

**Notice to Data Users:**  
**The documentation for this data set was provided solely by the Principal Investigator(s) and was not further developed, thoroughly reviewed, or edited by NSIDC. Thus, support for this data set may be limited.**

# SMEX04 Soil Characteristics Data: Arizona

## Summary

The SMEX04 Soil Characteristics data set contains data for Arizona, USA as part of the 2004 Soil Moisture Experiment (SMEX04). The original data were extracted from a multi-layer soil characteristics database for the conterminous United States and generated using Environmental Systems Research Institute (ESRI) ArcMap software for each regional study area. Parameters for this data set include available water capacity, bulk density, elevation, permeability, porosity, rock fragment class, rock fragment volume, texture class, texture/percent clay, and texture/percent sand. The temporal coverage is approximate, as these data are representative of the conditions present in the regional study area during the general timeline of the SMEX04 campaign. The total volume for these data is approximately 635 megabytes. Data are provided in ASCII text files and are available via FTP.

The Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) is a mission instrument launched aboard NASA's Aqua satellite on 04 May 2002. AMSR-E validation studies linked to SMEX are designed to evaluate the accuracy of AMSR-E soil moisture data. Specific validation objectives include: assessing and refining soil moisture algorithm performance; verifying soil moisture estimation accuracy; investigating the effects of vegetation, surface temperature, topography, and soil texture on soil moisture accuracy; and determining the regions that are useful for AMSR-E soil moisture measurements.

## Citing These Data:

The following example shows how to cite the use of this data set in a publication. List the principal investigators, year of data set release, data set title, publisher: NSIDC, and digital media.

Cosh, Michael H., and William A. White. 2009. *SMEX04 Soil Characteristics Data: Arizona*. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

## Overview Table

Category	Description
<a href="#">Data format</a>	ASCII Grid data files
<a href="#">Spatial coverage</a>	31.4° N to 32.1° N, 109.7° W to 110.3° W
<a href="#">Temporal coverage</a>	N/A
<a href="#">File naming convention</a>	az_site_parameter_#.txt
<a href="#">File size</a>	10 MB to 26 MB
<a href="#">Parameter(s)</a>	Available water capacity, bulk density, elevation, permeability, porosity, rock fragment class, rock

	fragment volume, texture class, texture/percent clay, texture/percent sand.
<a href="#">Procedures for obtaining data</a>	Data are available via FTP.

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## 1. Contacts and Acknowledgments:

### Investigator(s) Name and Title:

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### Acknowledgements:

Arizona soil data was retrieved from an online database hosted by the Earth System Science Center in the College of Earth and Mineral Sciences at The Pennsylvania State University, at <http://www.soilinfo.psu.edu>. The data is from CONUS-SOIL, a multi-layer soil characteristics data set for the conterminous United States. Elevation data for Arizona is from a 30-meter DEM.

## 2. Detailed Data Description:

### Format:

Data consist of ASCII grid files exported from ArcMap. The first six rows of each file contain header information, while the following rows contain the grid data. Missing data are represented by -9999.

### File Naming Convention:

Files are named according to the following convention and are further described in Table 1:

az\_site\_parameter\_#.txt

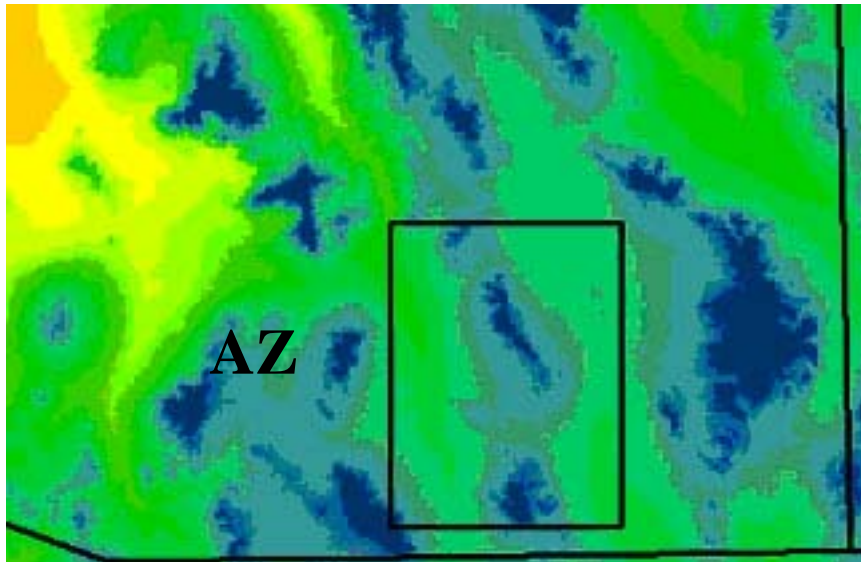
**Table 1.** Description of File Name Variables

Variable	Description
az	Arizona study site
site_parameter	site parameter (e.g. available_water_capacity, bulk_density, elevation, permeability, porosity, rock_fragment_class, rock_fragment_volume, texture_class, texture_clay, texture_sand)
#	Designates soil layer depth measured from the surface (for all files except az_elevation and az_available_water_capacity):  "1" designates 0-5cm "2" designates 5-10cm "3" designates 10-20cm "4" designates 20-30cm  (available_water_capacity was computed for the top 100cm from the surface.)
.txt	Indicates that this is an ASCII text file

### File Size:

File sizes range from 10 MB to 26 MB.

### Spatial Coverage:



Arizona (AZ):

Southernmost Latitude: 31.4° N

Northernmost Latitude: 32.1° N

Westernmost Longitude: 110.3° W

Easternmost Longitude: 109.7° W

UTM Coordinates, Zone 12, NAD-83:

xmin: 567000 E    xmax: 627000 E  
ymin: 3475800 N    ymax: 3555000 N

## Temporal Coverage:

Not applicable

## Parameter or Variable:

- Available Water Capacity: values given as volumetric percent, computed for a column length of 100cm, measured from the surface.
- Bulk Density: values given as mean bulk density.
- Elevation: values given in meters.
- Permeability: values given as mean permeability rate, in cm/hr.
- Porosity: values given as mean porosity.
- Rock Fragment Classification: values given as code (ranging 0-15), representing fragment class:
  - 0,"No data"
  - 1,"Bouldery"
  - 2,"Cobbly"
  - 3,"Channery"
  - 4,"Cherty"
  - 5,"Flaggy"
  - 6,"Gravelly"
  - 7,"Rubbly"
  - 8,"Shaly"
  - 9,"Stony"
  - 10,"Slaty"
  - 11,"Organic Materials"
  - 12,"Water"
  - 13,"Bedrock"
  - 14,"No Rock Fragments"
  - 15,"Other"
- Rock Fragment Volume: values given as percent of rock by volume.
- Texture/Percent Sand: values given as percent sand.
- Texture/Percent Clay: values given as percent clay.
- Texture Classification: values given as code (ranging 0-16), representing texture class:
  - 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"

### **3. Data Access and Tools:**

#### **Data Access:**

Data are available via FTP.

#### **Software and Tools:**

No special tools are required to view these data.

#### **Related Data Collections:**

See related information on the Soil Moisture Experiment (SMEX) Web site:  
[http://nsidc.org/data/amr\\_validation/soil\\_moisture/index.html](http://nsidc.org/data/amr_validation/soil_moisture/index.html)

### **4. Data Acquisition and Processing:**

Arizona ancillary soil characteristics data were retrieved from an online database hosted by the Earth System Science Center in the College of Earth and Mineral Sciences at The Pennsylvania State University, at <http://www.soilinfo.psu.edu>. The data are from CONUS-SOIL, a multi-layer soil characteristics data set for the conterminous United States. Elevation data for Arizona are from a 30-meter DEM.

### **5. References and Related Publications:**

Please see the SMEX04 site to access data:  
[http://nsidc.org/data/amr\\_validation/soil\\_moisture/smex04/index.html](http://nsidc.org/data/amr_validation/soil_moisture/smex04/index.html)