2BILLION TREES

2 BILLION TREES SCIENCE

Research in Support of Tree Planting

NOTE 11

Planting the "climate-smart" tree in the right place

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CFS CENTRE:
Great Lakes Forestry Centre

PROJECT LOCATION:
National

Project Drivers

Planting the right trees in the right place under climate change is key to sequestering carbon and reducing GHG emissions in the long term. Rapid climate change is affecting tree growth rates, mortality rates and range limits. Project designs for the 2 Billion Trees program (2BT) that incorporate climate considerations are more likely to ensure planted trees both survive and thrive. The Canadian plant hardiness zones have been a key tool for matching plant species and planting sites for almost six decades. Canada's Plant Hardiness Site, developed by researchers at CFS-NRCAN, is a modern and comprehensive data and knowledge system that presents plant hardiness zone maps and thousands of individual species models (i.e., species-specific maps showing the climate habitat now and in the future for tree species at any location in Canada). These tools support species selection and planting decisions under current and future climate conditions. They will aid 2 Billion Trees program participants with selecting more climatically suitable species for their projects.

Project Approach

Updates to the plant hardiness website are important to ensure that program proponents and participants are making planting decisions based on the latest climate data. Hardiness zone maps and individual species models are based on 30-year climate averages. However, the system currently employs data from the 1981 to 2010 climate period and updates to the 1991 to 2020 period are needed. The climate data needed to make these updates have only recently become available, as it takes 1 to 2 years for Quality Assurance/Quality Control protocols to be completed. Now that the data is available, the project team will update the plant hardiness website with data for the 1991 to 2020 climate period. Furthermore, new climate change projections have recently been made available through the Coupled Model Intercomparison Project (CMIP6). These projections will be downloaded and downscaled for use on the updated plant hardiness website.

Canada

Anticipated Outputs and Impacts

Results of these updates to the hardiness zone maps and models will be presented in a peer-reviewed journal article and knowledge transfer materials. The project team will also update the plant hardiness content of the CFS My Tree app, an online application developed using information from the Plant Hardiness Website. The My Tree app is an interactive mobile tool that allows users to identify suitable and climate-smart tree species for planting at a given location. The team will additionally publish an Open Science Database that will provide a list of suitable (climate-smart) tree species for all municipalities in Canada. This list will be accurate for current, mid-century and late-century use.

This project will support 2BT outcomes by helping program participants select more climatically suitable species and seed sources for their location of interest. This will support long term tree survival, and therefore present greater opportunities for trees to capture carbon. Furthermore, many other applications rely on the data from the Plant Hardiness Website to support their climate related products and tools. This project will make up-to-date climate data available for many other applications.