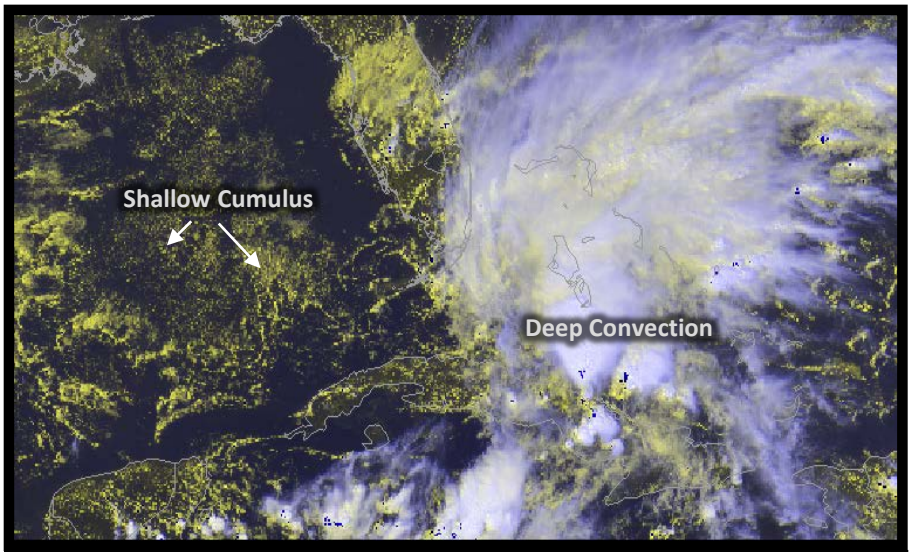
Day Cloud Convection RGB

Quick Guide

Why is the Day Cloud Convection RGB Important?

The Day Cloud Convection product is a simple RGB that uses the traditional visible and infrared channels that forecasters are familiar with. The contribution from the visible is related to the illumination and reflectance of cloud and surface features, while the infrared is related to temperature. The combination helps to distinguish between high and low clouds and can help reveal wind shear when animated. As a heritage product it can be produced for any meteorological satellite that carries one visible and one longwave infrared channel.



Day Cloud Convection RGB from GOES-16 ABI at 1857 UTC, 04 October 2017

Day Cloud Convection RGB Recipe

Color	Band (µm)	Min to Max Gamma	Physically Relates to…	Small contribution to pixel indicates…	Large Contribution to pixel indicates…
Red	0.64 (Ch. 2)	0 to 100 % albedo	Reflectance of clouds and surfaces	Water, vegetation, land	Cloud, snow, white sand
Green	0.64 (Ch. 2)	1.7			Cloud, snow, white sand
Blue	10.3 (Ch. 13)	49.85 to -70.15 °C 1	Surface or cloud top temperature	Warm: land (seasonal), ocean	Cold: land (winter), snow, high clouds

Impact on Operations

Primary Application

Surface and atmospheric features: Discern high level convective clouds from low-mid level water clouds, and dark surface features.

"The RGB product is really useful for giving a three dimensional view of the atmosphere. The product blends the useful properties of IR brightness temperature as a proxy for cloud height and the high resolution VIS albedo revealing details of cloud structure including active and lively (lumpy) and sleepy (stratiform) clouds."

Bodo Zeschke
Bureau of Meteorology Training Centre, Australia

Limitations

Daytime only application: The 0.64 µm band detects reflected visible solar radiation. Morning/evening sun angle and length of daylight will affect color interpretation.

Distinguishing snow cover and warm water clouds: Snow and water clouds both appear yellow in the RGB, but geographic features and/or cloud motion may help to differentiate between the two.

Two-component pseudo RGB: The red and green components both use the 0.64 µm band, providing duplicate as opposed to contrasting information.

Editors: Bernie Connell, Erin Dagg CSU/CIRA https://www.cira.colostate.edu/

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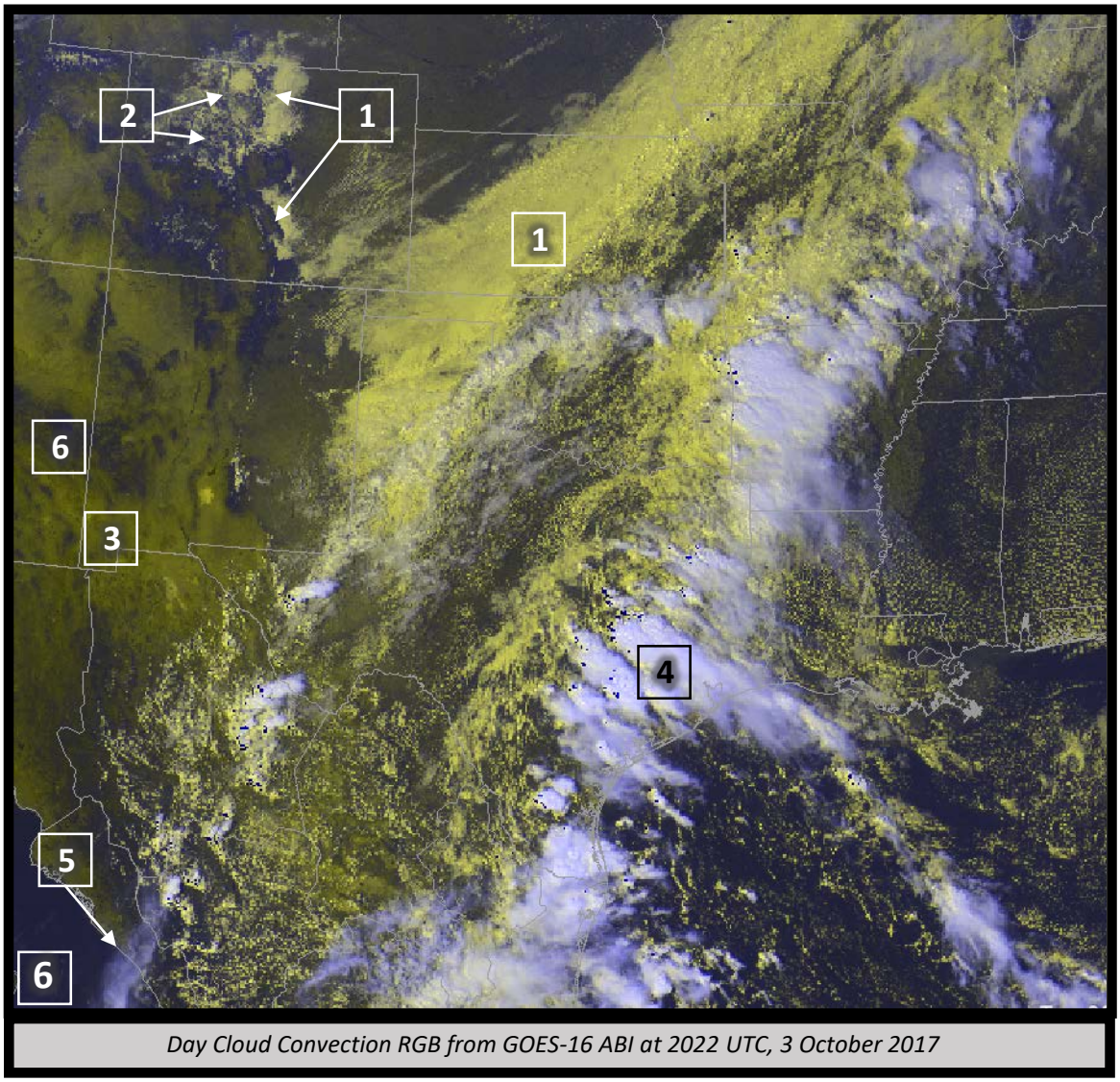
RGB Interpretation

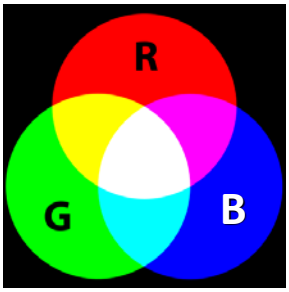
1	**Low to mid level water clouds** *(shades of yellow)*
2	**Snow** *(shades of yellow)*
3	**Land with sparse vegetation** *(olive green)*
4	**Upper-level clouds** *(shades of white and gray)*
5	**Thin cirrus** *(shades of blue-gray)*
6	**Water, flooded areas, and forested areas** *(dark blue)*

Note: colors may vary diurnally, seasonally, and latitudinally

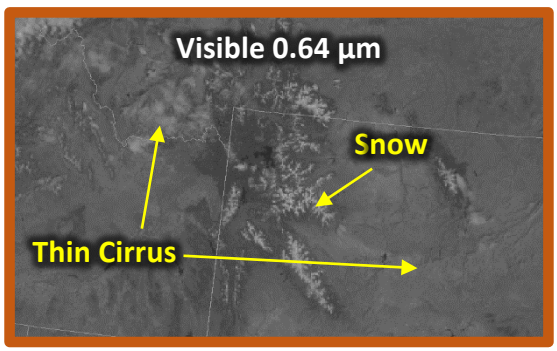


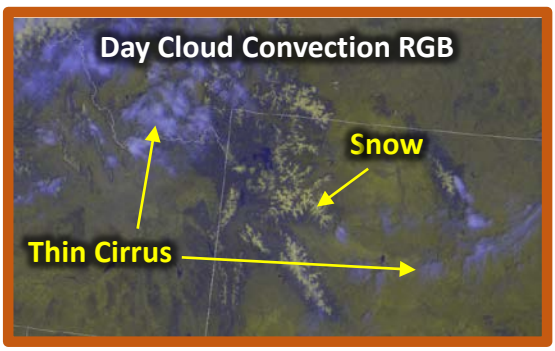
Day Cloud Convection RGB from GOES-16 ABI at 2022 UTC, 3 October 2017

RGB Color Guide



Comparison to visible imagery:
Thin cirrus, shallow cumulus, and snow are not always easy to differentiate in single image, single channel 0.64 µm visible imagery. The Day Cloud Convection RGB helps in analyzing cloud height, vertical wind shear, and cloud versus snow when imagery is viewed as an animation.





Resources

UCAR/COMET
Multispectral Satellite Applications: RGB Products Explained ('Visible & Infrared')

EUMeTrain *
1) RGB Quick Guide - HRV Clouds
2) RGB Colour Interpretation Guide ('HRV Cloud RGB')

Hyperlinks not available when viewing material in AIR Tool

* Note: gamma=1 for all components in HRV Cloud RGB