



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI**

**TROPICAL CYCLONE ADVISORY NO. 9**

**FROM: RSMC TROPICAL CYCLONES NEW DELHI DATED 04.12.2023**

**FROM: RSMC –TROPICAL CYCLONES, NEW DELHI**

**TO: STORM WARNING CENTRE, NAYPYI TAW (MYANMAR)  
STORM WARNING CENTRE, BANGKOK (THAILAND)  
STORM WARNING CENTRE, COLOMBO (SRILANKA)  
STORM WARNING CENTRE, DHAKA (BANGLADESH)  
STORM WARNING CENTRE, KARACHI (PAKISTAN)  
METEOROLOGICAL OFFICE, MALE (MALDIVES)  
OMAN METEOROLOGICAL DEPARTMENT, MUSCAT (THROUGH RTH JEDDAH)  
YEMEN METEOROLOGICAL SERVICES, REPUBLIC OF YEMEN (THROUGH RTH JEDDAH)  
NATIONAL CENTRE FOR METEOROLOGY, UAE (THROUGH RTH JEDDAH)  
PRESIDENCY OF METEOROLOGY AND ENVIRONMENT, SAUDI ARABIA (THROUGH RTH JEDDAH)  
IRAN METEOROLOGICAL ORGANISATION, (THROUGH RTH JEDDAH)  
QATAR METEOROLOGICAL DEPARTMENT (THROUGH RTH JEDDAH)**

**TROPICAL CYCLONE ADVISORY NO. 9 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 04.12.2023 BASED ON 0000 UTC OF 03.12.2023**

**SUB: CYCLONIC STORM “MICHAUNG” (PRONOUNCED AS “MIGJAUM”) OVER WEST CENTRAL AND ADJOINING SOUTHWEST BAY OF BENGAL**

THE CYCLONIC STORM “MICHAUNG” (PRONOUNCED AS “MIGJAUM”) OVER SOUTHWEST BAY OF BENGAL MOVED NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 0000 UTC OF TODAY, THE 4<sup>TH</sup> DECEMBER, 2023 OVER THE WEST CENTRAL AND ADJOINING SOUTHWEST BAY OF BENGAL OFF SOUTH ANDHRA PRADESH AND ADJOINING NORTH TAMILNADU COASTS NEAR LATITUDE 13.2°N AND LONGITUDE 81.2°E, ABOUT 110 KM EAST-NORTHEAST OF CHENNAI (43279), 190 KM SOUTHEAST OF NELLORE (43245), 210 KM NORTHEAST OF PUDUCHERRY (43331), 310 KM SOUTH-SOUTHEAST OF BAPATLA (43220) AND 330 KM SOUTHEAST OF MACHILIPATNAM (43185).

IT IS LIKELY TO MOVE NORTH-NORTHWESTWARDS, INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM BY 0600 UTC OF TODAY 4<sup>TH</sup> DECEMBER. THEREAFTER, IT WOULD MOVE NEARLY NORTHWARDS ALMOST PARALLEL AND CLOSE TO SOUTH ANDHRA PRADESH COAST AND CROSS SOUTH ANDHRA PRADESH COAST BETWEEN NELLORE AND MACHILIPATNAM, CLOSE TO BAPATLA BY 0600 UTC OF 5<sup>TH</sup> DECEMBER AS A **SEVERE CYCLONIC STORM** WITH A MAXIMUM SUSTAINED WIND SPEED OF 90-100 KMPH GUSTING TO 110 KMPH.

**TRACK AND INTENSITY FORECASTS:**

DATE/TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.23/0000	13.2/81.2	80-90 KMPH GUSTING TO 100 KMPH	CYCLONIC STORM
04.12.23/0600	13.7/80.9	85-95 KMPH GUSTING TO 105 KMPH	SEVERE CYCLONIC STORM
04.12.23/1200	14.2/80.6	90-100 KMPH GUSTING TO 110 KMPH	SEVERE CYCLONIC STORM
04.12.23/1800	14.7/80.5	95-105 KMPH GUSTING TO 115 KMPH	SEVERE CYCLONIC STORM
05.12.23/0000	15.4/80.4	90-100 KMPH GUSTING TO 110 KMPH	SEVERE CYCLONIC STORM
05.12.23/1200	16.3/80.6	70-80 KMPH GUSTING TO 90 KMPH	CYCLONIC STORM
06.12.23/0000	17.1/81.1	50-60 KMPH GUSTING TO 70 KMPH	DEEP DEPRESSION
06.12.23/1200	17.8/81.8	35-45 KMPH GUSTING TO 55 KMPH	DEPRESSION

INSAT-3D IMAGERY AT 0000 UTC OF 4<sup>TH</sup> DECEMBER, INDICATES THE ORGANISATION OF CLOUD MASS. ASSOCIATED INTENSITY IS T3.0. ASSOCIATED SCATTERED TO BROKEN LOW/MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTH-WEST AND ADJOINING WEST-CENTRAL BAY OF BENGAL BETWEEN LATITUDE 8.5°N TO 18.0°N LONGITUDE 80.0E TO 87.0E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEGREE CELSIUS.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 45 KNOTS GUSTING TO 55 KNOTS. ESTIMATED CENTRAL PRESSURE IS 996 HPA. SEA CONDITION IS LIKELY TO BE HIGH OVER THE SOUTHWEST BAY OF BENGAL.

MADDEN JULIAN OSCILLATION (MJO) IS CURRENTLY IN PHASE 4 WITH AMPLITUDE GREATER THAN 1. SEA SURFACE TEMPERATURE IS 28°C AROUND SYSTEM. TROPICAL CYCLONE HEAT POTENTIAL IS 60-70 KJ/CM<sup>2</sup> OVER SOUTHWEST BOB. THE NCICS BASED FORECASTS FOR EQUATORIAL WAVES INDICATE STRENGTHENING OF WESTERLY WINDS ALONG WITH PRESENCE OF EQUATORIAL ROSSBY WAVES & MJO OVER SOUTH BOB AND EASTERLY WINDS OVER CENTRAL BOB TILL 4<sup>TH</sup> DECEMBER. ALL THESE LARGE SCALE FEATURES ARE FAVOURABLE FOR FURTHER INTENSIFICATION OF THE SYSTEM.

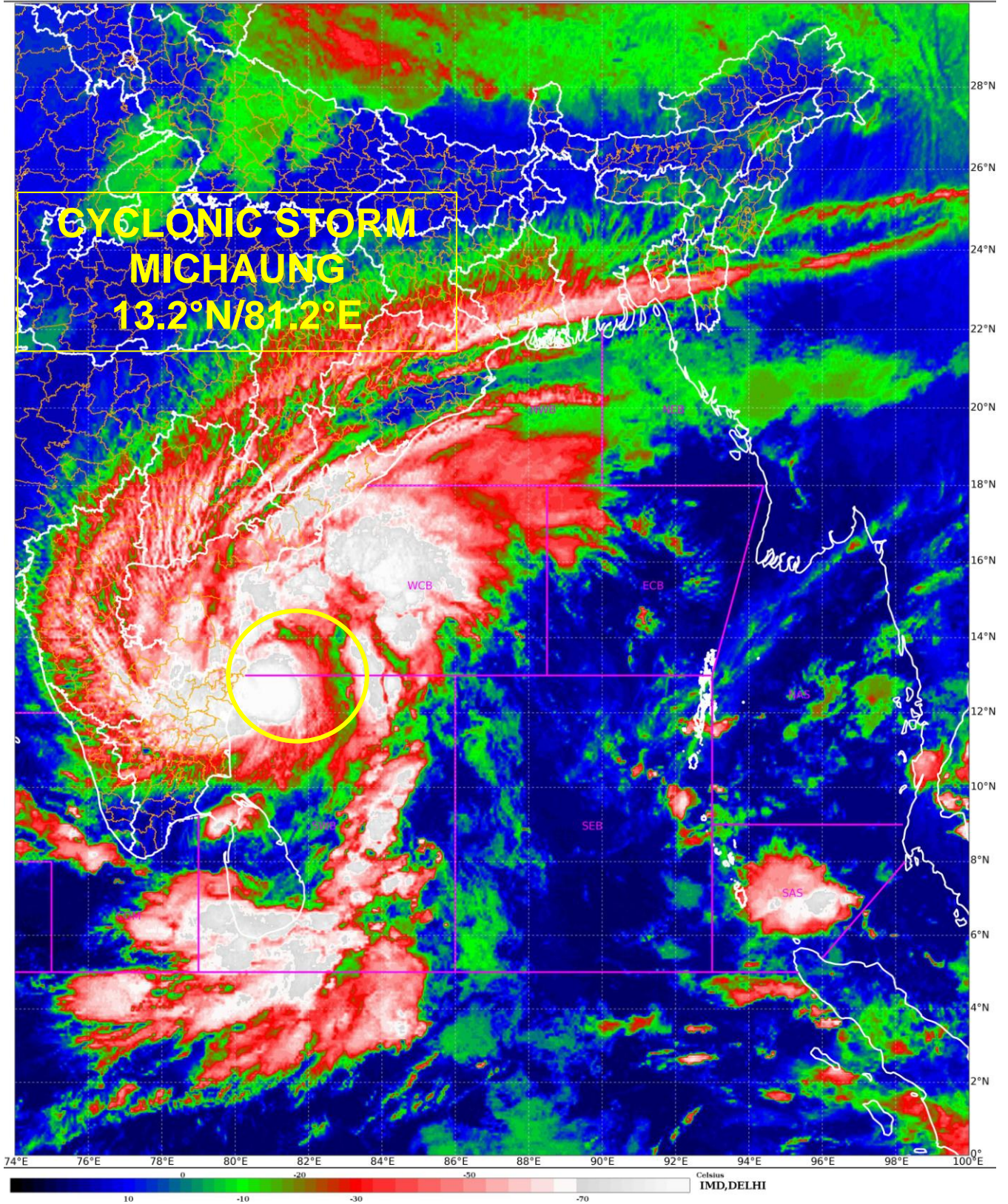
CURRENT ENVIRONMENTAL FEATURES INDICATE, THE LOW LEVEL VORTICITY OF ABOUT 250X10<sup>-6</sup>S<sup>-1</sup> AROUND SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE VORTICITY FIELD SHOWS NO TILTING WITH HEIGHT. POSITIVE LOW LEVEL CONVERGENCE IS ABOUT 30 X 10<sup>-5</sup> S<sup>-1</sup> TO THE EAST OF SYSTEM CENTRE. POSITIVE UPPER LEVEL DIVERGENCE IS ABOUT 40 X 10<sup>-5</sup> S<sup>-1</sup> TO THE NORTHEAST OF THE SYSTEM CENTRE WITH LESS DIVERGENCE EQUATORWARD. THUS, EQUATORWARD OUTFLOW IS DECREASED AND POLEWARD OUTFLOW IS INCREASED. THERE IS MINIMAL CHANGE IN WIND SHEAR AND IS ABOUT 10-20 KNOTS OVER SOUTHWEST BOB. TOTAL PRECIPITABLE WATER IMAGERY IS INDICATING WARM MOIST AIR ADVECTION FROM NORTH AND NORTHEAST SECTOR.

UPPER TROPOSPHERIC RIDGE RUNS ALONG 14°N. FROM 4<sup>TH</sup> DECEMBER/0000 UTC, THE SYSTEM WILL COME CLOSER TO THE RIDGE AND HENCE WOULD MOVE NEARLY NORTHWARDS AND BY 5<sup>TH</sup> /0000 UTC, IT WOULD CROSS RIDGE AND HENCE RECURVE NORTHEASTWARDS FROM 5<sup>TH</sup> DECEMBER/0000 UTC. UPPER TROPOSPHERIC WINDS ARE OF THE ORDER OF 50-60 KNOTS OVER NORTH ANDHRA PRADESH AND ODISHA COASTS. IT WOULD LEAD TO HIGHER WIND SHEAR.

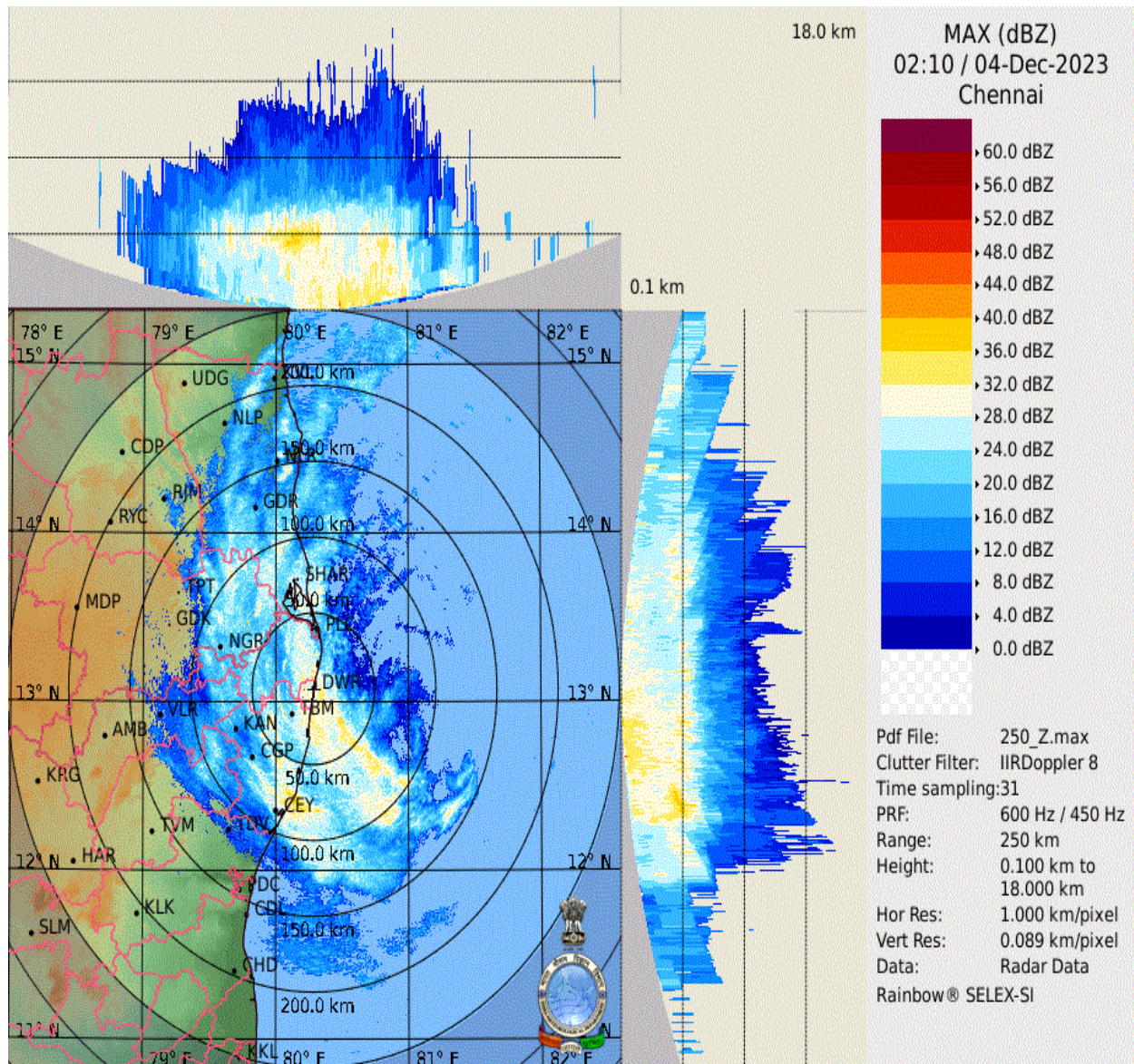
MOST OF THE MODELS ARE INDICATING INITIAL NORTHWESTWARDS MOVEMENT TOWARDS ANDHRA PRADESH COAST. THE LANDFALL POINT IS VARYING BETWEEN LATITUDE 15.1-15.7°N/80.0-80.3°E. THE LANDFALL TIME IS VARYING BETWEEN 5<sup>TH</sup>/0000 UTC TO 5<sup>TH</sup> /0900 UTC.

CONSIDERING ALL THE ABOVE, THE CYCLONIC STORM IS LIKELY TO MOVE NORTH-NORTHWESTWARDS, INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM BY 0600 UTC OF TODAY 4<sup>TH</sup> DECEMBER. THEREAFTER, IT WOULD MOVE NEARLY NORTHWARDS ALMOST PARALLEL AND CLOSE TO SOUTH ANDHRA PRADESH COAST AND CROSS SOUTH ANDHRA PRADESH COAST BETWEEN NELLORE AND MACHILIPATNAM, CLOSE TO BAPATLA BY 0600 UTC OF 5<sup>TH</sup> DECEMBER AS A **SEVERE CYCLONIC STORM** WITH A MAXIMUM SUSTAINED WIND SPEED OF 90-100 KMPH GUSTING TO 110 KMPH.

(TRISANU BANIK)  
SCIENTIST-C  
RSMC NEW DELHI



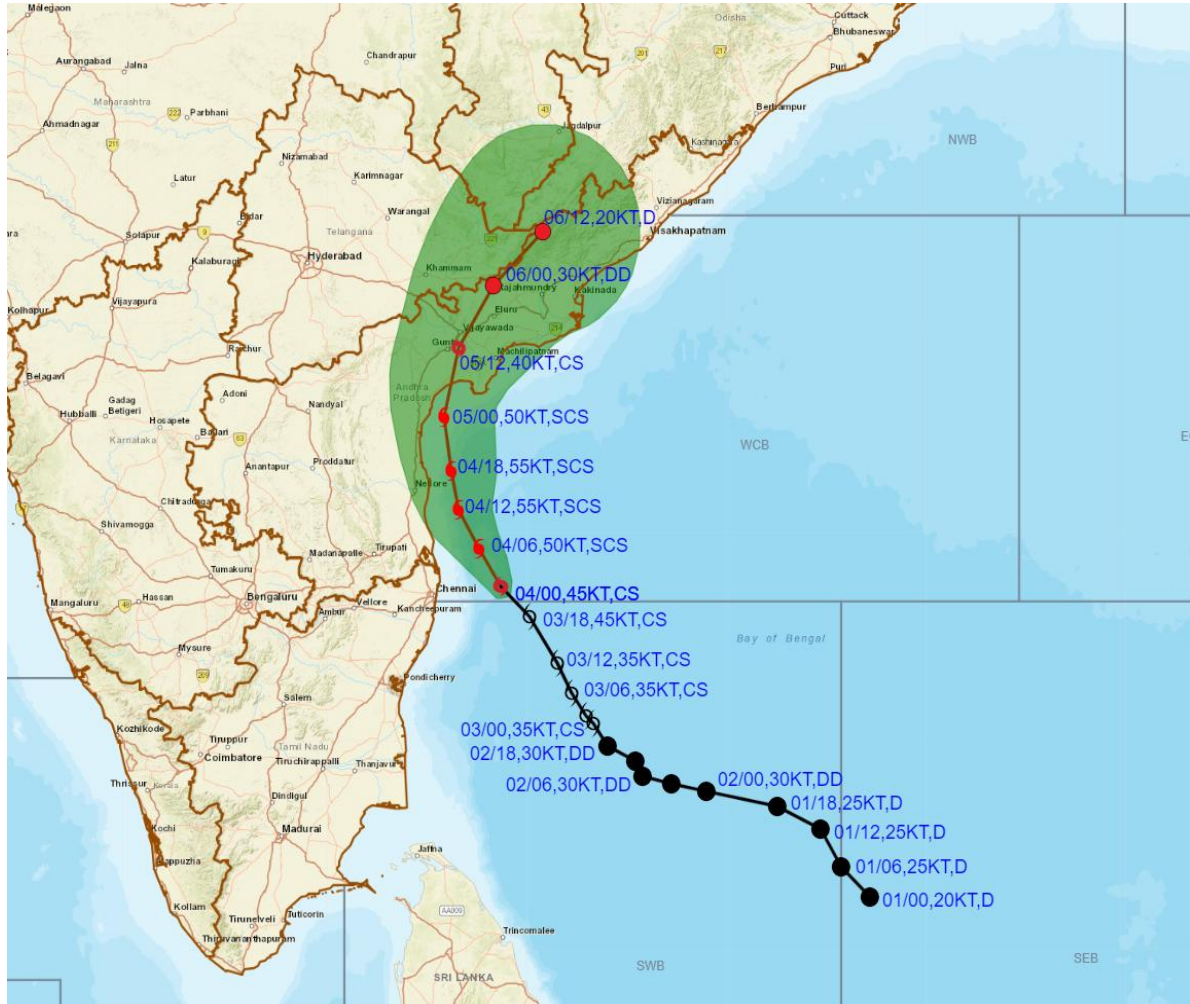
Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C  
PROBABILITY OF CYCLOGENESIS (FORMATION 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



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 & FORECAST TRACK, MAXIMUM SUSTAINED WIND AND CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM "MICHAUNG" OVER WESTCENTRAL AND ADJOINING SOUTHWEST BAY OF BENGAL BASED ON 0000 UTC (0530 IST) OF 04<sup>TH</sup> DECEMBER 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)

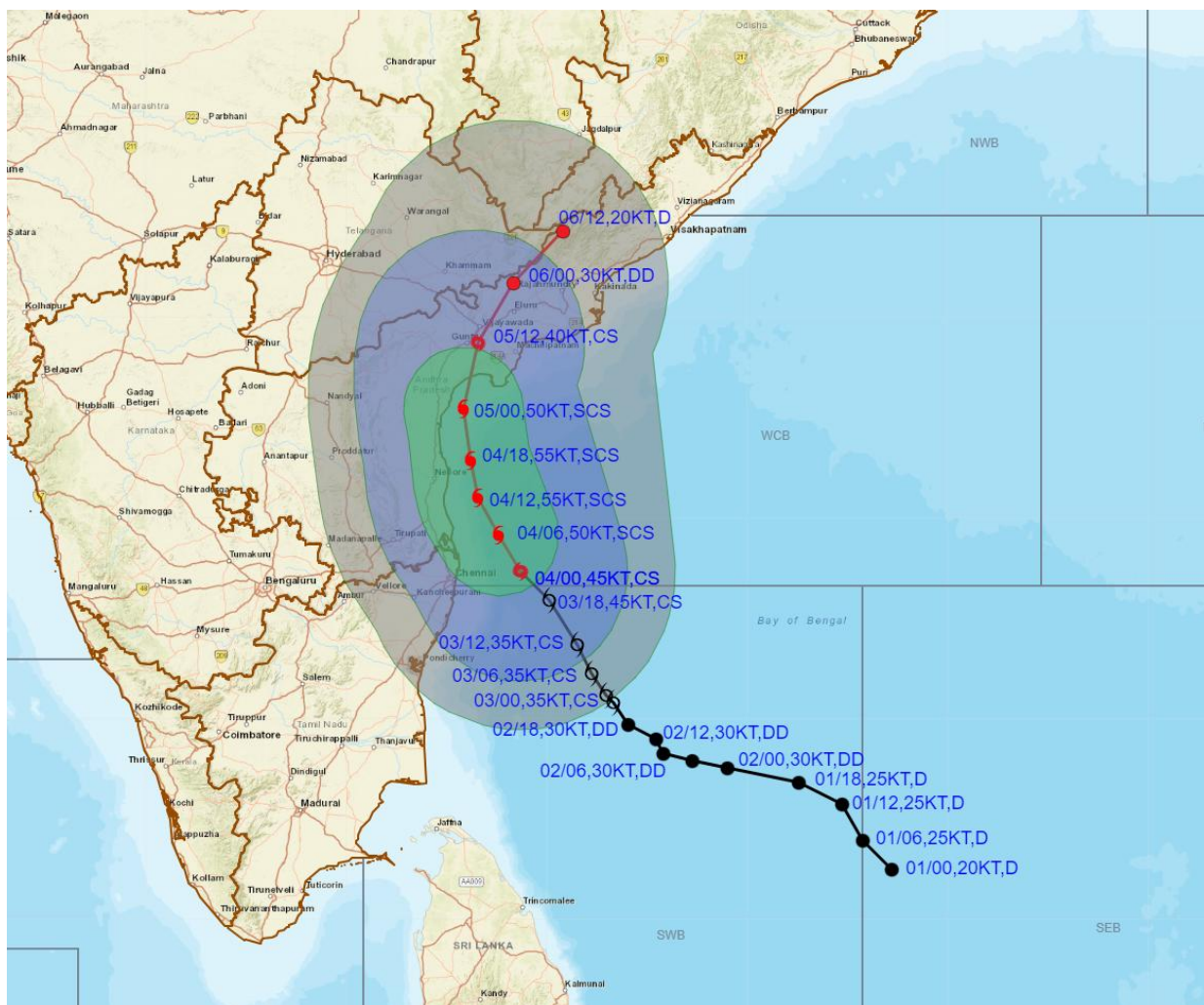
- LESS THAN 34 KT
- 34-47 KT
- ≥ 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

Forecast	DISTANCE (KM) AND DIRECTION FROM STATIONS				
	MO PONDICHERRY	CHENNAI/MINAMBAKKAM	NELLORE	BAPATLA	MACHILIPATNAM/ FRANCHPET
04.12.23/0000	210, NE	120, ENE	190, SE	310, SSE	330, S
05.12.23/0000	390, N	270, N	120, NNE	60, S	110, SW
06.12.23/0000	590, NNE	470, NNE	320, NNE	150, NNE	110, N

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 & FORECAST TRACK, MAXIMUM SUSTAINED WIND AND QUADRANT WIND IN ASSOCIATION WITH CYCLONIC STORM "MICHAUNG" OVER WESTCENTRAL AND ADJOINING SOUTHWEST BAY OF BENGAL BASED ON 0000 UTC (0530 IST) OF 04<sup>TH</sup> DECEMBER 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 (≥20 KT)

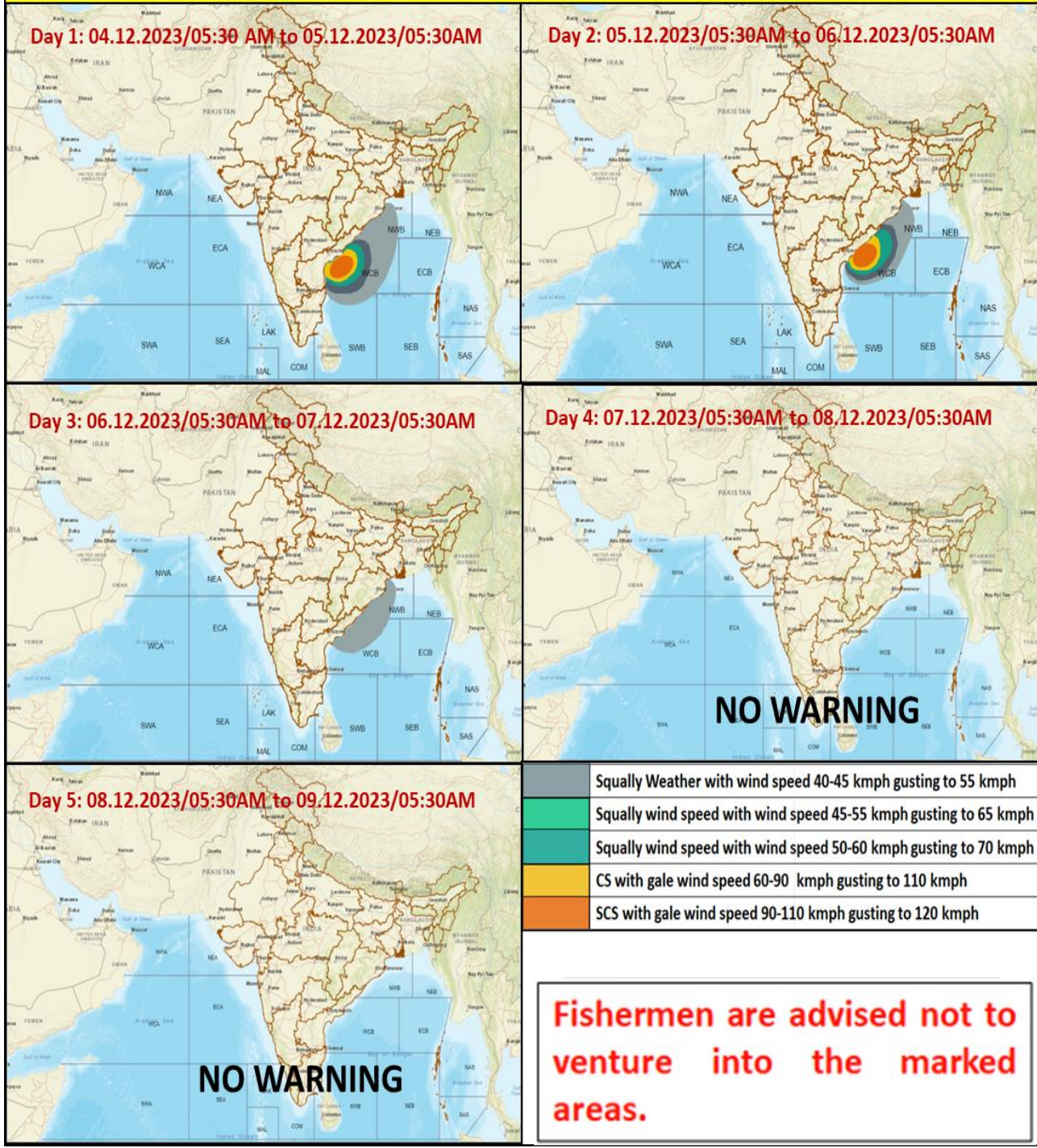
● LESS THAN 34 KT  
 ○ 34-47 KT  
 ⊙ ≥ 48 KT  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 ● CONE OF UNCERTAINTY  
 AREA OF MAXIMUM SUSTAINED WIND SPEED:  
 ■ 28-33 KT (52-61 KMPH)  
 ■ 34-49 KT (62-91 KMPH)  
 ■ 50-63 KT (92-117 KMPH)  
 ■ ≥ 64 KT (≥118 KMPH)

**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

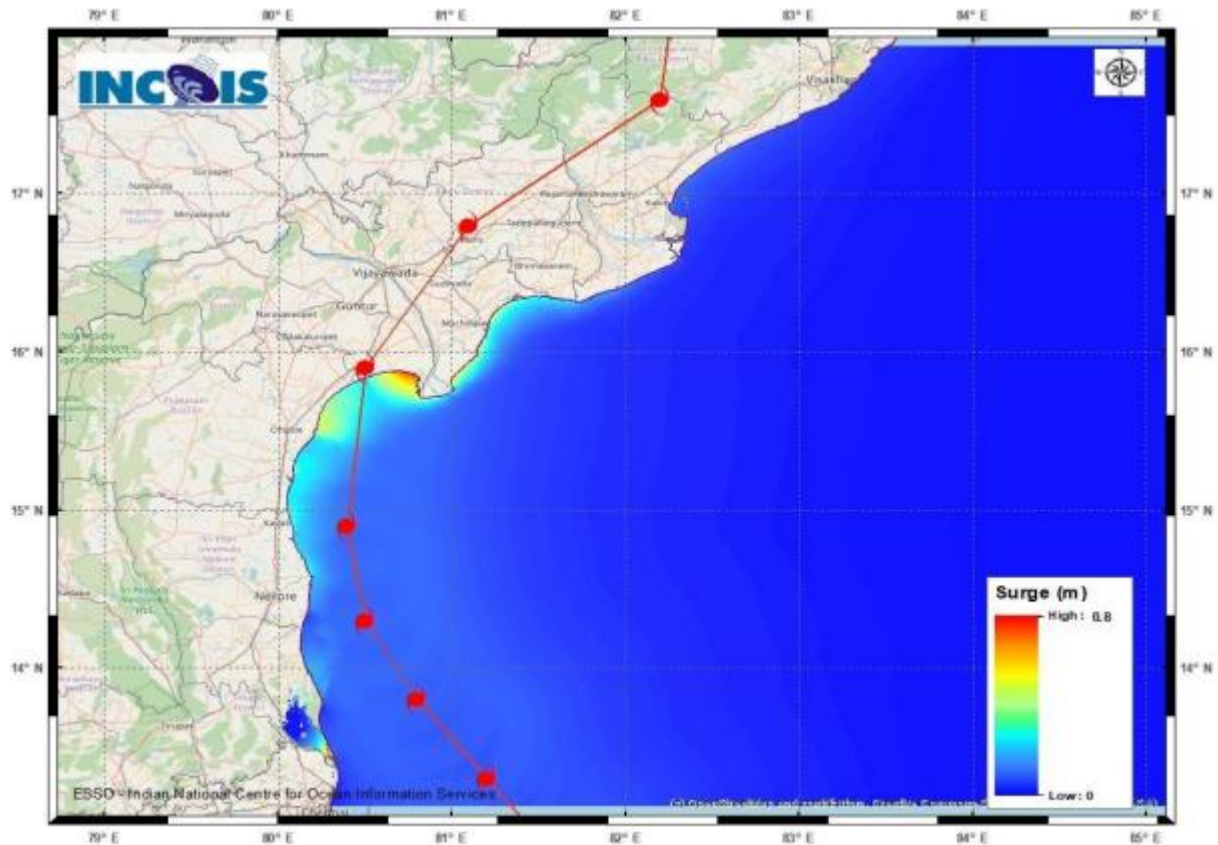
Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C  
 PROBABILITY OF CYCLOGENESIS (FORMATION 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

## Storm Surge Warning Graphics based on Forecast Track



### STORM SURGE HEIGHT INFORMATION:

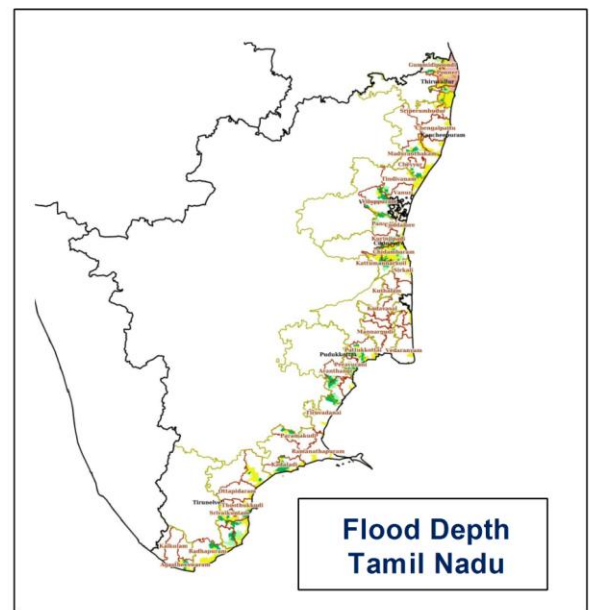
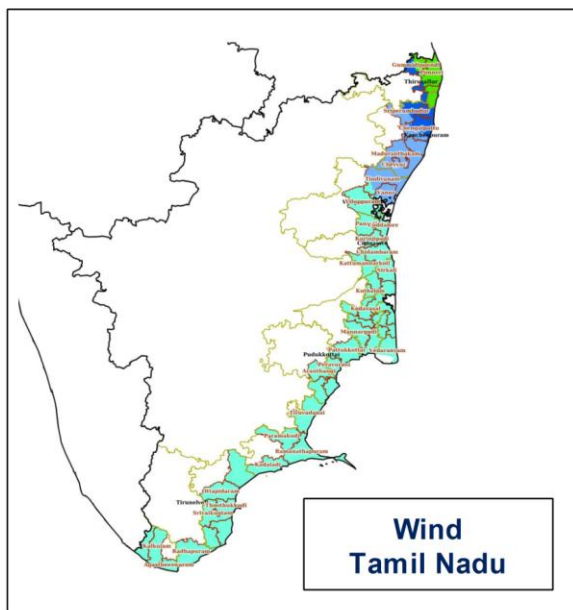
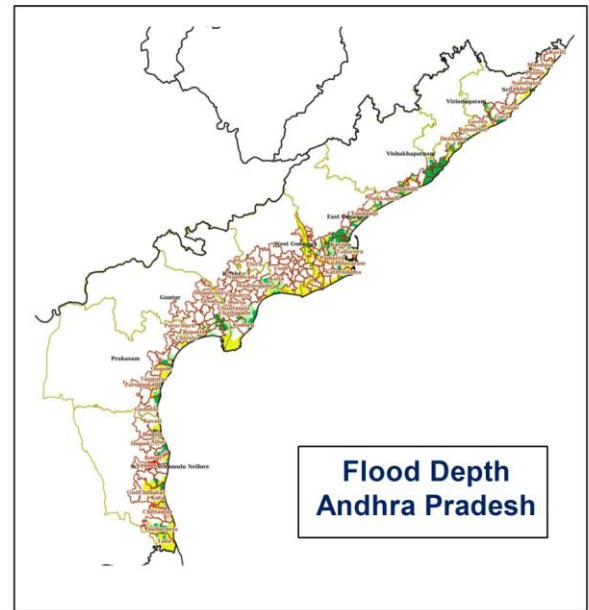
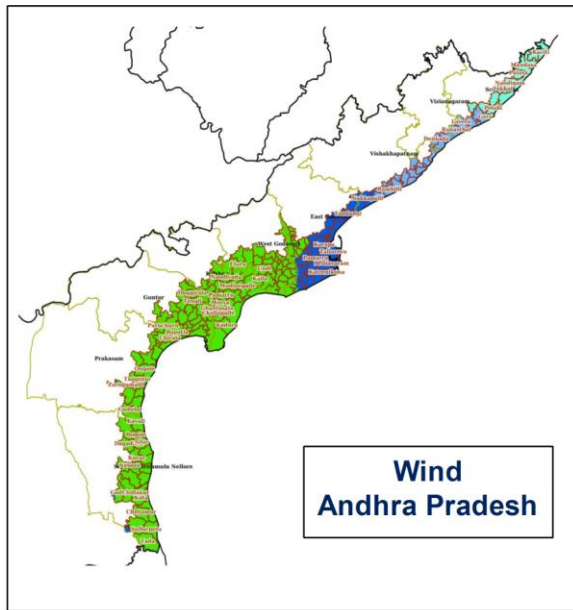
\* The below listed surge heights are over and above astronomical tide.

MANDAL/TALUK	DISTRICT	STATE/UNION TERRITORY	NEAREST PLACE OF HABITATION	STORM SURGE (m)	EXPECTED INUNDATION EXTENT (km)
Avanigadda	Krishna	Andhra Pradesh	Ramakrishnapuram	0.3-0.6	Upto 0.25
Machilipatnam	Krishna	Andhra Pradesh	Perupalem	0.3-0.5	Upto 0.17
Ongole	Prakasam	Andhra Pradesh	Kanuparthi	0.2-0.5	Upto 0.15
Ponneri	Thiruvallur	Tamil Nadu	Karimanal	0.2-0.7	Upto 0.27
Repalle	Guntur	Andhra Pradesh	Repalle	0.4-0.8	Upto 0.25
Sullurpeta	Nellore	Andhra Pradesh	Pudilayadoruvu	0.2-0.6	Upto 0.18

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



# Hazard Map with CYCLONIC STORM "MICHAUNG" Over Southwest Bay of Bengal



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