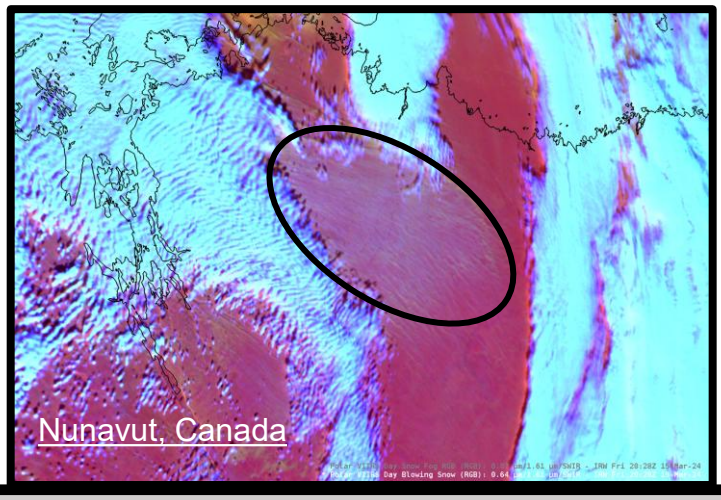
VIIRS Blowing Snow RGB

Quick Guide

Why is the VIIRS Blowing Snow RGB Important?

The VIIRS Blowing Snow RGB incorporates the visible, near-infrared, and fog difference imagery to indicate regions of blowing snow. The RGB highlights already accumulated snow that is picked up and blown by strong winds. Regions of blowing snow will often develop into plumes resembling Horizontal Convective Rolls (HCRs), within which significantly reduced visibilities pose a hazard to motorists and pilots. The RGB utilizes the VIIRS I-bands that have a 375-m spatial resolution.



The VIIRS Blowing Snow RGB observes widespread blowing snow (black ellipse) in Canada on 15 March 2024.

VIIRS Blowing Snow RGB Recipe

Color	Band (µm)	Min – Max Gamma	Small contribution to pixel indicates…	Medium contribution to pixel indicates…	Large Contribution to pixel indicates…
Red	(I-1) 0.64	10 to 110% 1	Water body, land surface	Blowing Snow	Cloud, snow and ice cover
Green	(I-3) 1.61	5 to 40% 1	Water body, snow and ice cover, glaciated clouds	Blowing Snow	Land surface, liquid clouds
Blue	(I-4) 3.74 - (I-5) 11.45	0 to 15 ˚ C 1	Water body, land surface	Blowing Snow	Cloud

Impact on Operations

Primary Application

Blowing Snow: Depending on the solar illumination, sun angle, and plume thickness, blowing snow appears as light pink/purple, brown/orange, and bright green/yellow against the darker red background (snow cover). Deepening HCRs associated with blowing snow may cast small shadows, allowing for the appearance of a revealing texture in the imagery. The apparent linear movement of blowing snow will be seen across snow-covered surfaces from subsequent VIIRS overpasses. Use surface observations and webcams in conjunction with the RGB imagery for validation.

Clouds and surface features: Clouds will appear as shades of blue/cyan and purple, depending on the phase and thickness. Bare ground will appear as bright green, snow cover as dark red, and water bodies as black.

Limitations

Daytime Only: The RGB utilizes visible and near-infrared channels, which limits its use to monitoring blowing snow during the day. In the winter months, the availability of the RGB is reduced due to the lack of sunlight. Note, in far northern Alaska, there is a short period where the RGB will not be available at all.

Temporal Resolution: Over CONUS, VIIRS overpasses can be seen 1-2 times per day, per satellite, typically from ~16-22Z. VIIRS has more frequent coverage over Alaska and the high latitudes.

Cloud Obscuration: Cloud cover can obscure areas of blowing snow.

Contributors: CIRA, NOAA/NESDIS, and GINA.

https://www.cira.colostate.edu/

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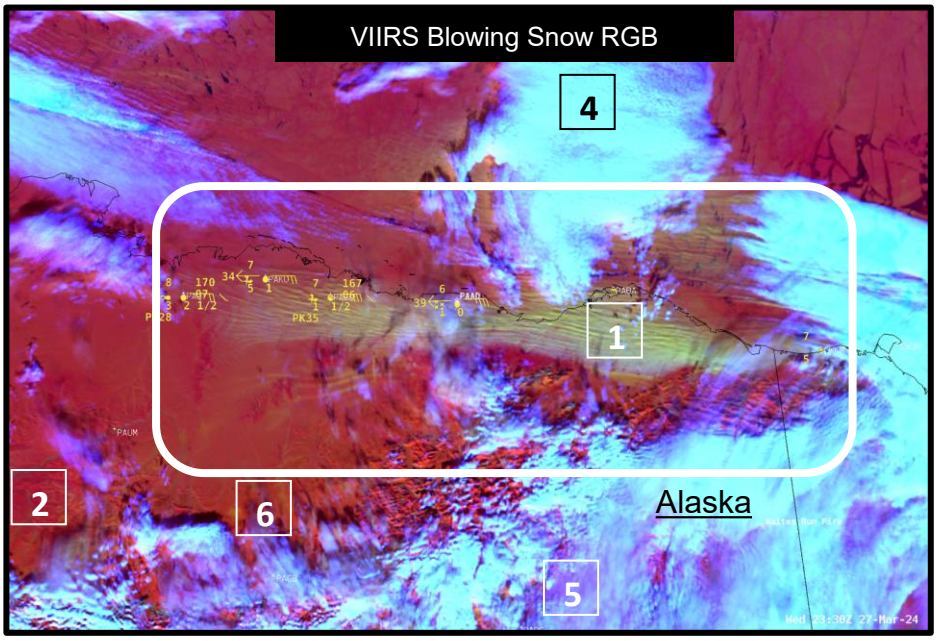
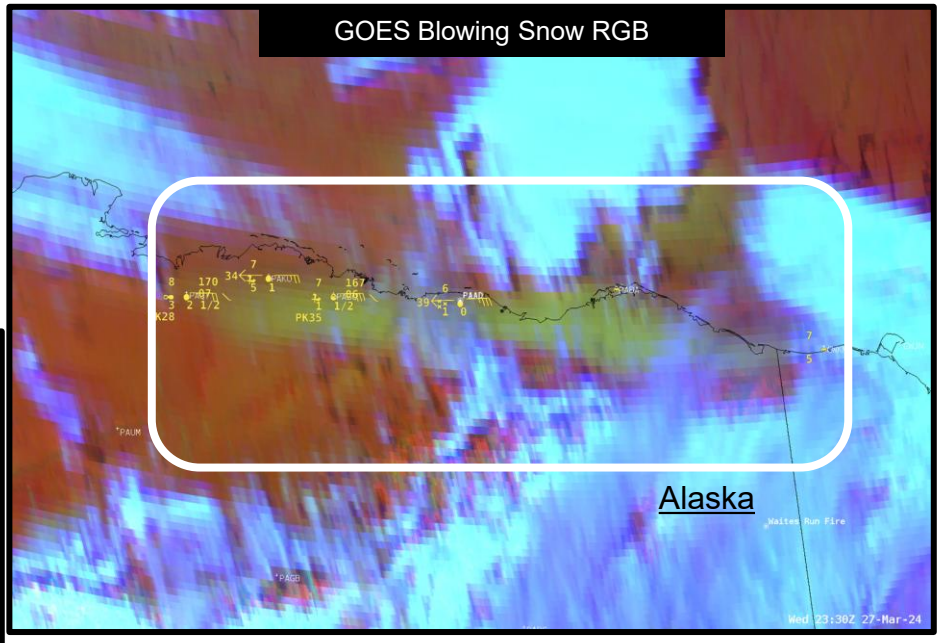
RGB Interpretation

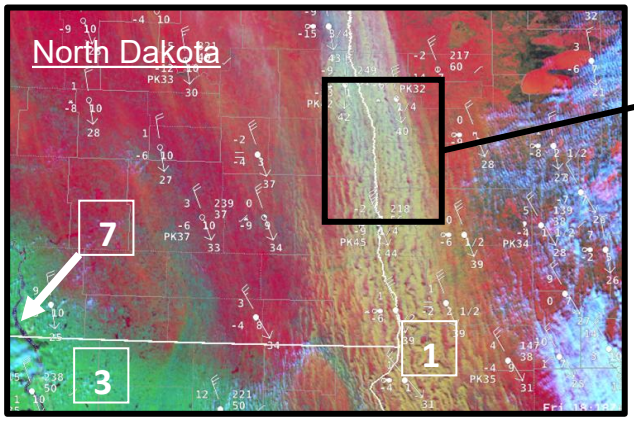
- **1 Blowing Snow** *(pink/purple, brown/orange, and green/yellow)*
- **2 Snow Cover** *(dark red)*
- **3 Bare Ground** *(bright green)*
- **4 Liquid or Supercooled Water Clouds** *(shades of blue/cyan)*
- **5 Thick Ice Clouds** *(purple)*
- **6 Thin Ice Clouds Over Snow** *(tan)*
- **7 Bodies of Water** *(black)*

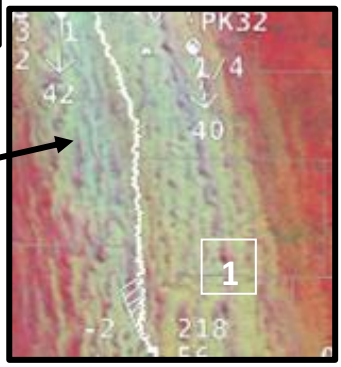
Note: colors may vary diurnally, seasonally, and may differ slightly from the GOES Blowing Snow RGB.





VIIRS and GOES ABI RGBs observe blowing snow over the Alaskan North Slope on 27 March 2024 (see images to the right). In the northern high latitudes, the GOES-18 RGB imagery pixel size is coarse, but the blowing snow signature is still present along the Alaskan North Slope. The VIIRS RGB enhances the visualization of blowing snow at 375-m, showing the HCRs and provides a distinct contrast between areas affected by blowing snow and those that are not. The 11 Feb 2022 blowing snow event along the North Dakota/Minnesota border can be seen below. The inset depicts blowing snow at a high spatial resolution.





Resources

Satellite Liaison Blog

Late March - North Alaska Blowing Snow Event

Mid-Jan 2024 Northern U.S. Plains Blowing Snow as Observed by GOES ABI and JPSS VIIRS Imagery

Dec 2022 Cold Front and Blowing Snow

CIRA SLIDER - JPSS Sectors

Northern Hemisphere, Southern Hemisphere, and CONUS.

Monthly Weather Review

GOES-16 Observations of Blowing Snow in Horizontal Convective Rolls on 24 February 2019

Hyperlinks not available when viewing material in AIR Tool