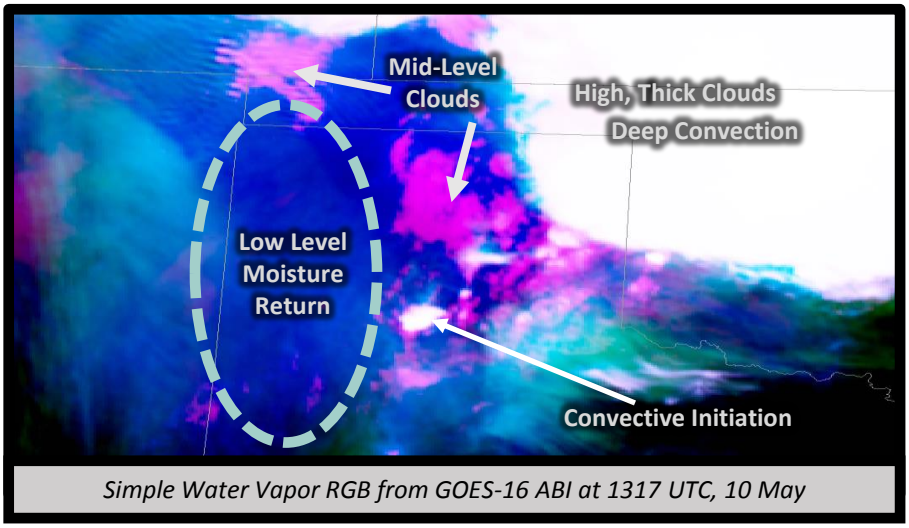
Simple Water Vapor RGB Quick Guide

Why is the Simple Water Vapor RGB Important?

This RGB helps discriminate the distribution of atmospheric water vapor. It allows a forecaster to distinguish where moisture return is occurring in the absence of clouds. Features traditionally identified in water vapor imagery such as conveyor belts, jet stream, and gravity waves are apparent. This recipe is especially useful for color sensitive individuals because of the contrast in colors between different levels.



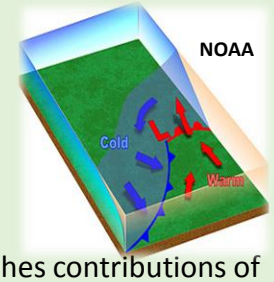
Simple Water Vapor RGB from GOES-16 ABI at 1317 UTC, 10 May

Simple Water Vapor RGB Recipe

Color	Band / Band Diff. (µm)	Range (Min – Max)	Physically Relates to…	Small contribution to pixel indicates…	Large Contribution to pixel indicates…
Red	10.3 (Ch. 13) (inverted)	5.81 to -70.86 C	Cloud top or surface temp.	Shallow Low-Mid Clouds	High and/or Deep Clouds
Green	6.2 (Ch. 8) (inverted)	-30.48 to -58.49 C	Upper Level Water Vapor	Relatively dry upper level atmosphere	Relatively moist upper level atmos.
Blue	7.3 (Ch. 10) (inverted)	-12.12 to -28.03 C	Lower Level Water Vapor	Relatively dry low-mid level atmos.	Relatively moist low-mid level atmos.

Impact on Operations

Primary Applications



Moisture Return: Low level moisture return in the absence of clouds can be seen due to the contribution of the 7.3µm channel.

Cyclone Structure: Distinguishes contributions of different atmospheric layers of water vapor. Warm, cold, and dry conveyor belts stand out.

Jet Features: Some jet features are easier to see in the Simple Water Vapor RGB than in the individual bands.

Secondary Applications: convective initiation, gravity waves, mountain waves, standing waves that impact turbulence.

Limitations

Cannot detect Fog/Stratus or low level features: There is very little contribution from the lowest layers of the atmosphere in this RGB, so low clouds such as stratus and fog cannot be discerned.

Upper cloud layers hard to distinguish: detail of upper-level clouds wash out due to gamma values and stretching applied to the RGB components.

Limb effects: The use of longer wavelength channels results in more atmospheric absorption at large viewing angles. As a result, cooler brightness temperatures and more white and aqua coloring is observed at high viewing angles.

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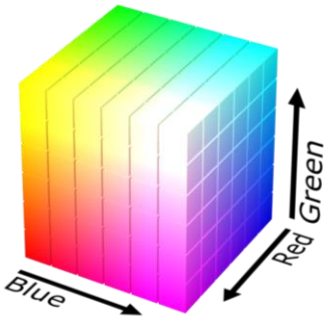
Quick Guide

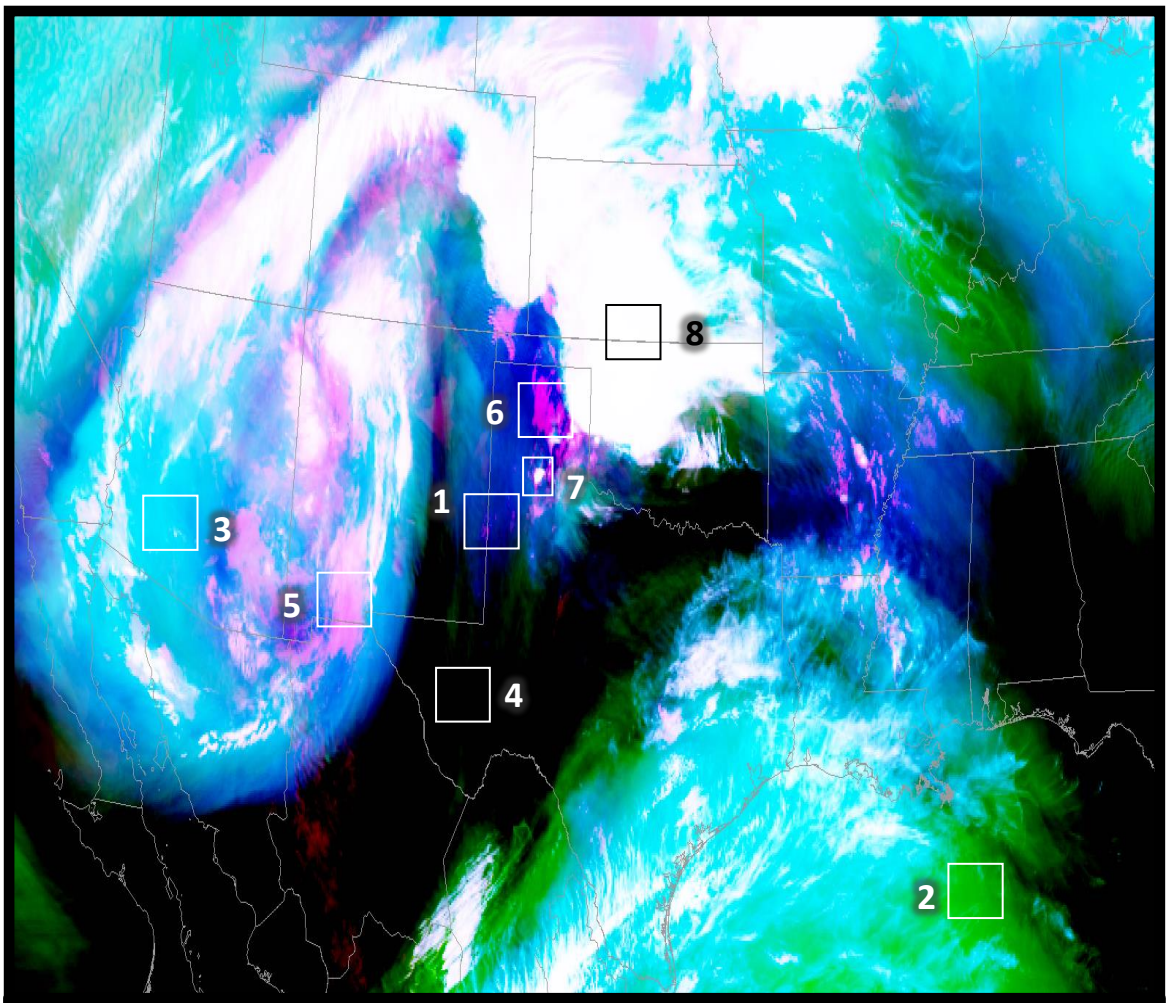
RGB Interpretation

1	**Low - Mid Level Moisture** *(blue)*
2	**Upper Level Moisture; dry below** *(green)*
3	**Moisture at all Levels/No Clouds** *(aqua)*
4	**Dry at all Levels** *(black)*
5	**Mid-Level Cloud; moist all levels** *(milky pink)*
6	**Mid-Level Cloud; low-mid moisture, dry above** *(bright pink)*
7	**Convective Initiation** *(white)*
8	**High, Thick Clouds** *(white)*

Note:, colors may vary diurnally, seasonally, and latitudinally

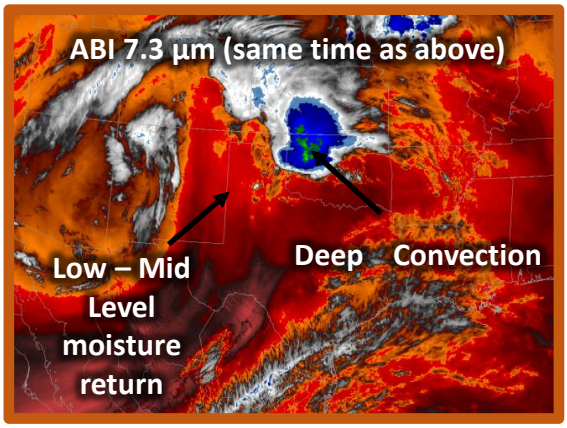
RGB Color Guide





Simple Water Vapor RGB from GOES-16 ABI at 1317 UTC, 10 May 2017.

Comparison to other products: Low Level moisture return can be identified on the 7.3 µm water vapor image below, but the RGB allows one to distinguish the depth of the moisture without analyzing all the water vapor bands (see box 1 above)



Resources

UCAR/COMET

Multispectral Satellite Applications: RGB Products Explained

JMA

New RGB recipes of Himawari-8

Hyperlinks not available when viewing material in AIR Tool