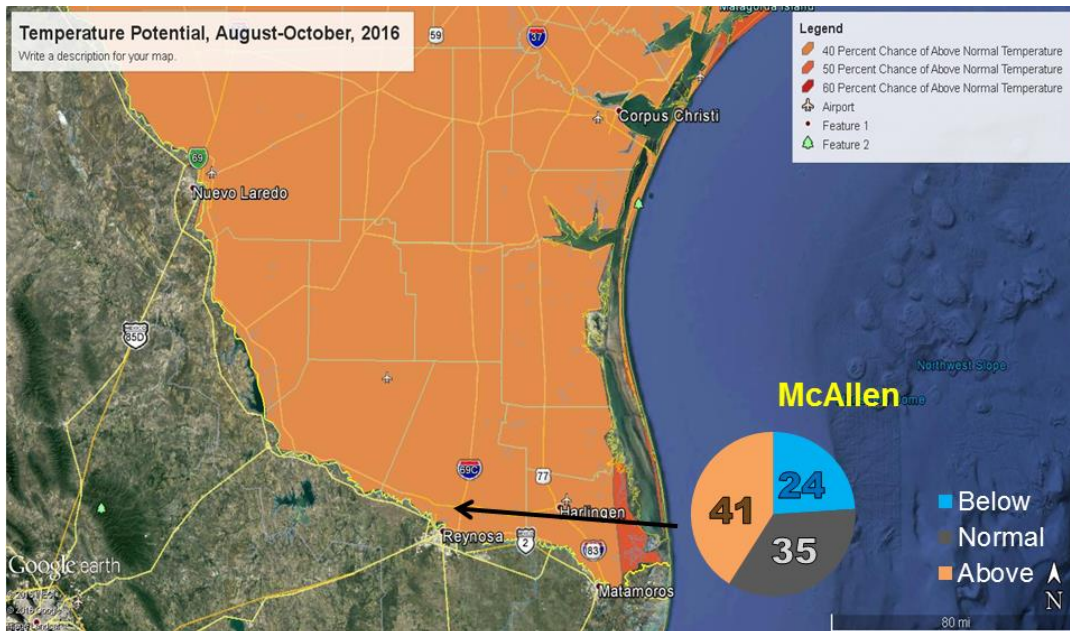
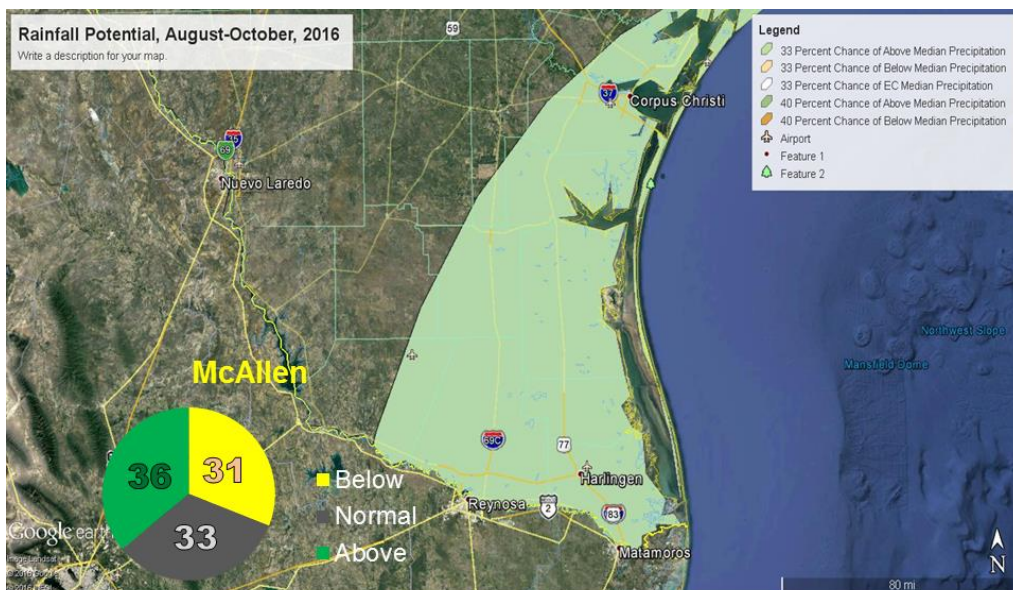


August-October 2016 Outlook



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

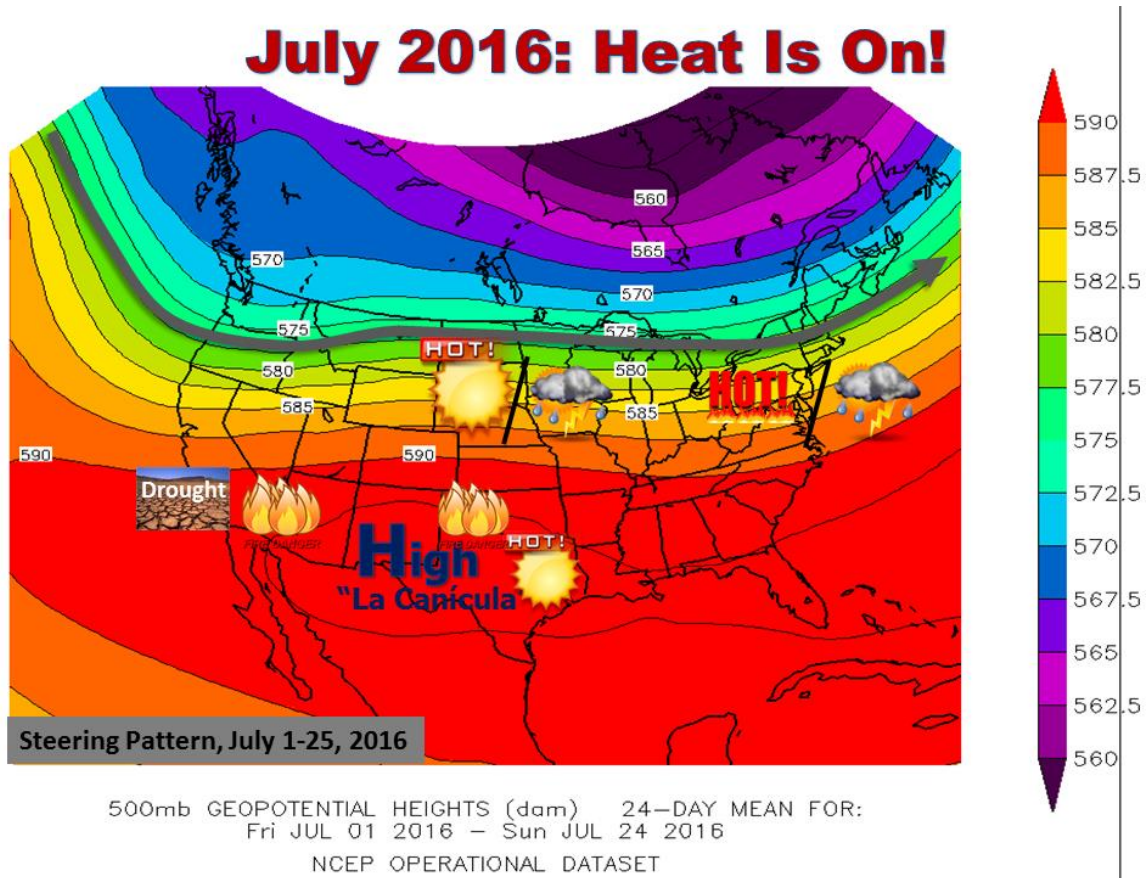


Average Rainfall:
7 to 9 Inches West
9 to 12 inches East

La Canícula To Reign into August Across the RGV... But Will It Rain by September?

As forecast at the [end of June](#), July 2016 was blazing hot across the Rio Grande Valley, and by month's end would likely rank among the three hottest July's on record for most locations. The pattern of "La Canícula"

(The Dog Days) that typifies early July through mid-August was not only dominant, but stronger than “average”, which led to the heat, lack of rainfall, and steady browning grasses/rangeland and brush. This browning, aided by the near record heat, lack of morning dew (from persistent overnight breezes), and somewhat lower afternoon humidity in spots led to the start of a “flash drought” by month’s end. Beyond the Valley, most of the United States ended July above to well above average, as the “dome” of the suppressing upper level high pressure ridge often extended well north into the Great Plains and Midwest, and occasionally spread into the mid-Atlantic and Northeast U.S.



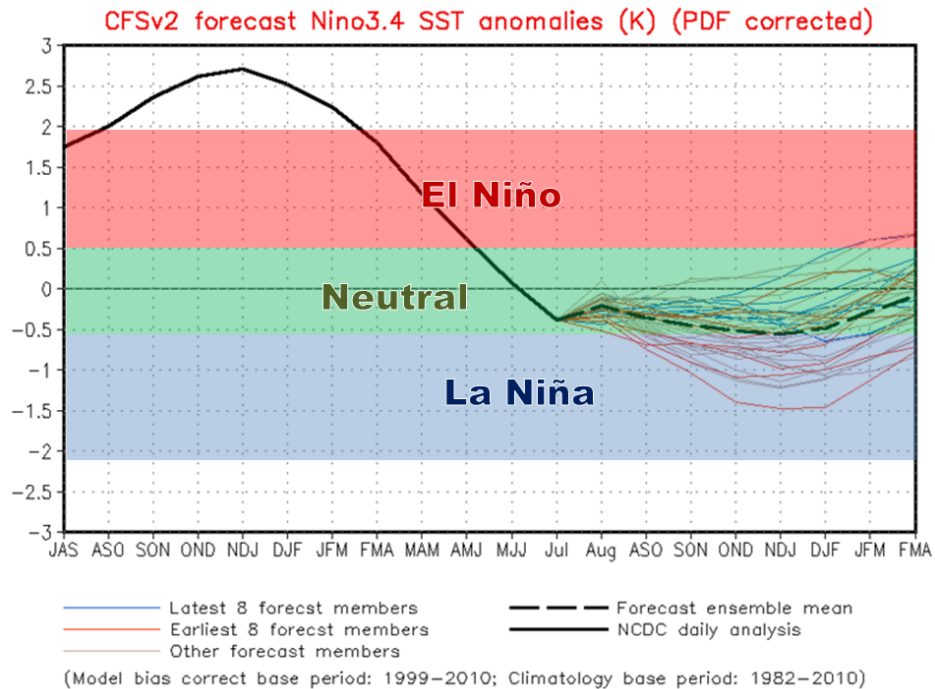
Teleconnections

Since the July-September Outlook, little had changed for the outlook for a La Niña. If anything, the probability for a *weak*, rather than *moderate*, La Niña, had increased 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 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.

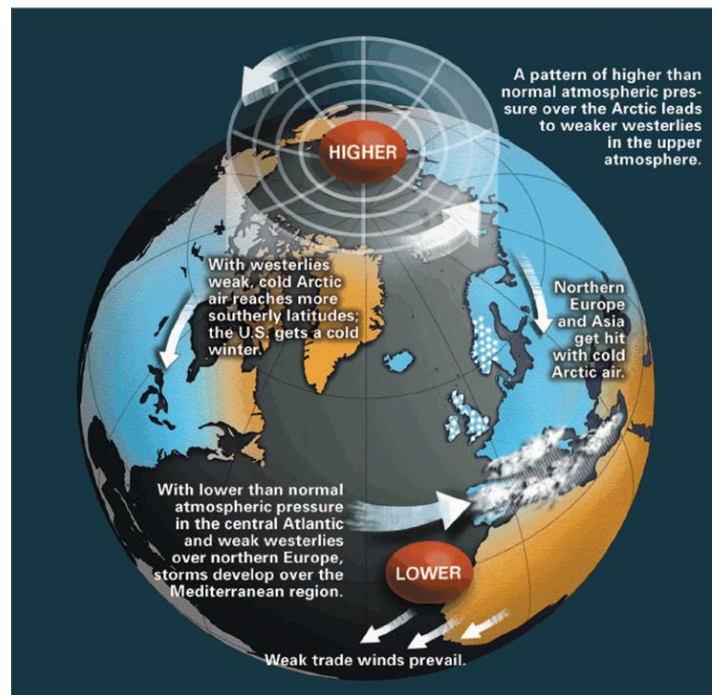
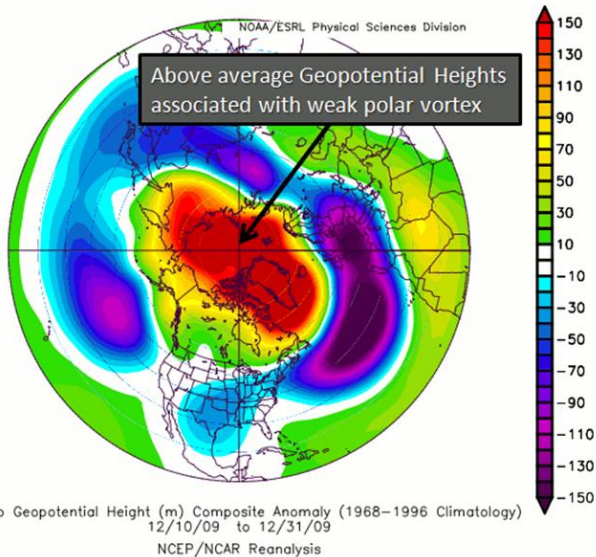
The [North Atlantic Oscillation](#), which had been largely in the positive phase (+NAO) from autumn 2015, winter 2016, and much of spring 2016, began trending into the negative phase (-NAO) for late spring, continuing into summer (below). While the impacts of both +NAO and -NAO on sensible weather trends 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. Should that shadow become a player, the continuation of the -NAO into 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 was the case in 2011 through 2013; with the exception of Alex (which formed early in the season but who’s center remained well south of the Valley) and Hermine (a “one-off” eastern Pacific-originating cyclone), 2010’s pattern was

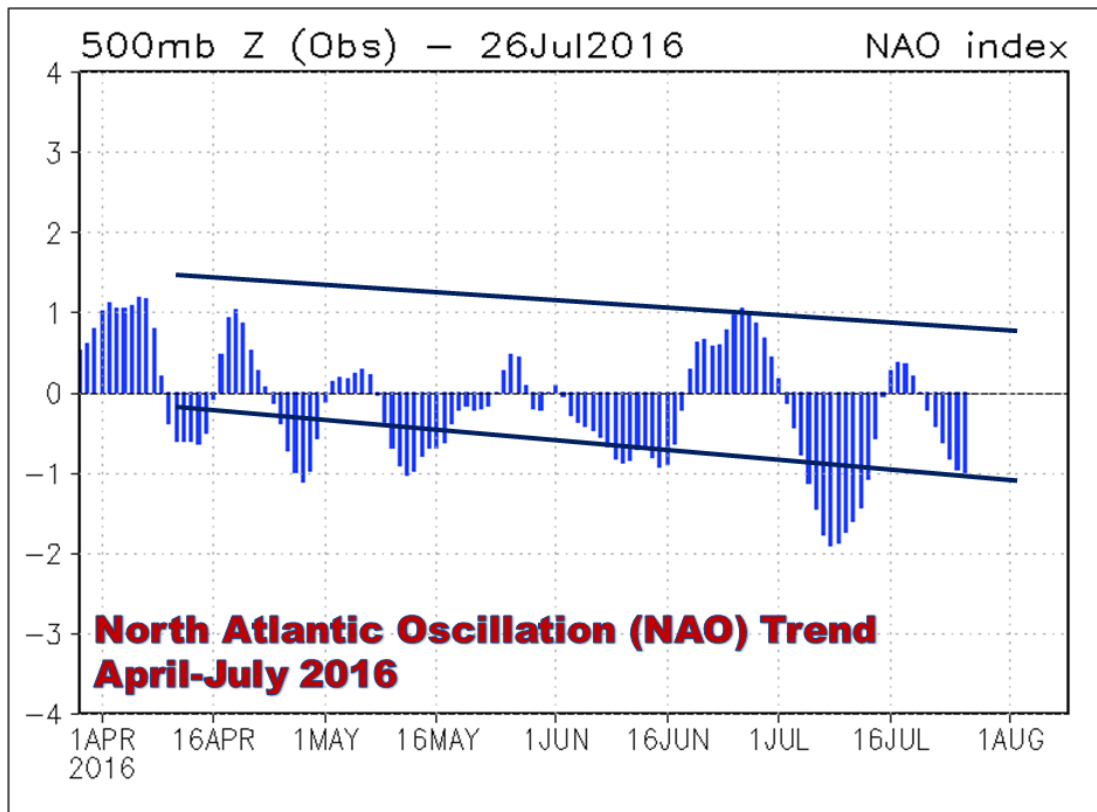
similar as well. All of these seasons featured -NAO or a lean toward a -NAO. 2014, and even the peak of the 2015 hurricane season, also featured a brief period of -NAO. Fortunately, 2013-2015 returned wet September weather back to the Rio Grande Valley after a two-year hiatus, as enough deep tropical moisture (without cyclones) was able to return and bring rainfall totals above-to-much above average.

The [Pacific-Decadal Oscillation](#), which was solidly in the negative phase (-PDO) from mid-2007 to the end of 2013, flipped positive from January 2014 through June 2016. +PDO has tended to favor a more persistent eastern Pacific atmospheric ridge along with above average sea surface temperatures, and has been known to help influence the strength of positive El Niño Southern Oscillation (ENSO- El Niño) which may have been the case in late 2015 and early 2016. It's recent strong positive value may have assisted with abundant rainfall in October 2015 ([Hergert, et. al., 2015](#)) when combined with El Niño, but unknown is whether this puzzle piece helped with the welcome September rains during a *neutral phase* ENSO in September 2013 and 2014.



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





ENSO: Tie Breaker?

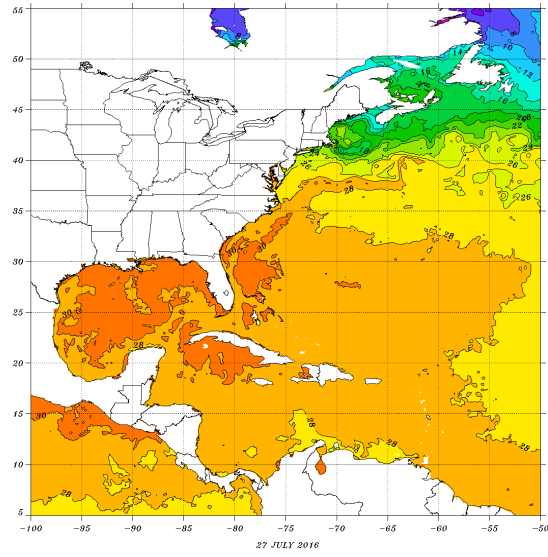
By late July, the weekly Oceanic Niño Index remained on the edge of La Niña in the primary zone of the equatorial tropical eastern Pacific Ocean (-0.6°C ; -0.5°C begins the La Niña condition), but recent indications suggested that a more gradual drop and leveling off in the weak category (prior page) into autumn 2016. What might that mean? Putting the puzzle pieces together *may* offer a clue. If we assume the negative trend in the NAO continues through August-October, the combination of the weak La Niña with the $-$ NAO could lead to a “lean” toward **drier** (and still warmer, as predicted) than average conditions. The $+PDO$ could be a wildcard, but its relative influence on the long range prediction is more unknown. That said, if the $+PDO$, regardless of ENSO, helps maintain the favorable eastern tropical Pacific warm waters (which contributed to perhaps seven named storms *in July 2016 alone!*) – it’s possible that remnants from a late-season event could be very helpful for Valley rainfall in September or October, which was the icing on the wet cake in October 2015.

With all of this in mind, we are “leaning” toward ‘normal’ to slightly below normal rainfall for the August-October period, with September and perhaps early October making up any deficits that appear likely during August. Should August remain as hot as the near-record July of 2016, the entire summer could rival the [number 1 and number 2 finishes of a number of stations in 2009](#) and rival the records for other sites in 1998.

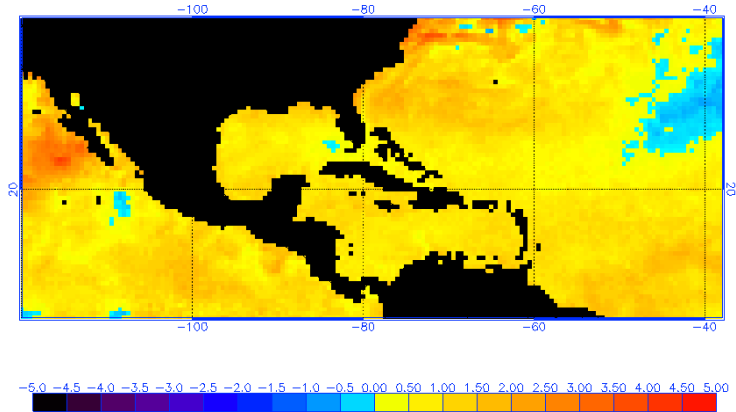
Other Factors - Tropics

Sea Surface Temperatures. Western Atlantic, Caribbean, and Gulf water temperatures remain 1 to 2°C (2 to 4°F) above seasonal normals, with values in the mid to upper 80s across much of the Gulf and Caribbean in some spots as July. Warm waters are the “fuel” for tropical waves and cyclones, but that fuel needs an engine to use it. That engine includes a wave, available moisture, and low wind shear.

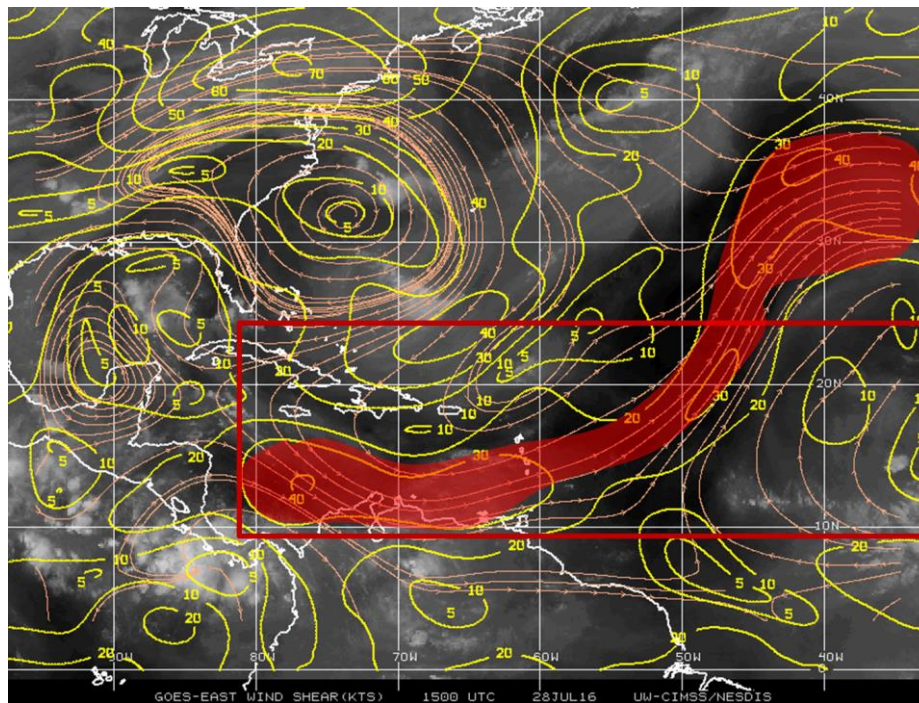
NOAA/NESDIS GEO-POLAR BLENDED 3 km SST ANALYSIS FOR THE US ATLANTIC



NOAA/NESDIS SST Anomaly (degrees C), 7/28/2016



Above: Left – sea surface temperature departures from normal – in this case, arrows showing generally 1 to 2°C above the late July value. Right – actual temperatures in the Gulf, Caribbean, and western Atlantic. Across the tropical and subtropical Atlantic, values ranged from the mid to high 80s. For tropical cyclone formation, sea surface temperatures around 80 with some depth are sufficient for the “fuel” component.

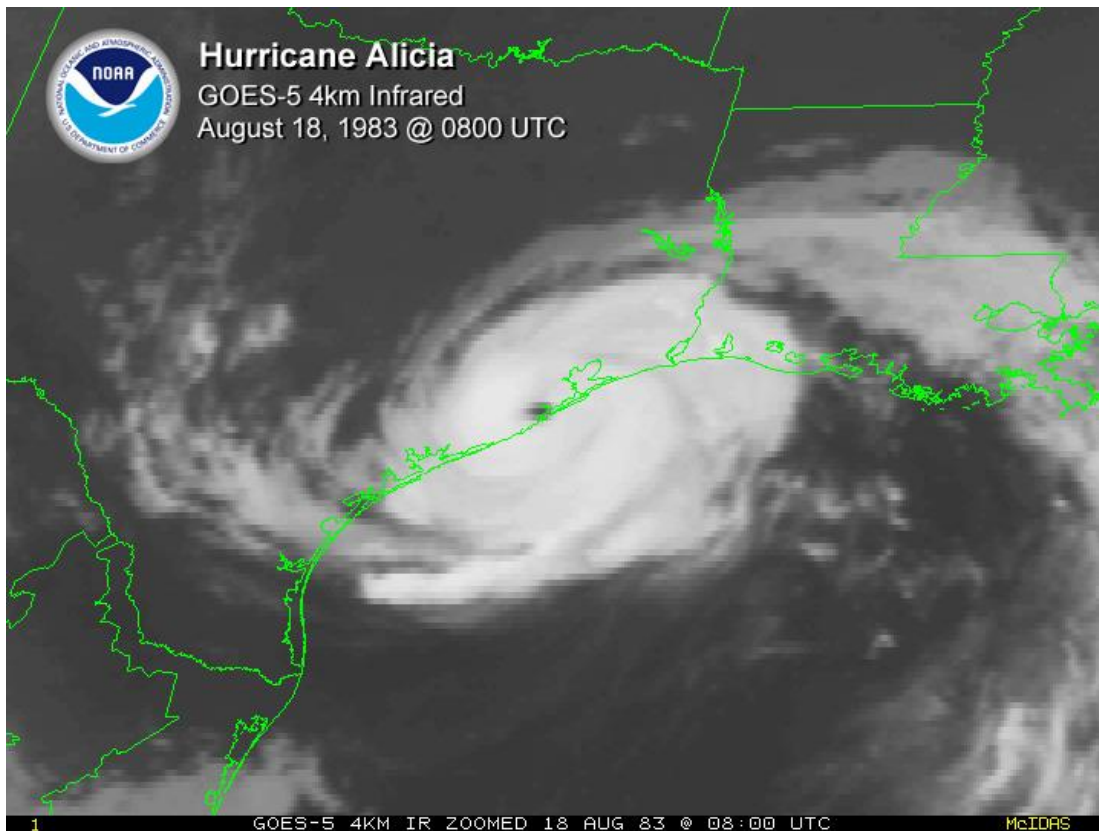


Above: Mean wind shear across the western part of the main development region (red box) as of July 28, 2016. Red shaded areas indicated >30 knots of shear, which typically is strong enough to limit or reduce the ability of tropical cyclones to form, grow, or survive. Most of the Caribbean Sea remained covered by high wind shear, despite the above average sea surface temperatures.

Outlook: August to October 2016

Late summer forecasts typically are easier than early to mid-summer forecasts, based on the typical rapid increase of rainfall from late August through September, which tends to come in most years (2011 and 2012 being recent exceptions). That said, uncertainties described above make this a more difficult proposition in 2016, especially in light of temperature and rainfall expectations that haven't always turned out and sometimes "flipped the script" since November 2015 – when a cooler and wetter winter (December-February) turned out to be milder and drier. As mentioned above, July 2016 will rank among the hottest all-time, and August looks to begin in the same vein. But what about mid-August and beyond? That's where the uncertainty creeps in.

August climatologically starts hot and rain-free, and that's right on track for the first third of the month in 2016. The pattern can evolve into a wetter and less hot situation for the last half should the Bermuda High form for any length of time. Given the "lean" toward a –NAO along with the trend toward a weak La Niña, indications suggest August may be drier – and hotter – than average for most of the time. The exception may come during the last week to ten days, as past dry starts to August have ended up closer to the average 1981-2010 rainfall due to one or two heavy rain events before the start of September. A positive phase NAO could well help, in addition to unknown factors at the time of this writing (June). Finally, the ultimate wild card would be any tropical cyclone for the northwest Gulf of Mexico. There is some predictability in late July for potential tropical development in the Atlantic Basin in August, but as Hurricane Alicia (1983) reminds us, a n old boundary with thunderstorm clusters over a very warm Gulf could allow a tropical cyclone to fester. Alicia slammed into the Houston Galveston and gave them a summer's worth of rainfall – but had it slid west rather than northwest from its starting point in the central Gulf, the Valley would have joined the wet (and wild) party.



September is the wildest card of them all. Should all the puzzle pieces line up (+NAO, low wind shear, etc.) and sufficient moisture exist in the deep tropics, the odds for a wet September – by tropical wave/upper level disturbance or a full-blown tropical storm or hurricane nearby – increases dramatically. However, conflicting puzzle pieces (-NAO, high wind shear, inconsistent deep atmospheric moisture) could lock in La Canícula and shunt the best moisture into places like Veracruz and the southern Yucatan, as well as the eastern and northeastern Gulf. We should know a lot more about the late season possibilities by the end of July and especially as we move into August.

October in a weak La Niña and –NAO would lean toward the 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 is 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.

Preparedness, Awareness

Summer heat above the usual swelter dominated July, and so far, most Valley residents and workers have coped. Should the late August and especially 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 could become an issue at times during the summer, mainly west of U.S. 281/IH 69C, but especially in October when drier but still hot air arrives *if* September fails to achieve a normal rain total, which ranges from 4.5 inches west to nearly 6 inches east. Late August through October will require a recall of flood safety; 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 by mid August, we remind everyone to be ready. Be responsive. Be resilient. Be [#HurricaneStrong!](#)

- **Excessive Heat.** Yes, the Valley is a hot place in summer. However, occasional heat index (“feels like”) temperatures exceeding 110°F on persistent southerly wind could become an issue, especially for the very young, elderly, and temporary residents, through August and perhaps much of September if the typical rainy pattern fails to materialize. Check out [local heat safety information](#) and [national safety tips](#), as well as ways to ensure you don’t forget about those children and pets in vehicle backseats, in [English](#) and [Spanish](#).
- **Wildfire Spread.** The drying of “long period” fuels such as brush and trees (mesquite, live oak) had led to an Energy Release Component at the 90th percentile as July ended, meaning that even in marginally low (25 to 40 percent) humidity days the potential for fuel to burn rapidly and spread through gusty winds was of increasing concern. A “flash drought” had begun to develop across the Valley, with abnormally dry to moderate drought conditions across the Upper Valley and Rio Grande Plains, with the potential for further spread and degradation deep into August. The saving grace of late August rains would be huge relief, but until then, 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.** The possibility of one or more slow-moving torrential rain events, more than likely involving thunder and lightning, remains a concern. This could be most important as we move into mid to late August and especially in September. Already in 2016 (as of June 25th), 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 (late August-September):
 - 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!!
 - July is also a good time to 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!

- Got Flood Insurance? Can your home or neighborhood handle the next Beulah (15 to 25 inches of rain in less than a day)? If unsure, early July is the time to get peace of mind. Remember, insurance policies take 30 days to trigger; waiting until August could be too late.
 - [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.