



MOA-derived Structural Feature Map of the Ronne Ice Shelf

Summary

This data set provides a structural feature map of the Ronne Ice Shelf in Antarctica (also known as the Filchner-Ronne Ice Shelf). The map was developed as part of a project to study fracture propagation in the Ronne Ice Shelf, with special focus on the Evans Ice Stream. Features were digitized from the MODIS Mosaic of Antarctica (MOA), a composite of individual Moderate Resolution Imaging Spectroradiometer (MODIS) images taken between 20 November 2003 and 29 February 2004, with an effective resolution of 125 m. The data set includes estimates of the shelf boundary, including ice stream grounding zones, outlets of glaciers feeding the shelf, extents of islands and ice rises, and the location of the shelf front, and features observed within the shelf, including suture zones between ice streams, streaklines, fractures (crevasses and rifts), and fold-like features. Individual features can be extracted as a group of points and grouping is used to facilitate identification and plotting.

Data files are available via FTP in ASCII text (.txt) format. One image file, in Portable Document Format (.pdf), shows the data included in the dataset, plotted using MATLAB. The data set also provides a MATLAB script which can be used to plot the data.

Citing These Data

We kindly request that you cite the use of this data set in a publication using the following citation. For more information, see our [Use and Copyright](#) Web page.

The following example shows how to cite the use of this data set in a publication. List the principal investigators, year of data set release, data set title, publisher: NSIDC, and digital media.

Hulbe, C.L. and C.M. LeDoux. 2011. *MOA-derived Structural Feature Map of the Ronne Ice Shelf*. Boulder, Colorado USA: National Snow and Ice Data Center.
<http://dx.doi.org/10.7265/N5PR7SXR>.

Overview Table

Category	Description
Data format	Data files are in ASCII text (.txt) format, along with a MATLAB script for plotting the data. An image file is provided in Portable Document Format (.pdf)
Spatial coverage and resolution	Southernmost Latitude: 84.679°S Northernmost Latitude: 74.355°S Westernmost Longitude: 86.557°W Easternmost Longitude: 26.811°W
Temporal coverage and resolution	Data are derived from MODIS imagery collected between 20 November 2003 and 29 February 2004.
Tools for accessing data	Data can be plotted using MATLAB or other software.
Grid/projection description	Data are plotted using gridx and gridy coordinates from the Mosaic of Antarctica (MOA), in units of kilometers, converted to longitude and latitude using standard parallel 71°S.
File naming convention	RonneFM_fractures.txt RonneFM_streaklines.txt
File size	Files range in size from 8 KB to 160 KB
Parameters	Latitude Longitude Gridx Gridy Set Number Group Number
Procedures for obtaining data	

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1. Contacts and Acknowledgments

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2. Detailed Data Description

Format

The data are in ASCII (.txt) format. One additional image file, in Portable Document Format (.pdf), shows the data included in the dataset, plotted using MATLAB.

File and Directory Structure

Data are available on the FTP site in the ftp://sidacs.colorado.edu/pub/DATASETS/AGDC/nsidc0497_hulbe_v01/ directory. Within this directory, there are eight ASCII text (.txt) files providing detailed locations and information about features identified on the ice shelf; one MATLAB script containing a basic script to plot the data using the group and set fields; one image file in Portable Document Format (.pdf) that provides an overview of the combined datasets; and a readme file in text format. All files are described in Table 1.

Table 1. File Description

Filename	Description of file contents or features
RonneFM_folds.txt	Fold-like features
RonneFM_fractures.txt	Fractures
RonneFM_glacieroutlets.txt	Glacier outlets
RonneFM_icerises.txt	Extents of ice rises and islands
RonneFM_icestreamgroundingzone.txt	Grounding zones of ice streams
RonneFM_interstreamzones.txt	Suture zones between ice from different ice streams
RonneFM_shelfboundary.txt	Combined boundary of ice shelf, includes glacier outlets and grounding zones
RonneFM_streaklines.txt	Streak lines
plotFMpoints.m	MATLAB native file containing a basic script to plot the data using the group and set fields
RonneFM_combined.pdf	Image showing all features in data set
00README.txt	Text file describing the data organization

File Naming Convention

Files are named according to the following convention and as described in Table 2:

RonneFM_feature.txt

Where:

Table 2. File Naming Convention

Variable	Description
Ronne	Location: Ronne Ice Shelf
FM	File type: FM = Feature Map
feature	Feature Type
.txt, .pdf, .m	Text file extension Portable Document File extension Matlab file extension

Example: `RonneFM_fractures.txt` provides fracture data for the Ronne Ice Shelf.

File Size

Files range in size from 8 KB to 160 KB

Spatial Coverage

This data set encompasses the region around and including the Ronne Ice Shelf, Antarctica.

Southernmost Latitude: 84.679°S
Northernmost Latitude: 74.355°S
Westernmost Longitude: 86.557°W
Easternmost Longitude: 26.811°W

Grid Description

Data are plotted using gridx and gridy coordinates from the MODIS Mosaic of Antarctica (MOA), in units of kilometers, converted to longitude and latitude using standard parallel 71°S.

Temporal Coverage

This data set is based on data collected between 2003 and 2004.

Parameter or Variable

Parameter Description

The data set contains ASCII text files with six fields: longitude, latitude, gridx, gridy, set number, and group number.

Table 3. Parameter Description

Variable	Description
Longitude Latitude	Location of the feature in geographic coordinates
Gridx Gridy	Coordinates from the MODIS Mosaic of Antarctica (MOA), in units of kilometers, converted to longitude and latitude using standard parallel 71°S
Set Number	Set number is used to identify groups of similar features within a given feature type, and rarely varies within a data file. This facilitates plotting using the MATLAB script.
Group Number	Group number is used to identify data points representing individual features, enabling the plotting of individual features as lines instead of individual points. This facilitates plotting using the MATLAB script.

Sample Data Record

The data are space-delimited and do not contain a header row. The six fields, from left to right, are longitude, latitude, gridx, gridy, set number, and group number.

-50.751331	-77.269702	-1075393.2693	878591.4918	1	9
-50.632784	-77.247122	-1075492.5560	882389.4228	1	9
-54.876441	-76.247771	-1227800.7383	863667.2427	1	10
-55.517754	-76.437386	-1220174.4911	838046.1335	1	10

Sample Data Image

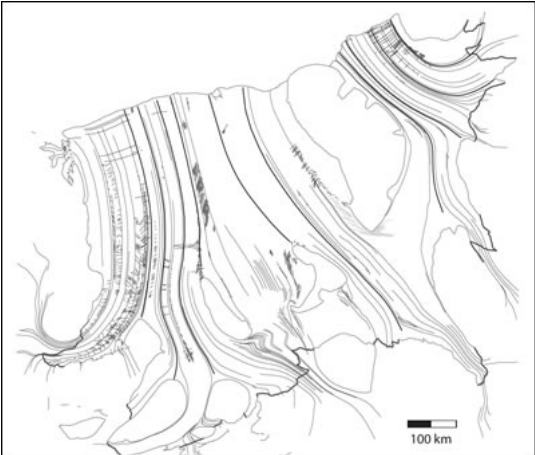


Figure 1. This map of the Ronne Ice Shelf shows the data plotted using MATLAB. This file is available on the FTP site as a PDF.

3. Data Access and Tools

Volume

Total volume of the data set is approximately 850 KB.

Software and Tools

Data files are readable using standard spreadsheet software. They can be plotted using MATLAB, using a script provided along with the data.

Related Data Collections

- [MODIS Mosaic of Antarctica \(MOA\)](#)

4. Data Acquisition and Processing

Data points representing ice shelf features were acquired by digitizing the [MODIS Mosaic of Antarctica \(MOA\)](#). The range of sun illumination angles in the composite image makes it possible to trace many features, including large fractures, streak lines, and disturbed ice associated with relict ice stream shear margins advecting through the shelf. Features in the map were digitized at the dark/light boundary. The methods are described in more detail in [Hulbe et al., 2010](#).

5. References and Related Publications

Hulbe, C.L., C. LeDoux, and K.C. Cruikshank. 2010. Propagation of Long Fractures in the Ronne Ice Shelf Investigated Using a Numerical Model of Fracture Propagation. *Journal of Glaciology*, 56 (197), 459-472. [doi:10.3189/002214310792447743](#).

LeDoux, C. 2007. A Boundary Element Model for Fracture Propagation. (MSc thesis, Portland State University.)

Haran, T., J. Bohlander, T. Scambos, T. Painter, and M. Fahnestock compilers. 2005, updated 2006. *MODIS Mosaic of Antarctica (MOA) Image Map*. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

Scambos, T., T. Haran, M. Fahnestock, T. Painter, and J. Bohlander. 2007. MODIS-Based Mosaic of Antarctica (MOA) Data Sets: Continent-Wide Surface Morphology and Snow Grain Size. *Remote Sensing of Environment* 111(2): 242-257, [doi:10.1016/j.rse.2006.12.020](#).

The following related documents are available

Table 4. Related Documents

Document	Description	URL
MODIS Mosaic of Antarctica	MODIS Mosaic of Antarctica Project Web site	http://nsidc.org/data/moa/index.html

6. Document Information

Acronyms

The following acronyms are used in this document.

Table 5. Acronyms and Abbreviations

Acronym	Description
AGDC	Antarctic Glaciological Data Center
FTP	File Transfer Protocol
MOA	Mosaic of Antarctica
MODIS	Moderate Resolution Imaging Spectroradiometer
NSIDC	National Snow and Ice Data Center
TXT	ASCII Text File Extension
URL	Uniform Resource Locator

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