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# Rio Grande | Bravo

## CLIMATE IMPACTS & OUTLOOK

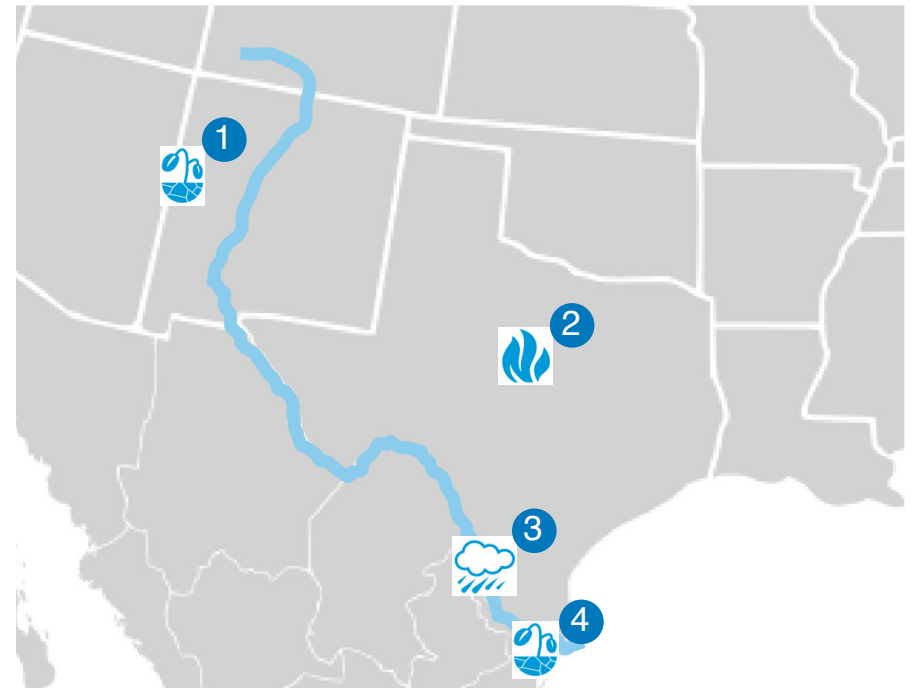
October 2017

### Summary

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

### AT A GLANCE

- 1 Western New Mexico**  
Abnormally dry conditions developed over the past month.
- 2 Central/East Texas**  
Above-average temperatures and below-average precipitation is forecasted through December, resulting in above-average fire potential for December.
- 3 Laredo, TX/Nuevo Laredo, Tamaulipas**  
Storms in late September brought over 8 inches of rain, resulting in flooding and bringing monsoon season precipitation totals to above average.
- 4 Nuevo León, Tamaulipas, southern TX**  
Abnormally dry and moderate drought conditions expanded over the past month.

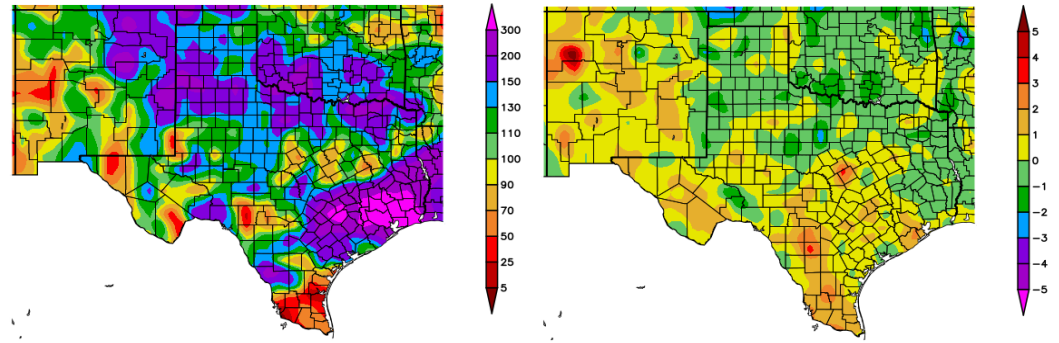


## REGIONAL CLIMATE OVERVIEW JULY | AUGUST | SEPTEMBER

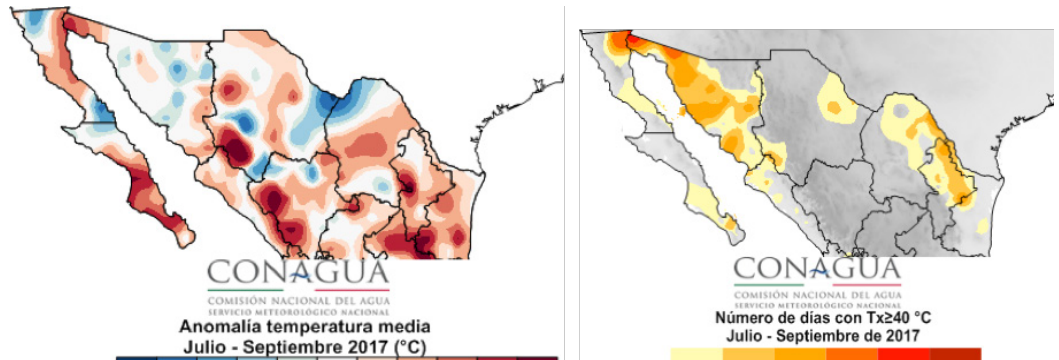
Over the last three months (July – September) precipitation was 25–90% below average for areas in western and southern New Mexico and Texas (Figure 1; left). Northeast New Mexico, North Texas, and small areas along the southern Rio Grande experience precipitation 150–300% above average. Temperatures were above average (0–2 °F; 0–1.1 °C) for most of the Rio Grande Basin over the same time period (Figure 1; right).

July to September was cooler than normal in Sonora and the Chihuahua-Coahuila border, which broke the trend of warmer-than-average temperatures for this summer. Temperatures were warmer than normal in southern Chihuahua and portions of Northeast Mexico where anomalies were greater than 5°C (9°F) (Figure 2, left). Sonora and portions of the Northeast accumulated the greatest number of days above 40 °C (104 °F); more than 45 days in Sonora and more than 30 in the Northeast (Figure 2, right).

Temperatures from October 1–16 were 0–6 °F (0–3.3 °C) above average for almost all of New Mexico and Texas (figure not shown). Precipitation over the same time period was 0–75% below average for most of Texas and West and Southeast New Mexico. Exceptions were eastern and southern New Mexico, and North and South Texas, where precipitation was 200–800% above average. For the first nine months of the year (January – September) *minimum* temperatures have been the warmest on record for New Mexico and the second warmest for Texas (NOAA). Minimum temperatures, usually measured just before sunrise, are important, especially during the hot summer months, because high minimum temperatures reduce the opportunities for people—especially those without air conditioning—to recover, overnight, from prolonged exposure to high temperatures.



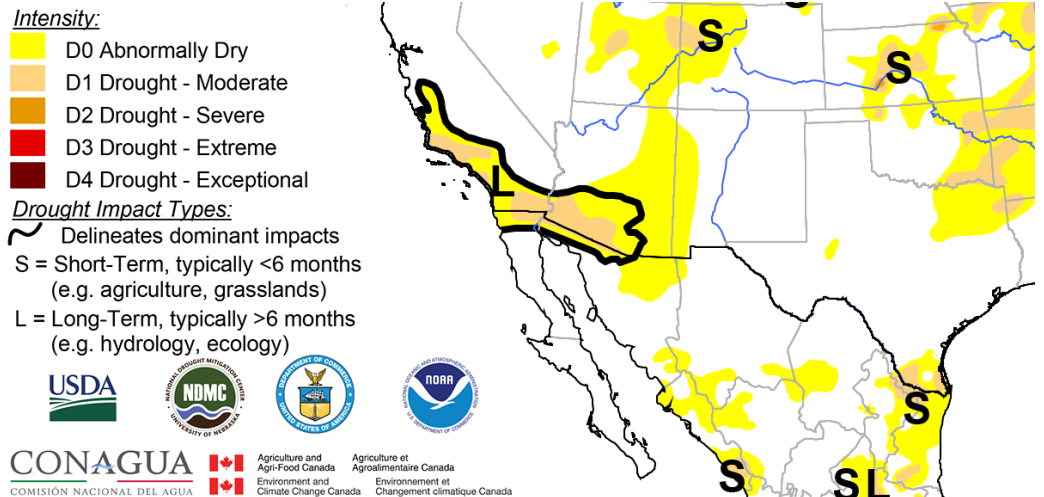
**Figure 1 (above):** Percent of average precipitation (left) and departure from average temperature in degrees F (right), compared to the 1981–2010 average, for 7/1/2017–9/30/2017. Maps from [HPRCC](#).



**Figure 2 (above):** Temperature anomalies in °C (left) and number of days with maximum temperatures at or above 40 °C (104 °F) (right) for July–September. Maps from [SMN](#).

### DROUGHT

Abnormally dry conditions have returned to western New Mexico over the past month, according to the [North American Drought Monitor](#) (NADM) (Figure 3). Drought conditions were eliminated near Del Rio and in Coahuila, but have worsened in Tamaulipas, Nuevo León, and southern Texas where abnormally dry and moderate drought conditions have persisted and expanded. Drought development is likely in western and southern Texas by January, according to the [U.S. Seasonal Drought Outlook](#).



**Figure 3 (right):** North American Drought Monitor, released October 16, 2017.

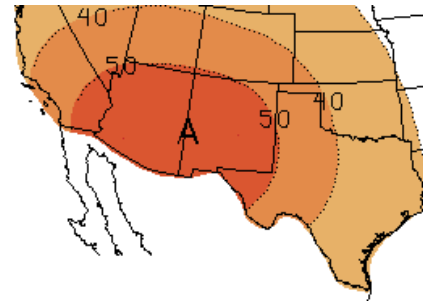
## FORECAST

### NOVEMBER | DECEMBER | JANUARY

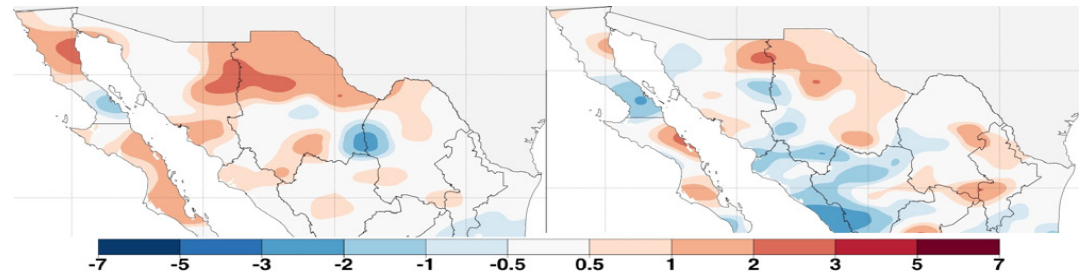
#### TEMPERATURE

The one-month NOAA temperature outlook (November; Figure 4) favors chances for above-average temperatures for all of New Mexico and Texas through November. Chances for above-average temperatures increase into the winter, with increased chances for above-average temperatures for all of both states through January, according to the NOAA three-month temperature outlook (November–January; [figure not shown](#)).

The forecast from CONAGUA's Servicio Meteorológico Nacional (SMN) for November predicts below-average minimum temperatures in southern Baja California and the southern border between Chihuahua and Coahuila, and above-average minimum temperatures in northern Baja California, Northeast Sonora and northern Chihuahua (Figure 5; left). For December, SMN predicts below-average minimum temperatures in southern Baja California, Southwest Chihuahua, Southeast Sonora and Durango, and above-average anomalies in northern Chihuahua, Northeast Coahuila, and Nuevo León (Figure 5; right).



**Figure 4 (left):** NOAA one-month temperature outlook (November). Forecast made on October 19, 2017 by [CPC](#).

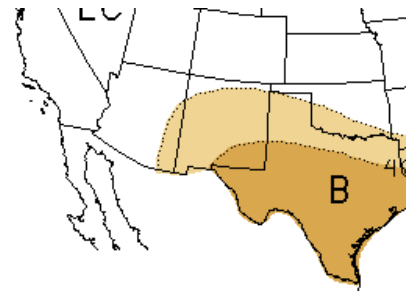


**Figure 5 (below):** Predicted minimum temperature anomalies for northern of Mexico in (°C), October (left) and November (right). Forecast made in October 1, 2017 by [SMN](#).

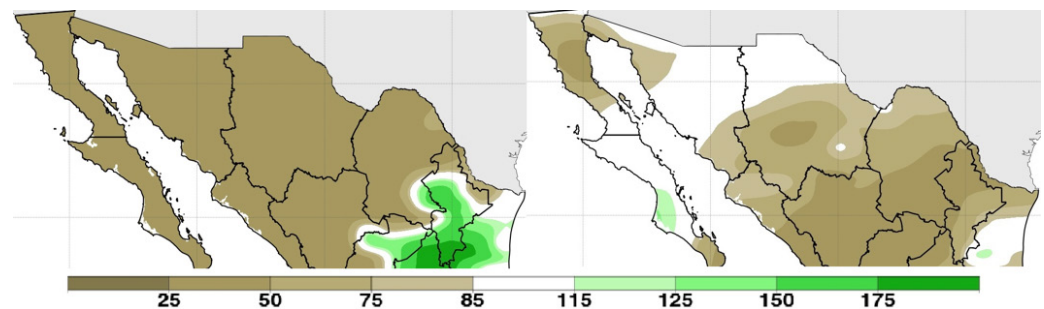
#### PRECIPITATION

For November, the NOAA precipitation outlook predicts chances for below-average precipitation for almost all of New Mexico and Texas (Figure 6). Chances for below-average precipitation increase slightly into the winter, with increased chances for below-average precipitation in all of Texas and most of New Mexico through January ([figure not shown](#)).

For November, the SMN precipitation outlook predicts below-average conditions for Baja California, Baja California Sur, Sonora, Chihuahua, Coahuila, northern Nuevo León y northeastern Tamaulipas, and above-average conditions for southeastern Coahuila, Nuevo León and Tamaulipas (Figure 7; left). For December, SMN predicts below-average precipitation for Baja California, northeastern and southeastern Sonora, southern Chihuahua, Coahuila, Nuevo León and northern Tamaulipas; the rest of the region is projected to experience normal precipitation (Figure 7; right).



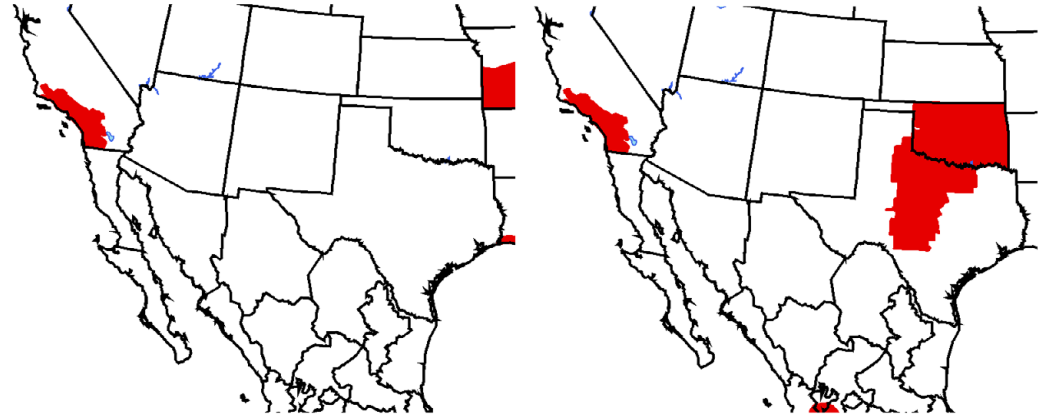
**Figure 6 (left):** NOAA one-month precipitation outlook (November). Forecast made on October 19, 2017 by [CPC](#).



**Figure 7 (below):** Predicted precipitation anomalies for northern of Mexico in (mm), November (left) and December (right). Forecast made on October 1, 2017 by [SMN](#).

## FIRE

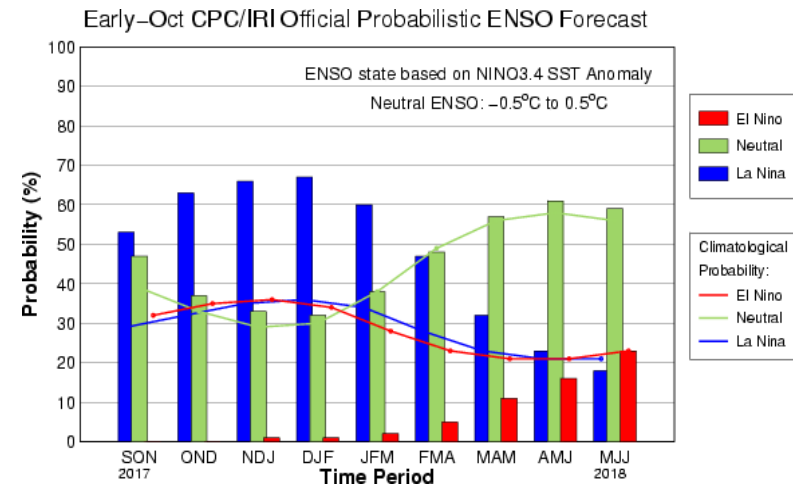
According to the National Interagency Fire Center (NIFC), fire risk is normal for New Mexico and Texas through November (Figure 8). However, expected La Niña conditions this fall are predicted to bring dry and warm conditions to the Southern Plains, including central Texas, by December, making grasses and brush more receptive to fire. In Mexico, the potential for forest fires will be within the normal range for the northern part of the country until December.



**Figure 8 (above):** Fire outlook for November (left) and December (right). Red shading indicates conditions that favor increased fire potential. Green shading indicates conditions that favor decreased fire potential. Forecast made on October 12, 2017 from NIFC and SMN.

## EL NIÑO-SOUTHERN OSCILLATION (ENSO)

As of early-October, the tropical Pacific remained in an ENSO-neutral state. However, sea surface temperatures (SSTs) in the east-central tropical Pacific have cooled to the threshold for La Niña and atmospheric conditions are suggestive of near La Niña patterns (IRI; NOAA). Thus, the official CPC/IRI outlook favors weak La Niña development (~55-65%) during the fall and winter of 2017-2018, and carries a La Niña watch (Figure 9). La Niña favors below average winter precipitation across the southern tier of the United States.



**Figure 9 (above):** ENSO probabilistic forecast from IRI.

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>

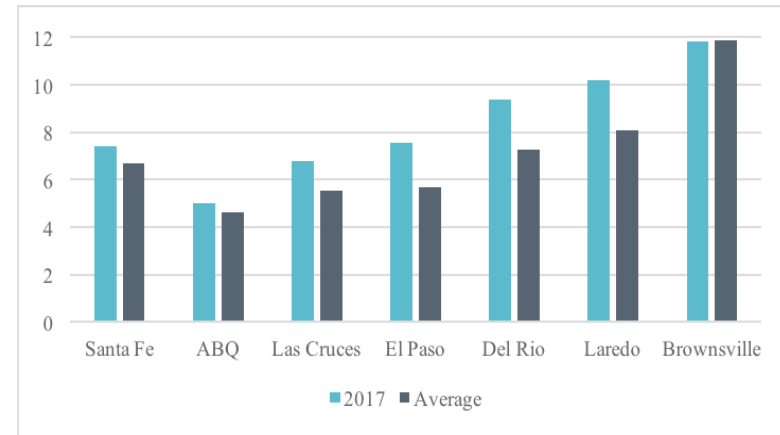


## MONSOON 2017

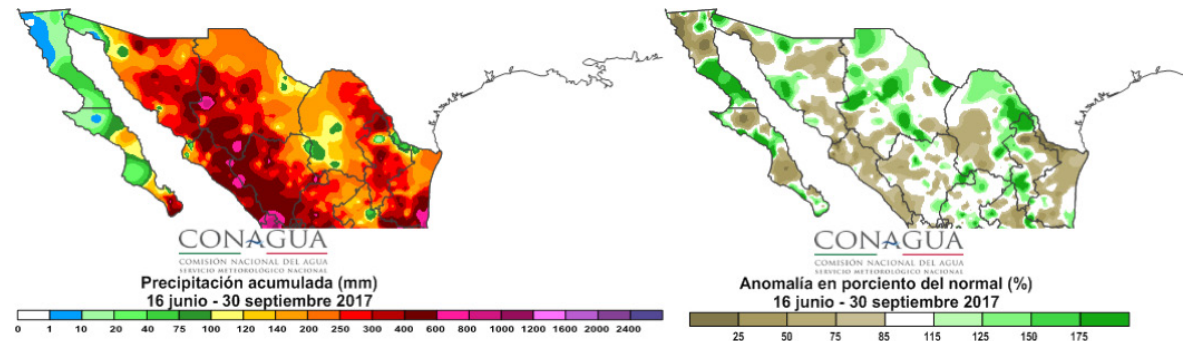
The monsoon season officially ended on September 30<sup>th</sup>. Every major U.S. city along the Rio Grande experienced average to above-average precipitation (Figure 10). Even though Las Cruces, NM and El Paso, TX received the majority of their precipitation prior to August 25<sup>th</sup>, final totals for both cities were over an inch above average. Brownsville, TX received very steady precipitation over the entire season, ending the season near average.

For northern New Mexico, including Santa Fe and Albuquerque, monsoon precipitation was below average until a low-pressure system in Utah drew moisture into the state towards the end of September. Albuquerque saw record rainfall and Santa Fe received over an inch of rain on September 27<sup>th</sup>, leaving both cities slightly above average for the season. Similarly, late September storms in Laredo and Del Rio took the season from well below-average, to well above-average. On September 24<sup>th</sup>, precipitation in Laredo was more than 5 inches below average. Over the next four days, storms brought over 8 inches of rain, so that the city ended the season over 2 inches above average. Storms on September 26<sup>th</sup> dumped 5.30 inches of rain, flooding the area and nearby Nuevo Laredo, MX, and causing the Rio Grande to overflow its banks.

At the end of the monsoon, rains were above normal in northern Chihuahua and Coahuila, in addition to portions of northern and western Sonora. In the rest of the region, the rains fell short, with Sinaloa, western Durango and the lower Rio Bravo receiving below normal rainfall. Maximum rains accumulated from June 16 to September 30 with 900 mm (35.4 in) in Basaseachi, Chihuahua, 807 mm (31.7 in) in José López Portillo Dam, and 788.5 mm (31 in) in Joaquin Amaro, Zacatecas (Figure 11).



**Figure 10 (above):** Precipitation amounts (in inches), June 15 – September 30, for 2017 (light blue), compared to average (dark blue). Source: [HPRCC](#)



**Figure 11 (above):** Accumulated precipitation from 16 June-31 August and percent of normal during the same period based on 1981-2010. Source: [SMN](#)

### Additional Monsoon Resources:

- NWS: [http://www.wrh.noaa.gov/twc/monsoon/monsoon\\_info.php](http://www.wrh.noaa.gov/twc/monsoon/monsoon_info.php)
- CLIMAS: <http://www.climas.arizona.edu/sw-climate/monsoon>
- SMN: <http://www.gob.mx/conagua/prensa/inicio-el-monzon-de-norteamerica-en-el-noroeste-de-mexico>

## TOOLS

### NEW ONLINE TOOL TEACHES STUDENTS ABOUT THE WATER-ENERGY NEXUS

A new online tool, known as the [HydroViz Nexus](#) platform, was developed by researchers to teach undergraduate and graduate students about the interactions between energy and water, which are strongly interrelated. For example, generating electricity requires large amounts of water, and pumping, delivering, and treating water require large amounts of energy. The web platform houses data on water supply and demand for surface and groundwater resources, information on U.S. power plants (such as energy generation and cooling technology), and other information, such as production cost and carbon emission rates.

## ANNOUNCEMENTS

### NEW MEXICO ACADEMY OF SCIENCE RESEARCH SYMPOSIUM

The Research Symposium is an opportunity for New Mexico undergraduate and graduate students in STEM disciplines to present their research. The [Symposium](#) takes place November 4<sup>th</sup> in Albuquerque.

### 98TH ANNUAL MEETING OF THE AMERICAN METEOROLOGICAL SOCIETY

The next meeting of the [American Meteorological Society](#) (AMS) is scheduled for January 7–11, 2018 in Austin, Texas. The meeting is “the world’s largest yearly gathering for the weather, water, and climate community.”

## NEWS

*Heavy rainfall floods streets, homes in Los Dos Laredos*, September 28, 2017: <http://www.lmtonline.com/local/article/Heavy-rainfall-floods-streets-homes-in-Los-Dos-12237287.php>

*Se desborda río Bravo en Nuevo Laredo; cierran accesos de puentes internacionales*, September 28, 2017: <http://www.eluniversal.com.mx/estados/se-desborda-rio-bravo-en-nuevo-laredo-cierran-puente-internacional>

*Rio Grande to dry up next week after ‘very good season’ for irrigators*, October 10, 2017: <http://www.lcsun-news.com/story/news/local/agriculture/2017/10/10/rio-grande-dry-up-next-week-after-very-good-season-irrigators/751451001/>

*Hispanic ranchers dealt blow in lengthy battle over grazing*, October 24, 2017: <http://newsok.com/article/feed/1471512>