Super El Nino and India's Monsoon

Prelims: *Current events of national and international importance | Geography*

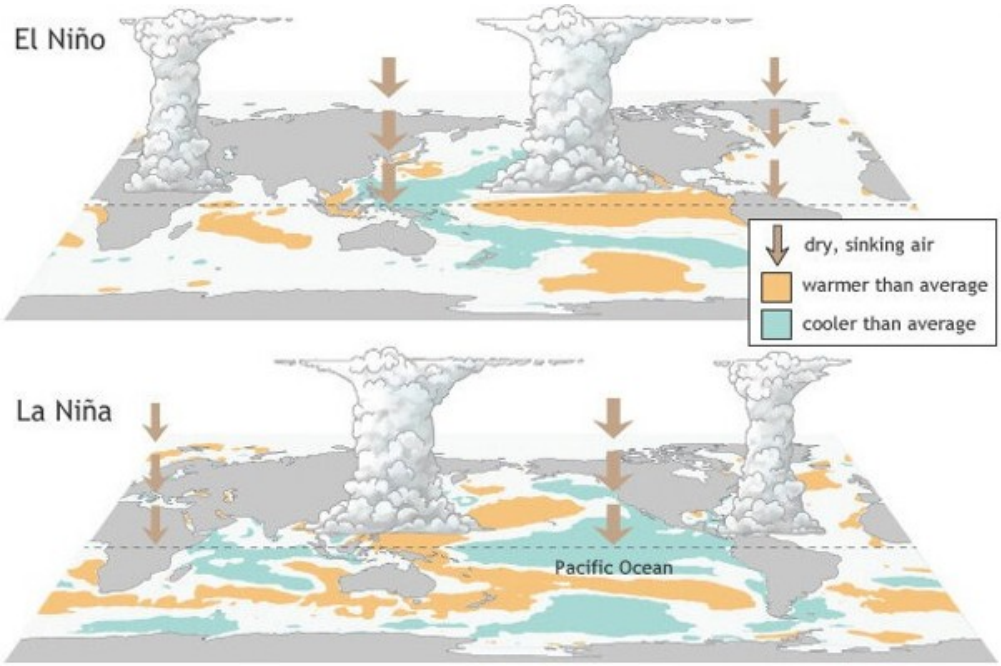
Why in News?

Recently, National Oceanic and Atmospheric Administration (NOAA) has warned that the ongoing El Niño could intensify into a super El Niño, raising concerns over India's monsoon performance.

ENSO (El Nino–Southern Oscillation) cycle

- It is a natural, recurring climate pattern characterized by ***fluctuations in ocean temperatures and atmospheric pressure*** across the Equatorial Pacific Ocean.
- It significantly alters global weather, temperatures, and rainfall.

3 – Phases
El Nino – The Warm Phase
La Nina – The Cool Phase
ENSO-Neutral



El Nino

- **El Nino -** El Nino is a naturally occurring climate phenomenon characterized by ***warmer-than-average sea surface temperatures*** in the central and eastern tropical Pacific Ocean.
- **Super El Nino –** Exceptionally strong warming episodes with adverse climatic impacts.

Temperature
0.5 to 1 degree Celsius – Weak
1 to 1.5 – Moderate
1.5 to 2 – Strong
Beyond 2 degrees – Very strong (Super).

- **Process –** Weak trade winds fail to push warm water west, causing the eastern Pacific to heat up and warmer water further weakens winds, amplifying El Nino.
- **Climate Change –** A warmer baseline ocean adds extra heat, making recent events stronger than earlier ones.
- **Past events –** Crossed the 2° threshold — 1972-73, 1982-83, 1997-98 and 2015-16 (extreme draughts).

Impact on India's Monsoon

- **Rainfall Deficit –** About 15 El Nino years since 1950 saw below-normal monsoon;
- **Distribution Issues –** Delayed onset, prolonged dry spells, and uneven rainfall more damaging than overall reduction.
- **Agriculture Economy –** Deficient monsoon affects food security, crop yields, and fiscal planning.
- **El Nino yearly cycle** — Developing in spring, peaking in winter, and fading by next spring.
- Its impact on India's monsoon is felt mainly *July–September*, not June., a dry June (35% deficit) doesn't guarantee monsoon failure.
- **Indian Ocean Dipole (IOD) Role –** Positive IOD can offset El Nino drying. Current forecasts suggest weak IOD, limiting buffering capacity.

Global Impact

- **Extreme Events –** Past super El Ninos linked to droughts in Australia, forest fires in Indonesia, coral bleaching and record global temperatures.
- **Cyclones –** Alters tropical cyclone distribution, suppresses Atlantic

hurricanes but increases Pacific typhoons.

Reference

Super El Nino | The Hindu