



# Branching out

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from the Canadian Forest Service

Laurentian Forestry Centre



## REDUCTION OF GREENHOUSE GASES: USING THE FOREST RESOURCE

**B**y ratifying the Kyoto Agreement on December 17, 2002, Canada committed itself to bringing its annual carbon dioxide (CO<sub>2</sub>) emissions for the 2008–2012 period down to 6% below the reference emission level of 1990. As a forest country, Canada considers the forest resource a valuable part of its net CO<sub>2</sub> emissions management strategy. The Canadian Forest Service estimates that careful management of our forests with a view to increasing their ability to take up and fix carbon could help improve the CO<sub>2</sub> emissions budget.

The carbon in our forests is mainly in the soil. The aerial biomass is a secondary, though more dynamic, sink. In addition, an old forest



*Measuring carbon allocation in roots.*  
Photo: P.Y. Bernier

containing a large carbon stock shows a lower rate of carbon uptake than a vigorously growing young forest. Forest harvesting and management therefore cause significant carbon exchanges between forest and atmosphere and have an impact on the site's total carbon budget.

After harvesting, the warming of the forest floor and the generation of large quantities of wood residues that readily decompose cause more CO<sub>2</sub> to be released. The resulting solid wood products store some of the carbon for long periods, but these quantities of carbon are not currently recorded in the Kyoto Protocol.



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Equipment for measuring soil respiration.  
Photo: P.Y. Bernier

A cut block, such as a burned area, therefore remains a source of CO<sub>2</sub> for several years after the disturbance, even if vegetation re-establishes itself vigorously. Forest harvesting and natural disturbances rejuvenate our forests and increase the rate of carbon sequestration, but also release much of the carbon that is already stored there.

A cut block therefore remains a source of CO<sub>2</sub> for several years after the disturbance.

forests through management activities and would thus reduce Canada's total carbon emissions.

Gains in carbon following reforestation of abandoned agricultural lands will likely be computed relative to the carbon that would have accumulated without

reforestation. We must therefore understand the carbon dynamics of abandoned farmland with and without reforestation.

Canadian Forest Service researchers are currently working to reduce the uncertainties associated with the greenhouse gas sequestration potential of our forests. The researchers are also trying to understand how the anticipated climate changes will affect the forest resource across Canada.

### USEFUL LINK

#### Climate Change

[www.nrcan-rncan.gc.ca/cfs-scf/science/resrch/climatechange\\_e.html](http://www.nrcan-rncan.gc.ca/cfs-scf/science/resrch/climatechange_e.html)

If admitted in international negotiations as a potential sink, forests could play a role through carbon credit transactions<sup>1</sup>. These would provide a means of taking into account the quantity of carbon sequestered by

### FOR FURTHER INFORMATION, PLEASE CONTACT:

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<sup>1</sup> Carbon credits do not yet exist inasmuch as their existence, and so their worth, has not yet been ratified by an international treaty. Rules would be laid down for their creation and use.