National Meteorological Satellite Center

Himawari-8 RGB Products

- True Color RGB
- Natural Color RGB
- Dust RGB
- Airmass RGB

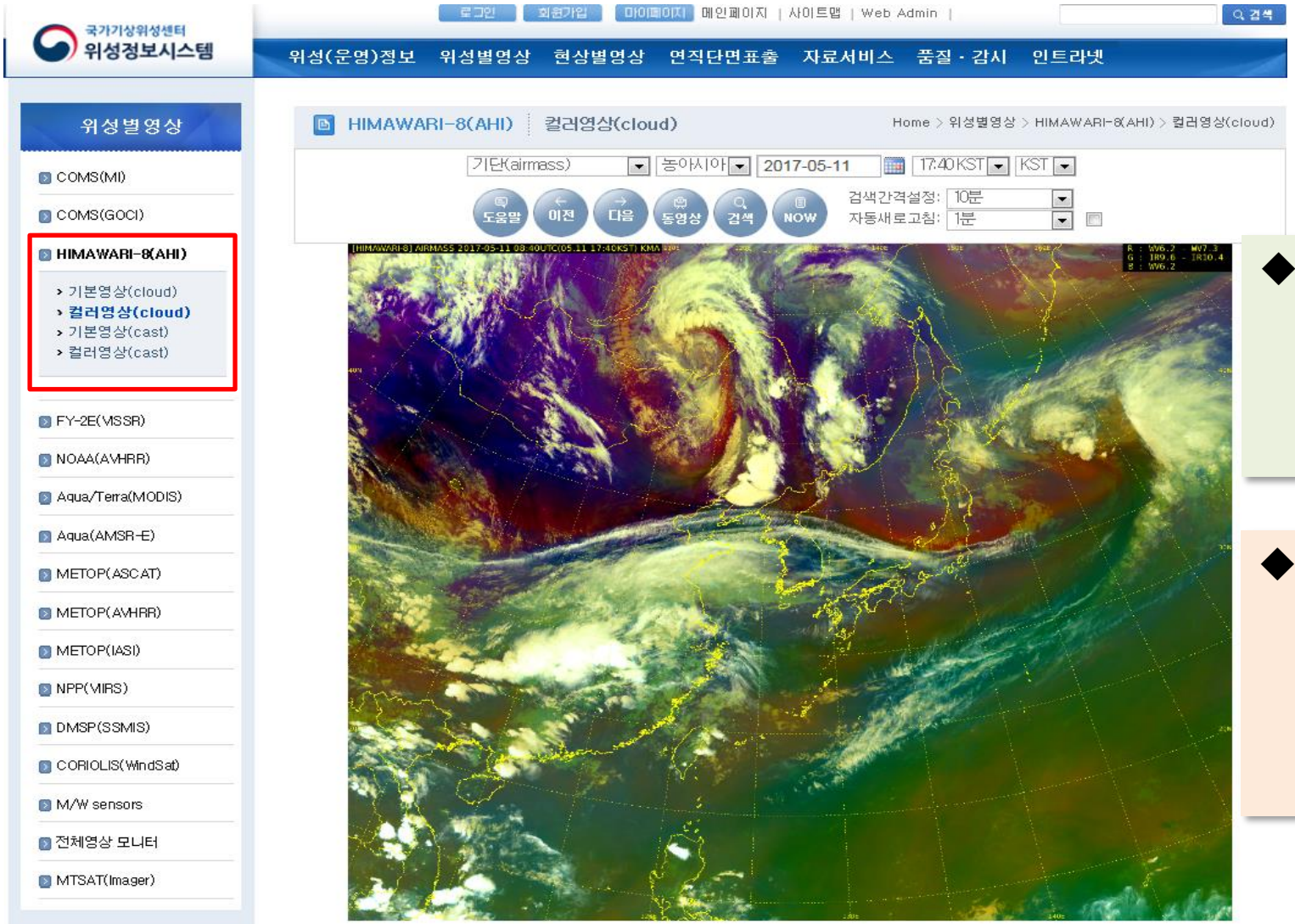
May 2017

Dr. Hye Sook, Park

Contact point of CoE-Korea : hyesookpark@korea.kr
Satellite Analysis Division, National Meteorological Satellite Center

Satellite Information System for KMA staffs

National Meteorological Satellite Center

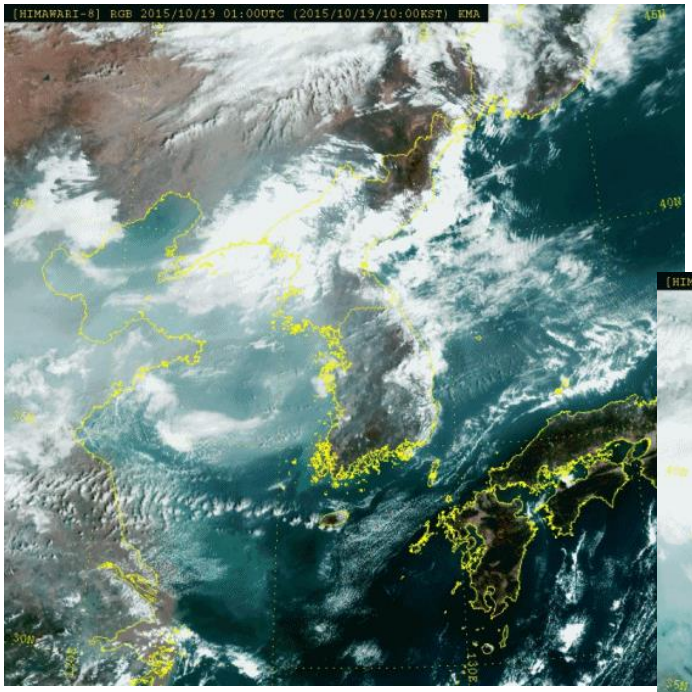


◆ **HimawariCloud** (2015.7)
- 16chs images
- 4 RGB Products
- Original Resolution
- about 12min latency

◆ **HimawariCast** (2017.4)
- 14chs images
- 3 RGB Products
- Reduced Resolution (VIS 1km, IR 4km)
- 10 min latency

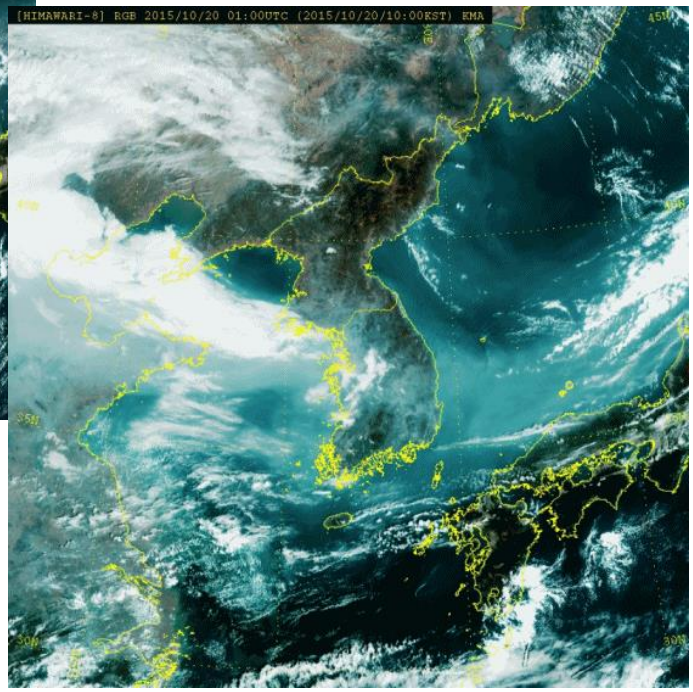
Usage of True color RGB images

- Monitoring of Smog/suspended dusts

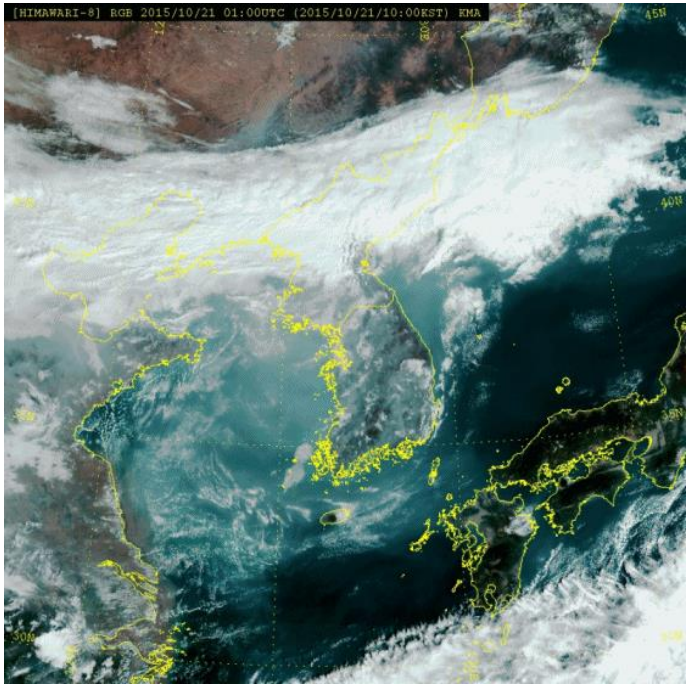


19 Oct., 2015

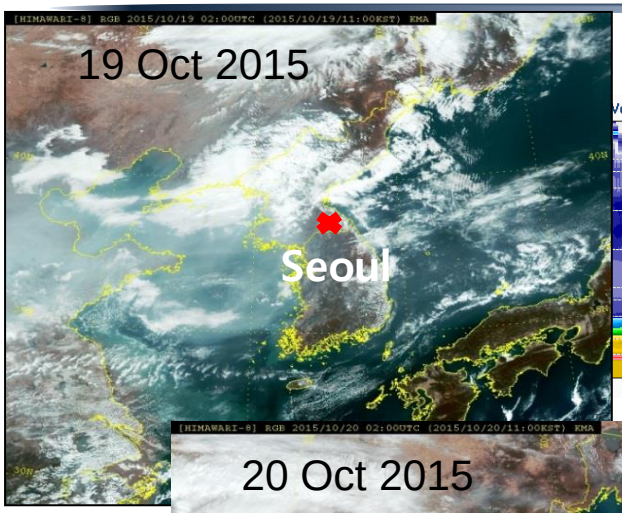
20 Oct., 2015



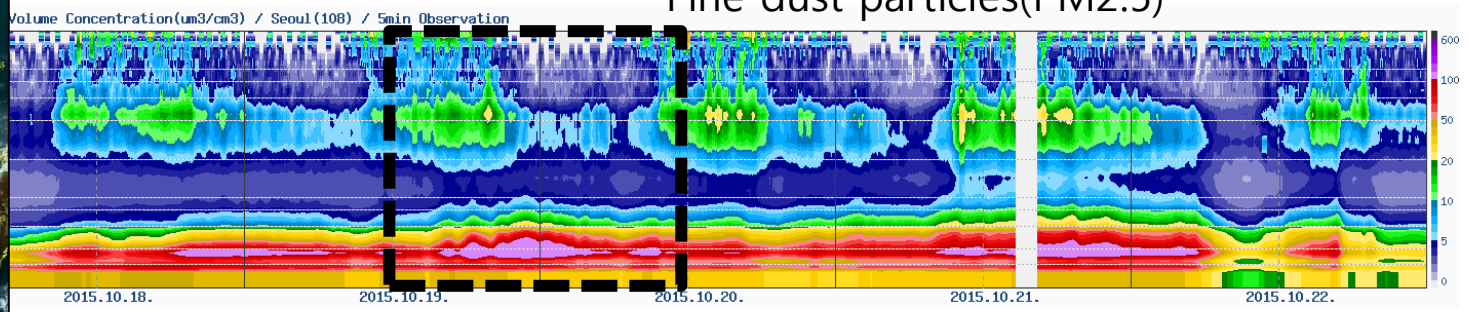
21 Oct., 2015

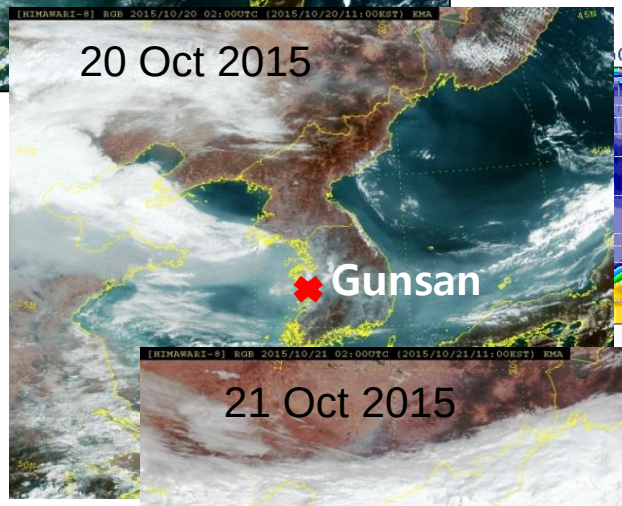


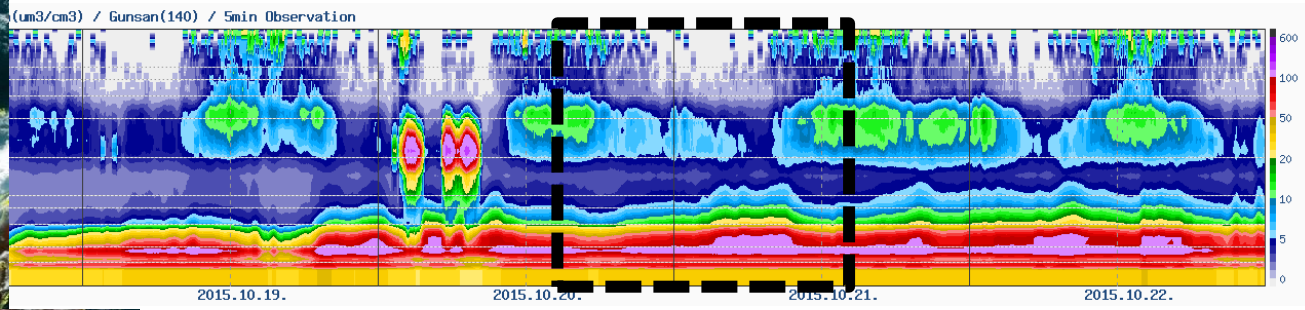
Usage of True color RGB images

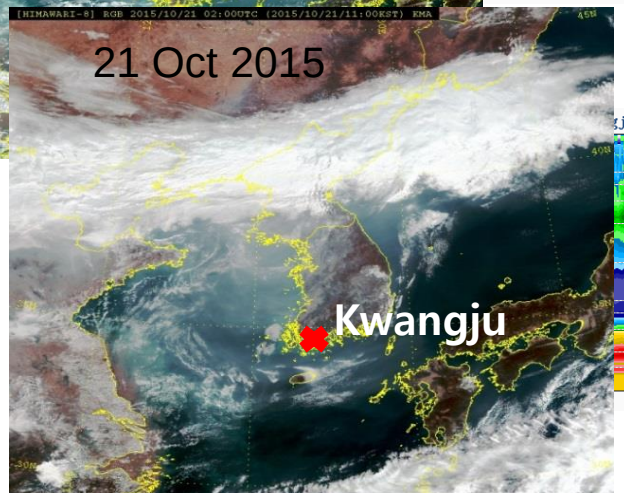


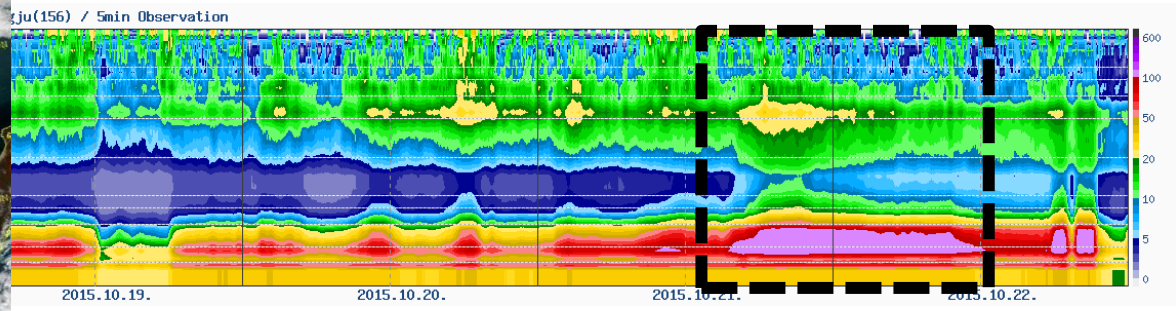
Fine dust particles(PM2.5)







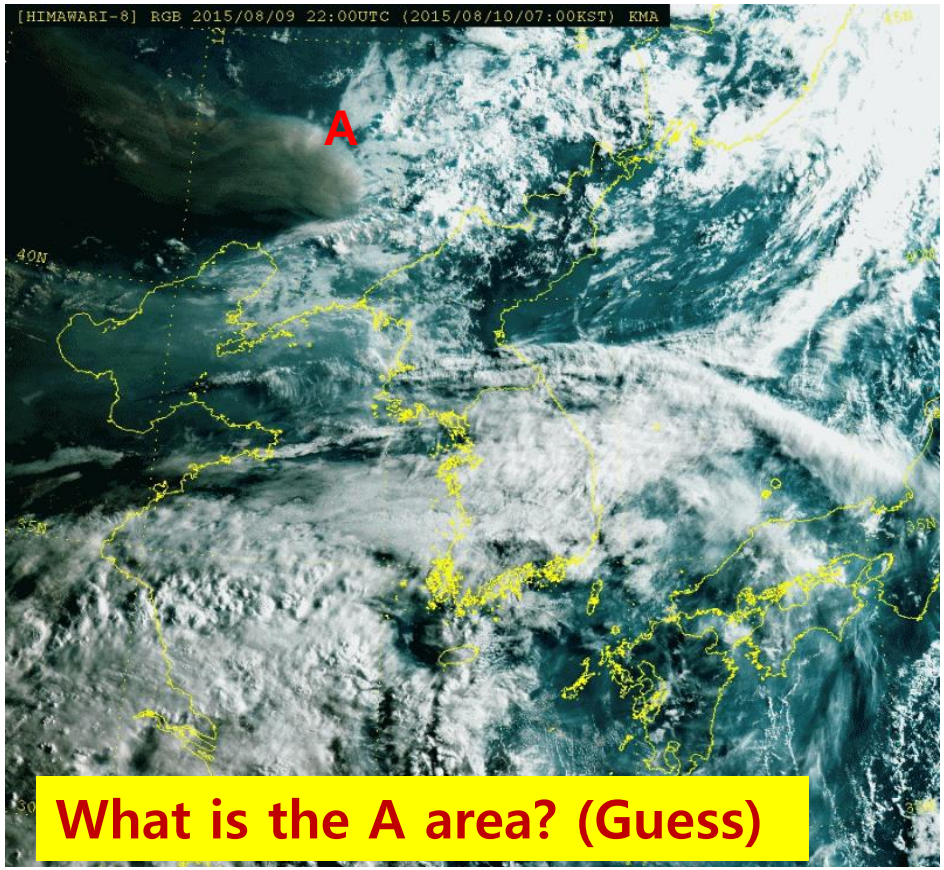




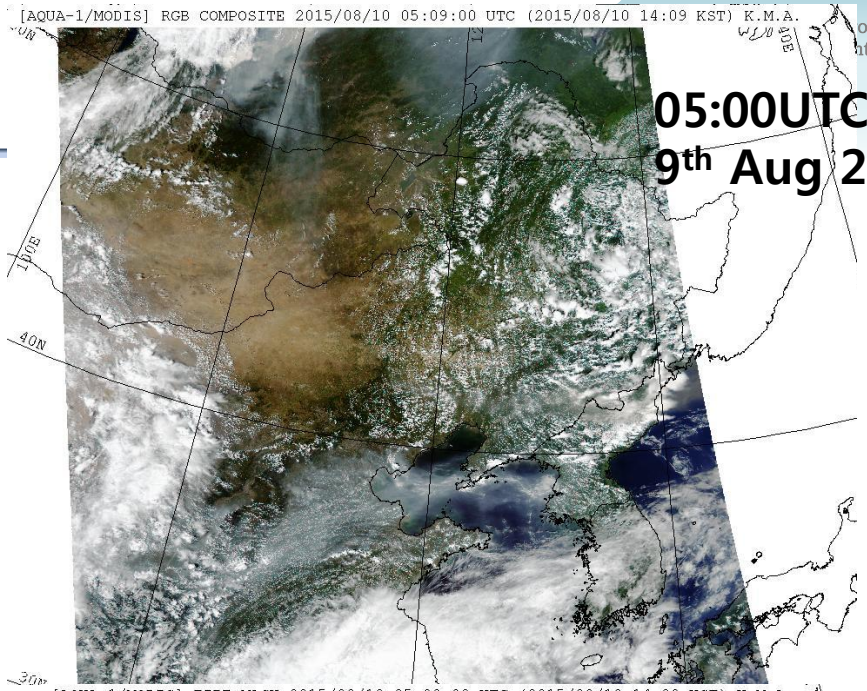
Usage of True color RGB images

- Monitoring of smoke/haze, pollutants

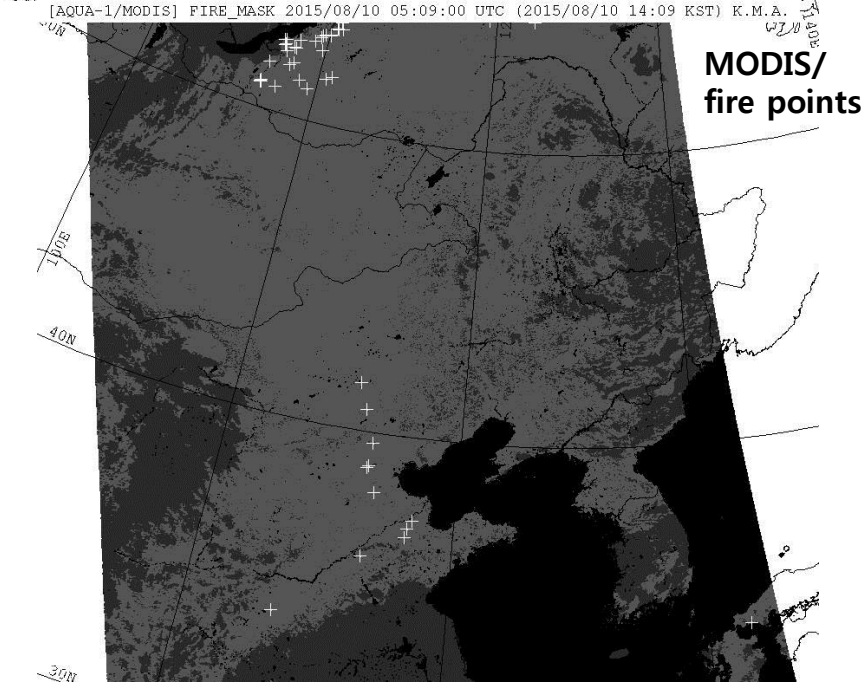
22:00UTC 9 Aug ~07:00UTC 10 Aug 2015



What is the A area? (Guess)



05:00UTC
9th Aug 2015

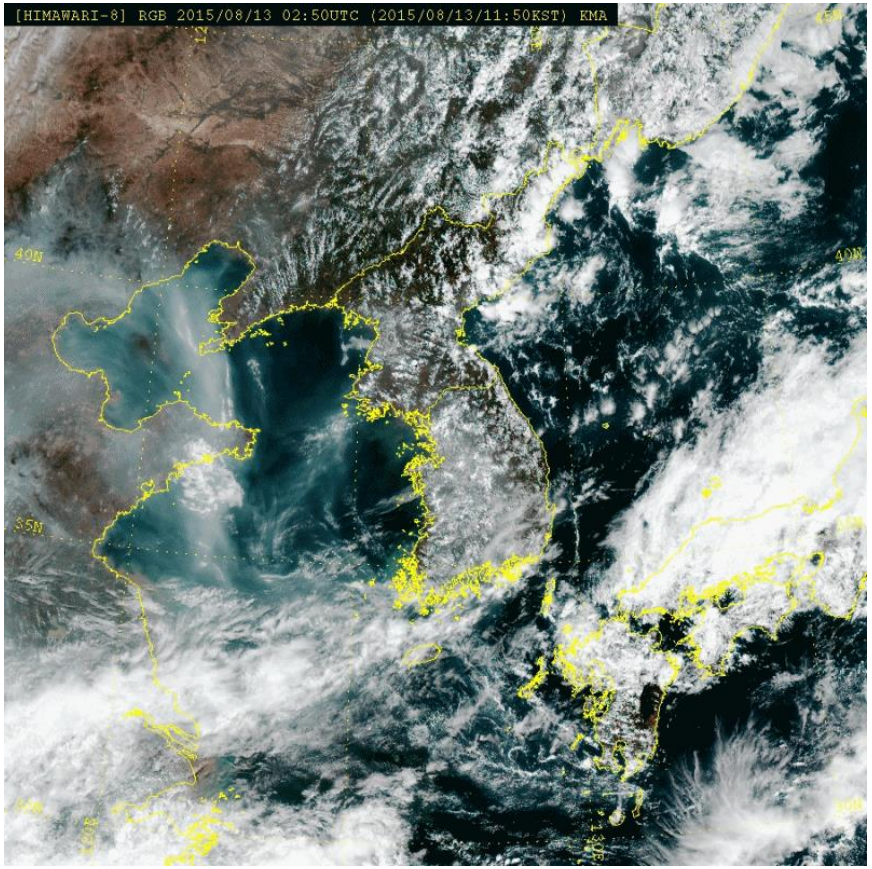


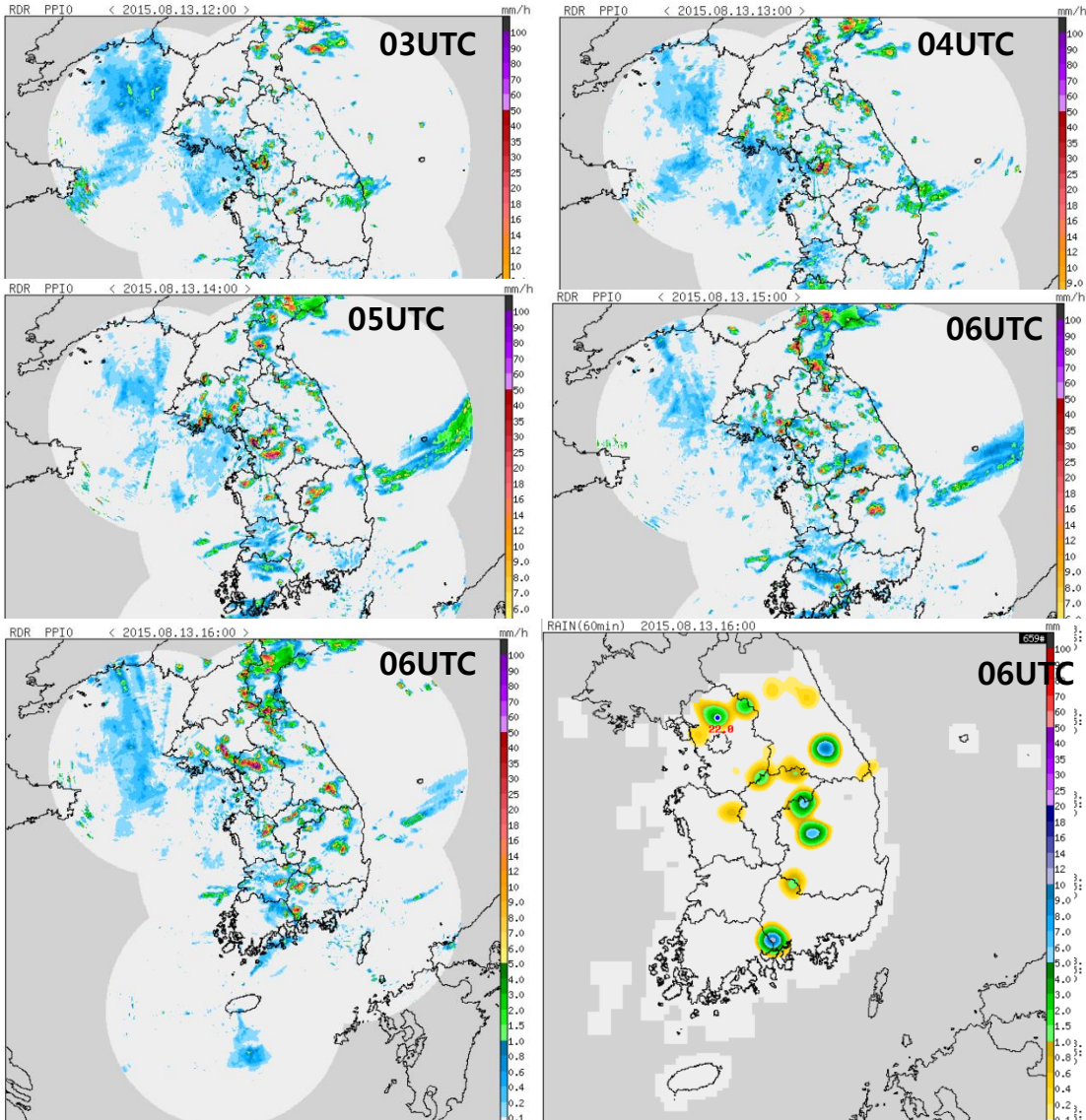
MODIS/
fire points

Usage of True color RGB images

Monitoring of mesoscale convective clouds

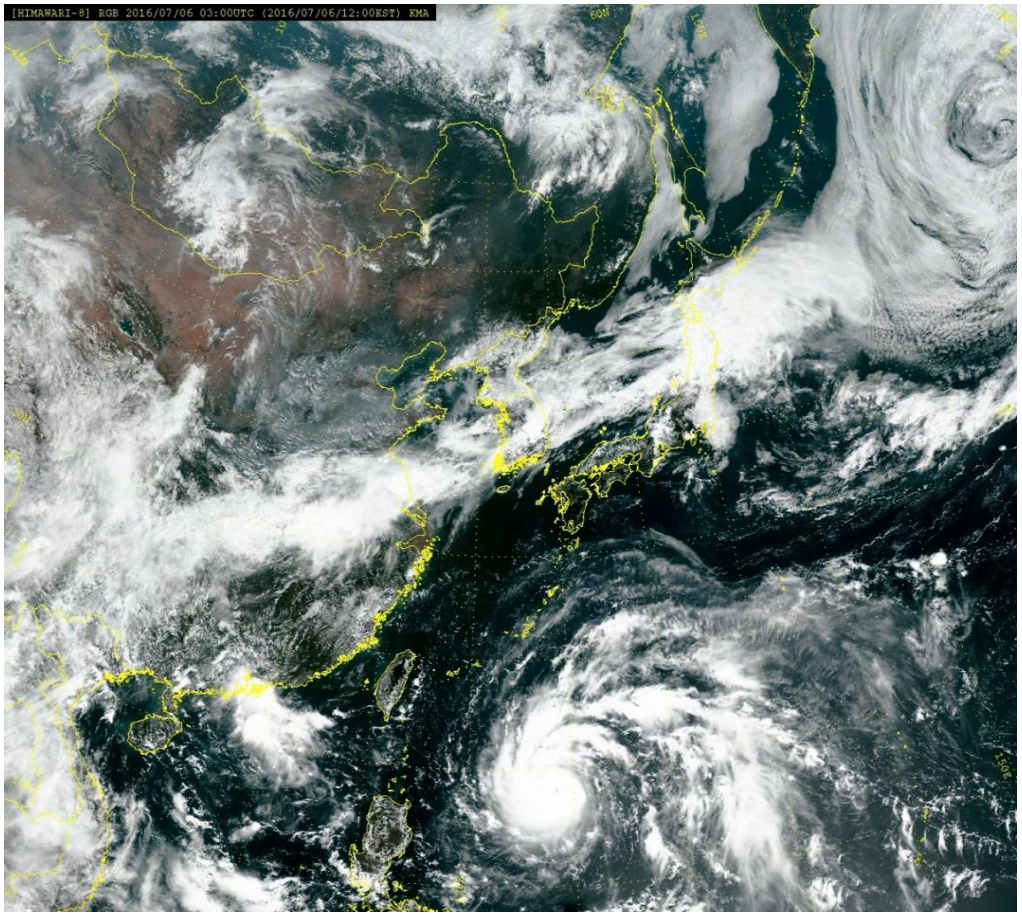
2015. 8. 13. 02:50~07:00UTC



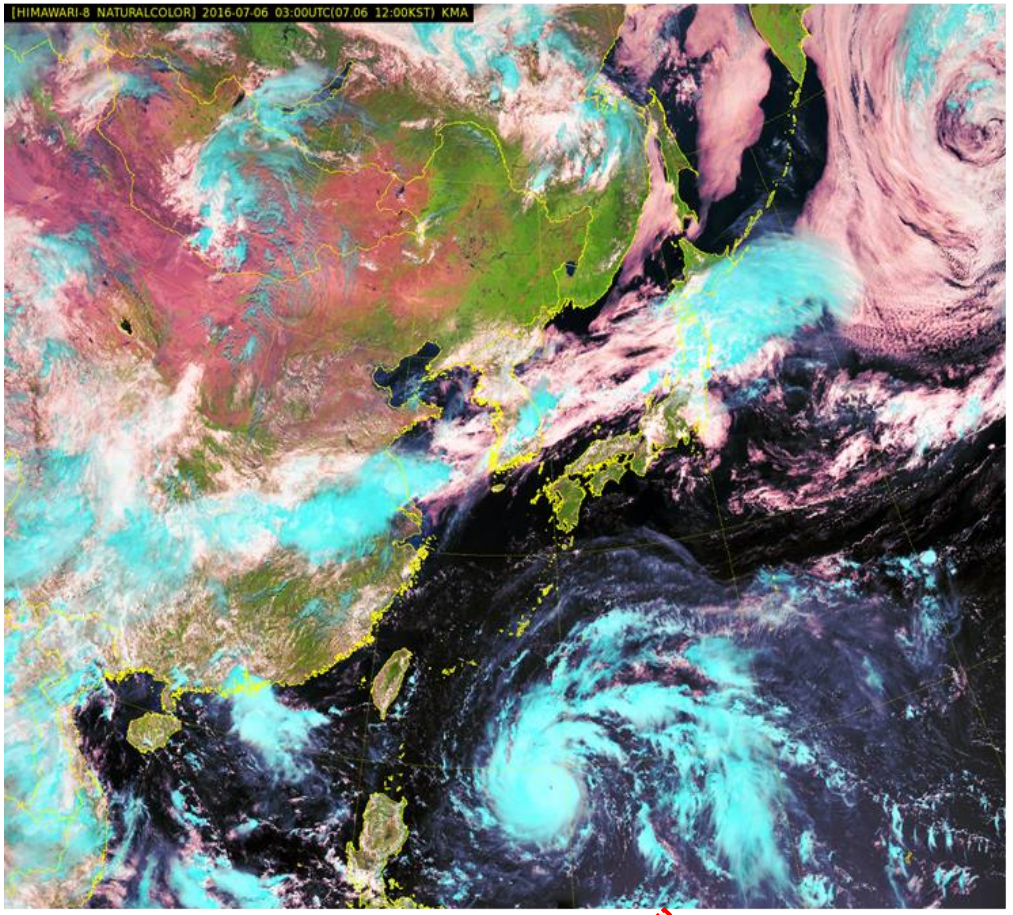


True Color & Natural color RGB images

True Color RGB



Natural Color RGB

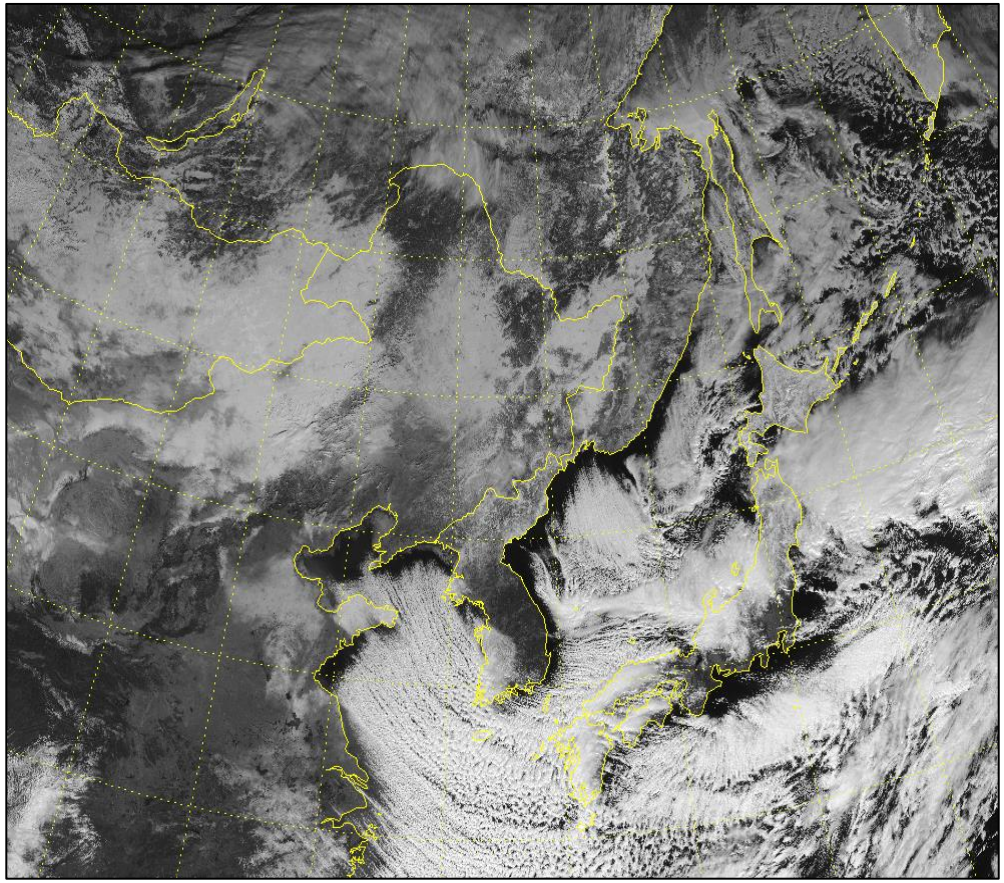


6 July 2016, 13:00 UTC

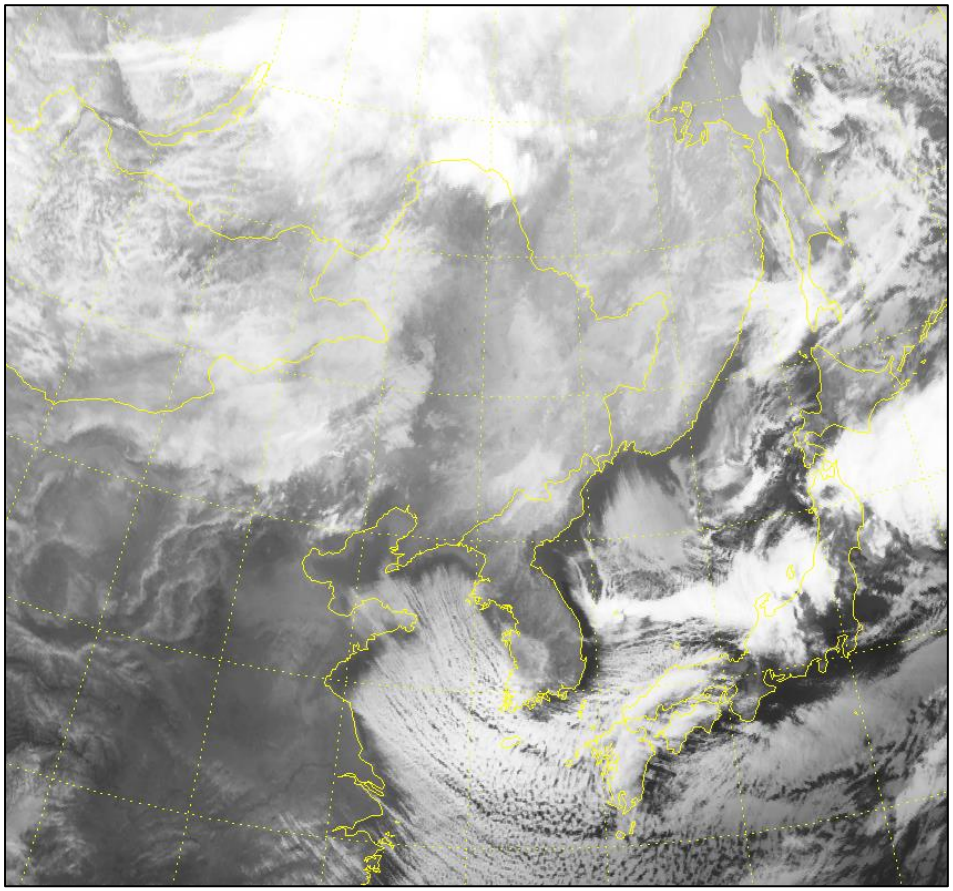
☞ Application : Vegetation, Snow, ice cloud

Usage of Natural color RGB images

COMS (VIS)



COMS (IR)



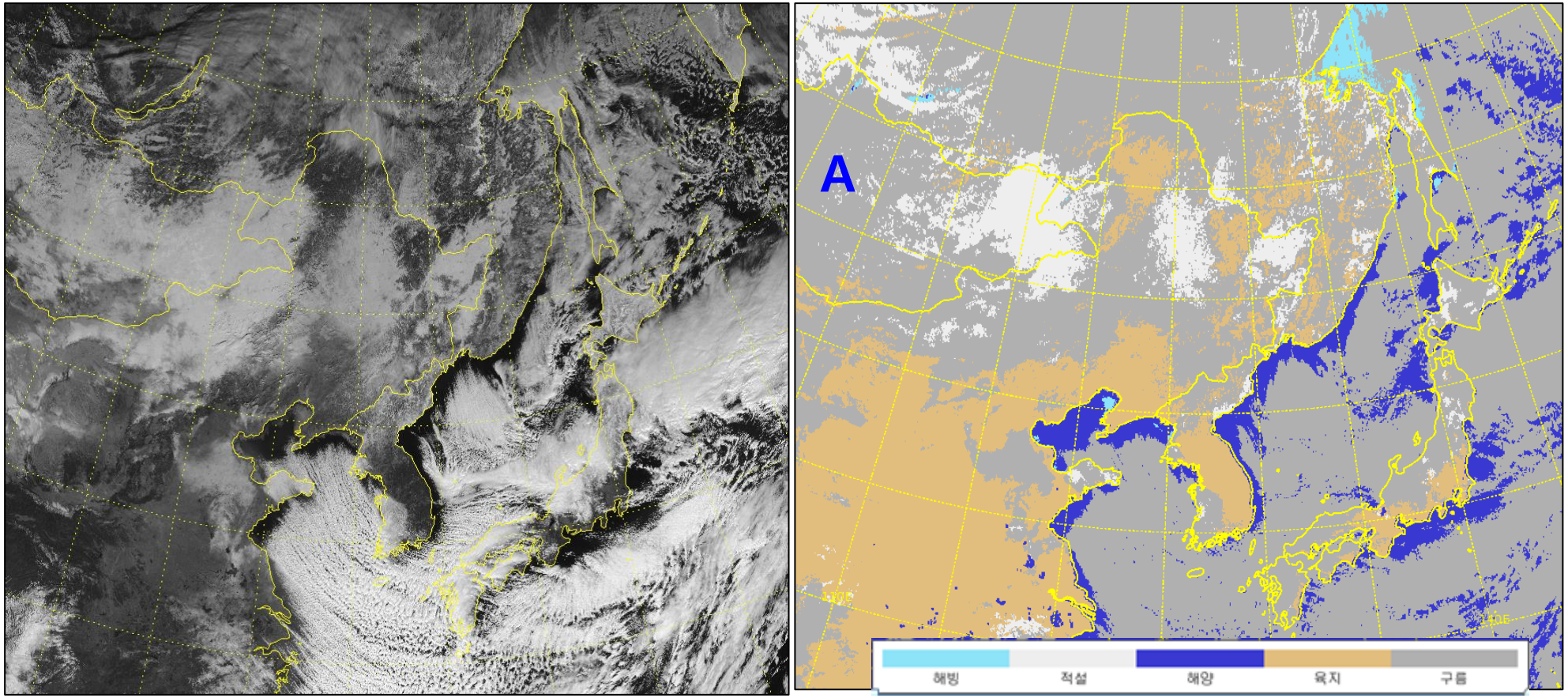
<2016-01-24 03:00 UTC>

Where is the snow area?

Where is the snow area? - using derived product

COMS (VIS)

COMS SNOW/SEA ICE



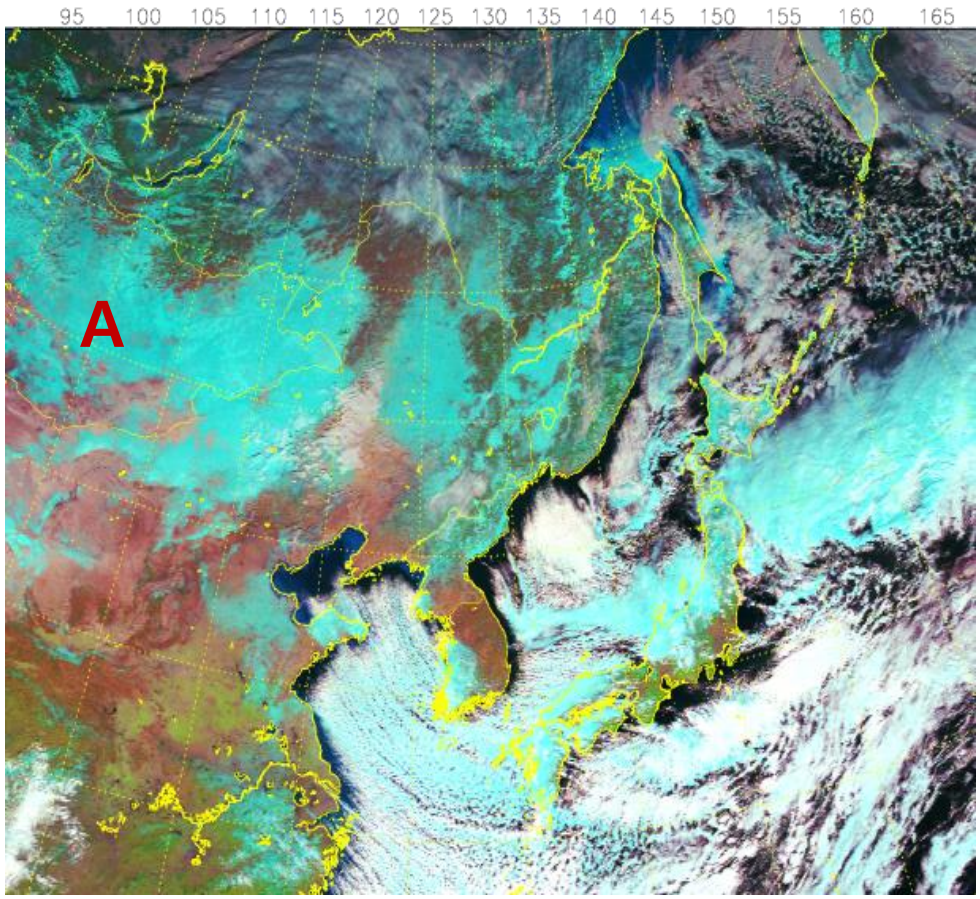
<2016-01-24 03:00 UTC>

A areas are really clouds ?

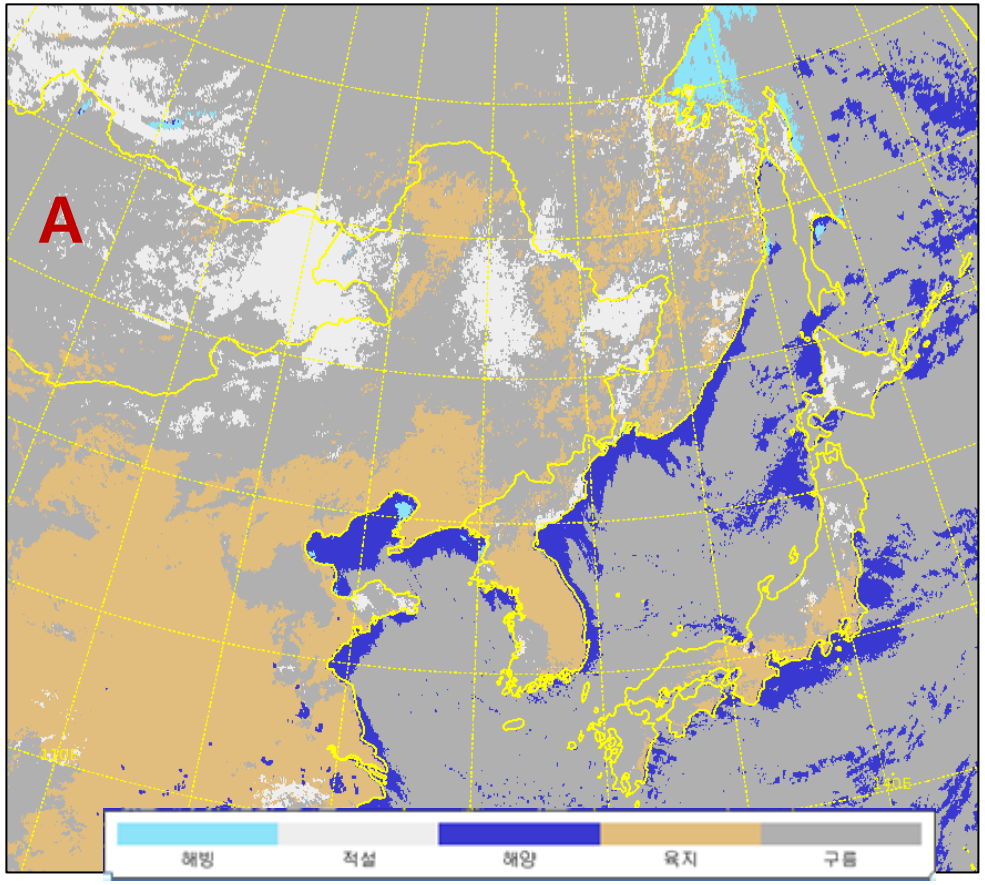
Where is the snow area? - using derived product

National Meteorological Satellite Center

Himawari-8 Natural Color RGB



COMS SNOW/SEA ICE

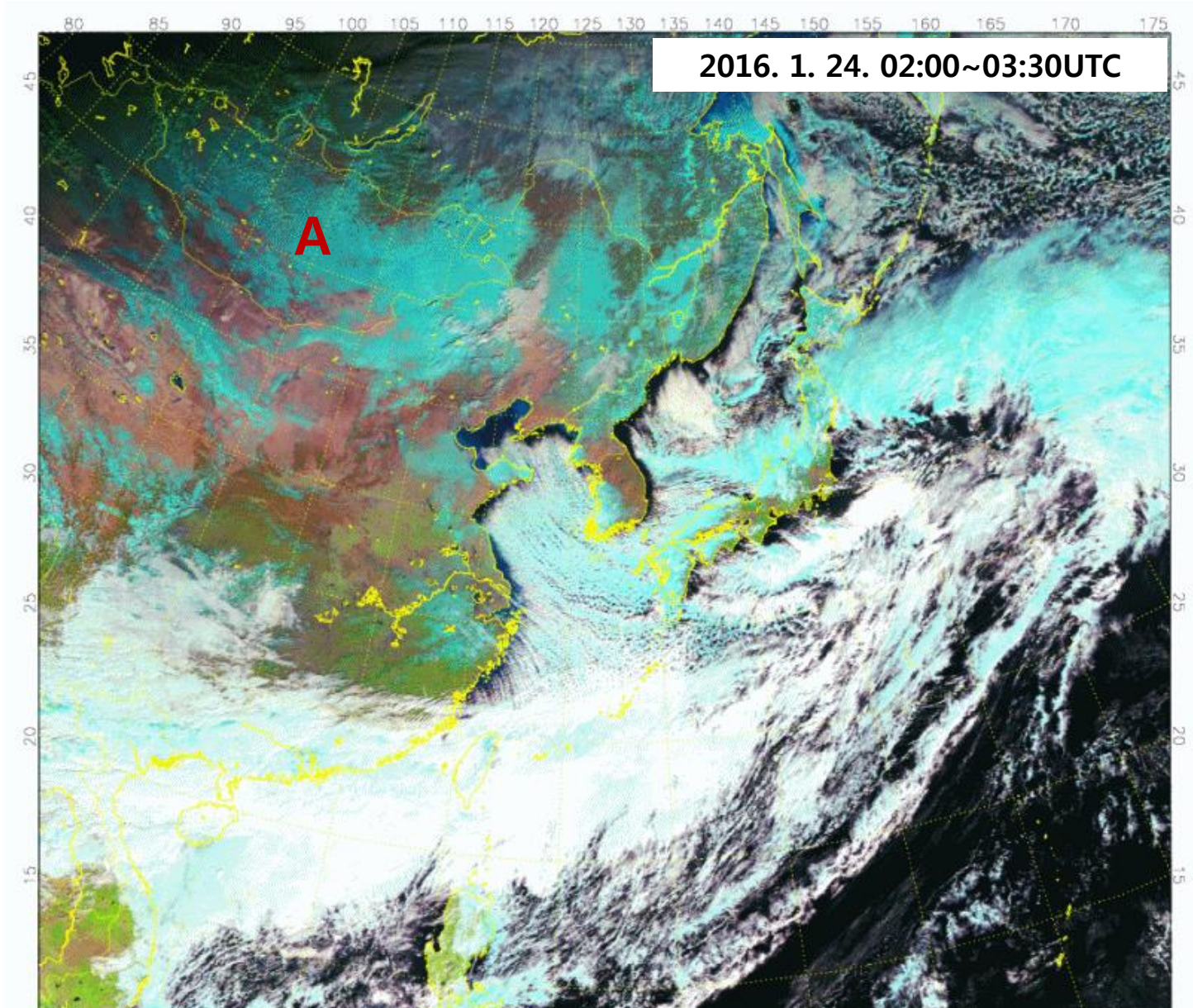


<2016-01-24 03:00 UTC>

A areas are really clouds ?

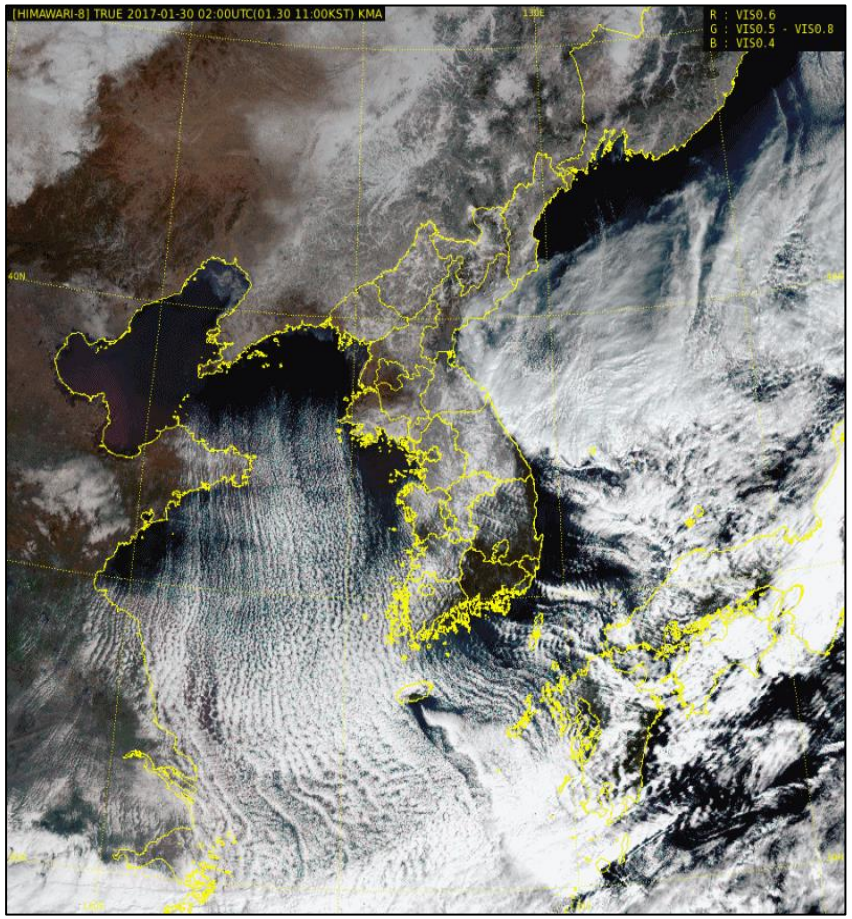
A areas are really clouds ?

National Meteorological Satellite Center



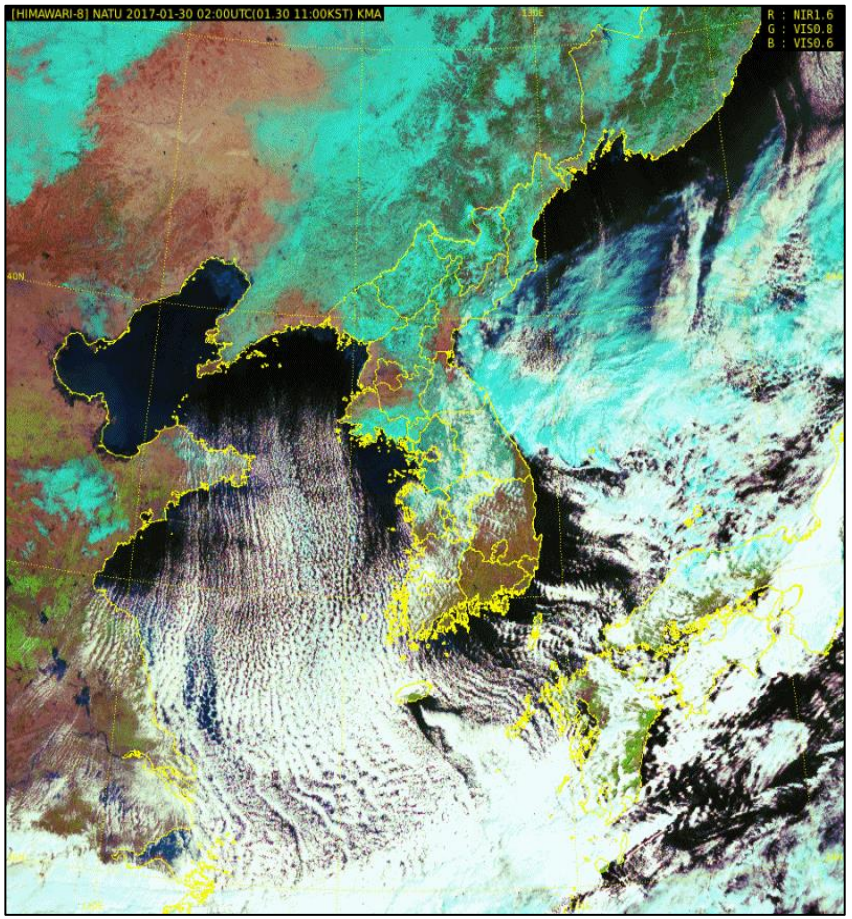
Natural color RGB images – snow area detection

True Color RGB



<VIS0.47+ VIS0.51+ VIS0.64>

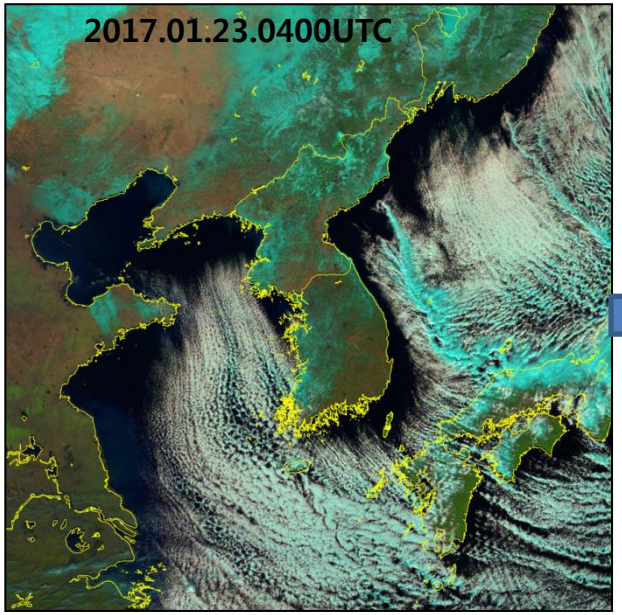
Natural Color RGB



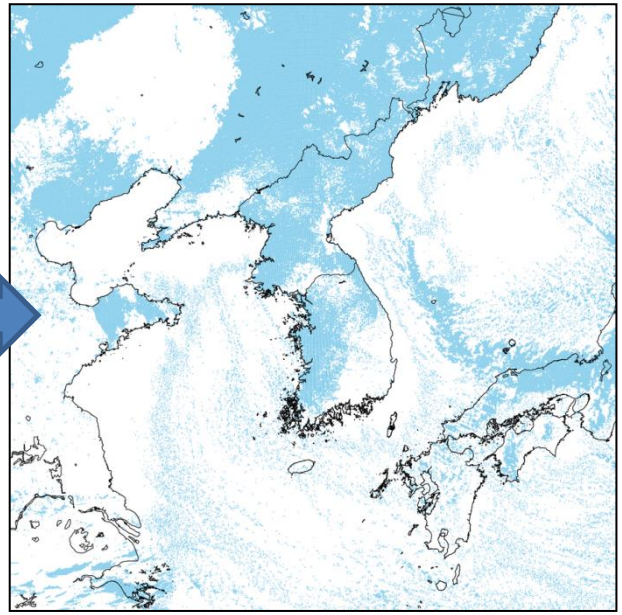
<NIR 1.6+ VIS0.8+ VIS0.6>

Discrimination of Snow and Clouds using Natural Color RGBs

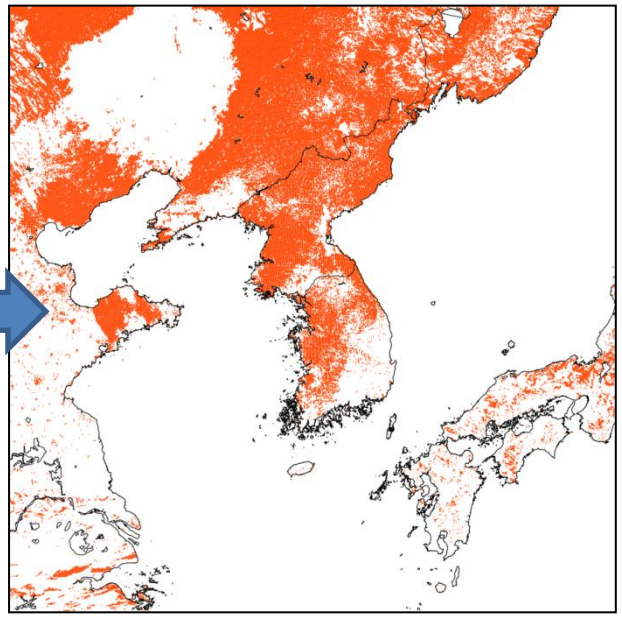
National Meteorological Satellite Center



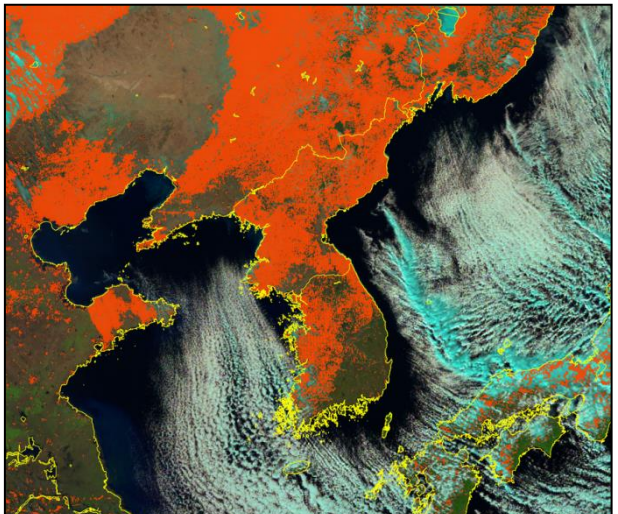
1. Natural Color RGB



2. Filtering1: snow/ice clouds



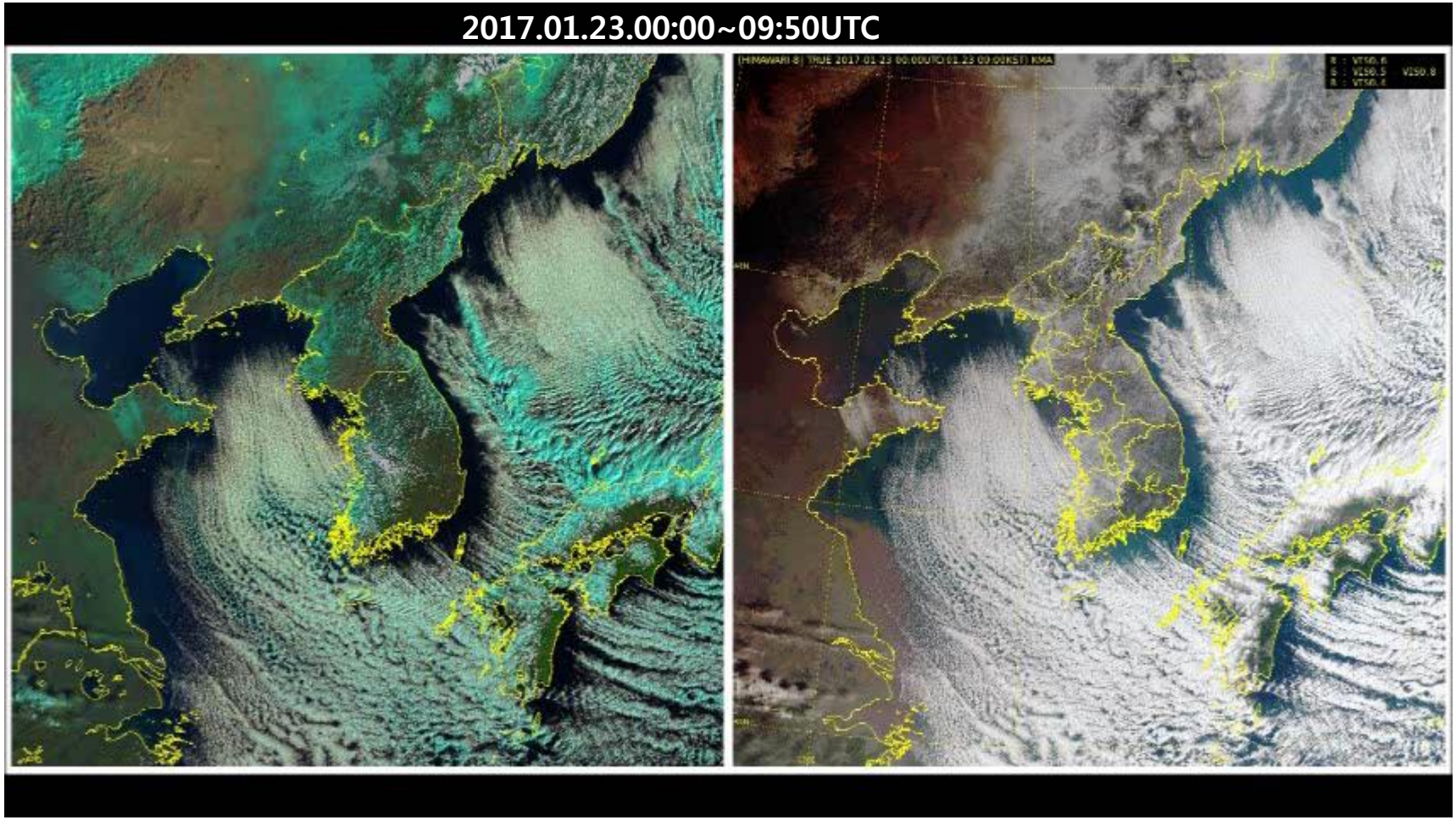
3. Filtering2: Snow area



4. Allocate new color over the snow areas

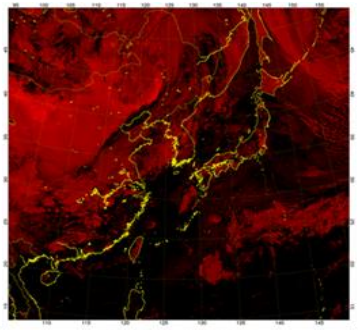
Discrimination of Snow and Clouds using Natural Color RGBs

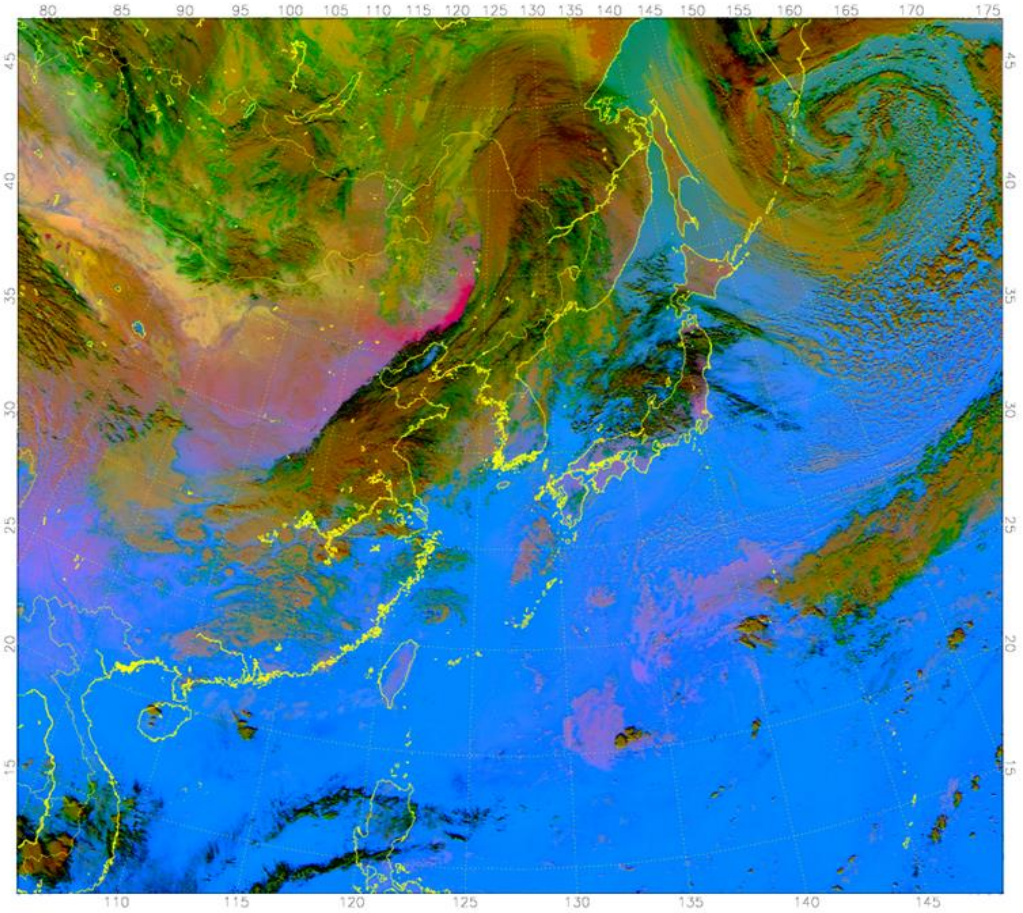
National Meteorological Satellite Center



- White : water clouds
- Cyan : ice clouds
- Weak Violet : snow area

Dust RGB images

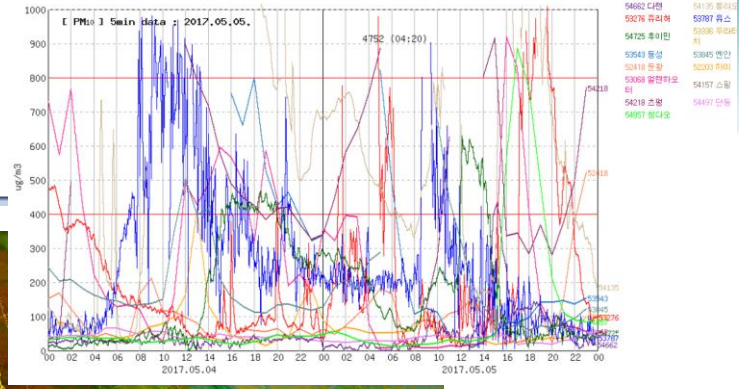


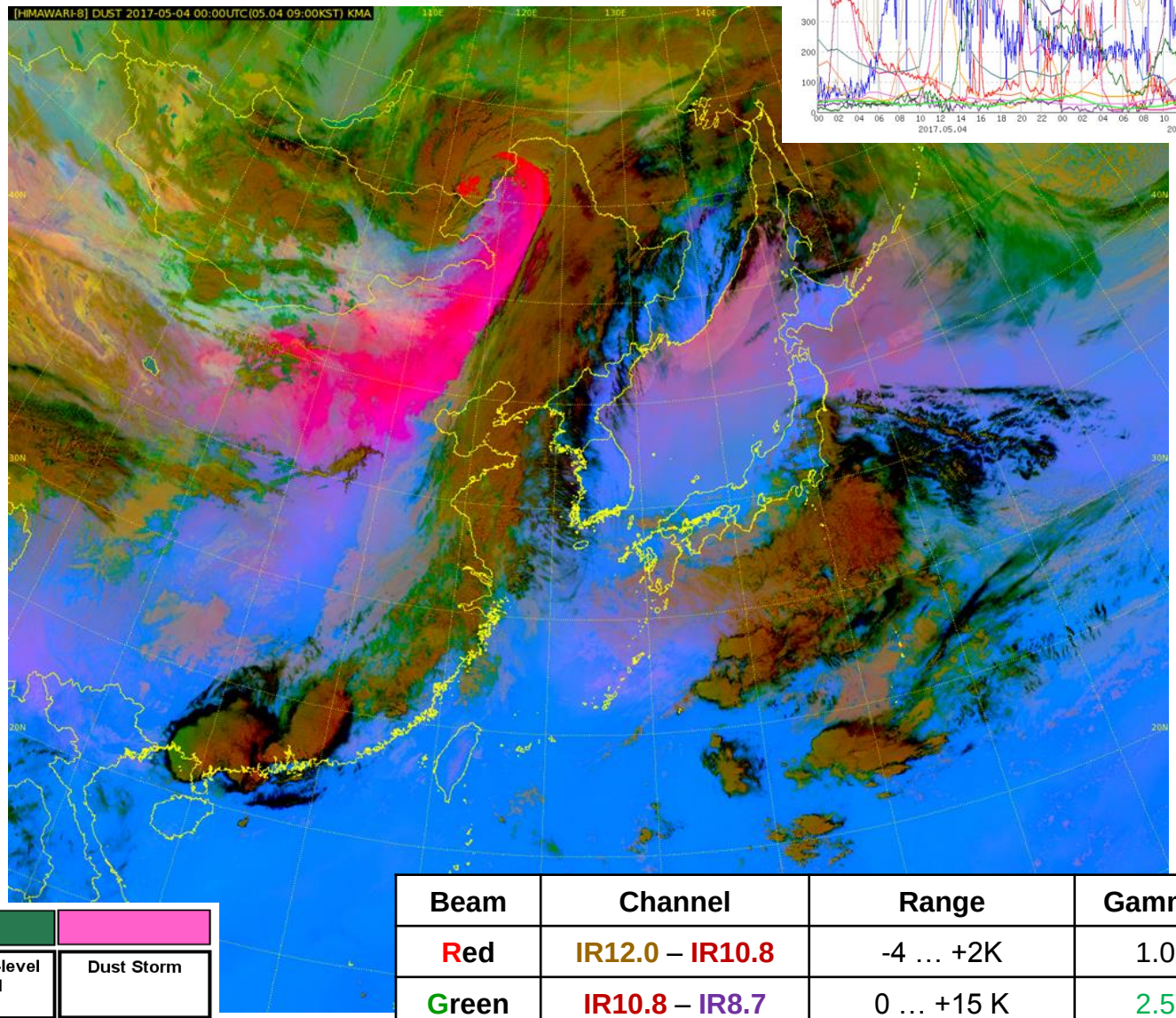


Beam	Channel	Range	Gamma	Gamma 2
Red	IR12.0 – IR10.8	-4 … +2K	1.0	1.0
Green	IR10.8 – IR8.7	0 … +15 K	2.5	1.0
Blue	IR10.8	+261 … +289 K	1.0	1.0

Asian Dust Monitoring

4th – 6th May 2017





Thin cirrus

Cold, thick, high-level clouds	Thick, mid-level cloud	Thin, mid-level cloud	Dust Storm

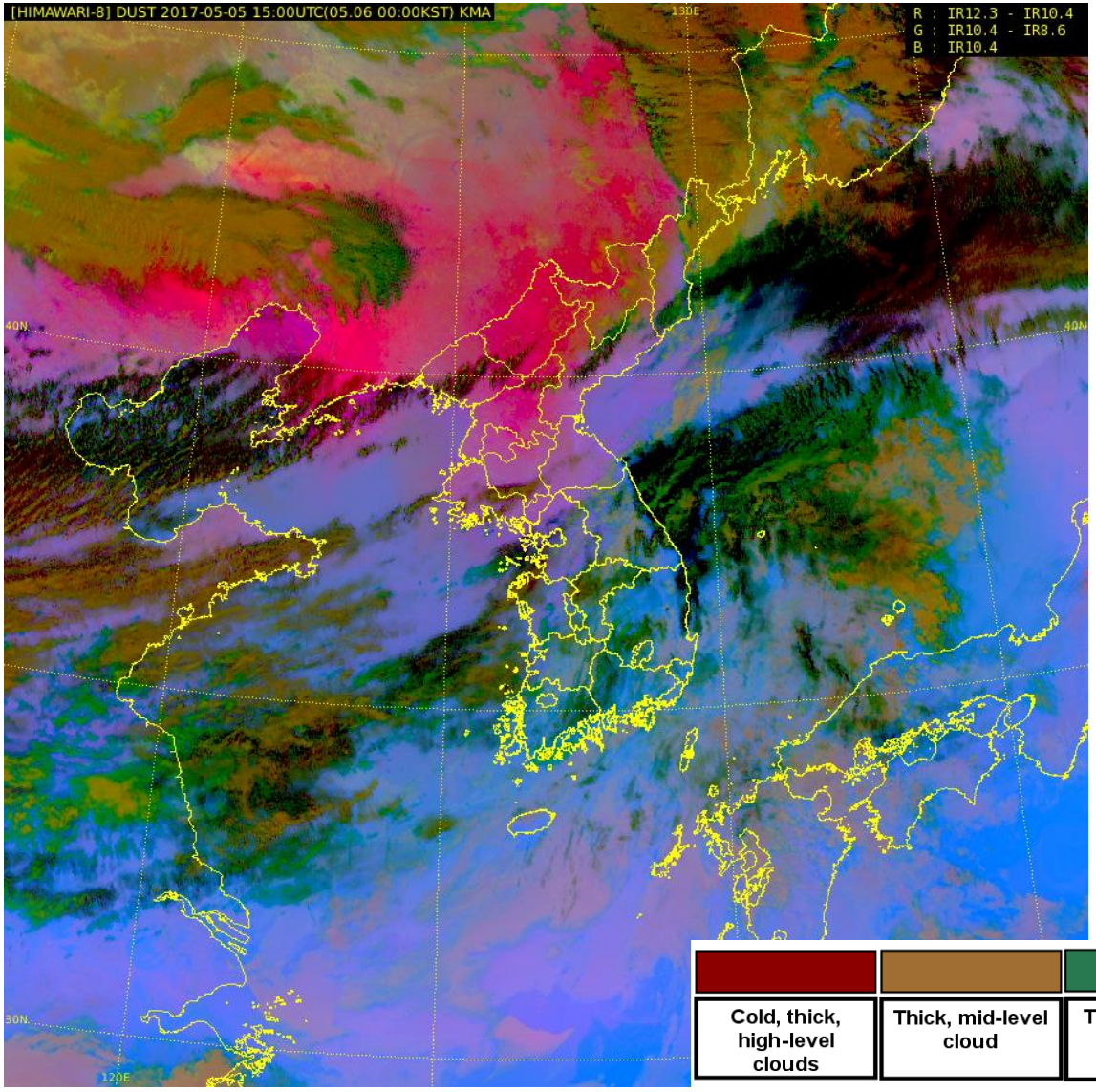
Ocean	Warm Desert	Cold Desert	Warm Land

Beam	Channel	Range	Gamma	Gamma 2
Red	IR12.0 – IR10.8	-4 … +2K	1.0	1.0
Green	IR10.8 – IR8.7	0 … +15 K	2.5	1.0
Blue	IR10.8	+261 … +289 K	1.0	1.0

Asian Dust Monitoring

National Meteorological Satellite Center

15:00UTC 5th May – 00:00UTC 6th May 2017

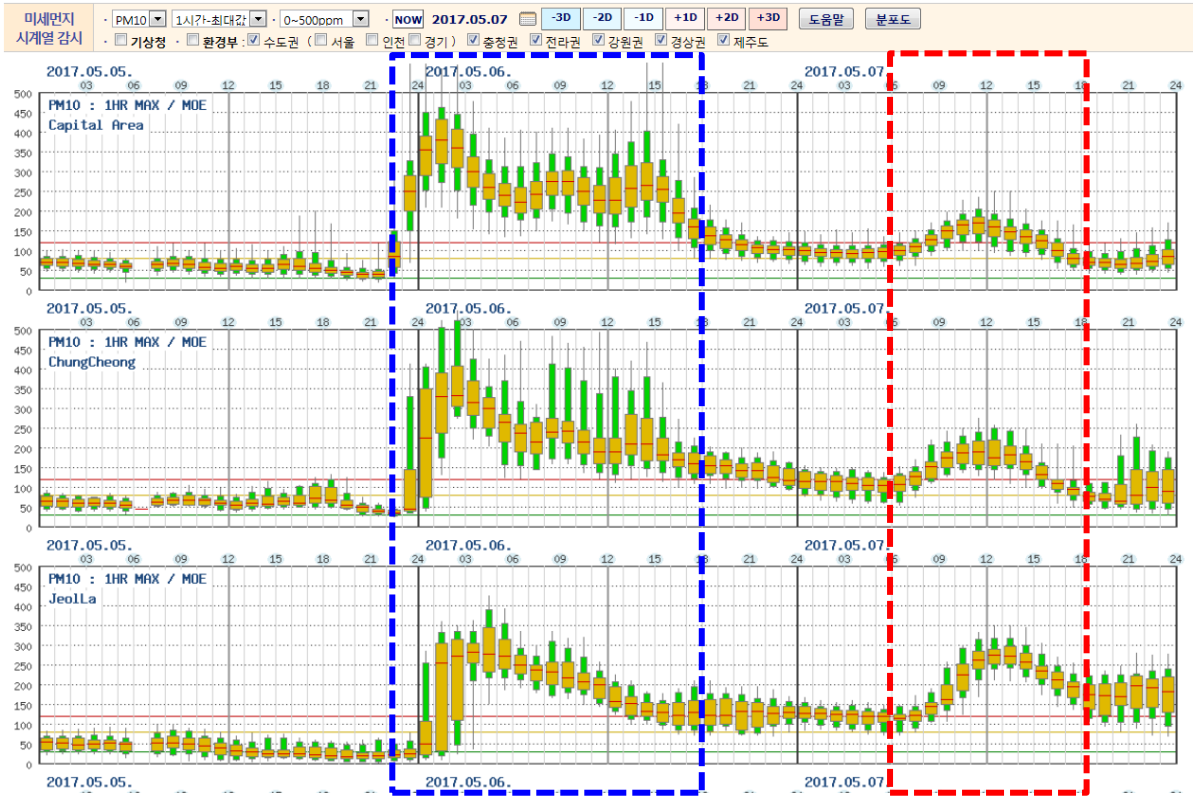


Asian Dust Monitoring – Surface Observation

National Meteorological Satellite Center

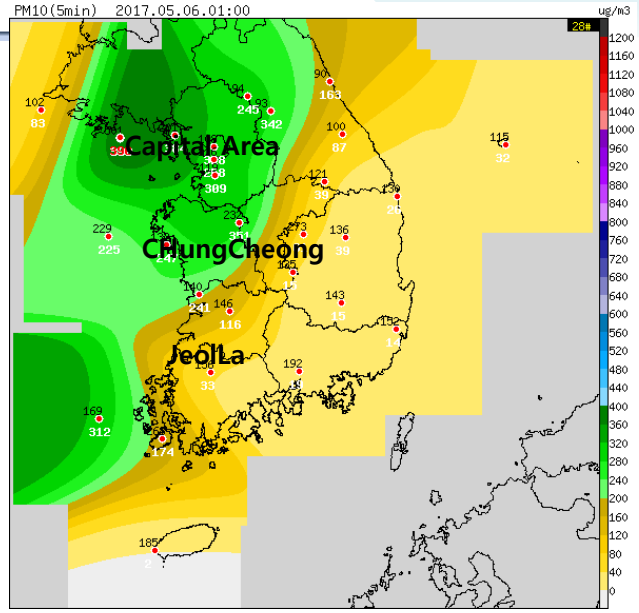
16:00UTC 5th May

Time series of PM10 concentration

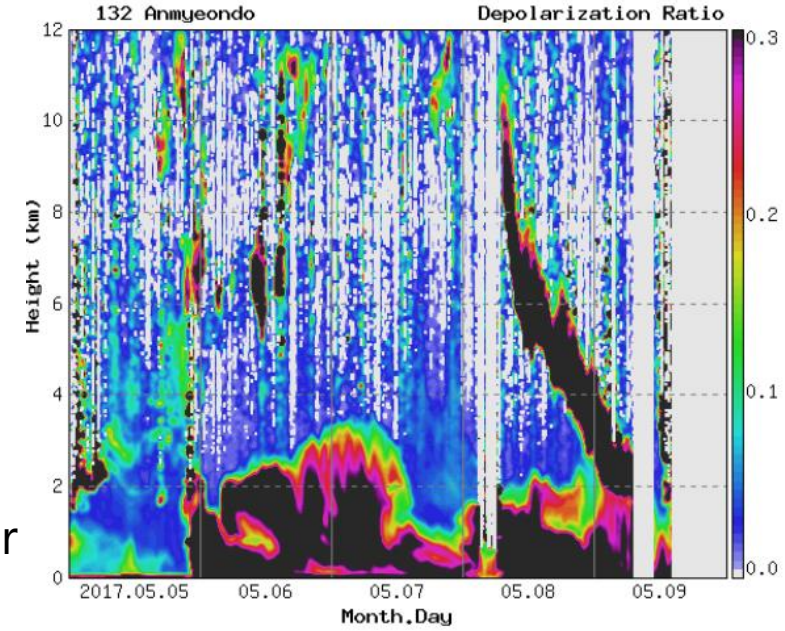


Strong dusts **Weak dusts**

600 times than normal day



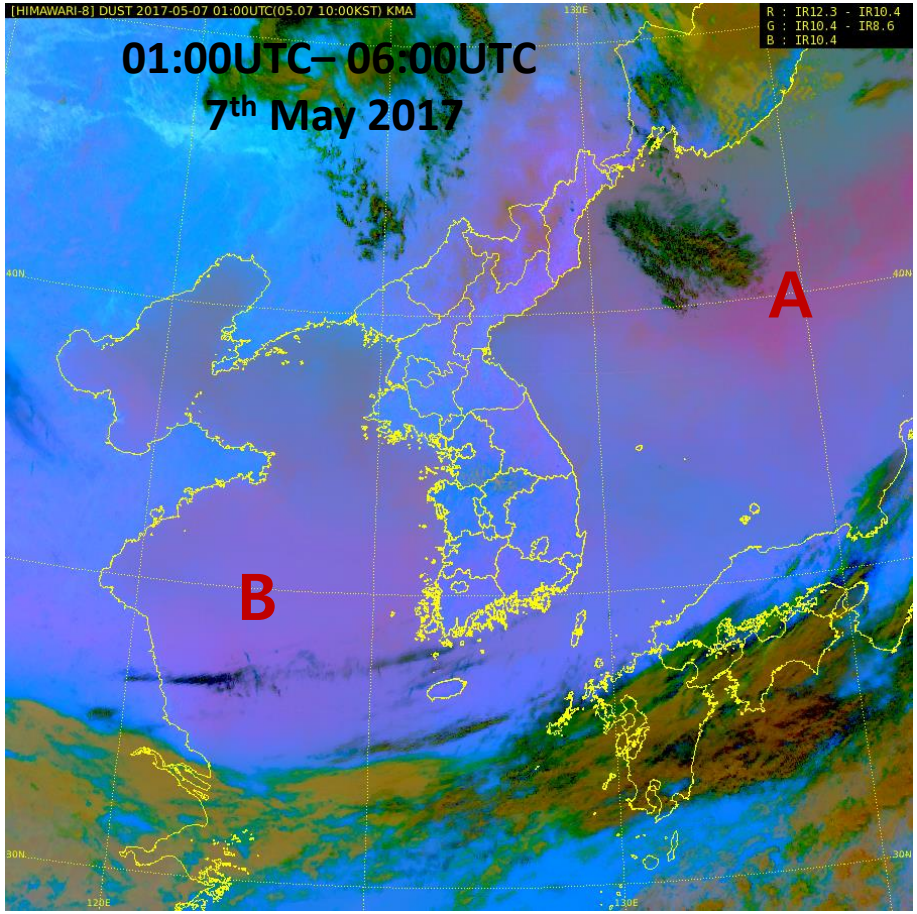
Lidar



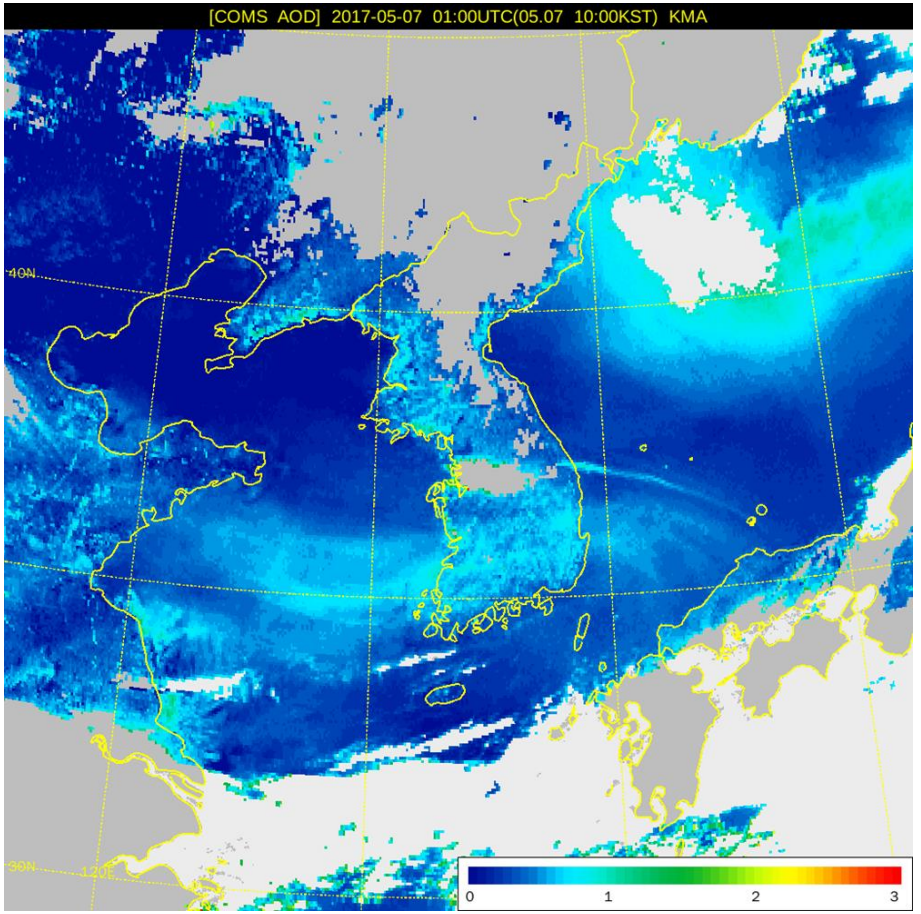
Asian Dust Monitoring – weak dusts (7th May 2017)

National Meteorological Satellite Center

Dust RGBs



COMS AOD



Do you think A and B areas are dusts ?

National Meteorological Satellite Center

Which one is best representing of dust and clouds ?

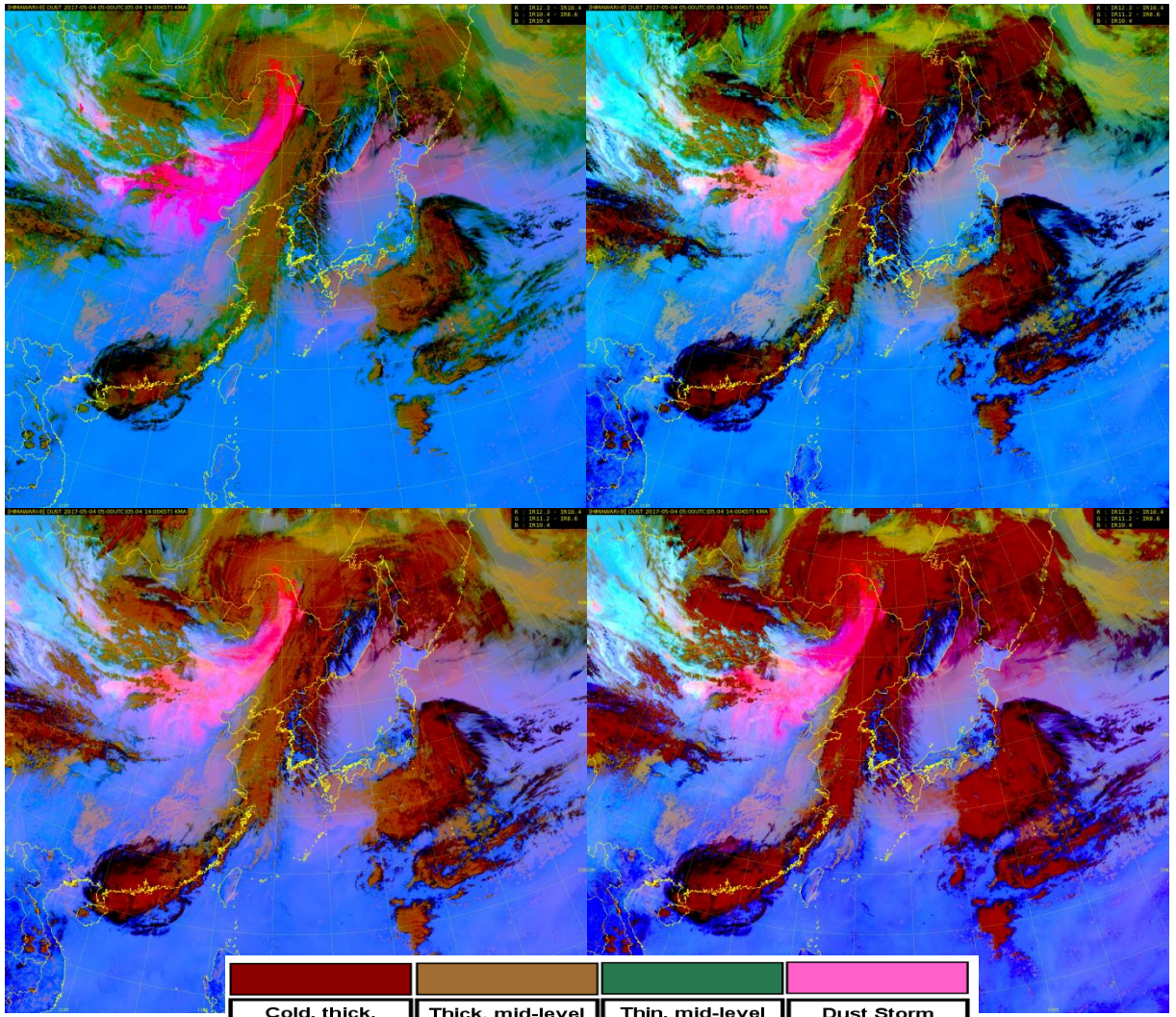
05:00 UTC 4th May 2017 (Strong dust case)

KMA
(EUMETSAT origin)

12.3 – 10.4 (-4~2)
10.4 – 8.6 (0~15)
10.4 (261~289)

EUMETSAT
Adjusted

12.3 – 10.4 (-4~2)
11.2 – 8.6 (0~10)
10.4 (261~289)

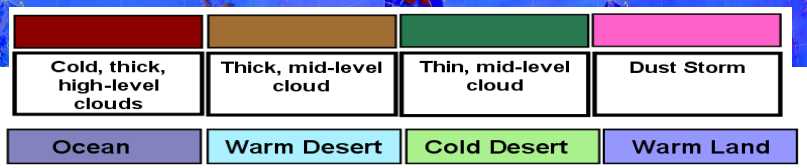


JMA

12.3 – 10.4 (-6.7~2.6)
11.2 – 8.6 (-0.5~20)
10.4 (261.2~288.7)

BOM

12.3 – 10.4 (-6.7~2.6)
11.2 – 8.6 (1~10.9)
10.4 (261.2~288.7)



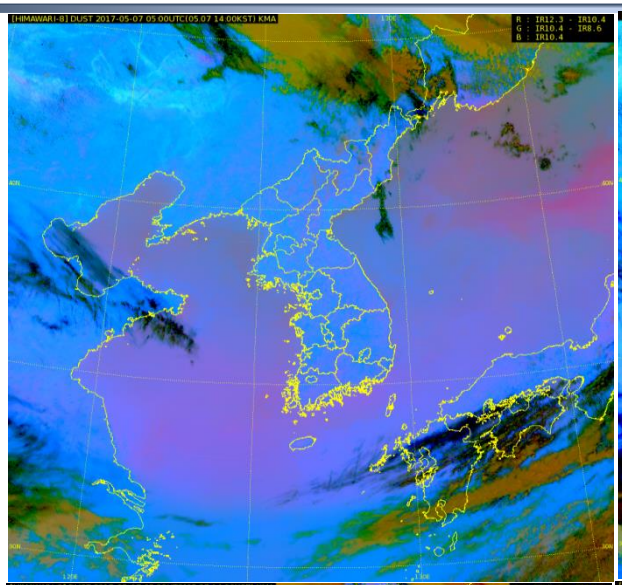
Which one is best for dust monitoring ?

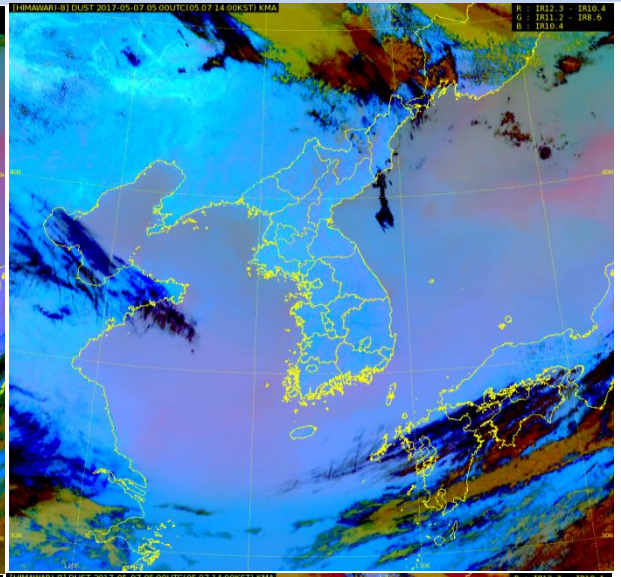
National Meteorological Satellite Center

05:00 UTC 7th May 2017
(Weak dust case)

KMA
(EUMETSAT origin)

12.3 – 10.4 (-4~2)
10.4 – 8.6 (0~15)
10.4 (261~289)



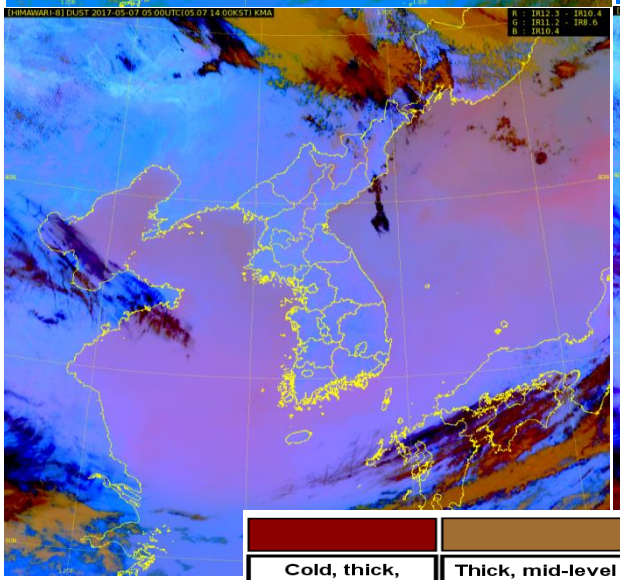


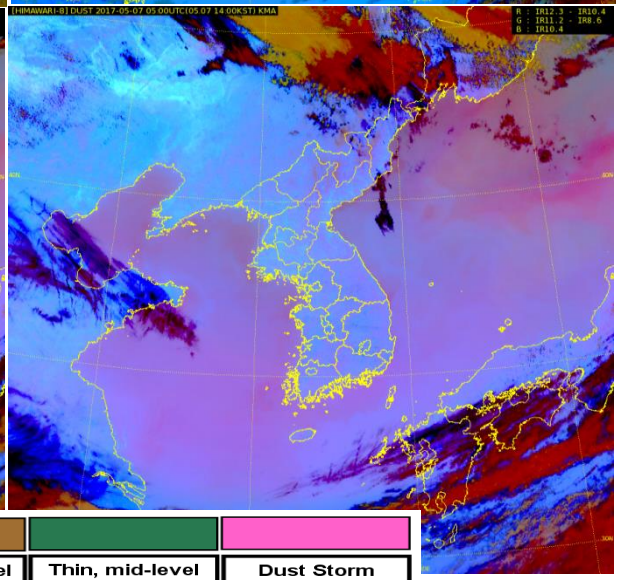
EUMETSAT
Adjusted

12.3 – 10.4 (-4~2)
11.2 – 8.6 (0~10)
10.4 (261~289)

JMA

12.3 – 10.4 (-6.7~2.6)
11.2 – 8.6 (-0.5~20)
10.4 (261.2~288.7)





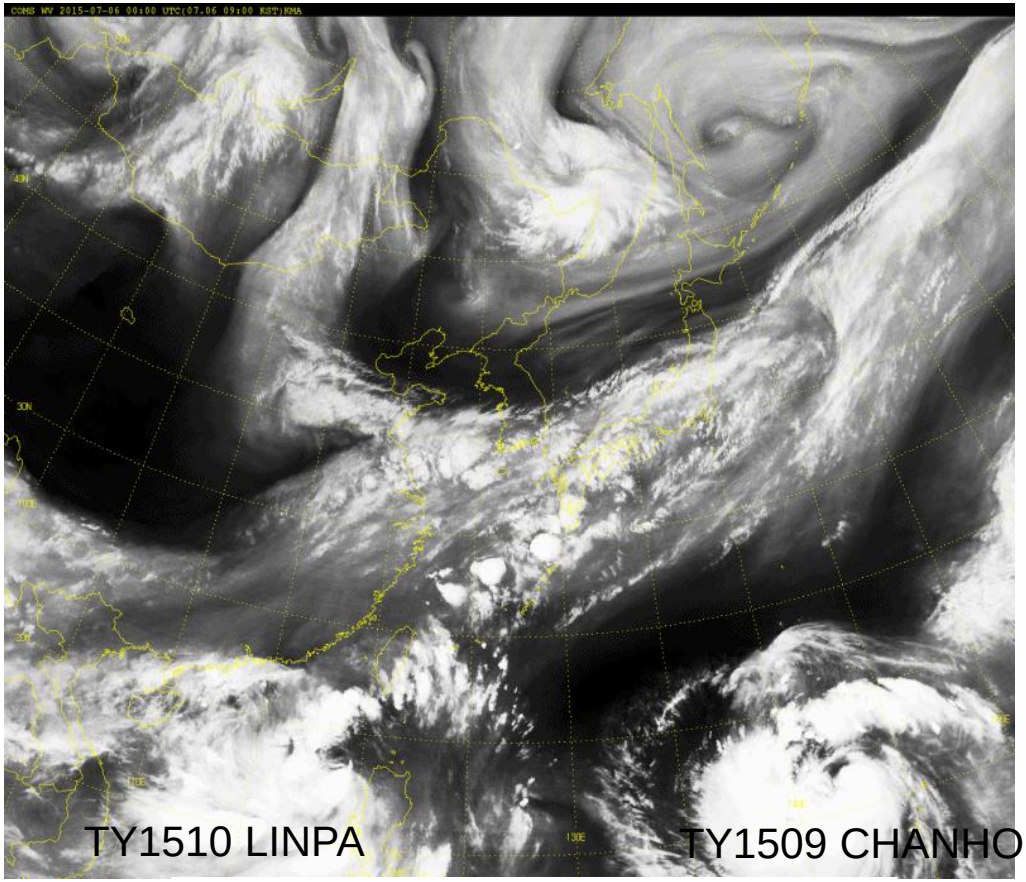
BOM

12.3 – 10.4 (-6.7~2.6)
11.2 – 8.6 (1~10.9)
10.4 (261.2~288.7)

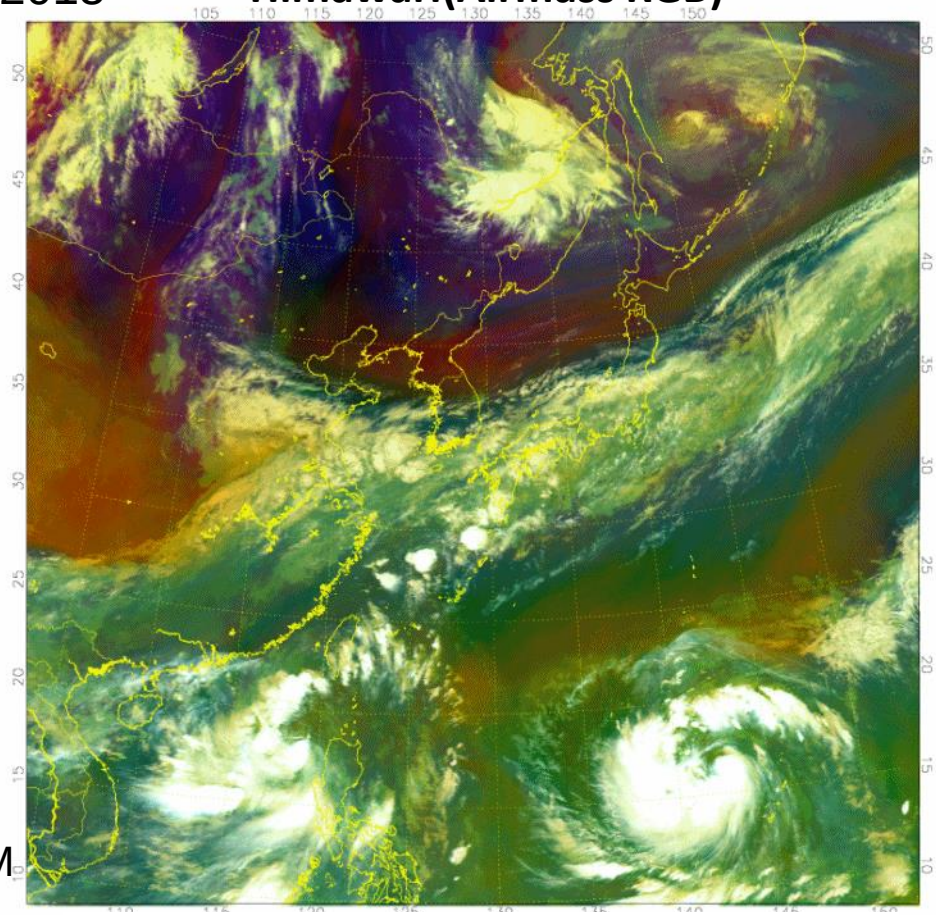
Usage of Airmass RGB

National Meteorological Satellite Center

COMS(WV) 6th July 2015 **Himawari(Airmass RGB)**



00:00~01:30 UTC(15min)



00:00~01:30 UTC(10min)

2015.07.06.0000UTC

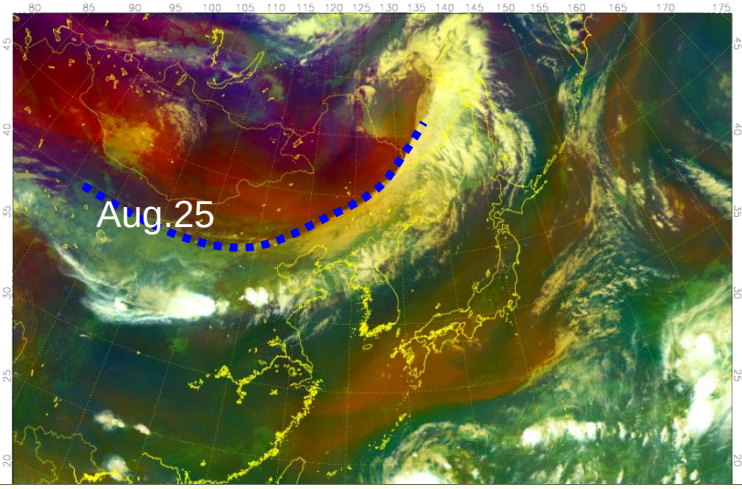
Which one is better for detection of dry area, jet stream upper-level circulation?

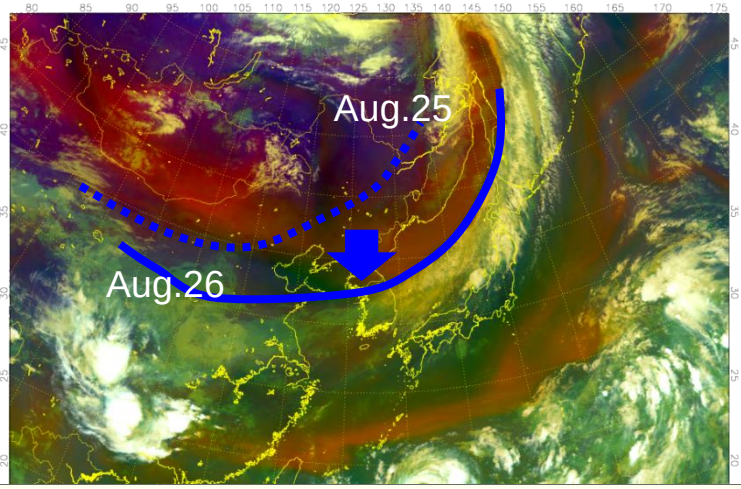
Which one is better for know airmass property and cloud information?

Usage of Airmass RGB – Downdraft of cold airmass

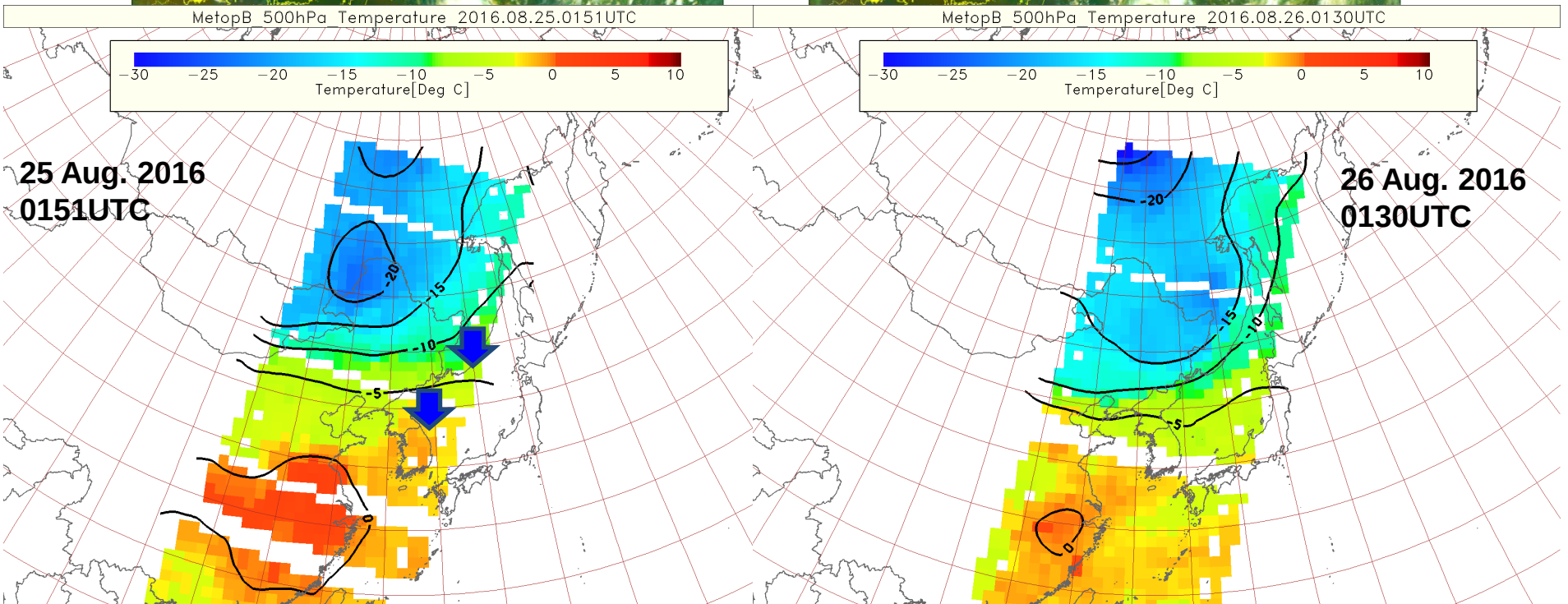
National Meteorological Satellite Center

02UTC
25th Aug
2016



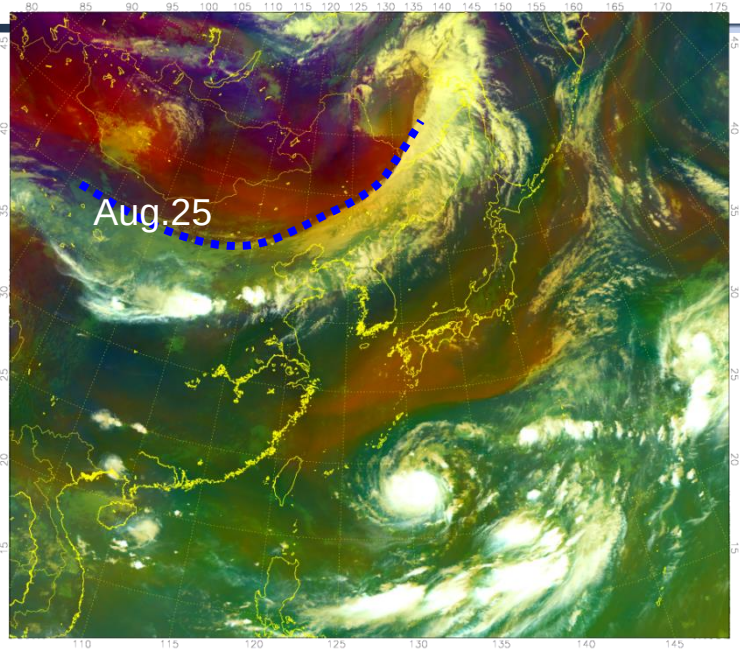


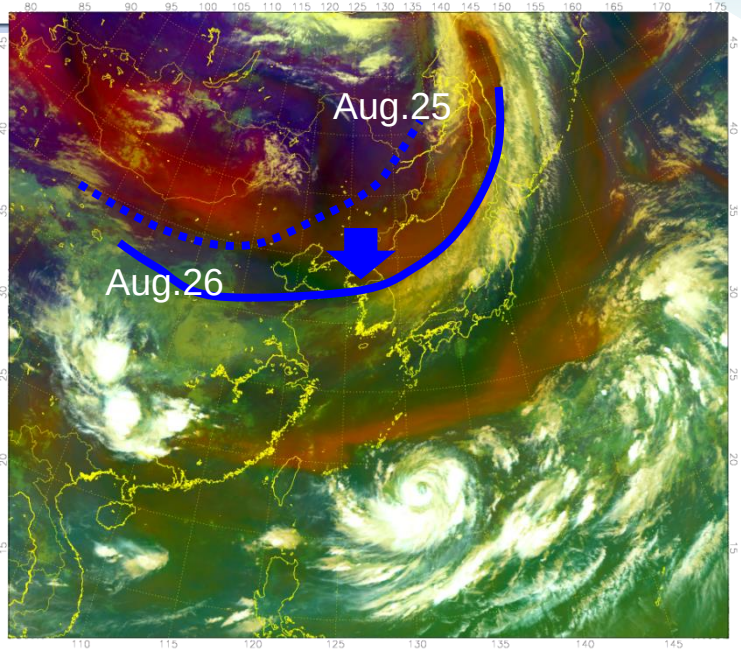
02UTC
26th Aug
2016



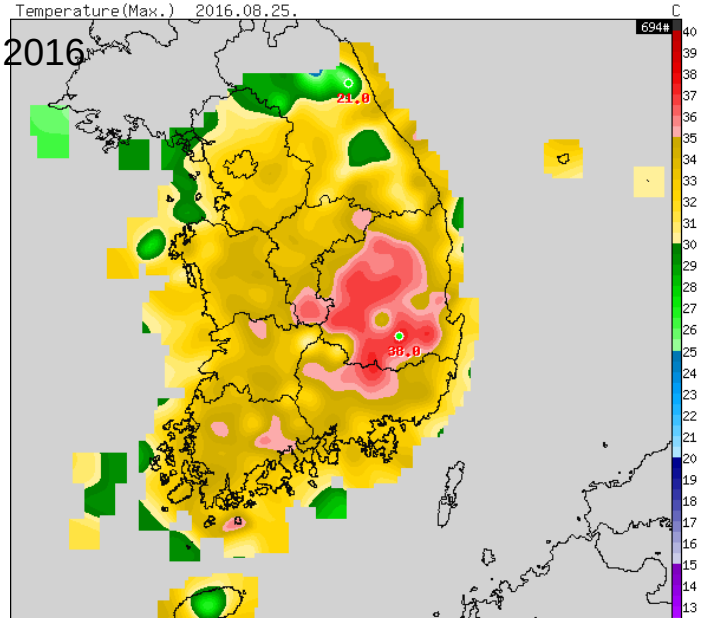
Usage of Airmass RGB – Downdraft of cold airmass

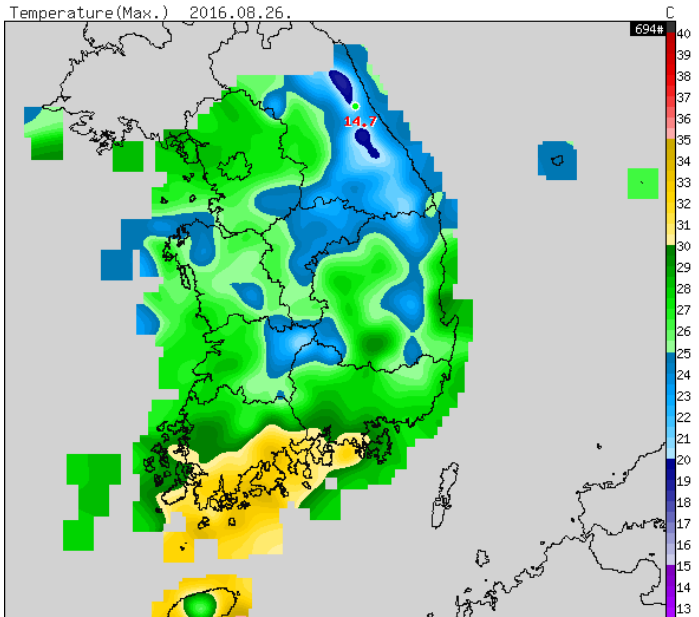
National Meteorological Satellite Center





25 Aug. 2016





26 Aug. 2016

Big drop of Temp