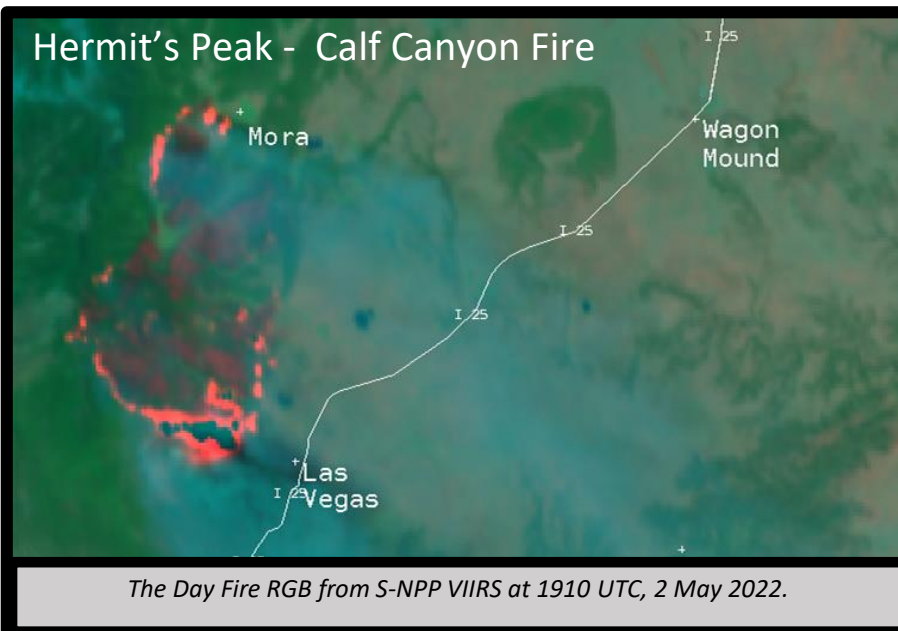


### Why is the Day Fire RGB Important?

This RGB combines three channels useful for fire monitoring. The 0.64  $\mu\text{m}$  channel provides sensitivity to smoke, the 0.86  $\mu\text{m}$  channel provides sensitivity to vegetation health and burn scars, and the 3.7  $\mu\text{m}$  channel is sensitive to the hot spots from fires. VIIRS channels are available at 375 m resolution, making it useful for detecting small fires.

**Also known as:** Day Land Cloud Fire RGB, Natural Fire Color RGB.

### Hermit's Peak - Calf Canyon Fire



The Day Fire RGB from S-NPP VIIRS at 1910 UTC, 2 May 2022.

### Day Fire RGB Recipe

Color	Band ( $\mu\text{m}$ )	Min-Max Gamma	Physically Relates to...	Small contribution to pixel indicates...	Large Contribution to pixel indicates...
Red	3.7	0 to 60 °C 0.4	Temperature, clouds	Cold land surfaces, ice/snow, clouds	Warm land surfaces, hot spots
Green	0.86	0 to 100% 1	Vegetation, land vs. water	Water, bare or rocky ground, burn scar	Healthy vegetation, snow/ice, clouds
Blue	0.64	0 to 100% 1	Smoke and clouds	Water, dark ground, burn scar	Smoke, snow/ice, clouds

### Impact on Operations

#### Primary Application

**Detect Fires:** the 375 m-resolution 3.7  $\mu\text{m}$  channel on VIIRS is the best channel for detecting small fires.



**Monitor Vegetation:** the 0.86  $\mu\text{m}$  channel has high sensitivity to vegetation health. Healthy vegetation will appear vivid green, while dried out grasses will appear more brown. Burn scars will appear reddish brown in a recent fire and dark brown in an old fire.

**Daytime Smoke:** the 0.64  $\mu\text{m}$  channel provides sensitivity to smoke during the day, which will appear blue.

### Limitations

#### Thick Clouds Inhibit Fire

**Detection:** fires are visible in clear sky areas and can be sensed through thin clouds and smoke.



**Warm Backgrounds:** deserts and land surfaces may be warm enough at 3.7  $\mu\text{m}$  to appear red, similar to small fires.

**VIIRS Saturation and Fold-over:** the 3.7  $\mu\text{m}$  channel on VIIRS saturates at  $\sim 95$  °C. Very intense fires ( $\sim 227$  °C +) can cause "fold-over" which digitally results in a very cold temperature. This causes some pixels in fires to appear blue or cyan instead of red.

### RGB Interpretation

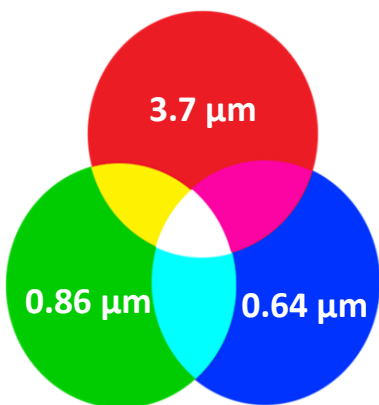
- 1 Fire/hot spot (red)
- 2 New Burn Scar (reddish brown)
- 3 Smoke (blue)
- 4 Clouds (cyan)
- 5 Healthy Vegetation (shades of green)
- 6 Bare Ground/Old Burn Scar/Urban Area (brown)
- 7 Water/Non-fire Areas at Night (nearly black)

*Note: colors may vary diurnally and seasonally*



The Day Fire RGB from S-NPP VIIRS at 2137 UTC, 9 October 2017.

### RGB Color Guide



### Comparison to the Day Land Cloud RGB:

Unlike the Day Land Cloud RGB, left, the Day Fire RGB, right, does not differentiate ice clouds and snow from low clouds. But, it is much more sensitive to hot spots from fires as seen at 2327Z on 6 June 2017.



### Resources

CIRA RAMMB

[SNPP - VIIRS Imagery and Visualization Team Blog](#)

CIRA JPSS SLIDER

[Near-real-time imagery: VIIRS Day Fire RGB](#)

Hyperlinks not available when viewing material in AIR Tool