



**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. 55 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 13.06.2023 BASED ON 0600 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 AND ADJOINING EASTCENTRAL ARABIAN SEA MOVED NEARLY NORTHWESTWARDS WITH A SPEED OF 8 KMPH DURING PAST 6-HOURS AND LAY CENTERED AT 0600 UTC OF TODAY, THE 13TH JUNE, 2023 OVER NORTHEAST ARABIAN SEA NEAR LATITUDE 21.0°N AND LONGITUDE 66.7°E, ABOUT 290 KM WEST-SOUTHWEST OF DEVBHUMI DWARKA (42731), 320 KM WEST-SOUTHWEST OF PORBANDAR (42830), 320 KM SOUTHWEST OF JAKHAU PORT, 330 KM SOUTHWEST OF NALIYA (42631) AND 440 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 (42929) AND KARACHI (41780) NEAR JAKHAU PORT (GUJARAT) AROUND 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 |
|-----------------------|-------------------------------------|--|---|
| 13.06.23/0600 | 21.0/66.7 | 150-160 Gusting To 180 | Very Severe Cyclonic Storm |
| 13.06.23/1200 | 21.4/66.6 | 145-155 Gusting To 170 | Very Severe Cyclonic Storm |
| 13.06.23/1800 | 21.7/66.7 | 140-150 Gusting To 165 | Very Severe Cyclonic Storm |
| 14.06.23/0000 | 22.0/67.0 | 135-145 Gusting To 160 | Very Severe Cyclonic Storm |
| 14.06.23/0600 | 22.3/67.3 | 135-145 Gusting To 160 | Very Severe Cyclonic Storm |
| 14.06.23/1800 | 22.7/67.7 | 130-140 Gusting To 155 | 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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| | | | |
|---------------|-----------|------------------------|----------------------------|
| 15.06.23/0600 | 23.2/68.2 | 125-135 Gusting To 150 | Very Severe Cyclonic Storm |
| 15.06.23/1800 | 23.6/68.6 | 105-115 Gusting To 125 | Very Severe Cyclonic Storm |
| 16.06.23/0600 | 24.1/69.3 | 70-80 Gusting To 90 | Cyclonic Storm |
| 16.06.23/1800 | 24.5/70.2 | 40-50 Gusting To 60 | Depression |

AS PER INSAT 3D IMAGERY INTENSITY OF THE SYSTEM IS T4.5. CLOUDS ARE ORGANISED IN CENTRAL DENSE OVERCAST PATTERN. MAJOR PART OF CONVECTION LIES TO THE WEST AND SOUTHWEST OF SYSTEM CENTRE. ASSOCIATED BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER CENTRAL ARABIAN SEA BETWEEN LATITUDE 17.5°N & 24.0°N AND LONGITUDE 62.0°E & 70.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. CLOUDS ARE ORIENTED IN SOUTH-SOUTHWEST TO NORTH-NORTHEAST. IN ASSOCIATION WITH THE OUTER BAND, CONVECTIVE CLOUDS ARE COVERING COASTAL DISTRICTS OF SAURASHTRA AND KUTCH, EXTENDING FROM DEVBHUMI DWARKA DISTRICT TO KUTCH DISTRICT.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 85 KNOTS GUSTING TO 95 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 970 HPA. THE PRESSURE HAS FALLEN ALONG SAURASHTRA AND KUTCH COASTS BY ABOUT 1-2 HPA DURING PAST 24 HOURS, ENDING AT 0600 UTC OF TODAY. SEA CONDITION IS LIKELY TO BE PHENOMENAL OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA.

REMARKS:

SEA SURFACE TEMPERATURE IS AROUND 29-30°C OVER EASTCENTRAL AND ADJOINING NORTHEAST ARABIAN SEA AND IS HIGHER 30-31°C OVER NORTHEAST ARABIAN SEA AND ALONG & OFF SAURASHTRA COAST. THE LOW LEVEL VORTICITY IS AROUND $300 \times 10^{-6} \text{S}^{-1}$ TO THE SOUTH-SOUTHWEST OF THE SYSTEM CENTRE AND IS NORTHEAST ORIENTED. LOW LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE AND UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE WIND SHEAR IS HIGH (20-25 KNOTS) OVER SYSTEM AREA AND IS DECREASING TO 05-15 KNOTS ALONG THE FORECAST TRACK. CURRENTLY, THE SYSTEM IS TRACKING NORTHWESTWARD ALONG THE WESTERN PERIPHERY OF A SUB-TROPICAL RIDGE LOCATED ALONG 22 DEG N IN ASSOCIATION WITH AN ANTICYCLONIC CIRCULATION LOCATED OVER CENTRAL INDIA, AND IS BEING STEERED BY ITS MIDDLE AND UPPER LEVELS SOUTHEASTERLY WINDS. AS, THE CYCLONE WILL CROSS THE RIDGE LOCATION, IT WILL EXHIBIT NORTH-NORTHEASTWARDS MOVEMENT. 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.

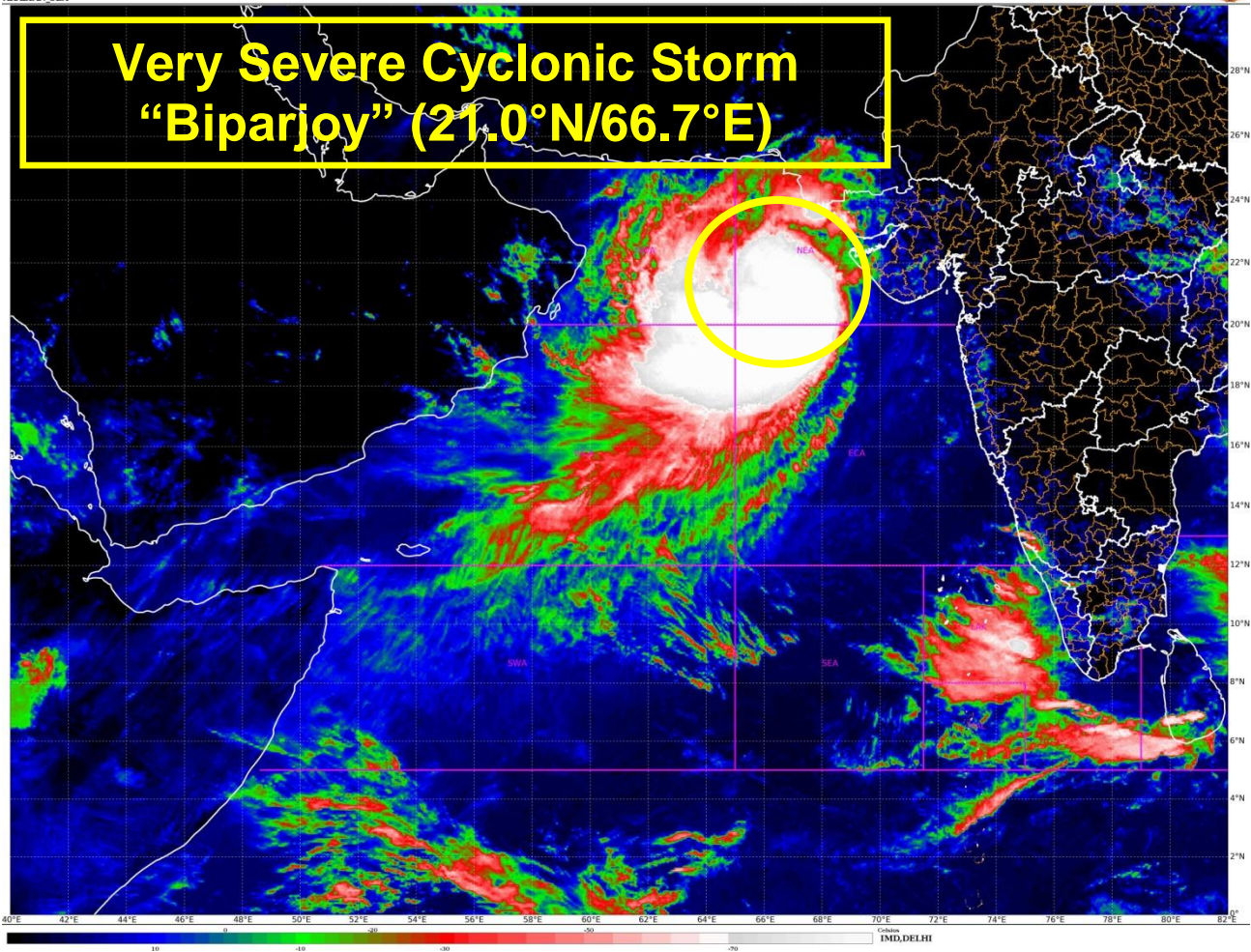
LATEST GUIDANCE FROM VARIOUS MODELS (NCUM-G, NCUM-R, ECMWF, IMD HWRF, VARIOUS IMD MME SYSTEMS) IS CONVERGING AND ALL OF THESE ARE INDICATING INTIAL NORTHWARDS MOVEMENT FOLLOWED BY GRADUAL NORTH-NORTHEASTWARDS MOVEMENT TOWARDS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS. ONLY IMD GFS AND NCEP GFS ARE INDICATING CROSSING OVER ADJOINING PAKISTAN COAST. THE LANDFALL TIME IS VARYING BETWEEN 0900 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 MOVE NEARLY NORTHWARDS TILL 13TH MIDNIGHT, THEN MOVE NORTH-NORTHEASTWARDS AND CROSS SAURASHTRA & KUTCH AND ADJOINING PAKISTAN COASTS BETWEEN MANDVI (42929) AND KARACHI (41780) NEAR JAKHAU PORT (GUJARAT) AROUND 1200 UTC OF 15TH JUNE AS A VERY SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH.

**RK JENAMANI
SCIENTIST G
RSMC NEW DELHI**



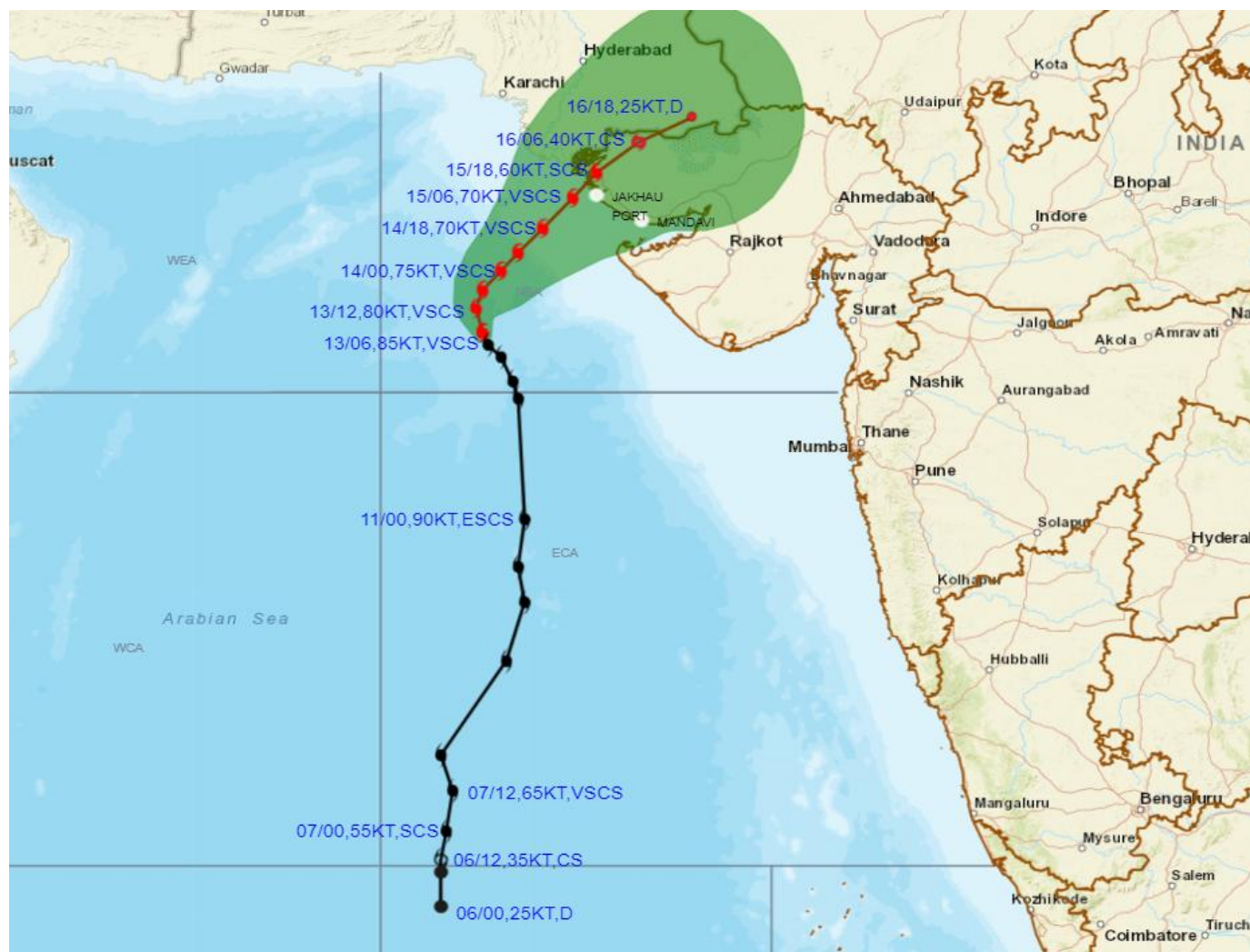
Very Severe Cyclonic Storm "Biparjoy" (21.0°N/66.7°E)



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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 13TH JUNE 2023.



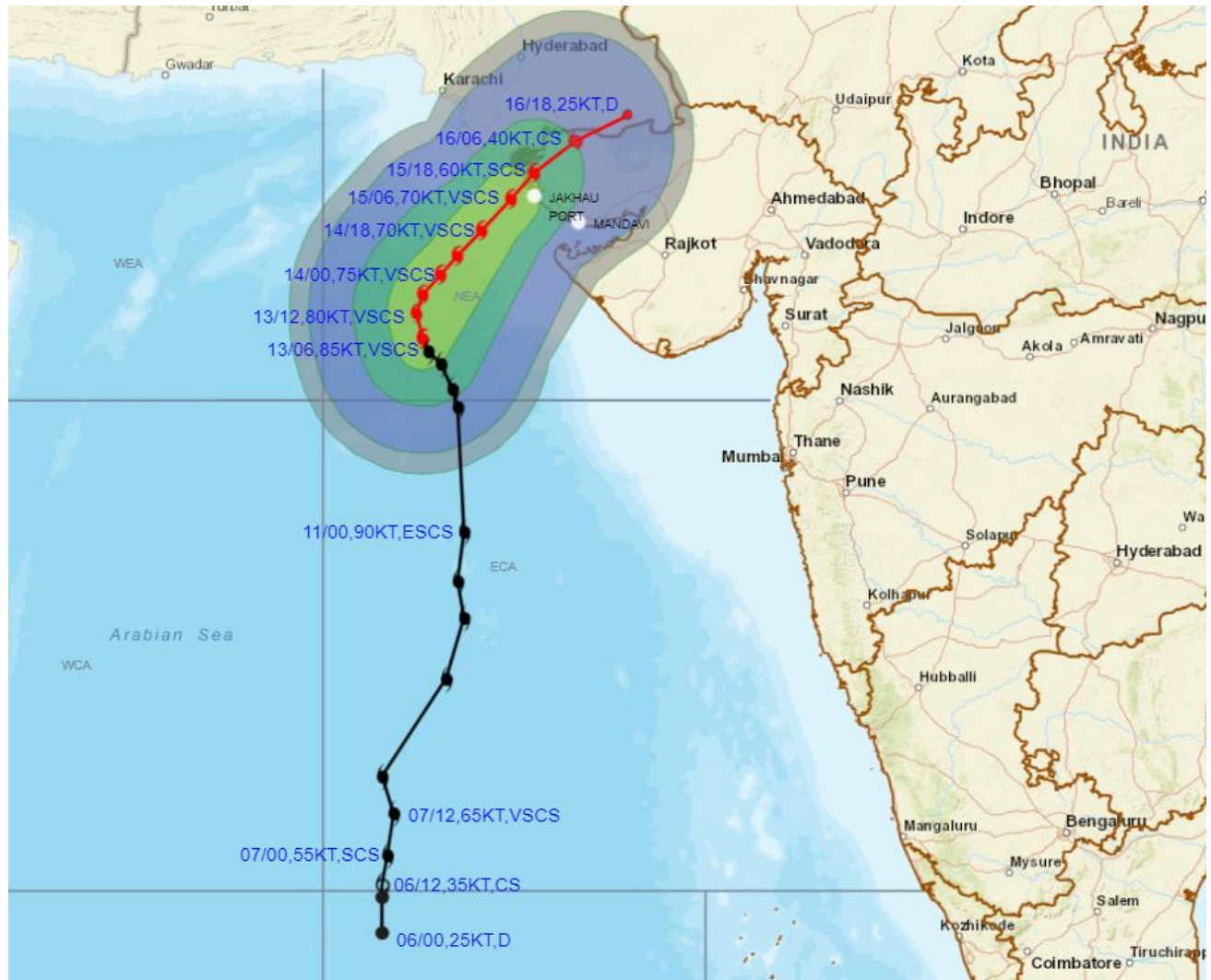
DATE/TIME IN UTC
 IST=UTC + 0530
 L: LOW PRESSURE AREA
 WML: WELL MARKED LOW PRESSURE AREA
 D: DEPRESSION (17-27 KT)
 DD: DEEP DEPRESSION (28-33 KT)
 CS: CYCLONIC STORM (34-47 KT)
 SCS: SEVERE CYCLONIC STORM (48-63KT)
 VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)
 ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)
 SuCS: SUPER CYCLONIC STORM (≥ 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 |
| 14.06.23/0600 | 250, WNW | 180, W | 160, SW | 190, SW | 280, S |
| 15.06.23/0600 | 230, NW | 130, NW | 50, W | 70, W | 220, SSE |
| 16.06.23/0600 | 280, N | 190, N | 120, NE | 110, NNE | 240, ESE |



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 13TH JUNE 2023.



DATE/TIME IN UTC
 IST=UTC + 0530
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 SuCS: SUPER CYCLONIC STORM (\geq 120 KT)

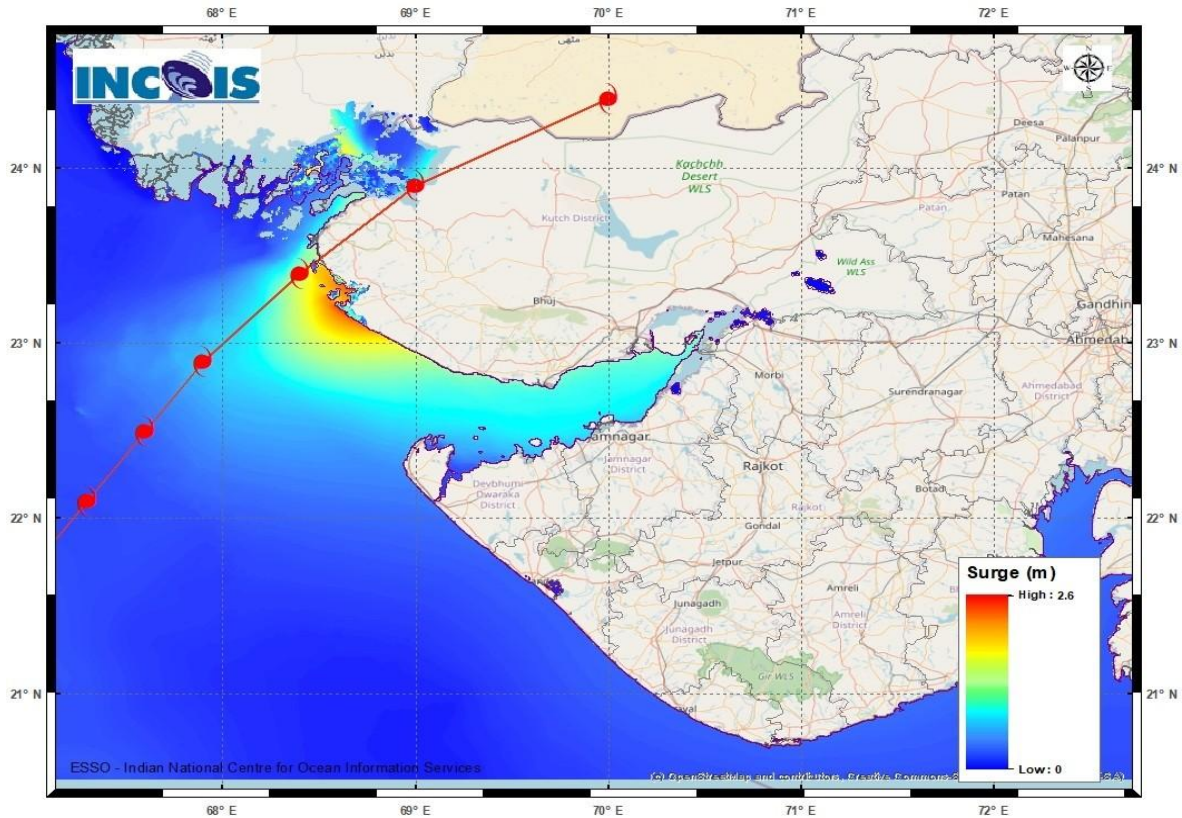
● LESS THAN 34 KT
 ◐ 34.47 KT
 ● \geq 48 KT
 — OBSERVED TRACK
 — FORECAST TRACK
 — CONE OF UNCERTAINTY
 AREA OF MAXIMUM SUSTAINED WIND SPEED:
 ■ 28-33 KT (52-61 KMPH)
 ■ 34-49 KT (62-91 KMPH)
 ■ 50-63 KT (92-117 KMPH)
 ■ \geq 64 KT (\geq 118 KMPH)

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

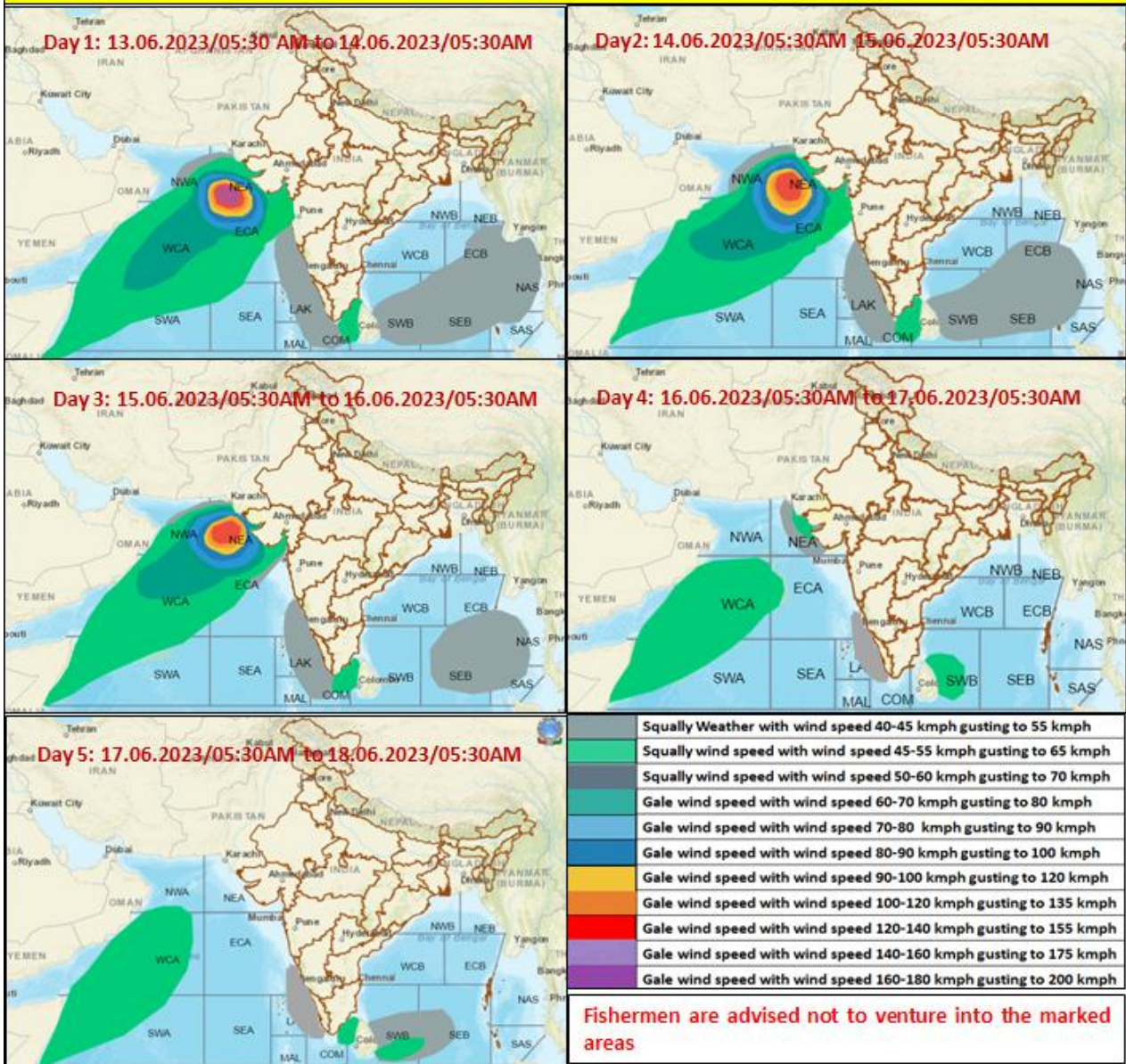


Astronomical Tide on 15th June 2023

| 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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