



## IMPACTS ON LANDS AND WILDLIFE

### A Unique Region

The Northeast is characterized by ancient mountains, glacial lakes and expansive Atlantic coastlines. The Appalachian mountain chain begins in Maine and stretches through West Virginia and beyond. Nearly deforested in the last century, this region has seen an incredible resurgence of the iconic maple-beech-birch forests of New England, as well as spruce-fir forests in the high elevations and oak-hickory forests further south. Two of the Great Lakes and countless smaller lakes left in the wake of retreating glaciers, also shape and define the region. And the coastlines contain vital marshes, bays and estuaries— fertile breeding grounds for birds, fish, crabs and lobsters. 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 Northeast region and to the habitats upon which they depend.



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. This will raise 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 while drought stress makes trees more vulnerable to attack. The northern hardwood forests of New England could be completely displaced by oak-hickory forests, taking the maple syrup and autumn leaf viewing economies – not to mention considerable habitat for migratory songbirds and other wildlife—with it. High-elevation conifer forests could be literally pushed off the top of the Earth by climate change.

**Coasts and estuaries:** Sea level rise and increased storm surges harm salt marshes and coastal estuaries, threatening these important breeding areas for fish and many other organisms.

**Fish and other aquatic species:** Coldwater marine animals like lobster and cod could lose significant habitat under climate change scenarios.



Photo: Raul Tonzon, National Geographic Stock

Maple Forest Photo: Raul Tonzon, National Geographic Stock

## 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 Northeast region have already risen by about 2°F in the past 100 years and are projected to rise by up to 8°F under the highest emission scenarios. By the end of the century, Vermont could resemble the climate of North Carolina today.

### *Precipitation Shifts*

Much of the Northeast 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 storm events. Already, over the past 50 years, the percent of precipitation falling in the heaviest events has increased 67% in the Northeast. More precipitation falling as large downpours means higher likelihood of flooding as well as stretches of drought between rains. 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.

### *Sea Level Rise*

Sea level rise is difficult to forecast over the long term given uncertainties about the rate of melting from the Greenland and Antarctic ice sheets. By the end of this century, sea level is projected to rise between 2.25 feet under the low emissions scenario and up to 3.25 feet under the highest emissions scenario. Due to land subsidence in the Northeast, the effect of the rise will seem about 10 to 20% higher than the actual.

### *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](http://www.globalchange.gov/usimpacts)



Roadway flooding Photo: U.S. Global Change Research Program