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CLIMATE IMPACTS & OUTLOOK

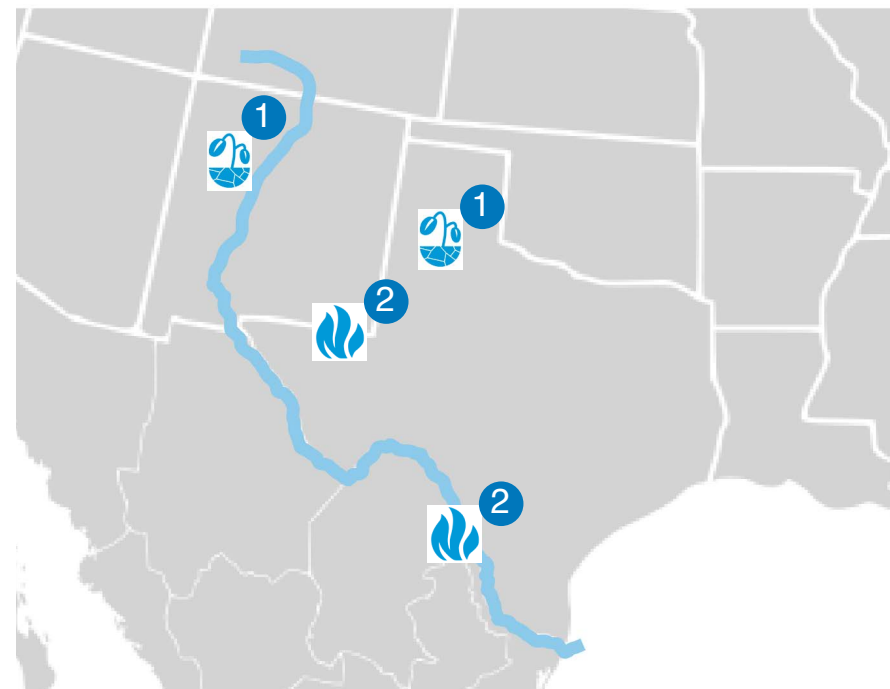
January 2018

Summary

Forecasts favor above-average temperatures and below-average precipitation for the Rio Grande/Bravo Basin through April.

AT A GLANCE

- 1 Western New Mexico, North-Central Texas**
Moderate to severe drought conditions developed over the past two months, and drought is likely to develop in southern New Mexico and Southwest Texas through April.
- 2 New Mexico, Texas, and Northeast Mexico**
Increased fire potential is forecasted through March, due to above-average temperatures, below-average precipitation, and spring wind events.



REGIONAL CLIMATE OVERVIEW OCTOBER | NOVEMBER | DECEMBER

October – December, 2017 precipitation was 0-50% below average for most of New Mexico and 5-90% below average for almost all of Texas. Exceptions were East-Central New Mexico and the extreme northern and southern tip of Texas, where precipitation was above average (Figure 1; left). Temperatures were 2–6 °F (1.1–3.3 °C) above average for New Mexico and 0–4 °F (0–2.2 °C) above average for most of Texas (Figure 1; right).

Temperatures from January 1–17 were 2–8 °F (1.1–4.4 °C) above average across western New Mexico, and 0–8 °F (1.1–4.4 °C) below average for eastern New Mexico and most of Texas (figure not shown). Precipitation over the same time period was 0–50% below average for almost all of Texas and New Mexico.

Due to two winter storms in December, temperatures were cooler than normal between October-December in northeastern Mexico, a contrast with the northwest part of the country, where warm and dry conditions continued. Anomalies ranged from higher than +5.0 °C (9 °F) in southern Chihuahua to less than -2.0 °C (3.8 °F) in northern Coahuila (Figure 2, left). A higher number of days with minimum temperatures less than or equal to 0 °C (32 °F) were present in Chihuahua-Durango, but snowfall due to winter storms left more than 5 days below this threshold in the Coahuila-Nuevo León border (Figure 2, right).

The last quarter of the year, in addition to being cold was also wet, with accumulated greater than 200mm in Nuevo León and Tamaulipas. Elsewhere, accumulated precipitation of about 100mm was observed in the Chihuahua-Sonora and Sinaloa-Durango limits (Figure 3, left). The rest of the northern part of the country ended the year below normal, stressing the Peninsula of Baja California, which experienced precipitation below 25% of average (Figure 3, right).

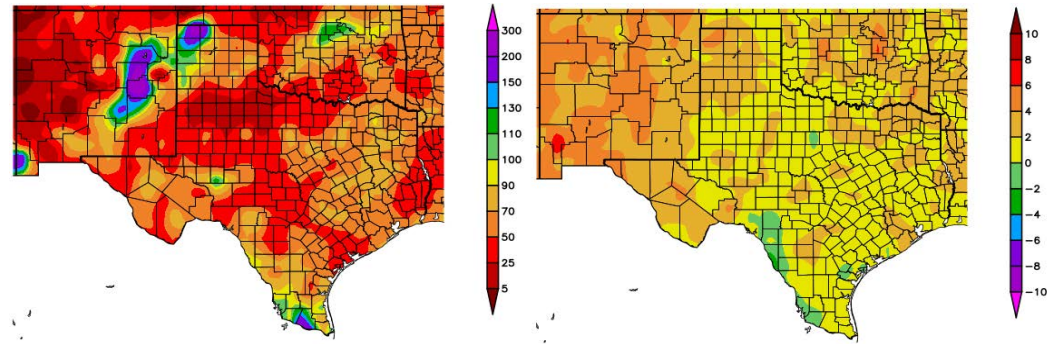


Figure 1 (above): Percent of average precipitation (left) and departure from average temperature in degrees F (right), compared to the 1981–2010 climate average, for 10/1/2017–12/31/2017. Maps from [HPRCC](#).

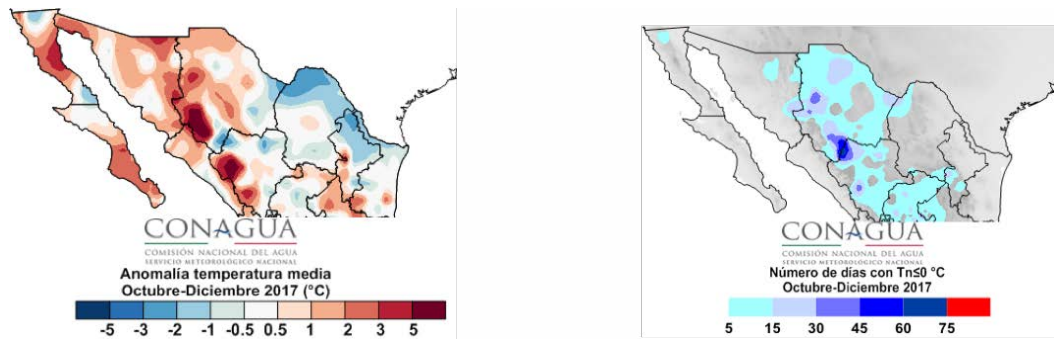


Figure 2 (above): Temperature anomalies in °C (left) and number of days with minimum temperatures at or below 0 °C (32 °F) (right) for October–December. Maps from [SMN](#).

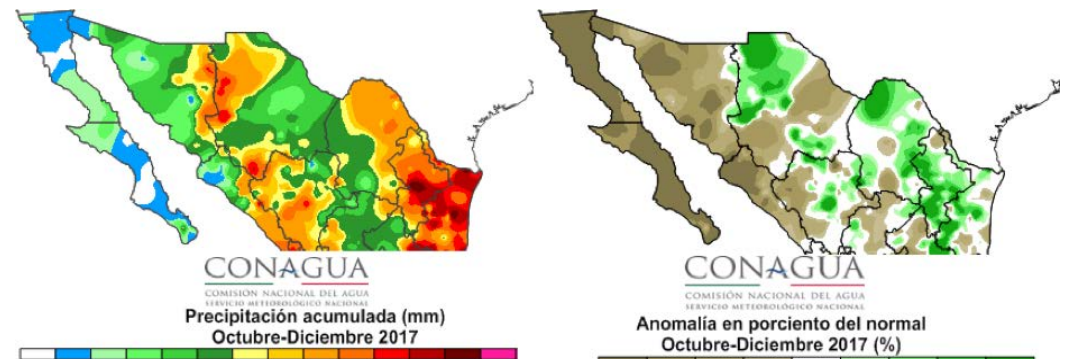


Figure 3 (above): Accumulated precipitation in mm (left) and percent of normal (right) for October–December. Maps from [SMN](#).

DROUGHT

Moderate drought conditions developed in western and northern New Mexico, over the past two months, according to the [North American Drought Monitor](#) (NADM) (Figure 4). Moderate to severe drought conditions have also developed in northern and central Texas. Abnormally dry conditions remain present in Tamaulipas. Drought conditions in New Mexico and Texas are predicted to persist, and drought development is likely in southern New Mexico and Southwest Texas, through April, due to continued La Niña conditions in the tropical Pacific Ocean, according to the [U.S. Seasonal Drought Outlook](#).

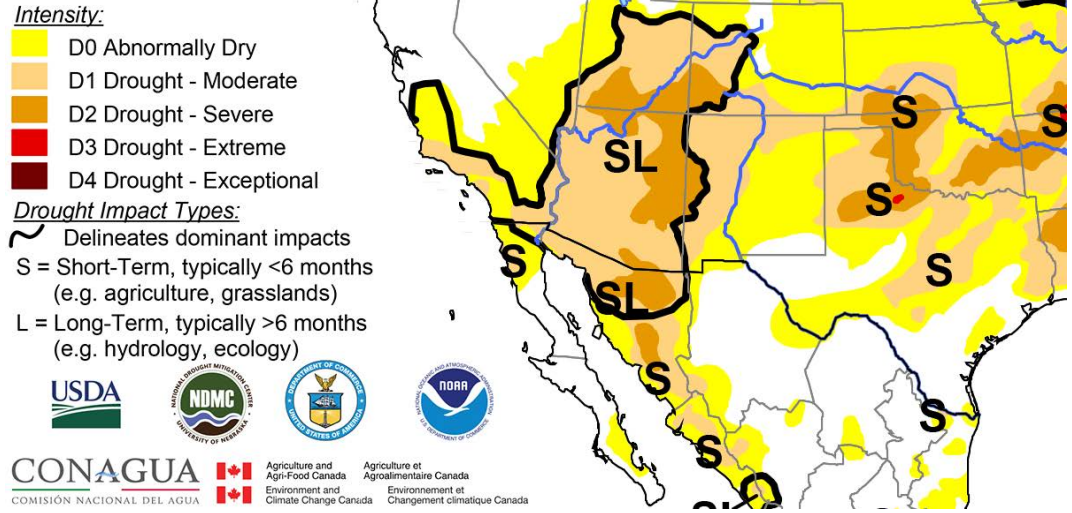


Figure 4 (right): North American Drought Monitor, released January 11, 2018.

FORECAST
FEBRUARY | MARCH | APRIL

TEMPERATURE

The three-month NOAA temperature outlook (February-April; Figure 5) favors chances for above-average temperatures for all of New Mexico and Texas through April, reflective of continued La Niña conditions in the tropical Pacific Ocean through the winter.

The forecast from CONAGUA’s Servicio Meteorológico Nacional (SMN) for February, predicts minimum temperature conditions with below-average anomalies in the Baja California Peninsula, Northwest Sonora, western Chihuahua and Sinaloa; above-average conditions are expected in Tamaulipas, Nuevo León, Coahuila and Northeast Chihuahua (Figure 6; left). For March the pattern is similar, with SMN predicting below-average minimum temperatures in Baja California, Southeast Chihuahua, western Sonora and Coahuila (Figure 6; right). However above-average anomalies are predicted in Northeast Sonora, Chihuahua, Coahuila, Nuevo León and Tamaulipas.

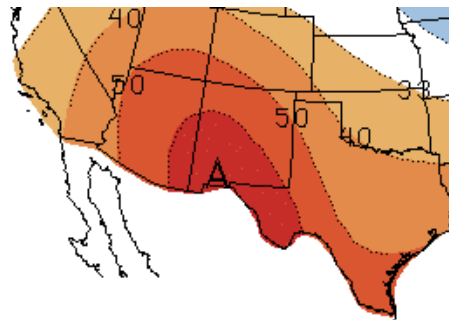


Figure 5 (left): NOAA three-month temperature outlook (February-April). Forecast made on January 18, 2017 by [CPC](#).

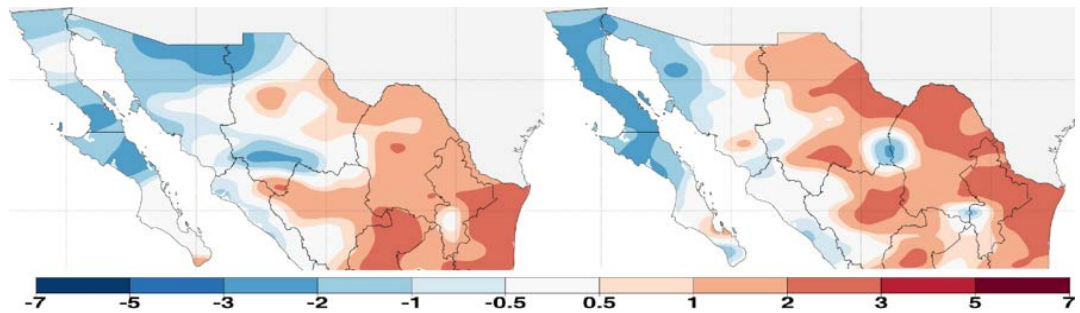


Figure 6 (below): Predicted minimum temperature anomalies for northern Mexico (in °C) for February (left) and March (right). Forecast made on January 1, 2018 by [SMN](#).

PRECIPITATION

The NOAA three-month precipitation outlook predicts increased chances for below-average precipitation for all of New Mexico and Texas, except for Northeast Texas (February-April; Figure 7). Precipitation forecasts reflect the projections for continued La Niña conditions in the tropical Pacific Ocean through the winter. La Niña conditions tend to lead to below-average precipitation in the Southwest U.S. and northern Mexico.

For February, the SMN precipitation outlook predicts above-average conditions in Baja California, Chihuahua, Southeast Coahuila and Nuevo León, and below-average conditions in Baja California Sur, Sonora and Coahuila (Figure 8; left). The precipitation forecast for March shows above-average conditions in Southeast Coahuila and Nuevo León, and below-average conditions in the Baja California Peninsula, Sonora, Chihuahua, Southeast Coahuila and eastern Tamaulipas (Figure 8; right).

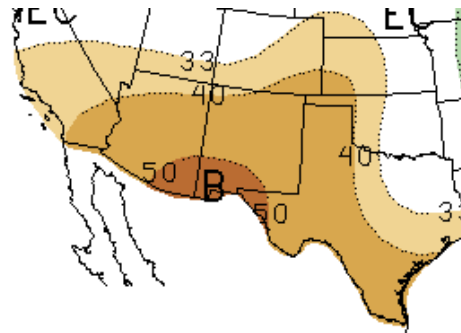


Figure 7 (left): NOAA three-month precipitation outlook (February-April). Forecast made on January 18, 2018 by [CPC](#).

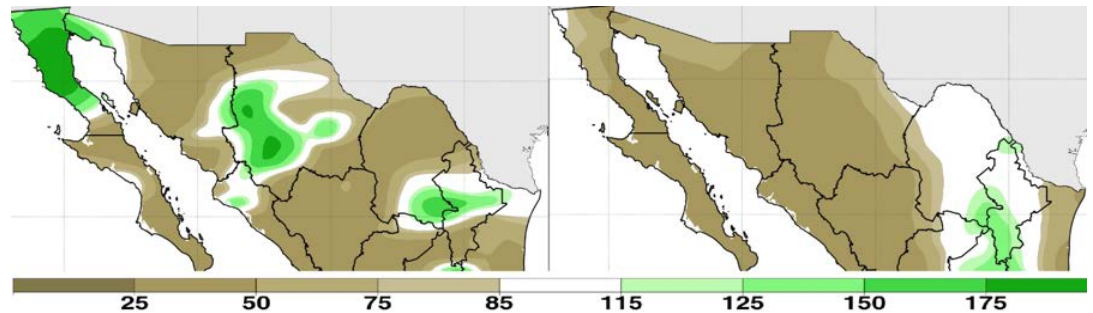


Figure 8 (below): Predicted precipitation anomalies for northern Mexico (in %) for February (left) and March (right). Forecast made on January 1, 2017 by [SMN](#).

FIRE

According to the North American Seasonal Fire Assessment and Outlook, fire risk is above average for most of Texas and eastern New Mexico through February, with fire risk expanding westward across New Mexico by March (Figure 9). The increased fire risk is due to continued drying across the region associated with La Niña conditions, coupled with the increasing frequency of wind events common during early spring in the region. In Mexico, forecasts for warm and dry conditions greatly increase fire potential across northeastern Mexico from the Big Bend region to the Gulf Coast through March.

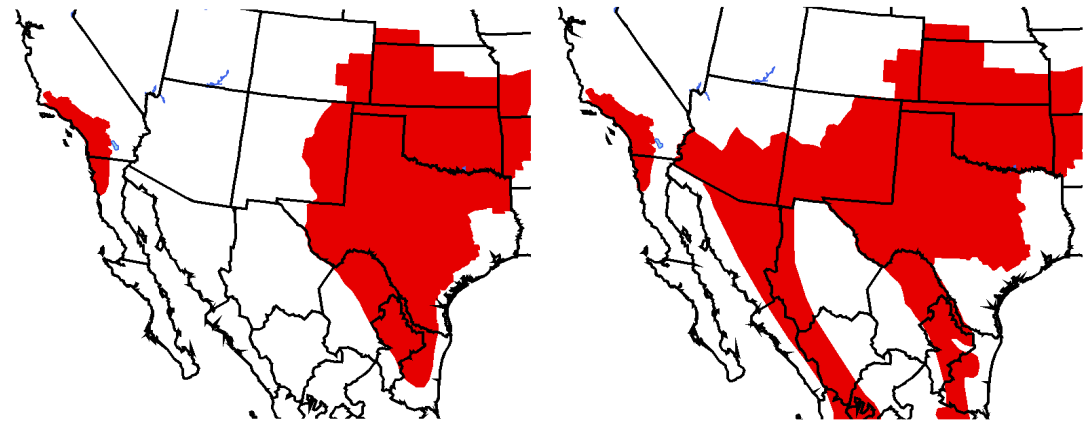
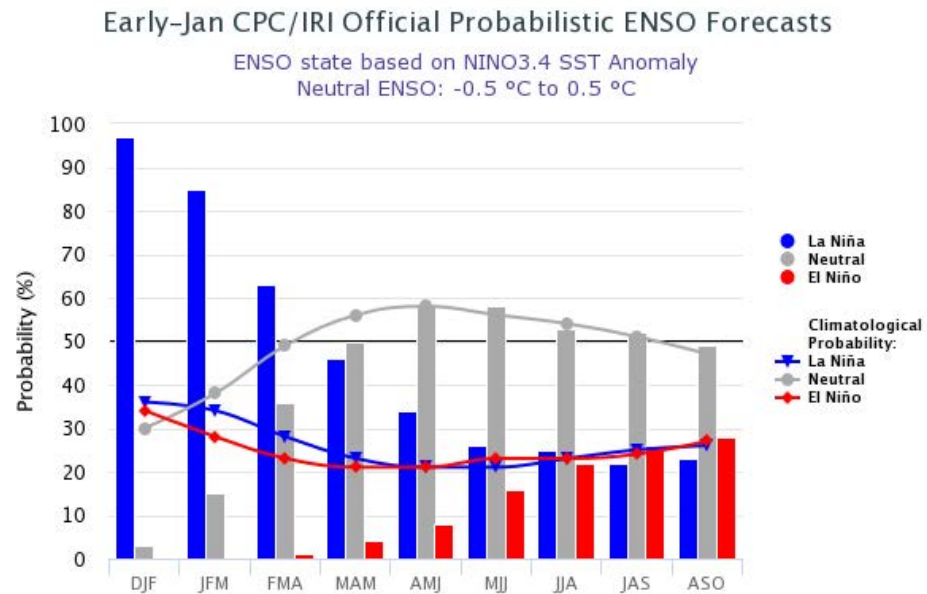


Figure 9 (above): Fire outlook for February (left) and March (right). Red shading indicates conditions that favor increased fire potential. Green shading indicates conditions that favor decreased fire potential. Forecast made on January 15, 2017 from [NIFC](#) and [SMN](#).

EL NIÑO-SOUTHERN OSCILLATION (ENSO)

As of early-January, the tropical Pacific Ocean and atmosphere continued to exhibit weak to moderate La Niña conditions ([IRI](#); [NOAA](#)). Forecasters believe the La Niña event is currently peaking, and will weaken through the rest of the winter (~85-95%) and then transition to ENSO-neutral conditions during the spring (Figure 10). La Niña events generally lead to above-average temperatures and below-average precipitation in states along the U.S. southern border and in northern Mexico.



For more information in:

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

Español: <http://smn.cna.gob.mx/es/climatologia/diagnostico-climatico/enos> and <http://www.smn.gov.ar/?mod=biblioteca&id=68>

2017 IN REVIEW

Temperatures in 2017 were 1–4 °F (0.6–2.2 °C) above average for New Mexico and Texas (Figure 11; left). It was the warmest year on record for New Mexico, and the second warmest for Texas (Figure 12). Precipitation varied across both states, with below-average precipitation in western New Mexico and West, Central, and South Texas, and above-average precipitation in eastern New Mexico and North Texas (Figure 11; right). Southeast Texas, near Houston, experienced precipitation over 20 inches above average due to Hurricane Harvey, in August.

The beginning of 2017 started out with record snowpack in parts of the Central Rockies, in February. By April 1st, there was above-average snowpack at most mountain locations. In the South, including parts of Texas, wildfires burned 2 million acres, during March, from warm, windy, and relatively dry conditions. The total acres burned was 600,000 acres above the previous record set and almost seven times the 2000-2010 average (NOAA). In Autumn, Texas experienced precipitation well below average. In October, areas of western Texas received precipitation less than 5% of average, and in November, southern Texas received precipitation less than 5% of average as well. Drought in both New Mexico and Texas was fairly stable over the course of the year, with less than 10% of both states experiencing moderate or greater drought conditions, until December, when drought conditions intensified.

Northern Mexico received variable precipitation in 2017, but the larger patterns were dryness in the Northwest and slight moisture in North and Northeast parts of the country (Figure 13, left). In contrast, the annual mean temperature was mostly warmer than normal (Figure 13, right). The Baja California Peninsula reach its second warmest year on record, while Sinaloa and Durango recorded its warmest year, according to data since 1971.

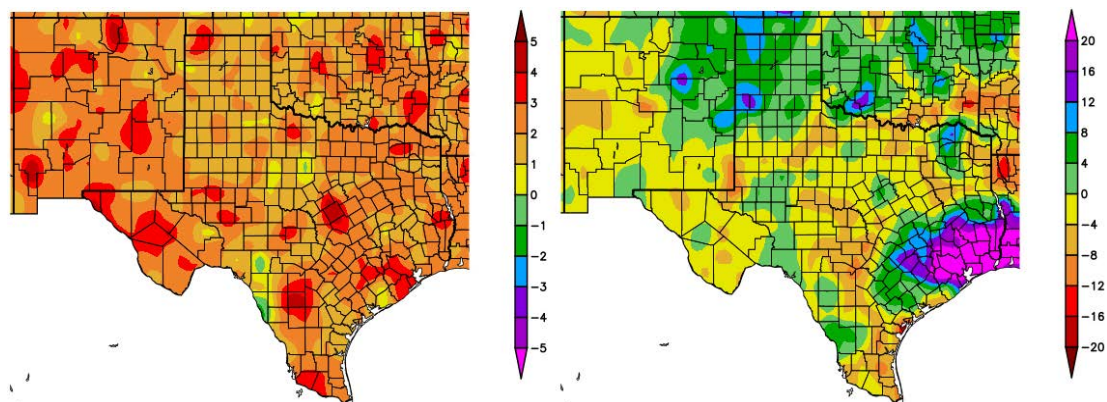


Figure 11 (above): Departure from average temperature in degrees F (left) and departure from average precipitation in inches (right), compared to the 1981–2010 climate average, for 1/1/2017–12/31/2017. Maps from [HPRCC](#).

Statewide Average Temperature Ranks
January–December 2017
Period: 1895–2017

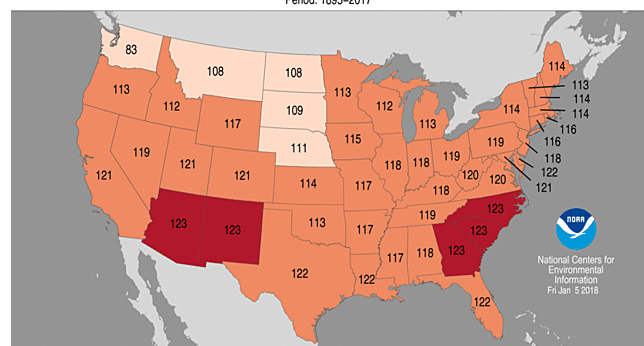
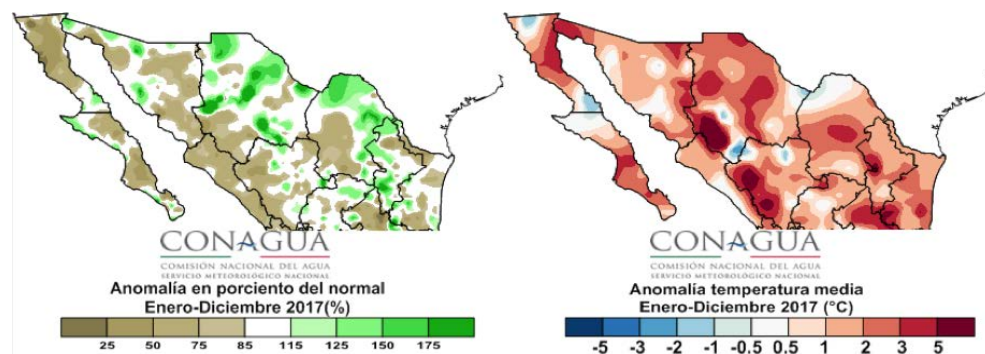


Figure 12 (left): Average U.S. Statewide Temperature Ranks from 1/1/2017–12/31/2017 from [NOAA](#).

Figure 13 (below): Percent of normal precipitation (left) and annual mean temperature anomalies in °C (right) for January–December. Maps from [SMN](#).



ANNOUNCEMENTS

2018 SOUTHERN PLAINS WILDFIRE FORUM

The meeting will focus on the recent wildfire events of 2016 and 2017 in Oklahoma, Kansas, and Texas. Topics discussed will include recovery perspectives and management strategies to reduce future wildfire risk. The forum will be held February 13, 2018, in Beaver, Oklahoma. Register [here](#).

WATER AND THE U.S.-MEXICO BORDER

The event will feature border region water leaders and policymakers discussing the U.S.-Mexico Colorado River agreement and border sustainability initiatives, among other topics. The [event](#) will be held March 1-2, 2018 in El Paso, TX.

NORTH AMERICAN DROUGHT MONITOR FORUM

The meeting will focus on trilateral advances in the North American Drought Monitor. The forum will be held May 1-3, 2018, in Calgary, Alberta, Canada.

NEWS

Drought returns to Texas just months after Hurricane Harvey floods state, January 24, 2018: https://www.texastribune.org/2018/01/24/texas-drought-ravages-panhandle/?utm_source=EHN&utm_campaign=6e1afc3686-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_8573f35474-6e1afc3686-99389877

New Online Tool Tailors Weather Forecasts to Watersheds, January 15, 2018: <https://www.newsdeeply.com/water/community/2018/01/15/new-online-tool-tailors-weather-forecasts-to-watersheds>

Research Finds Discrepancies Between Satellite and Global Model Estimates of Land Water Storage, January 22, 2018: <https://news.utexas.edu/2018/01/22/discrepancies-in-water-storage-trends-across-the-globe>

Potential for western US seasonal snowpack prediction, January 22, 2018: <http://www.pnas.org/content/early/2018/01/12/1716760115>