



INFORMATION ON THE COMPLETED PROJECT
CONTRIBUTION AGREEMENT

Remote Sensing Tools for Growth Monitoring and Yield Prediction

Sustainable forest management preserves the long-term health of Ontario's forests while offering social, economic and environmental benefits to Ontarians. Close to 90% of Ontario forests are publicly owned. They are known as Crown lands, and 44% of these Crown lands are managed forests.

PROJECT TITLE

Optimizing forest management with novel remote sensing tools to improve growth monitoring, yield prediction

ORGANIZATION

Ontario Ministry of Natural Resources and Forestry

CONTACT

Dan Puddister, Manager, Forest Research and Monitoring Section
dan.puddister@ontario.ca

START DATE

April 1, 2020

END DATE

March 31, 2023

The Ontario Ministry of Natural Resources and Forestry's project consists of four related studies using new technology to facilitate sustainable forest management in Ontario.

- In its first study, the Ministry team is creating a new method of surveying tree regeneration performance in Ontario forests. This new approach will rely on data collected using remote sensing techniques such as Single-Photon LiDAR, an enhanced version of the commonly used remote-sensing tool, LiDAR (a remote sensing method that uses light in the form of a pulsed laser to measure ranges). The findings of this study will be used to automate the process of estimating tree height—a costly, dangerous and time-consuming activity to conduct in the field.
- In its second study, the Ministry research team will develop models for Ontario forest managers wanting to better predict the impact of climate change on boreal forests. The team will create its models using machine learning, a modelling technique using computer systems that can learn and adapt without following explicit instructions. The completed models will help Ontario forest managers analyze the impacts of environmental conditions on the growth and yield of their forests.
- In its third study, the Ministry research team will investigate the effects of natural and human-caused disturbances on Ontario's managed boreal forests. It will specifically assess the impact of spruce budworm infestations and the creation of forest access roads. The team's analysis will pay additional attention to the impact of these disturbances on the loss of harvestable timber and forest fragmentation. Ultimately, the team will create new analytical tools to automate the assessment of recent and historic disturbances associated with insects and/or the creation of forest access roads.
- In its fourth study, the Ministry's research team will collaborate with First Nations and other stakeholders to evaluate the social acceptability of silvicultural interventions—such as the growing and harvesting of trees—in Ontario forests. The results of this study will teach forest managers about the diversity of perspectives on forestry to better inform their decisions. During this study, the research team will also develop virtual forest site visits, which will spotlight the values and concerns of First Nations communities regarding forests. Overall, the study aims to facilitate dialogue, discussion and data collection.