

Fengal: The Next Storm

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Context

The India Meteorological Department (IMD) recently announced the intensification of a deep depression into a cyclone, with a likelihood of the storm hitting the Tamil Nadu coast.

Background

- **India's Coastal Vulnerability:** Flanked by seas on three sides, India's east and west coasts are highly prone to cyclones, particularly during pre- and post-monsoon seasons.
- **Cyclone Frequency:** On average, five cyclones develop annually in the North Indian Ocean basin, with most forming in the Bay of Bengal and a smaller number in the Arabian Sea.

Key Updates

1. **Cyclone Identification:** The upcoming storm will be named **Fengal**, proposed by Saudi Arabia.
2. **Post-Monsoon Activity:** This is the **second cyclone** of the post-monsoon season, following Cyclone Dana, which affected Odisha in late October as a 'severe' category storm.

About Tropical Cyclones

What is a Cyclone?

- A **cyclone** is a powerful atmospheric vortex characterized by strong winds circulating around a central low-pressure zone.
- In the **Northern Hemisphere**, winds move in an **anti-clockwise direction**, while in the **Southern Hemisphere**, they move clockwise.
- Cyclones are known by different names worldwide:
 - **Hurricanes** (Atlantic Ocean)
 - **Typhoons** (Pacific Ocean)
 - **Willy-Willies** (Australian Seas)
 - **Cyclones** (North Indian Ocean)

Structure of a Cyclone:

1. **Eye:** The calm, cloud-free center of the storm.
2. **Eye Wall:** The surrounding area with the strongest winds and rainfall.
3. **Rain Bands:** Spiral bands of thunderstorms extending outward from the center.

Favorable Conditions for Cyclone Formation:

- **Warm Ocean Waters:** Sea surface temperatures above 26.5°C provide energy for the cyclone.
- **Coriolis Effect:** Essential for storm rotation, absent at the equator.
- **Low Wind Shear:** Ensures vertical development of storm clouds.
- **Pre-Existing Disturbance:** Typically a low-pressure system initiates the process.

How Cyclones Form (Cyclogenesis):

1. **Heating:** Warm ocean water heats the air above, creating a low-pressure zone.
2. **Moisture:** Air rushes into the low-pressure area, rises, and condenses, releasing latent heat.
3. **Rotation:** The Coriolis effect causes the system to spiral.
4. **Intensification:** The storm strengthens as it absorbs more heat and moisture from the ocean.

Conclusion

Cyclones are among the most destructive natural phenomena, particularly along India's coasts. With rising sea temperatures and changing climate patterns, understanding their formation, structure, and risks is critical for mitigation and preparedness.

