Relationship Between Monthly Temperatures and Precipitation During El Niño Events

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Introduction

• An El Niño event occurs when abnormally warm waters appears along the surface of the eastern Pacific Ocean along the equator. They can have significant impacts around the world, including the Midwest.
Data and Methods

- El Niño events are defined as years when the Oceanic Niño Index (ONI) is 0.5 or greater in July and sustained through at least December.


- Map source: http://www.cdc.noaa.gov/data/usclimdivs/
Disclaimer

• These results are based on a composite of historical El Niño events. However, each event is unique with different starting and ending times as well as different intensities. Future events may not behave precisely in the manner shown here.
Summary

1. Warmer-than-normal months
   a. September
   b. December-March

2. Cooler-than-normal months
   a. August
   b. April-May
Summary

1. Wetter-than-normal months
   a. August
   b. October
   c. December

2. Drier-than-normal months
   a. July
   b. September

Note: impacts on monthly precipitation were both weaker and less consistent
Maps of Monthly Temperature and Precipitation During El Niño Events
July Temperature Departure
August Temperature Departure

Composite Temperature Anomalies (F)
Versus 1971-2000 Longterm Average

NOAA/ESRL PSD and CIRES-CDC

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September Temperature Departure
November Temperature Departure

Composite Temperature Anomalies (F)
Versus 1971–2000 Longterm Average

[Map of the United States showing temperature anomalies with color coding]

NOAA/ESRL PSD and CIRES–CDC

-2.00 -1.50 -1.00 -0.50 0.00 0.50 1.00 1.50 2.00
December Temperature Departure
January Temperature Departure
February Temperature Departure
March Temperature Departure

Composite Temperature Anomalies (F)
Versus 1971–2000 Longterm Average

NOAA/ESRL PSD and CIRES–CDC

-3.0 -2.0 -1.0 0.0 1.0 2.0 3.0
April Temperature Departure

Composite Temperature Anomalies (F)
Versus 1971–2000 Longterm Average

NOAA/ESRL PSD and CIRES–CDC

-2.00 -1.50 -1.00 -0.50 0.00 0.50 1.00 1.50 2.00
May Temperature Departure
Precipitation
July Precipitation Departure
August Precipitation Departure
September Precipitation Departure
October Precipitation Departure
November Precipitation Departure

Composite Precipitation Anomalies (inches)
Versus 1971–2000 Longterm Average

NOAA/ESRL PSD and CIRES–CDC

-4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0

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December Precipitation Departure
January Precipitation Departure

Composite Precipitation Anomalies (inches)
Versus 1971–2000 Longterm Average

NOAA/ESRL PSD and CIRES–CDC

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February Precipitation Departure
March Precipitation Departure
April Precipitation Departure
May Precipitation Departure
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