

El Niño 2015-2016 : An Overview of What It Might Mean for Arizona

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El Niño conditions have developed in the tropical Pacific Ocean and current forecasts are calling for this event to continue through next spring and reach a strength not seen since the winter of 1997-1998^{1,2}. What might this mean for Arizona? Will it be cooler than usual? Will it be wetter? Will there be relevant related hazards or favorable circumstances? In this first of a series of Extension Climate Fact Sheets about the 2015-2016 El Niño event, we start to answer such questions by providing an overview of this phenomenon and how it possibly will influence weather across the state during the coming months.

What is an El Niño event?

An El Niño event takes place when warmer-than-average water moves into the central and eastern tropical Pacific Ocean in conjunction with a weakening of the overlying winds that blow towards the west. Large areas of rising air and precipitation track this warm water and, due to their change in location, can substantially alter the position of the storm track during fall, winter, and spring. El Niño events usually occur once every three to five years, lasting from 9 to 12 months and peaking in strength during the northern hemisphere winter³. Despite these typical features, no two El Niño events are alike.

How does an El Niño event influence cool-season weather in Arizona?

Changes brought about by an El Niño event can shift the storm track southward such that it passes through the Southwest more frequently. This potentially leads to a higher number of storms that pass through the region, some of which can bring considerable moisture. These circumstances increase the odds for cooler temperatures and above-average precipitation in Arizona during fall, winter, and spring months⁴.

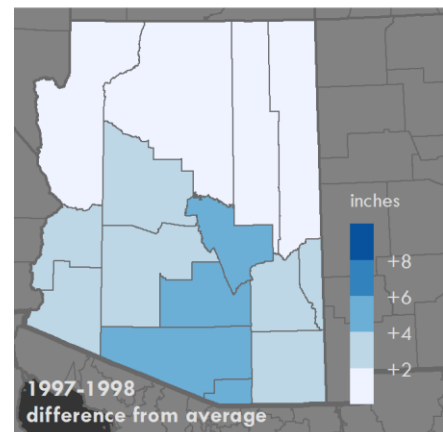
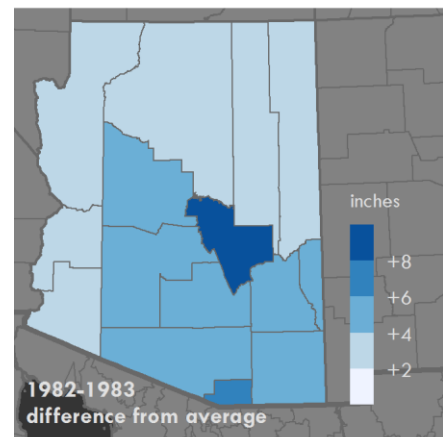
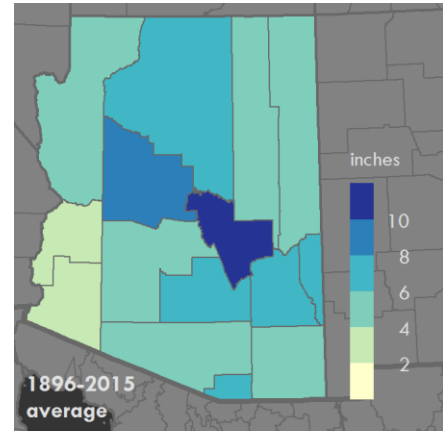


Figure 1. October-March precipitation totals are more likely to be above the long-term average during strong El Niño events⁶.



Does the strength of an El Niño event matter for cool-season weather in Arizona?

The warmer the water that moves into the central and eastern tropical Pacific Ocean, the stronger the El Niño event and the greater the chances for above-average precipitation in the Southwest. Since 1950, rain and snow totals in Arizona were higher than normal in five of the seven El Niño events categorized as strong⁵. The most recent strong events in 1982-1983 and 1997-1998 resulted in above-normal precipitation across the state, particularly in the southern and central parts (Figure 1, bottom two panels). For example, Gila County received almost double its average October-March precipitation during the 1982-1983 El Niño event.

What could be some relevant impacts related to the current El Niño event?

Cooler temperatures and above-average precipitation that might result from the 2015-2016 El Niño event could lead to a mix of related hazards and favorable circumstances that are relevant to agriculture, forestry and wildland fire management, human health and safety, property, ranching, and water resources. For example, El Niño events can lead to an increased average and higher variability in streamflow and flood size due to increased precipitation. We will address such impacts in timely Extension Climate Fact Sheets over the coming months.

How can I get more information?

In addition to periodic Extension Climate Fact Sheets like this one, climate specialists and scientists of Cooperative Extension are working with the Climate Assessment for the Southwest (CLIMAS) to produce a full suite of information related to the 2015-2016 El Niño event (www.climas.arizona.edu/sw-climate/el-niño-southern-oscillation). Please contact us for further information, data, and analysis that could be applied to stakeholder needs in your county.

References

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- ² www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html
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- ⁵ www.climate.gov/news-features/blogs/enso/united-states-el-niño-impacts-0
- ⁶ precipitation data are from www.cefa.dri.edu/Westmap

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