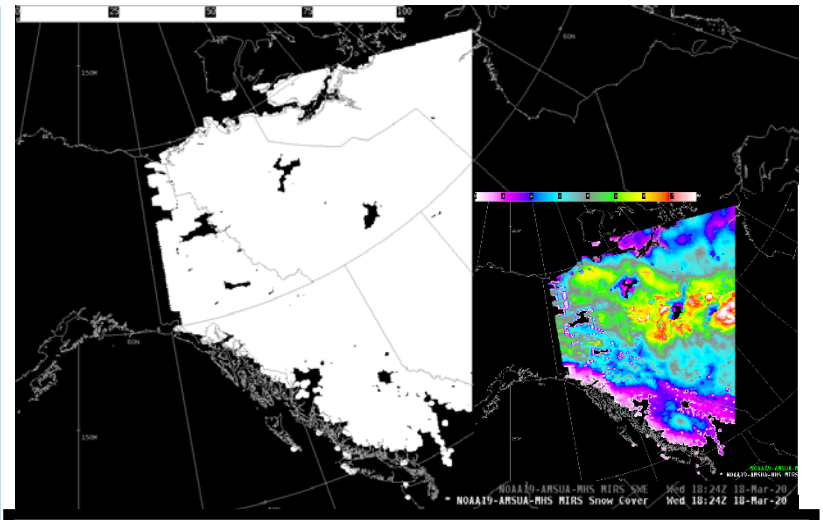
MIRS Snow Cover

Quick Guide

Surface Snow Cover from Microwave

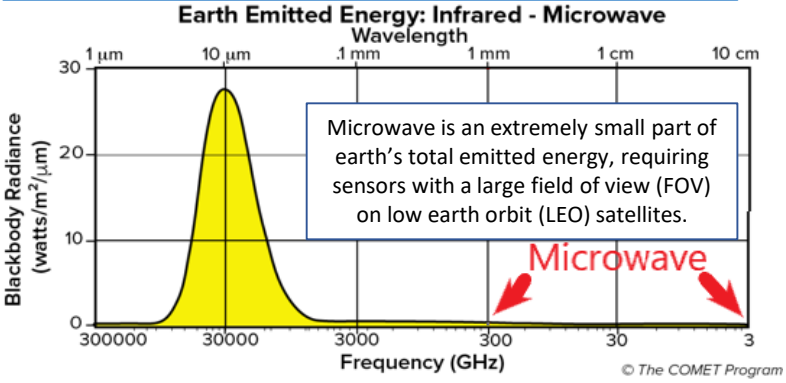
MIRS Snow Cover is a binary field: Snow exists or it does not. It is derived from the MIRS Snow Water Equivalent (SWE) product: any pixel with a non-zero amount of snow in SWE will have the snow cover flag activated. MIRS snow cover estimates compare retrieved surface emissivity with a catalog of emissivity and snowpack properties to find the best match.

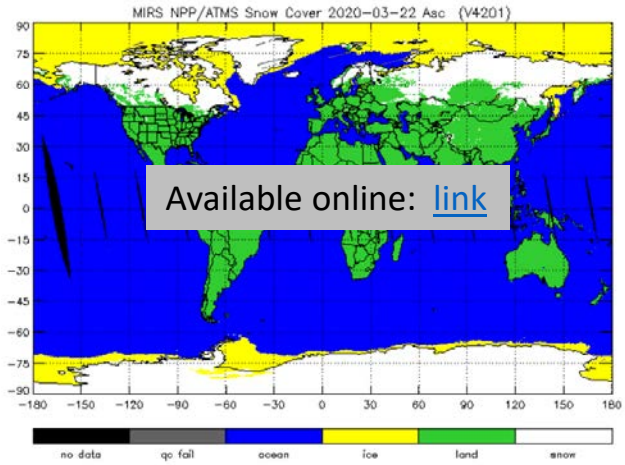
The MiRS Snow Cover product is valid day or night, and in most weather conditions. However, variable results arise from changes to the snowpack that affect emissivity, such as melting or ponding on the surface. This is especially noticeable diurnally at the southern edge of snow packs. Coarse resolution may not be able to resolve features within forests or regions with steep terrain.



MIRS Snow Cover from NOAA-19 AMSU-A at 1824 UTC, 18 Mar 2020

(Inset: Snow Water Equivalent for the same time)

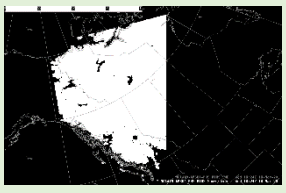




Available online: link

Impact on Operations

Surface snow not obscured by high clouds: the presence of snow at the surface can be estimated regardless of cloud cover.

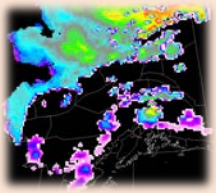


Fills gaps in surface based snow observations: Snow Cover can provide more complete spatial distribution of the snowpack where surface snow information is sparse.

Available day or night : Many satellite products use visible (daytime only) bands for snow detection. Microwave is also effective at night.

Limitations

Coarse resolution: Sensors may not be able to resolve topographic details such as forests, mountains, rivers.



Melting or water on snow hides snowpack: Emissivity of snow pack changes significantly with rain or melting snow on the surface. This affects the Snow Cover product.

Forested areas are not well represented: Trees can obscure or complicate emissivity of snow at the surface.

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