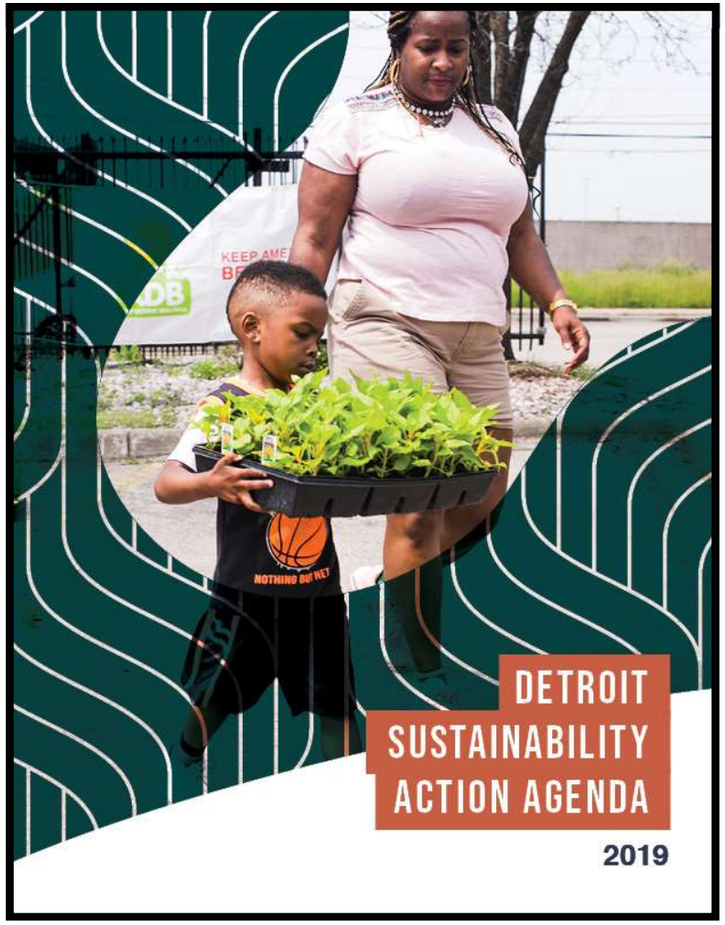
Office of
Sustainability

THE DETROIT SUSTAINABILITY ACTION AGENDA



Detroitmi.gov/sustainability

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10 GOALS

Healthy, Thriving People

- Improve **air quality** and reduce impacts from **pollution**
- Increase access to healthy **food, green spaces**, and **recreation** opportunities
- Advance **equity** in access to **economic opportunity**

Clean, Connected Neighborhoods

- Transform **vacant lots** and **structures** into safe, productive, sustainable spaces
- Reduce **waste** sent to landfills
- Make it easier and safer to **get around Detroit** without a personal vehicle

Affordable, Quality Homes

- Reduce the total **costs** of housing, including **utilities**
- Improve the **health** and **safety** of existing and new housing

Equitable, Green City

- Enhance infrastructure and operations to improve **resilience to climate impacts**
- Reduce municipal and citywide **greenhouse gas emissions**

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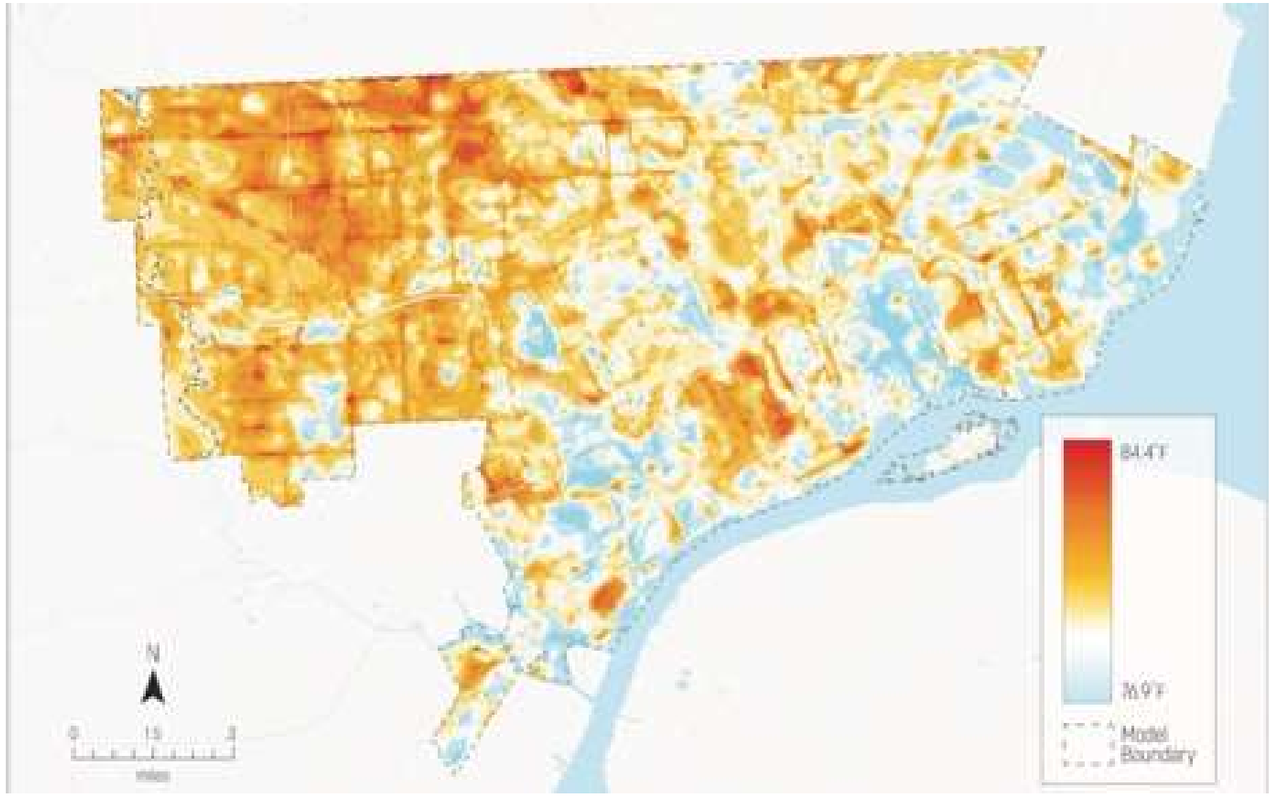
DETROIT CLIMATE STRATEGY OVERVIEW



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Climate Strategy Projects

CITY-LED

- Greenhouse gas inventories
- Emissions reduction strategies and tools – City and community
- Climate vulnerability analysis
- Climate resilience strategies: municipal and community
- Final strategy document

COMMUNITY-LED

- Equity lens & centering
- Climate equity advisory council
- Community engagement: survey, focus groups
- Community resources: resilience grants & toolkit

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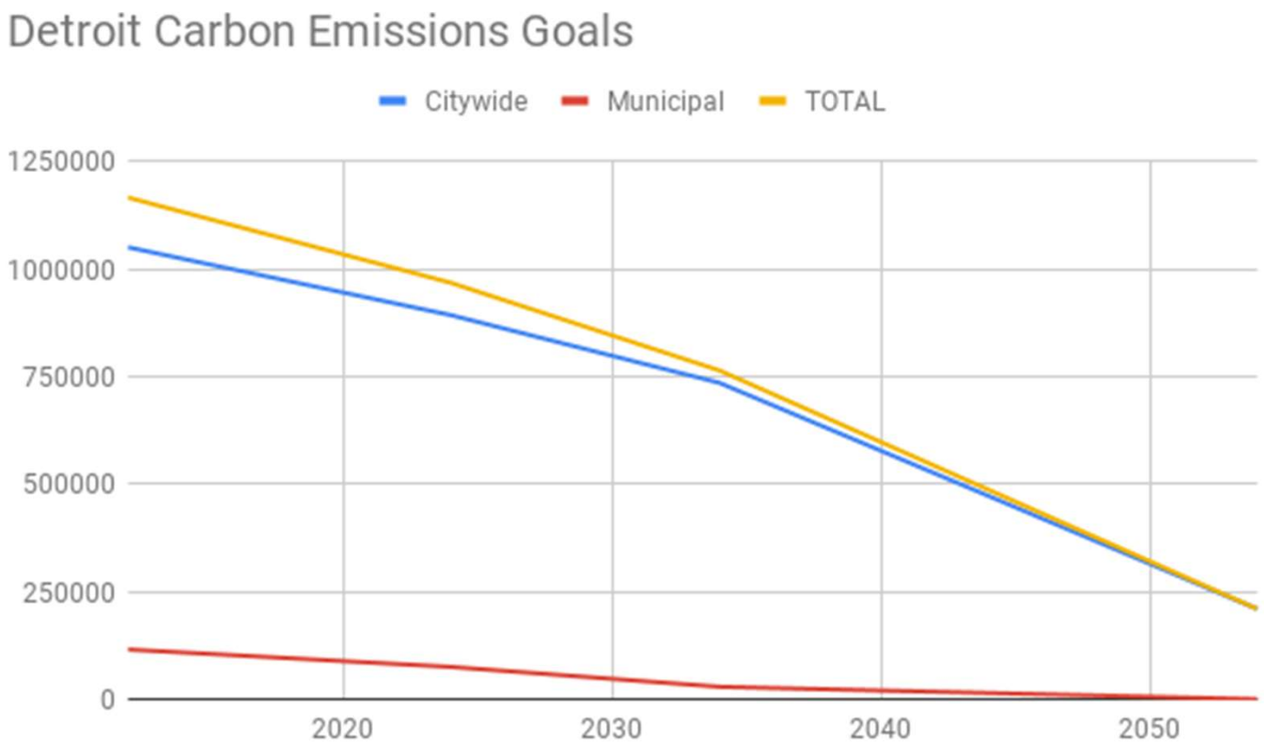
GREENHOUSE GAS ORDINANCE (JULY 2019)

- MUNICIPAL GOALS
  - 2024: 35%
  - 2034: 75%
  - 2054: 100%
- CITYWIDE (PARIS)
  - ~ 30% BY 2030



DRAFT WEDGES (ACTION CATEGORIES)

- Building energy efficiency
- Net zero new buildings
- Distributed renewable energy
- Clean electrification
- Industrial Energy Efficiency
- Decrease vehicle miles traveled
- Electric vehicle adoption
- Clean and efficient transit
- Off-road emissions reductions
- Landfill solid waste diversion
- Industrial Process Efficiency
- Resilience

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SPECIFICATIONS & GUIDANCE DOCUMENTS

- Building efficiency
- Building electrification
- On-site solar & storage
- Facility resilience
- Fleet efficiency
- Reduce vehicle miles traveled
- Electric vehicles

EV Charging Ready

A minimum 10 % of parking spots shall be made “EV Ready” for charging stations, meaning:

- There shall be a dedicated electrical circuit with sufficient capacity for each charging sp
- Conduit and wire shall be installed underground sufficient to deliver electricity to EV c spots
- Electrical panels shall be labeled EV Ready and positioned as close as possible to where will park
    - Level 2 Provide a panel with space and capacity for a 40 amp, 240 volt branch for each EV charger up to 19kW charge.
        - If more than four EV chargers, there should be a separate subpanel de for EV charger circuits
    - DCFC Provide a panel with space and capacity for a minimum 100 amp, 3 ph volt branch circuit for each EV charger up to 350kW charge.
        - If more than four EV chargers, there should be a separate subpanel de for EV charger circuits.

PROJECT TEAM INTRODUCTION

Joel Howrani Heeres

Engagement Team

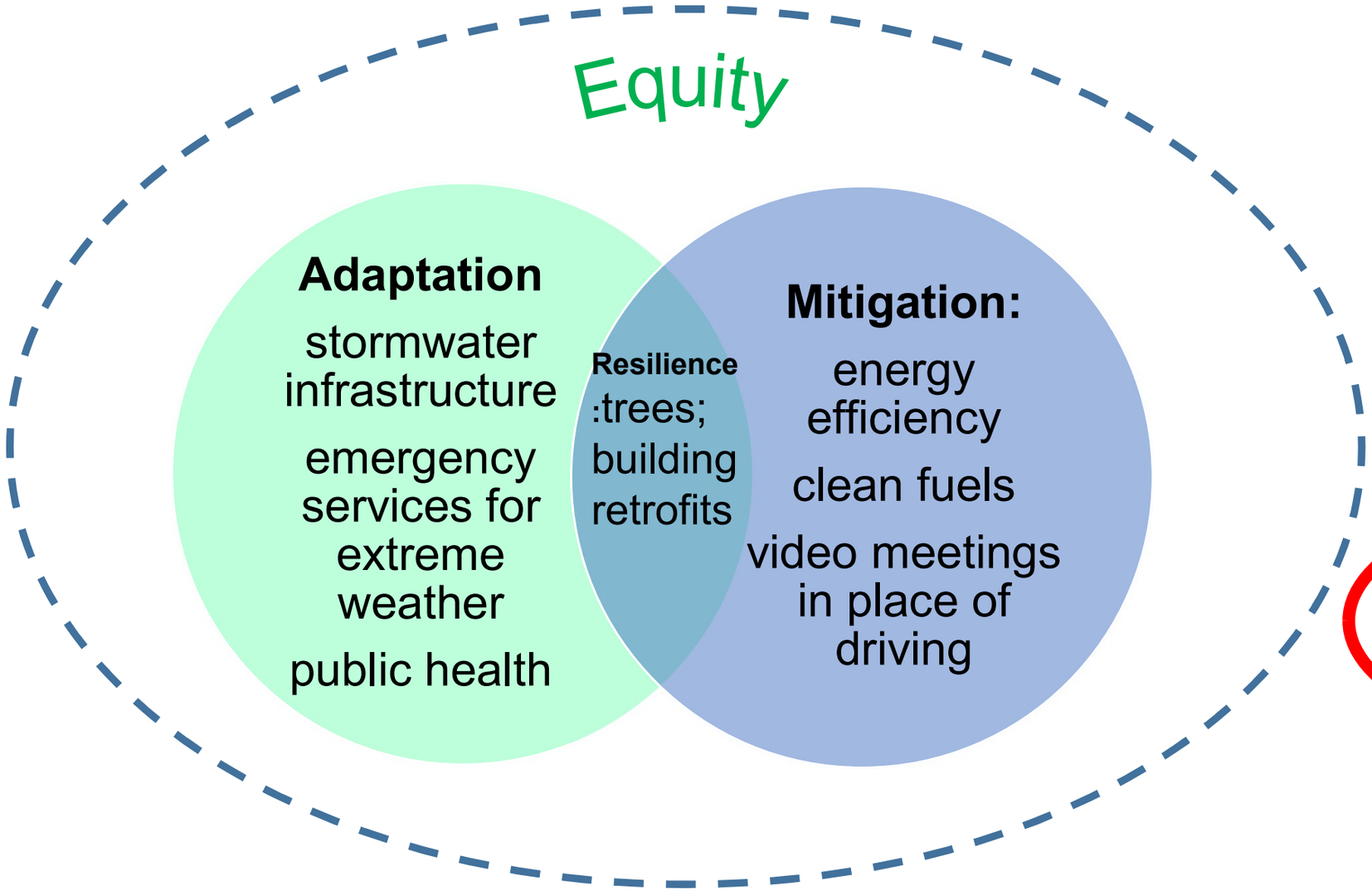
Justin Schott

Briana DuBose

Pashon Murray

Renee V. Wallace

ADAPTATION & MITIGATION EXAMPLES



Adaptation is preparing for the changing climate

Mitigation is reducing the causes of climate change

Resilience is adaptation + mitigation + equity

Exposure

Area impacted by climate hazards

Severity of climate impacts

Frequency of climate impacts

Household & community characteristics

Sensitivity

Housing and physical infrastructure

Access to and quality of services

Climate Vulnerability

Available response resources

Information, skills & communication

Institutional and social capital

Adaptive Capacity

Historical Climatology: Detroit, Michigan

GLISA
A NOAA RISA TEAM

Overview

Detroit is a historical city surrounded by the Great Lakes, and it serves as one of the major centers for commercial, financial, and transportation within the region. Like most of the region, the City of Detroit experiences many climate impacts; however, factors such as land use, pre-existing infrastructure and socioeconomic capactiy will determine the city's responsiveness to climate change. Increases in extreme heat days and precipitation lead to more potential threats of heat waves and flooding for the city. Compared to recent years, Detroit has begun its steps to revitalize much of city's landscape and infrastructure to accomodate the changes in climate. Because of its close proximity to Downtown Detroit, all information is provided by the climate station for Windsor, ON.*

Summary of Observed Changes

More precipitation: Total precipitation increased 10.7% (3.6 inches), from 1951 through 2014. Fall increases over that time exceeded 30% (2.3 inches).

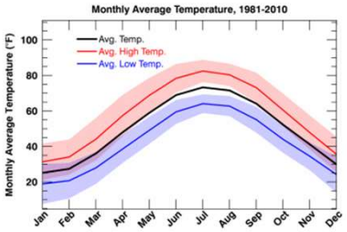
Less heavy precipitation: The number of very heavy precipitation events has decreased by 1.8% (comparing the 1951-1980 total to the 1981-2010 total).

Rising average temperatures: Annual average temperatures warmed by 2.7°F from 1951-2014. Average low temperatures have warmed at a greater rate than average high temperatures for the city.

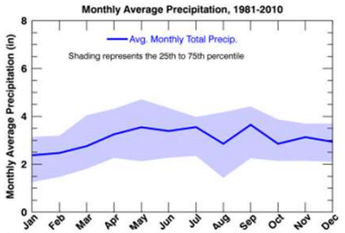
Longer freeze-free season: The freeze-free period of the year has lengtened drastically, by approximately 15 days, from 1951-2014.

Recent Climate Summary: 1981-2010 Temperature and Precipitation

Average Temperature	49.9°F
Average Low Temperature	41.8°F
Average High Temperature	58°F
Days/Year that exceed 90°F	8.9
Days/Year that fall below 32°F	114.5
Days/Year that exceed 100°F	0.3
Lowest Annual Average Temperature	48°F
Highest Annual Average Temperature	53.4°F
Average Precipitation Total	37.0 in
Lowest Annual Precipitation Total	25.5 in
Highest Annual Precipitation Total	48.3 in
Days/Year that exceed 1.25" of Precipitation	3.3



Average monthly temperatures during the 1981-2010 period. Shaded bands represent the standard deviation in the 30-year monthly average.



Average monthly total precipitation for the 1981-2010 period. The shaded band represents the 25th to 75th percentile.

GLISA is a collaboration of the University of Michigan Climate Center and Michigan State University.
*All data is provided by the GHCN station for Windsor, ON, Canada

The Potential Impacts of Climate Change on Detroit, Michigan

GLISA
GREAT LAKES INTEGRATED SCIENCES + ASSESSMENTS

Key Challenges

Detroit is a city rich with cultural tradition. Surrounded by the beauty of the Great Lakes, it serves as a commercial, financial, and transportation center for the region.

Detroit will face many of the same changes in climate as the surrounding geographic area, but the city's specific vulnerabilities will be determined primarily by other factors. Land use, pre-existing infrastructure design, and socioeconomic capacity are among many characteristics that will either reveal strengths or pose obstacles in adapting to climate change.

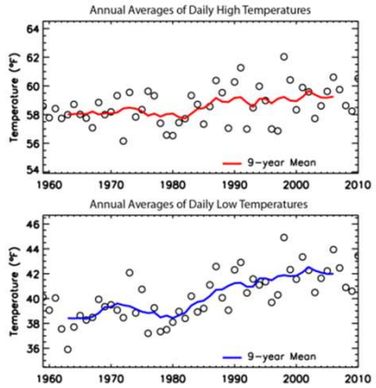
There are many potential impacts of climate change that cut across many sectors and jurisdictions. Detroit is expected to face the following critical challenges in the coming decades:

- ***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 severe rainstorms become more frequent and more intense, flooding will increase the risk of sewage overflows and water contamination.***
- ***Infrastructure will face challenges, such as direct damage due to weather and increasing demands for services during heat waves.***

Heat Waves and Hot Days

In Detroit, the 30-year average annual temperature increased by 1.4°F from the period 1961-1990 through the period 1981-2010. Most of this change has come from increases in overnight low temperatures (i.e., warmer nights), and from 1959-2011, average overnight temperatures on hot, dry days warmed 4.3°F.[1]

Small increases in average annual temperatures over time can greatly increase the probability of heat waves and hot days. The number of days per year with a high temperature above 90°F could increase from 15 at present to between 30 and more than 65 by the end of the century, while the maximum temperatures during those heat waves could rise as well.[2, 5]



Open circles represent the annual averages of daily high (top) and low (bottom) temperatures observed at Detroit Metropolitan Airport. Both have seen an increase since the 1930s, but overnight low temperatures have risen faster. Data source: NCDC, Station ID 94847.

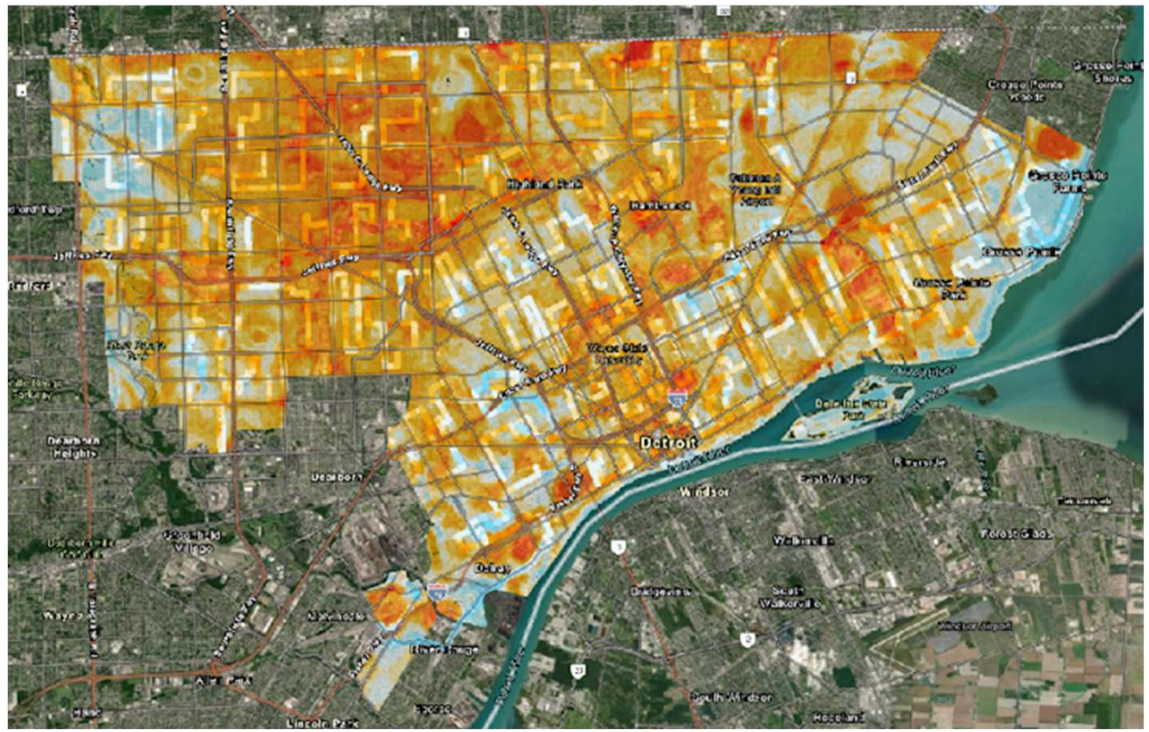
The Why: **Weather & Climate**

CLIMATE EMERGENCY

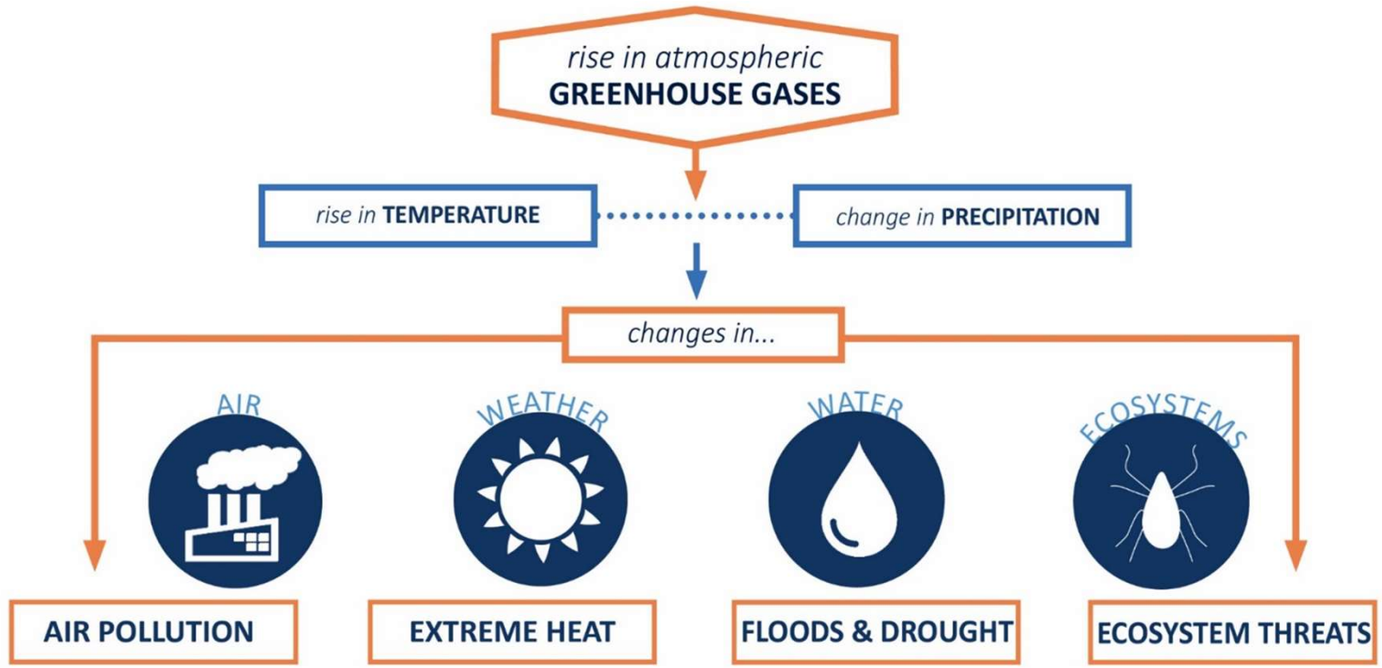
Extreme weather, floods, storms, heat emergencies, and more putting residents, businesses, and infrastructure at risk in Detroit.

“Climate change poses a serious threat to the economic well-being, public health, natural resources and neighborhoods in the City.” – Detroit Climate Ordinance

“Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.” –U.N. IPCC



IMPACTS FROM CLIMATE CHANGE



Direct effects
- » Initiate or worsen respiratory, cardiovascular and other diseases

Indirect effects
- » Reduced visibility
- » Reduced productivity at work or school
- » Degradation of crops and water bodies

Direct effects
- » Heat stress and illness
- » Worsening of pre-existing conditions
- » Heat-related mortality

Indirect effects
- » Infrastructure failures
- » Strain on essential services
- » Disruption to key social networks

Direct effects
- » Mental stress
- » Waterborne disease
- » Drowning and injuries

Indirect effects
- » Respiratory ailments
- » Disruption to economic and social networks
- » Strain on essential services
- » Wildfires

Direct effects
- » West Nile virus
- » Lyme disease
- » Liver, respiratory, nervous, skin disorders (from harmful algal blooms)

Indirect effects
- » Threats to livelihood
- » Financial strains

COSTS OF CLIMATE CHANGE

AIR POLLUTION

10.9% of adults and 13.2% of kids have ***asthma***.

One estimate of ***annual cost = $2,514 per patient*** and ***$92.4 M cumulative impact***.

EXTREME HEAT

EH currently causes an estimated 33 ***additional deaths*** at ***cost of $42 M annually***.

By end of century that could be 240 ***additional deaths*** at ***cost of $280 M***

FLOODS & DROUGHT

Flood damages:
- 2013 Kent County, $12 M
- ***2014 Detroit area, $1.2 B***
- 2018 Houghton, $100 M
- 2019 $15 M to farms

ECOSYSTEM THREATS

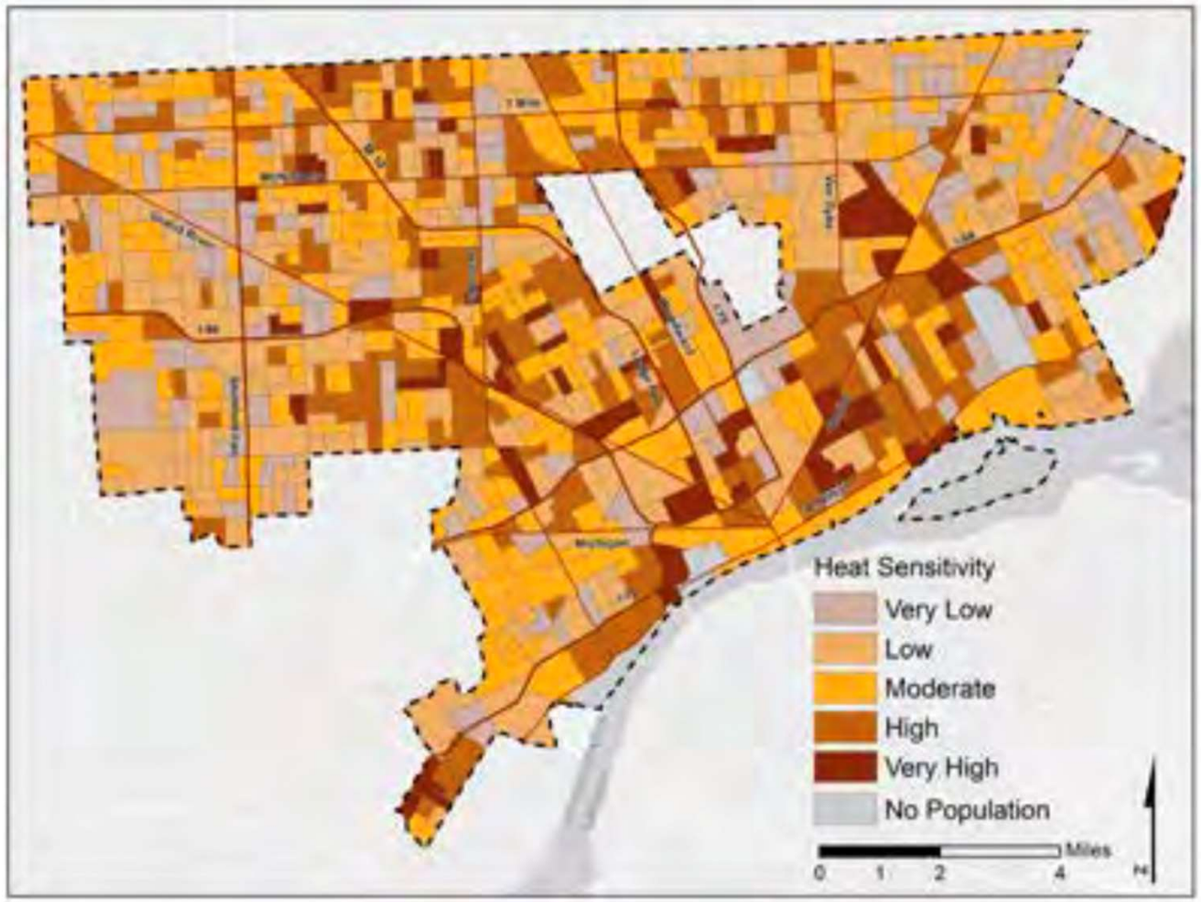
In 2012, 157 cases of Lyme **disease-related hospitalizations** and 11 **ED visits** were estimated to have resulted in $8M in health costs.

GOALS OF THE CVA

- Identify neighborhoods that most vulnerable to climate impacts
- Align resilience strategies with specific climate risks
- Prioritize resources in most vulnerable areas

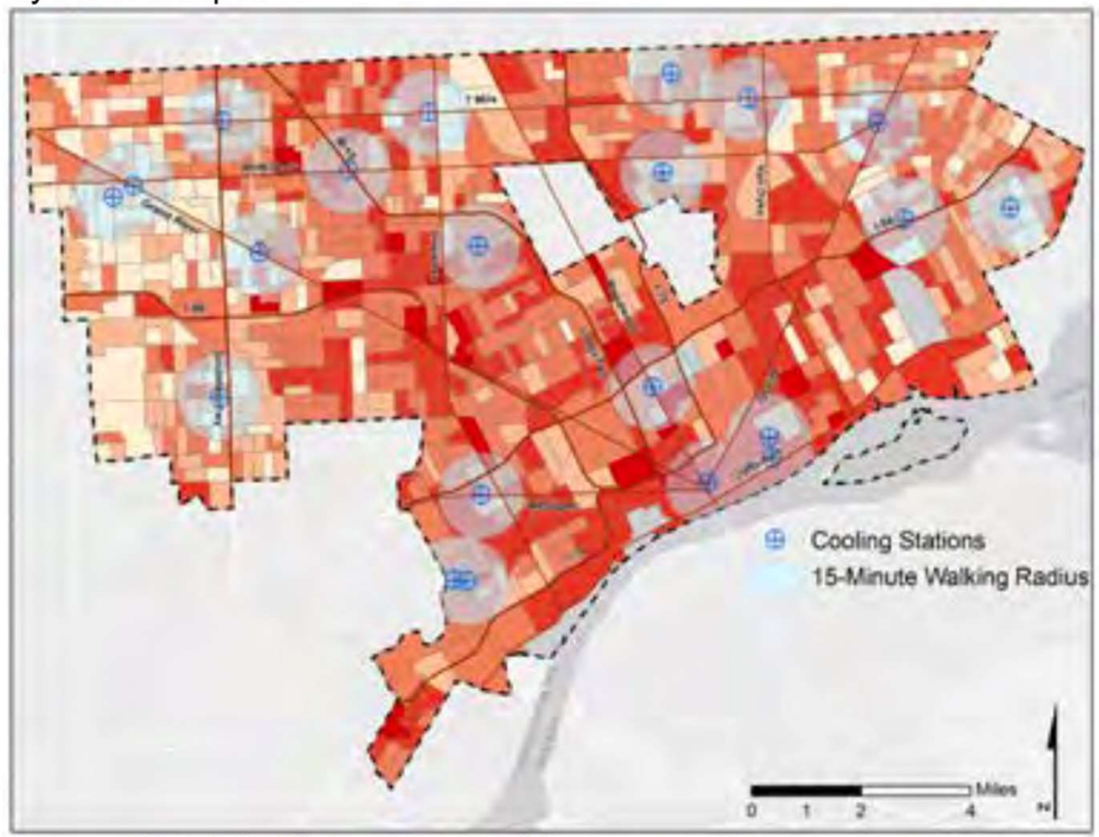
2012 CVA: U OF M

Figure 8 :Detroit Sensitivity to Excessive Heat by Block Group 2010



Source: American Community Survey; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

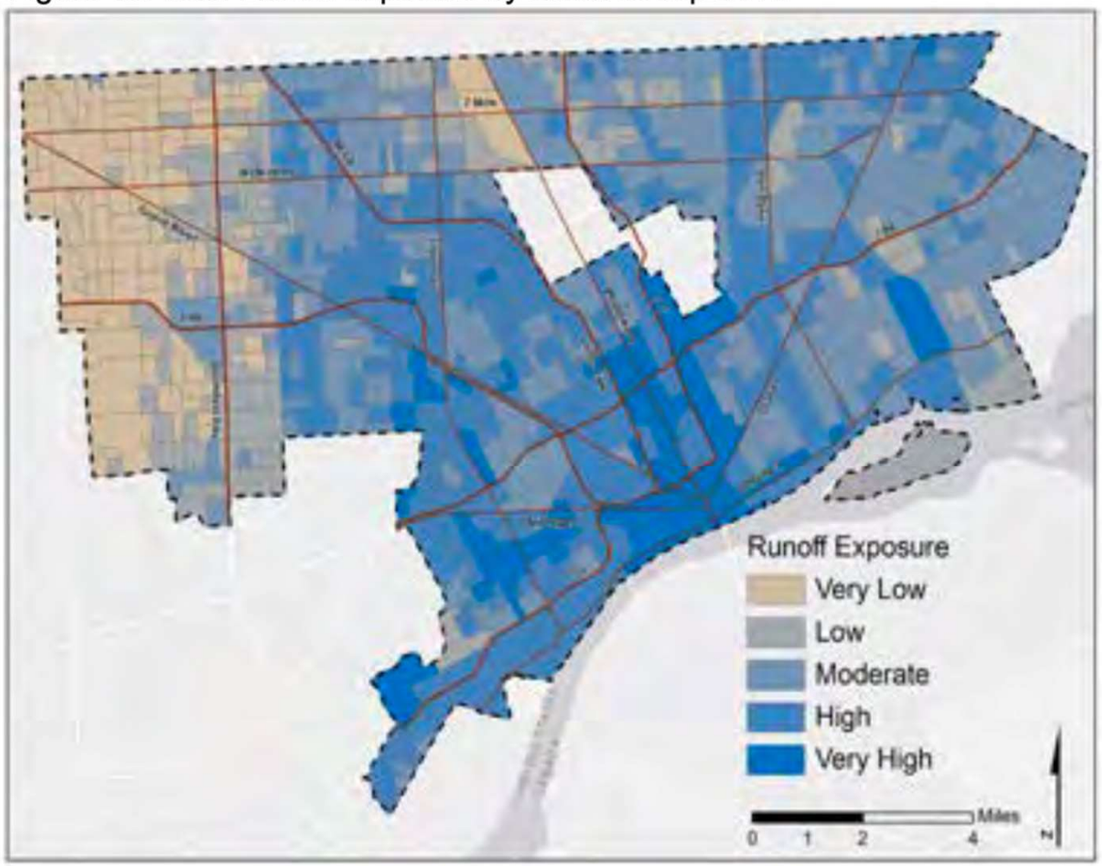
Figure 10 :Detroit Heat Vulnerability and Cooling Center Access by Block Group 2010



Source: USGS GloVis LandSat 7 ETM+; American Community Survey; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

2012 CVA: U OF M

Figure 16: Total Runoff Exposure by Block Group 2010



Source: Michigan Geographic Data Library; Michigan Digital Elevation Model; GloVis Landsat 7 ETM+; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

Figure 19: Household Sensitivity and Flood Potential

Source: American Community Survey 2006-2010; US Census 2010
Map Prepared By: University of Michigan Detroit Climate Capstone

PRIORITIZING RESILIENT ACTIONS:

ADDRESS CURRENT VITAL ISSUES

RESILIENCE ACTIONS IN DEVELOPMENT

- **Fund Creation and Operation of Resilience Hubs:** Develop community hubs (rec centers, other) where residents can go during outages and other events for cooling, charging, and other life needs
- **Rain Ready Program for single family homes**: Develop and deploy a program that offers an assessment and improvements that reduce the risk of household flooding in areas prone to flooding
- **Assess and improve Critical City facilities:** Increase resilience against electricity outages and heat/cold extreme events by including passive design, efficiency improvements and installation of backup power supply, co-generation and storage options.
- **Integrate climate considerations into the hazard mitigation plan:** Ensure that solutions to future/current climate hazards are presenting in the HMP update

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INFRASTRUCTURE & RESILIENCE GUIDING PRINCIPLES

- Future-proof investments –
  - Electrification & battery back-up
  - 100 year storm-ready
- Focus on Most Vulnerable
  - Seniors, poor, children
  - Improve housing resilience and reduce cost (utilities, maintenance)
- Green Infrastructure as Public Infrastructure
  - Public benefits = reduce household flooding
- Critical Public Facilities
  - Those need to serve the public
  - Electrification & battery back-up
  - 100 year storm-ready
- Work with Ecology

FUTURE ENGAGEMENT OPPORTUNITIES

TAKE OUR SURVEY to let us know what issues are most important to you and what solutions to climate change you want to see from the City.
Primary survey – takes 15-20 minutes to complete
Condensed survey – takes about 10 minutes to complete, and reduces the number of questions by 30%

FOCUS GROUPS: Sign up for (max 2) focus group on topics you care about or have specific expertise:
The Office of Sustainability will be hosting 6 focus groups on specific issues affected by climate change. Space is limited and registration is limited to a maximum of 2 focus groups that align with your interests and expertise.

1. Housing - Tuesday, 9/14
2. Health - Thursday, 9/16
3. Transportation< - Tuesday, 9/21
4. Waste & water - Thursday, 9/23
5. Food - Tuesday, 9/28
6. Economic development & opportunity - Thursday, 9/30

TOWNHALLS: Following the focus groups, we will be holding three virtual townhall events to report back what we heard and listen to more of your feedback. Townhalls are open to all, please plan to attend the one that best fits your schedule.

1. Tuesday, 10/12 - 6:00 - 8:00pm
2. Wednesday, 10/13 - 6:00 - 8:00pm
3. Saturday, 10/16 - 10:00am - 12:00pm

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DISCUSSION

Visit
http://detroitmi.gov/climate
for more information and to sign up for focus groups