



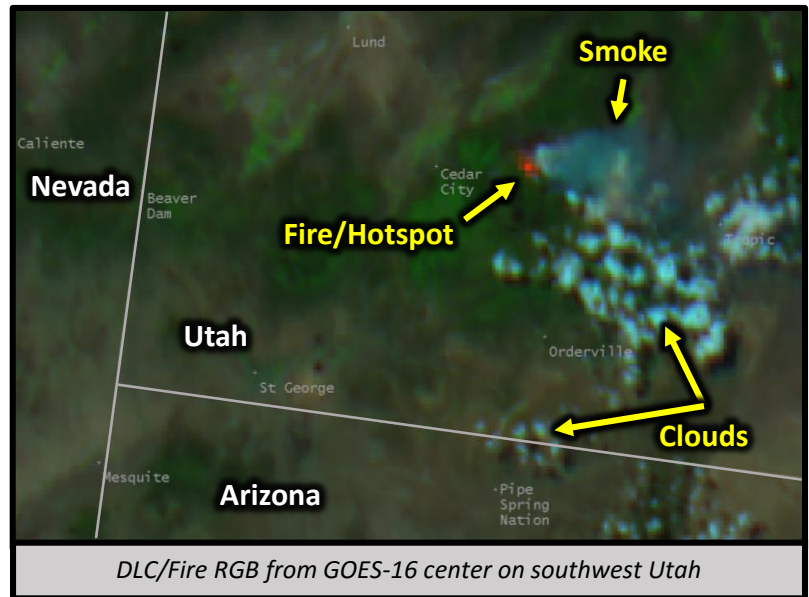
Day Land Cloud Fire RGB

Quick Guide



Why is the Day Land Cloud/Fire RGB Imagery Important?

This 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 2.2 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 2.2 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).



Day Land Cloud/Fire RGB Recipe

Color	Band / Band Diff. (μm)	Min – Max Gamma	Physically Relates to...	Small contribution to pixel indicates...	Large contribution to pixel indicates...
Red	2.2	0 -100 %, 1	Particle size / land type	Large water/ice particles, water or snow	Small water/ice particles, hotspot
Green	0.86	0 -100 %, 1	Reflectance	Thin cloud, water, less green vegetation, bare soil	Thick cloud, highly vegetated, snow, desert
Blue	0.64	0 -100 %, 1	Reflectance	Thin cloud, water, Forest, bare soil	Thick cloud, snow, desert

Impact on Operations

Primary Application

Surface and atmospheric features:

fire hotspots, smoke, burn scars, snow/ice cover



High ice clouds, snow, and sea ice are cyan:

These features appear cyan because ice strongly absorbs in the near-IR 2.2 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.

Natural color surfaces: Identify dark blue to black 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 μm : The 2.2 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 a separate RGB when primarily interested in cloud phase information.

Distinguishing snow and high ice clouds: Both snow and ice 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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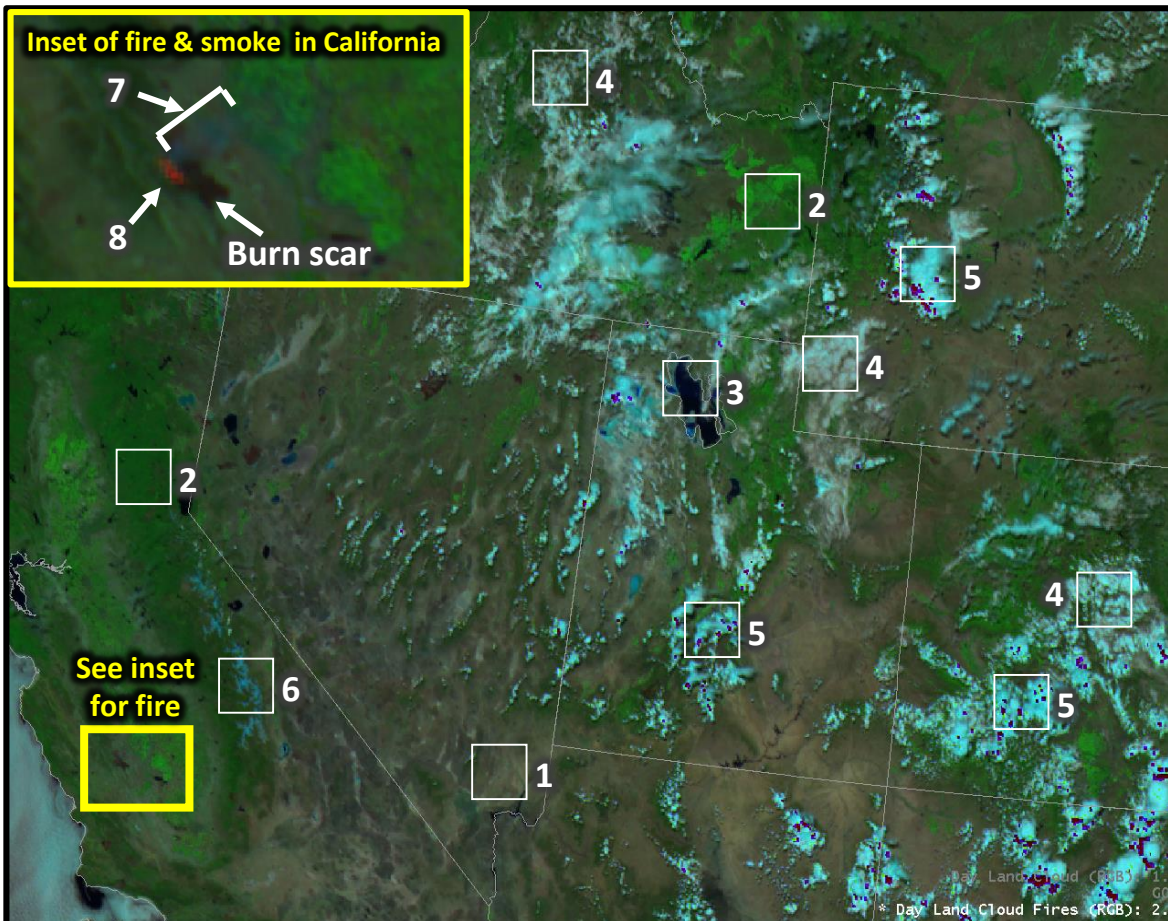
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RGB Interpretation

- 1** Inactive vegetation or bare land (Olive green to browns)
- 2** Vegetation (shades of green)
- 3** Water bodies or flooded areas (dark blue to black)
- 4** Low/Mid clouds (gray shades of cyan)
- 5** High, thick ice clouds (bright cyan)
- 6** Snow (cyan)
- 7** Smoke (dark cyan)
- 8** Hotspot, Fire (red)

Note: colors may vary diurnally, seasonally, and latitudinally

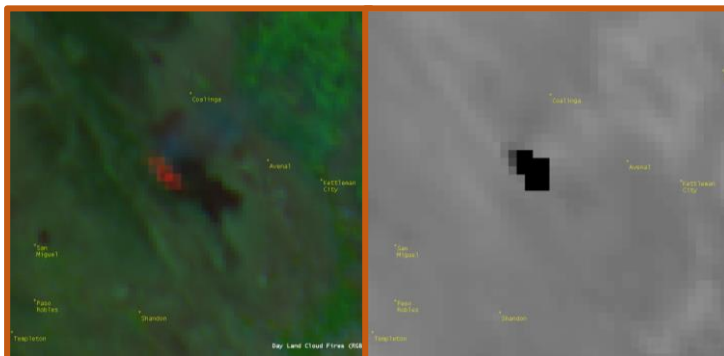
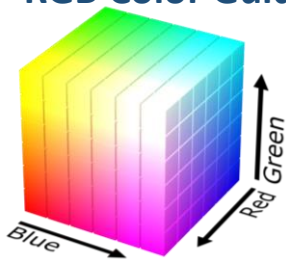


Day Land Cloud Fire RGB from GOES-16 ABI for 1822 UTC on 14 July 2017 centered over the western CONUS. An inset is provided to highlight the fire and smoke event in southern California. Note that the RGB has "noise" within convective clouds where the reflectance is greater than 1, (to be corrected).

Comparison to other products:

Fire hot spots are detected in traditional single channel near-IR imagery (3.9 μm). The use of the 2.2 μm in the Day Land Cloud Fire RGB allows one to see where the fire is more intense as well as the "hot" areas seen in the 3.9 μm . In addition, the vegetation/land change in the RGB will show the burn scar now and in the future.

RGB Color Guide



Resources

UCAR/COMET

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

NASA/SPoRT
[Applications Library](#)

EUMETrain
[RGB Interpretation Guide](#)

Hyperlinks not available when viewing material in AIR Tool