Theme 1: Informing carbon sink enhancements: nature-based climate solutions
https://www.canada.ca/en/services/environment/weather/climatechange/funding-programs/climate-action-awareness-fund.html#toc0

Real-time monitoring tool for estimating carbon absorption of forests and urban parks

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Abstract: Human activity in the forests has resulted in a reduction in their ability to act as "carbon sinks" and has been attributed to speed up climate breakdown. This climate breakdown is likely to have a more drastic impact on local and global temperatures. In the last few decades, the amount of carbon absorbed by the world's intact forest ecosystem has fallen and the forests now take up a third less carbon than they did in the late '90s, owing to the effects of higher temperatures, droughts, deforestation and forest fires. Recent literature insights have suggested about the possibility that these forests may become the carbon source by the year 2060. LIDAR technology has been widely used to get accurate data to estimate the level of carbon absorption in the forest and help researchers make real-time simulation modelling to alter the course of these forests from carbon emitters to carbon sinks. This would also help us perform simulation studies in creating urban forest ecosystems that might reverse carbon emissions. Using the LIDAR technology, we can precisely estimate the forest fire fuel by calculating the tree population density and also determining the amount of forest degradation in a specific geographic region. These studies can also estimate an area in the forest human activity has affected that and devise mitigating factors to reduce environmental degradation in real-time. Applying these learning to urban ecosystem would also help in devising policies and ecologically sensitive infrastructure development. The LIDAR technology can monitor forest fire patterns, which could serve as input parameter to predict and model potential fires based on change in the climatic conditions and devise strategies in actual time to avoid them soon. This project's aim is to seamless integrate LIDAR technology to estimate, model and predict carbon absorption rates in real-time and provide curative insights to nurture and create rural and urban forest ecosystem that could serve as "carbon sinks". It uses game-theory to model, predict and improve the carbon absorption rates by simulating various scenarios and suggesting curative actions in real-time.