
Simulating the carbon budget in the boreal forest of northwestern Ontario using the Canadian Carbon Budget Model (CBM-CFS3)

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As the public is increasingly concerned by environmental issues, forest managers must consider carbon accounting (carbon sequestration and mitigation) in their management strategies. The objective of the present study was to simulate the effect of different management scenarios on carbon accounting using the Carbon Budget Model of the Canadian Forest Service (CBM-CFS3). This model, developed as a carbon accounting tool, was used to investigate the effects of different forest age-class distributions, forest types, and management scenarios on the carbon contents and fluxes of two forest types on the Dog River Matawin Forest (DRMF) in Northwestern Ontario (NWO). The DRMF (784, 700 hectares), dominated by spruce (*Picea*), pine (*Pinus*), fir (*Abies*) and poplar (*Populus*), has been actively managed for almost 100 years. For the present study, the carbon stocks and fluxes of the Jack pine (*Pinus banksiana* Lamb.) and trembling aspen (*Populus tremuloides* Michx.) forest types were simulated. The comparison of regulated and unregulated management scenarios with similar average stand ages greater than 70 years indicated that the carbon stocks of a forest in full regulation will eventually surpass those of an unregulated forest. Both forest types continuously sequestered carbon throughout the simulations regardless of the forest management scenario. The more productive trembling aspen forest type had a greater total carbon content and a greater ability to sequester carbon than the jack pine forest type.

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Theme: Tree physiology, carbon and nutrient cycles and genetics

Time: Saturday, 9:30, room 2326
