

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 Ice Temperature Data

Summary

This data set contains snow ice temperature measurements collected over sea ice in the Barrow, Alaska USA area as part of the joint in situ and aircraft AMSRice03 campaign conducted in March 2003. The snow ice temperature data were collected 13 March 2003 and on 20 March 2003. Data set parameters are ice temperature, air temperature, snow/ice interface temperature, and snow depth. Temperatures were measured using a thermistor probe. Snow depth was measured with a self-recording depth probe. The total volume of this data set is approximately 11 kilobytes. Data are provided in five American Standard Code for Information Interchange (ASCII) text files 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, publisher: NSIDC, and digital media.

Sturm, M., and J. Stroeve. 2009. *AMSRice03 Snow Ice Temperature Data*. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

Overview Table

Category	Description
<u>Data format</u>	ASCII tab-delimited text files
<u>Spatial coverage</u>	71.18 N to 71.28 N, 156.15 W to 156.40 W
<u>Temporal coverage</u>	13 March 2003 and on 20 March 2003
<u>File naming convention</u>	beaufort_031303.txt

<u>File size</u>	1 - 3 KB
<u>Parameter(s)</u>	ice temperature, air temperature, snow/ice interface temperature, snow depth
<u>Procedures for obtaining data</u>	Data are available via FTP.

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1. Contacts and Acknowledgments:

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Acknowledgements:

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2. Data Description:

Format:

Five ASCII tab-delimited text files.

File Naming Convention:

The files are named according to the following convention and are further described in Table 1.

xxxx_mmddyy.txt

Table 1. Description of File Name Variables

Variable	Description
xxxx	Name of site (e.g. Beaufort, Chukchi, Elson)
mmddyy	2-digit month, 2-digit day, 2-digit year (e.g. 031303, 032003)
.txt	Indicates a text file

File Size:

The five files range from 1 KB to 3 KB, for a total of 11 KB.

Spatial Coverage:

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 on 13 March 2003 and on 20 March 2003

Parameter or Variable:

Parameters in this data set include ice temperature, air temperature, snow/ice interface temperature, and snow depth.

3. Data Access and Tools:

Data Access:

Data are available via FTP at:

ftp://sidacs.colorado.edu/pub/DATASETS/AVDM/data/cryosphere/AMSRice03/ground_data/snowicetemps/

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 program included a detailed set of snow and ice measurements along a series of transects across the shore-fast ice near Barrow, Alaska.

Field personnel measured the snow/ice interface temperature and the temperature 0.1 m below the ice surface in as many places as possible. This was done in as short a time as possible (about 3 hours) to avoid diurnal variations in temperature. The snow/ice interface temperature was measured by forcing a thermistor probe (accurate to $\pm 0.3^{\circ}\text{C}$) down through the snow-to-ice surface, letting the probe equilibrate for a minute, and then reading the temperature on a digital readout. For the ice temperature, we used a cordless drill to drill a hole to a depth of 10 cm in the ice and then placed the probe in the hole. This depth was chosen because it is an easy depth to drill to, and because the 10 cm and the ice surface temperature provide good values from which the surface ice temperature can be computed.

Daytime highs hovered near -20°C and nighttime lows dropped consistently to -28 to -30°C . These diurnal fluctuations were damped out by the snow pack and ice, producing snow/ice interface and ice temperatures that were temporally stable since they were subjected to essentially a “steady-state” driving temperature. Linear regressions of measured temperatures vs. snow depth by sub-areas have slopes that vary over a narrow range (0.21 to $0.31^{\circ}\text{C}/\text{cm}$ snow depth). The congruence of the regression lines suggests that in all areas the lower part of the snow pack and the upper part of the ice were functioning something like an isothermal block during the period of the study,

and that the snow pack had much the same thermal impact (per unit thickness) in all areas (Sturm 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 Aeronautical and Space Administration

NSIDC – National Snow and Ice Data Center

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