



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 120 HOURS ISSUED AT 1400 UTC OF 20.05.2020 BASED ON 1200 UTC OF 20.05.2020.

SUB: SUPER CYCLONIC STORM 'AMPHAN' (PRONOUNCED AS UM-PUN) CROSSED WEST BENGAL – BANGLADESH COASTS

THE SUPER CYCLONIC STORM 'AMPHAN' (PRONOUNCED AS **UM-PUN**) OVER NORTHWEST BAY OF BENGAL MOVED NORTH-NORTHEASTWARDS WITH A SPEED OF 25 KMPH DURING PAST 06 HOURS, CROSSED WEST BENGAL – BANGLADESH COASTS AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED OF 155-165 KMPH GUSTING TO 185 KMPH ACROSS SUNDARBANS, NEAR LAT. 21.65°N AND LONGITUDE 88.3°E AND LAY CENTRED AT 1200UTC OF TODAY, THE 20TH MAY, 2020, OVER WEST BENGAL COAST NEAR LATITUDE 21.9°N AND LONGITUDE 88.4°E, ABOUT 70 KM NEARLY TO THE SOUTH OF KOLKATA(42807), 95 KM EAST-NORTHEAST OF DIGHA (42901), 35 KM NORTHEAST OF SAGAR ISLANDS (42903) AND 185 KM SOUTH-SOUTHWEST OF KHEPUPARA (41984).

KOLKATA (42807) REPORTED 112 KMPH WINDS AT 1200UTC OF TODAY, THE 20TH MAY 2020

THE SYSTEM IS NOW BEING CONTINUOUSLY TRACKED BY THE DOPPLER WEATHER RADAR (DWR) AT KOLKATA (WEST BENGAL).

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
20.05.20/1200	21.9/88.4	140-150 GUSTING TO 165	VERY SEVERE CYCLONIC STORM
20.05.20/1800	23.2/88.8	100-110 GUSTING TO 125	SEVERE CYCLONIC STORM
21.05.20/0000	24.6/89.3	60-70 GUSTING TO 80	CYCLONIC STORM
21.05.20/0600	26.0/90.3	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 INSAT-3D SATELLITE IMAGERY BASED ON 1200 UTC OF 20TH MAY SHOWS THE VORTEX LIES OVER THE LAND IN AEAS OF WEST BENGAL COAST ASSOCIATED BROKEN LOW/MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION OVER BAY BETWEEN LATITUDE 19.0°N TO 27.0°N LONGITUDE 85.0°E TO 92.5°E. WALL CLOUDS MINIMUM CLOUD TOP TEMPERATURE -93 DEG 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 **970** HPA.

THE CYCLONE IS BEING TRACKED BY DOPPLER WEATHER RADARS (DWR) AT KOLKATTA (43049). THE SYSTEM IS AT DISTANCE 70 KM SOUTH OF KOLKATA RADAR.

AT 1200 UTC OF 20TH MAY, DIGHA (42901), REPORTED MEAN SEA LEVEL PRESSURE OF 980.0 HPA AND WIND DIRECTION/SPEED AS 320°/22 KNOTS, MIDNAPUR(42803) REPORTED MEAN SEA LEVEL PRESSURE OF 984.5 HPA AND WIND DIRECTION/SPEED AS 320°/42 KNOTS .

THE SYSTEM ENTERING THE COAST. CONSIDERING THE ENVIRONMENTAL CONDITIONS, WITH THE POSITIVE VORTICITY MAINTAINING AT $(250-300) \times 10^{-6} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS $(30-40) \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE HAS ALSO REDUCED TO $10 \times 10^{-5} \text{ SEC}^{-1}$ AROUND THE SYSTEM CENTRE. VERTICAL WIND SHEAR (VWS) IS MODERATE TO HIGH (25-30 KTS) AROUND THE SYSTEM CENTRE. IT IS INCREASING TO 30-40 KTS AT NORTH OF 23°N ALONG THE EXPECTED TRACK. THE UPPER TROPOSPHERIC RIDGE IS AT NORTH AND NOW LIES NEAR 22.0°N OVER BAY OF BENGAL. AT PRESENT THE SYSTEM IS MOVING NORTH-NORTHEASTWARD ALONG THE PERIPHERY OF THE ANTICYCLONE LIES OVER MAYNMAR.

VARIOUS NUMERICAL MODELS INCLUDING ECMWF, IMD GFS, NCEP GFS, GEFS, NEPS AND NCUM ARE INDICATING THE SYSSTEM IS LIKELY TO MOVE ACROSS NORTHWEST BAY OF BENGAL TOWARDS WEST BENGAL AND BANGLADESH COASTS AS AN EXTREMELY SEVERE CYCLONIC STORM DURING 1000-1200 UTC OF 20TH MAY 2020. THE FORECAST IS BASED ON THE CONSENSUS FROM VARIOUS MODELS.

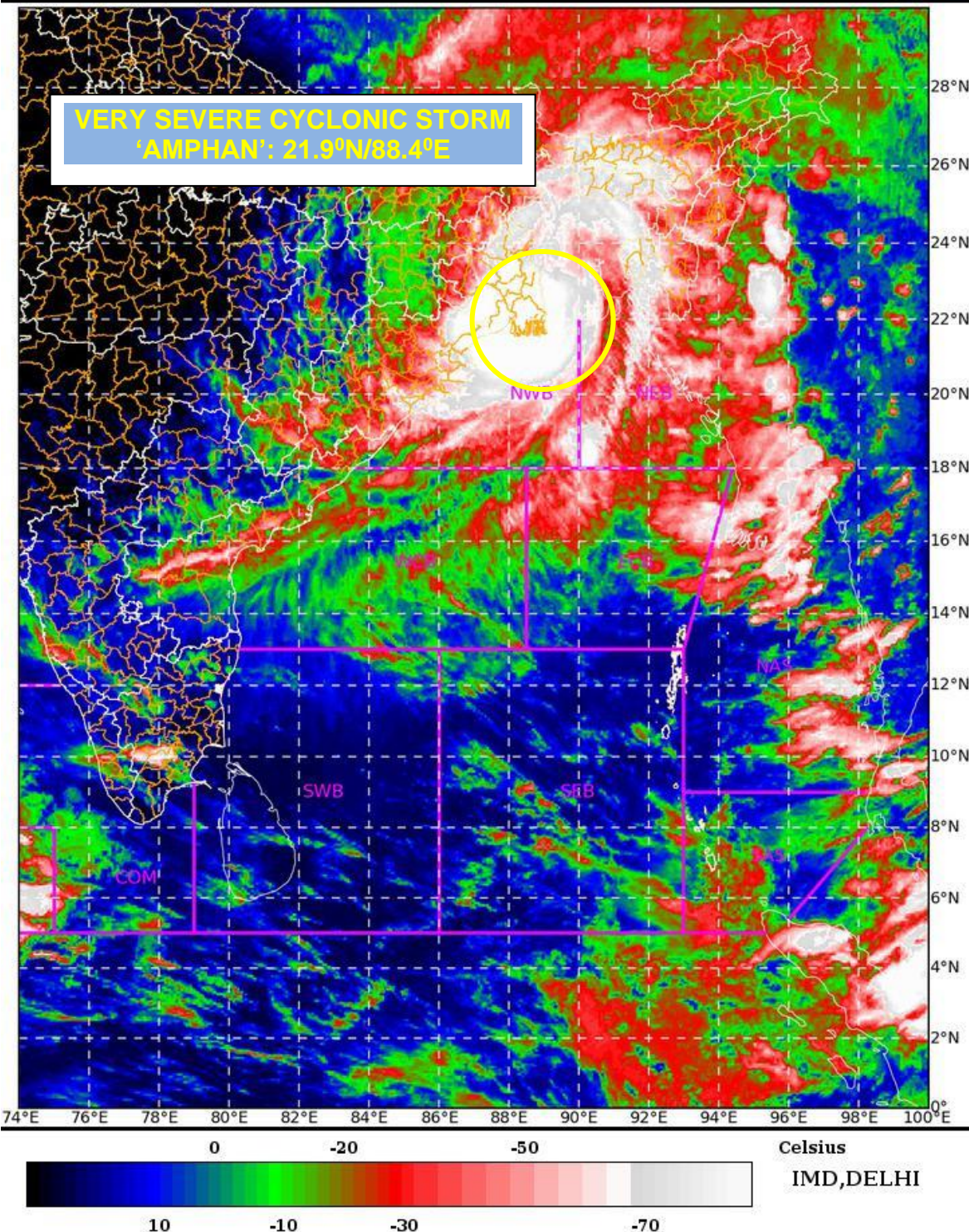
STORM SURGE GUIDANCE

STORM SURGE OF ABOUT 4-5 METERS ABOVE ASTRONOMICAL TIDE IS LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH & NORTH 24 PARGANAS AND ABOUT 3-4 METERS OVER THE LOW LYING AREAS OF EAST MEDINIPUR DISTRICT OF WEST BENGAL DURING THE TIME OF LANDFALL (FIGURE ENCLOSED).

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

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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



Legend: WCB – Westcentral Bay of Bengal
NWB – Northwest Bay of Bengal

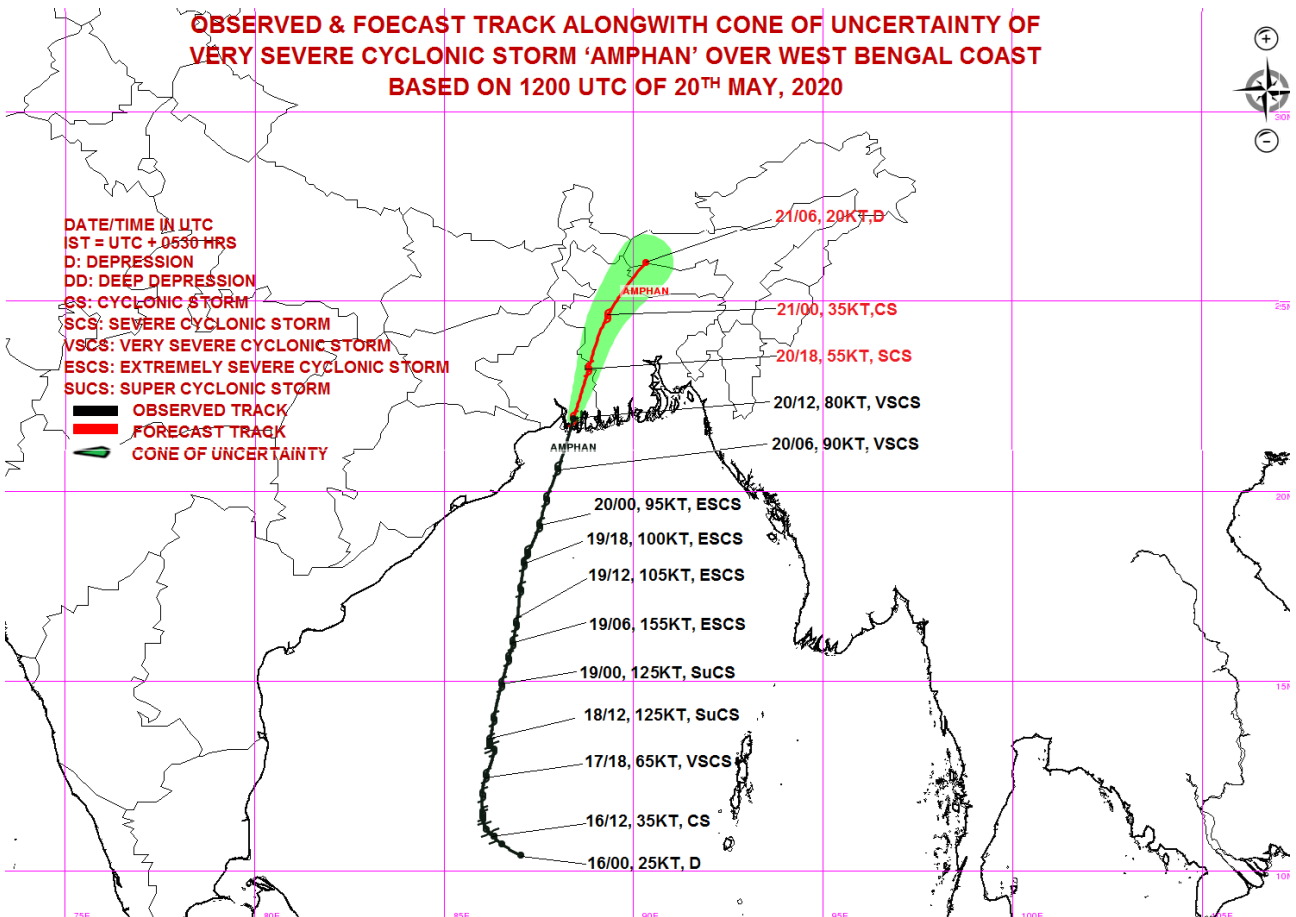
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF VERY SEVERE CYCLONIC STORM 'AMPHAN' OVER WEST BENGAL COAST BASED ON 1200 UTC OF 20TH MAY, 2020



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

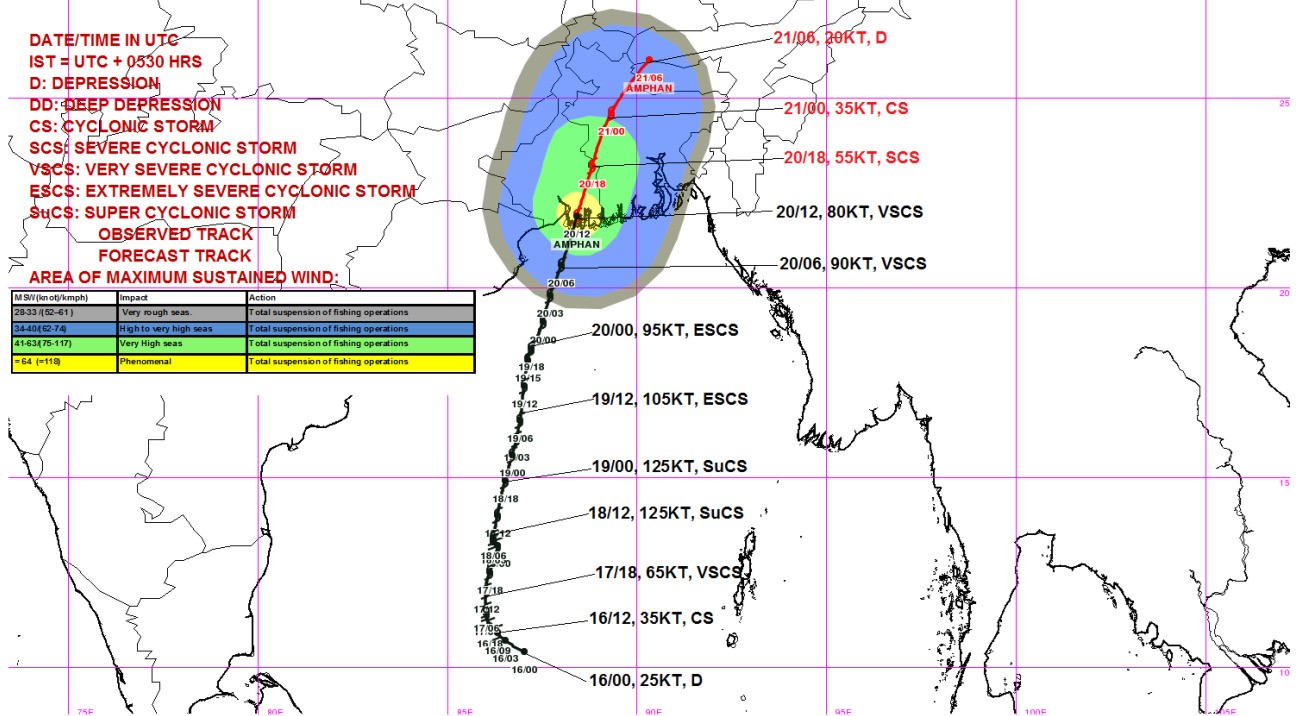


OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF VERY SEVERE CYCLONIC STORM 'AMPHAN' OVER WEST BENGAL COAST BASED ON 1200 UTC OF 20TH MAY, 2020



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

MSW (knot/imph)	Impact	Action
28-33 (62-81)	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)

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Figure: Storm Surge forecast from INCOIS issued at 1500 IST of 20th May 2020

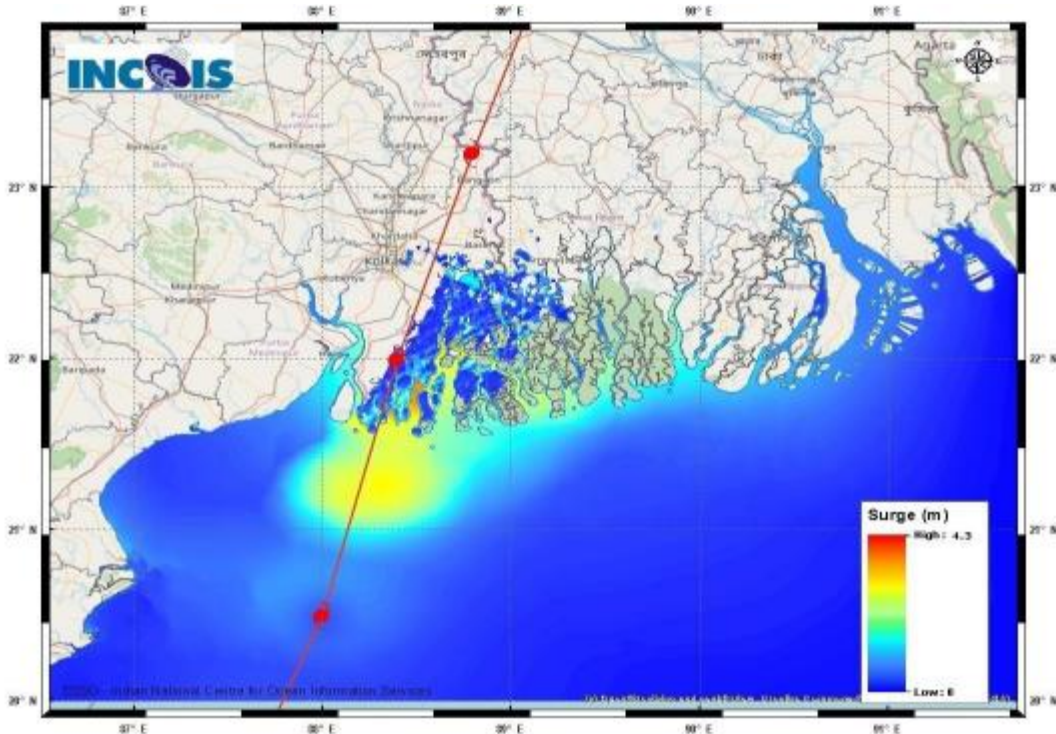


Fig: Computed storm surge & Inundation based on the IMD track forecast

Storm Surge of about 4-5 meters above Astronomical Tide is likely to inundate low lying areas of south & north 24 Parganas and about 3-4 meters over the low lying areas of East Medinipur District of West Bengal during the time of Landfall. Given below is the direct model output from INCIOS Strom Surge model.

STORM SURGE HEIGHT INFORMATION:

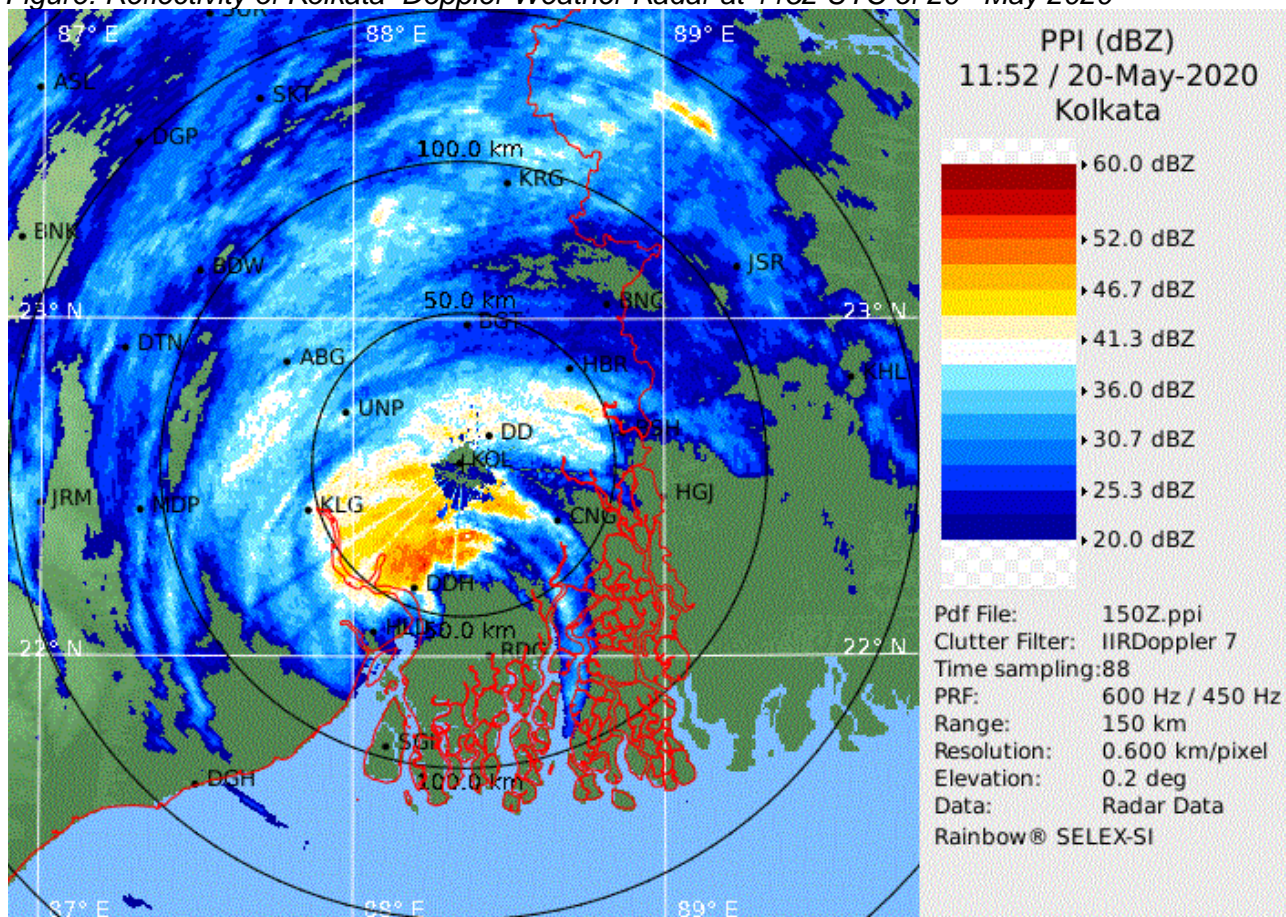
* The below listed surge heights are over and above astronomical tide.

MANDAL/TALUK	DISTRICT	STATE / UNION TERRITORY	NEAREST PLACE OF HABITATION	* STORM SURGE (m)	* EXPECTED INUNDATION EXTENT (km)
Bhangar-I	South 24 Parganas	West Bengal	Bhangar-I	0.5-4.3	Around 17
Basirhat	North 24 Parganas	West Bengal	Basirhat	0.5-3.9	Around 10
Diamond Harbour	South 24 Parganas	West Bengal	Daimond Harbor	0.5-3.5	Around 17
Bagnan-II	Haora	West Bengal	Bagnan-II	0.5-1.0	Around 0.4
Mahisadal	Medhinipur	West Bengal	Tentul Berya	0.5-1.0	Around 0.4
Nandigram-I	Medhinipur	West Bengal	Nakchira Chara	0.5-0.8	Around 0.4
off Haldia	Purba Medhinipur	West Bengal	Nayachar Island	0.5-1.5	Around 0.5
Sutahata-I	Medinipur	West Bengal	Maniruddin Chara	0.5-1.6	Around 0.4
Sutahata-II	Medinipur	West Bengal	Haldia	0.5-1.5	Around 0.3
Digha	Purba Medhinipur	West Bengal	Digha	0.5-0.7	Around 0.3
Tamluk	East Midnapore	West Bengal	Tamluk	0.5-1.5	Around 0.3
Bhadrak	Bhadrak	Odisha	Mohanpur	0.5-1.1	Around 0.8
Kendrapara	Kendraparha	Odisha	Baligarh	0.5-0.8	Around 2.6
Baleshwar	Baleshwar	Odisha	Sahanur	0.5-0.7	Around 0.7

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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

Figure: Reflectivity of Kolkata Doppler Weather Radar at 1152 UTC of 20th May 2020



PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

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