



# SMAPVEX16 Manitoba Meteorological Data, 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:

McNairn, H., K. Gottfried, and J. Powers. 2018. SMAPVEX16 Manitoba Meteorological Data, Version 1. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. <https://doi.org/10.5067/DLUBALJUPAWP>. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT [https://nsidc.org/data/SV16M\\_MET](https://nsidc.org/data/SV16M_MET)



National Snow and Ice Data Center

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# 1 DATA DESCRIPTION

## 1.1 Parameters

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This data set contains meteorological conditions from the Carman and Elm Creek weather stations, including:

- air temperature
- relative humidity
- precipitation
- soil temperature (measured at a depth of 5 cm)

## 1.2 File Information

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### 1.2.1 Format

Data are available in a single Comma Separated Values (.csv) file.

Location information for the relevant field sites are available in a Keyhole Markup language zipped (.kmz) file.

Extensible Markup Language (.xml) files with associated metadata are also provided.

### 1.2.2 File Contents

Data are presented in one .csv file, SV16M\_MET\_MAWeatherStations\_Vers3.csv.

Table 1 contains more details about this file's contents, and Figure 1 displays the column headers and ten lines of sample data.

Table 1. File Contents

File Columns	Descriptions
TIMESTAMP	Time of sampling in Central Daylight Savings Time, in MM/DD/YY HH:MM format
STATION	Weather station (Carman or Elm Creek)
AIR_TEMP	Average hourly temperature (°C)
REL_HUM	Average relative humidity (%)
PRECIP	Hourly precipitation totals (mm)
SOIL_TEMP_5	Average hourly soil temperature (°C), measured by Stevens Hydra-probe at a depth of 5 cm

TIMESTAMP	STATION	AIR_TEMP	REL_HUM	PRECIP	SOIL_TEMP_5
5/2/16 1:00	Carman	8.6	48.4	0	13
5/2/16 2:00	Carman	8.2	51.2	0	12.5
5/2/16 3:00	Carman	9.1	45.7	0	12.1
5/2/16 4:00	Carman	8.3	50.1	0	11.7
5/2/16 5:00	Carman	8.4	50.4	0	11.4
5/2/16 6:00	Carman	7.9	55.6	0	11.1
5/2/16 7:00	Carman	8	55.9	0	10.9
5/2/16 8:00	Carman	12.6	46.6	0	10.7
5/2/16 9:00	Carman	15.2	40.2	0	10.6
5/2/16 10:00	Carman	16.2	40.5	0	10.8

Figure 1. Sample Data

### 1.2.3 Naming Convention

File names are:

SV16M\_MET\_MAWeatherStations\_Vers3.csv

SV16M\_MET\_MAWeatherStations.kmz

SV16M\_MET is short for SMAPVEX16 (Soil Moisture Active Passive Validation Experiment 2016) Manitoba Meteorological Data.

## 1.3 Spatial Information

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### 1.3.1 Coverage

Northernmost Latitude: 49.680332° N

Southernmost Latitude: 49.499683° N

Eastermost Longitude: 97.98999° W

Westernmost Longitude: 98.033404° W

### 1.3.2 Resolution

Data were collected from two Manitoba Agriculture (MA) weather stations - Carman and Elm Creek.

### 1.3.3 Geolocation

The following table provides information for geolocating this data set

Table 2. Coordinate Reference System

<b>Geographic coordinate system</b>	NAD83(CSRS)
<b>Projected coordinate system</b>	NAD83(CSRS) / UTM Zone 14N
<b>Longitude of true origin</b>	-99
<b>Latitude of true origin</b>	0
<b>Scale factor at longitude of true origin</b>	0.9996
<b>Datum</b>	NAD83 Canadian Spatial Reference System
<b>Ellipsoid/spheroid</b>	GRS 1980
<b>Units</b>	meter
<b>False easting</b>	500000
<b>False northing</b>	0
<b>EPSG code</b>	3158
<b>PROJ4 string</b>	+proj=utm +zone=14 +ellps=GRS80 +towgs84=0,0,0,0,0,0,0 +units=m +no_defs
<b>Reference</b>	<a href="https://epsg.io/3158">https://epsg.io/3158</a>

## 1.4 Temporal Information

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### 1.4.1 Coverage

02 May 2016 through 30 September 2016

### 1.4.2 Resolution

Hourly

## 2 DATA ACQUISITION AND PROCESSING

### 2.1 Background

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This data set was collected as part of the [2016 Soil Moisture Active Passive Validation Experiment](#) conducted in the Carman/Elm Creek region of Manitoba, Canada. The experiment was designed to calibrate and increase the accuracy of NASA's Soil Moisture Active Passive (SMAP) products. For this data set, meteorological observations were collected to coincide with SMAP satellite overpasses and Passive Active L- and S-band Sensor (PALS) flights.

## 2.2 Acquisition

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This data set was supplied by [Manitoba Agriculture \(MA\)](#). MA operates 60 permanent weather stations around Manitoba, two of which are represented in this data set - Carman and Elm Creek. At both sites, temperature and relative humidity were measured approximately 2 meters off the ground. Soil moisture was measured at a depth of 5 cm. Data were recorded every five seconds and stored on Campbell Scientific dataloggers.

## 2.3 Processing

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5-second data were averaged into 15-minute, hourly, and daily data. This data set includes only the hourly values.

## 2.4 Instrumentation

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### 2.4.1 Description

Data were stored on Campbell Scientific dataloggers.

Vaisala sensors were used to measure temperature and relative humidity. More details are available on the [Vaisala Products and Services website](#).

Precipitation was measured using a OTT HydroMet Pluvio precipitation gauge. More details about this instrument are available on the [Hydromet's OTT Pluvio2 S Product website](#). In the summer months, a Hydrological Services tipping bucket rain gauge was also used to measure precipitation. More details about this instrument are available on the [Hydrological Services America Products website](#).

Soil temperature was measured with a Stevens HydraProbe. More details about this instrument are available on the [Stevens HydraProbe website](#).

## 3 RELATED DATA SETS

[SMAP Data | Overview](#)

## 4 RELATED WEBSITES

[SMAP at NASA](#)  
[SMAPVEX16](#)

[Manitoba Agriculture | Weather Stations](#)

## 5 CONTACTS AND ACKNOWLEDGMENTS

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## 6 DOCUMENT INFORMATION

### 6.1 Publication Date

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6 August 2018

### 6.2 Date Last Updated

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