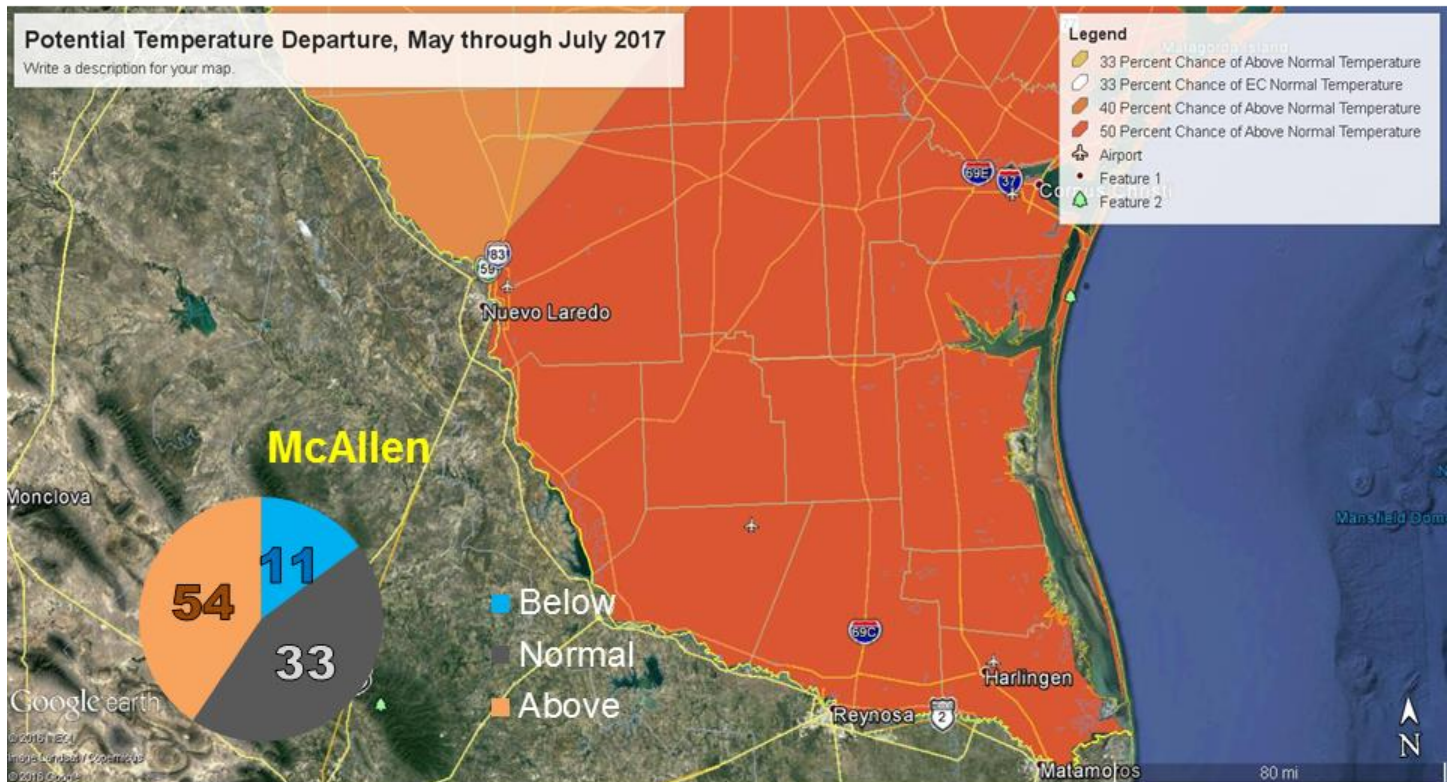


Summer Heat Begins to Match Up



Rio Grande Valley **Average Temperature** for May-July (based on 1981-2010)

Wake-Up: Lower 70s Ranchlands, Mid 70s Elsewhere

Afternoon: Mid 90s except Upper 90s Starr/Zapata and Upper 80s Beaches

Early to Mid-Summer Temperatures Expected to Continue into June

May through Early June Offer Uncertain Hope for Rain; Will La Canícula's Dryness Takeover in July?

Overview

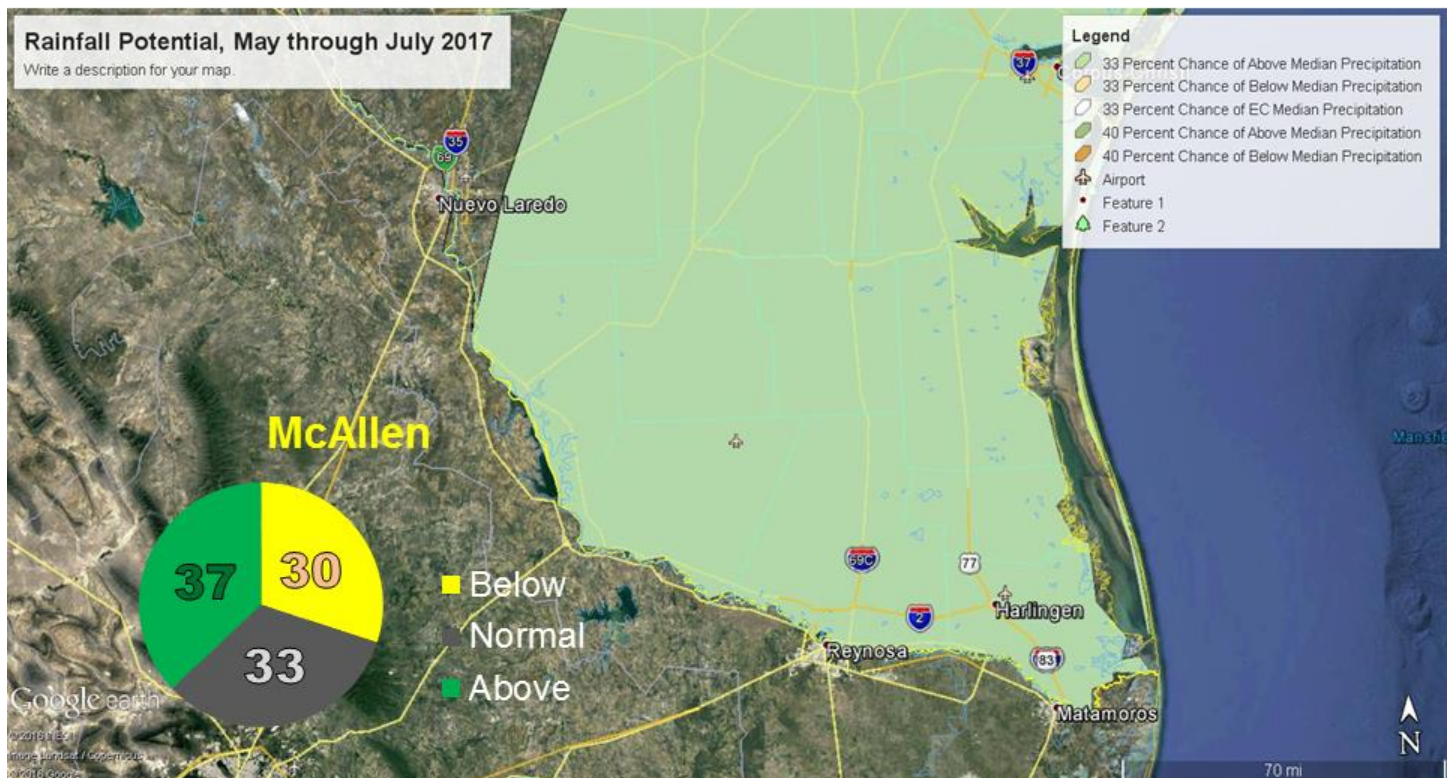
After yet another top twenty hottest month (April) on record across the Rio Grande Valley, where average temperatures ended up closer to those of mid-May than April. April finished with a sweaty, summer-like flourish with three of the final five days surging into the triple digits mainly from McAllen/Edinburg west in the Valley; even the heat index, or "feels like" temperature, soared above 111°F on the 29th – a very rare occurrence that typically doesn't arrive until the latter half of May. The last of spring (May) through the heart of summer (July) offer a confident expectation of above average temperatures to continue. If there's any good news, it may be that as the long term (1981-2010) average temperatures rise into the 90s by afternoon and 70s by morning, the departures – at least for May and June – trim back to 1 or 2 degrees vs. the 3 to 6 degrees that has been so dominant since July 2016. In fact, McAllen/Miller has had average temperatures more than three degrees above the 1981-2010 standard in every month since June – a ten-month streak!

Rainfall forecasts (below) are a more difficult proposition. A parade of atmospheric troughs moved generally from the central U.S. west coast or Pacific Northwest into the Great Basin, then generally eastward through the

southern Plains especially in March and April. While a couple of impulses brought welcome rains to parts of the Valley and Deep South Texas in [early March](#) and again just before mid April, the southern tip of Texas generally “waved” to the bigger action to the north, which included wind, hail, and tornado events in central and north Texas as well as helpful rainfall to keep drought/dry conditions at bay. May, and sometimes early June, is one of the most difficult months to handicap ahead of time. In 2015, spring (March through May) was dominated [by repeated flows of deep tropical](#) air which began in March and peaked in May with impressive rainfall totals that ended up 200 to 500 percent of the 1981-2010 average for most of the region. In 2016, the pattern was a mixed bag for March and April, but [May was also decisively wet](#), with a flatter but still notable atmospheric flow from southwest to northeast on average, which pushed multiple rain and severe storm events across the region.

The question remained open for May and early June, as April ended: Will the inevitable Southwest U.S. atmospheric systems open up and move east into northern Mexico and west Texas, driving sufficient tropical moisture into the Valley to provide ample rainfall capable of floods, as well as thunderstorm clusters that can produce large hail, damaging wind, and frequent to excessive lightning? Or will they spin in place near Baja California, keeping rain potential well west of south Texas and the region under upper level ridging? Or a third possibility: The waves lift far enough north into the southern/central Plains and keep us “waving” to the rain – increasing the potential for expanding dry/drought with the high evaporation rates and sun angle? Time will tell. For later June and July, will [“La Canicula”](#) take hold again? Such has been the trend in most years this decade and is favored with a potential weak El Niño, but confidence medium/high at this point.

Some Late Spring Rain?



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

What to Watch For: Big Picture

Overall, by the end of spring and headed into summer 2017, the following situations are expected to predominate:

- *Dry, Wet, Both?* On average, May and June rainfall tick up compared with April and July. It only takes one or two widespread thunderstorm clusters or systems to not only reach the two month average (4 to 6 inches) but surpass it with ease. There are enough signals (above) suggesting at least average rainfall with the potential for several events to bring totals above average from May through early June. Confidence remains low to medium, however, in this prediction, as upper level disturbances could hang out too far west to pump necessary tropical moisture from the eastern Pacific into the Valley, or pass by harmlessly to the north – keeping the heat and wind machine going while limiting the necessary energy and deep moisture to trigger the necessary storms. Should dry rule the period, high evaporation rates will increase areas and intensity of abnormally dry/drought conditions along with potential wildfire spread danger in cases of low humidity and gusty winds. A wetter pattern would remove any further dry/drought development – but also favor hail and wind (along with possible flooding rains) through early June, similar to 2016.
- July proved hot to very hot with minimal precipitation in 2016 – but this has been the case in all years this decade except 2010. Unless a window of opportunity opens for a Hurricane Dolly, tropical wave, or similar event (2008 was the best example of this), there is no compelling reason to think “La Canícula” won’t prevail and lean the month to the dry and hot side.

Teleconnections: El Niño Trying to Launch

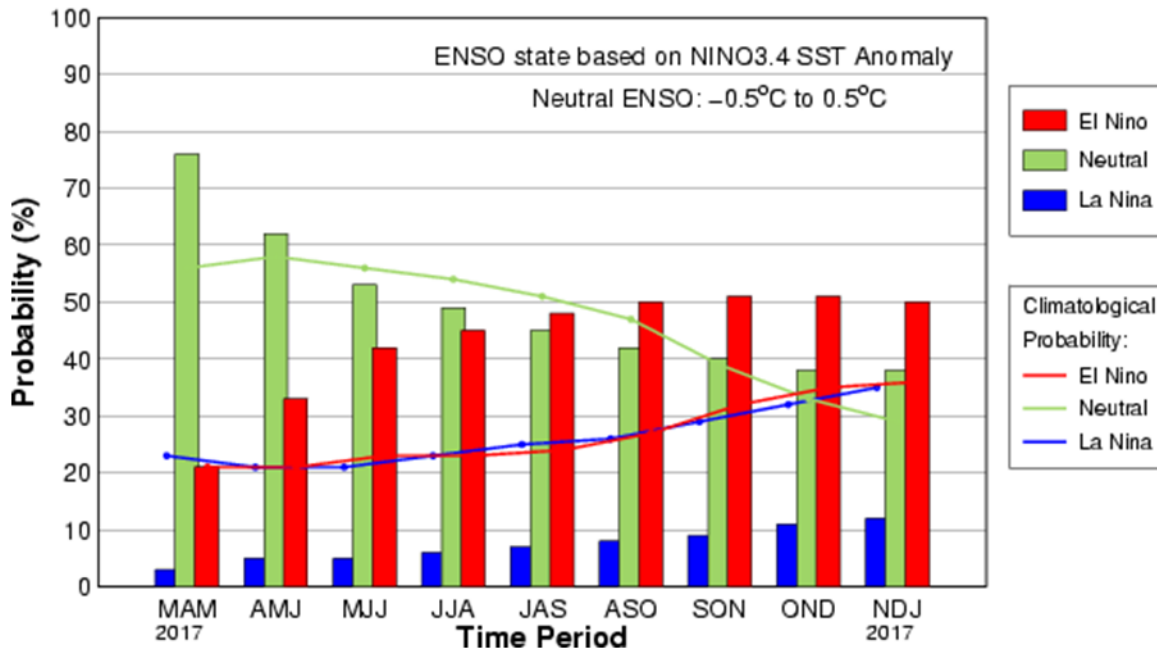
El Niño/Southern Oscillation (ENSO), which had been on a fairly quick move toward a warming eastern tropical Pacific, slid back into neutral leaning positive territory in April. Historically, spring warm surges have the potential to be “false positives” – and the neutral ENSO phase can last longer than expected. As shown below, by the end of the June-August period, the probability of El Niño and Neutral are statistically tied, implying that monthly Oceanic Niño Index (ONI) values for July would lean into a weak El Niño phase. This would tend to enhance the probability of a dominant La Canícula in July – hence the medium/high confidence of a (slightly) hotter than average July with slightly below average rainfall – very dependent on whether any “one-off” systems (thunderstorms, tropical/easterly waves, etc.) develop.

Other teleconnections contribute to the tricky late spring/early summer forecast. Similar to mid spring 2016, the North Atlantic Oscillation (NAO) has been in a persistent period of positive phase (+NAO) since the year began, but will it remain so as spring closes and summer arrives? The predictability of the NAO remains around one to two weeks, so only time will tell. As May began, there were some indications of negative phase (-NAO) conditions by mid-month – perhaps the start of a trend toward summer (which was the case in 2016). –NAO conditions in summer have often correlated well with hot, dry periods in south Texas; time will tell if this trend continues. Conversely, a +NAO dominating into July, along with a neutral ENSO (if that is the actual case) could favor a stronger Bermuda/southeast U.S. upper level ridge and a less influential “Canícula” ridge – possibly opening the door for tropical/easterly waves in July which would bring more rain and lower temperatures due to cloud cover (and the rain).

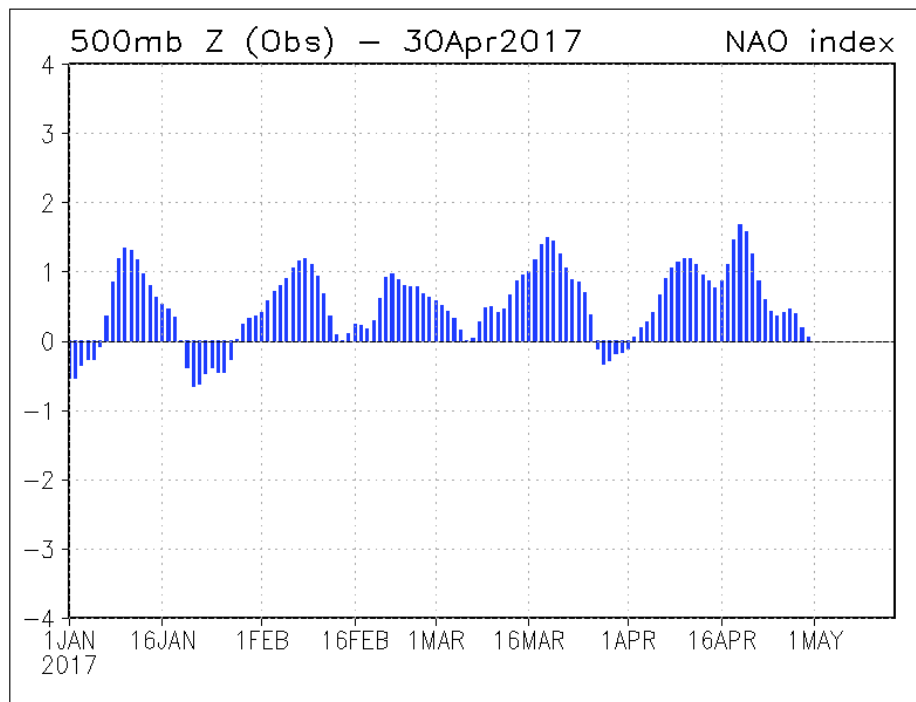
The Pacific-Decadal Oscillation (PDO) remained modestly positive into March (January-March), marking the 39th consecutive positive phase triad which began at the start of 2014. There is limited correlation between the PDO and late spring/summer conditions in south Texas – in fact, slightly cooler than average eastern Pacific (non-tropical) waters have oscillated with slightly above normal sea surface temperatures since March; additional storminess could keep water temperatures from recovering too quickly through May

The uncertainty in the future of each of these teleconnections adds to the low confidence of exactly how the May through early June rainfall potential is realized. As teleconnection trends and overall pattern trends develop through the period, there should be increasing confidence on how summer overall (June-August) ends up, especially regarding precipitation and the onset of the peak of the Atlantic hurricane season. For now, confidence is higher in the temperature forecast than the rainfall forecast – though the seasonal departure from average temperature departure is likely to be less than recent departures, which were as high as 10 degrees above average in February and held solid at 3 to 5 degrees above in March and April.

Early-Apr CPC/IRI Official Probabilistic ENSO Forecast



Above: Probabilistic ENSO forecast through early winter 2018, showing neutral conditions potentially fading to a weak El Niño by mid to late summer 2017.



Phase of the North Atlantic Oscillation, January through April, 2017. Note the dominance of the positive phase (+NAO, above zero) for nearly all of the period. Forecasts through the first half of May suggested a switch to at least a brief period of negative NAO (-NAO); unknown is whether it would become a trend or only be temporary.

Pattern Matters

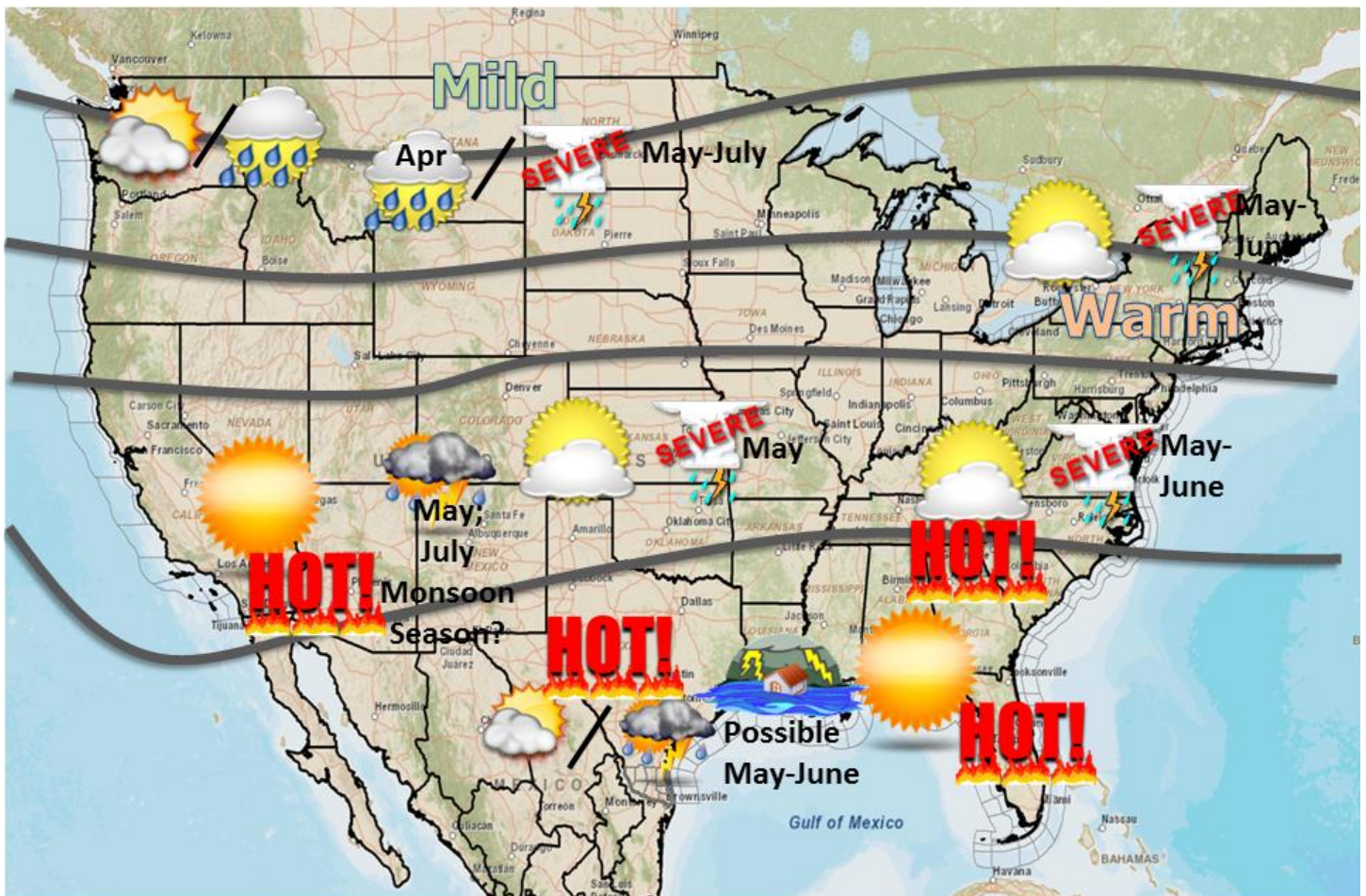
Given all these factors, we expect the U.S. weather steering pattern from May to July 2017 to look quite similar to that from [April through June](#). The main adjustment is to “lift” the pattern a bit farther north to cover the potential for La Canícula in July. The mean pattern would favor weak upper level troughing in the southwest U.S. with flat but generally building ridging farther east, favoring the southeast U.S. but also stretching back to

the Texas coast. Some of the expected rainfall across the U.S. Four Corners (New Mexico, Colorado, Arizona, and Utah) region would be from May/early June troughs, while late July could see an onset of the summer monsoon season where moisture flows north around the west edge of the Canicula ridge.

In terms of sensible weather, the Valley can expect a mix of sunshine and clouds, with occasional hazy periods courtesy of south to southeast low level flow from the last of agricultural (and some industrial) burning ins southeast Mexico/southern Yucatan Peninsula through May. The "Valley Wind Machine" will ebb as surface pressure systems heading across the southern Great Plains begin to weaken, but gusts to 30 mph are still possible at times. The higher levels of the atmosphere will remain relatively cold (compared to later June and July) which will support large hail, damaging wind, frequent lightning, and flooding rain from the strongest storms – but only if the river of air known as the jet stream allows it. This is why "possible" is shown for the potential of flooding rains for a third year in a row from southeast Texas to parts of Louisiana – with even more uncertainty for the Rio Grande Valley. Later June and July should see the seasonal loss of the wind machine, with more onshore flow and azure blue skies and a welcome loss of sooty haze as agricultural burning fades in Mexico.

Elsewhere in the United States, hot weather is expected across the southern tier, with dry weather increasing the threat for worsening drought in the southeast through the period, but improvement in Florida by June and July as the sea breeze thunderstorm season gets underway. The remainder of the country looks to be warmer than average, with potential severe weather lifting from the southern Plains north and east into the central/northern Plains to the Northeast/New England.

Expected Steering Pattern May-July 2017



Outlook: Late Spring-Summer 2017

May should begin on a “near normal” note, with slightly above normal temperatures and no rainfall followed by the season’s last front, which will bring a fantastic first weekend of pleasant temperatures and low humidity. Humidity returns for the second week, along with temperatures headed back above 90 but just a few degrees above the 1981-2010 average for the middle of the month. Thereafter comes the tricky part: Will energy impulses diving into southern California “open up” into Baja and northern Mexico and provide the deep tropical moisture necessary for significant rainfall events in the form of severe thunderstorms (damaging wind, hail) and flooding rainfall? In 2016, the second half of May was active and concluded with a macroburst event of [85 to 95 mph wind](#) and at least \$10 million in property damage to the Mission-Hidalgo (City) portion of Hidalgo County on the 31st. Or, will Deep South Texas/RGV “wave” to the energy – whether spinning over Baja or lifting into the southern Plains, with little more than more heat and hazy skies?

June could begin where May left off – similar to 2016, where a heavy rain and local wind damage event occurred on the 4th – before settling into drier and generally hot weather to finish. And then there’s the tropical wild card, evidenced by rapidly forming Tropical Storm Bill in mid-June, 2015, which was followed by related moisture wrap that combined with favorable upper level energy to drop more than eight inches of rain on the King Ranch, near Hebbronville (Jim Hogg), and a pocket around Edinburg between [June 17-19](#). The June tropical wild card is only possible if a period of back-building southeast U.S. high pressure can reach south/central Texas, and an early season disturbance can form in the western Caribbean or Bay of Campeche and move northwest toward the Texas coast. As of this writing, that situation is impossible to determine.

July should continue to see the heat build, with 100° days along and west of US 281/IH 69C becoming the norm by mid-month, if not sooner. Should a weak El Niño become established, and neutral to –NAO join up, Canícula will set up shop with an upper level ridge becoming established over west Texas/New Mexico extending into northern Mexico. If neutral ENSO and some type of +NAO prevail, the potential for the Bermuda ridge to dominate increases. If the ridge extends only to the western Gulf, a channel could develop that allows tropical waves to slide into northeast Mexico/south Texas (similar to 2008) and guarantee any dry/drought to be wiped out. The current “lean” remains on the hot, dry, “Canícula” side.

Preparedness, Awareness

It’s a mixed bag heading into late spring and early summer. Just about every possible hazard should be prepared for, ranging from severe local storms to heat and even drought. We’ll try to order them as best we can see the trends at this point, heading into May 2017.

- **Heat and Hydration.** The close of April (29) featured oppressive heat and humidity, including “feels like” temperatures between 107 and 116 – a rare day even in July. The atmosphere can still produce unusually warm/humid conditions in May (i.e. when strong surface low pressure systems move through the southern Even dry heat following wind shift lines (“fronts”) requires plenty of water to replenish lost moisture for people and pets, and whether the actual or feels like temperature surpasses 100°F, residents should continue to acclimate for periods of heat that are above the average at times through the period. For heat safety tips, check our local [heat awareness page](#) and the NWS [national page](#).
- **Thunderstorms.** We’ve bumped this hazard up to second, particularly for the threat in May and early June and based on the following: 1) Severe weather and thunderstorm flood season peaks in May (with the flood season extending into June); 2) Atmospheric pattern trends through April that could lead to similar outcomes that occurred in wet to very wet and stormy Mays of 2015 and 2016; 3) The reality that May is the peak of the Valley’s severe weather season – before tailing off around or just after mid-month. Any series of “Baja upper lows” remaining intact while moving through northern Mexico and Texas in May could deal a similar blow. We only need to step back to [May 31, 2016](#), to remember the impacts of wind and very large hail on the Rio Grande Valley.

Residents should continue to prepare their homes – check roofs, fences, siding, outdoor anchored furniture, etc. – and check their safety plans to have families ready for quick response should warnings be issued. This is not bad practice as the Atlantic Hurricane season is also around the corner.

- Flooding.** With late spring thunderstorms in the Valley, flooding can never be ruled out. Thunderstorms that initially produce wind and hail can evolve into “systems” that ultimately dump more than 4 inches of rain on sometimes unsuspecting poor drainage locations. March, and perhaps into early April (if no events have occurred), is time to revisit the following:
 - Flood Insurance. If you live in any poor drainage location, whether in a defined flood zone or not, March is the time for peace of mind. Remember, inundation flooding is **not** covered by conventional windstorm or fire/theft insurance.
 - Clear out any drainage canals, ditches, etc. of winter or early spring debris. This include sewer entries, traps, etc.
 - Check roofs and walls for leaks or cracks and seal them to prevent rainwater from entering home during downpours.
 - Do you know which roads flood in your neighborhood? In your community? Plan out alternate routes **now**, before flood conditions arrive.
- Poor Air Quality.** The agricultural burning season in southeastern Mexico and the Yucatan Peninsula continues through mid to late May. In both 2015 and 2016, persistent and often humid south/southeast low level flow underneath subsidence inversions set up often by warm/dry air above the surface flowing from the Sierra Madre Oriental often trapped fine particulates of soot near the ground, causing frequent periods of deteriorated air quality. On April 29, the first “Unhealthy for Sensitive Groups” Air Quality Index arrived in the Rio Grande Valley and impacts spread north to San Antonio. Persistent periods when agricultural burning is maximized and southeast/south humid surface flow combines can produce levels that are Unhealthy for Sensitive Groups. Sometimes, the Air Quality Index rises to or just above Unhealthy for All Groups, as was the case on March 31, 2016. You can keep tabs of air quality levels by surfing to airnow.gov and clicking on Texas. Additional updates and forecasts can be found at the [Texas Commission on Environmental Quality](#). Learn more from our [Hazardous Weather Guide](#) (scroll to page 20).
- Drought Severity.** This could be a spring to require 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 immediately, to be ready in case spring rains fail to materialize and the return of El Niño in summer potentially puts the damper on deep tropical moisture and cyclones.

Drought Severity Classification			Ranges				
Category	Description	Possible Impacts	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