



# Branching out

from the Canadian Forest Service ■ Laurentian Forestry Centre

Number 23  
2005

## Forest soils: a tool for carbon accounting

Canada's forests contain huge pools of carbon that play an essential role in the global carbon cycle. Each year, Canadian forests absorb an average of 2,800 megatonnes of carbon and emit an equivalent quantity of carbon through respiration and forest fires.

In a northern climate, the soil contains the largest portion of the forest carbon stored in various pools: organic matter, roots, soil surface litter and heterotrophic organisms (decomposers). Any change in the current soil balance could potentially affect CO<sub>2</sub> concentrations in the atmosphere and bring about climate change.

What would be the effect of soil warming on the carbon dynamics contained in the soil? To predict this impact more effectively, Canadian Forest Service researchers have developed a model to simulate the changes in the carbon pools of forest soils when the temperature increases. This model applies to the



Soil incubation in laboratory.  
Photo: D. Paré (SCF)

soils in sugar maple, balsam fir and spruce forest types in Eastern Canada and is based on carbon content measurements and carbon emissions collected in the laboratory during long-term incubation of the soils.

In simulation tests, the model has always indicated variations in carbon pools, either for various types of forest soils or on the basis of temperature. The results even suggest that the model could help to determine whether a balance can be struck between CO<sub>2</sub> emissions and CO<sub>2</sub> sequestration in the soil.

It is very important to keep on developing such increasingly reliable models because they help Canadians increase their understanding of the role of forests in the global carbon cycle, and they enable forest managers take carbon into account in sustainable forest management.

### FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

**Guy R. Larocque or David Paré**

Natural Resources Canada

Canadian Forest Service, Laurentian Forestry Centre

1055 du P.E.P.S., P.O. Box 10380, Stn. Sainte-Foy, Québec, Québec G1V 4C7

Telephone: (418) 648-5791 (G. Larocque) • (418) 648-7598 (D. Paré)

E-mail: [guy.larocque@nrcan.gc.ca](mailto:guy.larocque@nrcan.gc.ca) • [david.pare@nrcan.gc.ca](mailto:david.pare@nrcan.gc.ca)

Web site: [www.cfl.scf.nrcan.gc.ca](http://www.cfl.scf.nrcan.gc.ca)

### USEFUL LINK

**Forest carbon accounting**

[www.carbon.cfs.nrcan.gc.ca](http://www.carbon.cfs.nrcan.gc.ca)



A healthy forest ■ A strong forest sector ■ Knowledge at your fingertips



Natural Resources  
Canada

Ressources naturelles  
Canada

© Her Majesty the Queen in Right of Canada 2006  
Catalog Number Fo113-1/23-2006  
ISBN 0-662-69686-7 • ISSN 1705-5784

Canada