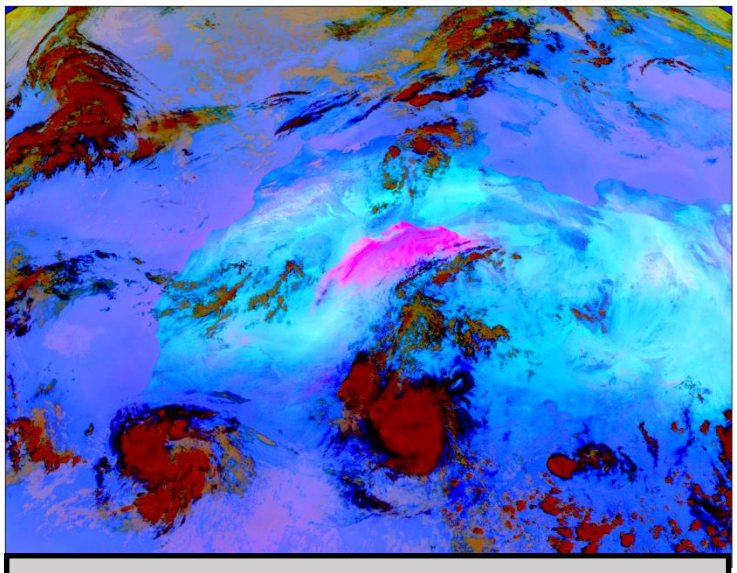
Dust RGB

Quick Guide

Why is the Dust RGB imagery important?

Dust can be hard to see in VIS 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 band differencing and the IR thermal channel. The IR band differencing allows dust storms to be observed during both daytime and at night. Dust appears pink/magenta during the day and can vary in color at night depending on height. Dust is also distinguishable in the RGB from land surfaces like deserts as well as oceans, given sufficient thickness/density. For cloudy regions this RGB also allows users to infer relative height of the observed cloud top surfaces as well as cloud phase and thicknesses.



Dust RGB from SEVIRI ABI on 3 September 2015 at 1245 UTC.

Dust RGB Recipe (MSG/SEVIRI)

Color	Band / Band Diff. (µm)	Physically Relates to…	Small contribution to pixel indicates…	Large contribution to pixel indicates…
Red	12.0-10.8	Optical depth as proxy to cloud thickness	Thin clouds	Thick clouds or dust
Green	10.8-8.7	Particle phase	Ice and particles of uniform shape (dust)	Water particles or thin cirrus over deserts
Blue	10.8	Surface temperature	Cold surface	Warm surface

Impact on Operations

Primary Application

Identifying dust: Dust plumes are easily distinguished from surrounding clouds, both day and night.

Height of dust (night only): At night, the resulting dust color changes with height. Low-level dust plumes have a purple/plum color and changes to ink/magenta with height.

Secondary Applications:

Cloud height/type analysis, inferring airmass/moisture boundaries (low vs high humidity), volcanic ash (orange/peach)

Limitations

High clouds obscure dust: High cloud cover can obscure dust plumes beneath them and make spatial analysis of the dust more difficult.

Dust thickness typically unknown: Magenta/pink variations in daytime are not indicators of thickness, but rather density. However, very thick dust plumes are purple in both day and night scenes.

Low clouds look like dust over oceans: Marine stratus over the ocean in the tropics appear light purple and can look similar in color to dust, particularly at night.

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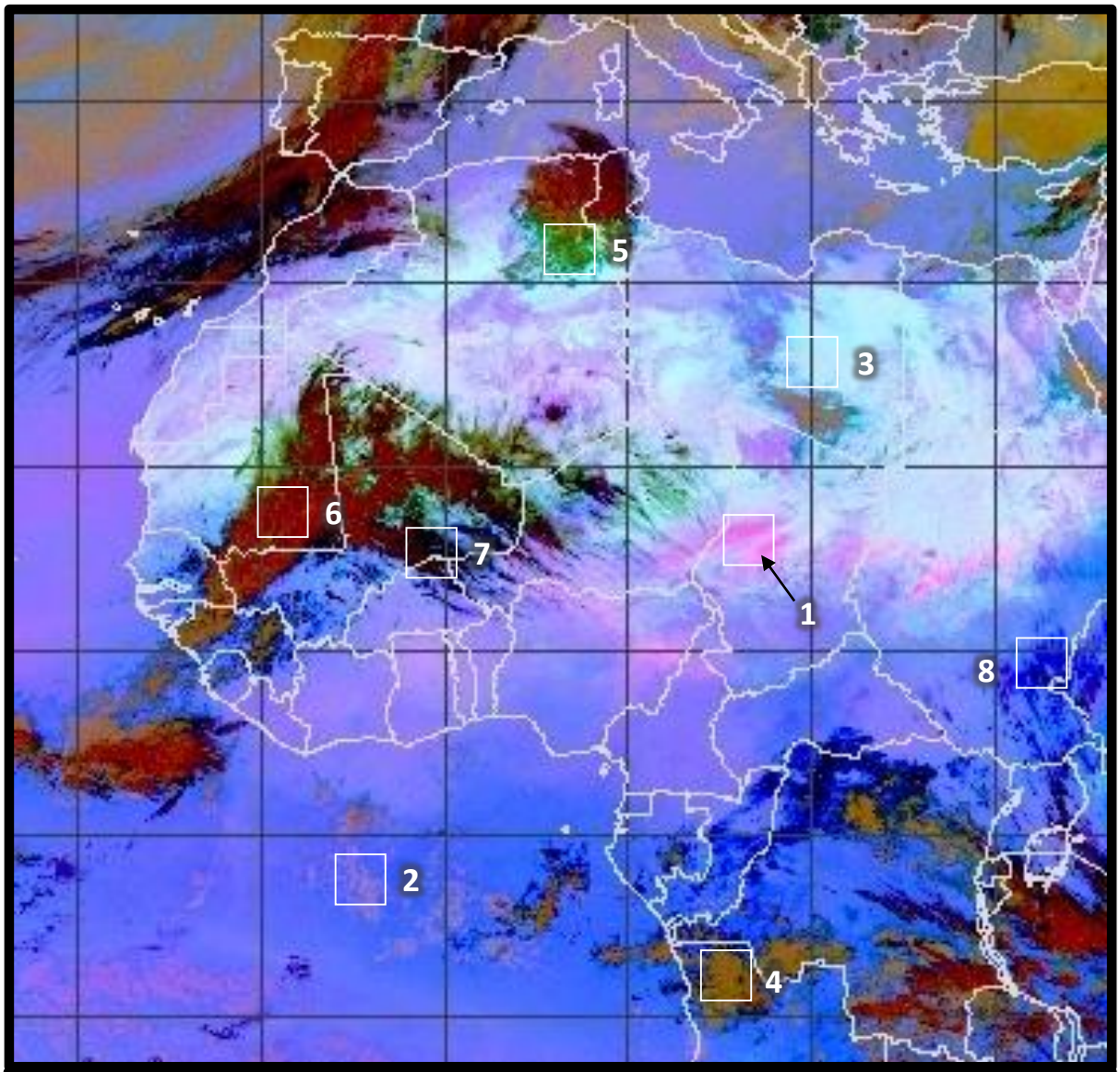
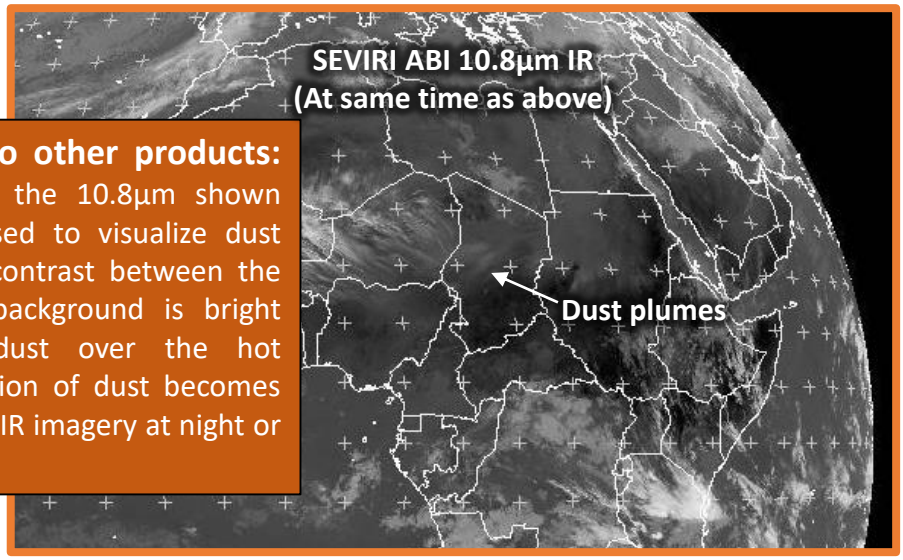
RGB Interpretation

1	**Dust plume** *(magenta, pink)*
2	**Low, warm water cloud, or thick dust** *(light purple)*
3	**Desert surface (day)** *(light blue)*
4	**Mid, thick clouds** *(tan shades)*
5	**Mid, thin cloud** *(green)*
6	**Cold, thick clouds** *(red)*
7	**High, thin ice clouds** *(black)*
8	**Very thin cloud (Over warm surface)** *(blue)*



Dust RGB from SEVIRI ABI at 1015 UTC, 28 January 2016.



Comparison to other products: IR imagery like the 10.8µm shown here can be used to visualize dust plumes, if the contrast between the dust and the background is bright enough (like dust over the hot desert). Detection of dust becomes more difficult in IR imagery at night or over oceans.

Resources

UCAR/COMET
Multispectral Satellite Applications: RGB Products Explained.

NASA/SPoRT
Aviation Forecasting RGB Products

EUMETrain
RGB Interpretation Guide