



## Climate Change, Extreme Precipitation, and Health

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

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
- Henry Ford Health System
- Michigan Environmental Justice Coalition
- We the People of Detroit

Alison Walding  
Project Manager  
Community Engagement Core  
walison@umich.edu

### Why is Climate Change Important to Public Health?

The American Public Health Association and World Health Organization call climate change one of the most serious public health threats facing us today.<sup>1 2</sup> Climate change is altering our weather patterns. These changes affect human health in many different ways.<sup>3 5</sup>

### How is Climate Change Impacting Extreme Precipitation in Michigan?

Temperatures are rising. Extreme rainfall events are becoming more frequent. In addition to heat and drought events, the frequency of severe storms will continue to increase.

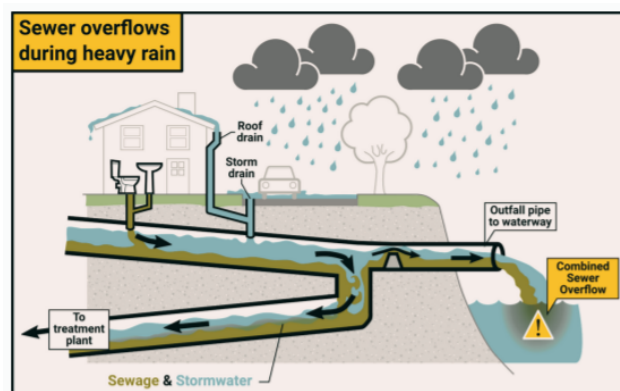
On June 25th and 26th, 2021, Detroit received **8 inches of rainfall within 3 days**. Typically, there are about 3 inches of rainfall total each June.<sup>8 9</sup> This rain resulted in historic flooding made worse by the city's aging infrastructure.<sup>10</sup> The federal government approved more than \$270 million to help with the disaster.

The region will need to invest in infrastructure and flood-proof homes and businesses to prevent future disasters.<sup>11 12</sup>

The Midwest saw a  
**42%**  
increase in its  
heaviest rain events  
from 1958 to  
2016.<sup>13</sup>



Brooker (2021) : Matthew Hatcher/SOPA Images/LightRocket via Getty Images



Adapted from ECOSS

Detroit is one of 860 U.S. cities with a combined sewer system (CSO). Detroit's CSO collects rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. During extreme rain events, it is possible for raw sewage to overflow into rivers or backup into households.<sup>12</sup>





## What are Some Health Issues Can We Expect for Detroit & Nearby Communities?

- **Waterborne Diseases:** Sewage in household or neighborhood floodwaters could increase exposure to various bacteria, such as legionella. <sup>4 6 12</sup> As flooded communities work to clean up excess water, they may not have resources to protect those most vulnerable to exposures.
- **Injuries & Death:** After heat, flooding causes the highest number of weather-related deaths and injuries in the U.S. <sup>15</sup>
- **Mold:** Mold is likely to grow in houses that have been flooded. This can lead to worsened asthma or cardiovascular diseases for those exposed.<sup>4</sup> This is particularly problematic in Detroit, where asthma hospitalization rates are more than 3x higher than the state of Michigan.<sup>7</sup>
- **Stress:** Extreme rain events can cause household and neighborhood flooding. This can be a stressful event or series of events that can lead to financial hardship, challenges navigating recovery claims and processes, bigger health issues, and even homelessness for those most impacted and with limited resources. <sup>12</sup>
- **Harmful Algal Blooms (HAB):** Increased extreme rain events may lead to more nutrients running off into the Detroit River and Lake Erie. These nutrients can lead to HABs, which can contaminate drinking water supplies. Treating drinking water contaminated by HABs has cost U.S. communities more than \$1 billion since 2010.<sup>14</sup>

## What Does this Mean for Me and My Community?

Community members and leaders can advocate for many possible solutions in Detroit & nearby <sup>12</sup>:

- Invest in grey (e.g., pumps, pipes, treatment facilities) and green infrastructure (vegetation, bioretention gardens) and prioritize neighborhoods that have experienced historic disinvestment and flooding
  - Improve process for flood-related claims to ensure they are accessible, equitable, and transparent
  - Develop grants and technical assistance to support residents in implementing neighborhood or household flood prevention
- There are a range of flood prevention strategies for households to consider — from relatively affordable to incredibly costly. For renters, some may not be possible without a landlord's support or resources. Some require technical or physical abilities when attempting do-it-yourself approaches.
- Install a flood sensor that can detect excess humidity or moisture in the air (\$10-\$200+)
  - Clear clogged lateral sewer pipe (\$150+)
  - Repair gutters (\$200+)
  - Build a rain garden &/or grade your lawn away from your home (\$200+)
  - Repair foundation drainage plumbing (\$700+)
  - Seal up foundation cracks & apply coating & sealants (\$600-\$10,000+)
  - Install a battery-powered sump pump (\$1,000-\$5,000)

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-LEED) 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.



SCHOOL OF PUBLIC HEALTH  
LIFESTAGE ENVIRONMENTAL EXPOSURES AND DISEASE CENTER  
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