

The Changing Role of the Saskatchewan Soil Survey

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Introduction

Semi-detailed mapping of the soils of the agricultural portion of the province, initiated in the 1950's and conducted by the Soil Survey Unit of the Saskatchewan Centre for Soil Research, has been completed.

A result of this mapping program has been the development of a large digital soil map database and associated soil attribute data files for the province. With the completion of the mapping programs, the focus of activities is switching from mapping to the proper maintenance, updating, interpretation and extension of spatial soil information in order that the needs of clients within and outside of agriculture are met at the full capacity of the soil information.

To realize its full potential, soil information must be commonly combined with various bio-physical, production, economic or other spatially related data. How these various forms of data relate and should be combined is not always implicit. Research is required to determine how systems defined by the various forms of data, relate to one another and how they best interact.

Interest in precision farming and the management of landscape components versus field scale management techniques, requires agronomic and soil interpretations to be applied at a more detailed scale than the current soil information allows. Research and development of proper techniques is required to effectively interpolate the current scale of soil information down to the landscape unit level. Developing procedures to collect and store information at the landscape level must also be refined.

The goal of the Soil Survey is the establishment of a provincially recognized Land Resource Centre responsible for the collection, maintenance, research and distribution (sale) of spatially related land information for the province of Saskatchewan.

- 1) To promote spatial soil information as a useful and necessary component of decision making processes relating to the management and conservation of soil and land resources.
- 2) To lead and coordinate research in developing guidelines for effective use of soil information in planning and environmental monitoring. This includes areas such as water quality, sustainable agriculture, land use and land suitability, new crop planning, soil quality and soil erosion.
- 3) Establish the infrastructure required to ensure long term access to soil information, including a long term business plan and marketing strategy for a self sustaining centre.
- 4) Initiate research activities into the extension of existing soil data to the landscape level of interpretation suitable for more detailed land evaluation uses such as precision farming.
- 5) Establish linkages to other land, environment and production related information databases including climate, land use, wildlife, water resources, yield ratings and economic factors.
- 6) Initiate extension activities to educate and better integrate land related information into production, environmental and planning related decision processes, such as new crop selection, watershed management and urban fringe planning.
- 7) Cooperate and lead in interdisciplinary research projects integrating land resource information with other areas of research.

Efforts of the staff of the Land Resource Centre would be concentrated in meeting stated objectives:

- 1) Develop partnerships to build a Land Resource Network so that land related

information is more easily integrated and accessible in the province. A current project with PFRA and SPMC/SGD to make all digital soil maps (GIS) compatible with the Sask GIS standard is an example of such projects.

- 2) Initiate extension and research activities to ensure full utilization of data for land and environmental evaluation, new crop development and evaluation, and production issues.
- 3) Complete data compilation and data standardization for 1: 100,000 soil reports and maps.
- 4) Develop a standardized database and seamless digital soil coverage for the province.
- 5) Develop a Web site for research results, publications and information access.
- 6) Coordinate activities with other initiatives in precision farming and on-farm planning.

In its role of research, the Land Resource Centre would strive for increased availability of land resource information to decision makers at industry, producer, and policy levels. Examples of the use of such information may include the evaluation of sites for intensive livestock operations, conservation issues, exploration sites, pipelines, and precision farming applications.

- Researching, compiling and extending information on land suitability for its potential and best use including the consideration of new or special crops.
- Water quality issues as they relate to agricultural land use issues.
- Evaluation of methods to monitor soil quality and erosion as they pertain to agricultural sustainability.
- Research on land use options to better manage agricultural inputs and to reduce off-farm effects and social costs.
- Developing methodologies of integrating soil, water, land use and climate information for delivery of broader systematic solutions.
- Develop methodologies of interpreting and extrapolating data from the 1: 100,000

scale database to landscape and field scales for purposes such as precision or landscape farming.

Research projects considered will be evaluated on a number of criteria including the application and impact on Saskatchewan Agriculture, the ability to raise self sustaining funding, coordination and cooperation with other researchers in other disciplines, and the utilization of spatial soils information. The exact nature of any specific research project will be determined by the personnel involved and the nature of the problem identified at the initiation of research.

- Economic research - Joint research projects which focus on land related farm economic issues such as land values, costs of production, transportation issues, land lease rates and government policies.
- Production Related research - Research projects dealing with on farm production issues which are or may be affected by varying soil, landscape and climate conditions including fertilizers, herbicides and inoculants.
- Environmental - Joint research on issues which impact on the sustainability of the Saskatchewan soil resource. What are implications of current, past and future management practices and how can the soil resource be maintained or enhanced.
- Precision Farming products - Development and research into techniques and technologies which will enable the current digital soil coverage to be applied at levels of detail required in precision farming practices.

Implementation

The Land Resource Centre will be established in association with the Soil Science Department at the University of Saskatchewan. The Land Resource Centre will work in close association with other research, teaching and extension initiatives of the Soil Science Department as well as with the Land Resource Unit of the Semiarid Prairie Agricultural Research Centre (SPARC), Agriculture and Agri-Food Canada, which is also located at the University of Saskatchewan. The continuation of this close partnership, developed in 1965 under the Agreement establishing the former

Saskatchewan Institute of Pedology and now the SCSR, is essential to ensure the coordination of research, sharing of soil information, (GIS hardware and software arrangement), and delivery of streamlined and cost efficient services and information, helping to meet the mandates of all partners.

The primary role of the Land Resource Centre will be to address the needs of the province of Saskatchewan. This primary focus recognizes the contributions of the province to the collection and maintenance of soil information. It also recognizes the role of the Land Resource Unit of SPARC in meeting the needs of national as well as provincial programs. Research, extension and information dissemination activities of the Land Resource Centre will be responsive to the needs of producers, provincial departments, and industry.

The Land Resource Unit of SPARC will provide leadership and coordination on a national level in developing and maintaining the National Soil Data Base and in other related activities affecting the province. These activities may include the correlation of soil databases according to national standards, supplying a Land Resource Officer with responsibility in Geographic Information Systems and database management, Land Resource scientists cooperating in research and soil quality evaluation, and the use of federal computing hardware and software facilities including GIS software and plotters.

A major component of the Land Resource Centre will be the extension of land interpretive products, integrated research, and land resource information.

An information/extension program will be initiated as one of the initial projects of the Centre to increase awareness of soil information products and services currently available. As more products and services are added, these too will be publicized.

Methods used to create awareness of the Centre and to extend information will include, but not be limited to, the development of a World Wide Web Internet Site, research publications, news releases, producer publications, marketable computer software, methodologies, soil maps and reports, and soil information databases.

Publications and product development may include

Soils of Saskatchewan Publication; a new and comprehensive publication of all the soils of Saskatchewan available both in printed and digital format, which

would become the new encyclopedia of Saskatchewan soils information.

- A universal and continuous digital coverage for the province. Completion of a seamless and SASKGIS compliant digital soil coverage for the province enabling equal access and consistent soil products across agricultural Saskatchewan.
- Targeted digital information products. In conjunction with industry partners, develop soil information and evaluation products specifically tailored to meet the needs of various agricultural sectors including land evaluation and appraisal, production issues such as lease rates, and precision farming products such as detailed soil maps and interpolated management units for intensive field scale data management.