



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

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 29.11.2023

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND THE ARABIAN SEA) VALID FOR NEXT 168 HOURS ISSUED AT 0730 UTC OF 29.11.2023 BASED ON 0300 UTC OF 29.11.2023.

BAY OF BENGAL:

SUB: WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST BAY OF BENGAL & ADJOINING SOUTH ANDAMAN SEA

YESTERDAY'S LOW PRESSURE AREA OVER SOUTH ANDAMAN SEA & ADJOINING SOUTHEAST BAY OF BENGAL MOVED WEST-NORTHWESTWARDS AND LAY AS A WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST BAY OF BENGAL & ADJOINING SOUTH ANDAMAN SEA AT 0300 UTC OF TODAY, THE 29TH NOVEMBER, 2023.

IT IS LIKELY TO MOVE WEST-NORTHWESTWARDS AND INTENSIFY INTO A DEPRESSION OVER SOUTHEAST BAY OF BENGAL ON 30TH NOVEMBER, 2023. THEREAFTER, IT IS LIKELY TO MOVE NORTHWESTWARDS AND INTENSIFY GRADUALLY INTO A CYCLONIC STORM OVER SOUTHWEST & ADJOINING SOUTHEAST BAY OF BENGAL AROUND 2ND DECEMBER.

INSAT -3D IMAGERY AT 0300 UTC, INDICATED LOW LEVEL CYCLONIC CIRCULATION CENTERED NEAR 5.2N/92.3E. THE SYNOPTIC ANALYSIS ALSO INDICATE WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST BAY OF BENGAL AND ADJOINING SOUTH ANDAMAN SEA NEAR 5.2/ 92.0E. MULTISAT WINDS AT 0300 UTC OF 29TH NOVEMBER, INDICATE THE SYSTEM NEAR 5.2N/91.3E WITH ASSOCIATED MAXIMUM SUSTAINED WIND SPEEDS OF 20 KNOTS IN THE NORTHEAST SECTOR .

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 15 KNOTS GUSTING TO 25 KNOTS. ESTIMATED CENTRAL PRESSURE IS 1005 HPA. SEA CONDITION IS LIKELY TO BE MODERATE TO ROUGH OVER THE SOUTHEAST BAY OF BENGAL AND ADJOINING SOUTH ANDAMAN SEA AND ALONG & OFF ANDAMAN & NICOBAR ISLANDS. A BUOY NEAR 6.5N/88.5E INDICATED MEAN SEA LEVEL PRESSURE OF 1007 HPA AND MAXIMUM SUSTAINED WIND SPEED AS 180⁰/05 KT. A SHIP NEAR 5.6N/92.2E INDICATED MEAN SEA LEVEL PRESSURE OF 1006 HPA AND MAXIMUM SUSTAINED WIND SPEED AS 75⁰/13 KT.

ASSOCIATED INTENSITY IS T1.0. CONVECTIVE CLOUD MASS HAS INCREASED IN PAST 24 HOURS. MULTIPLE LOW LEVEL CYCLONIC CIRCULATIONS ARE SEEN IN THE CLOUD IMAGERY. OUTFLOW IS ALSO VISIBLE TOWARDS CENTRAL AND NORTH BOB. WATER VAPOUR IMAGERY INDICATES CONVECTIVE CLOUDMASS UPTO MID-TROPOSPHERIC LEVELS. INTENSE CLOUD MASS HAS COME CLOSER TO THE CENTRE AS SEEN IN CLOUD TOP TEMPERATURE IMAGERY. CLOUDS ARE SEEN OVER NORTH ANDAMAN SEA AND EASTCENTRAL BAY OF BENGAL. SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST BAY OF BENGAL, SOUTH ANDAMAN SEA AND NEIGHBOURHOOD. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 85 DEG CELSIUS. SCATTERED LOW AND MEDIUM

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

CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LAY OVER WESTCENTRAL BAY OF BENGAL AND WEAK TO MODERATE CONVECTION LAY OVER NORTH ANDAMAN SEA.

PRE-GENESIS TRACK & INTENSITY FORECASTS:

Date/Time (UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
29.11.23/0300	5.4/91.9	25-30 kmph gusting to 40 kmph	Well Marked Low Pressure Area
29.11.23/1200	5.9/90.9	30-40 kmph gusting to 50 kmph	Well Marked Low Pressure Area
30.11.23/0000	6.6/89.9	40-50 kmph gusting to 60 kmph	Depression
30.11.23/1200	7.5/88.7	45-55 kmph gusting to 65 kmph	Depression
01.12.23/0000	8.5/87.5	50-60 kmph gusting to 70 kmph	Deep Depression
01.12.23/1200	9.6/86.3	55-65 kmph gusting to 75 kmph	Deep Depression
02.12.23/0000	10.7/85.2	60-70 kmph gusting to 80 kmph	Cyclonic Storm

***PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION) DURING NEXT 168 HRS:**

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
LOW	MOD	HIGH	HIGH	HIGH	HIGH	HIGH

***NOTE: EVERY 24HR FORECAST IS VALID UPTO 0300 UTC (0830 IST) OF NEXT DAY**

ARABIAN SEA:

YESTERDAY'S CYCLONIC CIRCULATION OVER SOUTHWEST ARABIAN SEA HAS BECOME LESS MARKED AT 0300 UTC OF TODAY, 29TH NOVEMBER, 2023.

SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LAY OVER SOUTH & ADJOINING CENTRAL ARABIAN SEA AND COMORIN AREA.

***PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION) DURING NEXT 168 HRS:**

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

***NOTE: EVERY 24HR FORECAST IS VALID UPTO 0300 UTC (0830 IST) OF NEXT DAY**

Remarks:

MADDEN JULIAN OSCILLATION (MJO) IS CURRENTLY IN PHASE 3 WITH AMPLITUDE GREATER THAN 1. IT WOULD MOVE ACROSS PHASES 3 AND 4 WITH AMPLITUDE GREATER THAN 1 DURING 29TH NOVEMBER TO 6TH DECEMBER. THUS, MJO WOULD SUPPORT CYCLOGENESIS OVER THE BAY OF BENGAL (BOB) REGION TILL 6TH DECEMBER. SEA SURFACE TEMPERATURE IS 28-30°C OVER MAJOR PARTS OF BOB. TROPICAL CYCLONE HEAT POTENTIAL IS 80-100 KJ/CM² OVER SOUTH ANDAMAN SEA, 100-120 KJ/CM² OVER SOUTHEAST BOB. THE NCICS BASED FORECASTS FOR EQUATORIAL WAVES INDICATE STRENGTHENING OF WESTERLY WINDS ALONGWITH PRESENCE OF EQUATORIAL ROSSBY WAVES & MJO OVER SOUTH BOB AND. EASTERLY WINDS (3-5 MPS) OVER CENTRAL BOB DURING 29TH-30TH NOVEMBER. ALL THESE LARGE SCALE FEATURES ARE FAVOURABLE FOR CYCLOGENESIS (FORMATION OF DEPRESSION) OVER SOUTHEAST BOB.

CURRENT ENVIRONMENTAL FEATURES INDICATE, POSITIVE LOW LEVEL VORTICITY OF 50-60X10⁻⁶S⁻¹ OVER SOUTH ANDAMAN SEA TO THE EAST OF SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 500 HPA LEVEL. POSITIVE LOW LEVEL CONVERGENCE HAS INCREASED AND IS ABOUT 20 X 10⁻⁵ S⁻¹ TO THE EAST OF SYSTEM CENTRE. POSITIVE UPPER LEVEL DIVERGENCE HAS INCREASED AND IS ABOUT 30 X 10⁻⁵ S⁻¹ TO THE EAST-NORTHEAST OF

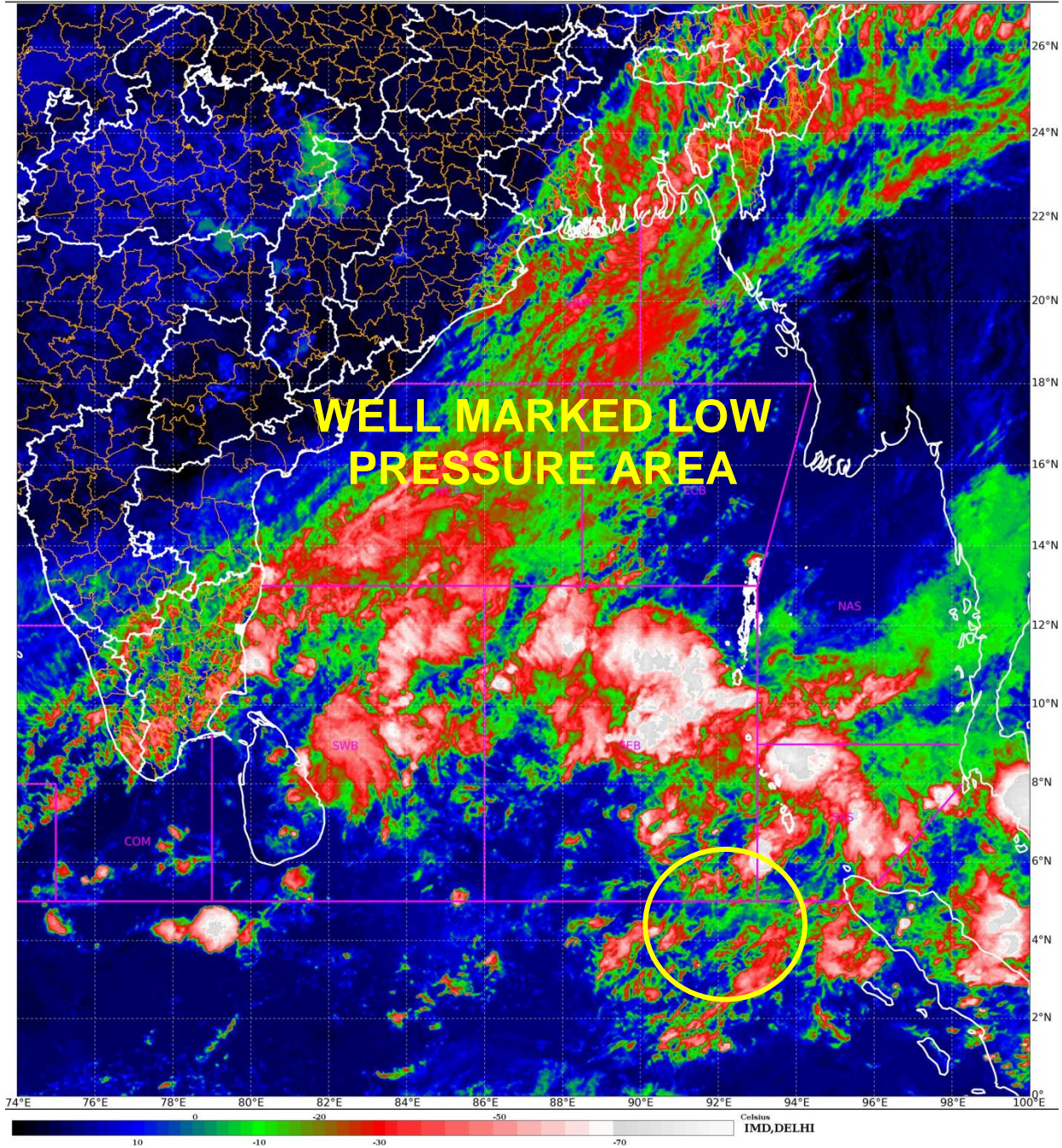
THE SYSTEM CENTRE. WIND SHEAR IS 5-15 KNOTS OVER SOUTH BOB AND SOUTH ANDAMAN SEA. LOW TO MODERATE CLOCKWISE DEEP LAYER MEAN WIND SHEAR IS SUPPORTING INTENSIFICATION OF THE SYSTEM. THE DEEP LAYER MEAN WIND IS INDICATING INITIAL WEST-NORTHWESTWARDS MOVEMENT, FOLLOWED BY NORTHWESTWARDS MOVEMENT UPTO 12^ON AND NORTHEASTWARDS RECURVATURE THEREAFTER OVER THE SEA.

AS PER TODAY'S GUIDANCE, MODELS ARE INDICATING DELAYED FORMATION OF DEPRESSION. THERE IS LARGE VARIATION AMONG VARIOUS MODELS WRT DATE OF FORMATION OF DEPRESSION WITH DATE VARYING BETWEEN 30TH NOVEMBER-2ND DECEMBER. HOWEVER, MOST OF THE MODELS ARE INDICATING INITIAL WEST-NORTHWESTWARDS MOVEMENT, FOLLOWED BY NORTHWESTWARDS MOVEMENT. MODELS ARE ALSO INDICATING NORTHEASTWARDS RECURVATURE OF THE SYSTEM. HOWEVER, THERE IS VARIATION AMONG VARIOUS MODELS W.R.T. POINT AND TIME OF RECURVATURE. THERE IS CONSENSUS AMONG VARIOUS MODELS W.R.T. INTENSIFICATION INTO CYCLONIC STORM OR HIGHER INTENSITY STORM.

IMD GFS IS INDICATING LOW PRESSURE AREA OVER SOUTHEAST BAY OF BENGAL ON 29TH, DEPRESSION ON 1ST DECEMBER/1200 UTC OVER SOUTHEAST BOB WITH RAPID INTENSIFICATION INTO A VERY SEVERE CYCLONIC STORM ON 3RD DECEMBER OVER SOUTHWEST BOB. IT IS INDICATING INITIAL WEST-NORTHWESTWARDS MOVEMENT FOLLOWED BY NORTHWESTWARDS MOVEMENT AND CROSSING OVER ANDHRA PRADESH COAST ON 5TH DECEMBER/0000 UTC. ECMWF IS INDICATING FORMATION OF DEPRESSION ON 2ND DECEMBER OVER SOUTHWEST BOB AND CYCLONIC STORM ON 3RD DECEMBER OVER SOUTHWEST BOB. IT IS INDICATING CROSSING OVER SOUTH ANDHRA PRADESH COAST ON 4TH DECEMBER/1200 UTC AS A DEPRESSION. SIMILARLY, NCUM IS INDICATING FORMATION OF DEPRESSION ON 2ND DECEMBER OVER SOUTHWEST BOB. IT IS ALSO SUGGESTING FURTHER INTENSIFICATION INTO A CYCLONIC STORM ON 4TH DECEMBER OVER WESTCENTRAL & ADJOINING SOUTHWEST BOB. FURTHER INTENSIFICATION IS ALSO SUGGESTED TILL 5TH DECEMBER WITH WEAKENING FROM 7TH ONWARDS OVER NORTHWEST BOB. IT IS INDICATING THE SYSTEM TO RECURVE NORTHEASTWARDS AND REACH BANGLADESH COAST ON 8TH DECEMBER. IMD MULTI MODEL ENSEMBLE (MME) IS INDICATING FORMATION OF DEPRESSION AROUND 30TH NOVEMBER. THEREAFTER, THE SYSTEM IS INDICATED TO INTENSIFY INTO A CYCLONIC STORM ON 3RD DECEMBER OVER SOUTHWEST BOB. MODEL IS INDICATING PEAK INTENSIFICATION UPTO SEVERE CYCLONIC STORM STAGE. IT IS INDICATING LIKELY NORTHEASTWARDS RECURVATURE THEREAFTER ALONG THE COAST OF NORTH ANDHRA-PRADESH AND SOUTH ODISHA. IT IS FURTHER INDICATING THE SYSTEM TO EMERGE INTO NORTHWEST BOB ON 7TH AND MOVE TOWARDS BANGLADESH COAST AS A WEAKER SYSTEM.

CONSIDERING ALL THE ABOVE, THE WELL MARKED LOW-PRESSURE AREA OVER SOUTHEAST BOB AND ADJOINING ANDAMAN SEA IS LIKELY TO MOVE WEST-NORTHWESTWARDS AND INTENSIFY INTO A DEPRESSION OVER SOUTHEAST BAY OF BENGAL ON 30TH NOVEMBER, 2023. THEREAFTER, IT IS LIKELY TO MOVE NORTHWESTWARDS AND INTENSIFY GRADUALLY INTO A CYCLONIC STORM OVER SOUTHWEST & ADJOINING SOUTHEAST BAY OF BENGAL AROUND 2ND DECEMBER.

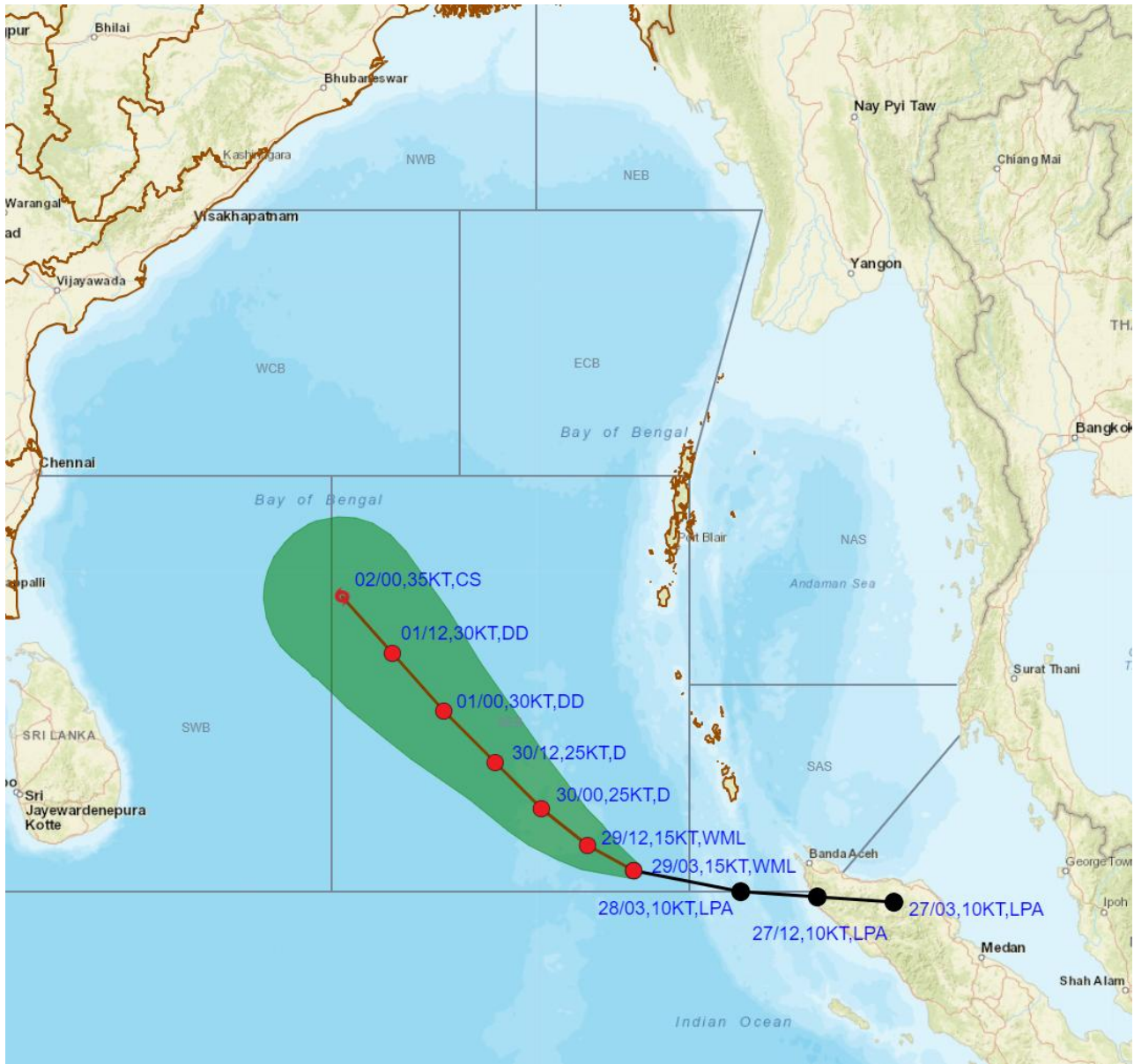
(M. SHARMA)
SCIENTIST-D
RSMC NEW DELHI



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



PREGENESIS TRACK FORECAST ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH LOW PRESSURE AREA OVER SOUTHEAST BAY OF BENGAL AND ADJOINING SOUTH ANDAMAN SEA BASED ON 0300 UTC (0830 IST) OF 29TH 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 (≥ 120 KT)

● LESS THAN 34 KT

⊙ 34-47 KT

⊙ ≥ 48 KT

■ OBSERVED TRACK

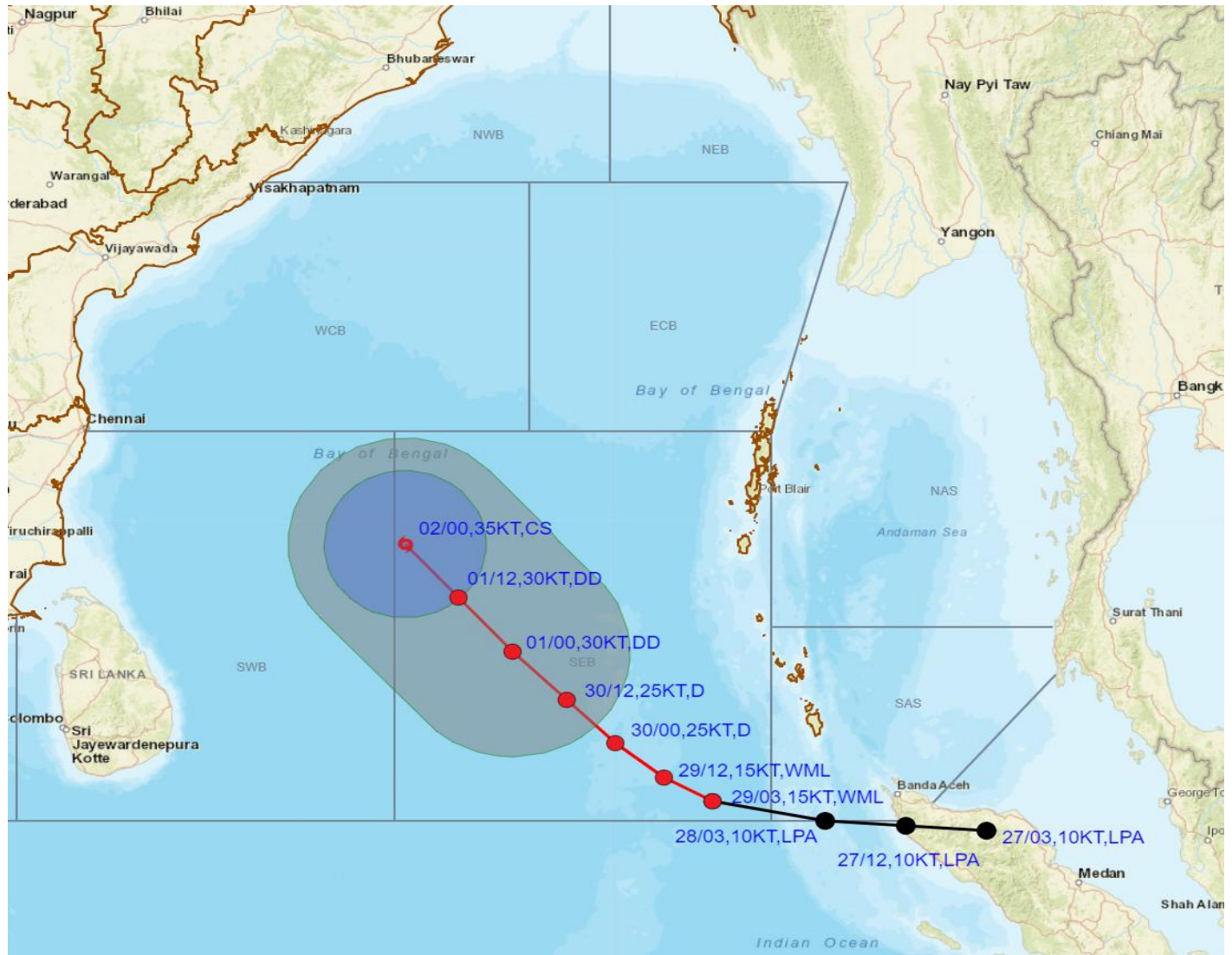
■ FORECAST TRACK

▲ CONE OF UNCERTAINTY

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



PREGENESIS TRACK FORECAST ALONG WITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH LOW PRESSURE AREA OVER SOUTHEAST BAY OF BENGAL AND ADJOINING SOUTH ANDAMAN SEA BASED ON 0300 UTC (0830 IST) OF 29TH 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 (≥ 120 KT)

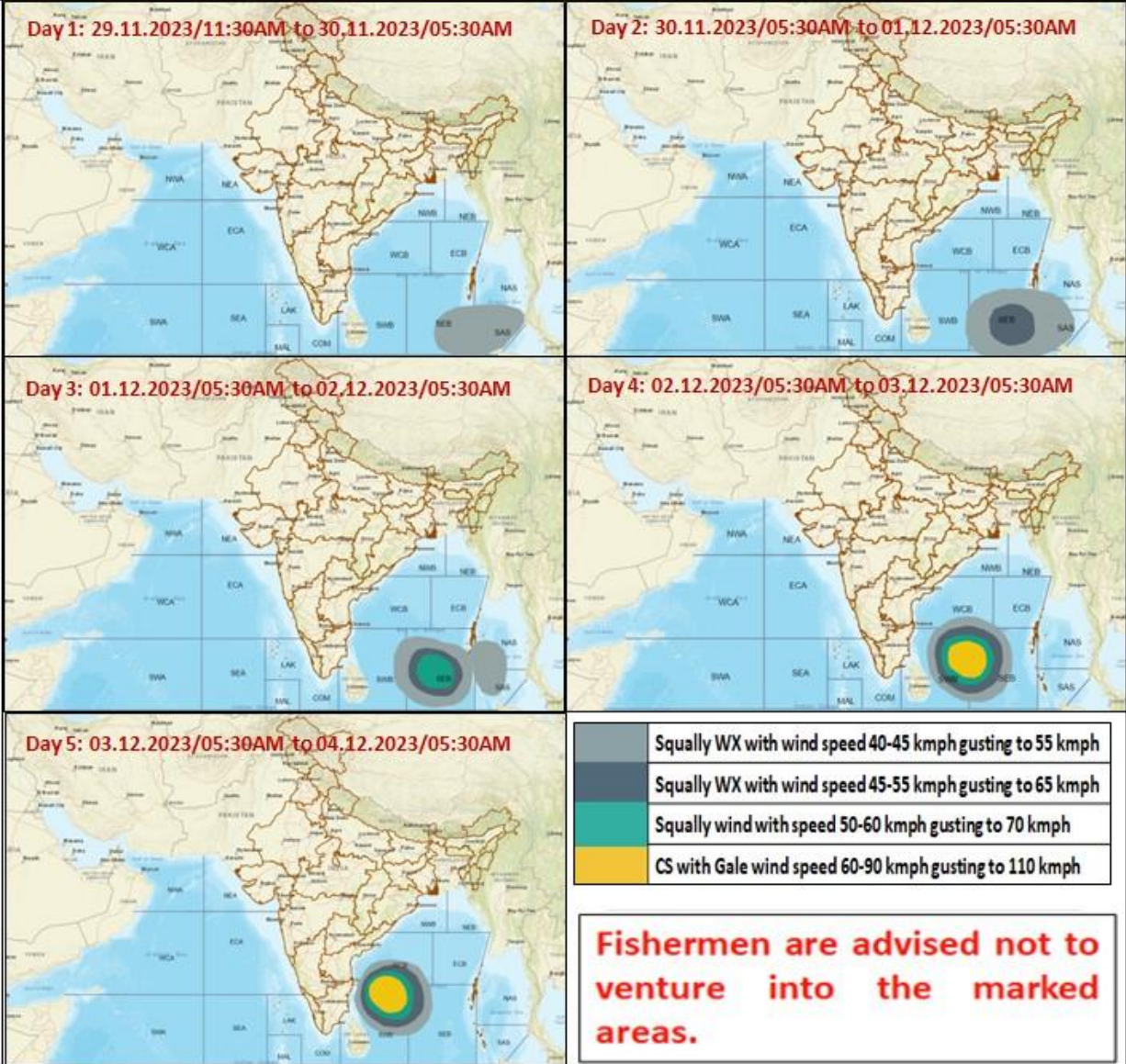
● LESS THAN 34 KT
 ○ 34-47 KT
 ○ ≥ 48 KT
 — OBSERVED TRACK
 — FORECAST TRACK
 ○ CONE OF UNCERTAINTY
 AREA OF MAXIMUM SUSTAINED WIND SPEED:
 ■ 28-33 KT (52-61 KMPH)
 ■ 34-49 KT (62-91 KMPH)
 ■ 50-63 KT (92-117 KMPH)
 ■ ≥ 64 KT (≥ 118 KMPH)

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

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

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