

FLASH FLOOD FORECASTING AND WARNING IN MALAYSIA

by

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**STEERING COMMITTEE MEETING OF THE
SOUTHEASTERN ASIA – OCEANIA REGION FLASH FLOOD GUIDANCE
JAKARTA, INDONESIA
10 - 12 JULY 2017**

Heavy rain causes flash floods, traffic jams in KL and PJ



2017

2014



2015

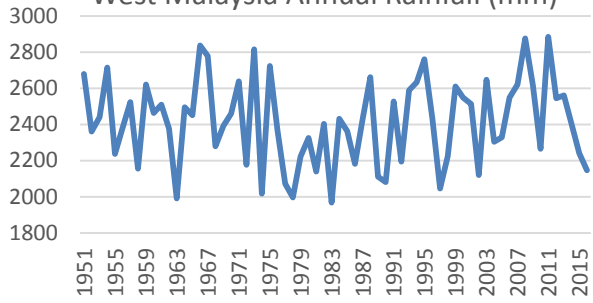


Flood chaos
A flash flood along Jalan Cheras in Kuala Lumpur catching motorists unawares and (below) a carpark in Jalan Meldrum in Johor Baru flooded during a downpour. Major parts of the Klang Valley and Johor were hit by heavy rains. See stories on Page 3.

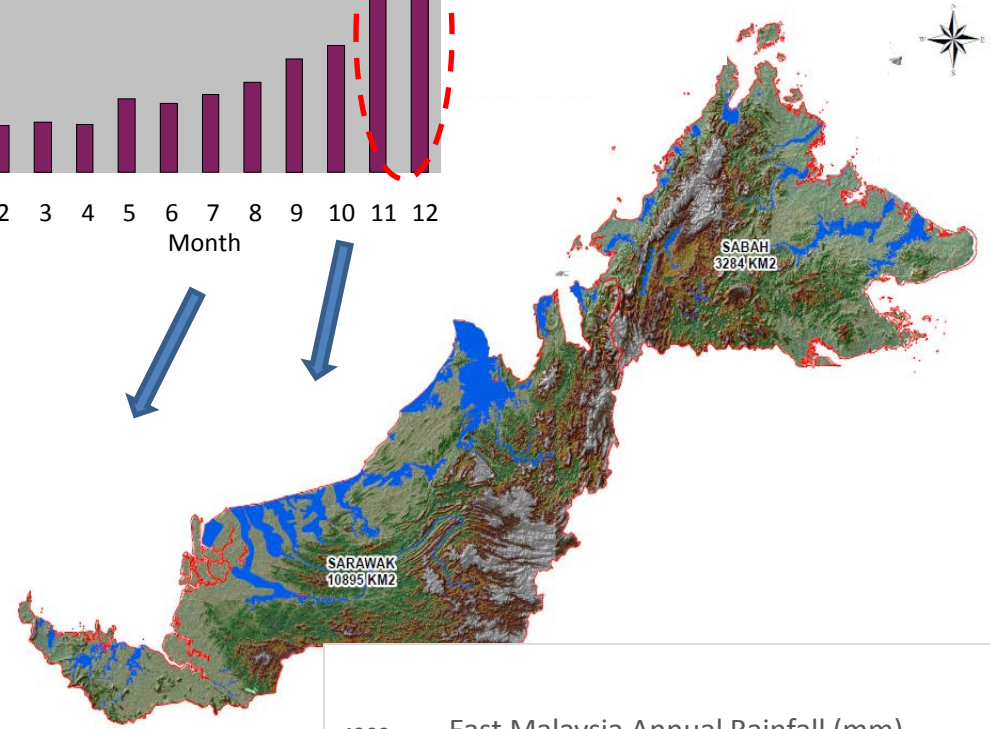
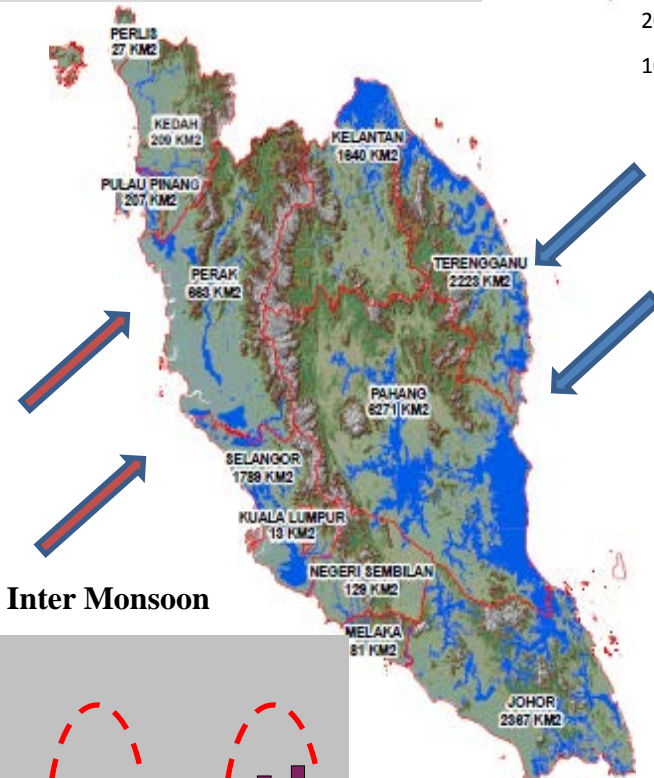
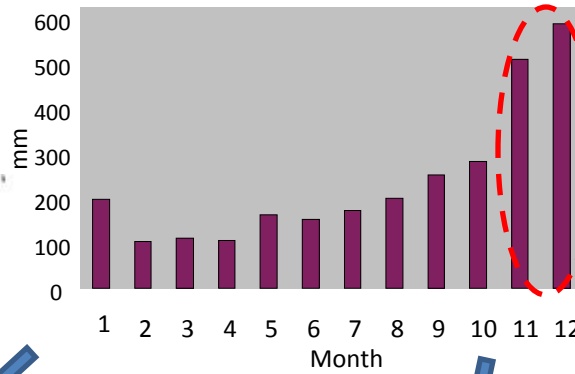


Flood Prone Areas in Malaysia

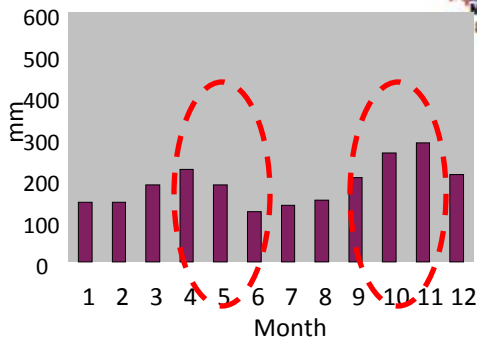
West Malaysia Annual Rainfall (mm)



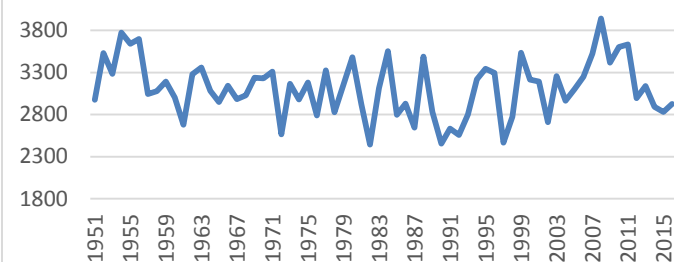
Winter Monsoon



Inter Monsoon



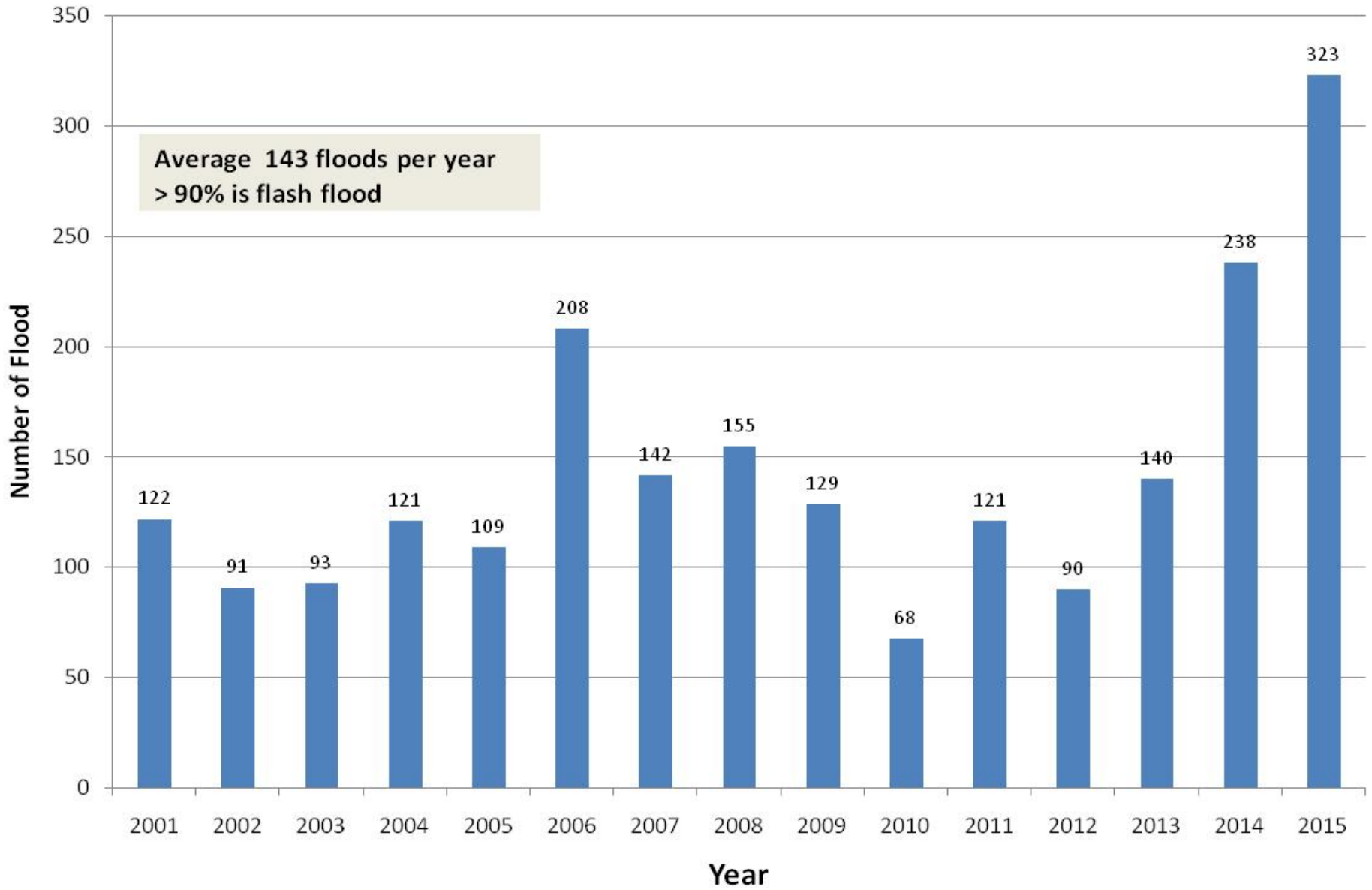
East Malaysia Annual Rainfall (mm)



10.1% (33,298 km-sq area)
5.67 mil population
RM 1 Billion loss per year

Flood Records Between 2001 - 2015 in Malaysia

Average 143 floods per year
> 90% is flash flood

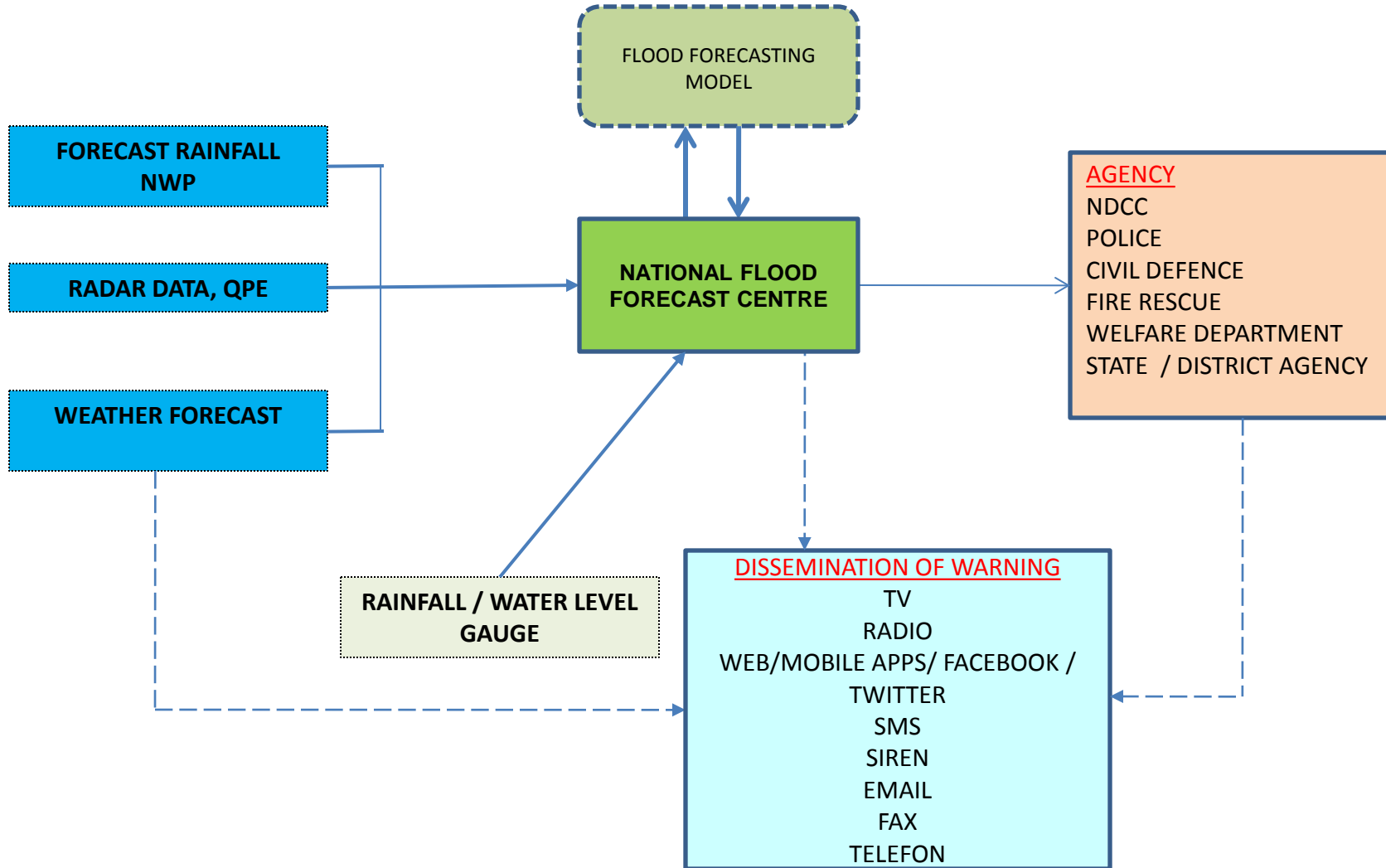


ROLE OF AGENCIES IN FLOOD FORECAST AND WARNING DISSEMINATION

METMALAYSIA

DID

NADMA



Weather Monitoring & Forecasting



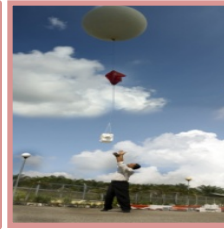
Radar Stn



Satellite Ground Receiving Stn



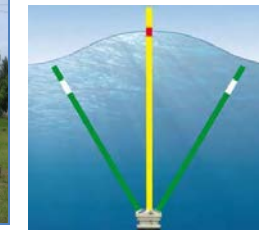
Observation Stn



Upper Air Stn



Auxillary Stn

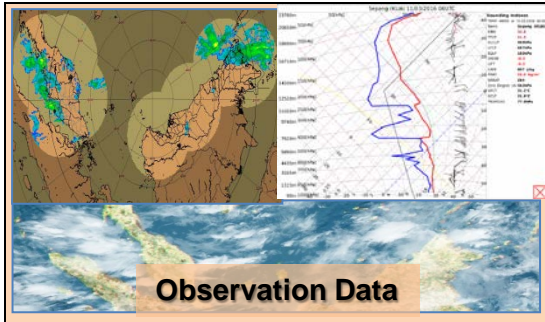


ADCP/RDCP

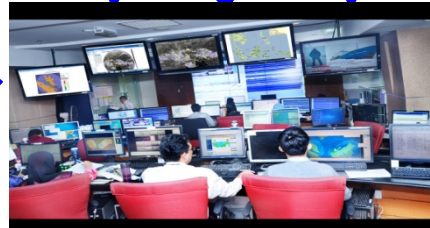


Webcam

Data Collection

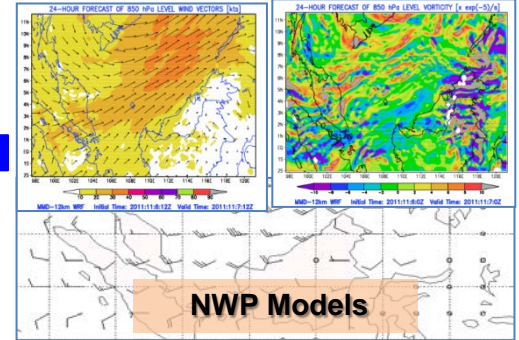


Analysis



National Weather Center

Analysis



NWP Models

Decision & Dissemination



Disaster Management Agencies



Other Agencies



Aviation



Military



Media



Fisheries & Shipping



Public



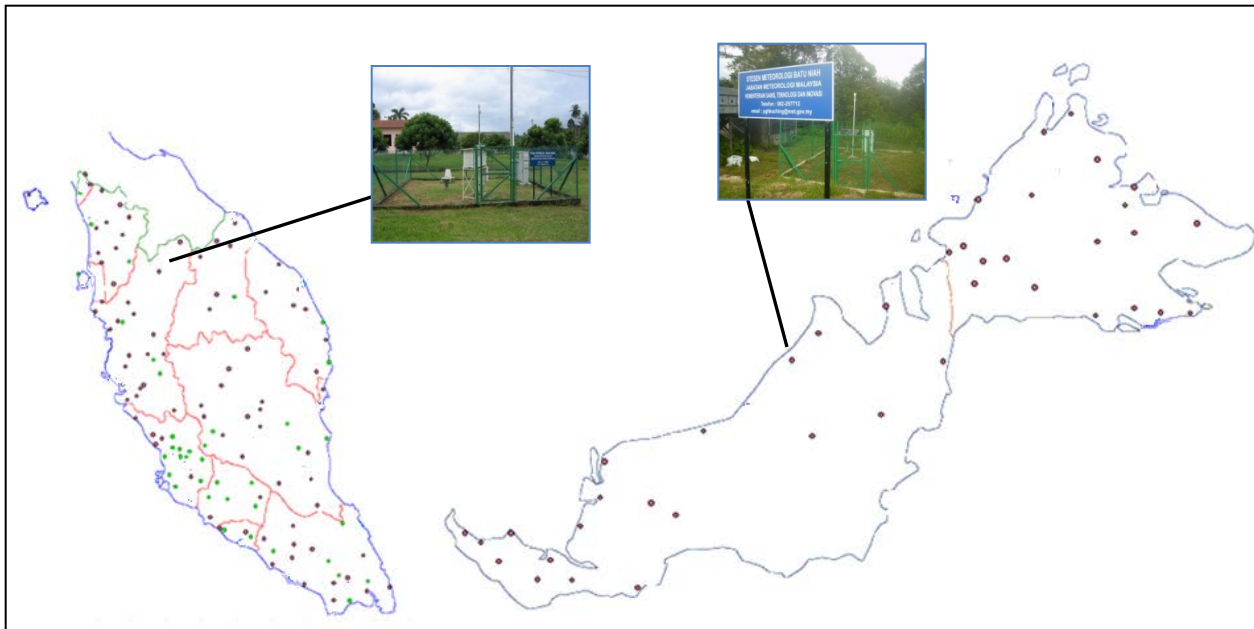
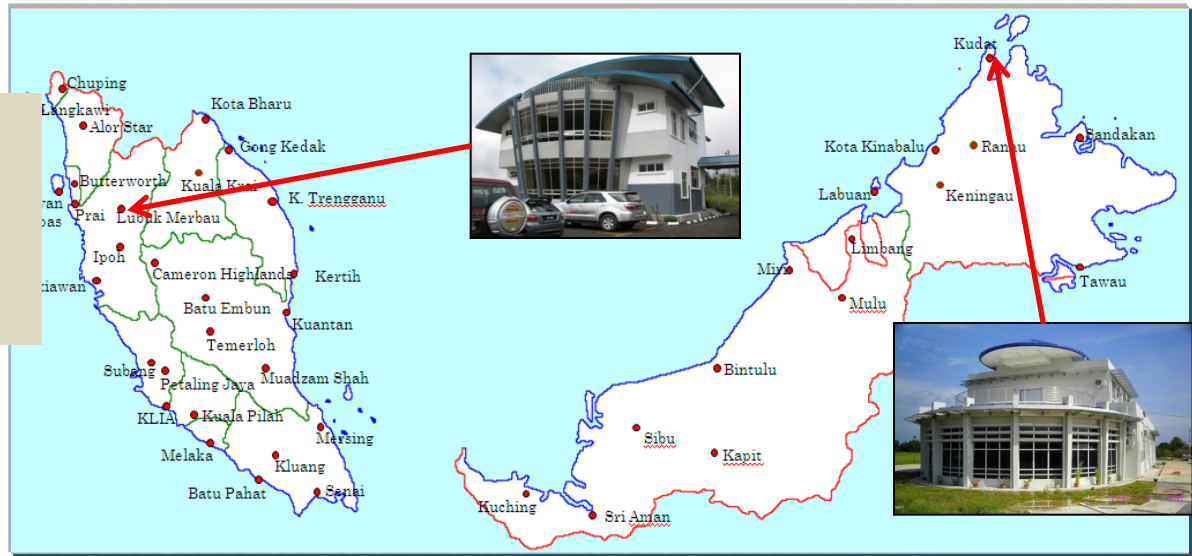
Oil & Gas



Sport & Recreation

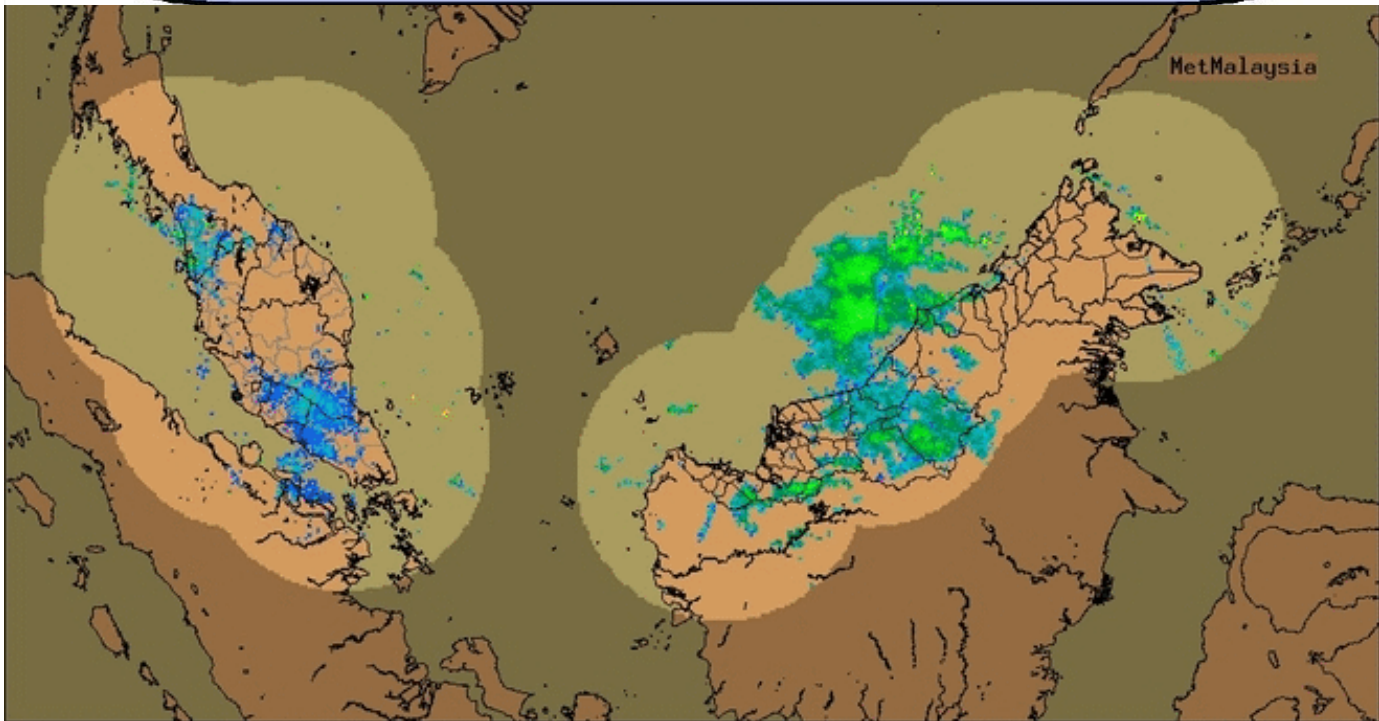
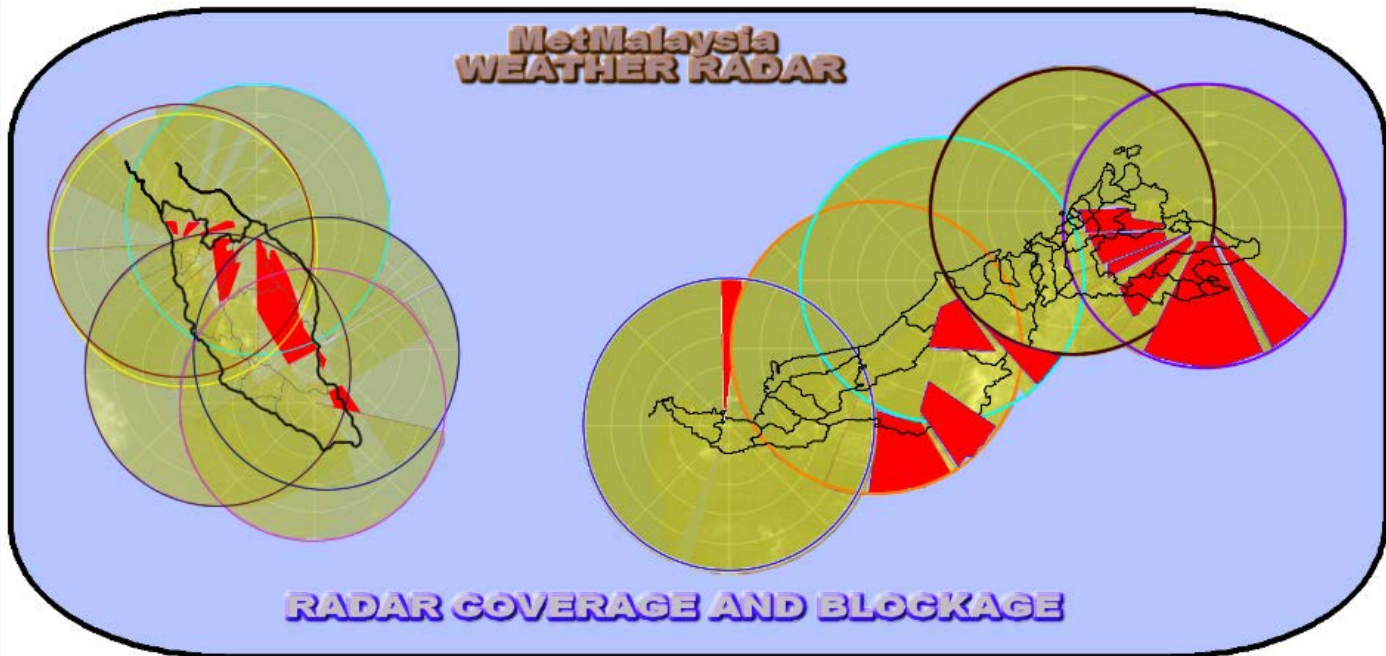
Weather Observation Stations

**42 Principal
Meteorological
Stations**



**394 Auxiliary
Weather Stations**

(203 stns. are automated)



New High Performance Computing (HPC)

Domain 1:

9-km horizontal resolution

➤ Grid points : 562 X 562

Domain 2:

3-km horizontal resolution

➤ Grid points: 760 x 490

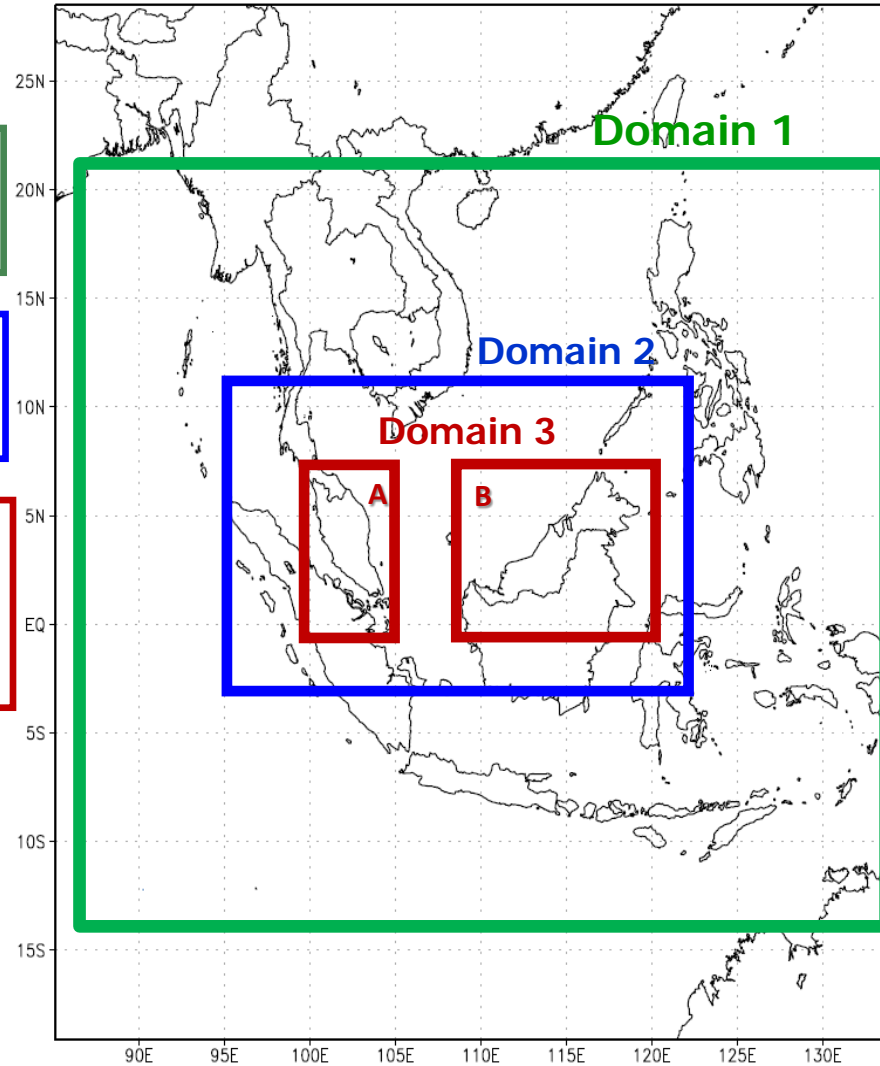
Domain 3:

1-km horizontal resolution

➤ Grid points A: 776 x 776

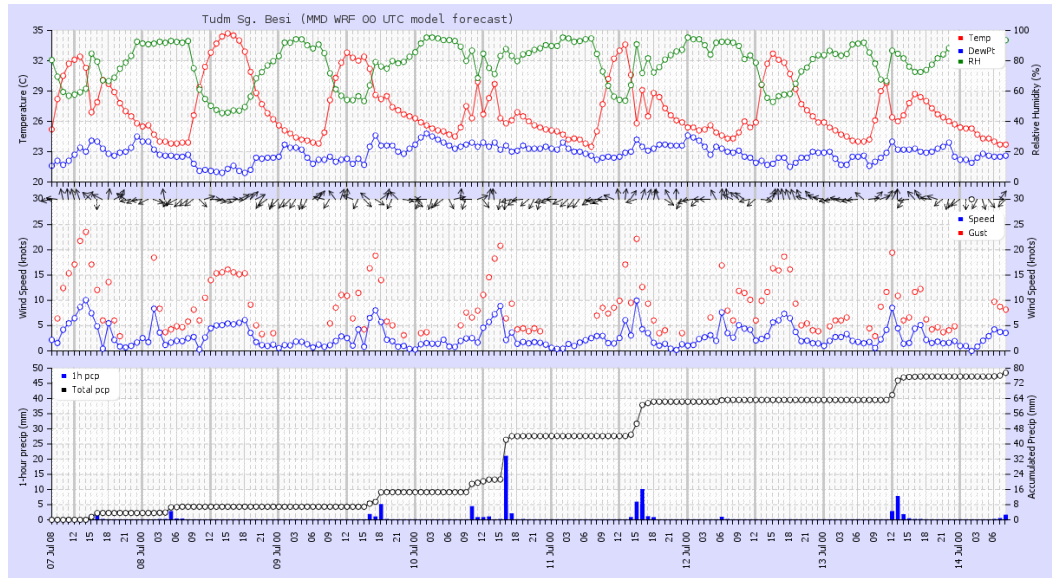
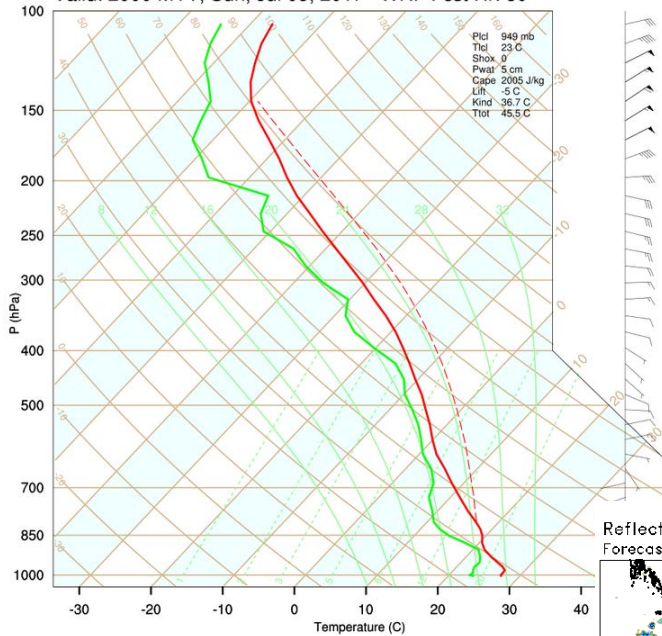
➤ Grid points B: 1292 x 884

Peak performance required is approximately ~ 100 T/flops



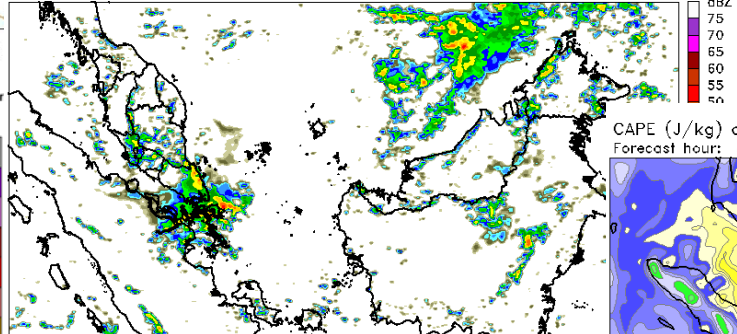
- ✓ Increased forecast lead time, from three days to seven days
- ✓ Higher resolution of 1 km
- ✓ Runs four times daily
- ✓ Better representation of TS convective system
- ✓ Improved access to forecast data with a new user-friendly interface with GIS capability

Tudm Sg. Besi
Valid: 2000 MYT, Sun, Jul 09, 2017 WRF Fcst Hr: 60

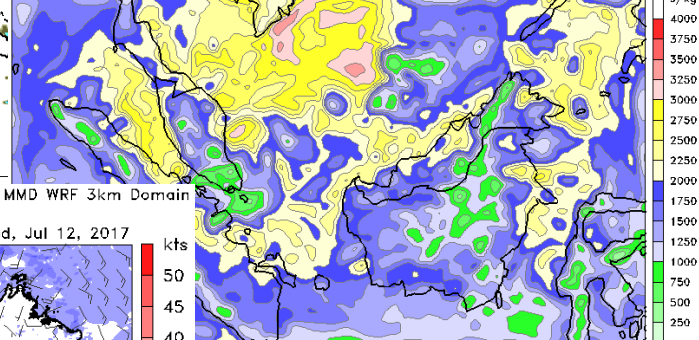


MMD WRF 3km Domain

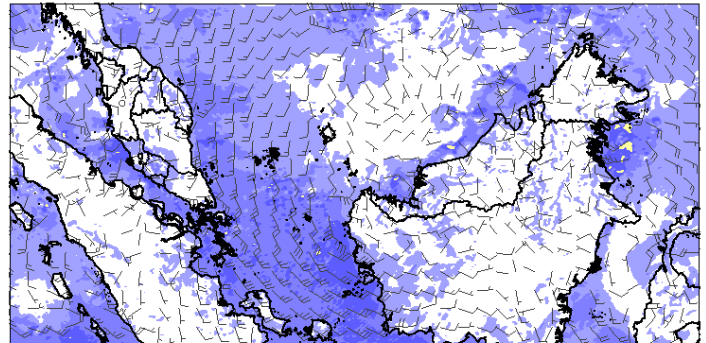
Reflectivity (dBZ)
Forecast hour: 78



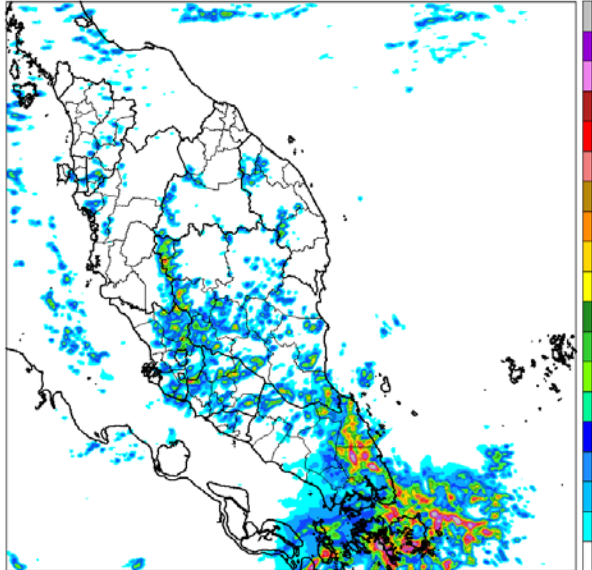
CAPE (J/kg) and CIN (J/kg)
Forecast hour: 81



Surface Wind Speed (kts)
Forecast hour: 120



3-h Precipitation (mm)
Forecast hour: 79

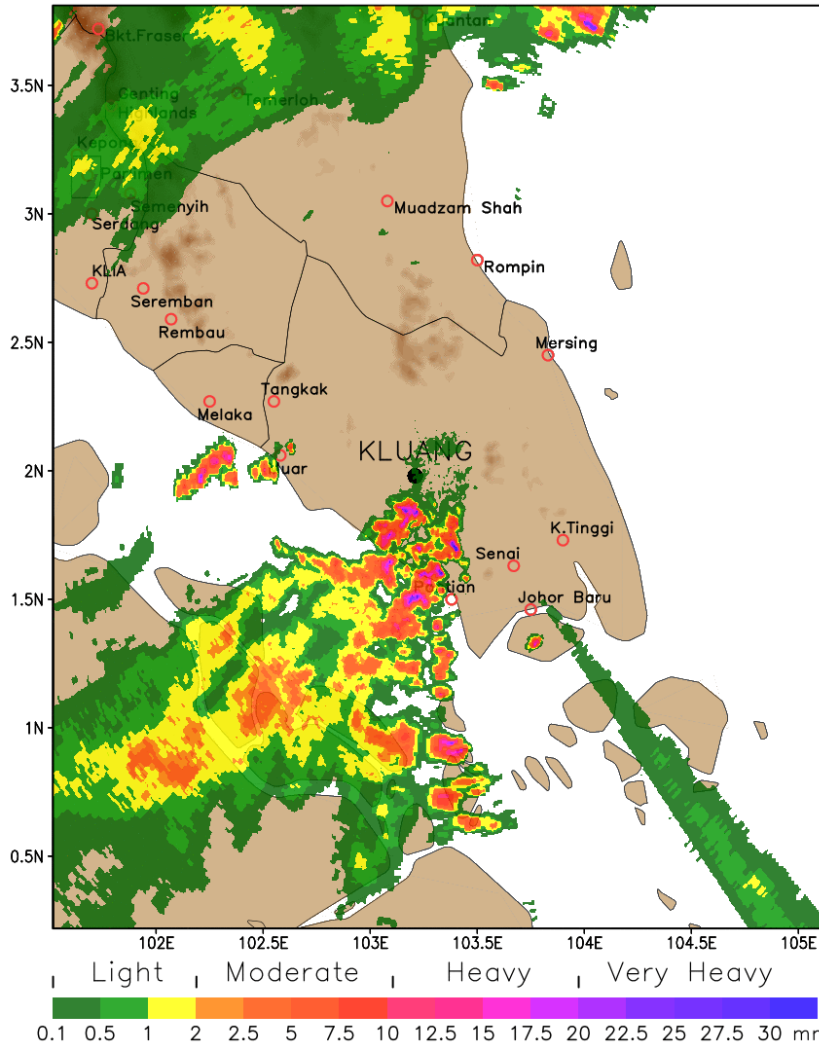


MMD WRF 1km Domain

Short – range *Warning of Intense Rainstorms in Localized Systems (SWIRLS)*

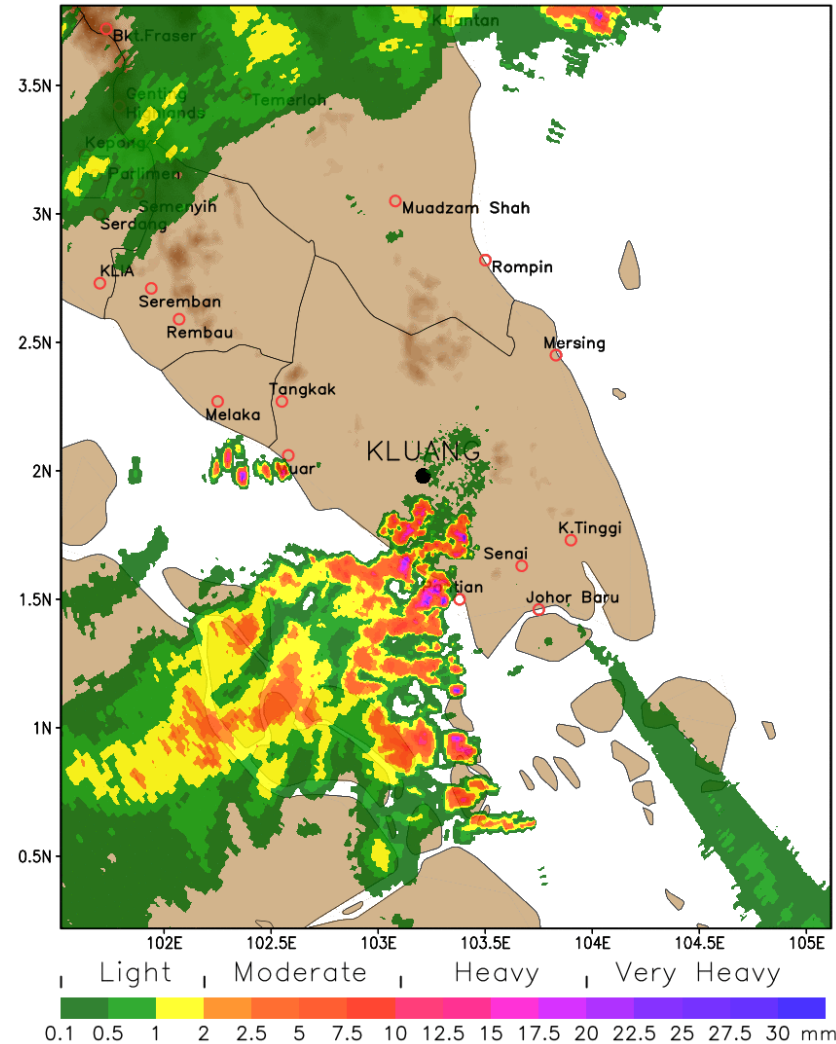
KLUANG

Observed on Tue Nov 1 01:00:00 2016



KLUANG

Nowcast valid on Tue Nov 1 01:00:00 2016



DISSEMINATION OF WEATHER INFORMATION, FORECAST, ADVISORY AND WARNING

- **SMS**
- **TV Broadcast**
- **Radio Broadcast**
- **Facsimile (Disaster management agencies)**
- **Mass Media**
- **Web page: *www.met.gov.my***
- **Social Media Network**



- **Facebook: *Malaysian-Meteorological-Department***
- **Twitter: *malaysianmet***
- **Instagram: *metmalaysia***





THANK YOU

SMART Tunnel Malaysia

