

# Alberta Soil Carbon Quantification Project

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## *Background*

Current Alberta Agricultural Carbon Offset protocols are based on rigidly defined conventional cropping practices. Producers seeking to improve their land and sequester carbon are excluded from these protocols if they do not comply with the defined practices. This is problematic. The practices of these protocols are not appropriate for all soil types and their rigid nature inhibits producers from adopting new methods or making land management decisions based on their specific lived experience. These limitations—and given that all nine million hectares of pastureland in Alberta are excluded from the protocols—greatly limits the effectiveness of Alberta’s agriculture-based carbon offsets to mitigate climate change.

Measuring SOC at the farm scale gives producers a feedback system to track the level of carbon they have in their soil and the effects their land management decisions have. This is crucial for future innovation of farming practices as well as to ensure agricultural offsets are rigorous and scientifically proven. By measuring and comparing SOC in native grasslands and perennial pastures adjacent to cropland, an understanding is created of the environmental impacts and the carbon released when land is converted to other uses.

This project will demonstrate a system that accurately measures SOC at the farm scale. The data we collect (management history, existing landscape data, remotely sensed/GIS data, and targeted soil sampling) will be stored on a secure server and will be used to parameterize models for future use throughout the province. The farms will be resampled to demonstrate changes in SOC.

We have already established a cohort of producers interested in being part of this project. Our criteria are to identify producers who have been recognized by their peers as exceptional managers, who use innovative agricultural practices. Within the cohort are neighbours who are using conventional practices and are also willing to participate. Our eight sites are located in different bioregions of the province, representing different climate and soil conditions. The producers will advise us at every stage, ensuring we are meeting their needs, both now and into the future. To increase knowledge and improve impact, producers are also included in the process of measuring and mapping SOC and learning about the factors associated with soil’s ability to sequester carbon, including the impact of their management decisions. Workshops featuring Dr. Kris Nichols and Alberta soil specialists, including Dr. Jeff Battigelli, will be filmed, and developed into content to be shared via podcasts and social media. In addition, a short, animated film will be produced to illustrate the impact of improved land management on the microbiology that makes carbon sequestration possible. This video will be shared throughout the province via social media and through our partner organizations.

This project is designed to be part of a much larger-scale project capable of drawing in funding from multiple sources and eventually becoming self-sustaining. Our larger project goal is to create a platform that provides a dependable, accessible, and easy to use system that benefits agriculture producers, industry’s need to meet emissions targets within a low carbon economy and ultimately improves the health the planet.