

ISK CLIMATE CHANGE & HEALTH SERIES

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The sixth Great Lake

We all know and love our five Great Lakes for the natural wonders and abundant resources they are. In recent years, scientists have begun referring to a “sixth Great Lake,” which contains almost as much water as Lake Huron but is often overlooked: Michigan’s groundwater. This enormous body of water feeds and flows with the Great Lakes and provides most of Michigan with drinking water. However, as rains becoming heavier and more frequent under climate change, our blessing of abundant freshwater both below and above ground can pose challenges and dangers.

Michigan floods under climate change

As we discussed in last month’s issue, under climate change, heavy storms in Michigan are likely to increase in both frequency and intensity. At the same time, as average annual temperatures continue to rise, a greater percentage of our precipitation will be rain. As a result, our lakes, as well as our amazing groundwater table, will see surges in water levels. When the water table is high enough, all it takes is a heavy downpour for a flood to occur, especially when we add in melting snow and hard, impermeable soil in the spring time. We are already seeing more flooding across the state, including in Kalamazoo. In the past two decades, Kalamazoo has seen at least four 100-year flood events (severe floods that, under a pre-industrial climate, are only expected to occur once every 100 years or so). While they might be more rare than heat waves or severe storms, floods are Michigan’s most common natural disaster and can have lasting direct and indirect impacts on our community and the consumers we serve here at ISK.



Flood waters in the city of Kalamazoo in 2018 led to road closures and millions of dollars in damages.

Photo by Cyrus Raymond, WWMT.

Health and mental health impacts of floods

Health: Floods can present a risk of drowning and other physical dangers, such as unsafe traffic conditions and exposure to cold water ([WWMT's reporting on the 2018 flood](#) summarized these dangers perfectly). There are also invisible dangers in flood waters, such as contamination from bacteria or chemicals. These can be harmful through direct exposure to flood waters, and can also make their way into drinking water, especially when wells are impacted. Summer flooding, though less common in Kalamazoo (so far), temporarily increases the available standing water in which vectors like mosquitos reproduce, leading to possible increases in vector bites and vector-borne diseases. In some cases, incidents of animal bites can increase during flooding due to animal stress and displacement.

The knock-on effects of flooding are many, including: damage to property and associated economic hardship for homeowners, renters, and businesses; risk of mold growth inside impacted properties; and disruption in energy services (which can impact food security if refrigerated food spoils). Critical health services can also be disrupted or delayed due to damage at service providers' properties and/or disruption in transportation services.

Mental Health: If you watched WWMT's video linked above, you saw how one Kalamazoo man's mental health was impacted by living in a flood zone. Worrying that our property will be damaged every time it starts to rain can take a toll on mental health, and many Kalamazoo residents living in flood zones face this reality. Similar to the aftermath of storms, the time after a flood can also be a time of increased anxiety and depression for many as they deal with illness, injury, displacement, and/or property damage. Experiencing a flood is also linked to an increased risk for PTSD, anxiety, and depression. Furthermore, there is again a risk of missed appointments and missed medications due to disruptions in critical mental health services.

On a long enough timeline, increased flooding in Kalamazoo can also damage the city's prosperity, as potential new residents, homeowners, students, and entrepreneurs may be wary about moving to a city where floods could risk their wellbeing. With average annual flood costs of up to \$1.8 million in Kalamazoo alone, flooding also causes us to miss out on additional funding for other important services.

Groups that are more vulnerable during floods include children and elderly individuals, individuals with a mental or physical disability, and those with prior health or mental health diagnoses. Those who have historically faced discrimination and disenfranchisement are also more vulnerable; indeed, in Kalamazoo, our legacy of racial segregation still leaves the poorest quality land – in this case, 100- and 500-year flood plains – overwhelmingly occupied by BIPOC. The [Neighborhoods at Risk Interactive Map](#) is a great tool for exploring social, economic, and climate risks (including flood risk) in each tract of Kalamazoo.

Take Action

For ourselves: Have a plan! If you live in a flood zone, having a go-bag ready for potential flood events is a great idea (see August issue for more details on go-bags!). Make a plan with your health/mental health provider for accessing services in the event of a flood. Whether you rent or own your home, clean and dry everything in your home after a flood and have your property checked for mold. During a flood, keep out of flood waters and keep children and pets from playing in or near the water. Additional safety tips can be found on the infographic on page 3.

FLOOD SAFETY TIPS

PREPARING BEFORE

- Know your area's flood risk
- If you live in a flood-prone area, purchase flood insurance
 - Flood insurance is NOT included in your homeowner's policy
- Take photos of important possessions
- Clean drains & gutters regularly
- Sign up to receive weather alerts

STAYING SAFE DURING

- Heed evacuation orders
- Stay up to date with the forecast
- DO NOT drive or walk through floodwaters
- Avoid driving over bridges with fast-moving water below
- Don't touch electrical equipment if it is wet

RECOVERING AFTER

- If your home is damaged, do not re-enter until it's deemed safe
- Take photos to document damage
- File an insurance claim ASAP
- Only use generators outside

For our clients: Many of our prevention steps with clients look similar for both floods and storms. For example, as we saw in the storms issue, it's important to know which of our clients are most at risk for flood-related impacts. We can ask our clients how they keep track of weather forecasts, including flood warnings, and check that they are familiar with weather warning terminology. We can also help clients figure out if they or their loved ones are located in a flood zone so that proper preparation can be made. Helping clients prepare a go-bag and make a plan for medications, accessing services, and keeping safe during and after a flood can reduce the risks of both direct and indirect health impacts. Infographics like the one on the left are handy for clients to take home with them. As always, anything we do for ourselves we want to encourage our clients to do for themselves, so referring to the above notes and resources can also help give us direction with our clients.

Tips for staying safe before, during, and after a flood. Image from MEMA

Here are some extra resources and tools regarding floods in Michigan:

- [Michigan Prepares flood page](#)
- [MIReady flooding & landslides page](#)
- [Michigan.gov Staying Safe After a Flood page](#)
- [Weather.gov preparedness tool](#)
- [Michigan Radio on flood events](#)
- [IJC on the "sixth Great Lake"](#)

As always...Don't forget the doggos!

Dogs and other pets are also at risk for flood impacts. Apply the same safety measures to pets that you apply to yourself and your family, ensuring that outdoor pets in particular are brought inside or kept on high ground during floods. Pets should never be allowed to drink or play in flood waters, and should be kept out of flooded areas of the home during and after the flood (until effected areas have been cleaned).



This month, talk to your colleagues about floods in Michigan:

- Have they been impacted by the Kalamazoo floods, or others?
- Do they live in a flood zone? If so, do they have a plan for flood events?
- Do they have any specific strategies for addressing flood preparedness with clients?
- Can they think of ways their clients might be impacted by a severe flood in Kalamazoo, and how they could help them respond?