Branching out

from the Canadian Forest Service ▪ Laurentian Forestry Centre

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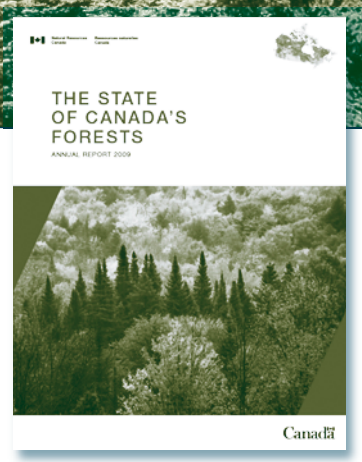
A model for predicting forest yield across Canada

Canada is required to prepare an annual report on the state of its forests to meet its international commitments and national requirements. To this end, the Canadian Forest Service co-ordinates the National Forest Inventory (NFI), which is based on a network of permanent sample plots covering all of Canada's forests. Repeated sampling of the plots through aerial photographs and ground measurements provides standardized information on forest attributes.

While the provinces supply data for the National Forest Inventory, not all of them have the requisite growth models to update merchantable volume estimates between the decadal measurements. Canadian Forest Service researchers have developed a national forest yield model to fill this gap. The goal was to derive short-term (10 years) merchantable volume projections for the main tree species for the provinces and territories lacking such models. The model uses a single equation to predict merchantable volume based on three variables: stand age, number of degree-days, and mean annual precipitation estimated for the site.

Photo: Pierre Bernier (CFS)

The model was adjusted to 25 Canadian forest tree species using a national temporary sample plot database.



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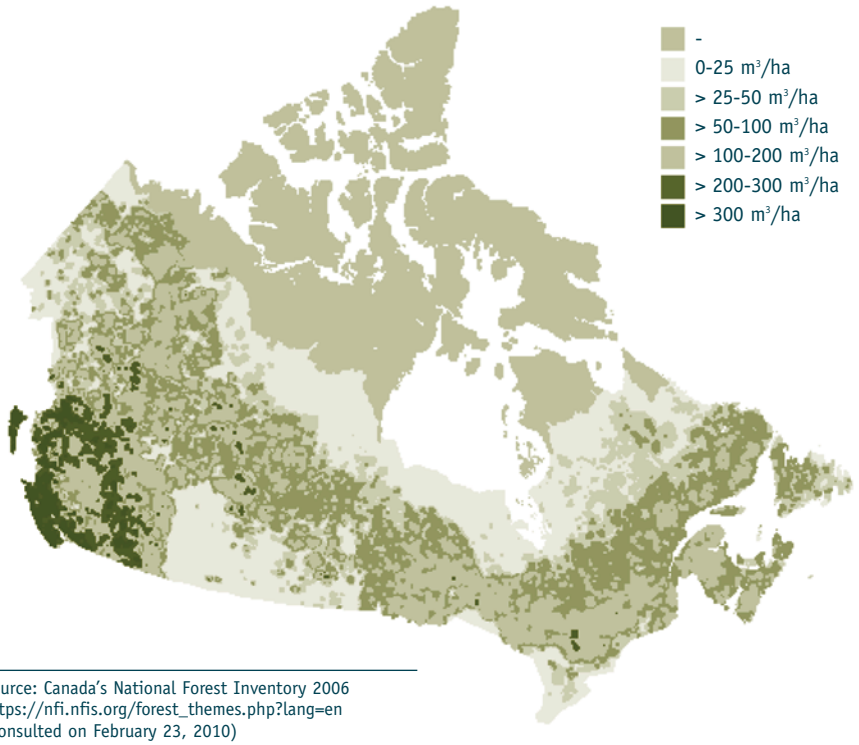
The researchers then compared the predictive capability of the model with that of several provincial models (Quebec, Nova Scotia, Ontario and British Columbia) by using growth measurements obtained from permanent sample plots. This comparison showed that the national model's capability to predict the net increase in merchantable volume is poor, but it performs as well as the provincial models that were tested.

The poor predictive capability of such models can be attributed to the use of databases for their adjustment that do not take stand growth dynamics (data from temporary sample plots and stem analyses) into account. Since observational data appear to be a limiting factor, it should be possible to simplify these models. This approach was followed when the national model was developed.

Finally, the spatial error structure of the national model is based on the use of Canada-wide data for adjustment purposes; this results in growth predictions without major discontinuities at provincial boundaries. The model therefore facilitates national reporting; it can serve as the sole source of information on tree growth, or it can compensate for the lack of models in some territories or provinces.

Total tree volume



Source: Canada's National Forest Inventory 2006
https://nfi.nfis.org/forest_themes.php?lang=en
(consulted on February 23, 2010)

USEFUL LINKS:

Annual Report on the State of Canada's Forests:
http://canadaforests.nrcan.gc.ca/rpt

Canada's National Forest Inventory:
https://nfi.nfis.org

FOR MORE INFORMATION, PLEASE CONTACT:

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