



Fibre Connect n° 2

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Welcome to the **SECOND Canadian Wood Fibre Centre eBulletin!**

In this issue:

- Welcome!
- New Science
- Recent Technology Transfer
- Recorded Webinars
- What's Happening in the CWFC?
- Petawawa Research Forest Update

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 and the Petawawa Research Forest (PRF). We develop knowledge, tools, and approaches aimed at reducing the risks to the forest wood fibre supply of 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.



Translocating seed sources to new geoclimatic environments has limited effect on lumber quality of eastern Canadian white spruce. This paper was published by **Isabelle Duschene, Patrick Lenz**, and others in the Canadian Journal of Forest Research. In this paper, the authors evaluate the effect of provenance origin on lumber production and quality at rotation age in two white spruce provenance trials established in contrasting environments in eastern Canada.

Full article: <https://cdnsiencepub.com/doi/full/10.1139/cjfr-2022-0075>



Analysis of a wood production strategy from expert perspectives. This paper was published by **Nelson Thiffault** and others in The Forestry Chronicle. In this paper, the authors present key observations from the roundtable discussion held in the fall of 2021. This discussion brought together experts in forestry and related fields to express their views on a new strategy adopted in Québec to increase its quantity and quality of timber production.

Full article, English: <https://pubs.cif-ifc.org/doi/10.5558/tfc2022-004>

Full article, French: <https://pubs.cif-ifc.org/doi/10.5558/tfc2022-003>



Vegetation management is essential to regeneration success of red oak (Quercus rubra L.) at its northern range limit: results from a 10-year field experiment. This paper was published by **Trevor A. Jones** and others in The Forestry Chronicle. In this paper, the authors study the effect of vegetation management treatments on height, root collar diameter, mortality probability, health, and dominance class in planted and natural red oak regeneration stands over 10 years.

Full article: <https://pubs.cif-ifc.org/doi/abs/10.5558/tfc2022-006>



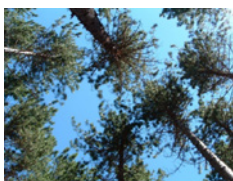
The phenotypic and genetic effects of drought-induced stress on apical growth, ring width, wood density and biomass in white spruce seedlings. This paper was published by **Patrick Lenz** and others in Springer. In this paper, the authors evaluate the genetic control of the growth and wood density response of white spruce clonal seedlings submitted to various drought conditions in a greenhouse experiment.

Full article: <https://link.springer.com/article/10.1007/s11056-022-09939-5>



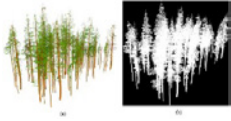
Harmonizing multi-temporal airborne laser scanning point clouds to derive periodic annual height increments in temperate mixedwood forests. This paper was published by **Joanne C. White** and others in the Canadian Journal of Forest Research. In this paper, the authors demonstrate the importance of assessing and harmonizing the vertical alignment of multi-temporal ALS data sets used for height growth calculations.

Full article: <https://cdnsiencepub.com/doi/full/10.1139/cjfr-2022-0055>



Potential Utility of a Climate-Sensitive Structural Stand Density Management Model for Red Pine Crop Planning. This paper was published by **Peter Newton** in MDPI forests. In this paper, the author evaluates and exemplifies the potential utility of a climate-sensitive modular-based structural stand density management model (SSDMM) developed for red pine in crop planning decision-making.

Full article: <https://www.mdpi.com/1999-4907/13/10/1695>



Estimation of vertical plant area density from single return terrestrial laser scanning point clouds acquired in forest environments. This paper was published by **Jean-François Côté** and others in Science Direct. In this paper, the authors wanted to be able to estimate the plant area density (PAD) of forest plots from terrestrial laser scanning (TLS) data by using a voxel-based approach with the software L-Vox.

Full article: <https://www.sciencedirect.com/science/article/pii/S0034425722002292#f0010>



Methods for Determining the Accuracy and Comparing the Agreement between Ground Measures and Advanced Forest Inventory Techniques. This paper was published by **Chao Li** and others on the Alberta Government open-source website. In this paper, the authors describe the methods that collectively provide the tools to address and answer how one can judge whether a new inventory technique is valid or of acceptable accuracy. They also explore how one can compare if a new inventory technique agrees with or is better than an existing one.

Full article: <https://open.alberta.ca/dataset/9781460154793/resource/5ce05543-b858-4470-8c7e-710d4a689e79>



High exposure of global tree diversity to human pressure. This paper was published by **Nelson Thiffault** and others in the Proceedings of the National Academy of Sciences (PNAS). In this paper, the authors analyze a recently developed global database of tree species' ranges to assess range protection and anthropogenic pressures for tree species and identify priority areas for the conservation of tree diversity. They also assess the geographic distribution of current protected areas and different potential conservation prioritization scenarios and their respective coverage of global tree species diversity.

Full article: <https://www.pnas.org/doi/10.1073/pnas.2026733119#:~:text=Based%20on%20quantitative%20range%20estimates,or%20very%20high%20human%20pressure>



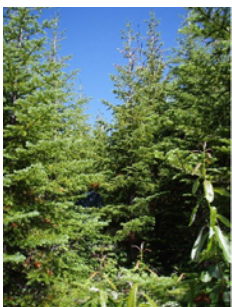
Detecting Compensatory Growth in Silviculture Trials - Empirical Evidence from Three Case Studies Across Canada. This paper was published by **Chao Li, Nelson Thiffault**, and others in Frontiers in Plant Science. In this paper, the authors evaluate if compensatory growth is common in forest stands using three case studies, each representing different data structures of silviculture trials.

Full article: <https://www.frontiersin.org/articles/10.3389/fpls.2022.907598/full>



An empirical financial analysis of biomass procurement harmonized with sawtimber and pulpwood supply in Eastern Canada. This paper was published by **Nelson Thiffault** and others in the Canadian Journal of Forest Research. In this paper, the authors study forest harvest operations to procure biomass in the form of trees and tree sections, along with sawtimber and pulpwood. They also analyze the cost-effectiveness of the supply chain, with a particular focus on harvest costs and the potential silvicultural savings from a reduced need for site preparation and reforestation.

Full article: <https://cdnsiencepub.com/doi/full/10.1139/cjfr-2021-0327>



Datasets of productivity and vegetation composition of boreal stands from an experiment comparing silviculture scenarios of increasing intensity after 20 years. This paper was published by **Nelson Thiffault** and others in Science Direct. In this paper, the authors describe datasets of plant community composition, dendrometric measurements, and the quantity and quality of snags of humid boreal stands (Quebec, Canada) from an experiment comparing silviculture scenarios of increasing intensity.

Full article: <https://www.sciencedirect.com/science/article/pii/S2352340922005844>

Recent Technology Transfer

APRIL 2022 TO OCTOBER 2022



Fibre fact no. 26: *Terrestrial lidar scanners help to better predict wood quality by using tree structure.* This fact sheet was written by **Dasvinder Kambo** and others. It demonstrates that fine-scale structural information derived from t-lidar and new modelling techniques can improve wood fibre attribute predictions.

Full issue: <https://cfs.nrcan.gc.ca/publications?id=40739>



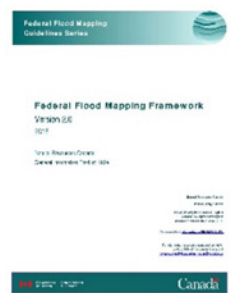
Fibre fact no. 25. *Real world tree breeding: growth and yield projections are met or exceeded in Douglas fir.* This fact sheet was written by **Dasvinder Kambo** and others. It validates tree breeding under “real world” conditions by confirming stand volume projections from growth and yield models.

Full issue: <https://cfs.nrcan.gc.ca/publications?id=40737>



Planter les forêts de demain à la forêt expérimentale de Petawawa. This report was written by **Nelson Thiffault, Jeff Fera, Michael Hoepting and Trevor Jones** in Progrès forestier. It provides an overview of research done at the Petawawa Research Forest concerning the Adaptive Silviculture for Climate Change project (ASCC).

Full issue only available in French (CWFC report at pages 8 to 10): <https://www.calameo.com/afsq/read/006572750c400f269073c>



Federal Flood Mapping Guidelines Series. This series was written by **Natural Resources Canada and Public Safety Canada**, with the participation of **Olivier van Lier**. It discusses flood mapping and its critical support in making informed decisions and investments to reduce the impacts of flooding in communities across Canada. The Canadian Wood Fibre Centre led the write-up of the **Federal airborne LiDAR data acquisition guideline annex** related to forestry.

Full issue: <https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/dsstr-prvntn-mtgtn/ndmp/fldpln-mppng-en.aspx>



InBrief from the Canadian Forest Service, Laurentian Forestry Centre. This publication was written by the **Laurentian Forestry Centre**. It summarizes research made in the genomics, entomology, silviculture, and resilience sectors of forestry, including work from CWFC researchers **Nelson Thiffault** and **Jean-Martin Lussier**.

Full issue: https://cfs.nrcan.gc.ca/publications?id=40598&lang=en_CA

Recorded Webinars

APRIL 2022 TO OCTOBER 2022

GLFC Online Seminar Series. *Growth models and forest management planning: a love-hate relationship.*
Speaker: **Mathieu Fortin.**

Full webinar: <https://www.facebook.com/watch/?v=557059828912954>

GLFC Online Seminar Series. *Extending ALS-based biomass component estimates: Assessing the contribution of spaceborne LiDAR data.* Speaker: **Oliver van Lier.**

Full webinar: <https://www.facebook.com/GLFC.CFS/videos/1011347749743736/>

Canadian Institute of Forestry E-lecture Series. *Adaptive Silviculture For Climate Change, Research Project (ASCC): International southern tree seed sourcing procurement challenges and opportunities.* Speakers: **Jeff Fera and Mike Hoepfing.**

Full webinar: <https://cif-ifc.adobeconnect.com/pybseokbeoxs/?launcher=false>

What's Happening in the CWFC?

DANIEL MAZEROLLE, DIRECTOR OF STRATEGIC OPERATIONS HAS BEEN PROMOTED TO DIRECTOR GENERAL OF THE PACIFIC FORESTRY CENTRE!



We are seeing off a very dear employee of the CWFC. Daniel Mazerolle is transitioning from a position as Director of Strategic Operations to Director General in one of our five research centres: the Pacific Forestry Centre. Located in British Columbia, this centre contributes to a great amount of research focused on forest entomology and pathology, fire management, forest inventory and monitoring, climate change, as well as economic and market research. With this diversified panel, we know Dan will find himself excited by this new change!

Petawawa Research Forest Update

CIF-IFC ANNOUNCES 2022 NATIONAL AWARD RECIPIENTS IN RECOGNITION OF OUTSTANDING AND UNIQUE ACCOMPLISHMENTS TO FORESTRY IN CANADA. OUR PETAWAWA RESEARCH FOREST IS ONE OF THEM!



Our staff at the PRF have received the Canadian Forest Management Group Achievement award because of their consistent high degree of forest management professionalism. By maintaining historic trials, partnering with scientists to conduct new research, using and testing leading edge technologies, and facilitating technology transfer and education, the staff at the PRF have helped maintain this exceptional working forest for scientific research and the advancement of sustainable forest management. Congratulations!

FORESTRY OPERATIONS

It was a busy summer of silvicultural activities at the Petawawa Research Forest (PRF) as we completed 178 hectares (ha) of mechanical site prep, 84 hectares of chemical site prep, and planted approximately 100,000 seedlings (predominantly white pine) across 80 ha. These activities are important to ensure the sustainable renewal of recently harvested forest.



PRF stand after mechanical site prep treatment.



PRF stand being treated with chemical site prep.

KNOWLEDGE EXCHANGE

We are finally back into the swing of things with our on the ground knowledge transfer experiences. This past summer, the PRF hosted eight tours, including Lakehead University, the Canadian Institute of Forestry's Annual Teacher's Tour, the Canadian Forest Services' Cumulative Effects research team, and more! This past December, our Canadian Wood Fibre Centre (CWFC) management team visited the PRF as part of their management retreat. It is nice to finally be able to use our woods once again and learn about all the forest research growing at the PRF.



CWFC Management team and PRF staff touring some of the key infrastructure at the PRF (in this picture, the Corry Lake Bridge).

PARTNERSHIPS



Department of National Defence (DND), Canadian Forces Base (CFB) Petawawa has partnered with the PRF team to create the base's next forest management plan. Lidar and imagery were re-flown for the PRF and base properties this past summer. A lidar calibration program is underway to develop an Enhanced Forest Inventory for CFB Petawawa. The Ontario Ministry of Natural Resources and Forestry (OMNRF) has partnered with us on this project and will be conducting the photo interpretation of the aerial imagery. The OMNRF benefits from this partnership by using the PRF as a pilot study focussing on integrating imagery and lidar for forest management planning purposes.

View from a Griffon helicopter of a range training area on CFB Petawawa as part of a PRF aerial

INFRASTRUCTURE



The PRF has procured an autonomous Fire Detection Camera System for detecting and alerting staff to potential fire outbreaks on the PRF and surrounding forests. This significant investment will be installed this winter and will support a state of the art fire detection program at the PRF. Finally, the winter renovations kick off at the silviculture building. Upgrades to this building will help support the hosting of tours, provide space for visiting researchers, and house our new fire detection camera system workspace.

PRF Silviculture building.

For more information on the Petawawa Research Forest please contact Heidi Erdle, PRF Forest Liaison and Technology Transfer Manager:
Heidi.erdle@nrca-nrcan.gc.ca

If you would like any additional information or would like to discuss any of the highlighted projects, send us an email at centre@nrca-nrcan.gc.ca

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