

Rio Grande|Bravo

CLIMATE IMPACTS & OUTLOOK December 2015

SUMMARY

Forecasts call for increased chances of below-average temperatures and above-average precipitation for much of the region through January 2016, due to El Niño.

AT A GLANCE

East New Mexico/Texas

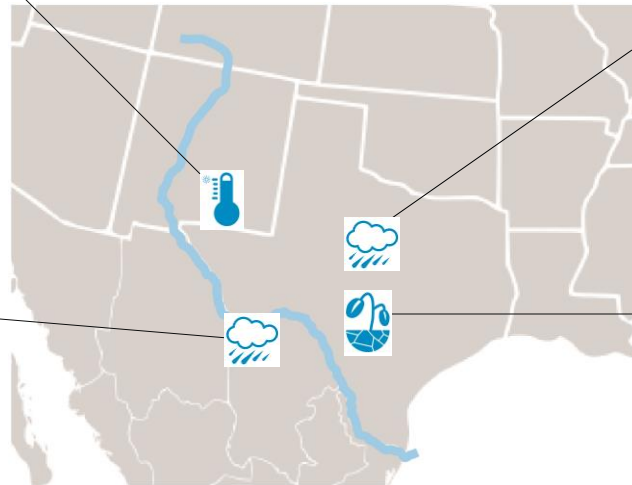
Increased chances of below-average temperatures

Texas

Above-average precipitation in October prevented the planting of 700,000 acres of cotton throughout the state

Rio Grande Basin

Increased chances of above-average precipitation for the entire region in January



Rio Grande Basin

The majority of the basin area is predicted to remain drought-free through February

REGIONAL CLIMATE OVERVIEW

SEPTEMBER | OCTOBER | NOVEMBER

Fall temperatures (September through November) across the Rio Grande Basin in New Mexico and Texas were 2-6°F (1.1 – 3.3°C) warmer than the 1981-2010 average. September was particularly hot, with many areas experiencing temperatures up to 6°F (3.3°C) above average. November temperatures were less extreme, with most areas experiencing temperatures that deviated from 1°F (.5°C) below average to 2°F (1.1°C) above average. In September, most areas in the Rio Grande Basin region in Coahuila and Chihuahua experienced temperatures 1.8–5.4°F (1-3°C) above average, with a small area of the Texas/Coahuila/Chihuahua border region experiencing temperatures 1-5°F (0.5-2.6°C) below average.

From September through November, some areas of U.S. Rio Grande region experienced only 70% of average precipitation, while others received 200%. September precipitation in the region fell below average, but was followed by a wet October, where most of the region experienced precipitation 150-300% of average. November precipitation on the U.S. side of the Rio Grande Basin varied from 75% of average to 400%. In Mexico, September was a relatively dry month; most of the region received only 25-75% of average precipitation.

The North American Drought Monitor identified areas in the Rio Grande Basin as abnormally dry and in moderate drought in September. However by the end of October, the vast majority of the region was drought free. Current conditions are expected to remain unchanged through February 2016 according to NOAA’s Climate Prediction Center ([CPC](http://www.cpc.ncep.noaa.gov)).

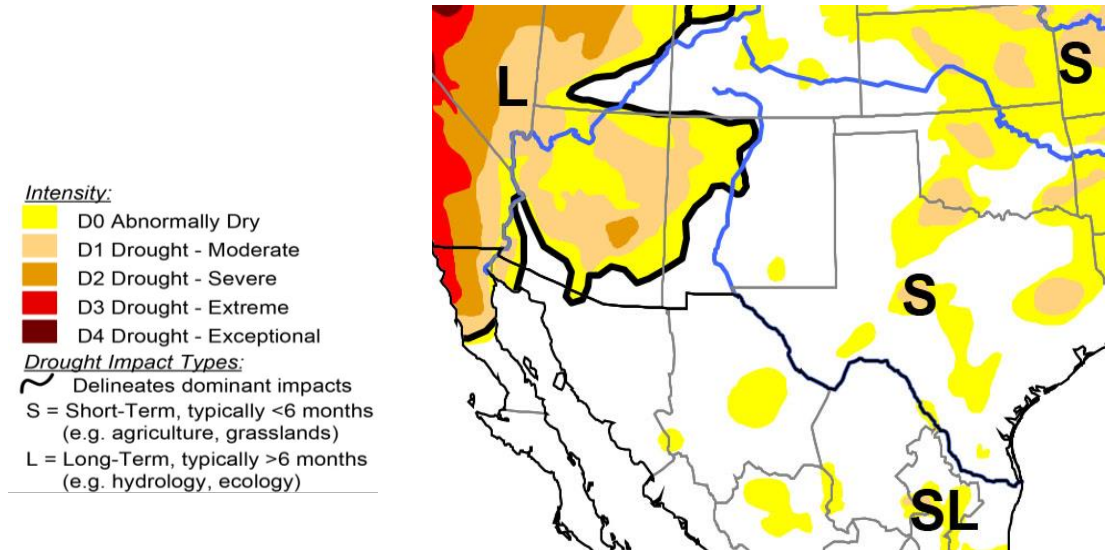


Figure 1. October North American Drought Monitor, released November 13, 2015:
<https://www.ncdc.noaa.gov/temp-and-precip/drought/nadm/maps/en/201510#map-selection>

FORECAST
DECEMBER | JANUARY | FEBRUARY

TEMPERATURE

The three-month NOAA temperature outlook calls for increased chances of below-average temperatures in the majority of Texas and the southeastern region of New Mexico. Forecasts for western and northern New Mexico call for equal chances for below-average, average, and above-average temperatures, indicating expected temperatures to fall “similar to climatological probabilities” ([NOAA](http://www.noaa.gov); Figure 2).

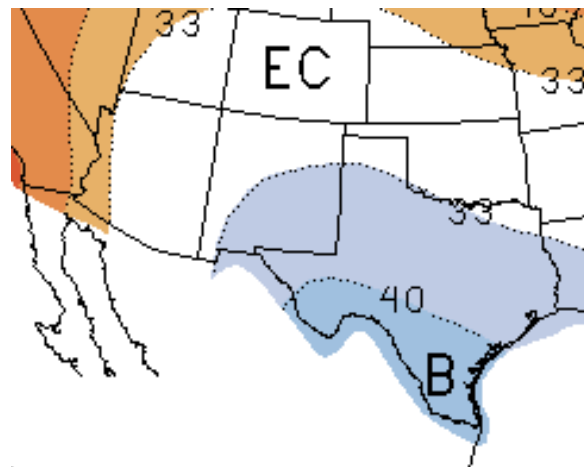


Figure 2 (above right). NOAA December through February seasonal temperature outlook. Forecast made on November 19, 2015:
http://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead01/off01_temp.gif.

According to the Mexico National Meteorological Services (SMN), minimum average monthly temperature anomalies are expected to fall below normal for Chihuahua, Coahuila, Nuevo Leon and Tamaulipas (Figure 3).

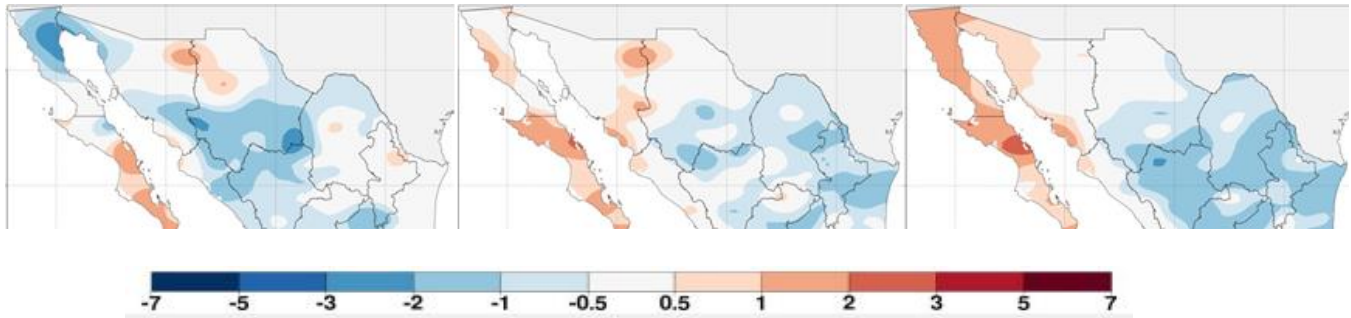


Figure 3. Predicted minimum temperature anomalies for northern Mexico (in °C). December-January-February (left to right). <http://smn.cna.gob.mx/climatologia/pronostico/prontemps.pdf>

PRECIPITATION

Due to current El Niño conditions, NOAA precipitation forecasts favor increased chances of above-average precipitation for the entire U.S. Southwest region, with the highest probability in southern New Mexico and along the Texas/Coahuila/Chihuahua border region (Figure 4). The SMN forecasts above-average precipitation for most of the Rio Grande Region in Mexico in January, but below-average precipitation in February (Figure 5). The difference between the NOAA and SMN forecasts in February could be due to several factors: (1) NOAA forecasts are based on a combination of statistical and dynamic models, whereas SMN forecasts use statistical models, based on similar years from history. The SMN forecasts give higher significance to the role of the Atlantic Ocean in the analogue years used for this forecast (1982, 1987, 1997, 2002, 2009, and 2014), (2) NOAA forecasts shifts in the probability of precipitation, whereas the SMN forecasts precipitation amounts, and (3) NOAA forecasts are for precipitation over a 3-month period, whereas SMN forecasts are for individual months, and each month may not be uniformly wetter-than-average.

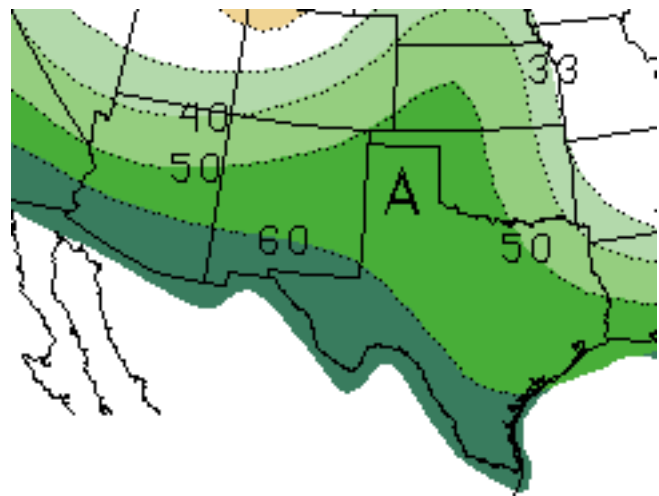


Figure 4 (above right). NOAA December through February seasonal precipitation outlook. Forecast made on November 19, 2015:

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead01/off01_prpcp.gif.

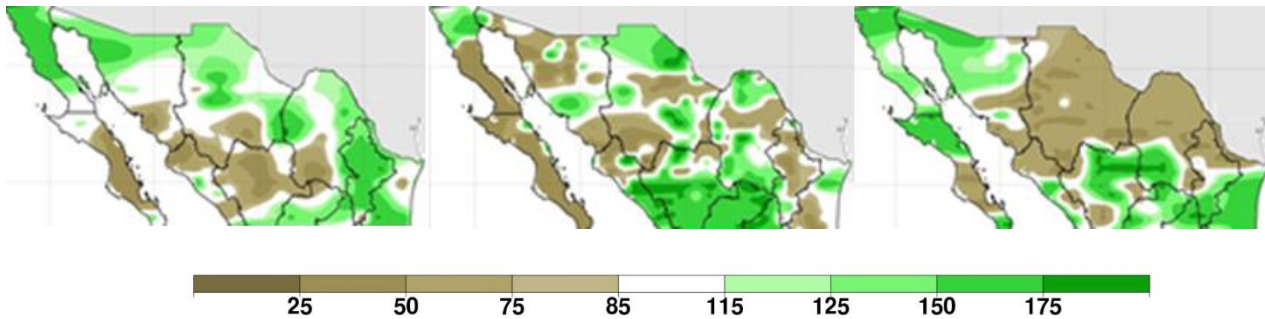


Figure 5. Percent of average precipitation for northern Mexico. December-January-February (left to right). http://smn.cna.gob.mx/index.php?option=com_content&view=article&id=119:pronostico-climatologico-estacional&catid=9&Itemid=52

FIRE

The Rio Grande/Bravo Basin is predicted to have normal fire potential through the end of 2015 and beginning of 2016. Eastern and central Texas is forecasted to have below-normal fire potential in December.

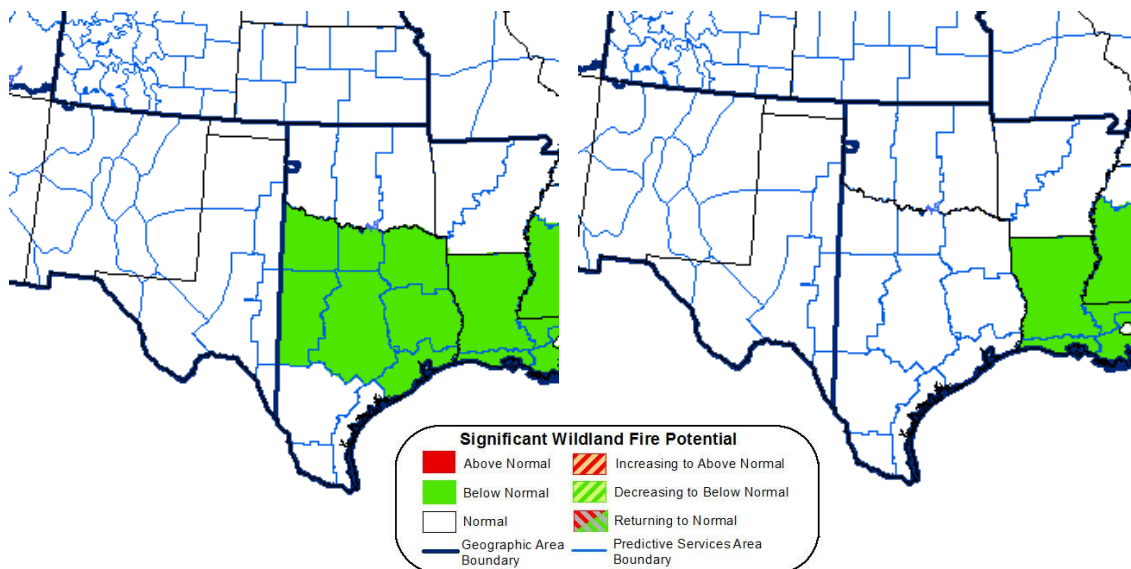


Figure 6. Significant wildland fire potential outlook for December (left) and January/February (right). <http://www.predictiveservices.nifc.gov/outlooks/outlooks.htm>

The El Niño-Southern Oscillation (ENSO) is a natural climate phenomenon that originates in the equatorial Pacific Ocean and affects weather around the world. During a La Niña event, the Southwest U.S. and northern Mexico typically experience dry conditions. During an El Niño event, the region typically experiences above-average precipitation. This increase in precipitation typically occurs in the late fall and winter months.

El Niño conditions are currently present in the tropical Pacific Ocean and are predicted to continue through the winter. The National Weather Service’s Climate Prediction Center (CPC) and the International Research Institute for Climate and Society (IRI) produce a probabilistic ENSO forecast based on sea surface temperature (SST) anomalies (Figure 7). The forecast shows that El Niño conditions are predicted to remain through the winter, gradually shifting to ENSO-neutral conditions by early summer 2016.

Climatologists predict that the 2015-2016 El Niño event may fall within the top three strongest episodes, as indicated by the magnitude of SST anomalies, since 1950. Past strong episodes, such as 1982-1983 and 1997-1998, resulted in dramatically increased precipitation and flooding in some areas of the U.S.-Mexico border region. For example, in October 1997, ENSO conditions combined with the season’s first cold front resulted in 10-20 inches of precipitation in areas of the lower Rio Grande valley. Strong ENSO conditions have also generally resulted in above normal snowpack and runoff in Colorado, potentially impacting the Rio Grande headwaters ([University of Colorado](http://www.colorado.edu/irog)).

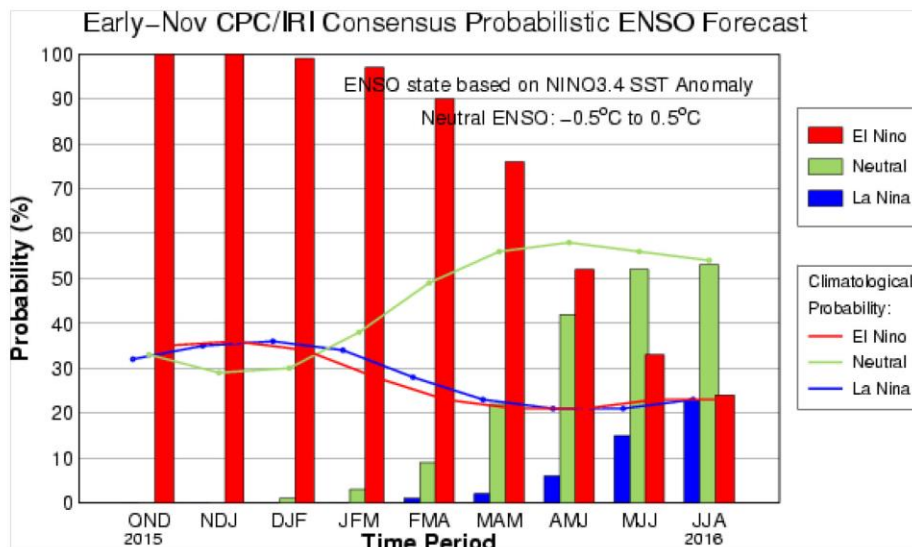


Figure 7. ENSO Probabilistic Forecast:

<http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

For more ENSO information:

English: <http://iri.columbia.edu/our-expertise/climate/enso/enso-essentials/> and <http://www.ncdc.noaa.gov/teleconnections/enso/>

Spanish: <http://www.smn.gov.ar/?mod=biblioteca&id=67> and <http://www.smn.gov.ar/?mod=biblioteca&id=68>

TEXAS FLOOD MONITOR

Climatologists at the University of Texas at Austin and the U.S. National Weather Service are putting the final touches on an advanced flood monitoring system. Using remote imagery and computer models, the new system is able to forecast in 784 locations in Central Texas up to 15 hours before the potential flooding event, an improvement over the existing flood prediction models in the state. The new system, scheduled to be released in May 2016, will be used in conjunction with the current system to better forecast floods in the area.

More information: <http://www.idahostatesman.com/news/business/national-business/article44576691.html>

MEXICO CLIMATE FORUM

Mexico's National Water Commission (CONAGUA), National Weather Service (SMN), and World Meteorological Organization (WMO), organized a climate forum in Chihuahua, Mexico on November 10-13, 2015 (1er Jornada Técnica del SMN, el V Encuentro de Servicios Climáticos y el XXIX Foro de Perspectivas Climáticas en la República Mexicana). The event, titled "First Technical Seminar of the National Weather Service" drew more than 120 attendees from diverse sectors, including agriculture, forest services, civil protection, and health. Climatologists and meteorologists from Cuba and the United States were also in attendance. The forum discussed the advances of SMN, Cuba's experience connecting climate services and health, verification of the November-April temperature, precipitation, and cold-front forecasts as well as the summer 2015 outlook. The next forum is planned for April or May 2016, location still to be decided.

More information: <http://www.akronoticias.com/2015/11/9815-49667.htm>
<http://201.116.60.189/es/climatologia/foros-de-prediccion-climatica>
<http://201.116.60.189/es/climatologia/servicios-climaticos>

NEWS HEADLINES

Wild Weather Shifts in Texas Spark Concern about “new normal”, November 12, 2015.

<http://www.usatoday.com/story/news/2015/11/12/texas-wild-weather-climate-change/75632584/>

Texas Largely Free of Drought, November 16, 2015.

http://www.myplainview.com/agriculture/article_03e65244-8cb1-11e5-af58-d75bbebf6d79.html

6 Places Where Melting Snow Means Less Drinking water, November 12, 2015

<http://news.nationalgeographic.com/2015/11/151112-river-basins-water-drought-snowpack-snowfall-climate-change-science/>

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