



## Data User Guide

# ***NRT AMSR2 Daily L3 12.5 km Tb and Sea Ice Concentration Polar Grids***

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### **Introduction**

The GCOM-W1 near real-time (NRT) AMSR2 Daily Level 3 gridded 12.5 km sea ice product includes brightness temperatures at 18.7 through 89.0 GHz and sea ice concentration. Data are mapped to a polar stereographic grid at 12.5 km spatial resolution. Sea ice concentration and brightness temperatures include daily ascending averages, daily descending averages, and daily averages. 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**

Markus, T., W. Meier, and J. C. Comiso. 2015. NRT AMSR2 Daily L3 12.5 km Tb, Sea Ice Concentration Polar Grids [indicate subset used]. Dataset available online, [<https://lance.nsstc.nasa.gov/amsr2-science/data/level3/seaice12>] from NASA LANCE AMSR2 at the GHRC DAAC Huntsville, Alabama, U.S.A. doi: [http://dx.doi.org/10.5067/AMSR2/A2\\_S112\\_NRT](http://dx.doi.org/10.5067/AMSR2/A2_S112_NRT)

### **Keywords:**

*Brightness temperature; sea ice; sea ice concentration*

## **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/](http://global.jaxa.jp/projects/sat/gcom_w/).

## **Investigators**

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## File Naming Convention

The data are formatted using the following file naming convention.

**Data:** AMSR\_2\_L3\_Sealce12km\_X##\_yyyymmdd.he5

**Browse:** AMSR\_2\_L3\_Sealce12km\_X##\_yyyymmdd\_f\_CON.png

**QA Summary Files:** AMSR\_2\_L3\_Sealce12km\_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 Hemisphere, S = Southern Hemisphere
.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/seaice12/> or <https://lance.itsc.uah.edu/amsr2-science/data/level3/seaice12/>. Please refer to Table 3 for 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	Polar Stereographic Projection*
Spatial Coverage	<b>North Polar Grid</b> N: 90, S: 30.98, E: 180, W: -180 <b>South Polar Grid</b> N: -39.23, S: -90, E: 180, W: -180
Spatial Resolution	12.5 km x 12.5km
Temporal Coverage	Start date: 09-06-2015 Stop date: Ongoing
Temporal Resolution	Daily averages, daily ascending average, daily descending average
Parameter	Brightness temperature Sea ice concentration Sea Ice Concentration differences between Bootstrap Basic Algorithm (BBA) and Enhanced NASA Team (NT2)
Processing Level	Level 3
Data Format	HDF-EOS5

\*For more information on the polar stereographic projection used for this dataset, please refer to the Spatial Coverage section within the corresponding AMSR-E [NSIDC documentation](#).

## Data Parameters

Each data file contains core metadata, product-specific attributes, and data fields in 16-byte integer format (Int16). Please note that a scale factor has been applied to the brightness temperature data. To obtain the brightness temperature in kelvins (K), multiple data values by 0.1. The valid range of brightness temperature is approximately 50 to 300 K. Please refer to Table 4 and Table 5 for additional parameter information.

Table 4: Northern Polar Grids

Field Name	Description	Data Type	Unit	Scale Factor
SI_12km_NH_18H_ASC	18.7 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_NH_18H_DAY	18.7 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_NH_18H_DSC	18.7 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_NH_18V_ASC	18.7 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_NH_18V_DAY	18.7 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_NH_18V_DSC	18.7 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_NH_23H_ASC	23.8 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1

SI_12km_NH_23H_DAY	23.8 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_23H_DSC	23.8 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_23V_ASC	23.8 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_23V_DAY	23.8 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_23V_DSC	23.8 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_36H_ASC	36.5 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_36H_DAY	36.5 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_36H_DSC	36.5 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_36V_ASC	36.5 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_36V_DAY	36.5 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_36V_DSC	36.5 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_89H_ASC	89.0 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_89H_DAY	89.0 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_89H_DSC	89.0 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_89V_ASC	89.0 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_89V_DAY	89.0 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_89V_DSC	89.0 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1	
SI_12km_NH_ICECON_ASC	Sea ice concentration daily ascending average	Int16	N/A	N/A	
	<b>Value</b>				<b>Description</b>
	0				Open Water
	1 to 100				Percent Ice Concentration
120	Land Mask				
SI_12km_NH_ICECON_DAY	Sea ice concentration daily average	Int16	N/A	N/A	
	<b>Value</b>				<b>Description</b>
	0				Open Water
	1 to 100				Percent Ice Concentration
120	Land Mask				
SI_12km_NH_ICECON_DSC	Sea ice concentration daily descending average	Int16	N/A	N/A	
	<b>Value</b>				<b>Description</b>
0	Open Water				

	1 to 100	Percent Ice Concentration			
	120	Land Mask			
SI_12km_NH_ICEDIFF_ASC	Sea ice concentration daily ascending average using the difference between BBA and NT2 algorithms		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100 or -1 to -100	Percent difference between algorithms*			
	120	Land Mask			
	200 to 300	Missing NT2 value (200+BBA)**			
	-200 to -300	Missing BBA value (-200-NT2)**			
-310	Out-of-range value in V12 data***				
SI_12km_NH_ICEDIFF_DAY	Sea ice concentration daily average using the difference between BBA and NT2 algorithms		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100 or -1 to -100	Percent difference between algorithms*			
	120	Land Mask			
	200 to 300	Missing NT2 value (200+BBA)**			
	-200 to -300	Missing BBA value (-200-NT2)**			
-310	Out-of-range value in V12 data***				
SI_12km_NH_ICEDIFF_DSC	Sea ice concentration daily descending average using the difference between BBA and NT2 algorithms		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100 or -1 to -100	Percent difference between algorithms*			
	120	Land Mask			
	200 to 300	Missing NT2 value (200+BBA)**			
	-200 to -300	Missing BBA value (-200-NT2)**			
-310	Out-of-range value in V12 data***				

Table 5: Southern Polar Grids

Field Name	Description	Data Type	Unit	Scale Factor
SI_12km_SH_18H_ASC	18.7 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_18H_DAY	18.7 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_18H_DSC	18.7 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_18V_ASC	18.7 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_18V_DAY	18.7 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_18V_DSC	18.7 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_23H_ASC	23.8 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_23H_DAY	23.8 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_23H_DSC	23.8 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_23V_ASC	23.8 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_23V_DAY	23.8 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_23V_DSC	23.8 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_36H_ASC	36.5 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_36H_DAY	36.5 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_36H_DSC	36.5 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_36V_ASC	36.5 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_36V_DAY	36.5 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_36V_DSC	36.5 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_89H_ASC	89.0 GHz horizontal daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_89H_DAY	89.0 GHz horizontal daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_89H_DSC	89.0 GHz horizontal daily average descending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_89V_ASC	89.0 GHz vertical daily average ascending Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_89V_DAY	89.0 GHz vertical daily average Tbs	Int16	Kelvin (K)	0.1
SI_12km_SH_89V_DSC	89.0 GHz vertical daily average descending Tbs	Int16	Kelvin (K)	0.1

SI_12km_SH_ICECON_ASC	Sea ice concentration daily ascending average		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100	Percent Ice Concentration			
	120	Land Mask			
SI_12km_SH_ICECON_DAY	Sea ice concentration daily average		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100	Percent Ice Concentration			
	120	Land Mask			
SI_12km_SH_ICECON_DSC	Sea ice concentration daily descending average		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100	Percent Ice Concentration			
	120	Land Mask			
SI_12km_SH_ICEDIFF_ASC	Sea ice concentration daily ascending average using the difference between BBA and NT2 algorithms		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100 or -1 to -100	Percent difference between algorithms*			
	120	Land Mask			
	200 to 300	Missing NT2 value (200+BBA)**			
	-200 to -300	Missing BBA value (-200-NT2)**			
-310	Out-of-range value in V12 data***				
SI_12km_SH_ICEDIFF_DAY	Sea ice concentration daily average using the difference between BBA and NT2 algorithms		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			
	0	Open Water			
	1 to 100 or -1 to -100	Percent difference between algorithms*			
	120	Land Mask			
	200 to 300	Missing NT2 value (200+BBA)**			
	-200 to -300	Missing BBA value (-200-NT2)**			
-310	Out-of-range value in V12 data***				
SI_12km_SH_ICEDIFF_DSC	Sea ice concentration daily descending average using the difference between BBA and NT2 algorithms		Int16	N/A	N/A
	<b>Value</b>	<b>Description</b>			



	0	Open Water			
	1 to 100 or -1 to -100	Percent difference between algorithms*			
	120	Land Mask			
	200 to 300	Missing NT2 value (200+BBA)**			
	-200 to -300	Missing BBA value (-200-NT2)**			
	-310	Out-of-range value in V12 data***			

## Quality Assessment

A Quality Assessment (QA) XML metadata summary file is provided for each data file. The QA summary file denotes whether or not the file passed the science quality flag.

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doi:10.1029/2007JC004181.

## Contact Information

To order these data or for further information, please contact:

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