



Rocket Plume RGB

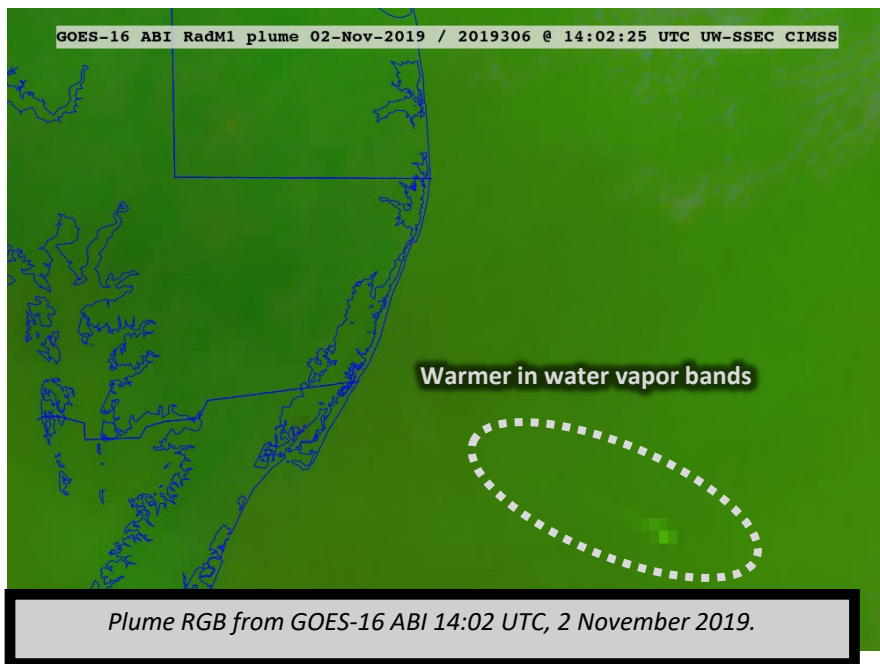
Quick Guide (day)



Why is the Plume RGB Important?

The improved spatial, temporal and spectral attributes of the ABI allow for monitors plumes associated with rockets and other hotspots.

Instead of needing to show 3 or 4-panels with separate spectral bands, these RGBs combine information on the plumes from several key spectral bands: 3.9 micrometer or the “fire band”, the upper-level water vapor band (8), and a visible or “near-visible” band. ABI band 2 is used during the day, while the 7.3 micrometer (water vapor) band at night.



How is the Plume RGB Created?

Color	Band / Band (μm)	Range (Min → Max)	Physically Relates to...	Gamma	Large Contribution to pixel indicates...
Red	7 / 3.9	273 to 338 K	Plume temperature	1.0	Warm plume
Green	8 / 6.2	233 to 253 K	Plume warming	1.0	Plume cloud
Blue (day)	2 / 0.64	0 to 80 %	Reflective clouds	1.0	Plume location

Impact on Operations

Primary Application

Application: Viewing the spectral signatures associated with rocket launches.



Application: This RGB can allow for a quick-look for signal associated with rocket plumes or other hot spots. The solar illumination determines if one wants to use the day or night version of this plume RGB. The IR-only “nighttime” version can be used both day and night.

Limitations

Thick clouds: Thick clouds or low-level moisture may hinder viewing the plume hotspot when it’s lower in the atmosphere.



Limitations:

- Care should be taken as the region of interest approaches the edge of the full disk.
- The water vapor plume may be harder to detect, depending on the background.
- The “blue” component can be overwhelmed by the 3.9 micrometer band.
- May need to address limits for better presentation, especially for cold scenes.





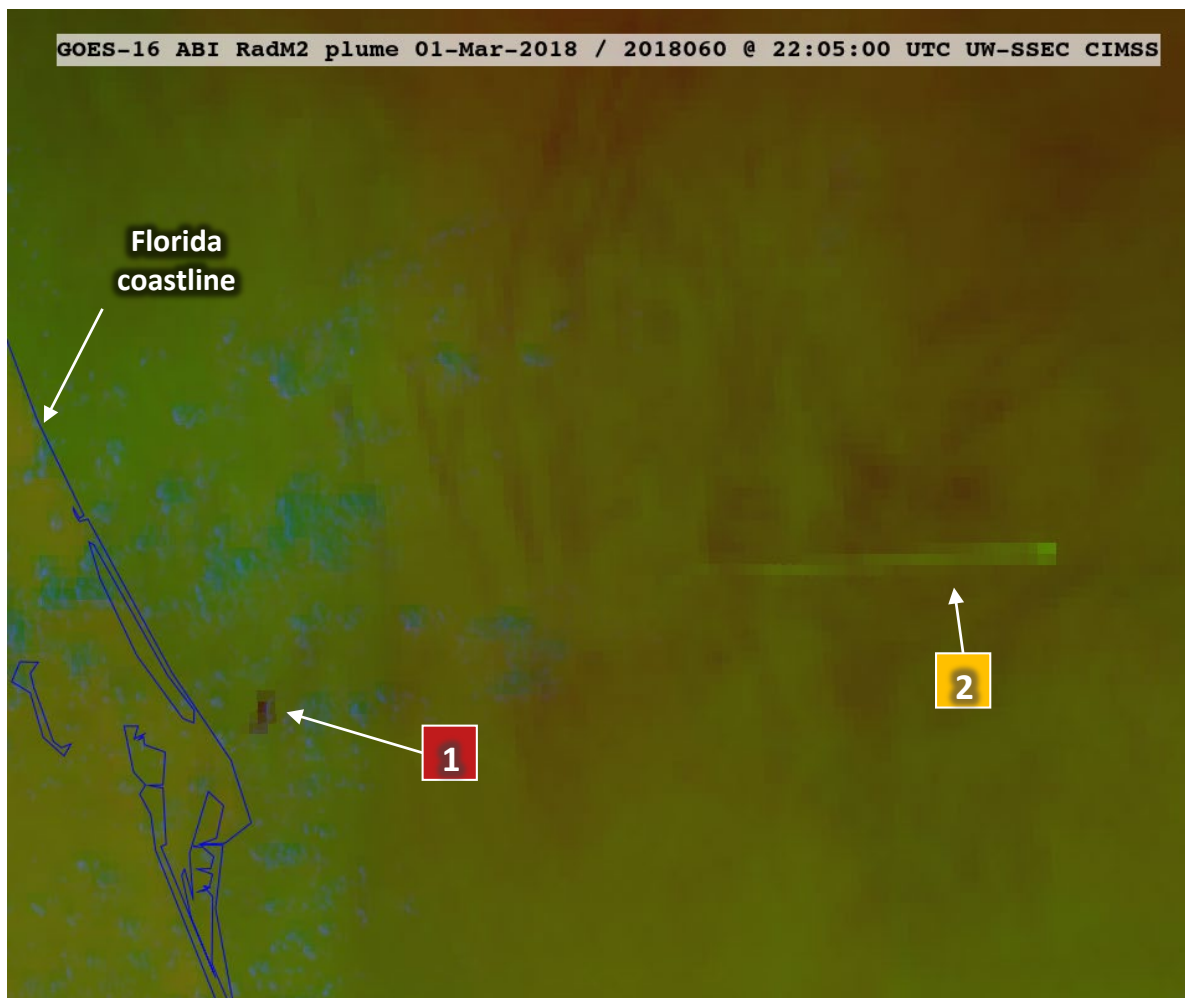
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Quick Guide (daytime)



RGB Interpretation

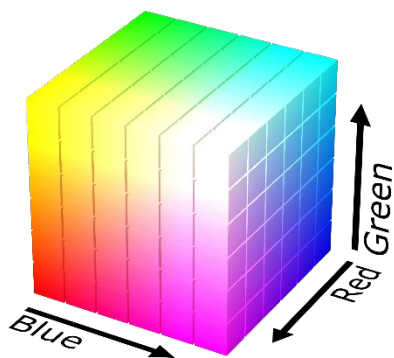
- 1** Plume hot-spot (reddish)
- 2** Rocket warming trail (yellow-green)



Plume from GOES-16 ABI at 2205 UTC, 01 March 2018.

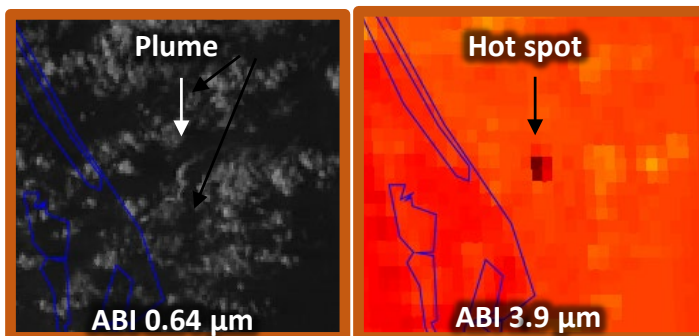
Note:, colors may vary diurnally, seasonally, and latitudinally; plus with hotspots, plumes, moisture amount, etc.

RGB Color Guide



Comparison to other products:

Similar to the Fire RGB with hotspots appearing red, similar to the airmass RGB, in that it leverages a mid-level water vapor band. The images shown on this page are of the GOES-S rocket launch from Cape Canaveral, Florida.



Resources

[Plumes at CIMSS Satellite Blog](#)

[Rocket Plume RGB introduction](#)

[Hot Spot Quick Guide](#)
[Hot Spot](#)

[ABI Band Fact Sheets](#)
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