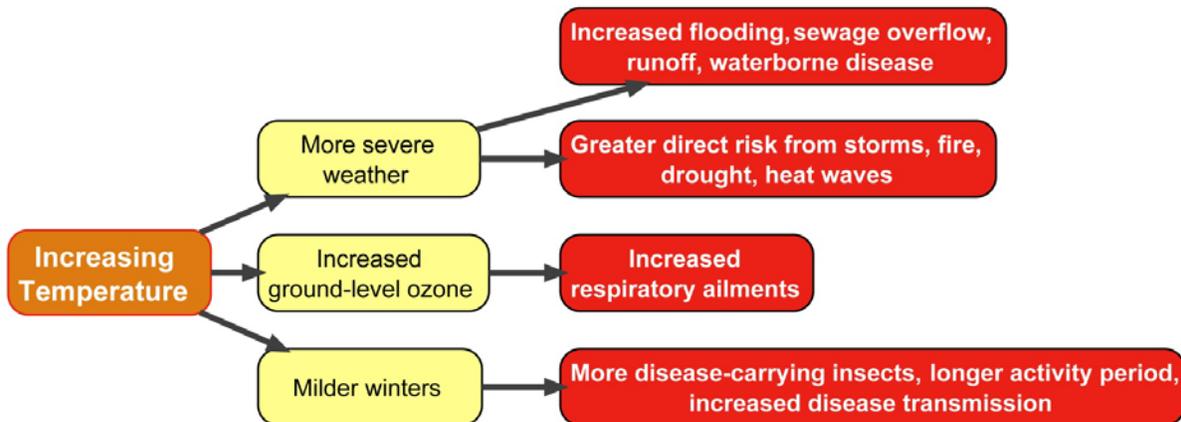


## Impacts of Climate Change on Public Health

Climate Change in the Great Lakes region could lead to a wide range of health effects related to heat, air quality, pollution, and disease vectors. In general, climate change will likely magnify existing health risks associated with air quality and water pollution.

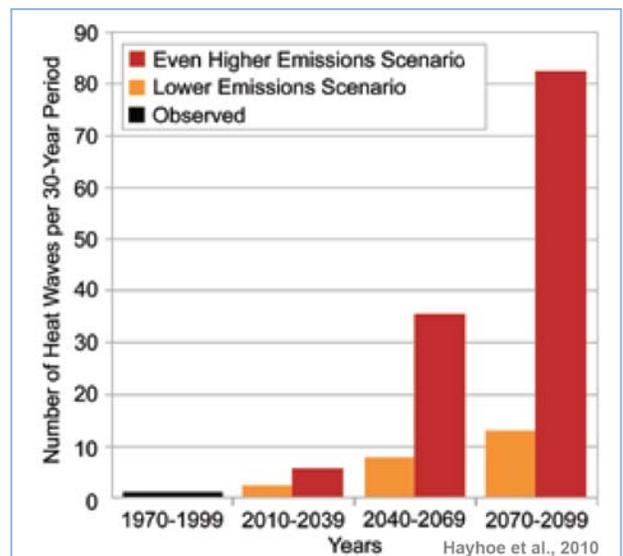


### Heat Waves

**Risks:** The Midwest will likely see more frequent, more severe, and longer lasting heat waves. Under high emissions scenarios, the number of hot days and the length of the heat wave season may increase dramatically by the end of the century. Events similar to the Chicago heat wave of 1995, which resulted in more than 700 deaths, will become more common. By the end of the century, such severe heat waves are projected to occur once every other year under low emissions scenarios, and three times per year under high emissions scenarios. Increased energy use for cooling can also compromise energy supplies, interfering with emergency response systems and energy dependent methods of alleviating heat risks.

**Strategies:** Preparation for severe heat events is, of course, critical. The designation of cooling shelters in existing public buildings, such as libraries and ice arenas, can provide relief. Energy efficient building codes, such as requiring “green” roofing and appropriate insulation, can help reduce energy demands and safeguard against brownouts.

The shady canopies of urban forests could provide relief and reduce the need for air conditioning. In low-income areas, where residents either do not have or cannot afford to use air conditioners, shade for tree canopies may be particularly helpful.



Projected frequency of heat waves similar to that of Chicago 1995 low and high emissions scenarios. Here, heat waves are defined as at least one week of daily maximum temperatures greater than 90 °F and nighttime minimums greater than 70 °F, with at least two consecutive days with daily temperatures above 100 °F and nighttime temperatures above 80 °F.

## Severe Storms and Stormwater Management

**Risks:** A higher frequency of severe precipitation events will increase the risk of flooding, erosion, agricultural runoff, and sewage overflow, increasing the risks of water supply contamination and waterborne disease. Direct impacts from severe weather, such as structural damage, traffic disruption, and power loss will likely be amplified. When coupled with more severe storms, the use of impervious surfaces greatly amplifies flooding risks by diverting stormwater into concentrated flows that can be particularly damaging in urban environments.

**Strategies:** Improved storm water management could help control these issues by diverting flows away from vulnerable areas, reducing water contamination and treatment needs. Many solutions exist at different levels of cost and complexity. Urban forests and “greenspaces” can both reduce concentrated flow and erosion. Ann Arbor has implemented large, subsurface holding tanks in some areas, and in others the city has provided incentives for private entities to install smaller, inexpensive stormwater holding systems and to use pervious surfaces.

## Declining Air Quality

**Risks:** Warmer temperatures could lead to more ground-level ozone, more particulate matter following dry conditions, and more associated respiratory illnesses. Several Great Lakes states are among those most vulnerable to poor air quality levels. Nationally, higher ozone concentrations due to rising temperatures could lead to an average of 3,700 more seniors and 1,400 more infants hospitalized for respiratory related problems in 2020.

**Strategies:** More extensive monitoring of air quality could improve public awareness and caution. Reducing motor vehicle exhaust and industrial emissions, particularly in urban areas, will reduce ground-level ozone production. Mass transit programs and the development of networked bicycle lanes have been effective at reducing traffic congestion in many cities, including Portland, Oregon and New York.



## Pests, Insects, and Disease Transmission

**Risks:** At longer time scales, diseases in the region, such as the West Nile virus and Lyme disease, might become more widespread since insects, such as mosquitoes and ticks, will survive the milder winters more easily and will have longer seasons of activity. The appearance in the region of new diseases and pests may also lead to additional stress on crops that could degrade food supplies.

**Strategies:** Educating the public on how to prevent exposure to diseases may help reduce infection and health complications. Appropriate farming techniques that reduce the risk of pests and disease will become increasingly critical to safeguarding food supplies.