Rio Grande|Bravo

CLIMATE IMPACTS & OUTLOOK

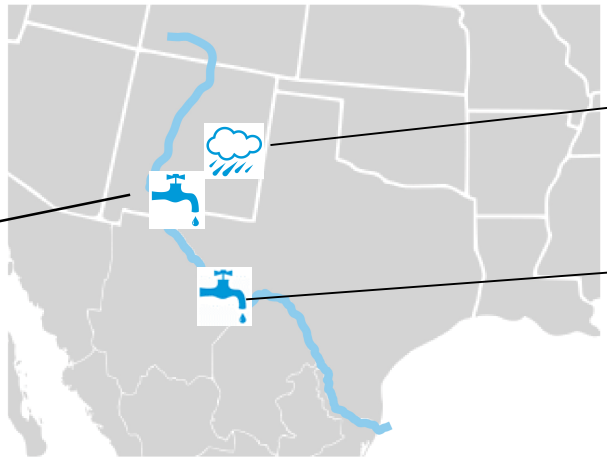
SUMMARY

Forecasts through November favor above-average temperatures in the Rio Grande/Basin area.

AT A GLANCE

Elephant Butte Reservoir, NM

As of September 16, the reservoir was at 6.5% of total capacity. Statewide, total reservoir storage was 24% of capacity at the beginning of September.



New Mexico

Precipitation totals were 71% of average precipitation during the first 7 months of 2016

Northern Coahuila, Mexico

Gauges recorded between 5.3 inches (134.5 mm) and 7.5 inches (190 mm) during a 24-hour period from August 19-20, due to an influx of moisture from the Gulf of Mexico.

REGIONAL CLIMATE OVERVIEW | JUNE | JULY | AUGUST

From June 1st through August 31st the Rio Grande/Bravo Basin received precipitation ranging from 50-300% of average (Figure 1, left). New Mexico received average to below-average precipitation for the majority of the state, while the border region in Texas recorded precipitation 110-300% of average, except in the far west and southern corners of the state, which recorded precipitation 25-90% of average. Temperatures were average to 3°F (1.6°C) above average for almost all of the region for the same time period (Figure 1, right). During the first half of September, precipitation varied from above average (400%) around the New Mexico/Texas border to below average in western New Mexico and eastern Texas. Temperatures varied from 2°F (1.1°C) below average to 2°F (1.1°C) above average in the basin region during the same period.

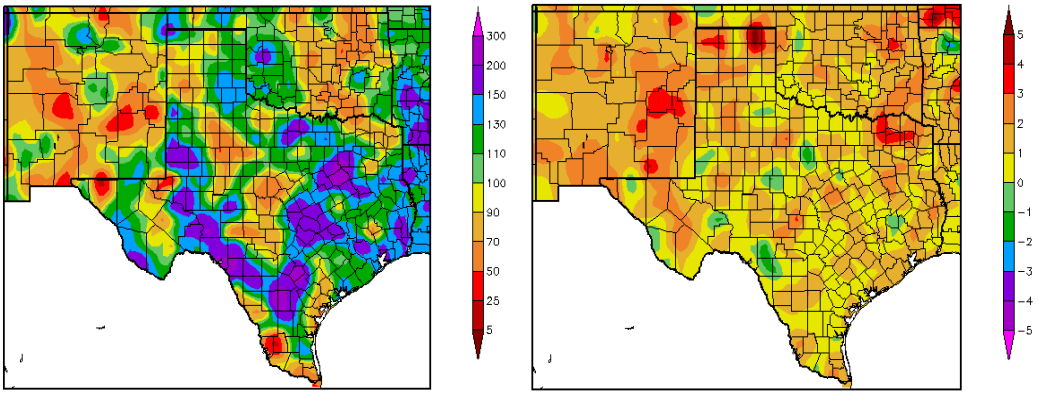


Figure 1: Percent of normal precipitation (left) and departure from normal temperature (right), for 6/1/2016 - 8/31/2016. Maps from HPRCC.

The average temperature for August in northern Mexico ranged from 68-90°F (20-35°C), with below-average temperatures in Sonora and the Chihuahua/Coahuila border region. Nuevo León, Tamaulipas, and central and southern Coahuila observed above-average temperatures (Figure 2, left). Areas in Chihuahua, Coahuila, and Nuevo Leon recorded up to 15 days with temperatures exceeding 105°F (40°C) in August (Figure 2, right).

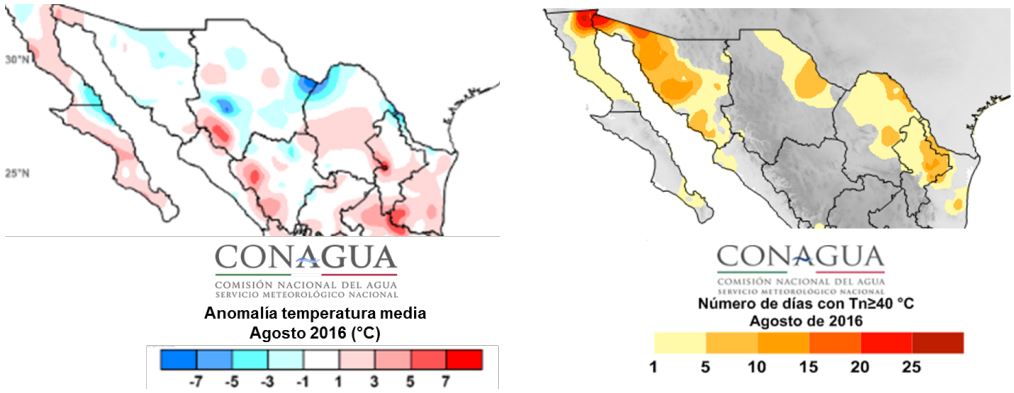


Figure 2: Temperature anomalies (left) and number of days with maximum temperatures at or above 105°F (40°C) in August. Maps from SMN.

DROUGHT

According to the North American Drought Monitor (NADM), by the end of August north-central Texas and most of New Mexico were experiencing abnormally dry (D0) or moderate drought conditions (D1) (Figure 3). Isolated areas in southern Texas, Chihuahua, Tamaulipas and eastern Nuevo León were experiencing abnormally dry conditions (D0).

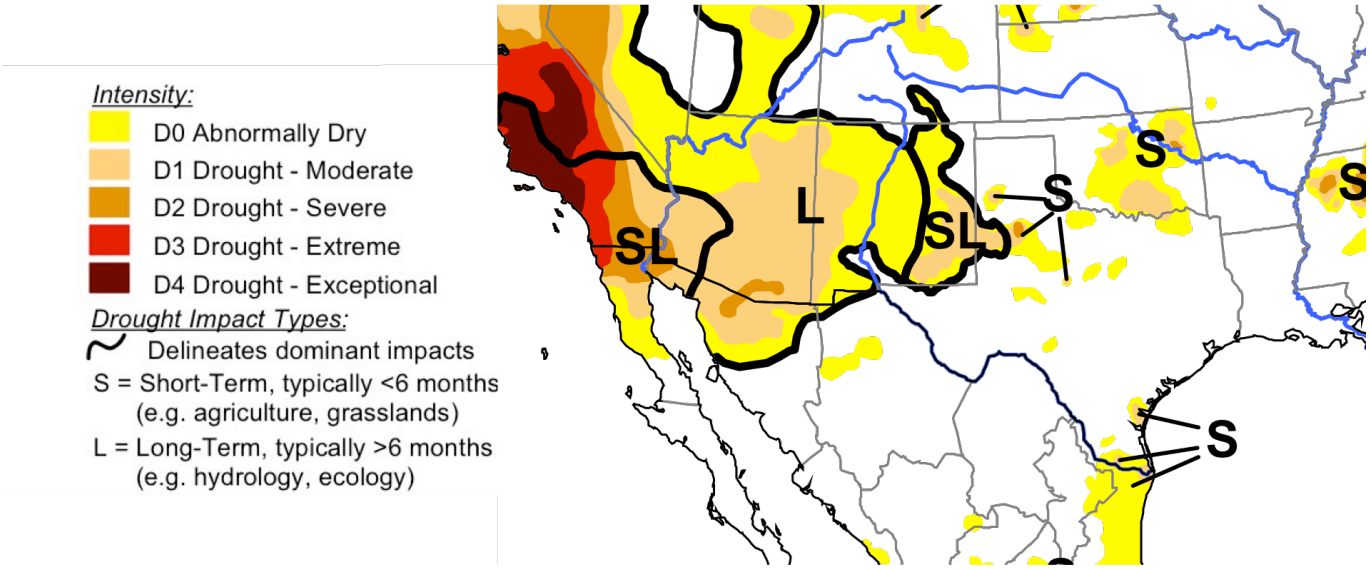


Figure 3 (above): North American Drought Monitor, released September 15, 2016.

TEMPERATURE

The NOAA outlook for October favors increased chances for above-average temperatures in New Mexico and western Texas, and equal chances for above-average, average, and below-average temperatures in the remainder of Texas (Figure 4). The three-month NOAA temperature outlook favors increased chances for above-average temperatures in the entire Rio Grande basin through December (figure not shown). CONAGUA's Servicio Meteorológico Nacional (SMN) forecasts above-average maximum temperatures in October for the Sonora/Chihuahua border region, below-average temperatures in northern Coahuila, and average maximum temperatures for the remainder of the border region (Figure 5). In November, SMN forecasts favor above-average temperatures in most of Chihuahua and Coahuila, and average to below-average temperatures in northern Coahuila, Tamaulipas and Nuevo León.

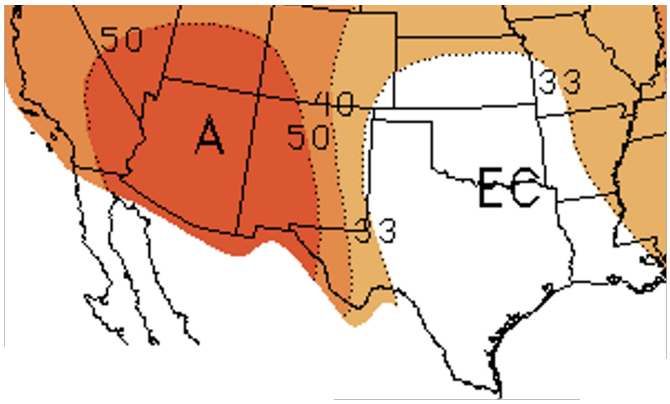


Figure 4 (above): NOAA October temperature outlook. Forecast made on September 15, 2016 by CPC.

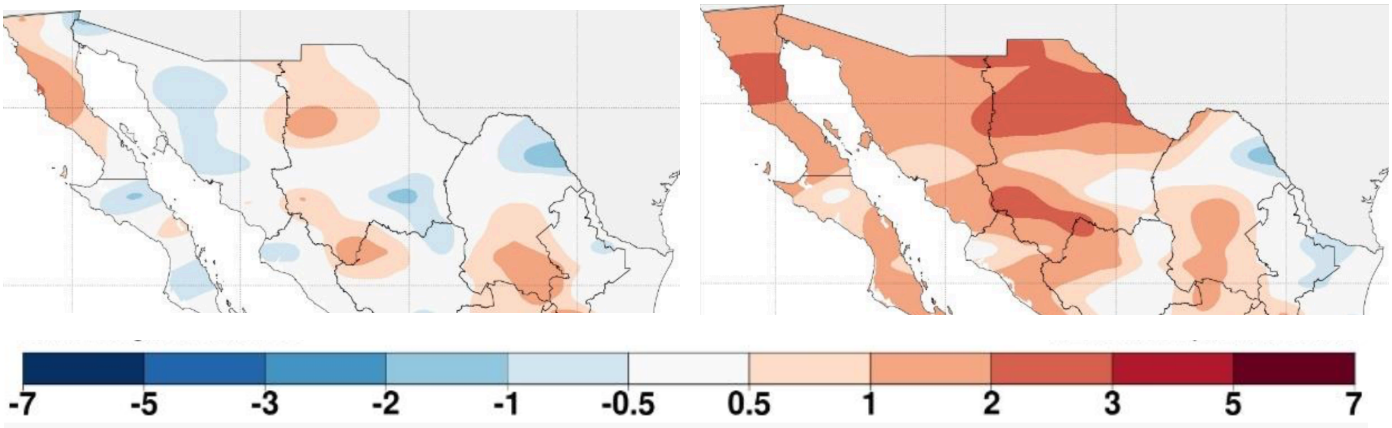


Figure 5 (above): Predicted maximum temperature anomalies for northern Mexico (in °C); October (left) and November (right). Forecast made on September 1, 2016 by SMN.

PRECIPITATION

The October NOAA precipitation forecast favors equal chances for above-average, average, and below-average precipitation for the Rio Grande/Bravo Basin (Figure 6). The three-month NOAA forecast through December favors below-average precipitation in almost all of Texas and equal chances for below average, average, and above average precipitation in most of New Mexico (figure not shown). In October, SMN forecasts favor below-average precipitation in northern and western Chihuahua and average precipitation in most of Coahuila, with isolated areas of above-average precipitation, in Tamaulipas and eastern Nuevo León (Figure 7). In November, SMN forecasts favor below-average precipitation for western Chihuahua and above-average precipitation for the rest of the border region. Differences between the NOAA and SMN forecasts 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, analogues years and the output of climate global models and (2) NOAA predicts shifts in the probability of precipitation, whereas the SMN predicts precipitation amounts.

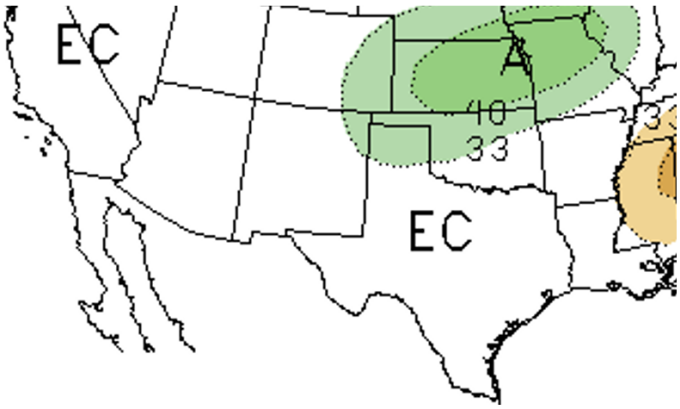


Figure 6 (above) : NOAA October precipitaiton outlook. Forecast made on September 15, 2016 by CPC.

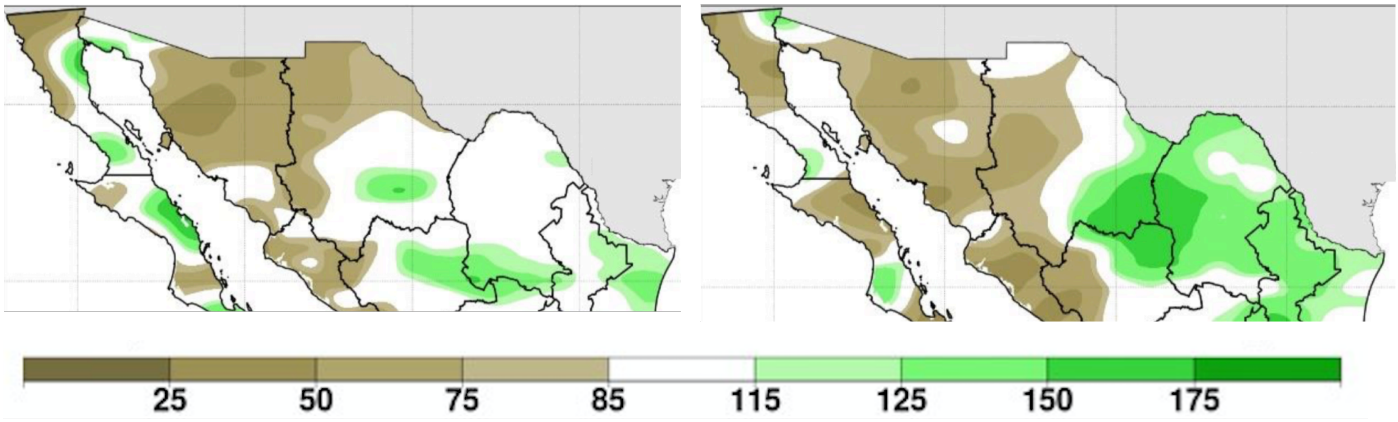


Figure 7 (above): Percent of average precipitation for northern Mexico; October (left) and November (right). Forecast made on September 1, 2016 by SMN using 2003, 2005, 2009, and 2014 as analogue years.

FIRE

The National Interagency Fire Center (NIFC) forecasts normal fire potential for all of the Rio Grande/Bravo region in October (Figure 8). Normal fire conditions are forecasted to continue in November for the region, except in Tamaulipas where forecasts favor above-normal fire activity.

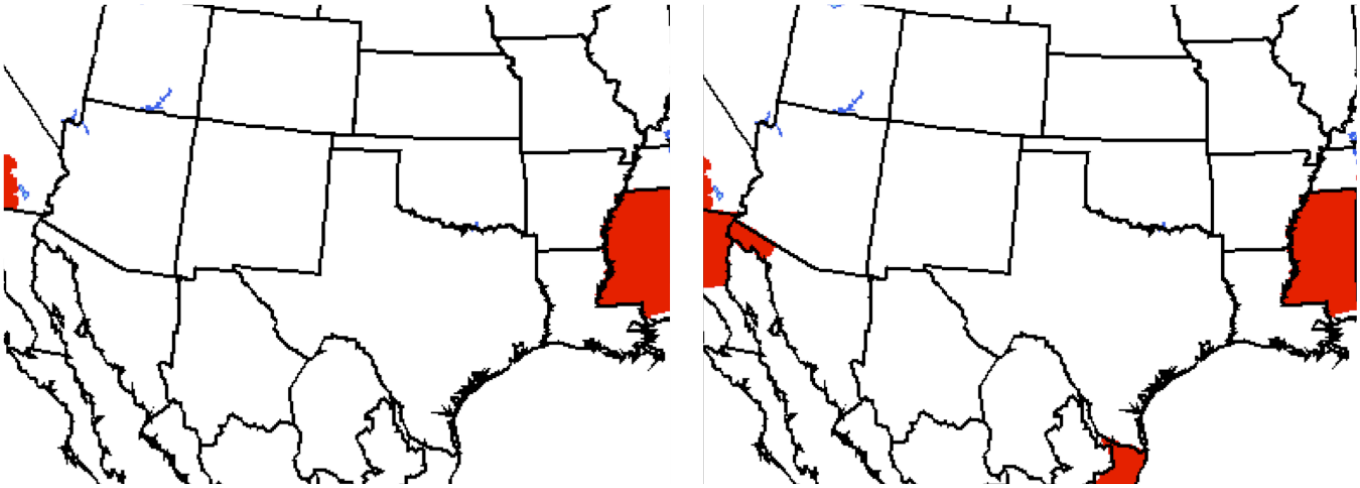


Figure 8 (above): Significant wildfire potential outlook for October (left) and November (right). Red shading indicates conditions that favor above-normal fire activity. Forecast made on September 10, 2016 from NIFC.

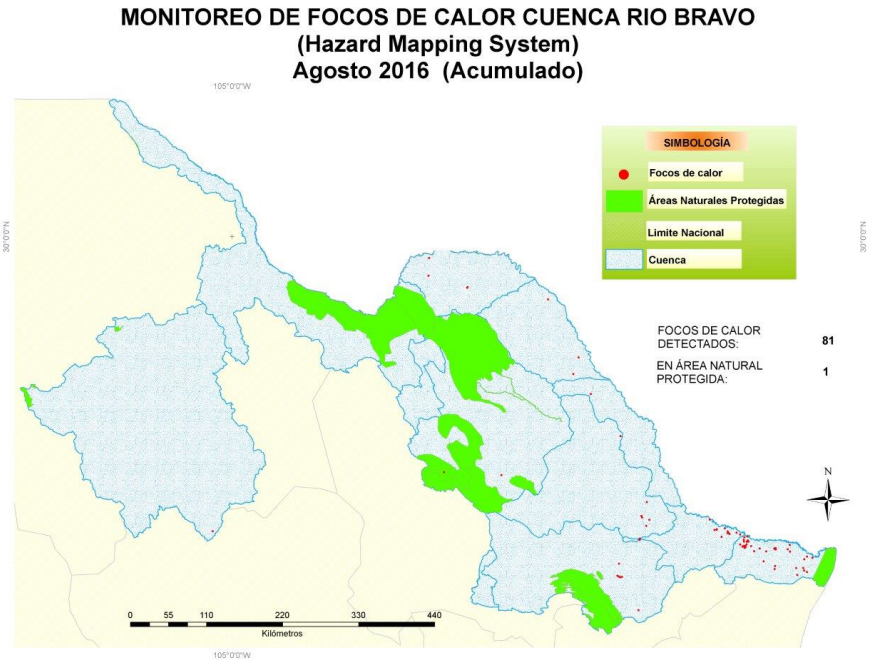


Figure 9 (right): Hostpots detected in the Rio Grande/Bravo Basin in August 2016 (right) from SMN

EL NIÑO-SOUTHERN OSCILLATION (ENSO)

Though sea surface temperatures in the east-central equatorial Pacific Ocean approached the weak La Niña threshold over the past month, atmospheric variables (e.g., convection, subsurface sea temperatures, and wind) indicate the presence of ENSO-neutral conditions (NOAA). Forecasts favor the continuation of ENSO-neutral conditions through fall and winter of 2016-2017, but still give a 30-40% chance of La Niña development (Figure 10; IRI). ENSO neutral conditions through the winter would be less likely to result in below-normal precipitation, a common characteristic of La Niña winters.

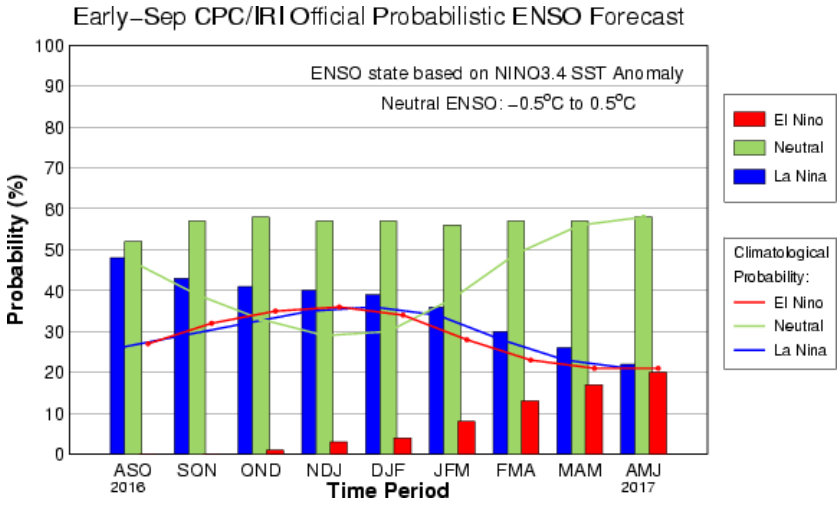


Figure 10 (above): ENSO probabilistic forecast from IRI.

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

THE NORTH AMERICAN MONSOON

A large portion of the Rio Grande/Bravo Basin region experiences the North American Monsoon during the summer, which accounts for approximately half of total annual precipitation in most areas (CPC). As a result of unequal rates of warming over land and water, wind patterns over northern Mexico and the U.S. Southwest reverse, pulling moisture from the Gulf of Mexico, Gulf of California and the eastern Pacific Ocean. Monsoon season typically begins in mid to late June in northwest Mexico (Sonora, Chihuahua, Sinaloa, and Durango) and early July in the U.S. Southwest (New Mexico and Arizona).

The southwestern United States experienced a strong start to the 2016 monsoon season in late June, with above-average precipitation in the basin region. However, in July, high-pressure systems in northern Mexico prevented significant monsoon activity for the first half of the month in the United States. Precipitation totals in New Mexico are average to above-average during the season so far, which officially ends on September 30th. NOAA forecasts through the remainder of the monsoon season indicate equal chances of below-average, average, and above-average precipitation, though NOAA notes

that the precipitation outlook has high uncertainty due to sparse model signal coverage. Northwest Mexico experienced average to above-average precipitation from June 16th through September 13th. Most of Chihuahua and western Coahuila showed signs of average monsoon activity in mid-June.

On August 19th, Coahuila experienced heavy rains, with the most intense period occurring in the early hours of August 20th as recorded using RADAR at the Air Force Base Laughlin, Texas. The presence of an extended trough from the central U.S. to northern Mexico, and the ingress of moisture from the Gulf of Mexico, lead to unstable conditions associated with a frontal system. The system resulted in accumulated rainfall of 7.4 inches (190 mm) in the Presa Centenario station, 5.9 inches (150 mm) in Ciudad Acuna and 5.3 inches (134.5 mm) at the Presa Amistad, all located in northern Coahuila (Figure 11).

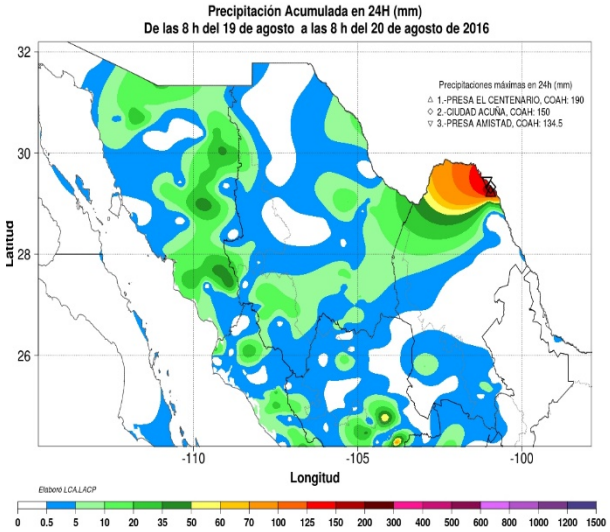


Figure 11: 24-hour Precipitation Accumulation, August 19-August 20, 2016

FEATURE

The Network of Climatic and Hydrometeorological Phenomena and Associated Disasters (REDESClim) is a research network through CONACYT created in 2011. REDESClim aims to facilitate collaboration between researchers, technologists, entrepreneurs, decision makers, and society members to initiate solutions to disasters in Mexico. The organization includes 134 members from all parts of Mexico. RedesCLIM has five main themes to meet its objectives and goals: 1) Monitoring and dissemination of information; 2) Diagnosis and analysis of processes; 3) Forecasting and prevention; 4) Modeling and processing; and 5) Public policy and knowledge transfer. These goals aim to encourage the government, private initiatives, academia, and society to influence public policies and encourage the prevention of hydrometeorological and climate events. REDESClim has a virtual seminar ever two months; more information can be found at www.redesclim.org.mx.

FORUMS

MEXICO CLIMATE FORUM

The VII Meeting of Climate Services and XXXI Climate Outlook Forum in Mexico will be held from November 29 to December 1 in Mexico City, Mexico. For more information see: http://smn.cna.gob.mx/es/climatologia/foros-de-prediccion-climatica

BIODIVERSITY CONSERVATION

The International Course on Planning for Biodiversity Conservation (Curso Internacional de Planificación Para La Conservación de La Biodiversidad) will be held October 3-7 in Panama City, Panama. More information can be found at: Cathalac.

NEWS HEADLINES

U.S., Mexican Scientists Collaborate on Border Aquifer Research; August 31, 2016:
http://www.circleofblue.org/2016/world/u-s-mexican-scientists-collaborate-border-aquifer-research/

Texas Has Seen Record Breaking Rainfall Over the Past Two Years; September 2, 2016:
http://www.star-telegram.com/news/state/texas/article99589107.html

Post Wildfire Concerns Diminish; August 14, 2016:
http://www.chieftain.com/news/5043678-120/grande-rio-rust-fish

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