



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

DEMS-RSMC SPECIAL TROPICAL CYCLONES NEW DELHI DATED 13.06.2023

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. 57 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1600 UTC OF 13.06.2023 BASED ON 1200 UTC OF 13.06.2023

SUB: VERY SEVERE CYCLONIC STORM “BIPARJOY” (PRONOUNCED AS “BIPORJOY”) OVER NORTHEAST ARABIAN SEA (CYCLONE WARNING FOR SAURASHTRA & KUTCH COASTS (ORANGE MESSAGE))

THE VERY SEVERE CYCLONIC STORM “BIPARJOY” (PRONOUNCED AS “BIPORJOY”) OVER NORTHEAST ARABIAN SEA MOVED NEARLY NORTH-NORTHWESTWARDS WITH A SPEED OF 7 KMPH DURING PAST 6-HOURS AND LAY CENTERED AT 1200 UTC OF TODAY, THE 13TH JUNE, 2023 OVER THE SAME REGION NEAR LATITUDE 21.3°N AND LONGITUDE 66.5°E, ABOUT 290 KM WEST-SOUTHWEST OF DEVBHUMI DWARKA (42731), 310 KM WEST OF PORBANDAR (42830), 310 KM SOUTHWEST OF JAKHAU PORT (GUJARAT), 330 KM SOUTHWEST OF NALIYA (42631) AND 410 KM SOUTH OF KARACHI (PAKISTAN, 41780).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 13TH MIDNIGHT, THEN MOVE NORTH-NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (GUJARAT, 42929) AND KARACHI (PAKISTAN, 41780) NEAR JAKHAU PORT (GUJARAT) BY 1200 OF 15TH 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:

Date/Time(UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
13.06.23/1200	21.3/66.5	150-160 Gusting To 180	Very Severe Cyclonic Storm
13.06.23/1800	21.6/66.5	150-160 Gusting To 180	Very Severe Cyclonic Storm
14.06.23/0000	21.9/66.7	145-155 Gusting To 170	Very Severe Cyclonic Storm
14.06.23/0600	22.2/66.9	140-150 Gusting To 165	Very Severe Cyclonic Storm

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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14.06.23/1200	22.5/67.2	135-145 Gusting To 160	Very Severe Cyclonic Storm
15.06.23/0000	23.1/67.9	130-140 Gusting To 155	Very Severe Cyclonic Storm
15.06.23/1200	23.6/68.7	120-130 Gusting To 145	Very Severe Cyclonic Storm
16.06.23/0000	24.2/69.8	90-100 Gusting To 110	Severe Cyclonic Storm
16.06.23/1200	24.8/71.0	50-60 Gusting To 70	Deep Depression
17.06.23/0000	25.3/72.3	30-40 Gusting To 50	Well Marked Low Pressure Area

AS PER INSAT 3D IMAGERY, INTENSITY OF THE SYSTEM IS T4.5. CLOUDS ARE ORGANISED IN CENTRAL DENSE OVERCAST PATTERN. ASSOCIATED BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY MAINLY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LATITUDE 17.5°N & 24.0°N AND LONGITUDE 62.0°E & 68.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. CLOUDS ARE ORIENTED IN SOUTH-SOUTHWEST TO NORTH-NORTHEAST DIRECTION. IN ASSOCIATION WITH THE OUTER BAND, CONVECTIVE CLOUDS ARE COVERING COASTAL DISTRICTS OF SAURASHTRA AND KUTCH, EXTENDING FROM DEVBHUMI DWARKA DISTRICT TO KACHCHH DISTRICT. MICROWAVE IMAGERY AT 0824 UTC INDICATES, INTENSE CONVECTIVE CLOUD MASS IN THE SOUTHERN SECTOR. MULTISAT WINDS INDICATE STRONGER WINDS IN THE NORTHEAST SECTOR. THE CONVECTION IN ASSOCIATION WITH CYCLONE HAS SHOWN DIURNAL VARIATION TODAY BEING MAXIMUM AT 0900 UTC LIKE PREVIOUS DAYS.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED (MSW) IS 85 KNOTS GUSTING TO 95 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 970 HPA. SEA CONDITION IS LIKELY TO BE PHENOMENAL OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA.

THE PRESSURE HAS FALLEN ALONG SAURASHTRA AND KUTCH COASTS BY ABOUT 0.5-1.0 HPA DURING PAST 24 HOURS, ENDING AT 1200 UTC OF TODAY. DIU (42914) REPORTED MEAN SEA LEVEL PRESSURE (MSLP) OF 999.8 HPA AND MSW OF 180°/ 27 KT. PORBANDER (42830) REPORTED MSLP OF 997.1 HPA AND MSW OF 140°/ 18 KT.

REMARKS:

SEA SURFACE TEMPERATURE IS AROUND 29-30°C OVER NORTHEAST ARABIAN SEA AND IS HIGHER 30-31°C, OFF SAURASHTRA COAST ALONG THE FORECAST TRACK. OCEAN HEAT CONTENT IS 60-70KJ/CM² AND IS EXPECTED TO DECREASE GRADUALLY ALONG THE FORECAST TRACK BECOMING 30-40 KJ/CM² OFF SAURASHTRA & KUTCH COASTS. TOTAL PRECIPITABLE WATER IMAGERY INDICATES WARM MOIST AIR INCURSION INTO THE CORE OF SYSTEM. THE LOW LEVEL VORTICITY IS THE SAME DURING PAST SIX HOURS AND IS AROUND 300X10⁻⁶S⁻¹ TO THE SOUTH-SOUTHWEST OF THE SYSTEM CENTRE AND IS NORTHEAST-SOUTHWEST ORIENTED. LOW LEVEL CONVERGENCE IS THE SAME IN PAST 03 HOURS ABOUT 30X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE AND UPPER LEVEL DIVERGENCE IS THE SAME AND IS ABOUT 20X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF SYSTEM CENTRE. VERTICAL WIND SHEAR HAS SLIGHTLY INCREASED AND IS AROUND (25-30 KNOTS) OVER THE SYSTEM AREA AND IS DECREASING TO 10-15 KNOTS ALONG THE FORECAST TRACK. CURRENTLY, THE SYSTEM IS TRACKING NORTH-NORTHWESTWARDS ALONG THE WESTERN PERIPHERY OF THE ANTICYCLONIC CIRCULATION LOCATED OVER CENTRAL INDIA. THE RIDGE RUNS ALONG 22°N. AS, THE CYCLONE WILL CROSS THE RIDGE LATITUDE, IT WILL EXHIBIT NORTH-NORTHEASTWARDS MOVEMENT. THE DEEP LAYER MEAN WINDS, INDICATE A DEEP TROUGH ALONG 66.0E TO THE WEST OF SYSTEM CENTRE. THIS TROUGH, WOULD TEND TO PUSH THE CYCLONE NORTHEASTWARDS AND ALSO WOULD LEAD TO INCREASE IN TRANSLATIONAL SPEED OF THE SYSTEM. AS THE SYSTEM WILL APPROACH COAST, IT IS LIKELY TO EXPERIENCE LOWER OCEAN THERMAL ENERGY (40-50 KJ/CM²) AND DECREASE IN MIDDLE LEVEL HUMIDITY DUE TO DRY COLD AIR INTRUSION.

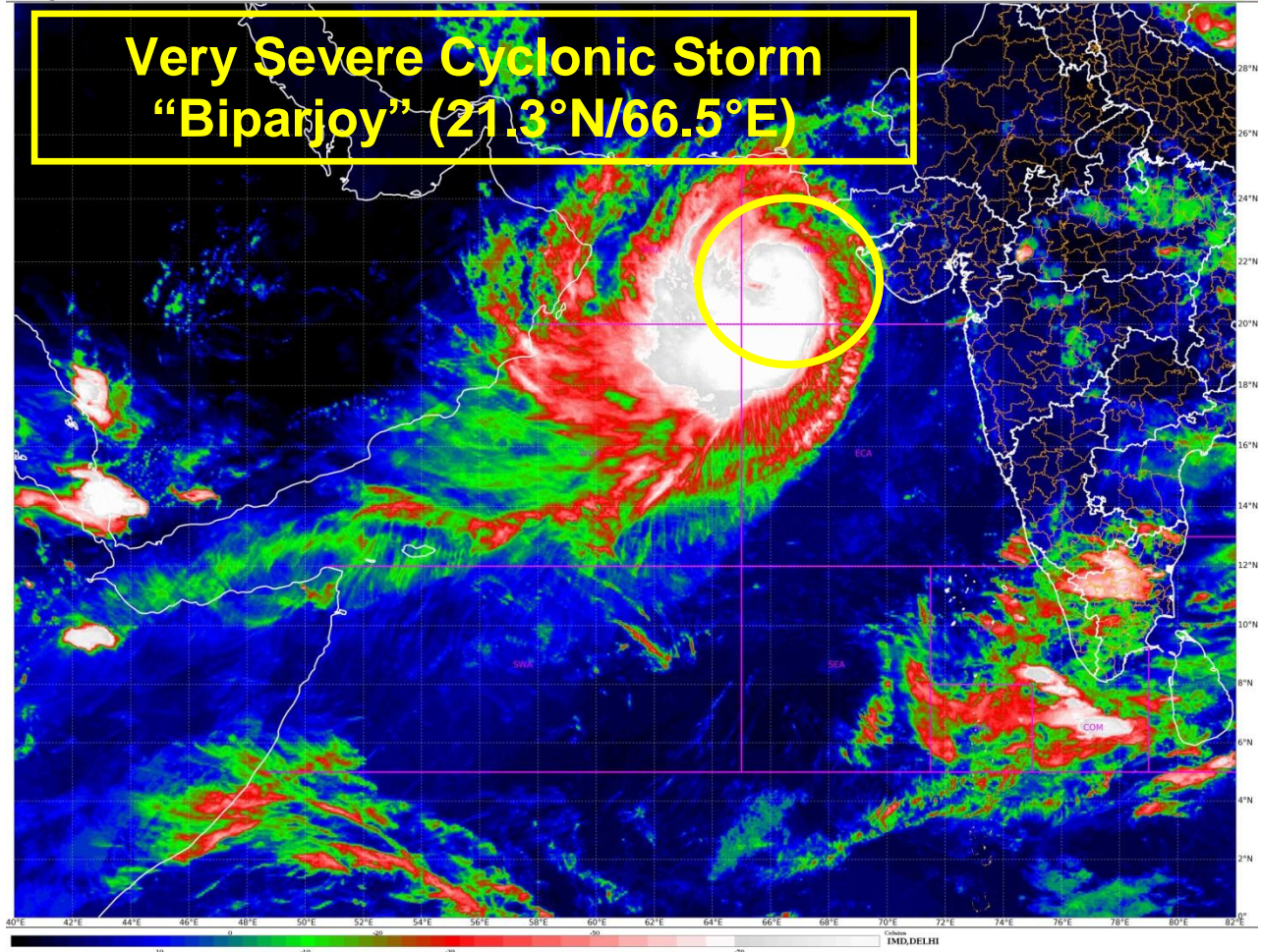
LATEST GUIDANCE FROM VARIOUS MODELS (NCUM-G, NCUM-R, ECMWF, IMD HWRF, VARIOUS IMD MME SYSTEMS) IS CONVERGING AND ALL OF THESE ARE INDICATING INTIAL NEAR NORTHWARDS MOVEMENT FOLLOWED BY GRADUAL NORTH-NORTHEASTWARDS MOVEMENT TOWARDS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS. ONLY IMD GFS AND NCEP GFS ARE INDICATING CROSSING OVER ADJOINING PAKISTAN COAST. THE LANDFALL TIME IS VARYING BETWEEN 1000 UTC TO 1800 UTC OF 15TH JUNE AND LANDFALL POINT IS VARYING BETWEEN LONGITUDE 67.5E AND 68.5E EXCEPT (IMD GFS, NCEP GFS).

CONSIDERING ALL THE ABOVE, TC BIPARJOY IS VERY LIKELY TO IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 13TH MIDNIGHT, THEN MOVE NORTH-NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (GUJARAT, 42929) AND KARACHI (PAKISTAN, 41780) NEAR JAKHAU PORT (GUJARAT) BY 1200 OF 15TH JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH.

**M SHARMA
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RSMC NEW DELHI**

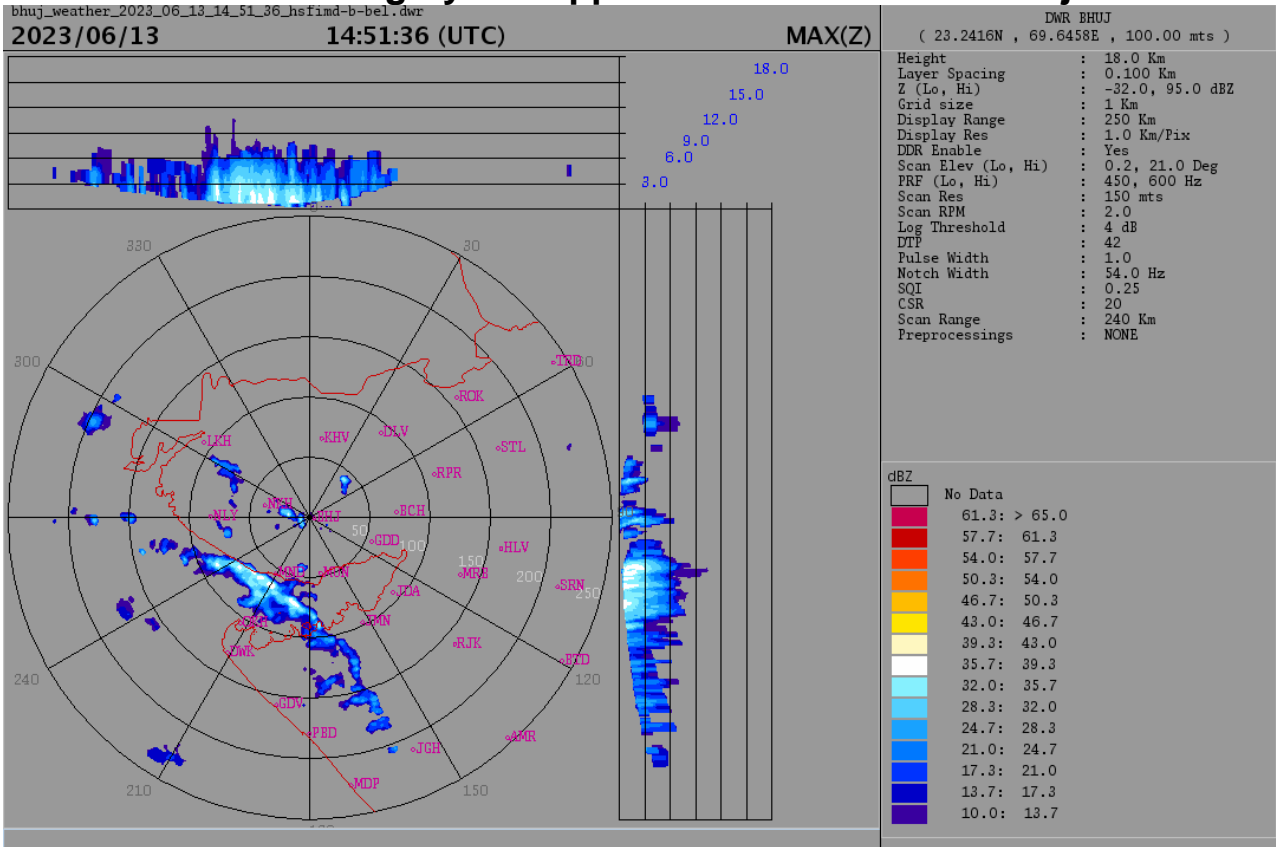


Very Severe Cyclonic Storm "Biparjoy" (21.3°N/66.5°E)



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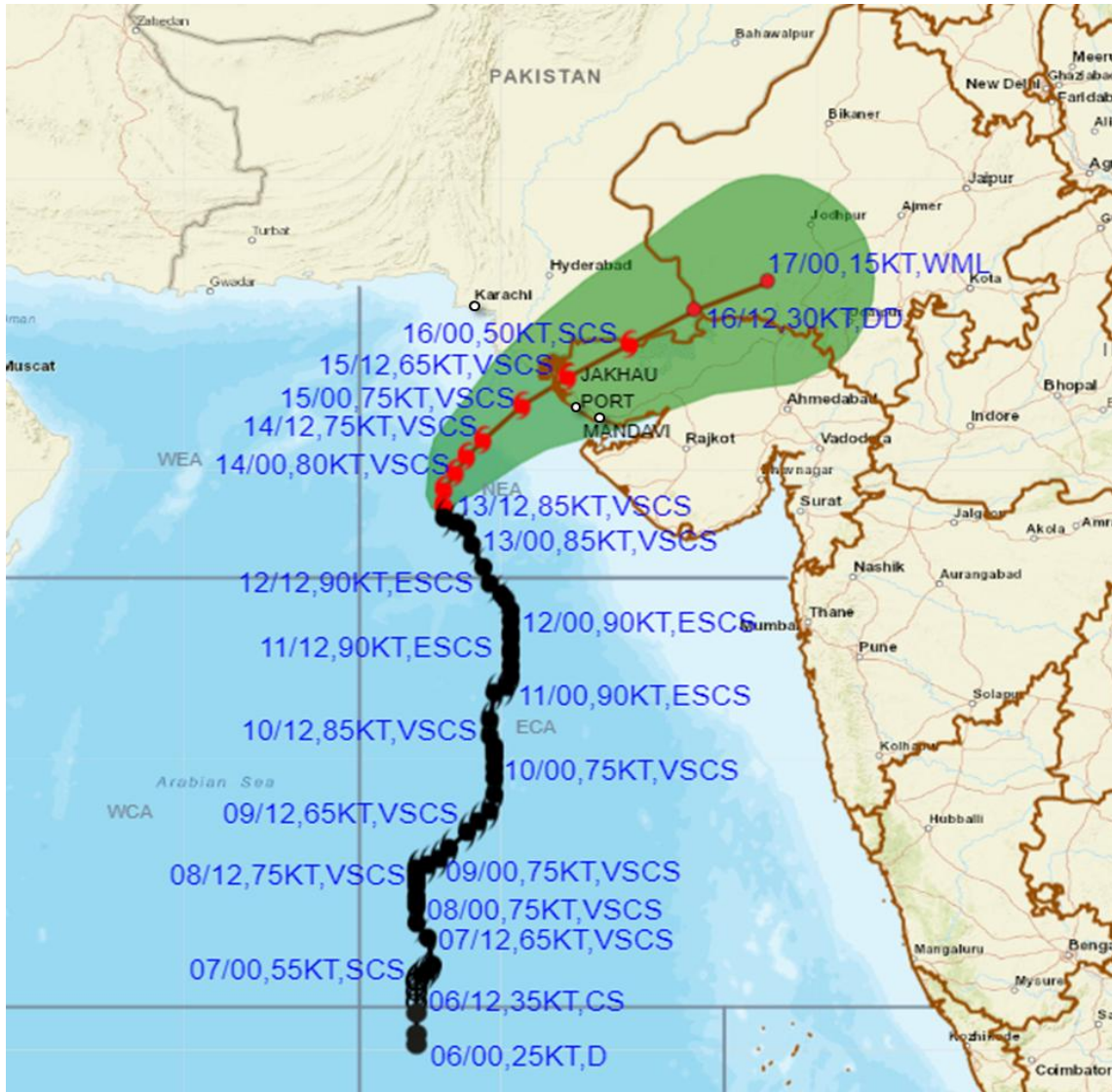
Radar Imagery of Doppler Weather Radar at Bhuj



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OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 1200 UTC (1730 IST) OF 13TH 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)

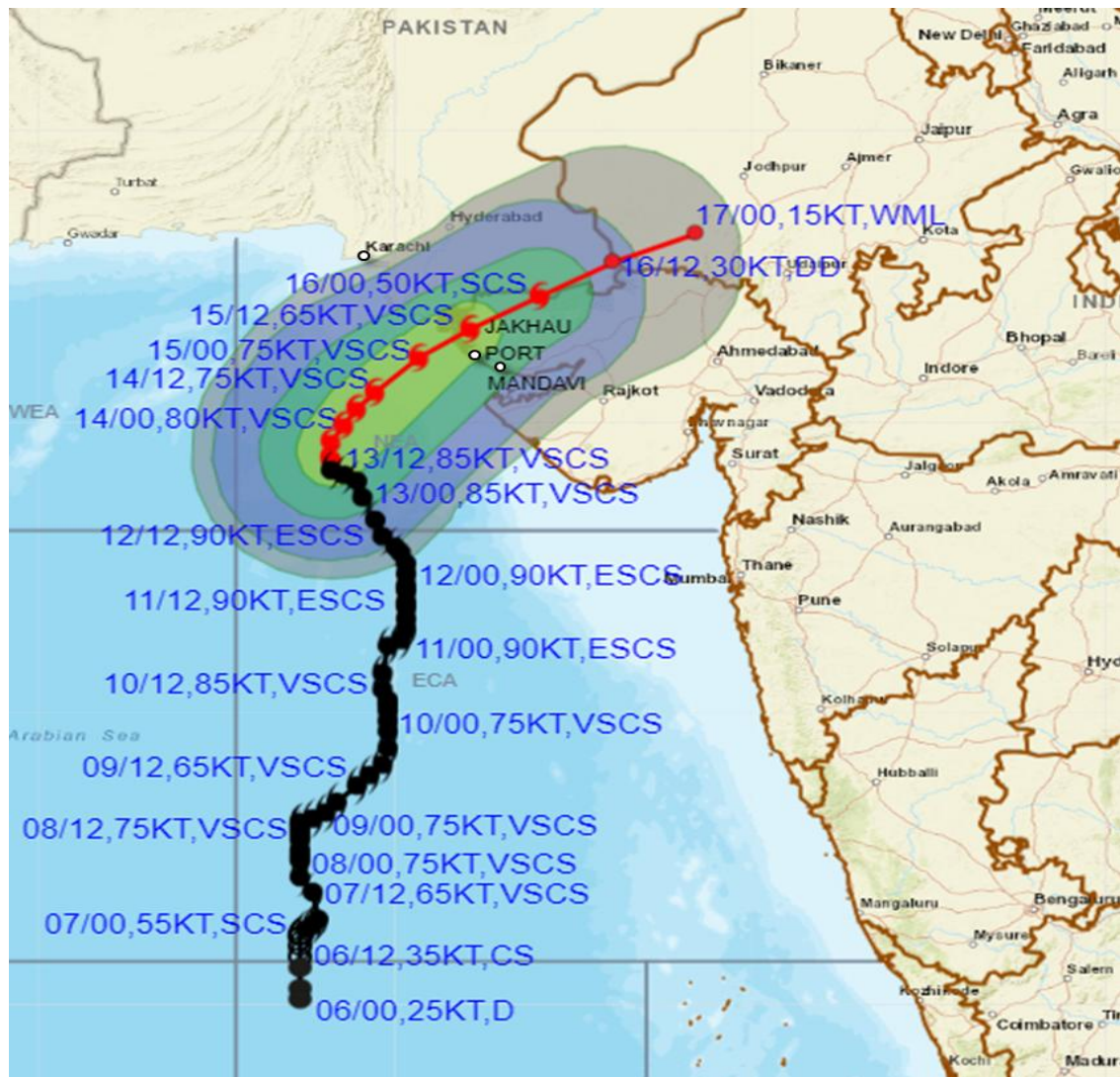
- LESS THAN 34 KT
- 34-47 KT
- \geq 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

Forecast	DISTANCE(KM) AND DIRECTION FROM STATIONS				
	PORBANDAR	DWARKA	JAKHAU PORT	NALIYA	KARACHI AIRPORT
14.06.23/1200	270, WNW	190, W	160, WSW	180, WSW	260, S
15.06.23/1200	240, NNW	150, NNW	50, NNE	50, NNW	220, SE
16.06.23/1200	380, NNE	330, NE	300, NE	280, NE	390, E

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DATE/TIME IN UTC

IST=UTC + 0530

L: LOW PRESSURE AREA

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SuCS: SUPER CYCLONIC STORM (\geq 120 KT)

● LESS THAN 34 KT

○ 34-47 KT

● \geq 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)

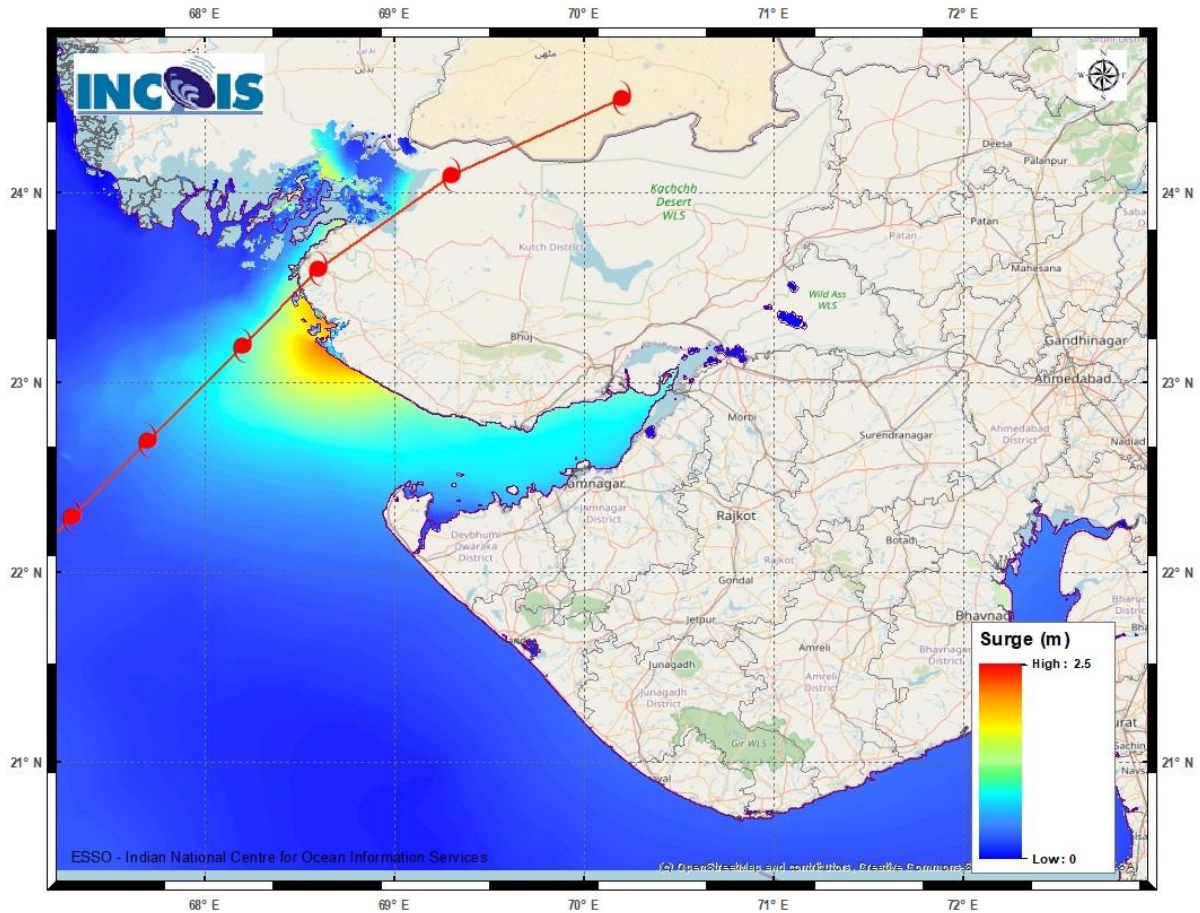
■ \geq 64 KT (\geq 118 KMPH)

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
\geq 64 (\geq 118)	Phenomenal	Total suspension of fishing operations

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Storm Surge Warning Map based on Forecast Track

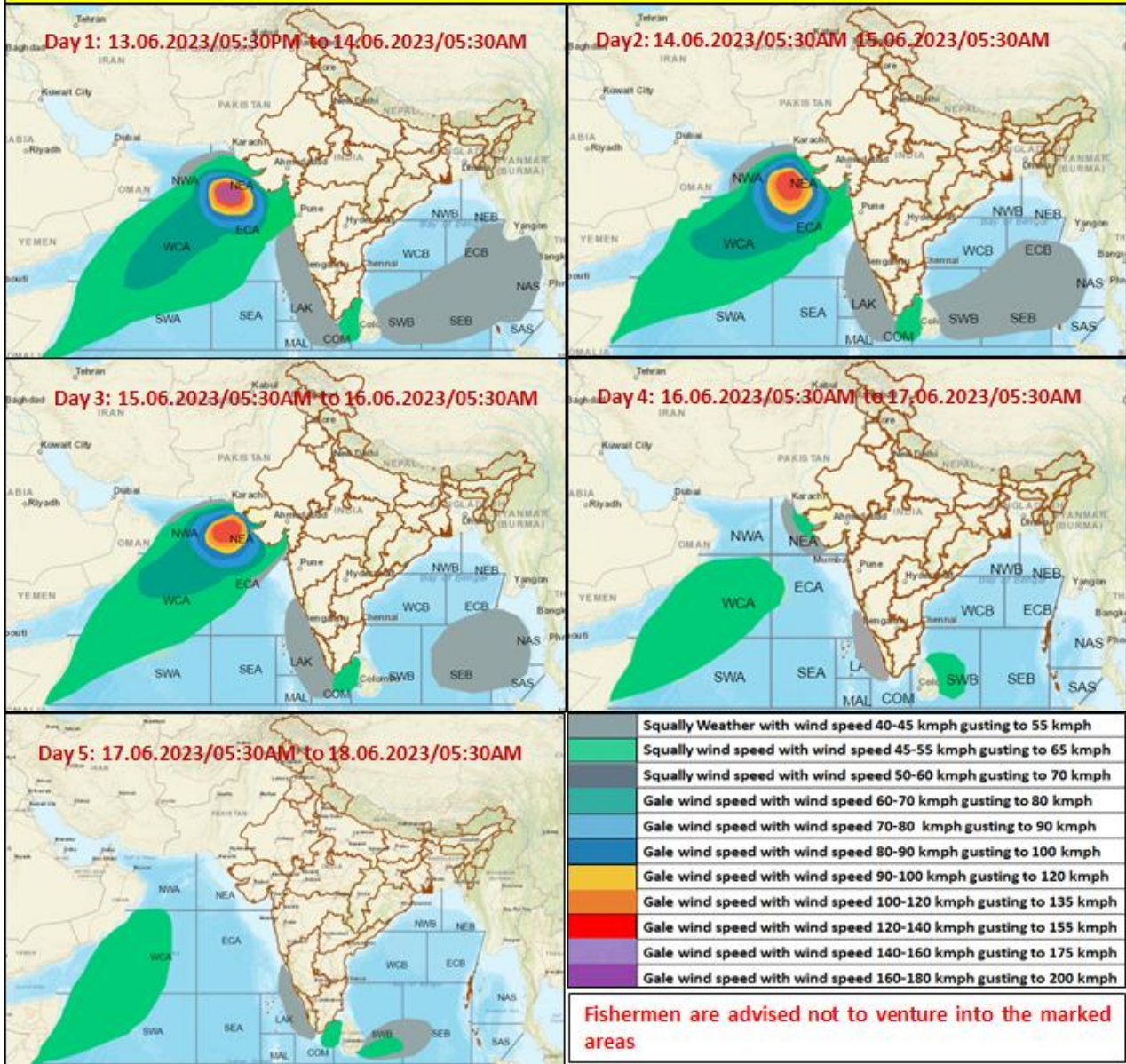


Astronomical Tide on 15th June 2023

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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