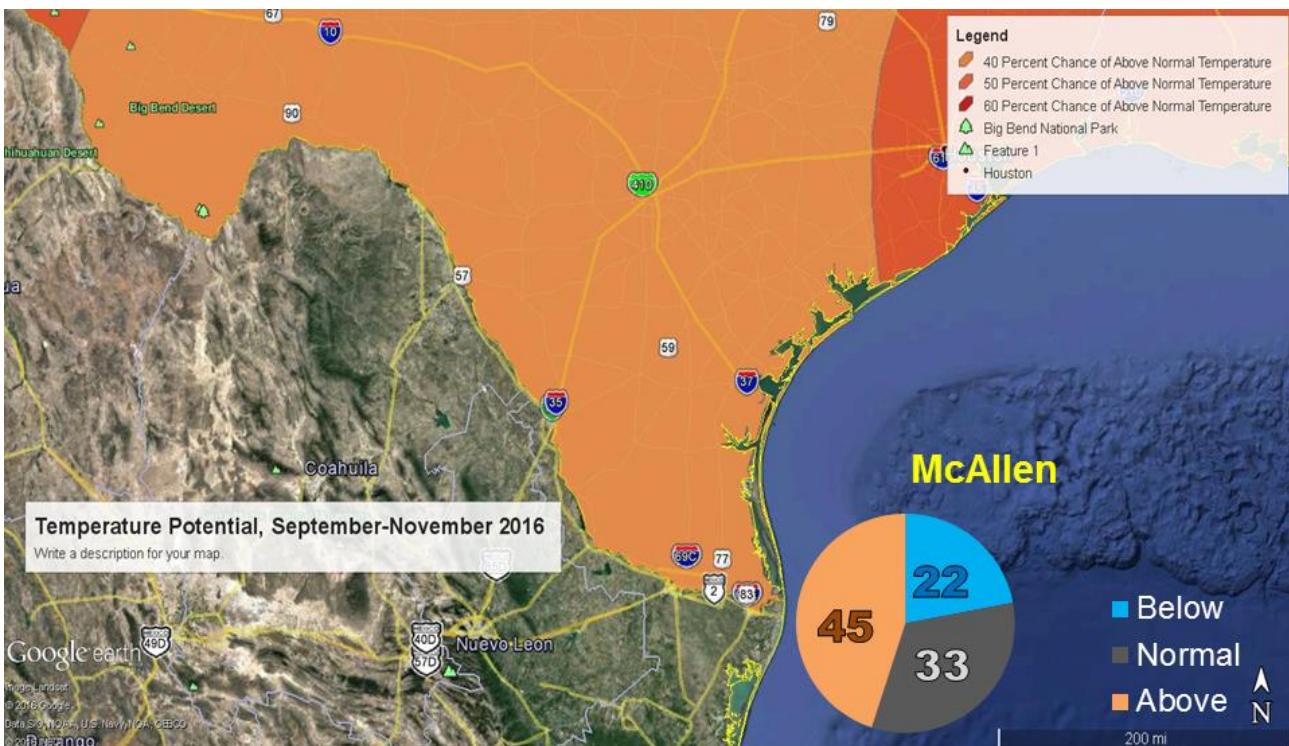


## *Autumn 2016 Outlook*



## **September Swelter...but Limited Rainfall?**

**Dry “Lean”, Warm Lock Could Spell Worsening RGV Autumn Drought**

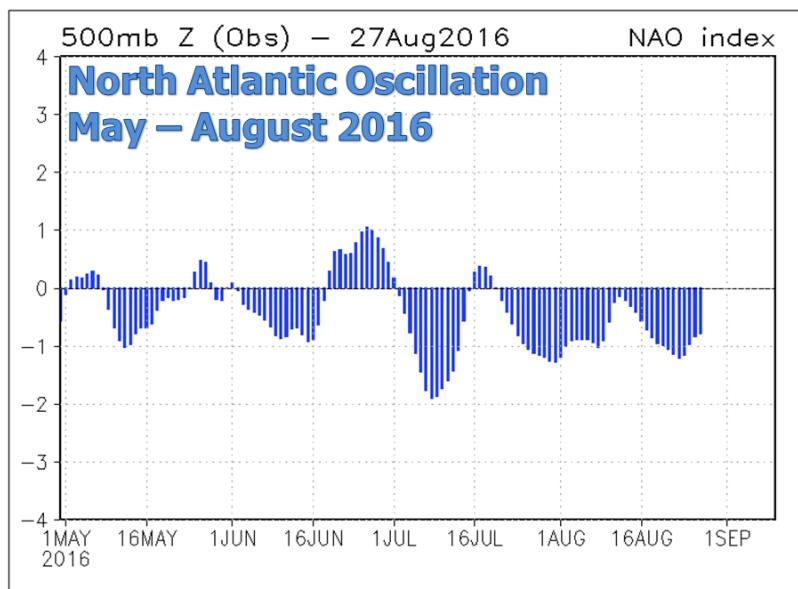
After a [July](#) that rivaled 2009 for the Valley's hottest, August 2016 paralleled [2009](#) for nearly all of the month with temperatures falling just below the 2009 benchmark. Rainfall was scarce for most of the Valley population until the very end of the month, but the ranchlands north and west received welcome and even flooding rainfall “hits” on successive Saturdays on [August 13 and 21](#). The autumn 2016 forecast is fraught with uncertainty, but confidence is high for a **warmer** than average season, and had increased for a **drier** than average season. The rainfall forecast (not shown) from the Climate Prediction Center was for “Equal Chances” (roughly 33.3% for above, below, or near average, which ranges from 6 to 9 inches in the Upper Valley and Rio Grande Plains to 9 to 12 inches elsewhere for the period. September is critical to the value, as monthly rainfall averages account for half of the full season (September through November) and are by far the highest of the calendar year.

### **Teleconnections**

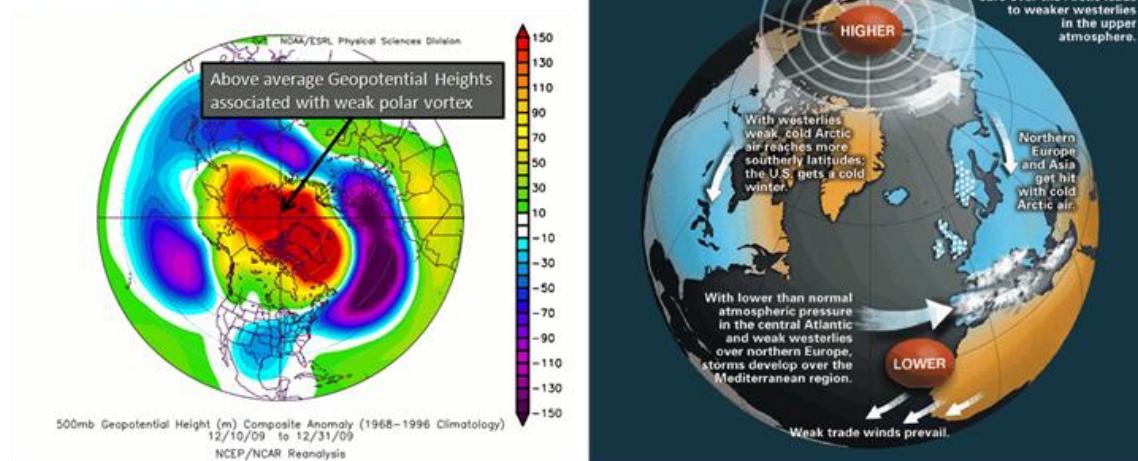
Since the [August to October Outlook](#), the probability for a weak La Niña, had solidified as the temperature departures continued to only “hug” the equator while a western Pacific “warm” response had yet to materialize. The lack of a well-defined La Niña signal and more of a slightly negative neutral value (below), in a sense, takes this teleconnection out of the mix as a reliable predictor for Rio Grande Valley outcomes, particularly for rainfall and the potential of a tropical cyclone. Therefore, we look to other teleconnections to help guide the peak of the Atlantic Hurricane Season period forecast.

The [North Atlantic Oscillation](#) remained solidly in the negative phase (-NAO) through summer (below). While the impacts of both +NAO and -NAO on sensible weather trends tend to be minimized in summer due to local or regional (known as “mesoscale”) events, there *may* be a shadow effect on the atmospheric steering pattern that is similar to what occurs during the cool season. As summer fades to autumn, the continuation of the -NAO beyond the peak of the 2016 Atlantic Hurricane Season would tend to favor general upper level troughs on or near the east coast – troughs which steer tropical cyclones back into the Atlantic or allow some to sneak onto the U.S. east coast, such as Irene in 2011. When the east coast trough is more dominant, residue from the “Canicular” ridge across Texas and the southern Plains to effectively “pinch off” the track of southernmost cyclones to move across the Yucatan Peninsula or Belize and ultimately landfall in Veracruz (southeast Mexico), too far for any impact to the Rio Grande Valley. This indeed occurred with Hurricane Earl to begin August, and could be a factor in September cyclones in the western Caribbean. As of this writing, several cyclones were in the Atlantic Basin; Major Hurricane Gaston was in the central Atlantic, well away from land and two other cyclones were expected to steer well east of Texas.

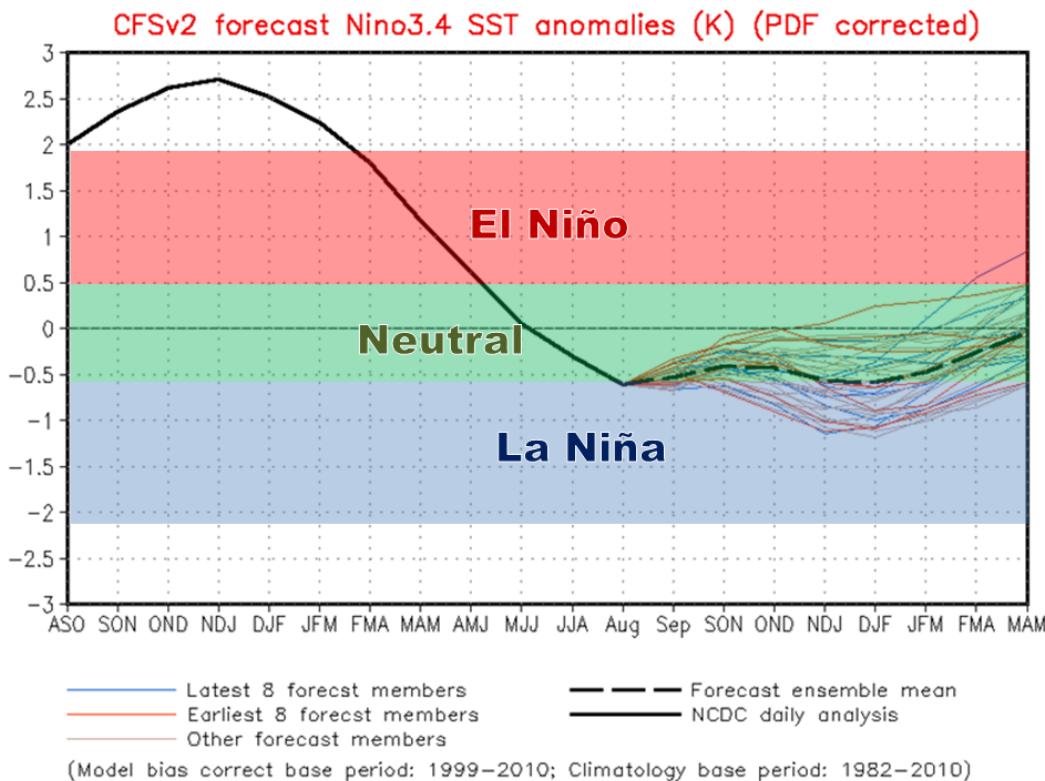
Beyond the tropics, however, is the potential impact on the steering pattern that a persistently -NAO may have as the autumn progresses. Will a periodic east coast trough “bump” up the southwest U.S. ridge? If this ridge extends farther east, the outcomes across the Rio Grande Valley and northeast Mexico would be a less intense version of summer’s “La Canícula” pattern but with analogous outcomes: Warmer and drier than average weather on the whole.



Negative Phase – Leans Toward Drier Pattern  
(and can close/block the door to tropical waves and cyclones in the Gulf)



The [Pacific-Decadal Oscillation](#) remained positive through July 2016, but appeared to begin trending toward a neutral value. Should the PDO continue to trend down, it, combined with the “neutral-leaning-negative” El Niño Southern Oscillation, would decrease confidence in the predictability for an atmospheric river of moisture similar to [October 2015](#) which dumped rainfall that landed many Valley locations in the top five wettest, in some cases through more than 100 years of record. Unknown is whether this puzzle piece helped with the welcome September rains during a *neutral phase* ENSO in September 2013 and 2014 – and could help again in 2016. The persistent –NAO combined with the lean toward a weak La Niña suggest September 2016 may struggle to achieve even an average value; typically drier weather that follows the season’s first notable cooling may be the dominant story for October and November 2016.



### **ENSO: The Great Unknown?**

By late August, the weekly Oceanic Niño Index remained just into La Niña in the primary zone of the equatorial tropical eastern Pacific Ocean (-0.5°C; -0.5°C begins the La Niña condition), and a leveling off in the weak category was most likely. What might that mean? Putting the puzzle pieces together *may* offer a clue. If we assume the negative trend in the NAO continues through autumn, the combination of the weak La Niña with the –NAO should lead to **drier** (and still warmer, as predicted) than average conditions.

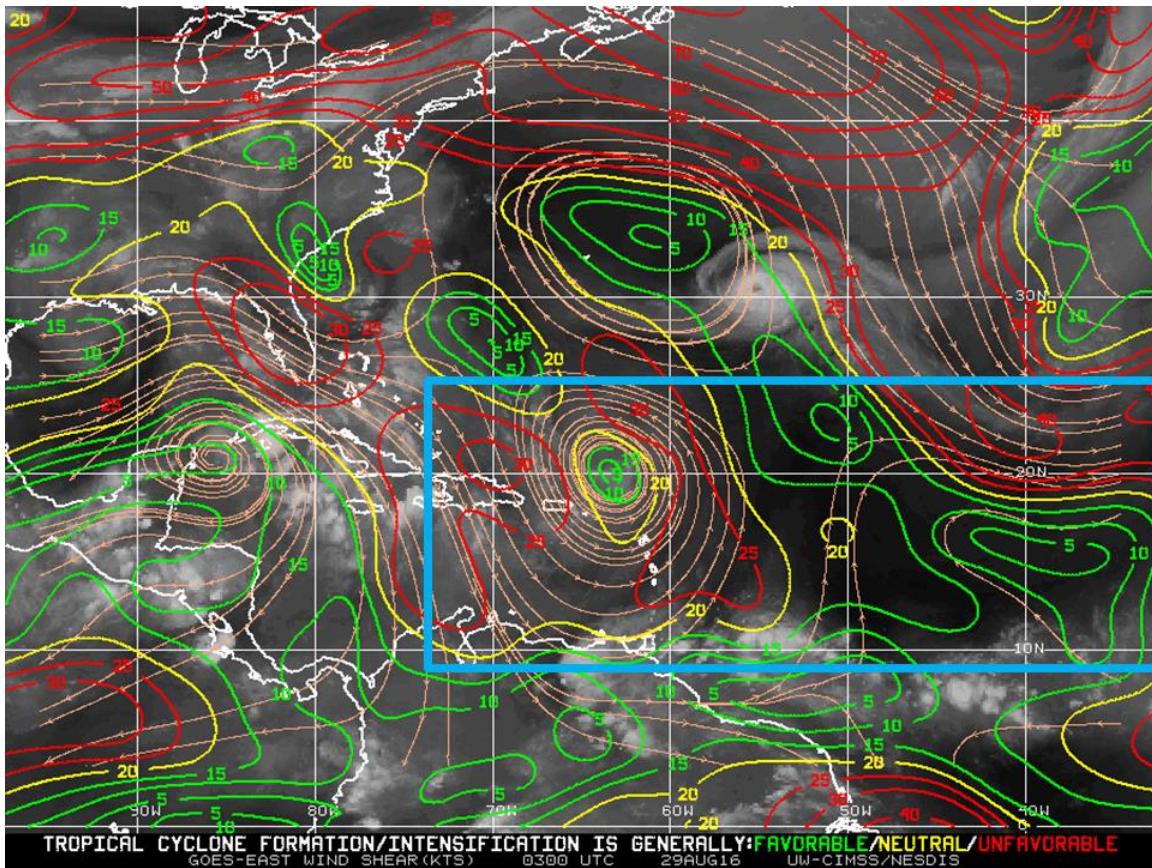
With all of this in mind, we are “leaning” toward slightly below normal rainfall for the autumn 2016, with September the critical month, as a significantly drier than average September (for example, 2 to 4 inches rather than 4.5 to 6 inches) would virtually lock up the drier three month period.

### **The Big Wild Card: September Tropics**

By the end of August, the Atlantic and Pacific basins were filled with tropical cyclones. The Pacific continued to achieve high, aided by very warm waters *north* of the El Niño equatorial zone as well as abundant deep moisture and low wind shear. At the end of August unofficially, there had already been 14 named cyclones, 7 hurricanes, and 3 major hurricanes – already in forecast “normal” range. A full two months of potential activity remaining virtually guaranteed yet another above average season by the end of October. The Atlantic could be summed up as: Active, but Failing to Launch. Excluding January’s Alex, by the end of August there were likely

eight additional named cyclones on the record, but only two hurricanes (Earl and Gaston) and one major (Gaston). Despite the lack of El Niño, wind shear remained a recurring issue that held back development from many of the August cyclones.

The question remained: Would low wind shear and sufficient moisture be available at some point in September across the Gulf and Caribbean to feed a tropical seed into a large and wet tropical storm or hurricane – one that would change the course of potential drought worsening across the Rio Grande Valley and other pockets of East, Southeast, Central, and South Texas? Would the track thread the needle similar to Beulah, Allen, and Dolly? There was no question about the availability of fuel; at the end of August, the Atlantic, Gulf, and Caribbean waters were plenty warm, with all areas between 1 and 3°C (2 and 6°F) above average. But pockets of dry air and vigorous wind shear in the main development region remained a hindrance in some cases (below).



Above: Mean wind shear across the western part of the main development region (blue box) as of August 29, 2016. Red areas indicated >30 knots of shear, which typically is strong enough to limit or reduce the ability of tropical cyclones to form, grow, or survive. Mixed pocket of low, medium, and high wind shear prevailed across the region, along with dry air. Hurricane Gaston (upper center) found the “sweet spot” of low wind shear and ample moisture to become the 2016’s first major (111 mph or higher).

## Outlook: September to November 2016

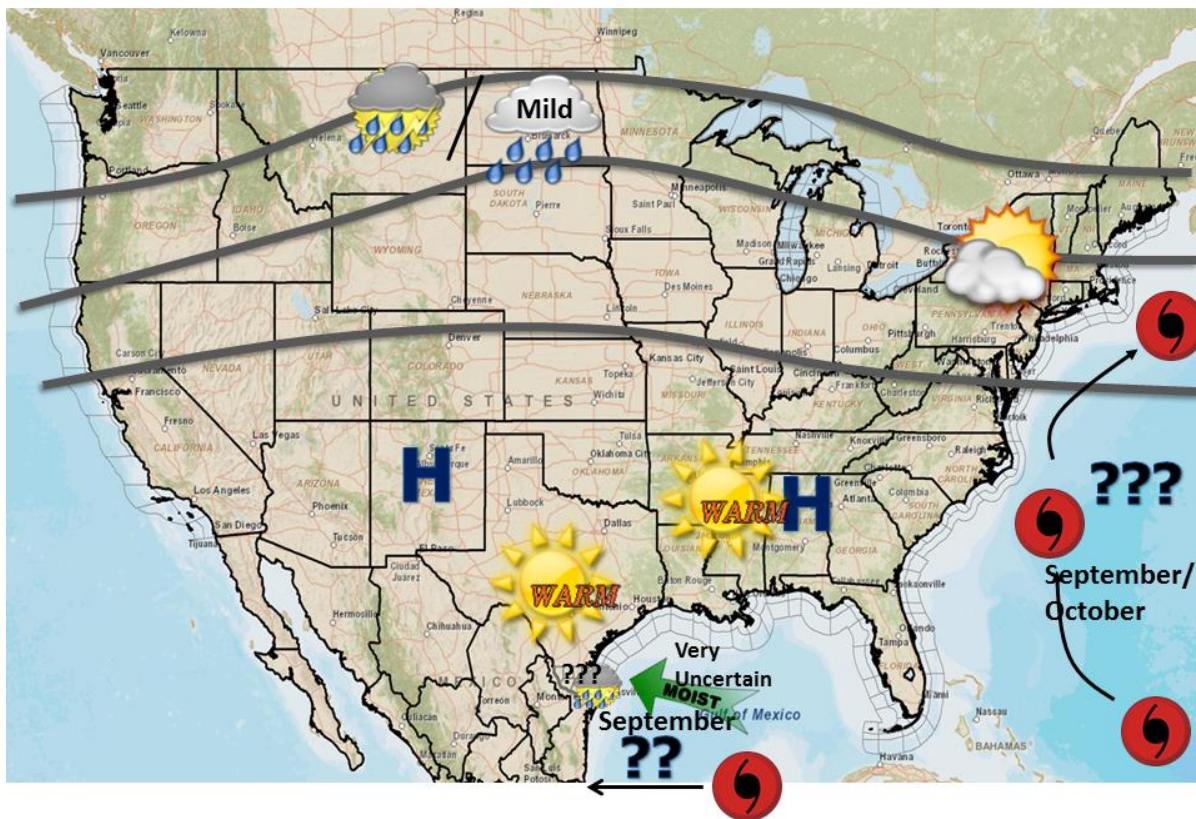
**September** remains the big wild card and, for rainfall, will determine the sense of the season. As hinted at in recent outlooks - conflicting puzzle pieces (-NAO, high wind shear, inconsistent deep atmospheric moisture) could maintain the “shadow” La Canícula and shunt the best tropical moisture into places like Veracruz and the southern Yucatan, as well as the eastern and northeastern Gulf. This scenario had “legs” for the first half of the month based on the consensus of global models; multi-model consensus for the three-month period was leaning toward slightly drier conditions as well. We can never rest easy in September; just one storm threading that needle to the Valley would change everything for September and beyond.

**October** continues to lean dry and warm, especially after the time of the first significant drying front, which can come as early as the end of September and as late as the end of October. The caution this year continues to be the very warm Eastern Tropical Pacific and the potential for a few cyclones to develop into October –

cyclones that often get “picked up” by the descending jet stream and turned northeast into south central Mexico and ultimately could leave remnants in Texas. Hurricane Patricia’s [remnants](#) were a classic example in 2015 and left parts of the Valley underwater for several days to weeks. Rainfall from Patricia alone across parts of Starr, Hidalgo, Cameron, and Willacy was an entire month’s worth, in less than a day. That said, the probability of the persistent south/southwest steering flow is lower in 2016 than 2015, with the combination of a weak La Niña, -NAO, and possibly lowering PDO values to favor more atmospheric ridging across the southwest U.S. and northern Mexico.

**November** should favor fairly non-descript weather on the whole, but individual changes common during the month are likely. Rainfall should be limited even in cases of change but the potential for pre-front thunderstorms dumping more than an inch of rainfall has to be considered. The most common change would be late summer-type heat being wiped out by a chilly cold front, which could drop temperatures more than 30 degrees in several hours. Often, these fronts are followed by cool and drizzly weather and can line up with Thanksgiving weekend.

## September-November 2016 Pattern Possibilities



**Above:** Expected average atmospheric steering pattern for September through November. Confidence is high for above normal temperatures. Rainfall across the country may be rather scarce, but confidence is lower. Tropical activity may “lean” toward tracks along the U.S. east coast or missing altogether; Caribbean/southwest Gulf tracks would favor tracking well south of the Valley. How much moisture can circulate around the high pressure cells (blue H) especially in September will depend on how much area they cover. Ridges extending into south Texas and north Mexico would tend to press the cyclones south, as has been the case in recent years.

### Preparedness, Awareness

Should September rainfall fail to materialize, drought will spread across the Valley from west to east, and the combination of abundant wildfire “fuel loading” of grasses and brush with periodic low humidity and gusty winds that was an issue from late July through mid-August could become an issue in autumn, particularly in the Lower and Mid Valley where late August rains were paltry. From the King Ranch through the South Texas Brush Country, a prolonged period of warm, dry autumn weather could quickly dry out new growth from August and modest September rains, setting the stage for drought conditions to return. As September goes, so goes the Valley’s available surface and soil moisture. September through October require a working flood safety

plan; any period of deeper tropical moisture surging across the Valley can bring local nuisance to life-threatening flood threat in just a few hours – including from the “one-off” local thunderstorm system, similar to the close-out event that slammed west Brownsville on [August 31, 2015](#). And, with hurricane season in full swing through early October, we remind everyone to be ready. Be responsive. Be resilient. Be [#HurricaneStrong!](#)

- **Wildfire Spread.** The drying of “long period” fuels such as brush and trees (mesquite, live oak) had led to an Energy Release Component near the 15 year maximum for the Lower Valley and parts of the mid Valley before some mid to late August rain relieved conditions a hair. Conditions were relieved more significantly across the ranchlands of Jim Hogg, Starr, and Zapata County by the end of August. However, the additional fuel loading could become critical *if* September ends of drier to much drier than average and October/November become drier still with lower humidity and wind. Moderate drought in the Lower Valley will worsen by October if rain is sparse in September and wildfire spread threat will pick up with it, especially following dry ‘northerns’ that start to appear in October. While a repeat of 2010 is not quite anticipated, it should be a cautionary tale: Record water year (October 2009-September 2010) rainfall was followed by dry, warm, and windy weather from October-November 2010, and several thousand ranch acres burned in southern Brooks and northern Hidalgo County as early as the first week of December. Farmers and ranchers should continue to follow safety precautions, including parking vehicles on dirt or pavement, not driving them in high grasses on dry, windy/breezy days, and refraining from using welding/grinding equipment in or near high grass/brush. [Be Firewise!](#) Remember, [only you can prevent wildfires.](#)
- **Flooding Rain.** Even with a “lean” toward a drier September and October, the possibility of one or more slow-moving torrential rain events, more than likely involving thunder and lightning, remains a concern. Already in 2016 (as of June 25<sup>th</sup>), 58 persons have drowned, nationwide, in floodwaters – including 29 in Texas. Here are several tips to help you get and stay ready for what is among the wettest periods of the year (September, possibly into October):
  - It's always a good time to check roofs and walls for leaky areas and repair; a dry July will provide the opportunity, as long as you keep hydrated and take frequent breaks.
  - Anytime is a good time to remove any debris from gutters and downspouts.
  - Speaking of debris - after trimming brush and cutting grass, be sure to remove it and never clog drainage ditches or canals!!
  - Take note of your daily drive, and recollect when flooding forced you to take an alternate route. Know those routes ahead of time for you to make a smart decision and not trap your vehicle in floodwaters. Remember, turn around – your life is worth more than impatience!
  - It is never too late to purchase flood insurance. Can your home or neighborhood handle the next Beulah (15 to 25 inches of rain in less than a day)? If unsure, it's always a good time to get peace of mind. Remember, insurance policies take 30 days to trigger.
    - [Flood Safety Awareness](#)
    - [Federal Alliance for Safe Homes Flood Resiliency](#)
- **Tropical Readiness.** It's never too late to revisit your hurricane action plan and restock your family's “stay” or “go” kit, as well as improve your home or business resilience by checking roof connections inside and out, walls and doors for leaky areas, window coverings, foundation seals for leaks, and so much more. It's been six years since a significant impact on the Rio Grande Valley. Another hurricane will “land” nearby and produce significant to catastrophic impacts, someday. That day could be any year, including 2016. Dry July days give you the opportunity to do all of this. But the window for preparedness may close, if August and September get “serious”.

Learn how with our most recent Rio Grande Valley Hurricane Guide, in [English](#) and [Spanish](#). Or, check out videos and other helpful tips at <http://hurricanestrong.org>, your one-stop shop for being ready, responsive, and resilient should this year be our year.