



Climate Change *and* Society

Climate change is expected to affect virtually every sector of society, including water resources, food production, energy use, transportation and commerce, recreation, and even national security. While some of these effects could be beneficial, particularly in the short term, many of the impacts could be costly, far-reaching, and damaging to local communities and society as a whole in the long term. This fact sheet describes some of the ways that climate change affects society.

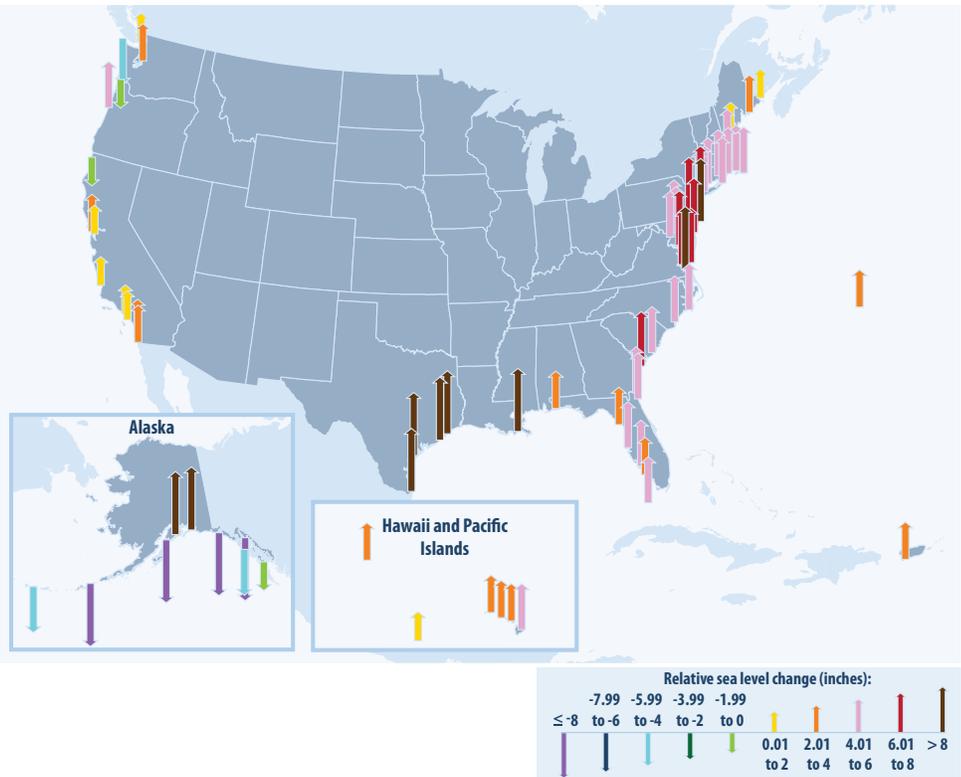
Water Resources

Changing weather patterns affect both the amount and quality of water resources available for drinking, irrigation, fish farming, power generation, shipping, recreation, and other uses. Rising temperatures are already decreasing the size of snowpack in the western United States. Over time, this reduced snowpack could affect seasonal water supplies in regions that depend on this source of water. Droughts can have similar effects in areas where water supplies are already scarce, such as the U.S. Southwest. In addition, floods and severe storms—which will become more frequent because of climate change—can compromise the quality of water supplies by washing chemicals and other contaminants into lakes, rivers, and streams.

Coastal Communities at Risk

The impacts from climate change are expected to be particularly noticeable to people who live, work, and engage in recreational activities along the coast. Average global sea levels rose during the 20th century and are expected to continue to rise at an increasing rate. Tropical storms are projected to become more intense as well.

Trends in Relative Sea Level Rise Along U.S. Coasts, 1958 to 2008



Source: National Oceanic and Atmospheric Administration. 2009. Update to data available at <http://tidesandcurrents.noaa.gov/publications/techrpt36.pdf>

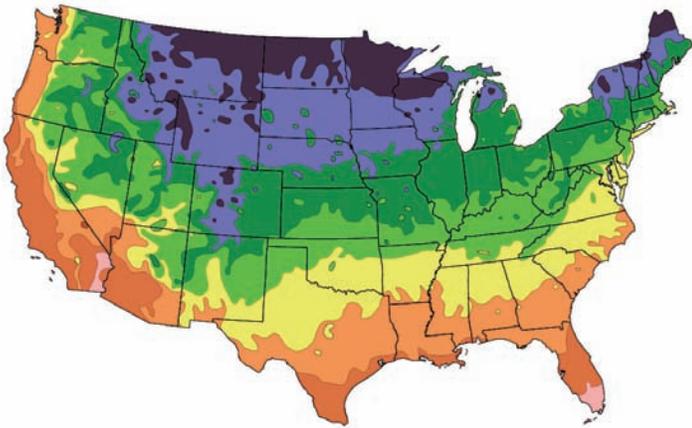
The U.S. East Coast and Gulf Coast are particularly vulnerable to sea level rise and storm surges because the land is relatively low and also subsiding in many places. Alaska is also at risk, with extreme changes in local sea level rise caused by a combination of geologic and climate-related factors.



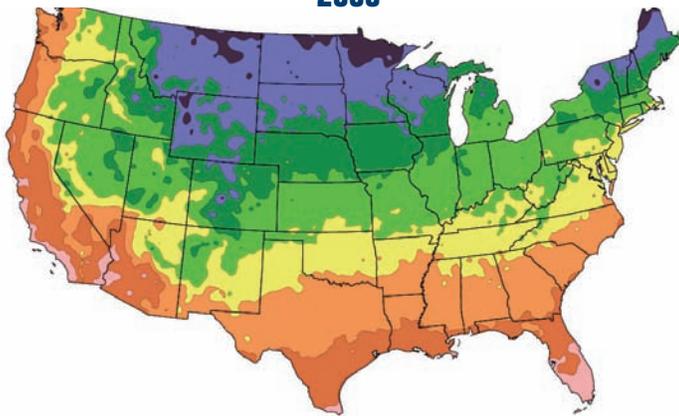
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Change in Plant Hardiness Zones, 1990 to 2006

1990



2006



2 3 4 5 6 7 8 9 10

Source: Arbor Day Foundation. 2006. www.arborday.org/media/map_change.cfm

Plant hardiness zones are regional designations that help farmers and gardeners determine which plant species are expected to survive a typical winter. Locations are assigned a numbered plant hardiness zone based on an average of the lowest temperatures recorded each winter. This figure depicts plant hardiness zones in the lower 48 states in 1990 and 2006.

Food Production

A changing climate will affect farming, ranching, and fishing. Some of these effects will be positive, and others will be negative, depending on the region and the type of food being produced.

Higher temperatures will mean a longer growing season in cooler regions. This could allow farmers to diversify crops or have multiple harvests from the same plot. In warmer regions, however, temperatures might become too high for certain crops to grow. In addition to rising temperatures, changing precipitation patterns and extreme weather events will also affect crops.

High temperatures and extreme weather can also stress livestock, causing some animals to become sick or die. Fisheries could see losses as well, particularly for fish that require cold or cool water, such as salmon.

Energy Use and Supply

Climate change is likely to affect the amount of energy used to heat buildings in the winter, as well as the amount of energy used to cool them in the summer. As average temperatures rise, some areas will require more energy to cool buildings but less energy to heat them.

Increased demand for air conditioning could stress the capacity of power plants, transmission grids, and distribution systems, causing brownouts or power outages during heat waves. Because power plants also use large amounts of water, facilities located in areas where water supplies are expected to be scarce could experience operational difficulties.

Other Effects

Changing climate conditions can also lead to other economic costs. For example, heat waves, decreased snowfall, and changing wildlife habitats could adversely affect some types of sporting and outdoor activities, including hunting, fishing, skiing, camping, and tourism. Larger and more intense storms, wildfires, and floods could damage infrastructure such as roads, railways, airports, power grids, water supply systems, and sewers, resulting in expensive repair costs.

Although climate change will affect all nations, some will feel the effects more acutely than others. Developing countries tend to have fewer resources, and thus extreme weather events, food shortages, and water shortages can lead to social disruption, instability, and conflict in these countries. In an increasingly interdependent world, environmental changes in other countries can pose challenges for U.S. national security as well.

Events such as Hurricane Katrina show that the United States and its citizens can feel the effects of extreme weather events. In areas where climate change leads to increased extreme weather events, like heat or storms, some people—including the poor, the elderly, and the disabled—could be disproportionately affected.

For More Information

For detailed information about greenhouse gas emissions, the effects of climate change, EPA efforts underway, and tips on what you can do, visit EPA's Climate Change Web site at www.epa.gov/climatechange.