



Regional Highlights from Global Climate Change Impacts in the United States

www.globalchange.gov/usimpacts

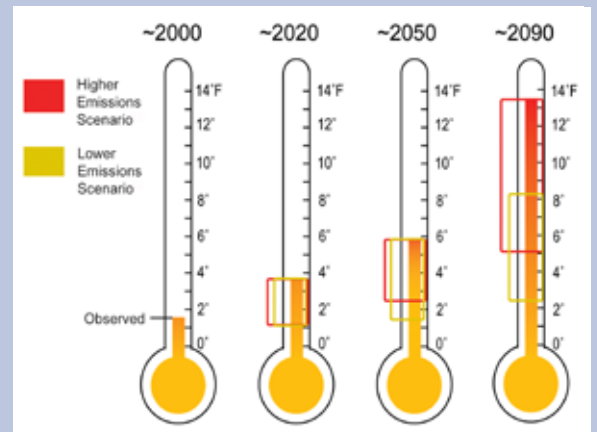
Great Plains

Over the last few decades, average temperatures have risen throughout the Great Plains, with the largest increases occurring in the winter months and over the northern states. Relatively cold days are becoming less frequent and relatively hot days more frequent.

In the future, temperatures are projected to continue to increase with larger changes under scenarios of higher heat-trapping gas emissions as compared to lower. Summer increases are projected to be larger than those in winter in the southern and central Great Plains. Precipitation is also expected to change, particularly in winter and spring. Conditions are expected to become wetter in the north and drier in the south. Projected changes include more frequent extreme events such as heat waves, droughts, and heavy rainfall.

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Observed and Projected Temperature Rise

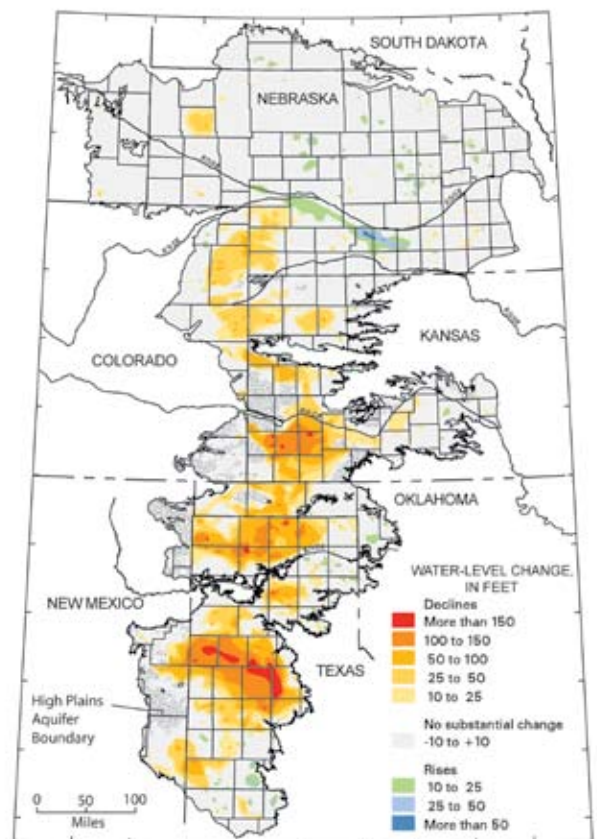


Great Plains' temperature already has increased ~1.5°F relative to a 1960-1979 baseline. By late this century, it is projected to increase by 2.5°F to more than 13°F compared with the 1960-1979 baseline, depending on future emissions of heat-trapping gases. The brackets on the thermometers represent the likely range of model projections, though lower or higher outcomes are possible.

A note on the emissions scenarios

None of the emissions scenarios used in this report include any policies specifically designed to address climate change. All, including the lower emissions scenario, lead to increases in heat-trapping gas emissions for at least the next few decades, though at different rates.

Water Level Changes in the High Plains Aquifer, 1950 to 2005



Key Issues

Projected increases in temperature, evaporation, and drought frequency add to concerns about the region's declining water resources.

Most of the region's water comes from the High Plains aquifer (also referred to by the name of its largest formation, the Ogallala aquifer) from which water withdrawals already outpace recharge. Rising temperatures, faster evaporation rates, and more sustained drought brought on by climate change will add more stress to overtaxed water resources.

Agriculture, ranching, and natural lands, already under pressure due to an increasingly limited water supply, are very likely to also be stressed by rising temperatures.

Agriculture covers 70 percent of the Great Plains. As temperatures continue to rise, the optimal zones for growing certain crops will shift. Pests will spread northward and milder winters and earlier springs will encourage greater numbers and earlier emergence of insects. Projected increases in precipitation are unlikely to be sufficient to offset decreasing soil moisture and water availability due to rising temperatures and aquifer depletion.

Climate change is likely to affect native plant and animal species by altering key habitats such as the wetland ecosystems known as prairie potholes or playa lakes.

Climate change is likely to combine with other human-induced stresses to further increase the vulnerability of ecosystems to pests, invasive species, and loss of native species. Breeding patterns, water and food supply, and habitat availability will all be affected by climate change. Grassland and plains birds, already stressed by habitat fragmentation, could experience significant shifts and reductions in their ranges.



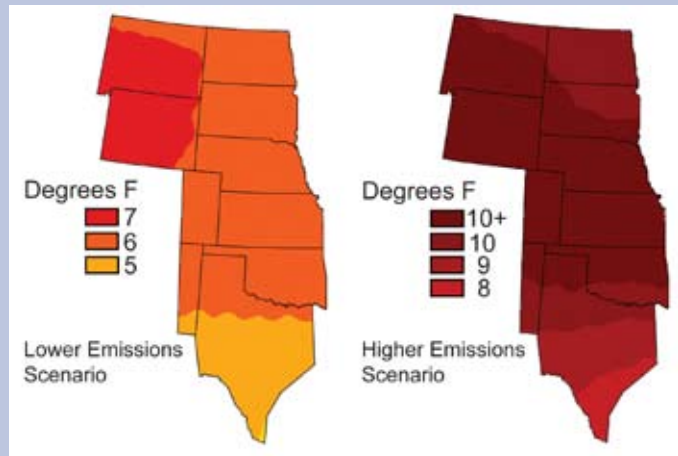
Playa lakes in west Texas fill up after a heavy spring rain.

Ongoing shifts in the region’s population from rural areas to urban centers will interact with a changing climate, resulting in a variety of consequences.

As young adults move out of small, rural communities, the towns are increasingly populated by a vulnerable demographic of the very old and the very young, placing them more at risk for health issues that are projected to increase with climate change. The region is also home to 65 Native American tribes; the people on tribal lands have limited capacities to respond to climate change. Many reservations already face severe problems with water quality and quantity and these problems are likely to be exacerbated by climate change.

The full report, including references for the material above, can be found online at: www.globalchange.gov/usimpacts
It is published by Cambridge University Press, with hard copies available at: www.cambridge.org
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Summer Temperature Change by 2080-2099



Temperatures in the Great Plains are projected to increase significantly by the end of this century, with the northern part of the region experiencing the greatest projected increase in temperature.