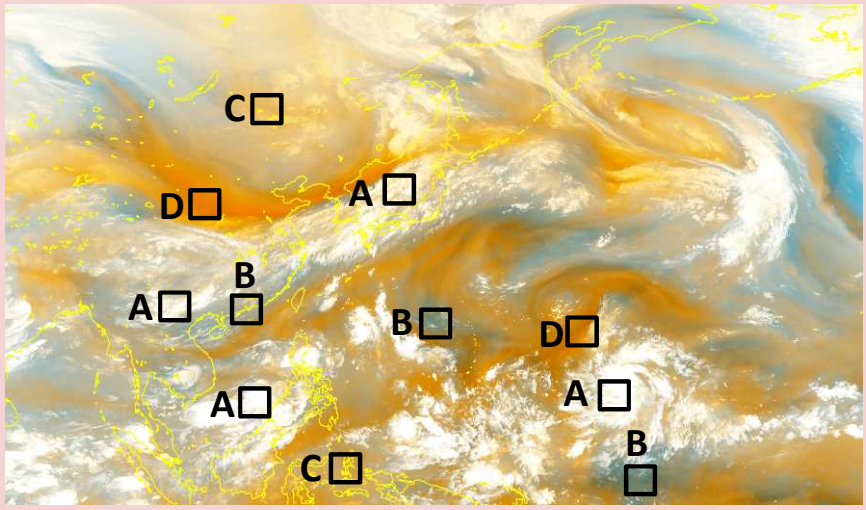
Meteorological Satellite Center (MSC) of JMA

Ver.1.0

Himawari Differential Water Vapor RGB Quick Guide



Differential Water Vapor RGB imagery and related interpretation (03:00 UTC, 7 September 2018)

A ☐ : clouds with high-level top
B ☐ : high-level moisture
C ☐ : dryness in the high-level atmosphere and moisture in the mid-level atmosphere
D ☐ : dryness in the mid-/high-level atmosphere

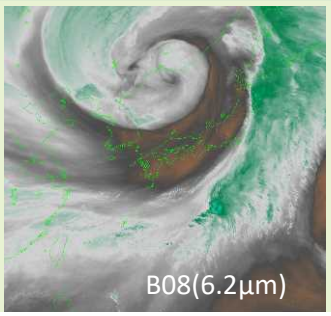
Main applications: Analysis of high-/mid-level atmospheric water vapor distribution

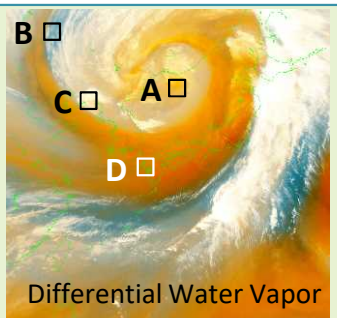
Benefits:

- Color-component provision of sterically valid features on lower- and upper-level atmospheric water vapor distribution and depth of upper-level moist/dry layers
- Applicability to analysis of water vapor distribution for different layers such as troughs, ridges and areas of darkening
- Applicability day and night thanks to infrared image composition

Limitations:

- Color shading effects from satellite viewing angle, particularly in limb areas (limb cooling effect)
- Lack of clarity in features such as low-level cloud/fog
- Orange color with yellowish tone occasionally obscuring moisture layer clarity, causing a need for special care in interpretation





Polar vortex associated with a low-pressure system around the Sea of Japan (04:00 UTC, 4 May 2016)
Upper-air flow can be seen in the water-vapor image (left). Moisture and dry-area differences are also visible in three-dimensional RGB imagery (right).
A ☐ : dryness in the high-level atmosphere and moisture in the mid-level atmosphere
B ☐ : high-level moisture
C ☐ :clouds with high-level top
D ☐ : dryness in the mid-/high-level atmosphere

RGB composition with recommended thresholds and related specifications for Differential Water Vapor RGB

Color	AHI bands	Central wave length [μm]	Min [K]	Max [K]	Gamma	Physical relation to	Smaller contribution to signal of	Larger contribution to signal of
Red	B10-B08	7.3-6.2	-3.0K	30.0K	3.5	Vertical water vapor distribution Mid-/high-level clouds	Mid-level humidity Mid-level clouds	Dry upper levels High-level clouds
Green	B10	7.3	213.2K	278.2K	2.5	Water vapor distribution at mid-level	Dry mid-levels Warm brightness temperatures	Moist mid-levels Cold brightness temperatures
Blue	B08	6.2	208.5K	243.9K	2.5	Water vapor distribution in upper level High clouds	Dry upper levels Warm brightness temperatures	Moist upper levels Cold brightness temperatures

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Developing low around the Korean Peninsula (21:00 UTC, 16 April 2016)
The dark-orange streak (indicated by the black arrow) to the vortex shaped-cloud with the developing low system appears to be dry intrusion.

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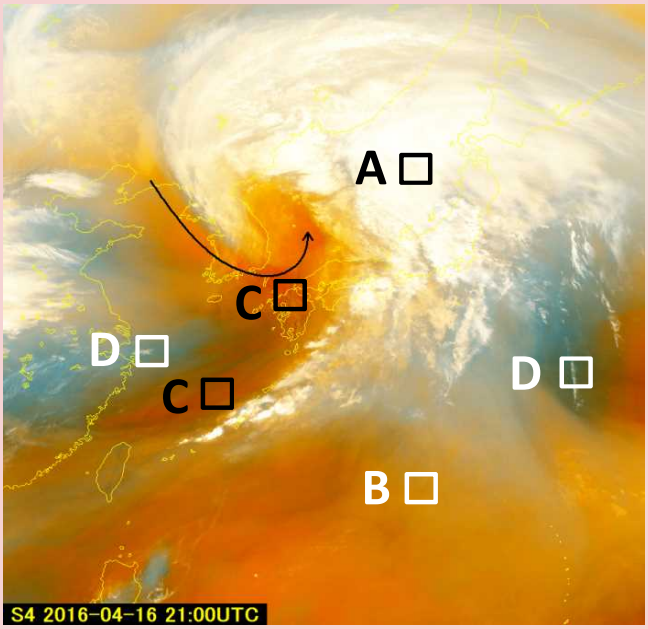
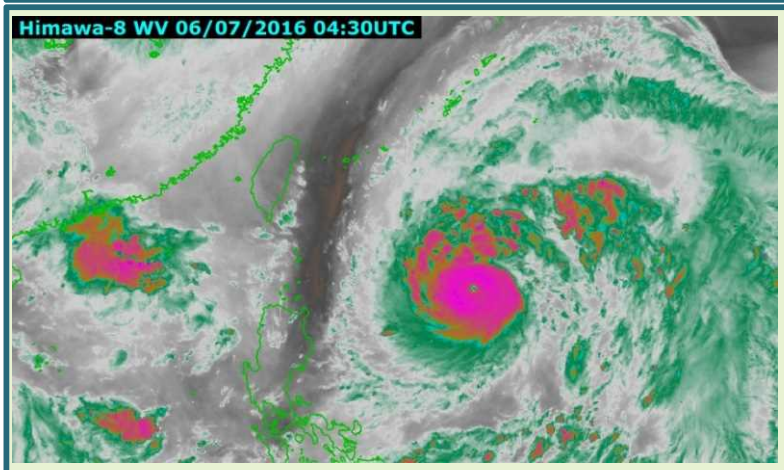
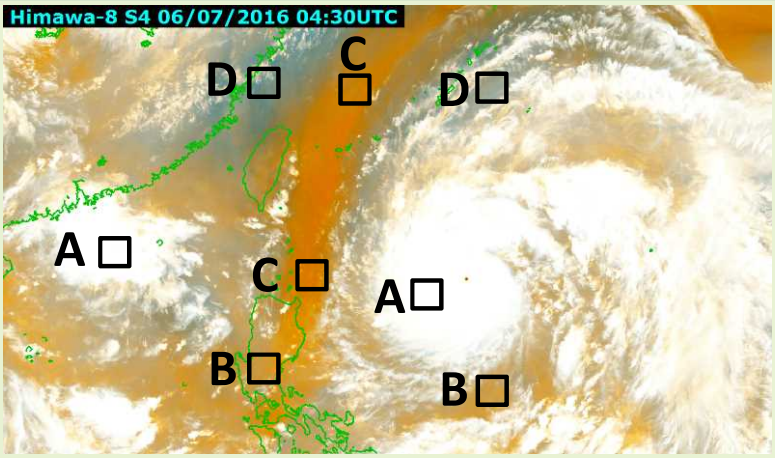
C ■: dryness in the mid-/high-level atmosphere
D ■ : high-level moisture







163K 321K

Typhoon (T1601 Nepartak) east of the Philippines (04:30 UTC, 6 July 2016)
The image on the left is B08 (6.2 μm), and that on the right is Differential Water Vapor RGB.

A □ : clouds with high-level top
B ■ : dryness in the high-level atmosphere and moisture in the mid-level atmosphere
C ■ : dryness in the mid-/high-level atmosphere
D ■ : high-level moisture

Color interpretation for Differential Water Vapor RGB

Color	Interpretation
	Clouds with high-level top
	High-level moisture
	Dryness in the high-level atmosphere and moisture in the mid-level atmosphere
	Dryness in the mid-/high-level atmosphere

Color interpretation may be developed in future work to enhance distinguishability.