



# SMAPVEX19-22 Massachusetts Temporary Soil Moisture Network, Version 1

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## USER GUIDE

### How to Cite These Data

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

Cosh, M., S. Kraatz, and A. Colliander. 2020. *SMAPVEX19-22 Massachusetts Temporary Soil Moisture Network, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. <https://doi.org/10.5067/3LXL78PSKVXQ>. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT [NSIDC@NSIDC.ORG](mailto:NSIDC@NSIDC.ORG)

FOR CURRENT INFORMATION, VISIT [https://nsidc.org/data/SV19MA\\_TNET](https://nsidc.org/data/SV19MA_TNET)



National Snow and Ice Data Center

# TABLE OF CONTENTS

1	DATA DESCRIPTION.....	2
1.1	Parameters .....	2
1.2	File Information .....	2
1.2.1	Format.....	2
1.2.2	File Contents .....	2
1.2.3	Naming Convention .....	3
1.3	Spatial Information .....	3
1.3.1	Coverage.....	3
1.3.2	Resolution.....	4
1.3.3	Geolocation .....	4
1.4	Temporal Information.....	5
1.4.1	Coverage.....	5
1.4.2	Resolution.....	5
2	DATA ACQUISITION AND PROCESSING .....	5
2.1	Acquisition .....	5
2.2	Processing .....	5
2.3	Quality, Errors, and Limitations .....	5
3	RELATED DATA SETS .....	5
4	RELATED WEBSITES.....	6
5	REFERENCES .....	6
6	DOCUMENT INFORMATION.....	6
6.1	Publication Date.....	6
6.2	Revision Date.....	6

# 1 DATA DESCRIPTION

These data consist of ground-based, soil moisture, soil temperature, and air temperature measurements recorded by twenty-five temporary stations located in the vicinity of Petersham, MA during the SMAPVEX19-22 campaign. The stations were installed across an area of approximately 23 km by 36 km in May 2019 and operated through 2022. Note that the product is named SMAPVEX19-22 because, although the current coverage is through 2021, it is projected to include 2022 data in the future.

## 1.1 Parameters

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This data set includes surface temperature, soil moisture, soil temperature, and air temperature for ground-based observations.

## 1.2 File Information

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### 1.2.1 Format

Data provided as Comma Separated Values (.csv) files.

### 1.2.2 File Contents

The data file contains the real part of the dielectric constant measured by soil moisture sensors at depths of 5 cm and 10 cm, and air temperature measured at 1.5 m.

Table 1. Data Fields and Descriptions

Variable	Description
ID	The station ID (401-425)
Date/Time	Date and time (yyyy/mm/dd HH:MM:SS)
RDC-v	Real part of the dielectric constant measured by the vertically installed sensor; Unitless
RDC-5	Real part of the dielectric constant measured by the sensor installed at 5 cm depth; Unitless
RDC-10	Real part of the dielectric constant measured by the sensor installed at 10 cm depth; Unitless
TS-v	Soil temperature measured by the vertically installed sensor; °C
TS-5	Soil temperature measured by the sensor installed at 5 cm depth; °C
TS-10	Soil temperature measured by the sensor installed at 10 cm depth; °C
Tair	Air temperature; °C

## 1.2.3 Naming Convention

Files are named according to the following convention:

SV19MA\_TNET\_v1.csv

Table 2. File Naming Convention

Variable	Description
SV19MA	SMAPVEX19-22 campaign; Petersham, Massachusetts site
TNET	Temporary network
v1	Version number
.csv	File extension

## 1.3 Spatial Information

### 1.3.1 Coverage

The Petersham, MA site coverage spans from 42.34° N to 42.69° N and 71.95° W to 72.29° W.

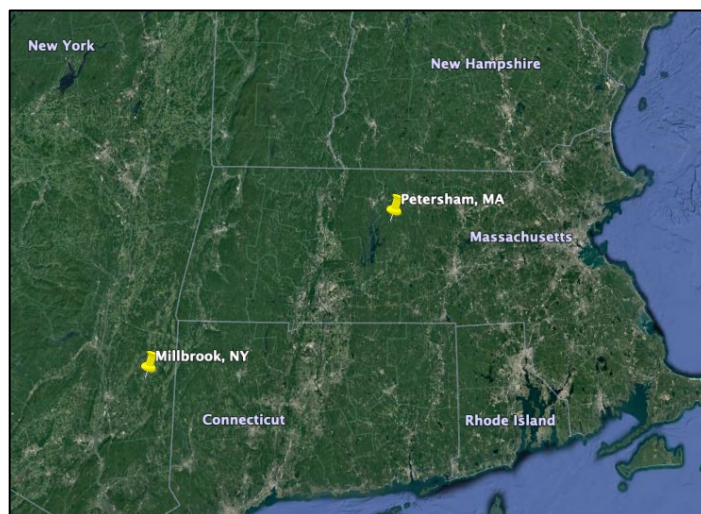


Figure 1. SMAPVEX19-22 Campaign Sites

Table 3. Station Location ID Numbers and Coordinates

ID	Latitude	Longitude
401	42.53523	-72.17393
402	42.53515	-72.17387
403	42.53503	-72.17385
404	42.51169	-72.21495
405	42.50965	-72.20412
406	42.43022	-72.121

407	42.559151	-71.954755
408	42.65856	-72.1681
409	42.64761	-72.15662
410	42.65373	-72.12053
411	42.68092	-72.01332
412	42.63366	-72.16853
413	42.42988	-71.95713
414	42.4334	-72.15585
415	42.42128	-72.1936
416	42.38341	-72.07815
417	42.5176	-72.20477
418	42.66071	-72.14417
419	42.62835	-72.02762
420	42.5074	-72.10041
421	42.47143	-72.11768
422	42.3804	-71.9763
423	42.38297	-72.19733
424	42.53523	-72.17393
425	42.53523	-72.17393

### 1.3.2 Resolution

These data are point observations.

### 1.3.3 Geolocation

The following table provides information for geolocating this data set:

Table 4. World Geodetic System 1984 (EPSG:4326)

<b>Geographic Coordinate System</b>	WGS 84
<b>Projected Coordinate System</b>	N/A
<b>Longitude of True Origin</b>	0°
<b>Latitude of True Origin</b>	N/A
<b>Scale factor at longitude of true origin</b>	N/A
<b>Datum</b>	World Geodetic System 1984
<b>Ellipsoid/spheroid</b>	WGS 84
<b>Units</b>	degree
<b>False Easting</b>	N/A

<b>False Northing</b>	N/A
<b>EPSG Code</b>	4326
<b>PROJ4 String</b>	+proj=longlat +datum=WGS84 +no_defs
<b>Reference</b>	<a href="http://epsg.io/4326">http://epsg.io/4326</a>

## 1.4 Temporal Information

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### 1.4.1 Coverage

This data set spans 1 May 2019 to 31 October 2021.

### 1.4.2 Resolution

Hourly

## 2 DATA ACQUISITION AND PROCESSING

### 2.1 Acquisition

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The soil moisture and soil temperature measurements were conducted with Stevens HydraProbe sensors. Three sensors were installed at each station location. One sensor was installed vertically, facing top down, while the other two were positioned horizontally, in the soil at depths of 5 cm and 10 cm respectively.

### 2.2 Processing

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These data include only basic quality checks and reformatting of the data.

### 2.3 Quality, Errors, and Limitations

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This Level 0 data was not calibrated or corrected. Some obviously erroneous data were filtered out. Where found, the value “10,000” represents invalid data.

## 3 RELATED DATA SETS

[SMAPVEX19-22 Millbrook Temporary Soil Moisture Network](#)

[SMAPVEX19-21 Massachusetts Vegetation Optical Depth](#)

## 4 RELATED WEBSITES

[SMAP Validation Data](#)

[SMAP Overview](#)

## 5 REFERENCES

Colliander, A., Cosh, M. H., Kelly, V. R., Kraatz, S., Bourgeau-Chavez, L., Siqueira, P., Roy, A., Konings, A. G., Holtzman, N., Misra, S., Entekhabi, D., O'Neill, P., & Yueh, S. H. (2020). SMAP Detects Soil Moisture Under Temperate Forest Canopies. *Geophysical Research Letters*, 47(19). <https://doi.org/10.1029/2020gl089697>

## 6 DOCUMENT INFORMATION

### 6.1 Publication Date

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December 2020

### 6.2 Revision Date

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May 2023