

## Climate Change Impacts in Massachusetts

A summary of the threats that climate change poses to the people, businesses and ecosystems of Massachusetts



**The Plymouth gentian requires changing water levels in order to survive. Climate change is predicted to alter water levels in a manner that threatens the survival of this species.**

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Increases in carbon dioxide and other greenhouse gases in the atmosphere have caused global temperatures to increase by more than 1°F over the past century. This global warming has resulted mainly from human activities such as the combustion of fossil fuels and deforestation. Global temperatures are expected to rise more this century as emissions of heat-trapping gases continue to mount. While the impacts of climate change will vary from region to region, it's clear that almost every place on the planet will be affected.

### WHAT MASSACHUSETTS CAN EXPECT

- Loss of critical coastal habitats and property from sea-level rise
- Shifting forest habitat and more forest fires
- Spreading Lyme disease and West Nile virus
- Decline in fish populations due to warming ocean temperatures
- Loss of tourism

Over the past 50 years, The Nature Conservancy has invested billions of dollars in land acquisition and conservation. These investments, as well as those of state and federal governments, are jeopardized if emissions of heat-trapping gases continue unchecked.

Massachusetts citizens have made substantial investments to protect critical natural resources across the state, from the coasts of Cape Cod to the forests of the Berkshires. On Cape Cod, tidal wetlands that protect rare and endangered species are at risk of flooding as sea levels continue to rise. In the Berkshires, forests will shift northward, and the brilliant reds, oranges and yellows produced by the current mix of trees may all but disappear. The impacts of global warming on places like the Berkshires and Cape Cod complicate our conservation challenges to ensure the survival of threatened species, critical tidal wetlands and forest habitats.

Following is a summary of how climate change will affect Massachusetts:

### Sea-level Rise Impacts

Beaches, sand dunes, and marshlands along the Massachusetts coast provide critical habitat for rare and vulnerable species that will be unable to adapt as shorelines erode and saltwater infiltrates



**Folger's Marsh, Nantucket. Tidal wetlands throughout coastal Massachusetts are at risk of flooding due to sea-level rise. © John Crisley.**

low-lying freshwater habitats. Destruction of these critical habitats will mean that species such as the piping plover and the endangered roseate tern will lose precious nesting grounds and rare plants and animals like the saltmarsh sharp-tailed sparrow and spadefoot toad will disappear.

Sea-level rise will have a direct impact on human life as well. Since 1950, mean relative sea level measured near Boston has risen by 5-6 inches and the rate is accelerating. Based on current rates of sea-level rise in Massachusetts, more than 5 percent of the land area of coastal communities such as Gloucester and Marshfield—equaling 278 and 1013 acres respectively—will be underwater by the end of this century.

### **Forest Impacts**

Massachusetts' forest composition is expected to change dramatically over the next century. Temperature increases are likely to cause species such as sugar maple and paper birch to migrate northwards, eventually leaving Massachusetts permanently.

With increased temperatures and changes in precipitation, Massachusetts and other

northeast states are projected to experience a 10 to 20 percent increase in the risk of forest fires. This could cause increased loss of life and severe damage to wildlife habitats and real estate.

### **Recreation/Tourism Impacts**

Global warming is expected to increase the prevalence of pests such as mosquitoes and ticks that may carry Lyme disease and West Nile virus. An increased risk of exposure is likely to adversely affect outdoor recreational activities.

Massachusetts is home to more than a dozen ski areas. As temperatures increase, a greater amount of winter precipitation is expected to fall as rain instead of snow. Ski areas in Massachusetts are likely to incur higher operating costs to maintain adequate snow pack which could result in the closure of some facilities.

### **Economic Impacts**

Sea-level rise will lead to significant coastal alteration, larger storm surges, and greater storm damage. If no adaptive measures are taken, increased damages from storm surges and floods due to sea-level rise are expected to cost the Boston metropolitan area \$20 to \$96 billion over the next 100 years. For property owners, insurance premiums are likely to increase by 60 percent due to increased hurricanes in the United States.

Traffic disruptions in the Boston metropolitan area are expected to occur twice as often in 2025 and aggregate travel delays are projected to increase by 80 percent due to flooding and sea-level rise associated with climate change.

### **Fisheries Impacts**

Populations of species that serve as food sources for cod have been shifting northward as North Atlantic temperatures have increased. This shift in abundance could have long-term impacts on cod fisheries

and could contribute to a total collapse of the industry.

Striped bass are expected to experience a major loss in habitat as ocean temperatures rise, especially in the southern range. This could have significant effects on the overall health of bass stocks in Massachusetts waters.

As on land, disease will spread more readily in a warmer marine environment. Many species such as lobsters and scallops will become more susceptible to disease because of increasing temperatures and rapidly changing habitats.

### **Northeast Regional Greenhouse Gas Initiative**

Americans cannot continue to rely on voluntary approaches to address the threat of climate change. Protecting the last great places in Massachusetts for our children and our grandchildren depends on the adoption of practical regulations like the Northeast States' Regional Greenhouse Gas Initiative (RGGI), a market-based proposal to place caps on carbon dioxide emissions from power plants. RGGI will achieve greenhouse gas reductions at the lowest possible cost and will serve as a model for other multi-state and federal efforts.

**The Nature Conservancy supports the adoption of RGGI and other pragmatic policies that will reduce emissions causing global climate change.**

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<http://nature.org/initiatives/climatechange/>

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