

Vietnam Hydro-Meteorological Services
National Centre for Hydro-Meteorological Forecasting

Remote Sensing in NCHMF

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Historical Facts

- ❖ Geostationary:
 - GMS-5: 1997 – 2004
 - MTSAT-1R: 2005 – 2006
 - MTSAT-2: 2007 – 10/2015
 - HIMAWARI: 11/2015 to date
 - FY: 2010 – 2014

 - ❖ Polar-orbiting
 - NOAA: 1997 – 2005
-

CONTENTS

- ❖ **Historical facts**

 - ❖ **Applications for Early Warning System**
 - **Daily weather**
 - **Convection, lightning, thunderstorm**
 - **Rainfall estimation**

 - ❖ **Data Distribution**
-

Data

Data available:

- ✓ Geostationary: MTSAT (48/day), FY-2DE (48/day)
 - ✓ Himawari 8/9 (144/day)
 - ✓ Microwave: Acquiring from HRPT & Internet sources
 - ✓ Weather radar data
 - ✓ Lightning data
 - ✓ Observation
-

Advanced Himawari Imagers

❖ MTSAT BAND

Band		Wavelength [μm]	Spatial Resolution
1	V1	Visible	0.46
2	V2		0.51
3	VS		0.64
4	N1	Near Infrared	0.86
5	N2		1.6
6	N3		2.3
7	I4	Infrared	3.9
8	WV		6.2
9	W2		7.0
10	W3		7.3
11	MI		8.6
12	O3		9.6
13	IR		10.4
14	L2		11.2
15	I2		12.3
16	CO		13.3

❖ VIS

❖ IR4

❖ IR3(WV)

❖ IR1

❖ IR2

❖ RGB band
❖ Compositing

❖ Aerosol
❖ Water cloud and Ice cloud
❖ Size of the cloud droplet
❖ Fog, Hot spot (Forest fire)

❖ Water vapor

❖ SO₂ (Sulfur dioxide)
❖ O₃ (Ozone)

❖ Atmospheric Windows

❖ CO₂ (Carbon dioxide)



Applications for Early Warning System

Operational weather analysis

- Cloud image, cloud classification
- Tropical cyclone operation
- Precipitation retrieval
- Effect of cold waves
- Tropical troughs
- Intertropical Convergence Zone
- The severe weather phenomena are strictly supervised

Nowcasting

- Detect and monitor the development of convective activities
 - Detect and monitor the development of thunderstorm
-

Tools used

- ✓ GMSLPD (MSC, JMA), SATAID (JMA)
 - ✓ Satellite Image Processing (SIP)
developed by own satellite team.
 - ✓ Display weather radar data images
 - ✓ Display lightning data
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The programs are used to display satellite images

The image displays three windows from the GMSLPD (Global Meteorological Satellite Live Product Display) software. The top-left window shows a satellite image of the Pacific region with a grid overlay, dated 19/06/2015 05:32 UTC. The top-right window shows a satellite image of the same region, dated 06/03/2017 04:15 UTC, with the title "Himawari VS 06/03/2017 04:20UTC". Both satellite windows feature a control panel on the right with options for image type (IR, WV, 3.7, EIR-C, VS, SP, S2, EIR-M), grid size (10), and various display functions (Coast, Line, Text, NWP, Radar, Wind, Gray, Meas, Obs, Info, Draw, TC). The bottom window is a data table titled "FY-2 Data Table (11:31:01, 24/06/2011)" showing a list of data points for FY-2C, FY-2D, and FY-2E channels, including parameters like PVI, CLD, and SFC. The data table includes a toolbar with icons for Open, Auto, Manual, Refresh, and Hide.

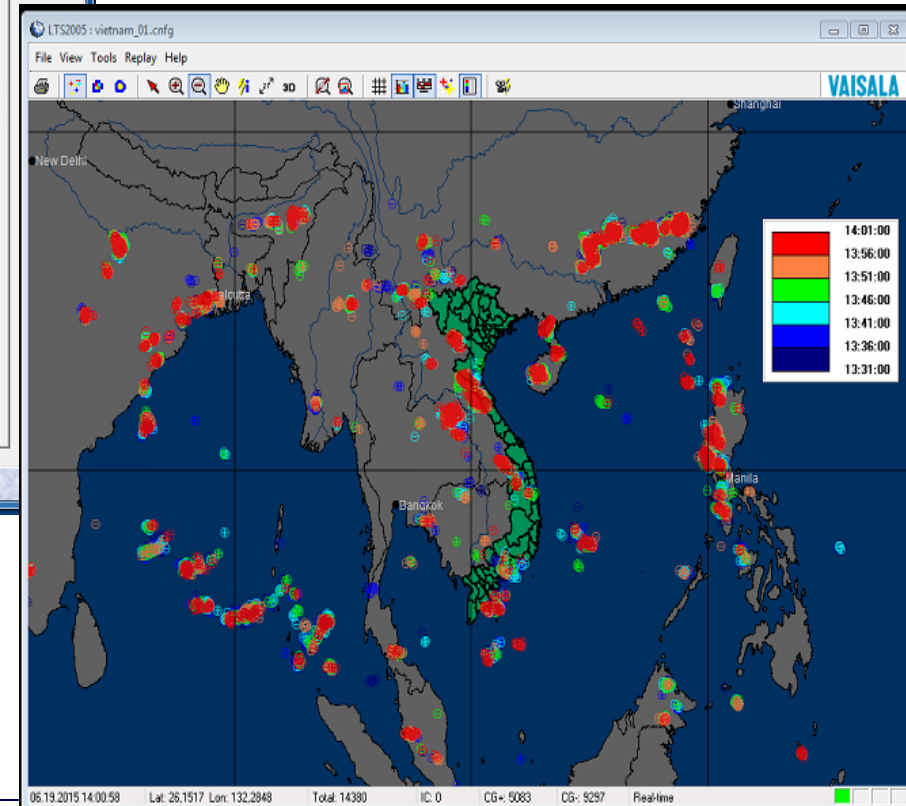
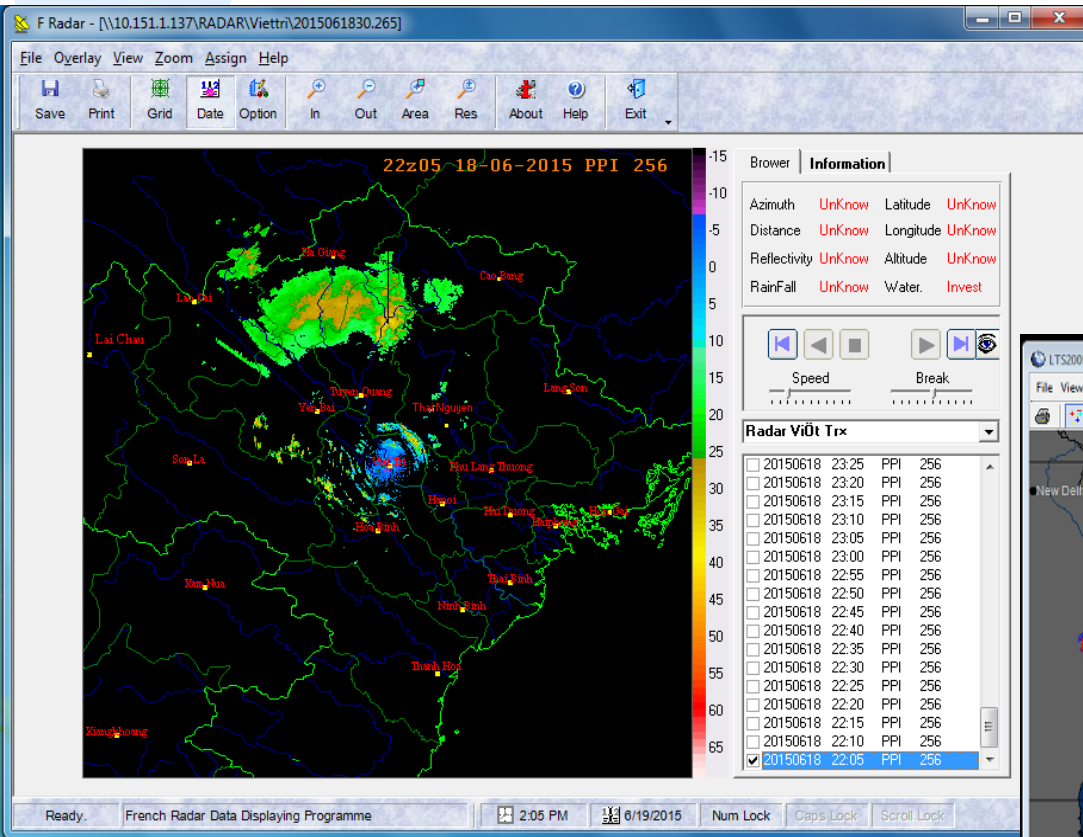
GMSLPD for Windows
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Zoom
Fast Slow
19/06/2015 05:32 UTC
Image
 IR VS
 WV SP
 3.7 S2
 EIR-C EIR-M
 Grid Line
 Coast NWP
 Text Radar Wind
Function
 Gray Info
 Meas Draw
 Obs TC

GMSLPD for Windows
Register Option Quit Help
Zoom
Fast Slow
06/03/2017 04:15 UTC
Image
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 N3 W2 S5
 W3 W1 S6
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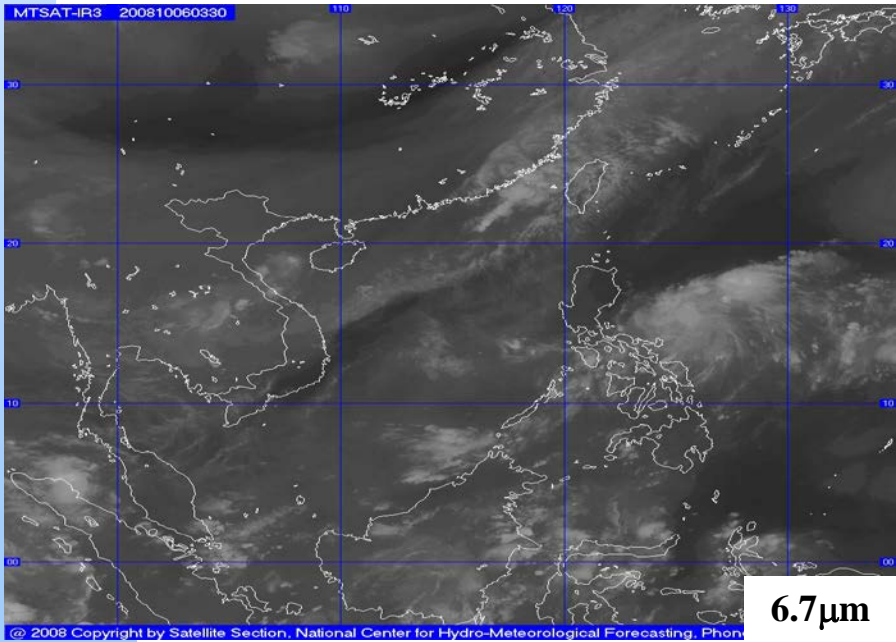
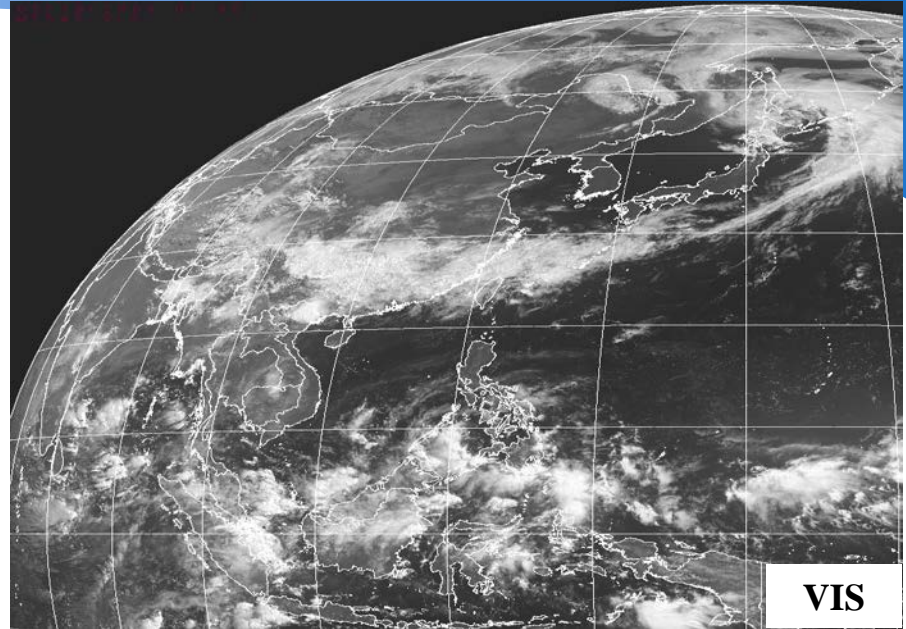
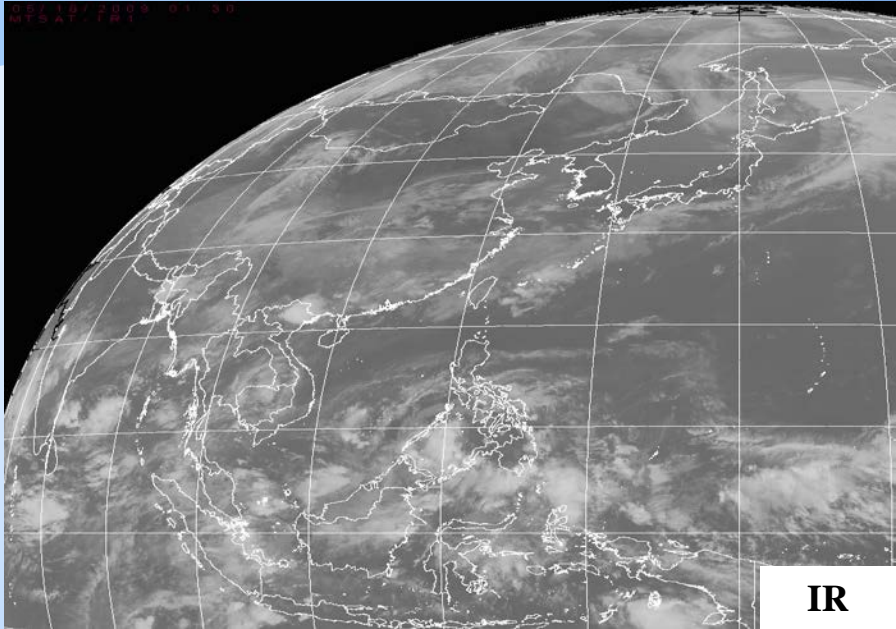
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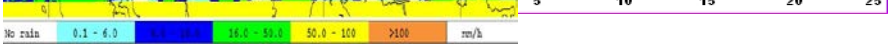
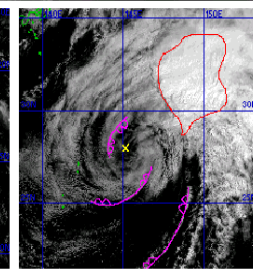
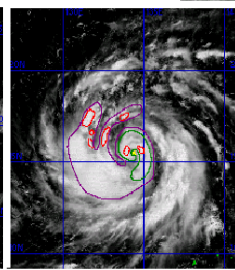
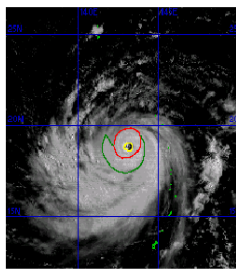
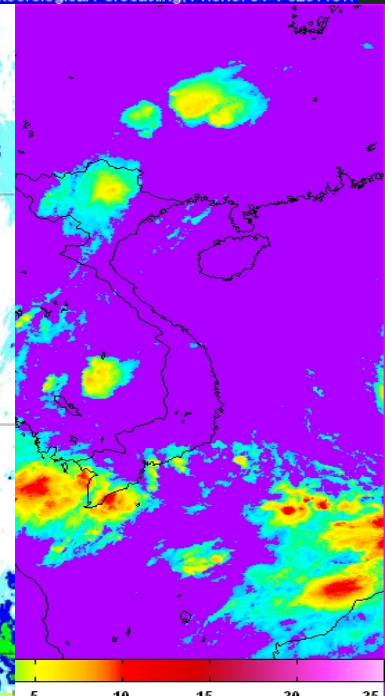
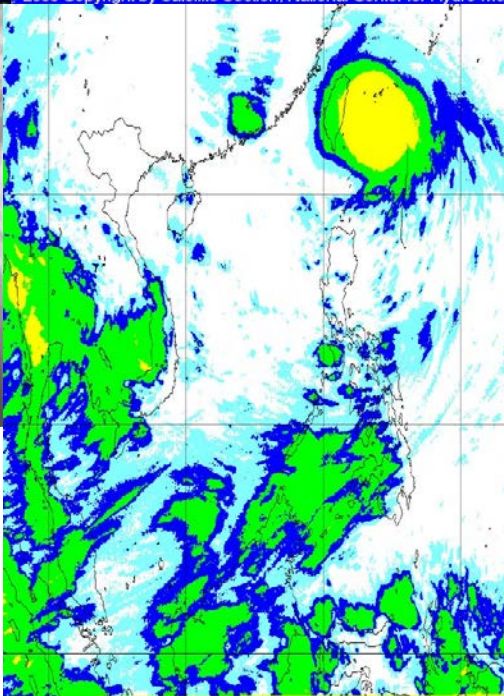
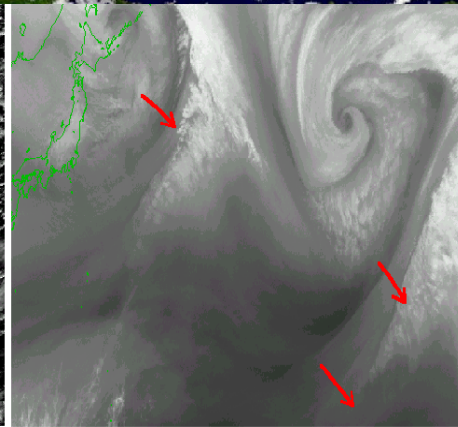
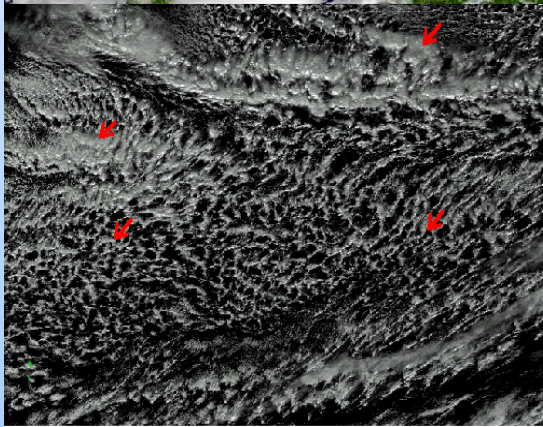
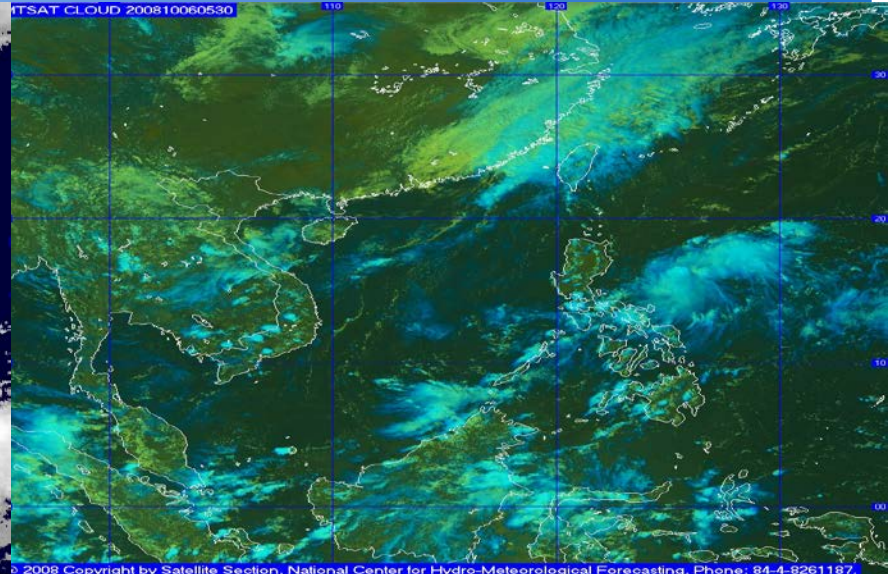
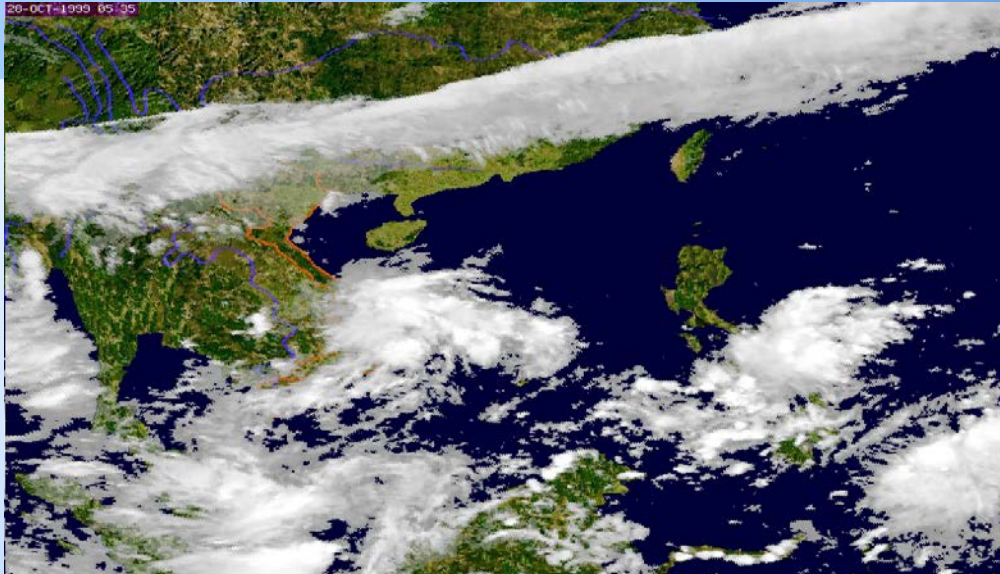
The programs are used to display weather radar images and lightning data



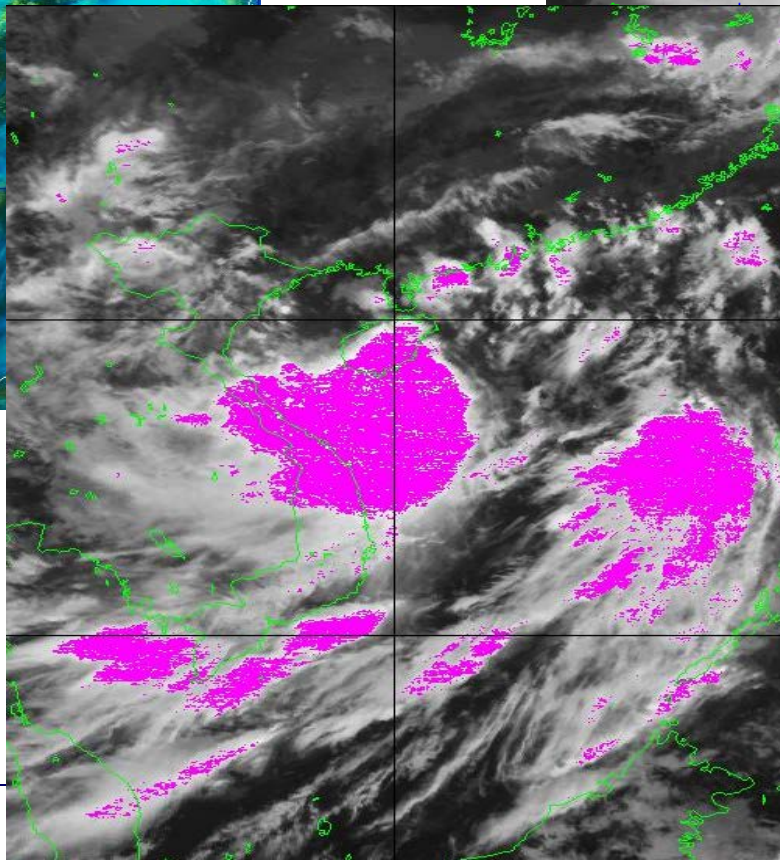
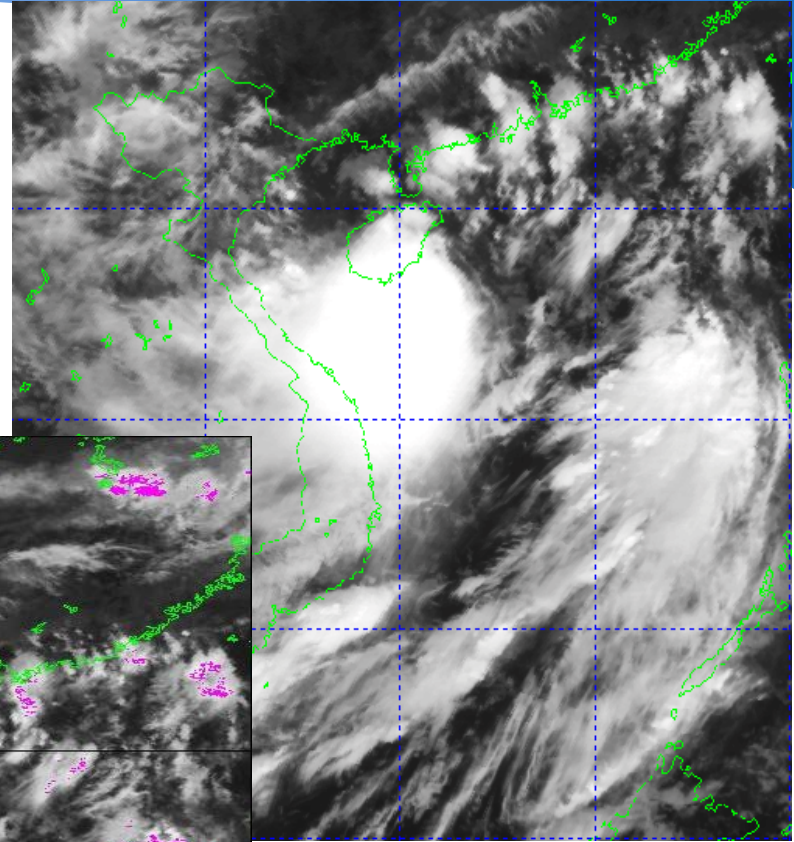
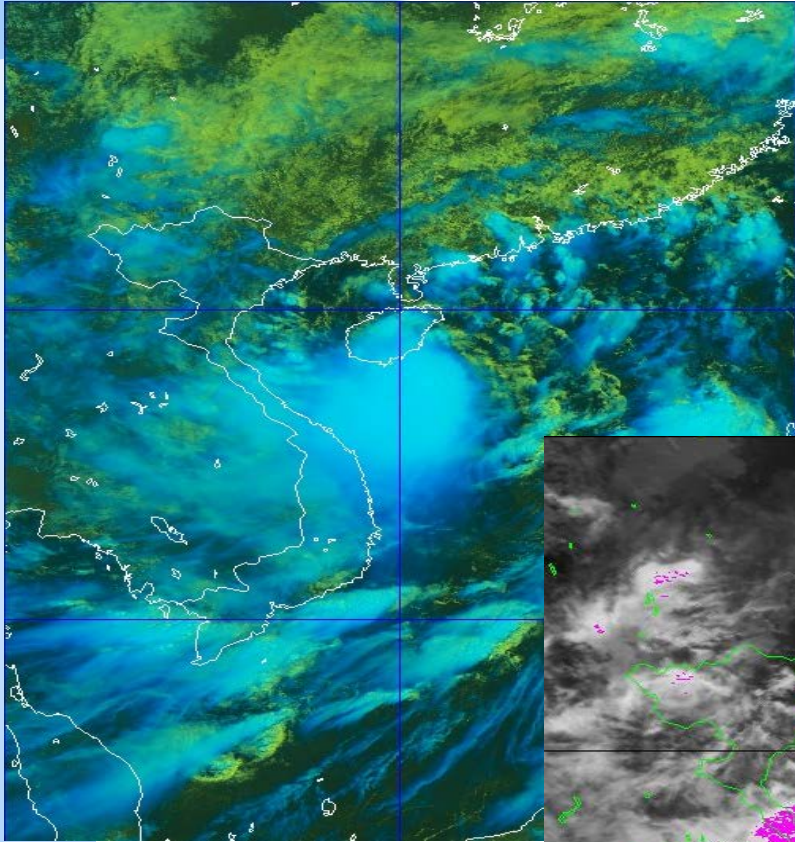
Daily Weather Analysis



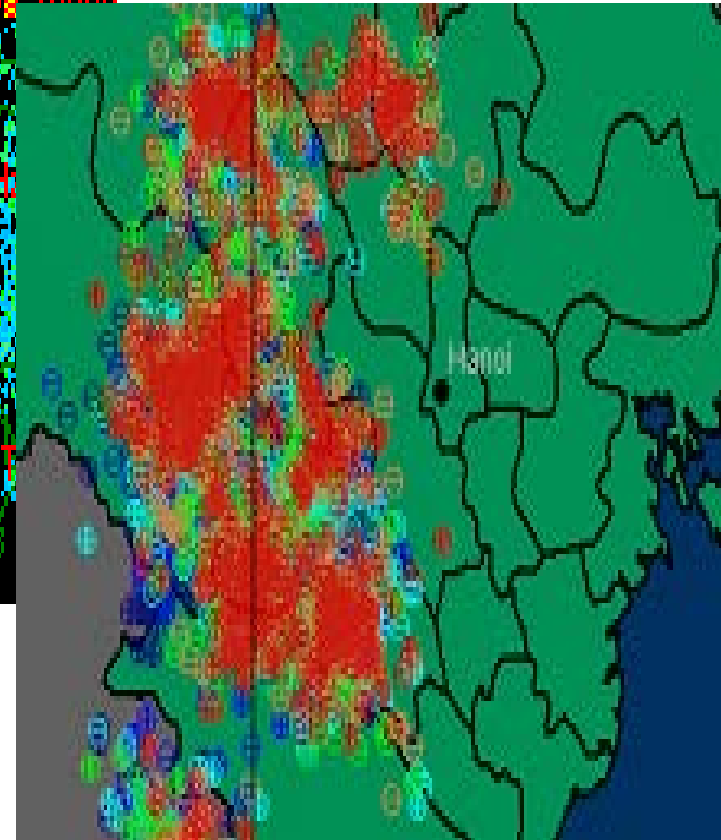
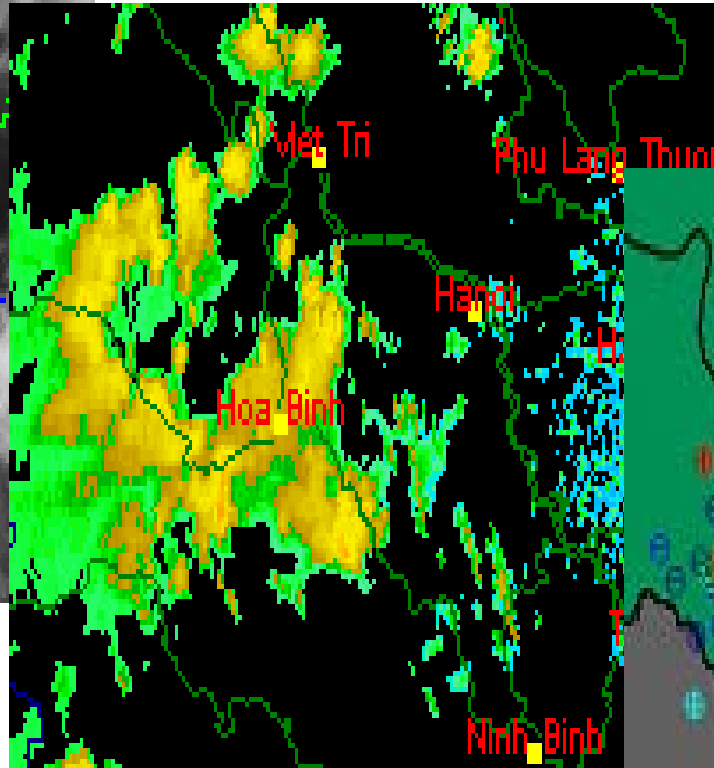
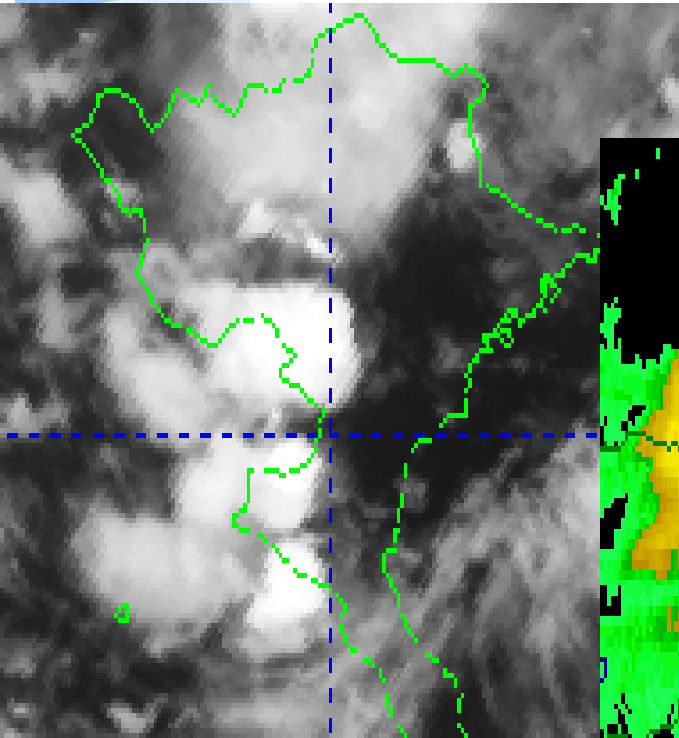
Daily Weather Analysis



Detect the development of convective activities



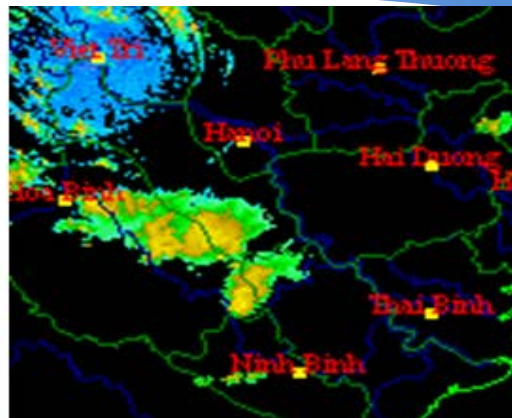
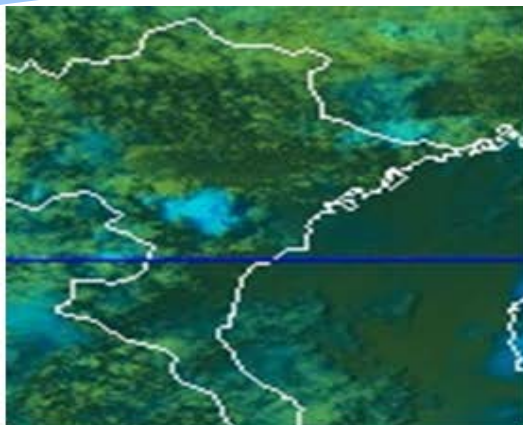
Thunderstorm warning



Thunderstorm warning

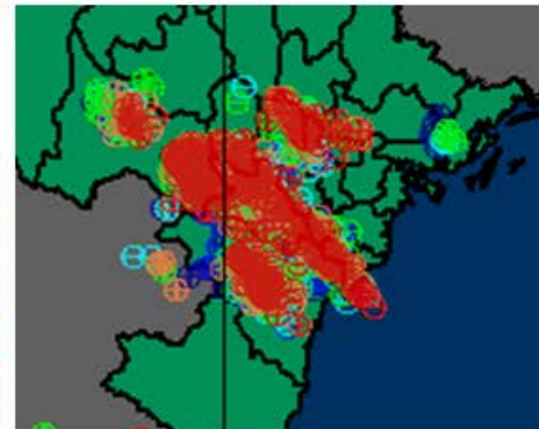
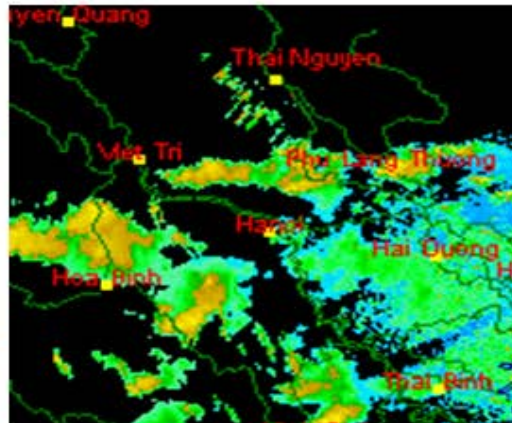
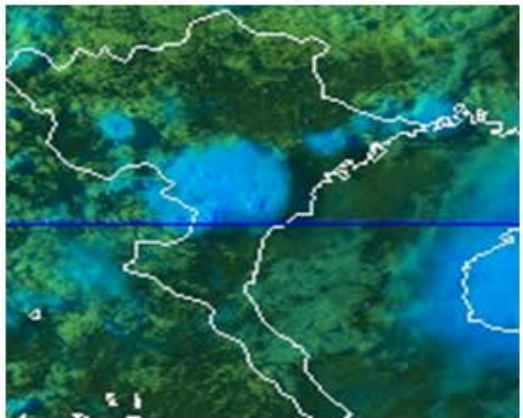
15h20

21/5/2015



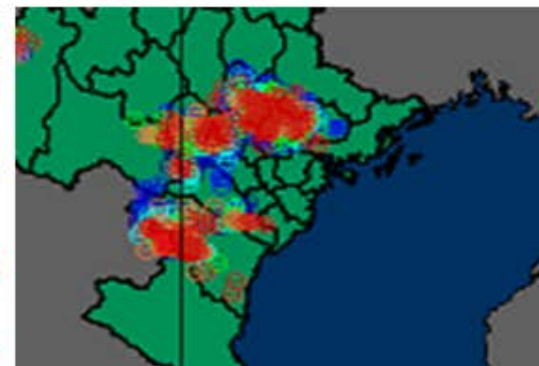
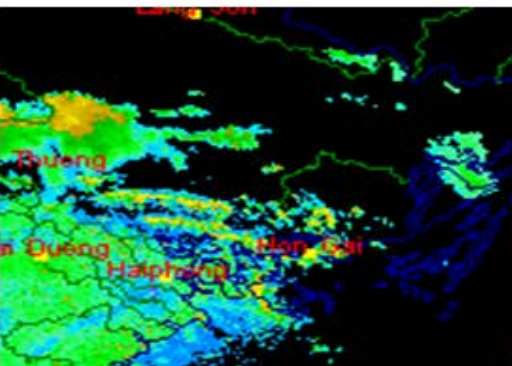
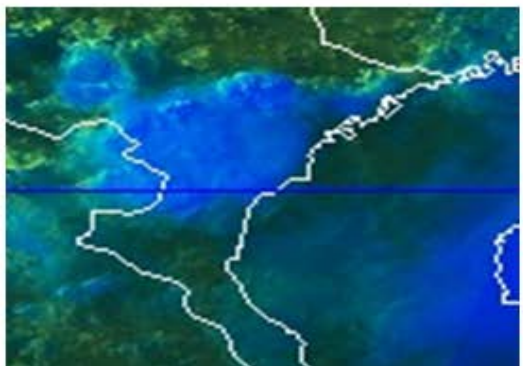
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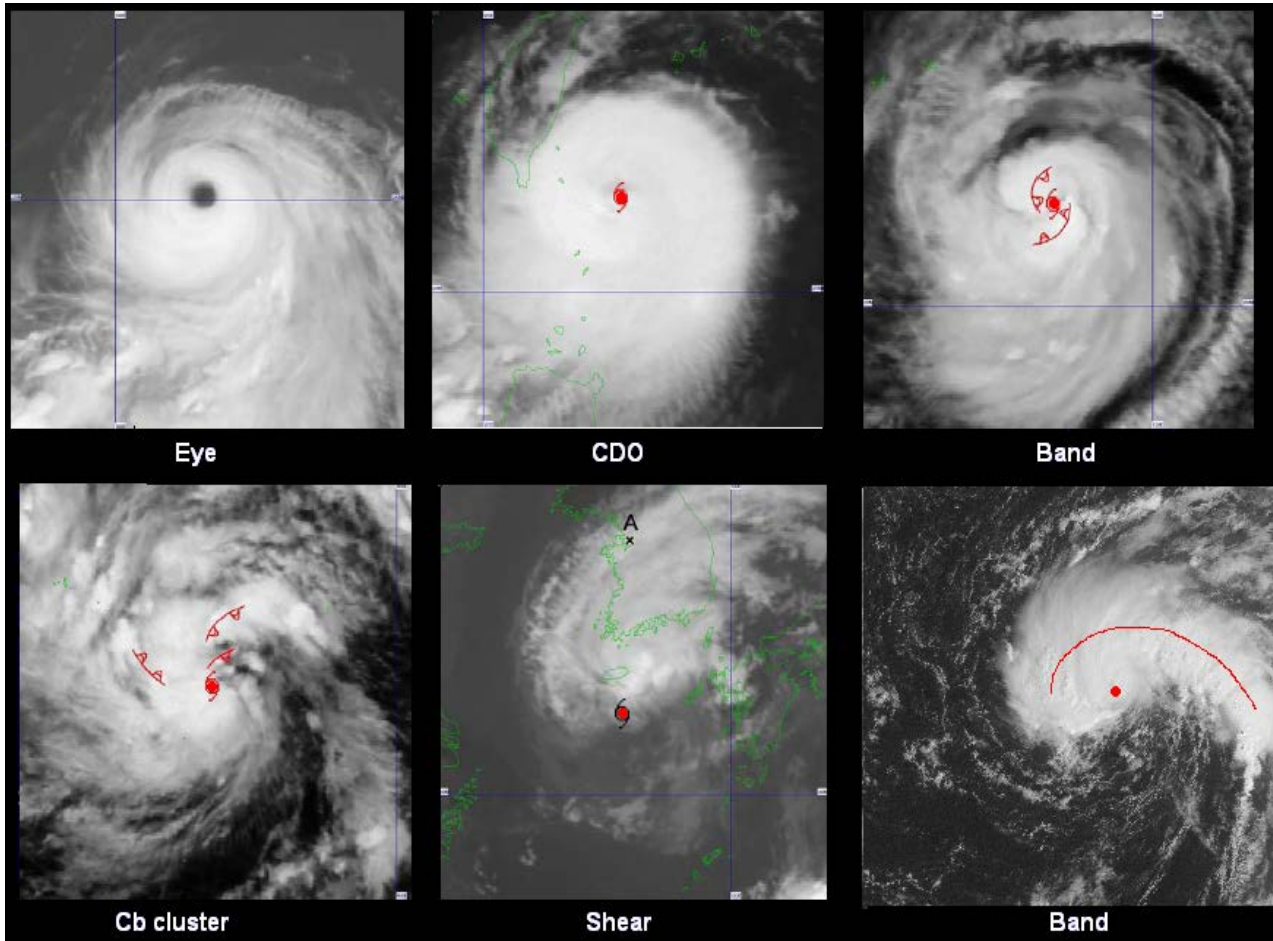
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21/5/2015

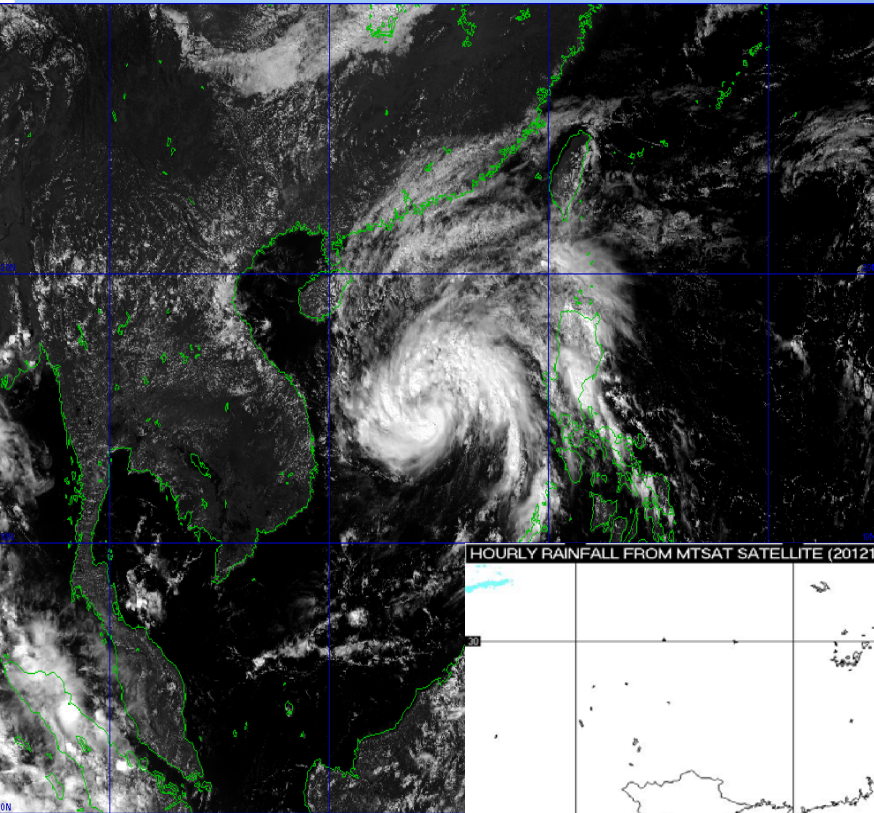


Tropical Cyclone Operation

- ✓ Issue for every 30mins, 01h, 03h and 06h.
- ✓ Use Infrared, water vapor, visible, MW, radar, Obs.
- ✓ Locate TC's Center and its movement in future.
- ✓ Estimate TC's Intensity and its tendency of change in future.

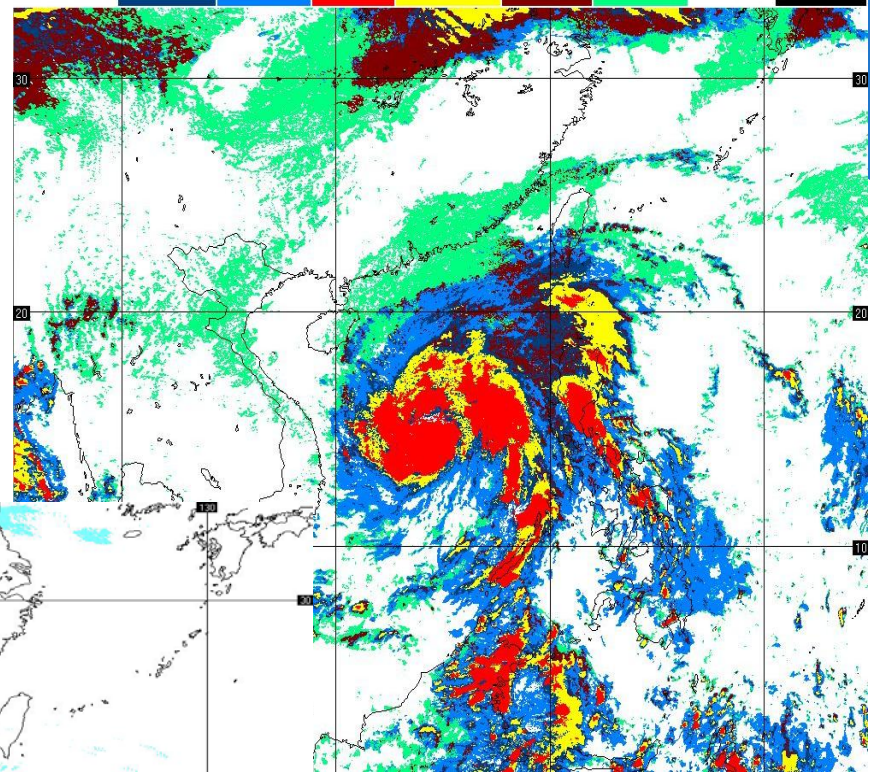


Rainfall Estimation

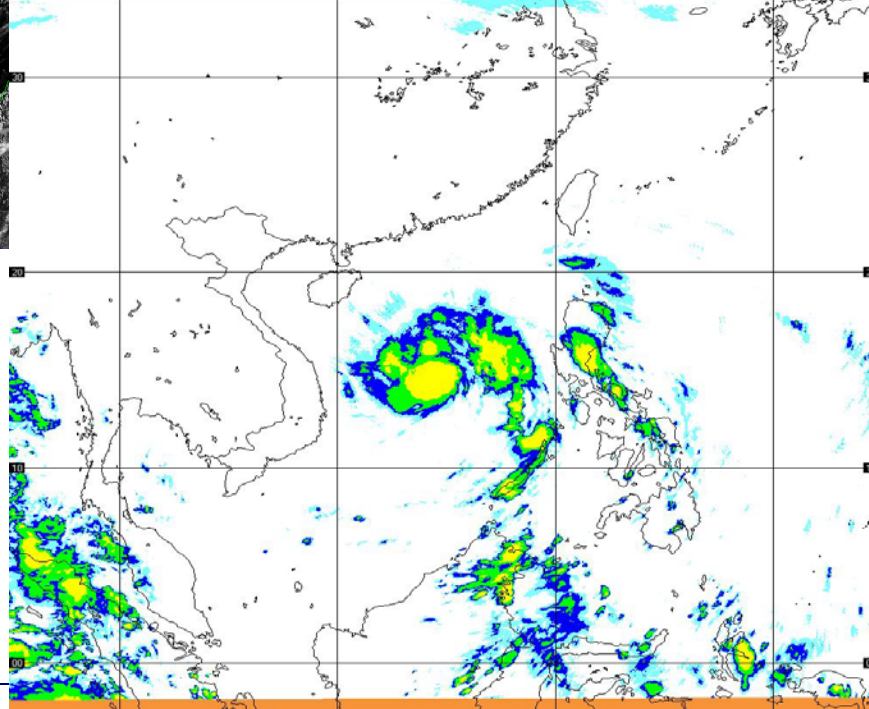


CLOUD TYPES

Thick Ci	Thin Ci	Cb	Mature Cb	Mid. Cld	Low Cld	Clear	Unknown
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HOURLY RAINFALL FROM MTSAT SATELLITE (2012102606)

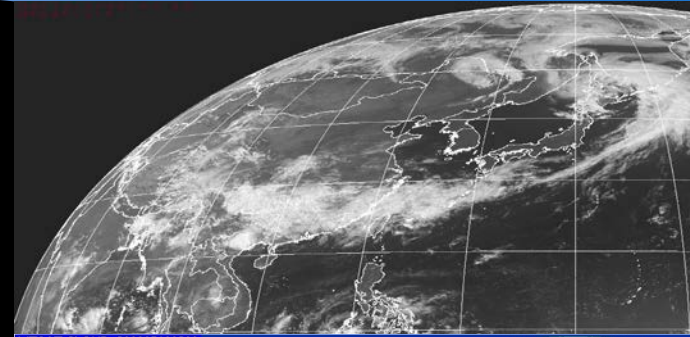
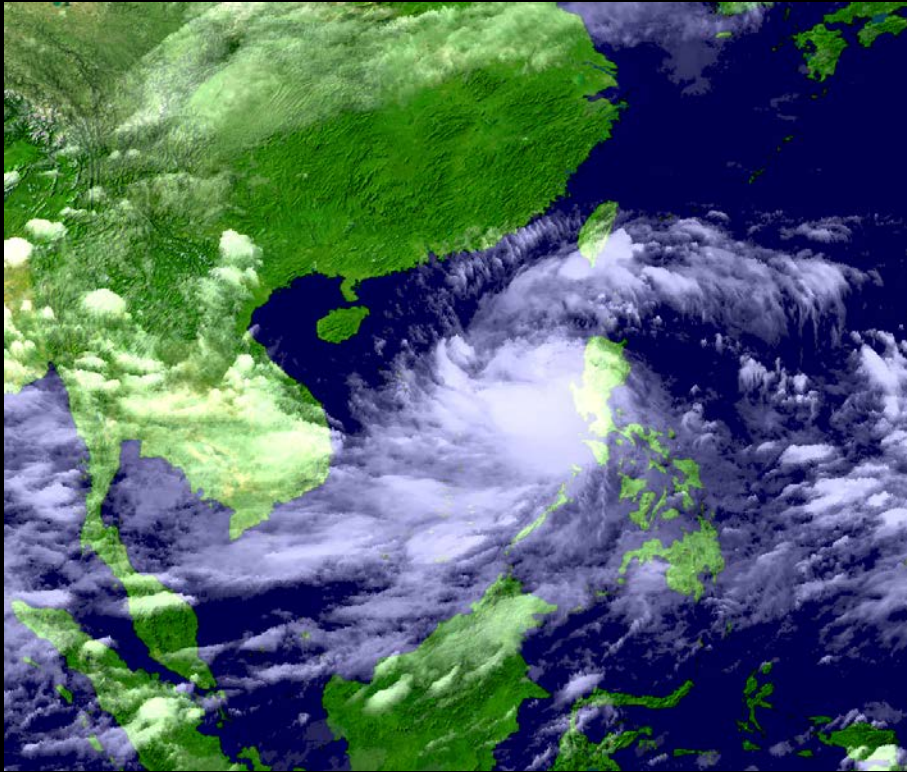


No rain 0.1 - 1.0 2.0 - 5.0 5.0 - 10.0 >10.0 mm/h

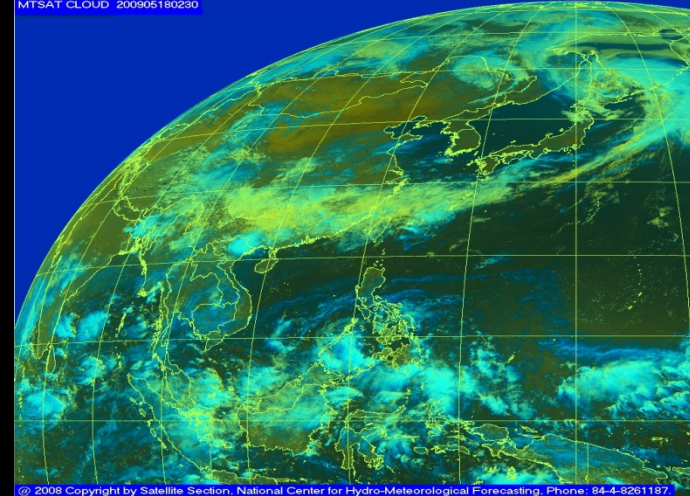
Data Distribution

Bulletin and data support to:

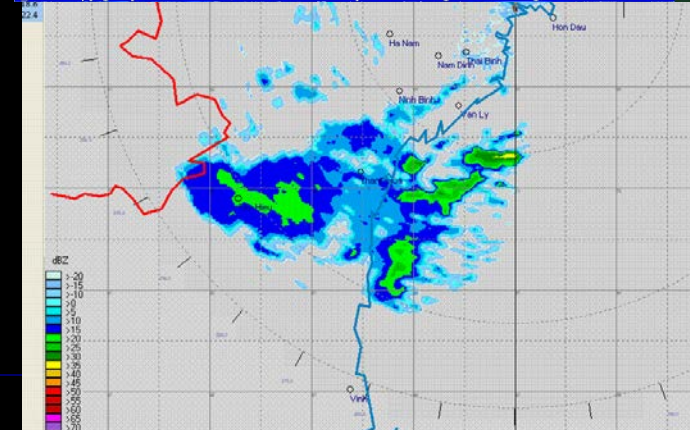
- 09 Regional Hydro-Meteo. Forecasting Centers
- 54 Provincial Hydro-Meteo. Forecasting Centers
- Disaster Management Center, MARD
- Vietnamese Salvage Agency
- Military Offices, Civil Aviation
- Domestic Broadcasting Agencies



MTSAT CLOUD 200905180230



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Thank you very much !
