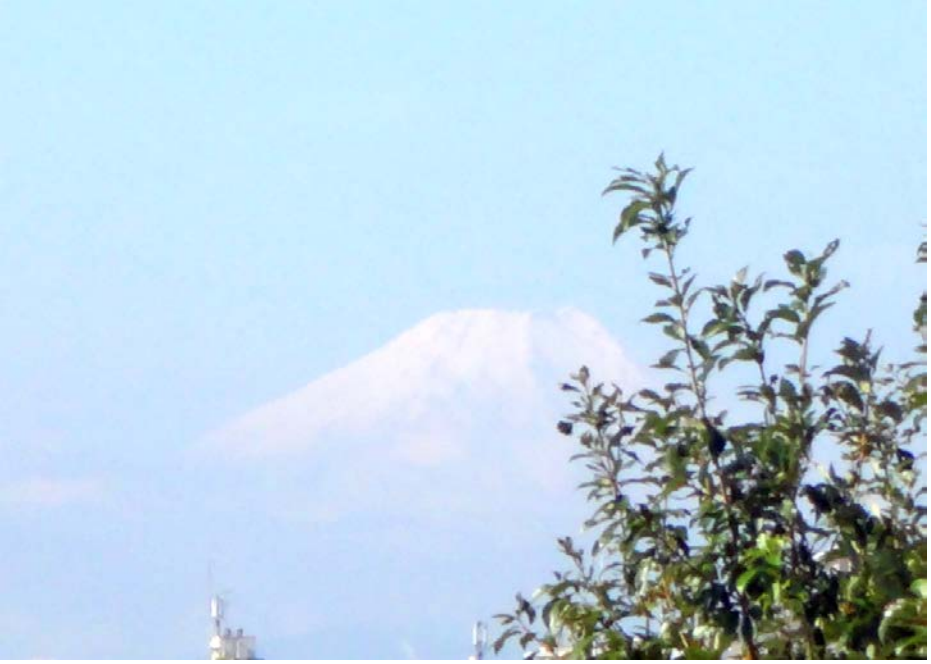
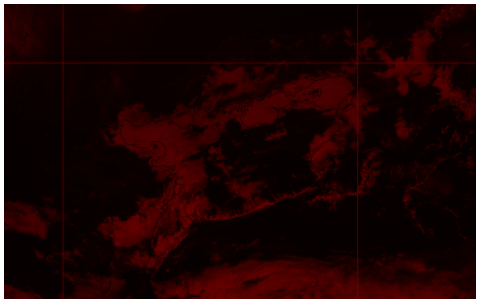


Himawari-8
True Color RGB

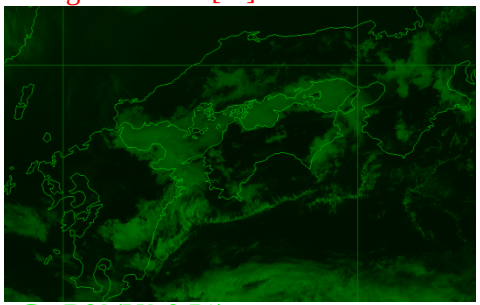
Meteorological Satellite Center, JMA

Ver. 20150519

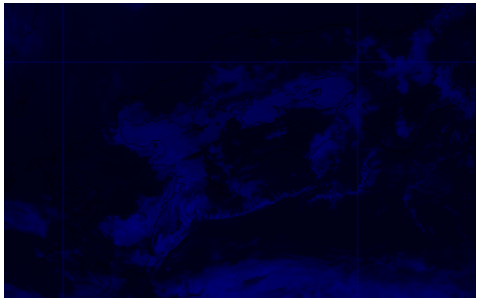
What's True Color RGB?



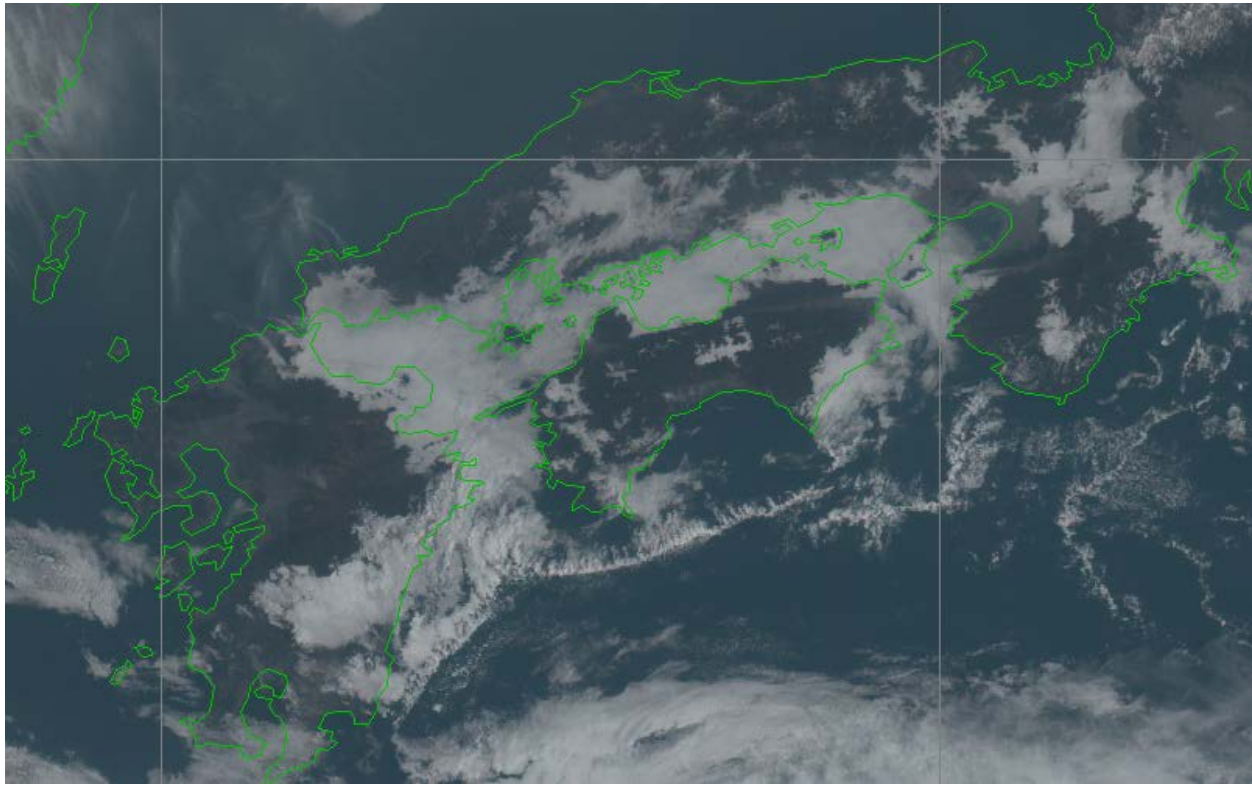
R : B03(VS 0.64)
Range : 0～100 [%] Gamma : 1.0



G : B02(V2 0.51)
Range : 0～100 [%] Gamma : 1.0



B : B01(V1 0.46)
Range : 0～100 [%] Gamma : 1.0



2015-03-17 00UTC

Components of “True Color” RGB

Channel	Himawari-8/ -9	MTSAT-1R/-2	MSG	Physical Properties	
1	0.46 μm			vegetation, aerosol **B**	Visible
2	0.51 μm			vegetation, aerosol **G**	
3	0.64 μm	0.68 μm	0.635 μm	**low cloud, fog** **R**	
4	0.86 μm		0.81 μm	**vegetation, aerosol**	Near Infrared
5	1.6 μm		1.64 μm	**cloud phase**	
6	2.3 μm			particle size	
7	3.9 μm	3.7 μm	3.92 μm	low cloud, fog, forest fire	Infrared
8	6.2 μm	6.8 μm	6.25 μm	mid- and upper level moisture	
9	7.0 μm			mid- level moisture	
10	7.3 μm		7.35 μm	mid- and upper level moisture	
11	8.6 μm		8.70 μm	cloud phase, SO2	
12	9.6 μm		9.66 μm	ozone content	
13	10.4 μm	10.8 μm	10.8 μm	cloud imagery, information of cloud top	
14	11.2 μm			cloud imagery, sea surface temperature	
15	12.3 μm	12.0 μm	12.0 μm	cloud imagery, sea surface temperature	
16	13.3 μm		13.4 μm	cloud top height	

This scheme is displayed by compositing three visible images, B03(VS 0.64) as red, B02(V2 0.51) as green and B01(V1 0.46) as blue color component.

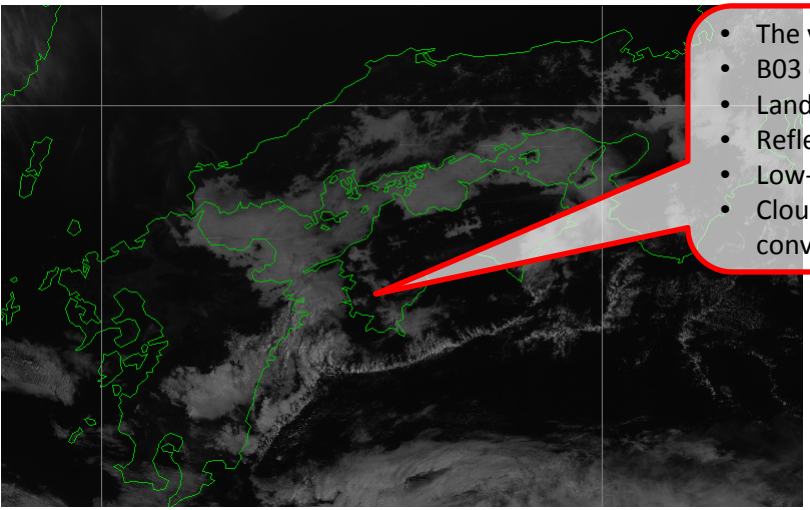
This scheme is available to display "true colored" image that is nearly visible with the naked eye.

Cloud area and snow/ ice covered area, aerosol, land surface can be observed by this RGB.

A set of RGB “True Color” scheme (RGB:B03/B02/B01)

R : B03(VS 0.64)
Range : 0～100 [%] Gamma : 1.0
G : B02(V2 0.51)
Range : 0～100 [%] Gamma : 1.0
B : B01(V1 0.46)
Range : 0～100 [%] Gamma : 1.0

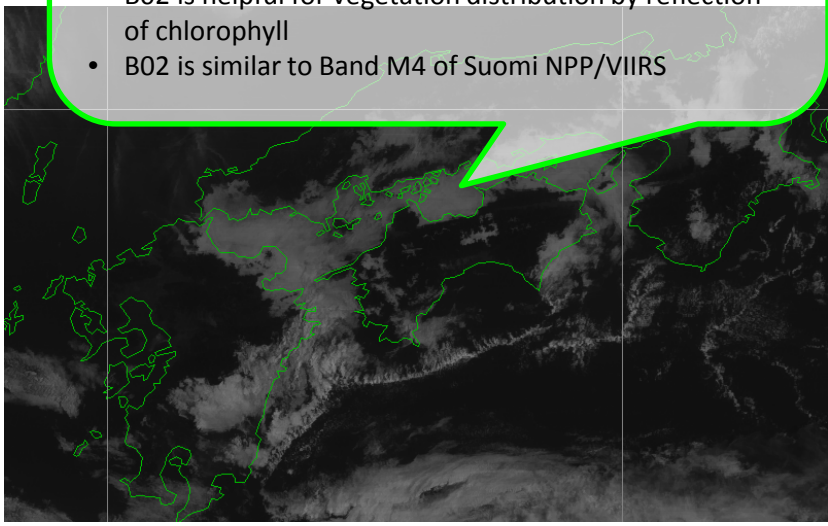
Characteristics and Basis of Three Components



- The visible imagery have, in general, high reflectivity for snow/ice covered area and clouds
- B03 corresponds to the wave length sensed as red light by human's naked eye
- Land surface looks relatively darker, sea surface looks darkest
- Reflection by clouds depends on optical thickness and density of cloud particles
- Low-level clouds and land/sea surface can be seen through thin high clouds
- Clouds can be distinguished by their "texture", i.e. strati form clouds of smooth texture or convective clouds of rough texture.

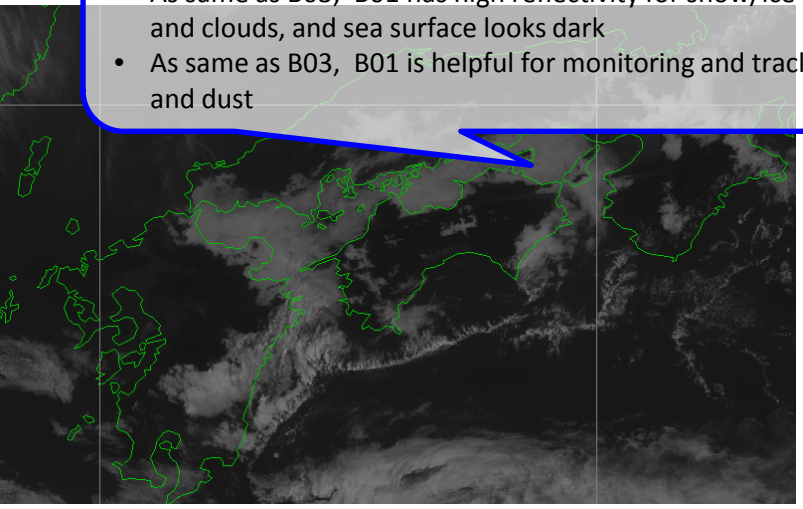
R : B03(VS 0.64) Range : 0～100 [%] Gamma : 1.0

- B02 corresponds to the wave length sensed as green light by human's naked eye
- As same as B03, B02 has high reflectivity for snow/ice covered area and clouds, and sea surface looks dark
- As same as B03, B02 is helpful for monitoring and tracking aerosol and dust
- B02 is helpful for vegetation distribution by reflection of chlorophyll
- B02 is similar to Band M4 of Suomi NPP/VIIRS



G : B02(V2 0.51) Range : 0～100 [%] Gamma : 1.0

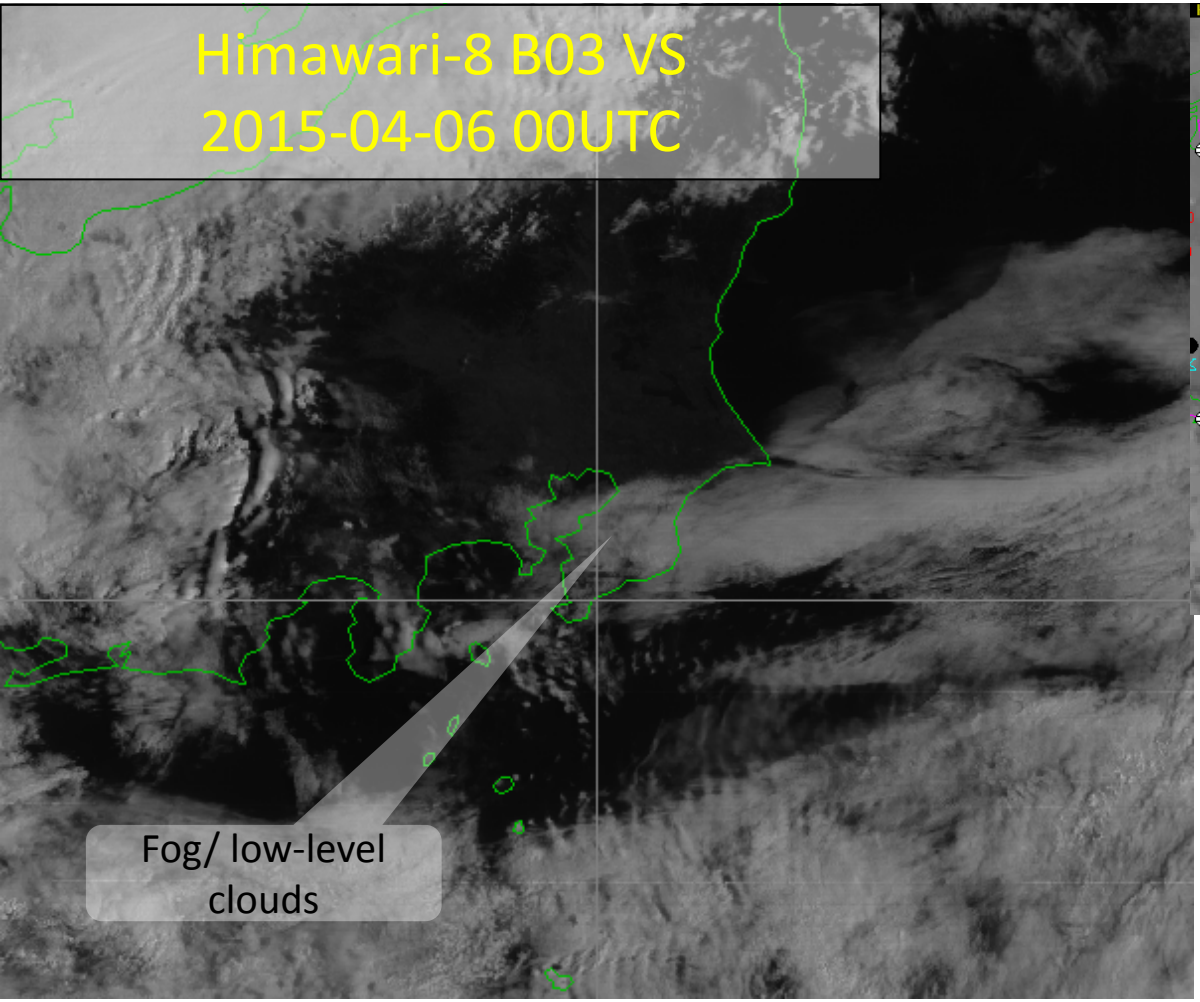
- B01 corresponds to the wave length sensed as blue light by human's naked eye
- As same as B03, B01 has high reflectivity for snow/ice covered area and clouds, and sea surface looks dark
- As same as B03, B01 is helpful for monitoring and tracking aerosol and dust

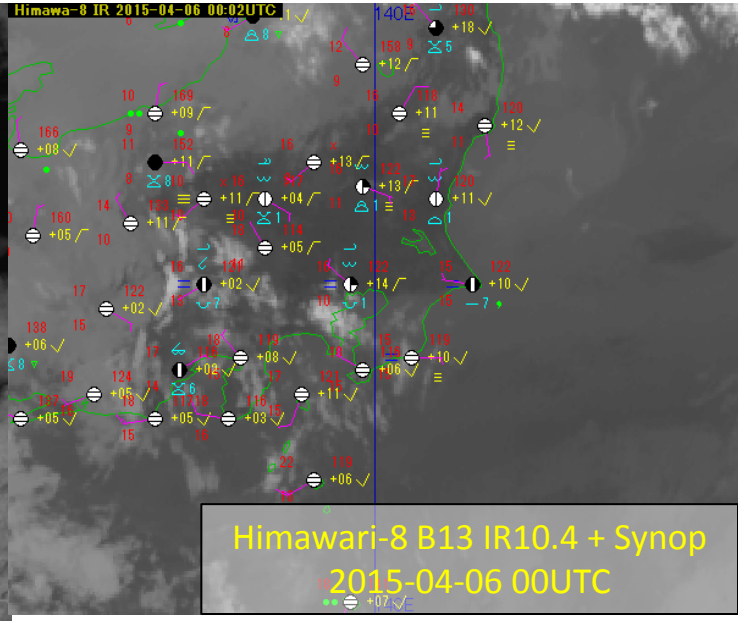


B : B01(V1 0.46) Range : 0～100 [%] Gamma : 1.0

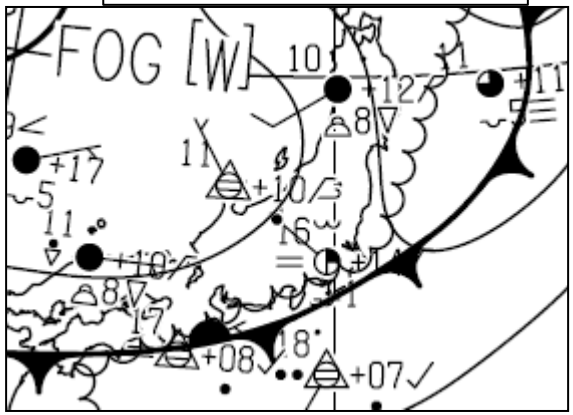
Example of True Color RGB

Fog/ low-clouds after the rainfall in Kanto Plain, Japan





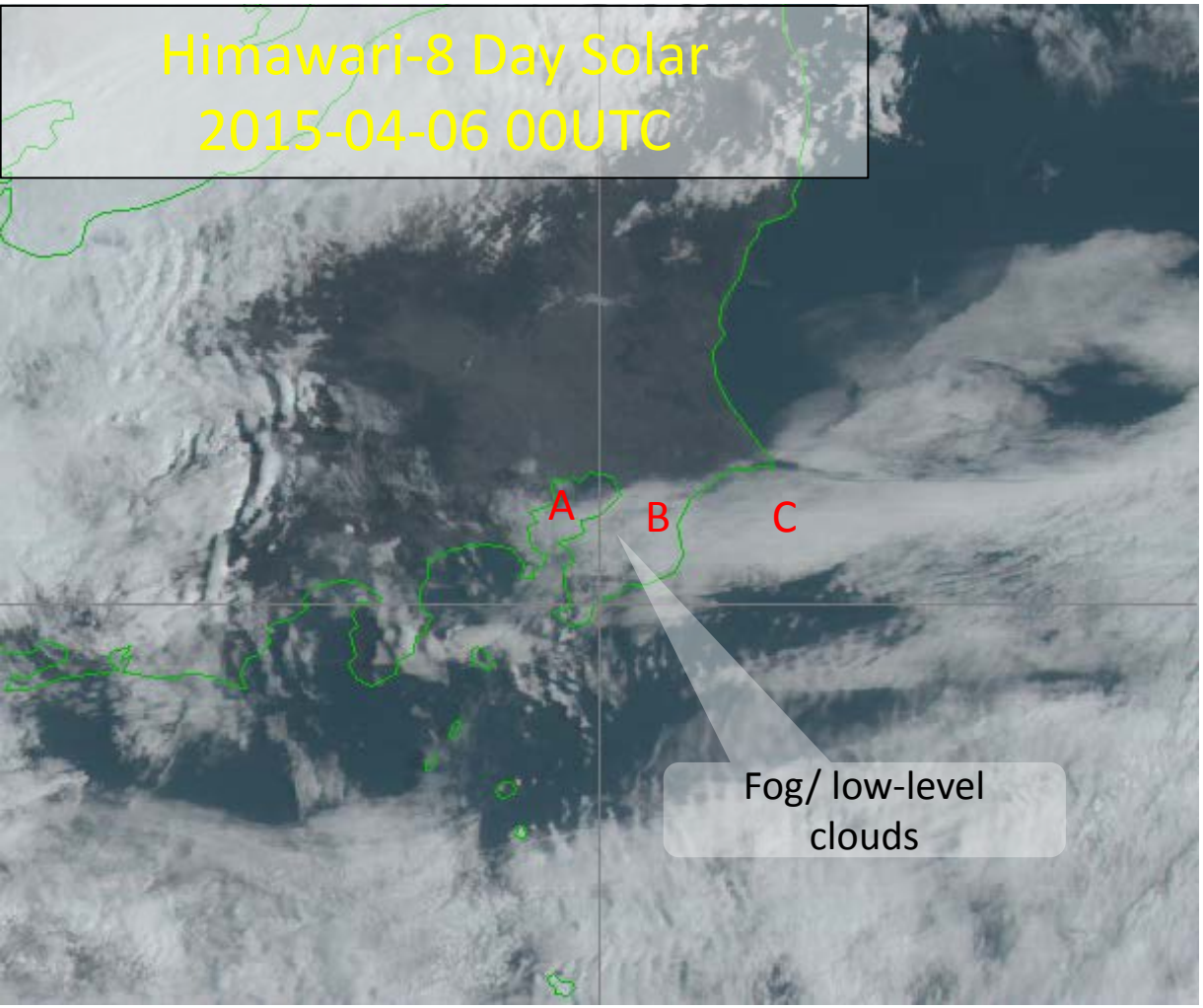
Weather chart (ASAS)
2015-04-06 00UTC

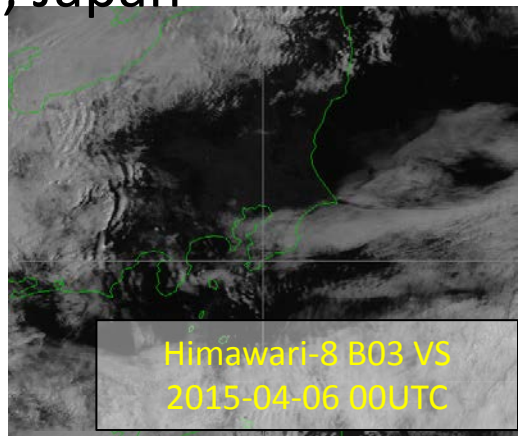


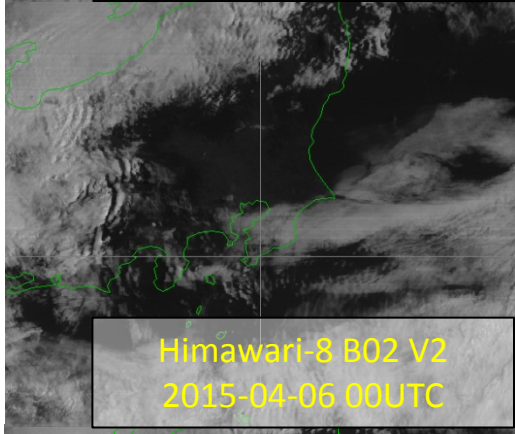
(Upper image) Smooth, whitish area correspond to fog or low-level clouds in B03(VS 0.64) image.
(Upper right image) B13(IR 10.4) image overlapped ground observations. The fog was observed at some stations.
The fog or low-clouds are not distinct in B13(IR 10.4) image.

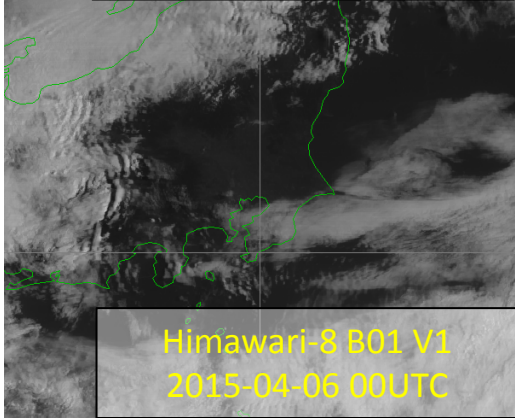
Example of True Color RGB

Fog/ low-clouds after the rainfall in Kanto Plain, Japan





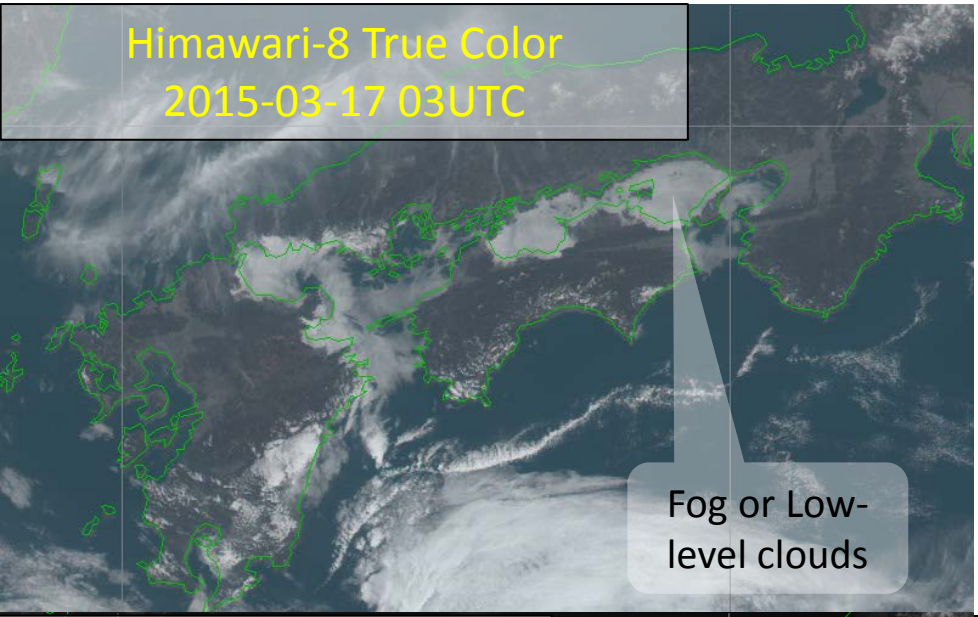




Smooth, whitish area correspond to fog or low-level clouds extended to Tokyo Bay(A), Bo-so Peninsula(B) and Pacific Ocean(C).

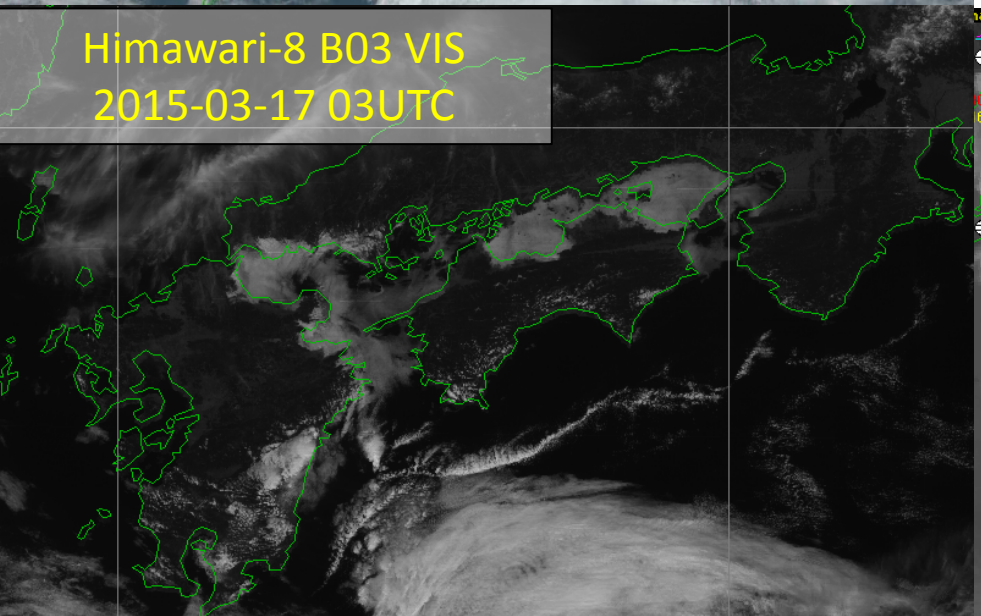
Example of True Color

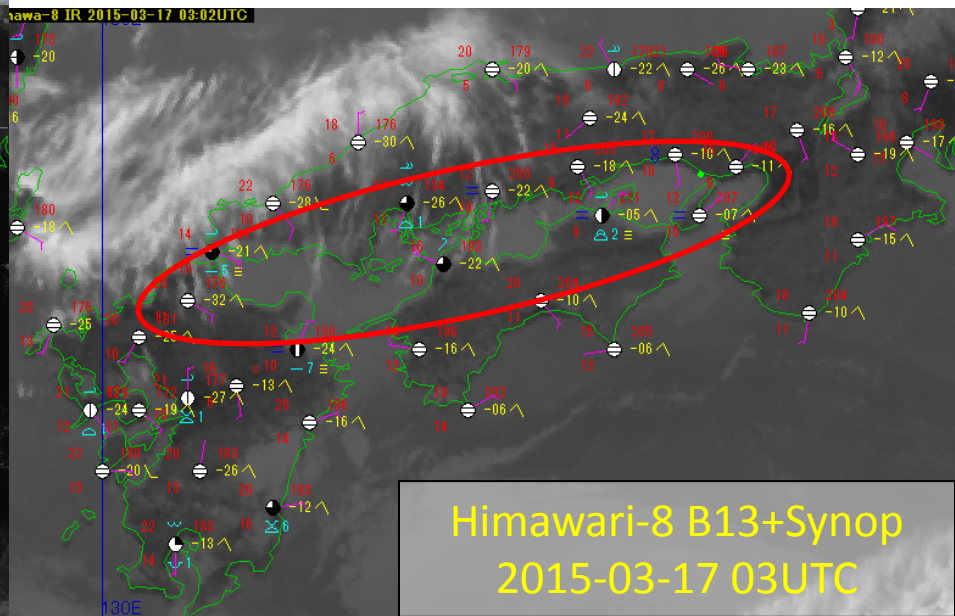
Fog/Low-level Clouds of “Setonai-kai (Inland Sea of Japan)”



(Lower right) Fog/ low-level clouds were observed at some stations (around red oval). However, fog/ low-level clouds are not clear in the IR image.

(Upper and lower left) Smooth, whitish areas correspond to fog/ low-level clouds in true color RGB and B03 visible image.

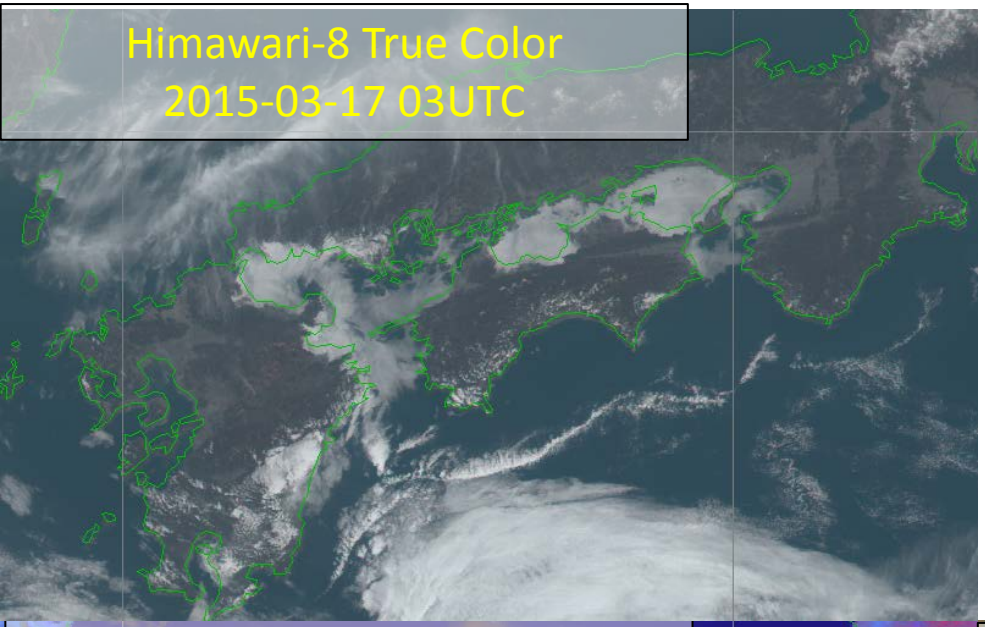




Example of True Color

Fog/Low-level Clouds of “Setonai-kai (Inland Sea of Japan)”

Comparison with standard RGB schemes

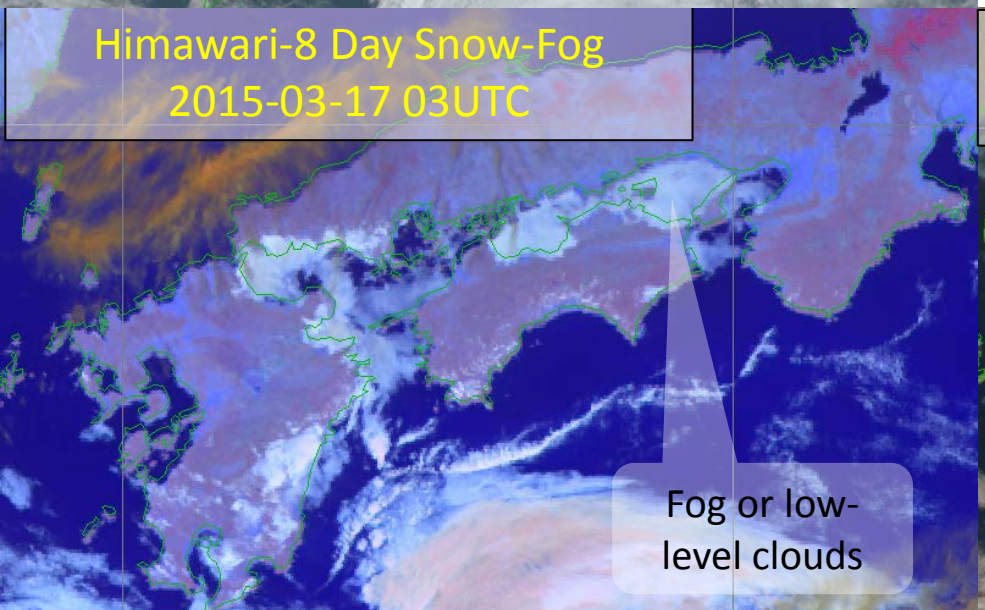


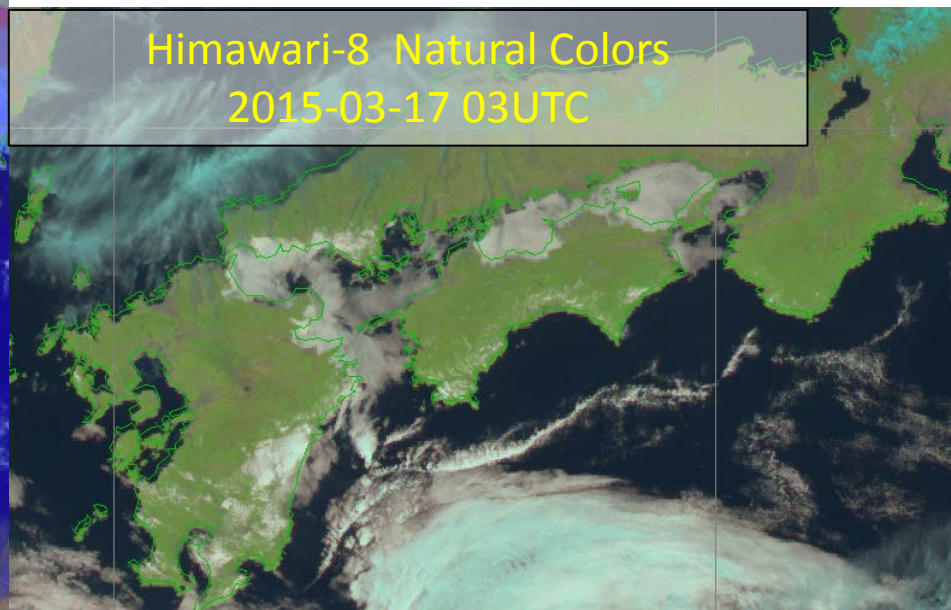
The distinction between fog/low-level clouds and other layer clouds is easier in Day Snow-Fog RGB and Natural color RGB imagery.

In True color RGB, all clouds including fog/ low-level clouds appear in whitish.

It is required to identify them based on texture and movement of clouds.

However, the True color RGB will be easy to use for traditional “single band” imagery user and RGB beginner.

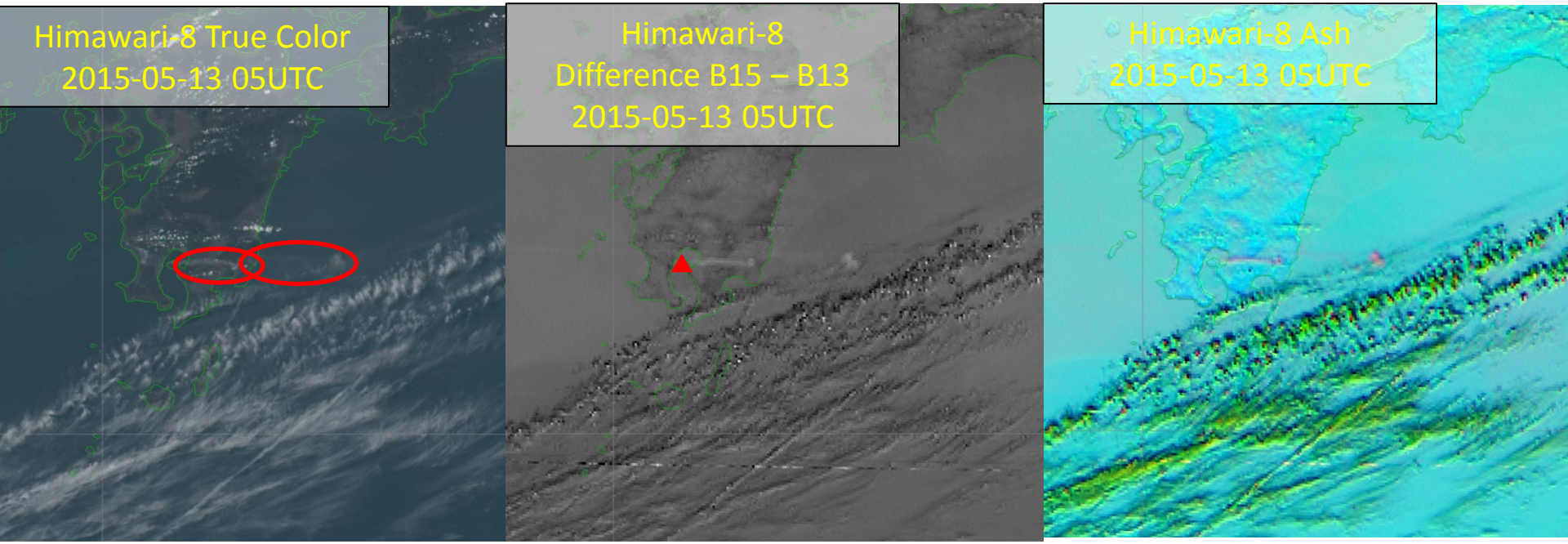




Example of True Color RGB

Volcanic ash of Sakurajima, Japan

Ash
(RGB:B15-B13/B13-B11/B13)



The drifting volcanic ash (from west to east) can be seen in true color RGB image and difference image (B15 – B13), however, the distinction between ash and upper layer cloud is not easy.

Ash RGB (specific RGB adapted to monitor and track volcanic ash and gas) appears to be better colorization (reddish area).

True Color RGB (summary)

This RGB scheme will be…

- available to display "true colored" image that is nearly visible with the naked eye, by composition of "three visible images" corresponding to red, green and blue colors with human's naked eye
- easy to use for traditional “single band” imagery user and RGB beginner
- available day time only
- “second-best” compared with other specific RGB scheme in the specific case such as nephanalysis and volcanic ash