



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

**DEMS-RSMC SPECIAL TROPICAL CYCLONES NEW DELHI DATED 15.06.2023**

**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. 69 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 48 HOURS ISSUED AT 0300 UTC OF 15.06.2023 BASED ON 0000 UTC OF 15.06.2023**

**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 MOVED NORTH-NORTHEASTWARD WITH A SPEED OF 6 KMPH DURING PAST 6-HOURS AND LAY CENTERED AT 0000 UTC OF 15<sup>TH</sup> JUNE, 2023 OVER THE SAME REGION NEAR LATITUDE 22.5°N AND LONGITUDE 67.0°E, ABOUT 180 KM WEST-SOUTHWEST OF JAKHAU PORT (GUJARAT), 210 KM WEST OF DEVBHUMI DWARKA (42731), 210 KM WEST-SOUTHWEST OF NALIYA(42631), 290 KM WEST-NORTHWEST OF PORBANDAR (42830), AND 270 KM SOUTH-SOUTHWEST OF KARACHI (PAKISTAN, 41780).

IT IS VERY LIKELY TO MOVE NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (GUJARAT) AND KARACHI (PAKISTAN) NEAR JAKHAU PORT (GUJARAT) BY 1200 UTC OF 15<sup>TH</sup> JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 115-125 KMPH GUSTING TO 140 KMPH.

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

<b>Date/Time(UTC)</b>	<b>Position (Lat. °N/ long. °E)</b>	<b>Maximum sustained surface wind speed (Kmph)</b>	<b>Category of cyclonic disturbance</b>
15.06.23/0000	22.5/67.0	125-135 Gusting To 150	Very Severe Cyclonic Storm
15.06.23/0600	22.9/67.3	120-130 Gusting To 145	Very Severe Cyclonic Storm
15.06.23/1200	23.3/67.8	115-125 Gusting To 140	Very Severe Cyclonic Storm
15.06.23/1800	23.7/68.6	105-115 Gusting To 125	Severe Cyclonic Storm
16.06.23/0000	24.1/69.3	70-80 Gusting To 90	Cyclonic Storm
16.06.23/1200	24.7/70.3	45-55 Gusting To 65	Depression

AS PER INSAT 3D IMAGERY, INTENSITY OF THE SYSTEM IS T4.0/C.I.4.0. CLOUDS ARE ORGANISED IN SHEAR PATTERN. ASSOCIATED BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY MAINLY OVER NORTH AND ADJOINING CENTRAL ARABIAN SEA BETWEEN LATITUDE 18.0°N & 24.0°N AND LONGITUDE 62.0°E & 68.5°E AND WEAK TO MODERATE CONVECTION LAY OVER SOUTH PAKISTAN, KUTCH & SAURASHTRA, ADJACENT GULF OF KUTCH, MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAJOR CONVECTION AREA IS SEEN IN SOUTHWEST SECTOR. 24 HOUR ANIMATION INDICATES THAT DISTANCE BETWEEN CENTRE OF SYSTEM AND INTENSE CLOUD MASS HAS INCREASED. THIS IS INDICATING WEAKENING OF THE SYSTEM IN PAST 24 HOURS. MULTISAT WINDS INDICATE STRONGER WINDS ARE SEEN IN THE SOUTHEAST SECTOR.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED (MSW) IS 65 KNOTS GUSTING TO 75 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 976 HPA. SEA CONDITION IS LIKELY TO BE PHENOMENAL OVER NORTHEAST ARABIAN SEA AND ROUGH TO VERY ROUGH OVER ADJOINING EASTCENTRAL ARABIAN SEA.

OKHA (42730) REPORTED DEPARTURE FROM NORMAL IN MEAN SEA LEVEL PRESSURE OF -4.3 HPA AND NALIYA (42631) OF -4.4 HPA & DWARKA (42731) REPORTED A DEPARTURE OF -5 HPA.

**REMARKS:**

SEA SURFACE TEMPERATURE IS AROUND 29-30°C OVER NORTHEAST ARABIAN SEA. OCEAN HEAT CONTENT IS 60-70KJ/CM<sup>2</sup> AND IS EXPECTED TO DECREASE GRADUALLY ALONG THE FORECAST TRACK BECOMING 30-40 KJ/CM<sup>2</sup> OFF SAURASHTRA & KUTCH COASTS. TOTAL PRECIPITABLE WATER IMAGERY INDICATES CONTINUED COLD AIR INCURSION INTO THE CORE OF SYSTEM. THE GRADIENT WIND ANALYSIS INDICATES THAT DURING PAST 24 HOURS, RADIUS OF GRADIENT WIND HAS INCREASED AND TEMPERATURE ANOMALY AT 300 HPA HAS DECREASED. FURTHER, AS THE SYSTEM REMAINED PRACTICALLY STATIONARY/MOVED VERY SLOWLY DURING PAST 12 HOURS, THE SURFACE AIR NEAR THE CORE COOLED DOWN, DUE TO UPWELLING IN THE SEA TO THE SOUTHEAST OF SYSTEM CENTRE. ALL THESE FEATURES LED TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL VORTICITY IS THE SAME DURING PAST THREE HOURS AND IS AROUND 300X10<sup>-6</sup>S<sup>-1</sup> TO THE SOUTH OF THE SYSTEM CENTRE. LOW LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT 20X10<sup>-5</sup>S<sup>-1</sup> TO THE SOUTHWEST OF THE SYSTEM CENTRE AND UPPER LEVEL DIVERGENCE HAS BECOME 20X10<sup>-5</sup> S<sup>-1</sup> IN PAST 6 HOURS TO THE SOUTH OF SYSTEM CENTRE. VERTICAL WIND SHEAR HAS INCREASED AND IS HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE RIDGE RUNS ALONG 21.5°N. THE DEEP LAYER MEAN WINDS, INDICATE A DEEP TROUGH ALONG 65.0E TO THE WEST OF SYSTEM CENTRE. THIS TROUGH, WOULD TEND TO PUSH THE CYCLONE NORTHEASTWARDS AND WOULD ALSO LEAD TO INCREASE IN TRANSLATIONAL SPEED OF THE SYSTEM. THE SYSTEM HAS NOW STARTED TRACKING NORTHEASTWARDS UNDER THE INFLUENCE OF SOUTHWESTERLY WINDS PREVAILING TO THE NORTH OF THE RIDGE AND THE WESTERLY TROUGH.

AS THE SYSTEM WILL APPROACH COAST, IT IS LIKELY TO EXPERIENCE LOWER OCEAN THERMAL ENERGY (40-50 KJ/CM<sup>2</sup>) AND DECREASE IN MIDDLE LEVEL HUMIDITY DUE TO DRY COLD AIR INTRUSION.

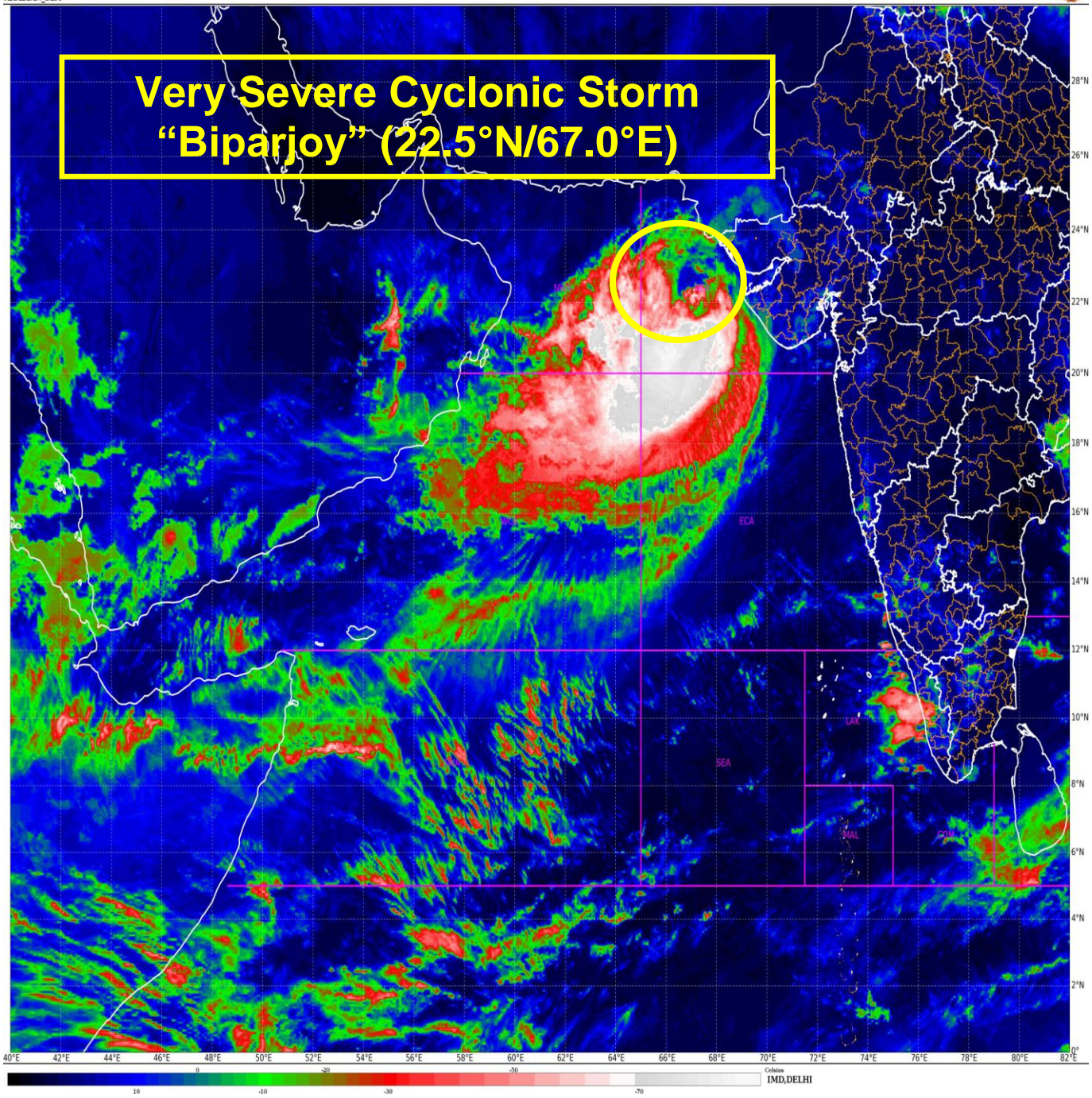
CONSIDERING ALL THE ABOVE, TC BIPARJOY IS VERY LIKELY TO MOVE NEARLY NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (GUJARAT, 42929) AND KARACHI (PAKISTAN, 41780) NEAR JAKHAU PORT (GUJARAT) BY 1200 UTC OF 15<sup>TH</sup> JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 120-130 KMPH GUSTING TO 145 KMPH.

**DR. TRISANU BANIK  
SCIENTIST C  
RSMC NEW DELHI**



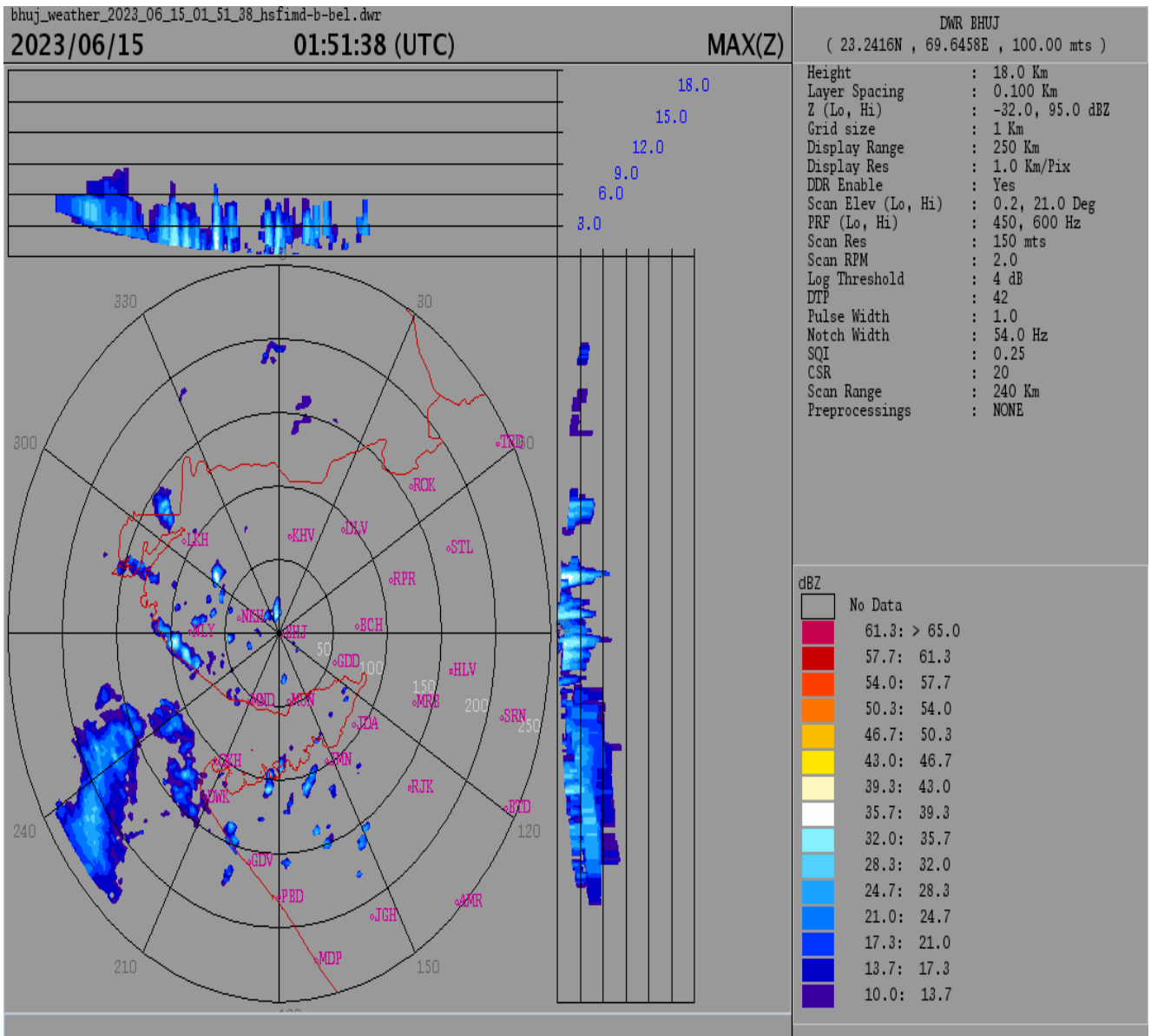


# Very Severe Cyclonic Storm "Biparjoy" (22.5°N/67.0°E)



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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# Radar Imagery of Doppler Weather Radar at Bhuj

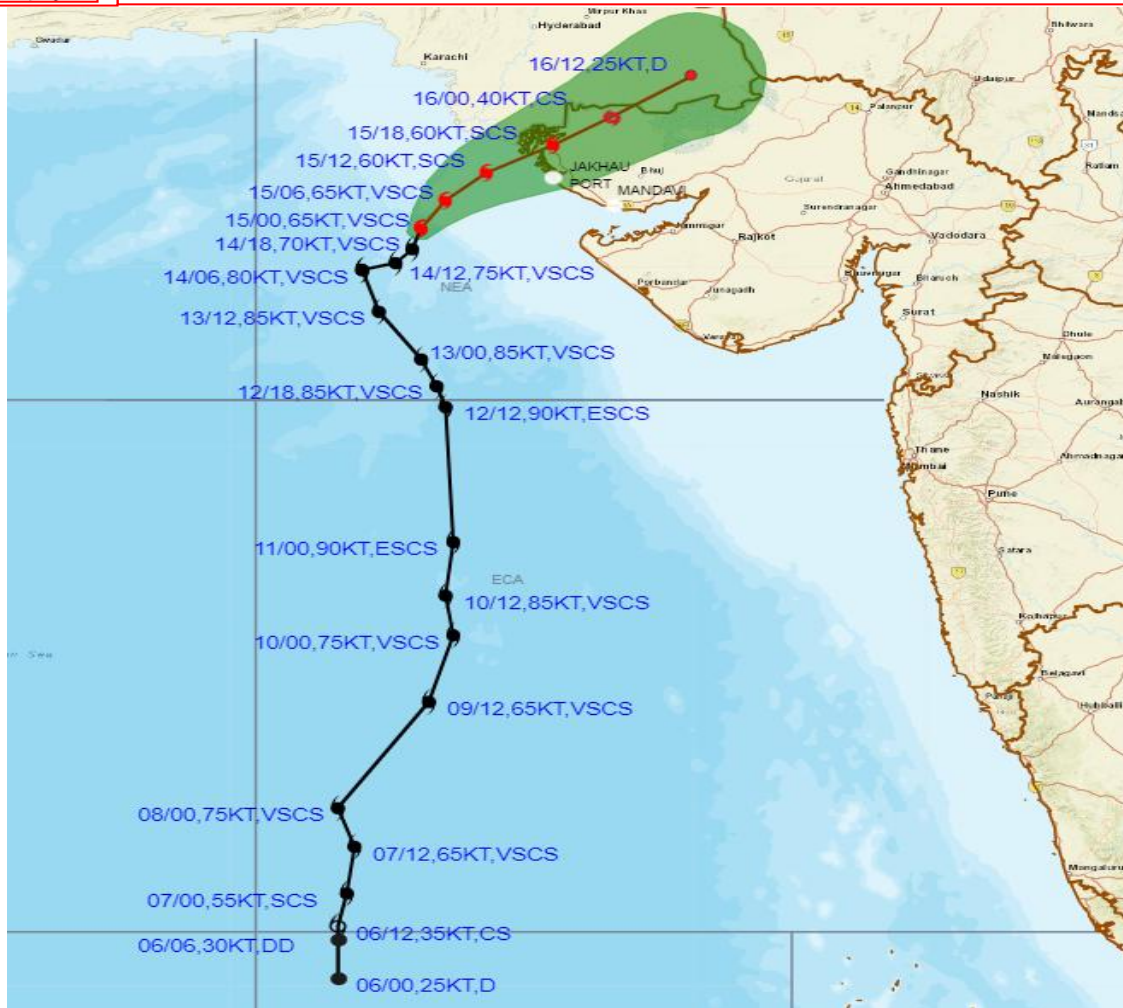


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**OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 0000 UTC (0530 IST) OF 15<sup>TH</sup> JUNE 2023.**



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)

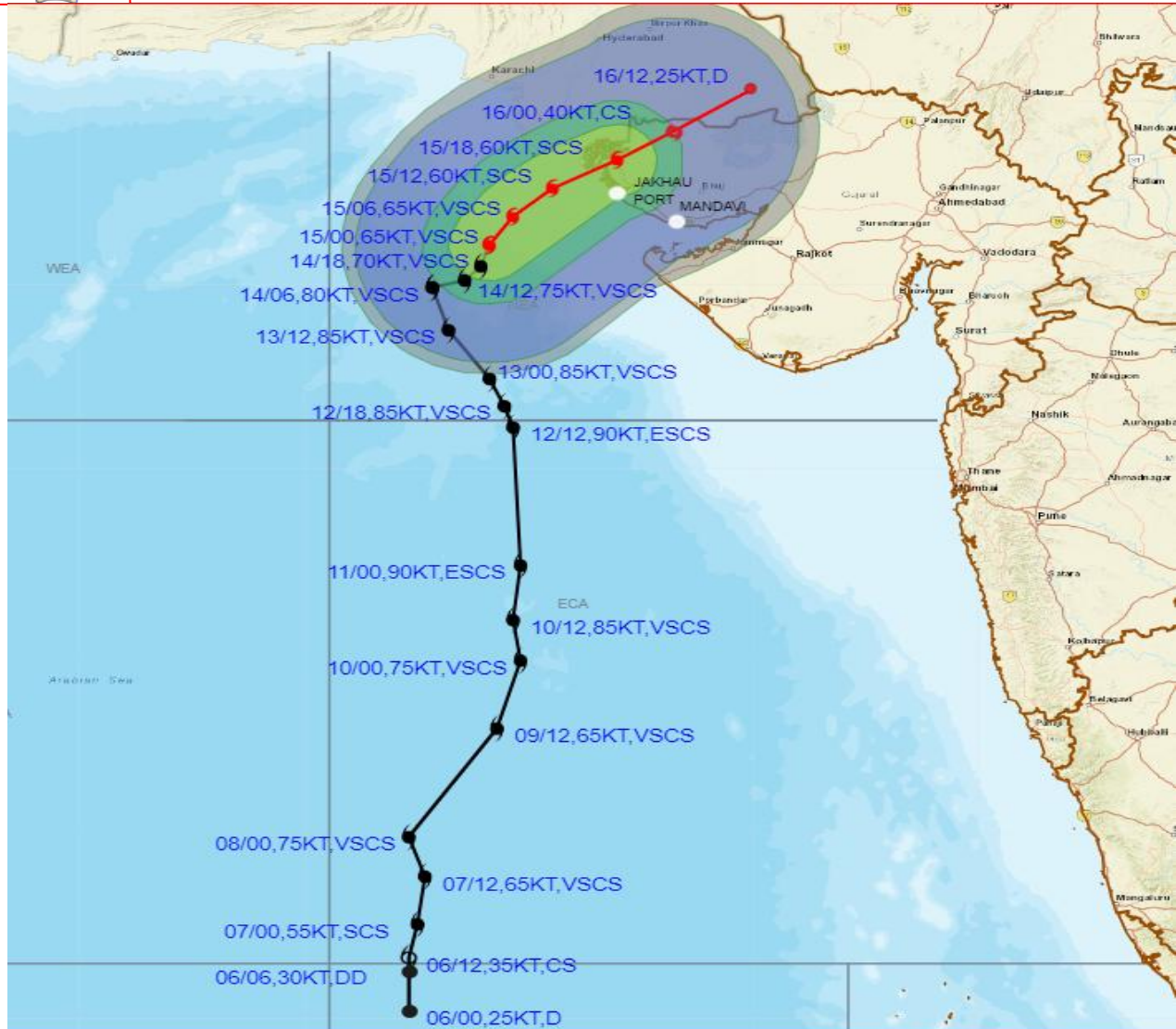
- LESS THAN 34 KT
- 34.47 KT
- ≥ 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- ▲ CONE OF UNCERTAINTY

Forecast	DISTANCE(KM) AND DIRECTION FROM STATIONS				
Date and Time	PORBANDAR	DWARKA	JAKHAU PORT	NALIYA	KARACHI AIRPORT
16.06.23/0000	280, N	190, N	120, NE	110, NNE	240, ESE

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**OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 0000 UTC (0530 IST) OF 15<sup>TH</sup> JUNE 2023.**



DATE/TIME IN UTC  
IST=UTC + 0530

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WML: WELL MARKED LOW PRESSURE AREA  
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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)

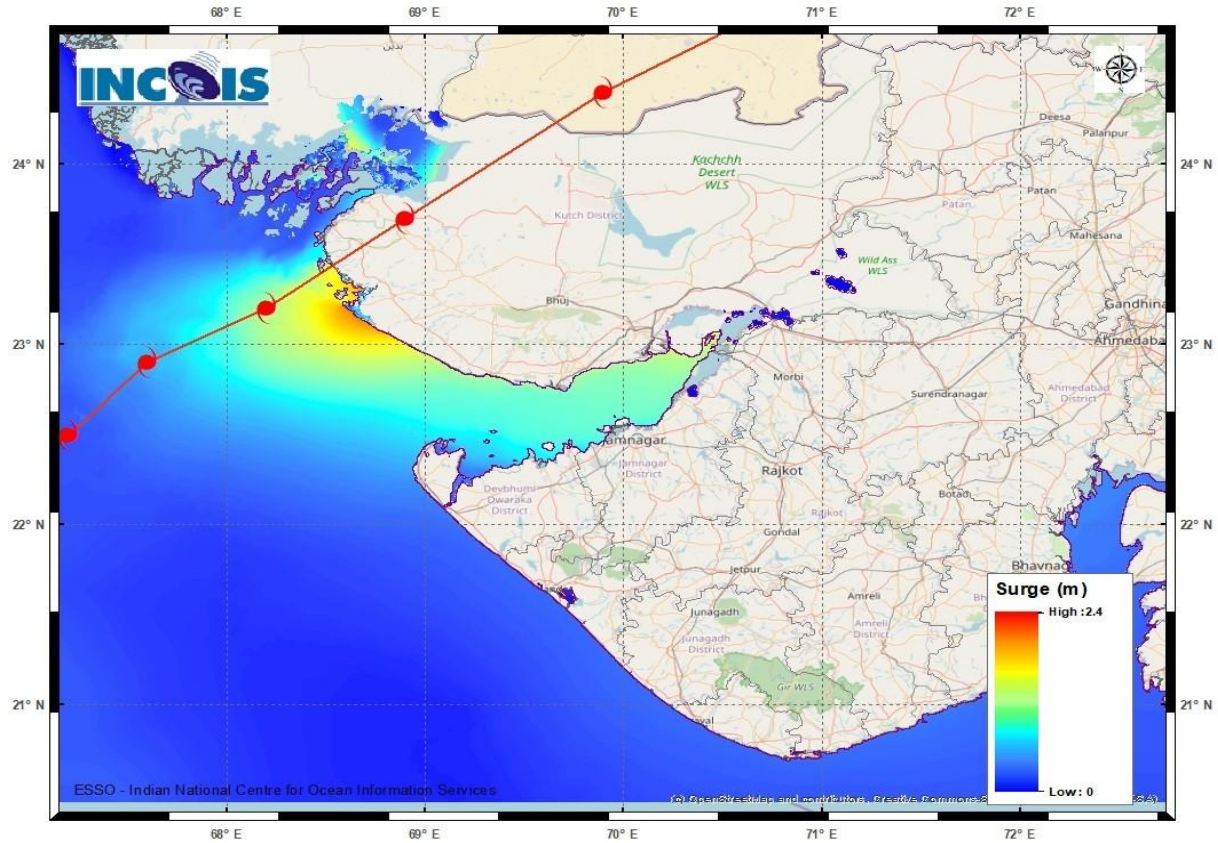
**IMPACT OVER THE SEA**

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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## Storm Surge Warning Map based on Forecast Track



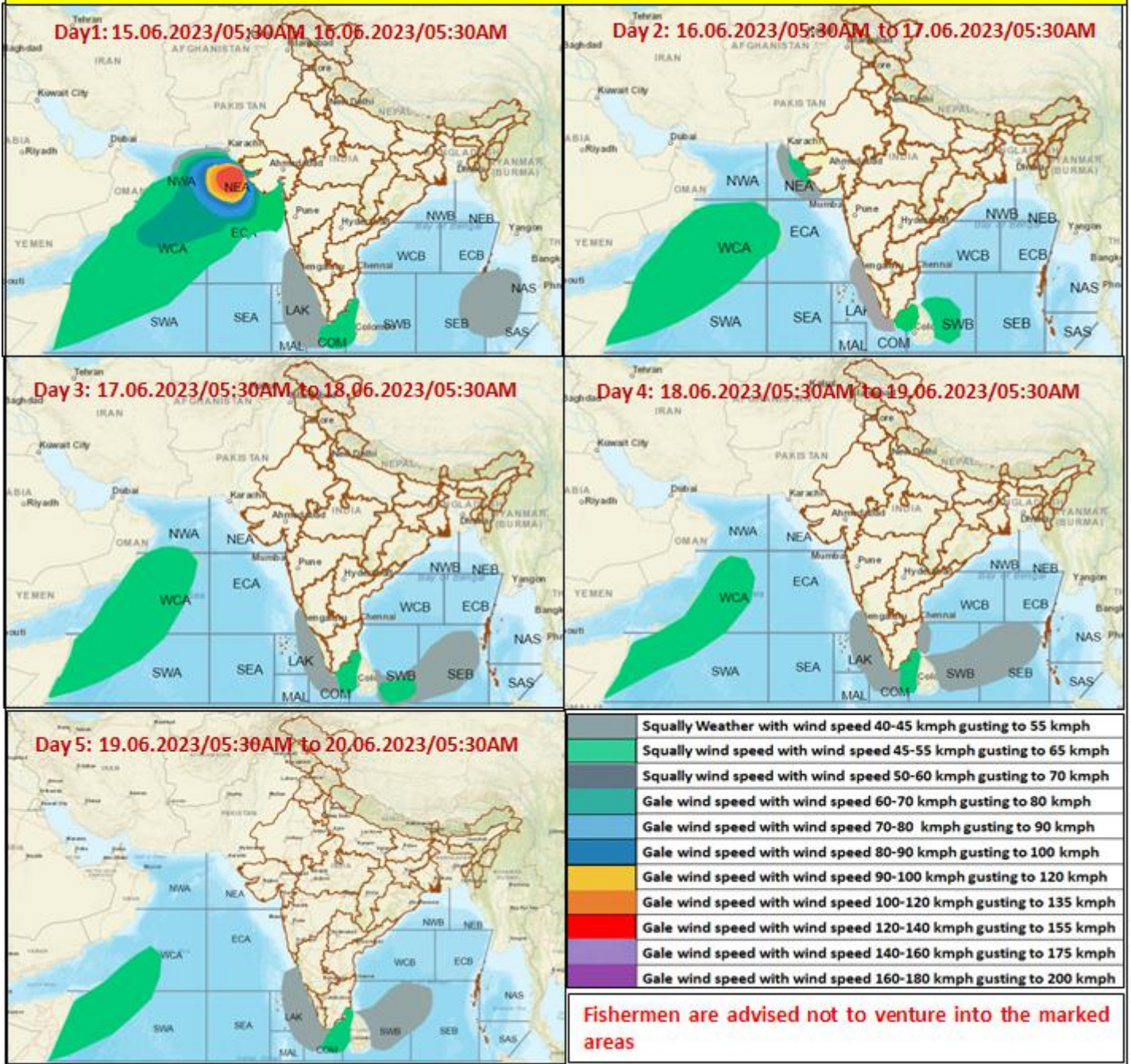
### Astronomical Tide on 15<sup>th</sup> June 2023

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

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## Fishermen warning graphics



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