

Cyclone Michaung intensifies into 'severe' cyclonic storm

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Why in news?

- According to the Indian Meteorological Department, Cyclone Michaung intensified into a severe cyclonic storm.
- It is likely to make landfall between Nellore and Machilipatnam in Andhra Pradesh on December 5.

How are Cyclones Classified?

- Cyclones are classified on the basis of wind speed by the Indian Meteorological Department (IMD):
 - Depression: Wind speeds of between 31–49 km/h
 - Deep Depression: Between 50–61 km/h
 - Cyclonic Storm: Between 62–88 km/h
 - Severe Cyclonic Storm: Between 89–117 Km/h
 - Very Severe Cyclonic Storm: Between 118–166 Km/h
 - Extremely Severe Cyclonic Storm: Between 167–221 Km/h
 - Super Cyclonic Storm: Above 222 Km/h

What is landfall of a cyclone?

- Landfall is the event of a tropical cyclone coming onto land after being over water.
- As per the IMD, a tropical cyclone is said to have made a landfall when the center of the storm – or its eye – moves over the coast.
 - The “eye” of a cyclone is a region of relatively calm weather found at the center of the storm.
 - It is a circular or oval-shaped area characterized by light winds, clear or partly cloudy skies, and decreased precipitation.
 - Within the eye, winds are light and variable, often with clear or only partially cloudy skies.
 - The size of the eye can vary significantly, ranging from a few kilometers to over 50 kilometers (30 miles) in diameter in larger cyclones.
- During landfall, the outer bands of the storm may have already reached the coast, bringing strong winds, heavy rain, and storm surge.
- Landfall marks the moment when the cyclone officially reaches the land.
 - A landfall should not be confused with a ‘direct hit’, which refers to a situation where the core of high winds (or eyewall) comes onshore but the centre of the storm may stay remain offshore.

How long does a landfall last?

- Landfalls can last for a few hours, with their exact duration depending on the speed of the winds and the size of the storm system.
- Cyclones lose their intensity once they move over land because of sharp reduction of moisture supply and increase in surface friction.
- This means that while landfalls are often the most devastating moments of cyclones, they also mark the beginning of its end.

News Summary

- Tropical cyclone Michaung will cross the Andhra Pradesh coast between the cities of Nellore and Machilipatnam in the forenoon of December 5.
- The IMD had initially predicted that Michaung would remain a ‘tropical cyclone’ (wind speeds of 62 kph to 87 kph) until it crossed the Andhra Pradesh coast.

- Later, the IMD upgraded it to the intensity of a 'severe' storm (wind speeds of 88 kph to 166 kph).

An unusual cyclone

- Due to unfavourable ocean conditions, storms that develop over the North Indian Ocean in December do not usually attain destructive intensities.
- Such intensification of a December cyclone is unique. The above-normal value of the heat index off the southern Andhra Pradesh coast led to the strengthening of Michaung.

Indian tropical storms

- Climatologically, about five cyclones develop in the North Indian Ocean basin — comprising the Bay of Bengal and the Arabian Sea — every year.
 - Of these, an average of four cyclones develop over the Bay of Bengal and one over the Arabian Sea.
- However, Arabian Sea storms often reach higher intensities and carry the potential to cause widespread damage.
- The North Indian Ocean basin is most prone to cyclone development during the pre-monsoon (April-June) and post-monsoon (October-December) months.
- Due to favourable ocean conditions, cyclones that form in May and November usually reach higher intensities than storms that form at other times.

Storm intensification

- Fuelled by ocean heats
 - Tropical cyclones are fuelled by ocean heat (in addition to other factors).
 - Ocean temperatures of 26 degrees Celsius or more, prevailing at depths between 50 metres and 100 metres, are conducive for cyclogenesis.
 - Cyclogenesis refers to the processes that lead to the development and strengthening of a cyclone.
 - An oceanographic parameter called the Tropical Cyclone Heat Potential (TCHP) is considered an important factor in cyclone genesis, intensification, and propagation.
 - TCHP is a measure of the heat energy available in the upper ocean layers that can potentially fuel the intensification of tropical cyclones.
 - It is defined as a measure of the integrated vertical temperature from the sea surface to the depth of the 26°C
- Intensification process is highly complex
 - This process is also influenced by a combination of various favourable atmospheric conditions including:
 - boundary layers (the fluid layer adjacent to a bounding surface),
 - wind shear (changes in wind direction and/or speed over a vertical or horizontal distance),
 - convection (transfer of heat within a fluid),
 - Rossby waves (which occur in rotating fluids),
 - upper ocean circulation, and air-sea interaction.

Q1) What is a tropical cyclone?

A tropical cyclone is an intense circular storm that originates over warm tropical oceans. It is also called a hurricane or a typhoon. It is characterized by low atmospheric pressure and heavy rain, and its winds exceed 119 km (74 miles) per hour.

Q2) What is the meaning of ocean heat?

The total amount of heat stored by the oceans is called “ocean heat content,” and measurements of water temperature reflect the amount of heat in the water at a particular time and location.

Source: [What makes Cyclone Michaung, headed to the Andhra coast, such an unusual storm?](#) | [National Oceanic and Atmospheric Administration](#) | [The Hindu](#)

Source: <https://vajiramandravi.com/current-affairs/michaung/>

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