



Early Warning System in Myanmar

Ms. Tin Yi

Department of Meteorology and Hydrology (DMH)

Myanmar

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Introduction

Mission of DMH

Observing and understanding weather, climate and water resources as well as providing meteorological, hydrological, seismologic and related services in support of national needs, including protection of life and property, safeguarding the environment, contributing to national security and sustainable development and promoting capacity building. It also contributes to national, regional and international cooperation.

Vision of DMH

Contribute to the socio-economic development of Myanmar and to enhance the safety, security and general well-being of its people.

How=> It achieves that through the provision of information, forecasts and early warnings in the areas of weather, climate, water and seismology through effective systems and innovative solutions.

Responsibility of DMH

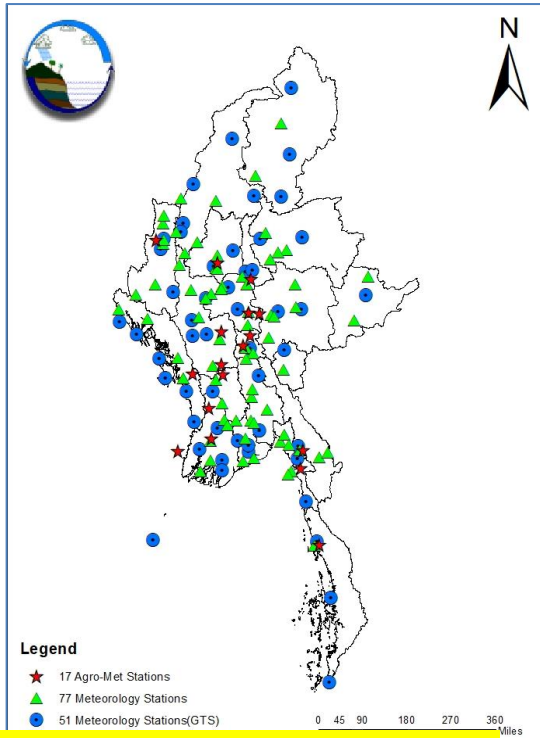
DMH is mainly responsible, for observing Meteorological and Hydrological data, issuing forecasts and early warnings for Meteorological and Hydrological disasters and issuing Earthquake news and Tsunami warnings, for disaster prevention/mitigation and development of socio-economic activities, in Myanmar.

Observations Network

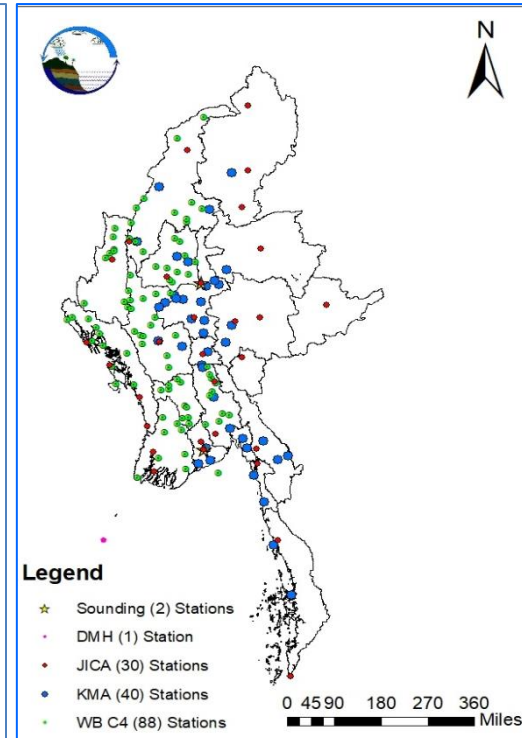
➤ AWOS	–	158
➤ Weather stations (Manual)	–	128
➤ Agro-met stations	–	17
➤ Aviation weather stations	–	10
➤ River Water Level stations (Manual)	–	76
➤ AWLMS	–	27
➤ Water Level Forecast stations	–	46
➤ radars	–	3
➤ Upper Air Radio Sonde stations	–	2
➤ Seismic stations	–	21

Observations Network

Manual Weather Stations

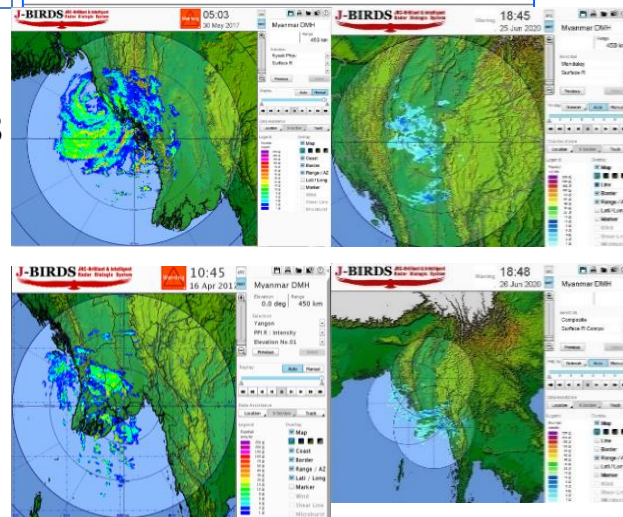
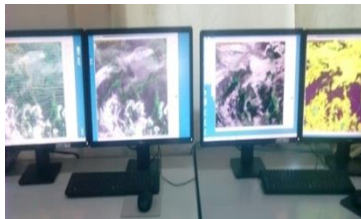
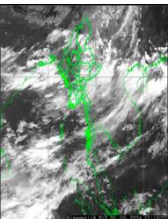


AWOS and Sounding Stations

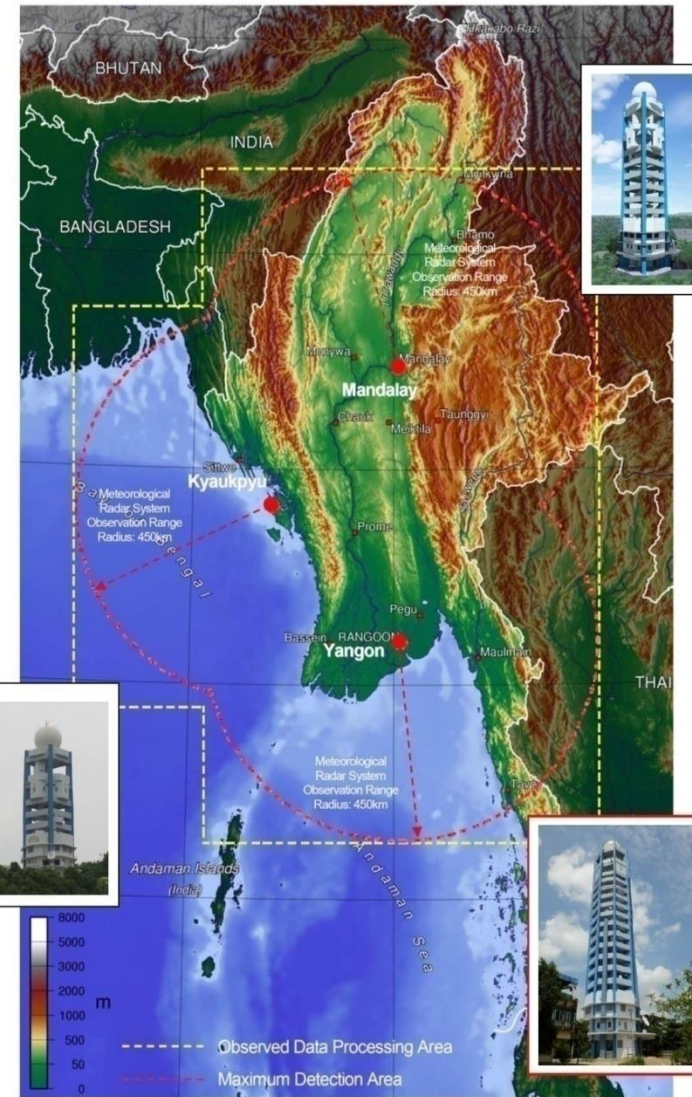


SATELLITE RECEIVER

Himawari 8 CMAcast

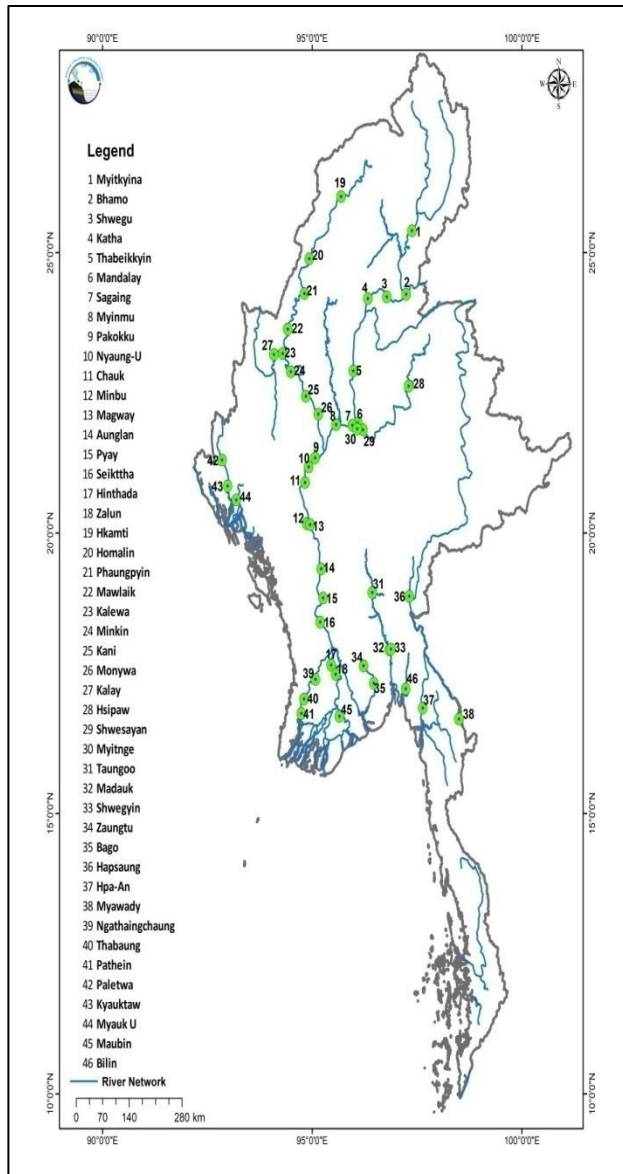


RADAR NETWORK



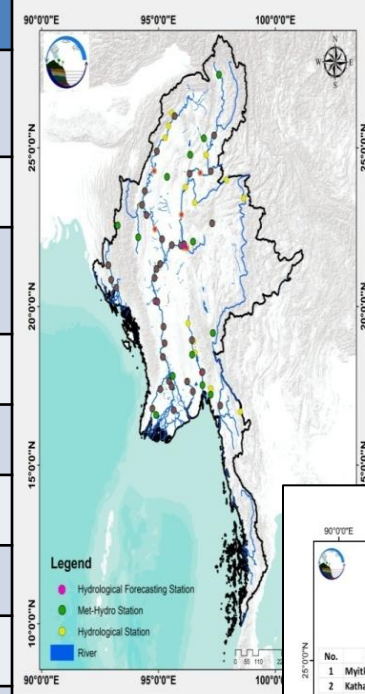
Observations Network

46 Hydrological Forecasting Stations

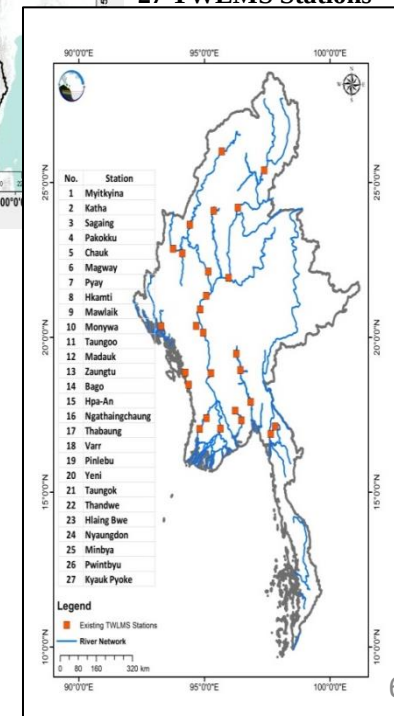


No.	Rivers	Station
1.	Ayeyarwady	18
2.	Chindwin	8
3.	Dokhtawady	3
4.	Bago	2
5.	Sittoung	2
6.	Ngawun	3
7.	Kalaten	2
8.	Thanlwin	2
9.	Thaungyin	1
10.	Shwegyin	1
11.	Toe	1
12.	Laymyo	1
13.	Myittha	1
14.	Bilin	1
Total		46

76 Hydrological Monitoring Stations

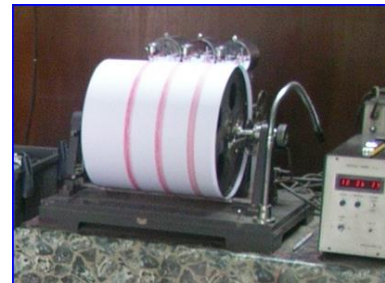
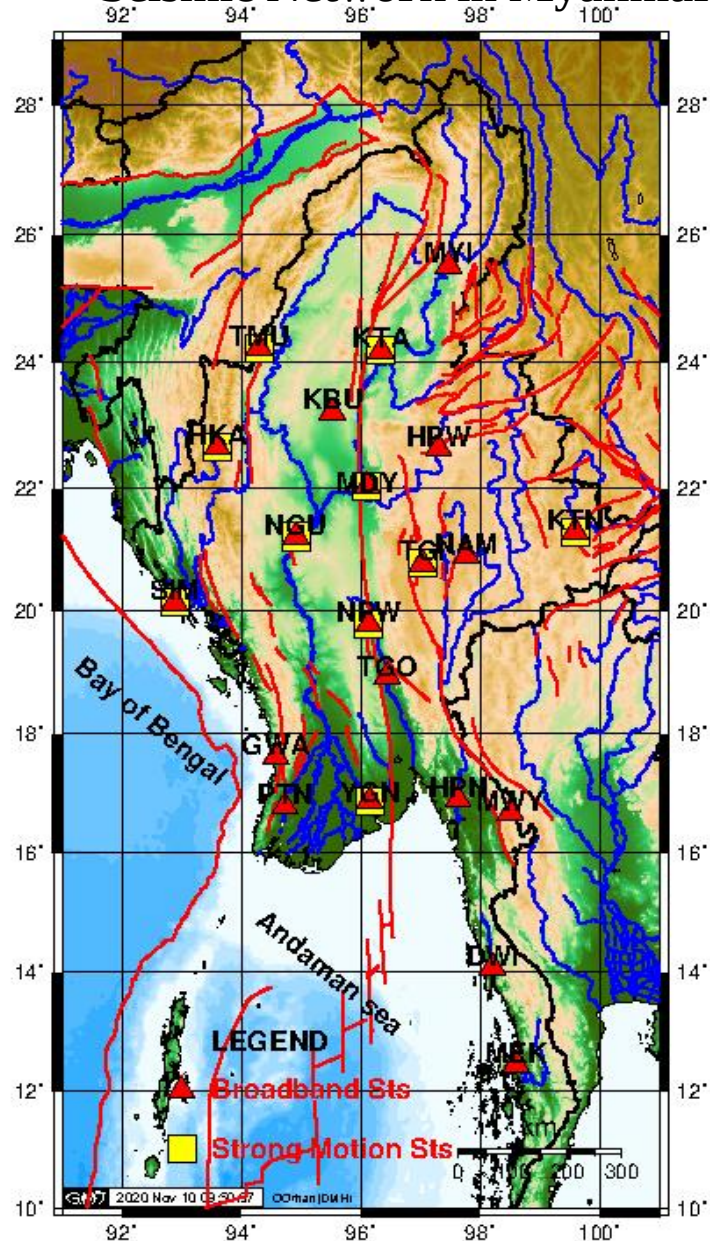


27 TWLMS Stations



Observations Network

Seismic Network in Myanmar



- ❑ 2 – Analog Stations
- ❑ 21 – Broadband Stations
- ❑ 10 – Strong Motion Accelerograph

Forecasts, Bulletins, News and Warnings

- **Daily Weather/water level Forecast**
- **Dekad Weather/water level Forecast**
- **Monthly Weather/water level Forecast**
- **General Weather/water Outlook for Monsoon season**
- **Seasonal Weather/water level Forecast**
- **Aviation Weather Forecast**
- **Marine Weather Forecast**
- **Special Weather Forecast**
- **Rainfall/Temperature New Records**
- **Storm News**
- **Condition of Southwest Monsoon Onset and withdrawal New**
- **Agro-meteorological Bulletin/ Forecast**
- **Bay Bulletin**
- **Flood/ Minimum water Level Bulletin**
- **Special Weather Bulletin**
- **Earthquake/ Tsunami News**
- **Elnino, Lanina News**
- **Storm Warning**
- **Storm Surge Warning**
- **Squall Warning**
- **Port Warning**
- **Heavy Rainfall Warning**
- **Untimely Rainfall Warning**
- **Flood Warning**
- **Minimum Alert Water Level**
- **Aviation Weather Warning**
- **Fog Warning**
- **Tsunami Warning**

Numerical Weather Prediction(NWP) Products



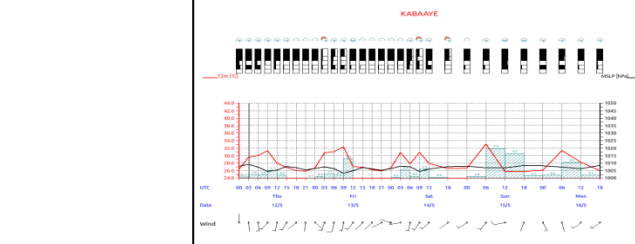
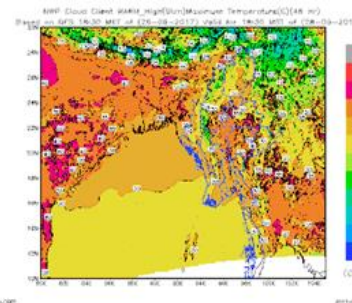
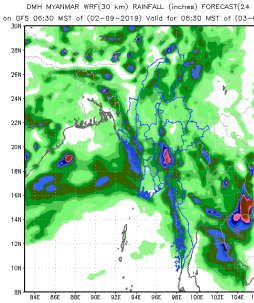
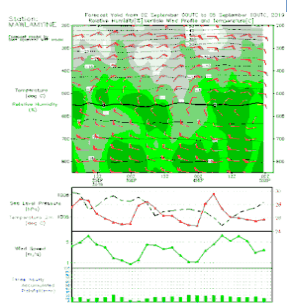
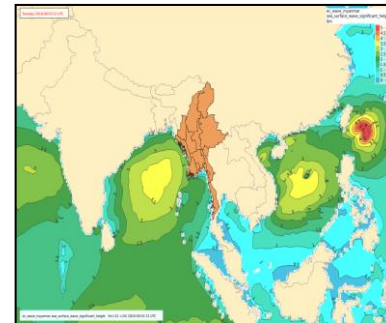
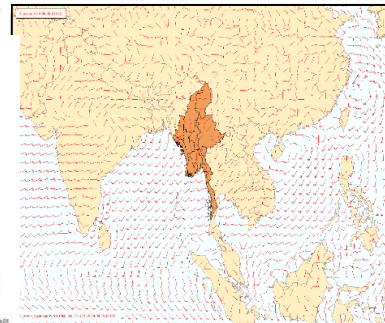
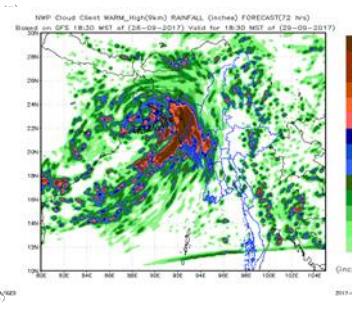
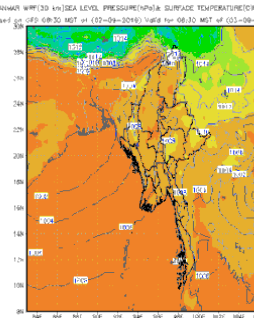
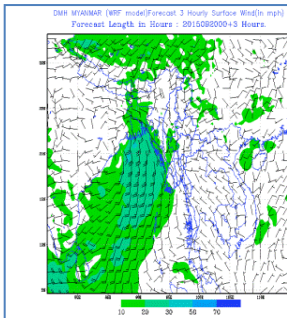
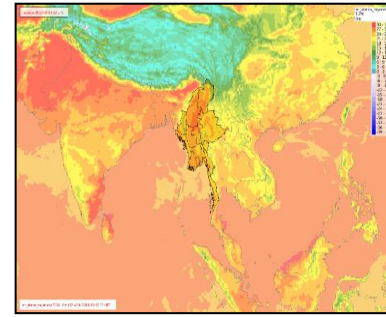
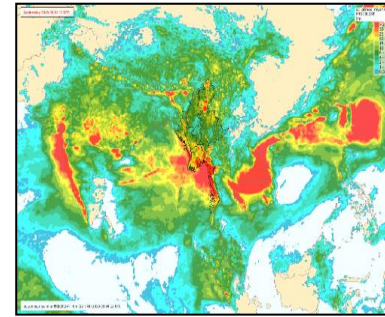
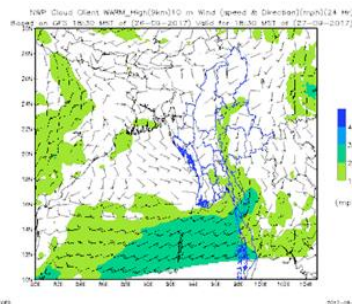
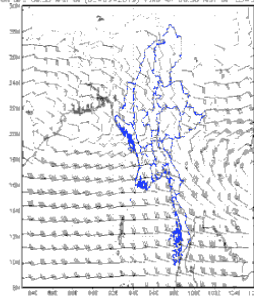
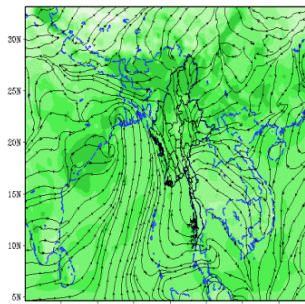
WRF Model

18 km (once a day)
9 km (twice a day)

DIANA Tool

11 km (twice a day)

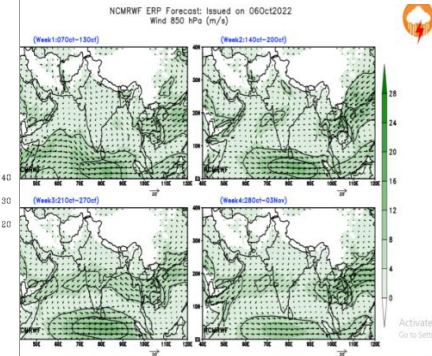
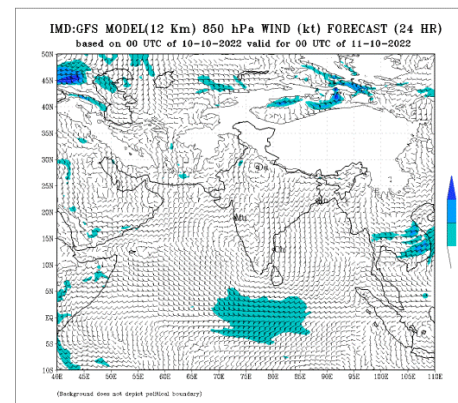
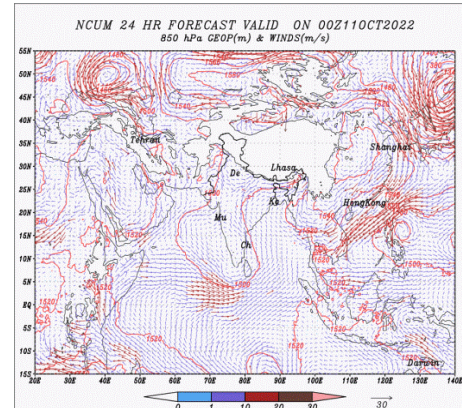
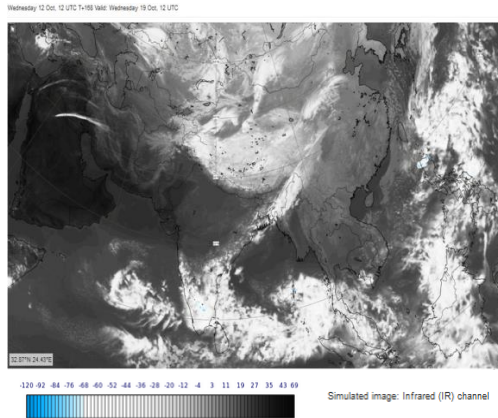
DMH MYANMAR (WRF model)Forecast Surface Stream Line & Relative Forecast Length in Hours : 2015092000+3 Hours.



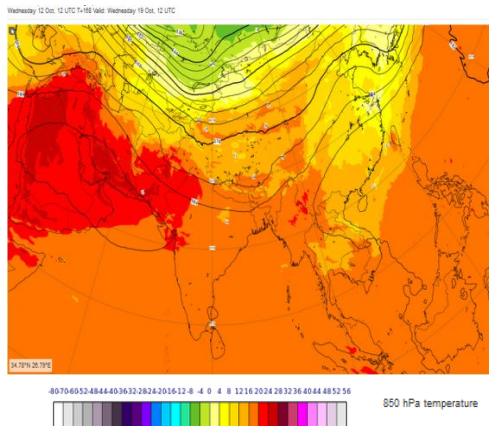
Numerical Weather Prediction(NWP) Products

- NWP Products from the Regional Centres (IMD, NCMRWF/BCWC, IITM, NOAA, ECMWF, GFS, etc)

Simulated images - infrared



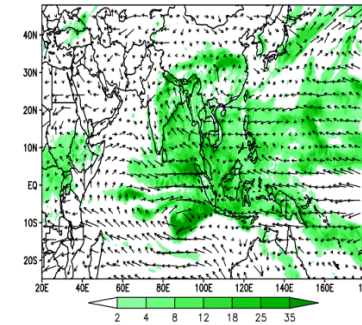
500 hPa geopotential height and 850 hPa temperature



MPME Forecast Valid Time = 00Z06OCT2022

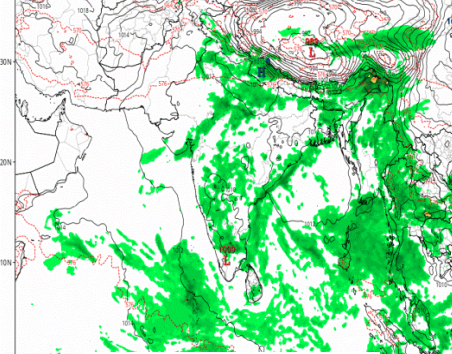
Initial Condition : 20221005

Rainfall (shaded, mm/day) & 850hPa winds (vector, 30°)



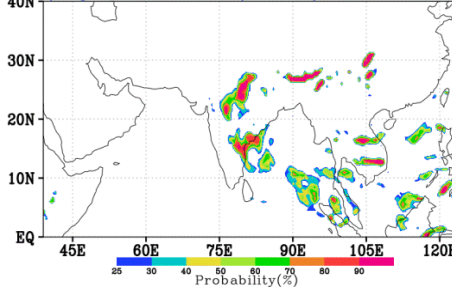
GFS 6-hour Averaged Precip Rate (mm/hr), MSLP (hPa) & 1000-500mb Thickness (dam)

Init: 00z Oct 10 2022, Forecast hour: [6] valid at 00z Mon, Oct 10 2022

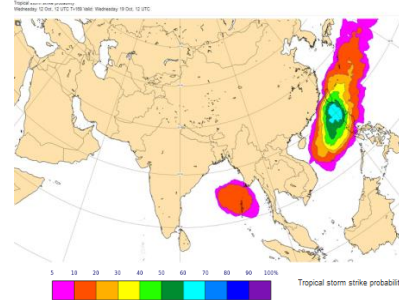


MPME, Forecast Valid Time = 00Z06OCT2022

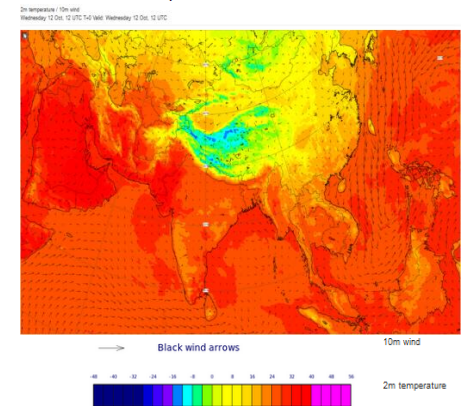
Cyclogenesis & Evolution probability from MPME-IGPP



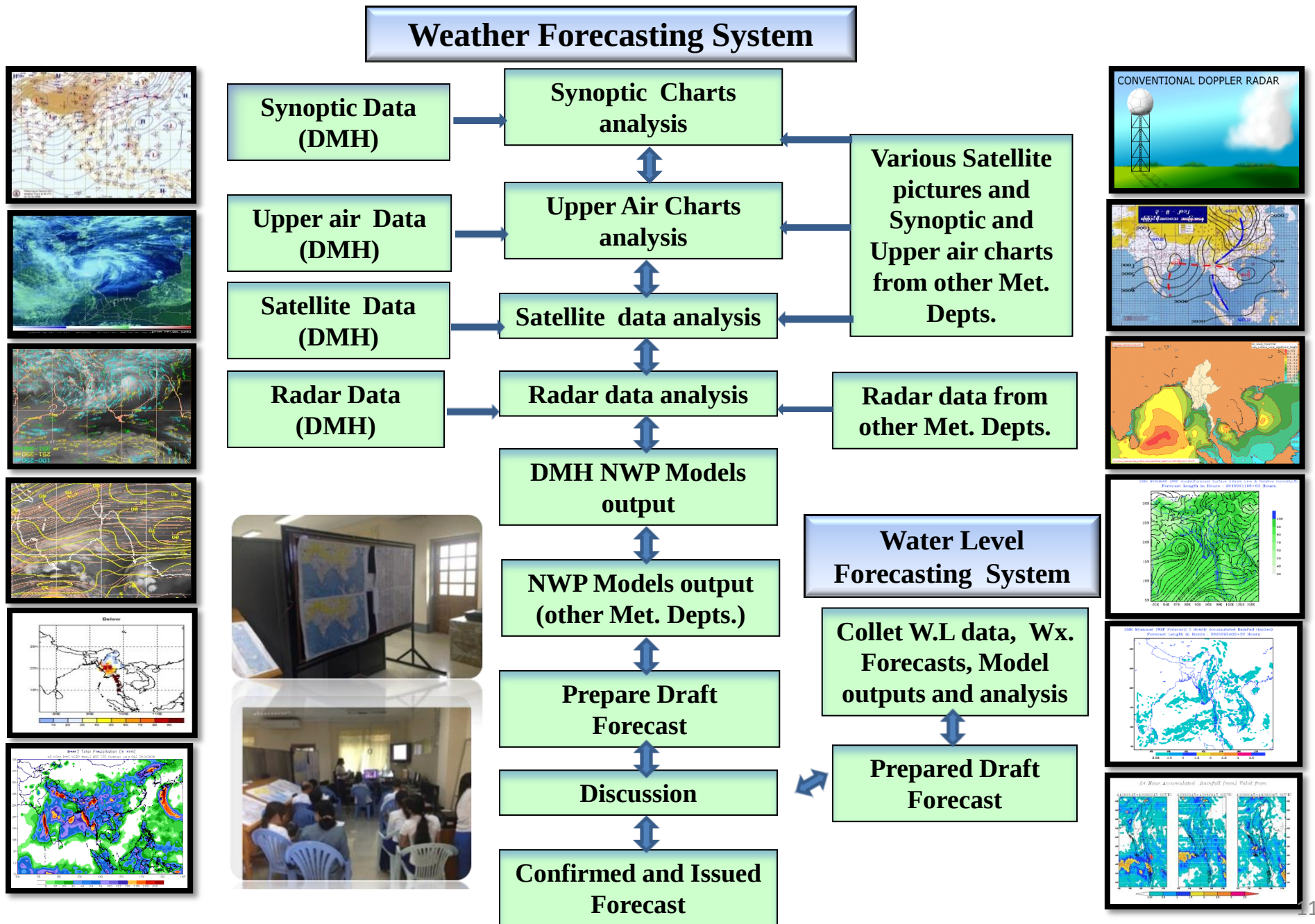
Tropical cyclone activity (Including genesis)



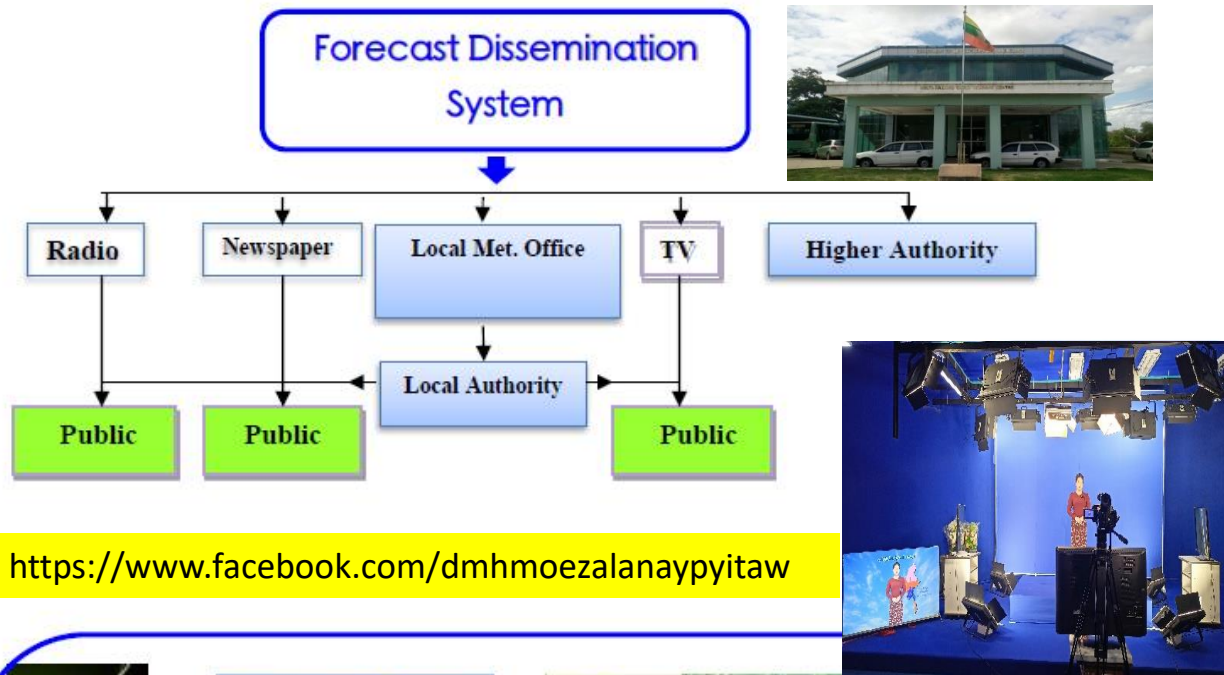
2 m temperature and 10 m wind



Forecasting System



Forecast Dissemination System



<https://www.facebook.com/dmhmoezalanaypyitaw>



Viber



- Telephone
- Fax, Email,
- SSB, CAP,
- SMS, DMRS
- Call Center



Forecast Dissemination System

moezala.gov.mm/monthly-weather-forecast-december-2020

mb cross equat... GFS Forecasts of 85... Meteorological Sat... Monsoon Monitoring... Explore the effects... RAMMB/CIRA SLID... JAXA Global Rainfal...

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<https://www.dmh.gov.mm/>

Department of Meteorology and Hydrology

Department of Meteorology and Hydrology

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(11.12.2020) Weather is generally fair over the North Bay and a few cloud to partly cloudy over the Andaman sea and elsewhere over the Bay of Bengal.

HIMAWARI - 8

Monthly Weather Forecast for December, 2020
Saturday, November 28, 2020 - 10:45

Monthly Weather Forecast for December, 2020

Issued on 28-11-2020

Bay of Bengal Condition

Two low pressure areas may form over the Andaman Sea and Bay of Bengal and these low pressure areas may further intensify into the depressions. Weather will be partly cloudy over the North Bay and partly cloudy to cloudy over the Andaman Sea and

Radar Image

J-BIRDS 13:03 11 Dec 2020

DEPARTMENT OF METEOROLOGY & HYDROLOGY

<https://www.facebook.com/dmhmoezalanaypyitaw>

မိုးလေဝသနှင့်လေဗေညွှန်ကြားမှု ဦးစီးဌာန
@dmhmoezalanaypyitaw · Government website

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နေ့စဉ်မိုးလေဝသထုတ်
=====

၂၀၂၀ ခြည့်နှစ်၊ ဒီဇင်ဘာလ (၁၁)ရက်နေ့ ညနေ (၄:၀၀)နာရီအချိန် ထုတ်ပြန်ချက်

ဘင်္ဂလားပင်လယ်အော်အခြေအနေ။ ဘင်္ဂလားပင်လယ်အော်တောင်ပိုင်းတွင် တိမ်အသင့်အတင့် ဖြစ်ထွန်းနေပြီး၊ ကပ္ပလီပင်လယ် ပြင်နှင့် ကျန်ဘင်္ဂလားပင်လယ်အော်တို့တွင် တိမ်အနည်းငယ် ဖြစ်ထွန်းနေပါသည်။... See more



မိုးလေဝသနှင့်လေဗေညွှန်ကြားမှု ဦးစီးဌာန၏တရားဝင် Facebook Page ဖြစ်ပါသည်။

2,198,058 people like this, including 273 of your friends

2,292,818 people follow this

<http://www.moezala.gov.mm/>

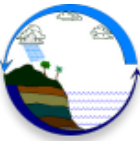
067 411 526

Send message

Closing soon
09:30 - 16:30

Government website

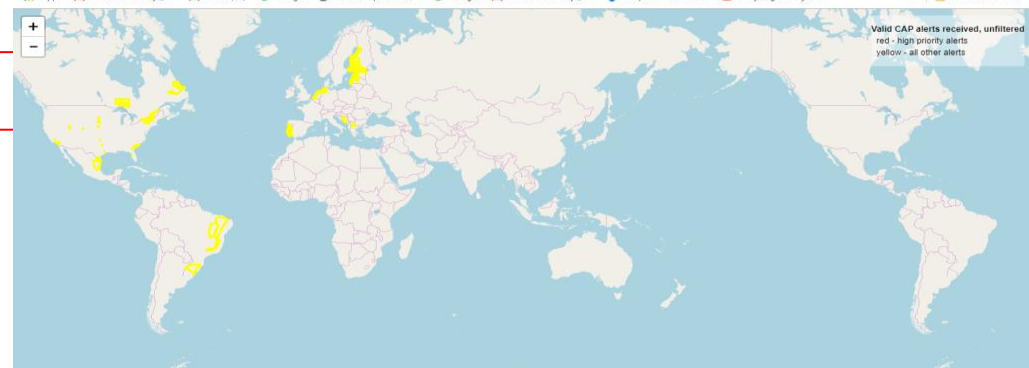
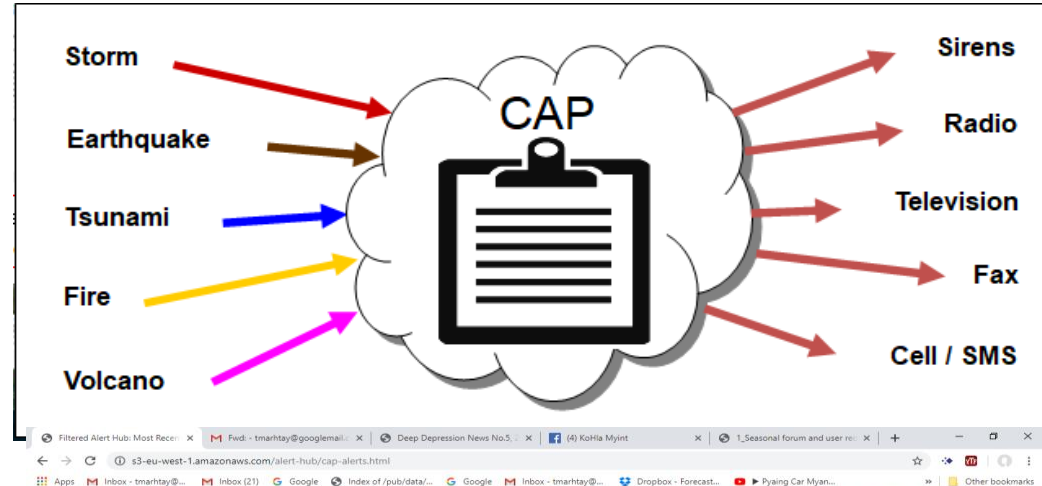
Forecast Dissemination System



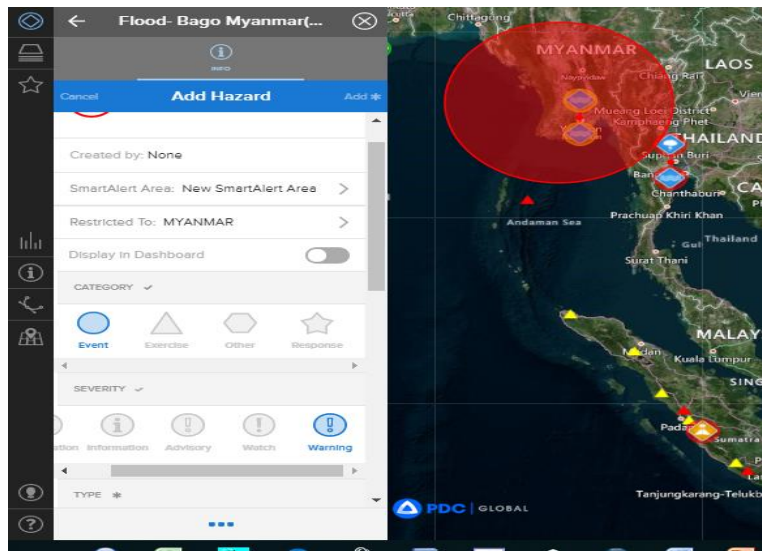
DMRS-Myanmar

“Building Disaster Monitoring and Early Warning Capacity(Disaster Monitoring and Response System)”

Common Alert Protocol(CAP)

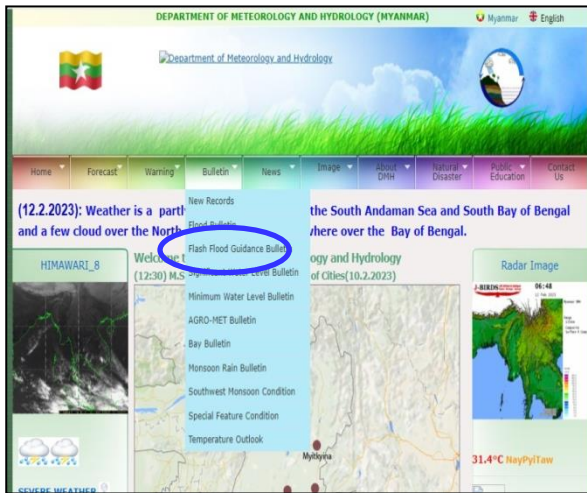


Users: MRCS, GAD, DOA, MFSD, DDM, etc.



Forecast Dissemination System

MyanmarFFGS -Myanmar Flash Flood Guidance System



<https://www.moezala.gov.mm/>

WMO, USAID/ OFDA, HRC and NOAA supported the necessary funding and technical guidance in order to implement a Myanmar flash flood guidance system(MyanmarFFGS).

MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF METEOROLOGY AND HYDROLOGY
NAY PYI TAW, MYANMAR

Flash Flood Guidance Bulletin

Date: 7.9.2022 Time of issue: 14:30 MST

Area of Concern (AoC): Small rivers and streams, mountain streams, and low-lying areas of some places in the Mandalay Region, Magway Region, Tanintharyi Region, and Nay Pyi Taw.

Precipitation and Soil Saturation: According to the real-time products of the Myanmar Flash Flood Guidance System (MyanmarFFG) at 12:30 hrs M.S.T today, observed rainfall is up to (0.63) inches during the last 6 hours and up to (1.38) inches at potential flash flood area in last 24 hours, and soil was saturated between (65) % and (90) % over AoC.

Precipitation Forecast: According to the real-time products of the Myanmar Flash Flood Guidance System (MyanmarFFG) at 12:30 hrs M.S.T today, forecast rainfall is (1.65) inches at a potential flash flood area during the next 24 hours over AoC.

Imminent Flash Flood Threat (IFFT)

Imminent Flash Flood Threat (IFFT) is not shown.

Remark: This is only a guidance bulletin and not a warning for flash flood.

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DEPARTMENT OF METEOROLOGY AND HYDROLOGY
NAY PYI TAW, MYANMAR

Persistent Flash Flood Threat (PFFT)

Persistent Flash Flood Threat (PFFT) is not shown.

06 hours Forecasted Flash Flood Threat (FFFT)

No Flash Flood Threat (FFFT) for the next 06 hours.

Remark: This is only a guidance bulletin and not a warning for flash flood.

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24 hours Flash Flood Risk Outlook (FFR)

Moderate to High Flash Flood Risk is (FFR) likely in Mandalay Region (Nyaung U District and Yamethin District), Magway Region (Magway District, Minbu District, and Pakokku District), Tanintharyi Region (Dawei District and Myeik District), and Nay Pyi Taw during next 24 hours.

According to the real-time products of the Myanmar Flash Flood Guidance System (MyanmarFFG) at 12:30 hrs M.S.T today, it may occur flash flood near the small rivers and streams, mountain streams, and low-lying areas of AoC during the next 24 hours, and it is especially advised to take precaution measures.

Remark: This is only a guidance bulletin and not a warning for flash flood.

- DMH analyzes to issue the news of flash flood in Myanmar by using the Precipitation products, Warning products, snow products and Risk products from the MyanmarFFGS console since 2018.
- Starting from 28-8-2022, DMH is issuing the Flash Flood Guidance Bulletin on the website of the Department of Meteorology and Hydrology, Myanmar(<https://www.moezala.gov.mm/>).

Cooperation for EWS



DMH cooperates with DDM & MRCS (EOC)



Public Awareness (Trainings, Drills/Exercises, Pamphlets, Media)

Needs of DMH

- ❖ **Observations Network (more radars, instruments (Met., Marine., Upper air, Hydro., Seismo., etc.))**
- ❖ **Data Integration**
- ❖ **Human Resources/ Capacity Building (instruments maintenance, Forecasting Techniques, Satellite Application, etc.)**
- ❖ **Technical Assistances/ Projects**
- ❖ **To develop forecasting techniques (NWP model, IBF, etc.)**
- ❖ **To develop AI application for EWS (Met./ Hydro.)**

Conclusion

- ❖ DMH, Myanmar needs to develop Human Resources/ Capacity Building for EWS and Meteorological , Hydrological and Seismological Services.
- ❖ DMH, Myanmar requests CMA to support for Capacity Building, technical assistances and projects, to develop EWS (including AI application, forecasting techniques, Satellite Application) and Meteorological Services of Myanmar.
- ❖ DMH, Myanmar will cooperate and collaborate with CMA and ASEAN countries to develop the EWS for local and regional.

Thank you very much for your kind attention!