

**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 Surface Roughness Data

### Summary

This data set contains surface roughness 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 surface roughness data were collected 16 March 2003. Data set parameters are snow base, surface elevation, and snow depth measured in centimeters using a SmartStik rotating laser and self-reading rod. The total volume of this data set is approximately 58 kilobytes. Data are provided in two 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.

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

### Overview Table

| <b>Category</b>               | <b>Description</b>   |
|-------------------------------|--|
| <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>      | 16 March 2003  |
| <u>File naming convention</u> | Mar16_BeaufortRoughness_1.txt<br>Mar16_BeaufortRoughness_2.txt |

|                                      |  |
|--------------------------------------|--|
| <u>File size</u>                     | Two 29 KB files                              |
| <u>Parameter(s)</u>                  | snow base, surface elevation, and 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:

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:**

Two ASCII tab-delimited text files.

### **File Naming Convention:**

The roughness files are named according to the date in 2003 and location in the Beaufort sub-area of the Barrow, Alaska study area.

Mar16\_BeaufortRoughness\_1.txt  
Mar16\_BeaufortRoughness\_2.txt

### **File Size:**

The two files are each 29 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 16 March 2003.

### **Parameter or Variable:**

Parameters in this data set include snow base, surface elevation, and snow depth.

## **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/surface\\_roughness/](ftp://sidads.colorado.edu/pub/DATASETS/AVDM/data/cryosphere/AMSRice03/ground_data/surface_roughness/)

## **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/amr\\_validation/](http://nsidc.org/data/amr_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. Ice roughness was measured using a laser level and range pole along a tape that had been laid out on the ice. Sea level datum for these profiles was established by drilling a hole in the ice.

### **Processing:**

We found a strong relationship between ice roughness, snow surface characteristics (i.e. snow drift patterns), and snow depth. In the Beaufort Sea and Navy Ice Camp sub-areas, near pressure ridges and in rubble fields, the snow pack was deep with large variations in depth. On the intervening smooth floes, the snow was thin (or absent) and relatively uniform (Sturm et al. 2006).

By inspection, we noted that the smooth ice had a snow pack less than 10 cm deep, rough ice had a snow pack deeper than 25 cm, and moderately deformed ice had a snow cover between 10 to 25 cm deep (Sturm et al. 2006).

## **5. References and Related Publications:**

Sturm, Matthew, James Maslanik, Don Perovich, Julianne 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, dot: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

### **Document Creation Date:**

28 September 2009