2BILLION TREES

2 BILLION TREES SCIENCE

Research in Support of Tree Planting

NOTE 16

Large-area afforestation monitoring for the 2 Billion Trees program – initial feasibility study

LEAD RESEARCHER:
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CFS CENTER:
Pacific Forestry Centre

PROJECT LOCATION:
Ontario

Project Drivers

Afforestation is an essential strategy for mitigating the impacts of climate change and preserving biodiversity. However, monitoring the outcome of afforestation work can be a challenging, costly, and time-consuming process. This research project, funded under the 2 Billion Trees (2BT) program, will work to address these obstacles. Remote sensing provides us with a practical tool to monitor and quantify afforestation efforts. This project will be an initial feasibility study of a remote sensing-based monitoring system that will enable monitoring forest regeneration at a national scale. The project will tackle and address several challenges related to incorporating remote sensing data for regeneration monitoring.

Project Approach

The proposed monitoring system will make use of several remote sensing datasets, including Sentinel and Landsat time series data (i.e., satellite data over time) and information from remote sensing-derived products. Analysis of changing spectral properties over time will be the core work of the monitoring system. Additional datasets will be considered to further enhance the monitoring system. Depending on availability, these will include airborne laser scanning and image-based point cloud data as well as fine scale UAV imagery. Point clouds will be used to accurately inform us on regeneration height and canopy cover of growing trees. The team will identify regional variations in forest regeneration patterns by leveraging time series data across different regions. These results will then be packaged into a product that can be applied to monitoring efforts of 2BT program afforestation projects.

Canada

Anticipated Outputs and Impacts

Improvements in our ability to monitor 2BT program projects, through the development and testing of monitoring tools and technologies, will result in improvements to 2BT program outcomes. The study will result in an assessment of the feasibility to implement a cost-effective, automated, large scale monitoring system for the outcome of the 2 Billion Trees program, and potentially well beyond the duration of the project. This system will also, over time, become a tool for which unsuccessful afforestation efforts can be evaluated and identified for potential follow-up actions.