



*UNITED STATES*  
**DEPARTMENT OF TRANSPORTATION**

# Federal Climate Adaptation Efforts



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# Impacts of Climate Change

Climate change is apparent now across our nation. Trends observed in recent decades include rising temperatures, increasing heavy downpours, rising sea level, longer growing seasons, reductions in snow and ice, and changes in the amounts and timing of river flows. These trends are projected to continue, with larger changes resulting from higher amounts of heat-trapping gas emissions, and smaller changes from lower amounts of these emissions. The observed changes in climate are already causing a wide range of impacts, and these impacts are expected to grow. Select examples follow.

## Sea Ice and Permafrost

Risks and costs in Alaska increase as thawing of permafrost damages roads, buildings, and forests, and declining sea ice increases coastal erosion and threatens the existence of some communities.

## Forests

Forest growth is generally projected to increase in much of the East, but decrease in much of the West as water becomes even scarcer. Major shifts in species are expected, such as maple-beech-birch forests being replaced by oak-hickory in the Northeast. Insect infestations and wildfires are projected to increase as warming progresses.

## Coldwater Fish

Salmon, trout, and other coldwater fish will face additional stresses as water temperatures rise and summer streamflows decline. Ecosystems and the tourism and recreation they support will be adversely affected.

## Coral Reefs

Rising water temperatures and ocean acidification threaten coral reefs and the rich ecosystems they support. These and other climate-related impacts on coastal and marine ecosystems will have major implications for tourism and fisheries.

## Interacting Stresses

Population shifts and development choices are making more Americans vulnerable to the impacts of climate change. An aging populace and continued population shifts to the Southeast, Southwest, and coastal cities amplify risks associated with extreme heat, sea-level rise, storm surge, and increasing water scarcity in some regions.

## Heavy Downpours

More rain is already coming in very heavy events, and this trend is projected to increase across the nation. Such events are harmful to transportation infrastructure, agriculture, water quality, and human health.

## Agriculture

Increasing heat, pests, floods, weeds, and water stress will present increasing challenges for crop and livestock production.

## Water and Energy Interactions

As warming increases competition for water, the energy sector will be strongly affected because power plants require large amounts of water for cooling.

## Water Supply

Water supplies in the rapidly growing Southwest will become increasingly scarce, calling for difficult trade-offs among competing uses.

## Coastal Communities

Sea-level rise and storm surge will increase threats to homes and infrastructure including water, sewer, transportation, and communication systems. Many barrier islands and coastal marshes that protect the coastline and support healthy ecosystems will be lost.

## Heat Waves

Heat waves will become more frequent and intense, increasing threats to human health and quality of life, especially in cities.

## Energy Supply

Warming will decrease demand for heating energy in winter and increase demand for cooling energy in summer. The latter will result in significant increases in electricity use and higher peak demand in most regions.

## Responding to Climate Change

Responses to climate change fall into two major categories. "Mitigation" focuses on reducing emissions of heat-trapping gases or increasing their uptake to reduce the amount and speed of climate change. "Adaptation" refers to changes made to better respond to present or future climate conditions in order to reduce harm or take advantage of opportunities. Both are necessary elements of a comprehensive response strategy.

# Interagency Climate Change Adaptation Task Force

Chaired by

White House Council on Environmental Quality (CEQ)

Office of Science and Technology Policy (OSTP)

National Oceanic and Atmospheric Administration (NOAA)

## Workgroups:

Agency Adaptation

Science Inputs to Policy

Insurance

Water Resources

International Resilience

Fish, Wildlife and Plants

Metropolitan

Coasts and Oceans

Land

Communications

Health



## Other Federal Efforts:

- U.S. Global Change Research Program
- National Climate Change Assessment
- NOAA's proposed Climate Service
- Department of Interior's Climate Science Centers and Landscape Conservation Cooperatives
- America's Climate Choices: Adapting to the Impacts of Climate Change



**NOAA CLIMATE SERVICES**  
National Oceanic and Atmospheric Administration

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**Past & Present Climate** ▶  
Climate at a Glance  
Read and explore summaries and digests of recent climate-related phenomena from NOAA's distributed climate service community.

**Predictions** ▶  
Looking Ahead  
Explore how climate phenomena are likely to unfold in the coming days, weeks, and months.

**NOAA Partners** ▶  
Locate Climate Expertise  
Use an interactive map to find national and regional climate services.

**Climate & You** ▶  
Utilizing Climate Data  
Climate information is essential for business and community planning. These resources focus on needs of specific sectors of society.

**Data Library** ▶  
Visualizing & Explore  
NOAA is a leading provider of access to data from research projects, stations, and satellites to the nation and the world.

# DOT/FHWA Adaptation Experience



Regional Climate Change Effects: Useful Information for Transportation Agencies (2010)

Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study (2008)

Coastal Sensitivity to Sea Level Rise: A Focus on the Mid-Atlantic Region (2009)



More at:

<http://climate.dot.gov>

<http://www.fhwa.dot.gov/hep/climate/resources.htm>

# Additional Resources

<http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation>

<http://climate.dot.gov>

