

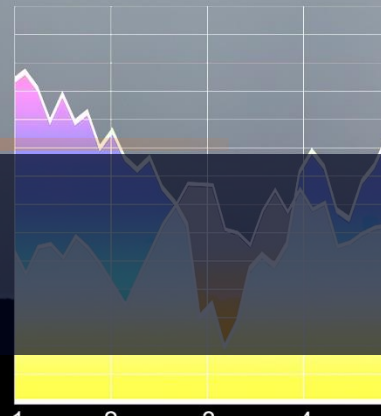
November 2024

# Southeast Michigan Climate Resiliency Data Portfolio



**SEMCOG**

SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS



## Mission

SEMCOG, the Southeast Michigan Council of Governments, is the only organization in Southeast Michigan that brings together all governments to develop regional solutions for both now and in the future. SEMCOG:

- Promotes informed decision making to improve Southeast Michigan and its local governments by providing insightful data analysis and direct assistance to member governments;
- Promotes the efficient use of tax dollars for infrastructure investment and governmental effectiveness;
- Develops regional solutions that go beyond the boundaries of individual local governments; and
- Advocates on behalf of Southeast Michigan in Lansing and Washington.

# Southeast Michigan Climate Resiliency Data Portfolio

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## Abstract

The "Climate Resiliency Data Portfolio" serves as a comprehensive resource for policymakers, planners, researchers, and community stakeholders, aiming to address the region's challenges posed by climate change. It compiles an extensive range of data sources and tools crucial for assessing vulnerabilities, planning interventions, and enhancing community resilience. The portfolio includes references to interactive maps, downloadable datasets, and reports from state and federal government sources, covering critical aspects such as climate-related hazards, risk assessment, equity considerations, green infrastructure, elevation and land cover, infrastructure, hydro, and environmental data. Designed as a living document, it evolves to incorporate the latest scientific research and emerging data sources, ensuring its ongoing relevance and comprehensiveness for effective climate resiliency planning and decision-making.

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Southeast Michigan Council of Governments  
Information Center  
1001 Woodward Avenue, Suite 1400  
Detroit, MI 48226-1904  
313-961-4266 • fax 313-961-4869  
www.semcog.org • infocenter@semcog.org

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## Introduction

Climate change poses significant challenges for communities worldwide, and Southeast Michigan is no exception. As climate patterns shift, the region faces increased risks from extreme weather events, flooding, heat waves, and other environmental stressors. To effectively plan and adapt to these changes, access to comprehensive and reliable data is essential.

This Climate Resiliency Data Portfolio is designed to serve as a vital resource for policymakers, planners, researchers, and community stakeholders in Southeast Michigan. It consolidates a wide array of data sources and tools that are critical for assessing vulnerabilities, planning interventions, and building resilient communities. The portfolio includes interactive maps, downloadable datasets, and reports from state and federal government sources, all tailored to the specific needs of Southeast Michigan.

The data and resources included in this portfolio cover various aspects crucial to climate resiliency, such as:

1. **Climate Resiliency:** Tools and datasets for understanding climate-related hazards and developing adaptation strategies.
2. **Risk Assessment:** Interactive tools and reports for evaluating flood, heat, and other environmental risks.
3. **Equity Considerations:** Data and maps that highlight social vulnerability and ensure equitable adaptation measures.
4. **Green Infrastructure:** Resources for implementing and assessing the impact of green infrastructure projects.
5. **Elevation and Land Cover:** Detailed elevation and land cover data are crucial for planning and risk assessment.
6. **Infrastructure:** Data on critical infrastructure such as bridges, roads, and dams that are vital for maintaining community resilience.
7. **Hydro:** Information on water bodies, wetlands, and other hydrological features important for flood management and ecological health.
8. **Environmental Data:** Comprehensive environmental datasets to monitor and mitigate the impact of climate change on natural resources.

Each section of this portfolio provides a detailed description of the available data, including how and where to access it. Whether you are looking to develop climate action plans, enhance community preparedness, or conduct environmental research, this portfolio offers the tools and information needed to support resilient decision-making.

The Climate Resiliency Data Portfolio is designed as a living document, evolving continually to incorporate the latest scientific research, emerging data sources, and feedback from stakeholders. As climate conditions and technological capabilities advance, new datasets and analytical tools will be integrated into the portfolio to ensure it remains relevant and comprehensive. Regular updates will reflect the dynamic nature of climate science and policy, enabling users to access the most current information and best practices. This adaptability ensures that the portfolio not only meets present needs but also remains a robust resource for future climate resiliency planning and decision-making.

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# Climate Resiliency

## Websites and Interactive Maps

### Climate Mapping for Resilience and Adaption (CMRA)

This website has information and several interactive maps to help understand what climate-related hazards the U.S. will be facing now and in the future.

- Climate-Related Hazards in Real Time: [Climate Mapping for Resilience and Adaptation](#)
- Climate Mapping for Resilience and Adaption: [CMRA - Climate Mapping For Resilience and Adaptation \(arcgis.com\)](#)

### U.S Climate Resilience Toolkit

This toolkit provides guidance, tools, and resources to help planners and the general public understand impacts of climate change for their communities.

- [U.S. Climate Resilience Toolkit | U.S. Climate Resilience Toolkit](#)

### Resilient Rural America Project

This is a free online training program to help rural communities become more resilient to extreme weather and changing climate conditions.

- [Model Forest Policy Program » Resilient Rural America Project \(RRAP\) \(mfpp.org\)](#)

### Arsht-Rock Resilience Center

This website focuses on building resilience to extreme heat using a variety of strategies.

- [Extreme heat - Arsht-Rock \(onebillionresilient.org\)](#)

The Arsht-Rock Foundation has also created the Heat Action Platform, a living, engagement-oriented tool for city officials, practitioners, and financial institutions to build resilience to extreme heat.

- [The Heat Action Platform - Heat Action Platform \(onebillionresilient.org\)](#)

### Environmental Justice Community Resiliency Planning Pilot Project

This pilot project in 48217/Southwest Detroit to build an Environmental Justice Community Resiliency Plan features a two-year planning process designed to provide guidelines for addressing issues that impact communities to provide a blueprint for resiliency (currently in progress). This effort was initiated by the Office of Environmental Justice Public Advocate along with community partners.

- [Environmental Justice Projects, Initiatives, and Past Actions \(michigan.gov\)](#)

## Downloadable Data and Reports

### SEMCOG Climate Resiliency and Flooding Mitigation Study

- [SEMCOG Climate Resiliency and Flooding Mitigation Study Report August 2020.pdf](#)

### Adaption Clearinghouse

The [database](#) includes climate change adaptation measures implemented by communities. With resources in a variety of sectors, this website is designed to help communities progress from assessment to implementation.

- [Adaptation Clearinghouse](#)

### EPA's Smart Growth Fixes for Climate Adaption and Resilience

This publication is meant for local government and staff looking for options that will help them update their existing codes and ordinances to better prepare their communities for climate-related impacts. The document offers strategies and basic guidance to help implement a policy based on what level of adjustment each community is aiming for.

- [Smart Growth Fixes for Climate Adaptation and Resilience \(epa.gov\)](#)

### Planning for Urban Heat Resilience

This is a framework for urban heat resilience planning created by The National Oceanic and Atmospheric Administration (NOAA) Climate Program Office, the interagency National Integrated Heat Health Information System (NIHHIS) and the American Planning Association. It features research, information, and ideas for improving urban heat resilience.

- [Planning for Urban Heat Resilience \(planning-org-uploaded-media.s3.amazonaws.com\)](#)

### American Planning Association's Falling Dominoes: A Planner's Guide to Drought and Cascading Impacts

This is a guide to combat drought and its impacts for local planners; it also covers "cascading effects," including health and economic impacts.

- [A Planner's Guide to Drought and Cascading Impacts](#)

### Michigan Climate and Health Adaptation Program (MICHAP) Strategic Plan

Made in cooperation with the Centers for Disease Control and Prevention (CDC), this is a climate-resilient public health system for Michigan at the statewide, local health department, and community levels.

- [Michigan Climate and Health Adaptation Program \(MICHAP\)](#)

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# Risk

## Websites and Interactive Maps

### SEMCOG Flooding Risk Tool – Interactive Map

This interactive map shows which roads, pump stations, culverts and Bridges and have highest risk of flooding.

- [SEMCOG Flooding Risk Tool Dashboard](#)

### Risk Factor

At this interactive website, homeowners and professionals can review the current and future risk at their properties for flood, wildfire, and extreme temperatures.

- [Find Your Property's Climate Risks - Homepage | Risk Factor](#)

### National Risk Index for Natural Hazards

The NRI is an easy -to-use, interactive tool that shows which communities are most at risk for natural hazards. It includes data about the expected annual losses to individual natural hazards, social vulnerability, and community resilience available at county and census tract levels.

- [National Risk Index for Natural Hazards | FEMA.gov](#)

### Resilience Analysis and Planning Tool (RAPT)

The Resilience Analysis and Planning Tool gives everyone access to powerful data and GIS mapping that can help everyone understand their community. RAPT has over 100 preloaded layers, including community resilience indicators from peer-reviewed research; the most current census demographic data; infrastructure data; and data on weather, hazards, and risk.

- [Resilience Analysis and Planning Tool \(RAPT\) \(arcgis.com\)](#)

### Policy Map

This interactive map features thousands of indicators from authoritative public and proprietary sources. Note: there is a free version, and an account does not need to be made to view map.

- [PolicyMap - Dig Deeper](#)

### Heat Vulnerability Index (HVI) Maps for Detroit

Maps showing HVI values for Detroit, MI were produced as part of a paper entitled “Mapping Vulnerability to Extreme Heat: A Critical Assessment of Heat Vulnerability Indices Created Using Principal Components Analysis.” Note the paper gets very technical, but includes useful information for interpreting HVIs.

[Mapping Human Vulnerability to Extreme Heat: A Critical Assessment of Heat Vulnerability Indices Created Using Principal Components Analysis | Environmental Health Perspectives | Vol. 128, No. 9 \(nih.gov\)](#)



## Climate Central Urban Heat Hot Spots

This webpage summarizes analysis of the urban heat island (UHI) index in 18,045 census tracts comprising 44 major U.S. cities, including downloadable data for Detroit, MI, to identify the most intense urban heat spots in most cities.

- [Urban Heat Hot Spots | Climate Central](#)

## Direct Relief Urban Heat Islands

This webpage summarizes effects of urban heat island, including a map for Detroit, MI.

- [“Urban Heat Islands” Across U.S. Put Certain Neighborhoods At Heightened Risk \(directrelief.org\)](#)

## EPA Urban Heat Island Effect

This EPA webpage has resources for learning, planning, and action surrounding urban heat island effect.

- [Heat Island Effect | US EPA](#)

## MI Environmental Project

This interactive map exists to “identify the relative vulnerability of census tracts (a geographic region defined for the purpose of taking a census) within Michigan to cumulative environmental exposures.” It defines the Heat Stress Index, which averages three factors that can contribute to climate change-related heat stress: vulnerabilities among people, places, and projected temperatures. The map measures which communities and locations will be most impacted by climate change.

- [MI Environment \(michiganview.org\)](#)

## U.S. Drought Monitor

This tool depicts the location and intensity of drought across the country. The map uses five classifications: Abnormally Dry (D0) for areas going into or coming out of drought and four levels of drought (D1-4).

- [Michigan | Drought.gov](#)

## Downloadable Data and Reports

### County Hazard Mitigation Plans

- [Livingston County](#)
- [Macomb County](#)
- [Monroe County](#)
- [Oakland County](#)
- [St. Clair County](#)
- Washtenaw County is in the process of creating a Hazard Mitigation Plan
- [City of Ann Arbor](#)
- Wayne County is in the process of creating a Hazard Mitigation Plan

## **Mapping Heat Vulnerability in Michigan**

- A report led by the Michigan Department of Community Health (MDCH) to identify and address health concerns related to extreme heat events.
- This report describes information on existing heat indexes and studies, drafts an initial set of basic maps based on Census data, assesses the availability of additional relevant data sources, proposes a set of additional maps, and proposes a strategy for indexing heat vulnerability.
- [Mapping Heat Vulnerability in Michigan](#)

## **Michigan State Vulnerabilities Fact Sheet**

- Fact sheet created by NOAA describing temperature, precipitation, and evaporation projections for Michigan.
- Includes temperature and precipitation graphs and maps.
- [Michigan State Climate Summary \(ncics.org\)](#)

## **National Integrated Drought Information System Outlook and Forecasts**

- Maps and datasets forecasting near-term precipitation and temperature conditions.
- [Outlooks & Forecasts | Drought.gov](#)

## **Detroit Region Vulnerability Assessment and Synthesis**

This report from the Urban Forestry Climate Change Response Framework, published by the USDA Northern Forests Climate Hub, evaluates the vulnerability of urban trees to a range of future climates within the City of Detroit. It includes useful maps and graphics.

- [DetroitVulnerabilityAssessment\\_Draft.pdf \(forestadaptation.org\)](#)

## **Observed and Projected Changes In Climate and Their Impacts**

This is a temperature projection report for the State of Michigan, created by UMASS Amherst.

- [https://www.geo.umass.edu/climate/stateClimateReports/MI\\_ClimateReport\\_CSRC.pdf](https://www.geo.umass.edu/climate/stateClimateReports/MI_ClimateReport_CSRC.pdf)

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# Equity

## Websites and Interactive Maps

### **CDC/ATSDR Social Vulnerability Index**

The CDC/STSDR Social Vulnerability Index (CDC/ATSDR SVI) uses 16 U.S. Census variables to help local officials identify communities that may need support before, during, or after disasters.

- [CDC/ATSDR Social Vulnerability Index \(SVI\)](#)

### **USDOT Equitable Transportation Community Explorer**

This interactive dashboard enables users to understand how a community or project area is experiencing transportation disadvantage compared to all other census tracts within a state across the five disadvantage component areas and the 40 indicators used to develop the five disadvantage areas.

- [ETC Explorer](#)

### **Environmental Justice Index (EJI)**

The EJI uses data from the U.S. Census Bureau, the US EPA, the US Mine Safety and Health Administration, and the US Centers for Disease Control and Prevention to rank the cumulative impacts of environmental injustice on health for every census tract.

- [Environmental Justice Index \(EJI\) \(cdc.gov\)](#)

### **Southeast Michigan Equity Emphasis Areas Application**

The tool provides one location where communities, partner organizations, and residents can learn about Southeast Michigan's current socioeconomic indicators and have a data-driven understanding of community needs to assist in effective planning.

- [SEMCOG Equity Emphasis Areas](#)

### **Bicycle and Pedestrian Mobility Maps**

SEMCOG has compiled several maps to review the mobility of residents. These maps help identify geographic areas that should be targeted for bicycle and pedestrian infrastructure, programs, and planning.

- [Equity and Demand Analysis | Bicycle and Pedestrian Mobility Maps for Southeast Michigan](#)

## **Tree Equity Score Map**

This map shows how well the benefits of urban tree canopy are reaching those in need. The Tree Equity Score combines information on numerous variables (including tree canopy, people in poverty, people of color, children and seniors, unemployment, linguistic isolation, health burden, heat disparity, and redlining) to create a single measure from 0 to 100. Users can view data on the composite Tree Equity score or the individual components. A lower score reflects a greater need for investment in tree canopy.

- [Tree Equity Score](#)

## **U.S Climate Vulnerability Index**

This interactive map visualizes how drivers of cumulative vulnerability disadvantage communities across the United States. The provides a robust, data-driven approach to understanding locally relevant determinants at a neighborhood scale. Pulling in 184 datasets to rank Census tracts, this mapping tool integrates cumulative impacts from quality of housing and access to supermarkets to proximity to toxic waste sites.

- [Climate Vulnerability Index](#)

## **Climate and Economic Justice Screening Tool (CEJST)**

The tool highlights disadvantaged census tracts using various indicators of burdens around the following categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development.

- [Climate and Economic Justice Screening Tool](#)

## **MiEJScreen: Environmental Justice Screening Tool**

MiEJScreen is an interactive screening tool that identifies a variety of stressors and demographics within communities that may impact environmental conditions or the public health of residents. The map allows users to explore the environmental, health, and socioeconomic conditions.

- [MiEJScreen: Environmental Justice Screening Tool \(Version 1.0\)](#)

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# Green Infrastructure

## Websites and Interactive Maps

### Detroit Stormwater Hub

- [Green Stormwater Infrastructure & Management | Detroit Stormwater](#)

### Green Infrastructure Opportunities – Washtenaw County

The Huron River Watershed Council identified Green Infrastructure opportunities in Washtenaw County, providing PDF maps and shapefiles.

- [Green Infrastructure Opportunities - Huron River Watershed Council \(hrwc.org\)](#)

### Green Infrastructure Map – Washtenaw County Region

- [Green Infrastructure - Map Washtenaw County Region](#)

### Green Dashboard

This interactive map includes the region's green infrastructure network, green stormwater management systems, resilient natural landscapes, along with public and protected lands.

- [SEMCOG GREEN Dashboard](#)

## Downloadable Data and Reports

### Green Infrastructure Assessments for Coastal Resilience

This report includes nature-based solutions to preserve coastlines and strengthen resiliency in Southeast Michigan.

- [Green Infrastructure Assessments for Coastal Resilience \(arcgis.com\)](#)

### Green Infrastructure in Michigan: An Integrated Assessment of its Use, Barriers & Opportunities

This report is focused on the understanding of drivers leading to the successful implementation of green infrastructure in Michigan, highlighting key initiatives and pilot projects.

- [Green Infrastructure in Michigan: An Integrated Assessment of its Use, Barriers & Opportunities \(michiganseagrant.org\)](#)

### Equity and Buildings: A Practical Framework for Local Government Decision Makers

This is a practical guide to help local governments center equity within infrastructure policies and planning.

- [Equity and Buildings: A Practical Framework for Local Government Decision Makers](#)

## Design Guides

- [Low Impact Development Manual for Michigan: A Design Guide for Implementors and Reviewers \(semcog.org\)](#)
- [Great Lakes, Green Streets Guidebook: A Compilation of Road Projects Using Green Infrastructure \(semcog.org\)](#)
- [A Detroit Property Owner's Guide to Bioretention](#)

## County/City Standards

- [Livingston County](#)
- [Macomb County](#)
- [Monroe County](#)
- [Oakland County](#)
- [St. Clair County](#)
- [Washtenaw County](#)
- [Wayne County](#)
- [City of Detroit: PCSWMO Design Manual December 2020 - Compressed.pdf \(detroitmi.gov\)](#)

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## Elevation and Land Cover

### Websites and Interactive Maps

- Digital elevation models (DEMs) and Lidar Data available on [USGS Lidar Explorer Map \(nationalmap.gov\)](https://nationalmap.gov)

### Downloadable Data and Reports

#### Elevation Data:

- [Great Lakes Bathymetry, including Lake St. Clair](#)
- [NOAA Bathymetric Data Viewer \(noaa.gov\)](#)
- [One-foot contours](#)

#### Aerial Imagery (2011, 2014, 2016)

- [SEMOG aerial imagery](#)
- [EarthExplorer \(usgs.gov\)](#)

#### Land Cover:

- [SEMCOG Land Use data](#) breaks down land use into categories that can be assigned a curve number.
- [USGS land cover data](#) includes land cover for the conterminous US at a 30-meter spatial resolution.

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## Boundaries

### Downloadable Data and Reports

- [County](#)
- [Minor Civil Divisions](#)

### Census Tracts (2010)

- [2010 Census Tracts](#)

### Census Datasets

- [Datasets \(census.gov\)](#)

### Parcel Data:

- Livingston: [Parcel Viewer \(arcgis.com\)](#)
- Macomb: [Macomb County Tax Parcels | Macomb County Open Data Portal \(arcgis.com\)](#)
- Monroe: [Monroe County Property Data Exchange \(arcgis.com\)](#)
- Oakland: [OC Tax Parcels \(Public\) | Access Oakland \(oakgov.com\)](#)
- St. Clair: [Public Tax Parcel Search \(stclaircounty.org\)](#)
- Washtenaw: [Washtenaw County \(sharefile.com\)](#)
- Wayne: [Wayne County Parcel Shape File | Wayne County \(arcgis.com\)](#)



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# Infrastructure

## Websites and Interactive Maps

### Bridge conditions

- [SEMCOG Bridge Condition Map](#)

### Building Footprints

- [SEMCOG Building Footprints](#)

### Michigan Dam Inventory

- [Michigan Dam Inventory \(arcgis.com\)](#)

## Downloadable Data and Reports

### Critical infrastructure

- [Airports](#)
- [Dams](#)
- [Grocery Stores](#)
- [Hospitals](#)

### Culverts

- [Culverts | State of Michigan \(arcgis.com\)](#)

### Railroads

- [Railroads \(v17a\) | Railroads \(v17a\) | State of Michigan \(arcgis.com\)](#)

### Roads

- [All Roads | State of Michigan \(arcgis.com\)](#)
- [DNR ROADS | DNR ROADS | State of Michigan \(arcgis.com\)](#)
- [Carpool Lots](#)
- [Pavement Conditions](#)

### Pump Stations

- [Pump Stations | MDOT Open Data - Home \(arcgis.com\)](#)

## Michigan Cooling Centers

This webpage contains a list of cooling centers in the following cities and counties: Detroit, Macomb, Monroe, Oakland, Washtenaw, Wayne, and Lansing.

- [Michigan Cooling Centers 2023 - Empowering Michigan](#)

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# Hydro

## Websites and Interactive Maps

### Wetlands:

- [Potential Wetland Restoration Areas | State of Michigan \(arcgis.com\)](#)
- [EGLE Interactive Map: Wetlands Map Viewer \(state.mi.us\)](#)

### County Drain Maps

- [Livingston County](#)
- [Macomb County](#)
- [Monroe County](#)
- [Oakland County](#)
- [St. Clair County](#)
- [Washtenaw County](#)
- [Wayne County](#)

### Great Lakes Coastal Wetland Mapping

This is an interactive map that identifies and classifies coastal wetlands and adjacent land use for the entire Great Lakes basin.

- [Great Lakes Coastal Wetlands \(mtri.org\)](#)

### FEMA Floodplains:

- [FEMA's National Flood Hazard Layer \(NFHL\) Viewer \(arcgis.com\)](#)

### How's My Waterway

This interactive map provides information about the condition of local waters based on data that states, federal, tribal, local agencies and others have provided to EPA.

- [How's My Waterway - Home \(epa.gov\)](#)

### The National Map Viewer

The National Map Viewer (TNM Viewer) is the one-stop destination for visualizing all the latest National Map data. It uses easy-to-navigate foundational base maps and makes it simple to interact with all our data themes to create your own map.

- [The National Map - Advanced Viewer](#)

## **USGS Current Water Data for Michigan**

This map provides real-time streamflow compared to historical streamflow for any day of the year for the USGS stream gages.

- [USGS WaterWatch -- Streamflow conditions](#)

## **Downloadable Data and Reports**

### **State of Michigan Watershed Boundaries (12-digit)**

- [Watershed Boundaries for the State of Michigan](#)

### **Lakes and Rivers**

- [Hydrography Lines | State of Michigan \(arcgis.com\)](#)
- [Hydrography Polygons | State of Michigan \(arcgis.com\)](#)

### **Recreation and Conservation Lands**

- [Parks, 2021 | SEMCOG Open Data \(arcgis.com\)](#)
- [Park Attributes | SEMCOG Open Data \(arcgis.com\)](#)
- [Washtenaw County Conservation Land](#)
- [Conservation and Recreation Lands \(Fee and Other\) | Michigan Department of Natural Resources \(arcgis.com\)](#)

### **FEMA Floodplains:**

- [FEMA Flood Map Service Center](#)

### **Pat 303 State Watersheds**

- [Part 303 State Wetland Inventory | State of Michigan \(arcgis.com\)](#)

### **NOAA Bathymetric Data:**

- [Bathymetric Data Viewer \(noaa.gov\)](#)

### **High Risk Erosion Zones**

- [High Risk Erosion Zones | EGLE Maps & Data \(arcgis.com\)](#)

### **Mitigation Banking Watersheds**

- [Mitigation Banking Watersheds | EGLE Maps & Data \(arcgis.com\)](#)

### **Michigan Resource Inventory System (MIRIS)**

- [Michigan Resource Inventory System \(MIRIS\) Wetland Classes | EGLE Maps & Data \(arcgis.com\)](#)

## Rainfall:

- [Southeast Michigan Current and Future Precipitation](#)
- [NOAA Atlas 14 Point Precipitation Frequency Estimates](#)
- [Historic Rainfall Data \(downloadable\) | National Climatic Data Center \(NCDC\) \(noaa.gov\)](#)
- [Community Collaborative Rain, Hail & Snow Network](#)
- [City of Ann Arbor Rain Gauges \(a2gov.org\)](#)

## Statewide GIS 3DHP Hydrography Improvement Project

- Statewide GIS 3DHP Hydrography Improvement Project [PowerPoint Presentation \(michigan.gov\)](#)
- [The 3D National Topography Model Call for Action - Part 1: The 3D Hydrography Program | U.S. Geological Survey \(usgs.gov\)](#)

## The Clinton Sensor Project

- [The Clinton Sensor Project - Institute of Water Research \(msu.edu\)](#)
- [Supporting project integration and translation: Clinton River Smart Stormwater Management \(umich.edu\)](#)

## Watershed Management Plans

- [Water Resources Plan for Southeast Michigan](#)
- [The Chain of Lakes Watershed Management Plan](#)
- [The Clinton River East Subwatershed \(Macomb County\)](#)
- [The Upper Huron/Kent Lake Subwatershed Management Plan](#)
- The Middle Huron River Watershed Management Plan, Section 2: [Middle Huron River Watershed Management Plan, Section 2 - Huron River Watershed Council \(hrwc.org\)](#)
- [The Lower Huron Watershed Management Plan](#)
- [Lake St. Clair Subwatershed Plan](#)
- [North Branch Subwatershed Plan](#)
- [Norton Creekshed Watershed Management Plan](#)
- [Red Run Subwatershed Plan](#)
- [Rouge River Watershed Management Plan](#)
- [Stony/Paint Creek Subwatershed Plan](#)

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# Environmental

## Websites and Interactive Maps

- [Michigan Materials Management Facilities \(arcgis.com\)](#), including Michigan Part 115 Landfills

### EGLE GeoWebFace Interactive Map

This map features geological information for the State of Michigan, including the location of oil/gas fields, mines/rock quarries and other geologic formations.

- [GeoWebFace Map Page \(state.mi.us\)](#)

### Greening of Detroit – Tree Plantings

This interactive map provides the locations of trees planted in the City of Detroit by Greening of Detroit.

- [OpenTreeMap | The Greening of Detroit's Tree Map | Map](#)

### Tree Canopy

This interactive map that can be used to classify land and tree cover across a given area using random sampling of aerial imagery.

- [i-Tree Canopy \(itreetools.org\)](#)

### US Tree Map

This is the most detailed and up-to-date source of tree cover data for the U.S., providing information on the presence/absence of trees at 60-cm resolution.

- [EarthDefine | US Tree Map: Seamless high-resolution tree canopy data](#)

### Hydric Soils

- [Hydric Soils | Hydric Soils | EGLE Maps & Data \(arcgis.com\)](#)

### MiEnviro Portal Interactive Map

- [MiEnviro Portal \(michigan.gov\)](#)

### Total Maximum Daily Loads – TMDLs

- [TMDL Watersheds Screening Tool \(arcgis.com\)](#)

## **EnviroAtlas Interactive Map**

EPA's interactive map allows users to discover, analyze and download geospatial data related to ecosystems services, their stressors, and human health.

- [EnviroAtlas \(epa.gov\)](https://enviroatlas.epa.gov/)

## **Michigan Clean Energy Map**

This interactive map pinpoints clean energy and energy efficiency sites. The map also highlights areas with clean energy potential.

- [E2 Michigan Clean Energy Map \(arcgis.com\)](https://arcgis.com/michigan-clean-energy)

## **Soil Data**

The web soil survey provides soil data and information produced by the National Cooperative Soil Survey and is operated by the National Resources Conservation Service (NRCS). This database includes hydrologic soil groups, hydraulic conductivity, depth to ground water, and more. The soil data on this website does not replace the need for an infiltration test, however it can be used when calculating runoff.

- [Web Soil Survey - Home \(usda.gov\)](https://websoilsurvey.sc.egov.usda.gov/)

## **Downloadable Data and Reports**

### **Contamination Locations**

This resource provides downloadable shapefiles for: Leaking Storage Tanks (Open and Closed), Sites of Environmental Contamination. Underground Storage Tanks, Brownfield Redevelopment

- [Environmental Mapper \(state.mi.us\)](https://state.mi.us/environmental-mapper)

### **Land Fill Locations**

- [Michigan Part 115 Landfills | State of Michigan \(arcgis.com\)](https://arcgis.com/michigan-part-115-landfills)

### **Oil Well Locations**

- [Oil Wells | U.S. Energy Atlas \(eia.gov\)](https://eia.gov/oil-wells)

### **Phragmites in Costal Great Lakes Report**

- [Radar Detection and Monitoring of Invasive Phragmites in the Coastal Great Lakes | Michigan Tech Research Institute \(MTRI\) \(mtu.edu\)](https://mtu.edu/michigan-tech-research-institute/mtr-i/radar-detection-and-monitoring-of-invasive-phragmites-in-the-coastal-great-lakes)

### **Tree Canopy Cover**

- [USDA Forest Service FSGeodata Clearinghouse - USFS Tree Canopy Cover Datasets](https://fs.fed.us/geodata/data/USFS_Tree_Canopy_Cover_Datasets)
- [Michigan DNR Forestry Canopy Data | Michigan Department of Natural Resources \(arcgis.com\)](https://arcgis.com/michigan-dnr-forestry-canopy-data)

**Tree Locations:**

- [City of Ann Arbor Data Catalog \(a2gov.org\)](https://a2gov.org/data-catalog/)

**Total Maximum Daily Loads – Total Maximum Daily Loads**

- [E. coli Total Maximum Daily Loads \(TMDLs\) Watersheds | State of Michigan \(arcgis.com\)](#)
- [Nitrate Total Maximum Daily Loads \(TMDLs\) Watersheds | State of Michigan \(arcgis.com\)](#)
- [Phosphorus Total Maximum Daily Loads \(TMDLs\) Watersheds | State of Michigan \(arcgis.com\)](#)
- [Sediment and Biota Total Maximum Daily Loads \(TMDLs\) Watersheds | State of Michigan \(arcgis.com\)](#)

**Wellhead Protection Areas (WHPA)**

- [Wellhead Protection Areas \(WHPA\) | EGLE Maps & Data \(arcgis.com\)](#)



## Summary Matrix

To enhance the utility of the Climate Resiliency Data Portfolio, a summary matrix was developed that categorizes each data source under the most relevant climate resiliency themes while also indicating its applicability to other related categories. This matrix was created to address the multifaceted nature of climate resiliency data, recognizing that many datasets and tools intersect multiple areas of concern such as risk assessment, equity considerations, and green infrastructure. By cross-referencing data sources with their various applications, the matrix provides a comprehensive overview that facilitates easier identification and access to relevant information for users. This enables policymakers, planners, researchers, and community stakeholders to leverage the data more effectively for integrated and holistic climate resiliency planning and decision-making. Solid black circles “●” represent the primary category and where additional information is found in the document, open circles “○” represent secondary categories.

Data	Climate Resiliency	Risk	Equity	Green Infrastructure	Elevation and Land Cover	Boundaries	Infrastructure	Hydro	Environment	Data to build H&H Model
CMRA	●	○								
US Climate Resilience	●			○						
Resilient Rural America	●	○								
Arsht-Rock Resilience Center	●	○								
SEMCOG Climate Resiliency Study	●						○	○		
Adaption Clearinghouse	●			○				○		
EPA Smart Growth Fixes	●							○	○	
Planning for Urban Heat Resilience	●	○								
Falling Dominoes	●	○								
Environmental Justice Community Resiliency Planning	●	○	○							
MICHAP Strategic Plan	●	○	○				○			
SEMCOG Flooding Risk		●					○	○		○
Risk Factor		●								
National Risk Index of Natural Hazards		●								

Data	Climate Resiliency	Risk	Equity	Green Infrastructure	Elevation and Land Cover	Boundaries	Infrastructure	Hydro	Environment	Data to build H&H Model
FEMA RAPT		●					○		○	
Policy Map		●	○							
HVI Maps for Detroit	○	●								
Climate Central Urban Heat Hot Spots	○	●								
Direct Relief Urban Heat Islands	○	●	○							
EPA Urban Heat Island Effect	○	●	○							
MI Environmental Project		●	○							
U.S. Drought Monitor		●								
County Hazard Mitigation Plans	○	●								
Mapping Heat Vulnerability in Michigan	○	●	○							
Michigan State Vulnerabilities Fact Sheet	○	●								
National Integrated Drought Information System		●								
Detroit Vulnerability Assessment	○	●							○	
Observed and Projected Changes in Climate	○	●								
CDC/ATSDR SVI			●							
USDOT Equitable Transportation Community Explorer	○	○	●							
EJI		○	●						○	
SE Michigan Equity Emphasis Areas App.			●							
Bicycle & Pedestrian Mobility Maps			●				○			
Tree Equity Score Map	○		●						○	
U.S Climate Vulnerability Index			●							
Climate and Economic Justice Screening Tool			●							
MiEJScreen			●							

Data	Climate Resiliency	Risk	Equity	Green Infrastructure	Elevation and Land Cover	Boundaries	Infrastructure	Hydro	Environment	Data to build H&H Model
Detroit Stormwater Hub				●				○		
GI Opportunities				●					○	
GI Map – Washtenaw County				●						
SEMCOG Green Dashboard	○		○	●				○	○	
GI Assessments for Coastal Resilience				●				○		
GI in Michigan				●						
Equity and Buildings			○	●						
GI Design Guides				●			○		○	
GI City/County Guidelines				●			○		○	
Great Lakes Bathymetry					●			○		○
SEMCOG 1-ft Contours				○	●		○	○		○
USGS LIDAR Explorer					●					○
SEMCOG & Earth Explorer Aerial Imagery					●					○
SEMCOG Land Cover				○	●					○
USGS Land Cover				○	●					○
County & Minor Civil Divisions						●				
Census Datasets			○			●				
County Parcel Data						●				
Bridge Conditions			○				●			
Building Footprints							●			○
Michigan Dam Inventory							●			○
Critical Infrastructure							●			
Culverts							●	○		○

Data	Climate Resiliency	Risk	Equity	Green Infrastructure	Elevation and Land Cover	Boundaries	Infrastructure	Hydro	Environment	Data to build H&H Model
Railroads							●			
Roads							●			○
Pump Stations							●	○		○
Michigan Cooling Centers							●			
Wetlands				○				●	○	○
County Drain Maps				○				●	○	○
Great Lakes Coastal Wetland Mapping				○				●	○	○
FEMA Floodplains		○		○				●		○
How's My Waterway								●	○	
The National Map Viewer								●		
MI Watershed Boundaries				○				●		○
Lakes & Rivers Shapefile								●		○
Recreation and Conservation Lands Shapefiles			○	○				●		○
High Risk Erosion Areas Shapefile				○				●	○	
Mitigation Banking Watersheds								●	○	
MIRIS								●	○	
Rainfall Data								●		○
GIS 3DHP Hydrology Improvement								●		
Clinton Sensor Project								●		
Watershed Management Plans				○				●	○	
MI Materials Management Facilities Map			○	○					●	
EGLE GeoWebFace Interactive Map				○					●	
Greening of Detroit Tree Plantings	○		○	○					●	

Data	Climate Resiliency	Risk	Equity	Green Infrastructure	Elevation and Land Cover	Boundaries	Infrastructure	Hydro	Environment	Data to build H&H Model
i-Tree Canopy	○			○	○				●	
US Tree Map									●	
Hydric Soils				○					●	○
MiEnviro Portal Map				○					●	
TMDLs Map & Shapefiles				○				○	●	
EnviroAtlas Interactive Map	○	○							●	
Michigan Clean Energy Map	○	○							●	
Soil Data				○				○	●	○
Contamination Locations		○							●	○
Land Fill & Oil Well Locations								○	●	○
Phragmites In Costal Great Lakes Report	○								●	
Tree Canopy Cover	○				○				●	
Tree Locations	○								●	
Wellhead Protection Areas									●	

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