SMEX03 Ancillary Soil Characteristics Data: Alabama, Georgia, Oklahoma: Version 1

USER GUIDE

How to Cite These Data

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

Cosh, M. and J. Birch. 2008. *SMEX03 Ancillary Soil Characteristics Data, Alabama, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. doi: https://doi.org/10.5067/R2SH2UNZ3D0U. [Date Accessed].

Cosh, M. and J. Birch. 2013. *SMEX03 Ancillary Soil Characteristics Data, Georgia, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. doi: https://doi.org/10.5067/L1UAFNTVCZGX. [Date Accessed].

Cosh, M. and J. Birch. 2013. *SMEX03 Ancillary Soil Characteristics Data, Oklahoma, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. doi: https://doi.org/10.5067/QF7VBMUAKBVP. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/NSIDC-0339 or https://nsidc.org/data/NSIDC-0572 or https://nsidc.org/data/NSIDC-0573

National Snow and Ice Data Center

TABLE OF CONTENTS

1 DETAILED DATA DESCRIPTION

This user guide applies to the following SMEX03 data sets:

NSIDC-0339 (SMEX03 Ancillary Soil Characteristics Data, Alabama)

NSIDC-0572 (SMEX03 Ancillary Soil Characteristics Data, Georgia)

NSIDC-0573 (SMEX03 Ancillary Soil Characteristics Data, Oklahoma)

1.1 Format

Data are provided in ArcInfo ASCII Grid data files. The first six rows of each file contain header information, while the following rows contain the actual grid data. Refer to Table 2 for clarification of ASCII Grid header variables, or to the Sample Record section of this document to view the sample data record. Missing data are represented by -9999. The image dimensions for each regional study area are described in Table 1.

Table 1. Study Area Image Dimensions

Alabama	1920 rows by 4000 columns
Georgia	3432 rows by 1855 columns
Oklahoma	600 rows by 2080 columns

Table 2. ArcInfo ASCII Grid Header Values

Variable	Description
ncols	Number of columns in the grid
nrows	Number of rows in the grid
xllcorner	Western edge of the grid
yllcorner	Southern edge of the grid
cellsize	Spatial resolution of the grid
NODATA_value	Refers to value representing missing data, such as -9999

1.2 File and Directory Structure

The top directory level contains subdirectories for each SMEX03 study region and the readme.txt file, as shown in Figure 1.

Figure 1. Top Level Directory Structure of SMEX03 Ancillary Data

1.3 File Naming Convention

The soil text files for each data set are named according to the following convention and as described in Table 3.

File Naming Convention:

rg_ppd.txt

File Name Example:

al_bd1.txt

Table 3. Description of File Name Variables

<table>
<tr><th>Variable</th><th>Description</th></tr>
<tr><td>rg</td><td>Regional Study Areas (al: Alabama; ga: Georgia; on: Oklahoma North; os: Oklahoma South)</td></tr>
<tr><td>pp</td><td>
<table>
<tr><th>Parameter Abbreviation</th><th>Parameter Description</th></tr>
<tr><td>awc</td><td>Available Water Capacity</td></tr>
<tr><td>bd</td><td>Bulk Density</td></tr>
<tr><td>poros</td><td>Porosity</td></tr>
<tr><td>perm</td><td>Permeability</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Variable</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><td>sand</td><td>Sand</td></tr>
<tr><td>clay</td><td>Clay</td></tr>
<tr><td>rvol</td><td>Rock Fragment Volume</td></tr>
<tr><td>dtc</td><td>Dominant Textural Code</td></tr>
<tr><td>rfc</td><td>Rock Fragment Class</td></tr>
</table>
</td></tr>
<tr><td>d</td><td>
<table>
<tr><th>Depth Code</th><th>Depth from soil surface</th></tr>
<tr><td>1</td><td>0 - 5 cm</td></tr>
<tr><td>2</td><td>5 - 10 cm</td></tr>
<tr><td>3</td><td>10 - 20 cm</td></tr>
<tr><td>4</td><td>20 - 30 cm</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Note: Files containing awc data do not include a depth code in the file name as in the file al_awc100.txt, for example, where 100 denotes cm rather than depth code value. There is only one awc file for each regional study area. AWC was computed for the top 100 cm from the surface.</td></tr>
</table>
</td></tr>
<tr><td>.txt</td><td>Indicates that this is a text file.</td></tr>
</table>

1.4 Spatial Coverage

This data set covers the regional study areas as referenced by the following:

Alabama

Southernmost Latitude: 34.668845602° N

Northernmost Latitude: 35.194353404° N

Westernmost Longitude: 87.777562595° W

Easternmost Longitude: 87.087325703° W

Georgia

Southernmost Latitude: 30.961064855° N

Northernmost Latitude: 31.903257457° N

Westernmost Longitude: 83.970846870° W

Easternmost Longitude: 83.36425277° W

Oklahoma North

Southernmost Latitude: 36.107428397 ° N

Northernmost Latitude: 36.871048244 ° N

Westernmost Longitude: 98.394729898 ° W

Easternmost Longitude: 97.418165280 ° W

Oklahoma South

Southernmost Latitude: 34.443677450 ° N

Northernmost Latitude: 35.422765186 ° N

Westernmost Longitude: 98.046657639° W

Easternmost Longitude: 97.700276141 ° W

1.4.1 Spatial Resolution

The pixel size is 30 m by 30 m.

1.4.2 Projection and Grid Description

The projection is the Universal Transverse Mercator (UTM) with the World Geodetic System 1984 Datum (WGS 84) applied. The UTM zones for each regional study area are listed in Table 4.

Table 4. UTM Zones of Study Areas

Alabama	Zone 16
Georgia	Zone 17
Oklahoma	Zone 14

1.5 Temporal Coverage

While the United States SMEX03 campaign took place in Alabama, Georgia, and Oklahoma between June 23 and July 18, 2003, these Ancillary Soil Characteristics data are representative of the conditions to be expected in the US regional study areas during the approximate timeline of the SMEX03 campaign.

1.6 Parameter or Variable

Parameters for each data set include the following and are further described in Table 5:

- Available Water Capacity
- Bulk Density
- Permeability
- Porosity
- Rock Fragment Class
- Rock Fragment Volume
- Percent Sand
- Percent Clay
- Texture Class

1.6.1 Parameter Range

Parameters and respective parameter ranges for the Alabama, Georgia, and Oklahoma data files are described in Table 5.

Table 5. Parameter Description

Parameters	**Values Given As**
Available Water Capacity	Volumetric percent, computed for a column length of 100 cm, measured from the surface of the soil
Bulk Density	Mean bulk density (g/cm^3) of soil
Permeability	Mean permeability rate (cm/hr) of soil
Porosity	Mean porosity (g/cm^3) of soil

<table>
<tr><th>Parameters</th><th>Values Given As</th></tr>
<tr><td>Rock Fragment Class</td><td>
<table>
<tr><th>Rock Fragment Class Code</th><th>Description</th></tr>
<tr><td>0</td><td>No Data</td></tr>
<tr><td>1</td><td>Bouldery</td></tr>
<tr><td>2</td><td>Cobbly</td></tr>
<tr><td>3</td><td>Channery</td></tr>
<tr><td>4</td><td>Cherty</td></tr>
<tr><td>5</td><td>Flaggy</td></tr>
<tr><td>6</td><td>Gravelly</td></tr>
<tr><td>7</td><td>Rubbly</td></tr>
<tr><td>8</td><td>Shaly</td></tr>
<tr><td>9</td><td>Stony</td></tr>
<tr><td>10</td><td>Slaty</td></tr>
<tr><td>11</td><td>Organic Materials</td></tr>
<tr><td>12</td><td>Water</td></tr>
<tr><td>13</td><td>Bedrock</td></tr>
<tr><td>14</td><td>No Rock Fragments</td></tr>
<tr><td>15</td><td>Other</td></tr>
</table>
</td></tr>
<tr><td>Rock Fragment Volume</td><td>Percent of rock by volume in soil</td></tr>
<tr><td>Percent Sand</td><td>Percent of sand in soil</td></tr>
<tr><td>Percent Clay</td><td>Percent of clay in soil</td></tr>
</table>

Parameters	Values Given As
Texture Class	

Texture Class Code	Description
0	No Data
1	Sand
2	Loamy Sand
3	Sandy Loam
4	Silt Loam
5	Silt
6	Loam
7	Sandy Clay Loam
8	Silty Clay Loam
9	Clay Loam
10	Sandy Clay
11	Silty clay
12	Clay
13	Organic Materials
14	Water
15	Bedrock
16	Other

1.6.2 Sample Data Record

Figure 2 displays a partial sample of the data file al_bd1.txt containing Alabama bulk density data. The first six rows display ArcInfo ASCII Grid header information, while the last six rows contain mean bulk density measurements, of which, only the first thirteen columns are shown in this sample. For clarification of ASCII Grid header variables, refer to Table 2 in the Format section.

ncols	4000												
nrows	1920												
xllcorner	492000												
yllcorner	3837000												
cellsize	30												
NODATA_value	-9999												
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	...
1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	...
1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	...
1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	...
1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	...
1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	...

Figure 2. Sample Data Record

2 SOFTWARE AND TOOLS

2.1 Software and Tools

No special tools are required to view these data.

3 DATA ACQUISITION AND PROCESSING

3.1 Data Acquisition Methods

Alabama, Georgia, and Oklahoma ancillary soil characteristics data were retrieved from the Soil Information for Environmental Modeling and Ecosystem Management database hosted by the Earth System Science Center at Pennsylvania State University. The data for the regional study areas were retrieved from a multi-layer soil characteristics data set for the conterminous United States, called CONUS-SOIL. The data were then exported with ESRI ArcMap and exported as ASCII Grid data files.

4 REFERENCES AND RELATED PUBLICATIONS

4.1 Related Data Collections

AMSR-E/Aqua Data at NSIDC

5 CONTACTS AND ACKNOWLEDGMENTS

Michael H. Cosh

HydrologyRemote Sensing Laboratory

US Department of Agriculture (USDA) - Agricultural Research Service (ARS)

Bldg. 007, Rm. 104, BARC-West

Beltsville, MD 20705 USA

Joanna Birch

Hydrology/Remote Sensing Laboratory

US Department of Agriculture (USDA) - Agricultural Research Service (ARS)

Bldg. 007, Rm. 104, BARC-West

Beltsville, MD 20705 USA

Acknowledgments:

The investigators thank the Earth System Science Center at Pennsylvania State University for providing the data used in this data set through the Soil Information for Environmental Modeling and Ecosystem Management database.

6 DOCUMENT INFORMATION

6.1 Publication Date

May 2008

6.2 Date Last Updated

3 January 2022