

New Climate Change Study Begins

The Department of Environment Energy and Forestry has initiated a new climate change study designed to assess implications for the future of Island forests.

The study is being conducted by Dr. Charles Bourque of UNB's Forestry and Environmental Management faculty. Dr. Bourque specializes in atmosphere-forest interactions, forest-pest management, and environmental monitoring. He will use forest inventory data from the 2000 Corporate Land Use Inventory, long term climate data from Environment Canada and the results of the 2008 LIDAR elevation and slope study to develop a computer model which will predict how the selected Acadian Forest tree species may respond to various climate change scenarios.

The study will focus on Acadian Forest species such as white spruce, cedar, hemlock, white pine, red oak and several maples and birches. Once the model is completed, researchers can use it to analyze climate change effects on other native trees as well as species from more southern regions of North America to see how they may perform under different climatic conditions. The outcomes will enable government, forest managers, wildlife biologists, forest product businesses, land owners and others who rely on healthy forests to plan for the future.

The Acadian Forest is part of the larger North American system called the Transition Forest. This forest stretches from the Maritimes across the middle of the continent to the Great Lakes and Minnesota. One of the primary characteristics of this forest is its mixture of northern and southern tree, plant and animal species. For instance, in a typical Island forest it is common to see white birch and yellow birch growing side by side. However, white birch grows from above the Arctic Circle south to New England so PEI marks the southern limits of its range. Yellow birch on the other hand ranges from Georgia north to the Gaspé, so the Island is at the northern end of its range. In our forest region the ranges of these two birches and many other tree species overlap creating a unique ecosystem, which is constantly adapting and changing in response to a variety of environmental and climatic influences.

PEI's environment has traditionally offered suitable growing conditions to both northern and southern tree species. However, trees which are adapted to more northern conditions such as White Birch, White Spruce, Eastern Larch and Balsam Fir may be at risk if the climate continues to warm. These species play critical roles on the environment and economy of our region, so their loss would have significant implications.

An example of these potential impacts can already be seen in western Canada where huge areas of forest have been killed by a severe infestation of a native insect species - the Mountain Pine Beetle (MPB). Milder winters in recent years have allowed more MPB larvae to survive. When combined with hotter and drier summers which stress the mature trees that host the insect, it did not take long for the beetle populations to reach critical levels and begin killing trees over a huge

area.

These particular BC forests contain fewer tree species and therefore, they are less diverse than forests in our region. This means that the magnitude of the loss is much greater because there are few species available to replace those lost to MPB. The rate of mortality also left little time for the impacted trees to produce enough seed to renew the sites and absorb all the carbon being released from the decomposition of the older trees. Therefore, for the next few years or decades, these forests will be net carbon contributors rather than carbon storage areas.

In some areas of eastern Canada, Balsam Fir and White Spruce are showing signs of suffering infestations of native insects. The Balsam Woolly Adelgid and the Spruce Beetle seem to be benefitting from recent warmer winters, killing large number of fir and spruce across the region. Because our forest has a greater range of species that can quickly fill in the gaps, we often do not notice these losses. However, the implications are that several native tree species which have important economic and ecological roles in the Acadian Forest region may already be disappearing from the Maritime landscape.

Developing the model, inputting data and running the scenarios will take about a year. Once the results are available, the information will be shared with interested Islanders. As well, the once the 2010 State of the Forest data becomes available, researcher will be able to update their models and see if any of the predictions are already occurring. For more information on climate change and Canadian forests visit the Canadian Forest Service web site <http://www.climatechange.gc.ca/>