



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 07.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600 UTC OF 07.06.2019 BASED ON 0300 UTC OF 07.06.2019.

BAY OF BENGAL:

SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE CONVECTION LAY OVER ANDAMAN SEA ,ARAKAN COAST ,NORTH & ADJOINING EASTCENTRAL BAY OF BENGAL AND ISOLATED LOW AND MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LAY OVER TENASSERIM COAST & REST BAY OF BENGAL.

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:

A LOW PRESSURE AREA IS VERY LIKELY TO FORM OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA OFF KERALA-KARNATAKA COASTS AROUND 9TH JUNE. IT IS LIKELY TO MOVE NORTH-NORTHWESTWARDS AND INTENSIFY GRADUALLY. SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTH ADJOINING WESTCENTRAL & EXTREME EASTCENTRAL ARABIAN 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	LOW	FAIR

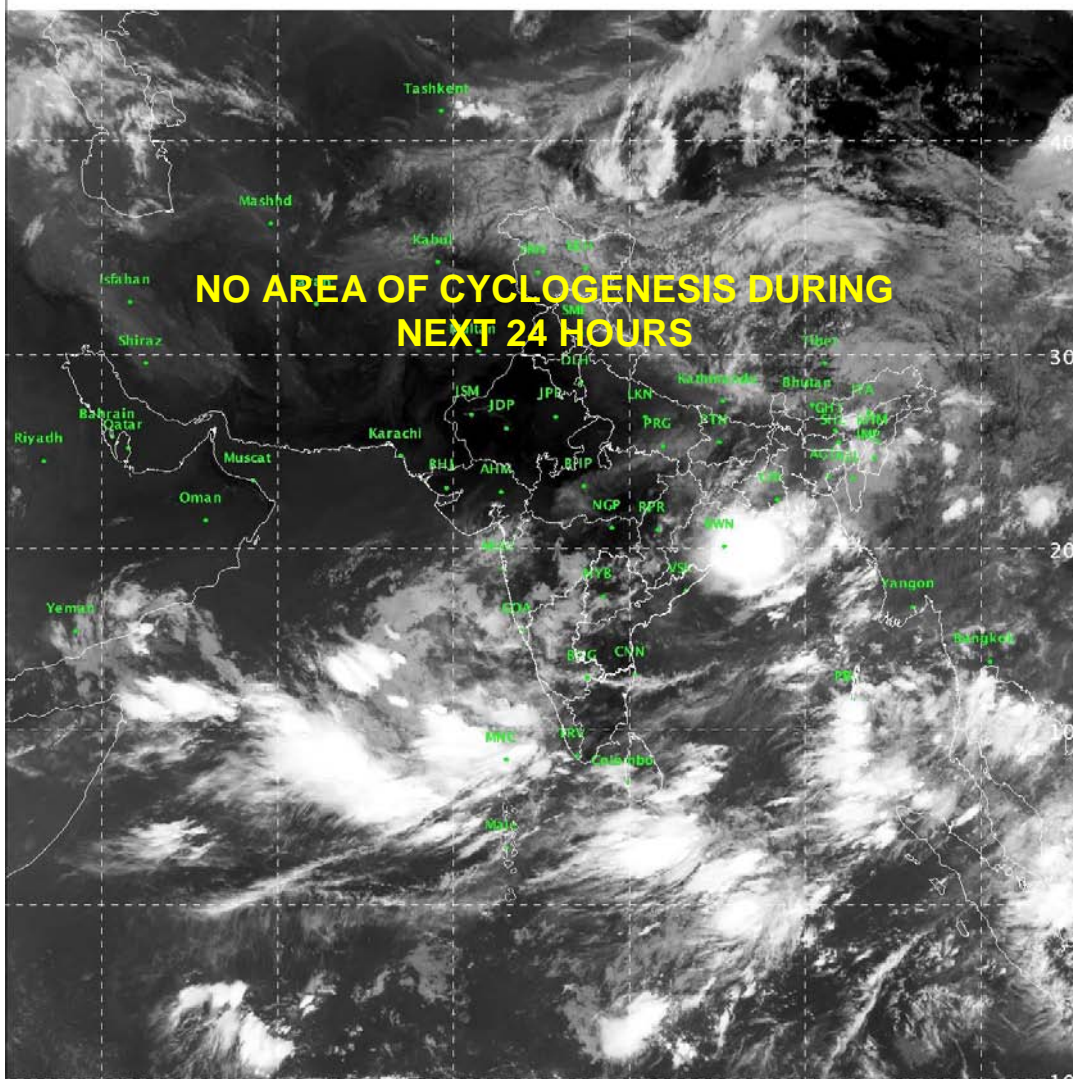
REMARKS: NIL

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 (LINEAR STRETCH: 1.0%)

07-06-2019/03:00 GMT
07-06-2019/08:30 IST



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 WEATHER OUTLOOK**

DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 09.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600 UTC OF 09.06.2019 BASED ON 0300 UTC OF 09.06.2019.

BAY OF BENGAL:

SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER GULF OF MARTBAN ,NORTH & WESTCENTRAL BAY OF BENGAL , ANDAMAN SEA & ADJOINING SOUTH BAY OF TENASSERIM COAST & SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CONVECTION LAY OVER REST BAY OF BENGAL.

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:

A LOW PRESSURE AREA HAS FORMED OVER SOUTHEAST ARABIAN SEA AND ADJOINING LAKSHADWEEP AREA & EASTCENTRAL ARABIAN SEA. ASSOCIATED CYCLONIC CIRCULATION EXTENDS UPTO MID-TROPOSPHERIC LEVELS. IT IS VERY LIKELY TO CONCENTRATE INTO A DEPRESSION DURING NEXT 48 HOURS OVER SOUTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS AND INTENSIFY FURTHER INTO A CYCLONIC STORM SUBSEQUENTLY.

BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CLOUDS OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA IN ASSOCIATION WITH LOW LEVEL CIRCULATION OVER THE AREA.

SCATTERED LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTH & ADJOINING CENTRAL ARABIAN SEA.

PROBABILITY OF CYCLOGENESIS DURING NEXT 120 HRS:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
NIL	MODERATE	HIGH	HIGH	HIGH

REMARKS: NIL

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 4 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION & CYCLOGENESIS OVER ARABIAN SEA.

THE LOW LEVEL RELATIVE VORTICITY IS NORTH-SOUTH ORIENTED AND IS AROUND $50-70 \times 10^{-5} \text{SEC}^{-1}$ OVER SOUTHEAST AS AND IS EXTENDING UPTO 200 HPA LEVEL IN ASSOCIATION WITH THE ITCZ OVER THE REGION. THE LOWER LEVEL CONVERGENCE IS ABOUT 20×10^{-5}

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

5SEC^{-1} OVER SOUTHEAST AS. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5}\text{SEC}^{-1}$ OVER SOUTHEAST AS. THE VERTICAL WIND SHEAR IS MODERATE (20 KT) OVER THE SOUTHEAST AS. IT IS DECREASING TOWARDS NORTH AND TOWARDS OMAN COAST. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 19° N. MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) SUGGEST FORMATION OF DEPRESSION OVER SOUTHEAST & ADJOINING EASTCENTRAL AS DURING NEXT 48 HOURS. THE SYSTEM IS LIKELY TO MOVE NORTH-NORTHWESTWARDS AND INTENSIFY FURTHER. THE GENESIS POTENTIAL PARAMETER INDEX DEVELOPED BY IMD INDICATES POTENTIAL ZONE FOR CYCLOGENESIS OVER SOUTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA ON 9TH JUNE WITH NORTH-NORTHWESTWARDS MOVEMENT.

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 10.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0700 UTC OF 10.06.2019 BASED ON 0300 UTC OF 10.06.2019.

DEPRESSION OVER DEPRESSION OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA

A DEPRESSION FORMED OVER SOUTHEAST AND ADJOINING LAKSHADWEEP & EASTCENTRAL ARABIAN SEA AND LAY CENTRED AT 0000 UTC OF TODAY, THE 10 TH JUNE, 2019 NEAR LATITUDE 11.7°N AND LONGITUDE 71.0°E. IT MOVED NORTHWARDS WITH A SPEED OF ABOUT 31 KMPH IN THE PAST THREE HOURS AND LAY CENTRED AT 0300 UTC OF TODAY, THE 10TH JUNE, 2019 NEAR LATITUDE 12.5°N AND LONGITUDE 71.0°E OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA, ABOUT 240 KM NORTHWEST OF AMINIDIVI (43311) (LAKSHADWEEP), 760 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 930 KM SOUTH-SOUTHEAST OF VERAVAL (42909) (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A DEEP DEPRESSION DURING NEXT 06 HOURS, INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS AND INTO A SEVERE CYCLONIC STORM THEREAFTER. IT IS LIKELY TO MOVE NORTH-NORTHWESTWARDS DURING NEXT 72 HOURS.

IT IS VERY LIKELY TO CAUSE ADVERSE IMPACT IN TERMS OF WIND & RAINFALL OVER SAURASHTRA & KUTCH MAINLY ON 13TH & 14TH JUNE, 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
10.06.19/0300	12.5/71.0	40-50 GUSTING TO 60	DEPRESSION
10.06.19/1200	13.2/70.8	55-65 GUSTING TO 75	DEEP DEPRESSION
11.06.19/0000	14.6/70.5	65-75 GUSTING TO 85	CYCLONIC STORM
11.06.19/1200	16.0/70.3	80-90 GUSTING TO 100	CYCLONIC STORM
12.06.19/0000	17.5/70.0	90-100 GUSTING TO 115	SEVERE CYCLONIC STORM
12.06.19/1200	19.0/69.8	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
13.06.19/0000	20.3/69.6	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM

REMARKS:

AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 10TH JUNE, 2019 THE INTENSITY OF THE VORTEX OVER **AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA** IS T1.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED MODERATE TO INTENSE CLOUDS OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA IN ASSOCIATION WITH THE SYSTEM. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA.

AT 0300 UTC OF 10TH JUNE, A BOUY LOCATED AT 10.6°N/72.3°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1003.1 HPA AND MEAN SURFACE WIND SPEED OF 250°/ 20 KNOTS. ANOTHER BOUY

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

LOCATED AT 10.9°N/72.2°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.7 HPA AND MEAN SURFACE WIND SPEED OF 320°/ 17 KNOTS. A SHIP (V7JA5) LOCATED AT 9.8°N/68.3°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1007.0 HPA AND MEAN SURFACE WIND SPEED OF 280°/ 22 KNOTS. AMINI DIVI (43311) REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.3 HPA AND MEAN SURFACE WIND SPEED OF 270°/ 14 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 4 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100-110 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY INCREASED IN PAST 24 HOURS AND IS AROUND 200 X10⁻⁵SEC⁻¹ TO THE WEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE WEST OF THE SYSTEM. THE UPPER LEVEL DIVERGENCE IS ABOUT 40 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM AREA. IT IS DECREASING TOWARDS NORTH AND TOWARDS OMAN COAST. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N.

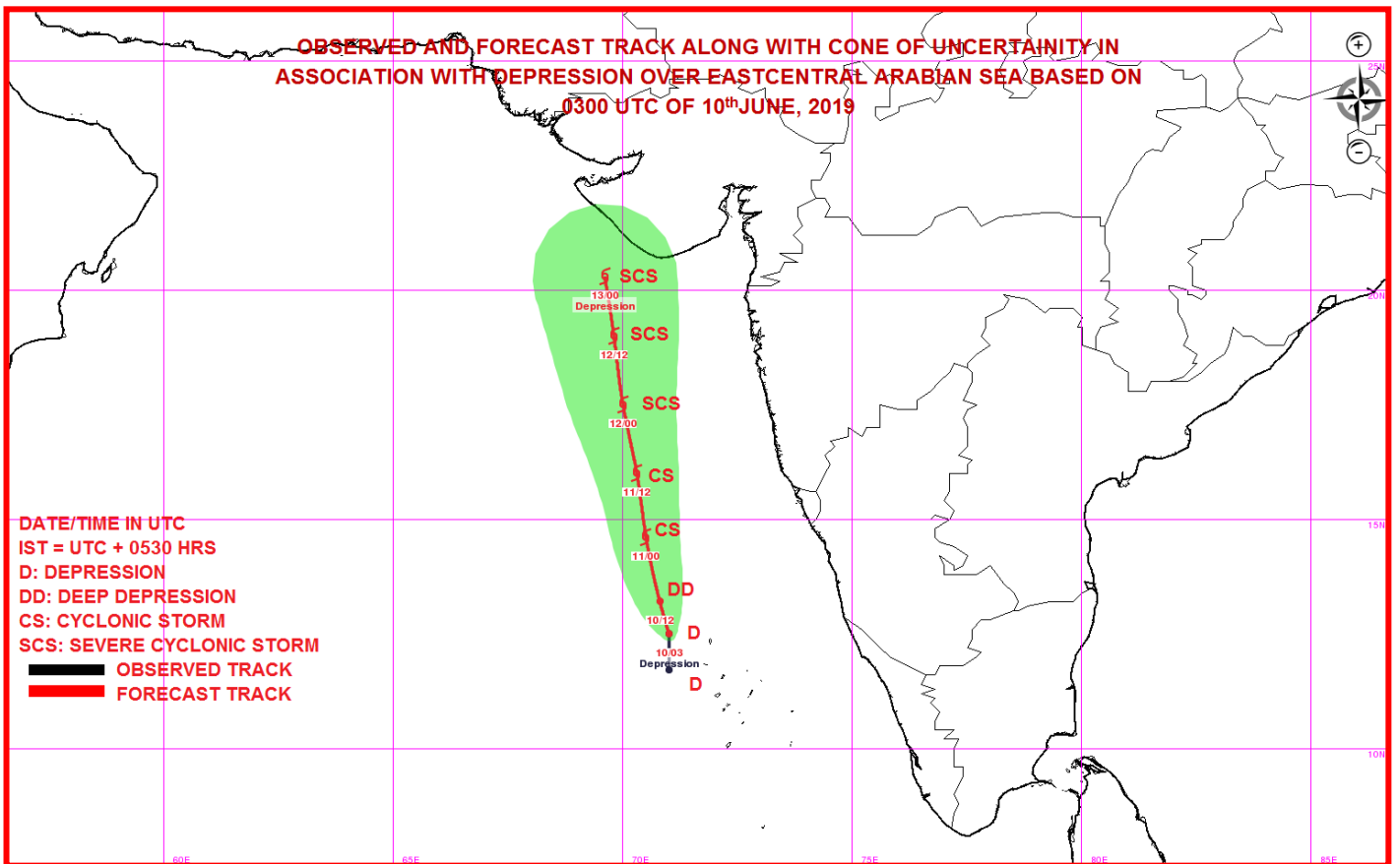
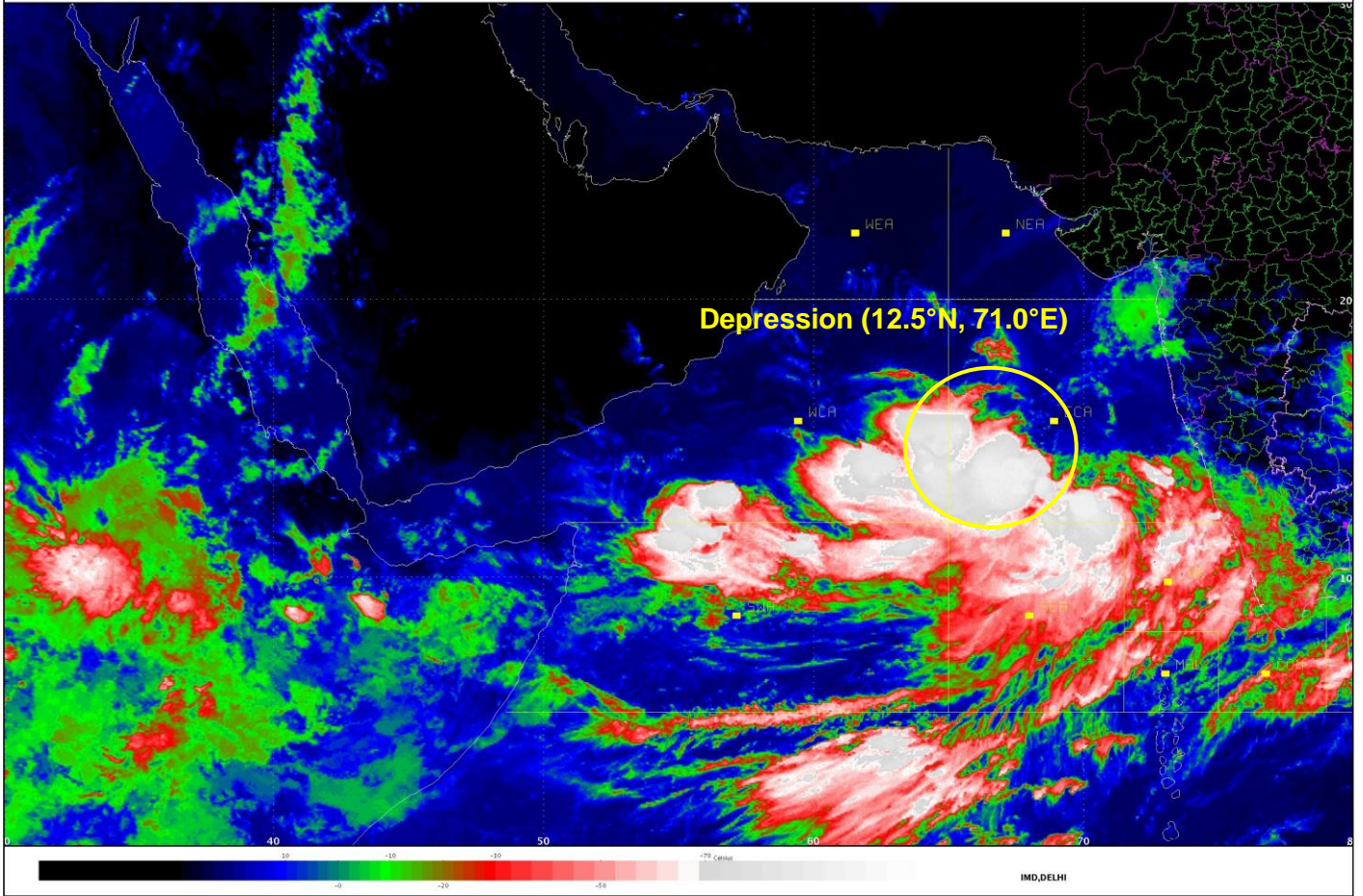
AS THE DEPRESSION IS LYING IN A FAVOURABLE ENVIRONMENTAL CONDITION IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A SEVERE CYCLONIC STORM DURING SUBSEQUENT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE OBSERVATION.

(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%



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 10.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0930 UTC OF 10.06.2019 BASED ON 0600 UTC OF 10.06.2019.

DEPRESSION INTENSIFIED INTO DEEP DEPRESSION OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA

THE DEPRESSION OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 15 KMPH IN LAST SIX HOURS, INTENSIFIED INTO A DEEP DEPRESSION AND LAY CENTRED AT 0600 UTC OF TODAY, THE 10TH JUNE, 2019 NEAR LATITUDE 12.5°N AND LONGITUDE 70.9°E OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA, ABOUT 250 KM NORTHWEST OF AMINIDIVI (43311) (LAKSHADWEEP), 760 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 930 KM SOUTH-SOUTHEAST OF VERAVAL (42909) (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A SEVERE CYCLONIC STORM SUBSEQUENT 24 HOURS. IT IS LIKELY TO MOVE NORTH-NORTHWESTWARDS DURING NEXT 72 HOURS.

IT IS VERY LIKELY TO CAUSE ADVERSE IMPACT IN TERMS OF WIND & RAINFALL OVER SAURASHTRA & KUTCH MAINLY ON 13TH & 14TH JUNE, 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
10.06.19/0600	12.5/70.9	50-60 GUSTING TO 70	DEEP DEPRESSION
10.06.19/1200	13.2/70.8	55-65 GUSTING TO 75	DEEP DEPRESSION
11.06.19/0000	14.6/70.5	65-75 GUSTING TO 85	CYCLONIC STORM
11.06.19/1200	16.0/70.3	80-90 GUSTING TO 100	CYCLONIC STORM
12.06.19/0000	17.5/70.0	90-100 GUSTING TO 115	SEVERE CYCLONIC STORM
12.06.19/1200	19.0/69.8	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
13.06.19/0000	20.3/69.6	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM

REMARKS:

AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 10TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA IS T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA.

AT 0600 UTC OF 10TH JUNE, A BOUY LOCATED AT 10.3°N/72.6°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1004.9 HPA AND MEAN SURFACE WIND SPEED OF 240°/ 19 KNOTS. ANOTHER BOUY LOCATED AT 12°N/68.7°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.6 HPA AND MEAN SURFACE WIND SPEED OF 260°/ 31 KNOTS. AMINI DIVI (43311) REPORTED A MEAN SEA LEVEL

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

PRESSURE OF 1002.6 HPA AND MEAN SURFACE WIND SPEED OF 260°/ 31 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100-110 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND 200 X10⁻⁵SEC⁻¹ TO THE WEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 50 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE WEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM AREA. IT IS DECREASING TOWARDS THE NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N.

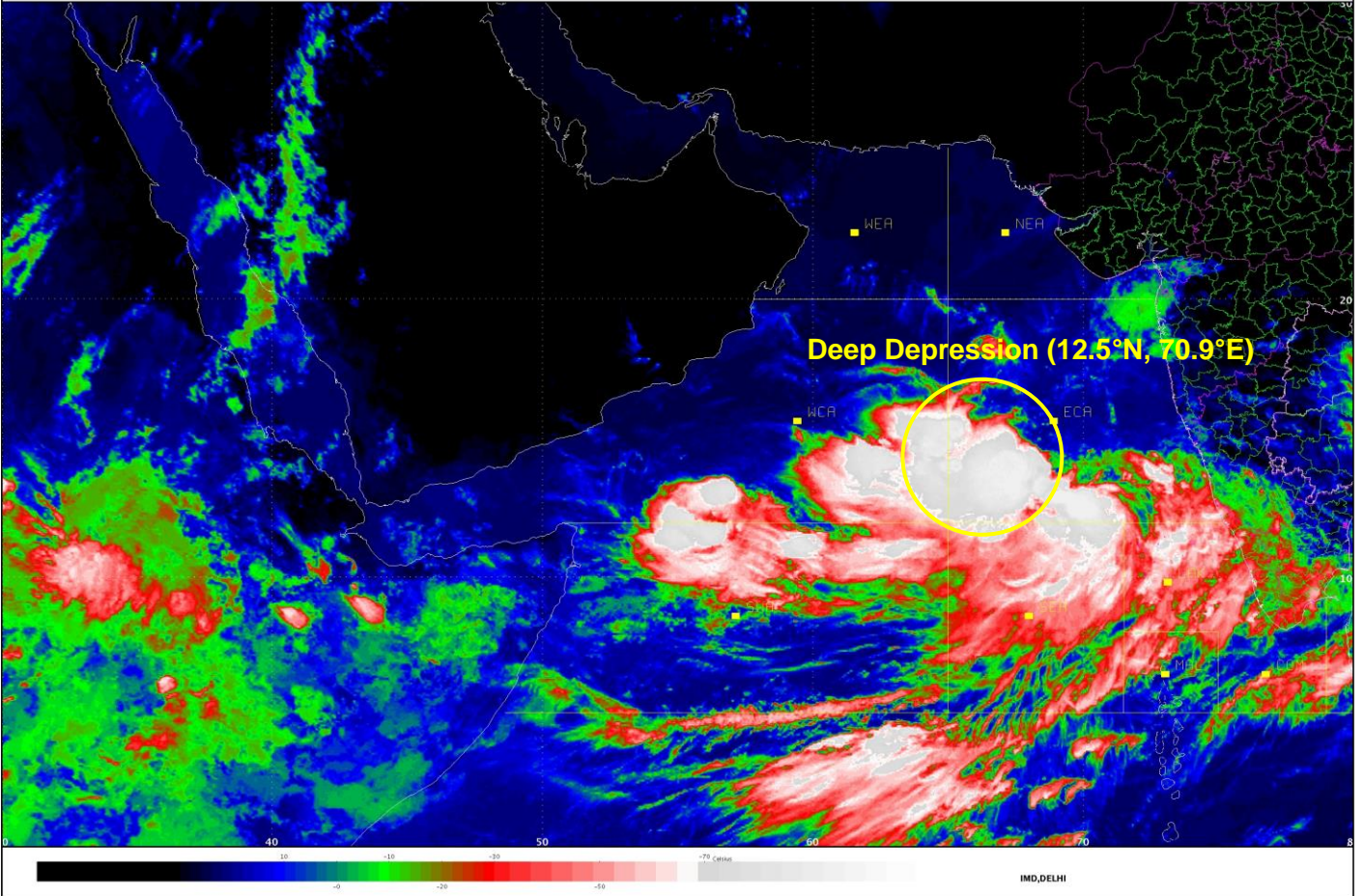
AS THE DEEP DEPRESSION IS LYING IN A FAVOURABLE ENVIRONMENTAL CONDITION, IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS AND INTO A SEVERE CYCLONIC STORM DURING SUBSEQUENT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE OBSERVATION.

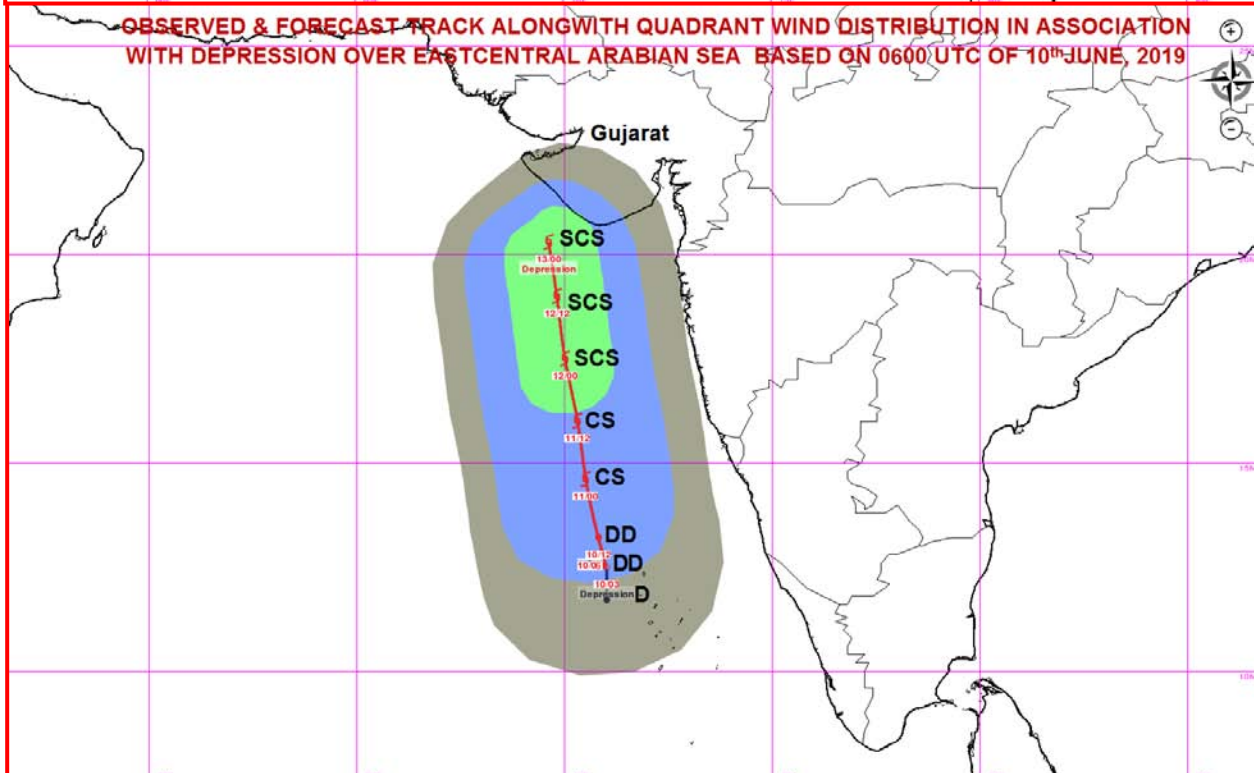
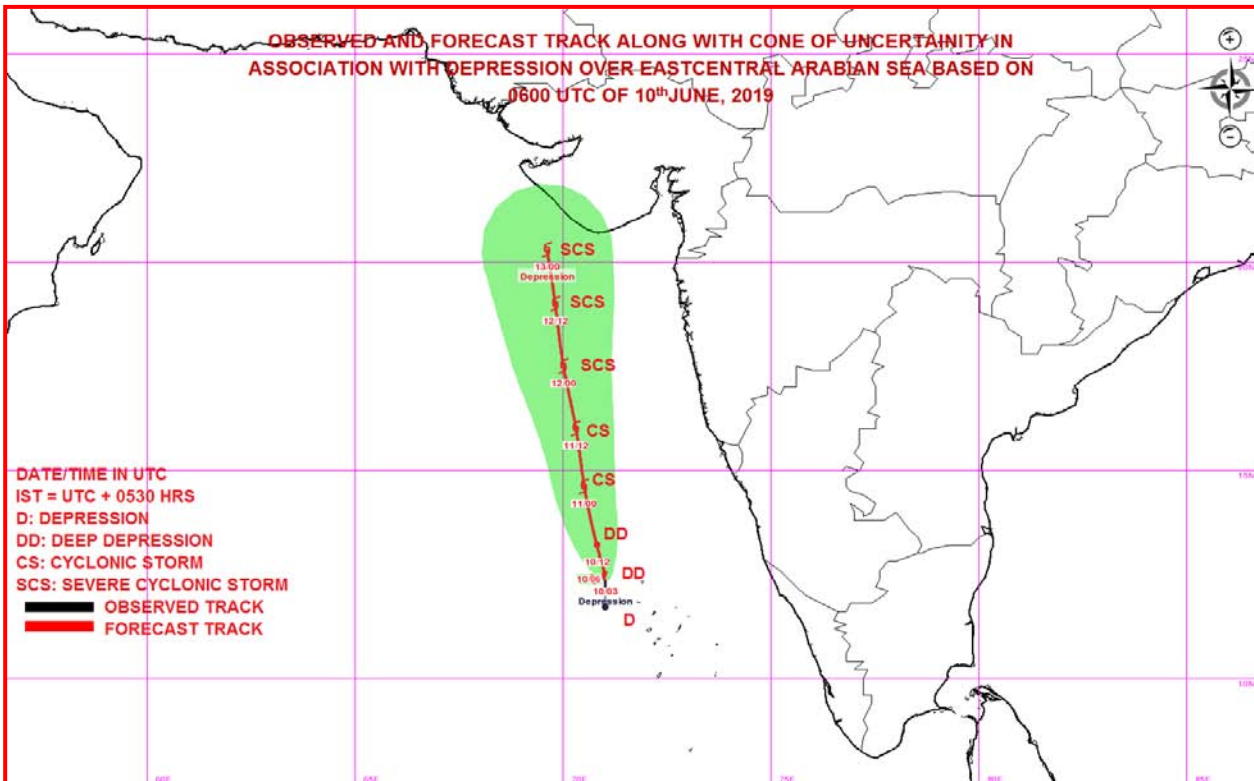
**(NEETHA K GOPAL)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



MSW(knot)/kmph)	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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 10.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1600 UTC OF 10.06.2019 BASED ON 1200 UTC OF 10.06.2019.

Deep Depression over Eastcentral & adjoining Southeast Arabian Sea: Cyclone Alert for Gujarat Coast: Yellow Message

The deep depression over Eastcentral and adjoining Southeast Arabian Sea & Lakshadweep area moved north-northwestwards with a speed of about 15 kmph in last six hours and lay centred at 1200 UTC of today, the 10th June, 2019 near latitude 13.3°N and longitude 70.8°E over Eastcentral & adjoining Southeast Arabian Sea, about 320 km northwest of Aminidivi (43311) (Lakshadweep), 680 km south-southwest of Mumbai (43003) (Maharashtra) and 840 km south-southeast of Veraval (42909) (Gujarat). It is very likely to intensify further into a Cyclonic Storm during next 12 hours and into a Severe Cyclonic Storm in subsequent 24 hours.

It is very likely to move nearly northward and cross Gujarat coast between Porbandar and Mahuva around Veraval & Diu region as a Very Severe Cyclonic Storm with wind speed 130-140 kmph gusting to 155 kmph during mid-night of 12th June 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
10.06.19/1200	13.3/70.8	55-65 gusting to 75	Deep Depression
10.06.19/1800	14.1/70.8	65-75 gusting to 85	Cyclonic Storm
11.06.19/0000	14.9/70.7	80-90 gusting to 100	Cyclonic Storm
11.06.19/0600	15.7/70.7	90-100 gusting to 110	Severe Cyclonic Storm
11.06.19/1200	16.5/70.7	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/0000	18.3/70.5	120-130 gusting to 145	Very Severe Cyclonic Storm
12.06.19/1200	20.1/70.5	130-140 gusting to 155	Very Severe Cyclonic Storm
13.06.19/0000	21.9/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/1200	23.1/69.9	70-80 gusting to 90	Cyclonic Storm
14.06.19/0000	23.6/69.5	50-60 gusting to 70	Deep Depression
14.06.19/1200	24.1/69.3	40-50 gusting to 60	Depression

REMARKS:

AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 10TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA IS T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 1200 UTC OF 10TH JUNE, A BOUY LOCATED AT 14.9°N/68.9°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.9 HPA AND MEAN SURFACE WIND SPEED OF 050°/ 24 KNOTS. ANOTHER BOUY LOCATED AT 12.1°N/68.8°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.3 HPA AND MEAN SURFACE WIND SPEED OF 260°/ 29 KNOTS. AMINI DIVI (43311) REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.4 HPA AND MEAN SURFACE WIND SPEED OF 270°/ 17 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100-110 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS $200 \times 10^{-5} \text{SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM AREA. IT IS DECREASING TOWARDS THE NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH-NORTHWESTERLY DIRECTION.

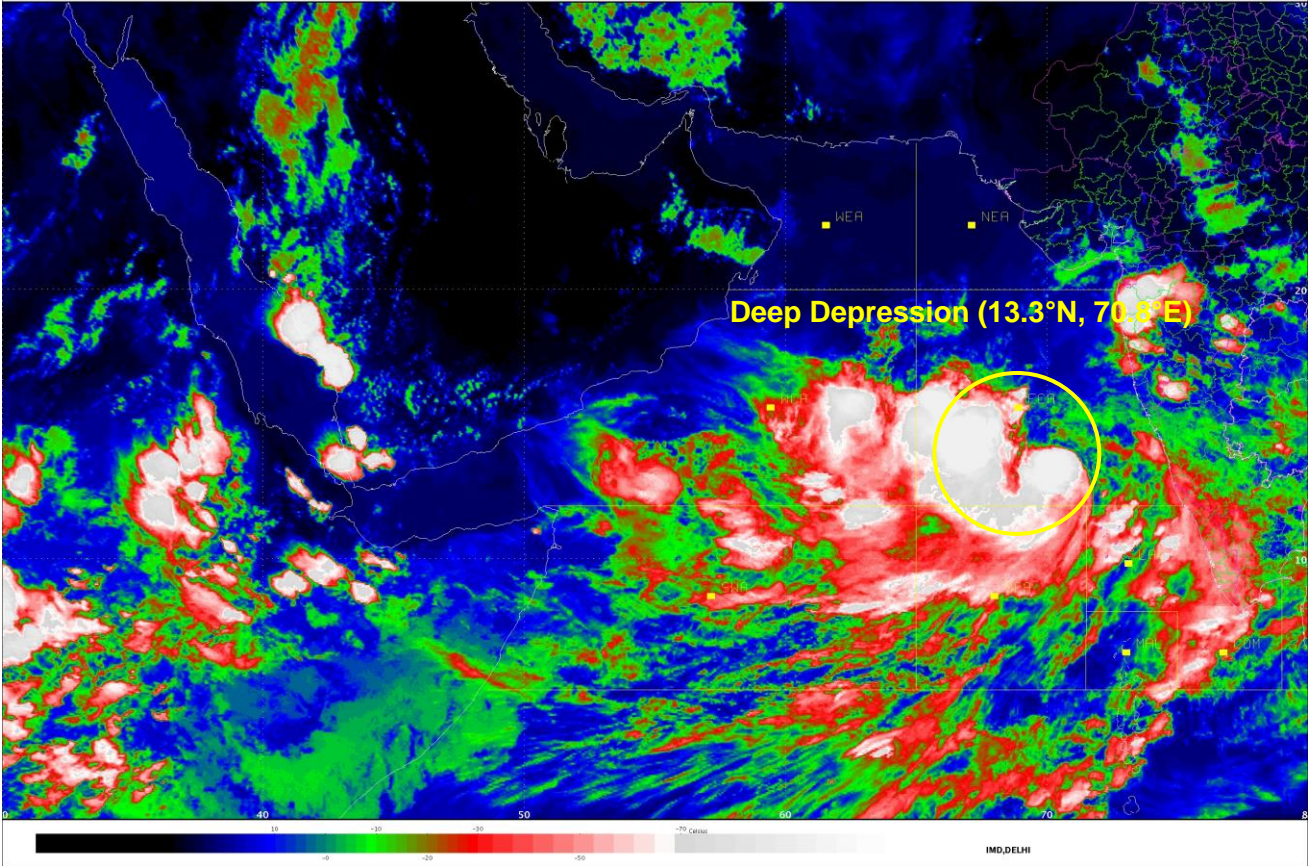
AS THE DEEP DEPRESSION IS LYING IN A FAVOURABLE ENVIRONMENTAL CONDITION, IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A SEVERE CYCLONIC STORM DURING SUBSEQUENT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE OBSERVATION.

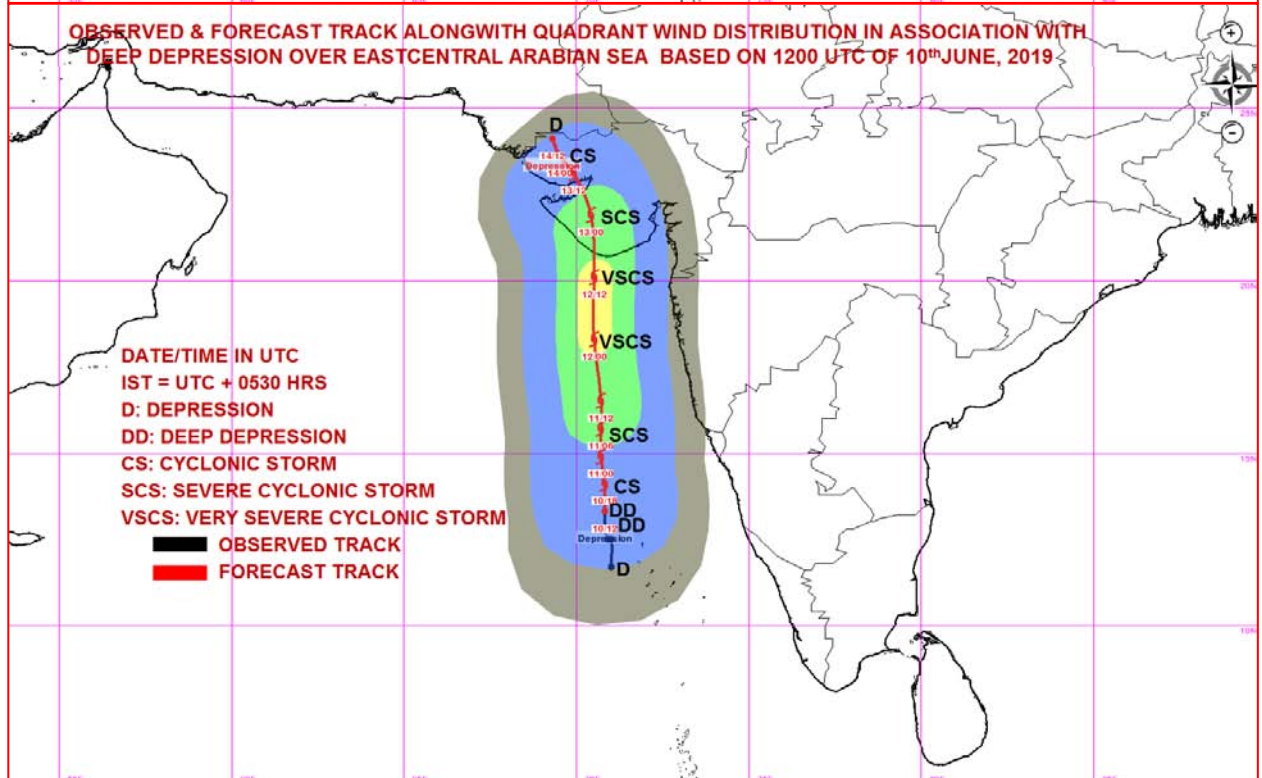
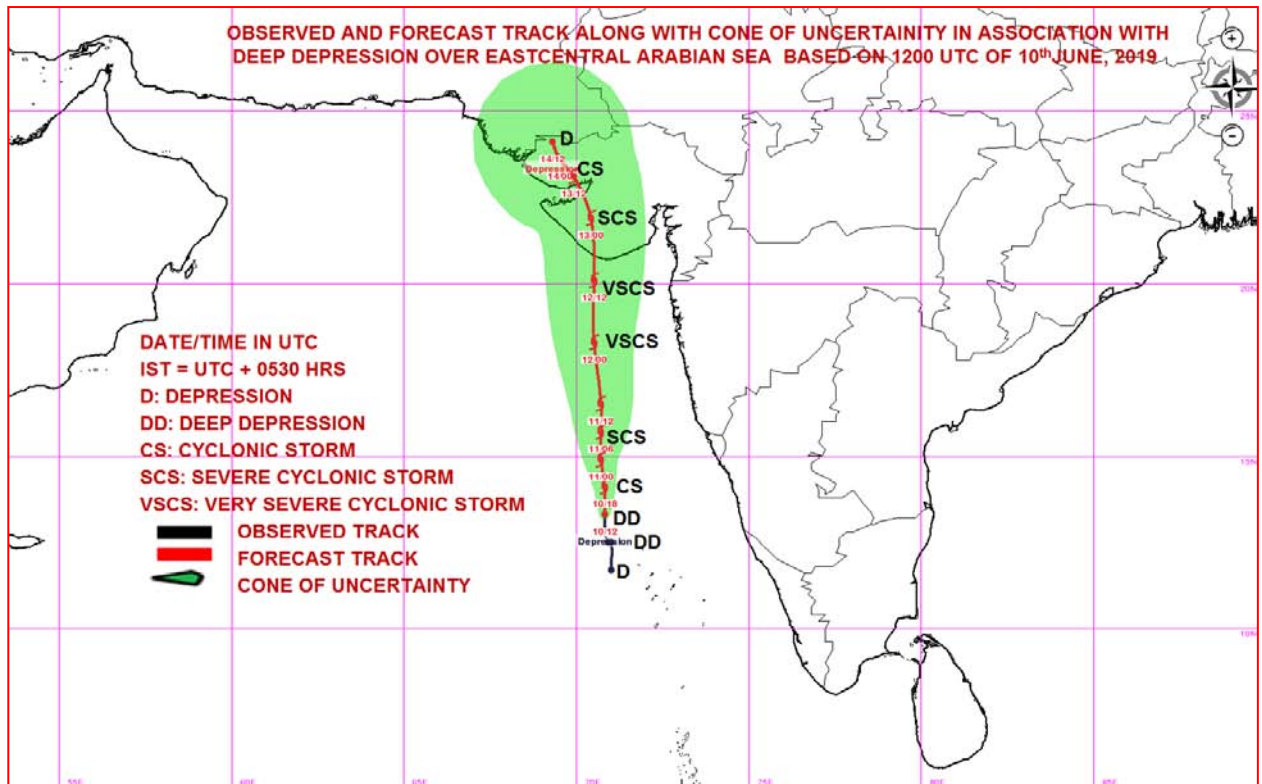
(KRISHNA MISHRA)
SCIENTIST-B, RSMC, NEW DELHI

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%



MSW(knot)/kmph)	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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 10.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2100 UTC OF 10.06.2019 BASED ON 1800 UTC OF 10.06.2019.

CYCLONIC STORM 'VAYU' OVER EASTCENTRAL & ADJOINING SOUTHEAST ARABIAN SEA: CYCLONE ALERT FOR GUJARAT COAST: YELLOW MESSAGE

THE DEEP DEPRESSION OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA INTENSIFIED INTO **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**), MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 12 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1800 UTC OF TODAY, THE 10TH JUNE, 2019 NEAR LATITUDE 13.9°N AND LONGITUDE 70.6°E OVER EASTCENTRAL & ADJOINING SOUTHEAST ARABIAN SEA, ABOUT 380 KM NORTHWEST OF AMINIDIVI (43311) (LAKSHADWEEP), 630 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 780 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARD AND CROSS GUJARAT COAST BETWEEN PORBANDAR AND MAHUVA AROUND VERAVAL & DIU REGION AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING EARLY MORNING OF 13TH JUNE 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
10.06.19/1800	13.9/70.6	65-75 gusting to 85	Cyclonic Storm
11.06.19/0000	14.6/70.6	70-80 gusting to 90	Cyclonic Storm
11.06.19/0600	15.3/70.6	80-90 gusting to 100	Cyclonic Storm
11.06.19/1200	16.0/70.6	90-100 gusting to 115	Severe Cyclonic Storm
11.06.19/1800	16.7/70.5	95-105 gusting to 120	Severe Cyclonic Storm
12.06.19/0600	18.3/70.5	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/1800	19.9/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/0600	21.5/70.2	100-110 gusting to 125	Severe Cyclonic Storm
13.06.19/1800	22.4/69.9	70-80 gusting to 90	Cyclonic Storm
14.06.19/0600	23.3/69.4	40-50 gusting to 60	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC ON 10TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -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 35 KNOTS GUSTING TO 45 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 995 HPA.

AT 1800 UTC OF 10TH JUNE, A BOUY LOCATED AT 14.9°N/68.9°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 340°/14 KNOTS. AMINIDIVI (43311) REPORTED A MEAN SEA LEVEL PRESSURE OF 1003.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/17 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100-110 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS $200 \times 10^{-5} \text{SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS UNFAVOURABLE (25-30 KNOTS) OVER THE SYSTEM AREA. IT IS DECREASING TOWARDS THE NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH-NORTHWESTERLY DIRECTION.

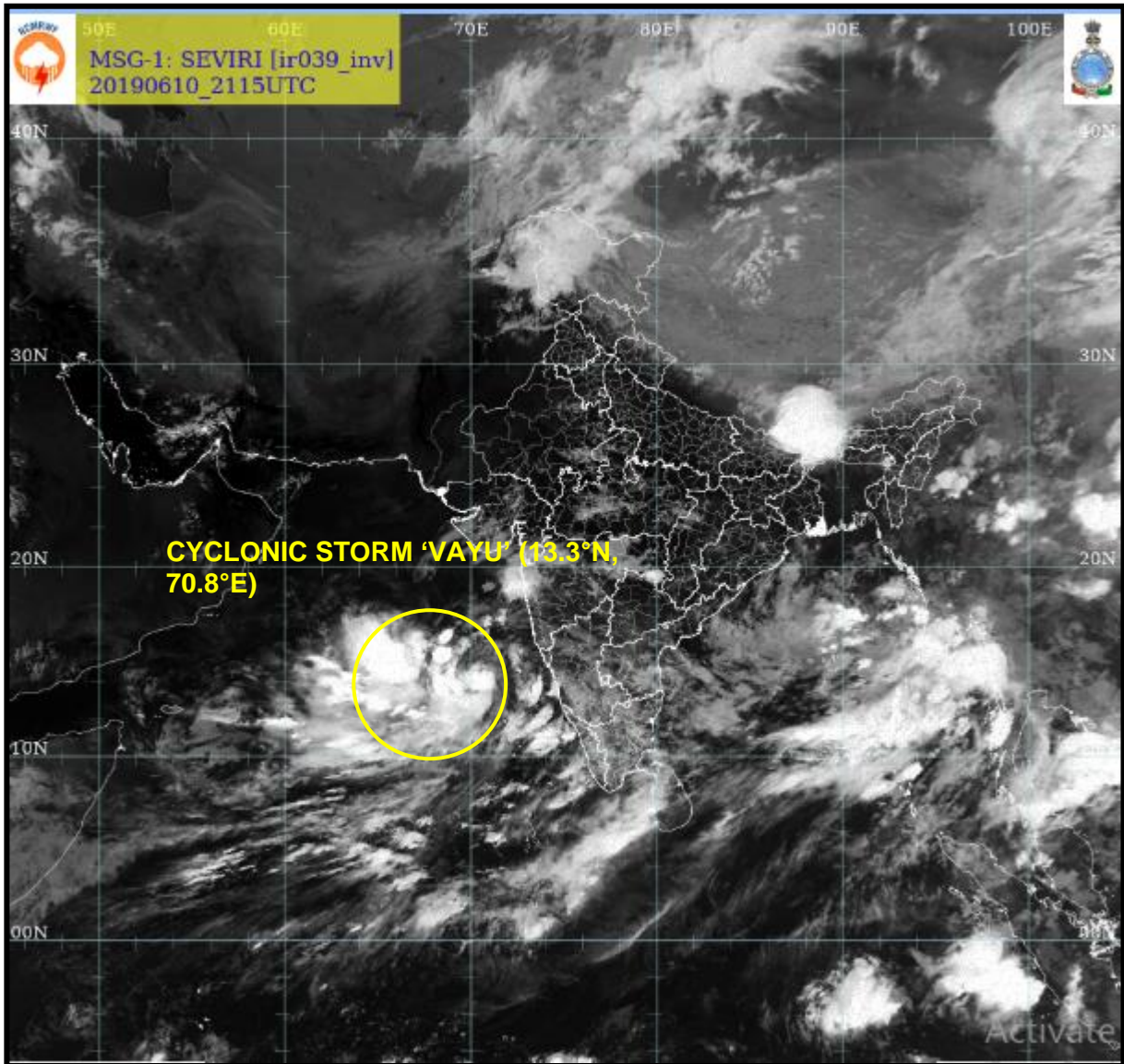
AS THE CYCLONIC STORM IS LYING IN FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE FORECAST.

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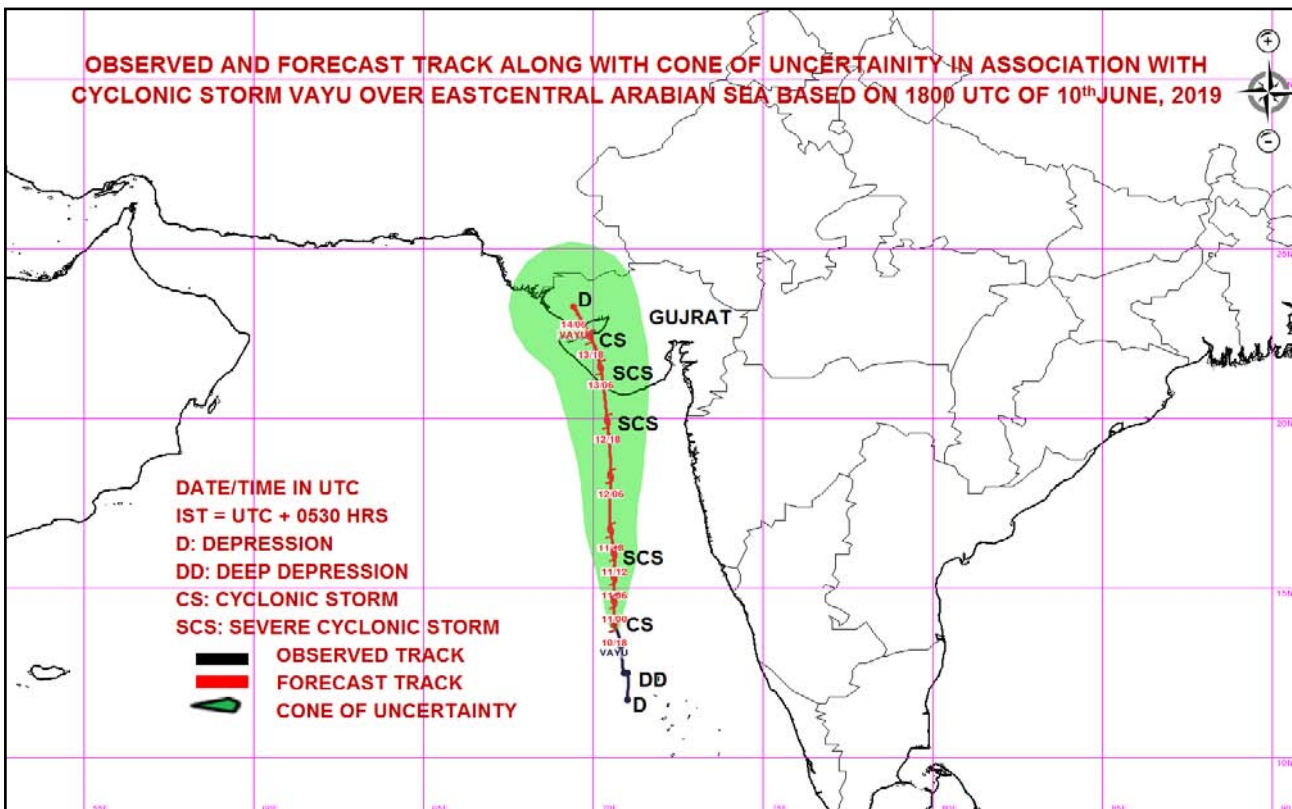
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

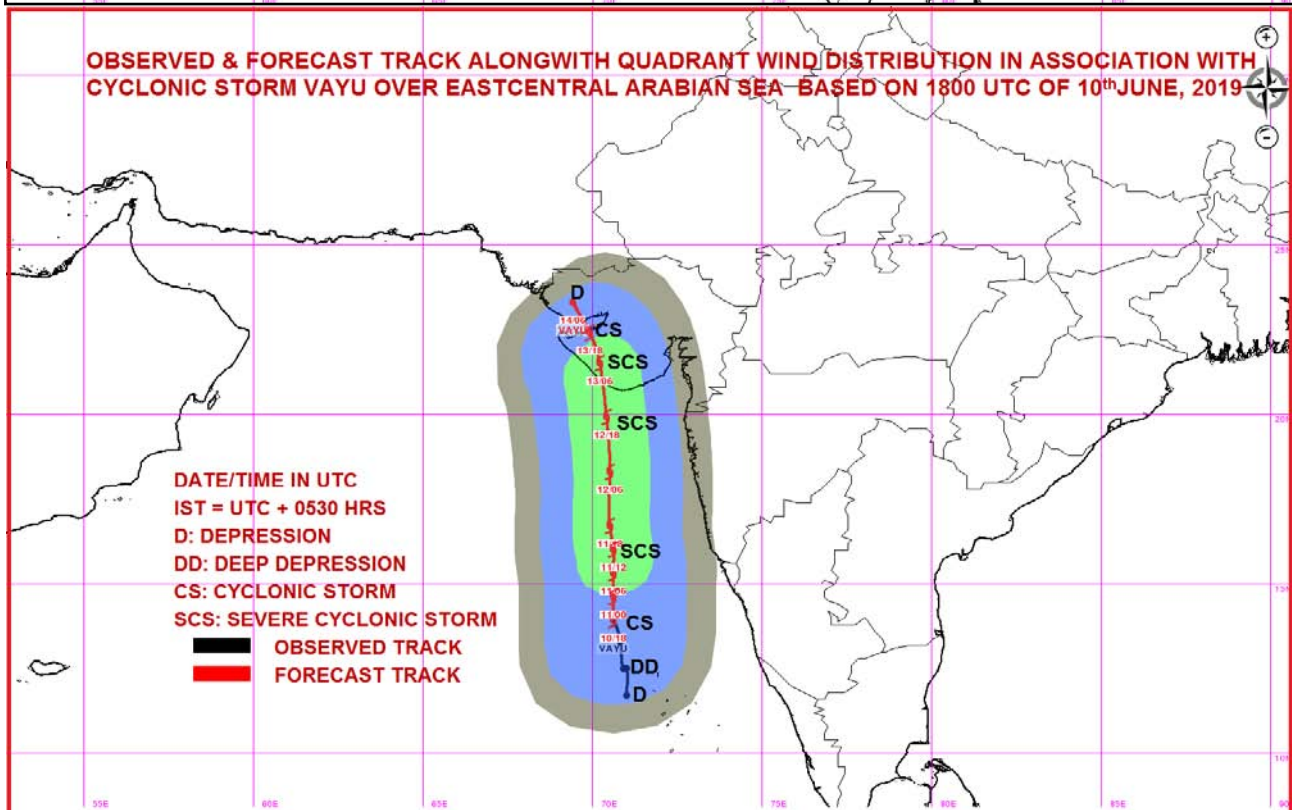


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1800 UTC OF 10th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1800 UTC OF 10th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations

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 10.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2300 UTC OF 10.06.2019 BASED ON 2100 UTC OF 10.06.2019.

CYCLONIC STORM 'VAYU' OVER EASTCENTRAL & ADJOINING SOUTHEAST ARABIAN SEA: CYCLONE ALERT FOR GUJARAT COAST: YELLOW MESSAGE

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL & ADJOINING SOUTHEAST ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 11 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 2100 UTC OF TODAY, THE 11TH JUNE, 2019 NEAR LATITUDE 14.2°N AND LONGITUDE 70.6°E OVER EASTCENTRAL & ADJOINING SOUTHEAST ARABIAN SEA, ABOUT 410 KM NORTH-NORTHWEST OF AMINIDIVI (43311) (LAKSHADWEEP), 600 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 740 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARD AND CROSS GUJARAT COAST BETWEEN PORBANDAR AND MAHUVA AROUND VERAVAL & DIU REGION AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING EARLY MORNING OF 13TH JUNE 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
10.06.19/2100	14.2/70.6	65-75 gusting to 85	Cyclonic Storm
11.06.19/0000	14.6/70.6	70-80 gusting to 90	Cyclonic Storm
11.06.19/0600	15.3/70.6	80-90 gusting to 100	Cyclonic Storm
11.06.19/1200	16.0/70.6	90-100 gusting to 115	Severe Cyclonic Storm
11.06.19/1800	16.7/70.5	95-105 gusting to 120	Severe Cyclonic Storm
12.06.19/0600	18.3/70.5	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/1800	19.9/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/0600	21.5/70.2	100-110 gusting to 125	Severe Cyclonic Storm
13.06.19/1800	22.4/69.9	70-80 gusting to 90	Cyclonic Storm
14.06.19/0600	23.3/69.4	40-50 gusting to 60	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC ON 10TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -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 35 KNOTS GUSTING TO 45 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 995 HPA.

AT 2100 UTC OF 10TH JUNE, A BOUY LOCATED AT 14.9°N/69.0°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.5 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 350°/17 KNOTS. A BOUY LOCATED AT 12.0°N/68.7°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/29 KNOTS. A BOUY LOCATED AT 10.8°N/72.2°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 300°/19 KNOTS. AMINIDIVI (43311) REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/06 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100-110 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS $200 \times 10^{-5} \text{SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS NEUTRAL TO UNFAVOURABLE (20-25 KNOTS) OVER THE SYSTEM AREA. IT IS DECREASING TOWARDS THE NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH-NORTHWESTERLY DIRECTION.

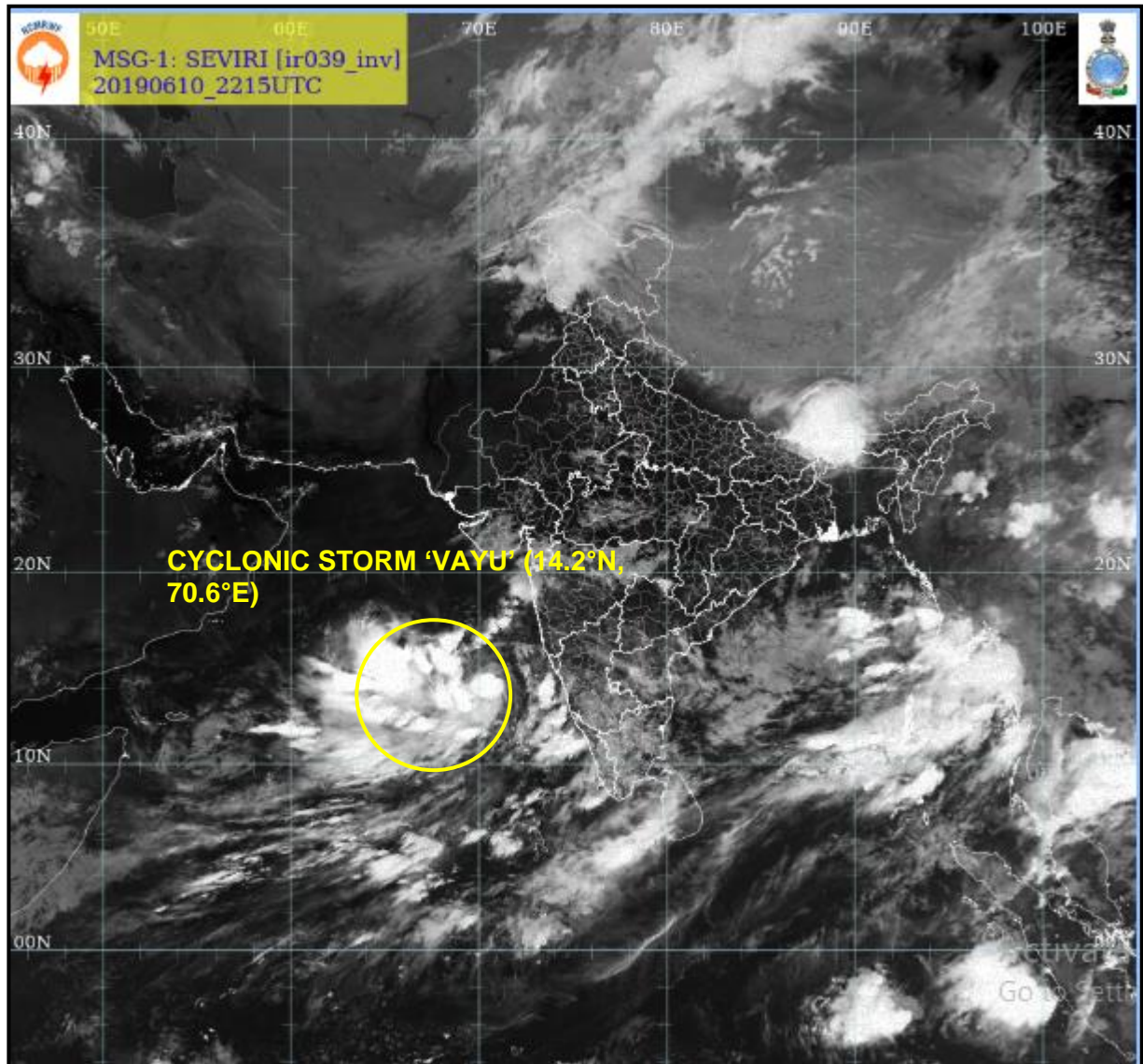
AS THE CYCLONIC STORM IS LYING IN FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS VERY LIKELY TO INTENSIFY INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE FORECAST.

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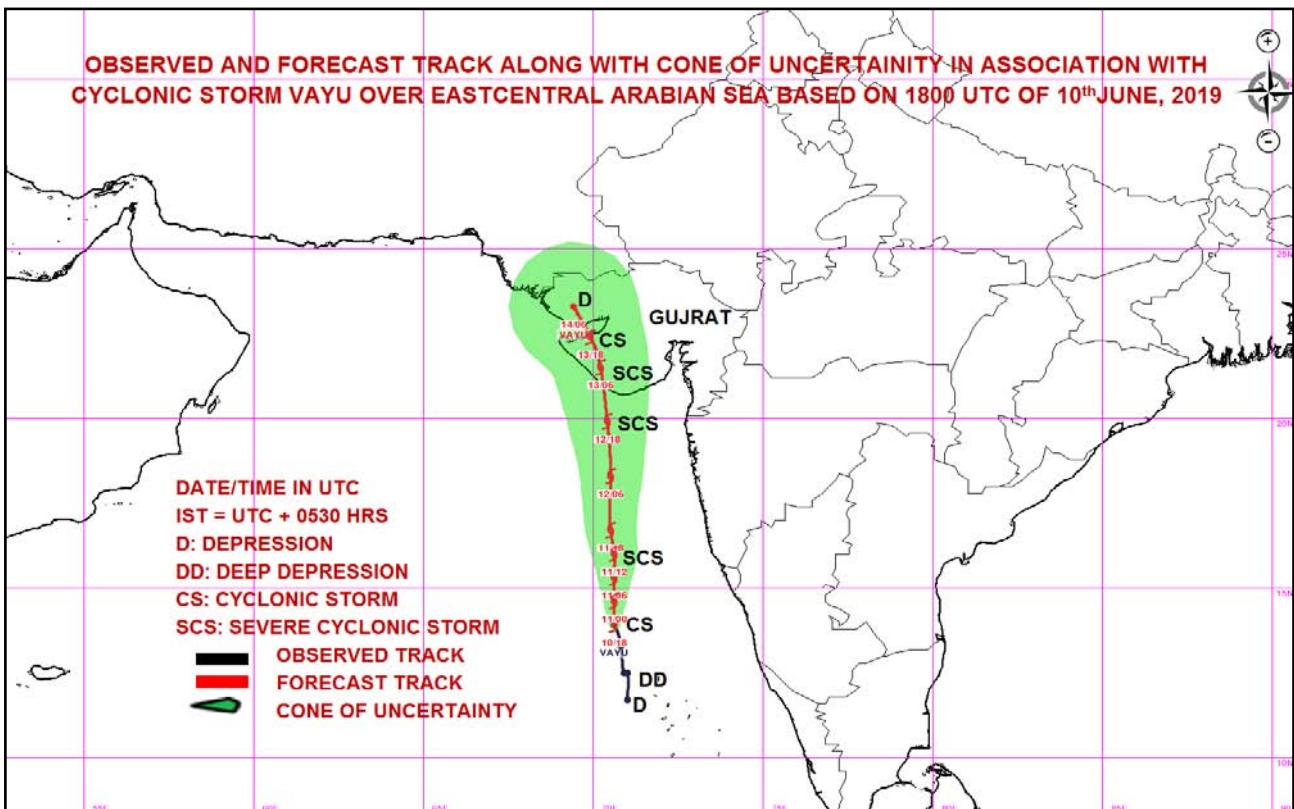
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

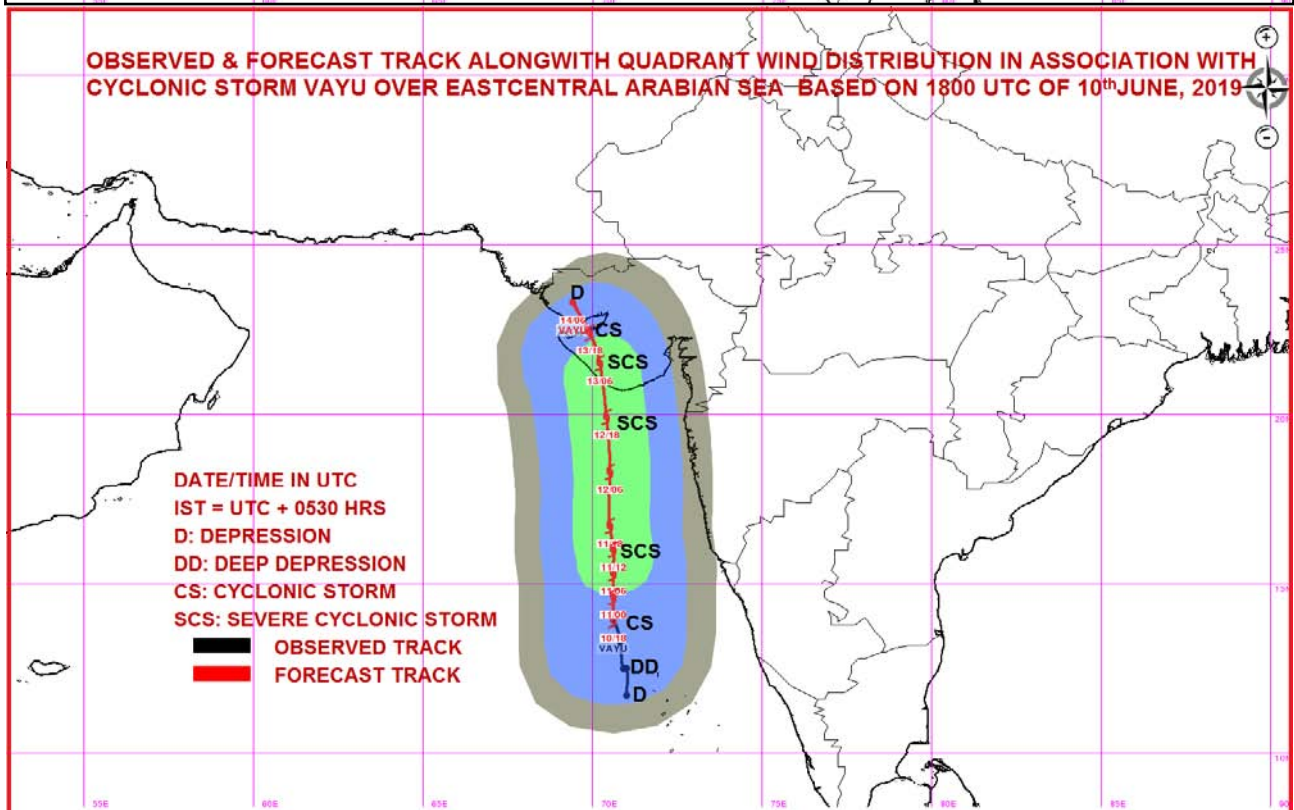


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1800 UTC OF 10th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1800 UTC OF 10th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations

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 11.06.2019

TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0300 UTC OF 11.06.2019 BASED ON 0000 UTC OF 11.06.2019.

CYCLONIC STORM 'VAYU' OVER EASTCENTRAL ARABIAN SEA: CYCLONE ALERT FOR GUJARAT COAST: YELLOW MESSAGE

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL & ADJOINING SOUTHEAST ARABIAN SEA MOVED NORTHWARDS WITH A SPEED OF ABOUT 15 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0000 UTC OF TODAY, THE 11TH JUNE, 2019 NEAR LATITUDE 14.7°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 460 KM NORTH-NORTHWEST OF AMINIDIVI (LAKSHADWEEP), 540 KM SOUTH-SOUTHWEST OF MUMBAI (MAHARASHTRA) AND 690 KM NEARLY SOUTH OF VERAVAL (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR AND MAHUVA AROUND VERAVAL & DIU REGION AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING EARLY MORNING OF 13TH JUNE 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
11.06.19/0000	14.7/70.6	70-80 gusting to 90	Cyclonic Storm
11.06.19/0600	15.3/70.6	80-90 gusting to 100	Cyclonic Storm
11.06.19/1200	16.0/70.6	90-100 gusting to 115	Severe Cyclonic Storm
11.06.19/1800	16.7/70.5	95-105 gusting to 120	Severe Cyclonic Storm
12.06.19/0000	17.5/70.5	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/1200	19.1/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/0000	20.8/70.3	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/1200	22.0/70.0	70-80 gusting to 90	Cyclonic Storm
14.06.19/0000	22.9/69.7	40-50 gusting to 60	Depression
14.06.19/1200	23.8/69.3	30-40 gusting to 50	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL AND ADJOINING SOUTHEAST ARABIAN SEA IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

THE SYSTEM HAS SLIGHTLY INTENSIFIED AND THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 KNOTS GUSTING TO 50 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 993 HPA.

AT 0000 UTC OF 11TH JUNE, A BOUY LOCATED AT 14.9°N/69.0°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 310°/19 KNOTS. A BOUY LOCATED AT 18.4°N/67.4°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 120°/10 KNOTS. A SHIP LOCATED AT 17.5°N/66.5°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 240°/21 KNOTS. RATNAGIRI (43110) REPORTED A MEAN SEA LEVEL PRESSURE OF 998.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/04 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100-110 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS $200 \times 10^{-5} \text{SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS PERSISTS AT ABOUT $20 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS UNFAVOURABLE (25-30 KNOTS) OVER THE SYSTEM AREA. IT IS DECREASING TOWARDS THE NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN NORTH-NORTHWESTWARD DIRECTION.

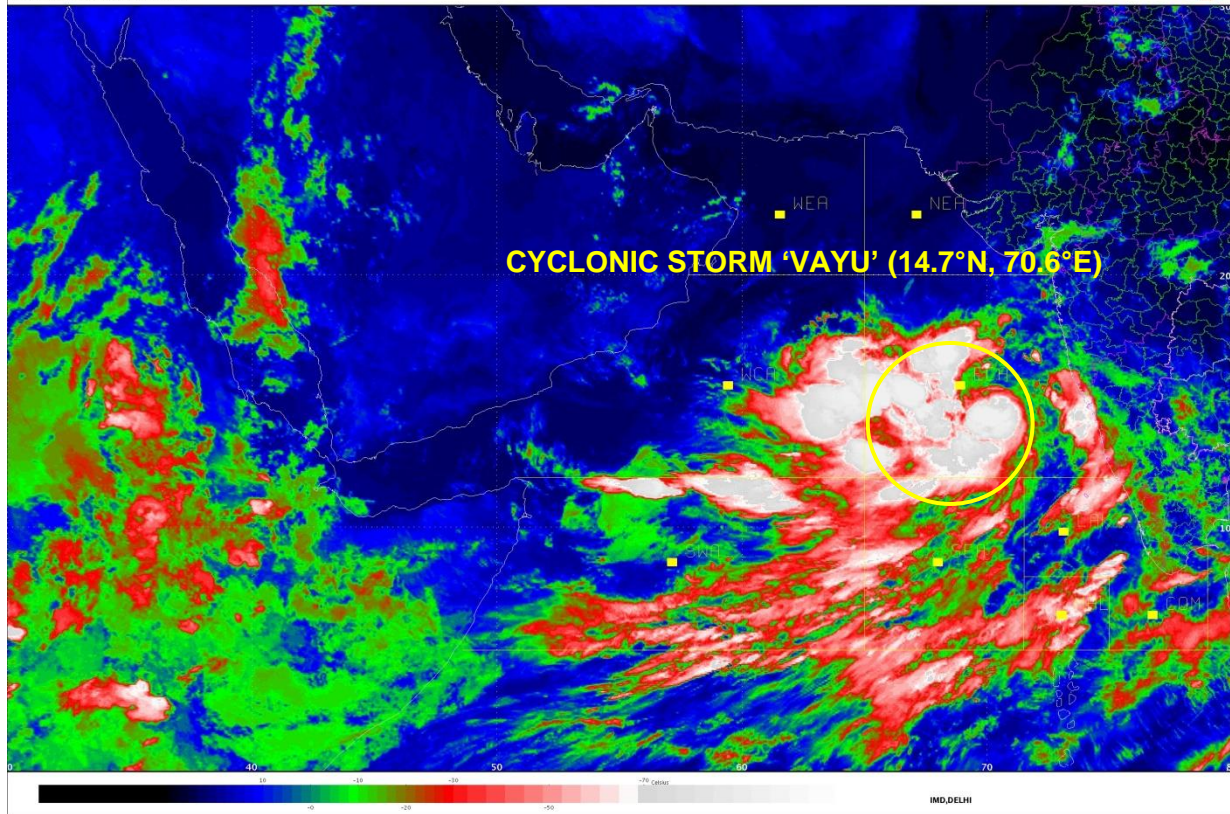
AS THE CYCLONIC STORM IS LYING IN FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE FORECAST.

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

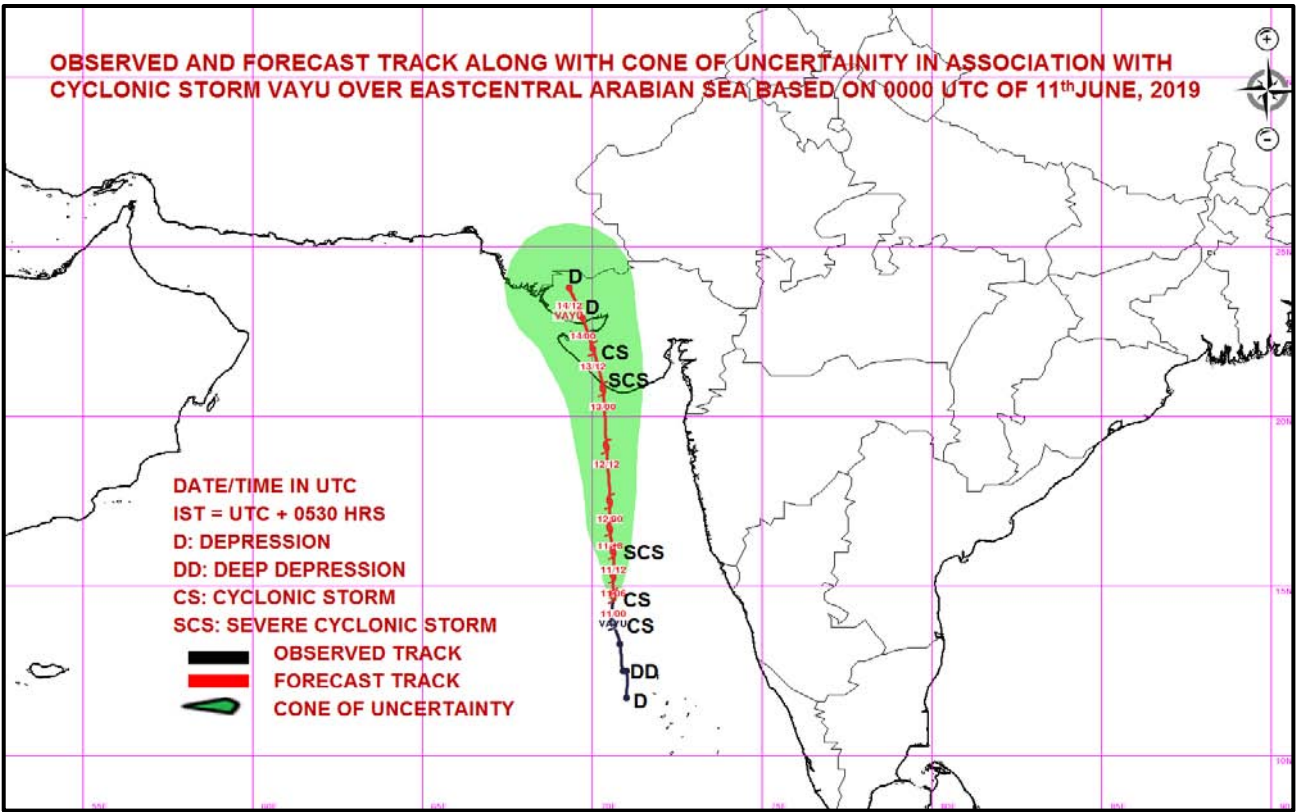
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

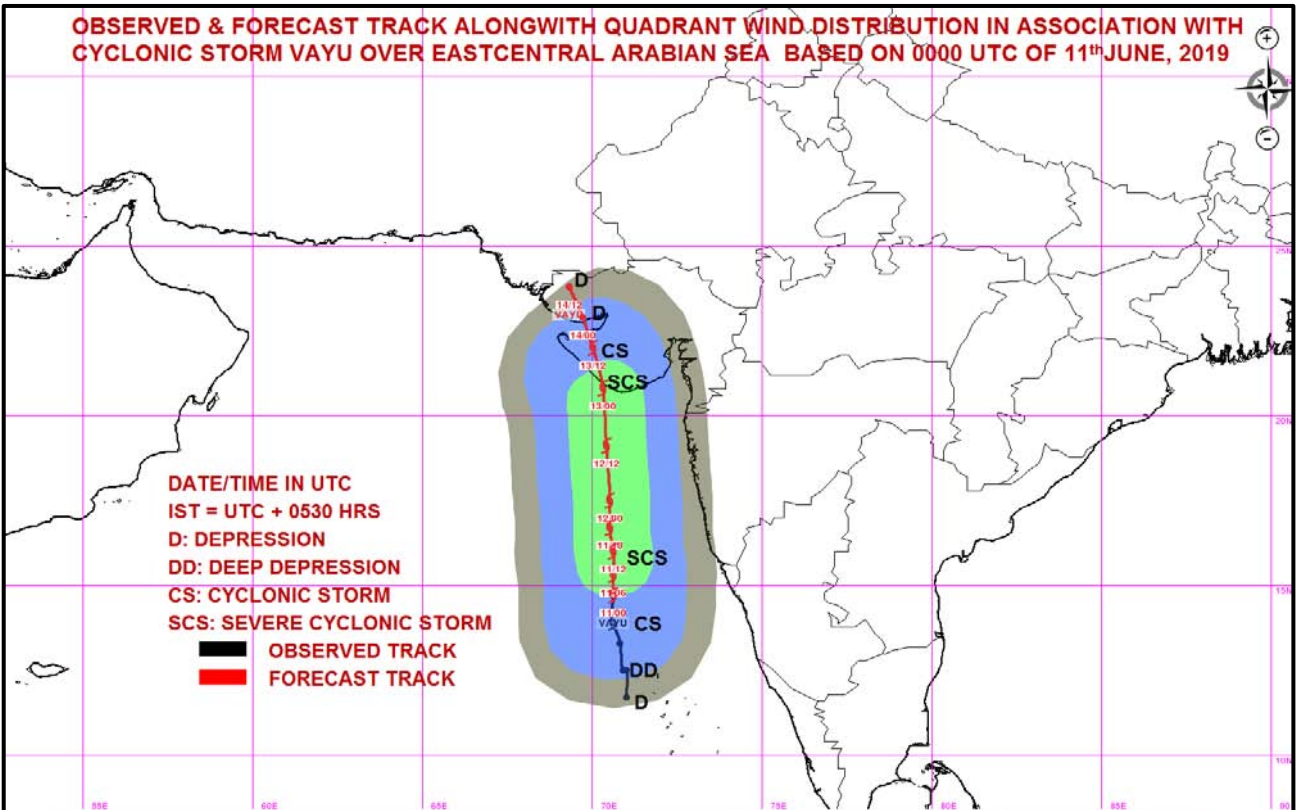


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 0000 UTC OF 11th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 0000 UTC OF 11th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations

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. 1

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. 1 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0700 UTC OF 11.06.2019 BASED ON 0300 UTC OF 11.06.2019.

SUB: CYCLONIC STORM 'VAYU' OVER EASTCENTRAL ARABIAN SEA

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL ARABIAN SEA MOVED NORTHWARDS WITH A SPEED OF ABOUT 15 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0300 UTC OF TODAY, THE 11TH JUNE, 2019 NEAR LATITUDE 15.0°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 350 KM WEST-SOUTHWEST OF GOA (43192), 510 KM SOUTH-SOUTHWEST OF MUMBAI (43003)(MAHARASHTRA) AND 650 KM NEARLY SOUTH OF VERAVAL (42909)(GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 12 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR (42830) AND MAHUVA (42837) AROUND VERAVAL (42909) & DIU REGION (42914) AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING 0000-0200 UTC OF 13TH JUNE 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
11.06.19/0300	15.0/70.6	70-80 gusting to 90	Cyclonic Storm
11.06.19/0600	15.3/70.6	80-90 gusting to 100	Cyclonic Storm
11.06.19/1200	16.0/70.6	90-100 gusting to 115	Severe Cyclonic Storm
11.06.19/1800	16.7/70.5	95-105 gusting to 120	Severe Cyclonic Storm
12.06.19/0000	17.5/70.5	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/1200	19.1/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/0000	20.8/70.3	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/1200	22.0/70.0	70-80 gusting to 90	Cyclonic Storm
14.06.19/0000	22.9/69.7	40-50 gusting to 60	Depression
14.06.19/1200	23.8/69.3	30-40 gusting to 50	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 KNOTS GUSTING TO 50 KNOTS. THE SEA CONDITION IS HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 993 HPA.

AT 0300 UTC OF 11TH JUNE, A BOUY LOCATED AT 14.8°N/69.0°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 320°/21 KNOTS. A BOUY LOCATED AT 11.9°N/68.6°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 260°/25 KNOTS. RATNAGIRI (43110) REPORTED A MEAN SEA LEVEL PRESSURE OF 998.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/03 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS 200 X10⁻⁵SEC⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 40 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

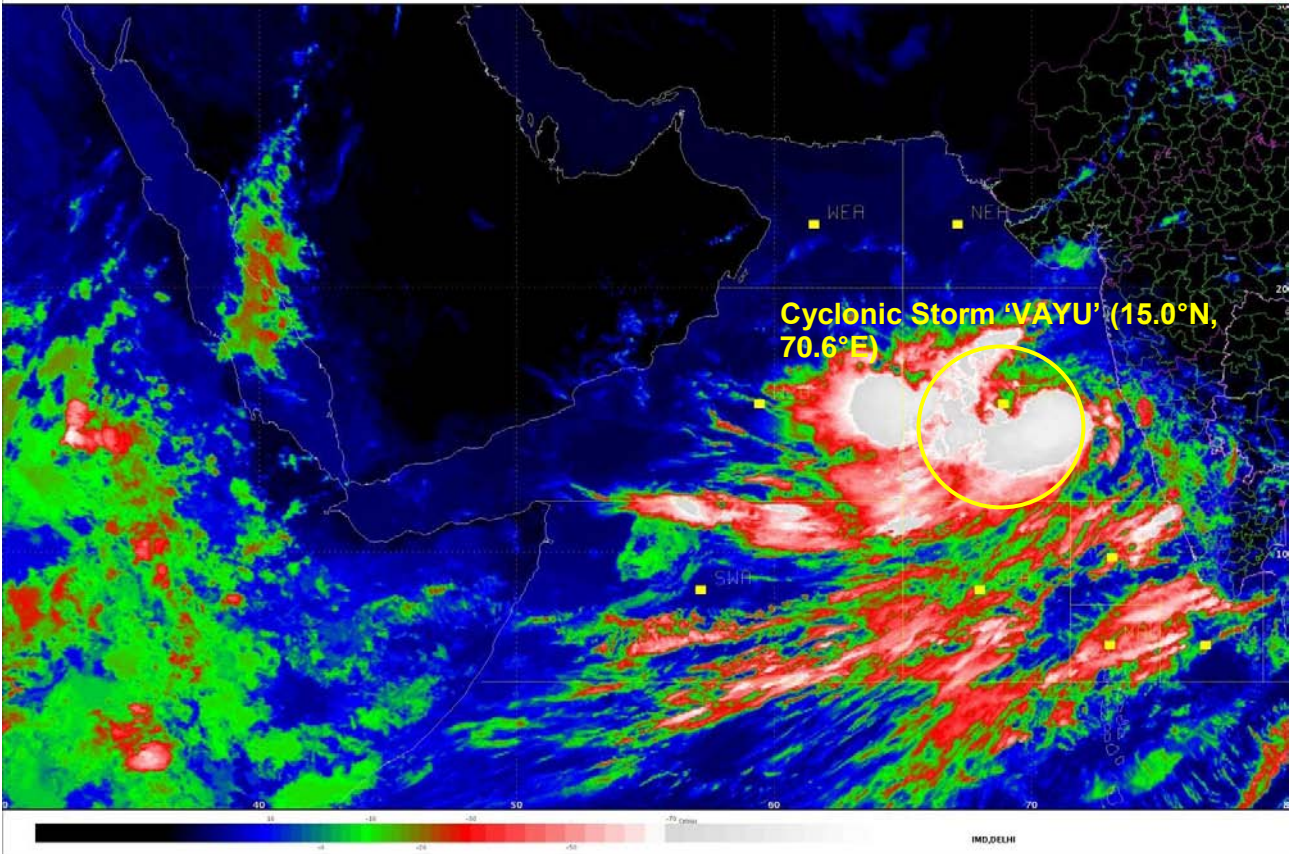
AS THE CYCLONIC STORM IS LYING IN FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

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

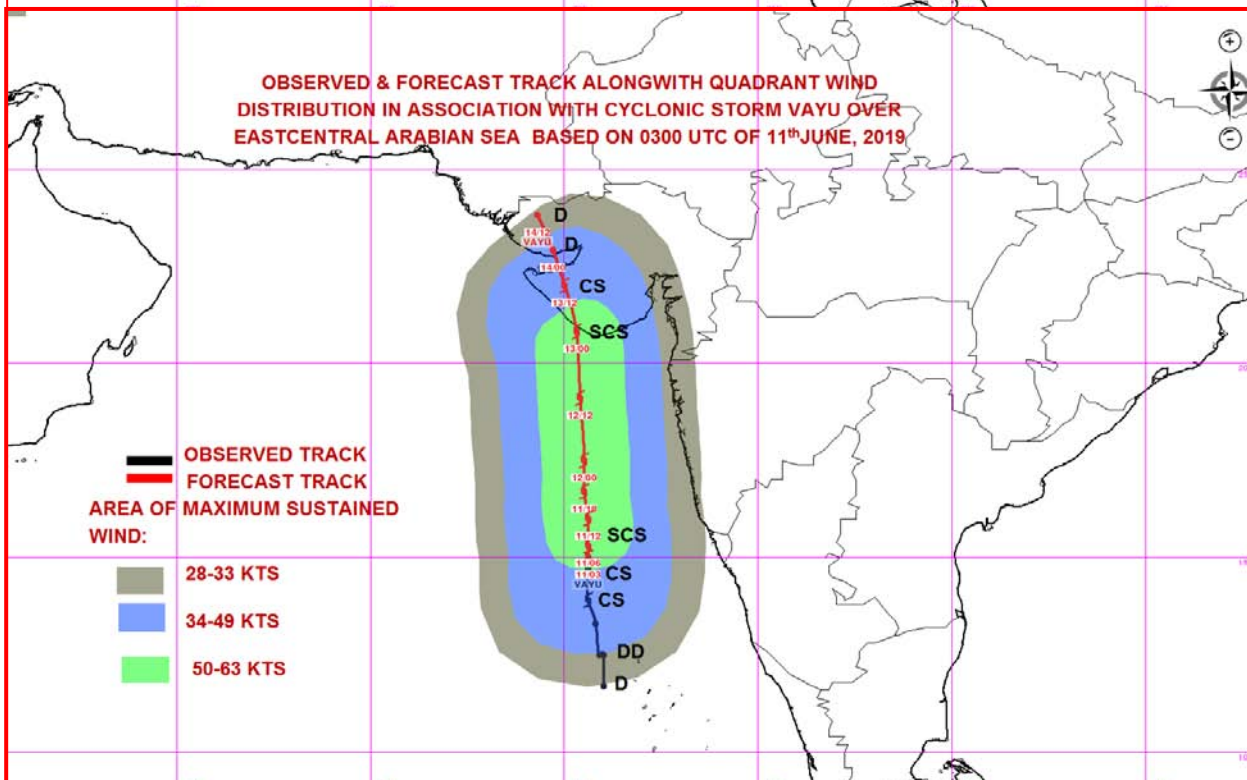
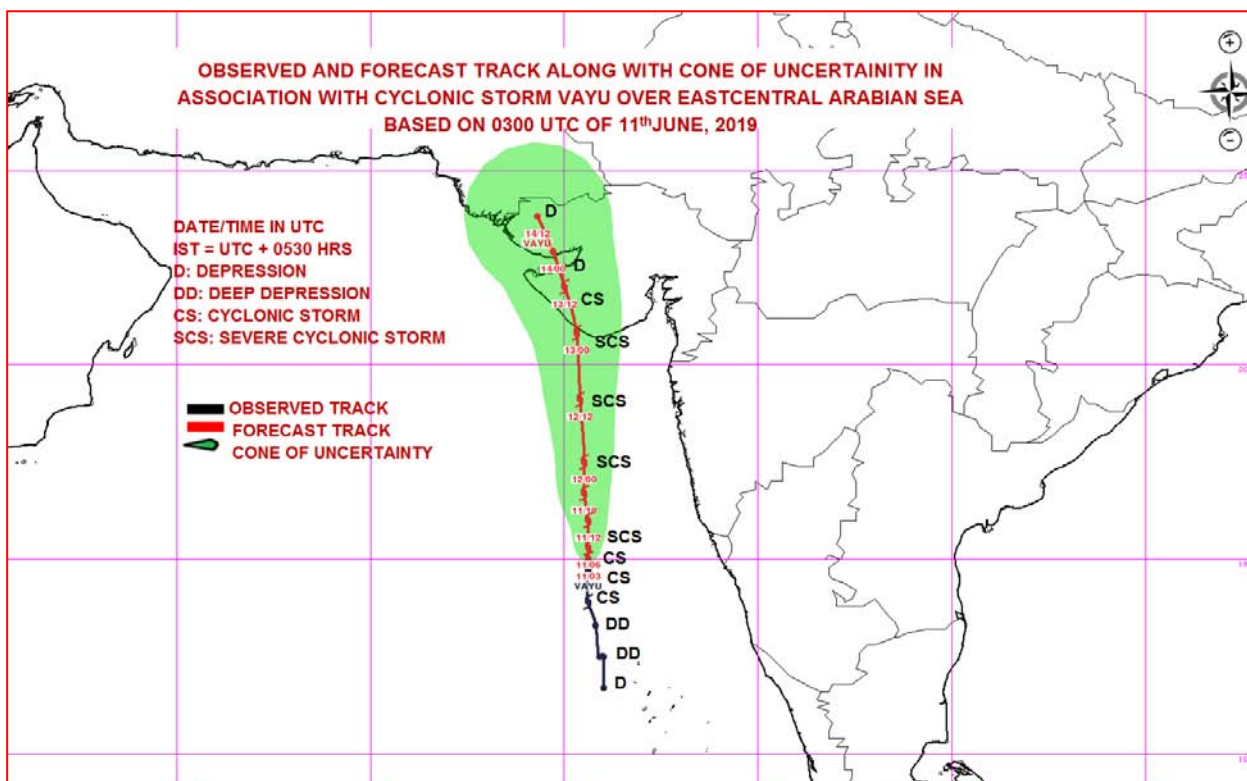
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations

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. 2

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. 2 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0930 UTC OF 11.06.2019 BASED ON 0600 UTC OF 11.06.2019.

SUB: CYCLONIC STORM 'VAYU' OVER EASTCENTRAL ARABIAN SEA

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTHWARDS WITH A SPEED OF ABOUT 09 KMPH IN LAST SIX HOURS, SLIGHTLY INTENSIFIED FURTHER AND LAY CENTRED AT 0600 UTC OF TODAY, THE 11TH JUNE, 2019 NEAR LATITUDE 15.2°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 340 KM WEST-SOUTHWEST OF GOA (43192), 490 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 630 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 12 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR (42830) AND MAHUVA AROUND VERAVAL (42909) & DIU REGION (42914) AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING 0000-0300 UTC OF 13TH JUNE 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
11.06.19/0600	15.2/70.6	80-90 GUSTING TO 100	CYCLONIC STORM
11.06.19/1200	16.1/70.6	90-100 GUSTING TO 115	SEVERE CYCLONIC STORM
11.06.19/1800	16.7/70.6	95-105 GUSTING TO 120	SEVERE CYCLONIC STORM
12.06.19/0000	17.5/70.5	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
12.06.19/0600	18.4/70.5	105-115 GUSTING TO 130	SEVERE CYCLONIC STORM
12.06.19/1800	19.9/70.4	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
13.06.19/0600	21.3/70.2	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
13.06.19/1800	22.0/69.9	80-90 GUSTING TO 100	CYCLONIC STORM
14.06.19/0600	22.5/69.7	50-60 GUSTING TO 70	DEEP DEPRESSION
14.06.19/1800	23.1/69.3	30-40 GUSTING TO 50	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 0600 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 45 KNOTS GUSTING TO 55 KNOTS. THE SEA CONDITION IS HIGH TO VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 990 HPA.

AT 0600 UTC OF 11TH JUNE, A BOUY LOCATED AT 12.0°N/68.6°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1004.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 260°/27 KNOTS. A SHIP LOCATED AT 12.6°N/73.9°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1005.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 210°/26 KNOTS. RATNAGIRI (43110) REPORTED A MEAN SEA LEVEL PRESSURE OF 998.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 090°/06 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS $200 \times 10^{-5} \text{SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{S}^{-1}$ AROUND THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $40 \times 10^{-5} \text{S}^{-1}$ AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

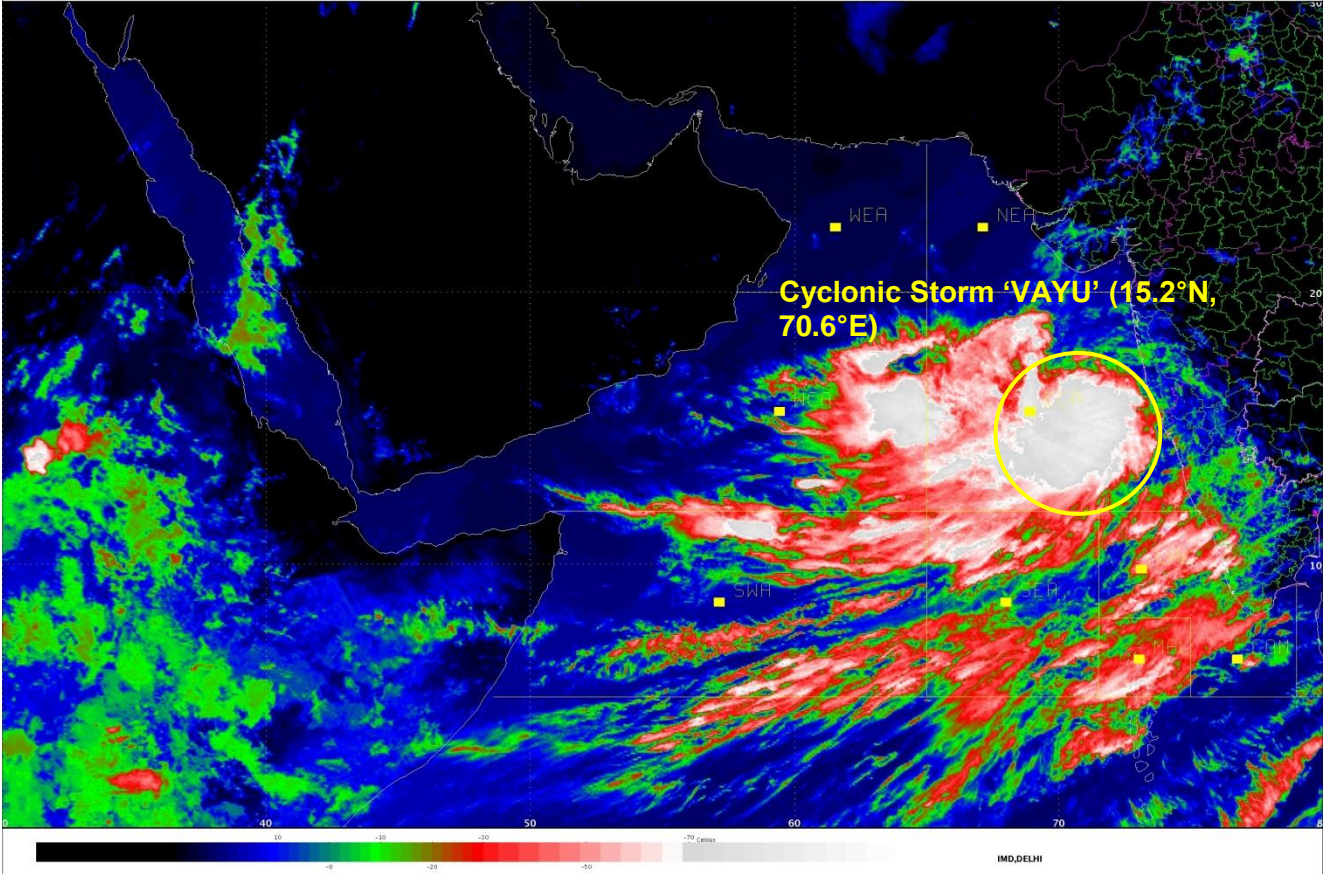
AS THE CYCLONIC STORM IS LYING IN FAVOURABLE ENVIRONMENTAL CONDITIONS, IT HAS INTENSIFIED SLIGHTLY AND IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 24 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

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

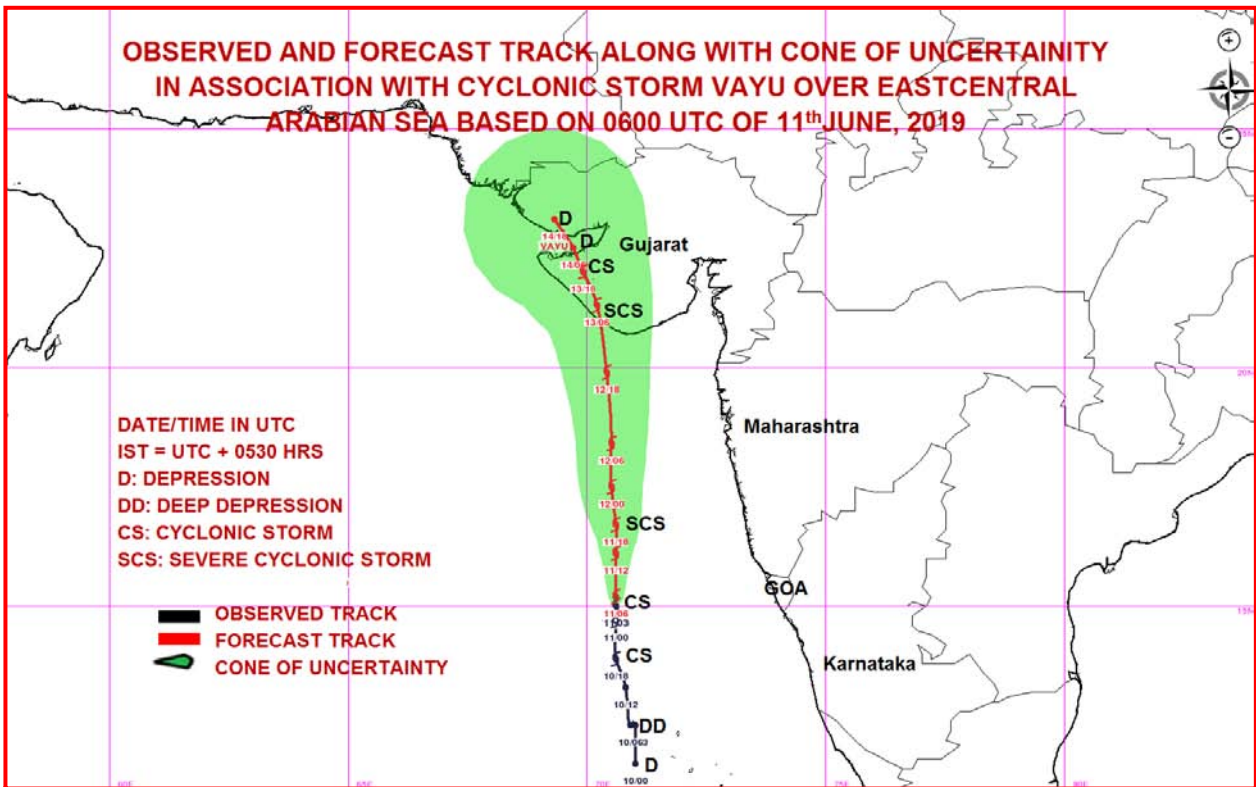
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

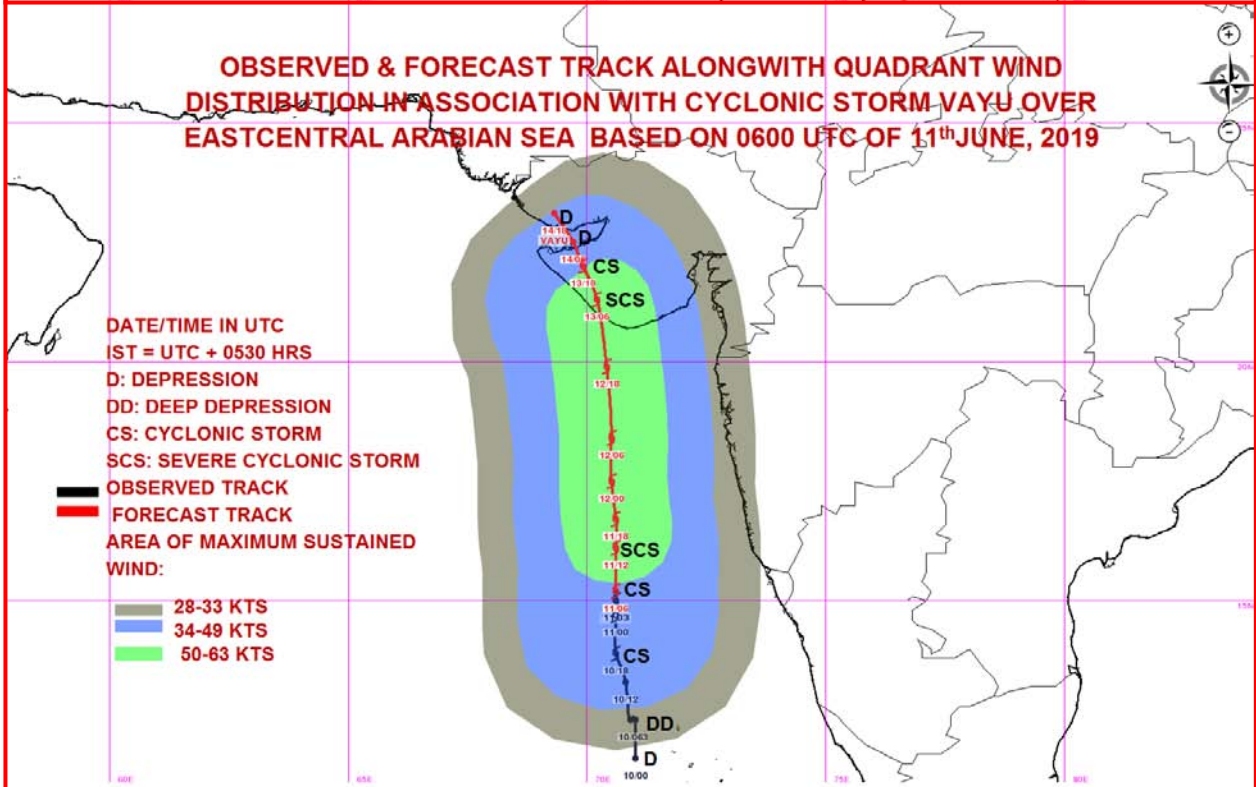


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

**OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY
IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL
ARABIAN SEA BASED ON 0600 UTC OF 11th JUNE, 2019**



**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND
DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER
EASTCENTRAL ARABIAN SEA BASED ON 0600 UTC OF 11th JUNE, 2019**



MSW(knot/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations

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. 3

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. 3 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1200 UTC OF 11.06.2019 BASED ON 0900 UTC OF 11.06.2019.

SUB: CYCLONIC STORM 'VAYU' OVER EASTCENTRAL ARABIAN SEA

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTHWARDS WITH A SPEED OF ABOUT 13 KMPH IN LAST SIX HOURS, SLIGHTLY INTENSIFIED FURTHER AND LAY CENTRED AT 0900 UTC OF TODAY, THE 11TH JUNE, 2019 NEAR LATITUDE 15.7°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 340 KM WEST-NORTHWEST OF GOA (43192), 440 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 570 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 06 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR (42830) AND MAHUVA (42837) AROUND VERAVAL (42909) & DIU REGION (42914) AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING 0000-0300 UTC OF 13TH JUNE 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
11.06.19/0900	15.7/70.6	85-95 gusting to 105	Cyclonic Storm
11.06.19/1200	16.1/70.6	90-100 gusting to 115	Severe Cyclonic Storm
11.06.19/1800	16.7/70.6	95-105 gusting to 120	Severe Cyclonic Storm
12.06.19/0000	17.5/70.5	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/0600	18.4/70.5	105-115 gusting to 130	Severe Cyclonic Storm
12.06.19/1800	19.9/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/0600	21.3/70.2	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/1800	22.0/69.9	80-90 gusting to 100	Cyclonic Storm
14.06.19/0600	22.5/69.7	50-60 gusting to 70	Deep Depression
14.06.19/1800	23.1/69.3	30-40 gusting to 50	Depression

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 0900 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 45 KNOTS GUSTING TO 55 KNOTS. THE SEA CONDITION IS HIGH TO VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 989 HPA.

AT 0900 UTC OF 11TH JUNE, A BOUY LOCATED AT 12.0°N/68.6°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/25 KNOTS. ANOTHER BOUY LOCATED AT 14.9°N/68.9°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.5 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 310°/29 KNOTS. RATNAGIRI (43110) REPORTED A MEAN SEA LEVEL PRESSURE OF 998.7 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY INCREASED AND IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 30 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

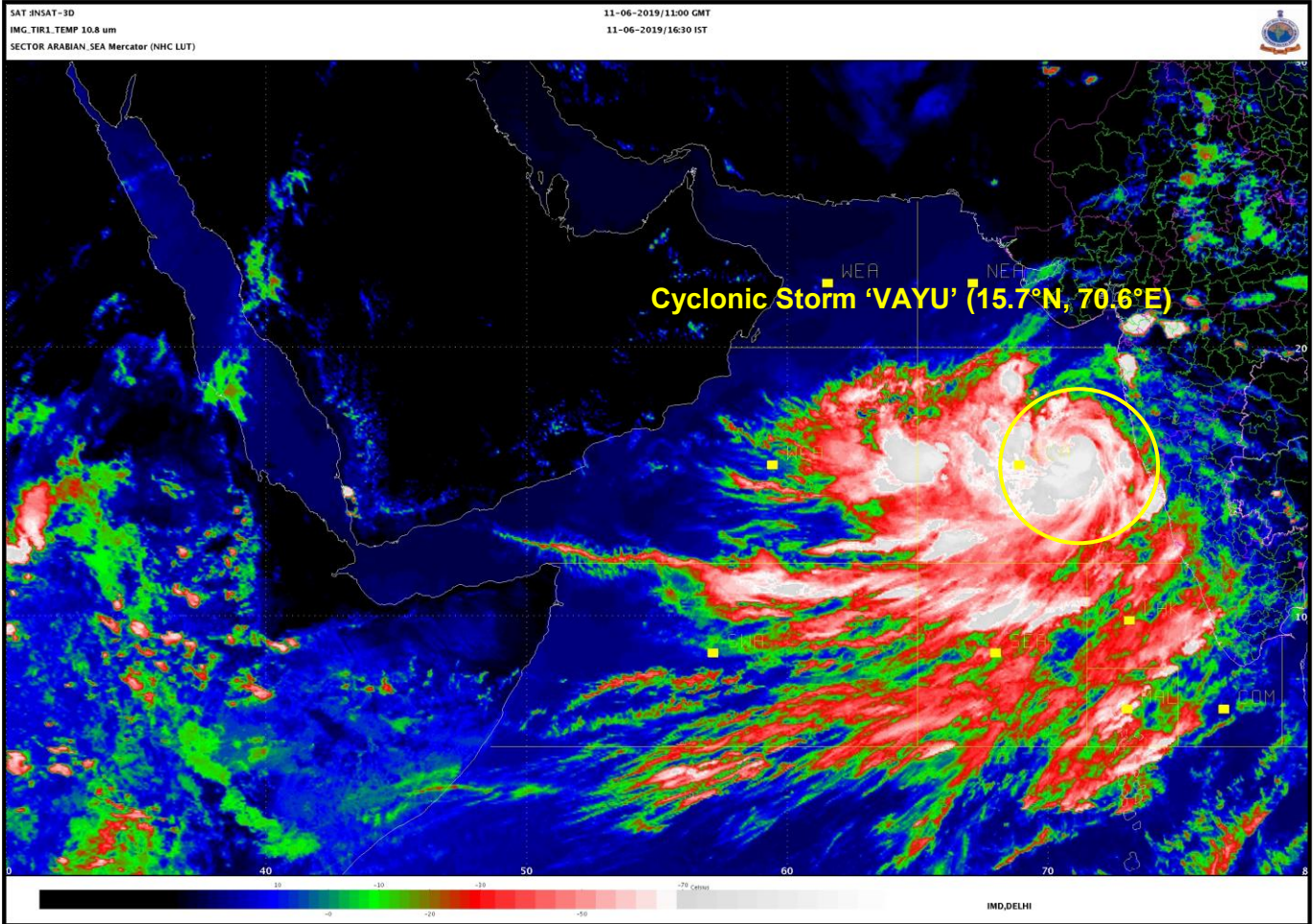
AS THE CYCLONIC STORM IS LYING IN FAVOURABLE ENVIRONMENTAL CONDITIONS, IT HAS INTENSIFIED SLIGHTLY AND IS VERY LIKELY TO INTENSIFY FURTHER INTO A SEVERE CYCLONIC STORM DURING NEXT 06 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

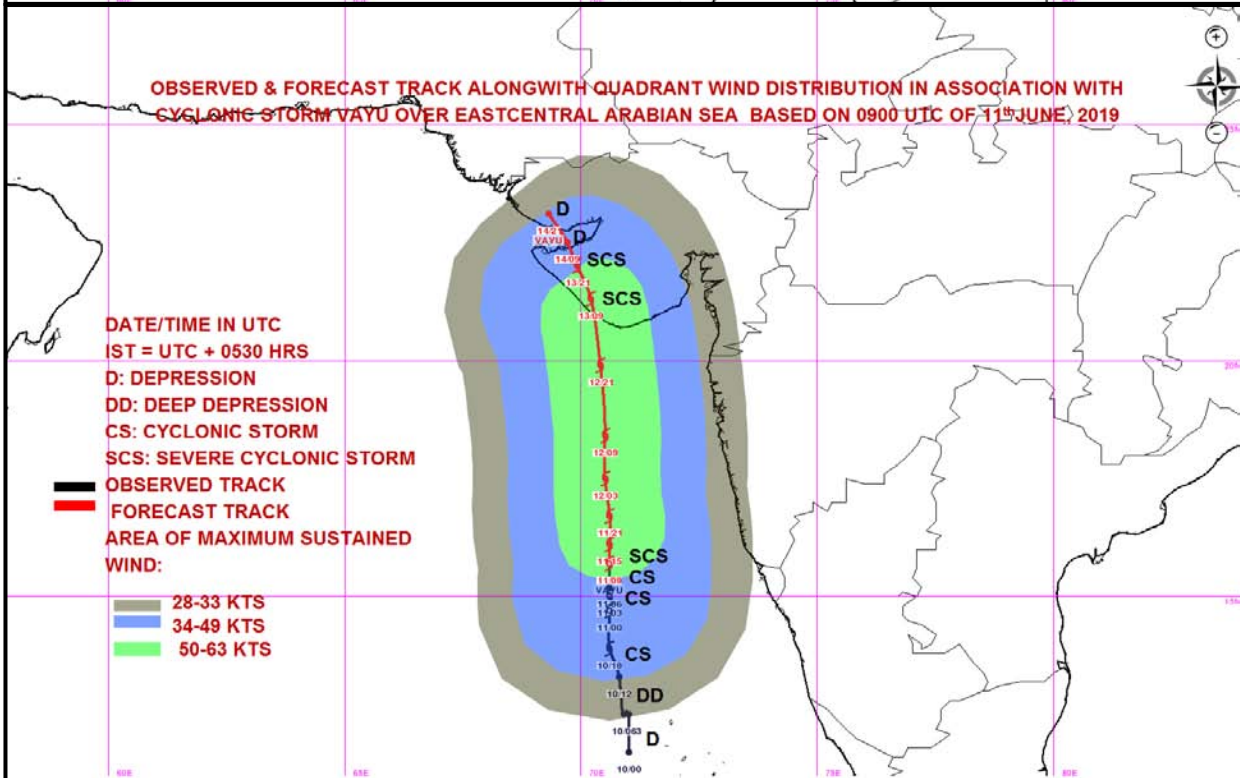
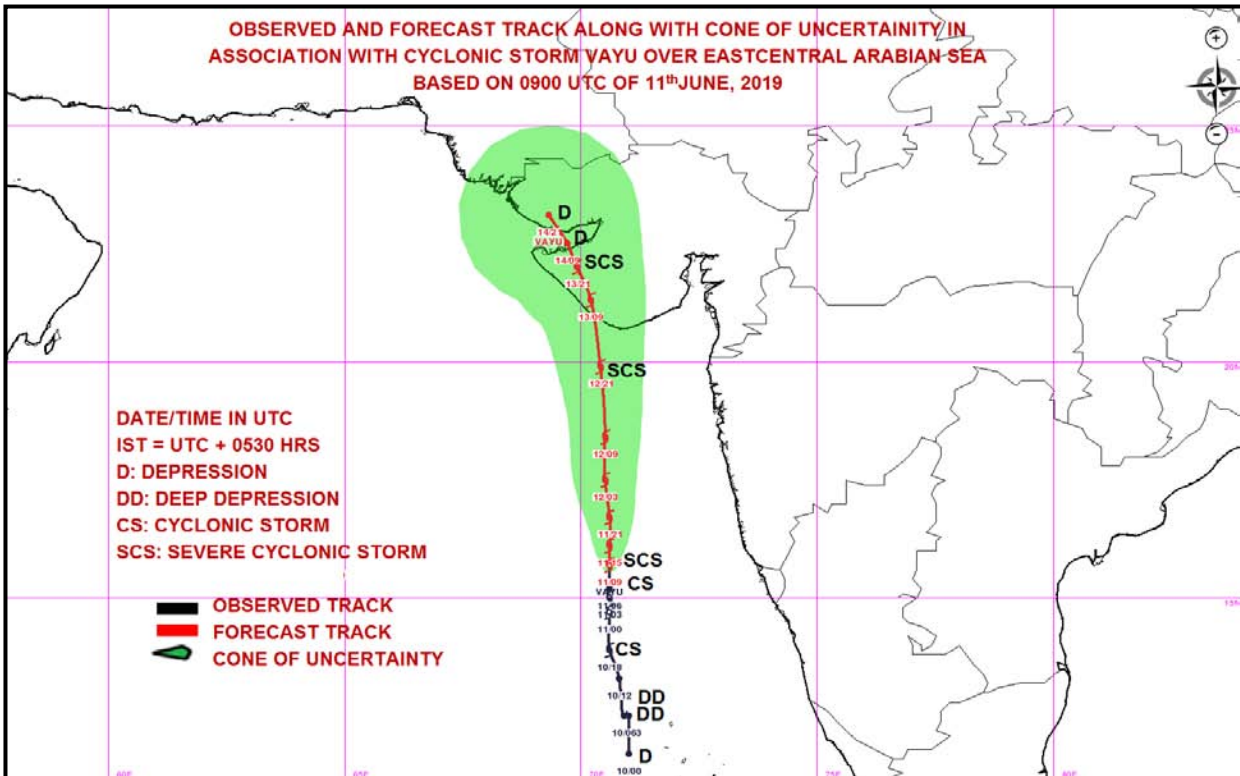
(NEETHA K GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



MSW(knot/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations

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. 4

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. 4 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1430 UTC OF 11.06.2019 BASED ON 1200 UTC OF 11.06.2019.

SUB: SEVERE CYCLONIC STORM 'VAYU' OVER EASTCENTRAL ARABIAN SEA

THE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTHWARDS WITH A SPEED OF ABOUT 17 KMPH IN LAST SIX HOURS, INTENSIFIED INTO SEVERE CYCLONIC STORM AND LAY CENTRED AT 1200 UTC OF TODAY, THE 11TH JUNE, 2019 NEAR LATITUDE 16.1°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 350 KM WEST-NORTHWEST OF GOA (43192), 410 KM SOUTH-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 530 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR (42830) AND MAHUVA (42837) AROUND VERAVAL (42909) & DIU REGION (42914) AS A SEVERE CYCLONIC STORM WITH WIND SPEED 110-120 KMPH GUSTING TO 135 KMPH DURING 0000-0300 UTC OF 13TH JUNE 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
11.06.19/1200	16.1/70.6	90-100 gusting to 115	Severe Cyclonic Storm
11.06.19/1800	16.7/70.6	95-105 gusting to 120	Severe Cyclonic Storm
12.06.19/0000	17.5/70.5	100-110 gusting to 125	Severe Cyclonic Storm
12.06.19/0600	18.4/70.5	105-115 gusting to 130	Severe Cyclonic Storm
12.06.19/1200	19.3/70.4	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/0000	20.7/70.3	110-120 gusting to 135	Severe Cyclonic Storm
13.06.19/1200	21.7/70.1	80-90 gusting to 110	Cyclonic Storm
14.06.19/0000	22.2/69.8	55-65 gusting to 75	Deep Depression
14.06.19/1200	22.8/69.5	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 985 HPA.

AT 1200 UTC OF 11TH JUNE, A BOUY LOCATED AT 12.0°N/68.6°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/25 KNOTS. ANOTHER BOUY LOCATED AT 14.9°N/68.9°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.5 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 310°/29 KNOTS. RATNAGIRI (43110) REPORTED A MEAN SEA LEVEL PRESSURE OF 998.7 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE DECREASED AND IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

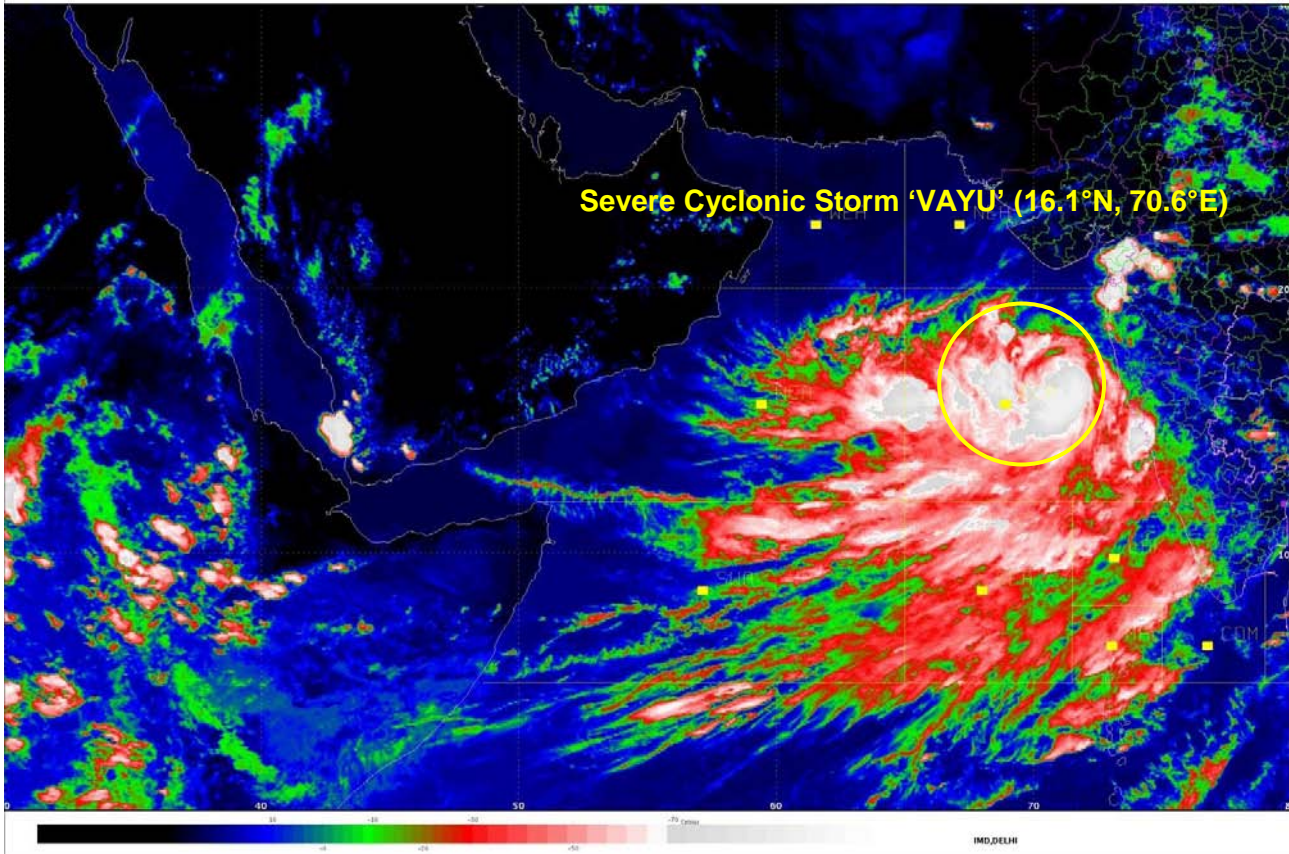
AS THE CYCLONIC STORM IS LYING IN A FAVOURABLE ENVIRONMENTAL CONDITIONS, IT HAS INTENSIFIED INTO A SEVERE CYCLONIC STORM AND IS VERY LIKELY TO INTENSIFY FURTHER DURING NEXT 36 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

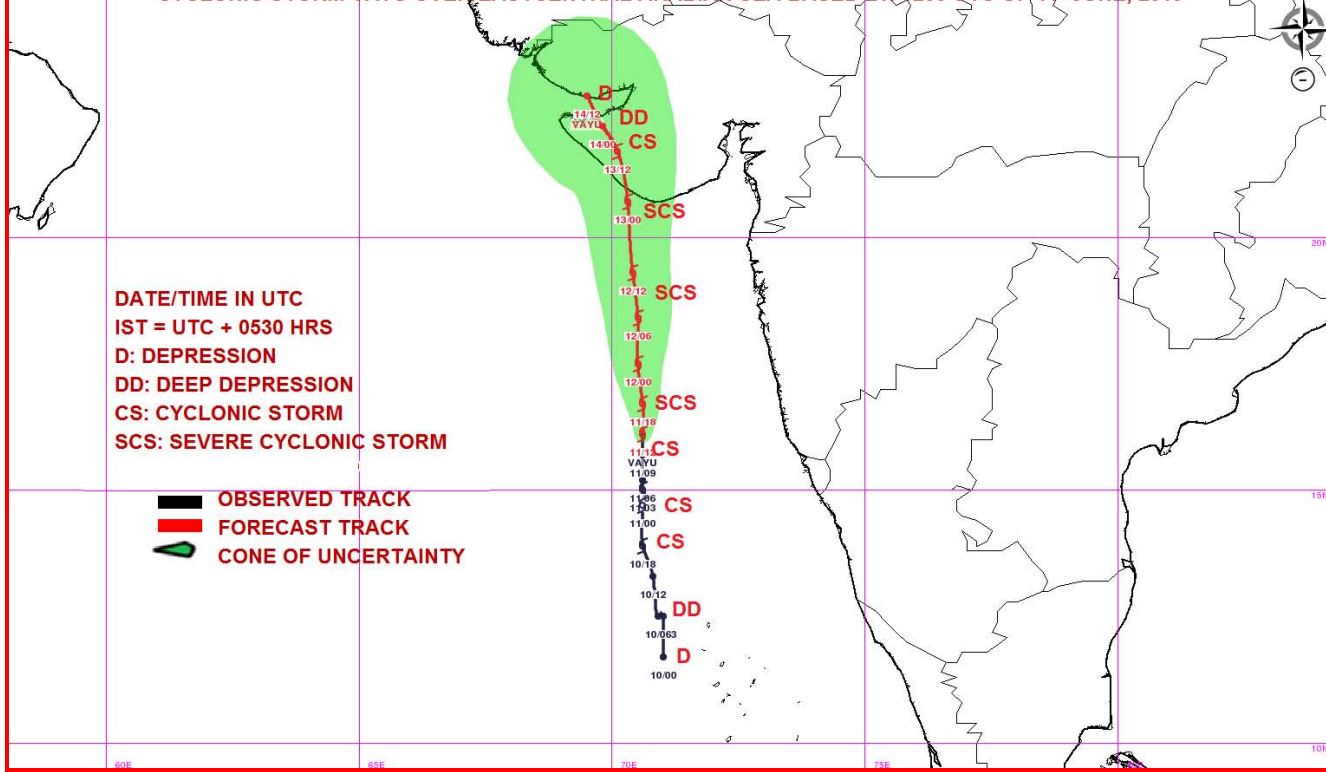
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

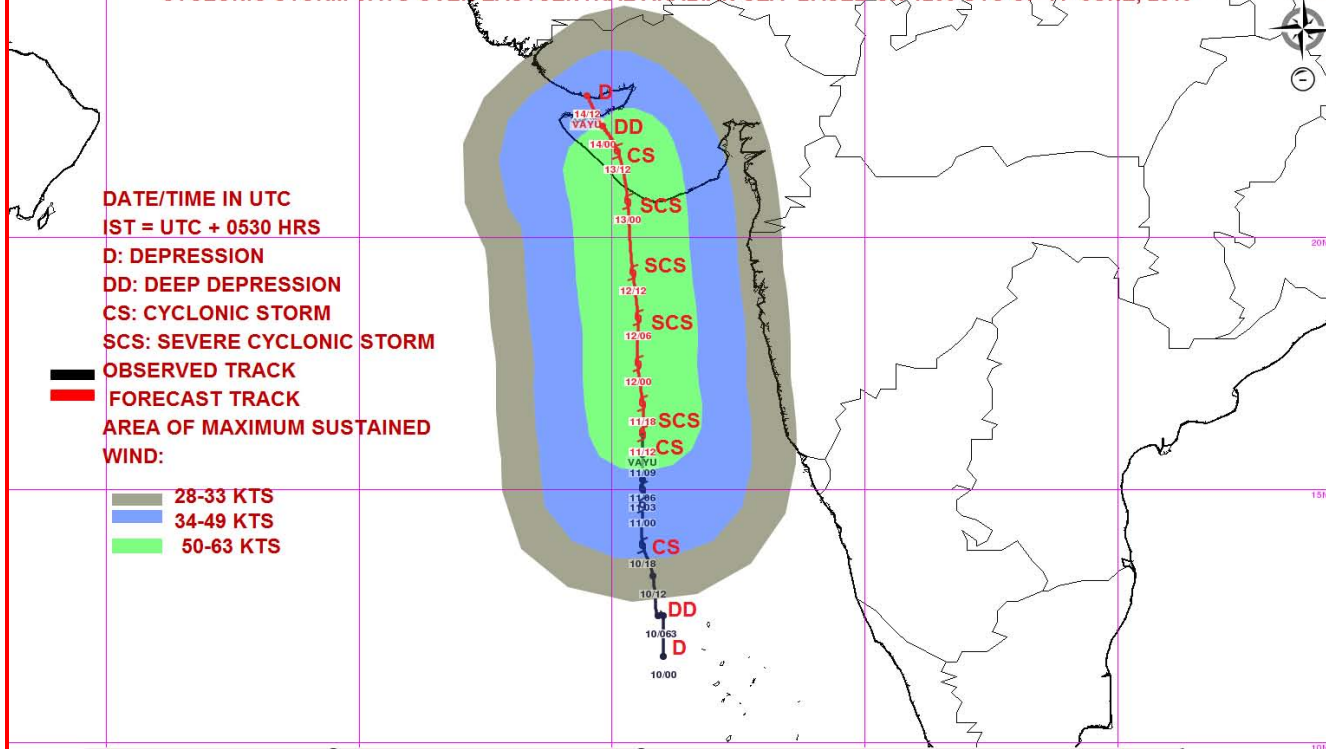
OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 11th JUNE, 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM

— OBSERVED TRACK
 — FORECAST TRACK
 CONE OF UNCERTAINTY

OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 11th JUNE, 2019



DATE/TIME IN UTC
 IST = UTC + 0530 HRS
 D: DEPRESSION
 DD: DEEP DEPRESSION
 CS: CYCLONIC STORM
 SCS: SEVERE CYCLONIC STORM

— OBSERVED TRACK
 — FORECAST TRACK
 AREA OF MAXIMUM SUSTAINED WIND:
 ■ 28-33 KTS
 ■ 34-49 KTS
 ■ 50-63 KTS

MSW(knot)/kmph)	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations

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. 5

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. 5 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1730 UTC OF 11.06.2019 BASED ON 1500 UTC OF 11.06.2019.

SUB: SEVERE CYCLONIC STORM 'VAYU' OVER EASTCENTRAL ARABIAN SEA

THE SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTHWARDS WITH A SPEED OF ABOUT 18 KMPH IN LAST SIX HOURS AND LAY CENTRED 1500 UTC OF 11TH JUNE, 2019 NEAR LATITUDE 16.7°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 400 KM WEST-NORTHWEST OF GOA, 350 KM SOUTH-SOUTHWEST OF MUMBAI (MAHARASHTRA) AND 470 KM NEARLY SOUTH OF VERAVAL (GUJARAT). IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A VERY SEVERE CYCLONIC STORM DURING NEXT 06 HOURS.

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR AND MAHUVA AROUND VERAVAL & DIU REGION AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 140-150 KMPH GUSTING TO 165 KMPH DURING EARLY MORNING OF 13TH JUNE 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
11.06.19/1500	16.7/70.6	100-110 gusting to 125	SEVERE CYCLONIC STORM
11.06.19/1800	17.2/70.6	120-130 gusting to 145	VERY SEVERE CYCLONIC STORM
12.06.19/0000	17.7/70.5	130-140 gusting to 155	VERY SEVERE CYCLONIC STORM
12.06.19/0600	18.4/70.5	135-145 gusting to 160	VERY SEVERE CYCLONIC STORM
12.06.19/1200	19.3/70.4	140-150 gusting to 165	VERY SEVERE CYCLONIC STORM
13.06.19/0000	20.7/70.3	140-150 gusting to 165	VERY SEVERE CYCLONIC STORM
13.06.19/1200	21.7/70.1	110-120 gusting to 135	SEVERE CYCLONIC STORM
14.06.19/0000	22.2/69.8	70-80 gusting to 90	CYCLONIC STORM
14.06.19/1200	22.8/69.5	45-55 gusting to 65	DEPRESSION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 1500 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 983 HPA.

AT 1500 UTC OF 11TH JUNE, A BOUY LOCATED AT 14.9°N/69.0°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 280°/30 KNOTS. ANOTHER BOUY LOCATED AT 18.5°N/67.5°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1004.0 HPA. RATNAGIRI (43110) REPORTED A MEAN SEA LEVEL PRESSURE OF 996.0 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE DECREASED AND IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

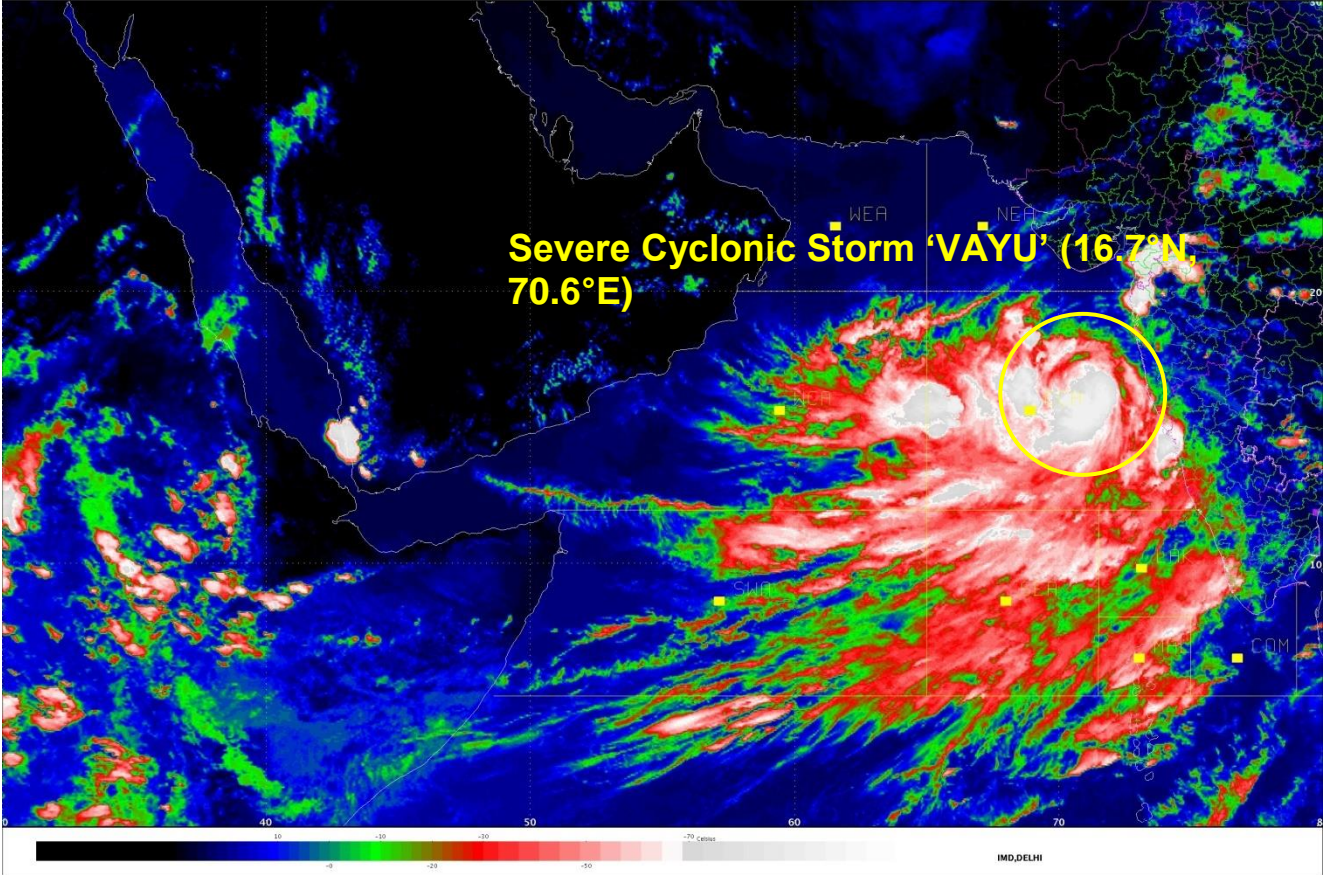
AS THE SEVERE CYCLONIC STORM IS LYING IN A FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS VERY LIKELY TO INTENSIFY FURTHER INTO A VERY SEVERE CYCLONIC STORM DURING NEXT 06 HOURS.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

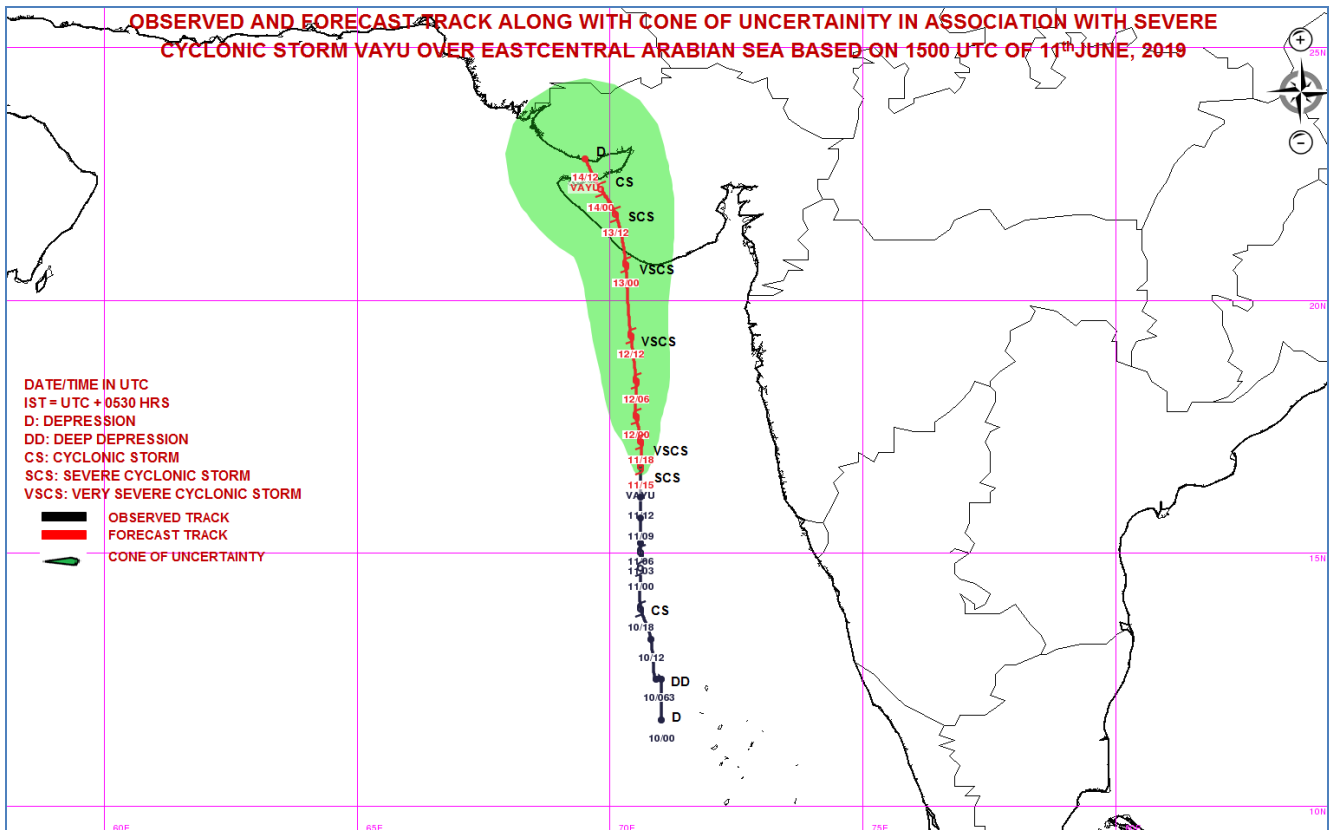
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

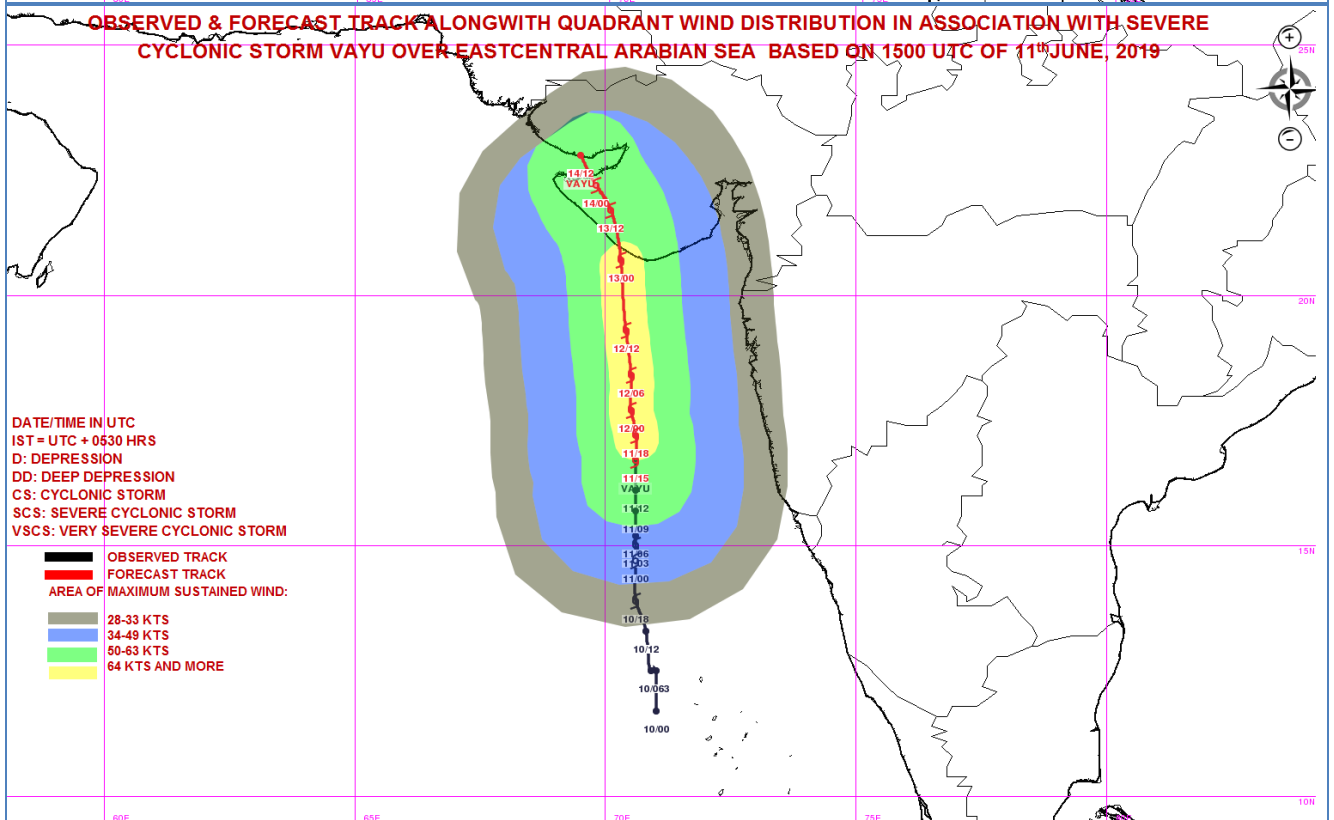
OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1500 UTC OF 11th JUNE, 2019



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 SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1500 UTC OF 11th JUNE, 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:

- 28-33 KTS
- 34-49 KTS
- 50-63 KTS
- 64 KTS AND MORE

MSW(knot)/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations
64-89 / (118-166)	Very High seas	Total suspension of fishing operations

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. 6

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. 6 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 2200 UTC OF 11.06.2019 BASED ON 1800 UTC OF 11.06.2019.

SUB: SEVERE CYCLONIC STORM 'VAYU' OVER EAST-CENTRAL ARABIAN SEA INTENSIFIED INTO VERY SEVERE CYCLONIC STORM:

THE SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTHWARDS WITH A SPEED OF ABOUT 18 KMPH IN LAST SIX HOURS, INTENSIFIED INTO VERY SEVERE CYCLONIC STORM AND LAY CENTRED AT 1800 UTC OF 11TH JUNE, 2019 NEAR LATITUDE 17.1°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 420 KM WEST-NORTHWEST OF GOA, 320 KM SOUTH-SOUTHWEST OF MUMBAI (MAHARASHTRA) AND 420 KM NEARLY SOUTH OF VERAVAL (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR AND MAHUA AROUND VERAVAL & DIU REGION AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 140-150 KMPH GUSTING TO 165 KMPH AROUND MORNING OF 13TH JUNE 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
11.06.19/1800	17.1/70.6	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
12.06.19/0000	17.8/70.5	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
12.06.19/0600	18.6/70.5	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
12.06.19/1200	19.4/70.4	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
12.06.19/1800	20.1/70.4	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
13.06.19/0600	21.2/70.2	125-135 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
13.06.19/1800	22.0/69.8	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
14.06.19/0600	22.5/69.4	60-70 GUSTING TO 80	CYCLONIC STORM
14.06.19/1800	22.9/69.0	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

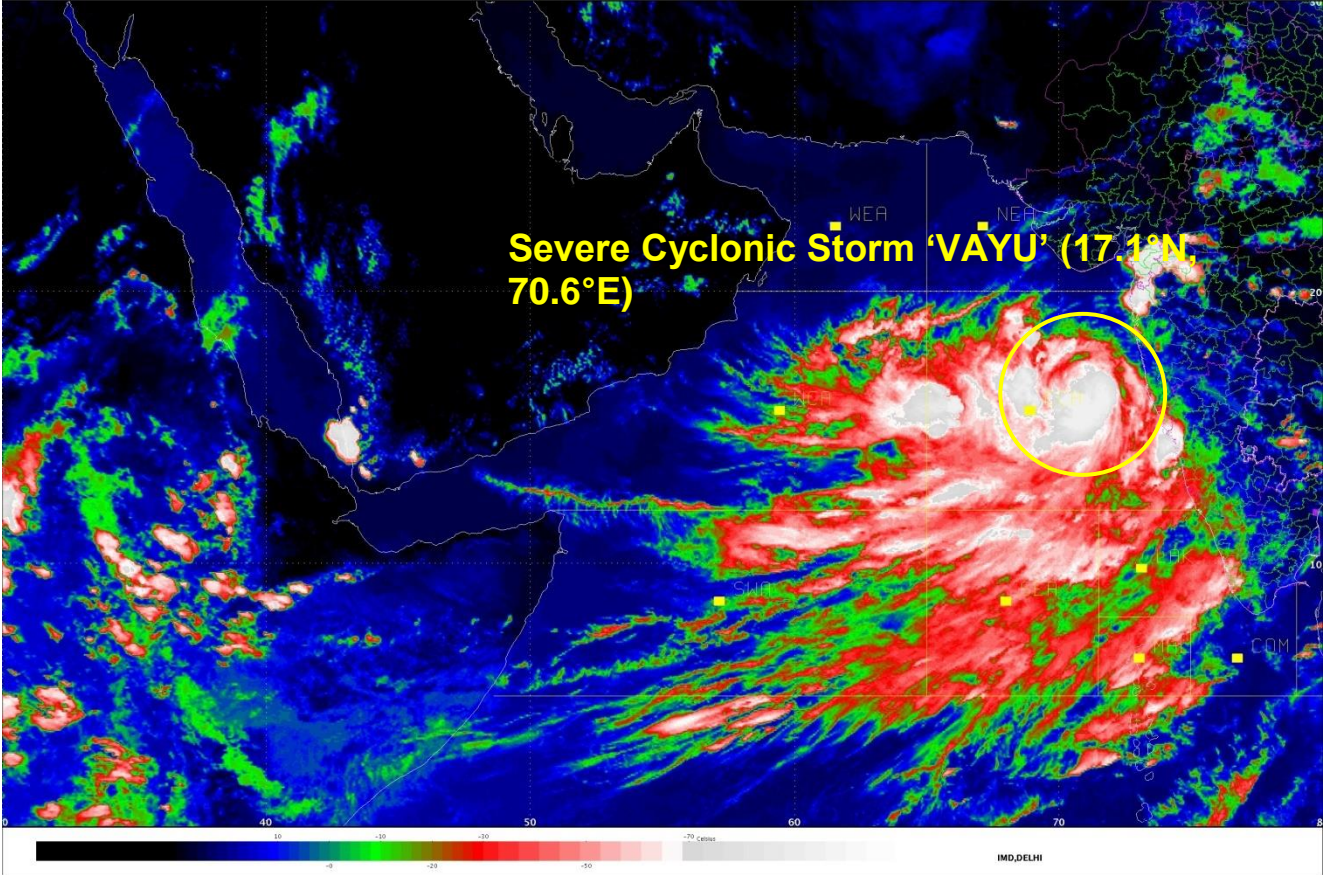
THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

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

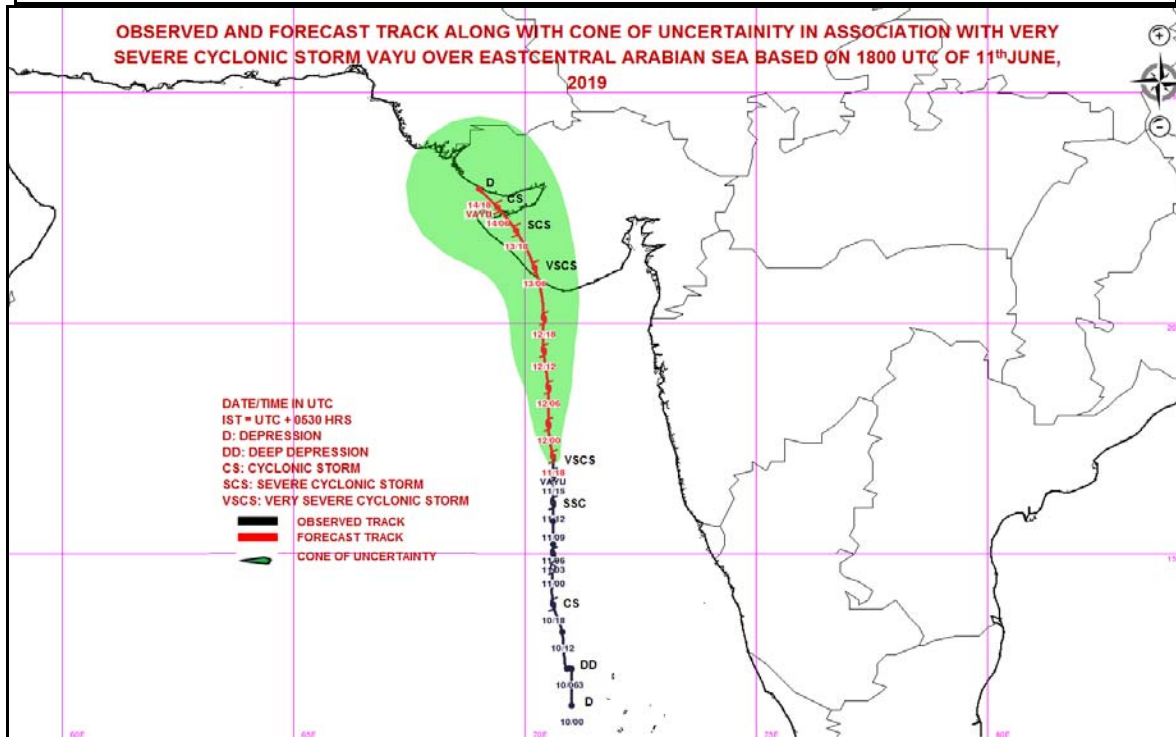
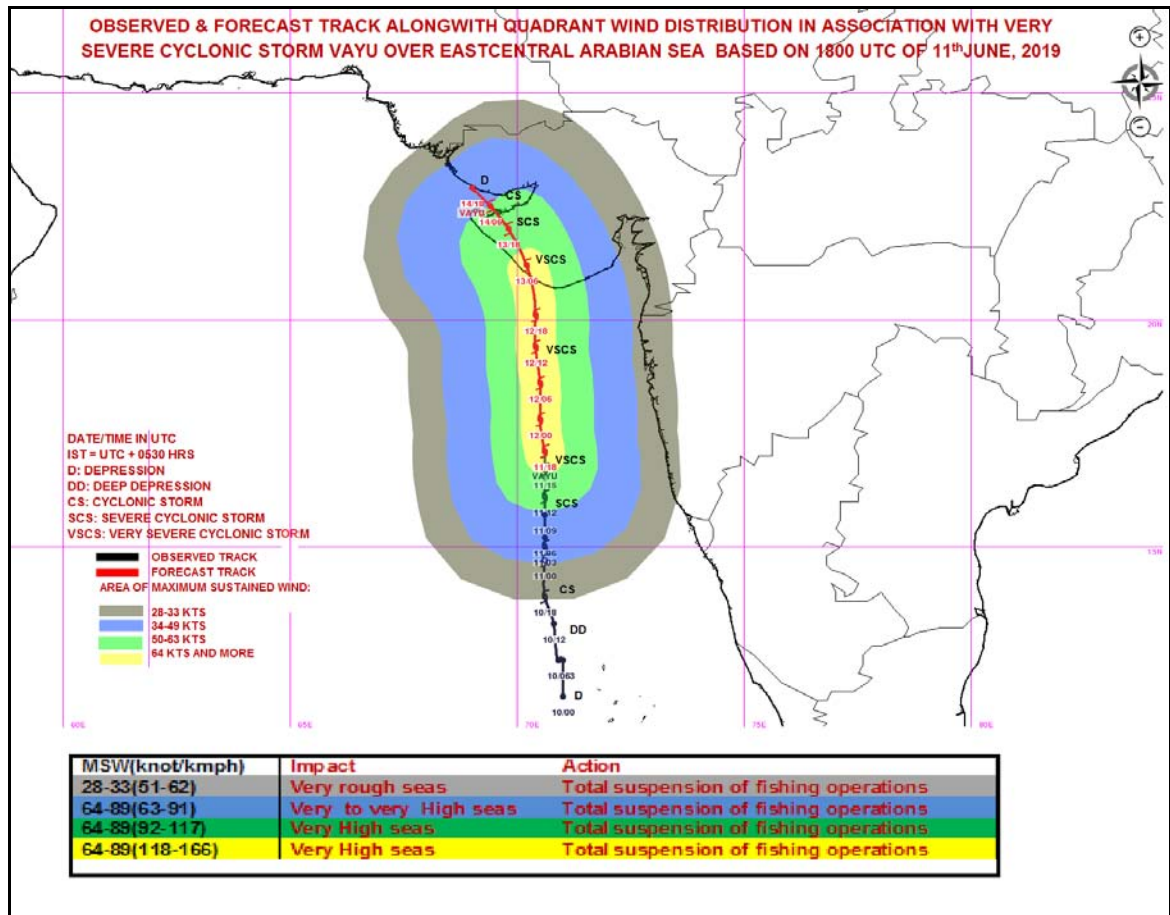
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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. 7

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. 7 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0030 UTC OF 12.06.2019 BASED ON 2100 UTC OF 11.06.2019.

SUB: VERY SEVERE CYCLONIC STORM 'VAYU' OVER EAST-CENTRAL ARABIAN:

THE VERY **SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTHWARDS WITH A SPEED OF ABOUT 11 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 2100 UTC OF 11TH JUNE, 2019 NEAR LATITUDE 17.5°N AND LONGITUDE 70.6°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 450 KM WEST-NORTHWEST OF GOA, 290 KM SOUTH-SOUTHWEST OF MUMBAI (MAHARASHTRA) AND 380 KM NEARLY SOUTH OF VERAVAL (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR AND MAHUVA AROUND VERAVAL & DIU REGION AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 140-150 KMPH GUSTING TO 165 KMPH AROUND MORNING OF 13TH JUNE 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
11.06.19/2100	17.5/70.6	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
12.06.19/0000	17.8/70.5	125-135 GUSTING TO 150	VERY SEVERE CYCLONIC STORM
12.06.19/0600	18.6/70.5	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
12.06.19/1200	19.4/70.4	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
12.06.19/1800	20.1/70.4	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
13.06.19/0600	21.2/70.2	125-135 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
13.06.19/1800	22.0/69.8	95-105 GUSTING TO 115	SEVERE CYCLONIC STORM
14.06.19/0600	22.5/69.4	60-70 GUSTING TO 80	CYCLONIC STORM
14.06.19/1800	22.9/69.0	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC ON 11TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER SOUTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

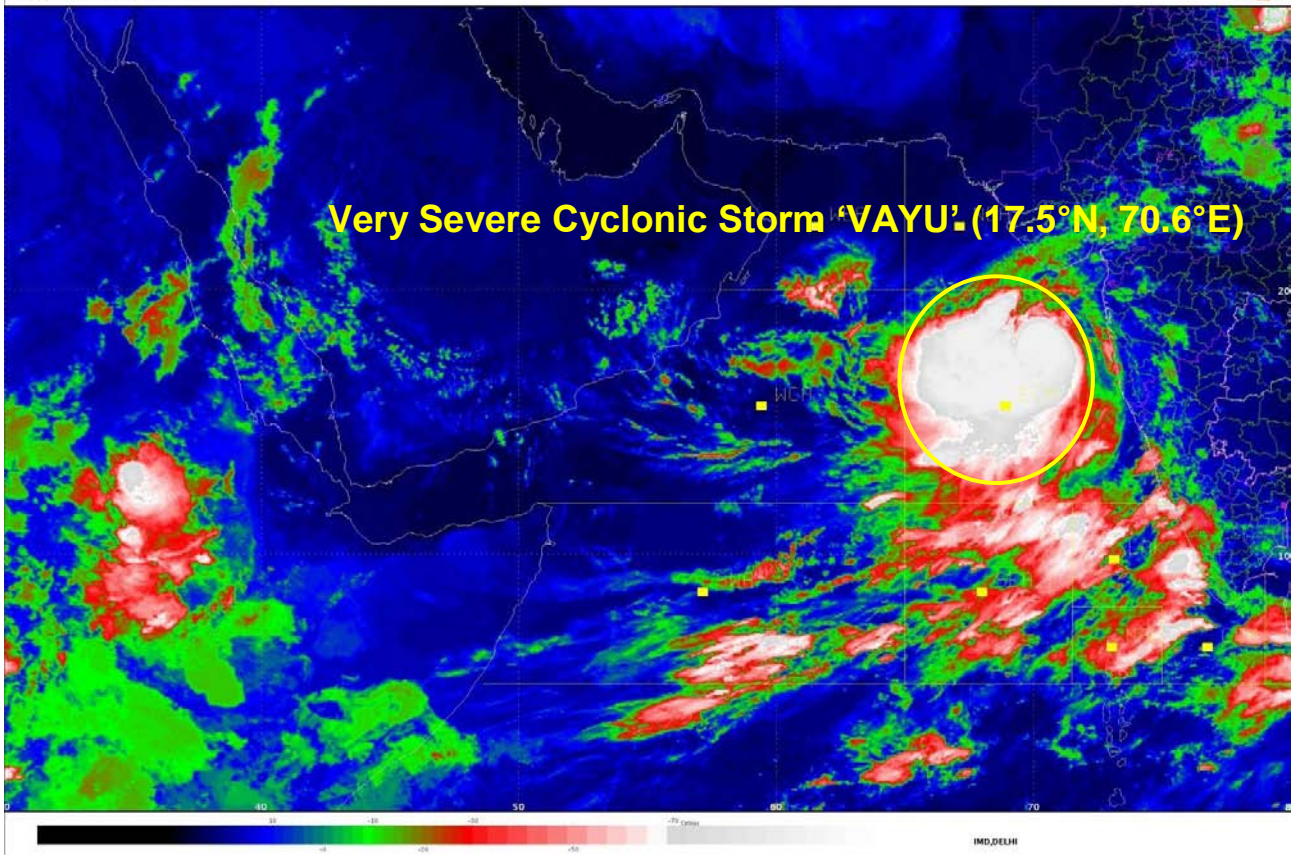
THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

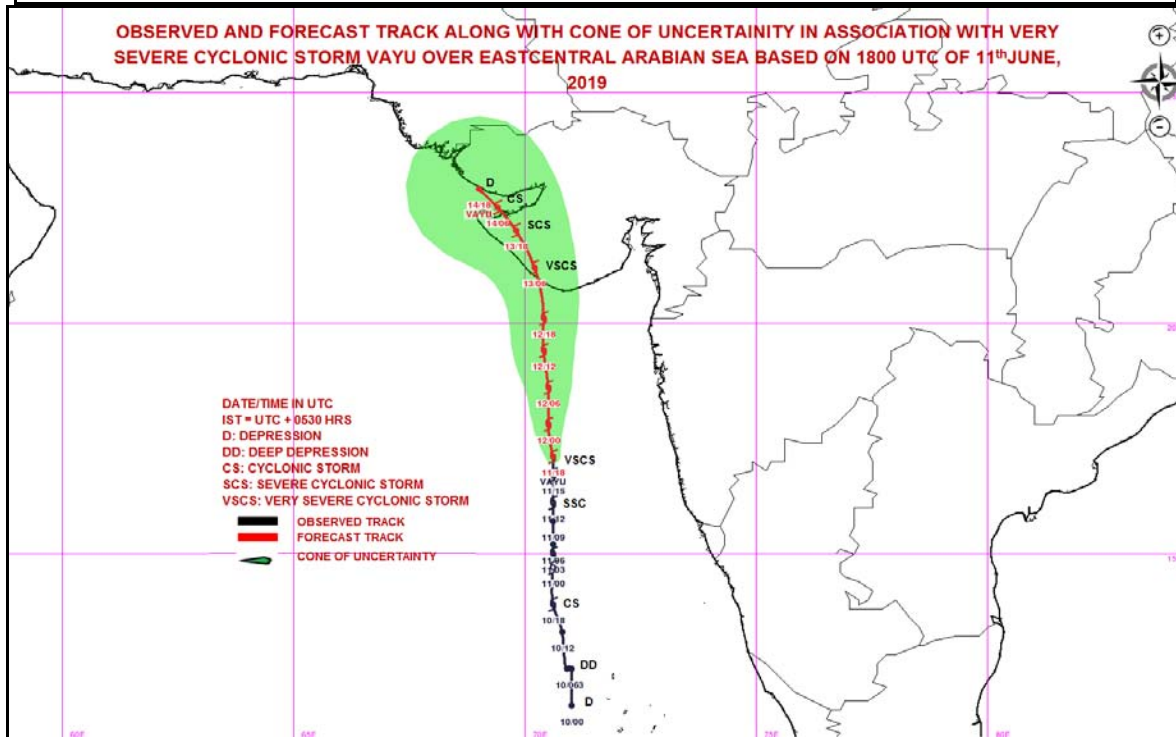
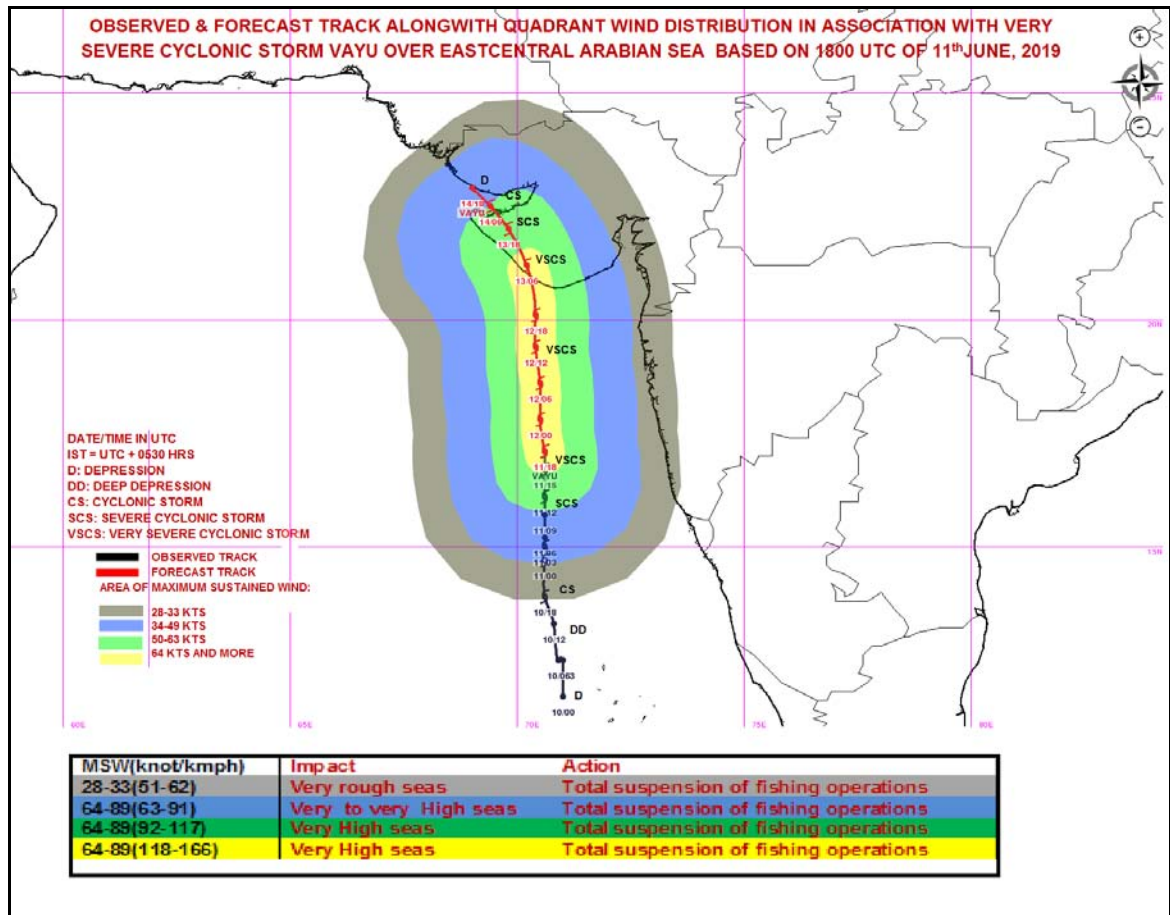
(D R PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI

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.8

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. 8 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0315 UTC OF 12.06.2019 BASED ON 0000 UTC OF 12.06.2019.

SUB: VERY SEVERE CYCLONIC STORM 'VAYU' OVER EAST-CENTRAL ARABIAN:

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED NEARLY NORTHWARDS WITH A SPEED OF ABOUT 13 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0000 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 17.8°N AND LONGITUDE 70.5°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 470 KM WEST-NORTHWEST OF GOA (43192), 280 KM SOUTH-SOUTHWEST OF MUMBAI (MAHARASHTRA) (43003) AND 340 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR (42830) AND MAHUVA AROUND VERAVAL (42909) & DIU REGION (42914) AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 145-155 KMPH GUSTING TO 170 KMPH AROUND MORNING OF 13TH JUNE 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
12.06.19/0000	17.8/70.5	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
12.06.19/0600	18.6/70.5	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
12.06.19/1200	19.4/70.4	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
12.06.19/1800	20.1/70.4	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
13.06.19/0000	20.7/70.3	145-155 GUSTING TO 170	VERY SEVERE CYCLONIC STORM
13.06.19/1200	21.6/70.0	115-125 GUSTING TO 135	SEVERE CYCLONIC STORM
14.06.19/0000	22.2/69.6	85-95 GUSTING TO 105	SEVERE CYCLONIC STORM
14.06.19/1200	22.7/69.2	60-70 GUSTING 80	CYCLONIC STORM
15.06.19/0000	23.1/68.8	30-40 GUSTING TO 50	DEPRESSION

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA HAS FURTHER INTENSIFIED AS T4.5 EMBDD EYE PATTERN.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND 100 KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

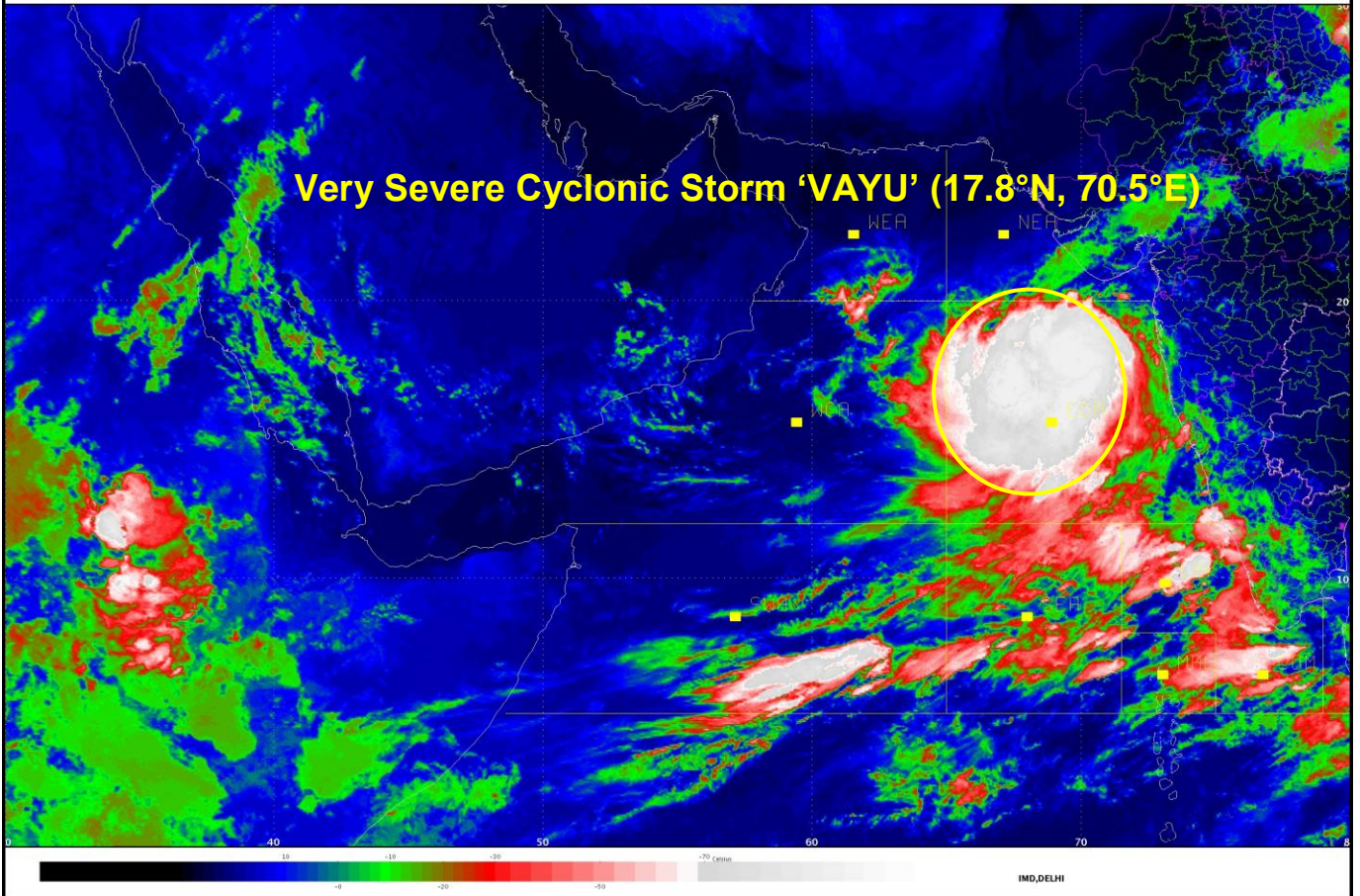
THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 20° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NORTH TO NORTH-NORTHWESTWARD DIRECTION.

MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS) AGREE WITH THE ABOVE FORECAST.

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

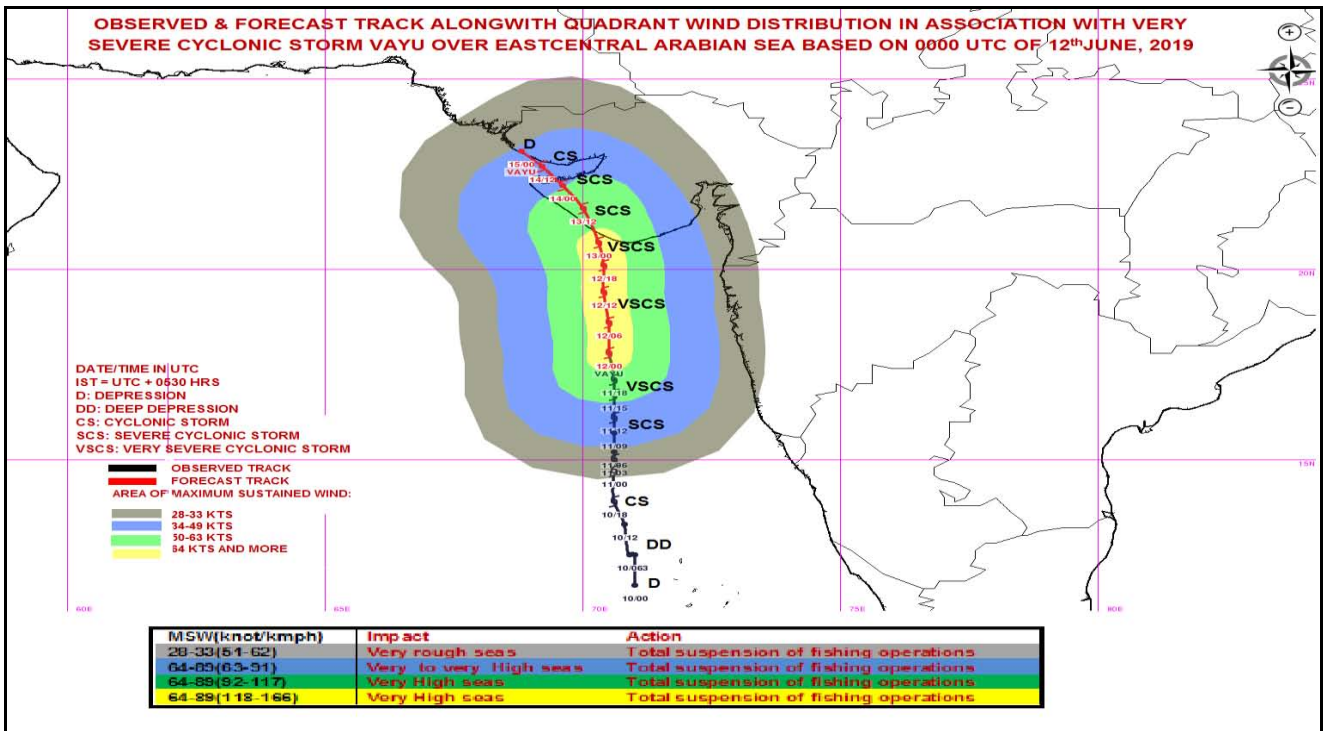
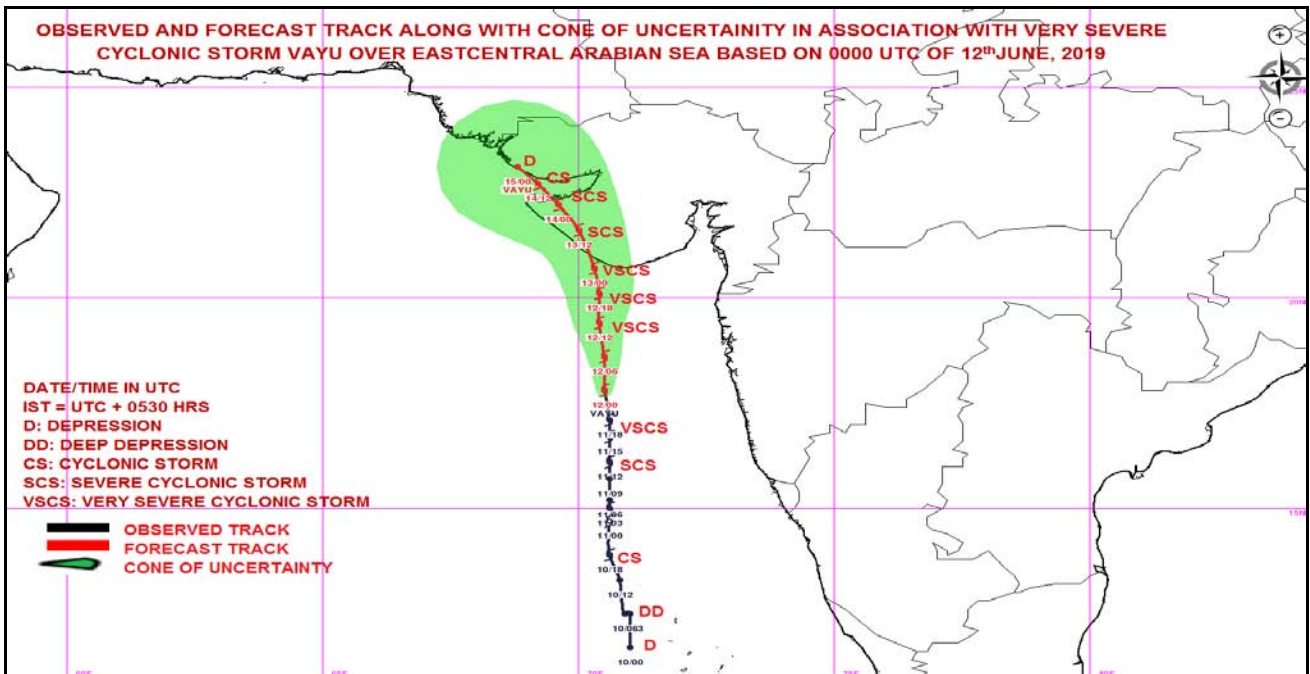
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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.9

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. 9 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0700 UTC OF 12.06.2019 BASED ON 0300 UTC OF 12.06.2019.

SUB: VERY SEVERE CYCLONIC STORM 'VAYU' OVER EAST-CENTRAL ARABIAN SEA:

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 11 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0300 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 18.0°N AND LONGITUDE 70.3°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 460 KM NORTHWEST OF GOA (43192), 290 KM WEST-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA) AND 320 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN PORBANDAR (42830) AND DIU (42914) AROUND WEST OF VERAVAL (42909) AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 145-155 KMPH GUSTING TO 170 KMPH 0000-0300 UTC OF 13TH JUNE 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
12.06.19/0300	18.0/70.3	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/0600	18.4/70.1	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/1200	19.2/70.1	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/1800	20.0/70.0	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/0000	20.9/70.0	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/1200	21.6/69.6	115-125 gusting to 135	Severe Cyclonic Storm
14.06.19/0000	22.1/69.6	85-95 gusting to 105	Severe Cyclonic Storm
14.06.19/1200	22.6/69.2	60-70 gusting 80	Cyclonic Storm
15.06.19/0000	23.1/68.8	30-40 gusting to 50	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 16.0°N TO 19.5°N LONG 66.0°E TO 72.0°E. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -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 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

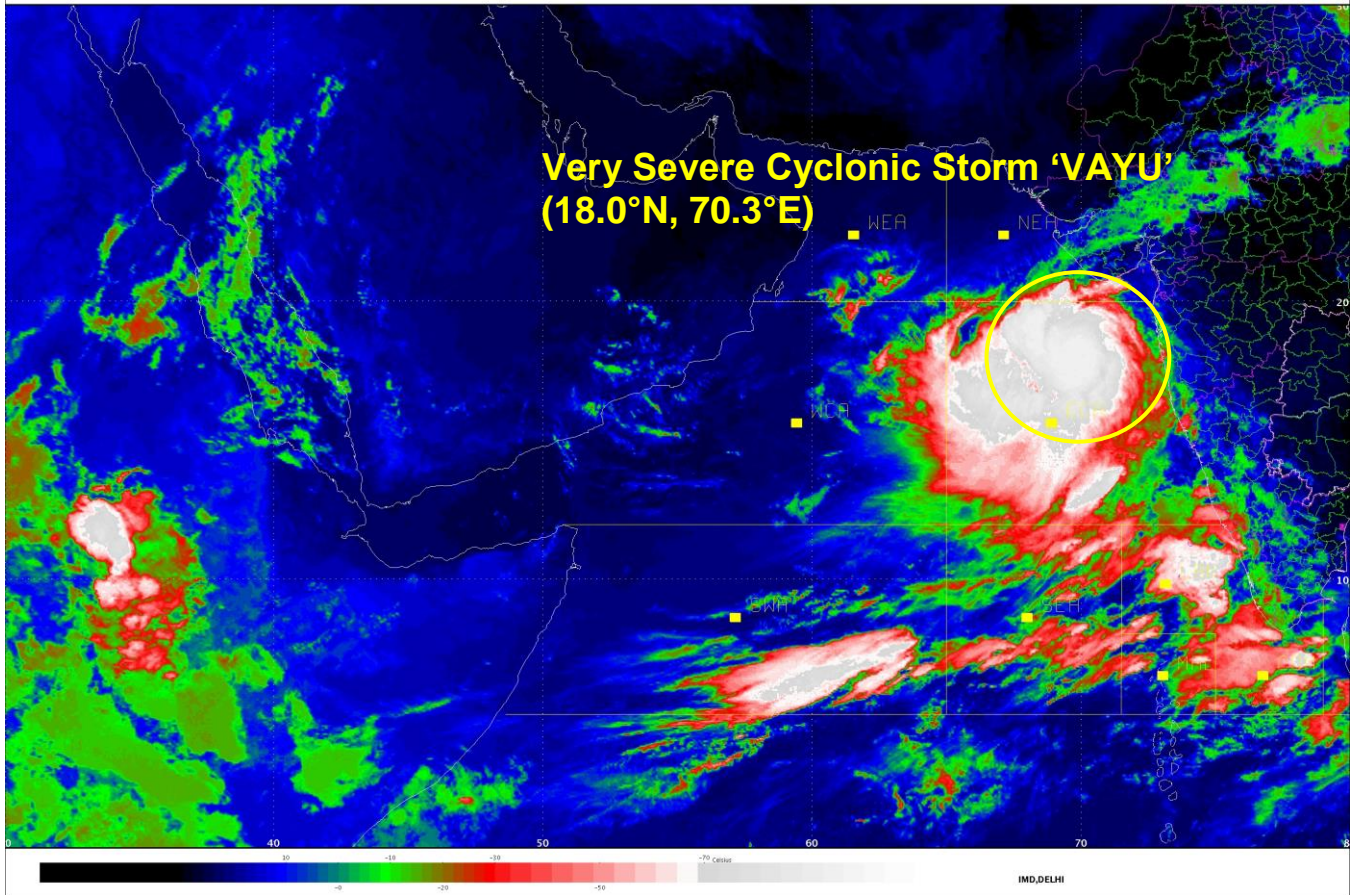
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE INCREASED AND IS ABOUT 50 X10⁻⁵ S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE ALSO INCREASED AND IS ABOUT 50 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL PARTS OF INDIA, IT IS MOVING IN A NEARLY NORTHWARD DIRECTION TILL LANDFALL. THEREAFTER IT IS LIKELY TO BE STEERED BY THE ANTICYCLONE OVER SAUDI PENINSULA AND HENCE WILL MOVE IN A NORTHWESTWARD DIRECTION.

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

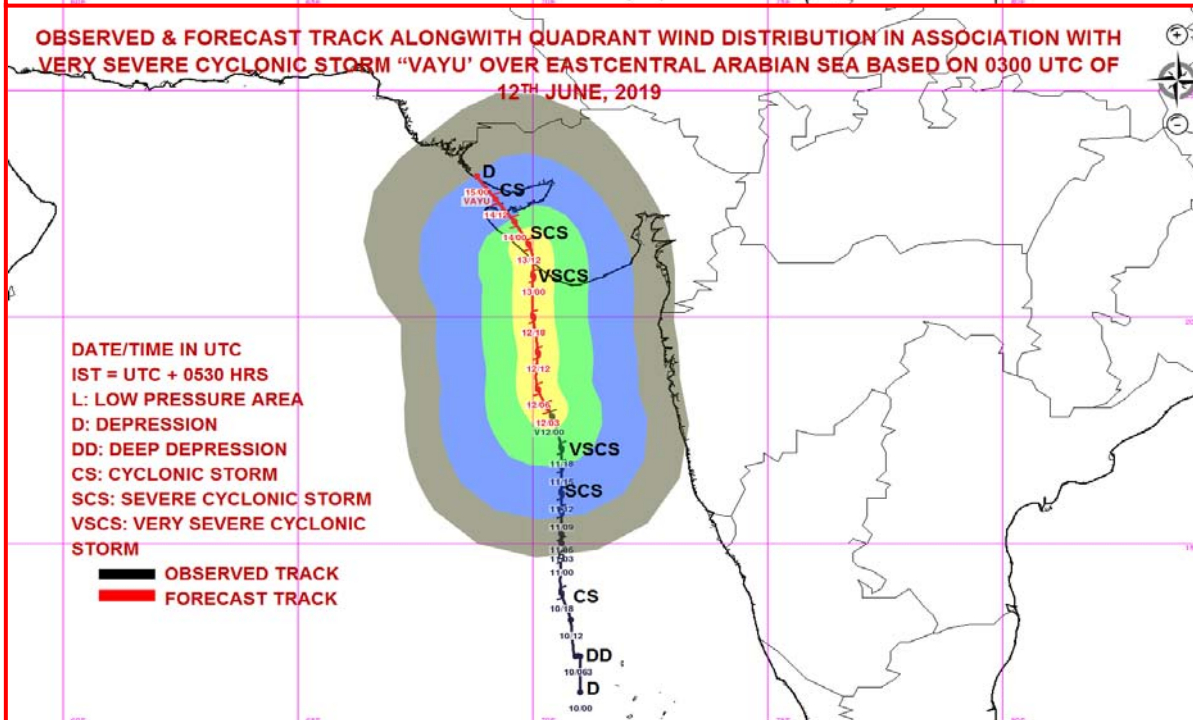
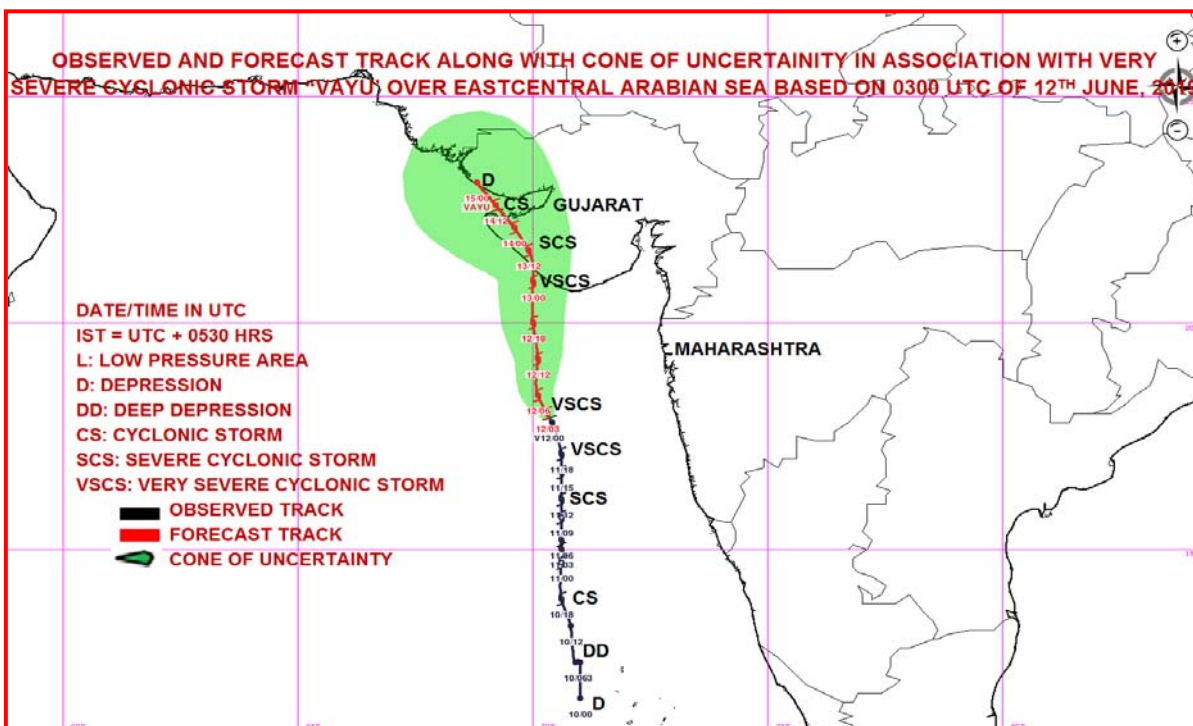
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot)/kmph)	Impact	Action
28-33 /(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 No. 10 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1000 UTC OF 12.06.2019 BASED ON 0600 UTC OF 12.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED NORTHWESTWARDS WITH A SPEED OF ABOUT 14 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0600 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 18.4°N AND LONGITUDE 70.0°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 310 KM WEST-SOUTHWEST OF MUMBAI (43003) (MAHARASHTRA), 280 KM NEARLY SOUTH OF VERAVAL (42909) (GUJARAT) AND 360 KM NEARLY SOUTH OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN DWARKA (42731) AND VERAVAL (42909) AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 155-165 KMPH GUSTING TO 180 KMPH 0600 UTC TO 0900 UTC OF 13TH JUNE 2019. AFTER CROSSING, THE SYSTEM IS LIKELY TO MOVE ALONG & PARALLEL TO SAURASHTRA & KUTCH COAST AFFECTING AMRELI, GIR SOMNATH, DIU, JUNAGARH, PORBANDAR, RAJKOT, JAMNAGAR, DEVBHOO MI DWARKA AND KUTCH.

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
12.06.19/0600	18.4/70.0	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/1200	19.2/69.9	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/1800	20.0/69.8	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/0000	20.9/69.8	150-160 gusting to 175	Very Severe Cyclonic Storm
13.06.19/0600	21.2/69.8	155-165 gusting to 180	Very Severe Cyclonic Storm
13.06.19/1800	21.9/69.6	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0600	22.3/69.3	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	22.7/68.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	22.9/68.3	100-110 gusting to 125	Severe Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 0600 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 16.0°N TO 19.5°N LONG 65.5°E TO 71.0°E. SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

OF CLOUDS AROUND THE SYSTEM CENTRE. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

AT 0600 UTC OF 12TH JUNE, A BOUY LOCATED AT 18.4°N/67.4°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1001.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/21 KNOTS. A SHIP LOCATED AT 17.9°N/64.8°E REPORTED A MEAN SEA LEVEL PRESSURE OF 999.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 300°/24 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND 250 X10⁻⁵SEC⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 20 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE NORTHEAST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 50 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS LYING IN THE OUTER PERIPHERY OF THE ANTICYCLONE OVER CENTRAL INDIA, IT IS LIKELY TO MOVE IN A NEARLY NORTHWARD DIRECTION TILL LANDFALL. THEREAFTER IT IS LIKELY TO BE STEERED BY THE ANTICYCLONE OVER SAUDI PENINSULA AND HENCE WILL MOVE IN A NORTHWESTWARD DIRECTION.

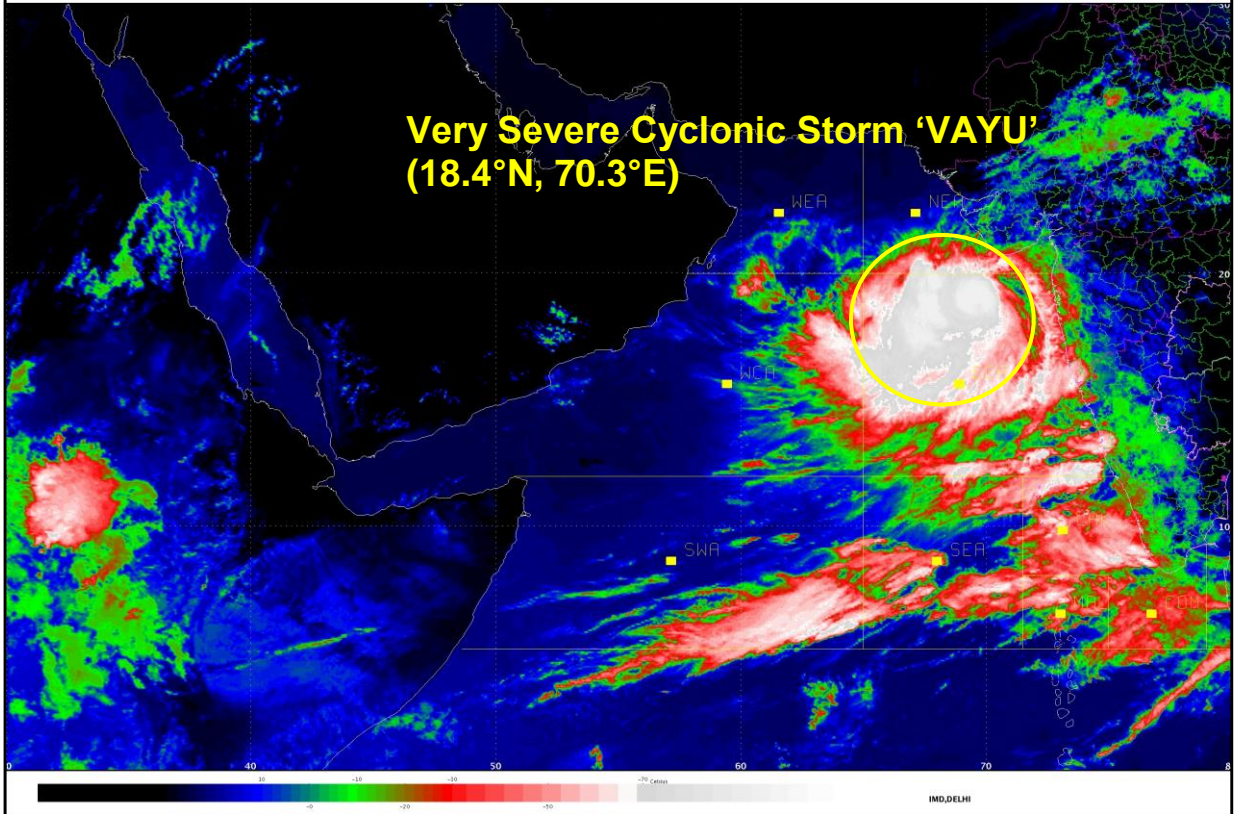
(NEETHA K. GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

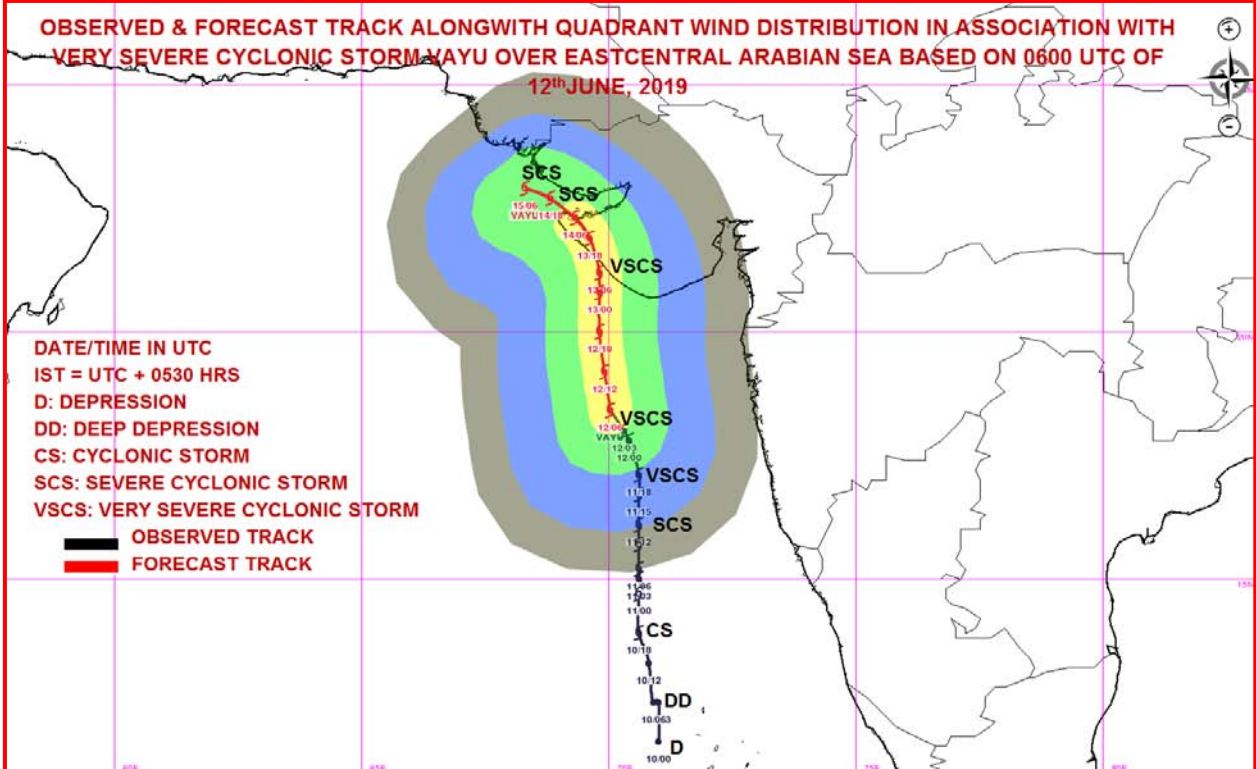
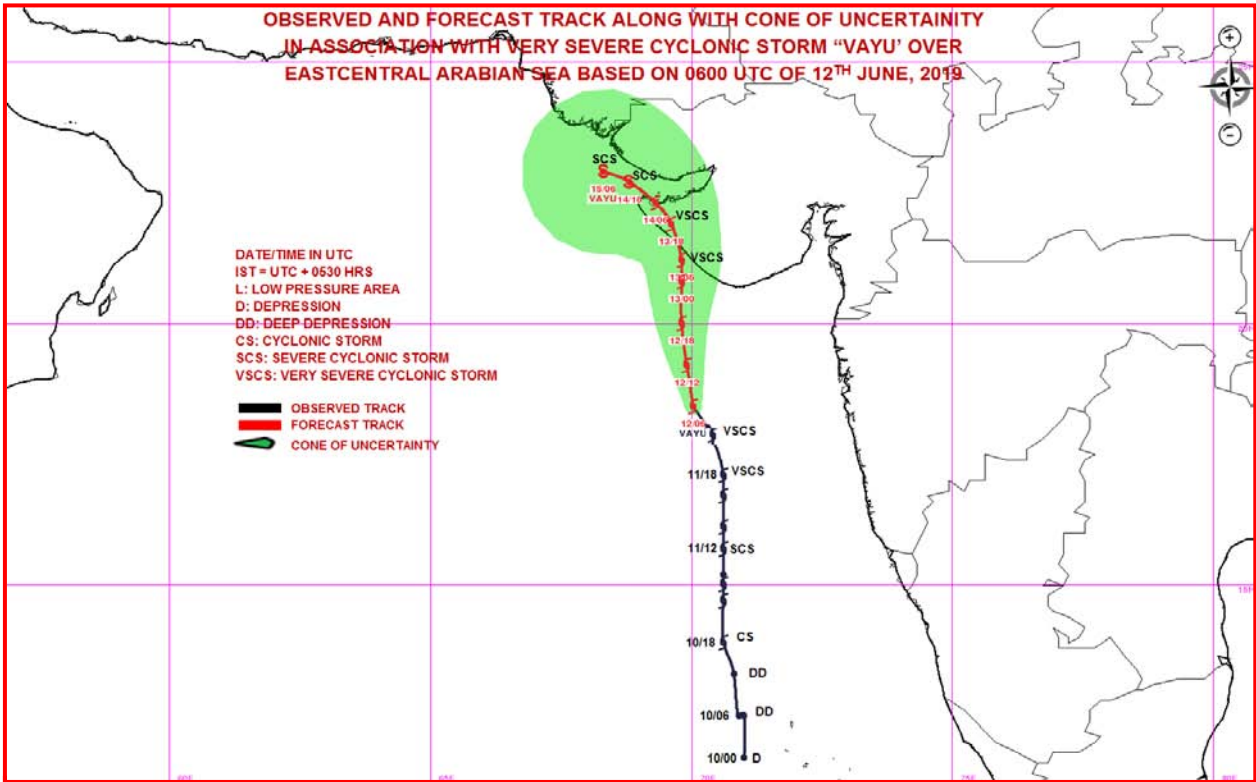
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT :INSAT-3D
IMG_TIR1_TEMP 10.8 um
SECTOR ARABIAN_SEA Mercator (NHC LUT)

12-06-2019/0830 GMT
12-06-2019/1400 IST



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



MSW(knot/kmph)	Impact	Action
28-33(51-62)	Very rough seas	Total suspension of fishing operations
64-89(63-91)	Very to very High seas	Total suspension of fishing operations
64-89(92-117)	Very High seas	Total suspension of fishing operations
64-89(118-166)	Very High seas	Total suspension of fishing operations

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.11

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. 11 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1200 UTC OF 12.06.2019 BASED ON 0900 UTC OF 12.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 16 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0900 OF 12TH JUNE, 2019 NEAR LATITUDE 18.8°N AND LONGITUDE 69.9°E OVER EASTCENTRAL ARABIAN SEA, ABOUT 310 KM NEARLY WEST OF MUMBAI (43003) (MAHARASHTRA), 230 KM SOUTH-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 310 KM NEARLY SOUTH OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN DWARKA (42731) AND VERAVAL (42909) AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 155-165 KMPH GUSTING TO 180 KMPH AROUND 0700 UTC TO 1100 UTC OF 13TH JUNE 2019. AFTER CROSSING, THE SYSTEM IS LIKELY TO MOVE ALONG AND PARALLEL TO SAURASHTRA & KUTCH COAST AFFECTING AMRELI, GIR SOMNATH, DIU, JUNAGARH, PORBANDAR, RAJKOT, JAMNAGAR, DEVBHOO MI DWARKA AND KUTCH DISTRICTS OF GUJARAT STATE.

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
12.06.19/0900	18.8/69.9	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/1200	19.2/69.9	140-150 gusting to 165	Very Severe Cyclonic Storm
12.06.19/1800	20.0/69.8	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/0000	20.9/69.8	150-160 gusting to 175	Very Severe Cyclonic Storm
13.06.19/0600	21.2/69.8	155-165 gusting to 180	Very Severe Cyclonic Storm
13.06.19/1800	21.9/69.6	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0600	22.3/69.3	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	22.7/68.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	22.9/68.3	100-110 gusting to 125	Severe Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 0900 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 15.5°N TO 19.5°N LONG 65.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -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 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

AT 0900 UTC OF 12TH JUNE, A BOUY LOCATED AT 14.9°N/69°E MEAN SURFACE WIND DIRECTION/SPEED OF 240°/21 KNOTS. MUMBAI (43003) REPORTED A MEAN SEA LEVEL PRESSURE OF 1000.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/14 KNOTS.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

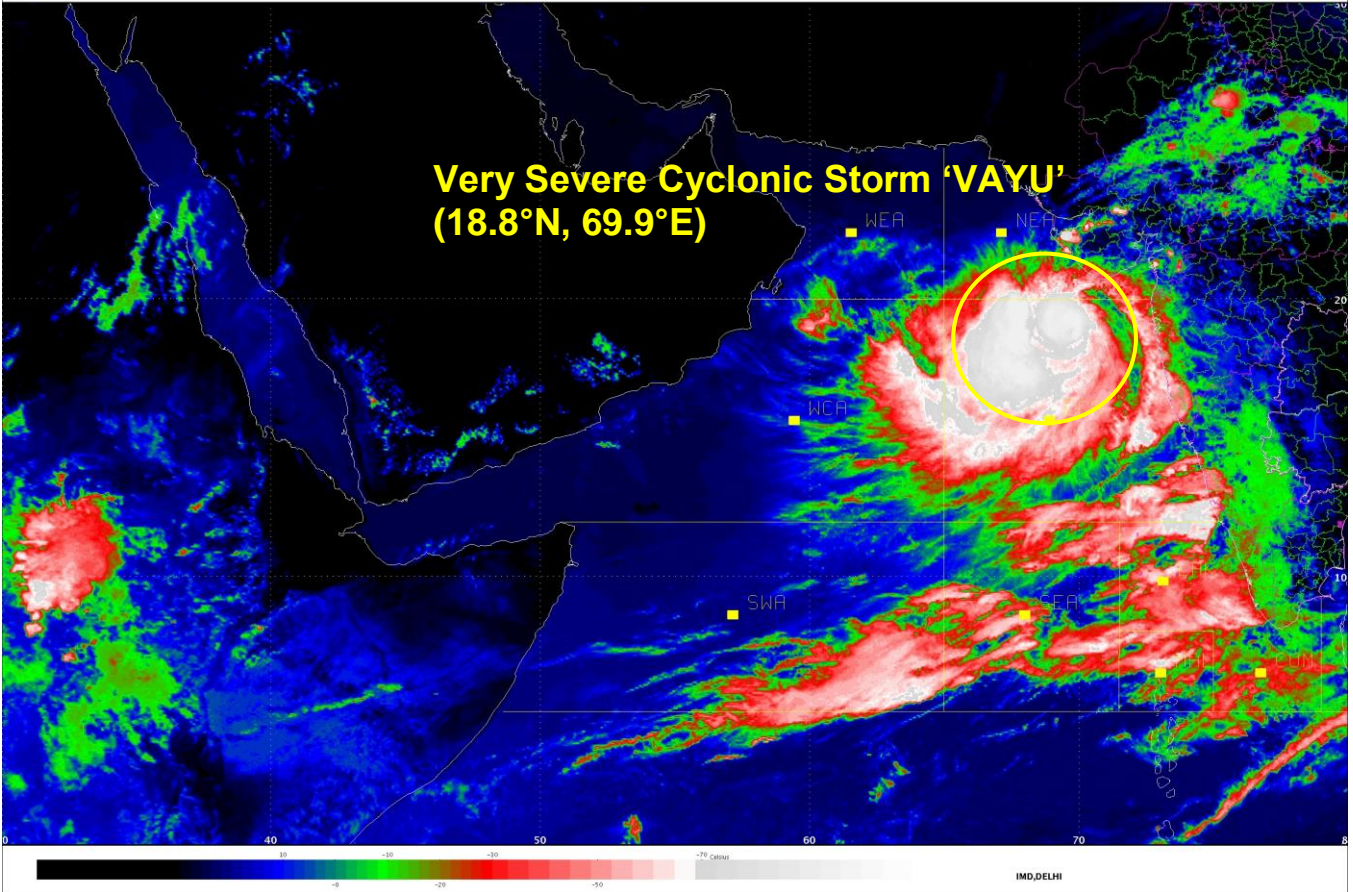
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 20 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{S}^{-1}$ AROUND THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $40 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. HOWEVER, IT DECREASES TOWARDS NORTH. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FURTHER.

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

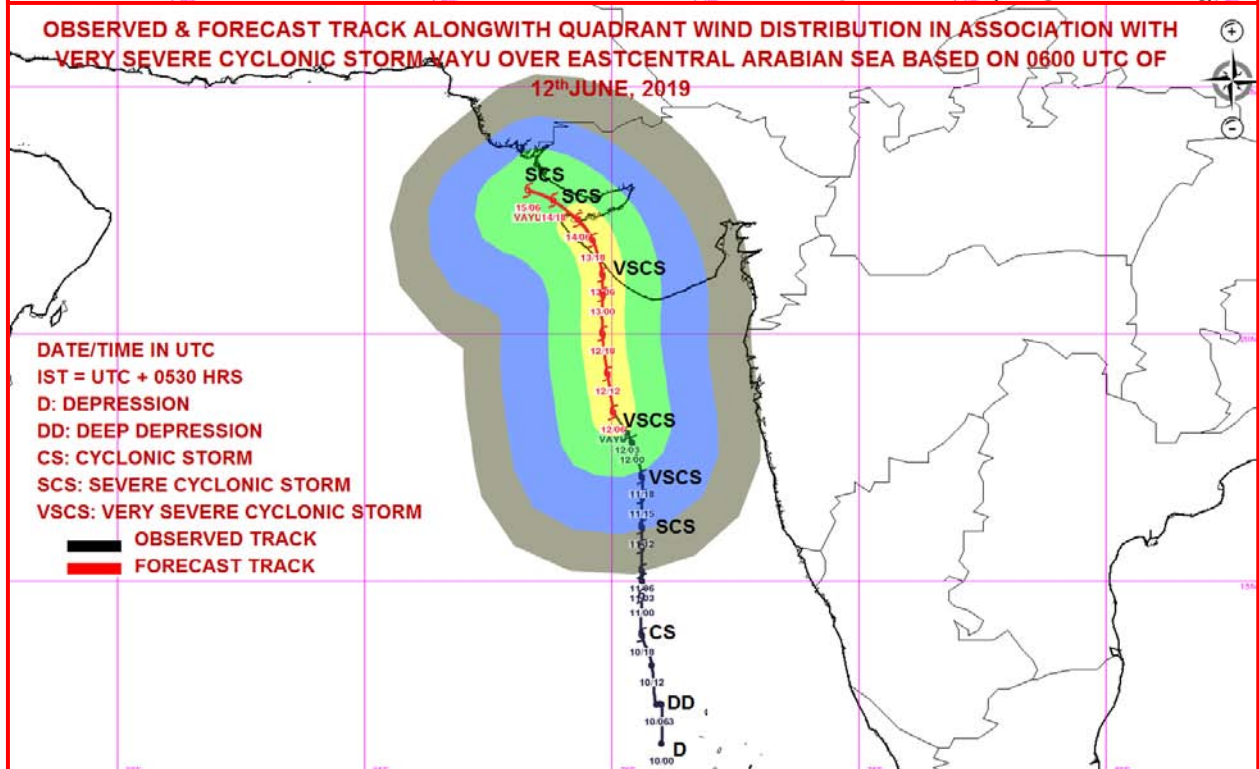
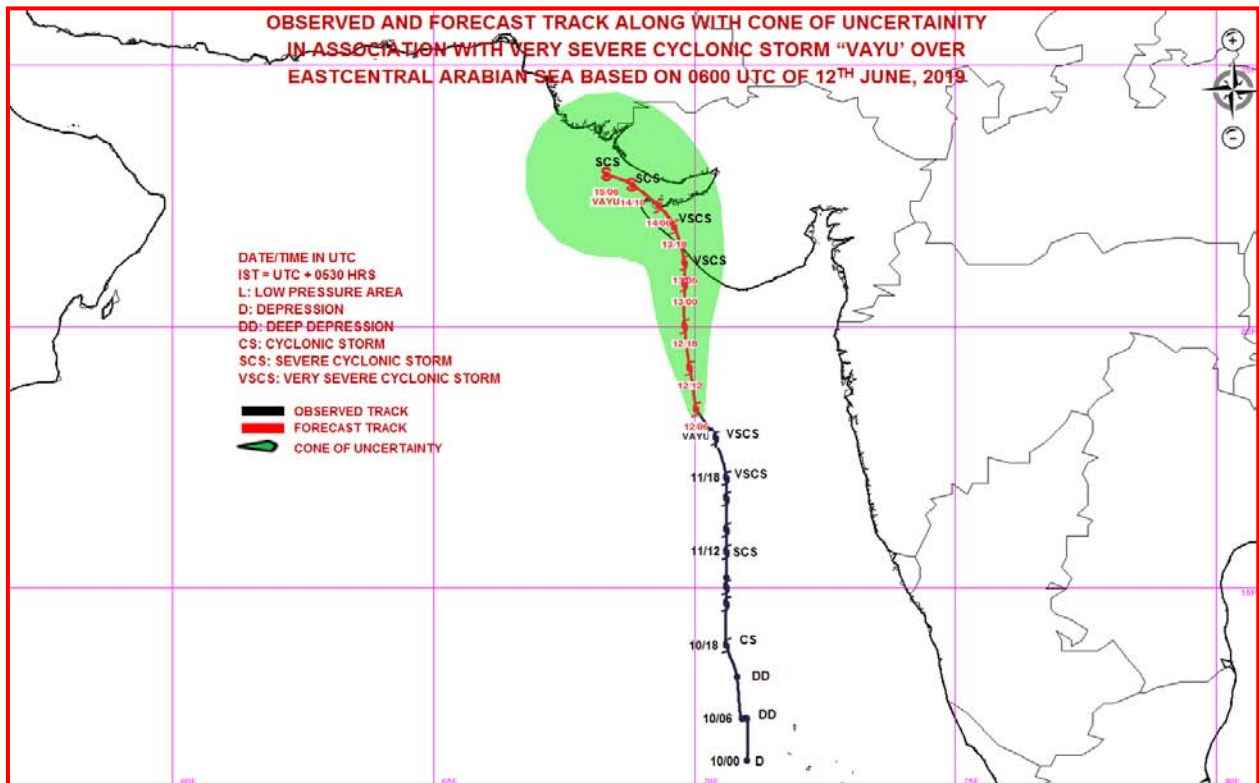
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot/kmph)	Impact	Action
28-33(51-62)	Very rough seas	Total suspension of fishing operations
64-89(63-91)	Very to very High seas	Total suspension of fishing operations
64-89(92-117)	Very High seas	Total suspension of fishing operations
64-89(118-166)	Very High seas	Total suspension of fishing operations

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.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 No. 12 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1500 UTC OF 12.06.2019 BASED ON 1200 UTC OF 12.06.2019.

THE VERY **SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 13 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1200 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 19.1°N AND LONGITUDE 69.9°E OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA, ABOUT 310 KM NEARLY WEST OF MUMBAI (43003) (MAHARASHTRA), 200 KM SOUTH-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 280 KM NEARLY SOUTH OF PORBANDAR (**42830**) (GUJARAT). **IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN DWARKA (42731) AND VERAVAL (42909) AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 155-165 KMPH GUSTING TO 180 KMPH AROUND AFTERNOON OF 13TH JUNE 2019.** AFTER CROSSING, THE SYSTEM IS LIKELY TO MOVE ALONG & PARALLEL TO SAURASHTRA & KUTCH COAST AFFECTING AMRELI, GIR SOMNATH, DIU, JUNAGARH, PORBANDAR, RAJKOT, JAMNAGAR, DEVBHOOI DWARKA AND KUTCH DISTRICTS OF GUJARAT STATE.

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
12.06.19/1200	19.1/69.9	145-155 gusting to 170	Very Severe Cyclonic Storm
12.06.19/1800	20.0/69.8	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/0000	20.9/69.8	150-160 gusting to 175	Very Severe Cyclonic Storm
13.06.19/0600	21.2/69.8	155-165 gusting to 180	Very Severe Cyclonic Storm
13.06.19/1200	21.6/69.7	155-165 gusting to 180	Very Severe Cyclonic Storm
14.06.19/0000	22.1/69.4	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1200	22.5/69.1	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	22.8/68.5	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1200	23.1/67.9	100-110 gusting to 125	Severe Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 14.5°N TO 21.5°N LONG 61.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -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 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

AT 1200 UTC OF 12TH JUNE, A SHIP LOCATED AT 19.1°N/69.7°E MEAN SURFACE WIND DIRECTION/SPEED OF 040°/55 KNOTS. MUMBAI (43003) REPORTED A MEAN SEA LEVEL PRESSURE OF 999.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/12 KNOTS. HARNAI (43109) REPORTED A MEAN SEA LEVEL PRESSURE OF 1002.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/68 KNOTS. DAHANU (43001) REPORTED A MEAN SEA LEVEL PRESSURE OF 996.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 090°/10 KNOTS

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

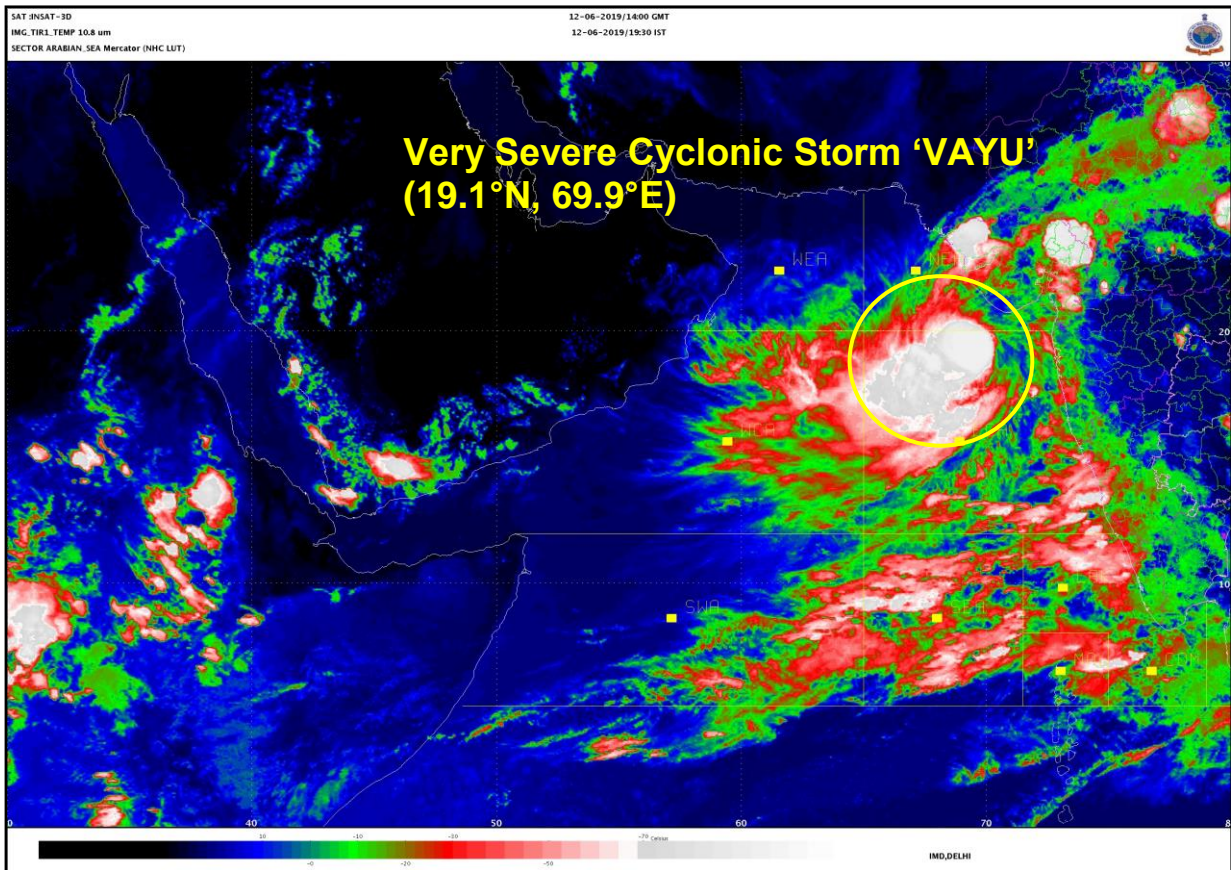
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY INCREASED AND IS AROUND 300 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 20 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 50 X10⁻⁵ S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 40 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE TO HIGH (10-20 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FURTHER.

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

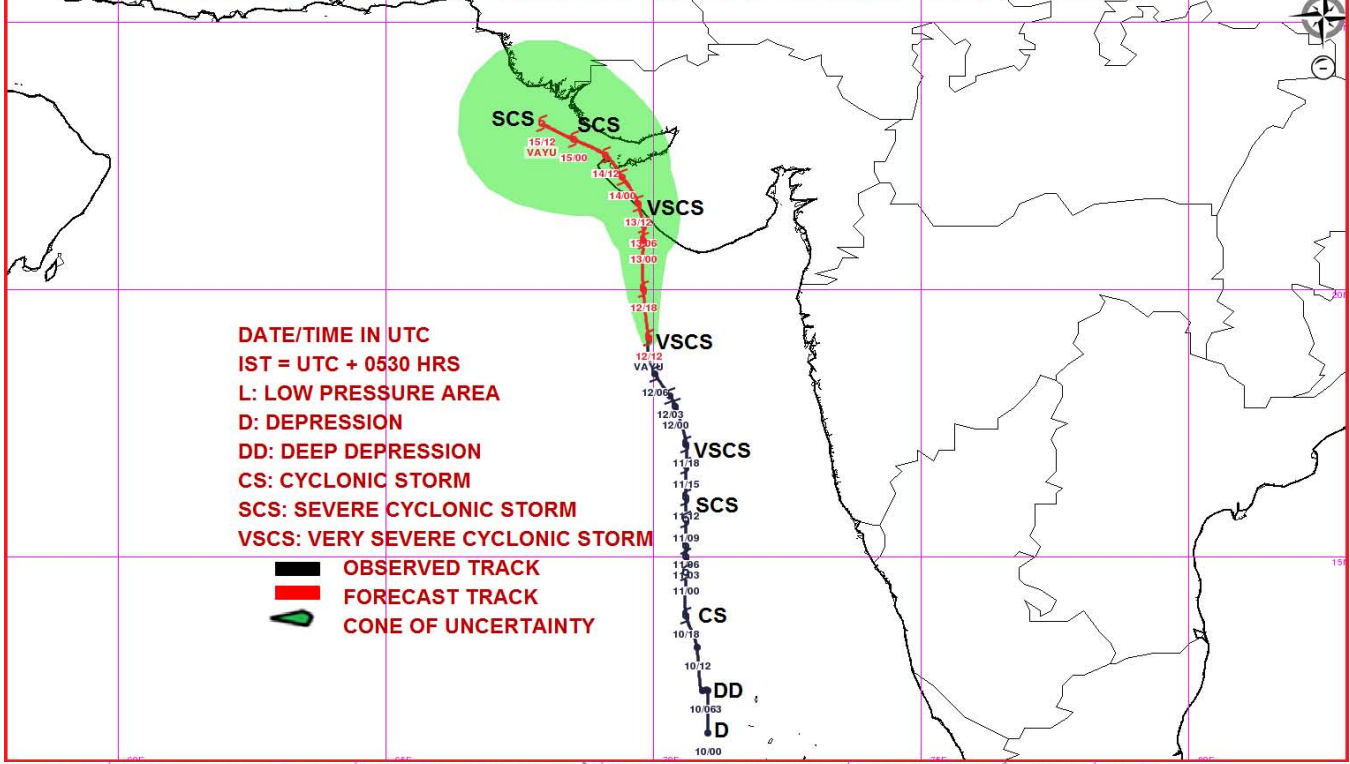
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

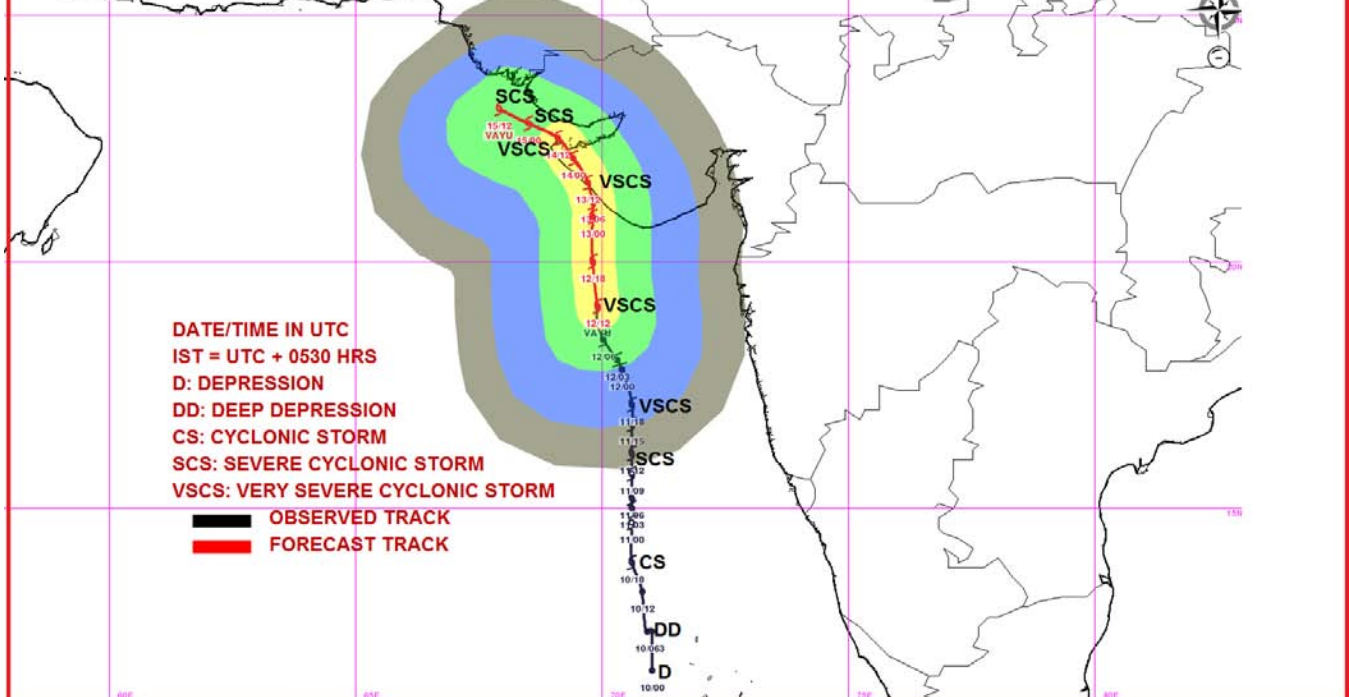


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 12th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 12th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 No. 13 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 1730 UTC OF 12.06.2019 BASED ON 1500 UTC OF 12.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 13 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1500 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 19.5°N AND LONGITUDE 69.8°E OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA, ABOUT 320 KM NEARLY WEST OF MUMBAI (43003) (MAHARASHTRA), 160 KM SOUTH-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 240 KM NEARLY SOUTH OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTHWARDS AND CROSS GUJARAT COAST BETWEEN DWARKA (42731) AND VERAVAL(42909) AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED 155-165 KMPH GUSTING TO 180 KMPH AROUND AFTERNOON OF 13TH JUNE 2019.

AFTER CROSSING, THE SYSTEM IS LIKELY TO MOVE ALONG & PARALLEL TO SAURASHTRA & KUTCH COAST AFFECTING AMRELI, GIR SOMNATH, DIU, JUNAGARH, PORBANDAR, RAJKOT, JAMNAGAR, DEVBHOOMI DWARKA AND KUTCH DISTRICTS OF GUJARAT.

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
12.06.19/1500	19.5/69.8	145-155 gusting to 170	Very Severe Cyclonic Storm
12.06.19/1800	20.0/69.8	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/0000	20.9/69.8	150-160 gusting to 175	Very Severe Cyclonic Storm
13.06.19/0600	21.2/69.8	155-165 gusting to 180	Very Severe Cyclonic Storm
13.06.19/1200	21.6/69.7	155-165 gusting to 180	Very Severe Cyclonic Storm
14.06.19/0000	22.1/69.4	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1200	22.5/69.1	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	22.8/68.5	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1200	23.1/67.9	100-110 gusting to 125	Severe Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 1500 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 15°N TO 21°N LONG 65.5°E TO 70.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY INCREASED AND IS AROUND $300 \times 10^{-5} \text{SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 20 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $50 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $40 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE TO HIGH (10-20 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FURTHER.

(D R Pattanaik)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

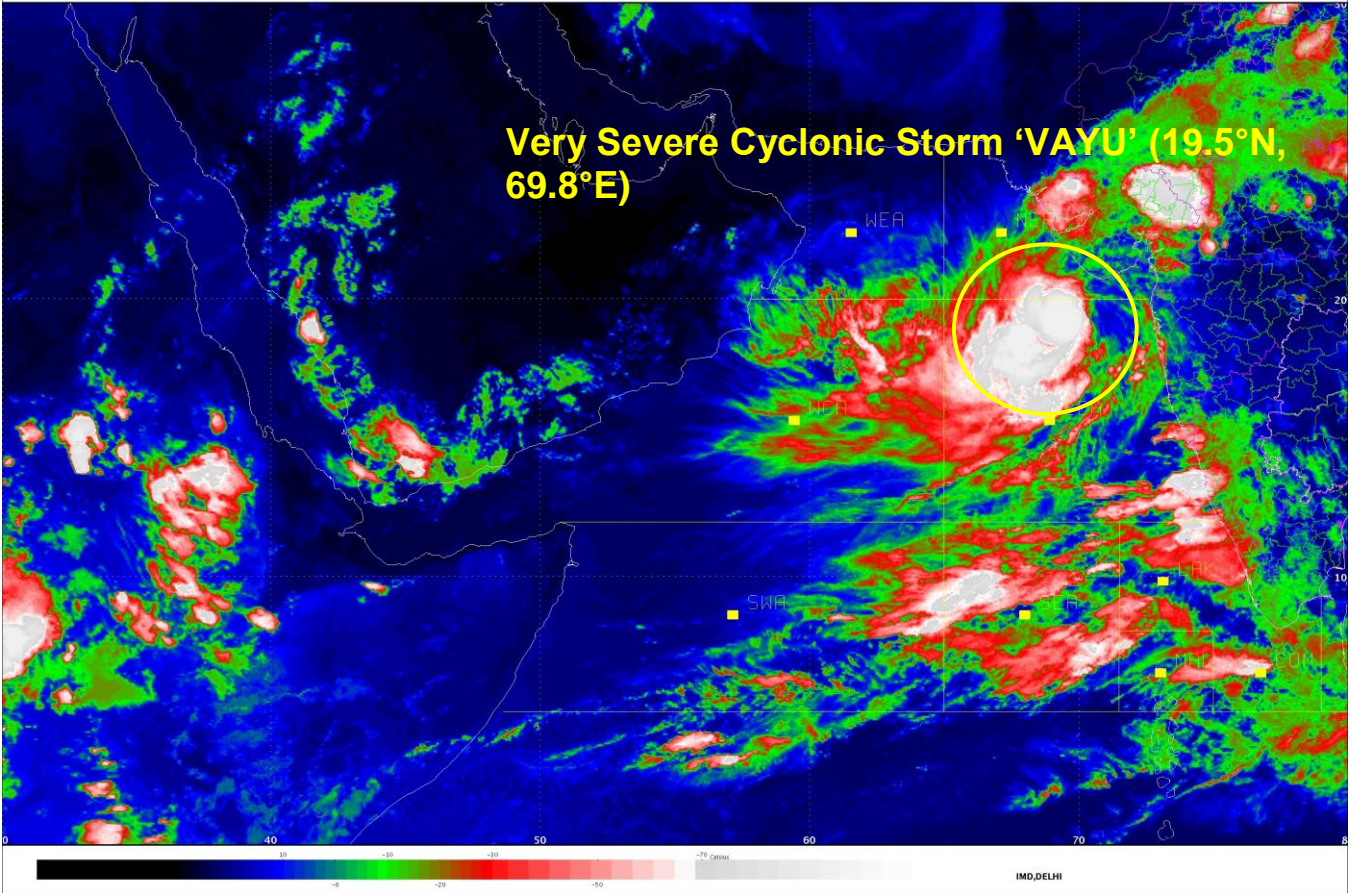
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT JNSAT-3D
IMG_TIR1_TEMP 10.8 um
SECTOR ARABIAN_SEA Mercator (NHC LUT)

12-06-2019/15:30 GMT
12-06-2019/21:00 IST



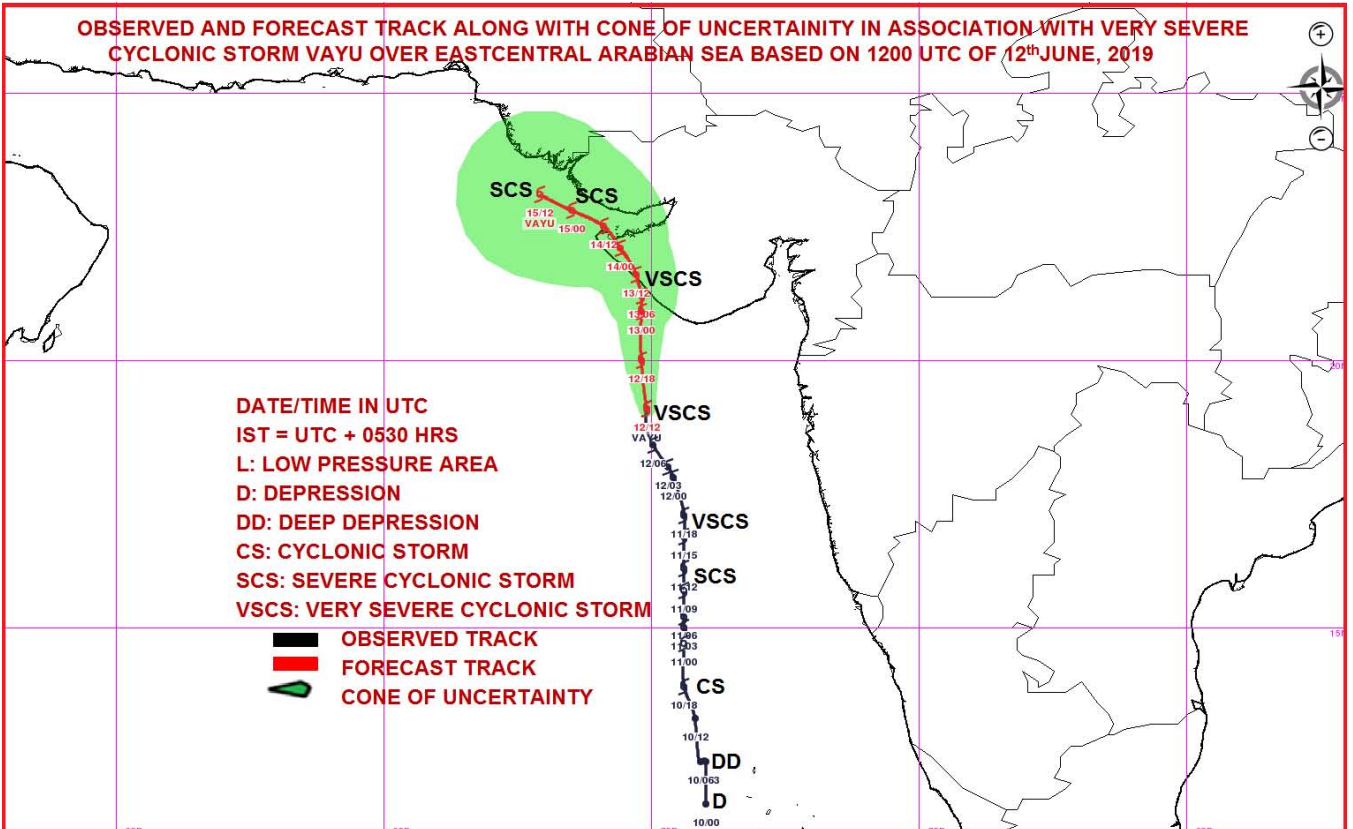
**Very Severe Cyclonic Storm 'VAYU' (19.5°N,
69.8°E)**



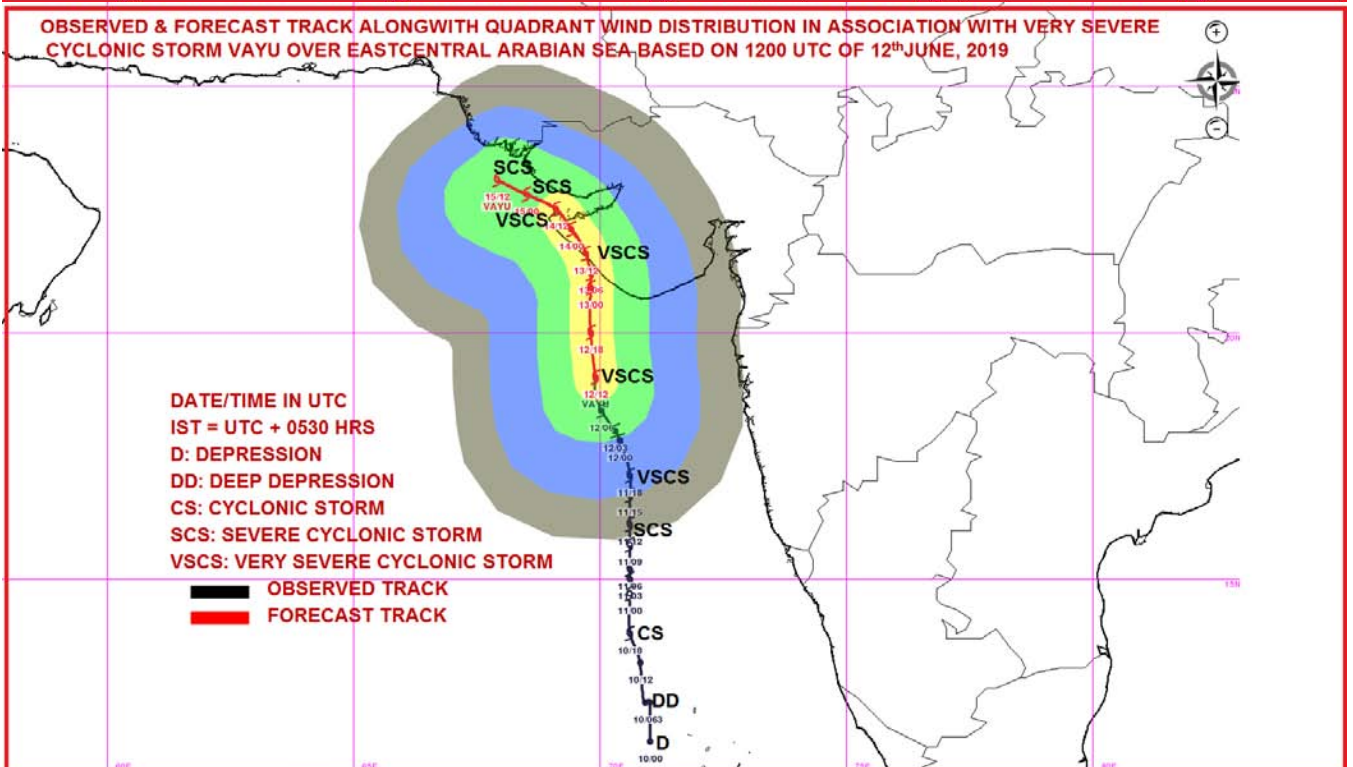
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 12th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 12th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33 /(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 No. 14 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 2200 UTC OF 12.06.2019 BASED ON 1800 UTC OF 12.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 12 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1800 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 19.7°N AND LONGITUDE 69.7°E OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA, ABOUT 340 KM NORTHWEST OF MUMBAI (43003) (MAHARASHTRA), 150 KM SOUTH-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 210 KM NEARLY SOUTH OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NEARLY NORTH-NORTHWESTWARDS ALONG SAURASHTRA COAST AFFECTING AMRELI, GIR SOMNATH, DIU, JUNAGARH, PORBANDAR, RAJKOT, JAMNAGAR, DEVBHOO MI DWARKA AND KUTCH DISTRICTS OF GUJARAT WITH WIND SPEED 155-165 KMPH GUSTING TO 180 KMPH LIKELY FROM AFTERNOON OF 13TH JUNE 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
12.06.19/1800	19.7/69.7	145-155 gusting to 170	Very Severe Cyclonic Storm
13.06.19/0000	20.4/69.5	150-160 gusting to 175	Very Severe Cyclonic Storm
13.06.19/0600	20.8/69.4	155-165 gusting to 180	Very Severe Cyclonic Storm
13.06.19/1200	21.2/69.3	155-165 gusting to 180	Very Severe Cyclonic Storm
13.06.19/1800	21.5/69.1	140-150 gusting to 165	Very Severe Cyclonic Storm
14.06.19/0600	21.9/68.7	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1800	22.1/68.3	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	22.2/68.0	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1800	22.2/67.8	100-110 gusting to 125	Severe Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 15°N TO 21°N LONG 65.5°E TO 70.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -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 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

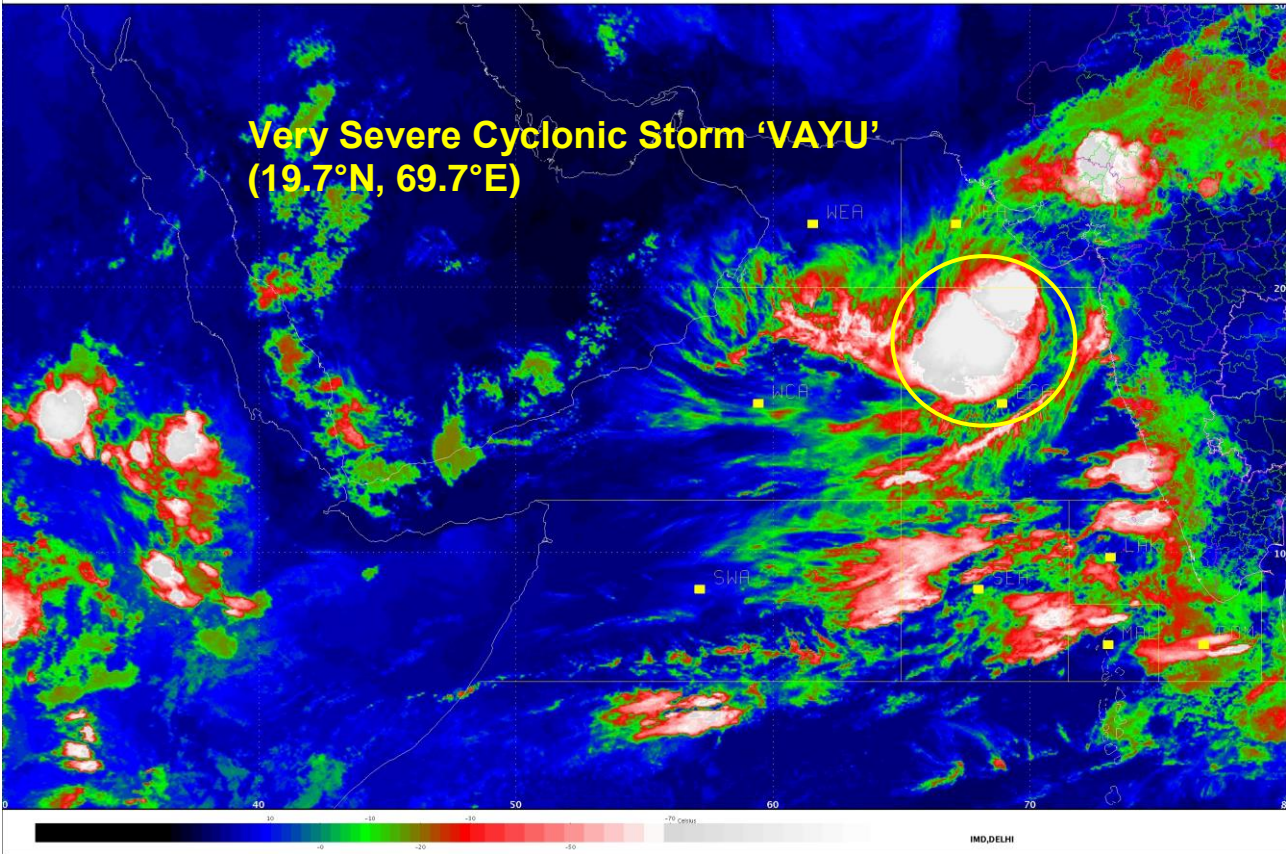
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY INCREASED AND IS AROUND 300 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 20 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE TO HIGH (10-20 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION.

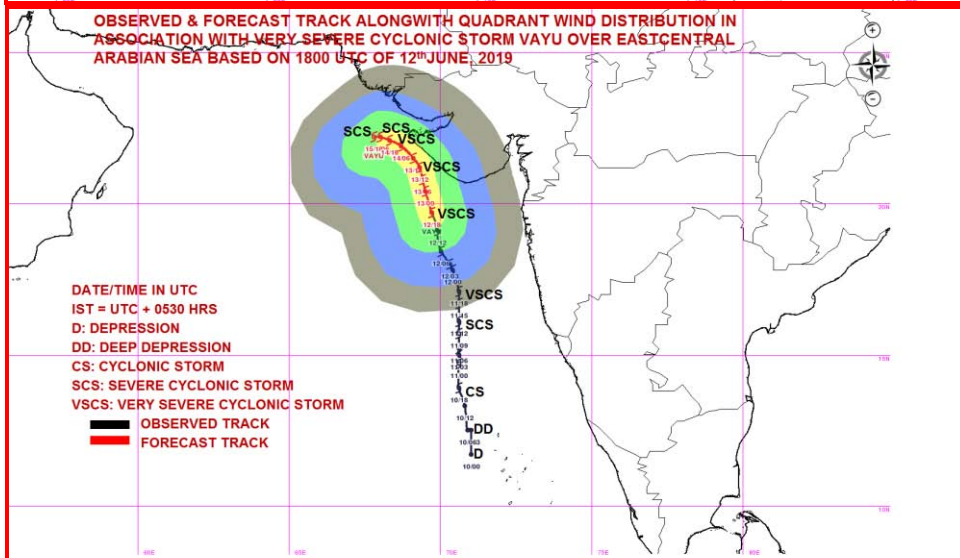
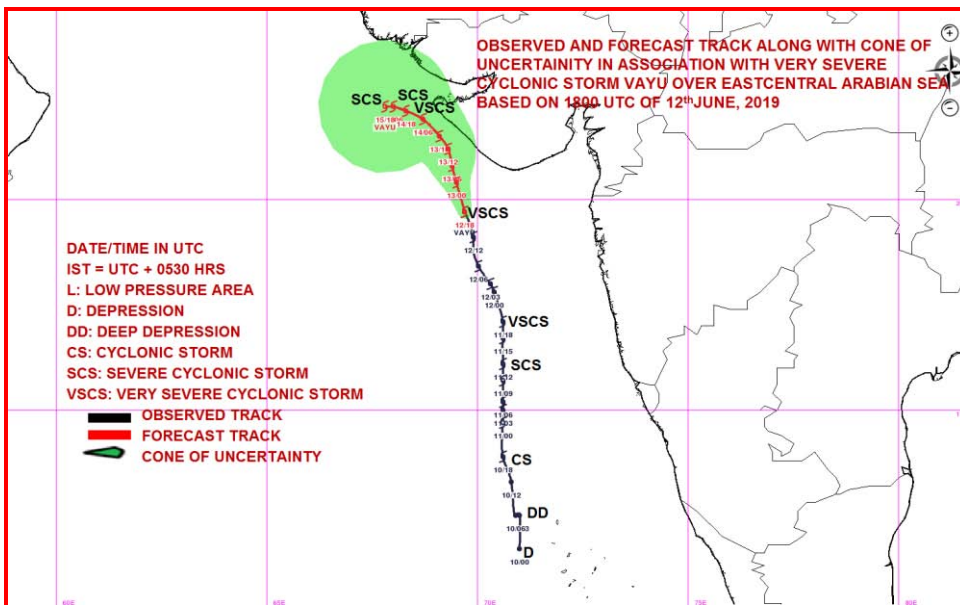
(Naresh Kumar)
SCIENTIST-E, RSMC, NEW DELHI

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%



MSW(knot)/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 No. 15 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0200 UTC OF 13.06.2019 BASED ON 2100 UTC OF 12.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER EASTCENTRAL ARABIAN SEA MOVED FURTHER NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 10 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 2100 UTC OF 12TH JUNE, 2019 NEAR LATITUDE 20.0°N AND LONGITUDE 69.6°E OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA, ABOUT 350 KM NORTHWEST OF MUMBAI (43003) (MAHARASHTRA), 130 KM SOUTH-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 180 KM NEARLY SOUTH OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME TIME AND THEN NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, DIU, JUNAGARH, PORBANDAR, AND DEVBHOO MI DWARKA WITH WIND SPEED 135-145 KMPH GUSTING TO 160 KMPH FROM AFTERNOON OF 13TH JUNE 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
12.06.19/2100	20.0/69.6	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/0000	20.4/69.6	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/0600	20.8/69.5	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1200	21.2/69.4	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1800	21.5/69.2	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0600	21.9/68.8	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	22.1/68.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	22.2/68.0	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1800	22.2/67.8	90-100 gusting to 115	Severe Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC ON 12TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER EASTCENTRAL ARABIAN SEA IS T4.5 WITH AN EMBEDDED EYE PATTERN. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 15°N TO 21°N LONG 65.5°E TO 70.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -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 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY IN PHASE 3 WITH AMPLITUDE MORE THAN 1. IT WILL CONTINUE IN SAME PHASE WITH AMPLITUDE GREATER THAN 1 FOR NEXT 3 DAYS. THEREAFTER, IT WILL MOVE TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

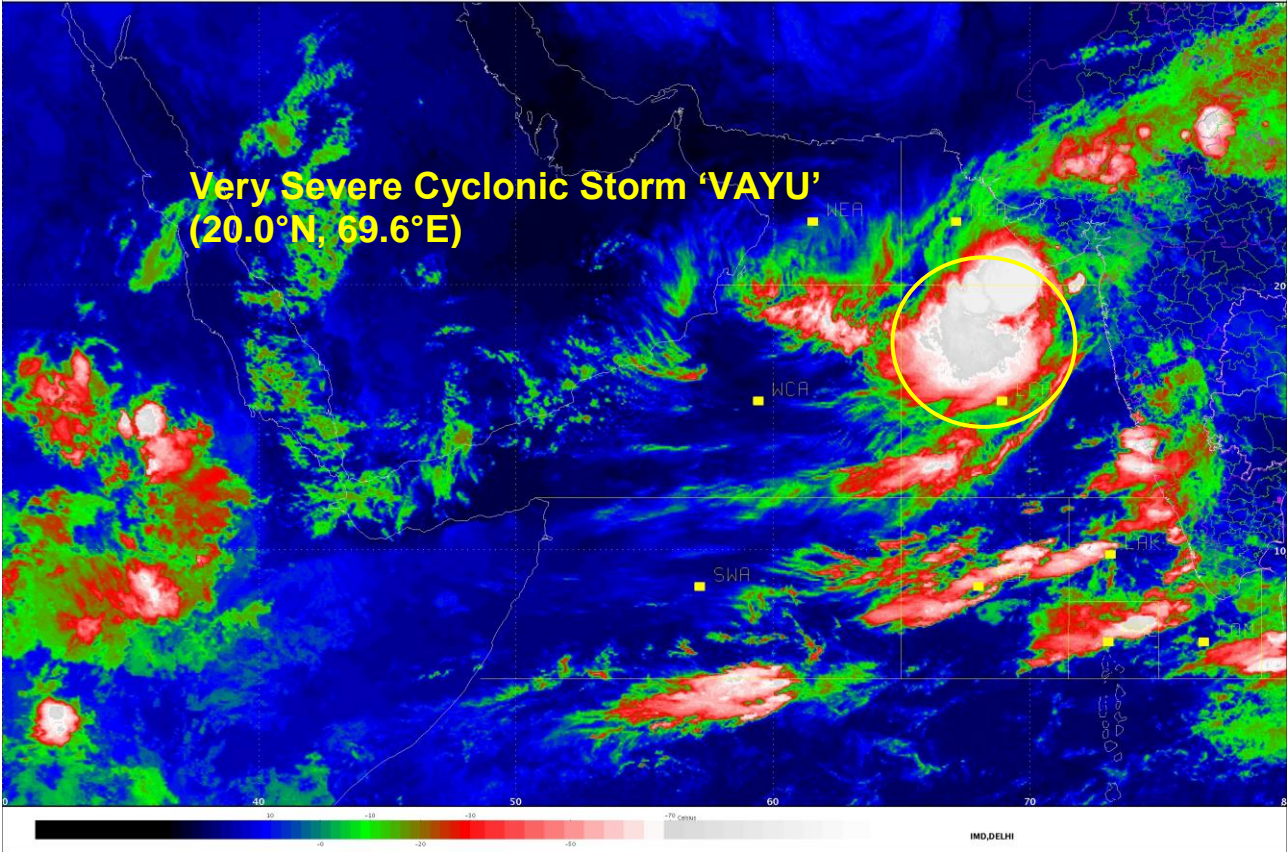
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY INCREASED AND IS AROUND 300 X10⁻⁵SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 20 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 40 X10⁻⁵ S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE TO HIGH (10-20 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 21° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

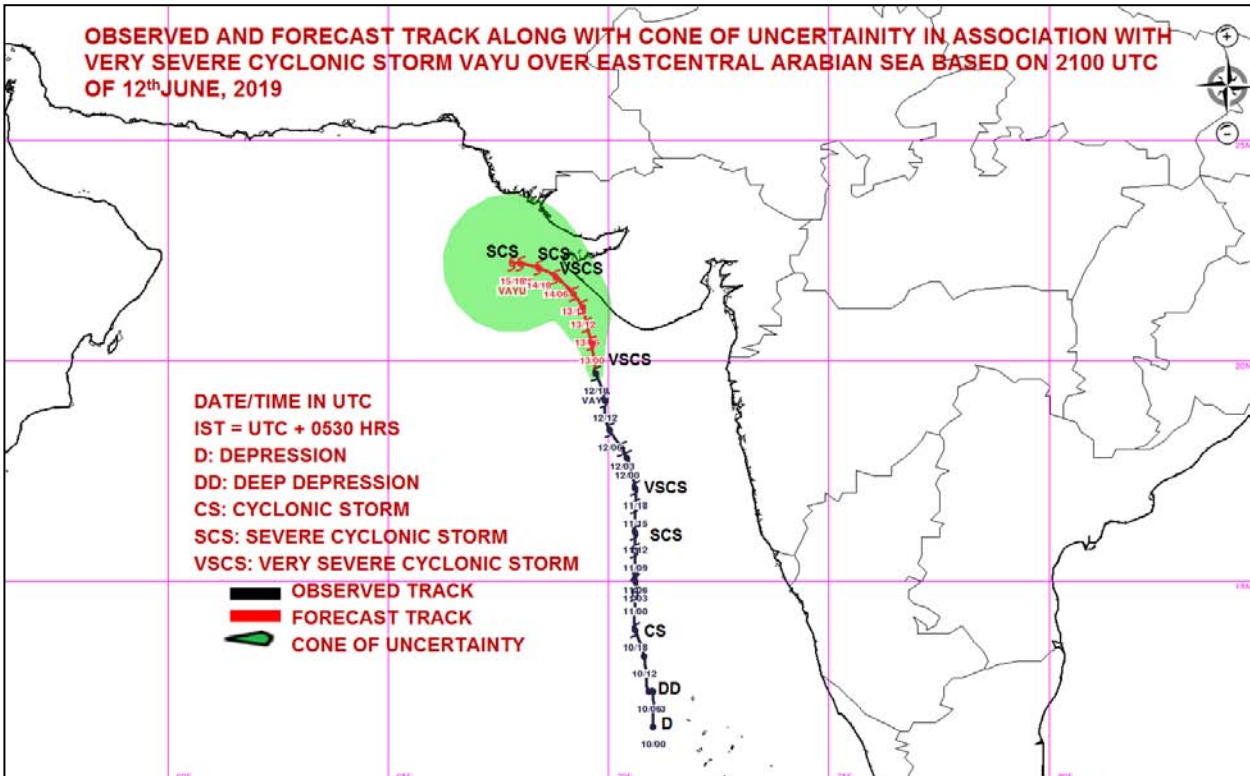
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



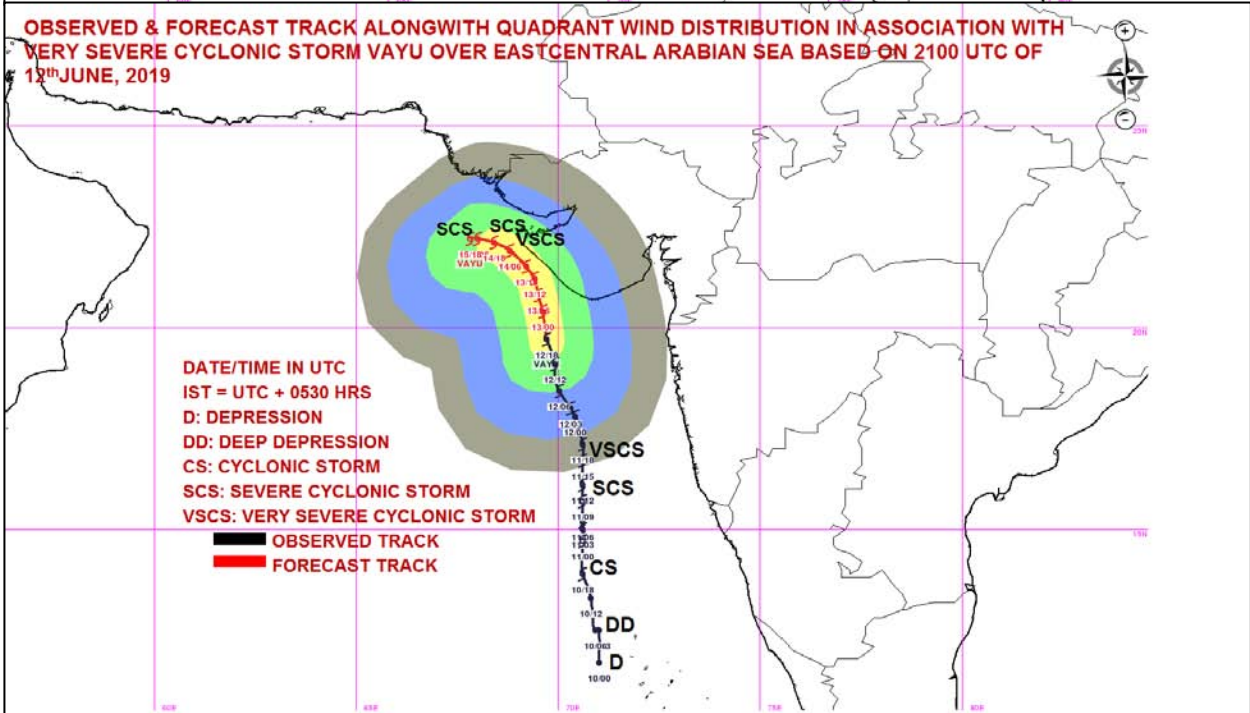
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 2100 UTC OF 12th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER EASTCENTRAL ARABIAN SEA BASED ON 2100 UTC OF 12th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 No. 16 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 96 HOURS ISSUED AT 0300 UTC OF 13.06.2019 BASED ON 0000 UTC OF 13.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER EASTCENTRAL & ADJOINING NORTHEAST ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 11 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0000 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.3°N AND LONGITUDE 69.5°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 150 KM SOUTH-SOUTHWEST OF DIU (42914), 110 KM SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 150 KM NEARLY SOUTH OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME TIME AND THEN NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, DIU, JUNAGARH, PORBANDAR AND DEVBHOO MI DWARKA WITH WIND SPEED 135-145 KMPH GUSTING TO 160 KMPH AROUND 0900 UTC OF 13TH JUNE 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
13.06.19/0000	20.3/69.5	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/0600	20.8/69.4	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1200	21.2/69.3	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1800	21.5/69.1	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0000	21.7/68.9	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1200	22.0/68.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	22.1/68.2	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1200	22.2/67.8	100-110 gusting to 125	Severe Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17°N TO 21.5°N LONG 65.5°E TO 70.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 0000 UTC OF 13TH JUNE, VERAVAL (42909) (GUJARAT) REPORTED MEAN SEA LEVEL PRESSURE OF 992.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/21 KNOTS AND PORBANDAR (42830) (GUJARAT) REPORTED MEAN SEA LEVEL PRESSURE OF 995.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 20°/18 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

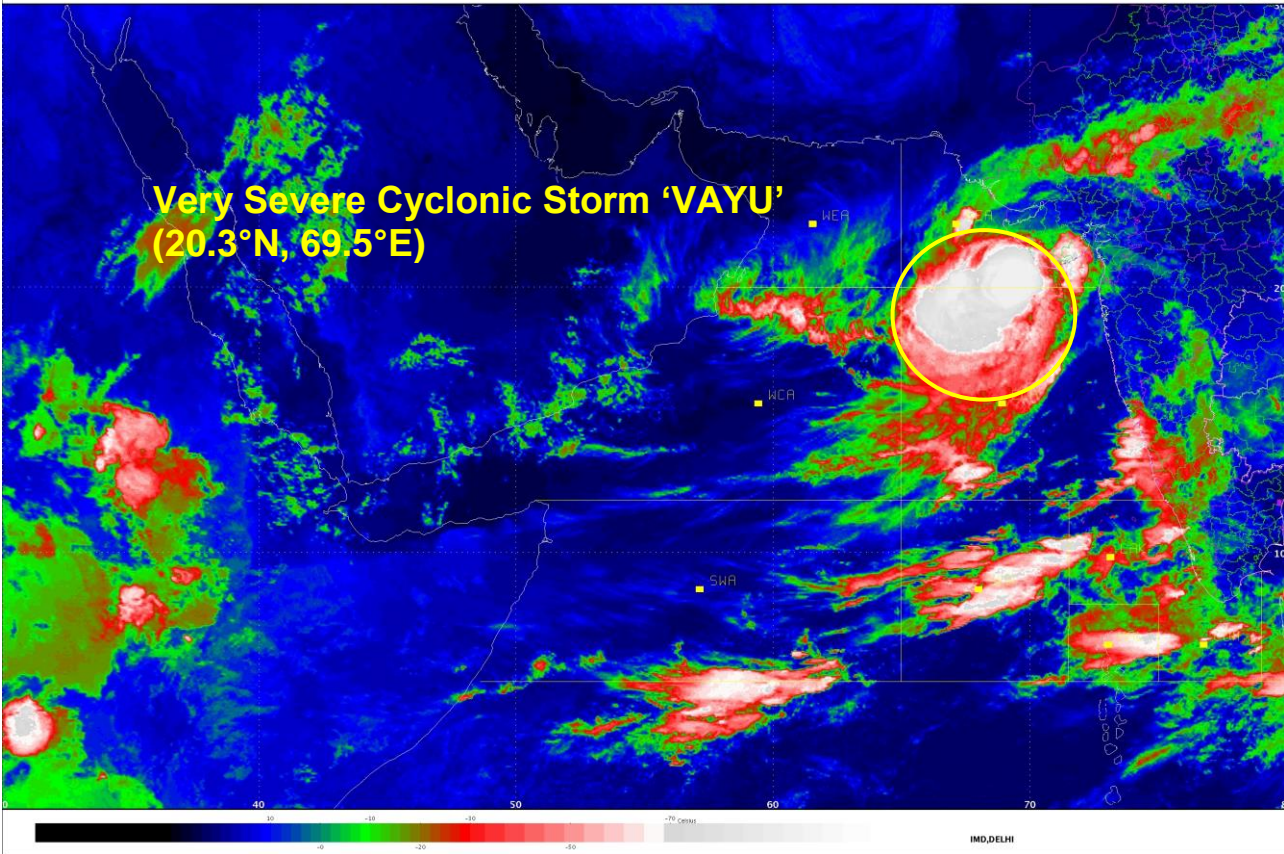
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY HAS DECREASED AND NOW IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME.

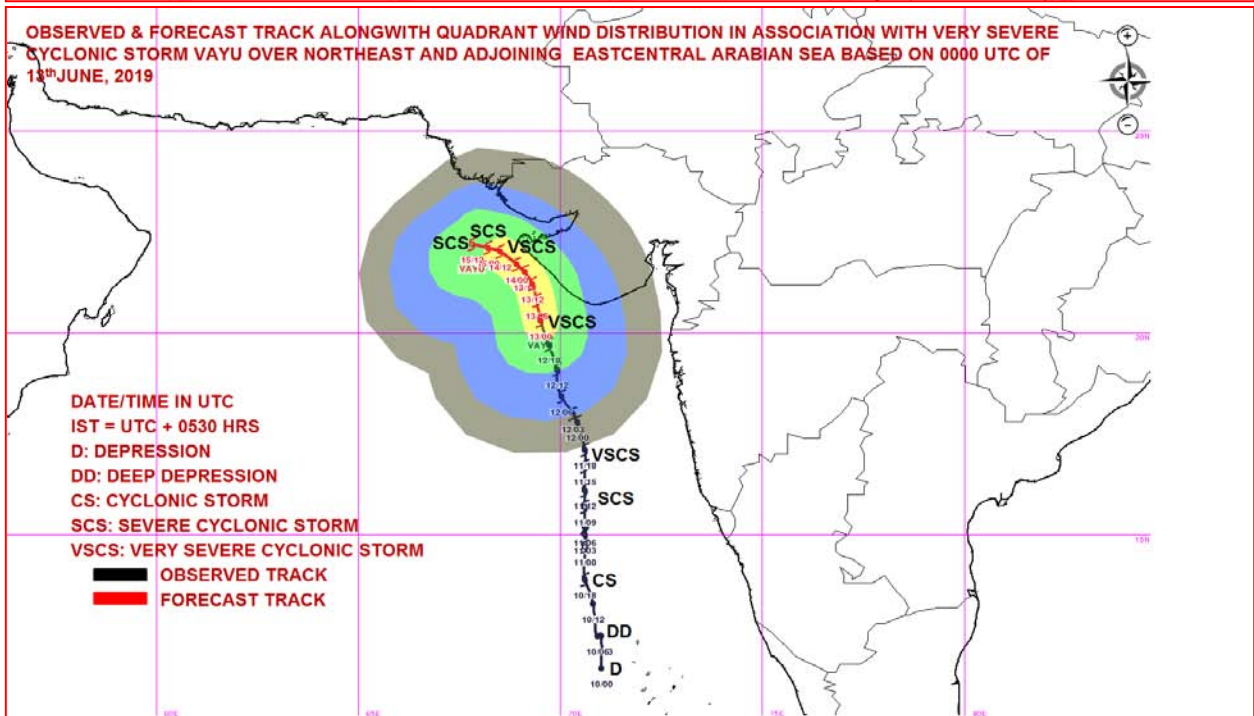
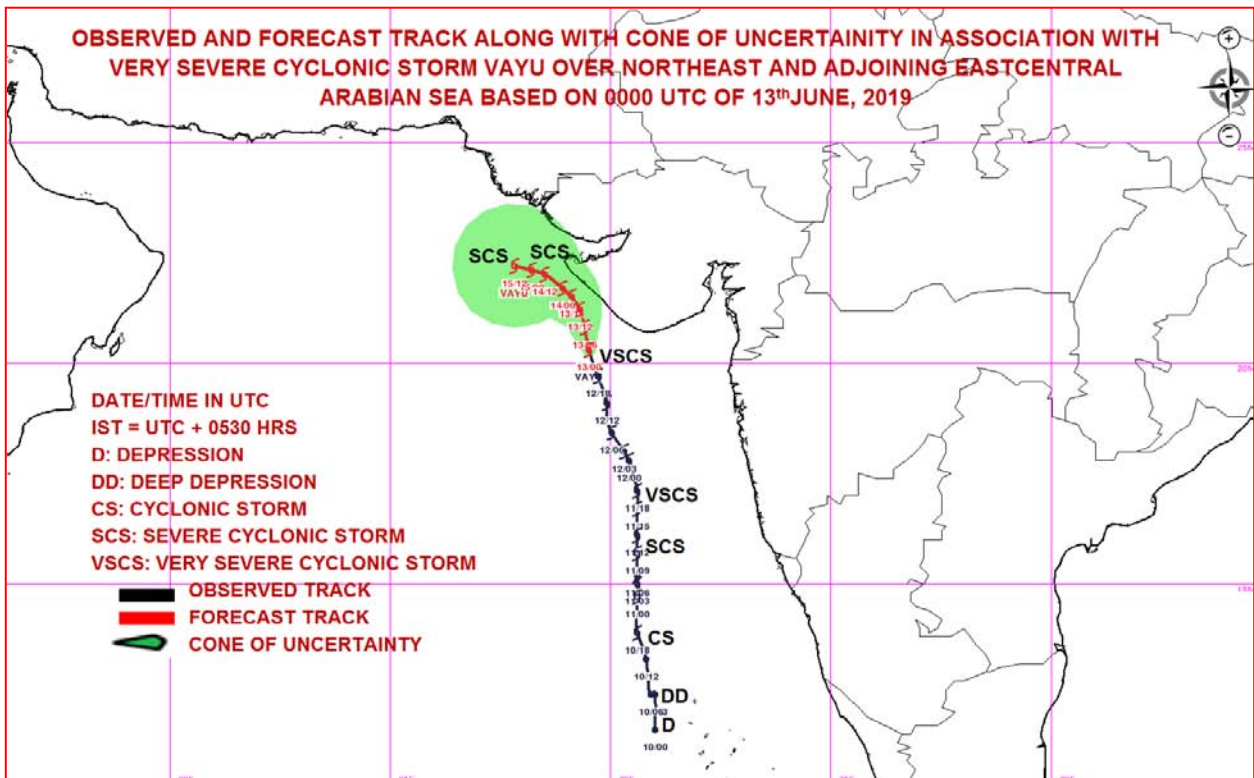
(SUNITHA DEVI)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



MSW(knot)/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 No. 17 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0700 UTC OF 13.06.2019 BASED ON 0300 UTC OF 13.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0300 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.4°N AND LONGITUDE 69.4°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 160 KM SOUTH-SOUTHWEST OF DIU, 110 KM SOUTHWEST OF VERAVAL (GUJARAT) AND 140 KM NEARLY SOUTH OF PORBANDAR (GUJARAT).

IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME TIME AND THEN NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, DIU, JUNAGARH, PORBANDAR AND DEVBHOOMI DWARKA WITH WIND SPEED 135-145 KMPH GUSTING TO 160 KMPH FROM AFTERNOON OF 13TH JUNE 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
13.06.19/0300	20.4/69.4	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/0600	20.8/69.4	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1200	21.2/69.3	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1800	21.5/69.1	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0000	21.7/68.9	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1200	22.0/68.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	22.1/68.2	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1200	22.2/67.8	100-110 gusting to 125	Severe Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17°N TO 21.5°N LONG 64.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 0300 UTC OF 13TH JUNE, VERAVAL (42909) (GUJARAT) REPORTED AND PORBANDAR PORBANDAR (42830) (GUJARAT) SHOW 24-HOUR PRESSURE FALL OF 6.0 & 4.9 HPA AND WIND DIRECTION/SPEED 120°/20 & 20°/25 KTS RESPECTIVELY.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 4 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND INTENSIFICATION OF THE SYSTEM OVER ARABIAN SEA.

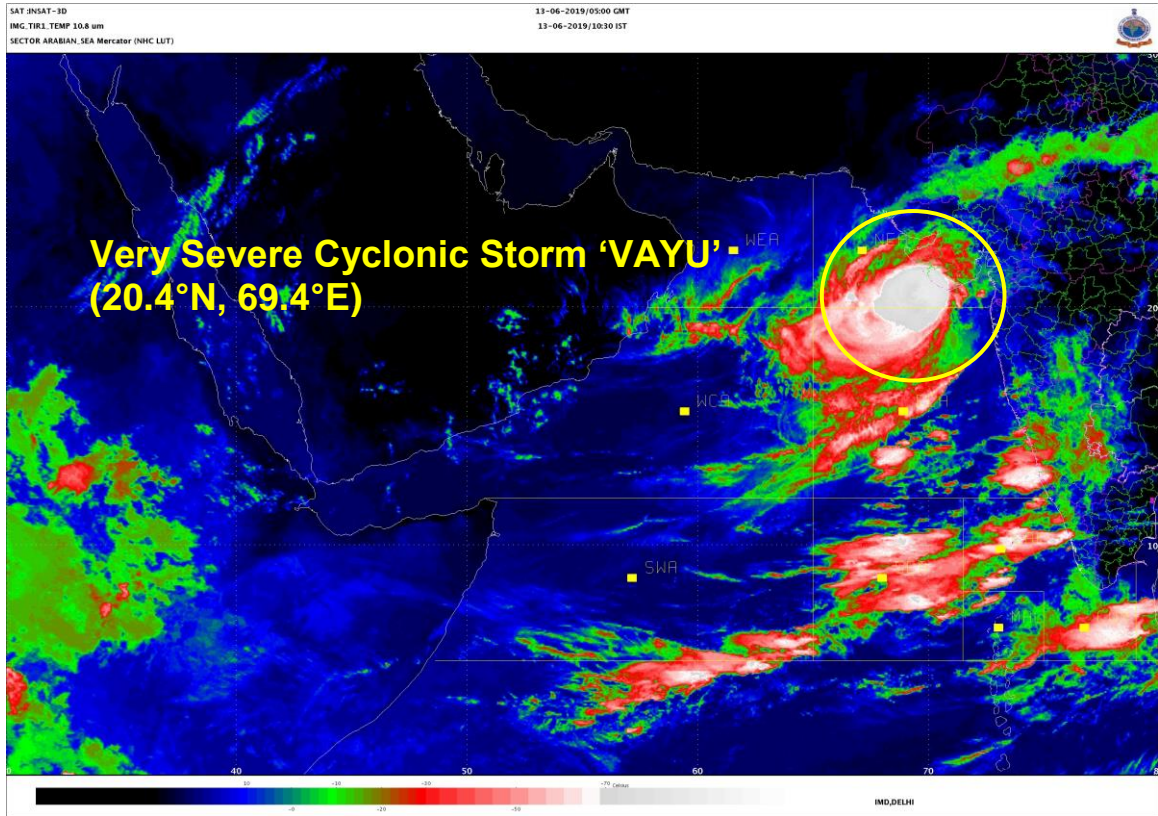
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 20° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND NOW IS AROUND 300 X10⁻⁵ SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 30 X10⁻⁵ S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 30 X10⁻⁵S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS GRADUALLY COMING UNDER THE INFLUENCE OF THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTH-NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME.

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

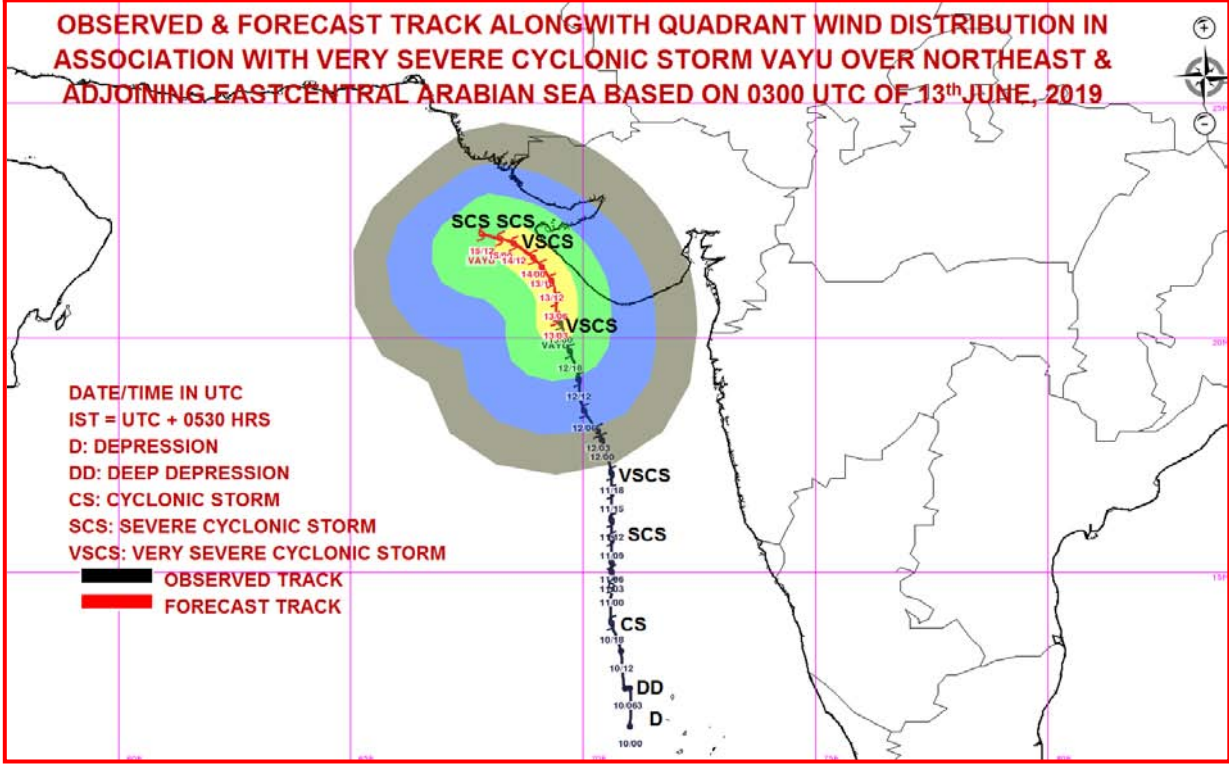
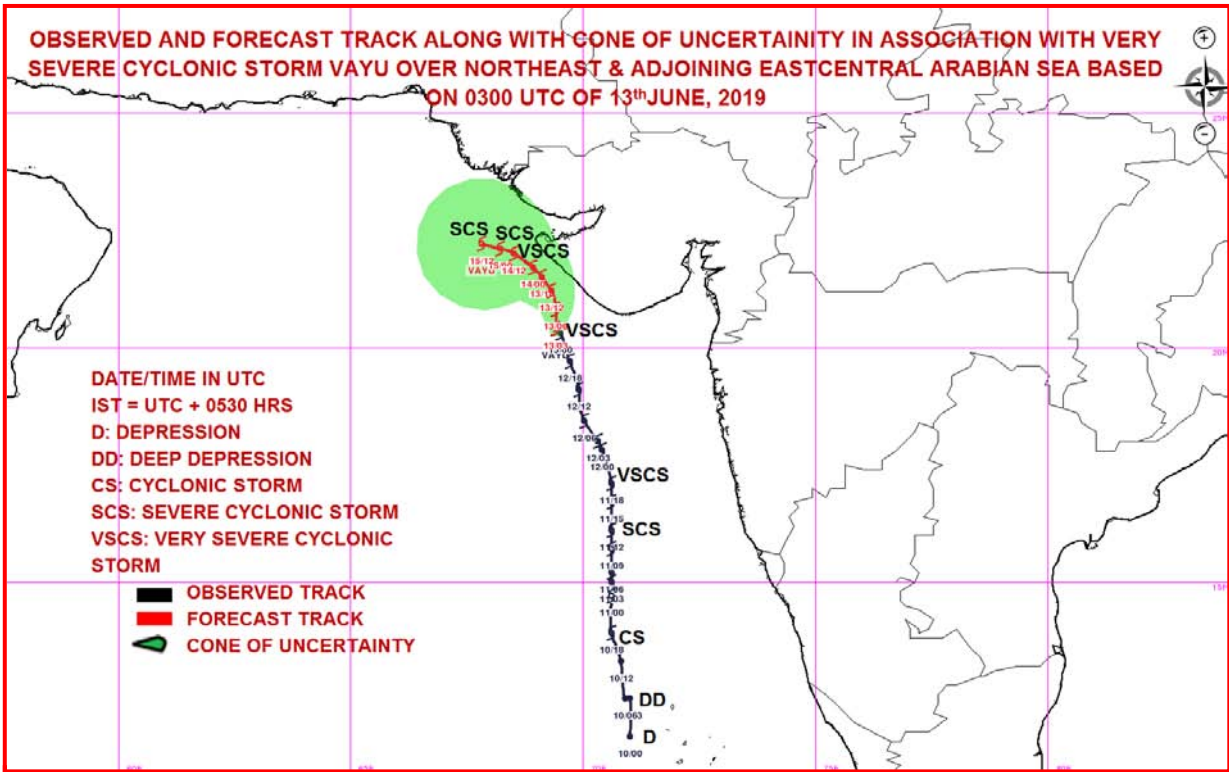
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot/kmph)	Impact	Action
28-33(51-62)	Very rough seas	Total suspension of fishing operations
64-89(63-91)	Very to very High seas	Total suspension of fishing operations
64-89(92-117)	Very High seas	Total suspension of fishing operations
64-89(118-166)	Very High seas	Total suspension of fishing operations

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.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 No. 18 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0900 UTC OF 13.06.2019 BASED ON 0600 UTC OF 13.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTHWESTWARDS WITH A SPEED OF ABOUT 05 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0600 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.5°N AND LONGITUDE 69.3°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 170 KM SOUTH-SOUTHWEST OF DIU (42914), 120 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 130 KM NEARLY SOUTH OF PORBANDAR (42830)(GUJARAT).

IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME TIME AND THEN NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, DIU, JUNAGARH, PORBANDAR AND DEVBHOOMI DWARKA DISTRICTS OF GUJARAT STATE WITH WIND SPEED 90-100 KMPH GUSTING TO 110 KMPH 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
13.06.19/0600	20.5/69.3	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1200	20.1/69.0	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1800	21.3/68.7	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0000	21.5/68.4	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0600	21.6/68.1	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	21.7/67.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	21.8/67.5	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1800	21.8/67.2	100-110 gusting to 125	Severe Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 0600 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17°N TO 21.5°N LONG 64.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 0600 UTC OF 13TH JUNE, VERAVAL (42909) (GUJARAT) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.4 HPA AND MEAN SEA LEVEL WIND OF 110/23 KNOTS AND PORBANDAR (42830)

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

(GUJARAT) REPORTD A MEAN SEA LEVEL PRESSURE OF 995.5 HPA AND WIND DIRECTION/SPEED 020°/25 KTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

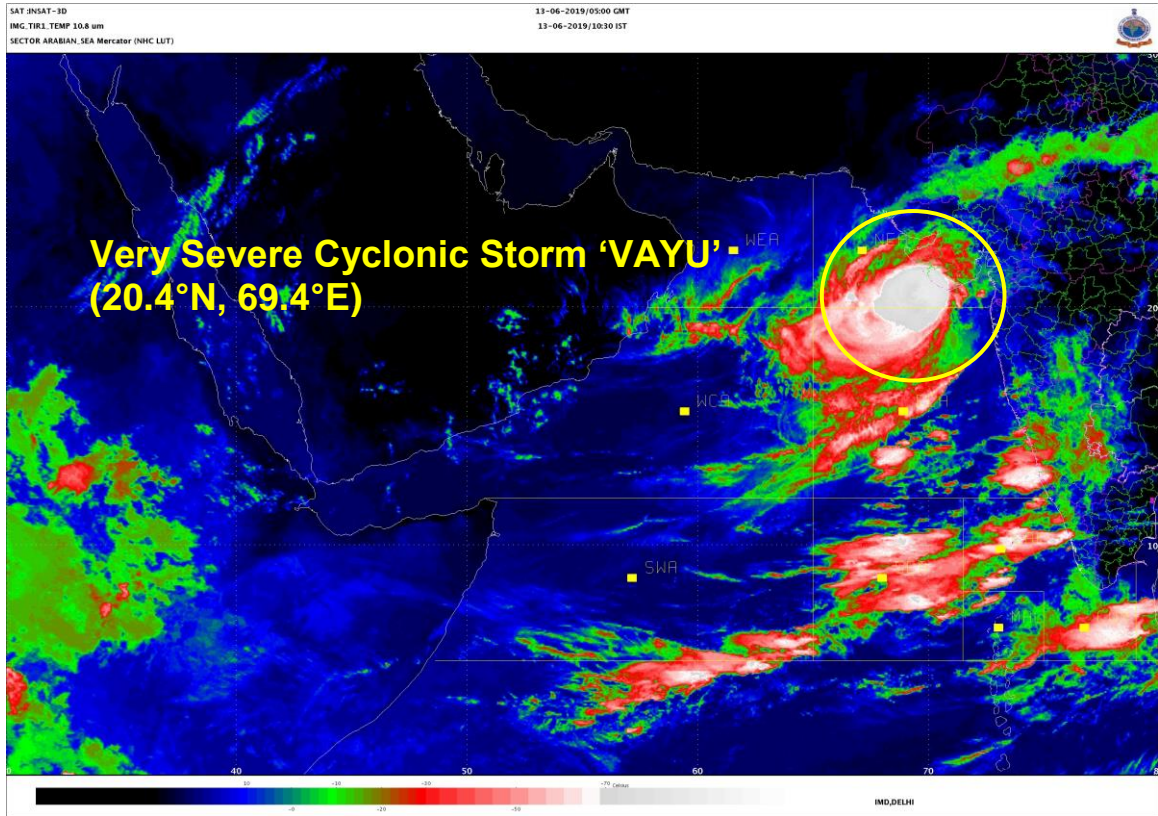
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 21° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND NOW IS AROUND 300 X10⁻⁵ SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 30 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNNG OF THE SYSTEM.

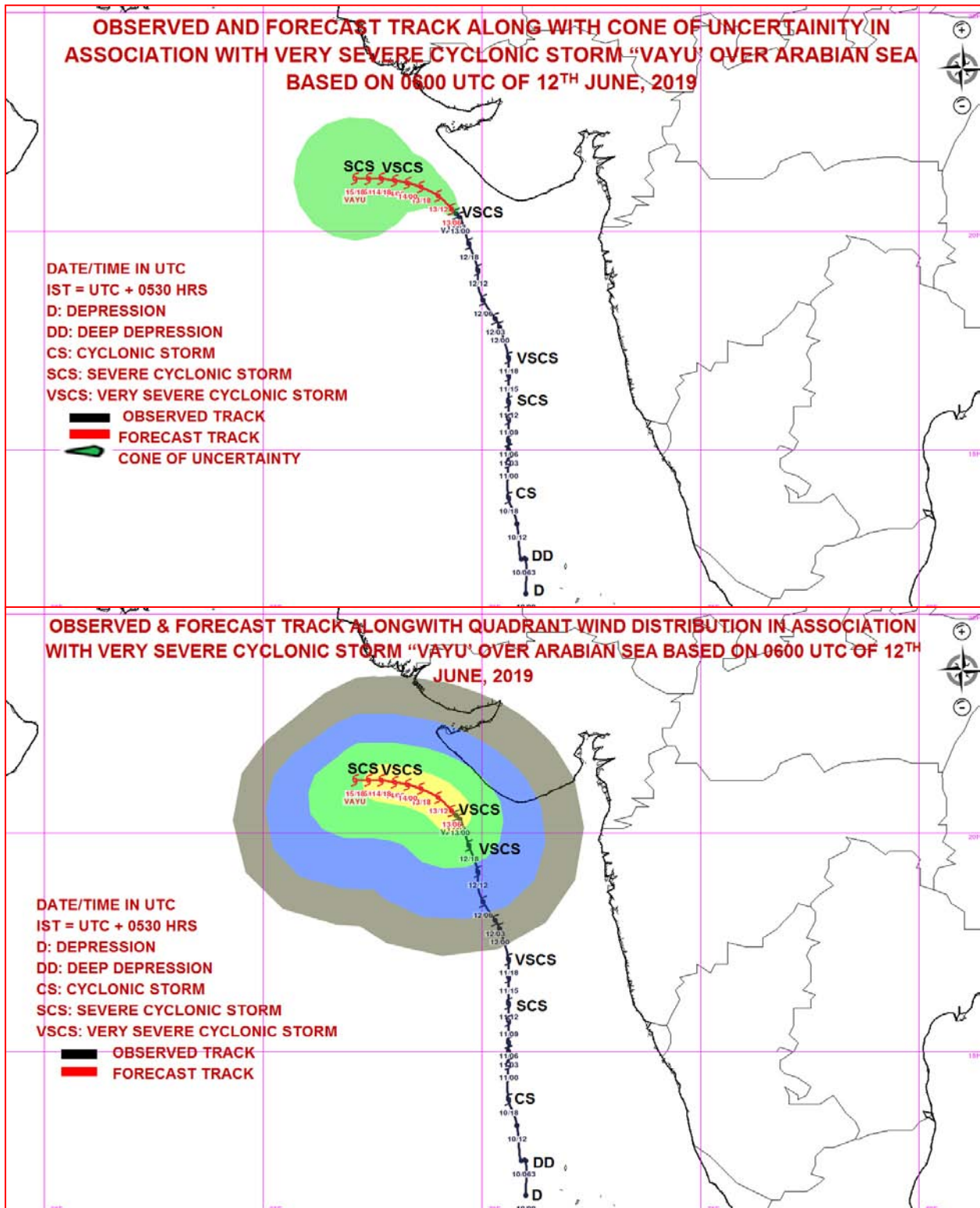
(NEETHA K GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



MSW(knot)/kmph)	Impact	Action
28-33 /(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 NO. 19 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1400 UTC OF 13.06.2019 BASED ON 0900 UTC OF 13.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTHWESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0900 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 69.1°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 190 KM WEST OF DIU, 130 KM WEST-SOUTHWEST OF VERAVAL (42909) AND 120 KM NEARLY SOUTH OF PORBANDAR (42830).

IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME TIME AND THEN NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, DIU, JUNAGARH, PORBANDAR AND DEVBHOOI DWARKA WITH WIND SPEED 90-100 KMPH GUSTING TO 110 KMPH 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
13.06.19/0900	20.7/69.1	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
13.06.19/1200	21.1/69.0	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC STORM
13.06.19/1800	21.3/68.7	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
14.06.19/0000	21.5/68.4	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC STORM
14.06.19/0600	21.6/68.1	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
14.06.19/1800	21.7/67.8	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
15.06.19/0600	21.8/67.5	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
15.06.19/1800	21.8/67.2	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM

REMARKS:

AS PER SATELLITE IMAGERY OF 0900 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17°N TO 21.5°N LONG 64.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

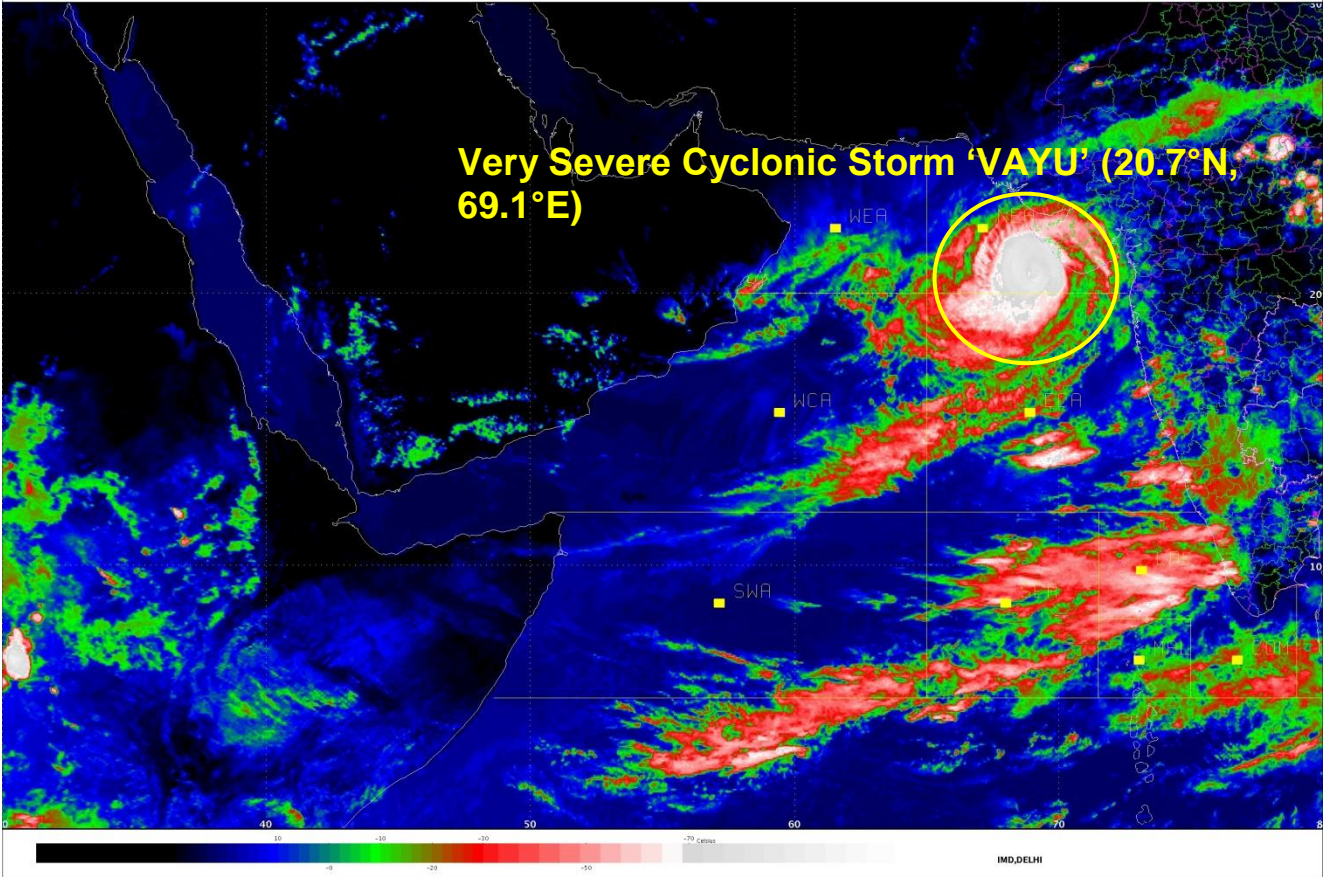
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 21° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND NOW IS AROUND 300 X10⁻⁵ SEC⁻¹ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 30 X10⁻⁵ S⁻¹ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10⁻⁵S⁻¹ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

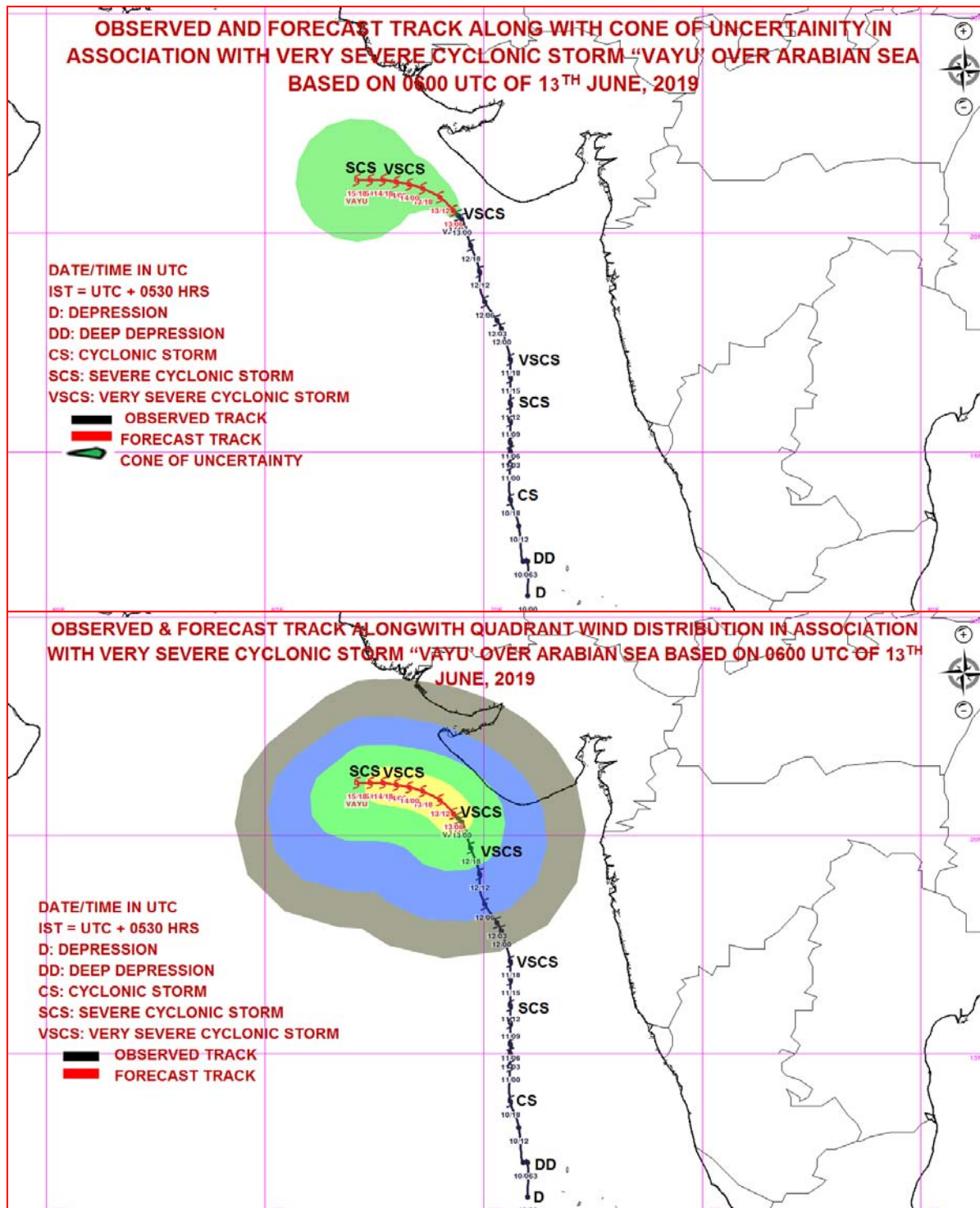
(NARESH KUMAR)
SCIENTIST-E, RSMC, NEW DELHI

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%



MSW(knot)/kmph)	Impact	Action
28-33 /(51–62)	Very rough seas.	Total suspension of fishing operations
34-47/(63-91)	High to very high seas	Total suspension of fishing operations
48-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.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 NO. 20 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1530 UTC OF 13.06.2019 BASED ON 1200 UTC OF 13.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NORTHWESTWARDS WITH A SPEED OF ABOUT 09 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 69.0°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 200 KM WEST-SOUTHWEST OF DIU, 130 KM WEST OF VERAVAL (42909) (GUJARAT) AND 100 KM SOUTH-SOUTHWEST OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME TIME AND THEN WEST-NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, JUNAGARH, PORBANDAR AND DEVBHOO MI DWARKA WITH WIND SPEED 70-80 KMPH GUSTING TO 90 KMPH 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
13.06.19/1200	20.9/69.0	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1800	21.3/68.6	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0000	21.5/68.3	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0600	21.6/68.0	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1200	21.7/67.7	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0000	21.8/67.4	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1200	21.8/67.1	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/0000	21.8/66.8	90-100 gusting to 115	Severe Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17°N TO 21.5°N LONG 64.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 1200 UTC OF 13TH JUNE, A SHIP LOCATED AT 18°52'N/71°24' REPORTED MEAN SEA LEVEL PRESSURE OF 998.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 220°/26 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

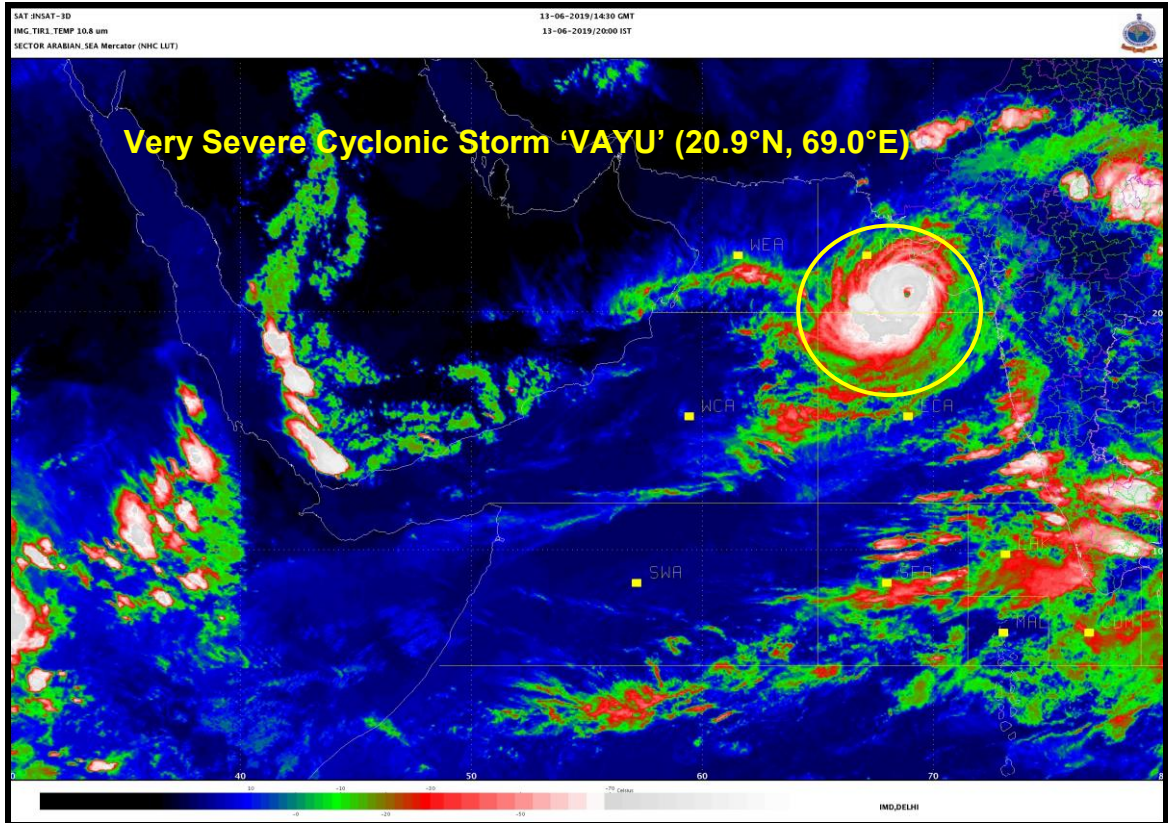
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 21° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS DECREASED AND NOW IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

**(DR PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI**

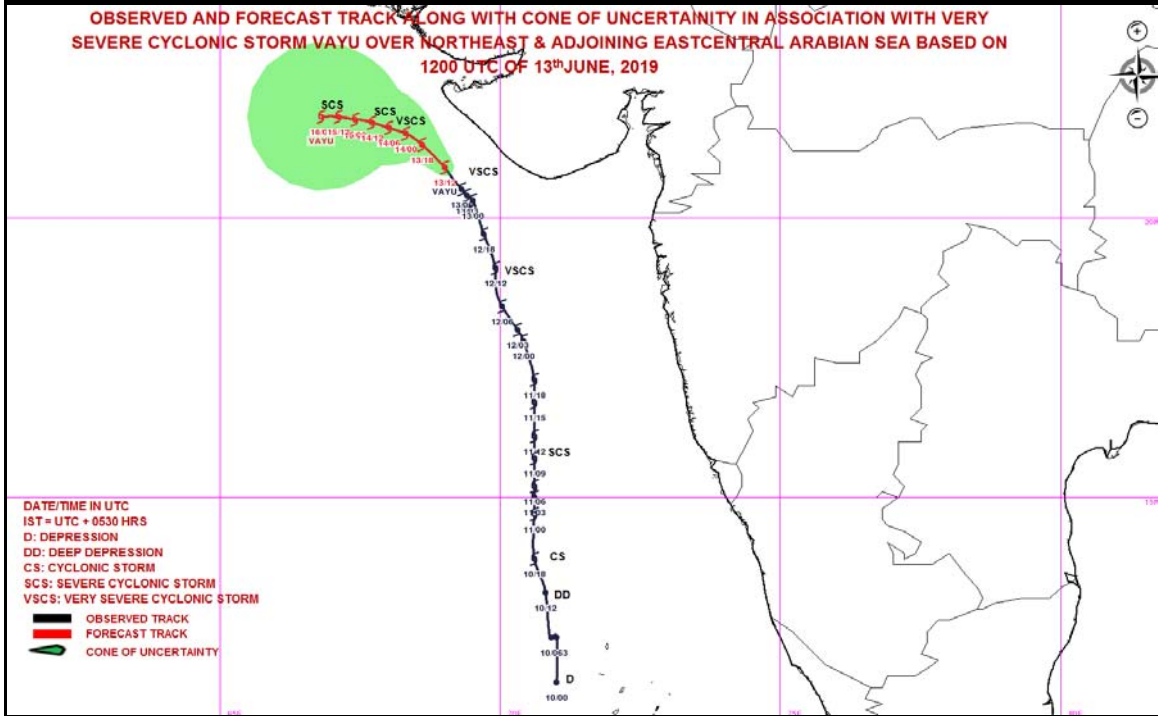
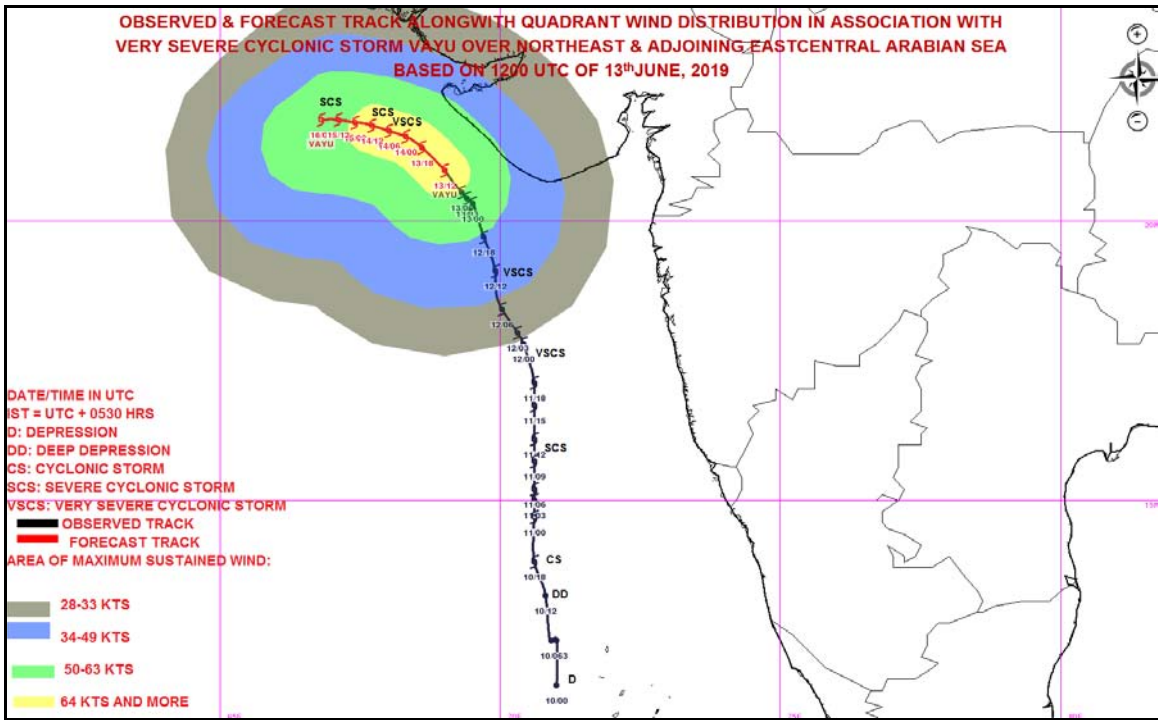
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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

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.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 NO. 21 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1700 UTC OF 13.06.2019 BASED ON 1500 UTC OF 13.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1500 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 68.8°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 220 KM WEST OF DIU, 160 KM WEST OF VERAVAL (42909) (GUJARAT) AND 120 KM SOUTHWEST OF PORBANDAR (42830) (GUJARAT).

IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME TIME AND THEN WEST-NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING GIR SOMNATH, JUNAGARH, PORBANDAR AND DEVBHOOI DWARKA WITH WIND SPEED 65-75 KMPH GUSTING TO 85 KMPH 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
13.06.19/1500	20.9/68.8	135-145 gusting to 160	Very Severe Cyclonic Storm
13.06.19/1800	21.3/68.6	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0000	21.5/68.3	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/0600	21.6/68.0	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1200	21.7/67.7	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0000	21.8/67.4	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1200	21.8/67.1	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/0000	21.8/66.8	90-100 gusting to 115	Severe Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 1500 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17°N TO 21.5°N LONG 64.5°E TO 71.5°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 1500 UTC OF 13TH JUNE, A SHIP LOCATED AT 19.3°N/67.3°E REPORTED MEAN SEA LEVEL PRESSURE OF 997.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/33 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

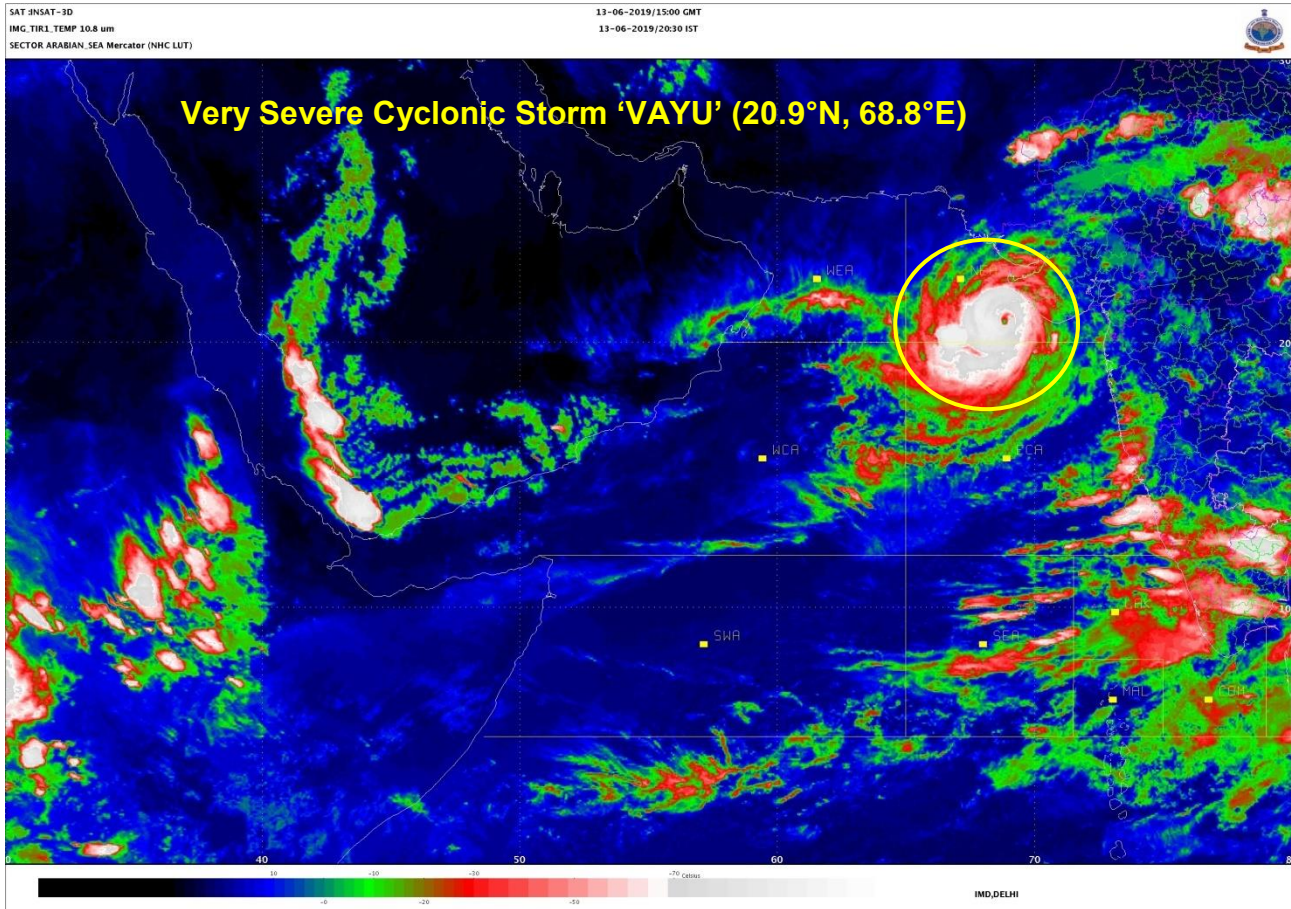
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 21° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS DECREASED AND NOW IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

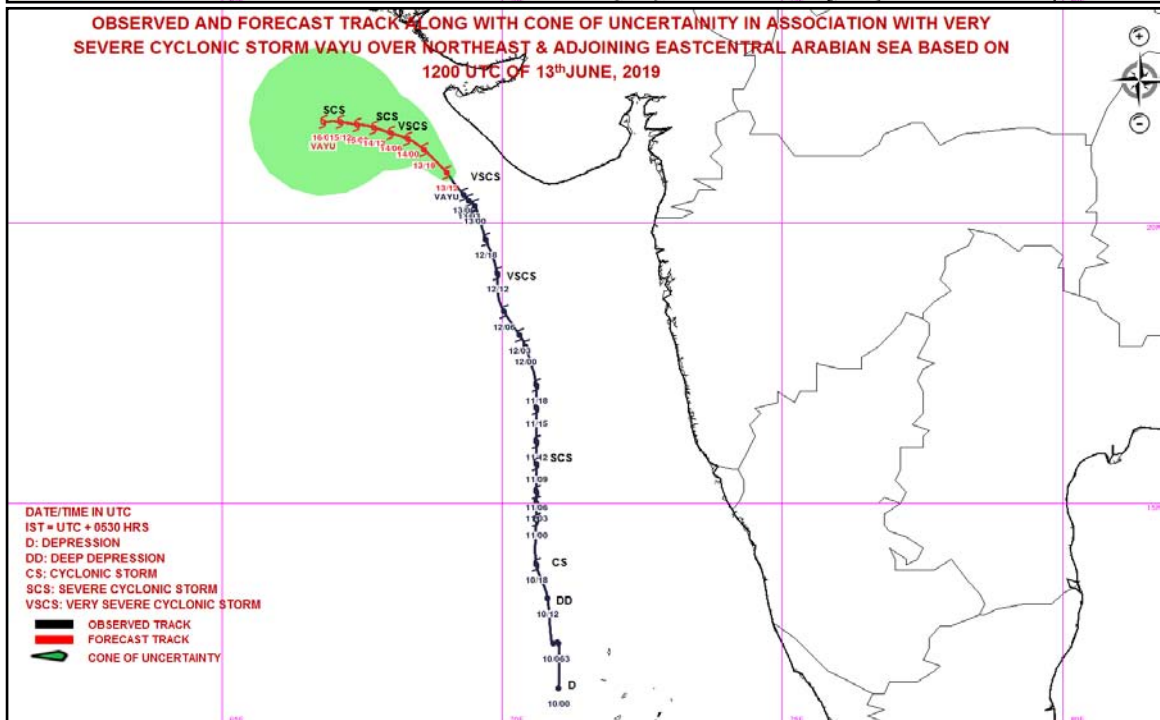
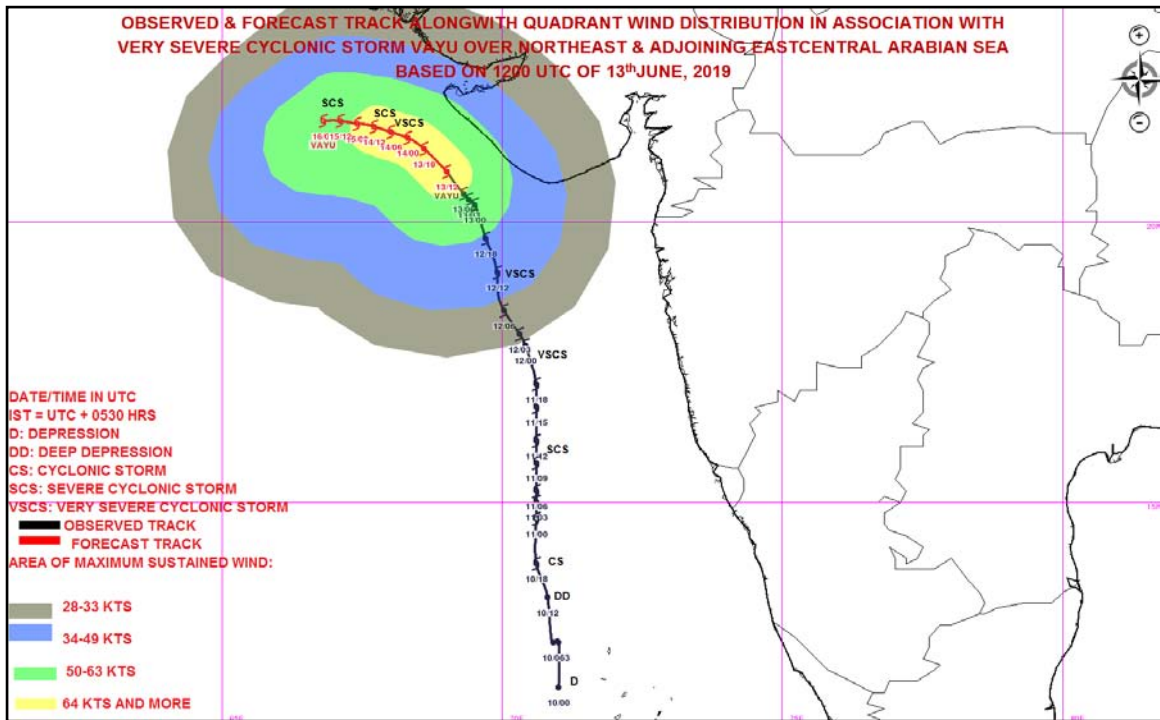
**(DR PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



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

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.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 NO. 22 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2100 UTC OF 13.06.2019 BASED ON 1800 UTC OF 13.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 03 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1800 UTC OF TODAY, THE 13TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 68.8°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 220 KM WEST OF DIU, 160 KM WEST OF VERAVAL (42909) (GUJARAT) AND 120 KM SOUTHWEST OF PORBANDAR (42830) (GUJARAT).

THE SYSTEM IS MOVING WEST-NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING PORBANDAR & DEVBHOOMI DWARKA WITH WIND SPEED 65-75 KMPH GUSTING TO 85 KMPH AND GIR SOMNATH & JUNAGARH WITH WIND SPEED 45-55 KMPH GUSTING TO 65 KMPH. IT IS VERY LIKELY TO CONTINUE TO AFFECT THESE DISTRICTS DURING NEXT 12 HOURS AND WIND SPEED OVER THESE DISTRICTS IS VERY LIKELY TO DECREASE GRADUALLY THEREAFTER.

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
13.06.19/1800	20.9/68.8	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0000	21.0/68.5	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0600	21.1/68.2	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1200	21.2/67.9	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	21.3/67.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	21.4/66.9	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1800	21.5/66.4	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/0600	21.5/66.0	80-90 gusting to 100	Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 18.5°N TO 22.0°N LONG 65.5°E TO 70.0°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 1700 UTC OF 13TH JUNE, A SHIP LOCATED AT 19.3°N/67.6°E REPORTED MEAN SEA LEVEL PRESSURE OF 996.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 260°/20 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 21° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

**(DR PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI**

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

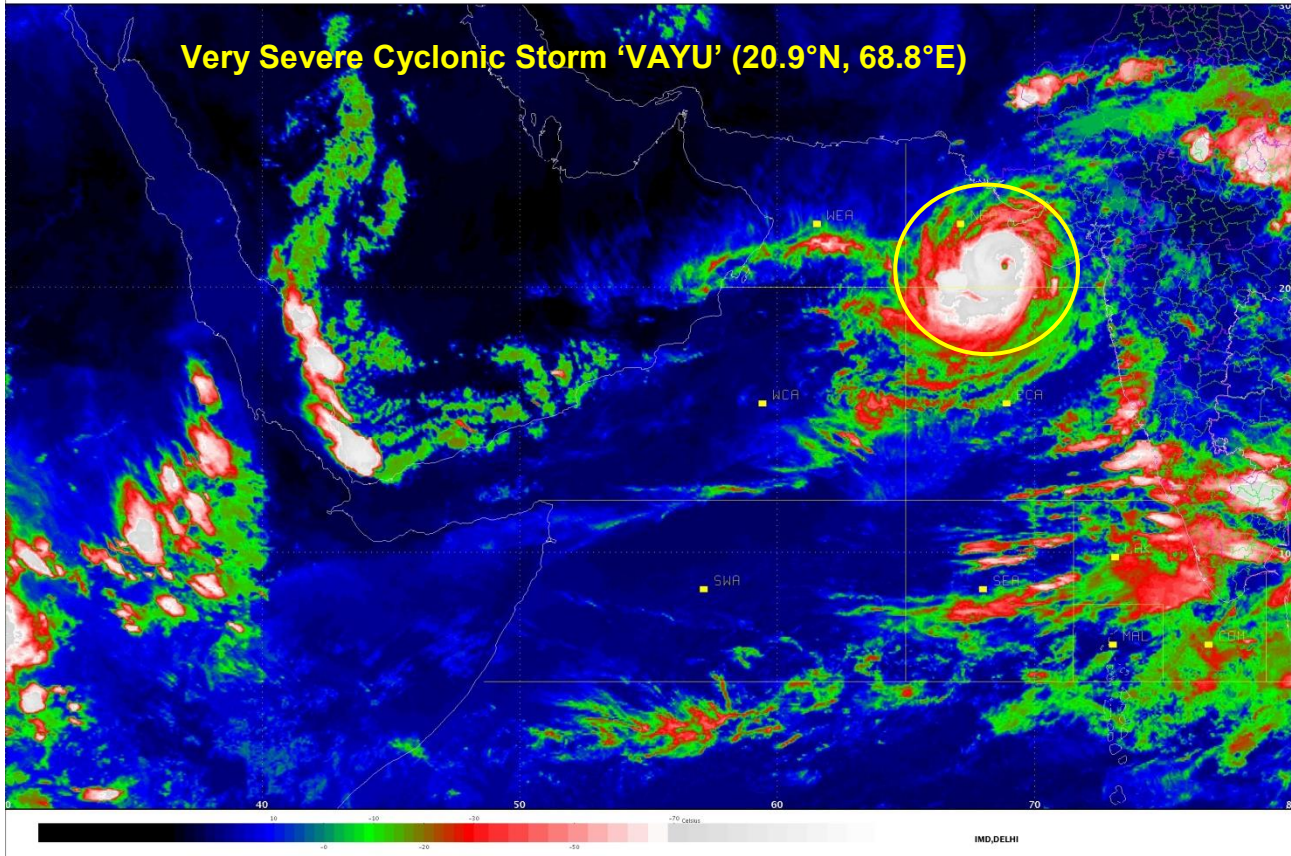
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT INSAT-3D
IMG_TIR1_TEMP 10.8 um
SECTOR ARABIAN_SEA Mercator (NHC LUT)

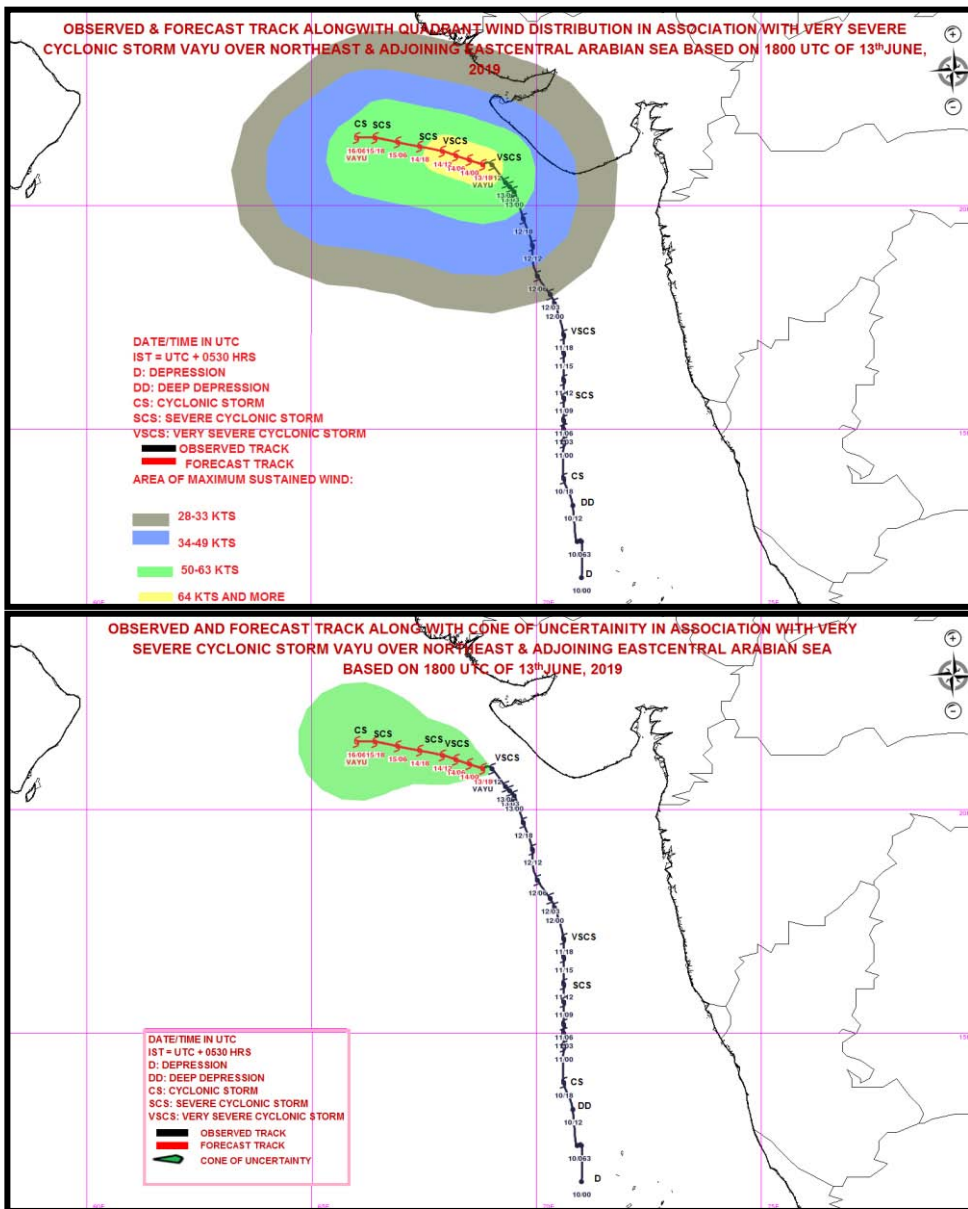
13-06-2019/15:00 GMT
13-06-2019/20:30 IST



Very Severe Cyclonic Storm 'VAYU' (20.9°N, 68.8°E)



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



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

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.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 NO. 23 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2300 UTC OF 13.06.2019 BASED ON 2100 UTC OF 13.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 03 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 2100 UTC, THE 13TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 68.6°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 130 KM SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 175 KM WEST OF VERAVAL (42909) (GUJARAT) AND 240 KM WEST OF DIU.

THE SYSTEM IS MOVING WEST-NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING PORBANDAR & DEVBHOOMI DWARKA WITH WIND SPEED 65-75 KMPH GUSTING TO 85 KMPH AND GIR SOMNATH & JUNAGARH WITH WIND SPEED 45-55 KMPH GUSTING TO 65 KMPH. IT IS VERY LIKELY TO CONTINUE TO AFFECT THESE DISTRICTS DURING NEXT 12 HOURS AND WIND SPEED OVER THESE DISTRICTS IS VERY LIKELY TO DECREASE GRADUALLY THEREAFTER.

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
13.06.19/2100	20.9/68.6	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0000	21.0/68.5	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0600	21.1/68.2	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1200	21.2/67.9	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	21.3/67.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	21.4/66.9	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1800	21.5/66.4	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/0600	21.5/66.0	80-90 gusting to 100	Cyclonic Storm

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC ON 13TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 18.5°N TO 22.5°N LONG 65.5°E TO 70.0°E. MINIMUM CLOUD TOP TEMPERATURE IS -93° C.

AT 2100 UTC OF 13TH JUNE, A SHIP LOCATED AT 19.0°N/69.3°E REPORTED MEAN SEA LEVEL PRESSURE OF 994.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 240°/51 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

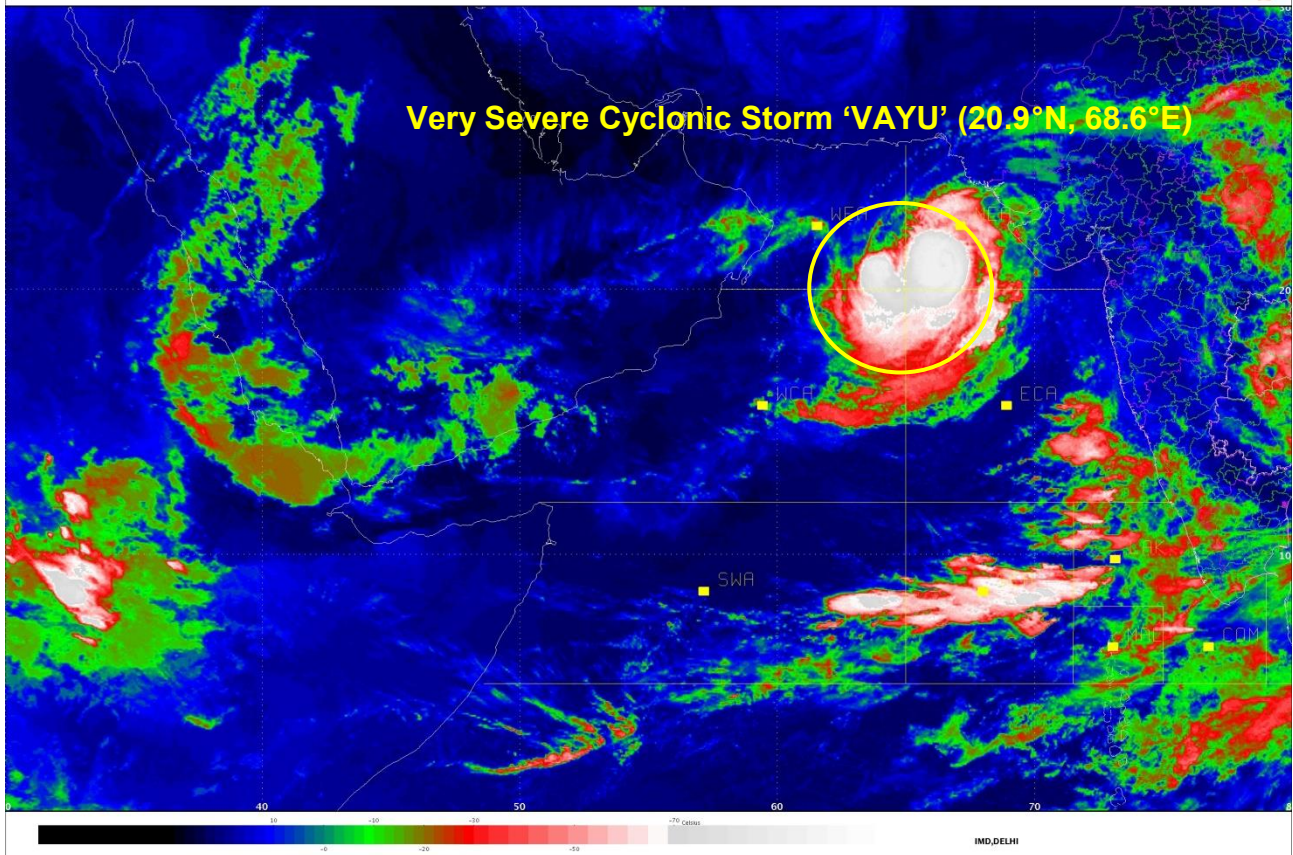
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 31°C OVER CENTRAL AND SOUTH ARABIAN SEA. IT DECREASES TO 29-30°C NEAR GUJARAT COAST. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² TO THE NORTH OF 21° N. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

**(DR PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI**

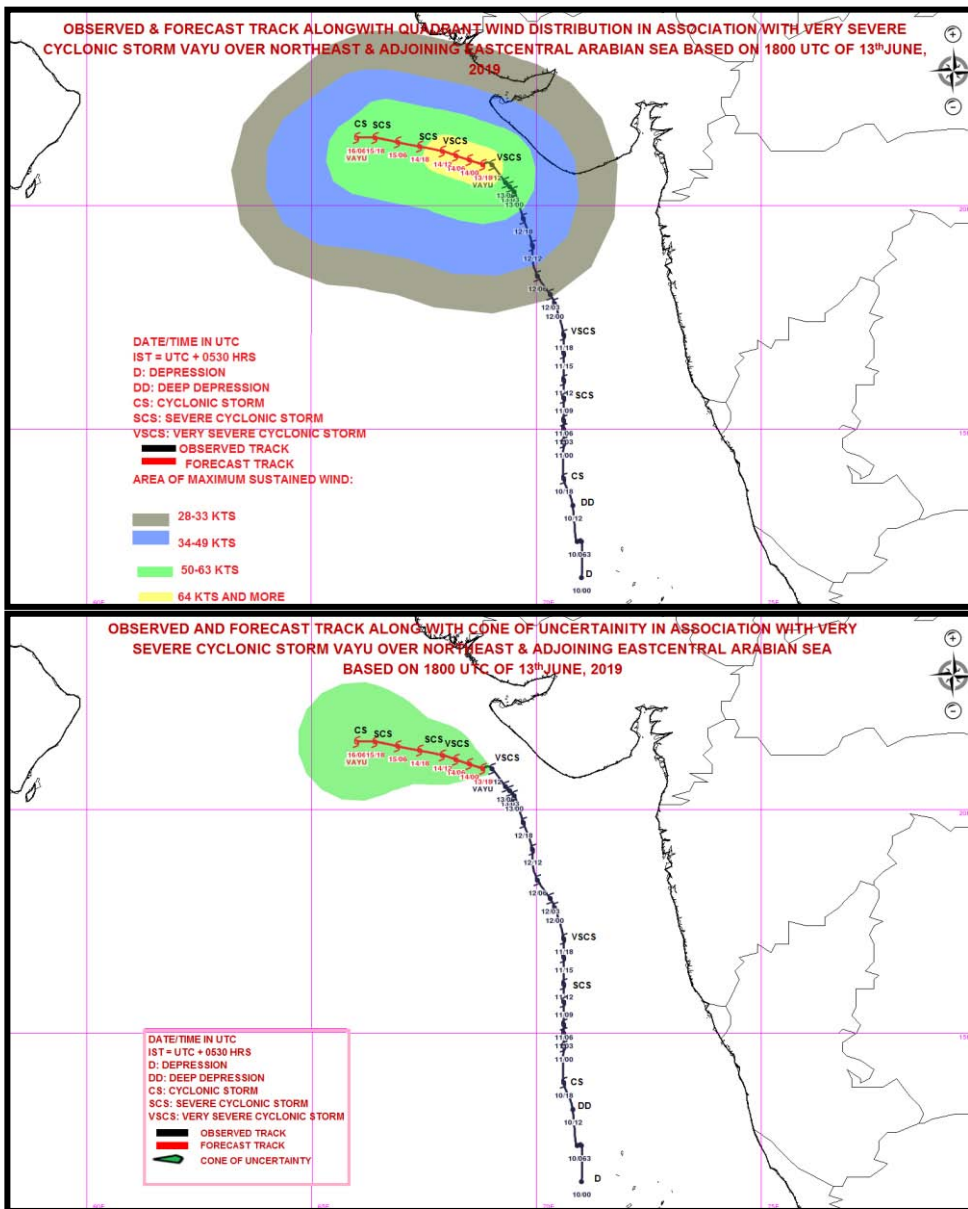
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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

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.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 NO. 24 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0300 UTC OF 14.06.2019 BASED ON 0000 UTC OF 14.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTNORTHWESTWARDS WITH A SPEED OF ABOUT 06 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0000 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 21.0°N AND LONGITUDE 68.5°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 130 KM SOUTHWEST OF PORBANDAR (GUJARAT), 185 KM WEST OF VERAVAL (GUJARAT) AND 250 KM WEST OF DIU.

THE SYSTEM IS MOVING WEST-NORTHWESTWARDS SKIRTING THE SAURASHTRA COAST AFFECTING PORBANDAR & DEVBHOOMI DWARKA WITH WIND SPEED 60-70 KMPH GUSTING TO 80 KMPH AND GIR SOMNATH & JUNAGARH WITH WIND SPEED 40-50 KMPH GUSTING TO 60 KMPH. IT IS VERY LIKELY TO CONTINUE TO AFFECT THESE DISTRICTS DURING NEXT 12 HOURS AND WIND SPEED OVER THESE DISTRICTS IS VERY LIKELY TO DECREASE GRADUALLY THEREAFTER.

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
14.06.19/0000	21.0/68.5	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0600	21.0/68.3	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1200	21.1/67.9	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	21.2/67.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0000	21.3/67.1	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1200	21.3/66.7	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/0000	21.4/66.2	80-90 gusting to 100	Cyclonic Storm
16.06.19/1200	21.4/66.1	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC ON 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17.5°N & 23.0°N LONG 64.0°E TO 70.5°E
AT 0000 UTC OF 14TH JUNE, A SHIP LOCATED AT 19.0°N/68.7°E REPORTED MEAN SEA LEVEL PRESSURE OF 993.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 240°/40 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 80 KNOTS GUSTING TO 90 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

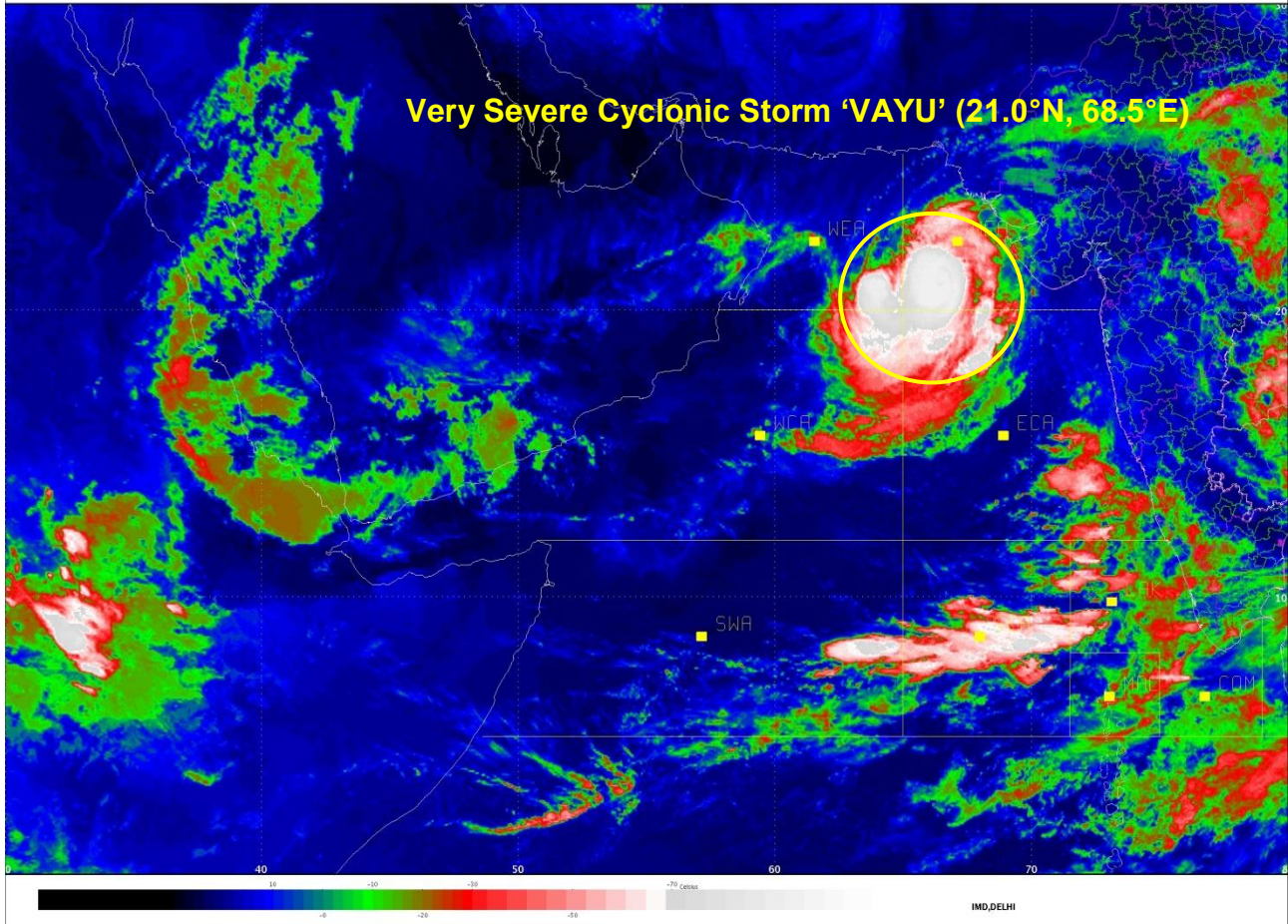
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (5-10 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A WEST-NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

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

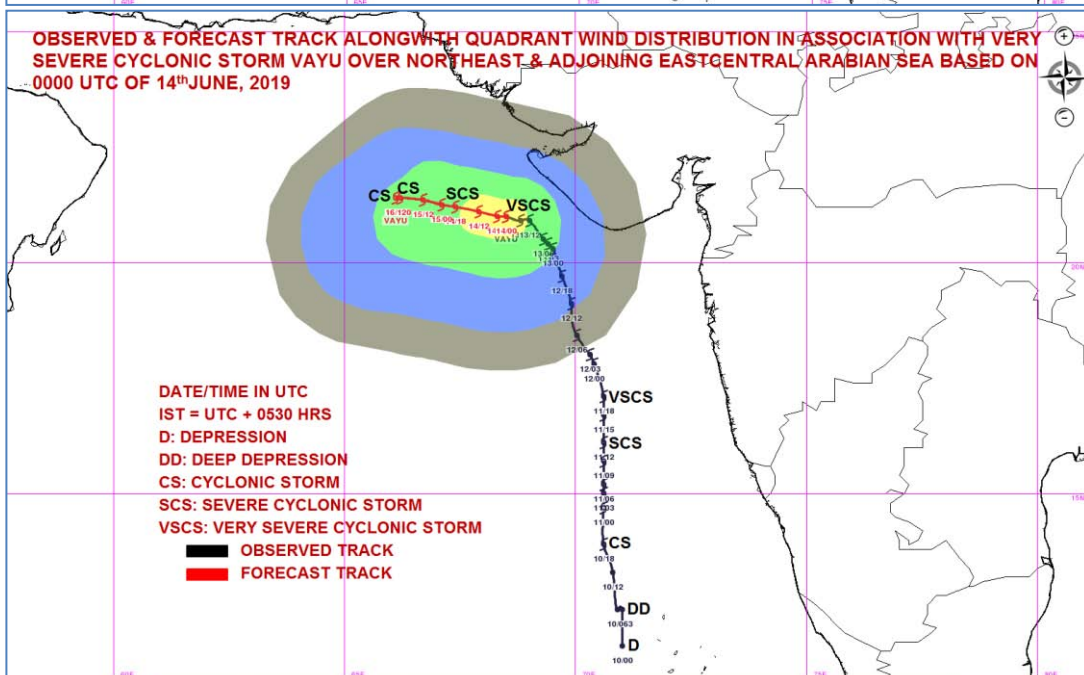
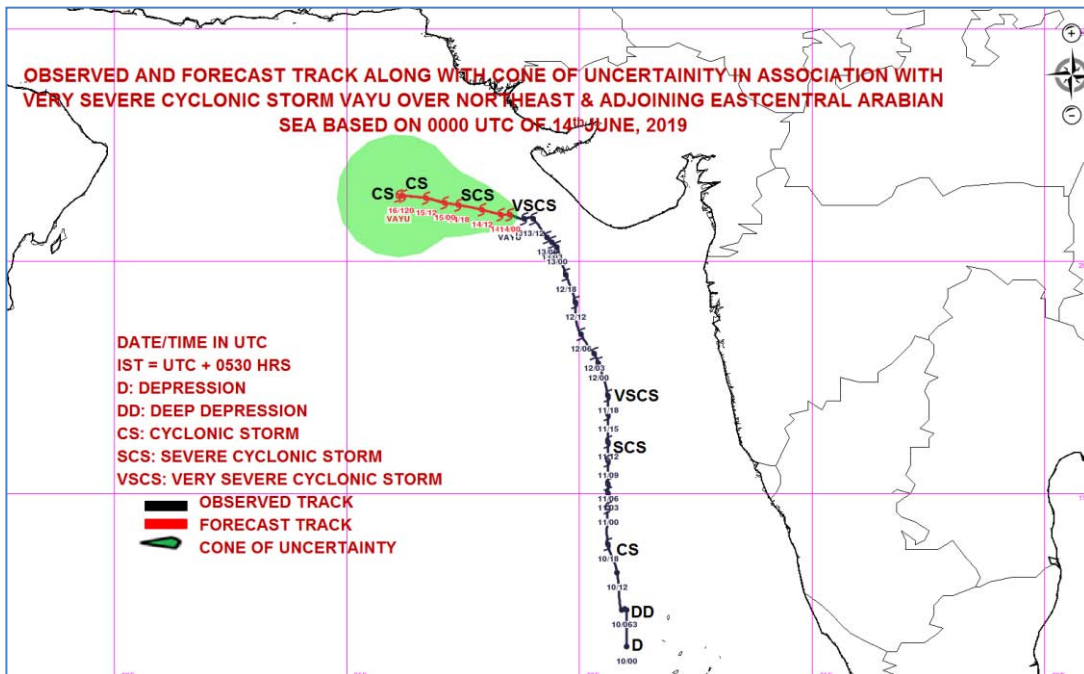
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot/kmph)	Impact	Action
28-33 / (51-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (63-91)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥ 118)	Phenomenal	Total suspension of fishing operations

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.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 NO. 25 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0700 UTC OF 14.06.2019 BASED ON 0300 UTC OF 14.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 04 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0300 UTC OF 14TH JUNE, 2019 NEAR LATITUDE 21.0°N AND LONGITUDE 68.3°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 150 KM WEST-SOUTHWEST OF PORBANDAR (GUJARAT), 210 KM WEST OF VERAVAL (GUJARAT) AND 270 KM WEST-NORTHWEST OF DIU.

THE SYSTEM IS MOVING NEARLY WEST-NORTHWESTWARDS AFFECTING PORBANDAR & DEVBHOOMI DWARKA WITH WIND SPEED 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH WITH WIND SPEED 30-40 KMPH GUSTING TO 50 KMPH. THE WIND SPEED OVER THESE DISTRICTS IS VERY LIKELY TO DECREASE GRADUALLY, AS THE SYSTEM IS MOVING AWAY FROM THE COAST.

!

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
14.06.19/0300	21.0/68.3	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/0600	21.0/68.3	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1200	21.1/67.9	120-130 gusting to 145	Very Severe Cyclonic Storm
14.06.19/1800	21.2/67.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0000	21.3/67.1	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1200	21.3/66.7	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/0000	21.4/66.2	80-90 gusting to 100	Cyclonic Storm
16.06.19/1200	21.4/66.1	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC ON 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17.5°N & 23.0°N LONG 64.0°E TO 70.5°E.

AT 0300 UTC OF 14TH JUNE, A SHIP LOCATED AT 19.0°N/68.0°E REPORTED MEAN SEA LEVEL PRESSURE OF 995.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 250°/35 KNOTS AND A BUOY LOCATED NEAR 18.5°N/67.5°E REPORTED MEAN SEA LEVEL PRESSURE OF 997.1 HPA AND MEAN SURFACE WIND SPEED OF 21 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 75 KNOTS GUSTING TO 85 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED SIGNIFICANTLY AND IS ABOUT $15 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE HAS INCREASED AND IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 22° N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A WEST-NORTHWESTWARD DIRECTION AND IS LIKELY TO FURTHER CONTINUE MOVING IN THE SAME DIRECTION FOR SOME MORE TIME AND ENTER INTO UNFAVOURABLE CONDITIONS LEADING TO GRADUAL WEAKNING OF THE SYSTEM.

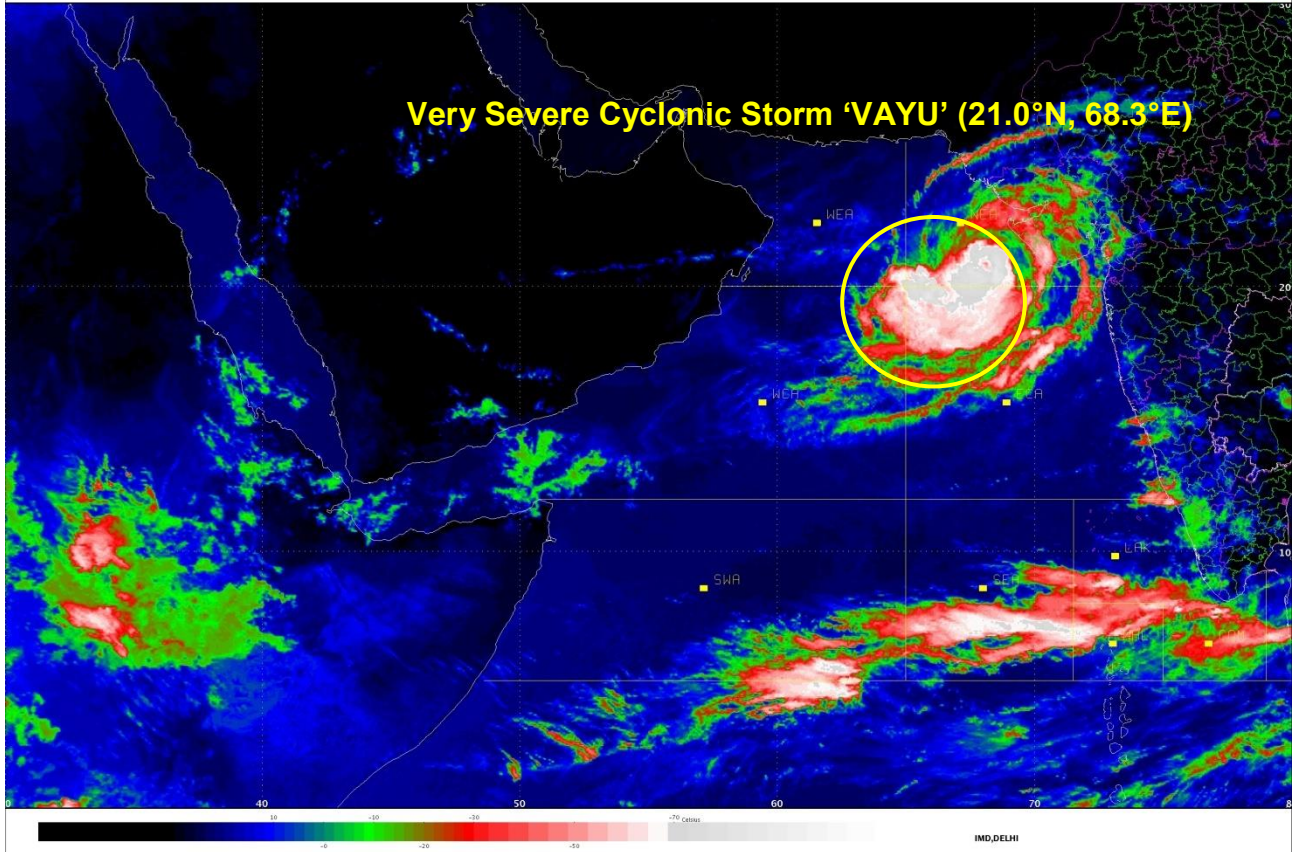
(SUNITHA DEVI)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

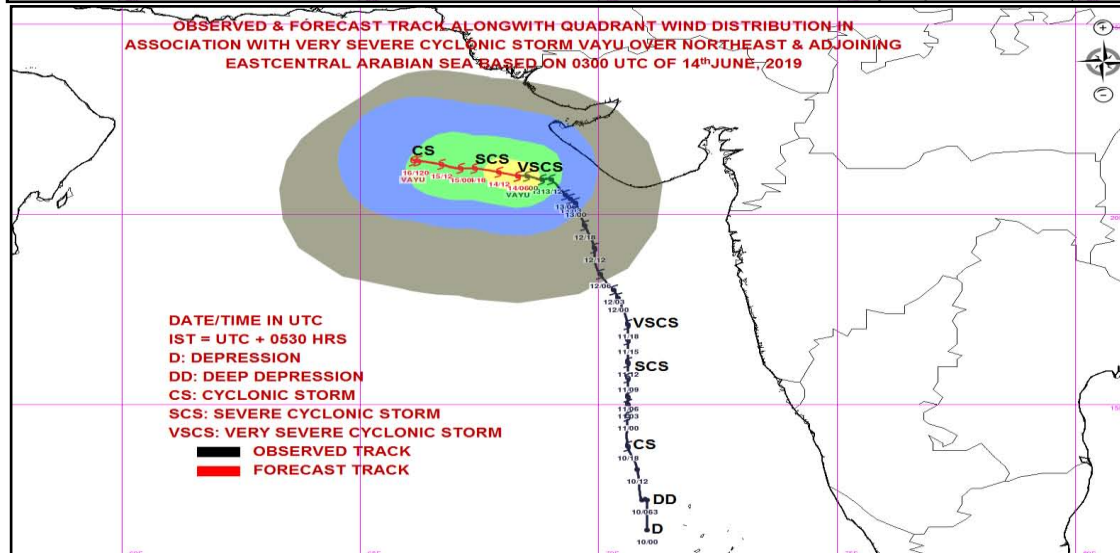
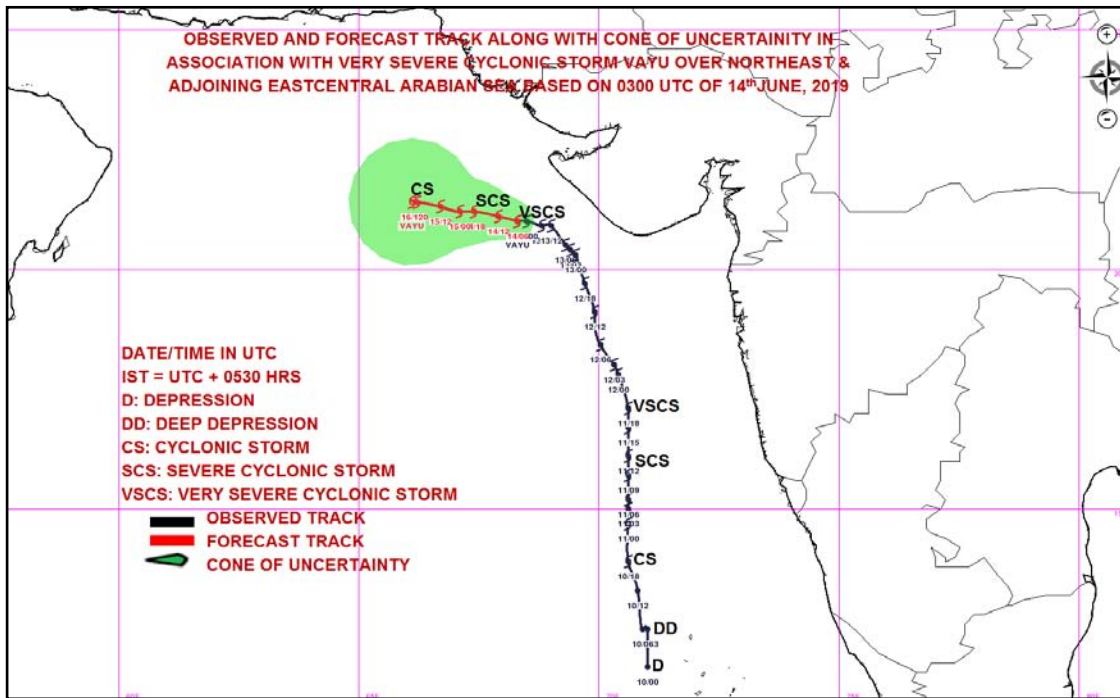
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT INSAT-3D
IMG_TIR1_TEMP 10.8 um
SECTOR ARABIAN_SEA Mercator (NHC LUT)

14-06-2019/06:00 GMT
14-06-2019/11:30 IST



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



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

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.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 NO. 26 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0900 UTC OF 14.06.2019 BASED ON 0600 UTC OF 14.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 05 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0600 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 21.0°N AND LONGITUDE 68.2°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 170 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 220 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 280 KM WEST-NORTHWEST OF DIU (42914).

THE SYSTEM IS MOVING NEARLY WESTWARDS AFFECTING PORBANDAR & DEVBHOOMI DWARKA DISTRICTS WITH WIND SPEED 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH DISTRICTS WITH WIND SPEED 30-40 KMPH GUSTING TO 50 KMPH. THE WIND SPEED OVER THESE DISTRICTS IS VERY LIKELY TO DECREASE GRADUALLY.

THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS AND RECURVE NORTHEASTWARDS THEREAFTER.

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
14.06.19/0600	21.0/68.2	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/1200	20.9/67.9	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/1800	20.8/67.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	20.7/67.2	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	20.7/66.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1800	20.8/66.0	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/0600	21.3/66.3	80-90 gusting to 100	Cyclonic Storm
16.06.19/1800	21.8/67.2	70-80 gusting to 90	Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 0600 UTC ON 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 19.6°N & 21.4°N LONG 67.0°E

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

TO 69.0°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C.

AT 0600 UTC OF 14TH JUNE, A SHIP LOCATED AT 19.2°N/67.5°E REPORTED MEAN SEA LEVEL PRESSURE OF 994.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 270°/38 KNOTS AND A SHIP LOCATED NEAR 20.0°N/70.6°E REPORTED MEAN SEA LEVEL PRESSURE OF 997.8 HPA AND MEAN SURFACE WIND SPEED OF 30 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 75 KNOTS GUSTING TO 85 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 48 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

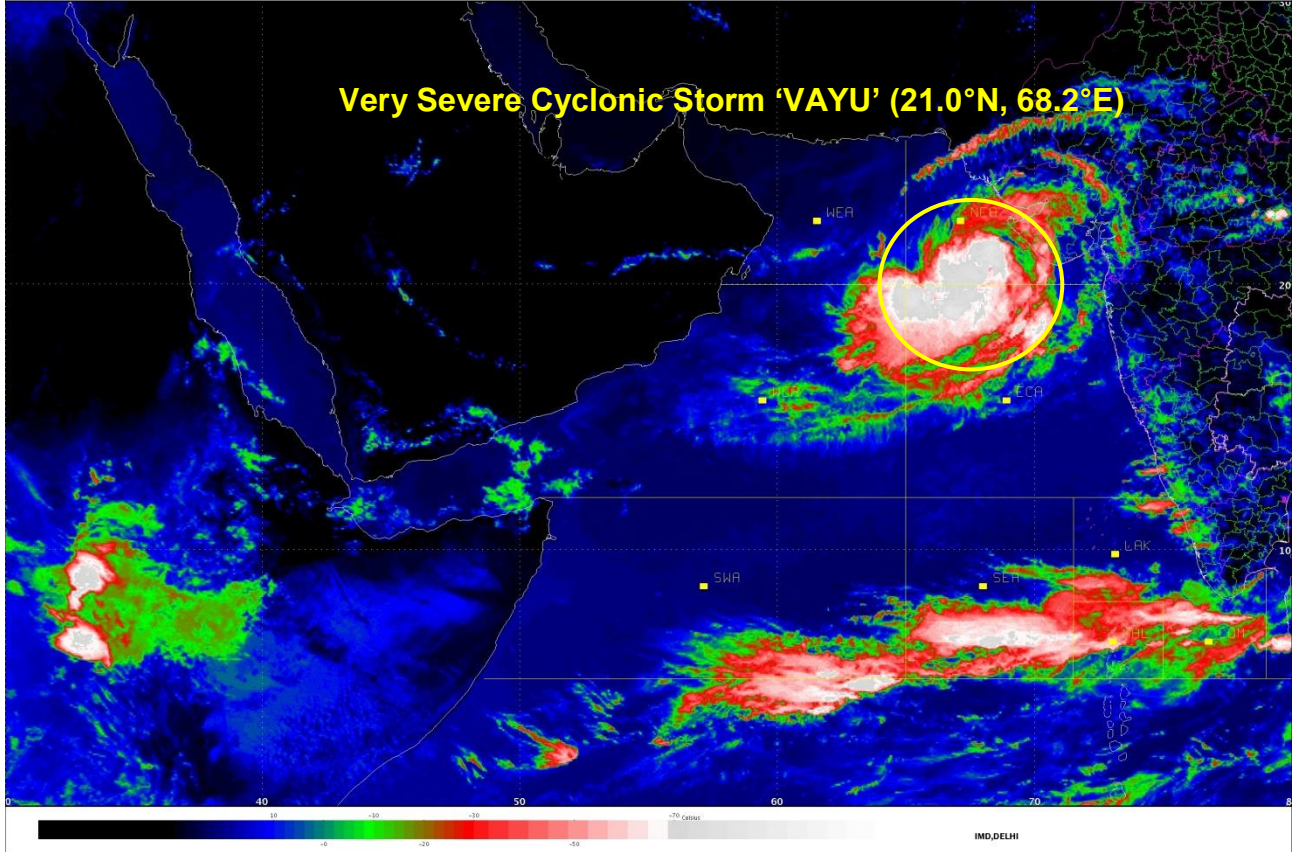
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT INSAT-3D
IMG. TIR1 TEMP 10.8 um
SECTOR ARABIAN SEA Mercator (NHC LUT)

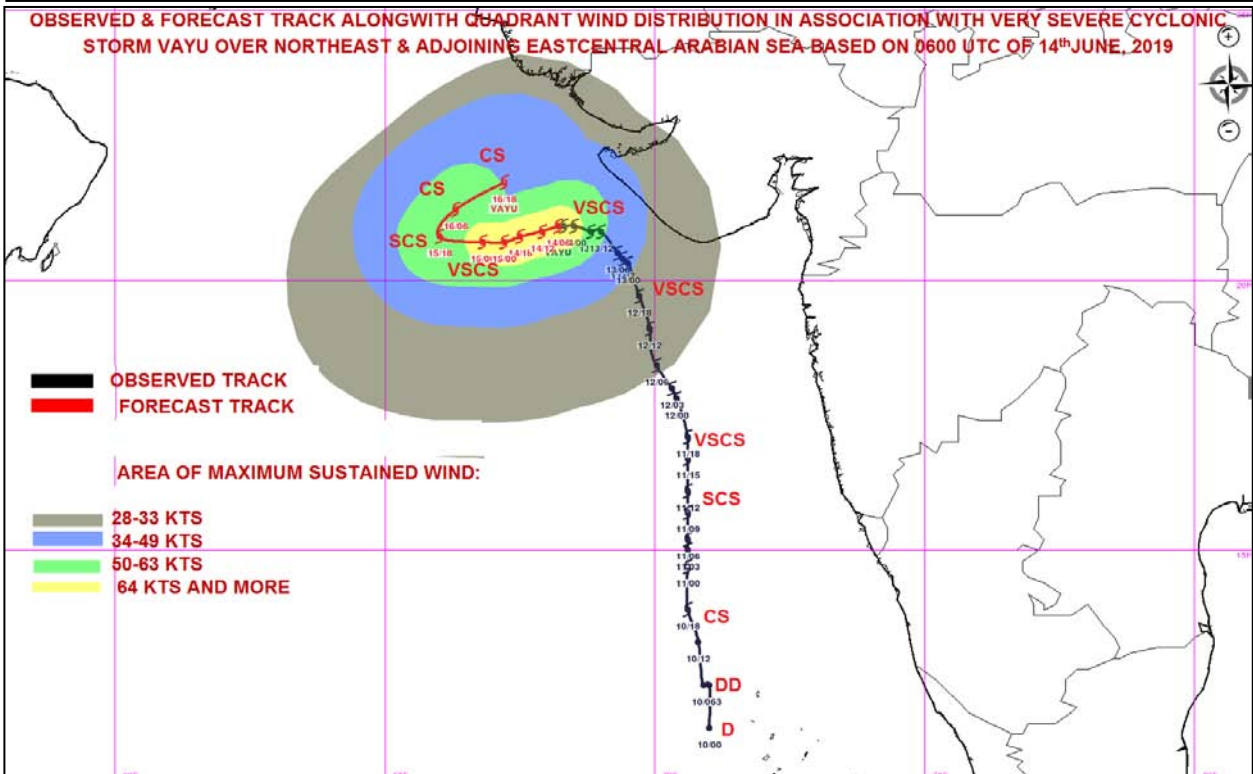
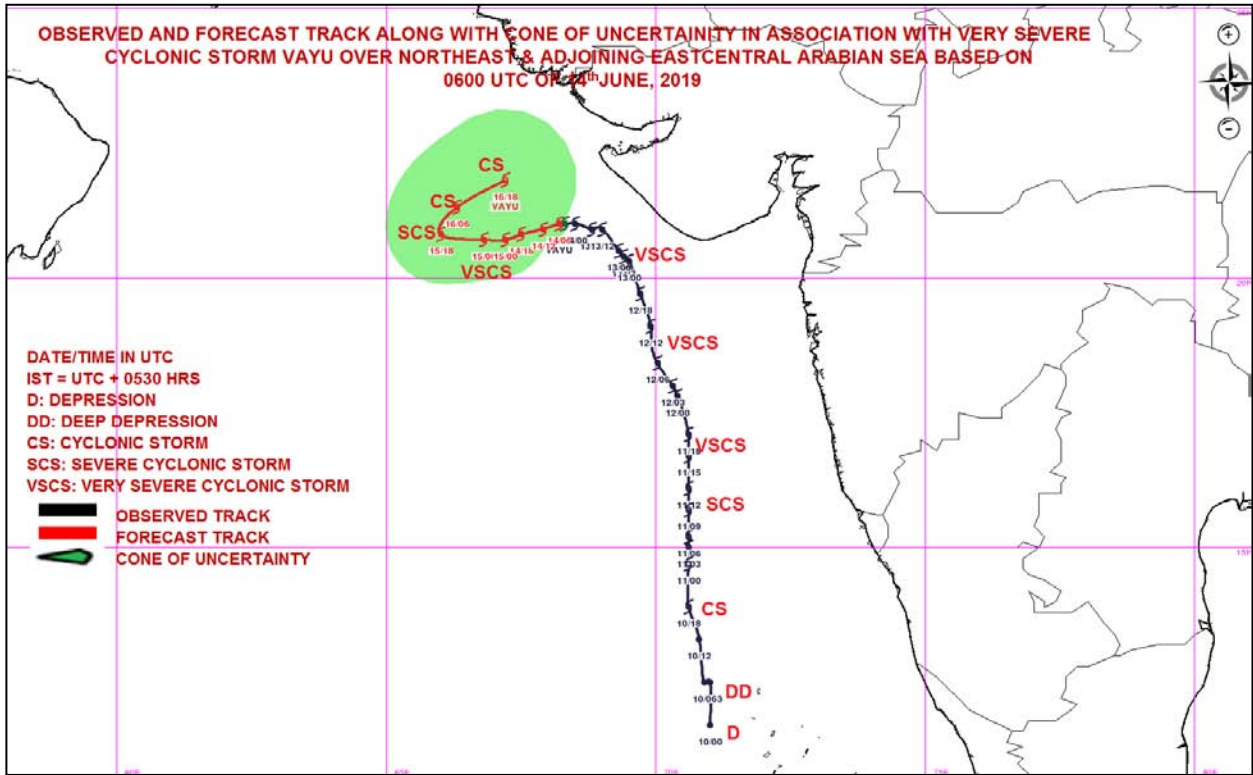
14-06-2019/08:30 GMT
14-06-2019/14:00 IST



Very Severe Cyclonic Storm 'VAYU' (21.0°N, 68.2°E)



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



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

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.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 NO. 27 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1100 UTC OF 14.06.2019 BASED ON 0900 UTC OF 14.06.2019.

THE VERY SEVERE CYCLONIC STORM 'VAYU' (PRONOUNCED AS VAA'YU) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF ABOUT 04 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0900 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 68.1°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 180 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 230 KM WEST OF VERAVAL (42909) (GUJARAT) AND 290 KM WEST-NORTHWEST OF DIU (42914). THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS AND RECURVE NORTHEASTWARDS THEREAFTER.

THE SYSTEM IS MOVING NEARLY WESTWARDS. HOWEVER, PORBANDAR & DEVBHOOMI DWARKA DISTRICTS ARE LIKELY TO EXPERIENCE SQUALLY WINDS SPEED REACHING 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH DISTRICTS WITH STRONG WINDS SPEED REACHING 30-40 KMPH GUSTING TO 50 KMPH DURING NEXT 12 HOURS DECREASE SUBSEQUENTLY.

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
14.06.19/0900	20.9/68.1	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/1200	20.9/67.9	135-145 gusting to 160	Very Severe Cyclonic Storm
14.06.19/1800	20.8/67.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	20.7/67.2	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	20.7/66.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1800	20.8/66.0	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/0600	21.3/66.3	80-90 gusting to 100	Cyclonic Storm
16.06.19/1800	21.8/67.2	70-80 gusting to 90	Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 0900 UTC ON 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 19.5°N & 21.8°N LONG 66.0°E TO 69.8°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 14TH JUNE, A SHIP LOCATED AT 19.2°N/66.9°E REPORTED MEAN SEA LEVEL PRESSURE OF 994.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 290°/50 KNOTS AND ANOTHER SHIP LOCATED NEAR 20.3°N/71.2°E REPORTED MEAN SEA LEVEL PRESSURE OF 998.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/28 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 75 KNOTS GUSTING TO 85 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 978 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

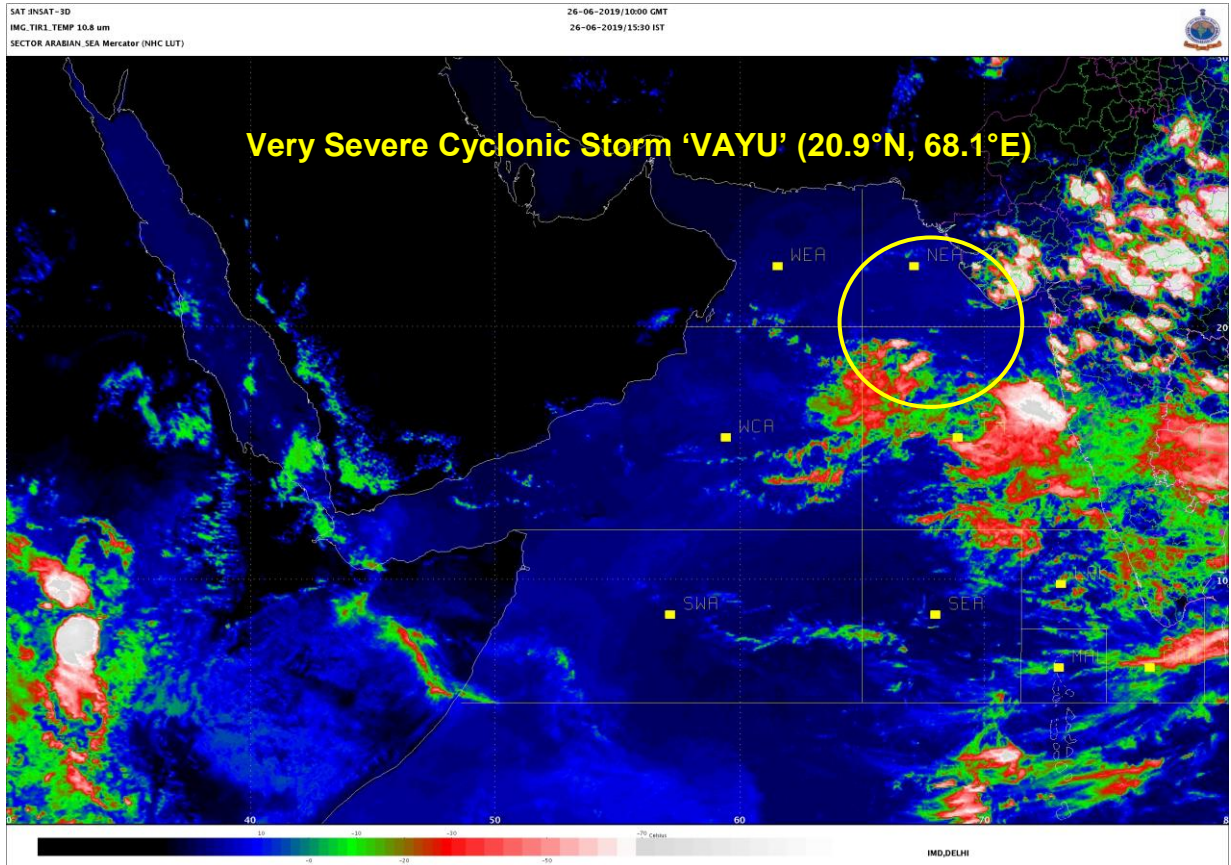
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 48 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

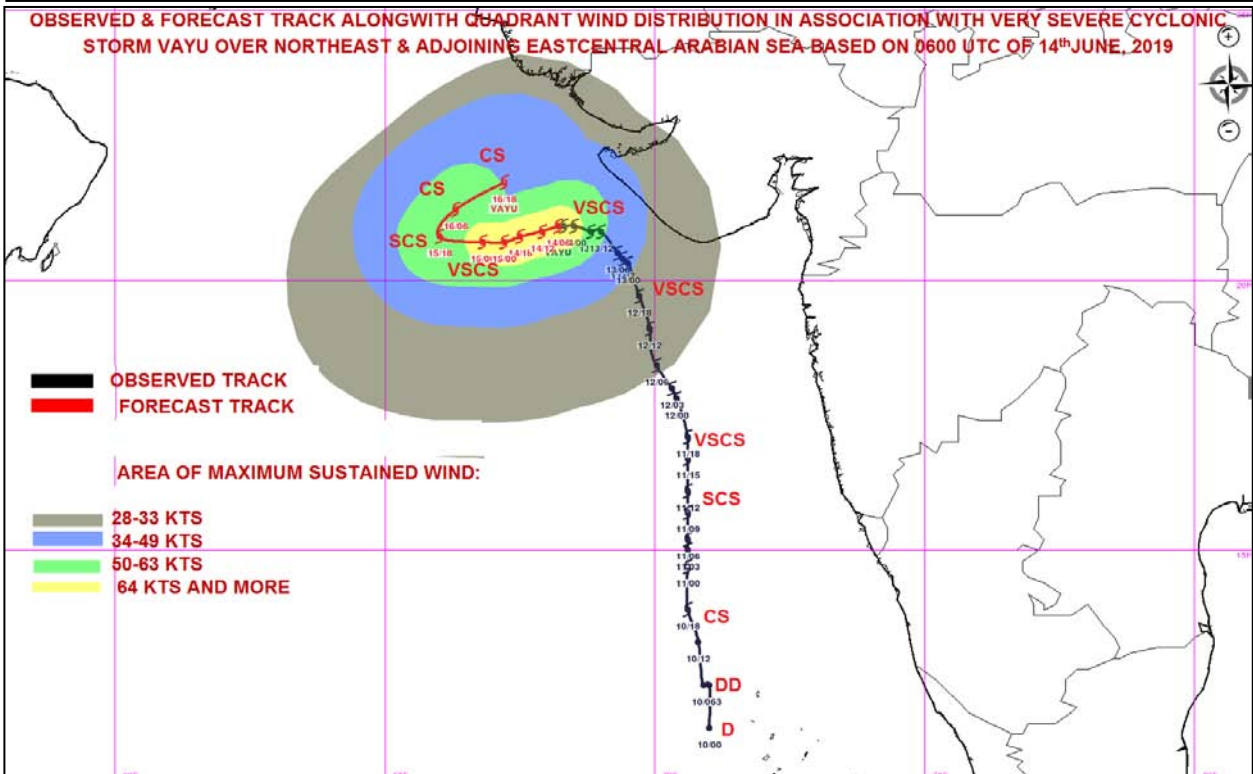
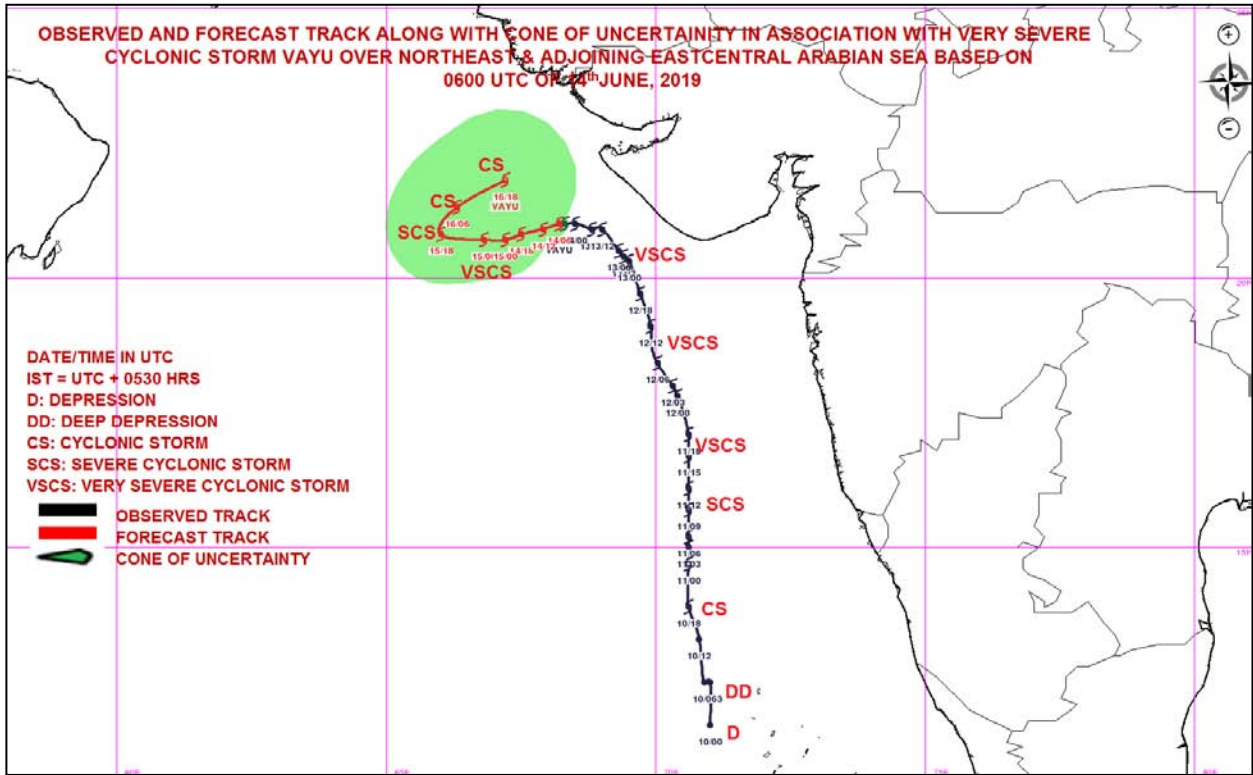
(NEETHA K GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



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

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.28

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. 28 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1500 UTC OF 14.06.2019 BASED ON 1200 UTC OF 14.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WEST-SOUTHWESTWARDS WITH A SPEED OF ABOUT 05 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 20.8°N AND LONGITUDE 68.0°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 190 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 240 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 300 KM WEST OF DIU (42914). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS AND RECURVE NORTHEASTWARDS THEREAFTER.**

THE SYSTEM IS MOVING NEARLY WESTWARDS. HOWEVER, PORBANDAR & DEVBHOOMI DWARKA DISTRICTS ARE LIKELY TO EXPERIENCE SQUALLY WINDS SPEED REACHING 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH DISTRICTS WITH STRONG WINDS SPEED REACHING 30-40 KMPH GUSTING TO 50 KMPH DURING NEXT 12 HOURS AND DECREASE SUBSEQUENTLY.

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
14.06.19/1200	20.8/68.0	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1800	20.7/67.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	20.7/67.2	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	20.7/66.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1200	20.8/66.4	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/0000	21.1/66.2	90-100 gusting to 110	Cyclonic Storm
16.06.19/1200	21.5/66.8	80-90 gusting to 100	Cyclonic Storm
17.06.19/0000	21.8/67.2	70-80 gusting to 90	Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC ON 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS C.I 4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 19.5°N & 21.8°N LONG 66.0°E TO 69.8°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 14TH JUNE, A SHIP LOCATED AT 19.4°N/66.2°E REPORTED MEAN SEA LEVEL PRESSURE OF 994.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 280°/40 KNOTS AND A BOUY LOCATED NEAR 18.5°N/67.5°E REPORTED MEAN SEA LEVEL PRESSURE OF 995.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 070°/24 KNOTS. PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 995.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 070°/30 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 48 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

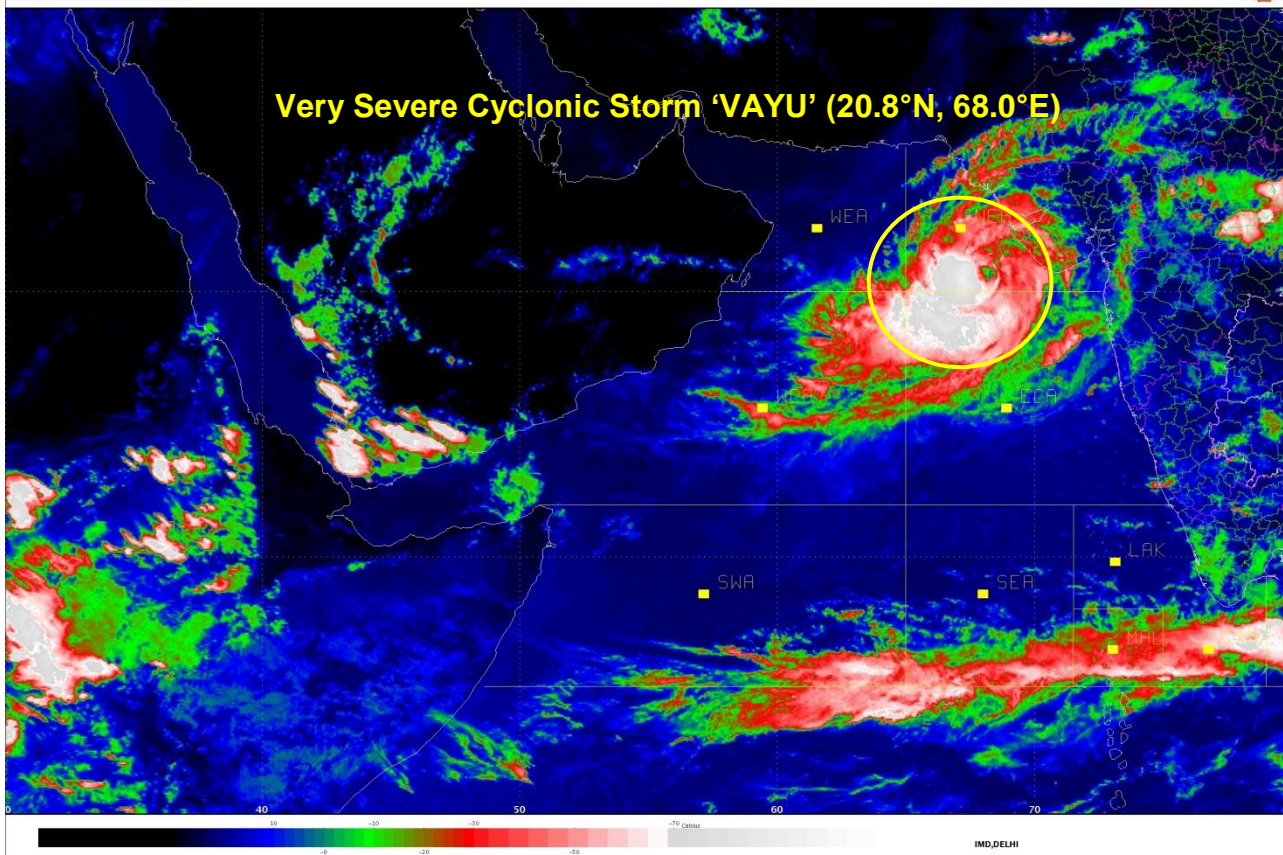
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

SAT INSAT-3D
IMG_TIR1_TEMP 10.8 um
SECTOR ARABIAN_SEA Mercator (NHC LUT)

14-06-2019/13:00 GMT
14-06-2019/18:30 IST

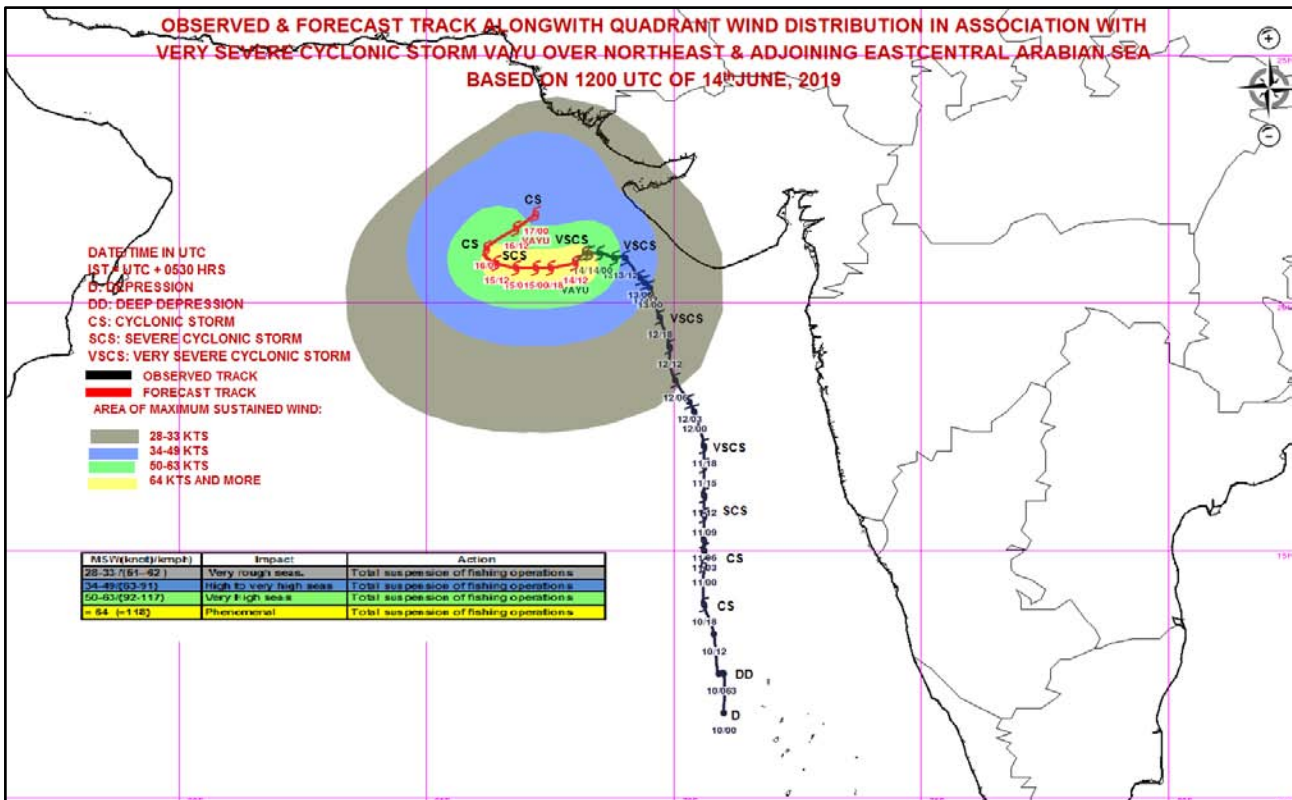
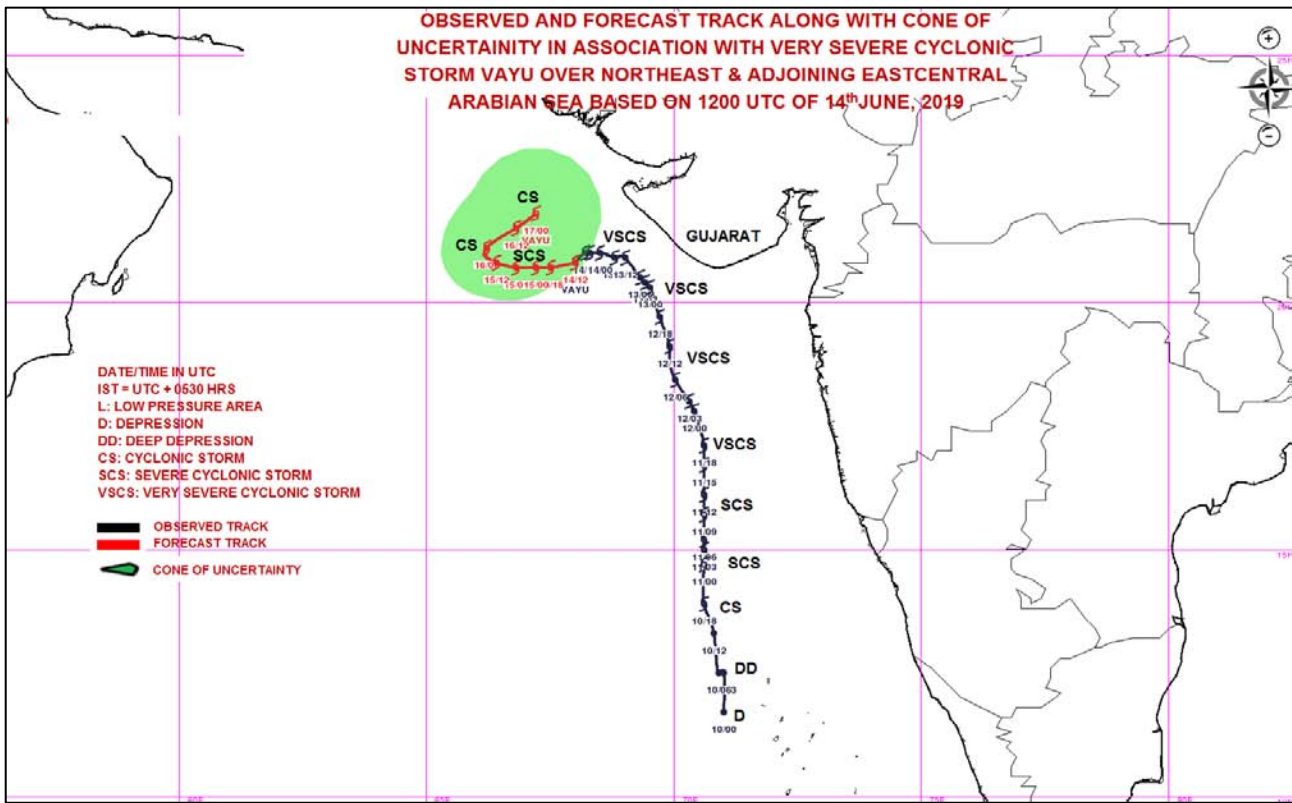


Very Severe Cyclonic Storm 'VAYU' (20.8°N, 68.0°E)



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot)/kmph)	Impact	Action
28-33 / (61-62)	Very rough seas.	Total suspension of fishing operations
34-49 / (62-74)	High to very high seas	Total suspension of fishing operations
50-63 / (92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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.29

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. 29 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1800 UTC OF 14.06.2019 BASED ON 1500 UTC OF 14.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WEST-SOUTHWESTWARDS WITH A SPEED OF ABOUT 04 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1500 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 20.8°N AND LONGITUDE 67.9°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 200 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 250 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 310 KM NEARLY WEST OF DIU (42914). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS AND RECURVE NORTHEASTWARDS THEREAFTER.**

THE SYSTEM IS MOVING NEARLY WESTWARDS. HOWEVER, PORBANDAR & DEVBHOOMI DWARKA DISTRICTS ARE LIKELY TO EXPERIENCE SQUALLY WINDS SPEED REACHING 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH DISTRICTS WITH STRONG WINDS SPEED REACHING 30-40 KMPH GUSTING TO 50 KMPH DURING NEXT 12 HOURS AND DECREASE SUBSEQUENTLY.

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
14.06.19/1500	20.8/67.9	130-140 gusting to 155	Very Severe Cyclonic Storm
14.06.19/1800	20.7/67.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	20.7/67.2	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	20.7/66.8	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/1200	20.8/66.4	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/0000	21.1/66.2	90-100 gusting to 110	Cyclonic Storm
16.06.19/1200	21.5/66.8	80-90 gusting to 100	Cyclonic Storm
17.06.19/0000	21.8/67.2	70-80 gusting to 90	Cyclonic Storm

REMARKS:

AS PER SATELLITE IMAGERY OF 1500 UTC OF 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS C.I 4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 19.5°N & 21.8°N LONG 66.0°E TO 69.8°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 14TH JUNE, A SHIP LOCATED AT 19.5°N/65.4°E REPORTED MEAN SEA LEVEL PRESSURE OF 997 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 290°/38 KNOTS AND A BOUY LOCATED NEAR 18.5°N/67.4°E REPORTED MEAN SEA LEVEL PRESSURE OF 1002.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 080°/24 KNOTS. PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 995.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 070°/19 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

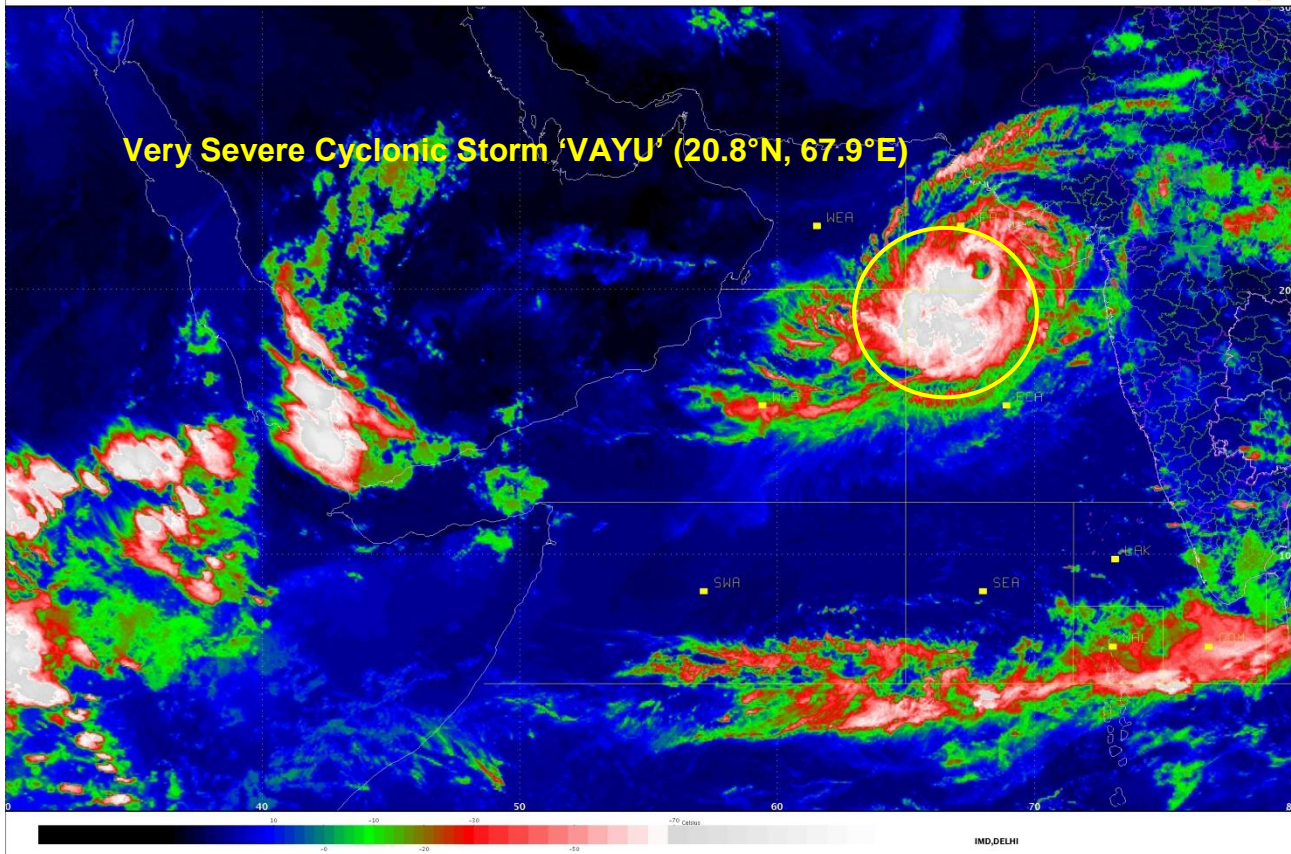
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (10-15 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 48 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

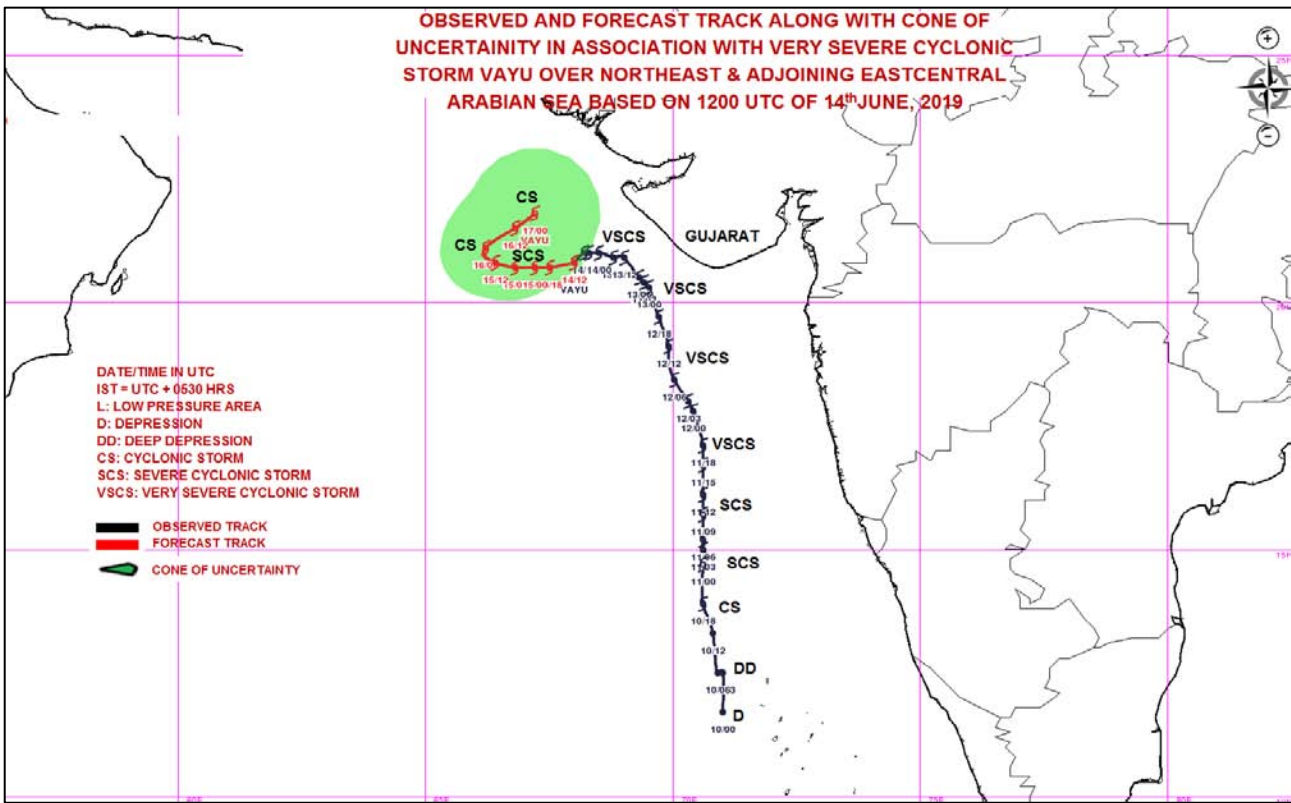
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

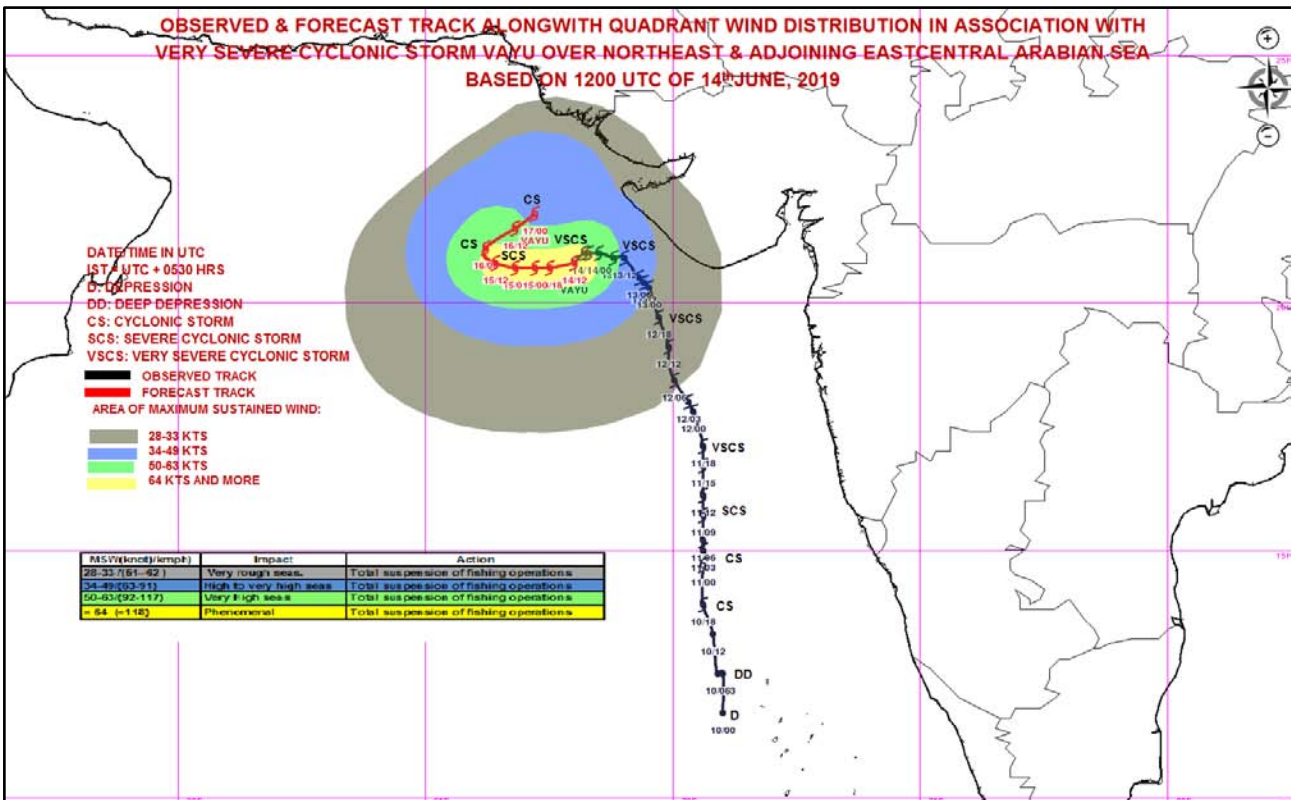


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 14th JUNE, 2019



OBSERVED & FORECAST TRACK ALONG WITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 14th JUNE, 2019



MSW(knot/kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-48 (62-74)	High to very high seas	Total suspension of fishing operations
50-63 (92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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. 30

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. 30 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2100 UTC OF 14.06.2019 BASED ON 1800 UTC OF 14.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 03 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1800 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 20.8°N AND LONGITUDE 67.8°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 210 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 270 KM NEARLY WEST OF VERAVAL (42909) (GUJARAT) AND 320 KM NEARLY WEST OF DIU (42914) (GUJARAT). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS AND RECURVE NORTHEASTWARDS THEREAFTER.**

THE SYSTEM IS MOVING NEARLY WESTWARDS. HOWEVER, PORBANDAR & DEVBHOOMI DWARKA DISTRICTS ARE LIKELY TO EXPERIENCE SQUALLY WINDS SPEED REACHING 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH DISTRICTS WITH STRONG WINDS SPEED REACHING 30-40 KMPH GUSTING TO 50 KMPH DURING NEXT 12 HOURS AND DECREASE SUBSEQUENTLY.

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
14.06.19/1800	20.8/67.8	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	20.7/67.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	20.6/67.0	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1200	20.6/66.5	85-95 gusting to 105	Cyclonic Storm
15.06.19/1800	20.7/66.2	80-90 gusting to 100	Cyclonic Storm
16.06.19/0600	20.9/66.0	70-80 gusting to 90	Cyclonic Storm
16.06.19/1800	21.4/66.3	55-65 gusting to 75	Deep Depression
17.06.19/0600	22.2/67.3	40-50 gusting to 60	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC OF 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS C.I 4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17.0°N & 21.8°N

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

LONG 63.5°E TO 71.5°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C.

AT 1800 UTC OF 14TH JUNE, A SHIP LOCATED AT 19.6°N/64.7°E REPORTED MEAN SEA LEVEL PRESSURE OF 998.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 290°/36 KNOTS. PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 997.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 070°/21 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

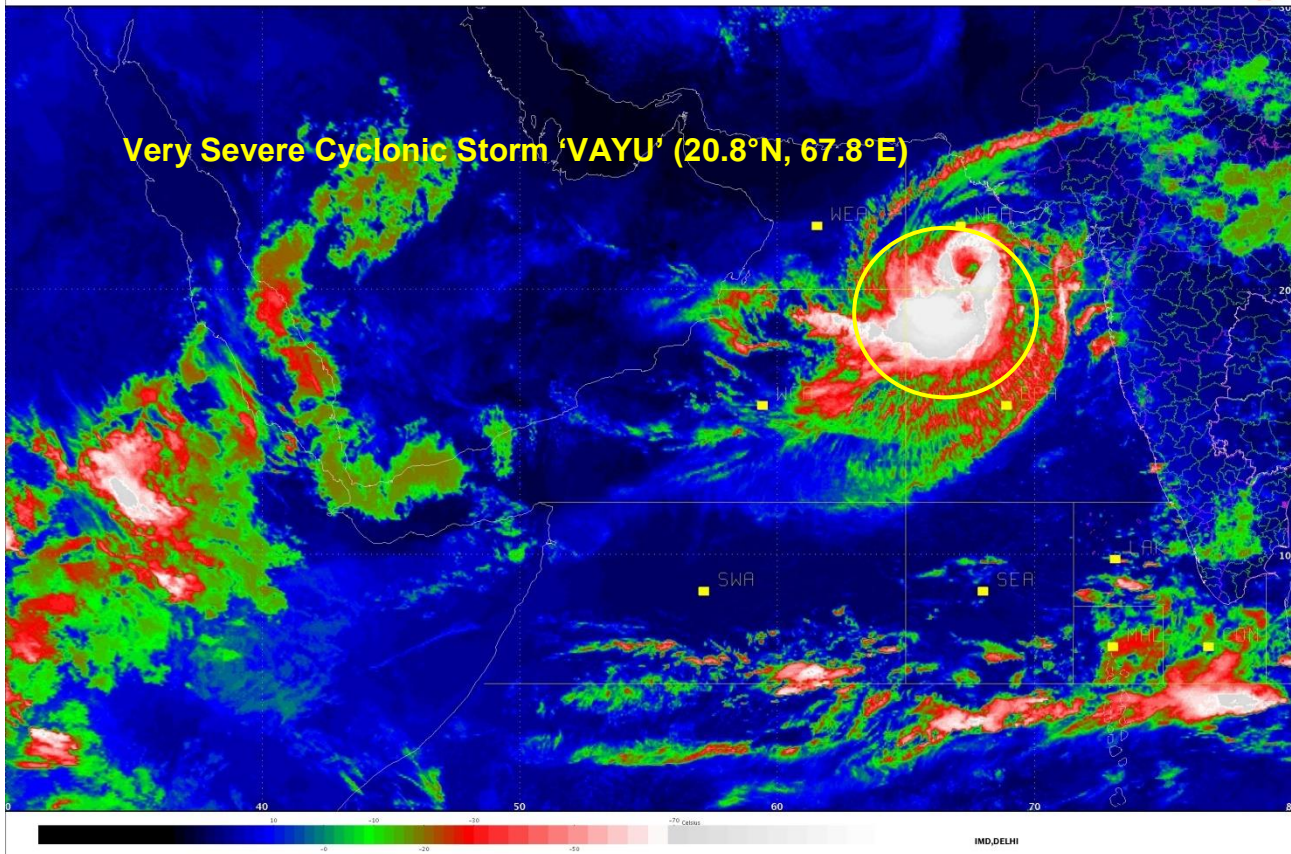
CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR HAS INCREASED AND IS LOW TO MODERATE (15-20 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 48 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

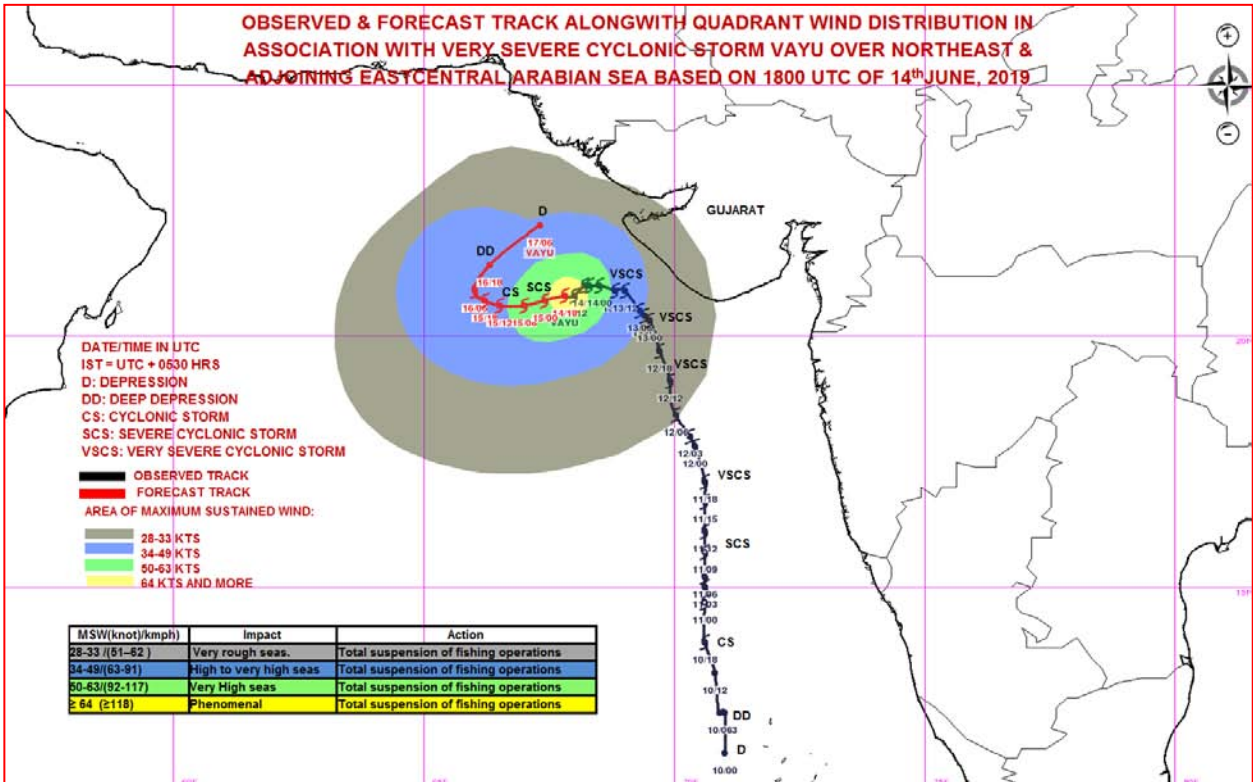
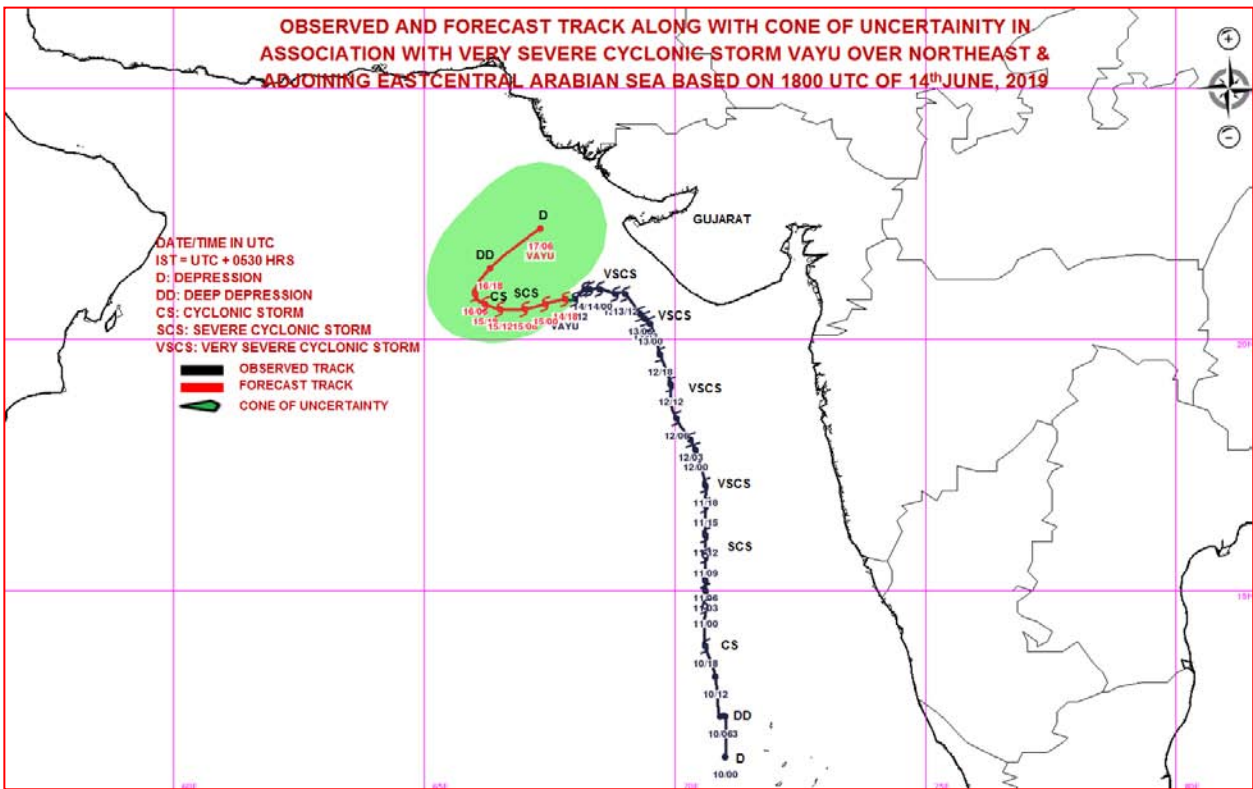
(NARESH KUMAR)
SCIENTIST-E, RSMC, NEW DELHI

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%



MSW(knot)/kmph)	Impact	Action
28-33 (61-82)	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

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. 31

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. 31 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2230 UTC OF 14.06.2019 BASED ON 2100 UTC OF 14.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 2100 UTC OF TODAY, THE 14TH JUNE, 2019 NEAR LATITUDE 20.8°N AND LONGITUDE 67.5°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 240 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 300 KM NEARLY WEST OF VERAVAL (42909) (GUJARAT) AND 350 KM NEARLY WEST OF DIU (42914) (GUJARAT). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS AND RECURVE NORTHEASTWARDS THEREAFTER.**

THE SYSTEM IS MOVING NEARLY WESTWARDS. HOWEVER, PORBANDAR & DEVBHOOMI DWARKA DISTRICTS ARE LIKELY TO EXPERIENCE SQUALLY WINDS SPEED REACHING 50-60 KMPH GUSTING TO 70 KMPH AND GIR SOMNATH & JUNAGARH DISTRICTS WITH STRONG WINDS SPEED REACHING 30-40 KMPH GUSTING TO 50 KMPH DURING NEXT 12 HOURS AND DECREASE SUBSEQUENTLY.

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
14.06.19/2100	20.8/67.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0000	20.7/67.4	110-120 gusting to 135	Severe Cyclonic Storm
15.06.19/0600	20.6/67.0	100-110 gusting to 125	Severe Cyclonic Storm
15.06.19/1200	20.6/66.5	85-95 gusting to 105	Cyclonic Storm
15.06.19/1800	20.7/66.2	80-90 gusting to 100	Cyclonic Storm
16.06.19/0600	20.9/66.0	70-80 gusting to 90	Cyclonic Storm
16.06.19/1800	21.4/66.3	55-65 gusting to 75	Deep Depression
17.06.19/0600	22.2/67.3	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC OF 14TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS C.I 4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 17.0°N & 21.8°N LONG 63.5°E TO 71.5°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C.

AT 2100 UTC OF 14TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 997.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 070°/18 KNOTS AND VERAVAL (42909) REPORTED MEAN SEA LEVEL PRESSURE OF 998.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 200°/13 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ALSO ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR HAS INCREASED AND BECOME MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM HAS COME UNDER MODERATE TO HIGH SHEAR ZONE, IT IS LIKELY TO WEAKEN INTO A SEVERE CYCLONIC STORM DURING NEXT 06 HOURS. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 48 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

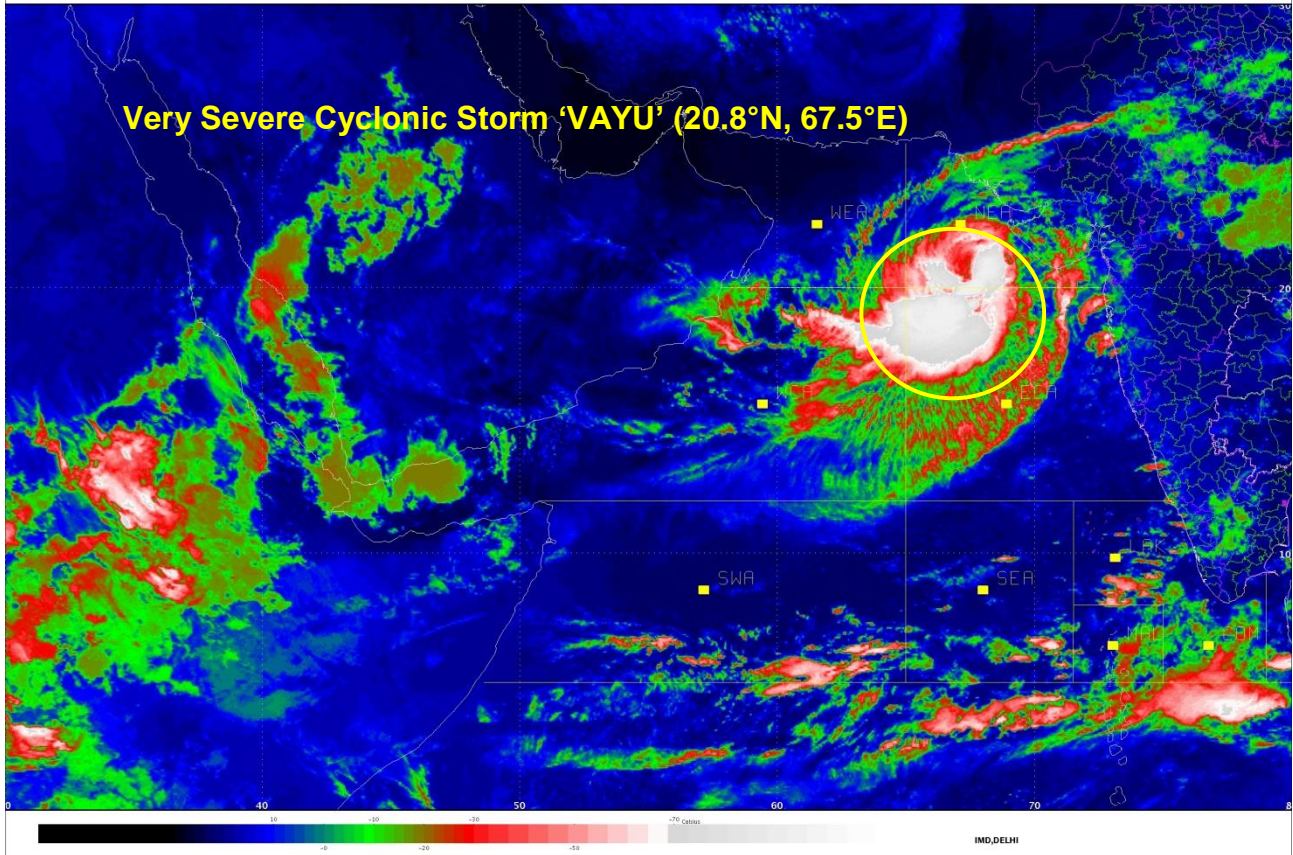
(KRISHNA MISHRA)
SCIENTIST-B, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

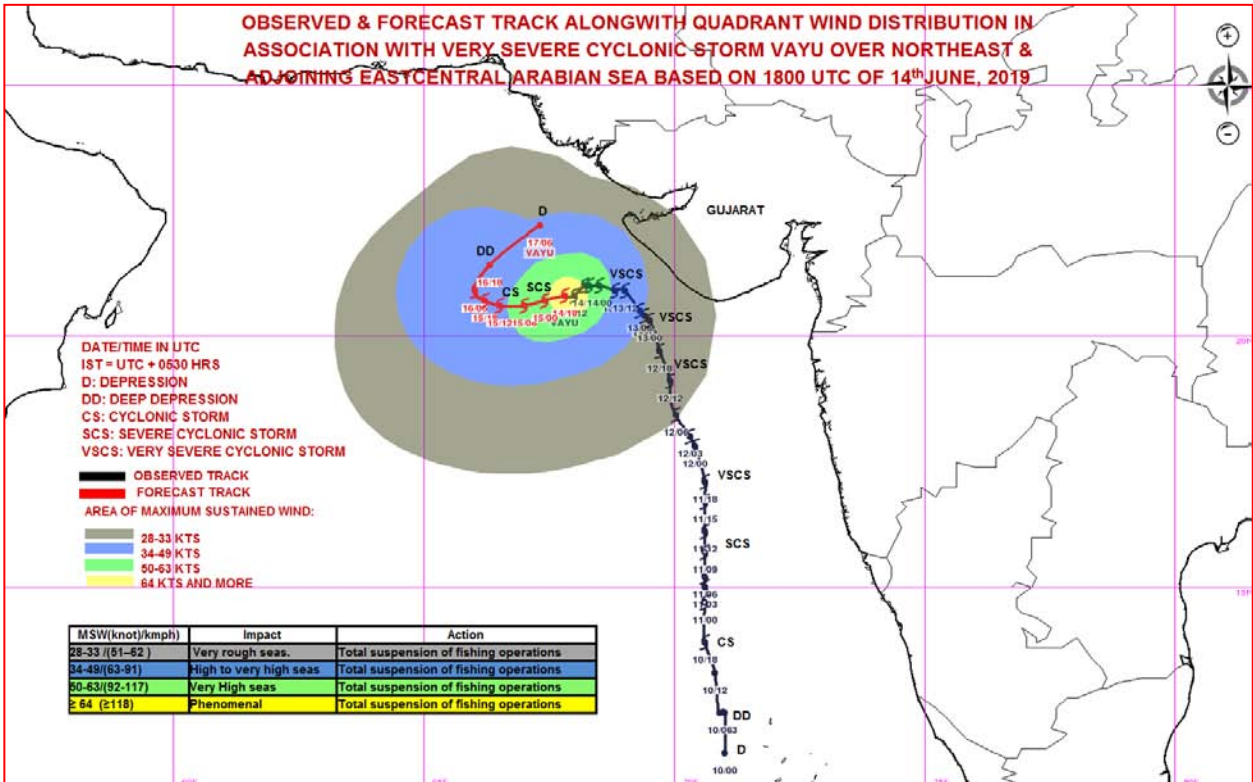
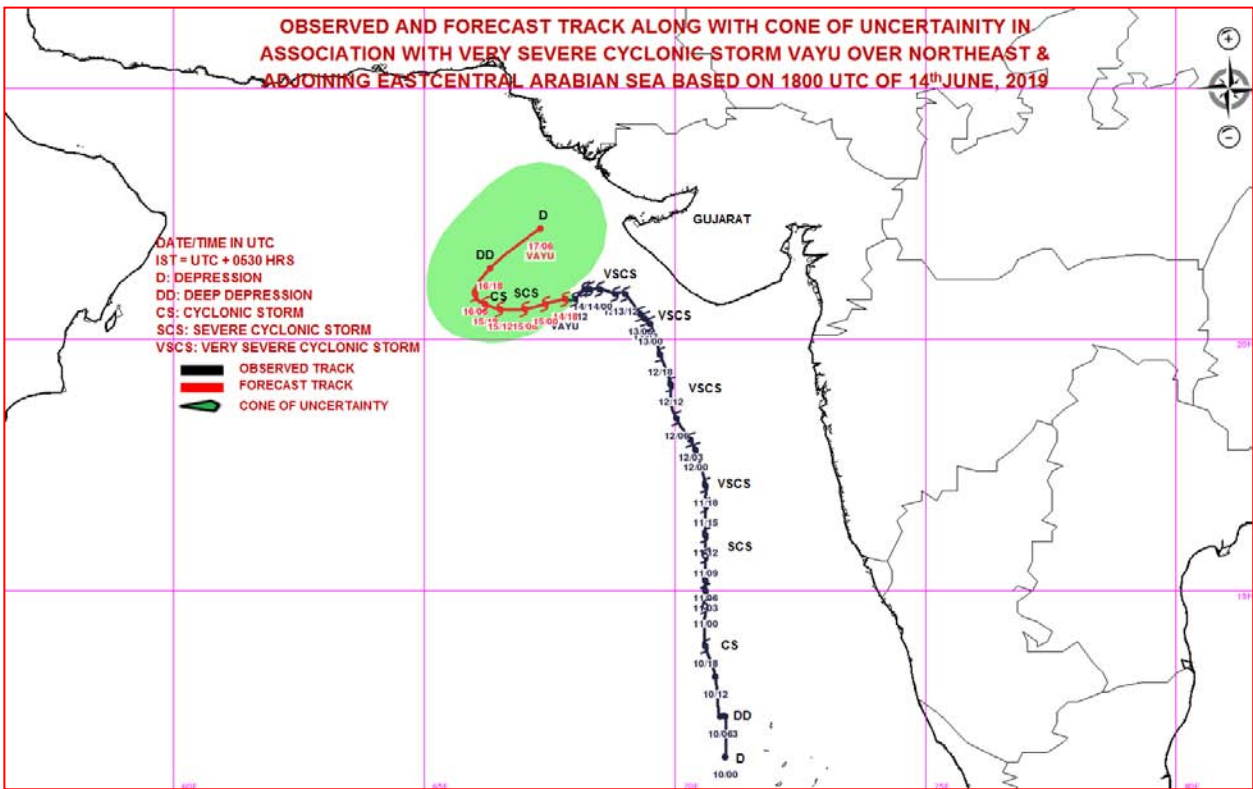
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



Very Severe Cyclonic Storm 'VAYU' (20.8°N, 67.5°E)



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



MSW(knot)/kmph)	Impact	Action
28-33 (61-82)	Very rough seas.	Total suspension of fishing operations
34-49(63-91)	High to very high seas	Total suspension of fishing operations
50-63(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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. 32

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. 32 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0300 UTC OF 15.06.2019 BASED ON 0000 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NEARLY WESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0000 UTC OF TODAY, THE 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 67.4°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 260 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 310 KM WEST OF VERAVAL (42909) (GUJARAT) AND 360 KM WEST OF DIU (42914) (GUJARAT). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 48 HOURS WITH GRADUAL WEAKENING AND RECURVE NORTHEASTWARDS THEREAFTER.**

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
15.06.19/0000	20.7/67.4	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/0600	20.6/67.0	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1200	20.6/66.5	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1800	20.7/66.2	120-130 gusting to 145	Very Severe Cyclonic Storm
16.06.19/0000	20.8/66.1	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1200	21.2/66.2	80-90 gusting to 100	Cyclonic Storm
17.06.19/0000	21.8/66.8	55-65 gusting to 75	Deep Depression
17.06.19/1200	23.0/68.3	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%

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS C.I 4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BET LAT 16.5°N & 22.5°N LONG 60.0°E TO 70.5°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C.

AT 0000 UTC OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 997.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/12 KNOTS AND VERAVAL (42909) REPORTED MEAN SEA LEVEL PRESSURE OF 998.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/08 KNOTS. A SHIP LOCATED AT 18.8°N/71.4°E REPORTED MEAN SEA LEVEL PRESSURE OF 999.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 220°/32 KNOTS AND A BOUY LOCATED NEAR 18.4°N/67.4°E REPORTED MEAN SEA LEVEL PRESSURE OF 1005.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 060°/27 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

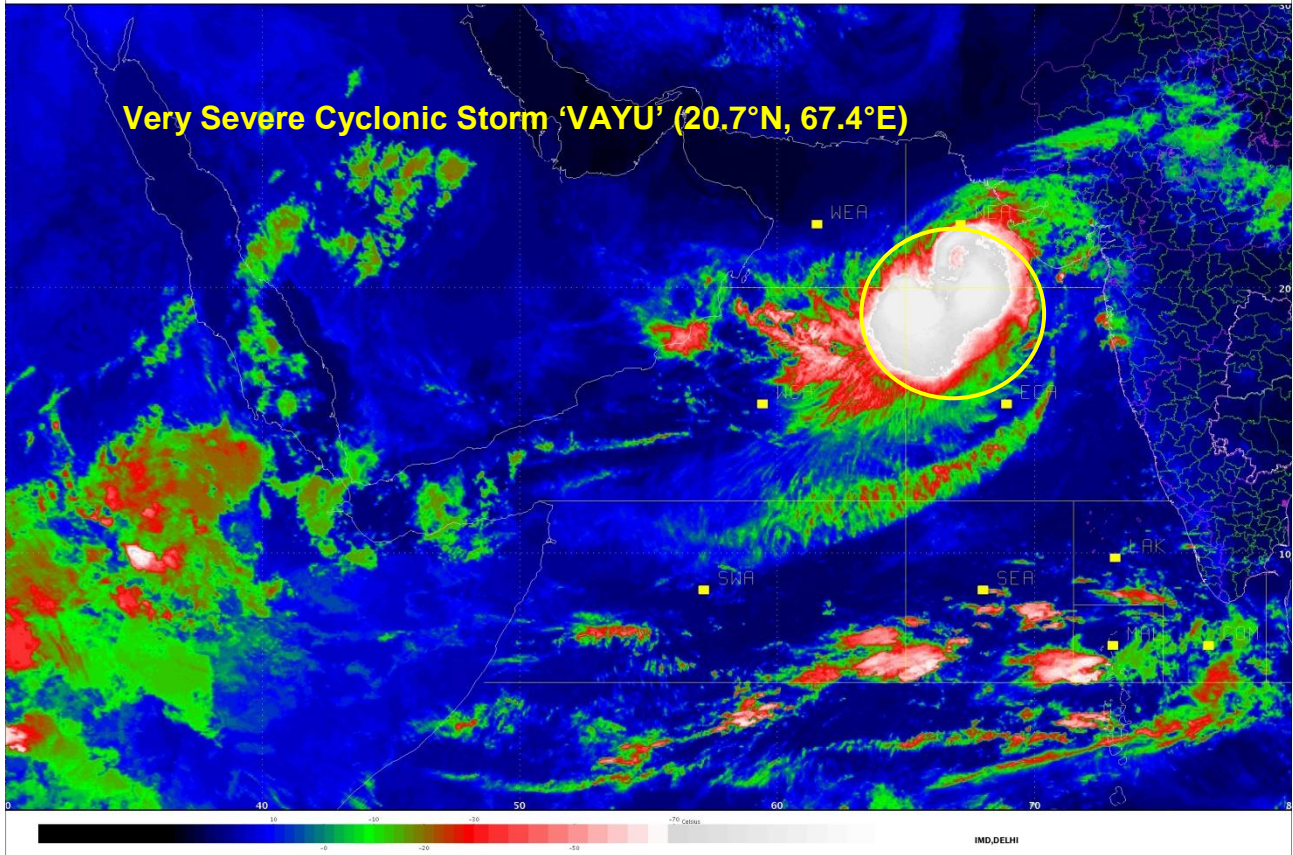
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-90) KJ/CM² OVER THE SYSTEM AREA. IT IS LESS THAN 60 KJ/CM² IN THE NORTHWEST ARABIAN SEA. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS INCREASED AND IS ABOUT $50 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR HAS INCREASED AND IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 36 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

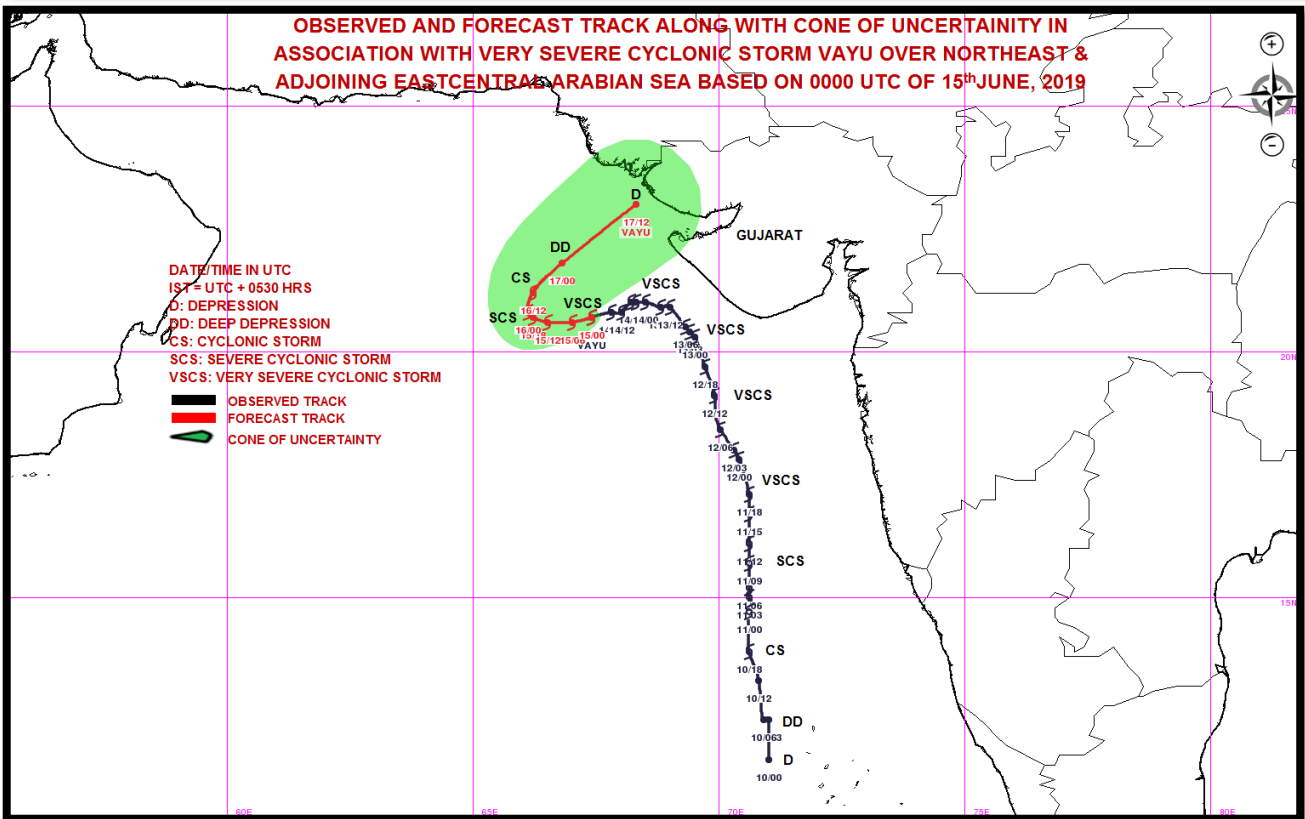
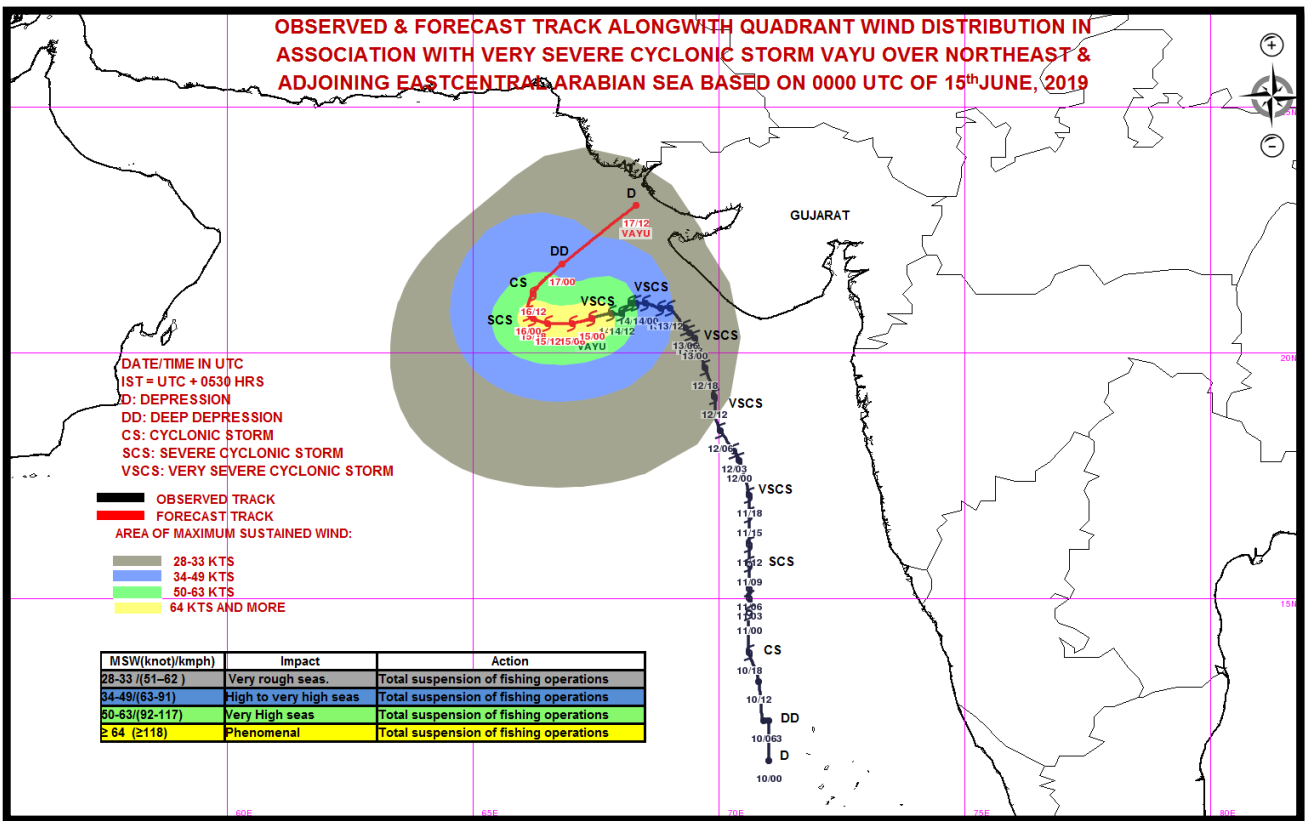
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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

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. 33

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. 33 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0700 UTC OF 15.06.2019 BASED ON 0300 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED NEARLY WESTWARDS WITH A SPEED OF ABOUT 06 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0300 UTC TODAY, THE 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 67.2°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 275 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 330 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 385 KM NEARLY WEST OF DIU (42914). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 24 TO 36 HOURS WITH GRADUAL WEAKENING AND RECURVE NORTHEASTWARDS THEREAFTER AND REACH COASTAL SAURASHTRA AND KUTCH AS A DEPRESSION BY 1200 UTC OF 17TH JUNE 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
15.06.19/0300	20.7/67.2	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
15.06.19/0600	20.7/66.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
15.06.19/1200	20.7/66.5	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
15.06.19/1800	20.7/66.2	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
16.06.19/0000	20.8/66.1	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
16.06.19/1200	21.2/66.2	80-90 GUSTING TO 100	CYCLONIC STORM
17.06.19/0000	21.8/66.8	55-65 GUSTING TO 75	DEEP DEPRESSION
17.06.19/1200	23.0/68.3	40-50 GUSTING TO 60	DEPRESSION

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS C.I 4.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BETWEEN LAT 16.5°N & 23.0°N, LONG 65.0°E TO 70.0°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C.

AT 0300 UTC OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/15 KNOTS AND DWARKA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 998.7 HPA AND MEAN SURFACE WIND

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

DIRECTION/SPEED OF 140°/08 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

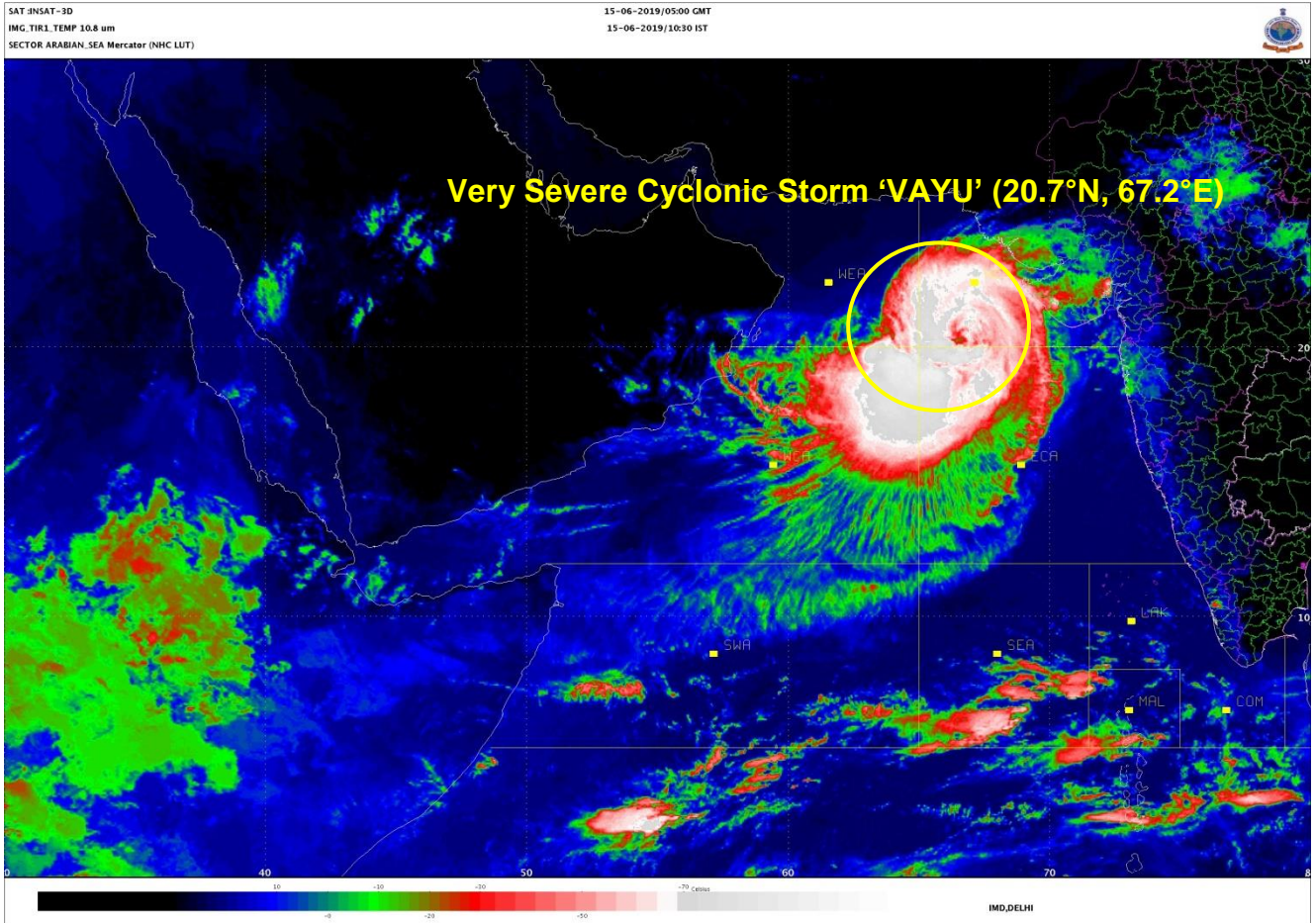
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS FURTHER INCREASED AND IS ABOUT $60 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE ALSO HAS INCREASED AND IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR CONTINUES TO BE MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 36 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

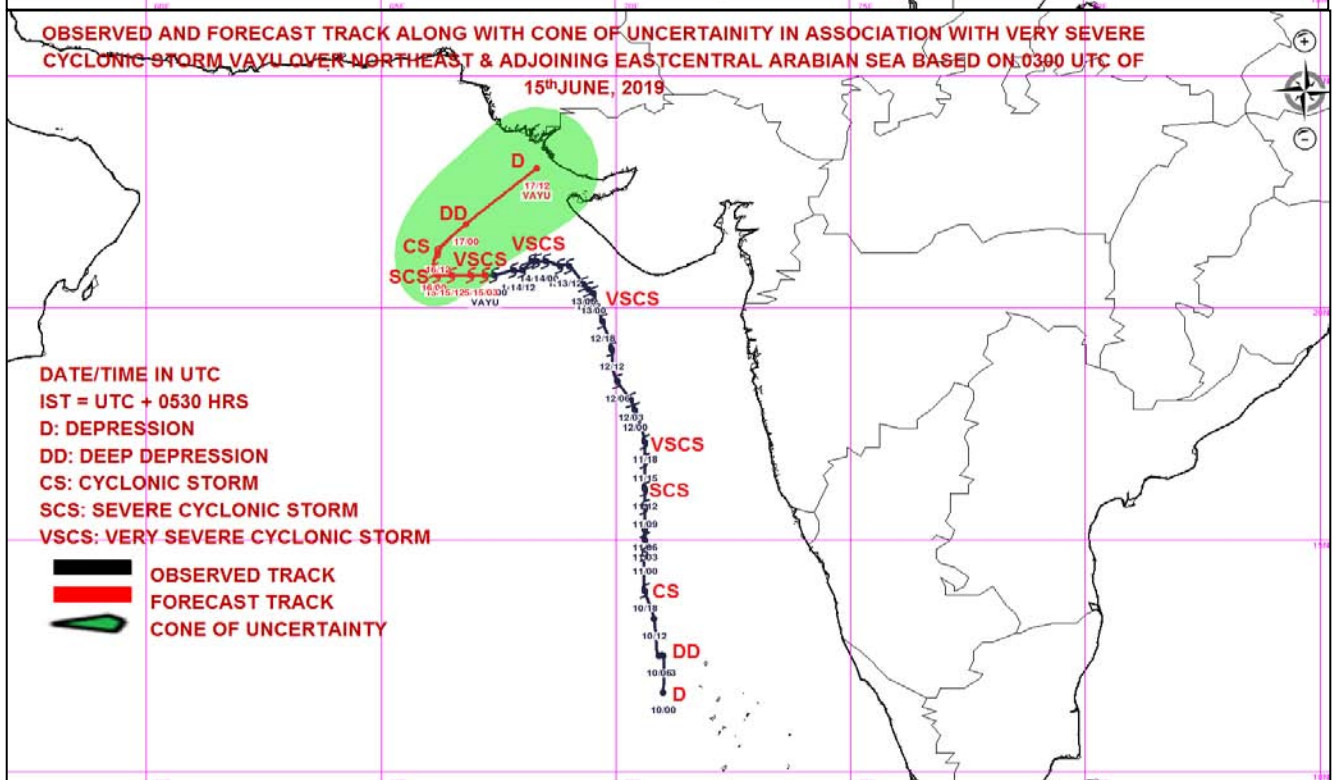
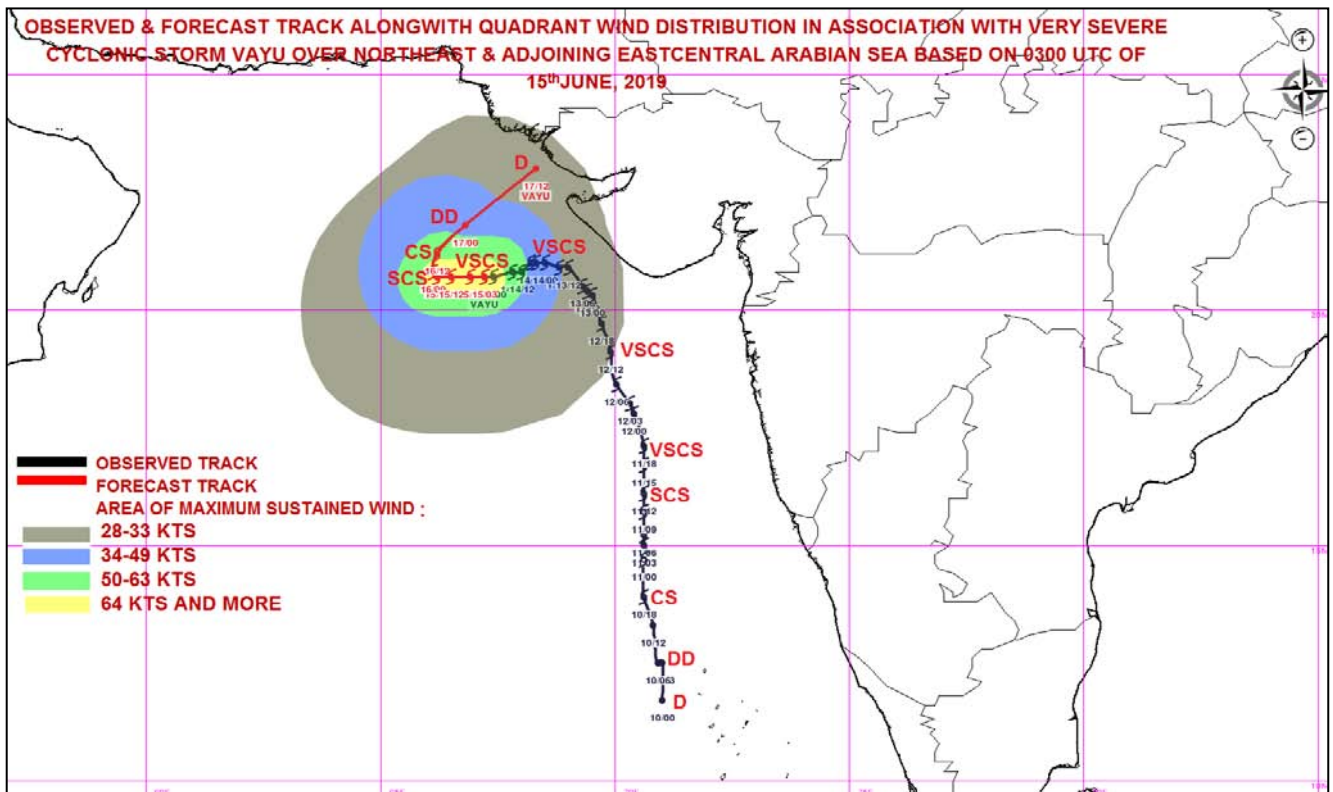
(NEETHA K. GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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



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

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. 34

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. 34 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 0900 UTC OF 15.06.2019 BASED ON 0600 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0600 UTC OF TODAY, THE 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 66.9°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 305 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 360 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 415 KM NEARLY WEST OF DIU (42914). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 24 TO 36 HOURS WITH GRADUAL WEAKENING AND RECURVE NORTHEASTWARDS THEREAFTER AND REACH COASTAL SAURASHTRA AND KUTCH AS A DEPRESSION BY 1200 UTC OF 17TH JUNE 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
15.06.19/0600	20.7/66.9	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1200	20.7/66.4	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1800	20.7/66.0	120-130 gusting to 145	Very Severe Cyclonic Storm
16.06.19/0000	20.9/65.7	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/0600	21.2/65.9	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1800	21.8/66.6	80-90 gusting to 100	Cyclonic Storm
17.06.19/0600	22.5/67.6	55-65 gusting to 75	Deep Depression
17.06.19/1800	23.5/69.0	40-50 gusting to 60	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 0600 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN BETWEEN LAT 17.5°N & 21.5°N, LONG 64.5°E TO 68.0°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/13 KNOTS AND DWARKA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/08 KNOTS. OKHA (42730) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/08 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR CONTINUES TO BE MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 36 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

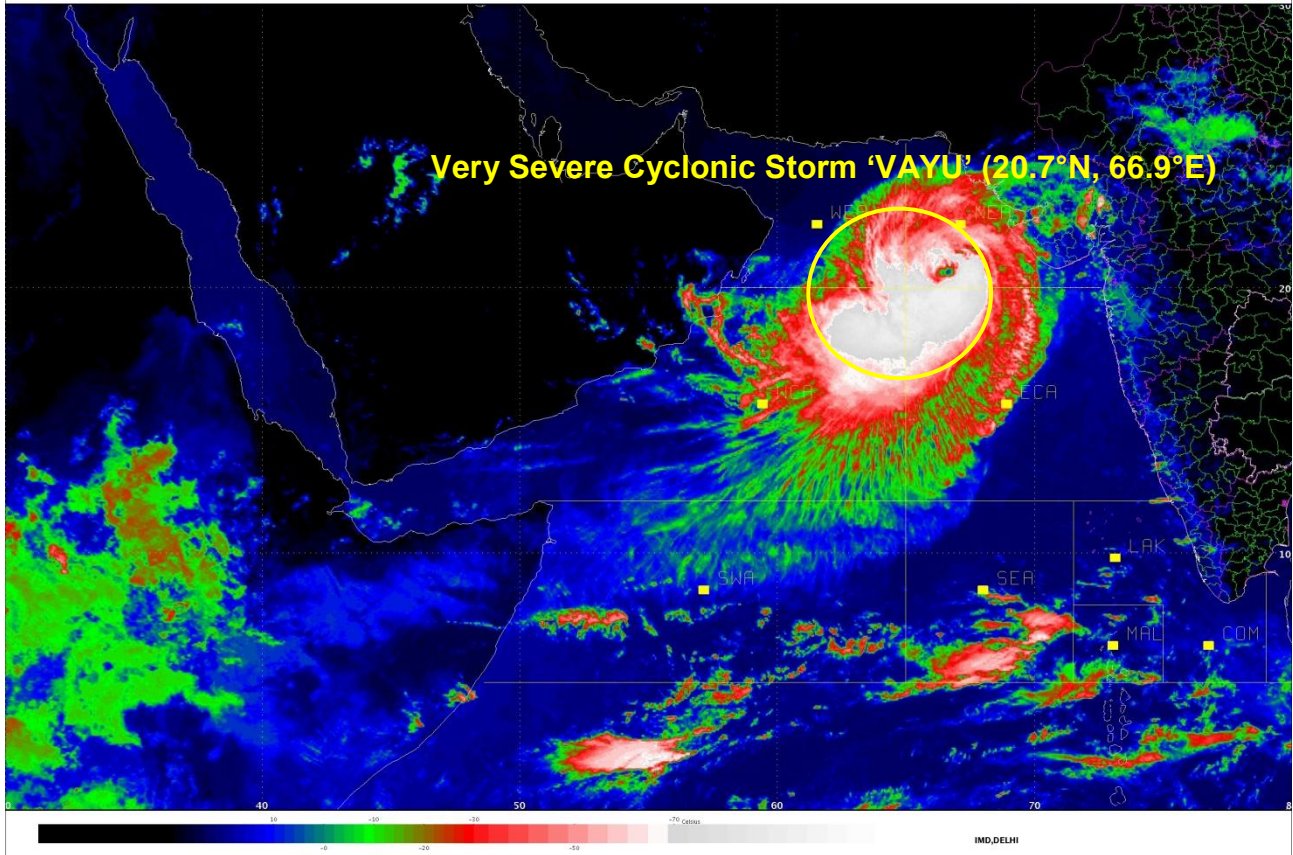
(NEETHA K. GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

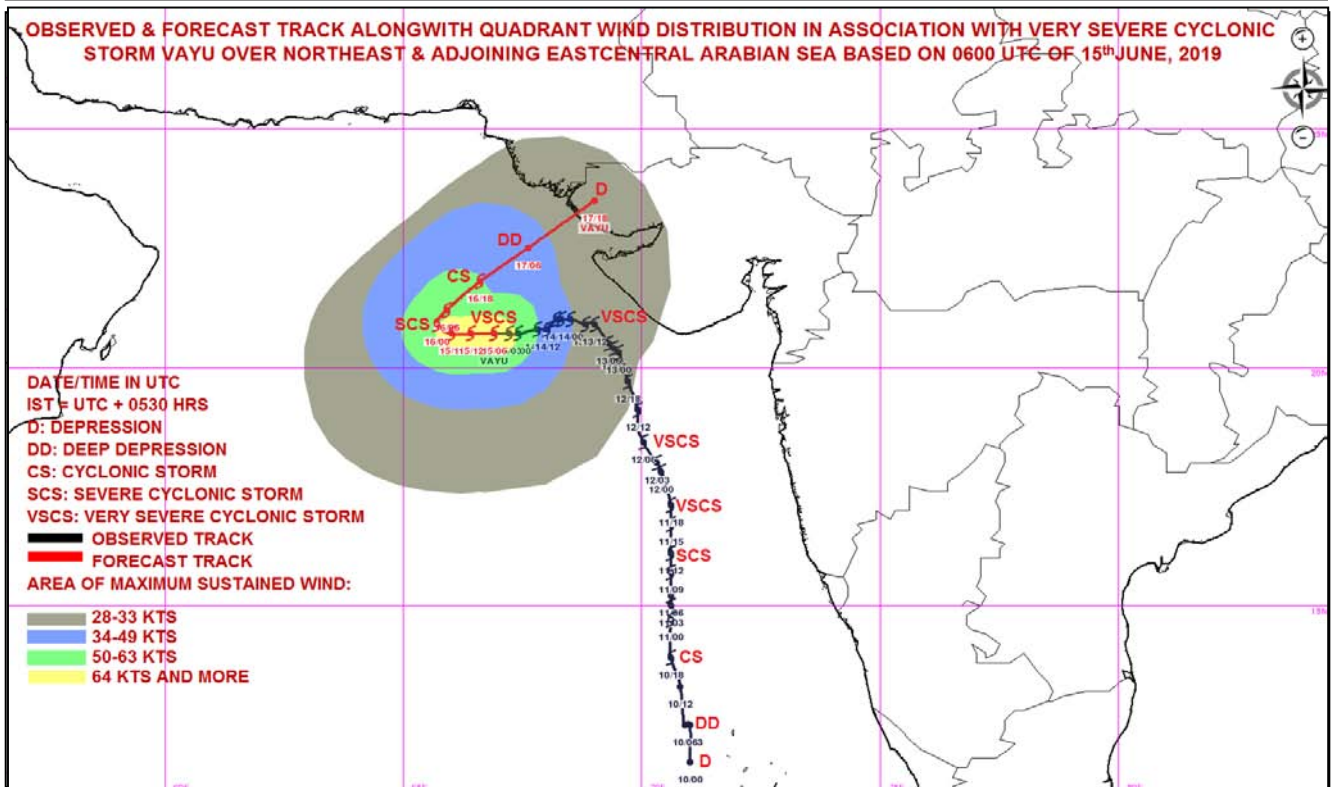
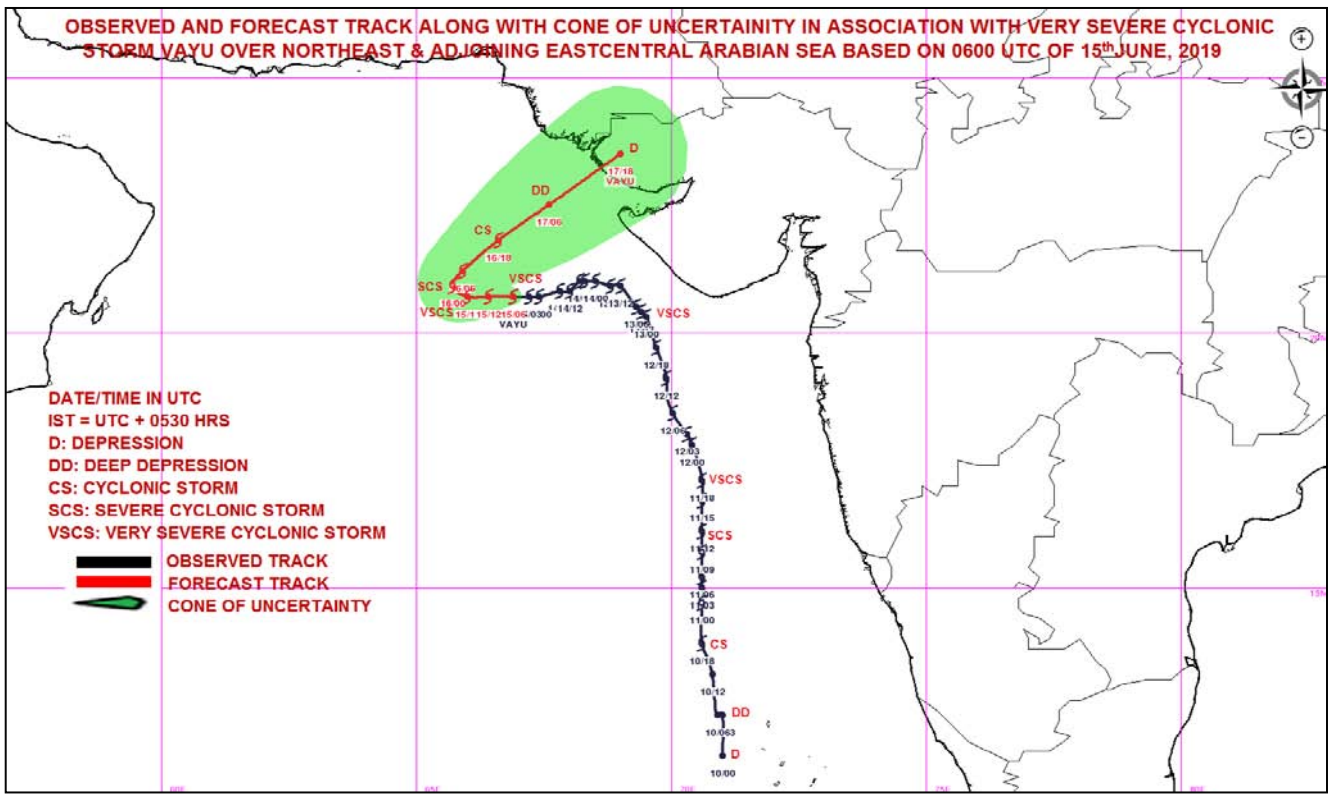
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IMG. TIR1 TEMP 10.8 um
SECTOR ARABIAN_SEA Mercator (NHC LUT)

15-06-2019/07:00 GMT
15-06-2019/12:30 IST



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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

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. 35

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. 35 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1200 UTC OF 15.06.2019 BASED ON 0900 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 0900 UTC OF TODAY, THE 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 66.7°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 325 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 380 KM WEST-SOUTHWEST OF VERAVAL (42909) (GUJARAT) AND 435 KM NEARLY WEST OF DIU (42914). **THE SYSTEM IS VERY LIKELY TO MOVE NEARLY WESTWARDS DURING NEXT 24 HOURS WITH GRADUAL WEAKENING AND RECURVE NORTHEASTWARDS THEREAFTER AND CROSS NORTH GUJARAT COAST AS A DEPRESSION BY 1200 UTC OF 17TH JUNE 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
15.06.19/0900	20.7/66.7	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1200	20.7/66.4	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1800	20.7/66.0	120-130 gusting to 145	Very Severe Cyclonic Storm
16.06.19/0000	20.9/65.7	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/0600	21.2/65.9	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1800	21.8/66.6	80-90 gusting to 100	Cyclonic Storm
17.06.19/0600	22.5/67.6	55-65 gusting to 75	Deep Depression
17.06.19/1800	23.5/69.0	40-50 gusting to 60	Depression

REMARKS:

AS PER SATELLITE IMAGERY OF 0900 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LAT 17.0°N & 21.9°N, LONG 62.5°E & 68.0°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 15TH JUNE, A SHIP LOCATED NEAR LAT. 16.7 DEG. N / LONG. 66.3 DEG. E REPORTED MEAN SEA LEVEL PRESSURE OF 1001.5 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 280°/33 KNOTS, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 90°/8.9 KNOTS AND DWARKA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 999.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/12.1 KNOTS. VERAVAL (42909) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/11.1 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AROUND THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR CONTINUES TO BE MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 36 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO LIKELY RECURVATURE OF THE SYSTEM NORTHEASTWARDS. DURING THIS PERIOD THE SYSTEM IS LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

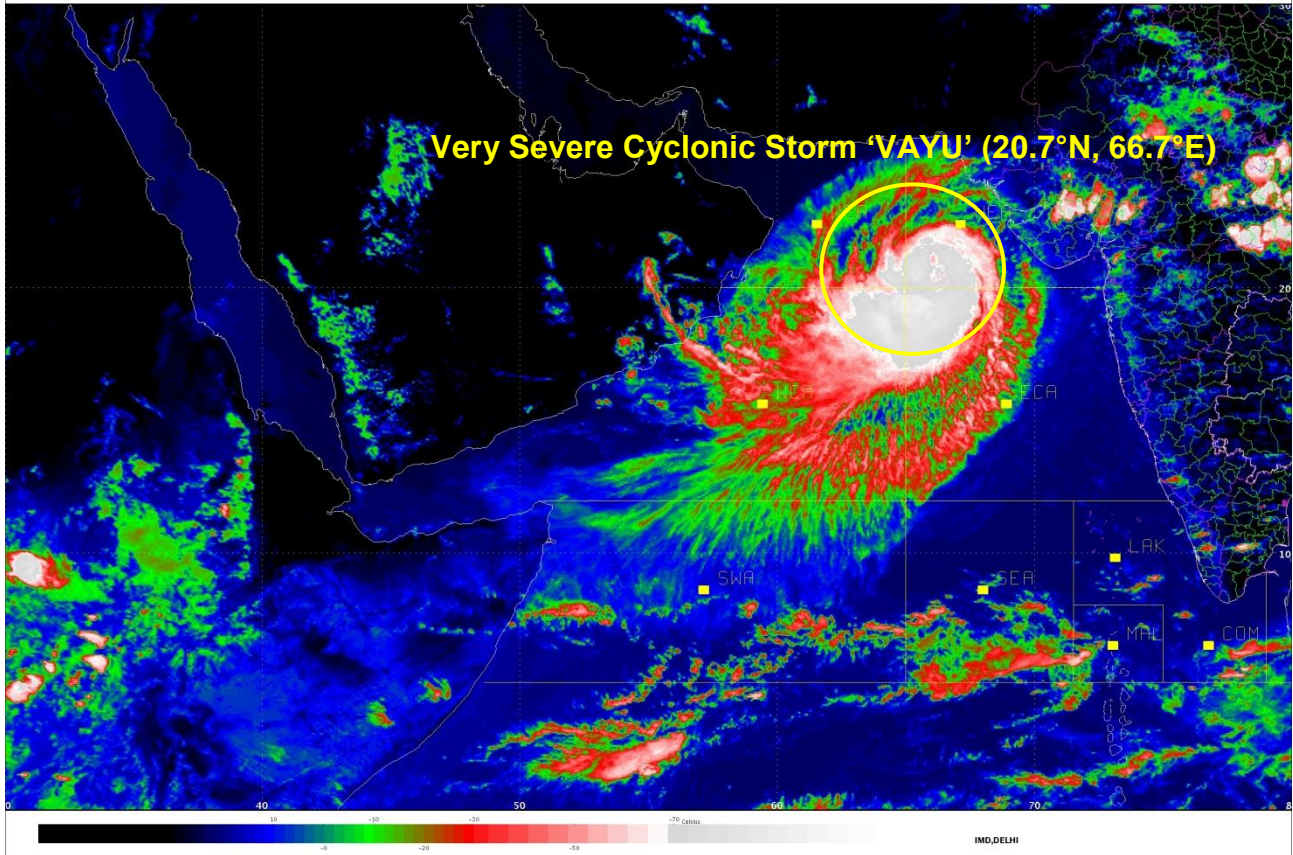
(NEETHA K. GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

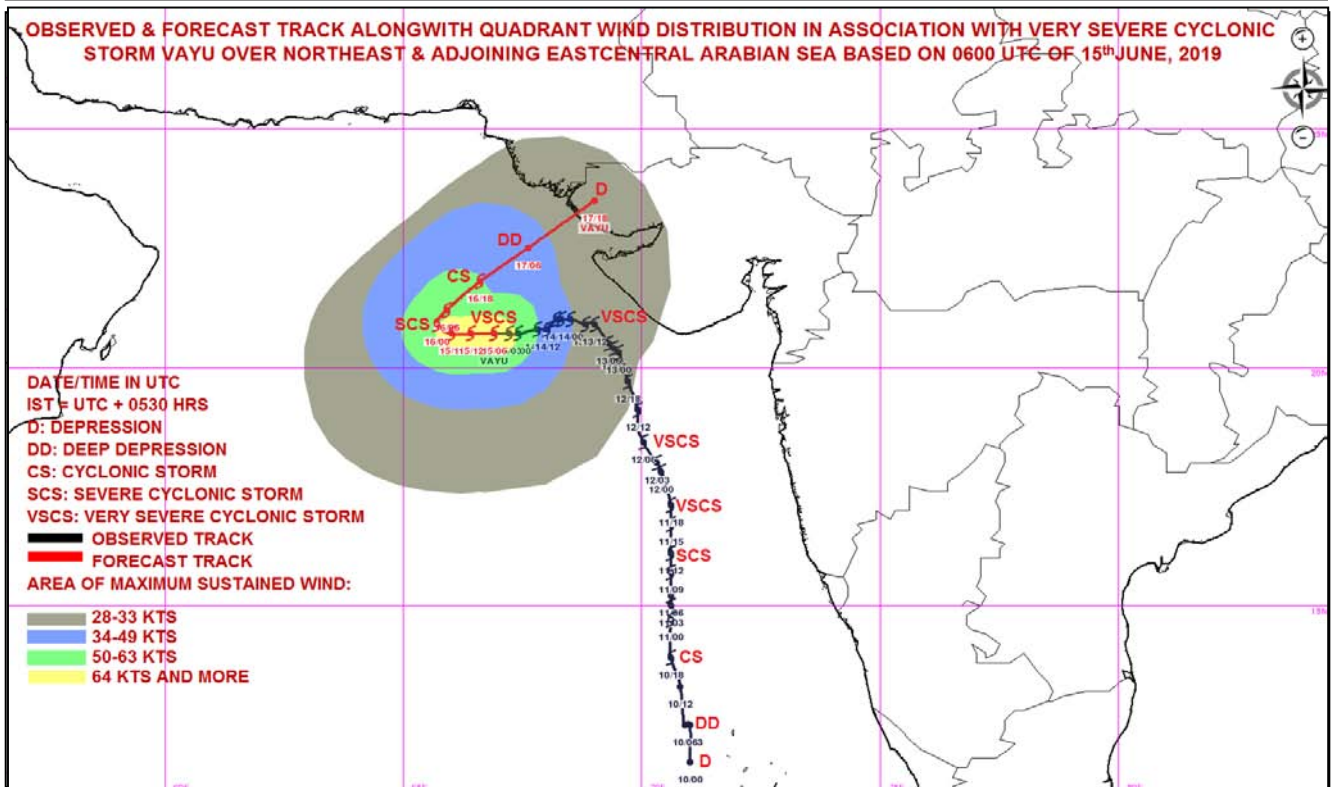
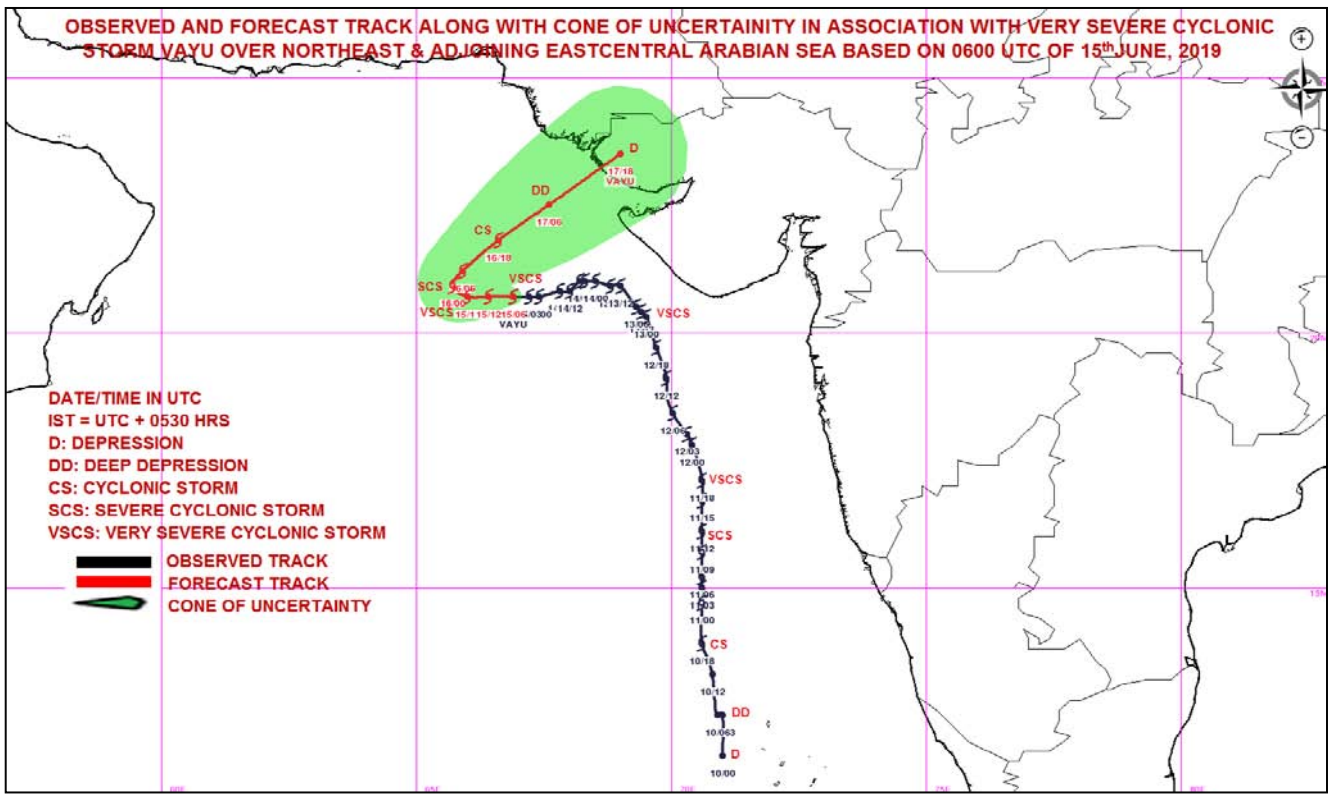
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IMG. TIR1 TEMP 10.8 um
SECTOR ARABIAN SEA Mercator (NHC LUT)

15-06-2019/10:30 GMT
15-06-2019/16:00 IST



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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

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. 36

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. 36 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1500 UTC OF 15.06.2019 BASED ON 1200 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WESTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 66.4°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 355 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 330 KM SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 450 KM SOUTHWEST OF BHUJ (42634). **THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A SEVERE CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS DURING NEXT 12 HOURS; GRADUALLY RECURVE THEREAFTER NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1200 UTC OF 17TH JUNE 2019 AS A DEPRESSION.**

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
15.06.19/1200	20.7/66.4	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1800	20.8/66.1	120-130 gusting to 145	Very Severe Cyclonic Storm
16.06.19/0000	20.9/65.8	110-120 gusting to 135	Severe Cyclonic Storm
16.06.19/0600	21.2/66.0	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1200	21.6/66.4	90-100 gusting to 115	Severe Cyclonic Storm
17.06.19/0000	22.3/67.2	65-75 gusting to 85	Cyclonic Storm
17.06.19/1200	23.2/68.5	45-55 gusting to 65	Depression
18.06.19/0000	23.9/69.6	20-30 gusting to 40	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LAT 16.4°N & 21.8°N, LONG 61.9°E & 68.5°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 999.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/12 KNOTS, DWARKA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 998.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/11 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 998.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/08 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

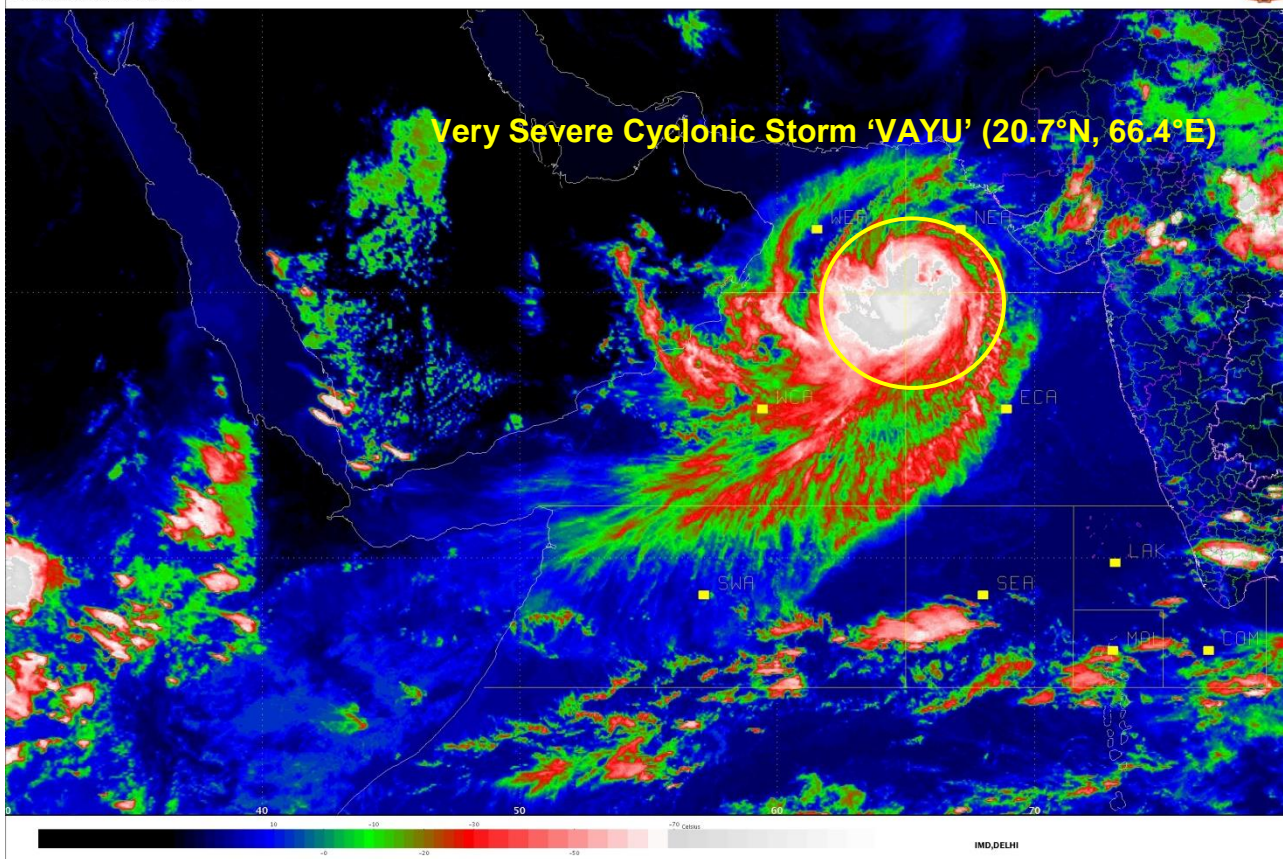
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY REMAINED SAME AND IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR INCREASED TO HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 12 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO RECURVATURE OF THE SYSTEM NORTHEASTWARDS TOWARDS NORTH GUJARAT COAST. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

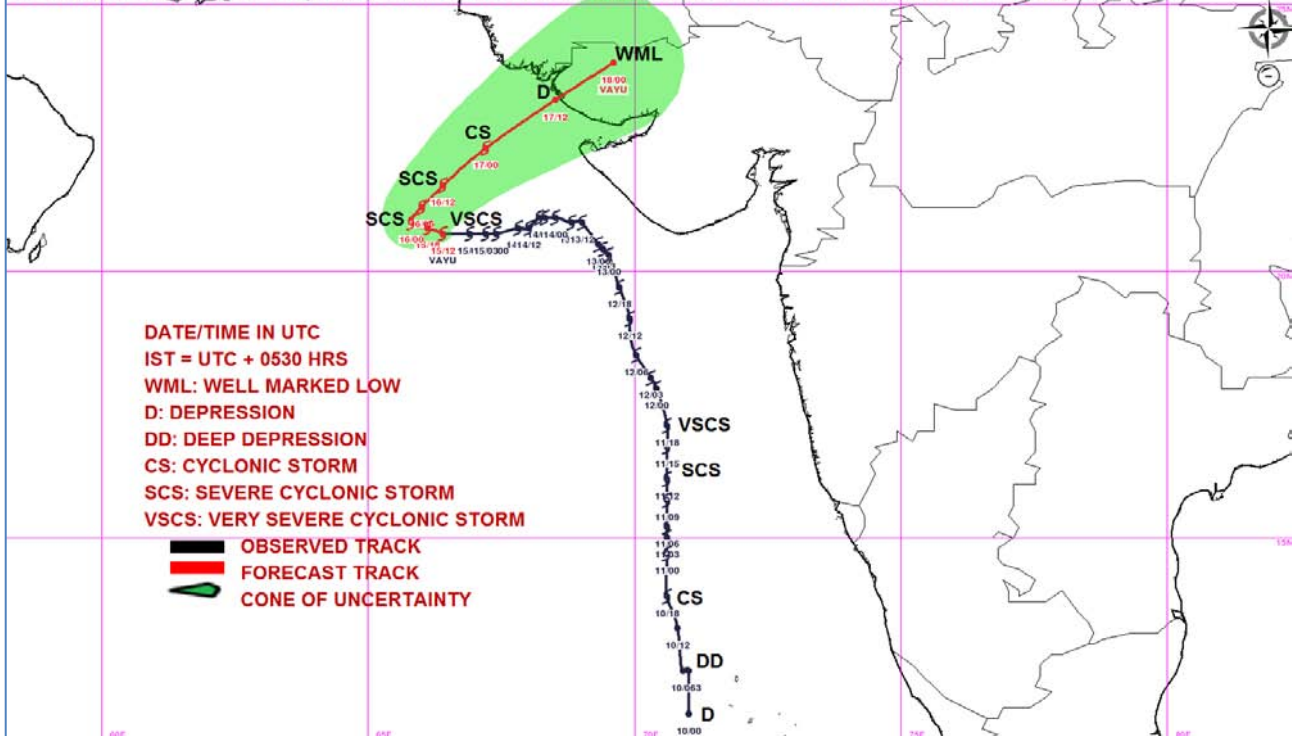
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



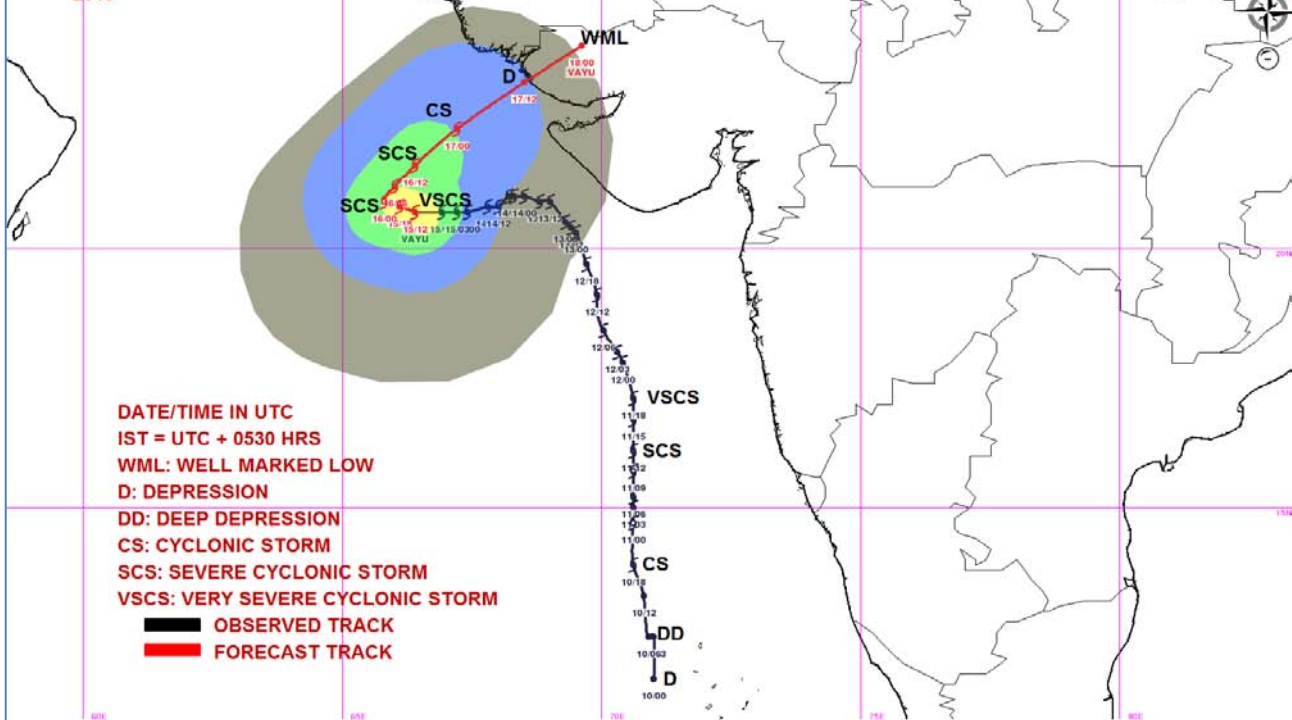
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 15th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 15th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33 (51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
= 64 (=118)	Phenomenal	Total suspension of fishing operations

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. 37

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. 37 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 1630 UTC OF 15.06.2019 BASED ON 1500 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1500 UTC OF 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 66.3°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 365 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 340 KM SOUTHWEST OF DWARKA (GUJARAT) (42731) AND 460 KM SOUTHWEST OF BHUJ (42634) (GUJARAT). **THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A SEVERE CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS DURING NEXT 12 HOURS; GRADUALLY RECURVE THEREAFTER NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1200 UTC OF 17TH JUNE 2019 AS A DEPRESSION.**

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
15.06.19/1500	20.7/66.3	120-130 gusting to 145	Very Severe Cyclonic Storm
15.06.19/1800	20.8/66.1	120-130 gusting to 145	Very Severe Cyclonic Storm
16.06.19/0000	20.9/65.8	110-120 gusting to 135	Severe Cyclonic Storm
16.06.19/0600	21.2/66.0	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1200	21.6/66.4	90-100 gusting to 115	Severe Cyclonic Storm
17.06.19/0000	22.3/67.2	65-75 gusting to 85	Cyclonic Storm
17.06.19/1200	23.2/68.5	45-55 gusting to 65	Depression
18.06.19/0000	23.9/69.6	20-30 gusting to 40	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 1500 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LAT 16.4°N & 21.8°N, LONG 61.9°E & 68.5°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1001 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 90°/10 KNOTS, DWARKA (42731) REPORTED MEAN SURFACE WIND DIRECTION/SPEED OF 135°/5 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 999 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/08 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

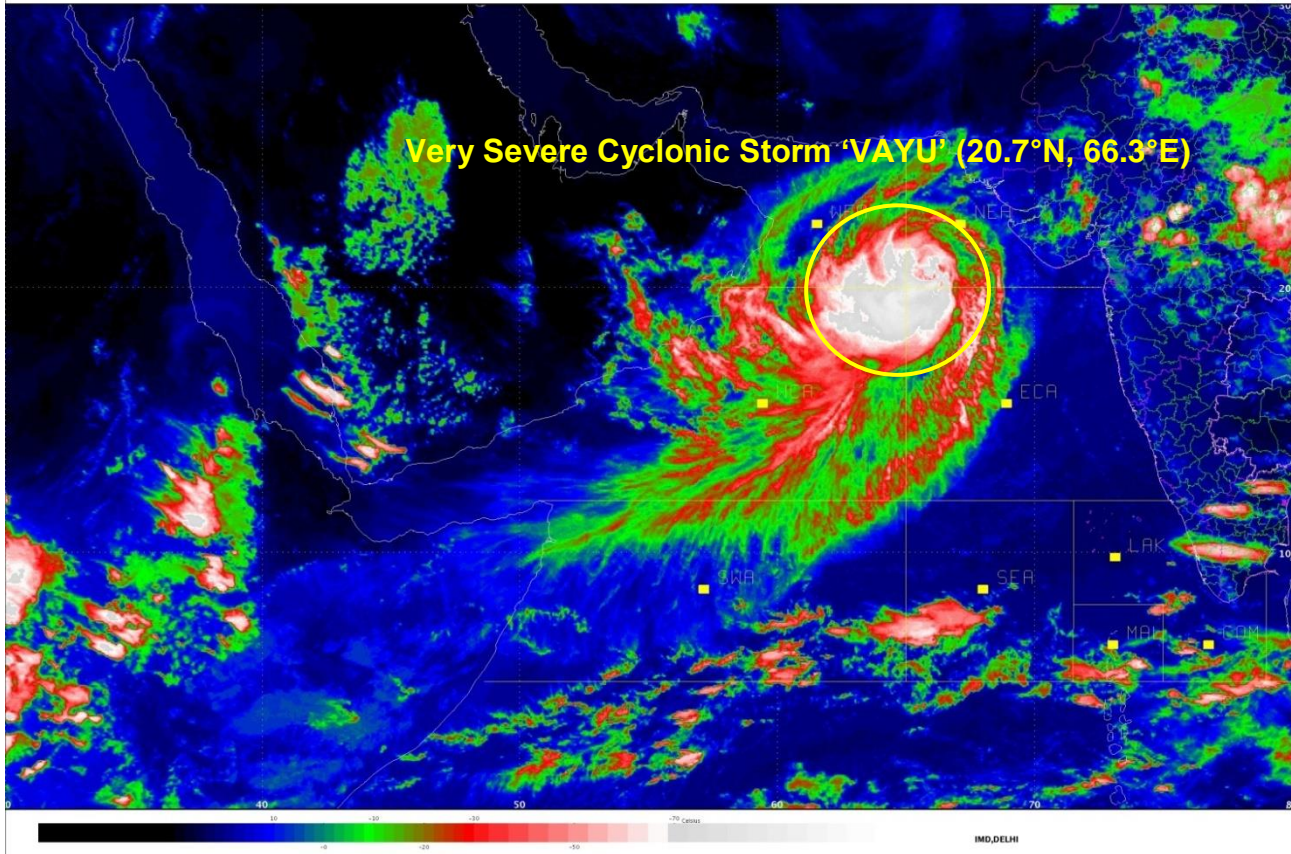
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY REMAINED SAME AND IS AROUND $300 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR INCREASED TO HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 12 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO RECURVATURE OF THE SYSTEM NORTHEASTWARDS TOWARDS NORTH GUJARAT COAST. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

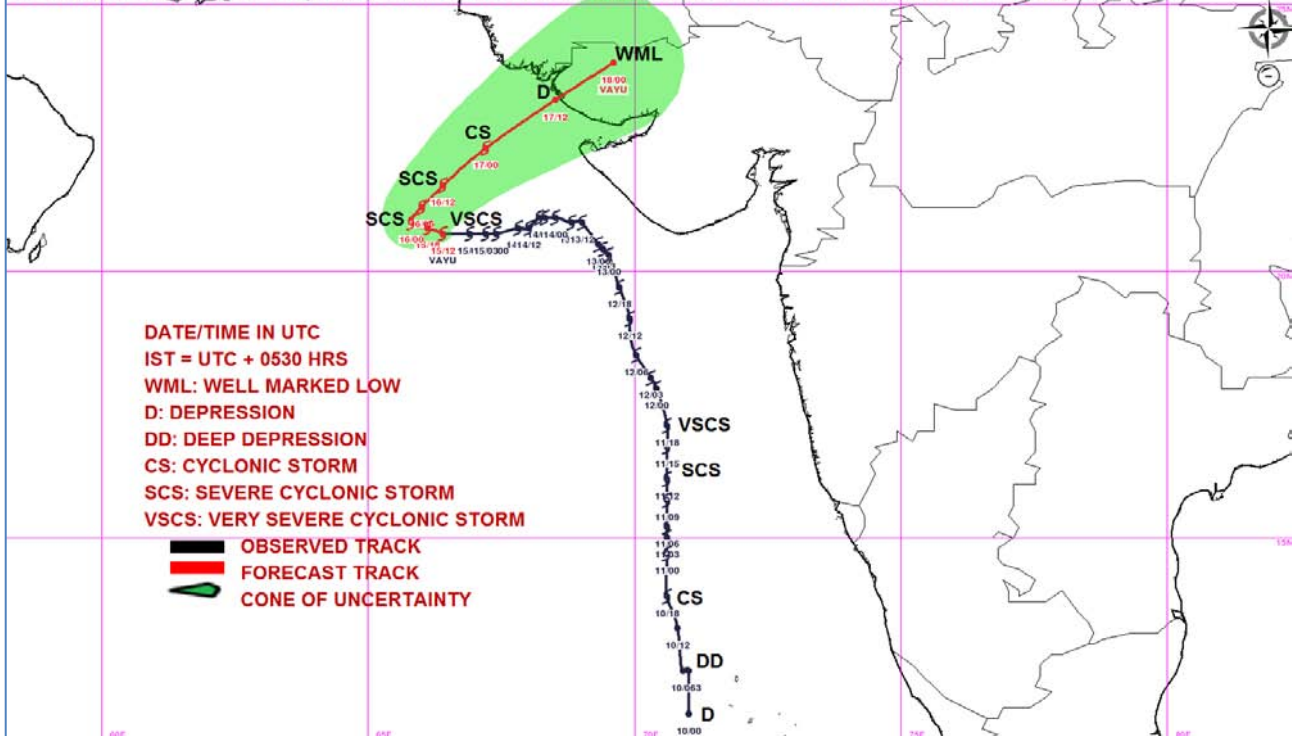
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

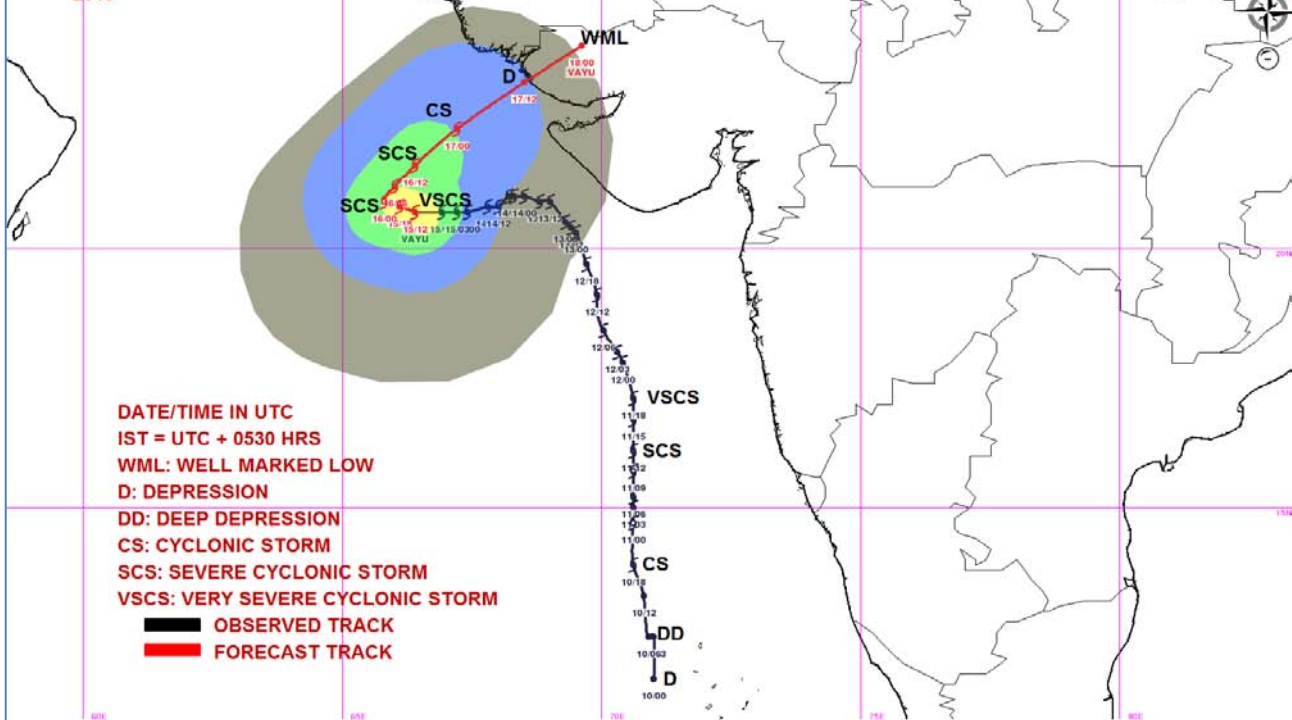


PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 15th JUNE, 2019



OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH VERY SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 1200 UTC OF 15th JUNE, 2019



MSW(knot)/kmph	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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. 38

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. 38 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2100 UTC OF 15.06.2019 BASED ON 1800 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 1800 UTC OF 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 66.0°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 395 KM WEST-SOUTHWEST OF PORBANDAR (GUJARAT) (42830), 365 KM SOUTHWEST OF DWARKA (GUJARAT) (42731) AND 480 KM SOUTHWEST OF BHUJ (GUJARAT) (42634). **THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A SEVERE CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS DURING NEXT 12 HOURS; GRADUALLY RECURVE THEREAFTER NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1200 UTC OF 17TH JUNE 2019 AS A DEPRESSION.**

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
15.06.19/1800	20.7/66.0	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
16.06.19/0000	20.7/65.6	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
16.06.19/0600	20.8/65.8	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
16.06.19/1200	21.0/66.2	90-100 GUSTING TO 115	SEVERE CYCLONIC STORM
16.06.19/1800	21.5/66.8	70-80 GUSTING TO 90	CYCLONIC STORM
17.06.19/0600	22.3/67.8	55-65 GUSTING TO 75	DEEP DEPRESSION
17.06.19/1800	23.2/69.0	45-55 GUSTING TO 65	DEPRESSION
18.06.19/0600	24.1/70.2	25-35 GUSTING TO 45	WELL MARKED LOW

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LAT 18.0°N & 22.0°N, LONG 61.5°E & 67.0°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 1800 UTC OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1002 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/10 KNOTS, DWARKA (42731) REPORTED MEAN SURFACE WIND DIRECTION/SPEED OF 135°/6 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1001 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/04 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

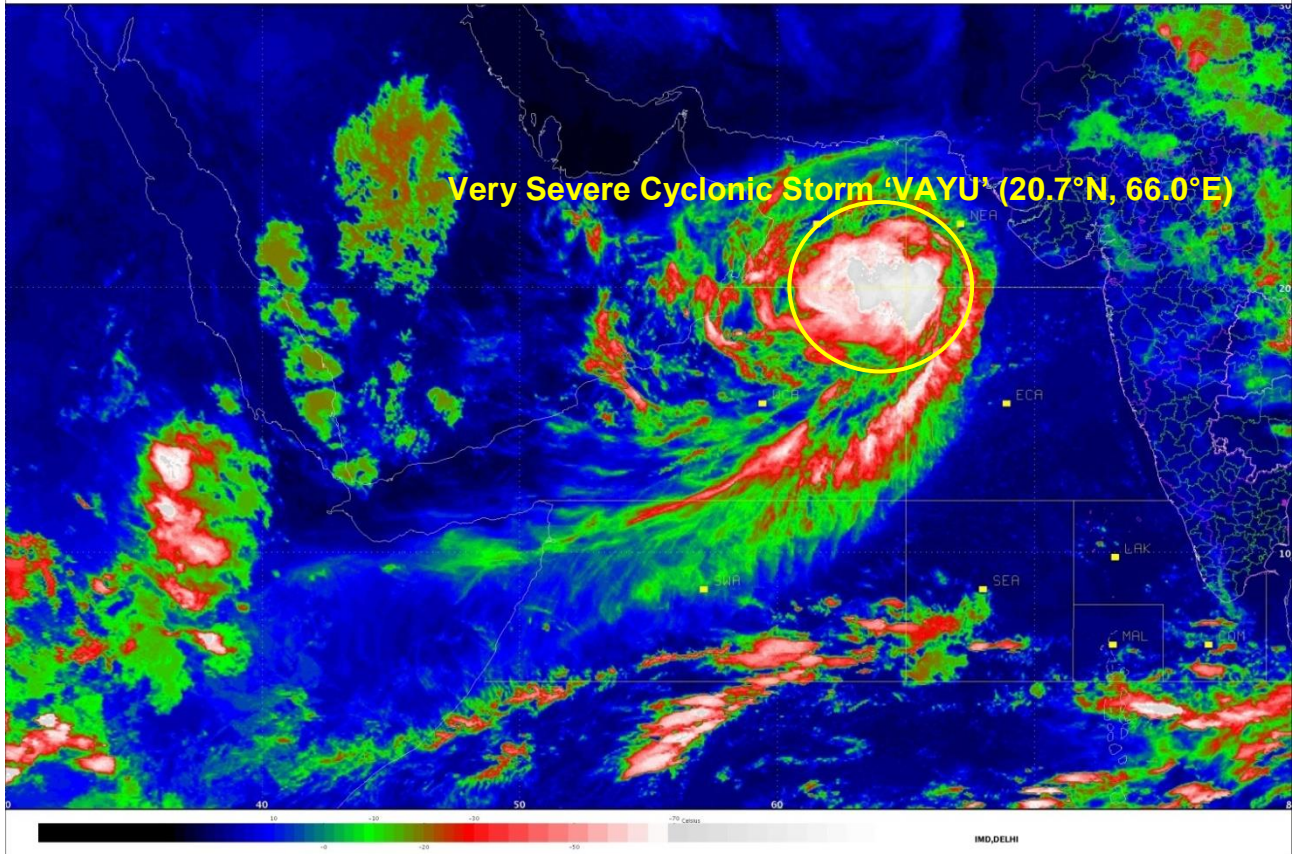
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS INCREASED AND IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR INCREASED TO HIGH (30-40 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 12 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO RECURVATURE OF THE SYSTEM NORTHEASTWARDS TOWARDS NORTH GUJARAT COAST. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

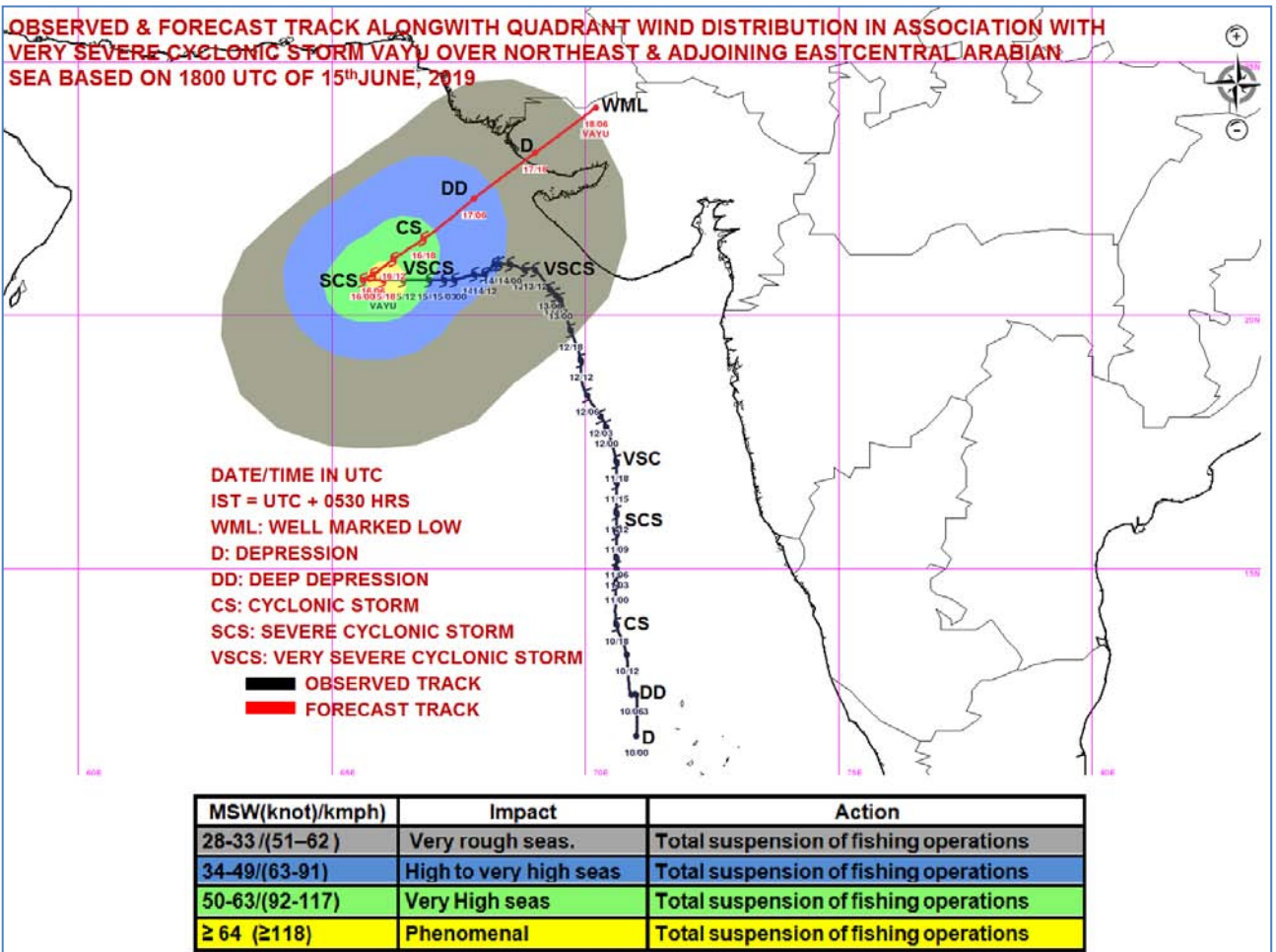
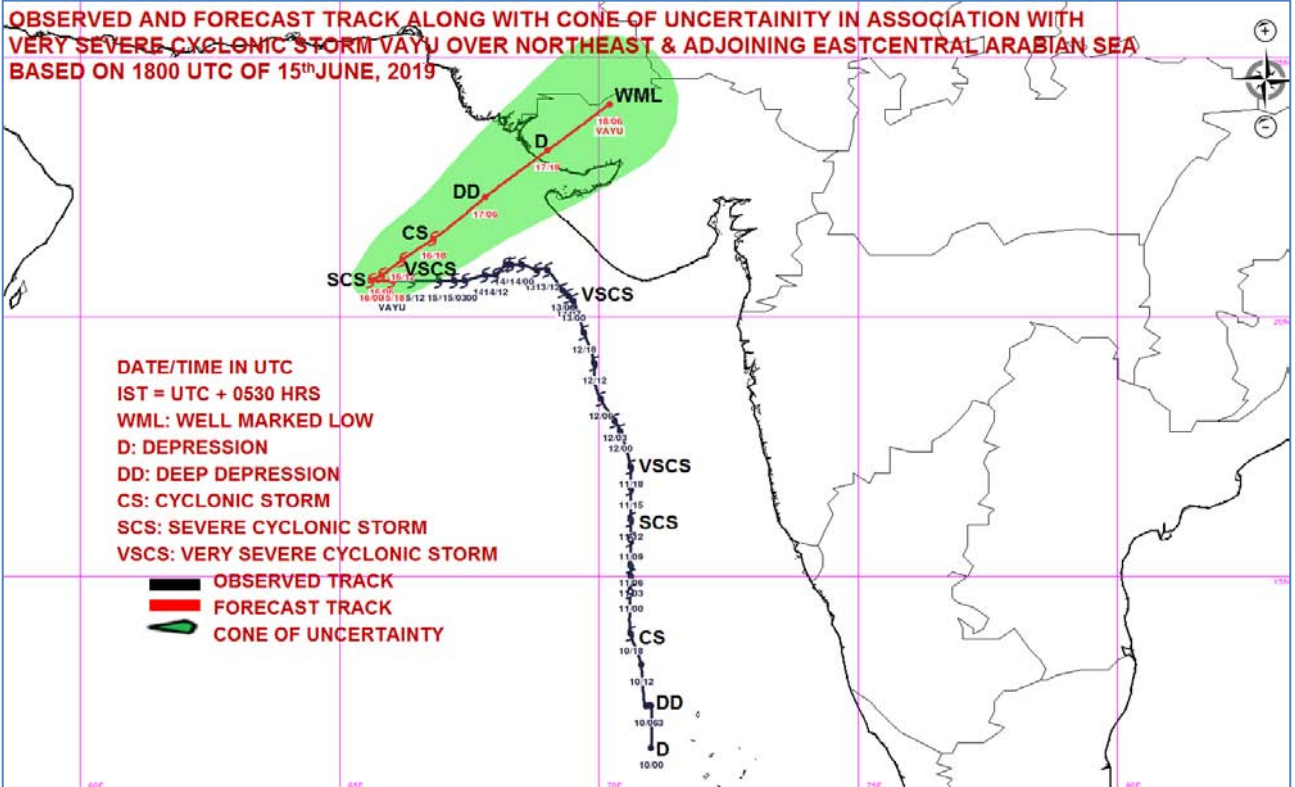
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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. 39

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. 39 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 72 HOURS ISSUED AT 2300 UTC OF 15.06.2019 BASED ON 2100 UTC OF 15.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WESTWARDS WITH A SPEED OF ABOUT 07 KMPH IN LAST SIX HOURS AND LAY CENTRED AT 2100 UTC OF 15TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 65.9°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 405 KM WEST-SOUTHWEST OF PORBANDAR (GUJARAT) (42830), 375 KM SOUTHWEST OF DWARKA (GUJARAT) (42731) AND 490 KM SOUTHWEST OF BHUJ (GUJARAT) (42634). **THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A SEVERE CYCLONIC STORM DURING NEXT 06 HOURS AND INTO A CYCLONIC STORM DURING THE SUBSEQUENT 24 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS DURING NEXT 12 HOURS; GRADUALLY RECURVE THEREAFTER NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1200 UTC OF 17TH JUNE 2019 AS A DEPRESSION.**

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
15.06.19/2100	20.7/65.9	120-130 GUSTING TO 145	VERY SEVERE CYCLONIC STORM
16.06.19/0000	20.7/65.6	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
16.06.19/0600	20.8/65.8	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
16.06.19/1200	21.0/66.2	90-100 GUSTING TO 115	SEVERE CYCLONIC STORM
16.06.19/1800	21.5/66.8	70-80 GUSTING TO 90	CYCLONIC STORM
17.06.19/0600	22.3/67.8	55-65 GUSTING TO 75	DEEP DEPRESSION
17.06.19/1800	23.2/69.0	45-55 GUSTING TO 65	DEPRESSION
18.06.19/0600	24.1/70.2	25-35 GUSTING TO 45	WELL MARKED LOW

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC OF 15TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LAT 18.0°N & 22.0°N, LONG 61.0°E & 66.5°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 2100 UTC OF 15TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1001 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/09 KNOTS, DWARKA (42731) REPORTED MEAN SURFACE WIND DIRECTION/SPEED OF 135°/11 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 999 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/03 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 65 KNOTS GUSTING TO 75 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 980 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS CURRENTLY MOVING TO PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND REMAIN IN SAME PHASE FOR SUBSEQUENT 3 DAYS. HENCE, MJO PHASE WILL BE FAVOURABLE FOR ENHANCEMENT OF CONVECTION AND MAINTENANCE OF THE INTENSITY OF THE SYSTEM OVER ARABIAN SEA.

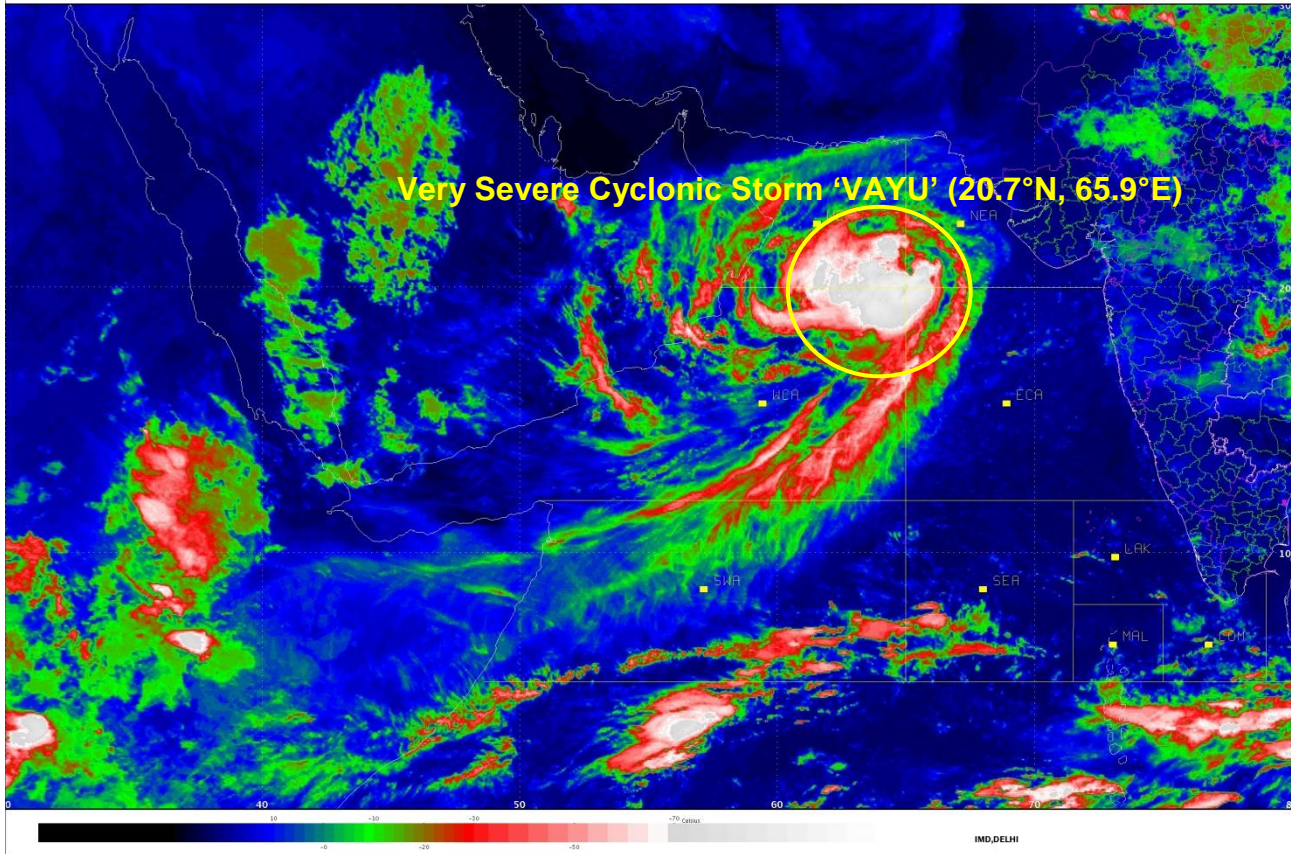
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $250 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS INCREASED AND IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR INCREASED TO HIGH (30-40 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 12 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO RECURVATURE OF THE SYSTEM NORTHEASTWARDS TOWARDS NORTH GUJARAT COAST. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

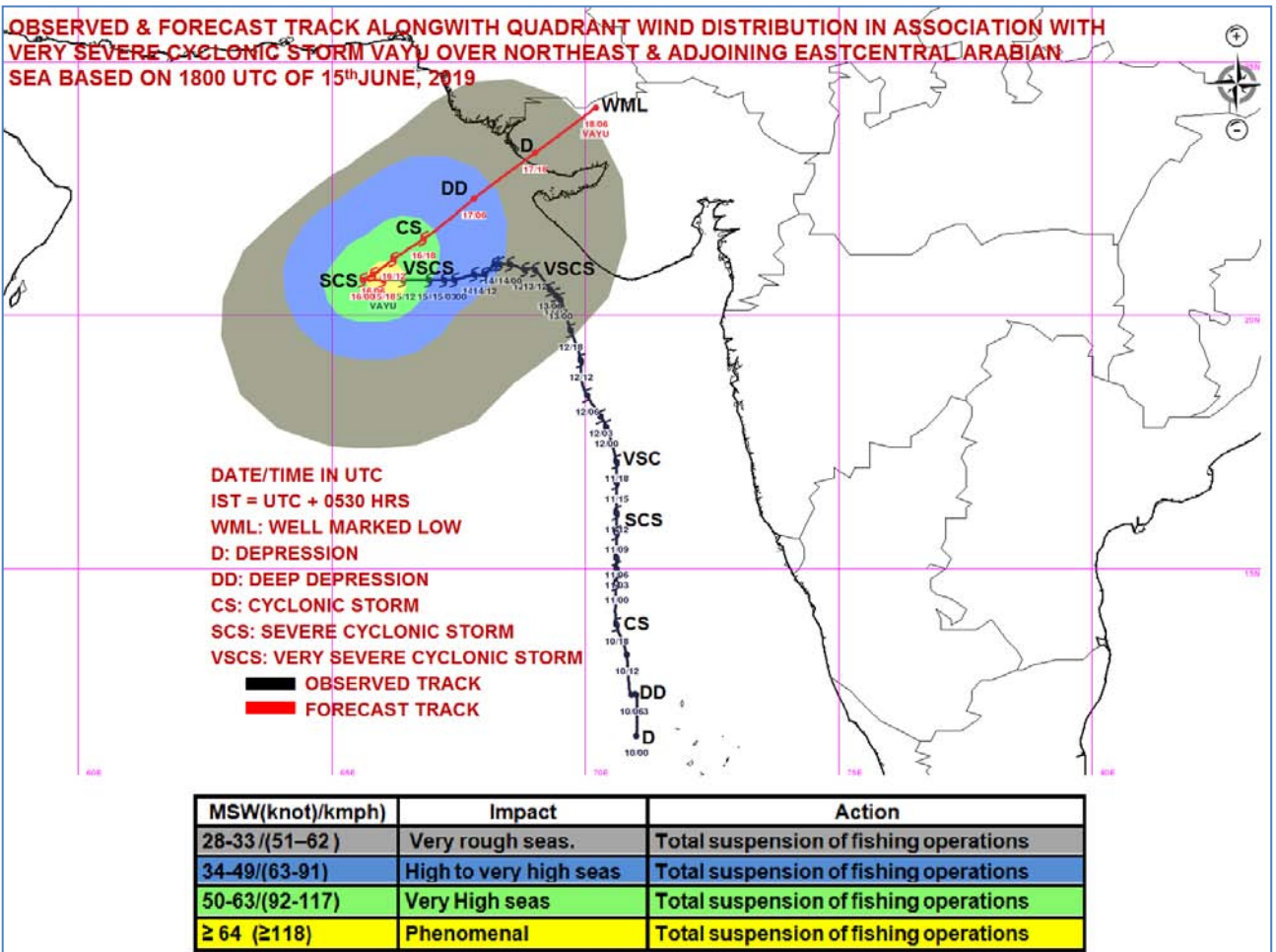
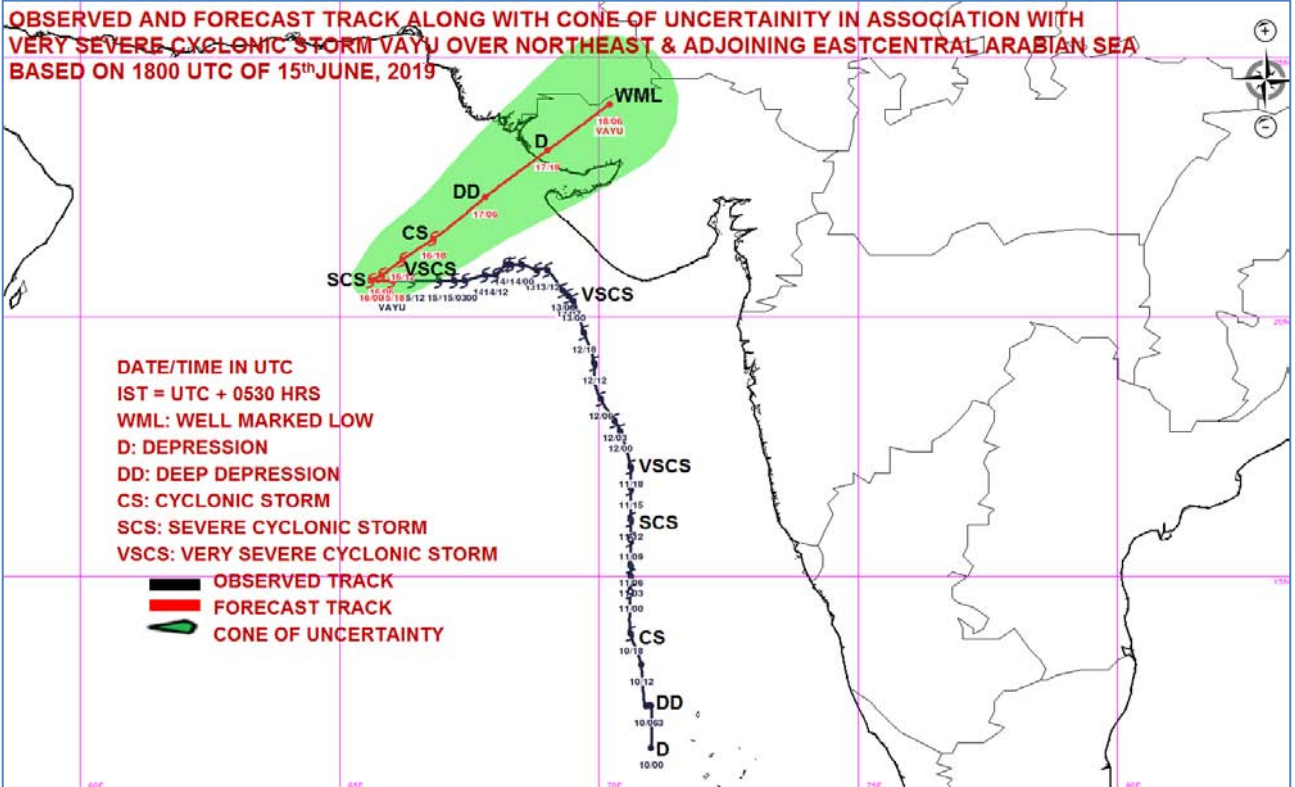
(D.R. PATTANAİK)
SCIENTIST-E, RSMC, NEW DELHI

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. 40

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. 40 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 48 HOURS ISSUED AT 0400 UTC OF 16.06.2019 BASED ON 0000 UTC OF 16.06.2019.

THE **VERY SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA CONTINUED TO MOVE WESTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS, WEAKENED INTO A SEVERE CYCLONIC STORM AND LAY CENTRED AT 0000 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 20.7°N AND LONGITUDE 65.5°E OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA, ABOUT 440 KM WEST-SOUTHWEST OF PORBANDAR (GUJARAT) (42830), 415 KM SOUTHWEST OF DWARKA (GUJARAT) (42731) AND 525 KM SOUTHWEST OF BHUJ (GUJARAT) (42634). **THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS DURING NEXT 06 HOURS; GRADUALLY RECURVE THEREAFTER NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST AROUND 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.**

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
16.06.19/0000	20.7/65.5	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
16.06.19/0600	21.0/65.1	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
16.06.19/1200	21.3/65.0	90-100 GUSTING TO 115	SEVERE CYCLONIC STORM
16.06.19/1800	21.6/65.4	80-90 GUSTING TO 100	CYCLONIC STORM
17.06.19/0000	21.9/66.1	70-80 GUSTING TO 90	CYCLONIC STORM
17.06.19/1200	22.8/68.1	50-60 GUSTING TO 70	DEEP DEPRESSION
18.06.19/0000	23.7/69.8	40-50 GUSTING TO 60	DEPRESSION

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA IS T 3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING EASTCENTRAL ARABIAN SEA BETWEEN LAT 18.0°N & 22.0°N, LONG 61.0°E & 66.0°E AND ALSO OVER WEST GUJARAT. MINIMUM CLOUD TOP TEMPERATURE 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 0000 UTC OF 16TH JUNE, PORBANDER (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1002 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/10 KNOTS, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.6 HPA MEAN SURFACE WIND DIRECTION/SPEED OF 180°/06 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 999.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 160°/10 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 60 KNOTS GUSTING TO 70 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 984 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 3 DAYS AND MOVE TO PHASE 5 THEREAFTER.

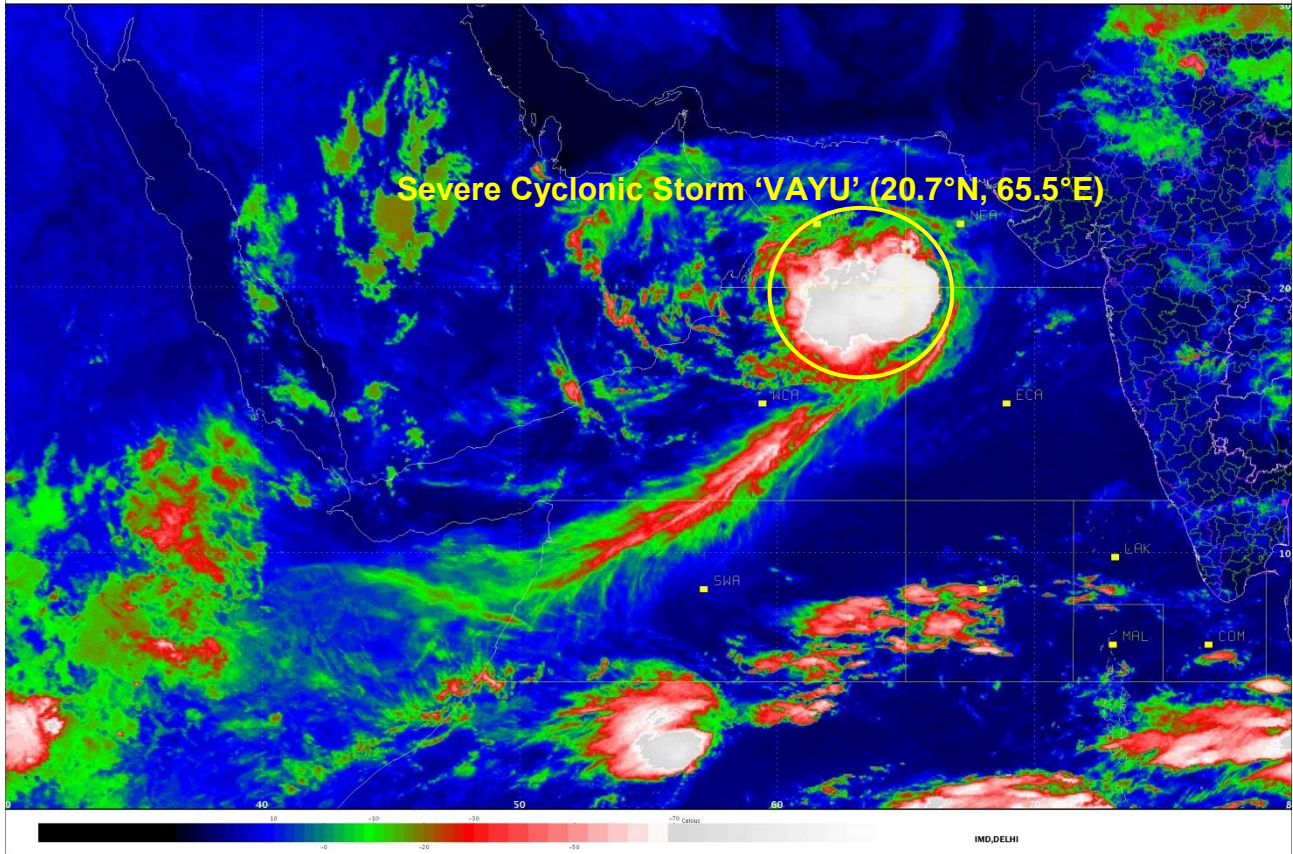
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY HAS DECREASED AND IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $40 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 23°N. AS THE SYSTEM IS BEING STEERED BY THE ANTICYCLONE OVER SAUDI ARABIAN PENINSULA THE SYSTEM IS MOVING IN A NEARLY WESTWARD DIRECTION AND IS LIKELY TO CONTINUE MOVING IN THE SAME DIRECTION FOR NEXT 06 HOURS. THEREAFTER IT IS LIKELY TO COME UNDER THE PERIFERY OF THE ANTICYCLONE OVER CENTRAL INDIA ONCE AGAIN LEADING TO RECURVATURE OF THE SYSTEM NORTHEASTWARDS TOWARDS NORTH GUJARAT COAST. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO GRADUAL WEAKENING.

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

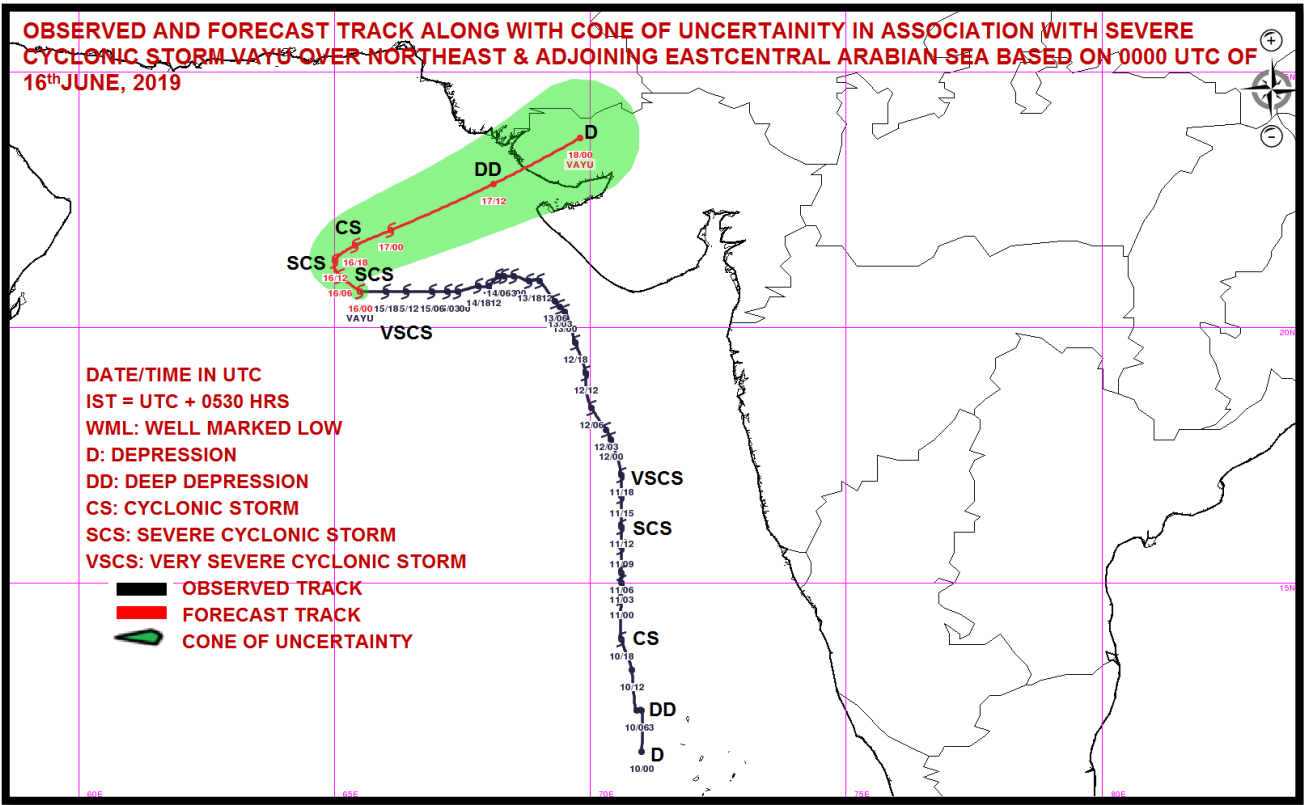
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%



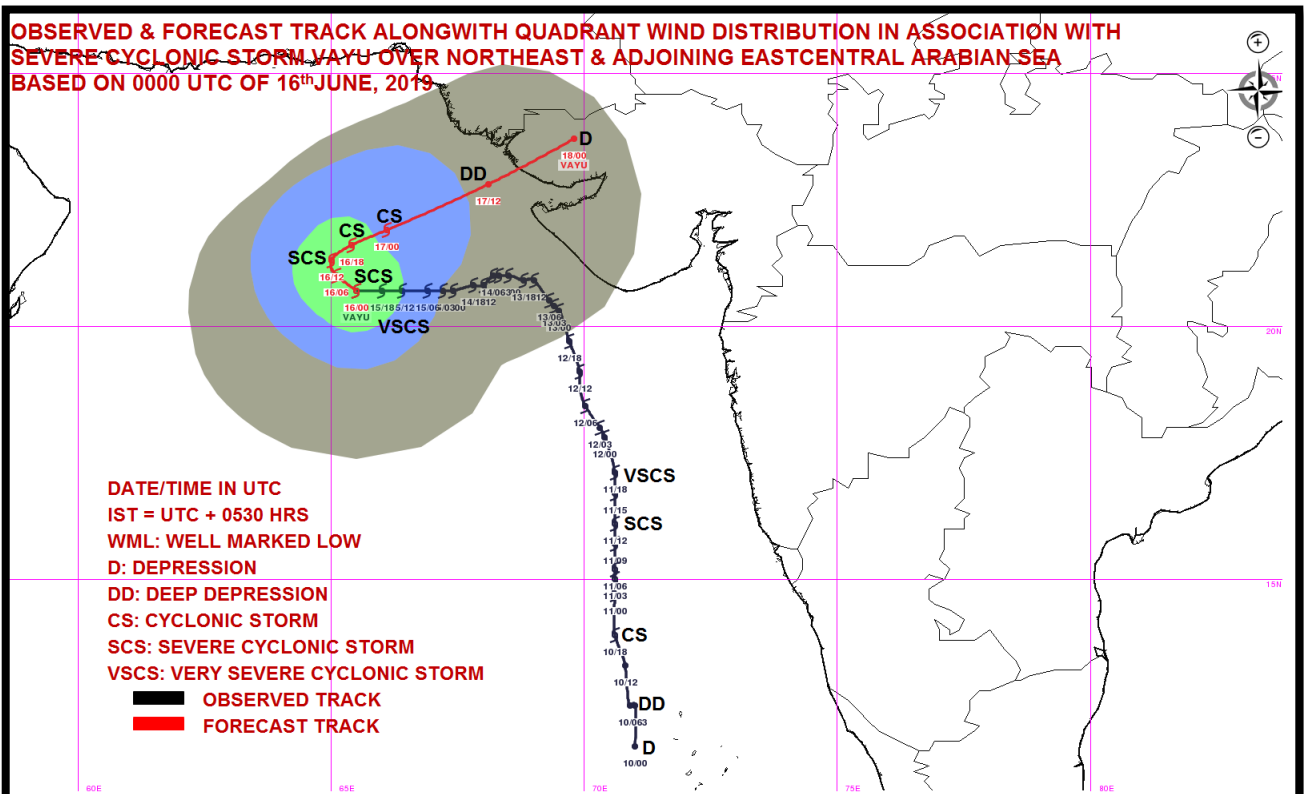
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 0000 UTC OF 16th JUNE, 2019



OBSERVED & FORECAST TRACK ALONG WITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH SEVERE CYCLONIC STORM VAYU OVER NORTHEAST & ADJOINING EASTCENTRAL ARABIAN SEA BASED ON 0000 UTC OF 16th JUNE, 2019



MSW(knot)/kmph)	Impact	Action
28-33/(51-62)	Very rough seas.	Total suspension of fishing operations
34-49/(63-91)	High to very high seas	Total suspension of fishing operations
50-63/(92-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

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 48 HOURS ISSUED AT 0900 UTC OF 16.06.2019 BASED ON 0600 UTC OF 16.06.2019.

THE **SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS, AND LAY CENTRED AT 0600 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 65.1°E OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA, ABOUT 480 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 440 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 550 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT). THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A DEEP DEPRESSION DURING SUBSEQUENT 12 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE SLOWLY NORTHWARDS DURING NEXT 06 HOURS AND THEN RECURVE GRADUALLY NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST AROUND 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
16.06.19/0600	20.9/65.1	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1200	21.2/65.3	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/1800	21.6/65.7	80-90 gusting to 100	Cyclonic Storm
17.06.19/0000	22.0/66.3	70-80 gusting to 90	Cyclonic Storm
17.06.19/0600	22.4/67.2	55-65 gusting to 75	Deep Depression
17.06.19/1800	23.2/68.7	45-55 gusting to 65	Depression
18.06.19/0600	23.8/69.8	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA IS C.I 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTH AND ADJOINING CENTRAL ARABIAN SEA BETWEEN LAT 17.5°N & 21.0°N, LONG 62.5°E & 66.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 0600 UTC OF 16TH JUNE, A BUOY LOCATED AT 18.5°N/67.4°E REPORTED MEAN SEA LEVEL PRESSURE OF 1001.7 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 015°/15 KNOTS, DWARKA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.5 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 160°/11 KNOTS, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1003.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/08 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 200°/12 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 985 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 3 DAYS AND MOVE TO PHASE 5 THEREAFTER.

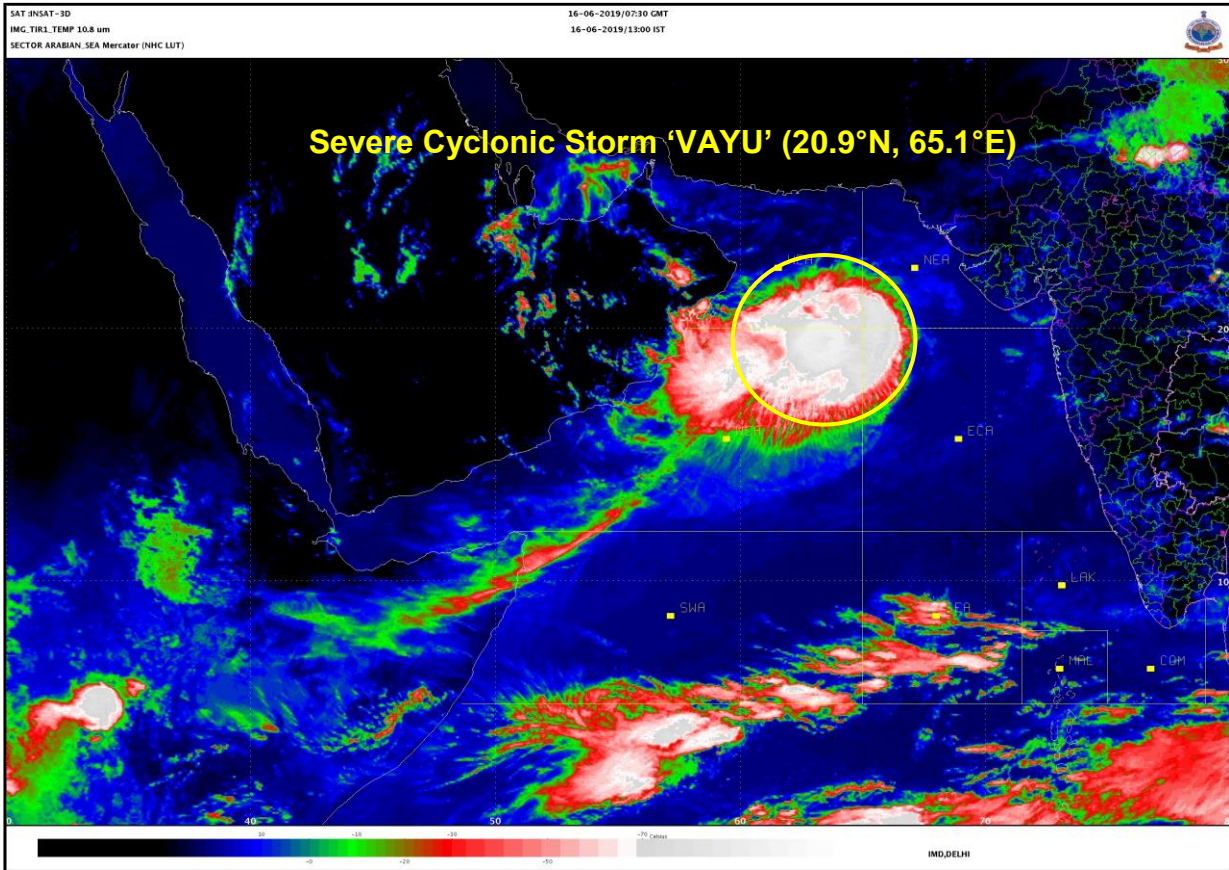
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR LIES TO THE NORTHWEST SECTOR OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA HAS SHIFTED NORHWARDS AND NOW RUNS ROUGHLY ALONG 25°N. AS THE SYSTEM IS IN THE PROCESS OF WEAKENING, ITS VERTICAL EXTENTION IS LIKELY TO DECREASE GRADUALLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN A NORTH/ NORTH-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING.

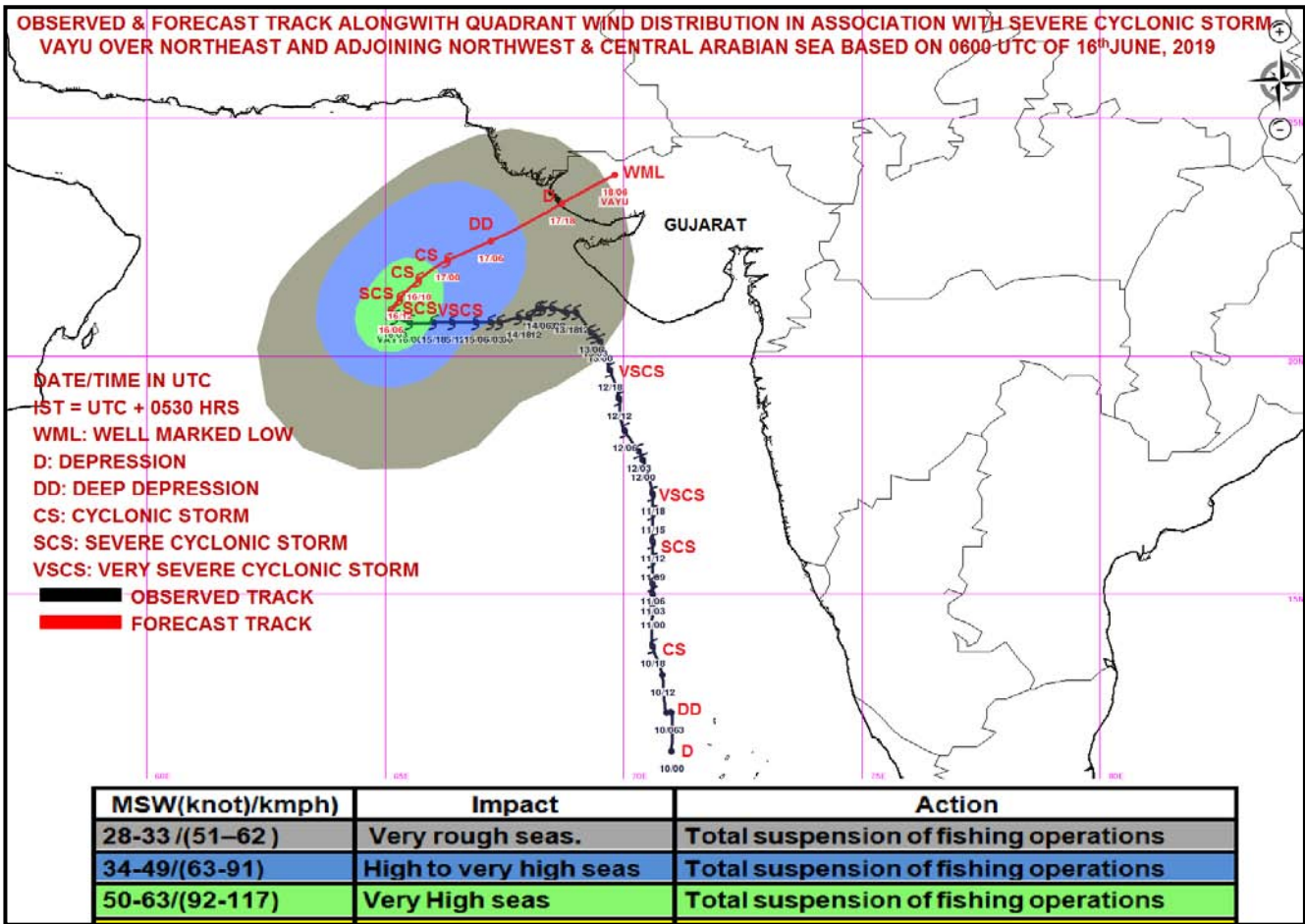
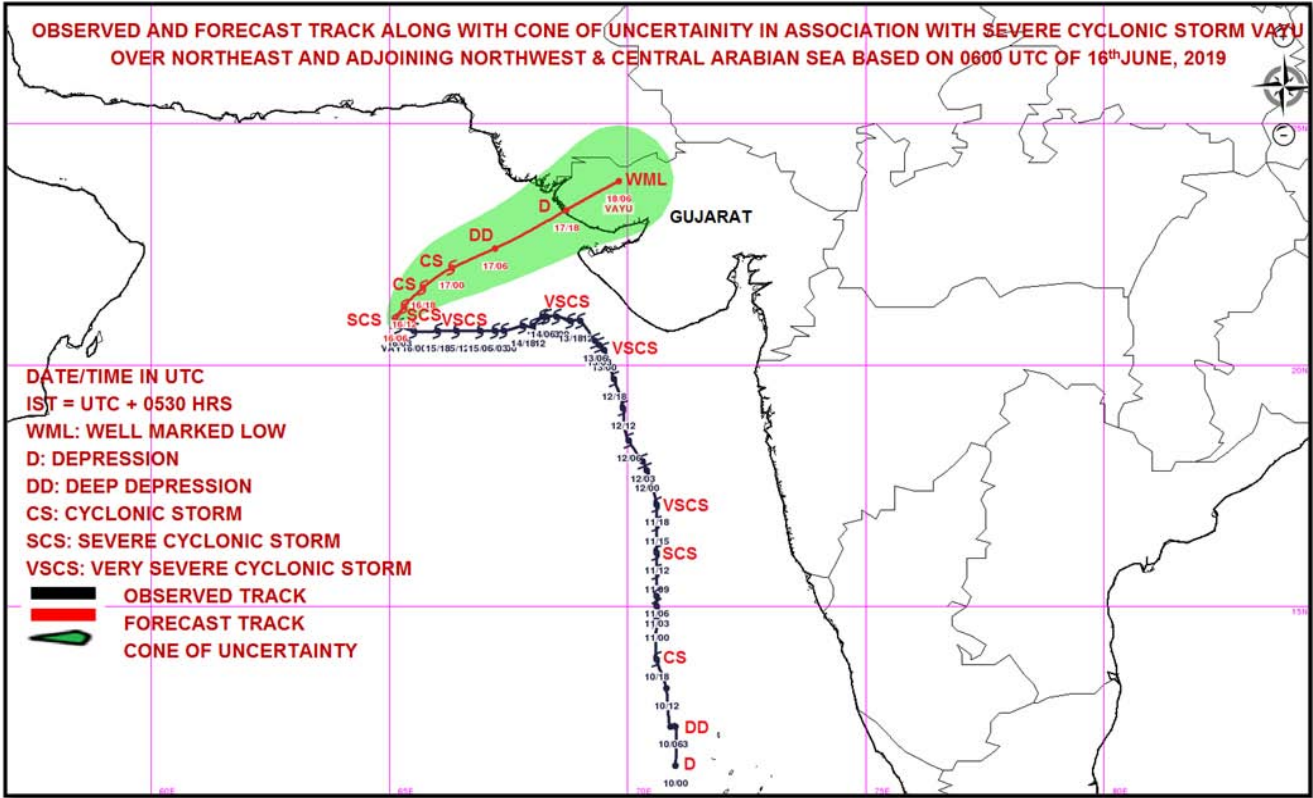
(NEETHA K.GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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 48 HOURS ISSUED AT 1130 UTC OF 16.06.2019 BASED ON 0900 UTC OF 16.06.2019.

THE **SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF ABOUT 05 KMPH IN LAST SIX HOURS, AND LAY CENTRED AT 0900 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 20.9°N AND LONGITUDE 65.1°E OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA, ABOUT 490 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 450 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 550 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT). THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A CYCLONIC STORM DURING NEXT 12 HOURS AND INTO A DEEP DEPRESSION DURING SUBSEQUENT 12 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE SLOWLY NORTHWARDS DURING NEXT 06 HOURS AND THEN RECURVE GRADUALLY NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST AROUND 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
16.06.19/0900	21.0/65.0	100-110 gusting to 125	Severe Cyclonic Storm
16.06.19/1200	21.2/65.3	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/1800	21.6/65.7	80-90 gusting to 100	Cyclonic Storm
17.06.19/0000	22.0/66.3	70-80 gusting to 90	Cyclonic Storm
17.06.19/0600	22.4/67.2	55-65 gusting to 75	Deep Depression
17.06.19/1800	23.2/68.7	45-55 gusting to 65	Depression
18.06.19/0600	23.8/69.8	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 0900 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA IS C.I 4.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTH AND ADJOINING CENTRAL ARABIAN SEA BETWEEN LAT 17.5°N & 21.0°N, LONG 62.5°E & 66.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 0900 UTC OF 16TH JUNE, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/08 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 200°/13 KNOTS AND PORBANDAR (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1003.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/12.1 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 55 KNOTS GUSTING TO 65 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 985 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 3 DAYS AND MOVE TO PHASE 5 THEREAFTER.

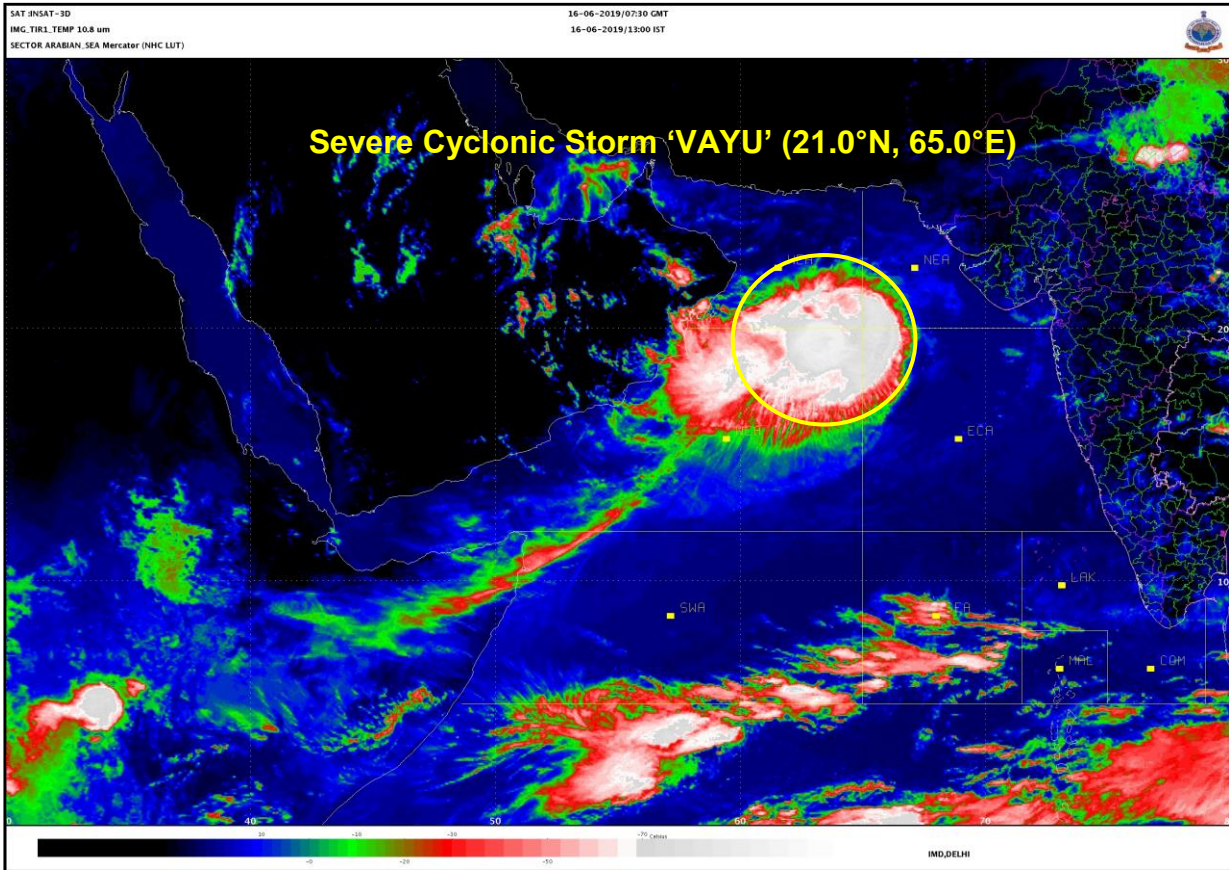
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 25°N. AS THE SYSTEM IS IN THE PROCESS OF WEAKENING, UNDER THE INFLUENCE OF HIGH WIND SHEAR ITS VERTICAL EXTENTION IS LIKELY TO DECREASE GRADUALLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN A NORTH/ NORTH-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING.MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

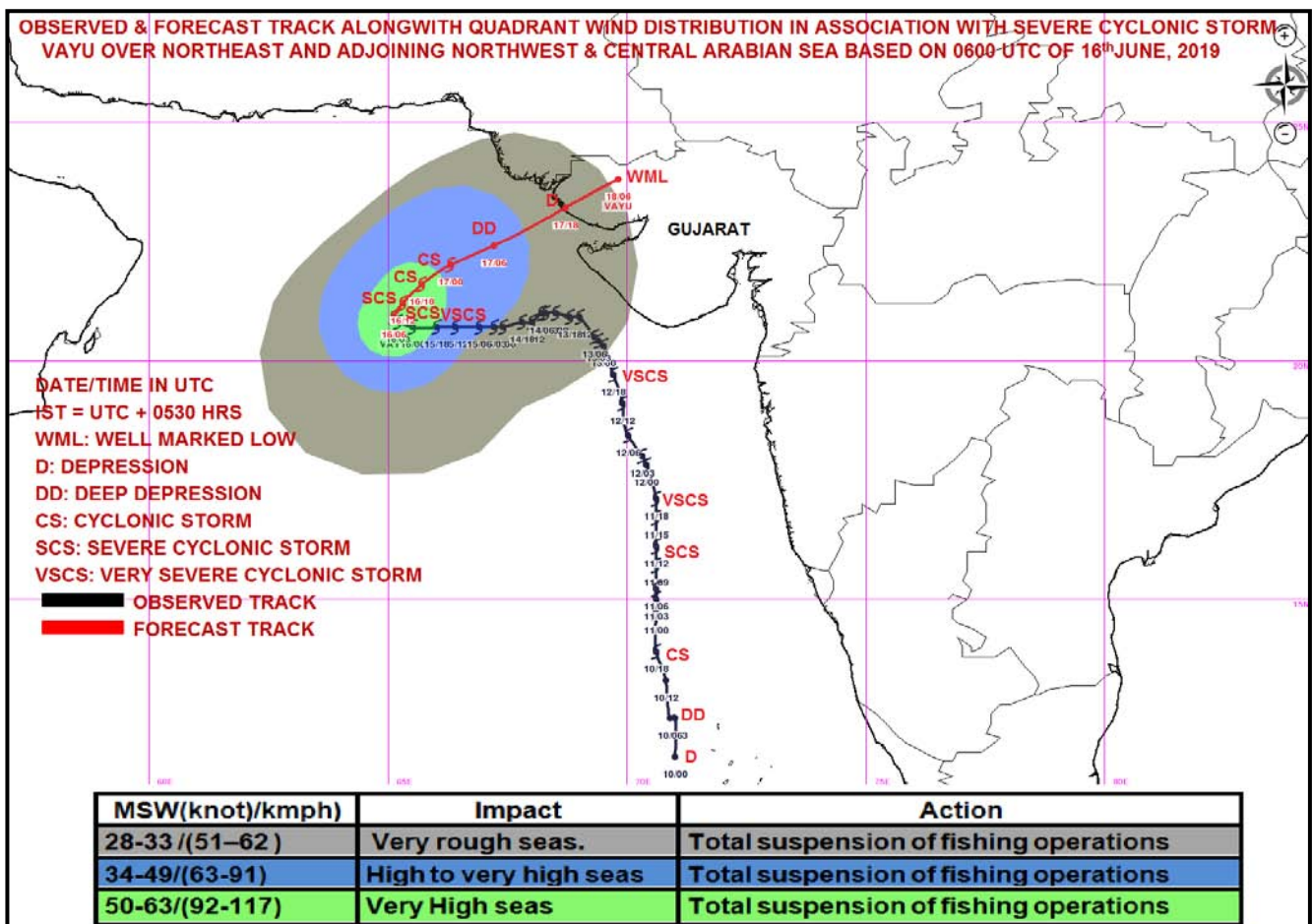
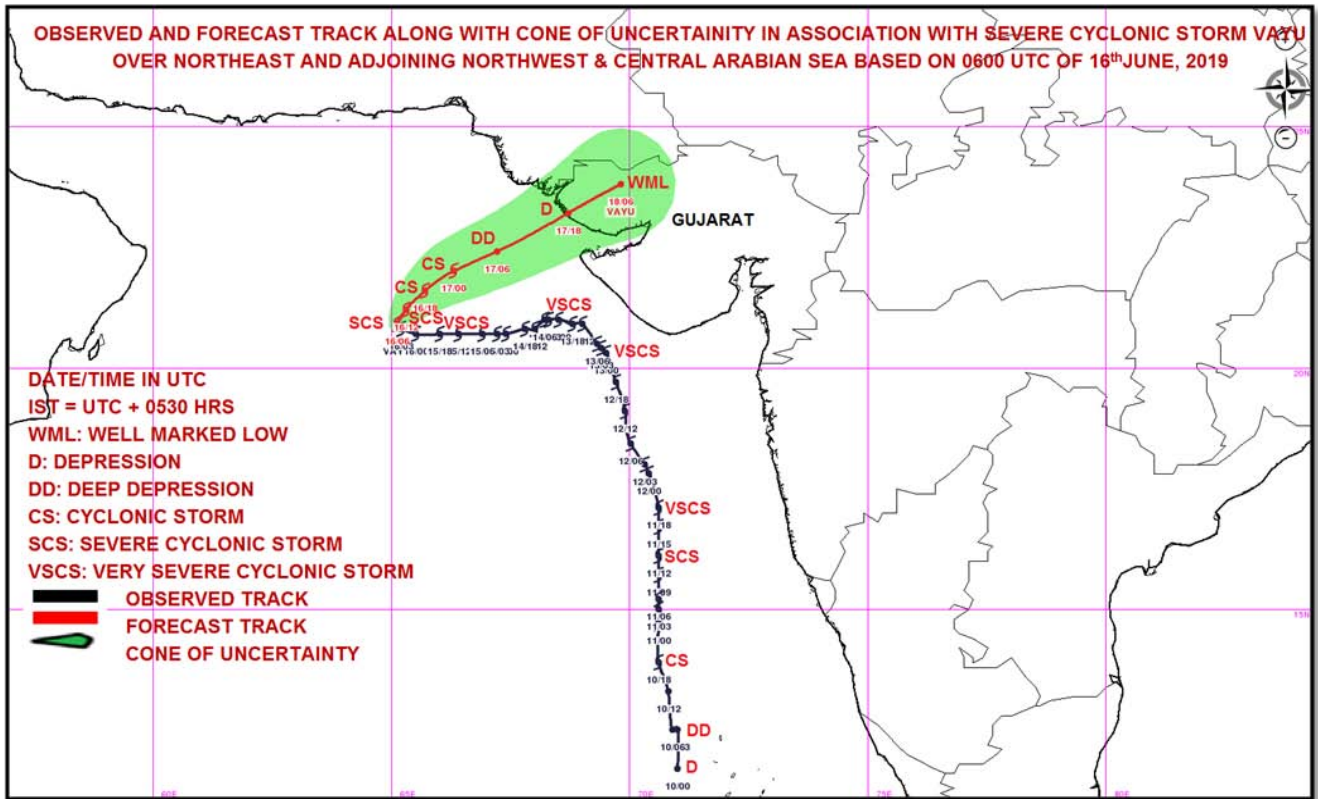
(NEETHA K.GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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. 44 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 48 HOURS ISSUED AT 1500 UTC OF 16.06.2019 BASED ON 1200 UTC OF 16.06.2019.

THE **SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF ABOUT 04 KMPH IN LAST SIX HOURS, AND LAY CENTRED AT 1200 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 21.1°N AND LONGITUDE 65.0°E OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA, ABOUT 490 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 440 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 550 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN GRADUALLY INTO A CYCLONIC STORM DURING NEXT 06 HOURS AND INTO A DEEP DEPRESSION DURING SUBSEQUENT 12 HOURS. THE SYSTEM IS VERY LIKELY TO RECURVE GRADUALLY NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
16.06.19/1200	21.1/65.0	90-100 gusting to 115	Severe Cyclonic Storm
16.06.19/1800	21.6/65.7	75-85 gusting to 95	Cyclonic Storm
17.06.19/0000	22.0/66.3	60-70 gusting to 80	Cyclonic Storm
17.06.19/0600	22.5/67.2	55-65 gusting to 75	Deep Depression
17.06.19/1200	22.9/68.0	45-55 gusting to 65	Depression
18.06.19/0000	23.4/67.2	40-50 gusting to 60	Depression
18.06.19/1200	23.9/70.4	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA IS C.I 3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTH AND ADJOINING CENTRAL ARABIAN SEA BETWEEN LAT 17.5°N & 21.5°N, LONG 62.0°E & 65.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 1200 UTC OF 16TH JUNE, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/13 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/11 KNOTS AND PORBANDAR (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/12.1 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 50 KNOTS GUSTING TO 60 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 987 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 3 DAYS AND MOVE TO PHASE 5 THEREAFTER.

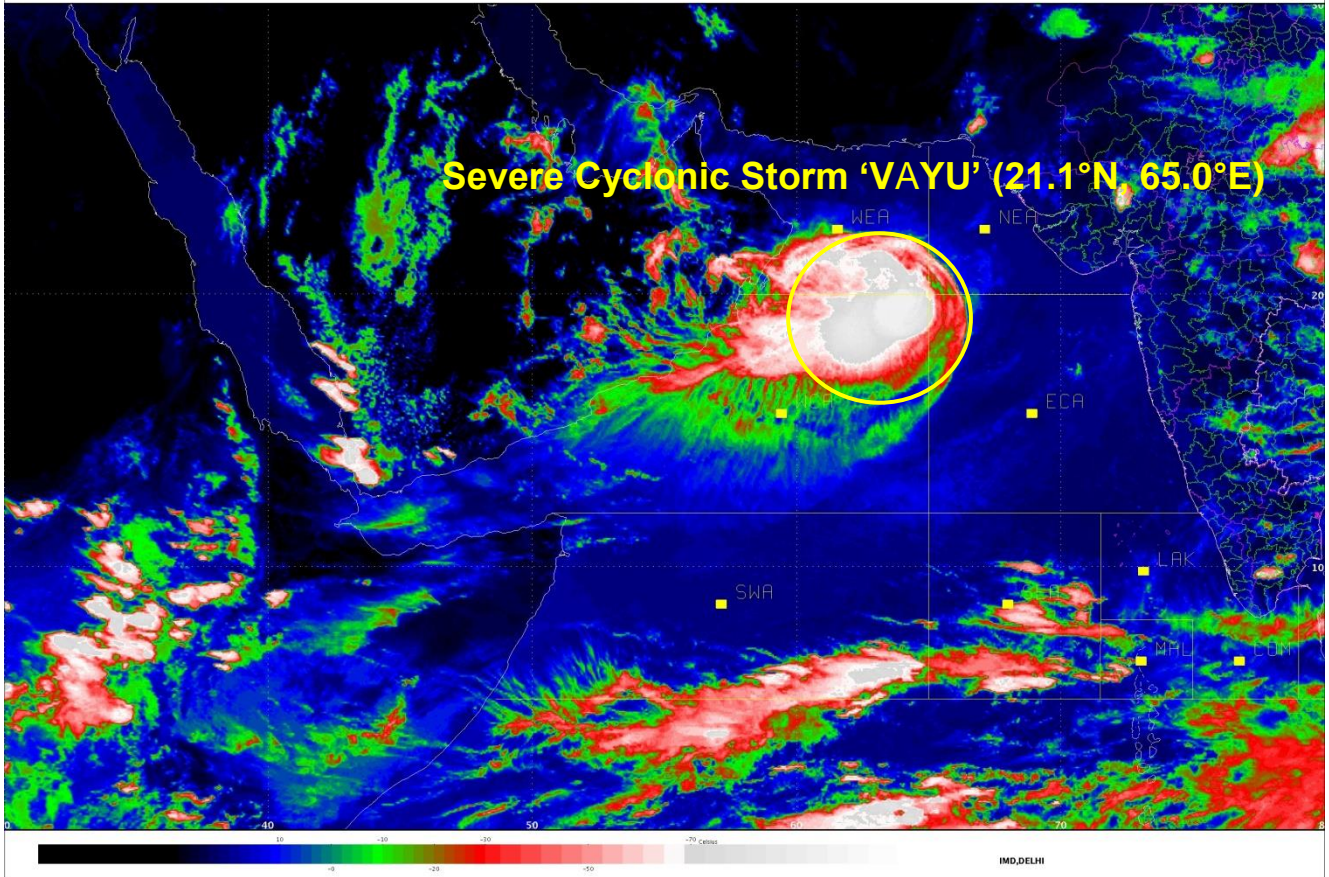
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $05 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 25°N. AS THE SYSTEM IS IN THE PROCESS OF WEAKENING, UNDER THE INFLUENCE OF HIGH WIND SHEAR ITS VERTICAL EXTENTION IS LIKELY TO DECREASE GRADUALLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN A NORTH/ NORTH-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING.MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

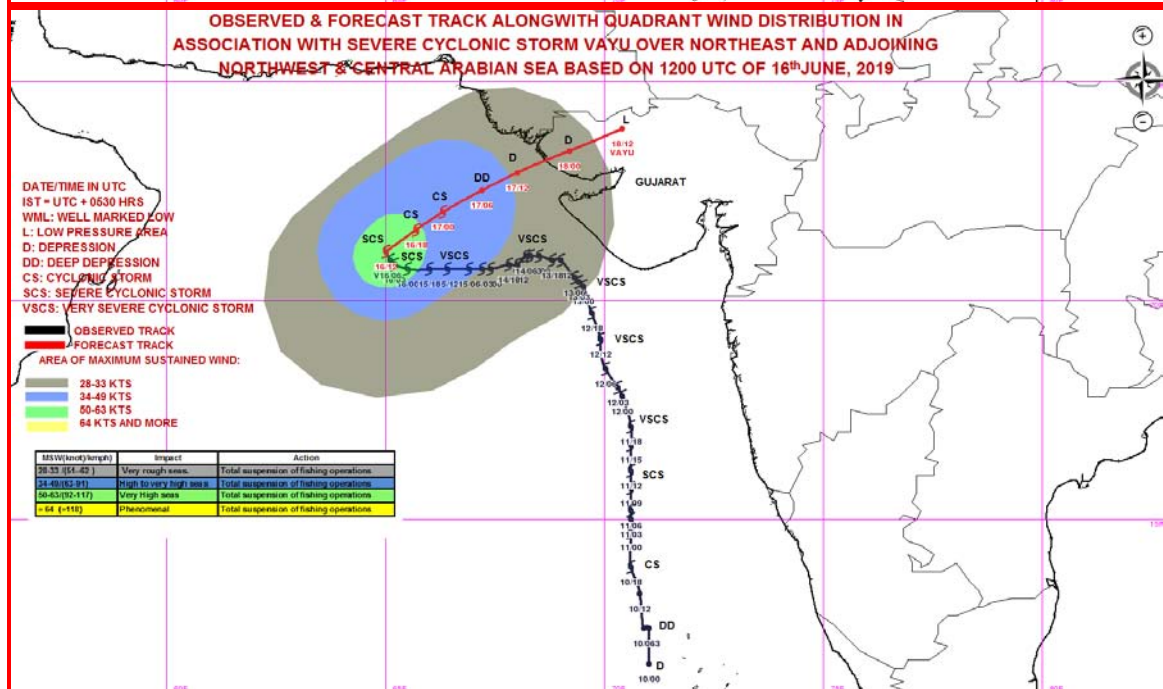
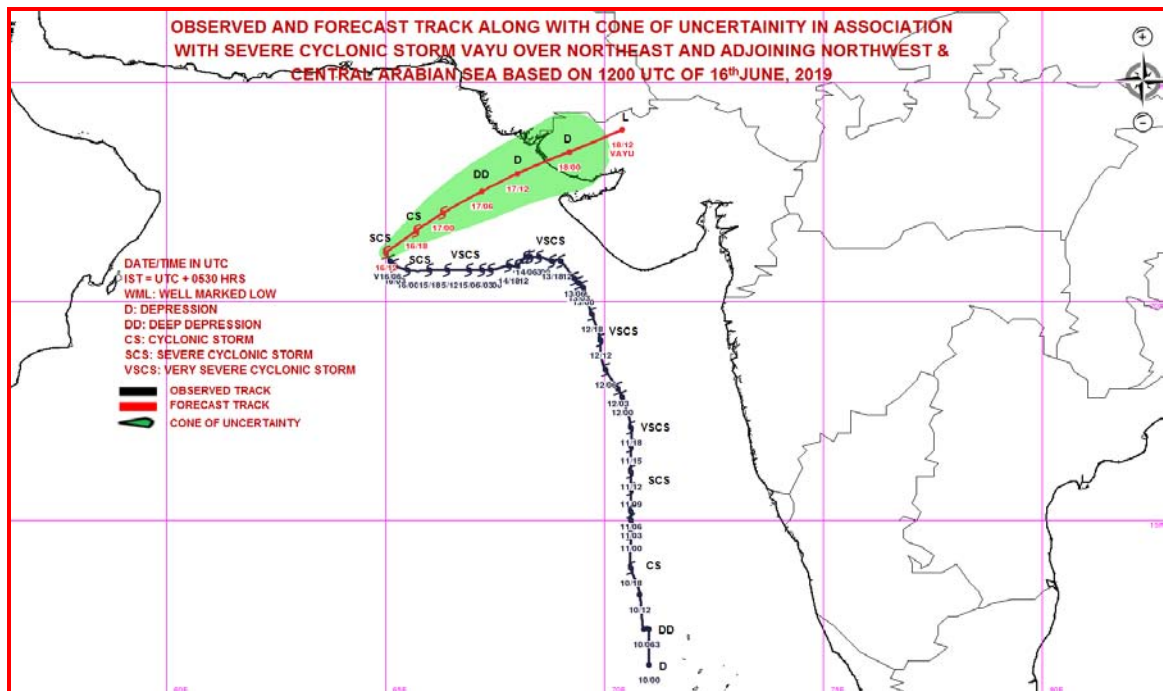
(NEETHA K.GOPAL)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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 48 HOURS ISSUED AT 1730 UTC OF 16.06.2019 BASED ON 1500 UTC OF 16.06.2019.

THE **SEVERE CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF ABOUT 05 KMPH IN LAST SIX HOURS, **WEAKENED INTO A CYCLONIC STORM** AND LAY CENTRED AT 1500 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 21.1°N AND LONGITUDE 65.3°E OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA, ABOUT 450 KM WEST-SOUTHWEST OF PORBANDAR (42830) (GUJARAT), 415 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 520 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEEP DEPRESSION DURING NEXT 12 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
16.06.19/1500	21.1/65.3	80-90 gusting to 100	Cyclonic Storm
16.06.19/1800	21.6/65.7	75-85 gusting to 95	Cyclonic Storm
17.06.19/0000	22.0/66.3	60-70 gusting to 80	Cyclonic Storm
17.06.19/0600	22.5/67.2	55-65 gusting to 75	Deep Depression
17.06.19/1200	22.9/68.0	45-55 gusting to 65	Depression
18.06.19/0000	23.4/67.2	40-50 gusting to 60	Depression
18.06.19/1200	23.9/70.4	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 1500 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA IS T3.0/C.I 3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA BETWEEN LAT 17.5°N & 21.5°N, LONG 62.0°E & 65.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 1500 UTC OF 16TH JUNE, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/08 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.0 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/10 KNOTS AND PORBANDAR (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1003.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 110°/12 KNOTS, A BUOY (18.5°N/67.5°E) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 20°/16 KNOTS

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 45 KNOTS GUSTING TO 55 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 990 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 3 DAYS AND MOVE TO PHASE 5 THEREAFTER.

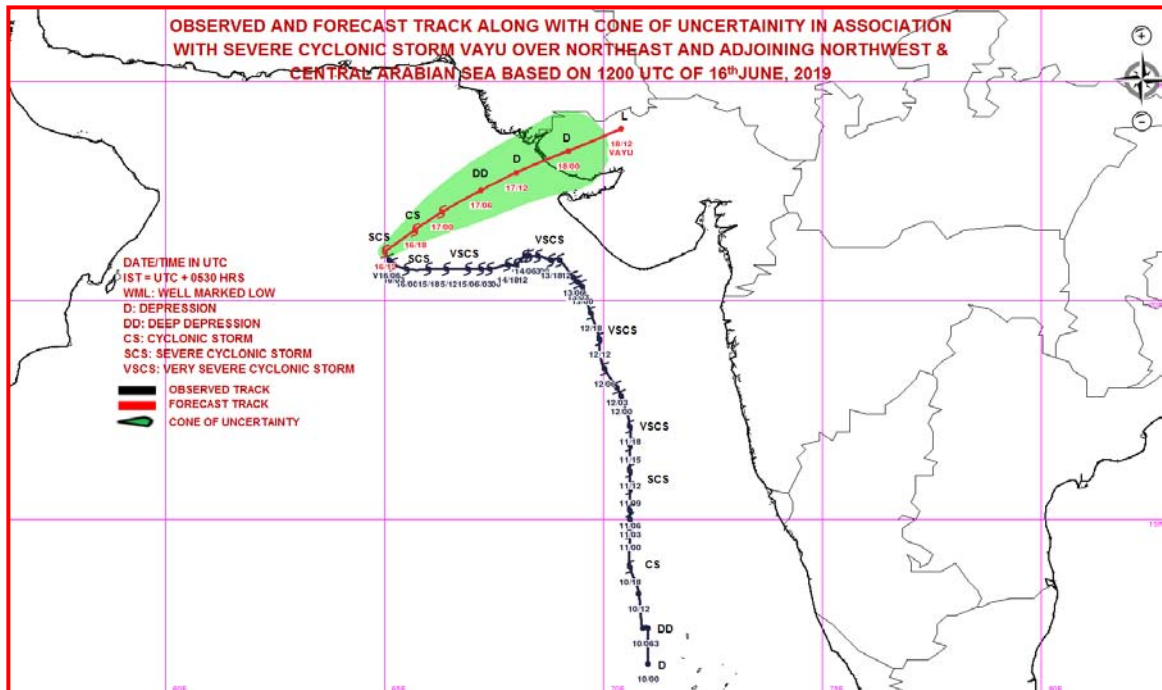
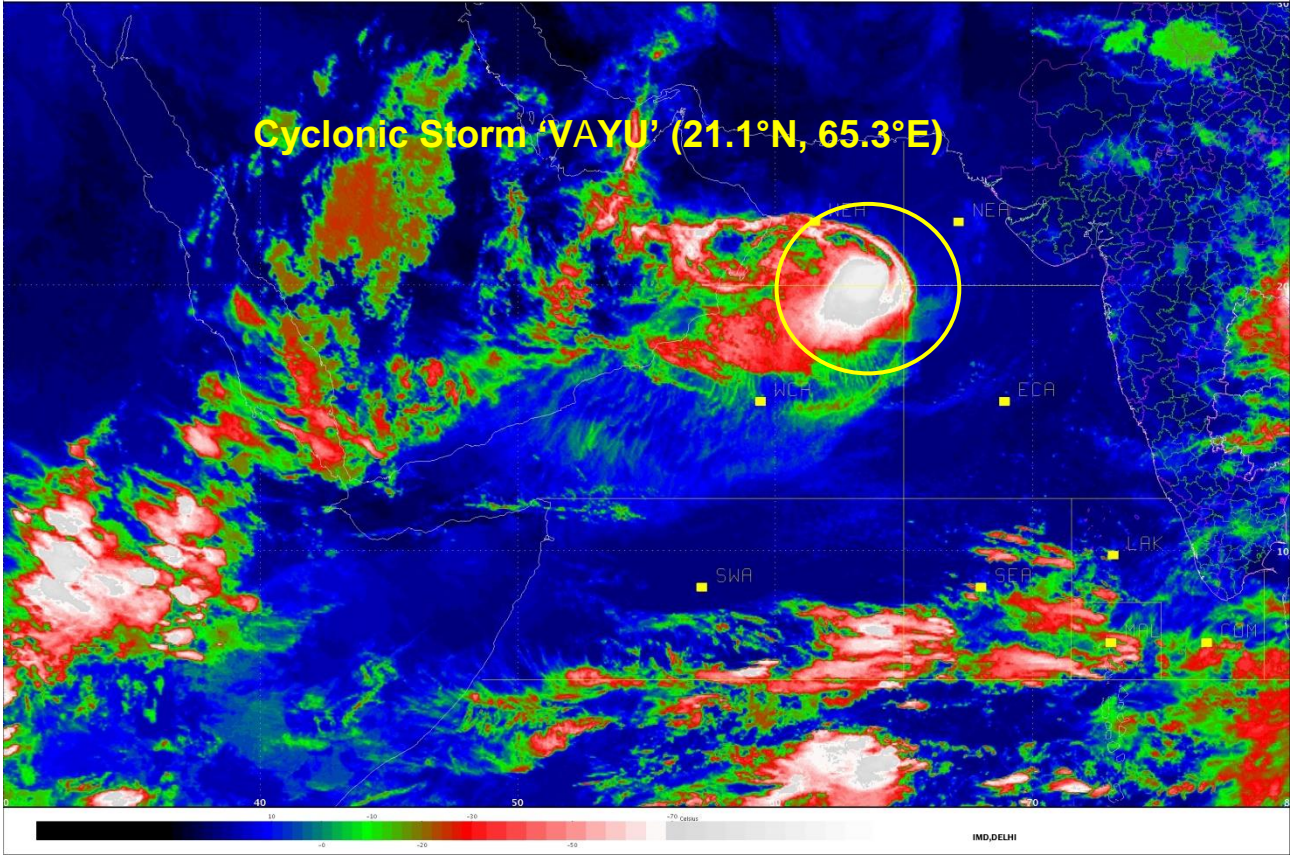
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $30 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 25°N. AS THE SYSTEM IS IN THE PROCESS OF WEAKENING, UNDER THE INFLUENCE OF HIGH WIND SHEAR ITS VERTICAL EXTENTION IS LIKELY TO DECREASE GRADUALLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN A NORTH/ NORTH-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

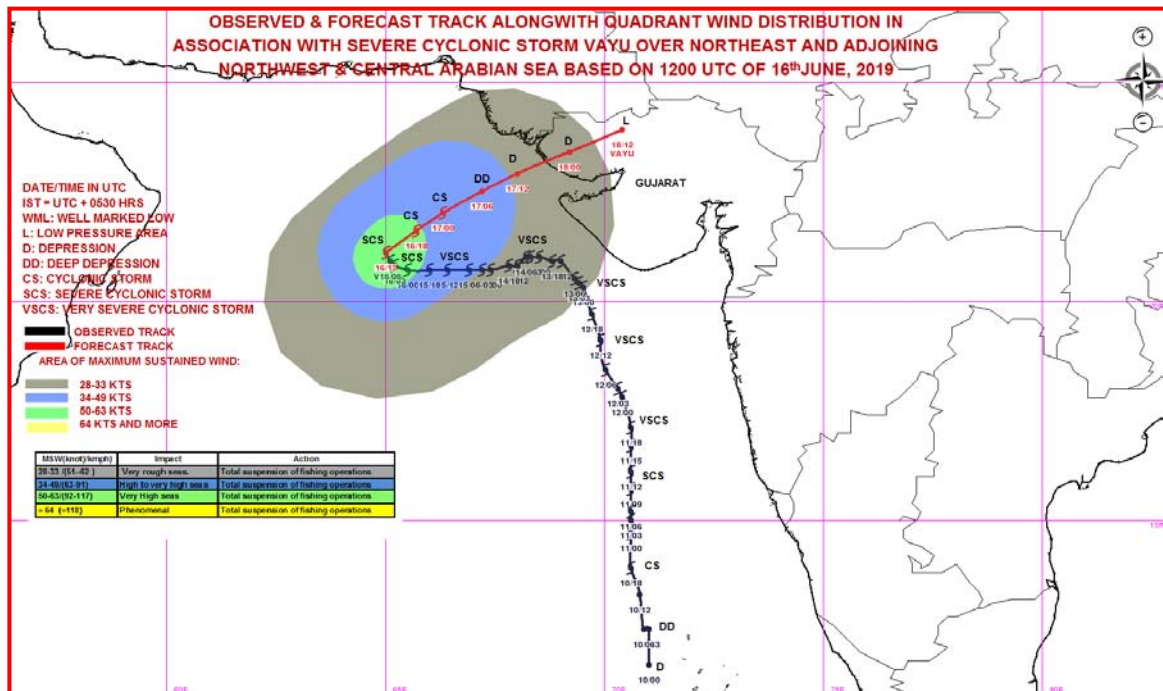
(NARESH KUMAR)
SCIENTIST-E, RSMC, NEW DELHI

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%



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 48 HOURS ISSUED AT 2100 UTC OF 16.06.2019 BASED ON 1800 UTC OF 16.06.2019.

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF ABOUT 15 KMPH IN LAST SIX HOURS AND LAY CENTERED AT 1800 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 21.2°N AND LONGITUDE 65.9°E OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA, ABOUT 390 KM NEARLY WEST OF PORBANDAR (42830) (GUJARAT), 350 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 460 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A DEPRESSION DURING SUBSEQUENT 12 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
16.06.19/1800	21.2/65.9	75-85 gusting to 95	Cyclonic Storm
17.06.19/0000	21.6/66.5	60-70 gusting to 80	Cyclonic Storm
17.06.19/0600	22.1/67.2	55-65 gusting to 75	Deep Depression
17.06.19/1200	22.7/68.0	45-55 gusting to 65	Depression
17.06.19/1800	23.2/68.7	40-50 gusting to 60	Depression
18.06.19/0600	23.7/69.8	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 1800 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA IS T3.0/C.I 3.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA BETWEEN LAT 17.5°N & 21.5°N, LONG 62.0°E & 65.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 1800 UTC OF 16TH JUNE, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1003.5 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/08 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/08 KNOTS AND PORBANDAR (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1004.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/10 KNOTS, BHUJ (42634) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.9 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 200°/09 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 40 KNOTS GUSTING TO 50 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 992 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 3 DAYS AND MOVE TO PHASE 5 THEREAFTER.

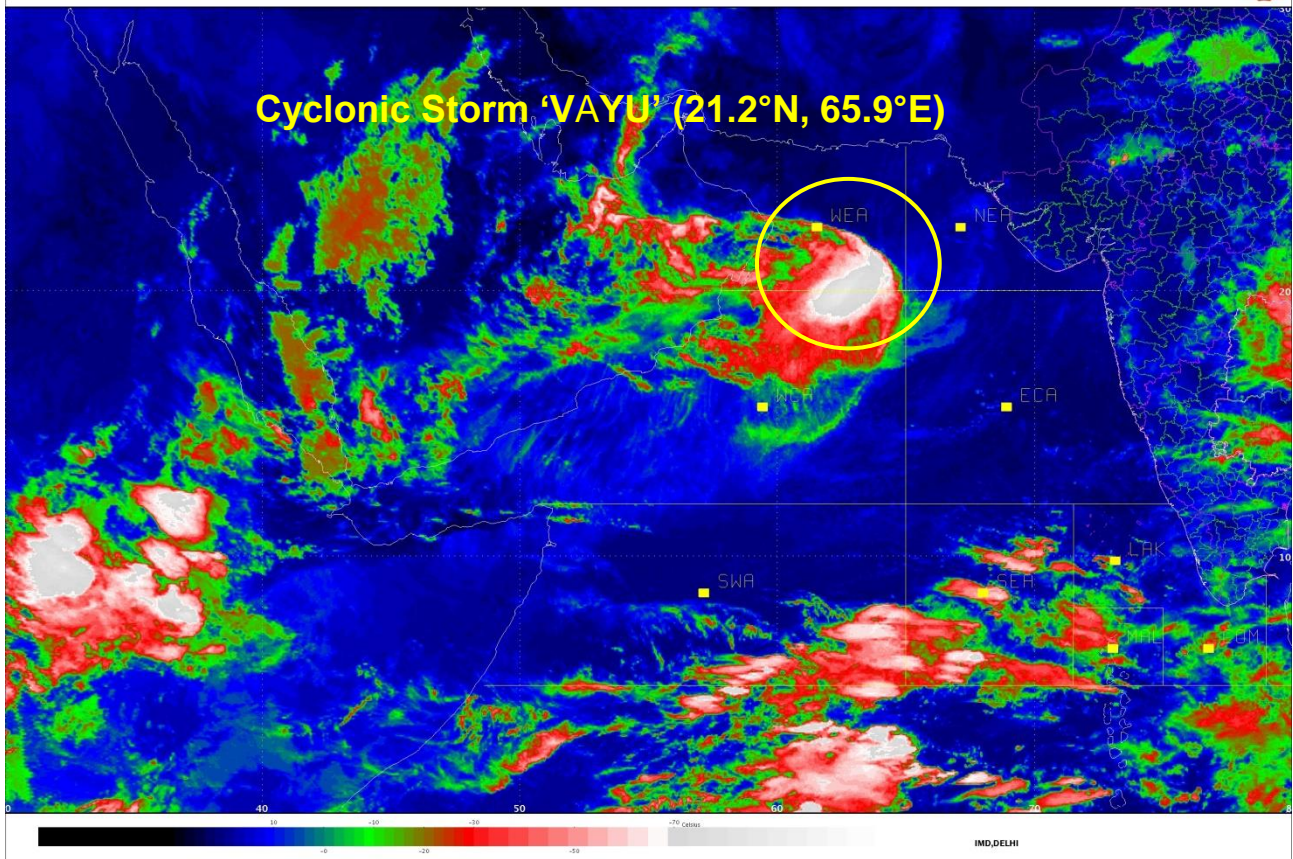
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ OVER THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ AND HAS SHIFTED TO NORTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE HAS DECREASED SIGNIFICANTLY AND IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 25°N. AS THE SYSTEM IS IN THE PROCESS OF WEAKENING, UNDER THE INFLUENCE OF HIGH WIND SHEAR ITS VERTICAL EXTENTION IS LIKELY TO DECREASE GRADUALLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN A EAST-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

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

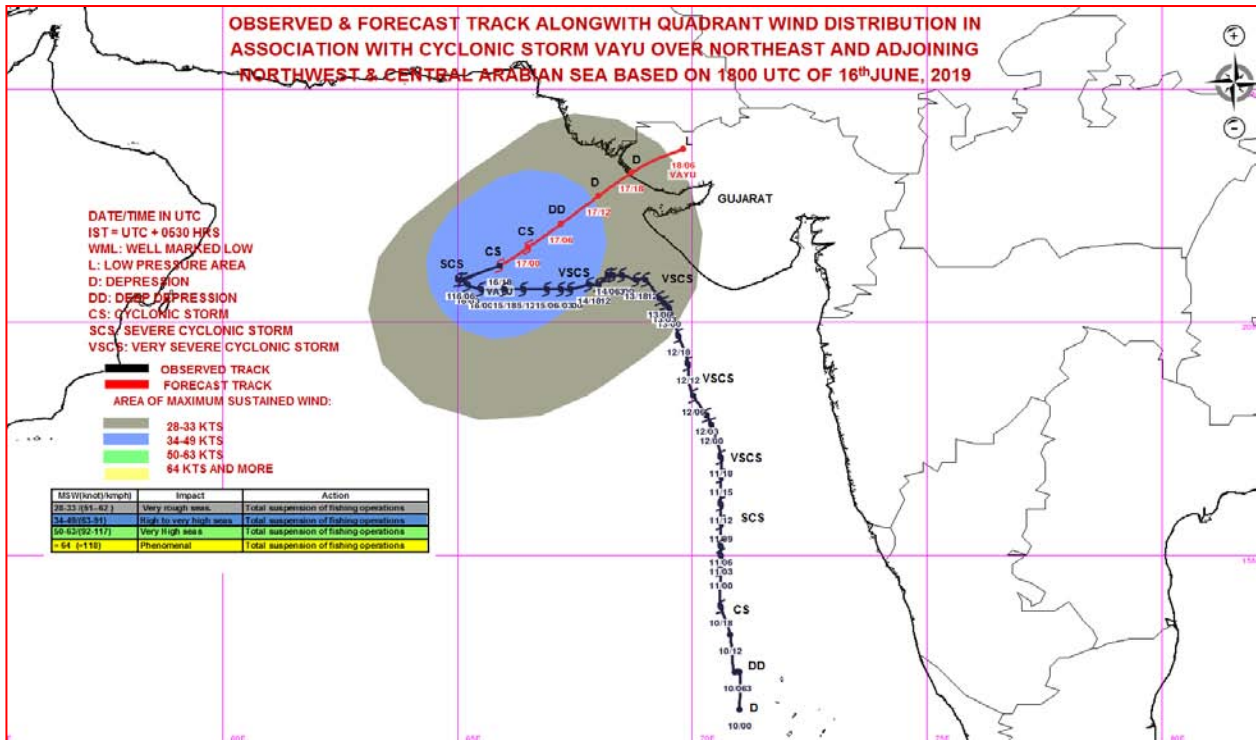
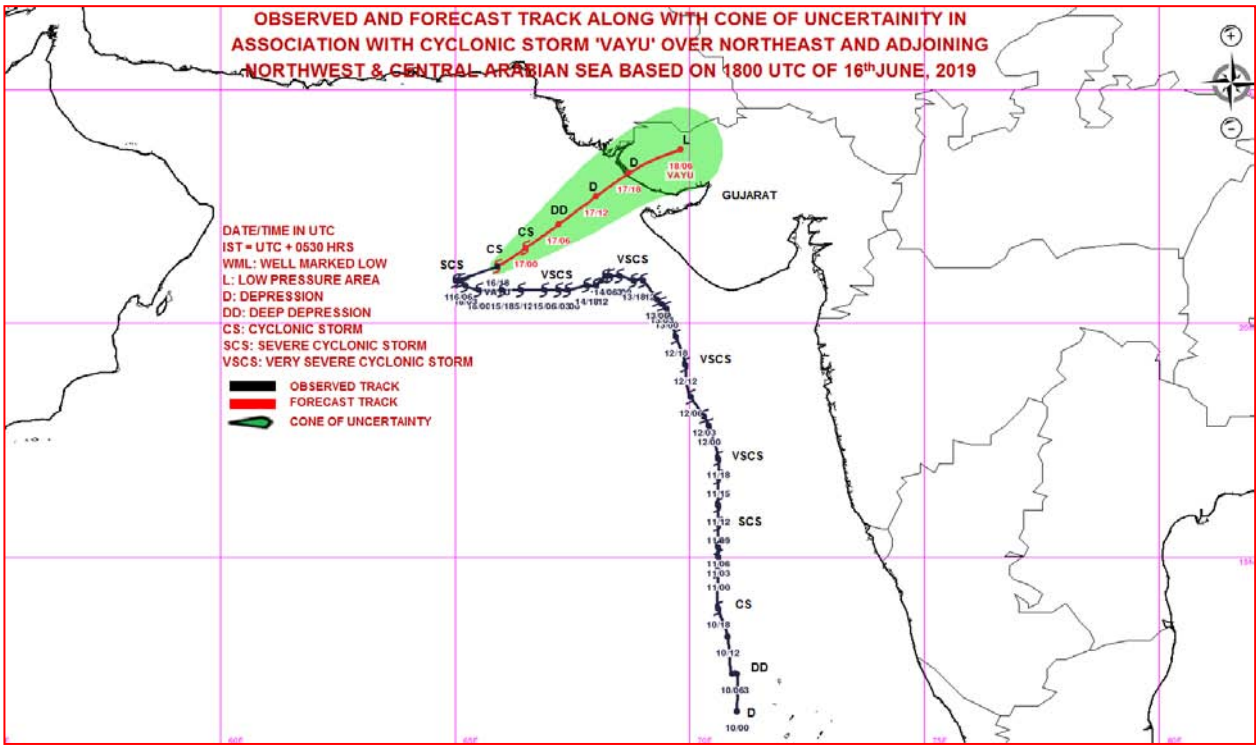
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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%



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 36 HOURS ISSUED AT 2230 UTC OF 16.06.2019 BASED ON 2100 UTC OF 16.06.2019.

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA MOVED EAST-NORTHEASTWARDS WITH A SPEED OF ABOUT 20 KMPH IN LAST SIX HOURS AND LAY CENTERED AT 2100 UTC OF 16TH JUNE, 2019 NEAR LATITUDE 21.4°N AND LONGITUDE 66.4°E OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA, ABOUT 340 KM NEARLY WEST OF PORBANDAR (42830) (GUJARAT), 300 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 400 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEEP DEPRESSION DURING NEXT 12 HOURS AND INTO A DEPRESSION DURING SUBSEQUENT 12 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
16.06.19/2100	21.4/66.4	70-80 gusting to 90	Cyclonic Storm
17.06.19/0000	21.6/66.5	60-70 gusting to 80	Cyclonic Storm
17.06.19/0600	22.1/67.2	55-65 gusting to 75	Deep Depression
17.06.19/1200	22.7/68.0	45-55 gusting to 65	Depression
17.06.19/1800	23.2/68.7	40-50 gusting to 60	Depression
18.06.19/0600	23.7/69.8	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 2100 UTC OF 16TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA IS T2.5/C.I 3.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA BETWEEN LAT 17.5°N & 21.5°N, LONG 62.0°E & 65.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 2100 UTC OF 16TH JUNE, OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1002 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/08 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/09 KNOTS, PORBANDAR (42830) REPORTED MEAN SEA LEVEL PRESSURE OF 1003 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 140°/12 KNOTS AND BHUJ (42634) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.6 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 200°/10 KNOTS.

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

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 2 DAYS AND MOVE TO PHASE 5 THEREAFTER.

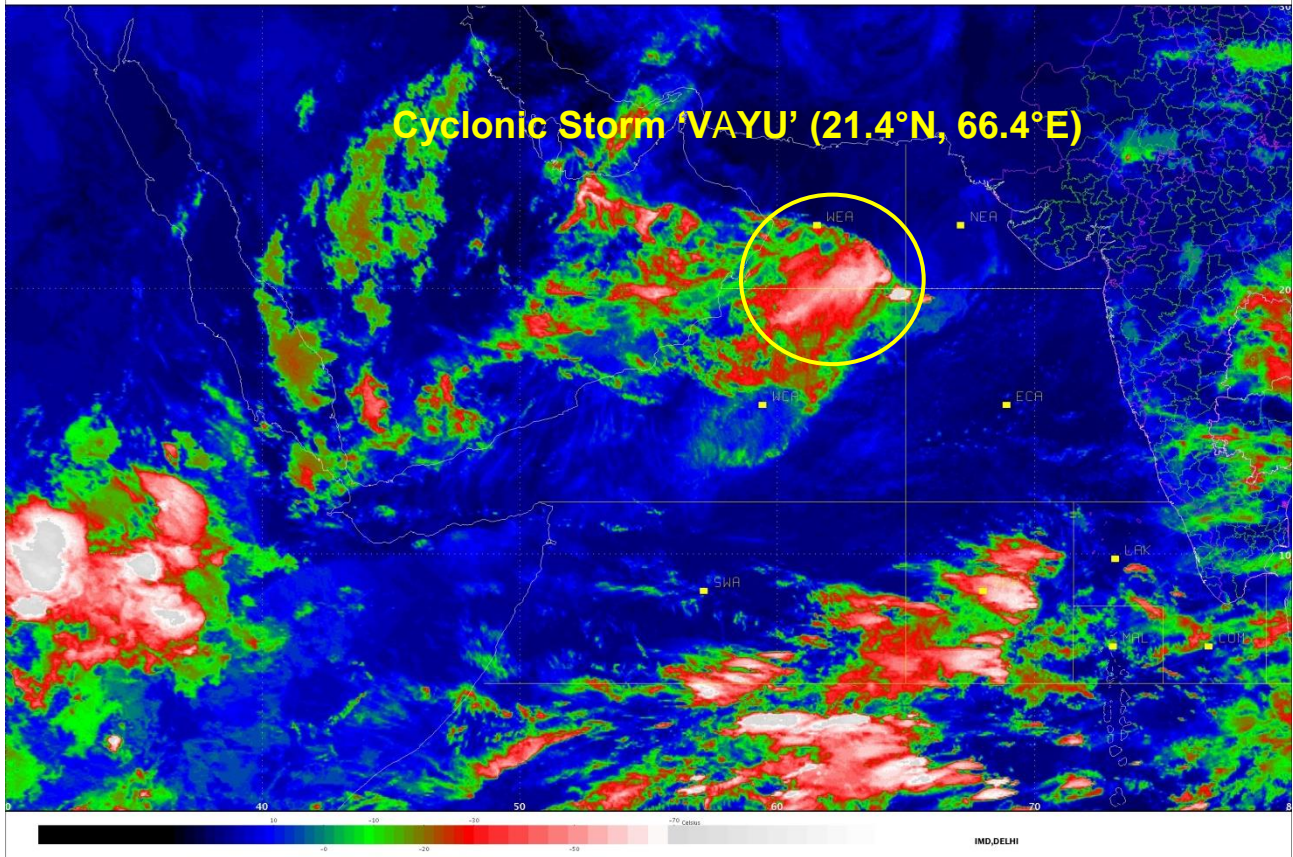
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. IT REDUCES TO 28-30°C OVER WESTERN PARTS OF NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $200 \times 10^{-5} \text{ SEC}^{-1}$ OVER THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE NORTHWEST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS ABOUT $10 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS HIGH (30-40 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 25°N. AS THE SYSTEM IS IN THE PROCESS OF WEAKENING, UNDER THE INFLUENCE OF HIGH WIND SHEAR ITS VERTICAL EXTENTION HAS DECREASED SIGNIFICANTLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN A EAST-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

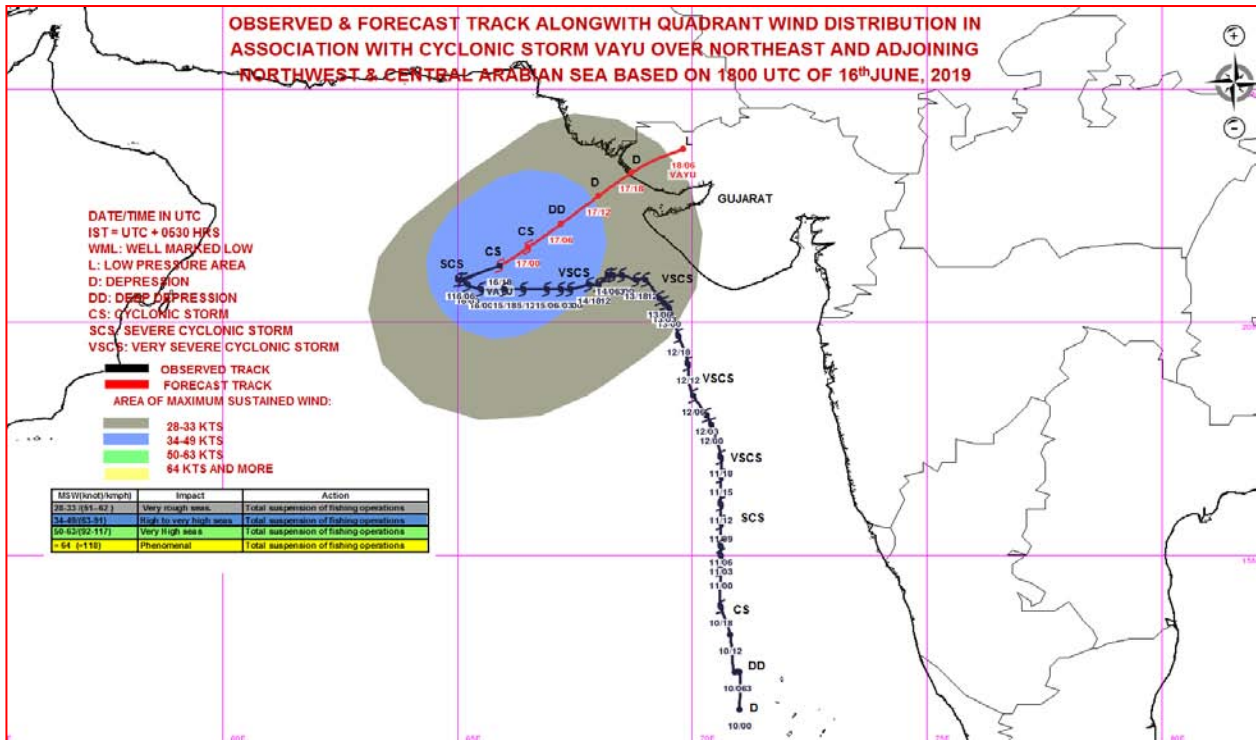
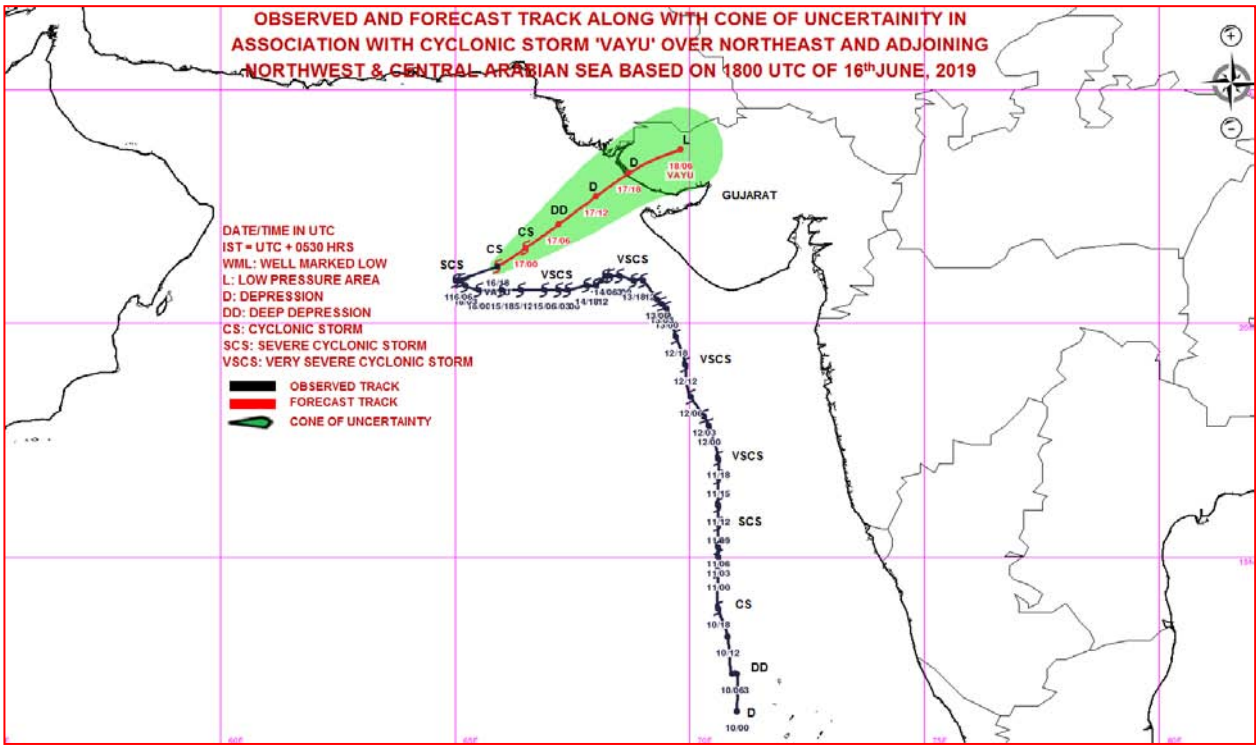
(NARESH KUMAR)
SCIENTIST-E, RSMC, NEW DELHI

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%



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 24 HOURS ISSUED AT 0300 UTC OF 17.06.2019 BASED ON 0000 UTC OF 17.06.2019.

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST AND ADJOINING NORTHWEST AND CENTRAL ARABIAN SEA MOVED FURTHER EAST-NORTHEASTWARDS WITH A SPEED OF ABOUT 17 KMPH IN LAST SIX HOURS AND LAY CENTERED AT 0000 UTC OF 17TH JUNE, 2019 NEAR LATITUDE 21.7°N AND LONGITUDE 66.7°E OVER NORTHEAST ARABIAN SEA AND NEIGHBOURHOOD, ABOUT 280 KM WEST-SOUTHWEST OF NALIYA (42631) (GUJARAT), 260 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 360 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEEP DEPRESSION DURING NEXT 06 HOURS AND INTO A DEPRESSION DURING SUBSEQUENT 06 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1800 UTC OF 17TH JUNE 2019 AS A DEPRESSION.

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
17.06.19/0000	21.7/66.7	60-70 gusting to 80	Cyclonic Storm
17.06.19/0600	22.1/67.2	50-60 gusting to 70	Deep Depression
17.06.19/1200	22.7/68.0	40-50 gusting to 60	Depression
17.06.19/1800	23.2/68.7	35-45 gusting to 55	Depression
18.06.19/0000	23.7/69.8	20-30 gusting to 40	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 0000 UTC OF 17TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING CENTRAL ARABIAN SEA IS C.I 2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA BETWEEN LAT 18.5°N & 23.5°N, LONG 62.0°E & 68.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 83°C. MAXIMUM ZONE OF CONVECTION LIES TO THE SOUTHWEST OF THE SYSTEM CENTRE.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 0000 UTC OF 17TH JUNE, SHIP (19.8°N/63.2°E) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 260°/27 KNOTS, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1000.1 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 160°/08 KNOTS AND BHUJ (42634) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.4 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 160°/09 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE SEA CONDITION IS VERY HIGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 995 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 2 DAYS AND MOVE TO PHASE 5 THEREAFTER.

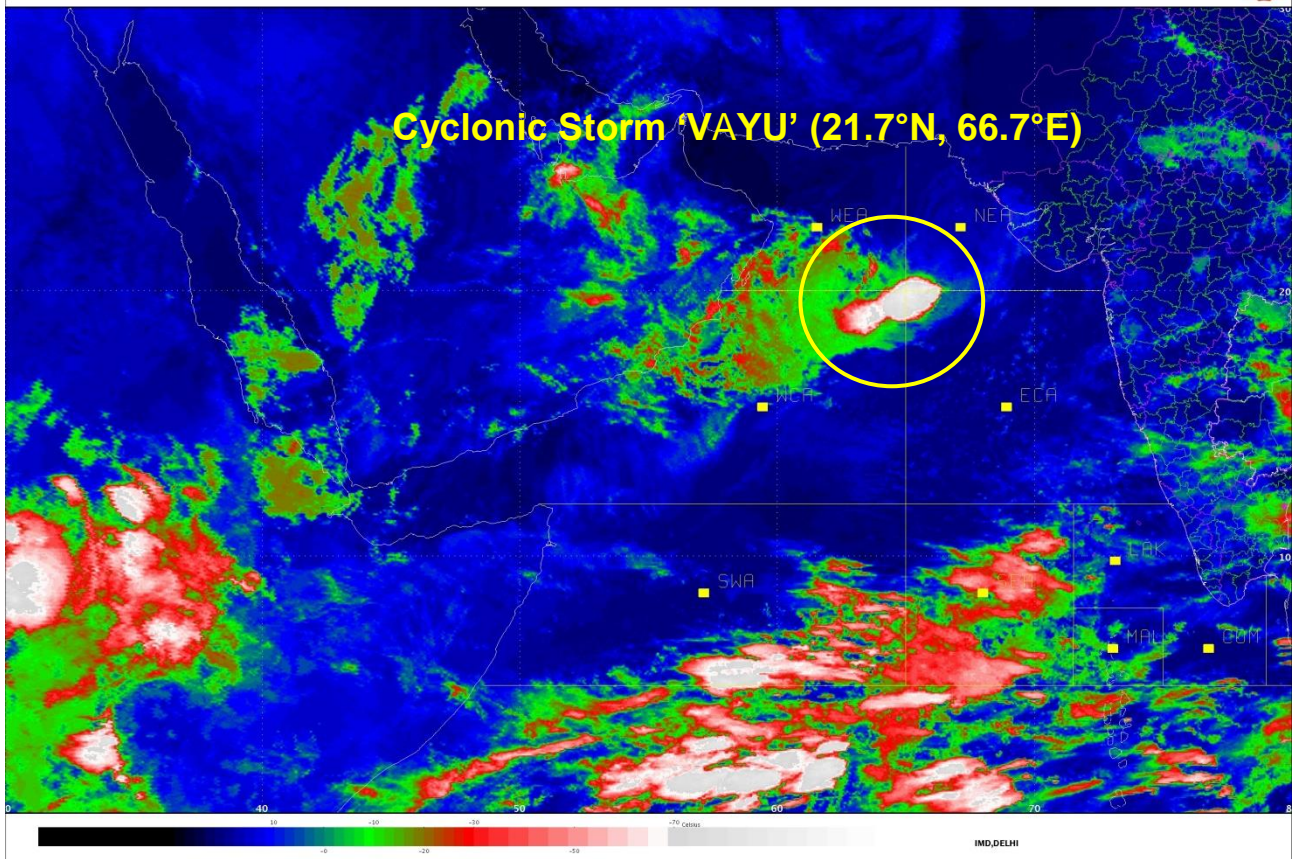
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (70-80) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $150 \times 10^{-5} \text{ SEC}^{-1}$ OVER THE SYSTEM CENTRE. POSITIVE VORTICITY PERSISTS UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ OVER THE SYSTEM CENTRE. UPPER LEVEL DIVERGENCE OF $5 \times 10^{-5} \text{ S}^{-1}$ PREVAILS TO THE SOUTHWEST OF THE SYSTEM CENTRE AND SUBSIDENCE IS OCCURRING OVER THE EASTERN SECTOR. THE VERTICAL WIND SHEAR IS HIGH (25-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 26°N. AS THE SYSTEM IS IN THE PROCESS OF FURTHER WEAKENING, UNDER THE INFLUENCE OF HIGH WIND SHEAR, ITS VERTICAL EXTENTION HAS REDUCED SIGNIFICANTLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN AN EAST-NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING. MOST OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

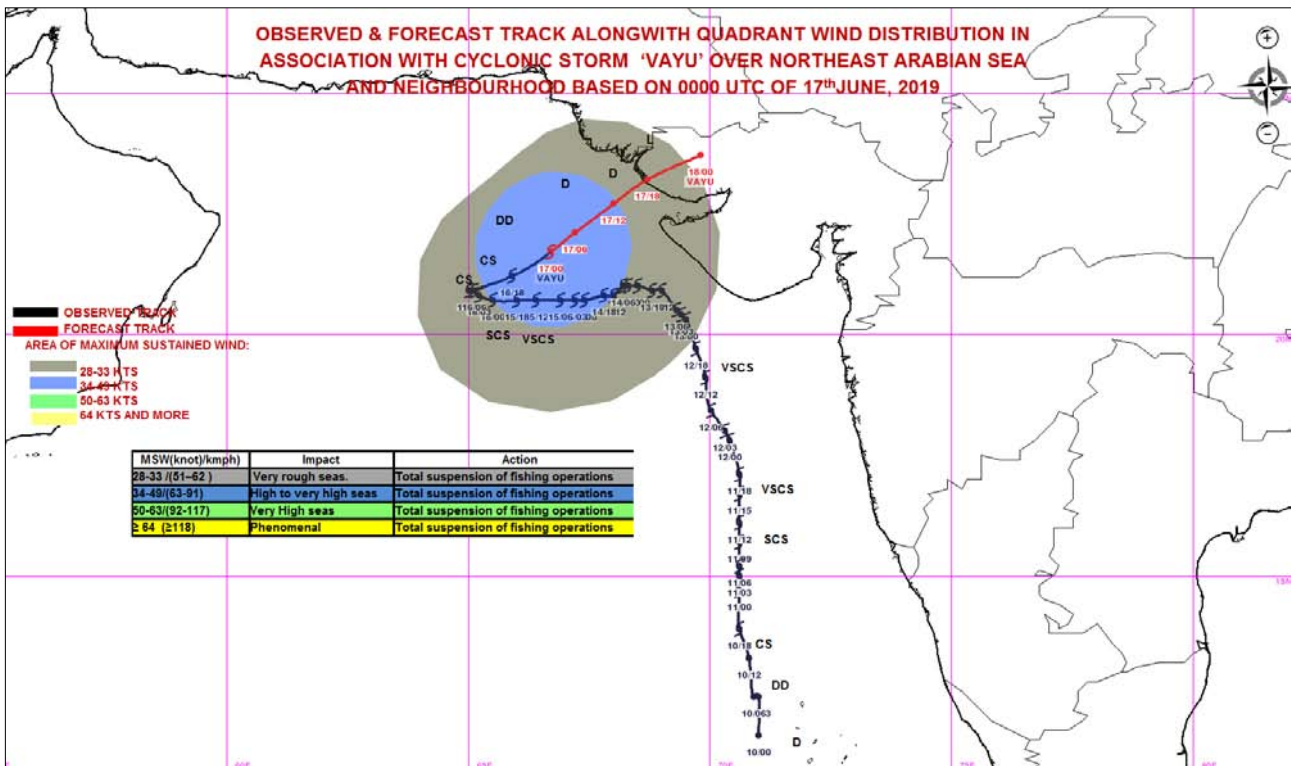
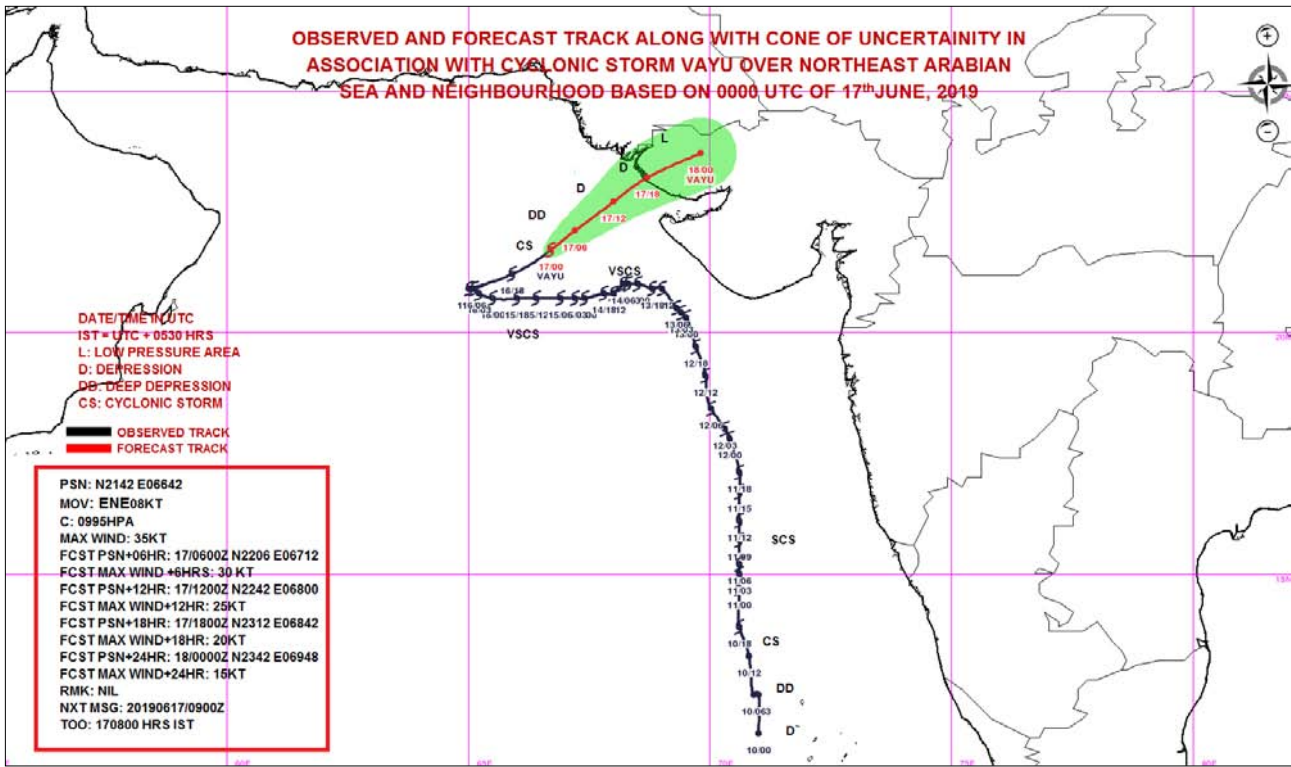
(SUNITHA DEVI S)
SCIENTIST-E, RSMC, NEW DELHI

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



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. 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 24 HOURS ISSUED AT 0630 UTC OF 17.06.2019 BASED ON 0300 UTC OF 17.06.2019.

SUB: CYCLONIC STORM 'VAYU' OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD WEAKENED INTO DEEP DEPRESSION OVER THE SAME AREA

THE **CYCLONIC STORM 'VAYU'** (PRONOUNCED AS **VAA'YU**) OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD MOVED NORTHEASTWARDS WITH A SPEED OF ABOUT 13 KMPH IN LAST SIX HOURS, WEAKENED INTO A **DEEP DEPRESSION** AND LAY CENTRED AT 0300 UTC OF 17TH JUNE, 2019 NEAR LATITUDE 21.9°N AND LONGITUDE 66.8°E OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD, ABOUT 260 KM WEST-SOUTHWEST OF NALIYA (42631)(GUJARAT), 240 KM WEST-SOUTHWEST OF DWARKA (42731)(GUJARAT) AND 340 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEPRESSION DURING NEXT 06 HOURS. THE SYSTEM IS VERY LIKELY TO MOVE NORTHEASTWARDS AND CROSS NORTH GUJARAT COAST BY 1800 OF 17TH JUNE 2019 AS A DEPRESSION.

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
17.06.19/0300	21.9/66.8	50-60 gusting to 70	Deep Depression
17.06.19/0600	22.1/67.2	50-60 gusting to 70	Deep Depression
17.06.19/1200	22.7/68.0	40-50 gusting to 60	Depression
17.06.19/1800	23.2/68.7	35-45 gusting to 55	Depression
18.06.19/0000	23.7/69.8	20-30 gusting to 40	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 0300 UTC OF 17TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING CENTRAL ARABIAN SEA IS C.I 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA BETWEEN LAT 19.0°N & 20.5°N, LONG 64.0°E & 66.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 90°C.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

AT 0300 UTC OF 17TH JUNE, NALIYA (42631) REPORTED MEAN SEA LEVEL PRESSURE OF 1001.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/13 KNOTS AND BHUJ (42634) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.2 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 200°/09 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE SEA CONDITION IS VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 2 DAYS AND MOVE TO PHASE 5 THEREAFTER.

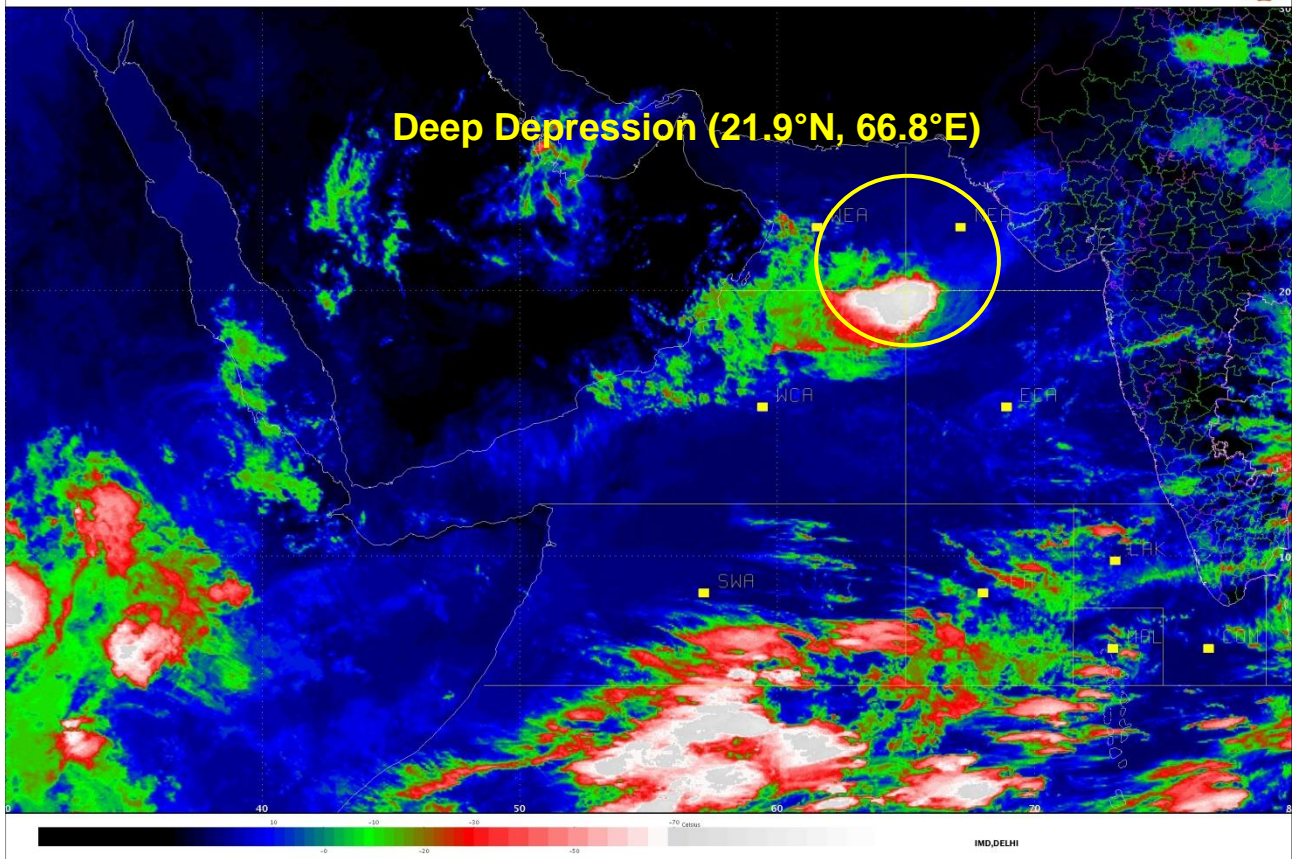
THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (50-70) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES TO LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $150 \times 10^{-5} \text{ SEC}^{-1}$ OVER THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ OVER THE SOUTHWEST OF THE SYSTEM CENTRE. UPPER LEVEL DIVERGENCE OF $10 \times 10^{-5} \text{ S}^{-1}$ PREVAILS TO THE SOUTHWEST OF THE SYSTEM CENTRE AND SUBSIDENCE IS OCCURRING OVER THE EASTERN SECTOR. THE VERTICAL WIND SHEAR HAS DECREASED AND IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 26°N. AS THE SYSTEM IS IN THE PROCESS OF FURTHER WEAKENING ITS VERTICAL EXTENTION HAS REDUCED SIGNIFICANTLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN NORTHEASTWARD DIRECTION AND IS LIKELY TO REACH NORTH GUJARAT COAST AS A DEPRESSION BY 1800 UTC OF 17TH JUNE 2019. DURING THIS PERIOD THE SYSTEM IS ALSO LIKELY TO ENTER INTO UNFAVOURABLE ENVIRONMENTAL CONDITIONS LEADING TO FURTHER WEAKENING. MOST OF THE NUMERICAL MODELS ARE IN AGREEMENT WITH THE ABOVE INFERENCE.

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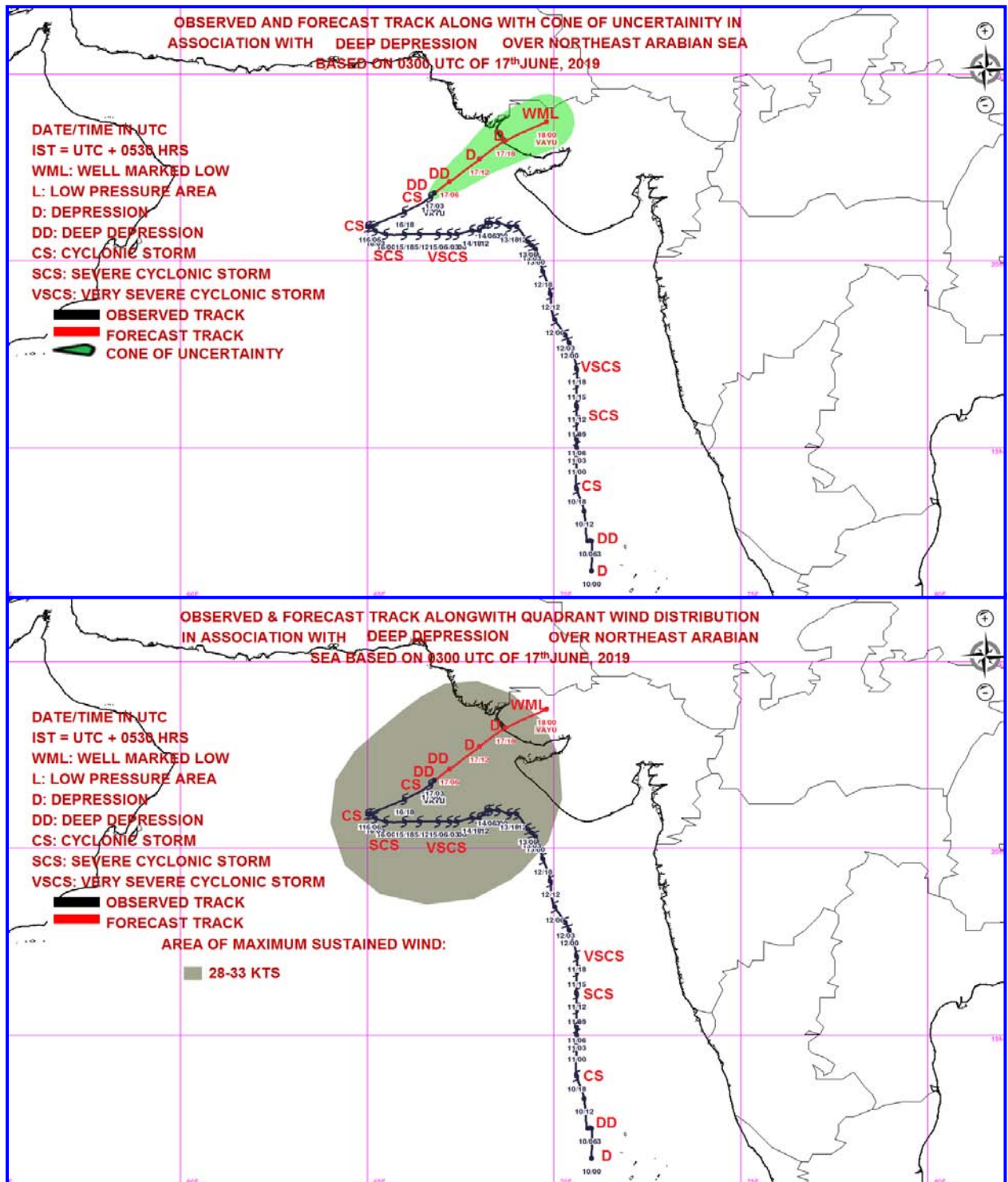
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



MSW(knot)/kmph)	Impact	Action
28-33 /(52-61)	Very rough seas.	Total suspension of fishing operations

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 10.06.2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 24 HOURS ISSUED AT 0900 UTC OF 17.06.2019 BASED ON 0600 UTC OF 17.06.2019.

DEEP DEPRESSION OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD

THE **DEEP DEPRESSION** OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD MOVED NORTHEASTWARDS WITH A SPEED OF ABOUT 08 KMPH IN LAST SIX HOURS, AND LAY CENTRED AT 0600 UTC OF 17TH JUNE, 2019 NEAR LATITUDE 22.0°N AND LONGITUDE 67.0°E OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD, ABOUT 235 KM WEST-SOUTHWEST OF NALIYA (42631) (GUJARAT), 220 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 320 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEPRESSION DURING NEXT 03-06 HOURS AND FURTHER WEAKEN INTO A WELL MARKED LOW PRESSURE AREA BY 1200 UTC OF 17TH JUNE 2019, WHILE MOVING TOWARDS NORTH GUJARAT COAST.

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
17.06.19/0600	22.0/67.0	50-60 gusting to 70	Deep Depression
17.06.19/1200	22.7/68.0	25-35 gusting to 45	Well Marked Low

REMARKS:

AS PER SATELLITE IMAGERY OF 0600 UTC OF 17TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING CENTRAL ARABIAN SEA IS C.I 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER NORTHEAST AND ADJOINING NORTHWEST & CENTRAL ARABIAN SEA BETWEEN LAT 18.0°N & 20.5°N, LONG 62.0°E & 66.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 90°C.

AT 0600 UTC OF 17TH JUNE, A SHIP LOCATED AT 19.4°N/66.5°E REPORTED MEAN SEA LEVEL PRESSURE OF 1005.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 240°/32 KNOTS. ANOTHER SHIP LOCATED AT 20.5°N/68.6°E REPORTED MEAN SEA LEVEL PRESSURE OF 998.8 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 220°/21 KNOTS. OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 1002.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/06 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE SEA CONDITION IS VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA.

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 4 WITH AMPLITUDE GREATER THAN 1 AND IS LIKELY TO REMAIN IN SAME PHASE DURING NEXT 2 DAYS AND MOVE TO PHASE 5 THEREAFTER.

THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C ALONG GUJARAT COAST AND ADJOINING NORTHEAST ARABIAN SEA. THE TROPICAL CYCLONE HEAT POTENTIAL IS AROUND (50-70) KJ/CM² OVER THE SYSTEM AREA. IT REDUCES TO LESS THAN 50 KJ/CM² ALONG GUJARAT COAST. TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE THAT WARM AIR ADVECTION IS CONTINUING TO THE SYSTEM CENTRE. HOWEVER, DRY AIR INTRUSION IS TAKING PLACE IN ITS SOUTHWEST SECTOR LEADING TO GRADUAL WEAKENING OF THE SYSTEM.

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

THE LOW LEVEL RELATIVE VORTICITY IS AROUND $150 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT $20 \times 10^{-5} \text{ S}^{-1}$ TO THE SOUTHWEST OF THE SYSTEM CENTRE. UPPER LEVEL DIVERGENCE OF $10 \times 10^{-5} \text{ S}^{-1}$ PREVAILS TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE AT 200 HPA RUNS ROUGHLY ALONG 26°N . AS THE SYSTEM IS IN THE PROCESS OF FURTHER WEAKENING ITS VERTICAL EXTENTION HAS REDUCED SIGNIFICANTLY. THE SYSTEM IS UNDER THE STEERING INFLUENCE OF LOWER & MID LEVEL WESTERLIES AND IS MOVING IN NORTHEASTWARD DIRECTION. AS THE SYSTEM IS ENCOUNTERING UNFAVOURABLE ENVIRONMENTAL CONDITIONS, THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A DEPRESSION DURING NEXT 03-06 HOURS AND FURTHER WEAKEN INTO A WELL MARKED LOW PRESSURE AREA BY 1200 UTC OF 17TH JUNE 2019, WHILE MOVING TOWARDS NORTH GUJARAT COAST.

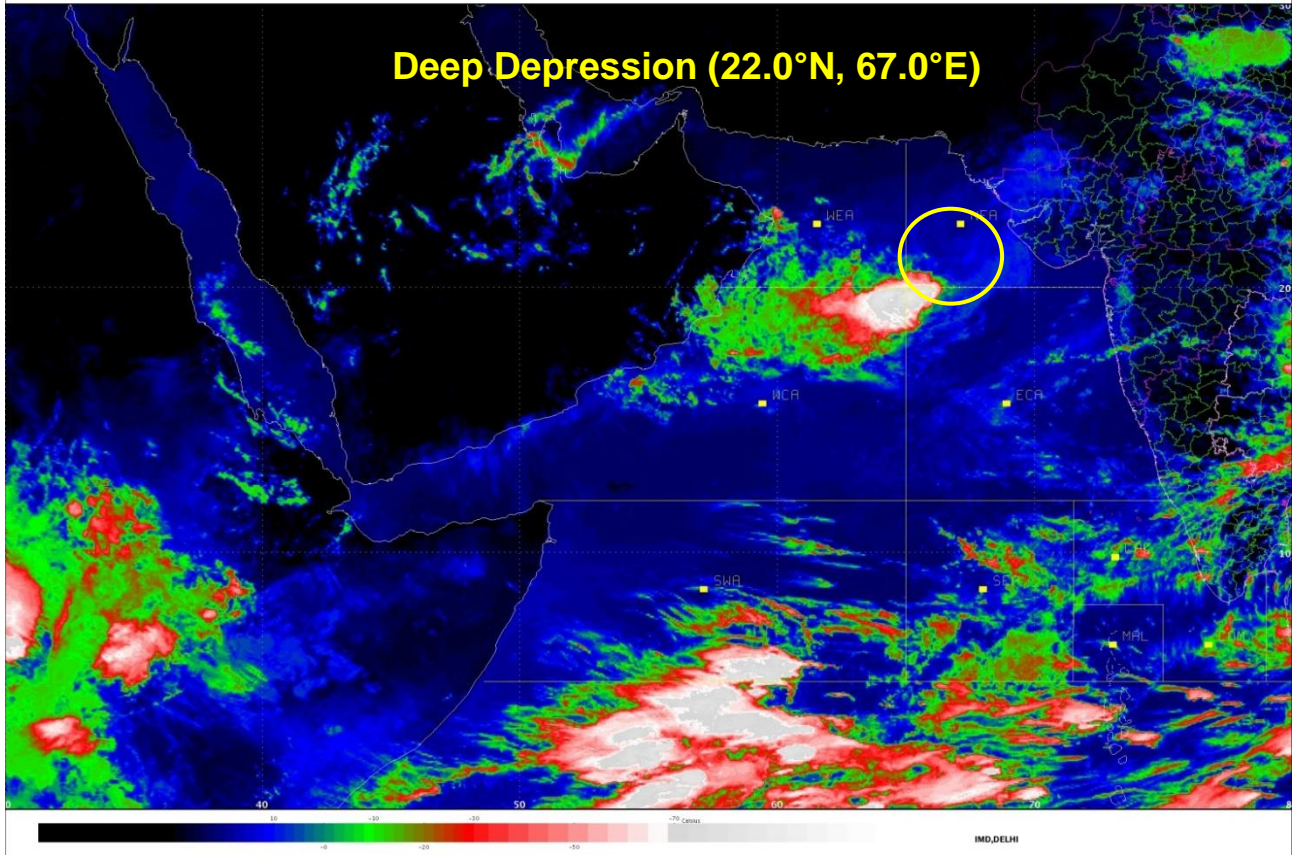
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PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

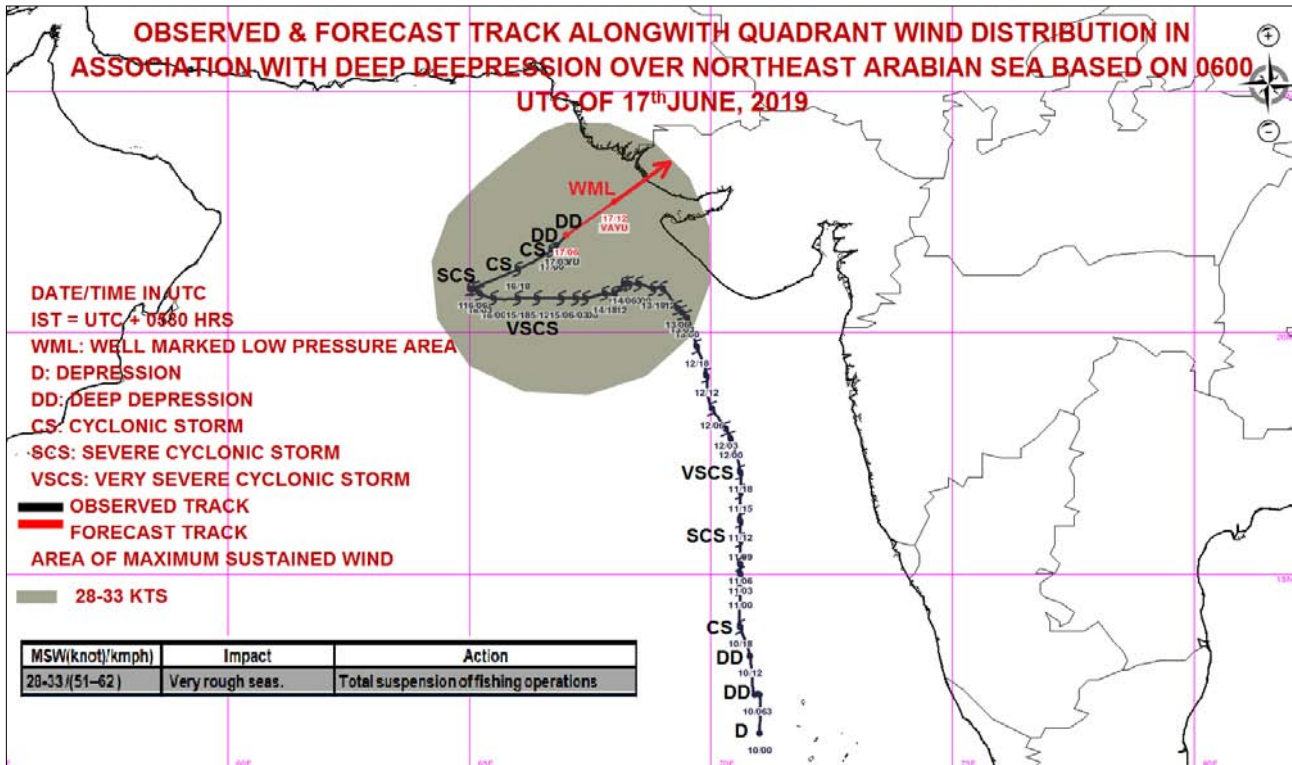
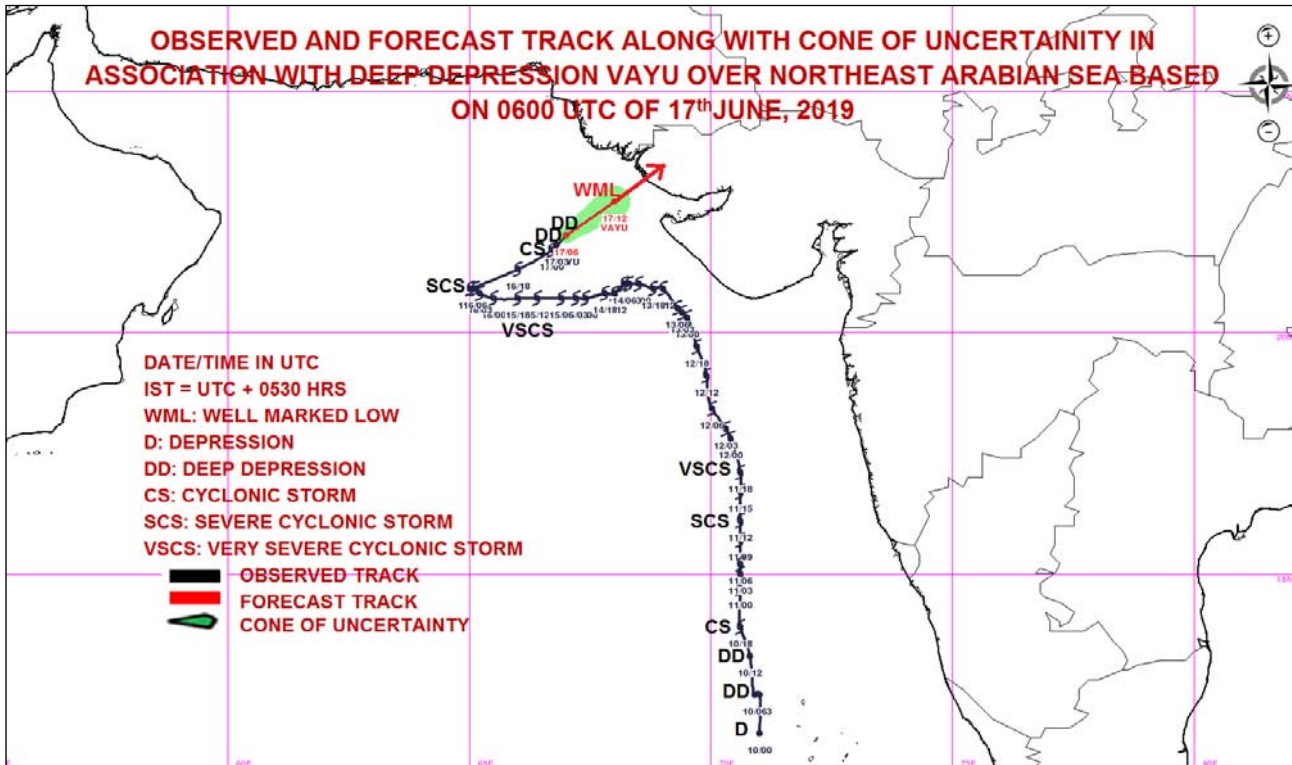


Deep Depression (22.0°N, 67.0°E)



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 17.06.2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 24 HOURS ISSUED AT 1400 UTC OF 17.06.2019 BASED ON 1200 UTC OF 17.06.2019.

DEEP DEPRESSION OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD

THE **DEEP DEPRESSION** OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD MOVED NORTHEASTWARDS AND WEAKENED INTO A DEPRESSION AT 0900 UTC. IT LAY CENTRED AT 1200 UTC OF 17TH JUNE, 2019 NEAR LATITUDE 22.5°N AND LONGITUDE 67.8°E OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD, ABOUT 135 KM WEST-SOUTHWEST OF NALIYA (42631) (GUJARAT), 130 KM WEST-SOUTHWEST OF DWARKA (42731) (GUJARAT) AND 220 KM WEST-SOUTHWEST OF BHUJ (42634) (GUJARAT).

THE SYSTEM IS VERY LIKELY TO WEAKEN INTO A WELL MARKED LOW PRESSURE AREA DURING NEXT SIX HOURS AND MOVE TOWARDS NORTH GUJARAT COAST.

REMARKS:

AS PER SATELLITE IMAGERY OF 1200 UTC OF 17TH JUNE, 2019 THE INTENSITY OF THE SYSTEM OVER NORTHEAST AND ADJOINING CENTRAL ARABIAN SEA IS C.I 1.5. CONVECTIVE CLOUDS HAVE SHEARED AWAY FROM THE CENTRE OF THE SYSTEM. SCATTERED LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION ARE SEEN OVER NORTHERN PARTS OF CENTRAL ARABIAN SEA.

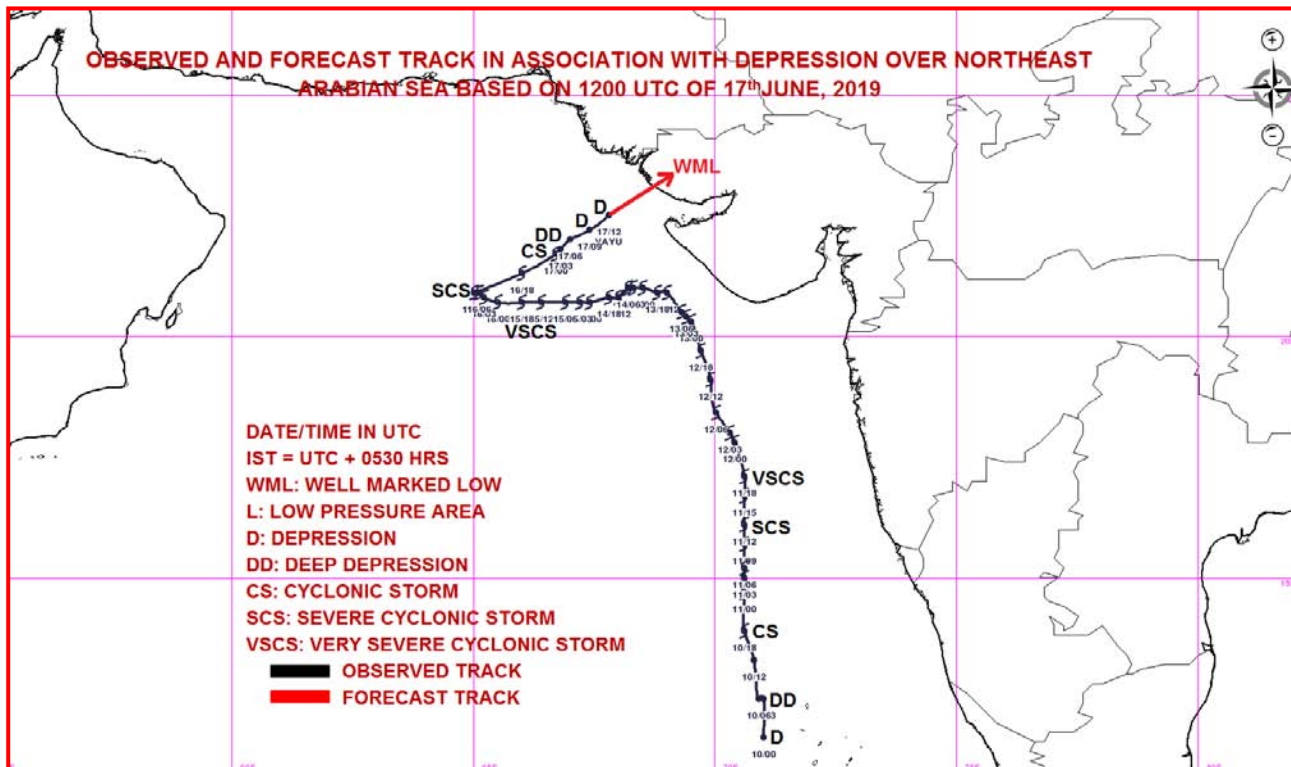
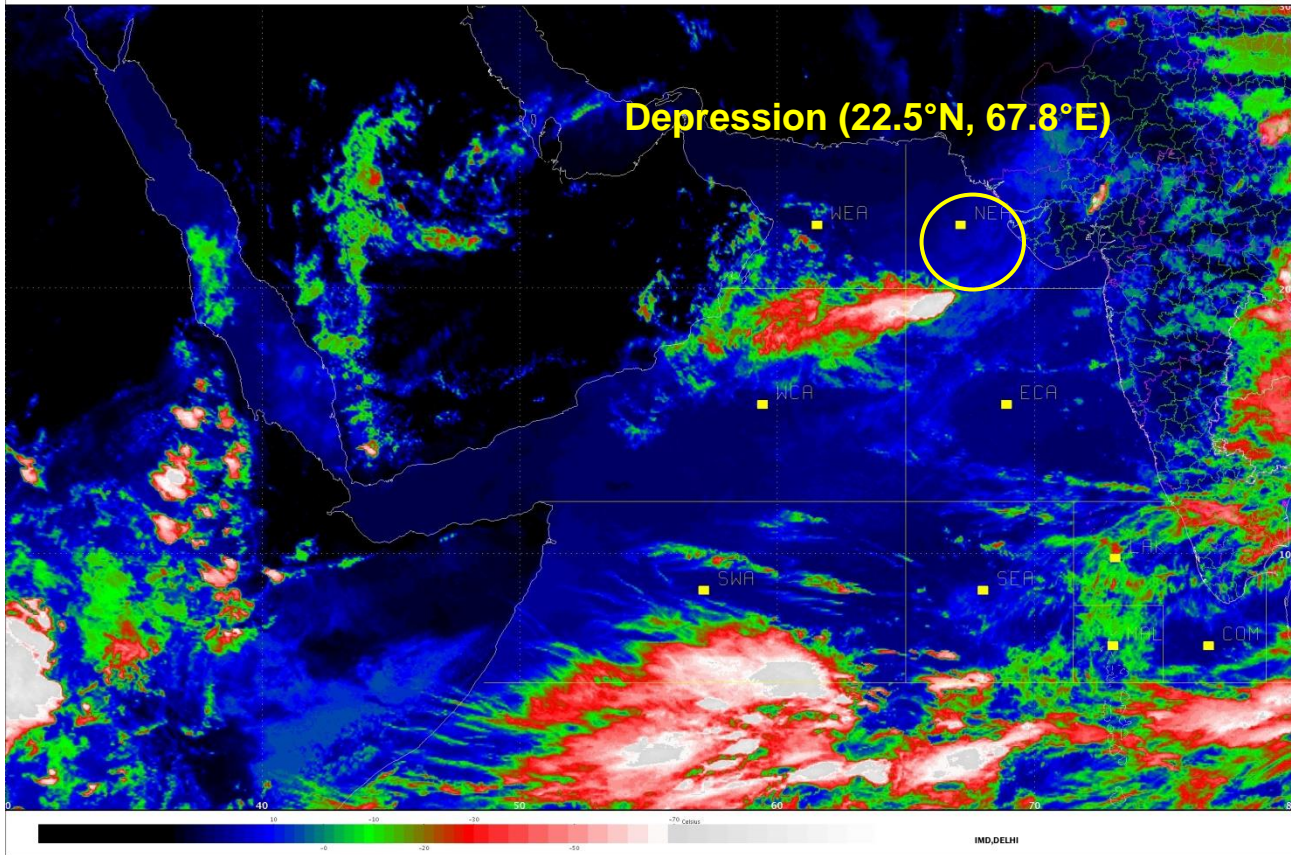
AT 1200 UTC OF 17TH JUNE, A SHIP LOCATED AT 20.3°N/66.6°E REPORTED MEAN SEA LEVEL PRESSURE OF 1000.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 260°/25 KNOTS. OKHA (42731) REPORTED MEAN SEA LEVEL PRESSURE OF 999.3 HPA AND MEAN SURFACE WIND DIRECTION/SPEED OF 180°/09 KNOTS.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS 997 HPA.

**(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%



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 17.06.2019

SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 24 HOURS ISSUED AT 2000 UTC OF 17.06.2019 BASED ON 1800 UTC OF 17.06.2019.

DEPRESSION WEAKENED INTO A WELL MARKED LOW PRESSURE AREA OVER NORTHEAST ARABIAN SEA AND ADJOINING SAURASHTRA & KUTCH

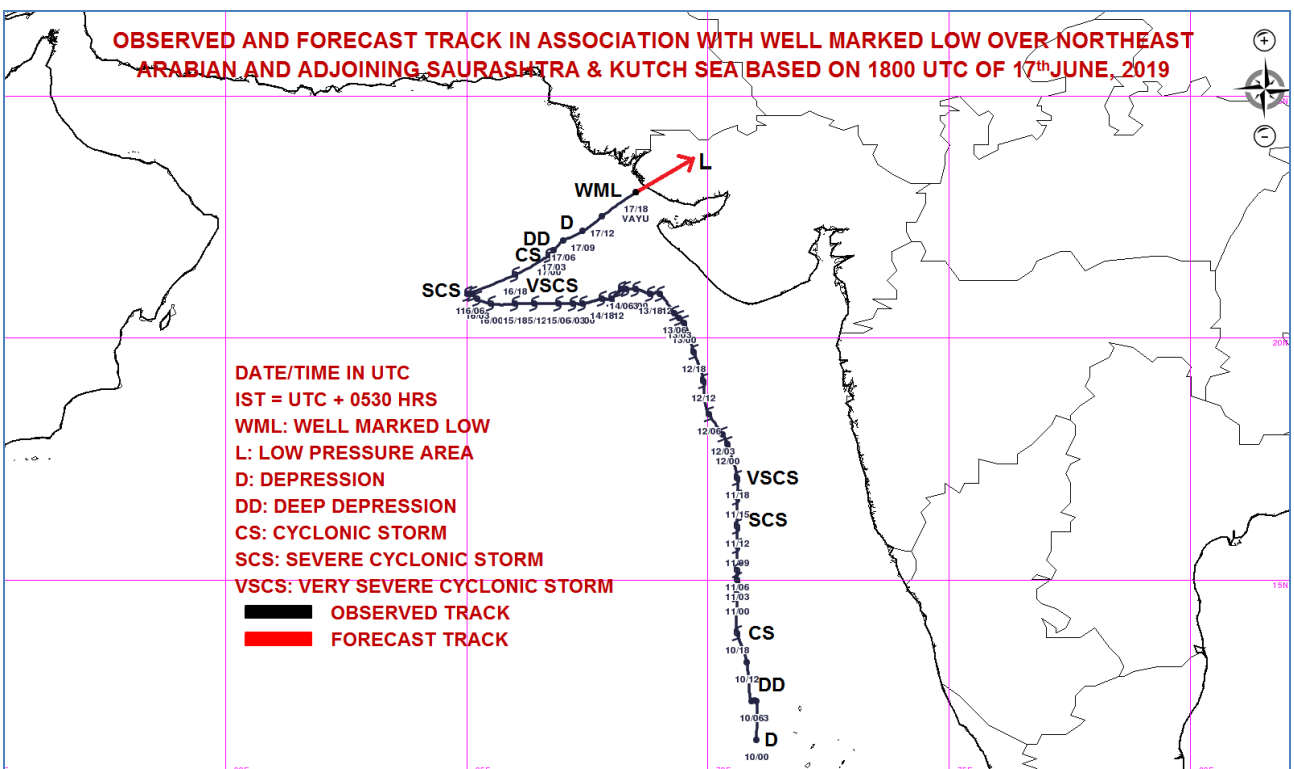
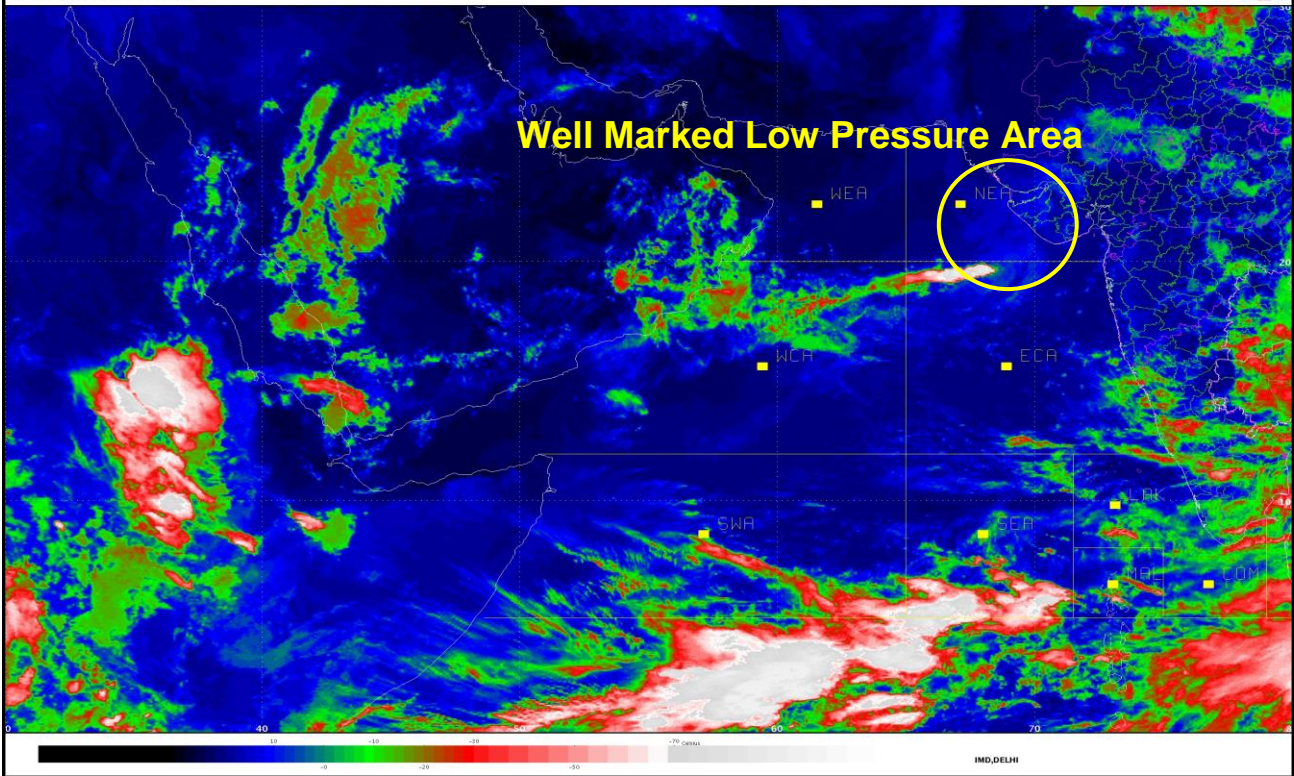
THE DEPRESSION OVER NORTHEAST ARABIAN SEA & NEIGHBOURHOOD MOVED EAST-NORTHEASTWARDS DURING PAST 6 HOURS AND WEAKENED INTO A WELL MARKED LOW PRESSURE AREA OVER NORTHEAST ARABIAN SEA AND ADJOINING SAURASHTRA & KUTCH AT 1800 UTC OF 17TH JUNE, 2019. IT IS VERY LIKELY TO MOVE FURTHER EAST-NORTHEASTWARDS AND WEAKEN INTO A LOW PRESSURE AREA DURING NEXT 12 HOURS.

THIS IS THE LAST BULLETIN FOR THIS SYSTEM. HOWEVER, REGULAR BULLETIN WILL CONTINUE FROM METEOROLOGICAL CENTRE AHMADABAD AND NATIONAL WEATHER FORECASTING CENTRE, IMD NEW DELHI.

**(D.R. PATTANAİK)
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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%



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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