



SMEX03 Surface and Soil Temperature Measurements: Alabama, Version 1

USER GUIDE

How to Cite These Data

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

SMEX03 Surface and Soil Temperature Measurements: Alabama, Version 1. [Indicate subset used].
Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center.
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FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT <https://nsidc.org/data/NSIDC-0319>



National Snow and Ice Data Center

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1 DETAILED DATA DESCRIPTION

1.1 Format

Data are provided in a Microsoft Excel file and as a tab-delimited ASCII text file. The text file contains the same data as the Excel file. Table 1 lists the column headings and data field descriptions for the files.

Table 1 Column Headings and Data Field Descriptions

Column Heading	Units	Description
Date	MM/DD/YY	Date of measurements
DOY	DDD	Numerical day of year (Julian Date)
Time	HH:MM	Time of day in Central Daylight Time (CDT)
Site	-	Site number (1-59)
Lat	decimal degrees	Latitude of site
Long	decimal degrees	Longitude of site
Surface	°C	Land surface temperature
1 cm	°C	Soil temperature at 1 cm depth
5 cm	°C	Soil temperature at 5 cm depth
10 cm	°C	Soil temperature at 10 cm depth

1.2 File Naming Convention

The Excel file is named Soil_Temps_AL.xls. The ASCII text file is named Soil_Temps_AL.txt.

1.3 Spatial Coverage

Southernmost Latitude: 34.68 ° N

Northernmost Latitude: 35.16° N

Westernmost Longitude: 87.07° W

Easternmost Longitude: 85.78° W

1.4 Temporal Coverage

Data were collected from 21 June 2003 to 2 July 2003.

1.4.1 Temporal Resolution

Temperature readings were taken daily.

1.5 Parameter or Variable

1.5.1 Parameter Description

Parameters in this data set are land surface temperature (°C) and soil temperature (°C) at depths of 1 cm, 5 cm, and 10 cm. A daily mean was calculated for each variable.

1.5.2 Sample Data Record

The following sample shows the first five rows of the Soil_Temps_AL.txt file.

Date	DOY	Time	Site	Lat	Long	Surface	1 cm	5 cm	10 cm
6/22/03	173	12:55	1	35.1114	-87.0021	36.0	33.5	32.2	27.3
6/22/03	173	11:24	2	35.1254	-86.8723	32.0	26.5	24.3	24.1
6/22/03	173	12:37	3	35.0505	-86.9961	48.0	29.7	26.6	25.2
6/22/03	173	12:00	4	35.0428	-86.8654	25.0	30.7	29.5	28.4

2 DATA ACQUISITION AND PROCESSING

2.1 Data Acquisition Methods

Data were collected at 59 locations in Alabama and southern Tennessee which included crop, pasture, and forested sites. Surface temperature measurements were made daily at each of the sites and recorded in field books. The infrared thermometers were pointed at the ground at a near-nadir angle. The protocol was for several readings to be made and an average recorded, but some teams took only a single reading. Soil temperatures were measured daily at depths of 1 cm, 5 cm, and 10 cm for each of the field sites. The thermometer was inserted vertically into the soil and

allowed time for stabilization at each depth. Values were recorded in the field books. For AMSR-E validation purposes, temperatures were measured each day between 11:00 a.m. and 3:00 p.m. CDT.

2.2 Error Sources

Due to breakage of the soil temperature sensors in hard soils, some sites were not sampled on particular days. Enough sensors broke to deplete the supply of spares, resulting in several sites not being sampled during the last few days of the experiment. Data that were not collected are flagged as -9999. Errors in land surface temperature are related mainly to representativeness of the readings. Variability at a given site could be extremely large ($> 20^{\circ}\text{C}$), particularly for crop sites which comprised a mixture of bare soil and vegetation, therefore a single reading may not represent the mean land surface temperature very well.

2.3 Sensor or Instrument Description

Investigators used a Raytek Raynger MT4 MiniTemp hand-held infrared thermometer to measure land surface temperature. The instrument has a range of -18°C to 400°C and a pre-set emissivity of 0.95. Accuracy is ± 2 percent of reading or $\pm 2^{\circ}\text{C}$, whichever is greater, for targets at -1°C to 260°C , and $\pm 3^{\circ}\text{C}$ for targets at -18°C to -1°C . Visit the Raytek Web site for more information. Soil temperatures were measured with a Taylor Switchable Digital Pocket Thermometer. Visit the [Taylor](#) Web site for more information.

3 REFERENCES AND RELATED PUBLICATIONS

Please see the [USDA SMEX03](#) Web site for in depth information on the science mission and goal of the SMEX project.

3.1 Related Data Collections

[AMSR-E/Aqua Data at NSIDC](#): AMSR-E standard data products available at NSIDC.

4 CONTACTS AND ACKNOWLEDGMENTS

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5 DOCUMENT INFORMATION

5.1 Publication Date

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5.2 Date Last Updated

22 March 2021