El Niño Impacts and Outlook

Midwest Region

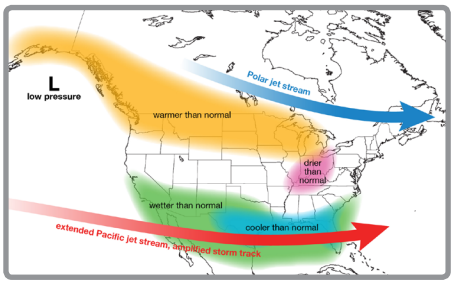
February 2016

Winter 2015/16 El Niño Update

What is El Niño?

An El Niño develops when sea surface temperatures are warmer than average in the equatorial Pacific for an extended period of time. This is important to North America because El Niño has an impact on our weather patterns, most predominantly in the winter.

Typical El Niño Winter Pattern



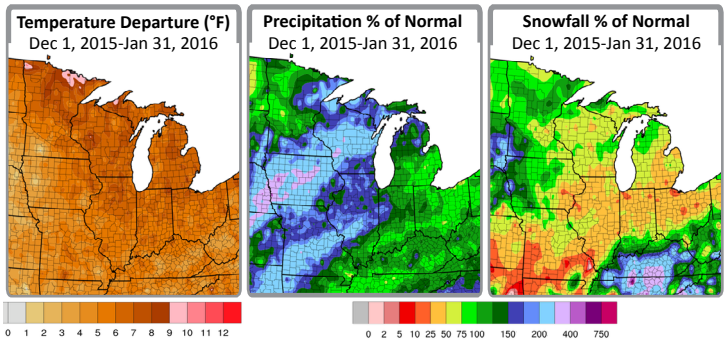
NOAA/Illinois StateWater Survey (https://www.climate.gov/news-features/department/enso-blog).

Although each El Niño is different, there are some general patterns that are predictable. For instance, the polar jet stream is typically farther north than usual, while the Pacific jet stream remains to the south.

With the Midwest positioned between the storm tracks, warmer and possibly drier conditions can develop during El Niño events. This does not mean that cold weather does not happen during El Niño winters, but typical extreme cold weather may be milder and less frequent. Warmer conditions may reduce total snowfall and the frequency of heavy snowfall events in the Midwest. However, a potentially more active storm track across the southern U.S. poses an increased risk of heavy snow events across the lower Midwest.

Winter 2015/16 To Date

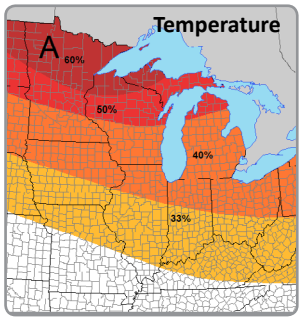
While the weather pattern this winter so far does share some similarities with the typical El Niño winter pattern, there are some differences as well. As predicted, temperatures have been above normal and in fact, December 2015 is now the warmest December on record for the Midwest (since records began in 1895). In addition, with the exception of Kentucky and areas in the western parts of the region, below-normal snowfall has been prevalent across the Midwest. On the other hand, overall precipitation has differed from the typical El Niño winter pattern and conditions have been very wet. The reason for some of the discrepencies from the typical pattern is that each El Niño episode can be different, and strong events in the past have brought varying conditions to the region. Other atmospheric factors like the North Atlantic and Arctic oscillations also play a big role in determing weather patterns in the Midwest.



Departure maps: Midwestern Regional Climate Center

El Niño Outlook

Temperature and Precipitation Outlooks



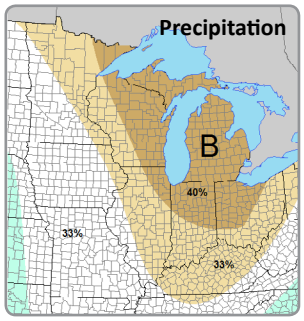
Valid for February-April 2016

EC: Equal chances for above-, below-, or near-normal

A: Above normal

B: Below normal

Percentages represent the probability for above-normal, below-normal, or equal chances.

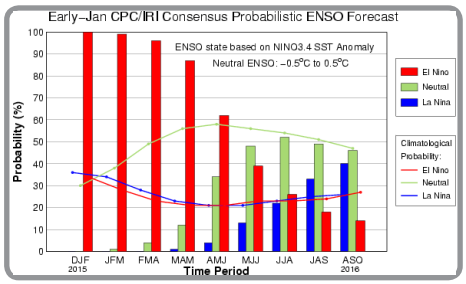


The February-April outlook for the Midwest calls for enhanced chances of above-normal temperatures for the entire region except for extreme western Kentucky, southern Illinois, and the southern half of Missouri where equal chances of above-, below- or near-normal temperatures exist. The precipitation outlook shows greater chances of below-normal precipitation mainly across the Upper Mississippi and Ohio River basins. Western Minnesota, Iowa, and Missouri have equal chances of above-, below- or near-normal precipitation. With very wet conditions the past few months, a drier period may be advantageous to bring water levels down on rivers and reservoirs. Also, the current lack of snow could help reduce spring runoff. However, one winter storm could change the current pattern of below-normal snowfall. Although the peak of the El Niño event was reached in the tropical Pacific in November, the impacts across the Midwest are typically felt during the winter and into the spring season.

The seasonal outlooks above combine many factors including dynamical models, the effects of long-term trends, soil moisture, and the El Niño Southern Oscillation cycle (ENSO). To learn more about these outlooks, or to retrieve the latest temperature, precipitation, and drought outlooks, please visit the Climate Prediction Center at: http://www.cpc.ncep.noaa.gov.

El Niño Evolution

El Niño conditions were officially declared in Spring 2015. Conditions strengthened as predicted through November 2015, when the sea-surface temperature anomalies peaked at around 2.3°C on the Oceanic Niño Index (ONI). The peak makes this El Niño one of the strongest on record, tied with the El Niño of 1997/98. The bar chart below shows the likelihood of El Niño, La Niña, or neutral conditions over the upcoming seasons. The odds are highest for El Niño (red bars) through late spring, when the highest odds shift toward neutral (green bars) or La Niña (blue bars) through the summer and into the fall. This is a typical evolution of the ENSO pattern.



The letters along the bottom are abbreviations for three-month periods, from December-January-February (DJF) through August-September-October (ASO).

Contacts: Doug Kluck (doug.kluck@noaa.gov)
Molly Woloszyn (mollyw@illinois.edu)