

ARM/GCIP NESOB-96 USDA/ARS Grazinglands Research Laboratory Soil
Temperature Dataset

1.0 General Description

The United States Department of Agriculture/Agricultural Research Service (USDA/ARS) Grazinglands Research Laboratory (GRL) Soil Temperature Dataset is one of several sub-surface datasets provided for the GEWEX Continental-Scale International Project (GCIP) Near Surface Observation Data Set (NESOB) 1996 project. This dataset contains data from two USDA/ARS/GRL networks: six stations from its Little Washita (Oklahoma) Micronet and one station from a special soil temperature and soil moisture network also located in the Little Washita. All stations are within the NESOB 1996 domain (100.5W to 94.5W longitude and 34N to 39N latitude) and time period (01 April 1996 through 30 September 1996). These data have not been quality controlled by the University Corporation for Atmospheric Research Joint Office for Science Support (UCAR/JOSS). All records from station A182 have been removed from this dataset in Version 2.

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2.0 Detailed Data Description

These soil temperature data were provided by the United States Department of Agriculture/Agricultural Research Service (USDA/ARS) Grazinglands Research Laboratory (GRL). These soil temperature data sets are experimental data sets collected for specific research objectives and are not subject to and/ or may not conform to published ARS standards.

These ARS data sets are accepted and used by the recipient upon the express understanding that ARS and its employees make no warranties, expressed or implied, concerning the accuracy, completeness, reliability or suitability for any given purpose, and that ARS and its employees shall be under no liability to any person by reason of any use made thereof.

The ARS requests that the recipient of these soil temperature data sets does not distribute, publish or disseminate the data under the recipients name without full and up-front acknowledgement of ARS as the source of the data, and that the recipient acknowledges the support and role of ARS in publications that use these data.

2.0.1 Little Washita Micronet Soil Temperature Data

The station identifiers for the Little Washita Micronet are 121, 134, 150, 156, 162, and 182. These stations use a thermistor device to measure soil temperature at depths of 5, 10, 15, and 30 cm below a vegetated surface. The values are 15 min averages.

These soil temperature measurements are made in the northeast section of each station. The thermistor probes are sheathed in stainless steel and buried horizontally in undisturbed ground. Because the cables

connecting the thermistors to the meteorological tower might conduct surface heat and divert draining rainwater, they were buried deeper than the thermistors, then angled upward. The thermistor at 5cm sometimes detects the passage of the solar panel's shadow (ARS 1999).

Site descriptions and photographs are available from the USDA/ARS/GRL on the web at:
<http://www.ocs.ou.edu/ars/sitedescriptions/default.html>

2.0.2 Special USDA/ARS/GRL Soil Temperature Network Data

The station identifier for the USDA/ARS/GRL Special Soil Temperature Network is 151. This station uses a Campbell Scientific model 107B sensor (thermistor device), and automatically records using a CR-10 data logger (ARS 1997).

Soil temperature data are given every 30 minutes throughout the course of the day at depths of 2.5, 5, 10, 15, 20, 25, 60, and 100 cm. Time 0 is midnight. The temperatures represent instantaneous values, not 30 minute averages.

For more information please contact Dr. Patrick Starks, USDA-ARS, Grazinglands Research Laboratory, 7207 W. Cheyenne St., El Reno, Oklahoma, (405)-262-4316.

2.1 Detailed Format Description

The ARM/GCIP NESOB-96 USDA/ARS/GRL Soil Temperature Dataset contains eight metadata parameters and twenty-four data parameters and flags. The metadata parameters describe the date, time, network, station and location at which the data were collected. All times are UTC. The data parameters consist of triplets for each depth. Soil temperature for the Little Washita Micronet is measured at 5, 10, 15, and 30 cm depths. Soil temperature for the Special Soil Temperature Network Site 151 is measured at 2.5, 5, 10, 15, 20, 25, 60, and 100 cm depths. Table 1 below details the data parameters. The data parameters have an associated Quality Control (QC) flag. Quality control was performed by USDA/ARS/GRL. See section 3.0 for details on the ARS QC flags. These data have not been QC'd by UCAR/JOSS. A description of the possible QC flag values is listed in Table 2.

Table 1

Parameters -----	Units -----
Date of Observation	UTC
Time of Observation	UTC
Network Identifier	Abbreviation of platform name
Station Identifier	Network Dependent
Latitude	Decimal degrees, South is negative

Longitude	Decimal degrees, West is negative
Station Occurrence	Unitless
Station Elevation	Meters
Soil Temperature	Celsius
Soil Depth	centimeters (2.5cm, 5cm, 10cm, 15cm, 100cm)
QC flag	(See Table 2)

Table 2

QC Code	Description
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U	Unchecked
G	Good
M	Normally recorded but missing
D	Questionable
B	Unlikely
N	Not available or Not observed.
X	Glitch
E	Estimated
C	Reported precipitation value exceeds 9999.99 millimeters or was negative.
T	Trace precipitation amount recorded.
I	Derived parameter can not be computed due to insufficient data.

2.2 Data Remarks

None.

3.0 Quality Control Processing

The data for the Little Washita Micronet stations (identifiers 121, 134, 150, 156, 162, and 182) were quality controlled by USDA/ARS/GRL. No QC was performed on this dataset by the University Corporation for Atmospheric Research/Joint Office for Science Support (UCAR/JOSS). The following table shows the translation between the original USDA/ARS/GRL QC flags and UCAR/JOSS QC flags. The UCAR/JOSS flags are given in the final dataset.

ARS QC flag	ARS description	UCAR/JOSS QC
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g - good	Passed QC tests extremely low probability of error	G
S - suspect	QC tests indicate some suspicion low probability of error	D
W - warning	Several QC test failures high probability of error	B

F - failure	Known error	B
M - missing	Data not received	M
I - ignore		I
N - not installed		N
U - unknown		U

If all soil temperatures for all depths measured at a given time are set to dubious, this indicates that a technician was servicing the site at that time.

The data for the Special Soil Temperature Network station (identifier 151) were not quality controlled by USDA/ARS/GRL.

4.0 References

- ARS, 1997: Format for the ARS micronet 5-minute data files. Version a5m001. [Electronic document provided by USDA/ARS/GRL].
- ARS, 1999: ARS Micronetwork Variables Measured. [Available on-line from <http://www.ocs.ou.edu/ars/variables/>].
- USDA-ARS, cited 1999: Grazinglands Research Laboratory Home Page [Available online from <http://grl.ars.usda.gov.>]