

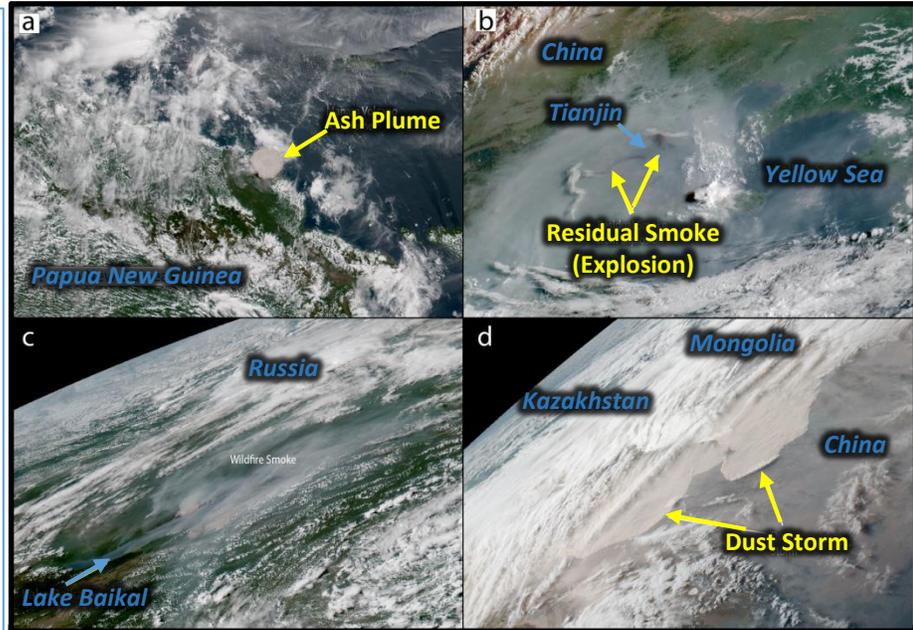


True Color RGB Quick Guide



What is True Color Imagery and Why is it Important?

True Color imagery was designed to display the Earth in colors similar to what we might see with our own eyes. The product is primarily a combination of the three channels that are sensitive to the red, green, and blue visible light, but some information from the near-infrared is included improve the color of green vegetated regions. A Rayleigh atmospheric 'correction' is applied to each band to improve product clarity. True Color imagery facilitates rapid delineation of surface types (desert, vegetation, snow cover) and atmospheric features (e.g., clouds, smoke, dust, smog, haze, and volcanic ash).



True Color RGB from Himawari-8 AHI (courtesy CIARA) showing (a) volcanic ash, (b) pollution, (c) biomass smoke, and (d) lofted dust.

True Color Imagery Components

Color	Band / Band Diff. (µm)	Physically Relates to...	Small contribution to pixel indicates ...	Large contribution to pixel indicates ...
Red	0.64	Red, green, and blue light as typically seen by the human eye	Low reflectance for the given band	High reflectance for the given band
Green	0.51 (derived from 0.87 for ABI)			
Blue	0.47			

Benefits to Operations

Primary Applications:

Surface/Atmospheric features:

Identify vegetation, algal blooms, snow/ice, and aerosols (dust, smoke, haze, sand, ash).



Surface types are true color: identify blue water bodies, green forests, yellow/tan deserts, etc.

Aerosols appear darker/diffuse: Haze/smog is usually spread over a wide region and more transparent. Smoke is darker gray than haze/smog. Dust and volcanic ash may appear brownish.

Secondary Applications:

Clouds: High reflection of solar radiation off clouds is sensed in visible channels. Clouds are white because all 3 channels have a large contribution to the RGB.

Limitations

Daytime only: true color relies on solar reflectance from the visible channels, and thus is not available at night.



Difficult to distinguish snow and clouds:

Both snow and clouds appear bright white. Snow can sometimes be distinguished by its spatial relationship to rivers, mountains, and valleys. Animating the imagery will also help differentiate stationary snow cover from drifting clouds.

Sunglint complicates water scenes:

Where water surfaces reflect sunlight toward the satellite, complex patterns of brightness/darkness can appear based on surface roughness.



True Color RGB

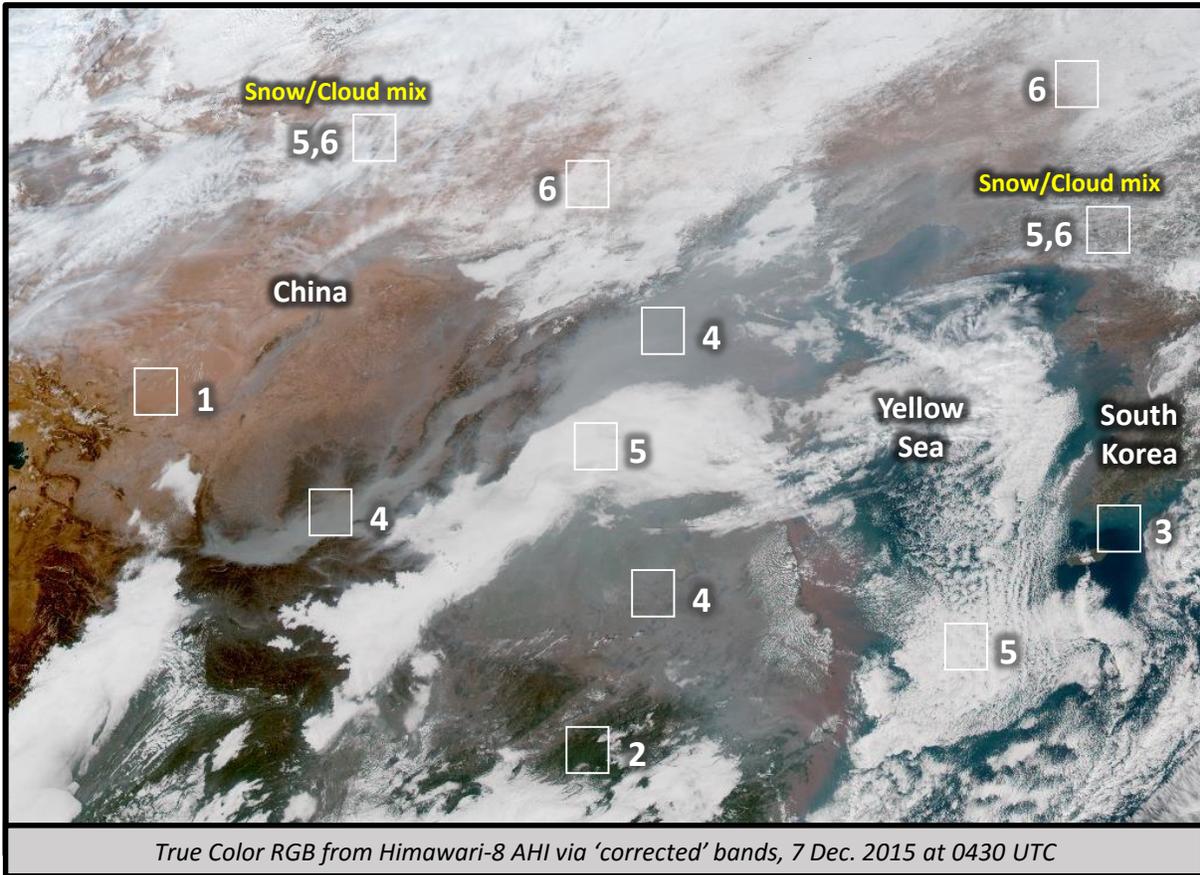
Quick Guide



RGB Interpretation

- 1** Bare land
(varying shades of brown)
- 2** Vegetation
(varying shades of green)
- 3** Ocean
(varying shades of dark blue and teal)
- 4** Smog/haze
(dull gray)
- 5** Clouds
(bright white)
- 6** Snow
(bright white)

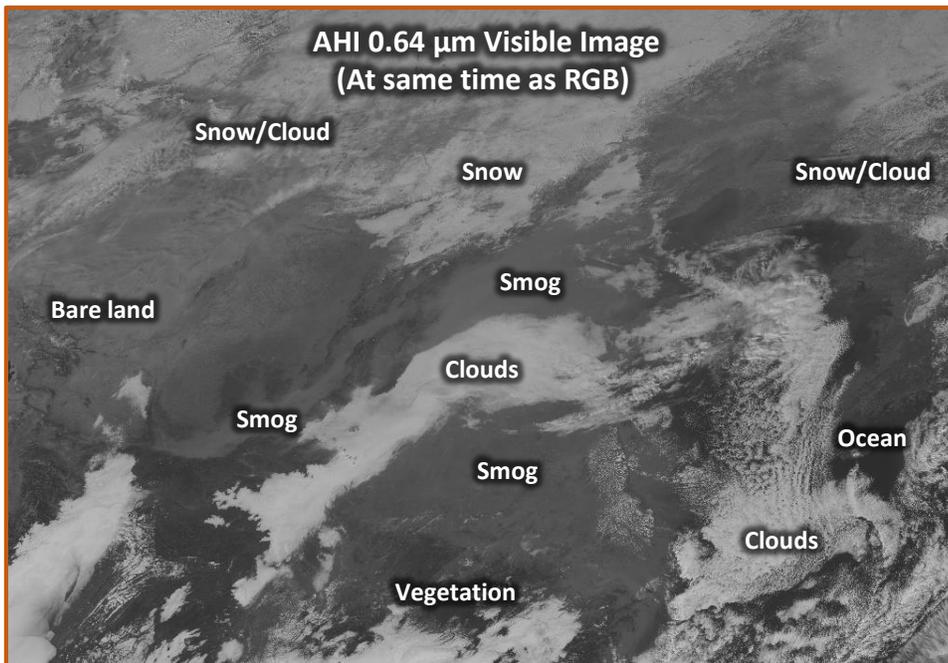
Note: colors may vary diurnally, seasonally, and with latitude.



True Color RGB from Himawari-8 AHI via 'corrected' bands, 7 Dec. 2015 at 0430 UTC

References:

Steven D. Miller, Christopher C. Schmidt, Timothy J. Schmit & Donald W. Hillger (2012): [A case for natural colour imagery from geostationary satellites, and an approximation for the GOES-R ABI](#), International Journal of Remote Sensing, 33:13, 3999-4028



Resources

UCAR/COMET
[Multispectral Satellite Applications: RGB Products Explained.](#)

NASA/SPoRT
[Training and Applications Library](#)

EUMETrain
[RGB Interpretation Guide](#)

Comparison to Traditional Imagery: Compared to traditional single channel visible imagery (0.64 μm), True Color provides more contrast between smog, clouds, and the land surfaces, but it is still difficult to distinguish clouds from snow.