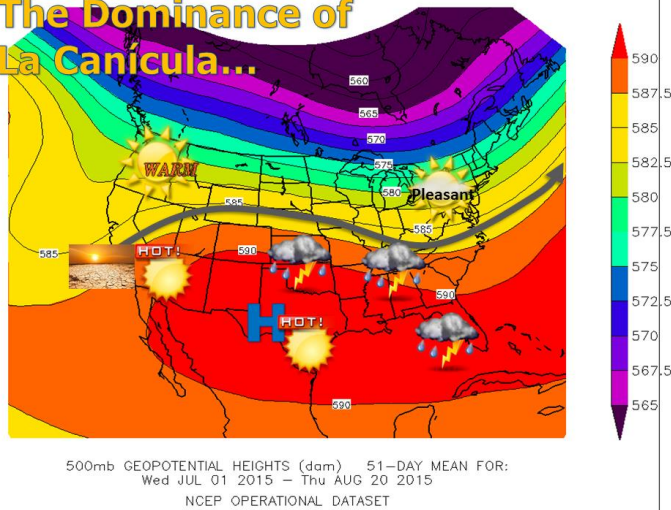
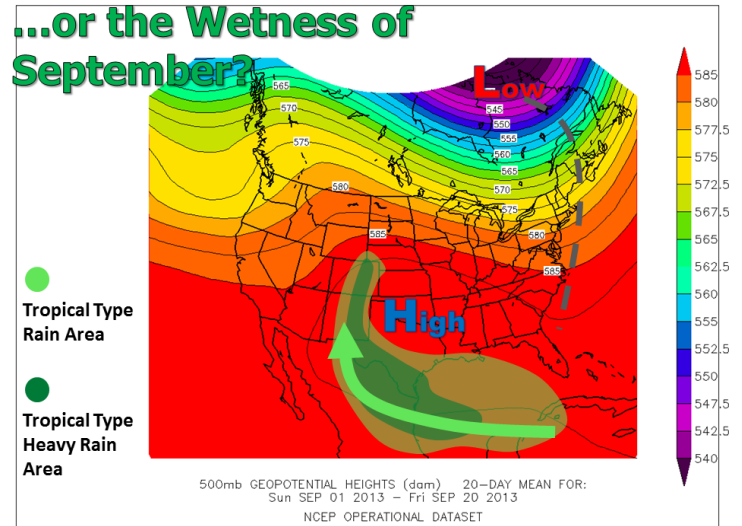


The Dominance of La Canícula...



...or the Wetness of September?



Subtle shifts make all the difference. At left, the “flat” steering pattern with an upper level (heat) ridge centered over West/Southwest Texas and New Mexico, combined with an *east-west* flow across the tropics, would steer most tropical cyclones and waves well south of Texas, leaving the region drier than average, should the pattern last beyond the July 3- August 11 Canicular period. At right, by September, the ridge typically extends farther north, and/or elongates from west to east or northwest to southeast, with the southern periphery farther north or on an angle into the western Gulf. This is the “open door” which brings rainy relief to the Valley in many Septembers, with recent “big” months in 2013 and 2014.

Hot And Dry to Start, but For How Long?

Another Searing “Canícula” (July 3 – August 11), but What Next for Valley?

As June scorched into July 2016, the “Dog Days” of summer were well in hand, as the [big upper ridge known as “La Canícula”](#) had established itself across Texas, northeast Mexico, and parts of the southern Rockies. Similar to the pattern from July 1 through August 20, 2015 (left, above), a similar pattern was expected to dominate through at least the first half of July, and likely right through month’s end.

But then?

Many questions remained. Would some variation of 2013’s pattern above, right) or 2014’s [Wet-tember](#) (similar) take hold in time for the peak of the Atlantic Hurricane Season? Or will atmospheric teleconnections, or “puzzle pieces”, allow for some shadow of La Canícula to remain into late August and September? The likely onset of La Niña in time for the last “big” month of the 2016 Hurricane Season would favor lower wind shear over percolating warm waters over much of the Caribbean and Gulf, but notable wind shear was still in place as June turned to July. Other factors will be discussed below.

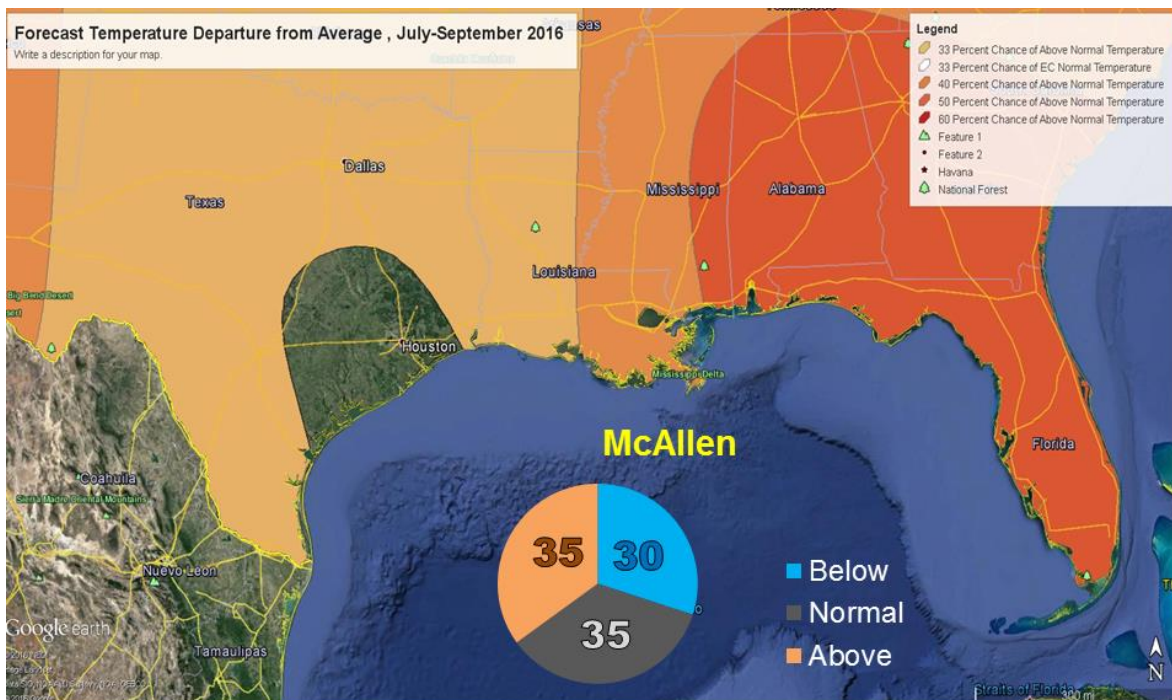
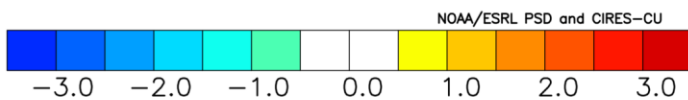
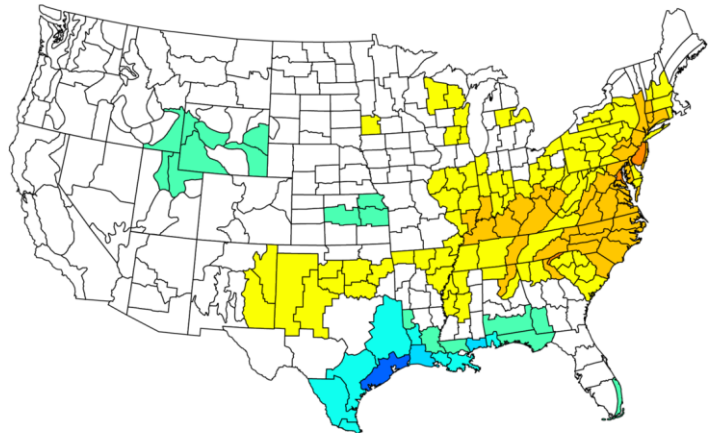
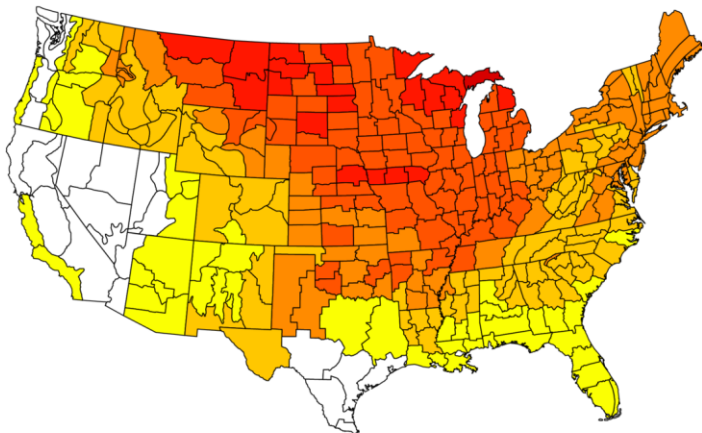
La Niña Replacing El Niño

By late June, as forecast, weekly Oceanic Niño Index, or ONI had fallen to the edge of La Niña in the primary zone of the equatorial tropical eastern Pacific Ocean (-0.4°C; -0.5°C begins the La Niña condition), and all indications suggested that a continued drop would persist through the summer and into autumn 2016. What might that mean for summer weather? As mentioned here often, El Niño/Southern Oscillation (ENSO) is but one factor to consider. Previous summers with moderate or stronger El Niño (warm phase of the oscillation) have favored hotter, drier conditions (enhanced [Canicular](#)) in July and August, and sometimes into September if the tropics are quashed *and* mid to high level easterlies are replaced with drier northerly flow that keeps deep moisture pinned well south of Texas. 2009 was one such summer. Do similar “flips” from El Niño to La Niña mean a similar “flop” in temperature? Not necessarily. 2011’s La Niña winter and spring that eased to a “leaning negative” neutral phase, led to one of the [hottest and driest July to September](#) periods on record in the Rio Grande Valley, and in Texas. Below, a comparison of temperature (left) and precipitation (right) departures from average for the combined summers of 1973, 1983, and 1998 are shown. Each year had a

similar El Niño (strong) to neutral or La Niña (weak to moderate) shift between early spring and late summer/early fall. The signal for hotter temperatures shifts away from south Texas; for precipitation, trends for wetter than average values solidify across much of the Gulf coast, most pronounced in Texas. Indeed, the official forecast matches closely with these three analogs. See the images underneath the analogs for the comparison.

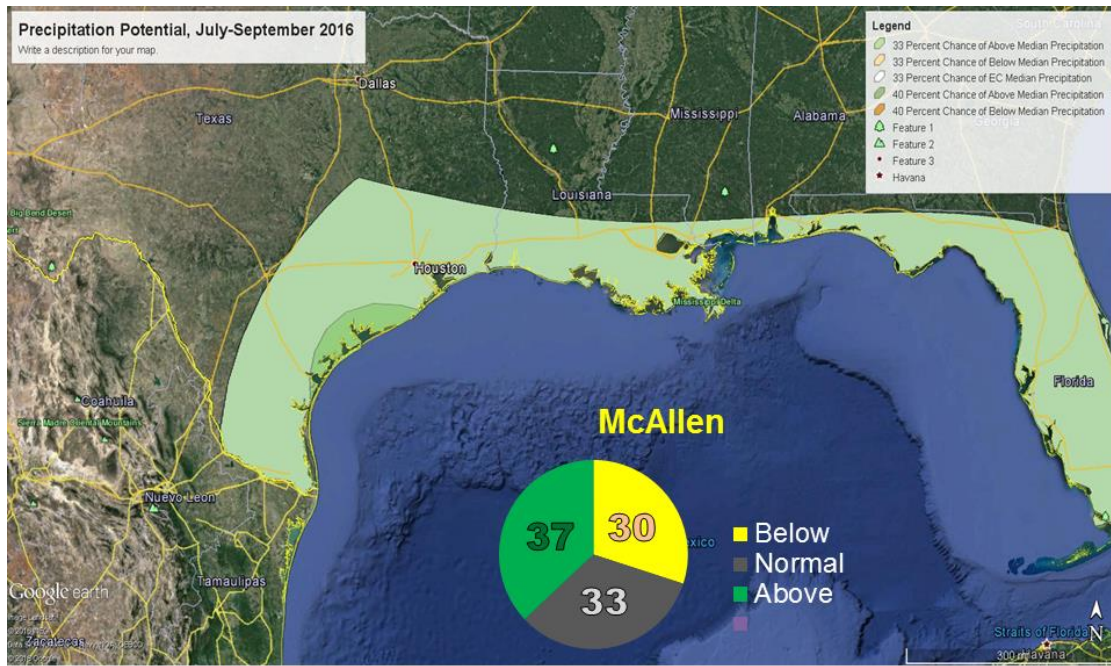
NOAA/NCDC Climate Division Composite Temperature Anomalies (F)
Jul to Sep 1973,1983,1998
Versus 1950-1995 Longterm Average

NOAA/NCDC Climate Division Composite Precipitation Anomalies (in)
Jul to Sep 1973,1983,1998
Versus 1950-1995 Longterm Average



Average Afternoon: 92° Beaches, 95° Lower Valley, 97-99° Mid-Upper Valley
Average Wake-Up: ~80° Beaches, 74-77° Elsewhere
Average All Hours: 86-89°

Percentage is based on the 1981-2010 averages for July-September; Valley averages are listed at the bottom of the image.



Average Rainfall:
7 to 9 Inches West
8 to 10 inches East

Percentage if based on the 1981-2010 Average for July to September; Valley averages are listed at the bottom.

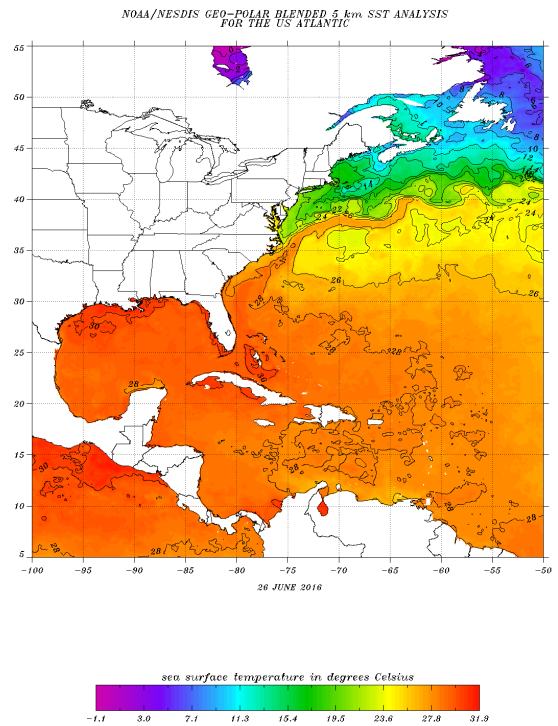
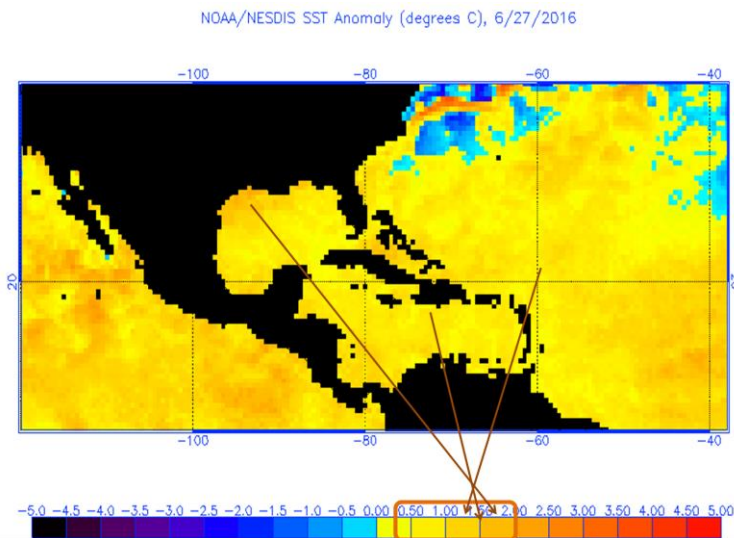
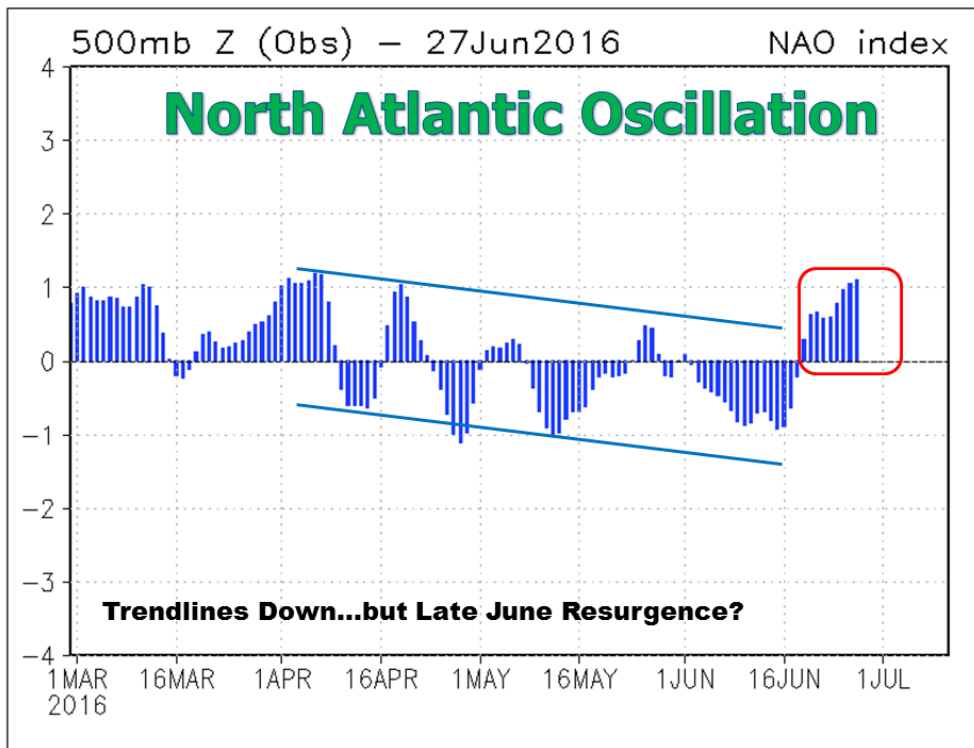
More than La Niña: Teleconnections, Wind Shear, and Water Temperature

Uncertainly lies in the eventual fitting together of the atmospheric puzzle later this summer and early this coming autumn. La Niña is once again the 800 pound “gorilla” predictor in the room, but not always the determining factor. Below are just a few flies in the ointment that could contribute, or negate, the general trends that a developing La Niña suggests.

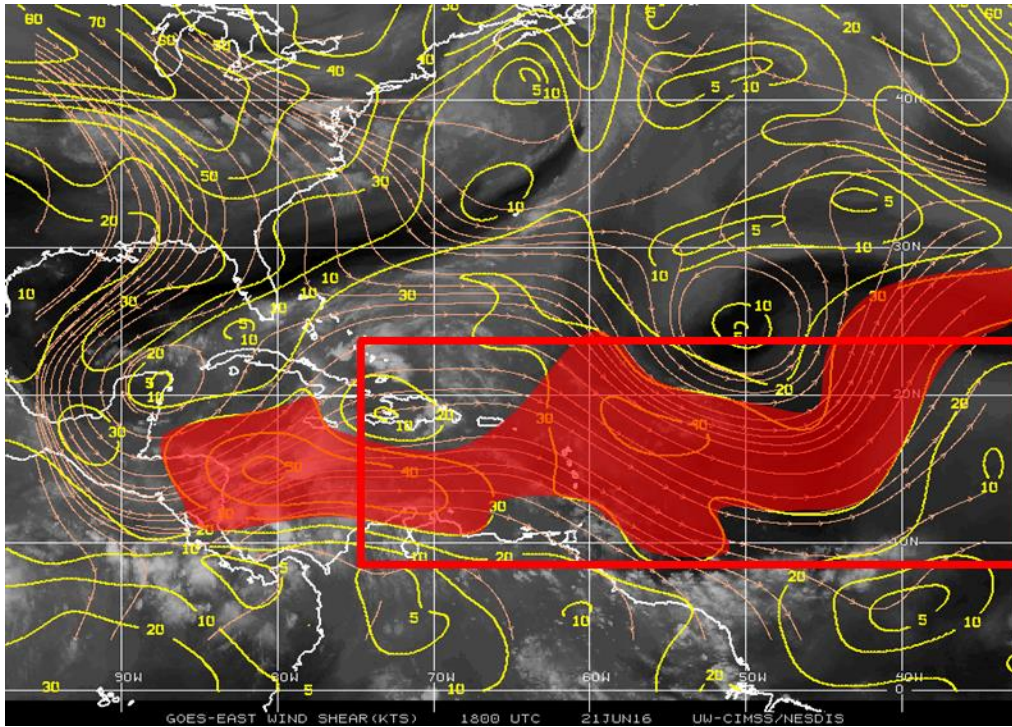
North Atlantic Oscillation (NAO). After a prolonged period of running in the positive (+NAO) phase, the NAO had generally trended negative (-NAO) between Mid April and Mid June. A recent upturn developed by the end of June. Will this be a new trend, will the index flip-flop through the remainder of summer, or will -NAO return? A general +NAO would favor the development of a Bermuda High and the northward lifting of atmospheric high pressure in general across the Plains to the Southeast U.S., potentially opening the door to tropical energy to cross the Caribbean, western Atlantic (Bahamas/Florida peninsula), and ultimately into the western Gulf and Texas/Louisiana. A neutral average NAO could favor just about any outcome and require more information, including periodic phase shifts. A -NAO would favor an eastern U.S. trough of upper level low pressure, which would help steer Atlantic storms away from the U.S. east coast and also maintain a strong La Canícula and help to pinch down the wave track into the southwestern Gulf. Unfortunately, predictability of NAO is only about two weeks, so trying to figure out August and September at the end of June is difficult.

Sea Surface Temperatures. A favorable atmospheric pattern since May has brought western Atlantic, Caribbean, and Gulf water temperatures to 1 to 2°C (2 to 4°F) above seasonal normals, with values in the mid to upper 80s and even near 90°F in some spots as June ended. 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.

Wind Shear. As of June 22, wind shear remained formidable – though was a bit lower than in May – across the Caribbean. While low wind shear is favorable for the development of a tropical cyclone with a wave combined with sufficient moisture, higher wind shear does not necessarily mean lower rainfall; “shear energy” moving from east to west can be an effective rain producer without the more severe impacts from tropical cyclone winds, storm surge, and concentrated torrential rainfall.



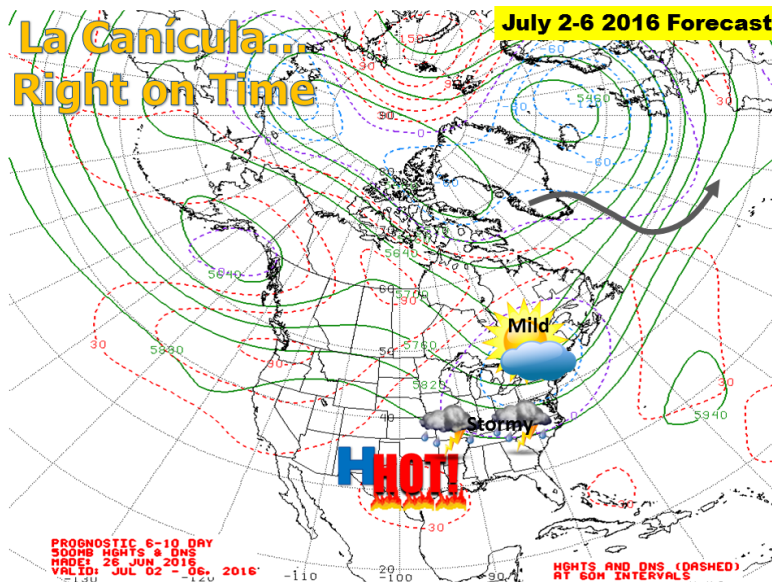
Above: Left – sea surface temperature departures from normal – in this case, arrows showing generally 1 to 2°C above the late June value. Right – actual temperatures in the Gulf, Caribbean, and western Atlantic. Across the tropical and subtropical Atlantic, values ranged from the lower to high 80s. For 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 June 22, 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: July to September 2016

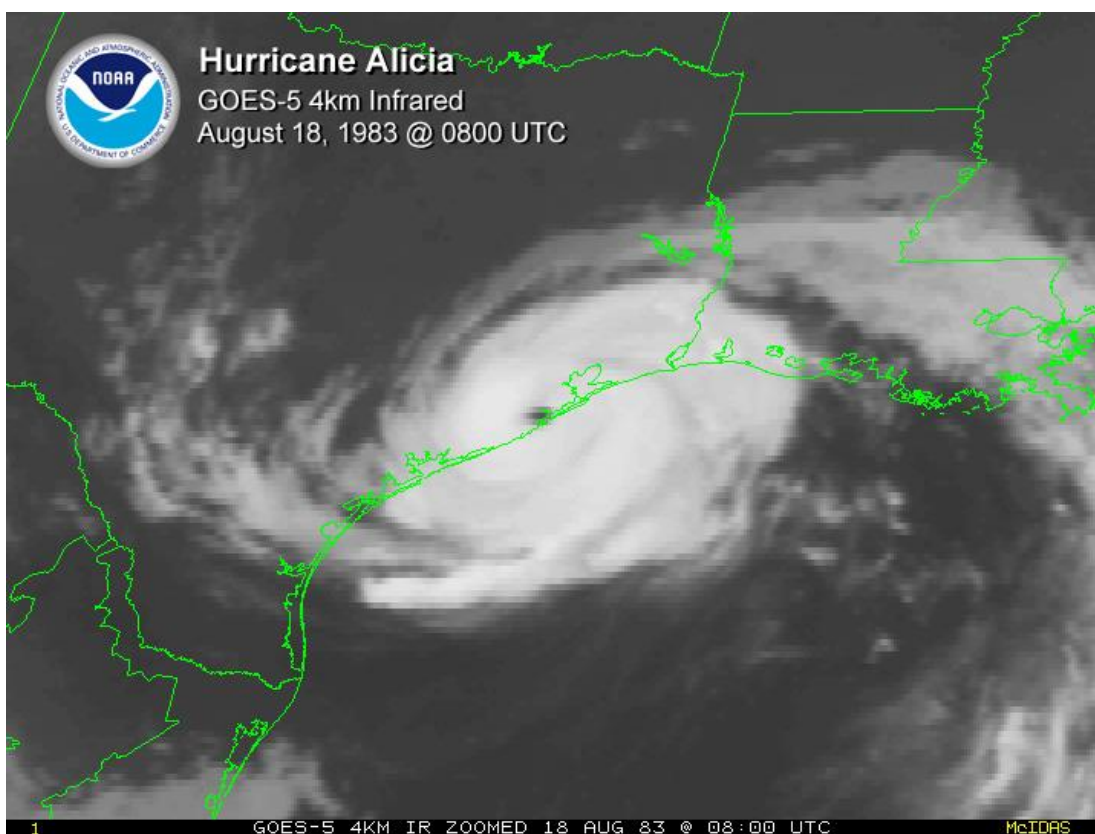
Summer forecasts are always among the most difficult for the Rio Grande Valley. The region is already known for its oppressive heat and humidity, so it takes prolonged drying or wetting to change the outcome one way (hotter and drier than average) or the other (cooler and rainier than average). June was a rather “schizophrenic” month, with a below average and wet start (temperatures 3 to 5°F below average with areas along/east of U.S. 281 at 400 to 600+ percent of average through the 12th) that turned hot and dry for remainder of the month, as La Canícula made its first appearance of the season. The heat ridge’s dominance ultimately turned the cool start around, and by month’s end temperatures were likely to range slightly above average; the early month rainfall across much of the populated Valley through the King Ranch would keep the June totals above average, while little rainfall across the Rio Grande Plains began a more rapid drying, which could set the stage for abnormally dry to potentially moderate drought conditions at some point in late July or August.



July: Bringing the Heat

Rare has a July not met expectations for at least average temperatures, which range generally from 95 to 100 by afternoon and 75 to 80 by morning. La Canícula alone allow this to occur, but a stronger Canícula signal almost guarantees strings of 98 to 104 degree afternoons (from east to west across the Valley) with little to no rainfall. That said, events such as tropical waves and rare cyclones, as was the case in 2008, can easily keep monthly temperatures below the hot averages. El Niño, La Niña, and “La Nada” have limited statistical influence on July weather in the Valley, and the true hurricane season doesn’t arrive until August.

August climatologically starts hot and rain-free, but the pattern can evolve into a wetter and less hot situation for the last half should the aforementioned Bermuda High form for any length of time. 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 no way to predict in late June what might happen for one week in August, but as Hurricane Alicia (1983, next page) reminds us, in a year with only four tropical cyclones, three hurricane, and one major – that major could be in Texas, and occur in August. Alicia, of course, 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.

Preparedness, Awareness

The heating of the atmosphere finally removed the threat for widespread wind or hail events, though the season ended with a “bang” on [May 31st](#). Once again this year, summer heat above the usual swelter will require some safety precautions; 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. 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](#).
- **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.