

## 24-Hour Microphysics RGB Quick Guide by NASA/SPoRT

### Why is the 24-Hour Microphysics RGB Imagery Important?

This RGB is closely related to the Nighttime Microphysics (NtMicro) RGB except it uses the 8.7 $\mu$ m channel in the green component instead of the 3.7 $\mu$ m channel. This occurs because the 8.7 $\mu$ m channel is not affected by solar reflectance, and it is not as “noisy” in cold scenes. Hence, cloud types at high latitudes can be analyzed in all seasons, both day and night, more easily than with the NtMicro RGB in order to support short-term forecasts, particularly for aviation needs.

### RGB 24-Hour Microphysics Product - What is used in the composite and what does each color represent?

Color	Band / Band Diff.	Physically Relates to...	Little contribution to composite indicates....	Large contribution to composite indicates .....
Red	12.0 <sup>2</sup> – 10.8 <sup>1</sup>	Optical Depth	Thin clouds	Thick clouds
Green	10.8 <sup>1</sup> – 8.7*	Particle Phase and Size	ice particles; surface (i.e. cloud free)	Water clouds with small particles
Blue	10.8 <sup>1</sup>	Temperature of surface	Cold surface/cloud	Warm surface/cloud

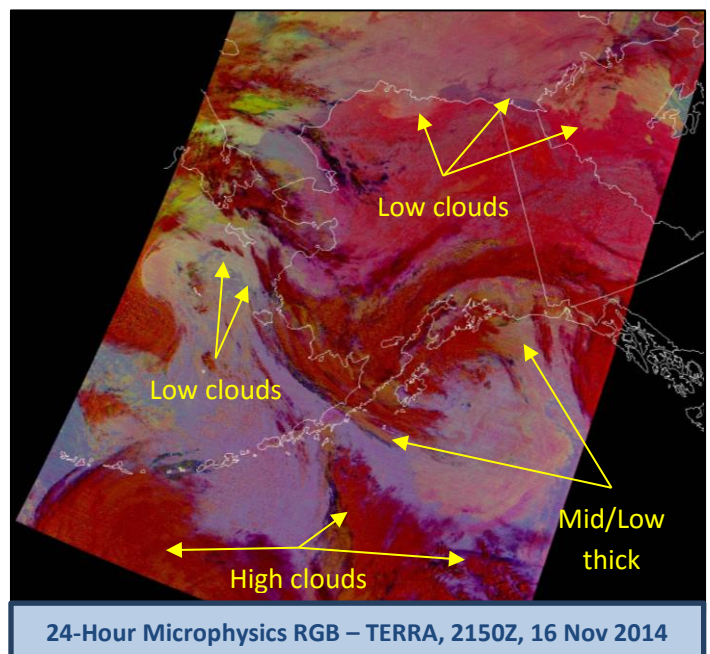
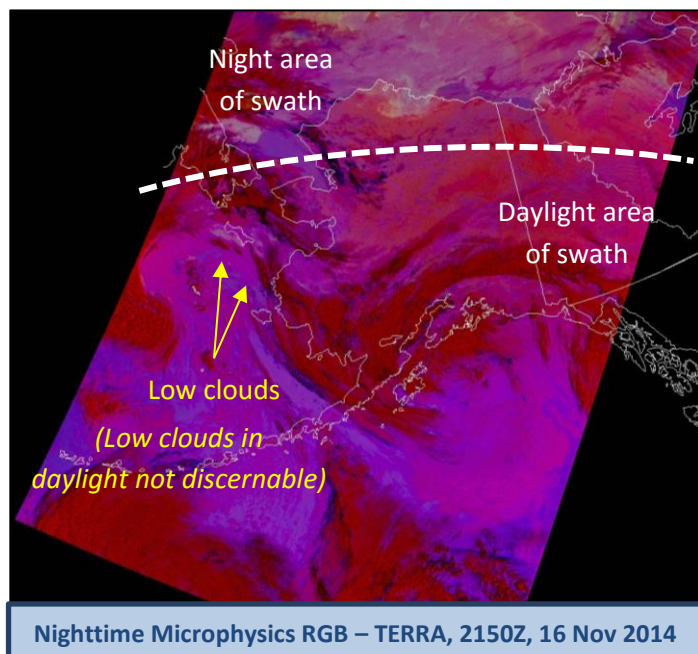
1. The 10.8 micron channel is on MODIS and VIIRS, but GOES-16 will use the 10.4 micron channel.

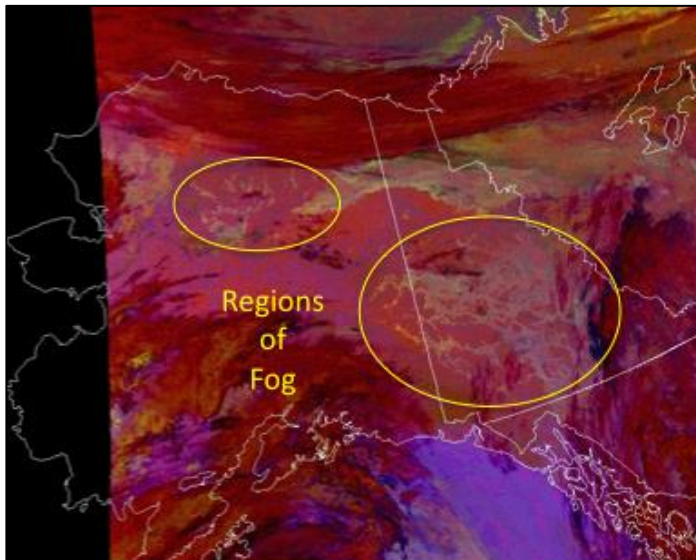
2. The 12.0 micron channel is on MODIS and VIIRS, but GOES-16 will use the 12.3 micron channel.

\* Note that only the 3.7 $\mu$ m channel from the NtMicro RGB was replaced to make the 24-Hour Microphysics RGB

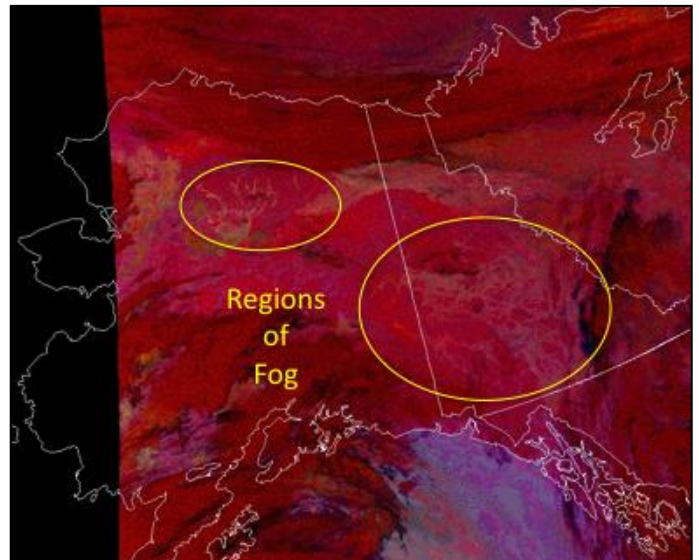
### What should I be looking for in the 24-Hour Micro RGB imagery?

- Low clouds will have a greenish cast and fog will tend toward tan coloring. Transparent appearance (sometimes with gray tones) indicates a relatively thin, low feature that is likely fog.
- Thick, high clouds and cold ground/snow are in reds and magentas
- Saturation of red occurs with Terra MODIS b/c of degradation of instrument –just be aware!
- VIIRS tends to show thin, ice clouds in darker greens vs. purples seen in MODIS – just be aware!

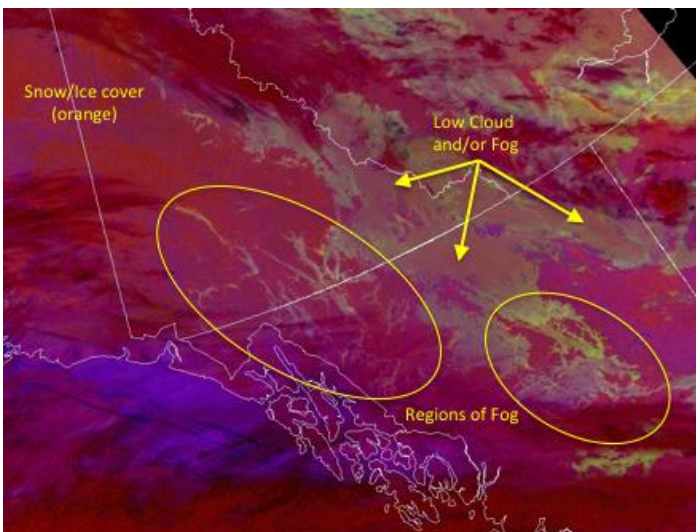




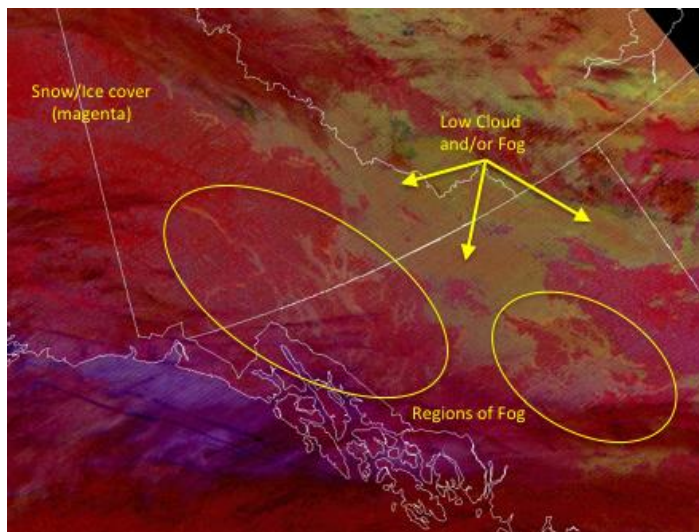
Nighttime Microphysics RGB – VIIRS, 1114Z, 20 Nov 2014



24-Hour Microphysics RGB – VIIRS, 1114Z, 20 Nov 2014



Nighttime Microphysics RGB – TERRA, 0635, 18 Nov 2014



24-Hour Microphysics RGB – TERRA, 0635, 18 Nov 2014

Items of note:

- The 24-hour Micro RGB will have less contrast between cloud objects than the NtMicro RGB, but still can show fog and low cloud regions.
- Differentiating fog from low clouds may be more difficult in 24-hour Micro RGB due to the use of the 8.7 $\mu$  channel rather than the 3.7 $\mu$  channel in the green component of the RGB.
- Fog and low clouds will appear in both RGBs, but 24-Hour Micro RGB can be applied day and night
- Aqua-MODIS does global data transmission over AK and often results in partial swath. Terra-MODIS and VIIRS instruments will have complete swaths over AK.
- Objects near the swath edges may be “brighter” because of effects from CO<sub>2</sub> absorption, particularly in 8.7 $\mu$