EASE-Grid Land-Ocean-Coastline-Ice Masks Derived from Boston University MODIS/Terra Land Cover Data, Version 1

USER GUIDE

How to Cite These Data

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

Knowles, K. 2004. *EASE-Grid Land-Ocean-Coastline-Ice Masks Derived from Boston University MODIS/Terra Land Cover Data, Version 1*. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/YR21Q0Q8IPR6. [Date Accessed].

Brodzik, M. J. and K. Knowles. 2011. EASE-Grid 2.0 Land-Ocean-Coastline-Ice Masks Derived from Boston University MODIS/Terra Land Cover Data, Version 1. [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/VY2JQZL9J8AQ. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/NSIDC-0607 or https://nsidc.org/data/NSIDC-0609

National Snow and Ice Data Center

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This user guide covers two data sets:

- EASE-Grid Land-Ocean-Coastline-Ice Masks from Boston University MODIS/Terra Land Cover Data
- EASE-Grid 2.0 Land-Ocean-Coastline-Ice Masks from Boston University MODIS/Terra Land Cover Data

1 DETAILED DATA DESCRIPTION

1.1 Format

Masks are provided as flat binary, 1 byte files stored by row. Quick-look browse images are also available in PNG (.png) format. The masks indicate the location of land, water, coastline, and ice using coded integers. Refer to Table 1 for the key to these values:

Table 1. Key to Values Stored in LOCI Masks

Value	Description
0	Land
101	Ice
252	Coastline
254	Off the map
255	Water

Note: The software used to generate the LOCI masks sets the width of coastline pixels to a user-specified value. For this data set, the coastline width has been set to zero, i.e. the masks do not contain the value for coastline (252). Masks with non-zero coastline pixel widths are available upon request by contacting NSIDC User Services.

Each resolution and projection combination is described by a Grid Parameter Definition (GPD). The short name, grid dimensions, and file sizes for each GPD are provided in Table 2 for EASE-Grid and in Table 3 for EASE-Grid 2.0. See Table 4 for the file naming convention.

Table 2. EASE-Grid Land Classification Resolutions and Grid Sizes

Projection	Available	Grid Dimensions (r x c)	File Size	GPD Short Name
N., S. Hemisphere	25 km	721 x 721	508 KB	Nl, Sl
	12.5 km	1441 x 1441	2 MB	Nh, Sh
Global	25 km	1383 x 586	792 KB	Ml
	12.5 km	2766 x 1171	3.1 MB	Mh

Table 3. EASE-Grid 2.0 Land Classification Resolutions and Grid Sizes

Projection	Parent Grid	Available Resolutions	Grid Dimensions (r x c)	File Size	GPD Short Name
N., S. Hemisphere	100 km	100 km	180 x 180	32 KB	EASE2_N100km, EASE2_S100km
		10 km	1800 x 1800	3.1 MB	EASE2_N10km, EASE2_S10km
		5 km	3600 x 3600	13 MB	EASE2_N05km, EASE2_S05km
	36 km	36 km	500 x 500	245 KB	EASE2_N36km, EASE2_S36km
		9 km	2000 x 2000	3.9 MB	EASE2_N09km, EASE2_S09km
		3 km	6000 x 6000	35 MB	EASE2_N03km, EASE2_S03km
	25 km	25 km	720 x 720	507 KB	EASE2_N25km, EASE2_S25km
		12.5 km	1440 x 1440	2 MB	EASE2_N12.5km, EASE2_S12.5km
		6.25 km	2880 x 2880	8 MB	EASE2_N6.25km, EASE2_S6.25km
		3.125 km	5760 x 5760	33 MB	EASE2_N3.125km, EASE2_S3.125km
Global	36 km	36 km	964 x 406	383 KB	EASE2_M36km
		9 km	3856 x 1624	6 MB	EASE2_M09km
		3 km	11568 x 4872	54 MB	EASE2_M03km
	25 km	25 km	1388 x 584	792 KB	EASE2_M25km
		12.5 km	2776 x 1168	3.1 MB	EASE2_M12.5km
		6.25 km	5552 x 2336	13 MB	EASE2_M6.25km
Temperate[1]	25 km	25 km	1388 x 540	750 KB	EASE2_T25km
		12.5 km	2776 x 1080	3.0 MB	EASE2_T12.5km
		6.25 km	5552 x 2160	12 MB	EASE2_T6.25km
		3.125 km	11104 x 4320	50 MB	EASE2_T3.125km

[1]The temperate grid is a subset of the global grid that omits the most poleward latitudes. It extends from 67 N° to 67 S°.

1.2 File and Directory Structure

1.2.1 EASE-Grid

Data are available via FTP in ftp://sidads.colorado.edu/pub/DATASETS/nsidc0607_loci_ease/. This directory contains a subdirectory for each EASE-Grid region: `north, south,` and `global`. The available land masks and browse images for a region are stored within the corresponding subdirectory.

1.2.2 EASE-Grid 2.0

Data are available via FTP in ftp://sidads.colorado.edu/pub/DATASETS/nsidc0609_loci_ease2/. This directory contains a subdirectory for each EASE-Grid region: `north, south,` and `global`. The available land masks and browse images for a region are stored within the corresponding subdirectory.

1.3 File Naming Convention

1.3.1 EASE-Grid

Example File Name: `Nl.LOCImask_land50_coast0km.721x721bin`
Generic File Name: `Pr.LOCImask_landTT_coastZkm.colxrow.ext`

Refer to Table 4 for the valid values for the file name variables listed above.

1.3.2 EASE-Grid 2.0

Example File Name: `EASE2_N25km.LOCImask_land50_coast0km.720x720.bin`
Generic File Name: `EASE2_PRRkm.LOCImask_landTT_coastZkm.colxrow.ext`

The following table describes this data set's file name variables:

Table 4. File Naming Convention for the Land Classification Files

Variable	Description
EASE2_	File contains EASE-Grid 2.0 data. Files without this variable contain EASE-Grid data.
P	Projection. Values: N = N. Hemisphere; S = S. Hemisphere; M = global; T = temperate
EASE: r EASE 2.0: RRkm	Resolution (EASE-Grid). h = 12.5km, l = 25km Resolution in km (EASE-Grid 2.0). For example: 03km = 3 km; 3.125km = 3.125 km; 05km = 5 km..

Variable	Description
LOCImask	File contains the LOCI mask
landTT	Identifies the land threshold used in the processing of these files (50: 50% cut off used).
coastZkm	Identifies the width of the coast used in the processing of these files. Coastlines = 0 px for this data set, i.e. value for coastline not present in data.
colxrow	Grid dimensions in pixels, column x row.
.ext	File extension. .bin = binary data file, .png = PNG browse image.

1.4 Spatial Coverage and Resolution

1.4.1 EASE-Grid

These data cover the entire globe and are provided in projections for the entire globe and for the Northern and Southern Hemispheres. See Table 2 for a complete listing of the projection/resolution combinations.

1.4.2 EASE-Grid 2.0

These data cover the entire globe and are provided in projections for the entire globe and for the Northern and Southern Hemispheres. See Table 3 for a complete listing of the projection/resolution combinations.

1.4.3 Projection and Grid Description

These data are provided in both the EASE-grid projection and the EASE-Grid 2.0 projection. The grid sizes are given in Table 2 and Table 3, respectively. For complete details on these two projections, see the EASE-Grid web page.

1.5 Temporal Coverage

The LOCI masks are derived from MODIS (Version 4) data obtained between July and December, 2000 (Friedl et al. 2002).

2 SOFTWARE AND TOOLS

See the EASE-Grid page for links to software and tools that geolocate and display EASE-Grid data sets.

3 DATA ACQUISITION AND PROCESSING

3.1 Processing Steps

The LOCI masks were generated from the following input data:

- EASE-Grid Land Cover Classifications Derived from Boston University MODIS/Terra Land Cover Data, Version 1
- EASE-Grid 2.0 Land Cover Classifications Derived from Boston University MODIS/Terra Land Cover Data, Version 1

These EASE-Grid and EASE-Grid 2.0 land cover data sets were derived from the Boston University MODIS/Terra 1 km Land Cover Product (MCD12Q1, V004). MCD12Q1 utilizes the 17 International Geosphere Biosphere Programme (IGBP) land cover classes in Table 5.

LOCI masks were generated using the follow algorithm:

1. For each grid cell, calculate the percent land by summing the percent of IGBP non-water classes (1-16).
2. Cells with >= 50% ice are classified as ice.
3. Cells with >= 50% land and < 50% ice are classified as land
4. Any remaining cells are classified as ocean (including lakes and inland water).

Note: The LOCI masks available as part of this data set have their coastline widths set to zero pixels. As such the files do not include the value for coastline. To obtain masks with custom coastline widths, please contact NSIDC User Services.

Table 5. IGBP Land Cover Classes

Class Number	Category	Class Number	Category
01	Evergreen needleleaf forest	10	Grasslands
02	Evergreen broadleaf forest	11	Permanent Wetlands
03	Deciduous needleleaf forest	12	Croplands
04	Deciduous broadleaf forest	13	Urban and built-up
05	Mixed forests	14	Cropland/natural vegetation mosaic
06	Closed shrublands	15	Snow and ice
07	Open shrublands	16	Barren or sparsely vegetated
08	Woody savannas	17	Water bodies
09	Savannas		

3.2 Version History

The following tables show the version history for these data sets.

Table 6. Version History for EASE-Grid LOCI Masks

Version	Date	Description
V1.0	2004	The EASE-Grid LOCI masks were created as an ancillary data set, not part of the official NASA DAAC data catalog. Instead, some of the data were distributed as ancillary data via a web page and others via personal communication with the authors.
V1.1	2014	These data were accessioned into the NASA DAAC catalog and given a data set ID number. During this process, NSIDC changed the title, filenames, and organization of the data to improve usability. For example, the file name for the Northern Hemisphere 25 km LOCI mask was changed as follows: Nl_loci_land50_coast0km.721x721.bin (old name) Nl.LOCImask_land50_coast0km.721x721bin (new name)

Table 7. Version History for EASE-Grid 2.0 LOCI Masks

Version	Date	Description
V1.0	2011	The EASE-Grid 2.0 LOCI masks were created as an ancillary data set, not part of the official NASA DAAC data catalog. Instead, the data were distributed via personal communication with the authors.
V1.1	2014	These data were accessioned into the NSIDC system and given a data set ID number. During this process, NSIDC changed the title, filenames, and organization of the data to improve usability. For example, the old file name for the Northern Hemisphere 25 km mask was changed as follows: EASE2_N25km_loci_land50_coast0km.720x720.bin (old name) EASE2_N25km.LOCImask_land50_coast0km.720x720.bin (new name)

3.3 Error Sources

Errors in the input data represent the primary source of error in this data set. See Data Corrections Applied in the User Guide for EASE-Grid and EASE-Grid 2.0 Land Cover Classifications Derived from Boston University MODIS/Terra Land Cover Data.

4 REFERENCES AND RELATED PUBLICATIONS

General

Friedl, M. A., et al. 2002. Global Land Cover Mapping from MODIS: Algorithms and Early Results. Remote Sensing of the Environment 83: 287-302.

EASE-Grid

Brodzik, M. J. and K. W. Knowles. 2002. "EASE-Grid: a versatile set of equal-area projections and grids" in M. Goodchild (Ed.) Discrete Global Grids. Santa Barbara, CA, USA: National Center for Geographic Information & Analysis.

EASE-Grid 2.

Brodzik, M. J., B. Billingsley, T. Haran, B. Raup, M. H. Savoie. 2012. EASE-Grid 2.0: Incremental but Significant Improvements for Earth-Gridded Data Sets. ISPRS International Journal of Geo-Information, 1(1):32-45. doi:10.3390/ijgi1010032. http://www.mdpi.com/2220-9964/1/1/32.

Brodzik, M. J., B. Billingsley, T. Haran, B. Raup, M. H. Savoie. 2014. Correction: Brodzik, M. J. et al. EASE-Grid 2.0: Incremental but Significant Improvements for Earth-Gridded Data Sets. ISPRS International Journal of Geo-Information 2012, 1, 32-45. ISPRS International Journal of Geo-Information, 3(3):1154-1156. doi:10.3390/ijgi3031154. http://www.mdpi.com/2220-9964/3/3/1154.

4.1 Related Data Collections

EASE-Grid Land Cover Classifications Derived from Boston University MODIS/Terra Land Cover Data
EASE-Grid 2.0 Land Cover Classifications Derived from Boston University MODIS/Terra Land Cover Data

5 CONTACTS AND ACKNOWLEDGMENTS

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6 DOCUMENT INFORMATION

6.1 Publication Date

2004

6.2 Date Last Updated

11 February 2021