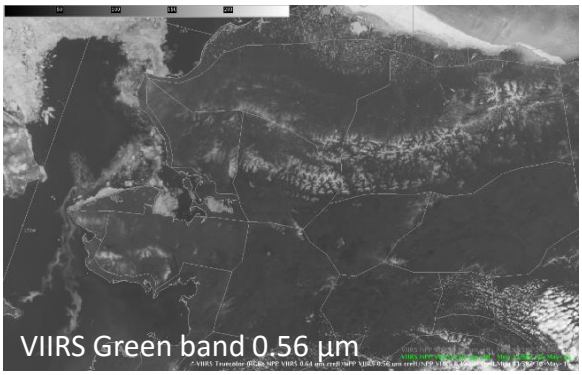
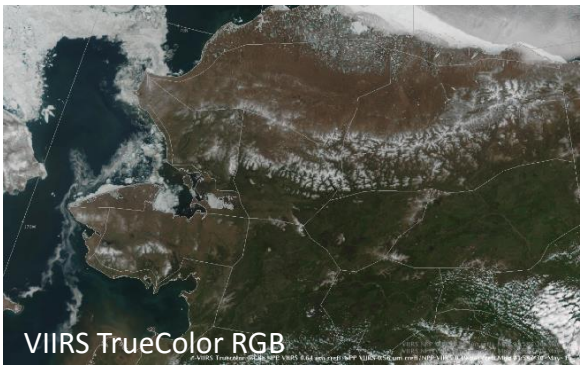
Alaskan Satellite Band Quick Guides

The 0.56µm "Green Visible" Band

Overview

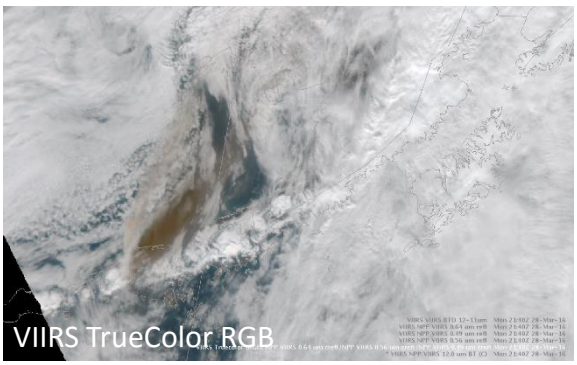
The 0.56 µm, or "green" band, is one of the visible light channels on the VIIRS Imager. This band is useful for daytime observations related to land features, clouds, and aerosols. Measurements in the green band can be used for air pollution studies, atmospheric aerosol products, and solar insolation estimates. This band is also helpful for identifying ocean characteristics such as sediment, phytoplankton communities, and coastal sea floor depths. This green band, combined with the "blue" (0.49 µm) and "red" (0.64 µm) is essential for a "TrueColor" RGB composite, which is similar to what a human eye would see from space.





It's not easy being green

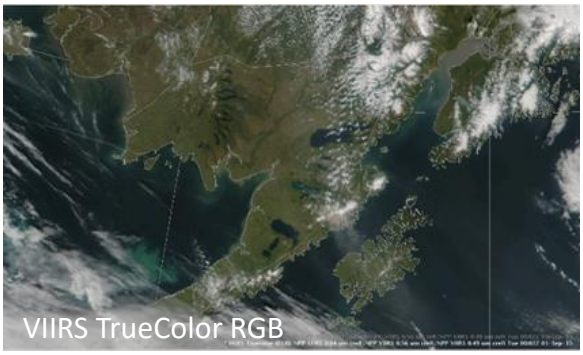
Not all plants reflect strongly in the green band. In the 0.56 µm image (above left), there is not an obvious difference in the reflected energy north or south of the Brooks Range, yet the TrueColor RGB image (above right) shows more green in the forested areas to the south. The difference is due more to greater contribution of red in the grasslands or tundra north of the range than to green wavelength differences. In the green band, conifer forests are typically dark, agricultural land is often brighter than natural vegetation, but the amount of green emissions varies with the season. Spring vegetation tends to be less green than dense summer vegetation.



This TrueColor RGB image (left) shows a brown ash cloud from Pavlof Volcano (28 Mar 2016). The green visible band has less scattering from fine aerosols than the blue band, but larger particles, such as ash and dust, scatter energy more effectively at larger visible wavelengths. This increases the contribution of green, and even red colors, which combine to make the brown color in this TrueColor RGB.

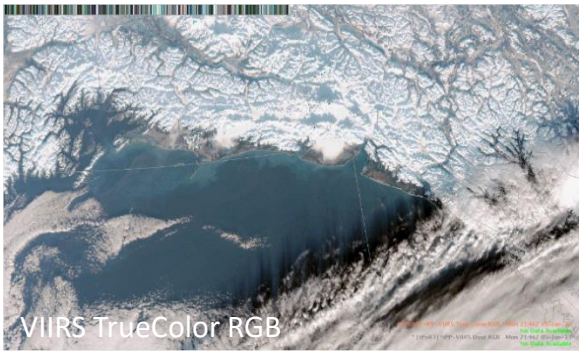
Ash, Dust, or Wildfire Smoke?

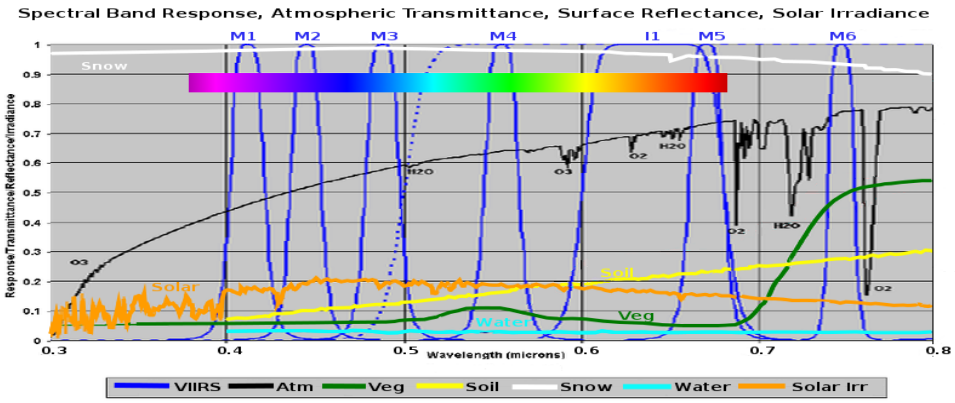
Re-suspended ash originating from the 1912 Katmai eruption is visible in the Truecolor RGB (right) blowing off the Alaska Peninsula. Finer smoke particles would scatter less at green wavelengths and have a bluish tint. So the brown coloring in this example illustrates how comparisons of visible wavelengths provide information about the characteristics of atmospheric pollution.



Are you seeing green?

Water selectively scatters and absorbs wavelengths of visible light. Shorter wavelengths reflect from greater depths while higher wavelengths scatter more from shallow coastal areas with suspended matter. This causes deep oceans to appear blue and near shore waters more green or brown. In the image at right, notice the ocean color variation between Yakutat Bay and Prince William Sound.





Satellite(s)	Instrument	Band Name	Wavelength	Resolution at NADIR
Suomi NPP	VIIRS	M4	0.56µm	750m
Terra and Aqua	MODIS	4	0.56µm	500m
Himawari	AHI	2	0.51µm	500m

This table shows a comparison between VIIRS and MODIS for the “Green” visible band.

Additional References

- Quick guides to channels on the GOES-R Advanced Baseline Imager (ABI). http://www.goes-r.gov/education/ABI-bands-quick-info.html
- For more information contact Eric Stevens eric@gina.alaska.edu or Carl Dierking cfdierking@alaska.edu

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