlook.com.

An initial estimate can be provided and then J&R Building Movers will schedule a time to conduct a site visit to the property. A site visit costs \$500. The \$500 will be deducted from the overall price of moving the house, should you choose to contract with J&R Building Movers.

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In the long-term, moving a house can often be better for your pocketbook, your neighbors, and the Great Lakes.

Furthermore, once a bluff or beach is reinforced, it is an ongoing financial investment to maintain the structure, which will be battered and worn down by the lake over time.

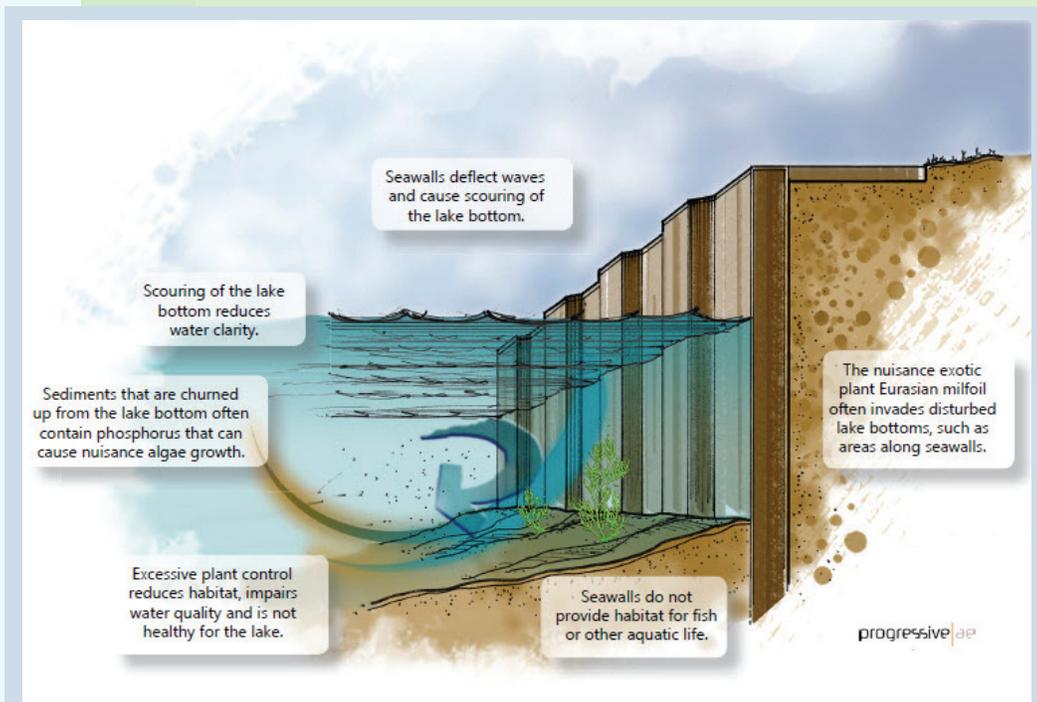
It is also important to note, a homeowner is responsible for any damage caused to neighboring properties from their individual actions. So if a seawall or riprap is installed incorrectly or fails and causes erosion of your neighbor's property, you are civilly liable for the damages your actions caused. In addition, any property owner whose house does fall into the lake is responsible for cleaning up all debris.

Why is moving a house a better option?

Moving structures away from eroding shorelines is a longer-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, the energy from the waves does not disappear. This energy is directed downwards and sideways. The energy that is directed down erodes 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 the wave energy is also deflected sideways to neighboring properties. This causes erosion on your neighbor's property where there might not have been any erosion.

Hardening the shoreline, through riprap or revetments, can alter sand movement and water currents. Because shore parallel structures prevent some exchange or movement of sand in a local area, depending on the positioning of the wall, the beach in front of that structure may actually be narrower. That is a result of greater reflection of the wave off the structure. There may also be additional starvation of the beach downdrift of the structure.



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Inland Lake Risks

Over the past several years, Michigan has received a record-breaking amount of precipitation. This above-average precipitation has resulted in many areas of Michigan experiencing high water and flooding issues. A high groundwater table means that 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 drainfields, contaminated drinking water wells, and could release chemicals or fuels from flooded basements and garages into our waters.

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 drainfield soils are becoming saturated. Wet areas, lush grass, or foul odors around the drainfield indicate that effluent is surfacing, and these are all warning signs that your septic system is not functioning properly. In shoreline areas, noticeable algae and plant growth or a distinctly colored patch of bottom sediment developing in the general vicinity of the drainfield can indicate excessive nutrient enrichment from a malfunctioning septic system. Always be sure to follow the requirements of your local sanitary code, and hire only reputable septic system installation firms.



How do I maintain my septic system?

It's important for shoreline property owners to properly maintain their septic system. Septic systems that are failing or unmaintained can threaten both surface and ground waters. Studies have shown that some pollutants carried by groundwater beneath the septic system often reach surface waters from septic systems located within 300 feet of the shoreline. Nutrients, such as nitrogen and phosphorus, are the primary pollutants of concern.

Nutrients can encourage excessive aquatic plant and algae growth, which can make swimming and boating undesirable. Septic system effluent can also contain disease-causing bacteria that can move to surface waters from septic systems, making it unsafe for swimming or other bodily contact. Contamination of groundwater from septic system effluent is a particular concern where the groundwater is used for drinking water. Because shoreline areas typically have high water tables and septic systems are often very close to the water, the potential to negatively impact groundwater and surface water from a failing septic system is significant.



- Have your septic tank inspected and pumped regularly by a licensed pumper. The general recommendation for how often to get your tank pumped is once every 3 to 5 years. Of course, the right pumping schedule for you is based on the size of the septic tank, the number of individuals in your household, and the amount of wastewater generated. Heavy or year-round use requires more frequent pumping than light or seasonal use.

- Consider improving or upgrading your system if the amount of wastewater you generate is more than your septic system can handle. Since it is not easy to make such extensive changes, carefully consider all of the activities that generate wastewater in your home - cooking, bathing, flushing toilets, doing laundry, dishwashing, etc. This will help you come up with measures you can take to conserve as much water as possible.
- DO NOT use commercial products that claim to be a substitute for maintenance pumping. Many of these products liquefy the sludge and cause it to enter the drainfield.
- Avoid using chemicals, such as drain cleaner and large amounts of bleach, because they kill the bacteria that break down solid wastes in the septic tank.
- Install a vegetative buffer strip of deep-rooted plants between the end of your drainfield and the shoreline area. These plants can help absorb nutrients before they reach water. Be mindful not to plant deep-rooted plants in the area directly over your drainfield, as roots might cause damage to your system, which may result in wastewater that is not adequately treated.
- Direct rainwater from gutters and other surface runoff away from the drainfield. Excessive moisture can saturate the soil and reduce the drain field's filtering capacity.
- Construct the septic system as far away from the shoreline as possible if you are building a new home. Never build or pave over a drain field. Keep vehicles away from the drainfield and septic tank.
- DO NOT apply fertilizer around a drainfield because the nutrients saturate the soil and cause it to stop removing nutrients from the wastewater.
- Limit your use of kitchen garbage disposal units. Heavy use adds large quantities of solids to your septic system and will shorten the time between septic tank maintenance.

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What do I do if my septic system 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 drainfield to minimize contact with wastewater. Keep in mind that these are only temporary fixes and further action is required to assess and correct the issue. Pumping may not help if the household piping is clogged or if high water levels are the culprit.

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 of your local sanitary code, and hire only reputable septic system installation firms.

What are the best water conservation practices?

Practice water conservation in all areas of the home. Some water conservation practices will pay off big time for septic systems.

- Install low-flow faucet aerators and showerheads. Using these low-flow devices is the best water conservation action to take and usually the cheapest.
- Do laundry one load daily instead of all loads in one day. This reduces the amount of water going into the system at one time.
- Fix leaky faucets and toilets to reduce the amount of water going into the system. Studies show that leaks account for more than 10% of the household water used.
- Only run the dishwasher when there's a full load.
- Use the garbage disposal sparingly. Disposers require a lot of water to run properly.
- Don't run the washer, the dishwasher and take a shower at the same time to reduce overloading the system.
- Do not connect sump pumps to the septic system. This will prevent water that does not need treating from going into the system.
- Do not water the grass over or around the drainfield. The field gets enough water from household use and does not need any additional water from lawn watering.



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What are other concerns from high water?

Electric shock drowning is an increased risk due to high water levels. Water-overtopped docks may have electrical hook-ups that have the potential to shock someone who comes in contact with the water. People should avoid swimming off of docks and piers that are wired with electricity. The water around a dock could be carrying lethal amounts of electricity even if the electrical source is hundreds of yards away.

Walking through a wet or flooded basement can also be extremely dangerous. Never walk through a flooded basement until the electricity is disconnected. Even a small amount of water on a basement floor can put you at risk for electrocution.

Shoreline property owners in areas that are likely to flood should move hazardous household materials to a safe area that is likely to remain dry. Items should be moved to higher ground because they pose a danger if their contents are released into the environment. Examples of items that should be moved to safer and drier areas include: vehicle batteries, propane tanks, drain cleaners, motor-vehicle oil, antifreeze, pesticides, and fertilizers.

Always use extreme vigilance while boating. Many piers, docks, and portions of breakwaters are currently underwater and not visible. In addition to these hazards and obstructions, debris is a common issue. Use particular caution boating at night when visibility is lessened.

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. If the casing on your well becomes submerged, your drinking water can become contaminated. The casing should extend at least 12 inches above the ground for sanitary protection. 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. You can also consider having a well contractor install a watertight cap on your wellhead.

If a well becomes submerged in surface water, do not drink the water or use it for brushing your teeth. If water has reached your well or is covering the top of your well casing, assume your well is contaminated.

Health risks can occur from a contaminated well. Bacteria such as E.coli and rotavirus can be found in contaminated water, along with deadly substances like lead and nitrates.

If contaminated, have your well disinfected as soon as possible and tested to ensure it is safe. 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 hardness, fluoride, chloride, iron, sodium, sulfates, nitrites and nitrates. You can stop by any of the health department offices to pick up one or both of the test kits. Simply collect your water sample and drop it off the same day to any of the four Environmental Health offices in Bellaire, Charlevoix, Harbor Springs, or Gaylord. They will ship it to the laboratory in Gaylord at no extra charge. **Samples MUST be collected on the day they are dropped off. Drop offs will only be accepted on Monday, Tuesday, and Wednesday mornings between 8 am and 11 am at all four locations.**

For more information, visit
<http://nwhealth.org/homeowners.html>

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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



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