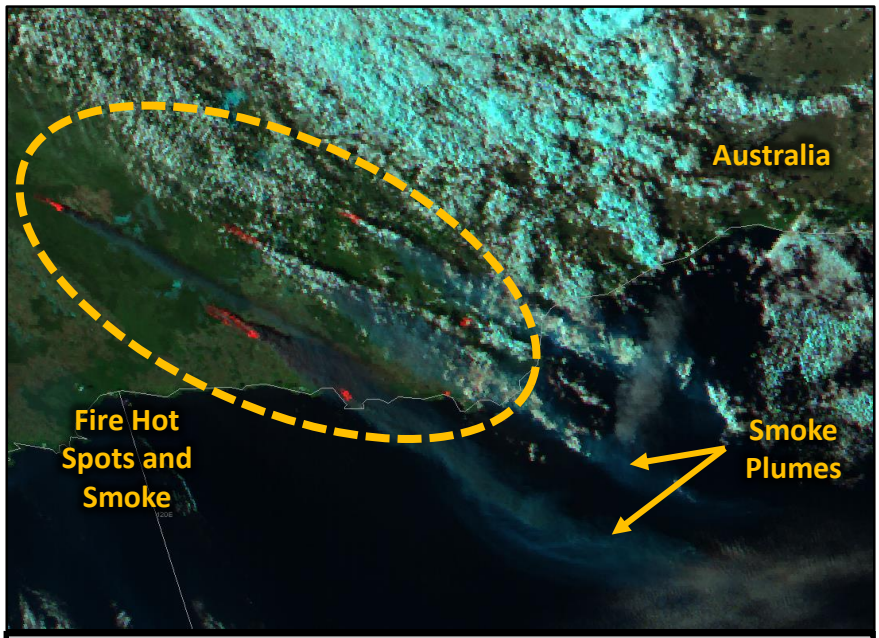
Natural Color/Fires RGB

Quick Guide

Why is the Natural Color/Fires RGB imagery important?

The Natural Color/Fire RGB is similar to the original Natural Color RGB by EUMETSAT except the 1.6 µm band used in the red component is replaced with the 2.3 µm band. This change highlights the fire hotspots with a red pixel color, but also changes the interpretation of the water vs. ice clouds. For the 2.3 µm band, water clouds are less reflective than the 1.6 µm band, resulting in both water and ice clouds having cyan coloring, except for very small cloud particles. Thus, the change limits the use of the RGB for differentiating water vs ice clouds. Land/Ocean surfaces are in expected colors (but not true color).



Natural Color/Fires RGB at 0730 UTC, 17 November 2015.

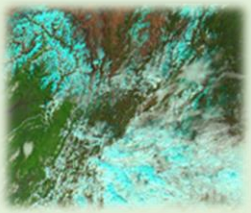
Natural Color/Fires RGB Recipe

Color	Band / Band Diff. (µm)	Physically Relates to…	Small contribution to pixel indicates…	Large contribution to pixel indicates…
Red	2.3	Reflectance	Low reflectance of surface/atmospheric features	**High reflectance of surface/atmospheric features**
Green	0.86			
Blue	0.64			

Impact on Operations

Primary Application

Surface and atmospheric features: fire hotspots, discern high, large particle clouds from low, small particle clouds, snow/ice.



High Ice Clouds, snow, and sea ice are cyan: these features appear cyan because ice strongly absorbs in the near-IR 2.3 µm band, leading to little red contribution.

Low water clouds are gray to dull white: water clouds with small droplets (i.e. fog) have a high reflectance in all three bands.

Surface types are Natural color: identify blue water bodies, green vegetation, and brown deserts.

Limitations

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

Less ice/water contrast than 1.6 um: the 2.3 µm reflectance of medium to large cloud particles is very similar, which results in less contrast of water and ice clouds and provides more overall cyan coloring to the scene. Suggest the use of 1.6 um when primarily interested in cloud phase information.

Distinguishing snow and high ice clouds: Both snow and clouds are bright cyan in the RGB, but geographic features may help identify snow.

Dust appears similar color as bare land

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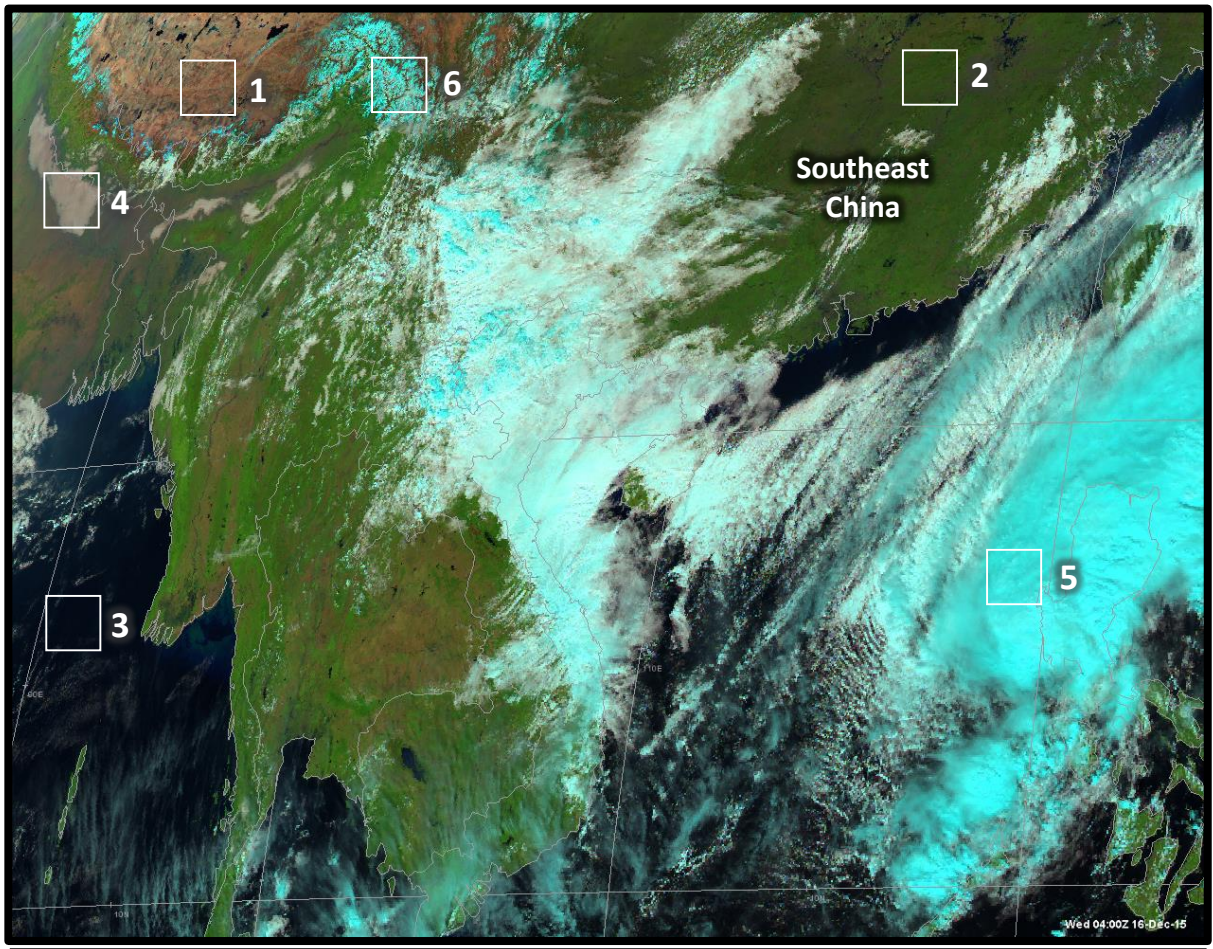
RGB Interpretation

- **1** **Bare land** *(varying shades of brown)*
- **2** **Vegetation** *(varying shades of green)*
- **3** **Water bodies or flooded areas** *(varying shades of dark blue to black)*
- **4** **Low water clouds** *(shades of gray and dull white)*
- **5** **High Ice Clouds** *(bright cyan)*
- **6** **Snow** *(bright cyan)*

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



Natural Color/Fires RGB from Himawari-8 AHI at 0400 UTC, 16 December 2015.

Comparison to other products:
Fire hot spots are detected in traditional single channel near-IR imagery (3.9 µm). Typically 1.6 µm is assigned to the Red Component of the Natural Color RGB. But when 2.3 µm is used for the Red Component, fire hot spots appear red because 2.3 µm has more sensitivity to heat emitted by active fires than 1.6 µm.

Resources

UCAR/COMET: Multispectral Satellite Applications: RGB Products Explained.

NASA/SPoRT: Applications Library

EUMETrain: RGB Interpretation Guide