

CLIMATE CHANGE AND THE NEW ENGLAND FOREST

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Based on models in a regional climate assessment study by the US Global Change Research Program, some scientists believe that within the next one hundred years or so, Boston could have a climate similar to Richmond or Atlanta. These computer models project that the average temperature will rise between 6 and 10 degrees F over the next century. In the next one hundred years New England's cooler regions may no longer promote the growth of sugar

maples, which are well adapted to the region's current climate. The change in climate will support species that now grow to the south of New England and in lower elevations, especially oaks and southern pines. Additionally, there will be the threat of non-native species, both insect pests and invasive plant species which may take over the forests.

According to Barry Rock, Professor of Natural Resources at the University of New Hampshire, "On average, trees can only move their range from 5 to 15 miles over a hundred year period." In the past, natural climate changes occurred over thousands of years. At the end of the most recent glacial period, about 4000 years ago, the forest communities gradually migrated north as the glaciers melted and retreated. The forest

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communities that developed in front of the glacier gradually migrated northward in its lee.

From 9,000 to 4,000 years ago, the average temperature of New England was nearly 4 degrees warmer than it is today. The climate was similar to modern day Virginia. Now it appears that the engines of the industrial age are taking the global climate into the past. Human activity is responsible for most of the global temperature rise in the past 40 years. This advance rate of climate change may not allow time for the forest to migrate northward. The result may be that balsams and maples will die off, to be replaced by invasive species from the south.

Some preliminary studies have been done by the University of

Vermont on producer data from the past 40 years. It appears that in Massachusetts the start of the sugaring season had advanced slightly less than 5 days to an earlier date, and the end of the season has advanced just over 6 days. This has resulted in a shortening of the "season" by 1.5 days overall. More disturbing is a possible trend of colder lows and warmer high temperatures, which may have the effect of advancing the end of the season even more.

In addition to the sale of maple products and tourism during sugaring season, there is a very important third component to the sugar maple economy of New England — fall foliage. There is a huge economy built around the annual migration of leaf peepers to New England. These

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famous fall colors, coming mostly from our beloved sugar maple tree, result from the breakdown of chlorophyll, the green pigments that mask orange and yellow pigments. The brilliant red colors, of anthocyanins are actually produced each fall. The first hard frosts, which bring out the most brilliant colors, used to come about the third week of September. In recent years these first frosts have arrived later and later. In both 2004 and 2005 the first hard frost didn't arrive in many New England areas until mid-October. Professor Rock predicts that foliage season will gradually come later and that the intensity of colors will decrease. We certainly got a glimpse of that scenario in 2005.

The overall effects of the coming climate change may prove to be as complex as understanding fall foliage or maple sugaring physiology. How much of the overall drop in health known as "maple decline" is caused by global warming as opposed to acid precipitation? The combined effects of air pollution and climate change are synergistic. Furthermore, global warming is also creating the opportunity for insects, fungi and diseases to invade environments with climates once too harsh for them to survive the cold winters. For example, the Hemlock Woolly Adelgid is being held in check by current cold climates, but that may soon change.

No matter what steps we take, the wheels of global climate change have been set in motion. The real question is how far down that road we'll travel before slowing it down.

WORLD PRODUCTION

Canada and the United States are the only two maple syrup producing countries in the world. In 2004, worldwide production of maple syrup was estimated at 42,783 metric tonnes (MT, with Canada accounting for 82% of that production and the US the remainder. Canada is therefore the largest maple syrup producer with production of 35,248 MT in 2004, valued at C\$149.5 million, while the United States produced 7,535 MT, valued at US\$42.8 million.

Over the last five years, Canada has accounted for 84% of the world's production of maple syrup, while the US has accounted for 16%. The percentages fluctuate slightly from year to year because of variations in yields associated with specific weather conditions each spring. The decline in Canadian production to 82% in 2004 was largely the result of the introduction of a production quota system in Quebec.

Because of low domestic consumption in Canada, the maple industry relies heavily of exports.

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