CFS CANADIAN FOREST SERVICE

Branching out

from the Canadian Forest Service ▪ Laurentian Forestry Centre

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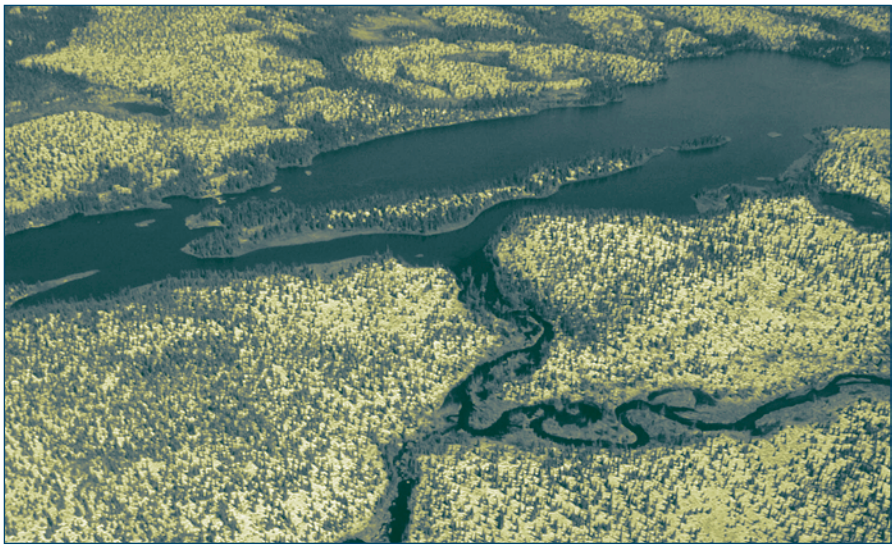
EOSD: monitoring our forests from space

The Earth Observation for Sustainable Development of Forests (EOSD) project, a partnership between the Canadian Forest Service (CFS) and the Canadian Space Agency, is aimed at establishing a national forest quantification and monitoring system using circa 2000 LANDSAT satellite images. Canada will use EOSD products to meet its national and international commitments related to climate change and sustainable forest management.

Four CFS[1] research centres are participating in this project. CFS-LFC researchers are responsible for carrying out activities in Quebec, in collaboration with several partners including Université de Sherbrooke, Université du Québec en Abitibi-Témiscamingue, Environment Canada and the ministère des Ressources naturelles et de la Faune du Québec (Quebec Department of Natural Resources and Wildlife).



Spruce–lichen forest in Quebec's Middle North region.
Photo: A. Beaudoin

As part of an initial operational component, work has been done to map the land cover of Quebec, particularly forested areas, and identify the types of forest stands and their density. As of March 2005, 70% of Quebec had been mapped. This colossal undertaking involves processing roughly one gigabyte[2] of data for each of the hundred or so LANDSAT satellite images required to produce the map. Digital coverage with a 25-m resolution will be completed in spring 2006 and the results will be accessible through a Web portal.

Another research component involves the mapping of major changes in forest cover (fires, harvested areas and defoliation) between 2000 and 2008. The CFS-LFC has helped to develop a simple and reliable method for classifying the main types of forest cover changes.

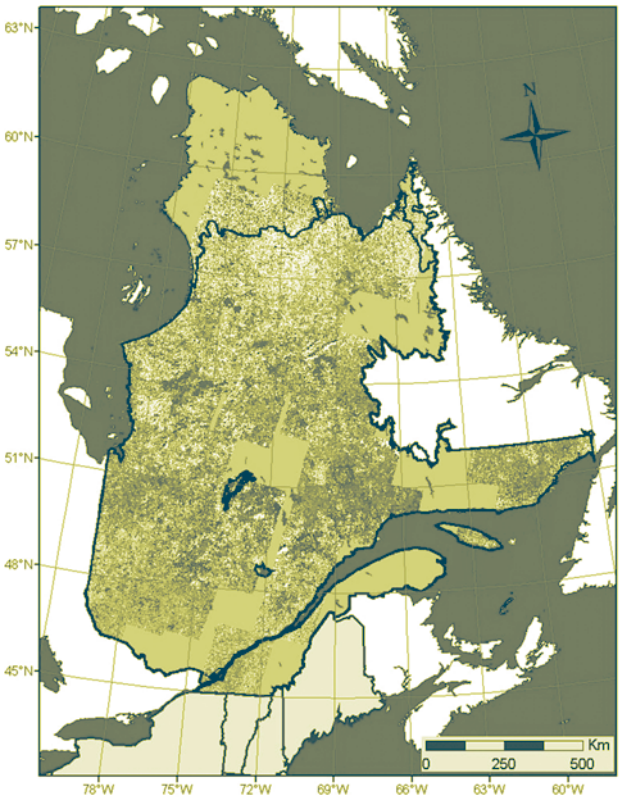
1 Pacific Forestry Centre (PFC), Northern Forestry Centre (NoFC), Laurentian Forestry Centre (LFC) and Atlantic Forestry Centre (AFC).
2 1 gigabyte (1 Gb) equals 1000 megabytes (1000 Mb).

Ressources naturelles Canada Natural Resources Canada

Canada

Researchers are also working on forest biomass (mass of forest vegetable matter per unit area) mapping. Techniques for quantifying biomass from satellite imagery are currently being tested in various pilot regions of Canada. The biomass maps will provide useful information for estimating forest carbon stocks and for monitoring certain criteria and indicators of sustainable forest management.

These various integrated components of the EOSD project are about to be deployed on a broad scale. They will underpin a new system for monitoring Canadian forests featuring widely accessible digital coverage that will be useful on both a local and a national scale. These products will be especially useful in northern regions, for which there is a paucity of data on forests (see Box).



EOSD land cover in Quebec (March 2005).
Photo: SCF-CFL

USEFUL LINKS

Earth Observation for Sustainable Development of Forests (EOSD)
http://eosd.cfs.nrcan.gc.ca

Canadian Space Agency
http://www.space.gc.ca

NORTHERN FORESTS ON THE MAP: FIELD APPLICATIONS

The Direction de la conservation des forêts (Forest Conservation Branch) of the ministère des Ressources naturelles et de la Faune du Québec uses EOSD land cover data for the sector north of the area under forest management, in the limited fire protection zone, in order to track forest fuel conditions (quantities) and support decision making in situations calling for action to protect communities and property.

The Centre d'études nordiques (Northern Studies Centre) at Université Laval is planning to use EOSD land cover data to inventory old forest stands throughout the James Bay area—an undertaking that would be too onerous and time-consuming to carry out using aerial photos. The inventory will be used to set up a dendrochronology sampling network that will support efforts to reconstruct past climate conditions and better predict the responses of northern forests to climate change.

FOR MORE INFORMATION, PLEASE CONTACT:

André Beaudoin
Natural Resources Canada
Canadian Forest Service
Laurentian Forestry Centre
1055 du P.E.P.S., P.O. Box 3800
Sainte-Foy, Quebec G1V 4C7

Phone: **(418) 648-3440**
Fax: (418) 648-5849
E-mail: andre.beaudoin@nrcan.gc.ca
Web site: www.cfl.scf.nrcan.gc.ca

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