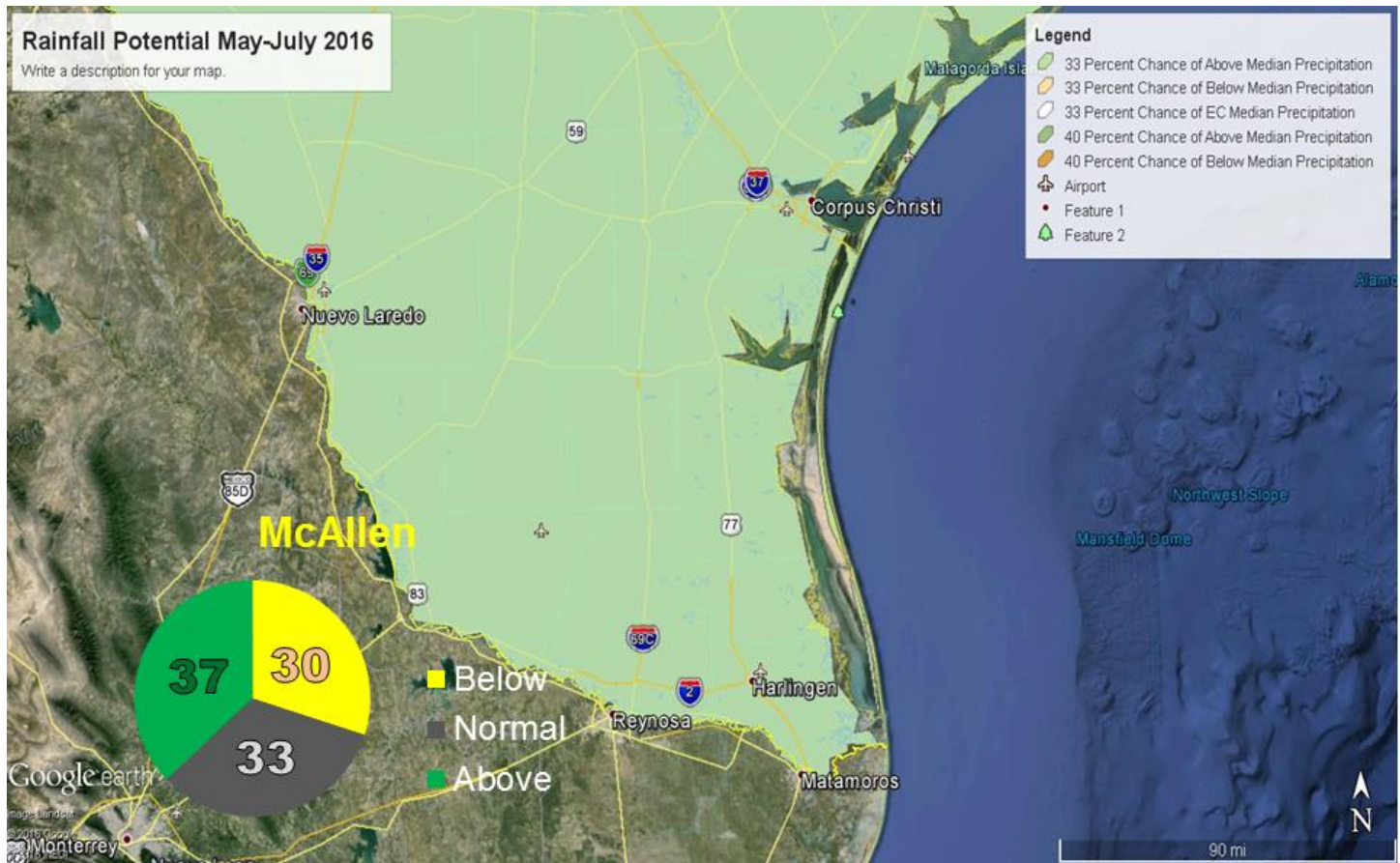


May-July 2016 Outlook



Rio Grande Valley **Average Rainfall** for May-July (based on 1981-2010)
Ranges from 6-7 inches Valley to 8-9 inches Northern Ranchlands

Enough Rain to Keep Things “Honest” in the RGV? Uncertainty on Temperature Departures as Summer Heat Builds; Lean is to the Hot Side

April continued the trend that began in March – building warmth and humidity which peaked with summer-like swelter for the final week of the month, where daytime temperatures soared into the 90s, overnight temperatures remained in the sultry 80s until just before daybreak. The month ended up 1 to 3°F above average – a third month in a row with significant departures from the 1981-2010 benchmark. Similar to March, individual rain events on the [18th and early 19th](#), and again overnight on the 24th, combined to provide pockets of above average rainfall – though the coverage of rain was minimal and mainly along the Rio Grande from Zapata to Starr County, and over the south half of Cameron County (Figure 1). Persistent southerly flow provided enough humidity for locations along/east of U.S. 281/IH 69C to stanch the return of drought. That same flow, working underneath subsidence inversions, brought several poor air quality days at different points during the month, peaking on April 26th.

El Niño on the Wane

As forecast, the strong El Niño that dominated the last half of 2015 and began 2016 began to rapidly fade in April 2016. Though conditions remained in the moderate range through the month, harbingers for the 2015/16

demise were evident by month's end. The "crash" of upper ocean heat content was predicted to reach the surface and continue to steadily cool the surface temperatures in the eastern Pacific; Kelvin waves, which had been persistently positive (down-welling indicating sea surface warming) through most of 2015 and into early 2016 had finally flipped to negative (upwelling of cooler waters) into the regions where El Niño is considered (Figure 2).

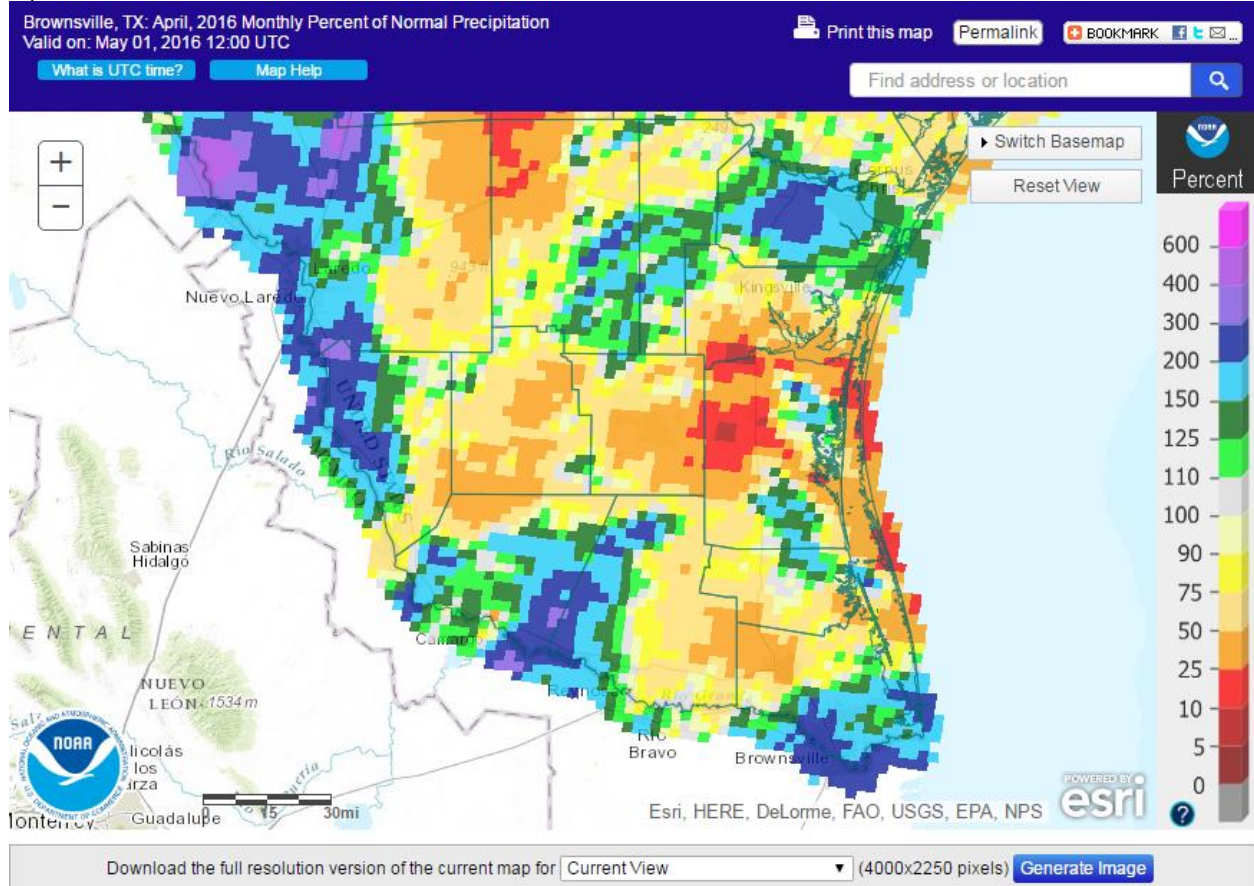


Figure 1: Rainfall percentage of normal for April 2016. Thunderstorm locations on the 18th/19th and again on the 24th made the difference between 150 and 300 percent of average, and less than 50% of average. April, one of the drier months on the calendar, averages 1 to 1.5 inches across the Valley.

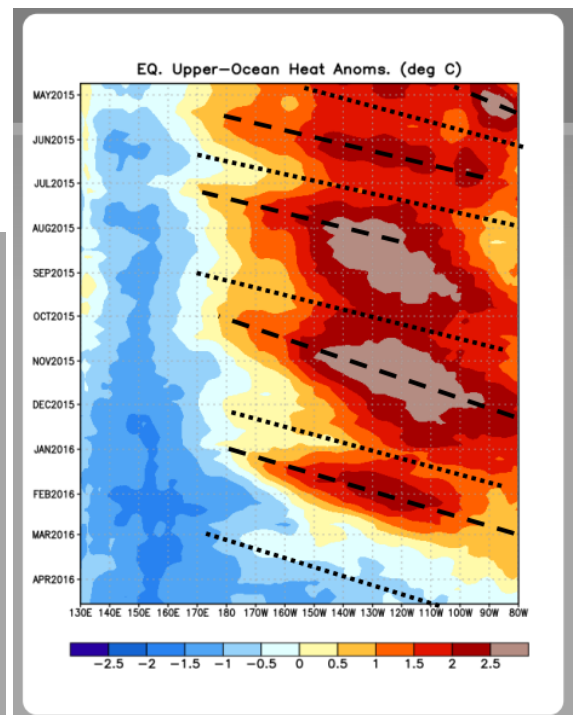
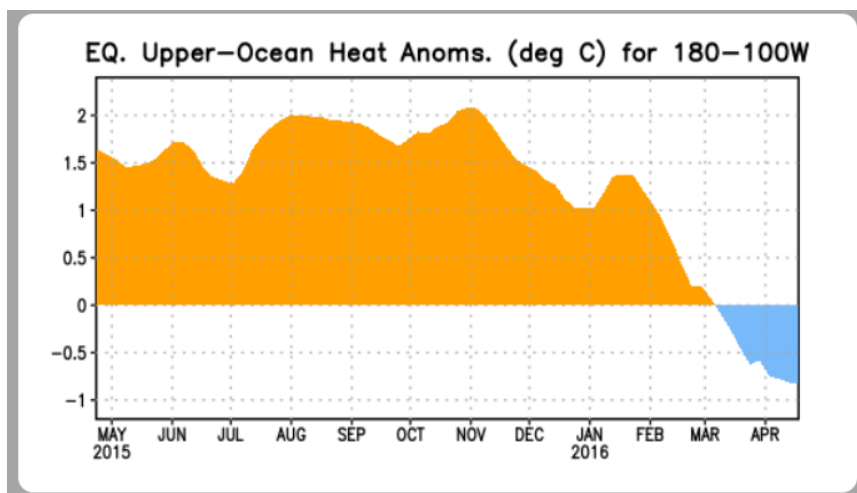


Figure2: Upper ocean heat content anomalies showing sharp change from positive to negative through spring 2016. Right: Upwelling (blue area) expanding into the El Niño region of the eastern tropical Pacific during March and April, 2016.

Outlook: Early to Mid Summer 2016

Typical for the Rio Grande Valley, the transition from spring to summer is one of the more difficult to forecast in any regime. The last time a rapidly transitioning El Niño/Southern Oscillation (ENSO) from El Niño to La Niña with a prolonged positive phase of the Pacific Decadal Oscillation was spring/early summer 1998, and featured a virtually rain-free May and June, below normal rainfall in July, and among the hottest three month period for several locations. One notable difference, however, is the phase of the North Atlantic Oscillation (NAO), which was generally **negative** in late spring through mid-summer 1998, vs. generally **positive** to neutral in 2016. Should the NAO shift toward negative as we reach June, all puzzle pieces would fit for a hot, dry, June and July as the negative NAO tends to strengthen the influence of “La Canícula”, when high pressure dominates northern Mexico, west Texas, and the southwest U.S. and enhances hot, rain-free weather from the Sierra Madre through the Rio Grande Valley. Even with a general positive NAO, February-April 2016 temperatures ranked among the top 20 warmest across the Rio Grande Valley (with some records dating back more than 100 years).

May and June: Difficult Call

With average afternoon temperatures reaching the 90s in most areas by months end, a prolonged period of dry weather with ample sunshine and periods of southwest to northwest wind would be needed to push daytime temperatures well above this. However, persistent southerly flow of very warm, humid air would bring above average morning temperatures – similar to what closed out April. The differences would be less than for April, as average morning temperatures range from the low to mid 70s by Memorial Day. [Note: For the final week of April, average morning temperatures were in the mid to upper 70s, ten degrees above average; that departure is cut in half by the end of May]. For May, the difficulty comes from the evolution of the steering pattern. April featured a fairly persistent western U.S. trough of low pressure, which sometimes moved east (into Colorado at mid-month, producing record snow there) but otherwise spun-off systems that lifted through the Great Plains, far enough north to keep the heaviest rains well north of the Valley, but not in Texas, where east and southeast Texas repeatedly flooded. May appears to be starting the same way, with a dry frontal passage followed by a quick return to warm/hot but dry weather, then another potential rain-maker for east and southeast Texas during the second week of the month with the Valley missing most of the action. The fronts may help pin temperatures closer to the long term average, though it remains uncertain how the last two weeks of the month will evolve.

Should June even come close to matching 1998, the Valley would be in a world of “heat”; June 1998 was far and above the hottest on record, with McAllen (90.3°F) destroying the nearest record at the time by 2.6°F (in 1980), and still soaring well above the most recent record in the [record to near record hot summer of 2009](#) by two degrees (88.3°F). In 1998, 25 of the 30 days surged to 100°F or higher, with a two-day period of searing heat on the 14th and 15th, when the mercury rose to 110°F, which remains the all-time hottest single day dating back to 1961! But...will it? The same southwest U.S. upper level low pressure systems in June will lift northward but leave a flat “ridge” pattern to the south, which favors westerly flow of drier air in the steering level – bringing the possible heat and plenty of humidity as described above. If the trough is replaced by a western U.S. ridge, with northwest steering flow into Texas, even hotter weather could dominate – but waves riding the east side of the ridge could bring thunderstorm clusters which can provide heavy rain as well as the potential for late-season microbursts and hailstorms.

Such would be the best opportunity for June rain. If a broader ridge extends east through the east coast, and a period of east to southeast steering flow develops, tropical waves (or full cyclones) can get into the act; after all, June is a month with some of the highest potential for nearby or land falling tropical disturbances along the Texas Gulf coast. Bill (2015) was the most recent example – and while the core of the rain remained north of the region, backside moisture and weak disturbances helped create a [significant rain event from June 17 to 19](#) across the mid and upper Valley.

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.

The current temperature forecast for May through July was for “equal chances” across South Texas/Rio Grande Valley, which means equal opportunity (33 percent for above average and average; 34 percent for below average). We tend to continue to “lean” toward **above average**, based on persistence since February, combined with a better than average expectation for the Valley to remain south of the storm track and see warm, sultry nights through early June result in the higher values until La Canícula helps boost late June and July numbers further.

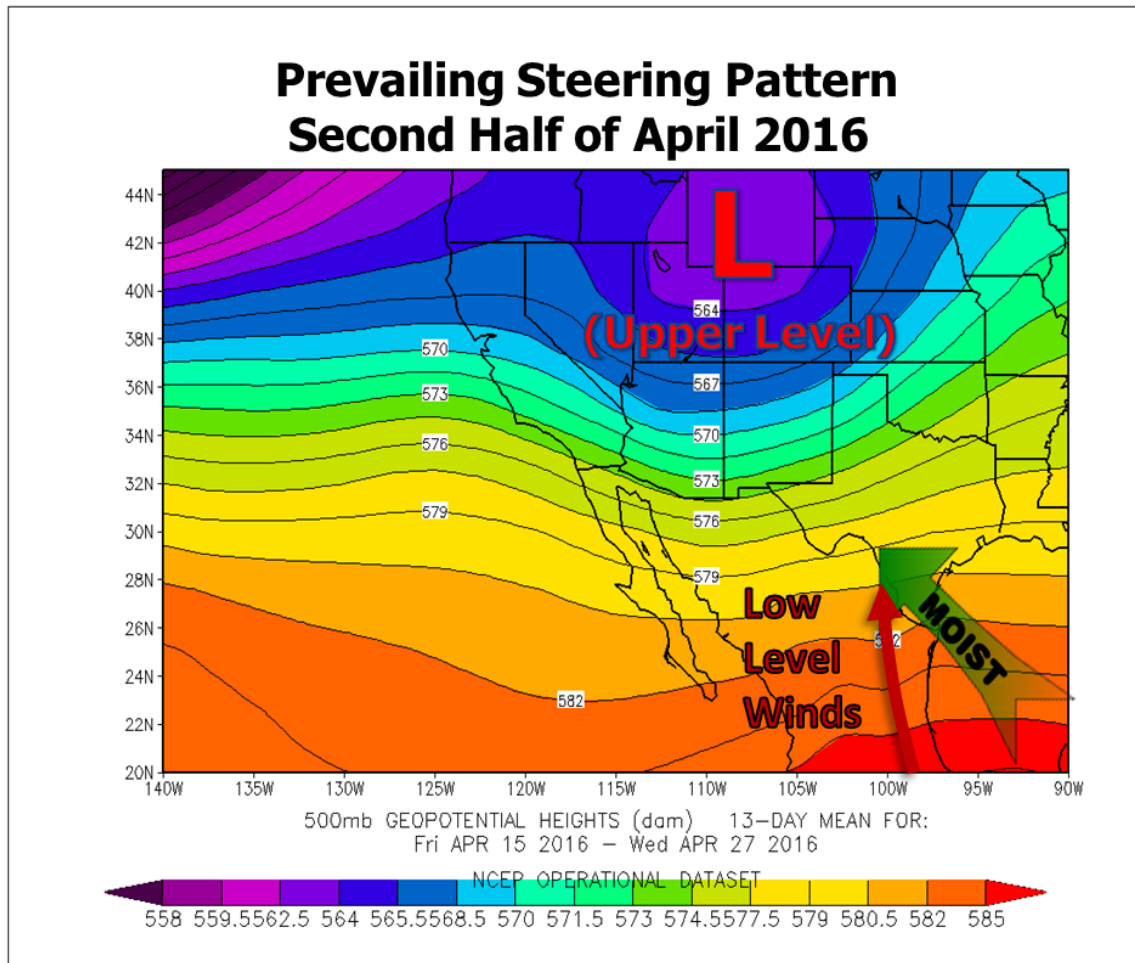


Figure 3: Mean 500 mb (upper level) pattern from April 15-27, 2016. In this case, upper level low was centered over the central Rockies, but originated in central California earlier in the month and setup in both areas at the very end of the month.

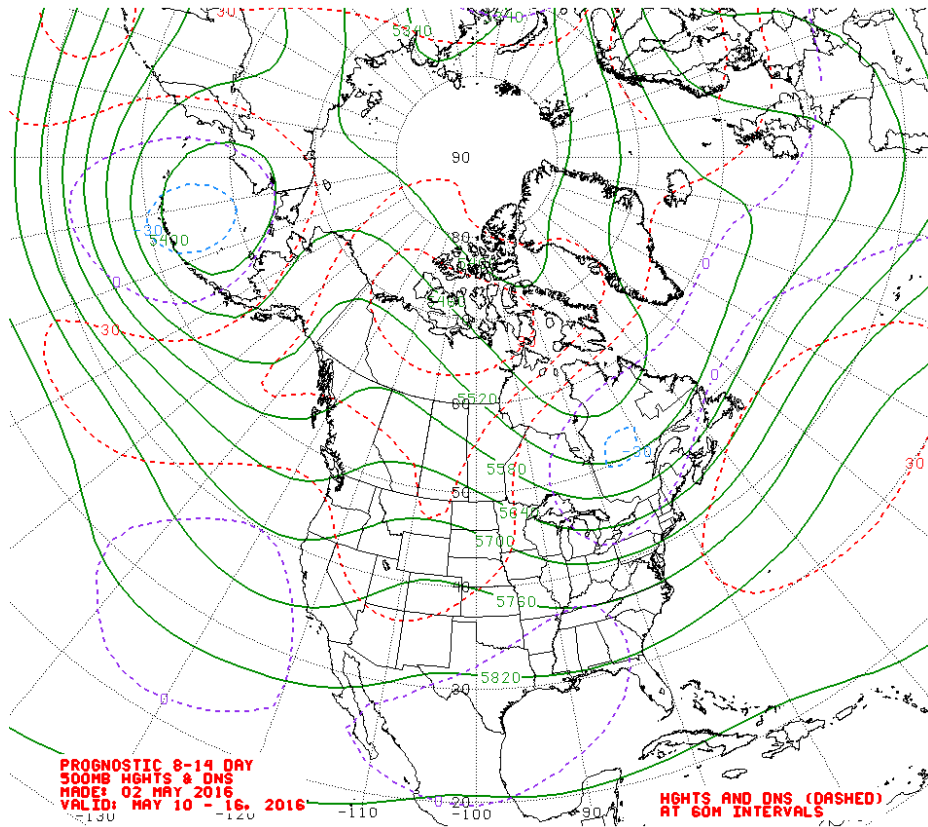


Figure 4: Second week of May, 2016, forecast of steering pattern (issued on May 2, 2016). Note the “dip” in the pattern across southern California and the U.S. four corners (Arizona, New Mexico, Utah, Colorado) region, which was common in March and April as well. The question begs: Is the dip – and any subsequent similar patterns through May and early June - far enough south to bring notable rain to the Rio Grande Valley? Or does most of the action remain farther north in Texas? Time will tell.

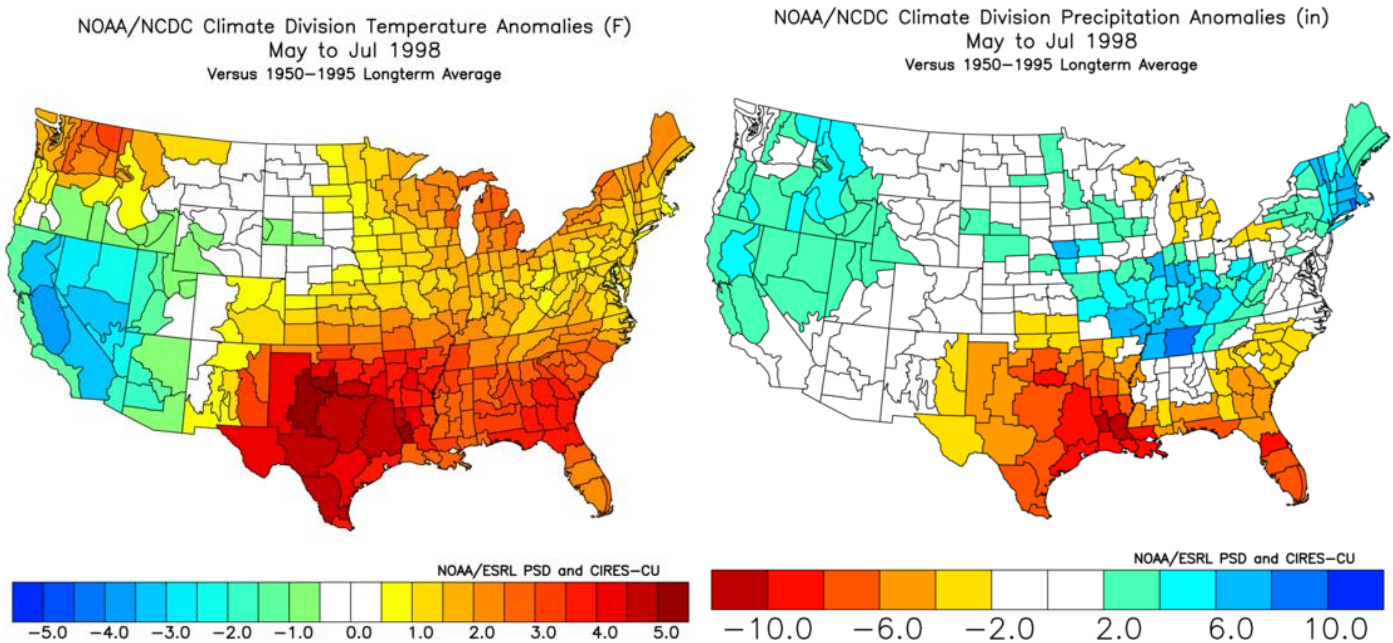
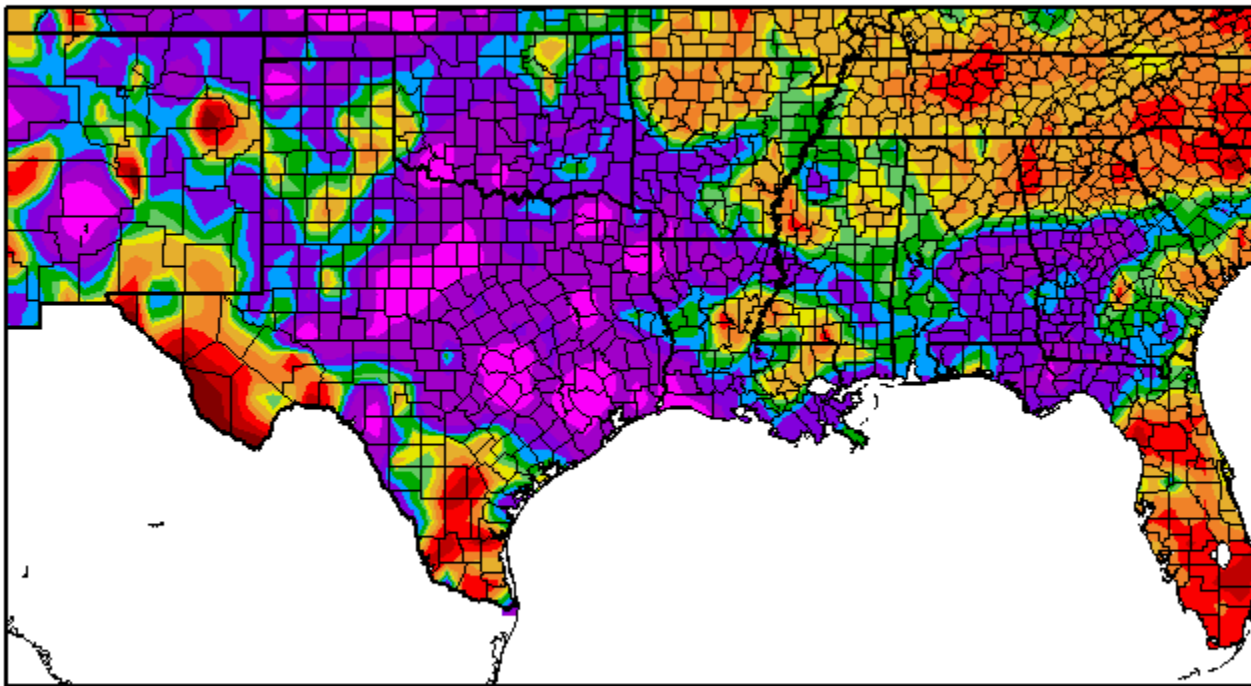


Figure 5: May-July 1998 Climate anomalies, for temperature (left) and rainfall (right), clearing showing how warm to hot and dry weather dominated east and south Texas to Florida with the upper level “heat” ridge firmly in place. However, April 2016 (below) was significantly wetter across Central, North, East, and Southeast Texas, as well as across portions of Louisiana and the Florida Panhandle. South Texas and South Florida were similarly dry.

Percent of Normal Precipitation (%) 4/1/2016 - 4/30/2016



Generated 5/2/2016 at HPRCC using provisional data. Regional Climate Centers

Preparedness, Awareness

Even if May to July ends up being on the dry (and hot) side of the pillow, severe weather in the form of hail storms, wind storms, and even small tornadoes remains an issue through much of May. Any influx of deep tropical moisture can produce thunderstorm clusters, some which may be slow-moving and create rapid onset of flooding with the general poor drainage of the region. With enough prior rain and plenty of humidity on tap, we'll push the threat for wildfire spread down a bit but keep in the mix in case late May and June turn hot and rain-free with lower humidity. We'll continue to focus on air quality (for May), heat, and potential for drought development.

- **Air Quality Concerns.** The continuation of Mexican agricultural burning, particularly over and toward the Yucatan Peninsula, combined with an expected dominant south to southeast wind flow pattern, will likely bring anywhere from a couple to numerous cases of annoying haze and polluted air from dust and smoke that causes persons with respiratory ailments, from asthma to allergies, to have breathing difficulties. At the end of March, RGV air quality reached "unhealthy" (155) for particulates before a 'norther cleaned out the air on April 1/2. Another round reached close (139) in mid April, and over 110 at month's end. The burning season continues through mid-May. Be prepared with particulate-blocking masks and other equipment, and be ready to spend time indoors in worse case situations. Clear/change air conditioning filters and service systems to ensure particulates are removed from the air before reaching the inside of the home. Keep tabs of the air quality conditions across Texas and U.S. at <http://airnow.gov>.
- **Hail, Thunderstorm Winds, Lightning, and Tornadoes?** With uncertainty reigning in the ultimate outcome of the late spring and early summer pattern – particularly by May and possibly depending on

the phase of the NAO – we urge all residents to be prepared for the hazards that thunderstorms can bring. Spring 2015 was laden with a combination of brazen lightning storms, damaging wind storms, and periodic – though minor – hail events. A mixed event largely missed the Valley on April 18/19 but did produce quarter sized hail east (South Padre Island) and west (ranchlands), and a long lived local supercell storms dropped a “blanket of golfball sized hail” in San Perlita on April 24th. May and early June’s still “chilly” mid and upper atmosphere is conducive to hail and damaging wind storms, so the Valley should remain vigilant for the oft-chance episode. Preparedness Tips can be found on a variety of guides from [this page](#); click on the links under “severe weather”. Or just check out the [2016 \(Spring\) Hazardous Weather Guide](#) for all the details!

- **Flooding Rain.** Even if spring ends up drier than average, 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 during the second half of spring, all depending on the eventual atmospheric pattern. We only need to look back to [April 2015](#) and [Spring 2015](#) overall to remember the several cases of flooding. And, a similar slow-mover in June brings even more tropical moisture with it.

It’s always a good time to check roofs and walls for leaky areas and repair; dry periods in March and probably April will provide the opportunity. But 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!! More here:

- [Flood Safety Awareness](#)
- **Excessive Heat.** Yes, the Valley is a hot place in late spring and summer. But a late May and June like 1998 would test even the most heat-hardy residents, especially since the early onset of 100°F temperatures and heat index (“feels like”) temperatures nearing 110°F or higher borne 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](#).
- **Wildfire Spread.** The number of “flash drought” events in January and February sounded the alarm to be wary of rapid spread of any wildfires that begin on “crispy” fuels such as grasses and brush. Continued dry weather will inevitably increase the area under moderate drought, and could bring severe drought to the ranchlands and mid/upper Valley at some point in June or even July. April rains were scattered, with parts of the Valley and ranchlands running at <50% of normal. Southerly flow and high relative humidity helped keep areas green, but wind shifts to the north bringing humidity down below 20 percent and temperatures near 100 as the sun gains elevation and days lengthen to bring increasing concern. 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](#).
- **Tropical Tricks?** As 2015’s [Tropical Storm Bill](#) and 2010’s [Hurricane Alex](#) showed, a rogue southwest Caribbean or southwest Gulf of Mexico tropical wave can fester into a tropical cyclone and potentially impact Texas during June. Bill occurred during the ramp-up to the current El Niño, while Alex formed during the rapid wind-down of the 2009/2010 El Niño. A dry April, May, and early June would be the perfect time to revisit your hurricane action plan and restock your family’s “stay” or “go” kit. Learn how with our most recent Rio Grande Valley Hurricane Guide, in [English](#) and [Spanish](#).