

Utilizing GOES-16 Multi-Spectral Color Images for Weather Analysis

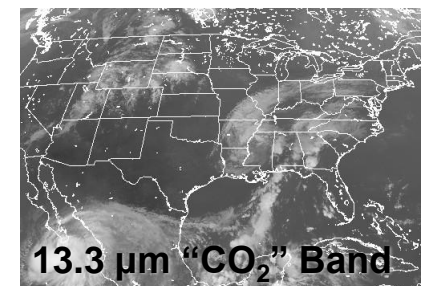
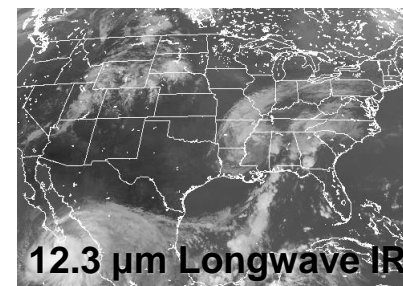
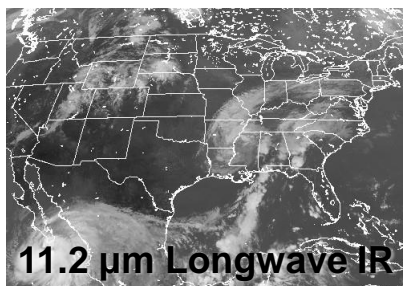
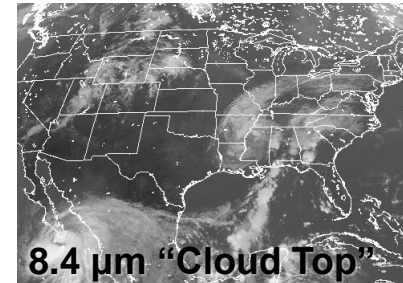
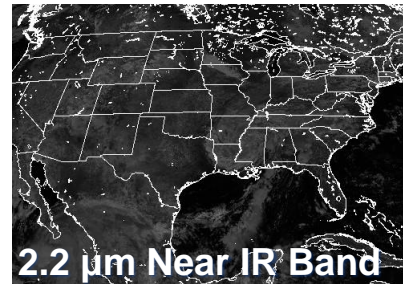
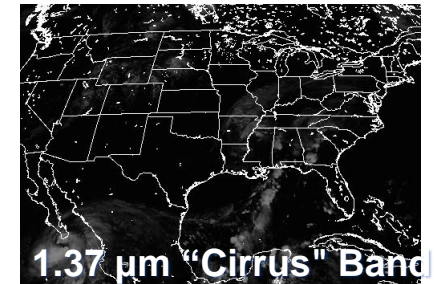
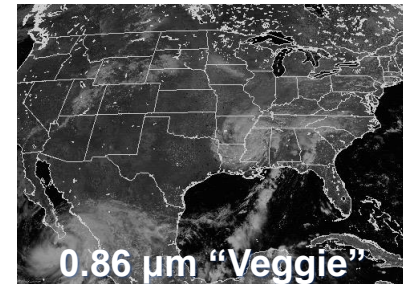
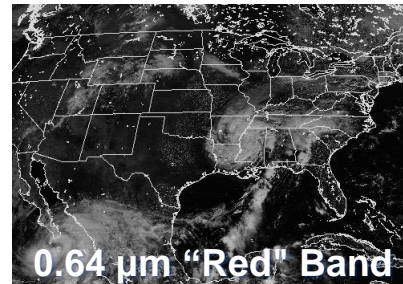
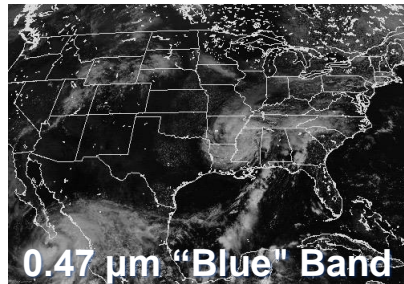
Lance Steele

Certified Consulting Meteorologist

Wednesday, October 25th 2017

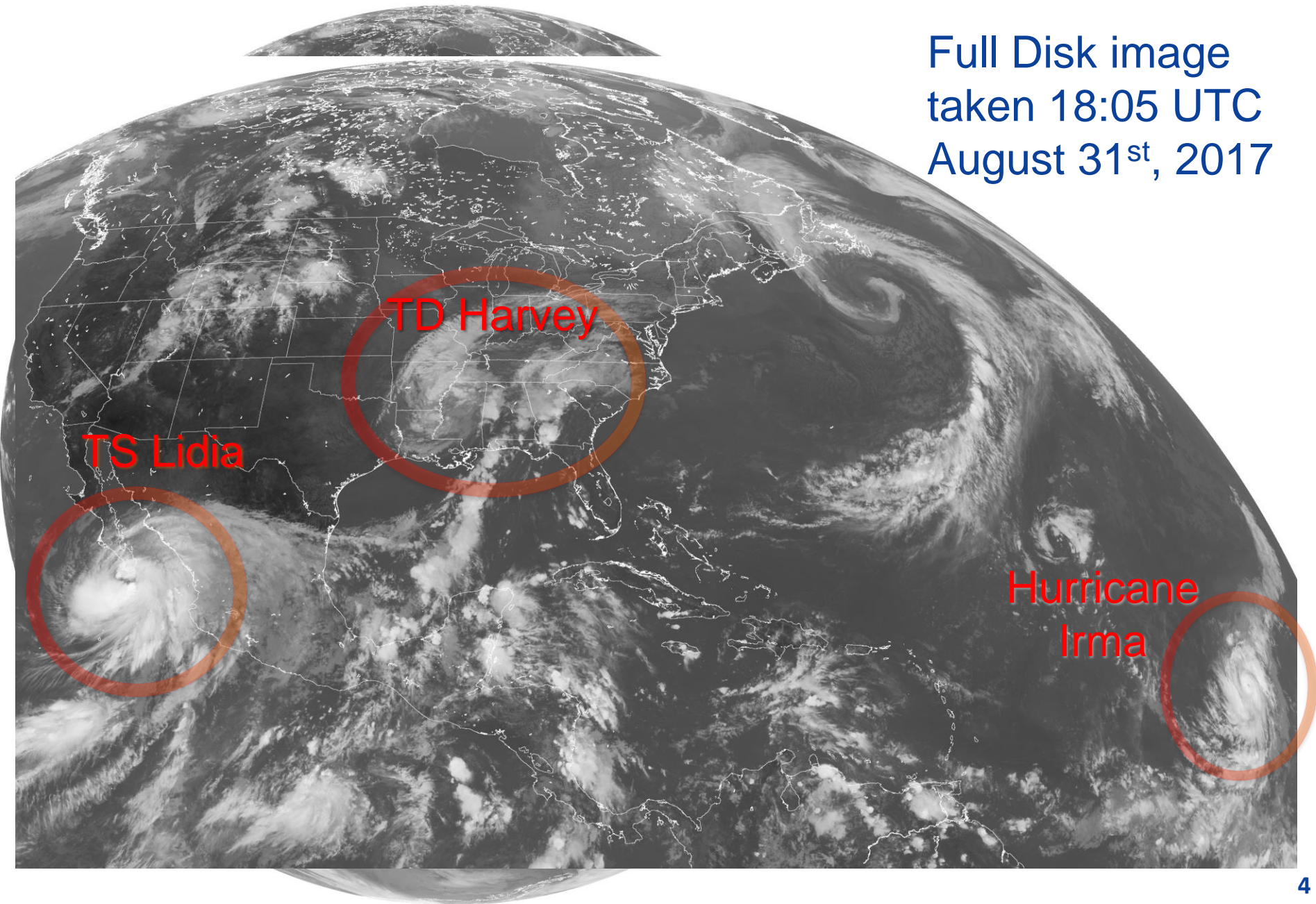


GOES-16: Sixteen Spectral Bands from VIS to IR

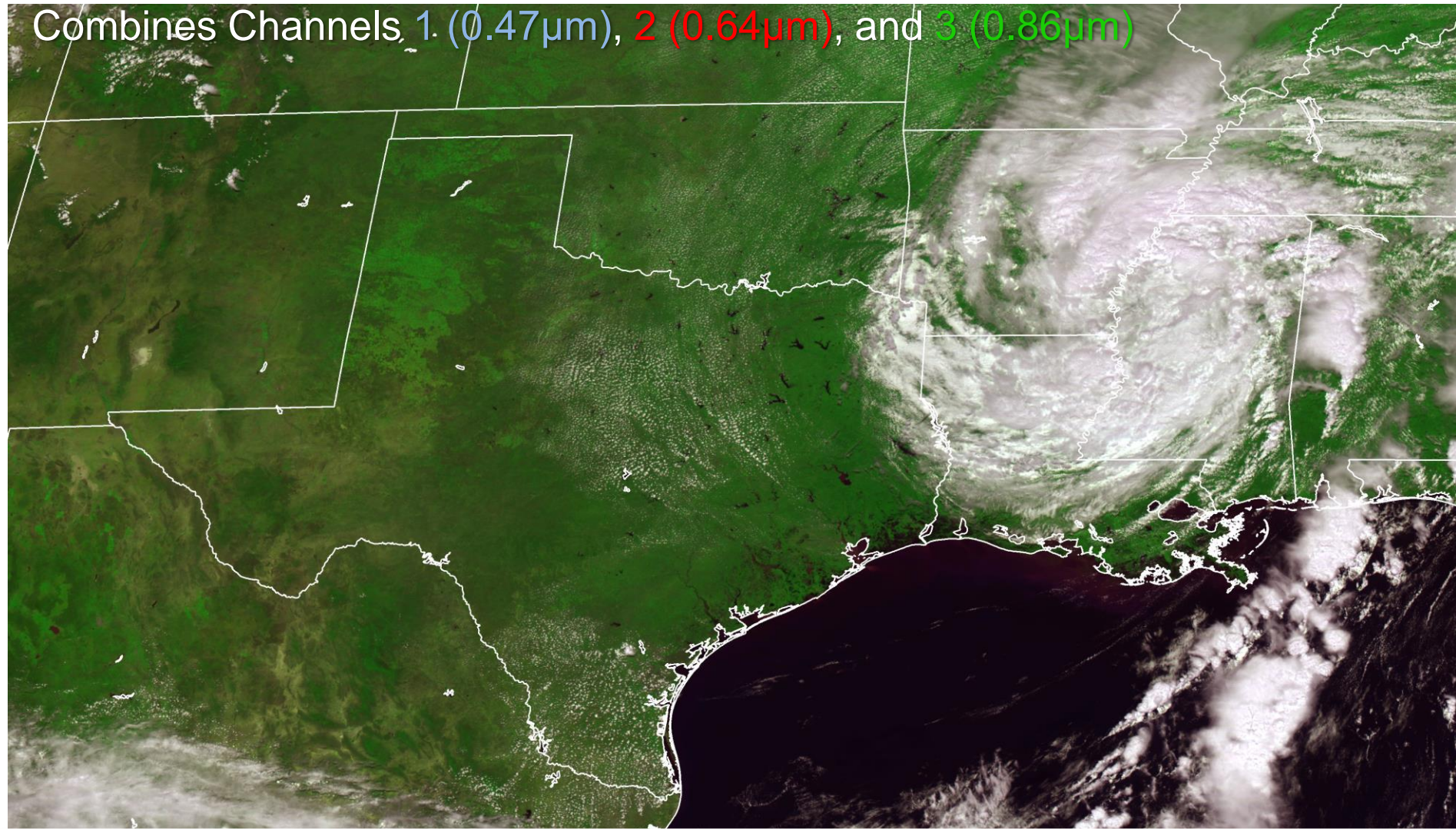


- Three times the number of bands
- Twice the resolution of previous GOES
- Two (or more) times the temporal frequency
 - An order of magnitude more data than previous GOES
- One full disk image produces a 500MB file for Channel 2 (0.5km resolution visible image) and 500MB for all other channels
 - With full disk scans every 15 minutes, plus all the other Level 1B and Level 2 data, the result is hundreds of gigabytes per day, and over a terabyte per week

Full Disk image
taken 18:05 UTC
August 31st, 2017

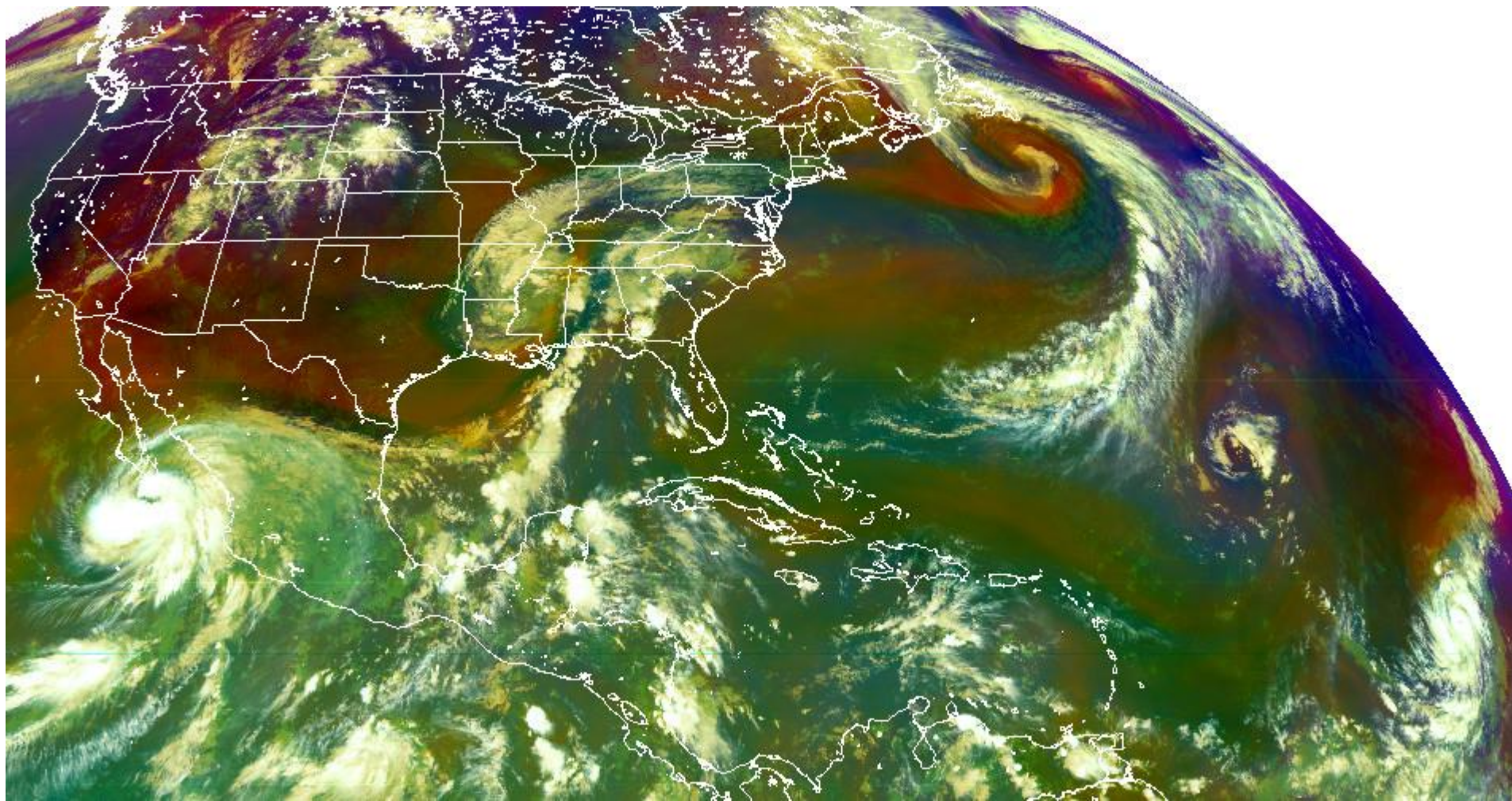


Combines Channels 1 ($0.47\mu\text{m}$), 2 ($0.64\mu\text{m}$), and 3 ($0.86\mu\text{m}$)



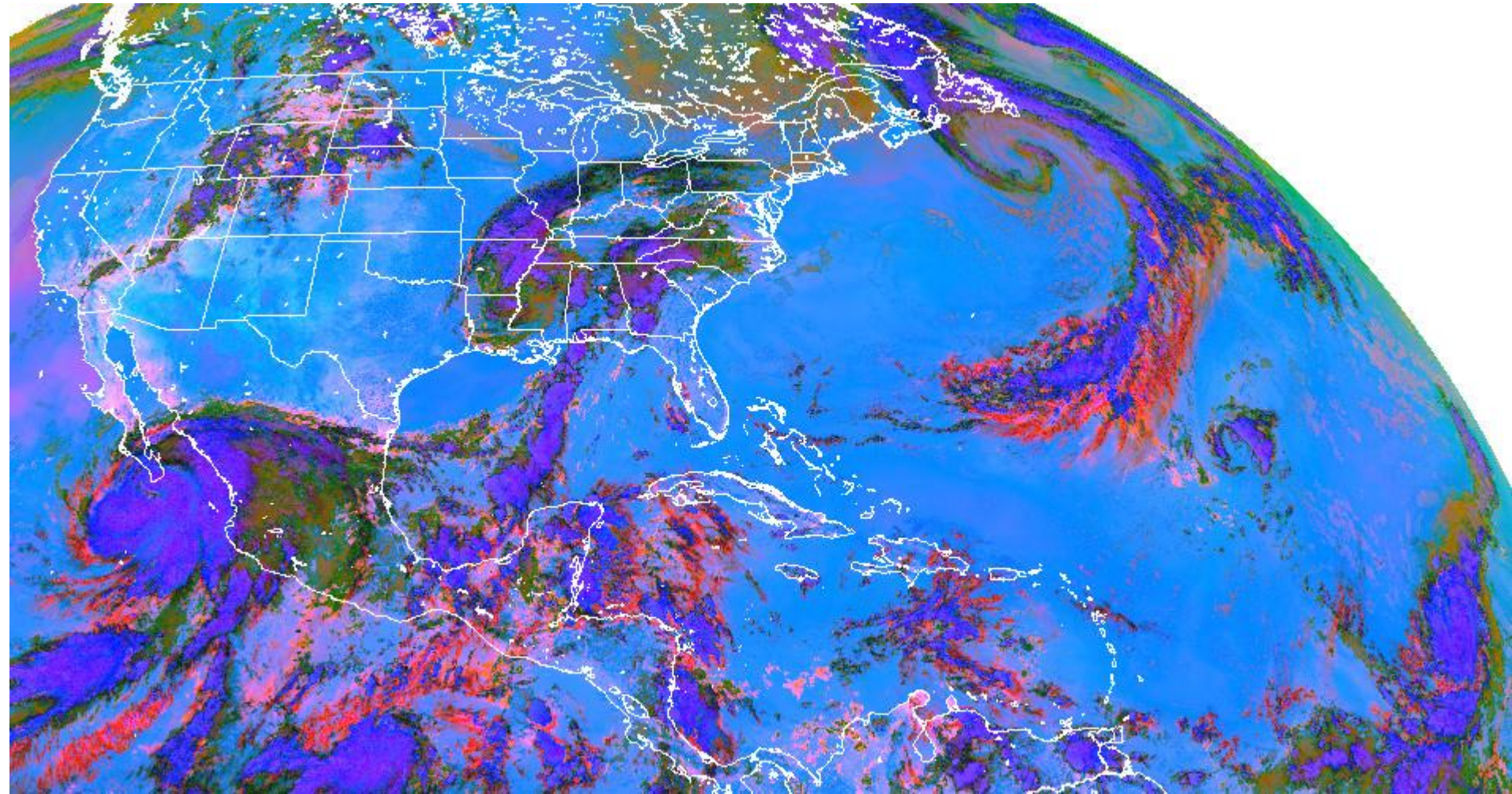
The Himawari 8 AHI has a $0.51\mu\text{m}$ band attuned to the green wavelength, but for GOES-16 the $0.86\mu\text{m}$ “Veggie” band is used to provide the green portion.

Combines Channels 8 (6.2 μ m), 10 (7.3 μ m), 12 (9.6 μ m), and 13 (10.3 μ m)



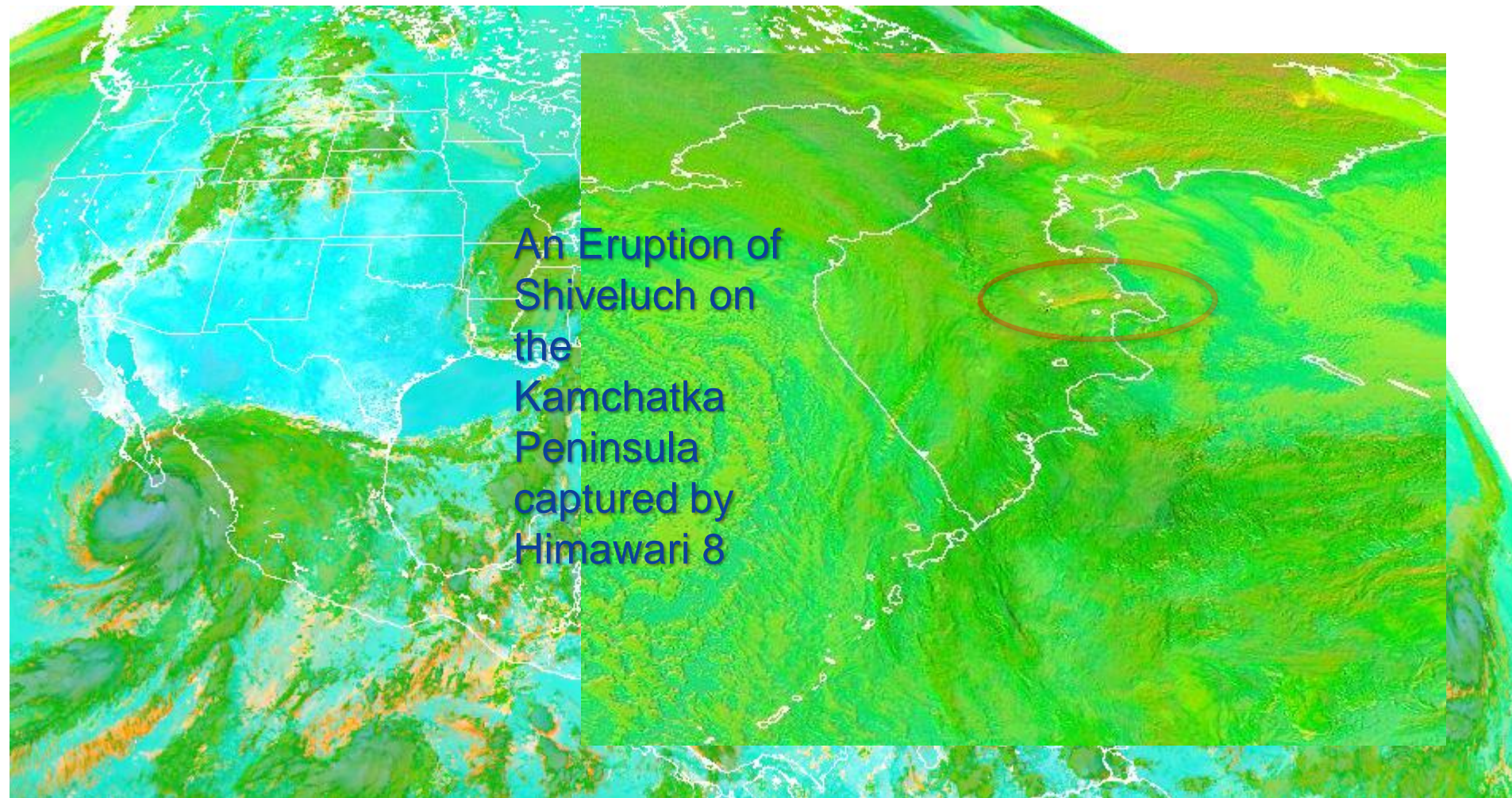
This product shows warm (ozone poor, high tropopause) air masses in green and cold air masses in blue. Dry descending stratospheric air (jet streak) is shown in a reddish hue.

Combines Channels 11 ($8.4\mu\text{m}$), 13 ($10.3\mu\text{m}$), and 15 ($12.3\mu\text{m}$)



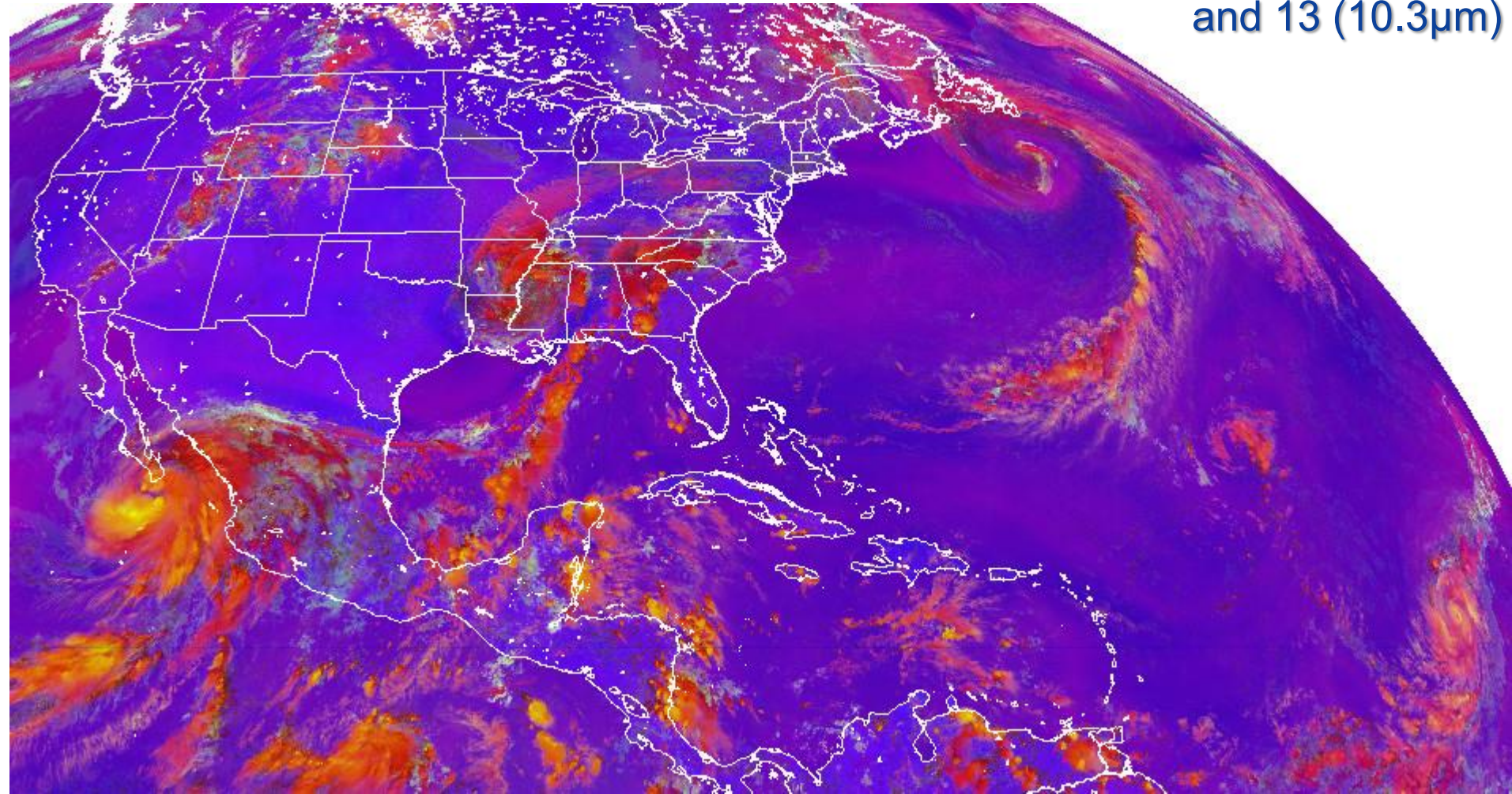
Dust appears magenta in this product. Dry land looks pale blue (or pale green in nighttime). Thick, high-level clouds have red-brown tones and thin high-level clouds are very dark.

Combines Channels 11 ($8.4\mu\text{m}$), 13 ($10.3\mu\text{m}$), and 15 ($12.3\mu\text{m}$)



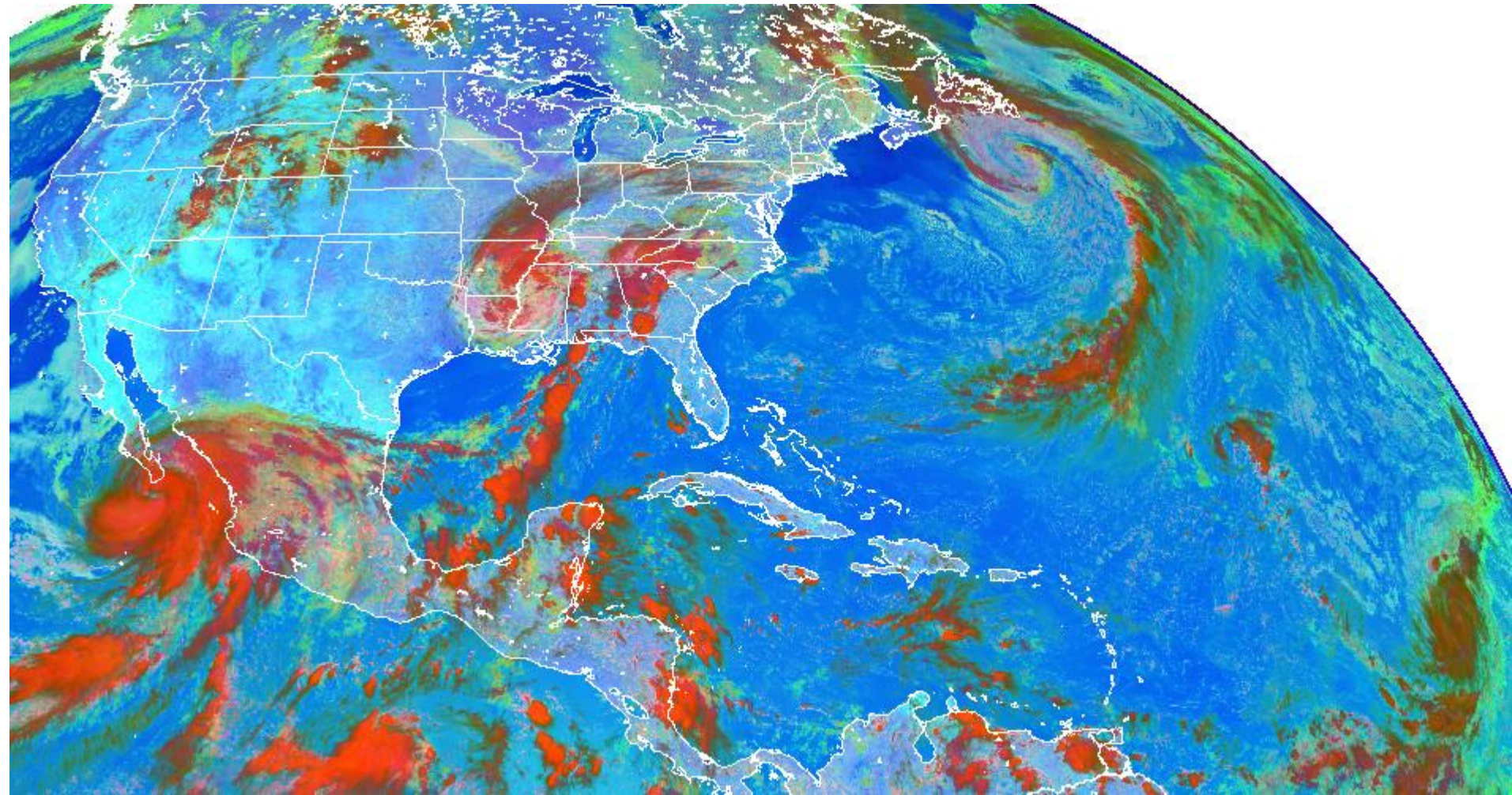
Similar to the dust product, areas of potential ash, dust, or other large particles will appear in pink or orange in this analysis.

Combines Channels 2 (0.64 μ m), 5 (1.6 μ m), 7 (3.9 μ m), 8 (6.2 μ m), 10 (7.3 μ m), and 13 (10.3 μ m)



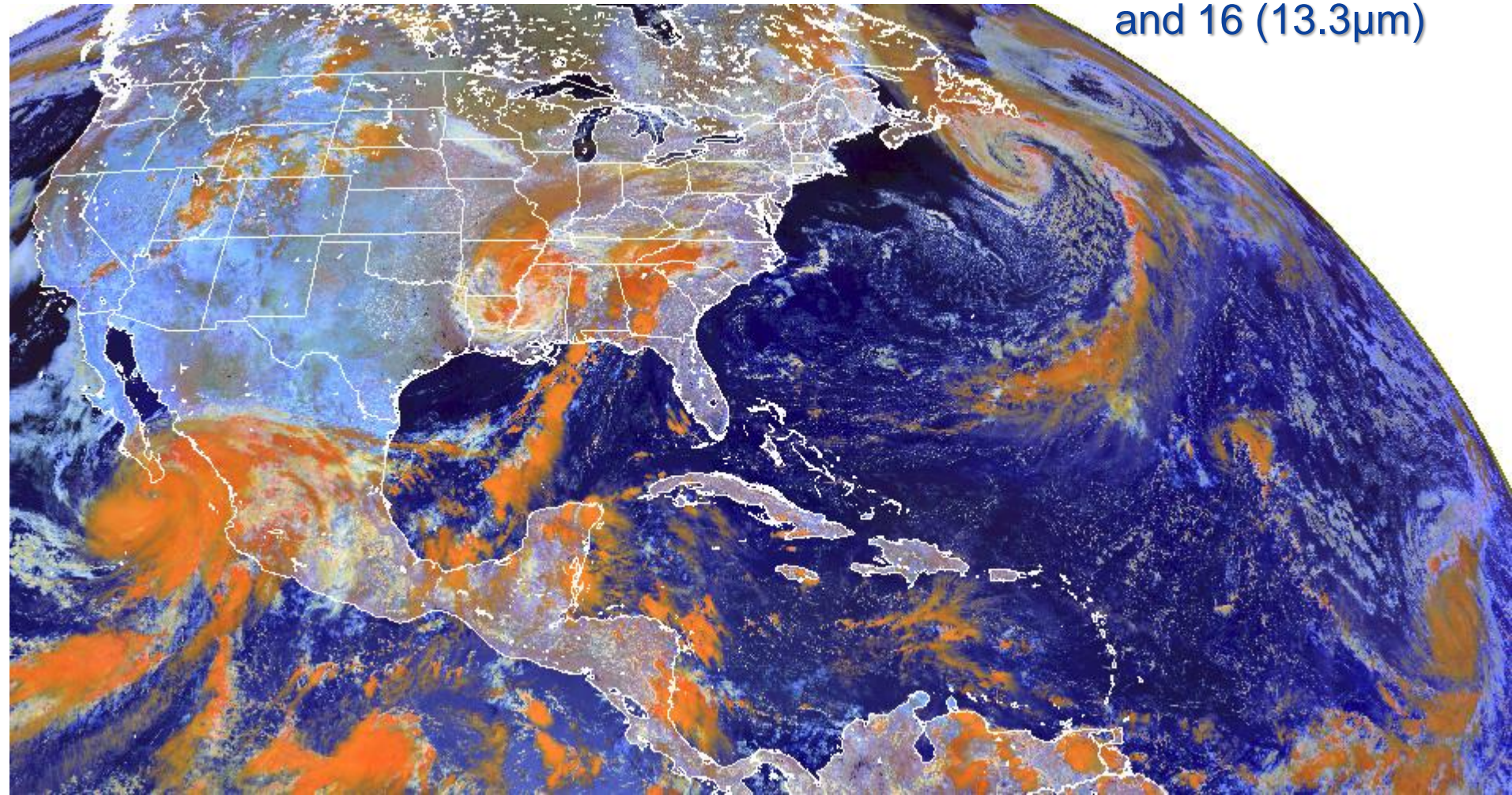
In this product severe convective storms are shown in red / orange with overshooting cloud tops depicted in bright yellow.

Combines Channels 3 ($0.86\mu\text{m}$), 7 ($3.9\mu\text{m}$), 13 ($10.3\mu\text{m}$), and 16 ($13.3\mu\text{m}$)



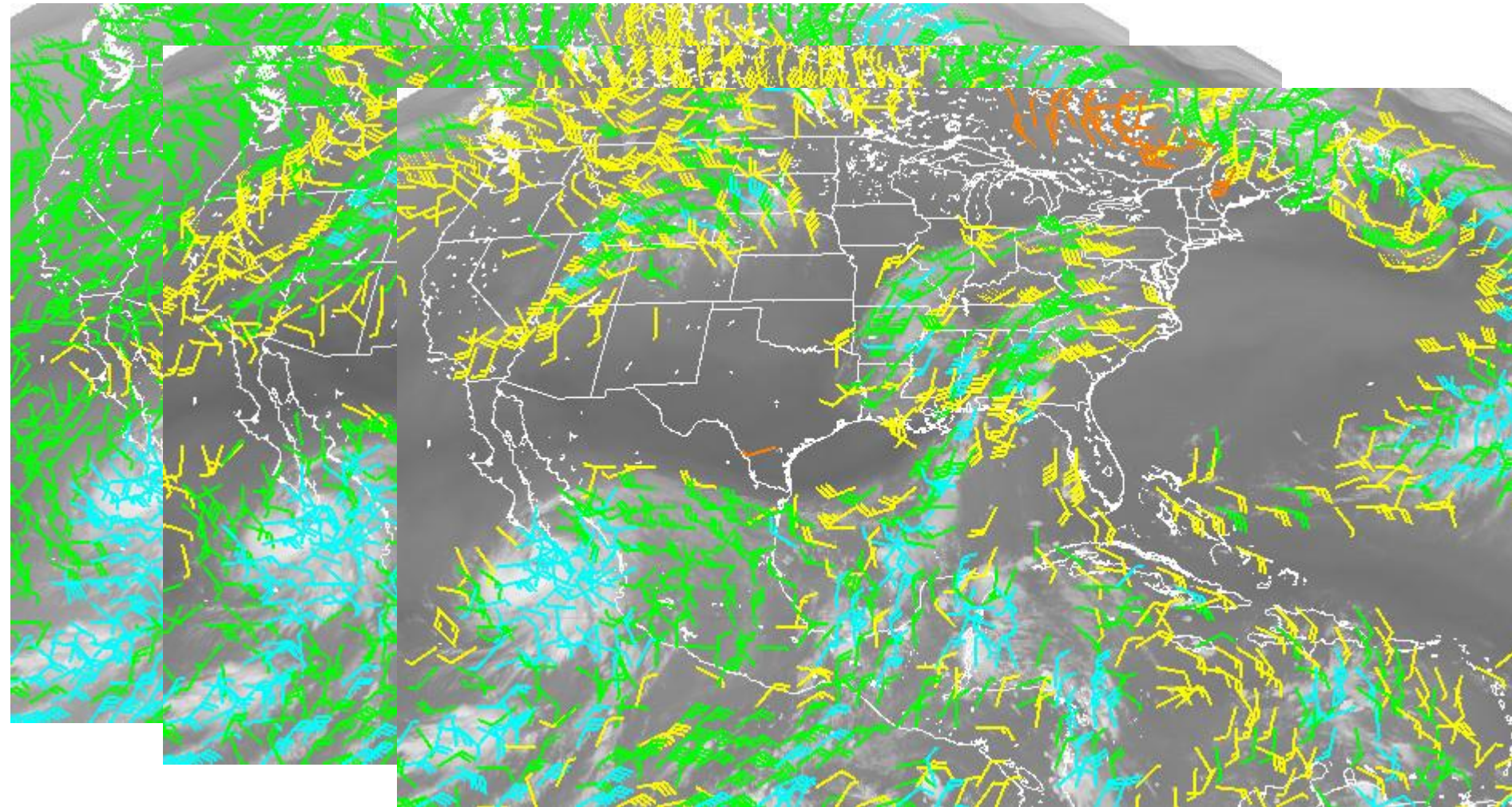
This combination is used for analysis of clouds, convection, fog, snow, and fires. Clouds with small droplets appear white, whereas precipitating clouds with larger droplets appear red.

Combines Channels 3 ($0.86\mu\text{m}$), 5 ($1.6\mu\text{m}$), 7 ($3.9\mu\text{m}$), 13 ($10.3\mu\text{m}$), and 16 ($13.3\mu\text{m}$)



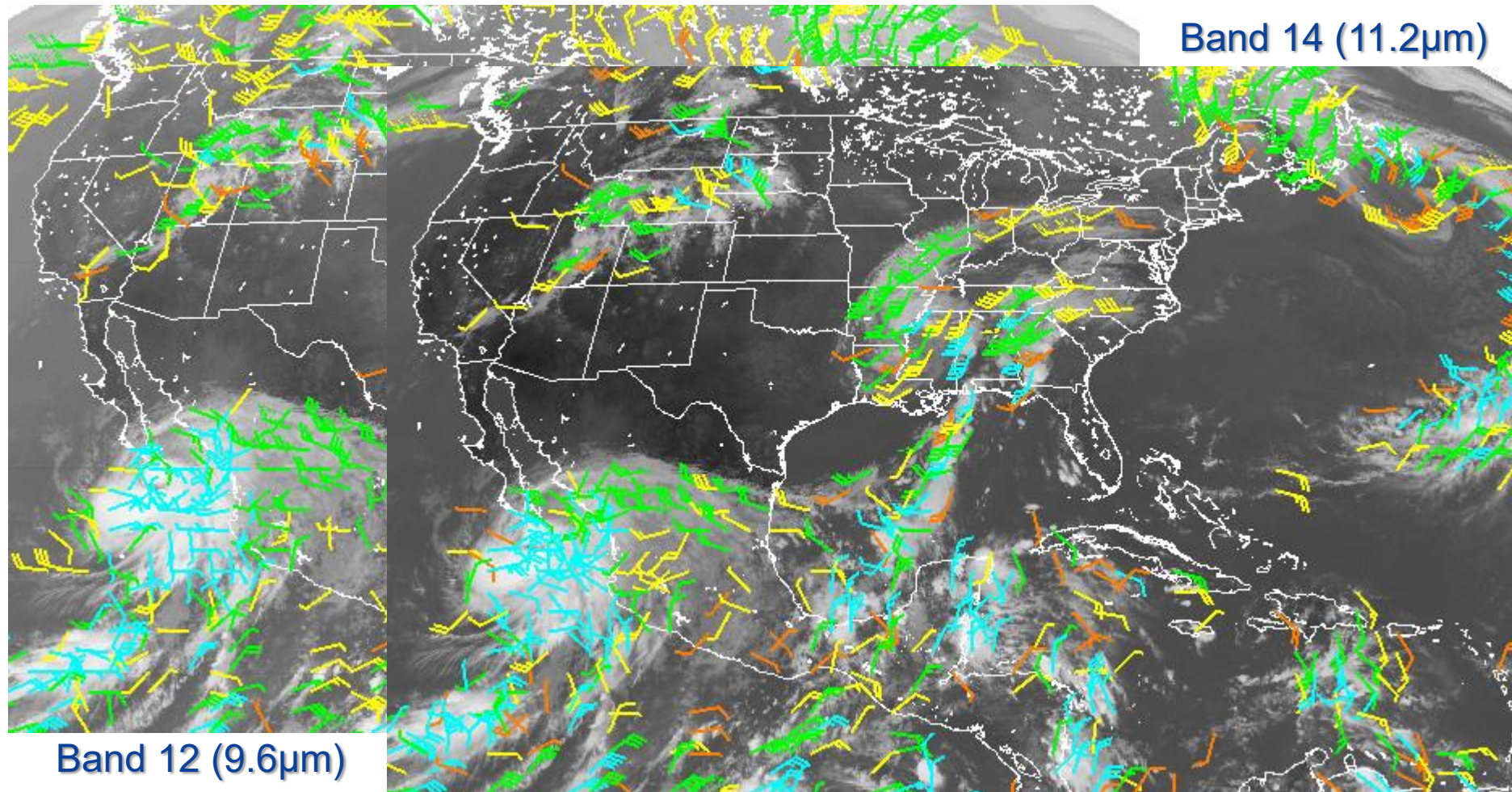
Small particle ice clouds appear more orange, whereas large particle clouds will be more red. Snow should appear red and fog/low clouds white, but neither are present in this image.

Three Water Vapor bands, including 8 ($6.2\mu\text{m}$), 9 ($6.9\mu\text{m}$), and 10 ($7.3\mu\text{m}$), provide multiple layers of atmospheric readings for motion vector analysis.



Orange vectors are between 800 and 500mb, yellow are between 500 and 350mb, green vectors are 350-250mb, and light blue 250-150mb.

Infrared channels provide more information at the upper levels (especially cloud tops), and near IR can be used for lower levels.



Orange vectors are between 600 and 500mb, yellow are between 500 and 350mb, green vectors are 350-250mb, and light blue 250-150mb.

