

SnowEx23 Apr23 AVIRIS-NG Surface Spectral Reflectance, Version 1 Technical Reference

1 DATA DESCRIPTION

This [data set](#) contains surface reflectance data collected from three boreal forests study sites (Delta Junction, Caribou Poker Creek watershed, and Farmer's Loop/Creamer's Field) around Fairbanks, Alaska as part of the NASA SnowEx 2023 field campaign. Data was acquired using the NASA Jet Propulsion Laboratory (JPL) Airborne Visible/Infrared Imaging Spectrometer – Next Generation (AVIRIS-NG) sensor mounted on a King Air B-200 aircraft. Data collection occurred during April and May 2023.

1.1 Data collection methods and acquisition

The NASA Airborne Visible/Infrared Imaging Spectrometer – Next Generation sensor was flown on a King Air B-200 platform. The dataset constitutes airborne data that was only collected when there were favorable weather conditions. There is no regular temporal resolution for when data was collected. Rather, data was collected opportunistically within the month-long campaign.

1.2 Errors and uncertainties

1.2.1 Atmospheric Correction

Atmospheric correction was performed by the NASA JPL AVIRIS-NG image processing team (Thompson et al., 2018). Because there were no direct measurements of atmospheric characteristics, the team used a standard atmospheric profile for the correction, which may have over-corrected some reflectance values. This would be especially obvious in the visible part of the spectrum, where atmospheric scattering is greatest.

1.2.2 Illumination Conditions

Illuminations conditions, such as clouds, low sun angle, shadows, surface roughness, topographic variability and mixed pixels, affect accuracy of snow reflectance measurements. To minimize effects of varying solar zenith angle, all measurements were taken within two hours of solar noon. Ground and airborne measurements were only collected and analyzed if clear sky conditions existed. However, in some cases there were high thin cirrus clouds present, but not blocking the

solar beam. Subvisual cirrus clouds might have been present but without measurements of atmospheric spectral transmittance, it is not possible to characterize and remove such effects.

2 RELATED DATA SETS

[SnowEx at NSIDC | Data Sets](#)

3 REFERENCES

Thompson, D. R., V. Natraj, R. O. Green, M. C. Helmlinger, B. Gao, M. L. Eastwood. 2018. Optimal estimation for imaging spectrometer atmospheric correction. *Remote Sensing of Environment* 216, doi:10.1016/j.rse.2018.07.003