NOAA/NMC/CAC Arctic and Antarctic Monthly Sea Ice Extent, 1973-1990, Version 1

USER GUIDE

How to Cite These Data

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

Ropelewski, C. F. 1983, updated 1990. NOAA/NMC/CAC *Arctic and Antarctic Monthly Sea Ice Extent, 1973-1990*, Version 1. [Indicate subset used]. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. https://doi.org/10.7265/N5Z60KZ1. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/G00917

National Snow and Ice Data Center

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1 DETAILED DATA DESCRIPTION

Sea ice extent from January 1973 through August 1990 was digitized from weekly operational sea ice charts produced by the Navy/NOAA Joint Ice Center. Charts were digitized by hand using a 1 degree latitude x 2.5 degrees longitude grid. The grid boxes were then summed in 1 degree latitude x 10 degrees longitude slices, and the ice covered area computed. The data represent the extent of sea ice at the end of each month, given for 36 10-degree longitudinal sectors in each hemisphere. Data were provided by the NOAA National Weather Service National Meteorological Center (NMC) Climate Analyses Center (CAC).

These data were provided to the WDC for Glaciology, Boulder, in 1983 by Chester F. Ropelewski, Chief of the NOAA National Weather Service Climate Analysis Center (CAC) Diagnostics Branch. In 1990, the Diagnostics Branch provided an update through August 1990.

These data are from operational ice analyses (ice charts) from the Navy-NOAA Joint Ice Center. These were prepared on a weekly basis using satellite imagery and supplementary conventional observations. The ice charts contain estimates of sea ice concentration for the Arctic and Antarctic.

A selection of these charts (one per month) was digitized at the CAC in order to study the variability of Antarctic sea ice between 1973 and 1982. The results of that study show considerable year-to-year variability with the minimum sea ice area varying by more than a factor of two and maximum sea ice area varying by almost 20% (Ropelewski, 1983). Ropelewski notes that there were no regular analyses or observations of sea ice for the entire Southern Hemisphere prior to 1973. Outside of short periods of intense observations, the only data available were irregularly scheduled observations, such as ship logs and limited aircraft reconnaissance. The first regularly scheduled satellite observations of Antarctic sea ice became available in January of 1973.

Ice-covered area from arctic charts was digitized and summarized in the same way as for the Antarctic.

To produce the ice extent data, the weekly ice chart closest to the end of each month was manually digitized. A 1° latitude x 2.5° longitude grid was placed over the charts. If a grid cell was judged to be more than half covered by ice at any concentration greater than 1/8th, that cell was marked as ice covered. Antarctic shelf ice was excluded. Ice covered area by longitudinal sector was then computed by summing the area of each ice covered grid cell within 1° latitude x 10° longitude "slices". The resulting Arctic and Antarctic data files have sea ice area for each of the 36 longitudinal sectors per month.

1.1 Format

Data are in tab-delimited text format, as shown in the Sample Data Record.

1.2 File Naming Convention

Arctic data are in the file "`arctic.dat`" while Antarctic data are in the file "`antarc.dat`".

1.3 Spatial and Temporal Coverage

Temporal resolution and coverage is monthly, January 1973 through August 1990. The spatial resolution of this data set is 1° latitude by 10° longitude. This is a summation of data on a 1° latitude x 2.5° longitude grid. The manual analyses upon which the gridded charts are based incorporate data at varying resolutions. The spatial coverage is north of 50° N, and south of 50° S.

The longitudinal sectors are as follows:

```
Sector    Longitude "slice"
------    -----------------
  01        0 - 10 deg. E
  02       10 - 20 deg. E
  03       20 - 30 deg. E

   .... around eastward to ...

  36       10 deg. W - 0 deg.
```

1.4 Parameter or Variable

Ice-covered area expressed in units of 1000 square kilometers (km2), is the only parameter in this data set.

1.4.1 Sample Data Record

The data shown are from the "antarc.dat" file. The example shows data from January (7301) through March (7303) of 1973. Each cell represents one sector. Data sectors start at zero degrees longitude and increase 10 degrees moving toward the east (0E, 10E, 20E, etc). Thus, there are 36 sectors for each month of each year.

Table 1. Sample Data Record

			7301					
43.31	77.3	88.63	103.47	121.76	63.6	86.78	74.45	140.99
66.05	64.59	63.11	25.15	25.64	38.46	169.07	105.19	48.53
201.34	260.12	288.99	278.63	301.71	265.1	139.35	99.1	142.91
185.69	65.45	22.16	578.59	803.84	850.44	315.55	89.29	63.94
				7302				
43.31	65.97	88.63	91.64	83.8	63.6	136.07	192.72	100.09
64.58	63.6	89.24	129.16	77.89	76.42	183.36	125.34	259.07
283.27	294.1	274.03	191.02	151.26	146.08	196.62	183.74	120.76
178.56	134.61	10.83	549.57	635.8	157.15	76.41	58.85	63.94
				7303				
88.63	112.29	100.46	103.47	96.62	103.53	176	301.13	194.7
103.53	116.84	129.16	156.75	104.51	177.48	235.13	253.92	325.03
338.41	327.08	329.67	301.79	266.22	230.11	230.11	205.9	199.56
248.04	134.61	22.16	564.32	646.96	309.57	200.29	100.12	63.94

2 SOFTWARE AND TOOLS

2.1 Software and Tools

Data can be viewed with any text editor.

2.2 Quality Assessment

The weekly chart dated closest to the end of the month was selected to represent the sea ice for that month, because it was not practical to analyze each of the weekly charts. This introduces error, or noise, into these estimates for year-to-year comparisons (Ropelewski, 1983). No quality assessment or quality control has been performed on these data at NSIDC.

3 REFERENCES AND RELATED PUBLICATIONS

Ropelewski, C.F. 1983. Spatial and temporal variations in Antarctic sea ice (1973-82). *Journal of Climate and Applied Meteorology*. 22, 470-473.

3.1 Related Data Collections

- Sea Ice Products at NSIDC
- Arctic Climatology Project - EWG Arctic Meteorology and Climate Atlas

4 CONTACTS AND ACKNOWLEDGMENTS

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5 DOCUMENT INFORMATION

5.1 Publication Date

13 April 1994

5.2 Date Last Updated

30 November 2020