| | About Us | Get Data | Submit Data | Data Management | Tools |

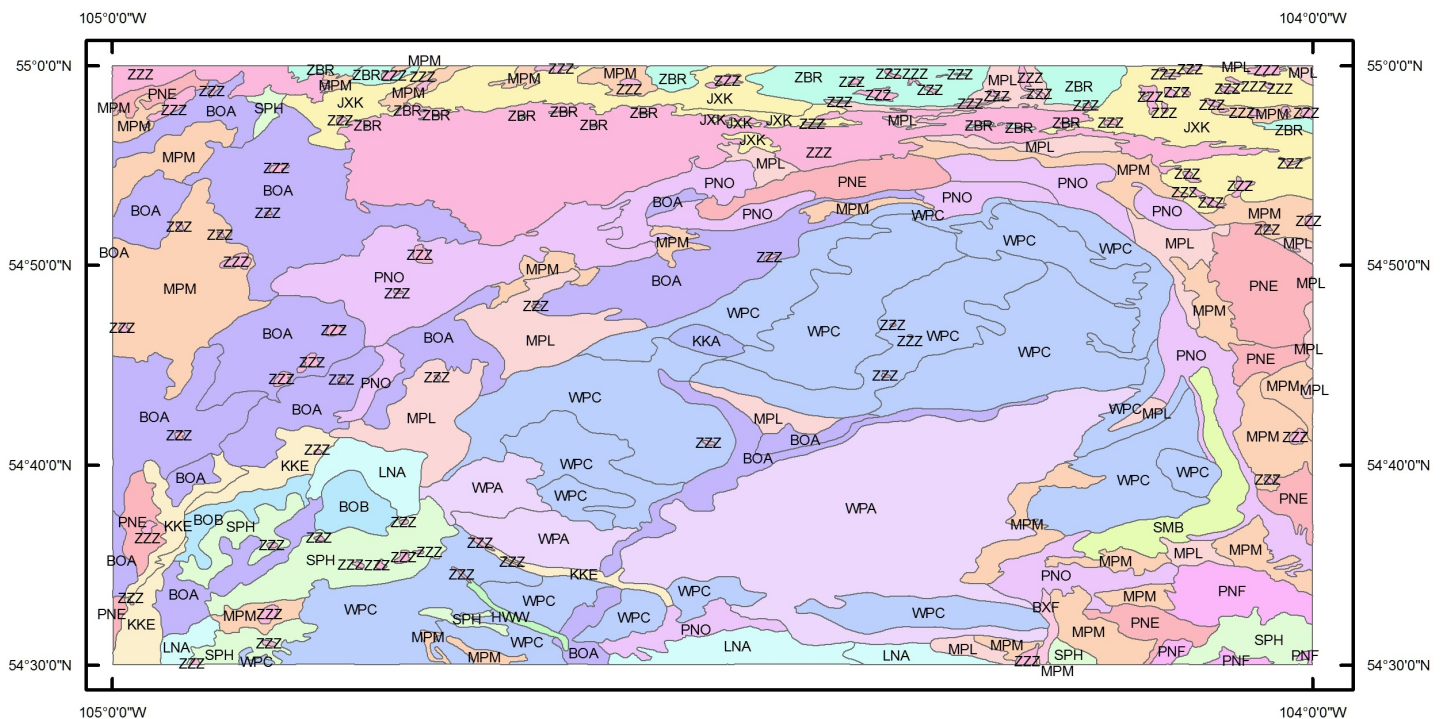# BOREAS Agriculture Canada Central Saskatchewan Vector Soils Data, R1

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Documentation Revision Date: 2016-11-16

Data Set Version: V2

Summary

This data set provides soil descriptions for forested areas in the BOREAS southern study area (SSA) in central Saskatchewan, Canada provided by Agriculture Canada. The data contain soil code, modifiers, extent, and soil names for the primary, secondary, and tertiary soil units within each polygon.

This data set consists of 20 files in ESRI shapefile format (*.shp).

KNOWN PROBLEMS

The original vector data were digitized from aerial photography that was not orthometrically corrected. Therefore, the location accuracy of the soil polygons may not be as accurate as one might expect. Sharp discontinuities may exist along map boundaries. These differences could be a result of coding and mapping variations between adjacent maps.

Figure 1. Primary soil units for skd057s.shp. 3-character soil codes are referenced in cansis.txt.

Citation

Knapp, D.E., and H. Rostad. 2016. BOREAS Agriculture Canada Central Saskatchewan Vector Soils Data, R1. ORNL DAAC, Oak Ridge, Tennessee, USA.

BOREAS Agriculture Canada Central Saskatchewan Vector Soils Data, R1

Table of Contents

1. Data Set Overview

This data set provides soil descriptions for forested areas in the BOREAS southern study area (SSA) in central Saskatchewan, Canada provided by Agriculture Canada. The data contain soil code, modifiers, extent, and soil names for the primary, secondary, and tertiary soil units within each polygon.

Boreal Ecosystem-Atmosphere Study: The Boreal Ecosystem-Atmosphere Study was a large-scale international interdisciplinary experiment in the boreal forests of central Canada. Its focus was improving our understanding of the exchanges of radiative energy, sensible heat, water, CO_2 and trace gases between the boreal forest and the lower atmosphere. A primary objective of BOREAS was to collect the data needed to improve computer simulation models of the important processes controlling these exchanges so that scientists can anticipate the effects of global change, principally altered temperature and precipitation patterns, on the biome.

Project data set list for Boreal Ecosystem-Atmosphere Study.

2. Data Characteristics

Spatial Coverage: BOREAS Southern Study Area, in central Saskatchewan, Canada.

Spatial Resolution: Vector data are based on soils maps that were created at a scale of 1:125,000.

Temporal Coverage: The soils were originally mapped in the early 1980s, but the data have been periodically updated by Agriculture Canada based on new information through the date of publication (2001-02-06).

Temporal Resolution: One time representation

Study Area: (all latitudes and longitudes given in decimal degrees)

Site (Region)	Westernmost Longitude	Easternmost Longitude	Northernmost Latitude	Southernmost Latitude
BOREAS SSA	-110.4511	-99.8739	55.0614	52.8618

Data File Information

This data set contains 20 shapefiles and three companion files in comma-separated value format. Each shapefile is provided as a compressed (*.zip) file containing six files (*.shx, *.dbf, *.prj, *.sbn, *.sbx, and *.shp). Shapefile attributes are listed in Table 1. There are three companion files that provide soil descriptions that must be used in conjunction with the shapefiles.

Shapefiles

Spatial Data Properties

      Geometry Type: Polygon

      Projected Coordinate System: NAD_1927_UTM_Zone_(12, 13, or 14)N

      Geographic Coordinate System: GCS_North_American_1927

      Datum: D_North_American_1927

      Prime Meridian: Greenwich

      Angular Unit: Degree

      Projection: Transverse_Mercator

false_easting: 500000.00000000

false_northing: 0.00000000

central_meridian: -105.00000000

scale_factor: 0.99960000

latitude_of_origin: 0.00000000

Linear Unit: Meter

Table 1. Descriptions of attributes included in the shapefiles

Attribute	Description
Shape	Shapefile feature type (polygon)
AREA	Feature area (m^2)
PERIMETER	Feature perimeter (m)
PROVINCE	Province abbreviation
HECTARES	Feature area in hectares
SOIL_CODE1	3-character code for the primary soil name
SOIL_CODE2	3-character code for the secondary soil name
SOIL_CODE3	3-character code for the tertiary soil name
MODIFIER1	3-character code to show soil variations of the primary soil. The modifier applies to the soil name and the soil code. Together with the SOIL_CODE1, a unique record can be identified in the soil name and soil layer file that matches both the SOIL_CODE1 and MODIFIER1 of the polygon.
MODIFIER2	3-character code to show soil variations of the secondary soil. The modifier applies to the soil name and the soil code
MODIFIER3	3-character code to show soil variations of the tertiary soil. The modifier applies to the soil name and soil code
EXTENT1	Percent of the map occupied by a specific soil
EXTENT2	Percent of the map occupied by a specific soil
EXTENT3	Percent of the map occupied by a specific soil

Companion Files

The **soil names** (*snf.csv*) file and **soil layer** (*skslf.csv*) companion files are standard files that provide soil attributes for the province of Saskatchewan. The soil code for each polygon in the ESRI Shapefiles can be linked to the corresponding soil code attribute in the soil names file. The information in the soil names file can be linked to the soil layer file. The soil layer file provides information about the soil strata for a particular soil name. The attributes in the soil name and soil

layer files are listed and described in **Table 2** and **Table 3**, respectively. Codes in the soil names and soil layer files can be decoded using using the information contained in the **soil codes** (*cansis.txt*) file.

Table 2. The soil names companion file (*snf.csv*) contains the following information:

Column name	Description
UNKNOWN	An unknown and undocumented attribute
PROVINCE	Province name
SOILNAME	Name of soil
SOIL_CODE	A 3-character soil code identifying a soil
MODIFIER	Soil type modifier
LU	Land use
KIND	Kind of soil
WATERTBL	Water table characteristics
ROOTRESTRI	Soil layer that restricts root growth
REST_TYPE	Type of root restricting layer
DRAINAGE	Soil drainage class
MDEP1	Mode of deposition for primary soil
MDEP2	Mode of deposition for secondary soil
MDEP3	Mode of deposition for tertiary soil
ORDER	Soil order
S_GROUP	Soil subgroup
G_GROUP	Great group
PROFILE	Header from Detail II file
DATE	Date of last revision
A-THICK	A horizon thickness

SOL-THICK	Soil thickness
SOL-CHEM	Soil chemistry
PM-MODIFY	Parent material modification
PM-COMPLEX	Parent material complex
PMDEP2	Mode of deposition of second parent material deposition where a soil name is a complex of materials
PM-CHEM	Parent material chemistry
PMTEXCLASS	Parent material textural class
TEXMODIFY	Texture modification
FAMPARTSIZ	Soil family particle size
PHYSIOG	Physiography

Table 3. The soil layer companion file (*skslf.csv*) contains the following information:

Column name	Description
PROVINCE	Province abbreviation
SOIL_CODE	3-character soil code, as in the soil name file (*snf.csv*).
MODIFIER	3-character modifier code, as in the soil name file (*snf.csv*).
LU	Land use code
LAYER_NO	Layer number for the soil
HZN_LIT	Horizon lithological discontinuity *
HZN_MAS	Master horizon (upper case) *
HZN_SUF	Horizon suffix (lower case) *
HZN_MOD	Horizon modifier *
UDEPTH	Upper horizon depth (cm)

LDEPTH	Lower horizon depth (cm)
COFRAG	Coarse fragments (% by volume)
DOMSAND	Dominant sand fraction: - (Not applicable), VC (Very coarse), C (Coarse), M (Medium), F (Fine), VF (Very fine)
VFSAND	Very fine sand (% by weight)
TSAND	Total sand (% by weight)
TSILT	Total silt (% by weight)
TCLAY	Total clay (% by weight)
ORGCARB	Organic carbon (% by weight)
PHCA	pH in calcium chloride
PH2	pH as specified in project report
BASES	Base saturation (%)
CEC	Cation exchange capacity (meq/100g)
KSAT	Saturated hydraulic conductivity (cm/hour)
KP0	Water retention at 0 kilopascals **
KP10	Water retention at 10 kilopascals **
KP33	Water retention at 33 kilopascals **
KP1500	Water retention at 1500 kilopascals **
BD	Bulk density (g/cm3)
EC	Electrical conductivity (deciSiemens/meter)
CACO32	Calcium carbonate equivalent (%)
VONPOST	Von Post estimate of decomposition
WOOD	Volume (%) of woody material
DATE	Date of last revision

* Decode this information by referencing the Canadian System of Soil Classification (Soil Classification Working Group, 1998).

** Water retention units are % volume corrected for coarse fragment content.

3. Application and Derivation

These data might be used for hydrological modeling or some other ecosystem modeling activity.

Users of these data should be cautious about inferring information from this data set and extending those inferences over a larger area. The polygons from the original data set are large and may have small inclusions of various soil types that are not mapped in these data layers.

4. Quality Assessment

No quality assessment was performed beyond displaying the data set to make sure that it appeared to be a digital soils map covering an area of Saskatchewan.

The source in Canada from whom these data were received has strong caveats about the use of the data. These data represent broad generalizations about the soil characteristics of this area. Caution is to be used when inferring information from the data.

KNOWN PROBLEMS

The original vector data were digitized from aerial photography that was not orthometrically corrected. Therefore, the location accuracy of the soil polygons may not be as accurate as one might expect. Sharp discontinuities may exist along map boundaries. These differences could be a result of coding and mapping variations between adjacent maps.

5. Data Acquisition, Materials, and Methods

The original vector data were digitized from aerial photography by Agriculture Canada (Padbury and Shields, 1991).

USER NOTE: Data files were received in ARC/INFO EXPORT format (*.e00) and converted to ESRI Shapefile format (*.shp) for distribution with this data set.

6. Data Access

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

BOREAS Agriculture Canada Central Saskatchewan Vector Soils Data, R1

Contact for Data Center Access Information:

- E-mail: uso@daac.ornl.gov
- Telephone: +1 (865) 241-3952

7. References

Padbury, G.A and J.A. Shields. 1991. Soil Landscapes of Canada-Saskatchewan Soil Landscapes Polygon Attribute Digital Data. CanSIS No. SK018200, version 90.11.30; CLBRR Archive, Agriculture Canada, Research Branch, Ottawa, Canada (CLBRR Contribution No. 91-108D).

Soil Classification Working Group. 1998. The Canadian System of Soil Classification, 3rd ed. Agriculture and Agri-Food Canada Publication 1646, 187 pp. ISBN 0-660-17404-9

8. Data Set Revisions

Data were previously distributed as:

Knapp, D., and Dr. H. Rostad. 1998. BOREAS/Agriculture Canada Central Saskatchewan Vector Soils Data. ORNL DAAC, Oak Ridge, Tennessee, USA. http://dx.doi.org/10.3334/ORNLDAAC/409

Data files were converted to shapefile format (*.shp) for this distribution. No data values were changed.

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	User Working Group	Field Campaigns	Archive	Search by DOI		
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	Data Citation Policy	Regional/Global	Submit Data	SDAT		
	News	Model Archive		MODIS Land Subsets		

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