GLERL Great Lakes Ice Concentration Data Base, 1960-1979, Version 1

USER GUIDE

How to Cite These Data

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

Assel, R. A. 1983. GLERL Great Lakes Ice Concentration Data Base, 1960-1979, Version 1. [Indicate subset used]. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. https://doi.org/10.7265/N5G44N6G. [Date Accessed].

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

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/G00804

National Snow and Ice Data Center

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1 DATA DESCRIPTION

This data set consists of ice concentration grids from 1960 to 1979 for the Great Lakes. Over 2800 charts were digitized to produce this data base. The data were given to NSIDC by the NOAA Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, MI.

1.1 Summary

An ice concentration data base covering a 20-winter period from 1960 to 1979 was established as part of a study to update an existing Great Lakes ice-cover climatology. Great Lakes ice charts were produced by United States and Canadian government agencies during the 20 years between 1960 and 1979. Over 2800 of these charts were used in developing this digital database. A copy of the NOAA data report, A Computerized Ice Concentration Data Base for the Great Lakes, is strongly recommended for use of the data base, but is not required.

Ice concentration grids for 1960 to 1979 are archived for half-month periods, generally December through April. Data values are coded to the nearest ten percent for each 5 km x 5 km grid square. A file of geographic coordinates of the center of each grid cell is included for each lake. A file of ice climatology data for each lake includes average, median and mode for each grid cell for each half-month period. Over 2800 charts were digitized to produce this data base. Charts were prepared by NOAA/National Weather Service Forecast Office in Ann Arbor, U.S. Coast Guard Ninth District Ice Navigation Center in Cleveland, and by the Canadian Atmospheric Environment Service. Chart data sources include NOAA satellite, U.S. Coast Guard side-looking airborne radar (SLAR) and aerial visual reconnaissance, Canadian Coast Guard SLAR and aerial visual reconnaissance, and Atmospheric Environment Service analyses. The data were given to NSIDC by the NOAA Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, MI.

1.2 File Information

There are three types of files: the original ice concentration files, the climatology data, and the date index and grid cell coordinate index. The following are the files containing the data as well as the data extraction routines. Note that the extraction routines were developed on an SGI running IRIX 4.0.1 and are intended for use as a prototype and may require some updates for the appropriate operating system

1.2.1 Format

Table 1. File Name and Description

File	Description
erie_lake.dat	Ice concentration file for Lakes Erie and St. Clair
erie_clim.dat	Climatology data for Lakes Erie and St. Clair
erie_date.dat	Date index and Coordinate index for Erie and St. Clair
huron_lake.dat	Ice concentration file for Lake Huron
huron_clim.dat	Climatology data for Lake Huron
huron_date.dat	Date index and Coordinate index for Lake Huron
mich_lake.dat	Ice concentration file for Lake Michigan
mich_clim.dat	Climatology data for Lake Michigan
mich_dat.dat	Date index and Coordinate index for Lake Michigan
ontario_lake.dat	Ice concentration file for Lake Ontario
ontario_clim.dat	Climatology data for Lake Ontario
ontario_date.dat	Date index and Coordinate index for Lake Ontario
superior_lake.dat	Ice concentration file for Lake Superior
superior_clim.dat	Climatology data for Lake Superior
superiod_date.dat	Date index and Coordinate index for Lake Superior
read_erie_climate.f	Extraction routine for Erie Climatology
read_erie_image.f	Extraction routine for Erie ice images
read_huron_climate.f	Extraction routine for Huron Climatology
read_huron_image.f	Extraction routine for Huron ice images
read_mich_climate.f	Extraction routine for Michigan Climatology
read_mich_image.f	Extraction routine for Michigan ice images
read_ontario_climate.f	Extraction routine for Ontario Climatology
read_ontario_image.f	Extraction routine for Ontario ice images
read_superior_climate.f	Extraction routine for Superior Climatology
read_superior_image.f	Extraction routine for Superior ice images

1.2.2 File Size

The entire data set is 101 MB.

1.3 Spatial and Temporal Coverage and Resolution

The Great Lakes in 5 km cells, for twice monthly periods during the years 1960-1979.

2 SOFTWARE AND TOOLS

The FORTRAN routines are included in order to facilitate the extraction and use of the data. There are two routines for each lake. The routines entitled read_*_image.f are used to extract the individual digitized ice charts. The routines entitled read_*_climate.f are used to extract the ice concentration climatology files. These files were developed for IRIX 4.0.1 and may require some updates for other operating systems. The files to extract each ice chart allow the user to narrow a query based upon time and geographic location. The user will be prompted to enter the ranges for which data are required. The data extends from December 1960 to April 1979 for the winter months only (December through April). The geographical ranges vary by lake with the latitude and longitude ranges changing accordingly. Note that the longitude is measured in degrees West and is considered a negative number. The user may export the data based upon default criteria; i.e. the entire lake grid. The files to extract the climatology charts for each lake also allow the user to extract a portion of an grid based upon geographical constraints, latitude and longitude. Additionally, the user can select data using the half month period and statistics codes used in the NOAA/GLERL data report.

Table 2. FORTRAN Codes for Extracting Data

Code	Half-month period
1	December 16-31
2	January 1-15
3	January 16-31
4	February 1-14
5	February 15-28
6	March 1-15
7	March 16-31
8	April 1-15
9	April 15-30

Table 3. Ice Concentration Codes

Code	Ice concentration statistics
1	Maximum
2	Minimum
3	Median
4	Average
5	Mode

3 VERSION HISTORY

Table 4. Version History Summary

Version	Release Date	Description of Changes
1.0	1983	Initial release
	July 2006	This document was reformatted. F. Fetterer reviewed this document
	July 2017	A. Windnagel updated broken links in References section.
	November 2020	Converted to PDF

4 RELATED DATA SETS

- GLERL Great Lakes Air Temperature/Degree Day Climatology
- GLERL Radiation Transfer Through Freshwater Ice
- GLERL Great Lakes Ice Thickness Data Base, 1966-1979
- Great Lakes Surface Ice Reports from U.S. Coast Guard

5 CONTACTS AND ACKNOWLEDGMENTS

Dr. Raymond A. Assel
NOAA/GLERL
2205 Commonwealth Boulevard
Ann Arbor, MI 48105-1561

Acknowledgments:

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6 REFERENCES

Assel. R. A., 1983. A Computerized Ice Concentration Data Base for the Great Lakes. *NOAA Data Report ERL GLERL-24*, April 1983 NTIS order number: PB83-233013 (National Technical Information Service, 5285 Port Royal Rd, Springfield VA 22161; telephone 703-487-4650).

Assel, R. A. 2005. Great Lakes weekly ice cover statistics. *NOAA Technical Memorandum GLERL-133*. NOAA, Great Lakes Environmental Research Laboratory, Ann Arbor, MI, 27 pp. https://www.glerl.noaa.gov//pubs/tech_reports/glerl-133/tm-133.pdf.

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Assel, R. A. 2004. Lake Erie ice cover climatology -- basin averaged ice cover: winters 1898-2002. *NOAA Technical Memorandum GLERL-128*. NOAA, Great Lakes Environmental Research Laboratory, Ann Arbor, MI, 15 pp. https://www.glerl.noaa.gov//pubs/tech_reports/glerl-128/tm-128.pdf.

7 DOCUMENT INFORMATION

7.1 Author

NSIDC Technical Writers

7.2 Publication Date

1983

7.3 Revision History

30 November 2020