



IceBridge LVIS L1A Geotagged Images, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

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FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT <https://nsidc.org/data/IOLVIS1A>



National Snow and Ice Data Center

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1 DATA DESCRIPTION

The images in this Level-1A product were collected by the NASA Digital Mapping Camera, which was mounted alongside the Land, Vegetation, and Ice Sensor (LVIS), as part of Operation IceBridge campaigns. Related data sets include *IceBridge LVIS L1B Geolocated Return Energy Waveforms*, which contains the geolocated laser waveform data for each laser footprint collected by the LVIS instrumentation, and *IceBridge LVIS L2 Geolocated Surface Elevation Product*, which contains canopy top elevations, ground elevations, and relative heights derived from the Level-1B data.

1.1 Parameters

The data files include images of various terrains, such as sea ice, ocean surface, and glaciers.

1.2 File Information

1.2.1 Format

The data files are provided in JPG (.JPG) format. Each data file is paired with an associated XML file (.xml), which contains additional metadata.

1.2.2 File Contents

Figure 1 shows an example image from the file IOLVIS1A_GL2017_0920_R1803_043816.JPG.



Figure 1. Sample image of snowy and icy terrain.

1.2.3 Naming Convention

Example file names:

IOLVIS1A_GL2017_0920_R1803_043816.JPG
 IOLVIS1A_GL2017_0920_R1803_043816.JPG.xml

The files are named according to the following convention, which is described in more detail in Table 1.

IOLVIS1A_LOYYYY_MMDD_RYYMM_nnnnnn.ext

Table 1. File Naming Convention

Variable	Description
ABOLVIS1A	Data set ID
LOYYYY	Campaign identifier: LL = location (GL = Greenland); YYYY= four-digit year of campaign
MMDD	Two-digit month, two-digit day of start of data collection
RYYMM	Date (two-digit year, two-digit month) of data release
nnnnnn	Number of seconds since UTC midnight of the day on which data collection started
ext	File type: .JPG (JPG data file) or .JPG.xml (XML metadata file)

1.3 Spatial Information

1.3.1 Coverage

Coverage for this data set includes parts of the Arctic, Greenland, and surrounding ocean areas, as noted by the spatial extents below:

- Southernmost latitude: 60° N
- Northernmost latitude: 90° N
- Westernmost longitude: 180° W
- Easternmost longitude: 180° E

1.3.2 Resolution

Spatial resolution varies with aircraft altitude. The nominal spatial resolution is 3.1 km by 2.0 km (0.35 m per pixel) at a nominal flight altitude of 27,000 ft.

1.3.3 Geolocation

International Terrestrial Reference Frame 2008 (ITRF08), WGS-84 ellipsoid

1.4 Temporal Information

1.4.1 Coverage

25 August 2017 to 20 September 2017

1.4.2 Resolution

IceBridge campaigns are conducted on an annually repeating basis. Arctic, Greenland, and Alaska campaigns are typically conducted during March, April, and May; Antarctic campaigns are typically conducted during October and November.

2 DATA ACQUISITION AND PROCESSING

2.1 Instrumentation

The images provided in this data set were taken with a downward-facing (nadir) Canon EOS 5DS R camera with an image resolution of 50.3 Megapixels (8896 px by 5920 px). The lens model is a Carl Zeiss Makro-Planar T* 100mm f/2 ZE. Frame overlap is approximately 75%.

2.2 Acquisition and Processing

Imagery is stored via Ethernet on a supporting computer running the Canon EOS camera utility software to monitor and control image exposure. Frame capture is controlled using an external intervalometer. The intervalometer provides a Transistor-Transistor-Logic (TTL) pulse to the navigation system, which enables precise timing, positioning, and attitude for each image capture.

Images are acquired at 5-second intervals. The image name contains the acquisition time in number of seconds since UTC midnight of the day on which data collection started. Each image is tagged with data regarding the precise time of the acquisition, as well as position and orientation of the camera at time of acquisition; this includes latitude, longitude, altitude, roll, pitch, and yaw.

2.3 Quality, Errors, and Limitations

Currently, there are no known errors or limitations in this data set.

3 SOFTWARE AND TOOLS

The data files can be viewed using any software that recognizes the JPG format. Frame ID markers (requires Google Earth to view KMZ files) are available at the NASA LVIS-ABOVE campaign website.

4 RELATED DATA SETS

- [IceBridge LVIS L0 Raw Ranges](#)
- [IceBridge LVIS L1B Geolocated Return Energy Waveforms](#)
- [IceBridge LVIS L2 Geolocated Surface Elevation Product](#)

5 RELATED WEBSITES

- [LVIS data product website at NSIDC](#)
- [LVIS website at NASA Goddard Space Flight Center](#)
- [ABOVE website at NASA](#)

6 CONTACTS AND ACKNOWLEDGMENTS

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7 DOCUMENT INFORMATION

7.1 Publication Date

05 December 2019

7.2 Date Last Updated

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