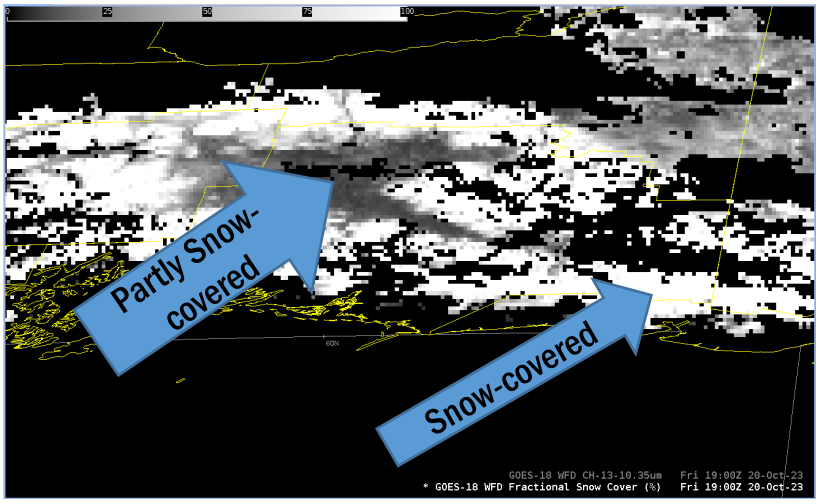
Snow Fraction Quick Guide

Why is Snow Fraction important?

The GOES-R ABI Snow Fraction product characterizes two properties of the snow cover, its area extent and the area fraction of snow within the instrument field of view. Snow extent is an important element of the Earth's climate and a sensitive indicator of the climate change. The fraction of exposed snow determines the albedo of snow-covered land surfaces and hence presents a critical input to numerical weather prediction and land surface models. The ABI snow product combined with the land surface temperature estimates helps to identify areas of melting snow. High temporal frequency of snow cover observations with ABI allows for monitoring of the diurnal change of the snow cover properties.



Snow Fraction, GOES-18 at 1900 UTC, 20 October 2023; Snow Fraction is a grey scale from 0 (black, no snow) to 100 (white, snow covered)

Useful Links

Algorithm Theoretical Basis Document: (Snow Cover; Snow Fraction)

CIMSS Satellite Blog Post that includes Snow Fraction Imagery (Link)

GOES-R F&PS (See Appendix A) (Link)

Operational Information

Day-time, clear sky only: The retrieval algorithm requires daylight to identify snow in satellite imagery and to estimate the snow fraction. Snow retrievals are impossible under cloudy conditions.

Resolution: Resolution is the same as infrared bands: 2 km at the equator.

Temporal Frequency: ABI snow products are derived hourly

ABI Bands: Snow fraction retrieval requires ABI Bands 2 (0.64µm) , 3 (0.86µm), 5(1.6µm) and 13(10.3µm)

Things to keep in mind

Viewable Snow Fraction: The derived snow fraction presents the fraction of snow on the ground as "seen" by satellite.

Factors affecting the product: Dense evergreen forest may prevent proper identification of the snow cover. Snow fraction retrievals may be adversely affected by cloud and topographic shadows.

Changing effective spatial resolution: The effective spatial resolution of the ABI Snow Fraction product gradually degrades polewards reaching about 5 km at 60^0 latitude.

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