Applications of Space Technology and GIS for Disaster Risk Reduction and Sustainable Development in Myanmar

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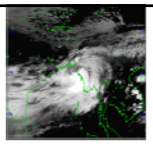
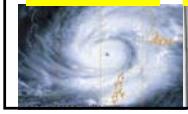
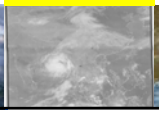
Natural hazards

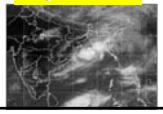


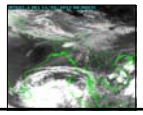

- ➢ **Meteorological**
- ➢ **Hydrological**
- ➢ **Geological**


- 2006 Apr Cyclone Mala
- 2008 May Cyclone Nargis
- 2010 Oct Cyclone GIRI
- 2011 Mar Tarlay Strong Earthquake
- 2011 JJA Heavy Rain & Floods
- 2011 Oct Pakokku Flash Flood
- 2012 JJA Lower/NE Myanmar Floods
- 2012 Nov Thabeikkyin Strong Earthquake
- 2013 May Cyclone Mahasen
- 2013 J-O Heavy rain triggered secondary hazards & Floods

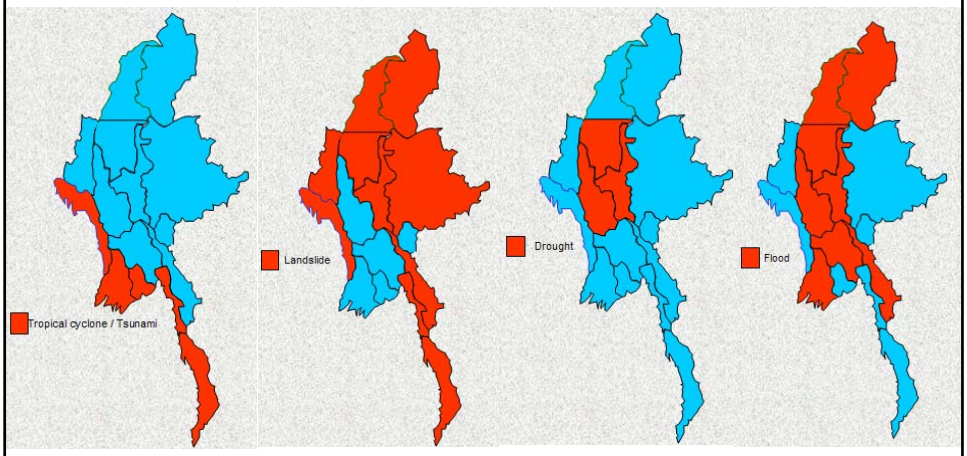
Mala, 2006 | **Akash, 2007** | **Nargis, 2008** | Bijli, 2009 | Giri, 2010 | **Mahasen, 2013**





Natural Disaster (Vulnerable) Area in Myanmar



Cyclone/Tsunami Landslide Drought Flood

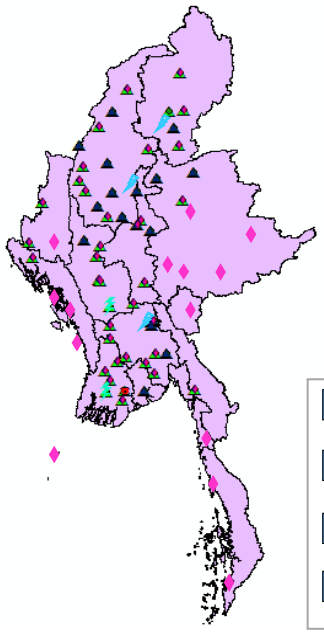
Meteorological/Hydrological Hazard Calendar

Hazards	J	F	M	A	M	J	J	A	S	O	N	D
Cyclone												
High Temperature												
Low Temperature												
Drought												
Squalls& Thunderstorm												
Flood												
Heavy Rain												
Monsoon Depression												
Hail												

The Roles and Responsibilities of DMH

- Meteorological Services in 1937
- Agro-meteorological Services in 1970
- Hydrological Services in 1964
- Seismological and Earthquake activities in 1961
- Member of IMO (International Meteorological Organization) in 1938
- Acid Deposition Monitoring in 2003
- Member of of EANET (Acid Deposition Monitoring Network in Asia) in 2006
- Issued Information, Forecasts and Warning
- Disseminate to decision makers, policy makers, Depts & public
- Early Warning System is main responsibility of DMH in case of Disaster Risk Reduction

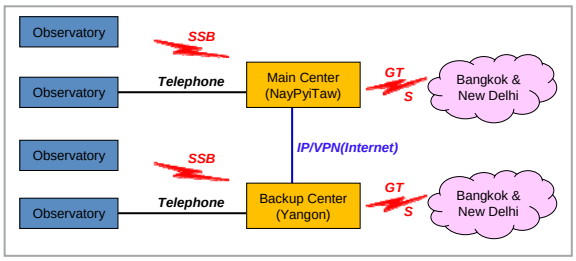
Meteorological and Hydrological Observation Network (DMH)



•(37) WMO Register (3)hourly Synoptic Observation Stations

•(1) Upper Air Observation Global Meteorological Observation System

Meteorological/Hydrological Stations	**- 39**
Meteorological Stations	**- 63**
Hydrological stations	**- 25**
Agro meteorological Stations	**- 17**
Upper Air Station	**- 1**



Responsibilities of DMH

Warning, Bulletin, Forecast and News

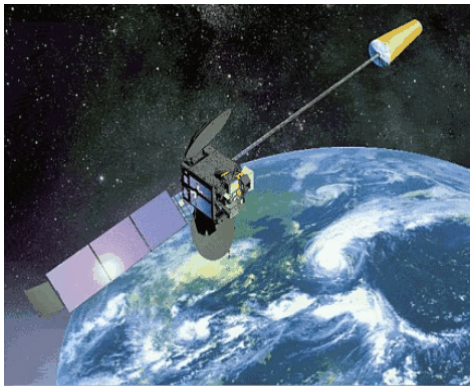
- Cyclone Warning
- Storm Surge Warning
- Flood Warning
- Untimely Rainfall Warning
- Fog Warning
- Heavy Rain Warning
- Aviation Weather Warning
- Low flow water level
- Tsunami Warning
- Port Warning
- ✓ Agro-meteorological Bulletin
- ✓ Bay Bulletin
- ✓ Flood Bulletin
- ✓ Special Weather Bulletin

- ❖ Daily Weather/Water Level
- ❖ 10 Days Weather/Flood
- ❖ Monthly Weather/Flood
- ❖ Seasonal Weather/River Flood Forecast
- ❖ Aviation Weather Forecast
- ❖ Marine Weather Forecast
- ❖ Special Forecast

- Earthquake News
- Rainfall / Temperature Records
- Cyclone News

Applications of Space Technology and GIS

In Meteorological Services



MTSAT Data Receiving System installed on 25th January, 2011 at Multi-Hazard Early Warning Center, Nay Pyi Taw (donated by JICA)

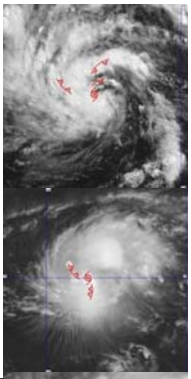
FY-Cast geostationary meteorological satellite installed at Nay Pyi Taw. (2011) (donated by CMA)

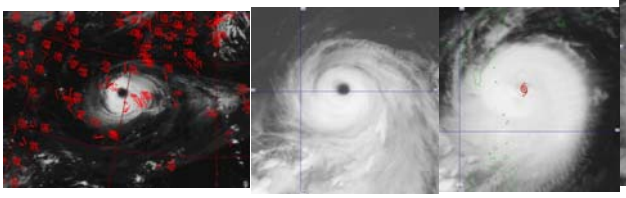
Applications of Space Technology and GIS

In order to issue early warning ….

By using *Dvorak Technique* in *SATAID* software

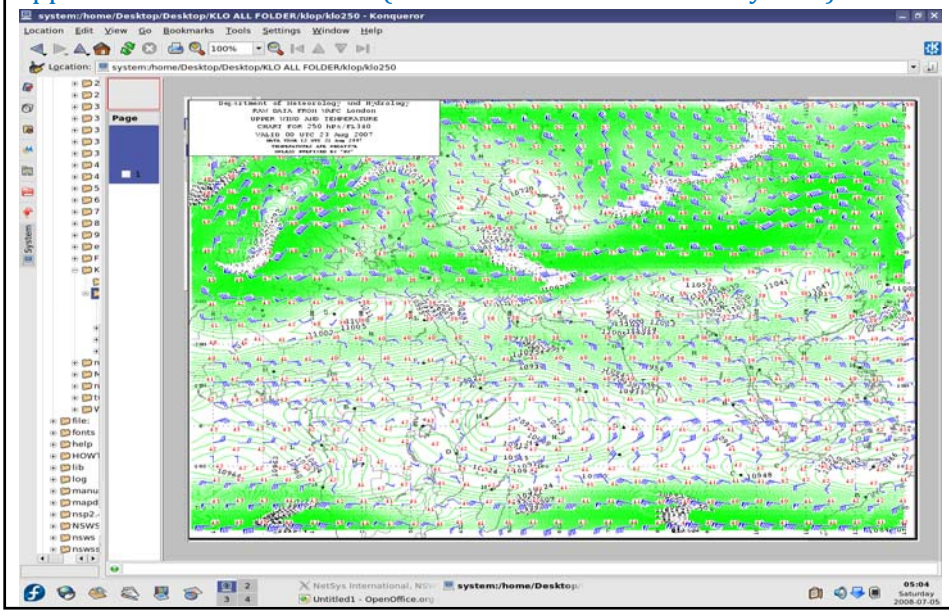
- Analyze Cloud Pattern
- Calculate Wind Vector, Vortex
- Calculate Cloud Top Temperature
- Analyze Tropical Cyclone
- Analyze Rain forecast



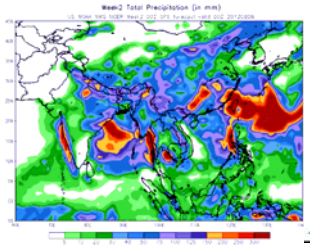


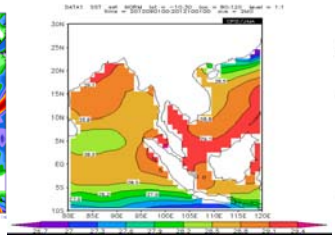
Applications of Space Technology and GIS

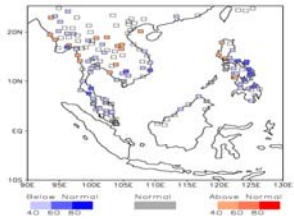
Upper air Products from GTS (Global Telecommunication System)



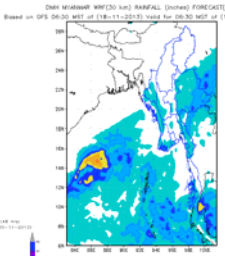
Applications of Space Technology and GIS

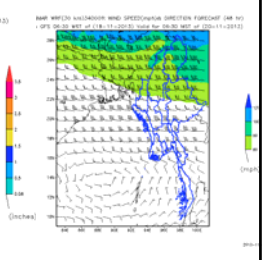


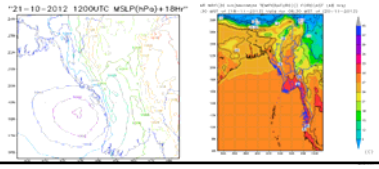




We can issue good outlook of Short And Medium Range Forecast by using Global Climate model. ***IMD/NOAA/ IRI/TMD/ ARL/ RIMES /ECMWF/ BCC/JTWC/JMA/KMA***…







DMH set up WRF Model Since 2012 Nov . Now Updated in our website For our users.

Applications of Space Technology and GIS

In Hydrological Services

For Daily Water Level Forecast

- River Stage Correlation Method
- Empirical Model (based on single and multiple regression analysis)
- Integrated Flood Analysis System (IFAS) (not for operational use)

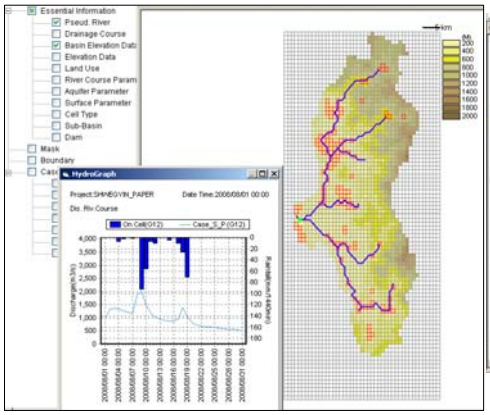
For Seasonal Water Level Forecast

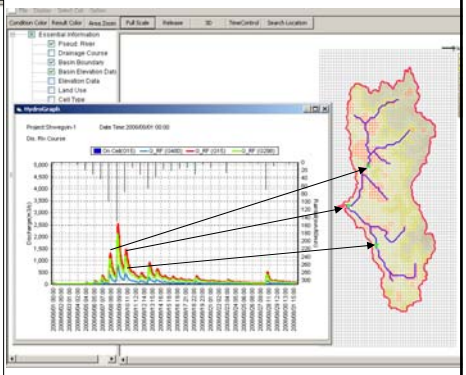
- Based on flood characteristic occurred in Analogue years
- Based on seasonal weather forecast
- Based on comparison of current flow with the individual hydrograph for the last (10) years
- Based on the average flow of the last (10) years
- Based on the Flood frequency analysis

Not Yet Flood Forecasting Method using Space Technology and GIS (for operational use)

Applications of Space Technology and GIS

Flood Forecasting by using (IFAS) (Space Technology and GIS)

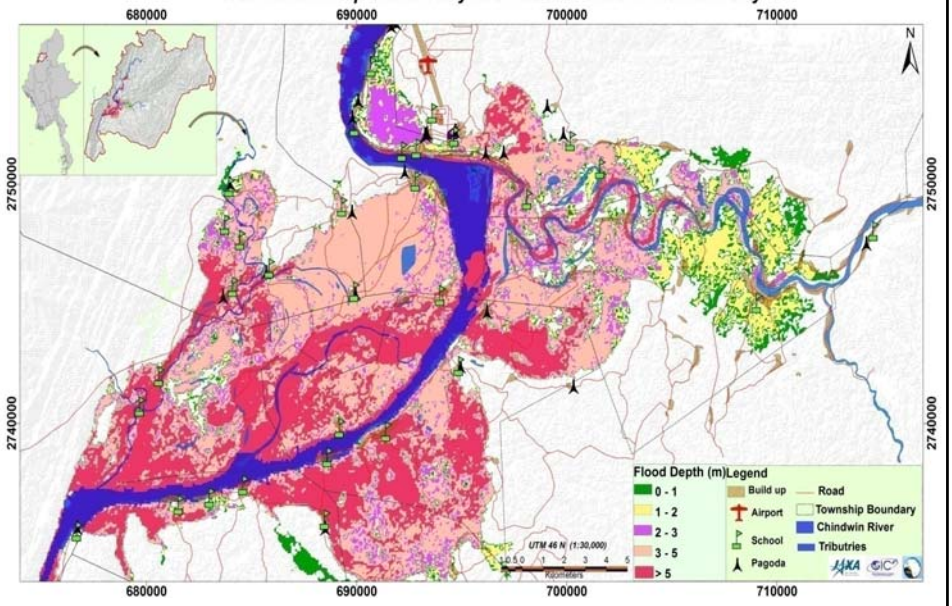




Training Workshop on Installation of Integrated Flood Analysis System (IFAS)(June 2010)

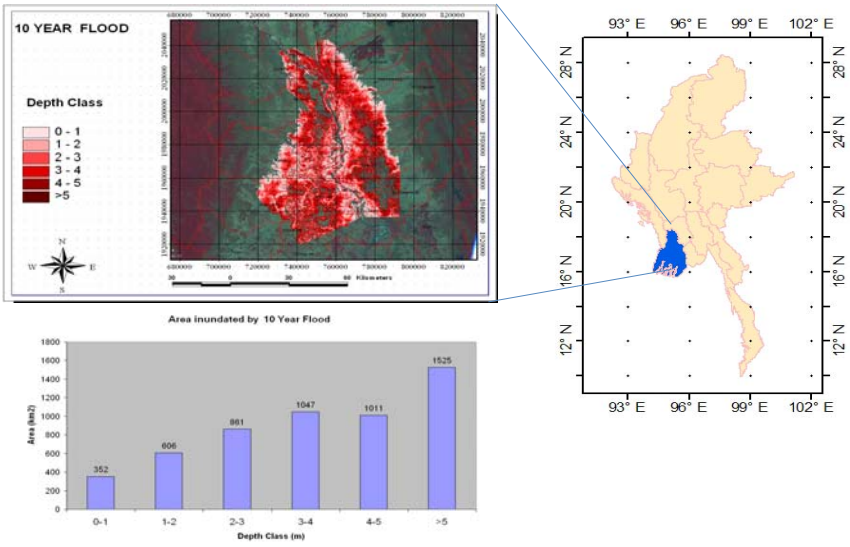
Applications of Space Technology and GIS

Flood Hazard Map of the 100 years Return Period in Homalin City



Applications of Space Technology and GIS

Flood Hazard Map for Zalun and Seiktha of Ayeyarwady Region



Applications of Space Technology and GIS