

Climate change effect on ENSO events

September 7, 2021

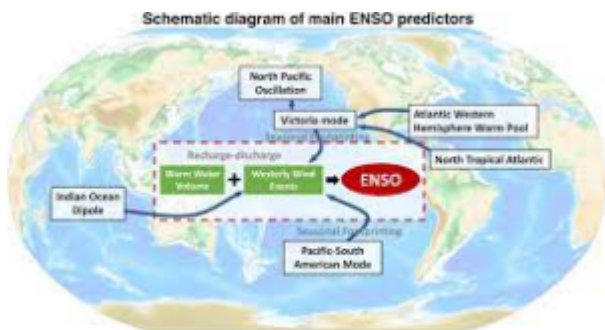
In news- A paper published recently in Nature Climate Change noted that increasing atmospheric carbon dioxide can cause a “weakening of future simulated ENSO sea surface temperature variability.

Key findings-

- The team used one of South Korea’s fastest supercomputers, Aleph.
- The paper notes that the intensity of the **ENSO temperature cycle can weaken as CO2 increases.**
- The unabated warming is likely to silence the world’s most powerful natural climate swing which has been operating for thousands of years.
- They noticed sea-surface temperature anomalies at CO2-doubling conditions and it became robust at CO2 quadrupling.
- The team studied the movement of atmospheric heat to decode the collapse of the ENSO system.
- They explain that future El Niño events will lose heat to the atmosphere more quickly due to the evaporation of water vapour.
- Also, in the future there will be a reduced temperature difference between the eastern and western tropical Pacific, inhibiting the development of temperature extremes during the ENSO cycle.
- The team also studied tropical instability waves, a prominent feature in the equatorial Pacific and noted that there can be a weakening of these waves in the projected future, which can cause a disruption of the La Niña event.

What is ENSO?

- El Niño-Southern Oscillation (ENSO) is the dominant **interseasonal–interannual variability in the tropical Pacific.**
- Though ENSO is a single climate phenomenon, it has three states, or phases, it can be in.
- The two opposite phases, “El Niño” and “La Niña,” require certain changes in both the ocean and the atmosphere because ENSO is a coupled climate phenomenon.
- “Neutral” is in the middle of the continuum.



- The **El Niño period is characterised by warming or increased sea surface temperatures** in the central and eastern tropical Pacific Ocean.
- A **La Niña event** causes the water in the eastern Pacific Ocean to be colder than usual.
- **Together, they are called ENSO or El Niño-Southern Oscillation.**