SMEX02 AMSR-E Level 3 Daily Gridded Brightness Temperatures, Iowa, Version 1

USER GUIDE

How to Cite These Data

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

Njoku, E. G. 2004. *SMEX02 AMSR-E Level 3 Daily Gridded Brightness Temperatures, Iowa, Version 1.* [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/N3VFUVIPUOBJ. [Date Accessed].

National Snow and Ice Data Center

TABLE OF CONTENTS

1 DETAILED DATA DESCRIPTION

1.1 Format

The latitude and longitude data are ASCII files. Each daily brightness temperature file contains 24 data arrays of dimension 24 x 35 (rows/latitudes x columns/longitudes). The data are stored as two-byte, big-endian integers in column major order, where following along the stored contiguous data increases rows before columns. Data arrays are from the 6.9, 10.7, 18.7, 36.5, and 89.0 GHz channels (V and H). The order and spatial resolution of the 24 data arrays are shown in the following table.

Table 1. Order and Spatial Resolution of
Data Arrays

Channel	Type	Resolution
TB06.9V	Ascending	56 km
TB06.9H	Ascending	56 km
TB10.7V	Ascending	56 km
TB10.7H	Ascending	56 km
TB18.7V	Ascending	56 km
TB18.7H	Ascending	56 km
TB36.5V	Ascending	56 km
TB36.5H	Ascending	56 km
TB36.5V	Ascending	12 km
TB36.5H	Ascending	12 km
TB89.0V	Ascending	12 km
TB89.0H	Ascending	12 km
TB06.9V	Descending	56 km
TB06.9H	Descending	56 km
TB10.7V	Descending	56 km
TB10.7H	Descending	56 km
TB18.7V	Descending	56 km
TB18.7H	Descending	56 km
TB36.5V	Descending	56 km
TB36.5H	Descending	56 km
TB36.5V	Descending	12 km
TB36.5H	Descending	12 km
TB89.0V	Descending	12 km
TB89.0H	Descending	12 km

1.2 File Naming Convention

Brightness temperature data file names use the following convention:

Iowa_AMSR_E_L3_DailyLand_X1_YYYYMMDD.bin
where:
X1 = version number of the level 3 data
YYYY = four-digit year
MM = two-digit month
DD = two-digit day

Latitude and longitude files are named "Iowa_lat.txt" and "Iowa_lon.txt".

1.3 File Size

Binary files are 40 KB each. Longitude and latitude files are 14 KB.

1.4 Volume

Binary files are 40 KB each. Longitude and latitude files are 14 KB. Total volume is 3.2 MB.

1.5 Spatial Coverage

The study area covers the state of Iowa in the United States.

Southernmost Latitude: 39 ° N
Northernmost Latitude: 45° N
Westernmost Longitude: -98° W
Easternmost Longitude: -89° W

1.5.1 Spatial Resolution

Each daily brightness temperature file contains data arrays from the 6.9, 10.7, 18.7, 36.5, and 89.0 GHz channels (V and H). The resolution is either 56 km or 12 km. The 6.9, 10.7, and 18.7 (V and H) data are 56 km resolution; the 89.0 GHz (V and H) data are 12 km resolution. The 36.5 GHz (V and H) data are provided with both 56 km and 12 km resolution. (Refer to the channel table in the Format section of this document.)

The 56 km and 12 km resolutions correspond to the Resolution 1 and Resolution 4 definitions contained in the AMSR-E/Aqua L2A Global Swath Spatially-Resampled Brightness Temperatures (Tb) documentation under Spatial Resolution.

1.5.2   Projection Description

The data are in 25 km cylindrical EASE-Grid projection. Please see Processing Steps for details.

1.6 Temporal Coverage

The study was conducted 1 June through 31 August 2002.

1.7 Parameter or Variable

1.7.1   Parameter Description

This data set contains AMSR-E level 3 daily gridded brightness temperatures.
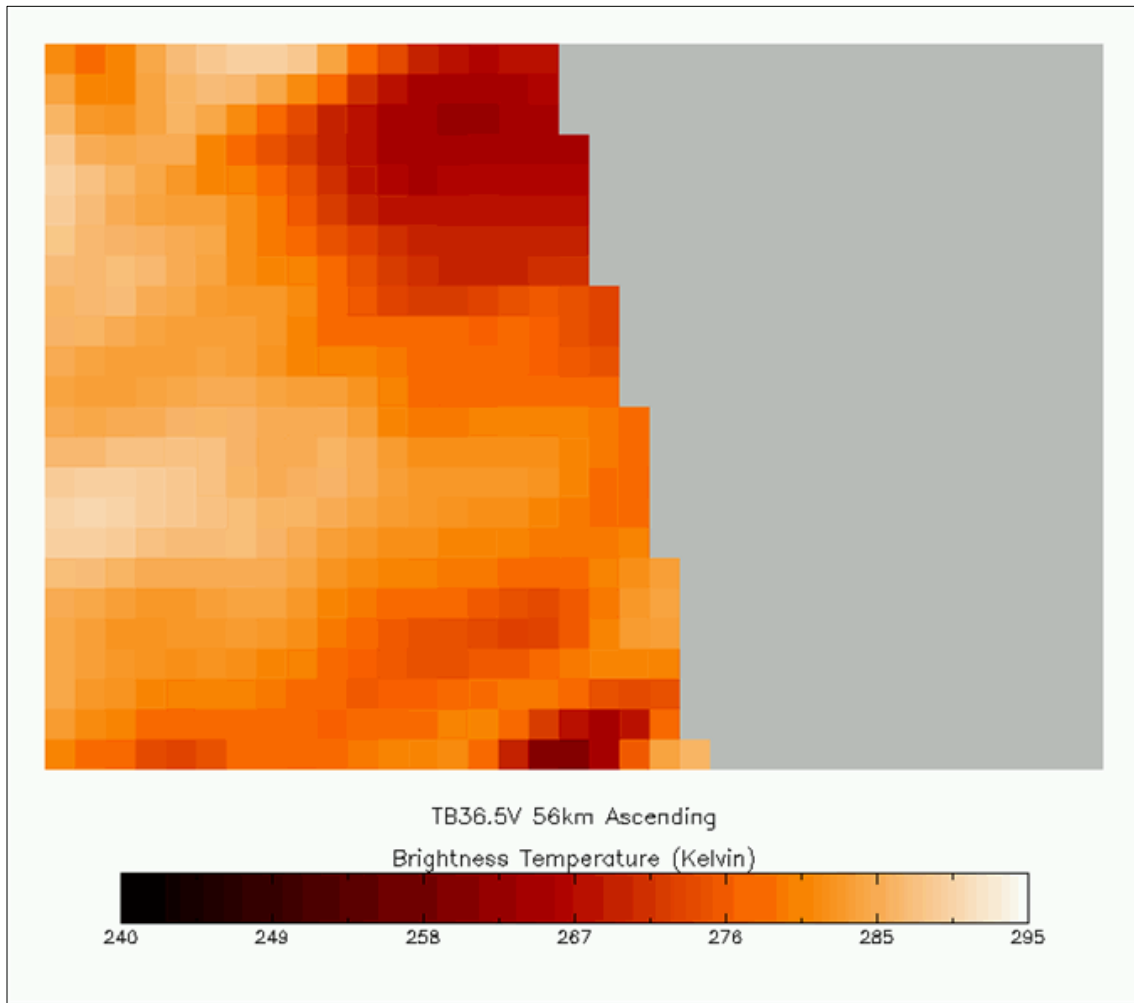
1.7.2   Unit of Measurement

Brightness temperatures are given in tenths Kelvin.

1.7.3   Parameter Values

The brightness temperature data values are in units of tenths Kelvin, and are written as two-byte integers. The data arrays are written sequentially in flat binary format on a big-endian UNIX machine.

1.7.4   Sample Images

The following sample images illustrate the 36.5 GHz (V) data in 56 km and 12 km resolution.
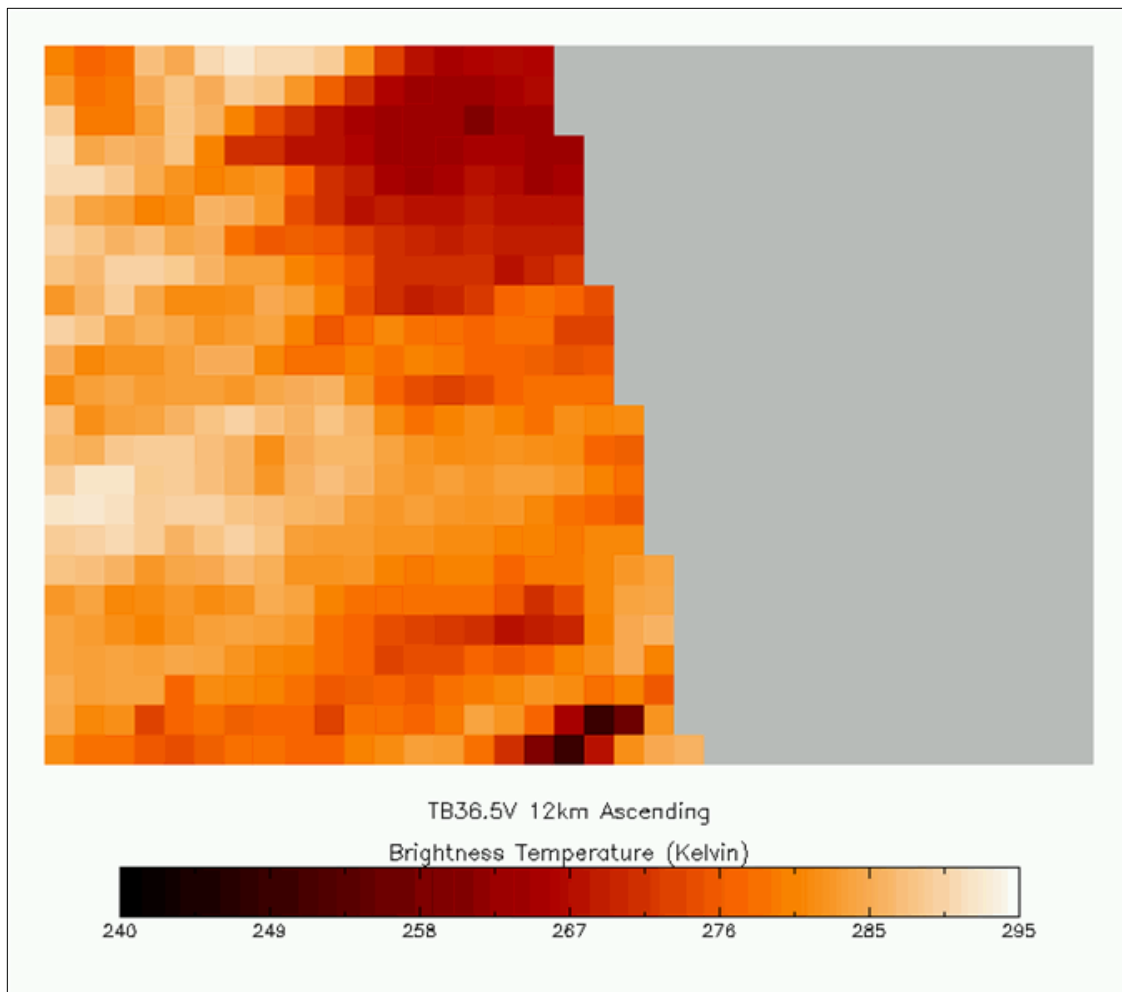
Figure 1. 56 km sample

Figure 2. 12 km sample

2 SOFTWARE AND TOOLS

The following MATLAB code illustrates how the data arrays can be read:

```
fid = fopen('Iowa_AMSR_E_L3_DailyLand_X1_20020601.bin','r','ieee-be');
  TB06vr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB06hr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB10vr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB10hr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB18vr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB18hr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB36vr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB36hr1a = fread(fid,[24 35],'integer*2') * 0.1;
  TB36vr4a = fread(fid,[24 35],'integer*2') * 0.1;
  TB36hr4a = fread(fid,[24 35],'integer*2') * 0.1;
  TB89vr4a = fread(fid,[24 35],'integer*2') * 0.1;
  TB89hr4a = fread(fid,[24 35],'integer*2') * 0.1;
  TB06vr1d = fread(fid,[24 35],'integer*2') * 0.1;
  TB06hr1d = fread(fid,[24 35],'integer*2') * 0.1;
  TB10vr1d = fread(fid,[24 35],'integer*2') * 0.1;
```

```
TB10hr1d = fread(fid,[24 35],'integer*2') * 0.1;
TB18vr1d = fread(fid,[24 35],'integer*2') * 0.1;
TB18hr1d = fread(fid,[24 35],'integer*2') * 0.1;
TB36vr1d = fread(fid,[24 35],'integer*2') * 0.1;
TB36hr1d = fread(fid,[24 35],'integer*2') * 0.1;
TB36vr4d = fread(fid,[24 35],'integer*2') * 0.1;
TB36hr4d = fread(fid,[24 35],'integer*2') * 0.1;
TB89vr4d = fread(fid,[24 35],'integer*2') * 0.1;
TB89hr4d = fread(fid,[24 35],'integer*2') * 0.1;
fclose(fid);
```

3 DATA ACQUISITION AND PROCESSING

3.1 Derivation Techniques and Algorithms

3.1.1 Processing Steps

The level 3 data are derived from level 2A source data. (See the AMSR-E/Aqua L2A Global Swath Spatially-Resampled Brightness Temperatures (Tb) documentation.) Level 3 gridded data were derived by resampling the level 2A swath data to the 25 km cylindrical EASE-Grid projection, using bin-averaging, and then compositing the daily swaths into separate ascending and descending grids. To associate a given array value with its location, refer to the latitude file "Iowa_lat.txt" and the longitude file "Iowa_lon.txt." For details regarding the EASE-Grid projection, please see All About EASE-Grid.

4 CONTACTS AND ACKNOWLEDGMENTS

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5 DOCUMENT INFORMATION

5.1 Publication Date

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5.2 Date Last Updated

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