Climate change is affecting human health in a variety of ways right in our backyards. People in Michigan are vulnerable to climate-related health threats from worsening air quality, extreme heat, extreme precipitation and flooding, and greater exposure to dangerous diseases. We must take action now to ensure a healthy climate for our children and grandchildren.

Last year the U.S. Environmental Protection Agency (EPA) proposed the Clean Power Plan, a common sense approach to protecting public health by limiting, for the first time, carbon pollution emitted by existing power plants, the largest driver of climate change. The plan deserves strong support as one of the biggest steps forward to tackle climate change and reduce its associated health risks.

Climate change is expected to affect the health of Michiganders in the following ways:

1. Extreme Heat and Heat Waves Lead to Increased Illness and Death

   As temperatures reach more frequent and hotter highs, death and illnesses occurring from heat stress, heatstroke, cardiovascular disease, kidney disease, and other causes often increase.¹

   - Nationally, heat extremes are projected to become more common, with summer highs that ranked among the hottest 5 percent in 1950–1979 rising to at least 70 percent of the time by 2035—2064.² Yesterday’s extreme temperatures could become tomorrow’s normal temperatures, with even worse extremes.

   - Under a scenario in which carbon pollution increases, Michigan can expect to see more than twice as many days over 90°F in 2084 as there were during the heat wave year of 1988.³

   - Wayne County experienced 16 days over 90°F in 2011; 56 such days are projected for 2084.

   - Heat-related deaths are also projected to sharply increase under this scenario, with Detroit potentially facing more than double the current number by the 2080s.⁴

   [Maps and data showing projected changes in temperature]

   The maps show projected increases in the average temperature on the hottest days by late this century (2081-2100) relative to 1986-2005 under a scenario that assumes a rapid reduction in heat-trapping gases (RCP 2.6) and a scenario that assumes continued increases in these gases (RCP 8.5). The hottest days are those so hot they occur only once in 20 years. Across most of the continental United States, those days will be about 10°F to 15°F hotter in the future under the higher emissions scenario. (Figure source: NOAA NCDC / CICS-NC)

2. Climate Change Worsens Air Pollution That Threatens Our Health

Rising temperatures, along with greater air stagnation and other climate effects, increase ground-level ozone smog. The more than 1.5 million people with asthma or chronic respiratory disease in Michigan are especially vulnerable to the harmful health effects of ozone smog, which makes it harder to breathe.

Of the hundreds of thousands of allergic disease hospitalizations in Michigan from 2001 to 2010, the Michigan Department of Community Health reported that 90 percent of these were due to asthma.

Twenty counties in the state earned a failing grade for high ozone days in the American Lung Association’s State of the Air 2014 report.

Current models indicate that areas with high ozone today are at risk of even greater ozone smog pollution in the future due to climate change.

A Harvard analysis shows that the health benefits from reducing particles and smog could save 1,900 lives and prevent 450 hospitalizations in Michigan from 2020-2030, and at the same time reduce carbon pollution to limit longer-term climate change.

3. Allergen Risks Rise

Elevated carbon dioxide and higher temperatures associated with climate change are already altering the range of plants’ occurrence and the timing of bloom, leaf, fruit, and pollen production.

More pollen produced over longer pollen seasons can worsen allergic symptoms and trigger asthma attacks, especially when combined with other air pollution.

Within the Midwest, extended pollen production seasons may lead to greater allergy and asthma risks, particularly for ragweed.

The Michigan Department of Community Health reported that the rate of hospitalization for allergic disease increased by more than 60 percent from 2001 to 2010.

4. Extreme Storms and Floods Proliferate

Heavy-precipitation events are already on the rise in the United States, and their frequency and magnitude are expected to increase in the years to come.

Extreme rainfall events have become 37 percent more frequent in Michigan over the past 60 years, and average annual precipitation in the state has increased by 3.7 inches in the past century.
5. Insect-Borne Infectious Diseases Spread

Climate change is among the factors affecting health risks from disease-carrying insects. Short- and long-term climate changes such as increasing temperature and humidity and shifts in the timing of seasonal rainfall can expand the range of insect hosts.22

- Since 2004 Michigan has reported 469 cases of West Nile virus and 711 cases of Lyme disease.23 Cases of Lyme in Michigan have been steadily increasing over the past decade.
- Ticks can transmit Lyme and other diseases. A recent climate model indicates that the state could see an expansion of areas suitable for deer ticks in the future.24

6. Elderly, Young, and Low-Income Populations Are Especially at Risk

The elderly, children, and economically disadvantaged people face particularly acute risks from climate-related health threats. Children, due to physiological and developmental factors, are vulnerable to heat, air pollution, infectious illness, and extreme weather. The elderly too are especially affected by extreme heat; in addition, preexisting health conditions make them more vulnerable to air pollution and infectious disease, and mobility issues increase risks from extreme weather. Among low-income populations, limited resources and already-high rates of chronic health conditions put people at greater risk of extreme weather and health impacts from climate change.25

- There are more than 1.4 million people 65 years old or older, more than 2.2 million children, and some 1.6 million low-income people in Michigan.26
- Forty percent of the residents of Detroit, across all races and ethnicities, are currently living below the poverty line.27 This includes nearly 60 percent of the city's children.
- In Michigan's cities, urban heat islands, along with existing health disparities and other challenges faced by low-income groups and people of color, will be exacerbated by climate change. And extreme weather events may devastate communities that lack resources to rebuild.28

HEAVY DOWNPOURS INCREASE DISEASE EXPOSURE

![Diagram](image)


ACTING ON CLIMATE

NRDC strongly supports the EPA's Clean Power Plan, which will reduce the biggest source of carbon pollution driving climate change by at least 30 percent by 2030. It is important for each state to create a State Implementation Plan that puts the goals of the Clean Power Plan into action. The states have the flexibility to design pollution-curbing strategies that work best for them, based on their current energy mix and opportunities to develop energy efficiency and clean renewable power. States should demonstrate leadership by moving ahead with those implementation plans.

We are running out of time to address this great environmental challenge of our day, but we are not out of solutions. We need to act on them now. We have an obligation to our children—and our children's children—to tackle climate change now.
ENDNOTES


3 Based on a comparison of historical and future projected days over 90 (under a high-emissions A2 scenario) across all Michigan counties, using data from the Centers for Disease Control and Prevention. “Tracking Climate Change,” epitracking.cdc.gov/showClimateChangeTracking.action.


17 Midwestern Regional Climate Center, “Climate Change and Variability in the Midwest,” 2014, mrcc.isws.illinois.edu/mw_climate/climateChange.jsp#.


