SnowEx21 Prairie Station Hourly Meteorological Data, Version 1

USER GUIDE

How to Cite These Data

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

Sproles, E., R. Palomaki, A. Mullen, Z. Miller, and J. Hendrikx. 2024. *SnowEx21 Prairie Station Hourly 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/PVE8RWNUZTKS. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/SNEX21_PS_MET

National Snow and Ice Data Center

TABLE OF CONTENTS

1 DATA DESCRIPTION

1.1 Parameters

This data set contains observations from a meteorological station installed at the Central Agricultural Research Center in Moccasin Montana as part of the NASA SnowEx 2021 Prairie Snow field campaign. Parameters include: air temperature, wind speed and direction, and barometric pressure (Table 1). Data are available from 12 November 2020 through 2 March 2021.

Table 1. Parameters

Parameter	Unit	Description
RECORD	-	Numerical ID for each instance of data collection (0-3380)
TIMESTAMP	hours	Time in UTC (MM/DD/YYYY HH:00)
AirTC_Avg	°C	Average air temperature
RH	%	Relative humidity
Windspeed_ms	m/s	Vector mean wind speed
WS_ms_Max	m/s	Vector max wind speed
WindDir	°	Vector mean wind direction
BP_mmHg	mmHG	Barometric pressure

1.2 File Information

1.2.1 Format

The data are available as a single comma-separated value (CSV) file.

1.2.2 File Contents

The CSV file consists of 8 columns of data, starting with a header row containing parameter names, as listed in Table 1.

1.2.3 Naming Convention

The data file is named `SNEX21_PS_MET_20201120_20210421_V01.0.csv`.

`SNEX21_PS` refers to the SnowEx 2021 Prairie Station Field Campaign, `MET` refers to meteorological data, `V01.0` refers to the data set version number, and `.csv` refers to the file type.

1.3 Spatial Information

1.3.1 Coverage

47.060545° N, 109.956783° W

1.3.2 Resolution

Measurements were taken at a single geographic point representing the location of a fixed meteorological instrument tower. Each instrument was located ~2 m above the ground.

1.3.3 Geolocation

The following tables provide information for geolocating this data set.

Table 2. Geolocation Details

Geographic coordinate system	WGS 84
EPSG code	4326
PROJ4 string	+proj=longlat +datum=WGS84 +no_defs +type=crs
Reference	https://epsg.io/4326

1.4 Temporal Information

1.4.1 Coverage

12 November 2020 to 01 April 2021

1.4.2 Resolution

Hourly

2 DATA ACQUISITION

2.1 Background

As part of the NASA SnowEx 2021 Prairie Snow field campaign, a meteorological station was installed at the Central Agricultural Research Center in Moccasin, Montana. The station collected a suite of supporting meteorological data; data collection overlapped temporally with other SnowEx observations, including Snow Ex21 Prairie Station Digital Surface Models from UAV-LiDAR,

Version 1 and SnowEx21 Prairie Station In Situ Dielectric Soil Moisture and Soil Temperature, Version 1.

2.2 Acquisition

All data, including air temperature, relative humidity, mean/max wind speed and direction, and barometric pressure data were measured at an elevation of 2 meters above the ground surface. Data was collected hourly over a period of 5 months.

2.3 Quality, Errors, and Limitations

Error in air temperature, wind speed, wind direction and barometric pressure are dependent on instrument accuracy. See Table 3 below for reported accuracy.

Table 3. Instrument Accuracy

Parameter	Instrument Accuracy
AirTC	±0.1°C (-40° to +40°C)
	±0.3°C (-60 to -40°C and 40 to 60°C)
WS	±0.3 m/s (0.6 mph)
BP	±0.3 hPa (at 20°C)
	±0.5 hPa (at -40° to +60°C)

2.4 Instrumentation

2.4.1 Description

Table 4 lists each instrument installed on the weather station and its specifications.

Table 4. Instrumentation Details

Instrument	Measured Parameters	Description
Campbell Scientific TempVue 20	Air temperature	Probe which measures temperature using a wire-wrapped, four-wire Pt100 Resistance Temperature Detector (RTD) element encapsulated in an epoxy-filled, stainless-steel housing Specifications
R.M. Young 05103L	Vector mean wind speed, vector mean wind direction	Wind monitor featuring a 4-blade helicoid propeller and precision potentiometer. Specifications
Campbell Scientific BaroVue 10	Barometric pressure	Sensor capable of measuring barometric pressure between range of 500 to 1100 hPa. Specifications

3 VERSION HISTORY

Table 5. Version History Summary

Version	Date Implemented	Impacted Temporal Coverage	Description of Changes
v01.0	September 2024	12 November 2020 – 02 April 2021	Initial release

4 RELATED DATA SETS

SnowEx at NSIDC | Data Sets

SnowEx21 Prairie Station Digital Surface Models from UAV-LiDAR, Version 1

SnowEx21 Prairie Station in Situ Dielectric Soil Moisture and Soil Temperature, Version 1

5 RELATED WEBSITES

SnowEx at NSIDC | Overview

SnowEx at NASA

6 DOCUMENT INFORMATION

6.1 Publication Date

October 2024

6.2 Date Last Updated

October 2024