Branching out

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Forest biomass harvesting: monitoring and validating the long-term effects

There is growing interest in forest biomass in Quebec and around the world, and many questions have been raised about the quantity of forest biomass available, and about harvesting methods and their associated costs and potential environmental impacts.

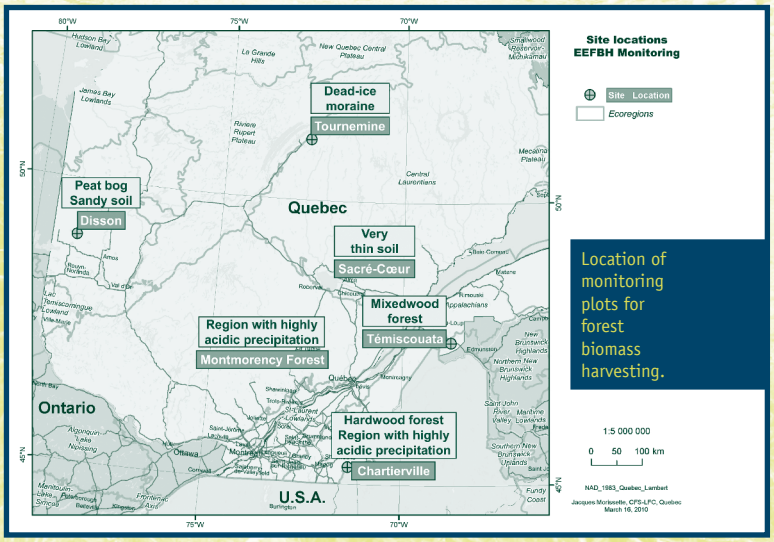
Studying the impact of biomass harvesting on soils

The Canadian Forest Service (CFS) established a number of permanent plots in the 1980s and 1990s, notably in Ontario and Nova Scotia, to measure the impact of different biomass harvesting rates on site productivity and soil properties.

These plots are now providing invaluable data on the effects of biomass removal more than two decades after harvesting. However, since these field trials cover only a fraction of the full range of ecological conditions present in Canadian forests, there is still a lot to learn about the actual impacts of biomass harvesting on Canada's forest ecosystems.

To gain more knowledge, CFS researchers enlisted the help of forest stakeholders in establishing a network of plots to monitor the effects of forest biomass harvesting. A number of stakeholders across Quebec are participating in this undertaking (*see Map*). The researchers will thus be able to establish plots on a wide variety of sites: hardwood forest, boreal forest, fragile northern sites, sites with clay soils, sandy soils, etc. The participants had a variety of reasons to get involved, including the desire to meet the requirements for environmental certification, to implement good harvesting practices and to help generate scientific knowledge that can be used to develop better standards.

Harvesting residues, Chartierville, QC.
Photo: Jacques Morissette (CFS)

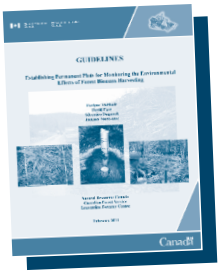


Location of monitoring plots for forest biomass harvesting.

Roadside pile of harvesting residues. Photo: Jacques Morissette (CFS)

Plot for monitoring the effects of biomass harvesting.
Photo: Jacques Morissette (CFS)

Framework for data collection



The CFS has developed a guide for forest stakeholders that describes the procedure for establishing permanent plots to monitor the environmental effects of forest biomass harvesting. It also outlines the methodology for collecting data on soils, vegetation and woody debris. The CFS will compile and archive the data to allow subsequent resampling of plots at different points in time. The analysis of data collected from a large number of plots representing a wide range of soil, climate and vegetation conditions and differing in their harvesting history will provide more detailed knowledge on the impact of biomass removal. This will make it possible to better identify the related environmental issues and to establish criteria for identifying sites at risk in order to ensure sustainable biomass harvesting.

Supporting other studies

Monitoring plots have also been established throughout the province, in collaboration with the Université du Québec à Montréal, the Université du Québec en Abitibi-Témiscamingue, the ministère des Ressources naturelles et de la Faune du Québec and other partners, in order to assess the impact of leaving certain quantities of logging residues on the growth of the main tree species used for reforestation in Quebec. In addition, testing is under way in the Lac-Saint-Jean, Eastern Townships, Abitibi and Lower St. Lawrence regions.

The CFS is also playing an advisory role in a variety of related projects. For example, it assisted the Centre d'enseignement et de recherche en foresterie de Sainte-Foy (CERFO) in developing a best practices guide on biomass harvesting for private woodlot owners in the Haut-Saint-François area (Eastern Townships). Other organizations, such as the Lac-Saint-Jean Model Forest, have sought CFS researchers' help in validating site sensitivity maps and optimizing the forest biomass supply chain.

Basing practices on scientific knowledge

A number of biomass-related projects have been implemented in Quebec, and many of these initiatives take place in local forests. However, there is still much to be learned about the effects of biomass removal. It is therefore important to have a management approach that can be adapted as new knowledge is acquired from research and testing efforts. A science-based approach to implementing biomass harvesting guidelines and best practices will also increase social acceptance of this type of harvesting.

USEFUL LINKS:

Project undertaken in collaboration with the Lac-Saint-Jean Model Forest:
http://www.foretmodeledulacsaintjean.ca/index.php?id=129

Establishing permanent plots for monitoring the environmental effects of forest biomass harvesting: guidelines:
http://cfs.nrcan.gc.ca/publications/

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