

**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 Landsat-7 ETM+ Imagery**

### **Summary**

This data set contains Landsat-7 Enhanced Thematic Mapper Plus (ETM+) satellite imagery of the Bering Sea and Chukchi Sea areas to complement the joint in situ and aircraft Advanced Microwave Scanning Radiometer Sea Ice Product Validation (AMSRice03) campaign conducted in March 2003. The 150 m resolution images correspond to the panchromatic band (band 8), and were collected on 13, 15, 20, and 22 March 2003. The total volume of this data set is approximately 161 megabytes. Data are provided in binary image files with corresponding Environment for Visualizing Images (ENVI) header 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.

Cavalieri, Donald J., and Alvaro Ivanoff. 2009. *AMSRice03 Landsat-7 ETM+ Imagery*. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

### **Overview Table**

<b>Category</b>	<b>Description</b>
<u>Data format</u>	Binary Band Sequential Format (BSQ) image files and ENVI header files
<u>Spatial coverage</u>	58 N to 74 N, 145 W to 175 W
<u>Temporal coverage</u>	13, 15, 20, and 22, March 2003

<u>File naming convention</u>	landsat_2003mar(nn)_mosaic_albedo_150m.hdr landsat_2003mar(nn)_mosaic_albedo_150m.img
<u>File size</u>	161 MB
<u>Parameter(s)</u>	Panchromatic imagery
<u>Procedures for obtaining data</u>	Data are available via FTP.

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### **1. Contacts and Acknowledgments:**

#### **Investigator(s) Name and Title:**

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### **2. Data Description:**

#### **Format:**

Four BSQ binary image files: 2D binary arrays (4 byte float).  
Each image file has a corresponding ENVI header file. Missing data is given a value of 0.

### **File Naming Convention:**

landsat\_2003mar13\_mosaic\_albedo\_150m.hdr  
landsat\_2003mar13\_mosaic\_albedo\_150m.img  
landsat\_2003mar15\_mosaic\_albedo\_150m.hdr  
landsat\_2003mar15\_mosaic\_albedo\_150m.img  
landsat\_2003mar20\_mosaic\_albedo\_150m.hdr  
landsat\_2003mar20\_mosaic\_albedo\_150m.img  
landsat\_2003mar22\_mosaic\_albedo\_150m.hdr  
landsat\_2003mar22\_mosaic\_albedo\_150m.img

### **File Size:**

The four image files range from 14.28 MB to 68.44 MB and total 161 MB.  
The four ENVI header files are 1 KB each.

### **Spatial Coverage:**

Southernmost Latitude: 58 N  
Northernmost Latitude: 74 N  
Westernmost Longitude: 175 W  
Easternmost Longitude: 145 W

### **Temporal Coverage:**

Imagery was captured on 13, 15, 20 and 22 March 2003.

### **Parameter or Variable:**

Panchromatic imagery in the range of .52 - .90  $\mu\text{m}$  for evaluation of sea ice concentration and conditions.

## **3. Data Access and Tools:**

### **Data Access:**

Data are available via FTP at:  
<ftp://sidads.colorado.edu/pub/DATASETS/AVDM/data/cryosphere/AMSRice03/satellite/landsat/>

## **Software and Tools:**

Tools appropriate for viewing these data are ENVI or other similar software packages.

## **Related Data Collections:**

For related data collections, please see the AMSR-E Validation Data Web site:  
[http://nsidc.org/data/amsr\\_validation/](http://nsidc.org/data/amsr_validation/)

## **4. Data Acquisition and Processing:**

### **Sensor or Instrument Description:**

The ETM+ on Landsat-7 is an enhanced version of the thematic mapper flown on Landsat-4 and -5 and provides synoptic high resolution multispectral imagery of the Earth's surface with a swath width of 185 kilometers. The instrument measures radiation in the visible and near IR (bands 1–4) and the shortwave IR (bands 5 and 7) at a spatial resolution of 30 meters. There is also a 60 meter resolution thermal IR band (band 6). The AMSRice03 Landsat imagery is derived from the ETM+ 15 meter resolution panchromatic band (band 8).

### **Acquisition:**

The Landsat-7 ETM+ images were acquired during March 2003 over areas of the Bering and Chukchi Seas to capture a variety of sea ice conditions and concentrations. The images were acquired under mostly clear sky conditions and coordinated, when possible, with NASA P3B flights to develop a high resolution dataset with which to validate the AMSR-E Arctic sea ice concentration product. ETM Plus panchromatic (band 8) radiances at 0.52–0.90  $\mu\text{m}$  were obtained on a 15-meter resolution polar stereographic grid and were calibrated to provide albedos for each 15 meter grid cell. (Cavalieri et al. 2006)

Images from Landsat band 8 were 15 m resolution. The resolution of the images was reduced to 150 m in order to make the size of the data set manageable.

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

Cavalieri, Donald J., Thorsten Markus, Dorothy K., Hall, Albin J. Gasiewski, Marian Klein, and Alvaro Ivanoff. 2006. Assessment of EOS Aqua AMSR-E Arctic Sea Ice Concentrations Using Landsat-7 and Airborne Microwave Imagery. *IEEE Transactions on Geoscience and Remote Sensing*, 44(11): 3057-3069.

More detailed information on the Landsat-7 ETM+ and derived products can be found at the Landsat-7 ETM+ Web site (<http://landsat.gsfc.nasa.gov/about/etm+.html>).

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

BSQ – Band Sequential Format

CIRES – Cooperative Institute for Research in Environmental Sciences

ENVI – Environment for Visualizing Images

ETM+ – Enhanced Thematic Mapper Plus

FTP – File transfer protocol

NASA – National Aeronautics and Space Administration

NSIDC – National Snow and Ice Data Center

### **Document Creation Date:**

13 October 2009