The NL-BELT Project: Researching the Effects of Climate Change on Our Forests

The boreal forest is a vast landscape that provides numerous ecosystem services, from clean air, water, and habitat for wildlife, to food, materials, and energy for human use. In Canada, the boreal forest covers 525 million hectares, making it one of the largest intact forest ecosystems. However, climate change is altering how the boreal forest functions and this will impact the services provided by this forest, both locally and globally. Forest-based communities and industries will need to adapt to these changes as they occur.

The Canadian Forest Service (CFS) of Natural Resources Canada has established the Newfoundland and Labrador Boreal Ecosystem Latitudinal Transect (NL-BELT), a series of research sites to investigate current and future changes in the functioning of the boreal forest as it responds to climate change.

The NL-BELT

The NL-BELT is a series of four sites stretching from south-western Newfoundland to southern Labrador. These sites all have common elements: lakes, streams, estuaries, wetlands, various degrees of elevation, and forests of varying ages and disturbance and management history. Where they differ is in latitude, and thus in climate, with the southernmost site of Grand Codroy being about 5° C warmer (average annual air temperature) than the northernmost site of Eagle River (Figure 1).

The sites are continually monitored to capture site-specific data such as average air temperature, above and below ground temperature and moisture levels, as well as other weather-related data. Researchers can then compare the data from across the sites to gain a better understanding of the effects of climate differences on the boreal ecosystem.

Research and Opportunities for Collaboration

The NL-BELT sites provide an exceptional opportunity for research and collaboration on a variety of issues related to boreal ecology and climate change. Current research activities include:

- Studying decomposition and organic matter transformations to understand the patterns and processes of carbon cycling;
- Identifying chemical indicators in soils and streams through biogeochemical techniques to provide a method for monitoring climate change effects on soil organic matter at the watershed scale;
- Measuring and monitoring various ecosystem attributes to better describe their respective contributions to the functioning of the forest and their sensitivity to disturbance (including moss biomass and growth, soil and root respiration, root biomass, litterfall, soil fertility, and coarse woody debris); and
- Characterizing forest dynamics history and past relationships with climate and disturbances, to better forecast future changes in forest productivity.

Researchers take soil samples for NL-BELT project.

The NL-BELT Project: Researching the Effects of Climate Change

Partnerships

The NL-BELT is a collaborative and multidisciplinary project. It is a joint effort between industry, provincial and federal governments, community organizations, and academic partners, which demonstrates the commitment of all parties towards a common future of healthy forests and communities. Each of the four sites is located near population centres, with opportunities for the engagement and involvement of local citizens (Figure 1).

Partners include: the Newfoundland and Labrador Department of Natural Resources, Memorial University of Newfoundland, the White Bay Central Development Association, the Codroy Valley Area Development Association, and Corner Brook Pulp and Paper.

The project is managed by the Corner Brook office of the Atlantic Forestry Centre (AFC), part of the CFS, which is located on the west coast of Newfoundland. The research team at AFC is comprised of scientists, technologists, and assistants with expertise in forest ecology, biogeochemical cycling, ecosystem modeling, and GIS and geodatabase development. The facility is located on the Grenfell campus of Memorial University, offering opportunities for student involvement and academic interactions.

AFC researchers take stream measurements at the Grand Codroy research site.

Making a Difference

The NL-BELT project provides a platform within which multidisciplinary and long-term studies can thrive and multiple partners can work towards common goals. The collaborative nature of this project also ensures a rich and unique training ground for students at various stages of their academic and professional careers.

In the face of an uncertain climate, the NL-BELT will help us gain a better understanding of how to prepare our forests and forest industry for the future, by contributing to the science foundation on which informed policy and decision-making are being built.

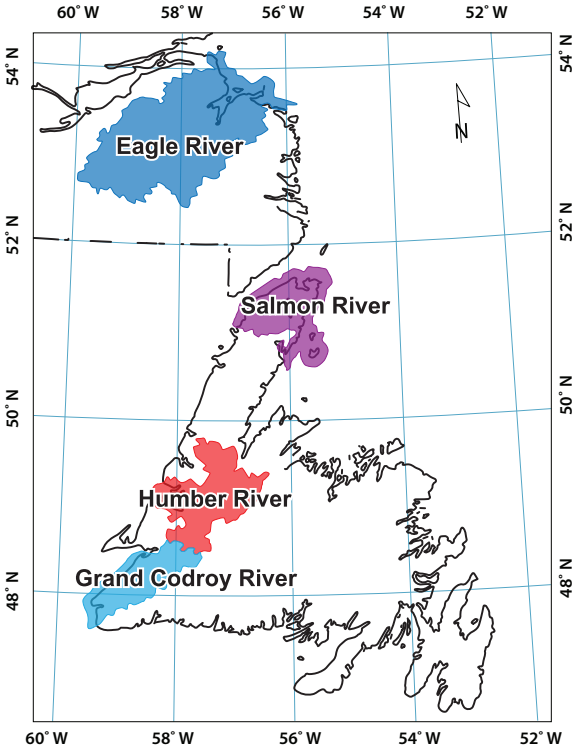

Figure 1. Map of western Newfoundland and southern Labrador highlighting the four research plots of the NL-BELT project.

For more information, contact:

Kate Edwards

Climate Change Scientist
Natural Resources Canada
Canadian Forest Service – Atlantic Forestry Centre
Corner Brook, Newfoundland & Labrador E3B 5P7
Tel: 709-637-4926
Kate.Edwards@NRCan-RNCan.gc.ca
nrcan.gc.ca

Cat. No. Fo104-2/2013 (Print)
ISBN 978-1-100-54633-9

Recycled paper