

Climate Change in the Midwest



IMPACTS ON LANDS AND WILDLIFE

A Unique Region

Stretching from Ohio to Missouri and up to Minnesota, the Midwestern region has been shaped by glaciers and rivers into a land like no other. The Great Lakes, which contain one-fifth of the world's fresh water, are perhaps the most prominent relic of the glacial retreat, though the region also contains tens of thousands of smaller lakes and prairie potholes. The iconic Northwoods of Michigan, Wisconsin and Minnesota are home to the largest wolf population in the country. The region also harbors the easternmost extent of the tallgrass prairie, which, having been reduced to small, scattered fragments, is one of the nation's most imperiled ecosystems. Virtually all these places and species are under stress from past land use and management practices, over-exploitation, pollution and other threats and all are increasingly vulnerable to climate change.

Natural Resources at Risk

Climate changes are projected to cause considerable stress to the wildlife of the Midwest region and to the habitats upon which they depend.



Sandhill cranes at Lake Andes NWR, SD Photo: USFWS



Image: Global Change Research Program

Forests: Increasing temperatures, coupled with shifts in precipitation and earlier loss of snowpack, are forecast to increase summertime drought conditions in forests, raising the risk of forest fires in the region. Climate change will also benefit forest pests as warmer temperatures hasten the growth and reduce wintertime die-off of pine beetles and other pests. Drought stress also makes trees more vulnerable to attack by insects and pathogens. The iconic birch forests of the Northwoods could move entirely out of the United States, as could the jack pine forests needed by the endangered Kirtland's warbler.

Grassland Birds and Prairie Plants: Due to extensive loss and fragmentation of prairie habitats, grassland birds have experienced dramatic declines. Droughts associated with climate change are likely to further damage populations through reduced nest success and greater fire frequency. Given that much of the remaining prairie in the Midwest region is fragmented and surrounded by agriculture, the ability for wildlife to move with changing climate conditions will be limited.

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Waterfowl and Aquatic Species: Drought and heat increase evaporation rates from the many prairie potholes and small lakes in the Midwest region. As these small, shallow water bodies shrink, so goes breeding and migration stopover habitat for dozens of species of ducks and geese, as well as cranes, frogs and invertebrates. Fish species that depend on cold water, such as trout and whitefish, could have significant reductions in available habitat under climate change.



Northern Pintail duck

Photo: USFWS

Expected Climate Changes

Rising temperatures

According to the U.S. Global Change Research Program's 2009 report "Global Climate Change Impacts in the United States," temperatures in the Midwest region have already risen by about 1.5°F in the past 100 years, and are projected to rise between 4°F and 10°F depending on the emissions scenarios. In other words, the climates of Illinois and Michigan are projected to resemble the climate of Texas today.

Precipitation Shifts

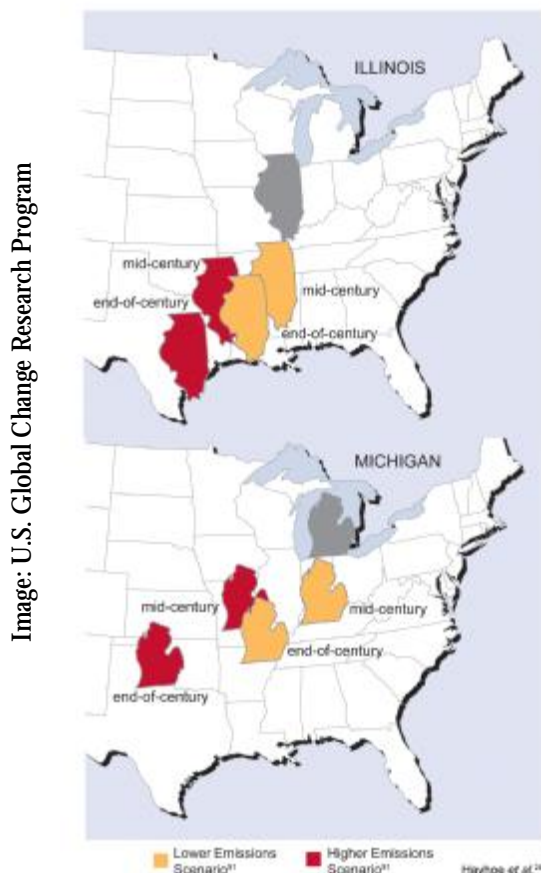
Much of the Midwest is projected to see small to moderate increases in precipitation over the next century. More important than amount, however, is the pattern of precipitation. A larger fraction of total precipitation is forecast to come in the form of large downpours. Already, over the past 50 years, the percent of precipitation falling in the heaviest events has increased over 30% in the Midwest. More precipitation falling in large storm events means higher likelihood of flooding, with increased intervals of drought in between. And, somewhat paradoxically, another projected effect of climate

change is an increase in the amount of snow due to winter snow tracks trending farther northward and more lake effect snowfalls resulting from less ice cover on the Great Lakes.

Great Lakes Changes

While precipitation is forecast to increase, these changes will not be enough to offset projected increases in evaporation due to higher temperatures in both summer and in winter, as the water will be protected with a covering of ice for a shorter period of time. Lake levels may drop between one to two feet depending on the emissions scenarios.

*Global Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo and Thomas C. Peterson (eds.) Cambridge University Press, 2009. Available at www.globalchange.gov/usimpacts



Model projections of summer average temperature and precipitation changes for mid (2040-2059) and end-of-century (2080-2099).