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Drivers of soil carbon dynamics in the boreal forest along a soil textural gradient

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Drivers of soil carbon dynamics in the boreal forest along a soil textural gradient

The boreal forest has historically been regarded as the largest terrestrial belowground carbon sink. However, increased soil organic matter decomposition by microbes due to climate change and silviculture (e.g., harvesting, site preparation) may shift boreal forests from being carbon sinks to carbon sources. My research seeks to understand how carbon is incorporated into mineral soils in the boreal forest, specifically looking at both abiotic and biotic processes that regulate microbial carbon use efficiency. I will use an established, stand-scale, experimental study to identify how silviculture influences soil carbon dynamics at three boreal forest sites varying in mineral soil texture in Ontario, Canada. This work will: 1) quantify carbon stocks and carbon storage potential over a 20-year period, 2) identify the biological underpinnings of how carbon is stabilized in soils, and 3) improve carbon storage estimates by quantifying microbial carbon use efficiency under warming and different mineral soil textures.