Why is the Day Fire RGB Important?
This RGB combines three channels useful for fire monitoring. The 0.64 μm channel provides sensitivity to smoke, the 0.86 μm channel provides sensitivity to vegetation health and burn scars, and the 3.7 μm 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.

<table>
<thead>
<tr>
<th>Color</th>
<th>Band (µm)</th>
<th>Min-Max Gamma</th>
<th>Physically Relates to...</th>
<th>Small contribution to pixel indicates...</th>
<th>Large Contribution to pixel indicates...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>3.7</td>
<td>0 to 60 °C</td>
<td>Temperature, clouds</td>
<td>Cold land surfaces, ice/snow, clouds</td>
<td>Warm land surfaces, hot spots</td>
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<tr>
<td></td>
<td></td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>0.86</td>
<td>0 to 100%</td>
<td>Vegetation, land vs. water</td>
<td>Water, bare or rocky ground, burn scar</td>
<td>Healthy vegetation, snow/ice, clouds</td>
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<tr>
<td>Blue</td>
<td>0.64</td>
<td>0 to 100%</td>
<td>Smoke and clouds</td>
<td>Water, dark ground, burn scar</td>
<td>Smoke, snow/ice, clouds</td>
</tr>
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<td></td>
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<td>1</td>
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</table>

Primary Application
Detect Fires: the 375 m-resolution 3.7 µm channel on VIIRS is the best channel for detecting small fires.

Monitor Vegetation: the 0.86 µm 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 µm 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 µm to appear red, similar to small fires.

VIIRS Saturation and Fold-over: the 3.7 µm channel on VIIRS saturates at ~95 °C. Very intense fires (~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.
VIIRS Day Fire RGB
Quick Guide

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

RGB Color Guide

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

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