



Quicklook Arctic Weekly EASE-Grid Sea Ice Age, Version 1

USER GUIDE

How to Cite These Data

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

Tschudi, M., W. N. Meier, and J. S. Stewart. 2019. *Quicklook Arctic Weekly EASE-Grid Sea Ice Age, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. <https://doi.org/10.5067/2XXGZY3DUGNQ>. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT <https://nsidc.org/data/NSIDC-0749>



National Snow and Ice Data Center

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1 DATA DESCRIPTION

NOTE: This data set is the Quicklook version of the (final) *EASE-Grid Sea Ice Age* data set. It is designed to fill the gap between annual updates of the final Sea Ice Age product and the present.

1.1 Parameters

The main parameter for this data set is sea ice age, measured in years.

1.2 File Information

1.2.1 Format

Data are provided in georeferenced netCDF (.nc) format.

PNG (.png) browse images are also provided.

1.2.2 File Contents

The netCDF file contains one value of sea ice age for each week, coded as integers in a 722 x 722 gridded subset of the 12.5 km Northern Hemisphere EASE-Grid. Table 1 lists the coded integer values and their meanings.

Table 1. Data File Values Used to Describe Sea Ice Age

Value	Description
0	Open water or < 15% sea ice concentration
1, 2, 3, ..., 16	Sea ice age; higher age estimates are not precise, so older ices, 5th-year (4-5 years old) and above, are generally considered together <ul style="list-style-type: none"> • 1 = ice that is 0-1 years old (first-year ice) • 2 = ice that is 1-2 years old (second-year ice) • 3 = ice that is 2-3 years old (third-year ice) • ... • 16 = ice that is 15-16 years old (16th-year ice)
20	Designates the grid cells that contain only land
21	Designates grid cells that contain ocean for which ice age was not calculated

1.2.3 Sample Browse Image

One browse image displaying sea ice age is provided for every week of data. Figure 1 shows a sample browse image.

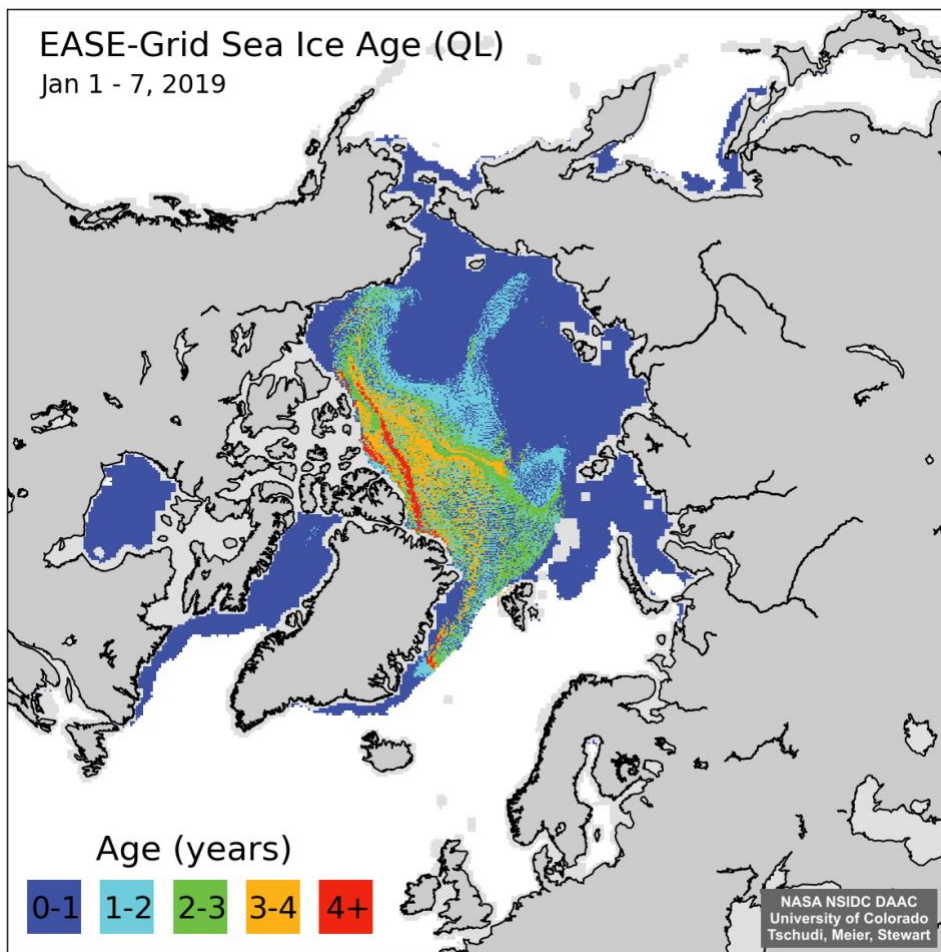


Figure 1. Sample browse image displaying sea ice age for the week of 01 January through 07 January 2019.

1.2.4 Naming Convention

The data files are named according to the following convention and as described in Table 2:

iceage_hh_rrrr_<start-date>_<end-date>_q1.ext

Example:

iceage_nh_12.5km_20190101_20190415_q1.nc
 iceage_nh_12.5km_20000101_20000107_q1.png

Table 2. Weekly Ice Age File Naming Convention

Variable	Description
hh	Hemisphere (nh = Northern)
rrrr	Resolution of input data source in km (e.g. 12.5 km)

Variable	Description
<start-date>	First day of data contained in the file, written in yyyyymmdd (4-digit year, 2-digit month, 2-digit day) format
<end-date>	Last day of data contained in the file, written in yyyyymmdd (4-digit year, 2-digit month, 2-digit day) format
ql	Indicates this file is part of the Quicklook Arctic Weekly EASE-Grid Sea Ice Age product
ext	Extension; .nc for netCDF file or .png for browse images

1.2.5 File Size

The netCDF file size varies from approximately 0.5 to 3.5 MB, depending on how many weeks of data are included in the file.

Browse images are approximately 400 KB.

1.3 Spatial Information

1.3.1 Coverage

This data set covers the Arctic Ocean within the boundaries defined below:

Southernmost Latitude: 29.7° N

Northernmost Latitude: 90.0° N

Westernmost Longitude: 180.0° W

Easternmost Longitude: 180.0° E

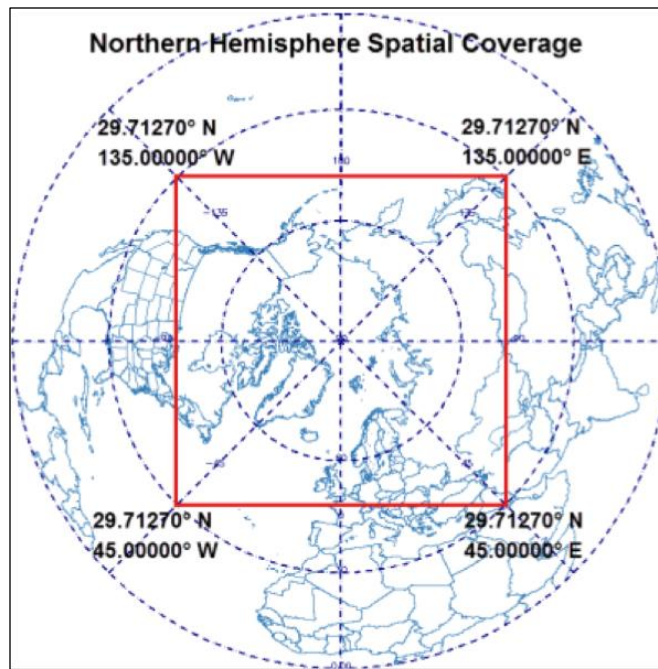


Figure 2. Spatial coverage of the Arctic Ocean on the Northern Hemisphere 12.5 km EASE-Grid.

1.3.2 Resolution

12.5 km

1.3.3 Geolocation

Data are projected using a 12.5 km Northern Hemisphere EASE-Grid. The grid is shifted by half a grid cell relative to the standard version of EASE-Grid, which has the center of the grid right over the pole. More details can be found in the tables below. More details on EASE-Grid can be found on the [EASE Grids](#) website.

Table 3. Geolocation Details

Geographic coordinate system	Unspecified datum based upon the International 1924 Authalic Sphere
Projected coordinate system	NSIDC EASE-Grid North
Longitude of true origin	0
Latitude of true origin	90
Scale factor at longitude of true origin	N/A
Datum	Not specified based on International 1924 Authalic Sphere
Ellipsoid/spheroid	International 1924 Authalic Sphere
Units	meter

False easting	0
False northing	0e
EPSG code	3408
PROJ4 string	+proj=laea +lat_0=90 +lon_0=0 +x_0=0 +y_0=0 +a=6371228 +b=6371228 +units=m +no_defs
Reference	http://epsg.io/3408

Table 4. Grid Details

Grid cell size (x, y pixel dimensions)	12534 projected meters (x) 12534 projected meters (y)
Number of rows	722
Number of columns	722
Geolocated lower left point in grid	29.7° N, 45.0° W
Nominal gridded resolution	12.5 km by 12.5 km
Grid rotation	N/A
ulxmap – x-axis map coordinate of the outer edge of the upper-left pixel (XLLCORNER for ASCII data)	-4,518,421 projected meters
ulymap – y-axis map coordinate of the outer edge of the upper-left pixel (YLLCORNER for ASCII data)	4,518,421 projected meters

1.4 Temporal Information

1.4.1 Coverage

Data coverage varies and changes with time. This data set begins the week after the last day of data in the [EASE-Grid Sea Ice Age, Version 4](#) product and is extended approximately monthly. When the *EASE-Grid Sea Ice Age, Version 4* data set is extended, this quicklook product is updated so that the two data sets do not overlap.

1.4.2 Resolution

Weekly

2 DATA ACQUISITION AND PROCESSING

2.1 Background

This data set is a sister product to the EASE-Grid Sea Ice Age, Version 4 data set. Users should refer to the EASE-Grid Sea Ice Age, Version 4 user guide for more information.

2.2 Acquisition

The input ice motion vectors used to create this sea ice age data set are the weekly *Quicklook Arctic Weekly EASE-Grid Sea Ice Motion Vectors, Version 1* data sets.

2.3 Processing

Note: The general processing steps for this data set mirror those of the *EASE-Grid Sea Ice Age, Version 4* data set and are described below.

- Input ice motion data from the *Quicklook Arctic Weekly EASE-Grid Sea Ice Motion Vectors, Version 1* data set are bilinearly interpolated to a 12.5 km x 12.5 km EASE-Grid. A sea ice mask, derived from the *Near-Real-Time DMSP SSMIS Daily Polar Gridded Sea Ice Concentrations, Version 1* data set, is applied.
- Each year's ice is tracked from year to year as a Lagrangian tracer parcel that starts at the center of each grid cell and moves according to the weekly mean ice velocity; tracer parcels may not end in the same grid cell in which they started.
- Ice parcel positions are computed weekly.
- Ice age is discretized in yearly increments. A year is defined as the melt season, which runs from one season's minimum Arctic ice extent (usually in September) to the next year's minimum.
- If an ice parcel remains at 15 percent or more for a melt season, then it has aged one year. If a parcel travels to a new grid cell that has less than 15 percent ice concentration, the original ice is assumed to have melted away.
- The age of a grid cell is the age of the oldest tracer parcel that exists in the grid cell.

2.4 Quality, Errors, and Limitations

2.4.1 Quality Assessment

A 15% sea ice concentration threshold was chosen to provide the most conservative possible estimates of change in areas where multiyear ice is present. For example, at the end of summer melt, a grid cell within the marginal ice zone might have a total passive microwave-derived concentration of 15%. Even though, upon freeze-up, 85% of the grid cell would consist of first-year ice, the age of that grid cell is assigned to the oldest ice that survived within that grid cell. Hence,

the maps show areas that contain at least some (15% or more) multiyear ice but do not provide information on the ratio of different ice ages within individual grid cells.

2.4.2 Error Sources and Limitations

When ice age is classified, the information can be compared to satellite-derived time series of ice age. Overall, this remote-sensing-based age product is similar to the buoy-derived ice ages produced by Rigor and Wallace (2004), but with greater spatial detail. The age estimates are restricted to open ocean areas only, where ice motion can be resolved using microwave satellite data. Note, since this excludes the passages in the Canadian Archipelago, the cited values for ice coverage are less than the actual amount of ice present in the Arctic.

Errors in estimating sea ice age depend on the following factors:

- Resolution of the satellite sensor
- Geolocation and binning errors of each image pixel
- Atmospheric effects and temporal variability of the surface, especially during the summer months

The sea ice age shown in this dataset is the oldest age within each grid cell and does not necessarily indicate that all ice in that cell is of that age. Ice may also be present in grid cells that are designated as open water if the concentration is less than 15%.

3 RELATED DATA SETS

[Polar Pathfinder Daily 25 km EASE-Grid Sea Ice Motion Vectors](#)

[Quicklook Arctic Weekly EASE-Grid Sea Ice Motion Vectors](#)

[EASE-Grid Sea Ice Age](#)

[MEaSURES Arctic Sea Ice Characterization 25 km EASE-Grid 2.0](#)

4 CONTACTS AND ACKNOWLEDGMENTS

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5 REFERENCES

Tschudi, M.A., W.N. Meier, and J.S. Stewart, 2020. An enhancement to sea ice motion and age products at the National Snow and Ice Data Center (NSIDC). *The Cryosphere*, 14,1519-1536. <https://doi.org/10.5194/tc-14-1519-2020>

6 DOCUMENT INFORMATION

6.1 Publication Date

11 March 2019

6.2 Date Last Updated

16 July 2020