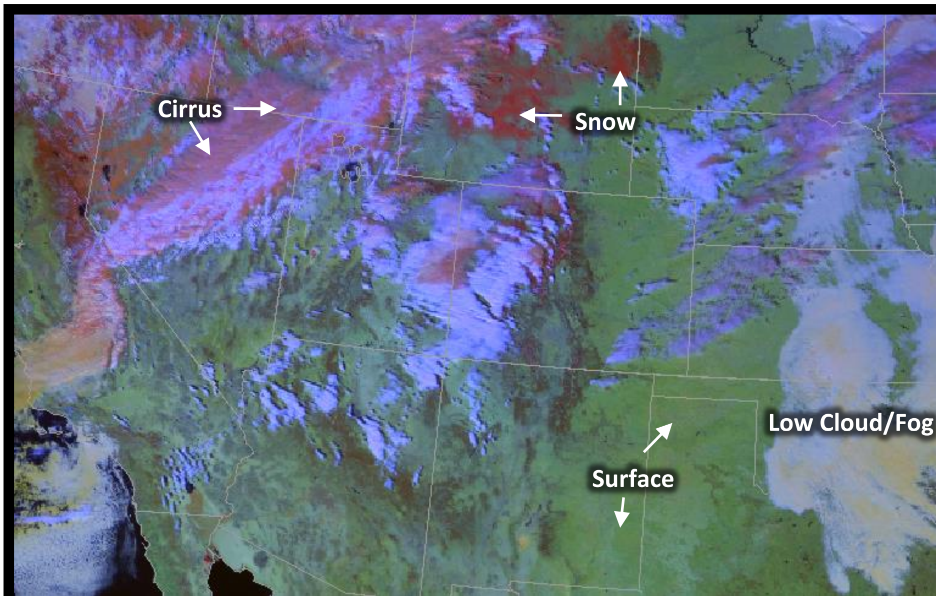
Day Snow-Fog RGB

*interpretation still under investigation

Quick Guide

Why is the Day Snow-Fog RGB Important?

On heritage GOES, it was difficult to distinguish white "reflective" snow from white "reflective" clouds on visible imagery. On the GOES-R series, the reflectance of snow, water, and ice clouds varies across the visible, near infrared, and infrared. The channels which bring out the distinguishing differences are combined in the Day Snow-Fog RGB to show greater contrast between snow and cloud than is generally possible with a single channel.



Day Snow-Fog RGB from GOES-16 ABI at 1735 UTC, 04 January 2018

Day Snow-Fog RGB Recipe

Color	Band / Band Diff. (µm)	Min to Max Gamma	Physically Relates to…	<u>Small</u> contribution to pixel indicates…	<u>Large</u> Contribution to pixel indicates…
Red	0.86 (Ch. 3)	0 to 100 % albedo 1.7	Reflectance of clouds and surfaces	Water, thin cirrus	Thick clouds, snow, sea ice
Green	1.6 (Ch. 5)	0 to 70 % albedo 1.7	Reflectance of clouds and surfaces	Water, snow	Vegetated land, thick water clouds
Blue	3.9 - 10.3 (Ch. 7 – Ch. 13)	0 to 30 °C 1.7	Proxy for 3.9 µm reflected solar radiance	Water, snow	Thick clouds

Impact on Operations

<u>Primary Application</u>

Distinguish snow and clear ground from clouds: The Near IR 1.6 and IR 3.9 wavelengths are useful for distinguishing non-reflective (dark) snow from reflective (bright) low-level water cloud. Low level cloud layers can be distinguished when thin middle or upper level clouds are present, particularly in an animation.

Cloud phase: Provides information on water versus ice cloud phase.

Limitations

Daytime only application: The 0.86 µm, 1.6 µm, and 3.9 µm bands detect reflected visible solar radiation.

Solar angle: Low solar angles at sunrise and sunset change the color interpretation, as well as limited application for high latitudes during winter.

Cirrus clouds: Limited ability to detect thin cirrus clouds due to low contrast with background features. This can be mitigated somewhat by animation.

Coniferous forest: Areas of coniferous forest mask snow signature beneath the canopy.

Channel difference for blue component: The temperature difference does not capture the reflected solar component as intended by JMA or EUMETSAT, but is an adequate proxy.

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RGB Interpretation

1 **Ice clouds, cirrus** *(shades of pink)*

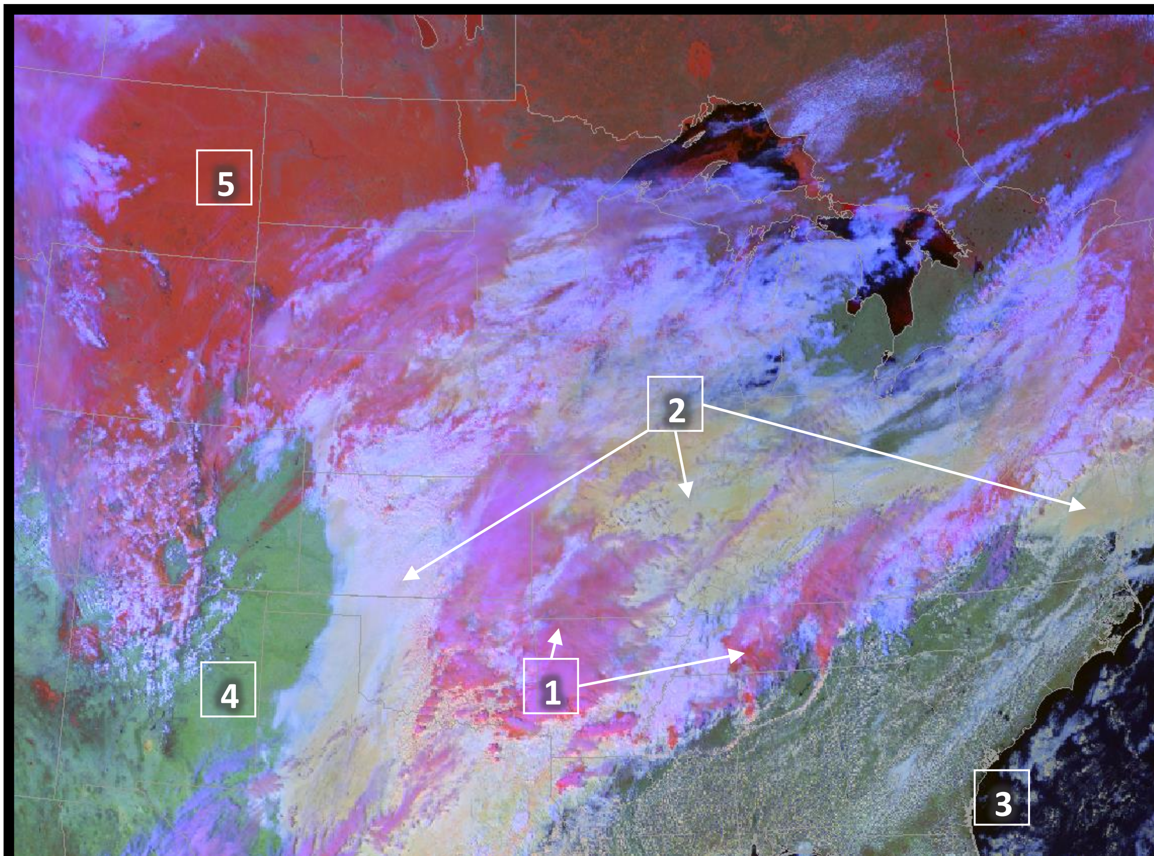
2 **Water clouds, fog** *(shades of yellow)*

3 **Ocean** *(black)*

4 **Vegetation** *(green)*

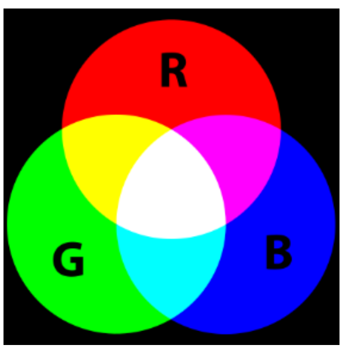
5 **Snow** *(red-orange)*

Note: colors may vary diurnally, seasonally, and latitudinally



Day Snow-Fog RGB from GOES-16 ABI at 1922 UTC, 20 December 2017.

RGB Color Guide



Resources

JMA*
[Day Snow-Fog RGB]

EUMeTrain*
[RGB Colour Interpretation Guide ('Snow RGB' formerly 'Day Solar RGB')]

*Note: color interpretation is slightly different from these products as the 3.9 µm reflected solar component is used for blue

Hyperlinks not available when viewing material in AIR Tool

Comparison to visible imagery:

The colors of the Day Snow-Fog RGB make it easier to distinguish between low clouds and snow/ice compared to visible imagery, as seen in the images from 11 January 2018 (below). It also provides better identification of the thickness of low-level clouds.