Rio Grande|Bravo

CLIMATE IMPACTS & OUTLOOK September 2017

SUMMARY

Forecasts favor above-average temperatures for all of the Rio Grande/Bravo Basin, and below-average precipitation for Central/East Texas, through December.

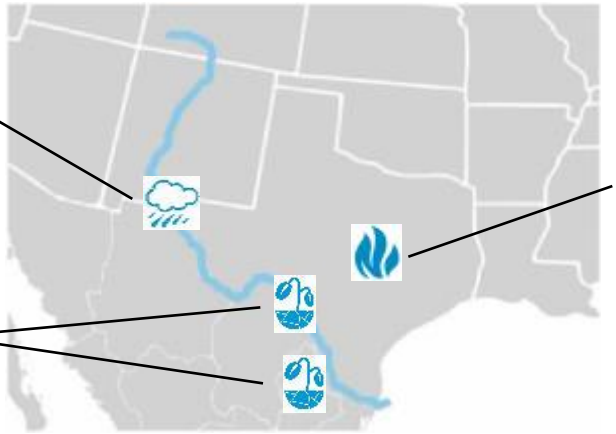
AT A GLANCE

Las Cruces, NM & El Paso, TX

The Paso del Norte region has experienced an above-average monsoon season.

Southwest Texas/Northeast Mexico

Drought conditions improved over the past month, but moderate drought and abnormally dry conditions remain along the U.S.-Mexico border, south of Del Rio, TX.



Central/East Texas

Above-average temperatures and below-average precipitation is forecasted through December, resulting in above-average fire potential for November/December.

REGIONAL CLIMATE OVERVIEW | JUNE | JULY | AUGUST

Over the last three months (June – August) precipitation was 25–90% below average for most of the Rio Grande Basin (Figure 1; left). Exceptions were southern and eastern New Mexico and areas in West Texas, where precipitation was 130–200% above average. Temperatures were above average (0–3 °F; 0–1.7 °C) for most of New Mexico and West and South Texas over the same time period (Figure 1; right).

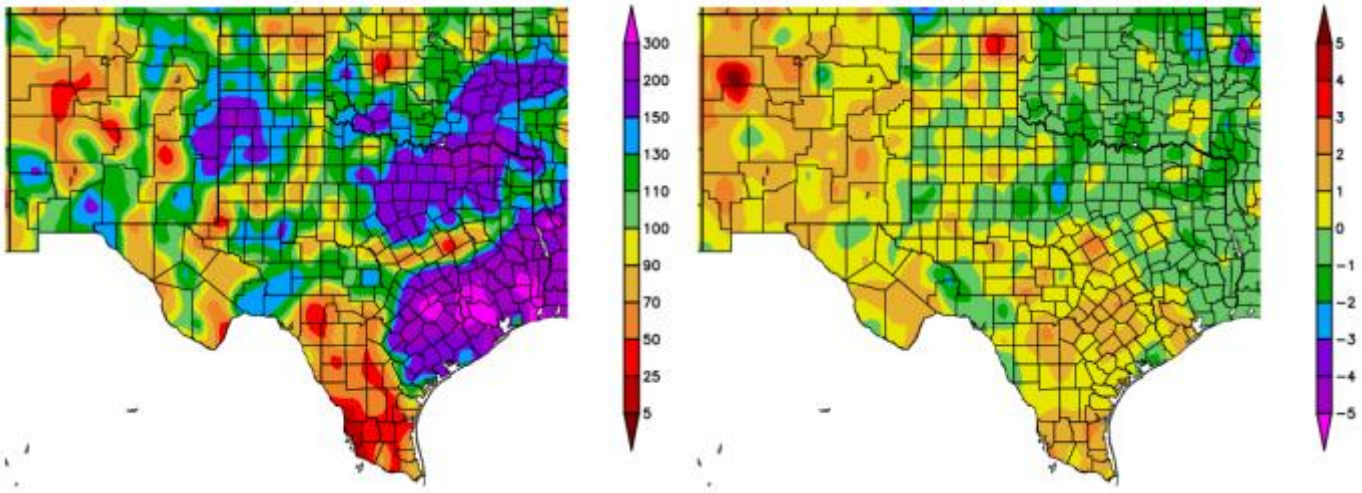
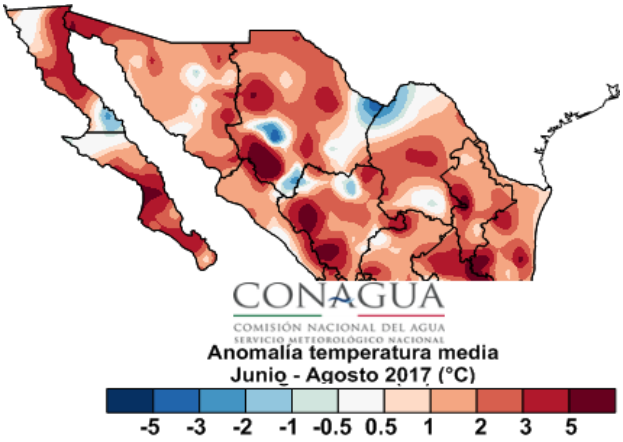


Figure 1 (above): Percent of average precipitation (left) and departure from average temperature in degrees F (right), compared to the 1981–2010 climate average, for 6/1/2017–8/31/2017. Maps from HPRCC.

There were practically no changes in the distribution of above-average temperatures in northern Mexico between June and August 2017. The highest anomalies greater than 5 °C (9 °F) (Figure 2, left) above average were observed mainly in southern Chihuahua, western Durango, and areas in Northeast Mexico. The majority of the regions that experienced temperatures above 40 °C (104 °F) for more than 30 days were located in Sonora, Coahuila and Nuevo León (Figure 2, right).



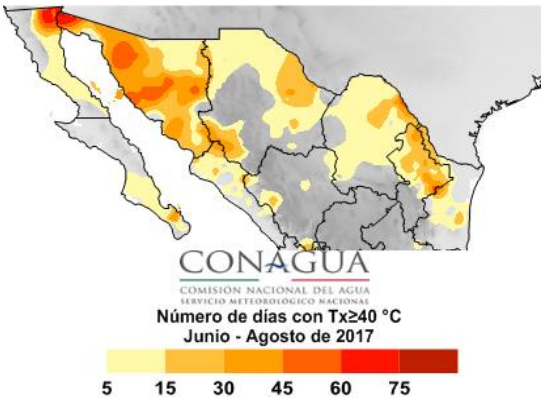


Figure 2 (above): Temperature anomalies in °C (left) and number of days with maximum temperatures at or above 40 °C (104 °F) (right) for June–August. Maps from SMN.

Temperatures from September 1–18 were 1–5 °F (0.6–2.8 °C) above average for most of New Mexico and West Texas, and 0–4 °F (0–2.2 °C) below average for the lower portion of the South Texas (figure not shown). Precipitation over the same time period was 0–25% below average for all of both states. For the first eight months of the year (January – August) *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.

DROUGHT

Monsoon rains have alleviated drought conditions in New Mexico and West Texas, according to the North American Drought Monitor (NADM) (Figure 3). As of September 16th, abnormally dry and moderate drought conditions remained in southern Texas, beginning near Del Rio and extending south along the Rio Grande. In Mexico, drought conditions improved slightly, with moderate to abnormally dry conditions in Coahuila, Nuevo León, and Tamaulipas.

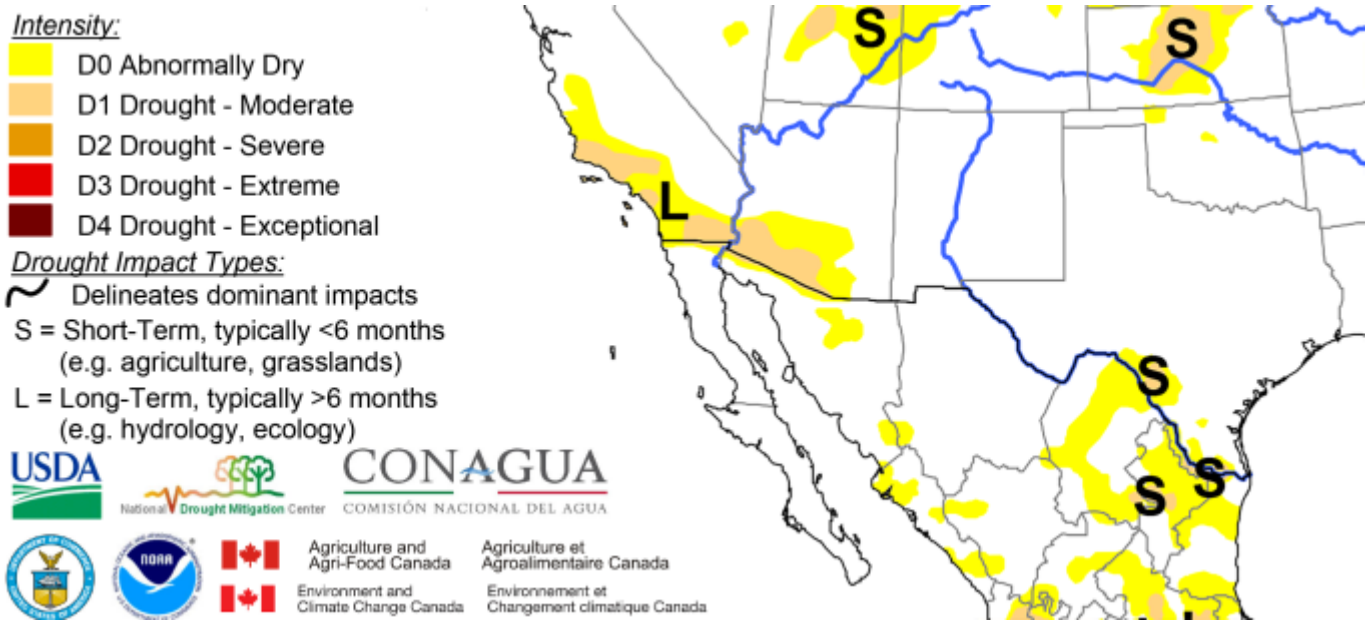


Figure 3 (above): North American Drought Monitor, released September 16, 2017.

FORECAST — OCTOBER | NOVEMBER | DECEMBER

TEMPERATURE

The one-month NOAA temperature outlook (October; Figure 4) favors equal chances of below-, average, or above-average temperatures for almost all of Texas, and above-average temperatures for all of New Mexico and far West Texas. Chances for above-average temperatures increase into the fall, with increased chances for above-average temperatures for all of both states through December, according to the NOAA three-month temperature outlook (October–December; figure not shown). The forecast from CONAGUA´s Servicio Meteorológico Nacional (SMN) for October predicts above-average temperatures in northwestern Mexico, mainly in Sonora, Chihuahua and Baja California. This pattern is expected to continue into November (Figure 5).

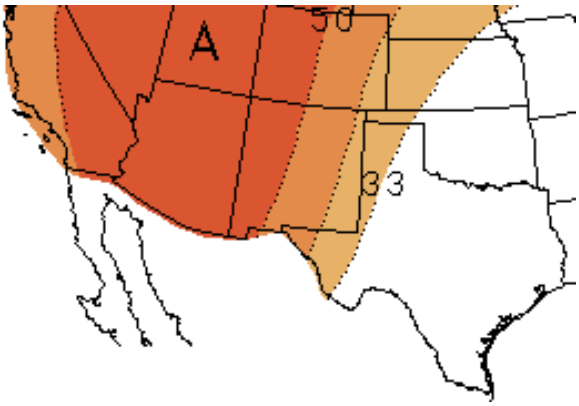


Figure 4 (above): NOAA one-month temperature outlook (October). Forecast made on September 21, 2017 by CPC.

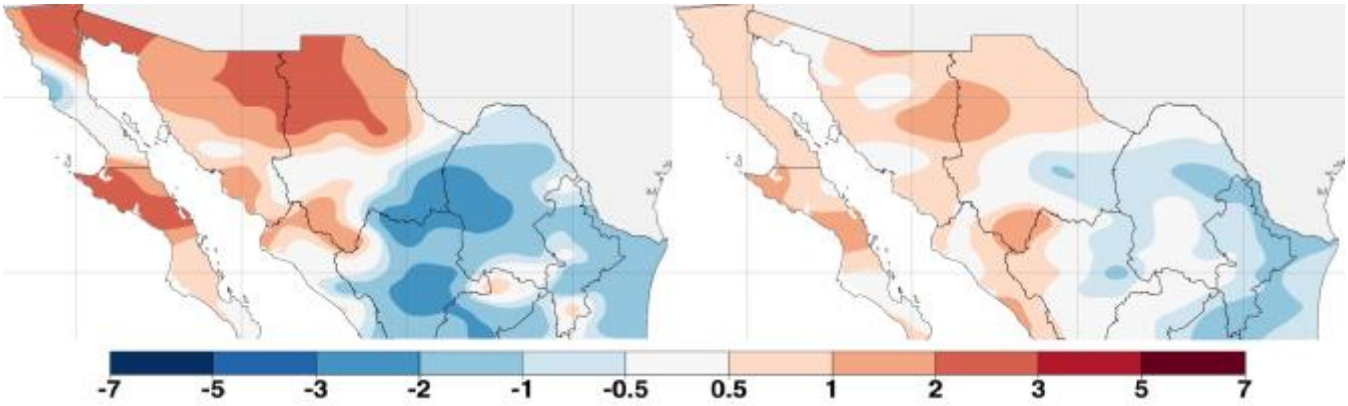


Figure 5 (above): Predicted maximum temperature anomalies for northern Mexico (in °C), October (left) and November (right). Forecast made on September 1, 2017 by SMN.

PRECIPITATION

For October, the NOAA precipitation outlook predicts equal chances of below-, average, or above-average precipitation for New Mexico and most of Texas, and increased chances for below-average precipitation for eastern Texas (Figure 6). Chances for below-average precipitation increase slightly into the fall, with increased chances for below-average precipitation in the eastern half of Texas through December (figure not shown). Equal chances remain for New Mexico and West Texas through December.

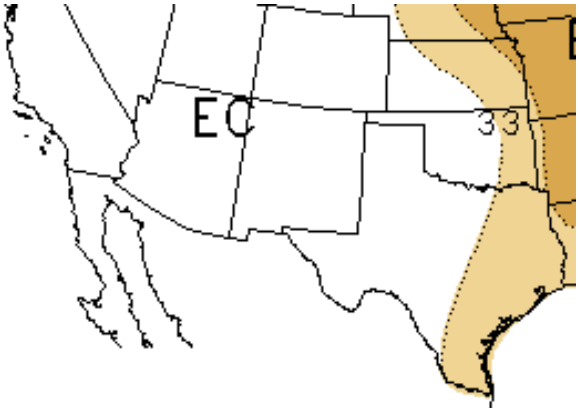


Figure 6 (above): NOAA one-month precipitation outlook (October). Forecast made on September 21, 2017 by CPC.

For October, the SMN precipitation outlook predicts below-average precipitation for Sonora, eastern Chihuahua and northern Baja California, and above-average precipitation for southern Coahuila, Nuevo León and Tamaulipas (Figure 7). For November, SMN predicts above-average precipitation for Coahuila, Nuevo León and eastern Chihuahua, and below-average precipitation in some regions of Chihuahua and Sonora.

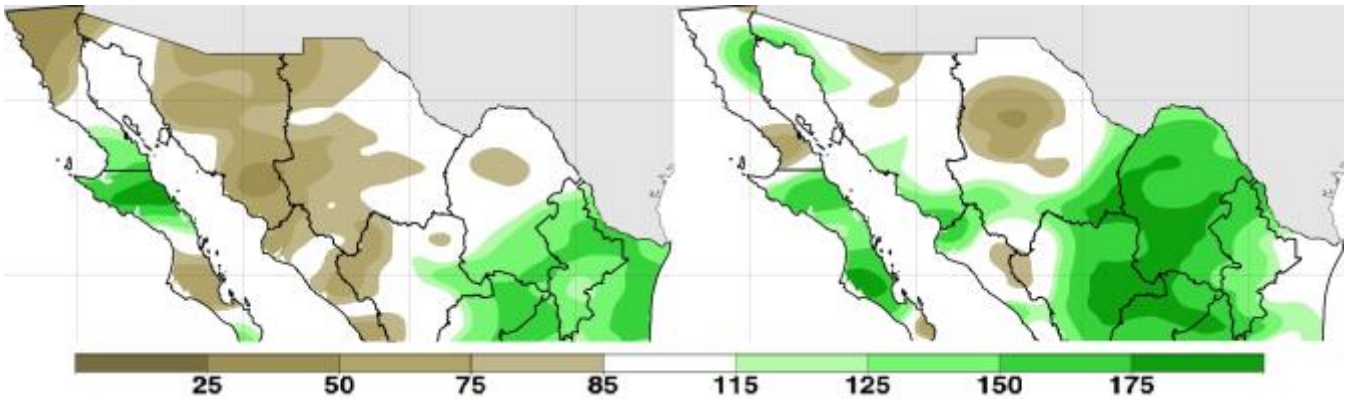


Figure 7 (above): Predicted precipitation anomalies for northern of Mexico in (°C), October (left) and November (right). Forecast made on September 1, 2017 by SMN.

FIRE

Close to average precipitation during the 2017 monsoon season in the Southwest U.S. curtailed fire activity over the past few months, according to the National Interagency Fire Center (NIFC). Fire risk will remain normal in New Mexico and Texas through October. However, the long-term forecasts (three-month CPC forecasts) predict below-average precipitation and above-average temperatures for central and eastern Texas for November and December. This is reflected in the fire potential outlook with above-normal fire potential for the same region through the end of the year (Figure 8). Normal fire potential is forecast for all of Mexico through November.

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

EL NIÑO-SOUTHERN OSCILLATION (ENSO)

As of mid-September, the tropical Pacific remained in an ENSO-neutral state, with average to below-average sea surface temperatures (SSTs) and atmospheric conditions exhibiting ENSO-neutral patterns (IRI; NOAA). With SSTs near the threshold for La Niña, some model predictions favor weak La Niña development as early as fall 2017, while others favor ENSO-neutral through the winter. The official CPC/IRI outlook (Figure 9) slightly favors La Niña development (55-60%) through 2017-2018 winter, and carries a La Niña watch, with chances of ENSO-neutral conditions remaining significant (35-40%).

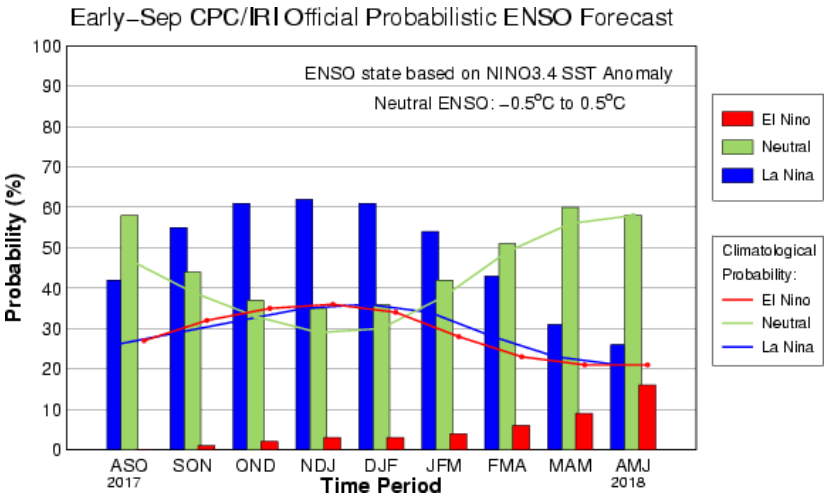


Figure 9 (above): ENSO probabilistic forecast from IRI.

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

MONSOON 2017

As the monsoon season winds down (the official end date is September 30), precipitation over the past month, since mid-August, has been mostly below-average for the Rio Grande/Bravo Basin (Figure 10). The river basin north of Big Bend National Park received precipitation 25-90% below average, and south of Big Bend received precipitation 0-25% below average.

Generally, monsoon precipitation is extremely variable. Even within the same city, some areas may receive large amounts of precipitation while other

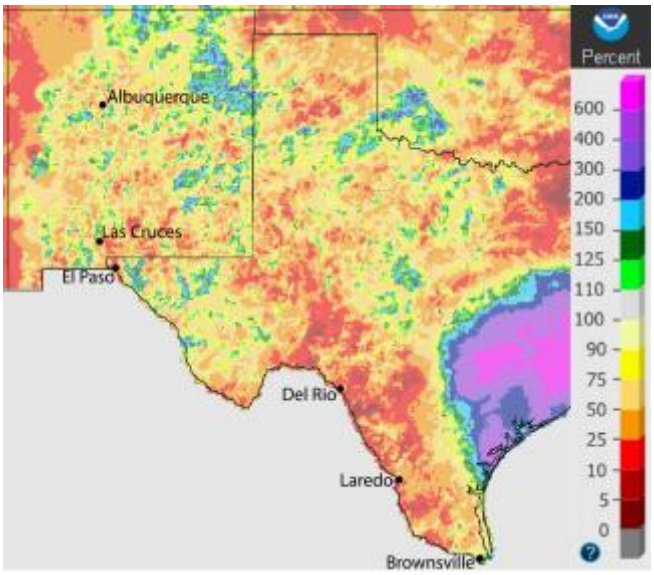


Figure 10 (above): Percent of average precipitation, August 21–September 20. Source: NWS

areas receive none. This monsoon season has been no different, with some cities and areas receiving below-average precipitation and others receiving above average (Figure 11). Las Cruces, El Paso, and Brownsville have received above-average precipitation since the start of the season, while Santa Fe, Albuquerque, Del Rio, and Laredo have received below-average (Figure 12). On average, however, precipitation since the beginning of the monsoon season has been generally located north of Del Rio (Figure 11).

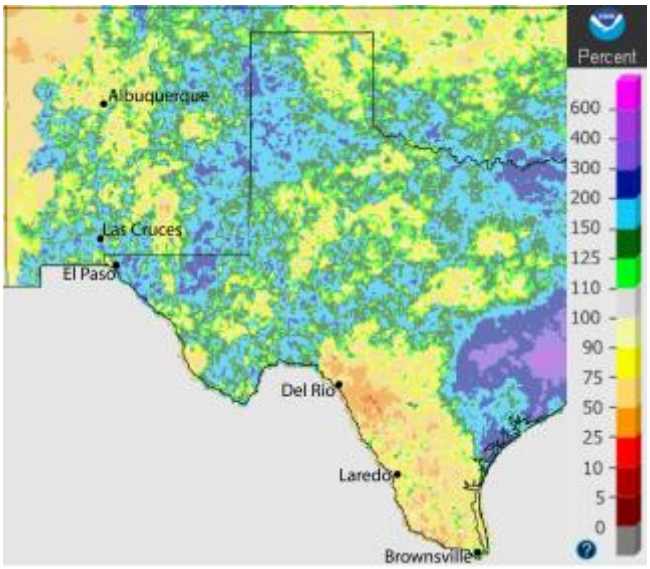


Figure 11 (above): Percent of average precipitation, June 22–September 20. Source: NWS

The monsoon continued to be very active in Sonora and Chihuahua during August. Precipitation amounts greather than 600 mm (23.6 inches) from June 16 to August 30 were observed along the Sierra Madre Occidental. Rains were above normal in Sonora and Chihuahua, but Sinaloa, Durango, Coahuila and Nuevo León continued to receive less precipitation than usual (below 50% of normal). Maximum rains in this period in northern Mexico were 809.5 mm (31.8 inches) in Basaseachi, Chihuahua and 717.0 mm (28.2 inches) in José López Portillo Dam in Sinaloa (Figure 13).

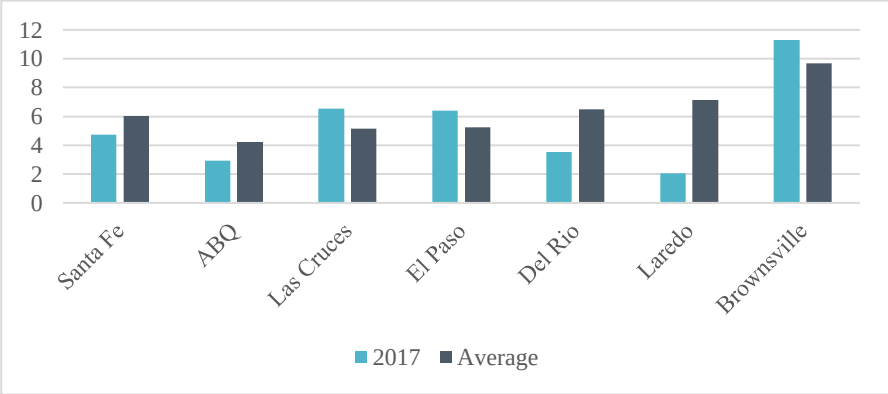


Figure 12 (above): Precipitation amounts (in inches), June 15 – September 19, for 2017 (light blue), compared to average (dark blue).

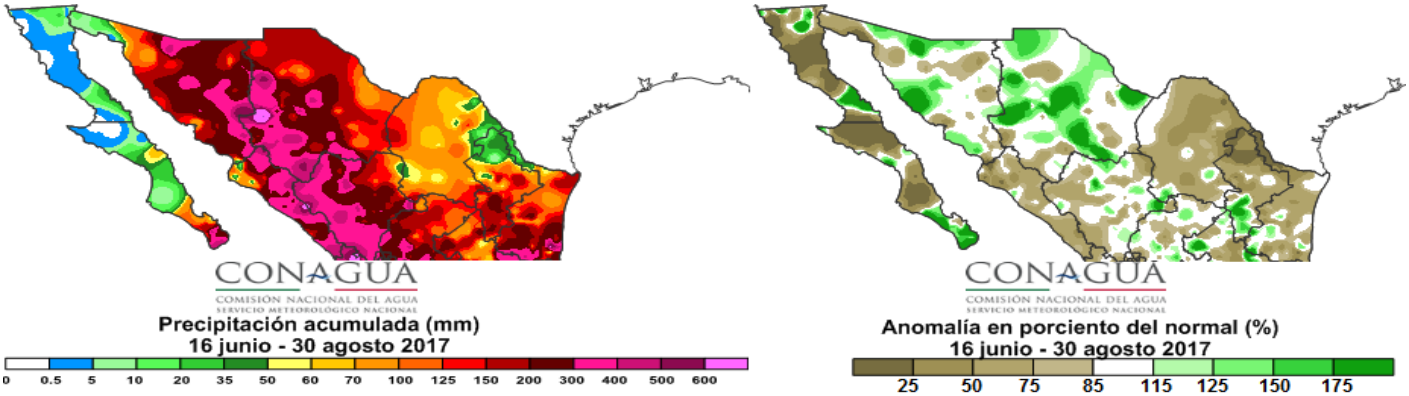


Figure 13 (above): Accumulated precipitation from 16 June-31 August and percent of normal during the same period based on 1981-2010. Source: SMN

Additional Monsoon Resources:

- NWS: http://www.wrh.noaa.gov/twc/monsoon/monsoon_info.php
- CLIMAS: http://www.climas.arizona.edu/sw-climate/monsoon
- CONAGUA: http://www.gob.mx/conagua/prensa/inicio-el-monzon-de-norteamerica-en-el-noroeste-de-mexico

TOOLS & RESEARCH

EVAPORATIVE DEMAND DROUGHT INDEX

The Evaporative Demand Drought Index (EDDI) is a relatively new tool that displays anomalous atmospheric evaporative demand for a given location in the contiguous U.S., northern Mexico, and southern Canada. EDDI is generated at timescales of 1-week through 12-months, and can serve as an early warning guidance tool for agricultural drought, hydrologic drought, and fire-weather risk.

NEW STUDY PROJECTS INCREASES IN SEDIMENTATION FROM LARGER, MORE FREQUENT WILDFIRES IN THE WESTERN U.S.

Larger, more frequent wildfires projected for the western U.S. will increase sedimentation rates, reducing reservoir storage and increasing the cost for reservoir maintenance and water treatment, according to a new study published in *Geophysical Research Letters*. Burned areas—expected to increase due to climate change—increase soil erosion and sedimentation into downstream rivers and reservoirs, reducing reservoir storage and decreasing water quality. The authors studied 471 watersheds across the western U.S. and found that 88% of watersheds are projected to undergo >10% increases in sediment yield by the year 2050, and 35% of watersheds are projected to experience a >100% increase in sediment yield.

NEW RESEARCH ON LANDFALLING TROPICAL CYCLONES IN THE EASTERN PACIFIC BASIN

New research (en Español) from the Inter-American Institute for Global Change Research sheds some light on the population impact from tropical cyclones in the eastern Pacific Basin. The research examined disaster estimates on the affected population of over 30 landfall events. Hurricane Pauline in 1997 affected over 800,000 people. The research can help improve hurricane preparedness along the western coast of Mexico.

ANNOUNCEMENTS

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."

WEBINAR: TRANSDISCIPLINARY APPROACHES TO INTEGRATING POLICY AND SCIENCE FOR SUSTAINABILITY

The Inter-American Institute (IAI) for Global Change Research is convening a webinar series October 3-7 on transdisciplinary approaches to integrating policy and science for sustainability. Webinar themes include: communicating science to policy; integrating research and innovation into sustainability science and policy; science diplomacy; transdisciplinary processes and methods; and proposal development and project management and financing. Go to the IAI website for a schedule of webinar sessions and to register.

COMET LESSONS

COMET provides bilingual training materials, published in MetEd, covering topics such as satellite meteorology, fire weather forecasting, and climate analysis tools. The five related Spanish lessons cover satellite meteorology and wave modeling:

- ASMET 7: Detección de turbulencia en aire claro sobre Sudáfrica
- SatFC-G: Principios básicos de radiación
- SatFC-G: Bandas en el visible e IR cercano
- SatFC-G: Bandas en el IR cercano
- Modelado de las olas cerca de la costa

NEWS

New Mexico Project Would Pipe Rural Groundwater 150 Miles to Big City, September 5, 2017: https://www.newsdeeply.com/water/articles/2017/09/05/new-mexico-project-would-pipe-rural-groundwater-150-miles-to-big-city

Farmers invited to meeting on over-use of irrigation water, September 5, 2017: http://www.lcsun-news.com/story/news/local/agriculture/2017/09/05/farmers-invited-meeting-over-use-irrigation-water/635840001/

Aseguran 1 riego; buscan segundo, September 12, 2017: https://www.elmanana.com/aseguran1riegobuscansegundo-4052936.html

Desborda el Río Conchos en Maravillas e Inunda Predios Agrícolas, August 20, 2017: https://impactonoticias.com.mx/local/desborda-el-rio-conchos-en-maravillas-e-inunda-predios-agricolas/

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