

Notice to Data Users:
The documentation for this data set was provided solely by the Principal Investigator(s) and was not further developed, thoroughly reviewed, or edited by NSIDC. Thus, support for this data set may be limited.

AMSRice03 Snow Pit Data

Summary

This data set contains snow pit data collected over sea ice in the Barrow, Alaska, USA area and nearby at the Navy Ice Camp in the main pack ice of the Arctic Ocean. Measurements were collected as part of the joint in situ and aircraft AMSRice03 campaign from 03 March to 23 March 2003. Snow pit parameters include number of layers, average layer thickness, total thickness, snow water equivalent (SWE), bulk density, hoar fraction, slab fraction, wet/icy fraction, new/recent fraction, and other fraction. Data are provided in a single American Standard Code for Information Interchange (ASCII) text file, and are available via FTP.

These data were collected as part of a validation study for the Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E). AMSR-E is a mission instrument launched aboard NASA's Aqua Satellite on 04 May 2002.

Citing These Data:

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, and publisher.

Sturm, M., and Julienne Stroeve. 2009. *AMSRice03 Snow Pit Data*. Boulder, Colorado USA: NASA DAAC at the National Snow and Ice Data Center.

Overview Table

Category	Description
<u>Data format</u>	ASCII tab-delimited text file
<u>Spatial coverage</u>	Barrow: 71.18 N to 71.28 N, 156.15 W to 156.40 W Navy Ice Camp: 72.90 N to 72.95 N, 147.50 W to 147.65 W

<u>Temporal coverage</u>	03 March 2003 to 23 March 2003
<u>File naming convention</u>	SnowPitsBarrow.txt
<u>File size</u> 3	KB
<u>Parameter(s)</u>	number of layers, average layer thickness, total thickness, snow water equivalent (SWE), bulk density, hoar fraction, slab fraction, wet/icy fraction, new/recent fraction, other fraction
<u>Procedures for obtaining data</u>	Data are available via FTP.

Table of Contents

1. Contacts and Acknowledgments
2. Detailed Data Description
3. Data Access and Tools
4. Data Acquisition and Processing
5. References and Related Publications
6. Document Information

1. Contacts and Acknowledgments:

Investigator(s) Name and Title:

Matthew Sturm, Research Physical Scientist, CCREL-Alaska, Ft. Wainwright, Alaska.
 Julienne Stroeve, Research Scientist, National Snow and Ice Data Center, CIRES,
 Boulder, Colorado.

Technical Contact:

NSIDC User Services
 National Snow and Ice Data Center
 CIRES, 449 UCB
 University of Colorado
 Boulder, CO 80309-0449
 phone: (303)492-6199
 fax: (303)492-2468
 form: Contact NSIDC User Services
 e-mail: nsidc@nsidc.org

Acknowledgements:

We thank the Barrow Arctic Science Consortium for providing logistics for the field campaign. Special thanks to Glenn Sheehan and Richard Glenn. Warren Matumeak provided field advice from his long experience on the sea ice. Tom Douglas, William Simpson and others enthusiastically participated in the field work. Don Cavalieri provided encouragement and support for the entire concept of an in-depth field campaign.

2. Data Description:

Format:

One ASCII tab-delimited text file.

File Naming Convention:

SnowPitsBarrow.txt

File Size:

3 KB

Spatial Coverage:

Navy Ice Camp:

Southernmost Latitude: 72.90 N

Northernmost Latitude: 72.95 N

Westernmost Longitude: 147.65 W

Easternmost Longitude: 147.50 W

Barrow Area:

Southernmost Latitude: 71.18 N

Northernmost Latitude: 71.28 N

Westernmost Longitude: 156.40 W

Easternmost Longitude: 156.15 W

Temporal Coverage:

Measurements were taken from 03 March 2003 to 23 March 2003.

Parameter or Variable:

Parameters in this data set include: number of layers, average layer thickness, total thickness, snow water equivalent (SWE), bulk density, hoar fraction, slab fraction, wet/icy fraction, new/recent fraction, and other fraction.

3. Data Access and Tools:

Data Access:

Data are available via FTP at:
ftp://sidads.colorado.edu/pub/DATASETS/AVDM/data/cryosphere/AMSRice03/ground_data/snowpits/

Software and Tools:

No special tools are required to view these data. Any text reader or web browser is suitable.

Related Data Collections:

For related data collections, please see the AMSR-E Validation Data Web site:
http://nsidc.org/data/amsr_validation/

4. Data Acquisition and Processing:

The AMSRice field experiment consisted of a detailed set of snow and ice measurements over sea ice along a series of transects across the shore-fast ice near Barrow, Alaska, USA and at a U.S. Navy ice camp in the central Beaufort Sea on the main pack ice 175 km north of Barrow.

Snow density was measured using a 100 cm³ steel cutter weighed on digital balance at ± 0.05 g/cm³. Snow water equivalent was obtained with a Federal snow coring tube; contents weighed; ± 0.5 cm water equivalent.

Snow pits were equi-spaced along 100-meter lines to capture the essential snow stratigraphy across the Barrow and Ice Camp sub-areas. Snow layer and grain characteristics observed in 118 snow pits indicated that 44% of observed snow layers were depth hoar; 46% were wind slab.

Based on results from 118 snow pits, the snow pack in all of the areas consisted primarily of layers of depth hoar overlain by wind slabs. There were also fine-grained and thin icy layers in a few locations. As might be expected given the younger ice in

the Chukchi Sea sub-area, the snow pack there had fewer layers than elsewhere. At the Navy Ice Camp, the wind slab fraction was slightly higher than in the other areas, perhaps a result of stronger winds out in the open ice pack. At all of the areas, depth hoar layers typically consisted of grains with long dimensions ranging from 2 to 10 mm, and short dimensions ranging from 0.1 to 0.3 mm (i.e., thin, plate-like grains). The depth hoar grain size distribution was highly mixed, consisting of both large and small grains. In contrast, the wind slab layers were well sorted and composed of equant grains that ranged in diameter from 0.1 to 0.9 mm (Sturm, M. et al. 2006).

5. References and Related Publications:

Sturm, Matthew, James Maslanik, Don Perovich, Julienne Stroeve, Jackie Richter-Menge, Thorsten Markus, Jon Holmgren, John Heinrichs, and Ken Tape. 2006. Snow Depth and Ice Thickness Measurements from the Beaufort and Chukchi Seas Collected During the AMSR-Ice03 Campaign. *IEEE Transactions on Geoscience and Remote Sensing - Part 1*, 44(11): 3009-3020, doi:10.1109/TGRS.2006.878236.

Refer to the AMSRIce03 Web site for in-depth information on the science mission and goal of the AMSRIce03 project:
<http://polarbear.colorado.edu/AMSRICE/AMSRIce03.html>.

6. Document Information:

List of Acronyms

The following acronyms are used in this document:

AMSR-E – Advanced Microwave Scanning Radiometer – Earth Observing System
CCREL – Cold Regions Research and Engineering Laboratory
CIRES – Cooperative Institute for Research in Environmental Sciences
FTP – File transfer protocol
NASA – National Aeronautics and Space Administration
NSIDC – National Snow and Ice Data Center
SWE – Snow Water Equivalent

Document Creation Date:

24 September 2009