

# EL NINO'S INFLUENCE ON GLOBAL AND MIDWESTERN CLIMATES

William L. Bland <sup>1/</sup>

## Introduction

Every few days a low pressure system rambles across the US, and if it passes close enough to us and is strong enough, we may see some clouds and precipitation, followed by blue skies and cooler temperatures. Such fluctuations are a feature of our Midwest climate. At the global scale, there are also semi-regular disruptions that change the weather, and none is better known than ENSO — the El Niño-Southern Oscillation. We expect ENSO events every 3 to 7 years. When a strong ENSO event occurs, its fingerprints can be seen many places around the globe. If you are a farmer in Australia, Indonesia, South Africa, or northern South America, plan for a dry spell. In the southern third of the US, expect more rain than usual. The global average temperature is always warmer than average during an ENSO. As with passing storm systems, there are some regular features, but also lots of unknowns about how ENSO will affect a given place.

An ENSO event is identified by unusual sea surface temperatures in the Pacific along the Equator, by the speed and direction of the trade winds in the same region, and from the difference in atmospheric pressure across the region. All three of these are linked by the physics of the atmosphere and oceans, so all are part of the picture, and they generally vary together. Some effects of ENSO are tied directly to them (like drought in Australia), but others, such as those experienced in North America, occur because of less direct effects on the jet streams that direct so much of our weather.

We are currently in the midst of what will likely prove to be one of the three strongest ENSO events since the start of good records in 1950. The competition for top spot is 1997/98 and 1982/83. ENSO events typically appear in summer and build to a peak November-January, before tailing off about May. For those of us in the upper Midwest, the ENSO fingerprint is not clear. Some strong events lead to relatively warm winters — certainly the case as I write this in late December — but other ENSO events have not affected us appreciably. Looking to the summers after strong ENSO events, there is no noticeable impact on June-August temperature or precipitation. There is some evidence that as an ENSO dies out (May-June), the region may be slightly cooler and wetter than average (MRCC 2015).

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<sup>1/</sup> Professor, Dept. of Soil Science, Univ. of Wisconsin-Madison and Extension Soil and Water Conservation Specialist, Univ. of Wisconsin-Extension.

Global commodity grain prices have not historically been directly affected by ENSO (World Bank 2015). Local supplies and prices will be affected, but these impacts do not seem to translate into global impacts. This year there are ample stocks so no change from this is expected.

#### References

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