



REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI

SPECIAL TROPICAL WEATHER OUTLOOK

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 02.12.2023

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND THE ARABIAN SEA) VALID FOR NEXT 168 HOURS ISSUED AT 2000 UTC OF 02.12.2023 BASED ON 1800 UTC OF 02.12.2023.

SUB: DEEP DEPRESSION OVER SOUTHWEST BAY OF BENGAL (CYCLONE ALERT FOR ANDHRA PRADESH AND ADJOINING NORTH TAMIL NADU-PUDUCHERRY COASTS: **YELLOW MESSAGE)**

THE DEEP DEPRESSION OVER SOUTHWEST BAY OF BENGAL MOVED NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1800 UTC OF THE 2ND DECEMBER, 2023 OVER THE SAME REGION NEAR LATITUDE 11.2°N AND LONGITUDE 82.7°E, ABOUT 330 KM EAST-SOUTHEAST OF PUDUCHERRY (43331), 340 KM SOUTHEAST OF CHENNAI (43279), 470 KM SOUTHEAST OF NELLORE (43245), 580 KM SOUTH-SOUTHEAST OF BAPATLA (43220) AND 580 KM SOUTH-SOUTHEAST OF MACHILIPATNAM (43185).

IT IS LIKELY TO MOVE NORTHWESTWARDS AND INTENSIFY INTO A CYCLONIC STORM OVER SOUTHWEST BAY OF BENGAL DURING NEXT 12 HOURS. THEREAFTER, IT WOULD MOVE NORTHWESTWARDS AND REACH WESTCENTRAL BAY OF BENGAL OFF SOUTH ANDHRA PRADESH AND ADJOINING NORTH TAMILNADU COASTS BY 0600 UTC OF 4TH 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 AROUND 0600 UTC OF 5TH DECEMBER AS A **CYCLONIC STORM** WITH A MAXIMUM SUSTAINED WIND SPEED OF 80-90 KMPH GUSTING TO 100 KMPH.

TRACK AND INTENSITY FORECASTS:

DATE/TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
02.12.23/1800	11.2/82.7	55-65 KMPH GUSTING TO 75 KMPH	DEEP DEPRESSION
03.12.23/0000	11.7/82.3	60-70 KMPH GUSTING TO 80 KMPH	CYCLONIC STORM
03.12.23/0600	12.2/81.9	65-75 KMPH GUSTING TO 85 KMPH	CYCLONIC STORM
03.12.23/1200	12.6/81.5	70-80 KMPH GUSTING TO 90 KMPH	CYCLONIC STORM
03.12.23/1800	13.1/81.2	75-85 KMPH GUSTING TO 95 KMPH	CYCLONIC STORM
04.12.23/0600	14.0/80.8	80-90 KMPH GUSTING TO 100 KMPH	CYCLONIC STORM
04.12.23/1800	15.0/80.7	80-90 KMPH GUSTING TO 100 KMPH	CYCLONIC STORM
05.12.23/0600	16.0/80.9	80-90 KMPH GUSTING TO 100 KMPH	CYCLONIC STORM
05.12.23/1800	17.0/81.7	65-75 KMPH GUSTING TO 85 KMPH	CYCLONIC STORM
06.12.23/0600	18.0/82.9	45-55 KMPH GUSTING TO 65 KMPH	DEPRESSION

INSAT-3D IMAGERY AT 1800 UTC, INDICATE FURTHER ORGANISATION OF CLOUD MASS. ASSOCIATED INTENSITY IS T2.0. ASSOCIATED SCATTERED TO BROKEN LOW/MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTH AND ADJOINING CENTRAL BAY OF BENGAL BETWEEN LATITUDE 6.0°N TO 17.0°N LONGITUDE 80.0E TO 90.0E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEGREE CELSIUS.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. ESTIMATED CENTRAL PRESSURE IS 1000 HPA. SEA CONDITION IS LIKELY TO BE VERY ROUGH OVER THE SOUTHWEST BAY OF BENGAL.

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 2ND TO 6TH DECEMBER. THUS, MJO WOULD SUPPORT CYCLOGENESIS OVER THE BAY OF BENGAL (BOB) REGION TILL 6TH DECEMBER. SEA SURFACE TEMPERATURE ALONG 27⁰C. TROPICAL CYCLONE HEAT POTENTIAL IS 60-70 KJ/CM² OVER SOUTHWEST AND WESTCENTRAL 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 4TH DECEMBER. THE CONVECTIVE CLOUD CLUSTERS ARE COMING CLOSER. ALL THESE LARGE SCALE FEATURES ARE FAVOURABLE FOR FURTHER INTENSIFICATION OF SYSTEM INTO A CYCLONIC STORM.

CURRENT ENVIRONMENTAL FEATURES INDICATE, THE LOW LEVEL VORTICITY OF $100 \times 10^{-6} \text{S}^{-1}$ AROUND SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE VORTICITY FIELD SHOWS NO TILTING WITH HEIGHT. POSITIVE LOW LEVEL CONVERGENCE IS ALMOST SAME DURING PAST 6 HOURS AND IS ABOUT $20 \times 10^{-5} \text{S}^{-1}$ TO THE EAST OF SYSTEM CENTRE. POSITIVE UPPER LEVEL DIVERGENCE IS SAME AND IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ TO THE NORTHEAST OF THE SYSTEM CENTRE WITH LESS DIVERGENCE EQUATORWARD. THUS, EQUATORWARD OUTFLOW IS DECREASED AND POLEWARD OUTFLOW IS INCREASED. THERE IS NOT MUCH CHANGE IN WIND SHEAR AND IS ABOUT 10-20 KNOTS OVER SOUTHWEST BOB. TOTAL PRECIPITABLE WATER IMAGERY IS INDICATING WARM MOIST AIR ADVECTION FROM SOUTH AND SOUTHEAST SECTOR.

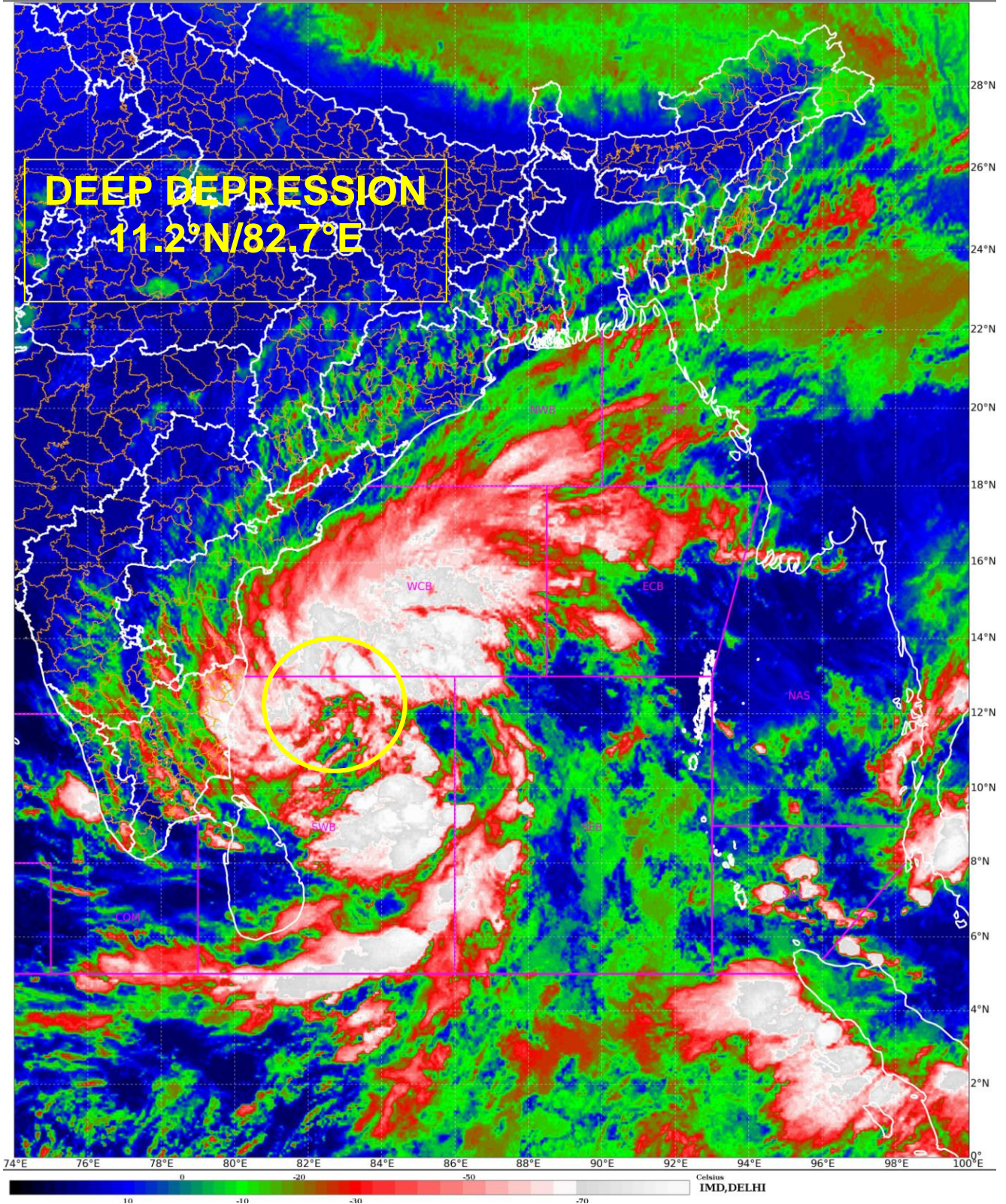
UPPER TROPOSPHERIC RIDGE RUNS ALONG 14⁰N. FROM 4TH DECEMBER/0000 UTC, THE SYSTEM WILL COME CLOSER TO THE RIDGE AND HENCE WOULD MOVE NEARLY NORTHWARDS AND BY 5TH /0000 UTC, IT WOULD CROSS RIDGE AND HENCE RECURVE NORTHEASTWARDS FROM 5TH DECEMBER/0000 UTC. UPPER TROPOSPHERIC WINDS ARE OF THE ORDER OF 50-60 KNOTS OVER NORTH ANDHRA PRADESH AND ODISHA COASTS. IT WOULD LEAD TO HIGHER WIND SHEAR.

MOST OF THE MODELS ARE INDICATING INTIAL WEST-NORTHWESTWARDS MOVEMENT FOLLOWED BY NORTHWESTWARDS MOVEMENT TOWARDS ANDHRA PRADESH COAST. THE LANDFALL POINT IS VARYING BETWEEN LATITUDE 15.5-16.5⁰N/80.0-82.0⁰E. HOWEVER, NCUM MODEL IS INDICATING LANDFALL NEAR 13.3N/80.1E. IMD MME IS INDICATING LANDFALL NEAR 16.3N/81.2E. THE LANDFALL TIME IS VARYING BETWEEN 4TH/1800 UTC TO 5TH /1500 UTC.

CONSIDERING ALL THE ABOVE, THE DEEP DEPRESSION IS LIKELY TO MOVE NORTHWESTWARDS AND INTENSIFY INTO A CYCLONIC STORM OVER SOUTHWEST BAY OF BENGAL DURING NEXT 12 HOURS. THEREAFTER, IT WOULD MOVE NORTHWESTWARDS AND REACH WESTCENTRAL BAY OF BENGAL OFF SOUTH ANDHRA PRADESH AND ADJOINING NORTH TAMILNADU COASTS BY 0600 UTC OF 4TH 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 AROUND 0600 UTC OF 5TH DECEMBER AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 80-90 KMPH GUSTING TO 100 KMPH.

(M. T BUSHAIR)
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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OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEEP DEPRESSION OVER SOUTHWEST BAY OF BENGAL BASED ON 1800 UTC (2330 IST) OF 02ND 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

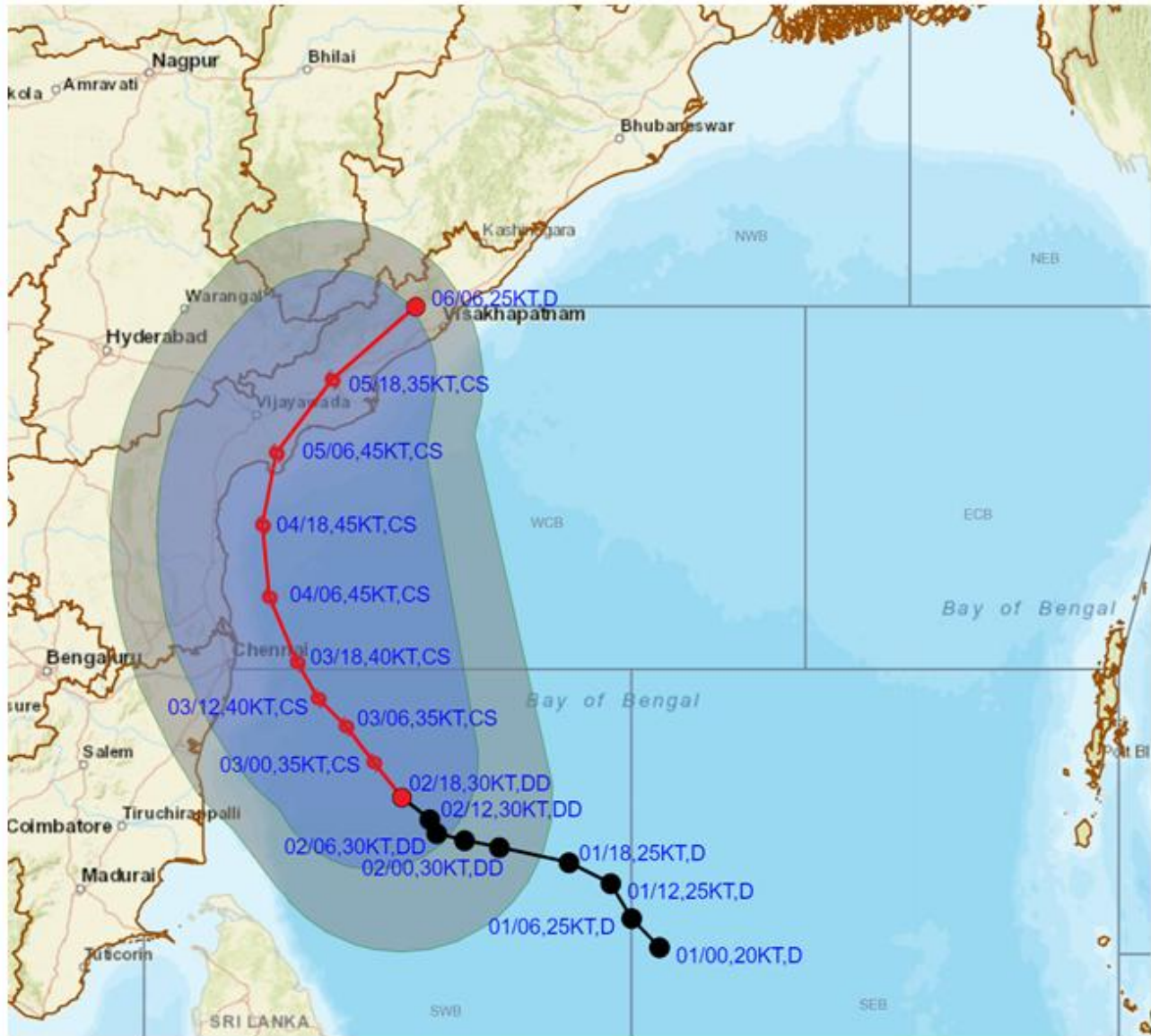
▲ CONE OF UNCERTAINTY

Forecast Date and Time (UTC)	DISTANCE (KM) AND DIRECTION FROM STATIONS				
	MO PONDICHERRY	CHENNAI/MINAMBAKKAM	NELLORE	BAPATLA	MACHILIPATNAM/ FRANCHPET
02.12.23/0600	390, ESE	410, SE	540, SE	650, SSE	650, SSE
03.12.23/0600	210, E	180, ESE	300, SE	420, SSE	430, S
04.12.23/0600	250, NNE	130, NNE	100, ESE	210, S	240, S
05.12.23/0600	470, NNE	350, NNE	200, NNE	50, ENE	40, SW
06.12.23/0600	760, NNE	640, NNE	520, NE	360, NE	290, NE

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OBSERVED & FORECAST TRACK, MAXIMUM SUSTAINED WIND AND QUADRANT WIND IN ASSOCIATION WITH DD OVER SOUTHWEST BAY OF BENGAL BASED ON 1800 UTC (2330 IST) OF 02ND 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)

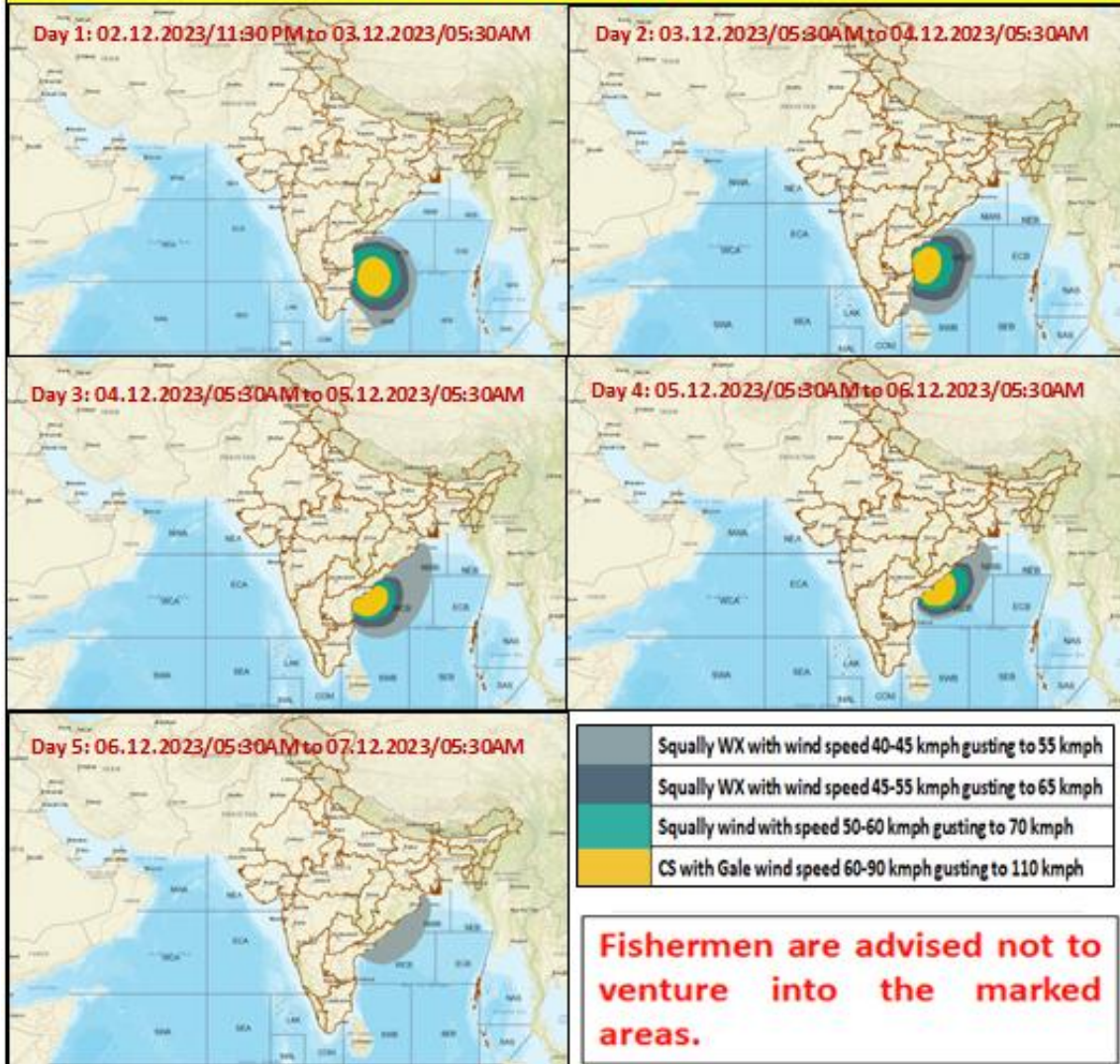
● LESS THAN 34 KT
 ○ 34-47 KT
 ● ≥ 48 KT
 — OBSERVED TRACK
 — FORECAST TRACK
 — CONE OF UNCERTAINTY
 AREA OF MAXIMUM SUSTAINED WIND SPEED:
 ■ 28-33 KT (52-61 KMPH)
 ■ 34-49 KT (62-91 KMPH)
 ■ 50-63 KT (92-117 KMPH)
 ■ ≥ 64 KT (≥118 KMPH)

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



Storm Surge Warning Graphics based on Forecast Track

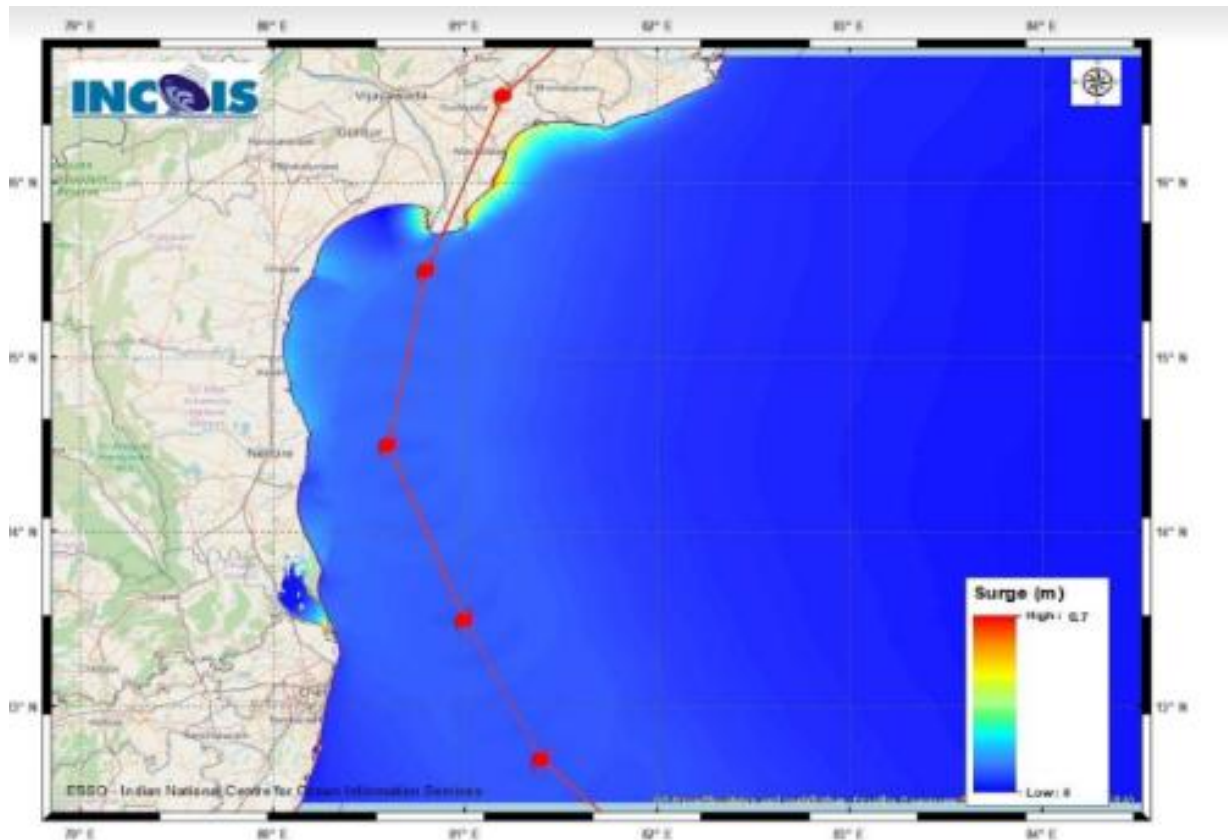


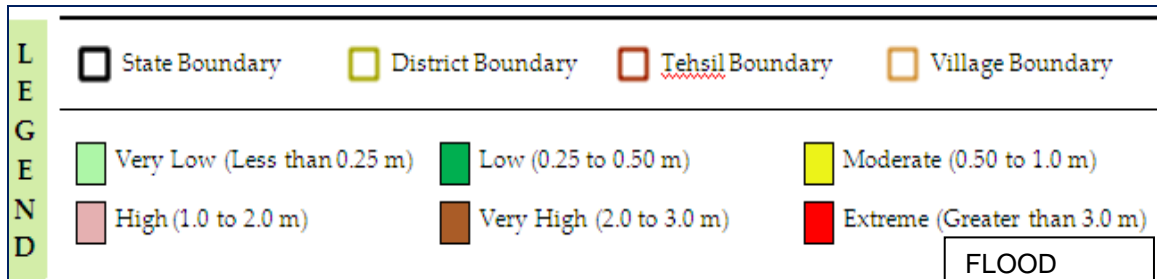
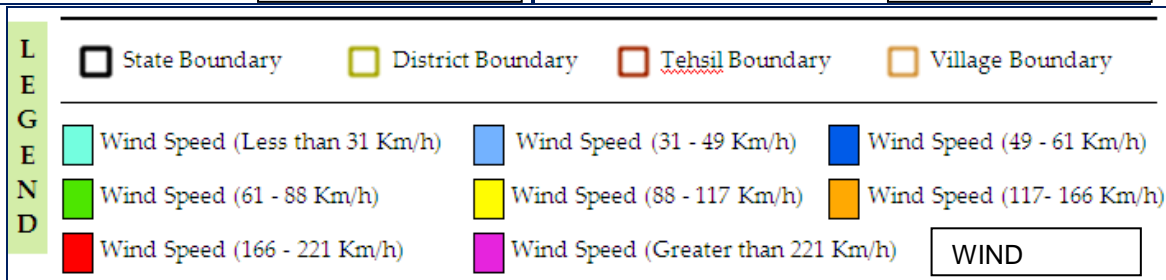
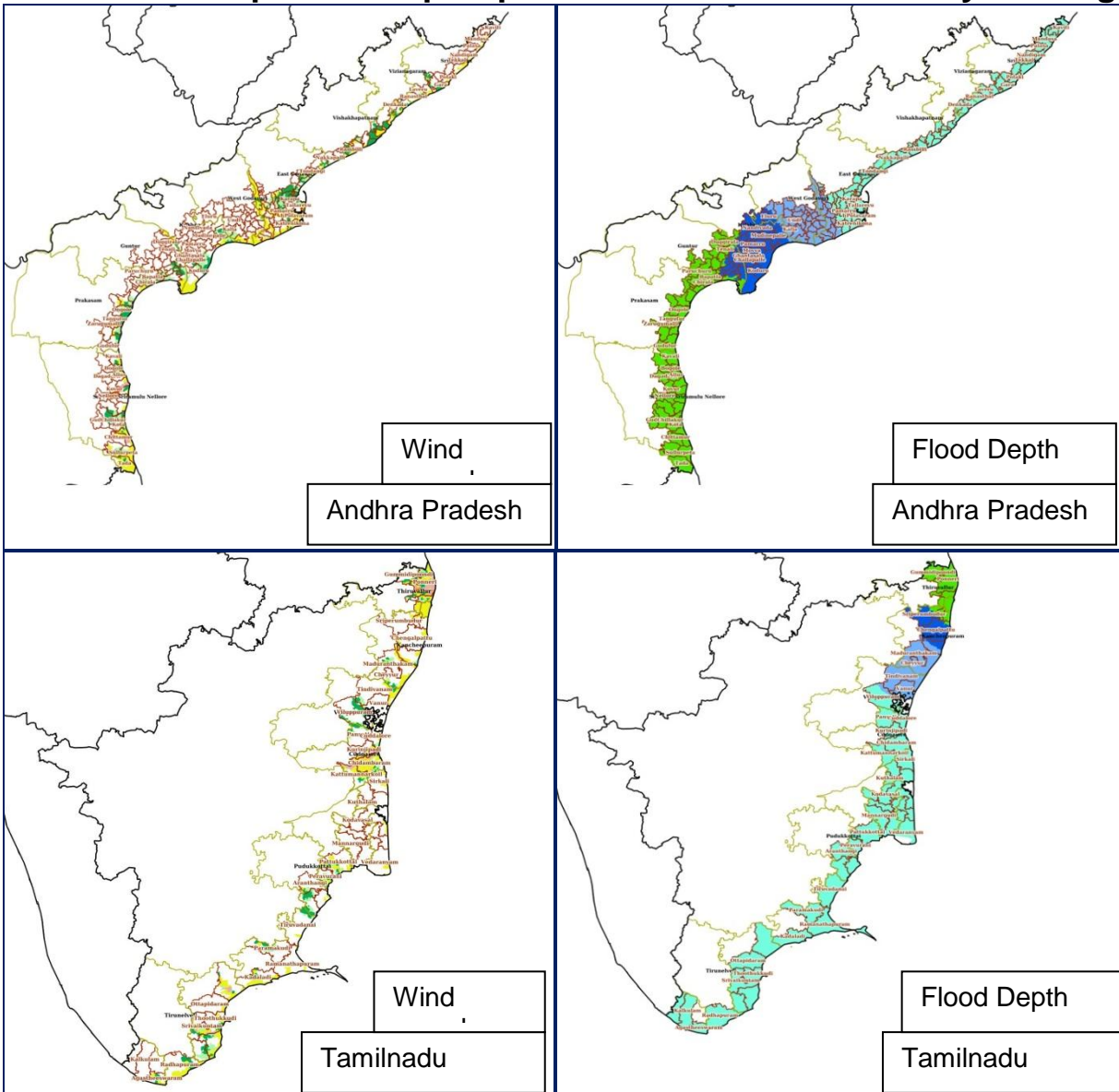
Figure: Storm Surge Map

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	0.3-0.7	Upto 0.15
Machilipatnam	Krishna	Andhra Pradesh	Perupalem	0.3-0.6	Upto 0.17
Repalle	Guntur	Andhra Pradesh	Repalle	0.2-0.5	Upto 0.25
Ponneri	Thiruvallur	Tamil Nadu	Karimanal	0.2-0.5	Upto 0.15

Hazard Map with Deep Depression over Southwest Bay of Bengal



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