Boreal Ecosystem Recovery & Assessment
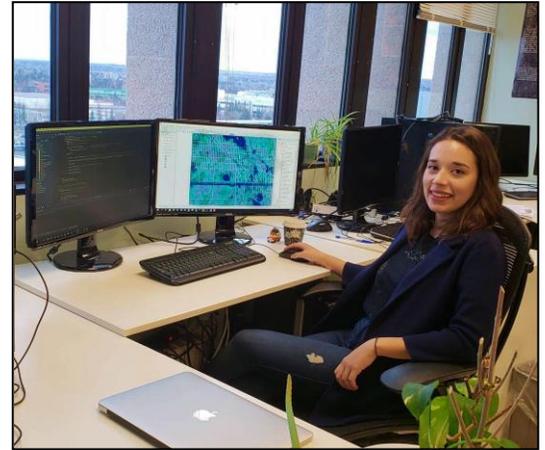*An NSERC Collaborative Research & Development Program*

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Project summary

Accurate depictions of linear disturbance features in the boreal forest are important for supporting research and conducting environmental monitoring of forest recovery. However the vast majority of existing seismic-line layers were produced by manual digitization, and so contain substantial spatial errors and oversimplifications. In this project, we sought to develop a semi-automated mapping tool called the *Seismic Line Mapper* for creating accurate depictions of seismic lines using 3-D remote sensing data. This custom GIS tool was created with ArcPy, and creates two main outputs: (i) a polyline feature class that depicts accurate centerlines of seismic lines, and (ii) a polygon feature class that depicts seismic-line extents. The tool requires just two inputs: (i) user-digitized vertices indicating "key point" (starts, ends, major corners) of seismic lines in the form of a shapefile, and (ii) a LiDAR-derived canopy height model (CHM). The tool is based on a workflow developed by Jerome Cranston from ABMI, and uses a least-cost-path approach to tracing seismic lines between user-defined key points.

Progress to date

The Seismic Line Mapper is operational and has been used to map seismic lines across Kirby South. We are still tweaking internal parameters and the user-interface and will spend additional time improving processing efficiency. Future development will focus on adding functionality for extracting additional seismic-line attributes (vegetation height, surface roughness, contrast to surrounding vegetation, etc).

Management implications

The Seismic Line Mapper provides an accurate and efficient means of cataloguing linear footprint features in the boreal forest, which will facilitate environmental monitoring of forest recovery.

Geographic location

The current tool development and testing is taking place within Kirby South near Conklin, AB.