Nimbus-7 SMMR Antenna Temperatures, Version 1

USER GUIDE

How to Cite These Data

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

Gloersen, P. and E. A. Francis. 2003. *Nimbus-7 SMMR Antenna 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/C8ZJDDHZAS59. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/NSIDC-0037

National Snow and Ice Data Center

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1   DATA DESCRIPTION

1.1 Parameters

The main parameter for this data set is raw antenna temperatures.

1.1.1   File Size

The size of each daily file is 35 MB.

1.1.2   Northern Hemisphere File Contents

- Header: 608 bytes
- Array: 608 columns X 448 rows
- Each row contains 304 bytes of daily, gridded antenna brightness temperatures followed by 304 bytes with a value of "1" (see Figure 1 for an example).
- Integer: 16-bit, big endian
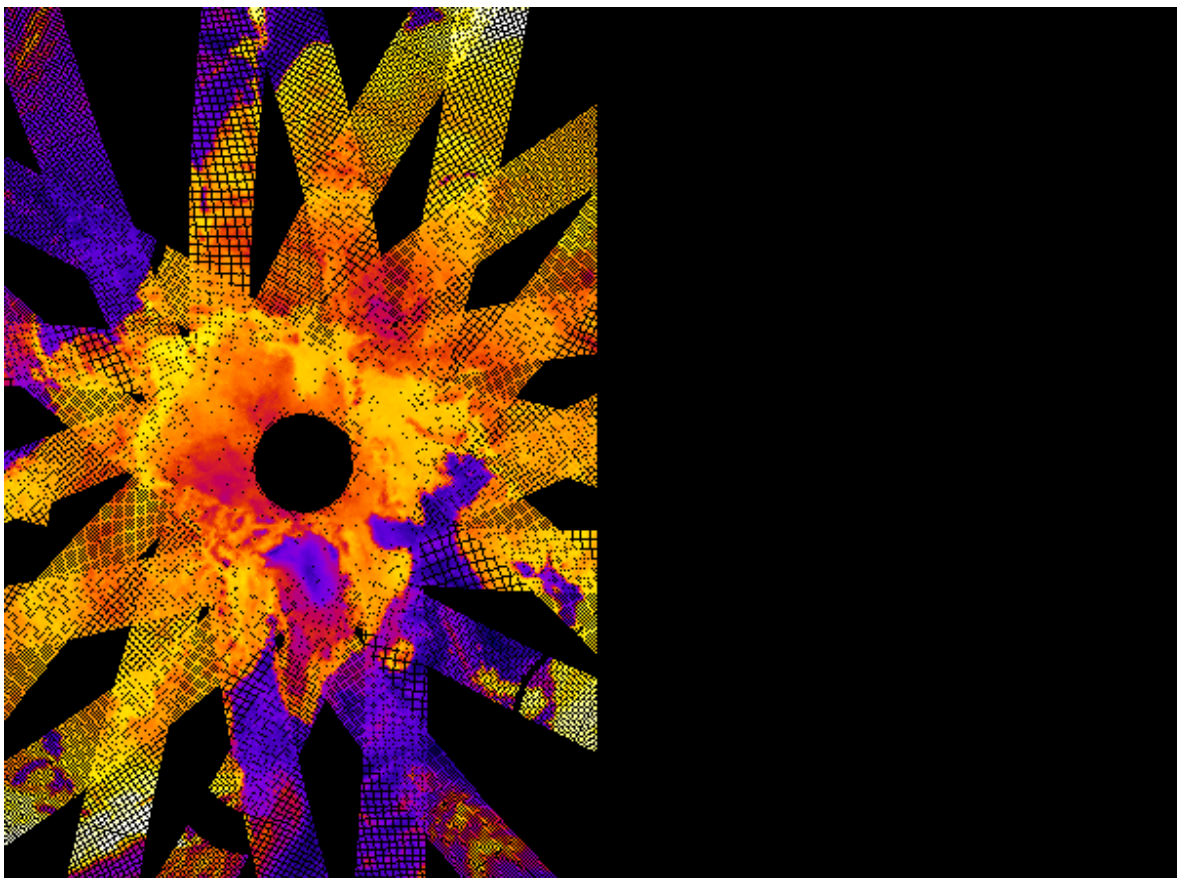- File format seems based on the standard 304 X 448 25 km Northern Hemisphere polar stereographic grid

Figure 1. Example of a Northern Hemisphere file from 02 January 1979. The image shows antenna temperatures from the 37H channel.

1.1.3   Southern Hemisphere File Contents

- Header: 586 bytes
- Array: 586 columns X 293 rows
- Each row contains 293 bytes of daily, gridded antenna brightness temperatures followed by 293 bytes with a value of "1" (see Figure 2 for an example).
- Integer: 16-bit, big endian
- File format is not based on a standard Southern Hemisphere polar stereographic grid. It may be based on an earlier (293 X 293) version of the polar stereographic grid or a subset of the standard 316 X 332 25 km Southern Hemisphere polar stereographic grid.
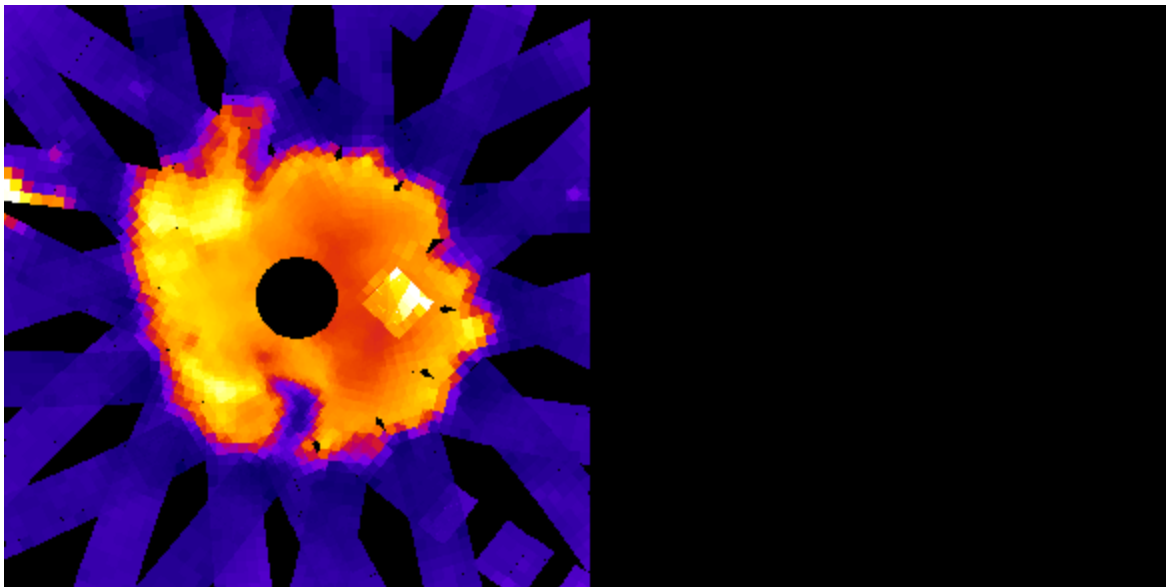

Figure 2. Example of a southern hemisphere file from 29 December 1986. The image shows antenna temperatures from the 06V channel.

1.1.4   Naming Convention

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

`smmr<sp|np>-YYYYDOY_<h|v>##`

Table 1. File Naming Convention

Naming Convention	Description
smmr	Indicates the data are derived from the Scanning Multichannel Microwave Radiometer instrument
<sp|np>	Hemisphere: sp = Southern Hemisphere np = Northern Hemisphere
YYYY	Year

Naming Convention	Description
DOY	Day of Year
<h|v>	Polarization: h = horizontal v = vertical
##	Frequency

Example files:

```
smmrnp-1978302_h06
smmrsp-1986363_v06
smmrnp-1979002_h37
```

1.2 Spatial Information

1.2.1 Coverage

Northern Latitude: 84° N
Southern Latitude: 84° S
Eastern Longitude: 180° E
Western Longitude: 180° W

1.3 Temporal Information

1.3.1 Coverage

Antenna temperature data are available from NSIDC for October 25 1978 to August 20 1987.

Data are missing for both polar regions on August 4, 8, and 16 1982; data are also missing for both polar regions between August 13 and August 23 1984.

1.3.2 Resolution

Because of spacecraft power limitations, the scanner operated only on alternate days. There are typically 14 days of coverage per month.

2   DATA ACQUISITION AND PROCESSING

2.1 Background

The Nimbus-7 Scanning Multichannel microwave Radiometer (SWMM) Antenna Temperatures (TA) data set consists of raw antenna temperatures from passive microwave radiometers. Each file in the data set consists of daily gridded antenna temperature data.

2.2 Acquisition

SMMR was a ten-channel passive microwave instrument using six conventional Dicke-type radiometers. It delivered orthogonally polarized antenna temperature data at 6.6, 10.69, 18.0, 21.0, and 37.0 GHz. The two 37.0 GHz radiometers operated continuously for each polarization. The other radiometers alternated polarizations on alternate scans.

Input raw swath SMMR antenna temperature data are available upon request. Users may contact the User Services Office at nsidc@nsidc.org for more information.

3   REFERENCES

Francis, E. A. 1987. Calibration of the Nimbus-7 Scanning Multichannel Microwave Radiometer (SMMR), 1979-1984. Oregon State University, M.S. thesis, 248p.

Gloersen, P., and F. T. Barath. 1977. A scanning multichannel microwave radiometer for Nimbus-G and Seasat-A. IEEE J. Oceanic Eng. OE-2:172-178.

Gloersen, P., and L. Hardis. 1978. Scanning Multichannel Microwave Radiometer (SMMR) Experiment. Nimbus-7 User's Guide. NASA/Goddard Space Flight Center, Greenbelt, MD.

4   DOCUMENT INFORMATION

4.1 Publication Date

17 January 2019

4.2 Date Last Updated

16 February 2022