



## Increased Health Risks from Climate Change

Throughout the 20th and into the 21st century, Michigan's climate has changed in measurable and impactful ways. Since 1951, the average annual temperature has increased by 0.6°F in the southeastern Lower Peninsula, and up to 1.3°F in the northwestern Lower Peninsula. During that same period, total annual average precipitation across the state increased by 4.5%, or 1.4 inches. Additional changes include an increased frequency of some types of extreme weather such as heavy precipitation events. These changing climate conditions impact both environmental and human systems, representing an emerging threat to public health in Michigan.

### THE CLIMATE HEALTH PROFILE REPORT: PATHWAYS OF VULNERABILITY

The report, "Michigan Climate and Health Profile Report 2015: Building resilience against climate effects on Michigan's health," was developed through a collaborative effort of the Michigan Department of Health and Human Services, the University of Michigan School of Public Health, and the Great Lakes Integrated Sciences and Assessments Program (GLISA).

Report authors highlight historic and projected climate change, and the impact of those changes on human health in the State of Michigan. Five priority climate-related health outcomes for Michigan were identified: respiratory diseases, heat related illnesses, waterborne diseases, vector-borne diseases, and injuries such as carbon monoxide (CO) poisoning.

### PRIORITY CLIMATE-RELATED HEALTH OUTCOMES

- 1 Respiratory diseases.** Projected conditions favor increased air pollution and worsening respiratory disease. An earlier and longer growing season for plants could increase pollen levels, which could exacerbate allergies and asthma.
- 2 Heat-related illnesses.** Heat waves with high temperatures, high humidity and stagnant air masses could become more common and may lead to an increase in heat-related illness and death.
- 3 Water-borne diseases.** Flooding events are expected to remain unchanged or worsen in coming decades. Runoff from sewage and septic systems will continue to be a problem, potentially increasing the risk of water-borne diseases and, in some cases, harmful algal blooms.
- 4 Vector-borne diseases.** Projections point to warmer winters, earlier springs and warmer summers, conditions suitable for mosquito-borne diseases such as West Nile virus and tick-carried diseases such as Lyme disease.
- 5 Carbon monoxide poisoning and weather-related injuries.** Weather-related power outages are likely to increase, especially in the winter, leading to increased use of generators and related cases of carbon monoxide poisoning. An increased frequency of freezing rain and flooding may raise the risk of motor vehicle accidents and other types of injuries.



## NATIONWIDE EFFORT

U-M researchers from the School of Public Health, the A. Alfred Taubman College of Architecture and Urban Planning, the School of Natural Resources and Environment, the Climate Center and GLISA contributed to the report. Developing the report led to DEQ involvement in the Centers for Disease Control and Prevention's (CDC) Climate-Ready States and Cities Initiative. This pilot initiative is a nationwide effort, involving 16 states and 2 cities, to inform communities and public health officials about the most current climate science related to environment and health.

## KEY OUTCOME

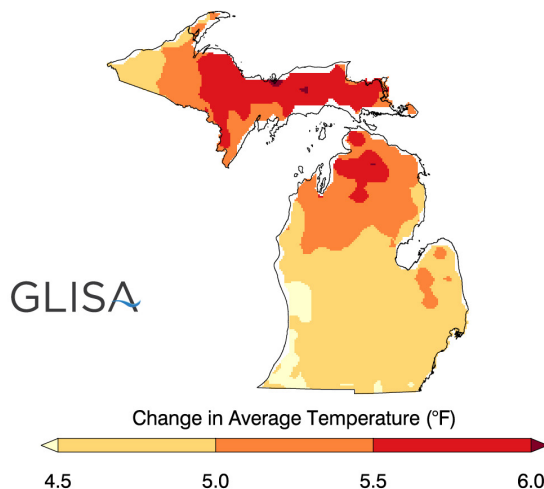
Authors anticipate that report results will help focus future efforts to strengthen Michigan's public health preparedness as extreme weather events become increasingly common. Based on current trends and projections for the future (2021-2050), the most likely climate change impacts in Michigan are extreme heat events, these events are defined as prolonged periods of increased temperature and humidity; changes in precipitation patterns, including excess rain leading to flooding; and extreme weather such as heavy snow and freezing rain.

How these climate changes impact the health and well being of Michigan's citizens depends on a variety of factors, including overall health, and age. To understand how each climate change could interact with existing social and environmental factors the report authors relied on U-M research and expertise. The final product is a guide to high ranking health concerns specific to nine geographic regions of Michigan based on climate change impacts, as well as key social and economic characteristics.

Based on the report findings, in the summer of 2016, the project will move into a new phase of work. The team will focus on developing and testing interventions to improve community health and building a training program for community health workers across the state.

## PROJECTED CHANGE IN AVERAGE ANNUAL TEMPERATURE

Period: 2041 -2070 / Higer Emissions: A2 / Data source: NOAA NCDC/CICS-NC



*Projected increases in annual average temperature by 2041-2070 as compared to the 1971-2000 period, assuming emissions of greenhouse gases continue to rise (A2 scenario). Northern areas will likely see greater warming by mid-century. The Eastern Upper Peninsula and Northern Lower Peninsula of Michigan may see particularly significant changes.*

## PROJECT TEAM

### UNIVERSITY OF MICHIGAN

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### STATE OF MICHIGAN

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## ACKNOWLEDGEMENT

The National Oceanic and Atmospheric Administration (NOAA) and the federal Centers for Disease Control (CDC) supported the development of this report.

Housed at the U-M Climate Center, the Great Lakes Integrated Sciences and Assessments Program (GLISA) is a collaboration of U-M and Michigan State University, and supported by NOAA.

GLISA is part of NOAA's Regional Integrated Sciences and Assessments program, and focuses on adaptation to climate change and variability.

See the full report: <http://glisa.umich.edu/projects/michigan-community-health-and-climate-change>