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

**TROPICAL CYCLONE ADVISORY NO. 11**

**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. 11 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 04.12.2023 BASED ON 0600 UTC OF 04.12.2023**

**SUB: SEVERE CYCLONIC STORM "MICHAUNG" (PRONOUNCED AS "MIGJAUM") OVER WEST CENTRAL AND ADJOINING SOUTHWEST BAY OF BENGAL OFF SOUTH ANDHRA PRADESH AND NORTH TAMILNADU COASTS**

THE SEVERE CYCLONIC STORM **"MICHAUNG" (PRONOUNCED AS "MIGJAUM")** OVER WESTCENTRAL AND ADJOINING SOUTHWEST BAY OF BENGAL **OFF SOUTH ANDHRA PRADESH AND ADJOINING NORTH TAMILNADU COASTS** MOVED NORTHWESTWARDS WITH A SPEED OF 08 KMPH DURING PAST 06 HOURS, OVER THE SAME REGION AND LAY CENTERED AT 0600 UTC OF TODAY, THE 4$^{TH}$ DECEMBER, 2023, NEAR LATITUDE 13.5°N AND LONGITUDE 80.8°E, ABOUT 90 KM NORTHEAST OF CHENNAI (43279), 140 KM SOUTHEAST OF NELLORE (43245), 200 KM NORTH-NORTHEAST OF PUDUCHERRY (43331),270 KM SOUTH OF BAPATLA (43220) AND 300 KM SOUTH OF MACHILIPATNAM (43185).

IT IS LIKELY TO INTENSIFY GRADUALLY AND 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$^{TH}$ 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. $^0$N/ LONG. $^0$E) | MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH) | CATEGORY OF CYCLONIC DISTURBANCE |
|---|---|---|---|
| 04.12.23/0600 | 13.5/80.8 | 85-95 KMPH GUSTING TO 105 KMPH | SEVERE CYCLONIC STORM |
| 04.12.23/1200 | 14.1/80.5 | 95-105 KMPH GUSTING TO 115 KMPH | SEVERE CYCLONIC STORM |
| 04.12.23/1800 | 14.7/80.4 | 95-105 KMPH GUSTING TO 115 KMPH | SEVERE CYCLONIC STORM |
| 05.12.23/0000 | 15.3/80.4 | 90-100 KMPH GUSTING TO 110 KMPH | SEVERE CYCLONIC STORM |
| 05.12.23/0600 | 15.8/80.4 | 90-100 KMPH GUSTING TO 110 KMPH | SEVERE CYCLONIC STORM |
| 05.12.23/1800 | 16.7/80.8 | 60-70 KMPH GUSTING TO 80 KMPH | CYCLONIC STORM |
| 06.12.23/0600 | 17.4/81.4 | 40-50 KMPH GUSTING TO 60 KMPH | DEPRESSION |
| 06.12.23/1800 | 17.9/82.1 | 20-30 KMPH GUSTING TO 40 KMPH | WELL MARKED LOW PRESSURE AREA |

INSAT-3D IMAGERY AT 0600 UTC OF 4$^{TH}$ DECEMBER, INDICATES THE ORGANISATION OF CLOUD MASS. ASSOCIATED INTENSITY IS T3.0. ASSOCIATED SCATTERED TO BROKEN LOW/MEDIUM CLOUDS WITH EMBEDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTH-WESTAND ADJOINING WEST-CENTRAL BAY OF BENGAL BETWEEN LATITUDE 10.0°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 50 KNOTS GUSTING TO 60 KNOTS. ESTIMATED CENTRAL PRESSURE IS 994 HPA. SEA CONDITION IS LIKELY TO BE HIGH TO VERY HIGH OVER SOUTHWEST BAY OF BENGAL.

MADDEN JULIAN OSCILLATION (MJO) IS CURRENTLY IN PHASE 4 WITH AMPLITUDE GREATER THAN 1. SEA SURFACE TEMPERATURE IS 28$^0$C AROUND SYSTEM. TROPICAL CYCLONE HEAT POTENTIAL IS 60-70 KJ/CM$^2$ OVER SOUTHWEST 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 OVER CENTRAL BOB TILL 4$^{TH}$ DECEMBER. ALL THESE LARGE SCALE FEATURES ARE FAVOURABLE FOR FURTHER INTENSIFICATION OF THE SYSTEM.

CURRENT ENVIRONMENTAL FEATURES INDICATE, THE LOW LEVEL VORTICITY OF ABOUT 200X10$^{-6}$S$^{-1}$ AROUND SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE VORTICITY FIELD SHOWS NO TILTING WITH HEIGHT. POSITIVE LOW LEVEL CONVERGENCE IS ABOUT 40 X 10$^{-5}$ S$^{-1}$ TO THE EAST OF SYSTEM CENTRE. POSITIVE UPPER LEVEL DIVERGENCE IS ABOUT 30 X 10$^{-5}$ S$^{-1}$ TO THE NORTHEAST OF THE SYSTEM CENTRE WITH LESS DIVERGENCE EQUATORWARD. 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$^0$N. THE SYSTEM IS CLOSER TO THE RIDGE AND HENCE WOULD MOVE NEARLY NORTHWARDS TILL 5$^{TH}$ DECEMBER 0000 UTC AND RECURVE NORTHEASTWARDS THEREAFTER. 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 INTIAL NORTHWESTWARDS MOVEMENT TOWARDS ANDHRA PRADESH COAST. THE LANDFALL POINT IS VARYING BETWEEN LATITUDE 15.1-15.7$^0$N/80.0-80.3$^0$E. THE LANDFALL TIME IS VARYING BETWEEN 5$^{TH}$/0000 UTC TO 5$^{TH}$ /0900 UTC.

CONSIDERING ALL THE ABOVE, THE SEVERE CYCLONIC STORM IS LIKELY TO INTENSIFY GRADUALLY AND 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$^{TH}$ DECEMBER AS A **SEVERE CYCLONIC STORM** WITH A MAXIMUM SUSTAINED WIND SPEED OF 90-100 KMPH GUSTING TO 110 KMPH.

(SHIBIN BALAKRISHNAN)
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%**
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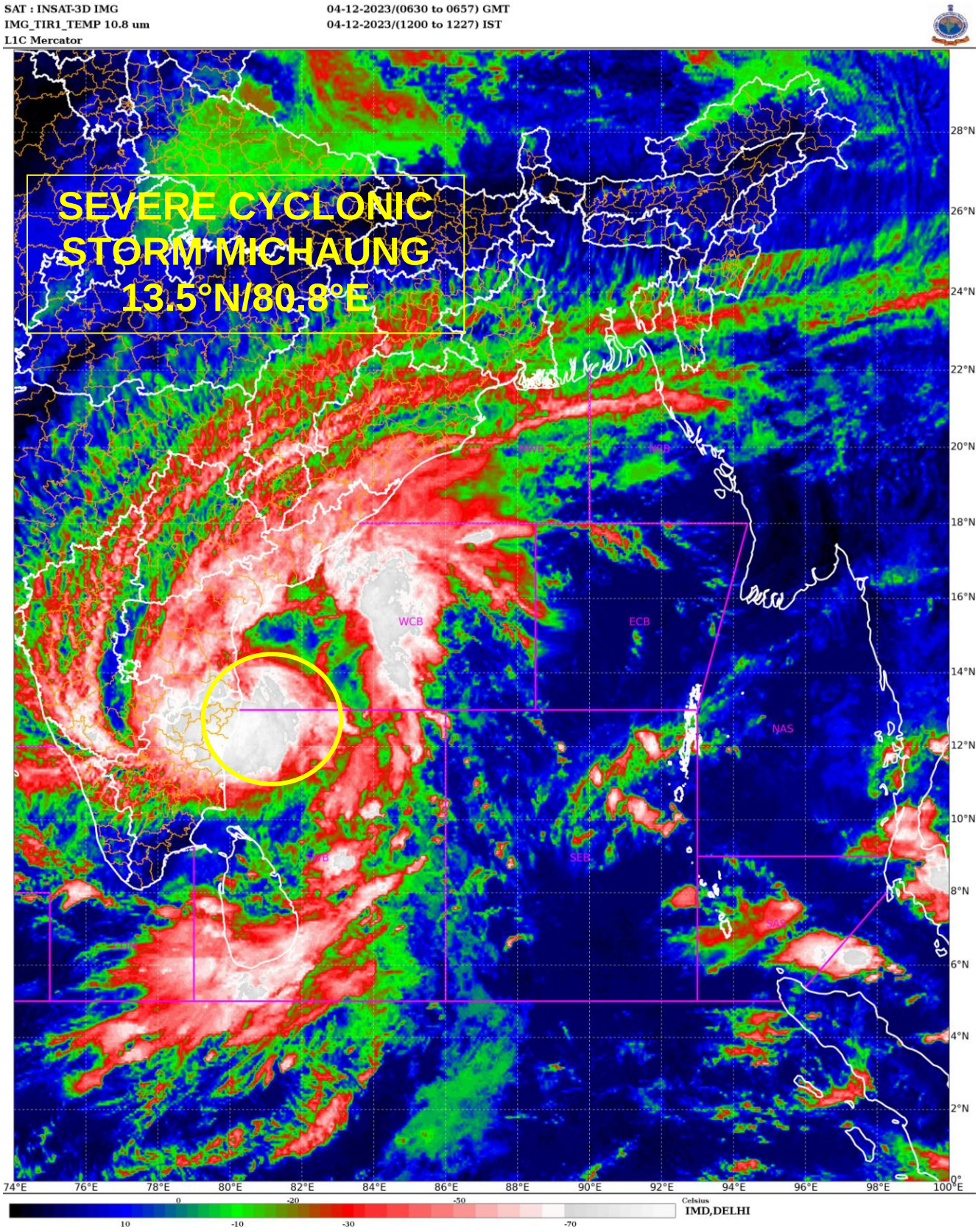


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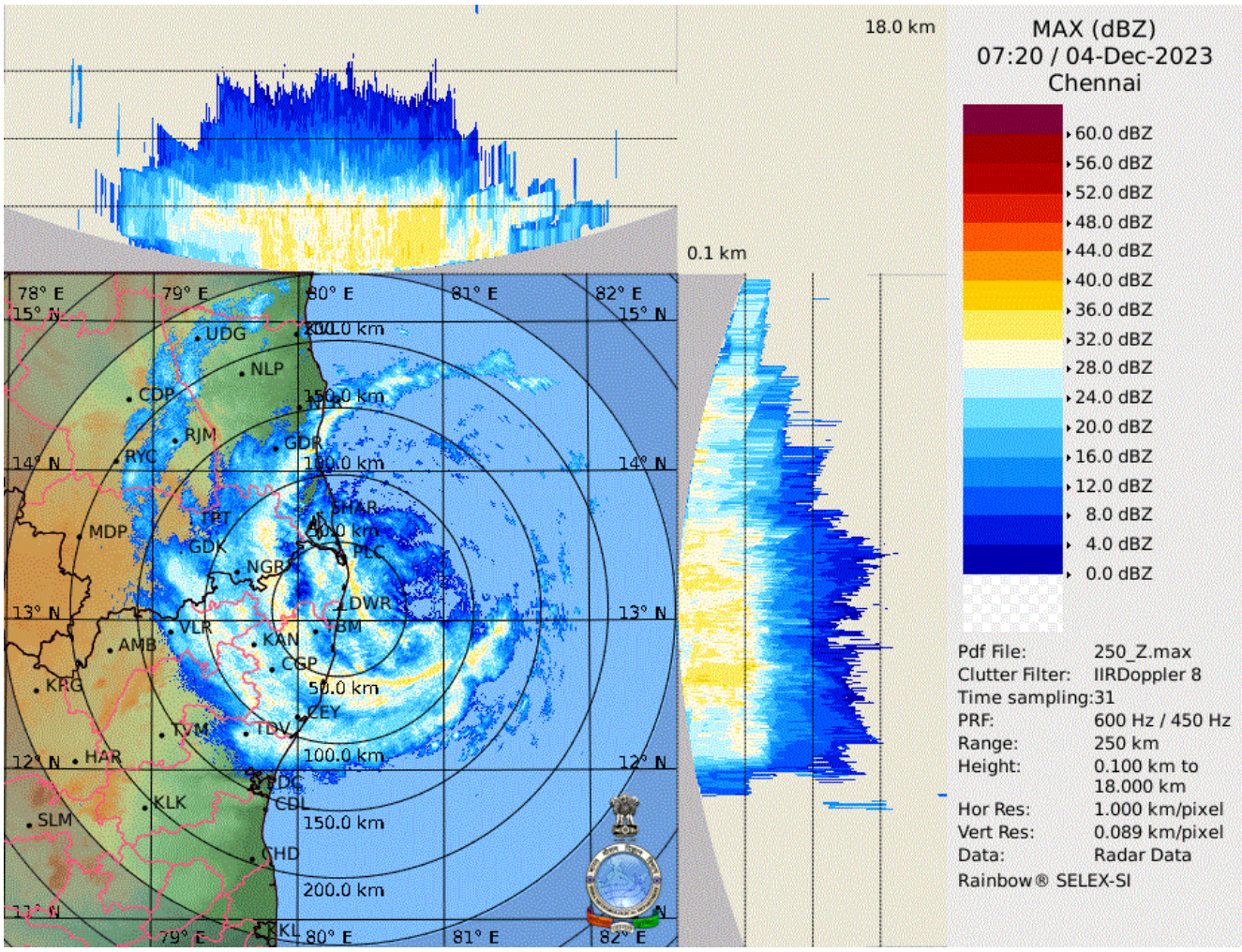


# CHENNAI DWR

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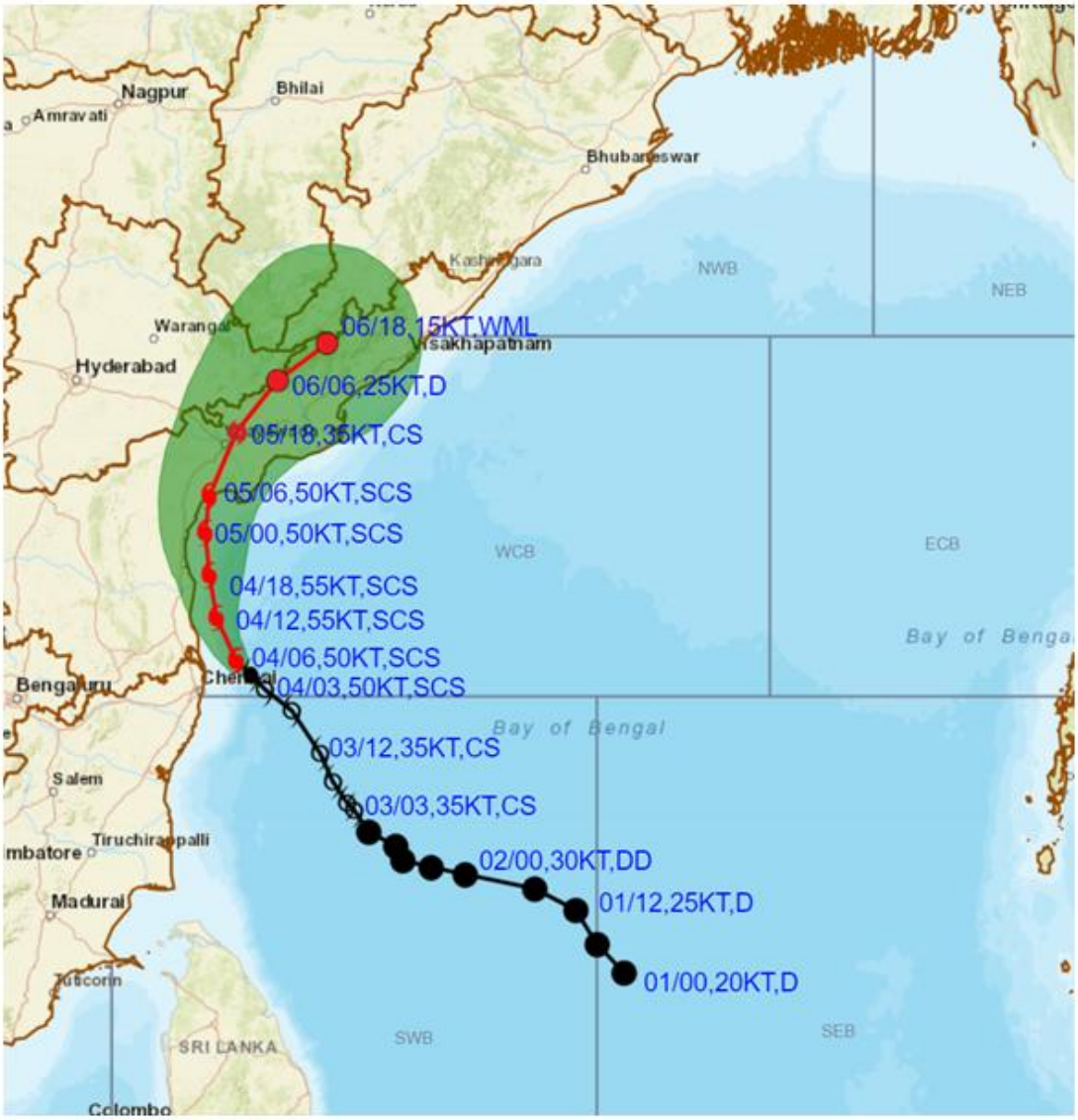
# OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINITY IN ASSOCIATION WITH SEVERE CYCLONIC STORM "MICHAUNG" OVER WESTCENTRAL & ADJOINING SOUTHWEST BAY OF BENGAL BASED ON 0600 UTC (1130 IST) OF 4TH DECEMBER 2023.




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 | | | | |
|---|---|---|---|---|---|
| Date and Time (UTC) | CHENNAI/MINAMBAKKAM | NELLORE | MO PONDICHERRY | BAPATLA | MACHILIPATNAM/ FRANCHPET |
| 04.12.23/0600 | 90, NE | 140, SE | 210, NNE | 260, S | 300, S |
| 05.12.23/0600 | 320, N | 160, NNE | 440, N | 20, SSW | 100, WSW |
| 06.12.23/0600 | 510, NNE | 370, NNE | 630, NNE | 200, NNE | 140, N |

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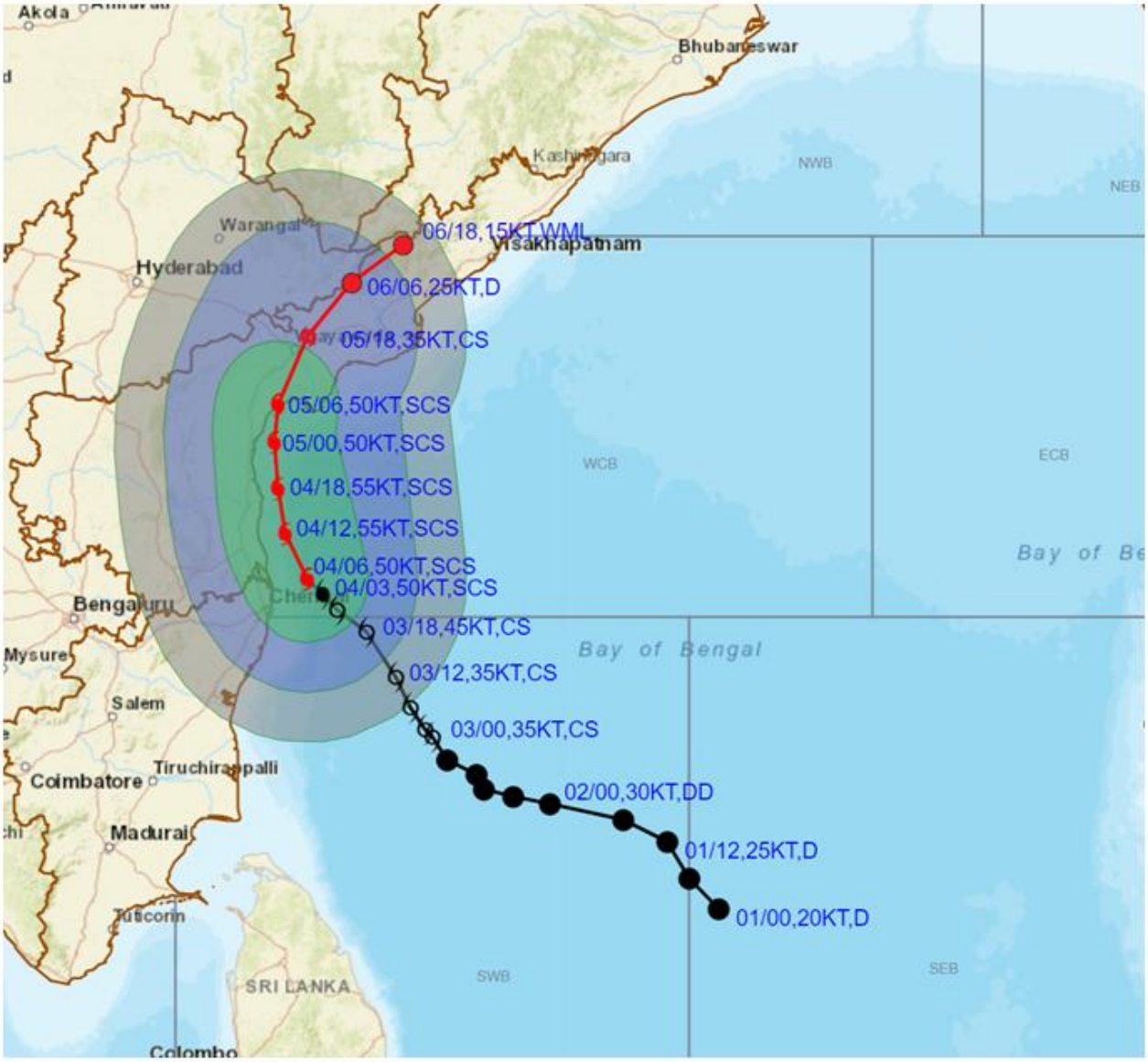
# OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND IN ASSOCIATION WITH SEVERE CYCLONIC STORM "MICHAUNG" OVER WESTCENTRAL & ADJOINING SOUTHWEST BAY OF BENGAL BASED ON 0600 UTC (1130 IST) OF 4TH DECEMBER 2023.

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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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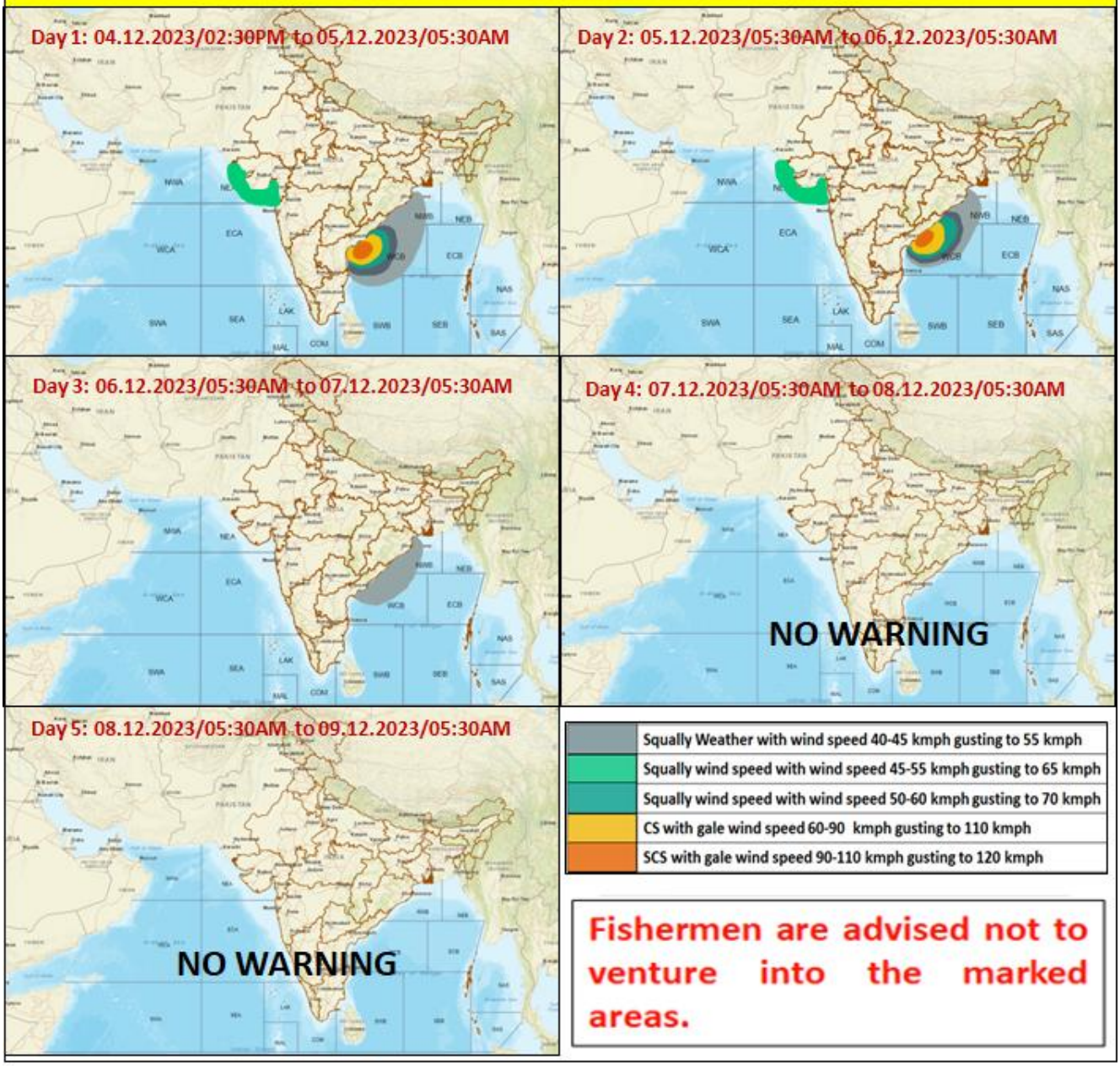
## Fishermen Warning Graphics

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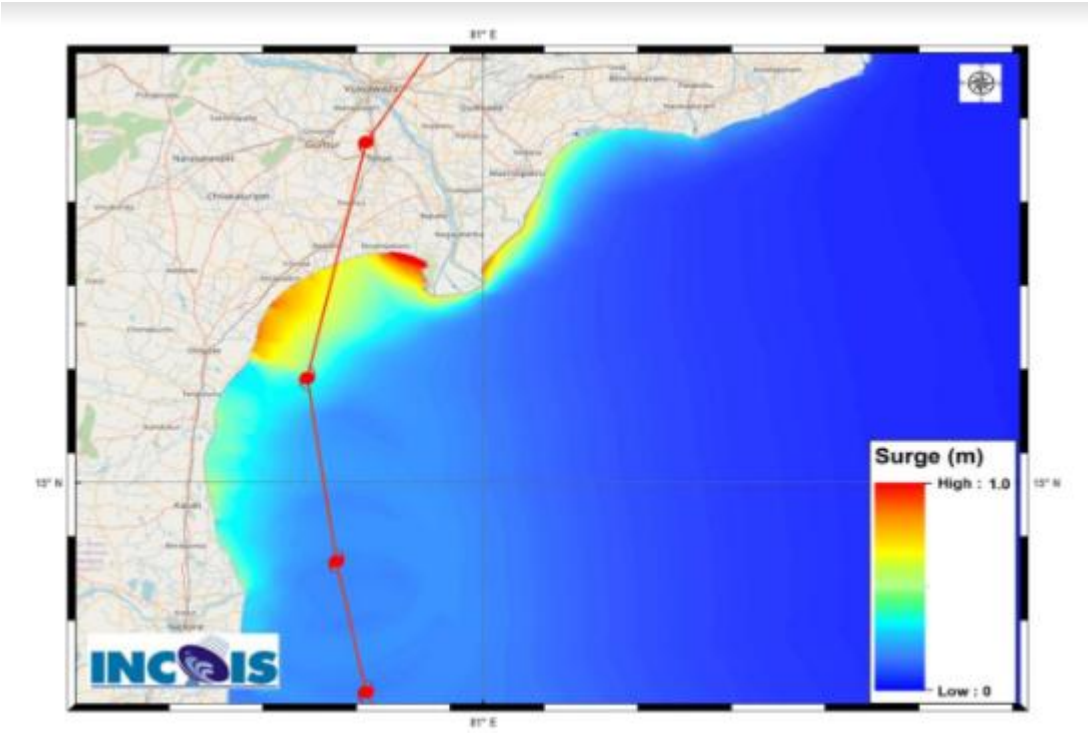
# Storm Surge Warning Graphics based on Forecast Track




**STORM SURGE HEIGHT INFORMATION:**

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

| MANDAL/TALUK | DISTRICT | STATE/UNION TERRITORY | NEARESTPLACE OF HABITATION | STORM SURGE (m) | EXPECTED INUNDATION EXTENT (km) |
|---|---|---|---|---|---|
| Repalle | Guntur | Andhra Pradesh | Repalle | 0.4-1.0 | Upto 0.25 |
| Avanigadda | Krishna | Andhra Pradesh | Ramakrishnapuram | 0.3-0.8 | Upto 0.20 |
| Machilipatnam | Krishna | Andhra Pradesh | Perupalem | 0.2-0.8 | Upto 0.15 |
| Chirala | Prakasam | Andhra Pradesh | Kotha Peta(Rural) | 0.4-0.6 | Upto 0.12 |
| Kovvur | Nellore | Andhra Pradesh | Isakapalle | 0.3-0.5 | Nill |
| Ongole | Prakasam | Andhra Pradesh | Kanuparthi | 0.2-0.5 | Upto 0.13 |
| Sullurpeta | Nellore | Andhra Pradesh | Pudilayadoruvu | 0.2-0.6 | Upto 0.18 |

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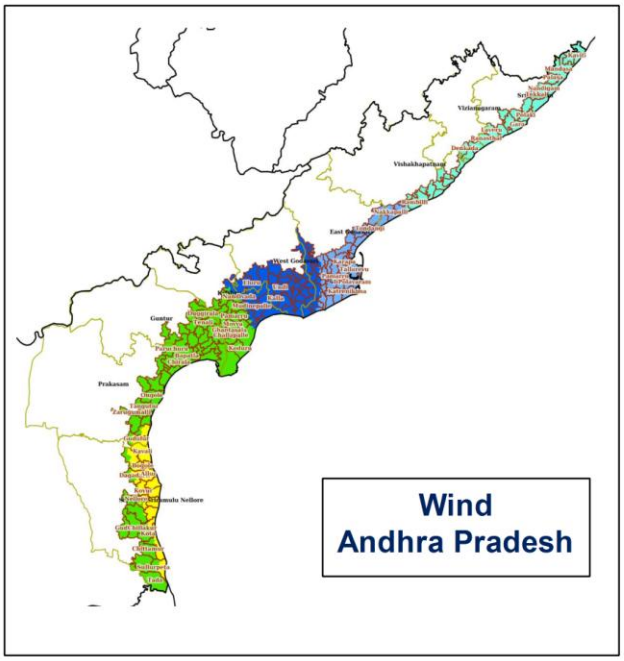
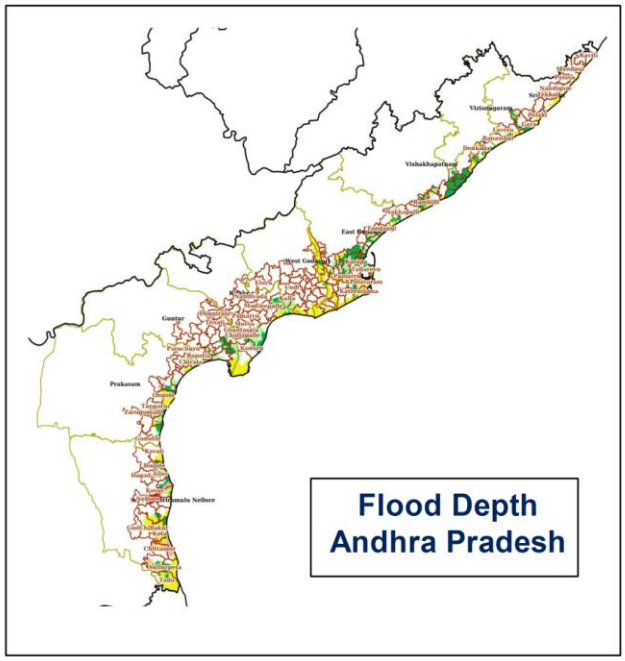
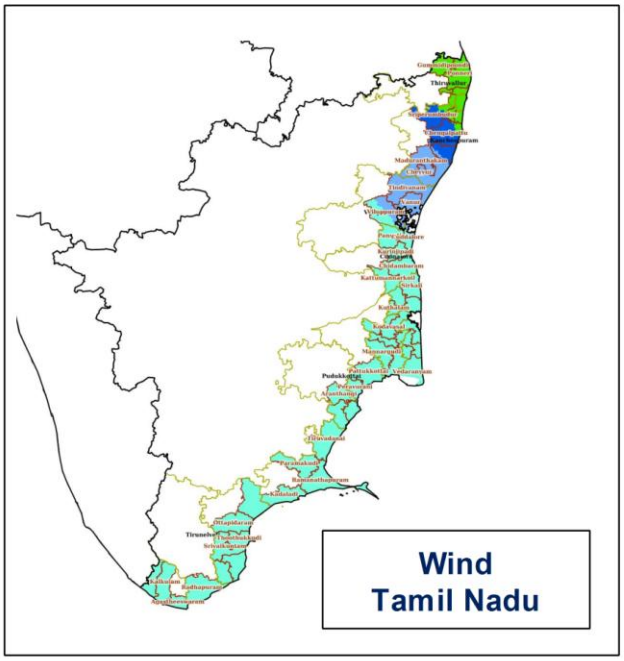
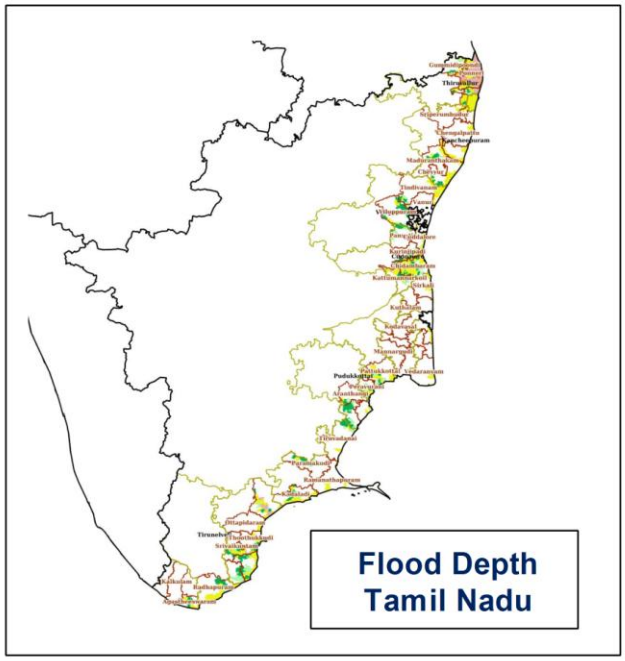
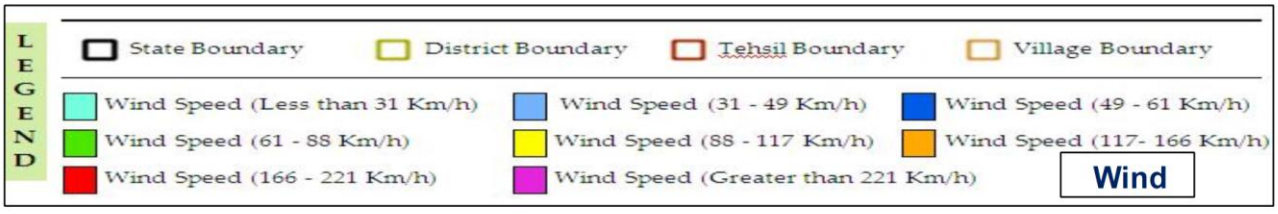
# Hazard Map with CYCLONIC STORM “MICHAUNG” Over Southwest Bay of Bengal

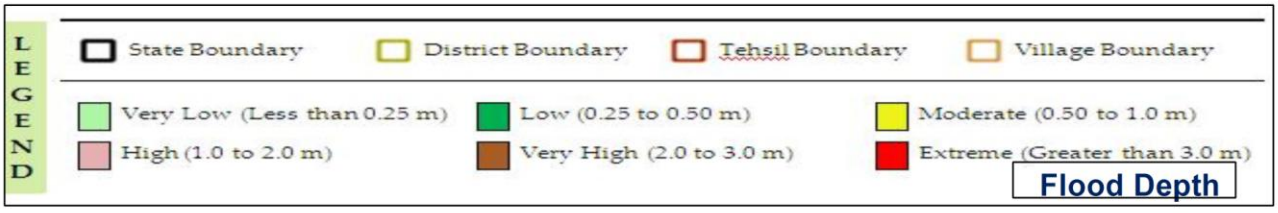
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