

COLLABORATION FOR STRENGTHENING CLIMATE RESILIENCE IN DETROIT



POTENTIAL IMPACTS OF CLIMATE CHANGE IN DETROIT

As the global climate continues to change, communities around the world will experience a variety of impacts. Detroit is projected to experience higher temperatures, more frequent and intense precipitation events, and fluctuating lake levels. From 1960 to 2010, the average annual temperature in Detroit has increased by 1.4°F. By 2050, the average annual temperature in the city is expected to increase an additional 1.5–5.4°F. The number of days per year with a high temperature above 90°F could increase from 15 days (current) to between 30 and more than 65 days by the end of the century, while the maximum temperatures during those heat waves could also rise. By the end of this century, the city could face extremely dangerous heat waves multiple times per decade. The region has also seen an increase in precipitation, with total annual precipitation increasing 11 percent from the 1961–1990 average to the 1981–2010 average, and this trend is projected to continue. Heavy rainfall events are now twice as frequent as they were 100 years ago.^{1,2}

Based on the projected impacts for the region, Detroit is expected to face various challenges, including:

- As average temperatures rise throughout the region, the probability of heat waves and hot days will grow, increasing the risk of heat-related illnesses.
- As heavy rainfall events become more frequent and more intense, flooding will increase the risk of sewage overflows and water contamination.
- Weather events may cause direct damage to water, energy, and transportation infrastructure, and

more heat waves will lead to increasing demands on energy infrastructure.

- Increased average temperatures will increase respiratory incidents for children with asthma and vulnerable elderly due to ozone and particle formation.

RESPONDING TO RESILIENCE CHALLENGES

In 2011, Detroiters Working for Environmental Justice, the oldest environmental justice organization in Michigan, convened several key stakeholders from diverse backgrounds to form the **Detroit Climate Action Collaborative** (DCAC). DCAC includes representatives from environmental, community, governmental, scientific and academic, health, business and other sectors. DCAC was established to help the city identify short- and long-term actions to reduce greenhouse gas emissions, provide expert advice on the most credible, aggressive and economically viable targets, develop a comprehensive Climate Action Plan, and to ready Detroiters for coping with the impacts of climate change.

DCAC partnered with Great Lakes Integrated Sciences and Assessments (GLISA) to develop *The Potential Impacts of Climate Change on Detroit, Michigan*, which outlines expected climate impacts on temperature and precipitation and the implications for air quality, flooding and stormwater management, water quality and infrastructure. DCAC partnered with the University of Michigan Taubman College of Architecture and Urban Planning to develop a **comprehensive report defining climate change vulnerability in Detroit** as well as a

greenhouse gas inventory for the city. The vulnerability assessment focuses on two key issues for Detroit: extreme heat and flooding. The vulnerability assessment provided various recommendations, including: reconsidering the distribution and location of designated cooling centers, reducing impervious surfaces and increasing tree planting in identified ‘hotspots’, acquiring additional information for further flood vulnerability analysis, and ground-truthing the most vulnerable heat and flood areas to further target efforts at the neighborhood scale.

DCAC also has established six work groups to develop climate change mitigation and adaptation strategies, including: homes and neighborhoods; parks, public space, and water infrastructure; public health; solid waste; business and institutions; and energy.

The City of Detroit has received funding from various sources to implement resilience through various projects, including:

- In August 2015, City received \$8.9 million in U.S. Department of Housing and Urban Development Community Development Block Grant funding for green demolitions and greening of vacant lots.
- In 2014, Detroit received a \$1 million Shoreline Cities Green Infrastructure grant through the U.S. Environmental Protection Agency’s Great Lakes Restoration Initiative. The money will pilot green infrastructure projects on 40 existing vacant lots on Detroit’s East Side.
- Green infrastructure is being used as part of the Detroit Water and Sewerage Department’s investment strategy (\$3 million per year) to use vacant land for infiltration practices. Various road rebuilding projects are including green infrastructure (pavers, bioswales, etc.) to soak up stormwater in the right of way or adjacent vacant lots.

Detroit is home to various types of business—most notably the automobile manufacturing industry—and many companies in the region are engaged on the climate challenge. As an energy company, DTE Energy has plans in place to deal with changing weather conditions over time. Potential climate impacts of concern to the company include changing temperatures and precipitation, as well as the potential for more severe storm events. Great Lakes water levels may decline due to changes in precipitation and evaporation, which could impact water supplies for cooling in electric generation, as well as the transportation of fuel and other materials via the lakes. Severe storm events can potentially damage electrical infrastructure and the transmission and distribution of energy. DTE regularly responds to severe weather events, and maintains a storm emergency and readiness center to help communicate with customers and restore power following events. DTE is also a partner in the DCAC, supporting resilience efforts throughout Detroit.

ENDNOTES

1. The Potential Impacts of Climate Change on Detroit, Michigan, GLISA, University of Michigan, 2014. <http://www.detroitclimateaction.org/wp-content/uploads/2015/01/DCAC-Climate-Impacts-Report.pdf>.
2. Foundations for Community Climate Action: Defining Climate Change Vulnerability in Detroit, University of Michigan, 2012. <http://graham.umich.edu/media/files/climate-action.pdf>.
3. DTE Energy response to 2014 CDP Climate Survey.
4. Detroit Climate Action Collaborative: <http://www.detroitclimateaction.org>.



The Center for Climate and Energy Solutions (C2ES) is an independent, nonprofit, nonpartisan organization promoting strong policy and action to address our climate and energy challenges. The C2ES Solutions Forum brings together businesses, states, and cities to expand clean energy, reduce greenhouse gas emissions, and strengthen resilience to climate change.