Global Hydrology Resource Center

Data User Guide

NRT Advanced Microwave Scanning Radiometer 2 (AMSR2) Daily L3 Global Snow Water Equivalent EASE-Grids

Introduction

The GCOM-W1 near real-time (NRT) AMSR2 Level 3 Snow Water Equivalent (SWE) datasets contain SWE data and quality assurance flags mapped to the Northern and Southern Hemisphere 25 km Equal-Area Scalable Earth Grids (EASE-Grids). NRT products are generated within 3 hours of the last observations in the file by the Land Atmosphere Near real-time Capability for EOS (LANCE) at the AMSR Science Investigator-led Processing System (AMSR SIPS), which is collocated with the Global Hydrology Resource Center (GHRC) Distributed Active Archive Center (DAAC).

Notice:
All LANCE AMSR2 data should be used with the understanding that these are preliminary products. Cross calibration with AMSR-E products has not been performed. As updates are made to the L1R data set, those changes will be reflected in this higher level product.

Citation

Tedesco, M. 2015. NRT AMSR2 Daily L3 Global Snow Water Equivalent EASE-Grids [indicate subset used]. Dataset available online, [https://lance.nsstc.nasa.gov/amsr2-science/data/level3/daysnow/] from NASA LANCE AMSR2 at the GHRC DAAC Huntsville, Alabama, U.S.A. doi: http://dx.doi.org/10.5067/AMSR2/A2_DySno_NRT

Keywords:

Snow; ice; snow water equivalent

LANCE

The Land Atmosphere Near real-time Capability for EOS (LANCE) makes EOS data from MODIS, AIRS, MLS, OMI, AMSR2, and MISR available within three hours of satellite overpass to meet the timely needs of applications such as numerical weather and climate prediction; forecasting and monitoring natural hazards, ecological/invasive species, agriculture, and air quality; providing help with disaster relief; and homeland security. Please note that LANCE has a rolling archive life of ten days on the HTTPS server. Once ten days pass following the data acquisition date, users must use the standard products.

If data latency is not a primary concern, please consider using science quality standard products. Science products are created using the best available ancillary, calibration and ephemeris information. Science quality products are an internally consistent, well-calibrated record of the Earth's geophysical properties to support science. The AMSR2 standard science quality data products will be available from the NSIDC DAAC.

Instrument Description

The Advanced Microwave Scanning Radiometer 2 (AMSR2) instrument aboard the Global Change Observation Mission - Water 1 (GCOM-W1) provides global passive microwave measurements of terrestrial, oceanic, and atmospheric parameters for the investigation of global water and energy cycles. Both AMSR2 and GCOM-W1 are built and operated by Japan Exploration Agency (JAXA). Data from this instrument are ingested from JAXA into NASA's LANCE element at the AMSR SIPS to be processed with US AMSR Science Team members' algorithms.

The AMSR instruments improved upon the heritage of the Scanning Multichannel Microwave Radiometer (SMMR), Special Sensor Microwave/Imager (SSM/I) and Tropical Rainfall Measuring Mission (TRMM) Microwave Instrument (TMI) instruments. Major improvements over those instruments included channels spanning the 6.9 GHz to 89 GHz frequency range, and higher spatial resolution from the 1.6 m reflector. More information about AMSR2 can be found at http://global.jaxa.jp/projects/sat/gcom_w/.

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File Naming Convention

The data are formatted using the following file naming convention.

Data: AMSR_2_L3_DailySnow_X##_yyyymmdd.he5
Browse: AMSR_2_L3_DailySnow_X##_yyyymmdd_f_SWE.png
QA Summary Files: AMSR_2_L3_DailySnow_X##_yyyymmdd.qa

Table 1: File naming convention variables

Variable	Description
X	Product Maturity code (Refer to table 2)
##	Two-digit file version number
yyyy	Four-digit year
mm	Two-digit month
dd	Two-digit day
f	N = Northern or S = Southern
.he5	HDF-EOS5 format
.xml	Metadata file
.met	Metadata file
.png	Portable Network Graphics format
.qa	GPS Quality Assessment Data

As NRT data are received from JAXA, partial daily products are generated and identified with a product maturity code of "P" in the filename. Once all Level-1R inputs are available, the complete daily product contains product maturity code "R" (near real-time) in the filename. Incremental processing makes data available to the user as it is received, rather than at the end of the day. Table 2 outlines the product maturity code variables used in the file naming convention.

Table 2: Product Maturity Code Variables

Variable	Description
P	Partial daily product
R	Near real-time

Data Format Description

Data are stored in HDF-EOS5 format and are available via HTTP from the EOSDIS LANCE system at https://lance.nsstc.nasa.gov/amsr2-science/data/level3/daysnow/ or https://lance.itsc.uah.edu/amsr2-science/data/level3/daysnow/. Each file contains 721 rows by 721 columns pixel data fields in 1-byte unsigned integer format. Please refer to Table 3 for more information on the dataset characteristics.

Table 3: Dataset Characteristics

Characteristic	Description
Platform	Global Change Observation Mission - Water 1 (GCOM-W1)
Instrument	Advanced Microwave Scanning Radiometer 2 (AMSR2)
Projection	Northern and Southern Hemisphere EASE-Grid projections. For more information, please visit: http://nsidc.org/data/ease/ease_grid.html

Spatial Coverage	N: 90, S: -90, W: -180, E: 180 (Global)
Spatial Resolution	25 km x 25km
Temporal Coverage	Start date: 09-06-2015 Stop date: Ongoing
Temporal Resolution	Daily
Parameter	Snow Water Equivalent
Processing Level	Level 3
Data Format	HDF-EOS5

Data Parameters

Each data file contains several SWE data fields and associated pixel values. Please refer to Tables 4 and 5 for additional data field and pixel value information.

Table 4: Data Fields

Data Field	Description	Value Range
Flags_NorthernDaily	QA Flag (Table 6)	241-255
SWE_NorthernDaily	Daily SWE Pixel Value (Table 5)	0-255
Flags_SouthernDaily	QA Flag (Table 6)	241-255
SWE_SouthernDaily	Daily SWE Pixel Value (Table 5)	0-255

Table 5: Pixel Values for SWE Fields

Value	Description
0-240	SWE divided by 2 (mm)
247	Incorrect spacecraft attitude
248	Off-earth
252	Land or snow impossible
253	Ice sheet
254	Water
255	missing

Note: SWE fields are scaled and must be multiplied by a factor of 2.

Quality Assessment

Quality Assessment (QA) metadata flags are provided with each data file. The associate QA flag pixel values are outline in Table 6. In addition, a separate XML metadata QA summary file is provided for each data file.

Table 6: Pixel Values for QA Flag Fields

Value	Description
241	Non-validated
248	Off-earth
252	Land or snow impossible
253	Ice sheet
254	Water
255	No Data

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