



# SnowEx20 Jemez UNM 800 MHz MALA GPR, 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:

Webb, R. 2021. *SnowEx20 Jemez UNM 800 MHz MALA GPR, Version 1* [Indicate subset used].  
Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center.  
<https://doi.org/10.5067/H38Q5FTBPZ8K>. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT [https://nsidc.org/data/SNEX20\\_J\\_UNM\\_GPR](https://nsidc.org/data/SNEX20_J_UNM_GPR)



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.....	3
1.3.3	Geolocation.....	3
1.4	Temporal Information .....	3
1.4.1	Coverage .....	3
1.4.2	Resolution.....	3
2	DATA ACQUISITION AND PROCESSING.....	4
2.1	Background .....	4
2.2	Acquisition.....	4
2.3	Processing.....	4
2.4	Quality, Errors, and Limitations .....	4
2.5	Instrumentation.....	4
3	SOFTWARE AND TOOLS .....	4
4	VERSION HISTORY .....	5
5	RELATED DATA SETS.....	5
6	RELATED WEBSITES .....	5
7	CONTACTS AND ACKNOWLEDGMENTS .....	5
8	REFERENCES .....	5
9	DOCUMENT INFORMATION.....	5
9.1	Publication Date .....	5
9.2	Date Last Updated .....	5

# 1 DATA DESCRIPTION

## 1.1 Parameters

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This data set contains the results of a ground penetrating radar (GPR) survey conducted at Jemez, New Mexico during the SnowEx20 campaign. The main parameters in this data set are two-way travel time, snow depth and snow water equivalent (SWE). Two-way travel time is the time it takes for a radar wave to travel from the point of release to the reflection point and back. Snow depth and SWE are derived from two-way travel times.

## 1.2 File Information

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### 1.2.1 Format

Data are provided in a single comma-separated values (.csv) file.

### 1.2.2 File Contents

The .csv files contain 12 columns with the parameters listed in Table 1.

Table 1. Data Parameters

Name	Description	Unit/Format
date_mmdyy	5-digit date representation (first digit of the month is omitted because it was zero)	[mddy]
Time_GMT	Greenwich Mean Time (hour and minute) of data acquisition	[HH:MM]
Long	Longitude	degree
Lat	Latitude	degree
elev_m	Elevation	m
TWT_ns	Two-way travel time	ns
velocity_m/ns	GPR signal velocity	m/ns
depth_m	Snow depth	m
SWE_mm	Snow water equivalent	mm
Northing	Northing	m
Easting	Easting	m
UTMZone	Universal Transverse Mercator time zone	[NA]

## 1.2.3 Naming Convention

The single data file is named SNEX20\_J\_UNM\_GPR.csv referring to SnowEx20 University of New Mexico ground penetrating radar data collected at Jemez, New Mexico.

## 1.3 Spatial Information

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### 1.3.1 Coverage

Northernmost Latitude: 35.889° N

Southernmost Latitude: 35.850° N

Easternmost Longitude: 106.505° W

Westernmost Longitude: 106.538° W

### 1.3.2 Resolution

Point measurements

### 1.3.3 Geolocation

The following table provides information for geolocating this data set.

Table 2. Geolocation Details

<b>Geographic coordinate system</b>	WGS 84
<b>EPSG code</b>	4326
<b>PROJ4 string</b>	+proj=longlat +datum=WGS84 +no_defs
<b>Reference</b>	<a href="https://epsg.io/4326">https://epsg.io/4326</a>

Additionally, to latitude/longitude in WGS 84 (epsg.io/4326) the data file also contains northing/easting in WGS 84 / UTM zone 13N (epsg.io/32613).

## 1.4 Temporal Information

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### 1.4.1 Coverage

22 January 2020 to 04 March 2020

### 1.4.2 Resolution

Seconds

## 2 DATA ACQUISITION AND PROCESSING

### 2.1 Background

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This data set contains the results of ground-penetrating radar surveys conducted at Jemez, New Mexico during the SnowEx20 field campaign. Data were collected between 22 January 2020 and 04 March 2020. using a MALA Geosciences ground penetrating radar unit with an 800 MHz antenna.

### 2.2 Acquisition

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Data were collected using a MALA Geosciences Professional Explorer (ProEx) GPR unit with an 800 MHz antenna. Data were logged approximately every 0.1 seconds. The GPR unit was towed behind a skier with an attached GPS

### 2.3 Processing

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Two-way travel times between the snow surface and the ground surface were picked using a semi-automatic method in the [ReflexW2D software package](#).

Two-way travel times were converted to snow depth and SWE using equations described in Kovacs et al., 1995. Average snow density data corresponding to the day of GPR measurements were collected from the snow pit observation nearest to the GPR surveys.

### 2.4 Quality, Errors, and Limitations

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Uncertainty of two-way travel times, snow depth, and SWE are on the order of 0.2 ns, 3cm, and 5-10%, respectively.

### 2.5 Instrumentation

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Data were collected using a MALA Geosciences Professional Explorer (ProEx) control unit. More information about this instrument can be found on the [MALA Ground Penetrating Radar](#) website.

## 3 SOFTWARE AND TOOLS

The .csv files can be accessed using software that reads ASCII text.

## 4 VERSION HISTORY

Table 3. Version History Summary

Version	Release Date	Description of Changes
V1	03 June 2021	Initial release

## 5 RELATED DATA SETS

[SnowEx at NSIDC | Data Sets](#)

## 6 RELATED WEBSITES

[SnowEx at NSIDC | Overview](#)

[SnowEx at NASA](#)

## 7 CONTACTS AND ACKNOWLEDGMENTS

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## 8 REFERENCES

Kovacs, A., Gow, A. J., & Morey, R. M. (1995). The in-situ dielectric constant of polar firn revisited. *Cold Regions Science and Technology*, 23, 245–256, [https://doi.org/10.1016/0165-232X\(94\)00016-Q](https://doi.org/10.1016/0165-232X(94)00016-Q).

## 9 DOCUMENT INFORMATION

### 9.1 Publication Date

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03 June 2021

### 9.2 Date Last Updated

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