

**Dr. Scott J. Davidson, Post-doctoral Fellow**

University of Waterloo, Dept. of Geography and Environmental  
Management

[s7davidson@uwaterloo.ca](mailto:s7davidson@uwaterloo.ca)

**Research Team:**

<sup>1</sup>Dr. Maria Strack, <sup>2</sup>Dr. Caroline Franklin, <sup>2</sup>Dr. Scott Nielsen,

<sup>1</sup>University of Waterloo, <sup>2</sup>University of Alberta



**Project summary**

This project aims to determine the impact of seismic lines (linear disturbances) on soil compaction and quality. The objectives are 1) to determine if there is a difference in soil compaction between on the line and in the natural areas using the bulk density method 2) to determine if there is a difference in LOI and C:N ratio between the line and the natural areas adjacent and finally 3) to evaluate methylmercury and total mercury concentrations between line and natural areas.

So far, the results show there is clearly higher compaction on the line in comparison to the adjacent natural areas, both at Tiger Sands and Kirby South. As expected, the soils collected at Kirby (fen site) have a higher volumetric water content (VWC) than those collected at Tiger Sands (poor mesic upland site). Within Tiger Sands, the wider lines have a higher VWC than the narrow lines.

**Progress to date**

Field campaign collecting soil samples across 2 sites impacted by linear disturbances. Bulk density and soil moisture measurements have been completed. The next steps are to calculate C:N ratio, Loss on Ignition (LOI) and Methyl- and Total mercury concentrations. This will be completed in Spring 2019. We aim to have the manuscript ready for submission by Late Spring 2019.

**Management implications**

Increased soil compaction can reduce vegetation productivity and the possibility for vegetation recovery post operation. It can also reduce water intake, decrease evapotranspiration and can cause higher moisture content on the lines than in adjacent forest. This project will provide an understanding of the impact of soil compaction across a range of different seismic line types and treatments on vegetation re-generation. It will also provide an insight into the impacts of linear disturbances on soil quality, potential methylmercury and total mercury concentrations.

**Geographic location**

2 sites across northern Alberta – Tiger Sands and Kirby South.