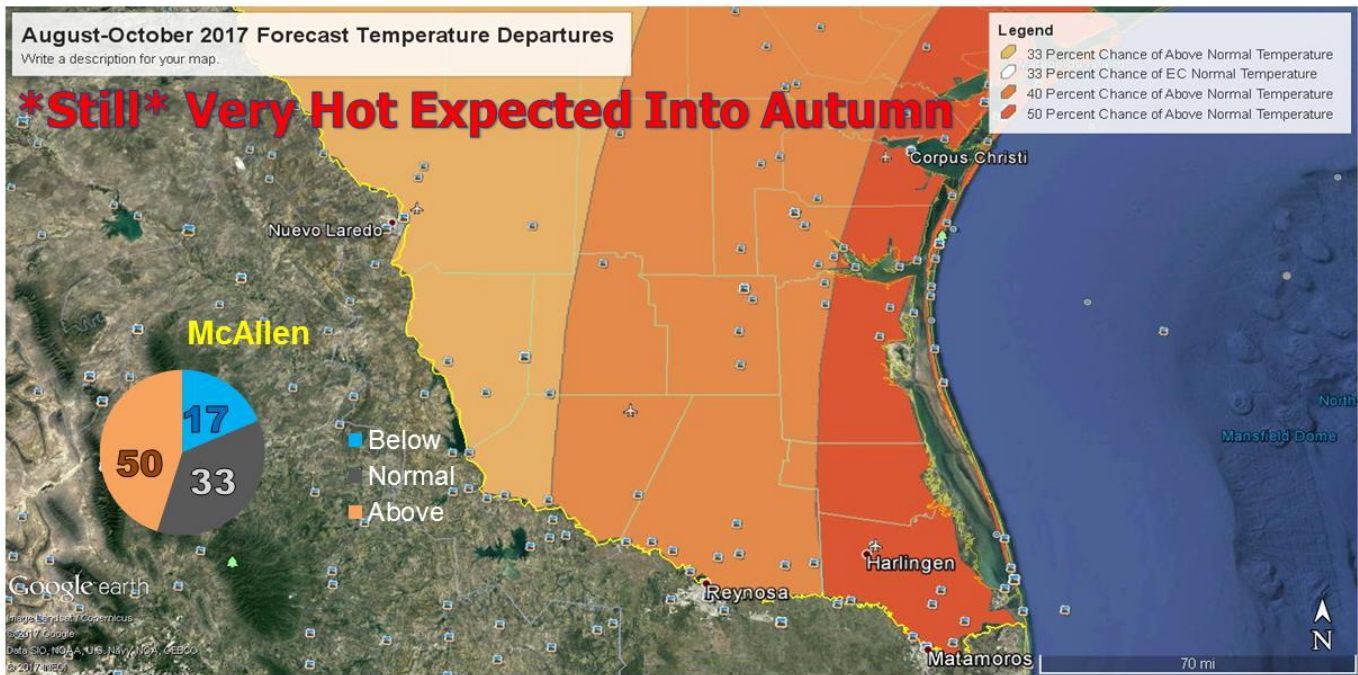


RGV August-October 2017 Outlook



Based on
1981-
2010:

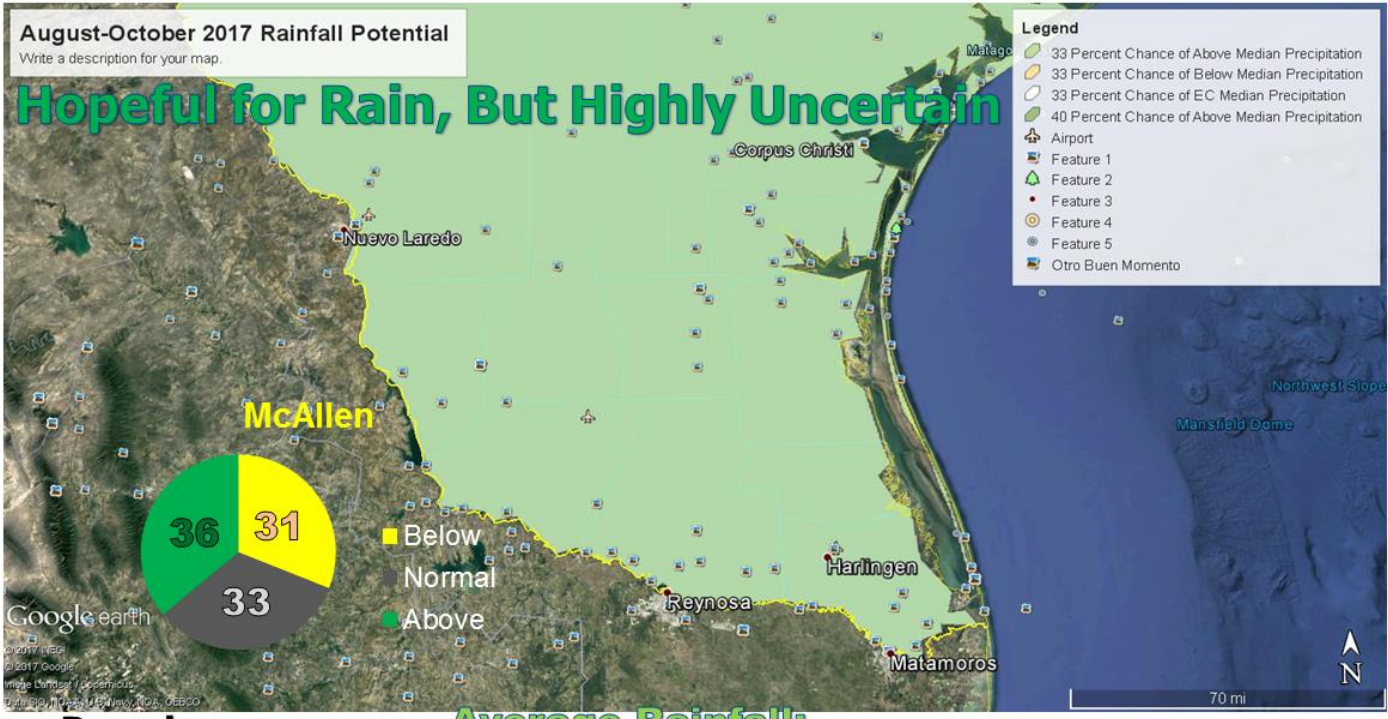
Average Afternoon: 88° Beaches, 90° Lower Valley,
94° Mid-Upper Valley
Average Wake-Up: ~75° Beaches, 72 Lower/Mid Valley, 68 Ranches

Record RGV 2017 Heat to Continue Into Early Autumn... But Rainfall Forecast Remains Very Difficult For Annual Peak Season

Tropical Forecast Remains Highly Uncertain; Drought May Worsen

Overview

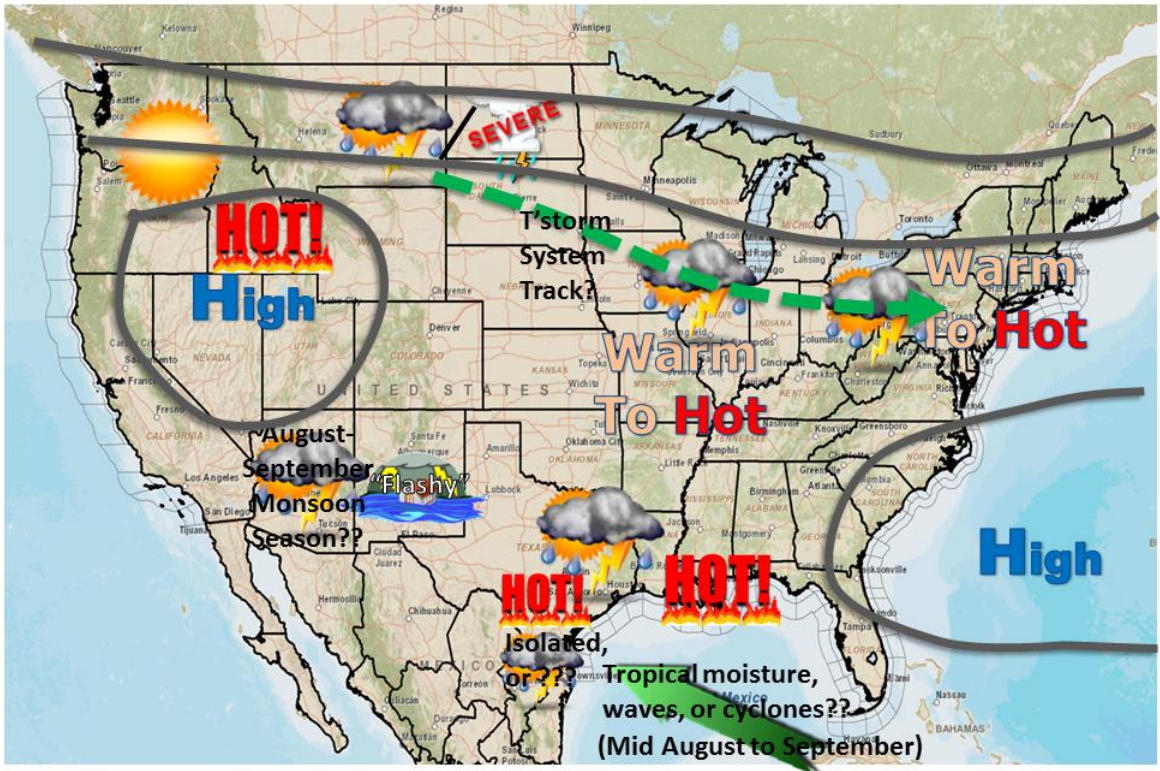
July 2017 largely continued where June left off: Hotter than average with only spotty rainfall that left most of Deep South Texas and the Valley between 10 and 50 percent of the monthly average (2 to 2.5 inches, in general) with few exceptions (western Willacy, parts of the Rio Grande Plains, and Greater Brownsville). “La Canícula” indeed dominated July – but whether it can continue to be dominant in August and into September (see Pattern Matters, below), the expectation (45 to 55 percent chance) of above average temperatures (only 15 to 25% chance below) suggest plenty more opportunity for triple-digit afternoons especially along and west of US 281/IH 69C through August and probably for a few days in September as well. By the end of July, McAllen/Miller Airport would likely have seen 54 days of 100°F or higher in 2017, easily within striking distance of the number 2 all-time mark (78, in 1998 and 2009) if La Canícula reigns deep into August. Outside of a significant pattern shift or a significant rain-making tropical cyclone towards the start of the peak of the Valley’s tropical season (i.e. around or after August 1), heat and humidity along with a frequent return to the “Valley Wind Machine” (breezy south to southeast winds) will continue well into August. September is often a “wild card” and climatology shows the month as the wettest, by far, on average – but this climatology is dictated by the general dominance of the Bermuda (vs. Canícula) ridge and an open door to tropical moisture, waves, or cyclones from the moisture-rich Caribbean and southern Gulf of Mexico. In 2016, vestiges of La Canícula remained and were critical in keeping rainfall below average across the region. This could remain case for the entire late summer period, despite the favorable forecast for **above** average rainfall (next page). Confidence – even as August neared – was low to very low in exactly how September would play out. And, as September goes could be how the Valley’s water supply goes – as hints of a late autumn 2017 and winter 2017/18 La Niña (or “leaning” La Niña) would favor drier than average rainfall at that point.



**Based on
1981-
2010:**

**Average Rainfall:
7 to 9 inches West
9 to 12 inches East**

This Steering Pattern, August-October 2017?



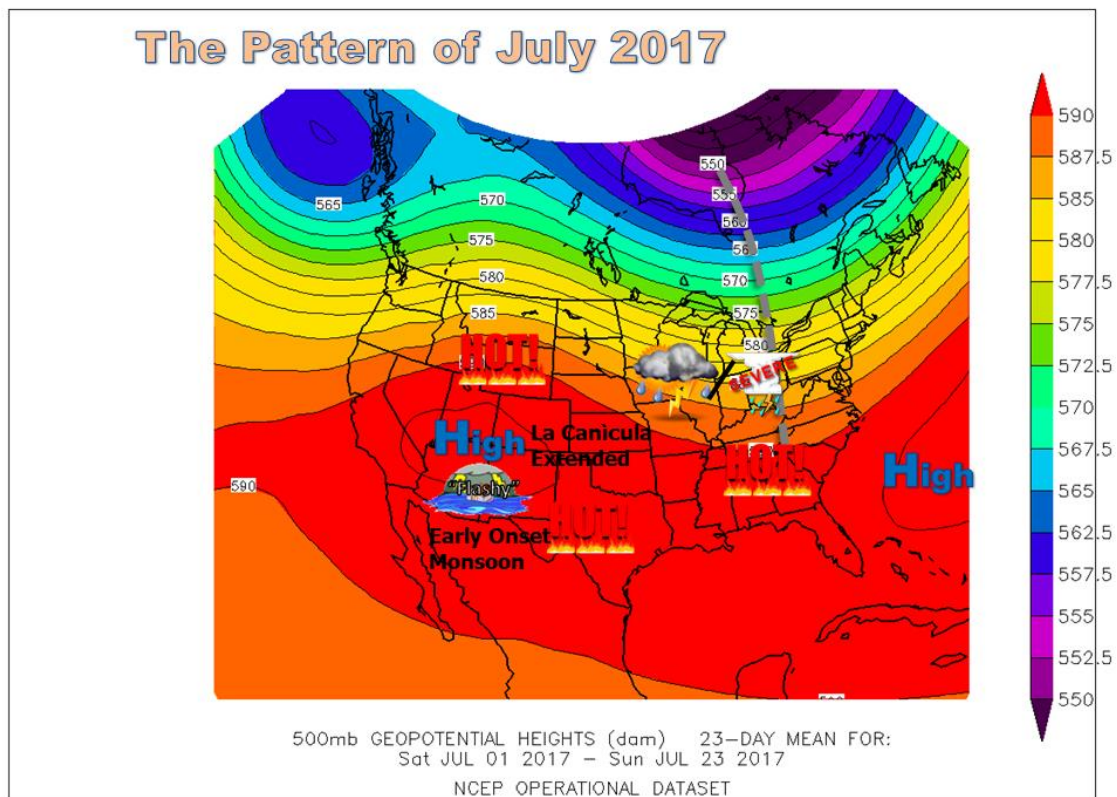
Pattern Matters

Possibility A: Canícula Recession (previous page)

The hot and (still) wet forecast for late summer 2017 is predicated on the forecast steering pattern, above. This would favor equal impact from a receding La Canícula ridge and an encroaching Bermuda ridge (High centered over/east of the Carolinas), with a “weakness” between the two which would allow deep tropical moisture to “shoot the gap” and take aim at coastal Texas and Louisiana with enough rainfall to keep values near or above the typical lower averages for by mid-August, then a more open door for heavier rainfall by September – bringing the three month totals above the 9 to 12 inch normals for the season. Unfortunately, *confidence* in this outcome remains low – if not **very** low – and July, 2017 (below, through the 24th) was just one example of why the confidence is still low; initial 0.5 (half month out) long-lead forecasts were for above average rainfall, Valley-wide; the update (issued on the last day of June) dropped this back to “equal chances” (~33 percent for all possibilities) and the reality – with the exception of pockets in western Willacy County, around Greater Brownsville, and Zapata County – was the aforementioned 10 to 75 percent of the 1981-2010 average (below, through the 24th).

Possibility B: Canícula Sustenance (next page)

Sometimes, persistence is the best forecast. La Canícula did not recede through the summer of 2016, even as a southward displaced western Atlantic ridge “linked up” with the parked ridge over southwest Texas/northeast Mexico. In June and July 2017 (below), the southwest US ridge shifted a bit northward, opening the door to Monsoonal moisture flowing through central and northwest Mexico but clamping the door shut on any widespread moisture over south Texas with the southeast extent of the ridge. If the July pattern dominates into August or beyond, two things will occur:

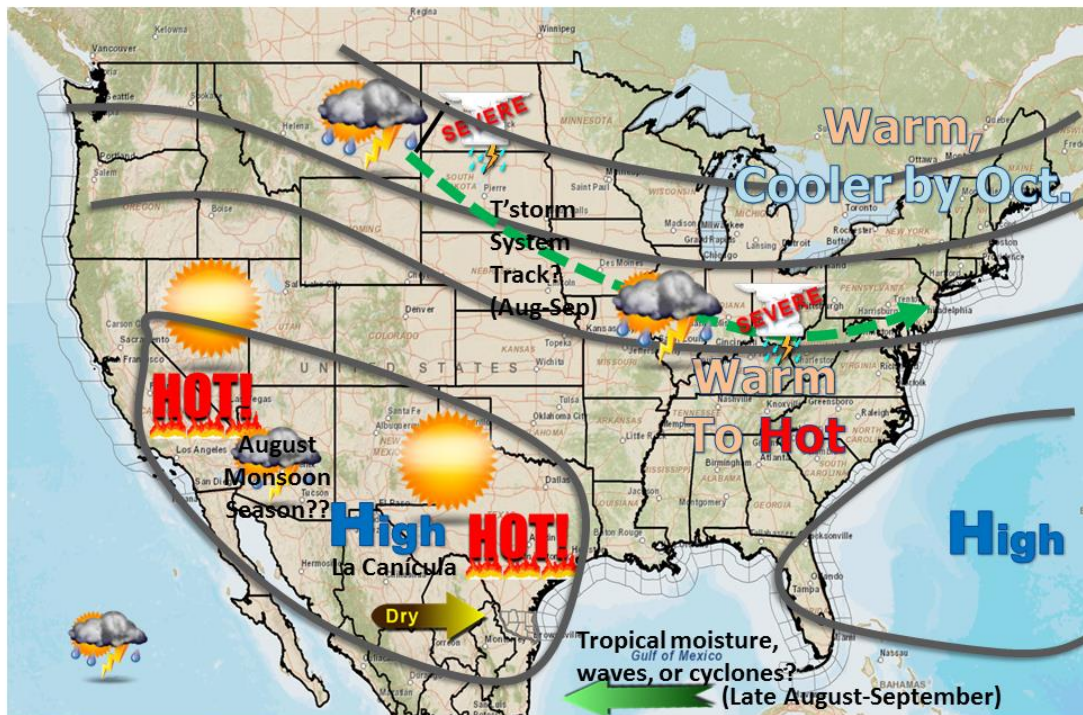


- Dry and hot to very hot air will be dominant underneath the ridge, including the Rio Grande Valley, which would suppress rainfall to below the August average
- A continuation into September would sharply reduce rainfall totals across the Valley, on average, to one-half or less (for example, 2 to 4 inches rather than 4 to 6 inches)
- Tropical moisture, waves, and cyclones would be directed from the Caribbean into southern Mexico (i.e. Veracruz rather than Tamaulipas)

This was largely the situation in [2016](#), where the northwest Gulf (Texas coast) was void of any direct peak-of-season landfalls, and the nearest approach to the Valley was from [Tropical Cyclone Earl](#), which was steered into Belize and hugged the northern coast of Mexico along the Bay of Campeche before creating killer floods and mudslides in Veracruz and Puebla, where scores died. In the “gap” between the weaker western Atlantic ridge extension and Canícula, Hurricanes Hermine (eastern Gulf) and Matthew (along the east coast of Florida) tracked, causing nearly \$16 billion in total damage from the Caribbean to the U.S.

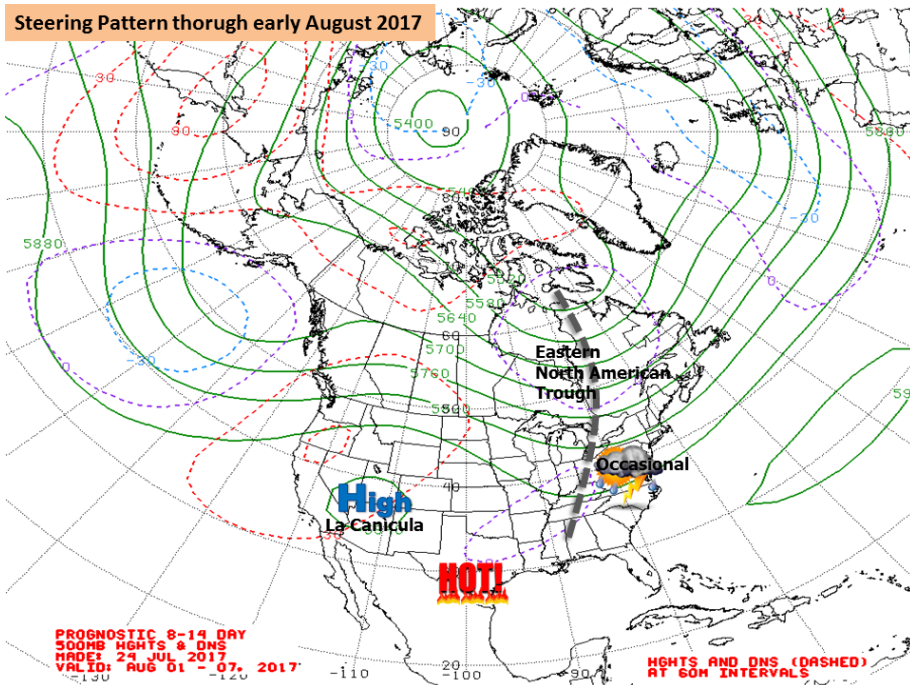
As of this writing, confidence in Possibility B is medium – higher than Possibility A, but still uncertain. As is the case in any summer, just one period of a wet pattern can tilt the seasonal precipitation to *above* average in a hurry. This occurred during a brief period in mid-July (11th-14th) where areas mentioned above received the balance of their rainfall.

Or THIS Steering Pattern, Still??



The Wildcard: September and the Tropics

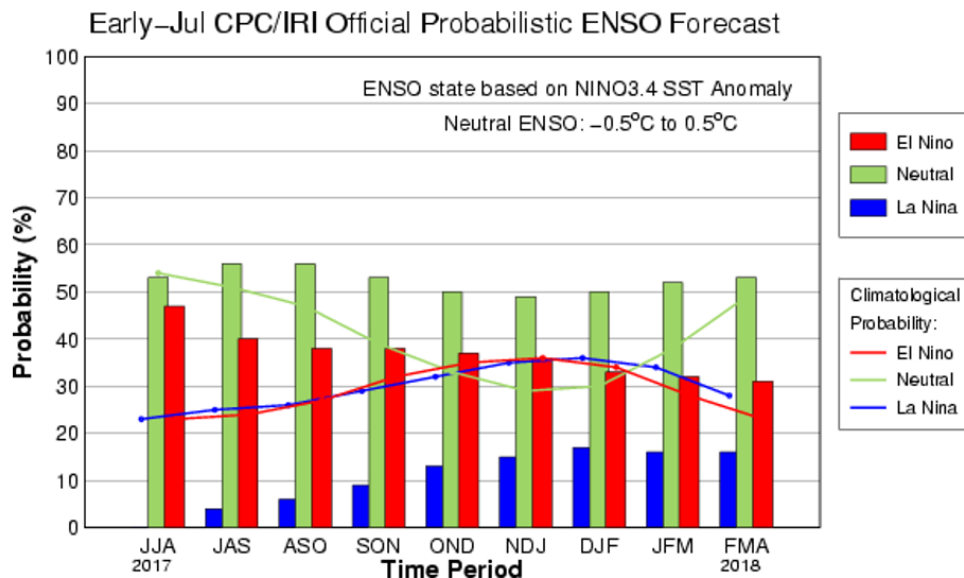
September in most years is when average rainfall spikes to between 4.5 and 6 inches, Valley-wide – and when the Bermuda/western Atlantic ridge typically “takes over” and opens the door to the necessary tropical moisture to produce multiple events of locally heavy rainfall, whether or not a tropical cyclone is associated. In 2016, Canícula held forth and rainfall was just 25 to 75% of these averages (except in Zapata County). This could be the case again in 2017, especially if the forecast through early to mid-August (below) verifies, and extends into late August or September. However, with some puzzle pieces still in place for a more active tropical season, including a neutral El Niño/Southern Oscillation (ENSO), warm Atlantic Ocean temperatures, and a mixed opportunity for low wind shear in the Caribbean and Gulf, the northwest Gulf will need to be on the lookout for bigger rains – especially if Possibility A (above) pans out. Stay tuned, but as always, be prepared for tropical moisture that could produce flooding rains from mid-August through the end of September, as always.



Above: Forecast steering pattern (~18,000 feet) through August 7, 2017. In general, this pattern tends to suppress rainfall in New Mexico, Texas, and northeast Mexico and press down tropical moisture in the southwest Gulf/Bay of Campeche area.

Teleconnections: ENSO Parked in Neutral?

Through the end of July, ENSO remained a shade below the necessary level to be considered El Niño – but eastern tropical Pacific waters stubbornly remained above average across all four Niño zones. Thus a steady state “neutral leaning positive” phase persisted into July. As shown below, through the peak of the 2017 Atlantic tropical season ENSO is forecast to be neutral with an expected lowering of anomalies to near zero across the critical Niño 3+4 regions (between 170W and 120W longitude), with a positive lean (very low probabilities of an eastern tropical Pacific “cooling” below average compared with “warming” – which is the El Niño phase). Interestingly, atmospheric wind shear remained persistent in the Caribbean through July, though some weakening was noted as August approached, at least temporarily. Perhaps this was a function of the weak but notable eastern tropical Pacific warming for most of spring 2017. Whether this continues into late summer and early autumn, a period when wind shear reaches its low point, is still uncertain at the end of July.



Above: Probabilistic ENSO forecast through early fall 2018 (J), showing neutral conditions as the most likely outcome through summer and fall 2017.

What to Watch For: Late Summer Heat, Worsening Drought. Rain??

Overall, for the remainder of meteorological summer (through August) into September, and likely into October the following situations are expected to predominate:

- *Heat.* The stronger than average Canícula period that persisted through July, continues to be more uncertain after the first few days of August, based on “Pattern A” above which shows some signs of periodic development during August. The Canicular (“Dog Days”) period in any year is from July 3 through August 11, but the associated Canicula-type weather pattern (Pattern B, above) could return later in August. This would ensure McAllen sees at least 15 to up to 25 days of 100°F or more in August, which would end summer (August) with more than 70 days for the city, ranking it among the top five years on record with 100°F days. Heat Index, or “feels like” temperatures, would consequently be higher – though the drier atmosphere would keep them in check and generally ranging from 103 to 109°F. (Valley danger typically begins at around 111°F). While temperatures will be a little lower near the coast, a typical afternoon may see Harlingen top out at 98°F and Brownsville at 93 to 95°F – in all cases, 1 to 2 degrees above average by day. Sultry mornings in the upper 70s to around 80 would be some 2 to 4 degrees above average – similar to long periods during the summers of 2015 and 2016. September will highly depend on whether the tropical moisture window opens and remains open, and October is very difficult to handicap for two reasons: 1) Will a shadow or Canícula return, as it did in 2016, or 2) will a rogue Pacific tropical cyclone be able to move northeast into Mexico and eventually portions of Texas, and link up with a late month cold front to drop several inches of rain across the Valley?
- *Drought.* Additional heat with little to no rainfall increases the stress on Valley/Brush Country grasses, trees, and brush. Some rain in July kept the drought increase modest, but at the end of July, a persistent area of moderate drought (known as “D1”) continued along the Rio Grande in western Cameron and the populated areas of Hidalgo County. A dry, hot August would ensure expansion of moderate drought with potential for severe drought in some of the more agriculturally-rich Rio Grande Valley areas. The future of any August drought expansion would then rest heavily on whether September plays out as “normal” (wettest month of the year) – or relatively dry, similar to 2016. A “wet-Tember” would eliminate most dry and drought areas.
- *Tropics Watch.* The seasonal Atlantic Basin forecast remained slightly above average – with a 45% chance for an above average number of cyclones (11 to 17 vs. 12), hurricanes (5 to 9 vs. 6), and major hurricanes (2 to 4 vs. 2). As of this writing four weak tropical storms (Arlene, Bret, Cindy and Don) had already occurred, but the total [Accumulated Cyclone Energy](#) Index was a paltry 3.1; Cindy had most of its rainfall/flooding impacts from an atmospheric “river” of deep tropical moisture channeled to the east of the center. Western Gulf action requires the following elements, or “puzzle pieces” to fall into place:
 - *Pattern.* Canícula locks down the western Gulf by providing subsidence (dry air) and a steering pattern that brings any cyclone moving west from the Caribbean on a westward track into central America, the Yucatan, or Veracruz. Canícula will have to break persistently in August to allow any cyclones to nudge into the southwest or western Gulf and make a direct or nearby strike. September is typically the best month for deep tropical moisture and a favorable steering pattern – and there’s a slight lean away from this outcome.
 - *Wind Shear.* Caribbean wind shear, as of this writing, remained somewhat stubbornly hostile, particularly across the southern half of the Main Development Region (generally from 8°N to 23°N latitude and west to around 72°W, or along the line of Hispaniola). The evolution of wind shear through summer is unknown, though a strong Canícula ridge can be part of a pattern that continues to favor upper level troughing to the east, with an increased amount of wind shear that can remain in the tropics and subtropics, including much of the Caribbean and western Atlantic. There remains uncertainty on the evolution of wind shear by late August and September.
 - *Moisture.* Wind shear dominance can also come with a dearth of moisture. And, there’s always the unknown strength of Saharan Desert dust storms (and movement) from east to west which

can add more dry air into the mix across the eastern through central tropical Atlantic, reducing the ability of African waves to develop particularly from late July through August.

- *Sea Surface Temperature.* This is one element that is expected to be “high octane gasoline” for any tropical engines that develop and move across the favored areas of the Gulf, Caribbean, and western Atlantic. Temperatures were up to 2 to 2.5°C (4 to 5°F) above average at the end of July in the Main Development Region, and 0.5 to 1°C (1 to 3°F) above in the Gulf and Caribbean, and the only changes would result from tropical cyclones or other disturbances that upwell the cooler water from below (through September) and any early cold fronts (October, mainly for the north/northwest Gulf). Time will tell.

Outlook: Late Summer/Early Fall 2017

August should begin where July leaves off, but uncertainty develops by mid-month as it typically does when trying to forecast teleconnections and combine with the ability of the tropics to maximize moisture availability. For now, the “lean” is to remain dry and hotter than average, with increasing uncertainty on whether Canícula shifts to a Bermuda high at various points and opens the door for deeper tropical moisture in any form. That situation would favor the second half of the month. Teleconnections, such as the [North Atlantic Oscillation](#) and the [Pacific North American Oscillation](#), could be key to unlocking the potential for more rain – or not. An initial trend toward the negative NAO (-NAO) into mid-August would favor lower rainfall and continued heat – an extension of July.

September is always the wild card, and no more than in 2017. Given the amount of neutrality with nearly all of the teleconnections, predicting whether La Canícula reigns, or the western Atlantic/Bermuda high “rains”, remains very difficult to handicap at the end of July. The lean here is for Canícula to still have a shadow influence in September, which would favor at least pockets of the Valley below the 4.5” to 6” 1981-2010 average – an unchanged prediction from June.

October hints at a developing “cool” phase of ENSO – or neutral leaning cool. Such a pattern would tend to favor a “shadow” La Canícula (southwest US ridge receding into northwest Mexico) that would keep, or return (if September sees a break) the dry and generally warm to hot pattern to the Rio Grande Valley once again. One thing to watch is the westward extent of the ridge. An extension toward Nevada and the Sierra mountains of California could allow intrusion of cooler air to push southeast around the ridge, with a mid to late October front of note (sharp temperature change and the end of the persistent humidity) which could bring temperatures back toward average (low to mid 80s by the end of the month).

Preparedness, Awareness

The forecast is confident for a hot August-October, and slightly leaning toward dry versus wet weather for the same period. Still, uncertainty increases to close August as well as the expectation for a slightly above average Atlantic tropical cyclone season makes the first half of August more “bonus time” to finish up revisiting, reassessing, and restocking hurricane/tropical supply “stay” and “go” plans and kits, make your home or community #hurricanestrong, and purchase wind and flood insurance well in advance of any possible strike. Take advantage of the expected quiet period for the first half of summer, at least.

- **Heat and Hydration.** July kept the heat beat going, without some of the record spikes that were seen in late June. Several days in the month had heat index, or “feels like” temperatures, flirt with or briefly exceed 110°F, and more such days are likely to prevail through the first half of August, if not longer. Though September is a wild card, a hot pattern or another tropical cyclone tracking into Louisiana can bring a heat spike, similar to what occurred with Cindy this year in June, and more appropriately with [Tropical Storm Lee](#) in 2011. Residents should continue to follow heat safety tips, found on our local [heat awareness page](#) and the NWS [national page](#). Most importantly, remember to Look Before You Lock your vehicle, especially as more people will be out and beginning the back to school shopping season.
- **Drought Severity.** The last of summer and first of autumn could remain dry – and a lot may hinge on September achieving at least normal rainfall. With ENSO hinting at leaning toward negative values (lean toward the drier La Niña in fall and winter), it may become an autumn to revisit two important “-ations” of

the Valley's complicated water use system: Those include smart **irrigation** and **conservation**. The persistent extreme to exceptional drought of 2011 to 2013 demonstrated to the Rio Grande Valley that one year's feast (the 2010 record **wet** water year, defined as October through September, rainfall) can become the next year's famine (2011 record **dry** water year). September 2016's drier (and hotter) than average result, followed by a much warmer and generally drier than average winter (December 2016 – February 2017) set the stage for the most irrigation water needs since 2013 for large and small crop growers alike. Residents can begin conserving water at any time to be ready in case September rains fail to materialize and tropical waves or cyclones stay away for yet another year. At the end of July, pool levels at Falcon International Reservoir had fallen to 24.7% (Texas share), and while Amistad remained well in gear (77.9% Texas share), how much water would be "shared" downstream is a decision that is unknown as of this writing.

Drought Severity Classification

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: <ul style="list-style-type: none"> short-term dryness slowing planting, growth of crops or pastures Coming out of drought: <ul style="list-style-type: none"> some lingering water deficits pastures or crops not fully recovered 	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested 	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed 	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/pasture losses Widespread water shortages or restrictions 	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies 	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

- Flooding Rains.** Will Canícula fail to hold at certain points – or overall – during late summer? If it fails, the rains will come – and could fall hard and fast, changing the dry landscape to a wet one – perhaps even a scene of a few “mini” lakes – in a hurry. As a Texas meteorologist once stated nearly a century ago: “Texas is a state of drought, broken by the occasional devastating flood.” We saw this statewide in 2015, just four years after a record dry water and calendar year (2011) – where dozens drowned and billions of dollars in property damage was noted. Willacy County became “Lake Willacy” that October. What can you do in July, which should remain relatively dry?
 - Clean out drainage ditches and canals of brush and debris. This is a very common reason for flooding that can be mitigated against
 - Wet and dry-proof your home. Learn more at http://flash.org/peril_flood.php and <http://ready.gov/floods>
 - Know your roads had have alternate routes ready should flooding develop in your community
 - Keep a first aid and flood safety kit in your vehicle
 - Purchase flood insurance, even if you're not in a designated flood zone! Remember, it takes 30 days to activate flood insurance – so waiting until August may be too late. <http://floodsmart.gov>
- All Things Tropical!** Become hurricane ready in early August! Bonus time is on the clock, but this could be **your last** chance if activity begins to percolate and head toward the Gulf later in August, and especially in September. Remember, this is the 50th Anniversary of Hurricane Beulah (September 20th landfall) in the Rio Grande Valley, so no better time to get serious about preparing than now – using the Valley's storm of record to recall the difficulties for Valley residents at a time when the population was about 25% of what it is today, and when infrastructure and land use was far different as well (the ability to recover from devastating floods and winds may be much more involved in 2017).
 - Become **HurricaneStrong Today!**
 - Adjust Your Plans at <http://hurricanes.gov/prepare>

- **Are you insured? Start your coverage at <http://twia.org>**
 - **How about for floods? Floods can inundate anyone in the Valley. Insurance is less expensive outside of a designated flood zone, but no less important. Learn more at <http://floodsmart.gov>**
 - **Check out more with our hurricane guides, in [English](#) and [Spanish](#).**
-
- ***Wildfire Danger.*** Sounds crazy in mid-summer, right? The persistence of drought, along with periodic growth of fuels in areas where some rains have fallen, could become a larger issue in October if the September rains don't arrive as "normal". There were a few minor wildfires in July, and that number could conceivably increase through August if the rains don't come in earnest – soon - and La Canícula dominates as it did through June and July. Remember to be [Firewise](#), anytime!