



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

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 15.11.2023

**TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND THE ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2100 UTC OF 15.11.2023 BASED ON 1800 UTC OF 15.11.2023.**

### BAY OF BENGAL:

#### SUB: DEPRESSION OVER WESTCENTRAL BAY OF BENGAL

THE DEPRESSION OVER WESTCENTRAL BAY OF BENGAL MOVED NORTHWARDS WITH A SPEED OF 13 KMPH DURING PAST 6 HOURS AND LAY CENTRED AT 1800 UTC OF TODAY, THE 15<sup>TH</sup> NOVEMBER OVER THE SAME REGION NEAR LATITUDE 16.0°N AND LONGITUDE 86.4°E, ABOUT 380 KM SOUTHEAST OF VISAKHAPATNAM (43149), 480 KM SOUTH OF PARADIP (42976), 630 KM SOUTH-SOUTHWEST OF DIGHA (42901) AND 780 KM SOUTHWEST OF KHEPUPARA (41984).

IT IS LIKELY TO CONTINUE TO MOVE NEARLY NORTHWARDS AND INTENSIFY INTO A **DEEP DEPRESSION** OVER WESTCENTRAL BAY OF BENGAL AROUND 0000 UTC OF 16<sup>TH</sup> NOVEMBER. THEREAFTER, IT WOULD RECURVE NORTH-NORTHEASTWARDS AND REACH NORTHWEST BAY OF BENGAL OFF ODISHA COAST AROUND 0000 UTC OF 17<sup>TH</sup> AND CROSS BANGLADESH COAST BETWEEN MONGLA AND KHEPUPARA AS A DEEP DEPRESSION WITH WIND SPEED 50-60 KMPH GUSTING TO 70 KMPH AROUND 0000 UTC OF 18<sup>TH</sup> NOVEMBER.

FORECAST TRACK & INTENSITY IS GIVEN BELOW:

DATE/TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
15.11.23/1800	16.0/86.4	45-55 KMPH GUSTING TO 65 KMPH	DEPRESSION
16.11.23/0600	17.3/86.6	50-60 KMPH GUSTING TO 70 KMPH	DEEP DEPRESSION
16.11.23/1800	18.5/87.0	55-65 KMPH GUSTING TO 75 KMPH	DEEP DEPRESSION
17.11.23/0600	19.7/87.7	55-65 KMPH GUSTING TO 75 KMPH	DEEP DEPRESSION
17.11.23/1800	20.9/88.8	50-60 KMPH GUSTING TO 70 KMPH	DEEP DEPRESSION
18.11.23/0600	22.1/89.9	45-55 KMPH GUSTING TO 65 KMPH	DEPRESSION
18.11.23/1800	23.1/90.5	35-45 KMPH GUSTING TO 55 KMPH	DEPRESSION

THE ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE WINDS ARE RELATIVELY STRONGER IN NORTHEAST SECTOR DUE TO NORTHEAST MONSOON CONDITIONS. THE ESTIMATED CENTRAL PRESSURE IS 1006 HPA. SEA CONDITION IS LIKELY TO BE ROUGH TO VERY ROUGH OVER WESTCENTRAL BAY OF BENGAL ON 16<sup>TH</sup> NOVEMBER AND OVER NORTHWEST BAY OF BENGAL ON 17<sup>TH</sup> & 18<sup>TH</sup>.

INTENSITY OF THE SYSTEM IS CHARACTERISED AS T 1.5/C.I.1.5. CLOUDS ASSOCIATED WITH THE 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 13.0N & 21.0N AND LONGITUDE 85.5 & 92.0.

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%  
This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins

MINIMUM CLOUD TOP TEMPERATURE IS -89°C. THE CONVECTION IS HIGHER OVER NORTHEAST SECTOR. MULTISATELLITE WINDS ALSO INDICATE STRONGER WINDS IN NORTHEAST SECTOR. TOTAL PRECIPITABLE IMAGERY INDICATES INCREASED WARM MOIST AIR INCURSION INTO THE CORE OF THE SYSTEM. ASCAT PASS AT 0317 UTC INDICATES WINDS WITH INTENSITY 20-30 KNOTS IN THE EASTERN SECTOR OF SYSTEM.

**Remarks:**

MADDEN JULIAN OSCILLATION INDEX IS IN PHASE 8 WITH AMPLITUDE CLOSE TO 1. IT WOULD MOVE TO PHASE 1 FROM 16<sup>TH</sup> NOVEMBER ONWARDS, WITH AMPLITUDE BECOMING MORE THAN 1. SEA SURFACE TEMPERATURE IS AROUND 29°C OVER WESTCENTRAL BOB AND SLIGHTLY LESS AROUND 27-28°C OVER SEA AREAS OF NORTH BOB AND ALONG & OFF ANDHRA PRADESH – ODISHA COASTS. THE TROPICAL CYCLONE HEAT POTENTIAL IS 80-100 KJ/CM<sup>2</sup> OVER SEA AREAS OF WESTCENTRAL BOB & NORTH BOB AND ALONG & OFF ANDHRA PRADESH – ODISHA COASTS. THE EQUATORIAL WAVES FORECAST INDICATE, STRONG WESTERLY WINDS (5-7 MPS) OVER SOUTH & ADJOINING CENTRAL BOB AND STRONG EASTERLY WINDS (5-7 MPS) OVER NORTH & ADJOINING CENTRAL BOB. THESE WOULD SUPPORT MAINTENANCE OF CYCLONIC CIRCULATION OVER WESTCENTRAL BOB. IN ADDITION KELVIN WAVES ARE LIKELY OVER CENTRAL BOB DURING 16<sup>TH</sup>-18<sup>TH</sup>. KELVIN WAVES ARE LIKELY TO ENHANCE DRY MID-LATITUDE WESTERLIES OVER THE REGION. THE ENHANCED WESTERLIES WOULD LEAD TO UPWELLING OVER ANDHRA PRADESH & ADJOINING ODISHA COASTS LEADING TO LOWERING OF SEA SURFACE TEMPERATURE OVER THE REGION AND ALSO WEAKENING OF THE SYSTEM WHEN IT REACHES NORTHWEST BOB AREA. ALSO IT WILL LEAD TO DRY AIR INCURSION FROM CENTRAL INDIA TO THE SYSTEM. THUS, KELVIN WAVE WILL PLAY A DETRIMENTAL ROLE IN WEAKENING OF THE SYSTEM. FURTHER, BROAD SCALE FEATURES LIKE MJO, EL-NINO AND IOD CONDITIONS ARE ALSO LIKELY TO CONTRIBUTE NEGATIVELY TO INTENSITY OF SYSTEM.

THE LOW LEVEL RELATIVE POSITIVE VORTICITY IS AROUND  $150 \times 10^{-6} \text{S}^{-1}$  AROUND SYSTEM AREA WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE POSITIVE LOW LEVEL CONVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO THE EAST OF SYSTEM AREA. POSITIVE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF SYSTEM AREA. WIND SHEAR IS MODERATE (15-20 KNOTS) OVER SYSTEM AREA AND ALONG THE FORWARD SECTOR UPTO 15°N. THEREAFTER, WIND SHEAR WOULD BECOME HIGH OVER NORTH BOB AND ALSO ALONG & OFF ODISHA-WEST BENGAL-BANGLADESH COASTS. UPPER TROPOSPHERIC RIDGE RUNS ALONG 14°N. MID LEVEL SHEAR IS < 20 KNOTS (LOW-MODERATE) OVER CENTRAL & ADJOINING NORTH BOB. ALL THESE FEATURES ARE LIKELY TO SUPPORT GRADUAL INTENSIFICATION OF THE SYSTEM INTO DEEP DEPRESSION BY 0000 UTC OF 16<sup>TH</sup> NOVEMBER AND FURTHER MAINTENANCE OF INTENSITY TILL 0000 UTC OF 18<sup>TH</sup> NOVEMBER AND WEAKENING THEREAFTER.

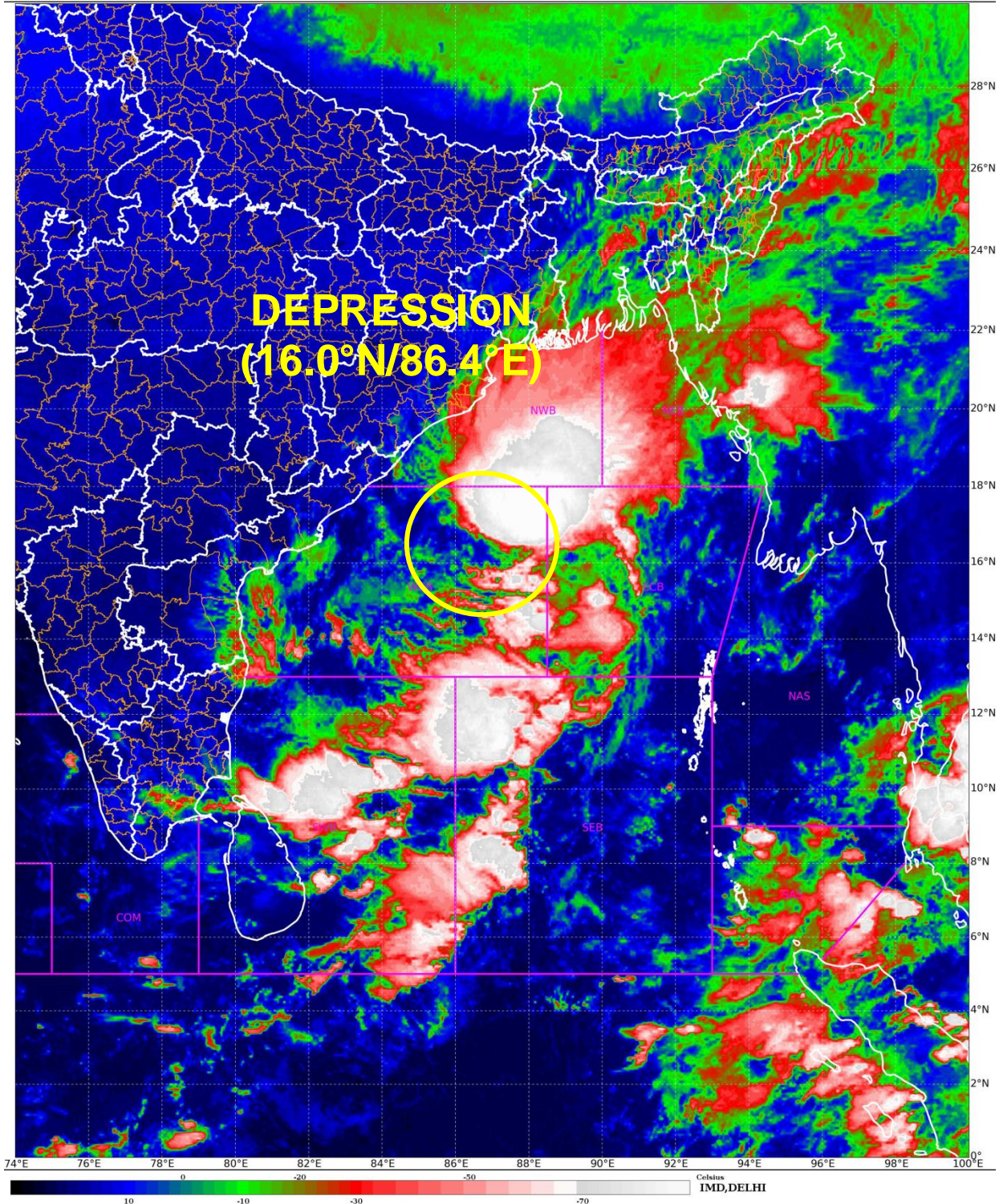
THE GUIDANCE FROM VARIOUS NUMERICAL MODELS (IMD GFS, NCEP GFS, ECMWF AND IMD MME) IS INDICATING INITIAL NORTHWARDS MOVEMENT FOLLOWED BY GRADUAL NORTH-NORTHEASTWARDS RECURVATURE TOWARDS WEST BENGAL-BANGLADESH COASTS. PEAK INTENSIFICATION IS SUGGESTED UPTO MARGINAL CYCLONE/DEEP DEPRESSION STAGE AROUND 1200 UTC OF 16<sup>TH</sup> NOVEMBER.

CONSIDERING ALL THESE, THE DEPRESSION OVER WESTCENTRAL BAY OF BENGAL IS LIKELY TO MOVE NEARLY NORTHWARDS AND INTENSIFY INTO A DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL AROUND 0000 UTC OF 16<sup>TH</sup> NOVEMBER. THEREAFTER, IT WOULD RECURVE NORTH-NORTHEASTWARDS AND REACH NORTHWEST BAY OF BENGAL OFF ODISHA COAST AROUND 0000 UTC OF 17<sup>TH</sup>, AND CROSS BANGLADESH COAST BETWEEN MONGLA AND KHEPUPARA AS A DEEP DEPRESSION WITH WIND SPEED 50-60 KMPH GUSTING TO 70 KMPH AROUND 0000 UTC OF 18<sup>TH</sup> NOVEMBER.



SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
LIC Mercator

15-11-2023/(1930 to 1956) GMT  
16-11-2023/(0100 to 0126) IST



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

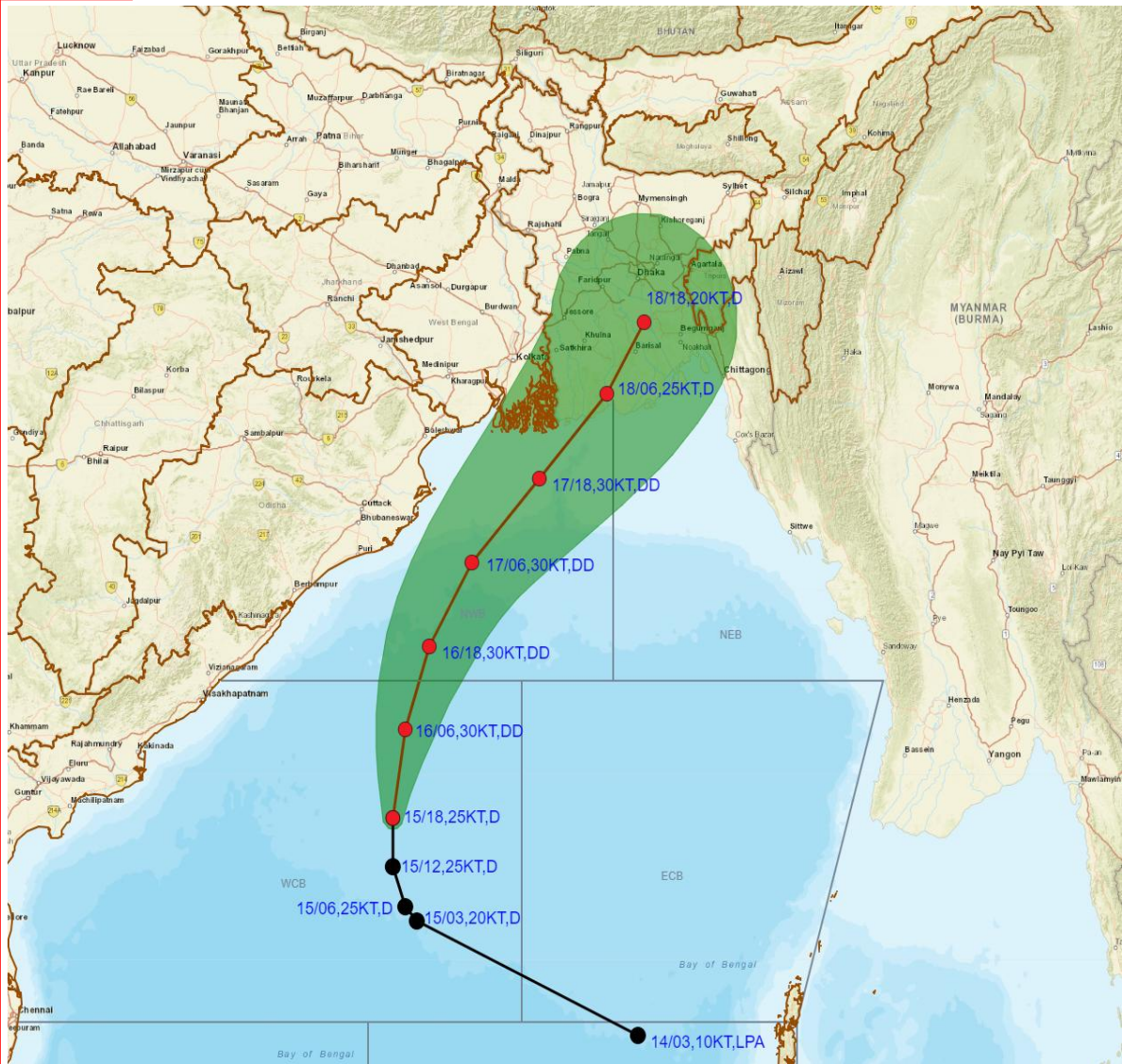
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33% , MODERATE: 34-66% AND HIGH: 67-100%

This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bul letins





**OBSERVED AND FORECAST TRACK AND INTENSITY ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEPRESSION OVER WESTCENTRAL BAY OF BENGAL BASED ON 1800 UTC (2330 IST) OF 15<sup>TH</sup> NOVEMBER 2023.**



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 ( $\geq 120$  KT)

- LESS THAN 34 KT
- 34-47 KT
- $\geq 48$  KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

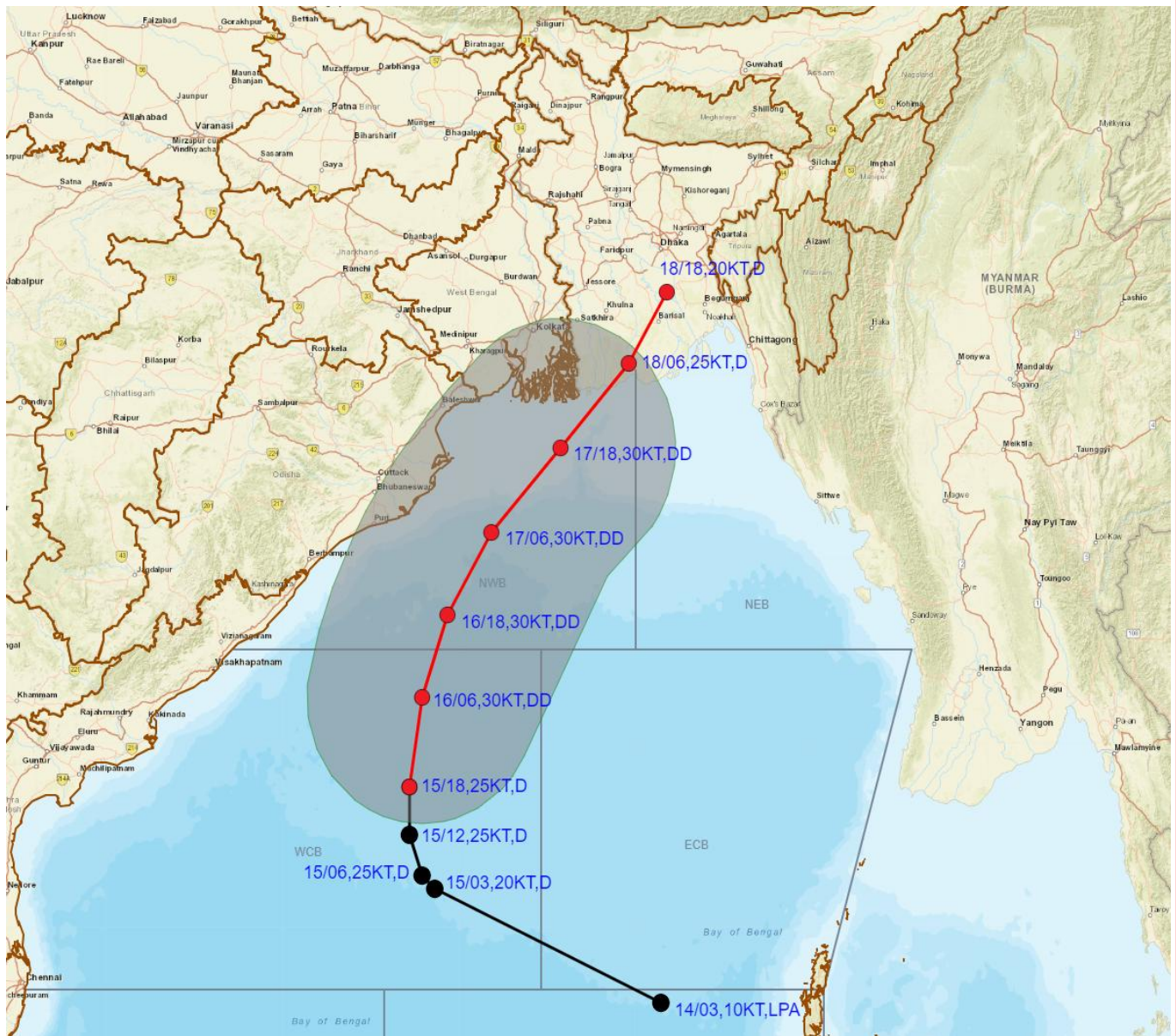
Forecast	DISTANCE(KM) AND DIRECTION FROM STATIONS			
Date and Time	PARADIP	DIGHA	KHEPUPARA	CHITTAGONG (AMBAGAN)
16.11.23/1800	200, S	350, S	510, SW	660, SW
17.11.23/0600	130, ESE	210, S	360, SW	510, SW
17.11.23/1800	230, ENE	160, ESE	190, SW	350, WSW

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%  
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins





**OBSERVED AND FORECAST TRACK AND INTENSITY ALONG WITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH DEPRESSION OVER WESTCENTRAL BAY OF BENGAL BASED ON 1800 UTC (2330 IST) OF 15<sup>TH</sup> NOVEMBER 2023.**



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 ( $\geq 120$  KT)

● LESS THAN 34 KT

○ 34-47 KT

●  $\geq 48$  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)

■  $\geq 64$  KT ( $\geq 118$  KMPH)

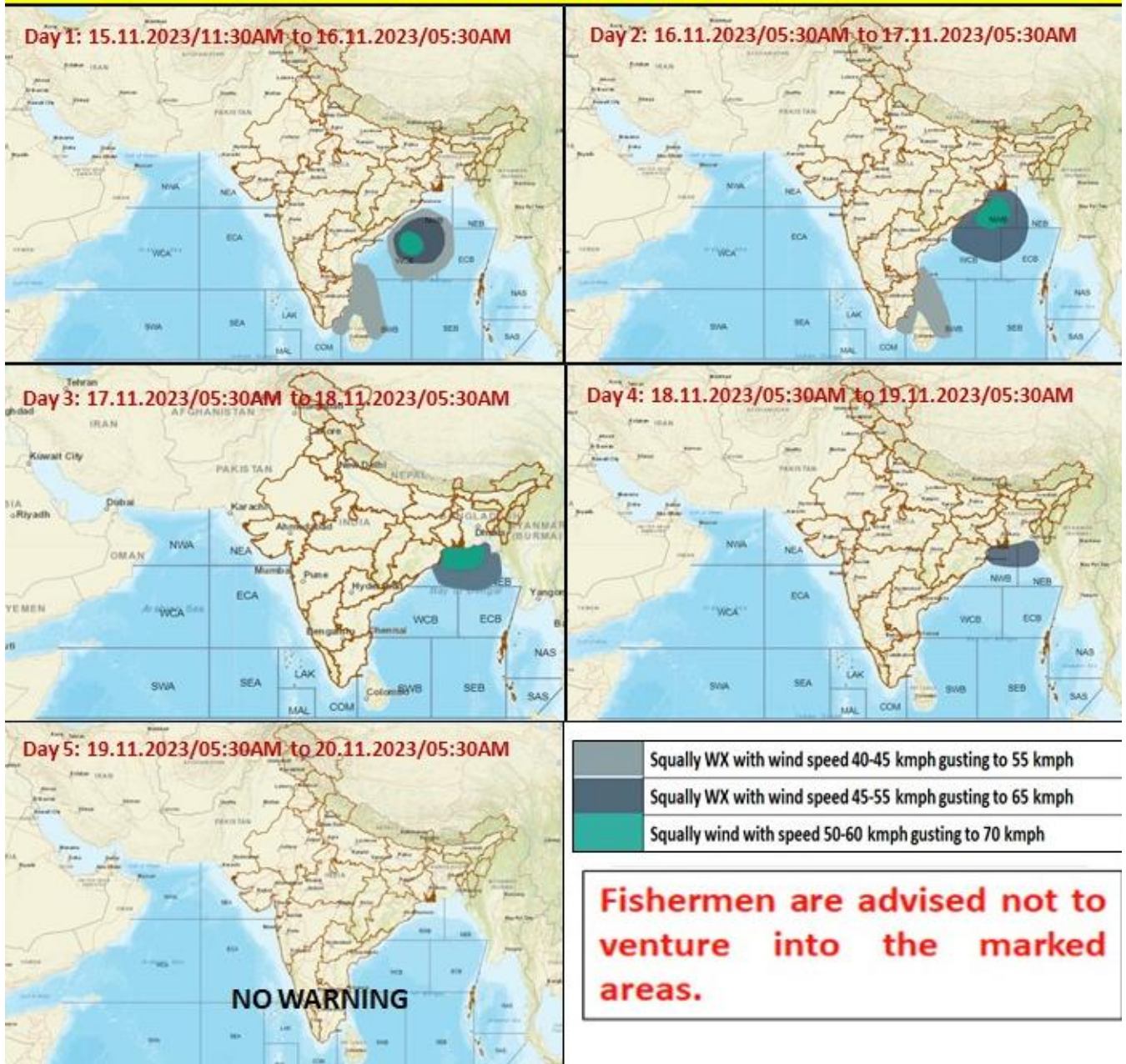
**IMPACT OVER THE SEA**

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
$\geq 64$ ( $\geq 118$ )	Phenomenal	Total suspension of fishing operations

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%  
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bul letins



## Fishermen warning graphics



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%  
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins