



## Fibre Connect n° 3

November 2023

### Welcome to the Canadian Wood Fibre Centre eBulletin!

In this issue:

- Welcome!
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The Canadian Wood Fibre Centre (CWFC) is a research branch within the Canadian Forest Service (CFS). Its employees are located at all five CFS Research Centres, the Petawawa Research Forest (PRF), the National Capital region and Corner Brook. We develop knowledge, tools, and approaches aimed at reducing the risks and enhancing the use of the forest wood fibre supply in Canada.

We support economic development, Canada's transition to a low-carbon economy, effective stewardship of forest resources, and the resiliency of forests to the impacts of climate change. Our innovative, sustainable, evidence-based solutions directly meet the needs of our end users.

In support of its research portfolio, the CWFC also operates the Petawawa Research Forest, which is available to scientists and collaborators from across federal and provincial departments, academia, and industry.

Through its contribution program, the CWFC supports projects that advance the Government of Canada's priorities in the forest sector.

The Forest Innovation Program (FIP), established to advance research, development and technology transfer activities in Canada's forest sector, directly supports the CWFC's work by helping the forest sector with its ongoing transformation through the adoption of emerging technologies ready for commercialization.



*Modelling the stand dynamics after a thinning induced partial mortality: A compensatory growth perspective.* Published by **Chao Li** and others in **Frontiers in Plant Science**. In this paper, the authors develop and utilize the TReeCG model to simulate the compensatory growth of trees after experiencing a partial mortality.

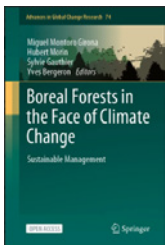
Full article: <https://pubmed.ncbi.nlm.nih.gov/36570945/>



*Influence of tree, stand, and site attributes on hardwood product yield: Insights into the Acadian Forests.* Published by **Jean-Martin Lussier** and others in **Forests**. In this paper, the authors characterize the tree, stand and site factors that influence the proportion of sawlog volume in tolerant hardwoods in New Brunswick.

Picture credit: Northern Hardwoods Research Institute Inc.

Full article: <https://www.mdpi.com/1999-4907/14/2/182>.



*Plantation Forestry, Tree Breeding, and Novel Tools to Support the Sustainable Management of Boreal Forests.* Written by **Nelson Thiffault**, **Patrick Lenz**, and others in **Boreal Forests in the Face of Climate Change**. In this chapter, the authors describe how plantation forestry (such as tree breeding and novel tools, including genomic selection) can support the sustainable management of boreal forests in the face of climate change by, among other benefits, reducing management pressure on natural forests and favoring ecosystem restoration.

Full article: [https://link.springer.com/chapter/10.1007/978-3-031-15988-6\\_14](https://link.springer.com/chapter/10.1007/978-3-031-15988-6_14)



*Innovative Silviculture to Achieve Sustainable Forest Management in Boreal Forests: Lessons from Two Large-Scale Experiments.* Written by **Nelson Thiffault**, **Jean-Martin Lussier**, and others in **Boreal Forests in the Face of Climate Change**. In this chapter, the authors discuss the effects of these treatments on tree growth, tree mortality, regeneration, and biodiversity. They also examine the challenges of existing silvicultural approaches in the context of climate change.

Full article: [https://link.springer.com/chapter/10.1007/978-3-031-15988-6\\_16](https://link.springer.com/chapter/10.1007/978-3-031-15988-6_16)



*Mechanical scarification can reduce competitive traits of boreal ericaceous shrubs and improve nutritional site quality.* Published by **Nelson Thiffault** and others in **Forestry**. In this paper, the authors revisit experimental plots in two boreal climate regions (warmer, drier Abitibi vs. cooler, wetter Côte-Nord) 18 years after a post scarification study was completed. This study demonstrated that scarification increased the growth of black spruce relative to non-scarified plots.

Full article: <https://academic.oup.com/forestry/article/96/2/293/6825197>



*Predicting aboveground biomass carbon sequestration potential in hybrid poplar clones under afforestation plantation management in southern Ontario, Canada.* Published by **Derek Sidders** and others in **The Forestry Chronicle**. In this paper, the authors evaluate options to predict above-ground biomass carbon potential of fast-growing species grown on farmland. They test mathematical equations to calculate above-ground woody biomass volume and carbon sequestration potential by comparing predicted values with actual harvested values.

Full article: <https://pubs.cif-ifc.org/doi/10.5558/tfc2022-011>



*La bioénergie forestière pour lutter contre les changements climatiques : quelles implications dans la transition énergétique du Québec (Canada)?* Published by **Nelson Thiffault** and others in **The Forestry Chronicle**. In this paper, the authors identify the biomass sources, practices and conversion pathways that are perceived to be conducive to the success of the emerging forest bioenergy sector.

Picture credit: Claudie-Maude Canuel

Full article only available in French: <https://pubs.cif-ifc.org/doi/abs/10.5558/tfc2023-004>



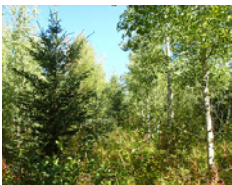
*Eastern white pine regeneration abundance, stocking, and damage along a gradient of harvest intensity.* Published by **Nelson Thiffault**, **Michael Hoepting**, and others in **The Forestry Chronicle**. In this paper, the authors present results on the regeneration of white pine after progressive cutting.

Full article: <https://pubs.cif-ifc.org/doi/abs/10.5558/tfc2023-011>



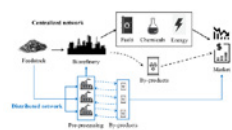
*Complex regeneration responses of eight tree species to partial harvest in mixedwood forests of northeastern North America.* Published by **Nelson Thiffault** and others in **Forest Ecology and Management**. In this paper, the authors examine the rate and time course of species-specific regeneration growth and mortality of eight tree species in the first fifteen years following operational partial harvests in the mixed-species forests of Maine, United States.

Full article: <https://www.sciencedirect.com/science/article/pii/S0378112722006661>



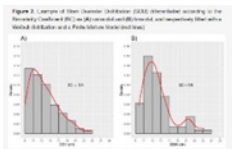
*Using spot treatments to regenerate an intimate mixture of trembling aspen and white spruce in Alberta: Results at age 15.* Published by **Mike Hoepting** and others in **The Forestry Chronicle**. In this paper, the authors present the growth response results 15 years after the establishment of a study which explored the methods for regenerating productive, intimate mixtures of trembling aspen and white spruce.

Full article: <https://pubs.cif-ifc.org/doi/abs/10.5558/tfc2023-010>



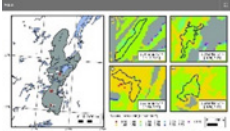
*A review of Canadian wood conversion technologies for the production of fuels and chemicals.* Published by **Cyriac Mvolo** and others in **The Canadian Journal of Chemical Engineering**. In this paper, the authors present a review of the Canadian technologies which can be utilized to produce both biofuels and biochemicals.

Full article: <https://onlinelibrary.wiley.com/doi/full/10.1002/cjce.24820>



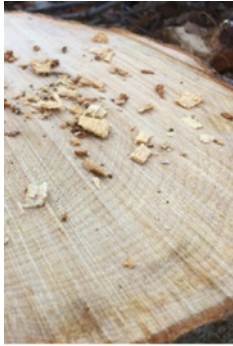
*Estimating Stem Diameter Distributions with Airborne Laser Scanning Metrics and Derived Canopy Surface Texture Metrics.* Published by **Olivier R. van Lier** and others in **Forests**. In this paper, the authors use airborne lidar technology to estimate stem diameter distributions (SDD) in the eastern boreal forests. The authors determined that texture metrics derived from a canopy height model can be used to improve the estimate of SDD parameters and confirmed that differentiating for modality prior to estimating SSD is especially beneficial in stands with bimodal distributions.

Full article: <https://www.mdpi.com/1999-4907/14/2/287>



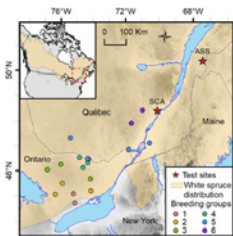
*Combining forest growth models and remotely sensed data through a hierarchical model-based inferential framework.* Published by **Mathieu Fortin, Jean-François Côté** and **Olivier R. van Lier** in the **Canadian Journal of Forest Research**. In this paper, the authors convert a simple growth model which was fitted to permanent sample plot data into a model based on Landsat 8 spectral values through a generalized hierarchical model-based framework. The resulting model makes it possible to map forest growth at a fine resolution and determine its uncertainty.

Full article: <https://cdnsiencepub.com/doi/full/10.1139/cjfr-2022-0168?af=R>



*A longer wood growing season does not lead to higher carbon sequestration.* Published by **Nelson Thiffault** and others in **Scientific Reports**. In this paper, the authors evaluate the intra-annual individual variability in growth traits in balsam fir to understand if a longer growing season, driven by climate change, will lead to enhanced carbon sequestration from wood production.

Full article: <https://www.nature.com/articles/s41598-023-31336-x>



*Increasing genomic prediction accuracy for unphenotyped full-sib families by modeling additive and dominance effects with large datasets in white spruce.* Published by **Simon Nadeau, Patrick Lenz**, and others in **Frontiers in Plant Science**. In this paper, the authors evaluate the effect of the inclusion of dominance on the precision of genetic parameter estimates and on the accuracy of conventional pedigree-based (ABLUP-AD) and genomic-based (GBLUP-AD) models.

Full article: <https://www.frontiersin.org/articles/10.3389/fpls.2023.1137834/full>

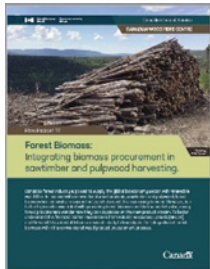


*Influence of Four Spacings between Trees and Four Samplings Heights on Selected Wood Quality Attributes of White Spruce (*Picea glauca* (Moench) Voss).* Published by **Cyriac Mvolo, James Stewart**, and others in **Forests**. In this paper, the authors study the impacts of stand management through spacing between trees on white spruce base on growth-related, anatomical, and physical wood quality attributes.

Full article: <https://doi.org/10.3390/f13111807>

# Recent Technology Transfer

(OCTOBER 2022 TO MARCH 2023)



**Fibre facts n° 27. Forest Biomass: Integrating biomass procurement in sawtimber and pulpwood harvesting.** This fact sheet was written by **Jeff Fera, Nelson Thiffault**, and others. It provides information on the integration of a forest biomass procurement process within a forest harvest for conventional wood products and with stand renewal activities.

Full issue: <https://cfs.nrcan.gc.ca/publications?id=40869>



**Couvert Boréal. Controlling speckled alder to restore productivity in the boreal forest.** Written by **Nelson Thiffault** and others. The authors present the first results on height growth of black spruce seedlings planted after various site preparations to control the invasion of speckled alder on wet sites in Abitibi.

Full issue only available in French: <http://www.cef-cfr.ca/uploads/Actualité/Aulne2022.pdf>



**In Brief from the Canadian Forest Service, Laurentian Forestry Centre.** This publication was written by the Laurentian Forestry Centre. It summarizes research on ecosystem management, successful planting, genetic selection, forest resilience to drought, mechanical properties of black spruce, urban forestry research needs and harvesting without damaging biodiversity. This publication includes work from CWFC researchers **Nelson Thiffault, Patrick Lenz** and **Simon Nadeau**.

Full issue: <https://cfs.nrcan.gc.ca/publications?id=40908>



**FastTRAC II launching informative project videos on March 21st, International Day of Forests.** This video presents FastTRAC II (Fast Tests for Rating and Amelioration of Conifers 2), a project that will implement genomic selection to accelerate the selection process and enhance advanced-generation red spruce and black spruce planting stocks. This video includes work from CWFC researcher **Patrick Lenz**.

Full issue: <http://fasttracproject.ca/en/fasttrac-ii-launching-informative-project-videos-on-march-21st-international-day-of-forests/>



**Information Report FI-X-024. A Compendium of Operational Research - Ellerslie Short Rotation Woody Crops Technical Development Site, Edmonton, Alberta.** Written by **Tim Keddy, Derek Sidders** and others. The authors summarize information collected over many years on growth rates, wood characteristics, carbon sequestration, and economics associated with short rotation woody crops.

Full issue: <https://cfs.nrcan.gc.ca/publications?id=40909>

# TreeSource

THE NATIONAL DATABASE FOR FOREST RESEARCH DATA HAS JUST BEEN UPGRADED!

**TreeSource**  
ts.rncan.gc.ca

The screenshot displays the TreeSource website interface. At the top left is the TreeSource logo and URL. Below it is a navigation menu with options like Home, Tutorial, Data search, and Map of sites. A central banner features a forest image. On the right, a map shows a location in Québec, Canada, with a site ID 533300N0762248W\_095261 (Id: 6584). A pop-up window provides details for this site, including coordinates, location (Grande-Trois, La), a description of inventory plots, and the species Picea mariana. Below the map, a table lists sample data for Picea glauca.

01. Sample name	02. Species	14. Total rings	Density (kg/m <sup>3</sup> )	MFA (°)
E560A1_01_00004_004_00479_00_core1	Picea glauca	20	490.4	22.01
E560A1_01_00015_002_00072_00_core1	Picea glauca	24	402.7	15.46
E560A1_01_00015_005_00075_00_core1	Picea glauca	22	554.3	27.51
E560A1_01_00016_001_01021_00_core1	Picea glauca	20	443	18.89

→ 710 K

→ 1.6 M

→ 16 K

**Register** for TreeSource to access the wealth of information and content through the hyperlinks in this article!

**TreeSource** is a repository of more than 12 000 natural and plantation research forests across Canada. In addition to extensive site metadata available through a [geo-referenced map](#), TreeSource is home to millions of [dendrometrical](#) and [dendrochronological](#) measurements, also readily accessible through the interface based on user-specific access privileges.

Recently, new features have been added to increase the versatility of TreeSource:

- The [Xylarium](#) is one of the major CWFC's contribution to the [Wood ID Project](#) in the fight against illegal logging. The Xylarium is an online collection of ~ 7000 reference wood specimens. It contains indigenous and exotic species and includes a [database of microscopic images](#) to help distinguish them by anatomical features.
- The [CFS-TRenD national database](#) is a collection of more than 14 million tree growth rings. It is part of the ongoing and historical tree-ring research projects conducted by the CFS and partner organizations.
- The [Site Use Tracker](#), a one-stop portal to formally request access to any of the 300+ field trials from the CFS. The tool generates a data sharing agreement and facilitates approval by automatically sending requests to a CFS committee for review.
- The TreeSource [Newsletter](#) is an e-bulletin sent to registered users, by request. It will keep you informed on all the most recent datasets and new web feature additions.

# Recorded Webinars

(OCTOBER 2022 TO MARCH 2023)



**Canadian Institute of Forestry E-lecture Series.** *Past, Present, and Future Canadian Forest Service Research in Support of Planting Two Billion Trees.* Speaker: **Dasvinder Kambo.**

Full webinar: <https://cif-ifc.adobeconnect.com/pgy8ft5ine8z/>



**Canadian Institute of Forestry E-lecture Series.** *2023 Annual LIDAR/EFI Cross-Country Checkup.* Speakers: **Olivier R. van Lier, Jean-Martin Lussier and Joanne White,** hosted by **Philip-Edouard Shay.**

Full webinar: <https://www.youtube.com/watch?v=AZUN8EZVM4M>



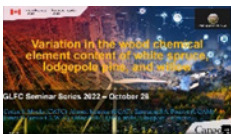
**Canadian Institute of Forestry E-lecture Series.** *Monitoring Post-Disturbance Forest Recovery.* Speaker: **Joanne White.**

Full webinar: <https://cif-ifc.adobeconnect.com/parjvqvn4pw8/>



**Canadian Institute of Forestry E-lecture Series.** *MASS - Montane Alternative Silvicultural Systems: Lessons Learned Over Three Decades of Research in Coastal BC.* Speaker: **Cosmin Filipescu.**

Full webinar: <https://cif-ifc.adobeconnect.com/pzp0u6ru20i8/>



**GLFC Online Seminar Series.** *Variation in the wood chemical element content of white spruce, lodgepole pine and willow.* Speaker: **Cyriac Mvolo.**

Full webinar: <https://www.facebook.com/GLFC.CFS/videos/1100139797539345/>



**GLFC Online Seminar Series.** *Everyday Innovation 36-years with the Canadian Forest Service. What does it mean to work in an organization that aspires to innovation?* Speaker: **Guy Smith.**

Full webinar: <https://www.facebook.com/GLFC.CFS/videos/480969214137792/>

# Petawawa Research Forest Update

(OCTOBER 2022 TO MARCH 2023)



## KNOWLEDGE EXCHANGE

The PRF upheld its long-standing tradition of hosting the University of Toronto Master of Forest Conservation team this February. In addition, Directors from across the CFS came to visit the PRF as part of their team building session in Ottawa. We expect many more tours over the upcoming months as organizations and individuals continue to become more comfortable with traveling.

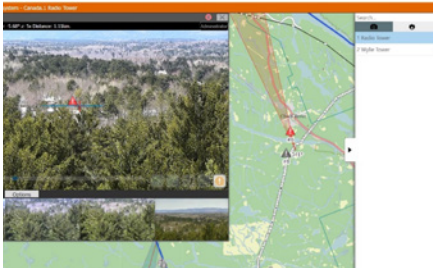
Elizabeth Cobb and Melissa Griffiths at PSP 1 during the CFS College of Directors Tour.



## PARTNERSHIPS

PRF and Department of National Defence (DND) continue to work together in the development of a Forest Management Plan for Petawawa Canadian Forces Base. A dense network of 157 plots is currently being measured (or remeasured) to support the calibration of Lidar flown last summer. The PRF hopes to have a completed Planning Composite Inventory (EFI for planning) by end of summer to kick start the strategic modelling project phase.

Jessalyn Morin and Ty Golden-Duval measuring plots to be used for lidar calibration of DND's forest inventory.



## FIRE DETECTION

The long-awaited autonomous fire detection camera system (4 years in the making) has been installed and is up and running at the PRF! This summer instead of checking for fires from fire towers or driving the PRF roads scanning for smoke or fire, PRF summer students will be alerted to suspicious potential smoke electronically via two fire detection cameras mounted across the property.

Screen capture of the fire detection camera monitoring system.



## THE LIGHTNING IS HERE

The PRF is now the proud owner of a fully electric F150, the Ford Lightning. There are many logistics to figure out regarding charging practices etc. but we think it will be a great vehicle for getting out and about in the PRF for research and operational activities.

PRF's new electric truck "Flash Gordon."



# What's Happening in the CWFC

(OCTOBER 2022 TO MARCH 2023)



In March 2023, Dr. Jim Stewart retired after more than 24 years of research at the CWFC and the CFS. Jim's work focused on the ecological and physiological processes that determine stand development in different silvicultural systems for lodgepole pine and white spruce forests. His studies investigated growth and yield responses to fertilization and density management, the effect of silviculture regimes on wood quality and fibre attributes, and improved inventory tools for managing forests based on value chain evaluations. He was also engaged in measuring and modelling standing tree biomass in boreal forests.

Jim's work informed and improved forest management in Canada. Here is a list to [Jim's CFS online publications Stewart, J.D. | Canadian Forest Service Publications | Natural Resources Canada \(nrcan.gc.ca\)](#)

Jim was a great colleague, and we wish him the best for the days to come, finding new ways in serving his community and the forest sector.



In April 2023, Guy Smith, who worked at the CWFC since 2008, retired from NRCan after 36 years with the public service.

Guy's leadership, superior inter-personal skills, mentorship of new and junior employees, and unwavering commitment to bilingualism, helped shape the CWFC. All those qualities, as well as his sense of humor, made him a much-valued CWFC employee and colleague.

He has left the CFS and NRCan with reflections on his career spent in labs, boardrooms and forests across the country in a seminar entitled Everyday Innovation - 36 years with the Canadian Forest Service, which is available in our Webinar section.

We wish Guy all the best in his retirement.

Guy is experiencing the common retirement phrase, "time has a way of filling up." Sometimes he's the tree planter, rescuing white spruce from ditches where they risk being mowed down. He notes that such trees have a crooked form, which makes them all the more endearing.

If you would like any additional information or would like to discuss any of the highlighted projects, send us an email at [centre@nrcan-nrcan.gc.ca](mailto:centre@nrcan-nrcan.gc.ca)

Follow us on X(Twitter): [@cwfc\\_ccfb](https://twitter.com/cwfc_ccfb)