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CANADIAN WOOD FIBRE CENTRE



Fibre Facts n° 19

Petawawa Research Forest : Remote Sensing Supersite

The Petawawa Research Forest (PRF) is Canada's oldest research forest, established in 1918, and recently celebrated 100 years of continuous forest science and operations. The PRF is located in the Great Lakes-St. Lawrence forest region of southern Ontario, and is characterized by a complex assemblage of coniferous and broadleaf tree species and varied forest management histories.

Canada

The Petawawa Research Forest



Over the years, PRF has also been a hub of research focused on new and emerging remote sensing technologies, resulting in a large collection of data including airborne imaging systems, Light Detection and Ranging (LiDAR) data, and data from Earth Observation satellites such as Landsat and Sentinel. These data holdings, combined with permanent and temporary field sampling plots, legacy forest inventories, and management history records, provide important reference data for evaluating new tools and approaches for forest inventory and monitoring applications. To enable widespread access to these data for end users, a remote sensing supersite was established at the PRF in 2019.

What is a remote sensing supersite?

It is an observation hotspot that brings together cutting edge data acquisitions from state-of-the-art airborne and spaceborne instruments, combined with historical data acquisitions and comprehensive field reference data. Those data, which often include long-term observations such as permanent sample plots, are made openly available via a centralized data portal to support the science and applications communities.

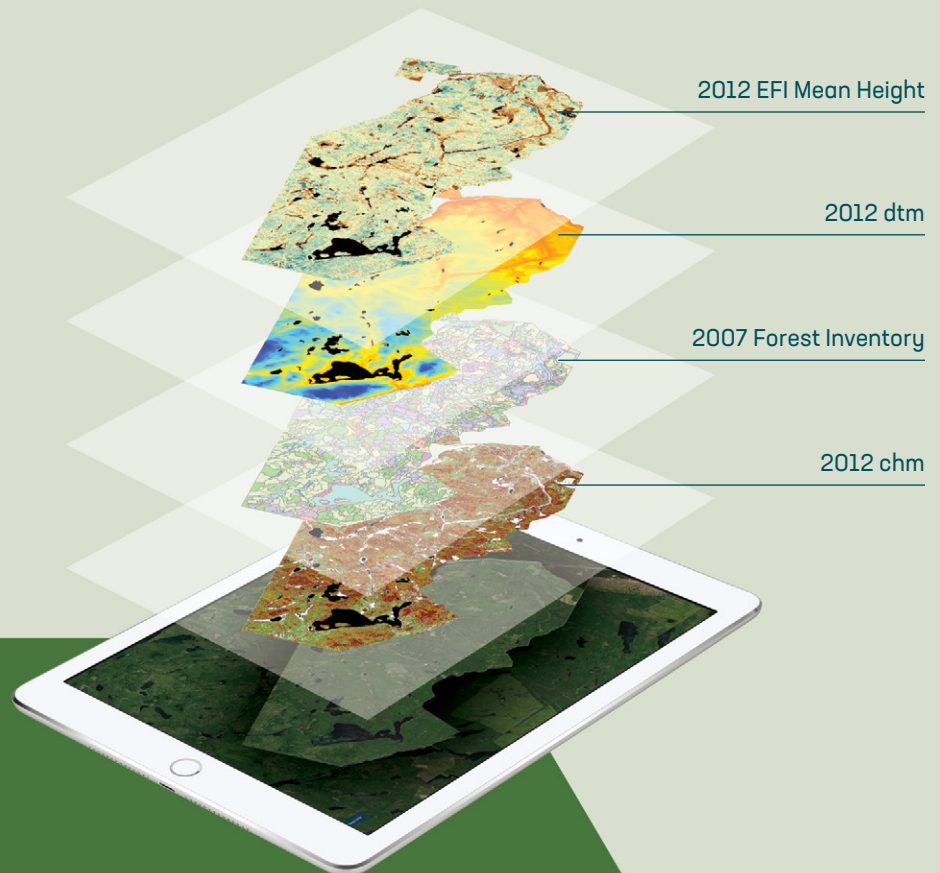




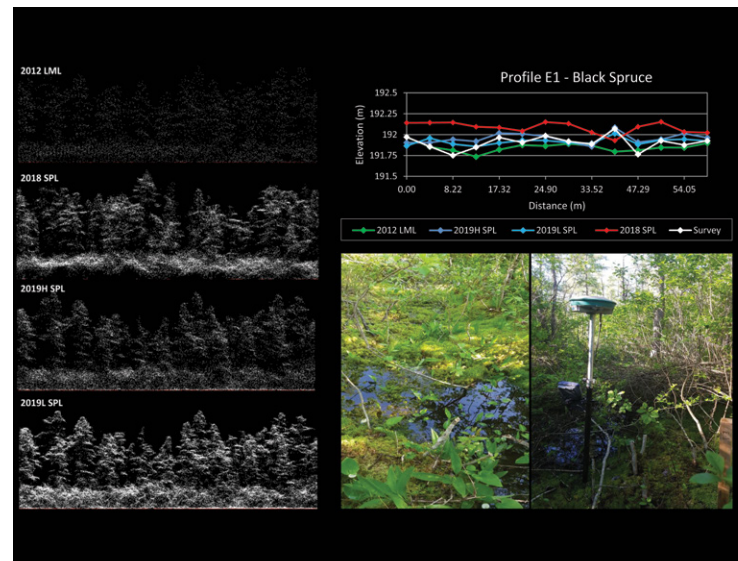
Photo of the oldest permanent sample plot in Canada (PSP1), located at the Petawawa Research Forest

By reducing economic and logistical barriers to accessing field reference and remotely sensed data, the supersite serves as an innovation incubator, allowing a broader range of end users to develop, test, and demonstrate their algorithms or data processing innovations. In this way, supersites are valuable for service providers and industry stakeholders, who may need to demonstrate the effectiveness of their approach or conduct proof-of-concept studies. In the same way, supersites provide valuable data for research and education purposes, providing access to curated data collections that can be used by students, or to develop courses or workshops. Supersites also allow legacy data to be leveraged in new ways in the future, to address questions that were not even thought of at the time of data acquisition.

Another key strength of the supersite is to enable the benchmarking of new technologies. At PRF, there are several acquisitions of LiDAR data that provide very accurate wall-to-wall characterizations of forest structure. These LiDAR data, combined with field reference data, allow for the rigorous and transparent testing of new remote sensing technologies and sensors and associated acquisition parameters. Undoubtedly, benchmarking is one of the key value propositions of a supersite, providing the required reference data to support investigations, while also reducing investment risk for stakeholders and service providers.

Supersites can also foster increased collaboration, providing a research hub where industry and scientific stakeholders can share resources towards the development of remote sensing applications. In a Canadian context, the supersite concept could be particularly beneficial to provinces and territorial forest management agencies by providing a focus area for research investment and collaboration to address questions of common interest related to new and emerging forest inventory technologies.

For the Canadian Wood Fibre Centre, which manages the PRF, the supersite provides a mechanism for a clear and consistent data sharing policy, and allows investments in public data to be fully realized. The PRF remote sensing supersite is part of Canada's National Forest Information System (NFIS; nfis.org), and is dynamic with new data holdings being added as they become available. While datasets can be directly downloaded, they can also be linked to directly through various Web Map Services (WMS) and Web Coverage Services (WCS) that are supported by most GIS software packages.



Example of LiDAR data combined with field reference data



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For more information:

To access and search the data holdings available at the PRF, please visit:
<http://opendata.nfris.org/mapserver/PRF.html>

For more information about the supersite and to learn more about the datasets that are available, please refer to this Open Access publication:
<https://doi.org/10.5558/tfc2019-024>

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