Global Hydrology Resource Center

# Data User Guide

# *NRT AMSR2 Daily L3 25 km Tb and Sea Ice Concentration Polar Grids*

## Introduction

The GCOM-W1 near real-time (NRT) AMSR2 Daily Level 3 gridded 25 km sea ice product includes brightness temperatures (Tb) at 6.9 through 89.0 GHz and sea ice concentrations. Data are mapped to a polar stereographic grid at 25 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 25 km Tb and Sea Ice Concentration Polar Grids [indicate subset used]. Dataset available online, [https://lance.nsstc.nasa.gov/amsr2-science/data/level3/seaice25] from NASA LANCE AMSR2 at the GHRC DAAC Huntsville, Alabama, U.S.A. doi: http://dx.doi.org/10.5067/AMSR2/A2_SI25_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/.

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## File Naming Convention

The data is formatted using the following file naming convention.

**Data:** AMSR_2_L3_SeaIce25km_X##_yyyymmdd.he5
**Browse:** AMSR_2_L3_SeaIce25km_X##_yyyymmdd_f_CON.png
**QA Summary Files:** AMSR_2_L3_SeaIce25km_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: Variable Values for Product Maturity Code

| 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/seaice25/ or https://lance.itsc.uah.edu/amsr2-science/data/level3/seaice25/. 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 | **North Polar Grid** N: 90, S: 30.98, E: 180, W: -180<br>**South Polar Grid** N: -39.23, S: -90, E: 180, W: -180 |
| Spatial Resolution | 25 km x 25km |
| Temporal Coverage | Start date: 09-06-2015 Stop date: Ongoing |
| Temporal Resolution | Daily averages, daily ascending average, daily descending average |
| Parameter | Brightness temperature<br>Sea ice concentration<br>Sea Ice Concentration differences between Bootstrap Basic Algorithm (BBA) and Enhanced NASA Team (NT2) |
| Processing Level | Level 3 |
| Data Format | HDF-EOS 5 |

*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_25km_NH_06H_ASC | 6.9 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_06H_DAY | 6.9 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_06H_DSC | 6.9 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_06V_ASC | 6.9 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_06V_DAY | 6.9 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_06V_DSC | 6.9 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_10H_ASC | 10.7 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |

| | | | | |
|---|---|---|---|---|
| SI_25km_NH_10H_DAY | 10.7 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_10H_DSC | 10.7 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_10V_ASC | 10.7 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_10V_DAY | 10.7 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_10V_DSC | 10.7 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_18H_ASC | 18.7 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_18H_DAY | 18.7 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_18H_DSC | 18.7 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_18V_ASC | 18.7 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_18V_DAY | 18.7 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_18V_DSC | 18.7 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_23H_ASC | 23.8 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_23H_DAY | 23.8 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_23H_DSC | 23.8 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_23V_ASC | 23.8 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_23V_DAY | 23.8 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_23V_DSC | 23.8 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_36H_ASC | 36.5 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_36H_DAY | 36.5 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_36H_DSC | 36.5 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_36V_ASC | 36.5 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_36V_DAY | 36.5 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_36V_DSC | 36.5 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_89H_ASC | 89.0 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_89H_DAY | 89.0 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_89H_DSC | 89.0 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_NH_89V_ASC | 89.0 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |

<table>
<tr><td>SI_25km_NH_89V_DAY</td><td>89.0 GHz vertical daily average Tbs</td><td>Int16</td><td>Kelvin (K)</td><td>0.1</td></tr>
<tr><td>SI_25km_NH_89V_DSC</td><td>89.0 GHz vertical daily average descending Tbs</td><td>Int16</td><td>Kelvin (K)</td><td>0.1</td></tr>
<tr><td>SI_25km_NH_ICECON_ASC</td><td>Sea ice concentration daily ascending average<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100</td><td>Percent Ice Concentration</td></tr><tr><td>120</td><td>Land Mask</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
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<tr><td>SI_25km_NH_ICEDIFF_ASC</td><td>Sea ice concentration daily ascending average using the difference between BBA and NT2 algorithms<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100 or -1 to -100</td><td>Percent difference between algorithms*</td></tr><tr><td>120</td><td>Land Mask</td></tr><tr><td>200 to 300</td><td>Missing NT2 value (200+BBA)**</td></tr><tr><td>-200 to -300</td><td>Missing BBA value (-200-NT2)**</td></tr><tr><td>-310</td><td>Out-of-range value in V12 data***</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
<tr><td>SI_25km_NH_ICEDIFF_DAY</td><td>Sea ice concentration daily average using the difference between BBA and NT2 algorithms<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100 or -1 to -100</td><td>Percent difference between algorithms*</td></tr><tr><td>120</td><td>Land Mask</td></tr><tr><td>200 to 300</td><td>Missing NT2 value (200+BBA)**</td></tr><tr><td>-200 to -300</td><td>Missing BBA value (-200-NT2)**</td></tr><tr><td>-310</td><td>Out-of-range value in V12 data***</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| SI_25km_NH_ICEDIFF_DSC | Sea ice concentration daily descending average using the difference between BBA and NT2 algorithms<br>**Value** / **Description**<br>0 — Open Water<br>1 to 100 or -1 to -100 — Percent difference between algorithms*<br>120 — Land Mask<br>200 to 300 — Missing NT2 value (200+BBA)**<br>-200 to -300 — Missing BBA value (-200-NT2)**<br>-310 — Out-of-range value in V12 data*** | Int16 | N/A | N/A |

Table 5: Southern Polar Grids

| Field Name | Description | Data Type | Unit | Scale Factor |
|---|---|---|---|---|
| SI_25km_SH_06H_ASC | 6.9 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_06H_DAY | 6.9 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_06H_DSC | 6.9 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_06V_ASC | 6.9 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_06V_DAY | 6.9 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_06V_DSC | 6.9 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_10H_ASC | 10.7 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_10H_DAY | 10.7 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_10H_DSC | 10.7 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_10V_ASC | 10.7 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_10V_DAY | 10.7 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_10V_DSC | 10.7 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_18H_ASC | 18.7 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_18H_DAY | 18.7 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_18H_DSC | 18.7 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_18V_ASC | 18.7 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_18V_DAY | 18.7 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |

| | | | | |
|---|---|---|---|---|
| SI_25km_SH_18V_DSC | 18.7 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_23H_ASC | 23.8 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_23H_DAY | 23.8 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_23H_DSC | 23.8 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_23V_ASC | 23.8 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_23V_DAY | 23.8 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_23V_DSC | 23.8 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_36H_ASC | 36.5 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_36H_DAY | 36.5 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
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| SI_25km_SH_36V_ASC | 36.5 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_36V_DAY | 36.5 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_36V_DSC | 36.5 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_89H_ASC | 89.0 GHz horizontal daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_89H_DAY | 89.0 GHz horizontal daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_89H_DSC | 89.0 GHz horizontal daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_89V_ASC | 89.0 GHz vertical daily average ascending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_89V_DAY | 89.0 GHz vertical daily average Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_89V_DSC | 89.0 GHz vertical daily average descending Tbs | Int16 | Kelvin (K) | 0.1 |
| SI_25km_SH_ICECON_ASC | Sea ice concentration daily ascending average<br>**Value** / **Description**<br>0 / Open Water<br>1 to 100 / Percent Ice Concentration<br>120 / Land Mask | Int16 | N/A | N/A |
| SI_25km_SH_ICECON_DAY | Sea ice concentration daily average<br>**Value** / **Description**<br>0 / Open Water<br>1 to 100 / Percent Ice Concentration<br>120 / Land Mask | Int16 | N/A | N/A |

<table>
<tr><td>SI_25km_SH_ICECON_DSC</td><td>Sea ice concentration daily descending average<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100</td><td>Percent Ice Concentration</td></tr><tr><td>120</td><td>Land Mask</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
<tr><td>SI_25km_SH_ICEDIFF_ASC</td><td>Sea ice concentration daily ascending average using the difference between BBA and NT2 algorithms<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100 or -1 to -100</td><td>Percent difference between algorithms*</td></tr><tr><td>120</td><td>Land Mask</td></tr><tr><td>200 to 300</td><td>Missing NT2 value (200+BBA)**</td></tr><tr><td>-200 to -300</td><td>Missing BBA value (-200-NT2)**</td></tr><tr><td>-310</td><td>Out-of-range value in V12 data***</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
<tr><td>SI_25km_SH_ICEDIFF_DAY</td><td>Sea ice concentration daily average using the difference between BBA and NT2 algorithms<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100 or -1 to -100</td><td>Percent difference between algorithms*</td></tr><tr><td>120</td><td>Land Mask</td></tr><tr><td>200 to 300</td><td>Missing NT2 value (200+BBA)**</td></tr><tr><td>-200 to -300</td><td>Missing BBA value (-200-NT2)**</td></tr><tr><td>-310</td><td>Out-of-range value in V12 data***</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
<tr><td>SI_25km_SH_ICEDIFF_DSC</td><td>Sea ice concentration daily descending average using the difference between BBA and NT2 algorithms<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Open Water</td></tr><tr><td>1 to 100 or -1 to -100</td><td>Percent difference between algorithms*</td></tr><tr><td>120</td><td>Land Mask</td></tr><tr><td>200 to 300</td><td>Missing NT2 value (200+BBA)**</td></tr><tr><td>-200 to -300</td><td>Missing BBA value (-200-NT2)**</td></tr><tr><td>-310</td><td>Out-of-range value in V12 data***</td></tr></table></td><td>Int16</td><td>N/A</td><td>N/A</td></tr>
</table>

## 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.

## References


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## Contact Information

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

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