Near-Real-Time DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures, Version 1

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. 2008. *Near-Real-Time DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures, Version 1.* [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/BBQSXI3ERWWY. [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 (SSM/I) and Special Sensor Microwave Imager/Sounder (SSMIS) brightness temperatures in 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 270 days of near-real-time data. The spatial resolution is 25 km for all channels. Data are contained in flat binary files.

1.1 Format

1.1.1 Brightness Temperature Files

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.

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)

1.1.2 Time Files

Time data are contained in 2-byte, signed integer arrays. 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 File and Directory Structure

Data are available on the HTTPs site in the https://daacdata.apps.nsidc.org/pub/DATASETS/nsidc0342_nrt_ease_grid_tbs/ directory.

1.3 File Naming Convention

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

```
ID2-Fxx-HHYYYYDDDP.CCC.gz
```

Where:

Table 1. File Naming Convention

Variable	Description
ID2	Indicates that this data was interpolated with an inverse distance squared method.
Fxx	DMSP satellite ID (f13: DMSP-F13; f17: DMSP-F17)
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

1.4 File Size

Gzipped Brightness Temperature Files: 133 KB to 417 KB per file

Gzipped Time Files: 9.7 KB to 30 KB per file

1.5 Spatial Coverage

These data files are provided in two different spatial coverages: Northern Hemisphere and Southern Hemisphere. Please see the Grid Extent Table on the EASE-Grid: A Versatile Set of Equal-Area Projections and Grids web page for specific latitude and longitude values.

1.5.1 Spatial Resolution

The spatial resolution for all channels is 25 km.

1.5.2 Projection/Grid Description

The SSM/I azimuthal EASE-Grids are equal-area projections: one for the Northern and one for the Southern Hemisphere. Please see the EASE-Grid for more information on the EASE-Grid.

1.6 Temporal Coverage and Resolution

This data set provides near-real-time SSM/I and SSMIS brightness temperatures for the past 270 days with a one-day lag period. The resolution is daily.

1.7 Parameter or Variable

The parameter of this data set is brightness temperature.

1.7.1 Parameter Description

Please refer to the 1.7 section of the DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures guide document for more information on the parameters in this data set.

1.8 Quality Assessment

Due to the near-real-time nature of this data set, no quality assessment is performed.

2 SOFTWARE AND TOOLS

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

2.1 Related Data Collections

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

3 DATA ACQUISITION AND PROCESSING

3.1 Theory of Measurements

The DMSP SSM/I and SSMIS instruments measure passive microwave radiances. For a detailed description of how the instruments obtain these measurements, refer to the Summary of SMMR, SSM/I, and SSMIS Sensors Technical Reference.

3.2 Data Acquisition Methods

Input data are acquired via FTP. The F13 input data were acquired from NASA's Global Hydrology Research Center (GHRC) and F17 input data are acquired from NOAA's National Environmental Satellite, Data, and Information Service (NESDIS).

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 has 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. Any such products should be evaluated for the impact of the different frequency and adjustments may be necessary for consistent products.

3.3 Derivation Techniques and Algorithms

These data have been interpolated with an inverse distance-squared (ID2) interpolation.

3.3.1 Processing Steps

These data are intended as a near-real-time extension of the DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures data set. Data processing is the same as for DMSP SSM/I-SSMIS Pathfinder Daily EASE-Grid Brightness Temperatures with the following exceptions:

1. Input data source of SSM/I swath data is from GHRC rather than Remote Sensing Systems (RSS).
2. Input data source of SSMIS swath data is from NESDIS rather than Remote Sensing Systems (RSS).
3. Gridding interpolation method is ID2 instead of Backus-Gilbert.

For information on the processing of these data, please see the 3.3.1section in the DMSP SSM/I Pathfinder Daily EASE-Grid Brightness

3.4 Sensor or Instrument Description

These data were acquired using the SSM/I instrument on the DMSP-F13 platform and the SSMIS instrument on the DMSP-F17 platform. For more information about = these instruments, please see Summary of SMMR, SSM/I, and SSMIS Sensors Technical Reference.

4 REFERENCES AND RELATED PUBLICATIONS

Brodzik, M. J. and K. W. Knowles. 2002. "EASE-Grid: A Versatile Set of Equal-Area Projections and Grids" in M. Goodchild (Ed.) Discrete Global Grids. Santa Barbara, California USA: National Center for Geographic Information & Analysis.

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