



KAMARAJ IAS ACADEMY
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Bomb Cyclone: Meteorological Extremes

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In the News: A massive "bomb cyclone" struck the Northern US and Lake Superior region in late December 2025, causing pressure to drop to **945 mbar** and triggering blizzard conditions.

Geophysical Mechanics

- **Bombogenesis:** The defining characteristic is a rapid pressure drop of at least **24 millibars in 24 hours**. This creates an extreme "pressure gradient," resulting in hurricane-force winds.
- **The Catalyst:** It occurs when a **Cold Arctic air mass** (High Pressure) collides with a **Warm Maritime air mass** (Low Pressure), usually over the North Atlantic or Great Lakes.

UPSC Geography Linkage

- **Winter Cyclones:** Unlike tropical cyclones (driven by warm water), bomb cyclones are **extratropical** and are driven by temperature contrasts (baroclinic instability).
- **Impact:** They disrupt the **Polar Vortex**, pushing frigid air much further south than usual.

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