



India Meteorological Department  
(Ministry of Earth Sciences)

BULLETIN NO. 66 (ARB/01/2023)

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DATED: 14.06.2023

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**Sub: Very Severe Cyclonic Storm “Biparjoy” (pronounced as “Biporjoy”) over Northeast Arabian Sea: Cyclone Warning for Saurashtra & Kutch Coasts (Red Message)**

The Very Severe Cyclonic Storm “Biparjoy” (pronounced as “Biporjoy”) over Northeast Arabian Sea remained practically stationary during past 6-hours and lay centered at 1130 hours IST of today, the 14<sup>th</sup> June, 2023 over the same region near latitude 21.9°N and longitude 66.3°E, about 280 km west-southwest of Jakhau Port (Gujarat), 290 km west-southwest of Devbhumi Dwarka, 300 km west-southwest of Naliya, 350 km west-northwest of Porbandar, and 340 km south-southwest of Karachi (Pakistan).

It is very likely to move nearly northeastwards and cross Saurashtra & Kutch and adjoining Pakistan coasts between Mandvi (Gujarat) and Karachi (Pakistan) near Jakhau Port (Gujarat) by evening of 15<sup>th</sup> June as a very severe cyclonic storm with maximum sustained wind speed of 125-135 kmph gusting to 150 kmph.

**Forecast track and intensity are given below:**

<b>Date/Time(IST)</b>	<b>Position (Lat. °N/ long. °E)</b>	<b>Maximum sustained surface wind speed (Kmph)</b>	<b>Category of cyclonic disturbance</b>
14.06.23/1130	21.9/66.3	140-150 Gusting To 165	Very Severe Cyclonic Storm
14.06.23/1730	22.3/66.6	135-145 Gusting To 160	Very Severe Cyclonic Storm
14.06.23/2330	22.6/67.0	135-145 Gusting To 160	Very Severe Cyclonic Storm
15.06.23/0530	22.9/67.5	130-140 Gusting To 155	Very Severe Cyclonic Storm
15.06.23/1130	23.2/68.0	125-135 Gusting To 150	Very Severe Cyclonic Storm
15.06.23/2330	23.8/69.0	105-115 Gusting To 125	Severe Cyclonic Storm
16.06.23/1130	24.4/70.1	70-80 Gusting To 90	Cyclonic Storm
16.06.23/2330	24.9/71.3	40-50 Gusting To 60	Depression
17.06.23/1130	25.4/72.7	20-30 Gusting To 50	Well Marked Low Pressure Area

**(i) Heavy Rainfall warning:**

- Light to moderate rainfall at most places with heavy to extremely heavy rainfall at isolated places very likely over Kachchh, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts of Saurashtra & Kutch on 14<sup>th</sup> June.
- The intensity of rainfall would increase with heavy to very heavy rainfall at a few places and extremely heavy falls at isolated places very likely over Kachchh, Devbhumi Dwarka & Jamnagar and heavy to very heavy rainfall at a few places over Porbandar, Rajkot, Morbi & Junagarh districts of Gujarat and Isolated heavy to very heavy rainfall is very likely over remaining districts of Saurashtra and north Gujarat region on 15<sup>th</sup> June.
- Light to moderate rainfall at most places with heavy to extremely heavy rainfall at isolated places very likely over north Gujarat and adjoining south Rajasthan on 16<sup>th</sup> and southeast Rajasthan & adjoining North Gujarat region on 17<sup>th</sup> June.

**(ii) Wind warning:**

**Northeast Arabian Sea:** Gale wind speed reaching 145-155 kmph gusting to 170 kmph prevailing over the region likely to decrease becoming 125-135 kmph gusting 150 kmph during 15<sup>th</sup> morning to evening. It would weaken gradually further more thereafter becoming squally wind speed reaching 45-55 kmph gusting to 65 kmph by 16<sup>th</sup> morning.

**Eastcentral Arabian Sea:** Gale wind speed reaching 60-70 kmph gusting to 80 kmph is prevailing and would become squally wind speed reaching 40-50 kmph gusting to 60 kmph from 15<sup>th</sup> morning for subsequent 12 hours.

**Adjoining Areas of westcentral & northwest Arabian Sea:** Squally wind speed reaching 45-55 kmph gusting to 65 kmph is likely to prevail on 14<sup>th</sup> June.

**Wind warning along & off Saurashtra & Kutch coasts (Kachchh, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts) including Gulf of Kutch:**

- Gale wind speed reaching 65-75 kmph gusting to 85 kmph will prevail along & off Porbandar & Devbhoomi Dwarka district coasts from forenoon of today, the 14<sup>th</sup> June.
- It would gradually increase becoming gale wind speed reaching 125-135 kmph gusting to 150 kmph during 15<sup>th</sup> forenoon to night along & off Kachchh, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts. Thereafter, it would decrease gradually becoming 85-95 kmph gusting to 105 kmph over Kachchh and adjoining districts of Saurashtra & Kutch by 16<sup>th</sup> early morning and squally wind speed reaching 50-60 kmph gusting to 70 kmph by 16<sup>th</sup> afternoon.
- Squally wind speed reaching 55-65 kmph gusting to 75 kmph very likely to prevail along & off remaining districts of Saurashtra coast on 14<sup>th</sup> & 15<sup>th</sup> June.

**Wind Warning for South Rajasthan**

- Squally wind speed reaching 45-55 kmph gusting to 65 kmph is likely over South Rajasthan during 16<sup>th</sup> noon to evening and 35-45 kmph gusting to 55 kmph till mid-night of 16<sup>th</sup> June.

### **(iii) Sea condition**

Sea condition will be phenomenal over northeast Arabian Sea till 15<sup>th</sup> evening and rough to very rough over adjoining eastcentral Arabian Sea during the same period.

#### **Along & off Saurashtra & Kutch coasts:**

Sea condition is likely to be very rough till 14<sup>th</sup> evening and high to phenomenal thereafter till 15<sup>th</sup> June evening and would improve thereafter.

### **(iv) Storm Surge Warning (Kachchh, Devbhumi Dwarka, Porbandar, Jamnagarh and Morbi districts)**

Storm surge of about 2 -3 m above the astronomical tide is likely to inundate the low lying areas of above districts during the time of landfall. The astronomical tides along these districts could be upto 3-6 meters in different places.

### **(v) Damage expected over Kachchh, Devbhumi Dwarka, Porbandar, Jamnagar, Morbi & Junagarh & Rajkot districts of Gujarat on 15<sup>th</sup> June:**

- Total destruction of thatched houses/ extensive damage to kutcha houses. Some damage to Pucca houses.
- Potential threat from flying objects.
- Bending/ uprooting of power and communication poles.
- Major damage to Kutcha and Pucca roads. Flooding of escape routes. Disruption of railways, overhead power lines and signalling systems.
- Widespread damage to standing crops, plantations, orchards, falling of green coconuts and tearing of palm fronds. Blowing down of bushy trees like mango.
- Small boats, country crafts may get detached from moorings.
- Visibility severely affected due to salt spray.

### **(vi) Fishermen Warning & Action Suggested (Kachchh, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts) and for Offshore & Onshore Industries (Graphics Attached):**

- Total suspension of fishing operations over eastcentral and adjoining Westcentral Arabian Sea till 15<sup>th</sup> June and over northeast Arabian Sea during 14<sup>th</sup> -15<sup>th</sup> June
- Those out at sea are advised to return to coast.
- Judicious regulation of offshore and onshore activities.
- Ports along the west coast of India may take necessary precautions.
- Naval base operations may maintain necessary precautions.
- Movement in motor boats and small ships all & off these coasts to be avoided.
- Mobilise evacuation from coastal areas of Saurashtra and Kutch (Kachchh, Devbhumi Dwarka, Porbandar, Jamnagar, Rajkot, Junagarh and Morbi districts).
- Judicious regulation of rail and road traffic.
- People in affected areas to remain indoors.
- Tourism activities may be restricted over these areas.
- Preparatory actions before the cyclones.

**The system is under continuous surveillance and the next message will be issued at 1730 hours IST of today, the 14<sup>th</sup> June, 2023.**

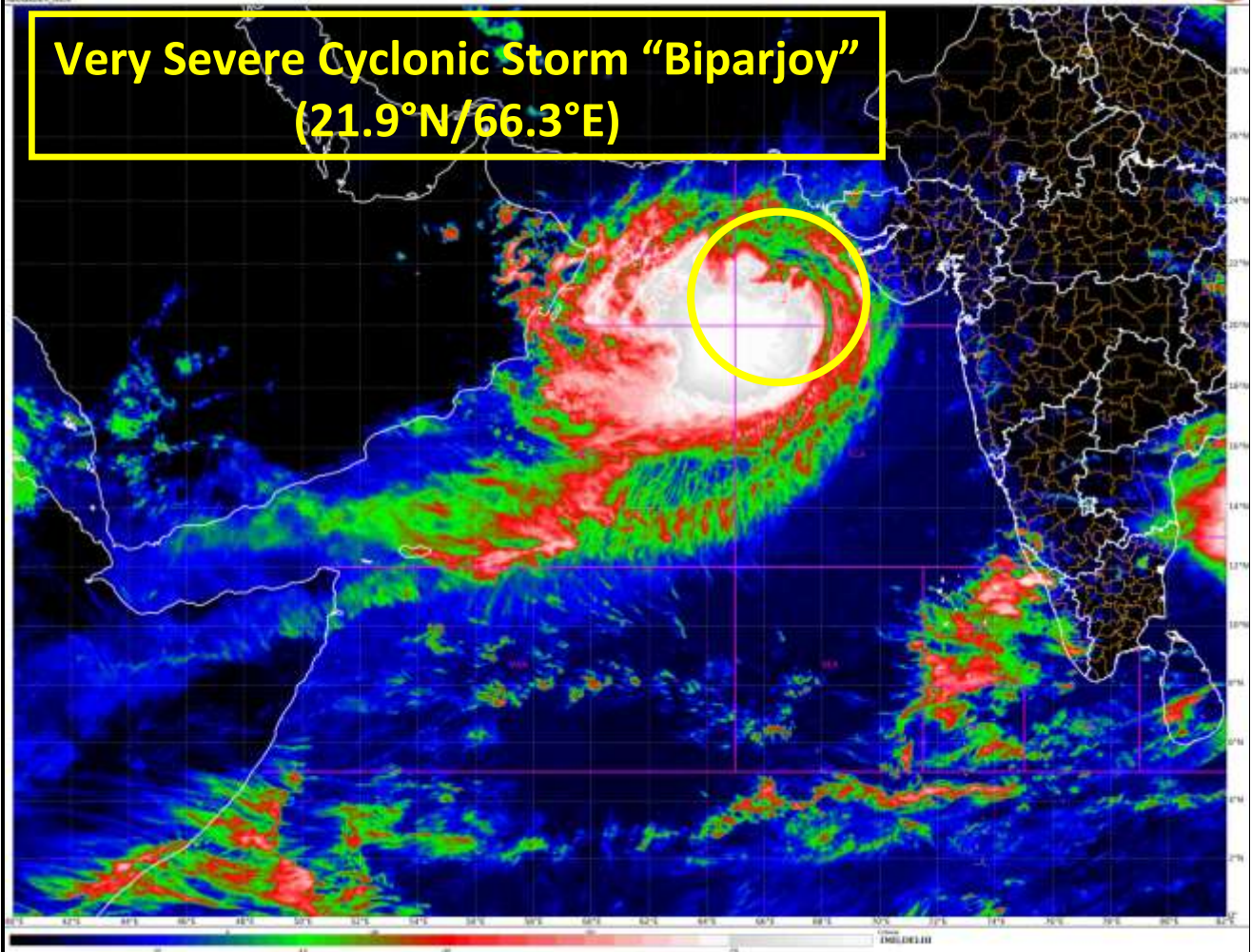
**(Ananda Kumar Das)**  
**Scientist F, Cyclone Warning Division, New Delhi**

*Copy to: ACWC Kolkata/ ACWC Chennai/ CWC Bhubaneswar/CWC Visakhapatnam/CWC Ahmedabad/ MO Port Blair/MC Raipur/MC Bhopal/MC Hyderabad/RMC Nagpur*  
**LEGEND: Heavy Rainfall:** 64.5 to 115.5mm, **Very Heavy Rainfall:** 115.6 to 204.4mm **Most Places:** more than 76% of total stations, **Isolated Places:** Less than 25% of total

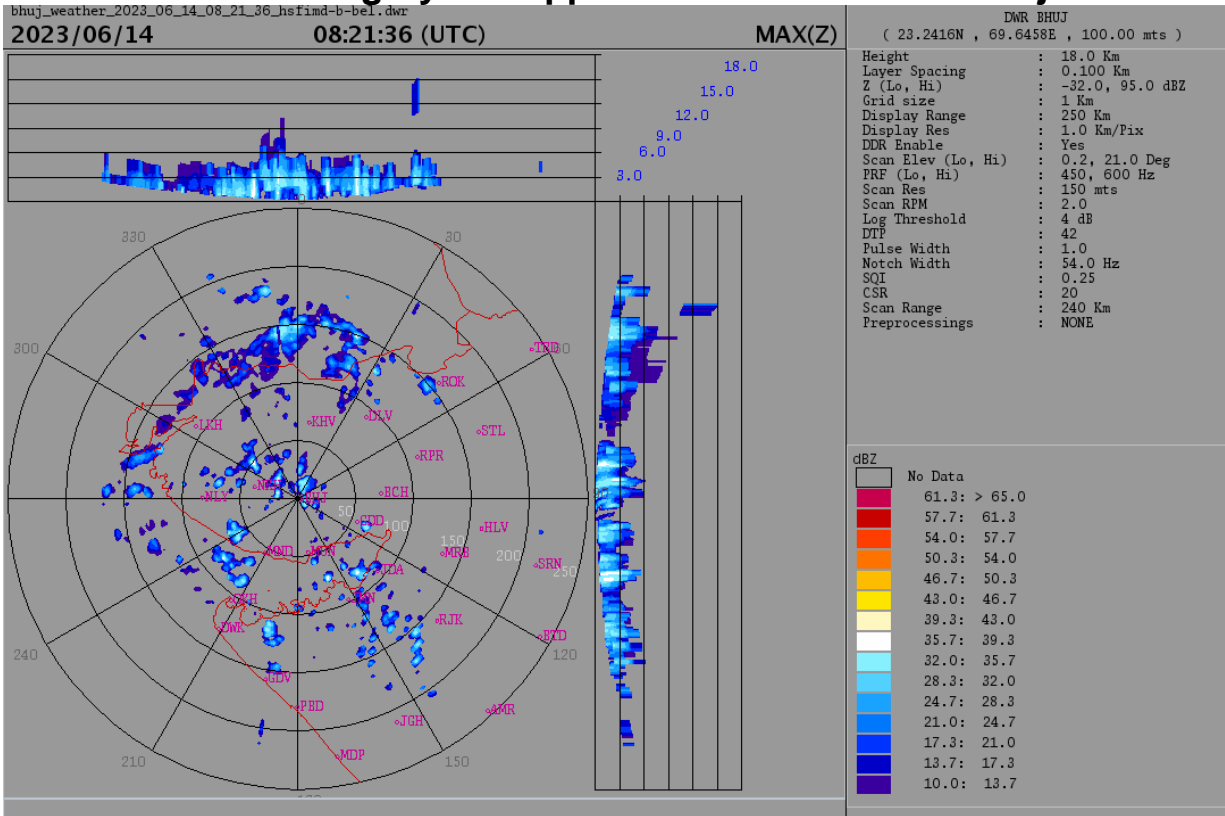
041 - 0000Z-001000  
FM: TDR, TEMF 10.0 sec  
000000.000

14-00-20220000 to 0000Z-001  
14-00-202201330 to 1300Z-001

**Very Severe Cyclonic Storm "Biparjoy"  
(21.9°N/66.3°E)**

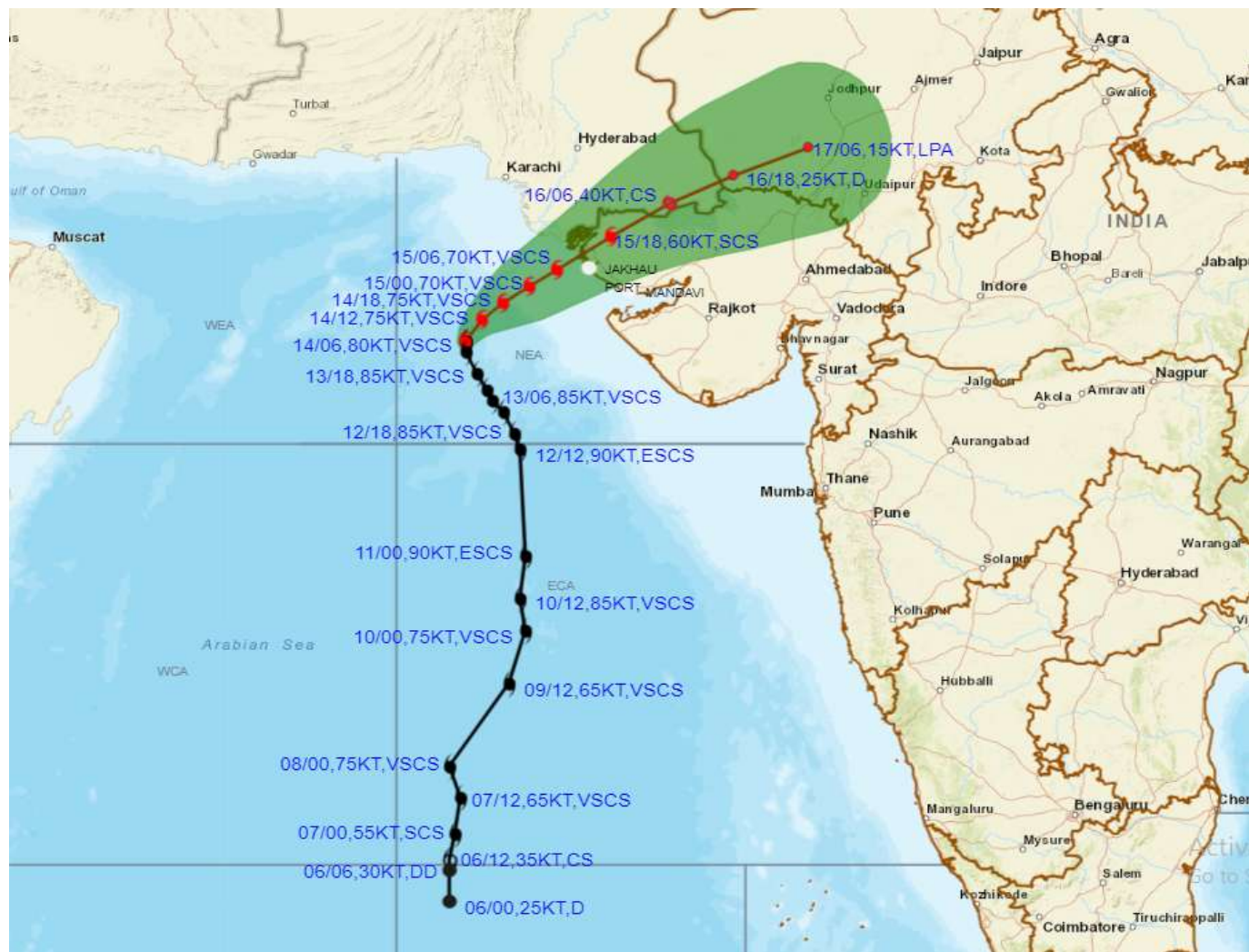


# Radar Imagery of Doppler Weather Radar at Bhuj





**OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 0600 UTC (1130 IST) OF 14<sup>TH</sup> JUNE 2023.**



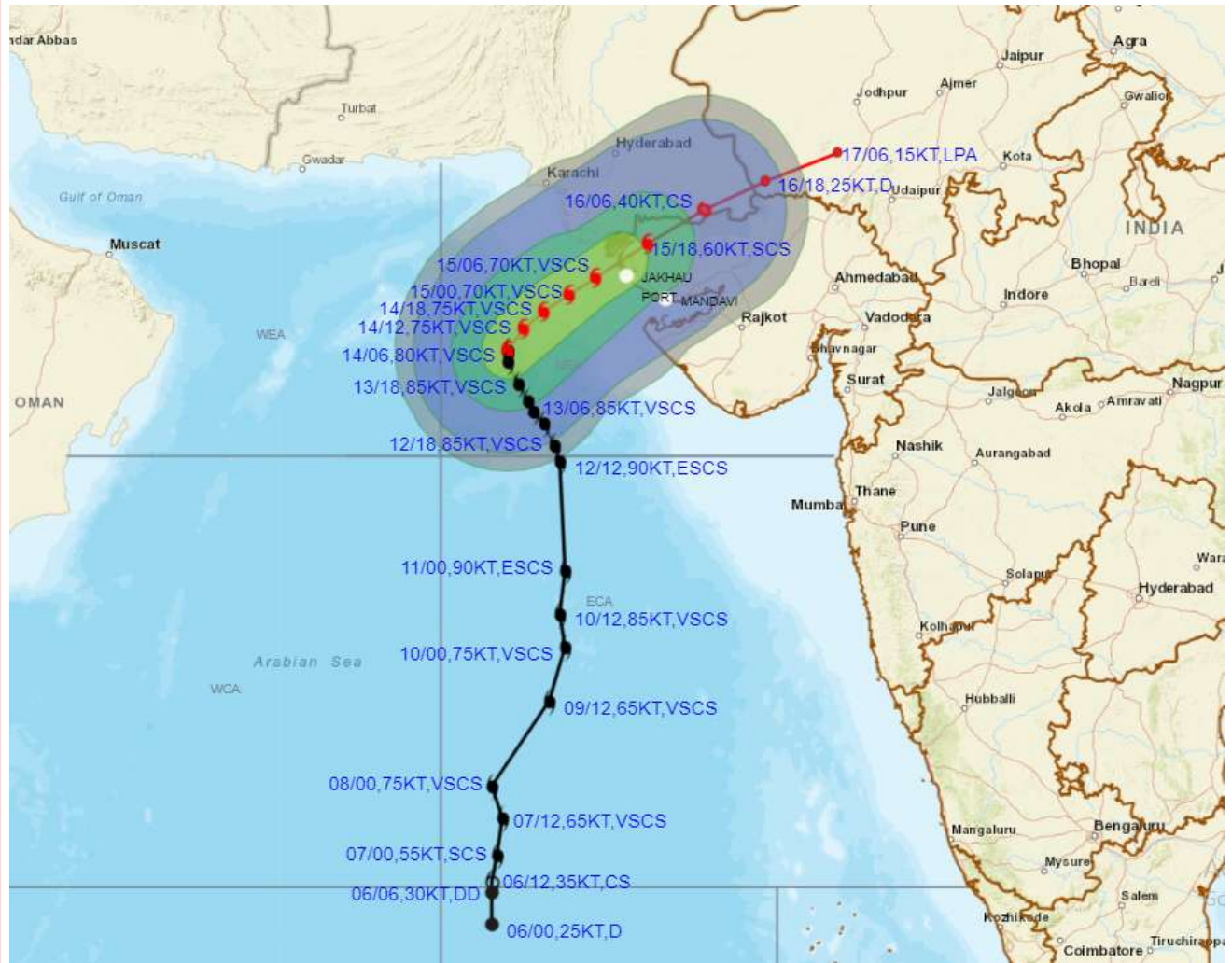
DATE/TIME IN UTC  
 IST=UTC + 0530  
 L: LOW PRESSURE AREA  
 WML: WELL MARKED LOW PRESSURE AREA  
 D: DEPRESSION (17-27 KT)  
 DD: DEEP DEPRESSION (28-33 KT)  
 CS: CYCLONIC STORM (34-47 KT)  
 SCS: SEVERE CYCLONIC STORM (48-63KT)  
 VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)  
 ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)  
 SuCS: SUPER CYCLONIC STORM ( $\geq$  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				
	PORBANDAR	DWARKA	JAKHAU PORT	NALIYA	KARACHI AIRPORT
15.06.23/0600	250, NW	150, NW	70, W	90, W	210, SSE
16.06.23/0600	310, N	250, NNE	210, NE	190, NE	310, E
17.06.23/0600	520, NE	500, NE	480, ENE	460, ENE	560, E



**OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF VERY SEVERE CYCLONIC STORM “BIPARJOY” OVER NORTHEAST ARABIAN SEA BASED ON 0600 UTC (1130 IST) OF 14<sup>TH</sup> JUNE 2023.**



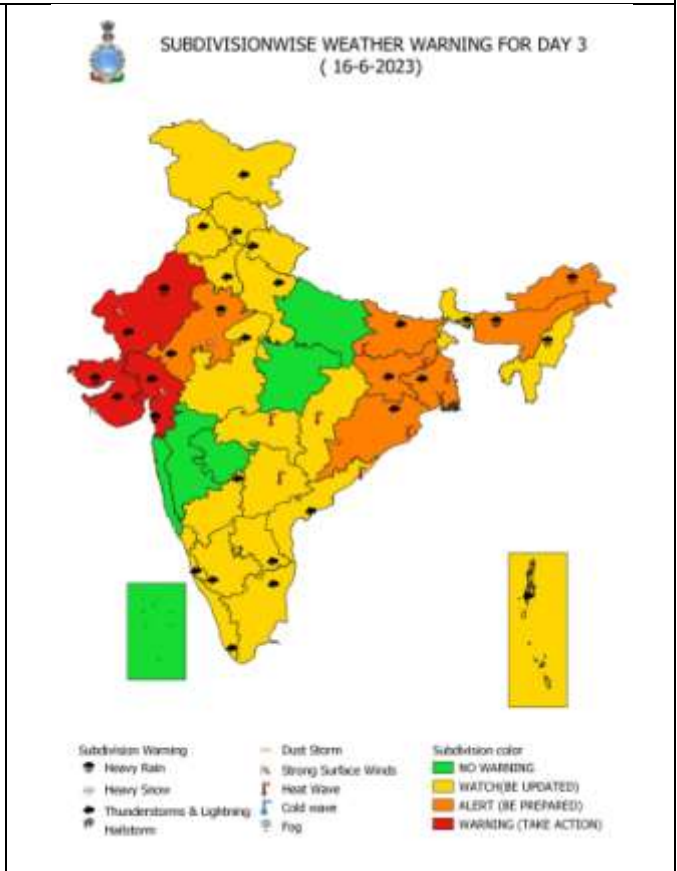
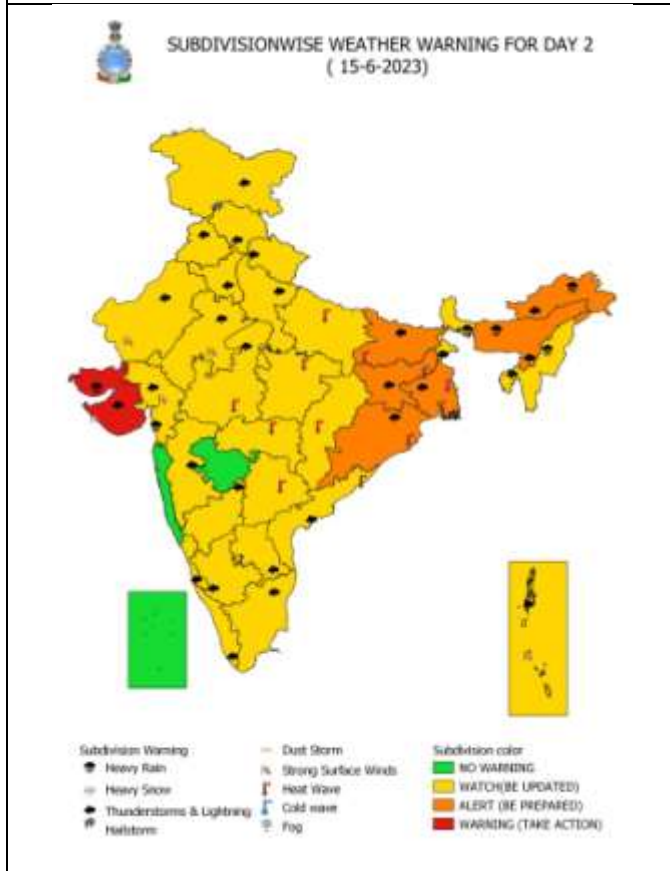
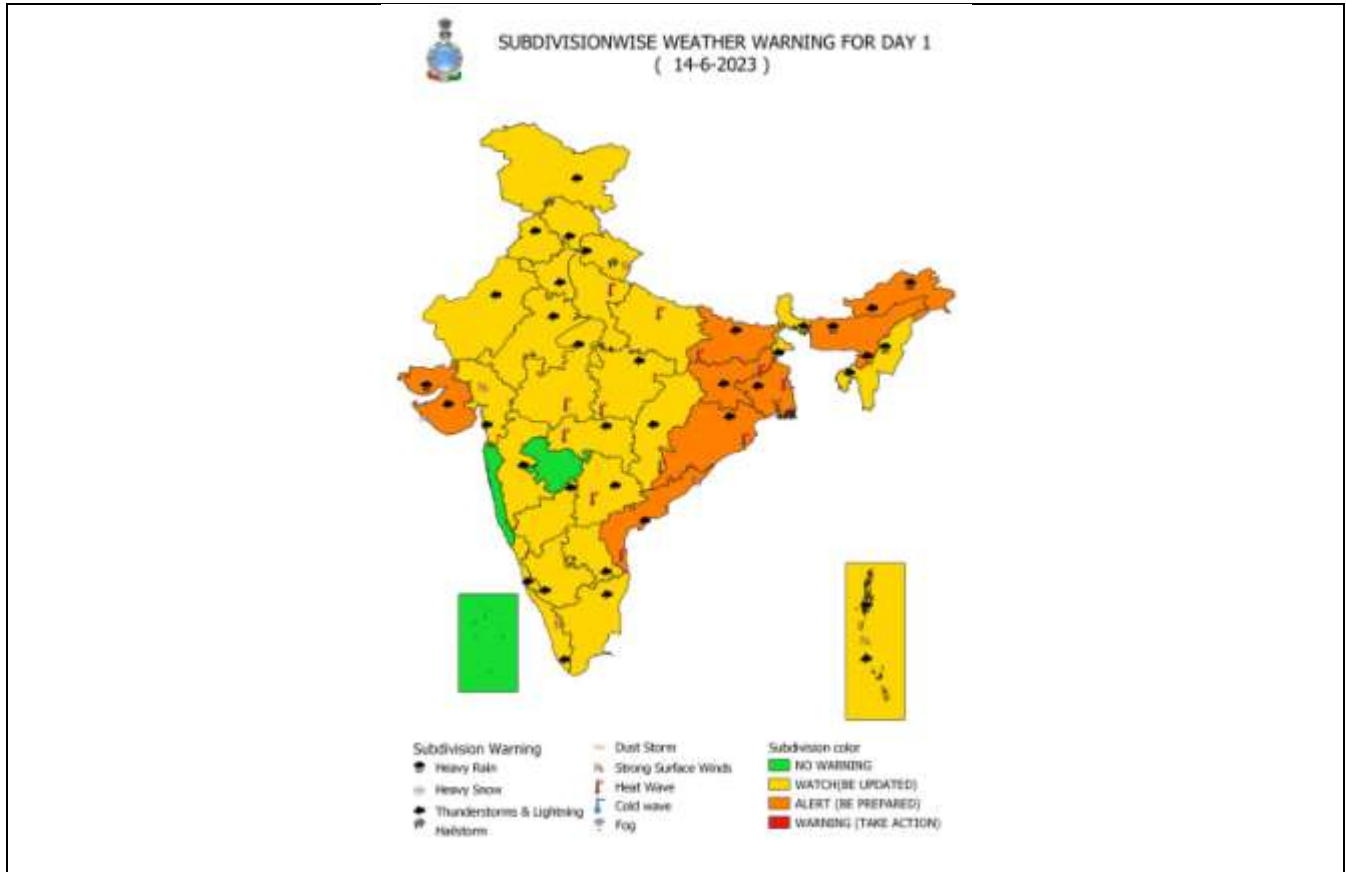
DATE/TIME IN UTC  
 IST=UTC + 0530  
 L: LOW PRESSURE AREA  
 WML: WELL MARKED LOW PRESSURE AREA  
 D: DEPRESSION (17-27 KT)  
 DD: DEEP DEPRESSION (28-33 KT)  
 CS: CYCLONIC STORM (34-47 KT)  
 SCS: SEVERE CYCLONIC STORM (48-63KT)  
 VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)  
 ESCS: EXTREMELY SEVERE 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

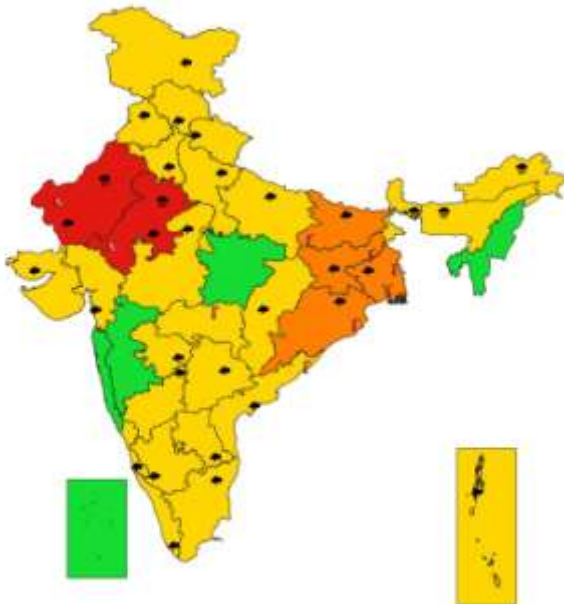
# All India Heavy Rainfall Warning for 14<sup>th</sup> to 16<sup>th</sup> June 2023







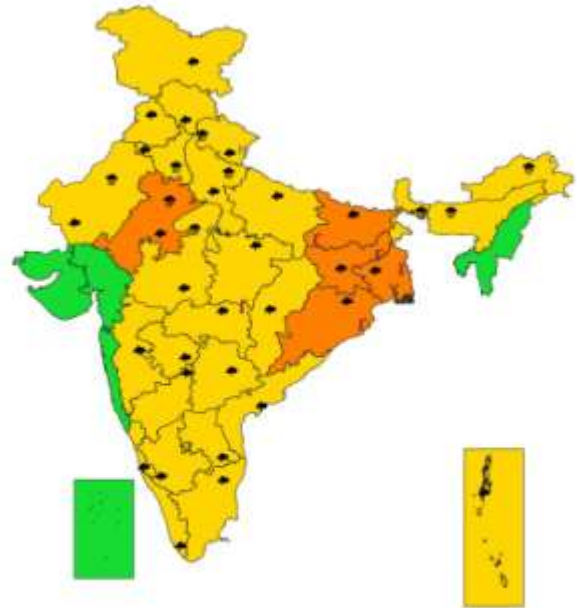
**SUBDIVISIONWISE WEATHER WARNING FOR DAY 4  
( 17-6-2023)**



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

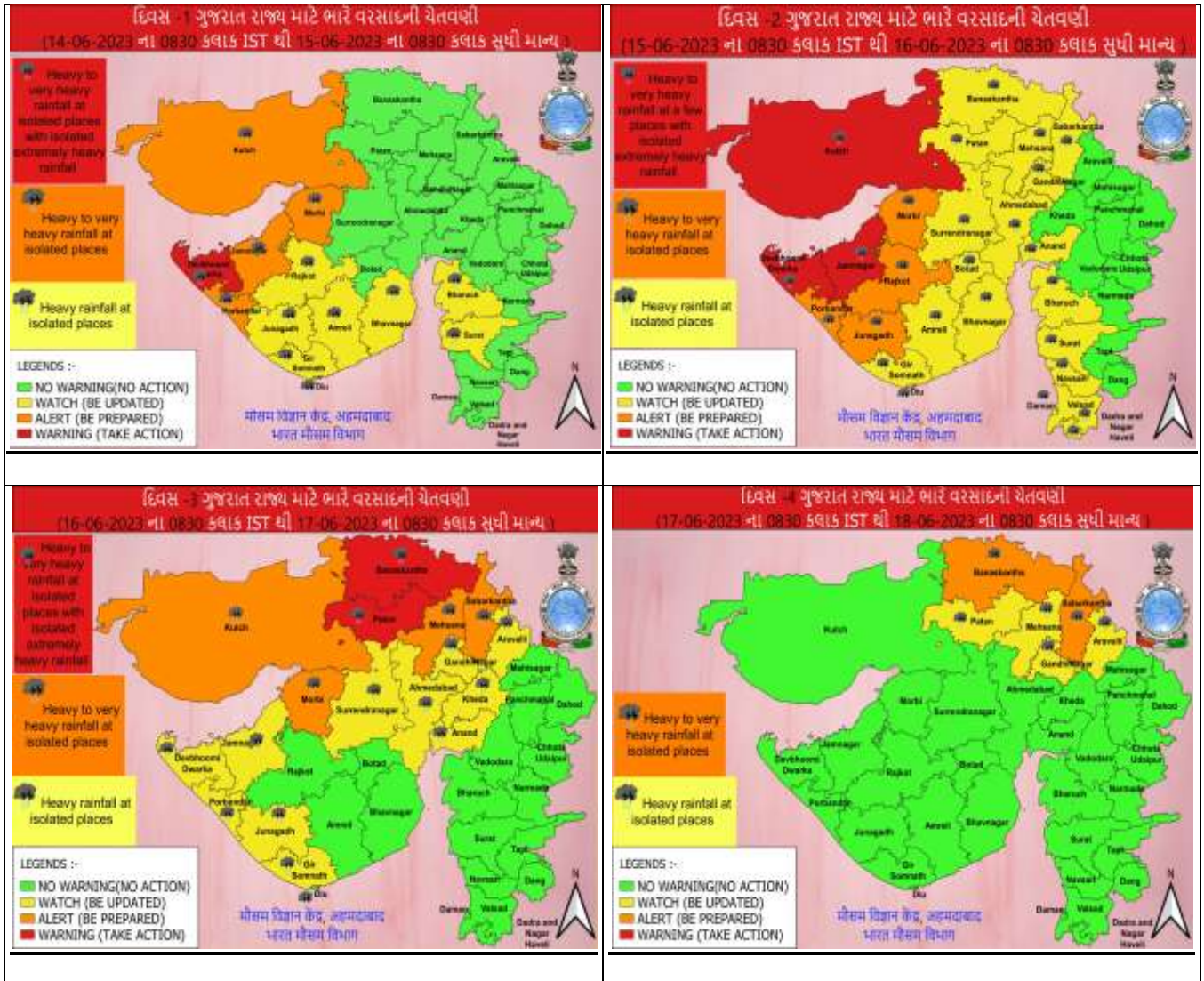


**SUBDIVISIONWISE RAINFALL FORECAST FOR DAY 5  
( 18-6-2023)**

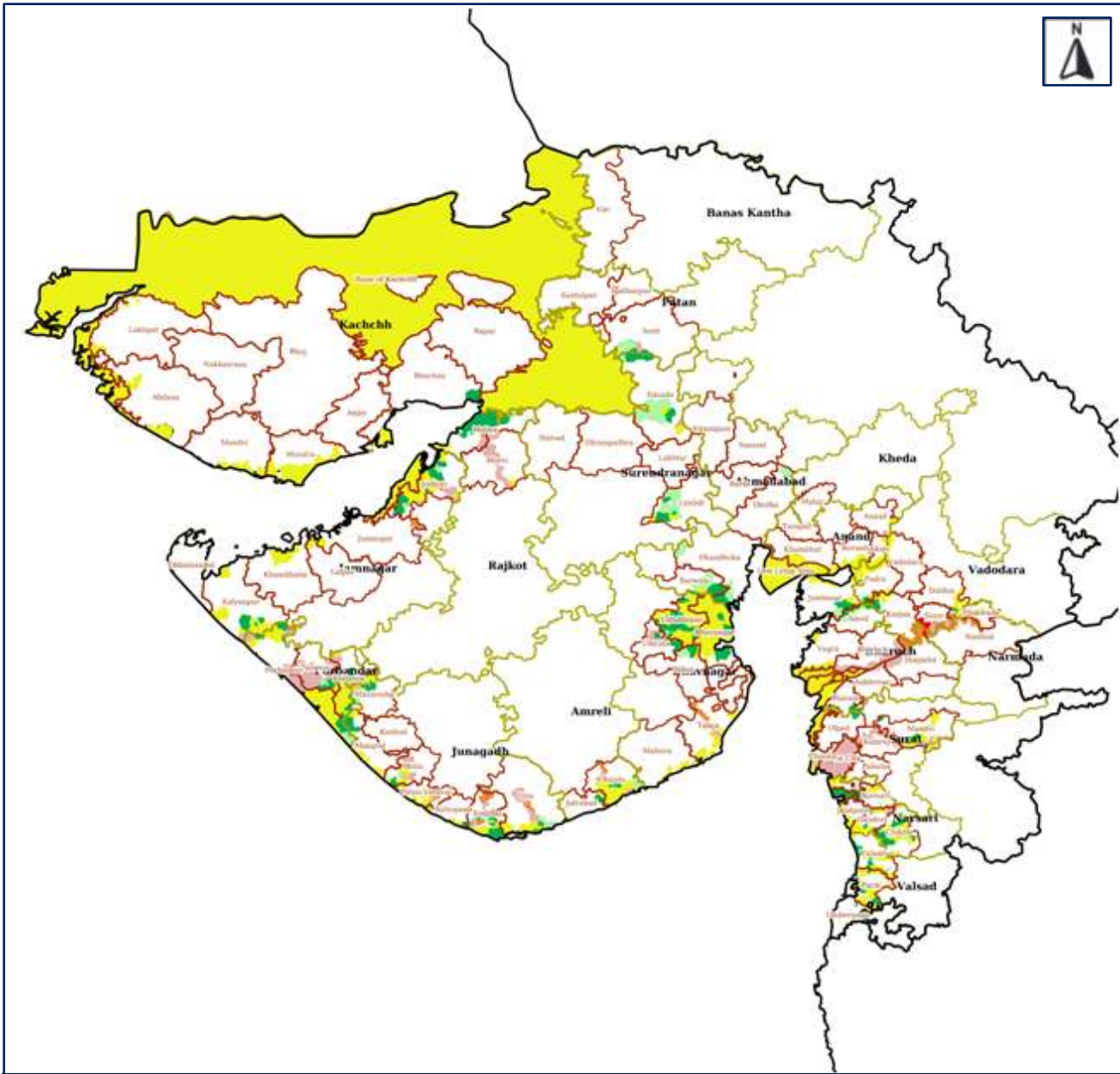


- |                             |                        |                          |
|-----------------------------|------------------------|--------------------------|
| <b>Subdivision Warning</b>  | — Dust Storm           | <b>Subdivision color</b> |
| ☁ Heavy Rain                | 🌪 Strong Surface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

## District-wise Heavy Rainfall Warning Maps for 15<sup>th</sup> to 17<sup>th</sup> June

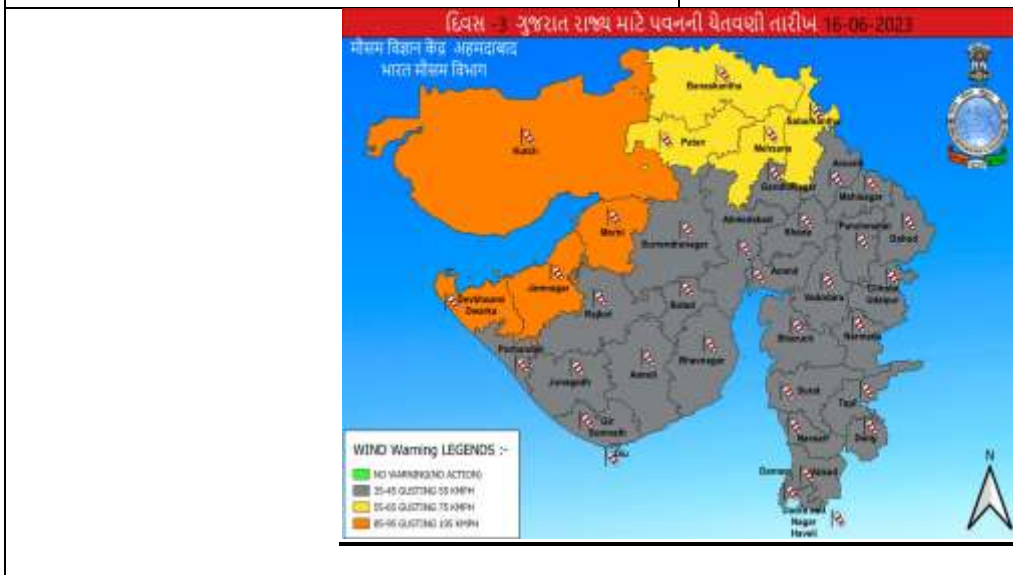
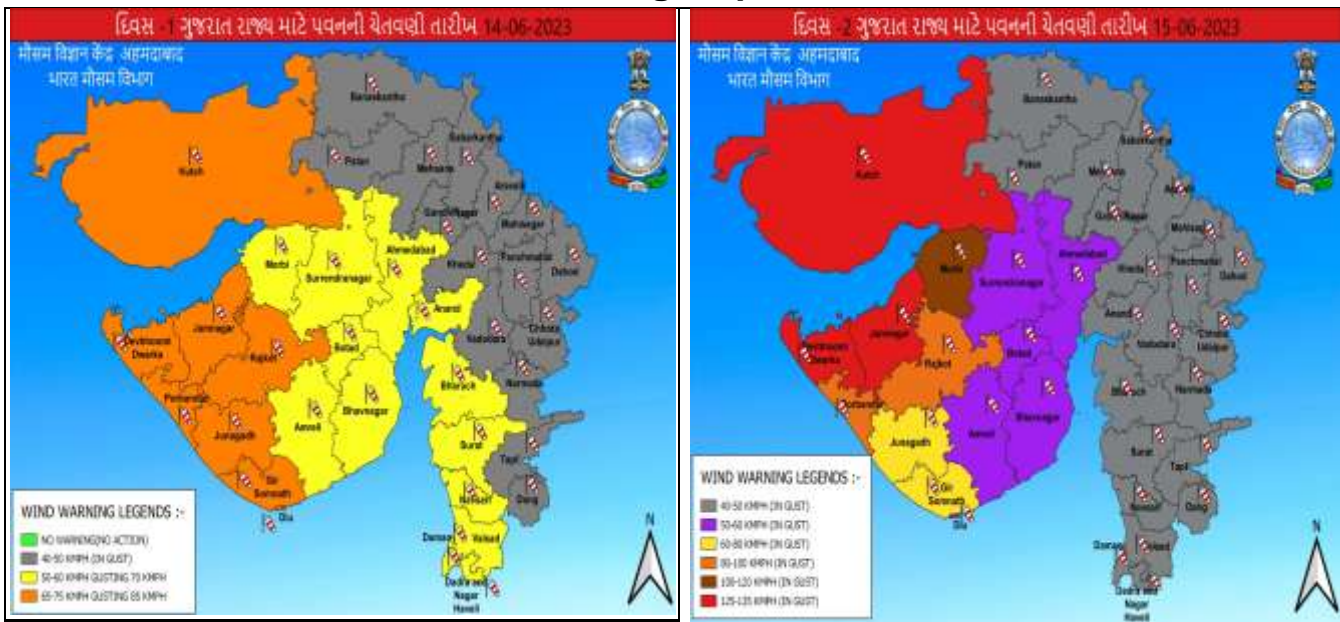


# Cyclone Biparjoy Flood Hazard Map (Tehsil-wise) on 15<sup>th</sup> June – Flood Depth

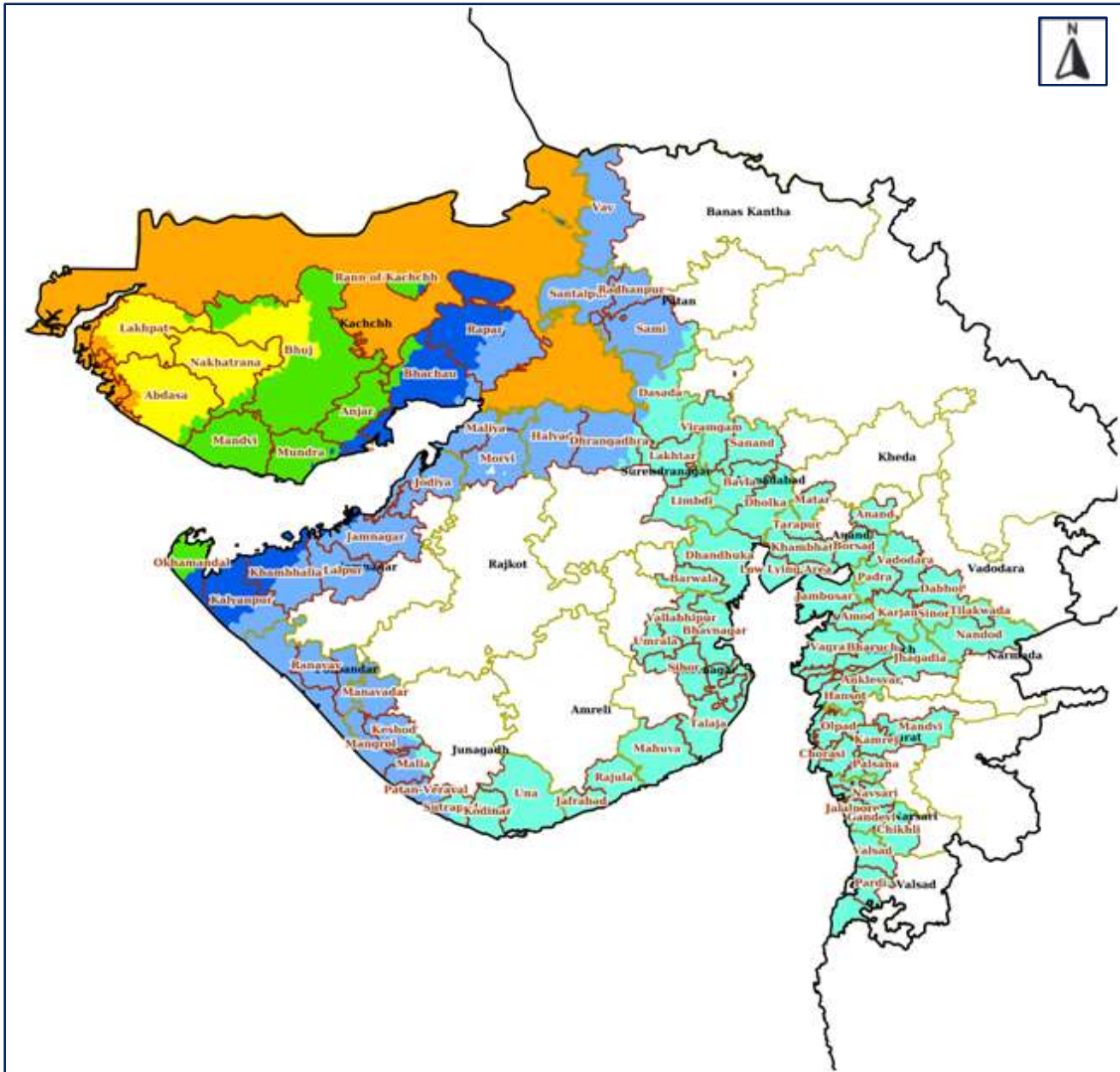


<b>LEGEND</b>	State Boundary	District Boundary	Tehsil Boundary	Village Boundary
	Very Low (Less than 0.25 m)	Low (0.25 to 0.50 m)	Moderate (0.50 to 1.0 m)	High (1.0 to 2.0 m)
	Very High (2.0 to 3.0 m)	Extreme (Greater than 3.0 m)		

## District-wise Wind Warning Maps for 14<sup>th</sup> to 16<sup>th</sup> June



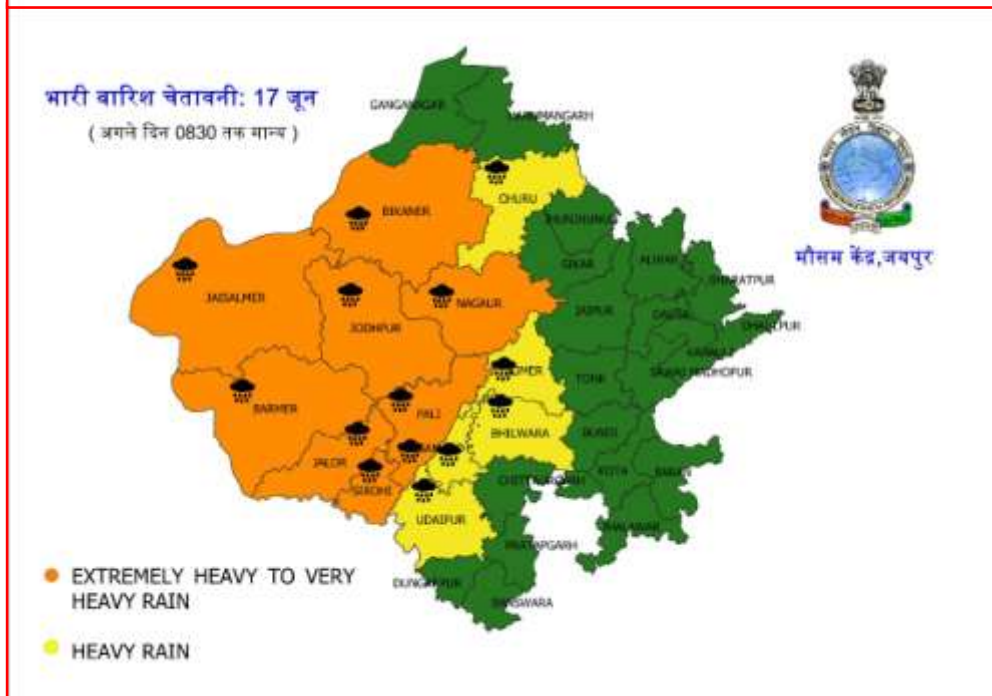
# Cyclone Biparjoy Wind Hazard Map (Tehsil-wise) on 15<sup>th</sup> June - Wind Speeds



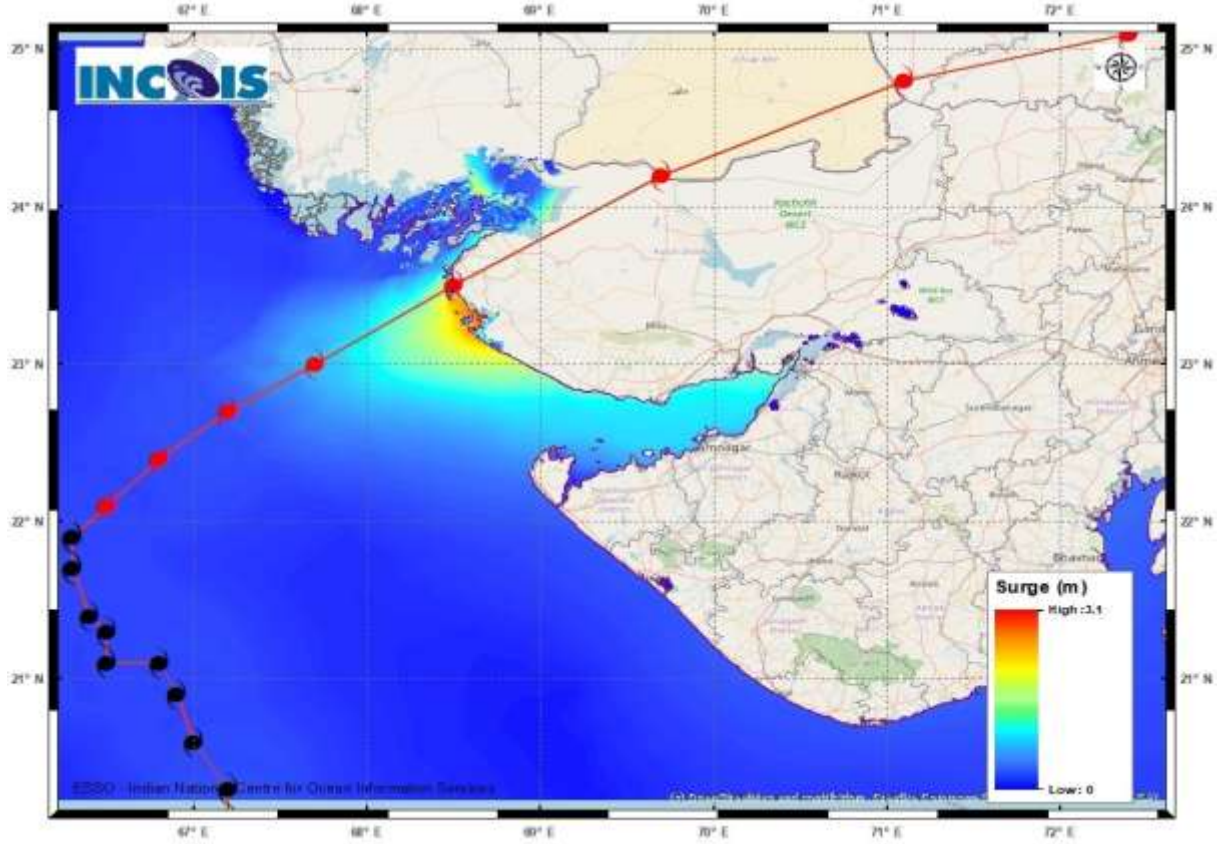
LEGEND	State Boundary	District Boundary	Tehsil Boundary	Village Boundary
	Wind Speed (Less than 31 Km/h)	Wind Speed (31 - 49 Km/h)	Wind Speed (49 - 61 Km/h)	
	Wind Speed (61 - 88 Km/h)	Wind Speed (88 - 117 Km/h)	Wind Speed (117- 166 Km/h)	
	Wind Speed (166 - 221 Km/h)	Wind Speed (Greater than 221 Km/h)		



# District-wise Wind Warning Maps on 16<sup>th</sup> and 17<sup>th</sup> June for Rajasthan



## Storm Surge Warning Map based on Forecast Track



### Astronomical Tide on 15<sup>th</sup> June 2023

Station	Time (IST)	Height (m)
Porbandar	09:37	2.61
Navlakhi	13:38	7.54
OKHA	11:36	3.74
DEENDAYAL PORT (KANDLA)	13:02	6.79



## Fishermen warning graphics



	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
	Gale wind speed with wind speed 60-70 kmph gusting to 80 kmph
	Gale wind speed with wind speed 70-80 kmph gusting to 90 kmph
	Gale wind speed with wind speed 80-90 kmph gusting to 100 kmph
	Gale wind speed with wind speed 90-100 kmph gusting to 120 kmph
	Gale wind speed with wind speed 100-120 kmph gusting to 135 kmph
	Gale wind speed with wind speed 120-140 kmph gusting to 155 kmph
	Gale wind speed with wind speed 140-160 kmph gusting to 175 kmph
	Gale wind speed with wind speed 160-180 kmph gusting to 200 kmph

**Fishermen are advised not to venture into the marked areas**