



## Climate Change, Extreme Precipitation, and Health

The M-LEEaD Center's Community Engagement Core (CEC) increases awareness and understanding of environmental health research.

Stakeholder Advocacy Board members include:

- Community Health and Social Services
- Detroit Health Department
- Detroit Hispanic Development Corporation
- Detroiters Working for Environmental Justice
- Eastside Community Network
- Ecology Center
- Green Door Initiative
- Henry Ford Health System
- MDHHS
- Michigan Environmental Justice Coalition
- Sierra Club
- We the People of Detroit

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### Why is climate change important to public health?

Climate change is altering weather and climate patterns. These changes could affect human health in direct and indirect ways, sometimes severely.<sup>3 5</sup> Climate change is one of the most serious public health threats facing us today (The American Public Health Association, World Health Organization)<sup>1 2</sup>. Increases in heavy rainfall events cause stormwater overflows and flooding. Health effects include breathing and digestion problems.

### What can decision makers do to prevent climate change and the effects of extreme precipitation on health?

Here are some steps decision makers can take to prevent stormwater overflow and water pollution in your neighborhood:

- Encourage reductions in the amount of surfaces that do not absorb water (e.g., cement, asphalt). Not only do those surfaces increase runoff during heavy rain events, they also capture heat, creating "heat islands" that make extreme heat events worse.
- Local, state and federal decision makers can reduce climate change by, for example, encouraging clean energy and reducing use of fossil fuels.
- Advocate for improvements in waste and sanitary sewage systems to be able to handle larger volumes of water.
- Encourage and fund land uses that absorb excess water, and prevent runoff during extreme rainfall events. This can include encouraging the use of rain gardens, retention ponds, and green space that absorbs rainwater.

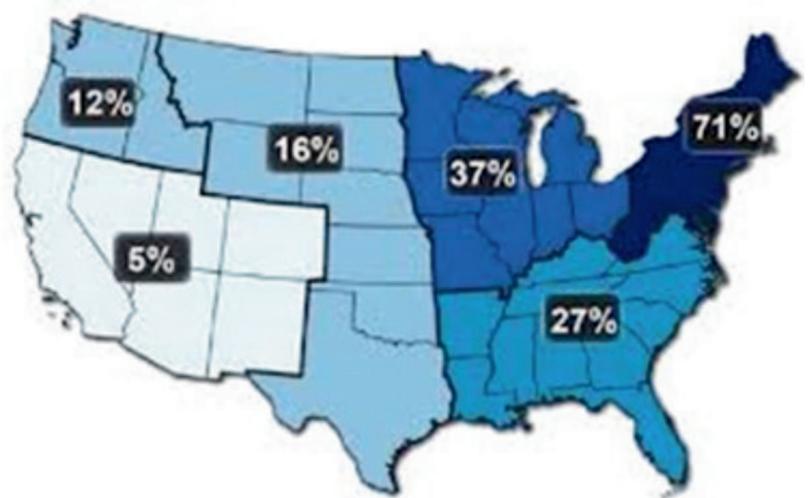


## How is climate change & extreme precipitation impacting Michigan?

- Extreme rainfall events are becoming more frequent, especially in winter and spring; however, overall the region will be drier with increasing periods of drought.
- Frequency and intensity of all types of severe storms will likely continue to increase.
- Rising temperatures and more extreme heat events cause increased evaporation. This, in turn, causes more extreme rainfall events.

The Midwest has seen a 31% increase in the heaviest (top 1%) of rainfall events from 1958 to 2007.

Source: Great Lakes Integrated Sciences Assessments (GLISA)



### Example from Midland:

On May 19, 2020, the Edenville and Sanford Dams, which are part of a four-dam system near Midland, failed. The failures forced the evacuation of thousands of residents and created catastrophic flooding and property losses. The two other dams on the same river system, the Smallwood and Secord dams, were damaged. The dams were unable to manage water flows that resulted when storms dropped as much as eight inches of rain over 48 hours in parts of Northeast Michigan. <sup>16</sup>



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## What precipitation-related health effects can we expect for Michigan?

### **Mold:**

Mold is likely to grow in houses that have been flooded. Exposure to mold can lead to asthma or cardiovascular diseases.<sup>4</sup>

### **Asthma:**

Household flooding may lead to increased mold. Mold exposure is likely to trigger asthma symptoms and make them worse.

### **Respiratory Diseases:**

Exposure to water-borne illnesses, such as Legionella, may increase.<sup>4</sup>

### **Toxins from Harmful Algal Blooms (HAB):**

Increased extreme rain events cause nutrients to run off into the Detroit River and Lake Erie. These increased nutrients lead to Harmful Algal Blooms (HABs), which can contaminate drinking water supplies. HABs produce toxins, which when ingested can result in sickness, even death.<sup>4</sup>

### **Diseases from raw sewage:**

In extreme rain events, storm water drains can become blocked. This causes an overflow of raw sewage. This can cause people to be exposed to multiple bacteria in the raw sewage.<sup>6</sup>

Source: greatlakes.org



*Combined Sewer Overflows (CSO), in the event of extreme rainfall, can overflow, sending raw sewage to a river or lake.*

Please see [http://mleead.umich.edu/Coec\\_Fact\\_Sheets.php](http://mleead.umich.edu/Coec_Fact_Sheets.php) for the citations included in this factsheet. The University of Michigan Lifestage Environmental Exposures and Disease Center (M-LEEaD) Community Engagement Core (CEC) promotes collaboration among UM environmental health researchers and communities to advance knowledge of environmental health issues that affect community members in Detroit and Southeast Michigan. Support for this research was provided by grant P30ES017885 from the National Institute of Environmental Health Sciences, National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.