

What is El Nino and will it end our drought?



Onion Creek.

photo by Jana Birchum

What has caused the drought?

We have been experiencing drought conditions since September, 2007. We've also been in a very strong La Nina cycle, the opposite of El Nino.

On July 9, 2009, The National Oceanic and Atmospheric Administration announced that the El Nino cycle is back. They also announced that it is expected to last through winter 2009-10.

When will the drought end?

Nobody knows. Rainfall for a given month varies substantially regardless of the period in affect. Precipitation for central Texas during summer months usually is less for El Nino periods than La Nina periods. Therefore, it is unlikely the drought with end this summer.

During fall through spring months, El Nino periods typically provide much more rainfall than La Nina periods, with more rainfall occurring in fall than winter months. However, as shown on the last slide, El Nino is predicted to end by the end of this coming winter. Thus, it is possible if not likely that the drought will end in the fall of 2009. If not, it might continue for a long time.

What is La Nina?

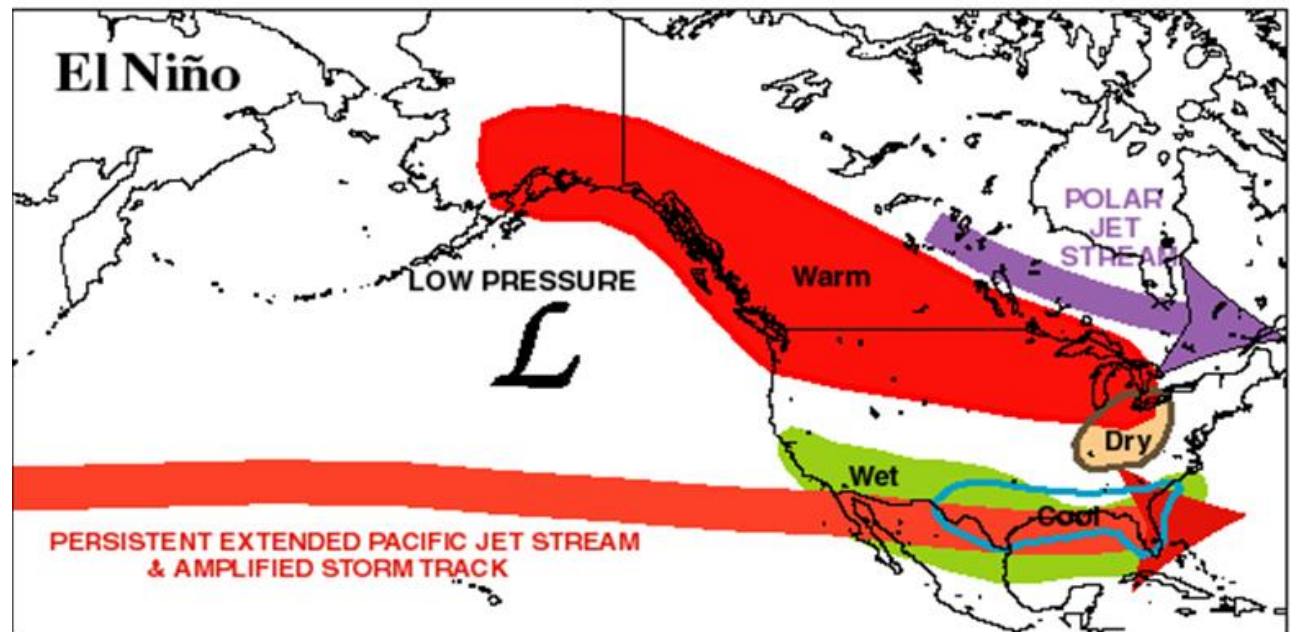
When we are in La Nina, the Central and Eastern Pacific sea surface temperatures are cooler than average. This shifts the jet stream north of Texas—jet streams transmit storms thus storm systems ride north of us. We typically get very little rain during such occurrences.

What is El Nino?

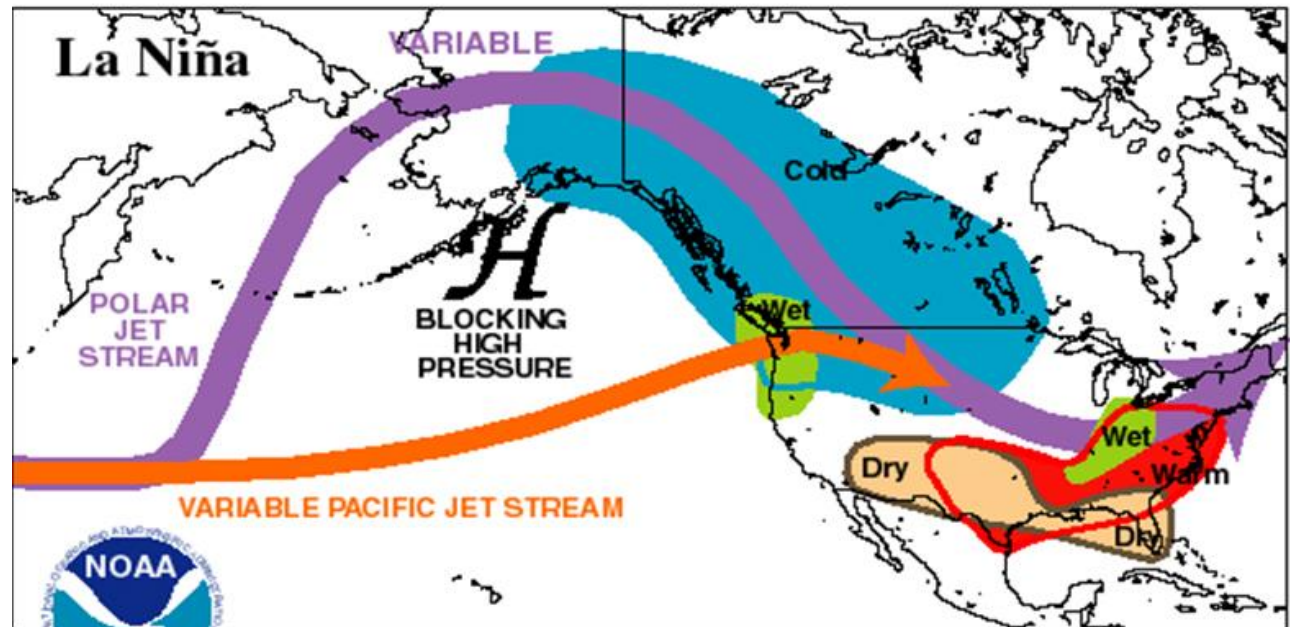
The El Nino cycle means that the Central and Eastern Pacific sea surface temperatures are now warmer than average. This will cause the jet stream to shift to the south. The Pacific Jet will move in such a way that it will ride over Texas and the Southern U.S.

The next slide presents an illustration of the Jet Stream during El Nino and La Nina periods.

During El Niño, the Pacific Jet Stream travels over the Southern U.S. and typically delivers above average rainfall to Texas.



During La Niña, the Pacific Jet Stream travels over the Northern US, thus Texas typically has less than average rainfall.



How often does El Nino occur and how long will it last?

Based on documentation for the past about 50 years, El Nino, La Nina, and neutral periods each occur about 1/3 of the time and typically last for about 7 months to almost 2 years.

The next slide presents, by months, Central Texas monthly rainfall characteristics for El Nino and La Nina periods.

Comparison of Central Texas precipitation for El Nino, La Nina, and neutral periods (January 1950 - December 1999)

Monthly mean precipitation for periods (in inches)				Percent by which El Nino precipitation exceeds (+) or is less than (-) La Nina precipitation
Month	All periods	El Nino	La Nina	
January	2.06	2.39	1.78	+ 34 %
February	2.40	3.21	1.34	+ 140 %
March	1.87	2.32	1.46	+ 59 %
April	2.77	3.00	2.89	+ 4 %
May	4.13	5.62	3.55	+ 58 %
June	3.79	3.92	3.72	+ 5 %
July	1.93	1.44	1.85	- 22 %
August	2.68	2.10	3.01	- 30 %
September	4.36	3.92	4.21	- 7 %
October	3.70	3.96	3.75	+ 6 %
November	2.44	2.83	1.64	+ 73 %
December	2.19	3.05	1.57	+ 94 %
Annual	34.32	37.76	30.77	+ 23 %

Will El Nino end the drought?

Rainfall for a given month varies substantially regardless of the period in affect. However, the previous slide shows that the mean precipitation during summer months is less for El Nino periods than for La Nina periods. Therefore it is unlikely that the current drought will end during the summer of 2009.

Additionally, as the slide shows, during fall through spring months, El Nino periods provide much more rainfall than La Nina periods. However, the greatest rainfall generally occurs during spring months.

However, as shown on the second slide, the National Weather Service predicts that El Nino will end in the winter of 2009. Fall months typically produce more rainfall then winter months, thus, it is possible if not likely that the drought will end in the Fall of 2009. If the drought is not over then, it might continue for a long time.

References for additional information

- **Definition in Wikipedia**

http://en.wikipedia.org/wiki/El_Ni%C3%B1o-Southern_Oscillation

- **National Weather Service link to El Nino**

<http://www.pmel.noaa.gov/tao/elnino/nino-home.html>

- **Effects of El Nino on Texas**

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/states/TX.html