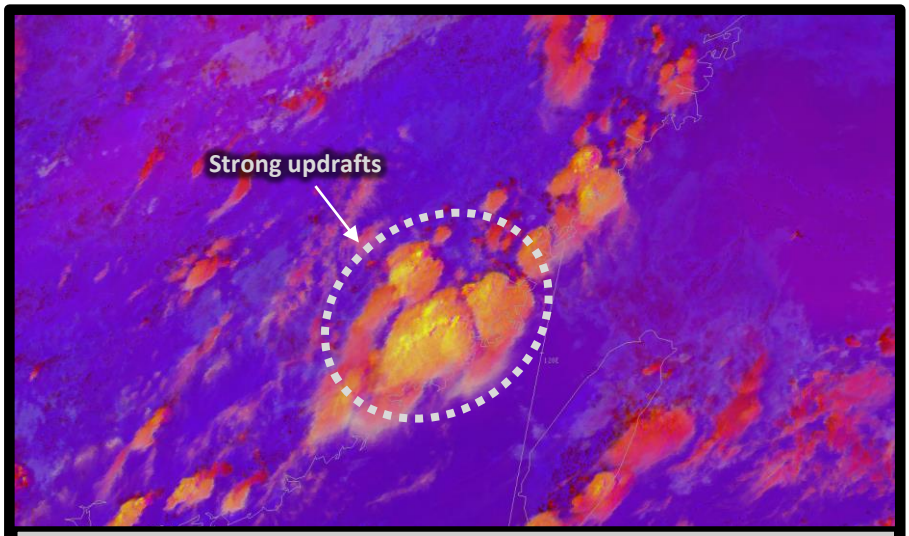
Daytime Convection RGB

Quick Guide

Why is the Convection RGB imagery Important?

The Daytime Convective Storms (Convection) RGB was designed for identification of convection with strong updrafts and small ice particles indicative of severe storms. This RGB helps increase nowcasting capabilities of severe storms by identifying the early stage of strong convection. Knowing the microphysical characteristics of convective clouds helps determine storm strength and stage to improve nowcasts and short-term forecasts. Bright yellow in the RGB indicates strong updrafts prior to the mature storm stage.



Convection RGB from Himawari-8 AHI at 0830 UTC, 4 September 2015

Convection RGB Recipe

Color	Band / Band Diff. (µm)	Physically Relates to…	Small contribution to pixel indicates…	Large Contribution to pixel indicates…
Red	6.2 – 7.3	Cloud height	Low clouds	High clouds
Green	3.9 – 10.4	Particle size	Large ice or water particles, weak updrafts	Small ice or water particles, strong updrafts
Blue	1.6 – 0.64	Cloud phase	Ice clouds	Water clouds

Impact on Operations

Primary Application

Convection and Severe Weather: identify intense updrafts that indicate strong convection.

Strong convection is bright yellow: Smaller particles are more reflective; the 3.9um value is large for small ice particles. Within strong convective updrafts, particles do not have enough time to grow. Strong convection quickly saturates in the red and green colors, resulting in yellow.

Differentiate new and mature convection: mature or dissipating convection is orange or red depending on the amount of larger ice particles and warmer cloud tops.

Limitations

Daytime only application: the RGB relies on solar reflectance from visible, near-IR, and shortwave IR channels.

Pixel color impacted by sun/satellite viewing angles: yellow can be falsely increased due to sun glint in the 3.9 channel. Pixel color fades during dawn/dusk when the sun angle is low.

Yellow colors may not always indicate strong convection: Very cold cloud tops with only moderate 3.9um reflectivity can result in yellow, but the updrafts are average strength. Yellow can also occur in mountain wave clouds or "polluted" air. Dust carried aloft can lead to long lived, small ice particles

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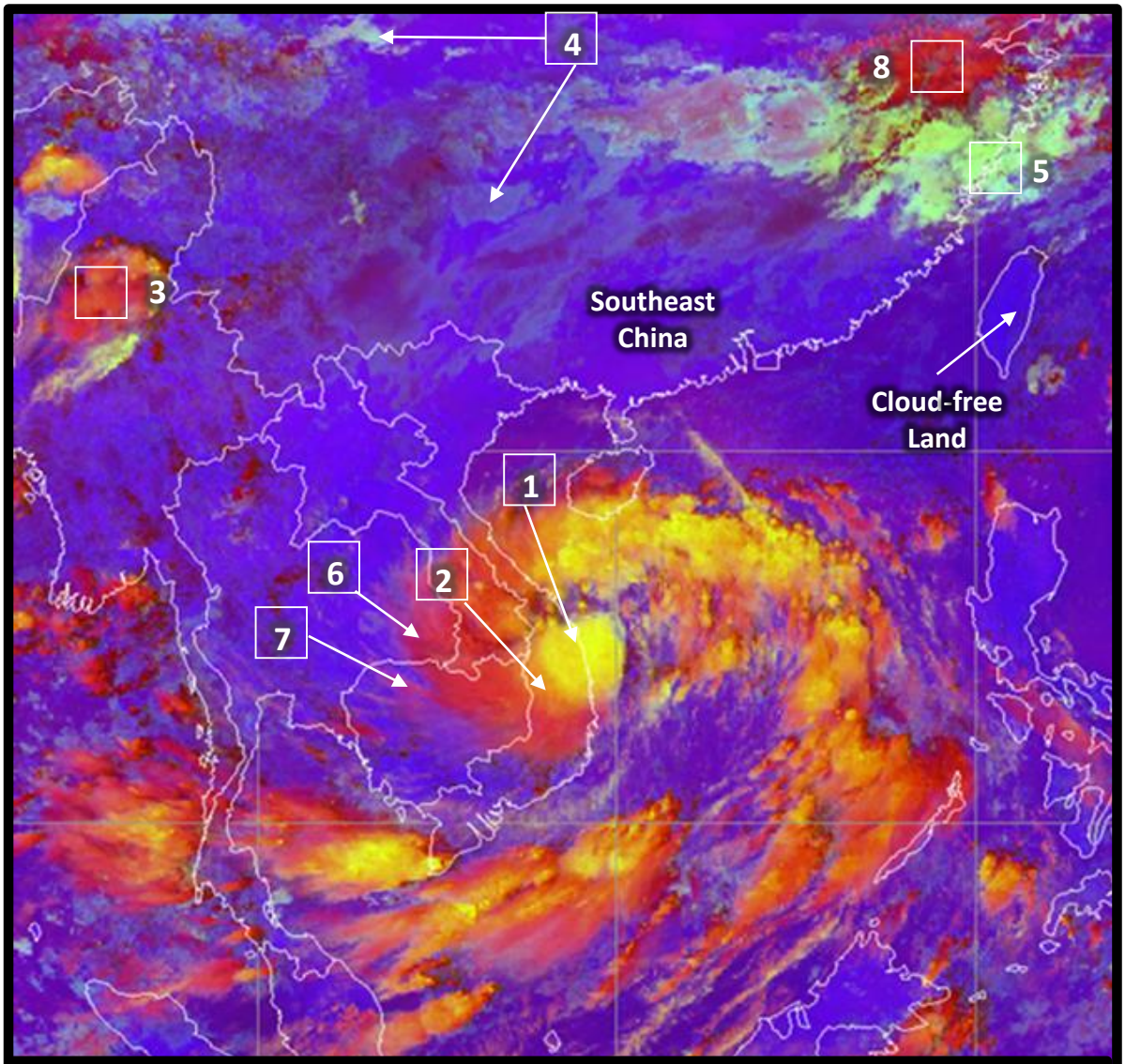
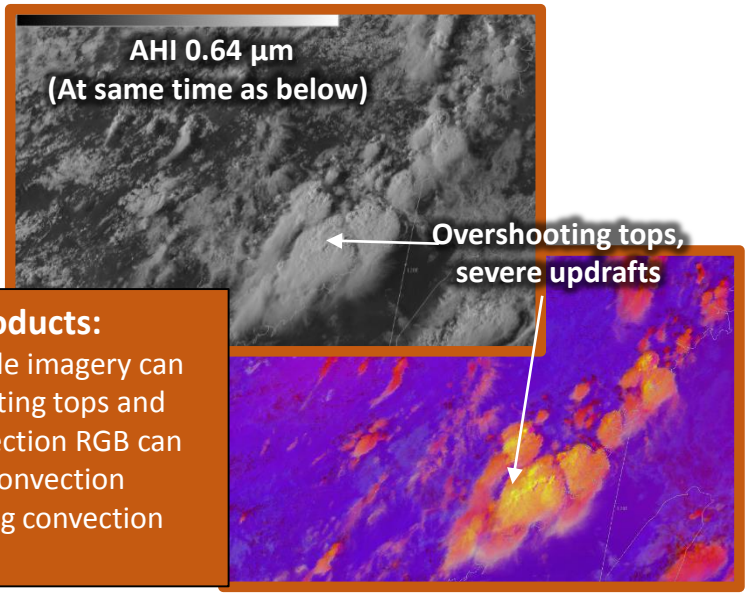
RGB Interpretation

1. **Strong convection, small ice particles** *(bright yellow)*
2. **Moderate convection, large ice particles** *(orange)*
3. **Weak convection, large ice particles** *(Red)*
4. **Low- to mid-water clouds** *(light blue)*
5. **Mid clouds, thick, small water or ice particles** *(light green)*
6. **Thin cirrus, large ice particles** *(deep red/pink)*
7. **Thin cirrus, small ice particles** *(purple)*
8. **High, thick clouds, large ice particles** *(red)*

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



Convection RGB from Himawari-8 AHI at 0120 UTC, 14 September 2015.



Comparison to other products:
The traditional 0.64 µm visible imagery can be used to identify overshooting tops and convective clouds. The convection RGB can distinguish between newer convection (bright yellow) and dissipating convection (oranges, reds).

Resources

UCAR/COMET
Multispectral Satellite Applications: RGB Products Explained.

EUMETSAT
Understanding Convective Clouds Through the Eyes of (MSG) Cloud Particle Size

EUMETrain
RGB Interpretation Guide