



Natural Resources
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CANADIAN FOREST SERVICE

Science HIGHLIGHTS

CARBON ACCOUNTING

How can forest products help mitigate climate change?

Tracking carbon in both forests and forest products can help us find strategies to mitigate climate change

Canada's forest plays an important role in the global carbon cycle, but the exact nature of the contributions of forests to the carbon cycle is difficult to quantify. That's why researchers at the Canadian Forest Service–Natural Resources Canada are working on detailed and scientifically rigorous forest carbon accounting. While continuing the development of carbon accounting tools for forest ecosystems, the Carbon Accounting Team is now developing a new tool to track the fate of carbon harvested in Canada.

"We are building on a comprehensive model that takes into account information on all the wood harvested in Canada so we can explore where carbon goes and what it is used for," says Werner Kurz, a senior research scientist at the Canadian Forest Service of Natural Resources Canada in Victoria, B.C.

Tracking the lifecycle of forest products and the carbon they contain

Accounting for carbon also means considering what researchers refer to as the "displacement factor." For example, if society were to stop using timber in construction, the use of other materials like concrete and steel would have to increase. Materials like these have a bigger carbon footprint than wood.

This concept of displacement is one of the reasons the Carbon Accounting Team is building a model that can track where the carbon in harvested wood goes. Currently, Canada provides data on carbon emissions and uptake from the atmosphere and reports it under the United Nations Framework Convention on Climate Change (UNFCCC). But UNFCCC accounting rules assume that when timber is harvested, the carbon it contains is released immediately to the atmosphere. This simplifying assumption incorrectly reports where and when emissions occur—and it removes incentives to use harvested wood products that retain carbon for long periods of time.

A more sophisticated and accurate approach, being advanced by Kurz and his colleagues, quantifies the fate of harvested wood. For example, lumber used in constructing a building sequesters carbon for as long as the building stands—this can mean carbon is sequestered for generations. Improved accounting of carbon in wood products helps identify more ways in which sustainable forest management and resulting products can help mitigate climate change.

Overview

Better understanding of the carbon cycle has the potential to help address challenges associated with climate change.

Compared with natural forests, managed forests store less carbon but take more carbon dioxide from the atmosphere.

Forests alone cannot mitigate climate change as they can't take up all the carbon we emit.



Forest management and the carbon cycle

"Sustainable forest management achieves multiple objectives. If we can manage forests so they maintain or increase carbon stocks while meeting society's need for energy, fibre and timber, we can achieve, in the long run, the greatest climate change mitigation benefit," Kurz says quoting a report of the Intergovernmental Panel on Climate Change.

Kurz and his colleagues have developed the Operational-Scale Carbon Budget Model of the Canadian Forest Sector—known as CBM-CFS3—that quantifies, monitors, reports and forecasts the greenhouse gas balance of forests. It can be applied at many scales, from stands to all of Canada and uses much of the same information needed for forest management planning, like forest inventories, tree species, growth and yield curves, natural and human-induced disturbance information, forest harvest schedules and land-use change information. It is a useful tool for forest managers to explore how different management actions can affect the forest carbon balance into the future.

The different roles that managed and natural forests play in the carbon cycle are of particular interest. "Managed forests store less carbon than natural forests, but because they are younger they take more carbon dioxide from the atmosphere through rapid growth," Kurz says. "The objectives of sustainable forest management are generally compatible with the objectives of good carbon management."

But Kurz cautions those who think forests alone hold the key to mitigating climate change. "Forests have an important role to play but they can't take up all the carbon we emit. To quantify the potential contribution of the forest sector and to develop mitigation portfolios, we first need tools that help us quantify the greenhouse gas balance. This understanding is the basis for finding ways to reduce emissions and increase sinks. And that is what existing and new forest carbon accounting tools are designed to do."

