

AGR1606: Enhanced Saskatchewan Soil Data for Sustainable Land Management

This project was designed around three main objectives that interrelate and build upon each other. Saskatchewan did not have easy and flexible access to its provincial soil information in a digital format. Hence, the first objective was to streamline access to Saskatchewan soil data by developing a fully digital framework to store, and an innovative application to access, Saskatchewan soil information, allowing both desktop and mobile users to identify soil properties at a specific location, and with a mobile device, using built-in GPS technology, to establish user location. The new data framework provides full access to existing Saskatchewan soil information for a diverse group of users and stakeholders: landowners and producers, researchers (university and government), private sector (environment and agronomy), and educators.

At the scale of 1:100,000, Saskatchewan's existing soil information is limited in its potential to inform field-scale decisions (e.g. precision applications), which require information at a finer scale of 1:5,000 or better, and are compatible with the data collected by producers (e.g. via combine yield monitors) and agronomists. Hence, objective 2 builds on objective 1 and enhances the resolution of existing soil data, at three sites, through digital soil mapping, by identifying and testing digital soil mapping techniques suitable for Saskatchewan's agricultural landscapes. Objective 2 was built on expert knowledge (e.g., MacMillan et al., 2005) and the latest digital soil mapping (DSM) technology, to develop a soil data enhancement technique that is optimized for Prairie soils and landscapes. The application of this spatially enhanced soil information was then demonstrated in objective 3 by integrating it with expert knowledge to develop a soil-crop productivity prototype application which demonstrates the use of the enhanced soil information, to help inform farm decision-making.

In many cases the availability of enhanced soil information is transformative, providing users with access to field-scale soil landscape knowledge that was previously the domain of experts. Coupling the improved storage and access to soil information with agronomic and environmental data improves decision making, building on the data collected by users. Last but not least, this project builds on the investment and legacy of decades of soil survey in Saskatchewan, paving the way for improving soil information, and making it readily accessible.