Sea Ice Index Ice Analysis Spreadsheets

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Introduction

The team of NSIDC scientists who compose articles for the Arctic Sea Ice News and Analysis (ASINA) web site reference data from the Sea Ice Index in the text. Extent and area values, as well as parameters derived from both daily and monthly Sea Ice Index data, are included when composing each post. Rates of change, the rank of daily or monthly extent values in the satellite record, and regional data are among the parameters the ASINA team commonly refer to and commonly produce questions for the readers. For these reasons, we now include spreadsheets of the parameters in use along with documentation of how they are calculated as an ancillary Sea Ice Index product.

The format of the spreadsheets and the precision of the values they contain are dictated by the requirement that they be easy to use by the ASINA team. For this reason, the spreadsheets are in Microsoft Excel rather than a non-proprietary format and values are reported to three decimal places, a precision much higher than would make sense for most uses.

In these tables, the number of significant figures is not a reflection of true geophysical significance. Here, the number of significant figures implies a precision for measurements of Arctic or Antarctic-wide extent that is better than about 10,000 (0.01 million) square kilometers, or about 0.2% of a typical 6 million square kilometers Arctic ice extent. However, uncertainty in daily passive microwave estimates of Arctic-wide extent due to noise in the data and sensitivity to brightness temperatures is on the order of 30,000-50,000 square kilometers or 0.03-0.05 million square kilometers (personal communication, Walt Meier 05 Oct. 2016). Day-to-day differences on the order of 0.001 million square kilometers, as shown in these spreadsheets, are unimportant and are included only to serve as tie-breakers when ranking is done and to make it easier for users to do their own calculations without finding differences with our conclusions due to rounding errors.

Data Access

The files described in this document can be found here:
https://noaadata.apps.nsidc.org/NOAA/G02135/seaice_analysis/

Spreadsheet Descriptions

Note: vX.x in the file name denotes the generic form for the version, for example v3.0.

Sea_Ice_Index_Monthly_Data_by_Year_G02135_vX.x.xlsx

This spreadsheet provides monthly Sea Ice Index sea ice extent and area data in one convenient file for both the Northern Hemisphere (NH) and the Southern Hemisphere (SH) from November 1978 to present. It contains five sheets described in Table 1 with the columns in the sheets described in Table 2.

Table 1. Description of Sea_Ice_Index_Monthly_Data_by_Year_G02135_vX.x.xlsx Data Sheets

Sheet Name*	Description
NH-Extent and SH-Extent	Contains sea ice extent data for the respective hemisphere. See Table 2 for column descriptions.
NH-Area and SH-Area	Contains sea ice area data for the respective hemisphere. See Table 2 for column descriptions.
Documentation	Contains brief documentation and URLs to more comprehensive documentation.

*NH = Northern Hemisphere; SH = Southern Hemisphere

Table 2. Description of Columns in Sea_Ice_Index_Monthly_Data_by_Year_G02135_vX.x.xlsx Data Sheets

Column	Column Name	Description
A	Unnamed	Contains the 4-digit year of the data
B-M	Named for the 12 months of the year: January, February, March, etc.	If this is on an *Extent* sheet, these columns contain monthly averaged sea ice extent, in millions of square kilometers, for that month and year. If this is on an *Area* sheet, these columns contain monthly averaged sea ice area, in millions of square kilometers, for that month and year. Blank spaces indicate missing data. For a description of how these values are calculated, see section 3.1.6 Monthly Sea Ice Extent and Area Data Files of the Sea Ice Index user guide.
O	Annual	Contains a weighted yearly average of the monthly extent/area values, in millions of square kilometers, weighted by the number of days in the month, for each year from 1979 to the most recent year. Annual values highlighted in red mean the value was computed without all the monthly values for that year and should be used with caution.

Note: The August 1987 area data is absent from the data set due to the change in instruments from the NIMBUS SMMR instrument to the DMSP SSM/I instrument during this month. The region not imaged by the sensor, called the pole hole, changes dramatically between these two instruments. Since values for ice area do not include the pole hole, there is a discontinuity in the area data for that month, so the value cannot be computed and thus is left out.

Sea_Ice_Index_Monthly_Data_with_Statistics_G02135_vX.x.xlsx

This spreadsheet organizes monthly average sea ice extent and area data, in millions of square kilometers from 1979 to present. Data are parsed by hemisphere and month and also includes includes monthly extent trends in an annual and decadal basis. Monthly extent anomalies, compared with 1981 to 2010 long-term averages; and extent rankings from lowest to highest year for each month are also available. This Excel file contains 25 sheets: 12 for each month of the year for the Northern Hemisphere (January-NH, February-NH, etc.) and 12 for each month of the year for the Southern Hemisphere (January-SH, February-SH, etc.). One final sheet, titled "Documentation," contains a brief overview and URLs to more comprehensive documentation. Blank cells indicate missing data.

The first eight summary rows in the 24 data sheets are described in Table 3. Data columns are described in Table 4.

Table 3. Description of Sea_Ice_Index_Monthly_Data_with_Statistics_G02135_vX.x.xlsx Summary Rows

Row Number	Row Name*	Description
1	*Month YYYY* extent	Contains the extent for the month for the sheet that you are viewing for the most current year that data are available in millions of sq km. For example, if you are viewing the *January-NH* sheet, then this is the extent, to two decimal places, for the most recent January.
2	*Month* 1981-2010 mean extent	Contains the 1981 to 2010 climatological extent to two decimal places for the month for the sheet you are viewing in millions of sq km. It is computed by averaging all the extent values for the month in question from 1981 to 2010.
3	*Month* YYYY - *Month* 1981 – 2010	Contains the difference of the most recent extent for the month you are viewing and its 1981 to 2010 mean in sq km. This value is the month's 1981 to 2010 mean subtracted from the month's latest extent.
4	*Month YYYY* rank	Gives three values after the row name. The first is the ranking. The ranking is based on the extent. The higher the ranking, that is the lower the number, the lower the extent value for the month. The second value is the number of years that rank lower than the most recent month, that is have higher extent; and the final number is the number of years that rank higher than the most recent month, that is have lower extent. For example, if the most recent month is ranked 1, then it has the lowest extent of all previous extents for that month.
5	*Month YYYY* (max)	Contains the highest monthly extent value and the difference from the extent of the latest complete month in sq km. This shows the difference in the

		latest complete month from the maximum monthly extent to date.
6	*Month YYYY* (min)	Contains the lowest monthly extent value and the difference from the extent of the latest complete month in sq km. This shows the difference in the latest complete monthly extent from the minimum extent to date.
7	*Month YYYY* trend	Provides the trend in percent/decade of the month in question. See section 3.1.5 Monthly Sea Ice Extent Anomaly Graphs of the user guide for more information.
8	*Month YYYY* trend	Provides the trend in sq km/year of the month in question. This value is the slope of the linear regression of all the extents up to the year in question multiplied by 1,000,000 to get sq km/year.

*Where:

- *Month* is the name of the month of the sheet you are viewing
- *YYYY* is the 4-digit year of the data. For all rows except the max and min rows, this 4-digit year is the most current year for that month. For the max and min rows, the 4-digit year is the year of the maximum extent or the minimum extent for the month in question, respectively.

Table 4. Description of Sea_Ice_Index_Monthly_Data_with_Statistics_G02135_vX.x.xlsx Data Columns

Column Name	**Description**
Unnamed	Counter
Year	4-digit year of the data
Month	1- or 2-digit month of the data
data-type	Describes whether the data is final (Goddard) or near-real-time (NRTSI-G)
Hemisphere	The hemisphere the data are from. N: North S: South
Extent	Sea ice extent, in millions of sq km, for the year noted in the *year* column rounded to two decimal places.
Area	Sea ice area, in millions of sq km, for the year noted in the *year* column rounded to two decimal places.
Rank	Rankings of each year are based on extent rounded to two decimal places. When years are tied, the years will have a decimal ranking. For example, 26.5 means tied for 26th place. The lower the value, the lower the extent for the month in question for the year listed in the *year* column.
extent-anomaly	The extent anomaly is calculated by subtracting the month's 1981 to 2010 mean from its extent for that year.
trend-through-year-km^2-per-year	This value is the slope of the linear regression of all the extents up to the year in question multiplied by 1,000,000 to get sq km/year. Note: This is different from the slope on the anomaly graphs which is the slope of the percent difference.
p-value	The statistical p-value for the anomalies in the extent through the year in question.

r-value	The correlation coefficient of the extent anomalies through the year in question.
Stderr	Contains the standard error, a measure of the statistical accuracy of an estimate, for the extents from the climatological mean (1981 to 2010).
Significant	Describes the significance of the change in extent for the year in question. If the value is significant, that is the r-value squared is greater than or equal to 0.65 and the p-value is less than or equal to 0.05, then this column is set to 1. If the r-value and p-value do not satisfy this condition, the cell is set to 0, meaning it is not significant.
%-trend-through-year	This is the slope of the linear regression of the extent anomalies through the year in question. For information on how this is computed see section 3.1.5 Monthly Sea Ice Extent Anomaly Graphs of the user guide.
reordered =>	This column is simply a divider column. The columns that follow it (Q, R, and S) are the same data as in columns H, B, and F, respectively, except sorted by rank.
ordered-rank	Ordered rank from smallest rank value (lowest extent, least ice) to largest (highest extent, most ice).
ranked-year	The 4-digit year ordered by rank given in *ordered-rank* column.
ranked-extent	The ice extent ordered by rank given in *ordered-rank* column.

Note: The August 1987 area data is absent from the data set due to the change in instruments from the NIMBUS SMMR instrument to the DMSP SSM/I instrument during this month. The region not imaged by the sensor, called the pole hole, changes dramatically between these two instruments. Since values for ice area do not include the pole hole, there is a discontinuity in the area data for that month, so the value cannot be computed and thus is left out.

Sea_Ice_Index_Daily_Extent_G02135_vX.x.xlsx

This spreadsheet contains daily sea ice extent from 1979 to present, in millions of square kilometers, for both the Northern (NH) and Southern (SH) Hemispheres. The spreadsheet contains eight data sheets (four for the North and four for the South) and present single-day extent values, calculated 5-day trailing average extent values (the values presented in the Charctic Interactive Sea Ice Graph), 5-day trailing average anomaly, and 5-day trailing average daily change in extent. There is a ninth sheet titled "Documentation" that provides basic information with links to more thorough documentation. Blank cells indicate missing data. Anomalies are compared with the 1981 to 2010 average for that date. Each data sheet is described in Table 5.

Table 5. Description of Sea_Ice_Index_Daily_Extent_G02135_vX.x.xlsx Data Sheets

Sheet Name*	**Description**
NH-Daily-Extent and SH-Daily-Extent	These two sheets provide the daily extent, to three decimal places, for their respective hemispheres. The data are laid out in columns. Column A is the month and Column B is the day of the month indicated in Column A. Starting with Column C are the years of available data beginning with 1978; the columns continue until the current year is reached. There is one final column after the year columns. It is labeled as *1981-2010* and contains the climatological average of the daily data for the years 1981 through 2010.
NH-5-Day-Extent and SH-5-Day-Extent	These two sheets provide the 5-day trailing average daily extent, to three decimal places, for their respective hemispheres. The sheets have the same columns as the *NH-Daily-Extent* and *SH-Daily-Extent* sheets except that the *1981-2010* column is the average of the 5-day trailing averages from 1981 through 2010. The 5-day trailing average is calculated by averaging the extent value from a given day with the extent value from the previous four days to produce a 5-day average. The average is only computed if at least 2 days of data exist in the 5-day span. **These sheets are provided because a 5-day trailing average helps to reduce erroneous daily variations.** *Note: With a 5-day trailing average, the average value on the last day will be higher than the true daily value when ice is decreasing (during the melt season) and lower than the true daily value when ice is increasing (during freeze-up). For the SMMR era of the data (26 October 1978 - 20 August 1987), when data were collected only every other day, the gaps in the data are first filled in by averaging the data value from the day before and the day after. Then, the 5-day trailing average is computed.*
NH-5-Day-Anomaly and SH-5-Day-Anomaly	These two sheets provide the anomalies in the daily 5-day trailing average data from the climatological mean. The anomaly is calculated by taking the 5-day trailing average extent for a day and subtracting from it the 1981 to 2010 mean for that day whose values can be found in the *NH[SH]-5-Day-Extent* sheets. Positive values are highlighted in blue and negative values are in red.

NH-5-Day-Daily-Change and SH-5-Day-Daily-Change	These sheets provide data describing the change in the daily extents over time. On these sheets, the value for a day is calculated by taking that day's 5-day trailing averaged value and subtracting from it the value for the day before whose values can be found in *NH[SH]-5-Day-Extent*. For example, in the *NH-5-Day-Daily-Change* sheet, January 2, 1979 has a value of 0.111. In the *NH-5-Day-Extent* sheet, January 1, 1979's value is 14.572 and January 2's value is 14.683; finding the change from the first day to the second day gives 0.111 (14.683 - 14.572 = 0.111). Positive values are highlighted in blue and negative values are in red.

*NH = Northern Hemisphere; SH = Southern Hemisphere

Sea_Ice_Index_Min_Max_Rankings_G02135_vX.x.xlsx

This spreadsheet contains daily and 5-day trailing average minimum and maximum sea ice extent values and rankings, 1978 to present, in millions of square kilometers, for the Northern (NH) and Southern (SH) Hemispheres. The twelve data sheets provide the lowest and highest recorded extent values and dates for each month and year. For daily rankings, the lowest and highest extent values to date for the current year are given. 1978 and the current year are excluded from the annual rankings due to incomplete data. There is a thirteenth sheet called "Documentation" that provides basic information with links to more thorough documentation. Each data sheet is described in Table 6.

Table 6. Description of Sea_Ice_Index_Min_Max_Rankings_G02135_vX.x.xlsx Data Sheets

Sheet Name*	**Description**
NH-5-Day-Extent-Min and SH-5-Day-Extent-Min	These sheets provide the minimum 5-day trailing average extent value and the date it occurred for each month and year. The top row of the sheets is the month. Column A is the rank of the minimums where a lower number means a lower extent with 1 being equal to the lowest extent. Under each month are two columns labeled *5-day* and *date*. The *5-day* column gives the value of the minimum 5-day trailing average extent and the *date* column gives the date that it occurred in the form YYYY-MM-DD.
NH-5-Day-Extent-Max and SH-5-Day-Extent-Max	These sheets provide the maximum 5-day trailing average extent value and the date it occurred for each month and year. The top row of the sheets is the month. Column A is the rank of the maximums where a lower number means a higher extent with 1 being equal to the highest extent. Under each month are two columns labeled *5-day* and *date*. The *5-day* column gives the value of the maximum 5-day trailing average extent and the *date* column gives the date that it occurred in the form YYYY-MM-DD.
NH-Daily-Extent-Min and SH-Daily-Extent-Min	These sheets provide the minimum recorded daily extent value and the date it occurred for each month and year. The top row of the sheets is the month. Column A is the rank of the minimums where a lower number means a lower extent with 1 being equal to the lowest extent. Under each month are two columns labeled *extent* and *date*. The *extent* column gives the value of the minimum daily extent and the *date* column gives the date that it occurred in the form YYYY-MM-DD.
NH-Daily-Extent-Max and SH-Daily-Extent-Max	These sheets provide the maximum recorded daily extent value and the date it occurred for each month and year. The top row of the sheets is the month. Column A is the rank of the maximums where a lower number means a higher extent with 1 being equal to the highest extent. Under each month are two columns labeled *extent* and *date*. The *extent* column gives the value of the maximum daily extent and the *date* column gives the date that it occurred in the form YYYY-MM-DD.

NH-Annual-5-Day-Extent and SH Annual-5-Day-Extent	These sheets provide the minimum and maximum 5-day trailing average extent value for an entire year for each year of the Sea Ice Index record. It contains seven columns. Column A is the year. Column B, labeled *min-5-day*, contains the minimum 5-day trailing extent for the year listed in Column A. Column C, labeled *min-rank*, is the ranking of the minimum value given in the *min-5-day* column; and Column D, labeled *min-date*, gives the date that this minimum occurred in the form YYYY-MM-DD. Columns E, F, and G, labeled *max-5-day*, *max-rank*, and *max-date*, provide the 5-day trailing maximum extent, the rank, and the date that the max occurred in the form YYYY-MM-DD, respectively.
NH-Annual-Daily-Extent and SH-Annual-Daily-Extent	These sheets provide the minimum and maximum recorded daily extent value for a year for each year of the Sea Ice Index record. It contains seven columns. Column A is the year. Column B, labeled *min-extent*, contains the minimum recorded extent for the year listed in Column A. Column C, labeled *min-rank*, is the ranking of the minimum value given in the *min-extent* column; and Column D, labeled *min-date*, gives the date that this minimum occurred in the form YYYY-MM-DD. Columns E, F, and G, labeled *max-extent*, *max-rank*, and *max-date*, provide the recorded maximum extent, the rank, and the date that the max occurred in the form YYYY-MM-DD, respectively.

*NH = Northern Hemisphere; SH = Southern Hemisphere

Sea_Ice_Index_Rates_of_Change_G02135_vX.x.xlsx

This spreadsheet contains average daily and monthly rates of sea ice extent change for each month, for the Northern (NH) and Southern (SH) Hemispheres, from 1978 to present. Daily rates of change are in square kilometers and square miles. Monthly rates of change are in millions of square kilometers and in square miles. There are eight data sheets and one sheet labeled "Documentation" that contains brief documentation and URLs to more comprehensive documentation. Each data sheet contains 13 columns. Column A is the year and the 12 subsequent columns are the month. Positive values are highlighted in blue and negative values are in red. The data sheets are fully described in Table 7.

Table 7. Description of Sea_Ice_Index_Rates_of_Change_G02135_vX.x.xlsx Data Sheets

Sheet Name*	**Description**
NH-Ice-Change-Mkm^2-per-Month and SH-Ice-Change-Mkm^2-per-Month	These sheets provide data that describes how the extent data is changing from month to month. A value is calculated by taking the 5-day trailing average extent on the last day of month listed in the column and subtracting from it the last 5-day trailing average extent from the last day of the previous month. For example, on the *NH-Ice-Change-Mkm^2-per-Month* sheet, the January 2017 value (1.189) is calculated by taking the 5-day extent from the last day of January 2017 (13.695 Mkm^2) and the last day of December 2016 (12.506 Mkm^2), from the Sea_Ice_Index_Daily_Extent_G02135_vX.x.xlsx file, and subtracting January 2017 from December 2016 to give 1.189. The *1981-2010* row is computed by averaging the values from 1981 through 2010 for the month. *Note: Values in the Sea_Ice_Index_Daily_Extent_G02135_vX.x.xlsx file have been rounded. However, the calculation of the change in the month in these sheets were computed using the full precision number, so some slight differences may be seen if the values from the daily extent file are used to compute the monthly rate of change due to rounding error.*
NH-Ice-Change-km^2-per-Day and SH-Ice-Change-km^2-per-Day	These sheets take the values from *NH[SH]-Ice-Change-Mkm^2-per-Month*, divide them by the number of days in that month, and then convert them to square kilometers.
NH-Ice-Change-mi^2-per-Month and SH-Ice-Change-mi^2-per-Month	These sheets take the values from *NH[SH]-Ice-Change-Mkm^2-per-Month* and convert them to square miles.
NH-Ice-Change-mi^2-per-Day and SH-Ice-Change-mi^2-per-Day	These sheets take the values from *NH[SH]-Ice-Change-km^2-per-Day* and convert them to square miles.

*NH = Northern Hemisphere; SH = Southern Hemisphere

N_Sea_Ice_Index_Regional_Daily_Data_G02135_vX.x.xlsx

This spreadsheet contains average daily sea ice extent and area, using 5-day trailing averages, in square kilometers, by region of the Arctic Ocean. The Arctic is broken up into 14 regions with boundaries defined by the ASINA team using Meier et al. (2007): Baffin Bay, Barents Sea, Beaufort Sea, Bering Sea, Canadian Archipelago, Central Arctic Ocean, Chukchi Sea, East Siberian Sea, Greenland Sea, Hudson Bay, Kara Sea, Laptev Sea, Sea of Okhotsk, and Gulf of St. Lawrence. See Figure 1 for a map of these regions.

The spreadsheet contains 29 sheets. The first 28 sheets contain the data and the final sheet, labeled "Documentation," contains brief documentation and URLs to more comprehensive documentation. Each of the 14 regions has two sheets: one with the 5-day trailing average area and one with the 5-day trailing average extent. Column A is the month and Column B is the day of the month indicated in Column A. Starting with Column C are the years of available data beginning with 1978; the columns continue until the current year is reached.

Note: Weather effects can cause the passive microwave signature of seawater to appear like that of ice. For the St. Lawerence region, the months of August through October are ice-free but false ice is sometimes detected by the passive microwave instruments that measure these data. A valid ice mask is applied to ensure that this area is ice free for those months, so the *St-Lawrence-Area-km^2* and *St-Lawrence-Extent-km^2* sheets will have zeros in the rows for August through October. July is often also ice-free but that month is not masked so sometimes values greater than zero do occur. For more information on masking false-ice detection, see the Valid Ice Masks section of the Sea Ice Index user guide.

N_Sea_Ice_Index_Regional_Monthly_Data_G02135_vX.x.xlsx

This spreadsheet contains average monthly sea ice extent and area, and lowest to highest monthly extent rankings for 1978 to present, in square kilometers, by region of the Arctic Ocean. The Arctic is broken up into 14 regions with boundaries defined by the ASINA team using Meier et al. (2007): Baffin Bay, Barents Sea, Beaufort Sea, Bering Sea, Canadian Archipelago, Central Arctic Ocean, Chukchi Sea, East Siberian Sea, Greenland Sea, Hudson Bay, Kara Sea, Laptev Sea, Sea of Okhotsk, and Gulf of St. Lawrence. See Figure 1 for a map of these regions.

The spreadsheet contains 29 sheets. The first 28 sheets contain the data and the final sheet, labeled "Documentation," contains brief documentation and URLs to more comprehensive documentation. Each of the 14 regions has two sheets: one with the monthly averaged area and one with the monthly averaged extent. Column A in each data sheet is the 4-digit year. The next 24 columns are the 12 months broken up into two columns each: Area/Extent and rank. For the rank, the lower the rank value, the lower the area or extent value with 1 being the lowest extent or area.

Note: Weather effects can cause the passive microwave signature of seawater to appear like that of ice. For the St. Lawerence region, the months of August through October are ice-free but false ice is sometimes detected by the passive microwave instruments that measure these data. A valid ice mask is applied to ensure that this area is ice free for those months, so the *St-Lawrence-Area-km^2* and *St-Lawrence-Extent-km^2* sheets will have zeros in the columns for August through October. July is often also ice-free but that month is only partially masked so sometimes values greater than zero do occur. Because these months are ice-free, the ranking of them is nonsensical because they are all tied at zero sq km. This is the reason for 19.5 in the rank column. For more information on masking false-ice detection, see the Valid Ice Masks section of the Sea Ice Index user guide.

In addition, for the central Arctic for August 1987, the data are zeroes because of the change in satellites during this month which led to a large false jump in the data due to the change in the size of the Arctic Pole Hole.

Arctic_region_mask_Meier_AnnGlaciol2007.msk

The Arctic Sea Ice Index regions are defined using the mask file, Arctic_region_mask_Meier_AnnGlaciol2007.msk, created by Meier et al. (2007). Figure 1 provides a visual representation of the regions defined by the mask file. Note: There is also an ASCII text version of this mask file available (Arctic_region_mask_Meier_AnnGlaciol2007.txt) that contains the same mask values.

The mask file is a 1 byte, unsigned integer headerless binary file with 304 columns x 448 rows. The values in the mask are the following:

0 - Lake (which are not considered part of the sea ice-covered region even if they are ice-covered)
1 - Ocean (outside of the defined regions)
2 - Okhotsk
3 - Bering
4 - Hudson
5 - St Lawrence
6 - Baffin
7 - Greenland
8 - Barents
9 - Kara
10 - Laptev
11 - East Siberian
12 - Chukchi
13 - Beaufort
14 - Canadian Archipelago
15 - Central Arctic
20 - Land
21 - Coast

The file can be read using Python with NumPy with the following lines of code:

```
import numpy as np

regional_mask = np.fromfile('./Arctic_region_mask_Meier_AnnGlaciol2007-
1.msk',dtype=np.uint8).reshape((448, 304))
```

Note that this mask file does not contain latitude and longitudes of the regions, however, the mask file is based on NSIDC Polar Stereographic projection. Therefore, the lat/lon polygons could be constructed by using the latitude and longitude variables from the NetCDF file NSIDC0771_LatLon_PS_N25km_v1.0.nc available from the Polar Stereographic Ancillary Grid Information, Version 1 (NSIDC-0771) data set landing page.

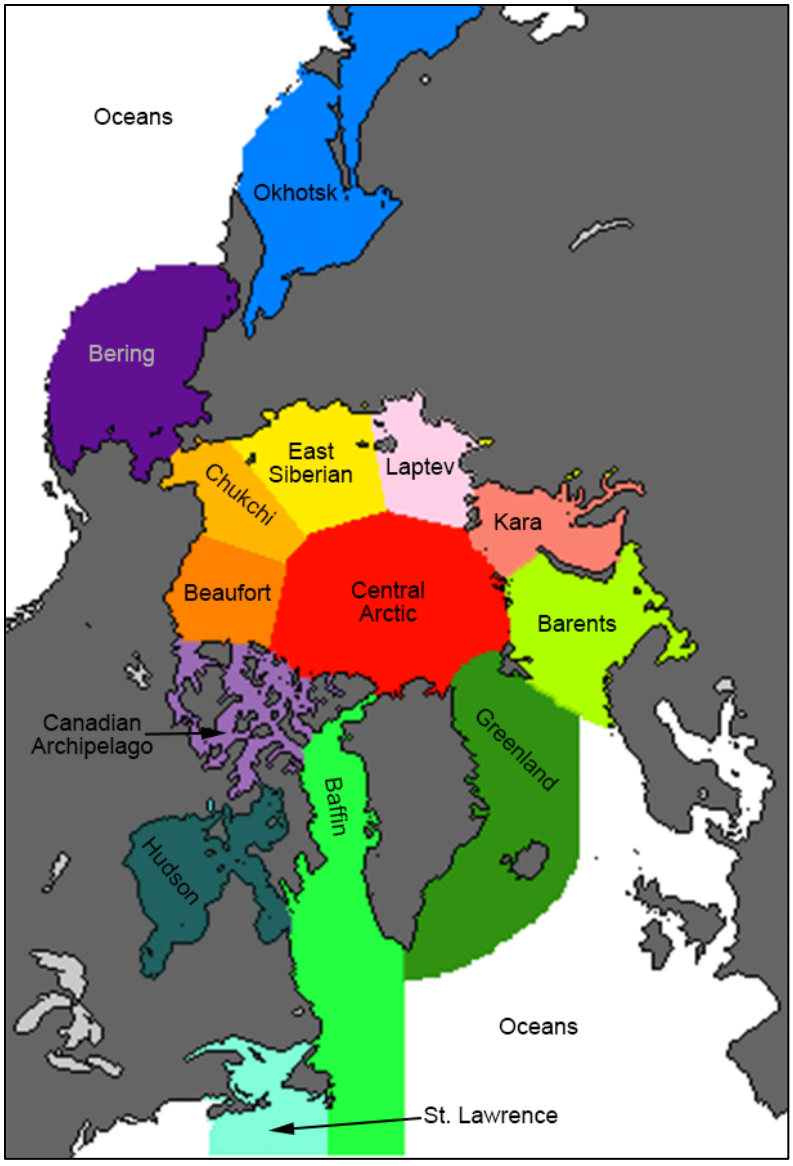

Figure 1. Arctic Regions

S_Sea_Ice_Index_Regional_Daily_Data_G02135_vX.x.xlsx

This spreadsheet contains average daily sea ice extent and area, using 5-day trailing averages, in square kilometers, by region of the Antarctic Ocean. The Antarctic is broken up into 5 regions with boundaries defined by the ASINA team using the NSIDC Polar Stereographich Southern Region Mask: Bellingshausen Amundsen Sea, Indian Ocean, Pacific Ocean, Ross Sea, and Weddel Sea. See Figure 2 for a map of these regions.

The spreadsheet contains 11 sheets. The first 10 sheets contain the data and the final sheet, labeled "Documentation," contains brief documentation and URLs to more comprehensive documentation. Each of the 5 regions has two sheets: one with the 5-day trailing average area and one with the 5-day trailing average extent. Column A is the month and Column B is the day of the month indicated in Column A. Starting with Column C are the years of available data beginning with 1978; the columns continue until the current year is reached.

S_Sea_Ice_Index_Regional_Monthly_Data_G02135_vX.x.xlsx

This spreadsheet contains average monthly sea ice extent and area, and lowest to highest monthly extent rankings for 1978 to present, in square kilometers, by region of the Antarctic Ocean. The Antarctic is broken up into 5 regions with boundaries defined by the ASINA team using the NSIDC Polar Stereographich Southern Region Mask: Bellingshausen Amundsen Sea, Indian Ocean, Pacific Ocean, Ross Sea, and Weddel Sea. See Figure 2 for a map of these regions.

The spreadsheet contains 11 sheets. The first 10 sheets contain the data and the final sheet, labeled "Documentation," contains brief documentation and URLs to more comprehensive documentation. Each of the 5 regions has two sheets: one with the monthly averaged area and one with the monthly averaged extent. Column A in each data sheet is the 4-digit year. The next 24 columns are the 12 months broken up into two columns each: Area/Extent and rank. For the rank, the lower the rank value, the lower the area or extent value with 1 being the lowest extent or area.

NSIDC Polar Stereographich Southern Region Mask

The Antarctic Sea Ice Index regions are defined using the NSIDC Polar Stereographic mask file, region_s.msk, available from the Does NSIDC have tools to extract and geolocate polar stereographic data? web page. Figure 2 provides a visual representation of the regions defined by the mask file.

The mask file contains a 300-byte header, followed by a two-dimensional byte array of 332 rows x 316 columns. The values in the mask are the following:

2 - Weddell Sea
3 - Indian Ocean
4 - Pacific Ocean
5 - Ross Sea
6 - Bellingshausen Amundsen Sea
11 - Land
12 – Coast

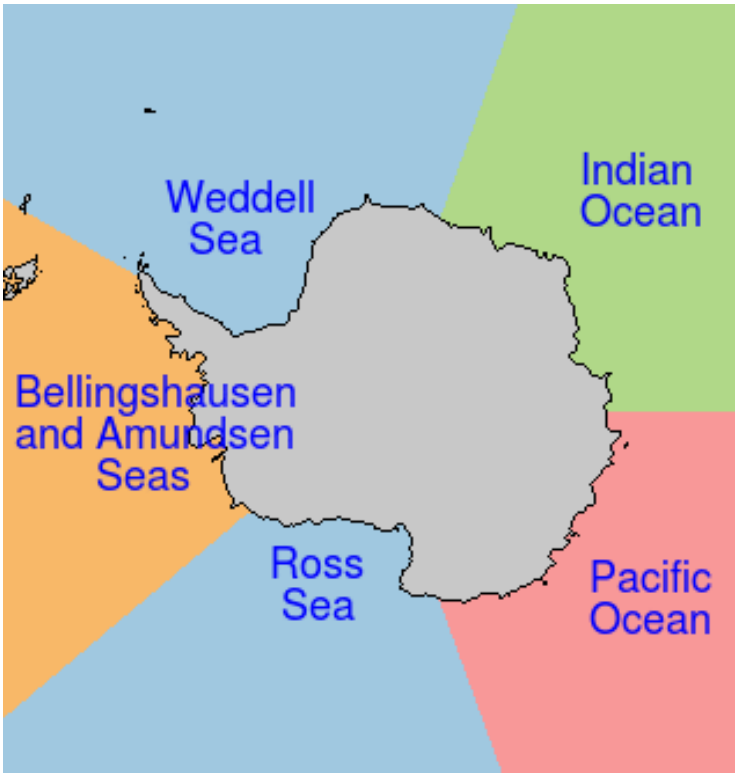

Figure 2. Antarctic Regions

Note that this mask file does not contain latitude and longitudes of the regions, however, the mask file is based on NSIDC Polar Stereographic projection. Therefore, the lat/lon polygons could be constructed by using the latitude and longitude variables from the NetCDF file NSIDC0771_LatLon_PS_S25km_v1.0.nc available from the Polar Stereographic Ancillary Grid Information, Version 1 (NSIDC-0771) data set landing page.

References

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July 2023: A. Windnagel updated the data access link to point to the new HTTPS location.
April 2020: A. Windnagel updated the document to include the new Antarctic regional spreasheets and the Southern Hemisphere regional mask.

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