

SnowEx23 Snow Depth from Time-Lapse Imagery, Version 1 Technical Reference

1 INTRODUCTION

1.1 Data Set Overview

This data set contains 54 photographs of snow surfaces collected during the NASA SnowEx23 field campaign near Fairbanks, Alaska. Photos were acquired in April and May 2023 at three study sites that represent a range of landcover conditions, including intact boreal forest, recently and historically burned forest, and open meadows. Snow surface photographs were collected concurrently with ground-based hyperspectral spectrometer measurements, snow surface samples, and alongside coincident observations from NEON towers, uncrewed aerial vehicles (UAVs), NASA's AVIRIS-NG airborne sensor, and hyperspectral satellite instruments. Each photo was taken at the same location as field snow surface reflectance and albedo measurements and snow surface samples, providing visual context for interpreting spectral variability. Due to equipment availability photographs were taken on just four days of field surveys. These images capture surface characteristics that influence snow reflectance and albedo, such as lighting conditions, surface roughness, canopy shading, and the presence of light-absorbing particles (e.g., forest litter, charred debris). Each photo is paired with metadata documenting the time, location, transect, and associated spectral measurement ID, enabling direct integration with the hyperspectral datasets.

1.2 File Information

1.2.1 Format

The data are available in a multiframe granule compressed into a .tgz file, which contains 54 image files (.jpg) and an image inventory file formatted as a Microsoft Excel worksheet (.xlsx).

1.2.2 Naming Convention

The inventory file is named SNEX23_SSI_photo_inventory_20230420_v01.0.xlsx. The image files are named according to the following convention:

SNEX23_SSI_[photoID]_v01.0.jpg,

where SNEX23_SSI is the data set identifier and [photoID] is to the photo file identifier as listed in the inventory spreadsheet.

1.3 Spatial Information

1.3.1 Coverage

Northernmost Latitude: 65.15746° N

Southernmost Latitude: 63.8619 ° N

Easternmost Longitude: 145.723° W

Westernmost Longitude: 147.508° W

1.3.2 Geolocation

This data set conforms to the WGS 84 coordinate reference system ([EPSG 4326](#)).

1.4 Temporal Information

1.4.1 Coverage and Resolution

14 April 2023 to 18 April 2023

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