

Development and Implementation of The Myanmar Stand-alone Flash Flood Guidance System (FFGS)

Available Mesoscale NWP Models: Spatial and Temporal Resolution

Dr. Tin Mar Htay

Staff Officer

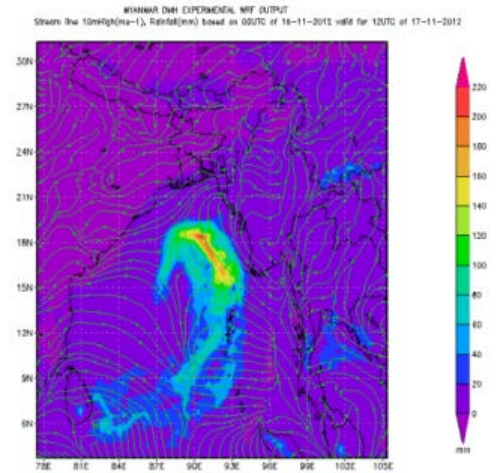
Department of Meteorology and Hydrology

Outlines

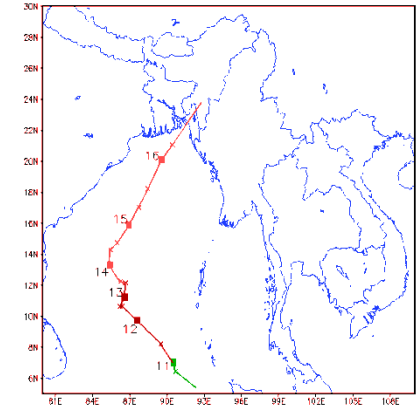
- WRF Outputs
- Diana Tools Products
- WARMS Outputs
- AWS Network
- Radar Network
- Future plan for Data Assimilation System

- WRF Outputs

- Started at 2012 (Nov)
- Training at DMH
- Secondment Training at RIMES and ADPC

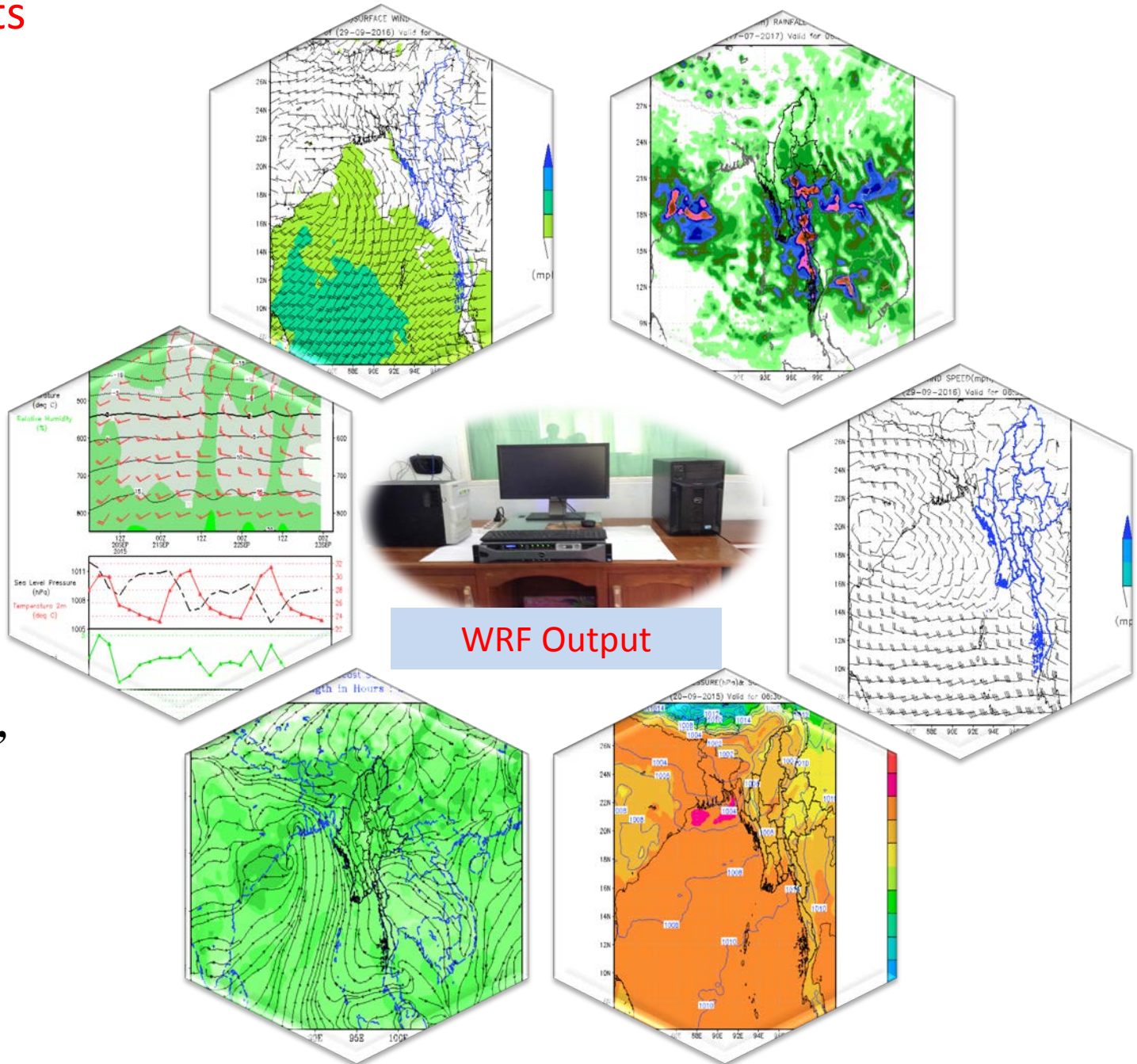


Cyclone MAHASEN Observed Date: 10-16 2013



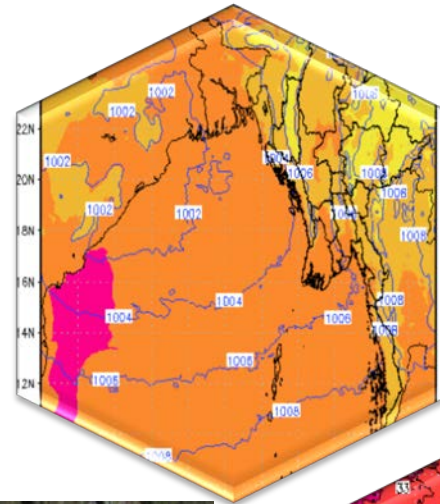
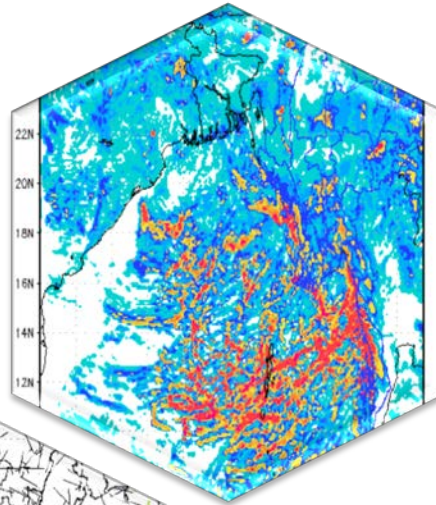
- WRF Outputs

• Input data :
GFS
(GRIB data)

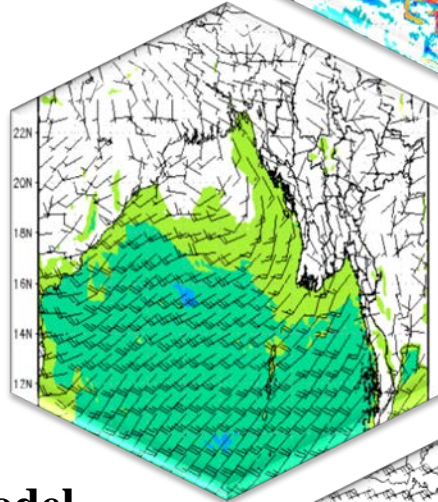


WRF regional model,
(30 km resolution)

- WRF Outputs

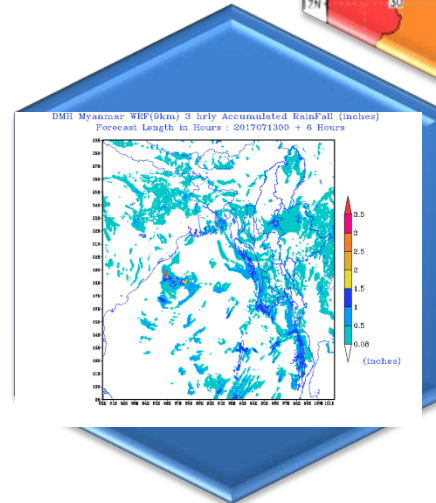
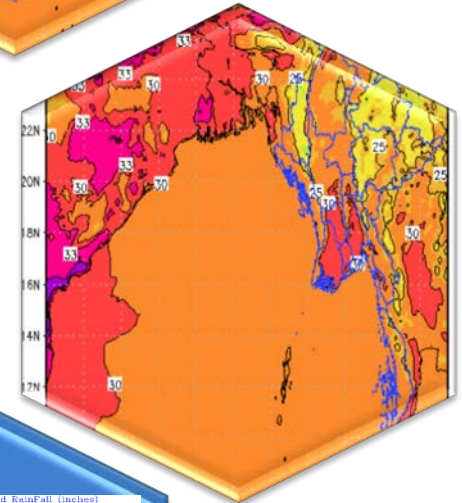
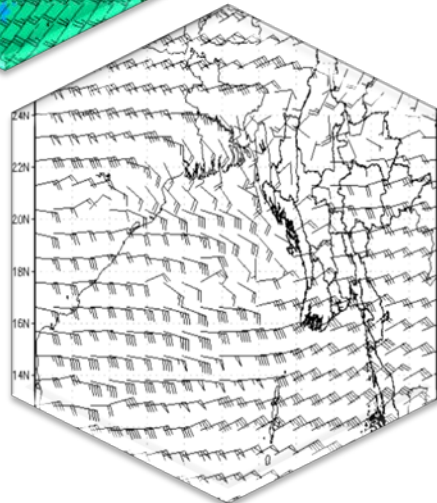


•Input data :
GFS model
(GRIB data)



















WRF Output

WRF regional model,
(9 km resolution)



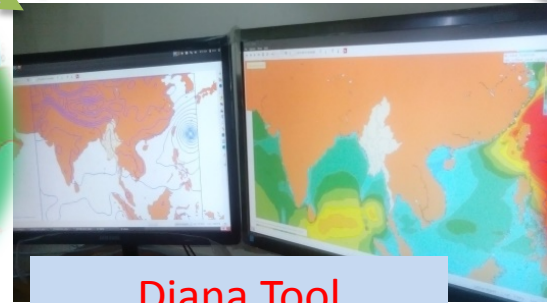
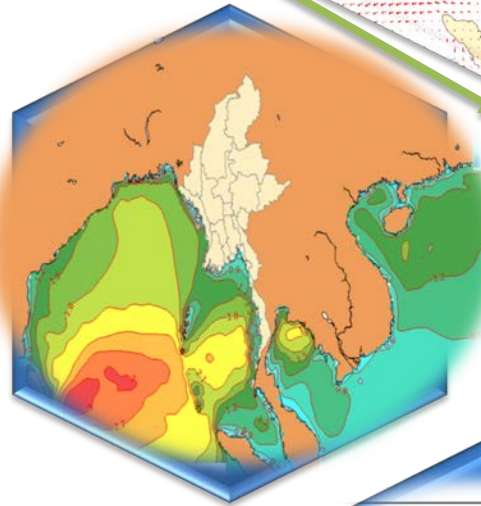
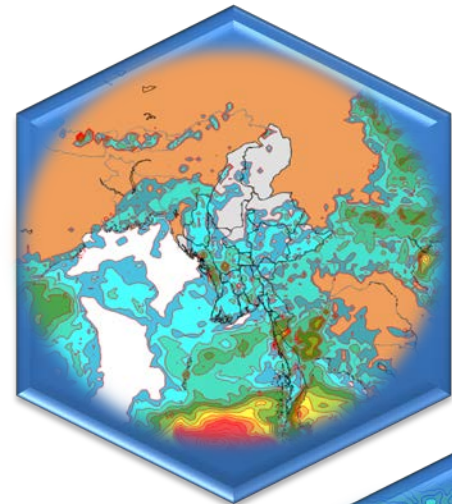
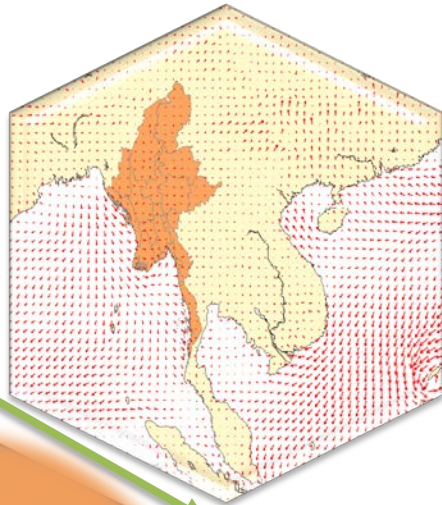
Index of /services/10DAYSFCST/MEDRANGE/MYAN_3D_9KM/13022018

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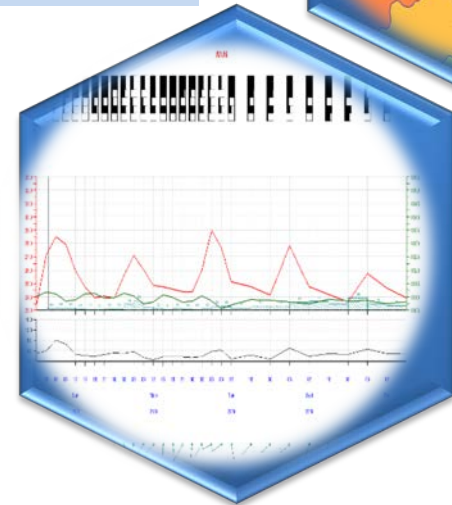
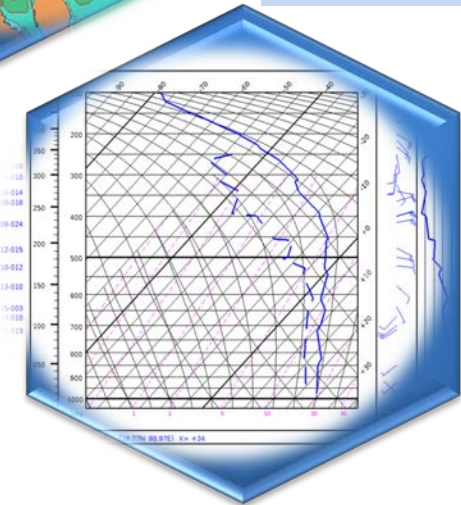
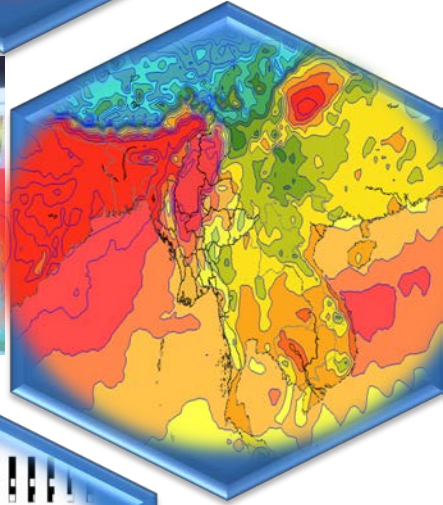
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 stp72.gif	2018-02-13 15:21	33K	
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 tmin72.gif	2018-02-13 15:21	35K	
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http://www.rimes.int/services/10DAYSFCST/MEDRANGE/MYAN_3D_9KM/

- Diana Tools Products



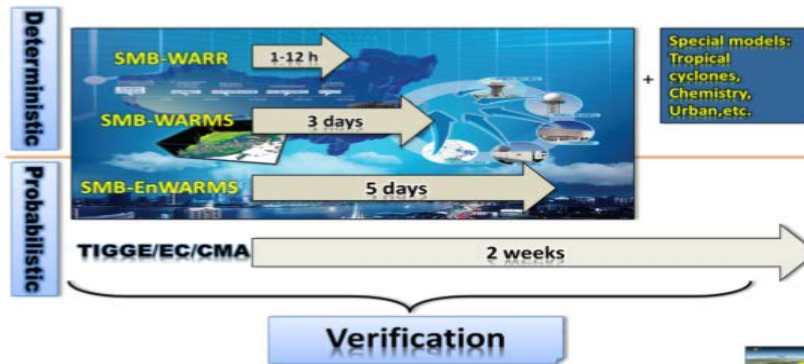
Diana Tool



**ECMWF
DIANA tools
(Norway, Met. N0.,
(11 km resolution)**

WARMS (WRF-ADAS REALTIME MODELING SYSTEM). Resolution : 9km,

Framework of SMS Regional Modeling System



(ARPS)Advanced Regional Prediction System

ADAS: ARPS Data Analysis System

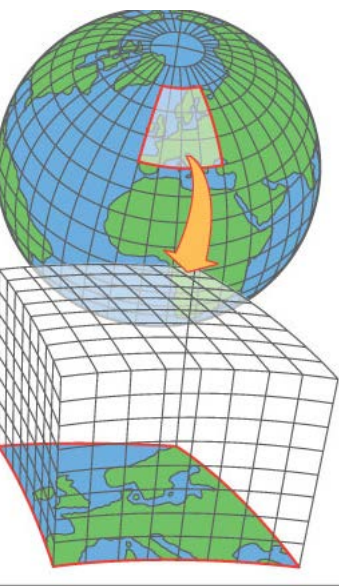


WARMS Outputs

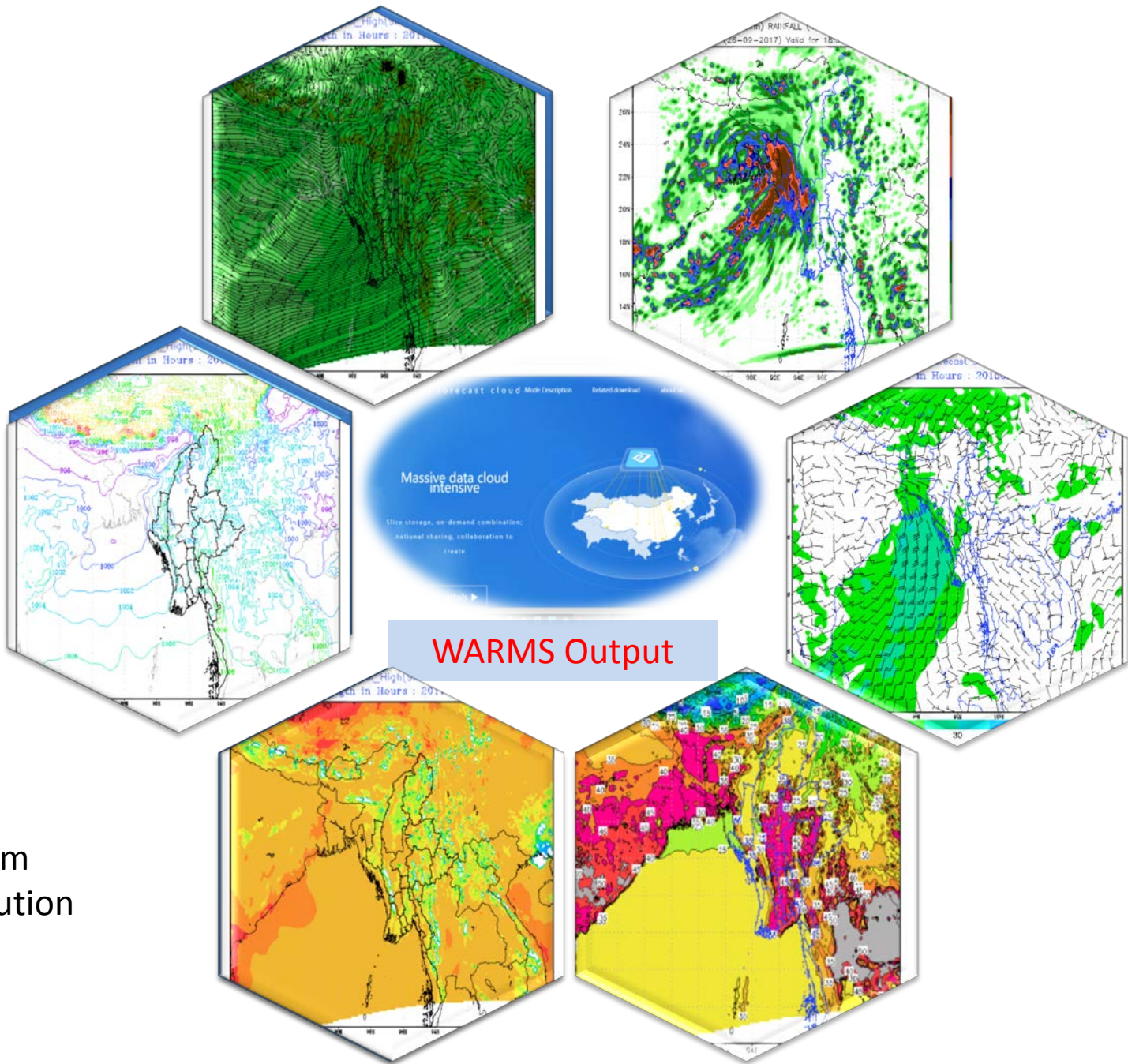
Obs+GFS



(WARMS)
WRF ADAS
Realtime
Modeling
System

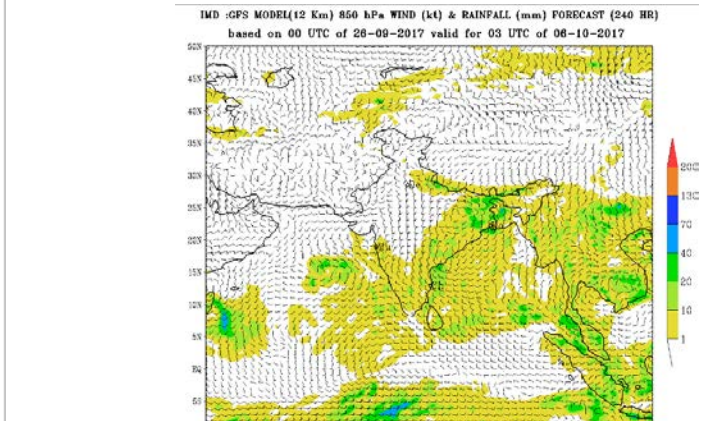
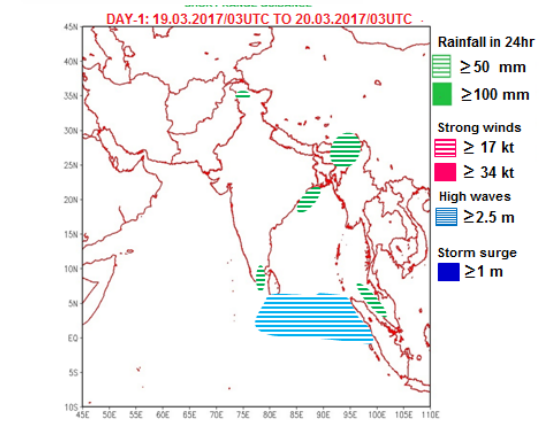
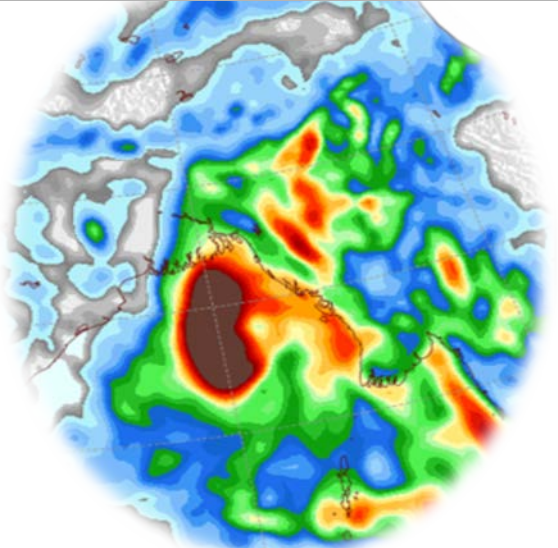
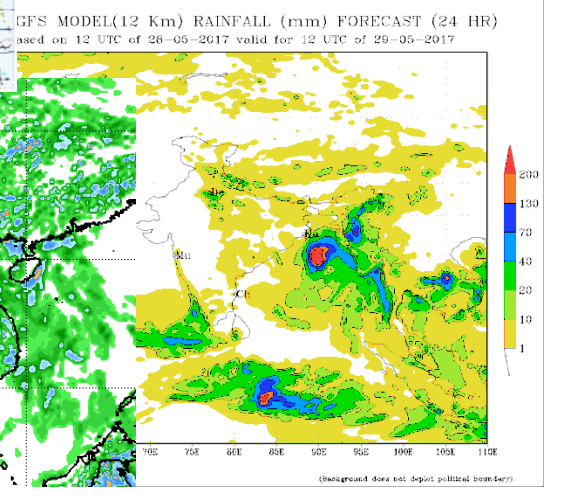
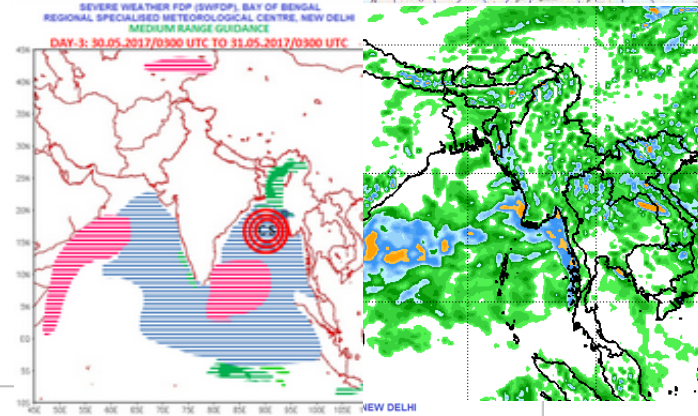
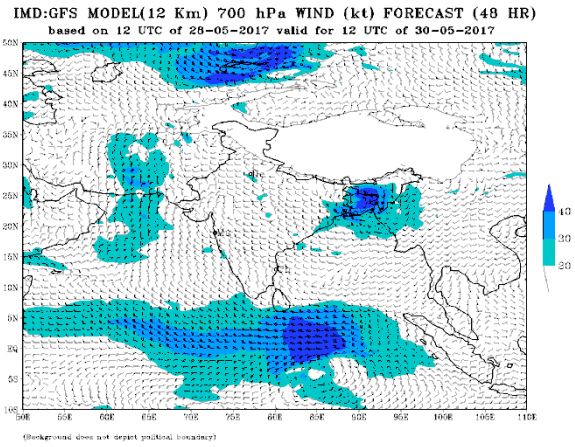
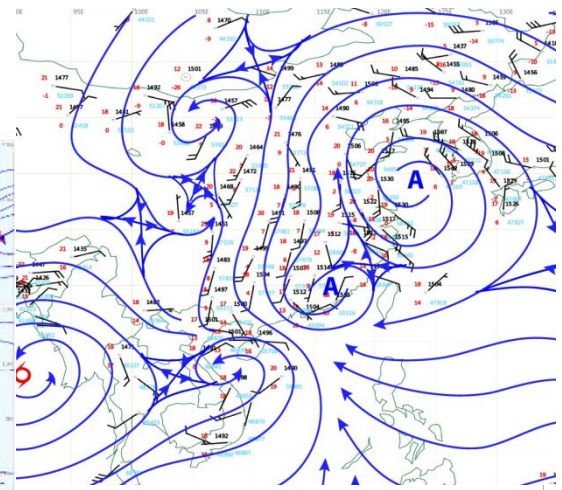
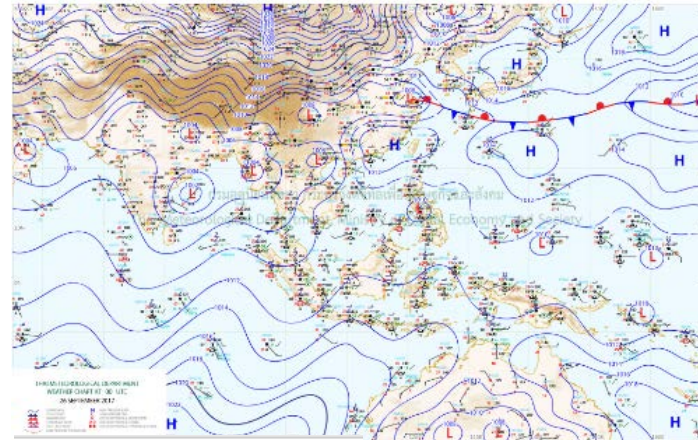
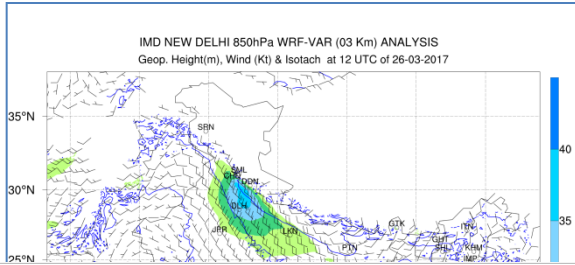


9km
resolution



Other NMHs' NWP products

3 Sep 26, 2017 07:00



State of the Sea

📍 14.77°N / 94.72°E

📍 18.72°N / 93.18°E

7-Day Marine Weather Forecast

7-Day Marine Weather Forecast

Monday 5/29

Morning 🚩

Very windy with large choppy seas. Small craft advisory. Large short period wind waves.

Winds: SSW 23 to 31 knots.
Seas: SW 11 feet at 9 seconds.

Afternoon 🚩

Very windy with large choppy seas. Small craft advisory. Large short period wind waves.

Tuesday 5/30

Morning 🚩

Windy conditions with chop. Small craft advisory. Moder period wind waves.

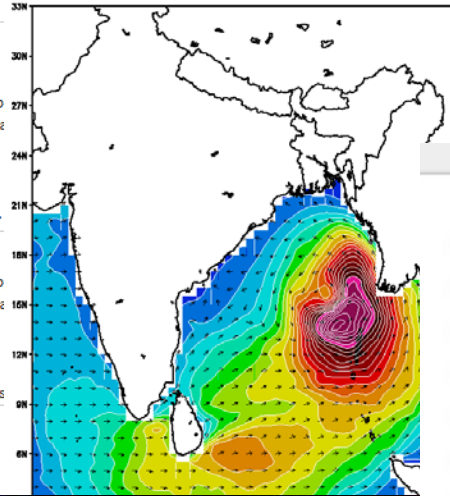
Winds: SSW 18 to 24 knots.
Seas: W 9 feet at 9 seconds.

Afternoon 🚩

Windy conditions with chop. Small craft advisory. Moder period swell.

Winds: SSW 16 to 22 knots.
Seas: W 8 feet at 10 seconds

WAM Wave Heights unit Meter and Directions 00Z29MAY2017

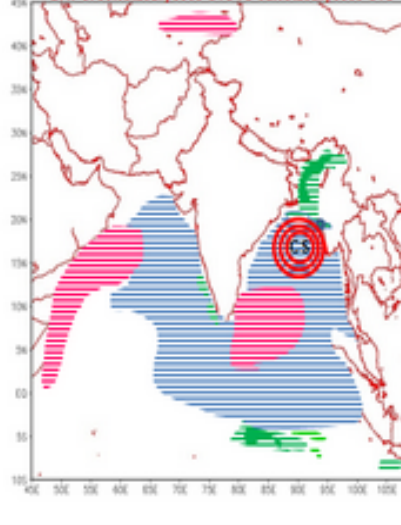


Tuesday 5/30

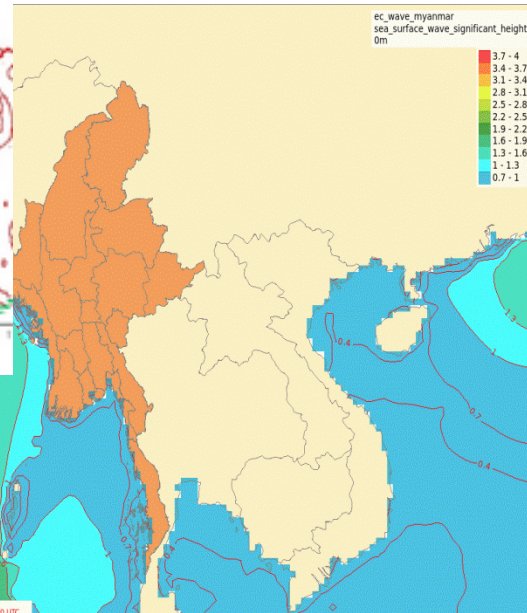
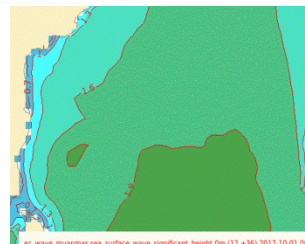
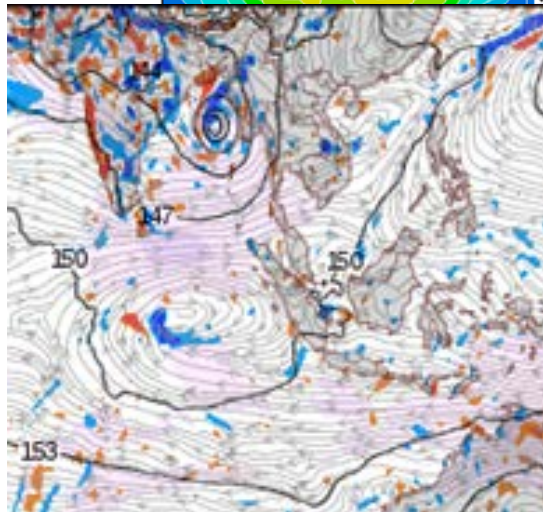
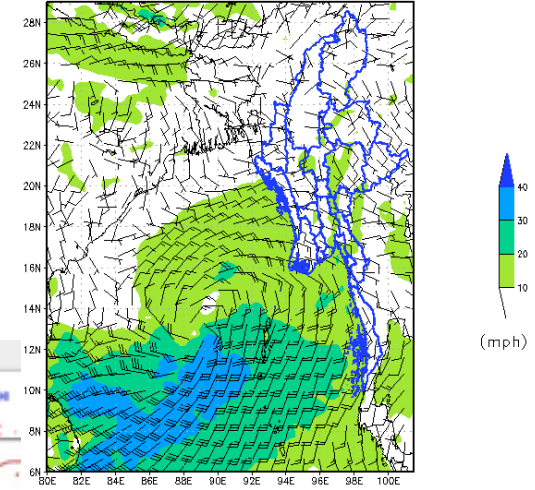
Morning 🚩

Gale warning with dangerous seas. Small craft advisory. Use extreme caution. Very large long period swell.

SEVERE WEATHER FDP (SWFOP), BAY OF BENGAL
REGIONAL SPECIALISED METEOROLOGICAL CENTRE, NEW DELHI
MEDIUM RANGE GUIDANCE
DAY-3: 30.05.2017/0300 UTC TO 31.05.2017/0300 UTC



EXPERIMENTAL WRF(30 km)SURFACE WIND SPEED(mph)& DIRECTION FORECAST (GFS 06:30 MST of (25-05-2017) Valid for 06:30 MST of (27-05-2017)



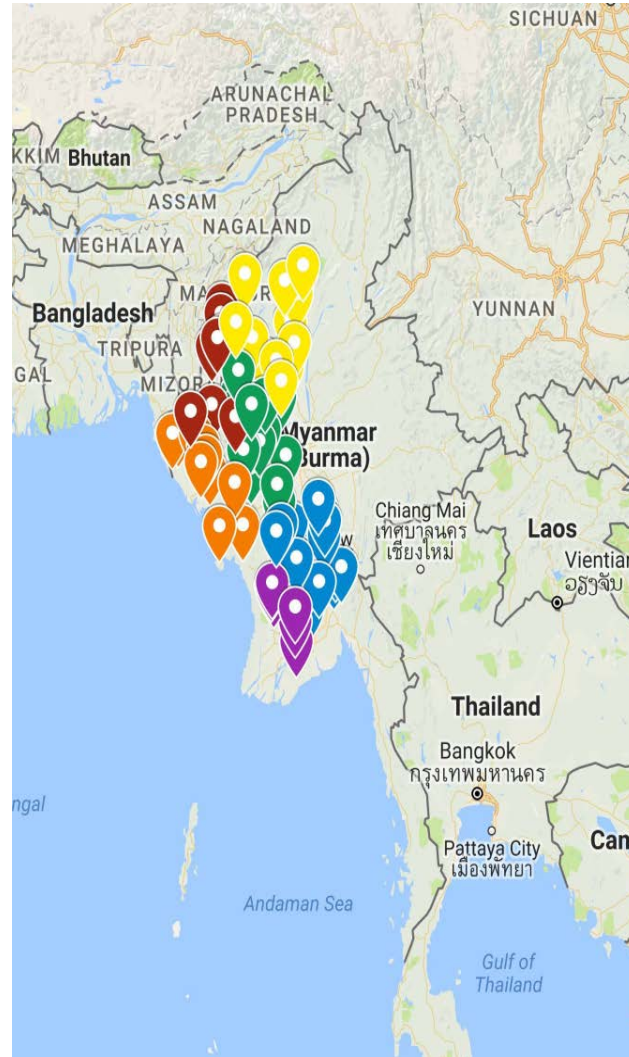
View 2-Day Forecast

ec_wave_myanmar sea_surface_wave_significant_height 0m (12 +36) 2017-10-01 00 UTC

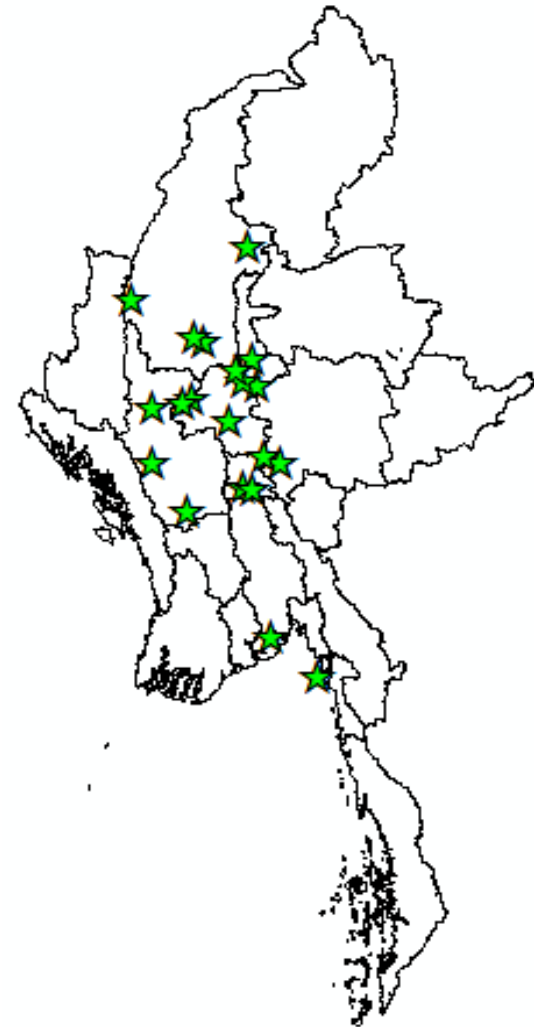
• AWS Network



**30 AWS
(JICA)
2016**



**90 AWS
IRM, World Bank
2017**



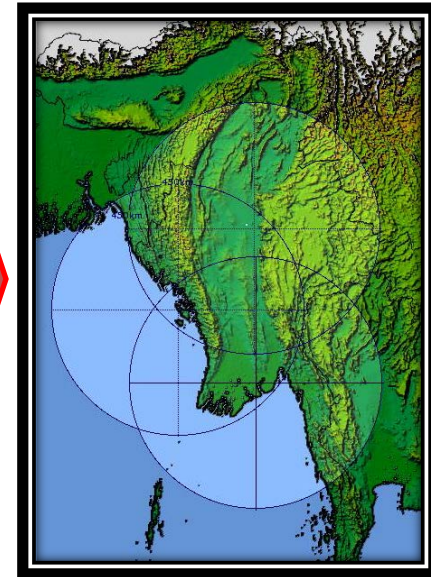
**20 ASOS
KMA/KMI
2017-2018**

Total = 140

Implementing Japan Grant Aid Project “Establishment of Disastrous
Weather Monitoring System”



*DMH Multi-Hazard Early
Warning Center, Nay Pyi Taw*

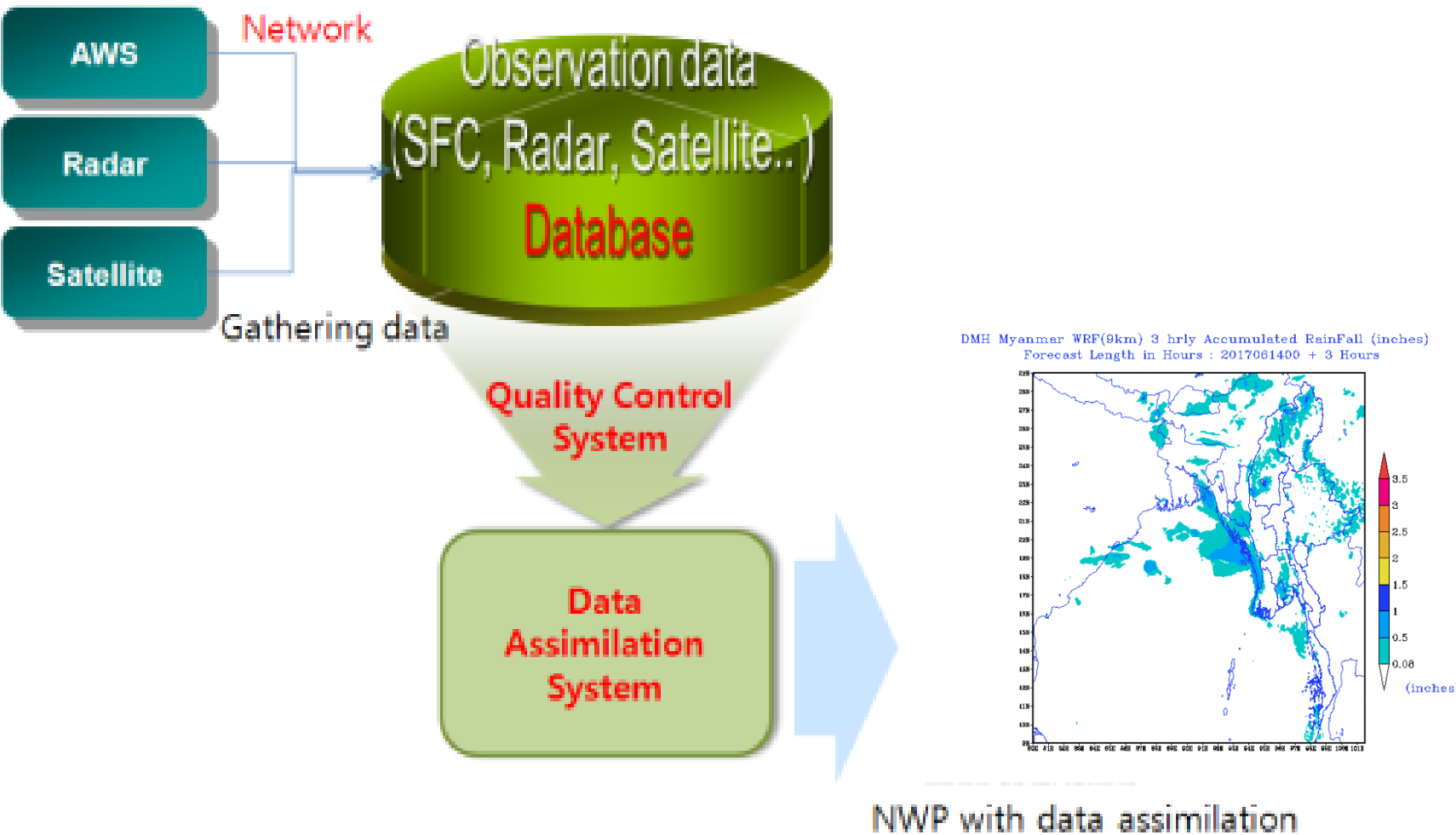


**40.73 million
USD**

FUTURE PLAN FOR DATA ASSIMILATION SYSTEM

Improvement Direction of Numerical Weather Prediction

Conceptual Chart of Numeric Forecast's Data Assimilation



Weather forecasting process (NWP)

- To develop a strategy for numerical prediction and establish a Numerical Analysis Centre
- Modernize the forecasting system (global NWP for routine forecasts from day 1 to day 10 (Adapt WRF for now-casting and very short range forecasting running at high resolution (about 3km, if feasible) for up to 6 hours or more with assimilation of radar and surface observations \ etc.)
- To set up boundary conditions to run WRF from the global models

Climate

- **Promote Climate Services**
- **Promote Specific for Climate Research**
- **Modernize Climate Prediction Model and NWP**
- **Modernize Climate Archiving System and databank**

