



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 41**

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. 41 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 04.11.2019 BASED ON 1200 UTC OF 04.11.2019.

SUB: (A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL ARABIAN AND ADJOINING WESTCENTRAL ARABIAN SEA

(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA

(A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL ARABIAN AND ADJOINING WESTCENTRAL ARABIAN SEA

THE **EXTREMELY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 07 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 1200UTC OF TODAY, THE 04TH NOVEMBER, 2019 OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA NEAR LATITUDE 18.9°N AND LONGITUDE 64.1°E, ABOUT 690 KM WEST-SOUTHWEST OF VERAVAL (42909), 740 KM WEST-SOUTHWEST OF DIU(42914) AND 650 KM WEST-SOUTHWEST OF PORBANDAR(42830). IT IS VERY LIKELY TO MAINTAIN INTENSITY TILL 5TH NOVEMBER MORNING AND WEAKEN THEREAFTER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS SLOWLY TILL 0000UTC OF 5TH NOVEMBER AND THEN MOVE RAPIDLY EAST-NORTHEASTWARDS. IT IS VERY LIKELY TO CROSS GUJARAT COAST BETWEEN DIU AND PORBANDAR AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 80-90 KMPH GUSTING TO 100 KMPH BY 0000UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.11.19/1200	18.9/64.1	175-185 GUSTING TO 205	EXTREMELY SEVERE CYCLONIC STORM
04.11.19/1800	19.1/64.0	180-190 GUSTING TO 210	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0000	19.4/64.1	170-180 GUSTING TO 200	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0600	19.7/64.6	155-165 GUSTING TO 185	VERY SEVERE CYCLONIC STORM
05.11.19/1200	19.9/65.3	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
06.11.19/0000	20.2/66.6	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
06.11.19/1200	20.5/68.5	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
07.11.19/0000	21.1/70.6	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	21.8/72.6	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0000	22.4/74.7	20-30 GUSTING TO 40	WELL MARKED LOW PRESSURE AREA

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 5.5. SYSTEM SHOWS EYE PATTERN WITH DIAMETER OF 30KM. EYE TEMPERATURE IS -1.5.0°C. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA BETWEEN LAT 17.1 °N TO 21.0°N AND LONG 62.0°E TO 65.5°E. THE MINIMUM CTT IS MINUS 85°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 100 KNOTS GUSTING TO 110 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 956 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 1200 UTC OF 04TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.4°N / 67.3°E REPORTED MEAN SEA LEVEL PRESSURE 1012.0 HPA, SST 26.4°C AND WIND 300⁰/10 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE OVER THE SYSTEM AREA RUNS ROUGHLY ALONG 18°N. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTH OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS LOW (05-10 KNOTS) OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 25-27°C, TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² AROUND THE SYSTEM CENTER.

UNDER THE FAVOURABLE WIND SHEAR ENVIRONMEN, A GRADUAL INTENSIFICATION PROCESS IS LIKELY TO CONTINUE TILL 0000 UTC OF 5TH NOVEMBER. PRESENTLY, AN ANTICYCLONE IS LOCATED TO THE NORTHEAST OF THE SYSTEM AND THE SYSTEM IS BEING STEERED BY THE SOUTHERN PERIPHERY WINDS, IT IS MOVING IN NORTHWEST-WARD DIRECTION. THIS MOVEMENT IS LIKELY TO CONTINUE DURING NEXT 15 HOURS. THEN IT IS LIKELY TO ENTER INTO COL REGION, MOVE NEARLY NORTHWARDS FOR A BRIEF PERIOD AND LIKELY TO COME UNDER THE INFLUENCE OF AN APPROACHING MID-LATITUDE WESTERLY TROUGH FROM 5TH NOVEMBER. AS A RESULT, THE SYSTEM IS VERY LIKELY TO RE-CURVE EAST-NORTHEASTWARDS FROM 5TH NOVEMBER. DURING THIS PERIOD, THE SYSTEM IS LIKEY TO MOVE RAPIDELY AND WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA

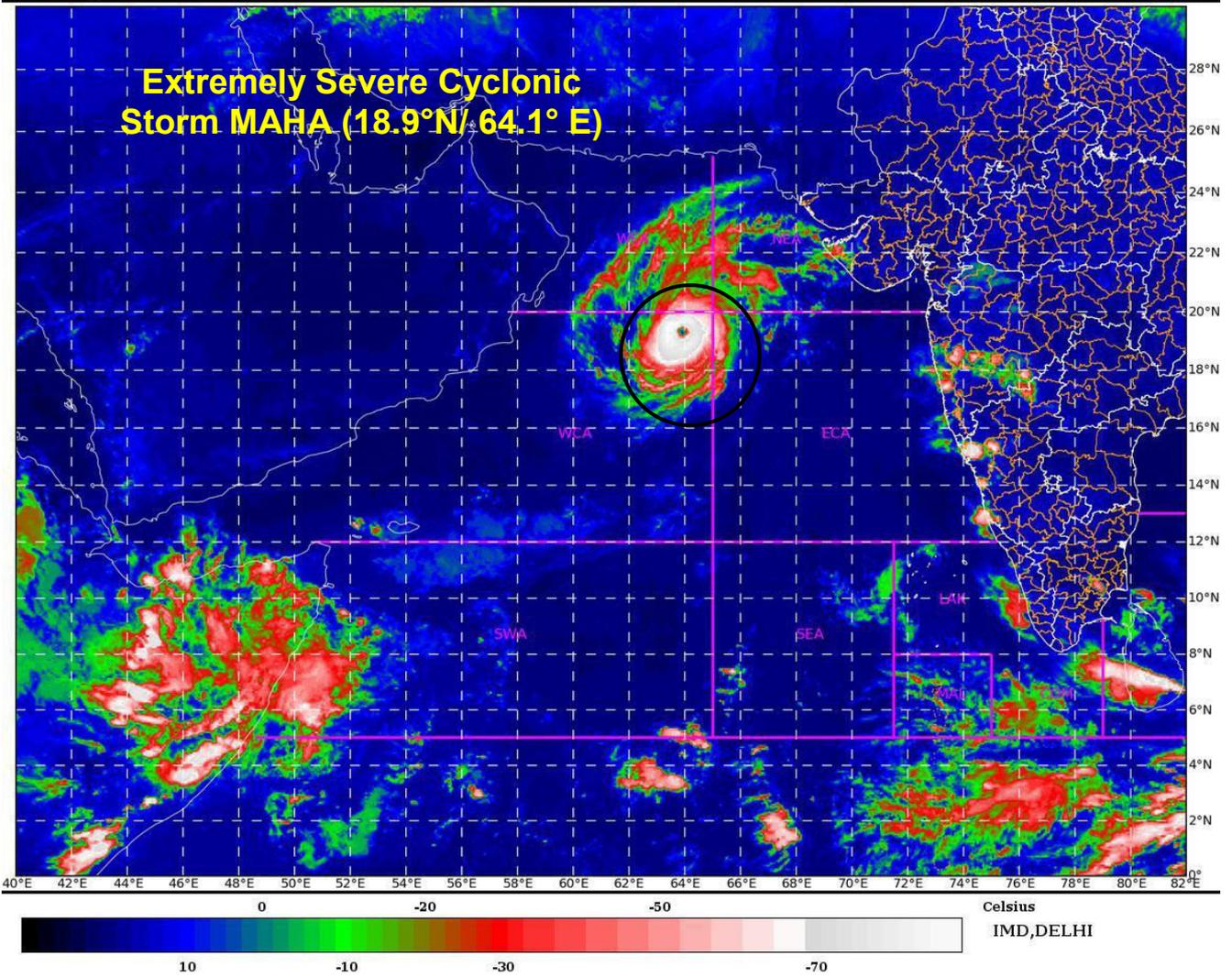
A LOW PRESSURE AREA FORMED OVER NORTH ANDAMAN SEA IN THE MORNING TODAY. IT BECAME WELL MARKED LOW PRESSURE AREA OVER THE SAME REGION IN THEAFTERNOON AND PERSISTS IN THE EVENING. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS, CONCENTRATE INTO A DEPRESSION OVER EASTCENTRAL BAY OF BENGAL DURING NEXT 12 HOURS. IT IS ALSO VERY LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM AND MOVE NORTHWESTWARDS DURING SUBSEQUENT 48 HOURS.

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTH ANDAMAN SEA AND ADJOINING EAST CENTRAL BAY OF BENGAL AND ADJOINING ANDAMAN ISLANDS BETWEEN LAT 08.0 °N TO 16.0°N AND LONG 86.0°E TO 93.0°E. THE MINIMUM CTT IS MINUS 93°C.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



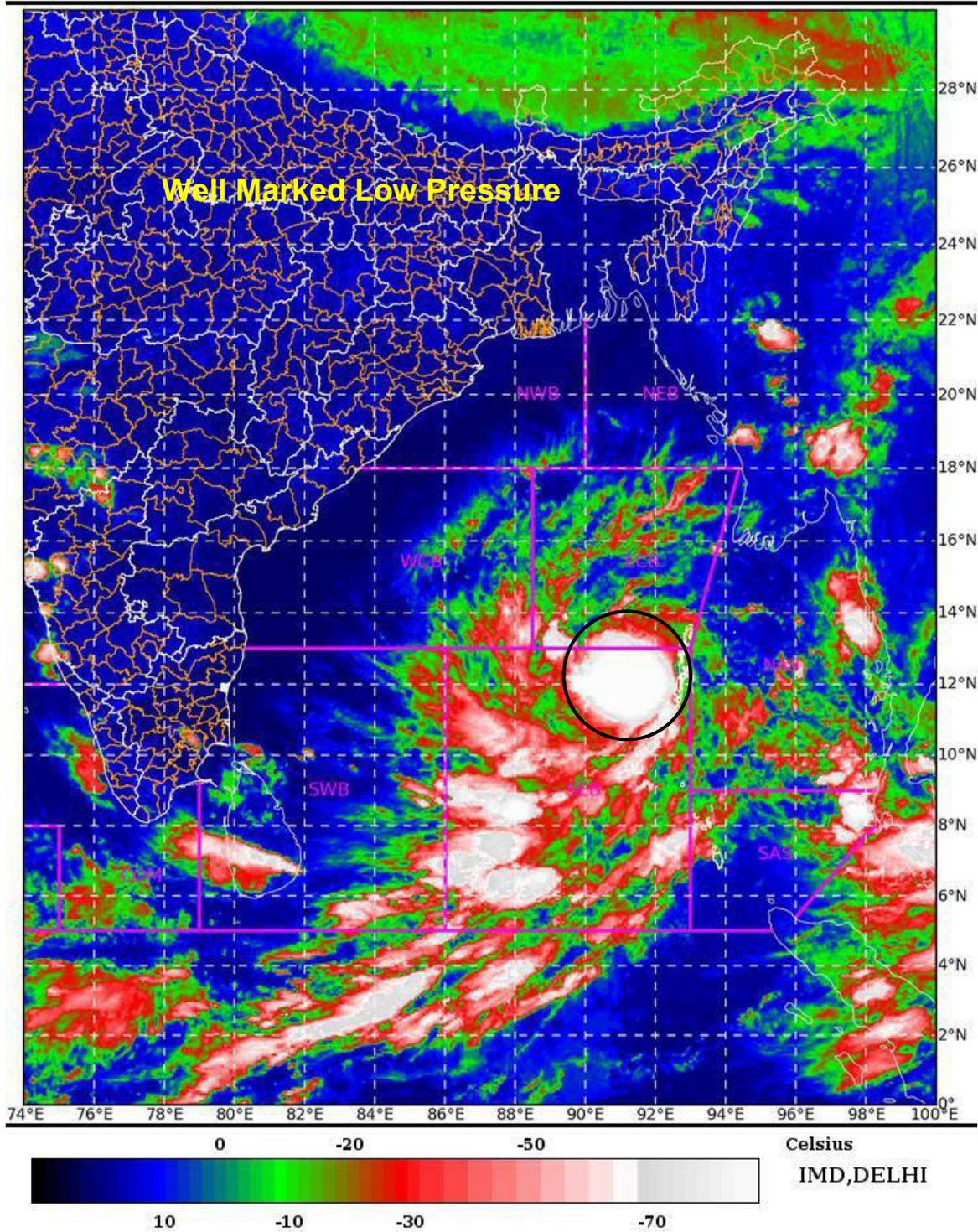
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT : INSAT-3D IMG 04-11-2019/(1430 to 1456) GMT

IMG_TIR1_TEMP 10.8 um 04-11-2019/(2000 to 2026) IST

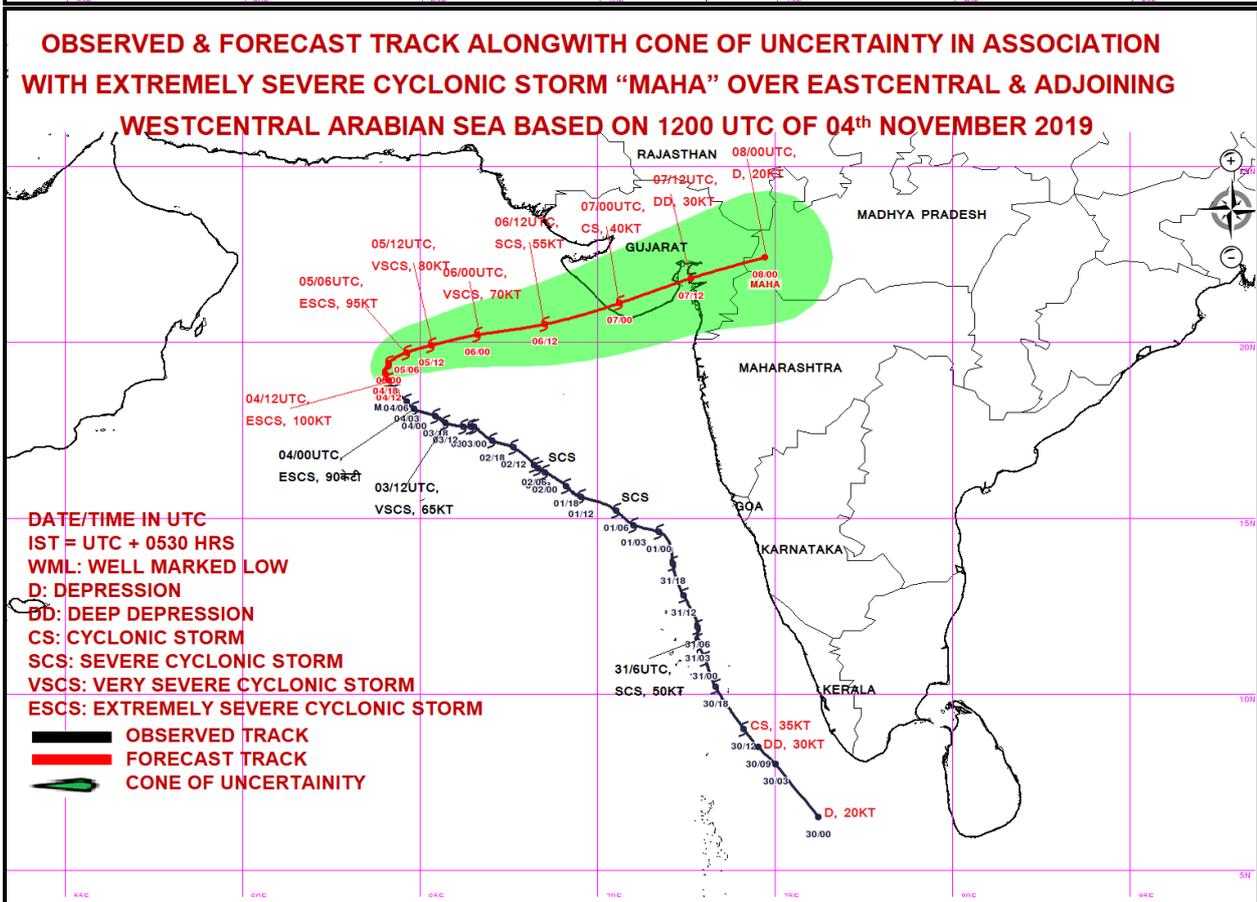
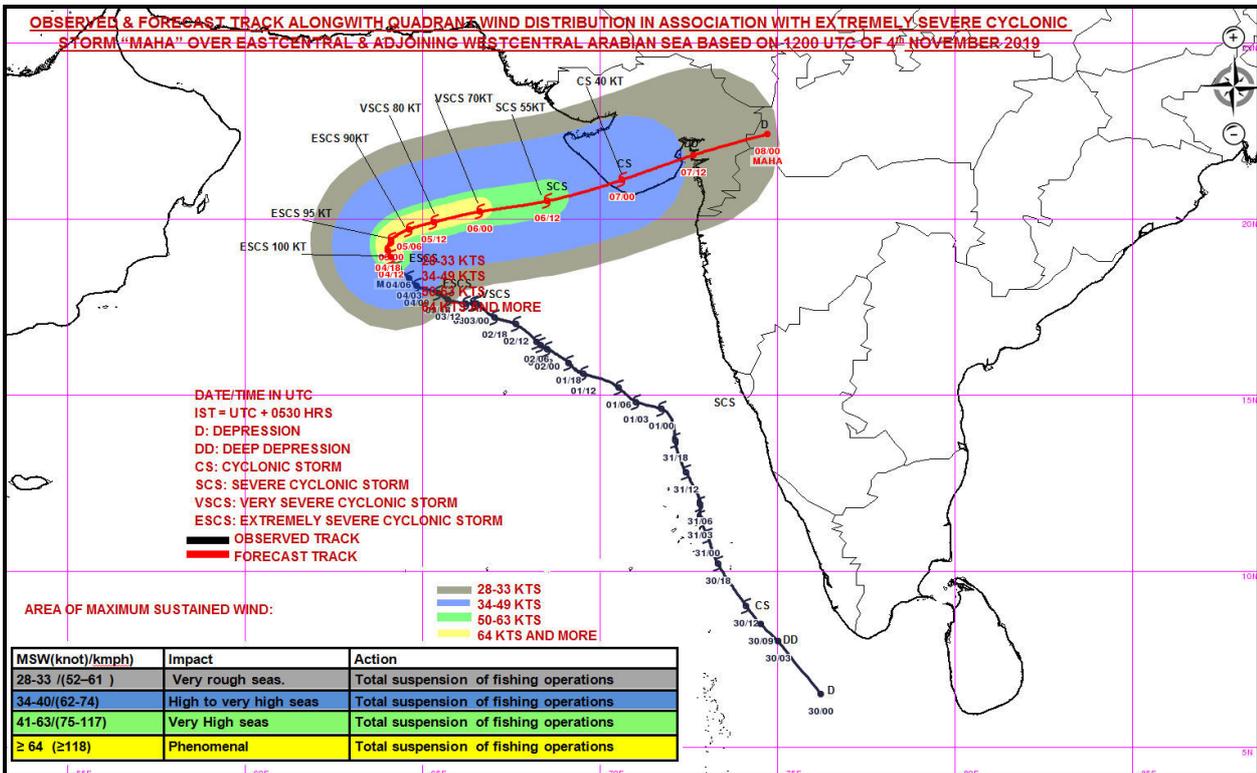


L1C Mercator



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 42**

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. 42 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1700 UTC OF 04.11.2019 BASED ON 1500 UTC OF 04.11.2019.

SUB: (A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA

(A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE **EXTREMELY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 1500UTC OF TODAY, THE 04TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 18.9°N AND LONGITUDE 64.1°E, ABOUT 690 KM WEST-SOUTHWEST OF VERAVAL (42909), 740 KM WEST-SOUTHWEST OF DIU(42914) AND 650 KM WEST-SOUTHWEST OF PORBANDAR(42830). IT IS VERY LIKELY TO MAINTAIN INTENSITY TILL 5TH NOVEMBER MORNING AND WEAKEN THEREAFTER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS SLOWLY TILL 0000UTC OF 5TH NOVEMBER AND THEN MOVE RAPIDLY EAST-NORTHEASTWARDS. IT IS VERY LIKELY TO CROSS GUJARAT COAST BETWEEN DIU (42914) AND PORBANDAR (42830) AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 80-90 KMPH GUSTING TO 100 KMPH BY 0000UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.11.19/1500	19.2/63.9	175-185 GUSTING TO 205	EXTREMELY SEVERE CYCLONIC STORM
04.11.19/1800	19.3/63.8	180-190 GUSTING TO 210	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0000	19.5/64.0	170-180 GUSTING TO 200	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0600	19.7/64.6	155-165 GUSTING TO 185	VERY SEVERE CYCLONIC STORM
05.11.19/1200	19.9/65.3	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
06.11.19/0000	20.2/66.6	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
06.11.19/1200	20.5/68.5	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
07.11.19/0000	21.1/70.6	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	21.8/72.6	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0000	22.4/74.7	20-30 GUSTING TO 40	WELL MARKED LOW PRESSURE AREA

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 5.5. SYSTEM SHOWS EYE PATTERN WITH DIAMETER OF 30KM. EYE TEMPERATURE IS PLUS 5.8⁰C. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA BETWEEN LAT 18.0⁰N TO 20.5⁰N AND LONG 62.0⁰E TO 65.0⁰E. THE MINIMUM CTT IS MINUS 85⁰C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 100 KNOTS GUSTING TO 110 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 956 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 1500 UTC OF 04TH NOVEMBER, 2019, A SHIP LOCATED NEAR LAT. 17.7°N / 67.3°E REPORTED MEAN SEA LEVEL PRESSURE 1012.5 HPA, SST 27.0°C AND WIND 140⁰/14 KNOTS AND ANOTHER SHIP LOCATED NEAR LAT. 16.8°N / 71.6°E REPORTED MEAN SEA LEVEL PRESSURE 1015.0 HPA AND WIND 340⁰/10 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19⁰N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS LOW (05-15 KNOTS) OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 25-27°C, TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² AROUND THE SYSTEM CENTER.

STILL UNDER THE FAVOURABLE WIND SHEAR ENVIRONMENT, A GRADUAL INTENSIFICATION PROCESS IS LIKELY TO CONTINUE TILL 0000 UTC OF 5TH NOVEMBER. AN ANTICYCLONE IS LOCATED TO THE NORTHEAST OF THE SYSTEM AND THE SYSTEM IS BEING STEERED BY THE SOUTHERN PERIPHERY WINDS, IT IS MOVING IN NORTH-NORTHWEST-WARD DIRECTION. THIS MOVEMENT IS LIKELY TO CONTINUE DURING NEXT 03 HOURS AND IT IS LIKELY TO ENTER INTO COL REGION. THEN IT IS LIKELY TO MOVE NEARLY NORTHWARDS FOR A BRIEF PERIOD AND LIKELY TO COME UNDER THE INFLUENCE OF AN APPROACHING MID-LATITUDE WESTERLY TROUGH FROM 5TH NOVEMBER. AS A RESULT, THEREAFTER, THE SYSTEM IS VERY LIKELY TO RE-CURVE AND MOVE RAPIDELY EAST-NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA

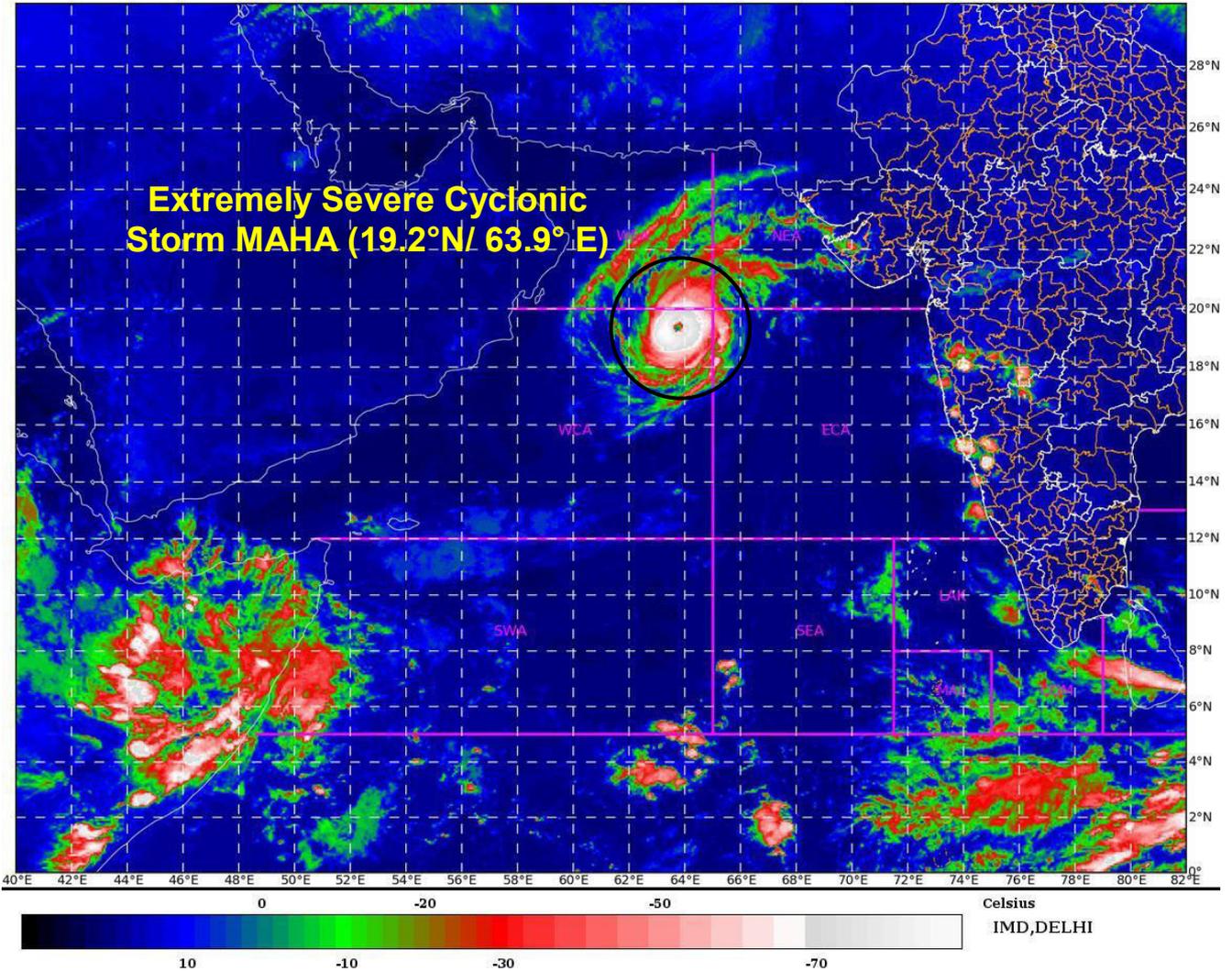
A WELL MARKED LOW PRESSURE AREA OVER THE NORTH ANDAMAN SEA IN THE AFTERNOON PERSISTS IN THE EVENING OVER THE SAME REGION. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS, CONCENTRATE INTO A DEPRESSION OVER EASTCENTRAL BAY OF BENGAL DURING NEXT 12 HOURS. IT IS ALSO VERY LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM AND MOVE NORTHWESTWARDS DURING SUBSEQUENT 48 HOURS.

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 1.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTH ANDAMAN SEA AND ADJOINING EAST CENTRAL BAY OF BENGAL AND ADJOINING ANDAMAN ISLANDS BETWEEN LAT 08.0⁰N TO 16.0⁰N AND LONG 89.5⁰E TO 92.5⁰E. THE MINIMUM CTT IS MINUS 93⁰C.

(ANANDA KUMAR DAS)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

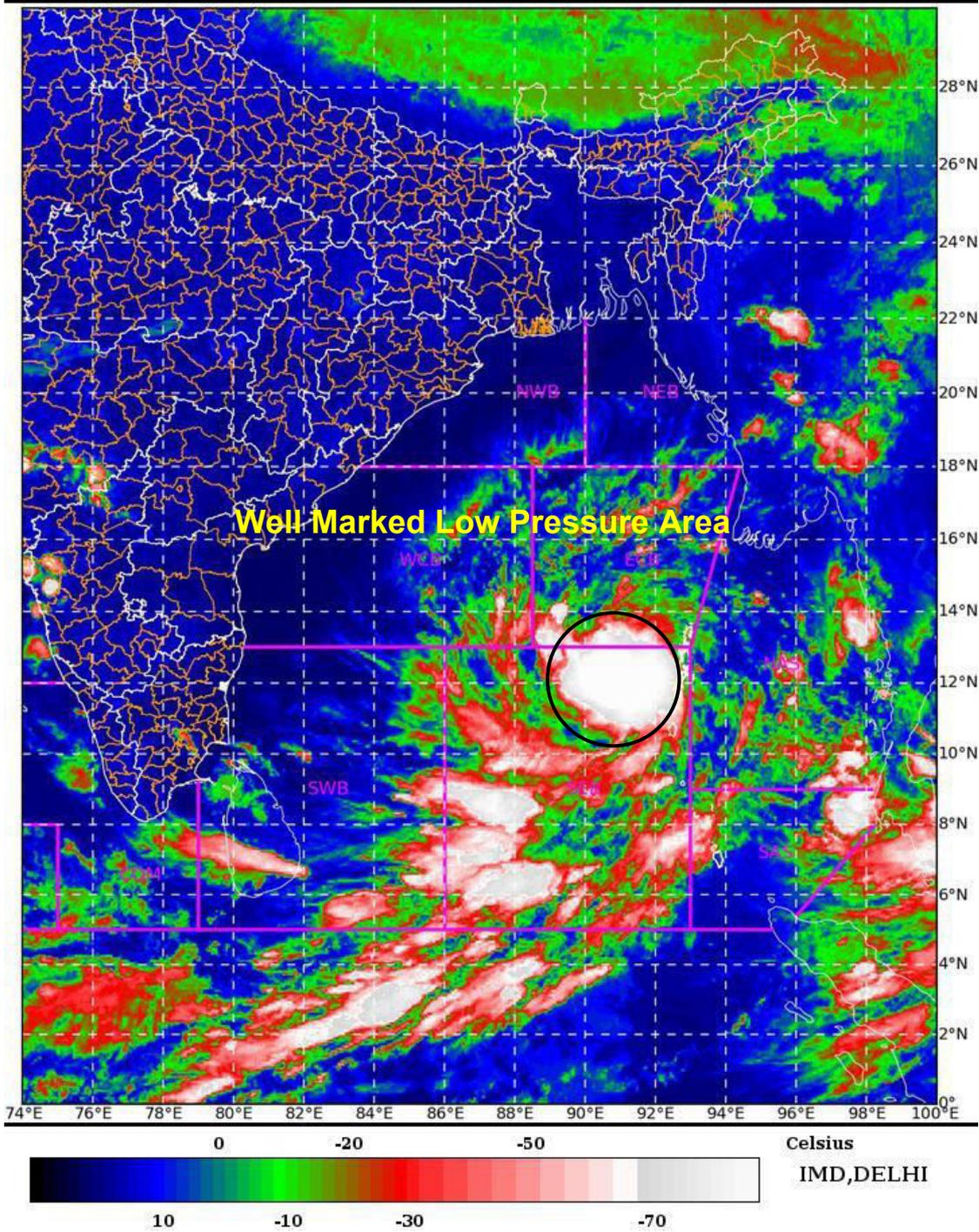


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT : INSAT-3D IMG 04-11-2019/(1530 to 1556) GMT

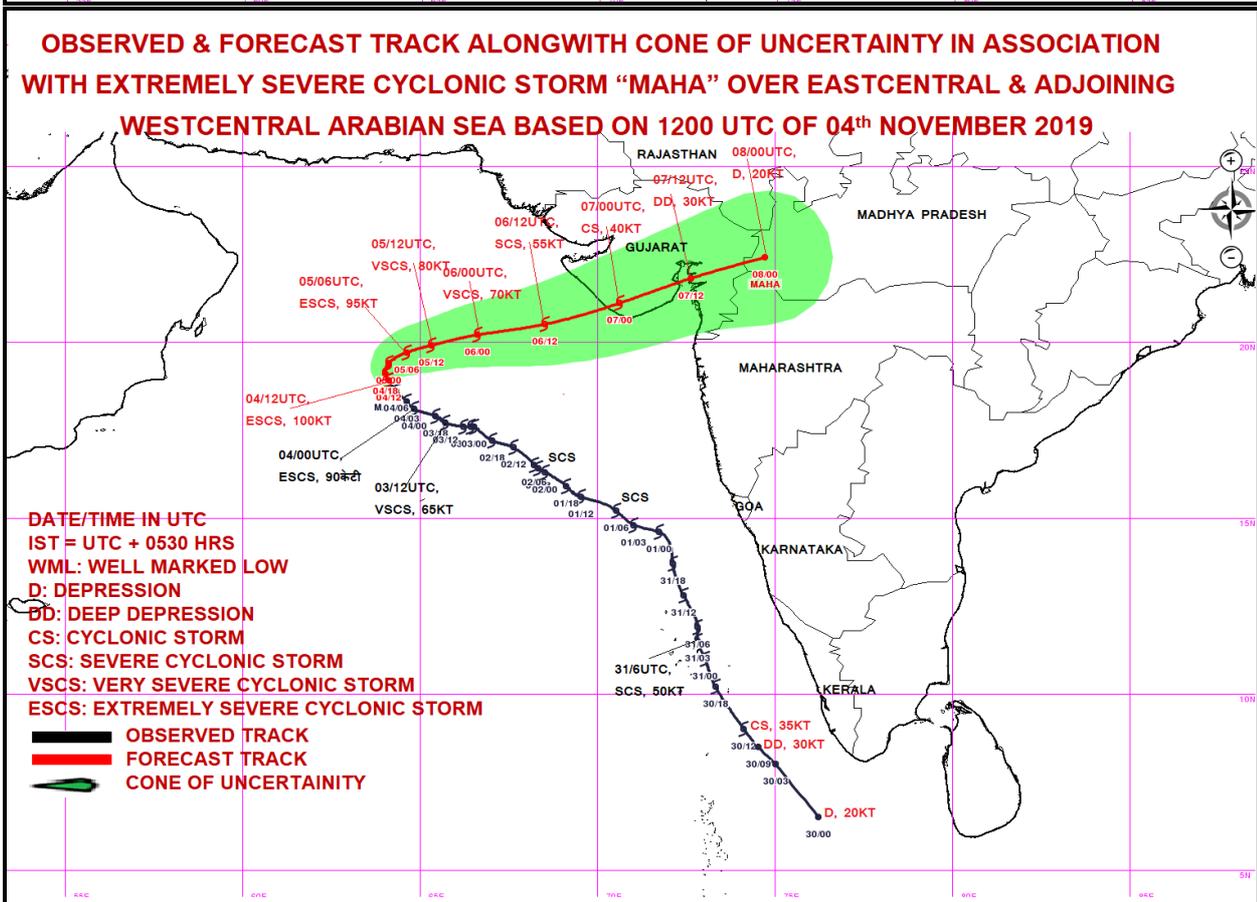
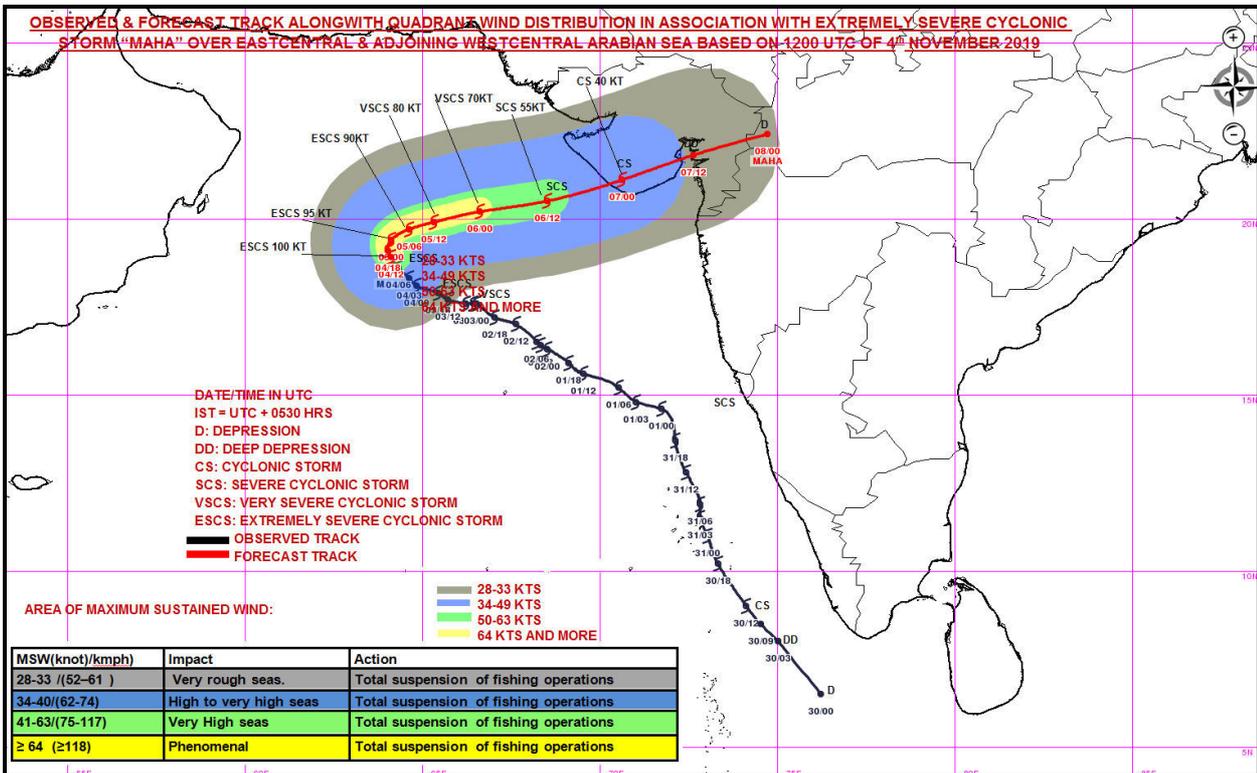
IMG_TIR1_TEMP 10.8 um 04-11-2019/(2100 to 2126) IST

L1C Mercator



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 43**

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. 43 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2100 UTC OF 04.11.2019 BASED ON 1800 UTC OF 04.11.2019.

**SUB: (A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA
(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA: INFORMATORY MESSAGE**

(A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE **EXTREMELY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 1800 UTC OF 04TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.3°N AND LONGITUDE 63.7°E, ABOUT 720 KM WEST-SOUTHWEST OF VERAVAL (42909), 770 KM WEST-SOUTHWEST OF DIU (42914) AND 670 KM WEST-SOUTHWEST OF PORBANDAR (42830). IT IS VERY LIKELY TO MAINTAIN INTENSITY AND MOVE SLOWLY NORTHWARDS DURING NEXT 06 HOURS. THEREAFTER, IT IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS WITH GRADUAL WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST BETWEEN DIU (42914) AND PORBANDAR (42830) AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH BY 0000 UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.11.19/1800	19.3/63.7	175-185 GUSTING TO 205	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0000	19.6/63.8	170-180 GUSTING TO 200	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0600	19.8/64.1	155-165 GUSTING TO 185	VERY SEVERE CYCLONIC STORM
05.11.19/1200	20.0/64.7	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
05.11.19/1800	20.1/65.6	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
06.11.19/0600	20.4/67.4	110-120 GUSTING TO 130	SEVERE CYCLONIC STORM
06.11.19/1800	20.8/69.6	85-95 GUSTING TO 105	CYCLONIC STORM
07.11.19/0600	21.5/71.6	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/1800	22.0/73.5	40-50 GUSTING TO 60	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 5.5. SYSTEM SHOWS EYE PATTERN WITH DIAMETER OF 30KM. EYE TEMPERATURE IS PLUS 5.8⁰C. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA BETWEEN LAT 18.0 ⁰N TO 20.5⁰N AND LONG 62.5⁰E TO 65.0⁰E. THE MINIMUM CTT IS MINUS 85⁰C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 100 KNOTS GUSTING TO 110 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 956 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 1800 UTC OF 04TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.5⁰N / 67.4⁰E REPORTED MEAN SEA LEVEL PRESSURE 1013.6 HPA, SST 26.1⁰C AND WIND 320⁰/10 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 200 X10⁻⁵ SEC⁻¹ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19⁰N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS LOW (05-15 KNOTS) OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 25-27⁰C, TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² AROUND THE SYSTEM CENTER.

STILL UNDER THE FAVOURABLE WIND SHEAR ENVIRONMENT, THE SYSTEM IS LIKELY TO MAINTAIN ITS INTENSITY 0000 UTC OF 5TH NOVEMBER. AN ANTICYCLONE IS LOCATED TO THE NORTHEAST OF THE SYSTEM, THE SYSTEM IS BEING STEERED BY THE SOUTHERN PERIPHERY WINDS AND IS SITUATED NEAR THE COL REGION. THE SYSTEM IS LIKELY TO CONTINUE ITS MOVEMENT TO NORTH-NORTHWESTWARD DIRECTION FOR A BRIEF PERIOD. THEN IT IS LIKELY TO COME UNDER THE INFLUENCE OF AN APPROACHING MID-LATITUDE WESTERLY TROUGH FROM 5TH NOVEMBER. AS A RESULT, THEREAFTER, THE SYSTEM IS VERY LIKELY TO RE-CURVE AND MOVE RAPIDLY EAST-NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA

THE WELL MARKED LOW PRESSURE AREA OVER THE NORTH ANDAMAN SEA PERSISTS OVER THE SAME REGION. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS, CONCENTRATE INTO A DEPRESSION OVER EASTCENTRAL BAY OF BENGAL DURING NEXT 06 HOURS. IT IS ALSO VERY LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM AND MOVE NORTHWESTWARDS DURING SUBSEQUENT 48 HOURS.

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 1.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTH ANDAMAN SEA AND ADJOINING EAST CENTRAL BAY OF BENGAL AND ADJOINING ANDAMAN ISLANDS BETWEEN LAT 10.5 ⁰N TO 13.5⁰N AND LONG 89.0⁰E TO 92.5⁰E. THE MINIMUM CTT IS MINUS 93⁰C.

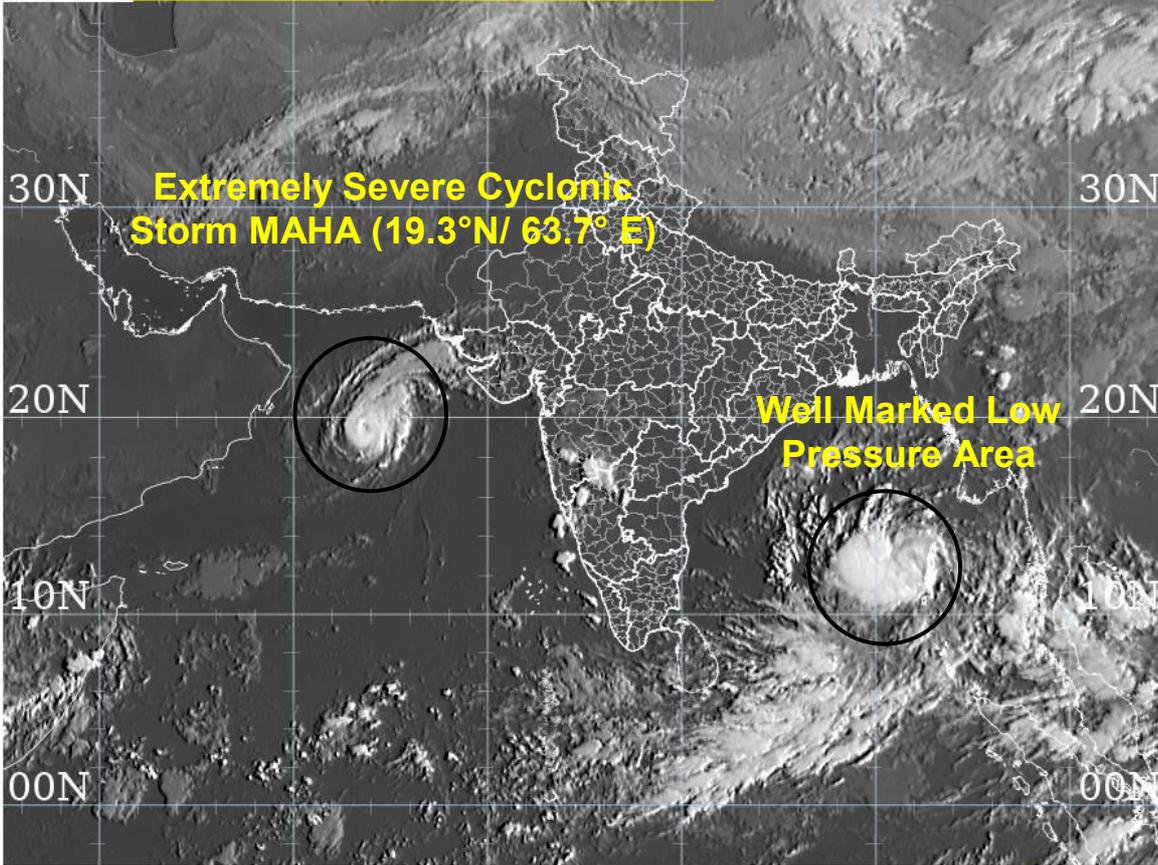
(ANANDA KUMAR DAS)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



60E 70E 80E 90E 100E
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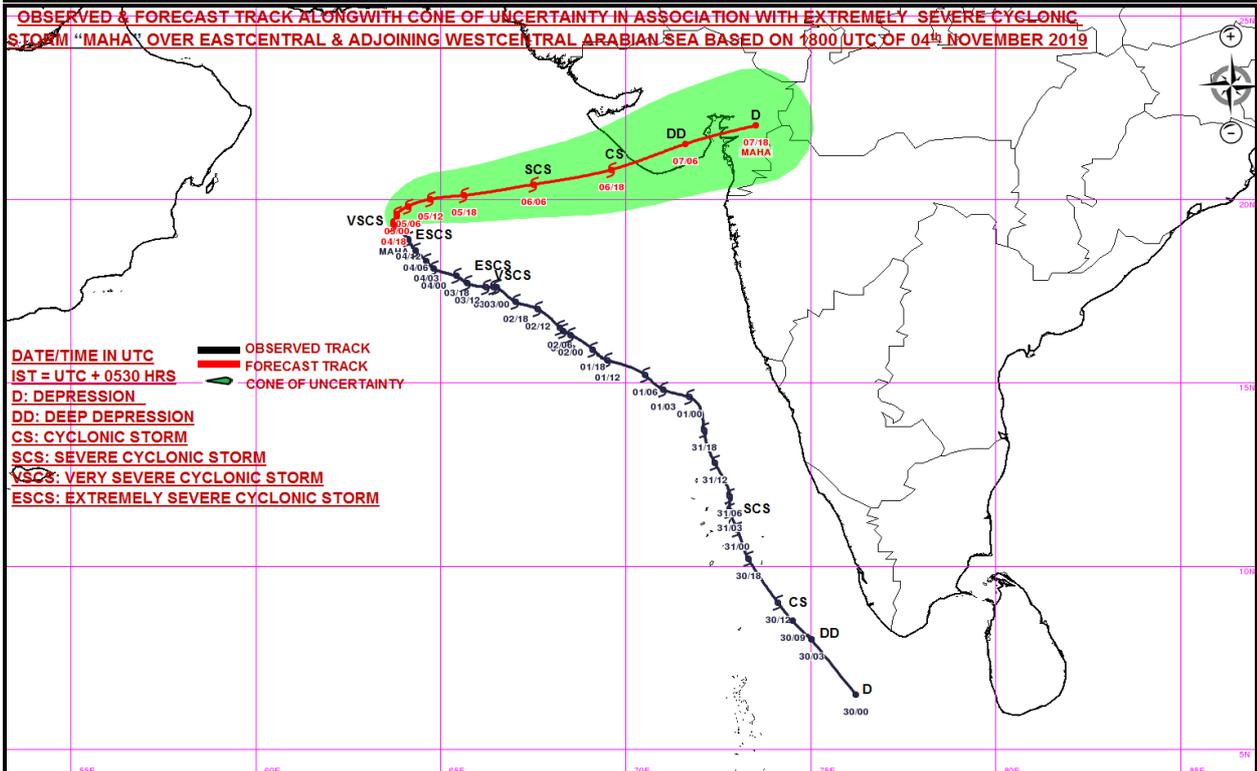
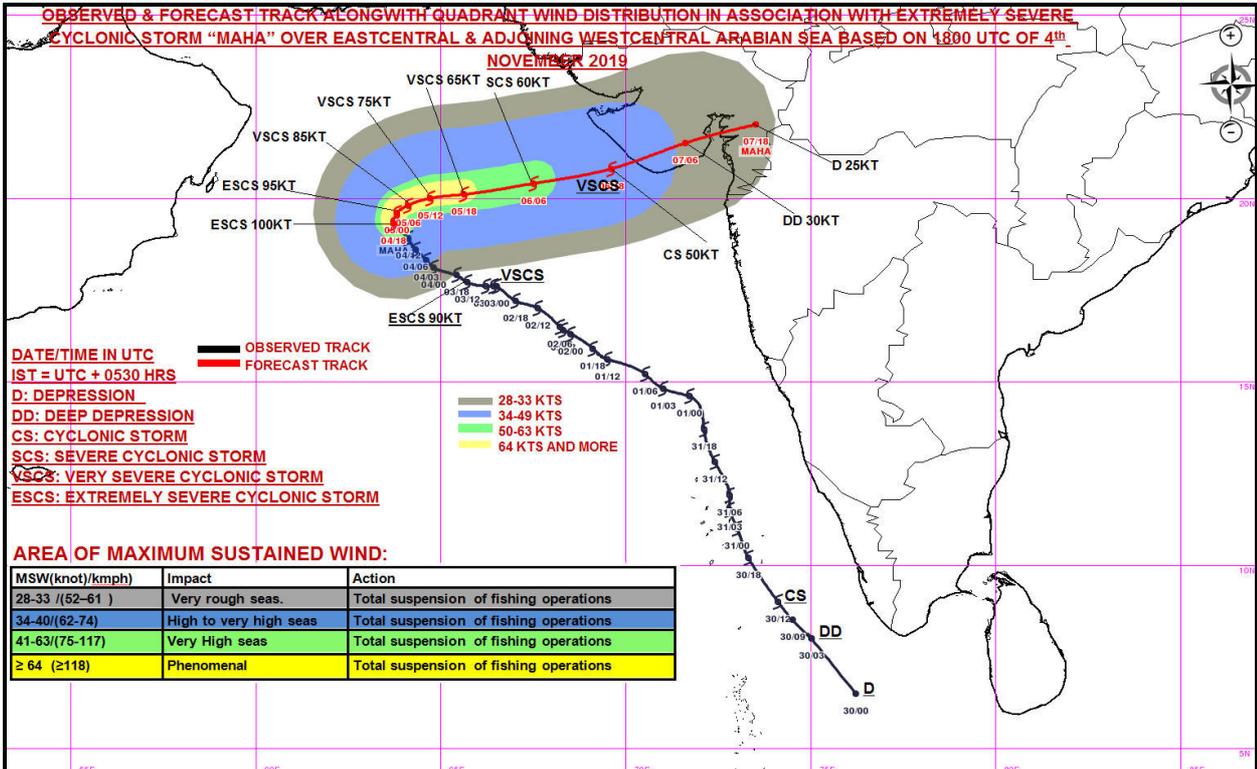


70E 80E



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 44**

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. 43 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0000 UTC OF 05.11.2019 BASED ON 2100 UTC OF 04.11.2019.

**SUB: (A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA
(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA AND ADJOINING SOUTHEAST BAY OF BENGAL: INFORMATORY MESSAGE**

(A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE **EXTREMELY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 2100 UTC OF 04TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.5°N AND LONGITUDE 63.6°E, ABOUT 670 KM WEST-SOUTHWEST OF PORBANDAR (42830), 720 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 780 KM WEST-SOUTHWEST OF DIU (42914). IT IS VERY LIKELY TO MAINTAIN INTENSITY AND MOVE SLOWLY NORTHWARDS DURING NEXT 06 HOURS. THEREAFTER, IT IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS WITH GRADUAL WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST BETWEEN DIU (42914) AND PORBANDAR (42830) AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH BY 0000 UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.11.19/2100	19.5/63.6	170-180 GUSTING TO 200	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0000	19.6/63.8	170-180 GUSTING TO 200	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0600	19.8/64.1	155-165 GUSTING TO 185	VERY SEVERE CYCLONIC STORM
05.11.19/1200	20.0/64.7	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
05.11.19/1800	20.1/65.6	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
06.11.19/0600	20.4/67.4	110-120 GUSTING TO 130	SEVERE CYCLONIC STORM
06.11.19/1800	20.8/69.6	85-95 GUSTING TO 105	CYCLONIC STORM
07.11.19/0600	21.5/71.6	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/1800	22.0/73.5	40-50 GUSTING TO 60	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 5.5. SYSTEM SHOWS EYE PATTERN WITH DIAMETER OF 30KM. EYE TEMPERATURE IS PLUS 5.8⁰C. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA BETWEEN LAT 18.0⁰N TO 20.5⁰N AND LONG 62.5⁰E TO 65.5⁰E. THE MINIMUM CTT IS MINUS 85⁰C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 100 KNOTS GUSTING TO 110 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 956 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 2100 UTC OF 04TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.5⁰N / 67.4⁰E REPORTED MEAN SEA LEVEL PRESSURE 1013.6 HPA, SST 26.1⁰C AND WIND 320⁰/10 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19⁰N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE WEST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 10-15 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 25-27⁰C, TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² AROUND THE SYSTEM CENTER.

STILL UNDER THE FAVOURABLE WIND SHEAR ENVIRONMENT, THE SYSTEM IS LIKELY TO MAINTAIN ITS INTENSITY TILL 0000 UTC OF 5TH NOVEMBER. AS, AN ANTICYCLONE IS LOCATED TO THE NORTHEAST OF THE SYSTEM AND SITUATED NEAR THE COL REGION, THE SYSTEM IS BEING STEERED BY THE SOUTHERN PERIPHERY WINDS. THE SYSTEM IS LIKELY TO CONTINUE ITS MOVEMENT TO NORTH-NORTHWESTWARD DIRECTION FOR A BRIEF PERIOD. THEN IT IS LIKELY TO COME UNDER THE INFLUENCE OF AN APPROACHING MID-LATITUDE WESTERLY TROUGH FROM 5TH NOVEMBER. AS A RESULT, THEREAFTER, THE SYSTEM IS VERY LIKELY TO RE-CURVE AND MOVE RAPIDLY EAST-NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA AND ADJOINING SOUTHEAST BAY OF BENGAL.

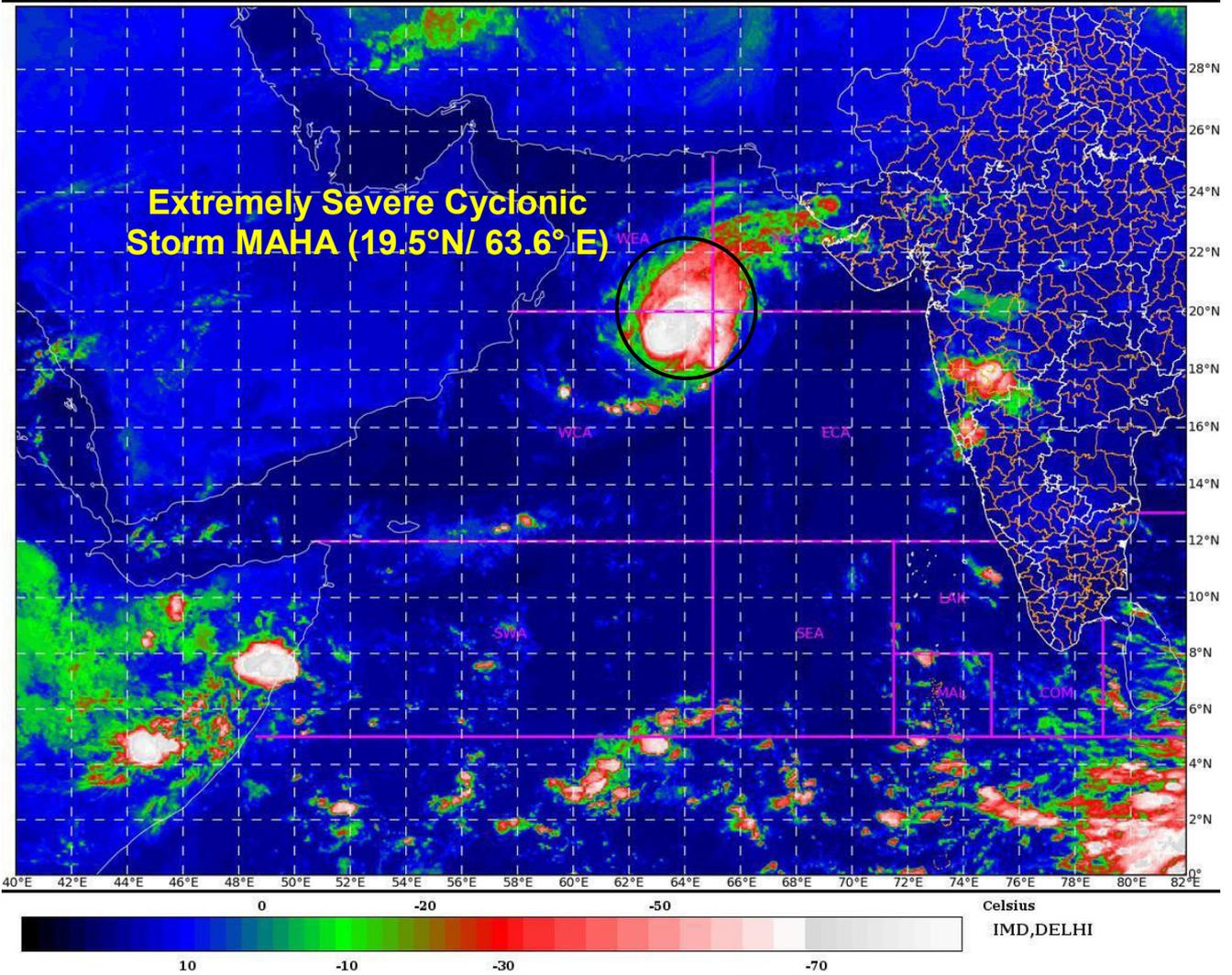
THE WELL MARKED LOW PRESSURE AREA OVER THE NORTH ANDAMAN SEA MOVED WEST-NORTHWESTWARDS DURING PAST 06 HOURS AND NOW LIES OVER NORTH ANDAMAN SEA AND ADJOINING SOUTHEAST BAY OF BENGAL. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS, CONCENTRATE INTO A DEPRESSION OVER EASTCENTRAL BAY OF BENGAL DURING NEXT 06 HOURS. IT IS ALSO VERY LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM AND MOVE NORTHWESTWARDS DURING SUBSEQUENT 48 HOURS.

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 04TH NOVEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 1.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTH ANDAMAN SEA AND ADJOINING EAST CENTRAL BAY OF BENGAL AND ADJOINING ANDAMAN ISLANDS BETWEEN LAT 10.5⁰N TO 14.5⁰N AND LONG 87.0⁰E TO 92.0⁰E. THE MINIMUM CTT IS MINUS 93⁰C.

**(ANANDA KUMAR DAS)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

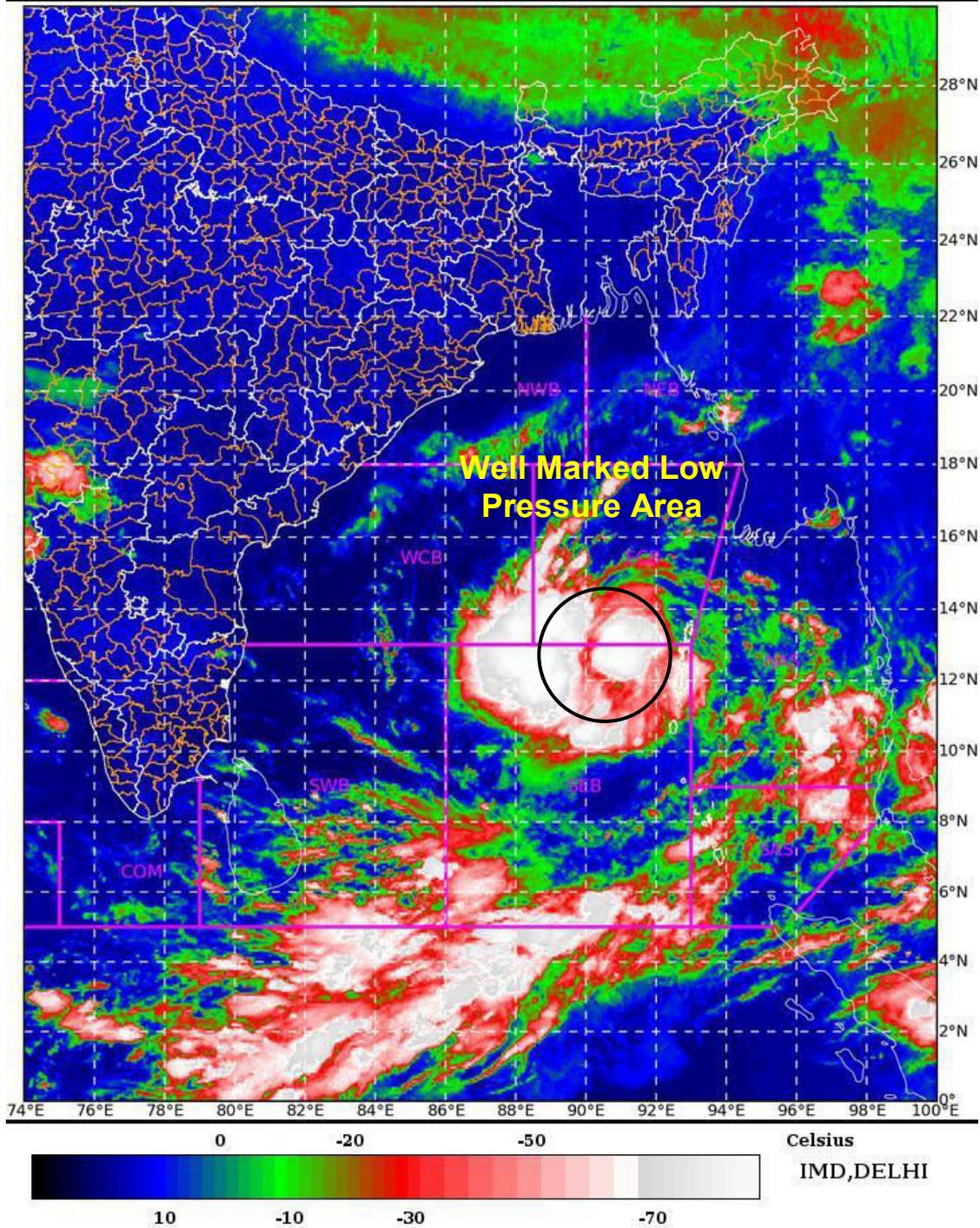


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

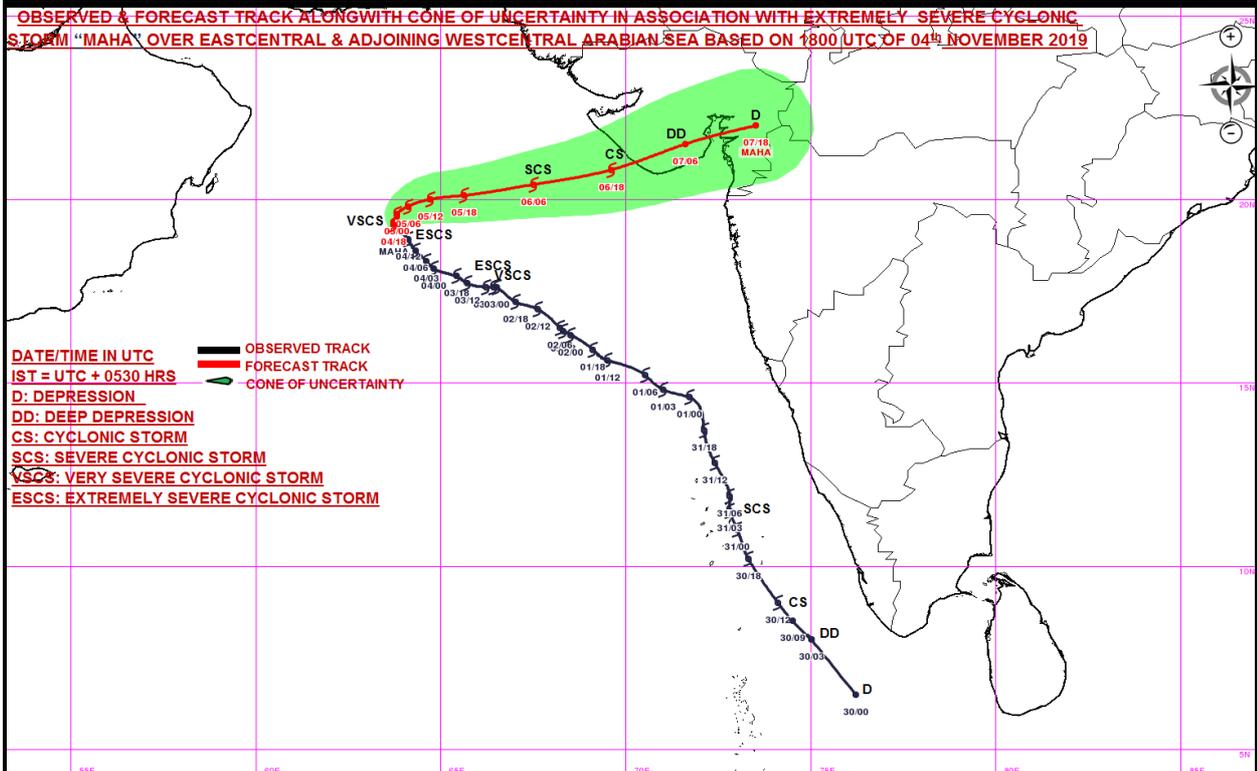
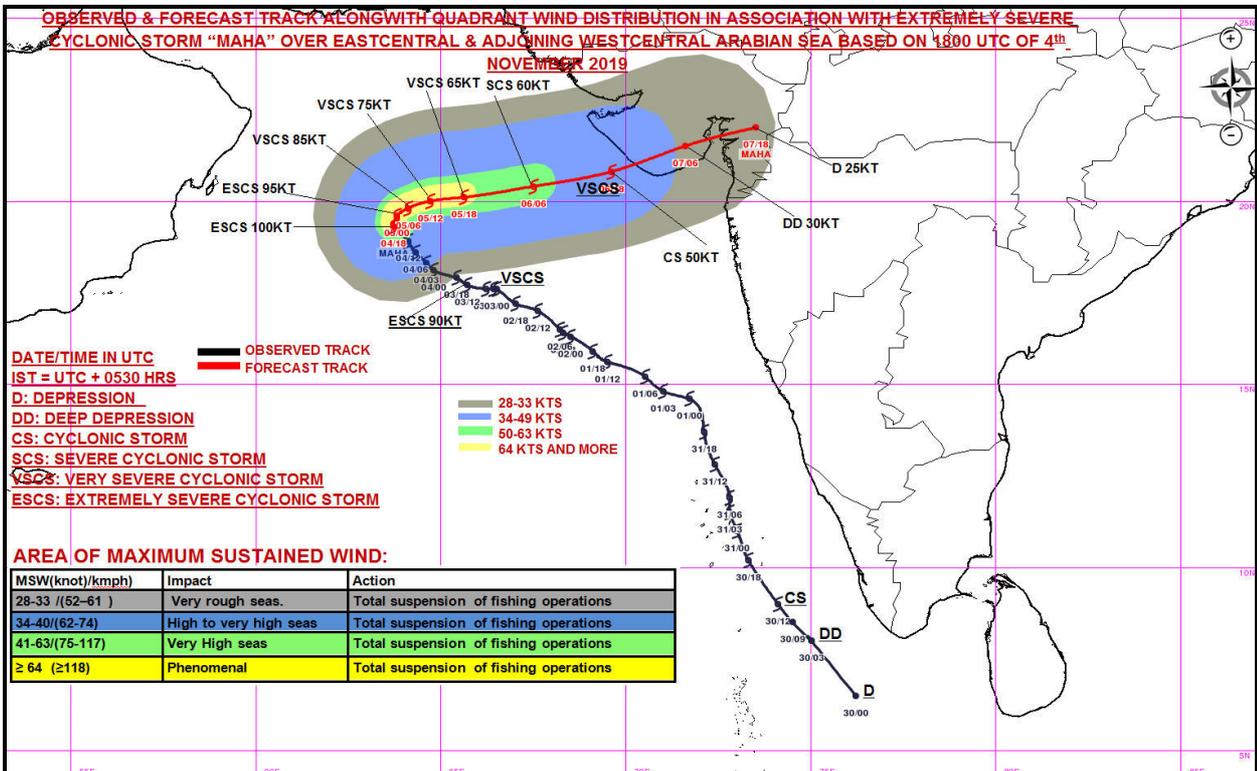
SAT : INSAT-3D IMG 04-11-2019/(2330 to 2356) GMT

IMG_TIR1_TEMP 10.8 um 05-11-2019/(0500 to 0526) IST

L1C Mercator



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 45**

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. 45 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0400 UTC OF 05.11.2019 BASED ON 0000 UTC OF 05.11.2019.

**SUB: (A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA
(B) WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA AND ADJOINING SOUTHEAST BAY OF BENGAL: INFORMATORY MESSAGE**

(A) EXTREMELY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE **EXTREMELY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 06 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 0000 UTC OF 05TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.6°N AND LONGITUDE 63.6°E, ABOUT 670 KM WEST-SOUTHWEST OF PORBANDAR (42830), 720 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 770 KM WEST-SOUTHWEST OF DIU (42914). IT IS VERY LIKELY TO MAINTAIN INTENSITY AND MOVE SLOWLY NORTHWARDS DURING NEXT 03 HOURS. THEREAFTER, IT IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS WITH GRADUAL WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST BETWEEN DIU (42914) AND PORBANDAR (42830) AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH BY 0000 UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0000	19.6/63.6	165-175 GUSTING TO 195	EXTREMELY SEVERE CYCLONIC STORM
05.11.19/0600	19.9/64.0	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
05.11.19/1200	20.0/64.7	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
05.11.19/1800	20.1/65.6	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
06.11.19/0000	20.2/66.5	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
06.11.19/1200	20.5/68.5	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0000	21.0/70.6	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/1200	21.6/72.6	40-50 GUSTING TO 60	DEPRESSION
08.11.19/0000	22.0/74.1	30-40 GUSTING TO 50	WELL MARKED LOW PRESSURE AREA

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 05TH NOVEMBER, 2019, CLOUDS SHOWS RAGGED EYE. THE CURRENT INTENSITY OF THE SYSTEM IS T 5.0/CI 5.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA BETWEEN LAT 18.0 °N TO 20.5°N AND LONG 62.5°E TO 65.5°E. THE MINIMUM CTT IS MINUS 85°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 90 KNOTS GUSTING TO 100 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 966 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 0000 UTC OF 05TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.3°N / 67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1010.0 HPA, SST 26.3°C AND WIND 320°/19 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE NORTH-NORTHEASTWARD DIRECTION FOR A BRIEF PERIOD. THEREAFTER, IT IS LIKELY TO COME UNDER THE INFLUENCE OF AN APPROACHING MID-LATITUDE WESTERLY TROUGH AND VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE WELL MARKED LOW PRESSURE AREA OVER NORTH ANDAMAN SEA MOVED WEST-NORTHWESTWARDS, CONCENTRATED INTO A DEPRESSION AND LAY CENTRED AT 0530 HRS IST OF TODAY, THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.1°N AND LONG. 91.5°E, ABOUT 150 KM WEST-NORTHWEST OF MAYA BANDAR (ANDAMAN ISLANDS), ABOUT 950 KM SOUTH-SOUTHEAST OF PARADIP (ODISHA), 1020 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (WEST BENGAL) AND 1000 KM SOUTH-SOUTHWEST OF KHEPUPARA (BANGLA DESH). IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS ODISHA – WEST BENGAL COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0000	13.1/91.5	40-50 GUSTING TO 60	DEPRESSION
05.11.19/1200	13.2/91.2	50-60 GUSTING TO 70	DEEP DEPRESSION
06.11.19/0000	13.5/91.0	60-70 GUSTING TO 80	CYCLONIC STORM
06.11.19/1200	13.6/90.8	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	14.3/90.6	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/1200	15.4/90.1	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
08.11.19/0000	16.1/89.3	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
08.11.19/1200	16.8/88.6	115-125 GUSTING TO 135	SEVERE CYCLONIC STORM
09.11.19/0000	17.4/88.1	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1730	18.1/87.7	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 05TH NOVEMBER, 2019, CLOUDS SHOWS SHEAR PATTERN. CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTH ANDAMAN SEA AND ADJOINING EAST CENTRAL BAY OF BENGAL AND ADJOINING ANDAMAN ISLANDS BETWEEN LAT 10.5 °N TO 14.5°N AND LONG 87.0°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 20 KNOTS GUSTING TO 30 KNOTS AROUND THE

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1005 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE. AT 0000 UTC OF 05TH NOVEMBER, 2019, A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1008.2 HPA, SST 29.6°C AND WIND 30⁰/10 KNOTS.

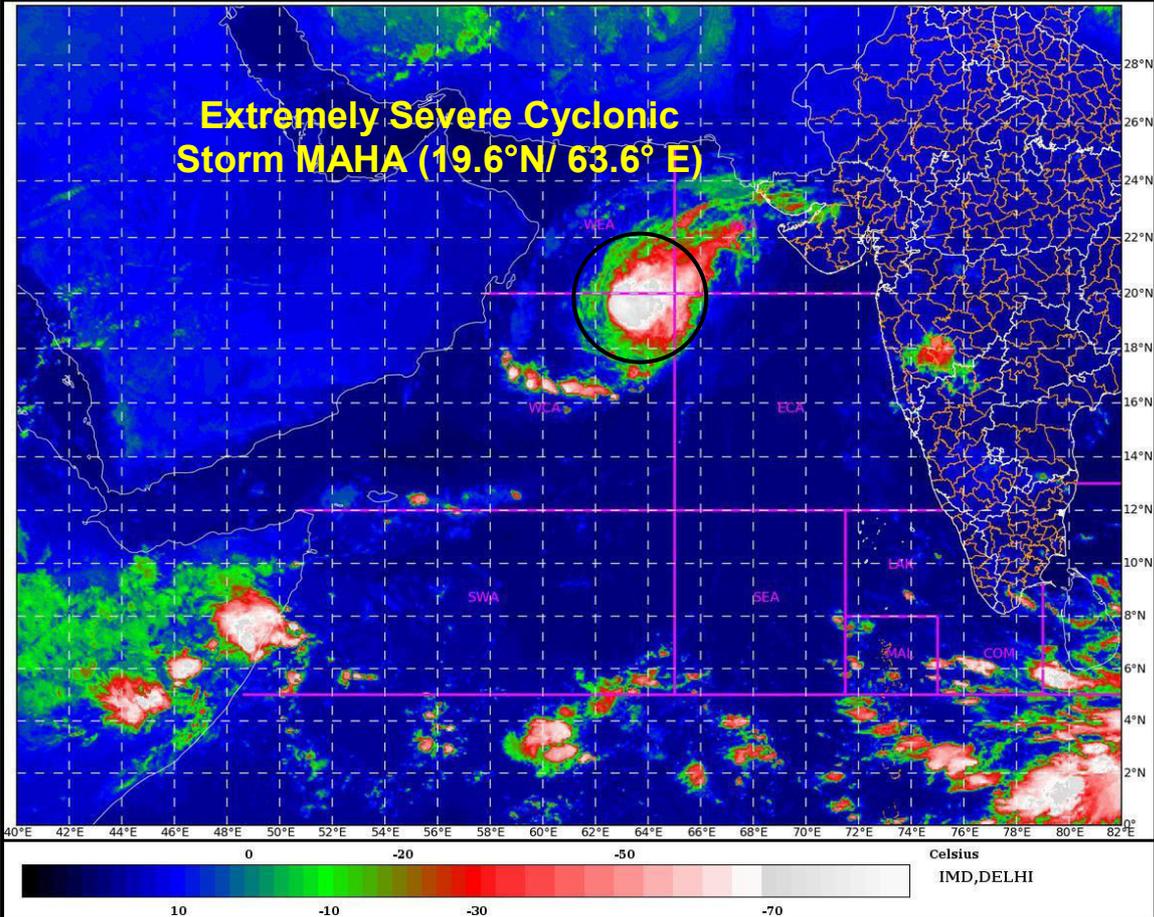
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $70 \times 10^{-5} \text{ SEC}^{-1}$ NEAR THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTHEAST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE WEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 10-15 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15⁰N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 60-85 KJ/CM² AROUND THE SYSTEM CENTER AND INCREASING ALONG THE FORECAST TRACK TO 80-100 KJ/CM². SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INITIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

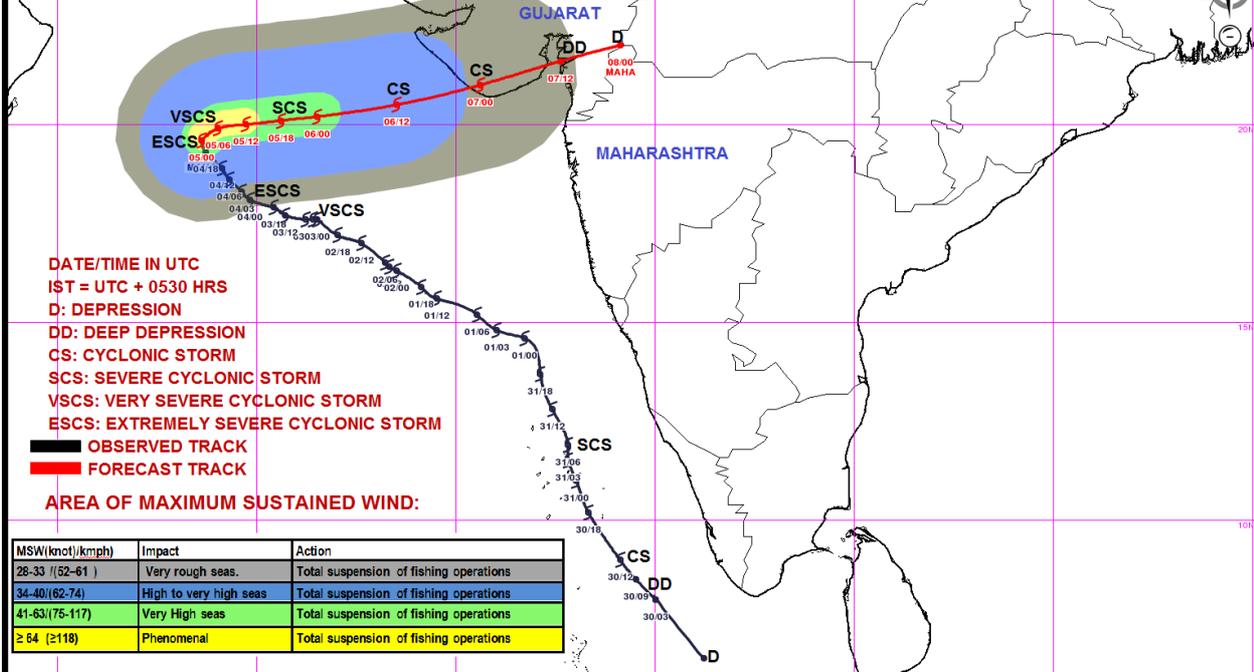
(ANANDA KUMAR DAS)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

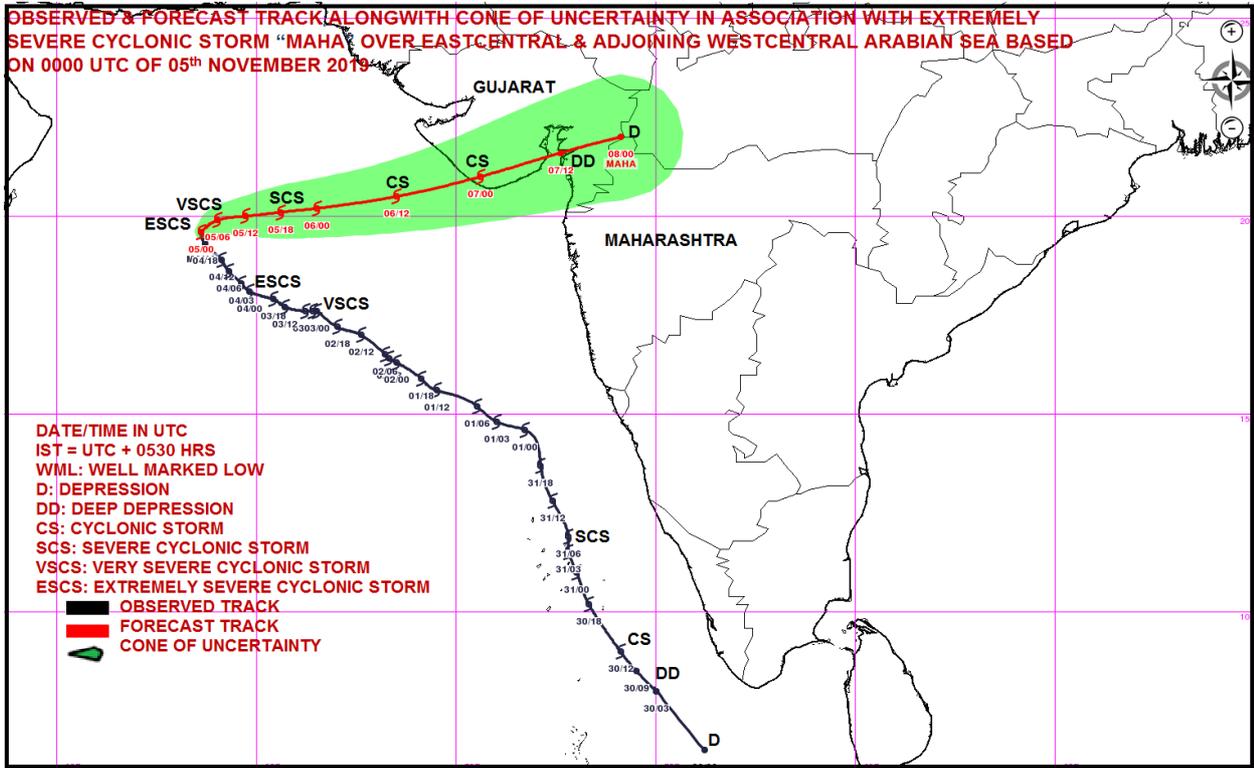


OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH EXTREMELY SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA BASED ON 0000 UTC OF 5th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



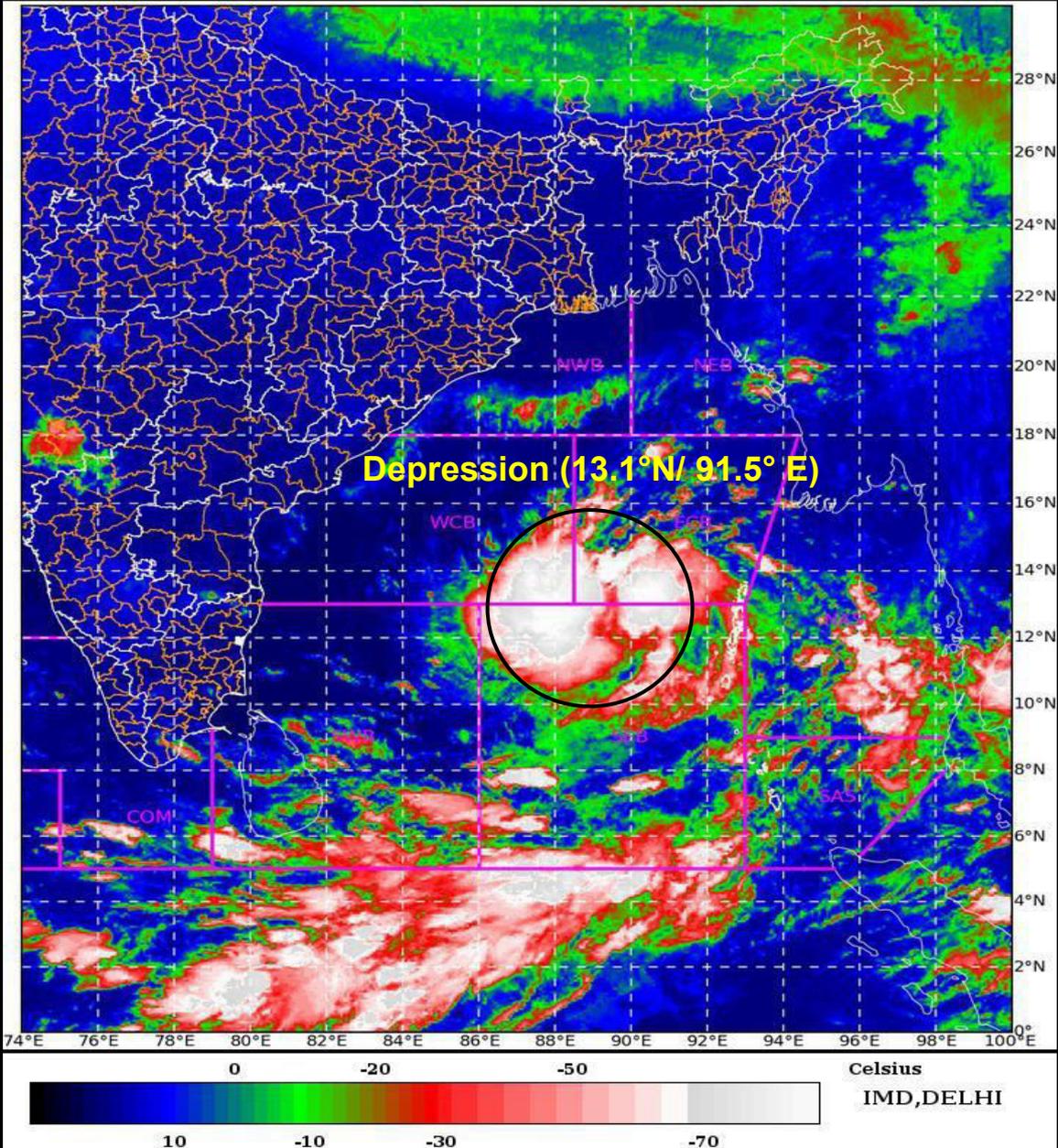
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT : INSAT-3D IMG 05-11-2019/(0200 to 0226) GMT

IMG_TIR1_TEMP 10.8 um 05-11-2019/(0730 to 0756) IST

L1C Mercator



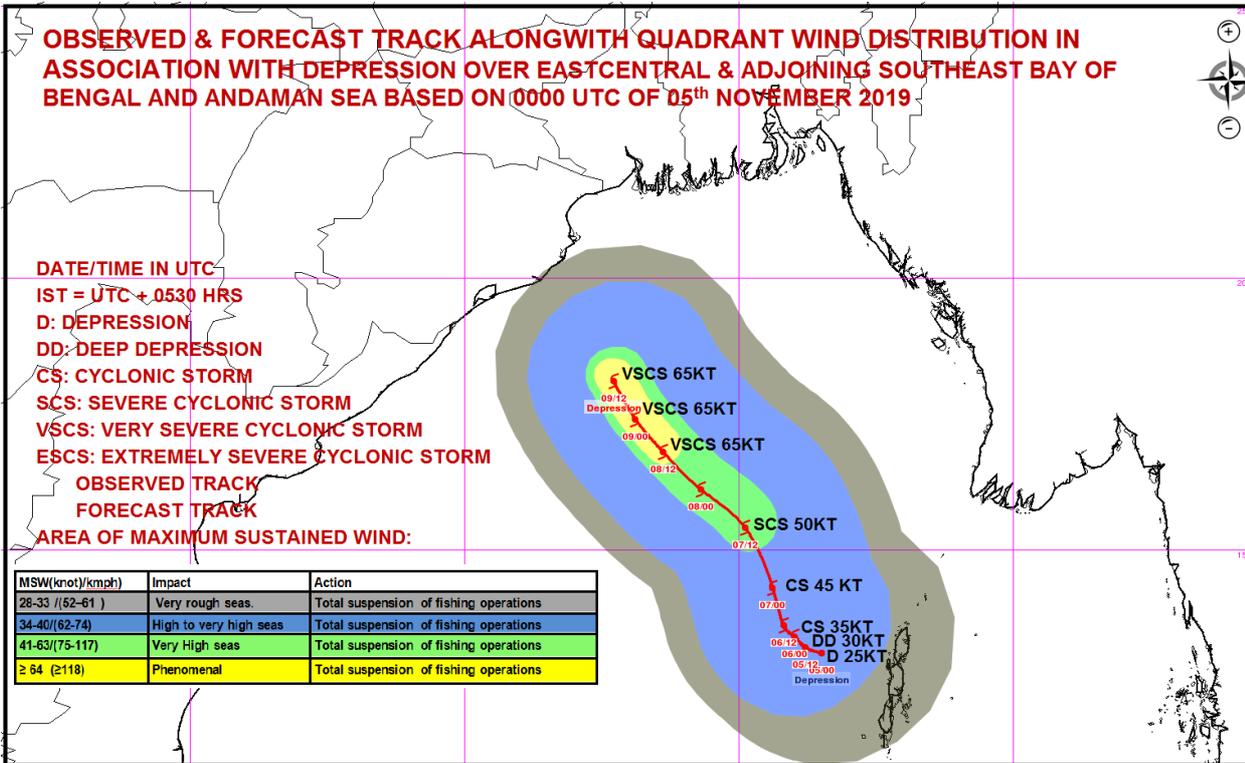
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND ANDAMAN SEA BASED ON 0000 UTC OF 05th NOVEMBER 2019

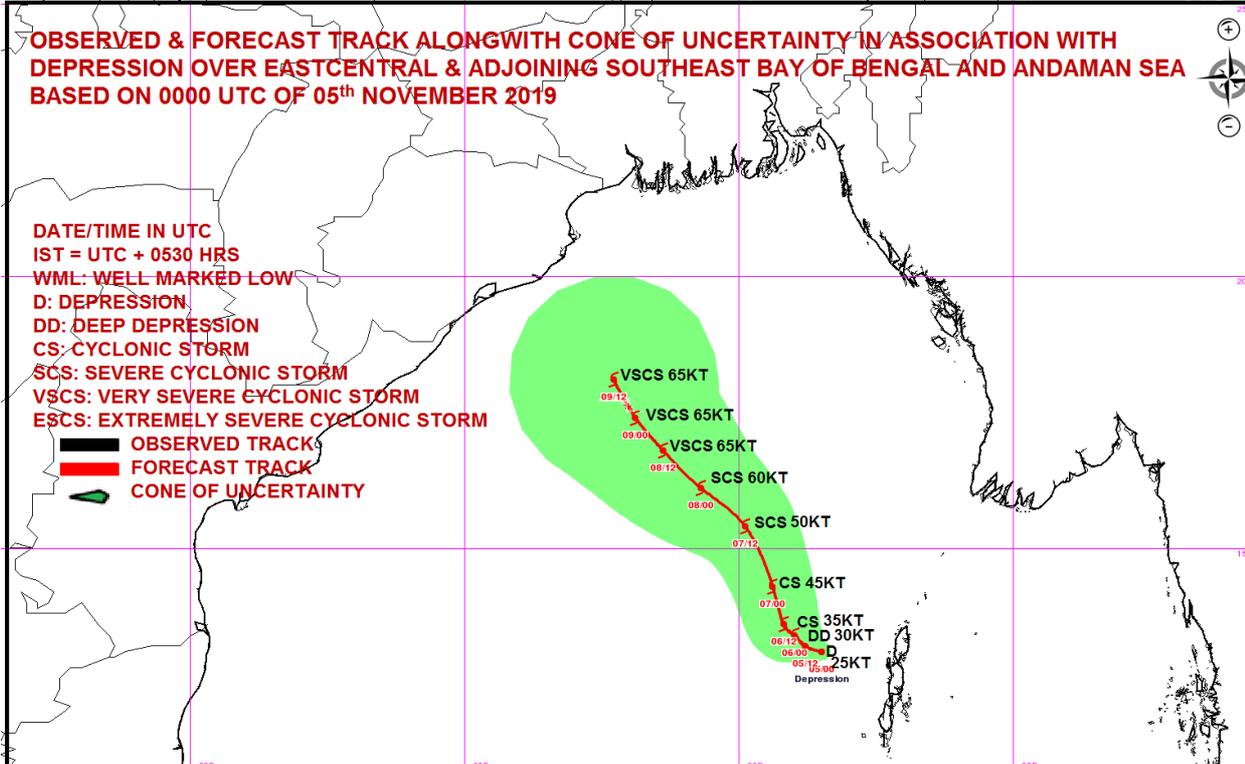
DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 ESCS: EXTREMELY SEVERE CYCLONIC STORM
 OBSERVED TRACK
 FORECAST TRACK
 AREA OF MAXIMUM SUSTAINED WIND:

MSW(knot)/kmph	Impact	Action
28-33 (52-61)	Very rough seas	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-63 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND ANDAMAN SEA BASED ON 0000 UTC OF 05th NOVEMBER 2019

DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 WML: WELL MARKED LOW
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 ESCS: EXTREMELY SEVERE CYCLONIC STORM
 OBSERVED TRACK
 FORECAST TRACK
 CONE OF UNCERTAINTY



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 46**

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. 46 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0630 UTC OF 05.11.2019 BASED ON 0300 UTC OF 05.11.2019.

**SUB: (A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA**

(A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE **EXTREMELY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTHWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HOURS, WEAKENED INTO A **VERY SEVERE CYCLONIC STORM** AND LAY CENTERED AT 0300 UTC OF 05TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.7°N AND LONGITUDE 63.6°E, ABOUT 660 KM WEST-SOUTHWEST OF PORBANDAR (42830), 720 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 770 KM WEST-SOUTHWEST OF DIU (42914). IT IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS WITH GRADUAL WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST BETWEEN DIU (42914) AND PORBANDAR (42830) AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH BY 0000 UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0300	19.7/63.6	155-165 GUSTING TO 180	VERY SEVERE CYCLONIC STORM
05.11.19/0600	19.9/64.0	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
05.11.19/1200	20.0/64.7	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
05.11.19/1800	20.1/65.6	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
06.11.19/0000	20.2/66.5	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
06.11.19/1200	20.5/68.5	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0000	21.0/70.6	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/1200	21.6/72.6	40-50 GUSTING TO 60	DEPRESSION
08.11.19/0000	22.0/74.1	30-40 GUSTING TO 50	WELL MARKED LOW PRESSURE AREA

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.5/CI 5.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WESTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 21.5°N AND LONG 62.2°E TO 65.5°E. THE MINIMUM CTT IS MINUS 81°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 85 KNOTS GUSTING TO 95 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 970 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 0300 UTC OF 05TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.3°N / 67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1013.6 HPA, SST 26.4°C AND WIND 320°/16 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 150 X10⁻⁵ SEC⁻¹ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WESTWARDS AND LAY CENTRED AT 0300 UTC OF 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.1°N AND LONG. 91.0°E, ABOUT 200 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 920 KM SOUTH-SOUTHEAST OF PARADIP (42976), 1000 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 990 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL& ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0300	13.1/91.0	40-50 GUSTING TO 60	DEPRESSION
05.11.19/1200	13.2/90.7	50-60 GUSTING TO 70	DEEP DEPRESSION
06.11.19/0000	13.4/90.5	60-70 GUSTING TO 80	CYCLONIC STORM
06.11.19/1200	13.6/90.4	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	14.3/90.2	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/1200	15.4/90.0	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
08.11.19/0000	16.1/89.3	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
08.11.19/1200	16.8/88.6	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0000	17.4/88.1	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1200	18.1/87.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 05TH NOVEMBER, 2019, CLOUS SHOWS SHEAR PATTERN. CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 10.5 °N TO 15.5°N AND LONG 85.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE. AT 0300 UTC OF 05TH NOVEMBER, 2019, MAYA BANDAR (43309) LOCATED REPORTED MEAN SEA LEVEL PRESSURE 1011.5 HPA AND WIND 230⁰/03 KNOTS. A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1009.8 HPA, SST 29.6°C AND WIND 30⁰/12 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $70 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 10-15 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15⁰N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 60-85 KJ/CM² AROUND THE SYSTEM CENTER AND INCREASING ALONG THE FORECAST TRACK TO 80-100 KJ/CM². SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

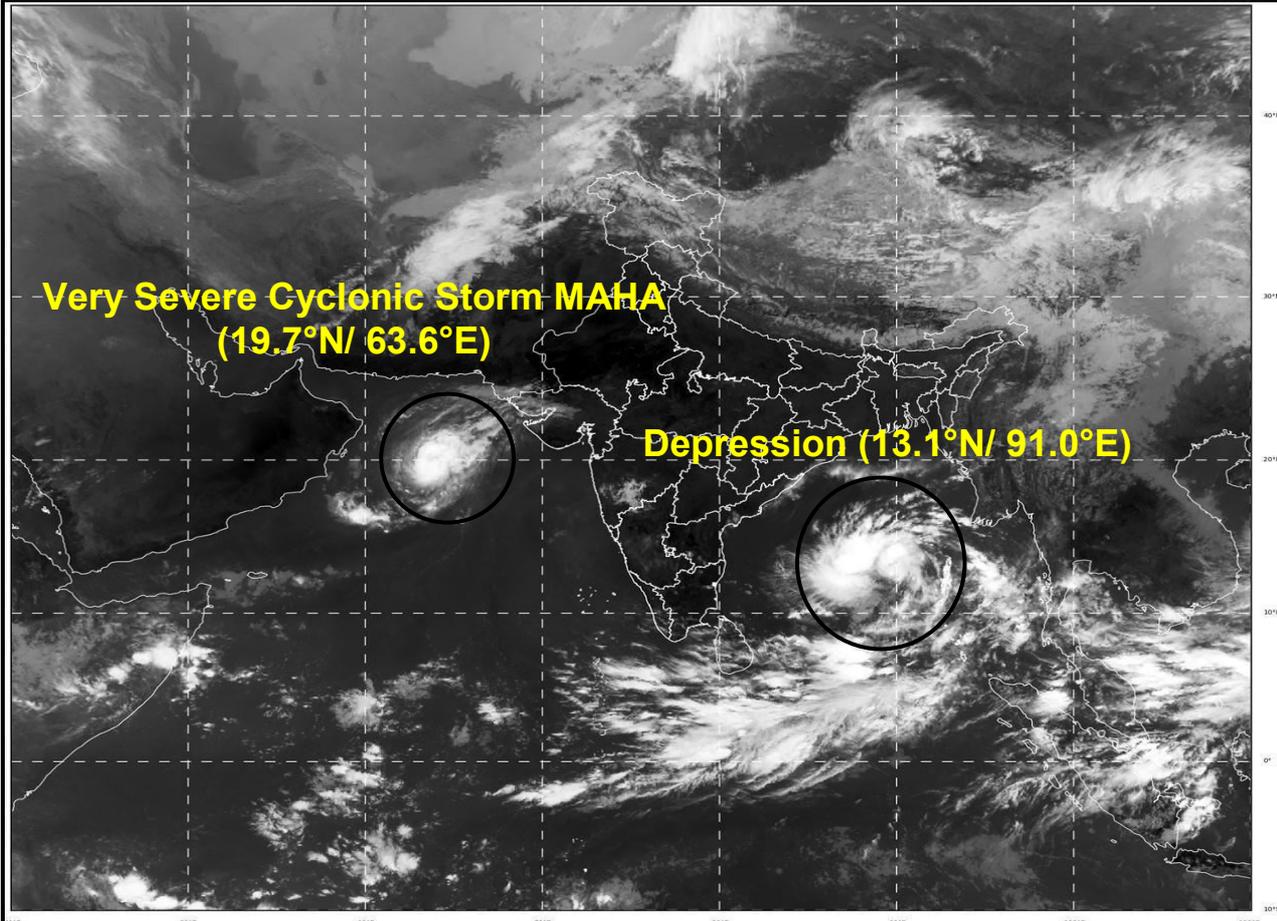
(SUNITHA DEVI)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT : INSAT-3D IMG
IMG_TIR1 10.8 um
L1C Mercator

05-11-2019/(0500 to 0527) GMT
05-11-2019/(1030 to 1057) IST



434

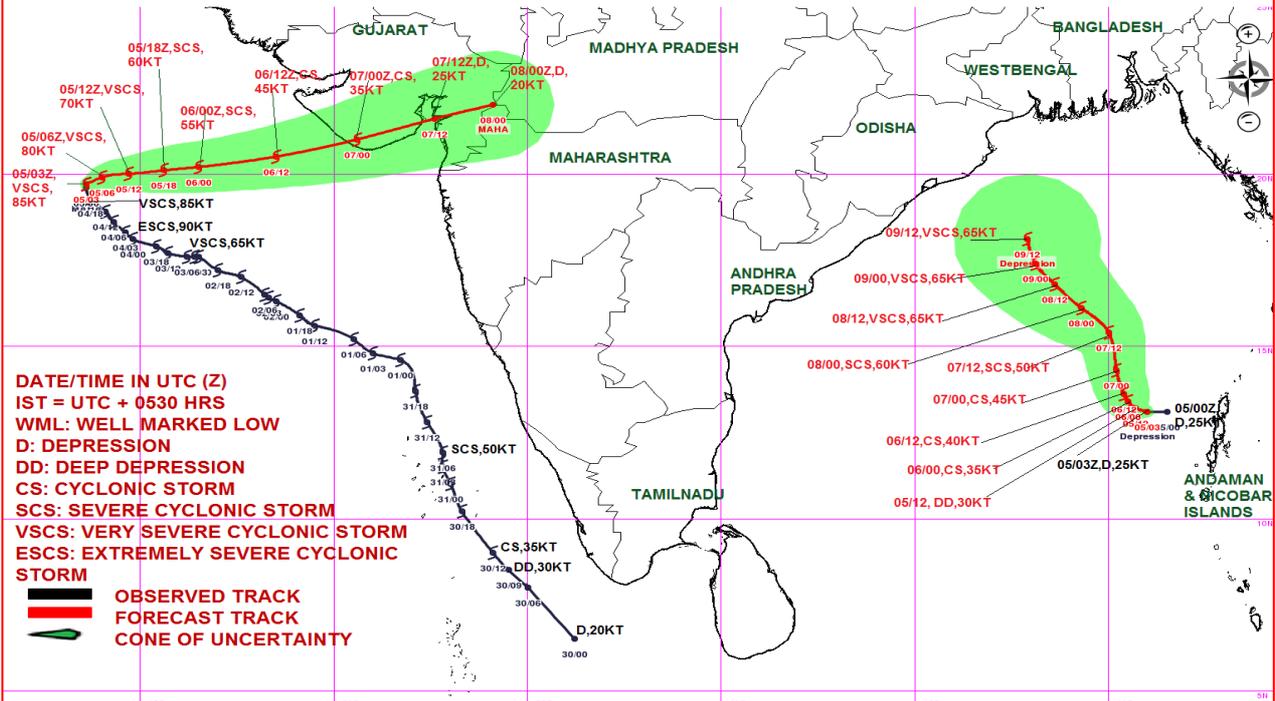
928

IMD, DELHI

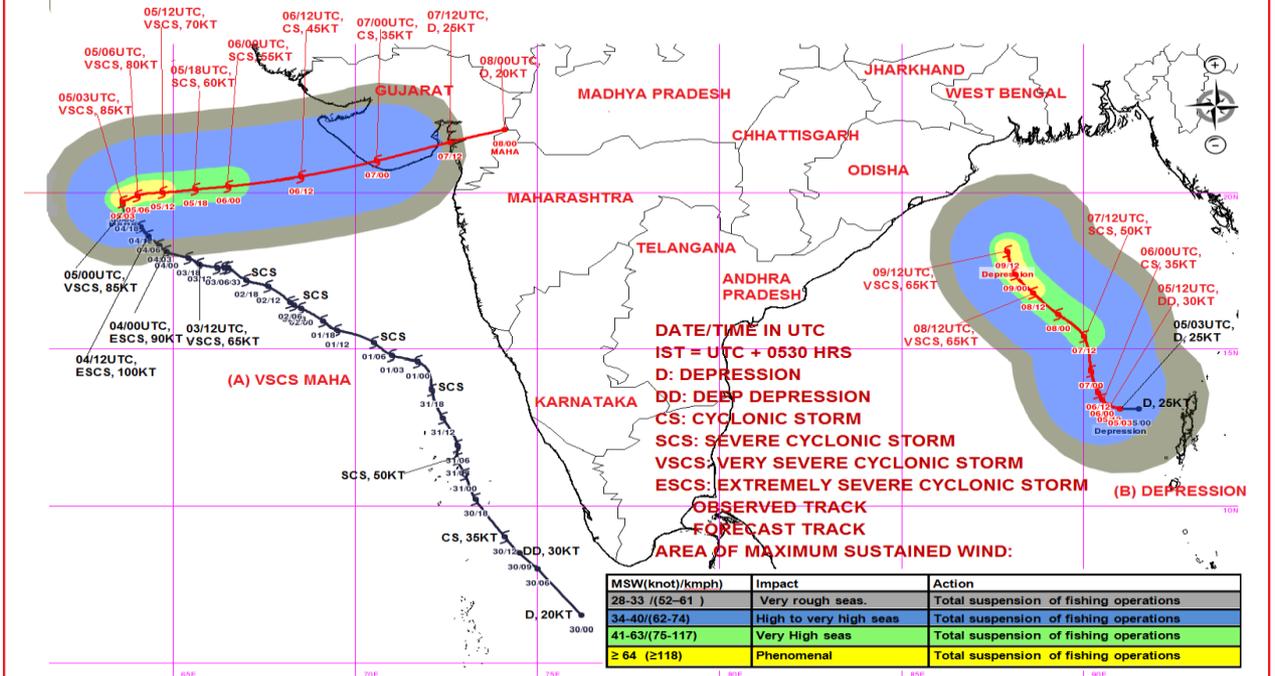
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) VERY SEVERE CYCLONIC STORM "MAHA" OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA AND (B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND ANDAMAN SEA BASED ON 0300 UTC OF 05th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) VERY SEVERE CYCLONIC STORM "MAHA" OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA AND (B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND ANDAMAN SEA BASED ON 0300 UTC OF 5th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 47**

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. 47 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 05.11.2019 BASED ON 0600 UTC OF 05.11.2019.

SUB: (A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

(A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHEASTWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0600UTC OF 05TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 63.7°E, ABOUT 650 KM WEST-SOUTHWEST OF PORBANDAR (42830), 700 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 760 KM WEST-SOUTHWEST OF DIU(42914. IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH RAPID WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0300 UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0600	19.8/63.7	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
05.11.19/1200	19.9/64.3	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
05.11.19/1800	19.9/65.2	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
06.11.19/0000	19.9/66.1	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
06.11.19/0600	19.9/67.25	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	20.2/69.3	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0600	20.9/71.06	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/1800	21.4/72.1	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0600	21.9/73.2	35-45 GUSTING TO 55	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.5/CI 5.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 21.5°N AND LONG 62.5°E TO 65.5°E. THE MINIMUM CTT IS MINUS 78°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 970 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 0600 UTC OF 05TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.3°N / 67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1013.9 HPA, SST 26.1°C AND WIND 320°/7.8 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 150 X10⁻⁵ SEC⁻¹ NEAR THE SOUTH OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WESTWARDS WITH A SPEED OF 14KMPH AND LAY CENTRED AT 0600 HRS IST OF TODAY, THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.1°N AND LONG. 90.7°E, ABOUT 240 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 900 KM SOUTH-SOUTHEAST OF PARADIP (42976), 990 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 980 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM TILL 0600UTC OF 6TH NOVEMBER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0600	13.1/90.7	50-60 GUSTING TO 70	DEPRESSION
05.11.19/1800	13.2/90.4	60-70 GUSTING TO 80	DEEP DEPRESSION
06.11.19/0600	13.3/90.1	65-75 GUSTING TO 85	CYCLONIC STORM
06.11.19/1800	13.8/90.1	75-85 GUSTING TO 95	CYCLONIC STORM
07.11.19/0600	14.8/89.9	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
07.11.19/1800	15.9/89.2	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/0600	17.2/88.8	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
08.11.19/1800	18.3/88.5	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/0600	19.0/88.4	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
09.11.19/1800	19.6/88.5	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 05TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.0 °N TO 16.0°N AND LONG 85.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE. AT 0600 UTC OF 05TH NOVEMBER, 2019, A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1008.4 HPA, SST 29.6°C AND WIND 30⁰/13.6 KNOTS.

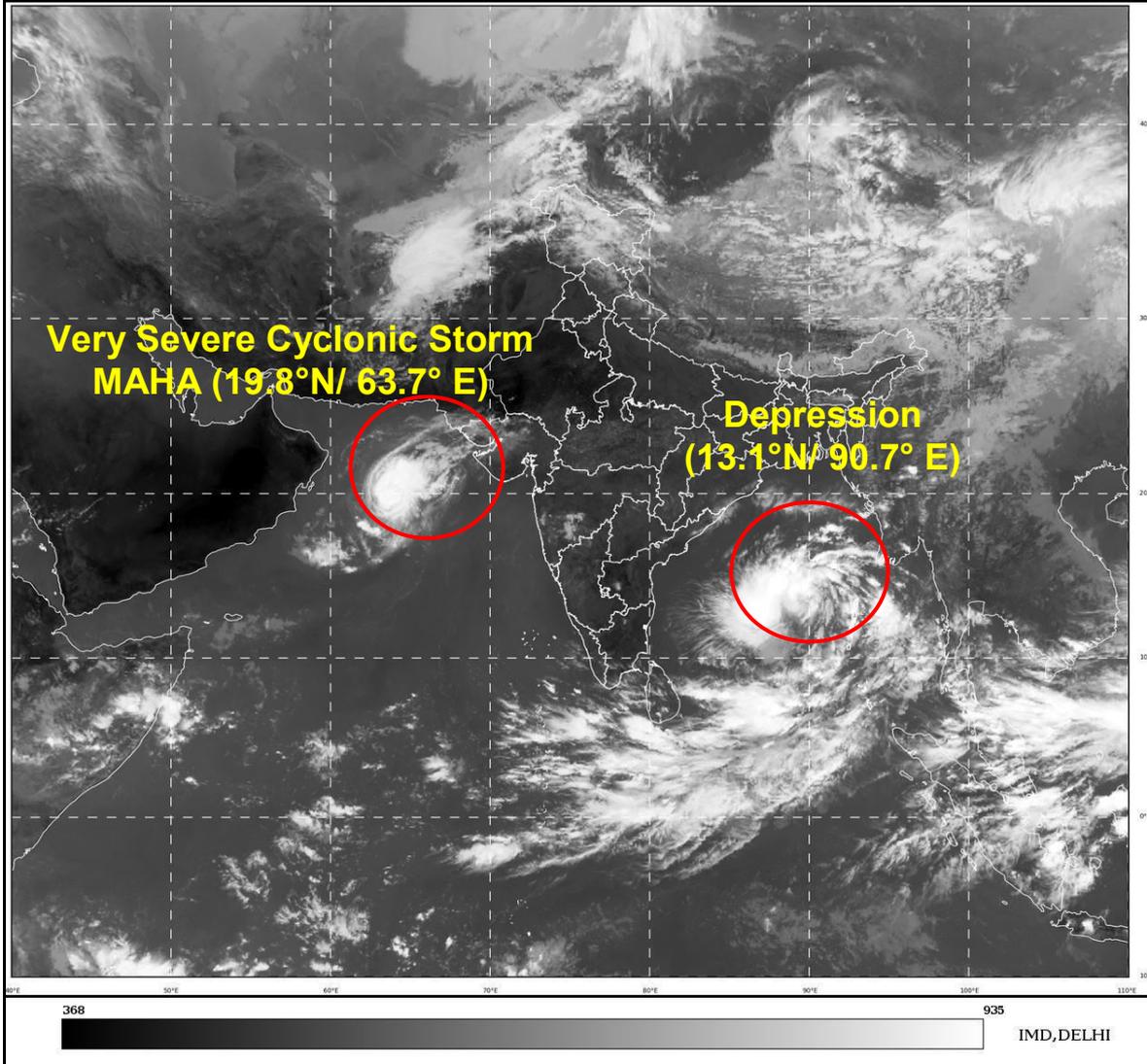
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $70 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 10-15 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 60-85 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

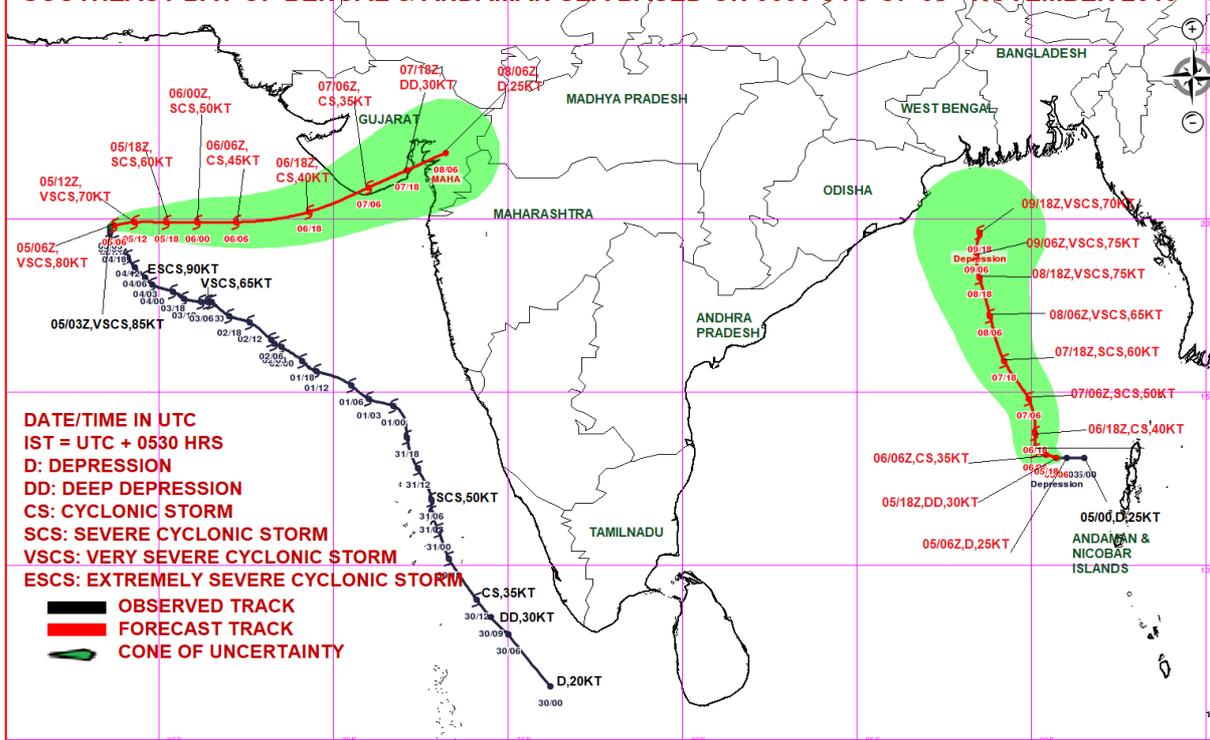
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

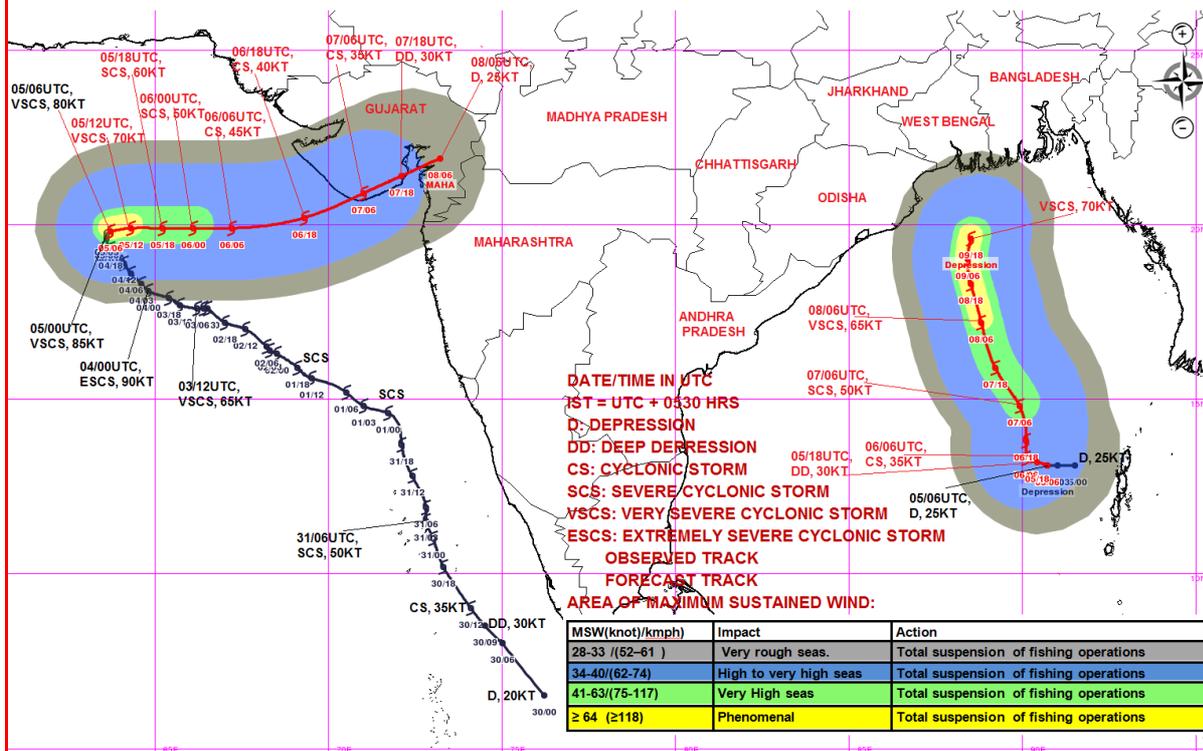


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) VERY SEVERE CYCLONIC STORM "MAHA" OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA AND (B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL & ANDAMAN SEA BASED ON 0600 UTC OF 05th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) VERY SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA AND (B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND ANDAMAN SEA BASED ON 0600 UTC OF 5th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 48**

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. 48 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1200 UTC OF 05.11.2019 BASED ON 0900 UTC OF 05.11.2019.

**Sub: (A) Very Severe Cyclonic storm 'MAHA' (Pronounced as M'maha) over westcentral and adjoining eastcentral Arabian Sea
(B) Depression over eastcentral & adjoining southeast Bay of Bengal and North Andaman Sea.**

(A) Very Severe Cyclonic storm 'MAHA' (Pronounced as M'maha) over westcentral and adjoining eastcentral Arabian Sea

THE **VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0900UTC OF 05TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 63.8°E, ABOUT 640 KM WEST-SOUTHWEST OF PORBANDAR (42830), 690 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 750 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH RAPID WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0300UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0900	19.8/63.8	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
05.11.19/1200	19.9/64.3	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
05.11.19/1800	19.9/65.2	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
06.11.19/0000	19.9/66.1	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
06.11.19/0600	19.9/67.25	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	20.2/69.3	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0600	20.9/71.06	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/1800	21.4/72.1	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0600	21.9/73.2	35-45 GUSTING TO 55	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.5/CI 5.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

INTENSE TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 22.5°N AND LONG 62.5°E TO 66.0°E. THE MINIMUM CTT IS MINUS 83°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 970 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE. AT 0900 UTC OF 05TH NOVEMBER, 2019, A BUOY (23456) LOCATED NEAR LAT. 18.3°N / 67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1010.9 HPA, SST 26.5°C AND WIND 340°/5.8 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ NEAR THE SOUTHWEST OF THE SYSTEM CENTRE. THE RIDGE ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WESTWARDS WITH A SPEED OF 11KMPH AND LAY CENTRED AT 0900 UTC OF TODAY, THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.1°N AND LONG. 90.4°E, ABOUT 270 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 890 KM SOUTH-SOUTHEAST OF PARADIP (42976), 980 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 990 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM TILL 0600UTC OF 6TH NOVEMBER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/0900	13.1/90.4	50-60 GUSTING TO 70	DEPRESSION
05.11.19/1800	13.2/90.2	60-70 GUSTING TO 80	DEEP DEPRESSION
06.11.19/0600	13.3/90.1	65-75 GUSTING TO 85	CYCLONIC STORM
06.11.19/1800	13.8/90.1	75-85 GUSTING TO 95	CYCLONIC STORM
07.11.19/0600	14.8/89.9	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
07.11.19/1800	15.9/89.2	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/0600	17.2/88.8	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
08.11.19/1800	18.3/88.5	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/0600	19.0/88.4	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
09.11.19/1800	19.6/88.5	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 05TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.0 °N TO 16.0°N AND LONG 85.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE. AT 0900 UTC OF 05TH NOVEMBER, 2019, A BUOY (23459) LOCATED NEAR LAT. 14.6°N / 87.1°E REPORTED MEAN SEA LEVEL PRESSURE 1005.9 HPA, SST 29.6°C AND WIND

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

40⁰/11.7 KNOTS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $70 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 10-15 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 60-85 KJ/CM^2 AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN $29\text{-}30^{\circ}\text{C}$ AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

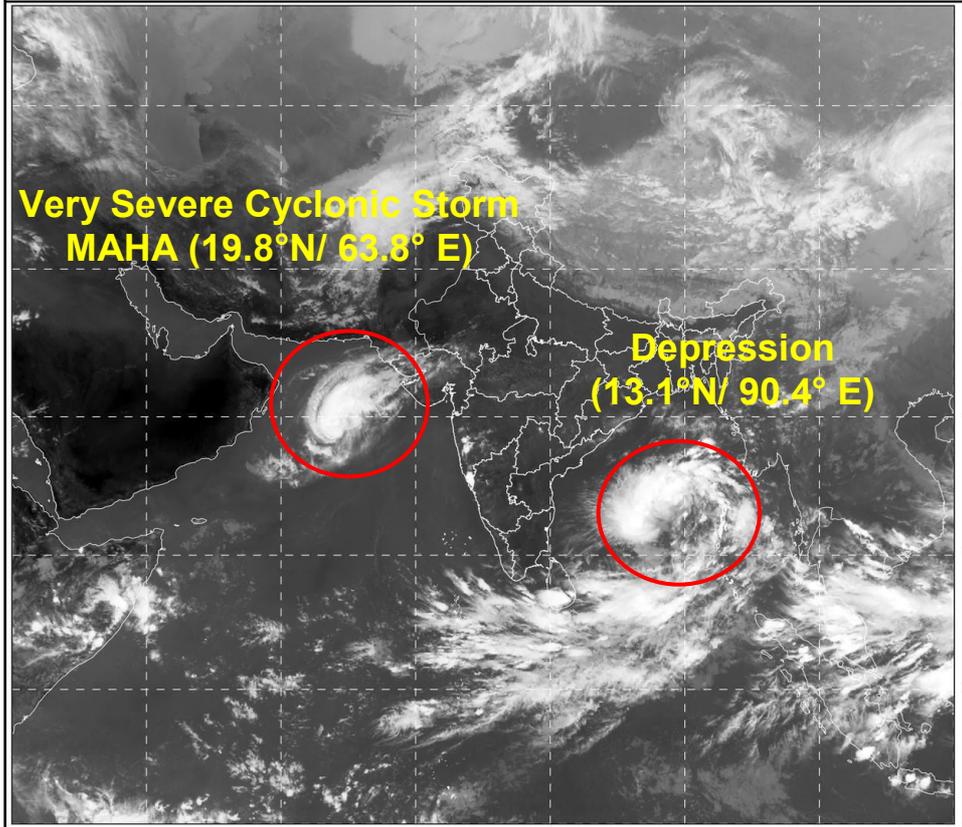
(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

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IMG_TIR1 10.8 um
LIC Mercator

05-11-2019/(1000 to 1026) GMT
05-11-2019/(1530 to 1556) IST



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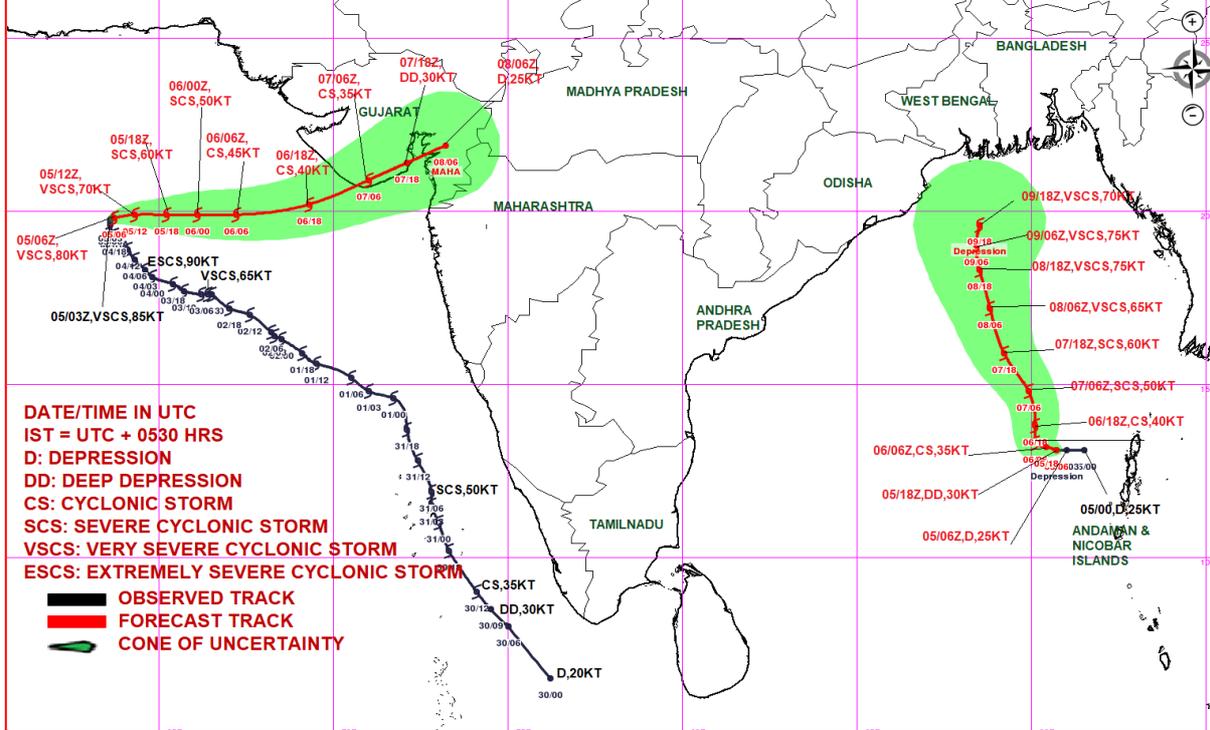
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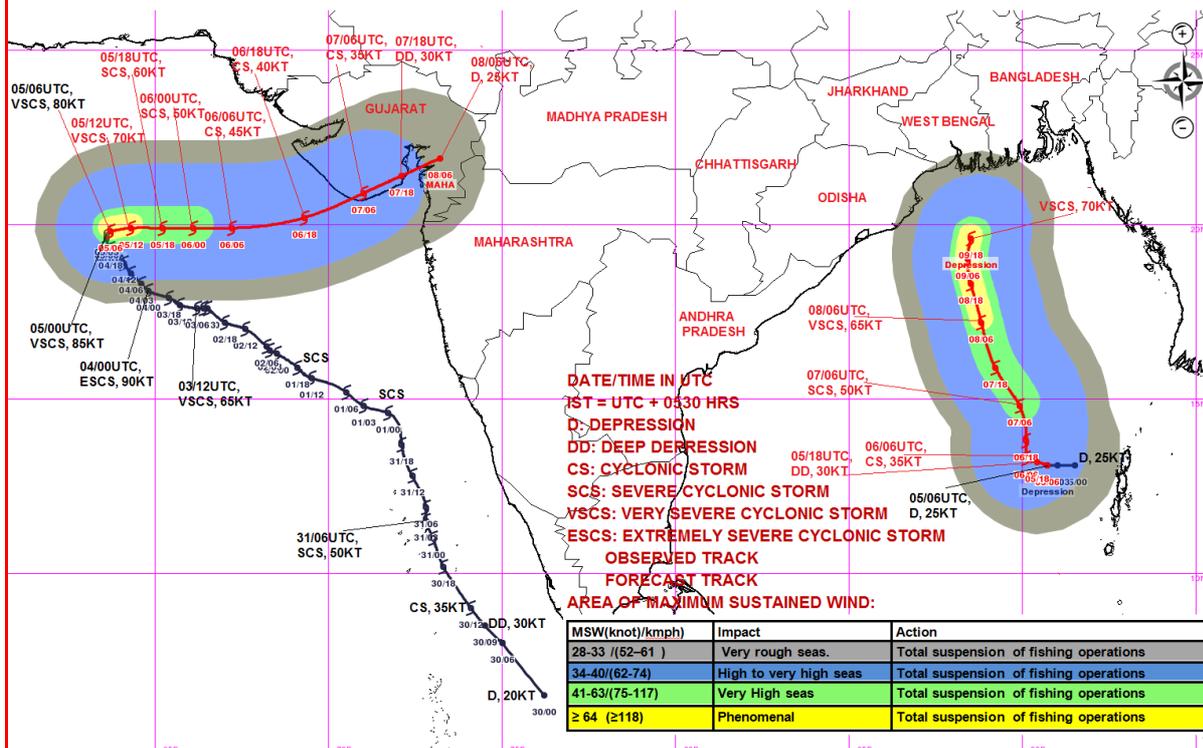
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) VERY SEVERE CYCLONIC STORM "MAHA" OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA AND (B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL & ANDAMAN SEA BASED ON 0600 UTC OF 05th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) VERY SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA AND (B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND ANDAMAN SEA BASED ON 0600 UTC OF 5th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 49**

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. 49 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 05.11.2019 BASED ON 1200 UTC OF 05.11.2019.

**SUB: (A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.**

(A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA

THE **VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER WESTCENTRAL & ADJOINING EASTCENTRAL ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1200UTC OF 05TH NOVEMBER, 2019 OVER WESTCENTRAL AND ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 64.1°E, ABOUT 610 KM WEST-SOUTHWEST OF PORBANDAR (42830), 660 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 710 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH RAPID WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0300UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/1200	19.8/64.1	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
05.11.19/1800	19.8/65.2	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
06.11.19/0000	19.9/66.1	100-120 GUSTING TO 130	SEVERE CYCLONIC STORM
06.11.19/0600	20.0/67.2	90-100 GUSTING TO 110	CYCLONIC STORM
06.11.19/1200	20.2/68.5	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0000	20.6/70.3	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	21.1/71.6	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0000	21.6/72.6	40-50 GUSTING TO 60	DEPRESSION
08.11.19/1200	22.1/73.6	20-30 GUSTING TO 40	WELL MARKED LOW PRESSURE AREA

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.5/CI 5.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 21.5°N AND LONG 63.0°E TO 66.0°E. THE MINIMUM CTT IS MINUS 92°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 150 X10⁻⁵ SEC⁻¹ AROUND THE SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵ S⁻¹ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WESTWARDS WITH A SPEED OF 11KMPH AND LAY CENTRED AT 1200 UTC OF TODAY, THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.2°N AND LONG. 90.1°E, ABOUT 300 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 870 KM SOUTH-SOUTHEAST OF PARADIP (42976), 960 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM NEARLY SOUTH OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM TILL 0600UTC OF 6TH NOVEMBER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/1200	13.2/90.1	45-55 GUSTING TO 65	DEPRESSION
06.11.19/0000	13.3/90.0	55-65 GUSTING TO 75	DEEP DEPRESSION
06.11.19/1200	13.5/90.0	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0000	14.3/89.9	70-80 GUSTING TO 90	SEVERE CYCLONIC STORM
07.11.19/1200	15.4/89.5	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
08.11.19/0000	16.6/89.0	110-120 GUSTING TO 130	SEVERE CYCLONIC STORM
08.11.19/1200	17.8/88.6	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0000	18.6/88.3	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
09.11.19/1200	19.3/88.2	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
10.11.19/0000	19.8/88.3	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 05TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.5 °N TO 16.0°N AND LONG 85.0°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

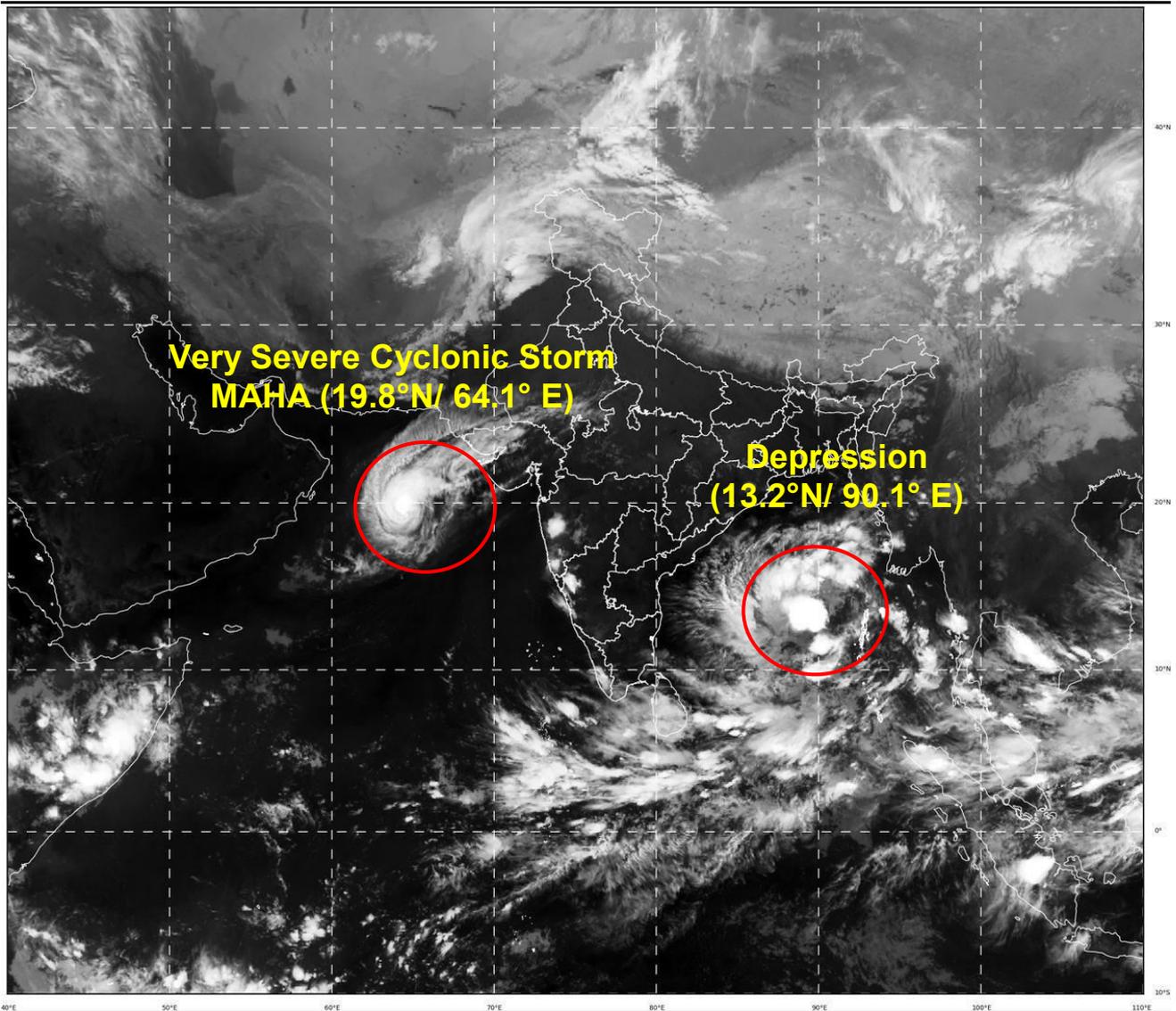
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $70 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 05-10 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF $80\text{-}90 \text{ KJ/CM}^2$ AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN $29\text{-}30^{\circ}\text{C}$ AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INITIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(R K JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

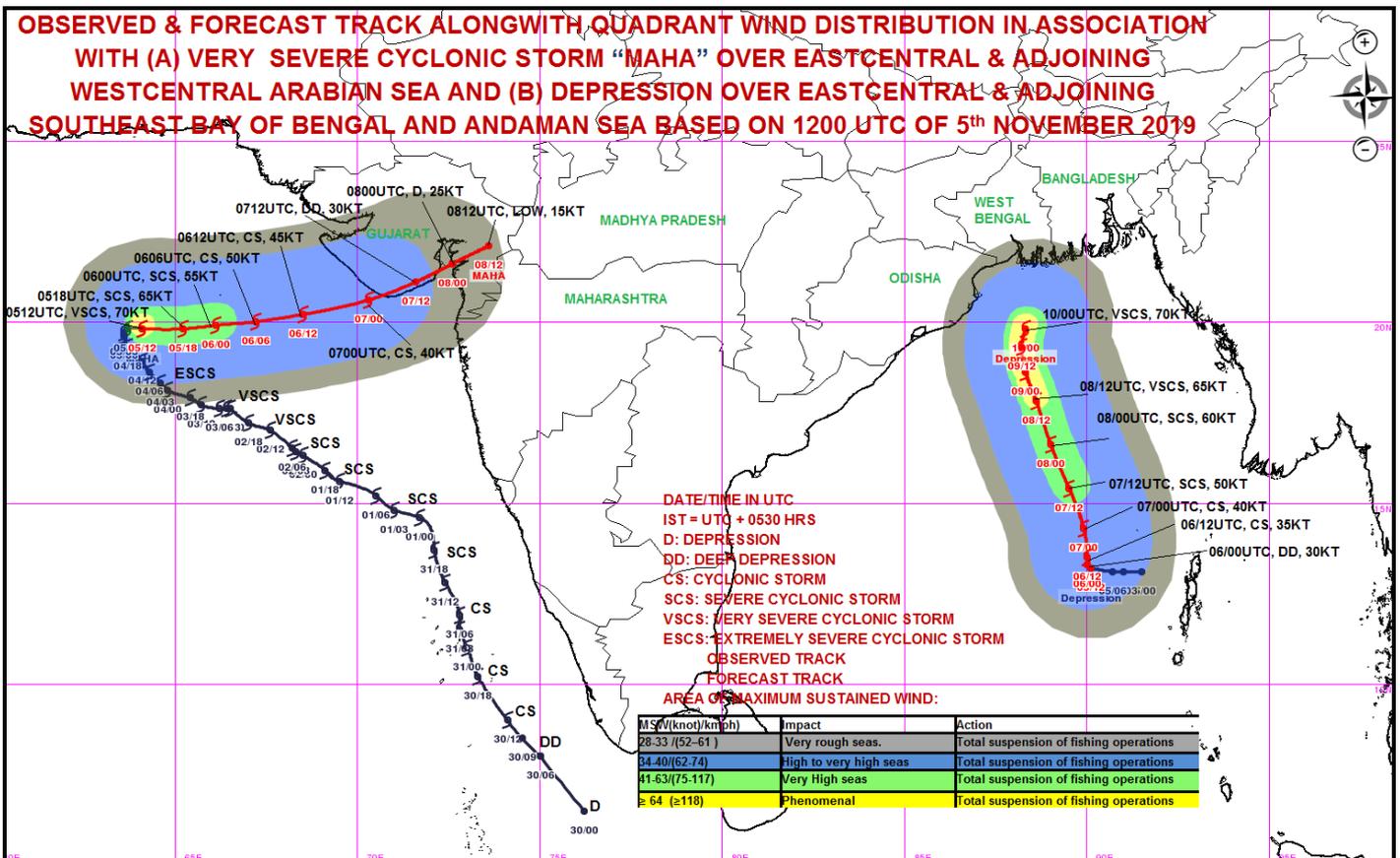
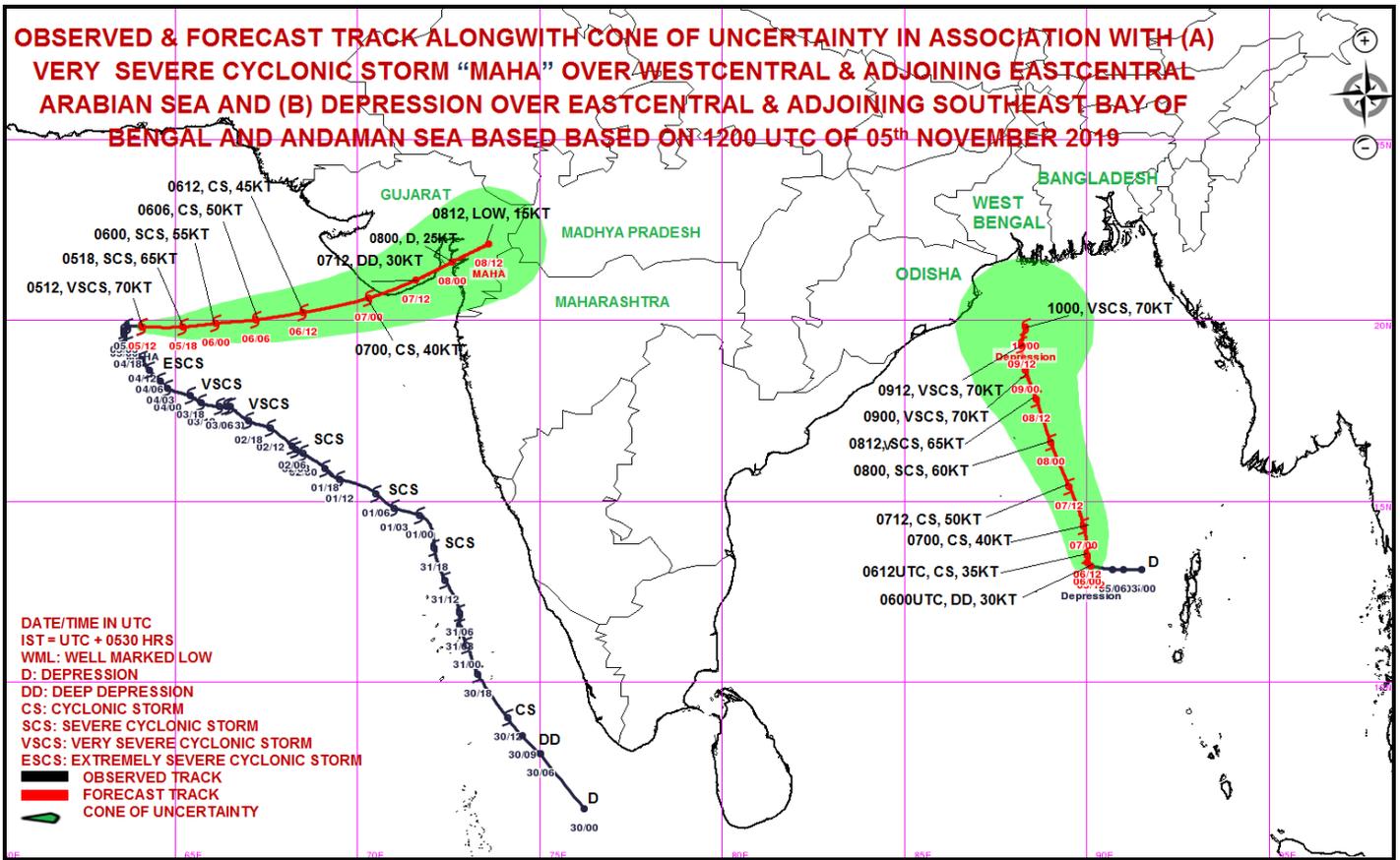


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IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 50**

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. 50 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1700 UTC OF 05.11.2019 BASED ON 1500 UTC OF 05.11.2019.

**SUB: (A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.**

(A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA

THE VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 08 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1500UTC OF 05TH NOVEMBER, 2019 OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 64.3°E, ABOUT 590 KM WEST-SOUTHWEST OF PORBANDAR (42830), 640 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 710 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH RAPID WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0300UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/1500	19.8/64.3	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
05.11.19/1800	19.8/64.7	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
06.11.19/0000	19.9/65.8	100-120 GUSTING TO 130	SEVERE CYCLONIC STORM
06.11.19/0600	20.0/66.9	90-100 GUSTING TO 110	CYCLONIC STORM
06.11.19/1200	20.2/68.5	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0000	20.6/70.3	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	21.1/71.6	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0000	21.6/72.6	40-50 GUSTING TO 60	DEPRESSION
08.11.19/1200	22.1/73.6	20-30 GUSTING TO 40	WELL MARKED LOW PRESSURE AREA

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.5/CI 5.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 22.0°N AND LONG 62.0°E TO 67.5°E. THE MINIMUM CTT IS MINUS 93°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WESTWARDS WITH A SPEED OF 11KMPH AND LAY CENTRED AT 1500 UTC OF TODAY, THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.3°N AND LONG. 89.8°E, ABOUT 340 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 840 KM SOUTH-SOUTHEAST OF PARADIP (42976), 950 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM NEARLY SOUTH OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM TILL 0600UTC OF 6TH NOVEMBER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/1500	13.3/89.8	45-55 GUSTING TO 65	DEPRESSION
06.11.19/0000	13.3/89.8	55-65 GUSTING TO 75	DEEP DEPRESSION
06.11.19/1200	13.5/89.8	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0000	14.3/89.7	70-80 GUSTING TO 90	SEVERE CYCLONIC STORM
07.11.19/1200	15.4/89.3	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
08.11.19/0000	16.6/88.8	110-120 GUSTING TO 130	SEVERE CYCLONIC STORM
08.11.19/1200	17.8/88.4	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0000	18.6/88.1	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
09.11.19/1200	19.3/88.0	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
10.11.19/0000	19.8/88.3	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 05TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 9.5 °N TO 17.5°N AND LONG 84.0°E TO 92.5°E. THE MINIMUM CTT IS MINUS 93°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

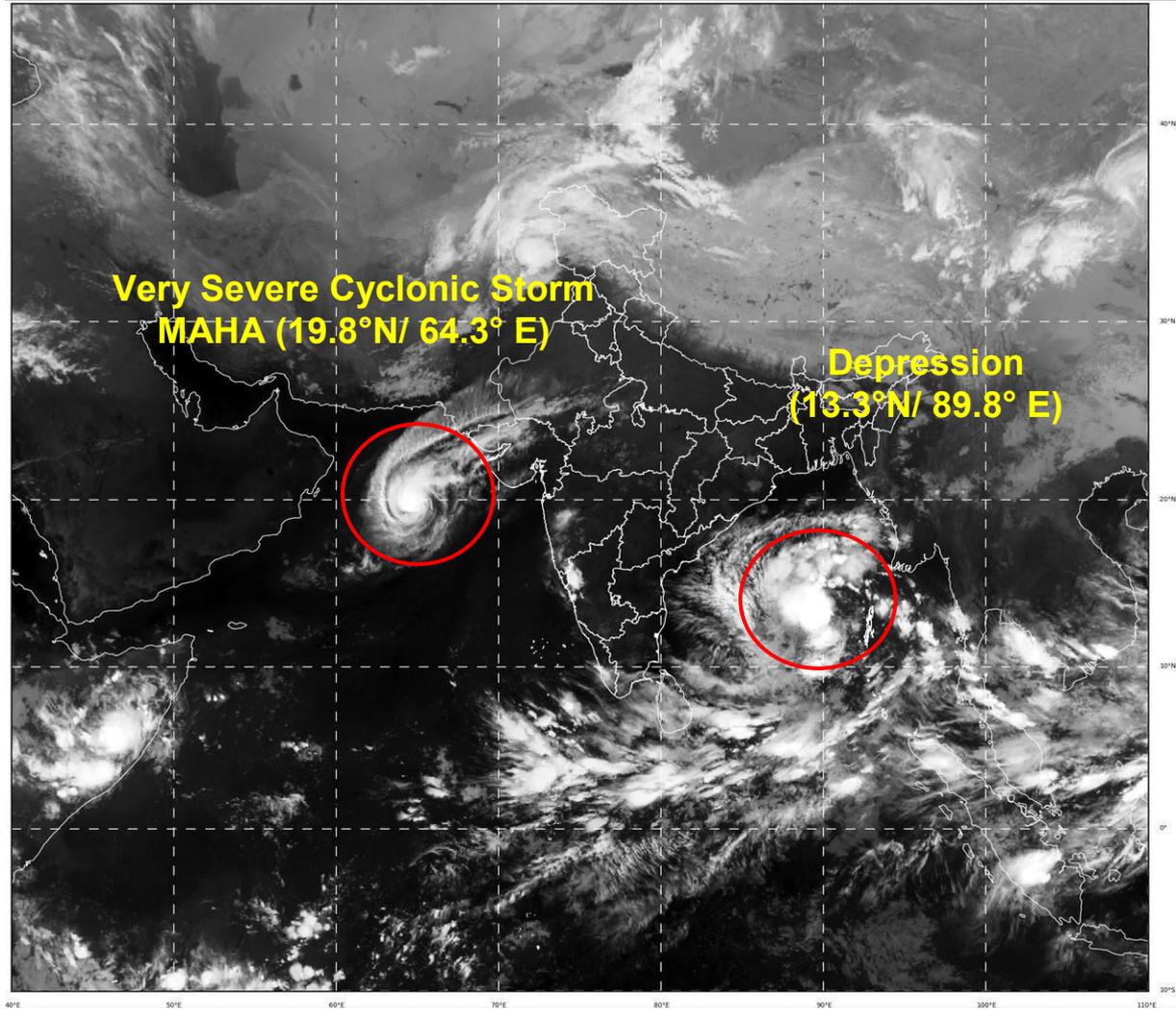
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $70 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 05-10 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-90 KJ/CM^2 AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN $29\text{-}30^{\circ}\text{C}$ AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(R K JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

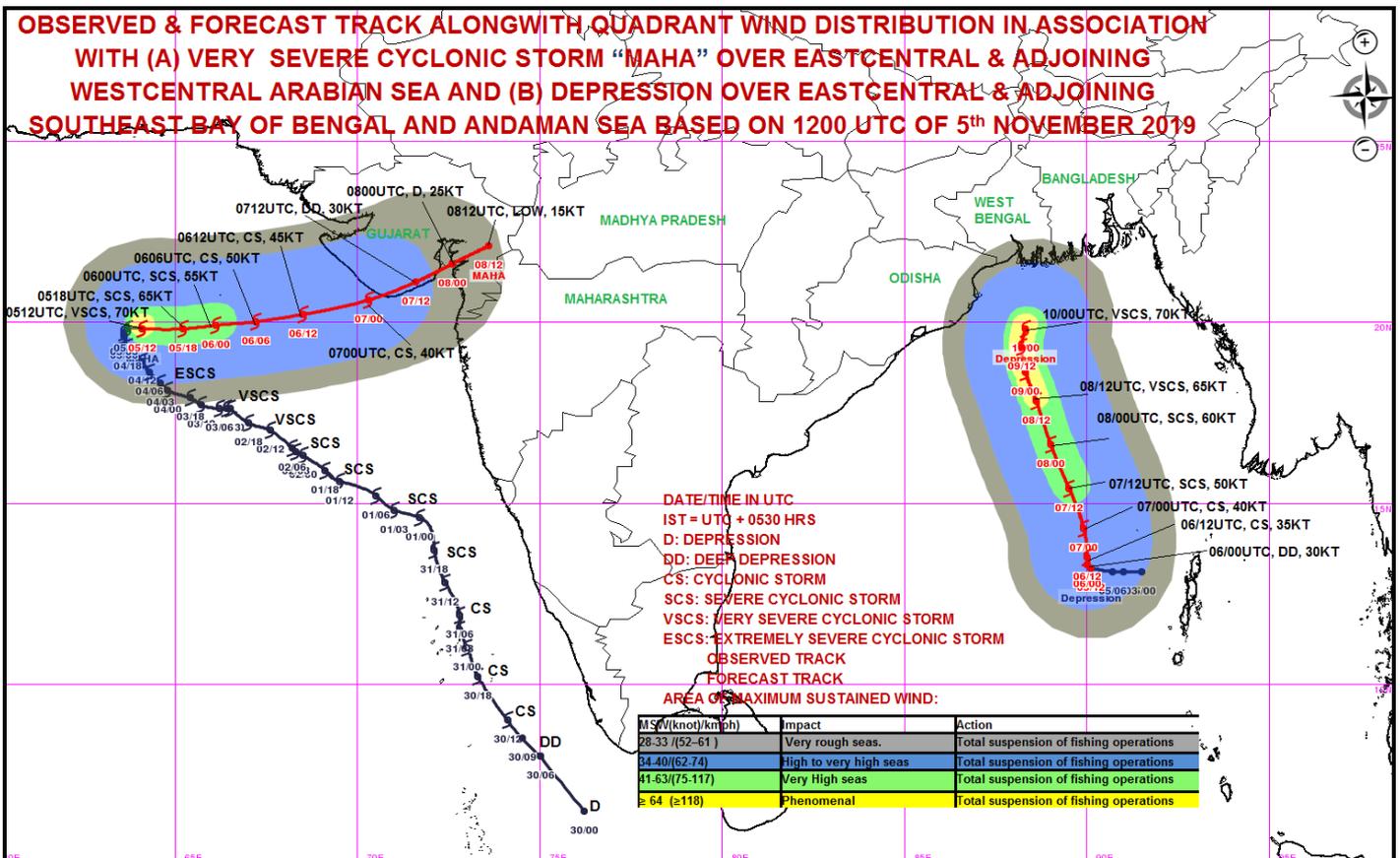
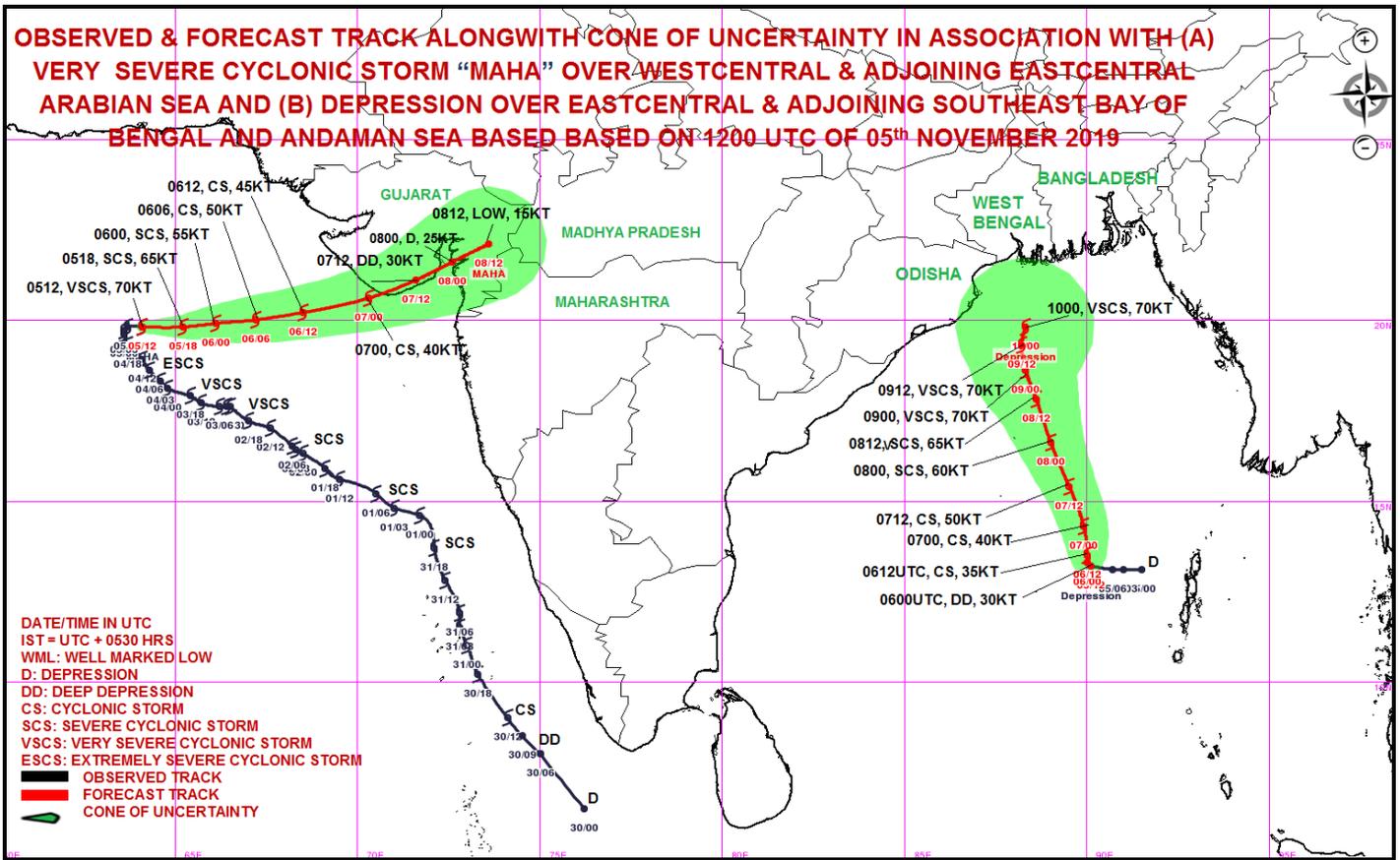


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IMD,DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 51**

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. 51 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2000 UTC OF 05.11.2019 BASED ON 1800 UTC OF 05.11.2019.

**SUB: (A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.**

(A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA

THE VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1800UTC OF 05TH NOVEMBER, 2019 OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 64.9°E, ABOUT 540 KM WEST-SOUTHWEST OF PORBANDAR (42830), 580 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 640 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH RAPID WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0300UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/1800	19.8/64.9	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
06.11.19/0000	19.8/65.8	100-120 GUSTING TO 130	SEVERE CYCLONIC STORM
06.11.19/0600	19.8/65.8	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
06.11.19/1200	19.9/68.0	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	20.2/69.1	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0600	20.6/70.6	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1800	21.0/71.7	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0600	21.0/71.7	40-50 GUSTING TO 60	DEEP DEPRESSION
08.11.19/1800	22.1/73.6	20-30 GUSTING TO 40	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.5/CI 5.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 21.5°N AND LONG 62.5°E TO 67.5°E. THE MINIMUM CTT IS MINUS 92°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 200 X10⁻⁵ SEC⁻¹ AROUND THE SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 10 X10⁻⁵ S⁻¹ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT 10 X10⁻⁵ S⁻¹ TO THE NORTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WESTWARDS WITH A SPEED OF 06 KMPH AND LAY CENTRED AT 1800 UTC OF TODAY, THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.3°N AND LONG. 89.8°E, ABOUT 340 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 840 KM SOUTH-SOUTHEAST OF PARADIP (42976), 950 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM NEARLY SOUTH OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM TILL 0600UTC OF 6TH NOVEMBER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/1800	13.3/89.8	45-55 gusting to 65	DEPRESSION
06.11.19/0600	13.8/89.3	55-65 gusting to 75	DEEP DEPRESSION
06.11.19/1800	14.9/88.9	60-70 gusting to 80	CYCLONIC STORM
07.11.19/0600	16.0/88.6	70-80 gusting to 90	SEVERE CYCLONIC STORM
07.11.19/1800	17.3/88.4	90-100 gusting to 110	SEVERE CYCLONIC STORM
08.11.19/0600	17.9/88.2	110-120 gusting to 130	SEVERE CYCLONIC STORM
08.11.19/1800	18.9/88.1	120-130 gusting to 145	VERY SEVERE CYCLONIC STORM
09.11.19/0600	19.3/88.0	125-135 gusting to 150	VERY SEVERE CYCLONIC STORM
09.11.19/1800	19.8/88.0	130-140 gusting to 155	VERY SEVERE CYCLONIC STORM
10.11.19/0600	19.8/88.3	130-140 gusting to 155	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 05TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 9.5 °N TO 17.5°N AND LONG 84.0°E TO 92.5°E. THE MINIMUM CTT IS MINUS 93°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

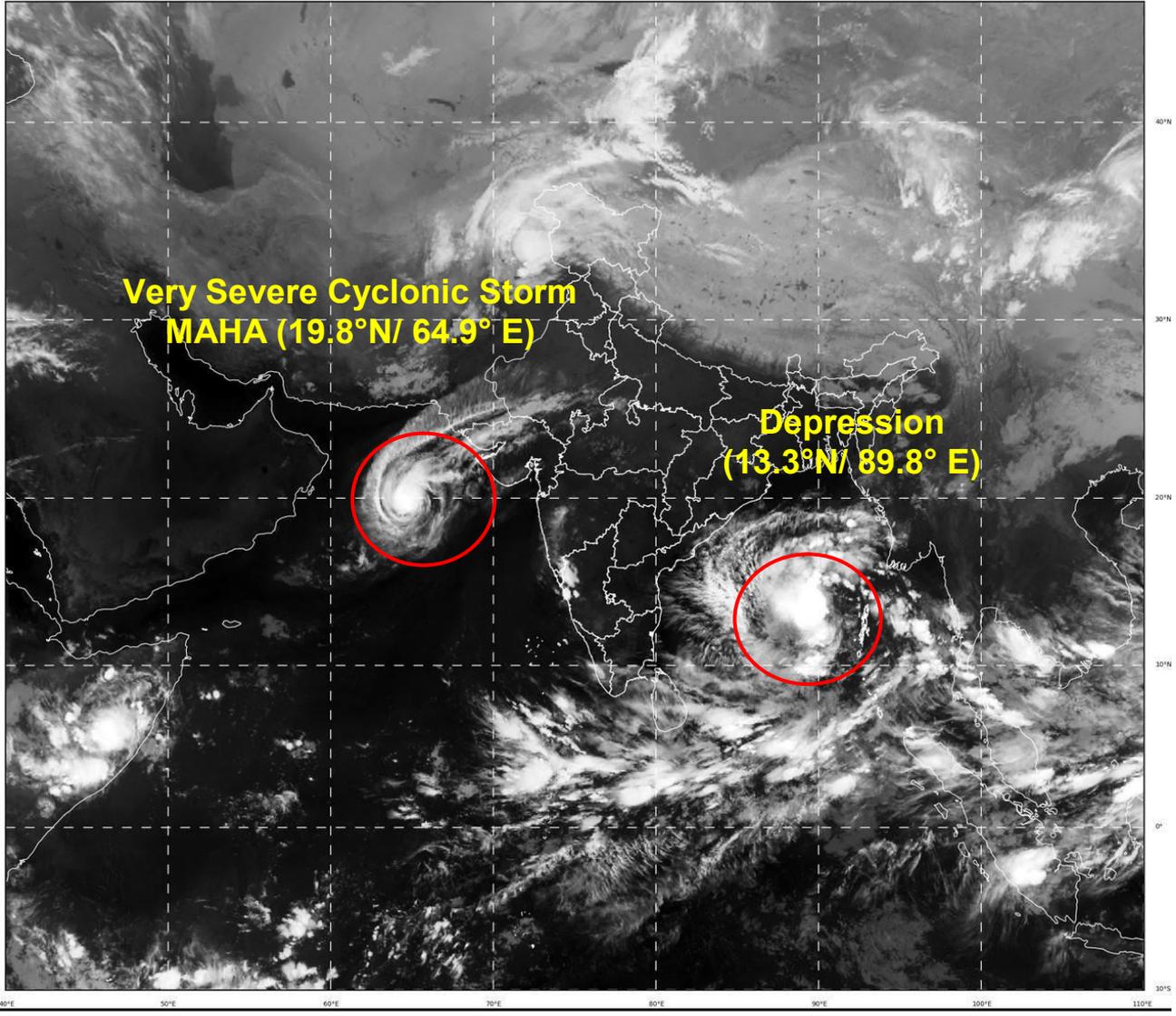
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $130 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 05-10 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-90 KJ/CM^2 AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN $29\text{-}30^{\circ}\text{C}$ AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INITIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(R K JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

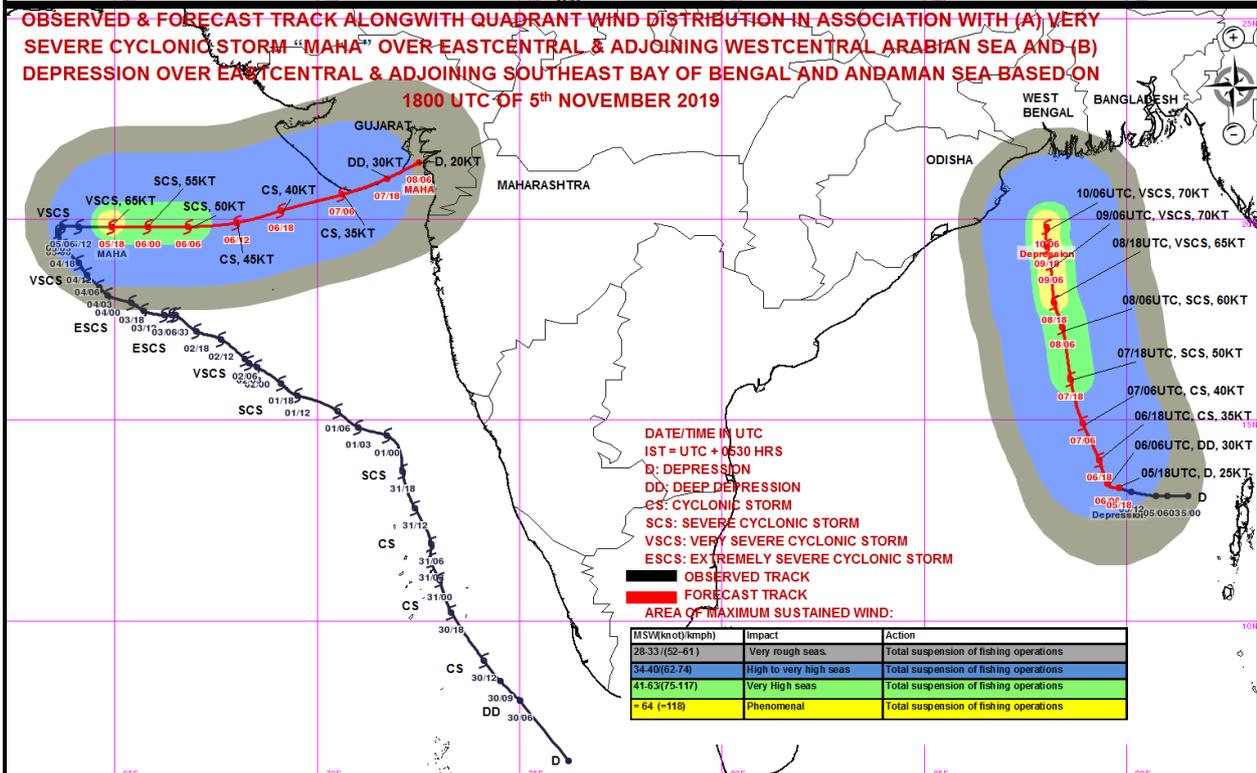
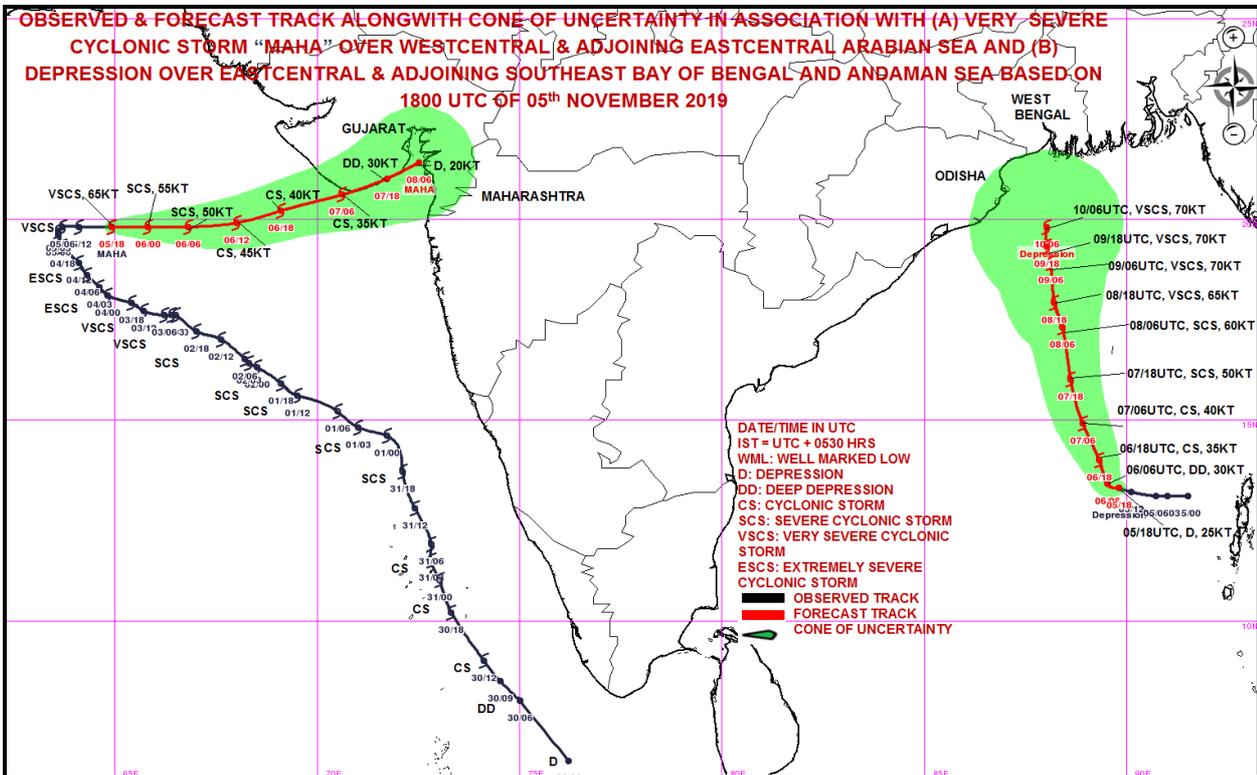


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IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 52**

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. 52 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0000 UTC OF 06.11.2019 BASED ON 2100 UTC OF 05.11.2019.

**SUB: (A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.**

(A) VERY SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA

THE VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 21 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 2100 UTC OF 05TH NOVEMBER, 2019 OVER EASTCENTRAL AND ADJOINING WESTCENTRAL ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 65.5°E, ABOUT 480 KM WEST-SOUTHWEST OF PORBANDAR (42830), 520 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 570 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH RAPID WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0300UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/2100	19.8/65.5	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
06.11.19/0000	19.8/65.8	100-120 GUSTING TO 130	SEVERE CYCLONIC STORM
06.11.19/0600	19.8/65.8	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
06.11.19/1200	19.9/68.0	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	20.2/69.1	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0600	20.6/70.6	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1800	21.0/71.7	50-60 GUSTING TO 70	DEEP DEPRESSION
08.11.19/0600	21.0/71.7	40-50 GUSTING TO 60	DEEP DEPRESSION
08.11.19/1800	22.1/73.6	20-30 GUSTING TO 40	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 05TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 4.0/4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.5 °N TO 21.5°N AND LONG 62.5°E TO 67.0°E. THE MINIMUM CTT IS MINUS 73°C. A BUOY (23456) LOCATED NEAR LAT. 18.5°N / 67.4°E REPORTED MEAN SEA LEVEL PRESSURE 1009.1 HPA, SST 26.3°C AND WIND 330⁰/12 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 200 X10⁻⁵ SEC⁻¹ AROUND THE SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 10 X10⁻⁵ S⁻¹ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT 10 X10⁻⁵ S⁻¹ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND 20-25 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE NORTH OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS SITUATED NORTH OF THE COL REGION, THE SYSTEM IS VERY LIKELY TO MOVE RAPIDLY EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO WEAKEN GRADUALLY UNDER THE INFLUENCE OF INCREASED VERTICAL WIND SHEAR ALONG THE FORECAST TRACK. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA.

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 06 KMPH AND LAY CENTRED AT 2100 UTC OF THE 5TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA, NEAR LAT.13.4°N AND LONG. 89.5°E, ABOUT 370 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 820 KM SOUTH-SOUTHEAST OF PARADIP (42976), 930 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM NEARLY WEST-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM TILL 0600UTC OF 6TH NOVEMBER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS INITIALLY AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.11.19/2100	13.4/89.5	45-55 gusting to 65	DEPRESSION
06.11.19/0600	13.8/89.3	55-65 gusting to 75	DEEP DEPRESSION
06.11.19/1800	14.9/88.9	60-70 gusting to 80	CYCLONIC STORM
07.11.19/0600	16.0/88.6	70-80 gusting to 90	SEVERE CYCLONIC STORM
07.11.19/1800	17.3/88.4	90-100 gusting to 110	SEVERE CYCLONIC STORM
08.11.19/0600	17.9/88.2	110-120 gusting to 130	SEVERE CYCLONIC STORM
08.11.19/1800	18.9/88.1	120-130 gusting to 145	VERY SEVERE CYCLONIC STORM
09.11.19/0600	19.3/88.0	125-135 gusting to 150	VERY SEVERE CYCLONIC STORM
09.11.19/1800	19.8/88.0	130-140 gusting to 155	VERY SEVERE CYCLONIC STORM
10.11.19/0600	19.8/88.3	130-140 gusting to 155	VERY SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 05TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 9.0 °N TO 18.5°N AND LONG 85.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C. A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1005.2 HPA, SST 29.5°C AND WIND 40⁰/10 KNOTS.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA. THE SEA CONDITION IS ROUGH AROUND THE SYSTEM CENTRE.

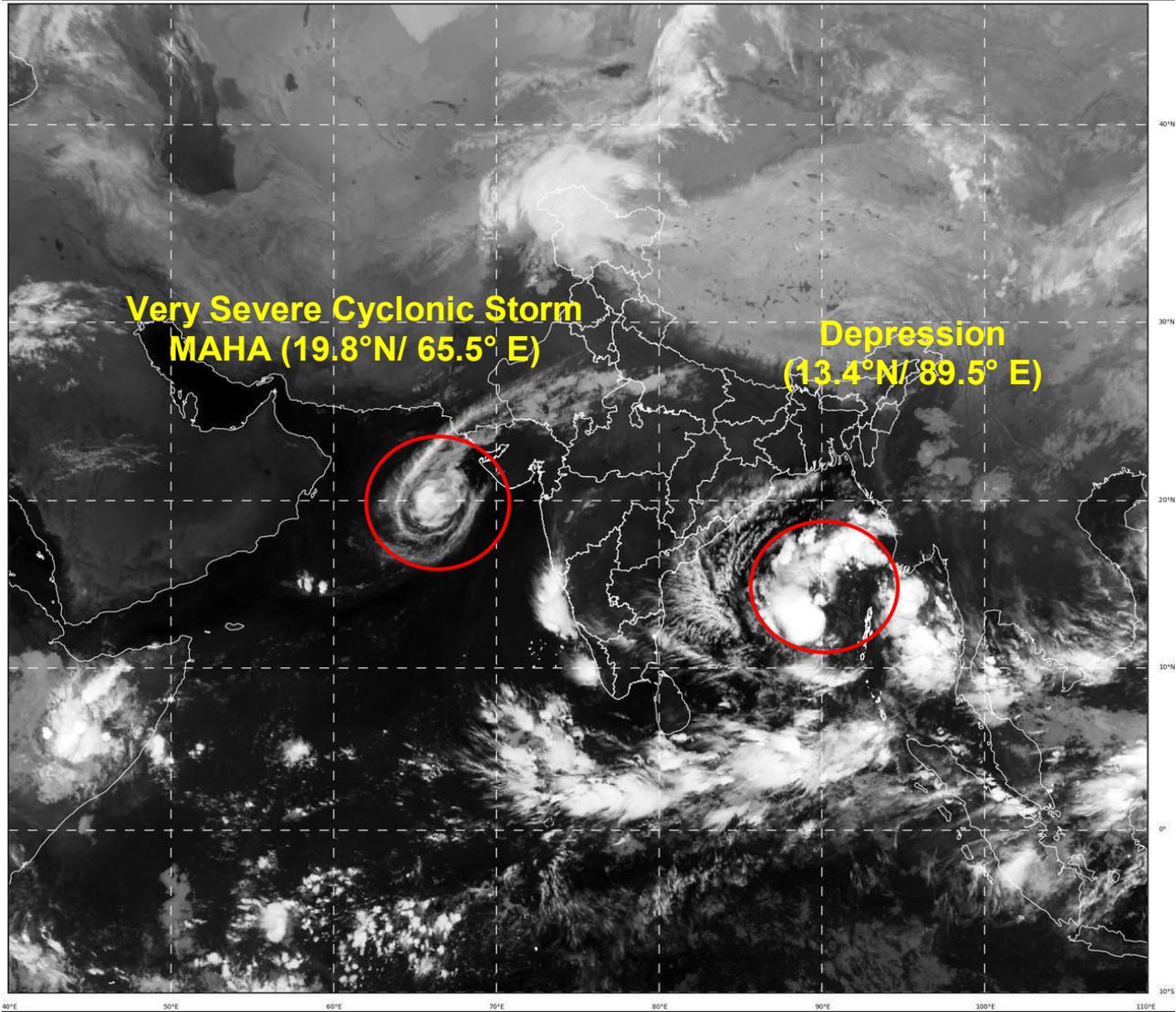
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $130 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 05-10 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-90 KJ/CM^2 AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN $29\text{-}30^{\circ}\text{C}$ AROUND THE SYSTEM. THE MODERATE SHEAR IN THE ATMOSPHERE AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARD AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(R K JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



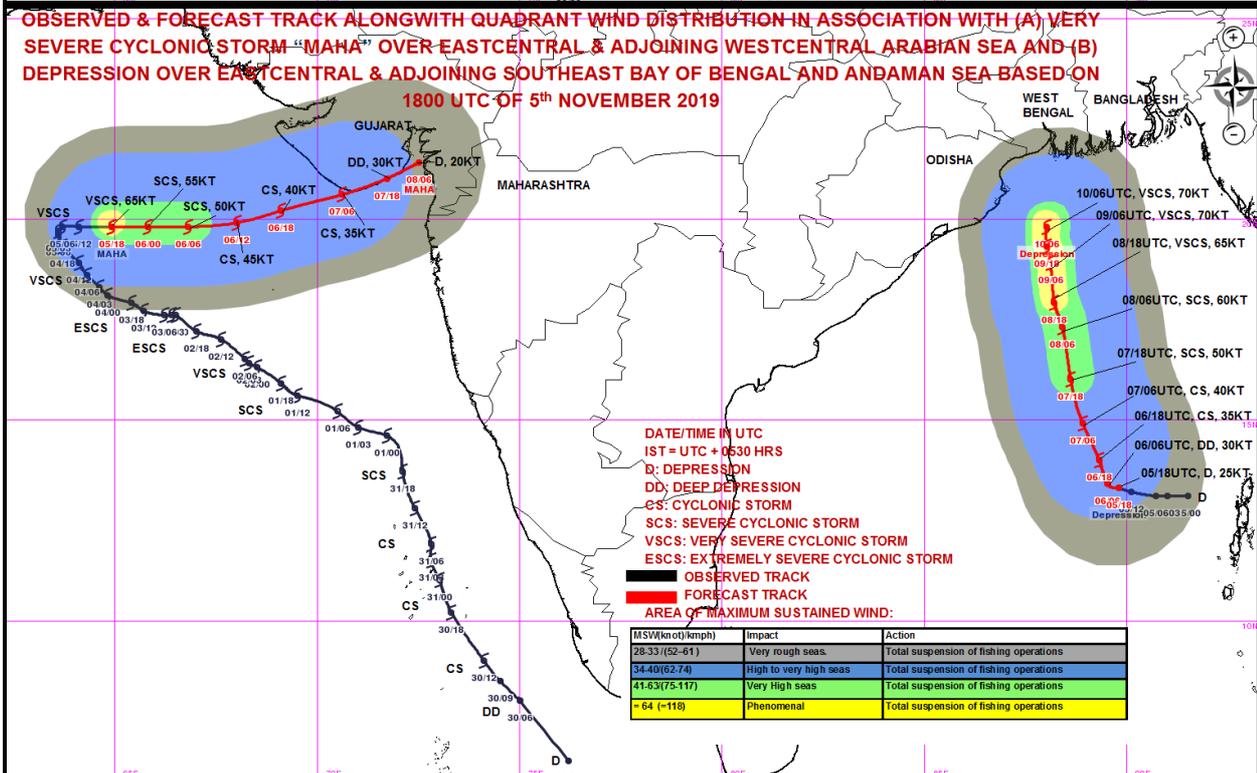
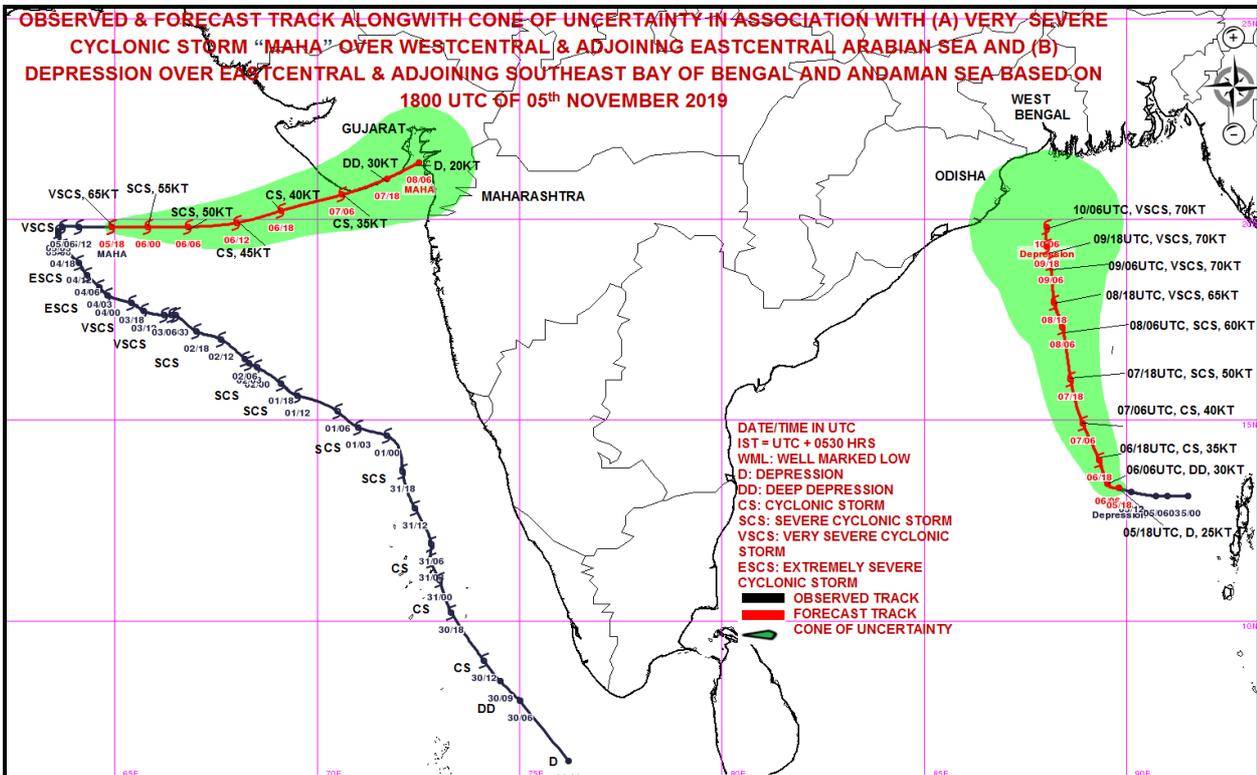
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IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 53**

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. 53 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 06.11.2019 BASED ON 0000 UTC OF 06.11.2019.

**SUB: (A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING NORTHEAST ARABIAN SEA
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL**

(A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL AND ADJOINING NORTHEAST ARABIAN SEA

THE **VERY SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER EASTCENTRAL & ADJOINING WESTCENTRAL ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 15 KMPH DURING PAST 06 HOURS, WEAKENED INTO A **SEVERE CYCLONIC STORM** AND LAY CENTERED AT 0000 UTC OF 06TH NOVEMBER, 2019 OVER EASTCENTRAL AND ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 65.8°E, ABOUT 450 KM WEST-SOUTHWEST OF PORBANDAR (42830), 490 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 540 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS WITH FURTHER WEAKENING. IT IS VERY LIKELY TO CROSS GUJARAT COAST AROUND DIU AS A CYCLONIC STORM WITH A MAXIMUM SUSTAINED WIND SPEED OF 70-80 KMPH GUSTING TO 90 KMPH AROUND 0600 UTC OF 7TH NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(IST)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.11.19/0000	19.8/65.8	110-120 gusting to 130	Severe Cyclonic Storm
06.11.19/0600	19.8/67.0	100-110 gusting to 120	Severe Cyclonic Storm
06.11.19/1200	19.9/68.2	90-100 gusting to 110	Severe Cyclonic Storm
06.11.19/1800	20.1/69.3	80-90 gusting to 100	Cyclonic Storm
07.11.19/0000	20.5/70.4	80-90 gusting to 100	Cyclonic Storm
07.11.19/1200	20.9/71.6	60-70 gusting to 80	Cyclonic Storm
08.11.19/0000	21.2/72.7	50-60 gusting to 70	Deep Depression
08.11.19/1200	21.5/73.8	40-50 gusting to 60	Depression

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 3.5/4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

TO VERY INTENSE CONVECTION LIES OVER WESTCENTRAL AND ADJOINING EASTCENTRAL & NORTH ARABIAN SEA BETWEEN LAT 18.0 °N TO 21.0°N AND LONG 64.5°E TO 67.5°E. THE MINIMUM CTT IS MINUS 67°C. THE CONVECTION ASSOCIATED WITH THE SYSTEM HAS REDUCED DURING PAST 06 HOURS. A SHIP (DGHX) LOCATED NEAR LAT. 20.9°N / 69.0°E REPORTED MEAN SEA LEVEL PRESSURE 1009.2 HPA, SST 27.0°C AND WIND 150°/10 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 60 KNOTS GUSTING TO 70 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 990 HPA. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 20-25 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS STARTED WEAKENING UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED, BEFORE THE EXPECTED LANDFALL. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEEP EPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL

THE DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL AND NORTH ANDAMAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 09 KMPH, INTENSIFIED INTO A **DEEP DEPRESSION** AND LAY CENTRED AT 0000 UTC OF THE 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.4°N AND LONG. 89.3°E, ABOUT 390 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 810 KM SOUTH-SOUTHEAST OF PARADIP (42976), 920 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS FOR SOME MORE TIME AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(IST)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.11.19/0000	13.4/89.3	50-60 gusting to 70	Deep Depression
06.11.19/0600	13.6/88.9	50-60 gusting to 70	Deep Depression
06.11.19/1200	14.0/88.6	60-70 gusting to 80	Cyclonic Storm
06.11.19/1800	14.6/88.4	60-70 gusting to 80	Cyclonic Storm
07.11.19/000	15.3/88.2	70-80 gusting to 90	Cyclonic Storm
07.11.19/1200	16.6/88.0	90-100 gusting to 110	Severe Cyclonic Storm
08.11.19/0000	17.6/87.9	100-110 gusting to 120	Severe Cyclonic Storm
08.11.19/1200	18.4/87.9	110-120 gusting to 135	Severe Cyclonic Storm
09.11.19/0000	19.1/87.9	110-120 gusting to 135	Severe Cyclonic Storm
09.11.19/1200	19.6/88.0	120-130 gusting to 145	Very Severe Cyclonic Storm
10.11.19/0000	19.8/88.1	120-130 gusting to 145	Very Severe Cyclonic Storm
10.11.19/1200	20.0/88.2	110-120 gusting to 135	Severe Cyclonic Storm
11.11.19/0000	20.2/88.3	100-110 gusting to 120	Severe Cyclonic Storm

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.0°N TO 19.5°N AND LONG 85.5°E TO 93.5°E. THE MINIMUM CTT IS MINUS 93°C. A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 86.9°E REPORTED MEAN SEA LEVEL PRESSURE 1005.4 HPA, SST 29.6°C AND WIND 20°/10 KNOTS.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1001 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

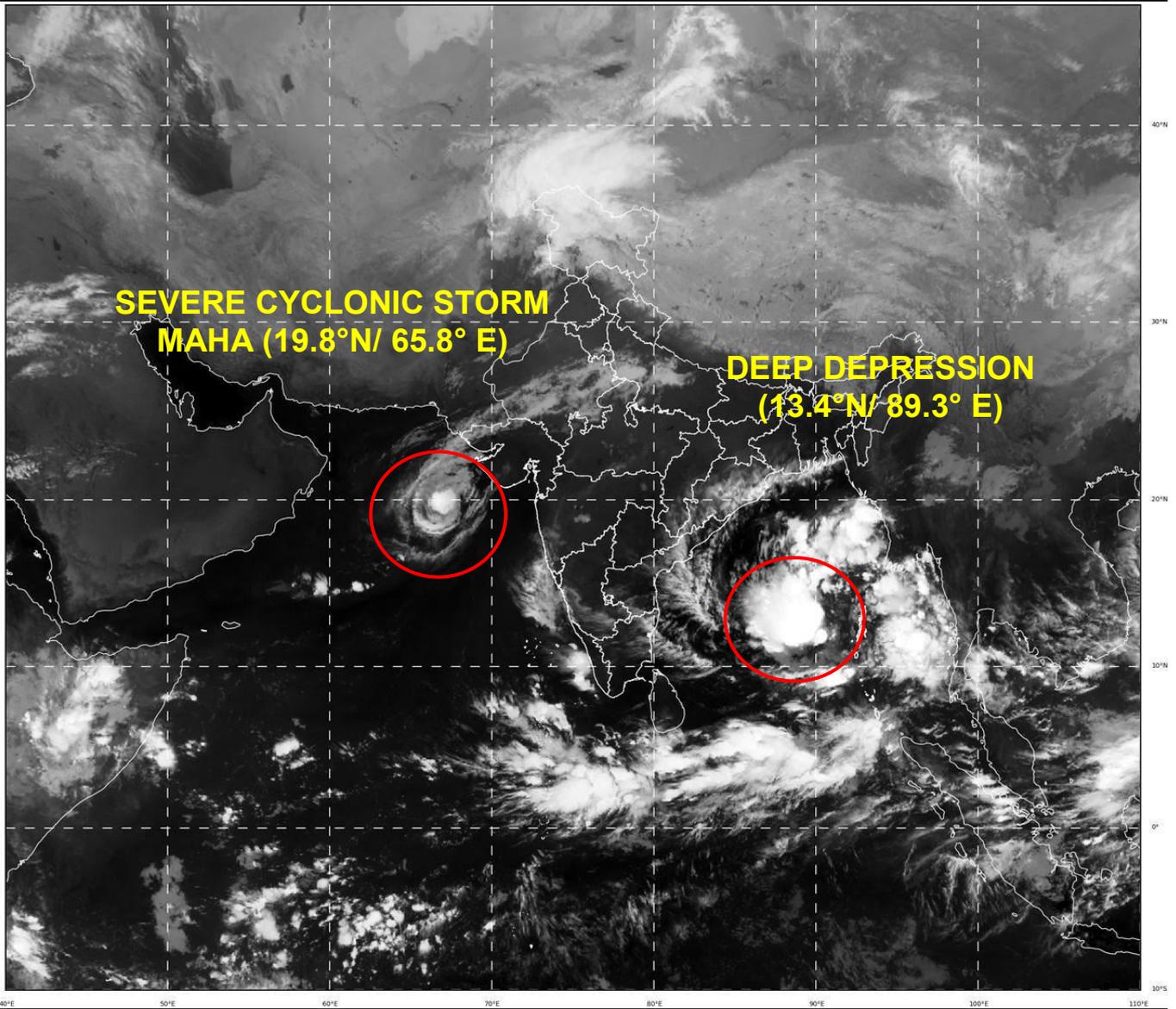
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM^2 AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN $28\text{-}30^{\circ}\text{C}$ AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARDS AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

**(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



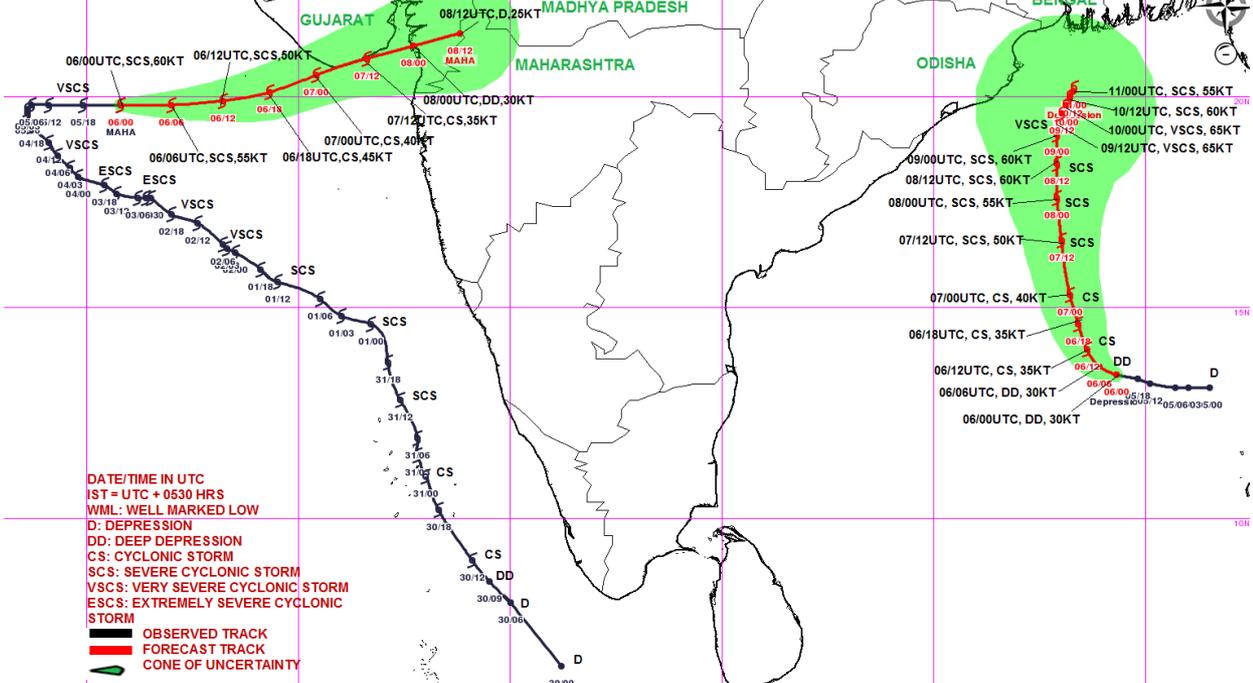
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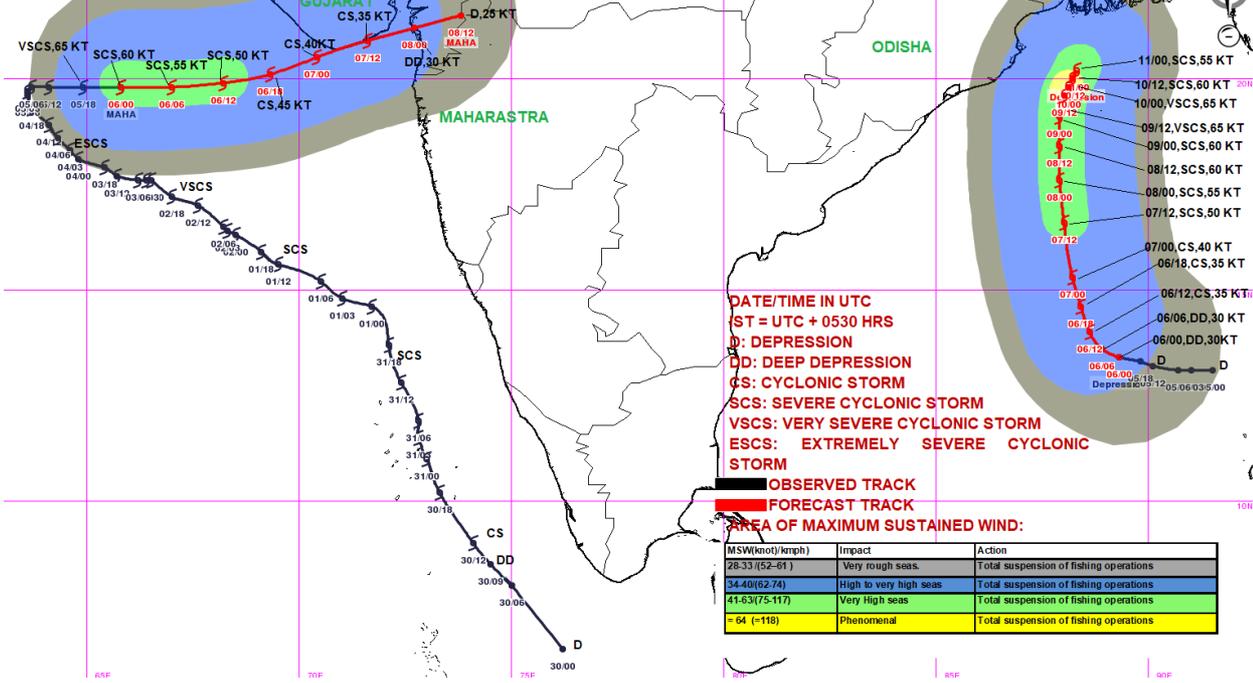
IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 0000 UTC OF 06th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 0000 UTC OF 6th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 54**

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. 54 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0700 UTC OF 06.11.2019 BASED ON 0300 UTC OF 06.11.2019.

**SUB: (A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA
(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA CONTINUED TO MOVE EASTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0300 UTC OF 06TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 66.3°E, ABOUT 400 KM WEST-SOUTHWEST OF PORBANDAR (42830), 440 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 490 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE NEARLY EASTWARDS, WEAKEN INTO A CYCLONIC STORM BY 1200 UTC OF 06 NOVEMBER, 2019. THEREAFTER IT IS LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION BY 0000 UTC OF 7TH NOVEMBER OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND 0600 UTC OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT WOULD FURTHER WEAKEN INTO A DEPRESSION BY 1200 UTC OF 07 NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(IST)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/0300	19.8/66.3	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
06.11.19/0600	19.7/67.0	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
06.11.19/1200	19.7/68.2	75-85 GUSTING TO 95	CYCLONIC STORM
06.11.19/1800	19.9/69.3	65-75 GUSTING TO 85	CYCLONIC STORM
07.11.19/0000	20.1/69.7	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/1200	20.3/71.6	40-50 GUSTING TO 60	DEPRESSION
08.11.19/0000	20.6/72.6	25-35 GUSTING TO 45	WELL MARKED LOW

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 3.5/4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 18.0 °N TO 21.0°N AND LONG 64.5°E TO 67.5°E. THE MINIMUM CTT IS MINUS 67°C. THE CONVECTION ASSOCIATED WITH THE SYSTEM HAS REDUCED DURING PAST 06 HOURS.

AT 0300 UTC, A SHIP (DGHX) LOCATED NEAR LAT. 20.4°N / 69.7°E REPORTED MEAN SEA LEVEL PRESSURE 1010.7 HPA, SST 27.0°C AND WIND 130°/5.1 KNOTS. A BUOY (23456) LOCATED NEAR LAT. 18.6°N / 67.3°E REPORTED MEAN SEA LEVEL PRESSURE 1009.2 HPA, SST 26.1°C AND WIND 340°/13.6 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 990 HPA. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 20-25 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 36 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL MOVED WESTWARDS WITH A SPEED OF 04 KMPH, AND LAY CENTRED AT 0300 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.4°N AND LONG. 89.3°E, ABOUT 390 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 810 KM SOUTH-SOUTHEAST OF PARADIP (42976), 920 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS FOR SOME MORE TIME AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL & ADJOINING NORTH ODISHA AND BANGLADESH COASTS
FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(IST)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/0300	13.4/89.3	50-60 GUSTING TO 70	DEEP DEPRESSION
06.11.19/0600	13.5/88.9	50-60 GUSTING TO 70	DEEP DEPRESSION
06.11.19/1200	13.8/88.6	60-70 GUSTING TO 80	CYCLONIC STORM
06.11.19/1800	14.6/88.4	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0000	15.3/88.2	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	16.6/88.0	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
08.11.19/0000	17.6/87.9	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
08.11.19/1200	18.4/87.9	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
09.11.19/0000	19.1/87.9	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
09.11.19/1200	19.6/88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
10.11.19/0000	19.8/88.1	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
10.11.19/1200	20.0/88.2	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
11.11.19/0000	20.2/88.3	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.0°N TO 19.5°N AND LONG 85.5°E TO 93.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0300 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.2°N / 87.3°E REPORTED MEAN SEA LEVEL PRESSURE 1006.8 HPA, SST 29.5°C AND WIND 20°/13.6 KNOTS; BUOY (23094) LOCATED NEAR LAT. 13.8°N / 84.5°E REPORTED MEAN SEA LEVEL PRESSURE 1008.5 HPA, SST 29.3°C AND WIND 40°/13.6 KNOTS;. BUOY (23093) LOCATED NEAR LAT. 16.2°N / 88.3°E REPORTED MEAN SEA LEVEL PRESSURE 1007.6 HPA, SST 29.5°C AND WIND 70°/17.5 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1001 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

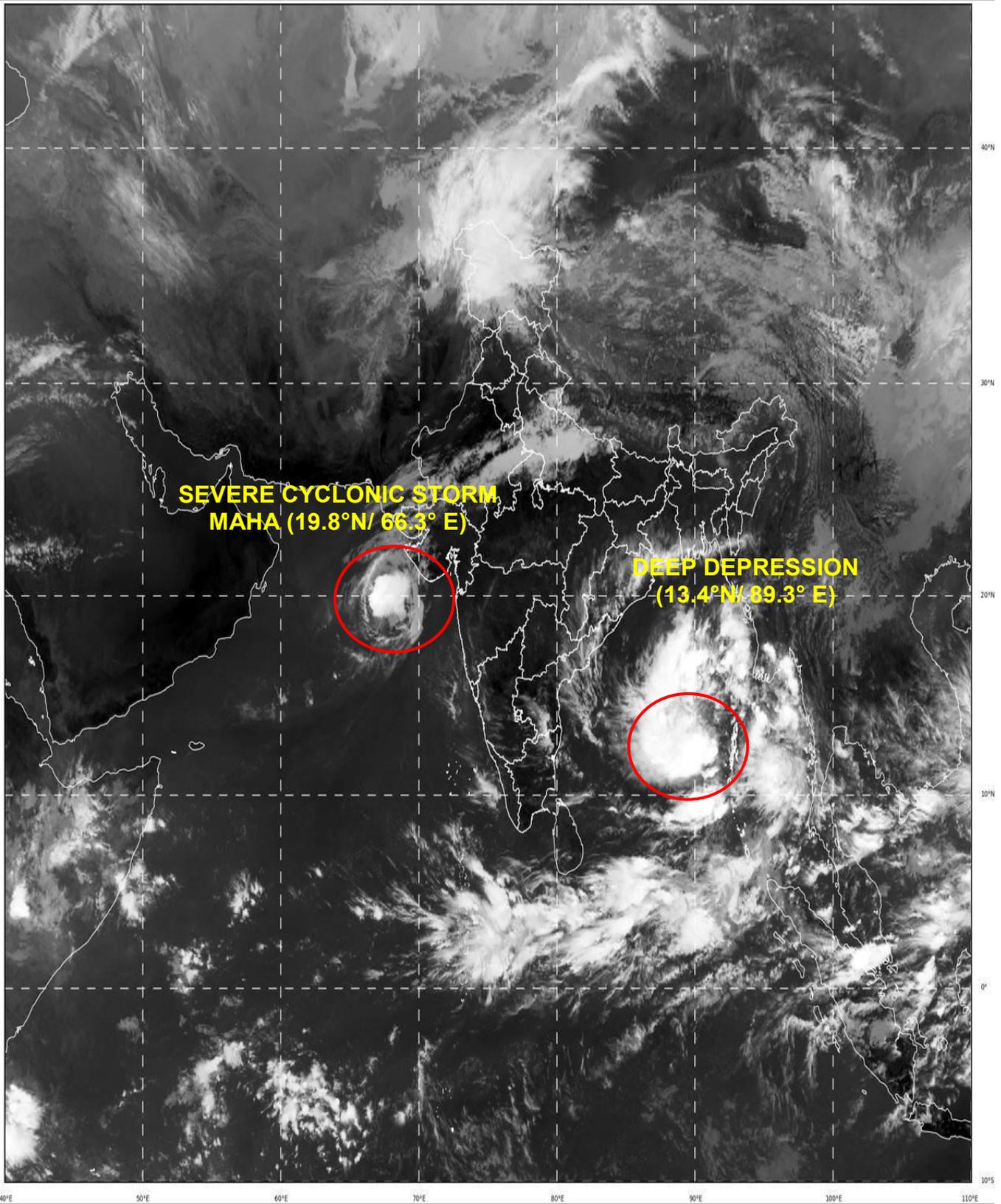
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $15 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM^2 AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INTIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARDS AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



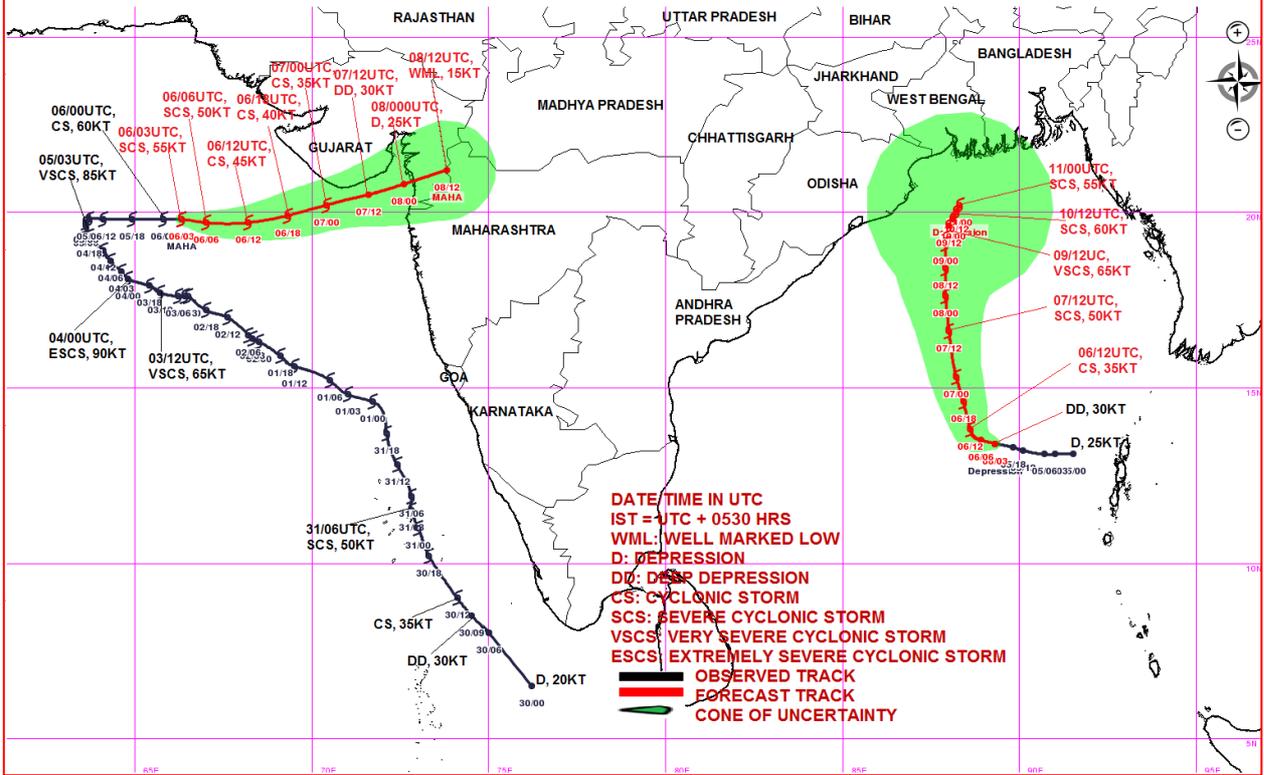
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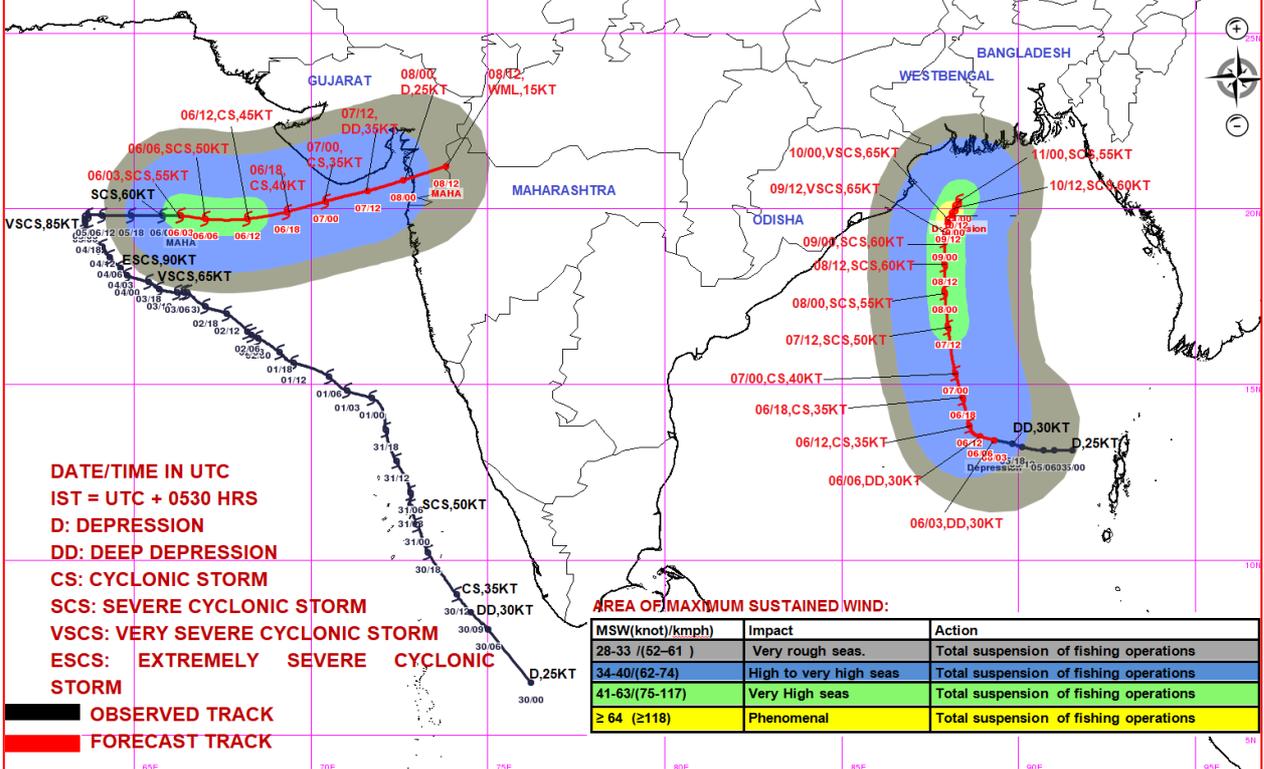
IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 0300 UTC OF 06th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 0300 UTC OF 6th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 55**

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 0930 UTC OF 06.11.2019 BASED ON 0600 UTC OF 06.11.2019.

**SUB: (A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA
(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 12 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0600 UTC OF 06TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.7°N AND LONGITUDE 66.5°E, ABOUT 390 KM WEST-SOUTHWEST OF PORBANDAR (42830), 420 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 470 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE NEARLY EASTWARDS, WEAKEN INTO A CYCLONIC STORM BY 1200 UTC OF 06 NOVEMBER, 2019. THEREAFTER IT IS LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION BY 0000 UTC OF 7TH NOVEMBER OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND 0600 UTC OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT WOULD FURTHER WEAKEN INTO A DEPRESSION BY 1200 UTC OF 07 NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(IST)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/0600	19.7/66.5	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
06.11.19/1200	19.7/68.0	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	19.9/69.3	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	20.2/70.4	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0600	20.4/71.2	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/1800	20.6/72.1	40-50 GUSTING TO 60	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.5/3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 19.0°N TO 21.0°N AND LONG 66.2°E TO 69.0°E. THE MINIMUM CTT IS MINUS 87°C.

AT 0600 UTC, A SHIP (TBWUK5A) LOCATED NEAR LAT. 17.8°N / 64.9°E REPORTED MEAN SEA LEVEL PRESSURE 1010.4 HPA, SST 26.0°C AND WIND 270°/23.9 KNOTS. A BUOY (23456) LOCATED NEAR LAT. 18.8°N / 67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1008.7 HPA, SST 26.0°C AND WIND 350°/19.4 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 50 KNOTS GUSTING TO 60 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 20-25 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 36 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL REMAINED PRACTICALLY STATIONARY, AND LAY CENTRED AT 0600 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.4°N AND LONG. 89.3°E, ABOUT 390 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 810 KM SOUTH-SOUTHEAST OF PARADIP (42976), 920 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME TIME AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/0600	13.4/89.3	50-60 GUSTING TO 70	DEEP DEPRESSION
06.11.19/1200	13.7/88.9	60-70 GUSTING TO 80	CYCLONIC STORM
06.11.19/1800	14.2/88.6	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	14.7/88.3	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0600	15.2/88.1	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
07.11.19/1800	16.7/88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
08.11.19/0600	17.5/87.9	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
08.11.19/1800	18.6/87.9	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/0600	18.6/87.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	20.4/88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
10.11.19/0600	20.8/88.1	115-125 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
10.11.19/1800	21.1/88.3	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.0°N TO 18.0°N AND LONG 86.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AT 0600 UTC, A BUOY (23459) LOCATED NEAR LAT. 13.35°N / 86.9°E REPORTED MEAN SEA LEVEL PRESSURE 1006.0 HPA, SST 30°C AND WIND 30°/15.6 KNOTS; BUOY (23093) LOCATED NEAR LAT. 16.35°N / 88.3°E REPORTED MEAN SEA LEVEL PRESSURE 1006.8 HPA, SST 29.5°C AND WIND 60°/13.6 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1001 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

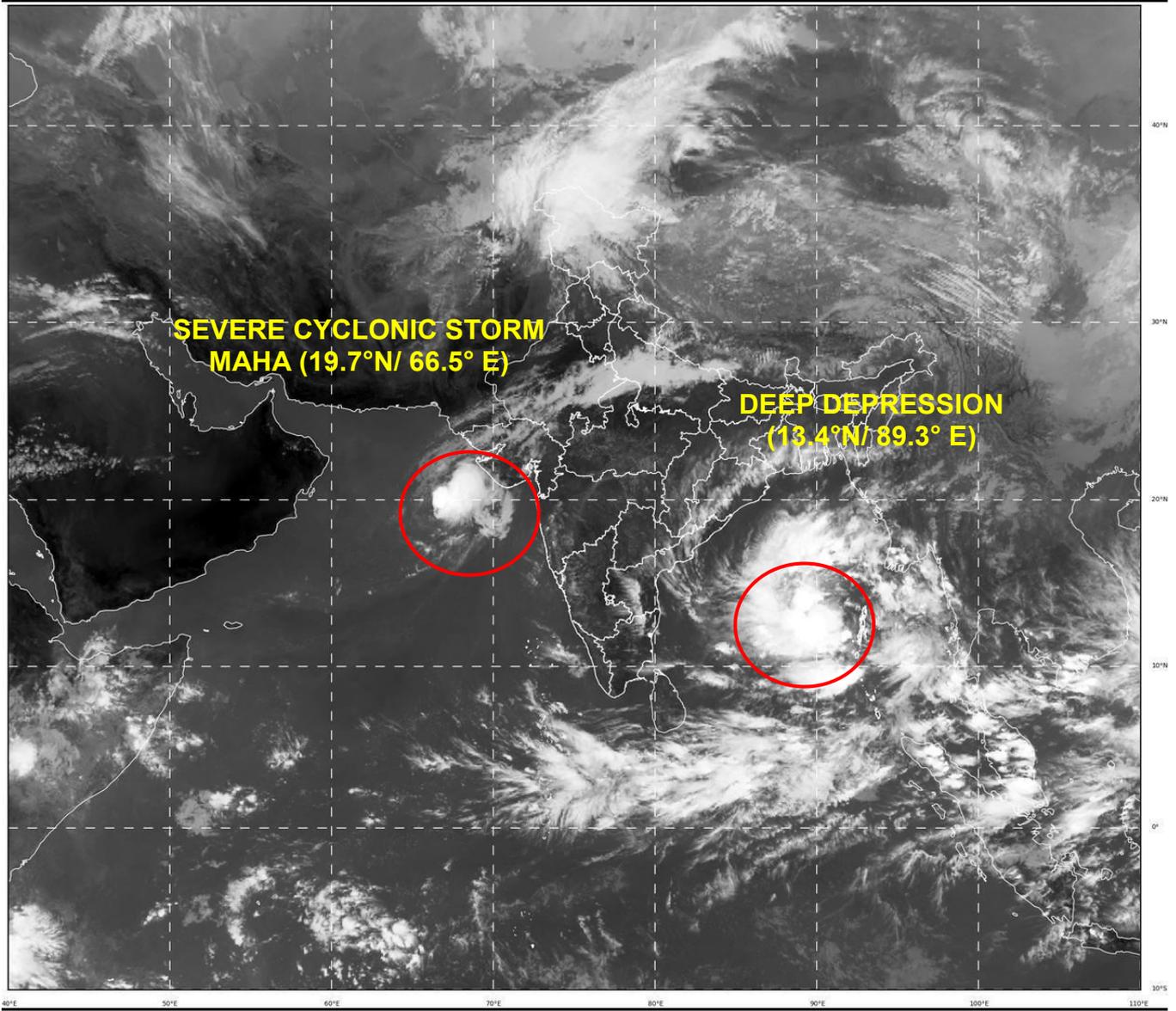
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. INITIALLY, AS THE SYSTEM IS SHALLOW, IT IS LIKELY TO MOVE WESTWARDS AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

**(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



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IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 56**

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. 56 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1200 UTC OF 06.11.2019 BASED ON 0900 UTC OF 06.11.2019.

**SUB: (A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA.
(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED NEARLY EASTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0900 UTC OF 06TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.6°N AND LONGITUDE 67.1°E, ABOUT 350 KM WEST-SOUTHWEST OF PORBANDAR (42830), 370 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 420 KM WEST-SOUTHWEST OF DIU(42914). IT IS VERY LIKELY TO MOVE NEARLY EASTWARDS, WEAKEN INTO A CYCLONIC STORM DURING NEXT 12 HOURS. THEREAFTER IT IS LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION BY 0000 UTC OF 7TH NOVEMBER OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND 0600 UTC OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT WOULD FURTHER WEAKEN INTO A DEPRESSION BY 1200 UTC OF 07 NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(IST)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/0900	19.6/67.1	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
06.11.19/1200	19.7/68.0	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	19.9/69.3	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	20.2/70.4	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0600	20.4/71.2	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/1800	20.6/72.1	40-50 GUSTING TO 60	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.5/3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 18.8°N TO 22.0°N AND LONG 66.2°E TO 69.0°E. THE MINIMUM CTT IS MINUS 87°C.

AT 0900 UTC, A SHIP (DGHX) LOCATED NEAR LAT. 18.8°N / 70.6°E REPORTED MEAN SEA LEVEL PRESSURE 1009.5 HPA, SST 27.0°C AND WIND 190°/10 KNOTS. A BUOY (23456) LOCATED NEAR LAT. 18.5°N / 67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1005.6 HPA, SST 26.1°C AND WIND 20°/21.4 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 50 KNOTS GUSTING TO 60 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 25-30 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 36 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL REMAINED PRACTICALLY STATIONARY, AND LAY CENTRED AT 0900 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.4°N AND LONG. 89.3°E, ABOUT 390 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 810 KM SOUTH-SOUTHEAST OF PARADIP (42976), 920 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 960 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME TIME AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/0900	13.4/89.3	50-60 GUSTING TO 70	DEEP DEPRESSION
06.11.19/1200	13.7/88.9	60-70 GUSTING TO 80	CYCLONIC STORM
06.11.19/1800	14.2/88.6	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	14.7/88.3	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/0600	15.2/88.1	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
07.11.19/1800	16.7/88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
08.11.19/0600	17.5/87.9	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
08.11.19/1800	18.6/87.9	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/0600	18.6/87.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	20.4/88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
10.11.19/0600	20.8/88.1	115-125 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
10.11.19/1800	21.1/88.3	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 10.7°N TO 17.8°N AND LONG 87.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AT 0900 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.0°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1003.0 HPA, SST 29.5°C AND WIND 40°/13.6 KNOTS; BUOY (23094) LOCATED NEAR LAT. 13.5°N / 84.1°E REPORTED MEAN SEA LEVEL PRESSURE 1005 HPA, SST 29.4°C AND WIND 40°/13.6 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1001 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

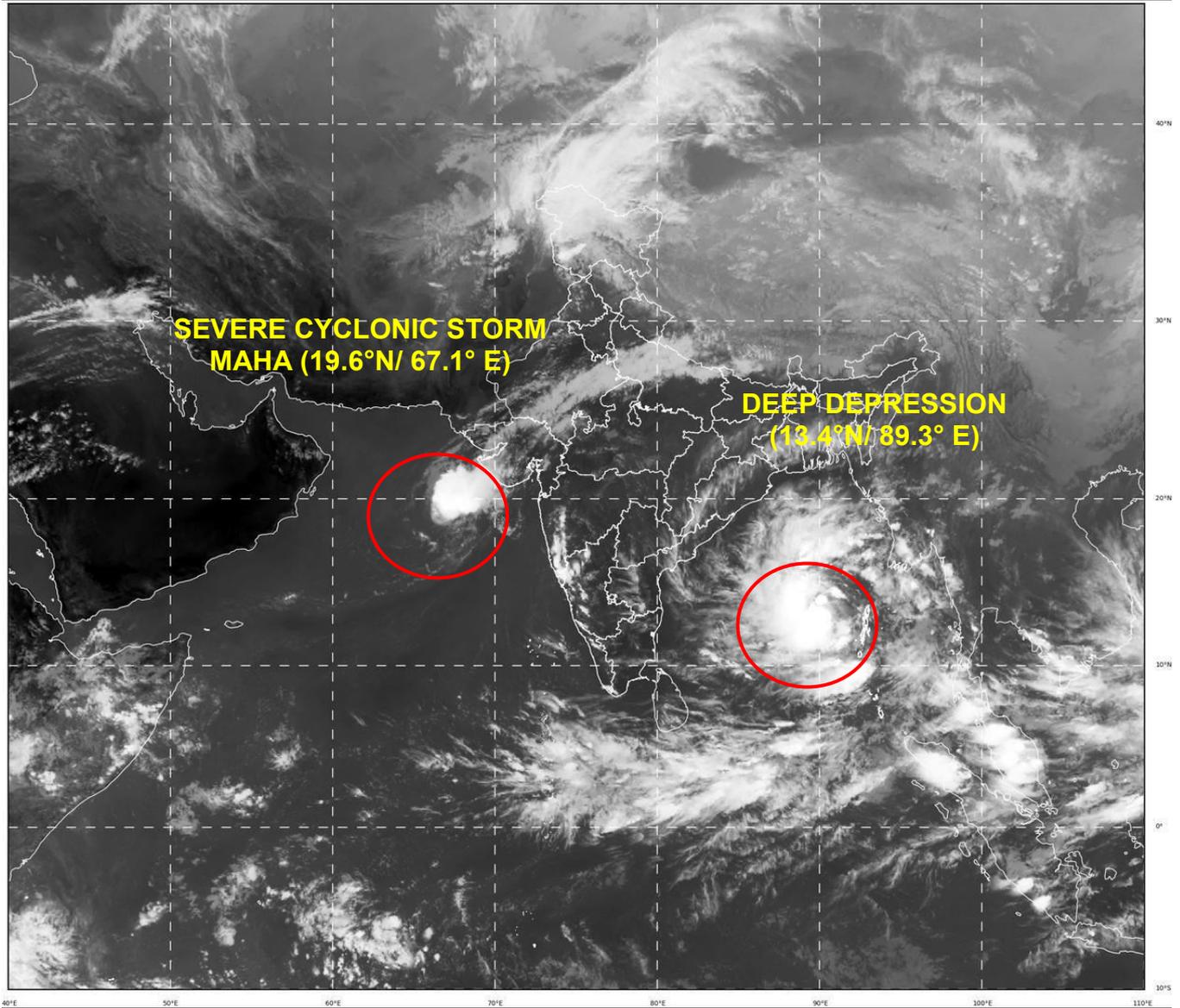
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. DURING THE PAST 09 HOURS, THE SYSTEM IS NEARLY STATIONARY, AS THERE IS NO WELL DEFINED STEERING FLOW FOR THIS SHALLOW SYSTEM IN ITS CURRENT LOCATION. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



394

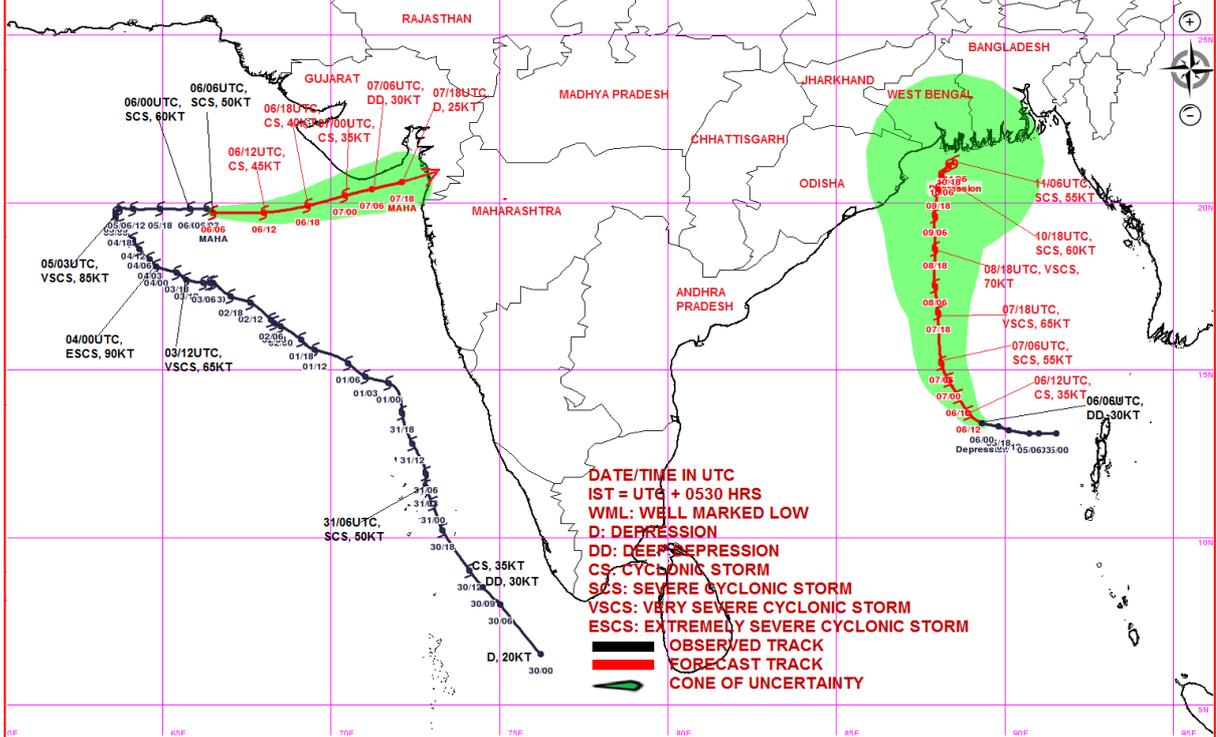
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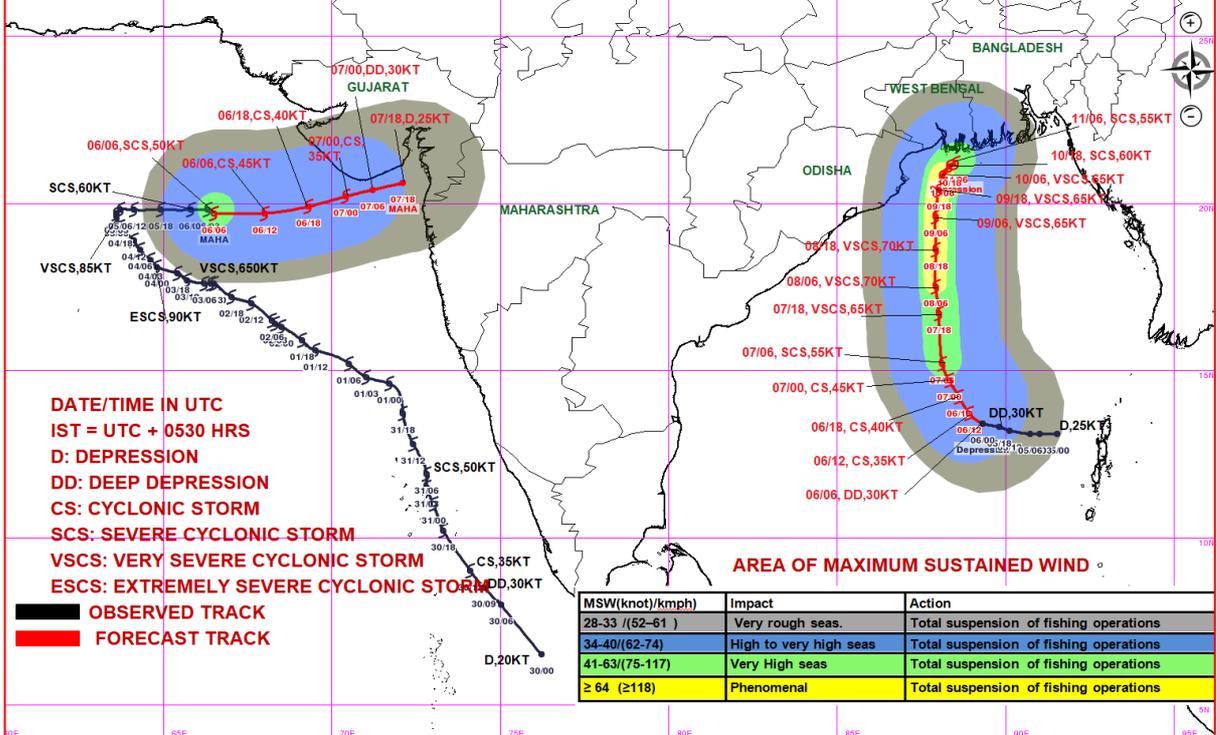
IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH
(A) SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST
ARABIAN SEA AND (B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY
OF BENGAL BASED ON 0600 UTC OF 06th NOVEMBER 2019**



**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN
ASSOCIATION WITH (A) SEVERE CYCLONIC STORM "MAHA" OVER EASTCENTRAL &
ADJOINING NORTHEAST ARABIAN SEA AND (B) DEEP DEPRESSION OVER EASTCENTRAL &
ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 0600 UTC OF 6th NOVEMBER 2019**



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 57**

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 1500 UTC OF 06.11.2019 BASED ON 1200 UTC OF 06.11.2019.

**SUB: (A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) WEAKENED INTO A CYCLONIC STORM OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA
(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) SEVERE CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) WEAKENED INTO A CYCLONIC STORM OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE SEVERE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED NEARLY EASTWARDS WITH A SPEED OF 21 KMPH DURING PAST 06 HOURS, WEAKENED INTO A CYCLONIC STORM AND AND LAY CENTERED AT 1200 UTC OF 06TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.7°N AND LONGITUDE 67.7°E, ABOUT 300 KM SOUTHWEST OF PORBANDAR (42830), 310 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 350 KM WEST-SOUTHWEST OF DIU(42914). THEREAFTER IT IS LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION BY 0000 UTC OF 7TH NOVEMBER OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND 0600 UTC OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT WOULD FURTHER WEAKEN INTO A DEPRESSION BY 1200 UTC OF 07 NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/1200	19.7/67.7	80-90 GUSTING TO 100	CYCLONIC STORM
06.11.19/1800	19.8/68.8	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/0000	19.9/69.8	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0600	20.0/70.4	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/1200	20.2/71.2	45-55 GUSTING TO 65	DEPRESSION
08.11.19/0000	20.4/72.2	35-45 GUSTING TO 55	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.5/3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 18.8°N TO 22.0°N AND LONG 66.5°E TO 69.7°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1200 UTC, A SHIP (DGHX) LOCATED NEAR LAT. 18.7°N / 70.4°E REPORTED MEAN SEA LEVEL PRESSURE 1008.3 HPA, SST 27.0°C AND WIND 200°/11 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 45 KNOTS GUSTING TO 55 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 996 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 25-30 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 36 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL MOVED SLIGHTLY NORTHWARDS WITH A SPEED OF 02 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1200 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.5°N AND LONG. 89.3°E, ABOUT 400 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 810 KM SOUTH-SOUTHEAST OF PARADIP (42976), 920 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 950 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME TIME AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/1500	13.7/89.3	50-60 gusting to 80	Deep Depression
06.11.19/1800	13.9/89.3	60-70 gusting to 80	Cyclonic Storm
07.11.19/0000	14.3/89.2	70-80 gusting to 90	Cyclonic Storm
07.11.19/0600	15.2/88.8	80-90 gusting to 100	Cyclonic Storm
07.11.19/1200	16.0/88.4	90-100 gusting to 110	Severe Cyclonic Storm
08.11.19/0000	17.4/88.0	100-110 gusting to 120	Severe Cyclonic Storm
08.11.19/1200	18.8/87.9	120-130 gusting to 145	Very Severe Cyclonic Storm
09.11.19/0000	20.0/87.9	130-140 gusting to 145	Very Severe Cyclonic Storm
09.11.19/1200	20.6/88.0	120-130 gusting to 145	Very Severe Cyclonic Storm
10.11.19/0000	20.9/88.1	115-125 gusting to 140	Very Severe Cyclonic Storm
10.11.19/1200	21.1/88.2	110-120 gusting to 130	Severe Cyclonic Storm
11.11.19/0000	21.2/88.4	105-115 gusting to 125	Severe Cyclonic Storm
11.11.19/1200	21.2/88.6	100-110 gusting to 120	Severe Cyclonic Storm

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 10.7°N TO 18.0°N AND LONG 86.5°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AT 1200 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.0°N/86.9°E REPORTED MEAN SEA LEVEL PRESSURE 1003.9 HPA, SST 29.5°C AND WIND 30°/13.6 KNOTS; BUOY (23093) LOCATED NEAR LAT. 16.4°N / 87.6°E REPORTED MEAN SEA LEVEL PRESSURE 1004.6 HPA, SST 29.5°C AND WIND 60°/15.6 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1001 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

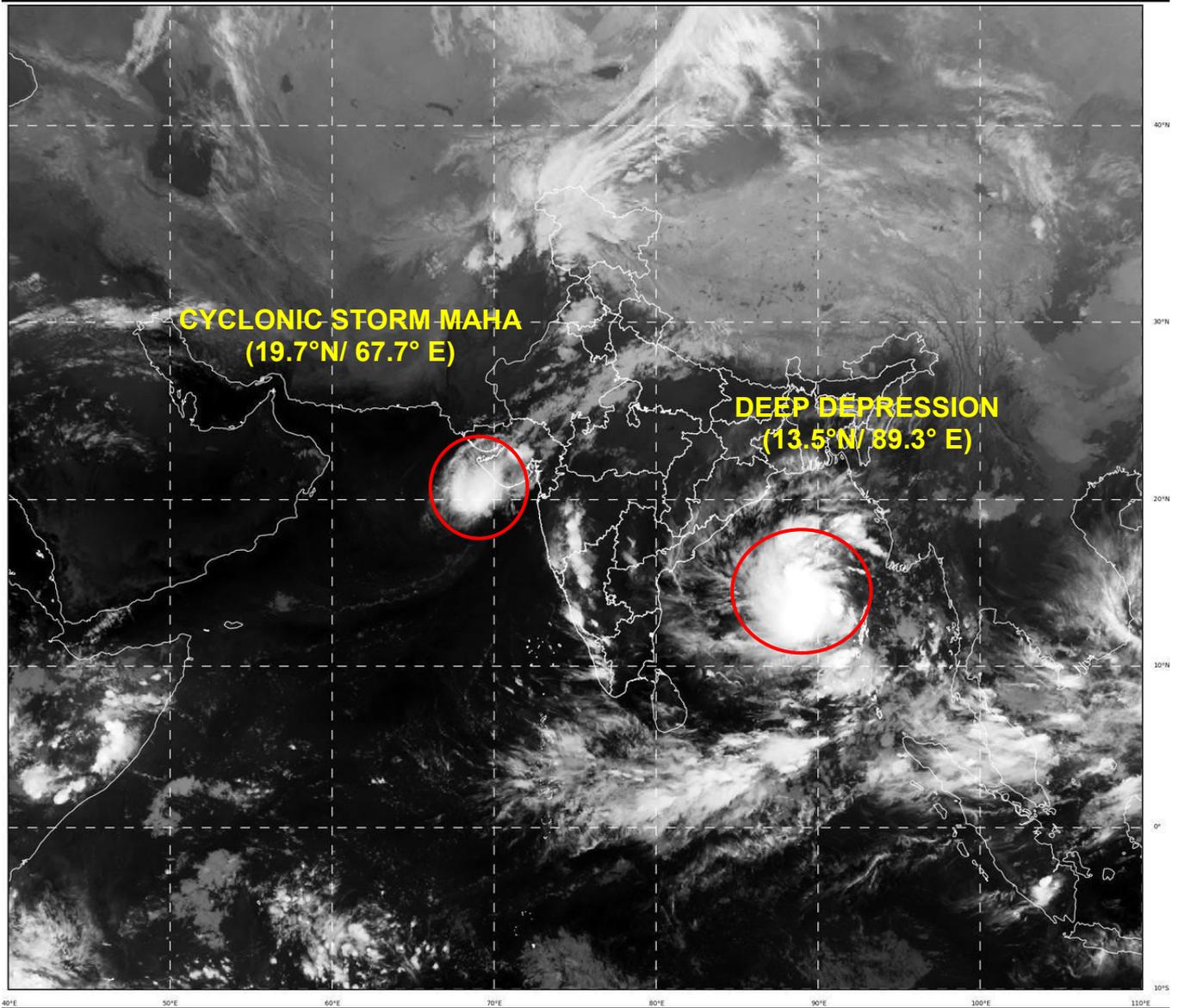
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. DURING THE PAST 09 HOURS, THE SYSTEM IS NEARLY STATIONARY, AS THERE IS NO WELL DEFINED STEERING FLOW FOR THIS SHALLOW SYSTEM IN ITS CURRENT LOCATION. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

**(NARESH KUMAR)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

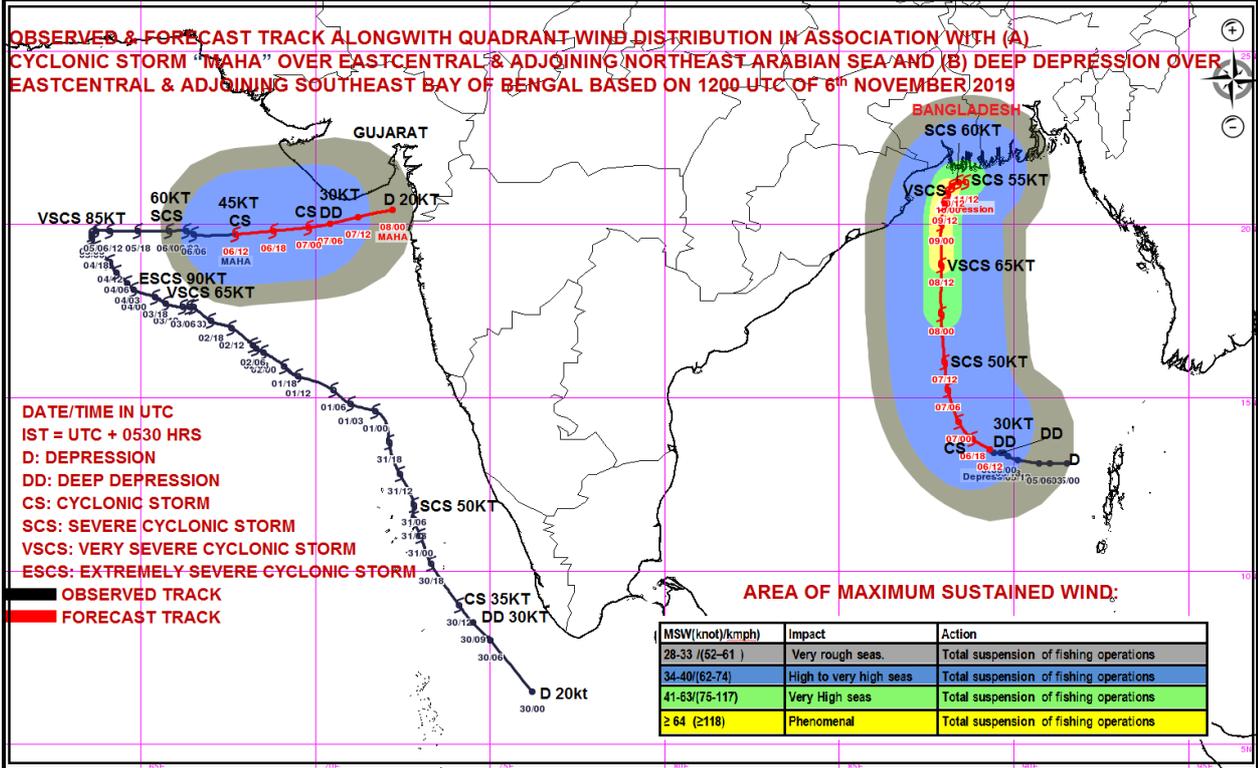
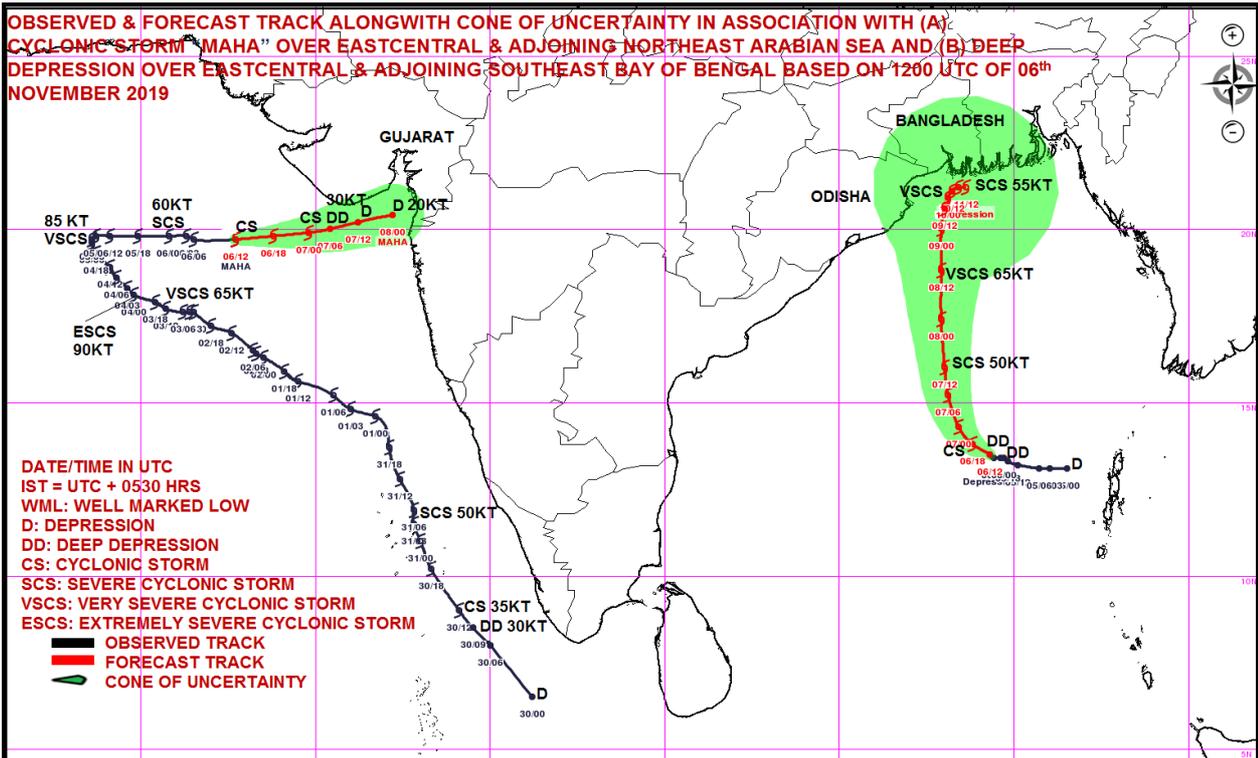


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IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 58**

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. 58 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1730 UTC OF 06.11.2019 BASED ON 1500 UTC OF 06.11.2019.

**SUB: (A) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA
(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE **CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED NEARLY EAST-NORTHEASTWARDS WITH A SPEED OF 21 KMPH DURING PAST 06 HOURS AND AND LAY CENTERED AT 1500 UTC OF 06TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 68.3°E, ABOUT 250 KM SOUTHWEST OF PORBANDAR (42830), 250 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 290 KM WEST-SOUTHWEST OF DIU(42914). THEREAFTER IT IS LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION BY 0000 UTC OF 7TH NOVEMBER OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND 0600 UTC OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT WOULD FURTHER WEAKEN INTO A DEPRESSION BY 1200 UTC OF 07 NOVEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/1500	19.8/68.3	70-80 GUSTING TO 90	CYCLONIC STORM
06.11.19/1800	19.8/68.8	60-70 GUSTING TO 80	CYCLONIC STORM
07.11.19/0000	19.9/69.8	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/0600	20.0/70.4	50-60 GUSTING TO 70	DEEP DEPRESSION
07.11.19/1200	20.2/71.2	45-55 GUSTING TO 65	DEPRESSION
08.11.19/0000	20.4/72.2	35-45 GUSTING TO 55	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.5/3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 19.0°N TO 22.0°N AND LONG 67.5°E TO 70.5°E. THE MINIMUM CTT IS MINUS 90°C.

AT 1500 UTC, A SHIP (DGHX) LOCATED NEAR LAT. 18.7°N / 70.4°E REPORTED MEAN SEA LEVEL PRESSURE 1009.1 HPA, SST 27.0°C AND WIND 140°/14 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 KNOTS GUSTING TO 50 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 994 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 25-30 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 36 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL MOVED SLIGHTLY NORTHWARDS WITH A SPEED OF 05 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1500 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.7°N AND LONG. 89.3°E, ABOUT 400 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 780 KM SOUTH-SOUTHEAST OF PARADIP (42976), 940 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 920 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 06 HOURS AND INTO A SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME TIME AND THEN NORTH-NORTHWESTWARDS, TOWARDS WEST BENGAL AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.11.19/1500	13.7/89.3	55-65 gusting to 75	Deep Depression
06.11.19/1800	13.9/89.3	60-70 gusting to 80	Cyclonic Storm
07.11.19/0000	14.3/89.2	70-80 gusting to 90	Cyclonic Storm
07.11.19/0600	15.2/88.8	80-90 gusting to 100	Cyclonic Storm
07.11.19/1200	16.0/88.4	90-100 gusting to 110	Severe Cyclonic Storm
08.11.19/0000	17.4/88.0	100-110 gusting to 120	Severe Cyclonic Storm
08.11.19/1200	18.8/87.9	120-130 gusting to 145	Very Severe Cyclonic Storm
09.11.19/0000	20.0/87.9	130-140 gusting to 145	Very Severe Cyclonic Storm
09.11.19/1200	20.6/88.0	120-130 gusting to 145	Very Severe Cyclonic Storm
10.11.19/0000	20.9/88.1	115-125 gusting to 140	Very Severe Cyclonic Storm
10.11.19/1200	21.1/88.2	110-120 gusting to 130	Severe Cyclonic Storm
11.11.19/0000	21.2/88.4	105-115 gusting to 125	Severe Cyclonic Storm
11.11.19/1200	21.2/88.6	100-110 gusting to 120	Severe Cyclonic Storm

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.5°N TO 17.0°N AND LONG 86.5°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AT 1500 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.0°N/86.9°E REPORTED MEAN SEA LEVEL PRESSURE 1005.7 HPA, SST 29.4°C AND WIND 50°/14 KNOTS; BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0°E REPORTED MEAN SEA LEVEL PRESSURE 1006.5 HPA, SST 29.5°C AND WIND 70°/16 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1001 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

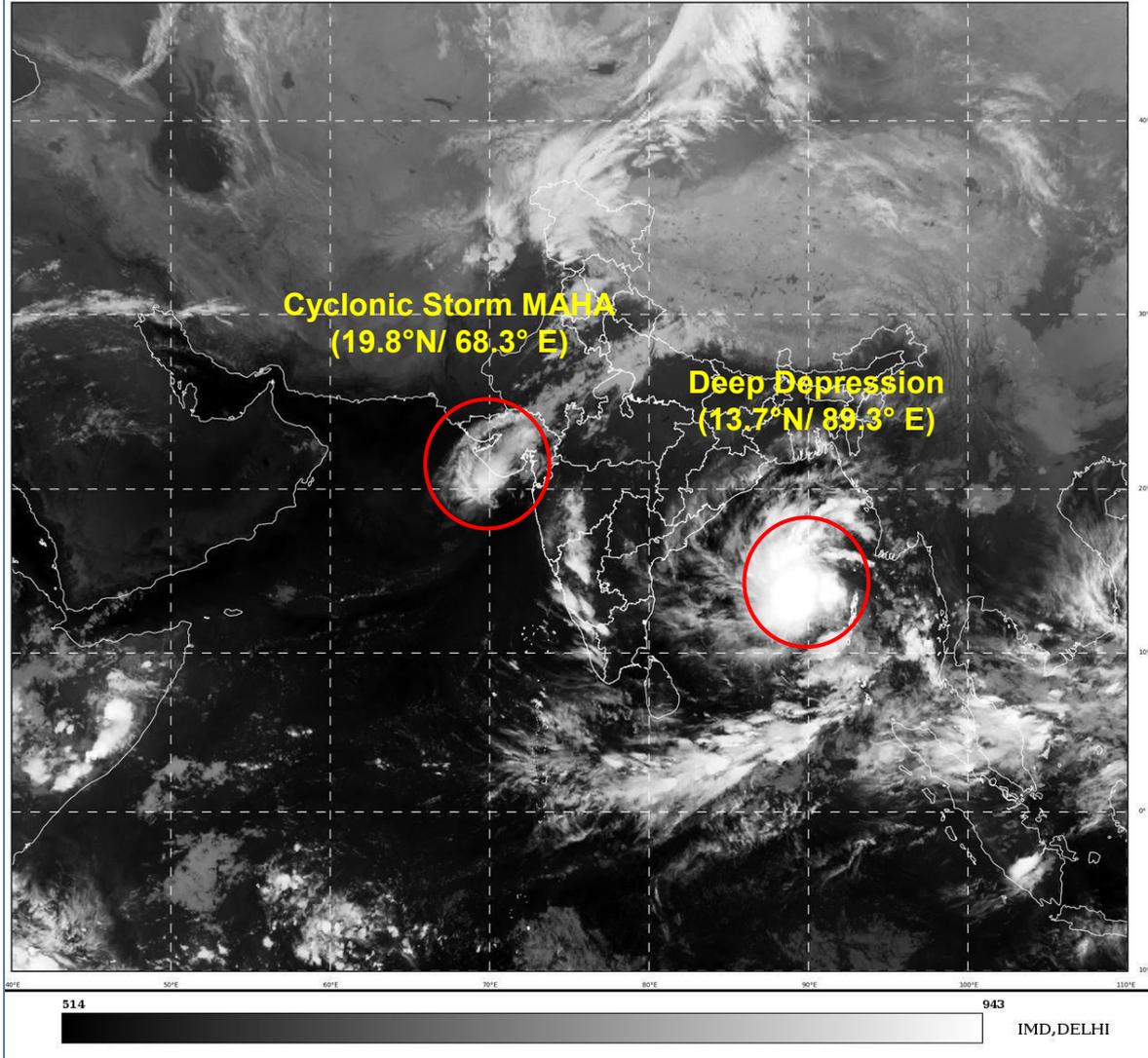
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

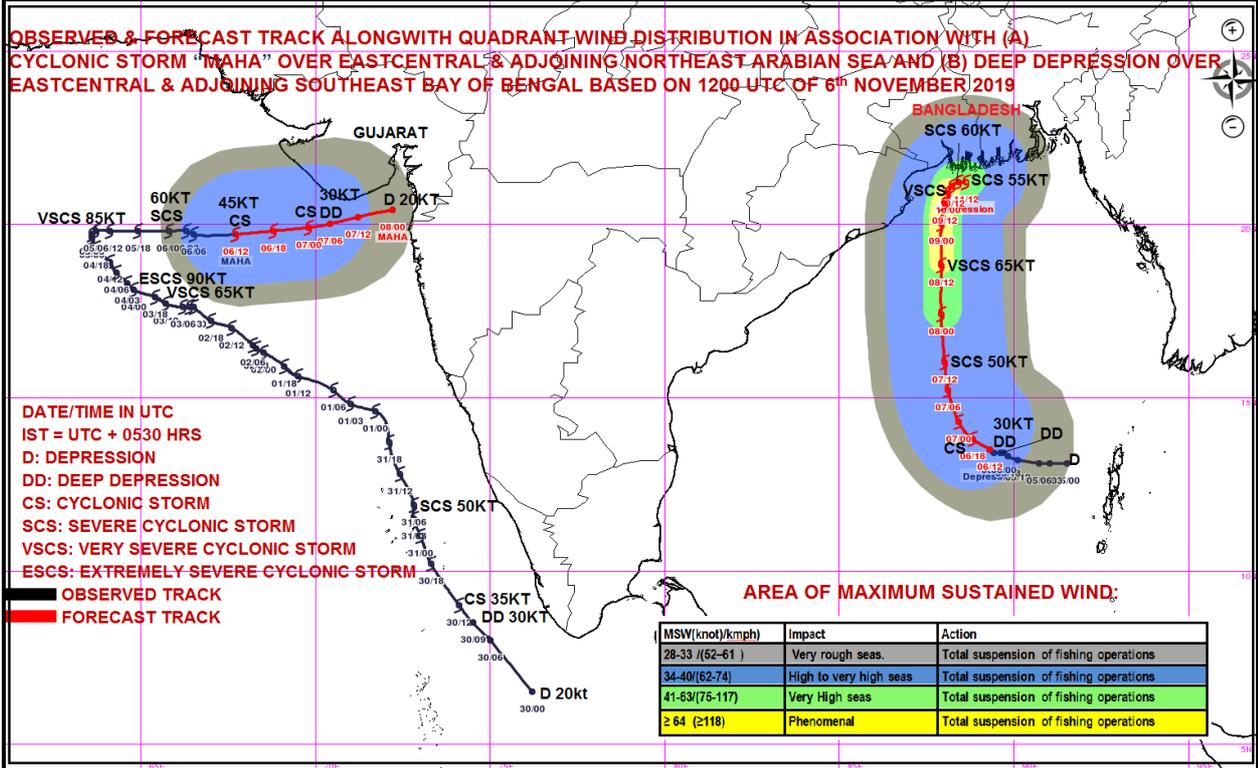
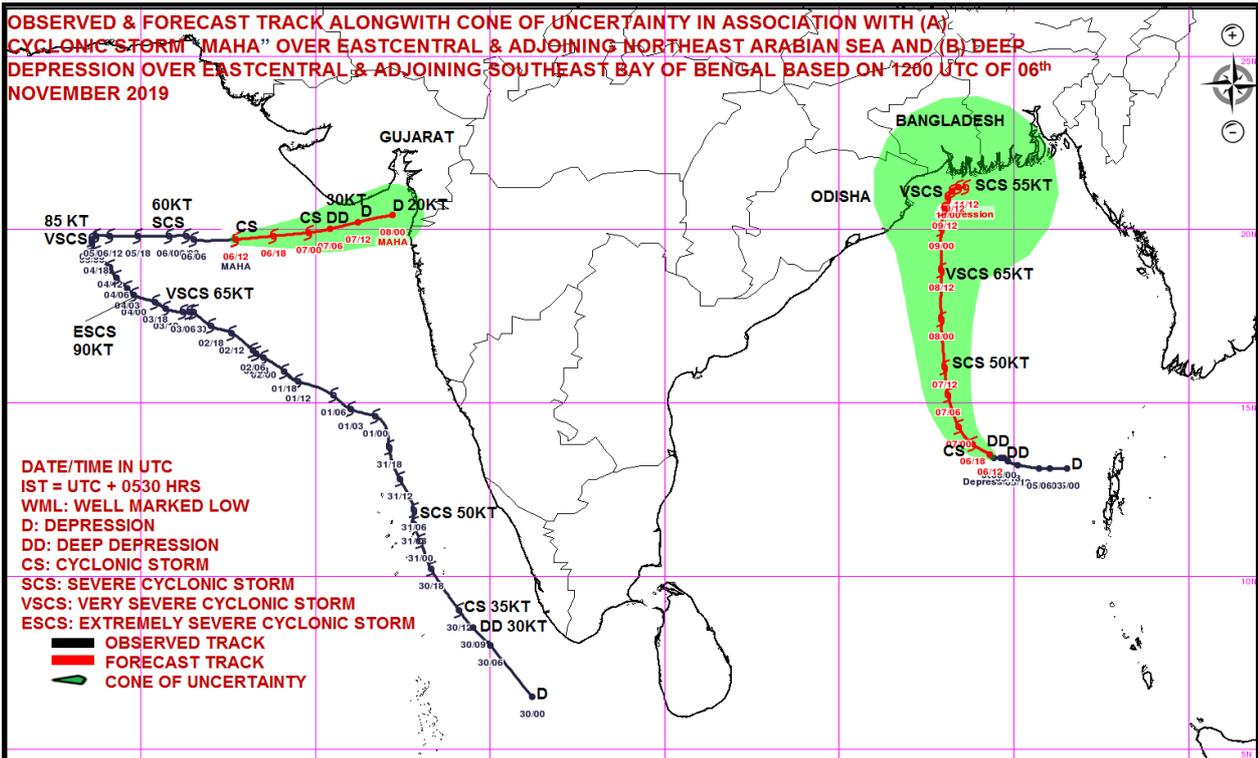
**(D.R. PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 59**

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. 59 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2130 UTC OF 06.11.2019 BASED ON 1800 UTC OF 06.11.2019.

**SUB: (A) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA
(B) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 12 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 1800 UTC OF 6th NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 68.4°E, ABOUT 240 KM SOUTH-SOUTHWEST OF PORBANDAR (42830), 230 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 280 KM WEST-SOUTHWEST OF DIU (42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA DURING NEXT 12 HOURS. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND NOON OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT IS VERY LIKELY TO WEAKEN FURTHER INTO A DEPRESSION BY TOMORROW EVENING.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(IST)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.11.19/2330	19.8/68.4	65-75 gusting to 85	Cyclonic Storm
07.11.19/0530	19.9/69.8	60-70 gusting to 80	Cyclonic Storm
07.11.19/1130	20.0/70.4	50-60 gusting to 70	Deep Depression
07.11.19/1730	20.2/71.2	40-50 gusting to 60	Depression
07.11.19/2330	20.3/71.6	35-45 gusting to 55	Depression

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0/3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 19.0°N TO 22.0°N AND LONG 68.0°E TO 71.0°E. THE MINIMUM CTT IS MINUS -80°C.

AT 1800 UTC, A SHIP (DGHX) LOCATED NEAR LAT. 18.8°N / 70.4°E REPORTED MEAN SEA LEVEL PRESSURE 1008.0 HPA, SST 27.0°C AND WIND 190°/16 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 KNOTS GUSTING TO 50 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 25-30 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 36 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL MOVED NORTHWARDS WITH A SPEED OF 05 KMPH DURING PAST 06 HOURS, INTENSIFIED INTO A **CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL)** AND LAY CENTRED AT 1800 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.13.8°N AND LONG. 89.3°E, ABOUT 400 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 770 KM SOUTH-SOUTHEAST OF PARADIP (42976), 850 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 910 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A VERY SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 36 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS TOWARDS WEST BENGAL AND BANGLADESH COASTS.

Forecast track and intensity are given in the following table:

Date/Time(IST)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.11.19/2330	13.8/89.3	60-70 gusting to 80	Cyclonic Storm
07.11.19/0530	14.4/89.1	70-80 gusting to 90	Cyclonic Storm
07.11.19/1130	15.2/88.8	70-80 gusting to 90	Cyclonic Storm
07.11.19/1730	15.9/88.5	75-85 gusting to 95	Cyclonic Storm
07.11.19/2330	16.4/88.3	85-95 gusting to 105	Severe Cyclonic Storm
08.11.19/1130	17.8/88.0	95-105 gusting to 115	Severe Cyclonic Storm
08.11.19/2330	19.1/87.9	105-115 gusting to 125	Severe Cyclonic Storm
09.11.19/1130	20.0/88.0	115-125 gusting to 140	Very Severe Cyclonic Storm
09.11.19/2330	20.6/88.1	105-115 gusting to 125	Severe Cyclonic Storm
10.11.19/1130	21.9/88.3	95-105 gusting to 115	Severe Cyclonic Storm
10.11.19/2330	21.1/88.6	85-95 gusting to 105	Severe Cyclonic Storm
11.11.19/1130	21.2/88.8	75-85 gusting to 95	Cyclonic Storm
11.11.19/2330	21.3/89.2	70-80 gusting to 90	Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 11.5°N TO 17.0°N AND LONG 87.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1800 UTC, A BUOY (23459) LOCATED NEAR LAT. 13.9°N/87.00°E REPORTED MEAN SEA LEVEL PRESSURE 1004.4 HPA, SST 29.4°C AND WIND 360°/12 KNOTS; BUOY (23093) LOCATED NEAR LAT. 16.2°N / 88.0°E REPORTED MEAN SEA LEVEL PRESSURE 1005.2 HPA, SST 29.4°C AND WIND 90°/14 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

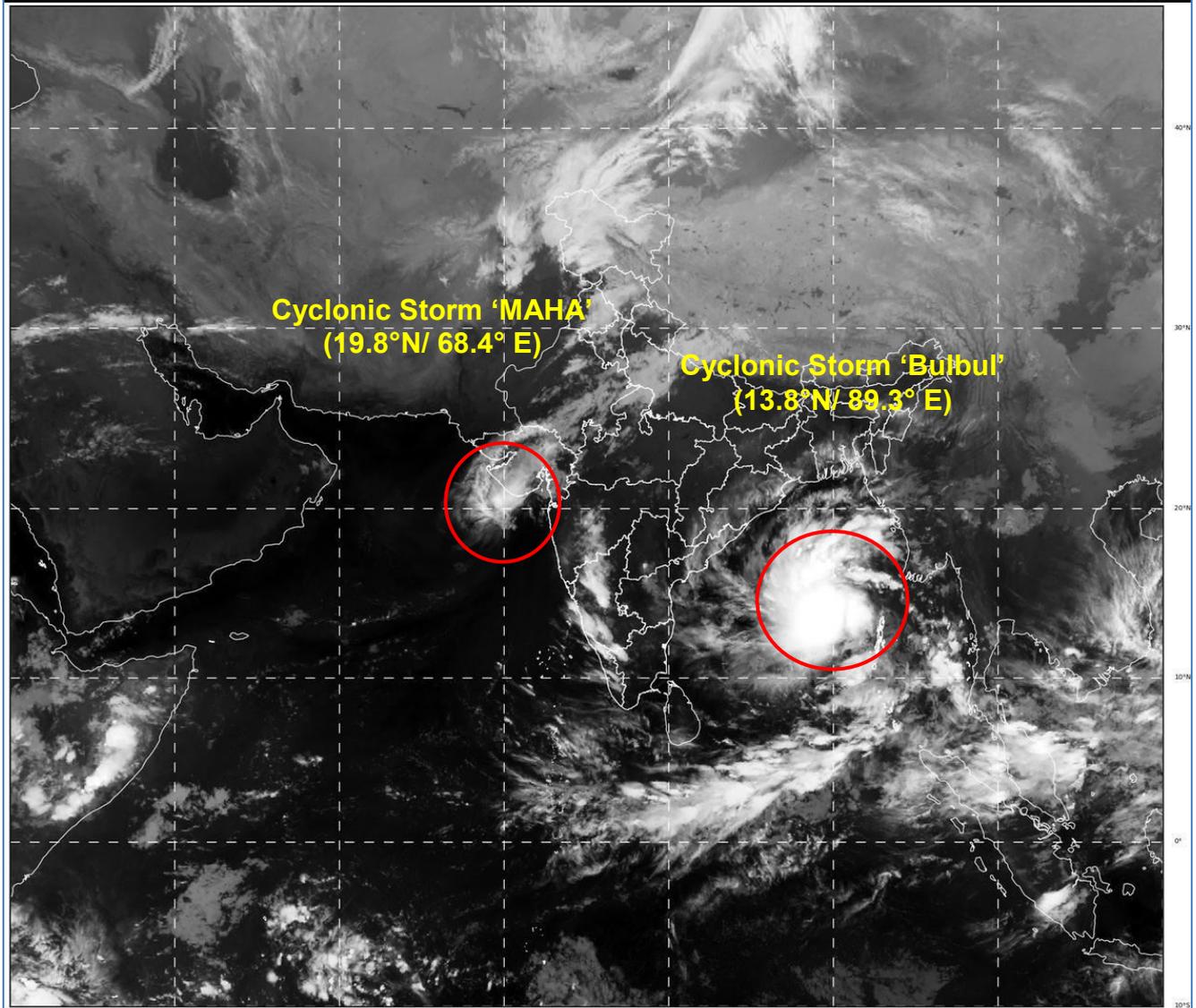
**(D.R. PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT : INSAT-3D IMG
IMG_TIR1 10.8 um
LIC Mercator

06-11-2019/(1630 to 1656) GMT
06-11-2019/(2200 to 2226) IST



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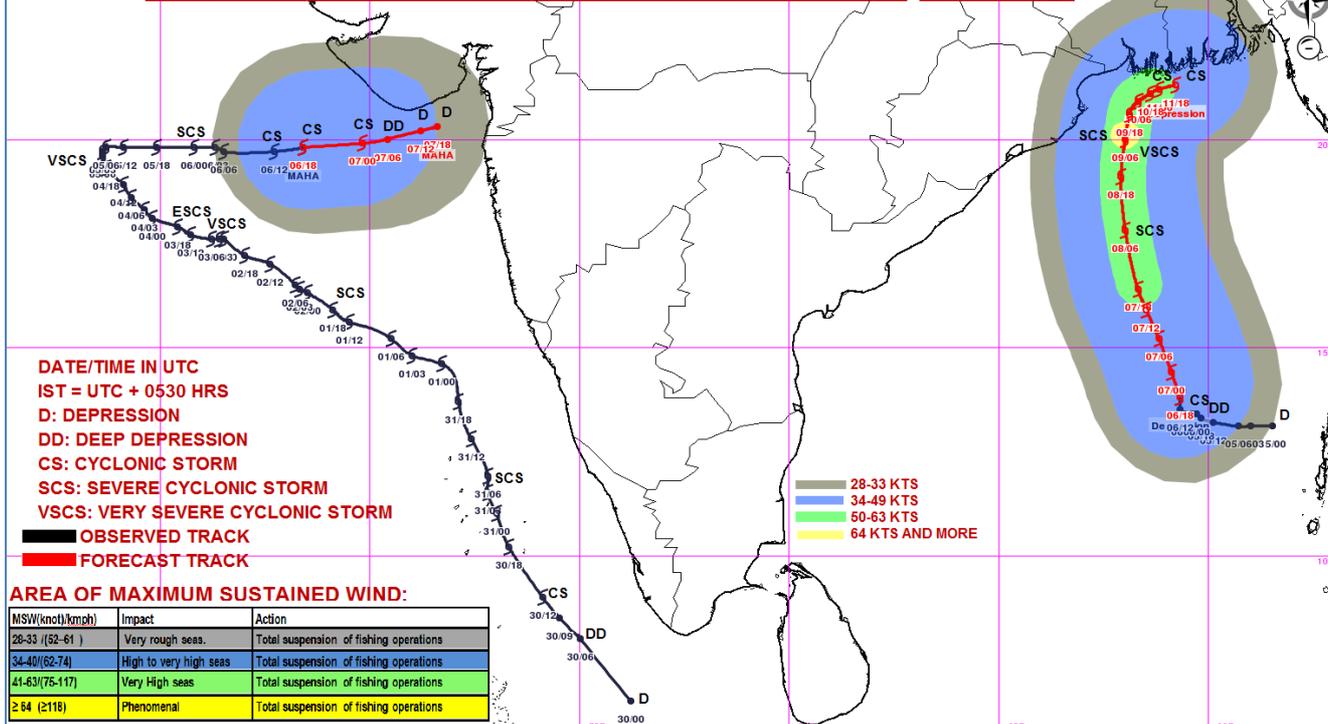
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IMD, DELHI

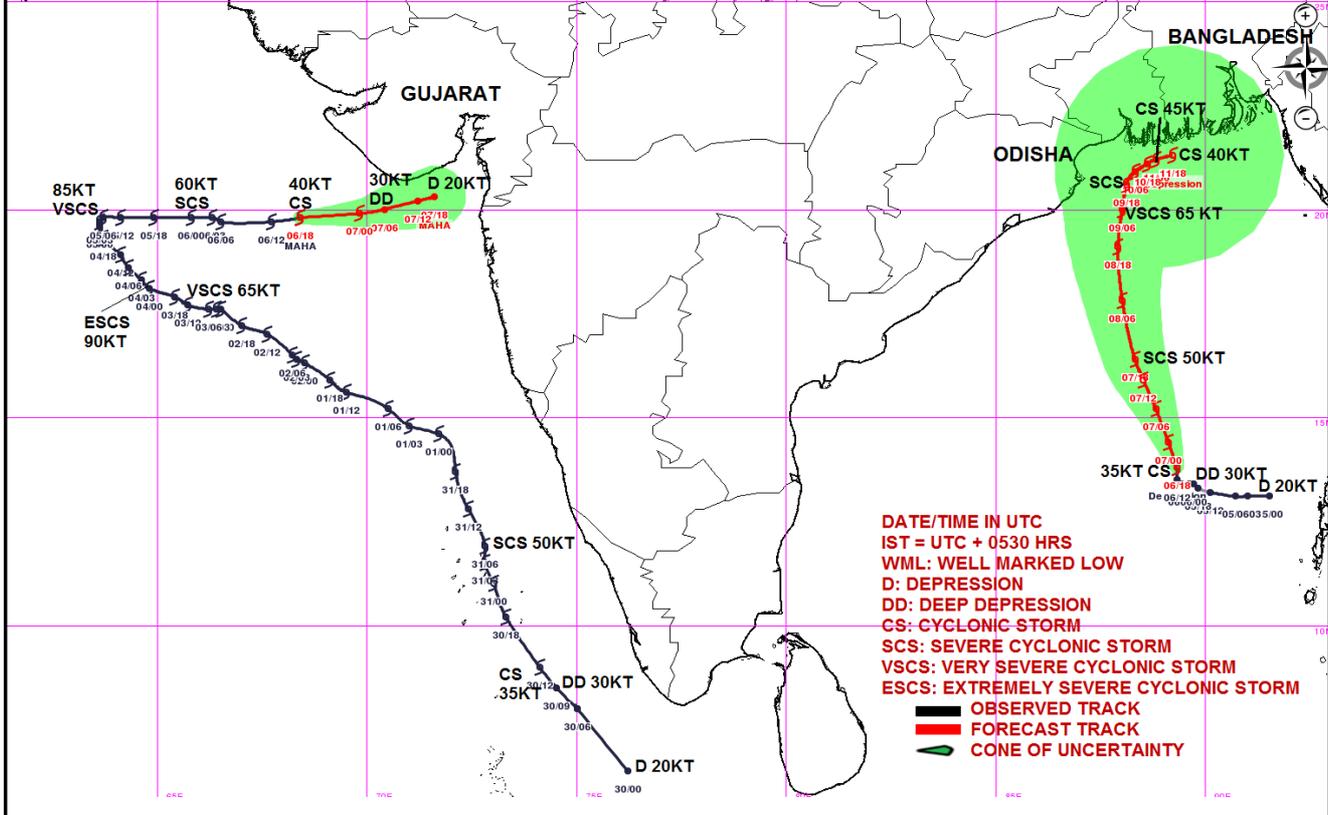
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CS "BULBUL" OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 1800 UTC OF 6th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 1800 UTC OF 06th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 60**

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. 60 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0030 UTC OF 07.11.2019 BASED ON 2100 UTC OF 06.11.2019.

**SUB: (A) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA
(B) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.**

(A) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 2100 UTC OF 6th NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 68.9°E, ABOUT 220 KM SOUTH-SOUTHWEST OF PORBANDAR (42830), 190 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 230 KM WEST-SOUTHWEST OF DIU (42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA DURING NEXT 12 HOURS. IT IS VERY LIKELY TO SKIRT SAURASHTRA COAST AND LIE CENTERED ABOUT 40 KILOMETERS SOUTH OF DIU AROUND NOON OF 7TH NOVEMBER AS A DEEP DEPRESSION. CONTINUING TO MOVE EAST-NORTHEASTWARDS, IT IS VERY LIKELY TO WEAKEN FURTHER INTO A DEPRESSION BY TOMORROW EVENING.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.11.19/2100	19.8/68.9	65-75 gusting to 85	Cyclonic Storm
07.11.19/0000	19.9/69.8	60-70 gusting to 80	Cyclonic Storm
07.11.19/0600	20.0/70.4	50-60 gusting to 70	Deep Depression
07.11.19/1200	20.2/71.2	40-50 gusting to 60	Depression
07.11.19/1800	20.3/71.6	35-45 gusting to 55	Depression

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 06TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0/3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 20.0°N TO 21.5°N AND LONG 69.3°E TO 71.5°E. THE MINIMUM CTT IS MINUS -93°C.

AT 2100 UTC, A SHIP (DGHX) LOCATED NEAR LAT. 18.9°N/70.5°E REPORTED MEAN SEA LEVEL PRESSURE 1007.3 HPA, SST 27.0°C AND WIND 190°/20 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 999 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 25-30 KNOTS OVER THE SYSTEM AREA AND 25-30 KNOTS ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 24 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(B) CYCLONIC STORM ‘BULBUL’ (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE **CYCLONIC STORM ‘BULBUL’ (PRONOUNCED AS BUL BUL)** OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL MOVED NEARLY NORTHWARDS WITH A SPEED OF 06 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 2100 UTC OF 6TH NOVEMBER 2019, OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL, NEAR LAT.14.0°N AND LONG. 89.3°E, ABOUT 400 KM WEST-NORTHWEST OF MAYA BANDAR (43309), ABOUT 750 KM SOUTH-SOUTHEAST OF PARADIP (42976), 860 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 890 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A VERY SEVERE CYCLONIC STORM DURING THE SUBSEQUENT 36 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS TOWARDS WEST BENGAL AND BANGLADESH COASTS.

Forecast track and intensity are given in the following table:

Date/Time(UTC)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.11.19/2100	14.0/89.3	60-70 gusting to 80	Cyclonic Storm
07.11.19/0000	14.4/89.1	70-80 gusting to 90	Cyclonic Storm
07.11.19/0600	15.2/88.8	70-80 gusting to 90	Cyclonic Storm
07.11.19/1200	15.9/88.5	75-85 gusting to 95	Cyclonic Storm
07.11.19/1800	16.4/88.3	85-95 gusting to 105	Severe Cyclonic Storm
08.11.19/0600	17.8/88.0	95-105 gusting to 115	Severe Cyclonic Storm
08.11.19/1800	19.1/87.9	105-115 gusting to 125	Severe Cyclonic Storm
09.11.19/0600	20.0/88.0	115-125 gusting to 140	Very Severe Cyclonic Storm
09.11.19/1800	20.6/88.1	105-115 gusting to 125	Severe Cyclonic Storm
10.11.19/0600	21.9/88.3	95-105 gusting to 115	Severe Cyclonic Storm
10.11.19/1800	21.1/88.6	85-95 gusting to 105	Severe Cyclonic Storm
11.11.19/0600	21.2/88.8	75-85 gusting to 95	Cyclonic Storm
11.11.19/1800	21.3/89.2	70-80 gusting to 90	Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 06TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 12.0°N TO 16.5°N AND LONG 86.5°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 2100 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.00°N/86.9°E REPORTED MEAN SEA LEVEL PRESSURE 1002.7 HPA, SST 29.4°C AND WIND 020°/12 KNOTS; BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0°E REPORTED MEAN SEA LEVEL PRESSURE 1002.5 HPA, SST 29.3°C AND WIND 060°/18 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

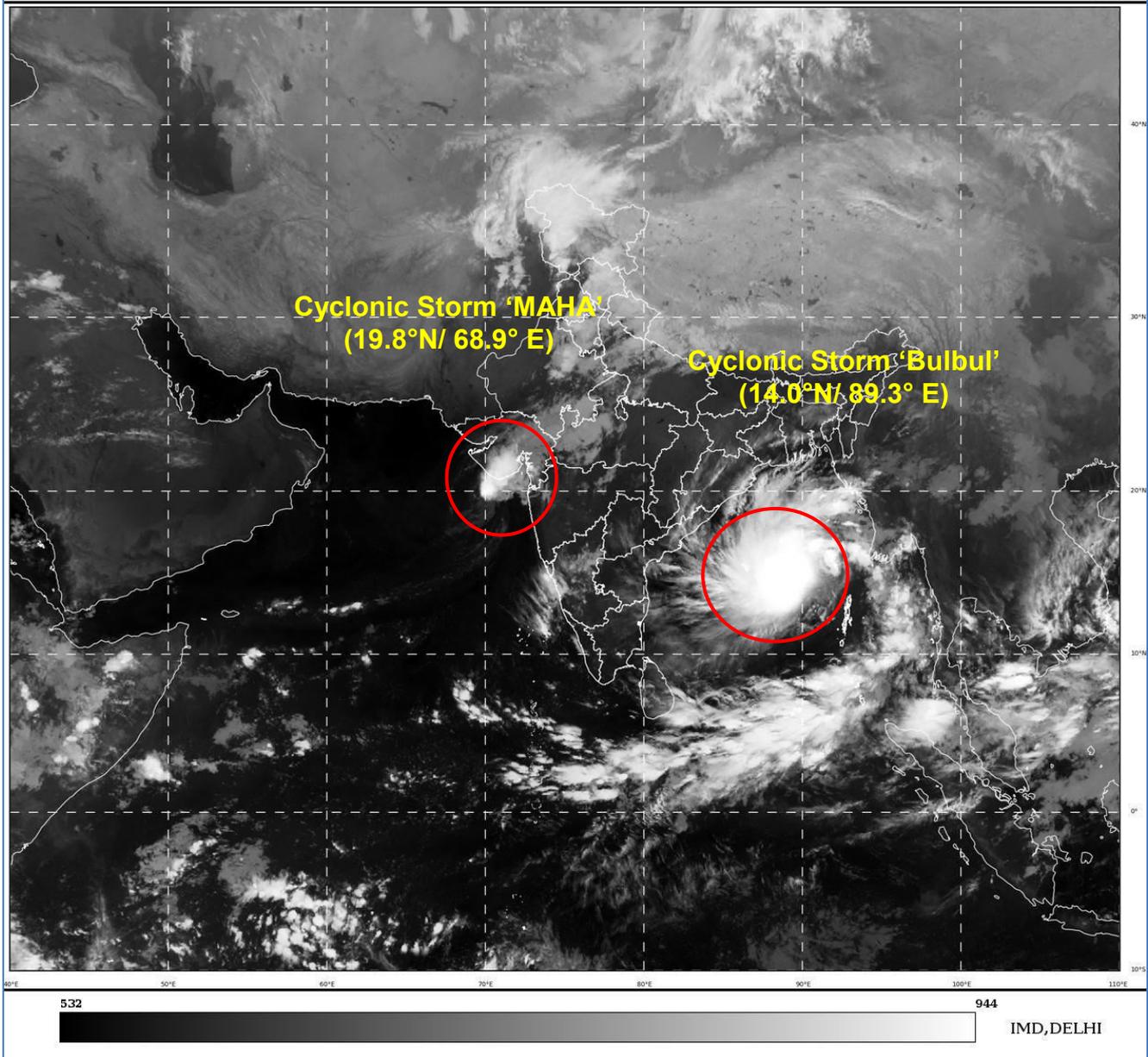
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IT IS 20-25 KT ALONG THE FORECAST TRACK. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(D.R. PATTANAIK)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

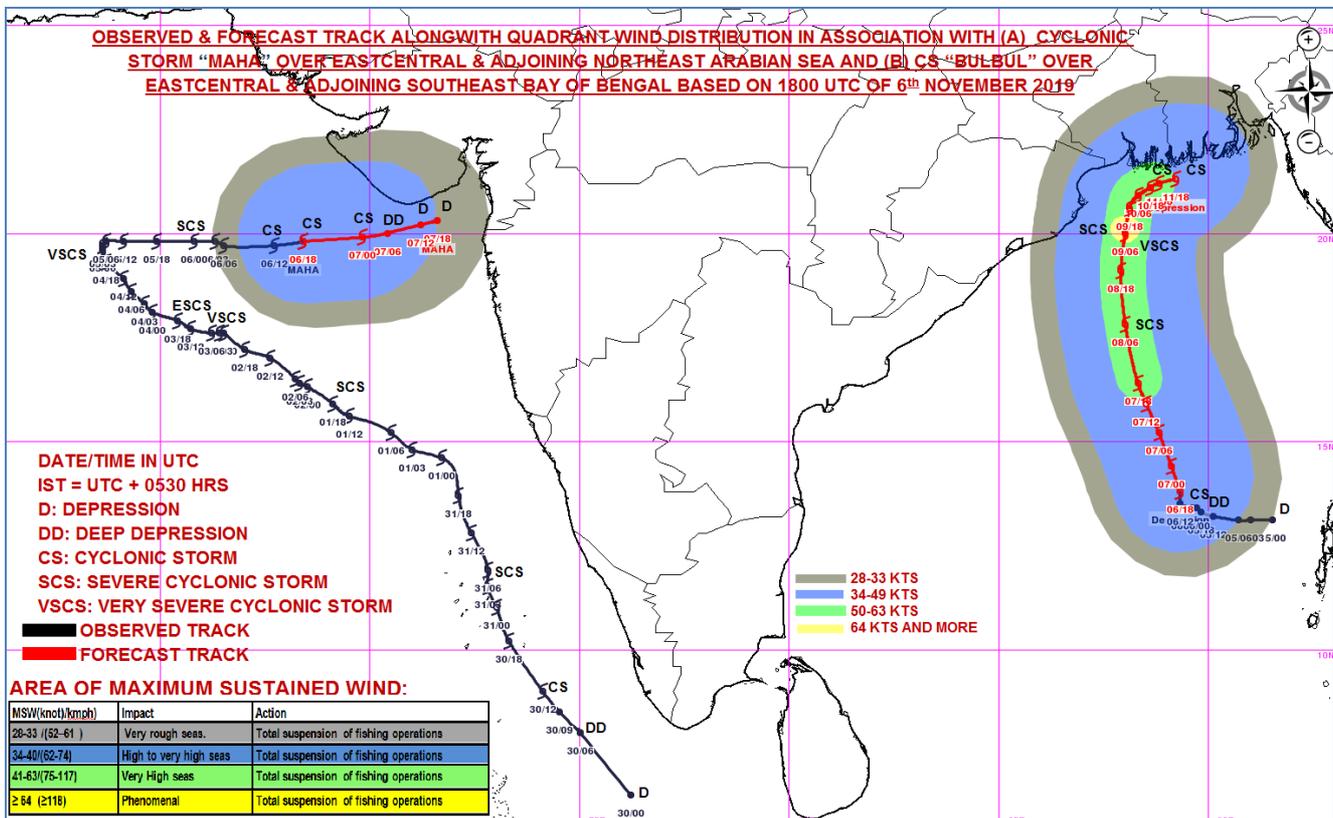
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



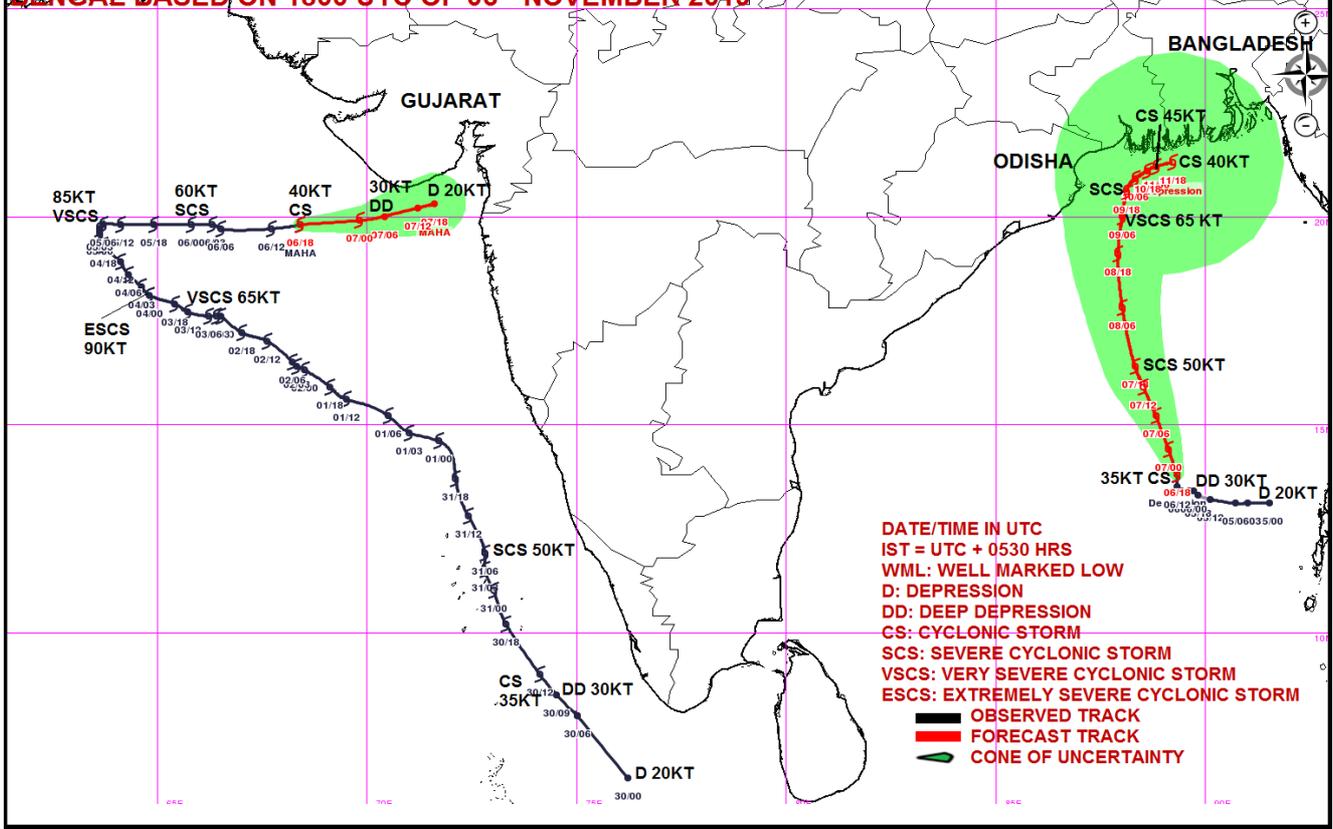
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CS "BULBUL" OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 1800 UTC OF 6th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) CYCLONIC STORM "MAHA" OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL BASED ON 1800 UTC OF 06th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 61 AND BULLETIN NO. 01**

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 AND BULLETIN NO. 01 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0400 UTC OF 07.11.2019 BASED ON 0000 UTC OF 07.11.2019.

**SUB: (A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.
(B) DEEP DEPRESSION 'MAHA' (PRONOUNCED AS M'MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA**

BULLETIN NO. 01

(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL.

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL & ADJOINING SOUTHEAST BAY OF BENGAL MOVED NORTHWARDS WITH A SPEED OF 07 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0000 UTC OF 7TH NOVEMBER 2019, OVER EASTCENTRAL NEAR LAT.14.2°N AND LONG. 89.3°E, ABOUT 730 KM SOUTH-SOUTHEAST OF PARADIP (42976), 830 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 830 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS TOWARDS WEST BENGAL AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

Date/Time(UTC)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
07.11.19/0000	14.2/89.3	65-75 GUSTING TO 85	CYCLONIC STORM
07.11.19/0600	15.0/89.0	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	15.7/88.6	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/1800	16.2/88.4	80-90 GUSTING TO 100	CYCLONIC STORM
08.11.19/0000	16.9/88.2	85-95 GUSTING TO 105	SEVERE CYCLONIC STORM
08.11.19/1200	18.3/88.0	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
09.11.19/0000	19.4/87.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1200	20.1/88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
10.11.19/0000	21.8/88.4	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
10.11.19/1200	21.0/88.7	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
11.11.19/0000	21.1/89.2	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
11.11.19/1200	21.1/89.5	75-85 GUSTING TO 95	CYCLONIC STORM
12.11.19/0000	21.1/89.8	60-70 GUSTING TO 80	CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 12.50°N TO 17.5°N AND LONG 86.5°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0000 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.00°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1003.2 HPA, SST 30°C AND WIND 030°/15.6 KNOTS; BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0°E REPORTED MEAN SEA LEVEL PRESSURE 1002.7 HPA, SST 29.4°C AND WIND 060°/19.4 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 28-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

BULLETIN NO. 61

(B) CYCLONIC STORM 'MAHA' (PRONOUNCED AS M'MAHA) WEAKENED INTO A DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE **CYCLONIC STORM MAHA (PRONOUNCED AS M'MAHA)** OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED EASTWARDS WITH A SPEED OF 17 KMPH DURING PAST 06 HOURS, WEAKENED INTO A DEEP DEPRESSION AND LAY CENTERED AT 0000 UTC OF 7th NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 19.8°N AND LONGITUDE 69.4°E, ABOUT 200 KM SOUTH-SOUTHWEST OF PORBANDAR (42830), 150 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 180 KM WEST-SOUTHWEST OF DIU (42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN FURTHER INTO A DEEP DEPRESSION OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA OFF SOUTH GURJARAT COAST DURING NEXT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ Long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
07.11.19/0000	19.8/69.4	55-65 gusting to 75	Deep Depression
07.11.19/0600	19.9/70.2	50-60 gusting to 70	Deep Depression
07.11.19/1200	20.1/71.0	40-50 gusting to 60	Depression
07.11.19/1800	20.2/71.5	40-50 gusting to 60	Depression

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 07th NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0/2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH ARABIAN SEA BETWEEN LAT 19.5°N TO 21.0°N AND LONG 69.5°E TO 71.0°E. THE MINIMUM CTT IS MINUS -93°C.

AT 0000 UTC, A BOUY (23456) LOCATED NEAR LAT. 18.5°N/67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1007.6 HPA, SST 26.0°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

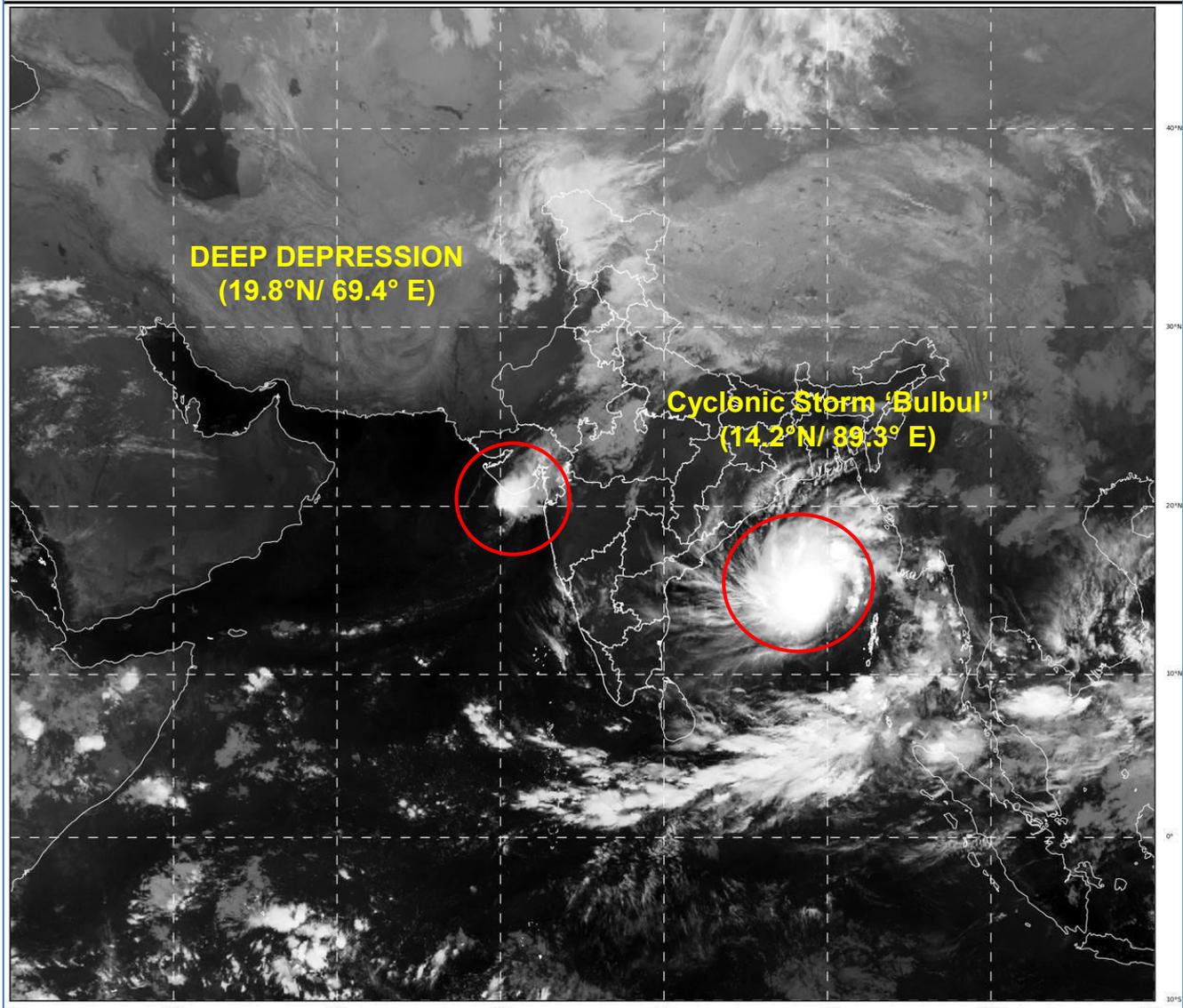
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 30-35 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 24-26°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 24 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(D.R. PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



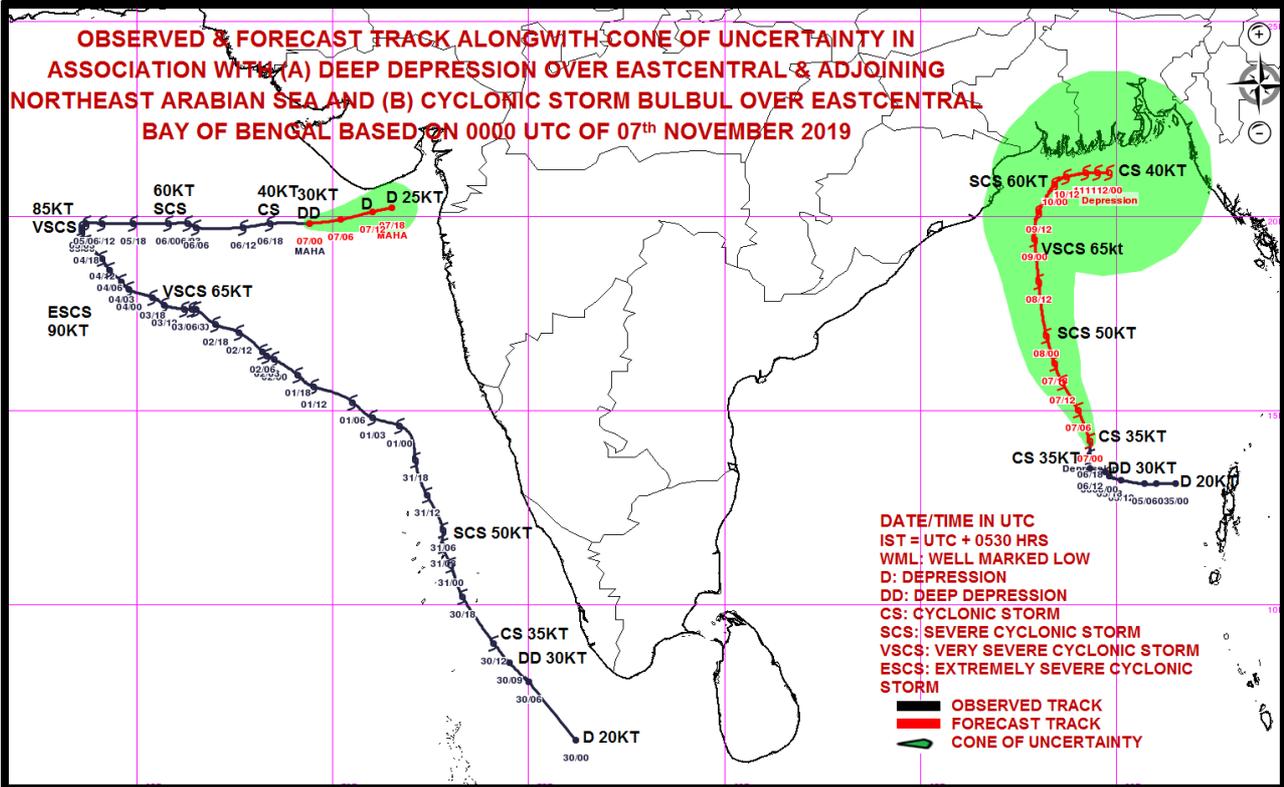
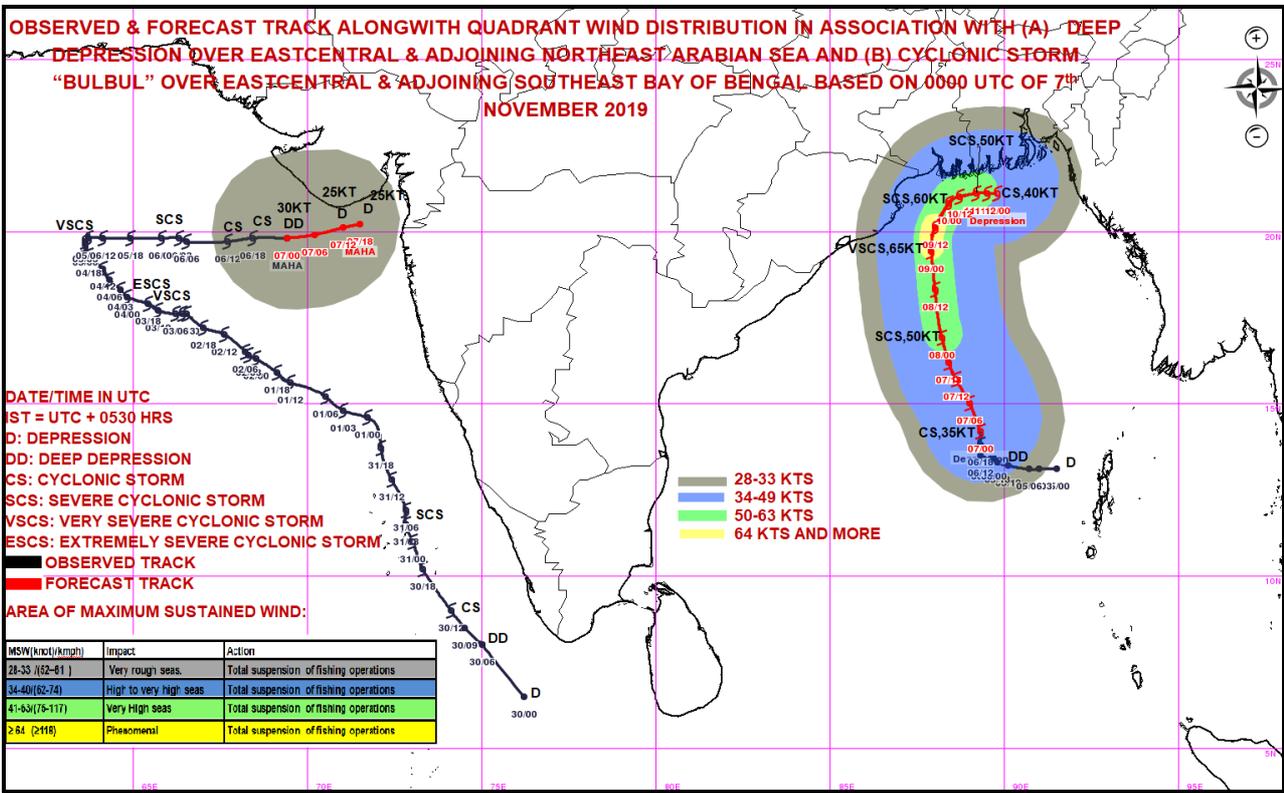
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IMD, DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 02 AND BULLETIN NO. 62**

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 BULLETIN NO. 02 AND BULLETIN NO. 62 AND FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0630 UTC OF 07.11.2019 BASED ON 0300 UTC OF 07.11.2019.

**SUB:(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL.
(B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA**

BULLETIN NO. 02

(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL.

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL CONTINUED TO MOVE NORTHWARDS WITH A SPEED OF 13 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0830 HRS IST OF TODAY, THE 7TH NOVEMBER 2019, OVER EASTCENTRAL BAY OF BENGAL, NEAR LAT.14.7°N AND LONG. 89.3°E ABOUT 680 KM SOUTH-SOUTHEAST OF PARADIP (ODISHA), 780 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (WEST BENGAL) AND 810 KM SOUTH-SOUTHWEST OF KHEPUPARA (BANGLADESH). IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS TOWARDS WEST BENGAL AND BANGLADESH COASTS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(IST)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/0300	14.7	89.3	65-75 GUSTING TO 85	CYCLONIC STORM
07.11.19/0600	15.0	89.2	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	15.7	88.8	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/1800	16.2	88.4	80-90 GUSTING TO 100	CYCLONIC STORM
08.11.19/0000	16.9	88.2	85-95 GUSTING TO 105	SEVERE CYCLONIC STORM
08.11.19/1200	18.3	88.0	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
09.11.19/0000	19.4	87.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1200	20.1	88.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
10.11.19/0000	21.8	88.4	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
10.11.19/1200	21.0	88.7	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
11.11.19/0000	21.1	89.2	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
11.11.19/1200	21.1	89.5	75-85 GUSTING TO 95	CYCLONIC STORM
12.11.19/0000	21.1	89.8	60-70 GUSTING TO 80	CYCLONIC STORM

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING SOUTHEAST BAY OF BENGAL BETWEEN LAT 12.50°N TO 17.5°N AND LONG 86.5°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0300 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.2°N/87.1°E REPORTED MEAN SEA LEVEL PRESSURE 1004.9 HPA, SST 29.4°C AND WIND 010°/15.6 KNOTS; BUOY (23094) LOCATED NEAR LAT. 13.8°N / 84.2°E REPORTED MEAN SEA LEVEL PRESSURE 1008.4 HPA, SST 29.2°C AND WIND 350°/15.6 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA. THE RIDGE ROUGHLY ALONG 15°N RUNS NORTH OF THE SYSTEM AREA. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

BULLETIN NO. 62

B) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED NEARLY EASTWARDS WITH A SPEED OF 19 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 0830 HRS IST OF TODAY, THE 07TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 20.0°N AND LONGITUDE 70.0°E, ABOUT 100 KM SOUTH-SOUTHWEST OF VERAVAL (GUJARAT) AND 120 KM WEST-SOUTHWEST OF DIU. IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN INTO A DEPRESSION OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA OFF SOUTH GUJARAT COAST DURING NEXT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(IST)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG.(°E)		
07.11.19/0300	20.0	70.0	55-65 GUSTING TO 75	DEEP DEPRESSION
07.11.19/0600	20.0	70.3	50-60 GUSTING TO 70	DEEP DEPRESSION
07.11.19/1200	20.1	71.0	45-55 GUSTING TO 65	DEPRESSION
07.11.19/1800	20.2	71.7	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 07th NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 1.5/2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL & ADJOINING NORTH EAST ARABIAN SEA, GULF OF CAMBAY & ADJOINING SOUTH GUJARAT BETWEEN LAT 19.5°N TO 22.0°N AND LONG 70.0°E TO 72.5°E. THE MINIMUM CTT IS MINUS -75°C.

AT 0300 UTC, A BOUY (23456) LOCATED NEAR LAT. 18.1°N/67.5°E REPORTED MEAN SEA LEVEL PRESSURE 1010.4 HPA, SST 26.3°C & WIND 130/11.7 KNOTS; A SHIP (DGHX) LOCATED AT LAT. 18.3°N/72.2°E REPORTED MEAN SEA LEVEL PRESSURE 1009.3 HPA, SST 27.0°C & WIND 200⁰/25.1 KNOTS.

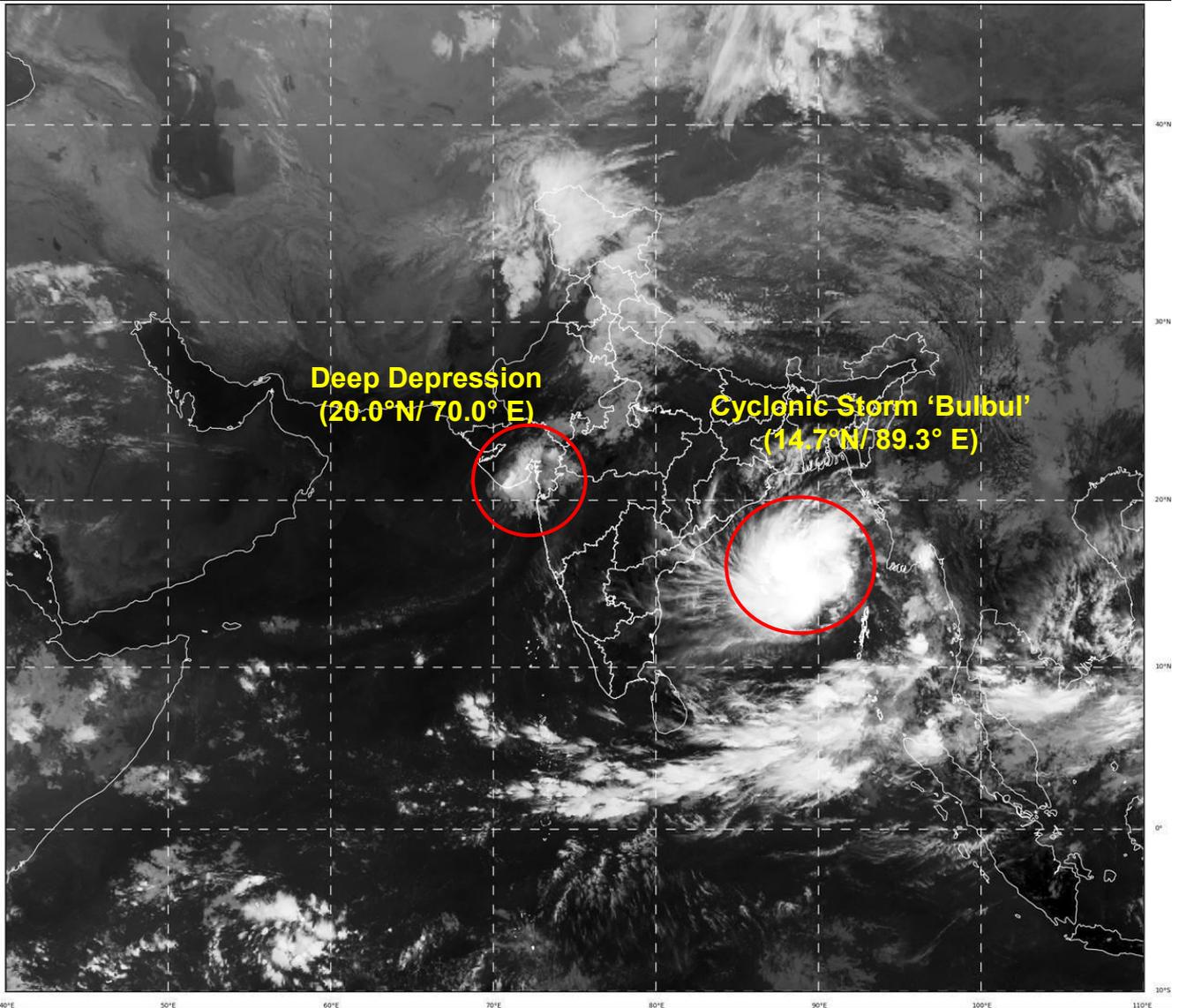
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

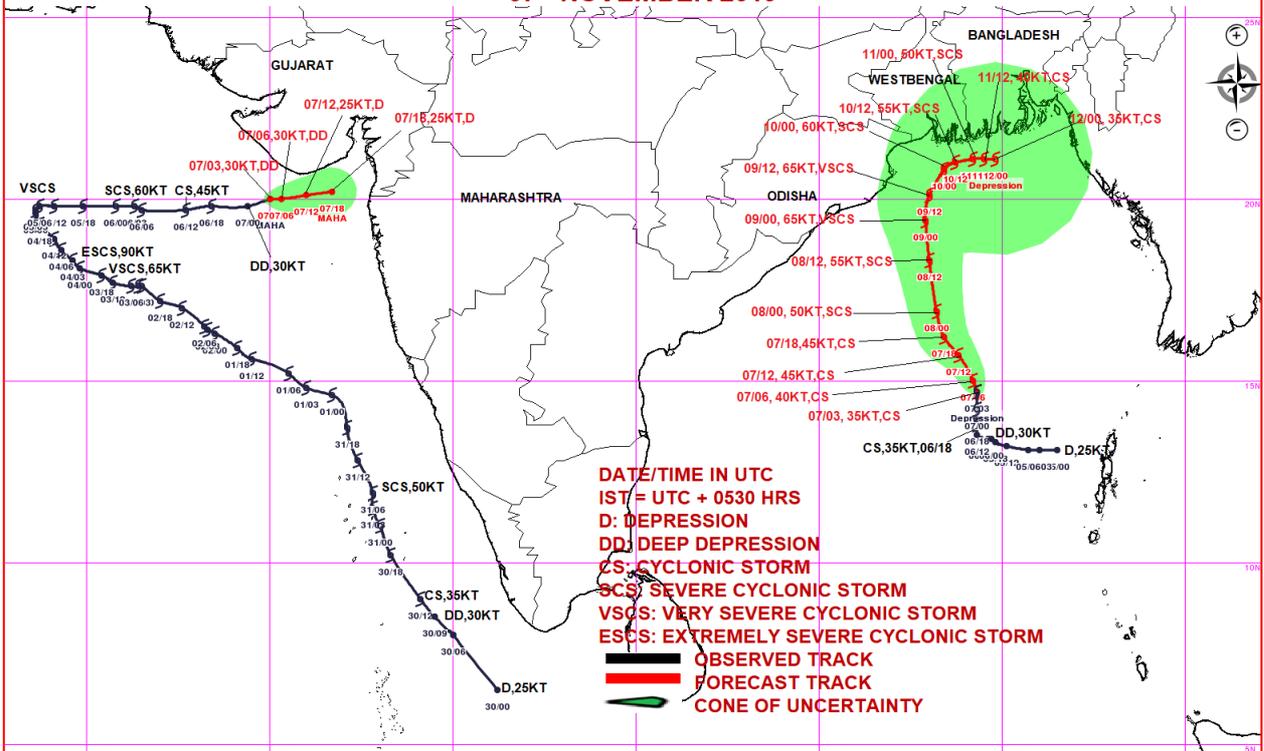
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $100 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT $05 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR AND THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH EAST SECTOR AND $05 \times 10^{-5} \text{ S}^{-1}$ IN SOUTH WEST SECTOR. THE VERTICAL WIND SHEAR IS 30-35 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 28-29°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 24 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

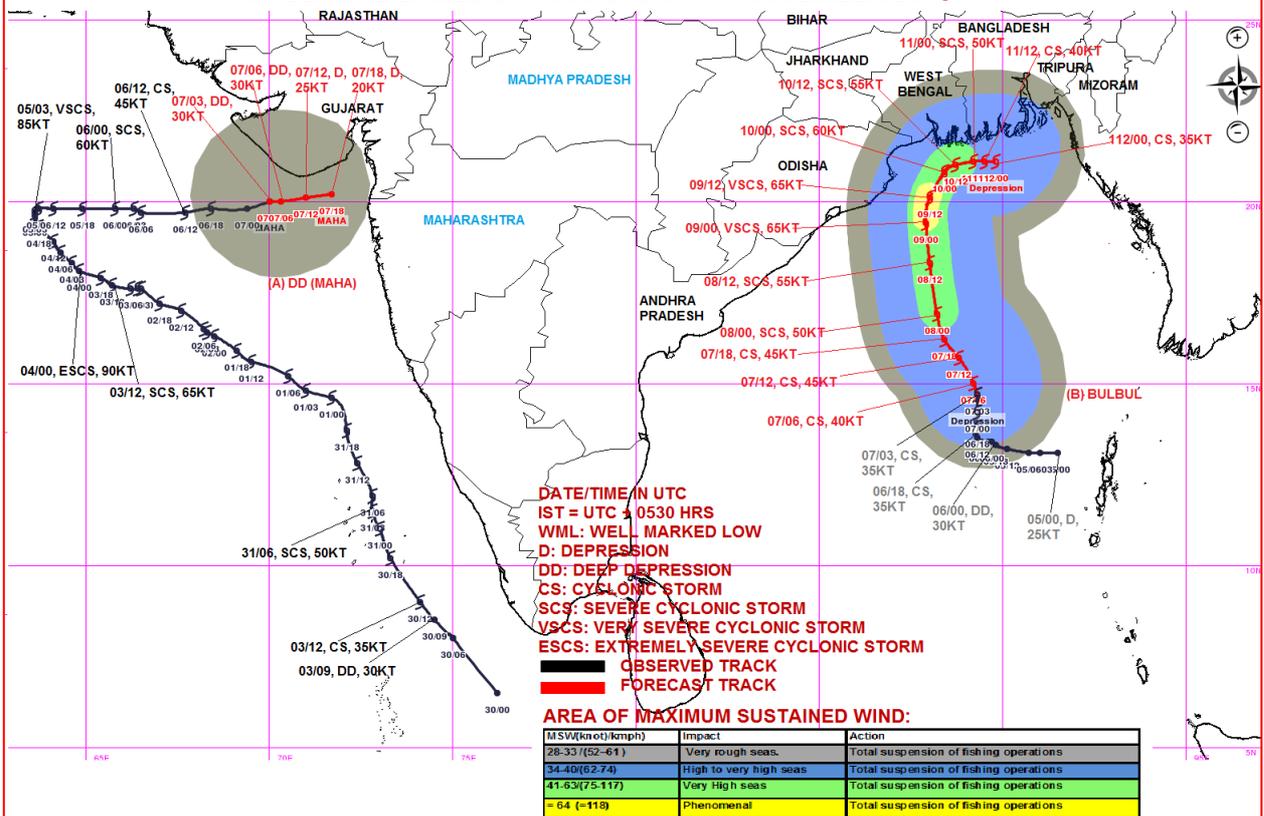
**(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI**



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) DEEP DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL BAY OF BENGAL BASED ON 0300 UTC OF 07th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) DEEP DEPRESSION (MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL BAY OF BENGAL BASED ON 0300 UTC OF 7th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 03 AND BULLETIN NO. 63**

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 BULLETIN NO. 03 AND BULLETIN NO. 63 AND FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 07.11.2019 BASED ON 0600 UTC OF 07.11.2019.

**SUB:(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL.
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA**

BULLETIN NO. 03

(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL.

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL MOVED NORTH- NORTHWESTWARDS WITH A SPEED OF 15 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600 UTC OF 7TH NOVEMBER 2019, OVER EASTCENTRAL BAY OF BENGAL, NEAR LAT.15.0°N AND LONG. 89.2°E ABOUT 640 KM SOUTH-SOUTHEAST OF PARADIP (42976), 740 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 780 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE INITIALLY NORTH-NORTHWESTWARDS FOR NEXT 12 HOURS AND THEN NEARLY NORTHWARDS TILL 9TH NOVEMBER MORNING AND THEN RE-CURVE NORTHEASTWARDS TOWARDS BANGLADESH AND ADJOINING WEST BENGAL.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/0600	15.0	89.2	70-80 GUSTING TO 90	CYCLONIC STORM
07.11.19/1200	15.6	88.5	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/1800	16.2	88.2	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
08.11.19/0000	16.8	88.0	100-110 GUSTING TO 115	SEVERE CYCLONIC STORM
08.11.19/0600	16.7	88.0	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/1800	18.9	87.8	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0600	19.9	87.8	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
09.11.19/1800	20.8	88.2	100-110 GUSTING TO 115	SEVERE CYCLONIC STORM
10.11.19/0600	21.4	89.0	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
10.11.19/1800	21.8	89.7	80-90 GUSTING TO 100	CYCLONIC STORM
11.11.19/0600	22.1	90.3	70-80 GUSTING TO 90	CYCLONIC STORM
11.11.19/1800	22.4	91.0	50-60 GUSTING TO 70	DEEP DEPRESSION
12.11.19/0600	22.6	91.8	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL AND ADJOINING WEST CENTRAL BAY OF BENGAL LOCATED NEAR LAT 13.0°N TO 19.0°N AND LONG 83.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0600 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.2°N/87.1°E REPORTED MEAN SEA LEVEL PRESSURE 1003.5 HPA, SST 29.4°C AND WIND 360°/19.4 KNOTS; BUOY (23094) LOCATED NEAR LAT. 13.8°N / 84.2°E REPORTED MEAN SEA LEVEL PRESSURE 1007.1 HPA, SST 29.1°C AND WIND 360°/15.6 KNOTS, BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.2°E REPORTED MEAN SEA LEVEL PRESSURE 1001.5 HPA, SST 29.3°C AND WIND 70°/21.4 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 KNOTS GUSTING TO 55 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT $150 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA. THE RIDGE RUNS ROUGHLY ALONG 15°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS LIKELY TO MOVE NORTHWESTWARDS, AS IT FURTHER INTENSIFIES AND THEREAFTER DUE TO WEAK STEERING FLOW THE SYSTEM WILL MOVE SLOWLY NORTH-NORTHWESTWARDS. THE MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

BULLETIN NO. 63

B) DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA

THE **DEEP DEPRESSION** OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED NEARLY EASTWARDS WITH A SPEED OF 18 KMPH DURING PAST 06 HOURS, WEAKENED INTO A **DEPRESSION** AND LAY CENTERED 0600 UTC OF 07TH NOVEMBER, 2019 OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA NEAR LATITUDE 20.0°N AND LONGITUDE 70.4°E, ABOUT 100 KM NEARLY TO THE SOUTH OF VERAVAL (42909) AND 90 KM NEARLY TO THE SOUTH OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN INTO A WELL MARKED LOW PRESSURE AREA OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA OFF SOUTH GUJARAT COAST DURING NEXT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/0600	20.0	70.4	40-50 GUSTING TO 60	DEPRESSION
07.11.19/1200	20.2	70.9	30-40 GUSTING TO 50	DEPRESSION
07.11.19/1800	20.4	71.4	20-30 GUSTING TO 40	WELL MARKED LOW

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 07TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 1.0/2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LIES OVER NORTH EAST ARABIAN SEA, GULF OF CAMBAY & ADJOINING SOUTH GUJARAT BETWEEN LAT 21.0°N TO 23.0°N AND LONG 71.5°E TO 72.5°E.

AT 0600 UTC, A BOUY (23456) LOCATED NEAR LAT. 18.8°N/67.8°E REPORTED MEAN SEA LEVEL PRESSURE 1010.9 HPA, SST 26.6°C & WIND 130/11.7 KNOTS; A SHIP (DGHX) LOCATED AT LAT. 18.3°N/72.2°E REPORTED MEAN SEA LEVEL PRESSURE 1009.3 HPA, SST 27.0°C & WIND 140°/11.7 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1004 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

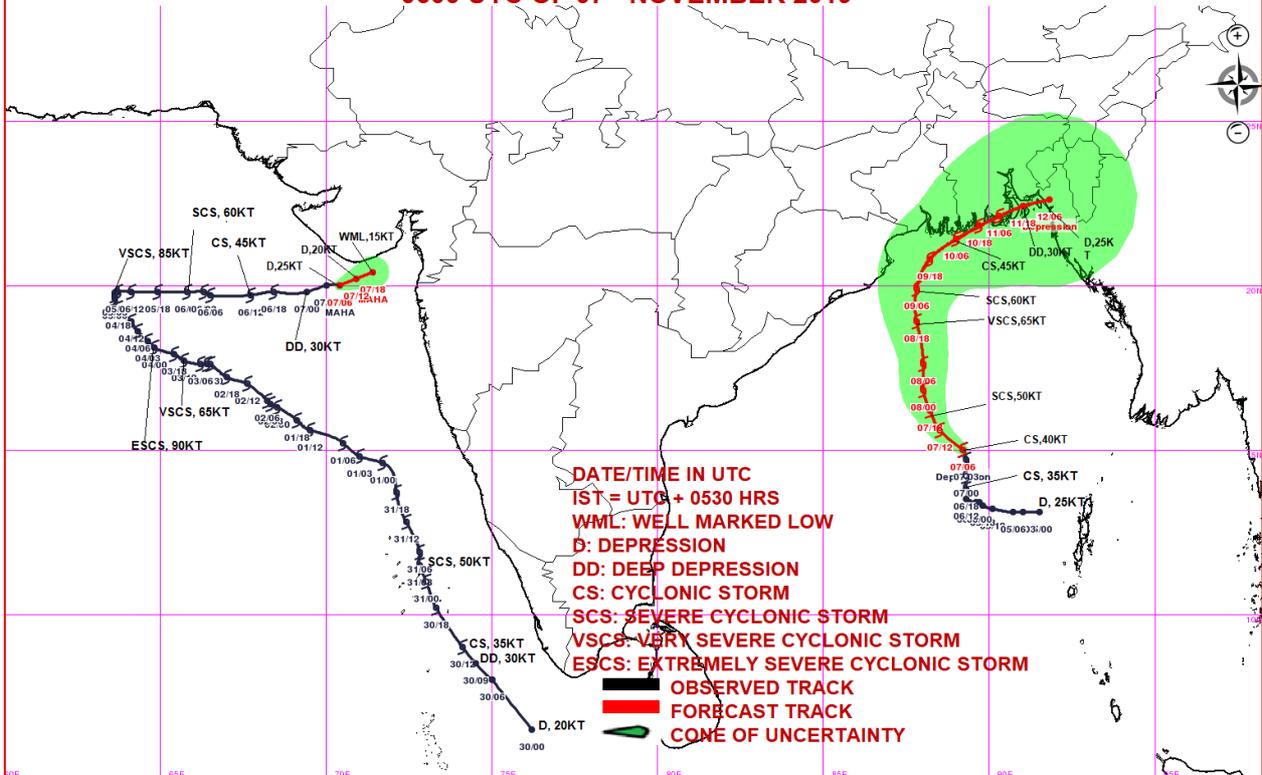
REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 50-100 X10⁻⁵ SEC⁻¹ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 05X10⁻⁵ S⁻¹ IN SOUTH WEST SECTOR. THE VERTICAL WIND SHEAR IS 30-35 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 28-29°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

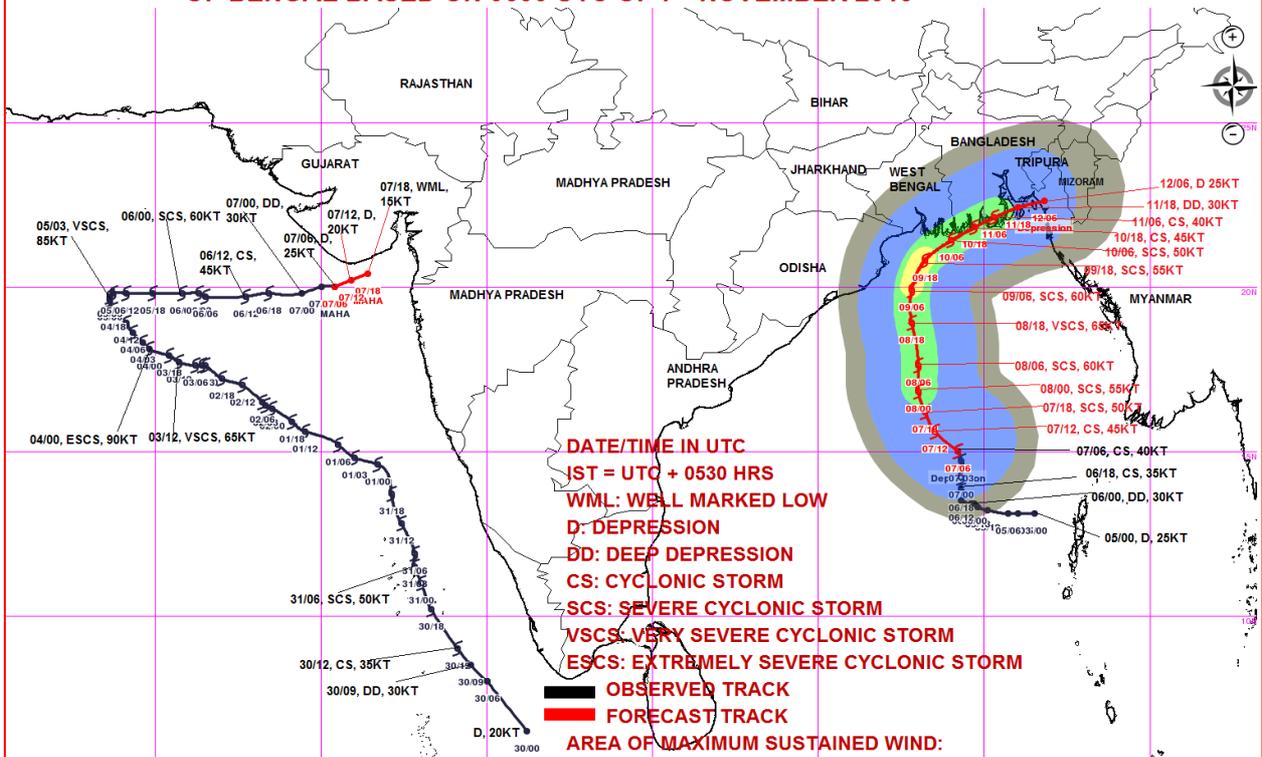
THE SYSTEM IS MOVING EASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 24 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL BAY OF BENGAL (B) DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND BASED ON 0600 UTC OF 07th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) DEPRESSION (MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL BAY OF BENGAL BASED ON 0600 UTC OF 7th NOVEMBER 2019



MSW(knot)/kmph	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-53 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 04 AND BULLETIN NO. 64**

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 BULLETIN NO. 04 AND BULLETIN NO. 64 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1200 UTC OF 07.11.2019 BASED ON 0900 UTC OF 07.11.2019.

**SUB:(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.
(B) DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA**

BULLETIN NO. 04

(A) CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL MOVED NORTHWESTWARDS WITH A SPEED OF 21 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0900 UTC OF 7TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.15.5°N AND LONG. 88.4°E ABOUT 560 KM SOUTH-SOUTHEAST OF PARADIP (42976), 680 KM SOUTH-SOUTHEAST OF SAGAR ISLANDS (42903) AND 740 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 06 HOURS. IT IS VERY LIKELY TO MOVE INITIALLY NORTH-NORTHWESTWARDS FOR NEXT 12 HOURS AND THEN NEARLY NORTHWARDS TILL 9TH NOVEMBER MORNING AND THEN RE-CURVE NORTHEASTWARDS TOWARDS BANGLADESH AND ADJOINING WEST BENGAL.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/0900	15.5	88.4	80-90 GUSTING TO 100	CYCLONIC STORM
07.11.19/1200	15.8	88.2	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
07.11.19/1800	16.2	88.1	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
08.11.19/0000	16.8	88.0	100-110 GUSTING TO 115	SEVERE CYCLONIC STORM
08.11.19/0600	16.7	88.0	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/1800	18.9	87.8	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0600	19.9	87.8	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
09.11.19/1800	20.8	88.2	100-110 GUSTING TO 115	SEVERE CYCLONIC STORM
10.11.19/0600	21.4	89.0	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
10.11.19/1800	21.8	89.7	80-90 GUSTING TO 100	CYCLONIC STORM
11.11.19/0600	22.1	90.3	70-80 GUSTING TO 90	CYCLONIC STORM
11.11.19/1800	22.4	91.0	50-60 GUSTING TO 70	DEEP DEPRESSION
12.11.19/0600	22.6	91.8	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER CENTRAL AND ADJOINING NORTH BAY OF BENGAL BETWEEN LAT. 12.0°N TO 21.0°N AND LONG. 84.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0900 UTC, A BUOY (23459) LOCATED NEAR LAT. 13.9°N/87.1°E REPORTED MEAN SEA LEVEL PRESSURE 1001.0 HPA, SST 29.4°C AND WIND 360°/19 KNOTS; ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.2°N / 87.9°E REPORTED MEAN SEA LEVEL PRESSURE 997.5 HPA, SST 29.3°C AND WIND 60°/25 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 45 KNOTS GUSTING TO 55 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 996 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS INCREASED AND IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IS ABOUT 20-25 KNOTS TO THE WEST OF THE SYSTEM CENTRE.. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE ENHANCED UPPER LEVEL DIVERGENCE, MODERATE VERTICAL WIND SHEAR AND HIGH SST OVER OCEAN IS SUPPORTING THE GRADUAL INTENSIFICATION OF THE SYSTEM. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS ALONG THE WESTERN PERIPHERIAL WINDS OF THE ANTICYCLONE LOCATED TO THE EAST OF THE SYSTEM FOR SOM MORE TIME AND THEREAFTER WILL MOVE SLOWLY NORTH-NORTHWESTWARDS AND THEN RE-CURVE NORTHEASTWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

BULLETIN NO. 64

B) DEPRESSION OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA

THE **DEPRESSION** OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 11 KMPH DURING PAST 06 HOURS, AND LAY CENTERED 0900 UTC OF 07TH NOVEMBER, 2019 OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA NEAR LATITUDE 20.2°N AND LONGITUDE 70.6°E, ABOUT 80 KM TO THE SOUTH OF VERAVAL (42909) AND 70 KM TO THE SOUTH OF DIU(42914). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS, WEAKEN INTO A WELL MARKED LOW PRESSURE AREA OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA OFF SOUTH GUJARAT COAST DURING NEXT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/0900	20.2	70.6	30-40 GUSTING TO 50	DEPRESSION
07.11.19/1200	20.2	70.9	25-35 GUSTING TO 45	DEPRESSION
07.11.19/1800	20.4	71.4	20-30 GUSTING TO 40	WELL MARKED LOW

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 07TH NOVEMBER, 2019. THE CURRENT INTENSITY OF THE SYSTEM IS T 1.0/1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LIES OVER NORTH EAST ARABIAN SEA, GULF OF CAMBAY & ADJOINING SOUTH GUJARAT BETWEEN LAT 21.0°N TO 23.0°N AND LONG 71.5°E TO 72.5°E.

AT 0000 UTC, A BOUY (23456) LOCATED NEAR LAT. 18.8°N/67.8°E REPORTED MEAN SEA LEVEL PRESSURE 1010.9 HPA, SST 26.6°C & WIND 130/11.7 KNOTS; A SHIP (DGHX) LOCATED AT LAT. 18.3°N/72.2°E REPORTED MEAN SEA LEVEL PRESSURE 1009.3 HPA, SST 27.0°C & WIND 140⁰/11.7 KNOTS.

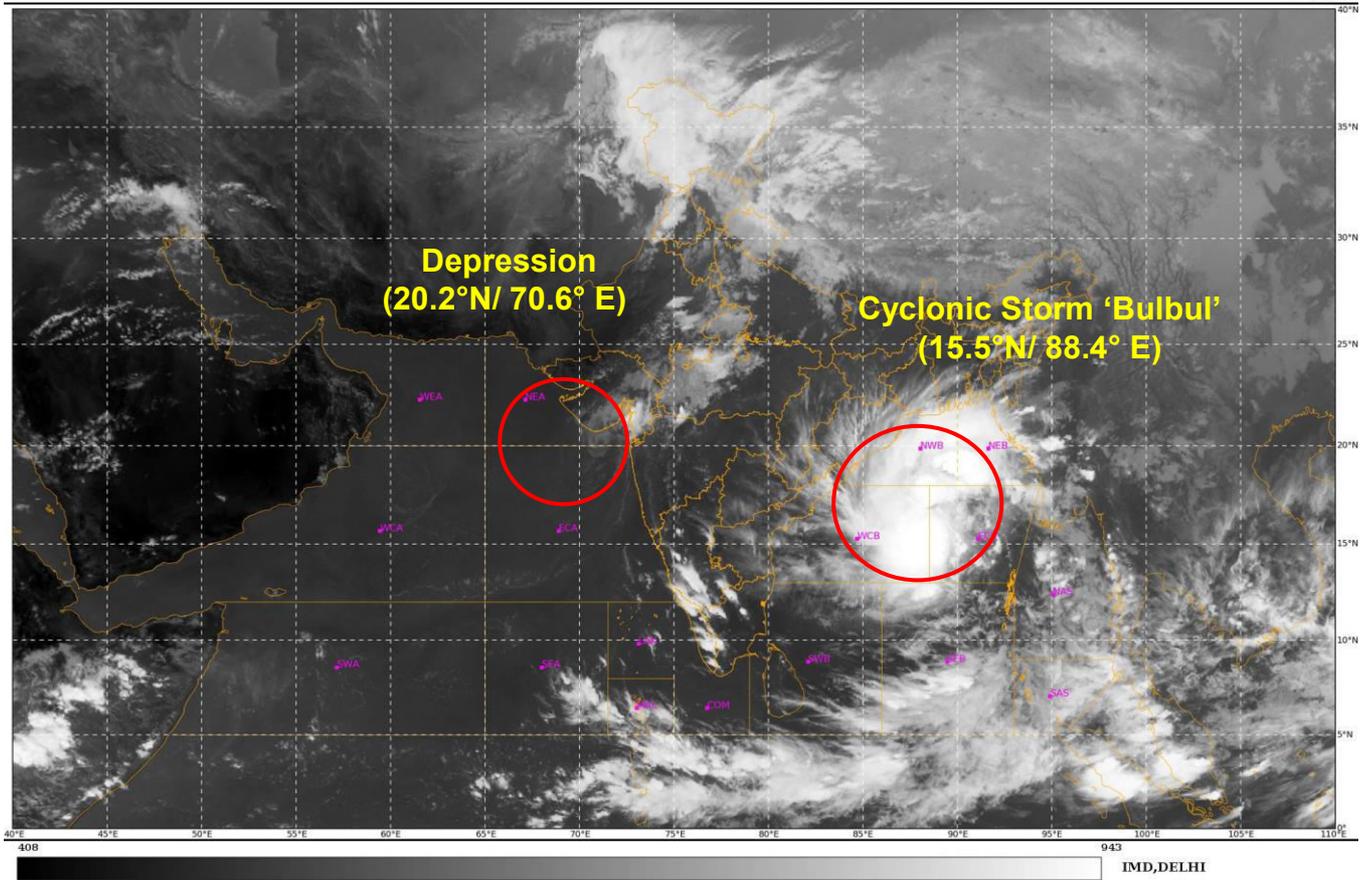
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 20 KNOTS GUSTING TO 30 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1004 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

REMARKS

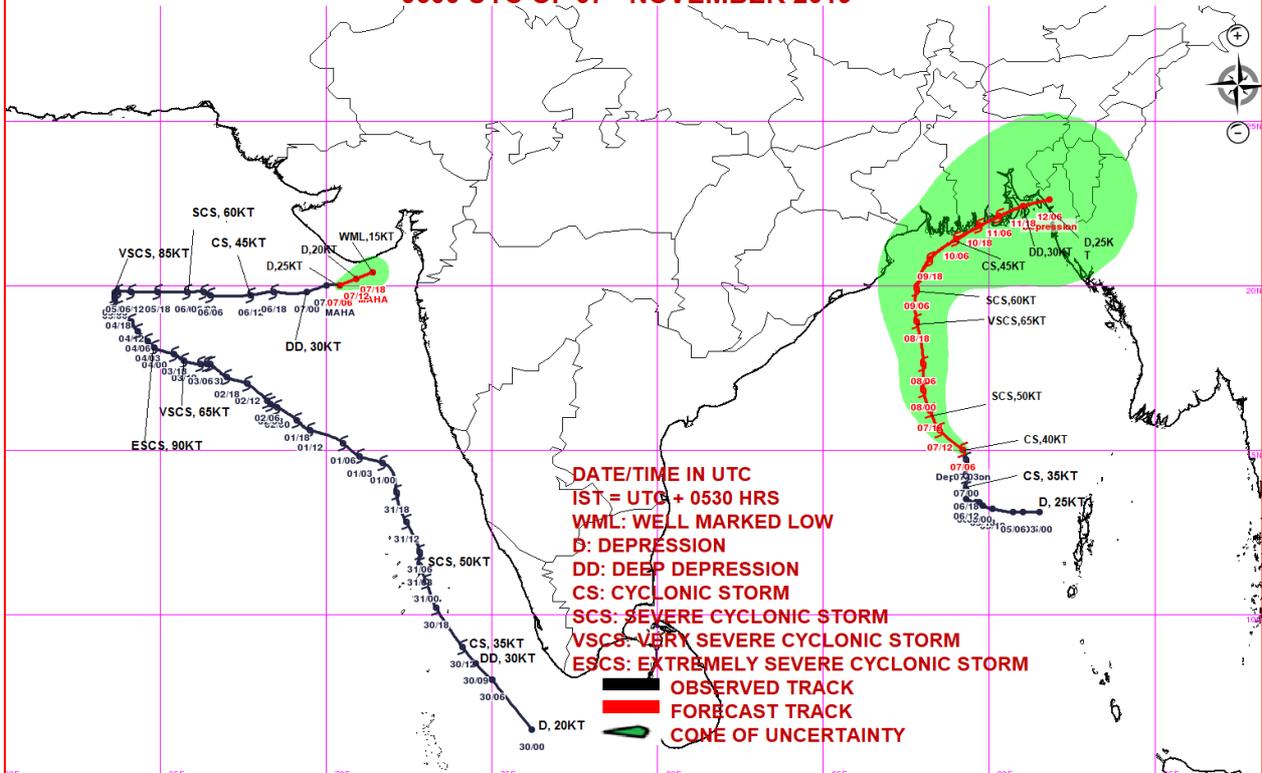
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT 50-100 X10⁻⁵ SEC⁻¹ TO THE SOUTH OF SYSTEM CENTRE. THE RIDGE IS ROUGHLY ALONG 19°N RUNS OVER THE SYSTEM AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT 05X10⁻⁵ S⁻¹ IN SOUTH WEST SECTOR. THE VERTICAL WIND SHEAR IS 30-35 KNOTS OVER THE SYSTEM AREA AND ALONG THE FORECAST TRACK. SEA SURFACE TEMPERATURE IS BETWEEN 28-29°C TO THE SOUTHWEST OF THE SYSTEM CENTER AND TROPICAL CYCLONE HEAT POTENTIAL OF 20-40 KJ/CM² IS AROUND THE SYSTEM CENTER.

THE SYSTEM IS MOVING EASTWARDS UNDER THE INFLUENCE OF MID-LATITUDE WESTERLIES. ALSO THE SYSTEM HAS WEAKENED UNDER THE INFLUENCE OF UNFAVOURABLE VERTICAL WIND SHEAR ENVIRONMENT. SINCE THIS CONDITION IS VERY LIKELY TO CONTINUE ALONG THE FORECAST TRACK, FURTHER WEAKENING IS ANTICIPATED DURING NEXT 06 HOURS. MAJORITY OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

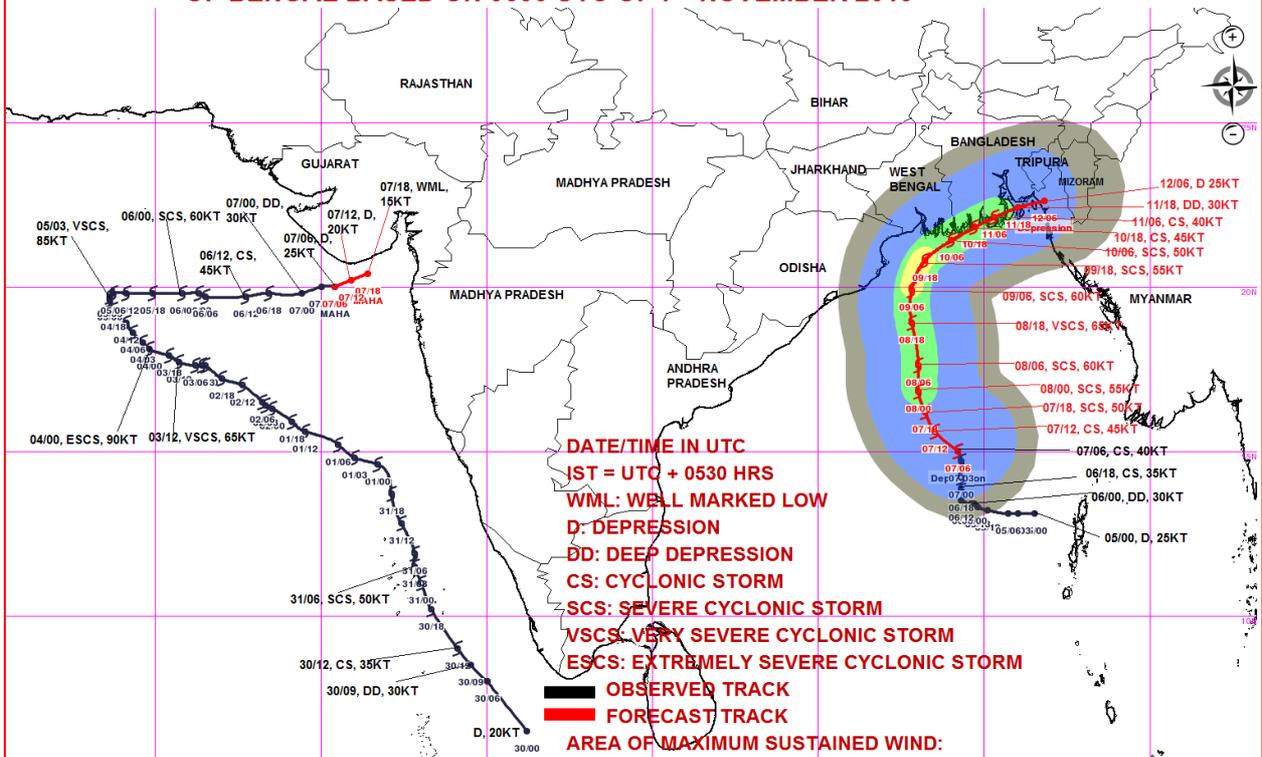
**(SUNITHA DEVI. S)
SCIENTIST-E, RSMC, NEW DELHI**



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH (A) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL BAY OF BENGAL (B) DEPRESSION OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND BASED ON 0600 UTC OF 07th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH (A) DEPRESSION (MAHA) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA AND (B) CYCLONIC STORM "BULBUL" OVER EASTCENTRAL BAY OF BENGAL BASED ON 0600 UTC OF 7th NOVEMBER 2019



MSW(knot)(kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-53 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 05 AND BULLETIN NO. 65**

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 BULLETIN NO. 05 AND BULLETIN NO. 65 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 07.11.2019 BASED ON 1200 UTC OF 07.11.2019.

**SUB:(A) SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.
(B) WELL MARKED LOW PRESSURE AREA OVER NORTHEAST ARABIAN SEA AND ADJOINING SOUTH GUJARAT COAST.**

BULLETIN NO. 05

(A) SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER EASTCENTRAL BAY OF BENGAL MOVED NORTHWESTWARDS WITH A SPEED OF 27KMPH DURING PAST 06 HOURS, INTENSIFIED INTO A SEVERE CYCLONIC STORM AND LAY CENTRED AT 1200 UTC OF 7TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.15.9°N AND LONG. 88.0°E ABOUT 510 KM SOUTH-SOUTHEAST OF PARADIP (42976), 640 KM SOUTH OF SAGAR ISLANDS (42903) AND 710 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY FURTHER TILL EARLY MORNING OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE INITIALLY NORTH-NORTHWESTWARDS FOR NEXT 12 HOURS, THEN NEARLY NORTHWARDS TILL 9TH NOVEMBER MORNING AND THEN RE-CURVE NORTHEASTWARDS TOWARDS BANGLADESH AND ADJOINING WEST BENGAL.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (⁰ N)	LONG. (⁰ E)		
07.11.19/1200	15.9	88.0	90-100 gusting to 100	Severe Cyclonic Storm
07.11.19/1800	16.4	87.7	100-110 gusting to 120	Severe Cyclonic Storm
08.11.19/0000	16.8	87.5	105-115 gusting to 125	Severe Cyclonic Storm
08.11.19/0600	17.6	87.4	110-120 gusting to 135	Severe Cyclonic Storm
08.11.19/1200	18.3	87.4	120-130 gusting to 145	Very Severe Cyclonic Storm
09.11.19/0000	19.5	87.5	120-130 gusting to 145	Severe Cyclonic Storm
09.11.19/1200	20.4	87.9	110-120 gusting to 135	Severe Cyclonic Storm
10.11.19/0000	21.1	88.3	100-110 gusting to 115	Severe Cyclonic Storm
10.11.19/1200	21.5	89.0	90-100 gusting to 100	Severe Cyclonic Storm
11.11.19/0000	21.8	89.7	70-80 gusting to 90	Cyclonic Storm
11.11.19/1200	21.9	90.5	50-60 gusting to 70	Deep Depression
12.11.19/0000	22.0	92.2	35-45 gusting to 55	Depression

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EAST CENTRAL AND ADJOINING WEST CENTRAL BAY OF BENGAL BETWEEN LAT. 12.0°N TO 21.0°N AND LONG. 84.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1200 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.0°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1002.1 HPA, SST 29.3°C AND WIND 350°/18 KNOTS; ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.3°N / 87.9°E REPORTED MEAN SEA LEVEL PRESSURE 996.4 HPA, SST 29.2°C AND WIND 110°/19 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 50 KNOTS GUSTING TO 60 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 996 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IS ABOUT 20-25 KNOTS TO THE WEST OF THE SYSTEM CENTRE. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH EASTEREN PERIPERY OF ABOVE ANTICYLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVED NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

BULLETIN NO. 65

B) DEPRESSION WEAKENED INTO A WELL MARKED LOW PRESSURE AREA OVER NORTHEAST ARABIAN SEA AND ADJOINING SOUTH GUJARAT COAST

THE **DEPRESSION** OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED EAST-NORTHEASTWARDS, WEAKENED INTO A WELL MARKED LOW PRESSURE AREA OVER NORTHEAST ARABIAN SEA AND ADJOINING SOUTH GUJARAT COAST AT 1200 UTC OF TODAY, THE 07TH NOVEMBER, 2019.

THIS IS THE LAST BULLETIN FOR THIS SYSTEM

**(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI**

SAT : INSAT-3D IMG

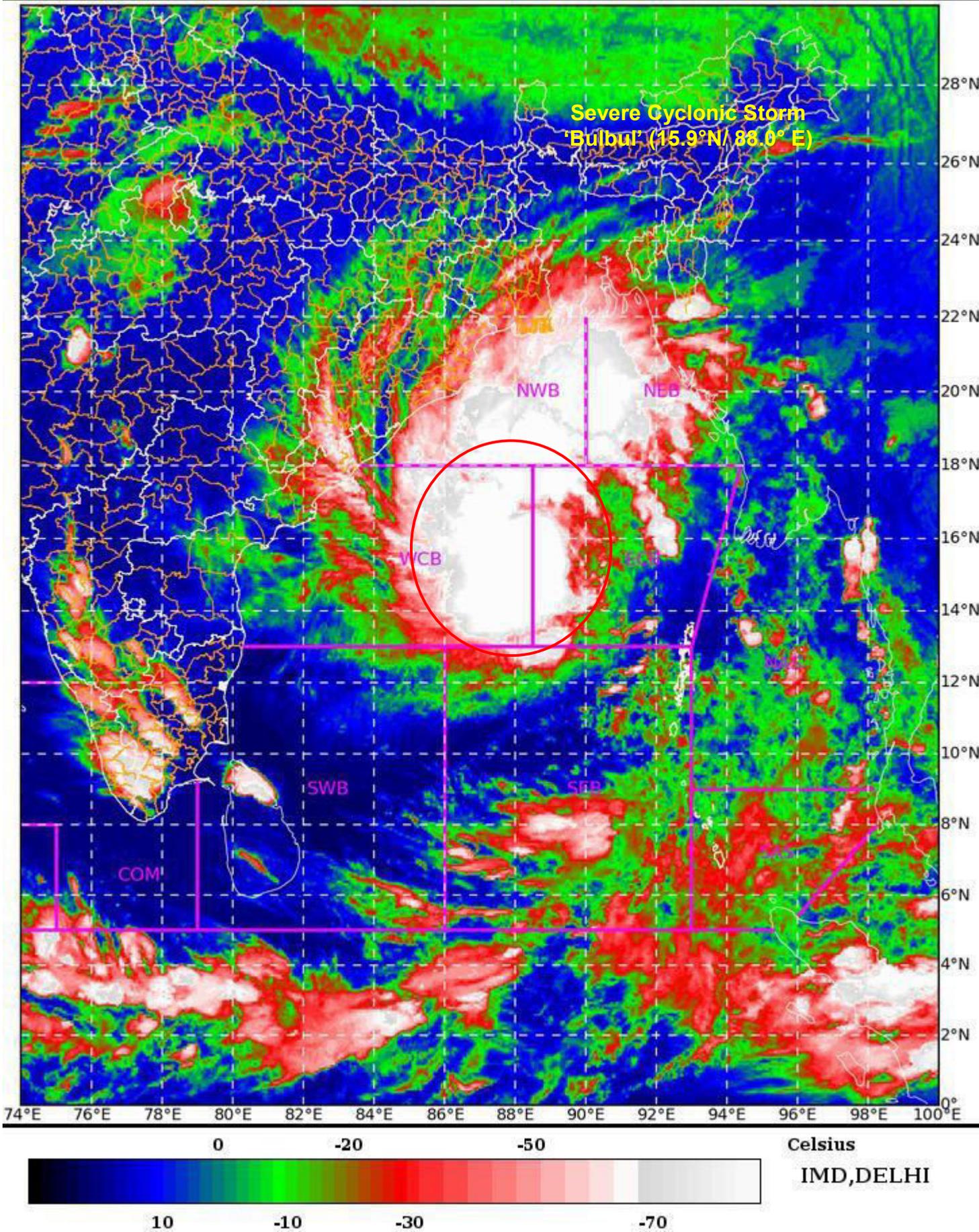
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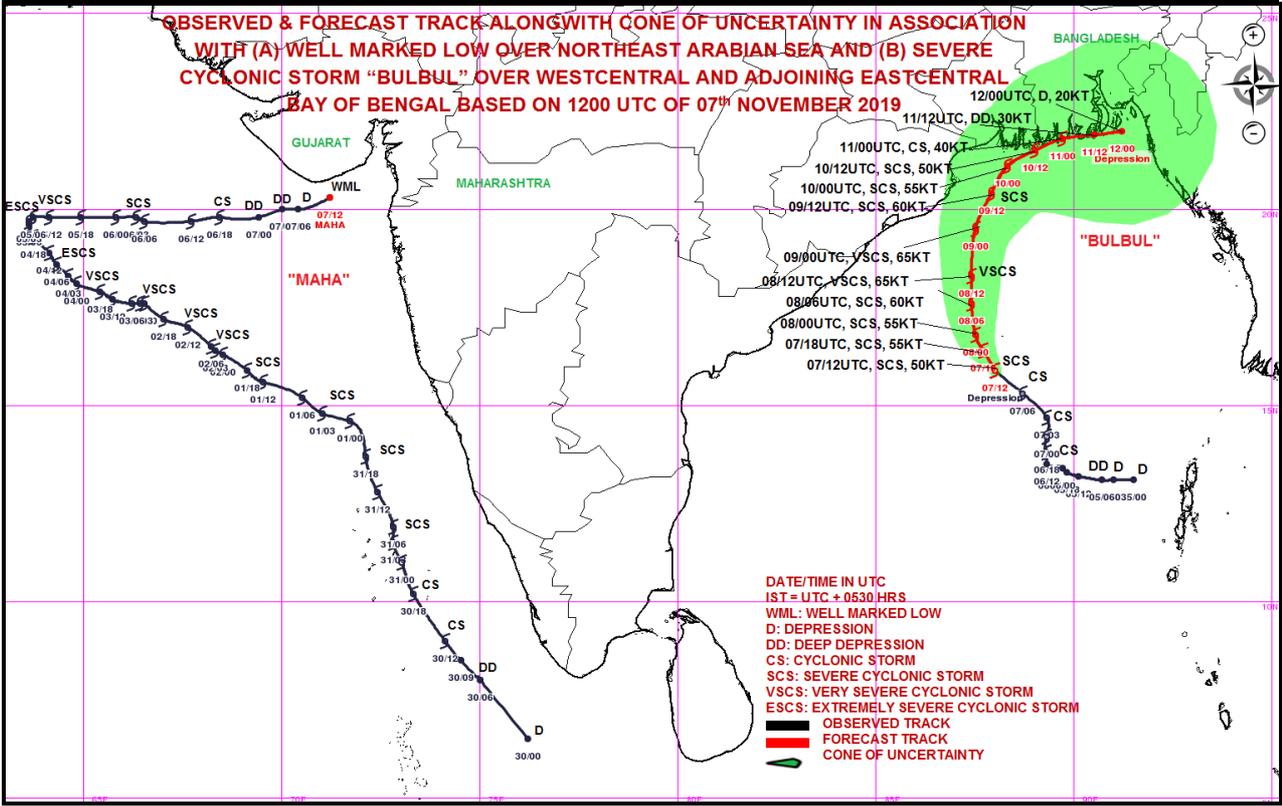
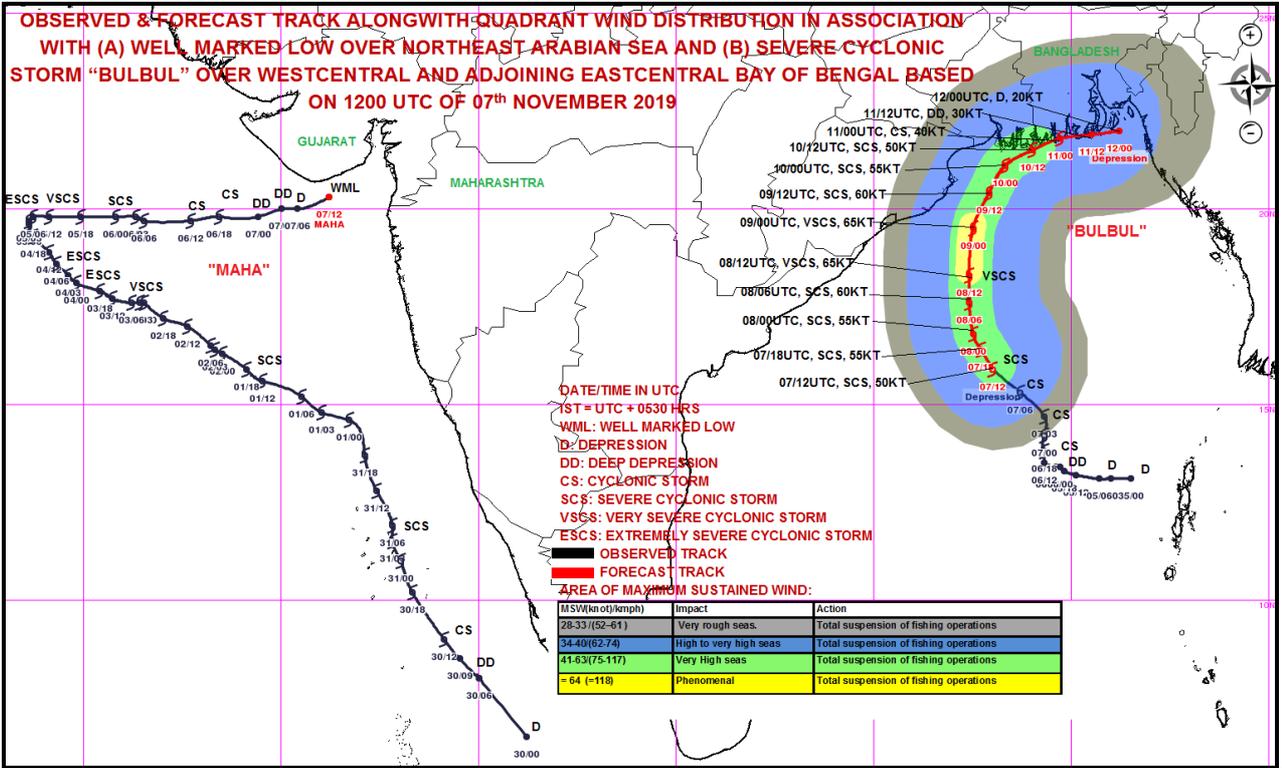
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07-11-2019/(1930 to 1956) IST



L1C Mercator







**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 06**

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 BULLETIN NO. 06 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1700 UTC OF 07.11.2019 BASED ON 1500 UTC OF 07.11.2019.

SUB:SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

BULLETIN NO. 06

THE SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WEST CENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 16KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1500 UTC OF 7TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.16.2°N AND LONG. 87.9°E ABOUT 470 KM SOUTH-SOUTHEAST OF PARADIP (42976), 600 KM SOUTH OF SAGAR ISLANDS (42903) AND 690 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY FURTHER TILL EARLY MORNING OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE INITIALLY NORTH-NORTHWESTWARDS FOR NEXT 12 HOURS, THEN NEARLY NORTHWARDS TILL 9TH NOVEMBER MORNING. THEREAFTER, IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COAST BETWEEN SAGAR ISLANDS AND KHEPUPARA AROUND FORENOON OF 10TH NOVEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/1500	16.2	87.9	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
07.11.19/1800	16.4	87.7	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
08.11.19/0000	16.8	87.5	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
08.11.19/0600	17.6	87.4	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/1200	18.3	87.4	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0000	19.5	87.5	120-130 GUSTING TO 145	SEVERE CYCLONIC STORM
09.11.19/1200	20.5	87.9	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
10.11.19/0000	21.3	88.5	100-110 GUSTING TO 115	SEVERE CYCLONIC STORM
10.11.19/1200	22.0	89.2	90-100 GUSTING TO 100	SEVERE CYCLONIC STORM
11.11.19/0000	22.6	90.0	70-80 GUSTING TO 90	CYCLONIC STORM
11.11.19/1200	23.1	90.7	50-60 GUSTING TO 70	DEEP DEPRESSION
12.11.19/0000	23.6	91.4	35-45 GUSTING TO 55	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EAST CENTRAL AND ADJOINING WEST CENTRAL BAY OF BENGAL BETWEEN LAT. 12.0°N TO 21.0°N AND LONG. 84.5°E TO 92.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1500 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.0°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1004.9 HPA, SST 29.3°C AND WIND 320°/16 KNOTS; ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.3°N / 87.9°E REPORTED MEAN SEA LEVEL PRESSURE 995 HPA, SST 29.2°C AND WIND 100°/25 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 50 KNOTS GUSTING TO 60 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IS ABOUT 20-25 KNOTS TO THE WEST OF THE SYSTEM CENTRE. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH EASTEREN PERIPERY OF ABOVE ANTICYLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVED NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(V R DURAI)
SCIENTIST-E, RSMC, NEW DELHI

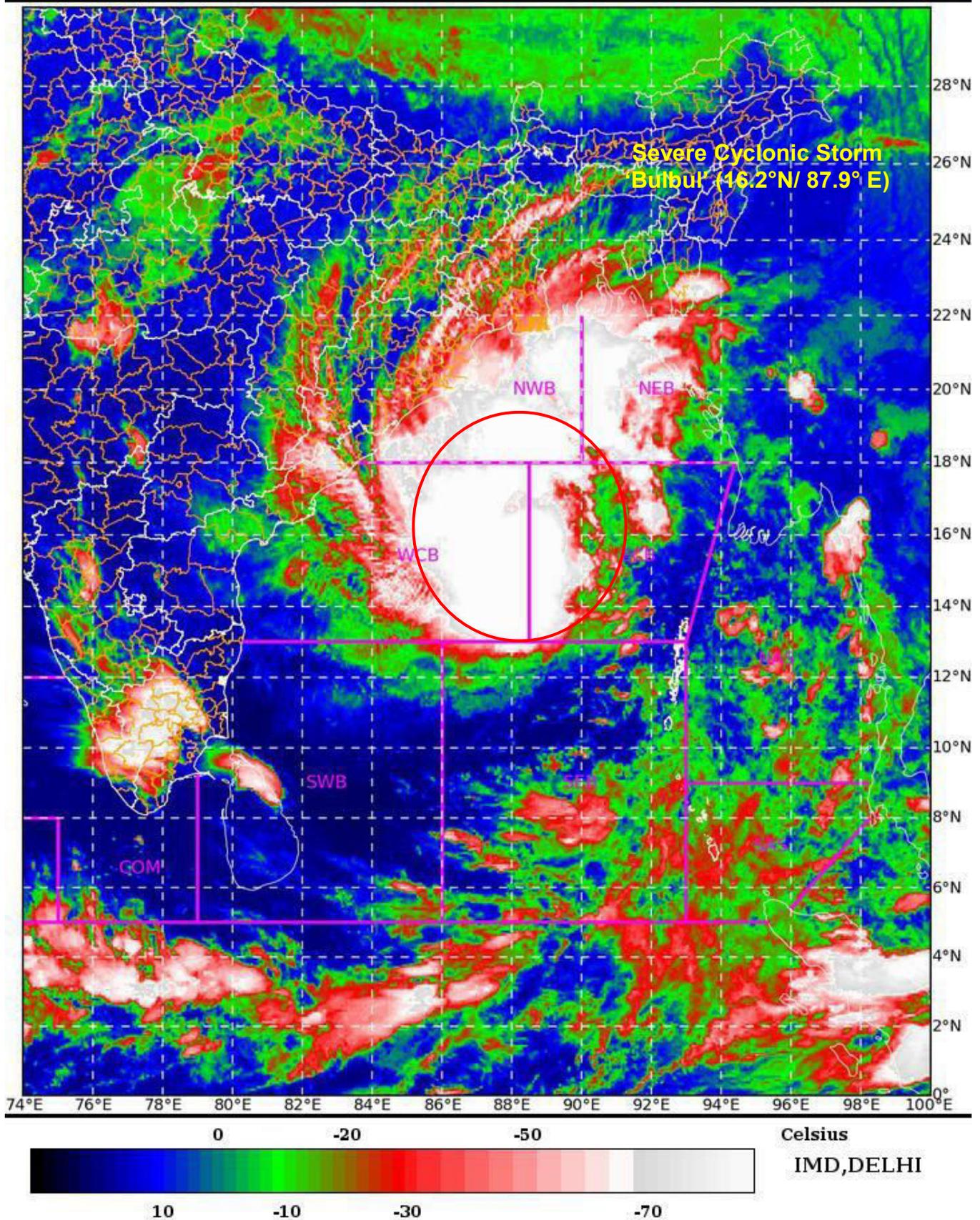
SAT : INSAT-3D IMG

07-11-2019/(1530 to 1556) GMT

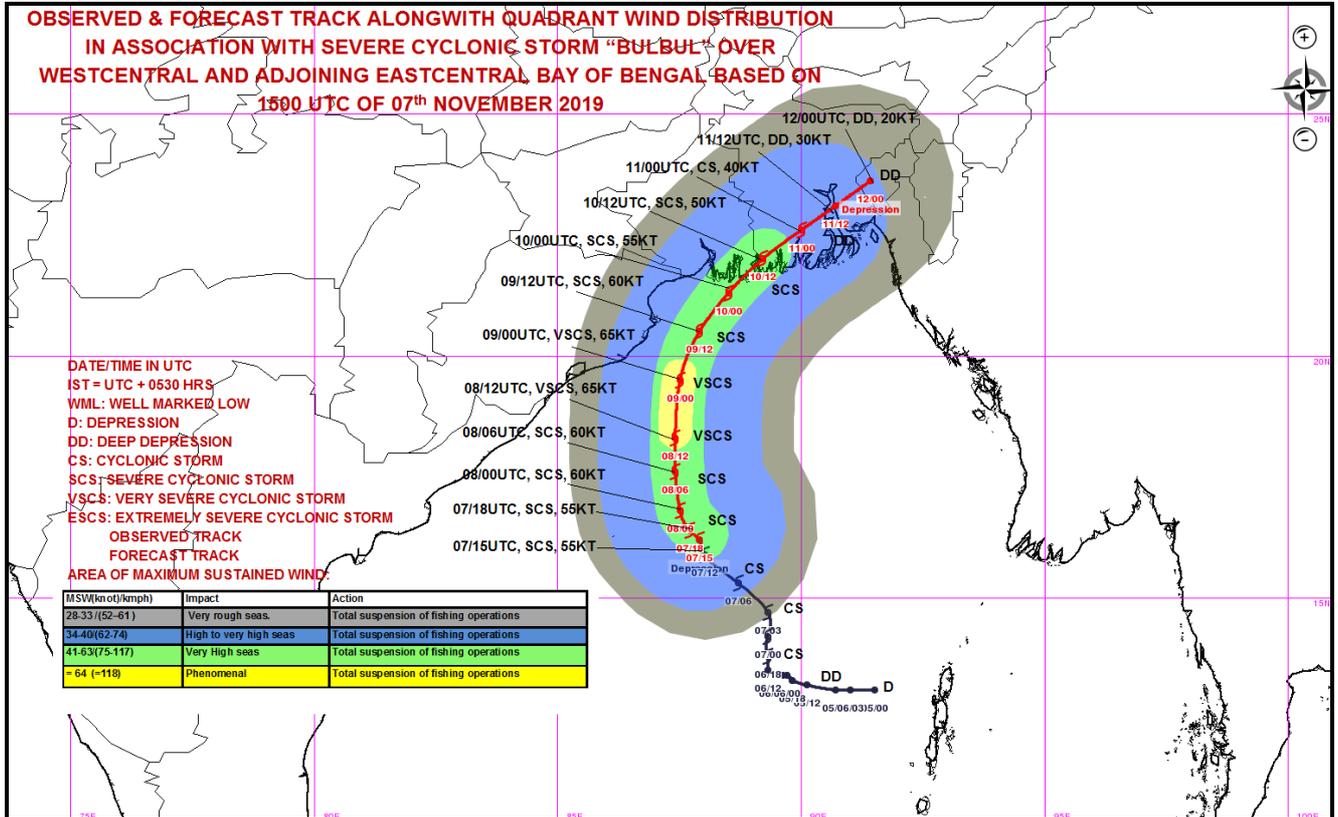
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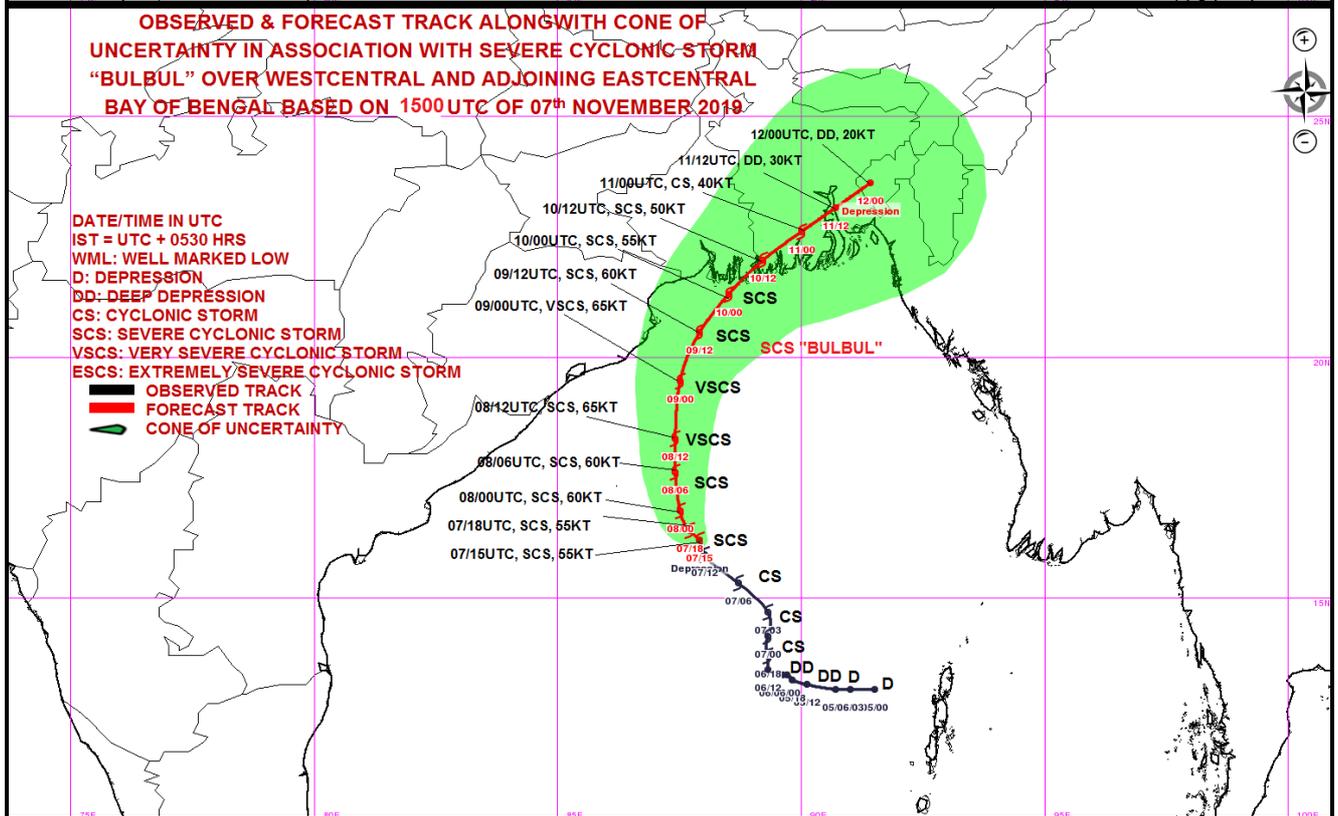
L1C Mercator



**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION
IN ASSOCIATION WITH SEVERE CYCLONIC STORM "BULBUL" OVER
WESTCENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL BASED ON
1500 UTC OF 07th NOVEMBER 2019**



**OBSERVED & FORECAST TRACK ALONGWITH CONE OF
UNCERTAINTY IN ASSOCIATION WITH SEVERE CYCLONIC STORM
"BULBUL" OVER WESTCENTRAL AND ADJOINING EASTCENTRAL
BAY OF BENGAL BASED ON 1500 UTC OF 07th NOVEMBER 2019**





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 07**

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 BULLETIN NO. 07 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2100 UTC OF 07.11.2019 BASED ON 1800 UTC OF 07.11.2019.

SUB:SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

BULLETIN NO. 07

THE **SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL)** OVER WEST CENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1800 UTC OF 7TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.16.4°N AND LONG. 87.8°E ABOUT 450 KM SOUTH-SOUTHEAST OF PARADIP (42976), 580 KM SOUTH OF SAGAR ISLANDS (42903) AND 670 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY FURTHER TILL EARLY MORNING OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE INITIALLY NORTH-NORTHWESTWARDS FOR NEXT 12 HOURS, THEN NEARLY NORTHWARDS TILL 9TH NOVEMBER MORNING. THEREAFTER, IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COAST BETWEEN SAGAR ISLANDS (WEST BENGAL) AND KHEPUPARA (BANGLADESH) DURING THE EARLY HOURS OF 10TH NOVEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
07.11.19/1800	16.4	87.8	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
08.11.19/0000	16.9	87.6	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
08.11.19/0600	17.7	87.6	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/1200	18.5	87.6	125-135 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
08.11.19/1800	19.1	87.7	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0600	20.2	88.0	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
09.11.19/1800	21.3	88.7	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.3	89.6	75-85 GUSTING TO 95	CYCLONIC STORM
10.11.19/1800	22.7	90.5	55-65 GUSTING TO 75	DEEP DEPRESSION
11.11.19/0600	22.9	91.4	45-55 GUSTING TO 65	DEPRESSION
11.11.19/1800	23.0	92.3	35-45 GUSTING TO 55	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EAST CENTRAL AND ADJOINING WEST CENTRAL BAY OF BENGAL BETWEEN LAT. 13.0°N TO 20.0°N AND LONG. 85.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1800 UTC, A BUOY (23459) LOCATED NEAR LAT. 14.0°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1005.4 HPA, SST 29.3°C AND WIND 300°/18 KNOTS; ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.3°N / 87.9°E REPORTED SST 29.2°C AND WIND 90°/26 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IS ABOUT 20-25 KNOTS TO THE WEST OF THE SYSTEM CENTRE. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH EASTEREN PERIPERY OF ABOVE ANTICYCLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVED NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(V R DURAI)
SCIENTIST-E, RSMC, NEW DELHI

SAT : INSAT-3D IMG

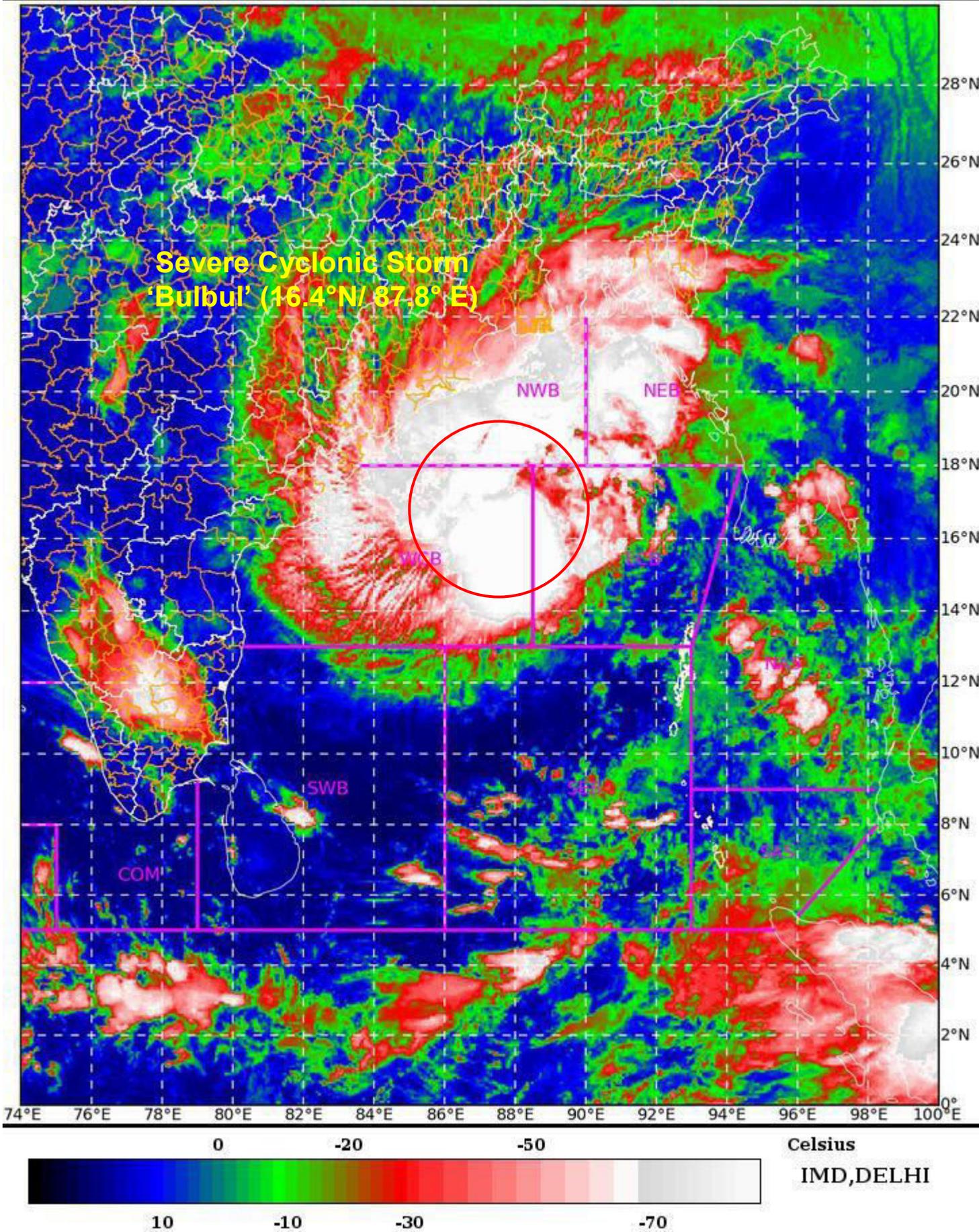
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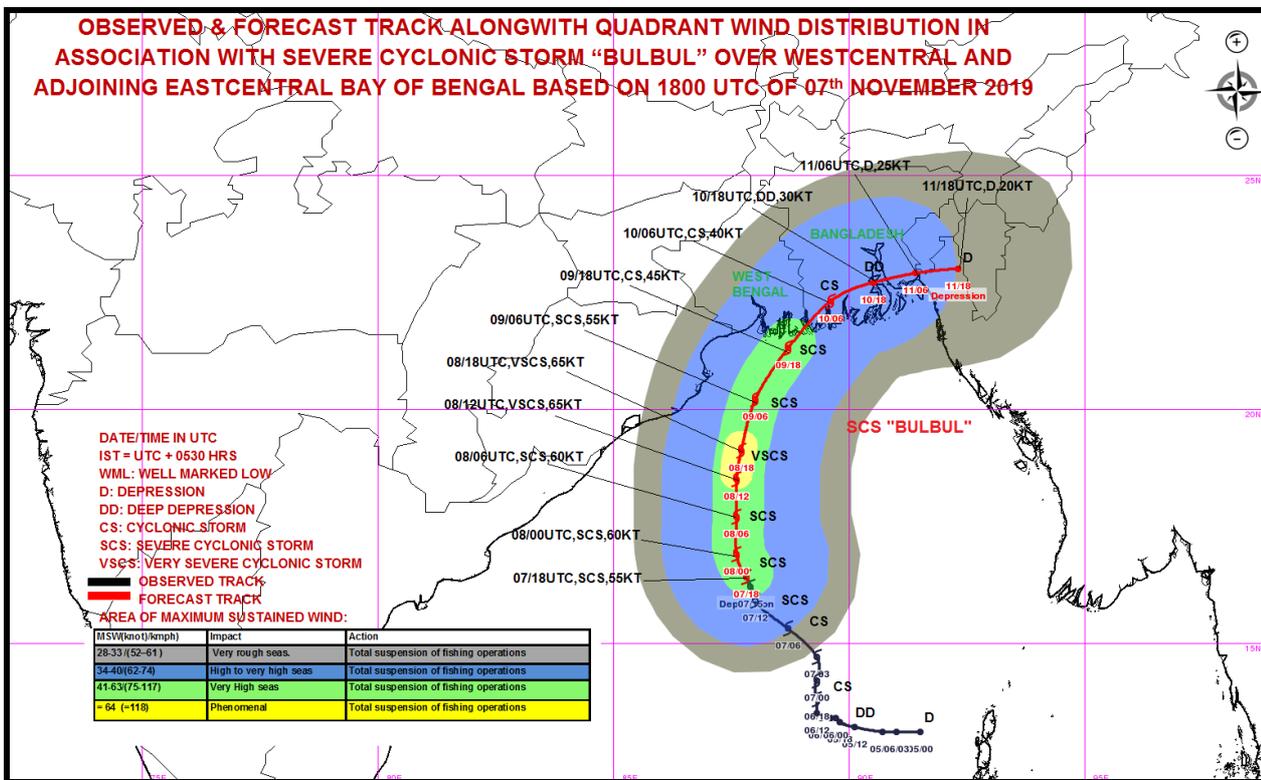
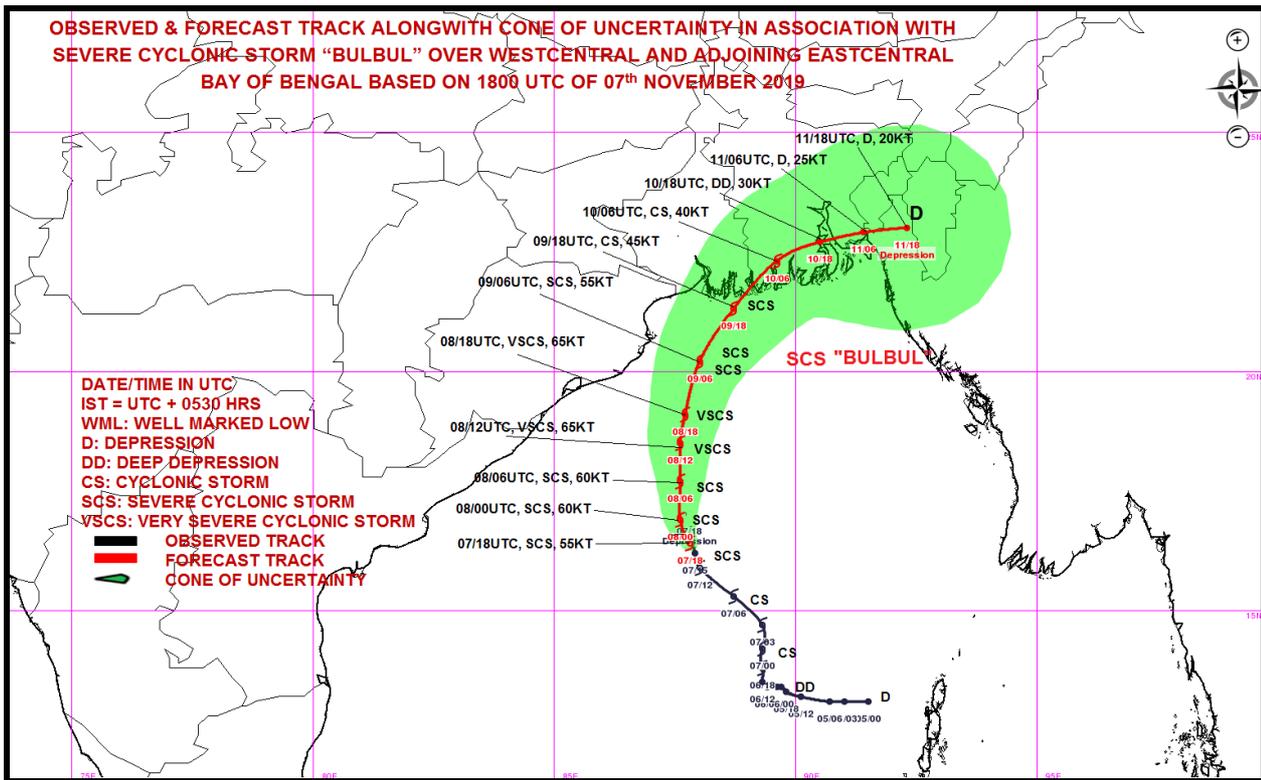
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08-11-2019/(0130 to 0156) IST



L1C Mercator







**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 08**

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 BULLETIN NO. 08 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0000 UTC OF 08.11.2019 BASED ON 2100 UTC OF 07.11.2019.

SUB:SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

BULLETIN NO. 08

THE SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WEST CENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 08 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 2100 UTC OF 7TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.16.6°N AND LONG. 87.7°E ABOUT 420 KM SOUTH-SOUTHEAST OF PARADIP (42976), 560 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 650 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY FURTHER TILL EARLY MORNING OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE INITIALLY NORTH-NORTHWESTWARDS FOR NEXT 12 HOURS, THEN NEARLY NORTHWARDS TILL 9TH NOVEMBER MORNING. THEREAFTER, IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COAST BETWEEN SAGAR ISLANDS (WEST BENGAL) AND KHEPUPARA (BANGLADESH) DURING THE EARLY HOURS OF 10TH NOVEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (⁰ N)	LONG. (⁰ E)		
07.11.19/2100	16.6	87.7	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
08.11.19/0000	16.9	87.6	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
08.11.19/0600	17.7	87.6	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
08.11.19/1200	18.5	87.6	125-135 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
08.11.19/1800	19.1	87.7	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/0600	20.2	88.0	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
09.11.19/1800	21.3	88.7	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.3	89.6	75-85 GUSTING TO 95	CYCLONIC STORM
10.11.19/1800	22.7	90.5	55-65 GUSTING TO 75	DEEP DEPRESSION
11.11.19/0600	22.9	91.4	45-55 GUSTING TO 65	DEPRESSION
11.11.19/1800	23.0	92.3	35-45 GUSTING TO 55	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 07th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EAST CENTRAL AND ADJOINING WEST CENTRAL BAY OF BENGAL BETWEEN LAT. 13.0°N TO 20.0°N AND LONG. 85.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 2100 UTC, A BUOY (23459) LOCATED NEAR LAT. 13.9°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1005 HPA, SST 29.2°C AND WIND 350°/12 KNOTS; ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.4°N / 88.0E REPORTED SST 29.1°C AND WIND 290°/25 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTRE.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IS ABOUT 20-25 KNOTS TO THE WEST OF THE SYSTEM CENTRE. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH EASTEREN PERIPERY OF ABOVE ANTICYCLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVED NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(V R DURAI)
SCIENTIST-E, RSMC, NEW DELHI

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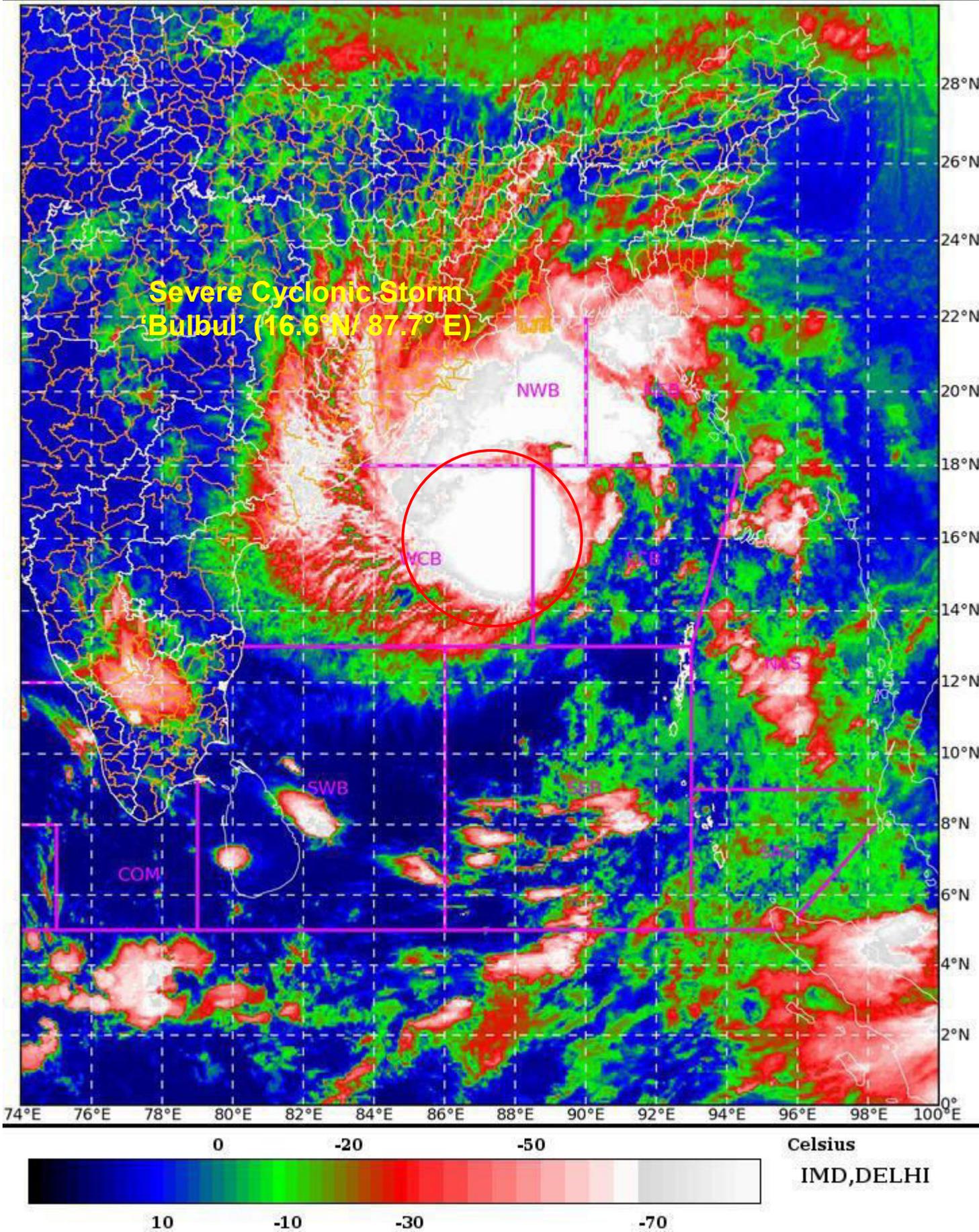
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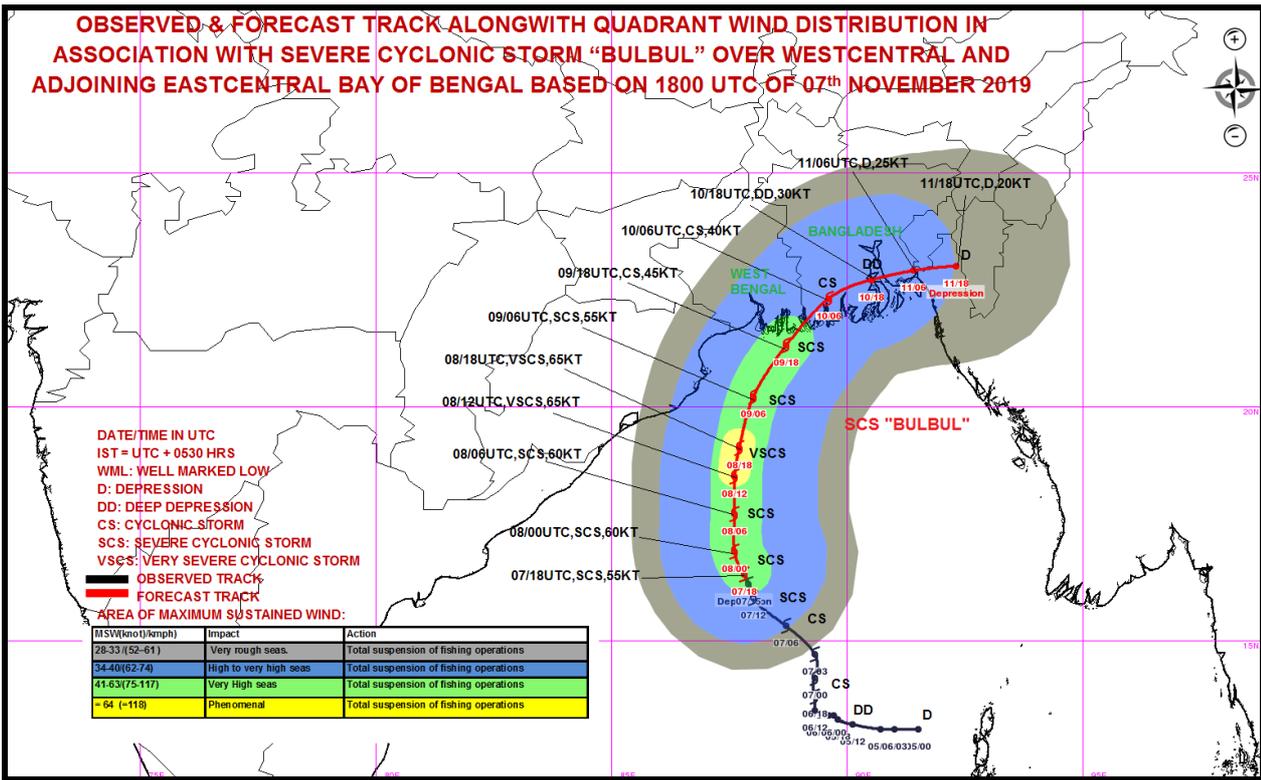
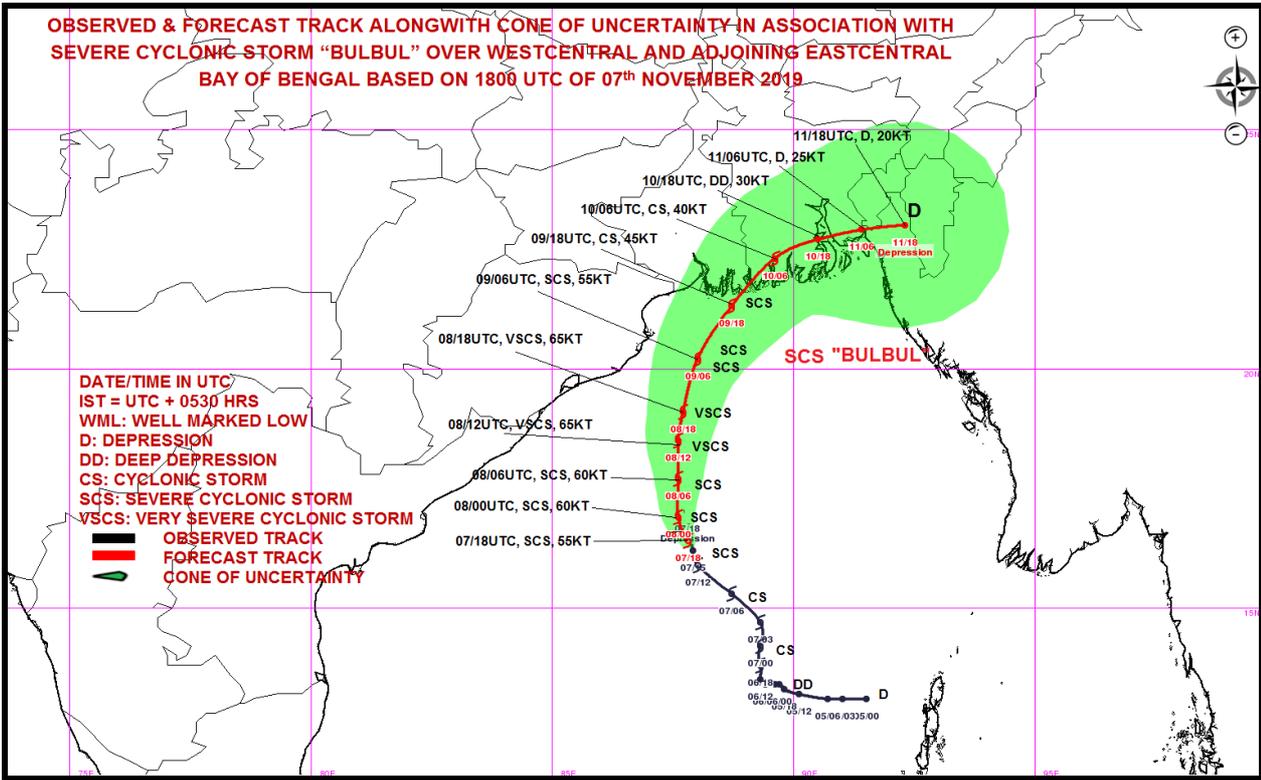
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08-11-2019/(0400 to 0426) IST



L1C Mercator







**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 09**

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 BULLETIN NO. 09 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 60 HOURS ISSUED AT 0330 UTC OF 08.11.2019 BASED ON 0000 UTC OF 08.11.2019.

SUB:VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

BULLETIN NO. 09

THE SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS, INTENSIFIED INTO A VERY SEVERE CYCLONIC STORM AND LAY CENTRED AT 0000 UTC OF 8TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.16.9°N AND LONG. 87.6°E ABOUT 390 KM SOUTH-SOUTHEAST OF PARADIP (42976), 530 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 630 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY FURTHER TILL 0000 UTC OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 0300 UTC OF 9TH NOVEMBER. THEREAFTER, IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1800 - 2100 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
08.11.19/0000	16.9	87.6	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
08.11.19/0600	17.7	87.6	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
08.11.19/1200	18.5	87.6	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
08.11.19/1800	19.10	87.7	150-160 GUSTING TO 175	VERY SEVERE CYCLONIC STORM
09.11.19/0000	19.6	87.8	150-160 GUSTING TO 175	VERY SEVERE CYCLONIC STORM
09.11.19/1200	20.8	88.3	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
10.11.19/0000	21.8	89.1	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
10.11.19/1200	22.5	90.1	75-85 GUSTING TO 95	CYCLONIC STORM
11.11.19/0000	22.8	90.8	50-60 GUSTING TO 70	DEEP DEPRESSION
11.11.19/1200	22.9	91.2	35-45 GUSTING TO 55	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EAST CENTRAL AND ADJOINING WEST CENTRAL BAY OF BENGAL BETWEEN LAT. 14.0°N TO 21.0°N AND LONG. 85.0°E TO 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0000 UTC, A BUOY (23459) LOCATED NEAR LAT. 14°N/87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1005 HPA, SST 29.2°C AND WIND 290°/16 KNOTS; ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0E REPORTED SST 29.1°C AND WIND 290°/35 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 70 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 986 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE OF ABOUT 1.5 TO 2.0 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF BANGLADESH COAST AND 1.0 TO 1.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF WEST BENGAL AT THE TIME OF LANDFALL.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND IS ABOUT 20-25 KNOTS TO THE WEST OF THE SYSTEM CENTRE. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH EASTEREN PERIPERY OF ABOVE ANTICYLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVED NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(V R DURAI)
SCIENTIST-E, RSMC, NEW DELHI.

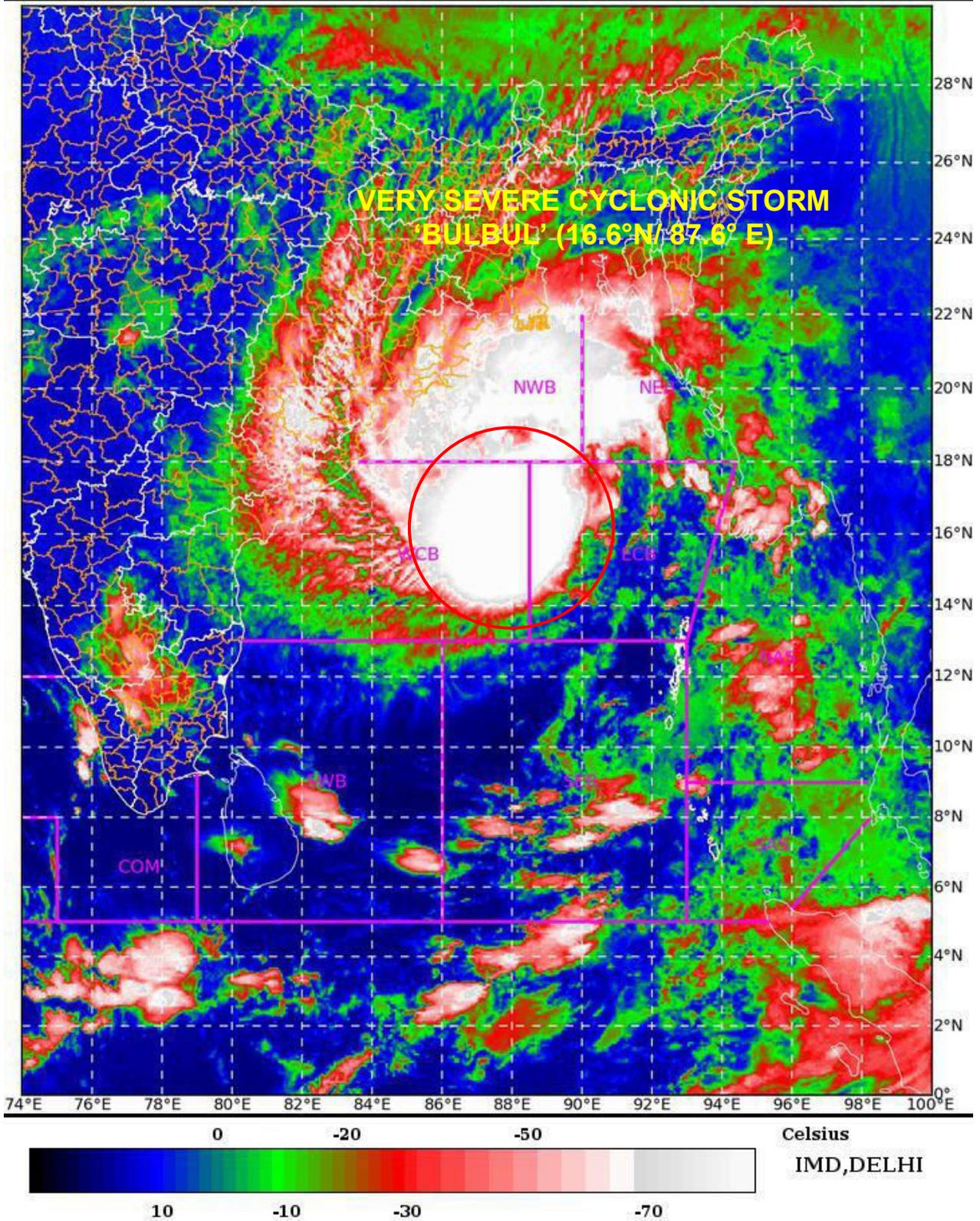
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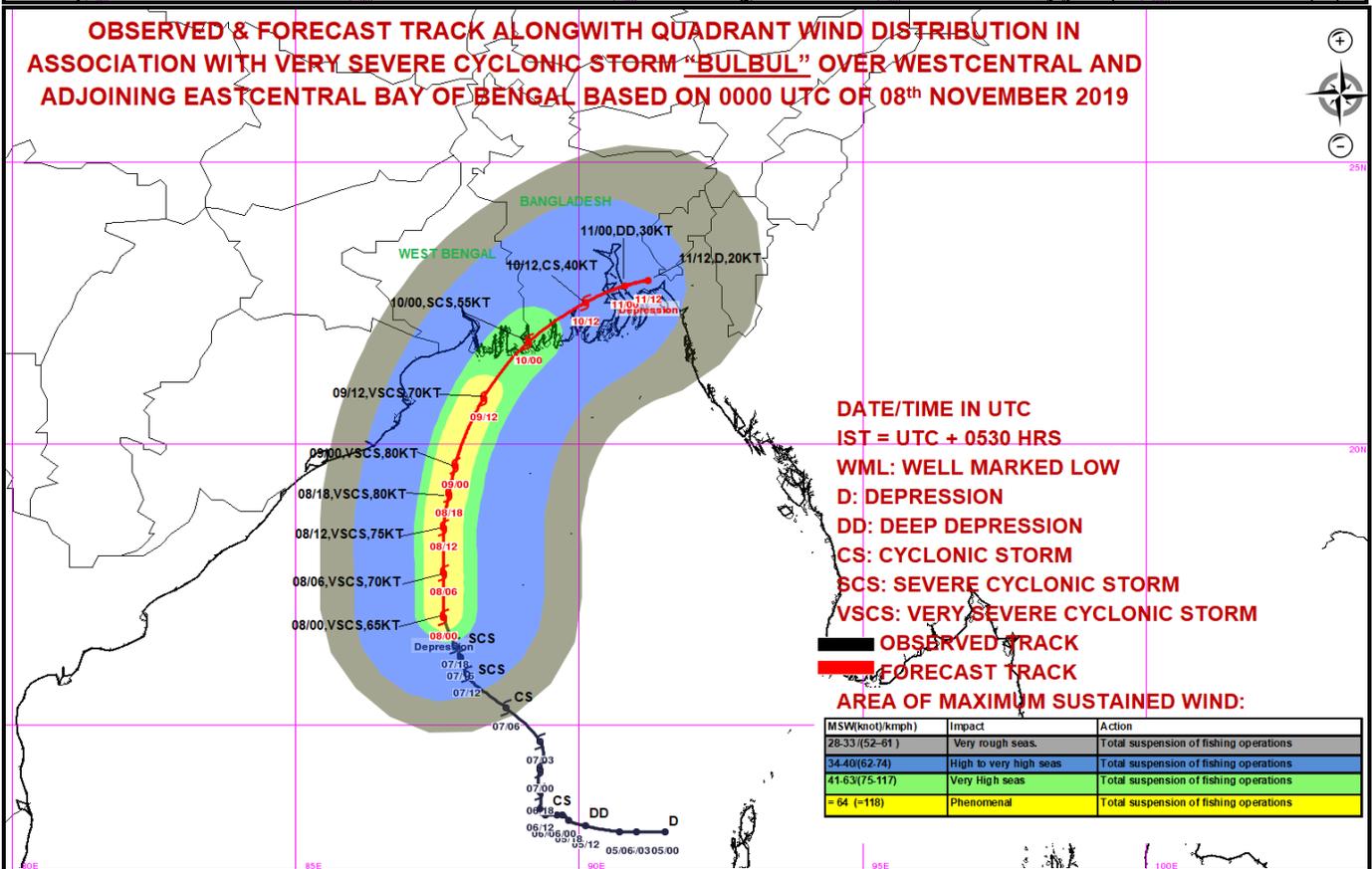
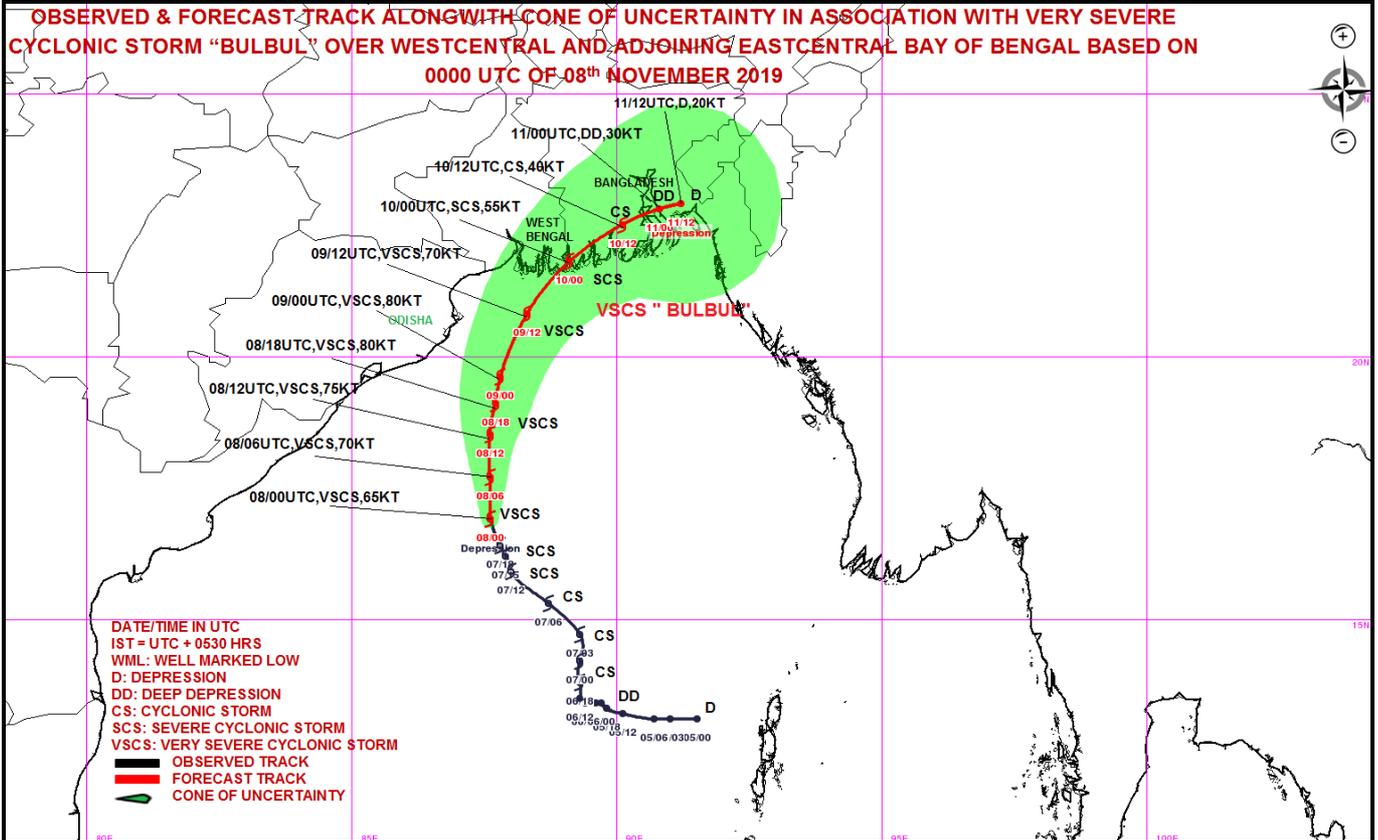
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08-11-2019/(0530 to 0556) IST

L1C Mercator







**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 10**

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 BULLETIN NO. 10 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 60 HOURS ISSUED AT 0530 UTC OF 08.11.2019 BASED ON 0300 UTC OF 08.11.2019.

SUB:VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

BULLETIN NO. 10

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 12 KMPH DURING PAST 06 HOURS, LAY CENTRED AT 0300 UTC OF 8TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.17.2°N AND LONG. 87.6°E ABOUT 350 KM SOUTH-SOUTHEAST OF PARADIP (42976), 490 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 590 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO INTENSIFY FURTHER TILL 0000 UTC OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 0300 UTC OF 9TH NOVEMBER. THEREAFTER, IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1800 - 2100 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
08.11.19/0300	17.2	87.6	120-130 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
08.11.19/0600	17.7	87.6	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
08.11.19/1200	18.5	87.6	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
08.11.19/1800	19.10	87.7	150-160 GUSTING TO 175	VERY SEVERE CYCLONIC STORM
09.11.19/0000	19.6	87.8	150-160 GUSTING TO 175	VERY SEVERE CYCLONIC STORM
09.11.19/1200	20.8	88.3	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
10.11.19/0000	21.8	89.1	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
10.11.19/1200	22.5	90.1	75-85 GUSTING TO 95	CYCLONIC STORM
11.11.19/0000	22.8	90.8	50-60 GUSTING TO 70	DEEP DEPRESSION
11.11.19/1200	22.9	91.2	35-45 GUSTING TO 55	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WEST CENTRAL AND ADJOINING EAST CENTRAL BAY OF BENGAL BETWEEN LAT. 14.0°N TO 21.0°N AND LONG. 86.0°E TO 91.5°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0300 UTC, A BUOY (23459) BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0E REPORTED SST 28.9°C AND WIND 300°/39 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 986 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE OF ABOUT 1.5 TO 2.0 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF BANGLADESH COAST AND 1.0 TO 1.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF WEST BENGAL AT THE TIME OF LANDFALL.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS MORE THAN $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20-30 \times 10^{-5} \text{ S}^{-1}$ CLOSE TO THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS 15-20 KNOTS OVER THE SYSTEM AREA AND INCREASING ALONG THE FORECAST TRACH AND BECOMING HIGH. THE RIDGE RUNS ROUGHLY ALONG 17°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH WESTEREN PERIPERY OF ABOVE ANTICYLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVE NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(NEETHA K. GOPAL)
SCIENTIST-E, RSMC, NEW DELHI.

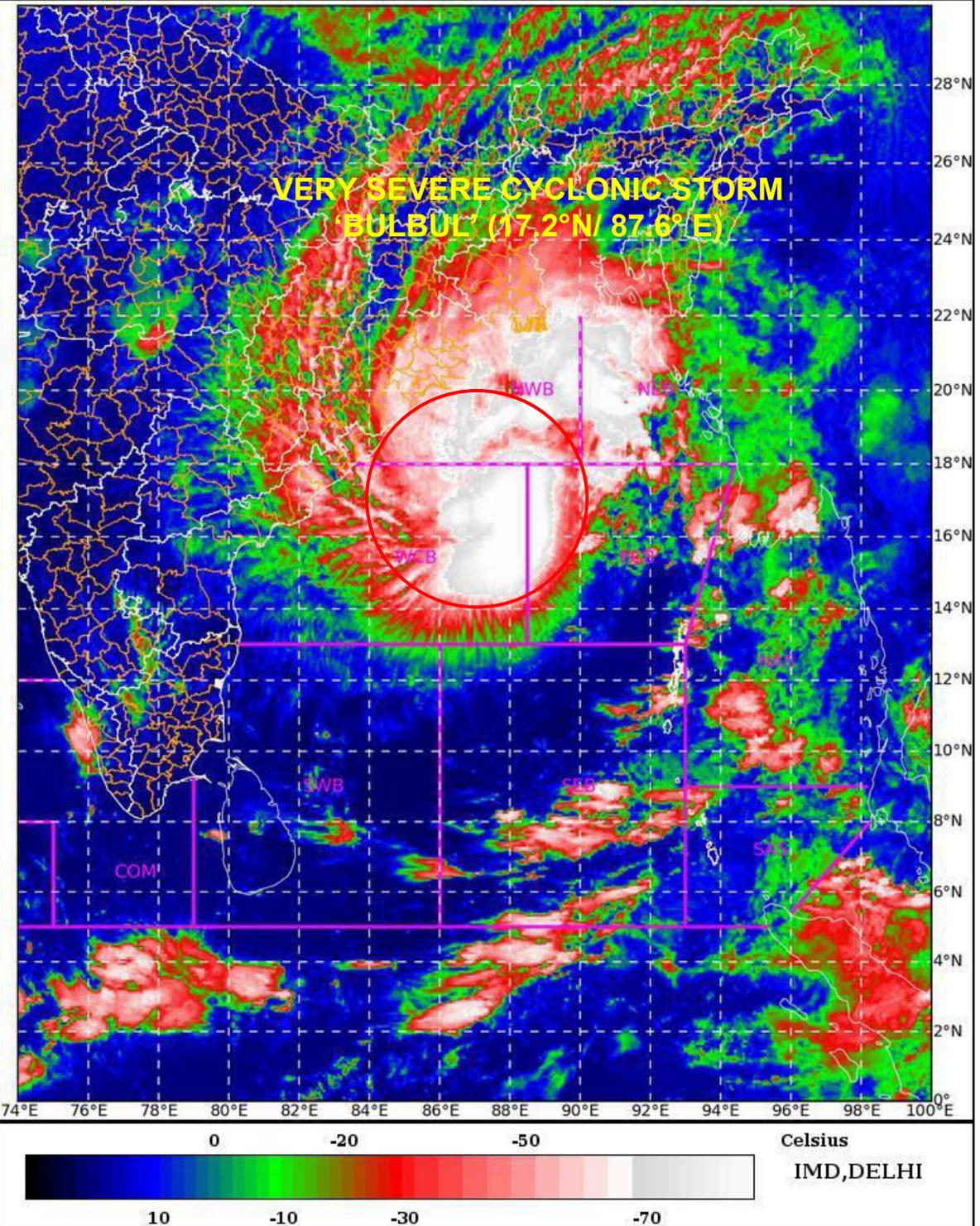
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08-11-2019/(0330 to 0357) GMT

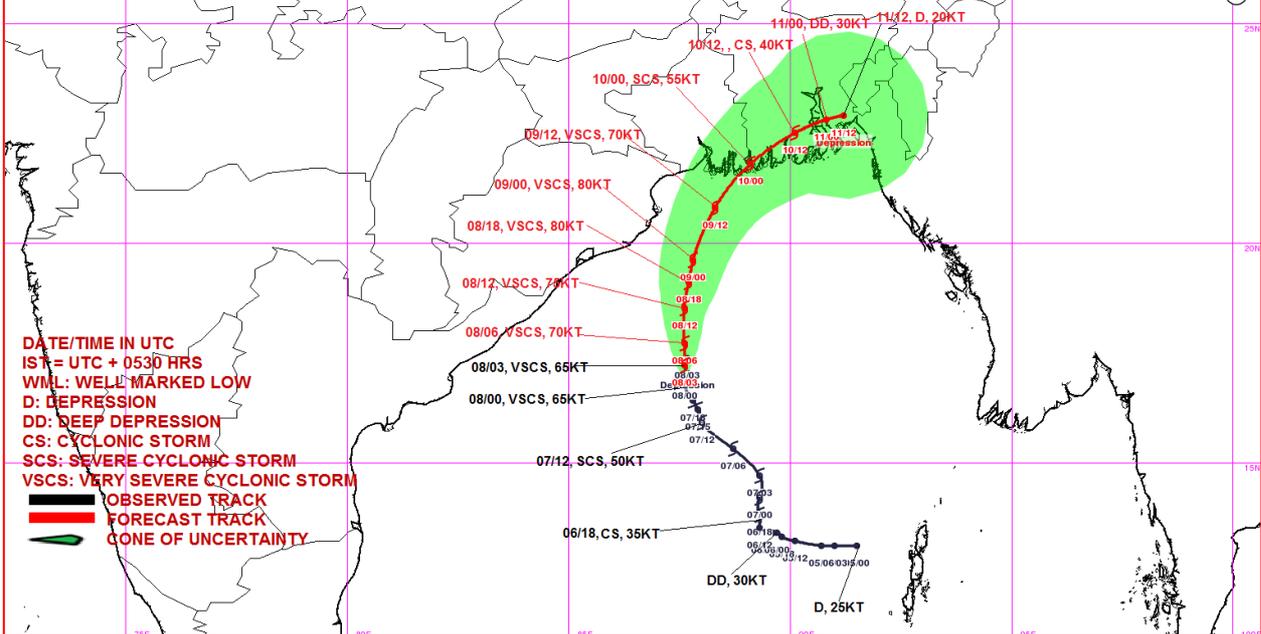
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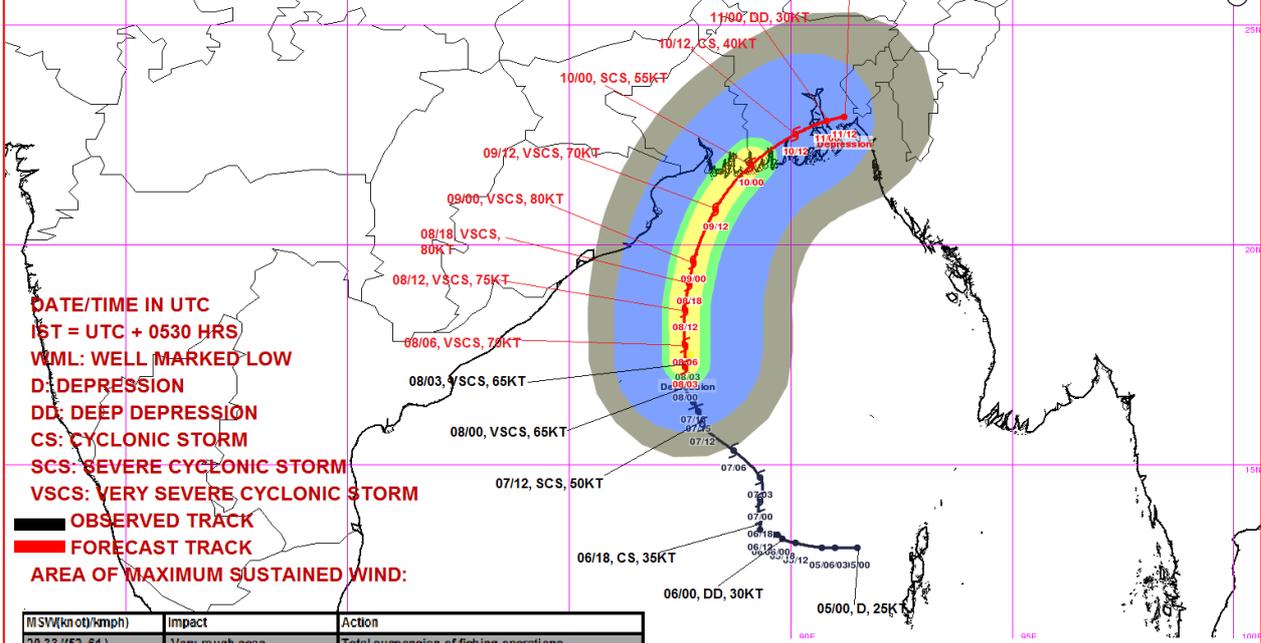
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OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER WESTCENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL BASED ON 0300 UTC OF 08th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER WESTCENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL BASED ON 0300 UTC OF 08th NOVEMBER 2019



MSW(knot)/kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-63 (75-117)	Very High seas	Total suspension of fishing operations
> 64 (>118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 12**

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 BULLETIN NO. 12 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0900 UTC OF 08.11.2019 BASED ON 0600 UTC OF 08.11.2019.

SUB:VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL.

BULLETIN NO. 12

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTHWARDS WITH A SPEED OF 17 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 0900 UTC OF 8TH NOVEMBER 2019, OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL, NEAR LAT.18.1°N AND LONG. 87.6°E ABOUT 260 KM SOUTH-SOUTHEAST OF PARADIP (42976), 390 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 510 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984) . IT IS VERY LIKELY TO INTENSIFY FURTHER TILL 0000 UTC OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 0300 UTC OF 9TH NOVEMBER. THEREAFTER, IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1800-2100 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time (UTC)	Position		Maximum sustained surface wind speed (kmph)	Category of cyclonic disturbance
	Lat. (^o N)	Long. (^o E)		
08.11.19/0900	18.1	87.6	130-140 gusting to 155	Very Severe Cyclonic Storm
08.11.19/1200	18.7	87.6	140-150 gusting to 165	Very Severe Cyclonic Storm
08.11.19/1800	19.4	87.6	150-160 gusting to 175	Very Severe Cyclonic Storm
09.11.19/0000	20.1	87.8	150-160 gusting to 175	Very Severe Cyclonic Storm
09.11.19/0600	20.8	88.1	140-150 gusting to 165	Very Severe Cyclonic Storm
09.11.19/1800	22.0	89.2	110-120 gusting to 135	Severe Cyclonic Storm
10.11.19/0600	23.2	90.8	70-80 gusting to 90	Cyclonic Storm
10.11.19/1800	23.9	92.6	40-50 gusting to 60	Depression

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WEST CENTRAL AND ADJOINING EAST CENTRAL BAY OF BENGAL BETWEEN LAT. 16.5°N TO 20.0°N AND LONG. 86.5°E TO 90.0°E. THE MINIMUM CTT IS MINUS 93°C. AT 0900 UTC, A BUOY (23459) LOCATED NEAR LAT. 16.3°N / 88.0E REPORTED SST 29.1°C AND WIND 290°/14 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE OF ABOUT 1.5 TO 2.0 METRES HEIGHT ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF BANGLADESH COAST DURING THE TIME OF LANDFALL.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR DURING THE TIME OF LANDFALL.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 10-15 KNOTS TO THE WEST OF THE SYSTEM CENTRE AND IS INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 19°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS CONTINUED TO BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND .THE SYSTEM LIES IN THE SOUTH WESTEREN PERIPERY OF ABOVE ANTICYLONE. AS A RESULT , IT IS MOVING NORTH-NORTHWESTWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTH-NORTHWESTWARDS FOR SOMETIME TILL 20°N AND RECURVE NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI.

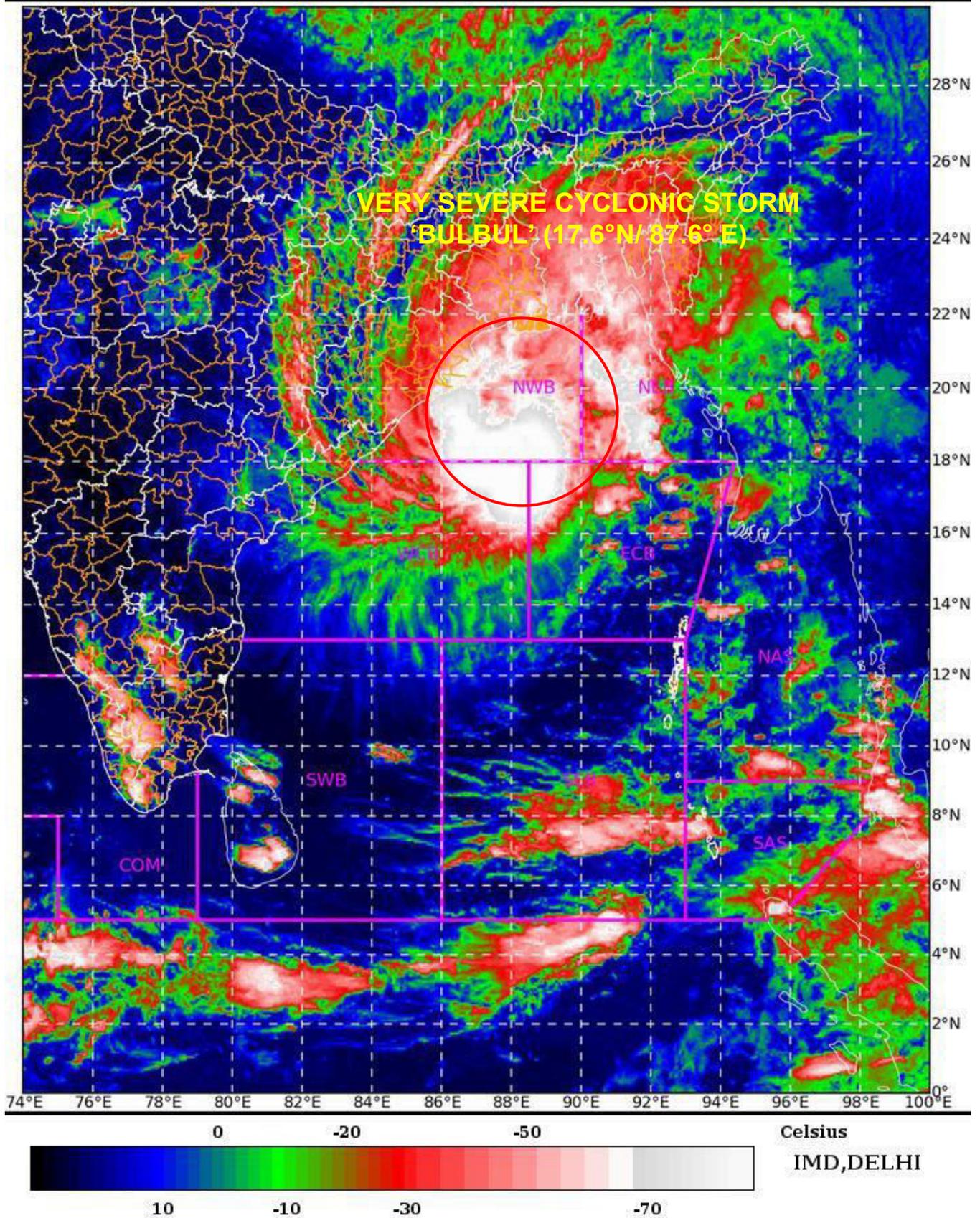
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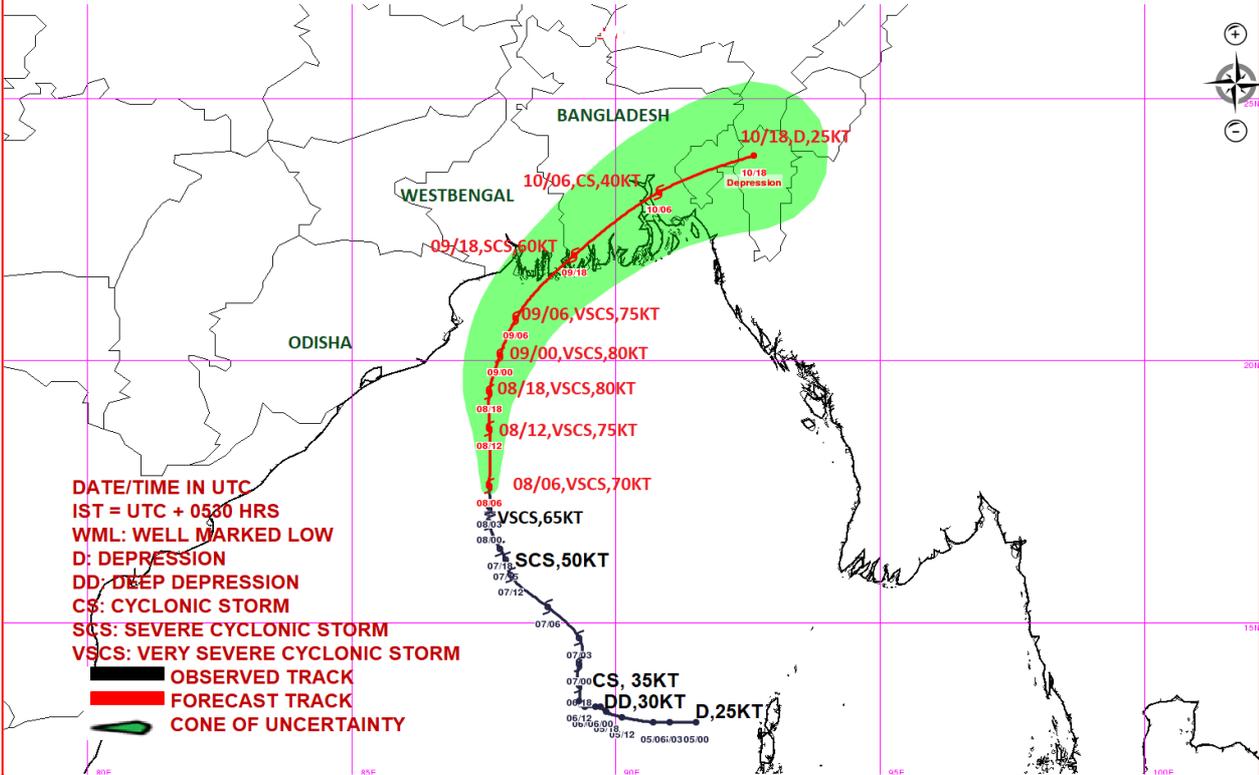
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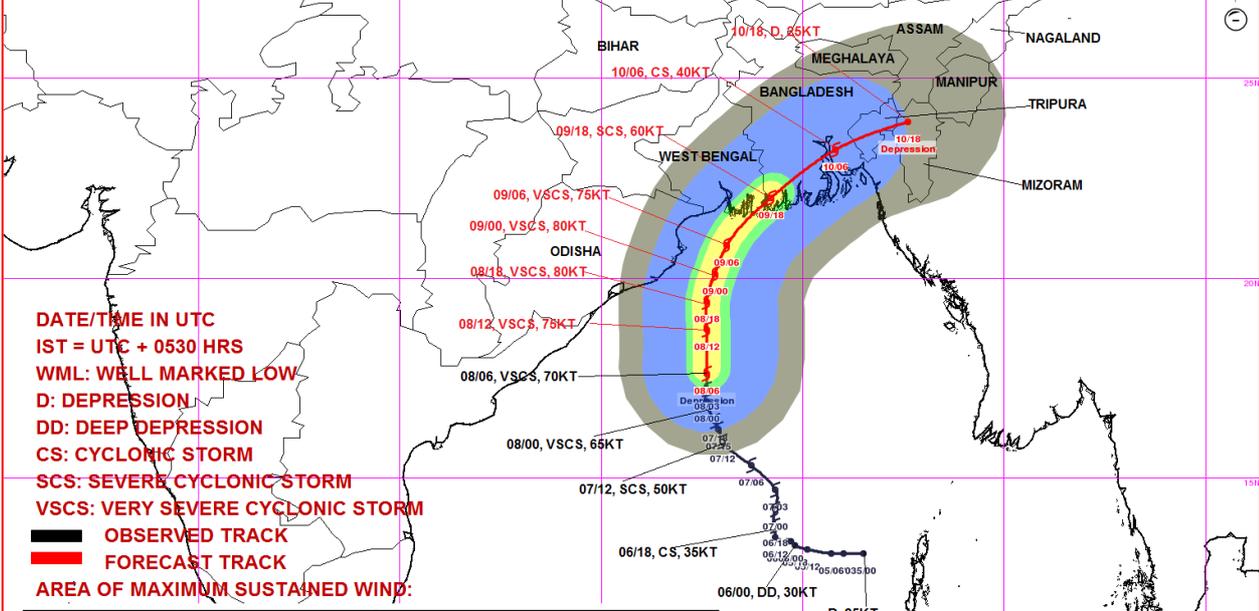
L1C Mercator



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH SEVERE CYCLONIC STORM "BULBUL" OVER WESTCENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL BASED ON 0600 UTC OF 08th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER WESTCENTRAL AND ADJOINING EASTCENTRAL BAY OF BENGAL BASED ON 0600 UTC OF 08th NOVEMBER 2019



MSW(knot)/kmph	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-63 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 13**

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 BULLETIN NO. 13 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1500 UTC OF 08.11.2019 BASED ON 1200 UTC OF 08.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER WESTCENTRAL & ADJOINING EASTCENTRAL BAY OF BENGAL MOVED NORTHWARDS WITH A SPEED OF 17 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1200 UTC OF 8TH NOVEMBER 2019, OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL, NEAR LAT.18.5°N AND LONG. 87.6°E ABOUT 220 KM SOUTH-SOUTHEAST OF PARADIP (42976), 350 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 470 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO INTENSIFY SLIGHTLY TILL 0000 UTC OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 0300 UTC OF 9TH NOVEMBER AND RE-CURVE NORTHEASTWARDS THEREAFTER. IT IS VERY LIKELY CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1800-2100 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time (UTC)	Position		Maximum sustained surface wind speed (kmph)	Category of cyclonic disturbance
	Lat. (°N)	Long. (°E)		
08.11.19/1200	18.5	87.6	140-150 gusting to 165	Very Severe Cyclonic Storm
08.11.19/1800	19.4	87.7	145-155 gusting to 170	Very Severe Cyclonic Storm
09.11.19/0000	20.1	87.8	150-160 gusting to 175	Very Severe Cyclonic Storm
09.11.19/0600	20.8	88.1	130-140 gusting to 155	Very Severe Cyclonic Storm
09.11.19/1200	21.4	88.7	120-130 gusting to 145	Very Severe Cyclonic Storm
10.11.19/0000	22.6	90.0	80-90 gusting to 100	Cyclonic Storm
10.11.19/1200	23.5	91.7	40-50 gusting to 60	Depression

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER WEST CENTRAL AND ADJOINING EAST CENTRAL BAY OF BENGAL BETWEEN LAT. 17.0°N TO 20.0°N AND LONG. 85.0°E TO 89.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1200 UTC, A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 87.0E REPORTED MEAN SEA LEVEL PRESSURE 1007.7 HPA, SST 29.1°C AND WIND 290°/12 KNOTS; BUOY (23094) LOCATED NEAR LAT. 13.4°N / 84.0E REPORTED MEAN SEA LEVEL PRESSURE 1007.8 HPA, SST 28.9°C AND WIND 320°/10 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-30 KNOTS TO THE NORTH OF THE SYSTEM CENTRE AND IS ALOS FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 19°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS CONTINUED TO BEING STEERED BY AN UPPER TROPOSPHERIC ANTICYLONIC CIRCULATION CENTERED OVER NORTH THAILAND. THE SYSTEM LIES IN THE WESTEREN PERIPERY OF ABOVE ANTICYLONE. AS A RESULT, IT IS MOVING NORTHWARDS. THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NORTHWARDS FOR SOMETIME TILL 20°N AND RECURVE NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, AN UPPER TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE FIELD OF STRONGER UPPER TROPOSPHERIC WINDS AND HENCE IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR. ALSO, SST IS COOLER OVER THE NORTH BAY OF BENGAL. THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)

SCIENTIST-F, RSMC, NEW DELHI.

SAT : INSAT-3D IMG

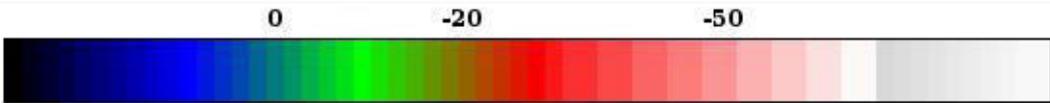
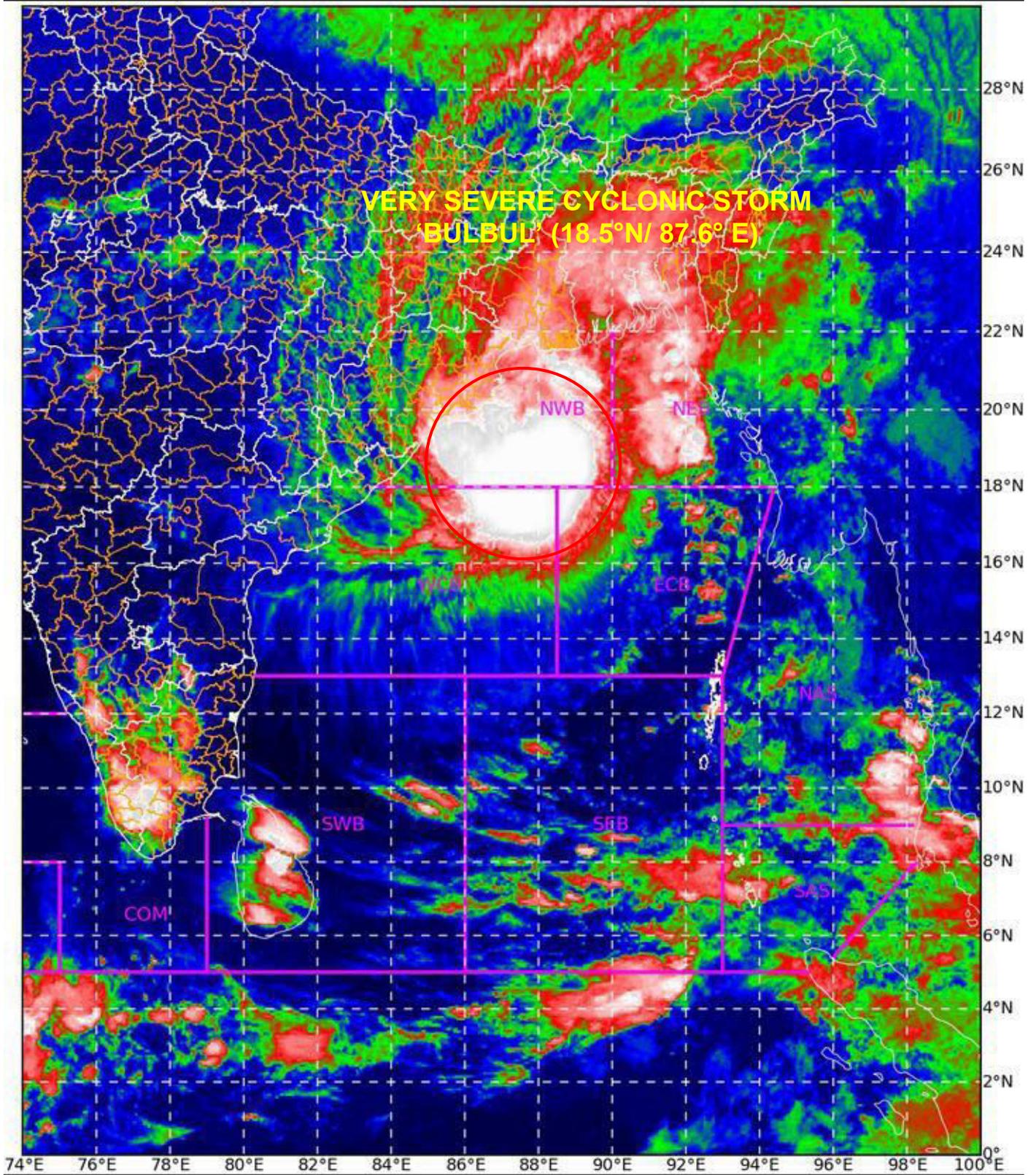
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08-11-2019/(1830 to 1856) IST



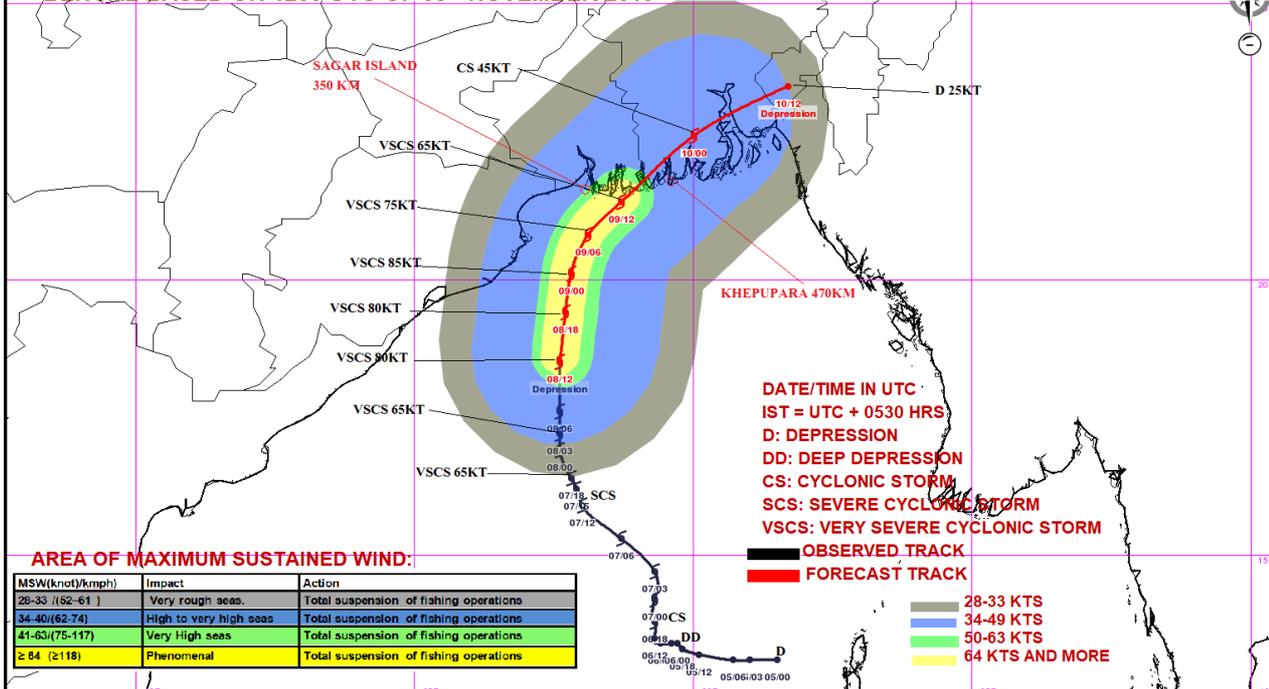
L1C Mercator



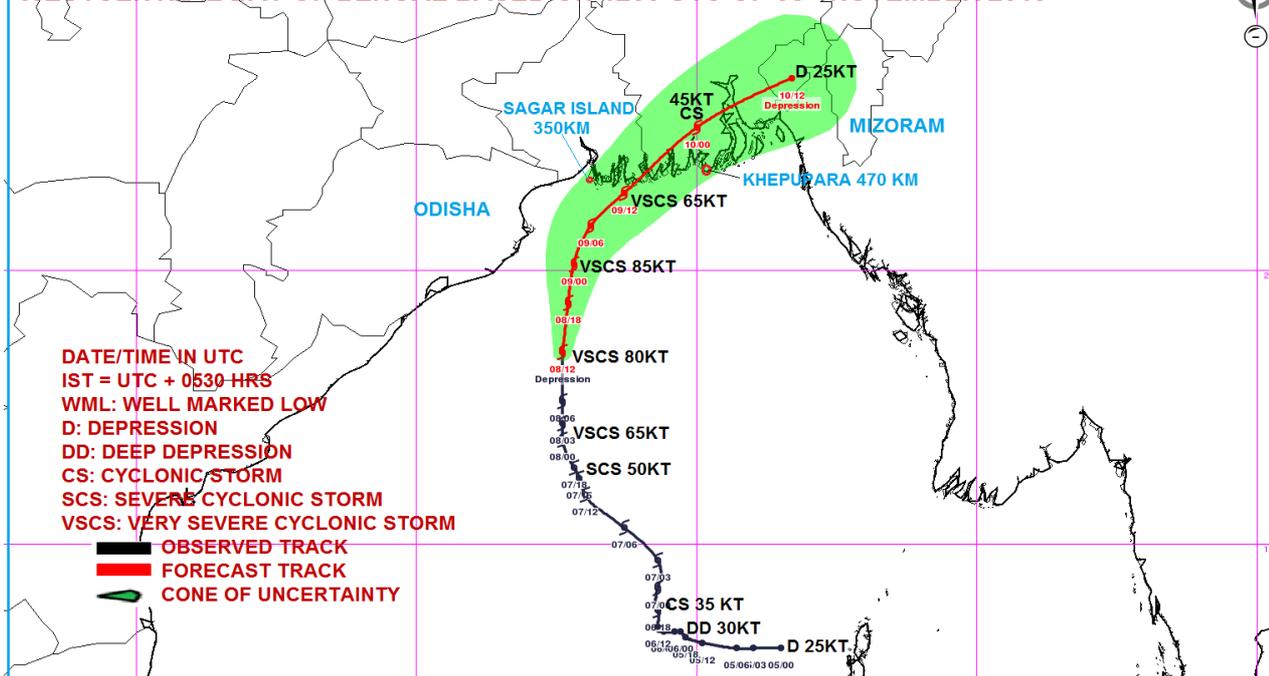
Celsius
IMD, DELHI

10 -10 -20 -30 -50 -70

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 1200 UTC OF 08th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 1200 UTC OF 08th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 14**

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 BULLETIN NO. 14 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1800 UTC OF 08.11.2019 BASED ON 1500 UTC OF 08.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL MOVED NEARLY NORTHWARDS WITH A SPEED OF 21 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1500 UTC OF 8TH NOVEMBER 2019, OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL, NEAR LAT.19.2°N AND LONG. 87.7°E ABOUT 160 KM SOUTHEAST OF PARADIP (42976), 270 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 410 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO INTENSIFY SLIGHTLY TILL 0000 UTC OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 0300 UTC OF 9TH NOVEMBER AND RE-CURVE NORTHEASTWARDS THEREAFTER. IT IS VERY LIKELY CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1800-2100 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH. THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS NOW BEING TRACKED BY THE DOPPLER WEATHER RADARS AT PARADIP (42976) AND GOPALPUR (43049) ALONG WITH OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time (UTC)	Position		Maximum sustained surface wind speed (kmph)	Category of cyclonic disturbance
	Lat. (°N)	Long. (°E)		
08.11.19/1500	19.2	87.7	140-150 gusting to 165	Very Severe Cyclonic Storm
08.11.19/1800	19.4	87.8	145-155 gusting to 170	Very Severe Cyclonic Storm
09.11.19/0000	20.1	87.9	150-160 gusting to 175	Very Severe Cyclonic Storm
09.11.19/0600	20.8	88.1	130-140 gusting to 155	Very Severe Cyclonic Storm
09.11.19/1200	21.4	88.7	120-130 gusting to 145	Very Severe Cyclonic Storm
10.11.19/0000	22.6	90.0	80-90 gusting to 100	Cyclonic Storm
10.11.19/1200	23.5	91.7	40-50 gusting to 60	Depression

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 17.0°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1500 UTC, A BUOY (23459) LOCATED NEAR LAT. 13.9°N / 87.0°E REPORTED MEAN SEA LEVEL PRESSURE 1010.0 HPA, SST 29.1°C AND WIND 290°/10 KNOTS AND ANOTHER BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0°E REPORTED MEAN SEA LEVEL PRESSURE 1007.3 HPA, SST 28.5°C AND WIND 300°/19.4 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ EAST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 20°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS CONTINUED TO BEING AT THE WESTEREN PERIPHERY OF AN UPPER TROPOSPHERIC ANTICYLONIC CIRCULATION CENTERED OVER NORTH THAILAND. AS A RESULT, THE SYSTEM IS STEERED NORTHWARDS. MOREOVER, THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NEARLY NORTHWARDS FOR SOMETIME TILL 20°N AND RECURVE NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, A MID-TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE GRIP OF STRONGER WESTERLY WINDS AND IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL. THE SST IS COOLER OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

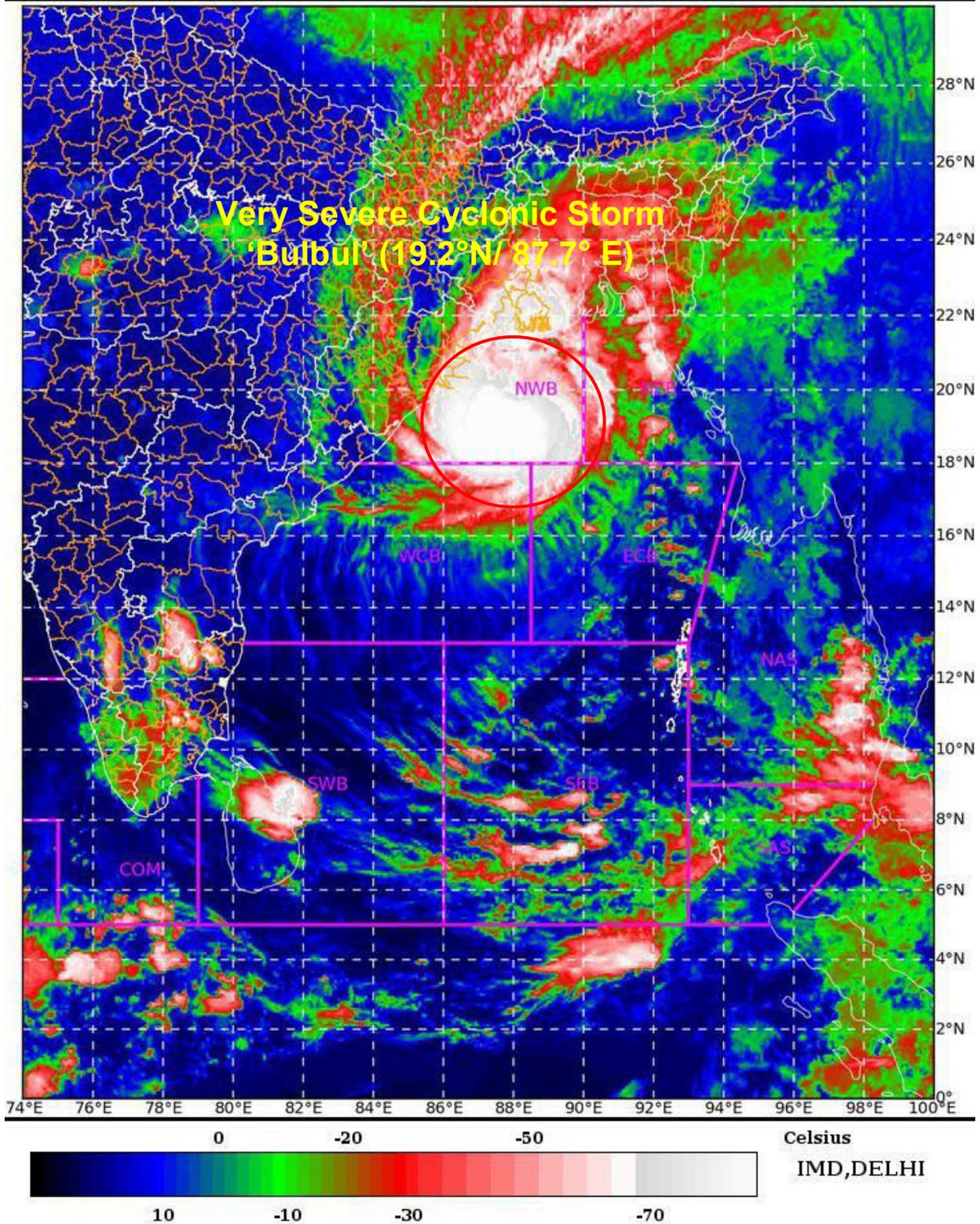
(ANANDA KUMAR DAS)

SCIENTIST-E, RSMC, NEW DELHI.

SAT : INSAT-3D IMG 08-11-2019/(1600 to 1626) GMT

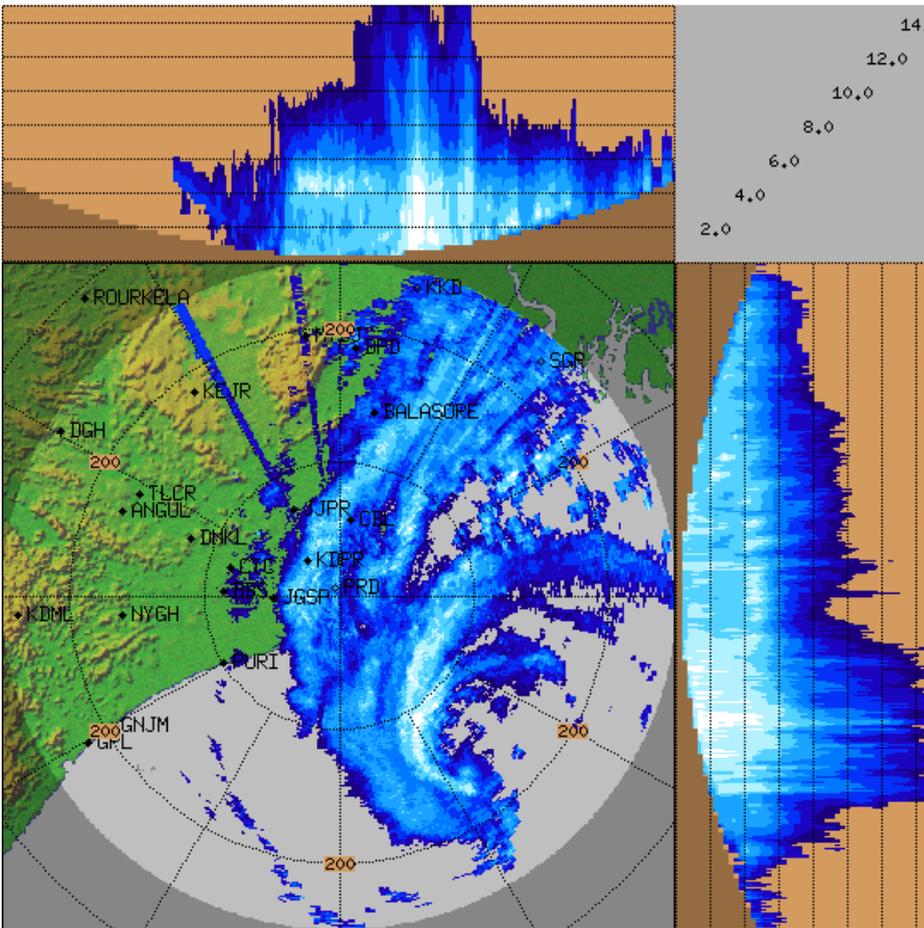
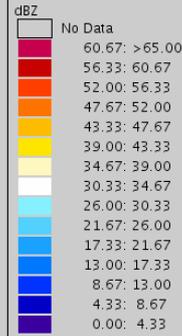
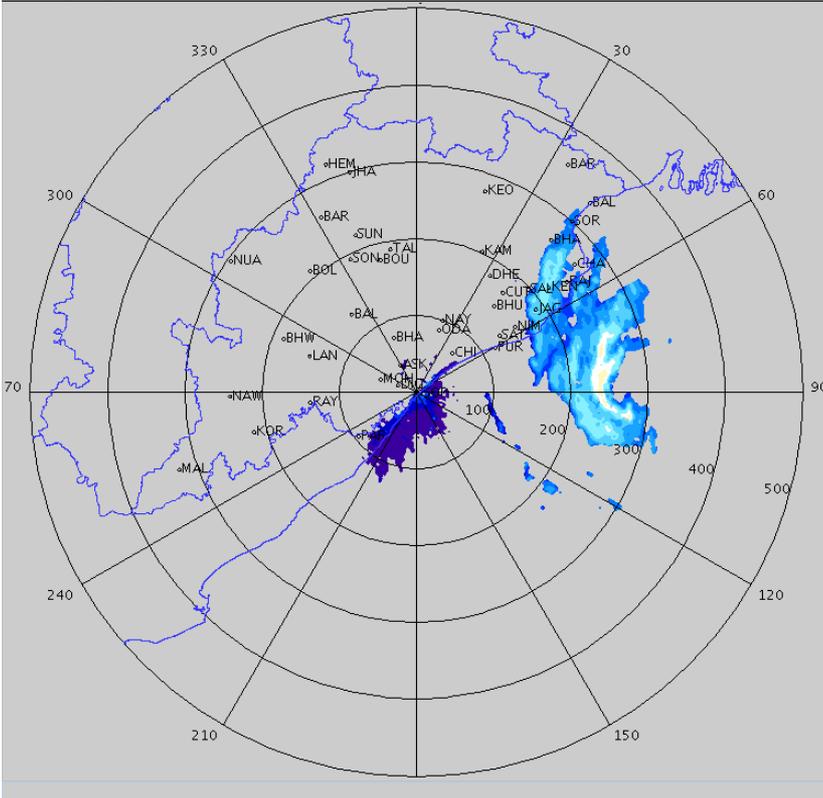
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L1C Mercator

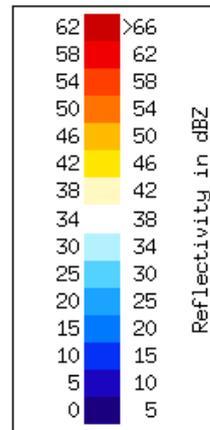


NWB=> NorthWest Bay of Bengal

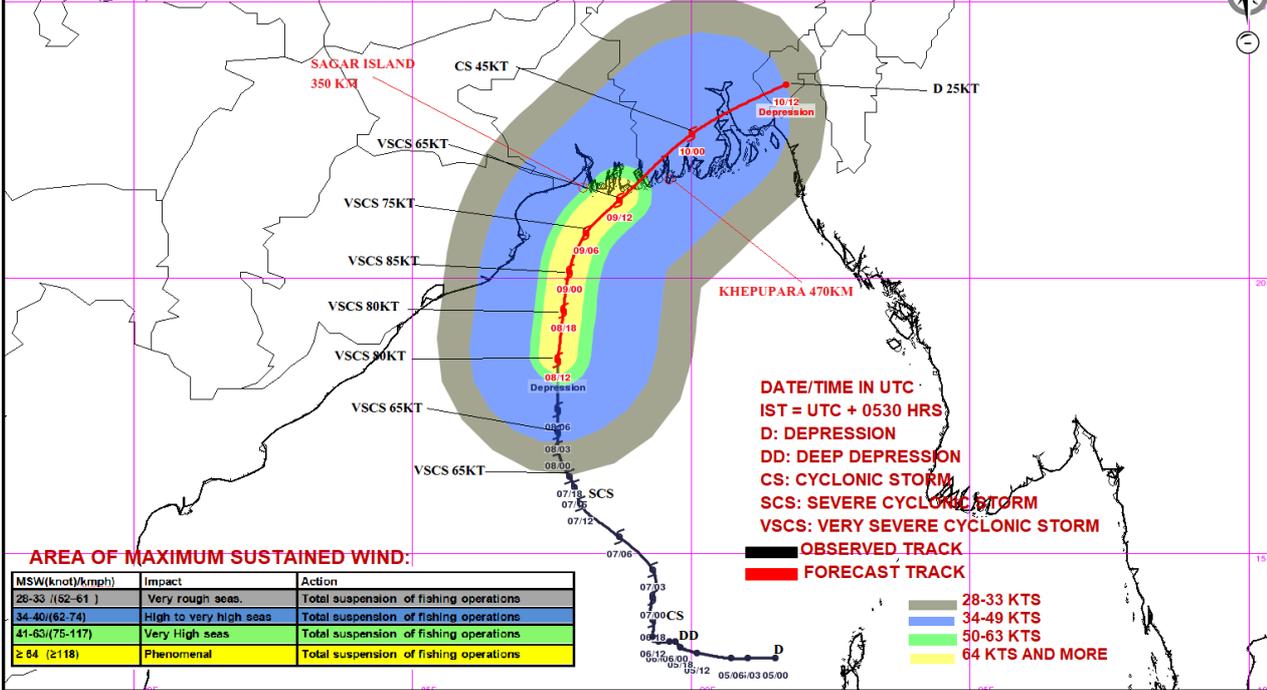
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 Display Res : 1.4 Km/Pix
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 PRF (Lo, Hi) : 0, 300 Hz
 Scan Res : 300 mts
 Scan RPM : 2.0
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 DTP : 24
 Pulse Width : 2.0 micro sec
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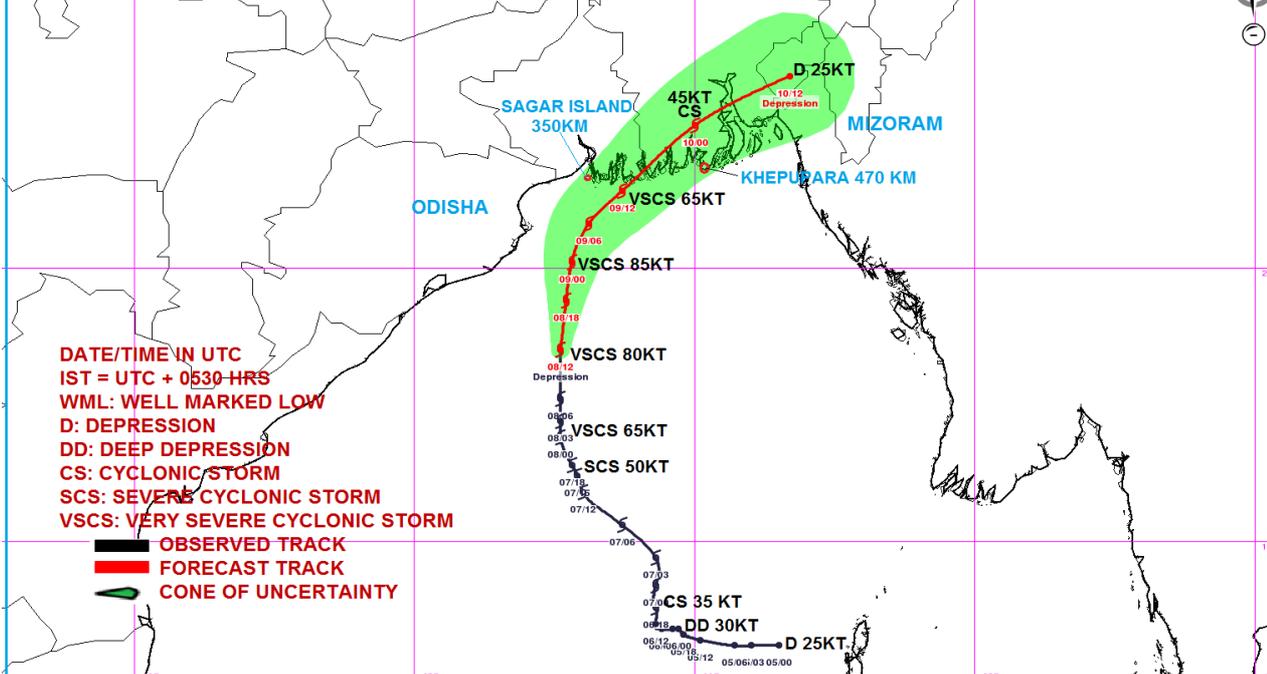
PARADEEP-RADAR
 Max with panels
 MAX_Z
 Task: IMD-B
 Min Hgt:0.0 km
 Max Hgt:15.0 km
 Max Range:250 km
16:12:18Z
8 NOV 2019 UTC



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 1200 UTC OF 08th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 1200 UTC OF 08th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 15**

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 BULLETIN NO. 15 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2100 UTC OF 08.11.2019 BASED ON 1800 UTC OF 08.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL MOVED NORTHWARDS WITH A SPEED OF 17 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1800 UTC OF 8TH NOVEMBER 2019, OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL, NEAR LAT.19.3°N AND LONG. 87.6°E ABOUT 140 KM SOUTHEAST OF PARADIP (42976), 260 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 400 KM WEST-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO RETAIN INTENSITY TILL 0000 UTC OF 9TH NOVEMBER. IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS TILL 0000 UTC OF 9TH NOVEMBER AND RE-CURVE NORTHEASTWARDS THEREAFTER. IT IS EXPECTED TO MOVE FAST AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984) ACROSS SUNDERBAN DELTA DURING 1500-1800 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS NOW BEING TRACKED BY THE DOPPLER WEATHER RADARS AT PARADIP (42976) AND GOPALPUR (43049) ALONG WITH OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
08.11.19/1800	19.3	87.6	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
09.11.19/0000	20.1	87.8	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
09.11.19/0600	20.8	88.1	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/1200	21.4	88.5	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	22.2	89.3	80-90 GUSTING TO 100	SEVERE CYCLONIC STORM
10.11.19/0600	23.2	90.7	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 17.5°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1800 UTC, A BUOY (23093) LOCATED NEAR LAT. 16.3°N / 88.0°E REPORTED MEAN SEA LEVEL PRESSURE 1007.2 HPA, SST 28.6°C AND WIND 290°/19.4 KNOTS. SURFACE STATIONS PURI (43053) REPORTED MEAN SEA LEVEL PRESSURE 1003.5 HPA AND WIND 360°/10 KNOTS, PARADIP (42976) REPORTED MEAN SEA LEVEL PRESSURE 1002.2 HPA AND WIND 340°/22 KNOTS, BALASORE (42895) REPORTED MEAN SEA LEVEL PRESSURE 1006.1 HPA, WIND 360°/10 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 20°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

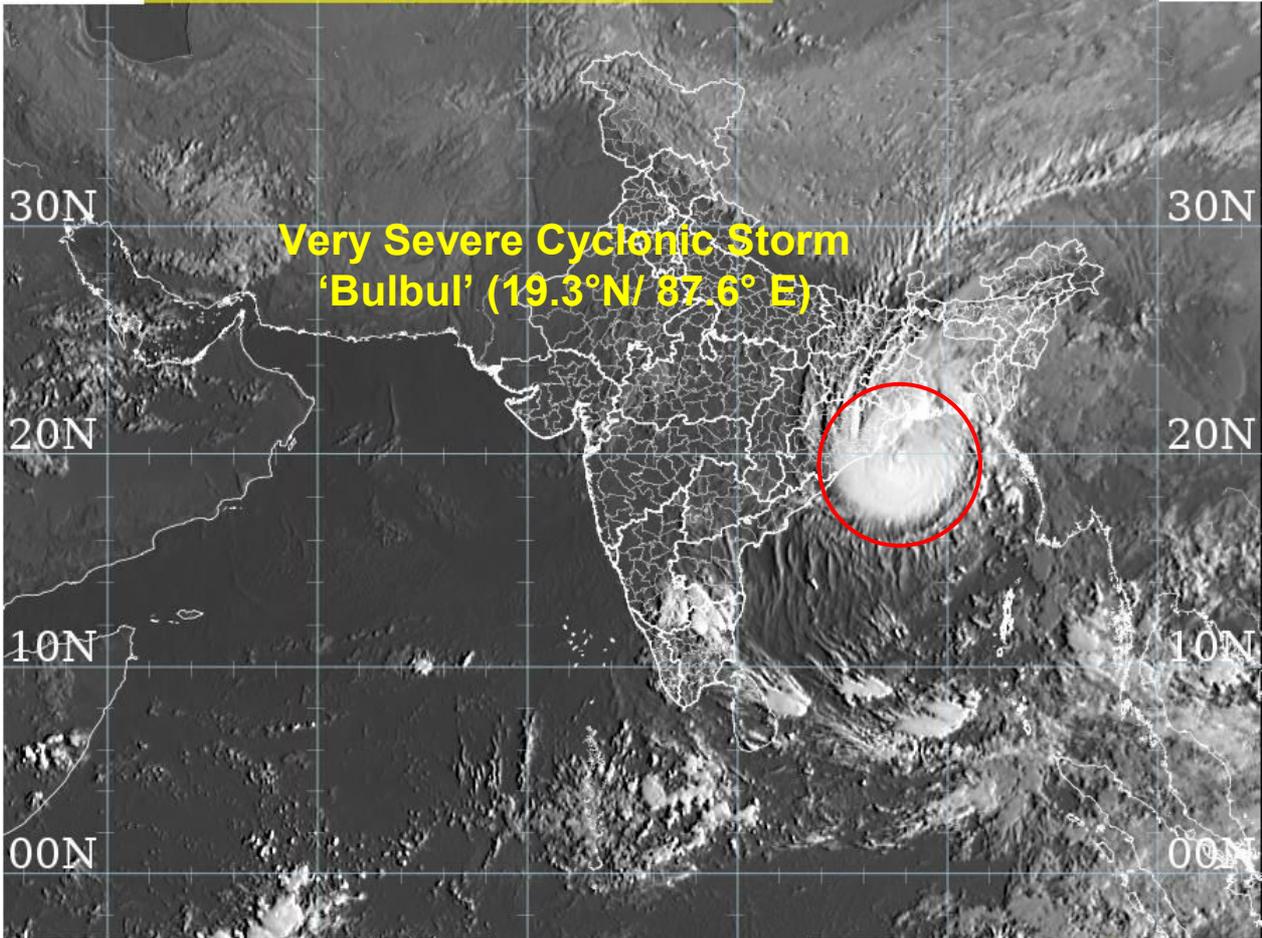
THE SYSTEM IS CONTINUED TO BEING AT THE WESTEREN PERIPHERY OF AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND. AS A RESULT, THE SYSTEM IS STEERED NORTHWARDS. MOREOVER, THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NEARLY NORTHWARDS FOR SOMETIME TILL 20°N AND RECURVE NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, A MID-TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH ONWARDS, THE SYSTEM WILL BE IN THE GRIP OF STRONGER WESTERLY WINDS AND IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL. THE SST IS COOLER OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(ANANDA KUMAR DAS)

SCIENTIST-E, RSMC, NEW DELHI.



60E 70E 80E 90E 100E
MSG-1: SEVIRI [ir108_3d]
20191108_1945UTC



 **EUMETSAT**

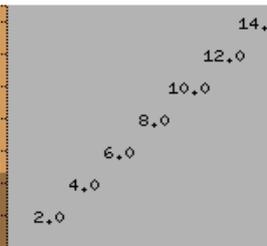
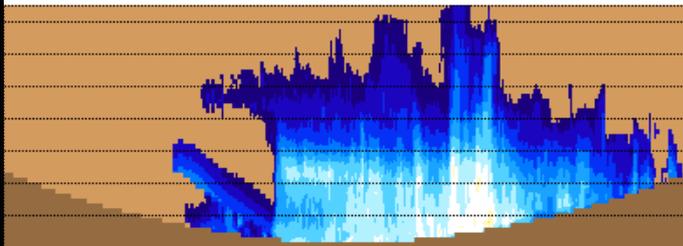
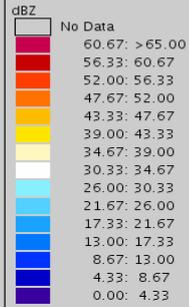
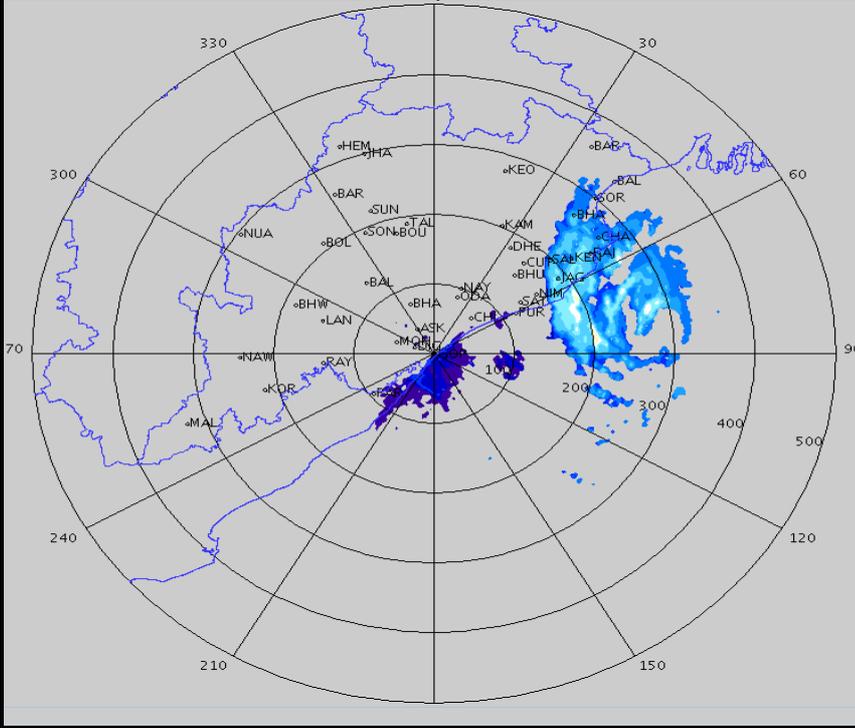
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80E

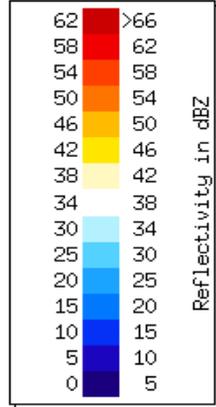
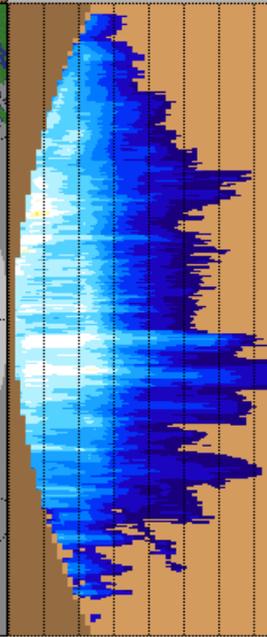
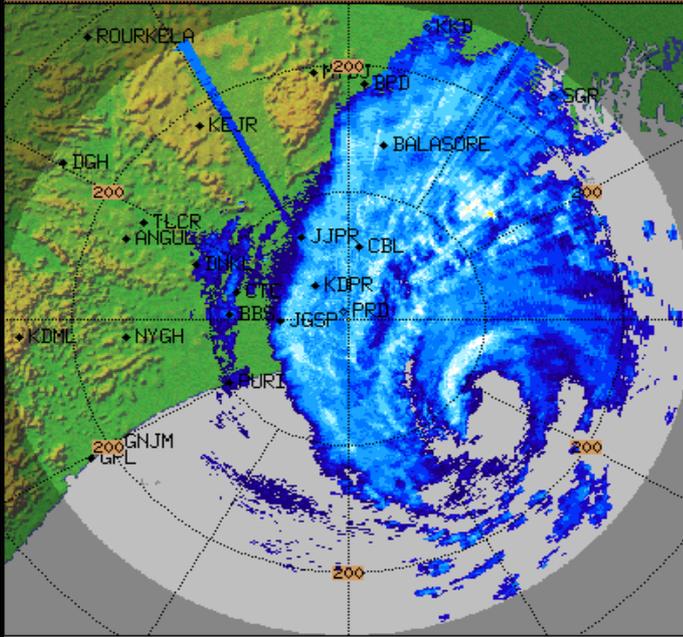
 **PyTROLL**

NWB=> NorthWest Bay of Bengal

Elevation : 0.2 Deg
 Z (Lo, Hi) : -31.5, 90.0 dBZ
 Display Range : 500 Km
 Display Res : 1.4 Km/Pix
 DDR Enable : Yes
 Scan Elev (Lo, Hi) : 0.2, 1.0 Deg
 PRF (Lo, Hi) : 0, 300 Hz
 Scan Res : 300 mts
 Scan RPM : 2.0
 Log Threshold : 3 dB
 DTP : 24
 Pulse Width : 2.0 micro sec
 Clutter Filter : IIR-HP(9.0 Hz)
 SQI : 0.0
 CSR : 2.0 dB
 Scan Range : 490 Km
 Preprocessings : NONE
 Filters : NONE



PARADEEP-RADAR
 Max with panels
 MAX_Z
 Task: IMD-B
 Min Hgt:0.0 km
 Max Hgt:15.0 km
 Max Range:250 km
19:42:19Z
8 NOV 2019 UTC





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 16**

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 BULLETIN NO. 16 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0030 UTC OF 09.11.2019 BASED ON 2100 UTC OF 08.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL MOVED NEARLY NORTHWARDS WITH A SPEED OF 07 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 2100 UTC OF 8TH NOVEMBER 2019, OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL, NEAR LAT.19.6°N AND LONG. 87.6°E ABOUT 130 KM EAST-SOUTHEAST OF PARADIP (42976), 230 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 370 KM SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO RETAIN INTENSITY TILL DURING NEXT 06 HOURS AND VERY LIKELY TO MOVE NEARLY NORTHWARDS. THEREAFTER IT IS VERY LIKELY TO RE-CURVE NORTHEASTWARDS AND EXPECTED TO MOVE FAST AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1500-1800 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS NOW BEING TRACKED BY THE DOPPLER WEATHER RADARS AT PARADIP (42976) AND GOPALPUR (43049) ALONG WITH OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
08.11.19/2100	19.6	87.7	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
09.11.19/0000	20.1	87.8	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
09.11.19/0600	20.8	88.1	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/1200	21.4	88.5	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	22.2	89.3	80-90 GUSTING TO 100	SEVERE CYCLONIC STORM
10.11.19/0600	23.2	90.7	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 08th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 17.5°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 2100 UTC, SURFACE STATIONS CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1000.4 HPA AND WIND 50°/13 KNOTS, BALASORE (42895) REPORTED MEAN SEA LEVEL PRESSURE 1003.7 HPA AND WIND 360°/15 KNOTS AND DIGHA (42901) REPORTED MEAN SEA LEVEL PRESSURE 1003.1 HPA, WIND 50°/11 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 KNOTS GUSTING TO 80 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-25 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 20°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS CONTINUED TO BEING AT THE WESTEREN PERIPHERY OF AN UPPER TROPOSPHERIC ANTICYCLONIC CIRCULATION CENTERED OVER NORTH THAILAND. AS A RESULT, THE SYSTEM IS STEERED NORTHWARDS FOR SOME TIME. MOREOVER, THE UPPER TROPOSPHERIC RIDGE LIES ALONG 20° N. HENCE THE SYSTEM IS EXPECTED TO MOVE NEARLY NORTHWARDS TILL 20°N AND RECURVE NORTHEASTWARDS THEREAFTER. AT THE SAME TIME, A MID-TROPOSPHERIC TROUGH IN WESTERLIES IS ALSO LIKELY TO APPROACH TOWARDS THE SYSTEM. AS A RESULT FROM 9TH 0000 UTC ONWARDS, THE SYSTEM WILL BE IN THE GRIP OF STRONGER WESTERLY WINDS AND IT WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL. THE SST IS COOLER OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS FROM 9TH ONWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

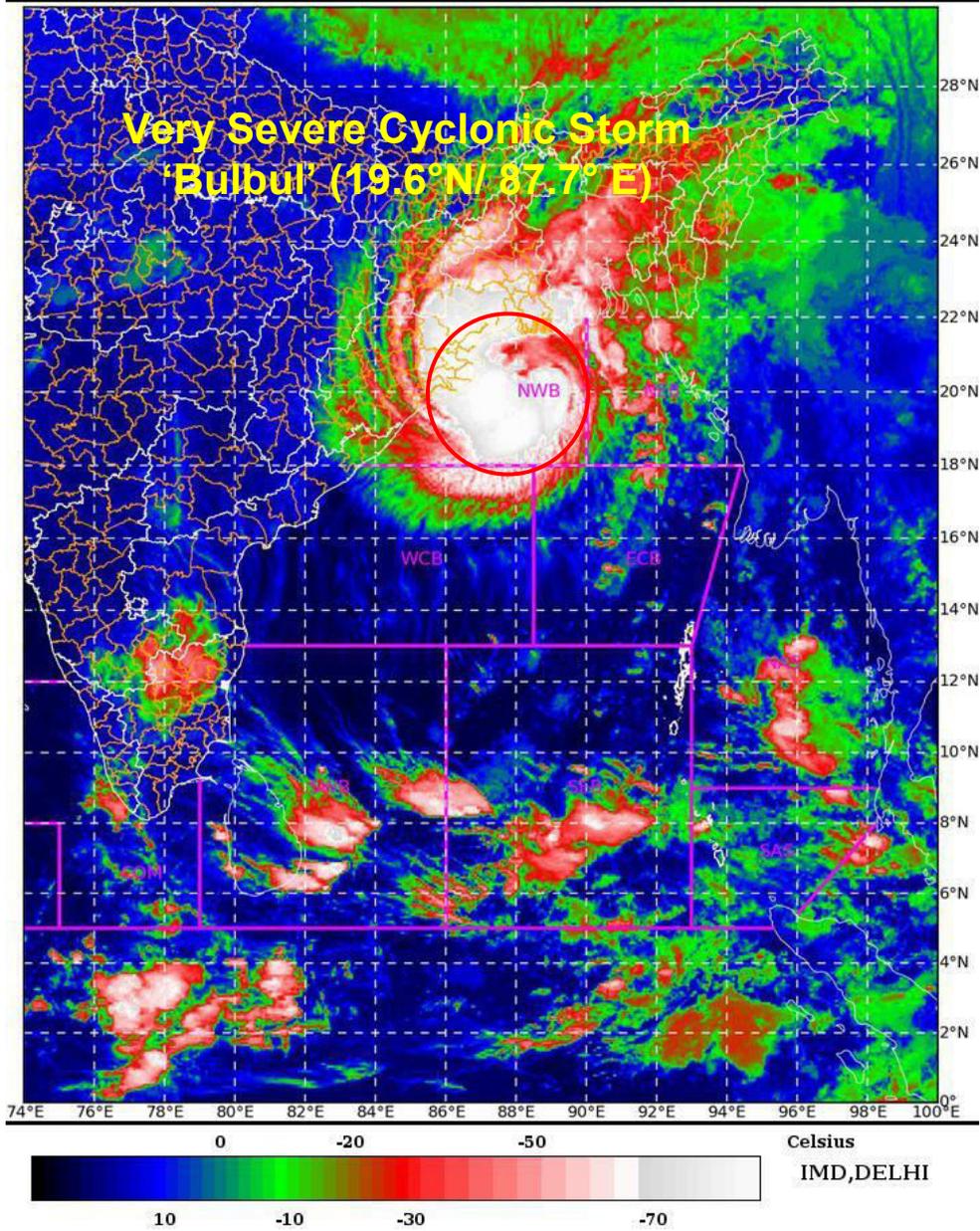
(ANANDA KUMAR DAS)

SCIENTIST-E, RSMC, NEW DELHI.

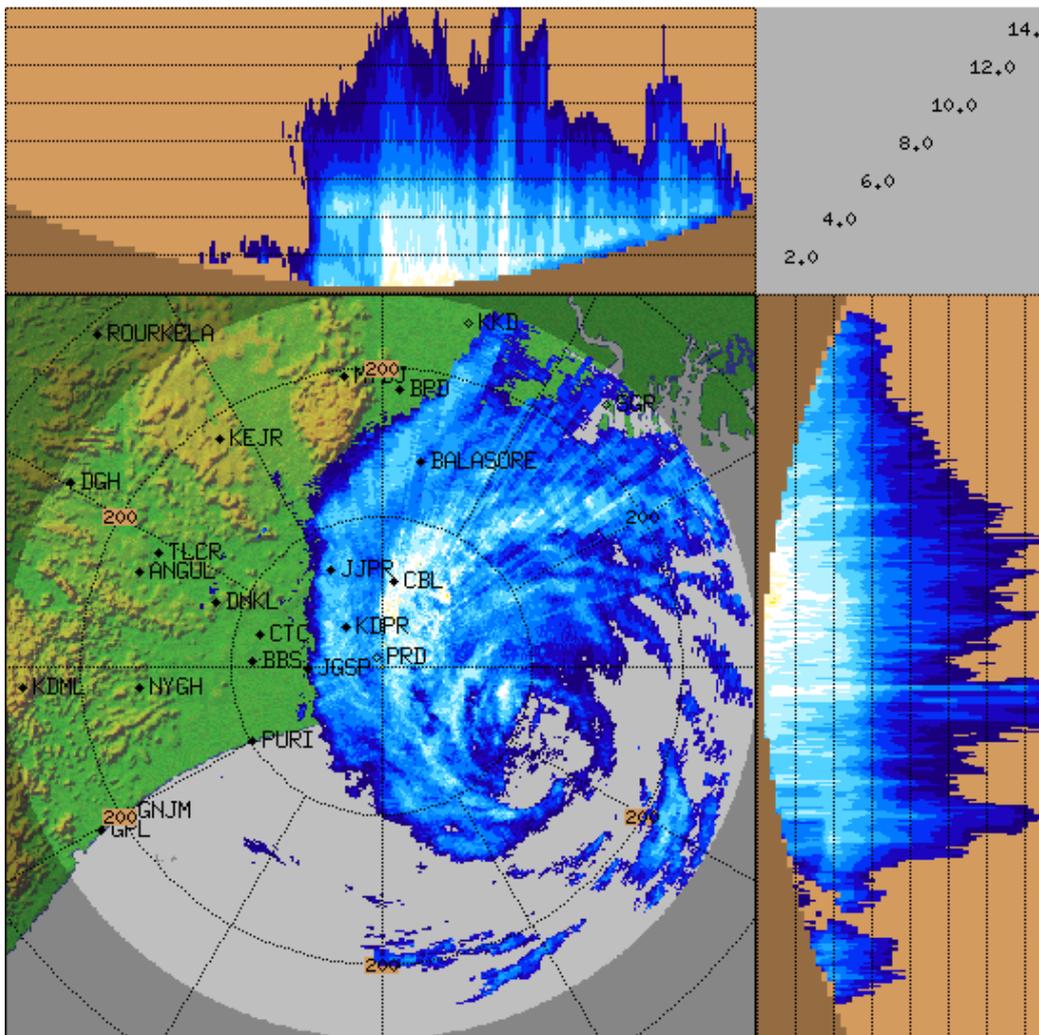
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IMG_TIR1_TEMP 10.8 um 09-11-2019/(0430 to 0456) IST

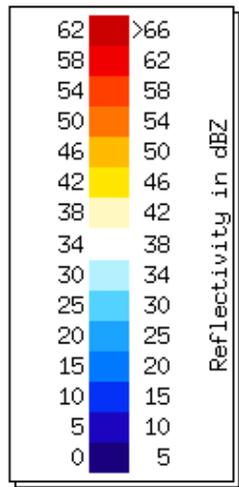
L1C Mercator

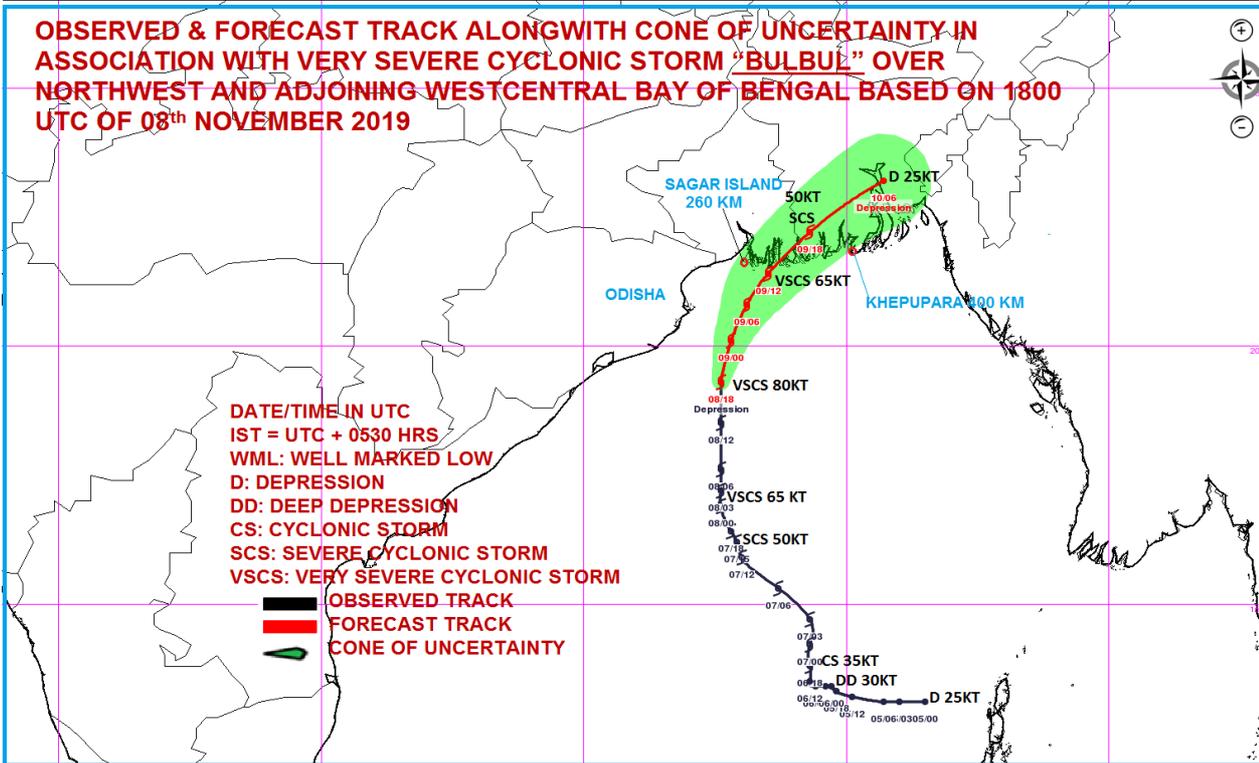
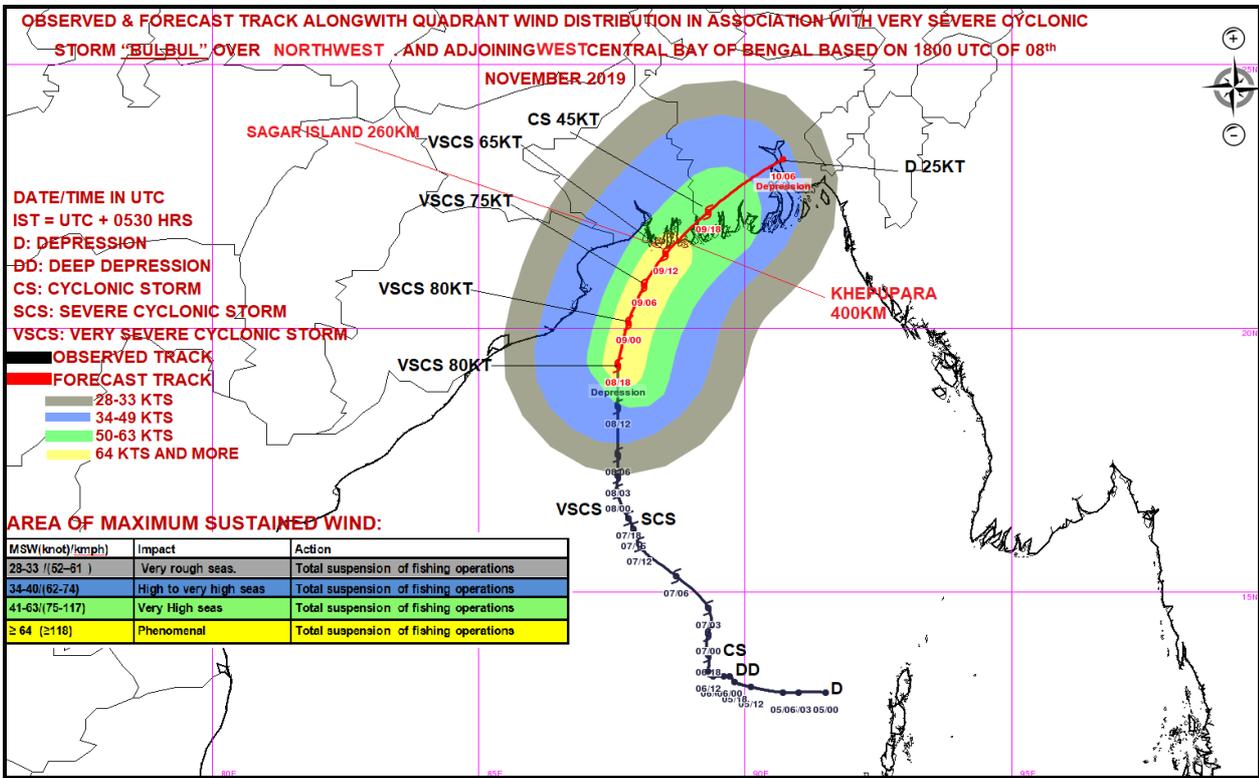


NWB=> NorthWest Bay of Bengal



PARADEEP-RADAR
 Max with panels
 MAX_Z
 Task: IMD-B
 Min Hgt:0.0 km
 Max Hgt:15.0 km
 Max Range:250 km
21:42:19Z
8 NOV 2019 UTC







**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 17**

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 BULLETIN NO. 17 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 09.11.2019 BASED ON 0000 UTC OF 09.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST & ADJOINING WESTCENTRAL BAY OF BENGAL MOVED NEARLY NORTHWARDS WITH A SPEED OF 13 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 0000 UTC OF 9TH NOVEMBER 2019, OVER NORTHWEST BAY OF BENGAL, NEAR LAT. 20.0°N AND LONG. 87.7°E ABOUT 110 KM EAST-SOUTHEAST OF PARADIP (42976), 190 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903) AND 340 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO WEAKEN GRADUALLY, MOVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1500-1800 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS NOW BEING TRACKED BY THE DOPPLER WEATHER RADARS AT GOPALPUR (43049), PARADIP (42976) AND KOLKATA (42809) ALONG WITH OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/0000	20.0	87.7	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
09.11.19/0600	20.6	88.0	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/1200	21.3	88.5	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	21.9	89.2	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
10.11.19/0000	22.5	90.0	70-80 GUSTING TO 90	CYCLONIC STORM
10.11.19/1200	23.6	91.4	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 09th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 18.0°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0000 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1000.0 HPA AND WIND 50°/15 KNOTS, BALASORE (42895) REPORTED MEAN SEA LEVEL PRESSURE 1003.5 HPA AND WIND 360°/20 KNOTS AND DIGHA (42901) REPORTED MEAN SEA LEVEL PRESSURE 1003.3 HPA, WIND 20°/09 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 75 KNOTS GUSTING TO 85 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-25 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 20°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS LYING NEAR THE UPPER TROPOSPHERIC RIDGE LINE ALONG 20° N. HENCE, THE SYSTEM IS EXPECTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL AS COOLER SST OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

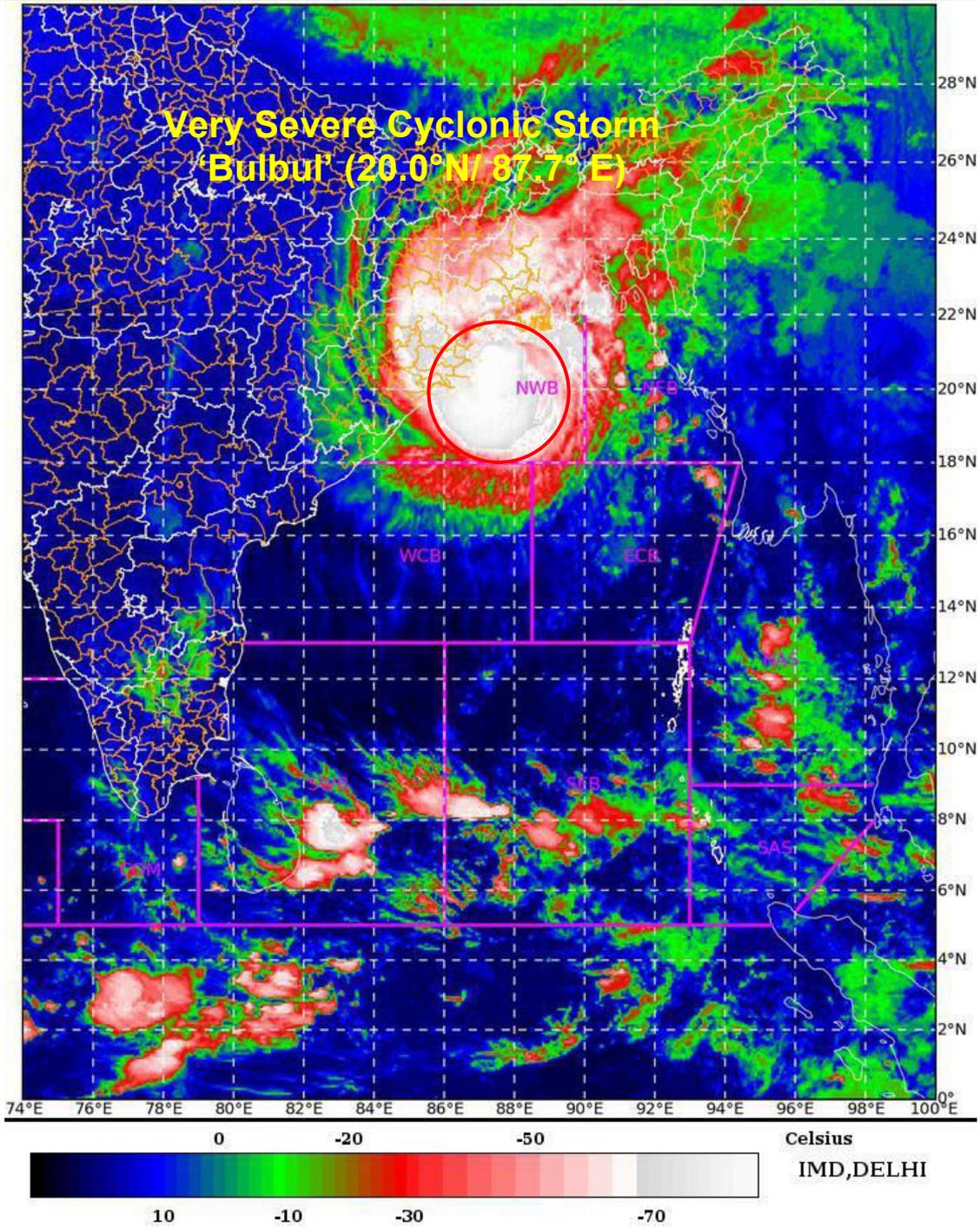
(ANANDA KUMAR DAS)

SCIENTIST-E, RSMC, NEW DELHI.

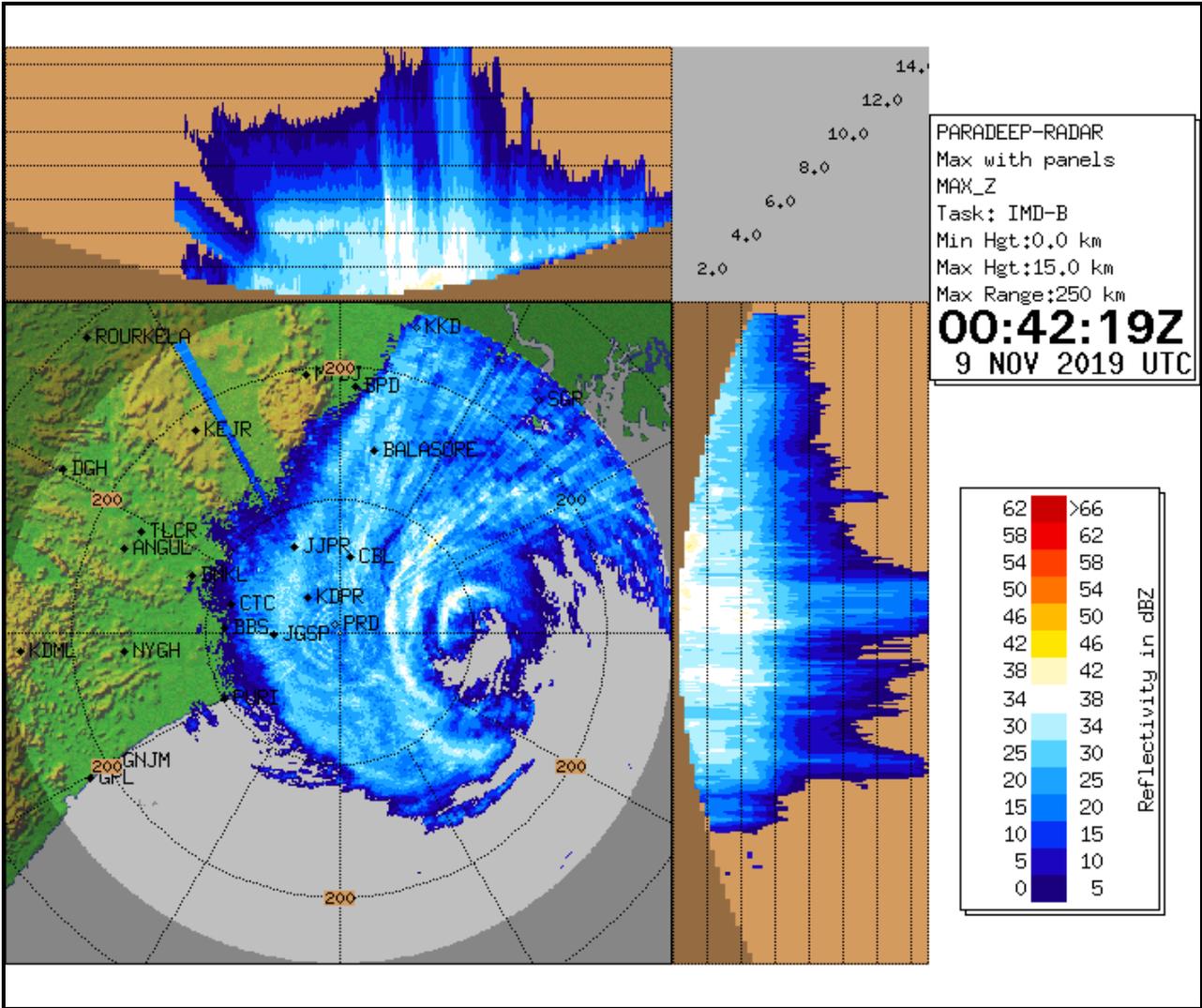
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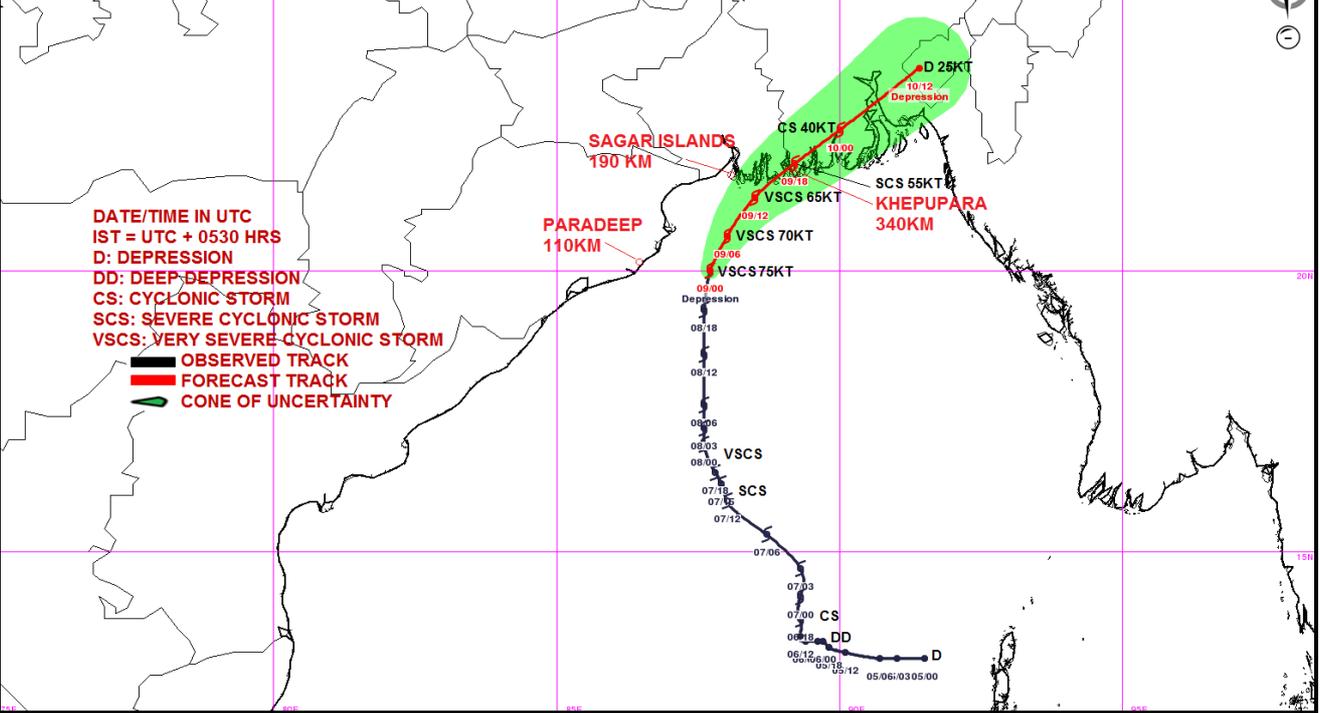
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NWB=> NorthWest Bay of Bengal

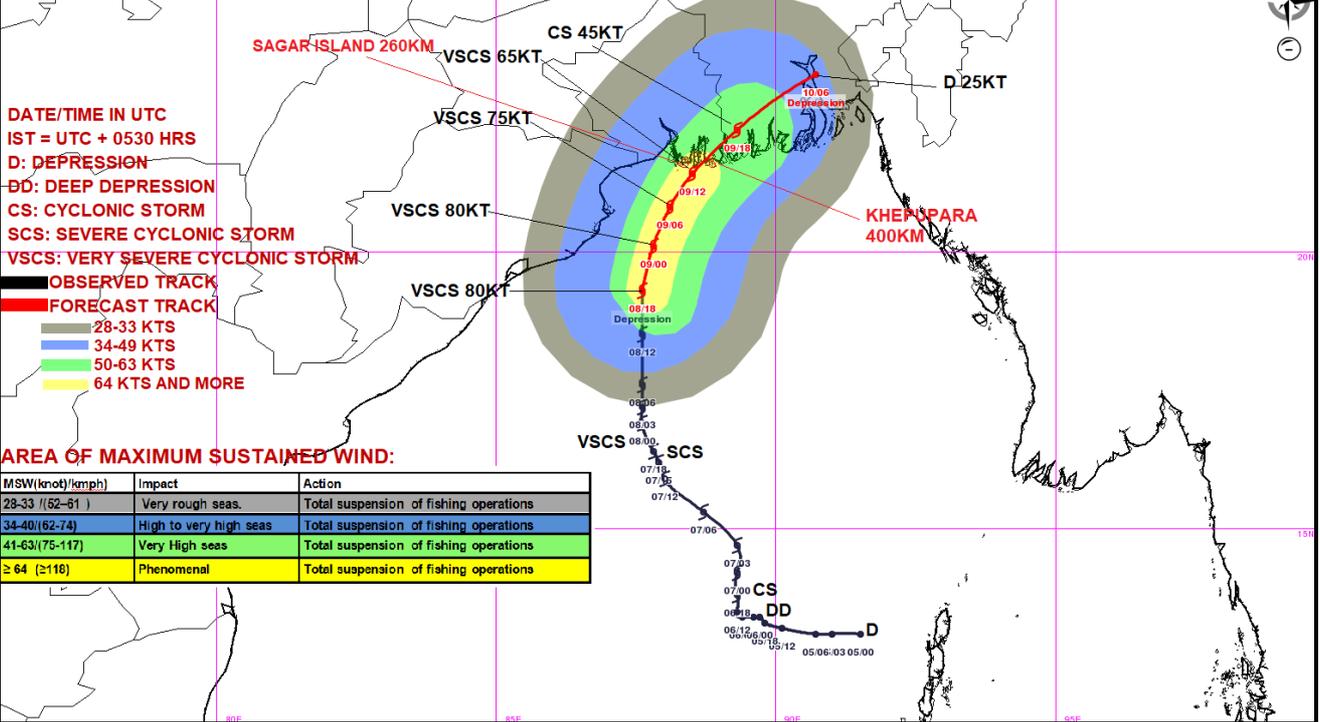


OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 0000 UTC OF 09th NOVEMBER 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 — OBSERVED TRACK
 — FORECAST TRACK
 — CONE OF UNCERTAINTY

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST AND ADJOINING WESTCENTRAL BAY OF BENGAL BASED ON 1800 UTC OF 08th NOVEMBER 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 — OBSERVED TRACK
 — FORECAST TRACK
 — 28-33 KTS
 — 34-49 KTS
 — 50-63 KTS
 — 64 KTS AND MORE

AREA OF MAXIMUM SUSTAINED WIND:

MSW(knot)/kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-63 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 18**

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 BULLETIN NO. 18 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 48 HOURS ISSUED AT 0500 UTC OF 09.11.2019 BASED ON 0300 UTC OF 09.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL MOVED NEARLY NORTHWARDS WITH A SPEED OF 15 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 0300 UTC OF 9TH NOVEMBER 2019, OVER NORTHWEST BAY OF BENGAL, NEAR LAT. 20.4°N AND LONG. 87.6°E ABOUT 95 KM EAST-NORTHEAST OF PARADIP (42976), 100 KM SOUTHEAST OF CHANDBALI (42973), 130 KM SOUTH SOUTHWEST OF DIGHA(42901), 140 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903), 140 KM SOUTH-SOUTHWEST OF BALASORE(42895), 245 KM SOUTH-SOUTHWEST OF KOLKATA (42807) AND 320 KM SOUTHWEST OF KHEPUPARA (41984).

IT IS VERY LIKELY TO WEAKEN GRADUALLY, MOVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1500-1800 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS NOW BEING TRACKED BY THE DOPPLER WEATHER RADARS AT GOPALPUR (43049), PARADIP (42976) AND KOLKATA (42809) ALONG WITH OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/0300	20.4	87.6	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
09.11.19/0600	20.8	87.8	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
09.11.19/1200	21.4	88.5	115-125 GUSTING TO 140	VERY SEVERE CYCLONIC STORM
09.11.19/1800	21.9	89.2	100-110 GUSTING TO 120	SEVERE CYCLONIC STORM
10.11.19/0000	22.5	90.0	70-80 GUSTING TO 90	CYCLONIC STORM
10.11.19/1200	23.6	91.4	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 09th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 18.5°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0300 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS PARADEEP (42976) REPORTED MEAN SEA LEVEL PRESSURE 1001.9 HPA AND WIND 320°/18 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 TO 80 KNOTS GUSTING TO 90 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR (WEST BENGAL) DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

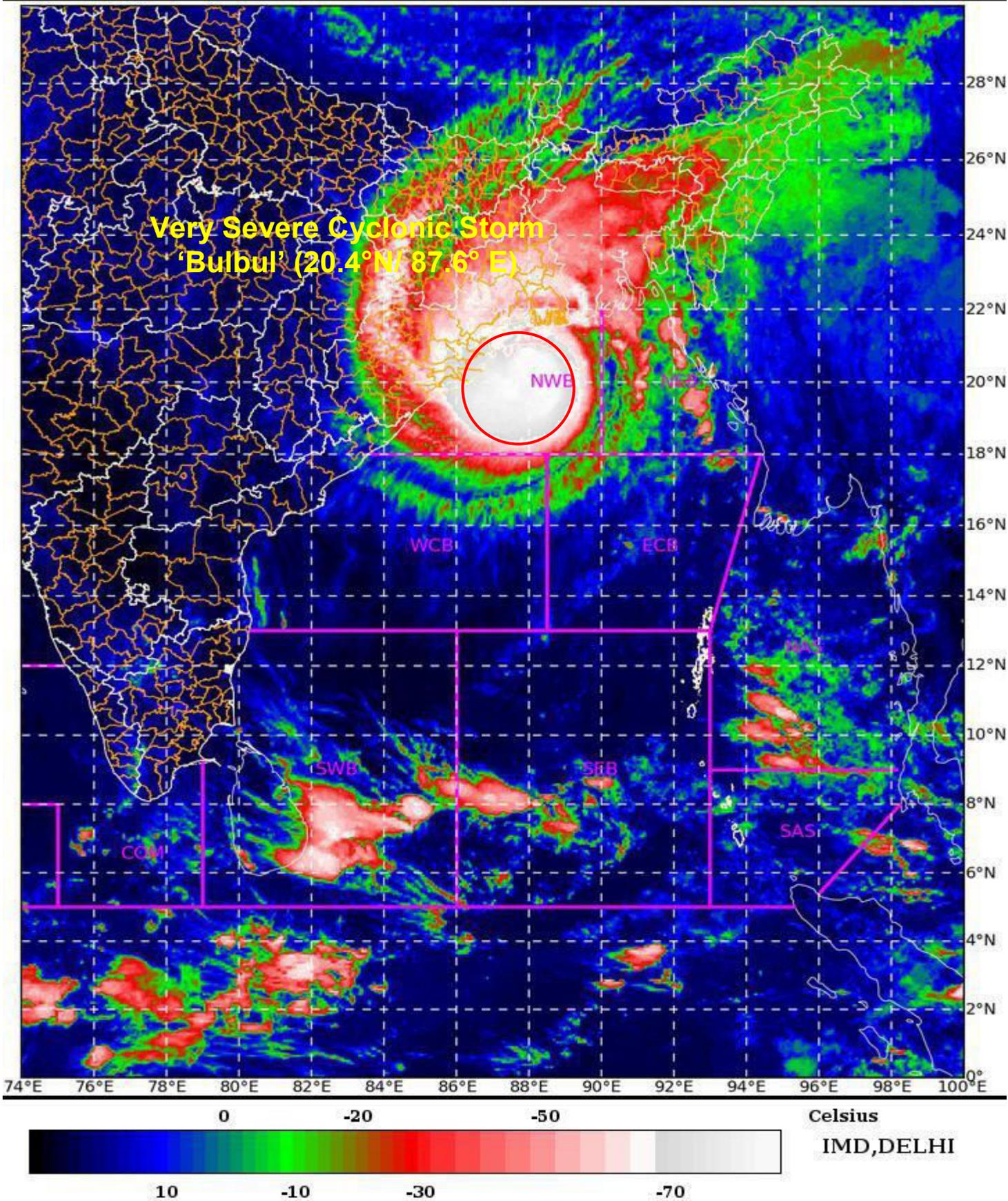
THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-25 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS LYING NEAR THE UPPER TROPOSPHERIC RIDGE LINE ALONG 20° N. HENCE, THE SYSTEM IS EXPECTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL AS COOLER SST OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS AND CROSS WEST BENGAL- BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1500-1800 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM.. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

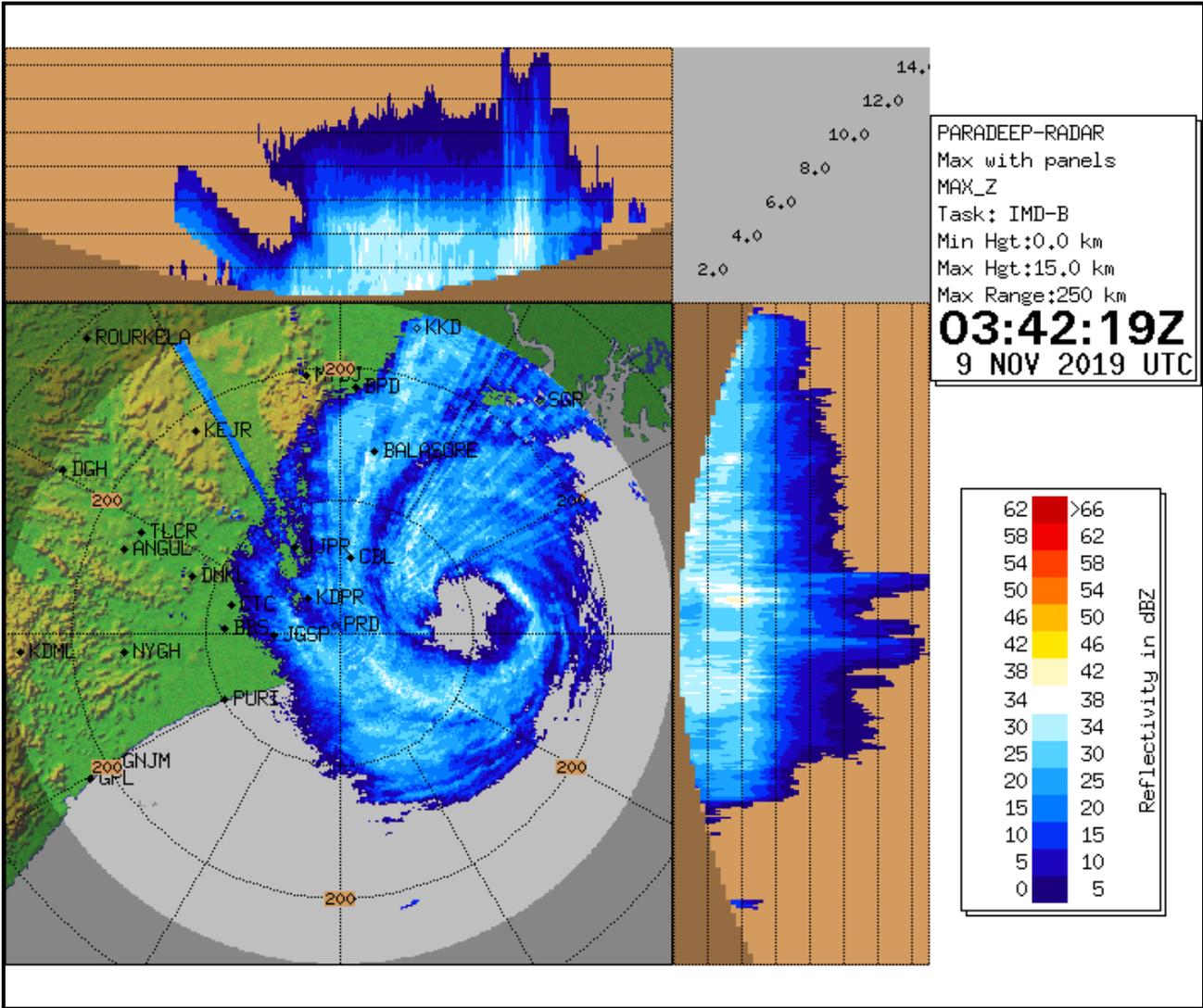
(NEETHA GOPAL)
SCIENTIST-E, RSMC, NEW DELHI



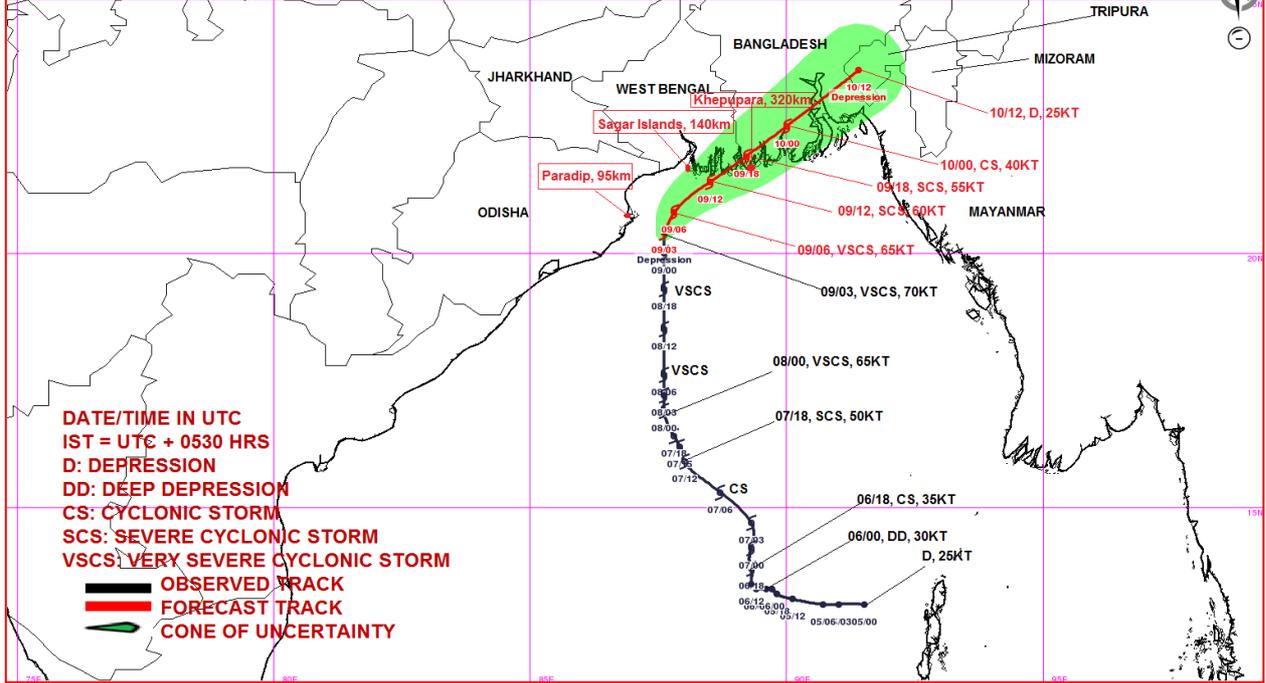
L1C Mercator



NWB=> NorthWest Bay of Bengal

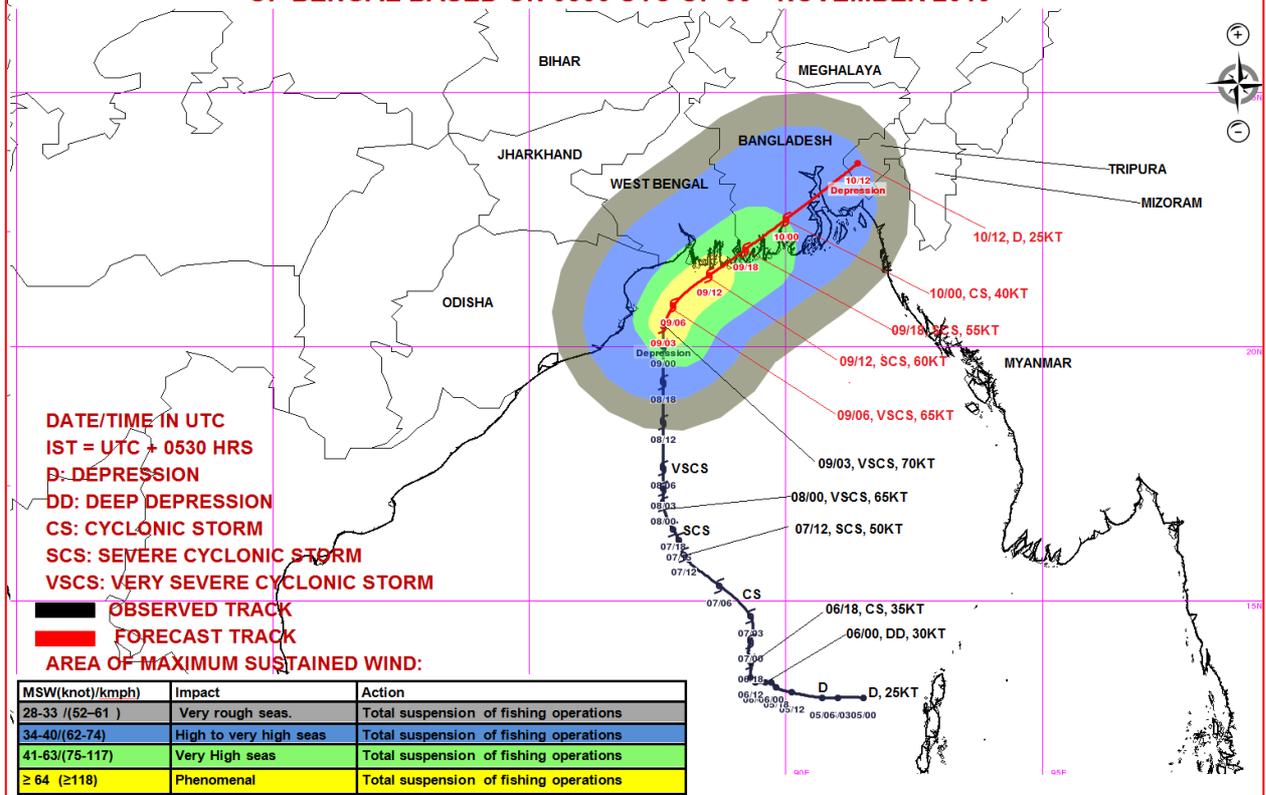


OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 0300 UTC OF 09th NOVEMBER 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 — OBSERVED TRACK
 — FORECAST TRACK
 — CONE OF UNCERTAINTY

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 0300 UTC OF 09th NOVEMBER 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 — OBSERVED TRACK
 — FORECAST TRACK
 AREA OF MAXIMUM SUSTAINED WIND:

MSW(knot)/kmph	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40(62-74)	High to very high seas	Total suspension of fishing operations
41-63(75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 19**

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 BULLETIN NO. 19 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0800 UTC OF 09.11.2019 BASED ON 0600 UTC OF 09.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL MOVED NEARLY NORTHWARDS WITH A SPEED OF 12 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 0600 UTC OF TODAY, THE 9TH NOVEMBER 2019, OVER NORTHWEST BAY OF BENGAL, NEAR LAT. 20.65°N AND LONG. 87.85°E ABOUT 125 KM EAST-NORTHEAST OF PARADIP (42976), 110 KM SOUTH-SOUTHWEST OF SAGAR ISLANDS (42903), 120 KM EAST-SOUTHEAST OF CHANDBALI (42973), 135 KM SOUTH-SOUTHEAST BALASORE (42895), 110 KM SOUTH-SOUTHWEST OF DIGHA (42901), 215 KM SOUTH-SOUTHWEST OF KOLKATA (42807) AND 290 KM WEST-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO WEAKEN GRADUALLY, MOVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1430-1730 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS BEING TRACKED BY THE DOPPLER WEATHER RADARS AT GOPALPUR, PARADIP AND KOLKATA IN ADDITION TO OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/0600	20.65	87.85	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
09.11.19/1200	21.2	88.1	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	21.8	88.7	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
10.11.19/0000	22.4	89.3	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.9	90.0	50-60 GUSTING TO 70	CYCLONIC STORM
10.11.19/1800	23.2	91.2	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 09th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 18.5°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0600 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS PARADEEP (42976) REPORTED MEAN SEA LEVEL PRESSURE 1001.5 HPA AND WIND 270°/19 KNOTS AND CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 999.0 HPA AND WIND 050°/15 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 TO 80 KNOTS GUSTING TO 90 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR (WEST BENGAL) DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 20-25 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS LYING NEAR THE UPPER TROPOSPHERIC RIDGE LINE ALONG 20° N. HENCE, THE SYSTEM IS EXPECTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL AS COOLER SST OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS AND CROSS WEST BENGAL- BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1500-1800 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM.. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(NEETHA GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

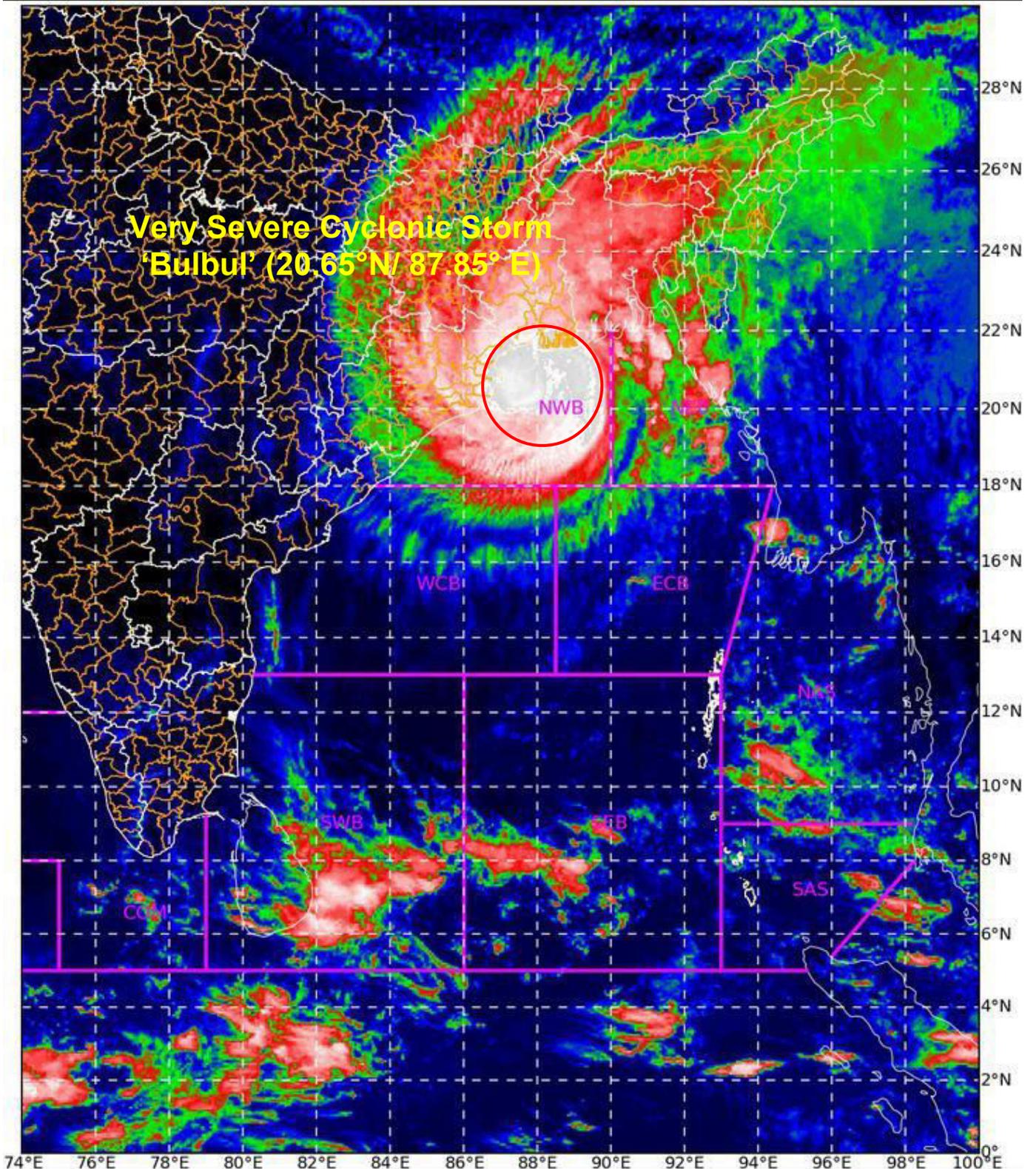
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L1C Mercator



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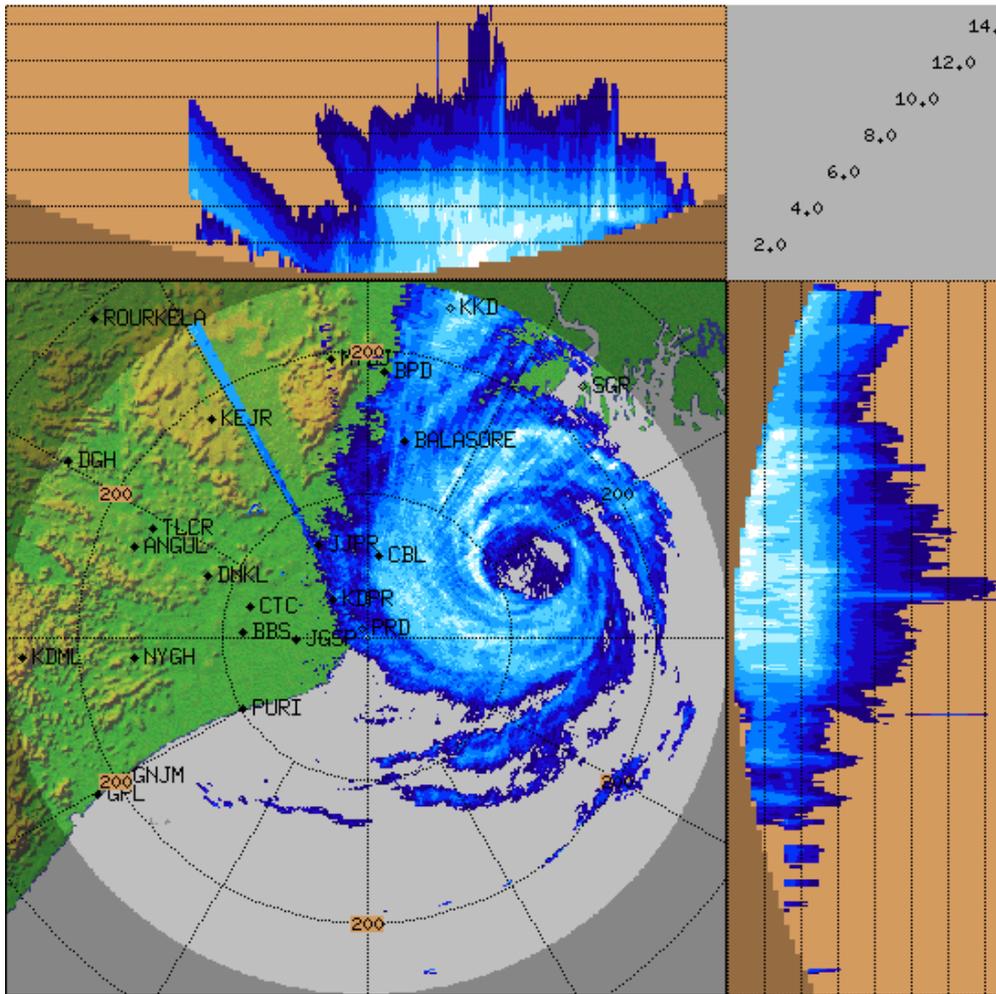
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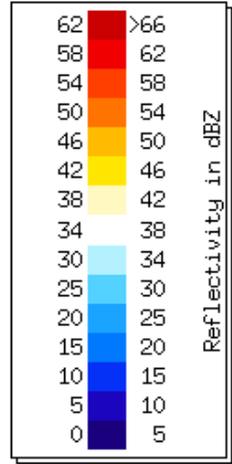
IMD, DELHI

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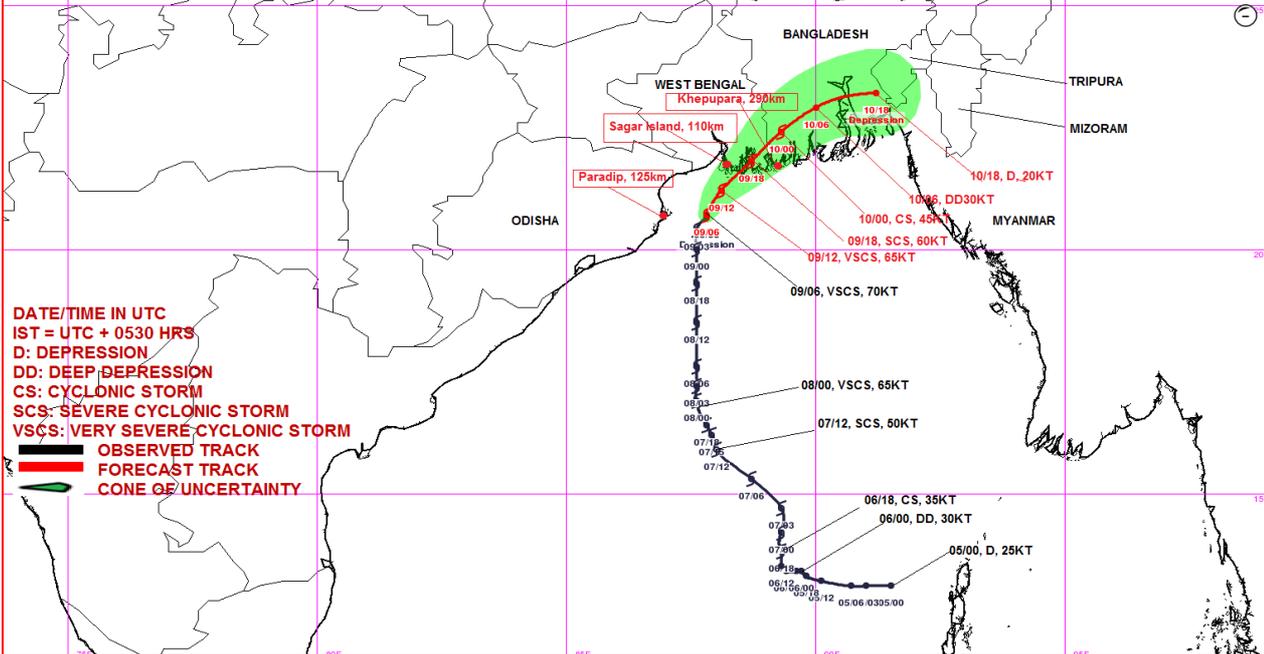
NWB=> NorthWest Bay of Bengal



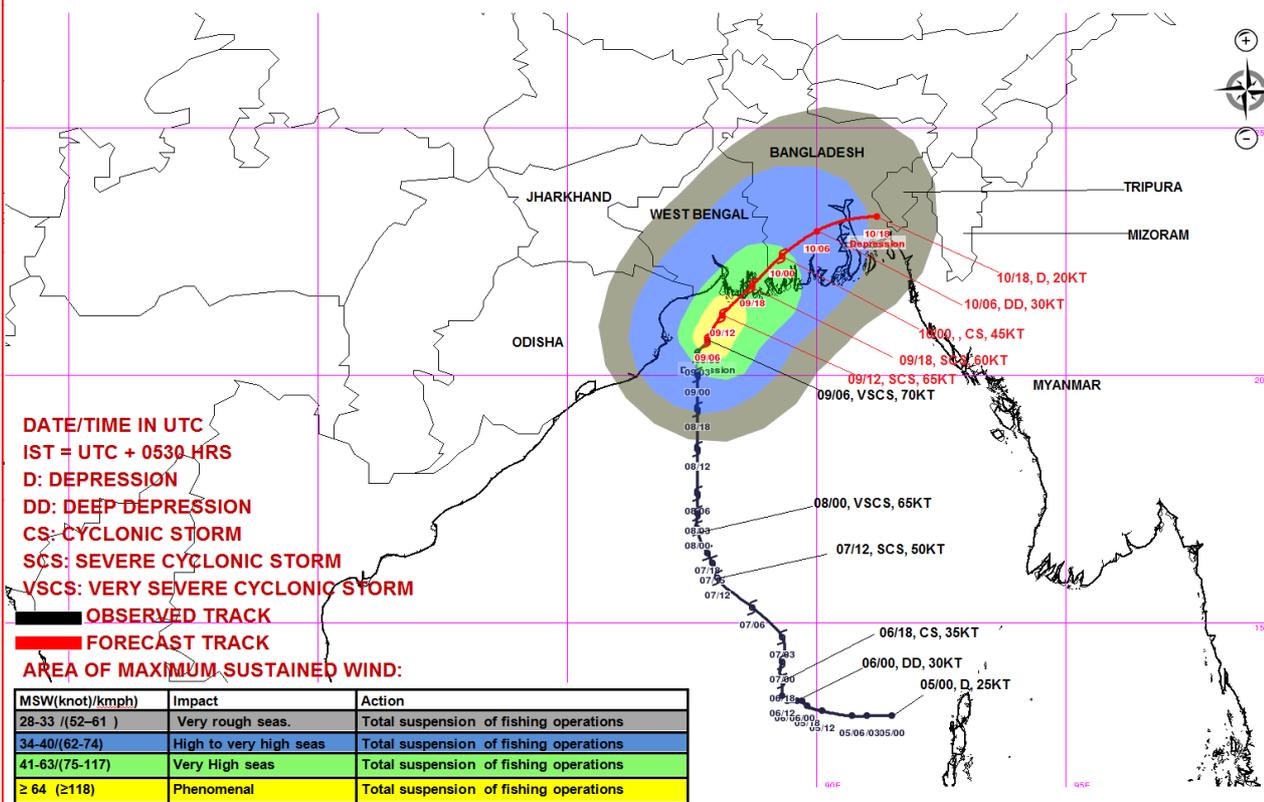
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9 NOV 2019 UTC



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 0600 UTC OF 09th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 0600 UTC OF 09th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 20**

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 BULLETIN NO. 20 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1030 UTC OF 09.11.2019 BASED ON 0900 UTC OF 09.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL CONTINUED TO MOVE NEARLY NORTHWARDS WITH A SPEED OF 09 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 0900UTC OF TODAY, THE 9TH NOVEMBER 2019, OVER NORTHWEST BAY OF BENGAL, NEAR LAT.20.9°N AND LONG. 87.9°E ABOUT 140 KM EAST-NORTHEAST OF PARADIP (42976), 85 KM SOUTH OF SAGAR ISLANDS (42903), 120 KM EAST OF CHANDBALI(42973), 120 KM SOUTH-SOUTHEAST BALASORE(42895), 90 KM SOUTH-SOUTHEAST OF DIGHA(42901), 185 KM SOUTH-SOUTHWEST OF KOLKATA (42807) AND 270 KM WEST-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO WEAKEN GRADUALLY, MOVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1430-1730 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS BEING TRACKED BY THE DOPPLER WEATHER RADARS AT GOPALPUR, PARADIP AND KOLKATA IN ADDITION TO OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/0900	20.9	87.9	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
09.11.19/1200	21.2	88.1	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
09.11.19/1800	21.8	88.7	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
10.11.19/0000	22.4	89.3	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/1130	22.9	90.0	50-60 GUSTING TO 70	CYCLONIC STORM
10.11.19/2330	23.2	91.2	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 09th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 18.5°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 0900 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 999.8 HPA AND WIND 020°/13 KNOTS PARADEEP (42976) REPORTED MEAN SEA LEVEL PRESSURE 1002.1 HPA AND WIND 270°/9.9 KNOTS AND CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1000.2 HPA AND WIND 360°/08KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 TO 80 KNOTS GUSTING TO 90 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR (WEST BENGAL) DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30-40 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 25-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 80-110 KJ/CM² AROUND THE SYSTEM CENTER. SEA SURFACE TEMPERATURE BETWEEN 29-30°C AROUND THE SYSTEM.

THE SYSTEM IS LYING NEAR THE UPPER TROPOSPHERIC RIDGE LINE ALONG 20° N. HENCE, THE SYSTEM IS EXPECTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM WILL EXPERIENCE HIGH VERTICAL WIND SHEAR AS WELL AS COOLER SST OVER THE NORTH BAY OF BENGAL. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN RAPIDLY WHILE MOVING NORTHEASTWARDS AND CROSS WEST BENGAL- BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1430-1730 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM.. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

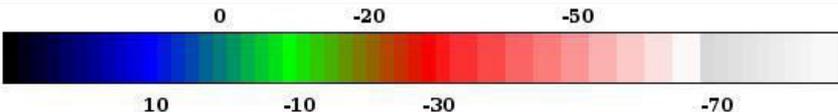
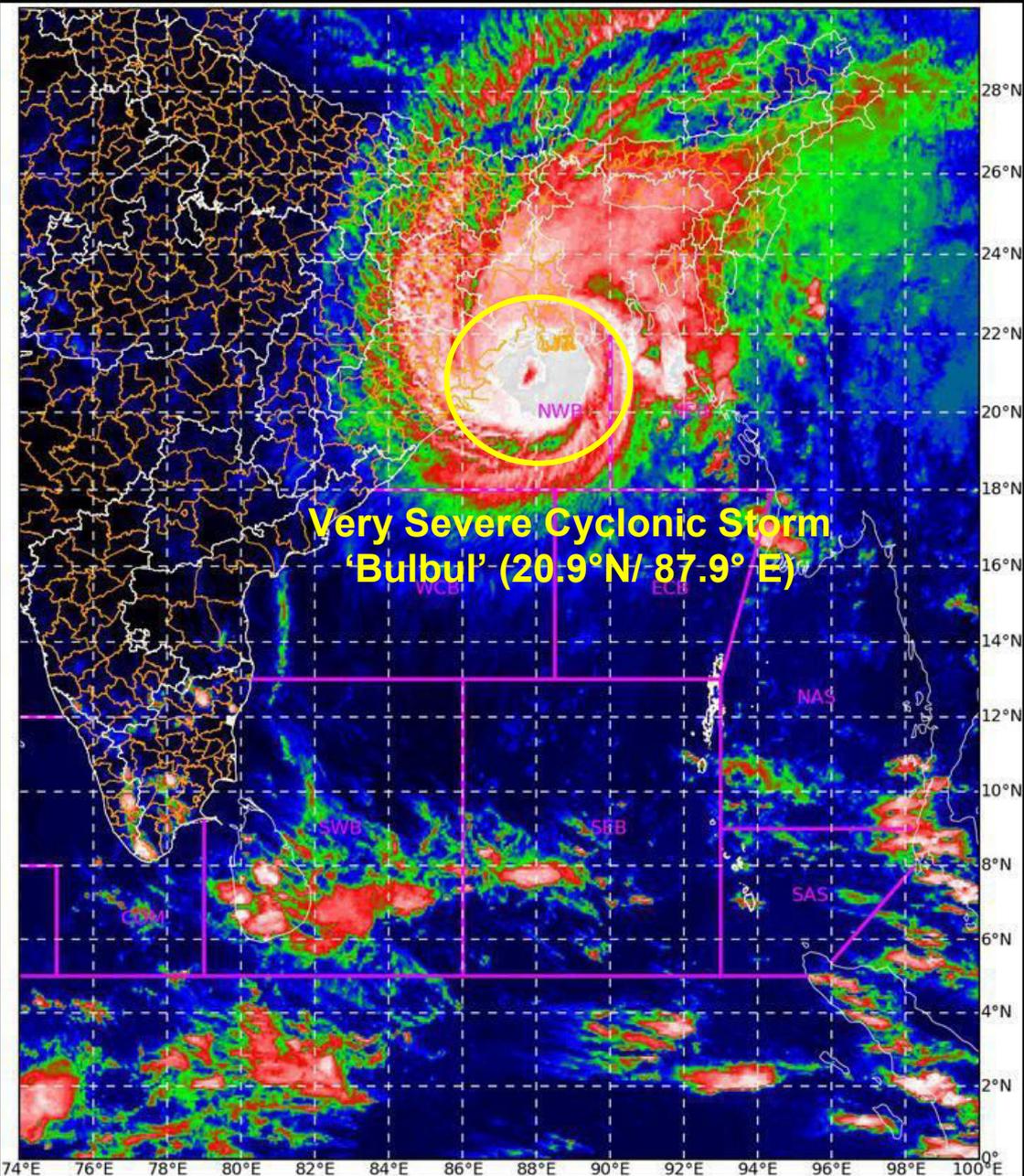
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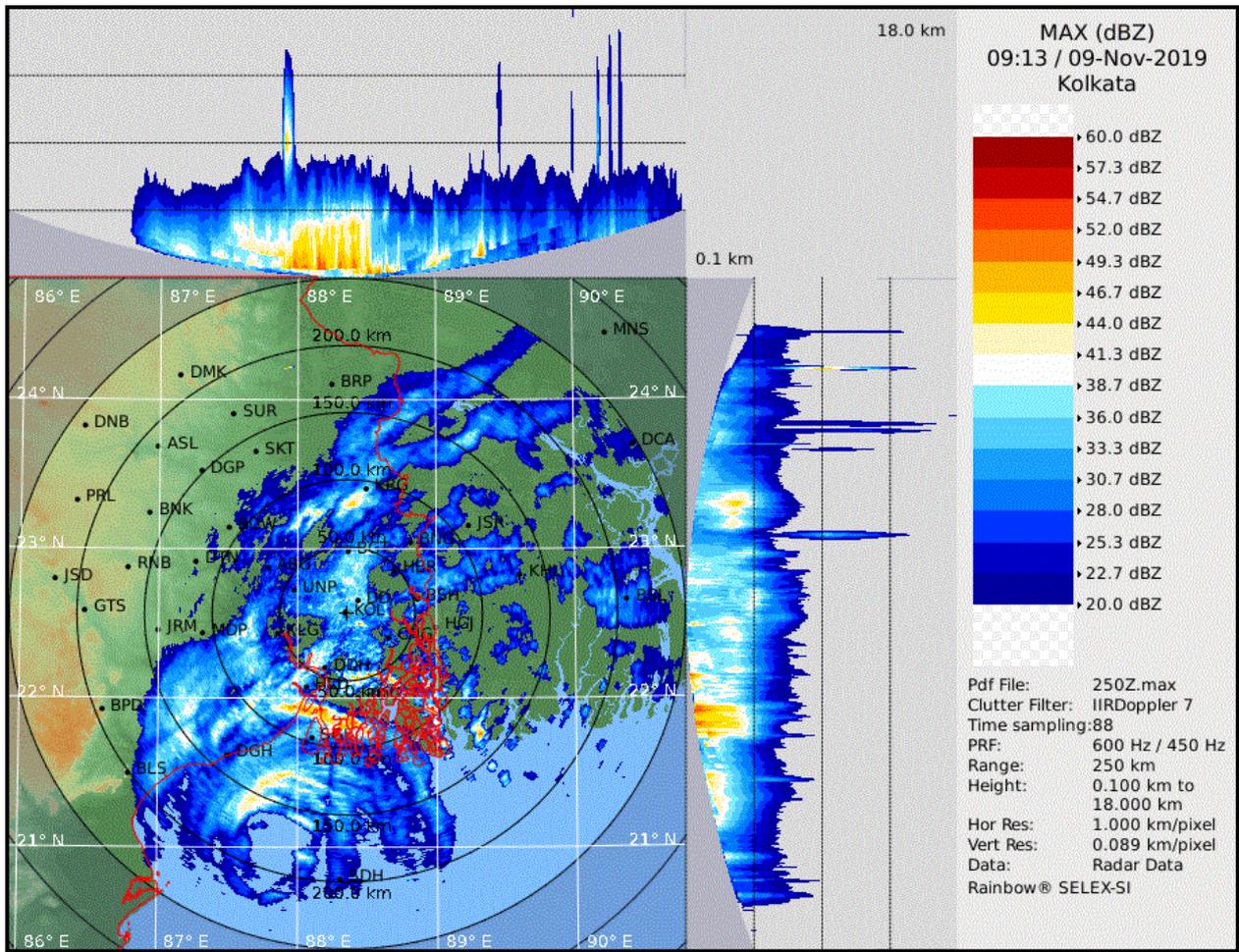
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09-11-2019/(1400 to 1427) IST

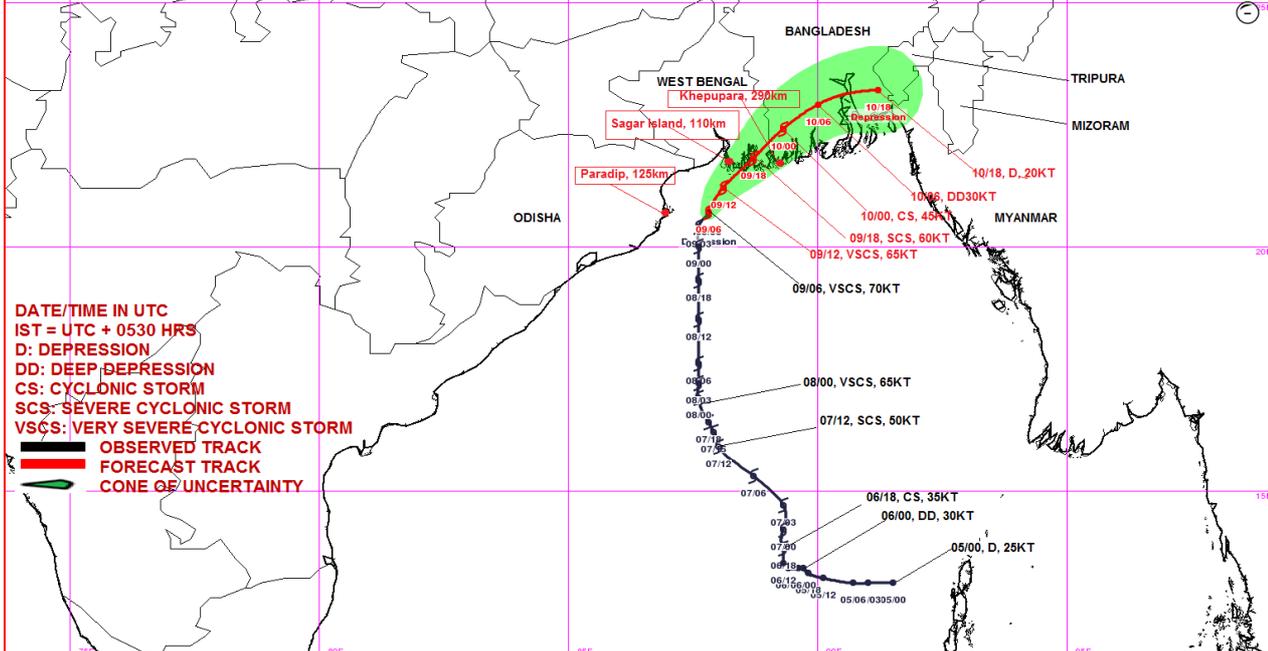
L1C Mercator



Celsius
IMD, DELHI

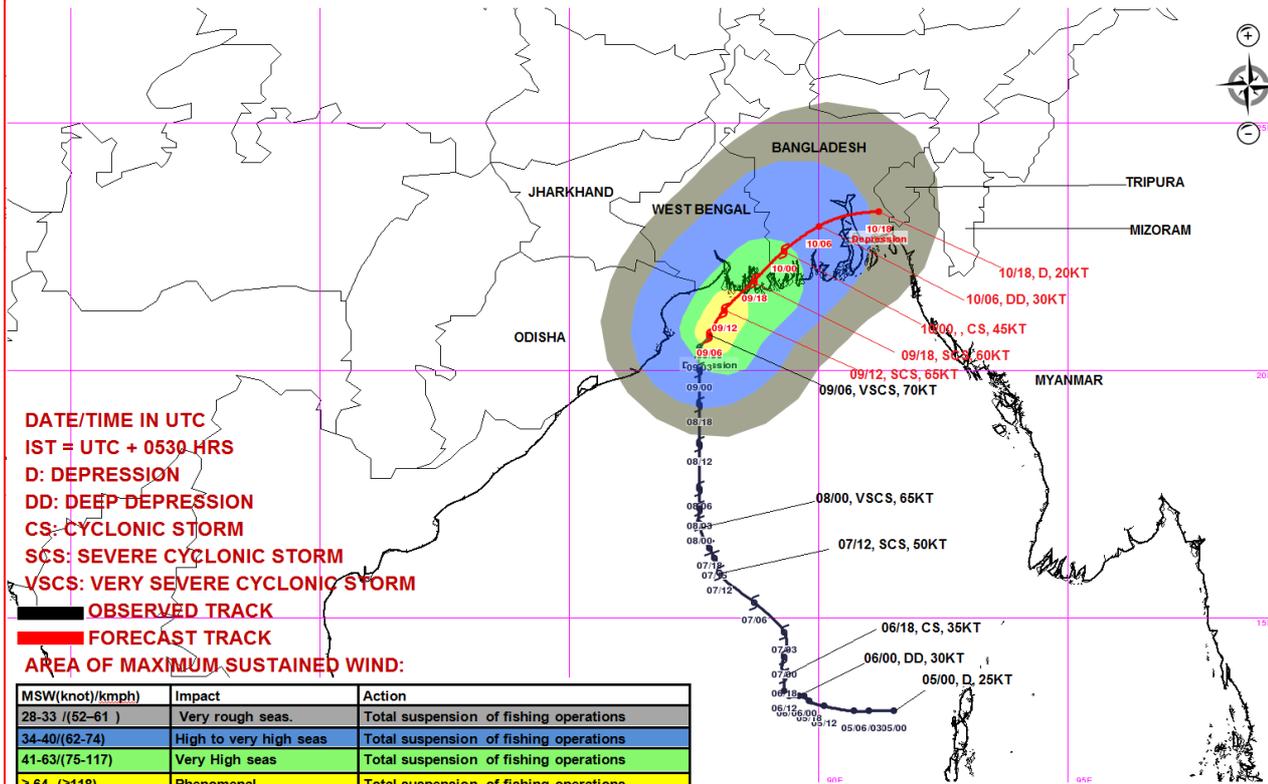


OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 0600 UTC OF 09th NOVEMBER 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 — OBSERVED TRACK
 — FORECAST TRACK
 — CONE OF UNCERTAINTY

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 0600 UTC OF 09th NOVEMBER 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM
 VSCS: VERY SEVERE CYCLONIC STORM
 — OBSERVED TRACK
 — FORECAST TRACK

AREA OF MAXIMUM SUSTAINED WIND:

MSW(knot)/kmph	Impact	Action
28-33 (62-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-63 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 21**

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 BULLETIN NO. 21 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1330 UTC OF 09.11.2019 BASED ON 1200 UTC OF 09.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL CONTINUED TO MOVE NORTH-NORTHEASTWARDS WITH A SPEED OF 11 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1200UTC OF TODAY, THE 9TH NOVEMBER 2019, OVER NORTHWEST BAY OF BENGAL, NEAR LAT.21.2°N AND LONG. 88.1°E ABOUT 175 KM EAST-NORTHEAST OF PARADIP (42976), 050 KM SOUTH OF SAGAR ISLANDS (42903), 150 KM NORTHEAST OF CHANDBALI(42973), 125 KM EAST-SOUTHEAST BALASORE(42895), 75 KM SOUTHEAST OF DIGHA(42901), 150 KM SOUTH-SOUTHWEST OF KOLKATA (42807) AND 230 KM WEST-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO WEAKEN GRADUALLY, MOVE NORTHEASTWARDS AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1430-1730 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH.

THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS BEING TRACKED BY THE DOPPLER WEATHER RADARS AT GOPALPUR, PARADIP AND KOLKATA IN ADDITION TO OTHER OBSERVING PLATFORMS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/1200	21.2	88.1	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
09.11.19/1800	21.8	88.7	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
10.11.19/0000	22.4	89.3	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.9	90.0	60-70 GUSTING TO 80	CYCLONIC STORM
10.11.19/1200	23.1	90.2	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 09TH NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.5/4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 19.5°N AND WEST OF LONG. 90.0°E. THE MINIMUM CTT IS MINUS 93°C.

AT 1200 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 997.7 HPA AND WIND 050°/22 KNOTS HALDIA (42806) REPORTED MEAN SEA LEVEL PRESSURE 1002.1 HPA AND WIND 050°/15 KNOTS, KOLKOTA(42807) REPORTED MEAN SEA LEVEL PRESSURE 1005.3 HPA AND WIND 050°/05KNOTS AND CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1000.2 HPA AND WIND 360°/08KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 70 TO 80 KNOTS GUSTING TO 90 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 982 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR (WEST BENGAL) DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30-40 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 25-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF $30-55 \text{ KJ}/\text{CM}^2$ AROUND THE SYSTEM AREA. SEA SURFACE TEMPERATURE BETWEEN $27-29^{\circ}\text{C}$ OVER THE SYSTEM AREA.

THE SYSTEM IS LYING NORTH OF THE UPPER TROPOSPHERIC RIDGE LINE ALONG 21°N . HENCE, THE SYSTEM STARTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR AS WELL AS LOW TCHP VALUE OVER THE NORTH BAY OF BENGAL. ALONG WITH IT, INTERACTION WITH LAND SURFACE ALSO WILL CAUSE WEAKENING OF THE SYSTEM. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN SLIGHTLY WHILE MOVING NORTHEASTWARDS AND CROSS WEST BENGAL-BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1430-1730 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM.. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

SAT : INSAT-3D IMG

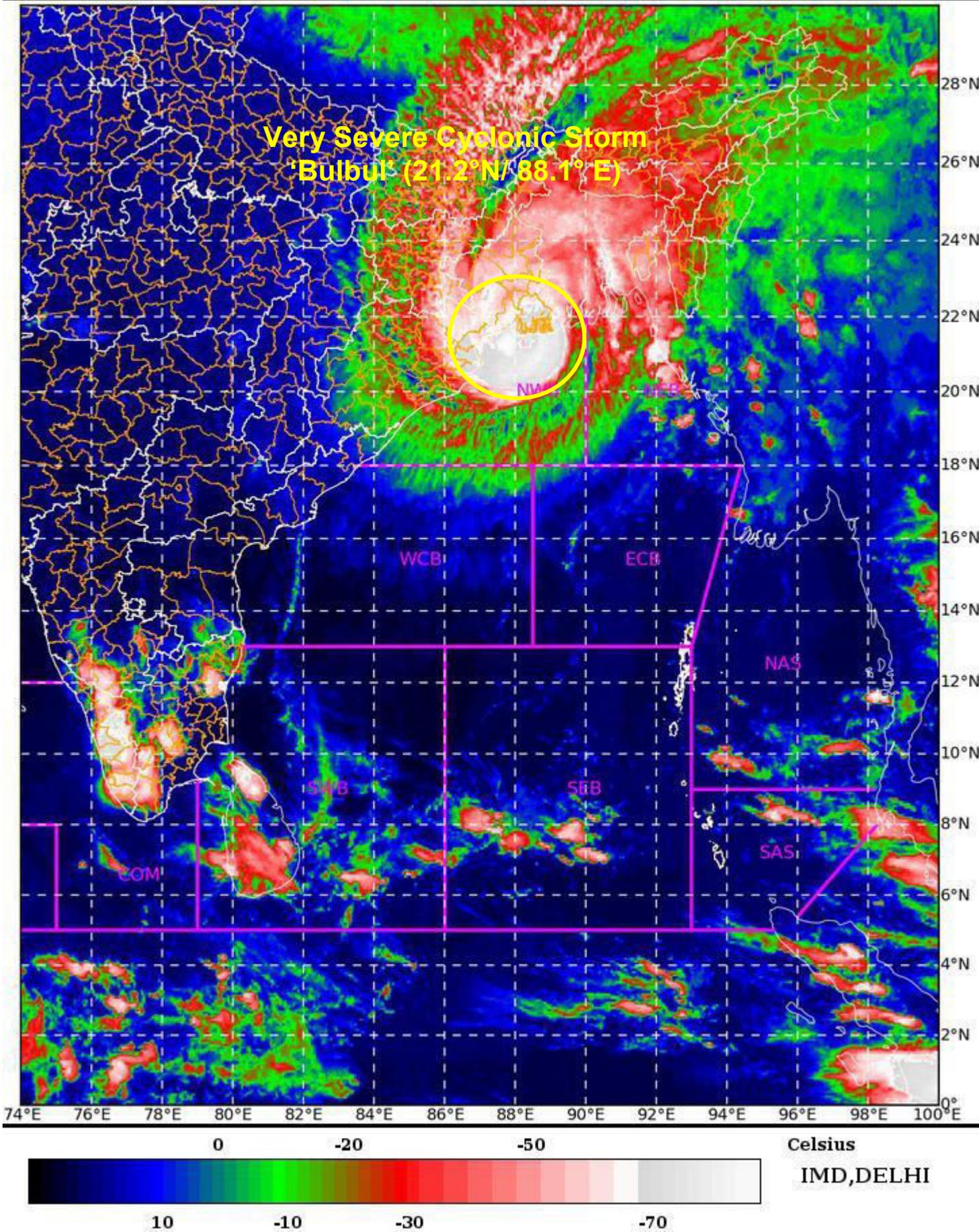
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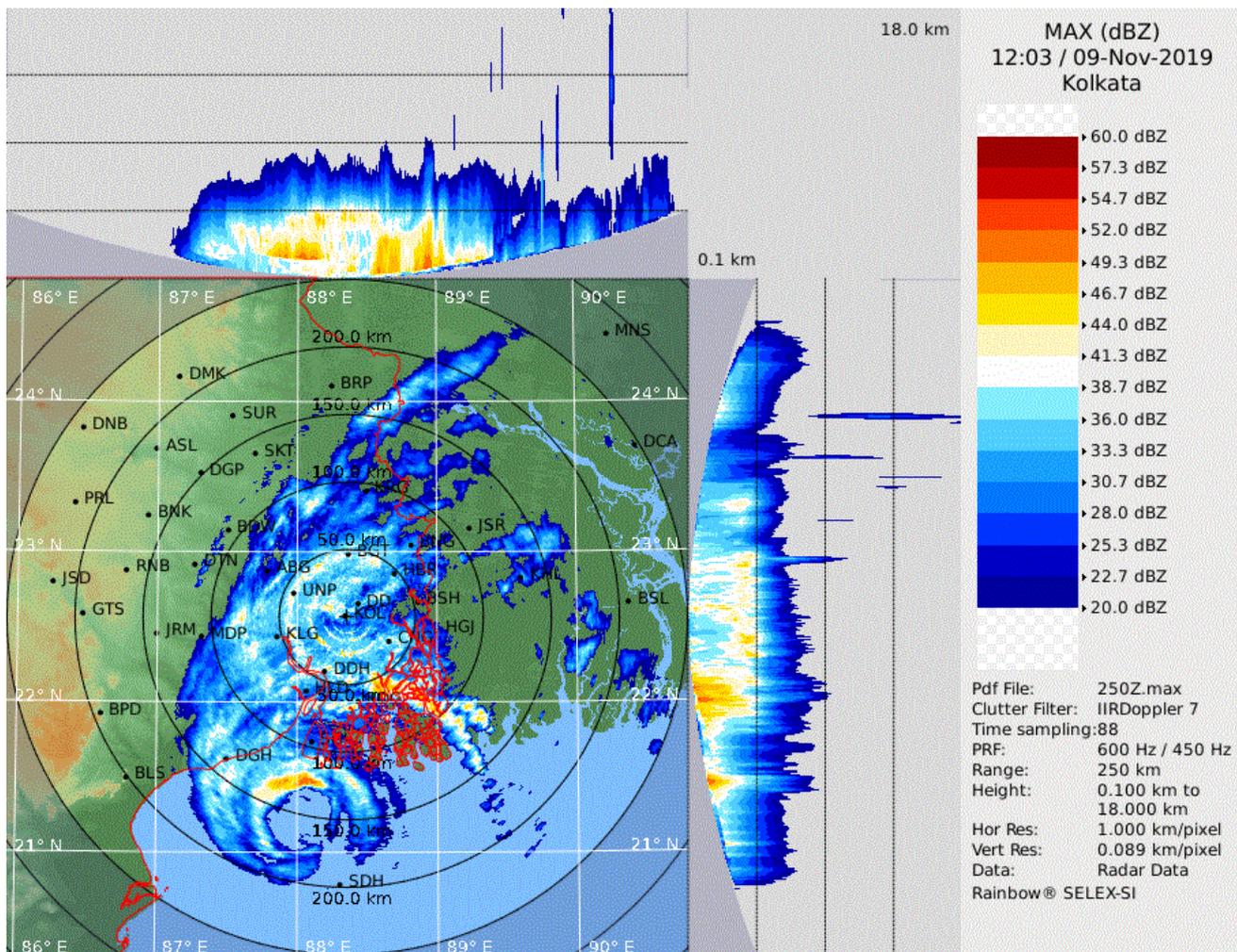
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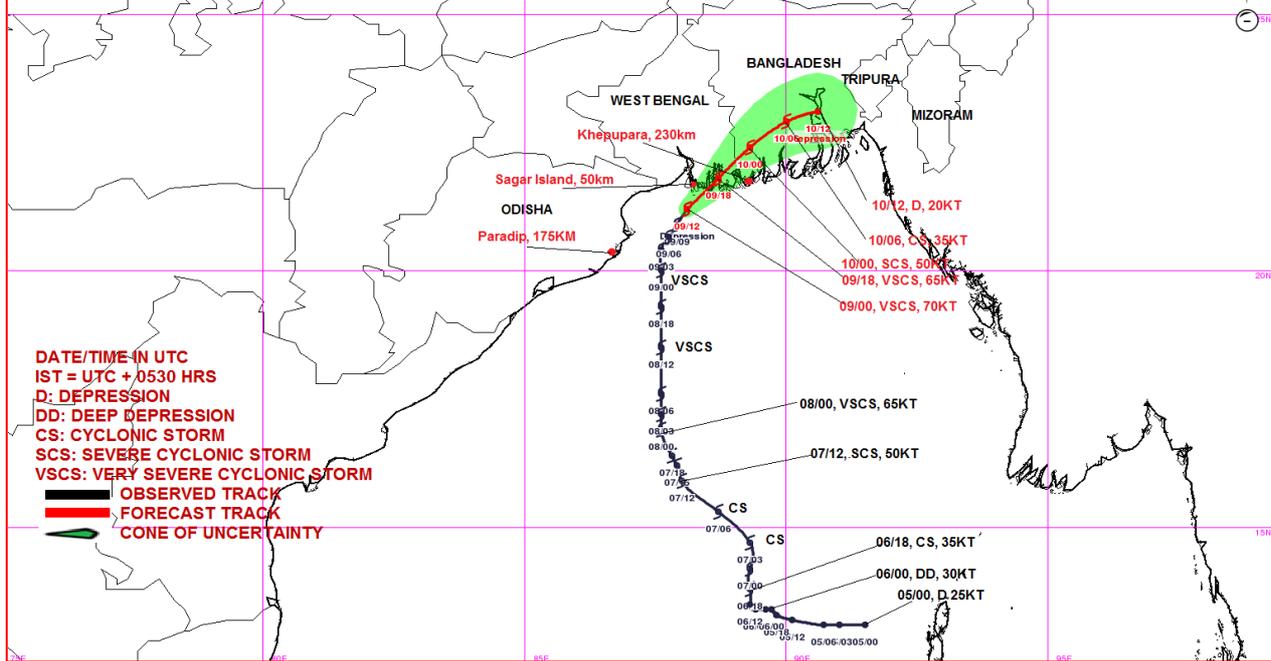


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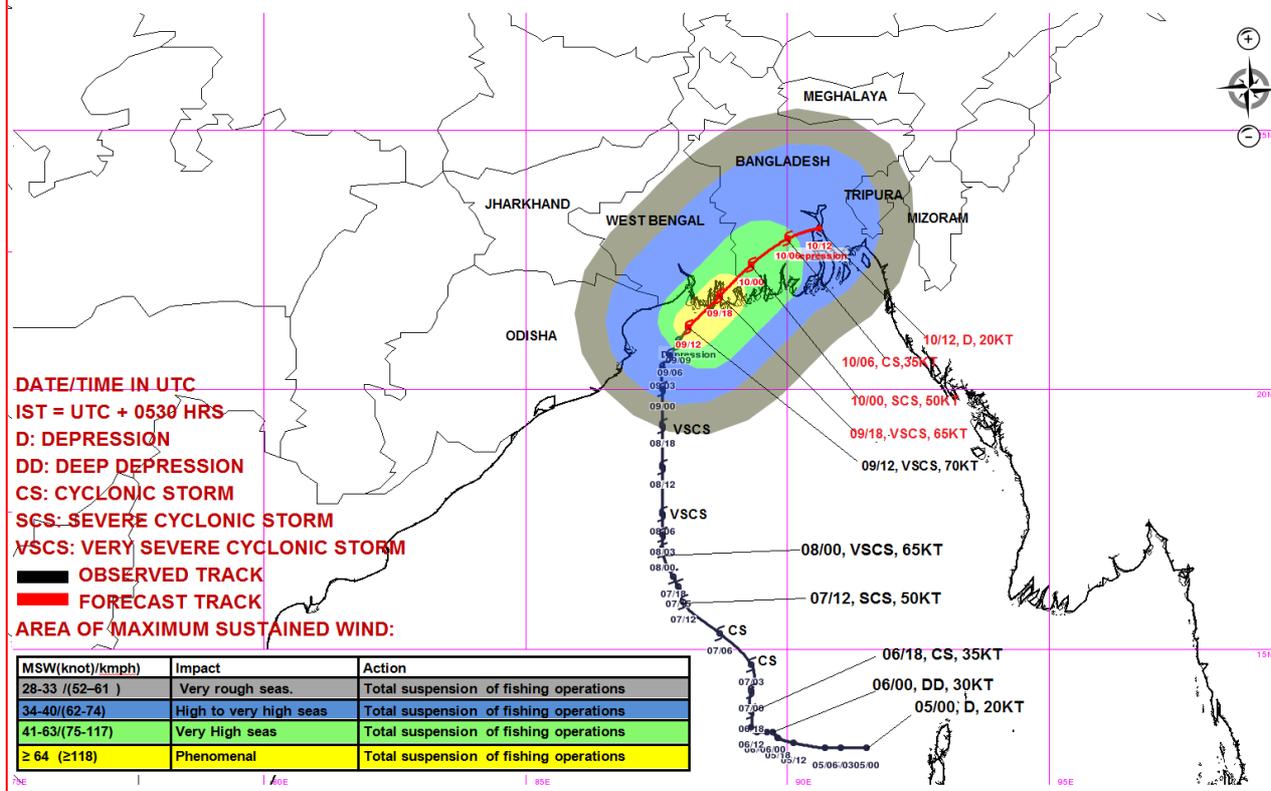




OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 1200 UTC OF 09th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM "BULBUL" OVER NORTHWEST BAY OF BENGAL BASED ON 1200 UTC OF 09th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 22**

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 BULLETIN NO. 22 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1600 UTC OF 09.11.2019 BASED ON 1500 UTC OF 09.11.2019.

SUB: VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL CONTINUED TO MOVE NORTHEASTWARDS WITH A SPEED OF 11 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1500 UTC OF TODAY, THE 09TH NOVEMBER 2019, OVER NORTHWEST BAY OF BENGAL, NEAR LAT. 21.4°N AND LONG. 88.3°E, 040 KM EAST-SOUTHEAST OF SAGAR ISLANDS (42903), 085 KM EAST-SOUTHEAST OF DIGHA(42901), 125KM SOUTH-SOUTHWEST OF KOLKATA (42807), 085 KM EASTSOUTHEAST OF DIGHA(42901), 125KM SOUTH-SOUTHWEST OF KOLKATA (42807), 100 KM SOUTH-SOUTHWEST OF CANNING TOWN(42812) AND 210 WEST-SOUTHWEST OF KHEPUPARA (41984). THE LANDFALL PROCESS HAS STARTED. WALL CLOUD REGION IS ENTERING INTO LAND. IT IS VERY LIKELY TO MOVE NORTHEASTWARDS, WEAKEN GRADUALLY AND CROSS WEST BENGAL - BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING DURING NEXT 03 HOURS AS A SEVERE CYCLONIC STORM WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING TO 135 KMPH. THE VERY SEVERE CYCLONIC STORM 'BULBUL' IS BEING TRACKED BY THE DOPPLER WEATHER RADARS AT GOPALPUR, PARADIP AND KOLKATA IN ADDITION TO OTHER OBSERVING PLATFORMS.

Forecast track and intensity are given in the following table:

Date/Time (UTC)	Position		Maximum sustained surface wind speed (kmph)	Category of cyclonic disturbance
	Lat. (°N)	Long. (°E)		
09.11.19/1500	21.4	88.3	120-130 gusting to 145	Very Severe Cyclonic Storm
09.11.19/1800	21.8	88.7	110-120 gusting to 135	Severe Cyclonic Storm
10.11.19/0000	22.4	89.3	80-90 gusting to 100	Cyclonic Storm
10.11.19/0600	22.9	90.0	50-60 gusting to 70	Deep Depression
10.11.19/1200	23.1	90.6	30-40 gusting to 50	Depression

AS PER THE SATELLITE IMAGERY AT 1500 UTC OF 09th NOVEMBER, 2019, CURRENT INTENSITY OF THE SYSTEM IS T 4.5/4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 21.5°N AND WEST OF LONG. 88.4°E. THE MINIMUM CTT IS MINUS 33°C.

AT 1500 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 1000.1 HPA AND WIND 020°/1 KNOTS HALDIA (42806) REPORTED MEAN SEA LEVEL PRESSURE 1003.3 HPA AND WIND 050°/09 KNOTS, KOLKOTA(42807) REPORTED MEAN SEA LEVEL PRESSURE 1006.6 HPA AND WIND 090°/06KNOTS AND CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1007.0 HPA AND WIND 360°/03KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 60 GUSTING TO 70 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 988 HPA. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO BE AROUND 2-3 KM INLAND.

STORM SURGE OF ABOUT 1.0 TO 2.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) AND 0.5-1.0 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF EAST MEDINIPUR (WEST BENGAL) DURING THE TIME OF LANDFALL. MAXIMUM EXTENT OF INUNDATION IS LIKELY TO UPTO 2KM INLAND.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30-40 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 25-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF $30-55 \text{ KJ}/\text{CM}^2$ AROUND THE SYSTEM AREA. SEA SURFACE TEMPERATURE BETWEEN $27-29^{\circ}\text{C}$ OVER THE SYSTEM AREA.

THE SYSTEM IS LYING NORTH OF THE UPPER TROPOSPHERIC RIDGE LINE ALONG 21°N . HENCE, THE SYSTEM STARTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR AS WELL AS LOW TCHP VALUE OVER THE NORTH BAY OF BENGAL. ALONG WITH IT, INTERACTION WITH LAND SURFACE ALSO WILL CAUSE WEAKENING OF THE SYSTEM. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN SLIGHTLY WHILE MOVING NORTHEASTWARDS AND CROSS WEST BENGAL-BANGLADESH COASTS BETWEEN SAGAR ISLANDS (42903) AND KHEPUPARA (41984), ACROSS SUNDERBAN DELTA DURING 1430-1730 UTC OF 9TH NOVEMBER AS A SEVERE CYCLONIC STORM.. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

SAT : INSAT-3D IMG

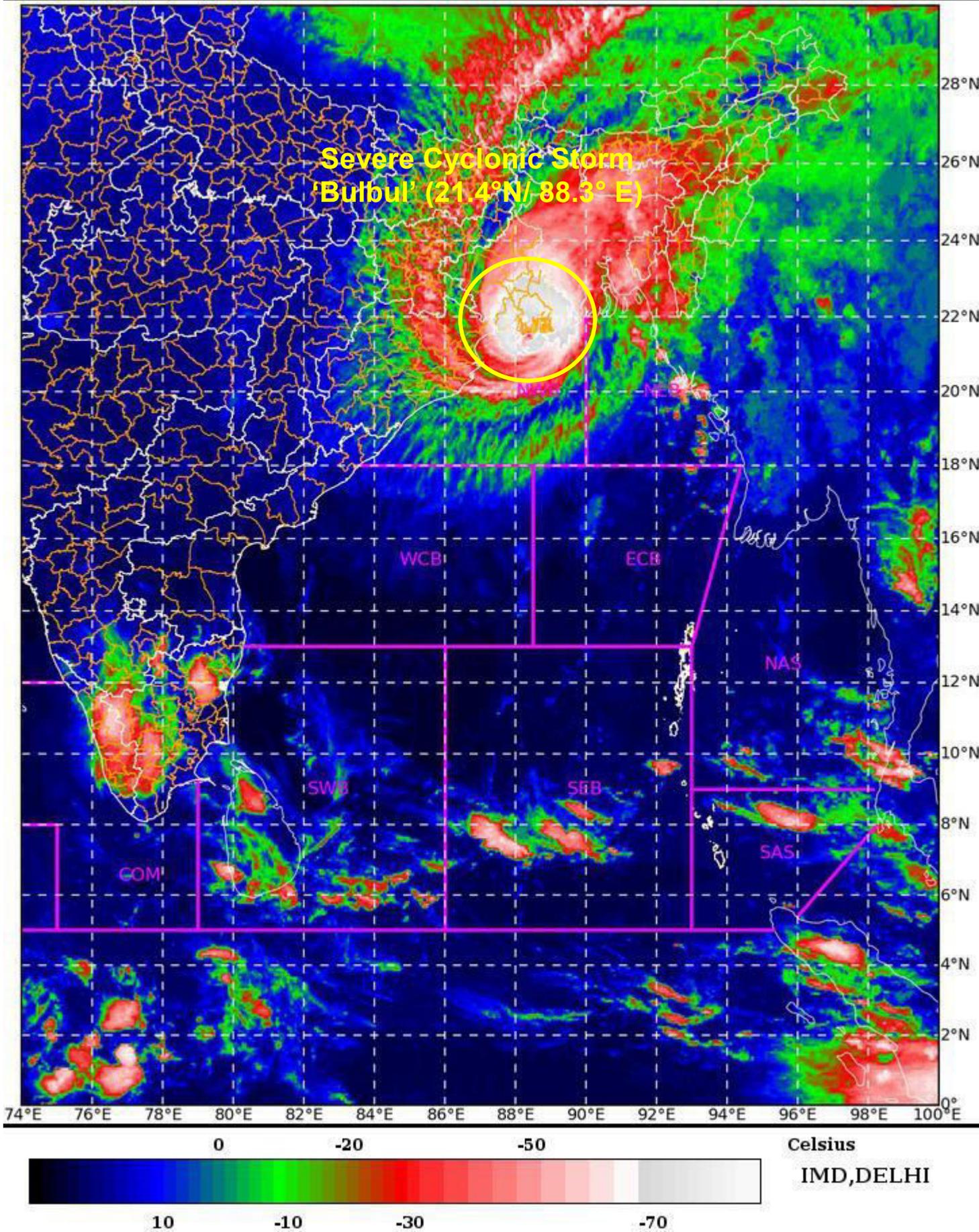
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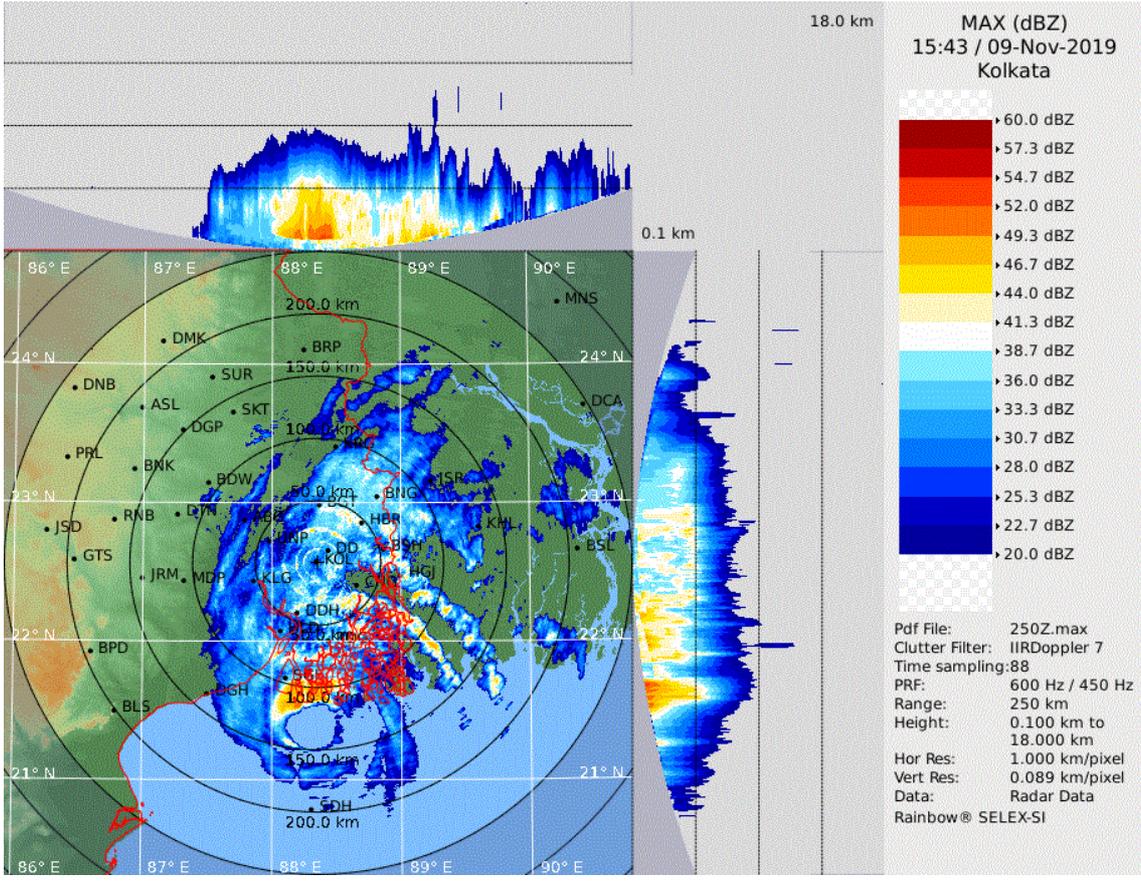
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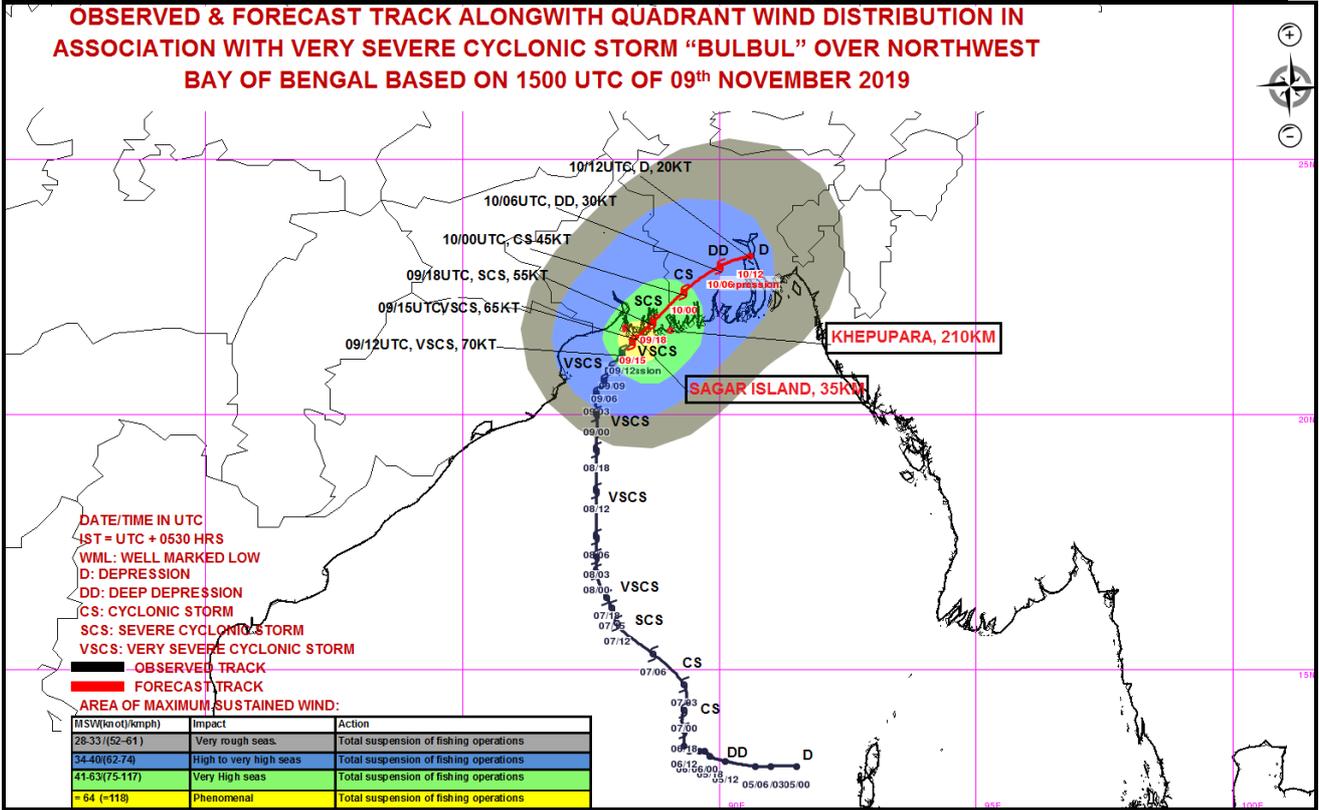
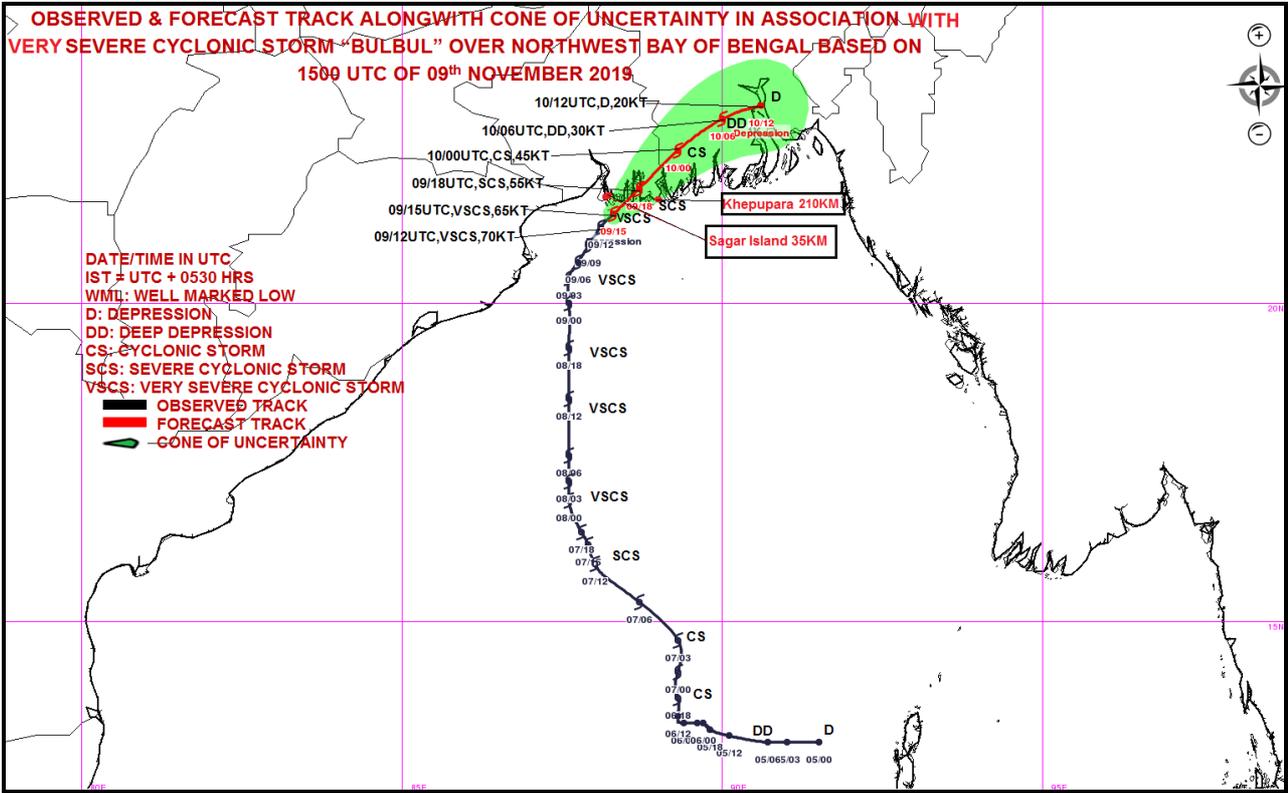
09-11-2019/(2030 to 2056) IST



L1C Mercator









**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 23**

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 BULLETIN NO. 23 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2030 UTC OF 09.11.2019 BASED ON 1800 UTC OF 09.11.2019.

SUB: SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL WEST BENGAL

THE VERY SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER NORTHWEST BAY OF BENGAL MOVED NORTHEASTWARDS WITH A SPEED OF 11 KMPH DURING PAST 06 HOURS, WEAKENED IN TO A SEVERE CYCLONIC STORM AND CROSSED WEST BENGAL COAST CLOSE TO SUNDERBAN DHANCHI FOREST DURING 1500 TO 1800 UTC OF 9TH NOVEMBER WITH MAXIMUM SUSTAINED WIND SPEED OF 110-120 KMPH GUSTING 135 KMPH AND LAY CENTRED AT 1800 UTC OF 09TH NOVEMBER 2019 OVER COASTAL WEST BENGAL, NEAR LAT. 21.6°N AND LONG. 88.6°E (CLOSE TO THE EAST OF SUNDERBAN DHANCHI FOREST), ABOUT 55 KM EAST OF SAGAR ISLANDS (42903), 115 KM EAST OF DIGHA (42901), 110 KM SOUTH-SOUTHWEST OF KOLKATA (42807), 75 KM SOUTH OF CANNING TOWN (42812) AND 175 WEST-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS TO BANGALADESH ACROSS SOUTH 24 PARGANAS DISTRICT OF WEST BENGAL AND WEAKEN GRADUALLY IN TO A CYCLONOC STORM OVER COASTAL BANGALADESH AND ADJOINING SOUTH AND NORTH 24 PARAGANAS DISTRICTS OF WEST BENGAL BY 0000 UTC OF 10TH NOVEMBER .

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/1800	21.6	88.6	105-115 GUSTING TO 125	SEVERE CYCLONIC STORM
10.11.19/0000	22.4	89.3	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.9	90.0	50-60 GUSTING TO 70	DEEP DEPRESSION
10.11.19/1200	23.1	90.6	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 09th NOVEMBER, 2019,. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING WEST CENTRAL BAY OF BENGAL NORTH OF LAT. 21.87°N AND WEST OF LONG. 88.92°E. THE MINIMUM CTT IS MINUS 78°C.

AT 1800 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 1002.8 HPA AND WIND 340°/10 KNOTS HALDIA (42806) REPORTED MEAN SEA LEVEL

PRESSURE 1001.1 HPA AND WIND 050°/15 KNOTS, KOLKOTA(42807) REPORTED MEAN SEA LEVEL PRESSURE 1005.2 HPA AND WIND 050°/09 KNOTS AND CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1007.0 HPA AND WIND 320°/02 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 60 GUSTING TO 70 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 990 HPA. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.5 TO 2.5 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING THE NEXT 06 HOURS .

STORM SURGE OF ABOUT 1.0 TO 1.5 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) DURING NEXT SIX HOURS.

REMARKS

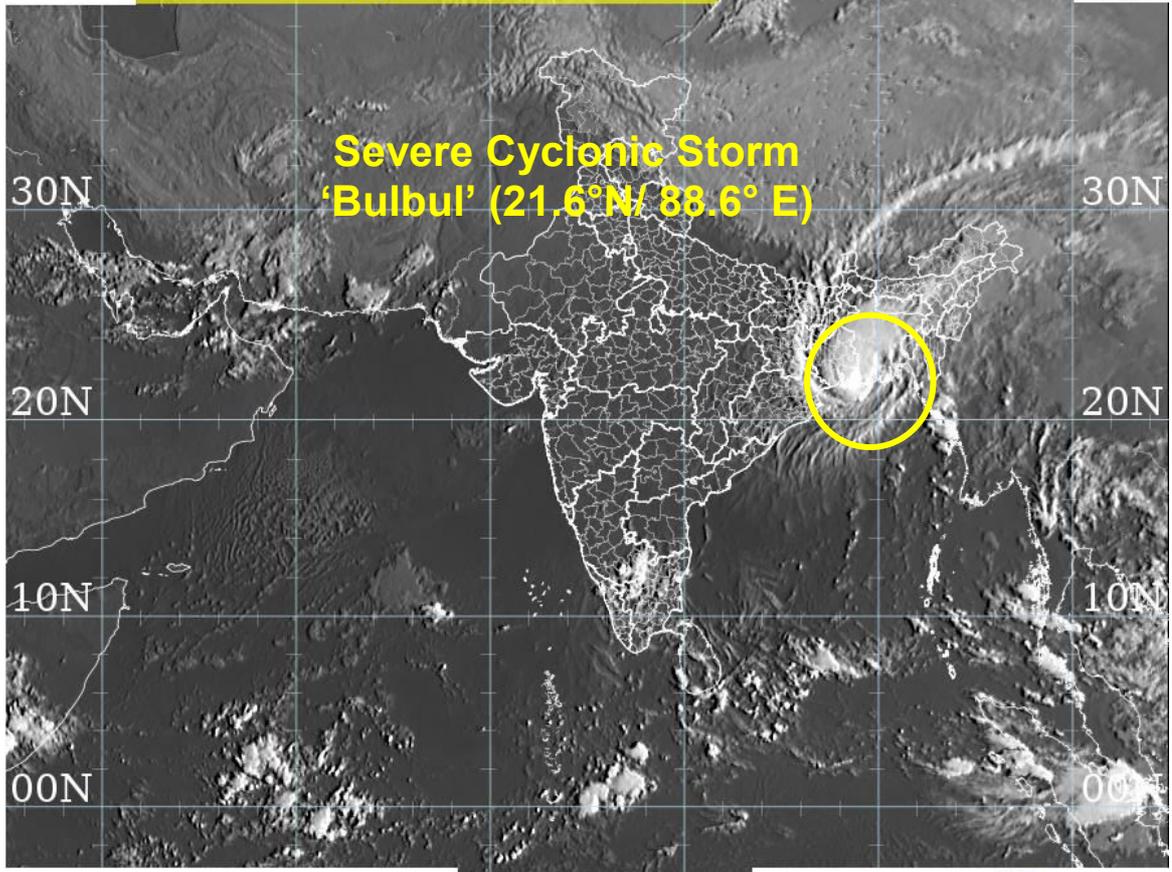
THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $40-50 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 25-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF 30-55 KJ/CM^2 AROUND THE SYSTEM AREA. SEA SURFACE TEMPERATURE BETWEEN $27-29^{\circ}\text{C}$ OVER THE SYSTEM AREA.

THE SYSTEM IS LYING NORTH OF THE UPPER TROPOSPHERIC RIDGE LINE ALONG 21°N . HENCE, THE SYSTEM STARTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR AS WELL AS LOW TCHP VALUE OVER THE NORTH BAY OF BENGAL. ALONG WITH IT, INTERACTION WITH LAND SURFACE ALSO WILL CAUSE WEAKENING OF THE SYSTEM. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN SLIGHTLY WHILE MOVING NORTHEASTWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(VR DURAI)
SCIENTIST-E, RSMC, NEW DELHI

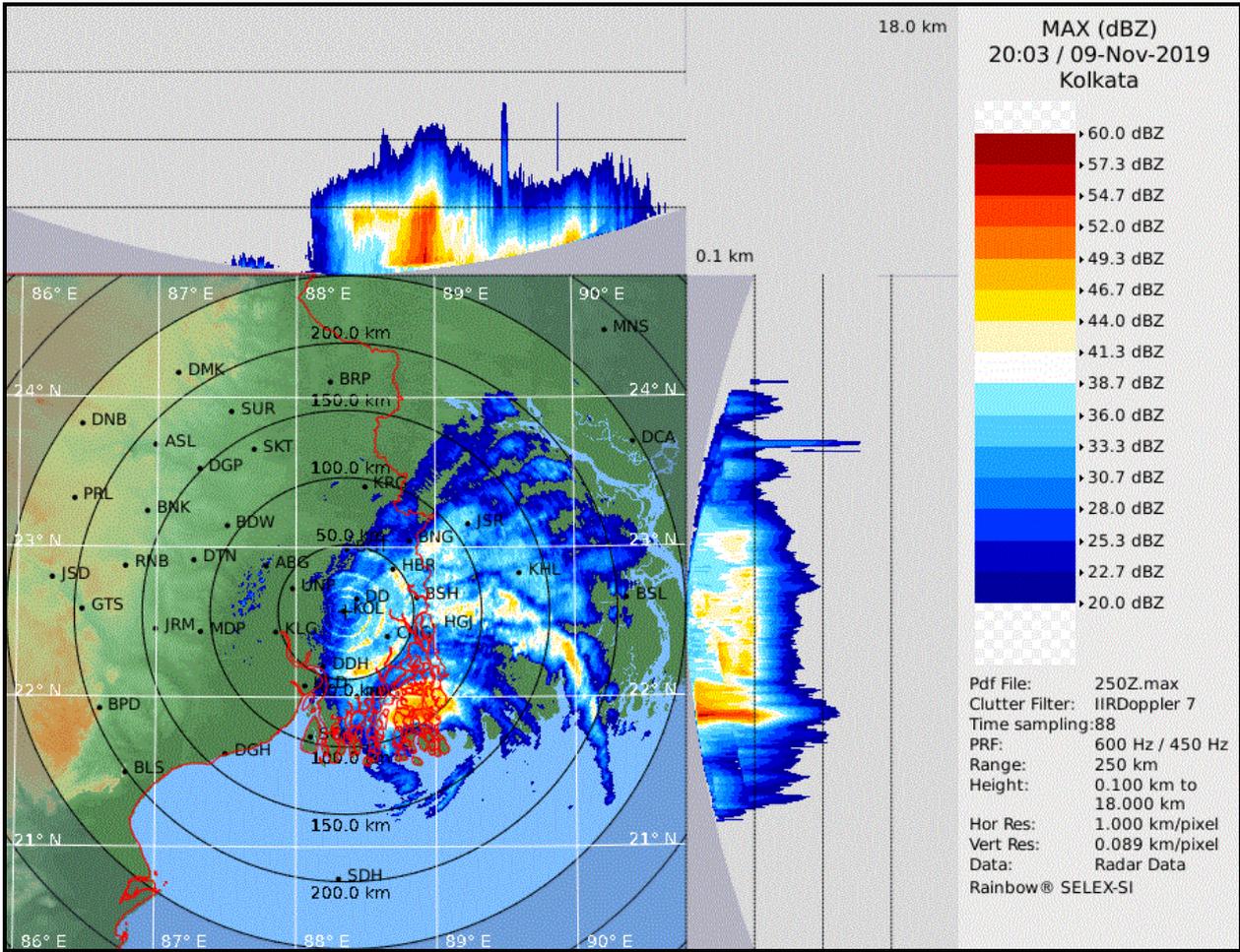


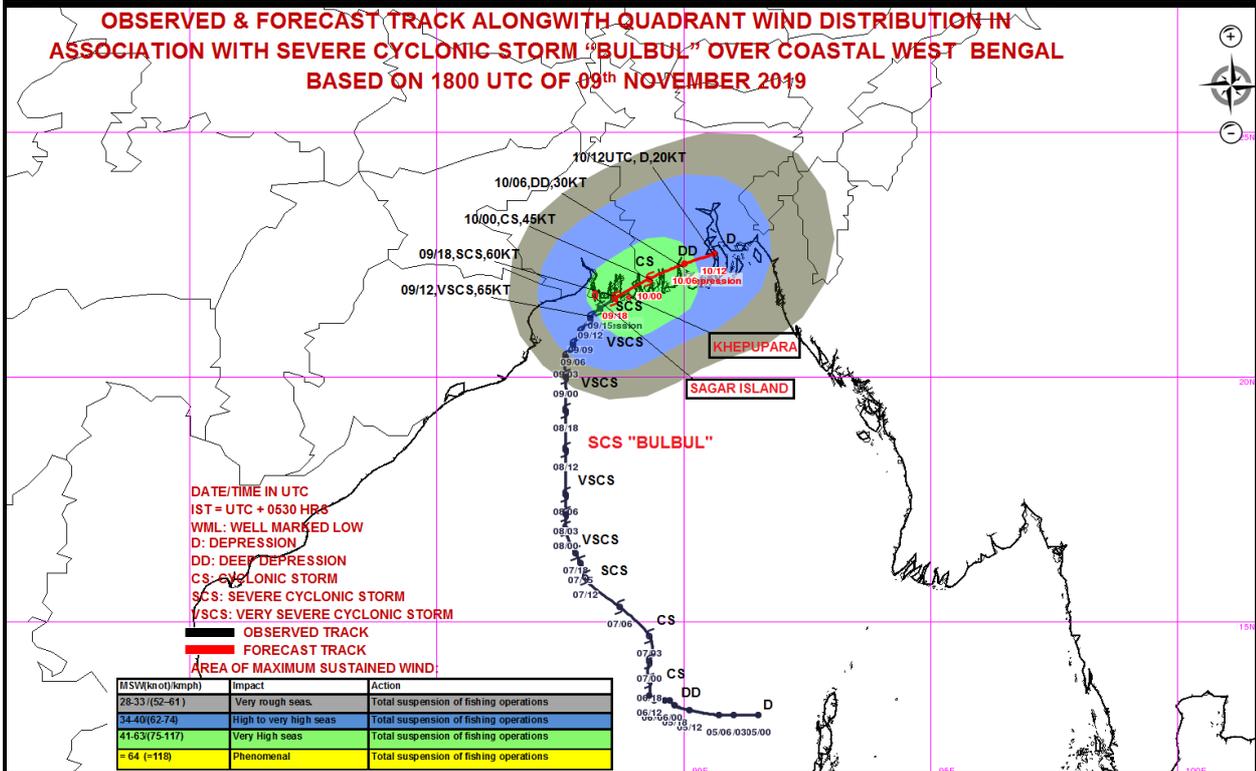
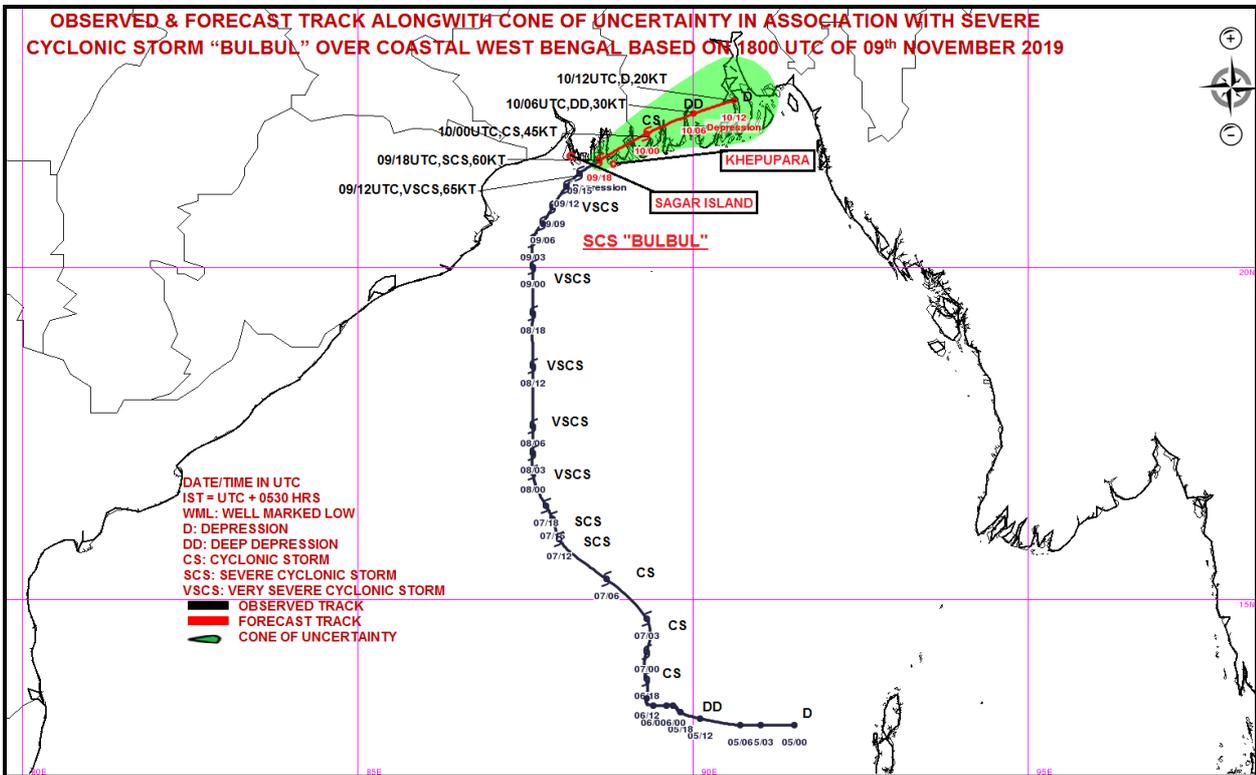
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70E 80E









**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 24**

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 BULLETIN NO. 24 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2230 UTC OF 09.11.2019 BASED ON 2100 UTC OF 09.11.2019.

SUB: SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL WEST BENGAL AND ADJOINING BANGLADESH

THE SEVERE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL WEST BENGAL MOVED NORTHEASTWARDS WITH A SPEED OF 11 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 2100 UTC OF 09TH NOVEMBER 2019 OVER COASTAL WEST BENGAL, NEAR LAT. 21.8°N AND LONG. 89.0°E, ABOUT 100 KM NORTHEAST OF SAGAR ISLANDS (42903), 115 KM EAST OF DIGHA (42901), 105 KM SOUTHWEST OF KOLKATA (42807) AND 125 WEST-SOUTHWEST OF KHEPUPARA (41984). IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS ACROSS BANGLADESH. IT IS LIKELY TO WEAKEN INTO A CYCLONIC STORM OVER COASTAL BANGLADESH AND ADJOINING SOUTH & NORTH 24 PARGANAS DISTRICTS OF WEST BENGAL DURING NEXT 03 HOURS AND INTO A DEEP DEPRESSION DURING SUBSEQUENT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
09.11.19/2100	21.8	89.0	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
10.11.19/0000	22.4	89.3	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.9	90.0	50-60 GUSTING TO 70	DEEP DEPRESSION
10.11.19/1200	23.1	90.6	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 2100 UTC OF 09th NOVEMBER, 2019,. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTHWEST AND ADJOINING NORTH EAST BAY OF BENGAL NORTH OF LAT. 21.27°N AND WEST OF LONG. 88.2°E. THE MINIMUM CTT IS MINUS 90°C.

AT 2100 UTC OF 09th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 1003.6 HPA AND WIND 340°/09 KNOTS HALDIA (42806) REPORTED MEAN SEA LEVEL PRESSURE 1001.3 HPA AND WIND 050°/06 KNOTS AND CHANDBALI (42973) REPORTED MEAN SEA LEVEL PRESSURE 1006.8 HPA AND WIND 320°/01 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 50 GUSTING TO 60 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTRE.

STORM SURGE GUIDANCE

STORM SURGE OF ABOUT 0.5 METER HEIGHT ABOVE ASTRONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH AND NORTH 24 PARGANAS (WEST BENGAL) DURING NEXT SIX HOURS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $40-50 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS 25-30 KNOTS TO THE NORTH-NORTHWEST OF THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK AND BECOMING HIGH ALONG WEST BENGAL – BANGLADESH COASTS. THE RIDGE RUNS ROUGHLY ALONG 21°N NORTH OVER BAY OF BENGAL REGION. TROPICAL CYCLONE HEAT POTENTIAL OF $30-55 \text{ KJ}/\text{CM}^2$ AROUND THE SYSTEM AREA. SEA SURFACE TEMPERATURE BETWEEN $27-29^{\circ}\text{C}$ OVER THE SYSTEM AREA.

THE SYSTEM IS LYING NORTH OF THE UPPER TROPOSPHERIC RIDGE LINE ALONG 21°N . HENCE, THE SYSTEM STARTED TO MOVE NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR AS WELL AS LOW TCHP VALUE OVER THE NORTH BAY OF BENGAL. ALONG WITH IT, INTERACTION WITH LAND SURFACE ALSO WILL CAUSE WEAKENING OF THE SYSTEM. DUE TO ALL THESE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS EXPECTED TO WEAKEN SLIGHTLY WHILE MOVING NORTHEASTWARDS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(VR DURAI)
SCIENTIST-E, RSMC, NEW DELHI

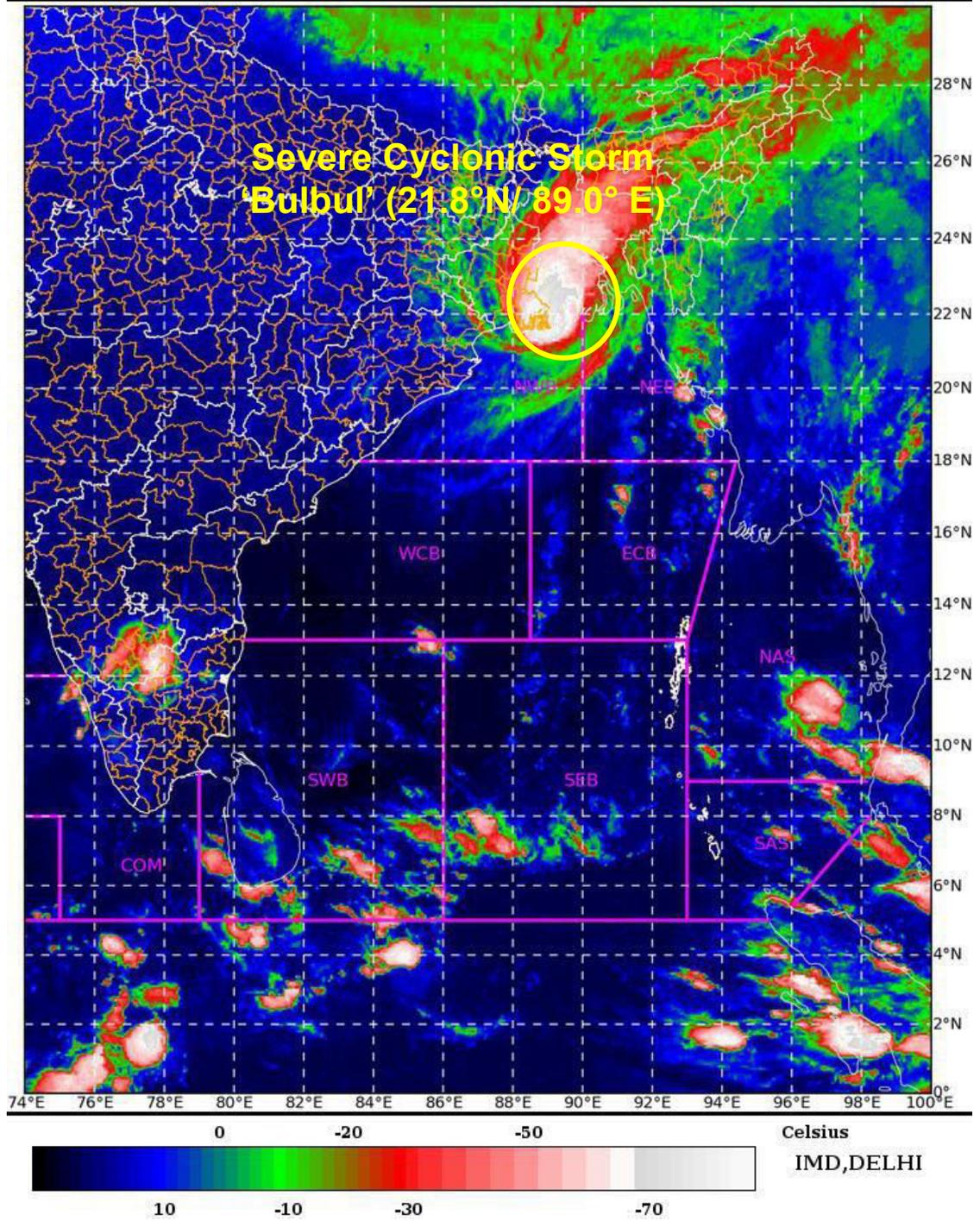
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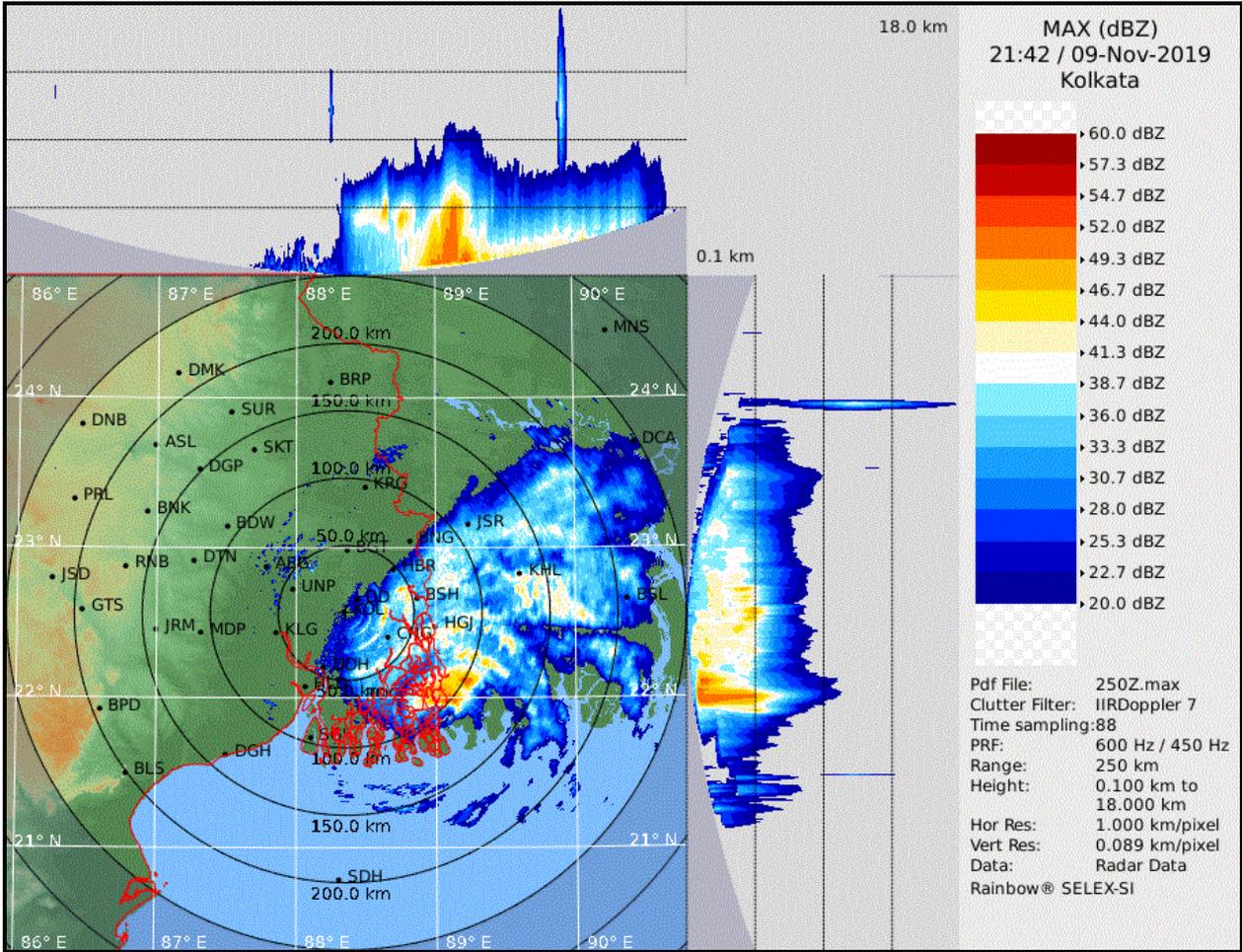
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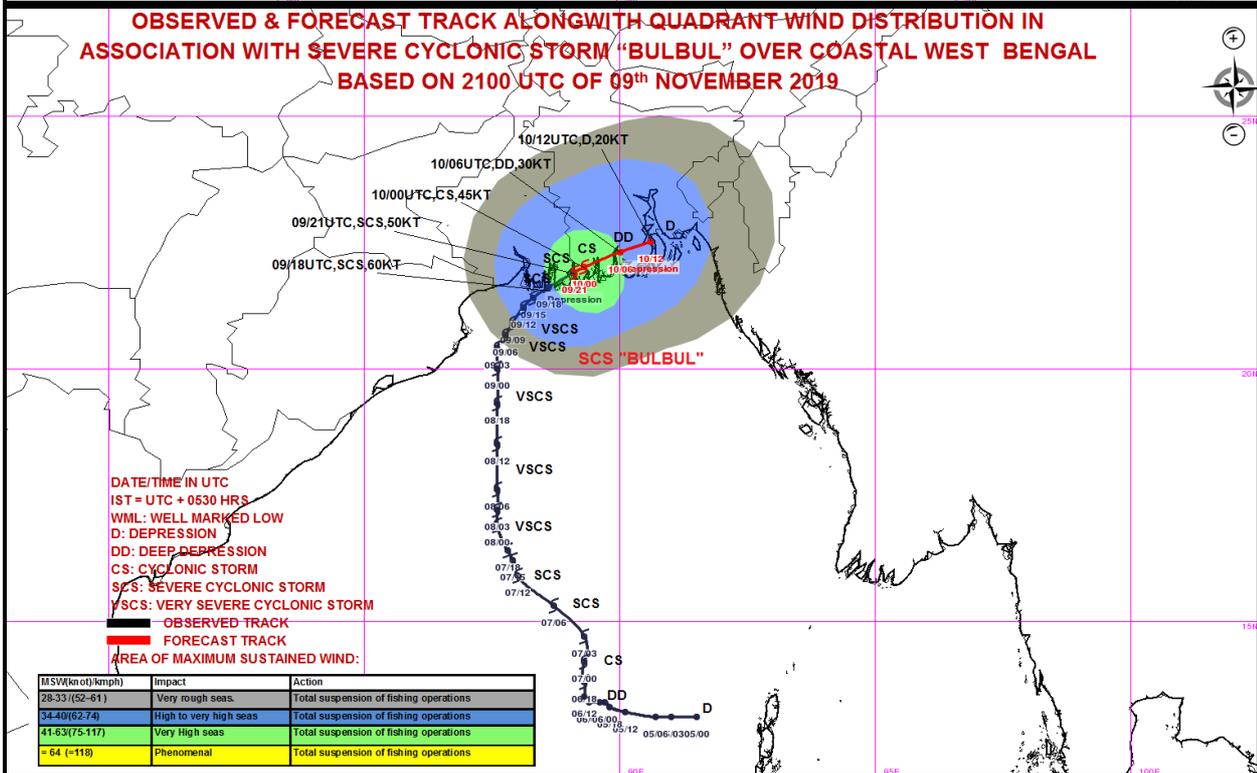
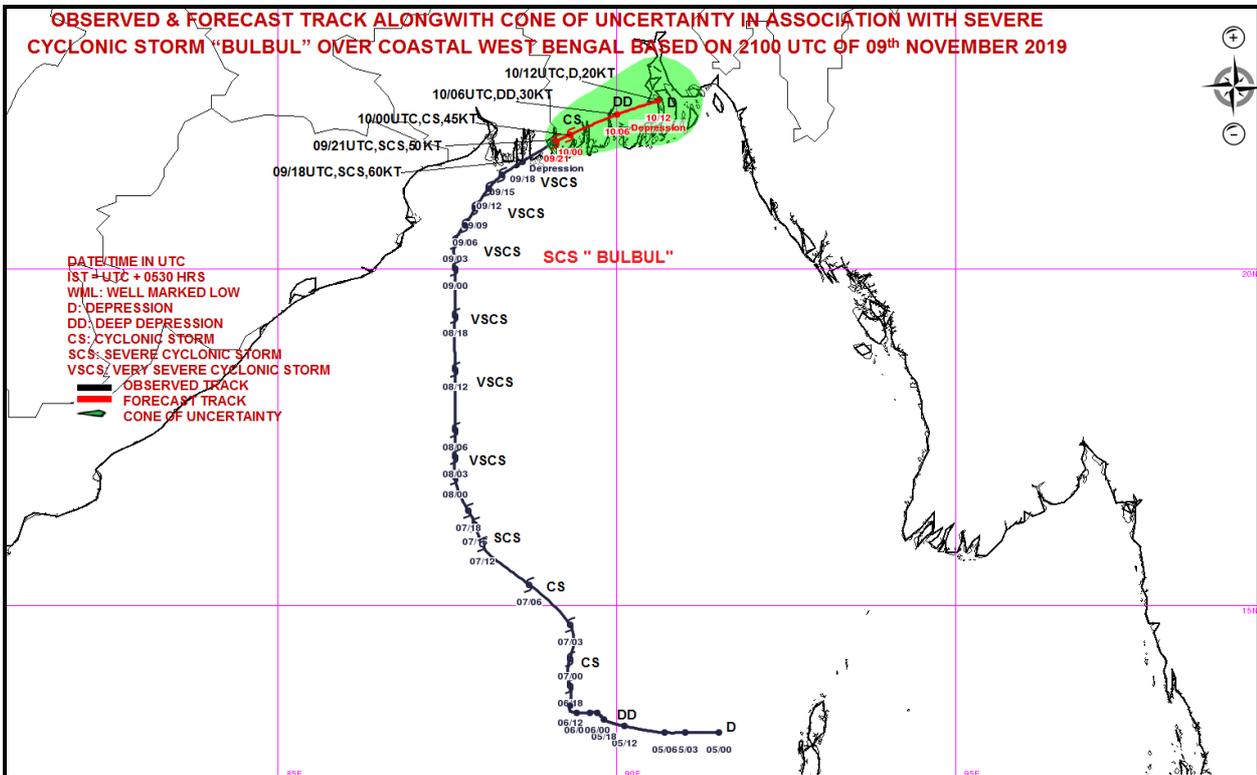
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10-11-2019/(0230 to 0256) IST

L1C Mercator









**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 25**

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 BULLETIN NO. 25 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 10.11.2019 BASED ON 0000 UTC OF 10.11.2019.

SUB: CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL BANGLADESH & NEIGHBOURHOOD

THE SEVERE CYCLONIC STORM '**BULBUL**' (PRONOUNCED AS **BUL BUL**) OVER COASTAL WEST BENGAL & ADJOINING BANGLADESH MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 17 KMPH DURING PAST 06 HOURS, **WEAKENED INTO A CYCLONIC STORM** AND LAY CENTRED AT 0000 UTC OF 10TH NOVEMBER 2019 OVER **COASTAL BANGLADESH & NEIGHBOURHOOD**, NEAR LAT. 22.1°N AND LONG. 89.5°E, ABOUT 160 KM EAST-NORTHEAST OF SAGAR ISLANDS (42903), 130 KM EAST-SOUTHEAST OF KOLKATA (42807) AND 75 KM WEST-NORTHWEST OF KHEPUPARA (41984).

IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS ACROSS BANGALADESH AND WEAKEN INTO A DEEP DEPRESSION DURING NEXT 06 HOURS AND INTO A DEPRESSION DURING SUBSEQUENT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
10.11.19/0000	22.1	89.5	80-90 GUSTING TO 100	CYCLONIC STORM
10.11.19/0600	22.3	90.0	60-70 GUSTING TO 80	CYCLONIC STORM
10.11.19/1200	22.5	90.6	50-60 GUSTING TO 70	DEEP DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0000 UTC OF 10th NOVEMBER, 2019. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST BANGLADESH ADJOINING NORTHWEST BAY OF BENGAL BETWEEN LAT. 21.5°N & 23.5°N AND LONG. 88.2°E & 90.4°E. THE MINIMUM CTT IS MINUS 80°C.

AT 0000 UTC OF 10th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 1005.5 HPA AND WIND 340°/10 KNOTS, KOLKATA (42809) REPORTED MEAN SEA LEVEL PRESSURE 1004.7 HPA AND WIND 360°/08 KNOTS AND KHEPUPURA (41984) REPORTED MEAN SEA LEVEL PRESSURE 1001.8 HPA AND WIND 130°/11 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 45 GUSTING TO 55 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS HIGH OVER NORTHWEST BAY OF BENGAL OFF BANGLADESH COAST.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.0 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING NEXT 06 HOURS.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS DECREASED AND IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO SOUTHWEST OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTH OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK. THE RIDGE RUNS ROUGHLY ALONG 21°N OVER BAY OF BENGAL REGION.

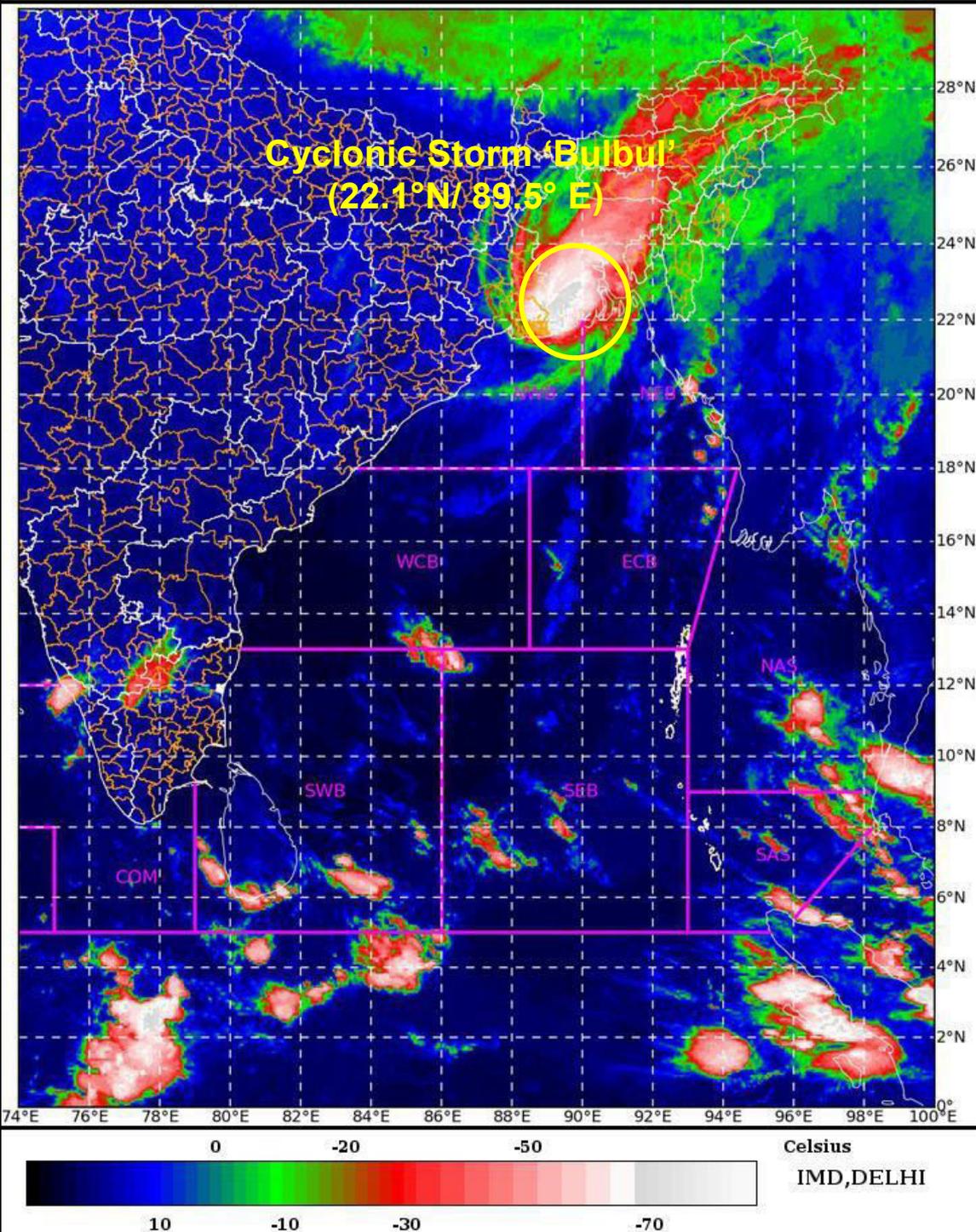
THE SYSTEM IS LYING NORTH OF THE UPPER TROPOSPHERIC RIDGE LINE ALONG 21° N . HENCE, THE SYSTEM IS MOVING NORTHEASTWARDS UNDER THE INFULENCE OF SOUTHWESTERLY WINDS TO THE NORTH OF THE RIDGE. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM INTO A DEEP DEPRESSION DURING NEXT 06 HOURS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

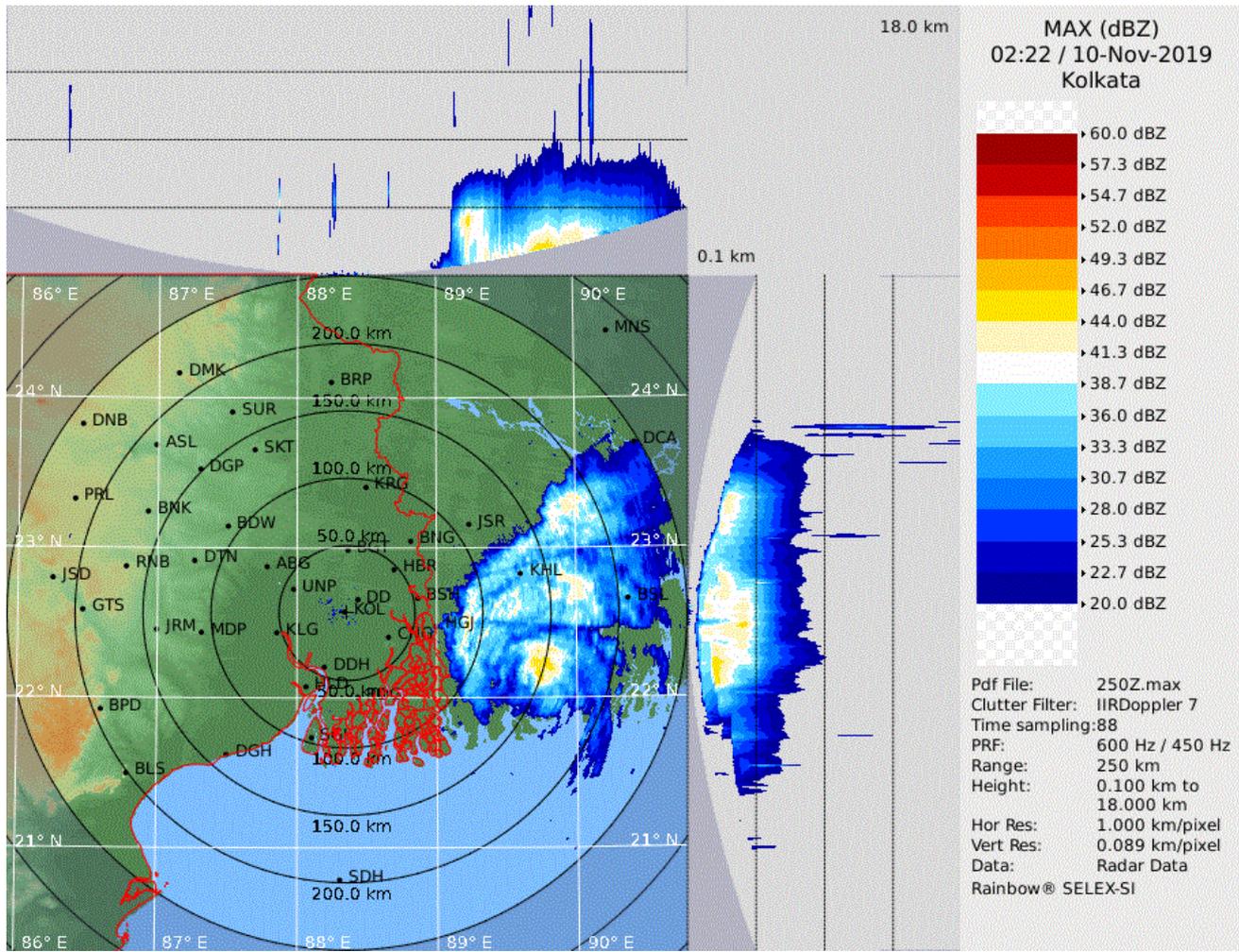
(VR DURAI)
SCIENTIST-E, RSMC, NEW DELHI

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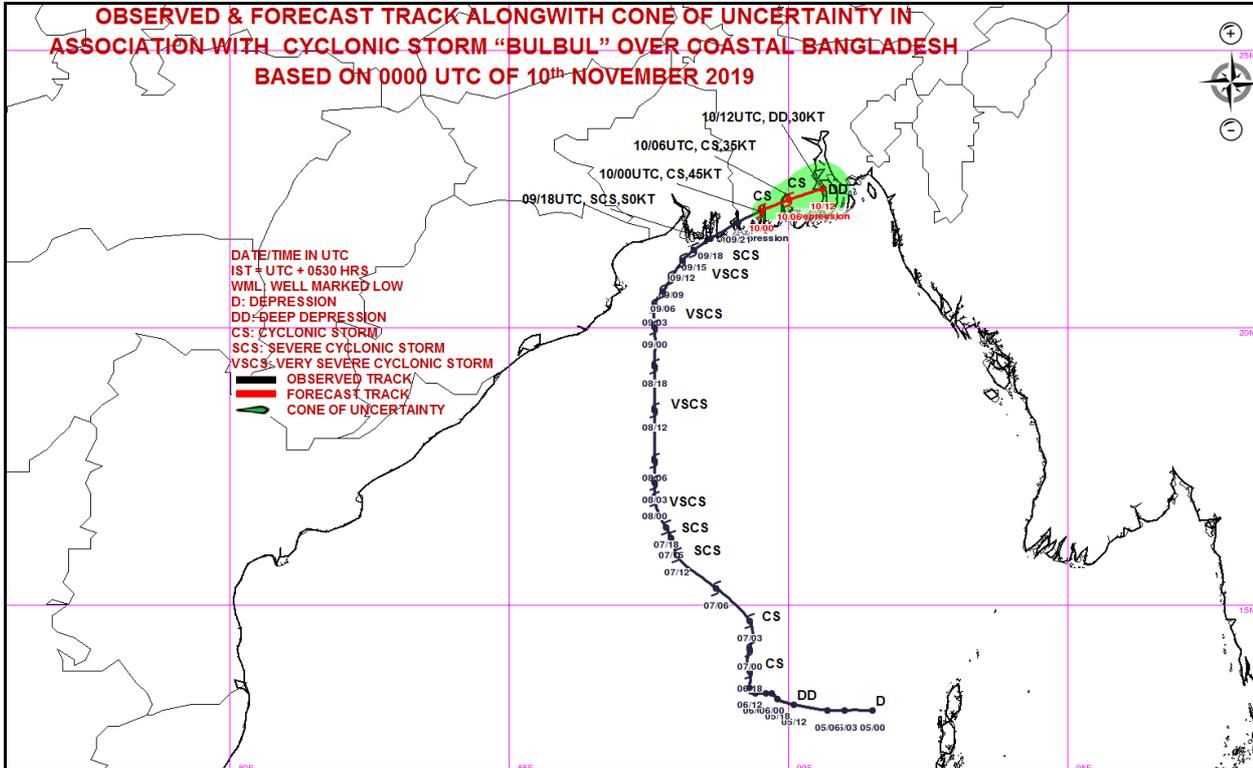
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L1C Mercator

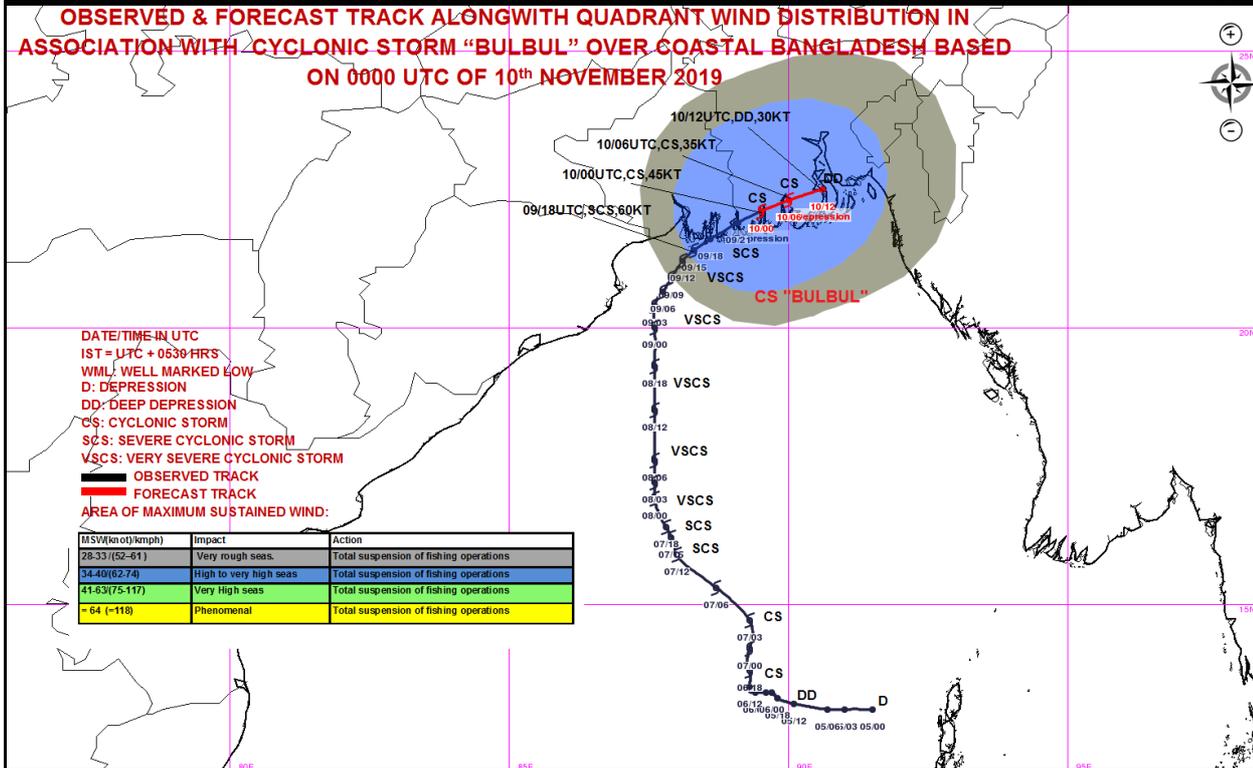




OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH BASED ON 0000 UTC OF 10th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH BASED ON 0000 UTC OF 10th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 26**

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 BULLETIN NO. 26 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600 UTC OF 10.11.2019 BASED ON 0300 UTC OF 10.11.2019.

SUB: CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL BANGLADESH & NEIGHBOURHOOD

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL BANGLADESH & NEIGHBOURHOOD MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0300 UTC OF 10TH NOVEMBER 2019 OVER COASTAL BANGLADESH & NEIGHBOURHOOD, NEAR LAT. 22.2°N AND LONG. 89.7°E, ABOUT 180 KM EAST-NORTHEAST OF SAGAR ISLANDS (42903), 70 KM OF EAST-NORTHEAST OF SUNDERBAN NATIONAL PARK, 140 KM EAST-SOUTHEAST OF KOLKATA (42807) AND 60 KM WEST-NORTHWEST OF KHEPUPARA (41984).

IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS AND WEAKEN INTO A DEEP DEPRESSION OVER COASTAL BANGLADESH & NEIGHBOURHOOD DURING NEXT 06 HOURS AND INTO A DEPRESSION DURING SUBSEQUENT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (°N)	LONG. (°E)		
10.11.19/0300	22.2	89.7	75-85 GUSTING TO 95	CYCLONIC STORM
10.11.19/0600	22.3	90.0	60-70 GUSTING TO 80	CYCLONIC STORM
10.11.19/1200	22.5	90.6	50-60 GUSTING TO 70	DEEP DEPRESSION
10.11.19/1800	22.8	91.2	40-50 GUSTING TO 60	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0300 UTC OF 10TH NOVEMBER, 2019. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST BANGLADESH ADJOINING EXTREME NORTHWEST BAY OF BENGAL THE MINIMUM CTT IS MINUS 77°C.

AT 0300 UTC OF 10TH NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 1008.2 HPA AND WIND 320°/06 KNOTS, KOLKATA (42809) REPORTED MEAN SEA LEVEL PRESSURE 1007.4 HPA AND WIND 20°/8.9 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 GUSTING TO 50 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS HIGH OVER NORTH BAY OF BENGAL ALONG AND OFF BANGLADESH COAST AND VERY ROUGH OVER

NORTHWEST BAY OF BENGAL ALONG AND OFF WEST BENGAL COAST.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.0 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING NEXT 06 HOURS

REMARKS

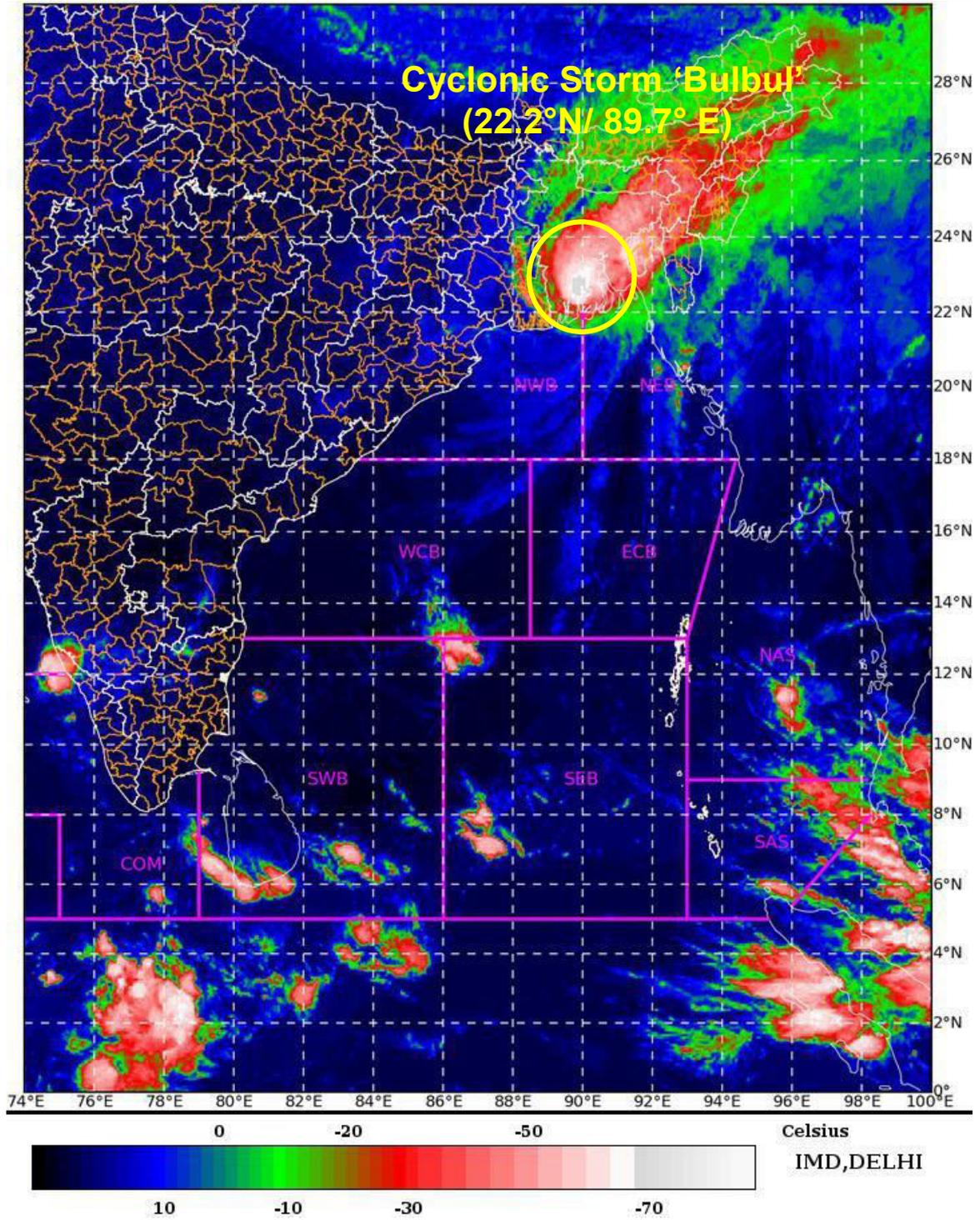
THE LOW LEVEL RELATIVE VORTICITY IS AROUND $150 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO SOUTH OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK. THE RIDGE HAS BECOME DISORGANISED OVER THE NORTH INDIAN OCEAN.

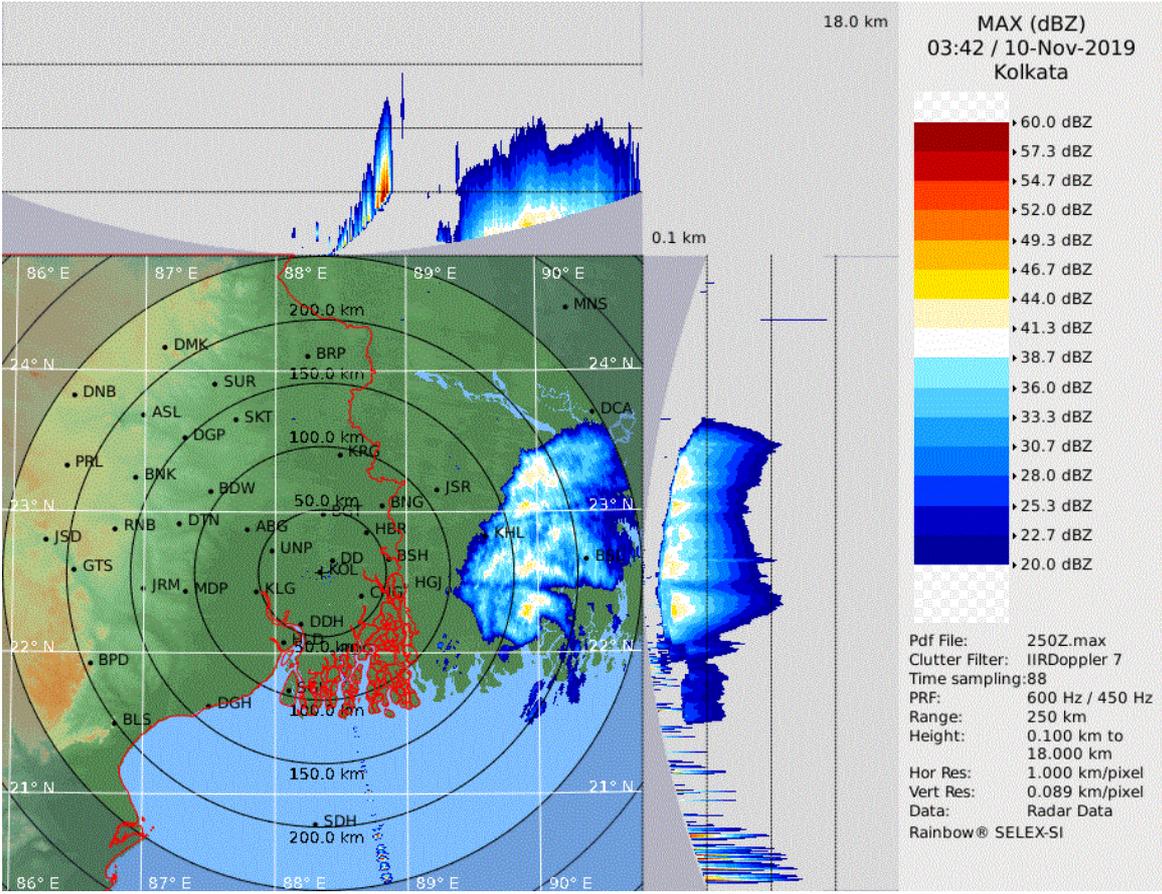
THE SYSTEM IS LYING UNDERNEATH THE MID-LATITUDE WESTERLIES. HENCE, THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFULENCE OF WEST-SOUTHWESTERLY WINDS IN THE MID & UPPER TROPOSPHERIC LEVELS. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM INTO A DEEP DEPRESSION DURING NEXT 06 HOURS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI S)
SCIENTIST-E, RSMC, NEW DELHI

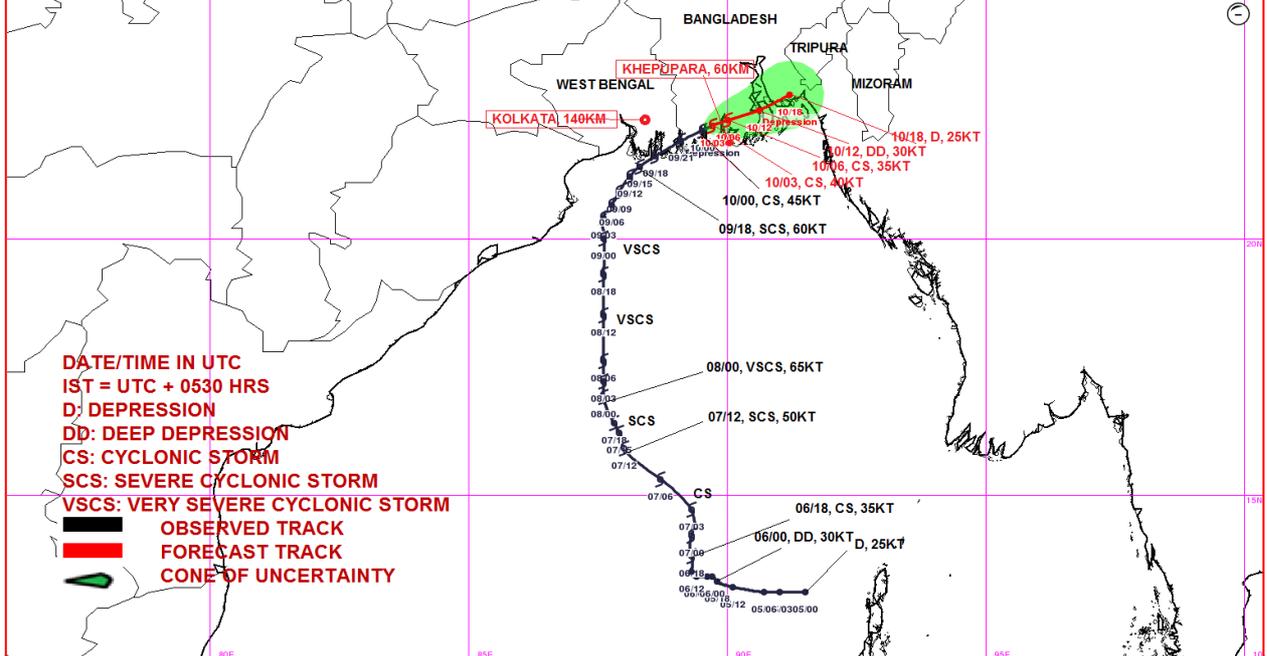


L1C Mercator

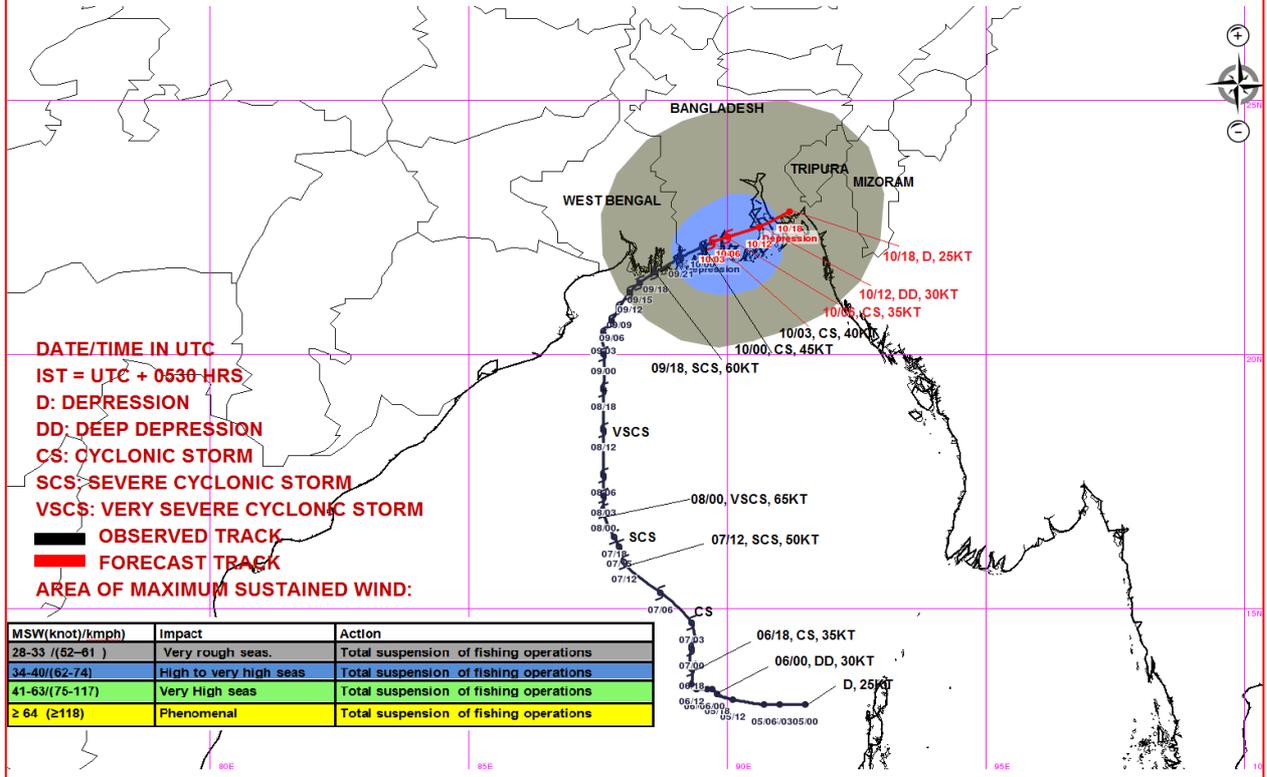




OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH AND NEIGHBOURHOOD BASED ON 0300 UTC OF 10th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH AND NEIGHBOURHOOD BASED ON 0300 UTC OF 10th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY BULLETIN NO. 27**

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 BULLETIN NO. 27 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0800 UTC OF 10.11.2019 BASED ON 0600 UTC OF 10.11.2019.

SUB: CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL BANGLADESH & NEIGHBOURHOOD

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL BANGLADESH & NEIGHBOURHOOD MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 9 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600 UTC OF 10TH NOVEMBER 2019 OVER **COASTAL BANGLADESH & NEIGHBOURHOOD**, NEAR LAT. 22.3°N AND LONG. 90.0°E, CLOSE TO AND TO THE NORTHWEST OF KHEPUPARA(41984), ABOUT 210 KM EAST-NORTHEAST OF SAGAR ISLANDS (42903), 120 KM OF EAST-NORTHEAST OF SUNDERBAN NATIONAL PARK, 170 KM EAST-SOUTHEAST OF KOLKATA (42807).

IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS AND WEAKEN INTO A DEEP DEPRESSION OVER COASTAL BANGLADESH & NEIGHBOURHOOD DURING NEXT 03 HOURS AND INTO A DEPRESSION DURING SUBSEQUENT 06 HOURS.

Forecast track and intensity are given in the following table:

Date/Time (UTC)	Position		Maximum sustained surface wind speed (kmph)	Category of cyclonic disturbance
	Lat. (°N)	Long. (°E)		
10.11.19/0600	22.3	90.0	70-80 gusting to 90	Cyclonic Storm
10.11.19/1200	22.5	90.6	50-60 gusting to 70	Deep Depression
10.11.19/1800	22.8	91.2	40-50 gusting to 60	Depression

AS PER THE SATELLITE IMAGERY AT 0600 UTC OF 10th NOVEMBER, 2019. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST BANGLADESH AND ADJOINING EXTREME NORTHWEST BAY OF BENGAL AND NEIGHBORHOOD. THE MINIMUM CTT IS MINUS 62°C.

AT 0600 UTC OF 10th NOVEMBER, 2019, SURFACE STATIONS DIGHA(42901), REPORTED MEAN SEA LEVEL PRESSURE 1008.2 HPA AND WIND 340°/05 KNOTS, KOLKATA (42809) REPORTED MEAN SEA LEVEL PRESSURE 1007.9 HPA AND WIND 340°/8.9 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 GUSTING TO 50 KNOTS AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS HIGH OVER NORTH BAY OF BENGAL ALONG AND OFF BANGLADESH COAST AND VERY ROUGH OVER NORTHWEST BAY OF BENGAL ALONG AND OFF WEST BENGAL COAST.

STORM SURGE GUIDANCE

STORM SURGE HEIGHT OF ABOUT 1.0 METRES ABOVE ASTONOMICAL TIDE IS VERY LIKELY TO INUNDATE LOW LYING COASTAL AREAS OF BANGLADESH DURING NEXT 06 HOURS

REMARKS

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $150 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO SOUTH OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ AROUND OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM CENTRE AND IS ALSO FURTHER INCREASING ALONG THE FORECAST TRACK. THE RIDGE HAS BECOME DISORGANISED OVER THE NORTH INDIAN OCEAN.

THE SYSTEM IS LYING UNDERNEATH THE MID-LATITUDE WESTERLIES. HENCE, THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFULENCE OF WEST-SOUTHWESTERLY WINDS IN THE MID & UPPER TROPOSPHERIC LEVELS. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM INTO A DEEP DEPRESSION DURING NEXT 03 HOURS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

(RK JENAMANI)
SCIENTIST-F, RSMC, NEW DELHI

SAT : INSAT-3D IMG

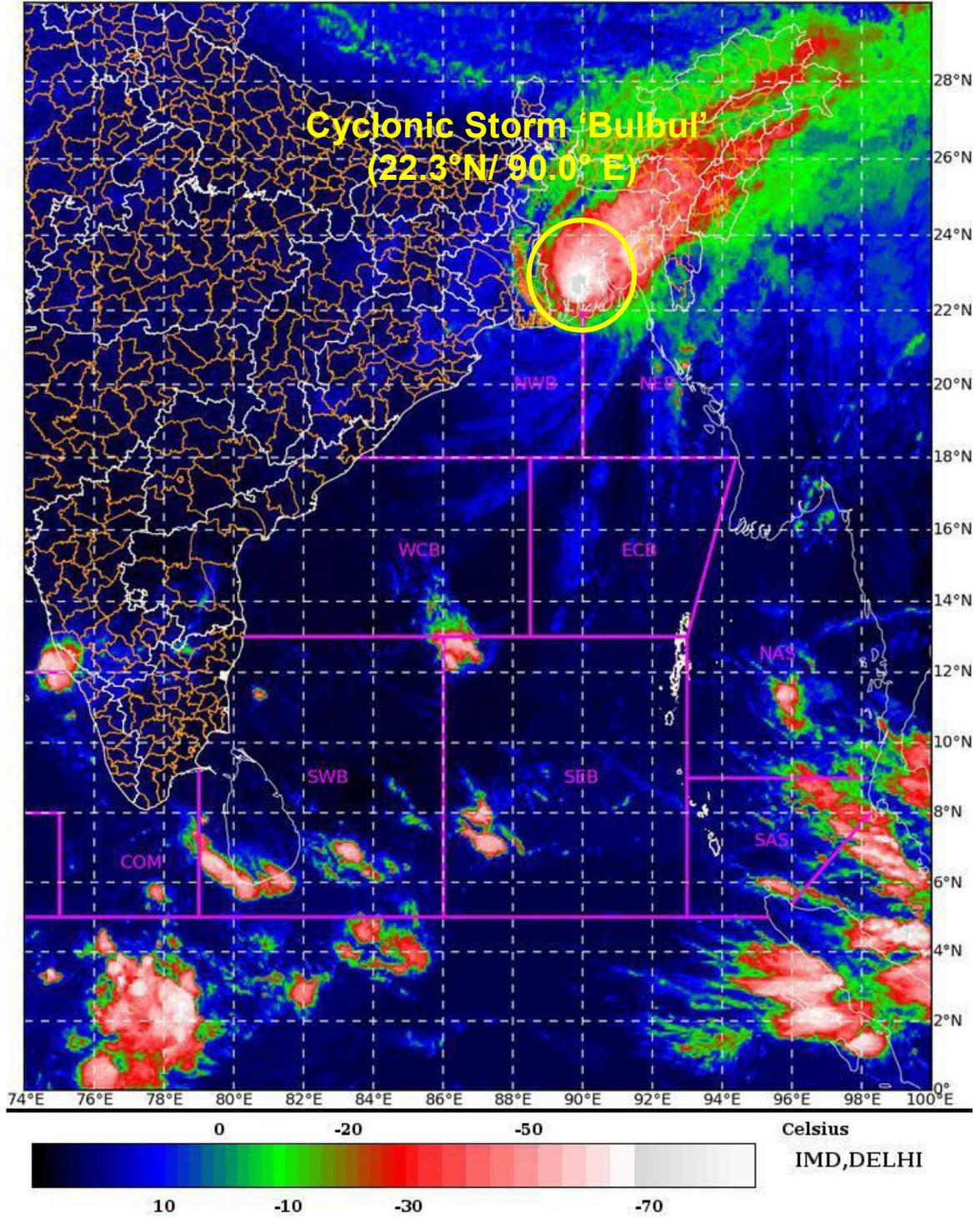
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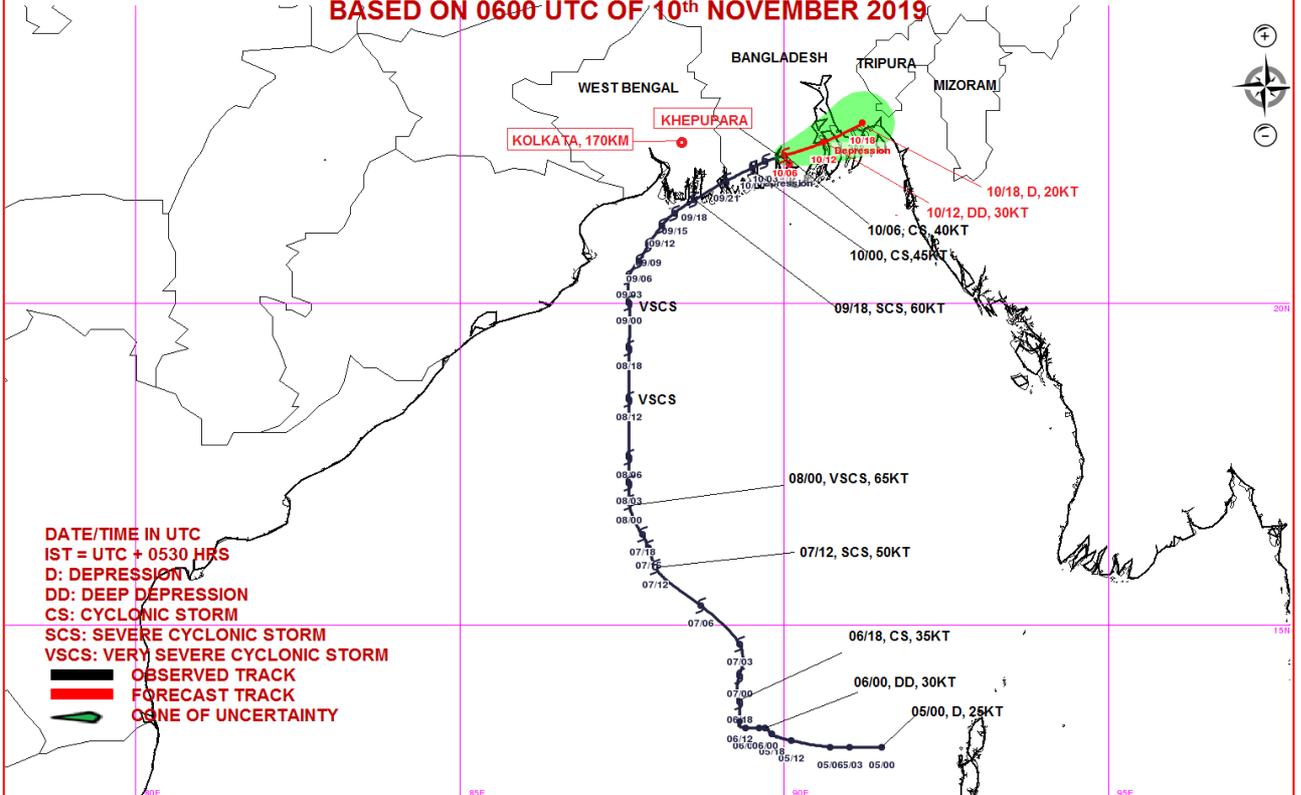
10-11-2019/(0900 to 0927) IST



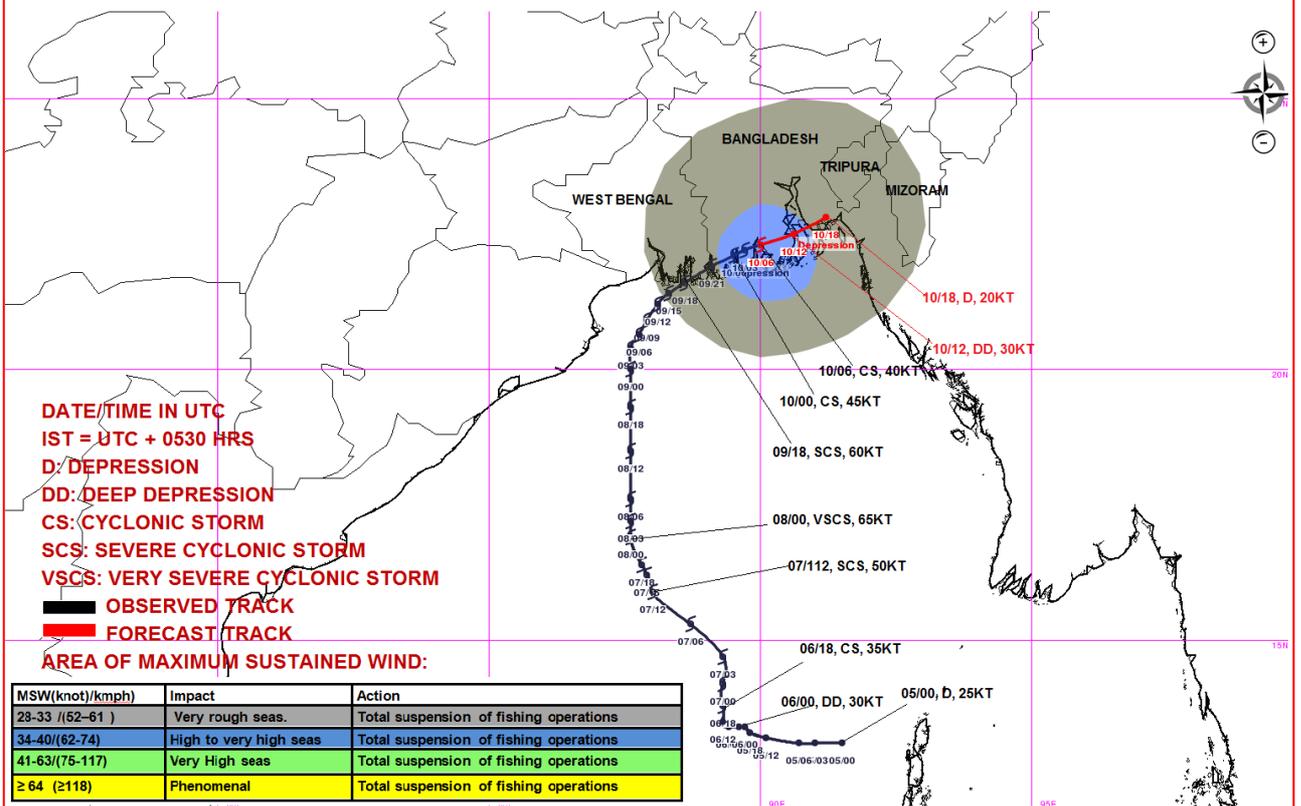
L1C Mercator



OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH AND NEIGHBOURHOOD BASED ON 0600 UTC OF 10th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH AND NEIGHBOURHOOD BASED ON 0600 UTC OF 10th NOVEMBER 2019





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
SPECIAL TROPICAL WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 10.11.2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1100 UTC OF 10.11.2019 BASED ON 0900 UTC OF 10.11.2019.

THE CYCLONIC STORM 'BULBUL' (PRONOUNCED AS BUL BUL) OVER COASTAL BANGLADESH & NEIGHBOURHOOD MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 9 KMPH DURING PAST 06 HOURS, WEAKENED INTO A DEEP DEPRESSION AND LAY CENTRED AT 0900 UTC OF 10TH NOVEMBER 2019 OVER COASTAL BANGLADESH & NEIGHBOURHOOD, NEAR LAT. 22.4°N AND LONG. 90.1°E, 50 KM NORTH-NORTHWEST OF KHEPUPARA (41984), ABOUT 220 KM EAST-NORTHEAST OF SAGAR ISLANDS (42903), 140 KM OF EAST-NORTHEAST OF SUNDERBAN NATIONAL PARK, 180 KM EAST OF KOLKATA (42807).

IT IS VERY LIKELY TO MOVE EAST-NORTHEASTWARDS AND WEAKEN INTO A DEPRESSION OVER COASTAL BANGLADESH & NEIGHBOURHOOD DURING NEXT 09 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (0N)	LONG. (0E)		
10.11.19/0900	22.4	90.1	55-65 GUSTING TO 75	DEEP DEPRESSION
10.11.19/1200	22.6	90.6	50-60 GUSTING TO 70	DEEP DEPRESSION
10.11.19/1800	22.8	91.2	40-50 GUSTING TO 60	DEPRESSION
11.11.19/0	23.0	91.8	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 0900 UTC OF 11th NOVEMBER, 2019. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER BANGLADESH AND ADJOINING EXTREME NORTHEAST BAY OF BENGAL, TRIPURA, NORTH MIZORAM, MANIPUR, SOUTH ASSAM, MEGHALAYA AND NEIGHBORHOOD. THE MINIMUM CTT IS MINUS 65°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTRE. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH OVER NORTH BAY OF BENGAL ALONG AND OFF BANGLADESH-WEST BENGAL COAST.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS FURTHER DECREASED AND IS AROUND $100 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE ALSO HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE REMAINS THE SAME AND IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM CENTRE.

THE SYSTEM IS LYING UNDERNEATH THE MID-LATITUDE WESTERLIES. HENCE, THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFULENCE OF WEST-SOUTHWESTERLY WINDS IN THE MID & UPPER TROPOSPHERIC LEVELS. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM INTO A DEEP DEPRESSION DURING NEXT 03 HOURS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

**(SUNITHA DEVI.S)
SCIENTIST-E , RSMC, New Delhi**

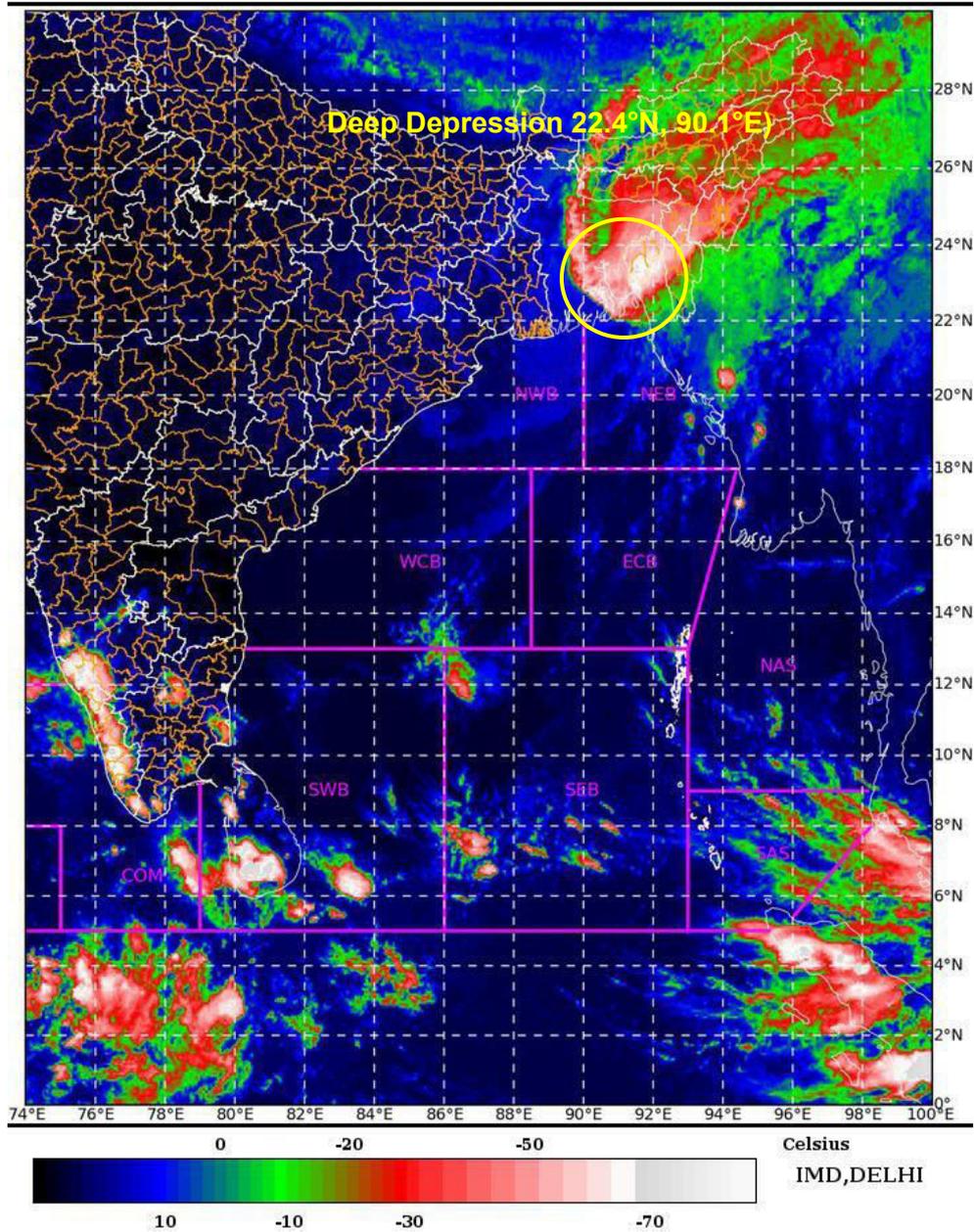
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT : INSAT-3D IMG 10-11-2019/(1000 to 1026) GMT

IMG_TIR1_TEMP 10.8 um 10-11-2019/(1530 to 1556) IST

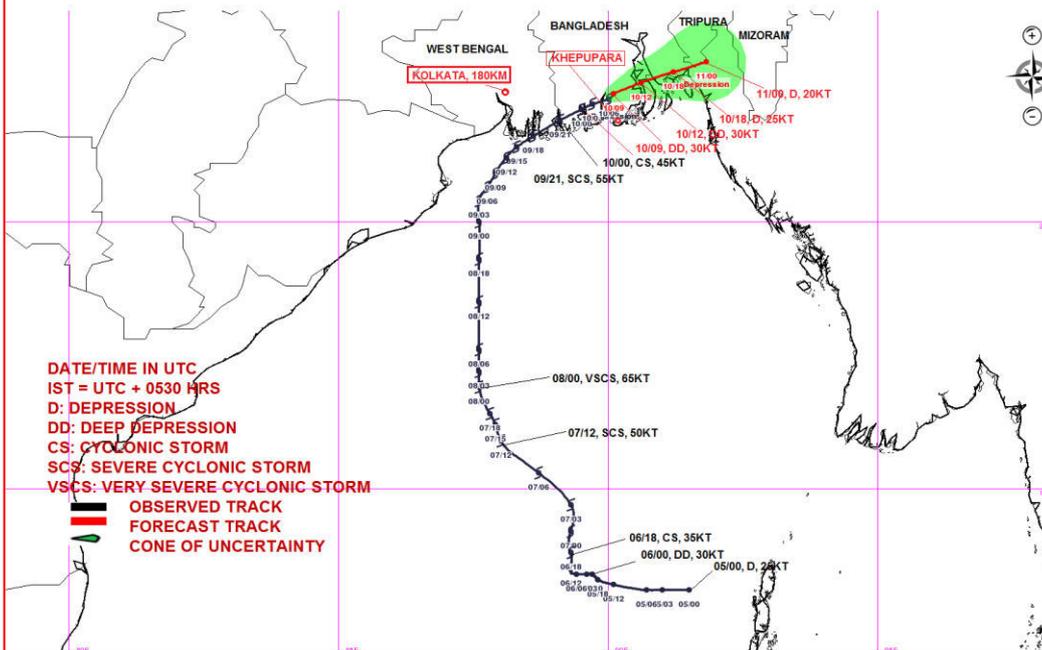
L1C Mercator



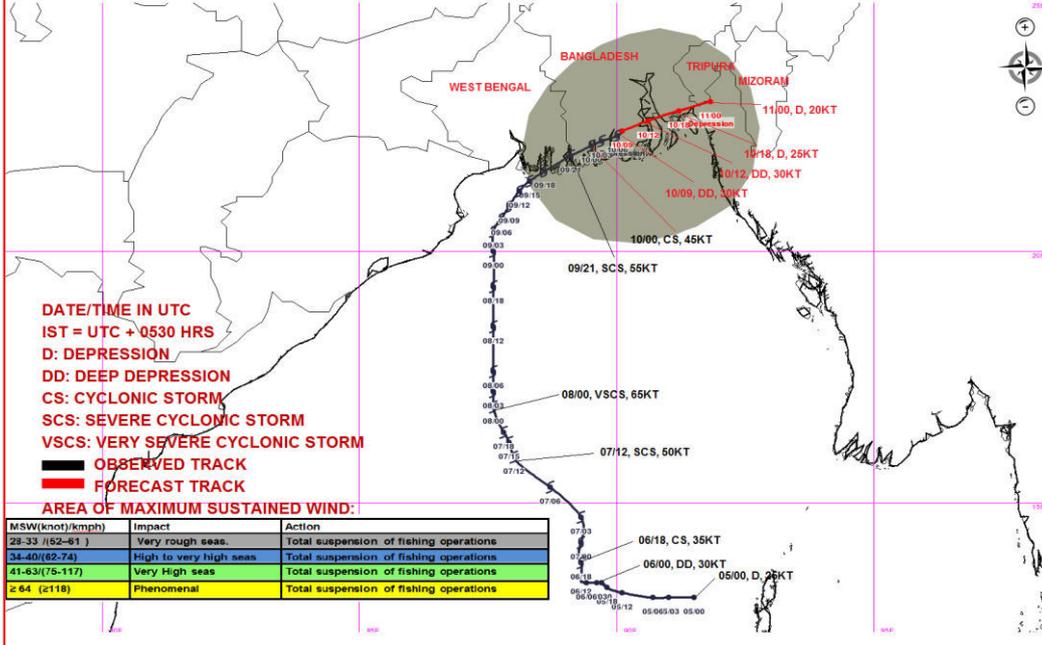
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH AND NEIGHBOURHOOD BASED ON 0900 UTC OF 10th NOVEMBER 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM "BULBUL" OVER COASTAL BANGLADESH AND NEIGHBOURHOOD BASED ON 0900 UTC OF 10th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
SPECIAL TROPICAL WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 10.11.2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 10.11.2019 BASED ON 1200 UTC OF 10.11.2019.

THE **DEEP DEPRESSION** OVER **COASTAL BANGLADESH & NEIGHBOURHOOD** MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 8 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1200 UTC OF 10TH NOVEMBER 2019 OVER **COASTAL BANGLADESH & NEIGHBOURHOOD**, NEAR LAT. 22.5°N AND LONG. 90.4°E, 60 KM NORTH-NORTHEAST OF KHEPUPARA (41984), ABOUT 260 KM EAST-NORTHEAST OF SAGAR ISLANDS (42903), 170 KM OF EAST-NORTHEAST OF SUNDERBAN NATIONAL PARK, 210 KM EAST OF KOLKATA (42807).

IT IS VERY LIKELY TO CONTINUE TO MOVE EAST-NORTHEASTWARDS AND WEAKEN INTO A DEPRESSION OVER COASTAL BANGLADESH & NEIGHBOURHOOD DURING NEXT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (0N)	LONG. (0E)		
10.11.19/1200	22.5	90.4	50-60 GUSTING TO 70	DEEP DEPRESSION
10.11.19/1800	22.8	91.2	45-55 GUSTING TO 65	DEEP DEPRESSION
11.11.19/0000	23.0	91.8	40-50 GUSTING TO 60	DEPRESSION
11.11.19/0600	23.2	92.4	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1200 UTC OF 11th NOVEMBER, 2019. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER BANGLADESH AND ADJOINING EXTREME NORTHEAST BAY OF BENGAL, TRIPURA, NORTH MIZORAM, MANIPUR, SOUTH ASSAM, MEGHALAYA AND NEIGHBORHOOD. THE MINIMUM CTT IS MINUS 65°C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTRE. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH OVER NORTH BAY OF BENGAL ALONG AND OFF BANGLADESH-WEST BENGAL COAST.

REMARKS

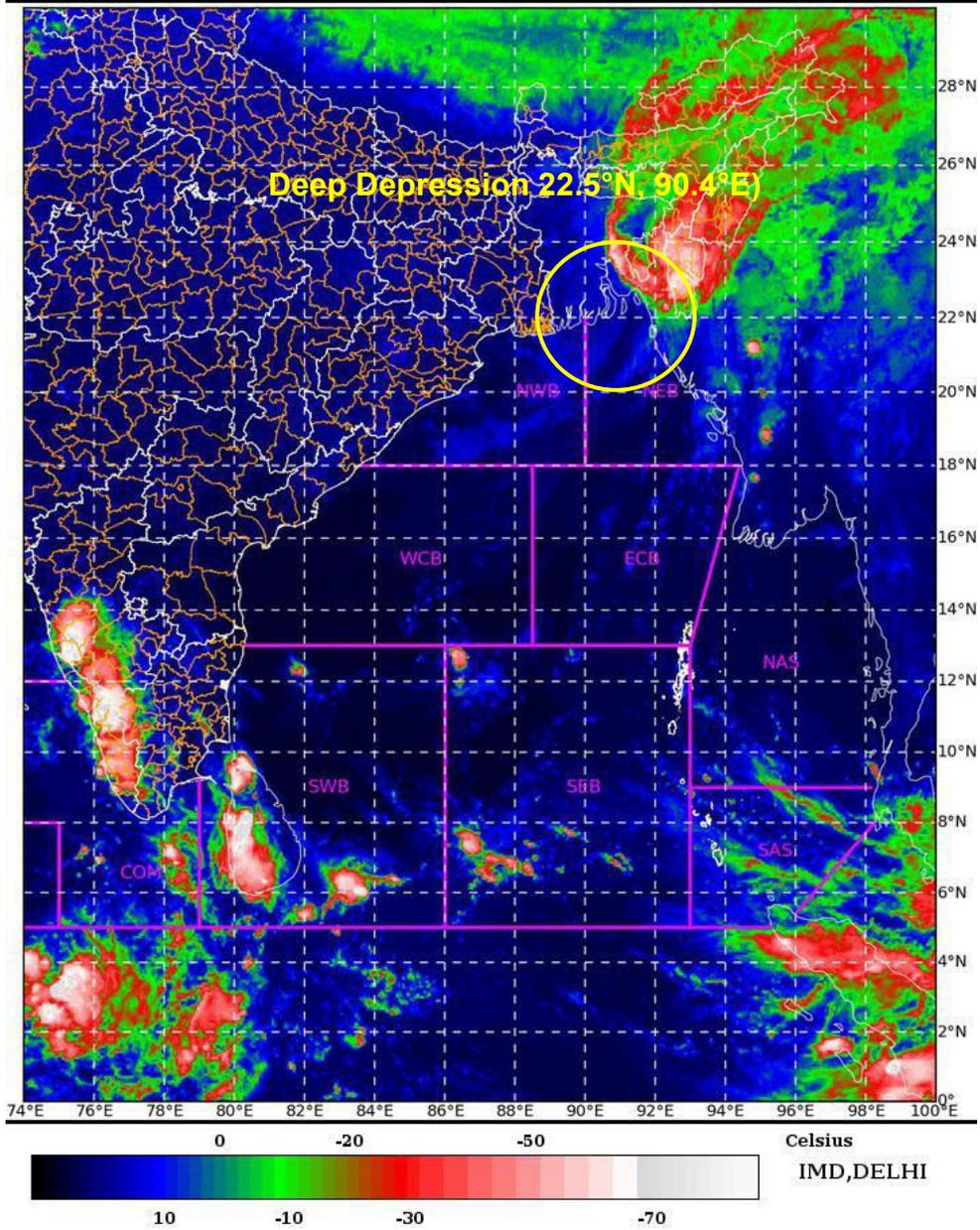
THE LOW LEVEL RELATIVE VORTICITY HAS FURTHER DECREASED AND IS AROUND $100 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE ALSO HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE REMAINS THE SAME AND IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM CENTRE.

THE SYSTEM IS LYING UNDERNEATH THE MID-LATITUDE WESTERLIES. HENCE, THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFULENCE OF WEST-SOUTHWESTERLY WINDS IN THE MID & UPPER TROPOSPHERIC LEVELS. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM INTO A DEPRESSION DURING NEXT 03 HOURS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

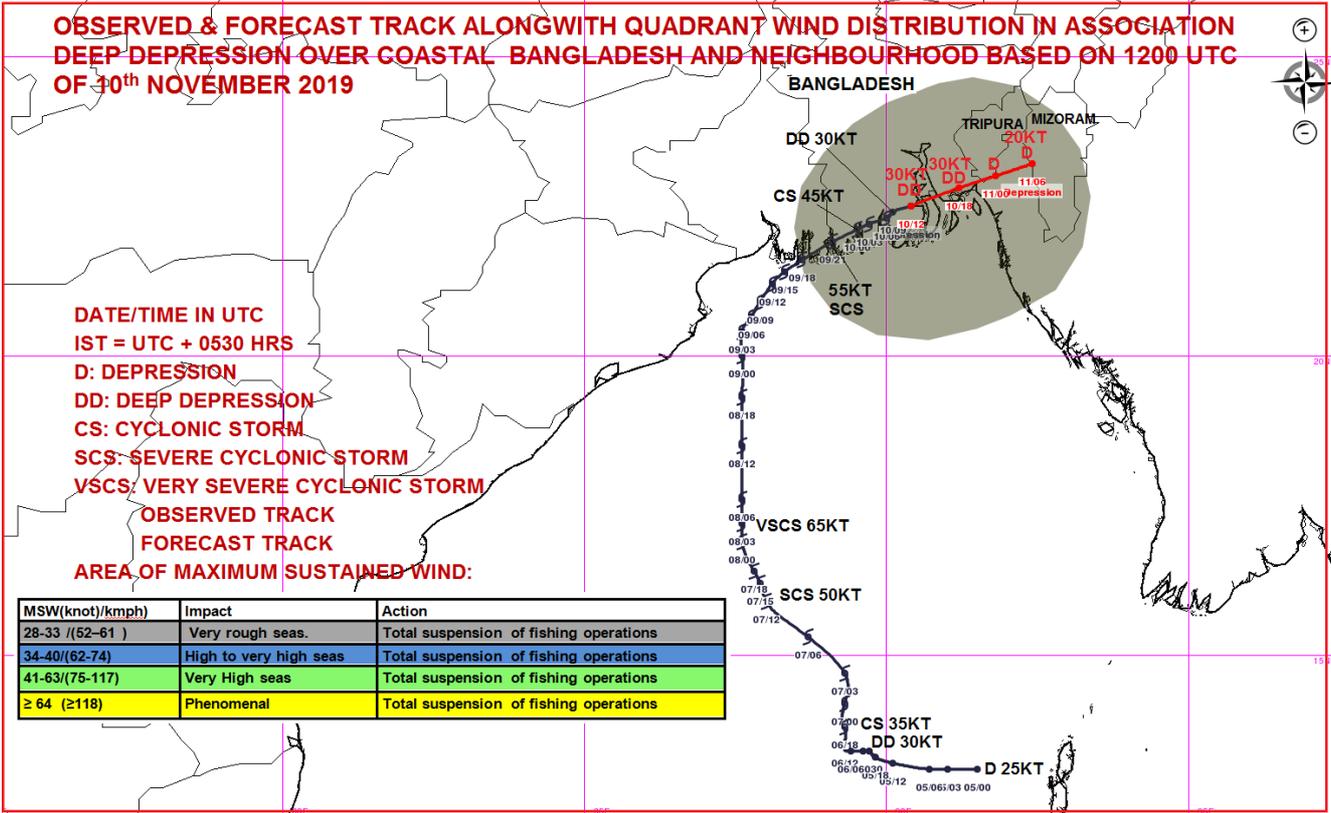
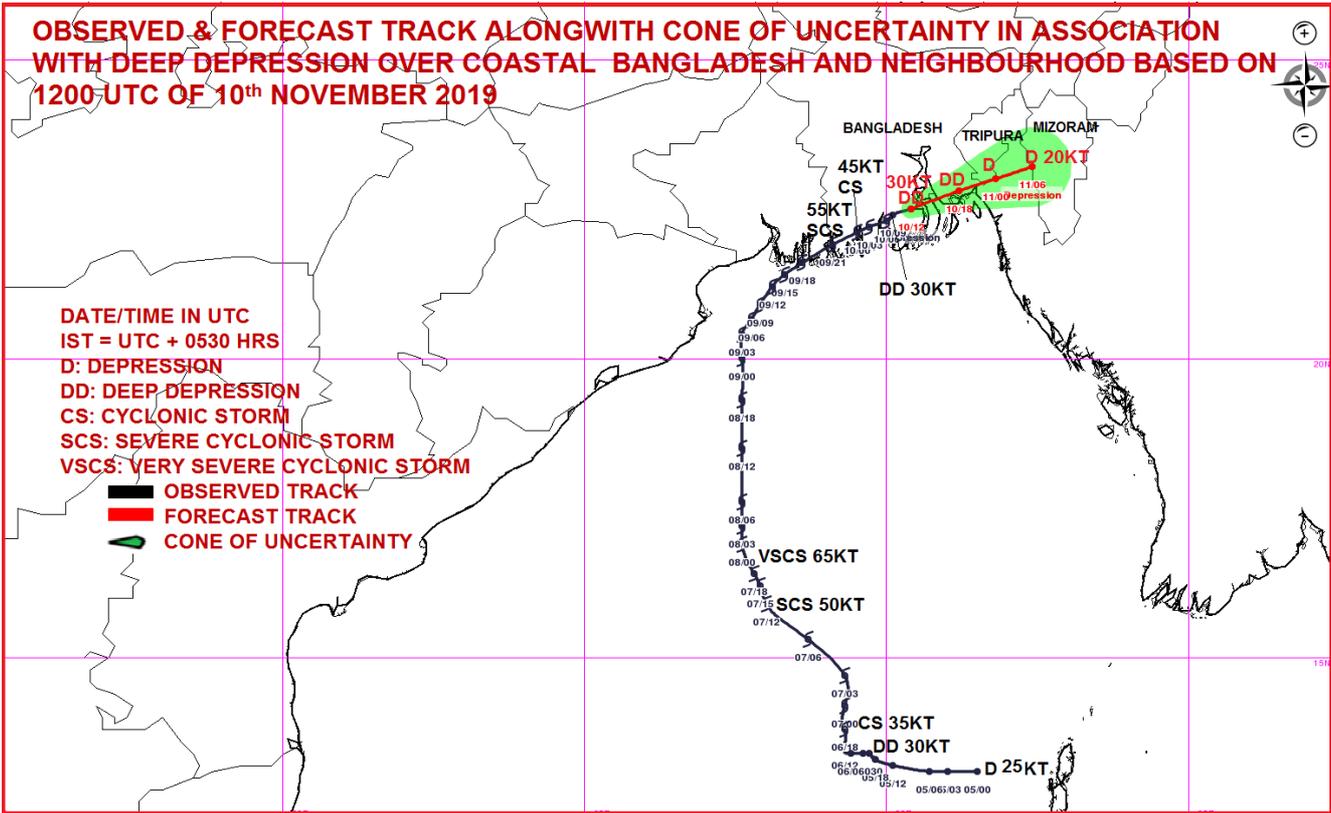
**(NARESH KUMAR)
SCIENTIST-E , RSMC, New Delhi**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
SPECIAL TROPICAL WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 10.11.2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2000 UTC OF 10.11.2019 BASED ON 1800 UTC OF 10.11.2019.

THE **DEEP DEPRESSION** OVER **COASTAL BANGLADESH & NEIGHBOURHOOD** MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS, AND LAY CENTRED AT 1800 UTC OF 10TH NOVEMBER 2019 OVER SOUTH-EAST **BANGLADESH & NEIGHBOURHOOD**, NEAR LAT. 22.7°N AND LONG. 91.2°E, 125 KM NORTH-NORTHEAST OF KHEPUPARA (41984), ABOUT 255 KM EAST-NORTHEAST OF SUNDERBAN NATIONAL PARK, 295 KM EAST OF KOLKATA (42807) AND 130 KM SOUTH OF AGARTALA (42724).

IT IS VERY LIKELY TO CONTINUE TO MOVE EAST-NORTHEASTWARDS AND WEAKEN INTO A DEPRESSION OVER SOUTH-EAST BANGLADESH & NEIGHBOURHOOD DURING NEXT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME (UTC)	POSITION		MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
	LAT. (0N)	LONG. (0E)		
10.11.19/1800	22.7	91.2	50-60 GUSTING TO 70	DEEP DEPRESSION
11.11.19/0000	22.9	91.8	40-50 GUSTING TO 60	DEPRESSION
11.11.19/0600	23.1	92.4	30-40 GUSTING TO 50	DEPRESSION

AS PER THE SATELLITE IMAGERY AT 1800 UTC OF 10th NOVEMBER, 2019. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LIES OVER MIZORAM, MANIPUR (MINIMUM CTT MINUS 50 DEG C AND ISOL WEAK CONVECTION OVER NORTH EAST BANGLADESH SOUTH ASSAM, MEGHALAYA AND TRIPURA.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 GUSTING TO 40 KNOTS AROUND THE SYSTEM CENTRE. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH OVER NORTH BAY OF BENGAL ALONG AND OFF BANGLADESH-WEST BENGAL COAST.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS FURTHER DECREASED AND IS AROUND $100 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE ALSO HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE REMAINS THE SAME AND IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM CENTRE.

THE SYSTEM IS LYING UNDERNEATH THE MID-LATITUDE WESTERLIES. HENCE, THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF WEST-SOUTHWESTERLY WINDS IN THE MID & UPPER TROPOSPHERIC LEVELS. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM INTO A DEPRESSION DURING NEXT 03 HOURS. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

**(DR PATTANAİK)
SCIENTIST-E , RSMC, New Delhi**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

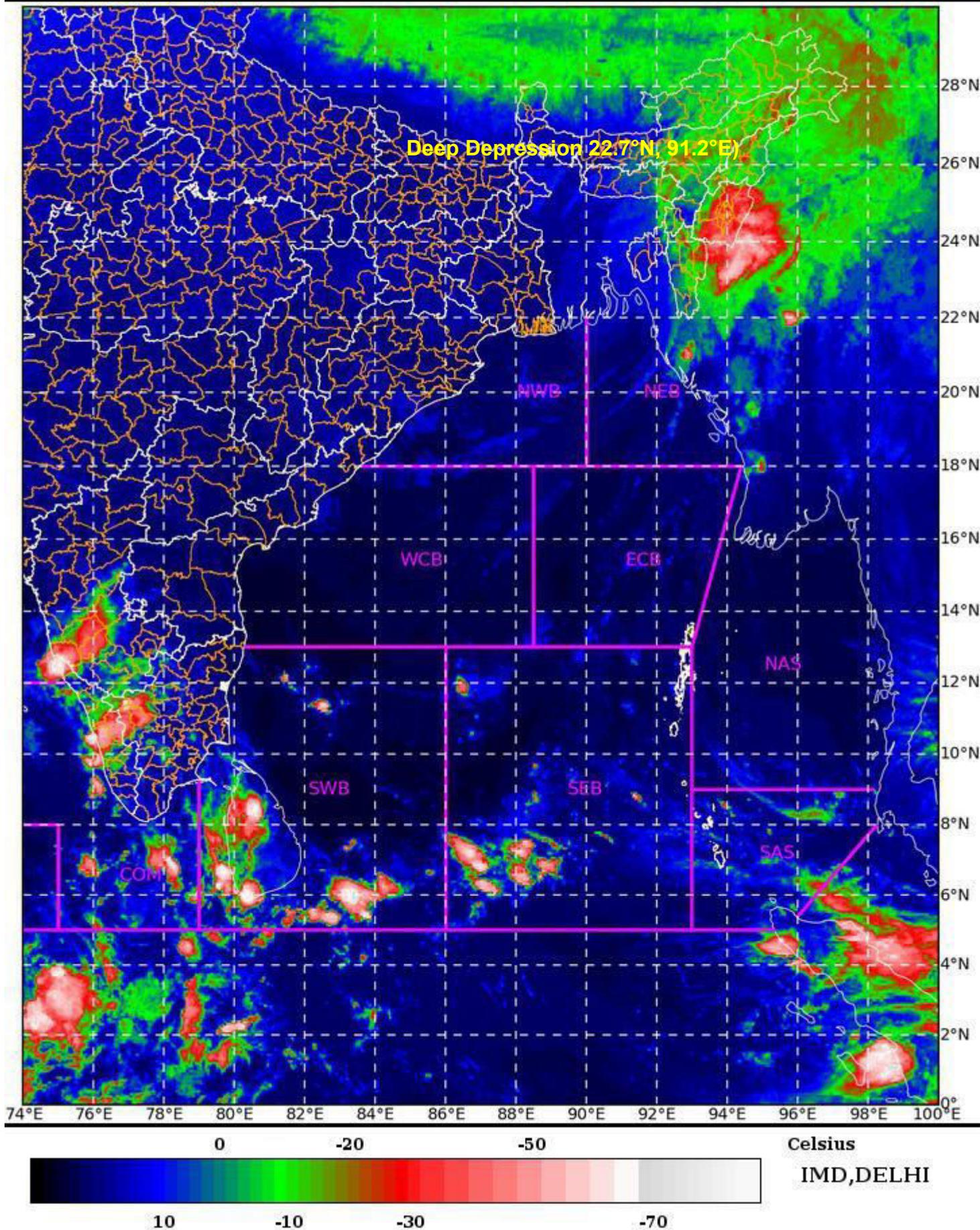
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10-11-2019/(1630 to 1656) GMT

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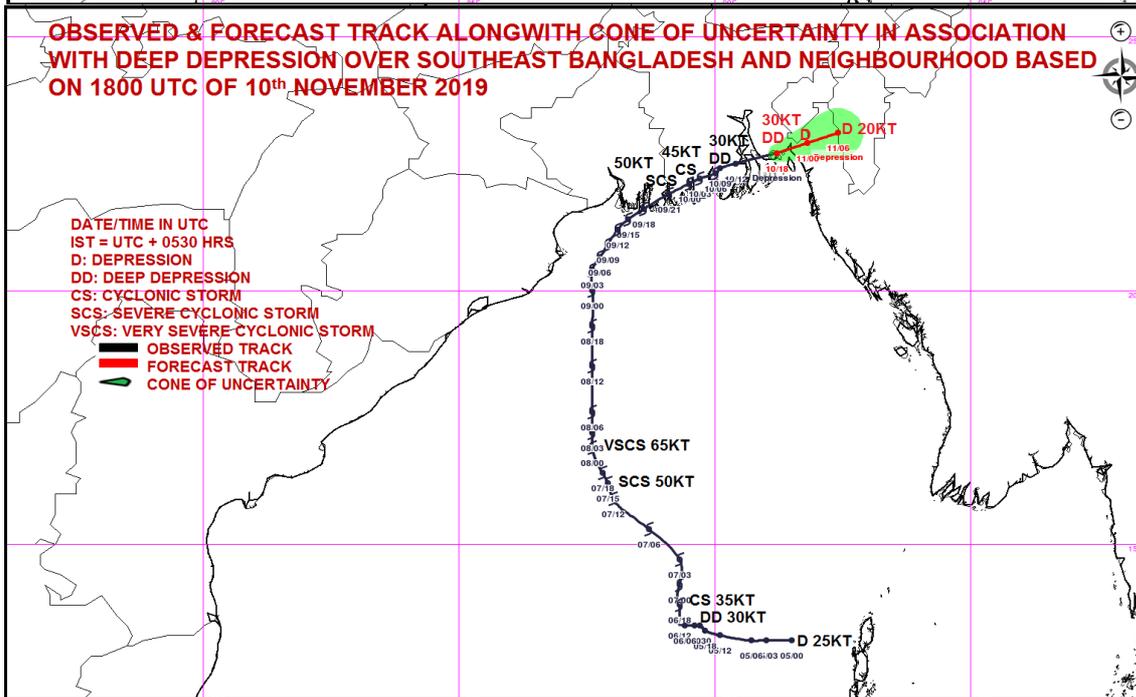
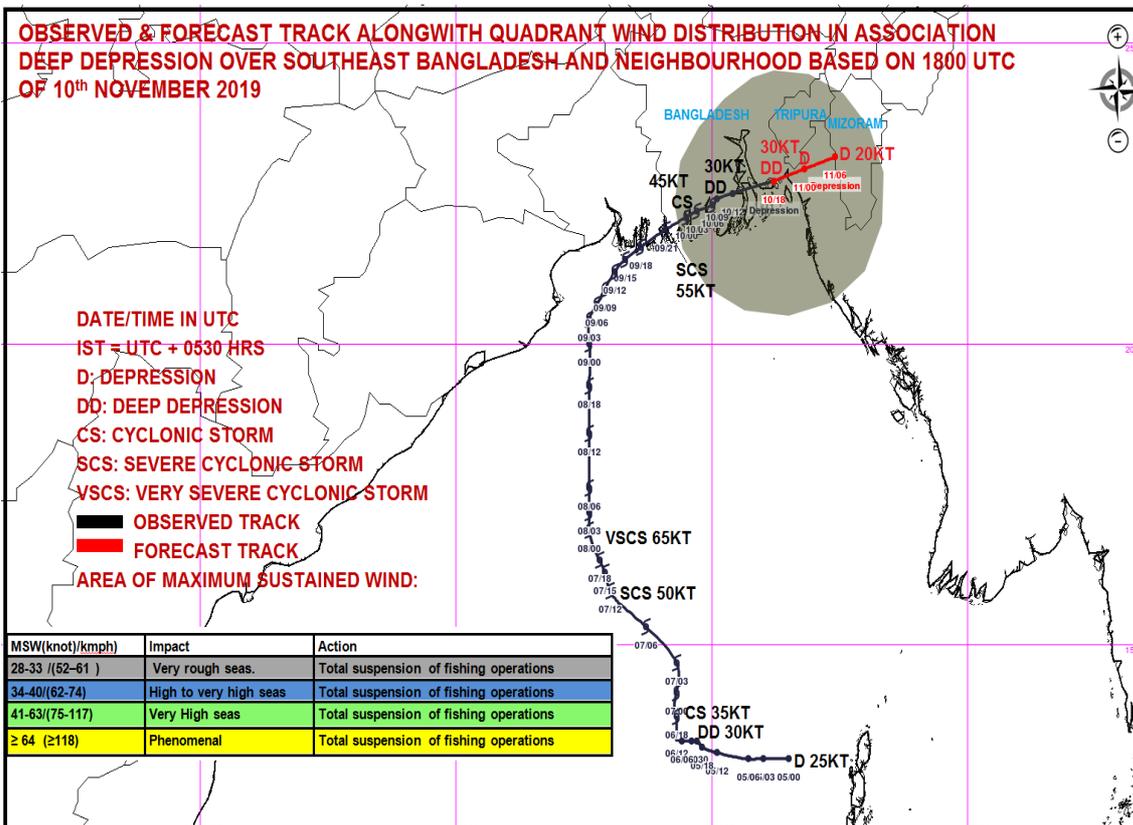
10-11-2019/(2200 to 2226) IST

L1C Mercator



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
SPECIAL TROPICAL WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 11.11. 2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0200 UTC OF 11.11.2019 BASED ON 0000 UTC OF 11.11.2019.

THE DEEP DEPRESSION OVER SOUTH-EAST BANGLADESH & NEIGHBOURHOOD MOVED EAST-NORTHEASTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS, WEAKENED FURTHER INTO A DEPRESSION AND LAY CENTRED AT 0000 UTC OF 11TH NOVEMBER 2019 OVER SOUTH-EAST BANGLADESH & ADJOINING SOUTH TRIPURA, NEAR LAT 23.1N AND LONG 91.9 E, ABOUT 210 KM NORTH-NORTH-EAST OF KHEPUPARA (41984) AND ABOUT 110 KM SOUTH-EAST OF AGARTALA (42724). IT IS VERY LIKELY TO CONTINUE TO MOVE EAST-NORTHEASTWARDS AND WEAKEN INTO A LOW PRESSURE AREA DURING NEXT 06 HOURS.

AS PER THE SATELLITE IMAGERY AT 0000UTC OF 11TH NOVEMBER, 2019. SCT LOW TO MEDIUM CLOUDS WITH EMBDD ISOLATED WEAK CONVECTION OVER SOUTH EAST BANGLADESH AND ADJOINING TRIPURA & NEIGHBOURHOOD.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 20 GUSTING TO 30 KNOTS AROUND THE SYSTEM CENTRE. THE ESTIMATED CENTRAL PRESSURE IS 1004 HPA.

REMARKS

THE LOW LEVEL RELATIVE VORTICITY HAS FURTHER DECREASED AND IS AROUND $50 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE ALSO HAS DECREASED AND IS ABOUT $05 \times 10^{-5} \text{ S}^{-1}$ TO SOUTHEAST OF THE SYSTEM CENTRE AND NO UPPER LEVEL DIVERGENCE PREVAILS OVER THE SYSTEM. THE VERTICAL WIND SHEAR IS HIGH (40 KNOTS) OVER THE SYSTEM CENTRE.

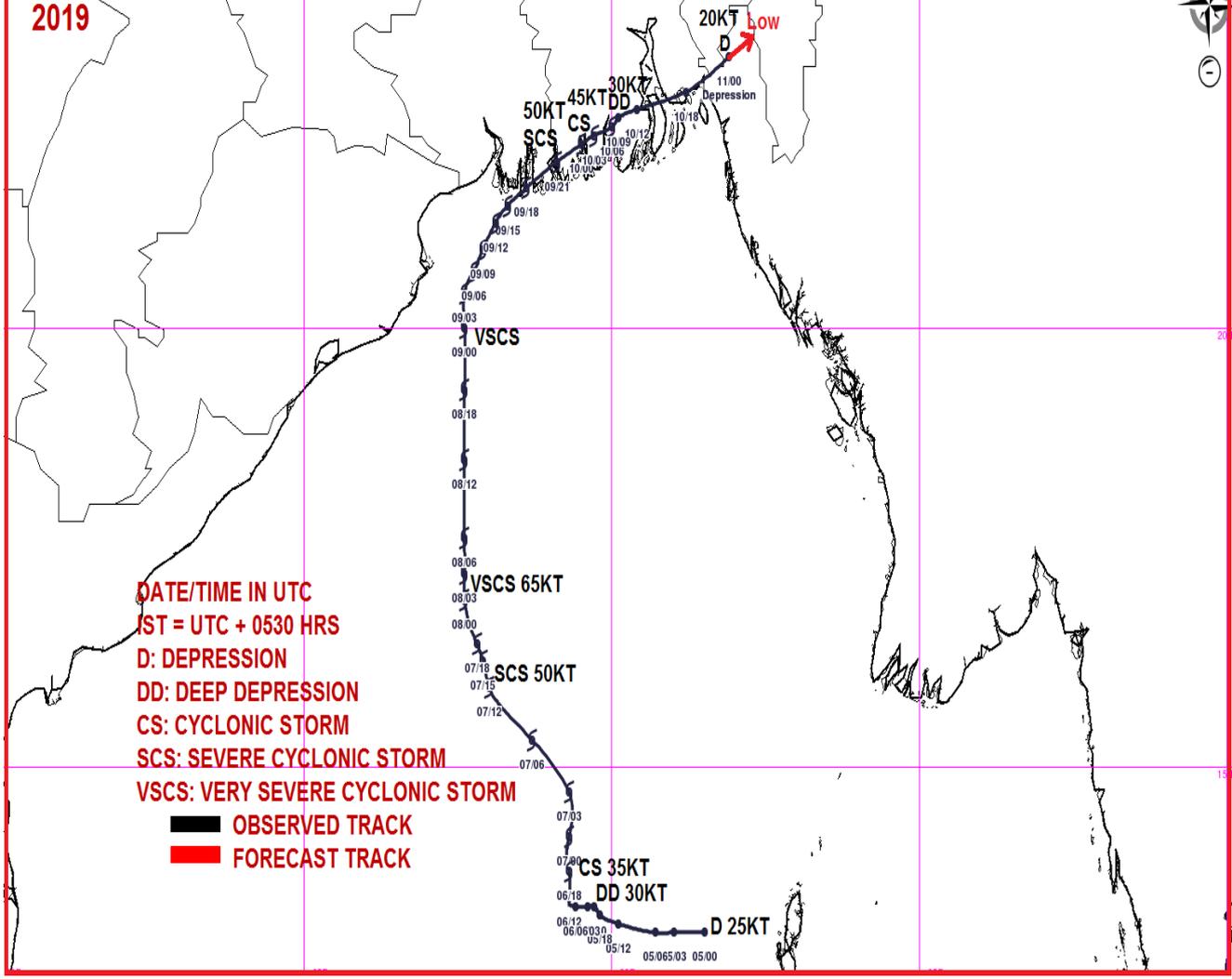
THE SYSTEM IS LYING UNDERNEATH THE MID-LATITUDE WESTERLIES. HENCE, THE SYSTEM IS MOVING EAST-NORTHEASTWARDS UNDER THE INFLUENCE OF WEST-SOUTHWESTERLY WINDS IN THE MID & UPPER TROPOSPHERIC LEVELS. THE SYSTEM IS EXPERIENCING HIGH VERTICAL WIND SHEAR WHICH WILL CONTRIBUTE TO FURTHER WEAKENING OF THE SYSTEM **INTO A LOW PRESSURE AREA DURING NEXT 06 HOURS**. MAJORITY OF THE NWP MODELS ARE IN AGREEMENT WITH THE ABOVE ANALYSIS.

**(DR PATTANAİK)
SCIENTIST-E , RSMC, New Delhi**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED & FORECAST TRACK IN ASSOCIATION WITH DEPRESSION OVER SOUTHEAST BANGLADESH AND ADJOINING SOUTH TRIPURA BASED ON 0000 UTC OF 11th NOVEMBER 2019



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
SPECIAL TROPICAL WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 11.11. 2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0500 UTC OF 11.11.2019 BASED ON 0300 UTC OF 11.11.2019.

THE DEPRESSION OVER SOUTH-EAST BANGLADESH & ADJOINING SOUTH TRIPURA MOVED SLIGHTLY EAST-NORTHEASTWARDS, WEAKENED INTO A LOW PRESSURE AREA AND LAY CENTERED AT 0300 UTC OF 11TH NOVEMBER 2019 OVER SOUTHERN PARTS OF TRIPURA & NEIGHBOURHOOD.

AS PER THE SATELLITE IMAGERY AT 0300UTC OF 11th NOVEMBER, 2019. SCT LOW TO MEDIUM CLOUDS WITH EMBDD ISOLATED WEAK CONVECTION OVER SOUTH EAST BANGLADESH AND ADJOINING TRIPURA & NEIGHBOURHOOD.

THIS IS LAST UPDATE IN ASSOCIATION WITH THIS SYSTEM

BAY OF BENGAL:

SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LAY OVER SOUTHEAST BAY OF BENGAL AND SOUTH ANDAMAN SEA.

PROBABILITY OF CYCLOGENESIS DURING NEXT 120 HRS:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
NIL	NIL	NIL	NIL	NIL

ARABIAN SEA:

SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED ISOLATED MODERATE TO INTENSE CONVECTION LAY OVER SOUTHEAST ARABIAN SEA OFF NORTH KERALA COAST AND COMORIN AREA.

PROBABILITY OF CYCLOGENESIS DURING NEXT 72 HRS:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
NIL	NIL	NIL	NIL	NIL

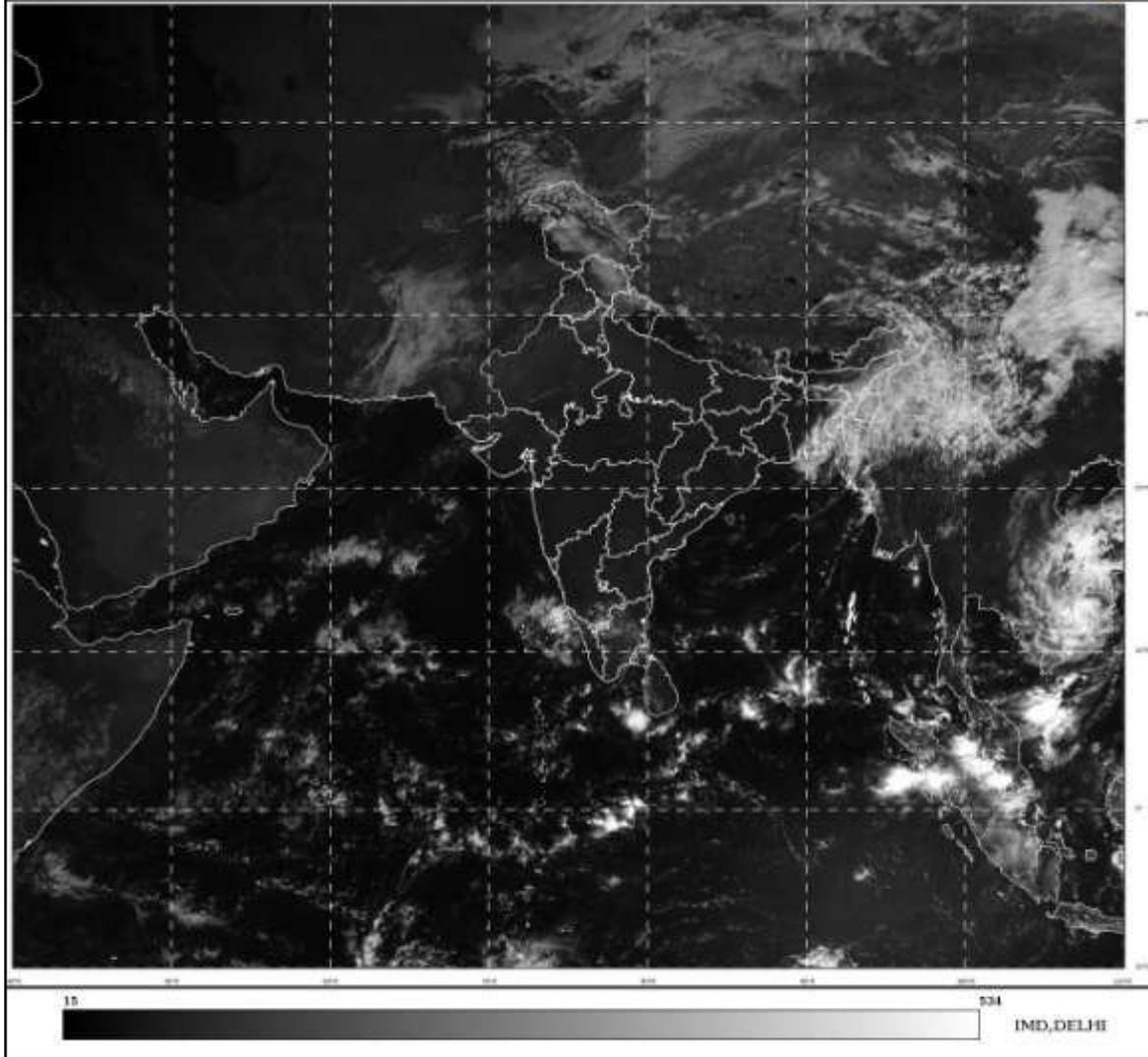
**(NEETHA K GOPAL)
SCIENTIST-E , RSMC, New Delhi**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

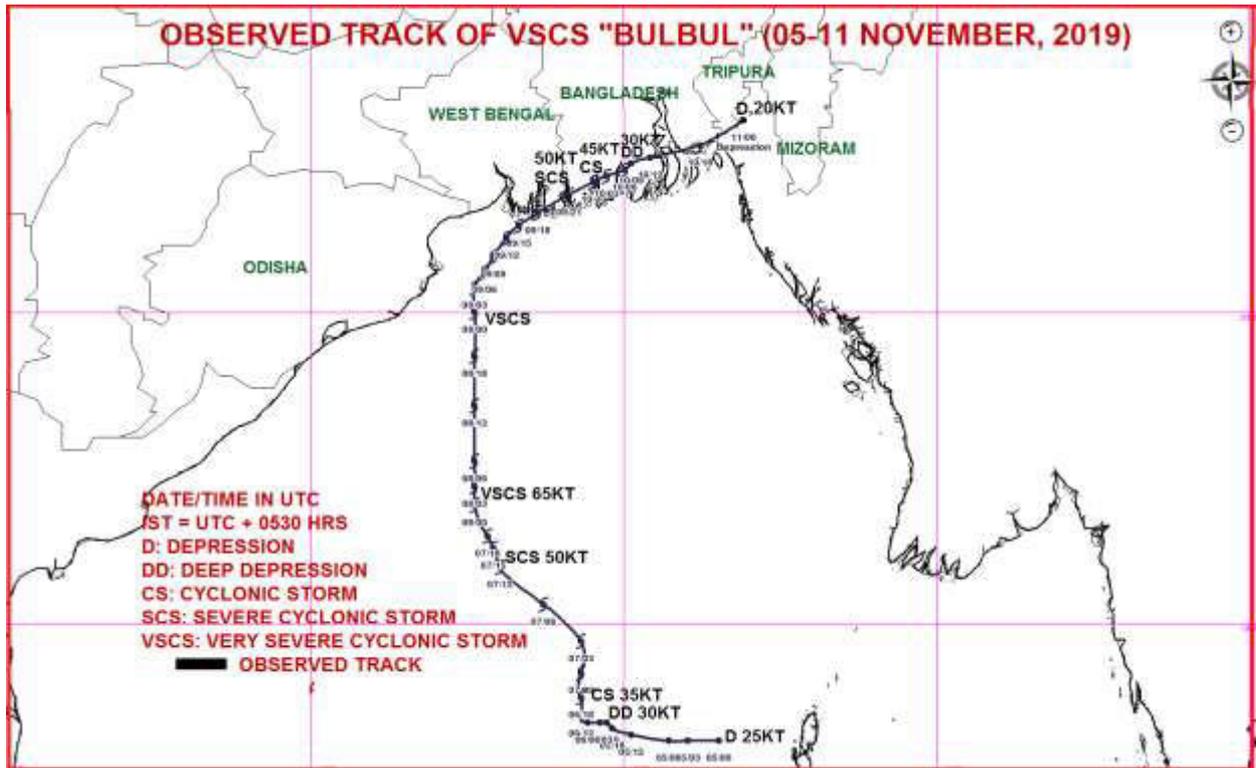
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Visible Count 0.65 um
LIC Mercator

11-11-2019/(0400 to 0427) GMT
11-11-2019/(0930 to 0957) IST



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%