

2. El Nino- Geography

Equatorial Pacific shows early signals of El Niño return in 2026 . Early signs from the Equatorial Pacific, specifically subsurface warming in the western region, indicate a transition from the current weak La Niña to El Niño conditions by the second half of 2026. This shift is expected to weaken trade winds and potentially suppress the Indian monsoon while pushing global temperatures higher.

Context- Emerging El Niño Signals

Forecast- The Equatorial Pacific Ocean is exhibiting early indicators suggesting a return of El Niño conditions.

Timeline- This phase could potentially commence in the second half of 2026.

Peak Period- The phenomenon is expected to reach its peak intensity during the Northern Hemisphere winter (late 2026 to early 2027).

About El Niño

Definition and Origin

Nature- El Niño represents the warm phase of the broader climate cycle known as the El Niño–Southern Oscillation (ENSO).

Etymology- The term is Spanish for "Little Boy" or "Christ Child", originally named by Peruvian fishermen who noticed the warming waters around Christmas.

Key Characteristics

Sea Surface Temperatures (SST)- It is defined by abnormally warm sea surface temperatures specifically in the central and eastern equatorial Pacific Ocean.

Suppression of Upwelling- The usual process where nutrient-rich cold water rises to the surface off the coasts of Peru and Ecuador is suppressed, impacting marine life.

Trade Winds- There is a significant weakening of the Trade Winds (which normally blow from east to west).

Atmospheric Mechanism

Pressure Changes- Atmospheric pressure patterns shift; pressure becomes lower than normal over the tropical eastern Pacific and higher than normal over the western Pacific.

Circulation Impact

Eastern Pacific- Rising air leads to increased rainfall and heightened storm activity.

Western Pacific- Experiencing sinking air results in higher pressure and more stable, drier weather conditions.

Global Reach- The shifts in pressure and rainfall do not stay local; they propagate worldwide, influencing global climate patterns, including significant effects on South Asia.

About El Niño–Southern Oscillation (ENSO)

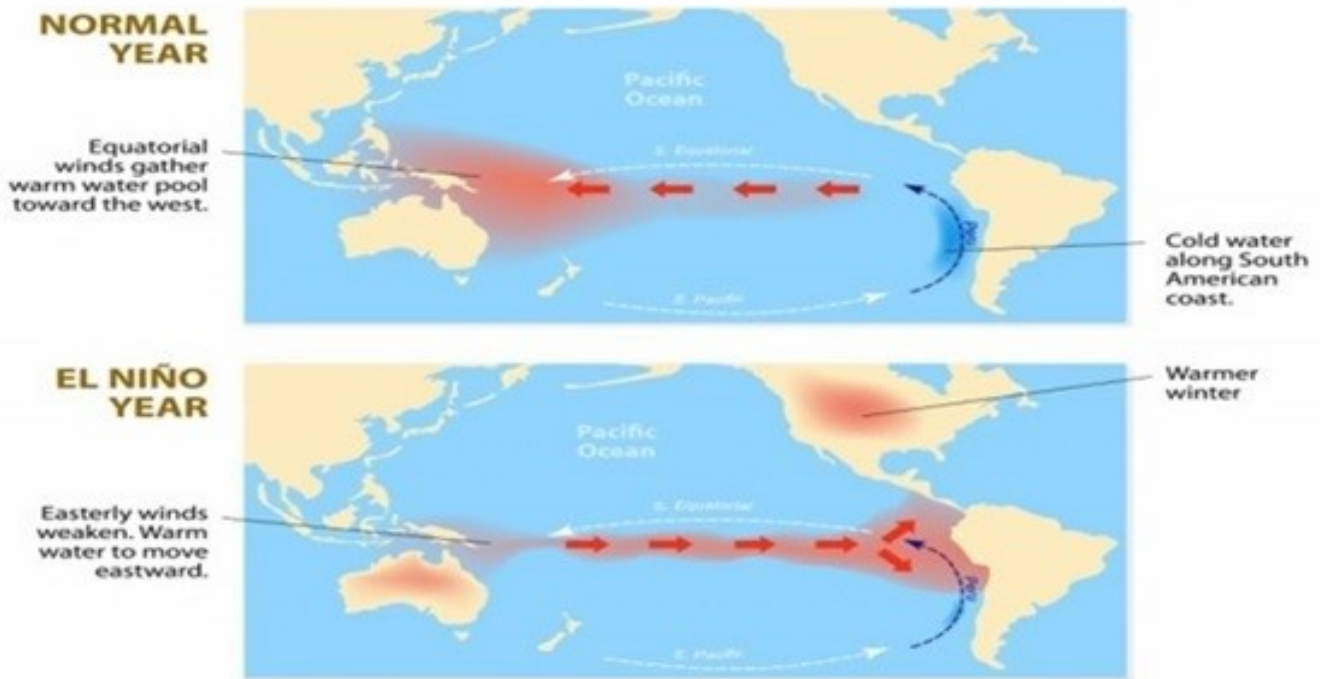
Definition- ENSO is a naturally occurring climate phenomenon involving periodic fluctuations in Sea Surface Temperatures (SST) and atmospheric pressure across the Equatorial Pacific Ocean.

Phases of ENSO

It consists of three distinct phases- El Niño (Warm), La Niña (Cool), and Neutral.

Feature	El Niño (Warm Phase)	La Niña (Cool Phase)	Neutral Phase
SST Con- dition	Abnormally warm in Cen- tral/Eastern Pacific.	Abnormally cool in Central/East- ern Pacific.	Near-average temperatures.
Trade Winds	Weaker than normal.	Strengthened (stronger than normal).	Normal strength.
Impact on India	Often associated with a weaker Indian Monsoon (drought risk).	Often linked to a stronger Indian Monsoon (excess rain risk).	Normal monsoon patterns.

THE EL NIÑO PHENOMENON



Current ENSO Conditions (Status of La Niña)

Current Phase- The Pacific is currently experiencing weak La Niña conditions, marked by colder-than-normal sea surface temperatures.

Trajectory- These conditions reached their peak in November and are projected to weaken further throughout the current Northern Hemisphere winter.

Transition- Temperature anomalies have begun to rise, signaling the "beginning of the end" of the current La Niña phase.

Indicators of a Potential El Niño Return

Scientific data from multiple agencies highlights specific signs of this transition.

Sea Surface Temperature (SST) Anomalies

Data Source- NOAA (National Oceanic and Atmospheric Administration).

Observation- There are early signs of warming in the equatorial Pacific waters.

Effect- This surface warming is actively contributing to the decay of the existing La Niña conditions.

Subsurface Ocean Heat Content

Western Pacific Warm Pool- Analysis of subsurface temperatures reveals a large pool of warm water accumulating in the western Pacific.

Depth- This heat is concentrated at depths between 100–250 metres.

Expansion- These warm anomalies are expanding eastward below the surface, effectively weakening La Niña from below.

Forecast Models

Severe Weather Europe- Their latest data indicates El Niño could return in 2026, specifically strengthening in the second half of the year.

ECMWF Seasonal Forecast- The European Centre for Medium-Range Weather Forecasts predicts ENSO conditions will enter the El Niño range by Summer 2026.

Intensity- Current models suggest a moderate-strength event, although historical trends show such events often intensify beyond initial early predictions.

Possible Climate Impacts

Global Temperature Thresholds- 1.5°C Limit A renewed El Niño event could push global average temperatures closer to, or even temporarily above, the critical 1.5°C warming threshold.

Extreme Weather- Scientists warn this will heighten risks of frequent and intense heatwaves, droughts,

wildfires, and other extreme weather events globally.

Impact on India

Monsoon Connection- Historically, several monsoon droughts in India have been directly linked to El Niño conditions in the Pacific.

Rainfall Suppression- The altered pressure patterns characteristic of El Niño typically suppress monsoon rainfall over the Indian subcontinent, posing risks to agriculture and water security.

Conclusion

The early emergence of El Niño signals for 2026 highlights the potential for continued global temperature stress in the near future. It remains crucial to maintain close monitoring of both oceanic and atmospheric indicators to anticipate and mitigate associated climate risks.

Source- <https://www.downtoearth.org.in/climate-change/equatorial-pacific-shows-early-signals-of-el-ni%C3%B1o-return-in-2026>

