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2BILLION TREES

2 BILLION TREES SCIENCE

Research in Support of Tree Planting

NOTE 4

Planting the right trees in the right places for co-benefits to water resources

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CFS CENTRE:
Great Lakes Forestry Centre

PROJECT LOCATION:
Sudbury, ON

Project Drivers

Much of Canada's drinking water comes from forested watersheds. The 2 Billion Trees (2BT) program offers a truly unique opportunity to reduce net greenhouse gas (GHG) emissions while simultaneously ensuring co-benefits to water quality and aquatic ecosystem health. The success of the 2BT program in demonstrating co-benefits to water is not guaranteed with existing planting approaches, and depends entirely on planting the right trees in the right places. This project plans to combine a trait-based modelling approach with a spatial hydrologic connectivity approach to determine the right tree to plant in the right place. This plan will maximize environmental co-benefits to water.

Project Approach

This project will combine hydrologic connectivity to predict forest areas with the highest potential influence on water using trait-based approaches to target planting trees with the greatest potential benefit in those areas. Using a model called PlantR, the project team will develop algorithms that find the most cost-effective combinations of species to plant to optimize the delivery of water related ecosystem services. Through collaboration with academics and provincial counterparts, the team will develop a framework summarizing the key mechanisms by which trees impact water related services. The team will use the hydroweight R package previously developed by CFS researcher Erik Emilson's team to identify areas of the Sudbury region (the study location) that are most likely to provide co-benefits to water resources and weigh the importance of a given part of the forest landscape. This project is based in the Sudbury region, but may inform 2BT program proponents across Canada.

Anticipated Outputs and Impacts

This project will deliver a tool that can provide tangible recommendations for the planting of trees for co-benefits to water quality and aquatic ecosystem health. In co-development with Sudbury stakeholders, the team will create a set of recommended species to plant that maximize water-related co-benefits, as well as a map of the region that identifies key areas where planting trees will have the highest positive impact on water resources. These results can be used to guide organizations, practitioners and communities in optimizing the benefits of their plantation initiatives on water resources. This tool will empower 2BT program participants to make project decisions that balance goals for carbon sequestration and co-benefits to water.

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Aussi disponible en français sous le titre : Planter le bon arbre au bon endroit : avantageux pour les ressources en eau.

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