Malaysia Country Report

MALAYSIA METEOROLOGICAL DEPARTMENT

asmadi@met.gov.my

Joint Meeting of RA II WIGOS Project and RA V TT-SU

Jakarta, Indonesia / 11 October 2018

BMKG Headquarter

Outline

I. Abstract (updates on status and plan of satellite data access, processing, application and training)

II. Satellite data and product requirements, training needs and infrastructure

Appendix

a. Background

b. Short description of NMHS activities

c. Current observational system overview

d. Access, processing and application of satellite data and products

e. Satellite data to address regional challenges

Abstract

MMD is currently operating various types of ground satellite receiving and processing system in managing, visualizing and processing of satellite data from Polar-Orbiting/LEO Satellites and Geostationary Satellites. Data and information received from these weather satellites either through ground receiving antenna (e.g. Himawari Cast, CMACast, FY2 Direct Broadcast for FY2G, SATRAX for *NOAA Series, TERRA, AQUA, NPP, METOP A&B , FY-3*, VXEOS for NOAA series) or internet services (e.g. Himawari Cloud) act as supporting recipes for weather forecasters in providing better advanced warnings of weather related phenomena. MMD are using SATAID, SWAP, METEOR, MICAPS, MESSIR COROBOR as a processing and display software.

Well trained personnel to manage and interprete satellite products, maintaining ground receiving system especially for polar orbiting satellites, up-to-date data processing package software due to increasing number of satellite data, and customize satellite-based products for specific users is a challenges for an effective satellite applications for National Meteorological and Hydrological Services (NMHSs).

With the latest technologies development of new generation weather satellites and the growing of demand for weather information and warnings from various stakeholders in Malaysia, MMD must confront the challenges by continuously improving the capabilities on various areas from time to time.

Satellite data and product requirements, training needs and infrastructure

- Satellite data and product requirements
  - Level 2 geostationary satellites data e.g forest fire, atmospheric aerosol and for aviation services
  - Near real time polar orbiting satellites data (Level 0 or Level 1b) through internet service to NMHSs
- Training needs
  - Interpreting RGBs products and high level satellite products
- Technical infrastructure issues to access and process/visualize satellite data
  - Up-to-date data processing package software that can automatically generate satellite Level 1b and RGB products for NMHSs services

Appendix

Country Overview

- Located between latitude 2°North to 7° North of the equator and longitude 99.5°East to 120°East in Southeast Asia
- A total of land area about 329,847 square kilometers; and separated by the South China Sea in two regions, Peninsular and Malaysian Borneo, with a population of over 30 million.
- Malaysia's climate is a tropical climate with generally uniform temperature that ranging from a maximum of 33°C to a minimum of 23°C and high humidity around 70%-90%.
- The average annual rainfall is 2,400 mm for Peninsular Malaysia, 3,800 mm for Sarawak and 2,600 mm for Sabah.
- Divided into two (2) seasons which are Southwest Monsoon (May-Sep), Northeast Monsoon (Nov-Mar) and two (2) shorter periods of Inter-monsoon (Apr and Oct).

Major Historical Hydrometeorological Disaster

WEATHER RELATED DISASTER


Monsoon Flood


Flash Flood


Drought


Forest Fire


Haze


Thunderstorm


Waterspout/Landspout


Tropical Cyclone/Storm

EARTHQUAKE & TSUNAMI DISASTER


Cracked Roads


Tsunami Waves


Landslide


Structural Damage

Monsoon and Weather Phenomena

Monsoon Flood

Strong Winds

Rough Seas

Northeast Monsoon (Nov-Mar)

- Monsoon rain (East Coast Peninsular & Western Sarawak)
- Strong Winds
- Rough Seas

Inter Monsoon (Apr)

- Thunderstorm
- Heavy Rain
- Wind Gust
- Waterspout/ Landspout
- Hail

Southwest Monsoon (May-Sep)

- Less rain in Peninsular & Sarawak (stable atmosphere)
- Squall line (at early morning in western Peninsular)

Inter Monsoon (Oct)

- Thunderstorm
- Heavy Rain
- Wind Gust
- Waterspout/Landspout
- Hail

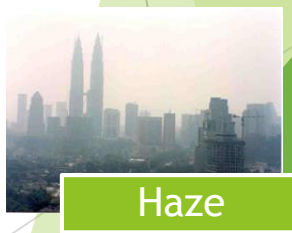
Flash Flood

Fallen Trees

Damaged Roof

Drought

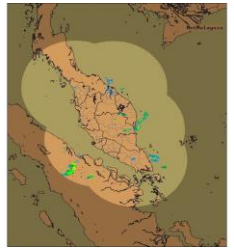
Forest Fire



Haze

Lightning

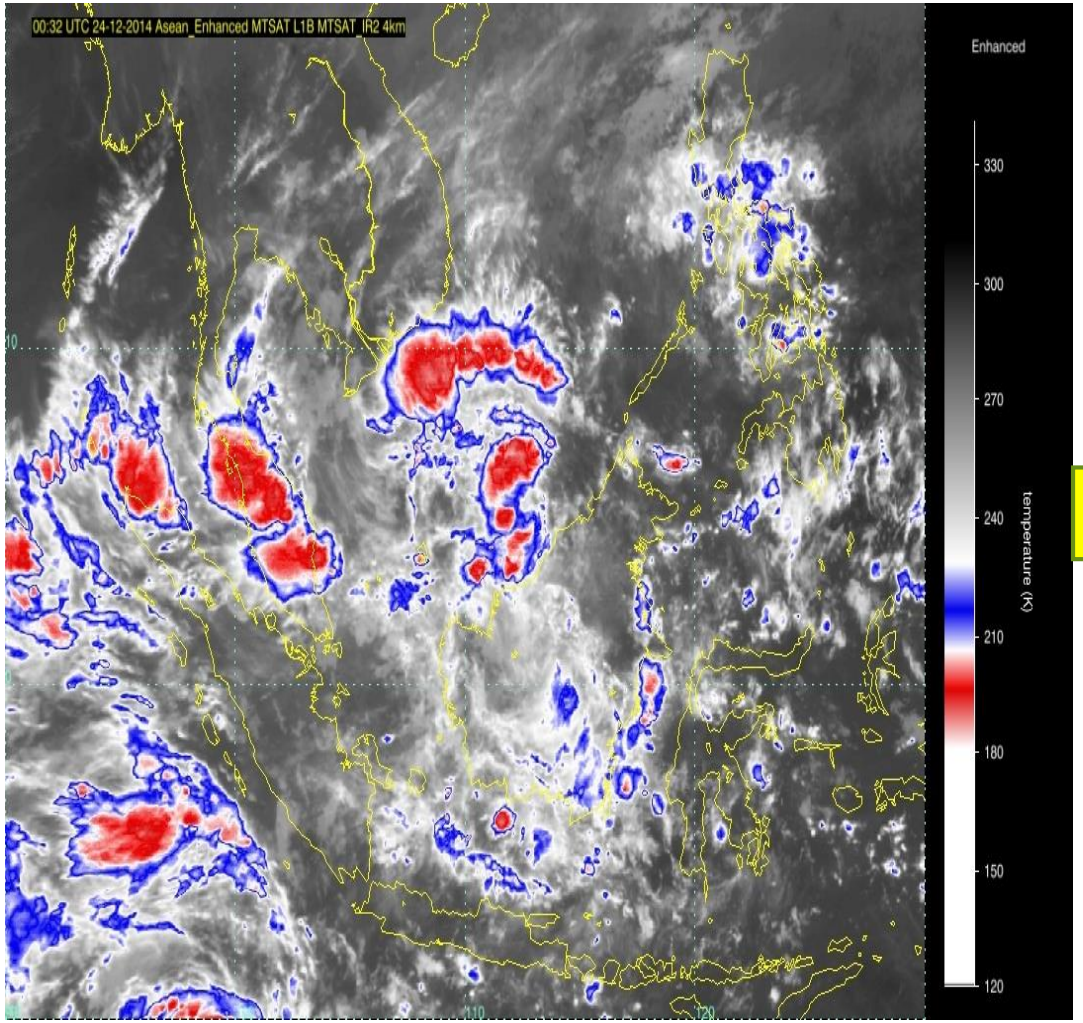
Landslide



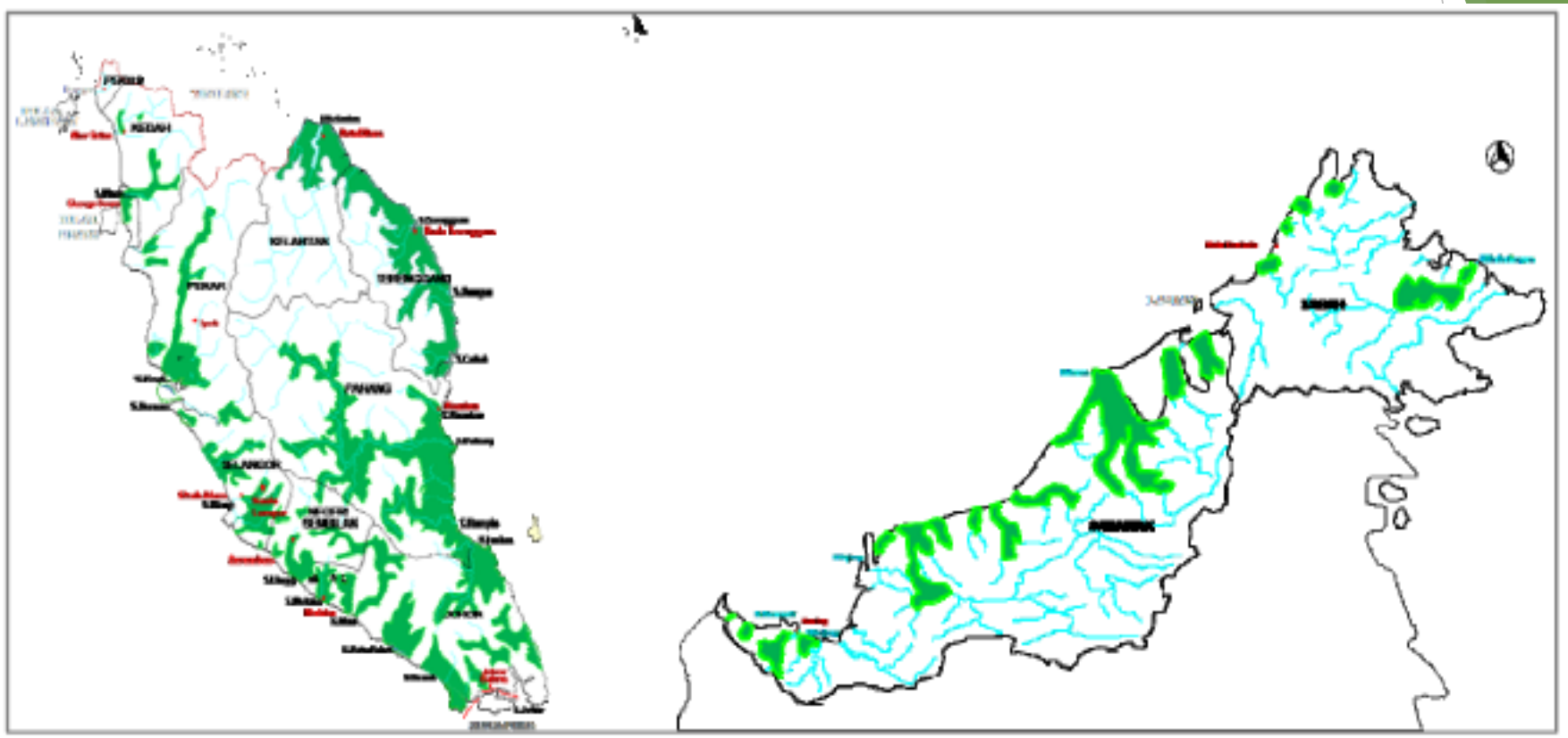
Squall Line

Monsoon Flood

- During Northeast Monsoon (Nov – Mar).
- Due to monsoonal rain (Continuous heavy rainfall up to several days)



Monsoon Flood



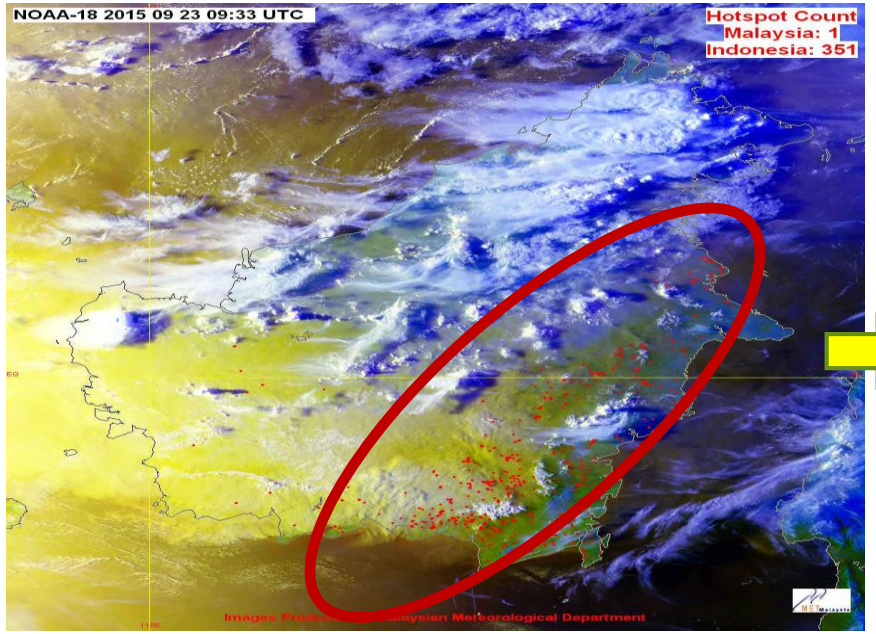
Flood-prone Areas in Malaysia Source: Drainage and Irrigation Department Malaysia [Online] (2012)

- The estimated area vulnerable to flood disaster is approximately 29,800 km2 or 9% of the total Malaysia area, and is affecting almost 4.82 million people which is around 22% of the total population of the country (DID, 2009)

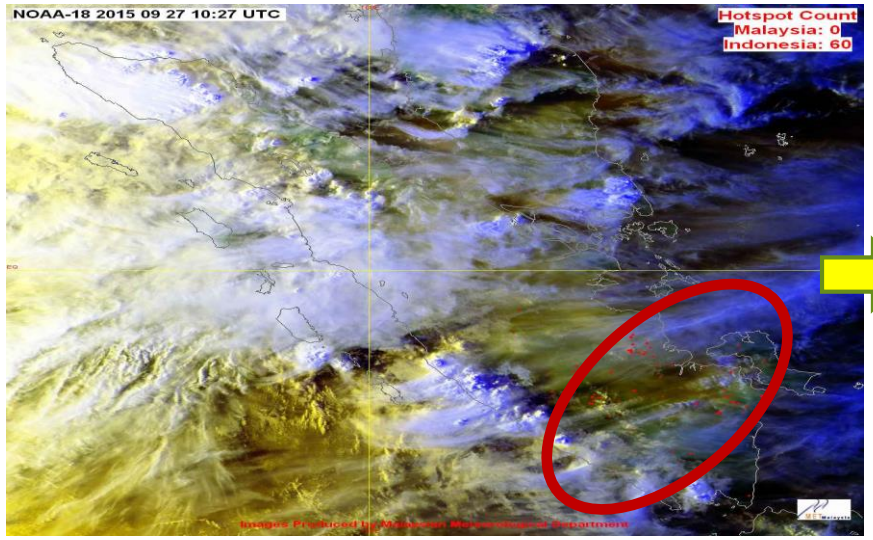
- The damage caused by the monsoon flood in parts of north and eastern Malaysia in 2014 is likely to exceed RM1 billion or almost USD$300 million (Berita Harian, 2014).

Drought and Haze

- During Southwest Monsoon (May-Sep)

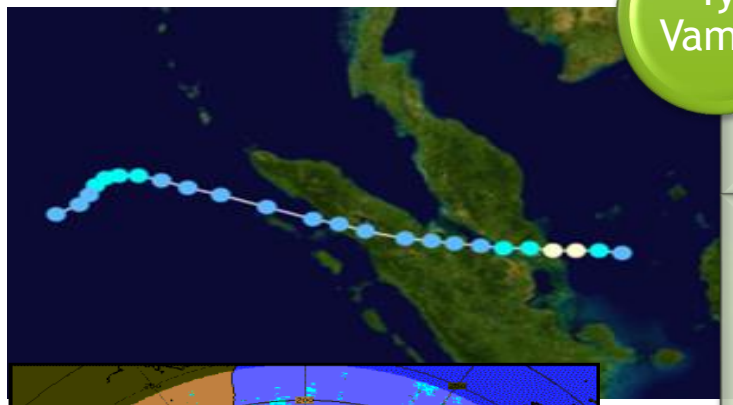


- Dry weather and less rain



Typhoon Vamei and tropical Storm Greg

Ty Vamei

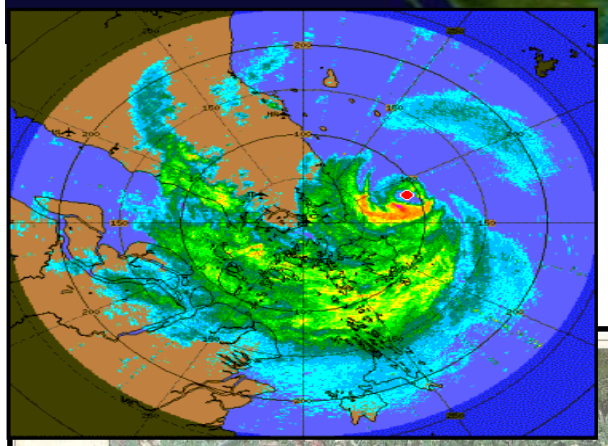


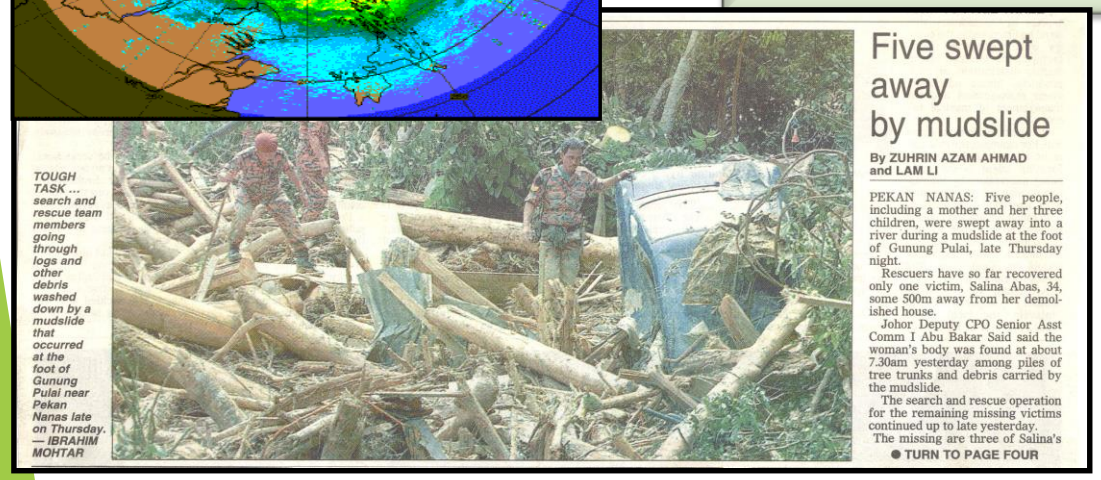
Hit east Johore on 27 Dec 2001

Strong winds (140 km/h) and heavy rain:

- Mud floods & flash floods.
- Damaged crops and several houses.

5 people killed





Five swept away by mudslide

By ZUHRIN AZAM AHMAD and LAM LI

PEKAN NANAS: Five people, including a mother and her three children, were swept away into a river during a mudslide at the foot of Gunung Pulai, late Thursday night.

Rescuers have so far recovered only one victim, Salina Abas, 34, some 500m away from her demolished house.

Johor Deputy CPO Senior Asst Comm I Abu Bakar Said said the woman's body was found at about 7.30am yesterday among piles of tree trunks and debris carried by the mudslide.

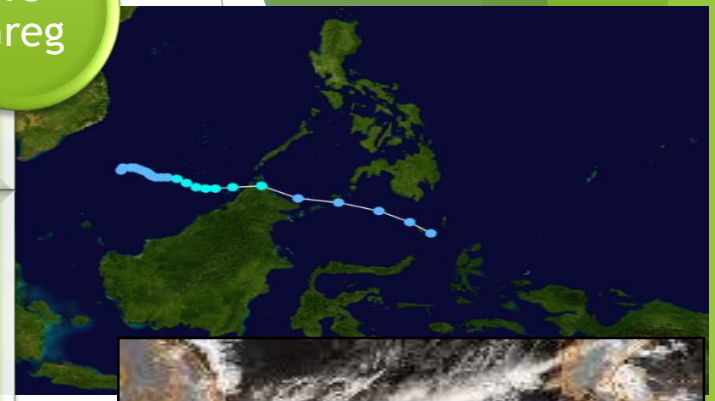
The search and rescue operation for the remaining missing victims continued up to late yesterday.

The missing are three of Salina's

● TURN TO PAGE FOUR

TOUGH TASK ... search and rescue team members going through logs and other debris washed down by a mudslide that occurred at the foot of Gunung Pulai near Pekan Nanas late on Thursday. — IBRAHIM MOHTAR

TS Greg



Crossed northern Sabah
26 Dec 1996

Strong winds (83 km/h) and heavy rain:

- Mud flood and torrential flooding.
- More than 4,000 houses damaged.

238 people killed

Tropical Storm Sonamu

6 NATION The Star, TUESDAY 8 JANUARY 2013

Sumber: The Star

Stories by FARIK ZOLKEPLI, SYED AZHAR, ONG HAN SEAN, C.A. ZULKIFLI and P. ARUNA. Photos by ZABIDI TUSIN and NIK NAIZI HUSIN

Terengganu prepares for worst-case scenario

KUALA TERENGGANU: People living ... moved their personnel out as a pre- ... He added that fishermen in the ... Terengganu and Setiu. ... Meanwhile, a st...

Sonamu: Usah terlalu cemas

Oleh SITI AIRUNNISA ALAUI
pengarang@utusan.com.my

Sumber: Utusan Malaysia

Red alert for Sonamu

Public urged to stay clear of beaches and fishermen asked to stay home

By Johnson K Saai and Peter Sibon

Sonamu has weakened, says dept

By Eve Sonary Heng
reporters@theborneopost.com

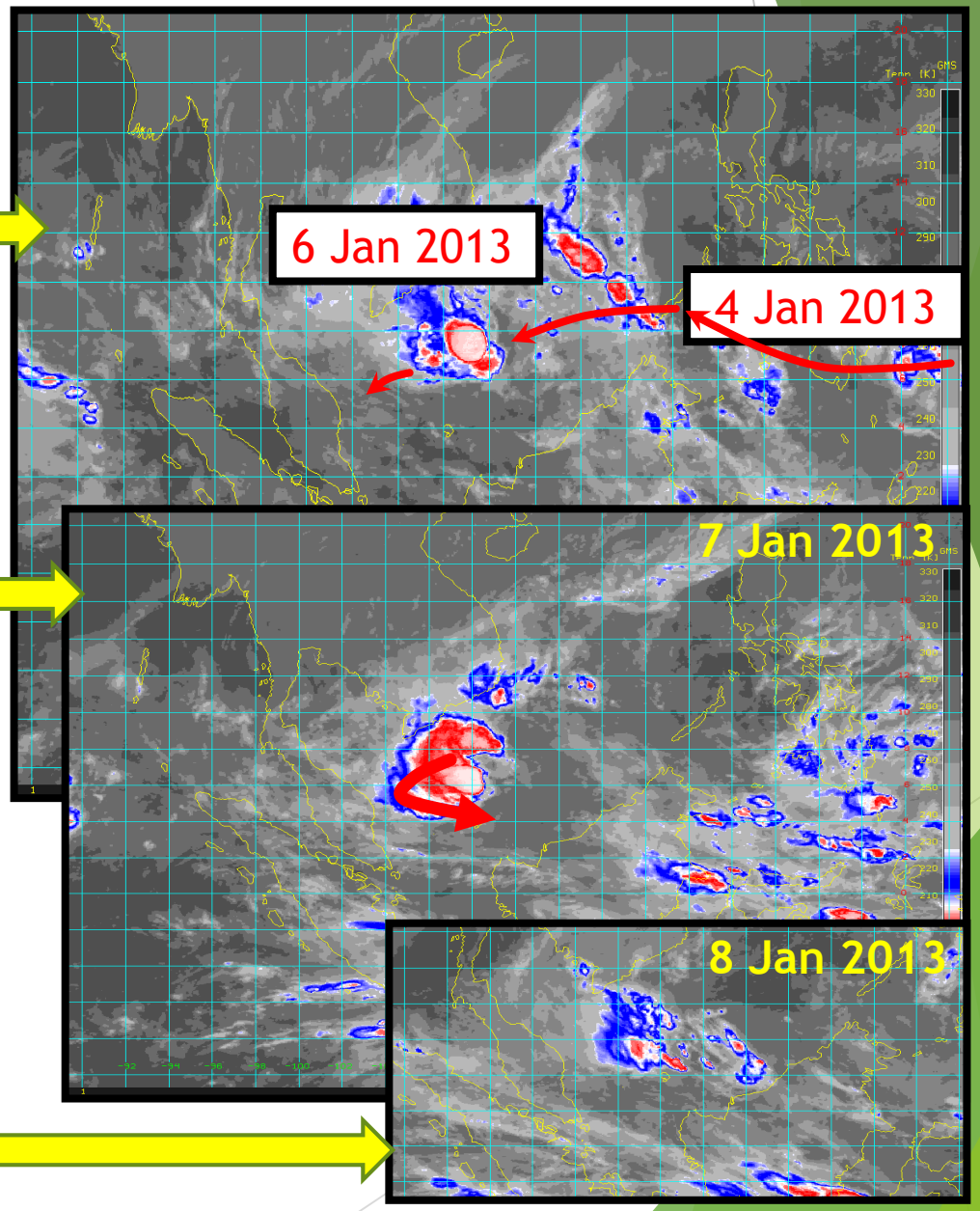
activities including fishing and ferry services.

"At the moment, the storm is getting weaker and is heading towards Australia. It is now called 'Narelle Wind'. However, we still advise people to be prepared for any eventuality and stay away from the beach and sea because of the strong waves," he said.

According to him, the tropical storm had stopped and did not reach Mukah or Kuching.

He explained that the thunderstorm and strong wind on Wednesday in Mukah was just the 'whiptail' of Sonamu.

"The real Sonamu is greater and stronger," he pointed out.



Major National Economic Sectors Relying on NMHSs

Public

Aviation

Disaster Management Agencies

Plantations

Fisheries

Shipping

Oil and Gas Exploration

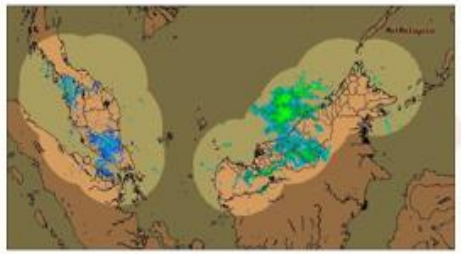
Sports & Recreational

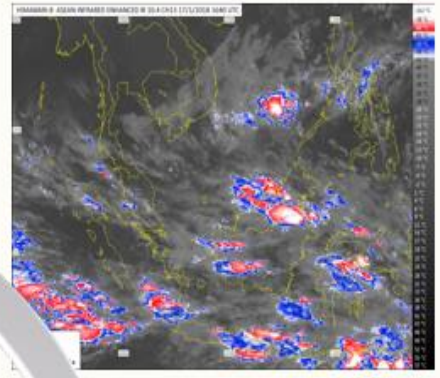
Special events

Mission & Objectives of MMD

MISSION

To fulfill Malaysia's needs on meteorological, climatological and geophysical services for national security, societal well-being and sustainable socio-economic development.





Weather information and forecast for military and civil aviation, marine and public

Promoting public awareness on extreme weather, earthquake and tsunami

MET Malaysia

Earthquake and tsunami information for public, media and disaster related agencies

Cloud seeding operation

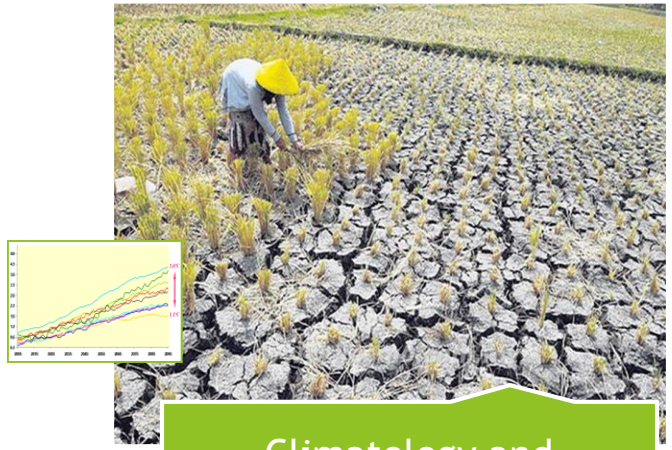
Early warning for severe weather, rough sea and tsunami for public, media and disaster related agencies

Services

Weather and Marine Forecasts & Warnings

Aviation Meteorology

Earthquake Information and Tsunami Warnings



Climatology and Agrometeorology Services

Atmospheric Science and Cloud Seeding

Current Observational System

Principal Meteorological Stations 42

Auxiliary Weather Stations 380

196 Automatic Weather Stations-AWS

Upper Air Stations 8

Weather Radar Stations 12

Peninsular – 7
Sarawak – 3
Sabah – 2

Satellite Ground Receivers 5

Polar Orbiting Satellite – 2
Geostationary Satellite – 3

Principal Meteorological Station

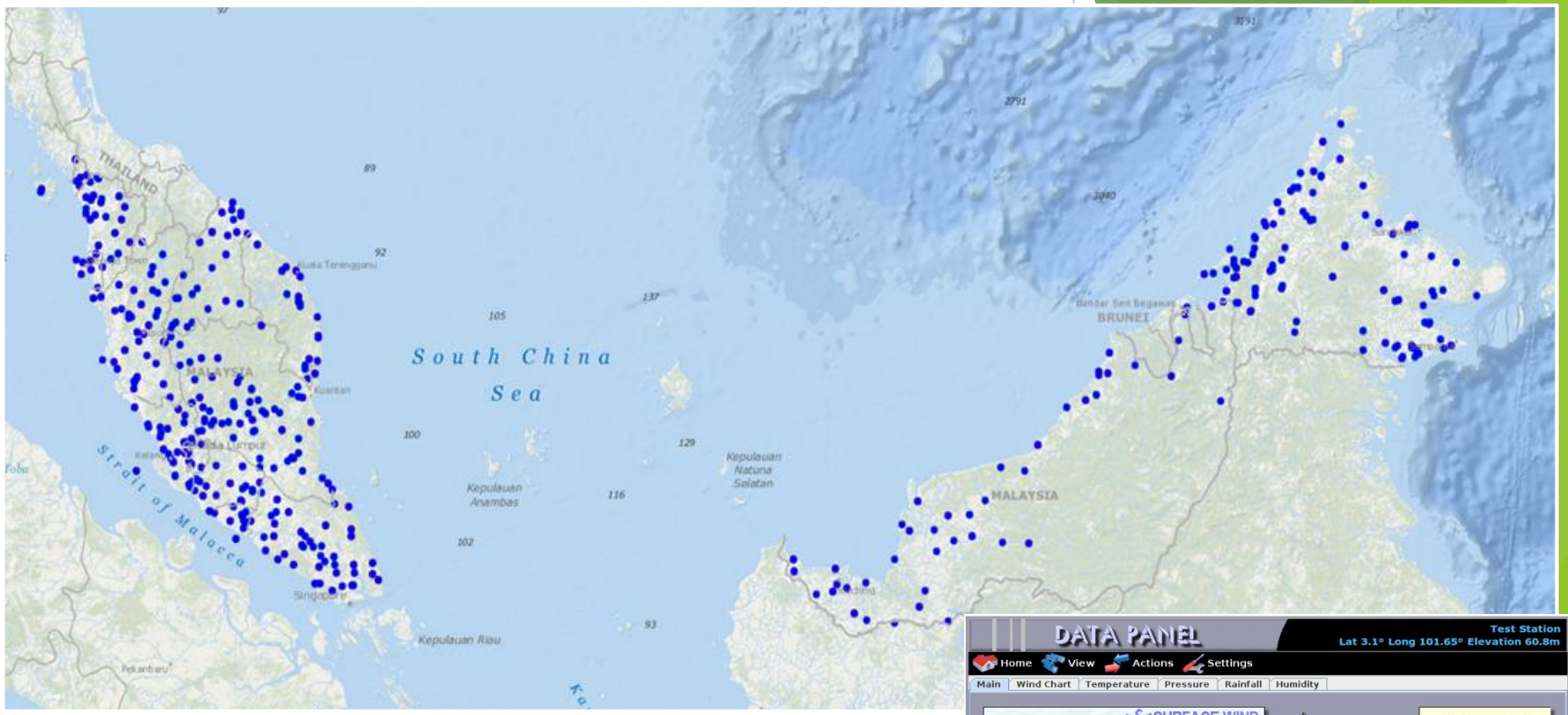
Principal Meteorological Stations

Cameron Highlands Meteorological Station

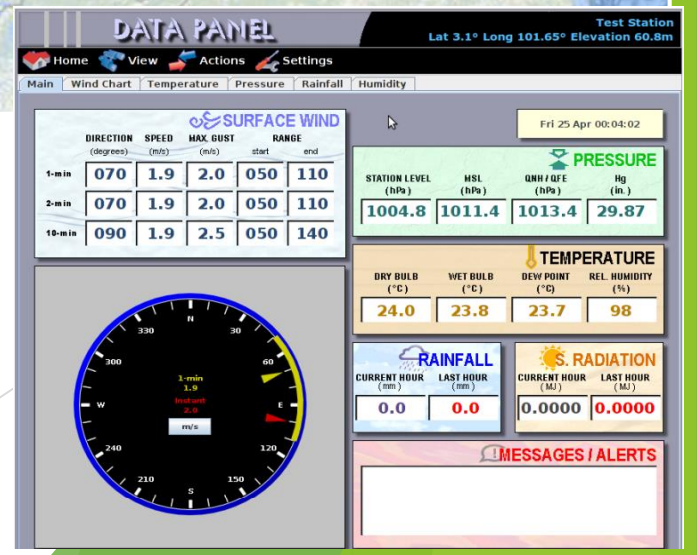
Met Farm

Auxiliary Weather Station

Auxiliary Weather Stations **380**



Automatic Weather Station (AWS)



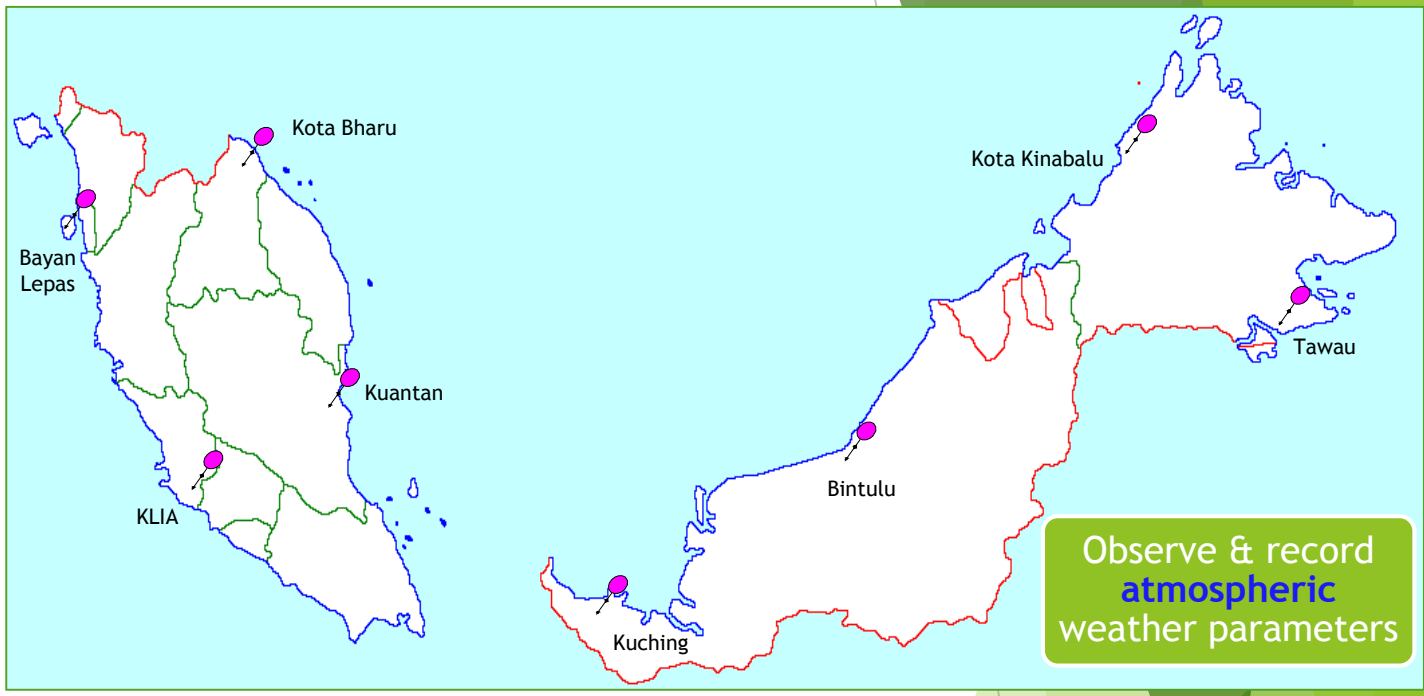
AWS Data Display

Upper Air Station

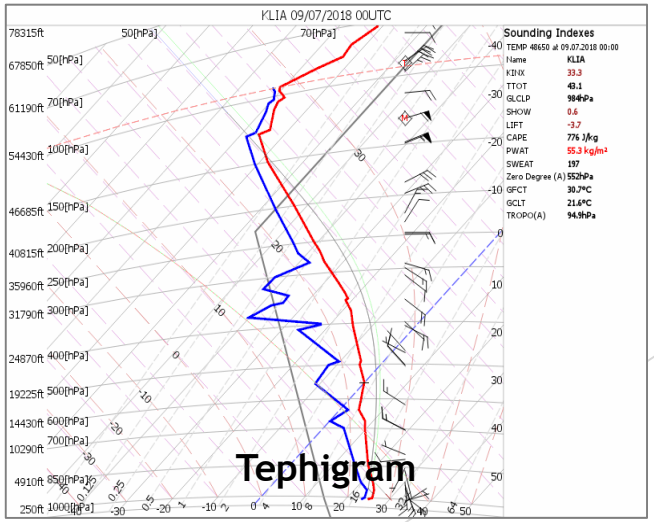
Upper Air Stations

8

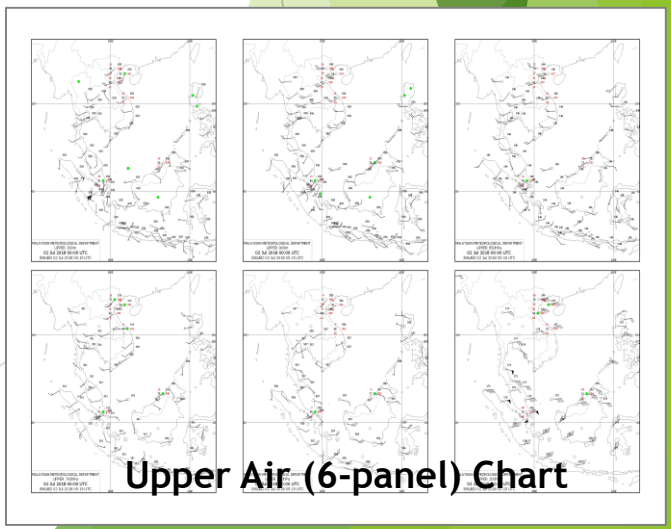
Radiosonde



Observe & record **atmospheric** weather parameters



Tephigram

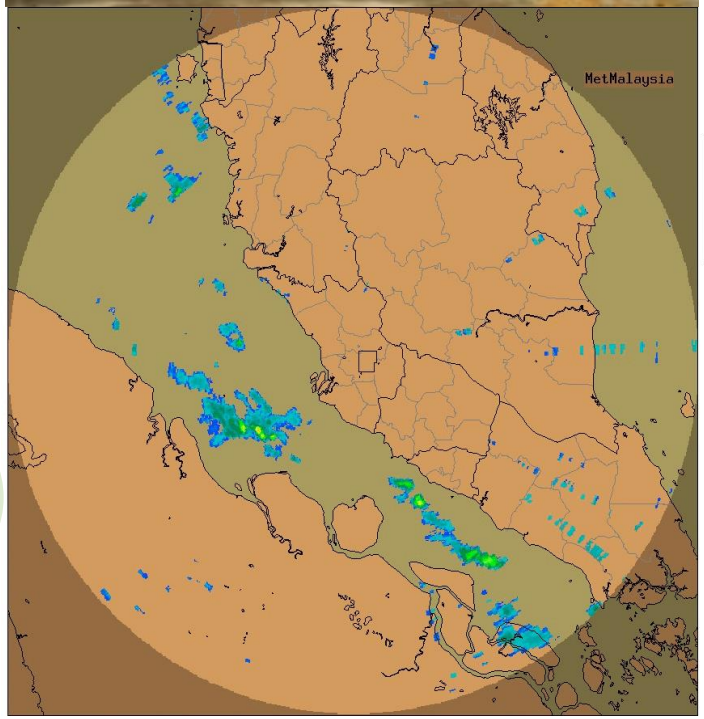


Upper Air (6-panel) Chart

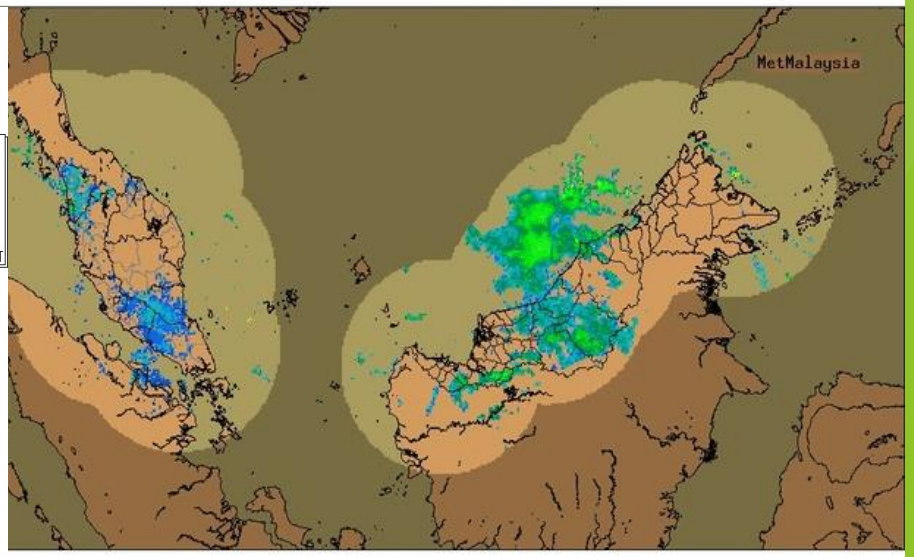
Weather Radar Station

Weather Radar Stations

12



- Alor Setar
- Butterworth
- Subang
- KLIA
- Kuching
- Kota Bharu
- Kuantan
- Kluang
- Bintulu
- Miri
- Kota Kinabalu
- Sandakan

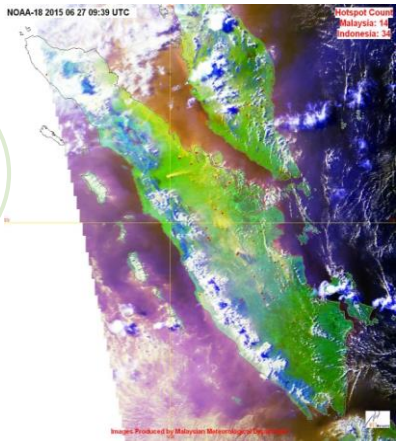


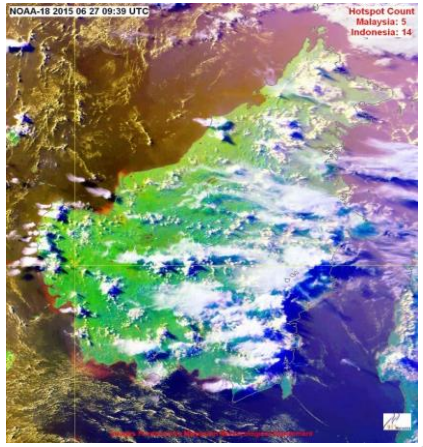
Satellite Ground Receivers

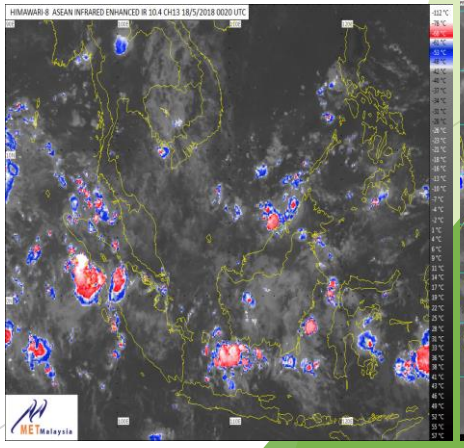
Satellite Ground Receivers

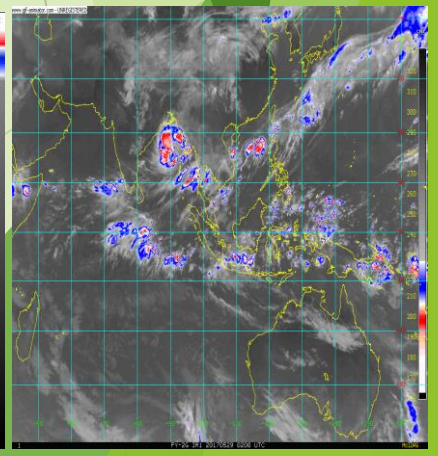
5

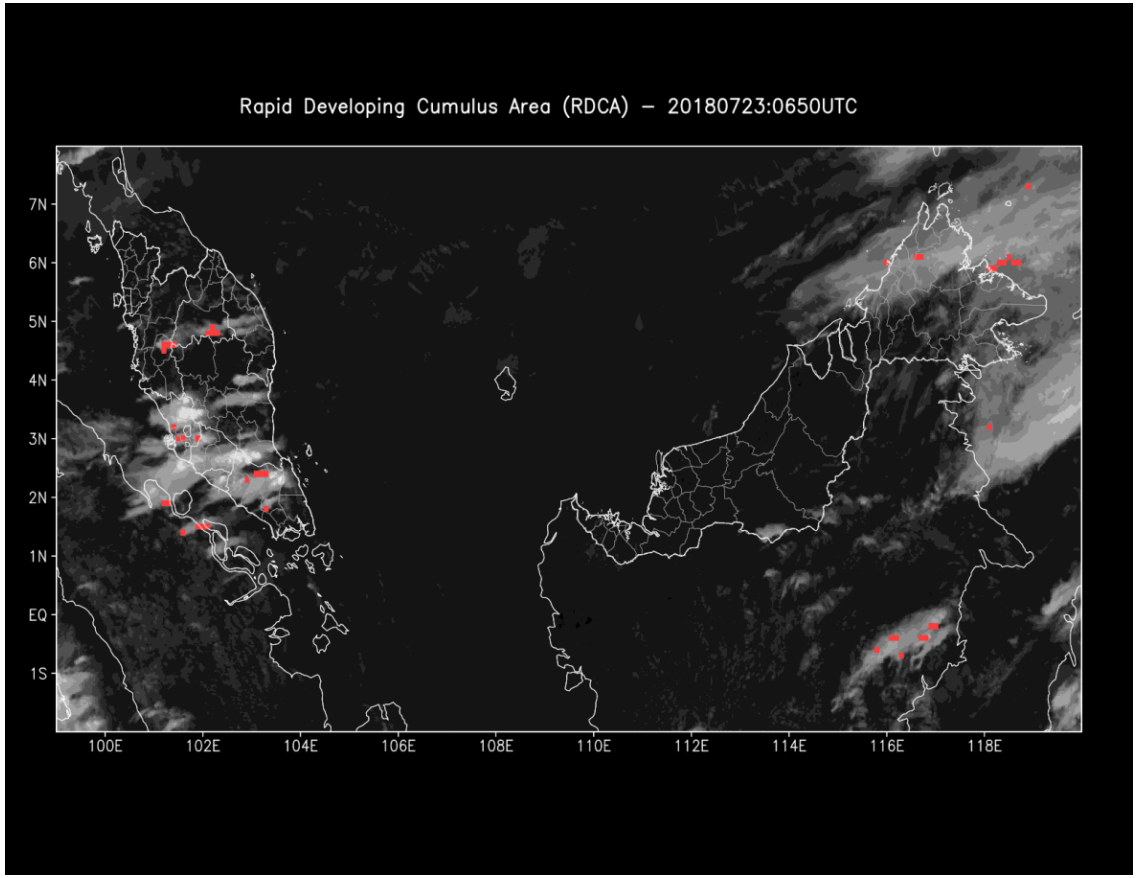
- Satellite Ground Receivers
  - Polar Orbiting Satellite
    - Hotspot and Haze Monitoring
      - NOAA
  - 
  - Geo-stationary Satellite
    - Weather Monitoring
      - HIMAWARI
      - FY2G

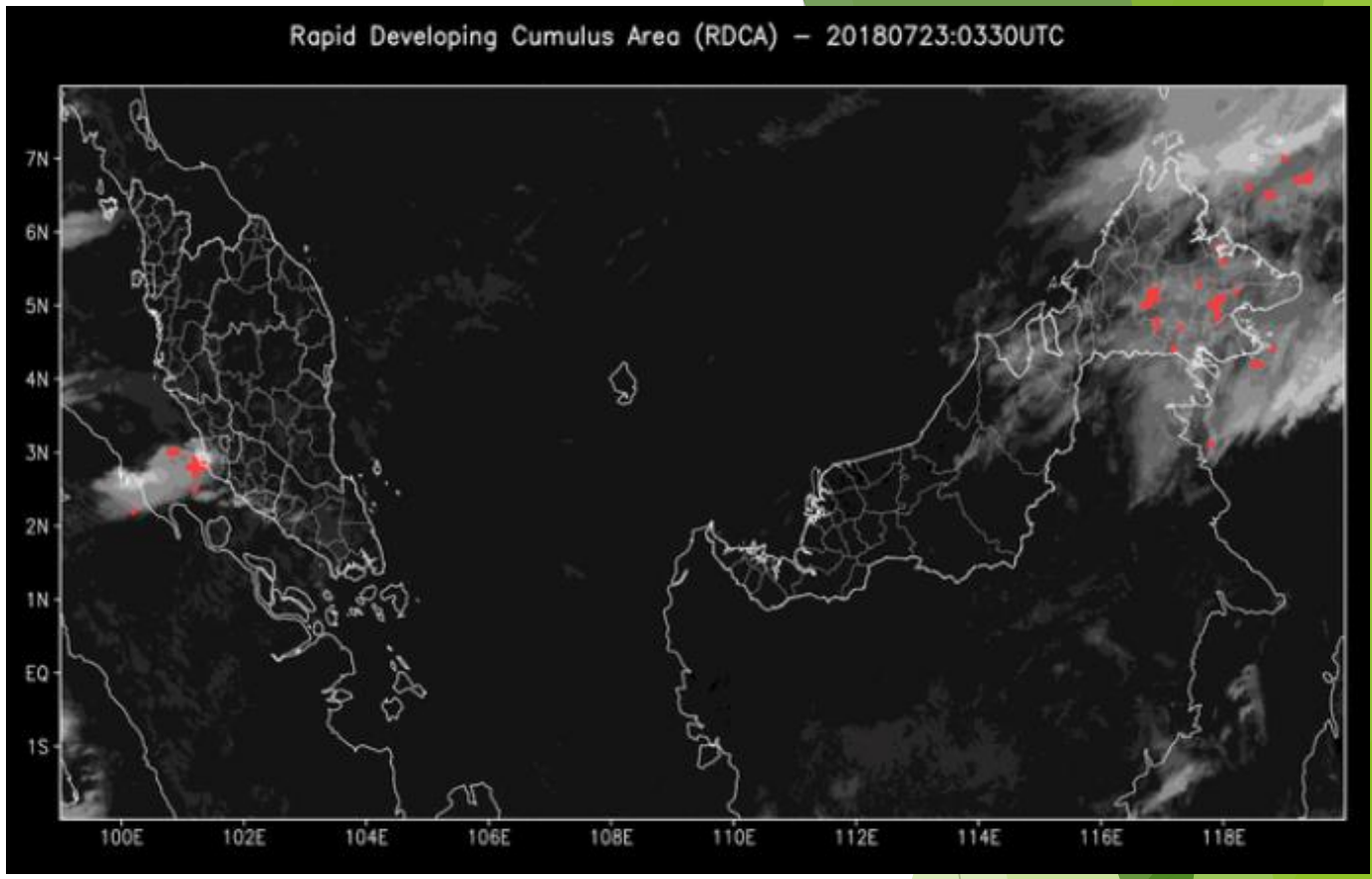












RDCA PRODUCT PRODUCED by MMD every 10 minutes data from 7 Channels (Band 03, 08, 10, 11,13,15 &16) High spatial resolution (0.5-2km) data downloaded from HimawariCloud Services

13-24 Mac 2017- Visiting Scientist Program at MSC/JMA

22-25 Oct 2018 – Technical Meeting on Himawari 8/9 RDCA Products

Validate RDCA data

input: the detection of RDCA

output: the accuracy of RDCA

Satellite Data Access

Geostationary Satellites

HIMAWARI-CAST

HIMAWARI CLOUD

INTERNET CLOUD SERVICE

CMA-CAST

FENG YUN
(Direct Broadcast)

MMD Satellite Section

Polar-Orbiting Satellites

SATRAX

VXEOS

Processing and Archiving of Satellite Data and Products

Polar-Orbiting/LEO Satellites

- VxEos X-L Band Ground Station *(NOAA Series)*
- Satrax700 X-L Band Ground Station *(NOAA Series, TERRA, AQUA, NPP, METOP A&B , FY-3)*

MESSIR-SAT

SATAID

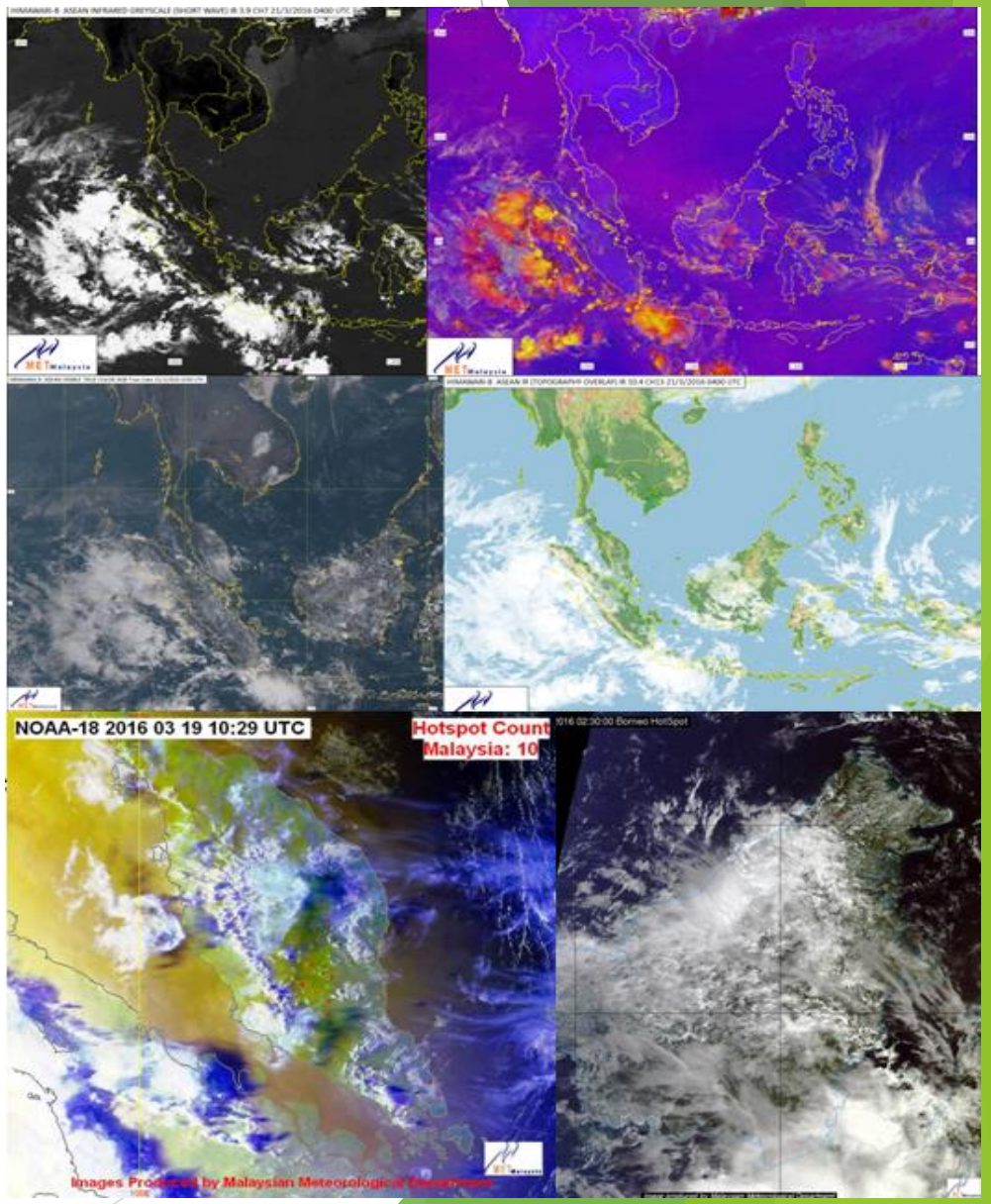
METEOR

SWAP

LEXICAL

Geostationary Satellites

- HimawariCast Ground Station *(Himawari-8)*
- CMACast Ground Station *(FY-2E, FY-2G & FY-2F)*
- Feng-Yun Ground Station *(FY-2G)*



Satellite Processing and Display System

Polar-Orbiting/LEO Satellites

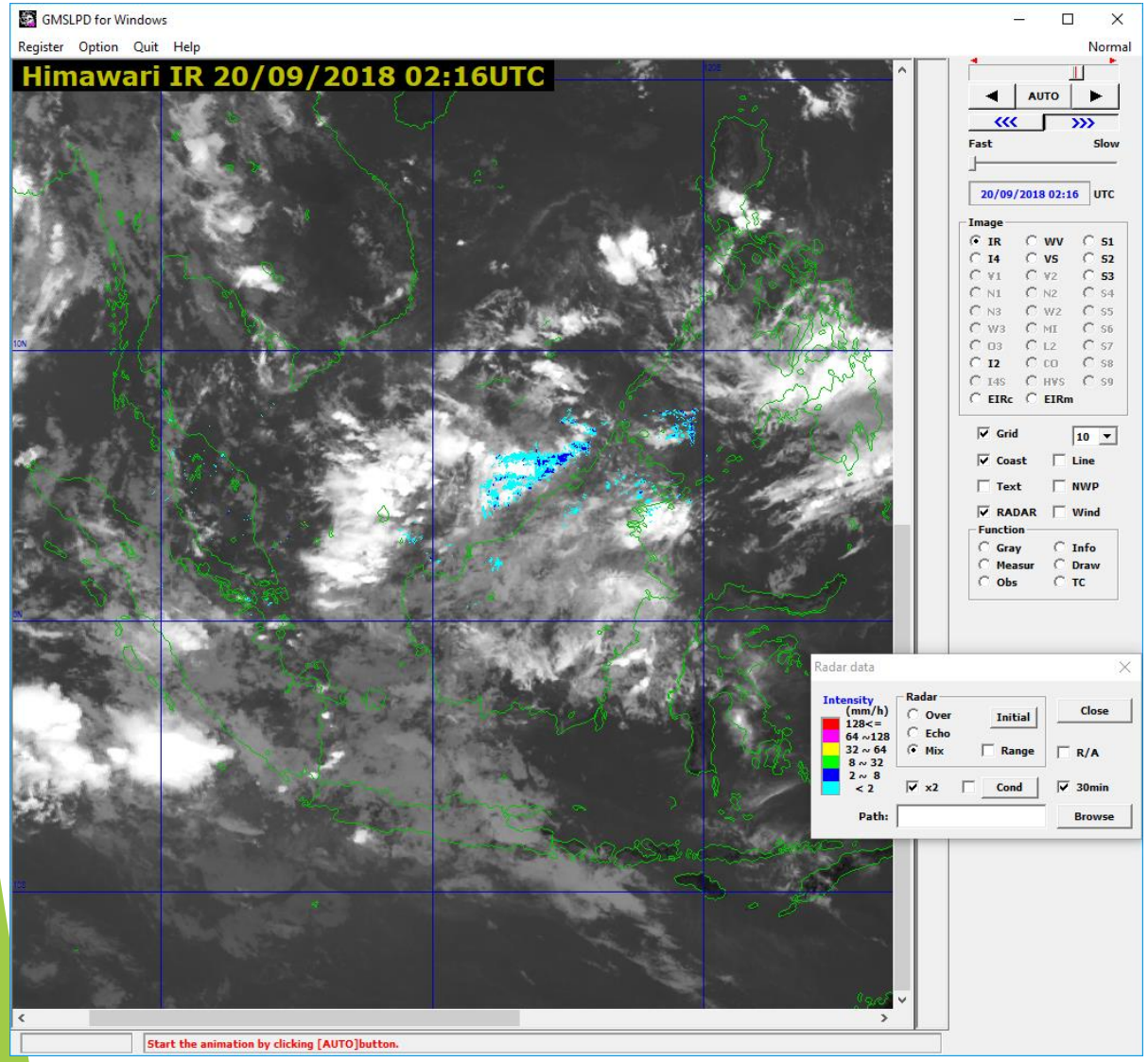
- VxEos X & L Band Acquisition and Processing System (Since 2009)
- Satrax700 X-L Band System (POESAT500 / METEOR) (since 2005)
- Lexical Processing and Display System (since 2005)

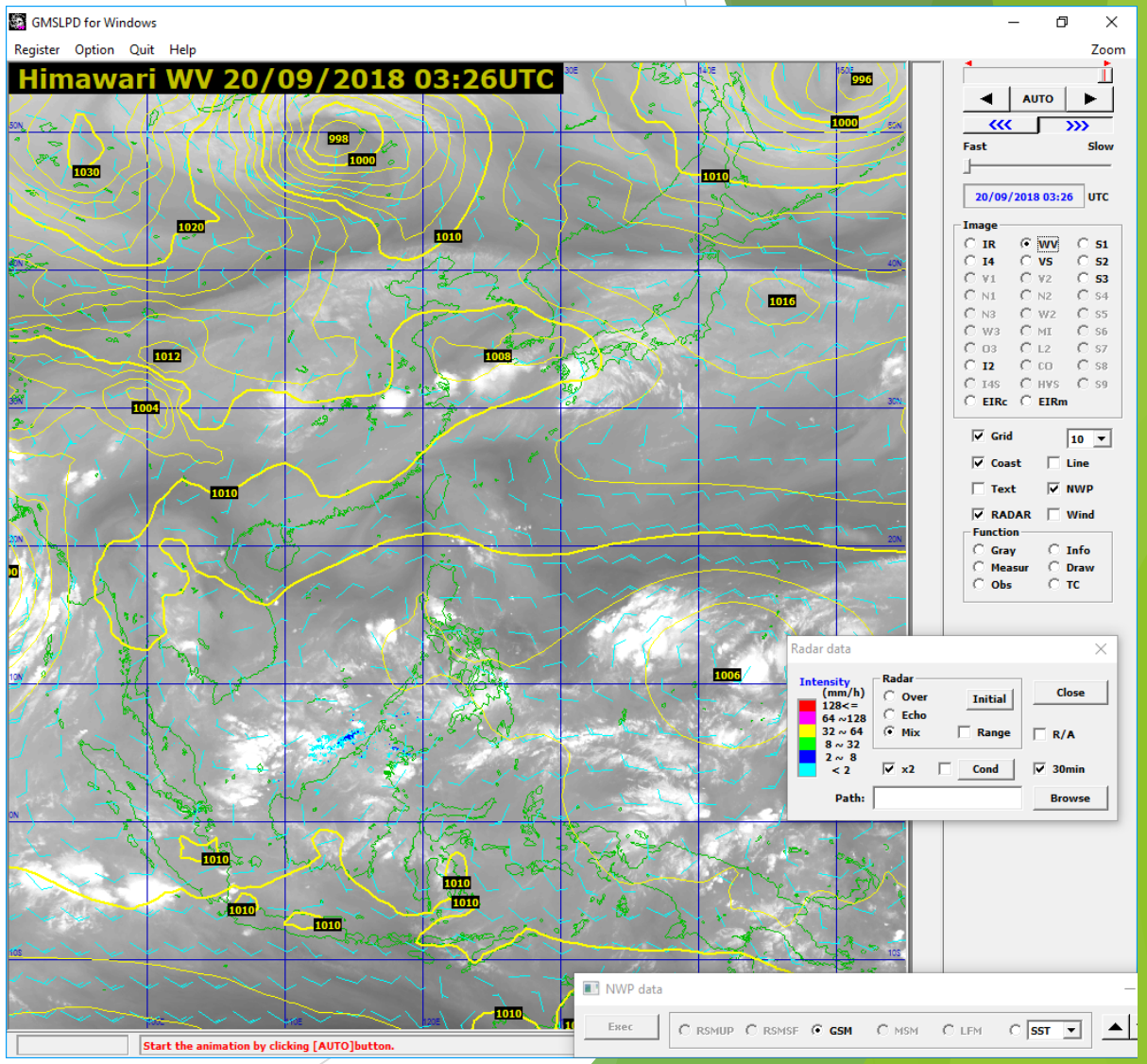
Geostationary Satellites

- HimawariCast System (*MESSIR-SAT ,Corobor) & SATAID & METEOR) since 2015*
- Feng-Yun 2G System *(ES&S FY-2 System –Mcidas)-(Since 2004)*
- CMACast System (GMSOFT, MICAPS & SWAP)- (since 2010)

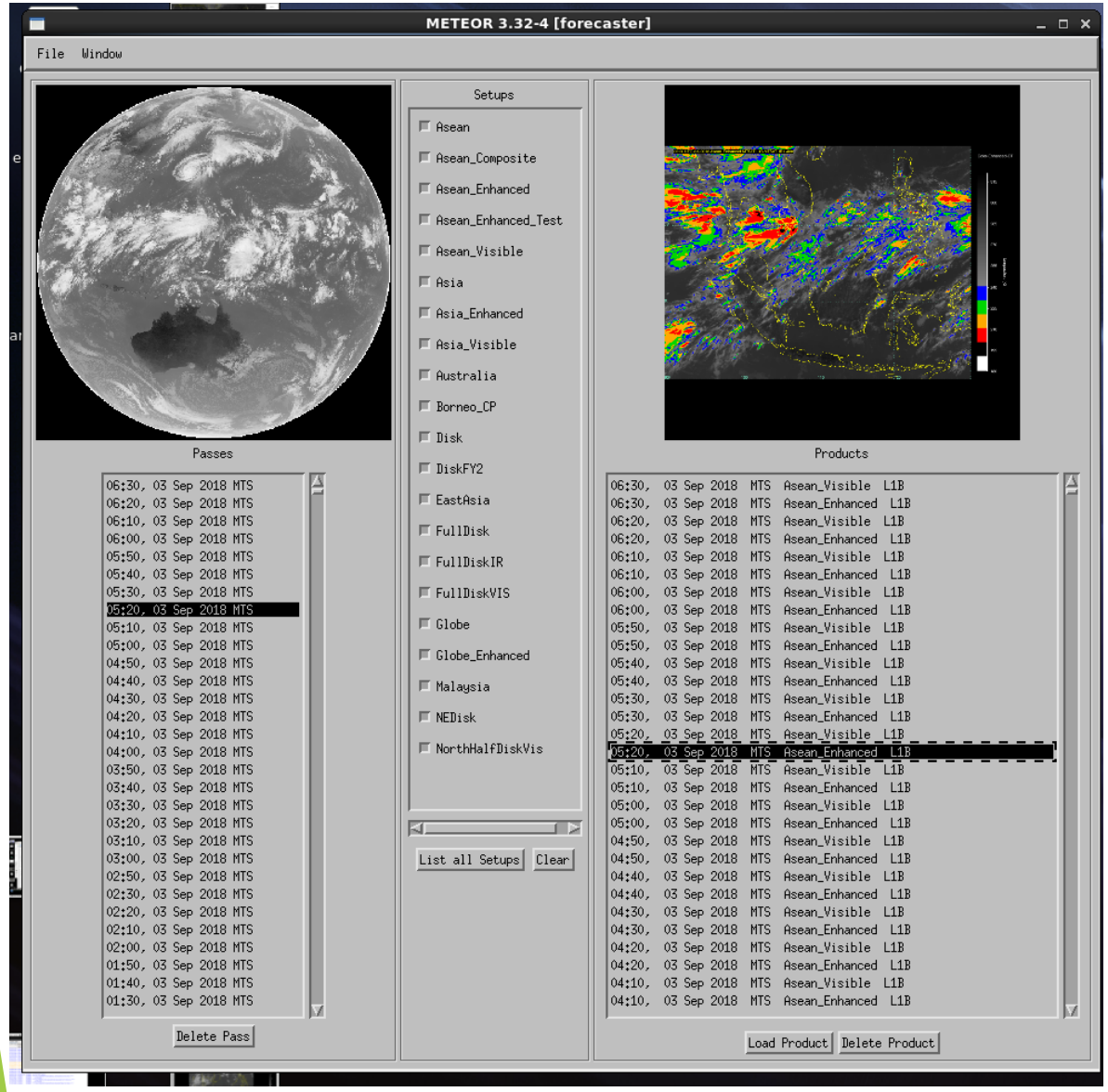
Note: need assistance on hardware and update of software application

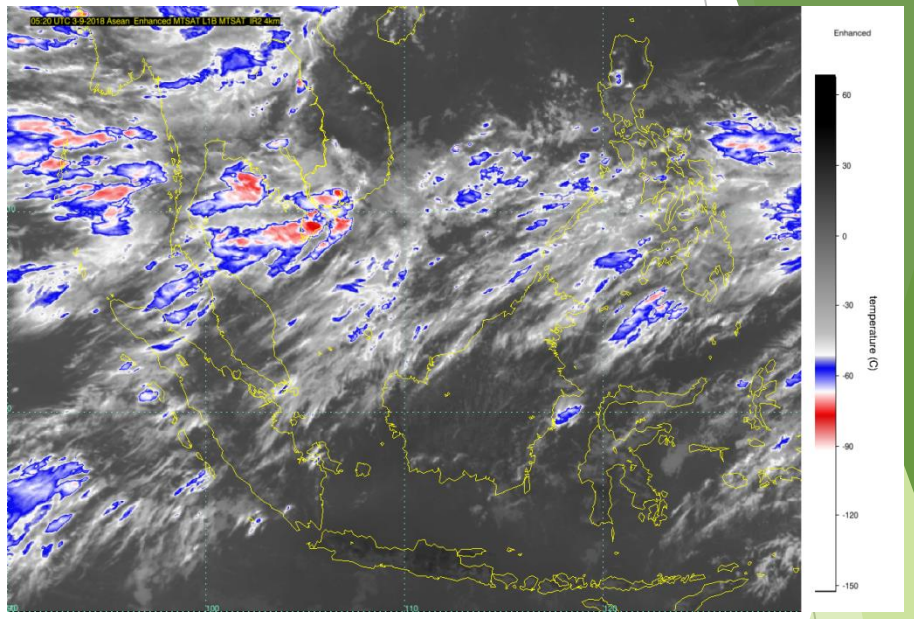
HIMAWARICAST DATA - SATAID

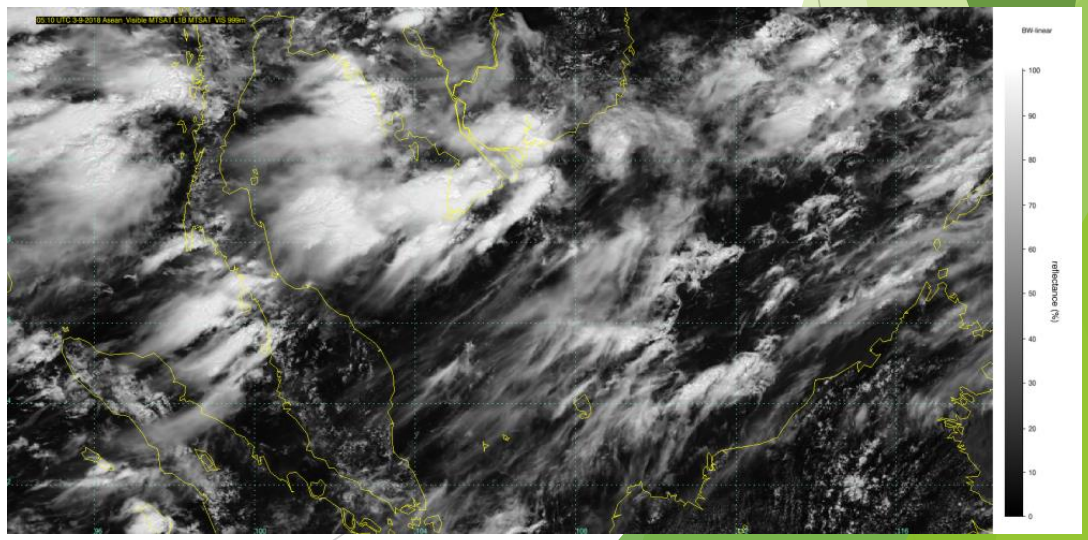




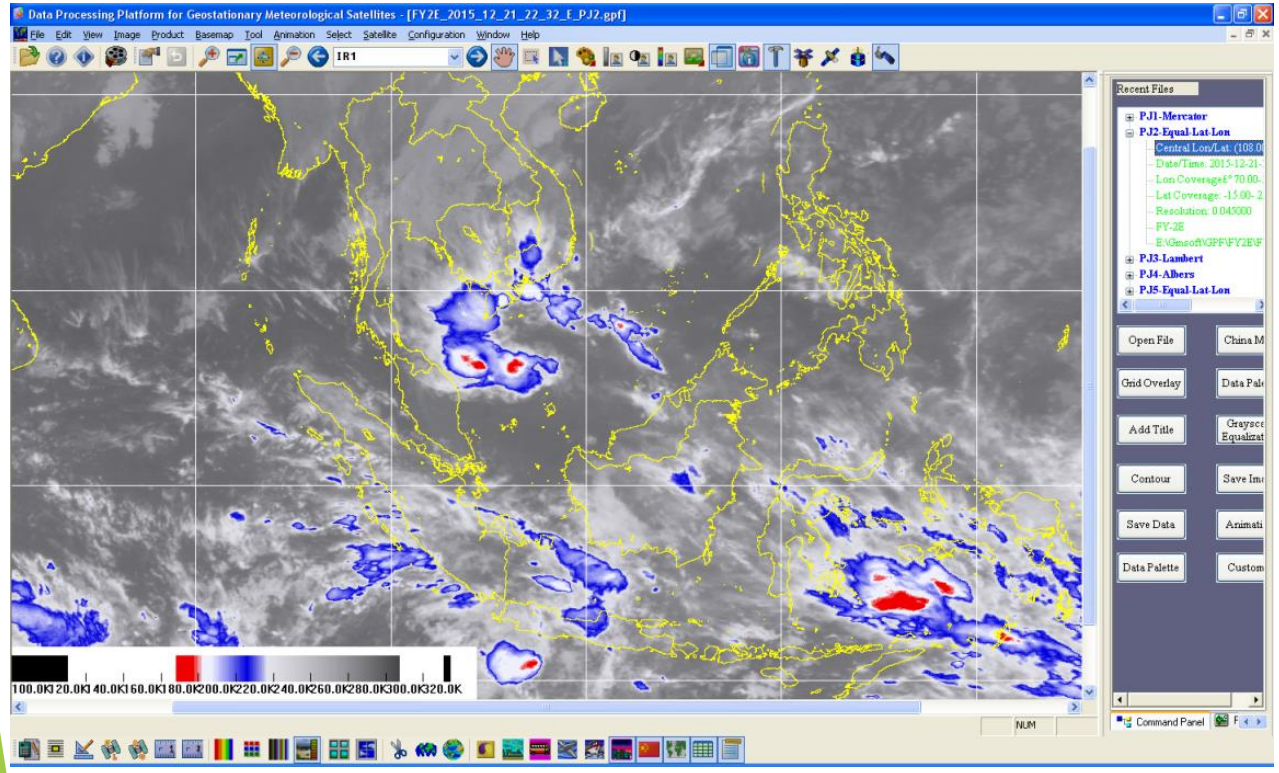
MTSAT / HIMAWARICAST DATA –METEOR



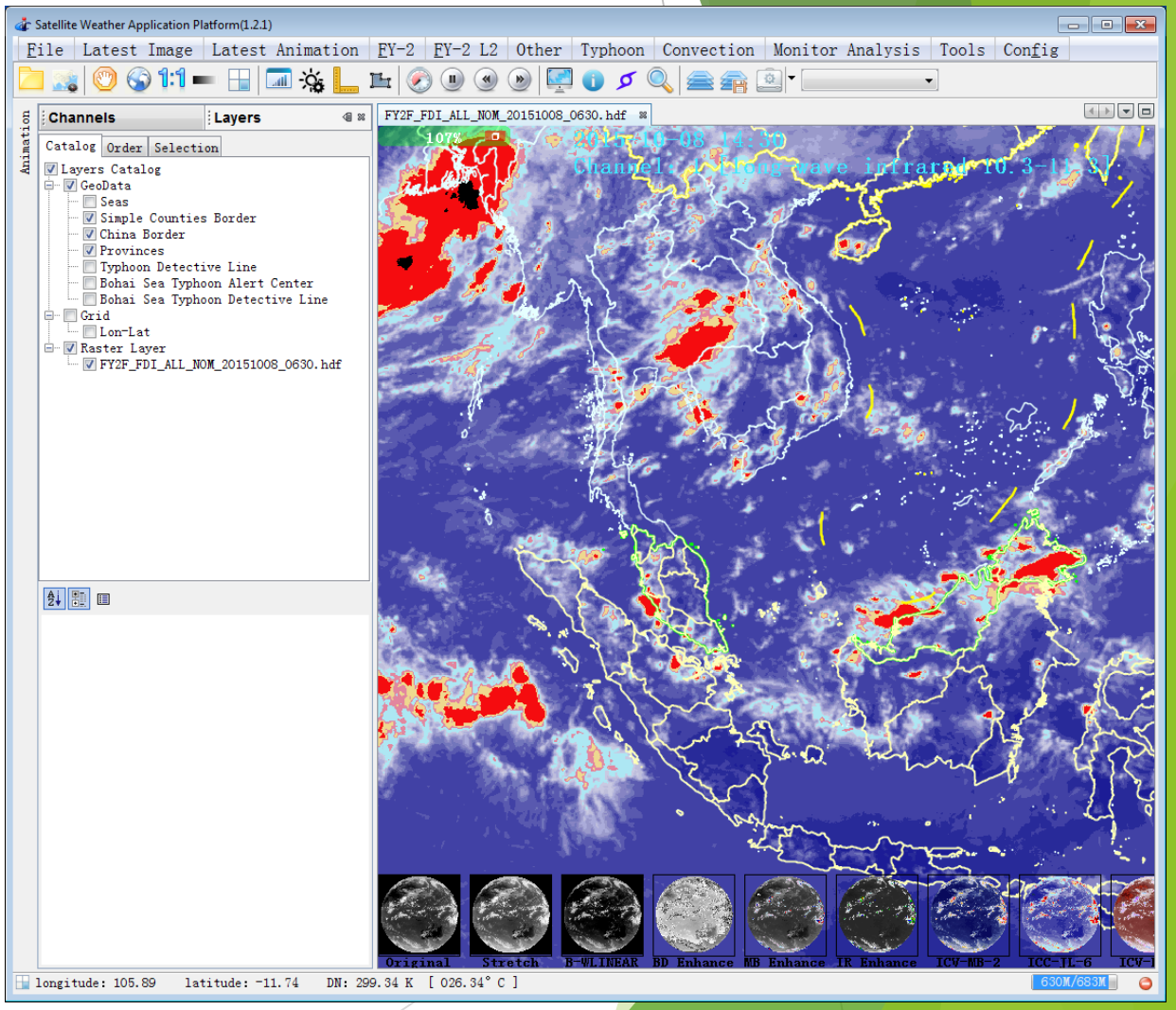




CMACAST DATA

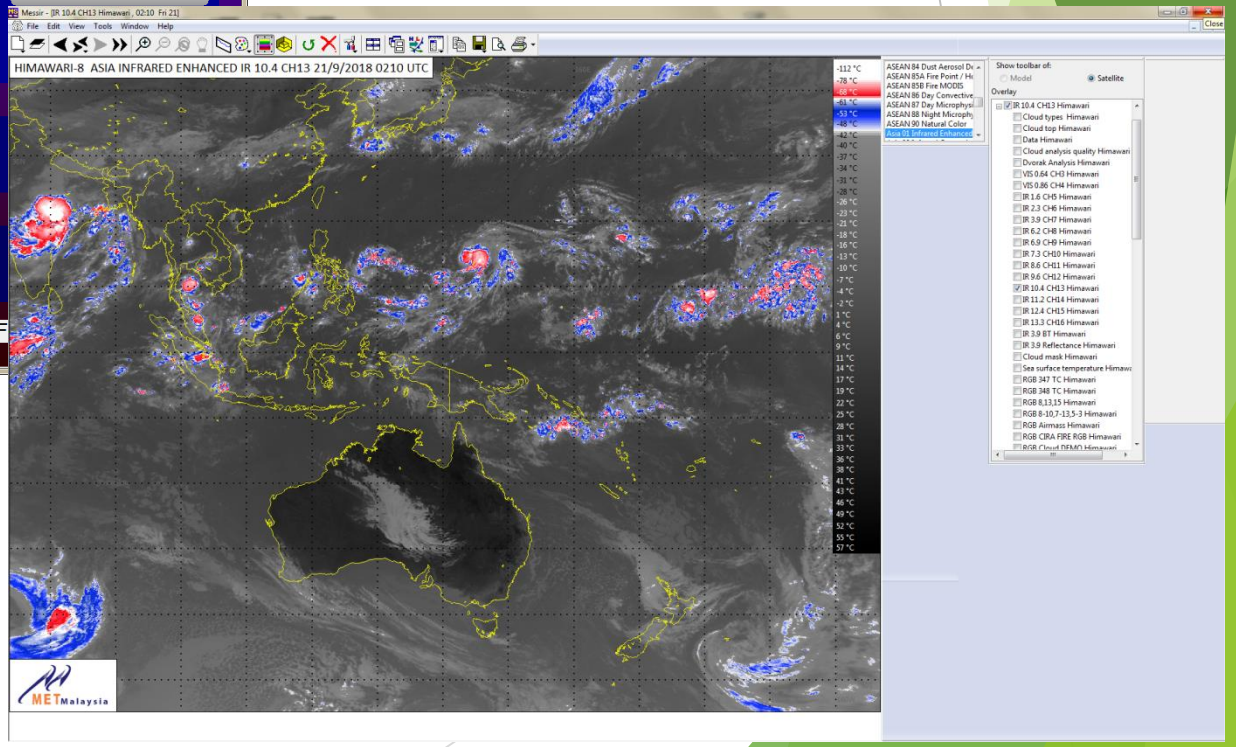


GMSOFT

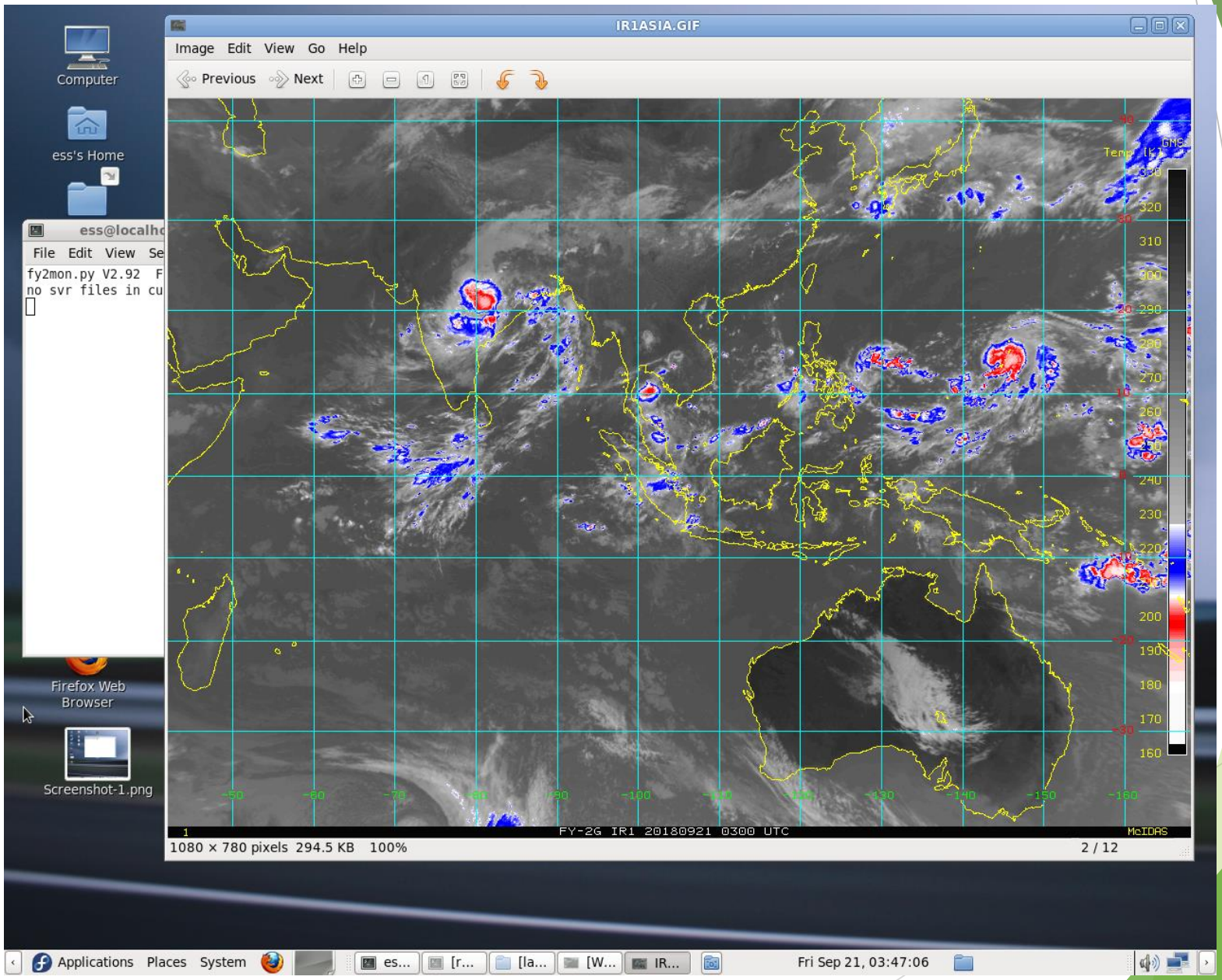


SWAP

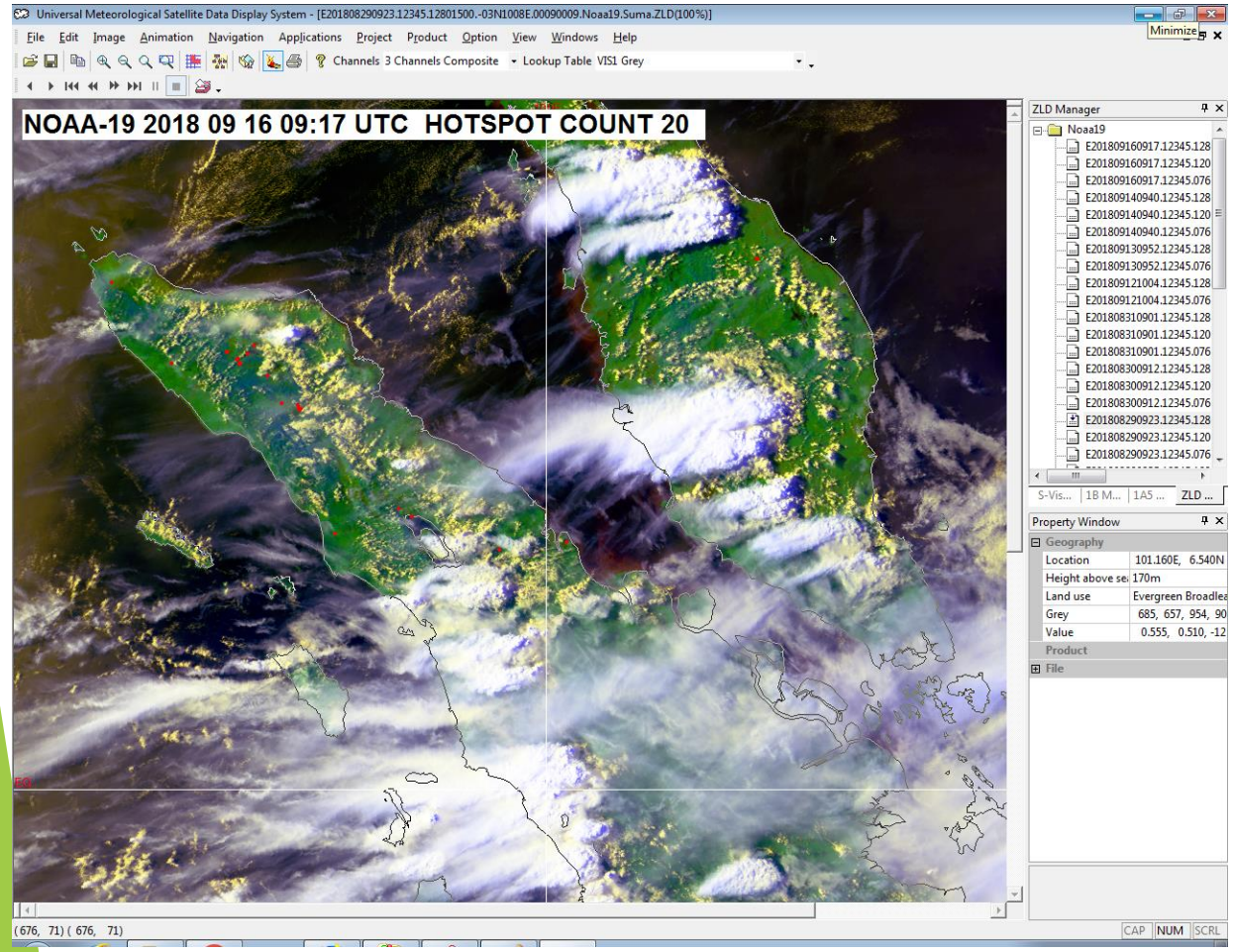
HIMAWARICAST DATA/ HSD/ HCAI /AMV PRODUCT MESSIR-SAT COROBOR



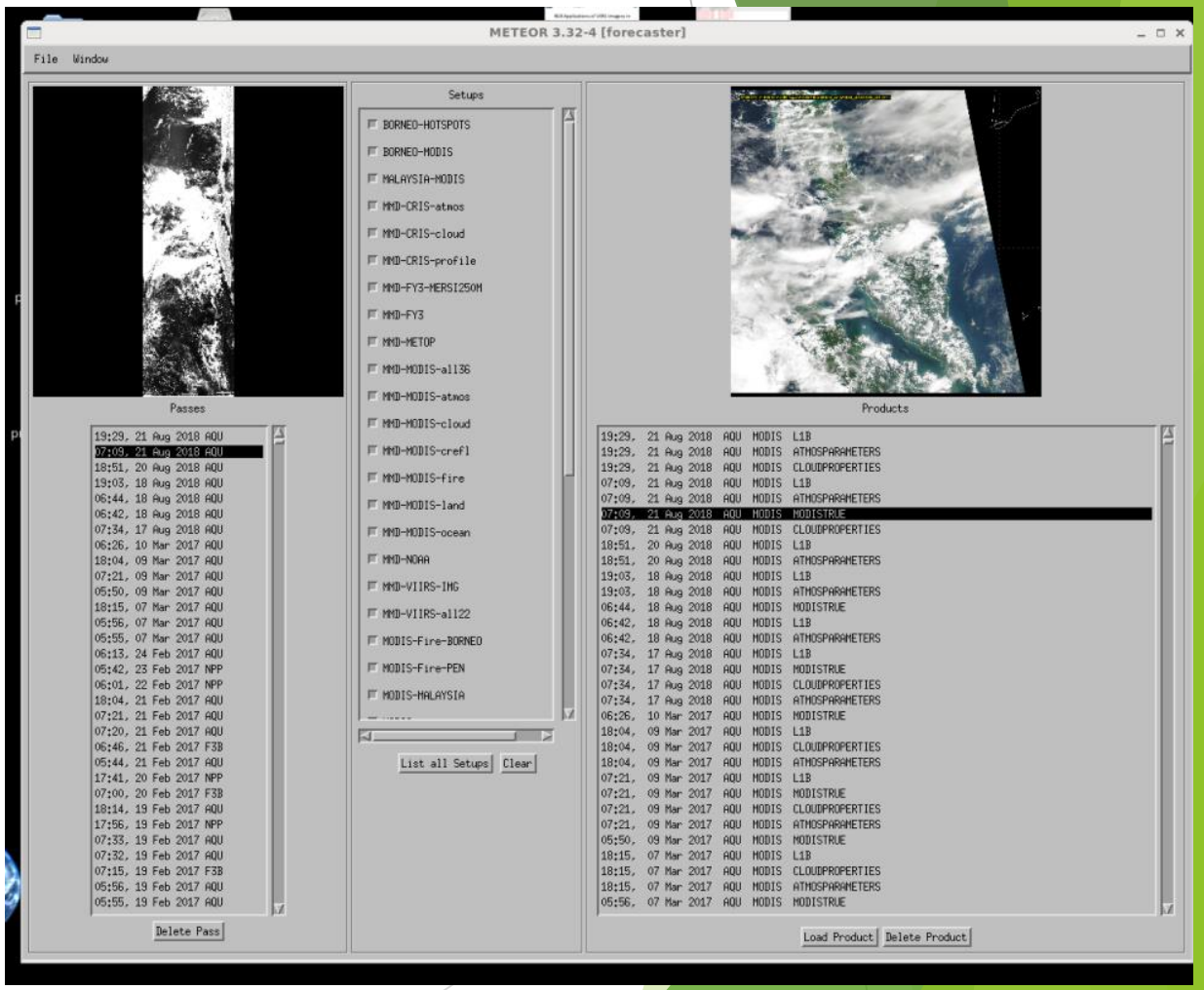
FY2G DATA (direct broadcast)-Mcidas



Polar Orbiting System

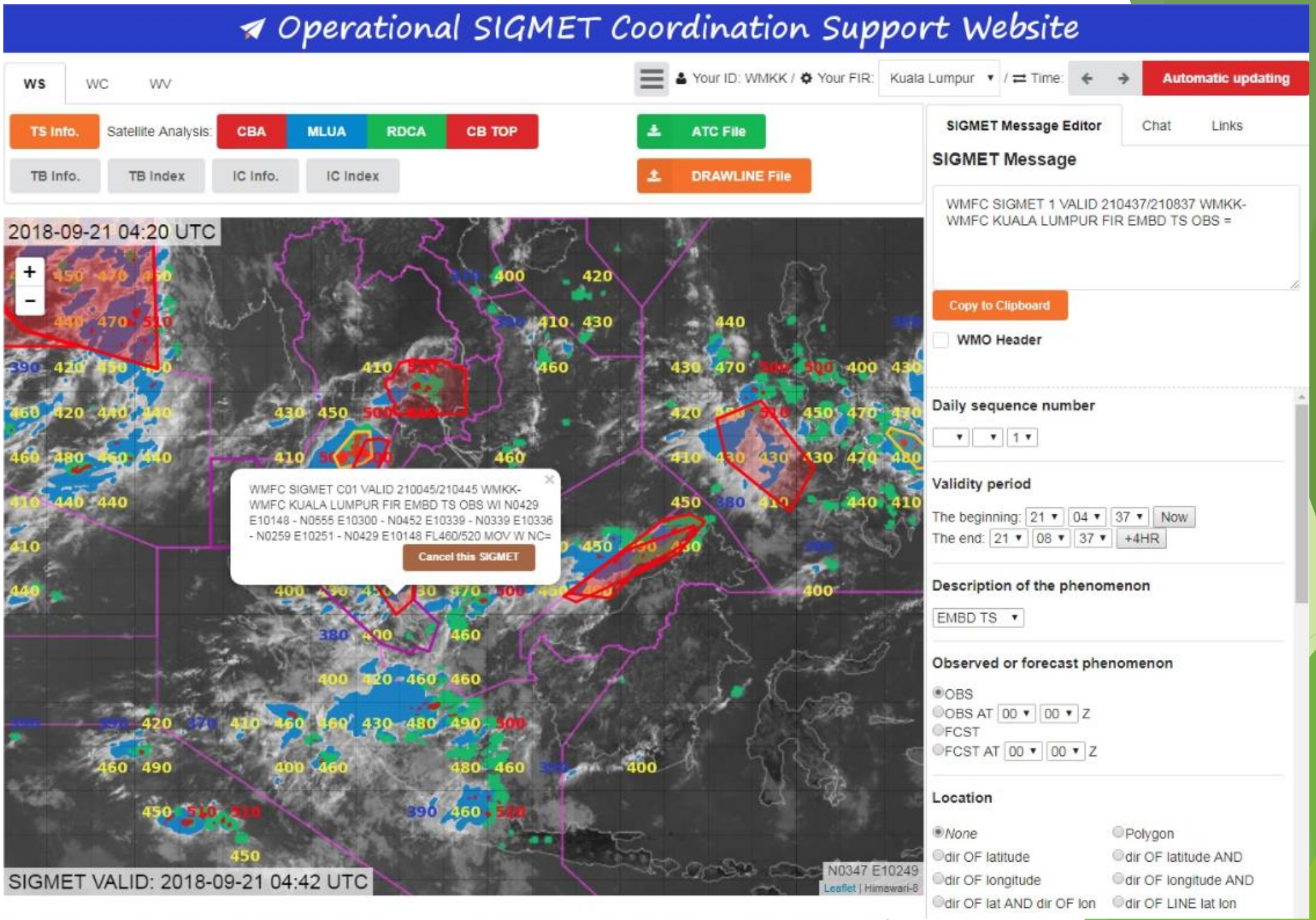


Lexical

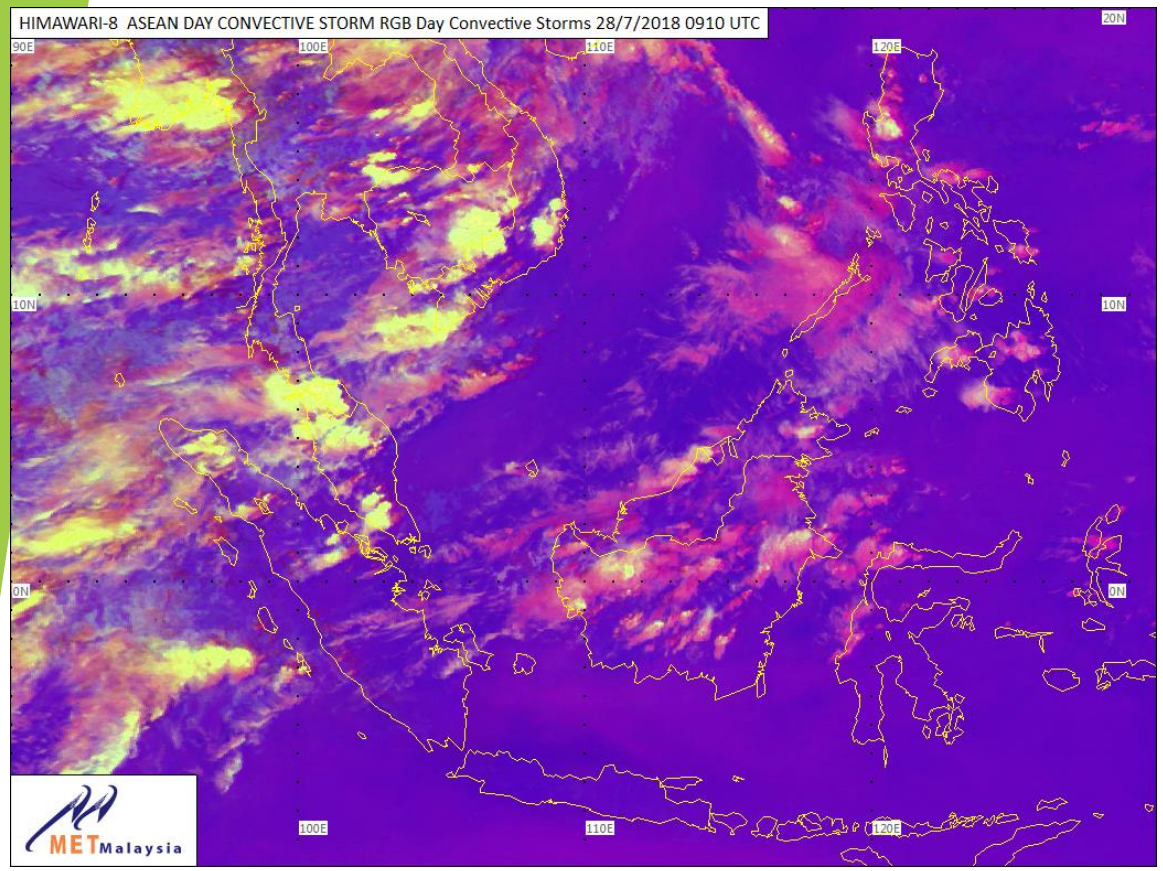


Meteor

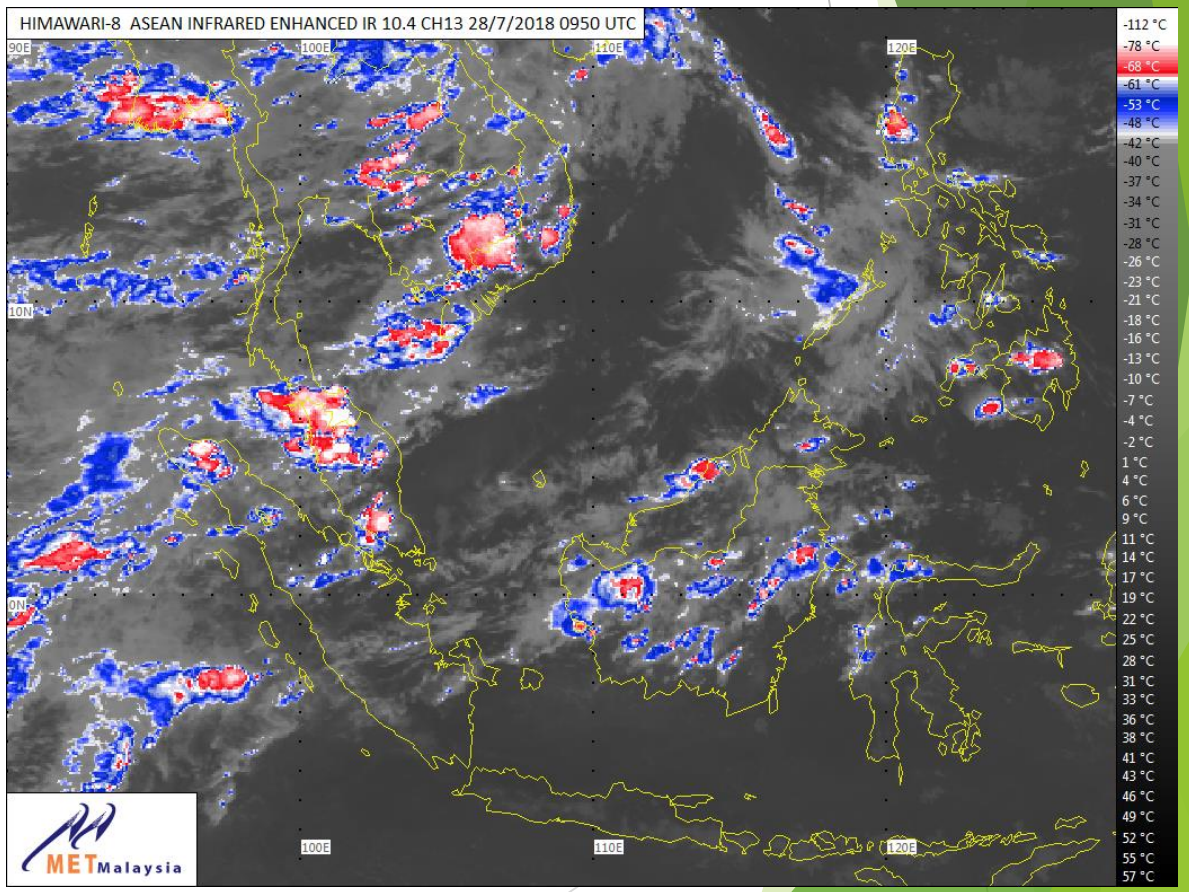
Operational SIGMET Coordination Support Website



Satellite Data to address Regional Challenges



Deep convective cloud detection



THANK YOU