



**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 120 HOURS ISSUED AT 0800 UTC OF 20.05.2020 BASED ON 0600 UTC OF 20.05.2020.**

**SUB: SUPER CYCLONIC STORM 'AMPHAN' (PRONOUNCED AS UM-PUN) OVER NORTHWEST BAY OF BENGAL**

THE SUPER CYCLONIC STORM 'AMPHAN' (PRONOUNCED AS UM-PUN) OVER NORTHWEST BAY OF BENGAL MOVED NORTH-NORTHEASTWARDS WITH A SPEED OF 29 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600UTC OF TODAY, THE 20<sup>TH</sup> MAY, 2020 AS AN EXTREMELY SEVERE CYCLONIC STORM OVER **NORTHWEST BAY OF BENGAL** NEAR LATITUDE 20.6°N AND LONGITUDE 88.0°E, ABOUT 140 KM EAST-NORTHEAST OF PARADIP (42976), 125 KM SOUTHSOUTHEAST OF DIGHA (42901), 125 KM NEARLY SOUTH OF SAGAR ISLANDS(42903) AND 275 KM WESTSOUTHWEST OF KHEPUPARA (41984).

IT IS VERY LIKELY TO MOVE NORTH-NORTHEASTWARDS ACROSS NORTHWEST BAY OF BENGAL AND CROSS WEST BENGAL – BANGLADESH COASTS BETWEEN DIGHA (WEST BENGAL) AND HATIYA ISLANDS (BANGLADESH) CLOSE TO SUNDARBANS DURING LATE AFTERNOON TO EVENING HOURS OF TODAY, THE 20<sup>TH</sup> MAY 2020 WITH MAXIMUM SUSTAINED WIND SPEED OF 155-165 KMPH GUSTING TO 185 KMPH.

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
20.05.20/1130	20.6/88.0	160-170 GUSTING TO 190	EXTREMELY SEVERE CYCLONIC STORM
20.05.20/1730	22.0/88.4	150-160 GUSTING TO 180	VERY SEVERE CYCLONIC STORM
20.05.20/2330	23.2/88.8	110-120 GUSTING TO 135	SEVERE CYCLONIC STORM
21.05.20/0530	24.6/89.3	60-70 GUSTING TO 80	CYCLONIC STORM
21.05.20/1730	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 0600 UTC OF 20<sup>TH</sup> MAY SHOWS THE SYSTEM INTENSITY IS T5.0/5.5 WITH CDO PATTERN WITH ASSOCIATED BROKEN LOW/MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION OVER BAY BETWEEN LATITUDE 17.0°N TO 22.5°N LONGITUDE 85.0°E TO 90.0°E & ALSO OVER ODISHA ADJOINING NORTH COASTAL ANDHRA PRADESH. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 90 KNOTS GUSTING TO 100 KNOTS. THE SEA CONDITION IS PHENOMENAL AROUND THE SYSTEM CENTER. THE ESTIMATED CENTRAL PRESSURE IS **960** HPA.

THE CYCLONE IS BEING TRACKED BY DOPPLER WEATHER RADARS (DWR) AT VISHAKHAPATNAM (43149), PARADIP (42976) AND GOPALPUR (43049). THE SYSTEM IS AT DISTANCE 140 KM EAST-NORTHEAST OF PARADIP RADAR.

AT 0600 UTC OF 20<sup>TH</sup> MAY, THE BOUY (**23092**) AT 17.24°N/89.1°E REPORTED MEAN SEA LEVEL PRESSURE OF 999.0 HPA AND WIND DIRECTION/SPEED AS 280°/19 KNOTS. PARADIP (42976) REPORTED MEAN SEA LEVEL PRESSURE OF 988.7 HPA AND WIND DIRECTION/SPEED AS 290°/47 KNOTS

THE MADDEN JULIAN OSCILLATION (MJO) INDEX IS IN PHASE 2 WITH AMPLITUDE MORE THAN 1 FOR NEXT TWO DAYS. IT WILL REMAIN IN PHASE 3 WITH AMPLITUDE MORE THAN 1 DURING SUBSEQUENT THREE DAYS. THUS MJO PHASE AND AMPLITUDE WILL SUPPORT ENHANCEMENT OF CONVECTIVE ACTIVITY OVER BAY OF BENGAL DURING NEXT 5 DAYS.

CONSIDERING THE SEA CONDITIONS, THE SEA SURFACE TEMPERATURE (SST) IS 30-31°C OVER ENTIRE BAY OF BENGAL, BUT SYSTEM IS ENTERING TO FURTHER LOWER TROPICAL CYCLONE HEAT POTENTIAL OF 60-80 KJ/CM<sup>2</sup> AND IT IS FURTHER DECREASING TOWARDS NORTH BAY OF BENGAL ALONG THE SYSTEM TRACK.

CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE POSITIVE VORTICITY HAS REDUCED SLIGHTLY AND NOW AROUND  $(200-250) \times 10^{-6} \text{ SEC}^{-1}$  AROUND THE SYSTEM CENTRE WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE ZONE IS ABOUT  $(30-40) \times 10^{-5} \text{ SEC}^{-1}$  LIES AT NORTHEAST OF THE SYSTEM CENTRE. THE UPPER LEVEL DIVERGENCE IS OF THE ORDER OF  $20 \times 10^{-5} \text{ SEC}^{-1}$  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 20°N ALONG THE EXPECTED TRACK. THE UPPER TROPOSPHERIC RIDGE HAS FURTHER SHIFTED NORTH AND NOW LIES NEAR 21.0°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 SYSTEM 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 20<sup>TH</sup> MAY 2020. THE FORECAST IS BASED ON THE CONSENSUS FROM VARIOUS MODELS.

## STORM SURGE GUIDANCE

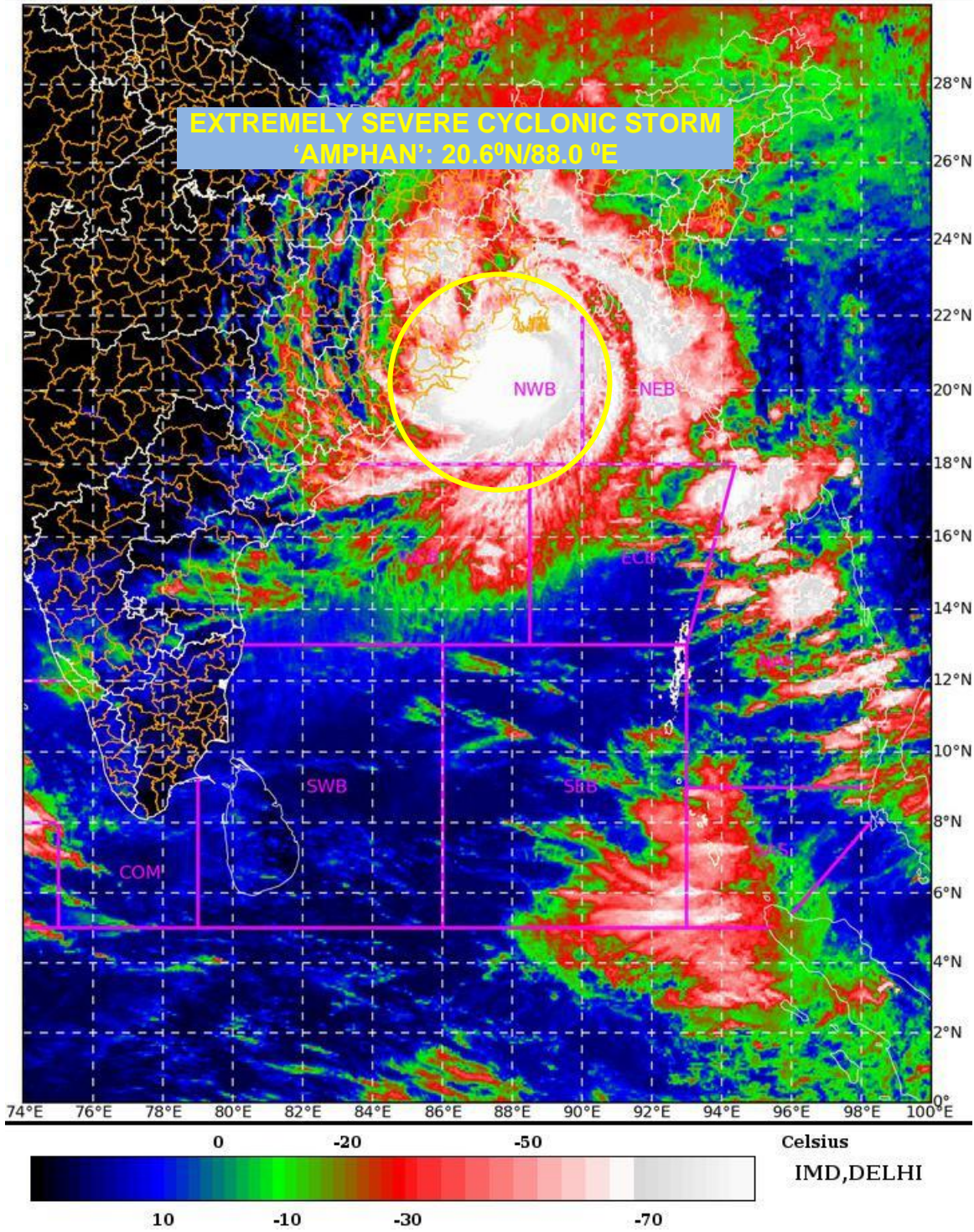
STORM SURGE OF ABOUT 4-5 METERS ABOVE ASTRONOMICAL TIDE IS LIKELY TO INUNDATE LOW LYING AREAS OF SOUTH & NORTH 24 PARGANAS AND ABOUT 3-4 METERS OVER THE LOW LYING AREAS OF EAST MEDINIPUR DISTRICT OF WEST BENGAL DURING THE TIME OF LANDFALL (FIGURE ENCLOSED).

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

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**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

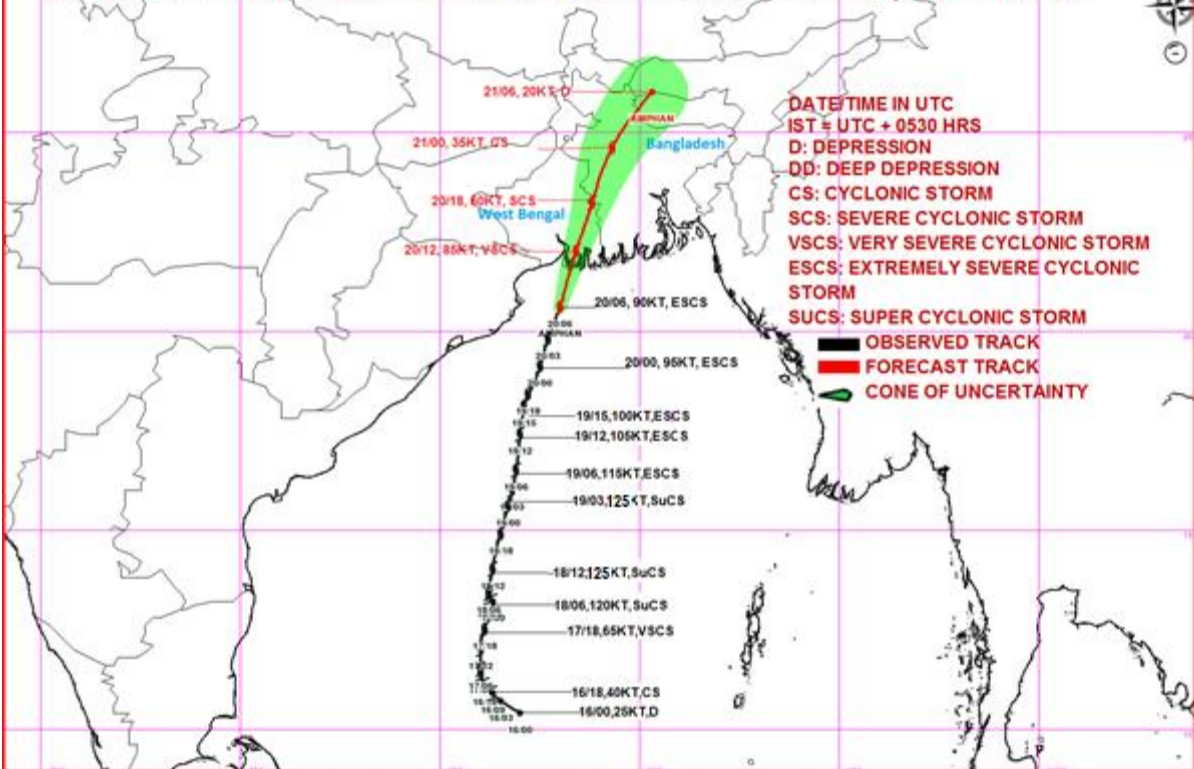
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



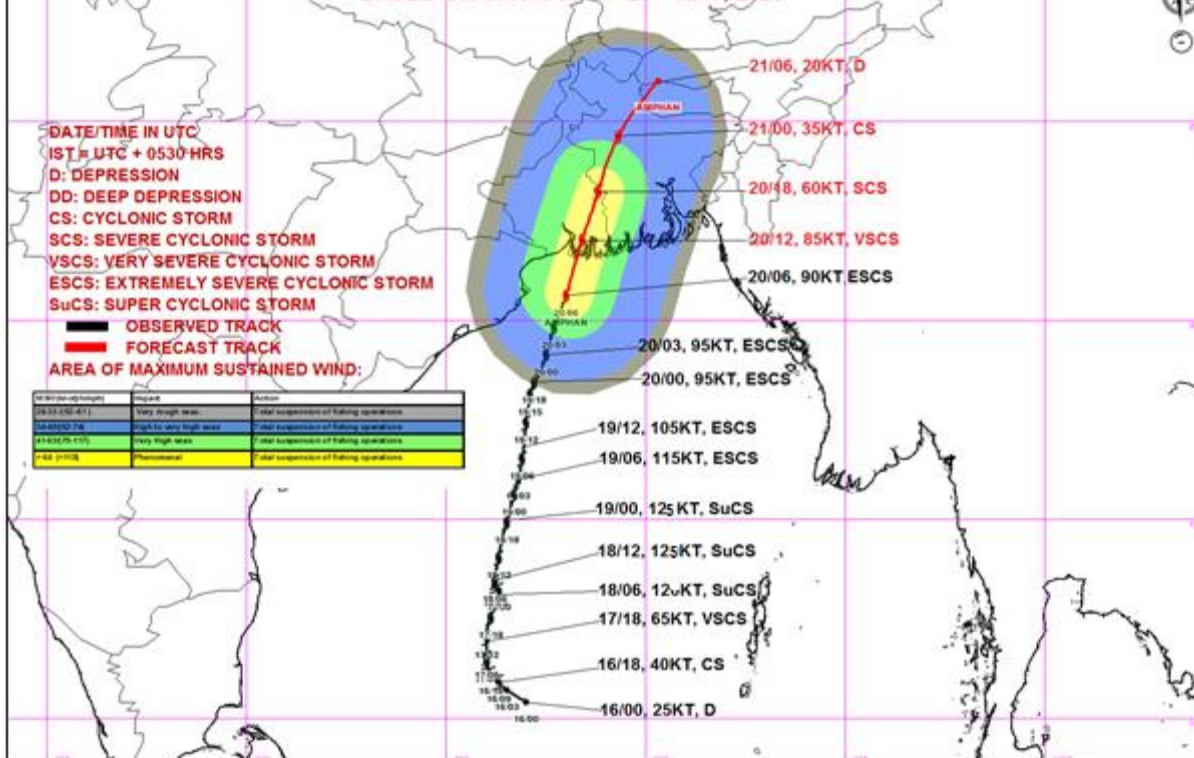
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**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF EXTREMELY SEVERE CYCLONIC STORM 'AMPHAN' OVER NORTHWEST BAY OF BENGAL BASED ON 0600 UTC OF 20<sup>TH</sup> MAY, 2020**



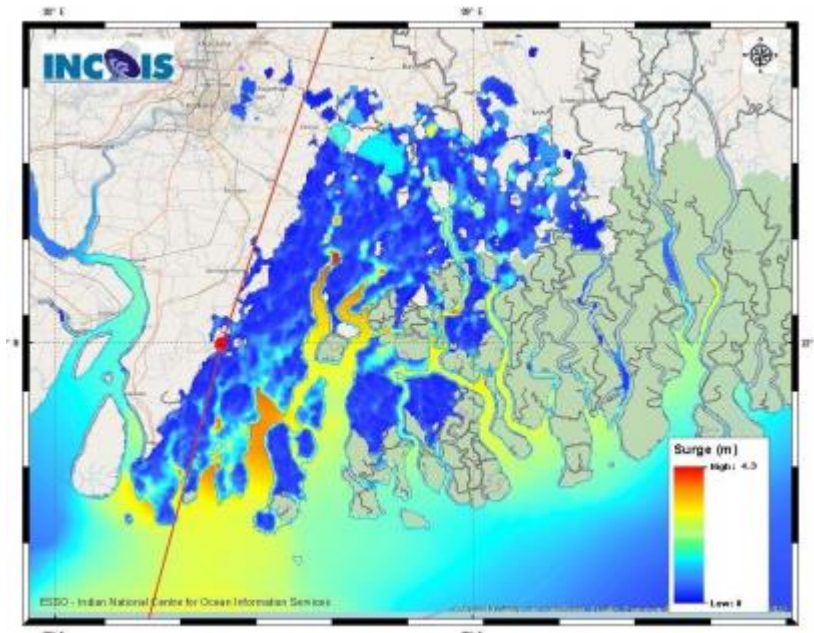
**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF EXTREMELY SEVERE CYCLONIC STORM 'AMPHAN' OVER NORTHWEST BAY OF BENGAL BASED ON 0600 UTC OF 20<sup>TH</sup> MAY, 2020**



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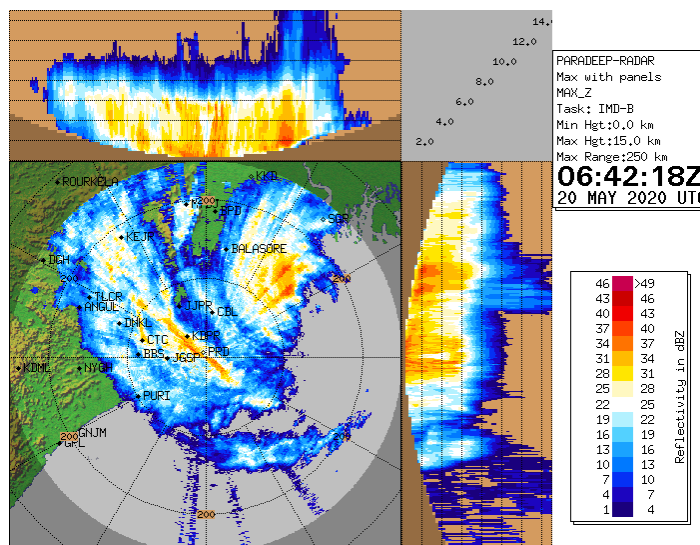
Figure: Storm Surge forecast from INCOIS issued at 1148 IST of 20<sup>th</sup> May 2020



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.

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	Nakhira 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	Sahapur	0.5-0.7	Around 0.7

Figure: Reflectivity of Paradip Doppler Weather Radar at 0642 UTC of 20<sup>th</sup> May 2020



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