



SMEX02 Land Surface Information: Soils Database, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Miller, D. 2006. *SMEX02 Land Surface Information: Soils Database, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. <https://doi.org/xxxxx.xxxxx>. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT <https://nsidc.org/data/NSIDC-0278>



National Snow and Ice Data Center

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1 DETAILED DATA DESCRIPTION

1.1 Format

These data files are ESRI shapefiles. A general description of each file type follows:

A detailed description of the "soils.dbf", "soils_wc_all.dbf", and "iaregnsoil.dbf" file variables is provided in the Iowa State Properties and Interpretations Database (ISPAID) User Guide, accessible under the Technical References tab of this data set's landing page.

1.2 File and Directory Structure

The "soils_database" directory contains two subdirectories, "Iowa" and "Walnut Creek". The "Iowa" subdirectory contains regional data, whereas the "Walnut Creek" subdirectory contains only the data for the Walnut Creek watershed.

.shp	cartographic vector data with a database table lookup association using .dbf and .shx files
.shx	file holding data for the actual vertices
.dbf	file holding index data pointing to specific structures in the .shp file
.prj	a text description of the coordinate system; external projection file
.sbn	file holding additional shapefile components and spatial indices
.sbx	file holding additional shapefile components and spatial indices

1.3 File Naming Convention

"Iowa Regional Data" subdirectory (260 MB):

regnDrain.*	This line coverage contains data about drainage features from the ICSS.
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regnSect.*	This polygon coverage contains geographical boundaries from the Public Land Survey System (PLSS) of the Iowa Department of Natural Resources GIS Library.
regnTwps.*	This polygon coverage contains PLSS township boundaries from the of the US Geological Survey (USGS) National Atlas.
regnRR.*	This line coverage contains geographic information about railroads from the Census 2000 Topologically Integrated Geographic Encoding and Referencing (TIGER) database.
regnPts.*	These files contain SMEX02 regional sample points.
regnRoads.*	This line coverage contains geographic information about road centerlines from the Census 2000 TIGER database.
iaregnsoil_read_me.htm	This file contains the SMEX02 Regional Soils data set notes.
iaregnsoil.*	This polygon coverage contains digital soil map units from the ICSS.
regnStreams.*	This line coverage contains geographic information about stream centerlines from the Census 2000 TIGER database.
iowa_soils_metadata.pdf	This file contains the ICSS digital soil map data documentation.

"Walnut Creek Data" subdirectory (39.7 MB):

drainage.*	This line coverage contains data about drainage features from the ICSS.
fields.*	This polygon coverage contains SMEX02 field boundaries.
plss_sect.*	This polygon coverage contains geographical boundaries from the PLSS of the Iowa Department of Natural Resources NRGIS Library.
plss_twp.*	This polygon coverage contains PLSS township boundaries from the of the USGS National Atlas.
railroad.*	This line coverage contains geographic information about railroads from the Census 2000 TIGER database.
roads.*	This line coverage contains geographic information about road centerlines from the Census 2000 TIGER database.
soils_wc_all.*	This polygon coverage contains digital soil map units from the ICSS.
soils.*	This polygon coverage contains digital soil map units from the ICSS clipped by research field boundaries.
streams.*	This line coverage contains geographic information about stream centerlines from the Census 2000 TIGER database.
townLimits.*	This polygon coverage contains the town limits from the Census 2000 TIGER database.

Both directories contain the "ispaid_user_guide.pdf" file, which is the Iowa Soil Properties and Interpretation Database (ISPAID) guide and includes a description of the attributes contained in digital soils data shapefiles.

The "*" symbol represents the various file extensions described in the Format section.

1.4 Spatial Coverage

The following 10 counties comprise the data set: Boone, Dallas, Franklin, Hamilton, Hardin, Jasper, Marshall, Polk, Story, and Wright.

Southernmost Latitude: 41.69459° N

Northernmost Latitude: 42.73229° N

Westernmost Longitude: 93.84162° W

Easternmost Longitude: 93.16104° W

1.4.1 Spatial Resolution

The minimum size delineation of soil polygons is two acres.

1.4.2 Projection and Grid Description

Data are based on the North American Datum of 1983 (NAD83). The data were collected from Universal Transverse Mercator (UTM) Zone 15.

1.5 Temporal Coverage

Because this data set was created by appending existing county digital soils data provided by ICCS and clipping them by the SMEX02 project area boundary, the dates of data acquisition are highly variable; therefore, they are unspecified.

1.6 Parameter or Variable

1.6.1 Parameter Description

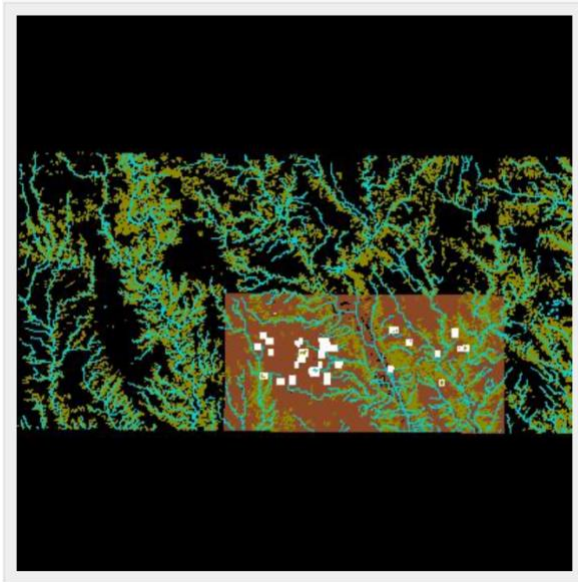
The data contain geographic information such as railroad, road, and stream locations; drainage features; political boundaries; and soil classifications. Please refer to the File Naming Convention section.

1.6.2 Parameter Source

Data were derived from aerial photography and topographic maps of the study area.

1.6.3 Sample Data Image

As displayed in ENVI, the image below was created with data from the Walnut Creek subdirectory including streams, drainage, soils, and field coverage.



1.6.4 Sample Data Record

The sample data below is from the "soils.dbf" file. Because the file includes 85 columns, only the first 9 columns and last column of data are shown below.

OBJECTID	SITE_ID	Measure_Ty	SMS	SMU	SCSSOIL5	SOILNAME	LCC	PRIMELND	...	Shape_Area
1	28	SM	138B	0138B1	IA0074	CLARION	2E	P	...	8745.915014
2	28	SM	138B	0138B1	IA0074	CLARION	2E	P	...	9098.510097

The column headings correspond to the following (as is described in "ispaid_user_guide.pdf"):

OBJECTID	Object identification number
SITE_ID	Site Identification number
Measure_Ty	This field is not applicable and should be disregarded.
SMS	The Soil Map Symbol is the symbol as used on the soil map sheets.

SMU	The Soil Map Unit symbol identifies the soil type, the slope class, and the erosion phase.
SCSSOIL5	The Soils-5 Number is a record number from a National Resources Conservation Services form, NRCS-SOI-5. The first two letters indicate the state.
SOILNAME	The Soil Name can be the soil series name or may include specific soil phase modifiers, such as texture of the surface horizon, profile depth limits, flooding frequency, overwash characteristics, etc.
LCC	In general, the Land Capability Classification shows the suitability of soils for most kinds of field crops.
PRIMELND	The United States Department of Agriculture (USDA) Prime Farmland rating defines land that is best suited to food, feed, forage, fiber, and oilseed crops.
Shape_Area	This field is not applicable and should be disregarded.

2 SOFTWARE AND TOOLS

2.1 Software and Tools

The data can be viewed using ArcView/GIS software.

2.2 Quality Assessment

With the exception of Polk county, the source of all soil property attributes is the Iowa Soil Properties and Interpretations Database (ISPAID). Soil Survey Geographic Database (SSURGO, version 2) and Map Unit Interpretation Record (MUIR) databases were used to populate a selected set of soil property attributes for Polk county. Due to dissimilarity between these data sets, attribute values for Polk county may differ from those of similar soils observed in neighboring counties.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. Please see "iowa_soils_metadata.pdf" for more details.

3 DATA ACQUISITION AND PROCESSING

3.1 Data Acquisition Methods

This data set was created by appending existing county digital soils data provided by the ICSS and clipping these data by the SMEX02 project area boundary.

3.2 Derivation Techniques and Algorithms

3.2.1 Processing Steps

At a ground resolution of two meters, 1:15,840 and 1:20,000 scale mylar map sheets were scanned with an Optronics camera at 200 dots per inch (DPI). The map sheets were originally drawn on black and white, rectified aerial photographs. These aerial photographs were not ortho-rectified; thus, soil lines contain terrain distortions inherited from the imagery. The maps were edited with Map Editing Software (MES) at the University of Minnesota. The map sheets were clipped to individual sections having a raster resolution of 320 x 200 pixels (a typical ground resolution of 5 x 8 meters). The raster images were converted to vector format, and then converted to Arc/Info format.

Soil data was transformed to fit the UTM coordinate system using the map registration marks from Iowa Department of Natural Resources (DNR), Natural Resources Geographic Information Systems (NRGIS) county PLSS files. PLSS coverages were digitized from 24,000 USGS topographic maps and have 22-meter root-mean-square (RMS) accuracy.

Section files were appended to the township level by the Iowa Geological Survey Bureau and the Iowa State University GIS Facility. Township level data that was appended to county-wide level data and projected to UTM Zone 15 North American Datum of 1983 (NAD83) Geodetic Reference System 1980 (GRS80) was converted to ESRI shapefile format by USDA Natural Resources Conservation Service in Ames, Iowa.

4 REFERENCES AND RELATED PUBLICATIONS

[NASA Land Surface Hydrology/Soil Moisture Field Experiments Data Archive](#)

5 CONTACTS AND ACKNOWLEDGMENTS

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6 DOCUMENT INFORMATION

6.1 Publication Date

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6.2 Date Last Updated

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