

El Niño and Precipitation



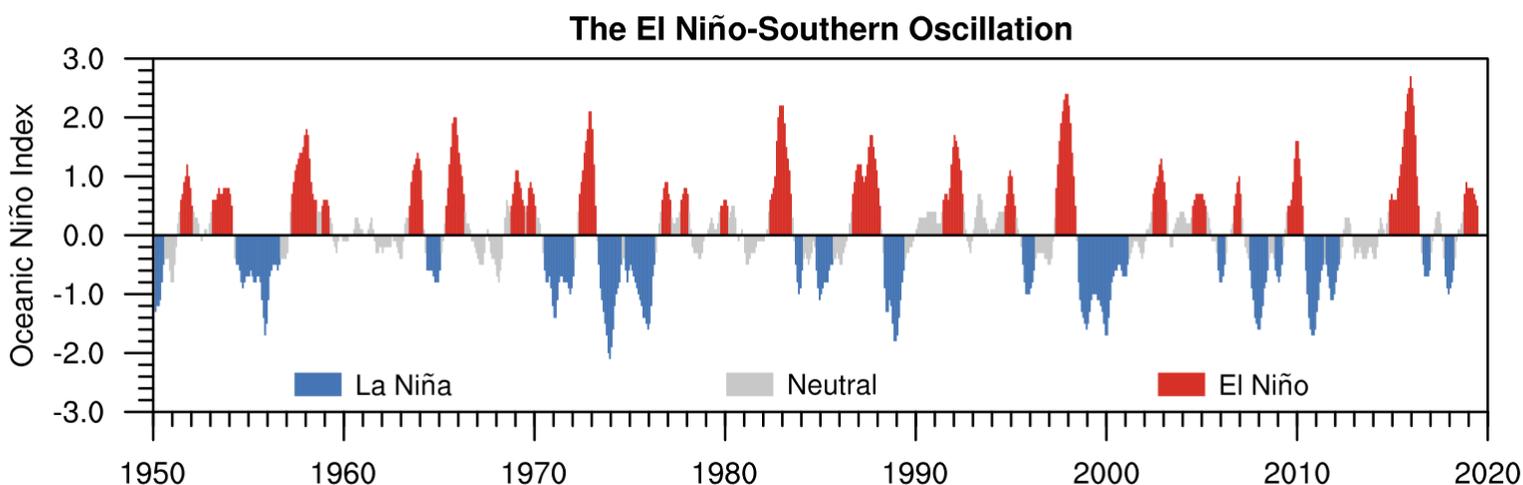
What is El Niño?

El Niño is the warm phase of the El Niño-Southern Oscillation. Its opposite phase is La Niña. El Niño is defined by warmer than average sea surface temperatures in the central-eastern equatorial Pacific Ocean and related atmospheric changes. Key characteristics of El Niño, shown in Fig. 1, include:

- Events occur irregularly, but typically happen 2-4 times per decade.
- Events vary in strength and typically reach their peak intensity late in the calendar year.
- Most events last about one year.

Why is El Niño Important?

El Niño triggers changes in global atmospheric circulation. These changes are responsible for anomalous precipitation patterns that can last from months to multiple seasons in FEWS NET regions (Fig. 2). While precipitation outcomes differ from one El Niño to the next, consistent patterns across past events provide a baseline for prediction. Agroclimatic assumptions used in FEWS NET scenario development are based on El Niño historical impacts, observed and predicted strength and duration, and other regional factors.



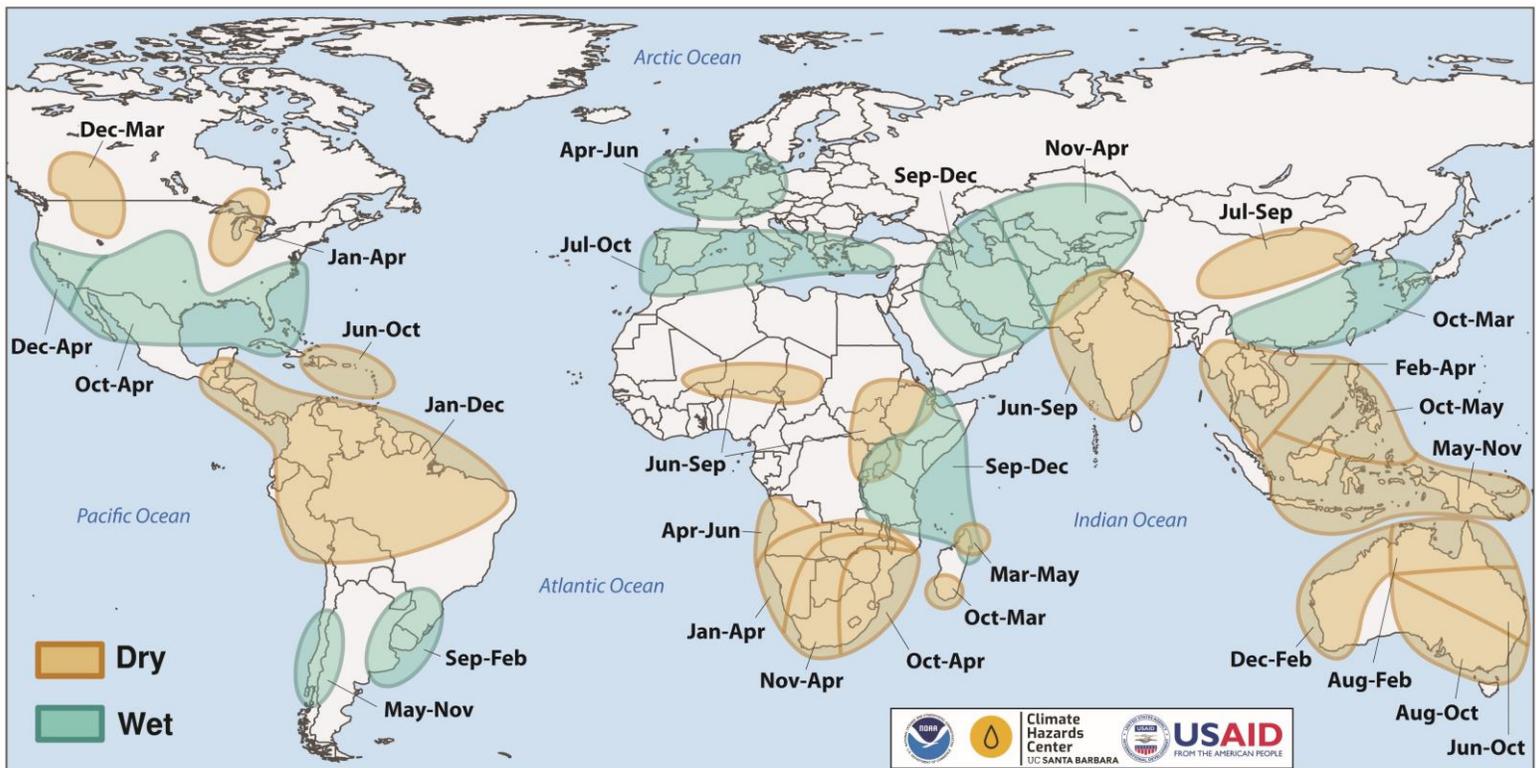
▲ **Fig. 1.** Time series of the El Niño-Southern Oscillation based on the Oceanic Niño Index. https://origin.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ONI_v5.php

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Regional Precipitation

El Niño is related to increases in the likelihood of above- and below-average precipitation over many regions of the globe (Fig. 2). These changes in precipitation likelihoods occur during certain times of the year. Over sub-Saharan Africa, primary rainfall seasons with dry conditions are in the central and eastern Sahel (June-September) and in Southern Africa

(October- April). Wet conditions are most likely from the Greater Horn to northern Madagascar during September-December. Over Central Asia, wet conditions are most likely during the wintertime precipitation season. Over Central America and the Caribbean, the likelihood of drier than normal conditions increase during June-October.



▲ Fig. 2. Timing of wet and dry conditions related to El Niño.

Methods

Wet and dry conditions are based on observed precipitation during the 22 El Niño events since 1950. Consistent with seasonal forecasts, wet and dry correspond to a statistically significant increase in the frequency of precipitation in the upper and lower thirds of historical values, respectively. Statistical significance at the 95% level is based on the resampling of precipitation during neutral El Niño-Southern Oscillation conditions.

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