

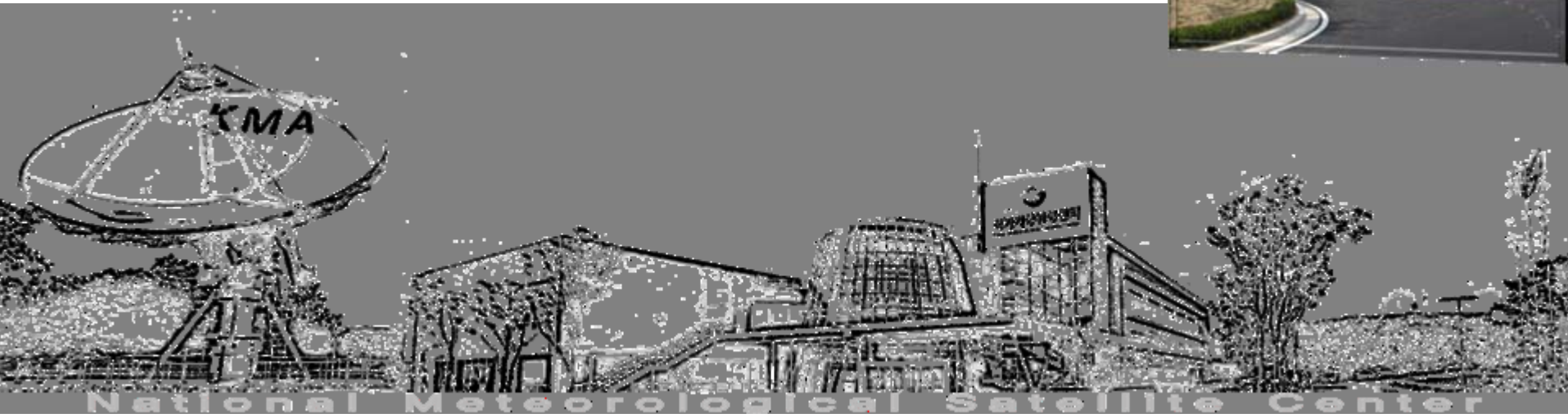
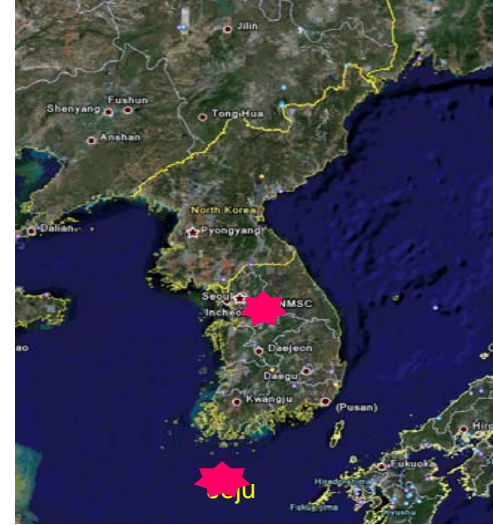
Applications on SAF-NWC Products using MTSAT-1R in Korea

**Jun-Dong Park, Jong Seo Park, and Dong Ho Kim
National Meteorological Satellite Center/KMA
April 27, 2010**



Brief History of NMSC/KMA

- 1970. 12 Installation of NOAA image receiving system and operation
- 1978. 4 Establishment of Satellite Meteorology Division
- 1979. 4 Receiving GMS-1 satellite image (LR FAX)
- 2005. Installation of MTSAT-1R receiving system
- 2006. 3 Ground-breaking ceremony of NMSC building
- 2008. 8 Completion of NMSC building
- 2009. 4 Establishment of NMSC organization (3 divisions, quota 43)

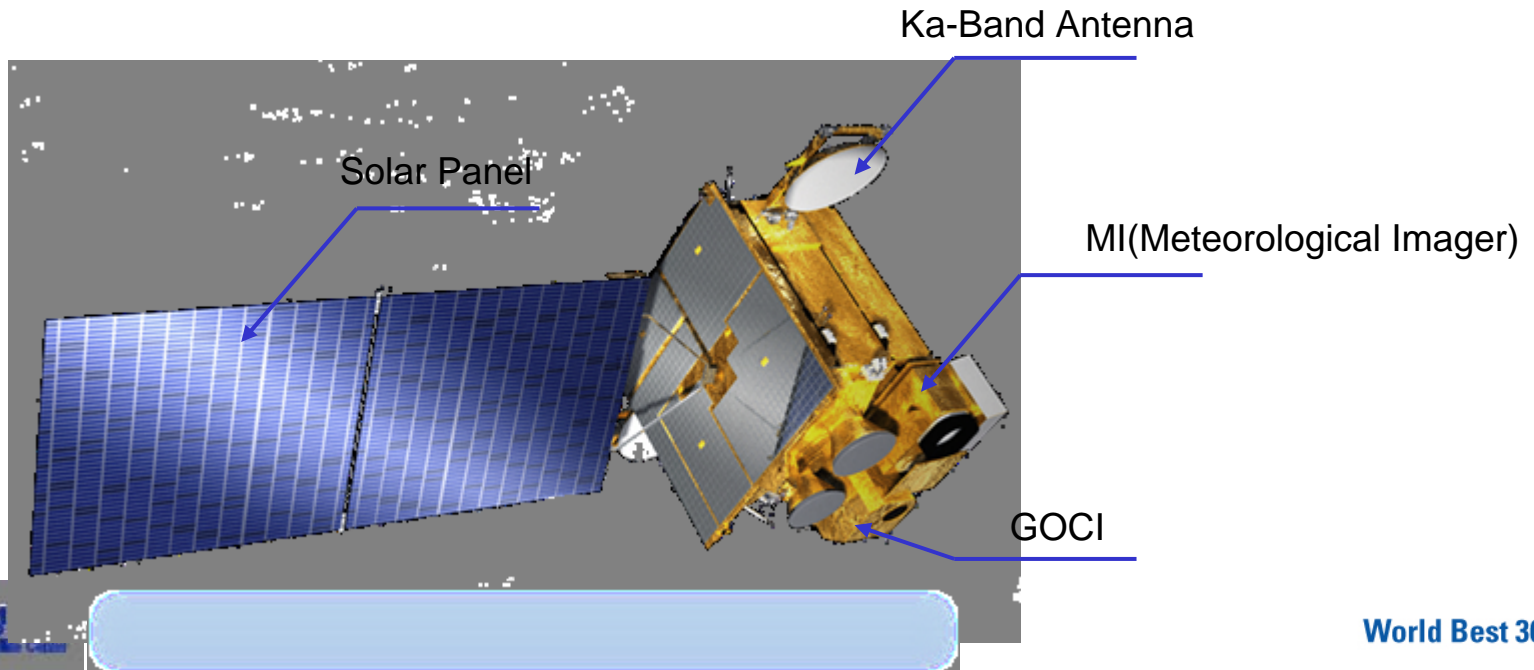


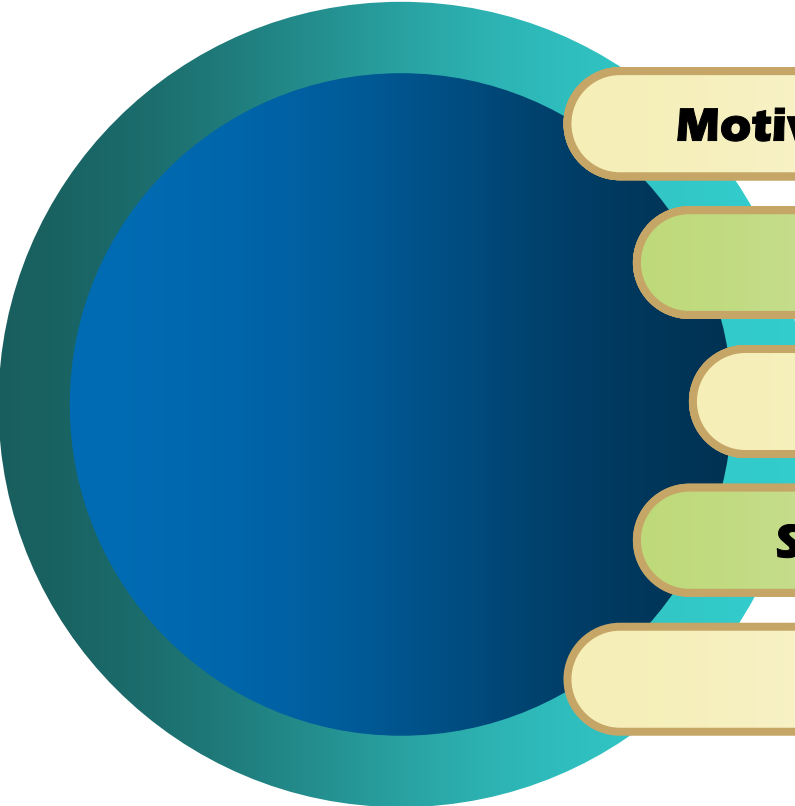
COMS

(Communication, Ocean, and Meteorological Satellite)

하늘을 친구처럼
국민을 하늘처럼

Orbital Location	128.2 E
Lifetime	7 Years
S/C Stabilization	3-axis
Station-keeping Accuracy	$\pm 0.05^\circ$ in lon/lat
Multiple Payloads	MI(5 channel imager), GOCI, Communication
Data Distribution	HRIT/LRIT within 15 min. after image acquisition





Motivation & MTSAT-1R

System Flow Chart

Examples & verification

Some other packages

Future works

- Schedule to launch COMS (first Korean Geostationary Meteorological Satellite) sometime in next month
 - Current MTSAT-1R: 30 Min temporal
 - After COMS: 15 Min for Asian area (Max 8 min on special scan)
- KMA-EUMETSAT has MoU since 2006
- Produce the prediction for short range forecast using high temporal resolution from COMS
- Provide additional information to support to nowcasting and very short range forecast using satellite

MSG vs. MTSAT/COMS

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MSG SEVIRI

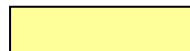
	IR 6.2 (WV)	IR 10.8	IR 12.0
Wave length	5.35 ~ 7.15	9.8 ~ 11.8	11.0 ~ 13.0
center	6.25	10.8	12.0

MTSAT-1R

	VIS	IR1	IR2	IR3 (WV)	IR4
Wave length	0.55 ~ 0.9	10.3 ~ 11.3	11.5 ~ 12.5	6.5 ~ 7.0	3.5 ~ 4.0
center	0.725	10.8	12.0	6.75	3.75

COMS

	VIS	SWIR	WV	IR1	IR2
Wave length	0.55 ~ 0.8	3.5 ~ 4.0	6.5 ~ 7.0	10.3 ~ 11.3	11.5 ~ 12.5
center	0.675	3.75	6.75	10.8	12.0



WV AMV

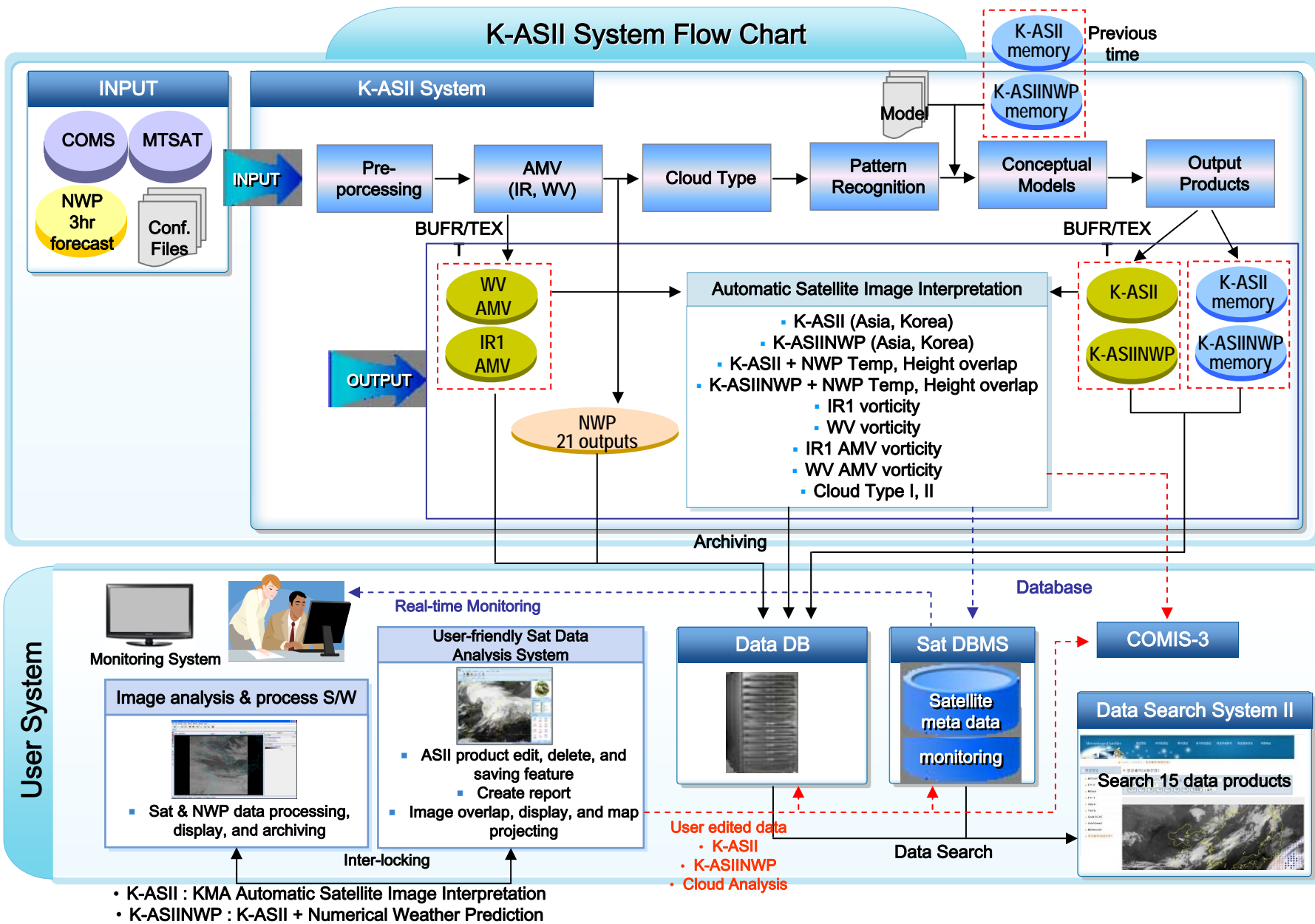


IR AMV



SAT only & SAT+NWP

K-ASII System Flow Chart

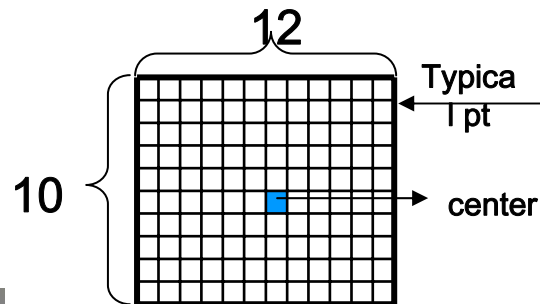
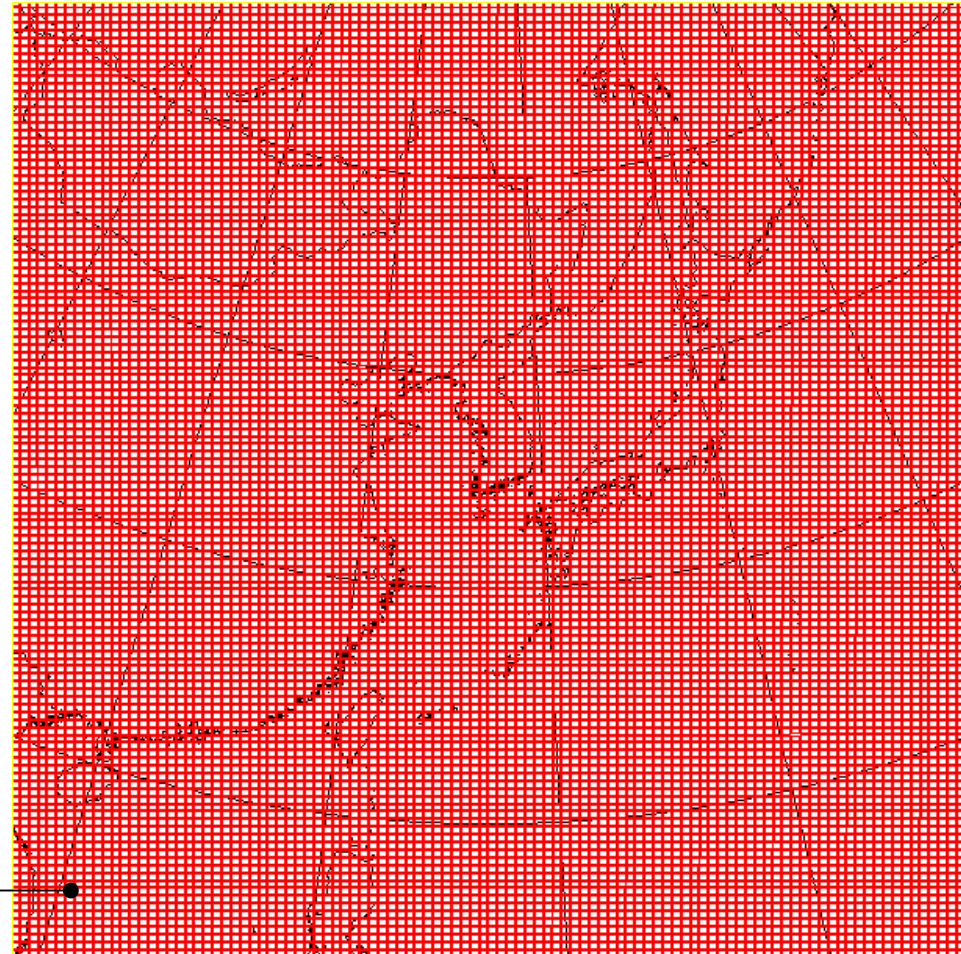


- K-ASII : KMA Automatic Satellite Image Interpretation
- K-ASIINWP : K-ASII + Numerical Weather Prediction

Aerial definition

하늘을 친구처럼
국민을 하늘처럼

	Definition
Region	▪ North East Asia
Input Satellite	▪ COMS, MTSAT-1/MTSAT-2
NWP	▪ GDAPS, later replace with UM
Image size	▪ 1248 x 1248
Pixel size	▪ 104 x 125 (= 13,000 pts)
1 pixel	▪ 12 x 10 pts
Center point	▪ Each point from out of 13,000 pts are on env file with lat/lon info
Outputs from each point	<ul style="list-style-type: none"> ▪ AMV ▪ Cloud type ▪ CM ▪ 21 outputs using NWP ▪ K-ASII outputs (12) ▪ K-ASII NWP outputs (12)

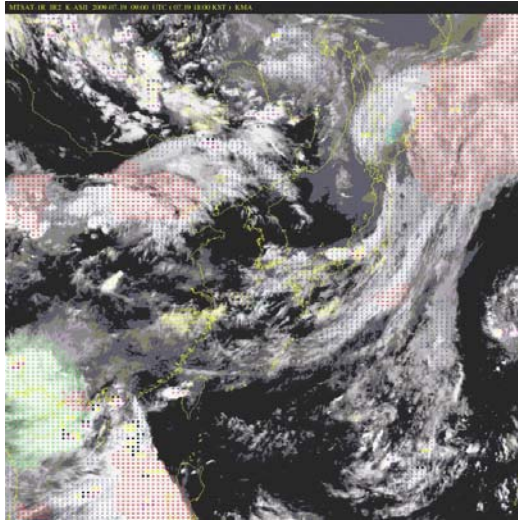


Typical outputs

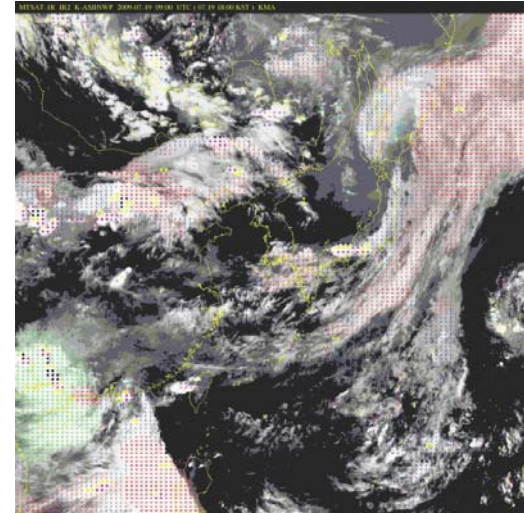
하늘을 친구처럼
국민을 하늘처럼



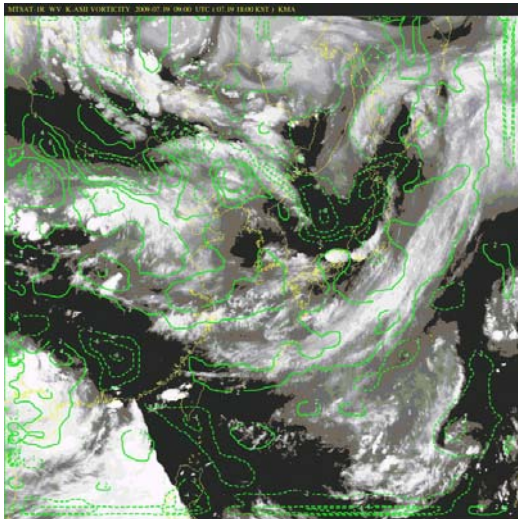
K-ASII



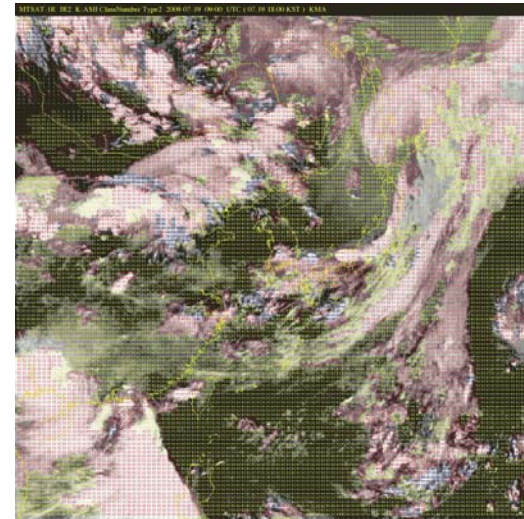
K-ASIINWP



WV AMV
vorticity

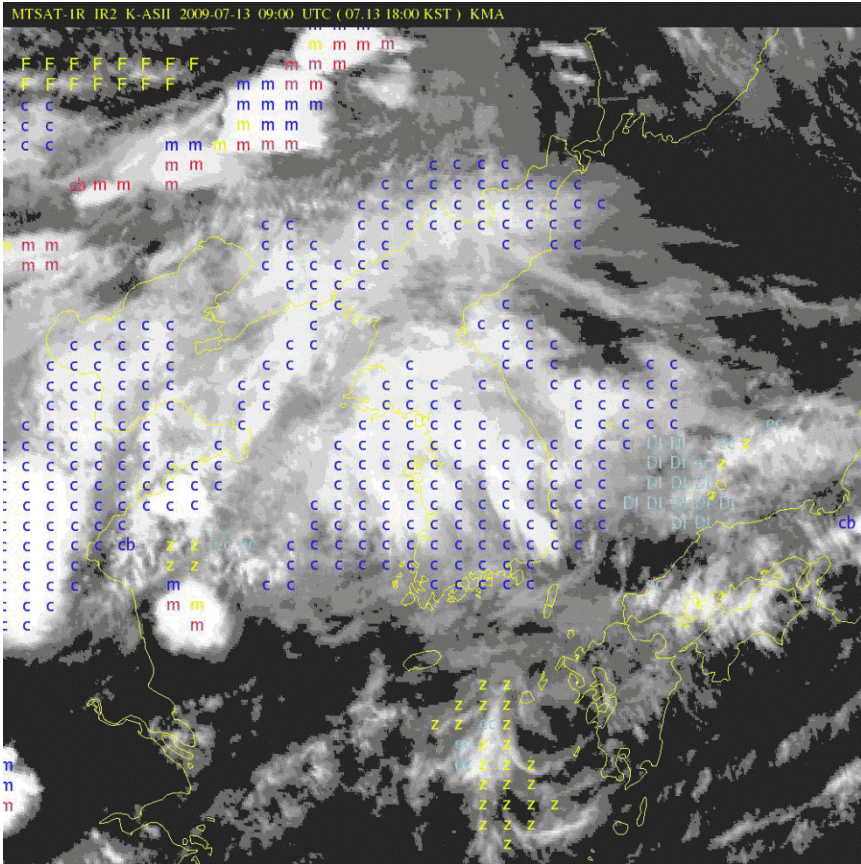


Cloud type

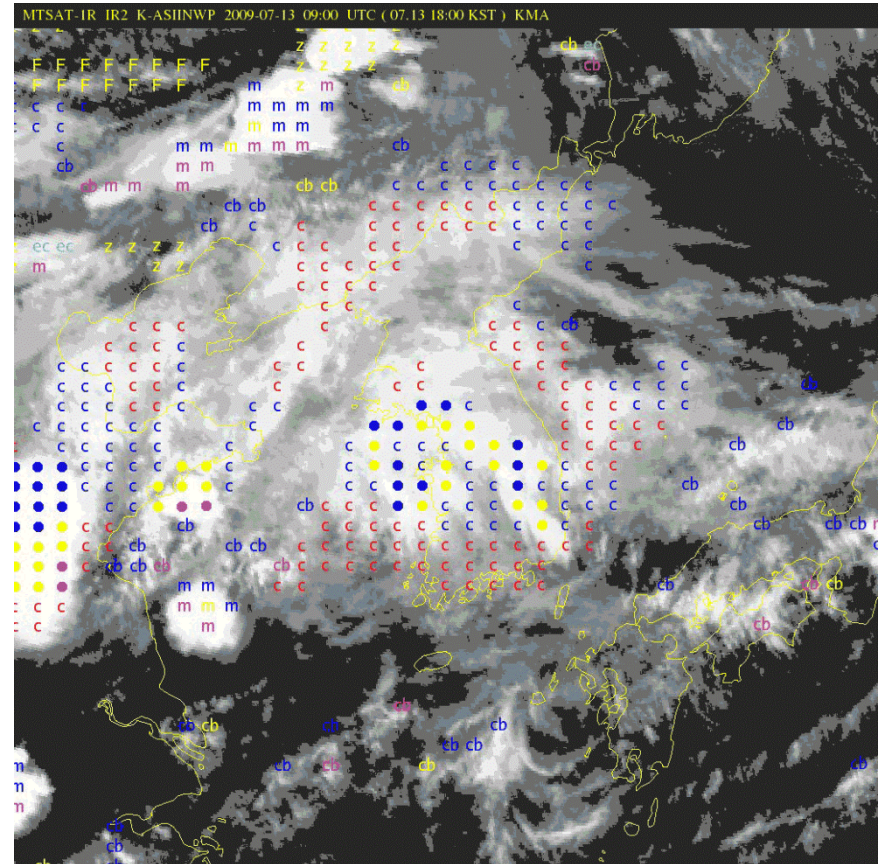




K-ASII



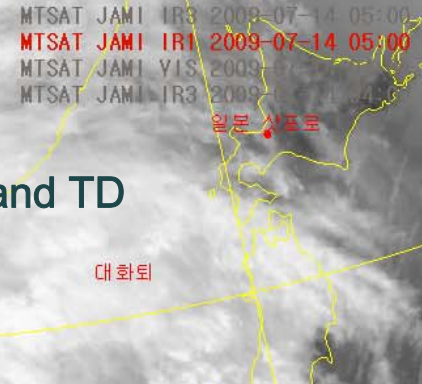
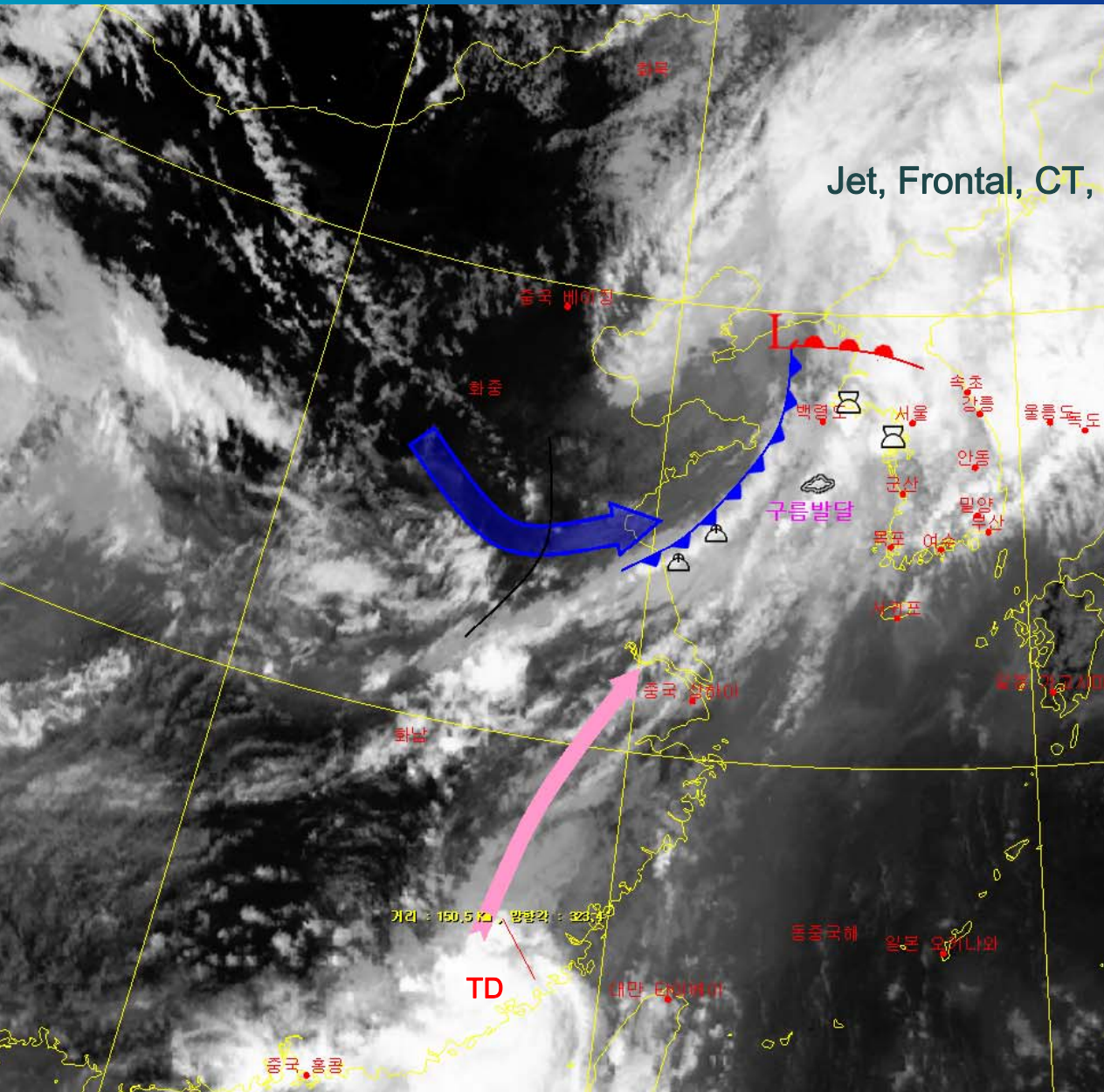
K-ASIIINWP



- K-ASII : KMA Automatic Satellite Image Interpretation
- K-ASIIINWP : K-ASII + Numerical Weather Prediction

July 14, 2009 0500UTC

하늘을 친구처럼
국민을 하늘처럼

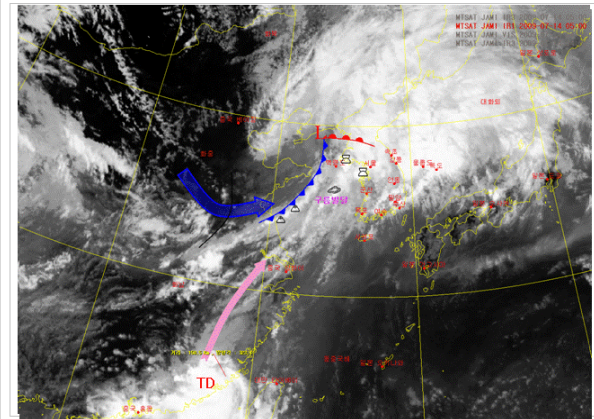


기상청 날씨누리 | 2009. 07. 14. 0618 UTC (2009. 07. 14. 1518 KST)

구름분석정보

2009-07-14-01-001

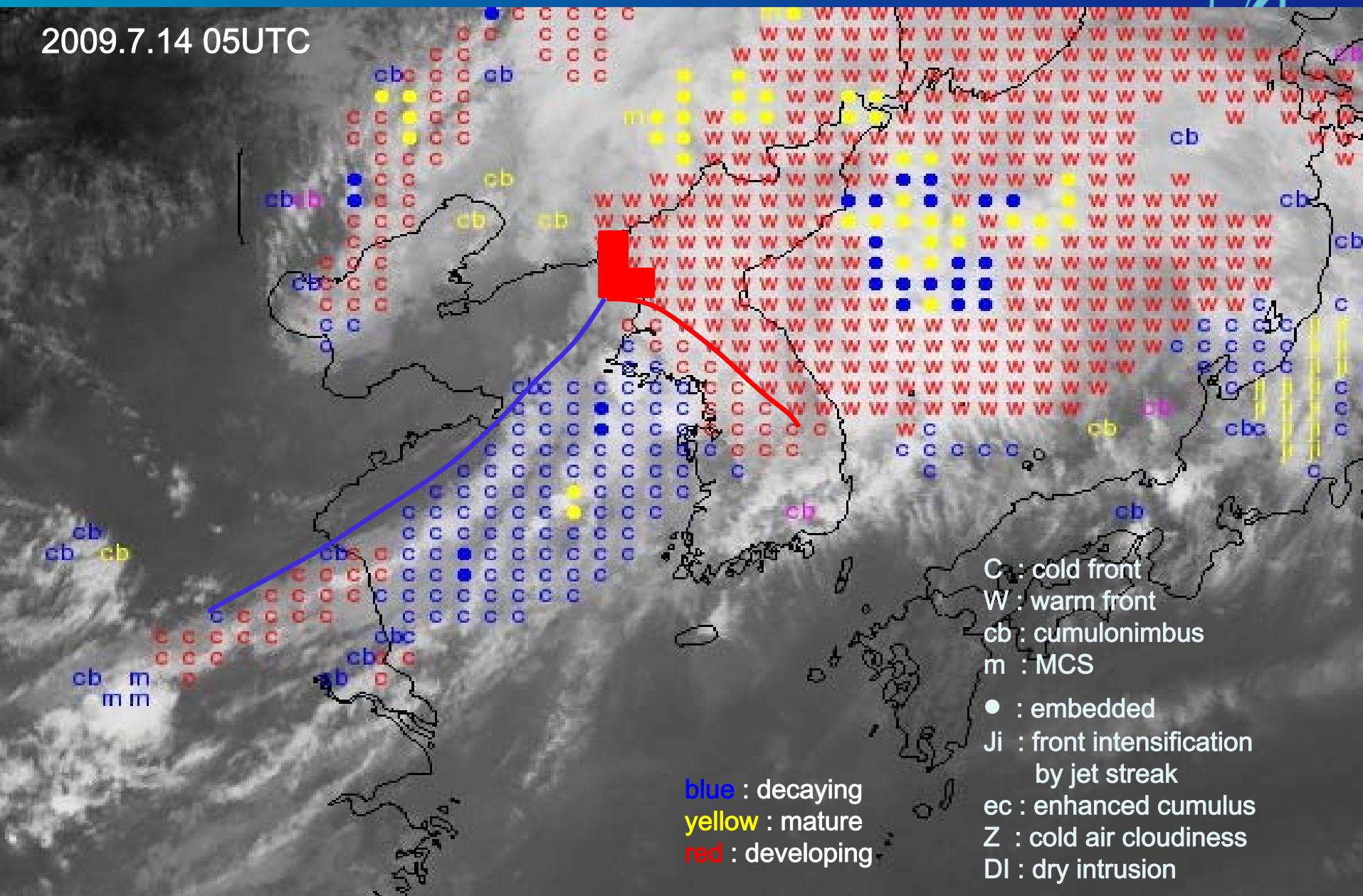
위성	센서	관측모드	분석영역	관측시간
MTSATIR	JAMI	아시아	기타	2009. 07. 14. 0500 UTC (2009. 07. 14. 1400 KST)



분석자 : 위성자료분석팀/고수미 | smkoh@kma.go.kr | Tel. 043-717-0236

- | 영상종류 | MTSAT-IR | 사용채널 | 적외채널 |
|--|----------|------|------|
| <ul style="list-style-type: none"> 분석 주관점 : 발달한 저기압의 한랭전선 전면에서 발생하는 구름의 발달과 이동경로. 이 구름대가 TD 구름대와 합류 후 발달하면서 한반도로 유입 현재 요동반도 남쪽에 중심을 둔 저기압의 한랭전선 전면에서 구름이 발달하여 서해에서 한반도 동부 지방을 중심으로 남서쪽에서 북동방향으로 가로지르면서 지속적으로 유입 수증기 영상에서, 상층의 양역 바운더리가 한중지방에서 산둥반도 남서쪽까지 길어져 상층의 한기의 남하가 확대되었음을 알 수 있음. 이 바운더리 부근에서 대류운이 지속적으로 발달하고 있음. 이와 더불어, 대만 서쪽의 열대성저기압이 6시간 동안 약 150km정도 북서쪽으로 이동하면서 수증기를 북쪽으로 수송하고 있으며, 그 선단인 하층운대는 북동쪽으로 방향을 전환하여 상해부근으로 이동 중. 이 구름대가 오늘날부터 한랭전선에 동반된 구름대와 합류하면서 구름대가 더 발달할 것으로 예상되며, 이로 인해 오늘날부터 내일 새벽까지 우리나라에 많은 강수 예상. | | | |

2009.7.14 05UTC



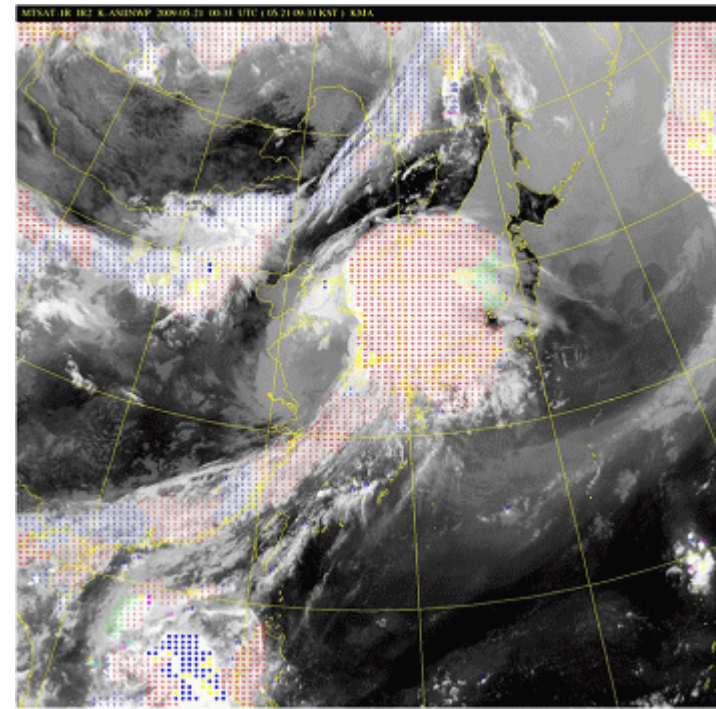
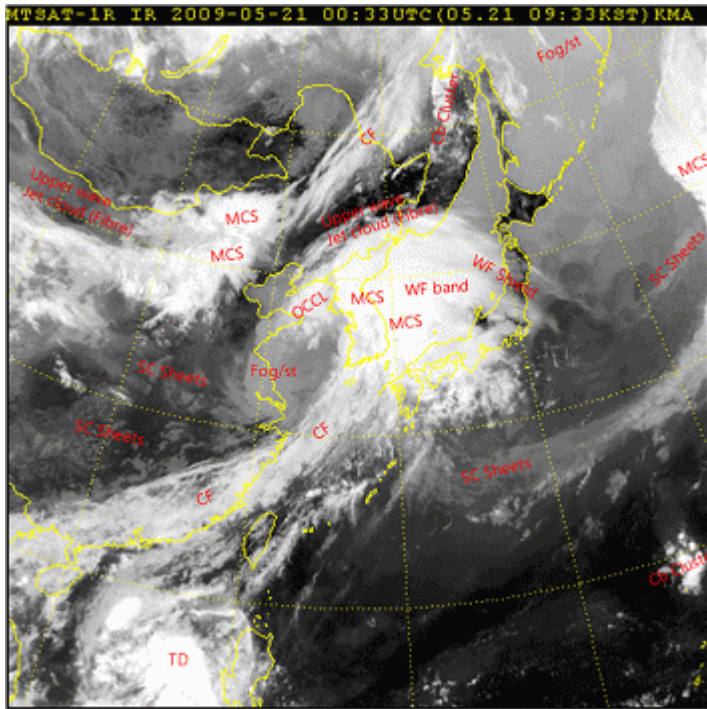
C : cold front
W : warm front
cb : cumulonimbus
m : MCS

● : embedded
Ji : front intensification
by jet streak
ec : enhanced cumulus
Z : cold air cloudiness
DI : dry intrusion

blue : decaying
yellow : mature
red : developing

May 21, 2009 0033UTC

하늘을 친구처럼
국민을 하늘처럼

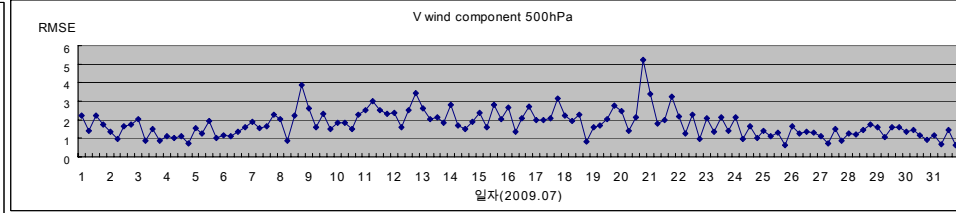
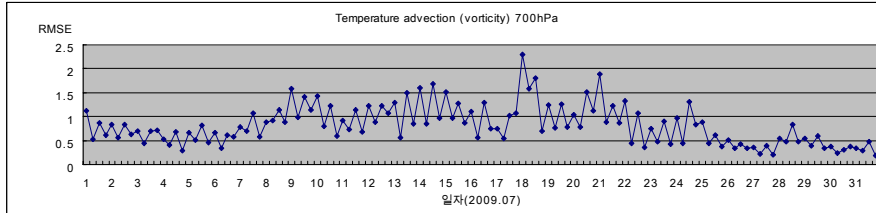
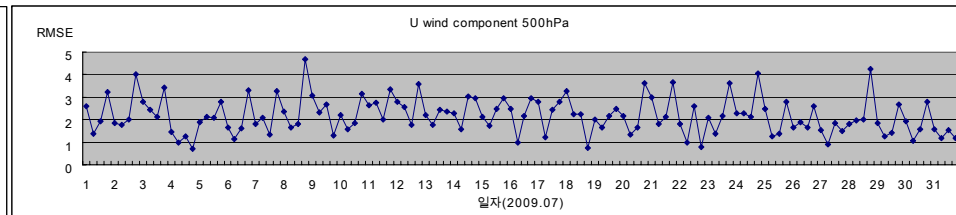
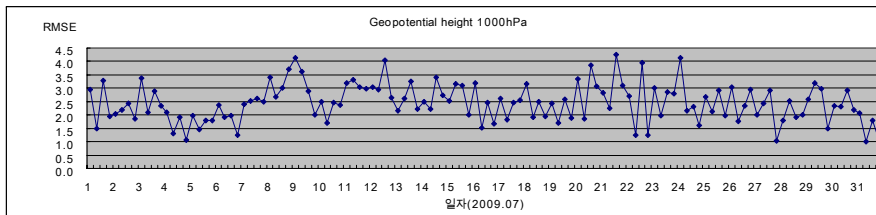


Warm Front	83.9%
Cold Front	92.1%
MCS	39.6%
Cb	100%
OCCL	0%

NWP sensitivity

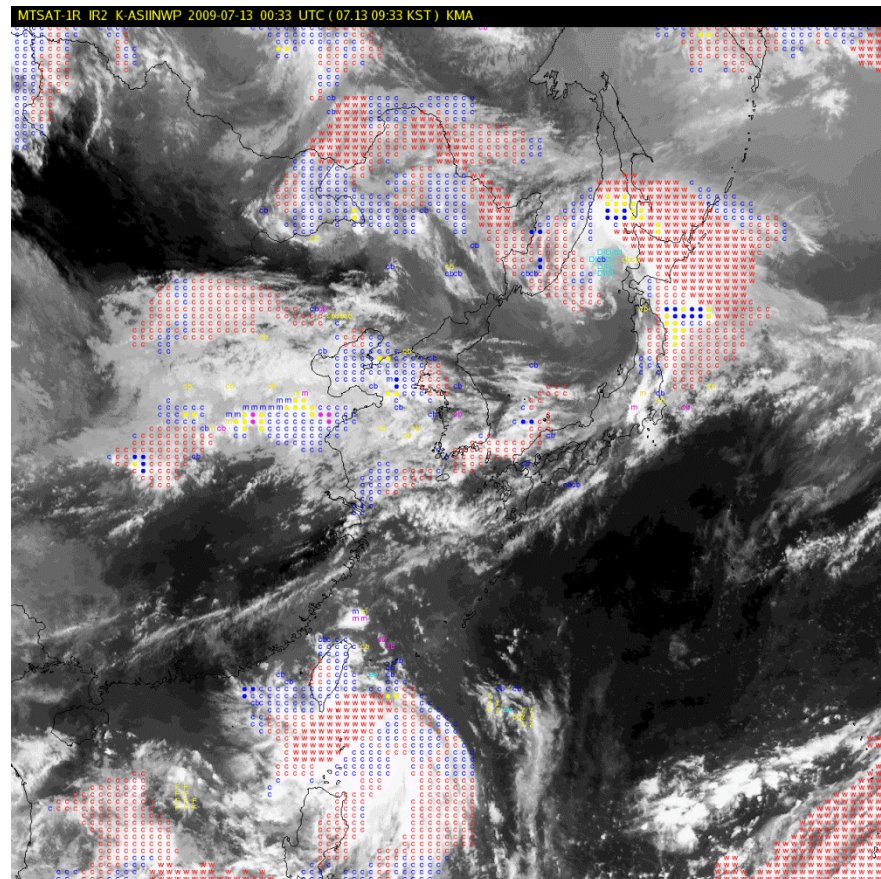
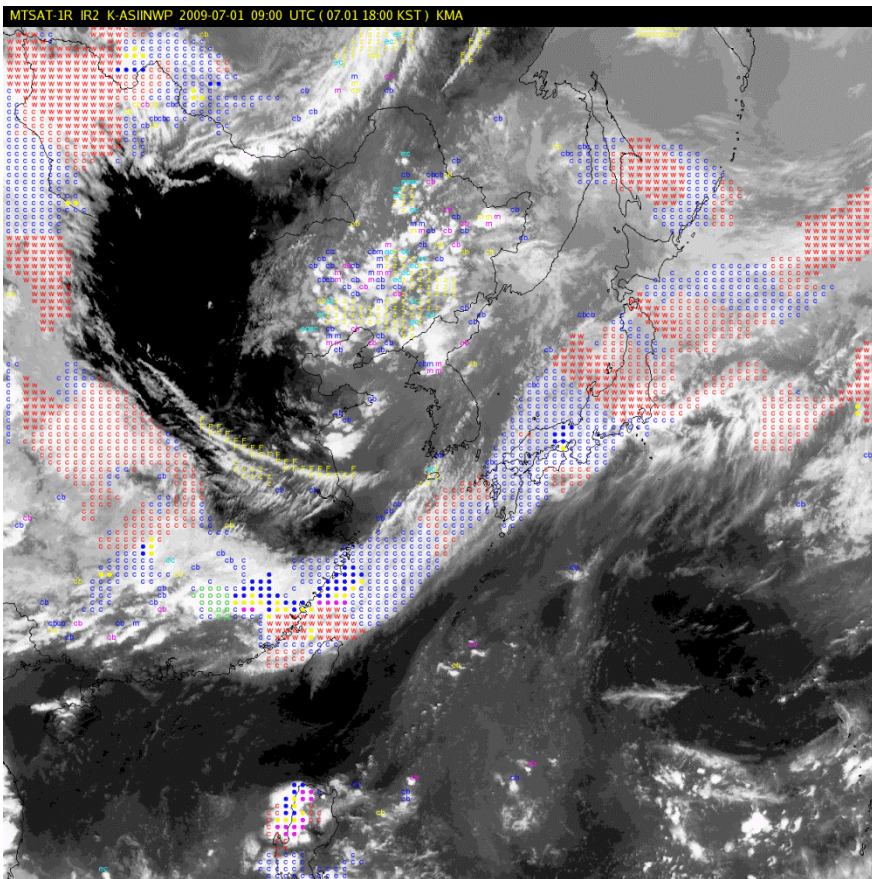
하늘을 친구처럼
국민을 하늘처럼

NWP		00h	06h	12h	18h	unit
RMSE	Geopotential height 1000hPa	0.73	0.79	0.91	0.75	gpdam (1dam=10m)
	Geopotential height 500hPa	0.87	0.69	0.77	1.16	
	Temperature advection (vorticity) 700hPa	0.99	0.61	1.01	0.65	K 12h ⁻¹
	U wind component 300hPa	2.73	2.16	2.81	2.13	m/s
	V wind component 300hPa	2.75	2.07	3.09	1.98	
	U wind component 500hPa	2.21	1.65	1.98	2.83	
	V wind component 500hPa	1.96	1.41	1.85	1.88	



PGE10 examples

하늘을 친구처럼
국민을 하늘처럼

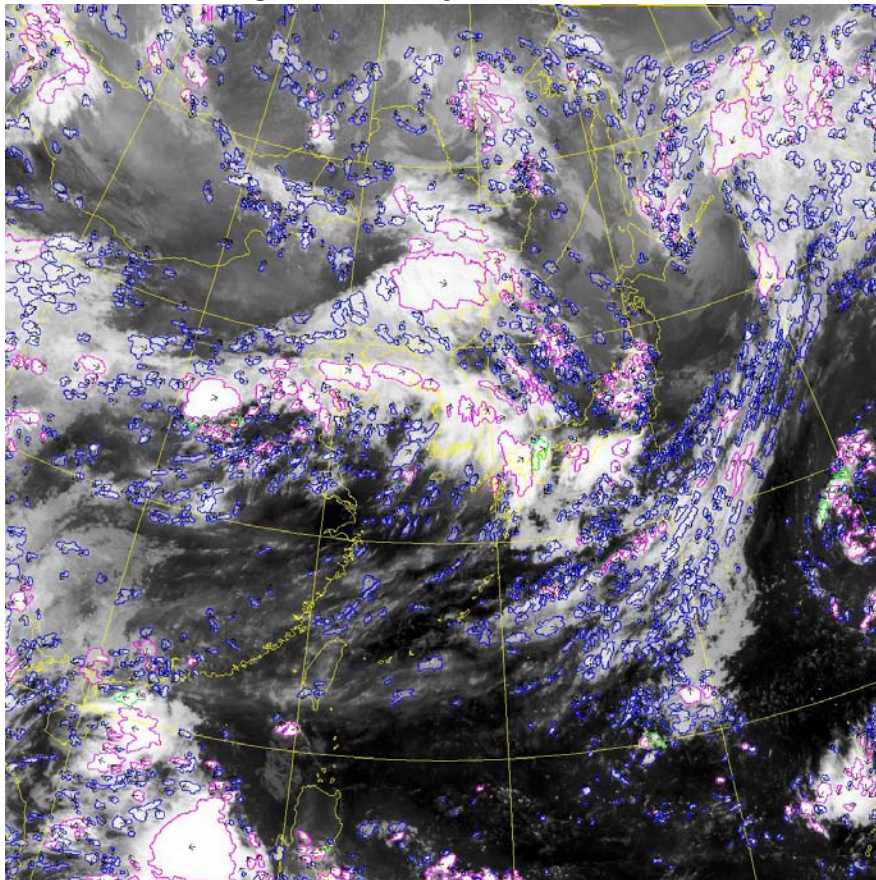


PGE11 example

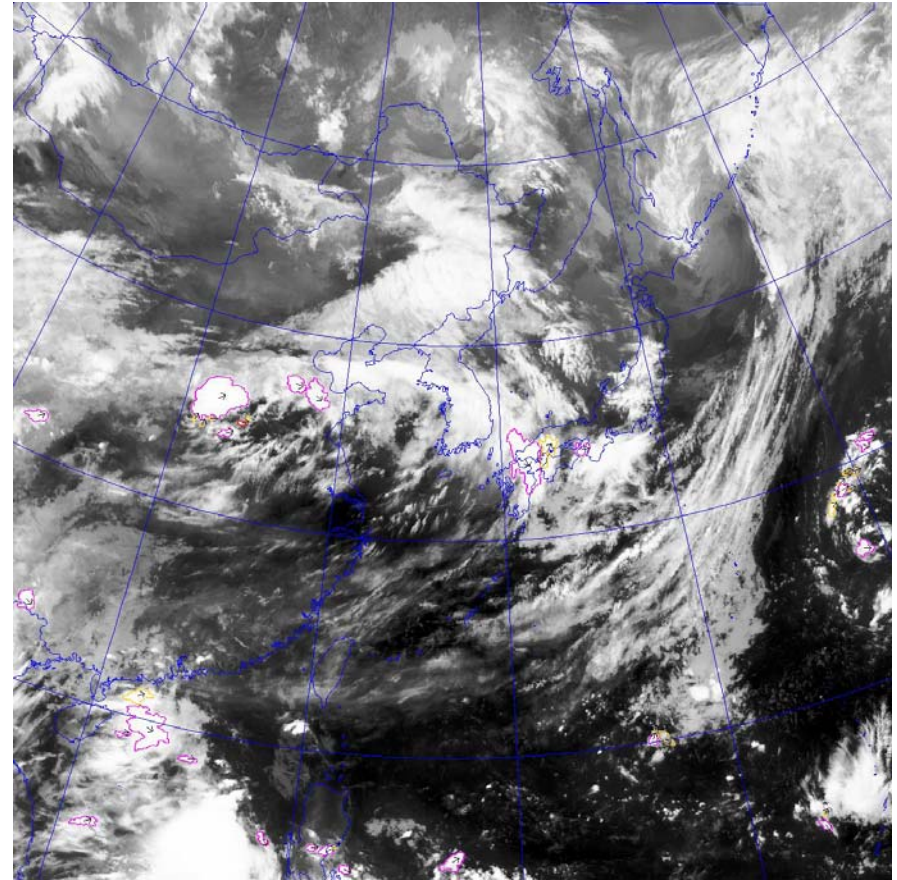
하늘을 친구처럼
국민을 하늘처럼

July 19, 2009 21:33 UTC

Tracking of cloud systems

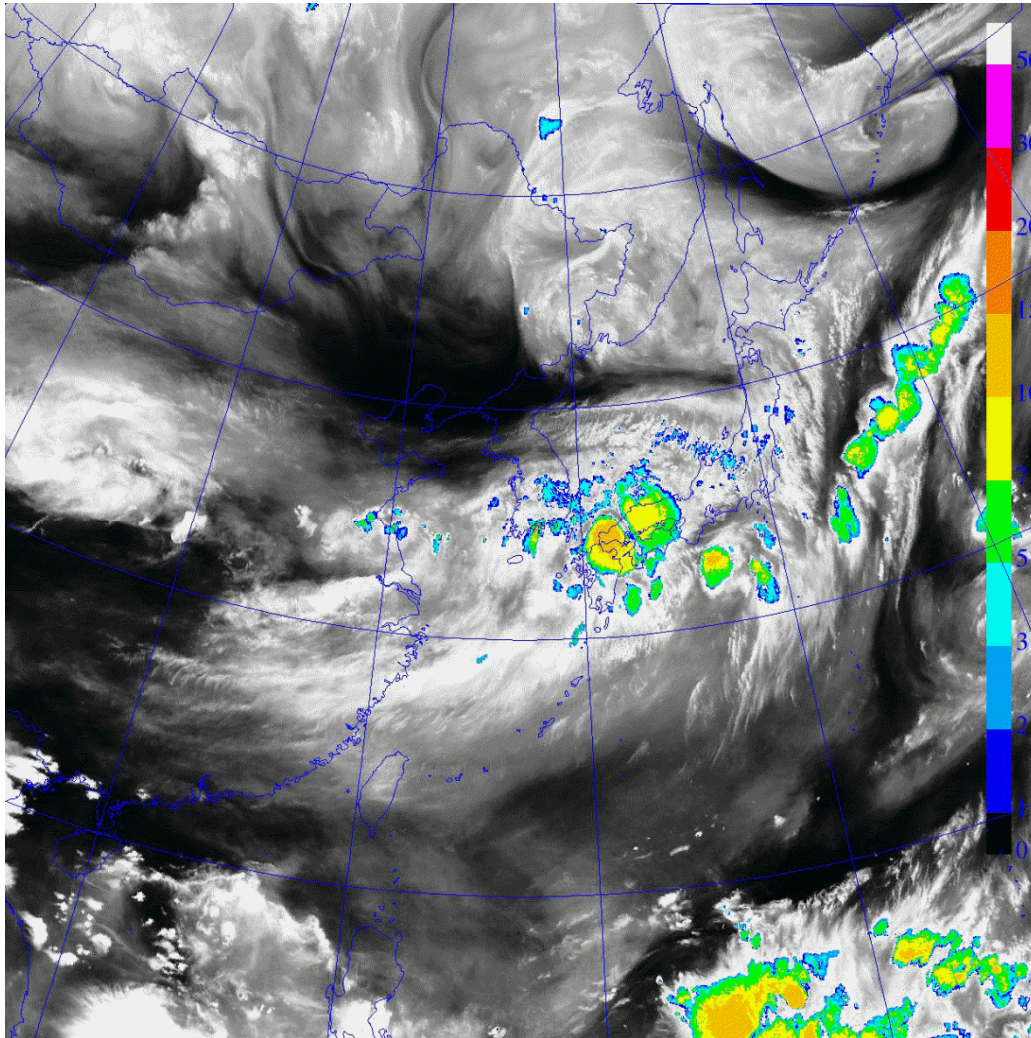


Discrimination of convective cells



PGE05 example

하늘을 친구처럼
국민을 하늘처럼



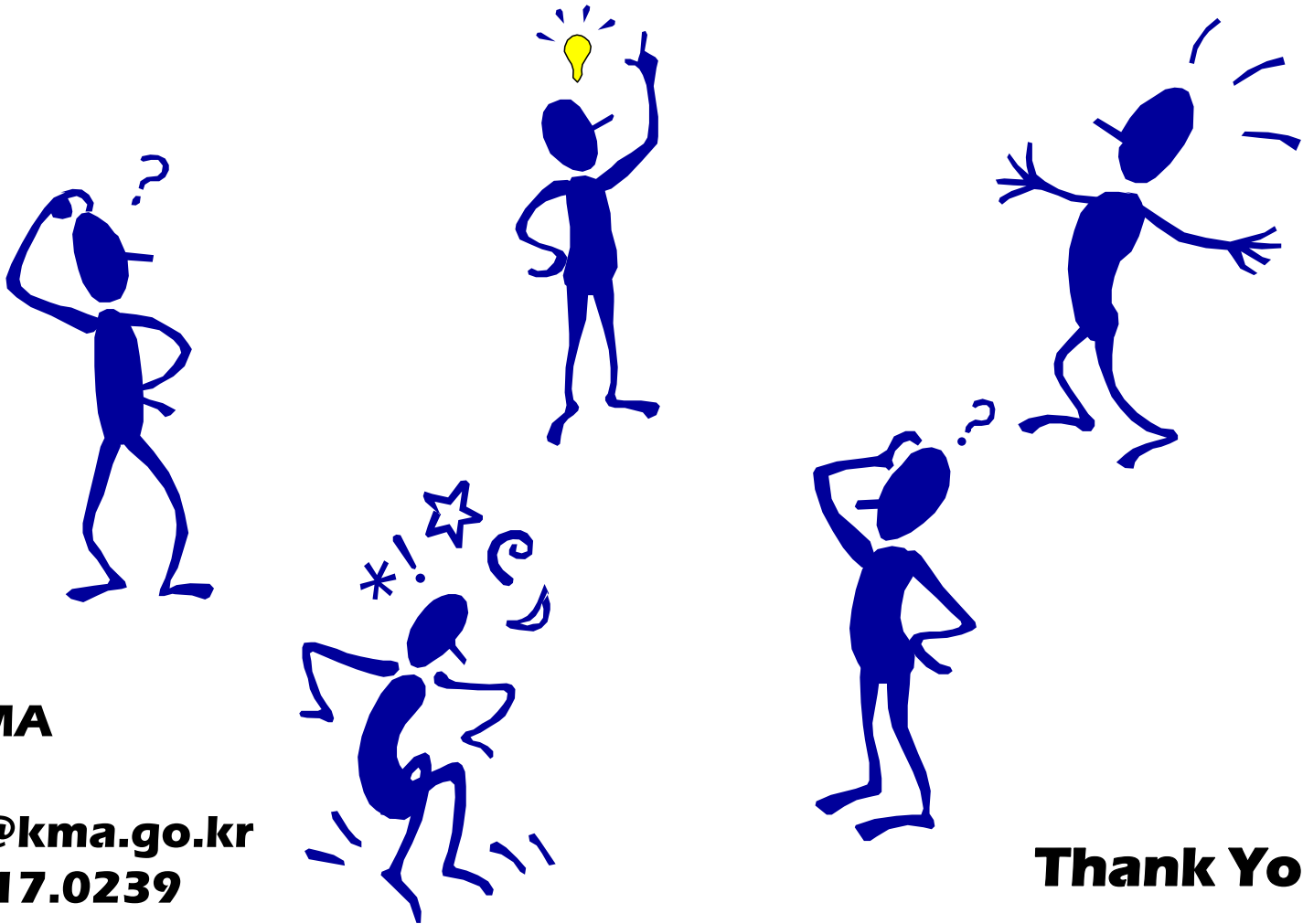
From July 20, 2009 2133 UTC
To July 21, 2009 0633 UTC



- **Fine tunes to apply the characteristics on MTSAT/COMS and weather pattern over our area**
- **Using UM from GDAPS or even KLAPS to describe more specifics**
- **Continue the verification from users over the summer seasons**
- **Apply more packages to expand system**

What Questions or Comments Do You Have?

하늘을 친구처럼
국민을 하늘처럼

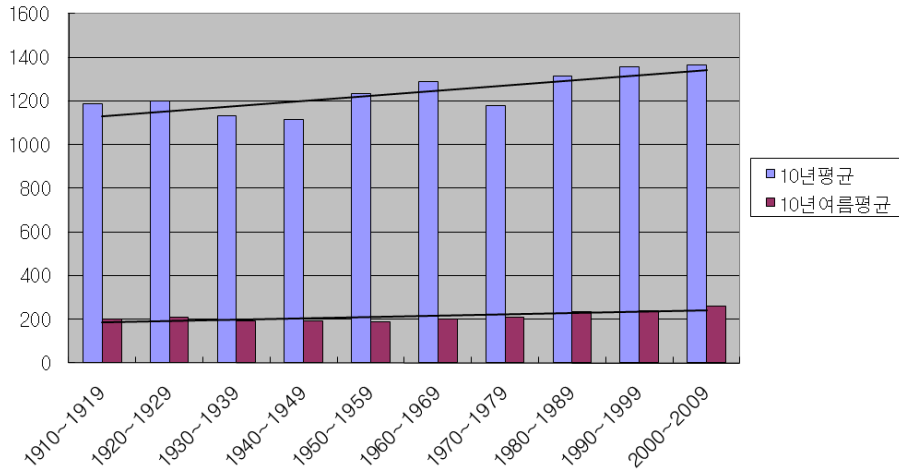


NMSC/KMA
Jun Park
jun.park@kma.go.kr
+82.43.717.0239

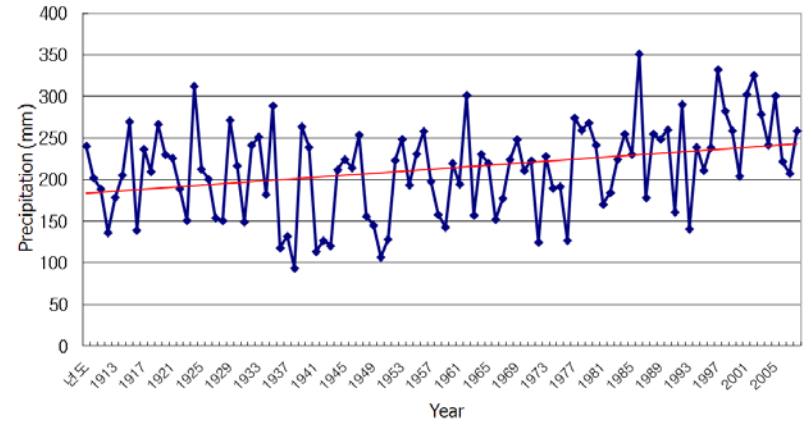
Thank You!

Back-up Slide

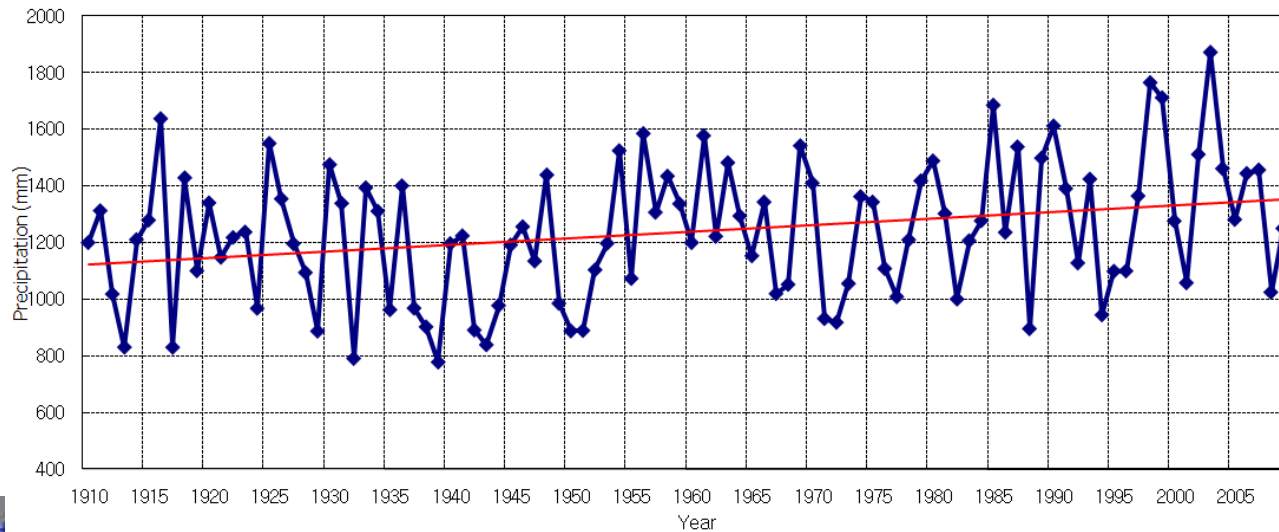
지난 100년 간의 강수량 자료로 나타낸 10년 단위 평균 & 10년 단위 여름평균



Summer(JJA) Average Precipitation during last 100 years (1910-2009)

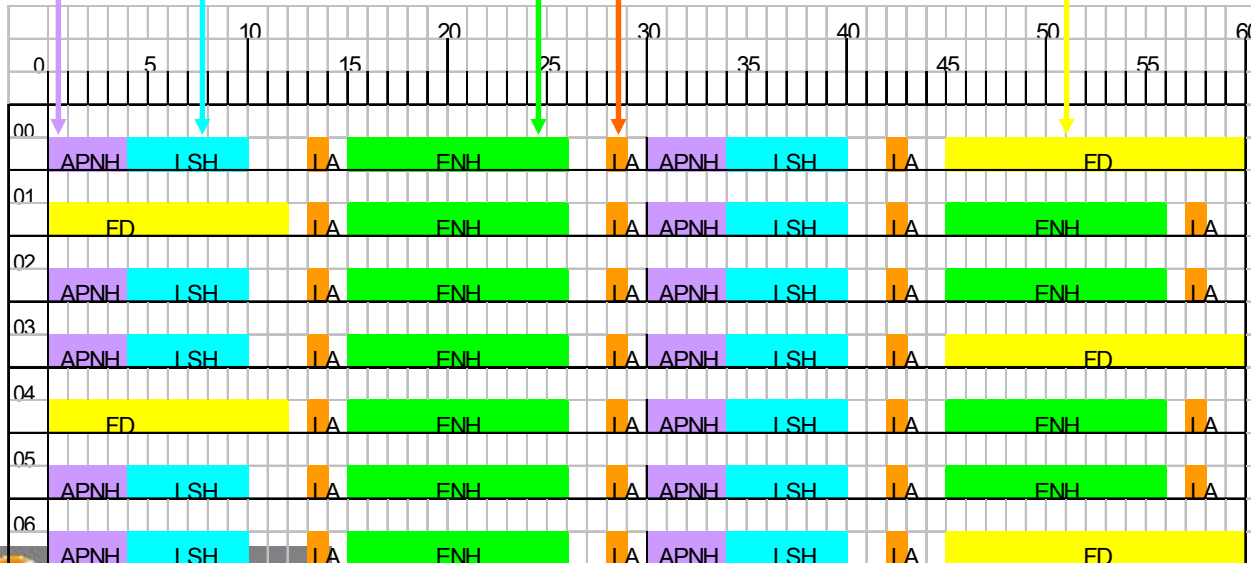
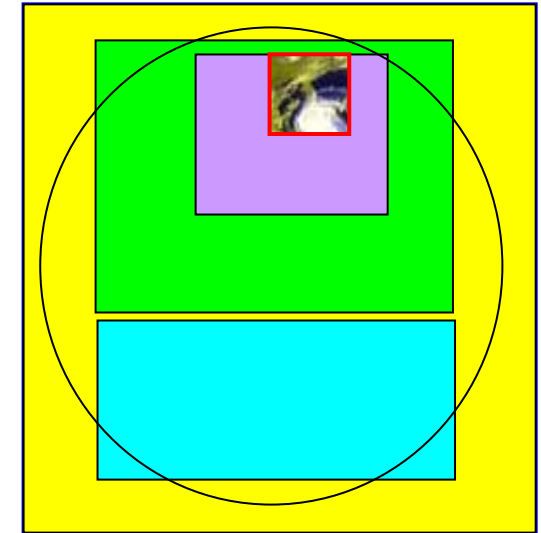
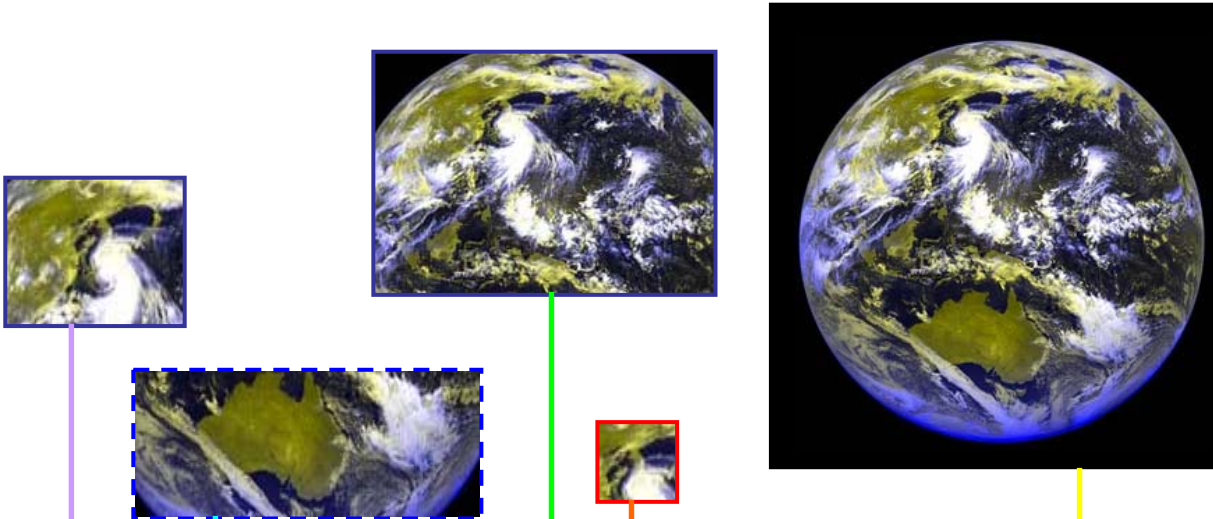


Year Average Precipitation during last 100 years (1910-2009)



COMS MI Observation Plan

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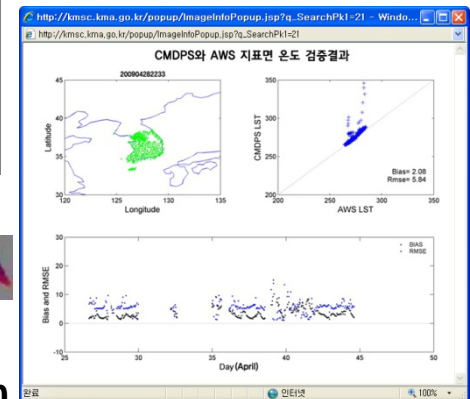
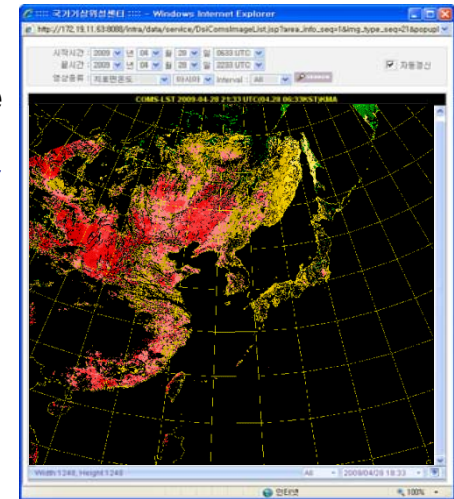
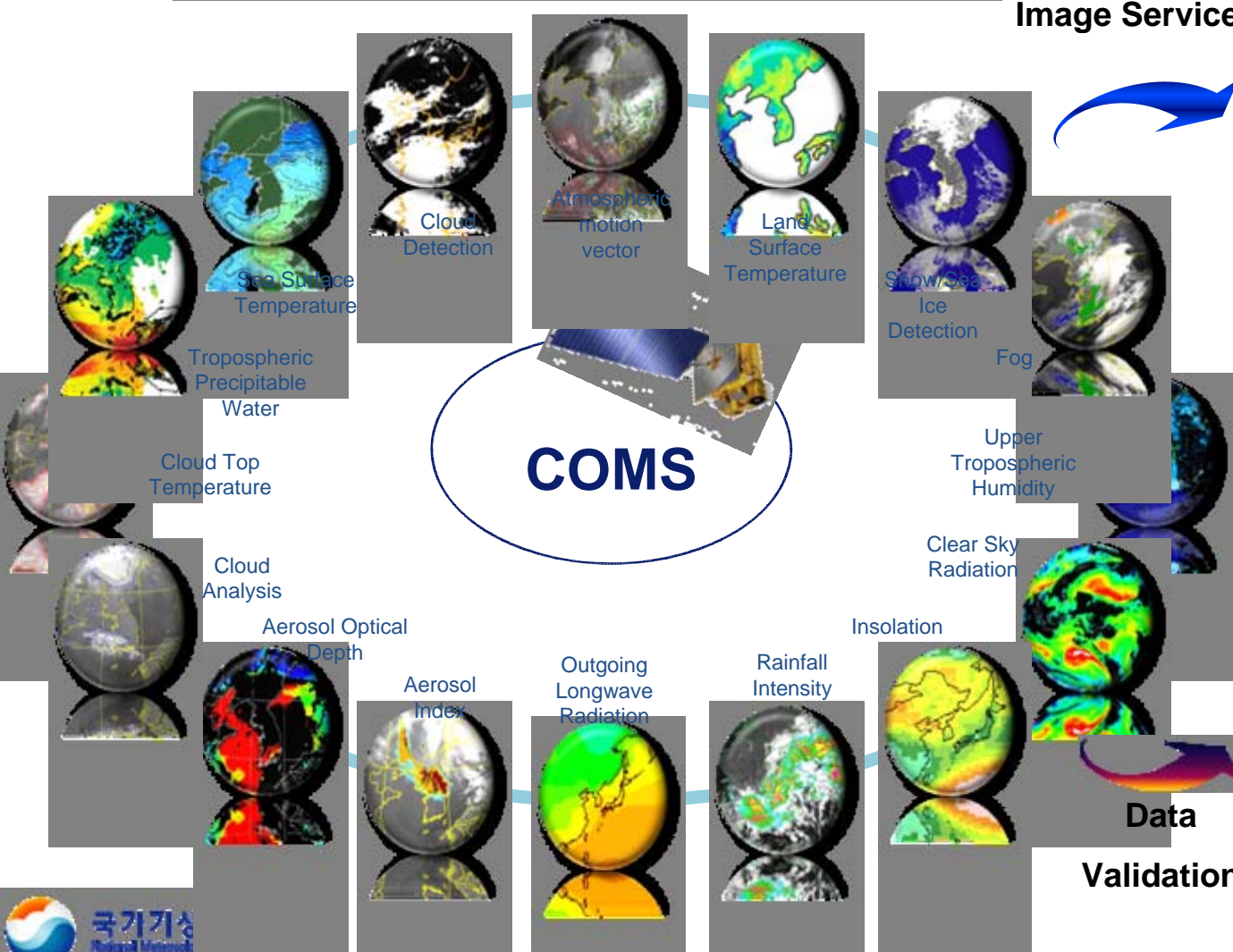


- Full Disk every 3 hours
- ENH every 30 min.
- LSH every 30 min.
- East Asia every 15 min.
- Korean Penin. every 8min

COMS L2 Product (CMDPS)

하늘을 친구처럼
국민을 하늘처럼

Products and Service Plan (TBD)



World Best 365

