

RGB Dust Quick Guide by NASA / SPoRT

Why is the Dust RGB imagery important?

Dust can be hard to see in visible and IR imagery because it is optically thin, or because it appears similar to other cloud types such as cirrus. The RGB product is able to contrast airborne dust from clouds using channel differencing and the IR thermal channel. The resulting combination of colors results in a pink/magenta color in the imagery for dust.

RGB Dust Product - What is used in the combine and what does each color represent?

Color	Band / Band Diff.	Physically Relates to....	Little contribution to composite indicates.....	Large contribution to composite indicates
Red	12.0 – 10.8	Optical thickness	Thin clouds. Difference is negative. Less of the 12um channel passes through the clouds (colder brightness temperature) than the 10.8um channel	Thick clouds or dust. Difference is positive. More of the 12um channel passes through the clouds (Warmer brightness temperature) than the 10.8um channel
Green	10.8 – 8.7	Particle phase (ice vs water) or composition	Ice particles or particles of similar characteristics have small difference	High clouds over desert regions – emission from surface overwhelms the relationship
Blue	10.8	Temperature of surface	Cold surface	Warm surface

What should I be looking for in the imagery?

The primary feature to look for in the imagery during the day are bright areas of magenta or pink (i.e. large amounts of red and blue) indicating airborne dust.

Dust (Day time)

When is the imagery available?

The Dust RGB imagery can be used both day and night because it includes only IR channels. For MODIS there can be up to 4 passes per day. NPP/VIIRS channels will also be used to create the Dust RGB imagery.

What are the things to watch out for?

Dust obscured from view: High level clouds may obscure dust plumes closer to the surface

Dust or low clouds?: Low-level clouds over oceans in a warm atmosphere are light purple during the day and can look similar to areas of dust.

Height of dust: The height of the dust is difficult to infer from daytime imagery as the color does not vary much from magenta; however, variations of color at night can provide some information about the height level. Near-surface visibility could be okay if the plume is aloft.

Color	Physical Meaning	Red	Green	Blue
	Dust at 400mb at night	255	79	150
	Dust at 700mb at night	160	80	210
	Dust at 900mb at night	136	80	239

High, thin clouds can be black or green: Thin, high clouds such as cirrus or those induced on the lee side of a mountain range will appear black (no color contributions). At times these clouds do not easily show up on Natural or True color RGB imagery. Note that the 10.7um channel's larger emissivity over deserts than the 8.7um channel, results in high cirrus clouds as green.

