

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 Climate Analysis Network (SCAN) Data: Arizona

Summary

This work is part of the Soil Moisture Experiment 2004 (SMEX04) project. This data set provides data from various sensors on the Soil Climate Analysis Network (SCAN) station 2026 located near historic Tombstone, Arizona USA. The data include hourly and daily recordings of precipitation, air temperature, solar radiation, wind speed, relative humidity, soil moisture, and soil temperature. The station houses numerous sensors that automatically record data. Sensors include global precipitation sensor, thermistor, thin film capacitance-type sensor, anemometer, pyranometer, pressure sensor, and a frequency-shift dielectric measuring device. Units of measurement vary, depending on the type of sensor. Data are uploaded by meteor burst telemetry to the Natural Resources Conservation Service (NRCS) Data Processing Center in Portland, Oregon.

The NRCS has been operating SCAN stations since November 1998, but this data set covers only the time period of interest to the Soil Moisture Experiments 2004 (SMEX04) campaign, 1 July 2004 through 30 September 2004. Data are available in two text files: one for hourly data, the other for daily data.

The Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) is a mission instrument launched aboard NASA's Aqua satellite on 4 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:

Jackson, T. J. and M. H. Cosh. 2009. *SMEX04 Soil Climate Analysis Network (SCAN) Data: Arizona*. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

Overview Table

Category	Description
<u>Data format</u>	ASCII tab-delimited text files
<u>Spatial coverage</u>	Measurements were taken at the SCAN site numbered 2026 in Tombstone, Arizona (31.73° N and 110.05° W), USA.
<u>Temporal coverage and resolution</u>	1 July 2004 through 30 September, 2004 Hourly and daily data are available.
<u>Tools for accessing data</u>	View data using a browser or text editor.
<u>File naming convention</u>	SCAN2026_Hourly.txt contains hourly data. SCAN2026_Daily.txt contains daily data.
<u>File size</u>	SCAN2026_Hourly.txt size is 399 KB. SCAN2026_Daily.txt size is 4 KB.
<u>Parameter(s)</u>	Precipitation, air temperature, solar radiation, wind speed, relative humidity, soil moisture, and soil temperature
<u>Procedures for obtaining data</u>	Data are available via FTP .

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1. Contacts and Acknowledgments:

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2. Detailed Data Description:

Format:

Data are in ASCII text format. The hourly data contain 36 columns; the daily data contain 8 columns. The following table is a key to the column headings and units of measure for the hourly data. The daily measurements (shown in the Label column) are a small subset of the hourly columns.

Label	Measurement Type	Description	Units
PCPIN	CURRENT	Global Precipitation Sensor	inches
ATHC6	CURRENT	Air temperature	Celsius
ATHX6	MAXIMUM	Air temperature	Celsius
ATHN6	MINIMUM	Air temperature	Celsius
ATHA6	AVERAGE	Air temperature	Celsius

SRHA	AVERAGE	Solar radiation	W/m ²
WSPHA	AVERAGE	Wind speed	m/h
WDHA	AVERAGE	Wind direction	degree
WSPHX	MAXIMUM	Wind speed	m/h
RH1C1	CURRENT	Relative humidity	percentage
RH1X1	MAXIMUM	Relative humidity	percentage
RH1N1	MINIMUM	Relative humidity	percentage
BPHGC	CURRENT	Barometric Pressure	inch of Hg
c1smv	CURRENT	Percent water by volume-2"	percentage
c1tmp	CURRENT	Soil temperature at depth of 2"	Celsius
c1rdc	CURRENT	Real dielectric constant 2"	unitless
c2smv	CURRENT	Percent water by volume at depth of 4"	percentage
c2tmp	CURRENT	Soil temperature at depth of 4"	Celsius
c2rdc	CURRENT	Real dielectric constant at depth of 4"	unitless
c3smv	CURRENT	Percent water by volume at depth of 8"	percentage
c3tmp	CURRENT	Soil temperature at depth of 8"	Celsius
c3rdc	CURRENT	Real dielectric constant at depth of 8"	unitless
c4smv	CURRENT	Percent water by volume at depth of 20"	percentage
c4tmp	CURRENT	Soil temperature at depth of 20"	Celsius
c4rdc	CURRENT	Real dielectric constant at depth of 20"	unitless
c5smv	CURRENT	Percent water by volume at	percentage

		depth of 40"	
c5tmp	CURRENT	Soil temperature at depth of 40"	Celsius
c5rdc	CURRENT	Real dielectric constant at depth of 40"	unitless

Daily Temperature Data

Label	Measurement Type	Description	Units
ATX6	MAXIMUM	Air temperature	Celsius
ATN6	MINIMUM	Air temperature	Celsius
ATA6	AVERAGE	Air temperature	Celsius
WSPDA	AVERAGE	Wind speed	m/h
WDDA	AVERAGE	Wind direction	degree
ENHUM	AVERAGE	Relative Humidity in Enclosure	Percent

File Naming Convention:

Files are named for the SCAN site and the frequency of data collection.
 SCAN2026_Hourly.txt contains hourly data.
 SCAN2026_Daily.txt contains daily data.

Spatial Coverage:

Measurements were taken at the SCAN sites numbered 2026 in Tombstone, Arizona (31.73° N and 110.05° W) USA.

Temporal Coverage:

Measurements were taken between 1 July 2004 and 30 September 2004.

Temporal Resolution:

Measurements are given daily and hourly.

Parameter or Variable:

Unit of Measurement:

The units of measurement for each parameter are given in the Format section.

Parameter Source:

The following table describes the parameters measured by each sensor:

Sensor	Parameter	Description
Global precipitation sensor	Precipitation	This instrument records daily cumulative inches of precipitation.
Shielded thermistor	Air temperature	Raised 6 feet off of the ground, this device reports the current temperature and the previous hourly maximum, hourly minimum, and hourly average.
Soil sensors	Soil moisture, soil temperature	The soil moisture and soil temperature data were recorded by sensors located at 5 depths, 2", 4", 8", 20", and 40".
Thin film capacitance-type sensor	Relative humidity	This sensor is six feet above the surface. The value is a percentage, reported as current, previous hourly maximum, and previous hourly minimum.
Anemometer	Wind speed and direction	This sensor is 10 feet above the surface. It provides an hourly average from continuously sampled data.
Pyranometer	Solar radiation	This silicon cell sensor is 10 feet above the surface. It provides hourly average readings of total incoming solar energy in terms of Watts per square meter.
Silicon capacitive pressure sensor	Barometric pressure	This sensor measures hourly barometric pressure.

3. Data Access and Tools:

Data Access:

Data are available via FTP.

Volume:

Combined file size is 403 KB.

Software and Tools:

View the data in a Web browser or text editor.

Related Data Collections:

For related data collections, please see [AMSR-E Validation](#).

4. References and Related Publications:

Please see [Soil Climate Analysis \(SCAN\)](#).

5. Document Information:

List of Acronyms

The following acronyms are used in this document:

AMSR-E - Advanced Microwave Scanning Radiometer - Earth
Observing System (AMSR-E)

SCAN - Soil Climate Analysis

SMEX - Soil Moisture Experiments

USDA - United States Department of Agriculture

NRCS - Natural Resources Conservation Service

Document Creation Date:

25 February 2005