

Our Changing Climate: Effects on the Midwest

Global warming occurs, in part, because humans are producing excessive greenhouse gases (such as carbon dioxide) in the form of air pollution. These emissions trap heat in the earth's atmosphere, which in turn is warming up our climate.

Shifts in our region's climate could radically alter our daily lives, economy, landscapes, and the Midwestern way of life.

How might climate change affect our region?

Scientists have developed models to anticipate some of the effects of climate change. Projections for the Midwest include:

- Hotter, wetter summers – longer, more frequent heat waves and more heat-related deaths
- More severe thunderstorms - higher wind gusts, bigger hailstones, more tornadoes
- Intense, unseasonal precipitation, alternating with long periods of drought
- Unseasonal temperature fluctuations



How does climate change affect the weather?

Weather is the smaller, short-term scale of daily atmospheric changes – a rainstorm, winds, etc. Weather changes every day, and weather patterns shift from year to year.

Weather is different from climate. **Climate** is longer term, and describes a region's average weather over the period of a long time.

Scientists estimate that the earth's average temperature will rise between 4-7° Fahrenheit this century.

When the climate warms, the weather changes. A warmer earth is generally less able to regulate temperature shifts, so weather patterns become more extreme.



Temperature. *A warmer atmosphere is less able to regulate temperature fluctuations.*

By 2100, the Midwest will be warmer, sometimes extremely so. *Average temperatures are likely to rise by 3 degrees Fahrenheit, including heat waves with spikes as high as 10-20 degrees above normal during summer.*

Water. *A warmer atmosphere intensifies and disrupts precipitation patterns.*



- The result is more extreme weather, with intensified flood and drought cycles, and unseasonable precipitation. These factors all contribute to soil erosion, run-off, and damage to waterways.
- Most current climate models project episodes of extreme drought (but a few suggest the possibility of a rainforest effect). Either way, humidity will increase. Surface waters could decline, and dependence on groundwater could increase.

Growing Things. *Agriculture and gardens will still exist in most of the Midwest, but will look much different. Some things will grow more, some less, some not at all, and some things will grow where they never could before.*

- **Staple Crops.** Wheat is temperature-sensitive, and corn is moisture-sensitive – so climate change affects them both. Wheat production will likely shift north. Corn production will depend more and more on irrigation and crop yields could suffer due to increasingly unpredictable and intense precipitation.
- **Weeds, Insects and Disease.** Higher temperatures lead to increases in weeds, insects, and pathogens – which mean more pesticides, fungicides, etc. More of these agricultural chemicals means increased contamination of surface and groundwater (even more of a problem if there is less available groundwater). Currently many of these chemicals are made from fossil fuels, and their prices are rising.
- **Impact on stock.** Higher temperatures are hard on animals, and heat stress compromises both beef and milk production.

Human Health Effects. *The predicted rise in temperature, and the heat waves that come with it, can have serious consequences for Midwesterners' health.*

- The elderly and the very young will be most affected by heat waves. In fact, most studies show that heat-related deaths are highest in those over 65. Particular segments of the population such as those with heart problems, asthma, the elderly, the very young and the homeless can be especially vulnerable to extreme heat.
- Babies and infants are also at higher risk for dehydration from increased temperatures.
- Also, as the region's climate warms, insect-borne diseases such as malaria and West Nile virus will move northward.

Sources:

<http://www.ipcc.ch/ipccreports/ar4-syr.htm>

<http://www.epa.gov/climatechange/index.html>

<http://www.sciam.com/article.cfm?id=thunder-hail-fire-what-does-climate-change-mean-for-us&print=true>

<http://www.weeds.iastate.edu>

<http://www.pewclimate.org/>