Current Status and Future Plan of Korea Meteorological Satellite Program

Dr. Ae-Sook Suh
National Meteorological Satellite Center
Korea Meteorological Administration

국가기상위성센터
National Meteorological Satellite Center

Brief history of KMA's Satellite Meteorology

국가기상위성센터
National Meteorological Satellite Center

1970. 12. Establishment of ESSA-8 and NOAA APT Receiving System
1978. 04. Establishment of Satellite Division within KMA
1979. 04. Start of GMA-1 Satellite Data Reception
1998. 01. Start of FY-2 Satellite Data Reception
2002. 05. Start of Meteosat-5 Satellite Data Reception
2003. 09. Kick off with COMS Development
2009. 04. Establishment of National Meteorological Satellite Center (3 division, 43)
2010. 06. Launch of COMS

NMSC

National
Meteorological
Satellite
Center

국가기상위성센터
National Meteorological Satellite Center

1. New building for NMSC

- Area : 33,058m²
- Construction duration : 2005 ~ 2008 (4yrs)

2. Organizational & Personnel

- New organization (From 30.04.2009)
  - 3 divisions and 43 employees
  - Satellite planning/operation/analysis

3. Major missions

- Meteorological Satellite Development & Operation
- Foreign Satellite Data Reception/Processing/ Analysis/Distribution
- Meteorological Satellite Data Real Time Analysis and Service
- International and Internal Cooperation in Meteorological Satellite

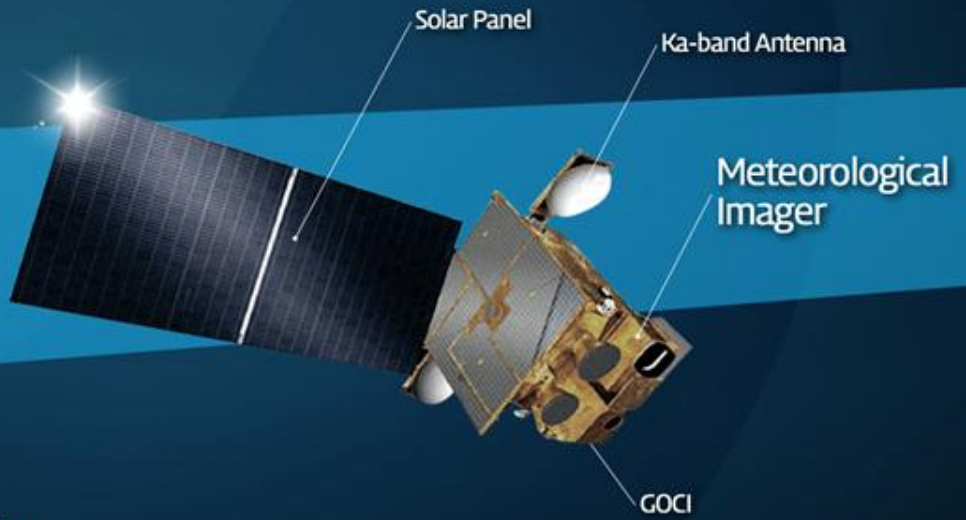
COMS Development Program

국가기상위성센터
National Meteorological Satellite Center

COMS is the first multi-purpose geostationary satellite for Korea in the application of Meteorology, Ocean and Communication

- Meteorological Mission : Continuous Meteorological Observation to support weather forecasting and early detection of severe weather phenomena
- Period : 2003 - 2010 (8 yrs)
- Orbit : 128.2E over equator (35,000 km)
- Mass : 2,500 kg
- Design life : 7 years

Communication, Ocean and Meteorological Satellite

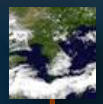


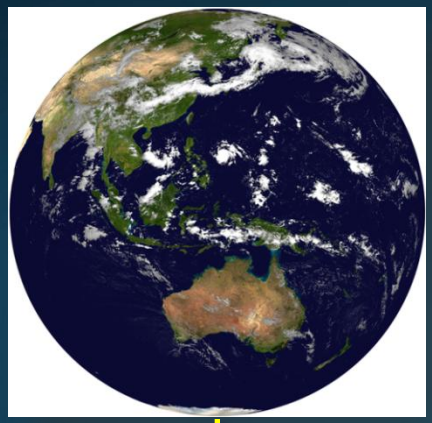
Channel	Band (㎛)	Spatial Resolution (㎞)	Application
Visible	0.55~0.80	1	Cloud, Dust, Fire, Fog detection
SWIR	3.50~4.0	4	Fog, Low Cloud, Fire detection, LST
WV	6.5~7.0	4	Upper Air Humidity & Temperature
IR1	10.3~11.3	4	Cloud & Dust detection, SST, LST
IR2	11.5~12.5	4	Cloud & Dust detection, SST, LST

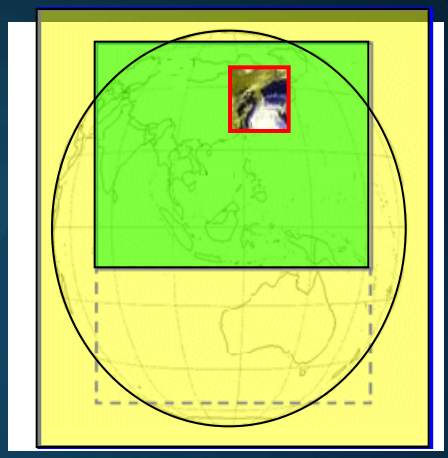
LST : Land Surface Temperature
SST : Sea Surface Temperature

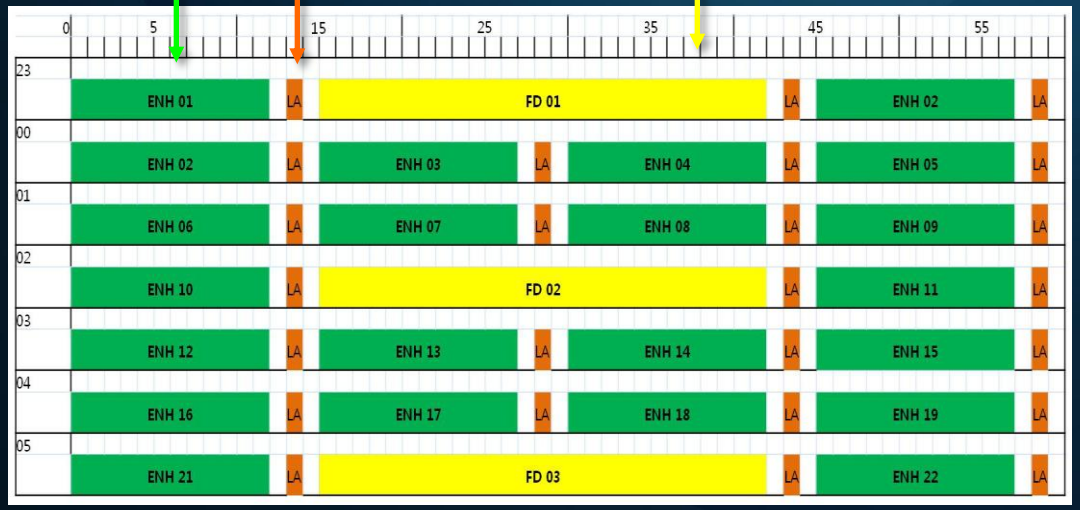
Observation Schedule for COMS

국가기상위성센터
National Meteorological Satellite Center









Full Disk	Every 3hrs
ENH	15min
Local Area	average 8min

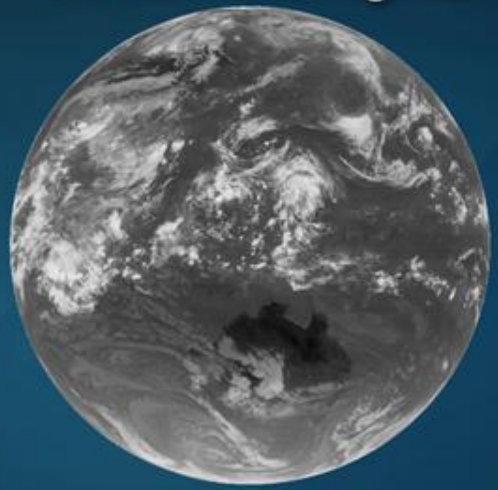
	ENH	LA
MTSAT	30min	30min
COMS	15min	average 8min

The First COMS Images

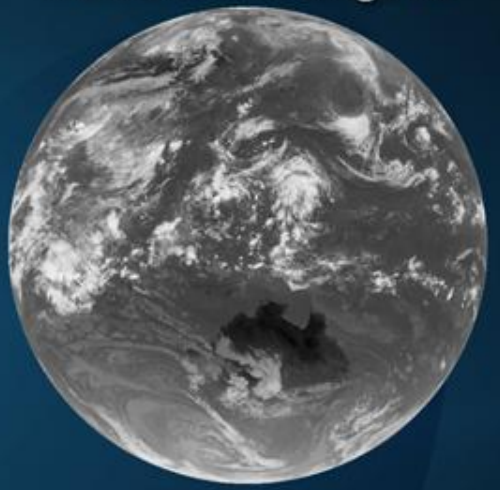
국가기상위성센터
National Meteorological Satellite Center

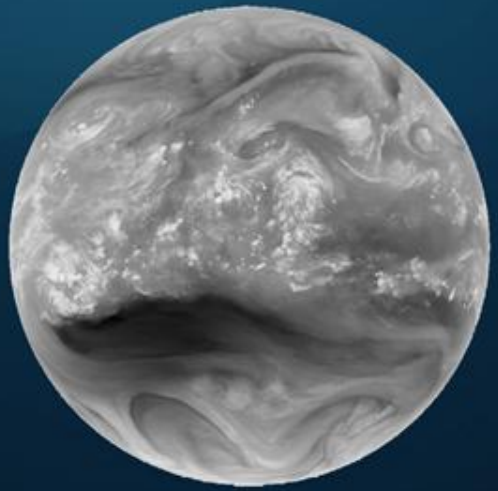
The first Visible Image
(2010. 08. 11 | 19:14 KST)

The first infrared image IR2

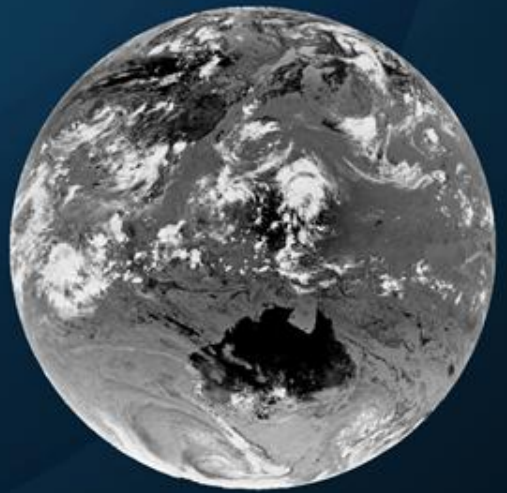


The first infrared image IR2





The first infrared image WV



The first infrared image SWIR

COMS Product

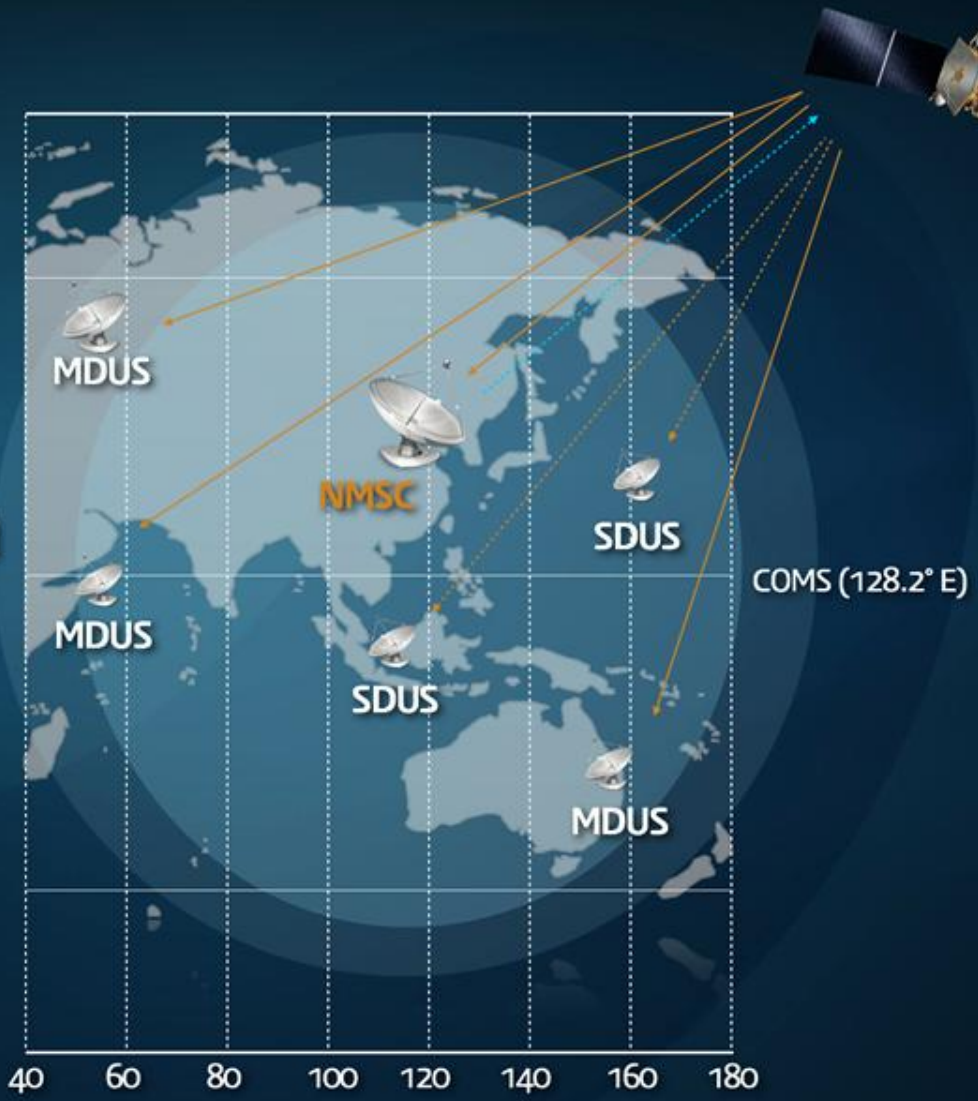
국가기상위성센터
National Meteorological Satellite Center

16 Derived Products : System Development (2003-2010) and (2011~)

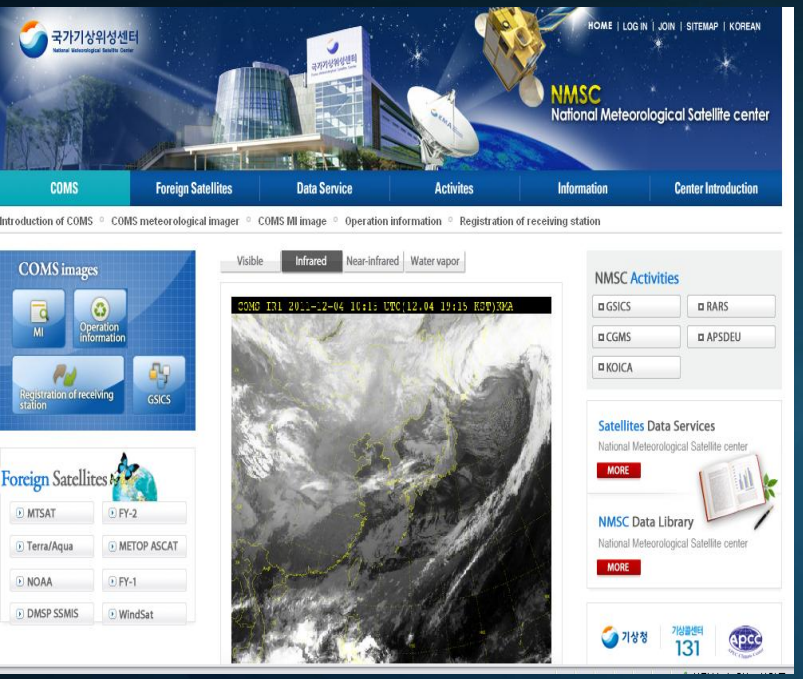
COMS Data Service (via COMS)

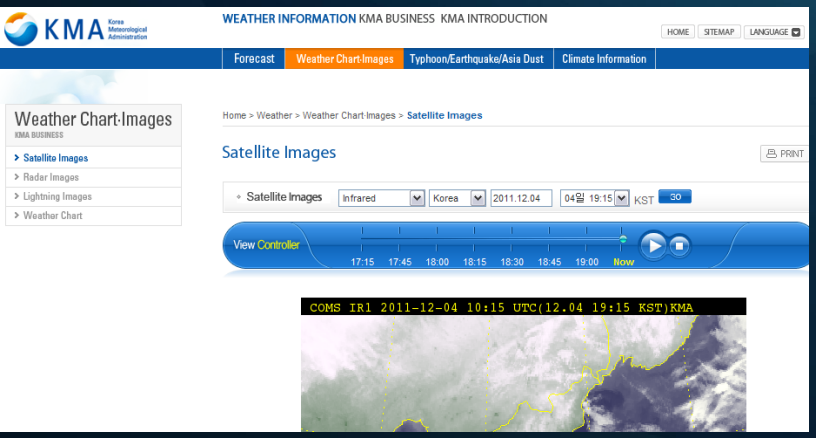
국가기상위성센터
National Meteorological Satellite Center

Asia-Pacific Region
covering 30 nations with
2.2 Billion People



COMS Data service(via ground network)





- KMA & National Meteorological Satellite Center(NMSC) Webpage
  - -Internet: http://www.kma.go.kr
  - -Internet: http://nmsc.kma.go.kr
  - -Intranet: http://intra.nmsc.kma.go.kr
- Phased service extension of 16 types of analysis data
- Real-time data service to disaster and secure management institute
- Real-time data service for activation of civil industry
- On-line service to whole nation people

COMS Receiving and Analysis System for Sri Lanka

- Develop and install COMS data receiving/analysis system that consists of COMS data acquisition system, processing system, analysis system, service system and archiving system
- Dispatch Korean experts to Sri Lanka to give necessary technical and administrative training
- Workforce training necessary for the successful and effective utilization of the system

International Cooperation & Training

국가기상위성센터
National Meteorological Satellite Center

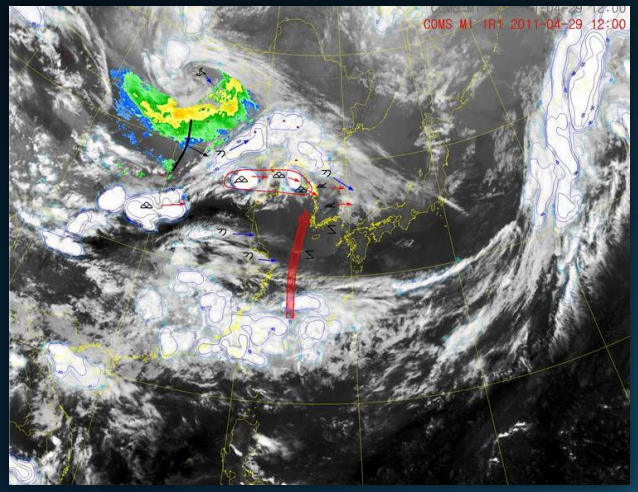
International Cooperation

- Coordination Group for Meteorological Satellite (CGMS)
- WMO Consultative Meetings on High-level Policy on Satellite Matters (WMO-CM)
- Asia-Pacific Satellite Data Exchange and Utilization (APSDEU)
- RARS (Regional ATOVS Retransmission System)
- GSICS (Global Space-based Intercalibration System)
- Bi-lateral cooperation with NOAA/NESDIS, EUMETSAT, NWC-SAF
- Support to Asia-Pacific nations to receive/utilize COMS data

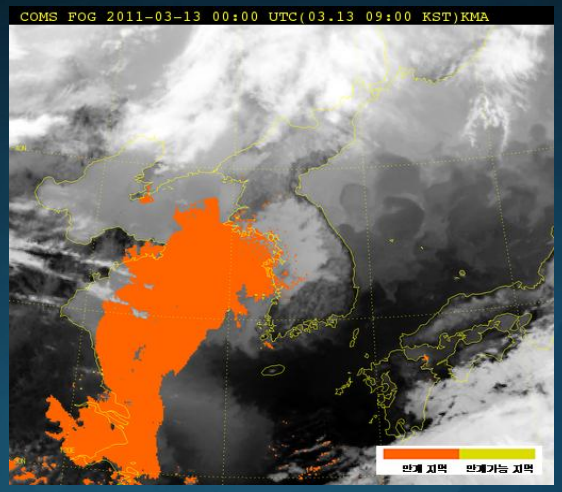
COMS Data Users' Training Program (Aug. 2010)

Supporting Weather Forecast

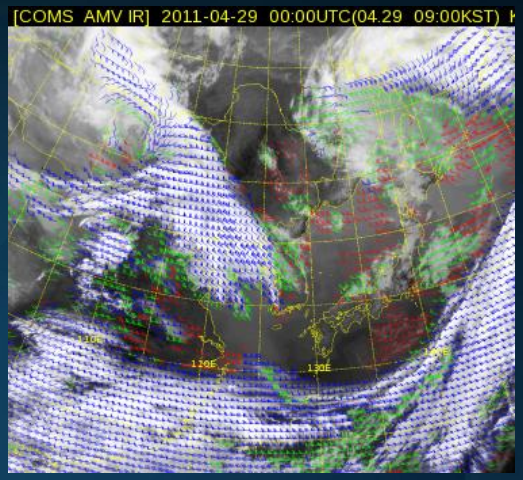
국가기상위성센터
National Meteorological Satellite Center



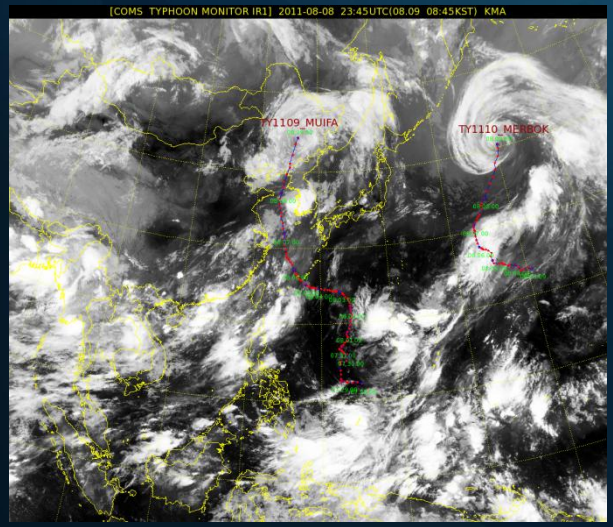
Cloud Analysis



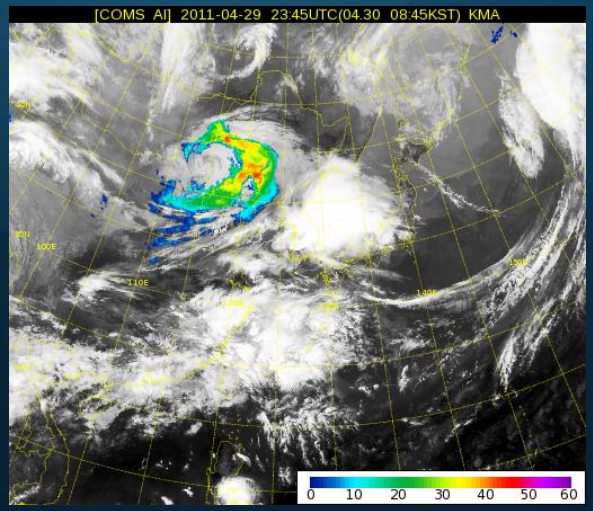
Fog Detection



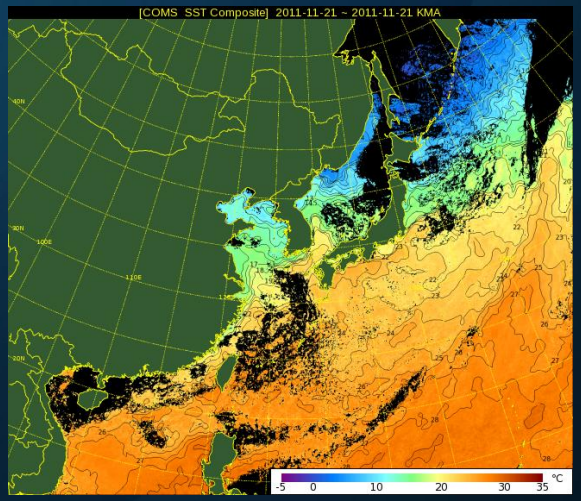
Atmospheric Motion Vector



Typhoon Monitor



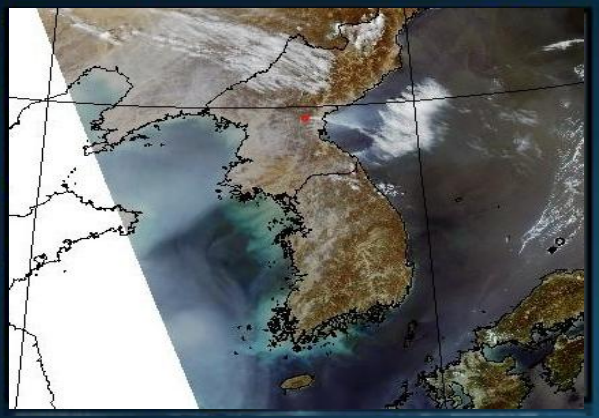
Asian Dust Detection



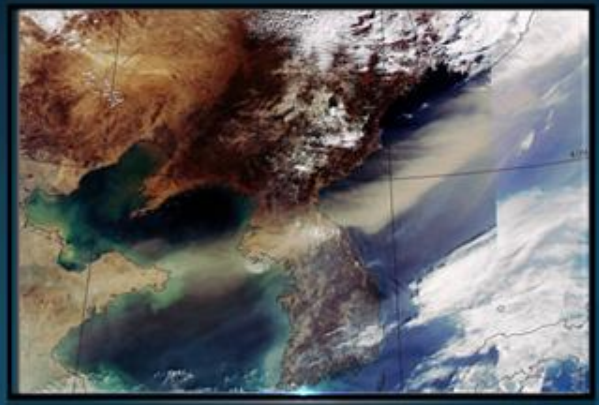
Sea Surface Temperature

Earth Environment Monitoring

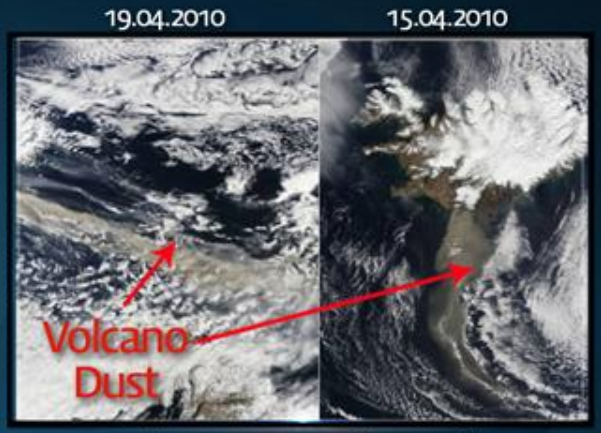
국가기상위성센터
National Meteorological Satellite Center



12.042011 Wild Fire



02.03.2008 Yellow Sand



Volcano Dust from the Island Volcano

13.03.2011 Fog

25.04.2010 Oil spill in Gulf of Mexico

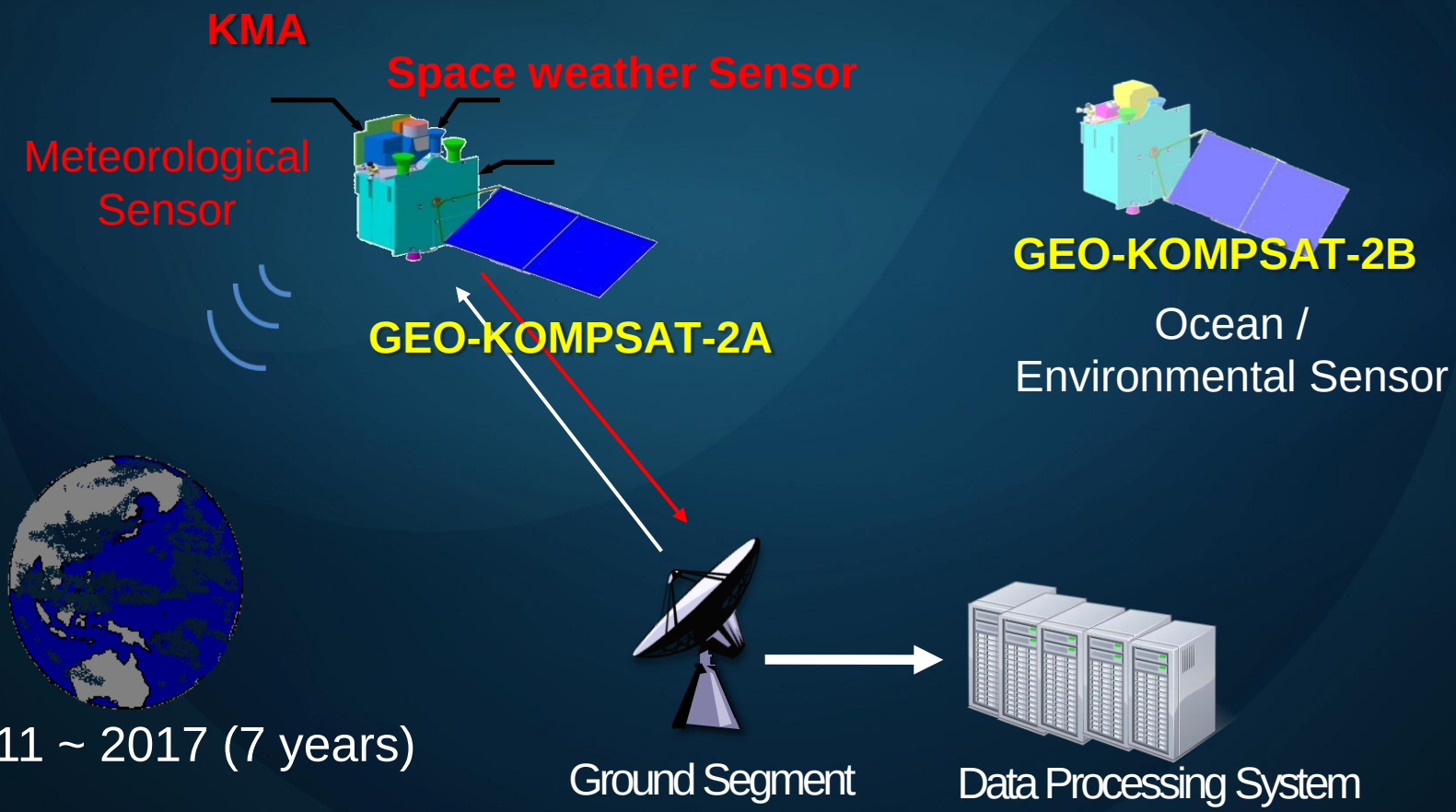
04.08.2010 Flooding over Yangtze river

Future Plan

GEO-KOMPSAT-2 Program

국가기상위성센터
National Meteorological Satellite Center

→ One for the next generation Meteorological Imager
→ The other for the Ocean and Atmospheric Trace Gas monitoring



*** Preliminary study has been accomplishing in 2011**

Development of GEO-KOMPSAT-2A

국가기상위성센터
National Meteorological Satellite Center

- Object
  - Obtaining a geostationary meteorological satellite for continuous monitoring of meteorological phenomena
  - Development of follow-on satellite for succession of COMS mission
- Mission
  - Continuing the COMS Meteorological Mission
  - Improving the Severe Weather Monitoring
    - Higher frequency of observation
    - Retrieving the atmospheric structure (pseudo-sounding)
  - Improving the support of the NWP model
    - Efficient data assimilation system
  - Intensifying the environment & climate monitoring
    - Various surface information retrieval
    - Air pollution monitoring
    - Establishing long-term observation data

Master Schedule

국가기상위성센터
National Meteorological Satellite Center

Satellite design and Review

Module Integration

System Integration

Launch/IOT

System Requirement Review

System Design

Preliminary Design

Detail Design

Platform AIT

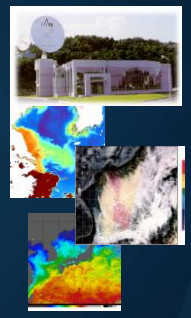
System Test

Instrument Test

Instrument Delivery

Launch/ IOT

Operation



2012 2013 2014 2015 2016 2017 2018

Contract Award and Kick-off

SRR

CDR

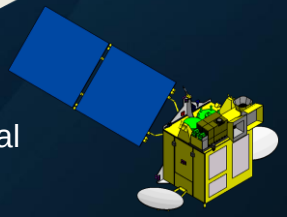
IRR

TRR and PSR

System Integration

Launch and IOT

Operational

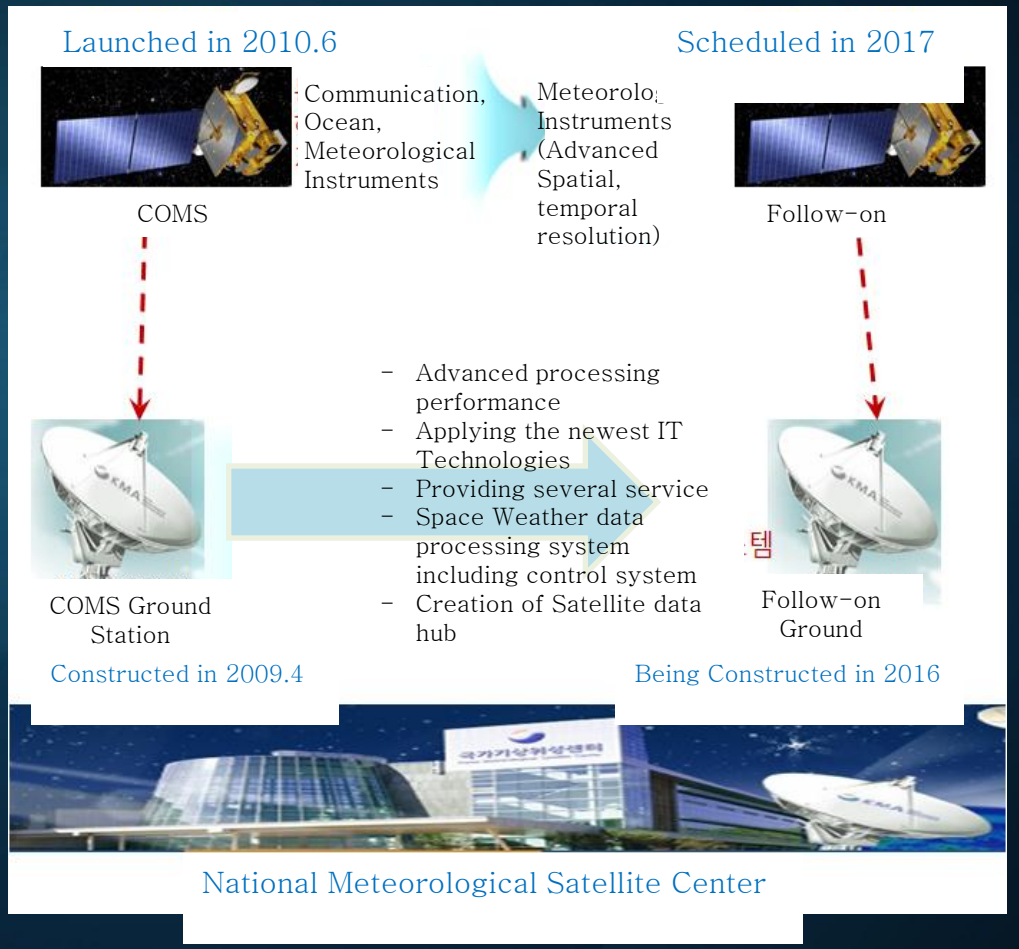


Ground Segment

국가기상위성센터
National Meteorological Satellite Center

Ground System development and Construction

- Receiving, Processing, analysis and Archiving service of meteorological and space weather data
- Accomplishing satellite control mission



➔ **Preliminary study for ground system during 2011**

Future Plan

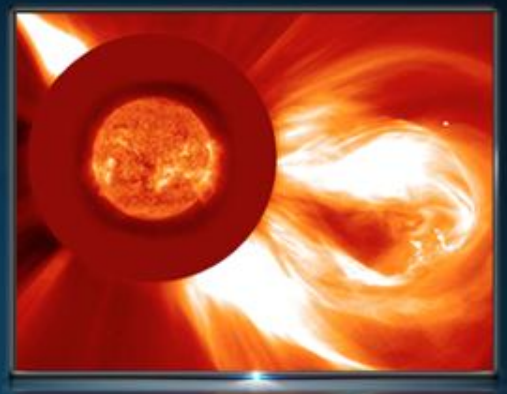
국가기상위성센터
National Meteorological Satellite Center

- Development of the GEO-KOMPSAT-2A
  - Completion of RFP for GEO-KOMPSAT-2A (‘11. 12)
  - Contract award with selected company (2012)
  - Preliminary Design Review(2013) and Critical Design Review(2014)
  - Delivery of meteorological and space weather payloads(2015)
  - Pre-Shipment Review(2016) and launch(2017)
- Development of the Ground Segment (2016)
  - Comprehensive Ground station for operation, satellite control, etc.
- Development of data processing system(2017)
  - Developing meteorological product for climate, environmental disaster prevention etc.

국가기상위성센터
National Meteorological Satellite Center

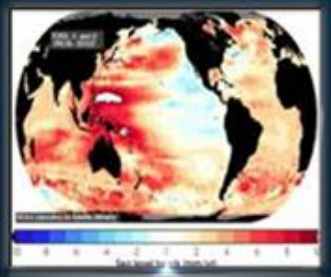
Development of Space Weather Observation and Prediction Technique

- Installment of GNSS Space Weather Application System
- Development of prediction model for the space weather
- Development of space environment sensor for geostationary satellite

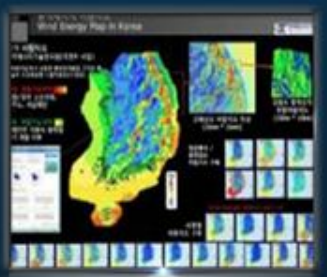


Development of Climate-Hydrology-Energy application technology

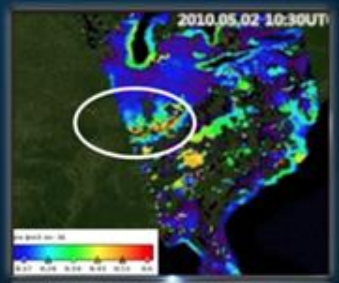
- Generation of high-quality climate value for the climate monitoring
- Support technology development for the hydrology, ocean and energy
- Development of next generation observation technique for the greenhouse gas



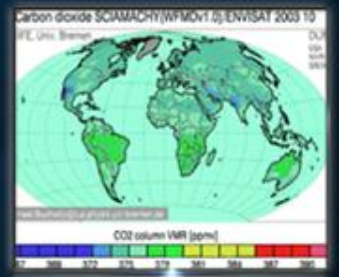
Ocean



Energy



Hydrology



Climate

Thank you very much for your attention!