Monthly Summaries of Soil Temperature and Soil Moisture in Mongolia, Version 1

USER GUIDE

How to Cite These Data

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

Paetzold, R., ed. 2003. *Monthly Summaries of Soil Temperature and Soil Moisture in Mongolia, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. https://doi.org/10.7265/4atz-9116. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/GGD627

National Snow and Ice Data Center

TABLE OF CONTENTS

1 DATA DESCRIPTION

A Campbell Scientific CR10X-2M datalogger records day, time, battery (voltage), and internal temperature. A combination of the following below-ground sensors are attached to the datalogger: Vitel Hydra dielectric constant soil moisture and temperature sensors, Campbell 107 soil temperature sensors, and an International Thermal Instrument GHT-1C-013 soil heat flux sensor.

Sensors installed 3 m above the ground include a Licor LI200X pyranometer (solar radiation), Campbell R.M. Young 05103 wind sensor, and an Everest Interscience 4000 infrared sensor. The following are mounted 1.6 m above the ground: Vaisala HMP45C air temperature and relative humidity sensor, Campbell R.M. Young wind sensor #05103, Campbell TE525 Texas Electronics TR-525I-R2 tipping bucket rain gauge, and Everest Interscience 4000 infrared sensor.

See Appendix A - Soil Characteristics for a summary of soils throughout the study area.

1.1 Format

The ASCII text file `ggd627_tsagaan_delger.txt` contains average, median, standard deviation, maximum, and minimum values for the following variables. The Excel spreadsheet file `ggd627_mongolia_soiltemp.xls` contains the same data. See Table 1 for details.

Table 1. Data File Column Description

Column No.	Column Name	Description	Units	Location	Sensor
1	WIND SPEED	Wind speed	m/s	Air 3 m	R.M. Young
2	WIND DIRECTION	Wind direction	Azimuth	Air 3 m	R.M. Young
3	RH	Relative humidity	%	Air 1.6 m	Vaisala HMP45C
4	AIR T	Air temperature	°C	Air 1.6 m	Vaisala HMP45C
5	AIR T	Air temperature	°C	Air 1.6 m	Campbell 107
6	AIR PRESS	Atmospheric pressure	hPa or mb	Air 1.6 m	CS105
7	PRECIP TOTAL	Total rainfall accumulation	mm	Air 1.6 mm	TE525
8	SOIL T	Soil temperature at 5-cm depth, measured with Campbell 107 sensor	°C	Soil 5 cm	Campbell 107

Column No.	Column Name	Description	Units	Location	Sensor
9	SOIL T	Soil temperature at 10-cm depth, measured with Campbell 107 sensor	°C	Soil 10 cm	Campbell 107
10	SOIL T	Soil temperature at 20-cm depth, measured with Campbell 107 sensor	°C	Soil 20 cm	Campbell 107
11	SOIL T	Soil temperature at 50-cm depth, measured with Campbell 107 sensor	°C	Soil 50 cm	Campbell 107
12	SOIL T	Soil temperature at 100-cm depth, measured with Campbell 107 sensor	°C	Soil 100 cm	Campbell 107
13	Vitel	Soil temperature at 5-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 5 cm	Vitel
14	Vitel	Volumetric water content at 5-cm depth, measured with Vitel sensor	H_2O v/v	Soil 5 cm	Vitel
15	Vitel	Soil temperature at 10-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 10 cm	Vitel
16	Vitel	Volumetric water content at 10-cm depth, measured with Vitel sensor	H_2O v/v	Soil 10 cm	Vitel
17	Vitel	Soil temperature at 20-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 20 cm	Vitel
18	Vitel	Volumetric water content at 20-cm depth, measured with Vitel sensor	H_2O v/v	Soil 20 cm	Vitel

Column No.	Column Name	Description	Units	Location	Sensor
19	Vitel	Soil temperature at 50-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 50 cm	Vitel
20	Vitel	Volumetric water content at 50-cm depth, measured with Vitel sensor	H_2O v/v	Soil 50 cm	Vitel
21	Vitel	Soil temperature at 100-cm depth, measured with Vitel sensor, Stack 1	°C	Soil 100 cm	Vitel
22	Vitel	Volumetric water content at 100-cm depth, measured with Vitel sensor	H_2O v/v	Soil 100 cm	Vitel
23	HEAT FLUX	Soil heat flux	W/m^2	Soil 5 cm	International Thermal Instrument
24	INT T	Datalogger temperature	°C	Datalogger	Campbell CR10
25	BATT	Battery voltage	volts	Enclosure	Campbell CR10

1.2 Naming Convention

`ggd627_tsagaan_delger.txt`: data from the Delger (White Bloom) site, Mongolia with a size of 16 KB

`ggd627_mongolia_soiltemp.xls`: Excel spreadsheet with the same data with a size of 44 KB

1.3 Spatial Coverage

Investigators collected data from the Delger (White Bloom) site, 190 km southeast of Ulaan Baatar, Mongolia. Coordinates are 46° 24' 22.6" N, 107° 38' 03.1" E.

1.4 Temporal Coverage

Data were collected from June 2001 through November 2002.

2 CONTACTS AND ACKNOWLEDGMENTS

Ron F. Paetzold
U.S. Department of Agriculture
Natural Resources Conservation Service
Lincoln, NE 68505
USA

Ichirow Kaihotsu
Hiroshima University
Kagamiyama 1-7-1
Higashi-hiroshima, 739-8521
Japan

Tom Jackson
USDA ARS Hydrology Lab
104 Bldg. 007, BARC-West
Beltsville, MD 20705
USA

Chien-Lu Ping
University of Alaska at Fairbanks
Palmer Research Center
Palmer, AK 99645

Garry Schaefer
USDA NRCS WCC
101 SW Main Suite 1600 Portland, OR 97204
USA

3 DOCUMENT INFORMATION

3.1 Publication Date

May 2003

3.2 Date Last Updated

February 2021

APPENDIX A - SOIL CHARACTERISTICS

Monthly Summaries of Soil Temperature and Soil Moisture in Mongolia

Pedon No: F01-002
Sampling area: Tsagaan Delger (White Blossom), (190 km southeast of Ulaan Baatar, Mongolia
Sampling location: Lat. 46°23' 36" N; Long. 107° 38' 5.6" E.
Elevation: 1555 m (GPS 4489 ft)
Landform: valley, rolling hills
Microrelief: slightly convex slope, 200 m long slope sampling at lower 1/3 position
Slope: 8 %
Aspect: 210°
Parent material: loess over calcareous lacustrine
Vegetation: steppe, heavily grazed (domestic livestock)
Special features: salt seep common in depressions
Sampling date: 05 June 2001
Sampled and described by: Chien-Lu Ping and Ron Paetzold
MAP: 200 mm est.
MAAT: 2 C est.
Depth to Permafrost: n/a
Depth of seasonal frost: n/a
Remarks: Soil climate station set up by Ron Paetzold and Garry Schaeffer

Table A - 1. Soil profile description

Horizon	Depth (cm)	Description
A	0-11	10YR4/4 (d) and 10YR3/3 (m) sandy loam; moderate medium subangular blocky structure; slightly firm, slightly sticky and slightly plastic; many very fine and fine and few medium roots; 3% pabble; clear smooth boundary (02-009)
Bw1	11-22	10YR3/4 (d) and 10YR 3/3 (m) sandy loam; weak medium subangular structure; friable, slightly sticky and slightly plastic; 5% pebble; common very fine and fine and few medium roots; clear smooth boundary (02-010)
Bw2	22-33	10YR4/4 (d) and 10YR 3/3 (m) sandy loam; massive; friable, slightly sticky and nonplastic; 5% pebble; common very fine and fine and few medium roots; abruot smooth boundary (02-011)
BCk	33-53	10YR8/1 (d) and 10YR5/3 (m) fine sandy loam; weak medium angular blocky structure; friable, slightly sticky and slightly plastic; common very fine and fine root channels (7.5YR4/4) some with roots remains; dense (many) root mat at the bottom of the horizon; powderly carbonates; clear smooth boundary (02-012)

Horizon	Depth (cm)	Description
Ck1	53-90	10YR8/1 (d) and 7.5YR7/2 carbonate deposit and 7.5YR4/4 very gravelly sandy loam (30%); moderate medium subangular structure; friable, slightly sticky ans slightly plastic; few medium and common fine root channels and remains; grave subrounded and angular 3-10 cm in diameterl with carbonate undercoating and Fe-humus coating on top; powderly carbonates; clear wavy boundary (02-013)
Ck2	90-100	Ck2 7.5YR6/2 and 7.5YR4/3 (30%) silt loam; moderate medium and fine subangular structures; slightly firm, slightly sticky and slightly plastic; many very fine and fine root channels and remains with color of 7.5YR4/4; (02-014)

Remarks:

On surface there is a 1cm layer of desert pavement made of andesitic fragments in pebble size; very gravelly sand; due to wind erosion.