SMEX03 Soil Climate Analysis Network (SCAN): Oklahoma, Version 1

USER GUIDE

How to Cite These Data

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

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/NSIDC-0295

National Snow and Ice Data Center

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1 DETAILED DATA DESCRIPTION

1.1 Format

Data are provided as tab-delimited ASCII text. Two types of files are available for each station: hourly and daily. Table 1 displays the station identification number, the station name, and the station location for the SCAN stations whose data are part of this data set. More information on SCAN stations is posted at http://www.wcc.nrcs.usda.gov/scan.

Table 1. SMEX03 Oklahoma SCAN Stations

SCAN Station No.	Station Name	Location	Coordinates (Latitude and Longitude)
2022	Fort Reno	Canadian County, OK	35.55º N, 98.02º W
2023	Little Washita	Grady County, OK	34.95º N, 97.98º W

Table 2 lists the column headings and definitions in the hourly files, and Table 3 lists the column headings and definitions in the daily files. More information on these parameters can be found at http://www.wcc.nrcs.usda.gov/scan/sensors.html.

Note 1: In both files, missing data values are denoted by either -99.9 or -99.99.

Note 2: Not all parameters listed are measured at every station.

Table 2. Column Headings and Definitions for the Hourly Files

Column	Description	Units	SCAN Station No.	
			2022	2023
ATHA6	Average air temperature	degrees Celsius	x	x
ATHC6	Current air temperature	degrees Celsius	x	x
ATHN6	Minimum air temperature	degrees Celsius	x	x
ATHX6	Maximum air temperature	degrees Celsius	x	x
BAD	Bad data			x
BPHGC	Current barometric pressure	inches of mercury (Hg)	x	x
c1rdc	Current soil dielectric constant at two inch depth	no units	x	x
c1sal	Current soil salinity at two inch depth	grams per liter	x	x
c1smv	Current soil moisture at two inch depth	percent water by volume	x	x

Column	Description	Units	SCAN Station No.	
			2022	2023
c1tmp	Current soil temperature at two inch depth	degrees Celsius	x	x
c2rdc	Current soil real dielectric constant at four inch depth	no units	x	x
c2sal	Current soil salinity at four inch depth	grams per liter	x	x
c2smv	Current soil moisture at four inch depth	percent water by volume	x	x
c2tmp	Current soil temperature at four inch depth	degrees Celsius	x	x
c3rdc	Current soil real dielectric constant at eight inch depth	no units	x	x
c3sal	Current soil salinity at eight inch depth	grams per liter	x	x
c3smv	Current soil moisture at eight inch depth	percent water by volume	x	x
c3tmp	Current soil temperature at eight inch depth	degrees Celsius	x	x
c4rdc	Current soil real dielectric constant at 20 inch depth	no units	x	x
c4sal	Current soil salinity at 20 inch depth	grams per liter	x	x
c4smv	Current soil moisture at 20 inch depth	percent water by volume	x	x
c4tmp	Current soil temperature at 20 inch depth	degrees Celsius	x	x
c5rdc	Current soil real dielectric constant at 40 inch depth	no units	x	x
c5sal	Current soil salinity at 40 inch depth	grams per liter	x	x
c5smv	Current soil moisture at 40 inch depth	percent water by volume	x	
c5tmp	Current soil temperature at 40 inch depth	degrees Celsius	x	x
Date	Date of measurement		x	x
Hour	Hour of measurement	Central Standard Time (CST)	x	x
Month	Month of measurement		x	x
PCPIN	Current precipitation	inches		x
RH1C1	Current relative humidity	percent	x	x
RH1N1	Minimum relative humidity	percent	x	x

Column	Description	Units	SCAN Station No.	
			2022	2023
RH1X1	Maximum relative humidity	percent	x	x
SLRHA	Average solar radiation	watts per square meter		x
SRHA	Average solar radiation	watts per square meter	x	
STC1C	Current soil temperature at two inch depth	degrees Celsius	x	x
STC2C	Current soil temperature at four inch depth	degrees Celsius	x	x
STC3C	Current soil temperature at eight inch depth	degrees Celsius	x	x
STC4C	Current soil temperature at 20 inch depth	degrees Celsius	x	x
STC5C	Current soil temperature at 40 inch depth	degrees Celsius	x	x
WDHA	Average wind direction	degrees	x	x
WSPHA	Average wind speed	meters per hour	x	x
WSPHX	Maximum wind speed	meters per hour	x	x
Year	Year of measurement		x	x

Table 3. Column Headings and Definitions for the Daily Files

Column	Description	Units	SCAN Station No.	
			2022	2023
ATA6	Average air temperature	degrees Celsius	x	x
ATN6	Minimum air temperature	degrees Celsius	x	x
ATX6	Maximum air temperature	degrees Celsius	x	x
Date	Date of measurement		x	x
ENHUM	Average relative humidity in enclosure	percent	x	x
Month	Month of measurement		x	x
Year	Year of measurement		x	x
WDDA	Average wind direction	degrees	x	x
WSPDA	Average wind speed	meters per hour	x	x

1.2 File and Directory Structure

Table 4 lists the files contained in this data set.

Table 4. Files Contained in this Data Set

File Name	Description	File Size
SCANxxxx_Hourly.txt	These are tab-delimited ASCII text files of the data in hourly measurements, where xxxx is the SCAN station identification number.	320 KB
SCANxxxx_Daily.txt	These are tab-delimited ASCII text files of the data in daily averages, where xxxx is the SCAN station identification number.	2.8 KB

1.3 Volume

The total data set volume is 656 KB.

1.4 Spatial Coverage

Southernmost Latitude: 34.95º N
Northernmost Latitude: 35.55º N
Westernmost Longitude: 98.02º W
Easternmost Longitude: 97.98º W

1.5 Temporal Coverage

Data were collected between 1 June 2003 and 31 July 2003.

1.5.1 Temporal Resolution

Hourly measurements are averages computed as the sum of all measurements taken during an hour divided by the number of measurements taken during that hour. Daily values are averages computed as the sum of all hourly measurements taken during a day divided by the number of hourly measurements taken during that day.

1.6 Parameter or Variable

1.6.1 Parameter Description

Table 5 describes the parameters in the hourly files.

Table 5. Parameters in Hourly Files

Parameter	Description
Precipitation	Current value
Air temperature	Maximum, minimum, average, and current values
Relative humidity	Maximum, minimum, average, and current values
Wind speed	Maximum and average values
Wind direction	Averages
Solar radiation	Averages
Soil temperature	Current values at 2, 4, 8, 20, and 40 inch ground depths
Percent water by volume	Current values at 2, 4, 8, 20, and 40 inch ground depths
Real dielectric constant	Current values at 2, 4, 8, 20, and 40 inch ground depths

Table 6 describes the parameters in the daily files.

Table 6. Parameters in the Daily Files

Parameter	Description
Temperature	Daily maximum, minimum, and average values
Wind speed	Daily average
Wind direction	Daily average
Enclosure relative humidity	Current value

1.6.2 Sample Data Record

The following sample shows the first five records from the hourly file `Scan2022_Hourly.txt`. The first six and last six columns are displayed.

Table 7. Sample Data Record from Hourly File Scan2022_Hourly.txt

Year	Month	Date	Hour	ATHC6	ATHX6	...	c5sal	STC1C	STC2C	STC3C	STC4C	STC5C
2003	6	1	0	16.68	16.75	...	0.29	19.24	20.02	19	17.39	17.44
2003	6	1	1	15.68	16.83	...	0.29	19.07	19.9	18.97	17.44	17.41
2003	6	1	2	14.55	15.75	...	0.3	18.9	19.83	18.93	17.44	17.44
2003	6	1	3	13.21	14.6	...	0.3	18.73	19.76	18.9	17.44	17.44

The following sample shows the first five records from the daily file Scan2022_Daily.txt. All nine columns are displayed.

Table 8. Sample Data Record from Daily File Scan2022_Daily.txt

Year	Month	Date	ATX6	ATN6	ATA6	WSPDA	WDDA	ENHUM
2003	6	1	26.67	15.34	21.49	9.58	41.32	59.17
2003	6	2	28.91	12.14	21.51	7.33	115.43	58.19
2003	6	3	27.4	17.53	22.1	8	333.63	59.1
2003	6	4	27.18	15.02	19.85	6.71	78.95	60.15

2 SOFTWARE AND TOOLS

Data files are viewable with a browser or text editor.

3 DATA ACQUISITION AND PROCESSING

3.1 Sensor or Instrument Description

Each SCAN station houses multiple sensors that automatically record data. These data are uploaded at regular intervals to the NRCS Data Processing Center, Portland, Oregon, USA. Table 9 describes the sensors housed in each SCAN station and the parameters they measure.

Table 9. SCAN Station Sensors and Measured Parameters

Sensor Name	Parameters Measured	Method of Measurement
Global precipitation sensor	Precipitation	Daily cumulative inches of precipitation are recorded.
Shielded thermistor	Air temperature	The instrument is raised six feet from the surface. Current temperature and the previous hour's maximum, minimum, and average temperatures are recorded.
Soil sensors	Soil moisture, soil temperature	Sensors are located at depths of 2, 4, 8, 20, and 40 inches below the surface. Current soil moisture and temperature are recorded.
Thin film capacitance-type sensor	Relative humidity	The sensor is raised six feet from the surface. Current relative humidity and the previous hour's maximum and minimum relative humidities are recorded.
Anemometer	Wind speed, wind direction	The instrument is raised 10 feet from the surface. Hourly averages are computed from continuous measurements.
Pyranometer	Solar radiation	The sensor is raised 10 feet from the surface. Hourly average readings of total incoming solar energy are computed.
Silicon capacitive pressure sensor	Barometric pressure	Hourly barometric pressure is recorded.

4 REFERENCES AND RELATED PUBLICATIONS

Please see the AMSR-E site to access data.

5 CONTACTS AND ACKNOWLEDGMENTS

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6 DOCUMENT INFORMATION

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