

Climate change in the U.S. Northeast

By U.S. Environmental Protection Agency, adapted by Newsela staff on 04.10.17

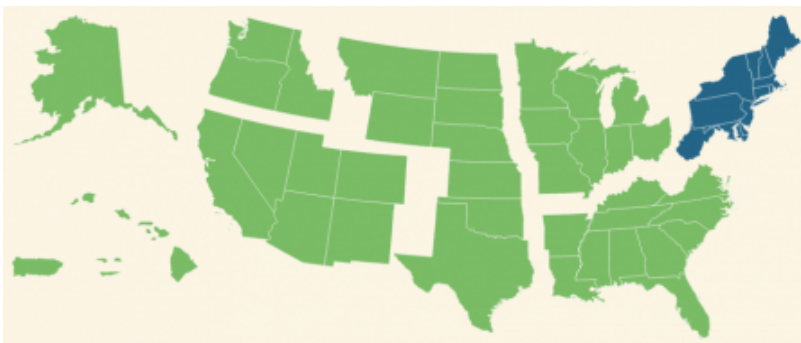
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Killington Ski Resort is located in Vermont. As temperatures increase as a result of climate change, the ski season in the northeastern U.S. will not last as long. Photo by: Jim Kelly/Flickr

Overview



The Northeast is home to historic cities and large rural areas that serve as important natural habitats and agricultural lands. Climate varies widely across the region and tends to be coldest in the north, at high elevations, and away from the coast.

The Northeastern climate is experiencing noticeable changes that are expected to intensify in the future. Between 1895 and 2011, temperatures rose by almost 2 degrees Fahrenheit and projections indicate warming of 4.5° degrees Fahrenheit to 10 degrees Fahrenheit by the 2080s. Heat waves are expected to increase in frequency, intensity, and duration. The total amount of precipitation and the frequency of heavy precipitation events has also risen in the region.

Between 1958 and 2012, the Northeast saw more than a 70 percent increase in the amount of rainfall measured during heavy precipitation events, more than in any other region in the United States. Projections indicate continuing increases in the winter and spring. The timing of winter and spring precipitation could lead to drought conditions in summer, as warmer temperatures increase evaporation and accelerate snow melt.

Higher temperatures in the Northeast are likely to increase heat-related deaths and decrease air quality, especially in cities. People at greatest risk include young children, the elderly, and those with health conditions like asthma. Those who live alone or in low income communities are also at increased risk, particularly if they do not have air conditioning or are in poor health. Increased energy demand could also affect access to air conditioning during heat waves.

Residents in cities may experience even warmer temperatures, as cities are significantly warmer due to dense populations and human activity. This is known as the urban heat island effect.

Residents in rural areas are also at high risk because of more buildings and homes without air conditioning.

Studies indicate that climate change is lengthening the pollen season. Common allergens such as ragweed, particularly for northern portions of the U.S. will be in the air for longer periods of time. Warmer and wetter conditions may increase seasonal activity and the extent of suitable habitat for ticks and mosquitoes, elevating risks of human exposure to vector-borne diseases like Lyme disease and West Nile Virus. More frequent extreme precipitation events and flooding could increase the risk of injury or death, exposure to waterborne illnesses, and reduced access to clean water.

Sea Level Rise, Heavy Precipitation Expected

Sea level rise, heavy precipitation, and storm surge are expected to increase flooding and coastal erosion. Aging infrastructure in the Northeast will be strained further. Millions of Northeastern residents live near coastlines and river floodplains, where they are at greater risk.



During storm events with heavy precipitation, combined sewer-stormwater systems in this region can overload. Combined sewer systems are designed to collect rainwater runoff, sewage from households, and industrial wastewater in the same pipe. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. Sewage enters bodies of water used for recreation or drinking water, creating health risks.

In the Northeast, sea level has risen by approximately 1 foot since 1900, which has caused more frequent flooding of coastal areas. Globally, sea level is projected to rise by 1 to 4 feet by the end of this century. In the Northeast, even higher sea level rise is possible. Sea level rise and coastal flooding are likely to disrupt and damage important communication systems, energy production, transportation, waste management, and access to clean water. These impacts could have large economic implications. In Boston, Massachusetts, the increase in flooding could cost up to \$94 billion this century.

The Impact On Agriculture

Climate change is affecting agricultural production in the Northeast. Heavy precipitation events can damage crops. Wetter springs can delay planting, resulting in later harvest and fewer usable crops. Longer, drier summers may reduce water availability and also reduce crop yield, the amount that can be grown in a given space. Warmer spring temperatures may be followed by cold snaps, causing frost damage.

Meanwhile, warmer winters and longer growing seasons may increase pressure from weeds and pests. Large portions of the region may become unsuitable for growing fruits, like apples and blueberries, and other crops, like grain and soybeans. Dairy production is important in the Northeast and is expected to be negatively affected by increasing temperatures. Warmer conditions harm animals, reducing how much milk and how many calves they can produce. Warming temperatures could also increase costs.

Fisheries are likely to be harmed by climate change. Many species will move north as the region's warming habitats become less suitable. This shift in location is expected to cause local declines in species including lobster and cod. New diseases currently limited by low temperatures may also reduce populations.

The Impact On Ecosystems

The Northeast is home to a varied mixture of species and ecosystems that are affected by climate change. Ranges of certain tree species are moving northward and to higher elevations where temperatures are cooler. The range of economically important tree species, like sugar maple, is expected to shrink within the U.S. as its preferred climate shifts north into Canada. Warmer temperatures are also increasing outbreaks of forests pests and diseases. Growing deer populations have been eating too many plants. Invasive plants like kudzu have been expanding their range and hurting some ecosystems.



Temperature changes also influence the timing of important ecological events, causing birds to migrate sooner and plants to bloom and leaf earlier. Climate change and sea level rise are expected to harm coastal ecosystems. This causes declines in water quality, increases harmful algal blooms, and shrinks marsh habitat.

Winter Recreational Activities Affected

Winter recreational snow and ice activities generate about \$7.6 billion for the Northeast economy annually. These activities include snow sports, like skiing, snowmobiling, snowshoeing, and dog sledding, as well as and ice-based activities like ice fishing and skating. Increases in temperature could reduce snow cover and shorten winter snow seasons, limiting and altering these activities.

For ski resorts to remain viable in the Northeast, the average length of the ski season should be at least 100 days. Nights must also be cold enough to allow for artificial snowmaking. There also must usually be snow during winter holidays when winter tourism is high. Projections indicate that some ski resorts in the region will close. By the end of the century, most resorts will be at risk because temperatures will become too warm to meet these needs. Resorts are likely to require more artificial snowmaking, using additional water and energy and increasing costs.

Quiz

- 1 Which of the following details is MOST important to the development of the article's central idea?
- (A) An increase in flooding could cost Boston, Massachusetts up to \$94 billion in the next 100 years.
 - (B) A variety of species and ecosystems are present in the Northeast.
 - (C) The sugar maple tree is important to the economy of the Northeast.
 - (D) Winter sport activities like skiing, snowmobiling, snowshoeing and dog sledding are popular in the Northeast.

- 2 The central idea of the article is developed by:
- (A) providing background that illustrates how climate change has affected the Northeast
 - (B) highlighting claims that the Northeast is likely to experience significant problems as a result of climate change
 - (C) describing how research shows the role of climate change in the recent severe weather in the Northeast
 - (D) explaining how the research is based on data from scientific studies that have taken place in the Northeast

- 3 Read the paragraph from the section "The Impact On Agriculture."

Climate change is affecting agricultural production in the Northeast. Heavy precipitation events can damage crops. Wetter springs can delay planting, resulting in later harvest and fewer usable crops. Longer, drier summers may reduce water availability and also reduce crop yield, the amount that can be grown in a given space. Warmer spring temperatures may be followed by cold snaps, causing frost damage.

Which of the following phrases helps you understand the meaning of the word "yield"?

- (A) Heavy precipitation events
- (B) later harvest and fewer usable crops
- (C) may reduce water availability
- (D) amount that can be grown

- 4 Read the sentence from the section "The Impact On Ecosystems."

Temperature changes also influence the timing of important ecological events, causing birds to migrate sooner and plants to bloom and leaf earlier.

The author uses the word "influence" to mean:

- (A) alter
- (B) discourage
- (C) bolster
- (D) sustain