Notice to Data Users:
The documentation for this data set was provided solely by the Principal Investigator(s) and was not further developed, thoroughly reviewed, or edited by NSIDC. Thus, support for this data set may be limited.

SMEX03 AMSR-E Daily Gridded Soil Moisture and Brightness Temperatures

Summary

This data set contains Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) Level-3 daily measurements of surface soil moisture and vegetation/roughness water content interpretive information, as well as brightness temperatures and quality control variables. Ancillary data include time, geolocation, and quality assessment. Input brightness temperature data, corresponding to a 56 km mean spatial resolution, are resampled to a global cylindrical 25 km Equal-Area Scalable Earth Grid (EASE-Grid) cell spacing. Data have been spatially subsetted to the SMEX03 study areas in Alabama, Georgia, and Oklahoma, USA and Brazil. The study period covers 1 April to 31 August 2003 for study areas in the USA and 6 November to 31 December 2003 for the Brazil study area. Data are stored in HDF-EOS format and are available via FTP.

Citing These Data

Njoku, Eni. 2004. *SMEX03 AMSR-E Daily Gridded Soil Moisture and Brightness Temperatures.* Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

Overview Table

Category	Description
Data format	Data files: Hierarchical Data Format - Earth Observing System (HDF-EOS) Metadata files: Extensible Markup Language (XML)
Spatial coverage	Alabama / Georgia: Southernmost Latitude: 28.0° N Northernmost Latitude: 38.0° N Westernmost Longitude: 90.0° W Easternmost Longitude: 80.0° W Oklahoma: Southernmost Latitude: 30.0° N Northernmost Latitude: 40.0° N Westernmost Longitude: 103.0° W Easternmost Longitude: 93.0° W Brazil: Southernmost Latitude: 17.0° S Northernmost Latitude: 7.0° S Westernmost Longitude: 50.0° W Easternmost Longitude: 40.0° W
Temporal coverage and resolution	Alabama, Georgia & Oklahoma: 1 April - 31 August 2003 Brazil: 6 November – 31 December 2003
File naming convention	rg_ AMSR_E_L3_DailyLand_v##_yyyymmdd.hdf

	rg_ AMSR_E_L3_DailyLand_v##_yyyymmdd.hdf.xml
File size	6 KB – 212 KB
Parameter(s)	Brightness Temperature (K) Vegetation/Roughness Parameter (kg m^{-2}) Surface Soil Moisture (g cm^{-3})
Procedures for obtaining data	Data are available through FTP.

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1. Contacts and Acknowledgments:

Investigator(s) Name and Title:

Technical Contact:

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2. Detailed Data Description:

Format

Data are stored in Hierarchical Data Format - Earth Observing System (HDF-EOS) Version 2.10 grid format.

For a detailed description of data fields, please refer to Level-3 Soil Moisture Data Fields.

File and Directory Structure:

Data are contained within three regional subdirectories (ALGA=Alabama/Georgia, BZ=Brazil, and OK=Oklahoma).

File Naming Convention:

Example file name: OK_AMSR_E_L3_DailyLand_T05_20030831.hdf

rg_ AMSR_E_L3_DailyLand_v##_yyyymmdd.hdf
rg_ AMSR_E_L3_DailyLand_v##_yyyymmdd.hdf.xml

Table 1: Description of File Name Variables

Variable	Description
rg	Region (ALGA=Alabama/Georgia, BZ=Brazil, OK=Oklahoma)
AMSR_E_L3_DailyLand	AMSR-E Level-3 Daily Land product
v	Product Maturity Code (T: transitional)
##	Algorithm version number
yyyymmdd	Date of file coverage
.hdf	HDF-EOS data file
.hdf.xml	XML metadata file

For complete documentation, please refer to the AMSR/-E Aqua Daily L3 Surface Soil Moisture, Interpretive Parameters, & QC EASE-Grid document.

File Size:

Data files range from approximately 187 KB – 212 KB.
Metadata files are approximately 6 KB.

Spatial Coverage:

Alabama / Georgia:
Southernmost Latitude: 28.0° N
Northernmost Latitude: 38.0° N
Westernmost Longitude: 90.0° W
Easternmost Longitude: 80.0° W

Oklahoma:
Southernmost Latitude: 30.0° N
Northernmost Latitude: 40.0° N
Westernmost Longitude: 103.0° W
Easternmost Longitude: 93.0° W

Brazil:
Southernmost Latitude: 17.0° S
Northernmost Latitude: 7.0° S
Westernmost Longitude: 50.0° W
Easternmost Longitude: 40.0° W

Spatial Resolution:

Input brightness temperature data, corresponding to a 56 km mean spatial resolution (for frequencies 6.9 GHz through 36.5 GHz), and a 12 km mean spatial resolution (for frequencies 36.5 GHz and 89 GHz), are resampled to a global cylindrical 25 km Equal-Area Scalable Earth Grid (EASE-Grid) cell spacing. The effective spatial resolutions are thus larger than the inherent 56 km and 12 km resolutions.

Projection and Grid Description:

Data are provided in the EASE-Grid global cylindrical projection. For details, please review the EASE-Grid: A Versatile Set of Equal-Area Projections and Grids Web page.

Level-2A brightness temperatures are resampled to a global cylindrical EASE-Grid with a nominal grid spacing of 25 km (true at 30° S). The size of the grid is 586 rows by 1383 columns. For more information, including details about the EASE-Grid projections plus related products and tools, see NSIDC's EASE-Grid DataWeb site.

For complete documentation, please refer to the AMSR/-E Aqua Daily L3 Surface Soil Moisture, Interpretive Parameters, & QC EASE-Grid document.

Temporal Coverage:

Alabama, Georgia & Oklahoma: 1 April - 31 August 2003
Brazil: 6 November – 31 December 2003

Temporal Resolution:
Each file has daily coverage.

Parameter or Variable

Parameter Description

Brightness Temperatures (K)
6.9 GHz, 10.7 GHz, 18.7 GHz, and 36.5 GHz vertical and horizontal brightness temperatures are provided at 6.9 GHz resolution. 36.5 GHz and 89.0 GHz vertical and horizontal brightness temperatures are provided at 36.5 GHz resolution.

Surface Soil Moisture (g cm-3)
Soil moisture in the top ~1 cm of soil is averaged over the retrieval footprint. A value of -9999 indicates no retrieval, due to bad brightness temperature data in the retrieval channels or screening by land surface classification.

Vegetation/Roughness Parameter (kg m-2)
This term incorporates the effects of vegetation and roughness together. See the Derivation Techniques and Algorithms section in the AMSR-E/Aqua L2B Surface Soil Moisture, Ancillary Parameters, & QC EASE-Grids guide document. When interpreted as an effective vegetation water content, it is the total water content in the vertical column of vegetation, averaged over the retrieval footprint. A value of -9999 indicates no retrieval, due to bad brightness temperature data in the retrieval channels or screening by land surface classification. Refer to the Data Acquisition and Processing section of this guide document for more information.

3. Data Access and Tools:

Data Access:
Data are available via FTP.

4. Data Acquisition and Processing:

For a description of the theory of measurements, derivation techniques, algorithms, quality control, and processing steps, please refer to the AMSR/-E Aqua Daily L3 Surface Soil Moisture, Interpretive Parameters, & QC EASE-Grid document.

Sensor or Instrument Description:

Please refer to the AMSR-E Instrument Description document.

5. References and Related Publications:

Conway, D. 2002. Advanced Microwave Scanning Radiometer - EOS Quality Assurance Plan. Huntsville, AL: Global Hydrology and Climate Center.

Njoku, Eni G, T. Chan, W. Crosson, and A. Limaye. 2004. Evaluation of the AMSR-E Data Calibration Over Land. *Italian Journal of Remote Sensing* 29 (4): 19 - 37.

Njoku, Eni G., T. L. Jackson, V. Lakshmi, T. Chan, and S.V. Nghiem. 2003. Soil Moisture Retrieval from AMSR-E. *IEEE Transactions on Geoscience and Remote Sensing* 41 (2): 215-229.

Njoku, Eni G, T. Chan, W. Crosson, and A. Limaye. 2004. Evaluation of the AMSR-E Data Calibration Over Land. *Italian Journal of Remote Sensing.* 30/31: 19-37.

Njoku, Eni G. and T. K. Chan, 2005. Vegetation and Surface Roughness Effects on AMSR-E Land Observations. *Remote Sensing of Environment* (in press).

Njoku, Eni G. 1999. *AMSR Land Surface Parameters. Algorithm Theoretical Basis Document, Version 3.0.* Pasadena, CA, USA: NASA Jet Propulsion Laboratory.

For more information regarding related publications, see the Research Using AMSR-E Data Web page.

6. Document Information:

List of Acronyms

Please see the EOSDIS Acronym and Abbreviation List Web page list for a general list of acronyms.