



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI SPECIAL TROPICAL WEATHER OUTLOOK**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 16.11.2023**

**TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND THE ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 16.11.2023 BASED ON 1200 UTC OF 16.11.2023.**

**BAY OF BENGAL:**

**SUB: DEEP DEPRESSION OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL**

THE DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL MOVED NORTH-NORTHEASTWARDS WITH A SPEED OF 15 KMPH DURING PAST 6 HOURS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 16<sup>TH</sup> NOVEMBER OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL NEAR LATITUDE 18.6°N AND LONGITUDE 87.7°E, ABOUT 210 KM SOUTH-SOUTHEAST OF PARADIP (42976), 330 KM SOUTH OF DIGHA (42901) AND 450 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984).

IT IS LIKELY TO CONTINUE TO MOVE NORTH-NORTHEASTWARDS, INTENSIFY FURTHER INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND CROSS BANGLADESH COAST BETWEEN MONGLA AND KHEPUPARA WITH WIND SPEED OF 60-70 KMPH GUSTING TO 80 KMPH AROUND 2100 UTC OF 17<sup>TH</sup> NOVEMBER, 2023.

FORECAST TRACK & INTENSITY IS GIVEN BELOW:

DATE/TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
16.11.23/1200	18.6/87.7	50-60 KMPH GUSTING TO 70 KMPH	DEEP DEPRESSION
16.11.23/1800	19.2/88.0	55-65 KMPH GUSTING TO 75 KMPH	DEEP DEPRESSION
17.11.23/0000	19.8/88.3	60-70 KMPH GUSTING TO 80 KMPH	CYCLONIC STORM
17.11.23/0600	20.4/88.6	65-75 KMPH GUSTING TO 85 KMPH	CYCLONIC STORM
17.11.23/1200	21.0/89.0	65-75 KMPH GUSTING TO 85 KMPH	CYCLONIC STORM
18.11.23/0000	22.1/89.9	60-70 KMPH GUSTING TO 80 KMPH	CYCLONIC STORM
18.11.23/1200	23.2/90.5	50-60 KMPH GUSTING TO 70 KMPH	DEEP DEPRESSION
19.11.23/0000	24.3/91.0	40-50 KMPH GUSTING TO 60 KMPH	DEPRESSION

THE ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE WINDS ARE RELATIVELY STRONGER IN NORTHEAST SECTOR DUE TO NORTHEAST MONSOON CONDITIONS. THE ESTIMATED CENTRAL PRESSURE IS 1004 HPA. SEA CONDITIONS ARE LIKELY TO BE ROUGH TO VERY ROUGH OVER WESTCENTRAL BAY OF BENGAL DURING 16<sup>TH</sup> -17<sup>TH</sup>, OVER NORTH BAY OF BENGAL TILL 16<sup>TH</sup> MID NIGHT BECOMING VERY ROUGH TO HIGH THEREAFTER TILL 18<sup>TH</sup> MORNING. SEA CONDITION WOULD BE ROUGH TO VERY ROUGH ALONG AND OFF ODISHA COAST DURING 16<sup>TH</sup> -17<sup>TH</sup>, WEST BENGAL AND BANGLADESH COASTS DURING 16<sup>TH</sup> - 18<sup>TH</sup> NOVEMBER 2023.

INTENSITY OF THE SYSTEM IS CHARACTERISED AS T2.0. CLOUDS ASSOCIATED WITH THE DEEP DEPRESSION ARE ORGANISED IN SHEAR PATTERN. BROKEN LOW & MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER CENTRAL & ADJOINING NORTH BAY OF BENGAL BETWEEN 16.0N & 22.0N AND LONGITUDE 87.0E & 92.5E, AND MODERATE TO INTENSE CONVECTION OVER GANGETIC WEST BENGAL, NORTHEAST STATES AND SOUTH BANGLADESH. MINIMUM CLOUD TOP TEMPERATURE IS -93<sup>0</sup>C.

**STORM SURGE GUIDANCE:**

STORM SURGE OF ABOUT 1-2 METER HEIGHT ABOVE THE ASTRONOMICAL TIDE IS LIKE TO INUNDATE OVER LOW LYING AREAS OF BANGLADESH NEAR THE LANDFALL POINT AT THE TIME OF LANDFALL.

**Remarks:**

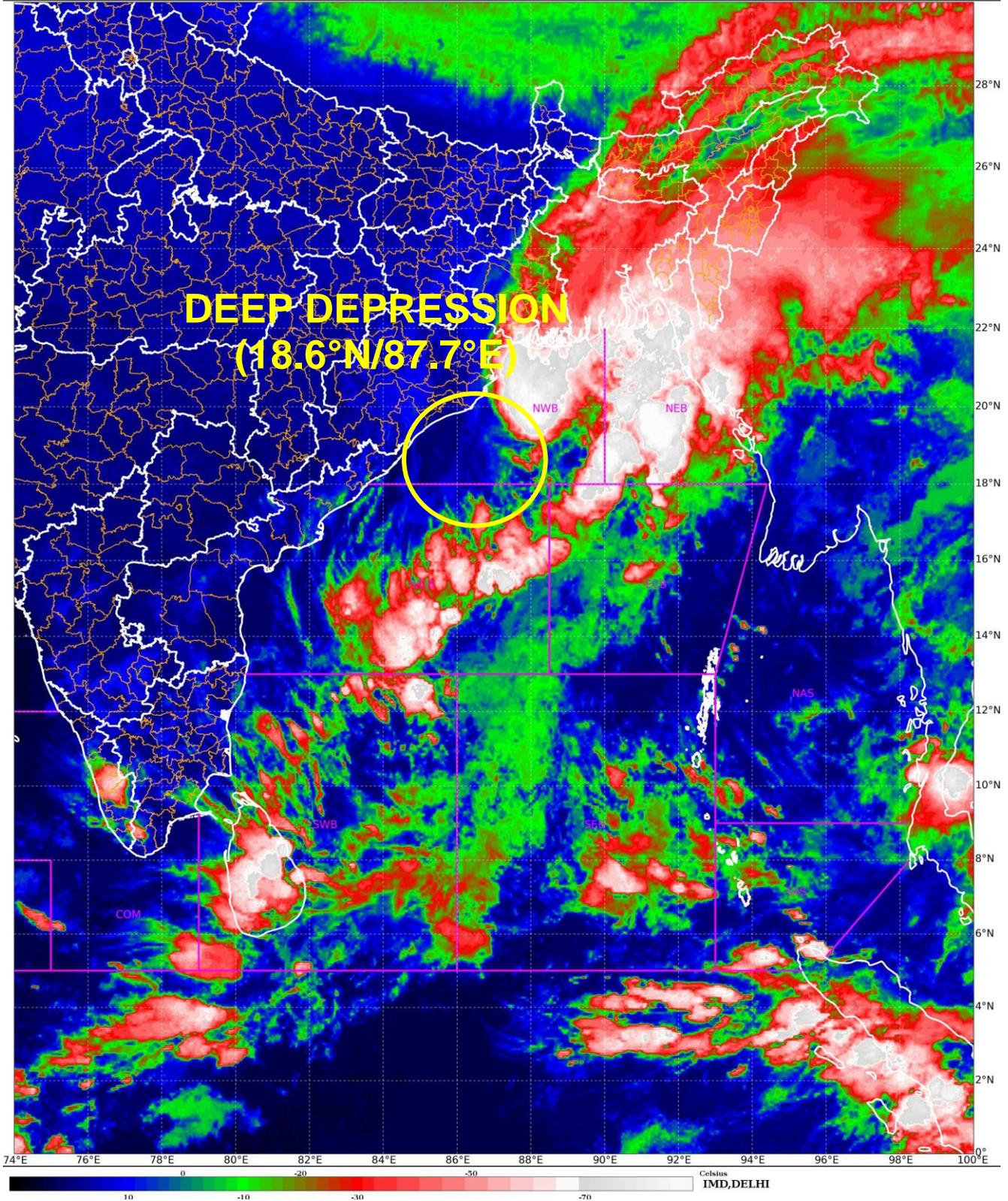
MADDEN JULIAN OSCILLATION INDEX IS IN PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WOULD MOVE TO PHASE 2 FROM 19<sup>TH</sup> NOVEMBER ONWARDS, WITH AMPLITUDE BECOMING MORE THAN 1. SEA SURFACE TEMPERATURE IS AROUND 30<sup>0</sup>C OVER THE SYSTEM AREA. THE TROPICAL CYCLONE HEAT POTENTIAL IS 70-80 KJ/CM<sup>2</sup> OVER SYSTEM AREAS AND TOWARDS THE TRACK OVER NORTH BAY OF BANGAL. THE LOW LEVEL RELATIVE POSITIVE VORTICITY IS SAME AND IS AROUND 150 X10<sup>-6</sup> S<sup>-1</sup> TO THE SOUTHEAST OF SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 500 HPA LEVEL. THE POSITIVE LOW LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT IS ABOUT 30X10<sup>-5</sup>S<sup>-1</sup> TO THE EAST OF SYSTEM AREA. POSITIVE UPPER LEVEL DIVERGENCE REMAINS SAME AND IS ABOUT 40 X10<sup>-5</sup> S<sup>-1</sup> TO THE NORTHEAST OF SYSTEM AREA. WIND SHEAR IS HIGH (AROUND 30 KNOTS) OVER SYSTEM AREA AND ALSO ALONG & OFF WEST BENGAL-BANGLADESH COASTS. UPPER TROPOSPHERIC RIDGE RUNS ALONG 15<sup>0</sup>N.

A TROUGH IN MIDDLE TROPOSPHERIC LEVELS RUN ALONG LONGITUDE 78<sup>0</sup>E TO THE NORTH OF LATITUDE 18<sup>0</sup>N LEADING TO COLD & DRY AIR INCURSION IN THE NORTH BAY OF BENGAL. AN ANTICYCLONIC CIRCULATION IN LOWER TO MIDDLE TROPOSPHERIC LEVELS LIES OVER SOUTH MYANMAR AND ADJOINING THAILAND COAST LEADING TO WARM MOIST AIR INCURSION IN NORTH BAY OF BENGAL. THUS, THERE IS CONFLUENCE OF COLD AND DRY AIR FROM THE WEST WITH WARM AND MOIST AIR FROM THE SOUTHEAST OVER NORTH BAY OF BENGAL. IT WOULD SUPPORT DEVELOPMENT OF DEEP CONVECTION OVER THE REGION AND HENCE INTENSIFICATION OF THE SYSTEM. THIS CONFLUENCE WOULD ALSO LEAD TO INCREASE IN WIND SHEAR OVER THE NORTH BAY OF BENGAL AND MAY LEAD TO WEAKENING OF THE SYSTEM. INTENSIFICATION/WEAKENING OF THE SYSTEM MAY DEPEND UPON WHICH FACTOR (WIND SHEAR OR UPPER LEVEL DIVERGENCE) IS PROMINENT.

THE GUIDANCE FROM VARIOUS NUMERICAL MODELS (IMD GFS, NCEP GFS, ECMWF AND IMD MME) IS INDICATING NORTH-NORTHEASTWARDS MOVEMENT TOWARDS BANGLADESH COASTS. GRADUAL INTENSIFICATION INTO A CYCLONIC STORM IS LIKELY DURING NEXT 12 HOURS.

IT IS LIKELY TO CONTINUE TO MOVE NORTH-NORTHEASTWARDS, INTENSIFY FURTHER INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND CROSS BANGLADESH COAST BETWEEN MONGLA AND KHEPUPARA WITH WIND SPEED OF 60-70 KMPH GUSTING TO 80 KMPH AROUND 2100 UTC OF 17TH NOVEMBER, 2023.

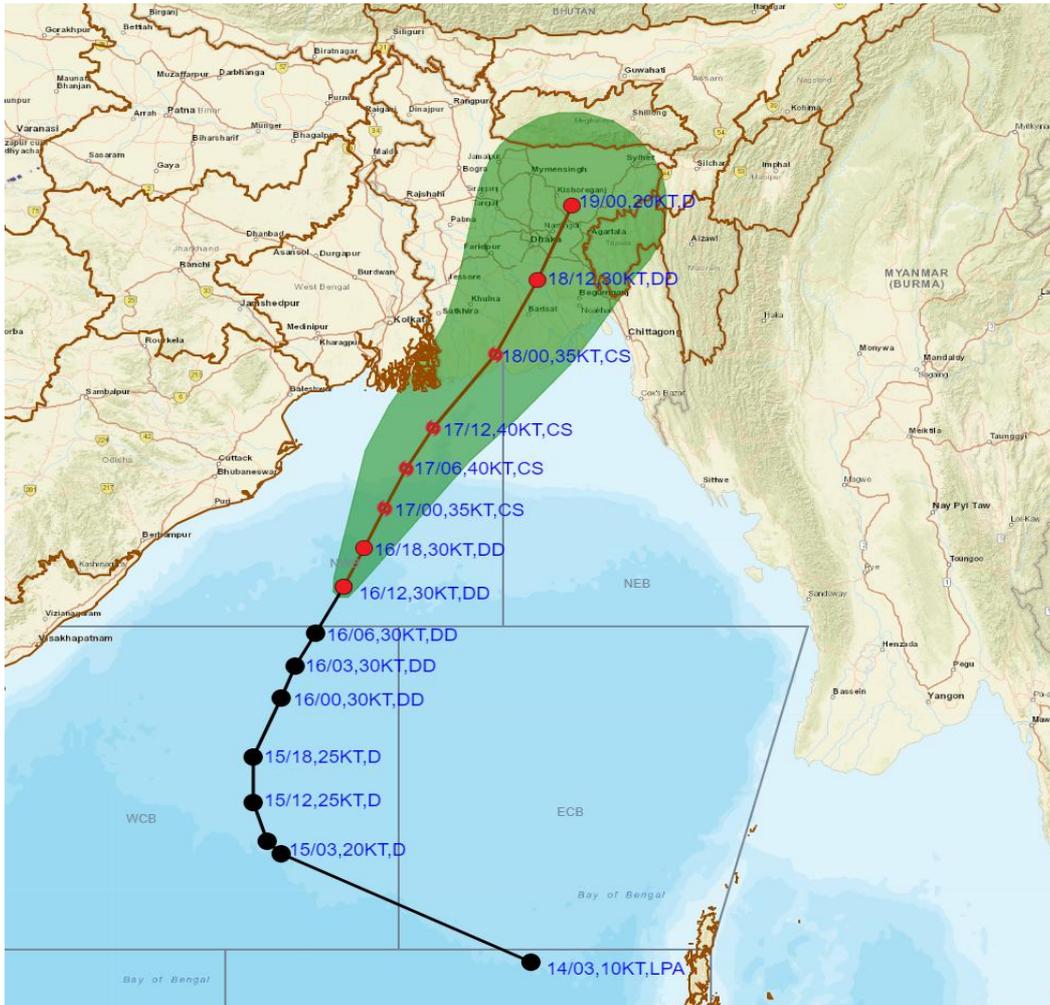
(M SHARMA)  
SCIENTIST-D, RSMC



Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C  
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%  
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# OBSERVED AND FORECAST TRACK AND INTENSITY ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEEP DEPRESSION OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF



**DATE/TIME IN UTC**  
**IST=UTC + 0530**  
**L: LOW PRESSURE AREA**  
**WML: WELL MARKED LOW PRESSURE AREA**  
**D: DEPRESSION (17-27 KT)**  
**DD: DEEP DEPRESSION (28-33 KT)**  
**CS: CYCLONIC STORM (34-47 KT)**  
**SCS: SEVERE CYCLONIC STORM (48-63KT)**  
**VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)**  
**ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)**  
**SuCS: SUPER CYCLONIC STORM (≥ 120 KT)**

- LESS THAN 34 KT
- 34-47 KT
- ≥ 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

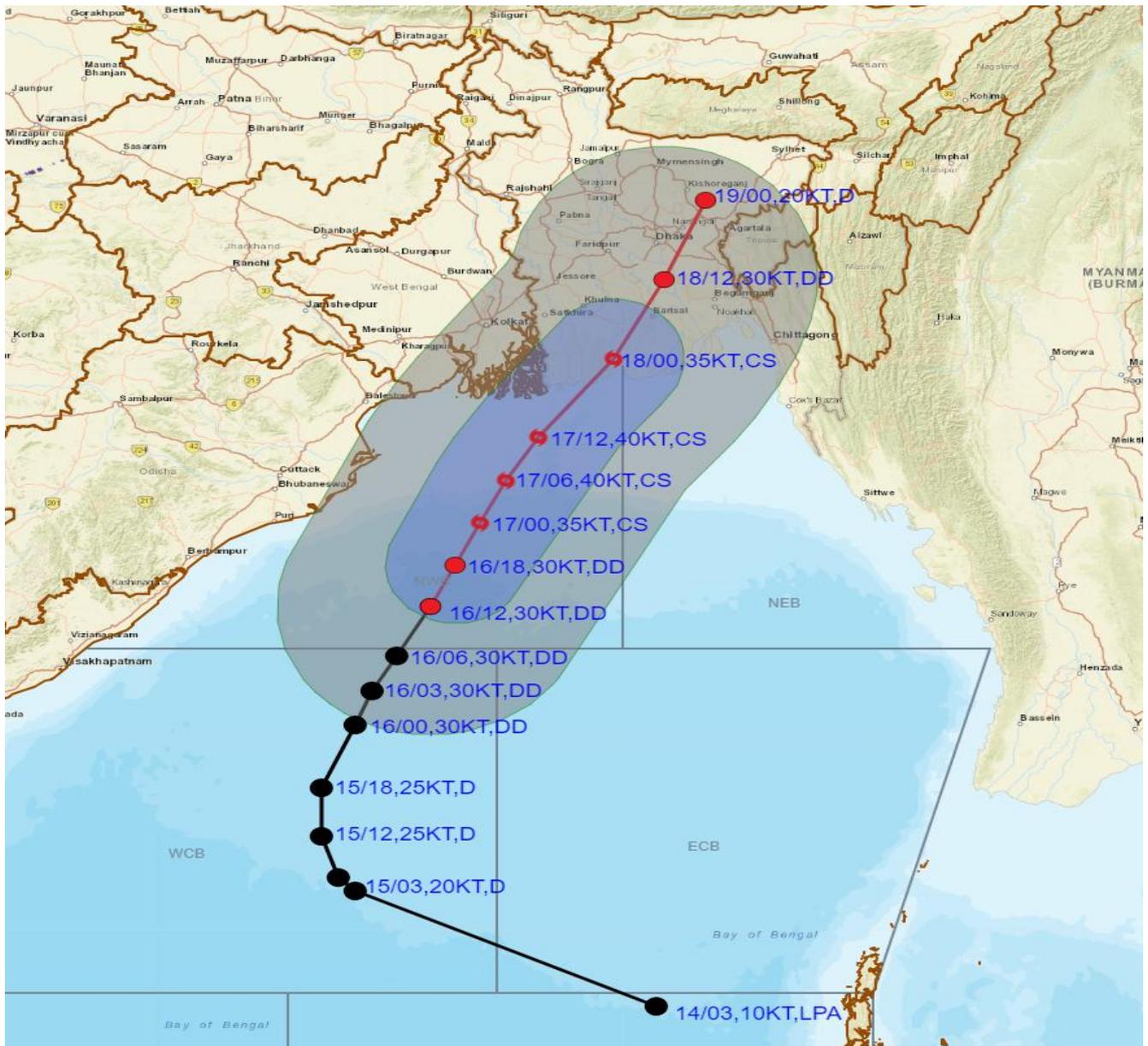
Forecast	DISTANCE(KM) AND DIRECTION FROM STATIONS			
Date/Time (UTC)	PARADIP (CWR)	DIGHA	KHEPUPARA	CHITTAGONG (AMBAGAN)
16.11.23/1200	270, SSE	410, S	540, SSW	680 SW
17.11.23/1200	260, ENE	180, ESE	160, SW	320, WSW
18.11.23/0000	390, ENE	260, ENE	40, WNW	190, W
18.11.23/1200	510, NE	360, ENE	140, NNE	160, NW

IST= UTC + 0530

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**OBSERVED AND FORECAST TRACK AND INTENSITY ALONG WITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH DEEP DEPRESSION OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 1200 UTC (1730 IST) OF 16<sup>TH</sup> NOVEMBER 2023.**



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 SuCS: SUPER CYCLONIC STORM (≥ 120 KT)

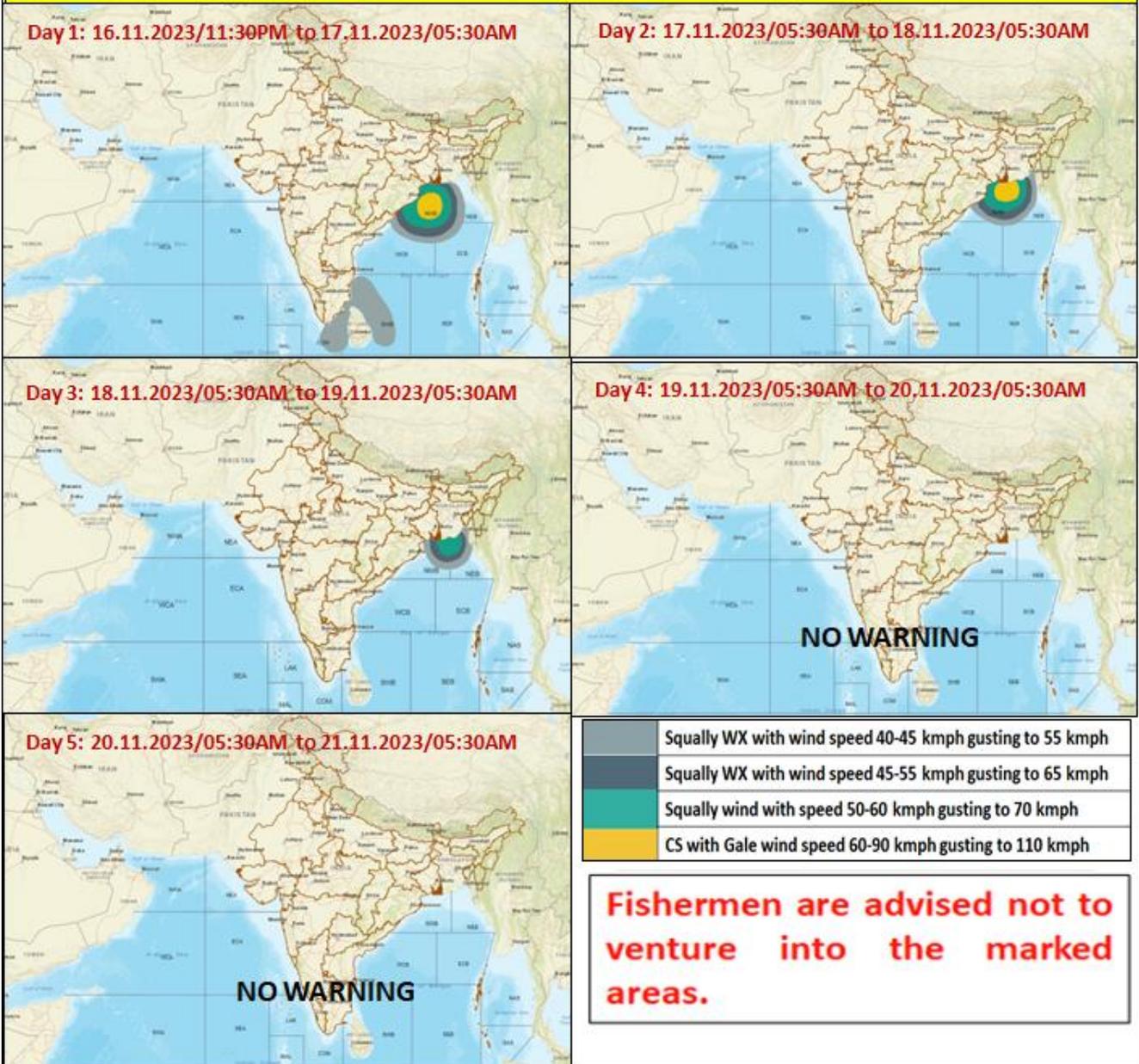
● LESS THAN 34 KT  
 ○ 34-47 KT  
 ● ≥ 48 KT  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 ▲ CONE OF UNCERTAINTY  
 AREA OF MAXIMUM SUSTAINED WIND SPEED:  
 ■ 28-33 KT (52-61 KMPH)  
 ■ 34-49 KT (62-91 KMPH)  
 ■ 50-63 KT (92-117 KMPH)  
 ■ ≥ 64 KT (≥118 KMPH)

**IMPACT OVER THE SEA**

MSW (knot/kmph)	Impact	Action
28-33 (52-61)	Very rough seas	Total suspension of fishing operations
34-49 (62-91)	High to very high seas	Total suspension of fishing operations
50-63 (92-117)	Very high seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

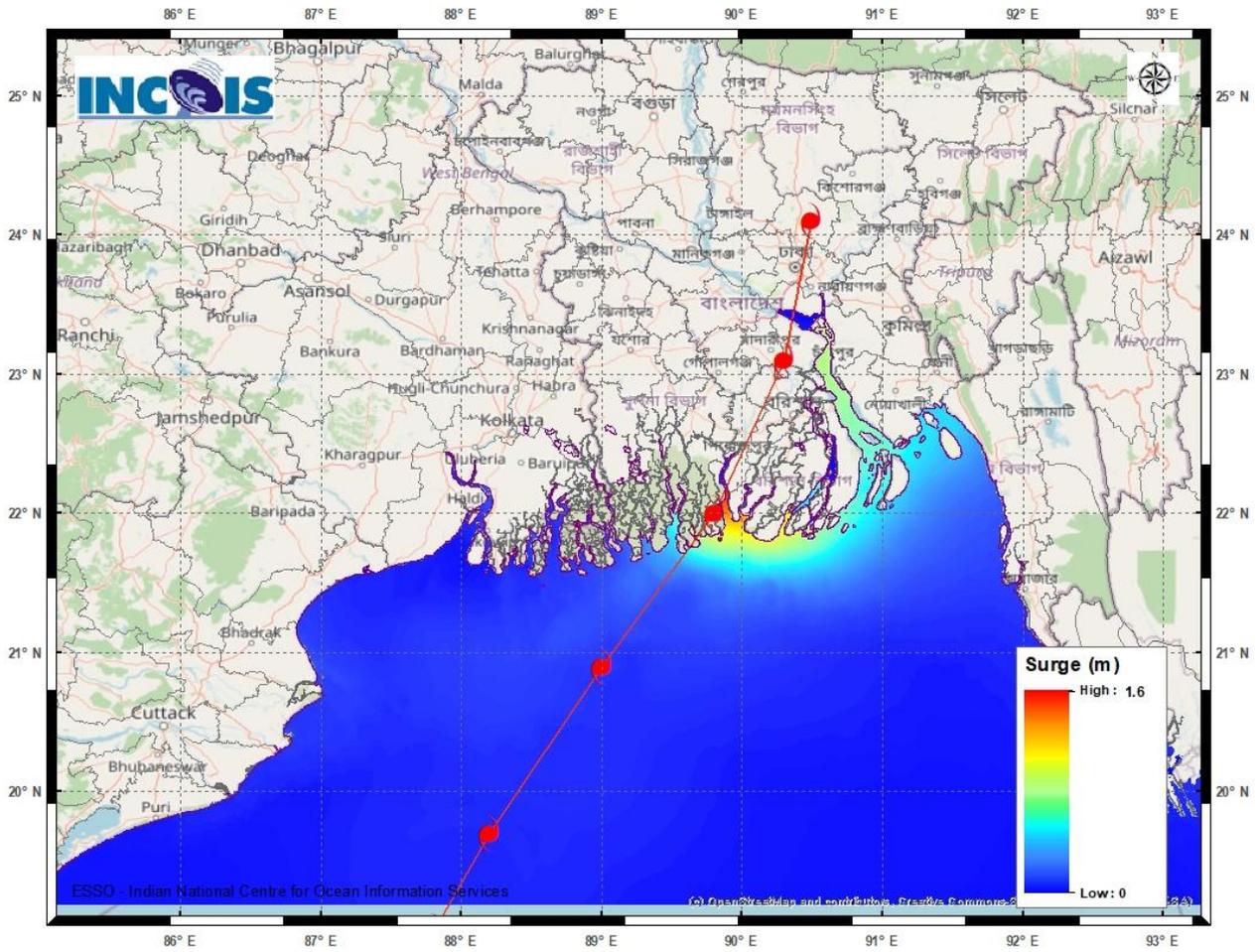
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## Fishermen warning graphics



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## Storm Surge Guidance



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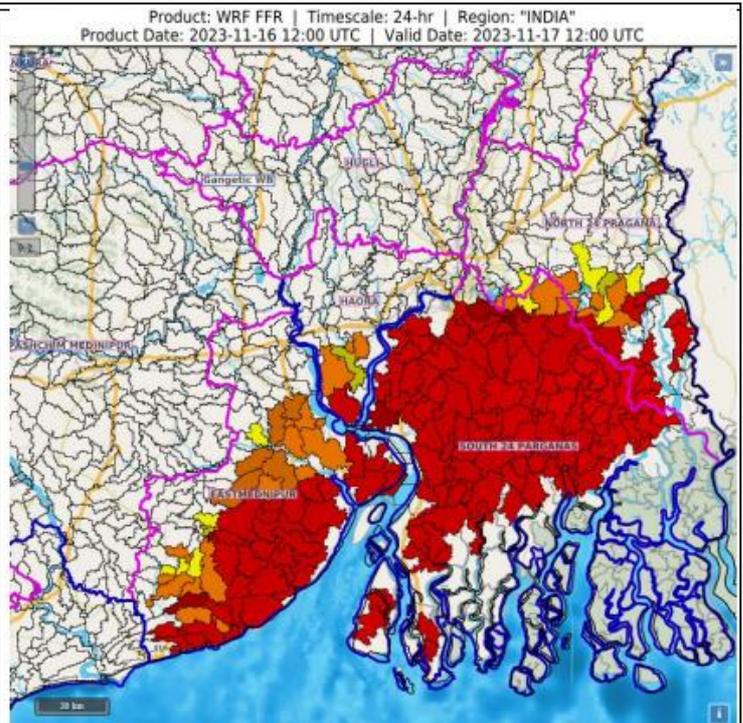
## Flash Flood Guidance

### **24 hours Outlook for the Flash Flood Risk (FFR) till 1730 IST of 17-11-2023**

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**Moderate flash flood risk** likely over few watersheds & neighbourhoods of **Southern parts of Gangetic West Bengal Met Sub-divisions** during next 24 hours.

Surface runoff/ Inundation may occur at some fully saturated soils & low-lying areas over AoC as shown in map due to expected rainfall occurrence in next 24 hours.



### **Flash Flood Risk**

**High Risk (Take Action)**

**Moderate Risk (Be Prepared)**

**Low Risk (Be Updated)**