



**India Meteorological Department
(Ministry of Earth Sciences)**

National Bulletin No. 16 (BOB/06/2023)

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Sub: Cyclonic Storm "MICHAUNG" (pronounced as MIGJAUM) over Southwest Bay of Bengal (Cyclone Warning for Andhra Pradesh and adjoining North Tamil Nadu-Puducherry Coasts: Orange Message)

The Cyclonic Storm "MICHAUNG" (pronounced as MIGJAUM) over Southwest Bay of Bengal moved north-northwestwards with a speed of 08 kmph during past 06 hours and lay centered at 2030 hours IST of today, the 3rd December, 2023 over the same region near Latitude 12.4°N and Longitude 81.9°E, about 230 km east-northeast of Puducherry, 190 km east-southeast of Chennai, 310 km southeast of Nellore, 410 km south-southeast of Bapatla and 430 km south-southeast of Machilipatnam.

It is likely to continue to move north-northwestwards, intensify further and reach Westcentral Bay Of Bengal off south Andhra Pradesh and adjoining north Tamilnadu coasts by 4th December forenoon. 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 during forenoon of 5th 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 (IST)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
03.12.23/2030	12.4/81.9	65-75 kmph gusting to 85 kmph	Cyclonic Storm
03.12.23/2330	12.6/81.7	70-80 kmph gusting to 90 kmph	Cyclonic Storm
04.12.23/0530	13.1/81.3	80-90 kmph gusting to 100 kmph	Cyclonic Storm
04.12.23/1130	13.7/80.8	85-95 kmph gusting to 105 kmph	Cyclonic Storm
04.12.23/1730	14.3/80.5	90-100 kmph gusting to 110 kmph	Severe Cyclonic Storm
05.12.23/0530	15.4/80.4	90-100 kmph gusting to 110 kmph	Severe Cyclonic Storm
05.12.23/1730	16.4/80.7	70-80 kmph gusting to 90 kmph	Cyclonic Storm
06.12.23/0530	17.2/81.7	50-60 kmph gusting to 70 kmph	Deep Depression
06.12.23/1730	18.0/82.8	30-40 kmph gusting to 50 kmph	Depression

Warnings:

(i) Rainfall Warning (graphics enclosed):

- **North Coastal Tamil Nadu & Puducherry:** Light to moderate rainfall at most places with heavy to very heavy rainfall at a few places with isolated extremely heavy falls is very likely on 3rd & 4th and isolated heavy rainfall on 5th December and decrease thereafter.
- **Coastal Andhra Pradesh:** Light to moderate rainfall at most places with heavy to very heavy rainfall at a few places with extremely heavy falls at isolated places over south coastal Andhra Pradesh on 3rd and heavy to very heavy rainfall at a few places with extremely heavy falls at isolated places over coastal Andhra Pradesh & Yanam on 4th & 5th December. Isolated heavy rainfall is likely over north coastal Andhra Pradesh on 6th December.
- **Royalaseema:** Light to moderate rainfall at many places with isolated heavy to extremely heavy falls is very likely on 3rd & 4th and isolated heavy rainfall on 5th December and decrease thereafter.
- **Telangana:** Light to moderate rainfall at few places with **isolated heavy rainfall** is likely on 4th & 5th with **isolated very heavy rainfall** over the same region on 5th December.
- **Odisha:** Light to moderate rainfall at most places with **isolated heavy rainfall** is likely over south Coastal and adjoining south Interior Odisha during 4th & 6th with **isolated very heavy rainfall** over the same region on 5th December.

(ii) Wind warning:

- **Southwest Bay of Bengal along & off north Tamil Nadu-Puducherry Coasts:** **Gale wind** speed reaching **65-75 kmph gusting to 85 kmph** is prevailing over Southwest Bay of Bengal. It is likely to gradually increase becoming **70-80 kmph gusting to 90 kmph** from 3rd December mid night for subsequent 12 hours. It will gradually decrease thereafter.
- **Westcentral Bay of Bengal and along & off south Andhra Pradesh Coast:** **Squally wind** speed reaching **60-70 kmph gusting to 80 kmph** is prevailing over westcentral Bay of Bengal. It is likely to gradually increase becoming **Gale Wind** speed reaching **70-80 kmph gusting to 90 kmph** from 3rd mid night; **80-90 kmph gusting to 100 kmph** from 4th

morning and **90-100 kmph gusting to 110 kmph** from 4th evening to 5th December noon. It would gradually decrease thereafter.

- **Along & off north Andhra Pradesh Coast:**

Squally wind speed reaching **45-55 kmph gusting to 65 kmph** likely from 4th December evening, likely to gradually increase **becoming 55-65 kmph gusting to 75 kmph** from 5th December morning for subsequent 24 hours. It would gradually decrease thereafter.

- **Along & off Odisha Coast:**

Squally wind speed reaching **35-45 kmph gusting to 55 kmph** likely from 4th December evening, likely to gradually increase becoming **40-50 kmph gusting to 60 kmph** from 5th December evening for subsequent 12 hours. It would gradually decrease thereafter.

(iii) Sea Condition:

- **Southwest Bay of Bengal and along & off north Tamil Nadu-Puducherry Coasts:**

Very Rough to high sea condition is prevailing and likely to continue till 4th December morning and likely to become rough to very rough thereafter till 5th December morning. It is likely to improve thereafter gradually.

- **Westcentral Bay of Bengal and along & off south Andhra Pradesh Coast:**

Very Rough to High sea condition is prevailing over the region. It is likely to become high to very high from 4th evening to 5th December noon. It is likely to improve thereafter gradually becoming high to very rough from 5th evening and very rough to rough from 6th morning for next 12 hours.

- **Along & off North Andhra Pradesh Coast:**

Rough to Very Rough to sea condition is likely from 4th December, very rough to high on 5th and very rough to rough on 6th December.

- **Along & off Odisha Coast:**

Rough to Very Rough to sea condition is likely from 4th December evening till 6th December morning.

(iv) Fishermen Warning (graphics attached):

Fishermen are advised not to venture into:

- Southwest Bay of Bengal and along & off North Tamil Nadu-Puducherry Coasts till 5th December.
- Westcentral Bay of Bengal and along & off Andhra Pradesh Coast till 6th December.
- Along & off Odisha coast from 4th December evening till 6th December

(v) Storm Surge (Graphics enclosed):

Storm surge of about 1-1.5 meter above astronomical tide likely to inundate south Coastal Andhra Pradesh districts at the time of landfall.

(vi) Damage Expected over coastal districts of South Andhra Pradesh (Nellore, Tirupati Prakasam, Bapatla, Guntur, Krishna and West Godavari) and adjoining coastal districts of North Tamil Nadu-Puducherry:

- Major damage to thatched houses/ huts. Roof tops may blow off. Unattached metal sheets may fly.
- Possibilities of damage to vulnerable structure.
- Breaking of tree branches, uprooting of large avenue trees. Major damage to banana and papaya trees. Large dead limbs blown from trees.
- Minor damage to power and communication lines due to breaking of branches and uprooting of trees.
- Major damage to Kutcha and minor damage to Pucca roads due to heavy rain.

- Damage to paddy crops, horticultural crops and orchards.
- Sea water inundation in low lying areas after erosion of Kutcha embankments
- Inundation of low lying areas in coastal districts due to heavy rainfall and flash flood
- Localized Flooding of roads and closure of underpasses mainly in urban areas of the above region.
- Occasional reduction in visibility due to heavy rainfall.
- Disruption of traffic due to water logging and squally winds
- Localized Landslides/Mudslides
- It may lead to riverine flooding in some river catchments (for riverine flooding please visit Web page of CWC)

(vi) Action Suggested for coastal districts of South Andhra Pradesh and adjoining coastal districts of North Tamil Nadu-Puducherry:

- Total suspension of fishing operations.
- Surface transport and shipping operations need to be regulated
- Onshore & Offshore operation need to be regulated as per guidelines
- Coastal hutment dwellers to be in safer places.
- People in affected areas to remain indoors.
- Avoid going to areas that face the water logging problems often.
- Avoid staying in vulnerable structure.

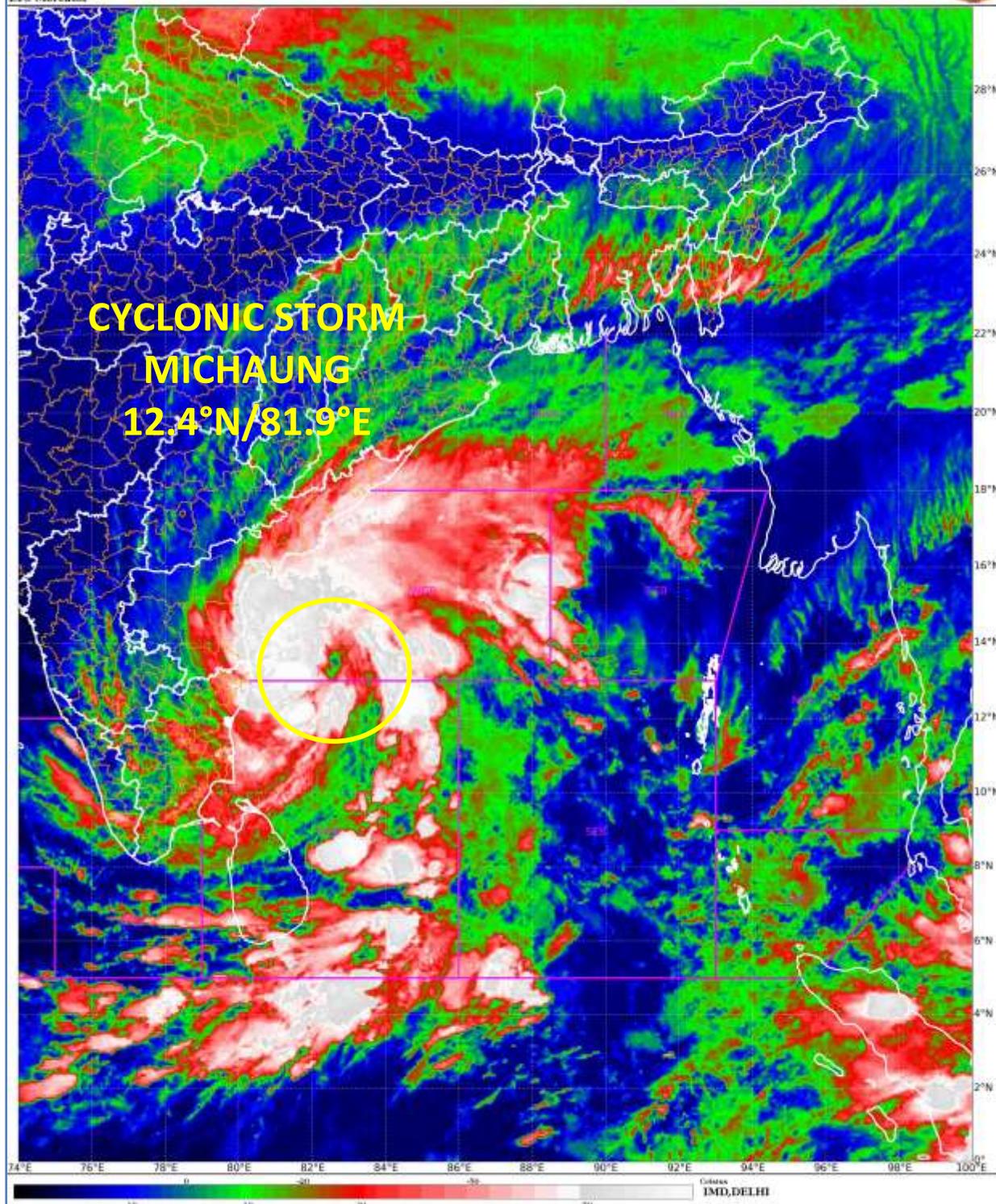
The system is under continuous surveillance and the next message will be issued at 0230 hours IST of 04th December, 2023.

**(Shobhit Katiyar)
Scientist D, Cyclone Warning Division, New Delhi**

Copy to: ACWC Chennai/ ACWC Kolkata/ CWC Bhubaneswar/ CWC Vishakhapatnam/ MC Amravati

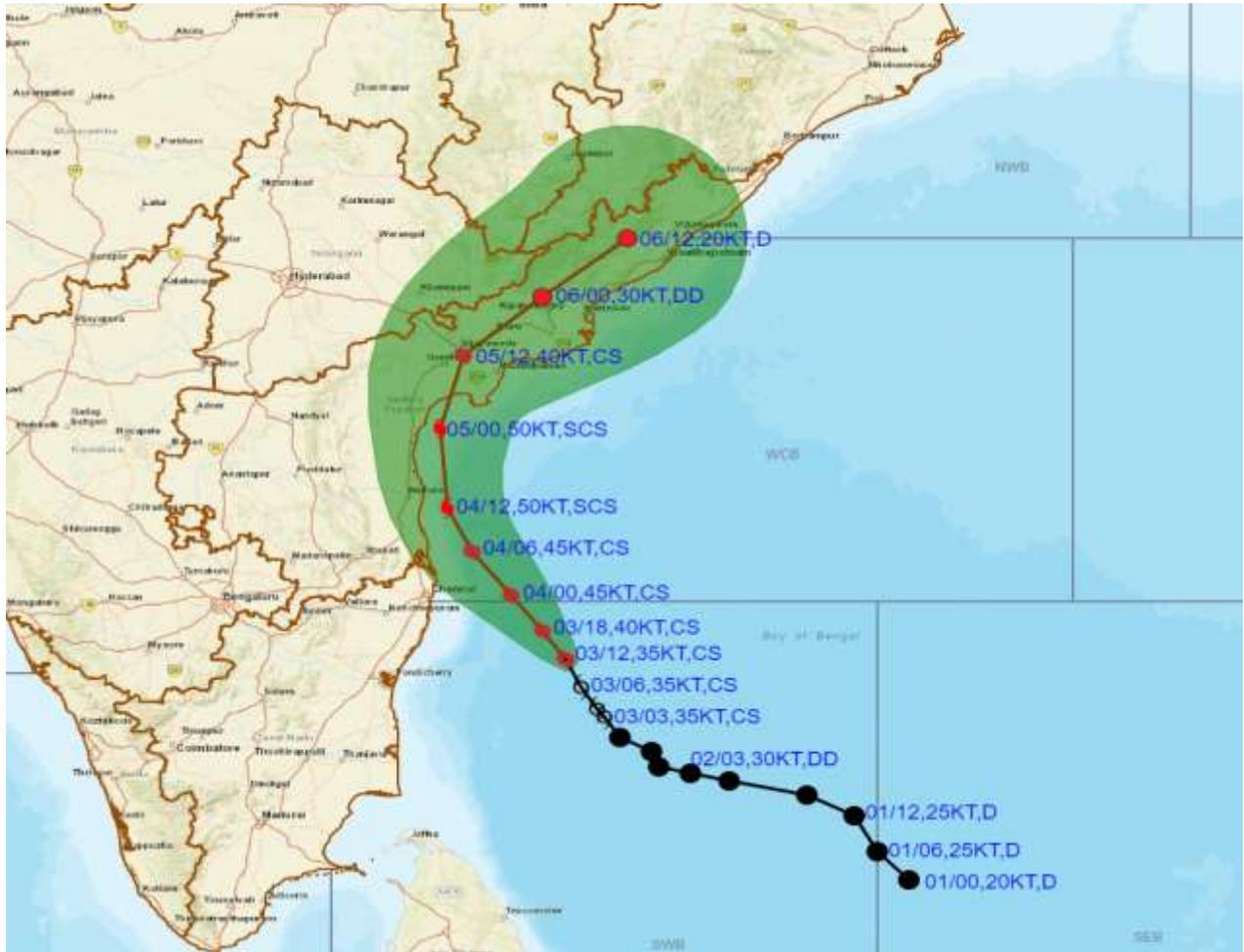
SAT : INSAT-3D IMG
IMG_TIR1_TEMP 10.8 um
LIC Mercator

03-12-2023/(1530 to 1556) GMT
03-12-2023/(2100 to 2126) IST





OBSERVED & FORECAST TRACK, MAXIMUM SUSTAINED WIND AND CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM "MICHAUNG" OVER SOUTHWEST BAY OF BENGAL BASED ON 1200 UTC (1730 IST) OF 03RD



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

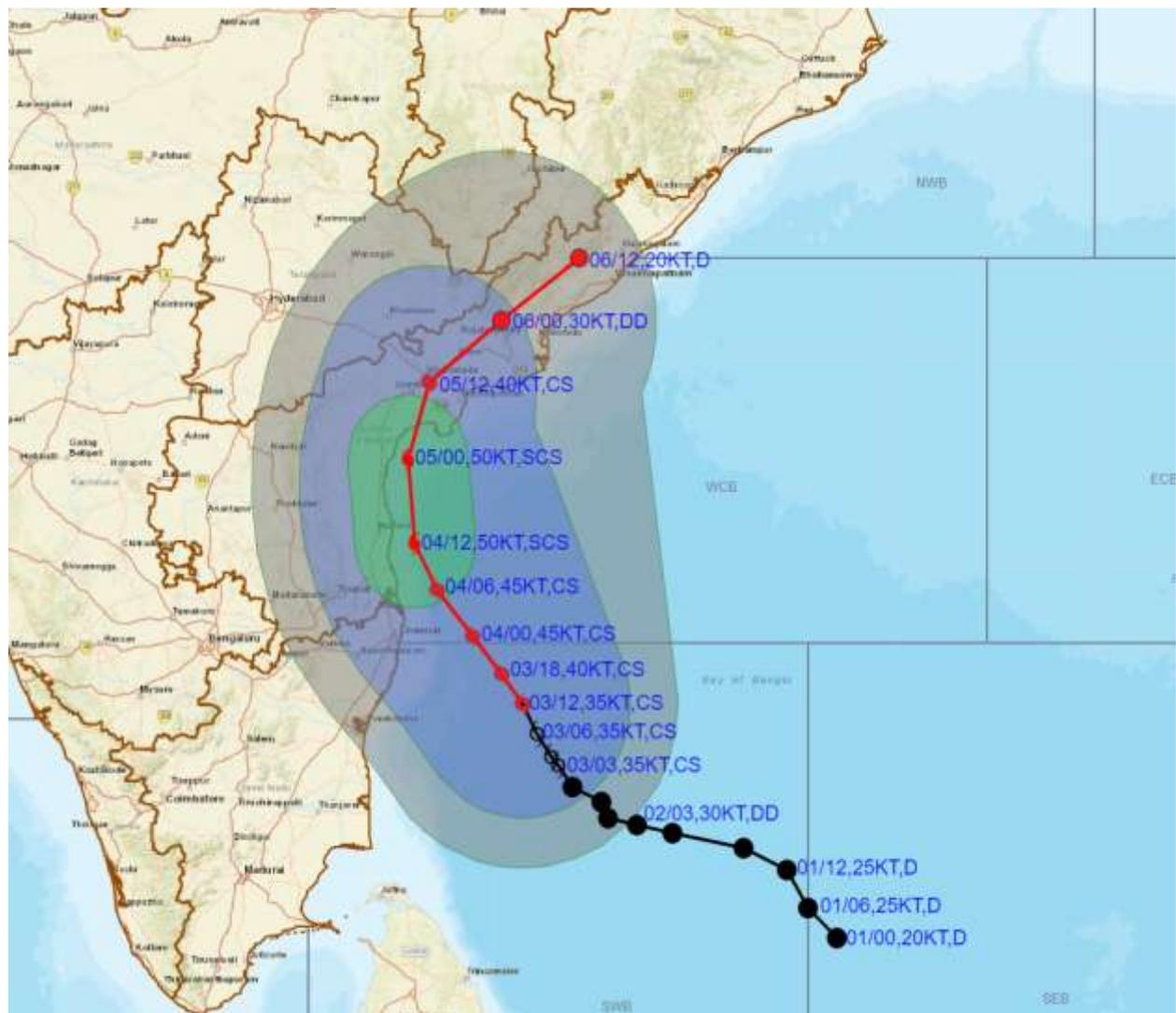
— FORECAST TRACK

▲ CONE OF UNCERTAINTY

Forecast	DISTANCE (KM) AND DIRECTION FROM STATIONS				
	MO PONDICHERY	CHENNAI/MINAMBAKKAM	NELLORE	BAPATLA	MACHILIPATNAM/ FRANCHPET
03.12.23/1200	240, E	210, ESE	330, SE	440, SSE	450, SSE
04.12.23/1200	280, NNE	150, NNE	60, ESE	170, S	220, SSW
05.12.23/1200	510, N	390, N	240, NNE	70, NNE	60, WNW
06.12.23/1200	750, NNE	630, NNE	500, NE	350, NE	270, NE



OBSERVED & FORECAST TRACK, MAXIMUM SUSTAINED WIND AND QUADRANT WIND IN ASSOCIATION WITH CYCLONIC STORM "MICHAUNG" OVER SOUTHWEST BAY OF BENGAL BASED ON 1200 UTC (1730 IST) OF 03RD 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



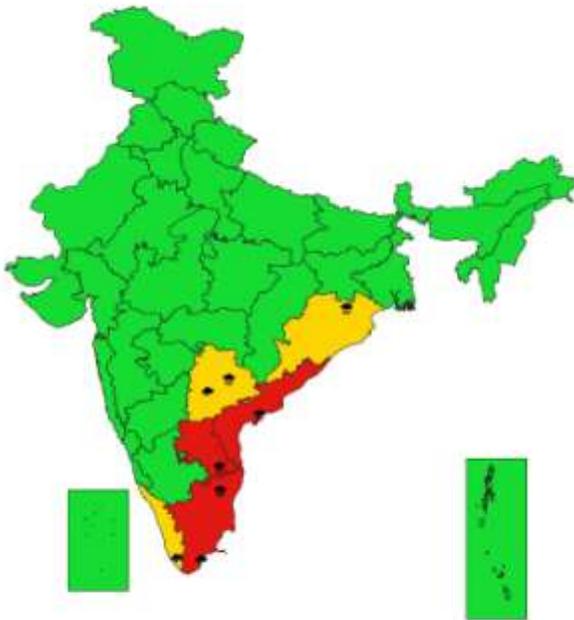
**SUBDIVISIONWISE WEATHER WARNING FOR DAY 1
(3-12-2023)**



- | | | |
|-----------------------------|------------------------|--------------------------|
| Subdivision Warning | Dust Storm | Subdivision color |
| ☁ Heavy Rain | 🌪 Strong Surface Winds | 🟢 NO WARNING |
| ❄ Heavy Snow | 🔥 Heat Wave | 🟡 WATCH (BE PREPARED) |
| ⚡ Thunderstorms & Lightning | 🌡 Cold wave | 🟠 ALERT (BE PREPARED) |
| ☁ Halostorm | 🌫 Fog | 🔴 WARNING (TAKE ACTION) |



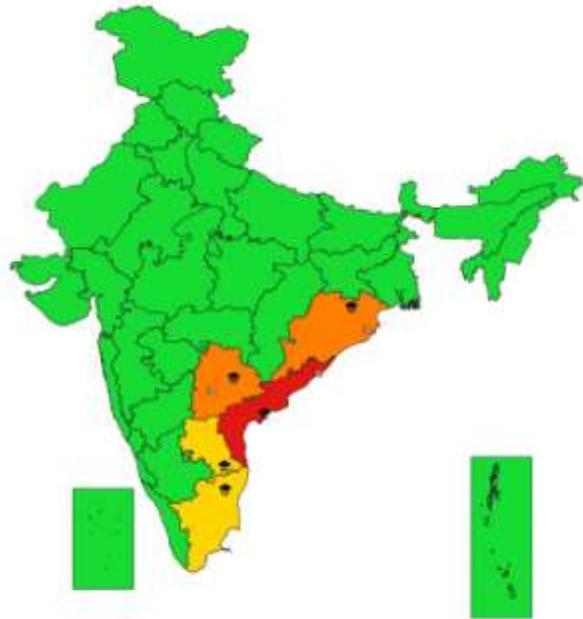
**SUBDIVISIONWISE WEATHER WARNING FOR DAY 2
(4-12-2023)**



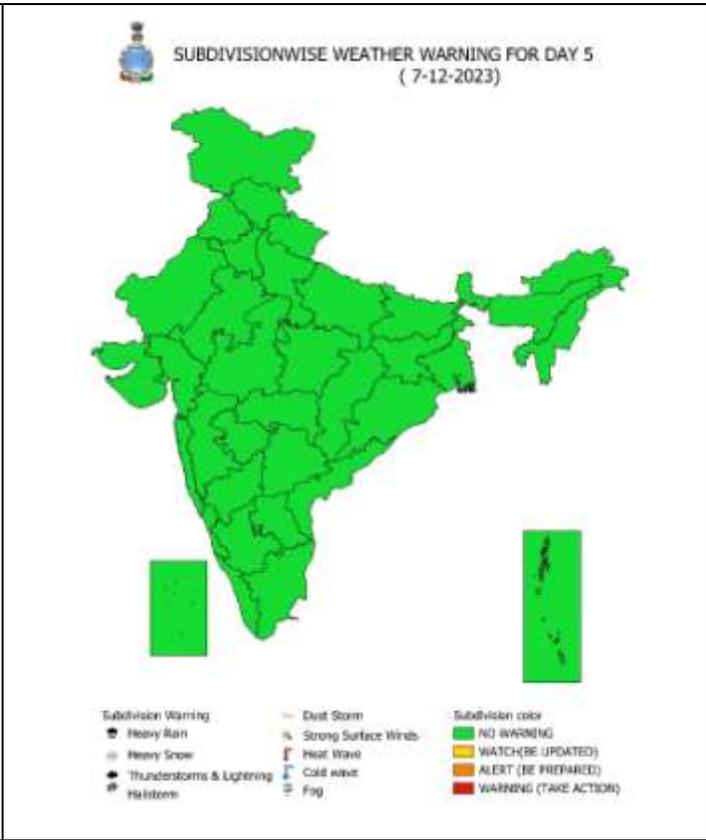
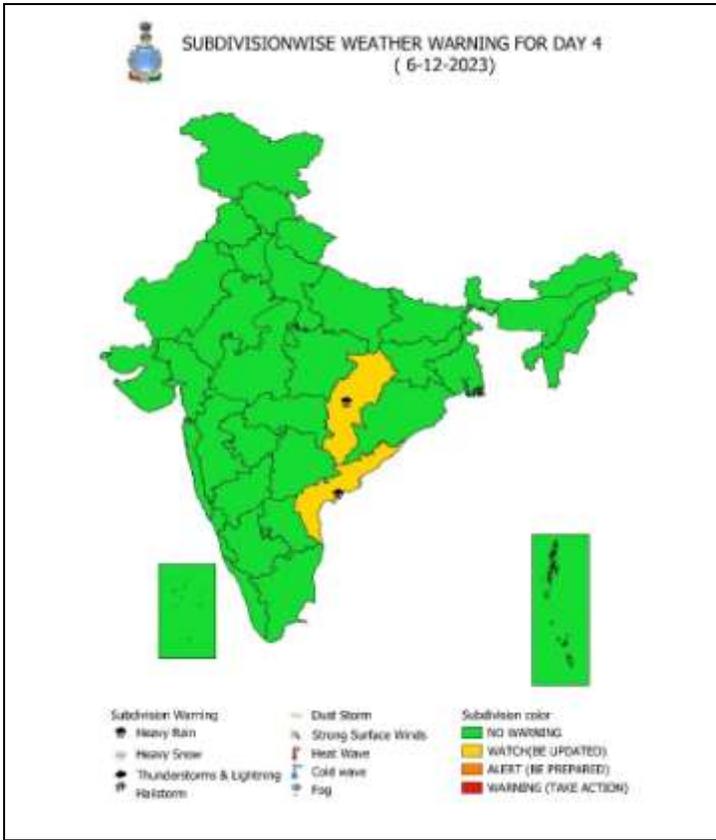
- | | | |
|-----------------------------|------------------------|--------------------------|
| Subdivision Warning | Dust Storm | Subdivision color |
| ☁ Heavy Rain | 🌪 Strong Surface Winds | 🟢 NO WARNING |
| ❄ Heavy Snow | 🔥 Heat Wave | 🟡 WATCH (BE PREPARED) |
| ⚡ Thunderstorms & Lightning | 🌡 Cold wave | 🟠 ALERT (BE PREPARED) |
| ☁ Halostorm | 🌫 Fog | 🔴 WARNING (TAKE ACTION) |



**SUBDIVISIONWISE WEATHER WARNING FOR DAY 3
(5-12-2023)**



- | | | |
|-----------------------------|------------------------|--------------------------|
| Subdivision Warning | Dust Storm | Subdivision color |
| ☁ Heavy Rain | 🌪 Strong Surface Winds | 🟢 NO WARNING |
| ❄ Heavy Snow | 🔥 Heat Wave | 🟡 WATCH (BE PREPARED) |
| ⚡ Thunderstorms & Lightning | 🌡 Cold wave | 🟠 ALERT (BE PREPARED) |
| ☁ Halostorm | 🌫 Fog | 🔴 WARNING (TAKE ACTION) |



WARNING

WARNING (TAKE ACTION)

ALERT (BE PREPARED)

WATCH (BE UPDATED)

NO WARNING (NO ACTION)

☁ Heavy Rain

☁ Strong Winds

☁ Frost

☁ Heavy Snow

👁 Visibility

🌡 Cold Wave

⚡ Thunderstorm

🌀 Cyclone

🌡+ Heat Wave

☁ Dust Storm

☁ Squall/ Hail

🌊 Sea State

Fishermen warning graphics

Day 1: 03.12.2023/11:30 AM to 04.12.2023/05:30AM



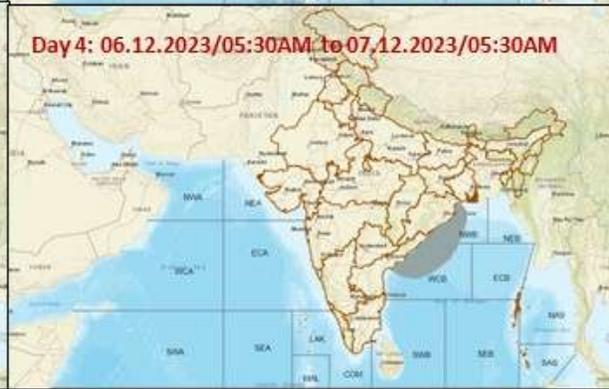
Day 2: 04.12.2023/05:30AM to 05.12.2023/05:30AM



Day 3: 05.12.2023/05:30AM to 06.12.2023/05:30AM



Day 4: 06.12.2023/05:30AM to 07.12.2023/05:30AM



Day 5: 07.12.2023/05:30AM to 08.12.2023/05:30AM



Squally Weather with wind speed 40-45 kmph gusting to 55 kmph

Squally wind speed with wind speed 45-55 kmph gusting to 65 kmph

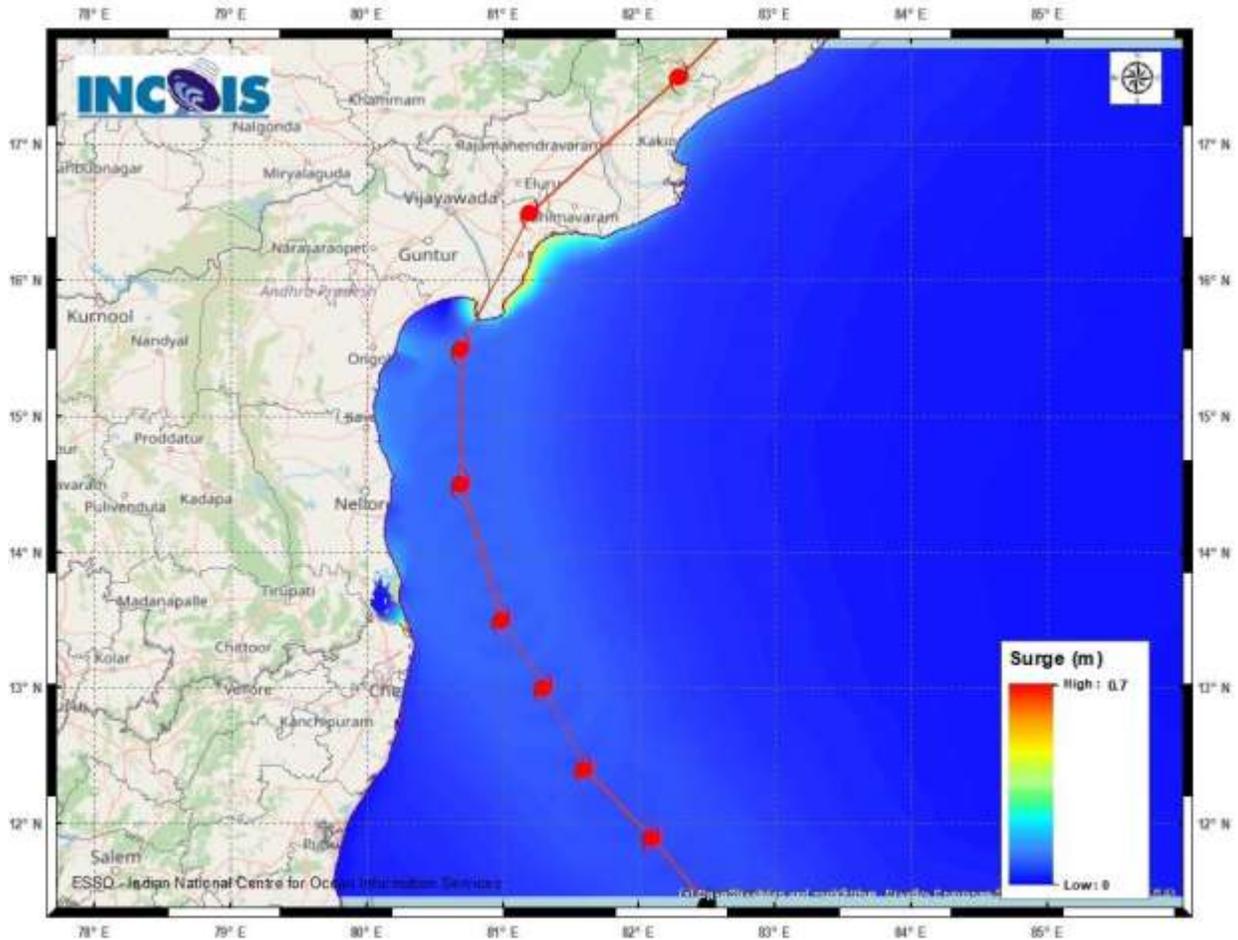
Squally wind speed with wind speed 50-60 kmph gusting to 70 kmph

CS with gale wind speed 60-90 kmph gusting to 110 kmph

SCS with gale wind speed 90-110 kmph gusting to 120 kmph

Fishermen are advised not to venture into the marked areas.

Storm Surge Warning Graphics based on Forecast Track



STORM SURGE HEIGHT INFORMATION:

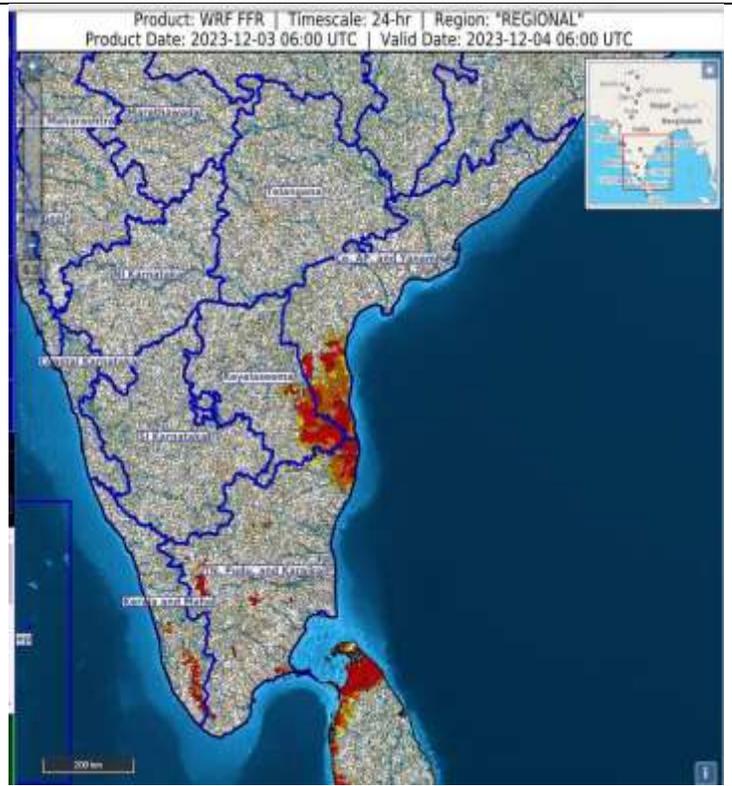
* The below listed surge heights are over and above astronomical tide.

MANDAL/TALUK	DISTRICT	STATE/UNION TERRITORY	NEAREST PLACE OF HABITATION	STORM SURGE (m)	EXPECTED INUNDATION EXTENT (km)
Avanigadda	Krishna	Andhra Pradesh	Ramakrishnapuram	0.2-0.7	Upto 0.16
Machilipatnam	Krishna	Andhra Pradesh	Perupalem	0.3-0.7	Upto 0.17
Ponneri	Thiruvallur	Tamil Nadu	Karimanal	0.2-0.6	Upto 0.15
Repalle	Guntur	Andhra Pradesh	Repalle	0.3-0.5	Upto 0.25

Flash Flood Guidance

24 hours Outlook for the Flash Flood Risk (FFR) till 1130 IST of 04-12-2023 :

Moderate Flash flood risk likely in next 24 hours over Southern part of Coastal Andhra Pradesh and Yanam and adjoining area of South-East part of Rayalaseema and Northern part Tamil Nadu & Puducherry.



Hazard Map with Cyclonic Storm MICHAUNG over Southwest Bay of Bengal

