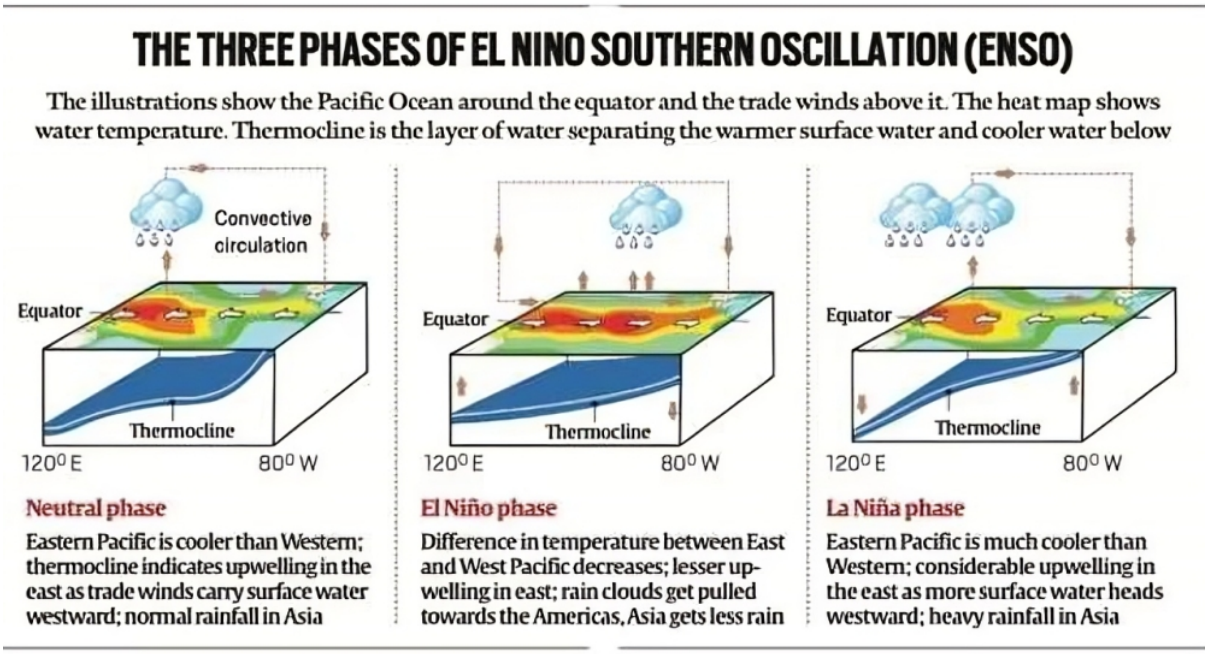
El Niño Southern Oscillation (ENSO)

Prelims: *Current events of National and International importance | Geography*

Why in News?

The year 2026 is being called an El Niño year due to the extreme summers, which cause heatwaves.

- **El Niño Southern Oscillation (ENSO)** – It is a climate phenomenon marked by *changes in sea temperatures along the eastern Pacific Ocean*, coupled with fluctuations in the overlying atmosphere.
- It can alter and interfere with the global atmospheric circulation, which, in turn, influences the weather worldwide.
- **Phases of El Niño**
  - Warm (El Niño, Spanish for little boy),
  - Cool (La Niña, Spanish for little girl), and
  - Neutral.
- **Time Period** – It occurs in *irregular cycles* of 2 to 7 years.



- **Warm/El Niño Phase** – During El Niño, the surface waters of this region of the *Pacific get unusually warm*, disrupting the flow of moist winds in India.
- The result is a *weak or delayed monsoon* for India, as well as dry spells in major agricultural states.

- There is also evidence that the *frequency and severity of heatwaves* India experiences are linked with the El Niño phenomenon.
- **Cool/La Niña Phase** – The opposite happens when La Niña is underway, that is, *cooling of the surface waters* of the eastern Pacific.
- India thus gets stronger, moisture-bearing winds, and typically experiences a *boost in its southwest monsoon*.
- In extreme situations, the *excessive rain* has caused flooding and crop damage as well.
- **Neutral Phase** – The eastern side of the Pacific Ocean (near the northwestern coast of South America) is cooler than the western side (near the Philippines and Indonesia).
- This is due to the prevailing wind systems that move from east to west, sweeping the warmer surface waters towards the Indonesian coast.
- The relatively cooler waters from below come up to replace the displaced water.

Quick Fact

Madden-Julian Oscillation (MJO)
• **MJO** – It is a *moving system of wind*, cloud and pressure that brings rain as it *circles around the equator*. • **Features** – It is a disturbance of clouds, wind and pressure that moves eastward at a speed of 4-8 metres per second. • Within 30 to 60 days, MJO wind bands can travel around the world and cause significant weather changes during their movement. • In a favourable phase, it can enhance rainfall over India during the monsoon season.

Reference

Indian Express | From Western Disturbance to El Niño: the climate terms we are hearing