



Pacific Decadal Oscillation

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Researchers from the **Indian Institute of Tropical Meteorology, Pune** and **Assam University** set out to understand the drying phase in the northeast.

- Northeast India, one of the wettest places on the Earth has been experiencing rapid drying, especially in the last 30 years. Some places which used to get as high as 3,000 mm of rain during the monsoon season have seen a drop of about 25-30%.
- It is found that rainfall in the region is largely dependent on monsoon rainfall and the impact of **Pacific decadal oscillation (PDO)** clearly visible in the region in the form of deficit rainfall over the years.
- Decreasing monsoon rainfall is associated with **natural changes in the subtropical Pacific Ocean**.

The Pacific Decadal Oscillation

- PDO is a long-term ocean fluctuation of the Pacific Ocean, which waxes and wanes approximately every 20 to 30 years.
- Just like El Nino/La Nina in the tropical Pacific, PDO has a signature for a longer time (on the decadal scale) in the sea surface temperatures and its interaction with the atmosphere, which in turn affects the northeast Indian summer monsoon.

Comparison from ENSO

- **Time scale:** PDO is a pattern of Pacific climate variability similar to **El Nino-Southern Oscillation (ENSO)** in character, but which varies over a much longer time scale. The PDO can remain in the same phase for 20 to 30 years, while ENSO cycles typically only last 6 to 18 months.
- The PDO, like ENSO, consists of a warm and cool phase which alters upper-level atmospheric winds.
- **The implication of PDO Shifts:** PDO phase can have significant implications for the global climate, **affecting Pacific and Atlantic hurricane activity, droughts and flooding** around the Pacific basin, the productivity of marine ecosystems, and global land temperature patterns.

- **Impact on ENSO:** PDO can intensify or diminish the impacts of ENSO according to its phase. **If both ENSO and the PDO are in the same phase**, it is believed that El Niño/La Niña impacts may be magnified. Conversely, if ENSO and the PDO are out of phase, it has been proposed that they may offset one another, preventing "true" ENSO impacts from occurring.