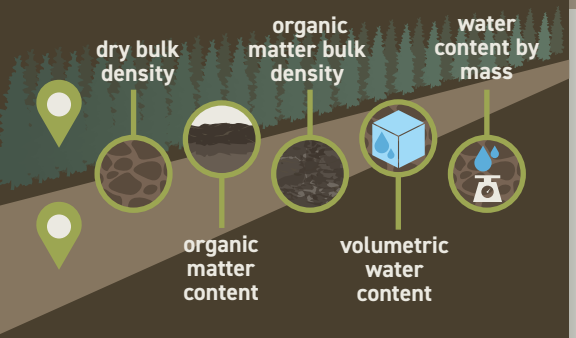
Soil properties on seismic lines

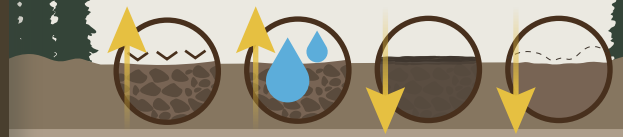
Alberta's Boreal region contains a vast network of linear features, like seismic lines, cleared for oil and gas exploration. Restoration is often required because vegetation can struggle to regrow on these lines due to soil compaction and removal, resulting in significant ecosystem impacts. Understanding a seismic line's soil properties is key to informing restoration efforts.

This study compiled data on five key surface soil properties on and off seismic lines across northern Alberta.



Soil properties differ on and off seismic lines, especially on old 'conventional' lines.

Compared to the undisturbed forest, seismic lines had:



Conventional lines: wide lines created before 1990 typically cleared by bulldozers, resulting in high soil compaction and topsoil removal.

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Organic matter loss drove many changes in soil properties, especially dry bulk density.

However, other factors like compaction and changes to carbon cycling also play a role.

Restoration techniques, like inverted mounding, designed to help re-create microtopography also alter and degrade soil properties.

Implications

An assessment of microtopographic recovery should be conducted before prescribing restoration treatments to limit further degradation of soil structure. For instance, **on low-impact seismic lines, microtopography appears to recover quicker suggesting that mounding may not be necessary.**