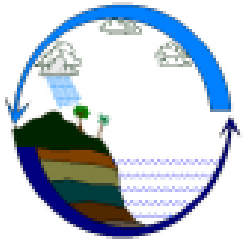


WMO Workshop on Cyclone Forecasting and Analyzing
Muscat, OMAN 17-19 Dec 2012

Activities of Cyclone Forecasting in Myanmar

Kyaw Lwin Oo

Assistant Director(Meteorology)

Department of Meteorology and Hydrology

History of Hydrometeorological services…..

- Established Meteorological services 1 April 1937.
- Member of IMO since January 1938.
- Aviation Meteorological Office 1946.
- Hydrological services established Jan 1964.
- Agro Meteorological services 1982.
- Seismological and earthquake activities in July 1986.
- Main responsibility is to provide Early Warning.

Now We're on (75) Years of National Meteorological Services.(1937-2012)

DMH Manpower 2Q-2012

Sr	Grade	Approve	Assign	Vacancy
1	Officer	135	102	33
2	Technical Staffs, Observers and Other	1290	592	698
	Total	1425	694	731

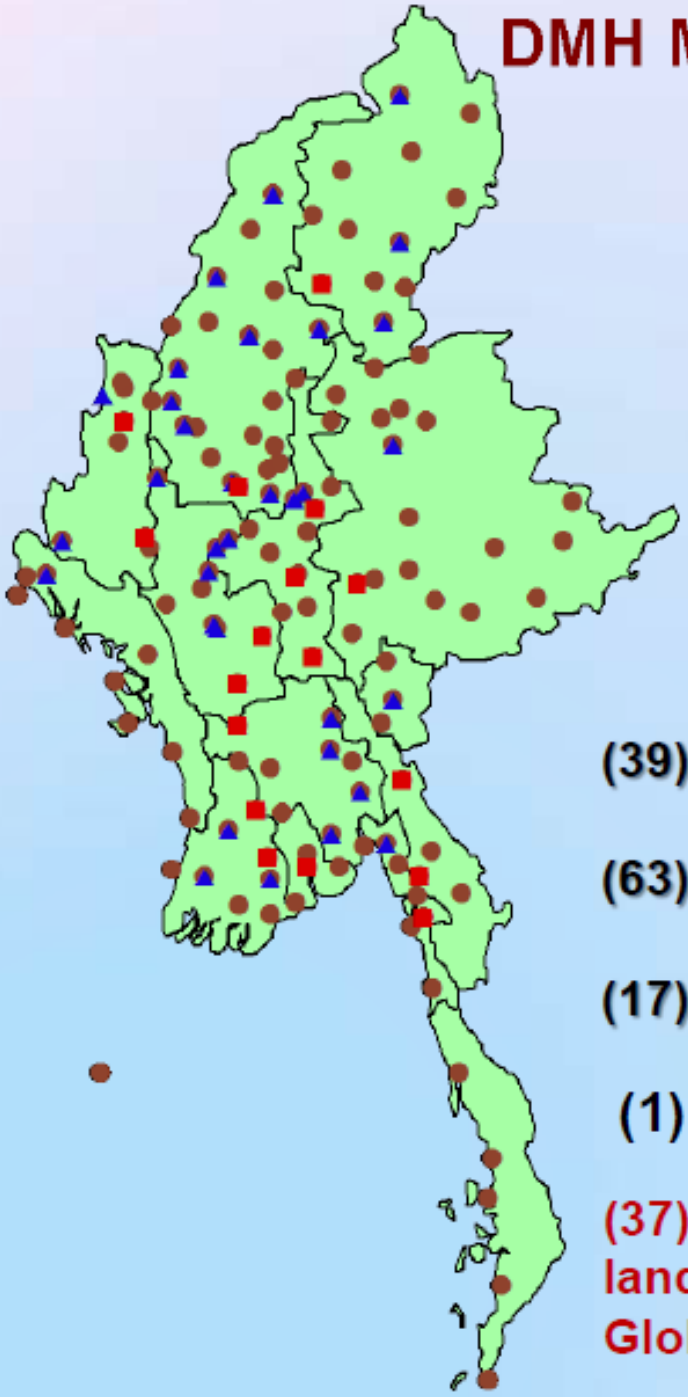
49 %

51 %

DMH's Organization

We're planning to extend some technical division To build up Capacity.

DMH Meteorological Observation Networks



RADIO Telephone	43
Telephone	59
Telegraph	2

(39) ▲ Hydro/Meteorological Observatory

(63) ● Meteorological Observatory

(17) ■ Agrometeorological Observatory

(1) Upper Air Observatory

(37) Stations routinely disseminate every (3) hourly land observations and (1) Upper Air Obsevation to Global Meteorological Observing System.

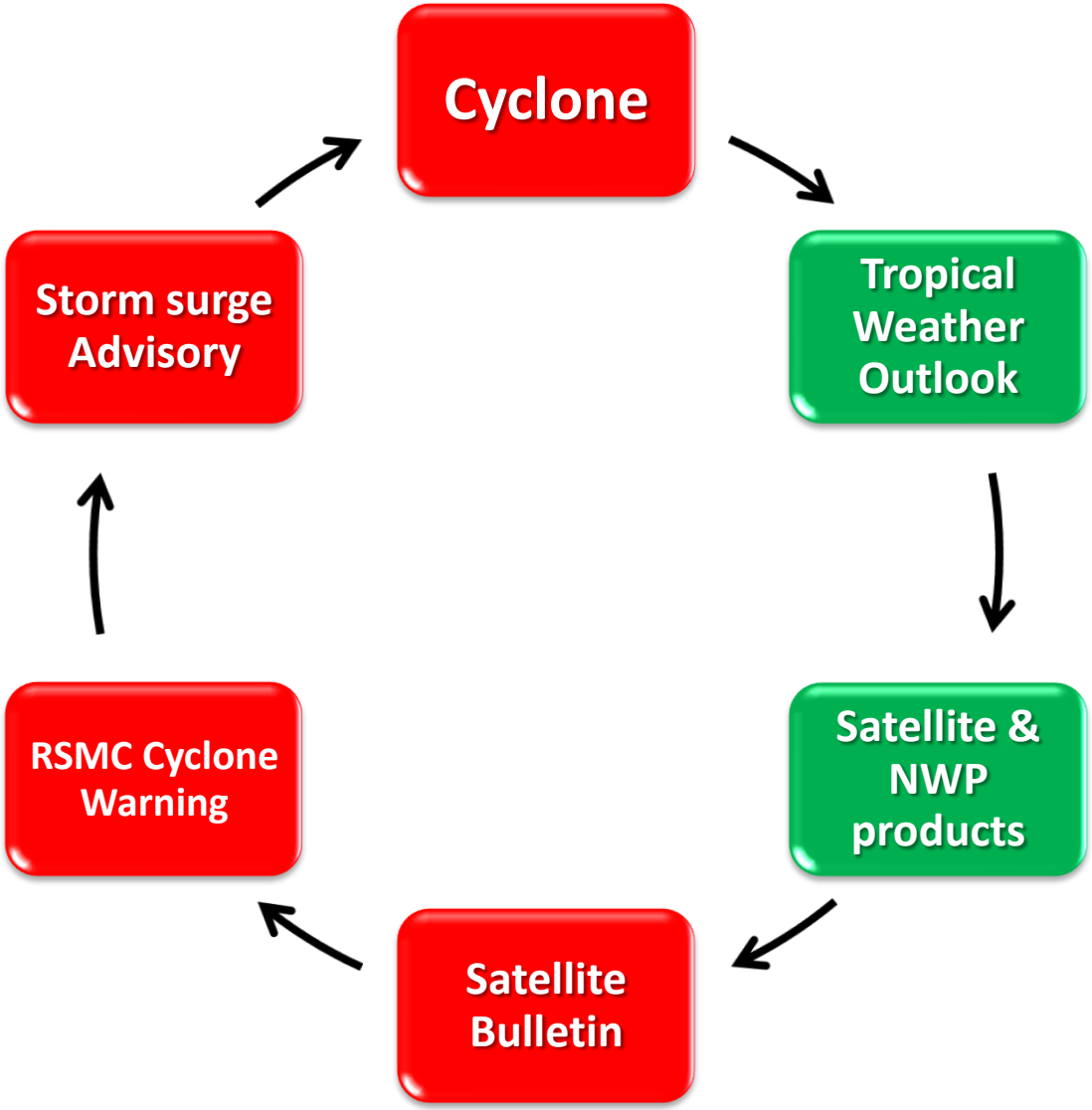
Role of National Hydro Met Services ….
….as by World Meteorological Organization

- Observing and understanding Weather, Climate and Water resources as well as in providing meteorological, hydrological and related services in support of national needs such as:
  - Protection of life and property.
  - Safeguarding the environment.
  - Contributing to national security and sustainable development.
  - Promotion capacity building.
- Contributing to National, Regional and International cooperation.

Myanmar's Climate: Meteorological View

- Different Climatic characters based on Annual Rainfall, Temperature and Location, Altitude and Geography.
- Dry Zone areas shows Double Peak in Monthly Rainfall /Thunder while others show single Mode.
- Number of Cyclone in the Bay of Bengal, frequency of passage of Western disturbances from the NE India, frequency of Easterly Waves and activity of Typhoon Remnants from the China Sea towards Myanmar, accentuate Local, Regional Weather and Climate.
- Clear evident of abnormal cyclone landfall, Monsoon Climatology and extreme temperature and rainfall.
- Links with the Regional Climatic pattern and some Atmospheric Oscillation like El Nino and other Oceanographic Phenomenon.

NMC-Myanmar use RSMC New Delhi's Outlook/Bulletin/Warning/Advisory

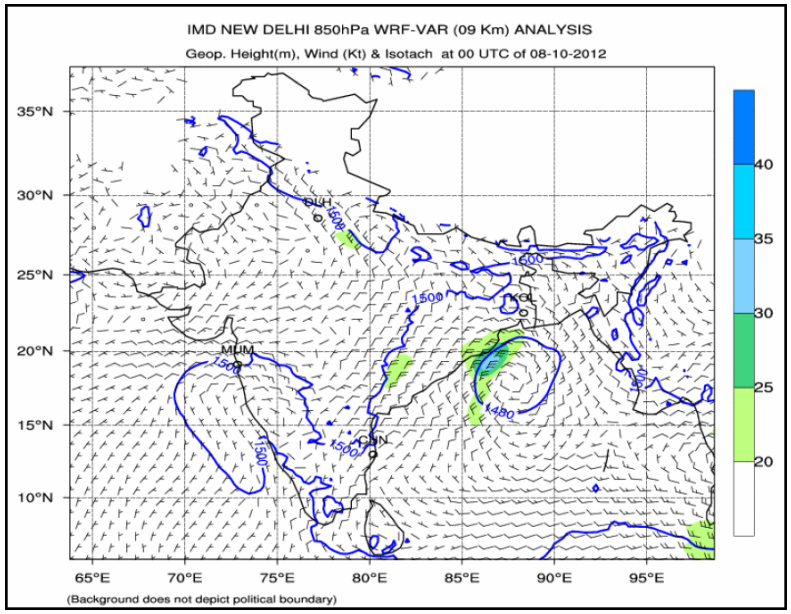


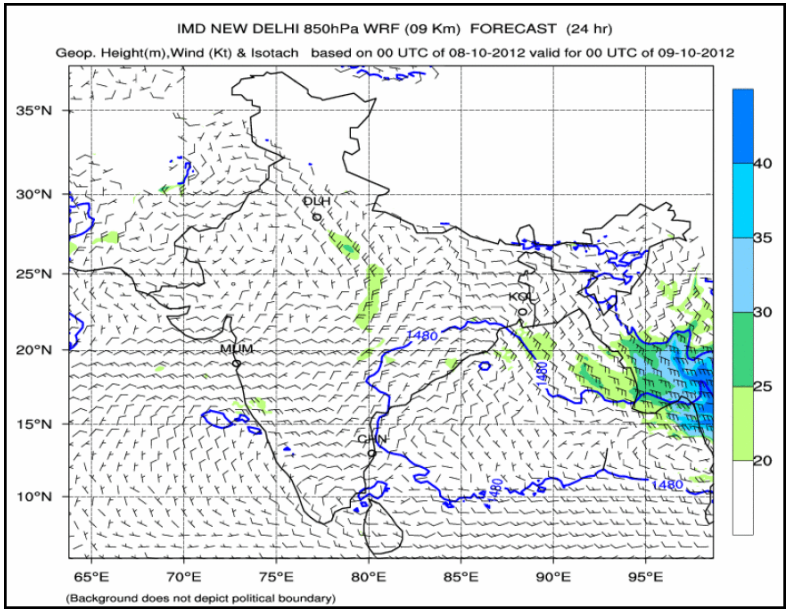
2012 LPA, Depression and Cyclone

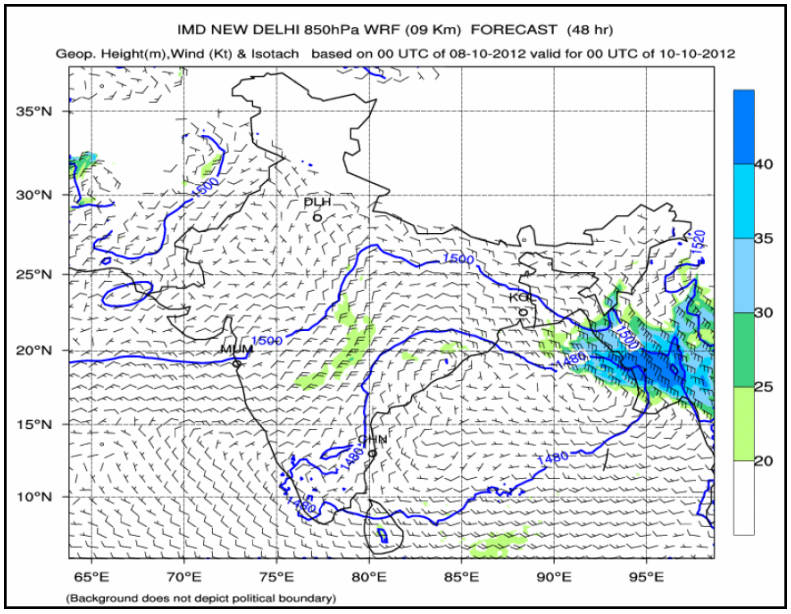
Sr	System	Place	Date	Affect in Myanmar
1	LPA	NW Bay	20-22 July	Monsoon Vigorous, Heavy Rain
2	LPA	NW Bay	3-6 August	Highest Monsoon Intensity
3	LPA	NW Bay	17-19 August	Only strong monsoon
4	LPA	N Bay	25-27 August	Heavy rain in some Coastal areas
5	LPA	WC/NW Bay	3-6 Sept	Monsoon Strong
6	LPA	WC Bay	27 Sep-2 Oct	Moderate Monsoon
7	Depression	NW-NE Bay	7 Oct-12 Oct	Squally Weather in NW areas.
8	CS NILAM	SE Bay	27 Oct-1Nov	
9	Depression	SE Bay	14 Nov-20 Nov	
10	LPA	Andaman Sea	28 Nov-3 Dec	Damaged paddy field due to rain

Seasonal Cyclone Forecast Vs Observed for 2012 Monsoon Season

Period	Forecast	Observed
Early Monsoon	2 LPA, 1 DEP	Nil
Peak Monsoon	2LPA, 1DEP	4 LPA
Late Monsoon	3 LPA, 2 DEP	2 LPA, 1 DEP


IMD NEW DELHI 850hPa WRF-VAR (09 Km) ANALYSIS
Geop. Height(m), Wind (Kt) & Isotach at 00 UTC of 08-10-2012
DLH
KOL
MUM
CHN
1500
1480
35°N
30°N
25°N
20°N
15°N
10°N
65°E
70°E
75°E
80°E
85°E
90°E
95°E
40
35
30
25
20
(Background does not depict political boundary)


IMD NEW DELHI 850hPa WRF (09 Km) FORECAST (24 hr)
Geop. Height(m),Wind (Kt) & Isotach based on 00 UTC of 08-10-2012 valid for 00 UTC of 09-10-2012
DLH
KOL
MUM
CHN
1480
35°N
30°N
25°N
20°N
15°N
10°N
65°E
70°E
75°E
80°E
85°E
90°E
95°E
40
35
30
25
20
(Background does not depict political boundary)


IMD NEW DELHI 850hPa WRF (09 Km) FORECAST (48 hr)
Geop. Height(m),Wind (Kt) & Isotach based on 00 UTC of 08-10-2012 valid for 00 UTC of 10-10-2012
DLH
KOL
MUM
CHN
1500
1480
35°N
30°N
25°N
20°N
15°N
10°N
65°E
70°E
75°E
80°E
85°E
90°E
95°E
40
35
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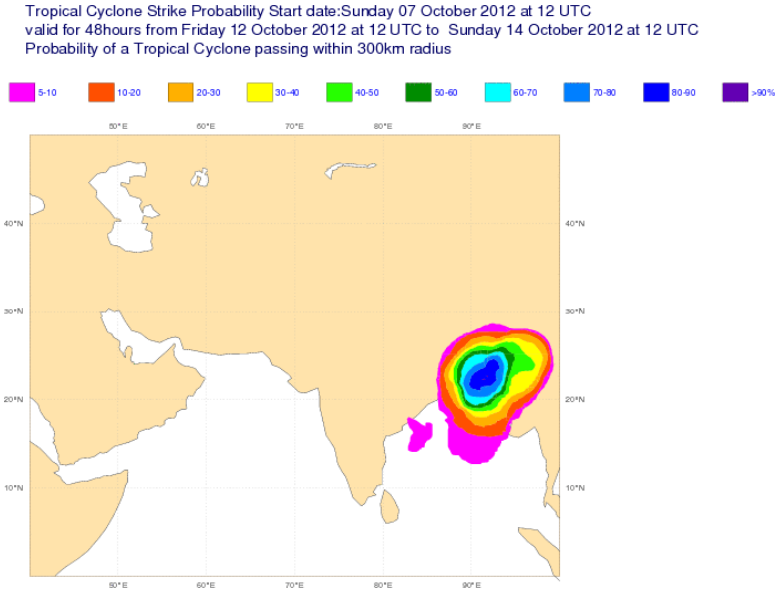
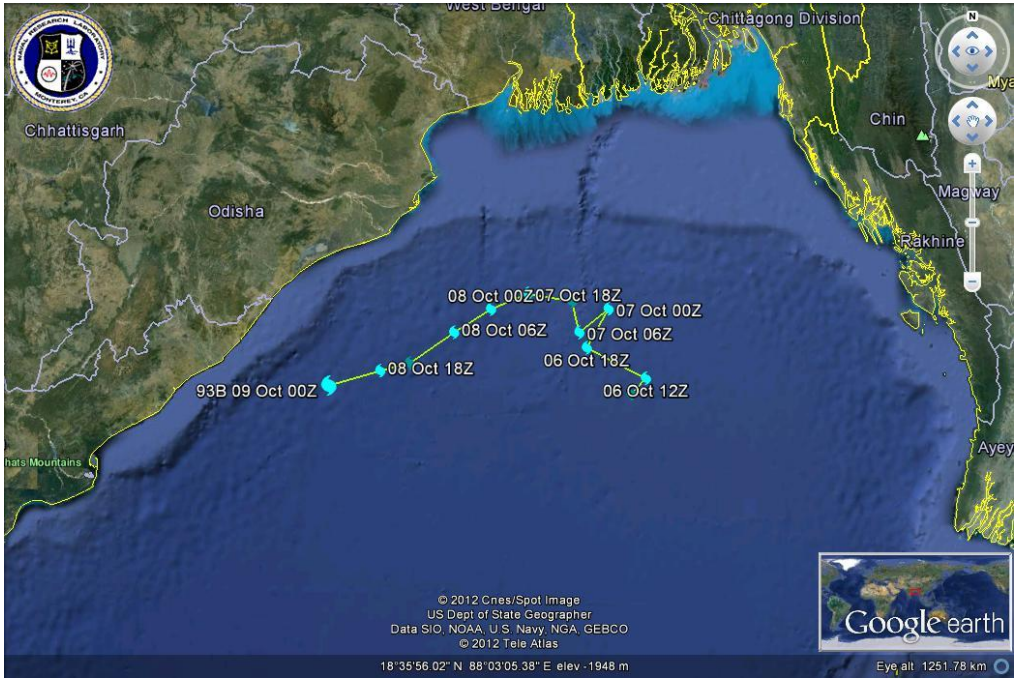
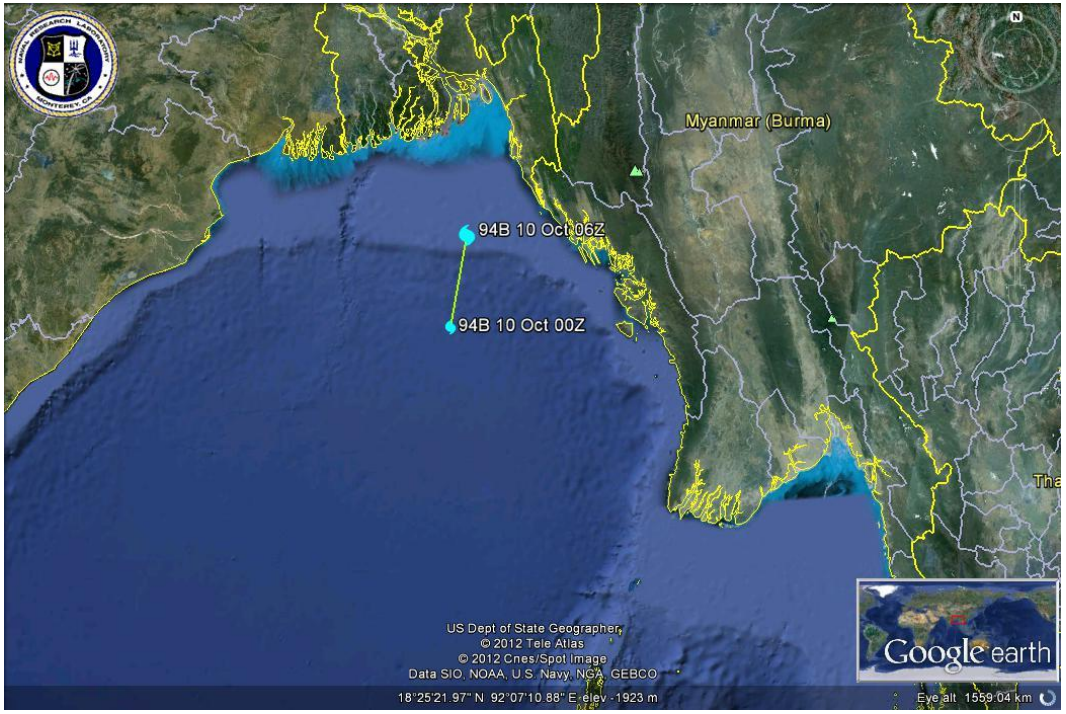
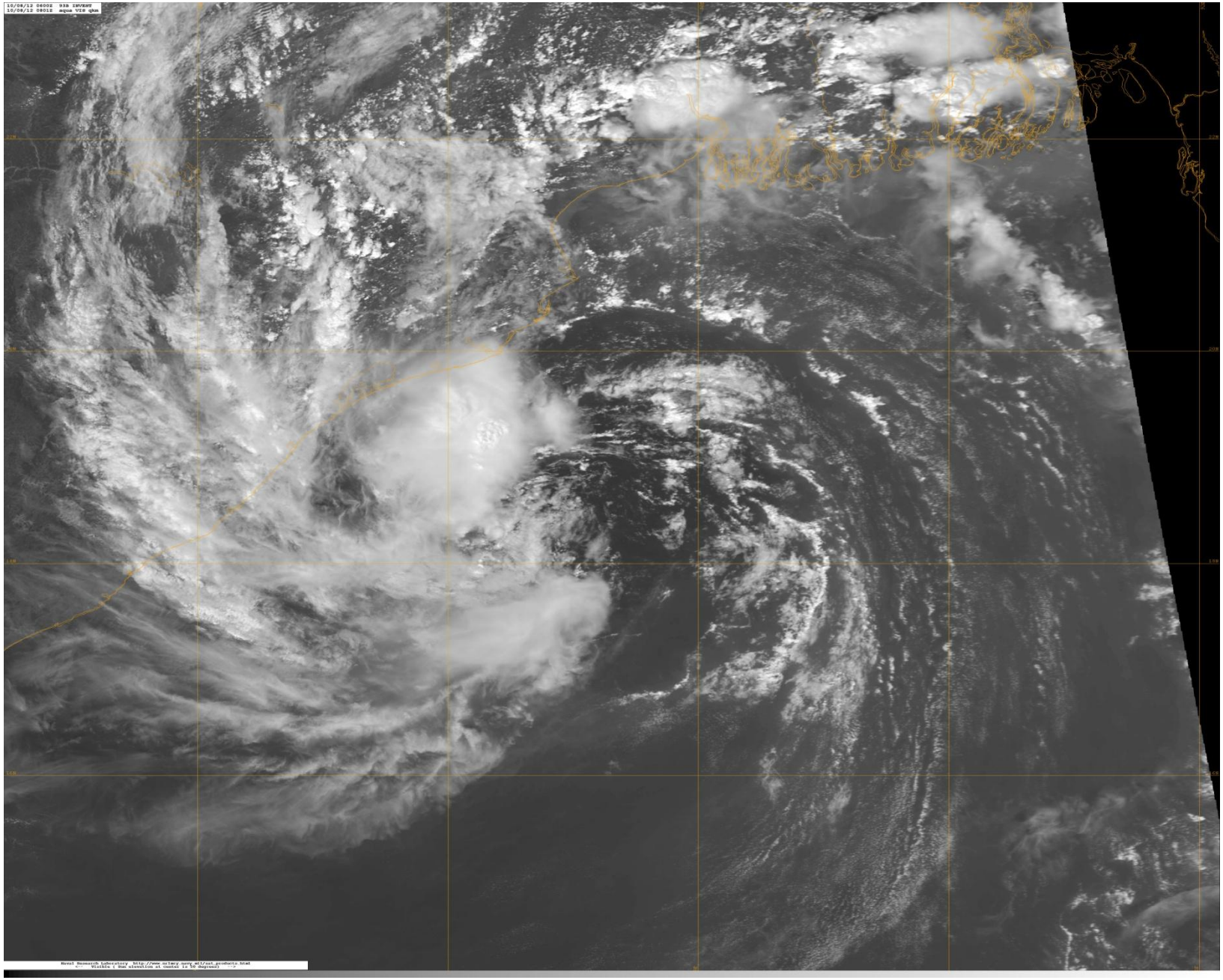
25
20
(Background does not depict political boundary)


Tropical Cyclone Strike Probability Start date:Sunday 07 October 2012 at 12 UTC
valid for 48hours from Friday 12 October 2012 at 12 UTC to Sunday 14 October 2012 at 12 UTC
Probability of a Tropical Cyclone passing within 300km radius
5-10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
>90%
40°N
30°N
20°N
10°N
50°E
60°E
70°E
80°E
90°E


Chittagong Division
Chhattisgarh
Odisha
Chin
Rakhine
Ayey
08 Oct 00Z
07 Oct 18Z
07 Oct 00Z
08 Oct 06Z
07 Oct 06Z
06 Oct 18Z
08 Oct 18Z
93B 09 Oct 00Z
06 Oct 12Z
© 2012 Cnes/Spot Image
US Dept of State Geographer
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2012 Tele Atlas
18°35'56.02" N 88°03'05.38" E elev -1948 m
Eye alt 1251.78 km
Google earth

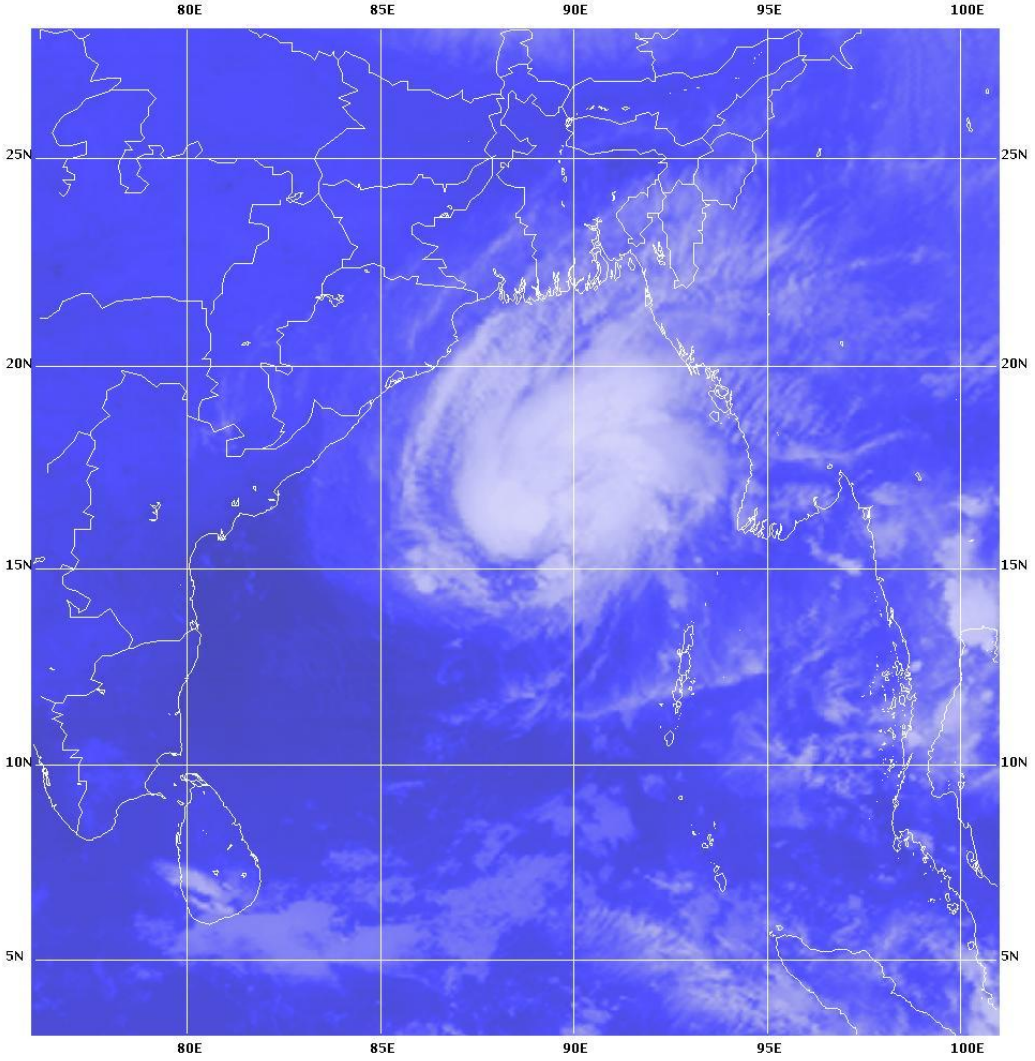

Myanmar (Burma)
94B 10 Oct 06Z
94B 10 Oct 00Z
US Dept of State Geographer
© 2012 Tele Atlas
© 2012 Cnes/Spot Image
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
18°25'21.97" N 92°07'10.88" E elev -1923 m
Eye alt 1559.04 km
Google earth

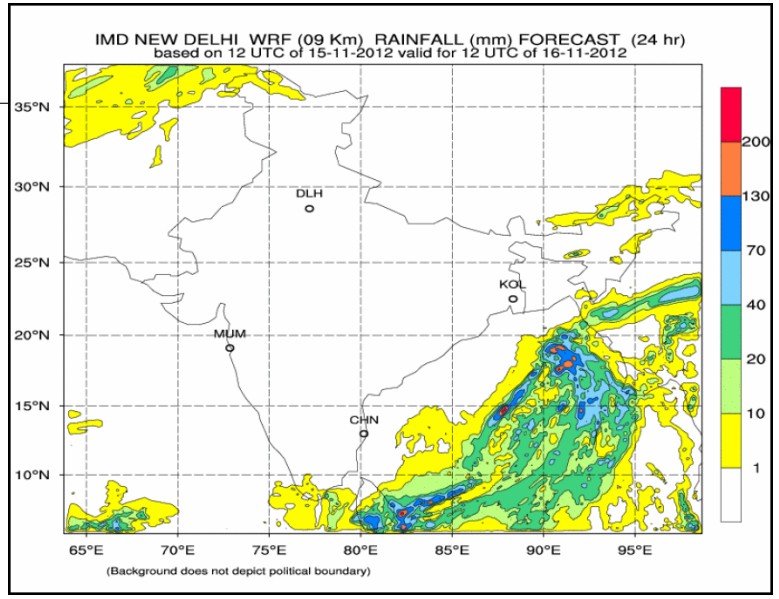

10/09/12 0600Z 93S INVEST
10/09/12 0801Z aqua VIS qkm
Naval Research Laboratory http://www.nrlmry.navy.mil/sat_products.html
<-- Visible (Sun elevation at center is 50 degrees) -->
220
210
200
190
180
170
160
150

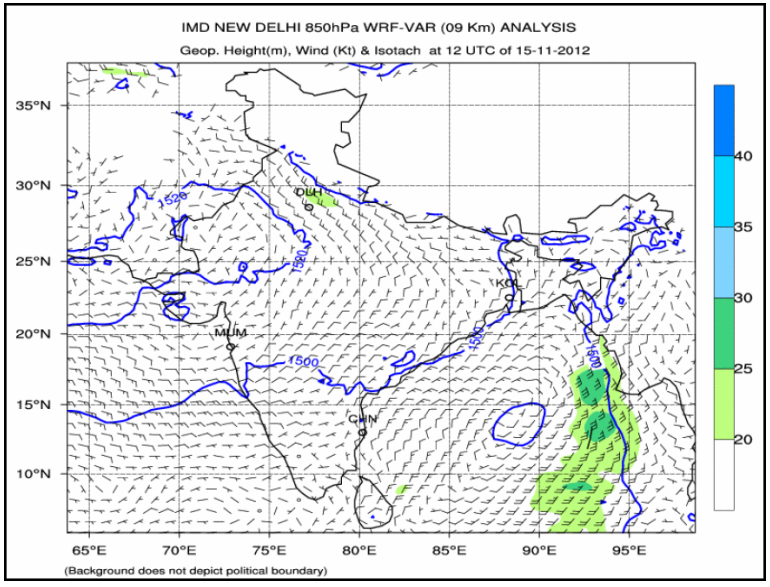
17NOV2012 1300UTC	Sensor : VHRR	SAT : KALPANA-1
BAY-CYCLONE	Proj : MERCATOR	Resolution : 2727 m

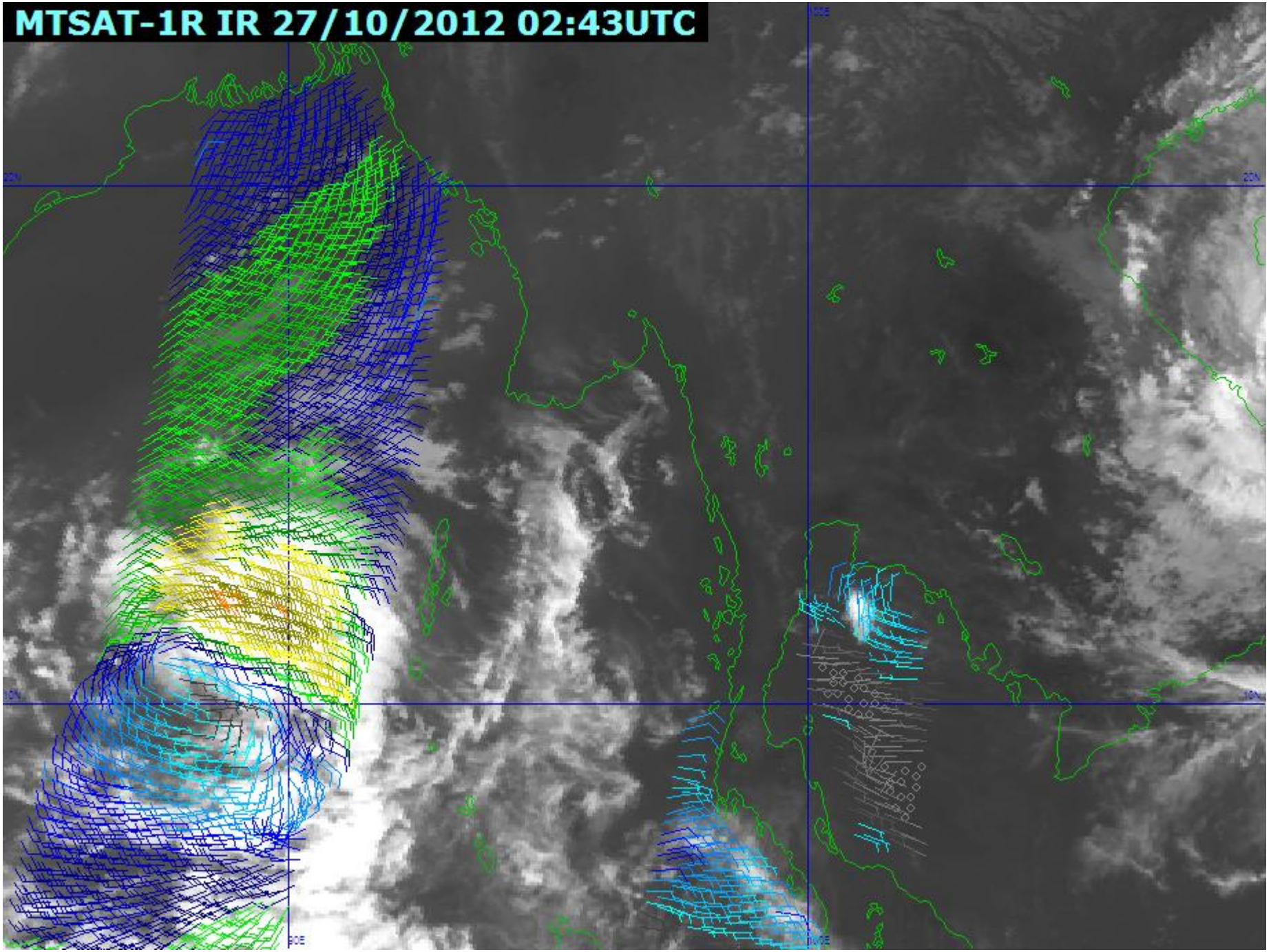
IR IR IR

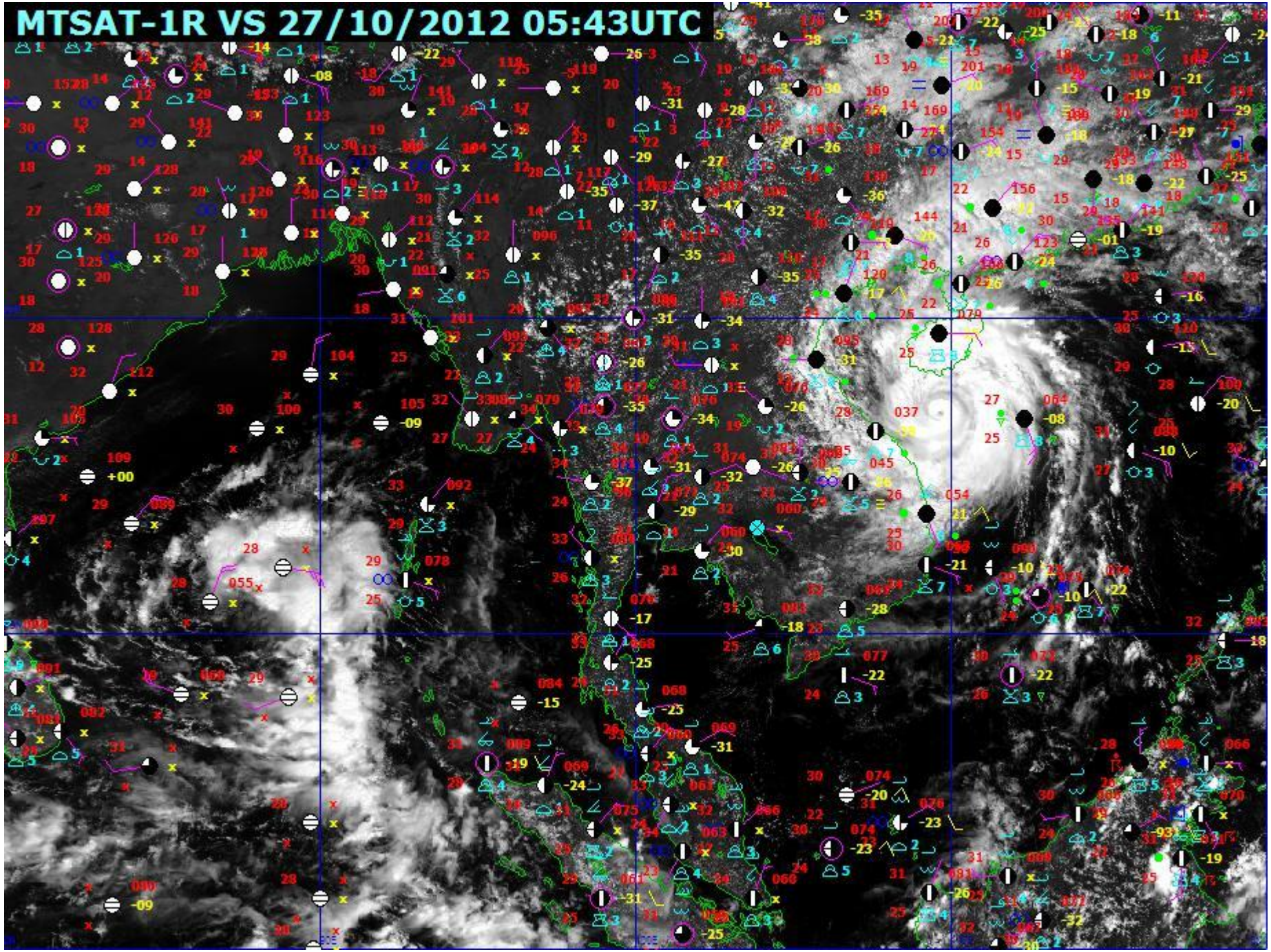
16.1N/89.2E T2.0

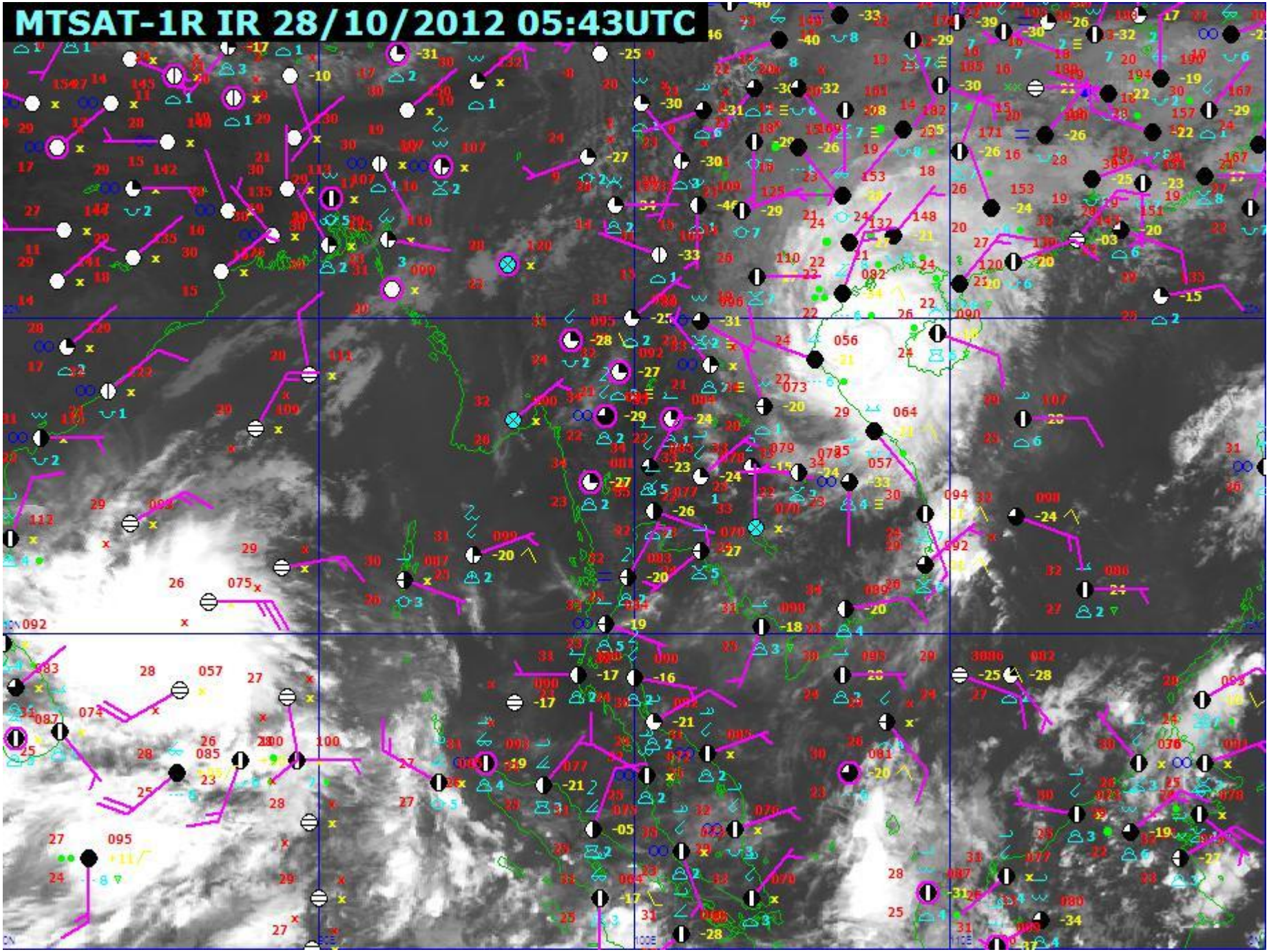




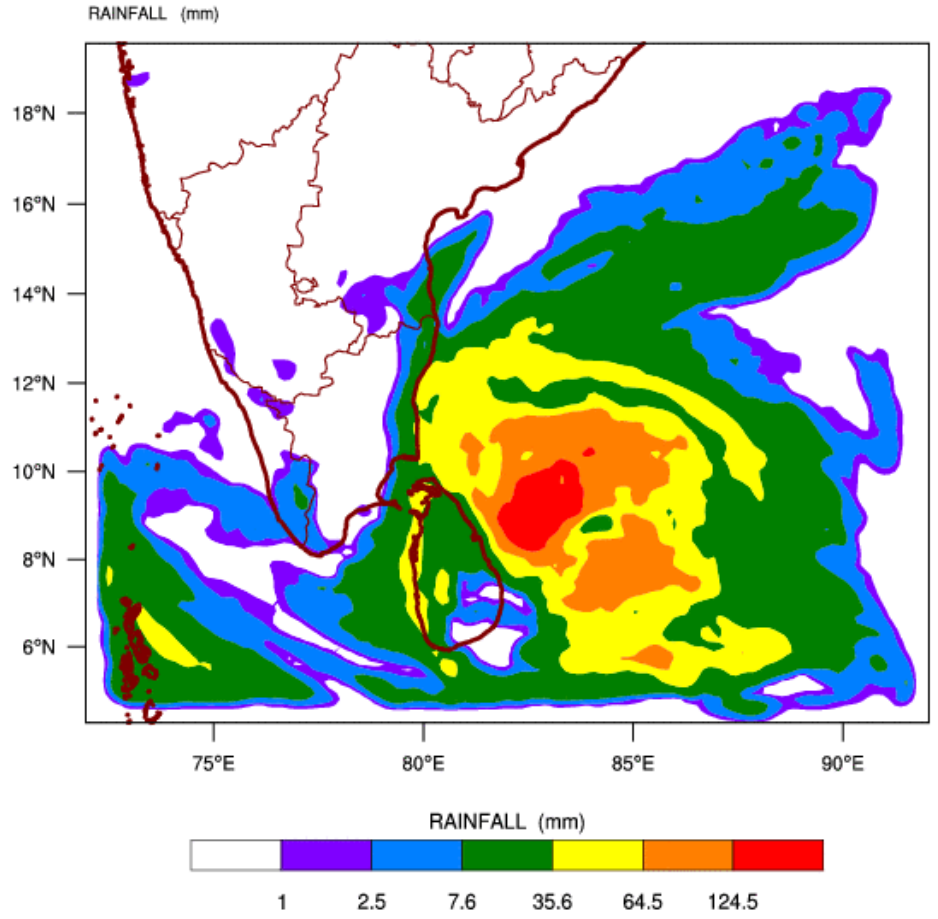


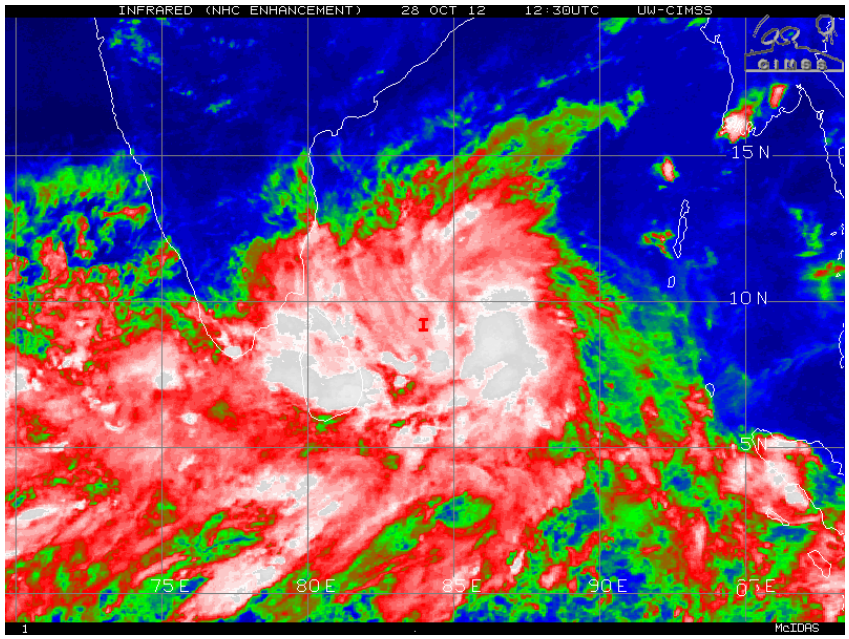

MTSAT-1R IR 27/10/2012 02:43UTC


MTSAT-1R VS 27/10/2012 05:43UTC


MTSAT-1R IR 28/10/2012 05:43UTC

WRF MODEL FORECAST (24 HR.) RAINFALL(mm)\
based on 00 UTC of 29-10-2012 valid for 03 UTC of 30-10-2012

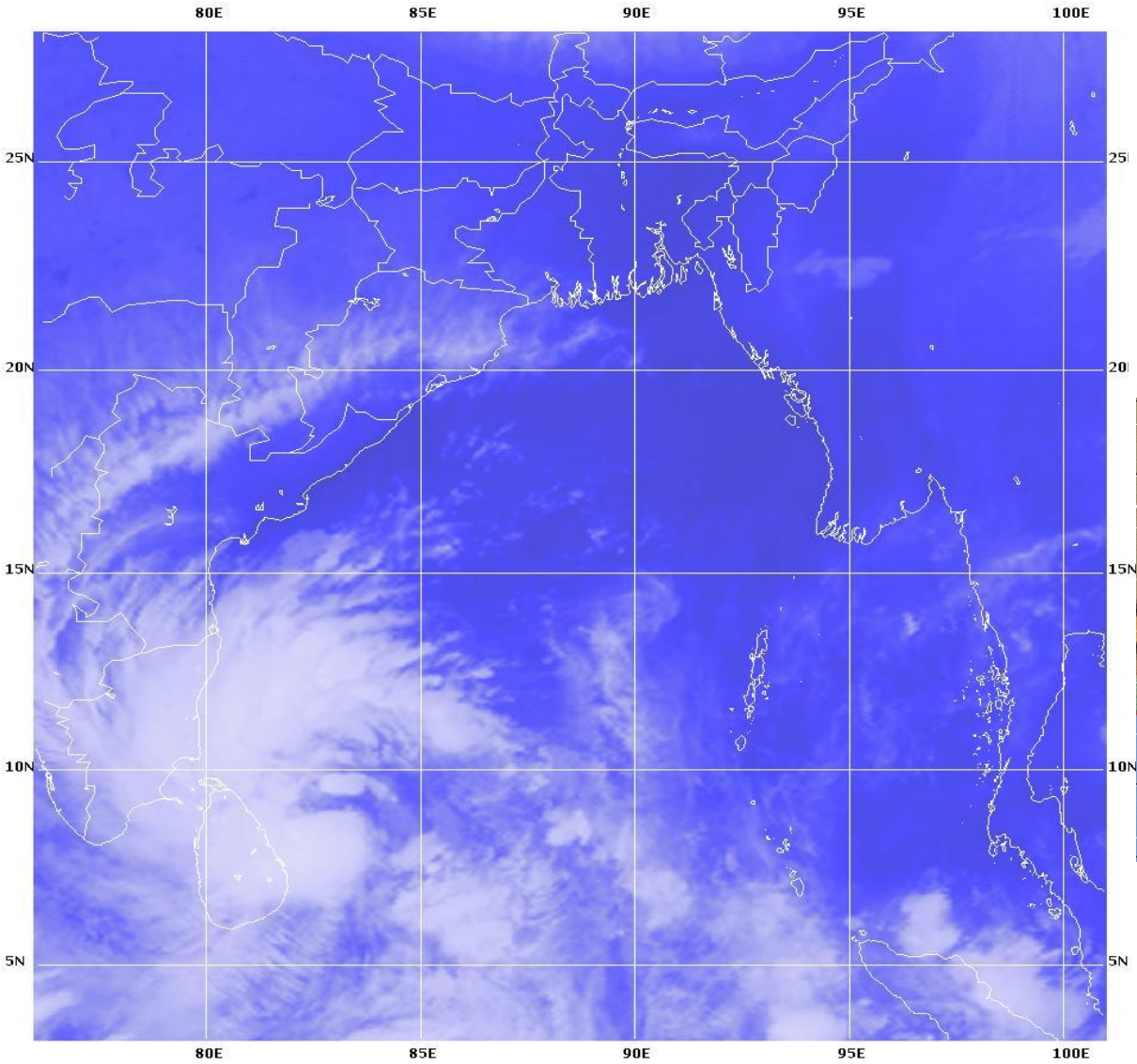




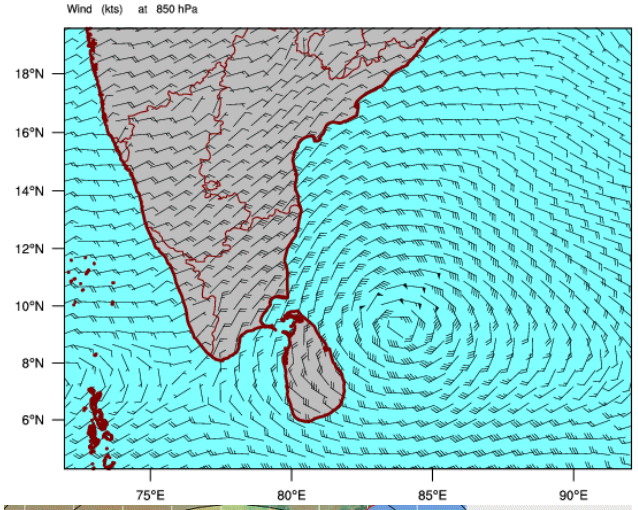
30OCT2012 0100UTC	Sensor : VHRR	SAT : KALPANA-1
BAY-CYCLONE	Proj : MERCATOR	Resolution : 2727 m

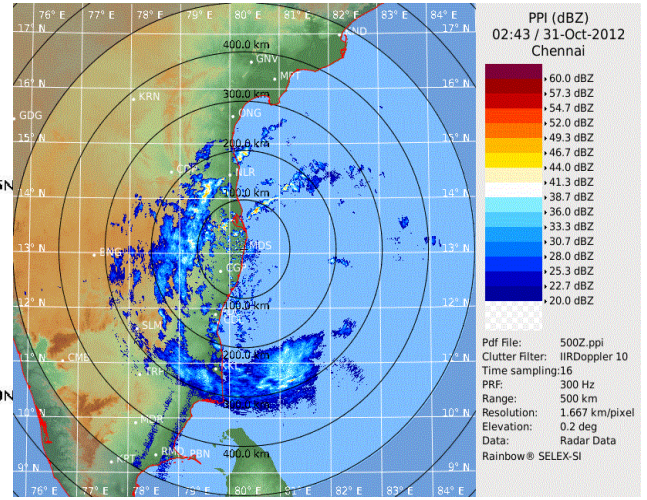
IR IR IR

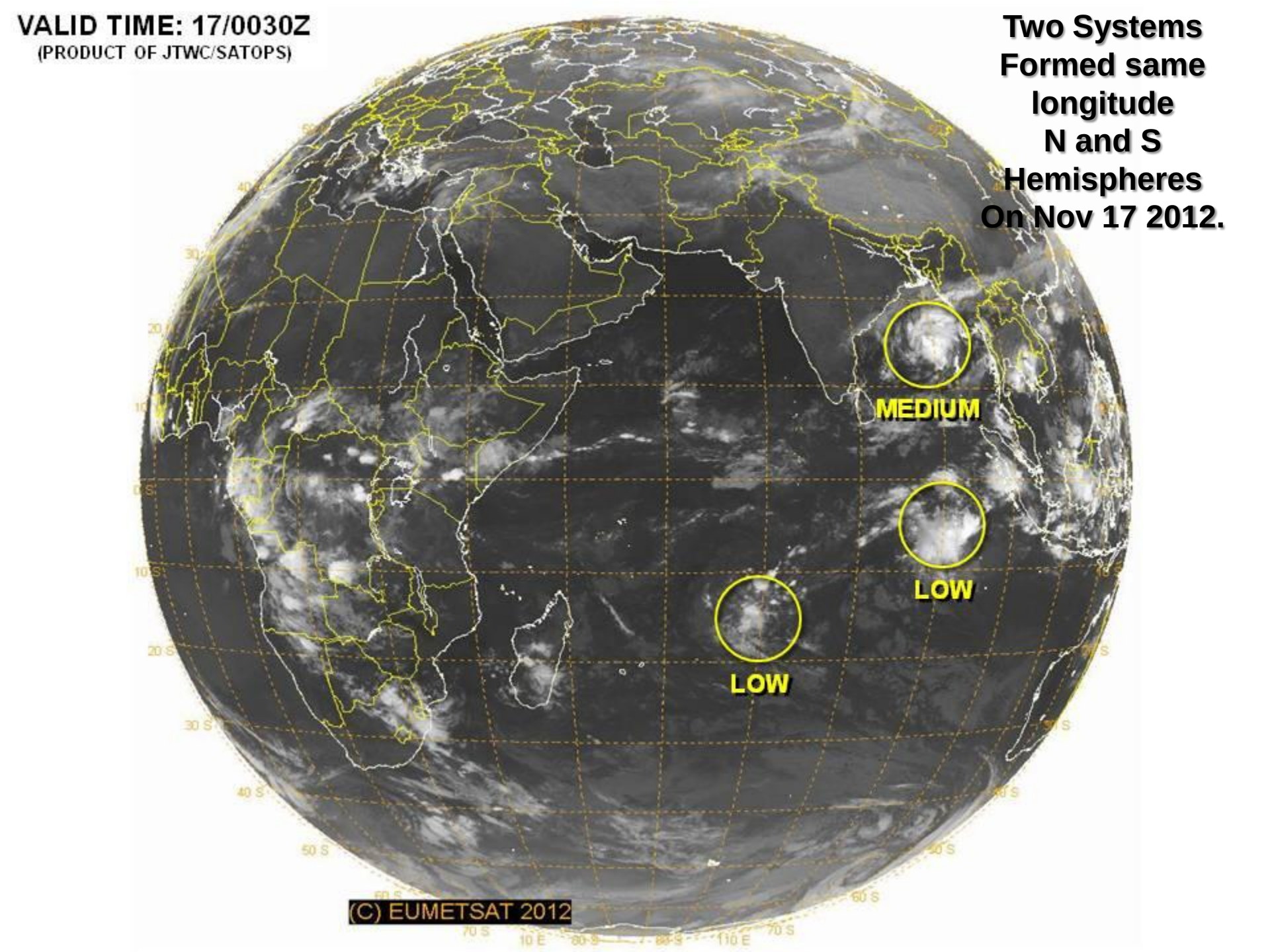
8.7N/82.0E T2.0

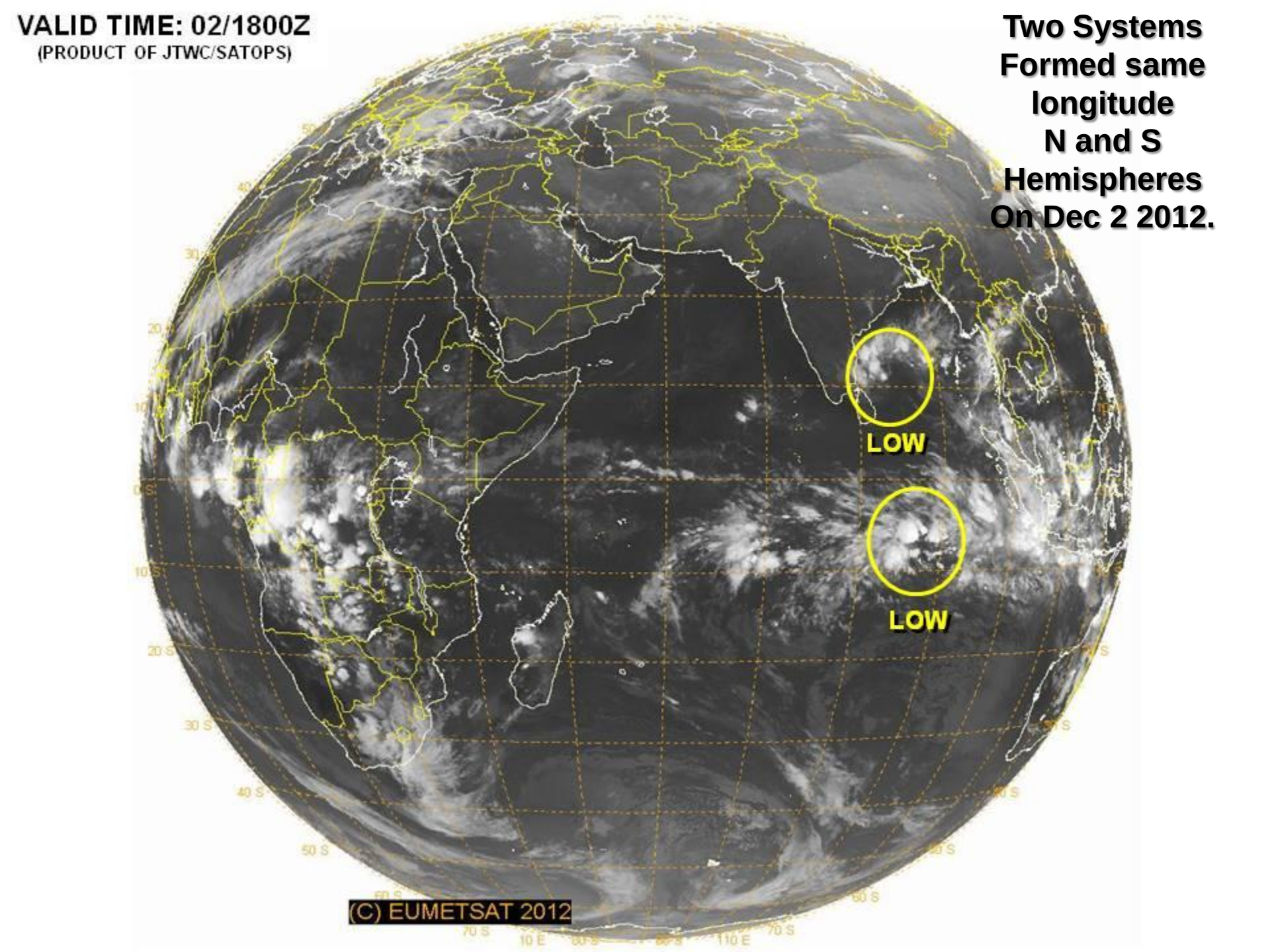


WRF MODEL FORECAST (24 HR.) 850hPa wind speed (kts)\
based on 00 UTC of 29-10-2012 valid for 00 UTC of 30-10-2012






VALID TIME: 17/0030Z
(PRODUCT OF JTWC/SATOPS)
Two Systems
Formed same
longitude
N and S
Hemispheres
On Nov 17 2012.
MEDIUM
LOW
LOW
(C) EUMETSAT 2012


VALID TIME: 02/1800Z
(PRODUCT OF JTWC/SATOPS)
Two Systems
Formed same
longitude
N and S
Hemispheres
On Dec 2 2012.
LOW
LOW
(C) EUMETSAT 2012

Types of Forecast/Warning	Responsible Section/Division	Time
Daily Weather	Forecast	7:00Am/12:00Am/2:00pm/ 4:00pm/7:00pm
10 day weather	LRF	Every month of 8/18/28
Monthly Weather	LRF	Every month of (28)
Seasonal Weather	LRF	April 28/June 28/August 28
Aviation Weather	Aviation Met	Every 6 Hourly
Special weather	Forecast	As per request and weather conditions
Coastal Weather	Forecast	10:30 Am/ 1:30pm
New Records	Forecast	If new record occur..
Agromet Bulletin	Agromet	Every 10 day
Cyclone/surge	Forecast	24-36 Hr before
Heavy rainfall	Forecast	Vigorous monsoon/cyclone/....
Untimely Rainfall	Forecast	Weather disturbance....
Fog Warning	Aviation Met	If necessary
Port Warning	Forecast	Squally wx is expected

DMH's Warning, Forecast, Bulletin 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
- Port Warning

- Daily Weather/water level
- Monthly Weather/Flood
- Seasonal Weather/River Flood Forecast
- Aviation Weather Forecast
- Marine Weather Forecast
- Special Forecast

- Agro-meteorological Bulletin
- Bay Bulletin
- Flood Bulletin
- Special Weather Bulletin

- Earthquake News
- Rainfall/Temperature Records
- Cyclone News

We're trying quality products !

We received IMD/RSMC Outlook/Special Outlook

भारत मौसम विज्ञान विभाग
पृथ्वी विज्ञान मंत्रालय

INDIA METEOROLOGICAL DEPARTMENT
MINISTRY OF EARTH SCIENCES

Saturday 17 November 2012

ALL INDIA WEATHER BULLETIN (Evening)

Main Weather Observations

TEMPERATURES: Minimum temperatures are markedly below normal over parts of Karnataka, Maharashtra and Chhattisgarh. They are below normal by 2-4°C over many parts of Tamilnadu, Andhra Pradesh, Madhya Pradesh, Bihar, Jharkhand and Arunachal Pradesh. They were near normal over rest parts of the country. The lowest minimum temperature of 7.3°C was recorded at Adampur **(Punjab)** in the country.

RAINFALL (From 0830 hours IST of yesterday to 0830 hours IST of today): Rainfall occurred at most places over Andaman & Nicobar Islands. Weather remained mainly dry over rest parts of the country. The chief amounts of rainfall (**1 cm and above**) recorded at 0830 hours IST of today are: Carnicobar-6, Hut Bay-3, and Long Islands, Port Blair, Nancowry and Mayabander-1 each.

CLOUDS: Kalpana-1: Cloud imagery at 1430 hours IST shows convective clouds over some parts of Jammu & Kashmir, over most parts of north & central Bay of Bengal. Low/medium clouds are seen over remaining parts of western Himalayan region, eastern and northeastern states, coastal Andhra Pradesh and some parts of coastal Tamilnadu.

Meteorological Analysis based on 1430 hours IST

- The depression over eastcentral Bay of Bengal moved slightly westwards and concentrated into a deep depression (T 2.0). It lay centred at 1430 hrs. IST of today, 17th November 2012 near lat. 15.5°N/ long. 89.5°E over eastcentral Bay of Bengal, about 1000 km east-northeast of Chennai, 700 km east-southeast of Visakhapatnam and 600 km southeast of Paradip. The system would intensify further into a cyclonic storm and move west-northwestwards during next 24 hours, then move west-southwestwards towards south Andhra Pradesh and north Tamilnadu coasts during 48 hours.
- The western disturbance as an upper air system over north Pakistan and adjoining Jammu & Kashmir persists.

For more details kindly visit www.imd.gov.in or contact : +91 11 24631913, +91 11 24629798
Service to the Nation since 1875

SPECIAL TROPICAL WEATHER OUTLOOK

DEMS–RSMC TROPICAL CYCLONES NEW DELHI 17-11-2012

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 24 HOURS ISSUED AT 0900 UTC OF 17 NOVEMBER, 2012 BASED ON 0600 UTC OF 17 NOVEMBER, 2012 (.)

LATEST SATELLITE IMAGERY AND CURRENT BUOY OBSERVATIONS INDICATE THAT THE WELL MARKED LOW PRESSURE AREA OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL CONCENTRATED INTO A DEPRESSION AND LAY CENTRED AT 0600 UTC OF TODAY, THE 17TH NOVEMBER 2012 OVER EASTCENTRAL BAY OF BENGAL NEAR LATITUDE 15.5°N AND LONGITUDE 90.0°E, ABOUT 1050 KM EAST-NORTHEAST OF CHENNAI (43279), 750 KM EAST-SOUTHEAST OF VISAKHAPATNAM (43149), 650 KM SOUTHEAST OF PARADIP (42976) AND 700 KM SOUTH-SOUTHWEST OF COX'S BAZAR (42992). THE SYSTEM WOULD INTENSIFY INTO A DEEP DEPRESSION AND MOVE SLOWLY NORTHWESTWARDS DURING NEXT 24 HRS. IT WOULD MOVE WEST/WEST-SOUTHWESTWARDS TOWARDS SOUTH ANDHRA PRADESH AND NORTH TAMIL NADU COASTS DURING SUBSEQUENT 48 HRS.

ACCORDING TO SATELLITE IMAGERIES, THE INTENSITY OF THE SYSTEM IS T 1.5 ASSOCIATED BROKEN TO SOLID LOW/MEDIUM CLOUDS WITH EMBEDED INTENSE TO VERY INTENSE CONVECTION LIES OVER BAY BET LAT 13.5°N TO 20.5°N EAST OF LONG 88.0°E AND ADJOINING ARAKAN COAST. ASSOCIATED CONVECTION HAS INCREASED GRADUALLY WITH RESPECT TO HEIGHT AND ORGANISATION DURING PAST 12 HRS. THE LOWEST CLOUD TOP TEMPERATURE (CTT) IS ABOUT -75°C.

SUSTAINED MAXIMUM SURFACE WIND SPEED IS ESTIMATED TO BE ABOUT 25 KNOTS GUSTING TO 35 KNOTS AROUND SYSTEM CENTRE. THE STATE OF THE SEA IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE. THE ESTIMATED CENTRAL PRESSURE IS ABOUT 1004 HPA.

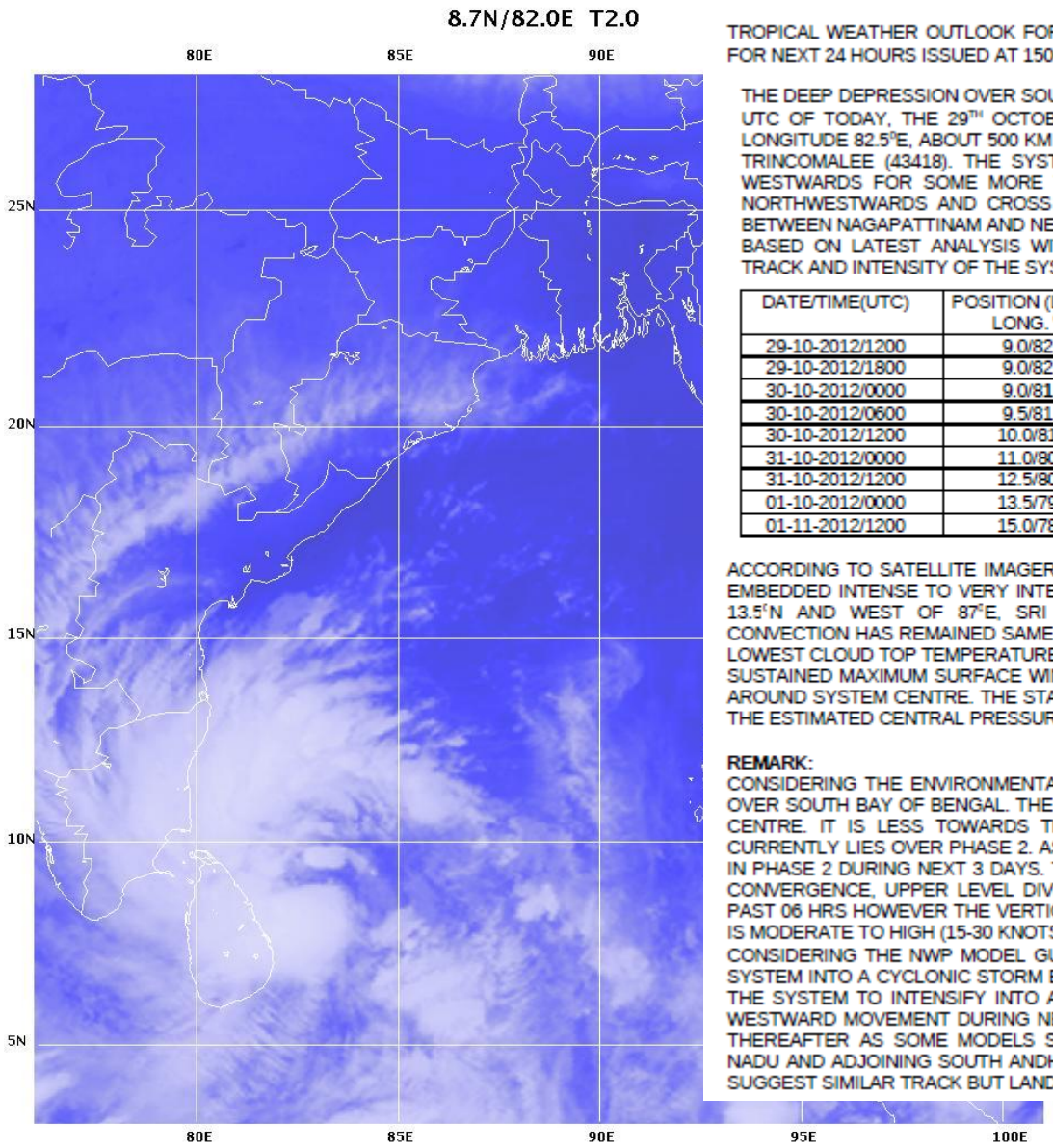
THE BUOY OBSERVATIONS AROUND SYSTEM CENTRE SHOWS 20 KNOTS WIND IN THE NORTHERN SECTOR AND ABOUT 15 KNOTS IN THE SOUTHERN SECTOR AT 0600 UTC OF 17TH NOVEMBER 2012.

REMARK:
CONSIDERING THE ENVIRONMENTAL FEATURES, THE SEA SURFACE TEMPERATURE IS ABOUT 28-30 DEG. C. OVER SOUTH BAY OF BENGAL. THE OCEAN THERMAL ENERGY IS 50 - 80 KJ/CM SQUARE AROUND THE SYSTEM CENTRE. IT IS LESS (< 50 KJ/CM SQUARE) OVER SOUTHWEST BAY OF BENGAL OFF NORTH TAMIL NADU COAST AND NORTH BAY OF BENGAL. THE MADDEN JULIAN OSCILLATION INDEX CURRENTLY LIES OVER PHASE 5. AS PER STATISTICAL AND NWP MODEL PREDICTIONS, IT IS EXPECTED TO LIE IN PHASE 5 DURING NEXT 3 DAYS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 16 DEG.N AND HENCE PROVIDES REQUIRED POLEWARD OUTFLOW FOR INTENSIFICATION OF THE SYSTEM. THE LOW LEVEL CONVERGENCE AND RELATIVE VORTICITY HAVE INCREASED DURING PAST 24 HRS AS WELL AS UPPER LEVEL DIVERGENCE. THE MAXIMUM VORTICITY LIES OVER SOUTHWEST SECTOR OF THE SYSTEM. THE VERTICAL WIND SHEAR BETWEEN 200 AND 850 HPA LEVELS IS MODERATE (10-20 KNOTS) AROUND SYSTEM CENTRE.

CONSIDERING THE NWP MODEL GUIDANCE, MOST OF THE MODELS SUGGEST THE INTENSIFICATION OF THE SYSTEM INTO A DEEP DEPRESSION DURING NEXT 24 HRS AND SUBSEQUENTLY, IT MAY WEAKEN GRADUALLY AS IT MOVES CLOSER TO COAST. DYNAMICAL- STATISTICAL MODEL OF IMD ALSO SUGGESTS THE SYSTEM TO INTENSIFY. WITH RESPECT TO TRACK, MOST MODELS SUGGEST NORTHWESTWARD/ WEST-NORTHWESTWARD MOVEMENT DURING NEXT 24 HRS AND WESTWARD/WEST-SOUTHWESTWARD MOVEMENT DURING SUBSEQUENT 72 HRS TOWARDS NORTH TAMIL NADU AND SOUTH ANDHRA PRADESH COASTS.

30OCT2012 0100UTC	Sensor : VHRR	SAT : KALPANA-1
BAY-CYCLONE	Proj : MERCATOR	Resolution : 2727 m

IR IR



DEMS–RSMC TROPICAL CYCLONES NEW DELHI 29-10-2012_

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 24 HOURS ISSUED AT 1500 UTC OF 29 OCTOBER, 2012 BASED ON 1200 UTC OF 29 OCTOBER, 2012.

THE DEEP DEPRESSION OVER SOUTHWEST BAY OF BENGAL MOVED WESTWARDS, AND LAY CENTRED AT 1200 UTC OF TODAY, THE 29TH OCTOBER 2012 OVER SOUTHWEST BAY OF BENGAL NEAR LATITUDE 9.0°N AND LONGITUDE 82.5°E, ABOUT 500 KM SOUTH-SOUTHEAST OF CHENNAI (43279) AND 130 KM EAST-NORTHEAST OF TRINCOMALEE (43418). THE SYSTEM WOULD INTENSIFY FURTHER INTO A CYCLONIC STORM AND MOVE WESTWARDS FOR SOME MORE TIME AND COME VERY CLOSE TO SRI LANKA COAST AND THEN MOVE NORTHWESTWARDS AND CROSS NORTH TAMIL NADU AND ADJOINING SOUTH ANDHRA PRADESH COAST BETWEEN NAGAPATTINAM AND NELLORE AROUND 1200 UTC OF 31ST OCTOBER, 2012.
BASED ON LATEST ANALYSIS WITH NWP MODELS AND OTHER CONVENTIONAL TECHNIQUES, ESTIMATED TRACK AND INTENSITY OF THE SYSTEM ARE GIVEN IN THE TABLE BELOW:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	SUSTAINED MAXIMUM SURFACE WIND SPEED (KMPH)	CATEGORY
29-10-2012/1200	9.0/82.5	55-65 GUSTING TO 75	DEEP DEPRESSION
29-10-2012/1800	9.0/82.0	65-75 GUSTING TO 85	CYCLONIC STORM
30-10-2012/0000	9.0/81.5	70-80 GUSTING TO 90	CYCLONIC STORM
30-10-2012/0600	9.5/81.3	75-85 GUSTING TO 95	CYCLONIC STORM
30-10-2012/1200	10.0/81.0	80-90 GUSTING TO 100	CYCLONIC STORM
31-10-2012/0000	11.0/80.5	80-90 GUSTING TO 100	CYCLONIC STORM
31-10-2012/1200	12.5/80.0	80-90 GUSTING TO 100	CYCLONIC STORM
01-10-2012/0000	13.5/79.0	50-60 GUSTING TO 70	DEEP[DEPRESSION
01-11-2012/1200	15.0/78.0	25-35 GUSTING TO 45	LOW

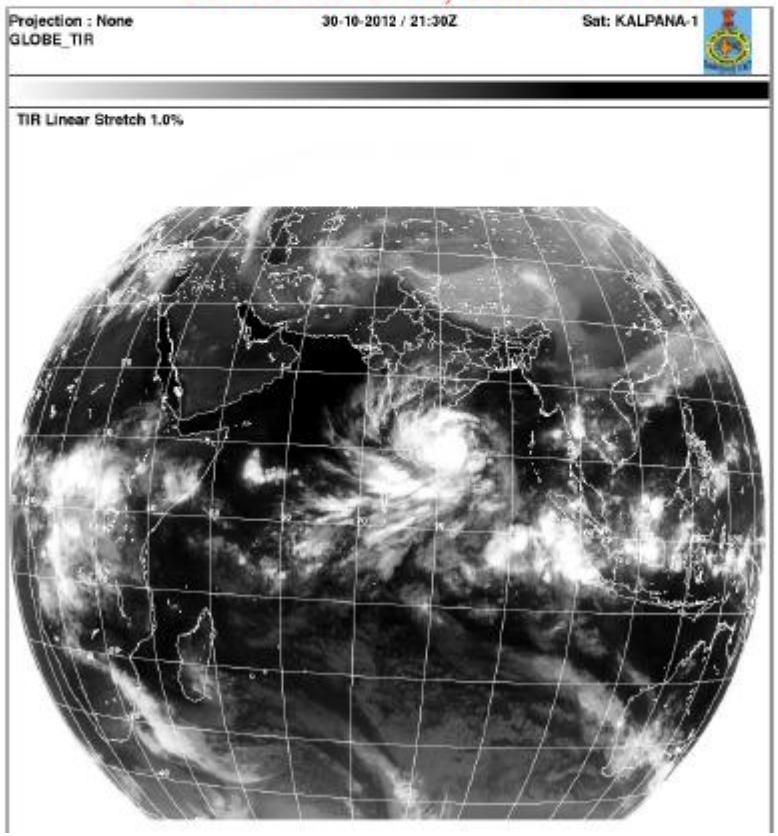
ACCORDING TO SATELLITE IMAGERIES, THE INTENSITY OF THE SYSTEM IS T 2.0. LOW/MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION SEEN OVER BAY OF BENGAL BETWEEN LAT 05.0°N AND 13.5°N AND WEST OF 87°E, SRI LANKA, COASTAL TAMIL NADU AND PUDUCHERRY. THE ASSOCIATED CONVECTION HAS REMAINED SAME WITH RESPECT TO HEIGHT AND ORGANISATION DURING PAST 06 HRS. THE LOWEST CLOUD TOP TEMPERATURE (CTT) IS ABOUT -85°C.
SUSTAINED MAXIMUM SURFACE WIND SPEED IS ESTIMATED TO BE ABOUT 30 KNOTS GUSTING TO 40 KNOTS AROUND SYSTEM CENTRE. THE STATE OF THE SEA IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE. THE ESTIMATED CENTRAL PRESSURE IS ABOUT 1000 HPA.

REMARK:
CONSIDERING THE ENVIRONMENTAL FEATURES, THE SEA SURFACE TEMPERATURE IS ABOUT 29-30 DEG. C. OVER SOUTH BAY OF BENGAL. THE OCEAN THERMAL ENERGY IS 50 - 80 KJ/CM SQUARE AROUND THE SYSTEM CENTRE. IT IS LESS TOWARDS THE NORTH OF THE SYSTEM. THE MADDEN JULIAN OSCILLATION INDEX CURRENTLY LIES OVER PHASE 2. AS PER STATISTICAL AND NWP MODEL PREDICTIONS, IT IS EXPECTED TO LIE IN PHASE 2 DURING NEXT 3 DAYS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 13 DEG.N. THE LOW LEVEL CONVERGENCE, UPPER LEVEL DIVERGENCE AND RELATIVE VORTICITY HAS SLIGHTLY INCREASED DURING PAST 06 HRS HOWEVER THE VERTICAL WIND SHEAR BETWEEN 200 AND 850 HPA LEVELS HAS INCREASED AND IS MODERATE TO HIGH (15-30 KNOTS) AROUND SYSTEM CENTRE.
CONSIDERING THE NWP MODEL GUIDANCE, MOST OF THE MODELS SUGGEST THE INTENSIFICATION OF THE SYSTEM INTO A CYCLONIC STORM BY NEXT 12 HRS. DYNAMICAL- STATISTICAL MODEL OF IMD ALSO SUGGESTS THE SYSTEM TO INTENSIFY INTO A CYCLONIC STORM. WITH RESPECT TO TRACK, MOST MODELS SUGGEST WESTWARD MOVEMENT DURING NEXT 12 HRS. HOWEVER, THERE IS DIFFERENCE IN NWP MODEL GUIDANCE THEREAFTER AS SOME MODELS SUGGEST NORTH-NORTHWESTWARD MOVEMENT TOWARDS NORTH TAMIL NADU AND ADJOINING SOUTH ANDHRA PRADESH COAST AND LANDFALL NEAR CHENNAI.A FEW MODELS ALSO SUGGEST SIMILAR TRACK BUT LANDFALL NEAR TO NORTH OF NAGAPATTINAM.

भारत मौसम विज्ञान विभाग
पृथ्वी विज्ञान मंत्रालय
India Meteorological Department
Ministry of Earth Sciences

SATELLITE BULLETIN BASED ON SATELLITE IMAGERIES AND PRODUCTS

Date: 30.10.2012; Time: 2100 UTC

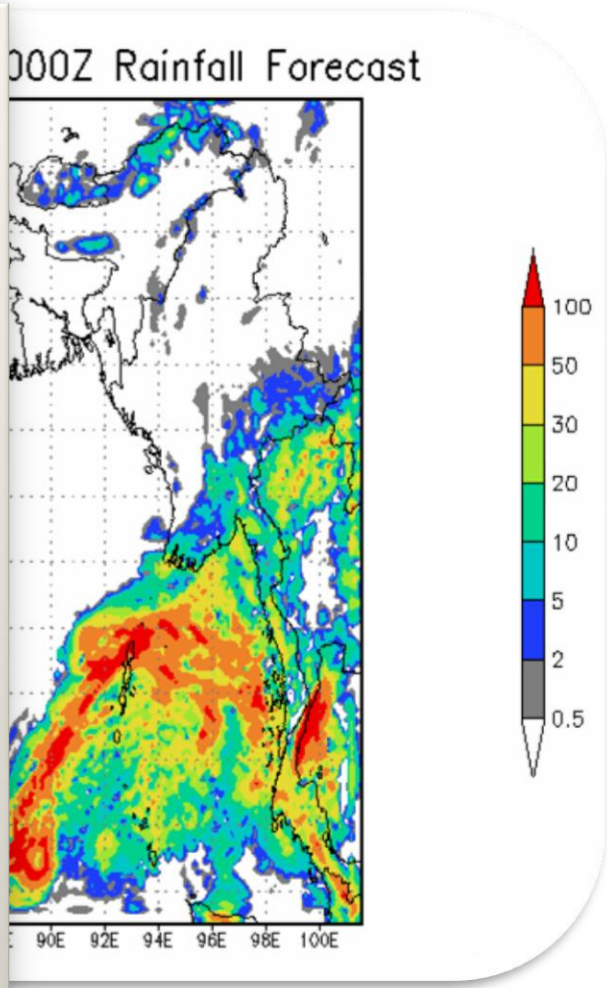


(3) Hourly SATELLITE BULLETIN

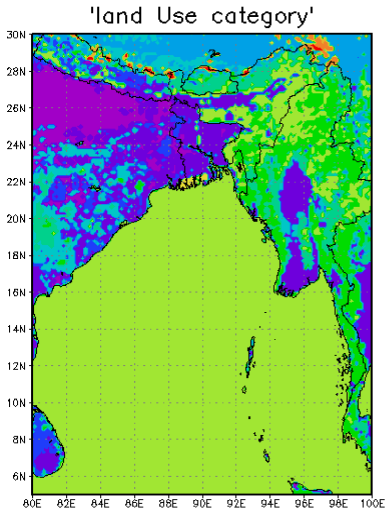
BASED ON INSAT PICTURE OF 302100 UTC (.) REGION COVERED BETWEEN LAT 50.0N TO 30.0S AND LONG 40.0E TO 125.0E (.)

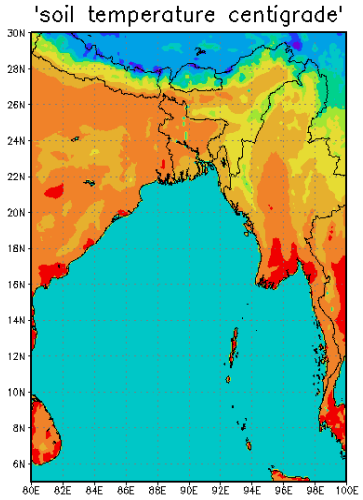
SAILENT FEATURES:-

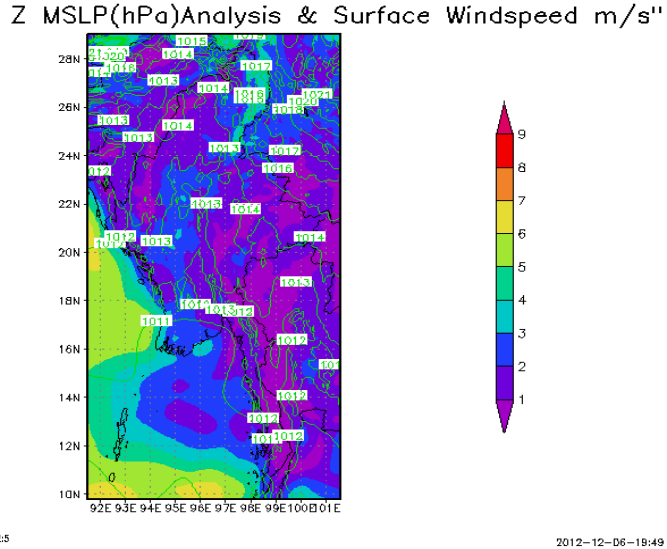
VORTEX(02B) OVER SW BAY ADJ SRILANKA CENTERED NEAR 10.2N/ 81.8E (.) INTENSITY T2.5 RPT T2.5 (.) ASSTD BKN INT TO V INT CONVTN OVER SRILANKA GULF OF MANNAR PALK STR TN ADJ RYLSM SW ADJ WC BAY BET LAT 7.5N TO 13.5N WEST OF LONG 84.0E (.) BKN M/LAYERED CLOUDS OVER E IRAN ADJ PAK N AFGN AND N/HOOD IN ASSW WD OVER THE AREA (.)



Weather Research and Forecast (3) Day Training was conducted by (3) Experts from ADPC at DMH NPT to (7) officials on 16-18 Nov 2012 for GFS and other global and regional Weather forecast products.







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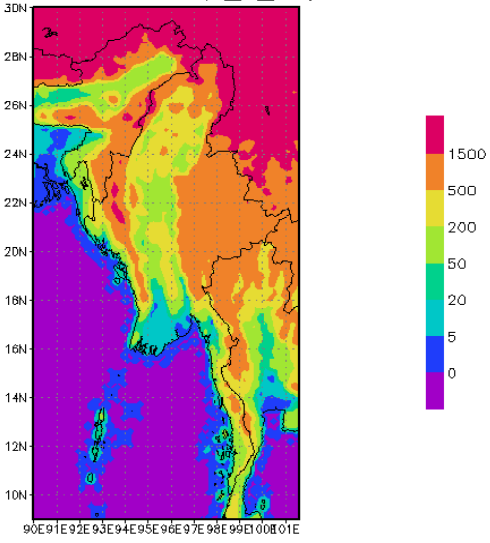

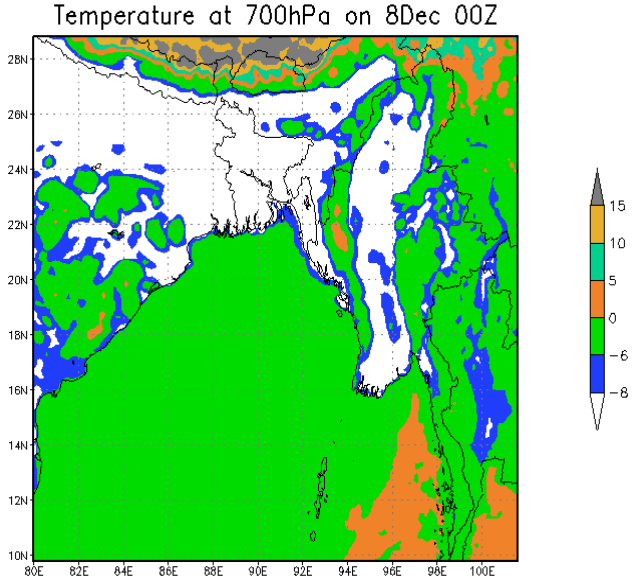

Salient Points

- No significant cyclonic storm formed in April and/or May.
- Most of the system developed over NW Bay.
- Only 1 Cyclonic storm formed.
- (1) TD and (1) LPA weakened over water. Possibility in association with same system, same longitude in Southern Hemisphere.
- Some system associated with Arabian Sea, Bay of Bengal and China Sea and Pacific in same time.

Thank You