

# Change and the Heartland

Big issues, bite-sized lessons

How Climate Change Will Affect the Midwest



## What will the Climate be like in 2050?



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UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

While climate change is a problem around the entire world, it's important to understand how it is already affecting us close to home, and is likely to continue doing so. Scientists at the University of Illinois are working hard to project how the Midwest's climate will change over the coming century and how those changes will affect our health, our agriculture, and our economy.

### 2050's Climate Depends on Our Energy Choices

The amount of climate change expected in the next century depends to a large extent on the energy choices we make today and over the next decade or two. These choices will determine future emissions of heat-trapping gases. If emissions continue to grow, as they have over the last hundred years, a temperature increase of 4 to 8 degrees can be expected across the Midwest. But if emissions can be reduced, temperatures are likely to increase by 2.5 to 5 degrees instead.

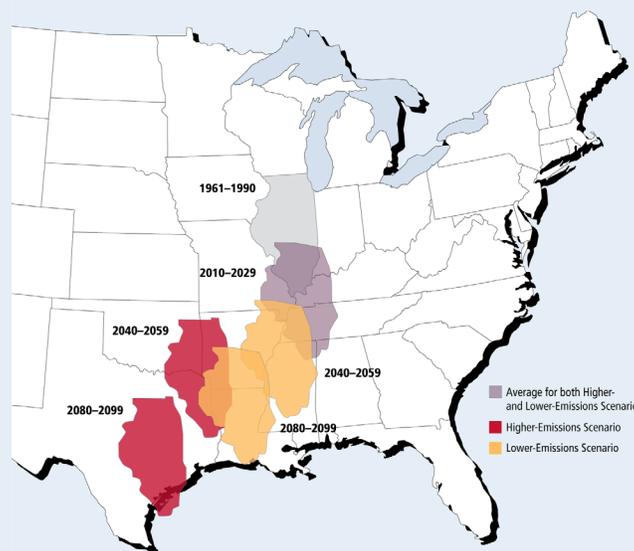
### More and Longer Heat Waves, Lower Air Quality

In 1995, a heat wave in Chicago led to 700 deaths. Temperatures soared as high as 106 degrees during the day and stayed above 80 degrees on many of the hottest nights.

Such heat waves will be more commonplace in 2050. Under lower emissions scenarios, they could occur once per decade. Under higher emissions scenarios, they could happen once a year. Those heat waves will increase the risk of blackouts as power plants are strained by air conditioner use, leaving citizens more vulnerable to high temperatures.

Along with higher temperatures will come increased ozone production. When breathed, ozone harms our lungs. It particularly affects the young, the old, and people with asthma.

## Climate Projection for Illinois



With higher emissions, Illinois summers may feel more like those in Tennessee or Alabama, and Michigan would feel like Kentucky. With lower emissions, Illinois could feel like Arkansas, and Michigan could feel like southern Illinois.

### Hot Weather Means More Mosquitoes and Ticks, New Pests and Diseases

Cold winter temperatures are what keep the Midwest safe from many of the pests and weeds that thrive in southern states. Mild winters may allow new insect pests, such as fire ants, and new weeds, such as kudzu, to spread throughout the Midwest. Mild winters will also extend the season for existing pests, including

# Climate 2050

# Projections for the Midwest

mosquitos and ticks. New pests and higher populations of existing pests increase the risk of diseases like West Nile virus.

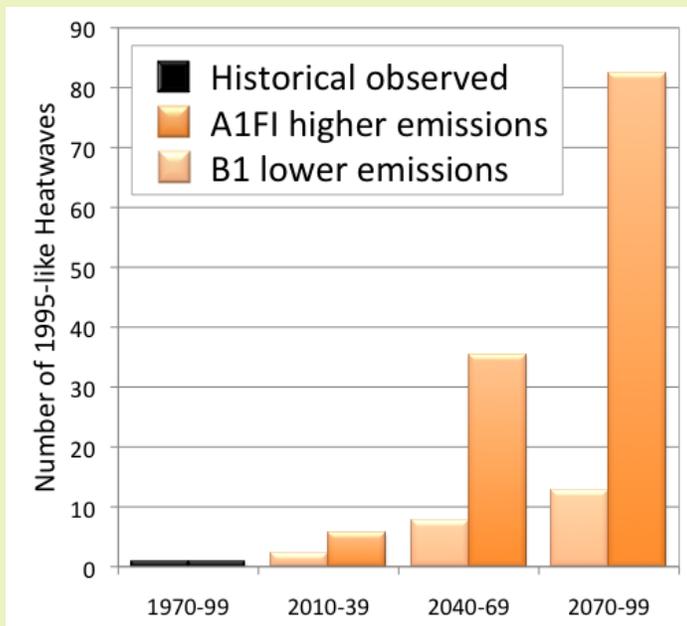
Waterborne disease-causing bacteria, viruses, and protozoa will also flourish in warmer temperatures, leading to more frequent beach closures. Those waterborne diseases could become a health hazard when more frequent heavy downpours increase the risk of flooding.

### Crops Would Welcome Longer Growing Season, But Weather May Bring Damage and Delays

Farmers will have a longer growing season in 2050, and the extra CO<sub>2</sub> in the atmosphere may help crops grow more quickly. But these benefits are likely to be offset by other factors.

Mild winters will allow different insects and diseases of crops to move up from the south, while outbreaks of pests already present in the Midwest will increase in severity. Also, increased CO<sub>2</sub> will tend to benefit weeds more than certain crops. The drier, hotter summers may mean crop-killing droughts and temperatures that inhibit pollination of plants like corn. The heat will also affect livestock production as farmers pay more to keep their animals cool.

### More Frequent, More Severe Heat Waves



By mid-century in Chicago, heat waves similar to the record-breaking one in 1995 may occur as often as every 10 years, on average, under a lower emissions future, and once every year under higher emissions.

Global Climate Change Impacts in the United States, NOAA/USGCRP (2009)

Wetter springs also may delay planting, while more intense storms increase the likelihood of damaging floods.

### Long-Term Drop in Great Lakes Levels as Evaporation Increases

Warmer temperatures mean less ice covering the Great Lakes during winter. Reduced ice cover extends the length of time that water can evaporate from the lakes into the air. Though increased evaporation may initially be offset by increasing precipitation, evaporation is likely to dominate by midcentury.

Long-term average lake levels are projected to drop by 0.5 feet for Lake Superior and up to 1.5 feet for Lake Michigan, requiring costly dredging to keep many canals and harbors open.

### Midwestern Summers May Feel Like South, Winters More Like East

As the climate shifts, Midwesterners may experience summers more like those in the South, and winters more like the East. Illinois summers, for example, by 2050 may feel more like Alabama under lower emissions scenarios, or like east Texas under higher emissions scenarios.

Although winters will be warmer by 2050, we'll still see about as much snow, meaning that Chicago winters, for example, may feel more like Cleveland does today under a lower emissions future, or like Pittsburgh under a higher one.

Native Midwestern plants and animals will have to shift along with the climate or risk possible extinction. Urban areas and the Great Lakes may inhibit that migration.

### The Future Is in Our Hands

Climate change has already irrevocably altered the character of the Midwest, but our emission decisions today will make a difference tomorrow. Making sound, sensible emission reductions will ensure that our communities, our economy, and our ecosystems continue to thrive.

### About the Researchers

Dr. Donald Wuebbles is the Harry E. Preble Endowed Professor in the Department of Atmospheric Sciences at the University of Illinois. Katharine Hayhoe is an adjunct research scientist in the Department of Atmospheric Sciences at the University of Illinois and a professor in the Department of Geosciences at Texas Tech University.