



**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. 61 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0345 UTC OF 14.06.2023 BASED ON 0000 UTC OF 14.06.2023

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 NEARLY NORTHWARDS WITH A SPEED OF 3 KMPH DURING PAST 6-HOURS AND LAY CENTERED AT 0000 UTC OF TODAY, THE 14TH 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 (42731), 300 KM WEST-SOUTHWEST OF NALIYA (42631), 350 KM WEST-NORTHWEST OF PORBANDAR (42830), AND 340 KM SOUTH-SOUTHWEST OF KARACHI (PAKISTAN, 41780).

IT 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 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
14.06.23/0000	21.9/66.3	145-155 Gusting To 170	Very Severe Cyclonic Storm
14.06.23/0600	22.1/66.5	145-155 Gusting To 170	Very Severe Cyclonic Storm
14.06.23/1200	22.4/66.8	140-150 Gusting To 165	Very Severe Cyclonic Storm
14.06.23/1800	22.7/67.2	135-145 Gusting To 160	Very Severe Cyclonic Storm
15.06.23/0000	23.0/67.7	130-140 Gusting To 155	Very Severe Cyclonic Storm
15.06.23/1200	23.5/68.5	125-135 Gusting To 150	Very Severe Cyclonic Storm
16.06.23/0000	24.2/69.7	90-100 Gusting To 110	Severe Cyclonic Storm
16.06.23/1200	24.8/71.1	50-60 Gusting To 70	Deep Depression
17.06.23/0000	25.1/72.4	25-35 Gusting To 45	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 CENTRAL AND ADJOINING NORTH ARABIAN SEA BETWEEN LATITUDE 17.0°N & 23.0°N AND LONGITUDE 61.0°E & 67.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. CLOUDS ARE ORIENTED IN SOUTH-SOUTHWEST TO NORTH-NORTHEAST DIRECTION. MICROWAVE IMAGERY AT 0824 UTC INDICATES, INTENSE CONVECTIVE CLOUD MASS IN THE SOUTHERN SECTOR. MULTISAT WINDS INDICATE STRONGER WINDS IN THE NORTHEAST SECTOR.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED (MSW) IS 80 KNOTS GUSTING TO 90 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 966 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 MEAN SEA LEVEL PRESSURE (MSLP) OF 997.1 HPA AND MSW OF 140°/ 9 KT. PORBANDER (42830) REPORTED MSLP OF 999.0 HPA AND MSW OF 180°/ 12 KT.

REMARKS:

SEA SURFACE TEMPERATURE IS AROUND 29-30°C OVER NORTHEAST ARABIAN SEA. 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 TWELVE HOURS AND IS AROUND 300X10⁻⁶S⁻¹ TO THE SOUTH-SOUTHWEST OF THE SYSTEM CENTRE AND IS NORTHEAST-SOUTHWEST ORIENTED. LOW LEVEL CONVERGENCE HAS INCREASED AND IS ABOUT 50X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE AND UPPER LEVEL DIVERGENCE HAS ALSO INCREASED AND IS ABOUT 40X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF SYSTEM CENTRE. VERTICAL WIND SHEAR HAS SLIGHTLY DECREASED AND IS AROUND (20-25 KNOTS) OVER THE SYSTEM AREA AND IS DECREASING TO 10-15 KNOTS ALONG THE FORECAST TRACK. CURRENTLY, THE SYSTEM IS TRACKING NORTHEASTWARDS ALONG THE WESTERN PERIPHERY OF THE ANTICYCLONIC CIRCULATION LOCATED OVER CENTRAL INDIA. THE RIDGE RUNS ALONG 22°N. THE DEEP LAYER MEAN WINDS, INDICATE A DEEP TROUGH ALONG 65.0E TO THE WEST OF SYSTEM CENTRE. THIS TROUGH, WOULD FURTHER TEND TO FURTHER 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 HWRP, VARIOUS IMD MME SYSTEMS) IS CONVERGING AND ALL OF THESE ARE INDICATING GRADUAL NORTHEASTWARD 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 0900 UTC

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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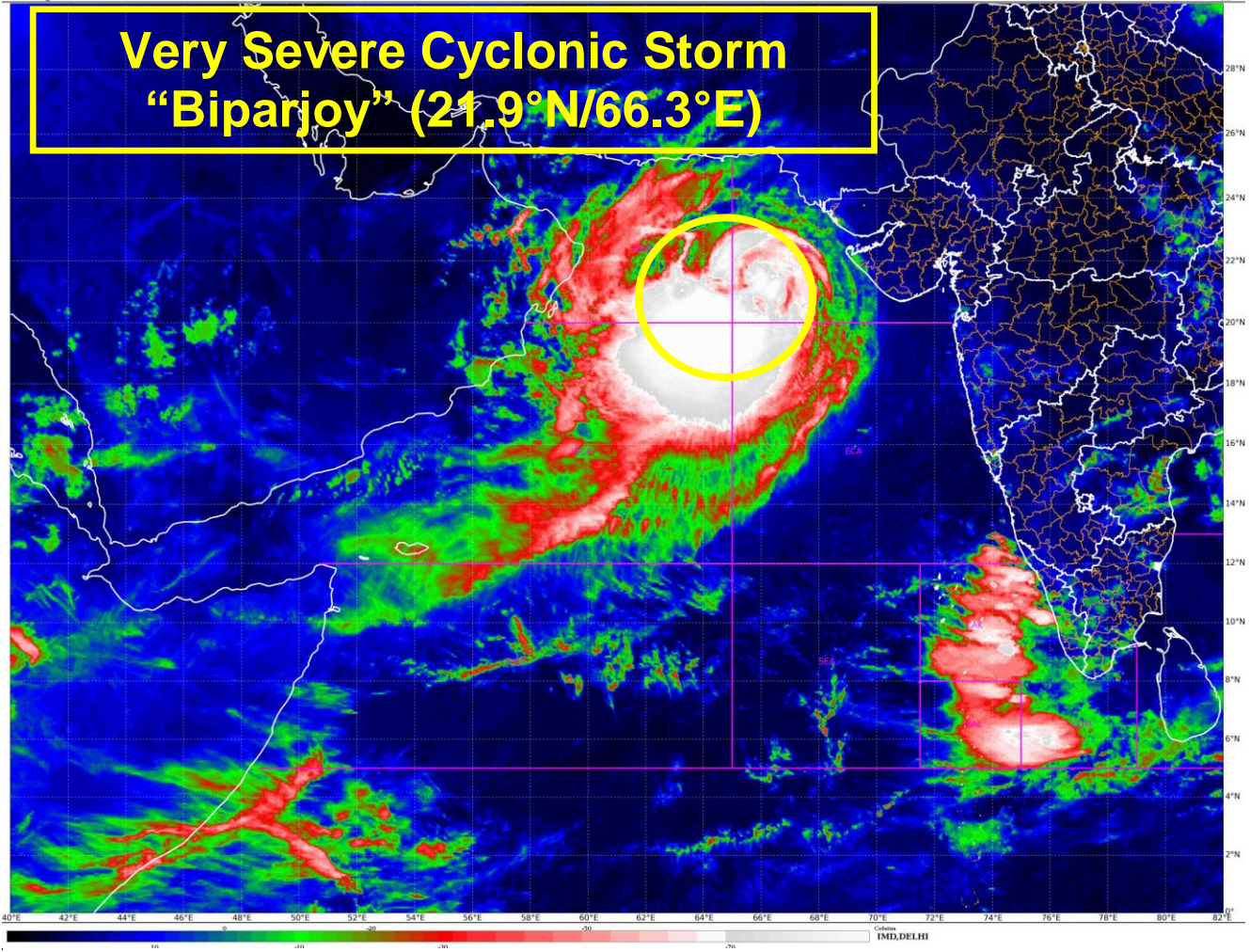
TO 1500 UTC OF 15TH JUNE AND LANDFALL POINT IS VARYING BETWEEN LONGITUDE 67.5E AND 68.5E EXCEPT (IMD GFS, NCEP GFS).

CONSIDERING ALL THE ABOVE, TC BIPARJOY IS VERY LIKELY TO 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 15TH JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH.

**R. K. JENEMANI
SCIENTIST G
RSMC NEW DELHI**

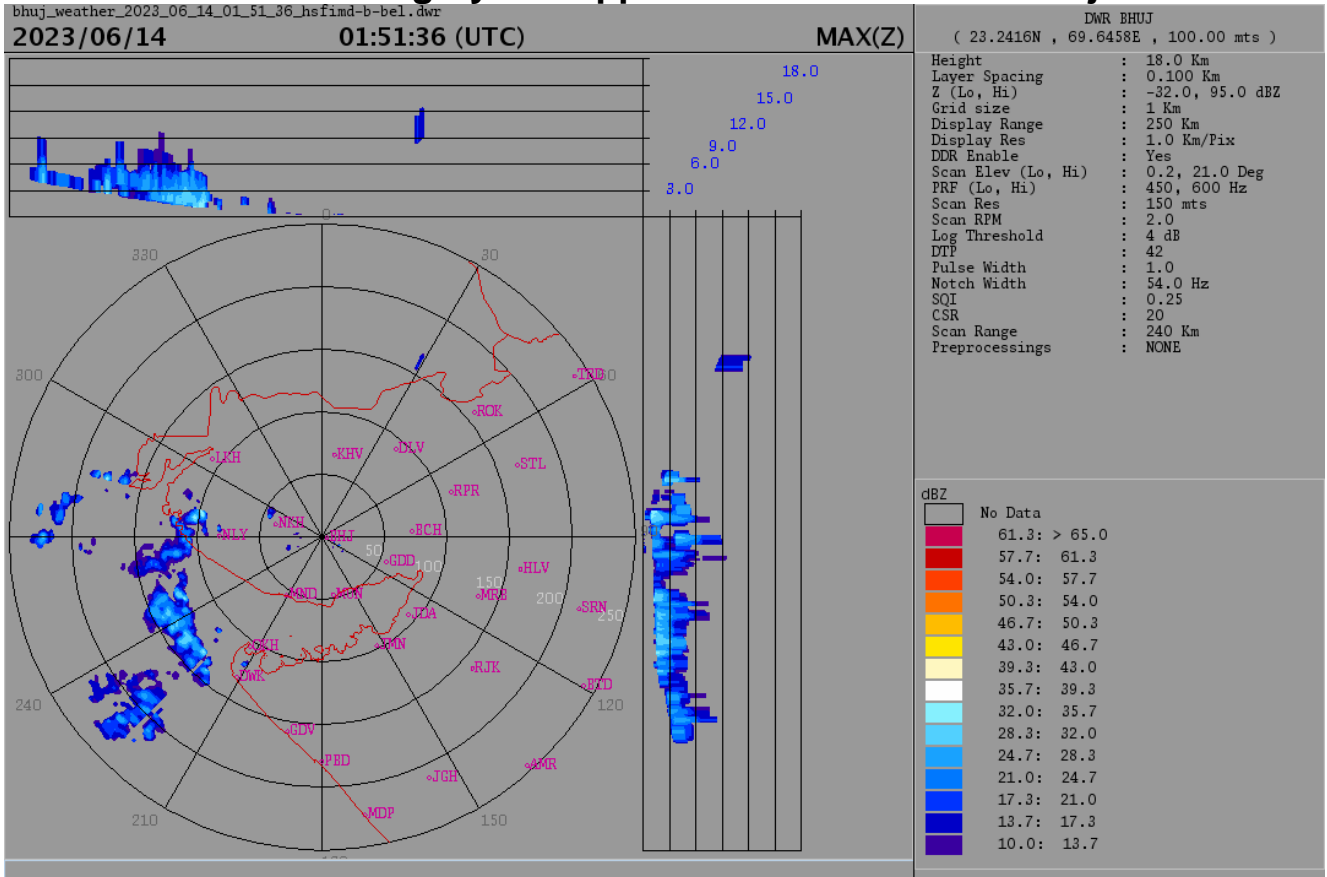


Very Severe Cyclonic Storm "Biparjoy" (21.9°N/66.3°E)



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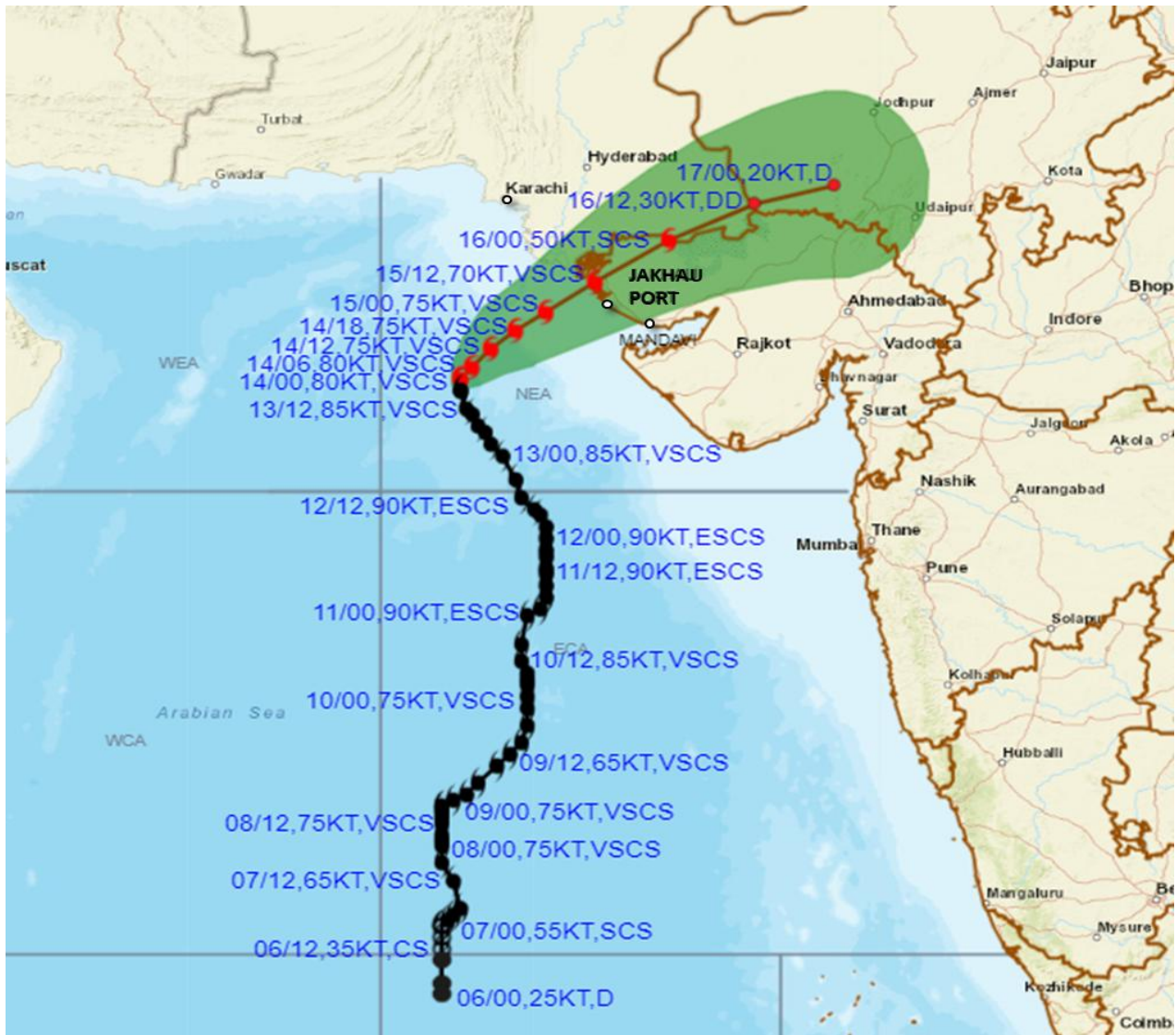
Radar Imagery of Doppler Weather Radar at Bhuj



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OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF VERY SEVERE CYCLONIC STORM "BIPARJOY" OVER NORTHEAST ARABIAN SEA BASED ON 0000 UTC (0530 IST) OF 14TH 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)

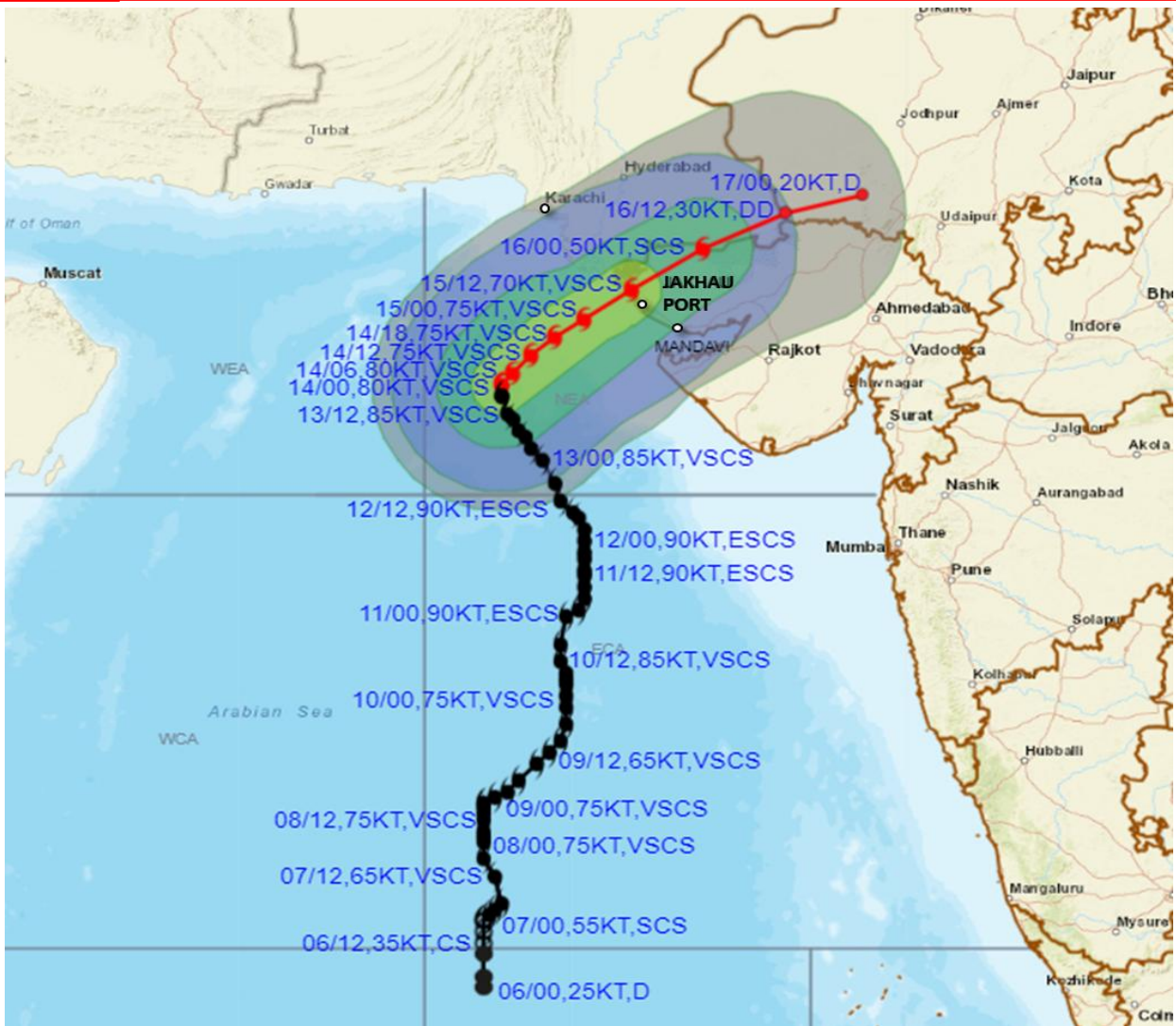
- LESS THAN 34 KT
- 34-47 KT
- \geq 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

Forecast	DISTANCE(KM) AND DIRECTION FROM STATIONS				
	PORBANDAR	DWARKA	JAKHAU PORT	NALIYA	KARACHI AIRPORT
15.06.23/0000	260, NW	160, WNW	100, WSW	130, WSW	220, SSE
16.06.23/0000	290, N	220, NNE	160, NE	140, NE	280, ESE
17.06.23/0000	470, NE	450, NE	440, ENE	420, ENE	530, E

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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 14TH JUNE 2023.



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)

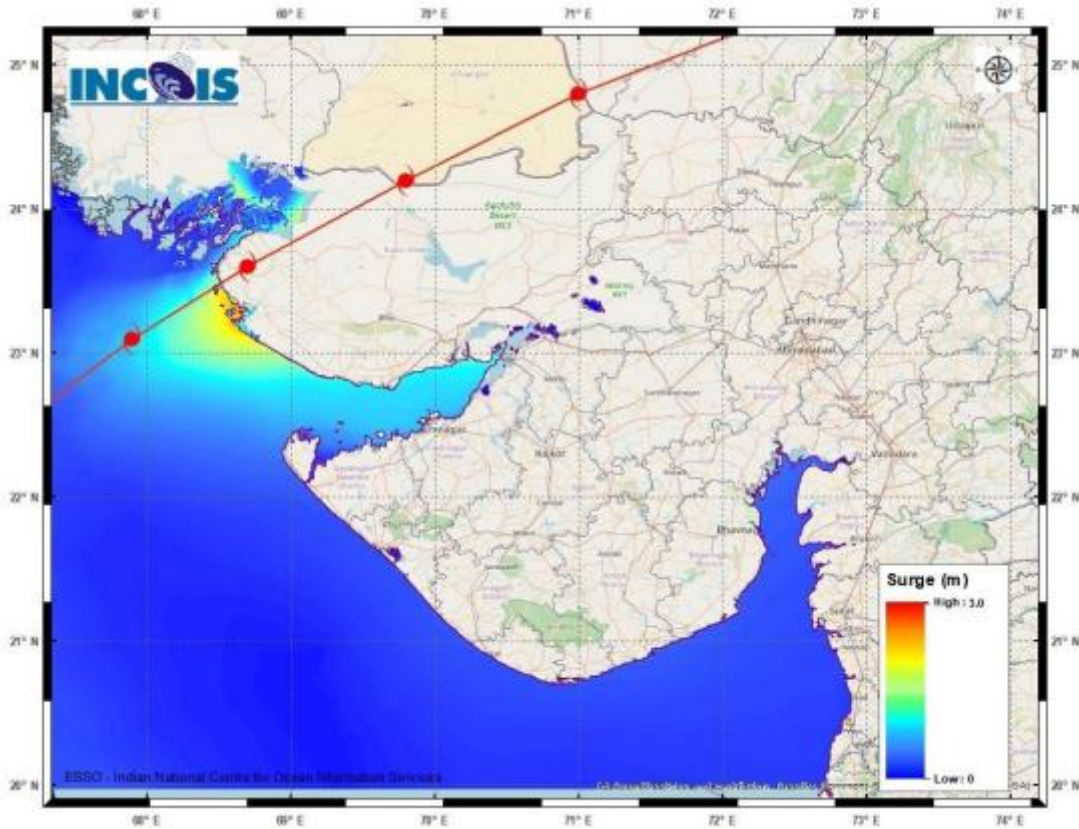
■ \geq 64 KT (\geq 118 KMPH)

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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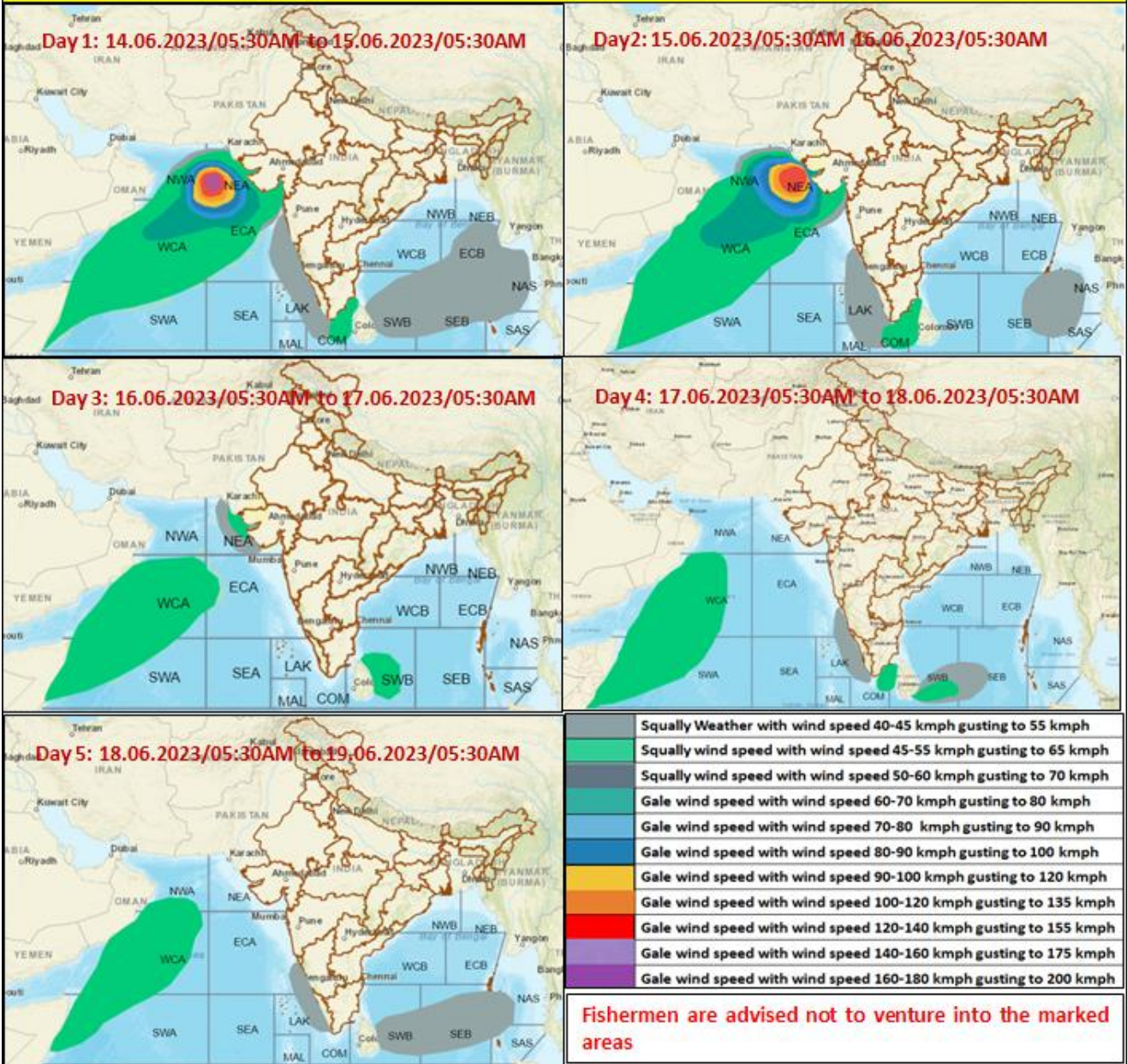
Storm Surge Warning Map based on Forecast Track



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

Fishermen warning graphics



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