Near-Real-Time DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures, Version 2

USER GUIDE

How to Cite These Data

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

Brodzik, M. J. and R. Armstrong. 2018. *Near-Real-Time DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures, Version 2.* [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/K7VT6D6Y2SO6. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/NSIDC-0342

National Snow and Ice Data Center

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1 DATA DESCRIPTION

This data set provides daily, near-real-time Special Sensor Microwave Imager/Sounder (SSMIS) brightness temperatures on the Equal-Area Scalable Earth-Grid (EASE-Grid). The data set consists of gridded data in two projections: Northern Hemisphere and Southern Hemisphere. The data lag by one day and provide 365 days of near-real-time data. The spatial resolution is 25 km for all channels. Data are contained in flat binary files.

1.1 Parameters

The parameter of this data set is brightness temperature.

1.2 File Information

1.2.1 Format

Brightness temperature data are contained in flat binary files (little-endian) with one array per file consisting of 2-byte integer arrays of brightness temperatures in tenths of kelvins.

Time data are contained in 2-byte, signed integer arrays.

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

1.2.2 File Contents

Each brightness temperature file contains gridded data for a single sensor channel and polarization; they are derived from either ascending or descending orbits (for example, 37 GHz, horizontal, ascending) for one day. There are 18 brightness temperature files per day for each projection. There are two files for each day (ascending and descending orbits) for each projection and for each sensor channel (frequency and polarization).

Time data are minutes since 00:00 Coordinated Universal Time (UTC) of the date of the enclosing file. Each time file represents the corresponding time of the swath sample used for the interpolation of the given grid cell, for either ascending or descending orbits for that day. There are two time files per day (ascending and descending passes) for a given projection, both at 25 km resolution.

1.2.3 Directory Structure

Data are available on the HTTPS site at:
https://daacdata.apps.nsidc.org/pub/DATASETS/nsidc0342_nrt_ease_grid_tbs/

1.2.4 Naming Convention

Files are named according to the following convention and as described in Table 1:

`ID2-Fxx-HHYYYYDDDP.CCC.gz`

Table 1. File Naming Convention

Variable	Description
`ID2`	Indicates that this data was interpolated with an inverse distance squared method.
`Fxx`	DMSP satellite ID (`F17`: DMSP-F17, `F18` DMSP-F18)
`HH`	Hemisphere (`NL`: Northern, `SL`: Southern)
`YYYY`	4-digit year
`DDD`	3-digit day of year
`P`	Direction of pass (`A`: ascending, `D`: descending)
`CCC`	Indicates channel and polarization or time file: `19H`: 19 GHz Horizontal `19V`: 19 GHz Vertical `22V`: 22 GHz Vertical `37H`: 37 GHz Horizontal `37V`: 37 GHz Vertical `85H`: 85 GHz Horizontal (SSM/I data only) `85V`: 85 GHz Vertical (SSM/I data only) `91H`: 91 GHz Horizontal (SSMIS data only) `91V`: 91 GHz Vertical (SSMIS data only) `tim`: Time file
`gz`	Indicates that this is a gzipped file

1.3 Spatial Information

1.3.1 Coverage

Data files are provided in two different spatial coverages: Northern Hemisphere and Southern Hemisphere.

1.3.2 Spatial Resolution

The spatial resolution for all channels is 25 km.

1.3.3 Geolocation

The following tables provide information for geolocating this data set.

Table 2. Geolocation Details

Geographic Coverage	Northern Hemisphere	Southern Hemisphere
Geographic coordinate system	Unspecified datum based upon the International 1924 Authalic Sphere	Unspecified datum based upon the International 1924 Authalic Sphere
Projected coordinate system	Northern Hemisphere Lambert Azimuthal	Southern Hemisphere Lambert Azimuthal
Longitude of true origin	0	0
Latitude of true origin	90	-90
Scale factor at longitude of true origin	1	1
Datum	Not specified (based on International 1924 Authalic Sphere)	Not specified (based on International 1924 Authalic Sphere)
Ellipsoid/spheroid	International 1924 Authalic Sphere	International 1924 Authalic Sphere
Unit	meters	meters
False easting	0	0
False northing	0	0
EPSG code	3408	3409
PROJ4 string	+proj=laea +lat_0=90 +lon_0=0 +x_0=0 +y_0=0 +a=6371228 +b=6371228 +units=m +no_defs	+proj=laea +lat_0=-90 +lon_0=0 +x_0=0 +y_0=0 +a=6371228 +b=6371228 +units=m +no_defs
Reference	https://epsg.io/3408	https://epsg.io/3409

Table 3. Grid Details

Grid cell size (x, y pixel dimensions)	25.0 km
Number of rows	721
Number of columns	721
Nominal gridded resolution	25 km by 25 km
Grid rotation	N/A
ulxmap – x-axis map coordinate of the center of the upper-left pixel (XLLCORNER for ASCII data)	-9036842.76
ulymap – y-axis map coordinate of the center of the upper-left pixel (YLLCORNER for ASCII data)	9036842.76

1.4 Temporal Information

1.4.1 Coverage

This data set provides near-real-time SSMIS brightness temperatures for approximately the past 365 days with a 1-day lag period.

1.4.2 Resolution

Daily

2 DATA ACQUISITION AND PROCESSING

2.1 Background

The DMSP SSMIS instrument measures passive microwave radiances. For details regarding the SSMIS instrument, refer to the SMMR, SSM/I, and SSMIS Sensors Summary.

2.2 Acquisition

Input data are acquired via HTTPS from the Comprehensive Large Array-data Stewardship System (CLASS) at the National Oceanic and Atmospheric Administration (NOAA).

2.3 Processing

These data are intended as a near-real-time extension of the DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures data set. Processing are identical between the two, except that the input data source for this product comes from the NOAA CLASS system rather than Remote Sensing Systems (RSS). Users should refer to the DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures user guide for more details.

2.4 Quality, Errors, and Limitations

Due to the near-real-time nature of this data set, quality assessment is not performed.

2.5 Instrumentation

2.5.1 Description

These data were acquired using the SSMIS instrument on the DMSP-F18 platform. For more information about the instrument and platform, refer to the SMMR, SSM/I, and SSMIS Sensors Summary.

3 SOFTWARE AND TOOLS

Geolocation tools for this data set are available via the EASE-Grid Data Tools web page.

4 VERSION HISTORY

Table 4 provides a summary of the version history of this product.

Table 4. Summary of Version History

Version	Release Date	Description of Changes
V2	28 March 2018	Switched the SSMIS processing stream from the DMSP-F17 satellite to SSMIS data from the DMSP-F18 satellite.
V1	01 September 2009	Changes to this version include: Swtiched the SSM/I processing stream from the DMSP-F13 satellite to SSMIS data from the DMSP-F17 satellite. Changed the gridding interpolation method from Backus-Gilbert (BG) to inverse distance squared (ID2) to maintain consistency between this data set and the DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures data set. SSMIS swath data, the input data source for this product, is obtained from the NOAA CLASS system rather than RSS.
	2008	Initial release of this data product using SSM/I on the DMSP-F13 satellite.

4.1.1 Version 2 Update, 28 March 2018

As of 06 March 2018, NSIDC switched its SSMIS processing stream from the DMSP-F17 satellite to SSMIS data from the DMSP-F18 satellite. Data prior to this date will overlap with DMSP-F17 and remain available via HTTPS until they age off (approximately 9 months). An assessment of the data comparing the results from SSMIS DMSP-F17 and SSMIS DMSP-F18 showed that, for any given day, about half of the F17 and F18 observations overlap identical grid cells with a time separation of less than two hours. Through linear regression testing, observations from the two

satellites align with very high correlation. Lower frequency channels generally have offsets of less than 5 Kelvin with r2 correlations above 0.98, and higher frequency channels show biases less than 10 Kelvin with r2 correlation values above 0.95.

4.1.2 Version 1 Update, 01 September 2009

The DMSP-F13 satellite that has been central to our brightness temperature products for the past several years is nearing the end of its mission and is no longer a reliable resource for our brightness temperature products. As is standard data practice, we have transitioned to a newer sensor. As of 01 September 2009, NSIDC switched its SSM/I processing stream from the DMSP-F13 satellite to SSMIS data from the DMSP-F17 satellite. For data continuity, F17 data have been acquired and processed back to 01 August 2009 to allow for a one-month overlap period for the two sensors. The F13 data will remain available via FTP until they age off and are eventually replaced by the F17 data. However, NSIDC recommends using the F13 near-real-time data for intercomparison purposes only. SSMIS data from the DMSP-F17 satellite are used for the current near-real-time product.

Regarding the F17 data, users should note a difference in the high frequency channel. The SSMIS sensor is similar to the SSM/I sensor and has the same low frequency channels: dual-polarized 19 GHz and 37 GHz channels, and a vertically polarized 22 GHz channel. However, the high-frequency 85.5 GHz channel on SSM/I has been replaced by a 91 GHz channel on SSMIS. Users should note that the different frequency will affect any products that employ a high frequency channel.

5 RELATED DATA SETS

DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures

6 CONTACTS AND ACKNOWLEDGMENTS

Mary J. Brodzik
CIRES, 449 UCB
University of Colorado
Boulder, CO 80309-0449 USA
(303) 492-6199

7 DOCUMENT INFORMATION

7.1 Publication Date

23 July 2019

7.2 Date Last Updated

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